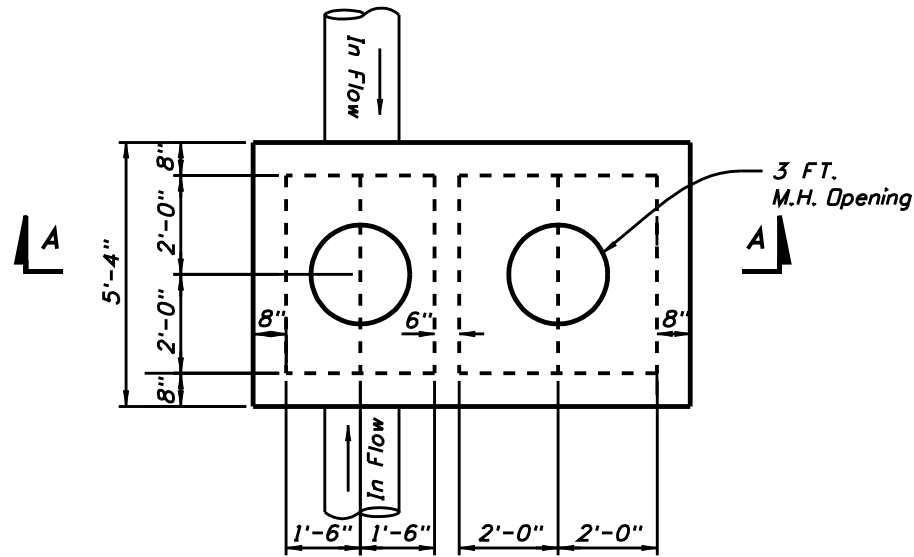
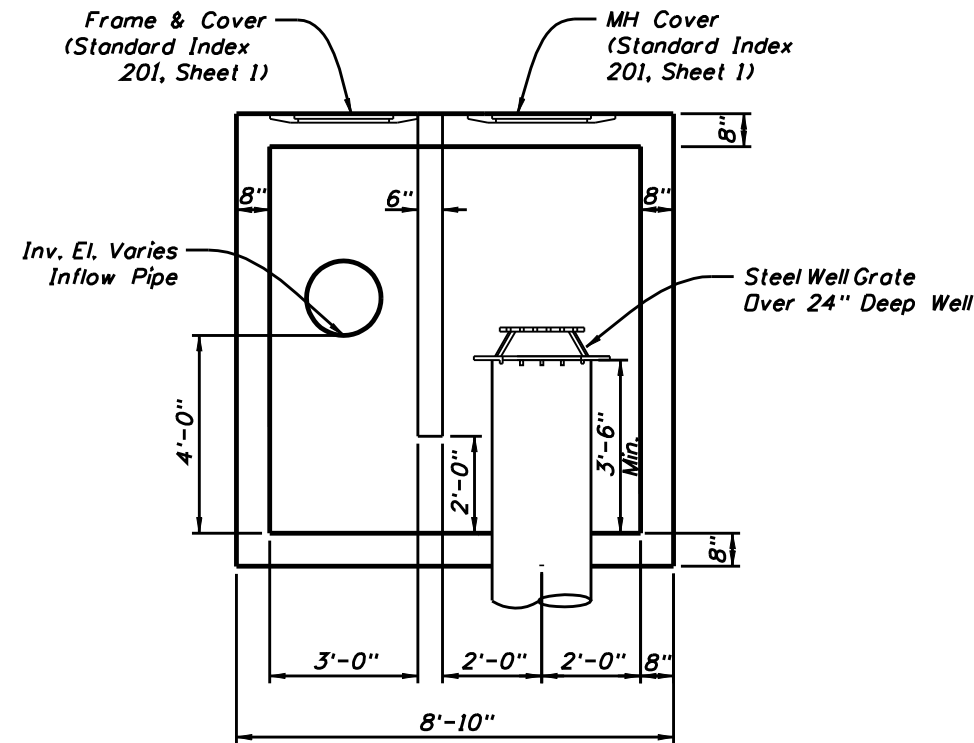


STEEL WELL GRATE DETAIL
NEENAH GRATE CATALOG NO. R-4341-A
OR EQUIVALENT

Note: Steel well grate to be installed over 24" deep well.
Steel grate to be hot dipped galvanized after fabrication.
Cost to be included in the price of casing.

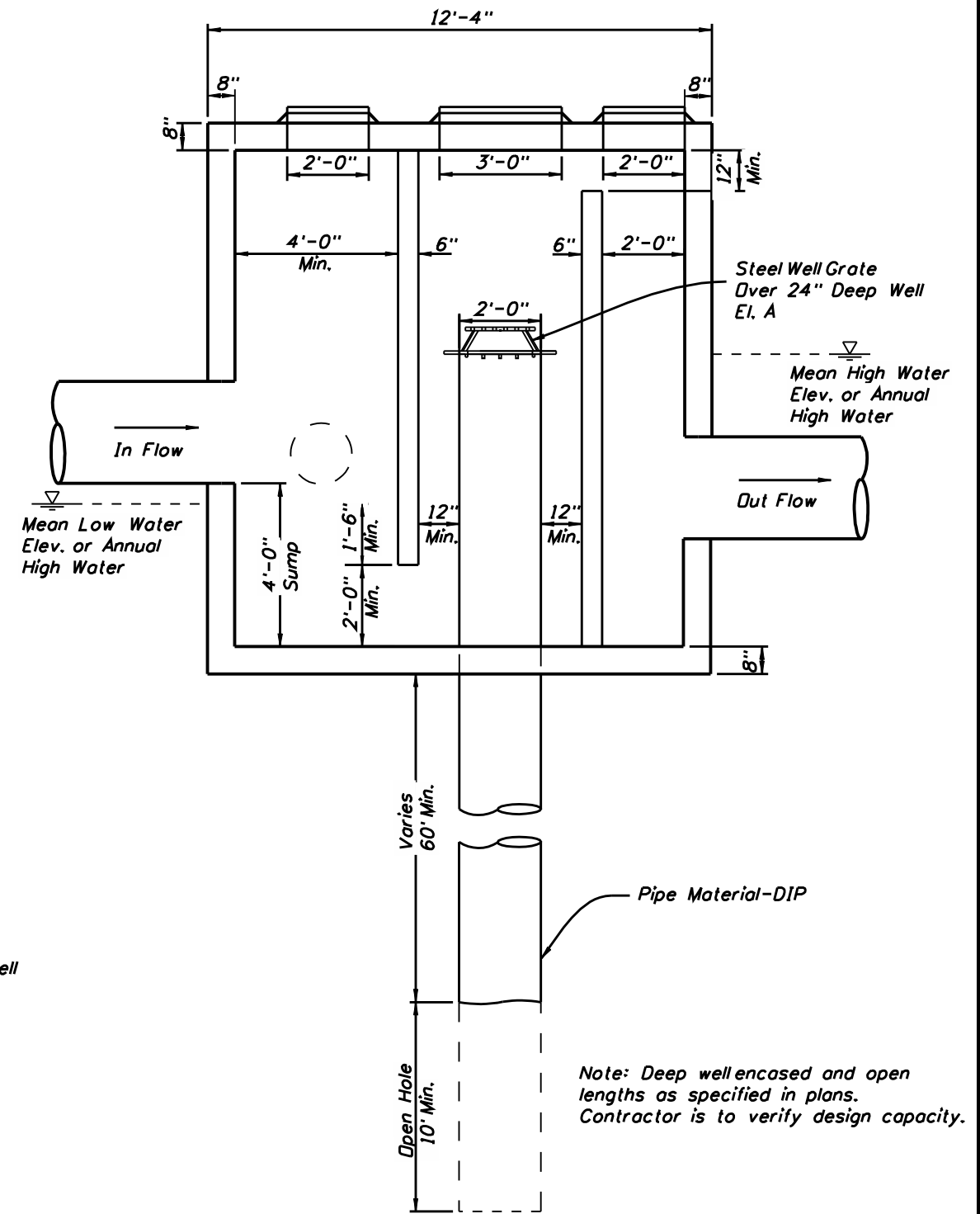


TOP SLAB PLAN



SECTION A-A

STRUCTURE WITH NO OUTFLOW

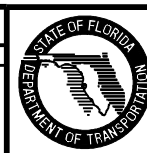


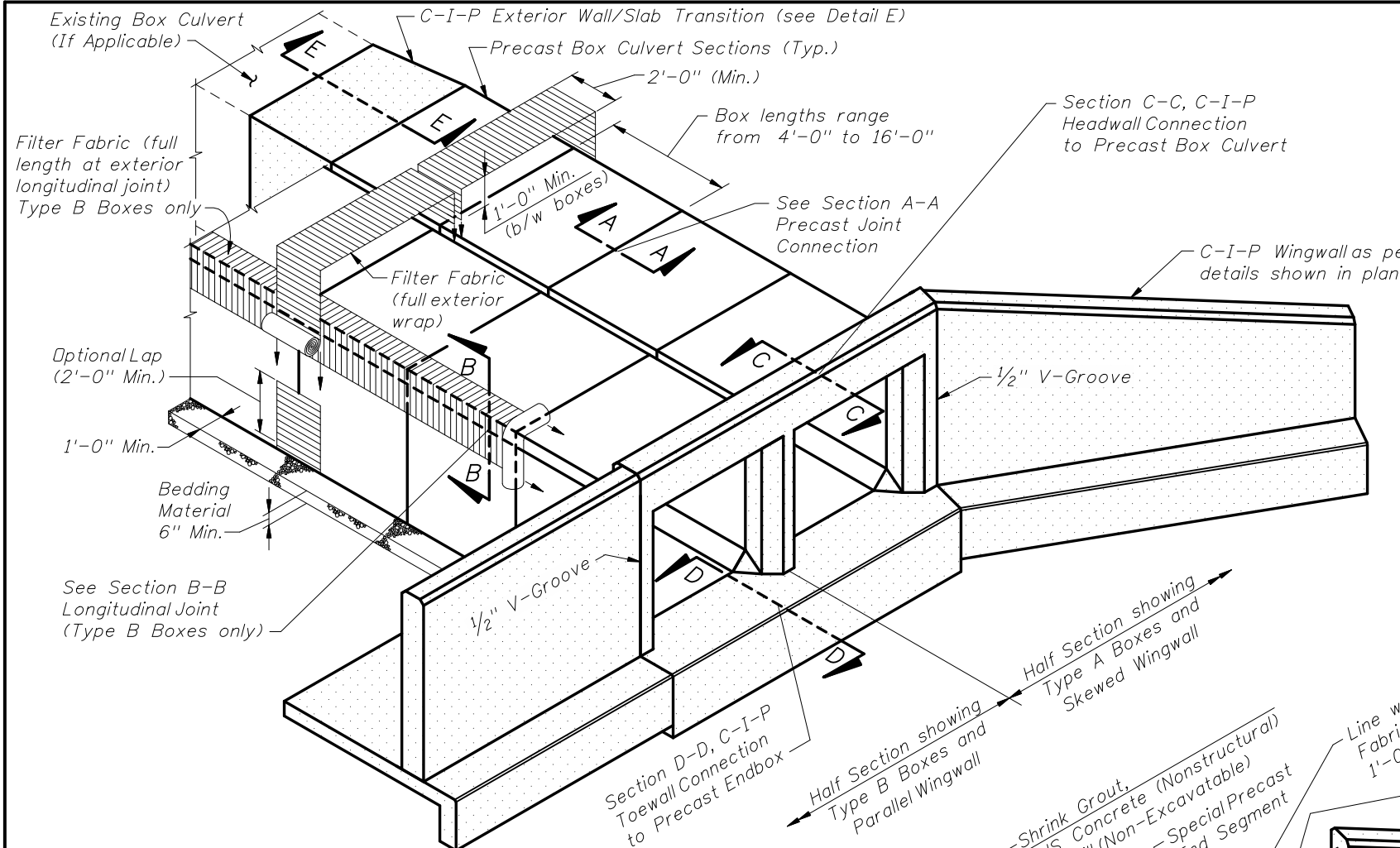
SPECIAL MANHOLE STRUCTURE
DETAIL WITH OUTFALL

Design Notes

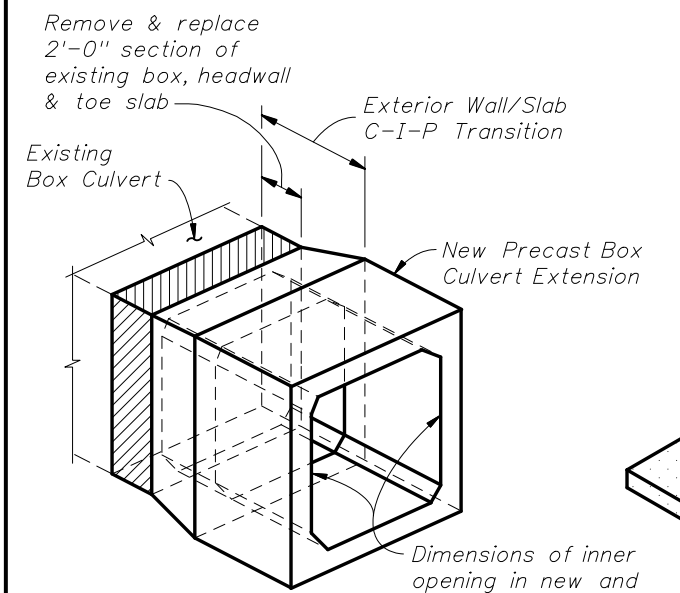
1. Depth of Casing Varies, 60' min.
2. Depth on Open Hole, 10'-20'.
3. Actual Size Of The Inflow And Outflow Chambers Will Be Determined By The Size Of The Pipes (Refer To Table 3 Of Index 200.) The Width Of The Box Shall Be Constant Based On The Largest Pipe. The Length Is To Be Adjusted Based On Size and Orientation Of The Pipes.

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
01/01/09	MTP	This Is A New Standard For Deep Well Injection.			

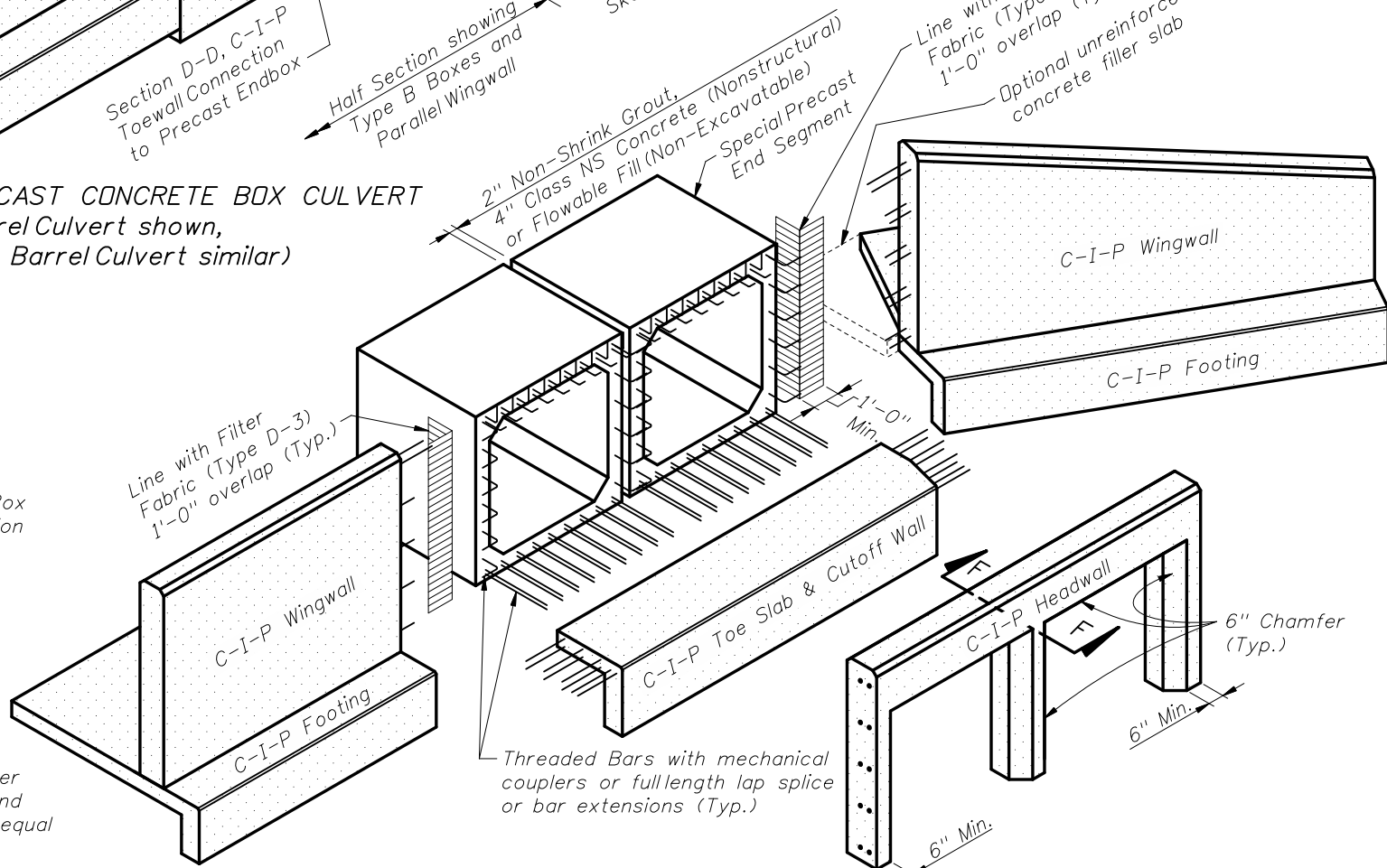




ISOMETRIC VIEW OF PRECAST CONCRETE BOX CULVERT
(Double Barrel Culvert shown,
Single or Multiple Barrel Culvert similar)



DETAIL E
PICTORIAL VIEW OF EXTERIOR
WALL/SLAB TRANSITION



EXPLODED VIEW OF CONNECTIONS AT END OF CULVERT
(Double Barrel Culvert shown, Single or Multiple Barrel Culvert similar)

PERMITTED PRECAST ALTERNATE BOX SECTIONS				
TYPE	DESCRIPTION	SINGLE BARREL	MULTIPLE BARRELS	DESIGN NOTES
A	Single Cell Monolithic (Four Sided)			Index No. 292 or Contractor Design
B	Single Cell Two-Piece (Four Sided)			Contractor Design
C	Multicell Monolithic	Not Applicable		Contractor Design

GENERAL NOTES:

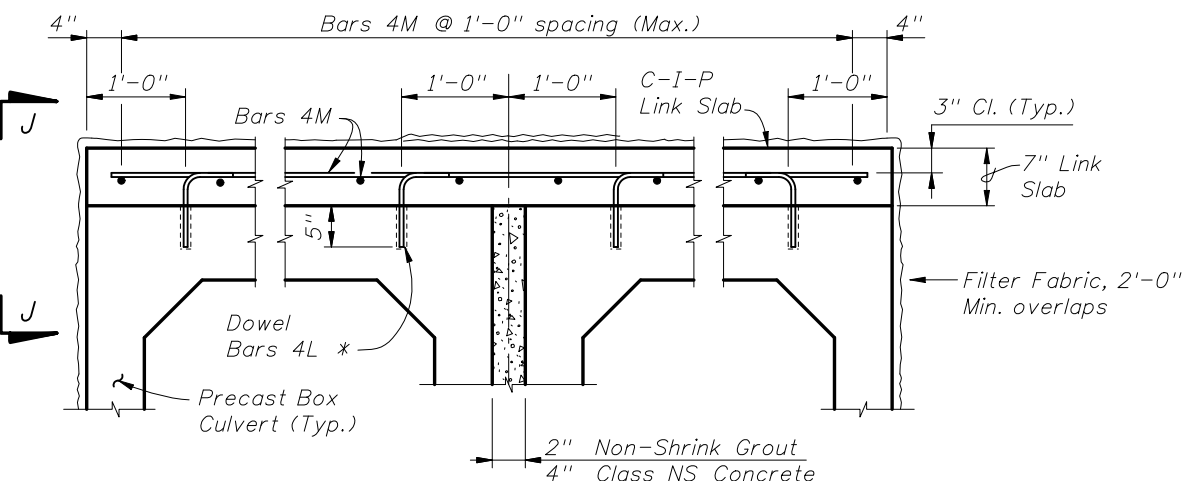
- Specifications:
 - General:
 - FDDT Standard Specifications for Road and Bridge Construction, Section 410 (current edition, and supplements thereto).
 - Concrete (Precast):
 - Class III or Class II Modified (5,000 psi) for slightly aggressive environments.
 - Class IV (5,500 psi) for moderately to extremely aggressive environments.
 - Concrete (Cast-In-Place):
 - Class II (3,400 psi) for slightly aggressive environments.
 - Class IV (5,500 psi) for moderately to extremely aggressive environments.
 - Reinforcing Steel:
 - ASTM A615 Grade 60 deformed bar unless otherwise noted, with a minimum clearance of 2" for slightly and moderately aggressive environments or 3" for extremely aggressive environments, unless otherwise shown. Equal area substitution of welded wire (WWR) reinforcement is permitted.
- Work this Index with the Cast-In-Place Concrete Box Culvert Details and Data Tables shown in the plans, Index No. 289 and the Precast Concrete Box Culverts shown in the shop drawings.
- All joints between precast sections must be tongue & groove with joint sealant. Joints between cast-in-place & precast sections shall have longitudinal reinforcing extending from top, bottom & both side slabs of the precast box tied to the cast-in-place reinforcement. Single barrel culverts may have precast headwalls cast integrally with the end segment when approved by the Engineer.
- Extension of existing multiple barrel box culverts with multiple single cell precast box culverts is not permitted unless approved by the District Structures Engineer. Full transition details must be shown in the shop drawings when approved.
- Culverts larger than the specified size may be substituted with no additional payment to the Contractor. Substitution must be approved by the Engineer, minimum earth cover and invert elevations shown in the Contract Documents must be maintained.

INSTRUCTIONS TO DESIGNER:

- Show Differential Settlement (ΔY) and Effective Length (L) for single curvature deflection in the Contract Plans where significant long-term settlement is anticipated. See Sheet 5 of 5 for details.

REVISIONS			
DATE	BY	DESCRIPTION	DATE
01/01/09	SJN	Changed "Class I Concrete" to "Class NS Concrete".	





LINK SLAB TYPICAL SECTION
(Multiple Barrel Culvert shown, Single Barrel Culvert similar)

* Install dowels with an Adhesive Bonding Material System in accordance with Specification Section 416. The Contractor may substitute mechanical couplers in lieu of adhesive bonded dowels. Shift dowels to clear box culvert reinforcing.

LINK SLAB NOTES:

1. Provide a Cast-In-Place Link Slab to ensure uniform joint opening of precast box culverts when the differential settlement shown in the plans exceeds the following limits, except that a Link Slab is not required for differential settlements less than 1/2".

$$\Delta Y \leq \frac{(L)^2}{760 \times R \times W}$$

Where:
 ΔY = Maximum Long-Term Differential Settlement (ft.)
 R = Exterior height of Box Culvert (ft.)
 W = Length of Box Culvert Segments (ft.)
 L = Effective length for single curvature deflection (ft.)

2. Extend Link Slab to back face of headwalls and to limits of existing box culverts for extensions.

ESTIMATED LINK SLAB QUANTITIES		
ITEM	UNIT	QUANTITY
Class II or IV Concrete (Culvert)	CY/SF	0.0216
Reinforcing Steel (Roadway)	Lb./SF	1.52

NOTE: Estimated quantities are based the plan area of precast box slabs, and are provided for information only. No additional payment will be made for Link Slabs where these are required for the precast box culverts.

BILL OF REINFORCING STEEL			
MARK	SIZE	NO. REQ'D	LENGTH
L	4	2 per Barrel/Ft.	1'-3"
M	4	As reqd.	As reqd.

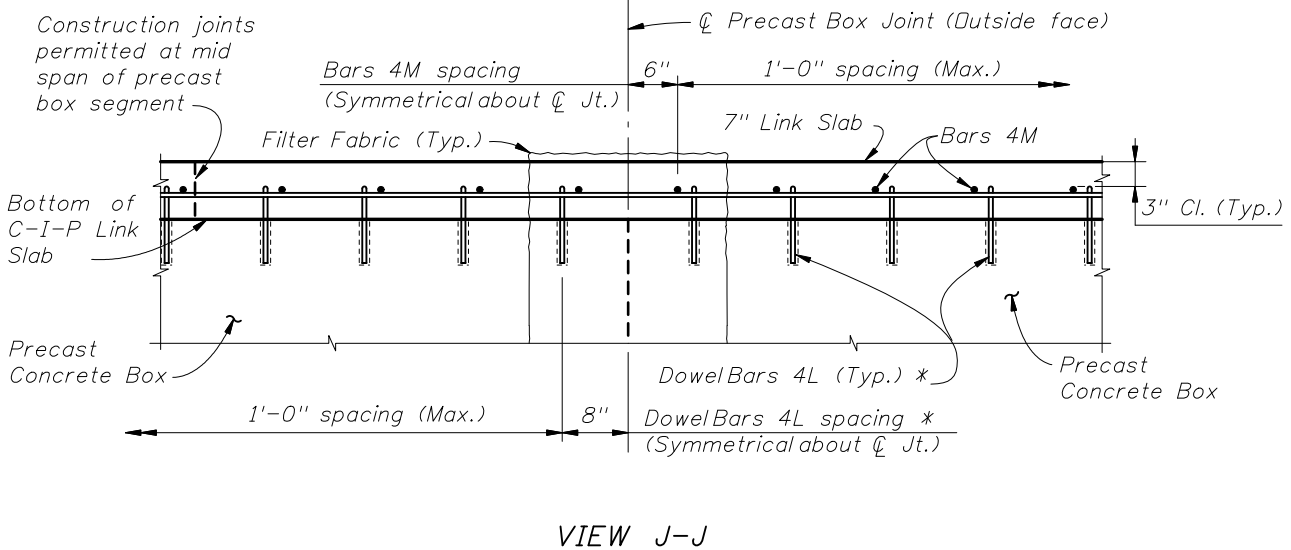
REINFORCING STEEL BENDING DIAGRAMS

NOTES:

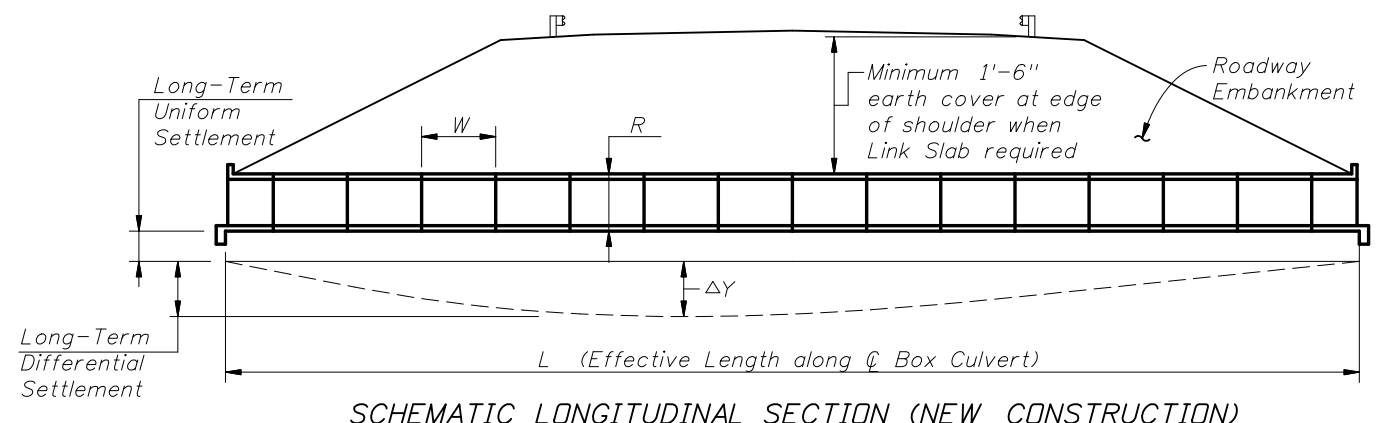
1. All bar dimensions are out to out.
2. Lap splice length for Bars 4M is 1'-4" minimum.

DESIGN NOTE:

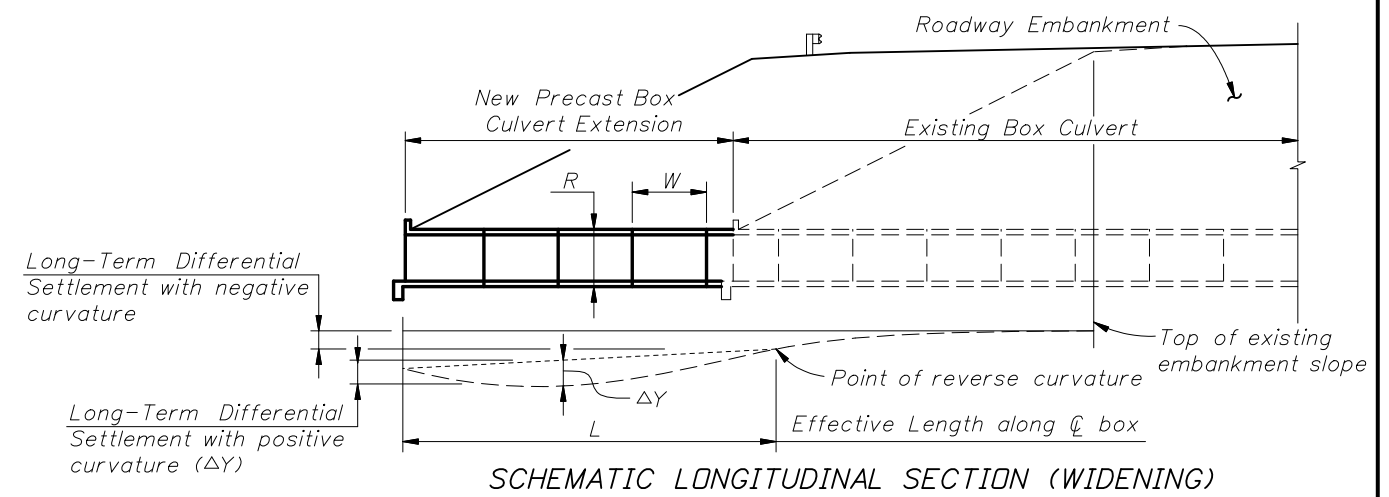
1. Link Slab required when joint openings from differential settlement exceed 1/8" as determined in Link Slab Note 1.



VIEW J-J



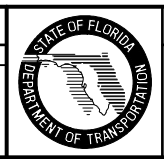
SCHEMATIC LONGITUDINAL SECTION (NEW CONSTRUCTION)



SCHEMATIC LONGITUDINAL SECTION (WIDENING)

DIFFERENTIAL SETTLEMENT COUNTERMEASURES FOR PRECAST BOX CULVERTS

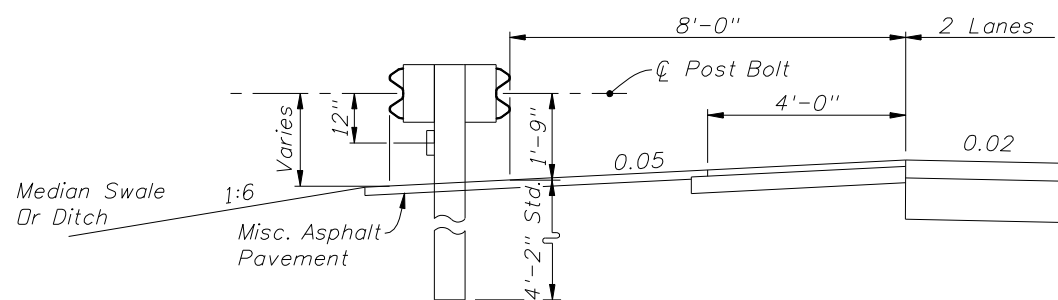
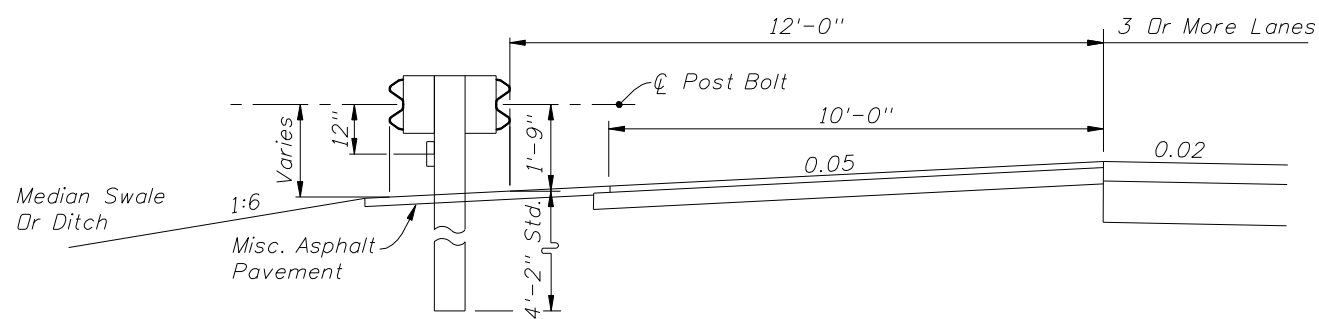
REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
01/01/09	SJN	Changed "Class I Concrete" to "Class NS Concrete" and Bond Beams to Link Slab.			



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SUPPLEMENTAL DETAILS FOR PRECAST CONCRETE BOX CULVERTS

Interim Date	Sheet No.
01/01/09	5 of 5
Index No.	
291	



Notes:

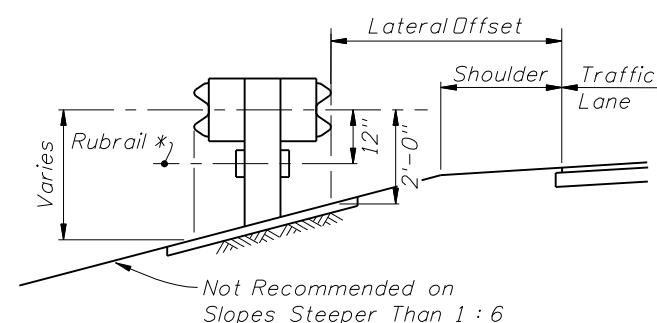
1. Typical placement shown. May be constructed at other locations as called for in the plans.
2. Rubrail required on median side or ditch side of barrier.

MOUNTING HEIGHT FOR DOUBLE FACED GUARDRAIL ON MEDIAN SHOULDERS (FREEWAYS)

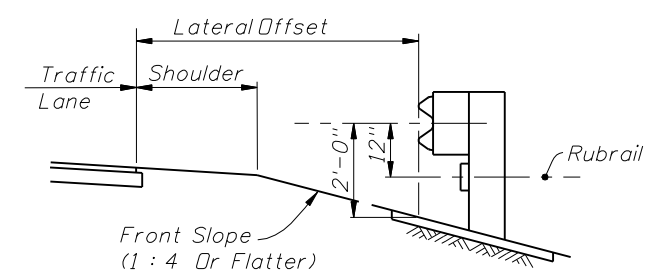
LATERAL PLACEMENT ON SLOPES (FROM EDGE OF NEAR TRAFFIC LANE) ⁽¹⁾			
Slope	Standard Guardrail ⁽²⁾	Guardrail Not Recommended	Guardrail With Rubrail ⁽³⁾
1:4	to 13'	14' to 27'	28' to 45'
1:5	to 14'	15' to 25'	26' to 45'
1:6	to 16'	17' to 22'	23' to 45'
1:7	to 20'	21' to 24'	25' to 45'
1:8	to 25'		26' to 45'
1:9	to 26'		27' to 45'
1:10	to 27'		28' to 45'

Notes:

- (1) For shoulders less than 12' in width the tabulated values will be reduced by the difference between 12' and the shoulder width. Placement of guardrail on front slopes steeper than 1:4 not recommended. Cost of rubrail to be included in the contract unit price for guardrail.
- (2) Standard guardrail: 1'-9" to ϕ post bolt. Rubrail required on median side when double face guardrail is used.
- (3) Guardrail with rubrail: 2'-0" to ϕ post bolt.



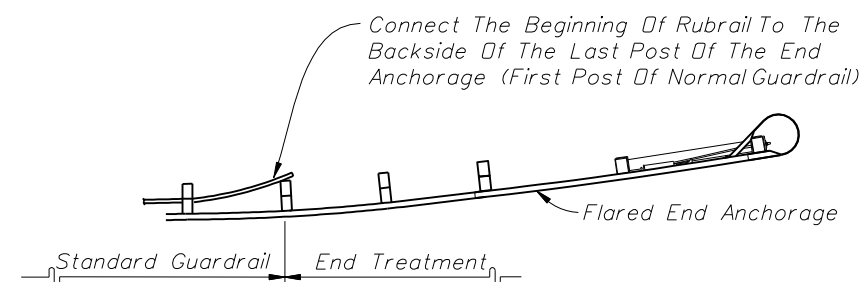
GUARDRAIL ON MEDIAN SLOPES



GUARDRAIL ON OUTSIDE SLOPES

* C6x8.2, Plates And Fastners or Bent Plate And Fastners In Accordance With Standards RLR01 And RER01 Of AASHTO-AGC-ARTBA "A Guide To Standardized Highway Barrier Hardware"

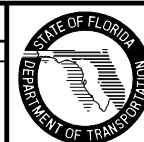
GUARDRAIL ON SLOPES



RUBRAIL TERMINATION

REVISIONS

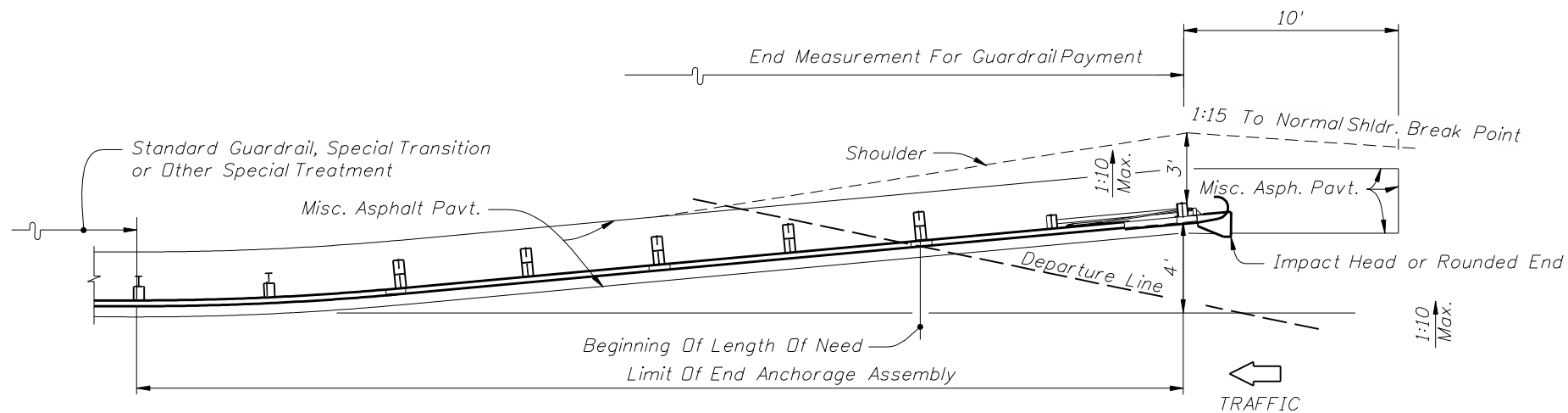
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
12/10/08	ABK	Added details for guardrail on slopes			



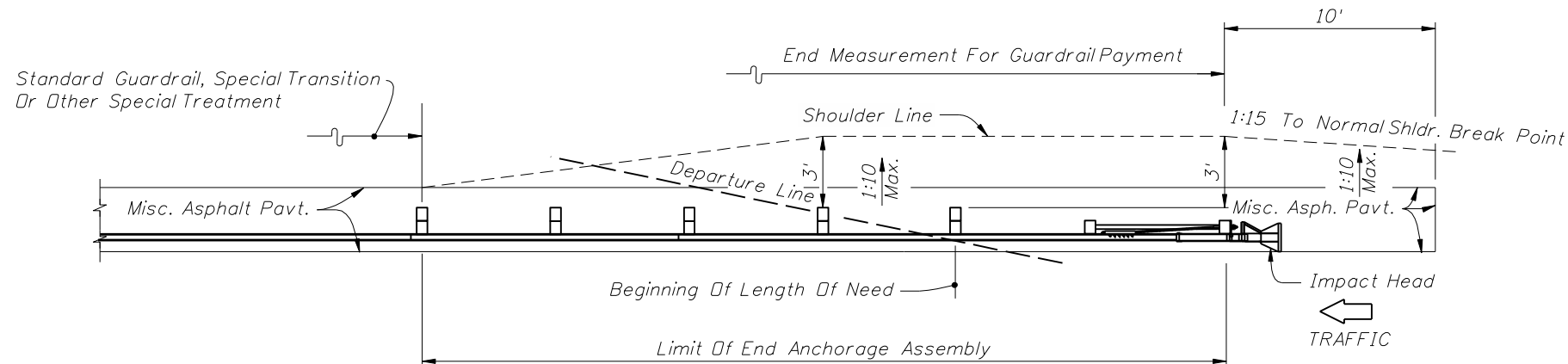
2008 Interim Design Standard

GUARDRAIL

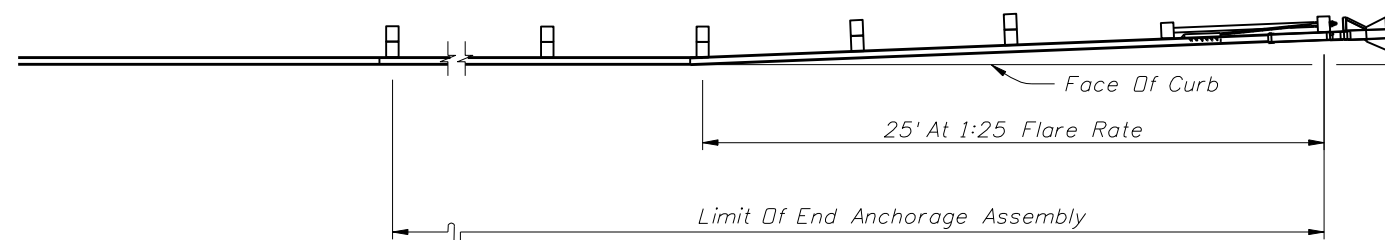
Interim Date	Sheet No.
01/01/09	24 of 24
Index No.	
400	



FLARED OPTION



PARALLEL OPTION



PLACEMENT OF PARALLEL OPTION AT CURBED LOCATIONS

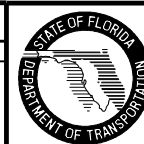
GENERAL NOTES

1. These drawings are representative of the various proprietary guardrail end anchorage assemblies listed on the Department's Qualified Products List (QPL). For specific details and requirements see the vendor drawings on the QPL at www.dot.state.fl.us/specificationsoffice/
2. These drawings present the general graphics to show the limits of payment for guardrail and end anchorage assemblies, modifications to the shoulder and placement of the miscellaneous asphalt mow strips.
3. These drawings, along with the various vendor drawings on the QPL, are intended to show sufficient details for installation of the end anchorage assemblies and their connection to shoulder guardrail. This precludes the requirement for shop drawing submittals unless otherwise called for in the plans. The various end anchorage assemblies shall be assembled in accordance with the manufacturer's detailed drawings, procedures and specifications.
4. The various proprietary end treatments listed on the QPL are intended for use as approach end guardrail anchorages for shoulder guardrail. The effective length of the end treatments vary—refer to the vendor drawings on the QPL for the length and the use of special panels and details. Standard guardrail, guardrail transitions or other special treatments shall not be included within the limits of the end anchorage assembly. See the vendor drawings for the alignment of the end treatment with respect to the normal guardrail alignment.
5. Flared or parallel end anchorage assemblies shall not be used in medians where horizontal clearance requires use of a back rail.
6. Each of the various end anchorage assemblies have unique features. Careful attention should be given to the types and orientation of the posts and other components. Refer to the vendor drawings on the QPL for the specific requirements of each system.
7. For galvanizing requirements of the metallic components see Standard Specifications Section 967.
8. The end anchorage assemblies shown on the QPL are suitable for all design speeds.
9. Flared end anchorage assemblies shall be paid for under the contract unit price for Guardrail, End Anchorage Assembly (Flared), EA.
Parallel end anchorage assemblies shall be paid for under the contract unit price for Guardrail, End Anchorage Assembly (Parallel), EA.
The unit price for end anchorage assemblies shall be full compensation for furnishing and installing all components in accordance with the plans, the manufacturer's detail drawings, procedures and specifications and these drawings.

APPROACH END ANCHORAGE DETAILS

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
12/10/08	ABK	New sheet added showing limits of pay for guardrail, details of shoulder treatment and miscellaneous asphalt for guardrail approach end treatments.			



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GUARDRAIL

Interim Date: 01/01/09
Sheet No.: 25 of 25
Index No.: 400

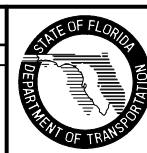
TABLE OF WOVEN GEOTEXTILE VALUES

PROPERTY		REQUIRED TEST METHOD	MIRAFI BXG11	MIRAFI BXG12	MIRAFI GEOLON HS 2400	MIRAFI GEOLON HS 3000	COMTRAC 70.70	GEOTEX 315ST	GEOTEX 2x2HF	GEOTEX 3x3HF	GEOTEX 4x4	GEOTEX 4x4HF	GEOTEX 4X6	
Permittivity (0.05 sec ⁻¹ Min.)		ASTM D 4491	—	—	0.02	0.02	0.20	0.04	0.65	0.18	0.15	0.40	0.26	
UV Stability (Min. Retained Strength @ 500 hr.)		ASTM D 4355	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	
Burst Strength (psi)		ASTM D 6241	—	—	—	—	—	1,000	1,100	1,000	1,500	1,200	1,500	
Grab Strength (lb.)		ASTM D 4632	—	—	—	—	—	315	315	450/350	600/500	475/440	600/700	
A.D.S. (in.)		ASTM D 4751	1.0 x 1.0	1.0 x 1.0	0.0118	0.0118	0.0181	0.0167	0.0167	0.0236	0.0236	0.533	0.312	
Tensile Strength (lb./ft.)		ASTM D 4595												
Machine Direction	Ultimate (T _{ult})		2,000	2,000	28,800	36,000	4,800	2,100	2,400	3,600	4,800	4,800	4,800	
	2% Strain		500	500	—	—	—	156	276	400	456	960	700	
	5% Strain		920	920	14,400	18,000	2,196	564	744	1,392	1,452	2,400	1,200	
Cross Direction	Ultimate		2,000	4,000	3,600	3,600	3,600	2,100	2,400	3,600	4,800	4,800	6,600	
	2% Strain		500	750	—	—	—	576	660	400	1,380	1,320	1,000	
	5% Strain		920	1,350	—	—	—	1,104	1,404	1,740	2,604	2,400	2,640	
Strain @ Ultimate Tensile Strength				12%	12%	10%	10%	9%	15%	10%	10%	10%	8%	8%
Secant Modulus @ (lb./ft.)	2% Strain		ASTM D 4595	25,000	25,000	—	—	—	7,800	13,800	27,000	22,800	48,000	48,000
	5% Strain	18,400		18,400	288,000	360,000	24,400	11,280	14,880	27,000	29,040	48,000	48,000	
	10% Strain	—		—	288,000	360,000	24,400	10,440	12,480	24,000	31,200	48,000	48,000	
Seam Breaking Strength (lb./ft.)		ASTM D 4884			3,600	3,600	2,400	—	—	—	—	—	—	
Puncture Resistance (lb.)		ASTM D 4833	—	—	—	—	—	120	120	180	170	190	280	
Tear Strength (lb.)	Machine Direction	ASTM D 4833	—	—	—	—	—	120	120	180	250	180	180	
	Cross Direction	ASTM D 4833	—	—	—	—	—	120	120	110	250	180	250	
Soil-Geosynthetic Friction		ASTM D 6706	0.8	0.8	0.8	0.8	0.9	0.65	0.65	0.65	0.65	0.65	0.65	
Creep Resistance-T _{creep} (lb./ft.)		ASTM D 5262	—	—	17,280	21,600	—	600	—	—	—	—	—	
Creep Reduction Factor (T _{ult} /T _{creep})			1.6	1.6	1.67	1.67	1.67	3.5	5.0	5.0	5.0	5.0	5.0	
Installation Damage (RF _c)	Sand	GRI : GG4 & GT7	1.05	1.05	1.1	1.1	1.2	1.4	1.4	1.4	1.4	1.4	1.4	
	Limestone		1.10	1.10	1.20	1.20	1.5	1.4	1.4	1.5	1.4	1.4	1.4	
Durability (RF _d)	Chemical	ASTM D 5322	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	
	Biological	ASTM D1987, D3083, G21 & G22	1.0	1.0	1.0	1.0	1.0	1.1	1.1	1.1	1.1	1.1	1.1	
Joint Strength (RF _j)	Mechanical	ASTM D 4595, GRI : GG4 & GT7	—	—	—	—	—	—	—	—	—	—	—	
	Overlap *	ASTM D 6706	1.0	1.0	1.0	1.0	1.0	1.2	1.2	1.0	1.2	1.0	1.2	
Approved Application Usage			3, 4	3, 4	3, 4	3, 4	3	2	2	2	2	2	2	

Approved Application Usage: 1 = Steepened Slopes
 2 = Reinforcement of Foundations over Soft Soils
 3 = Both Steepened Slopes & Reinforcement of Foundations over Soft Soils
 4 = Reinforced Embankment
 5 = Construction Expedient
 * Minimum 3' Overlap

APPROVED GEOSYNTHETIC PRODUCTS
 (WOVEN GEODGRID)
 APPLICATION AND PROPERTIES

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
07/01/08	LJ	Changed Required Test Method for Burst Strength, Soil-Geosynthetic Friction, Creep Reduction Factor, and Overlap Joint Strength. Changed Properties for Comtrac 70.70.	01/01/09	LJ	Deleted AMOCD 2006, 2016 and 2040. Added GEOTEX 315ST, 2x2HF, 3X3HF, 4x4, 4x4HF and 4x6.



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GEOSYNTHETIC REINFORCED SOILS

TABLE OF WOVEN GEOGRID VALUES

PROPERTY		REQUIRED TEST METHOD	MARAFI MG 2XT	MARAFI MG 3XT	MARAFI MG 5XT (Matrex 30)	MARAFI MG 7XT	MARAFI MG 8XT	MARAFI MG 10XT (Matrex 60)	MARAFI MG 18XT (Matrex 90)	MARAFI MG 20XT (Matrex 120)	MARAFI MG 22XT (Matrex 180)	MARAFI MG 24XT (Matrex 240)	
UV Stability (Min. Retained Strength @ 500 hr.)		ASTM D 4355	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	
Tensile Strength (lb./ft.)		ASTM D 6637											
Machine Direction	Ultimate (T_{ult})		2,000	3,150	4,300	5,700	7,000	9,500	9,360	12,420	17,760	25,380	
	2% Strain		—	—	—	—	—	—	—	—	—	—	
	5% Strain		1,000	1,056	1,740	2,160	2,520	3,120	3,250	5,340	6,700	7,000	
Cross Direction	Ultimate		2,000	—	—	—	—	—	—	—	—	—	—
	2% Strain		—	—	—	—	—	—	—	—	—	—	—
	5% Strain	—	—	—	—	—	—	—	—	—	—	—	
Strain @ Ultimate Tensile Strength		ASTM D 6637	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	
Secant Modulus (lb./ft.)	2% Strain		—	—	—	—	—	—	—	—	—	—	
	5% Strain		20,000	21,120	34,800	43,200	50,400	62,400	65,000	106,800	134,000	140,000	
	10% Strain		—	—	—	—	—	—	—	—	—	—	
Junction Strength (lb./ft.)		GRI : GG2	—	—	—	—	—	—	—	—	—	—	
Soil-Geosynthetic Friction		ASTM D 6706	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	
Creep Resistance- T_{creep} (lb./ft.)		ASTM D 5262	1,250	1,969	2,688	3,563	4,375	5,938	5,850	7,221	10,326	14,756	
Creep Reduction Factor (T_{ult}/T_{creep})			1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.72	1.72	1.72	
Installation Damage (RF _C)	Sand	GRI : GG4 & GT7	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	
	Limestone		1.5	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	
Durability (RF _D)	Chemical	ASTM D 5322	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	
	Biological	ASTM D1987, D3083, G21 & G22	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
Joint Strength (RF _J)	Mechanical	ASTM D 6637, GRI : GG4 & GT7	—	—	—	—	—	—	—	—	—	—	
	Overlap *	ASTM D 6706	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	
Approved Application Usage			3	3	3	3	3	3	3	3	3	3	

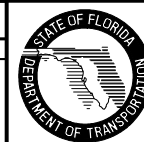
Approved Application Usage:

- 1 = Steepened Slopes
- 2 = Reinforcement of Foundations over Soft Soils
- 3 = Both Steepened Slopes & Reinforcement of Foundations over Soft Soils
- 4 = Reinforced Embankment
- 5 = Construction Expedient
- * Minimum 3' Overlap

APPROVED GEOSYNTHETIC PRODUCTS
(WOVEN GEOGRID)
APPLICATION AND PROPERTIES

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
07/01/08	LJ	Changed Required Test Method for Burst Strength, Soil-Geosynthetic Friction, Creep Reduction Factor, and Overlap Joint Strength.	01/01/09	LJ	Changed Joint Strength Overlap value to 1.2 for all products.



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GEOSYNTHETIC REINFORCED SOILS

Interim Date: 01/01/09
Sheet No. 5 of 9
Index No. 501

TABLE OF WOVEN GEOGRID VALUES

PROPERTY		REQUIRED TEST METHOD	SYNTEEN SF 11	SYNTEEN SF 12	SYNTEEN SF 20	SYNTEEN SF 35	SYNTEEN SF 40	SYNTEEN SF 50	SYNTEEN SF 55	SYNTEEN SF 80	SYNTEEN SF 110
UV Stability (Min. Retained Strength @ 500 hr.)		ASTM D 4355	70%	70%	70%	70%	70%	70%	70%	70%	70%
Tensile Strength (lb./ft.)		ASTM D 6637									
Machine Direction	Ultimate (T_{ult})		2,388	2,388	1,672	2,627	3,050	3,731	3,774	5,583	7,462
	2% Strain		526	526	370	462	488	791	736	1,016	1,186
	5% Strain		990	1,042	670	725	970	922	1,159	1,273	1,684
Cross Direction	Ultimate		3,870	5,268	1,630	2,556	3,050	3,933	2,499	2,206	2,179
	2% Strain		578	797	370	399	430	630	604	882	1,274
	5% Strain	792	1,129	670	583	765	815	796	1,563	1,581	
Strain @ Ultimate Tensile Strength		ASTM D 6637	12.6%	13.0%	9.4%	14.1%	9.9%	14.2%	11.5%	13.9%	18.8%
Secant Modulus (lb./ft.)	2% Strain		26,300	26,300	18,494	23,114	24,408	39,551	36,799	50,807	59,298
	5% Strain		15,840	20,840	13,397	14,499	19,404	18,432	23,174	25,459	33,712
	10% Strain		—	—	15,206	15,234	22,089	18,432	27,137	37,910	27,380
Junction Strength (lb./ft.)		GRI : GG2	354	320	—	—	—	—	—	—	—
Soil-Geosynthetic Friction		ASTM D 6706	1.0	1.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Creep Resistance- T_{creep} (lb./ft.)		ASTM D 5262	—	—	1,005	1,523	1,525	2,201	2,265	3,182	4,029
Creep Reduction Factor (T_{ult}/T_{creep})			—	—	1.66	1.73	2.00	1.70	1.67	1.75	2.02
Installation Damage (RF _C)	Sand	GRI : GG4 & GT7	1.18	1.06	1.05	1.15	1.15	1.08	1.08	1.08	1.08
	Limestone		1.31	1.20	1.75	1.70	1.60	1.55	1.55	1.55	1.35
Durability (RF _D)	Chemical	ASTM D 5322	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10
	Biological	ASTM D1987, D3083, G21 & G22	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10
Joint Strength (RF _J)	Mechanical	ASTM D 6637, GRI : GG4 & GT7	—	—	—	—	—	—	—	—	—
	Overlap *	ASTM D 6706	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10
Approved Application Usage			5	5	3	3	3	3	3	3	3

Approved Application Usage:

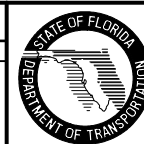
- 1 = Steepened Slopes
- 2 = Reinforcement of Foundations over Soft Soils
- 3 = Both Steepened Slopes & Reinforcement of Foundations over Soft Soils
- 4 = Reinforced Embankment
- 5 = Construction Expedient

* Minimum 3' Overlap

APPROVED GEOSYNTHETIC PRODUCTS
(WOVEN GEOGRID)
APPLICATION AND PROPERTIES

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
07/01/08	LJ	Changed Required Test Method for Burst Strength, Soil-Geosynthetic Friction, Creep Reduction Factor, and Overlap Joint Strength.	01/01/09	LJ	Deleted Application Usage 3 & 4 for SYNTEEN SF 11 & SF 12.



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GEOSYNTHETIC REINFORCED SOILS

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TABLE OF WOVEN GEOGRID VALUES								
PROPERTY		REQUIRED TEST METHOD	RAUGRID 3/3	RAUGRID 4/2	RAUGRID 6/3	RAUGRID 8/3	RAUGRID 10/3	FORNIT 20
UV Stability (Min. Retained Strength @ 500 hr.)		ASTM D 4355	95%	95%	95%	95%	95%	92%
Tensile Strength (lb./ft.)		ASTM D 6637						
Machine Direction	Ultimate (T_{ult})		2,233	2,843	4,350	5,288	6,590	1,159
	2% Strain		—	—	—	—	—	360
	5% Strain		712	767	1,144	1,165	1,582	774
Cross Direction	Ultimate		2,213	1,459	1,959	2,089	2,192	1,641
	2% Strain		—	—	—	—	—	543
	5% Strain	541	356	452	507	521	1,111	
Strain @ Ultimate Tensile Strength		ASTM D 6637	10.8%	11.8%	13.1%	12.2%	11.5%	6%
Secant Modulus (lb./ft.)	2% Strain		—	—	—	—	—	18,000
	5% Strain		—	—	—	—	—	15,480
	10% Strain		—	—	—	—	—	—
Junction Strength (lb./ft.)		GRI : GG2	N/A	100%	100%	100%	100%	480
Soil-Geosynthetic Friction		ASTM D 6706	0.8	0.8	0.8	0.8	0.8	0.9
Creep Resistance- T_{creep} (lb./ft.)		ASTM D 5262	1,466	1,870	2,862	3,479	4,335	—
Creep Reduction Factor (T_{ult}/T_{creep})			1.52	1.52	1.52	1.52	1.52	—
Installation Damage (RF _C)	Sand	GRI : GG4 & GT7	1.10	1.10	1.10	1.10	1.10	1.10
	Limestone		1.17	1.17	1.17	1.17	1.17	1.30
Durability (RF _D)	Chemical	ASTM D 5322	1.15	1.15	1.15	1.15	1.15	1.10
	Biological	ASTM D1987, D3083, G21 & G22	1.15	1.15	1.15	1.15	1.15	1.0
Joint Strength (RF _J)	Mechanical	ASTM D 6637, GRI : GG4 & GT7	—	—	—	—	—	—
	Overlap *	ASTM D 6706	—	—	—	—	—	1.0
Approved Application Usage			2, 5	2, 5	2, 5	2, 5	2, 5	2, 5

Approved Application Usage:
 1 = Steepened Slopes
 2 = Reinforcement of Foundations over Soft Soils
 3 = Both Steepened Slopes & Reinforcement of Foundations over Soft Soils
 4 = Reinforced Embankment
 5 = Construction Expedient
 * Minimum 3' Overlap

**APPROVED GEOSYNTHETIC PRODUCTS
(WOVEN GEOGRID)
APPLICATION AND PROPERTIES**


REVISIONS							2008 Interim Design Standard	Interim Date	Sheet No.
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION			01/01/09	7 of 9
07/01/08	LJ	Changed Required Test Method for Burst Strength, Soil-Geosynthetic Friction, Creep Reduction Factor, and Overlap Joint Strength.	01/01/09	LJ	Added Fornit 20.	GEOSYNTHETIC REINFORCED SOILS	Index No. 501		

TABLE OF EXTRUDED GEOGRID VALUES

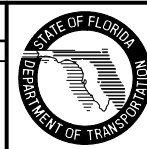
PROPERTY		REQUIRED TEST METHOD	TENSAR BX 4100	TENSAR BX 4200	TENSAR BX 1100	TENSAR BX 1120	TENSAR BX 1200	TENSAR BX 1220	TENSAR BX 1500
UV Stability (Min. Retained Strength @ 500 hr.)		ASTM D 4355	90%	90%	90%	100%	90%	100%	90%
Tensile Strength (lb./ft.)		ASTM D 6637							
Machine Direction	Ultimate (T_{ult})		860	1,270	850	850	1,315	1,315	1,790
	2% Strain		240	370	280	280	410	410	580
	5% Strain		480	705	580	580	810	810	1,200
Cross Direction	Ultimate		875	1,370	1,300	1,300	1,975	1,975	2,055
	2% Strain		300	500	450	450	670	670	685
	5% Strain	635	960	920	920	1,360	1,360	1,370	
Strain @ Ultimate Tensile Strength		ASTM D 6637	10%	10%	10%	10%	10%	10%	10%
Secant Modulus @ (lb./ft.)	2% Strain		11,995	18,506	14,000	14,000	20,500	20,500	29,000
	5% Strain		9,596	14,092	11,600	11,600	16,200	16,200	27,400
	10% Strain		—	—	—	—	—	—	—
Junction Strength (lb./ft.)		GRI : GG2	90%	90%	790/1,210	93%	93%	93%	93%
Soil-Geosynthetic Friction		ASTM D 6706	—	0.95	0.90	0.90	0.90	0.90	0.90
Creep Resistance- T_{creep} (lb./ft.)		ASTM D 5262	250	420	280	280	425	425	575
Creep Reduction Factor (T_{ult}/T_{creep})			3.5	3.27	3.1	3.1	3.1	3.1	3.1
Installation Damage (RF _C)	Sand	GRI : GG4 & GT7	1.10	1.10	1.10	1.10	1.10	1.10	1.10
	Limestone		1.43	1.35	1.35	1.35	1.35	1.35	1.35
Durability (RF _D)	Chemical	ASTM D 5322	1.1	1.1	1.1	1.1	1.1	1.1	1.1
	Biological	ASTM D1987, D3083, G21 & G22	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Joint Strength (RF _J)	Mechanical	ASTM D 6637, GRI : GG4 & GT7	—	—	—	—	—	—	—
	Overlap *	ASTM D 6706	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Approved Application Usage			3, 4, 5	3, 4, 5	3, 4, 5	3, 4, 5	3, 4, 5	3, 4, 5	3, 4, 5

Approved Application Usage:
 1 = Steepened Slopes
 2 = Reinforcement of Foundations over Soft Soils
 3 = Both Steepened Slopes & Reinforcement of Foundations over Soft Soils
 4 = Reinforced Embankment
 5 = Construction Expedient
 * Minimum 3' Overlap

APPROVED GEOSYNTHETIC PRODUCTS
 (EXTRUDED GEOGRID)
 APPLICATION AND PROPERTIES

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
07/01/08	LJ	Changed Required Test Method for Burst Strength, Soil-Geosynthetic Friction, Creep Reduction Factor, and Overlap Joint Strength.	01/01/09	LJ	Changed Creep Resistance and Reduction Factor for TENSAR BX 1100, BX 1120, BX 1220 & BX 1500.



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GEOSYNTHETIC REINFORCED SOILS

TABLE OF EXTRUDED GEOGRID VALUES

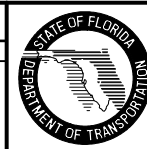
PROPERTY		REQUIRED TEST METHOD	TENSAR UX 1400 HS UX 1400 MSE UX MESA 3	TENSAR UX 1500 HS UX 1500 MSE UX MESA 4	TENSAR UX 1600 HS UX 1600 MSE UX MESA 5	TENSAR UX 1700 HS UX 1700 MSE UX MESA 6	TENAX MS 220	TENAX MS 330	COMBIGRID 30/30 Q1 151 GRK 3	SECUGRID 20/20 Q1	SECUGRID 30/30 Q1
UV Stability (Min. Retained Strength @ 500 hr.)		ASTM D 4355	90%	90%	90%	90%	85%	85%	90%	90%	90%
Tensile Strength (lb./ft.)		ASTM D 6637									
Machine Direction	Ultimate (T_{ult})		4,790	7810	9,860	11,980	925	1,370	2,055	1,646	2,055
	2% Strain		1,100	1,850	2,330	2,740	300	418	686	549	686
	5% Strain		2,130	3,560	3,980	5,140	615	925	1,475	1,029	1,475
Cross Direction	Ultimate		—	—	—	—	1,400	2,100	2,055	1,646	2,055
	2% Strain		—	—	—	—	445	616	686	549	686
	5% Strain	—	—	—	—	890	1,340	1,475	1,029	1,475	
Strain @ Ultimate Tensile Strength		ASTM D 6637	10%	10%	10%	10%	12%	12%	8%	9%	7.5%
Secant Modulus (lb./ft.)	2% Strain		55,000	92,500	116,500	137,000	15,000	20,900	34,300	27,450	34,300
	5% Strain		42,600	71,200	79,600	102,800	12,330	18,500	29,500	20,580	29,500
	10% Strain		—	—	—	—	—	—	—	—	—
Junction Strength (lb./ft.)		GRI : GG2	90%	90%	90%	90%	835	1,230	337	549	617
Soil-Geosynthetic Friction		ASTM D 6706	0.462	0.462	0.462	0.462	—	—	0.65	0.93	0.93
Creep Resistance- T_{creep} (lb./ft.)		ASTM D 5262	1,970	3,000	3,960	4,975	—	—	726	581	726
Creep Reduction Factor (T_{ult}/T_{creep})			2.43	2.60	2.49	2.41	3.5	3.5	2.83	2.83	2.83
Installation Damage (RF _C)	Sand	GRI : GG4 & GT7	1.10	1.10	1.10	1.10	1.1	1.1	1.1	1.1	1.1
	Limestone		1.20	1.20	1.20	1.20	1.1	1.1	1.1	1.1	1.1
Durability (RF _D)	Chemical	ASTM D 5322	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
	Biological	ASTM D1987, D3083, G21 & G22	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Joint Strength (RF _J)	Mechanical	ASTM D 6637, GRI : GG4 & GT7	1.0	1.0	1.0	1.0	1.0	1.0	—	—	—
	Overlap *	ASTM D 6706	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Approved Application Usage			3	3	3	3	2, 5	2, 5	2, 5	2, 5	2, 5

Approved Application Usage:
 1 = Steepened Slopes
 2 = Reinforcement of Foundations over Soft Soils
 3 = Both Steepened Slopes & Reinforcement of Foundations over Soft Soils
 4 = Reinforced Embankment
 5 = Construction Expedient
 * Minimum 3' Overlap

APPROVED GEOSYNTHETIC PRODUCTS
 (EXTRUDED GEOGRID)
 APPLICATION AND PROPERTIES

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
07/01/08	LJ	Changed Required Test Method for Burst Strength, Soil-Geosynthetic Friction, Creep Reduction Factor, and Overlap Joint Strength. Changed Properties for MS220 & TENAX MS 330.	01/01/09	LJ	Added COMBIGRID 30/30 Q1 151 GRK 3, SECUGRID 20/20 Q1 and SECUGRID 30/30 Q1



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GENERAL NOTES

- 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.
- Sight distance (d) applies to normal and skewed intersections (intersecting angles between 60° and 120°), and where vertical and/or horizontal curves are present. Sight distance (d) is measured along the major roadway from the center of the entrance lane of the minor roadway to the center of the near approach lane (right or left) of the major roadway. Distances d_L and d_R are measured from the centerline of the entrance lane of the minor roadway to a point on the edge of the near side outer traffic lane on the major roadway. Distance d_M is measured from the centerline of the entrance lane of the minor roadway to a point on the median clear zone limit or horizontal clearance limit for the far side roadway of the major roadway.
- The limits of clear sight define a corridor throughout which a clear sight window must be preserved. See WINDOW DETAIL, Sheet 2.
 - Clear sight must be provided between vehicles at intersection stop locations, and vehicles on the major roadway within dimension 'd'.
 - Since observations are made in both directions along the line of sight, the reference datum between roadways is 3'-6" above respective pavements.
- Barrier systems within intersection sight corridors, where penetration into the sight window might occur, shall be located to provide the least adverse affect practical.
- The corridor defined by the limits of clear sight is a restricted planting area. Drivers of vehicles on the intersecting roadway and vehicles on the major roadway 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:

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 sabalpalms > 11" ≤ 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 used with lawn; pavers; pavement; gravel, bark or wood chip beds; 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. Tree size and spacing shall conform to the following tabular values:

Description	Speed (mph)													
	30	35	40	45	50	55	60	30	35	40	45	50	55	60
	(Inches)													
Diameter (Within Limits Of Sight Window)	>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)	22	91	27	108	33	126	40	146	45	165	52	173	60	193

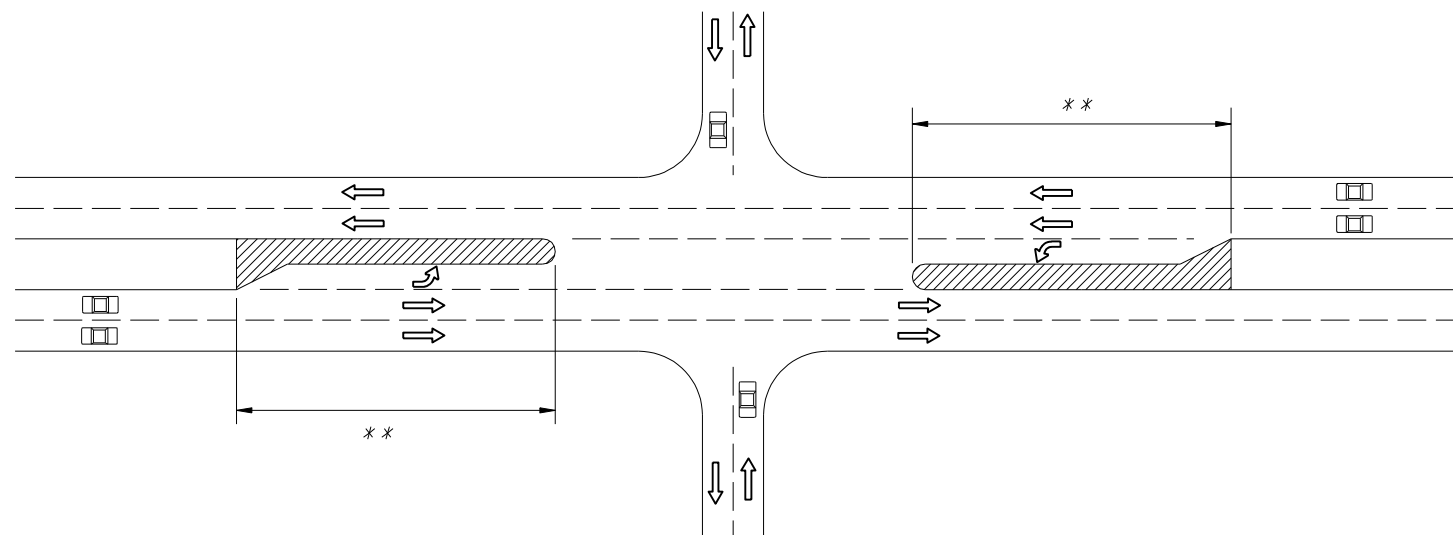
Sizes and spacings are based on the following conditions:

- A single line of trees in the median parallel to but not necessarily colinear with the centerline,
- A straight approaching mainline, within skew limits as described in No. 2 above.
- 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.
 - Sabalpalms with diameters > 11" to ≤ 18" spaced at intervals providing a 2 second full view of entering vehicle at stop bar location when viewed by mainline driver beginning at distance 'd'; see PERCEPTION DIAGRAM, Sheet 2.
- 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 No. 5.

DESIGN NOTES

- The information shown on this index is intended solely for the purpose of clear sight development and maintenance at intersecting highways, roads and streets, 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.
- 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 roadways).
- 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.
- 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.'
- 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.
- 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.



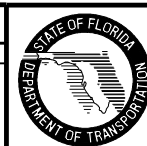
PLAN

Special Areas Limited to Ground Cover

** For Signalized and unsignalized intersections, the median area along left turn lanes, including the taper, shall be limited to ground cover with height not greater than 18" below the sight line datum regardless of whether or not the area is within the limit of clear sight.

REVISIONS

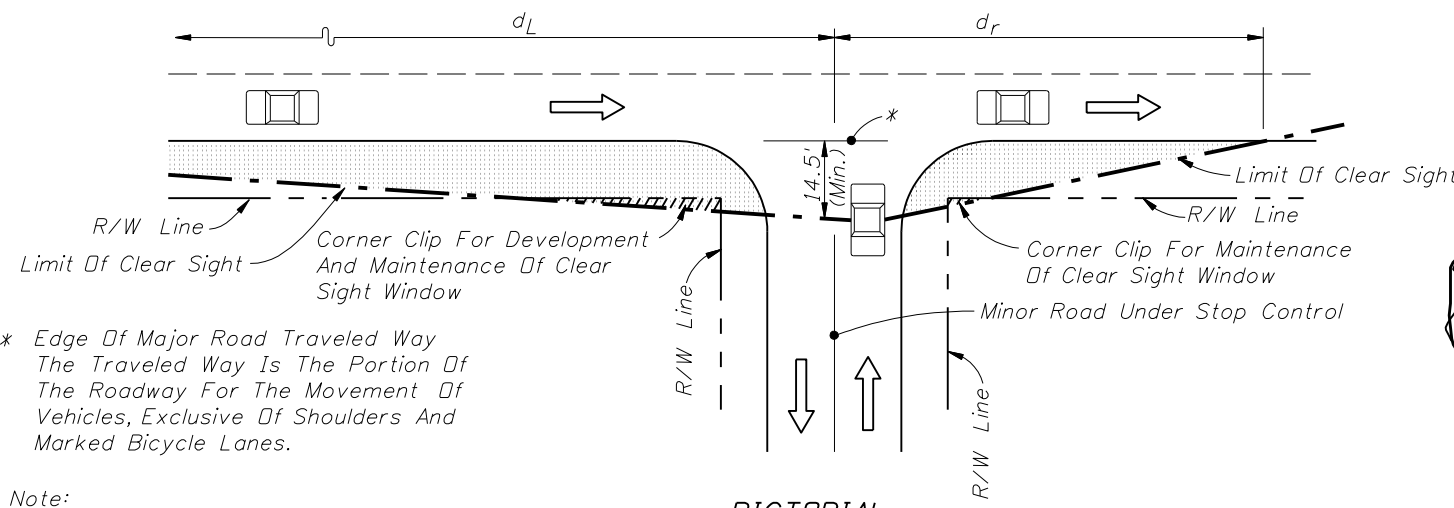
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
12/10/08	ABK	Added median treatment detail.			



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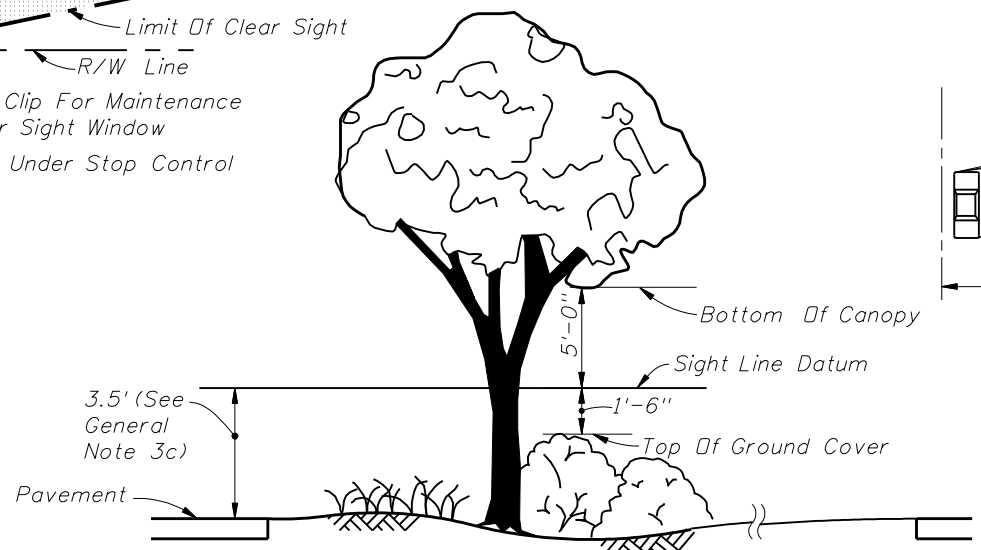
SIGHT DISTANCE AT INTERSECTIONS

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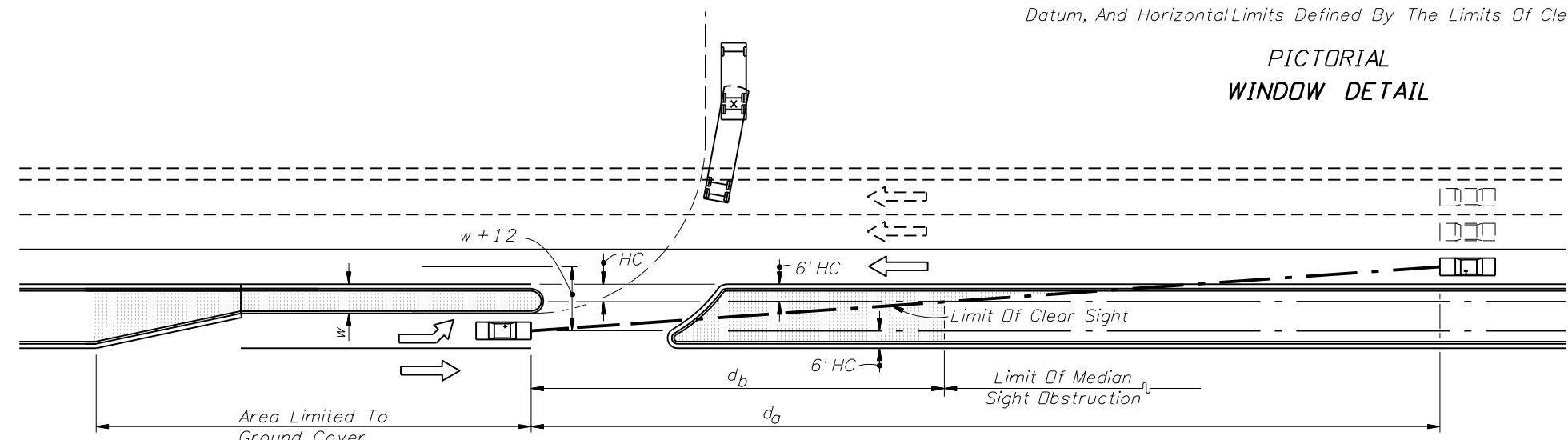
Note:
Lines For 'Limit Of Clear Sight' Are Opposite Hand When Major Road Near Lane Traffic Moving Left (e.g., One-Way Left).

PICTORIAL
ORIGIN OF CLEAR SIGHT LINE
ON MINOR ROAD



The Intent Of This Standard Is To Provide A Window With Vertical Limits Of Not Less Than 5' Above And 1'-6" Below The Sight Line Datum, And Horizontal Limits Defined By The Limits Of Clear Sight.

PICTORIAL
WINDOW DETAIL



PICTORIAL

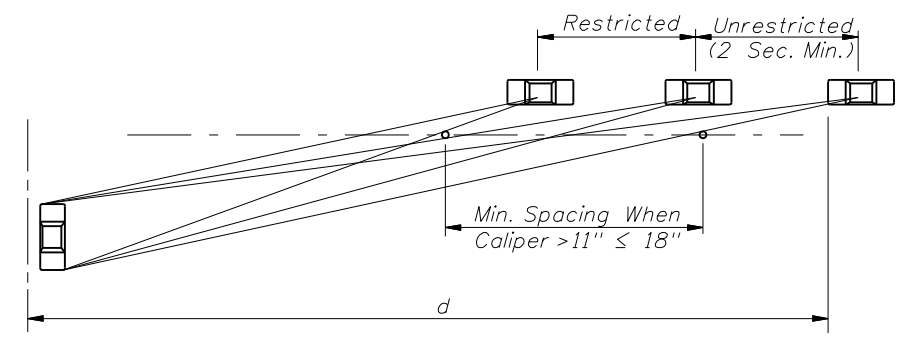
Design Speed MPH	d_o (Feet)								
	1 Lane Crossed			2 Lanes Crossed			3 Lanes Crossed		
	P	SU	Comb.	P	SU	Comb.	P	SU	Comb.
30	245	285	330	265	320	360	285	350	390
35	285	335	385	310	370	420	335	405	460
40	325	380	440	355	425	480	380	465	525
45	365	430	495	395	475	540	430	520	590

☆ See Note.

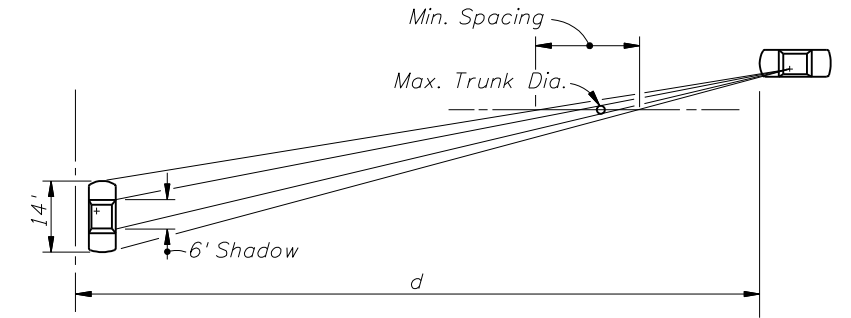
☆ The d_o values in this table were established by the method referenced in Design Note 2, and are applicable to urban, predominantly curbed roadways with design speeds of 45 mph or less and meeting the restricted conditions defined in Index No. 700. For horizontal clearance (HC) of six feet (6'), the values for d_b may be determined by the equation $d_b = d_o(w/(w+12))$. For roadways with nonrestricted conditions, d_o and d_b should be based on the geometry for the left turn storage and on clear zone widths (See Index No. 700).

For wide medians where the turning vehicle can approach the through lanes at or near 90°, use d_v values from tables on sheets 4 or 5. (The clear sight line origin is assumed to be 14.5' from the edge of the near lane.)

CHANNELIZED DIRECTIONAL MEDIAN OPENINGS



PERCEPTION DIAGRAM
SETTING SABAL PALM (STATE TREE) SPACING



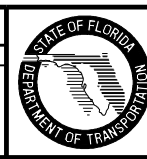
SHADOW DIAGRAM

LEGEND

Areas Free Of Sight Obstructions

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
12/10/08	ABK	Added note for wide median sight distances.			



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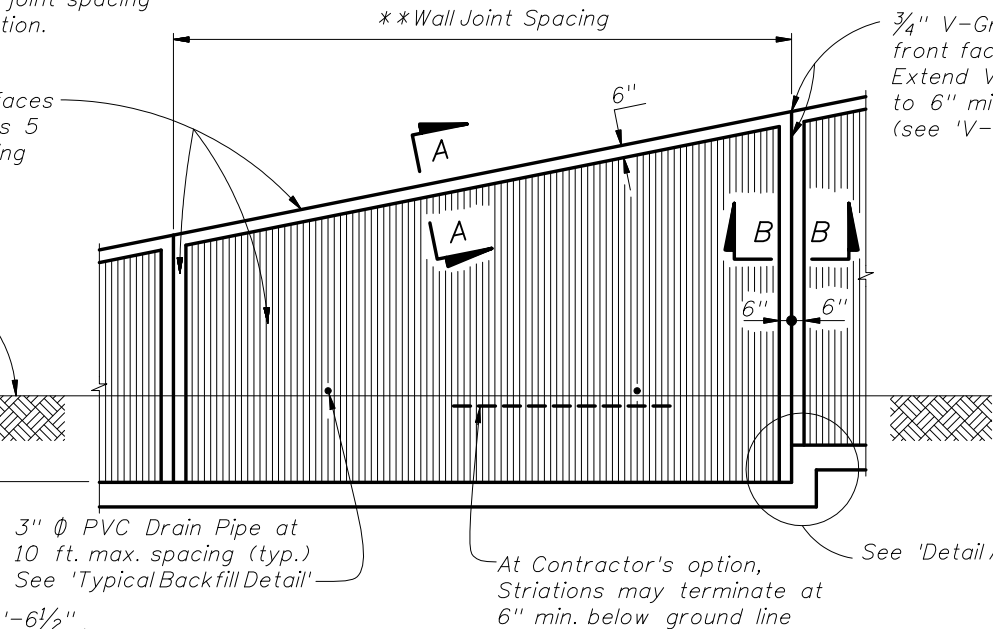
SIGHT DISTANCE AT INTERSECTIONS

Interim Date: 01/01/09
Sheet No.: 6 of 6
Index No.: 546

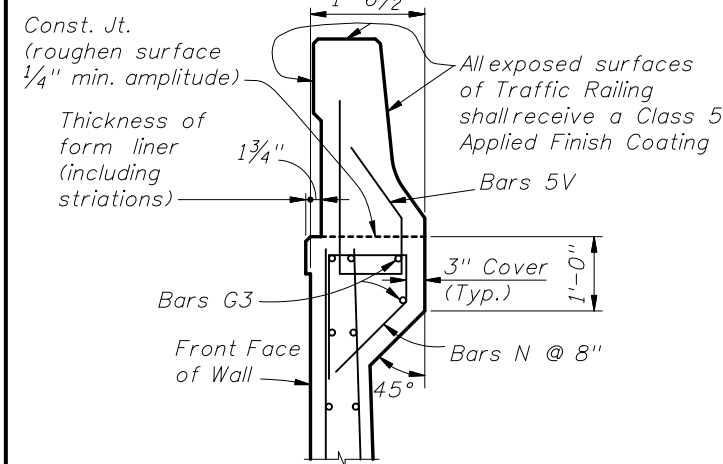
**Wall joint spacing 25 ft. maximum.
At minimum, every fourth wall joint to be an expansion joint.
See Plans for actual wall joint spacing and expansion joint location.

All exposed wall surfaces shall receive a Class 5 Applied Finish Coating

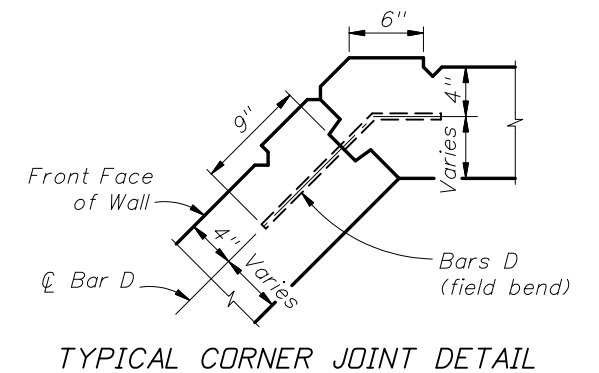
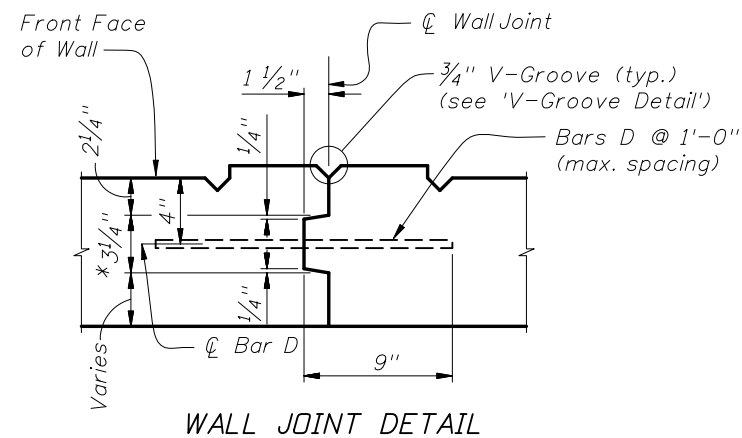
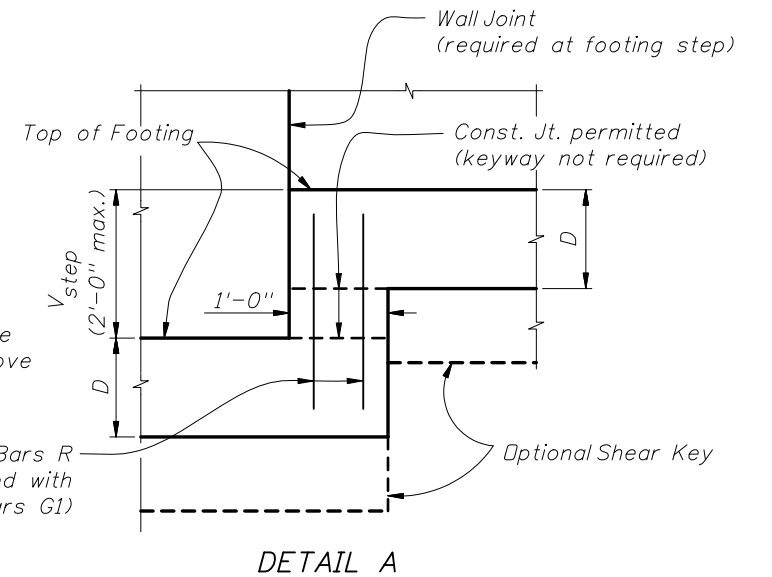
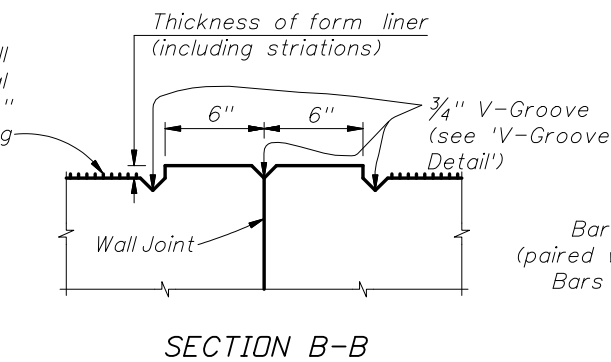
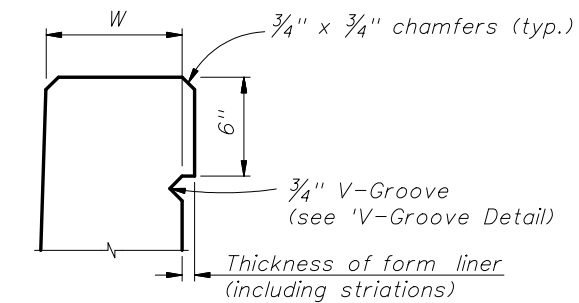
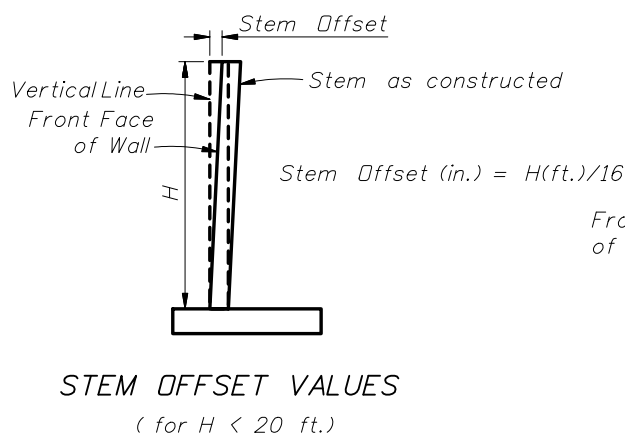
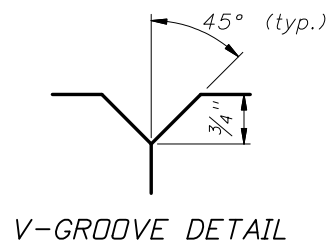
Ground Line
Top of Footing Level (typ.)



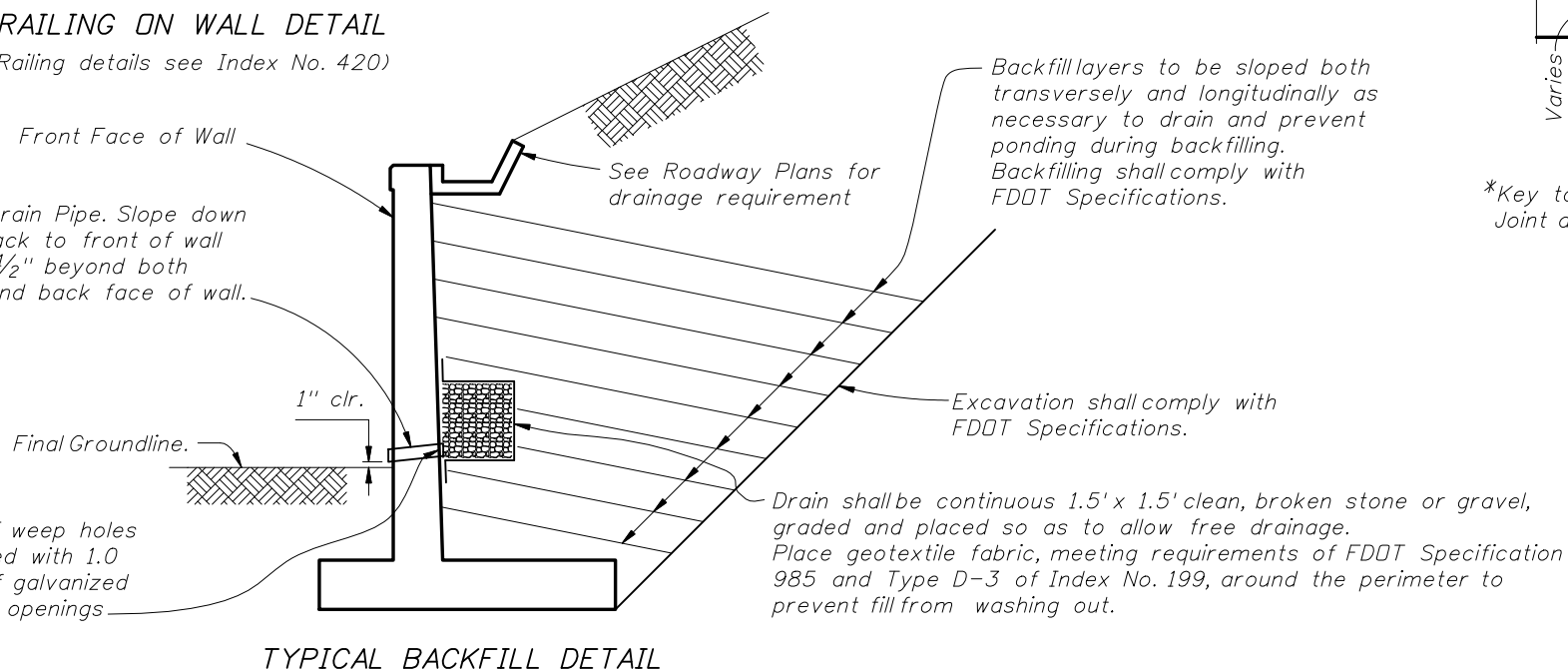
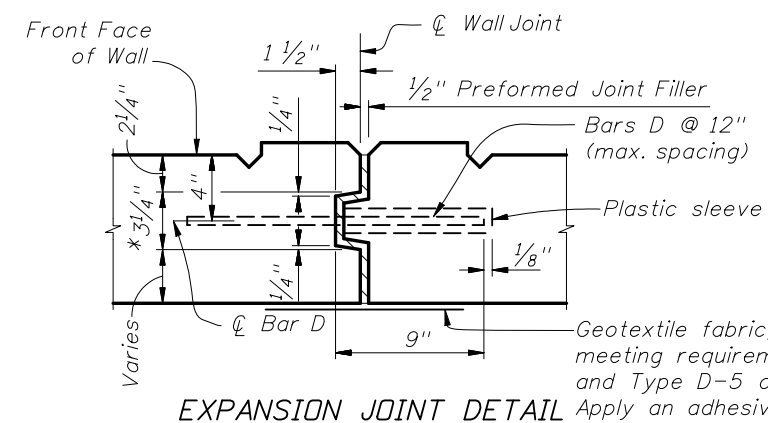
FRONT ELEVATION



TRAFFIC RAILING ON WALL DETAIL
(for Traffic Railing details see Index No. 420)

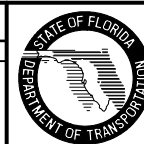


*Key to stop at top of footing and 6" from top of wall. Joint across footing and top of wall to be straight line.



REVISIONS

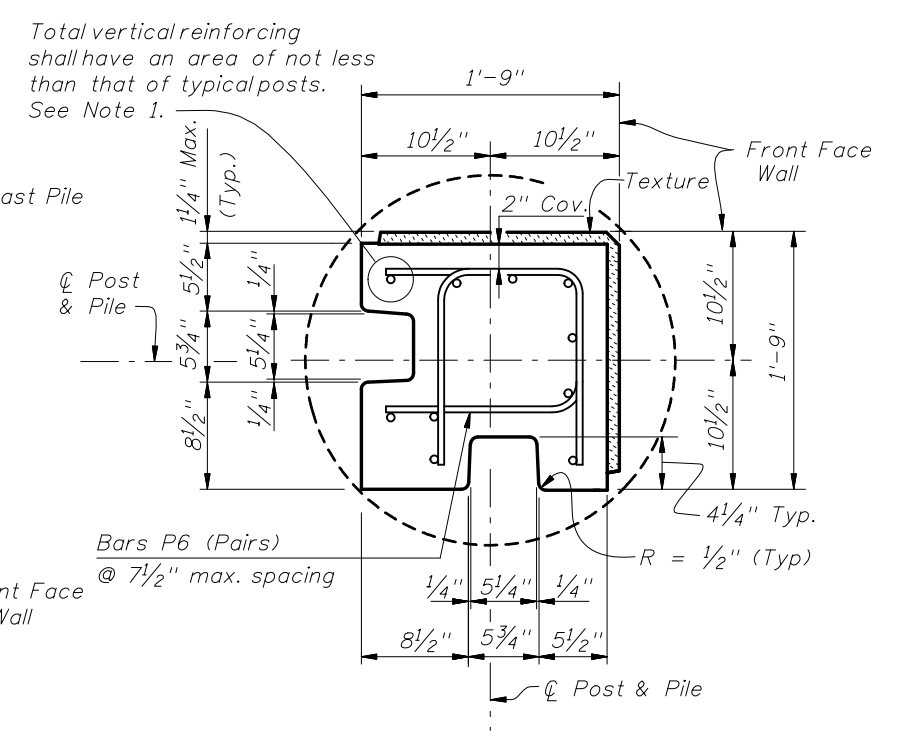
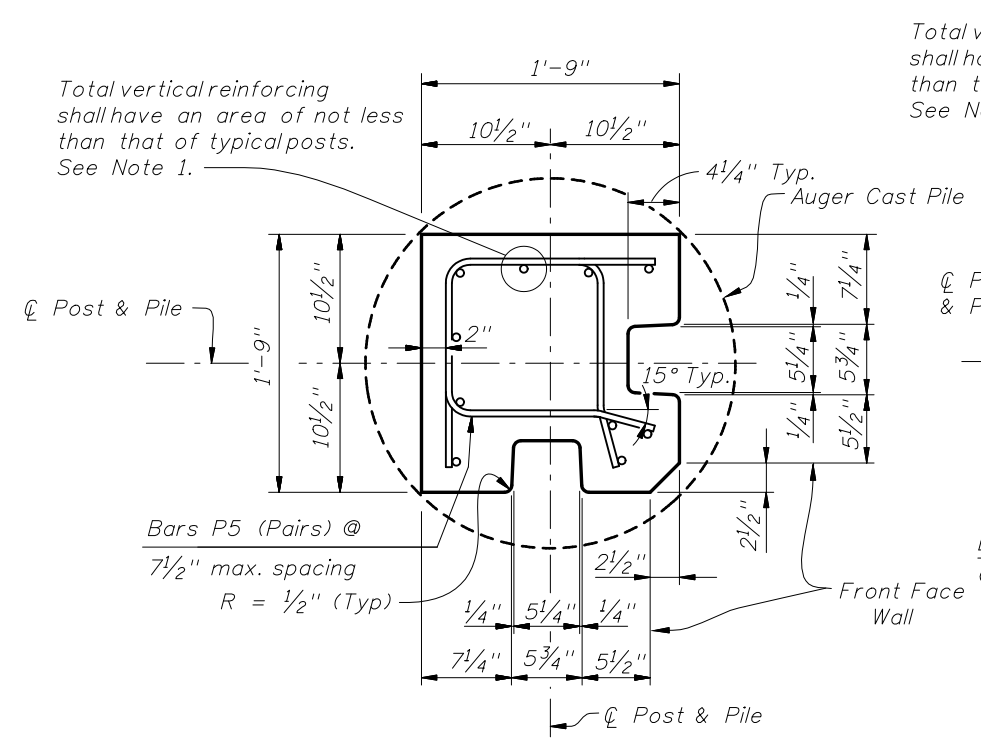
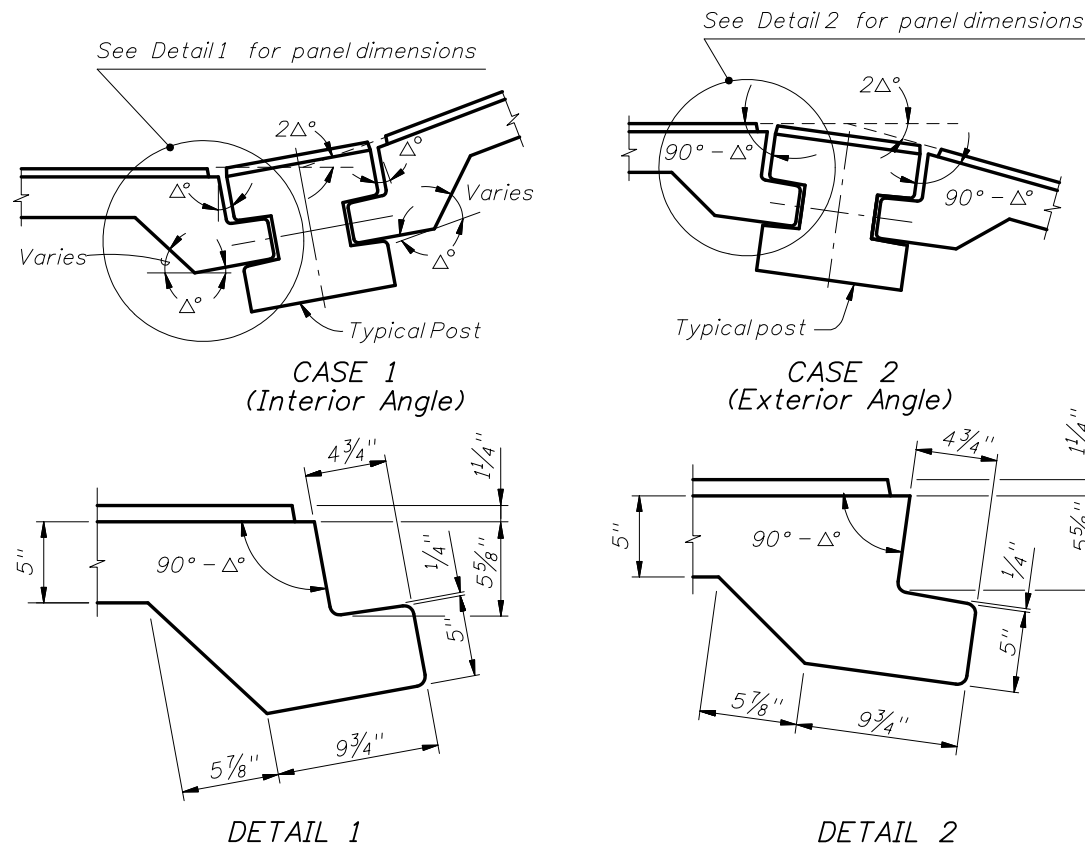
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
07/01/08	CBH	Changed to plastic sleeve expansion joint.			
01/01/09	CBH	Changed Wall Joint and Expansion Joint Key.			



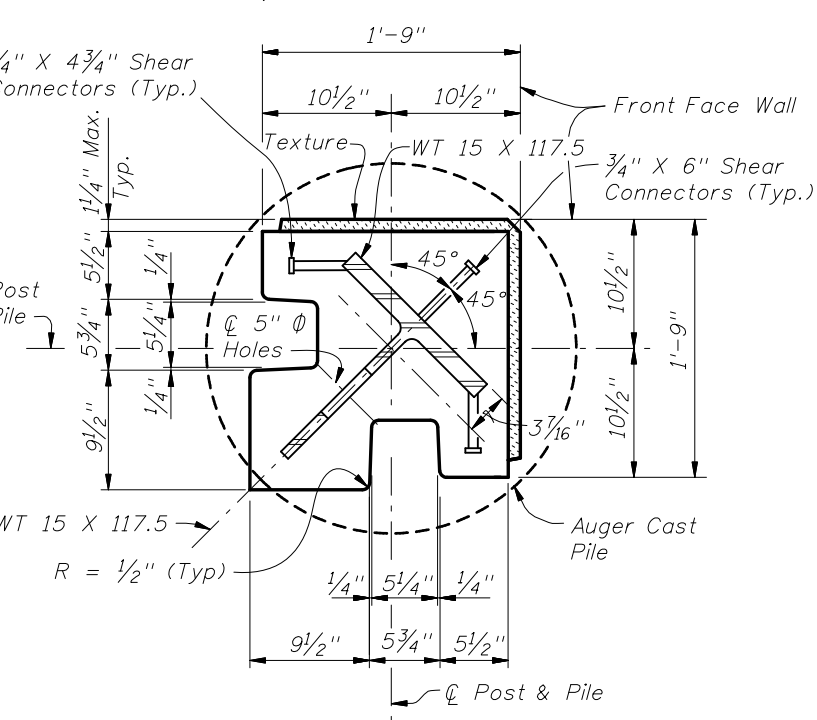
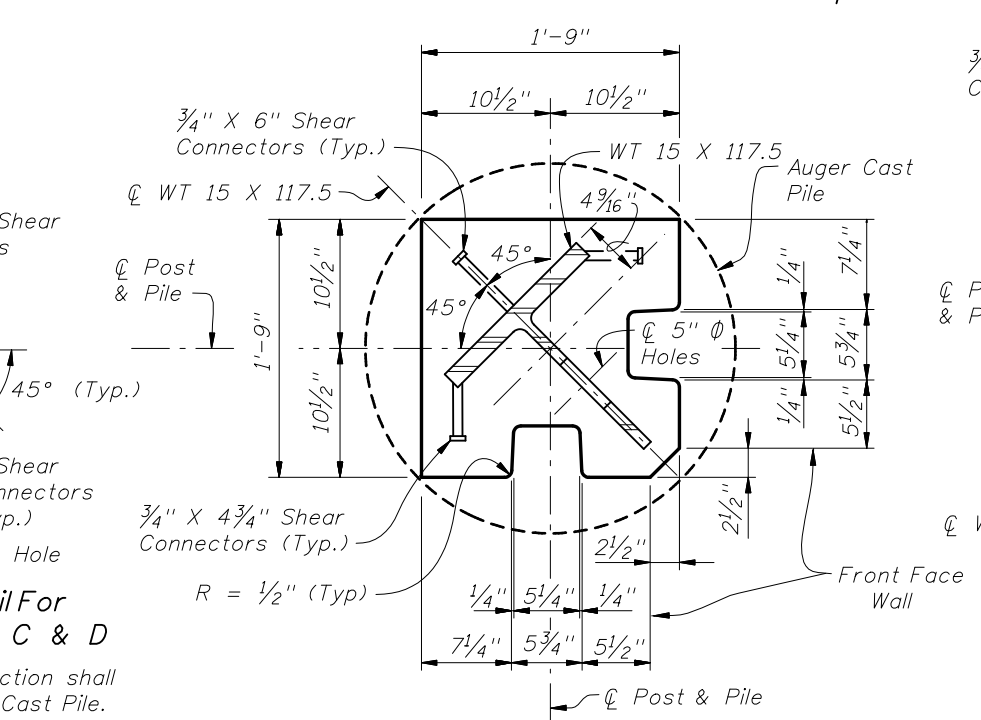
2008 Interim Design Standard

RETAINING WALL - CAST IN PLACE

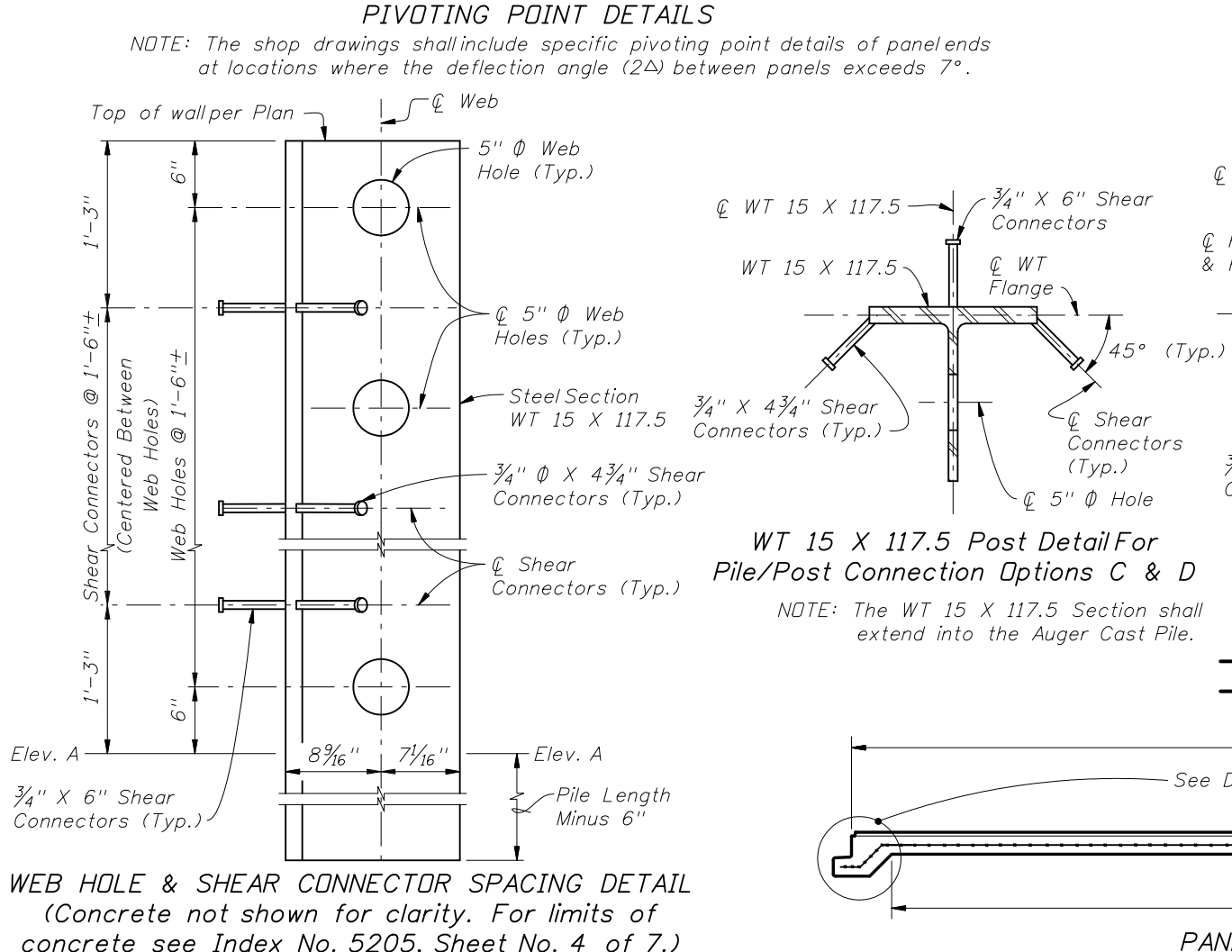
Interim Date	Sheet No.
01/01/09	2 of 2
Index No.	
5100	



SPECIAL POSTS FOR 90° CORNERS FOR PILE/POST CONNECTION OPTIONS A, B & E
Collars for Special Posts shall be 3'-6" Ø

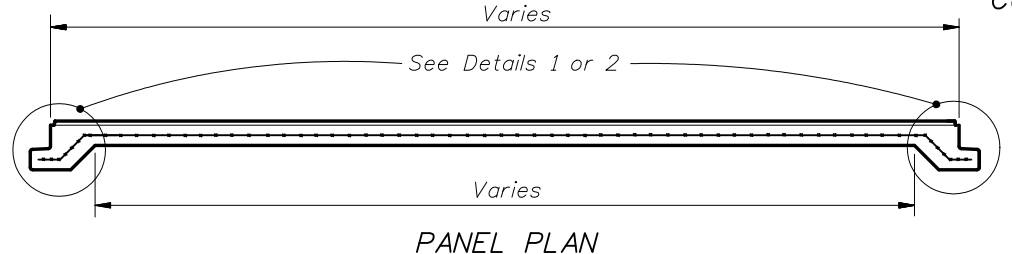


SPECIAL POSTS FOR 90° CORNERS FOR PILE/POST CONNECTION OPTIONS C & D
Collars for Special Posts shall be 3'-6" Ø



WEB HOLE & SHEAR CONNECTOR SPACING DETAIL
(Concrete not shown for clarity. For limits of concrete see Index No. 5205, Sheet No. 4 of 7.)

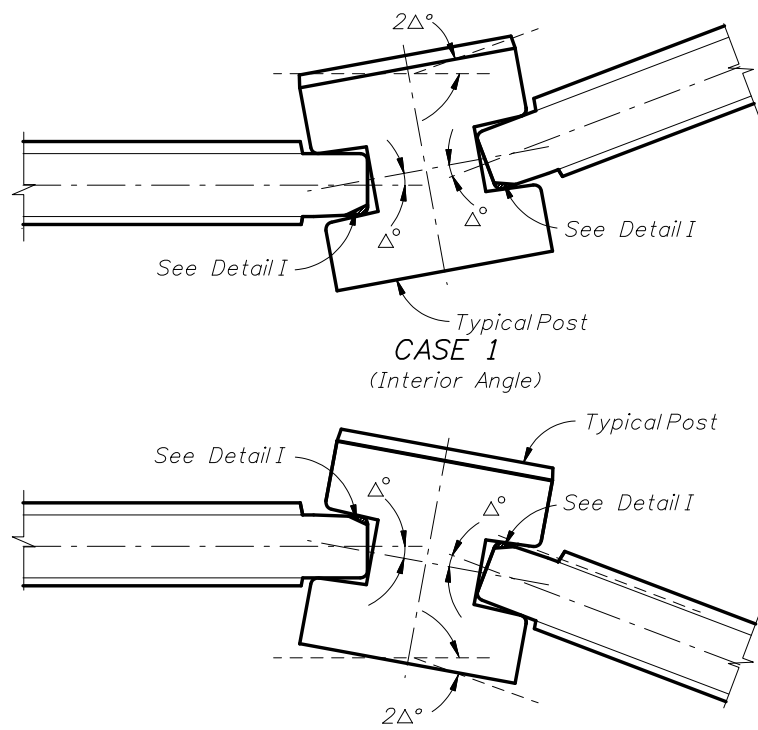
WT 15 X 117.5 Post Detail For Pile/Post Connection Options C & D
NOTE: The WT 15 X 117.5 Section shall extend into the Auger Cast Pile.



- NOTES:
1. For Table of Reinforcing Steel Sizes, see Index No. 5206.
2. For Pile/Post Connection Options A through E, see Index No. 5205.
3. For Post & Pile Lengths, see Index No. 5206.

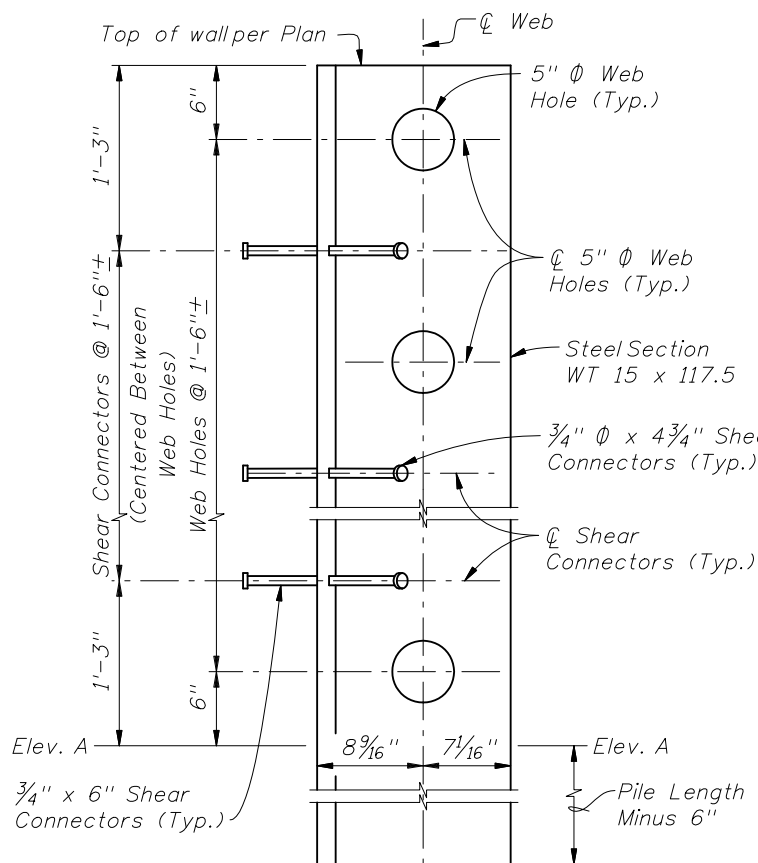
REVISIONS			
DATE	BY	DESCRIPTION	
01/01/09	SJN	Changed #4 Bar Mark to Bars P5 and P6 for Pile/Post Options A, B, & E ; Texture Thickness to 1/4" Max.	

	2008 Interim Design Standard	Interim Date 01/01/09	Sheet No. 3 of 4
	PRECAST SOUND BARRIERS - FLUSH PANEL OPTION	Index No. 5202	

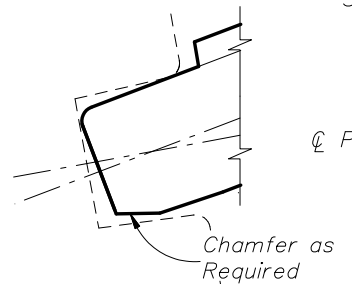


PIVOTING POINT DETAILS

NOTE: The shop drawings shall include specific pivoting point details of panel ends at locations where the deflection angle (2Δ) between panels exceeds 20° .

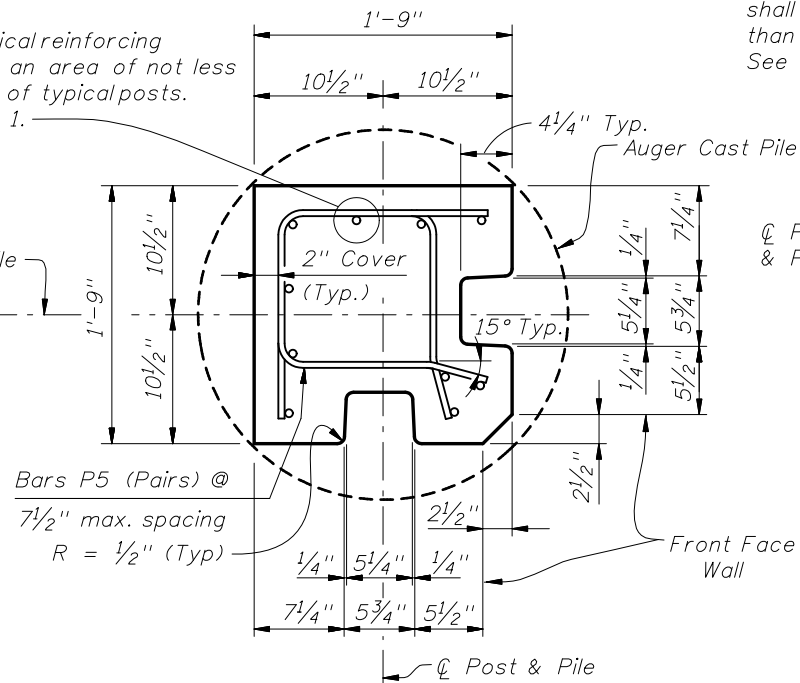


WEB HOLE & SHEAR CONNECTOR SPACING DETAIL
(Concrete not shown for clarity. For limits of concrete see Index No. 5205, Sheet No. 4 of 7.)



Total vertical reinforcing shall have an area of not less than that of typical posts. See Note 1.

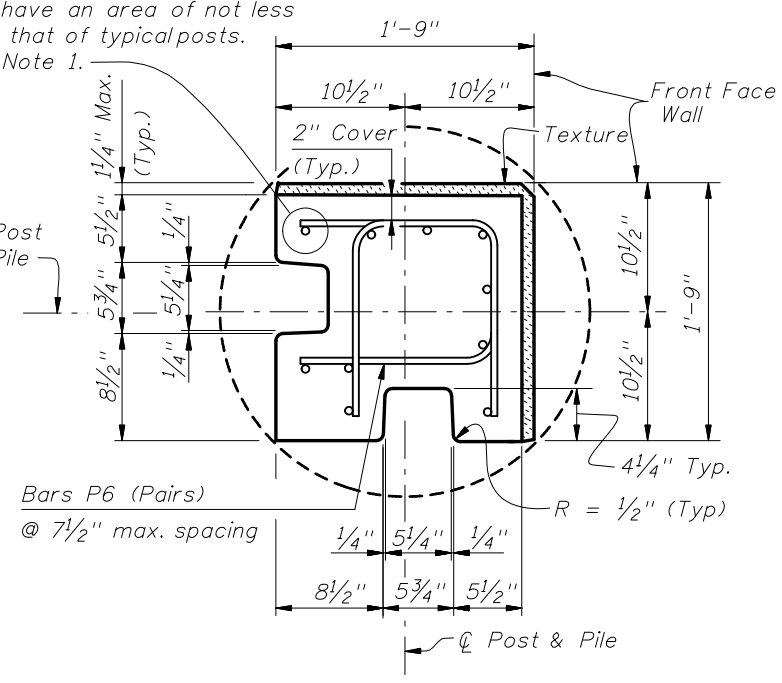
Φ Post & Pile



SPECIAL POSTS FOR 90° CORNERS FOR PILE/POST CONNECTION OPTIONS A, B & E
Collars for Corner Posts shall be 3'-6" Φ

Total vertical reinforcing shall have an area of not less than that of typical posts. See Note 1.

Φ Post & Pile

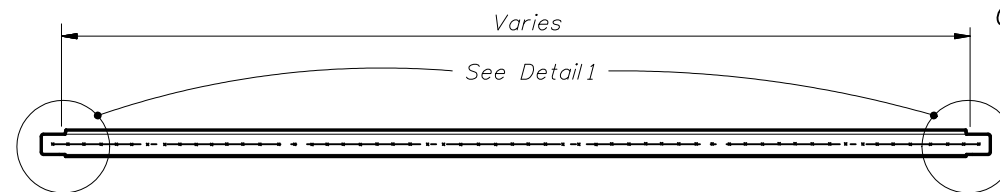


SPECIAL POSTS FOR 90° CORNERS FOR PILE/POST CONNECTION OPTIONS C & D
Collars for Corner Posts shall be 3'-6" Φ

NOTES:

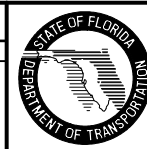
- For Table of Reinforcing Steel Sizes, see Index No. 5206.
- For Pile/Post Connection Options A through E, see Index No. 5205.
- For Post & Pile Lengths, see Index No. 5206.

PANEL PLAN



REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
07/01/08	SJN	Changed #4 Bar Mark to Bars P5, P6, P7 & P8 for Pile/Post Options A, B & E; Texture thickness to 1/4" Max. and sheet number to Sheet No. 3 of 5.	01/01/09	SJN	Corrected callout for Bars P5 & P6 in Corner Post Option A, B and E.



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PRECAST SOUND BARRIERS
- RECESSED PANEL OPTION

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TRAFFIC RAILING/SOUND BARRIER NOTES

This railing has been structurally evaluated to be equivalent or greater in strength to a safety shape/sound barrier combination railing which has been crash tested to NCHRP Report 350 TL-4 Criteria. The Transverse Design Force for the design of bridge deck overhang shall be 54 kips applied horizontally at 3'-6" height above the deck.

CONSTRUCTION REQUIREMENTS : The Traffic Railing/Sound Barrier and joints shall be constructed plumb, they shall not be constructed perpendicular to the roadway surface. Slip forming is not permitted.

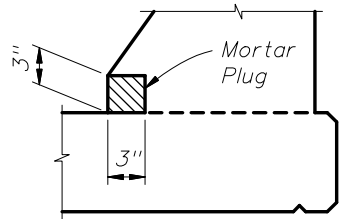
CONCRETE AND REINFORCING STEEL : For Railing/Sound Barrier on bridges see General Notes. For Wall and Footing mounted Railing/Sound Barrier, concrete shall be Class II for slightly aggressive environments and Class IV for moderately or extremely aggressive environments. All reinforcing steel shall be Grade 60.

NAME, DATE AND BRIDGE NUMBER : For Railing/Sound Barrier on bridges, the Name and Bridge Number shall be placed on the Traffic Railing so as to be seen on the driver's right side when approaching the bridge. The Date shall be placed on the driver's left side when approaching the bridge. The Name shall be as shown in the General Notes in the Structures Plans. The Date shall be the year the bridge is completed. For a widening when the existing railing is removed, use both the existing date and the year of the widening. Black plastic letters and figures 3" in height may be used, as approved by the Engineer, in lieu of the letters and figures formed by 3/8" V-Grooves. V-Grooves shall be formed by preformed letters and figures.

MARKERS : For Railing/Sound Barrier on bridges, Elevation Markers shall be placed on top of the Traffic Railing/Sound Barrier or Bridge Deck at the end bents as directed by the Engineer. Markers are to be furnished by the Florida Department of Transportation and installed by the Contractor. The cost of installing the markers shall be included in the Contract Unit Price for the Railing/Sound Barrier.

REFLECTIVE RAILING MARKERS : Reflective Railing Markers shall meet Specification Section 993. Install markers 2'-4" above the riding surface at the spacing shown in the table below. Reflector color (white or yellow) shall match the color of the near edgeline. The cost of the reflective markers shall be included in the Contract Unit Price for the Traffic Railing/Sound Barrier.

REFLECTIVE RAILING MARKER SPACING	
Distance - Edge of Travel Lane to Face of Railing	Spacing (Ft.)
< 4'	40'
4' to 8'	80'
> than 8'	None Required

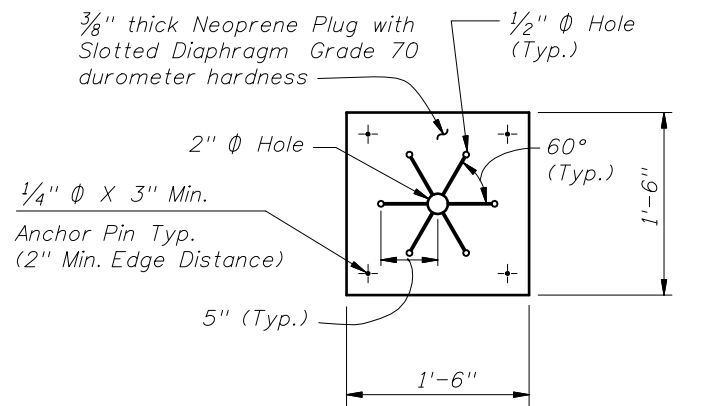


DETAIL "B" - SECTION AT INTERMEDIATE OPEN JOINT

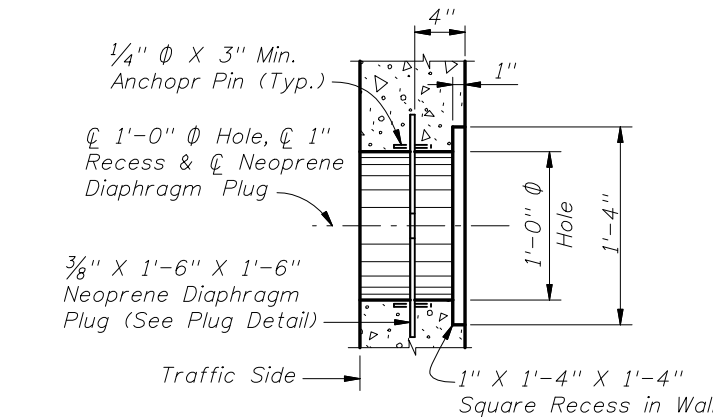
NOTE: At Intermediate Open Joints, the lower 3" portion of the open joint shall be plugged by filling it with mortar in accordance with Section 400 of the Specifications.

ESTIMATED TRAFFIC RAILING/SOUND BARRIER QUANTITIES		
ITEM	UNIT	QUANTITY
Concrete (Railing)	CY/LF	0.104
Concrete (Sound Barrier)	CY/LF	0.145
Reinforcing Steel (Typical)	LB/LF	78.57
Additional Reinf. @ Open Joint	LB	430.24

(The above quantities are based on the bridge mounted typical section, 2% deck cross slope and railing on low side of deck.)



NEOPRENE DIAPHRAGM PLUG DETAIL

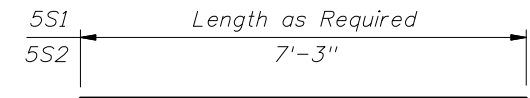


TYPICAL SECTION FIRE HOSE ACCESS DETAIL

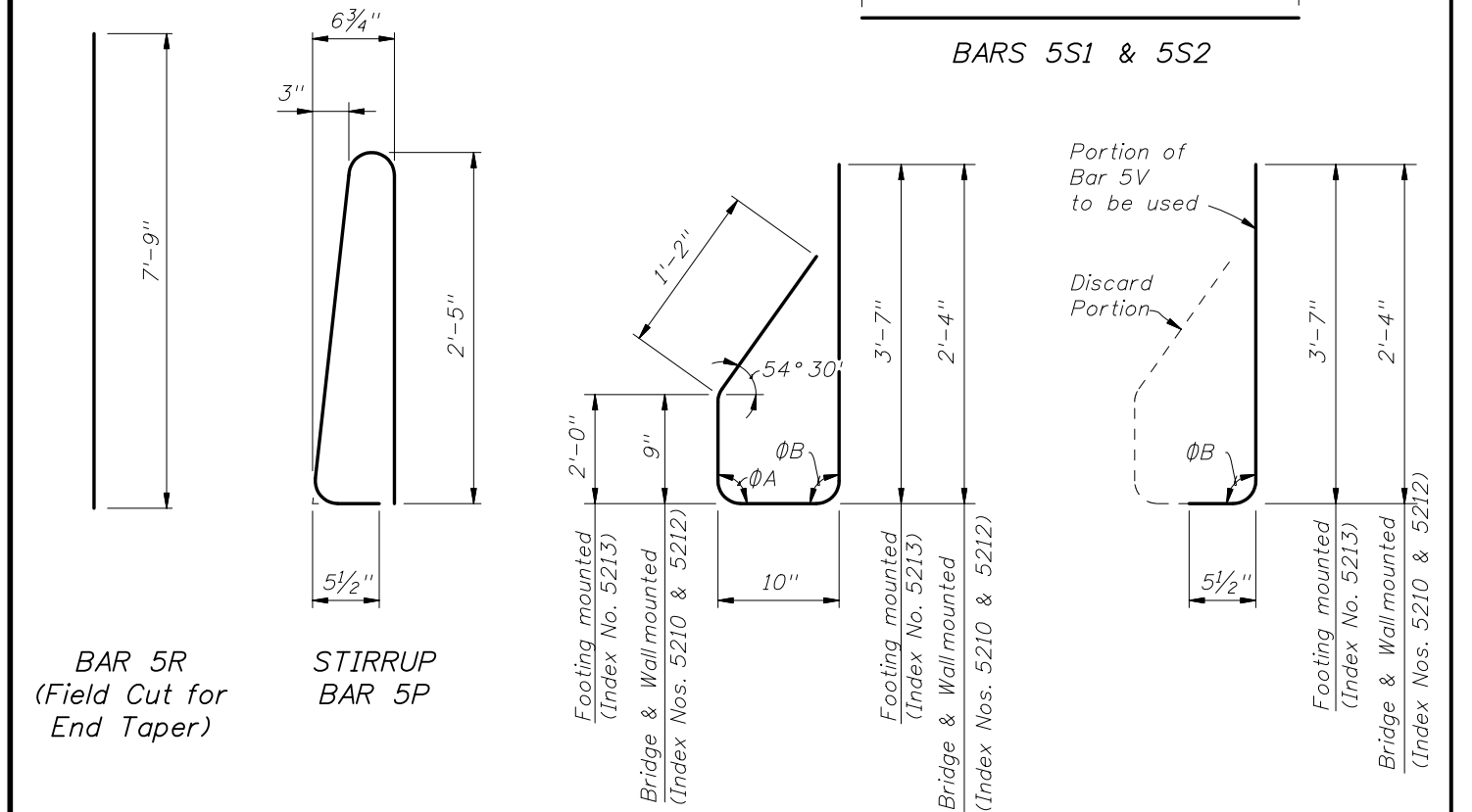
NOTE: Fire hose access holes are required at or near fire hydrant locations. Field cut reinforcement as required to maintain 2" minimum cover at access holes. Locate fire hose access holes a minimum of 10'-0" from 3/4" open joints when possible.

REINFORCING STEEL BENDING DIAGRAMS

BILL OF REINFORCING STEEL			BRIDGE CROSS-SLOPE			
MARK	SIZE	LENGTH	LOW GUTTER		HIGH GUTTER	
			ØA	ØB	ØA	ØB
P	5	5'-7"	90°	90°	90°	90°
R	5	7'-9"	93°	87°	87°	93°
S1	5	As Req'd.	96°	84°	84°	96°
S2	5	7'-3"	90°	90°	90°	90°
V (Bridge and Wall)	5	5'-1"				
V (Footing)	5	7'-7"				

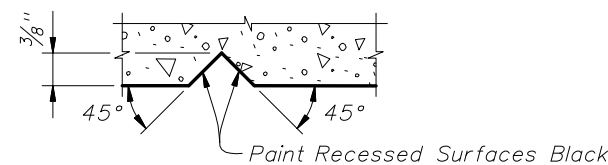


BARS 5S1 & 5S2



REINFORCING STEEL NOTES:

- All bar dimensions in the bending diagrams are out to out.
- All reinforcing steel at the open joints shall have a 2" minimum cover.
- Bars 5S1 may be continuous or spliced at the construction joints. Lap splices for Bars 5S1 shall be a minimum of 2'-2".
- The Contractor may use Welded Wire Reinforcement when approved by the Engineer. Welded Wire Reinforcement shall conform to ASTM A 497.
- Bars 5R shall be one continuous bar. No mechanical couplers or lap splices are permitted.
- See Index Nos. 5214 and 5215 for Bars 5V and 5T in L-shaped and Trench footings.

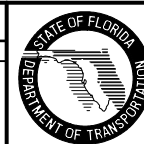


SECTION THRU RECESSED "V" GROOVE TO FORM INSCRIBED LETTERS AND FIGURES

CROSS REFERENCE: For locations of Detail "B", see Sheet 1.

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
01/01/09	SUN	Changed "NAME, DATE AND BRIDGE NUMBER" note. Added "REFLECTIVE RAILING" note and "REFLECTIVE RAILING MARKER SPACING" table.			



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TRAFFIC RAILING/SOUND BARRIER (8'-0")

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5210	

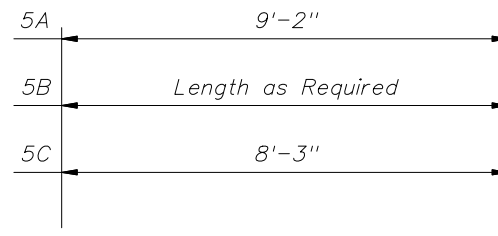
REINFORCING STEEL BENDING DIAGRAMS

BILL OF REINFORCING STEEL

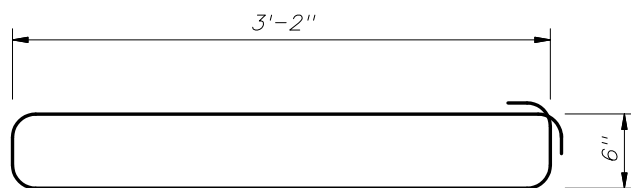
MARK	SIZE	LENGTH
A	5	9'-2"
B	5	AS REQ'D.
VC	5	8'-3"
Le	5	3'-3"
S3	5	7'-4"
U1	5	4'-1"
U2	5	12'-10"
DOWEL	1" \emptyset Smooth Bar	2'-0"

REINFORCING STEEL NOTES:

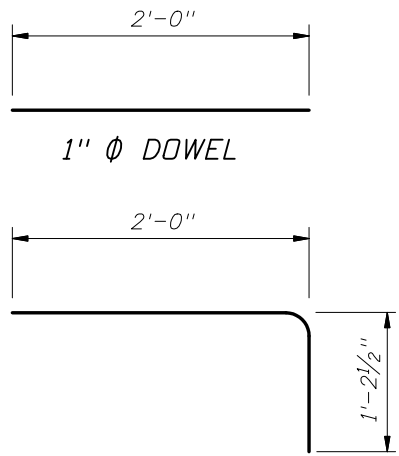
- All bar dimensions in the bending diagrams are out to out.
- All reinforcing steel at the open joints will have a 2" minimum cover.
- Lap splices for Bars 5B will be a minimum of 2'-2".
- The Contractor may use Welded Wire Fabric when approved by the Engineer. Welded Wire Fabric will conform to ASTM A 497.



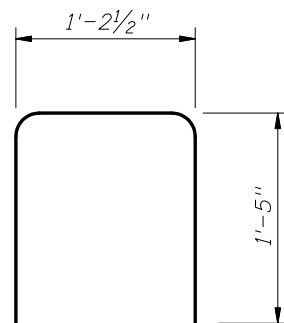
BARS 5A, 5B & 5C



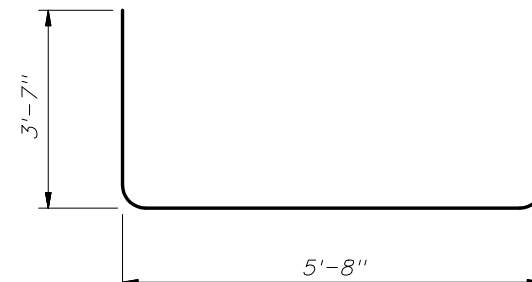
BAR 5S3



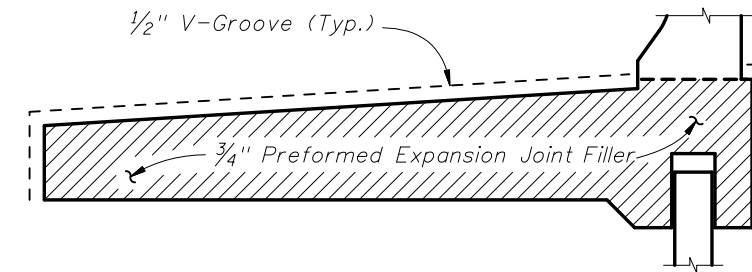
BAR 5L



BAR 5U1

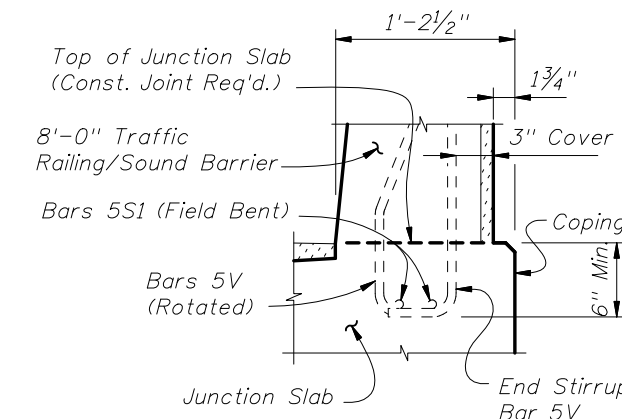


BAR 5U2



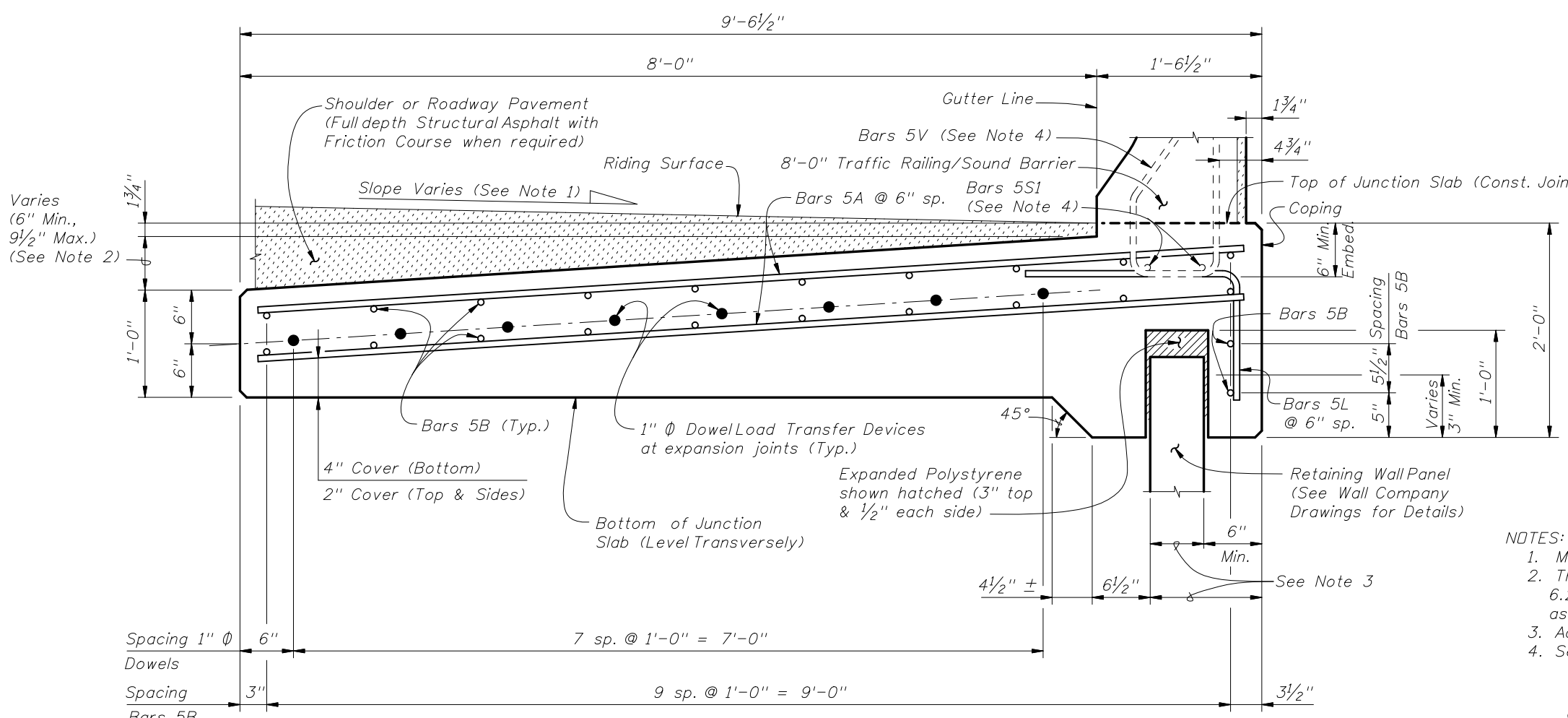
DETAIL "A"

(Showing Locations of 1/2" V-Grooves and 3/4" Preformed Expansion Joint Filler)



PARTIAL END VIEW OF RAILING END TRANSITION FOR GUARDRAIL ATTACHMENT (Showing Bars 5V and Bars 5S1)

NOTE: See Index No. 5210, Detail "A" for details.



SECTION B-B
TYPICAL SECTION THRU JUNCTION SLAB AND RETAINING WALL

ESTIMATED JUNCTION SLAB QUANTITIES		
ITEM	UNIT	QUANTITY
Concrete (Junction Slab)	CY/Ft.	0.470
Reinforcing Steel (Typical)	LB/Ft.	67.97
Additional Reinf. @ Expansion Joint	Lb.	42.72

(The above concrete quantities are based on a superelevation of 6.25%.)

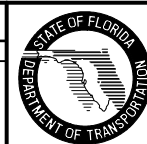
NOTES:

- Match Cross Slope of Travel Lane or Shoulder.
- The minimum dimension of 6" corresponds to a superelevation of 6.25%. For superelevations exceeding 6.25%, increase this dimension as required to match roadway superelevation.
- Actual location & width vary depending on type of Retaining Wall used.
- See Index No. 5210 for Bars 5V and 5S1.

CROSS REFERENCE:
For location of Section B-B, see Sheet 1.

REVISIONS

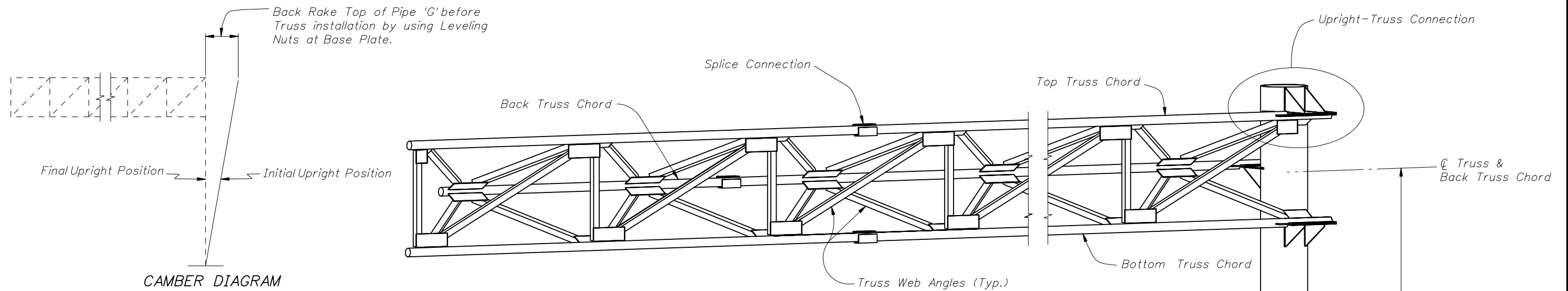
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
01/01/09	SJN	Changed "Shoulder or Roadway Pavement" note in SECTION B-B and 6" to 6" Min. for coping thickness.			



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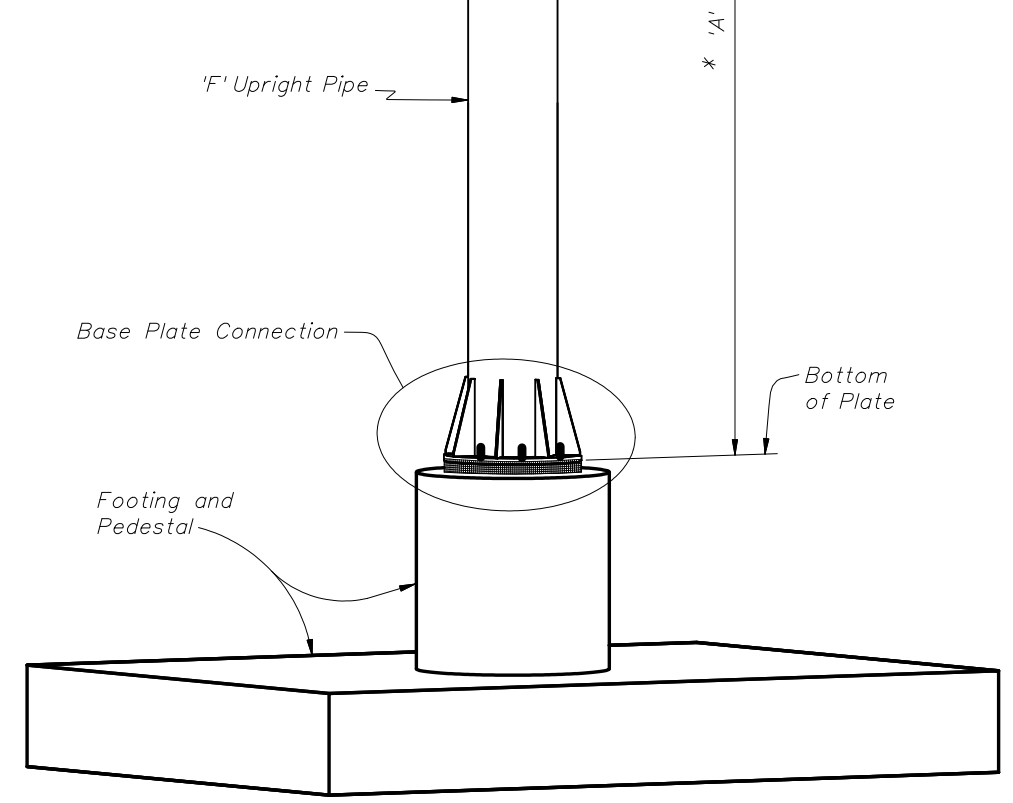
TRAFFIC RAILING/SOUND BARRIER (8'-0")
JUNCTION SLAB

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01/01/09	2 of 2
Index No.	
5212	



CANTILEVER SIGN STRUCTURE NOTES

- 1) Design according to FDOT Structures Manual. Alternate Designs are not allowed.
- 2) Submit shop drawings for all work. Include:
 - a. Field verification of all upright heights.
 - b. Foundation elevations necessary to insure minimum vertical clearances as per traffic plans.
 - c. Anchor bolt orientation with respect to centerline of truss and the direction of traffic.
 - d. Show chord splices a minimum distance of 2 truss panel lengths apart. "SD" Panel from upright is the closest panel in which a chord splice may be used. See plans for Cantilever Sign Structure Data Table. Upright splices are not allowed.
- 3) Shop Fabrication, Assembly, Handling and Shipping:
 - a. Do not begin fabrication before receiving shop drawing approval.
 - b. Welding: Conform to American Welding Society Structural Welding Code (Steel) ANSI/AWS D1. 1 (current edition).
 - c. Shop assemble the entire structure after galvanizing and prior to shipment.
 - d. If necessary, disassemble and secure components for shipment.
- 4) Sign Structure Materials:
 - a. Upright and Chords (Steel Pipe): API -5L-X42 (42 ksi yield) or ASTM A500, Grade B.
 - b. Steel Angles: ASTM A 709, Grade 36.
 - c. Steel Plates: ASTM A 709, Grade 36.
 - d. Weld Metal: E70XX.
 - e. Bolts: ASTM A325 Type 1, (install per Specification Section 700) with single, self-locking nuts.
 - f. Anchor Bolts: ASTM F1554, Grade 55 with ASTM A563 Grade A heavy-hex double nuts.
 - g. Install all nuts per manufacturer's instructions.
 - h. Bolt hole diameters: equal to the bolt diameter plus 1/16".
 - i. Anchor bolt hole diameters: equal to the bolt diameter plus 1/2".
- 5) Galvanization: Nuts, bolts and washers: ASTM F2329. Other steel items: ASTM A123
- 6) Sign Panels: Aluminum. See Elevation drawing for sizes and locations.
- 7) Foundation Materials:
 - a. Reinforcing Steel: ASTM A615, Grade 60.
 - b. Concrete: Class IV, minimum 5.5 ksi compressive strength at 28-days for all environmental classifications for Spread Footing. Class IV (Drilled Shaft), minimum 4.0 ksi compressive strength at 28-days for all environmental classifications for Drilled Shaft.
- 8) Construct the Sign Structure foundation in accordance with FDOT Specification Section 455.
- 9) Prior to erection, record the as-built anchor locations and provide to the Engineer.
- 10) After placement of the upright and prior to installation of the truss, adjust the leveling nuts beneath the base plate to achieve the back rake shown on the Camber Diagram.
- 11) Place backfill above the footing prior to installation of the sign panels. Do not remove or reduce in height without prior approval of the Engineer.
- 12) Install sign panels as shown on the Elevation drawing.
- 13) Payment: All costs associated with the Sign Structure, Sign Panels, Foundation and all incidental items will be paid for under the Sign Structure pay item.
- 14) 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.

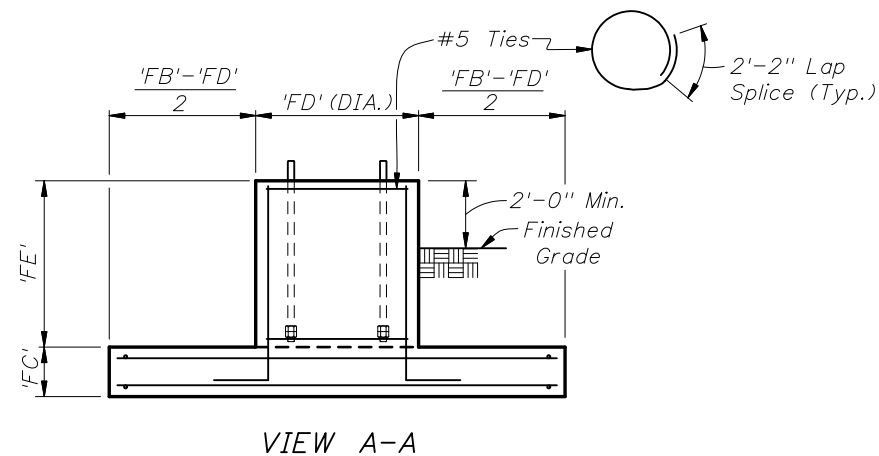
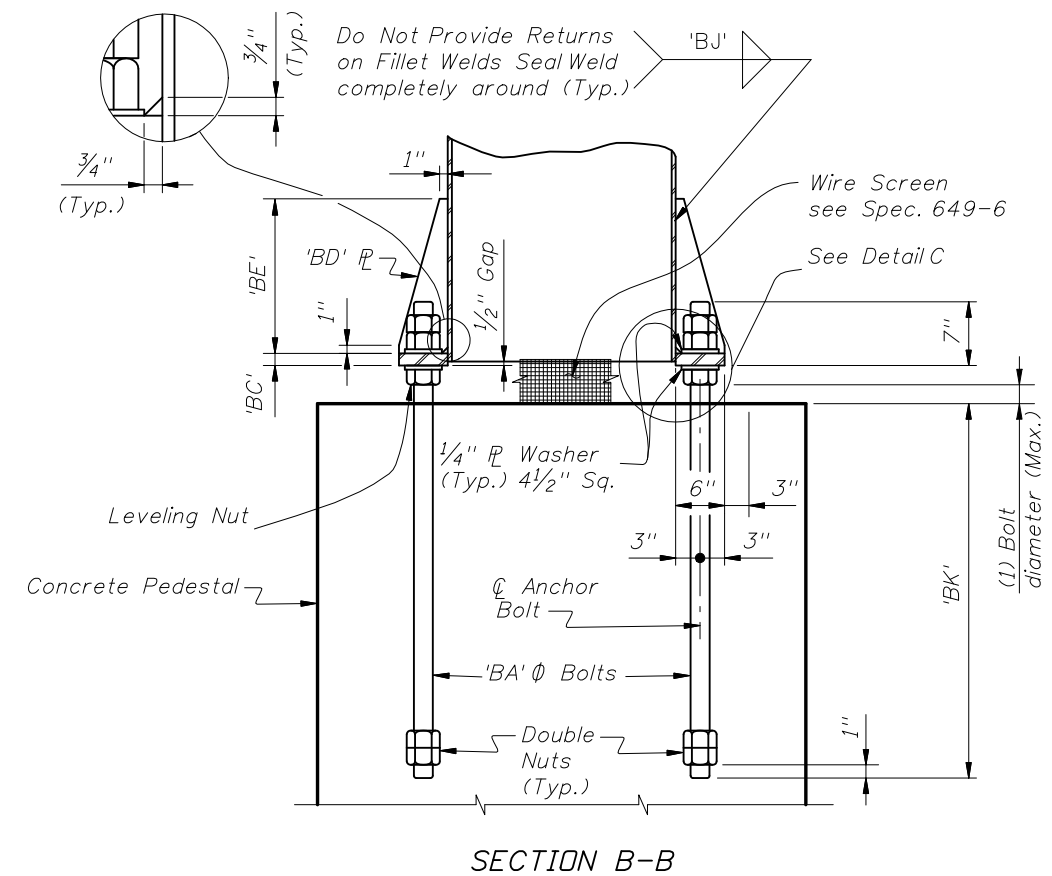
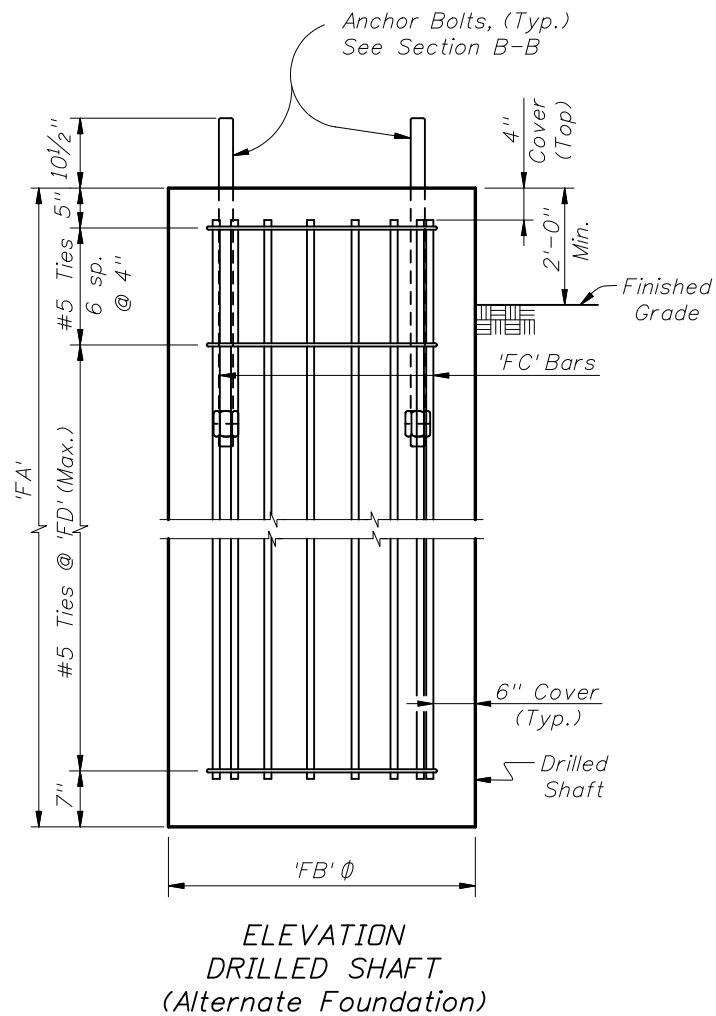
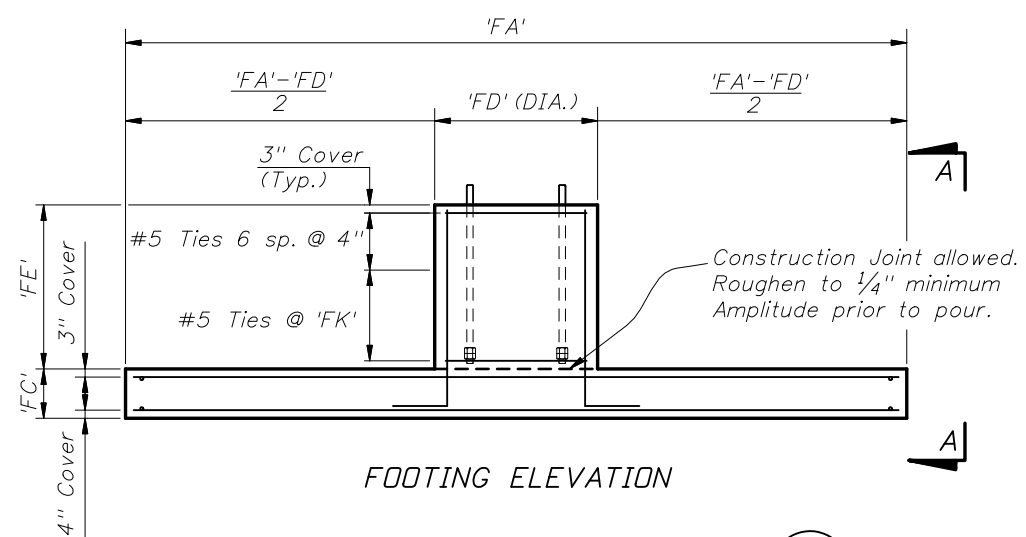
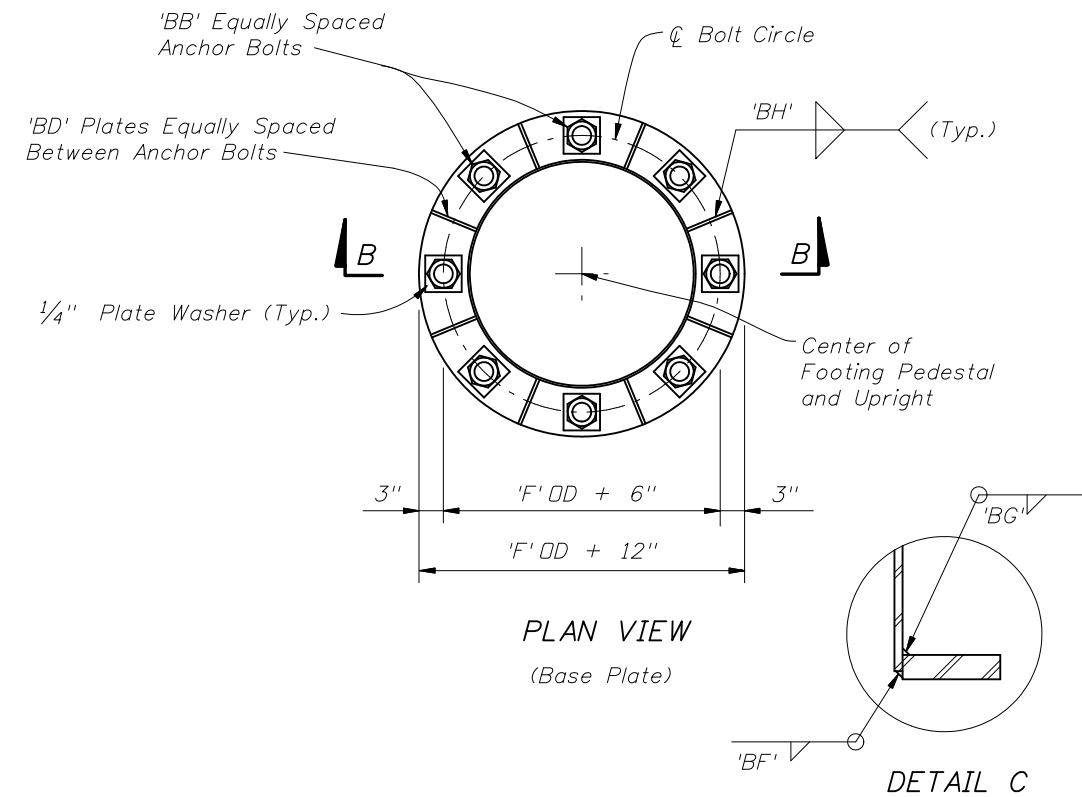
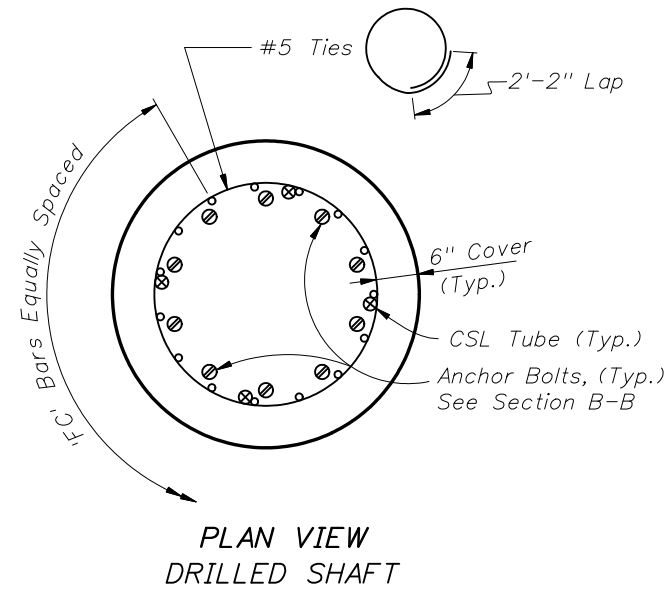
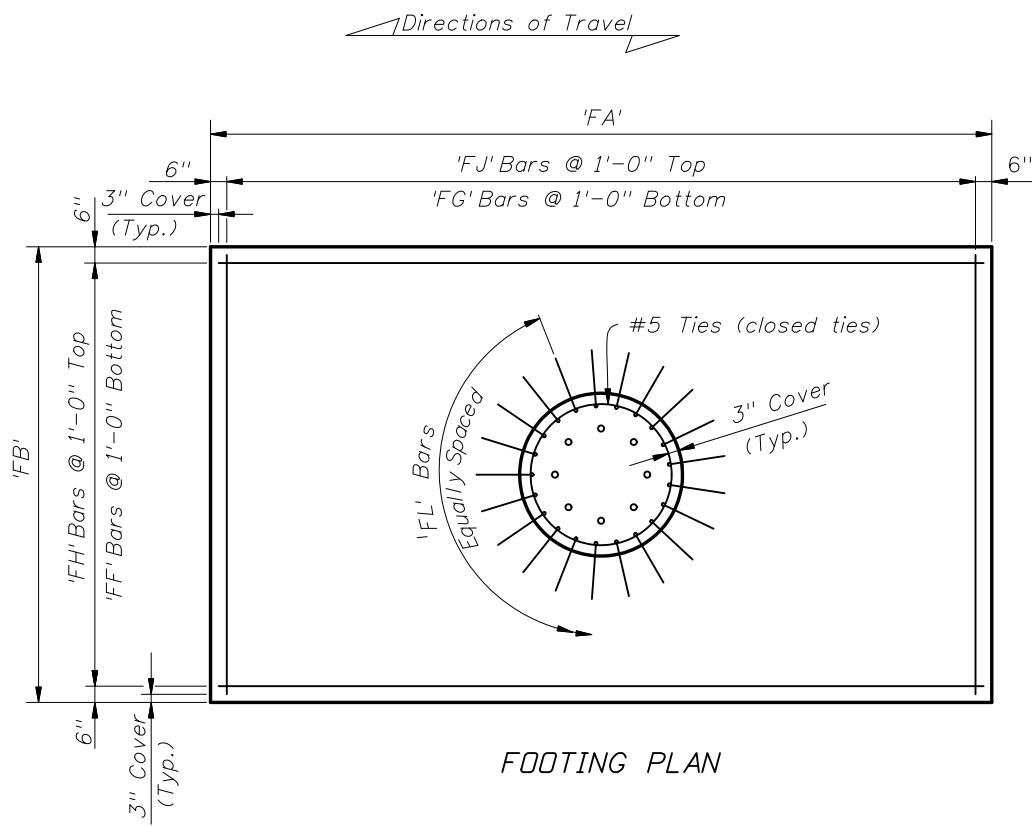


ISOMETRIC VIEW

*NOTE: Contractor shall verify these Dimensions prior to Fabrication of Upright.

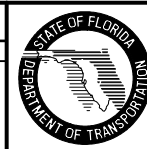
NOTE: See Plans for Cantilever Sign Structure Data Table.

REVISIONS						2008 Interim Design Standard	Interim Date	Sheet No.
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION		01/01/09	1 of 5
01/01/08	DYW	Changed Notes 4e, 7b & 9.						
07/01/08	CBH	Changed Note 4e.						
01/01/09	CBH	Deleted Grout Pad and added Wire Screen. Added CSL tube note.						
CANTILEVER SIGN STRUCTURE								Index No. 11310



REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
07/01/08	CBH	Changed foundation standoff distance. Changed drilled shaft detail.			
01/01/09	CBH	Deleted Grout Pad and added Wire Screen. Added CSL tubes. Changed 'FC' and 'FL' reinforcing.			

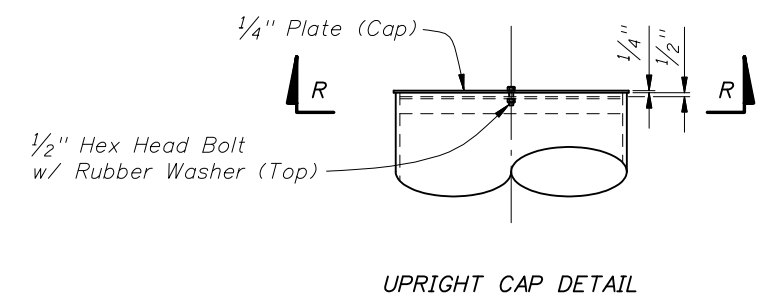
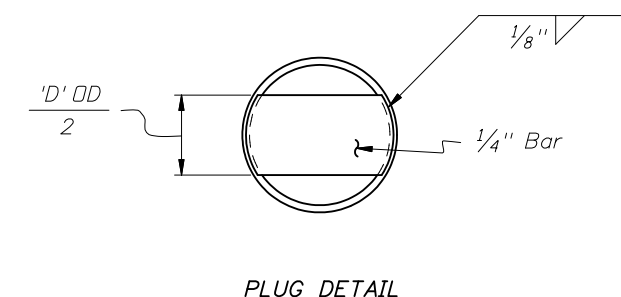
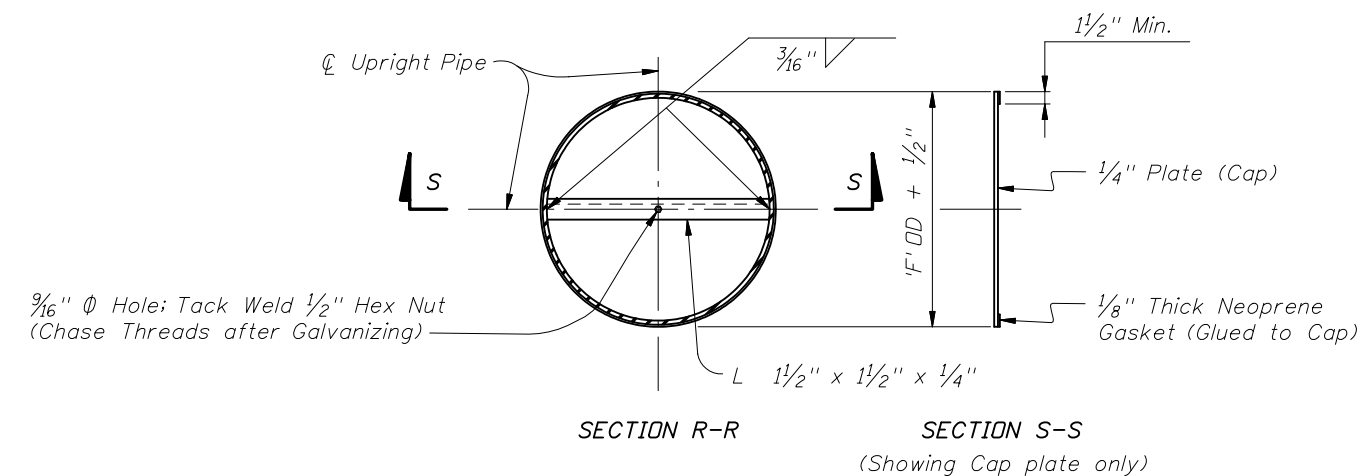
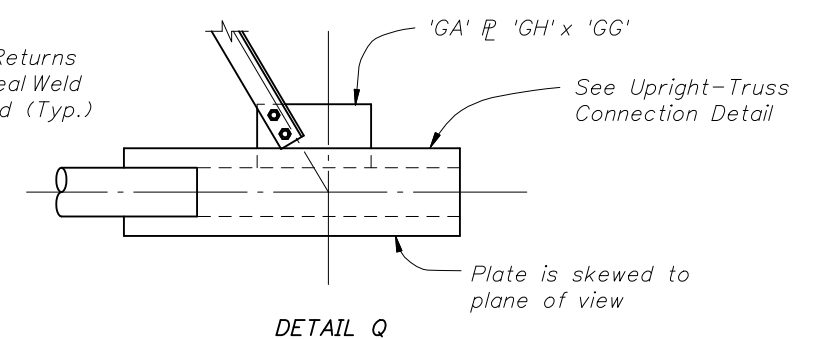
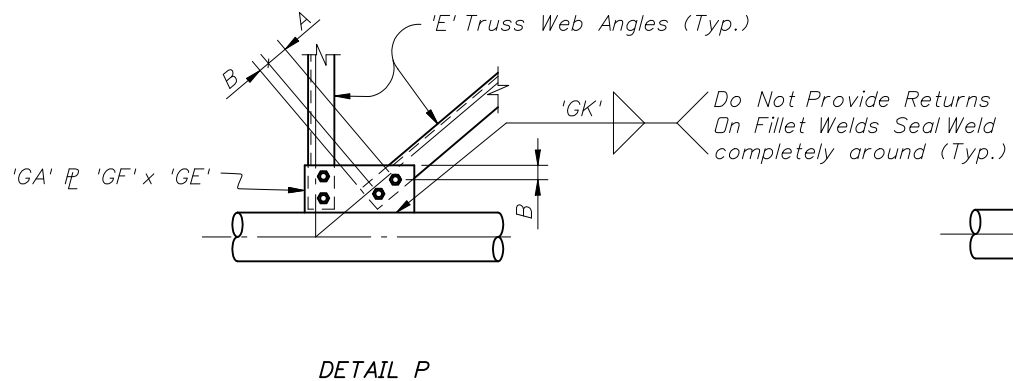
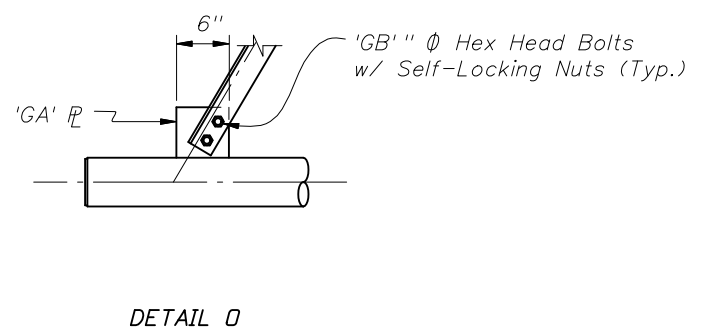
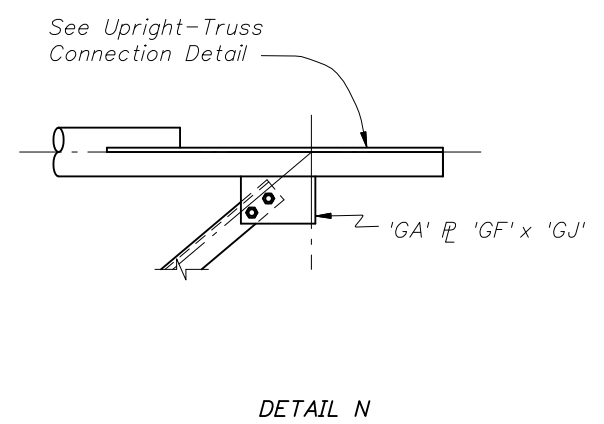
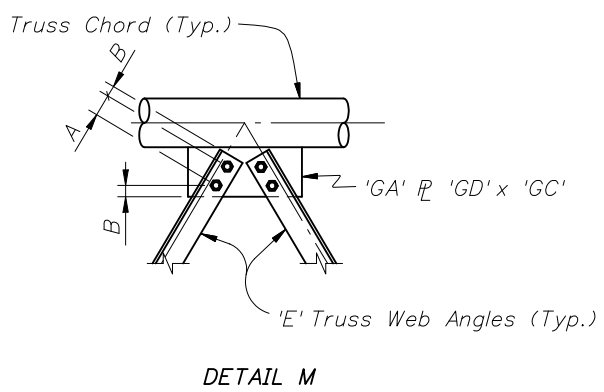
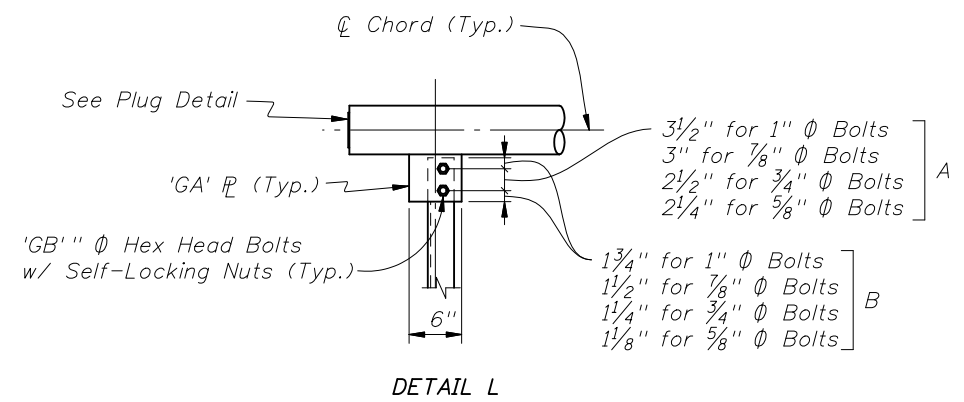


2008 Interim Design Standard

CANTILEVER SIGN STRUCTURE

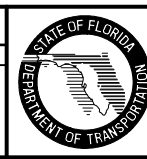
Interim Date 01/01/09 Sheet No. 2 of 5

Index No. 11310



NOTE:
Abbreviation
OD ~ Outside Diameter

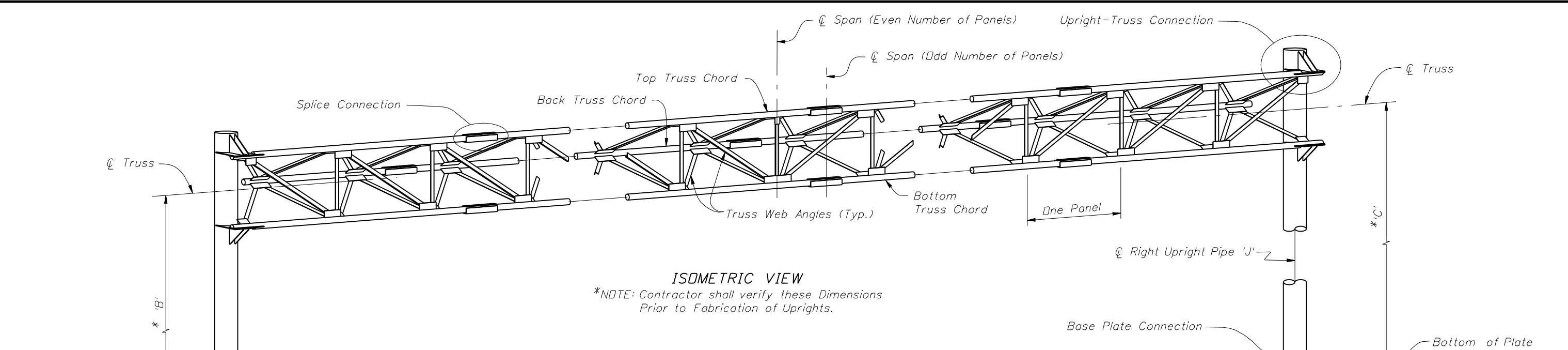
REVISIONS			
DATE	BY	DESCRIPTION	
01/01/09	CBH	Changed bolt spacing connection details.	



2008 Interim Design Standard

CANTILEVER SIGN STRUCTURE

Interim Date: 01/01/09
Sheet No.: 5 of 5
Index No.: 11310



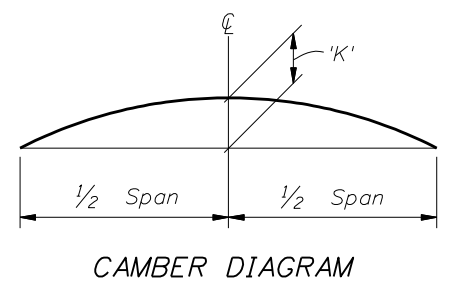
ISOMETRIC VIEW

*NOTE: Contractor shall verify these Dimensions Prior to Fabrication of Uprights.

SPAN SIGN STRUCTURE NOTES

- 1) Design according to FDDT Structures Manual. Alternate Designs are not allowed.
- 2) Submit shop drawings for all work. Include:
 - a. Field verification of all upright heights.
 - b. Foundation elevations necessary to insure minimum vertical clearances as per traffic plans.
 - c. Anchor bolt orientation with respect to centerline of truss and the direction of traffic.
 - d. The method to be used to provide the required parabolic camber. (See Camber Diagram)
- 3) Shop Fabrication, Assembly, Handling and Shipping:
 - a. Do not begin fabrication before receiving shop drawing approval.
 - b. Welding: Conform to American Welding Society Structural Welding Code (Steel) ANSI/AWS D1.1 (current edition).
 - c. Shop assemble the entire structure after galvanizing and prior to shipment.
 - d. If necessary, disassemble and secure components for shipment.
- 4) Sign Structure Materials:
 - a. Upright and Chords (Steel Pipe): API -5L-X42 (42 ksi yield) or ASTM A500, Grade B.
 - b. Steel Angles: ASTM A 709, Grade 36.
 - c. Steel Plates: ASTM A 709, Grade 36.
 - d. Weld Metal: E70XX.
 - e. Bolts: ASTM A325 Type 1, (install per Specification Section 700) with single, self-locking nuts.
 - f. Anchor Bolts: ASTM F1554, Grade 55 with ASTM A563 Grade A heavy-hex double nuts.
 - g. Install all nuts per manufacturer's instructions.
 - h. Bolt hole diameters: equal to the bolt diameter plus 1/16".
 - i. Anchor bolt hole diameters: equal to the bolt diameter plus 1/2".
- 5) Galvanization: Nuts, bolts and washers: ASTM F2329. Other steel items: ASTM A123
- 6) Sign Panels: Aluminum. See Elevation drawing for sizes and locations.
- 7) Foundation Materials:
 - a. Reinforcing Steel: ASTM A615, Grade 60.
 - b. Concrete: Class IV (Drilled Shaft), minimum 4.0 ksi compressive strength at 28-days for all environmental classifications.
- 8) Construct the Sign Structure foundation in accordance with FDDT Specification Section 455.
- 9) Prior to erection, record the as-built anchor locations and provide to the Engineer.
- 10) Provide a parabolic camber with the maximum upward deflection as shown on the Camber Diagram.
- 11) Locate Chord splices a minimum of 3 truss panel lengths apart. Chord splices may be either the Standard splice or the Alternate splice but not both on this structure. Upright splices are not allowed.
- 12) Install sign panels as shown on the Elevation drawing.
- 13) Payment: All costs associated with the Sign Structure, Sign Panels, Foundation and all incidental items will be paid for under the Sign Structure pay item.
- 14) 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

NOTE: See Plans for Span Sign Structure Data Table.



REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
01/01/08	DYW	Changed Notes 4e, 7b, & 9.			
07/01/08	CBH	Changed Notes 4e.			
07/01/09	CBH	Deleted Grout Pad and added Wire Screen. Added CSL tube note.			



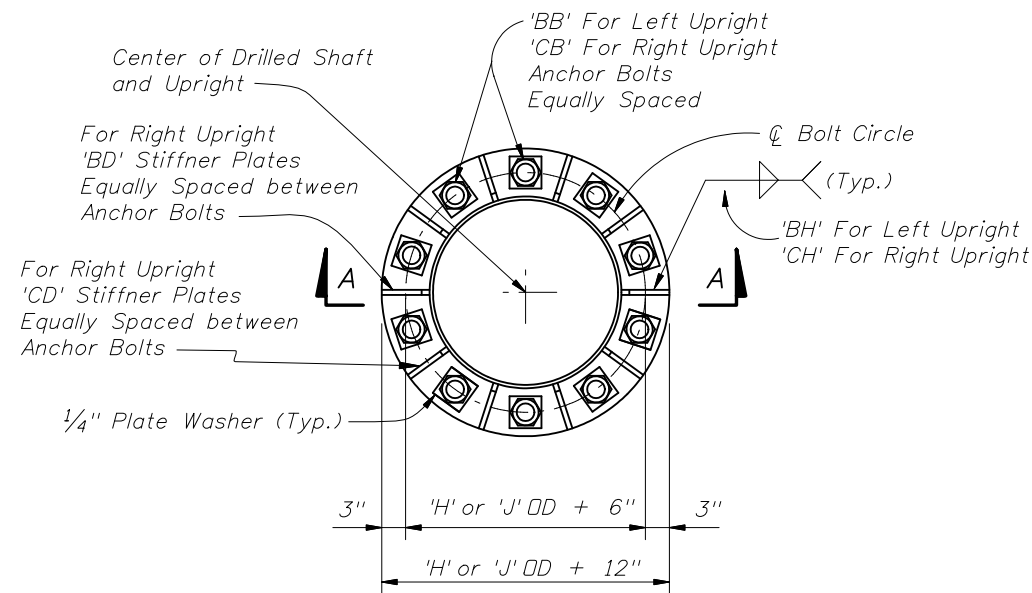
2010 Interim Design Standard

SPAN SIGN STRUCTURE

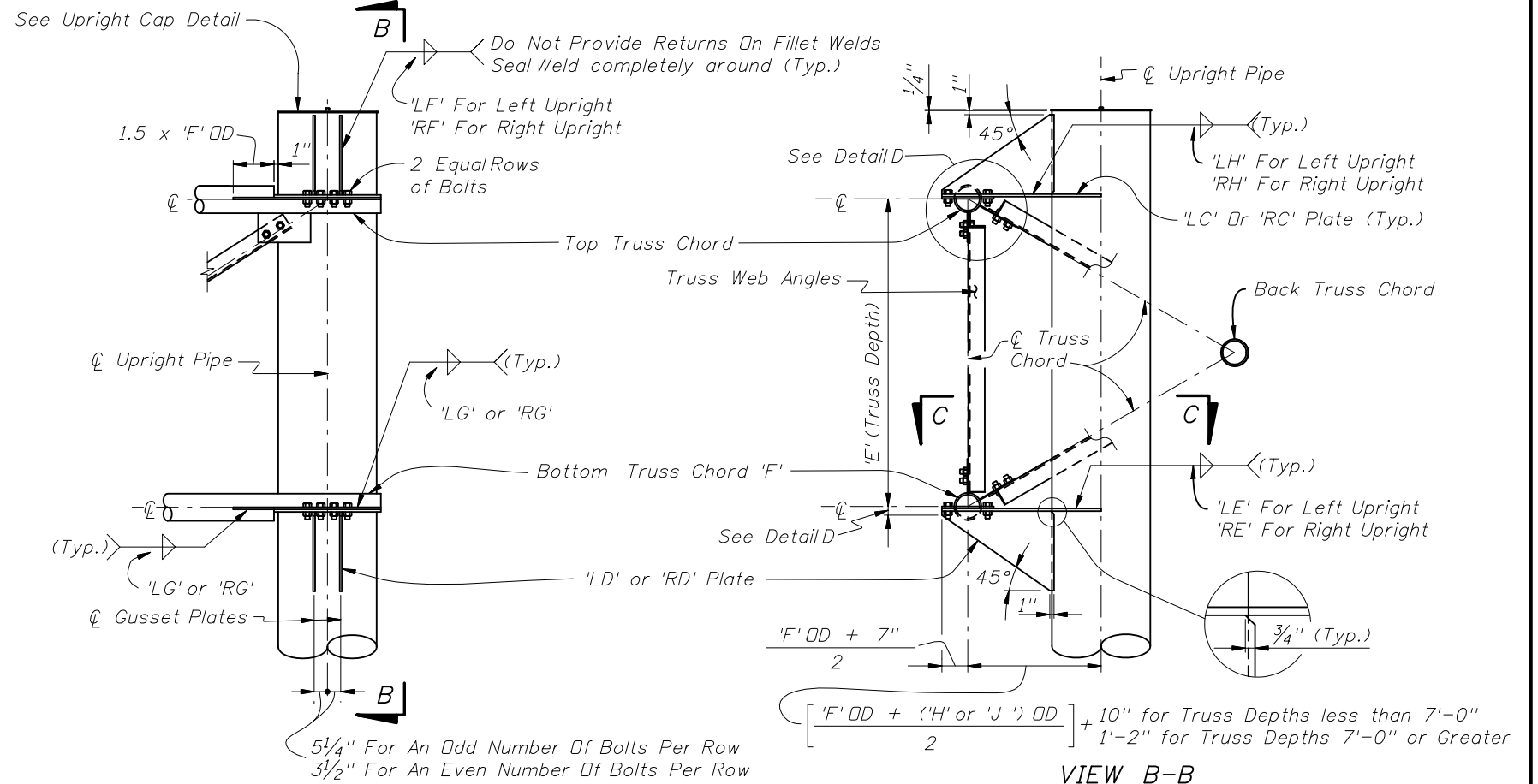
Interim Date: 01/01/09

Sheet No. 1 of 5

Index No. 11320



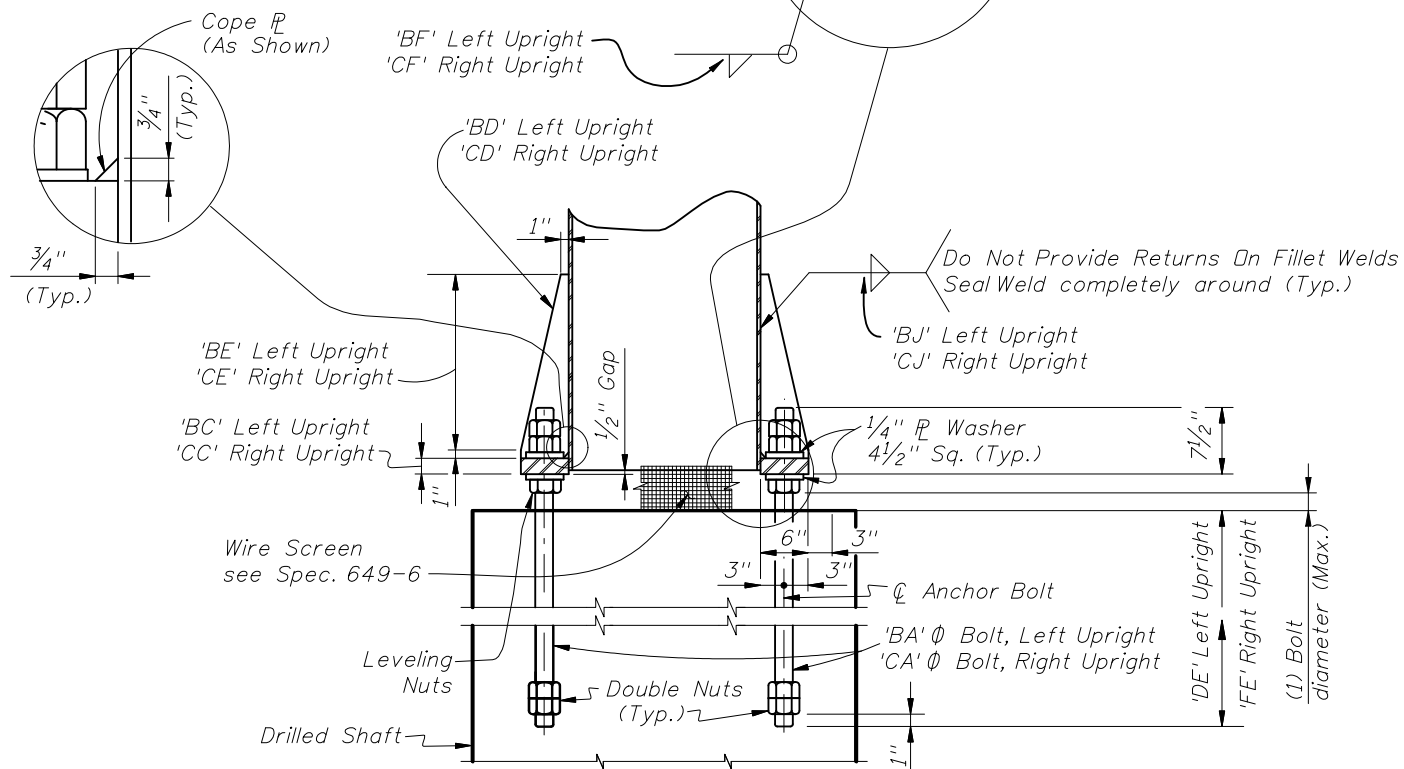
PLAN VIEW
BASE PLATE



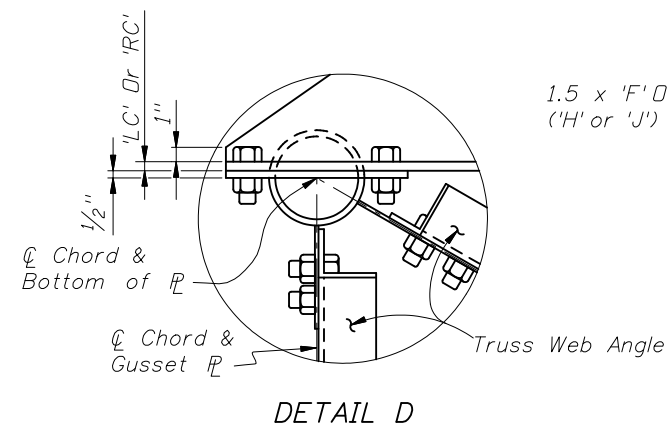
RIGHT UPRIGHT-TRUSS CONNECTION DETAIL
(LEFT UPRIGHT -TRUSS CONNECTION SIMILAR)

Web Members From Back Truss
Chord Omitted For Clarity

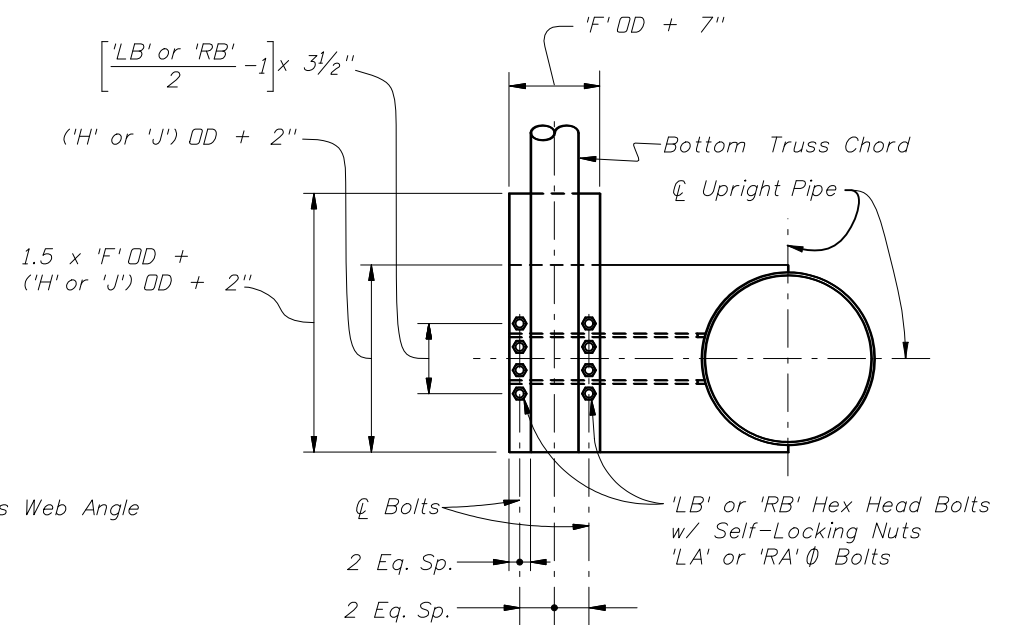
VIEW B-B



SECTION A-A



DETAIL D



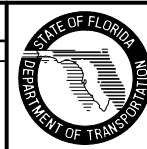
SECTION C-C

(With Gusset Plate and
Angles omitted for clarity)

NOTE:
Abbreviation
OD ~ Outside Diameter

REVISIONS

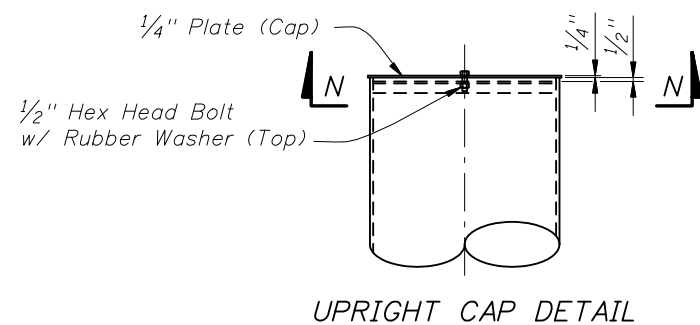
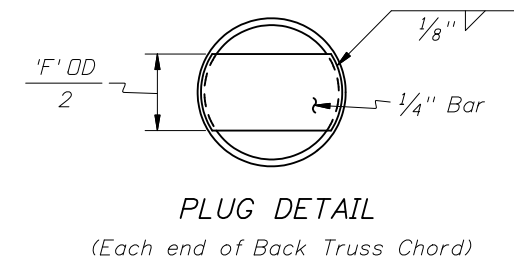
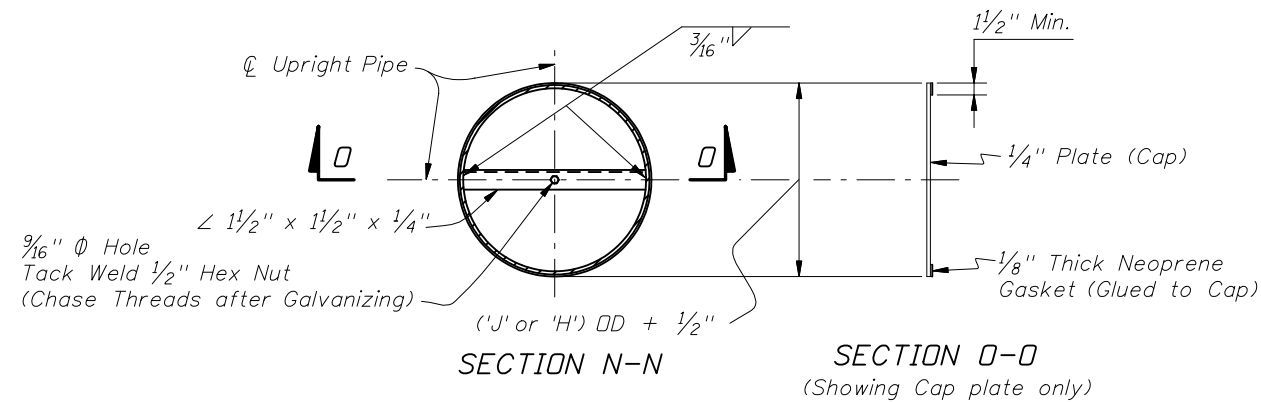
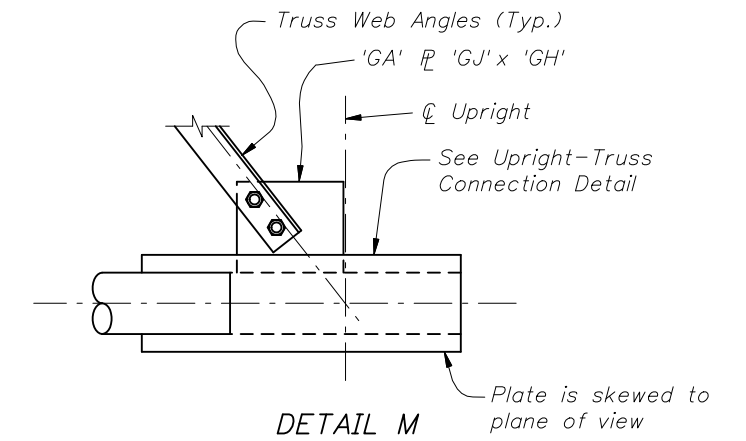
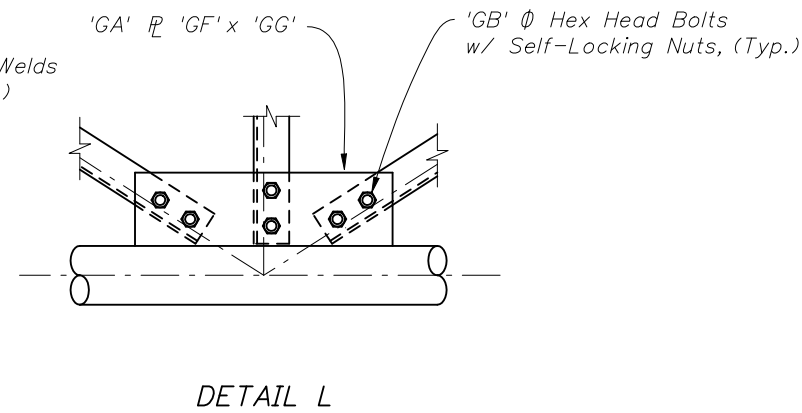
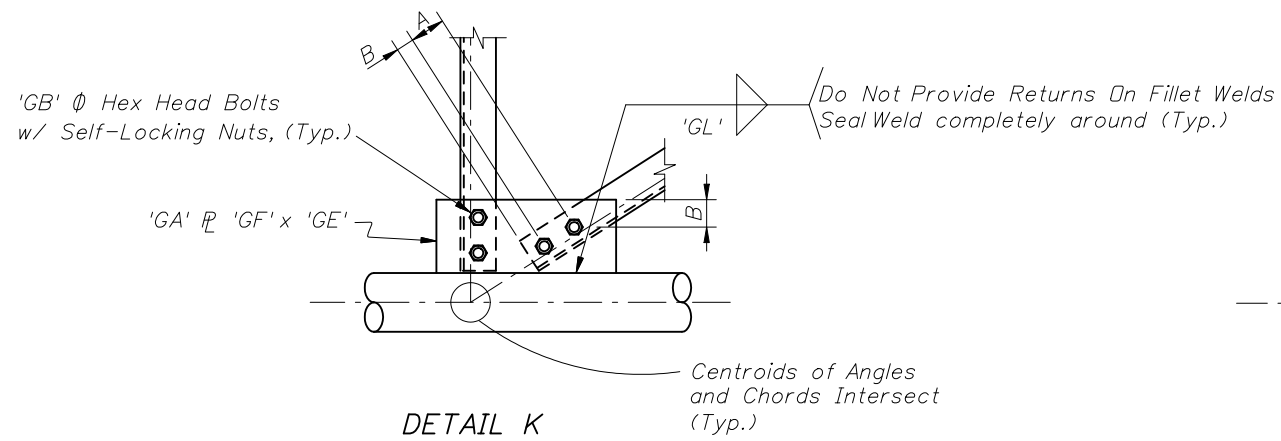
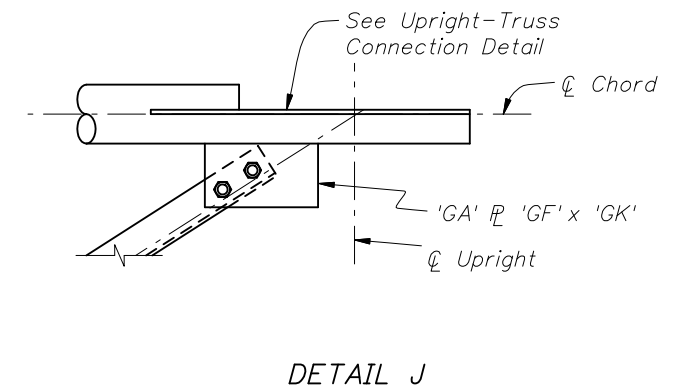
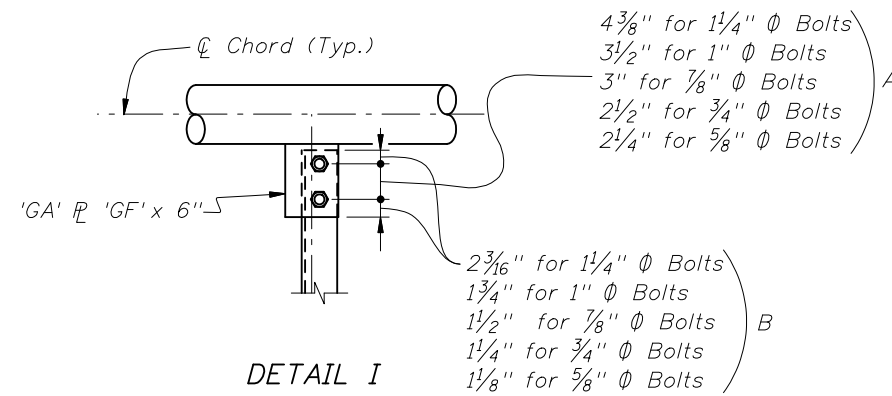
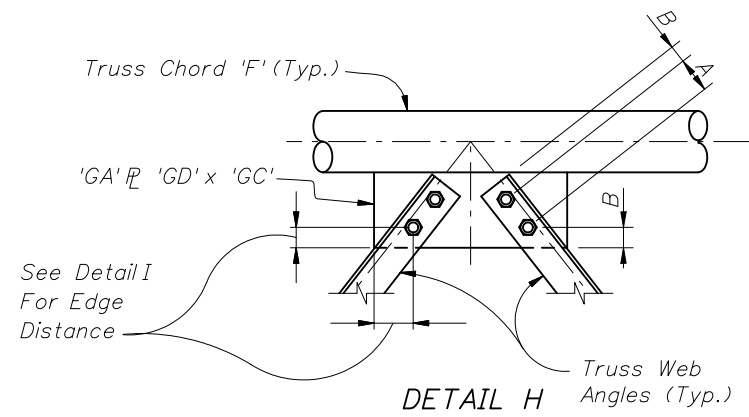
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
07/01/08	CBH	Changed foundation standoff distance.			
01/01/09	CBH	Deleted grout pad and added wire screen.			



2008 Interim Design Standard

SPAN SIGN STRUCTURE

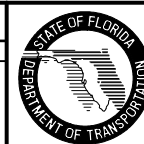
Interim Date 01/01/09	Sheet No. 2 of 5
Index No. 11320	



NOTE:
Abbreviation
DD ~ Outside Diameter

REVISIONS

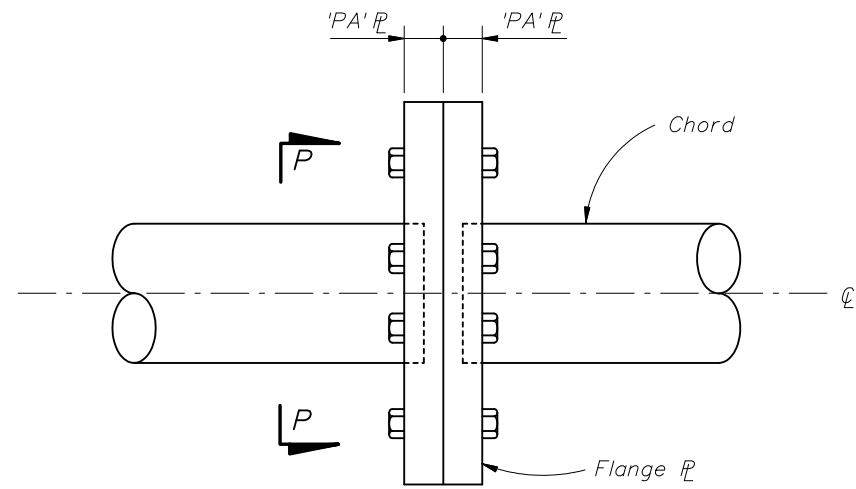
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
01/01/09	CBH	Changed bolt spacing connection details.			



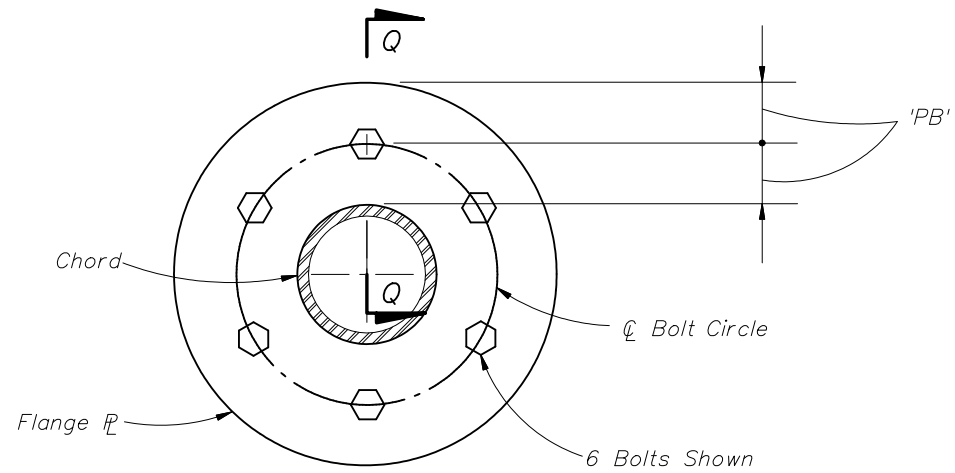
2008 Interim Design Standard

SPAN SIGN STRUCTURE

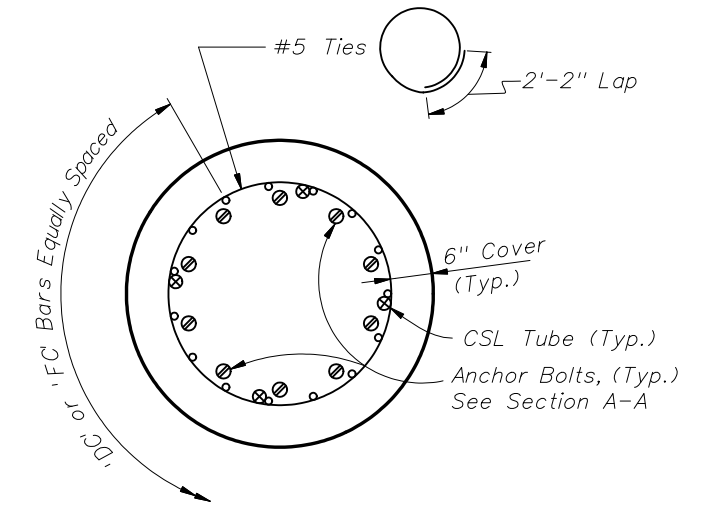
Interim Date	Sheet No.
01/01/09	4 of 5
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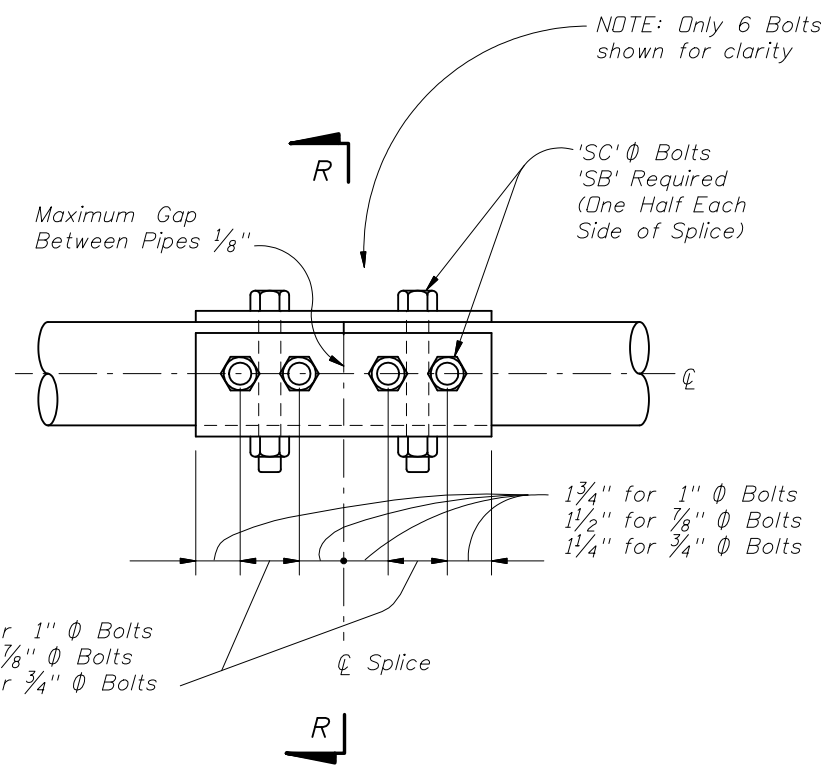
ELEVATION
ALTERNATE SPLICE CONNECTION



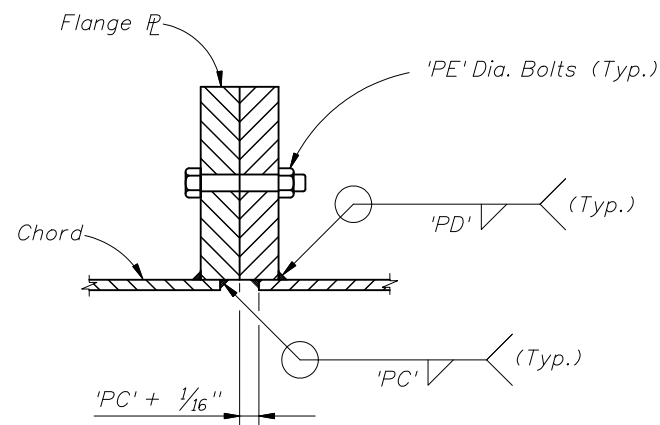
SECTION P-P



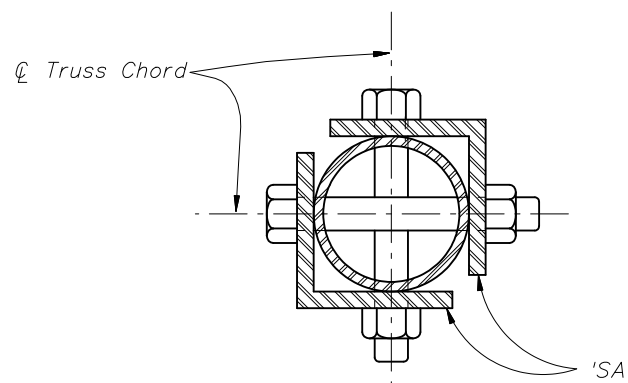
PLAN VIEW
DRILLED SHAFT



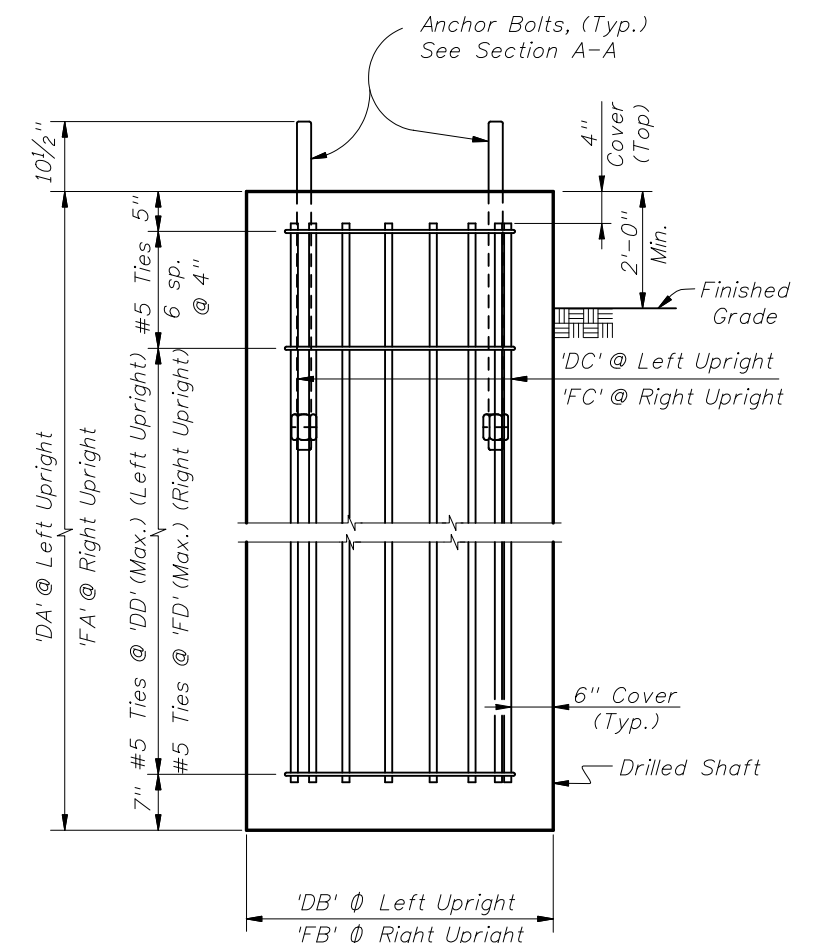
ELEVATION
SPLICE CONNECTION



SECTION Q-Q



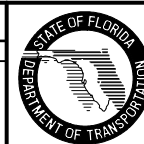
SECTION R-R



ELEVATION
DRILLED SHAFT

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
07/01/08	CBH	Changed drilled shaft detail.			
01/01/09	CBH	Added CSL tubes.			



2008 Interim Design Standard

SPAN SIGN STRUCTURE

Interim Date
01/01/09

Sheet No.
5 of 5

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11320

SINGLE COLUMN GROUND SIGN NOTES:

- 1) DESIGN WIND SPEED: See Wind Speeds by County.
- 2) GENERAL SPECIFICATIONS: Current FDOT Standard Specifications for Road and Bridge Construction and supplements thereto.
- 3) DESIGN SPECIFICATIONS: AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, as modified by the FDOT Structures Manual.
- 4) ALUMINUM: Aluminum Materials shall meet the requirements of Aluminum Association Alloy 6061-T6 (ASTM B209, B221, or B308), except as noted below.
- 5) CONCRETE: Class I.
- 6) SIGN PANELS: 0.08 inches min. thick Aluminum Plate with all corners rounded.
- 7) ALUMINUM BOLTS, NUTS, AND LOCK WASHERS:
 - a. Aluminum bolts: ASTM F468, Alloy 2042-T4 with at least 0.0002 inches thick anodic coating and chromate sealed.
 - b. Nuts: ASTM F467, Alloy 6061-T6 or 6262-T9.
 - c. Lockwashers: ASTM B221, Alloy 7075-T6.
- 8) STAINLESS STEEL BOLTS, NUTS, AND LOCKWASHERS: Stainless Steel Bolts, Nuts, and Lockwashers: ASTM F593 and ASTM F594, Alloy Group 2. Condition A, CW2, or SH4 may be provided in lieu of Aluminum Bolts, Nuts, and Washers.
- 9) U-BOLTS, NUTS, AND LOCKWASHERS: U-bolts, Nuts, and Lockwashers: ASTM A307, Grade A, galvanized in accordance with ASTM F2329.
- 10) INSTALLING FRANGIBLE COLUMN SUPPORTS: Columns (posts) may be installed by driving the columns in accordance with this Index, or as an alternate method, the columns (posts) may be set to the depth indicated in preformed holes backfilled with suitable material tamped in layers not thicker than 6" to provide adequate compaction or filled with flowable fill or bagged concrete.
- 11) BREAKAWAY SUPPORTS REQUIREMENTS: Install non-frangible aluminum column (post) (larger than 3 1/2") with breakaway supports as shown on Sheet 5 of 8. Signs shielded by barrier wall or guardrail do not require breakaway support.
- 12) QPL: Manufacturers seeking approval of alternate aluminum round tube, steel U-channel and steel square tube single post ground sign assemblies for inclusion on the Qualified Products List (QPL), must submit a QPL application, design calculations, and detailed drawings showing the product meets all the requirements of this index, including the design table, and Specification 700. Additional Steel Post Specifications are:
 - a. U-channel: ASTM A 499 Grade 60, or ASTM A576 Grade 1080 (with a minimum yield strength of 60 ksi).
 - b. Square Tube: ASTM A 653 Grade 50, or ASTM A 1011 Grade 50.

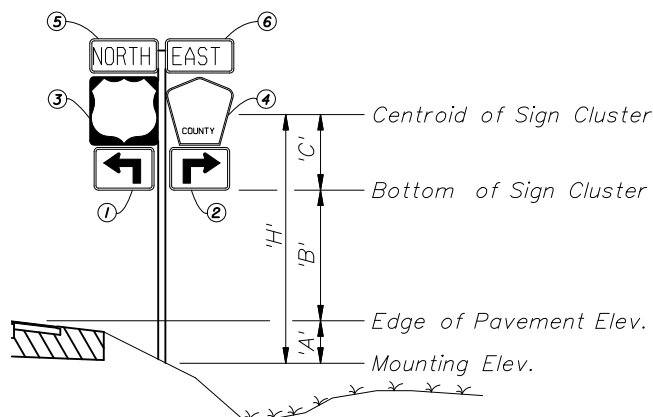
WIND SPEEDS BY COUNTY:

- 110 MPH**
Alachua, Baker, Bradford, Clay, Columbia, Gadsden, Gilchrist, Hamilton, Hardee, Jackson, Jefferson, Lafayette, Lake, Leon, Madison, Marion, Polk, Putnam, Sumter, Suwannee and Union counties.
- 130 MPH**
Bay, Brevard, Calhoun, Charlotte, Citrus, De Soto, Dixie, Duval, Flagler, Franklin, Glades, Gulf, Hendry, Hernando, Highlands, Hillsborough, Holmes, Lee, Levy, Liberty, Manatee, Nassau, Okaloosa, Okeechobee, Orange, Osceola, Pasco, Pinellas, Sarasota, Seminole, St Johns, Taylor, Volusia, Wakulla, Walton and Washington counties.
- 150 MPH**
Broward, Collier, Dade, Escambia, Indian River, Martin, Monroe, Palm Beach, Santa Rosa and St. Lucie counties.

GUIDE TO USE THIS STANDARD:

1. Calculate the area and the centroid for an individual sign or a sign cluster. Note that the centroid and areas have been calculated for frequently used sign clusters. These are shown on Sheet No. 6, 7 & 8 of 8.
2. Determine the height 'H' from groundline for the individual sign or the cluster.
3. Select the appropriate Column (Post) Selection Tables by Wind Speed and find the intersection point.
4. Design the post and the foundation according to the dark-bold lines or shaded area (if cantilever sign) in the Column (Post) Selection Tables and Post and Foundation Table. For sign posts with signs oriented in two directions, only the sign with the largest area should be analyzed to determine the post requirements.

EXAMPLE:



Size H x V	Centroid			'A _n ' (IN ²)	'X _n ' x 'A _n ' (IN ³)	'Y _n ' x 'A _n ' (IN ³)	
	local 'Y _n ' (IN)	global 'X _n ' (IN)	global 'Y _n ' (IN)				
(IN x IN)	(IN)	(IN)	(IN)	(IN ²)	(IN ³)	(IN ³)	
① 21 x 15	7.5	-10.5-1.5-1.5 = -13.5	7.5	315	-4,252.5	2,362.5	
② 21 x 15	7.5	10.5+1.5+1.5 = 13.5	7.5	315	+4,252.5	2,362.5	
③ 24 x 24	12	-12-1.5 = -13.5	15+1+12= 28	576	-7,776	16,128	
④ 24 x 24	12	12+1.5 = 13.5	15+1+12= 28	436	5,886	12,208	
⑤ 24 x 12	6	-12-1.5 = -13.5	15+1+24+ 1+6=47	288	-3,888	13,536	
⑥ 24 x 12	6	12+1.5 = 13.5	15+1+24+ 1+6=47	288	3,888	13,536	
				2,218	-1,890	60,133	TOTALS

$\Sigma('A_n') = 2,218 \text{ IN}^2 = 15.4 \text{ FT}^2$ $\Sigma('X_n' \times 'A_n') = -1,890 \text{ IN}^3 = -1.09 \text{ FT}^3$ $\Sigma('Y_n' \times 'A_n') = 60,133 \text{ IN}^3 = 34.8 \text{ FT}^3$

$'X'_c = \frac{\Sigma('X_n' \times 'A_n')}{\Sigma 'A_n'} = -0.1 \text{ FT}$ $'Y'_c = \frac{\Sigma('Y_n' \times 'A_n')}{\Sigma 'A_n'} = 2.26 \text{ FT}$

Assume: Bay County, 'A' = 1 FT, 'B' = 7 FT
Calculated: 'X'_c = -0.1 FT 'C' = 'Y'_c = 2.26 FT
Since 'X'_c < 6", it is not a cantilever sign, only dark-bold lines in the table will be referenced to.

'H' = 'A' + 'B' + 'C' = 10.26 FT ==> **USE 11 FT** $\Sigma('A_n') = 15.4 \text{ FT}^2$ ==> **USE 16 FT²**

COLUMN (POST) SELECTION TABLE (WIND SPEED = 130 MPH)

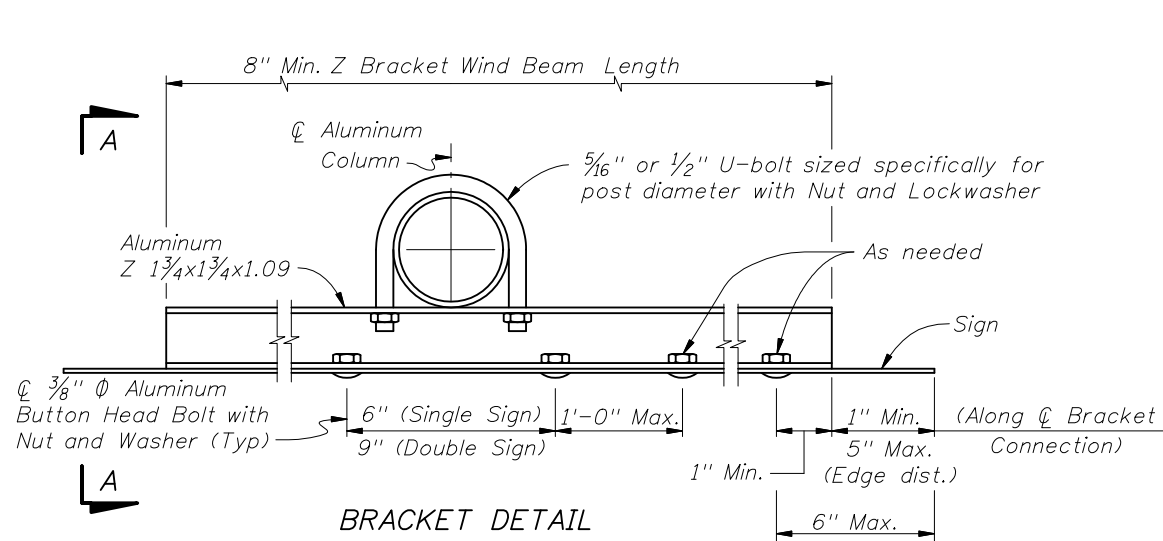
TOTAL PANEL AREA (SF) \ 'H' (FT)	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0	18.0	19.0	20.0
3													
4													
5													
6													
7													
8													
9													
10													
11													
12													
13													
14													
15													
16													
17													
18													
19													
20													

For WIND SPEED = 130 MPH, 'H' = 11 FT, Area = 16 FT²

- Refer to the 130 mph Column (Post) Selection Table, as copied from Sheet 3 of 8 and shown here.
- Using the 16 ft² area on the left hand side of the table, go across to the 11 ft height and find the cell marked with X.
- find the symbol [4] which the dark-bold line under the X cell leads to.
- In the Post and Foundation Table, the symbol [4] concludes that the design requires a 4.0" diameter and 0.25" thick Aluminum Column (Post) and a 2.0' diameter and 4.0' deep Concrete Foundation.

= If CANTILEVER SIGN configuration (see Cantilever Sign Details) falls in this region, use next larger post size than that indicated.

NOTES AND EXAMPLE

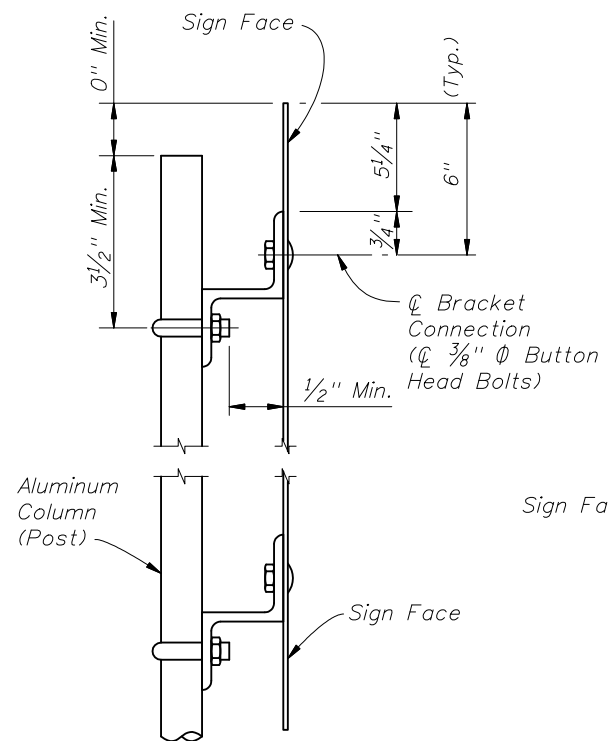


BRACKET DETAIL

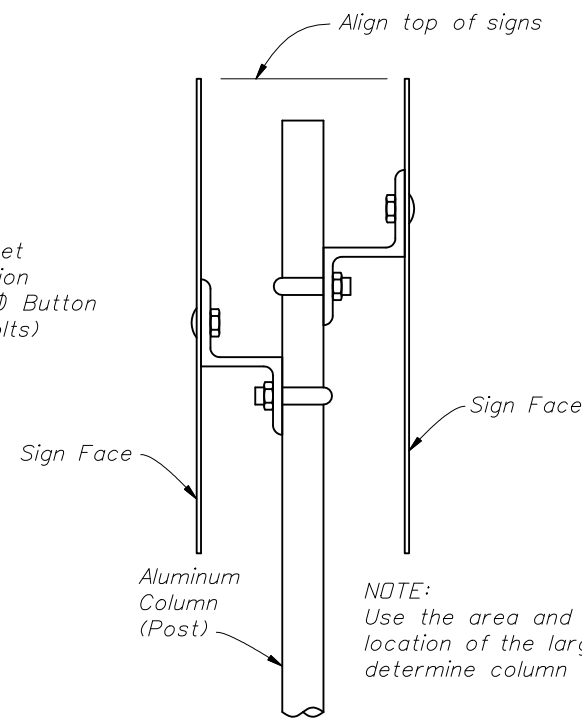
NOTES:

1. 5/16" Φ Stainless Steel Hex Head Bolts with Flat Washer under Head and Lockwasher under Nut may be used in lieu of 3/8" Φ Aluminum Button Head Bolts.
2. Nylon washers provided by the sheeting supplier shall be used on all ground mounted signs. The washers shall be installed under the sign bolt head to protect the sheeting.
3. Vertical spacing of brackets shall not exceed 2'-6". Use additional brackets, spaced evenly, to maintain maximum spacing.

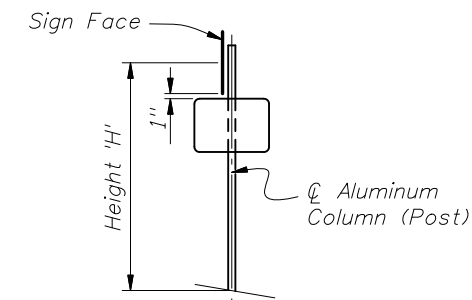
*For signs with either dimension of sign size greater than 30". (See Sheet No. 6 thru 8 of 8 for sign size)



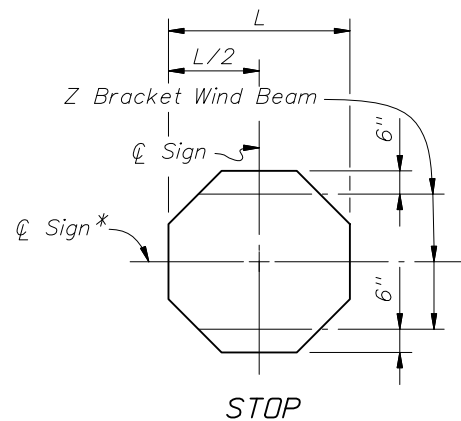
VIEW A-A



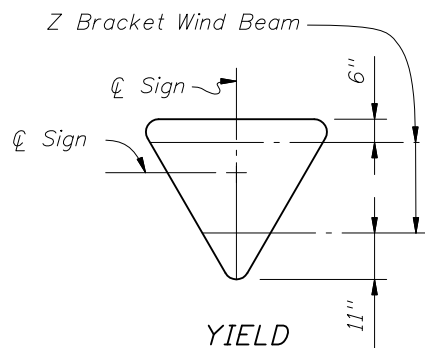
SIGNS BACK-TO-BACK



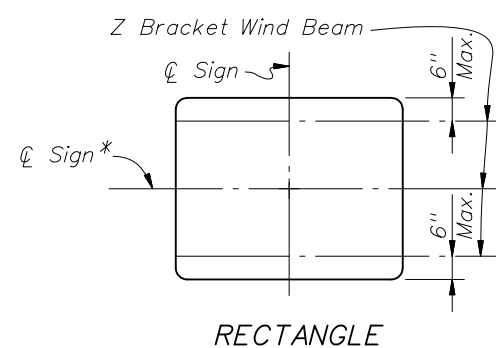
SIGNS AT 90°



STOP

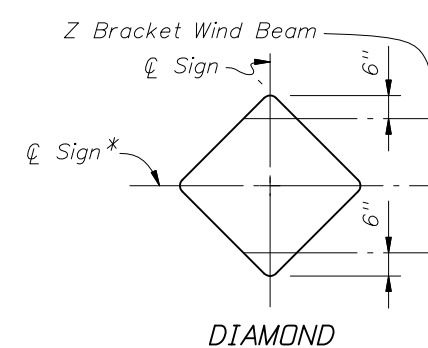


YIELD

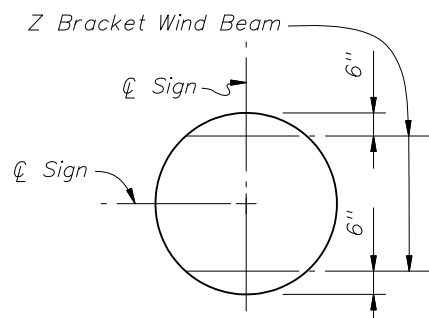


RECTANGLE

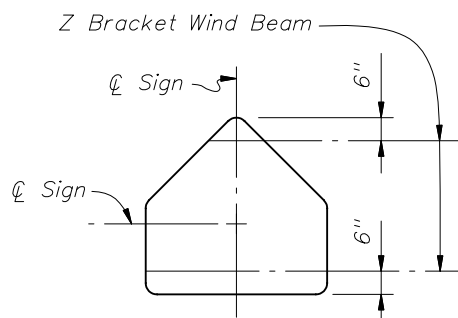
(Use only one Wind Beam at Φ Sign for sign height up to 12")



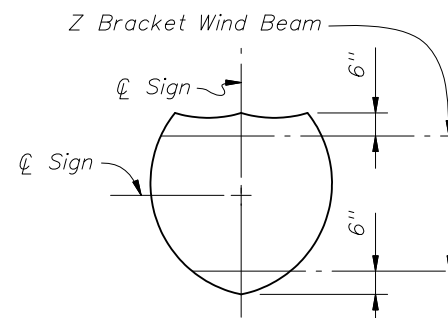
DIAMOND



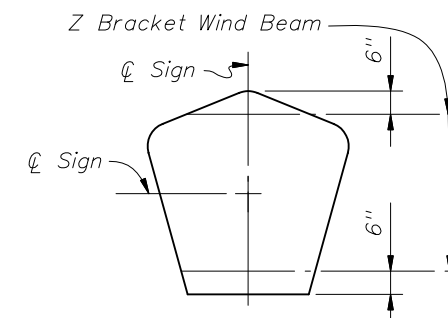
RAILROAD



SCHOOL



SHIELD

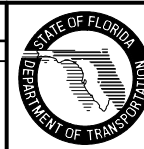


COUNTY

CONNECTION AND WIND BEAM

REVISIONS

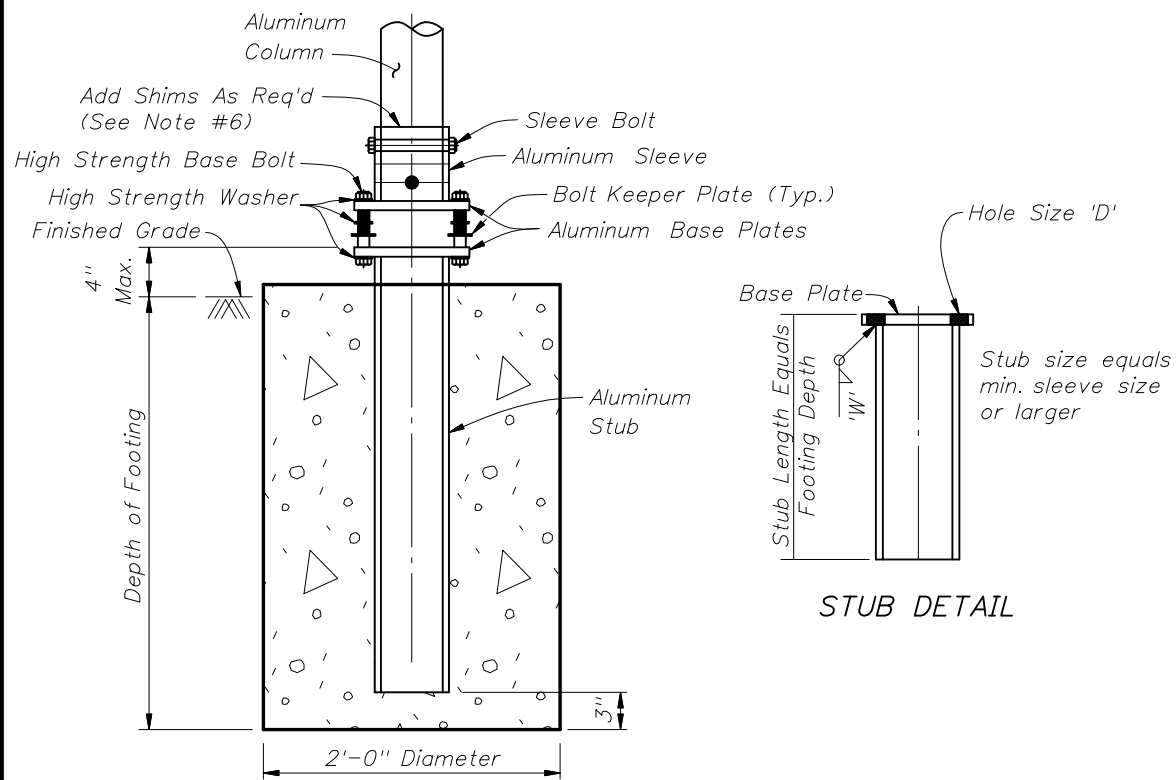
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
01/01/08	DYW	Deleted SIGNS AT 90° note. Changed STOP, YIELD, RECTANGLE and DIAMOND details. Added "*For...." note. Changed '1" Min.' to '0" Min.' in VIEW A-A.	01/01/09	DYW	Changed panel overhang dimension.
07/01/08	DYW	Modified U-bolt size and sign paneledge distance.			



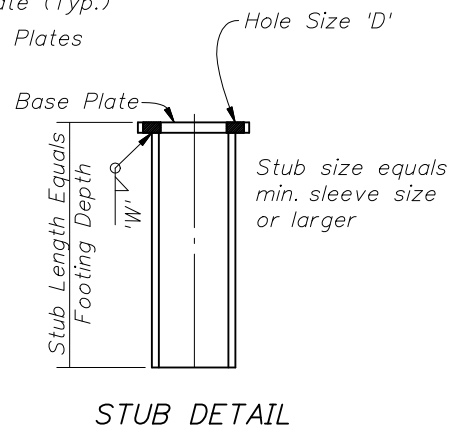
2008 Interim Design Standard

SINGLE COLUMN GROUND SIGNS

Interim Date	Sheet No.
01/01/09	4 of 8
Index No.	
11860	



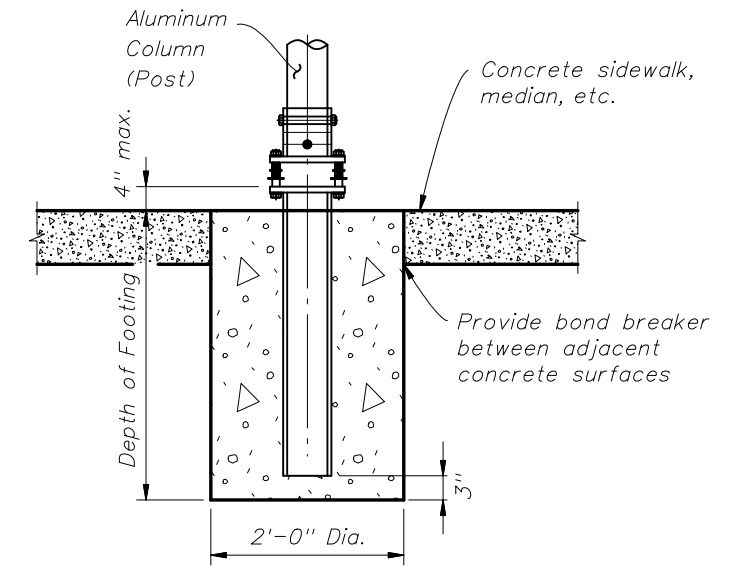
SLIP BASE AND FOOTING DETAIL
(non-frangible post)



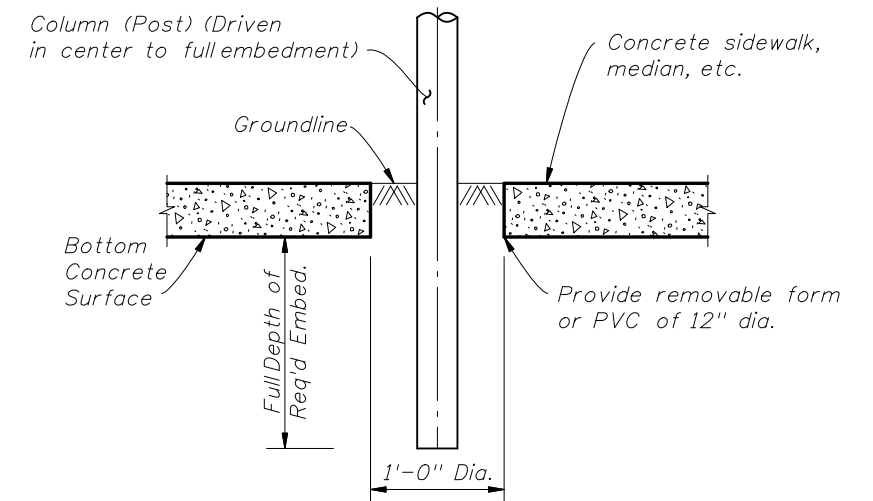
STUB DETAIL

SLIP BASE NOTES:

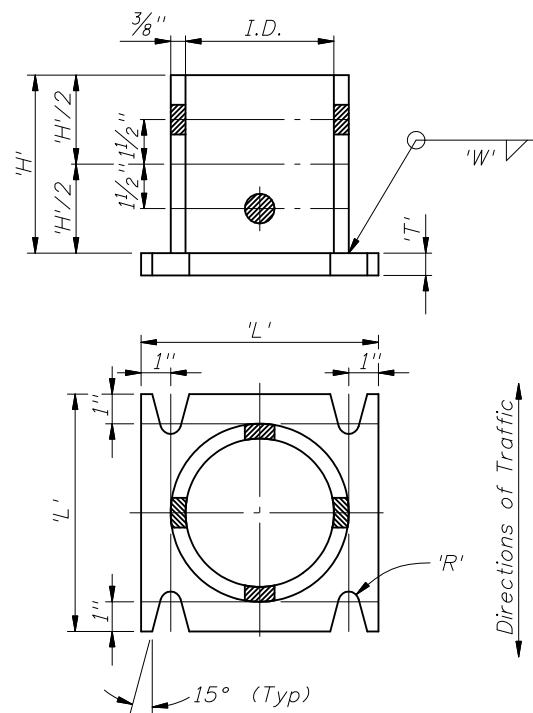
- Use sleeves with an inside diameter (I.D.) no more than $\frac{1}{16}$ " larger than the outside diameter (O.D.) of the column.
- Sleeve Bolts: ASTM A-307, $\frac{1}{2}$ " Φ galvanized steel bolt (with lock nuts) or Alloy 2024-T4 or 6061-T6 (ASTM B-211).
- Base bolts, Nuts, and Washers: high strength ASTM A-325 with ASTM B633 SC3, Type II electroplated zinc coating.
- Base plates may have either single or double beveled slots.
- An alternate cast base plate of aluminum alloy 356 and T6 temper in lieu of the fabricated base plate may be submitted for approval. If a cast base plate is used, the stub will be the same size as the column and will be bolted to the casting.
- Assemble the slip base connection in the following manner:
 - Connect column to sleeve using two $\frac{1}{2}$ " Φ machine bolts.
 - Assemble top base plate to stub base plate using high strength bolts with three hardened washers per bolt. One of the three washers per bolt and two bolt keeper plates go between the base plates.
 - Use shim stock as required to plumb the column.
 - Tighten all bolts to the maximum possible with a 12" to 15" wrench. (This will bed the washers and shims and clear the bolt threads.)
 - Loosen each bolt one turn and using a calibrated wrench retighten to the prescribed torque (see table) under the supervision of the Project Engineer.
 - Burr threads at junction with nut using a center punch to prevent nut loosening.
- Use galvanized steel shims to obtain a tight fit between the column face and the sleeve. Place shims in all quadrants between the $\frac{1}{2}$ " Φ sleeve bolts. Use shims that are 1" shorter than the height of the sleeve.
- Both fabricated and cast base assemblies were impact tested by the Texas Transportation Institute, College Station, TX on February 10, 2003, and both alternate assemblies were determined to be compliant with the performance recommendations of the National Cooperative Highway Research Program (NCHRP) report 350.



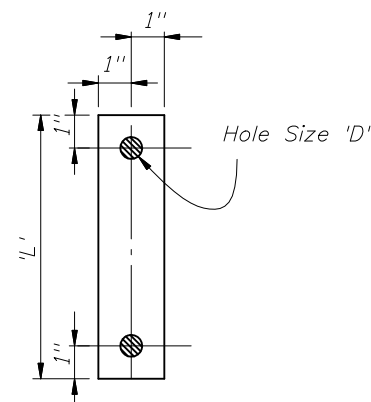
SLIP BASE AND FOOTING DETAIL IN CONCRETE
(non-frangible post in crossovers, medians, & sidewalks)



DRIVEN POST DETAIL IN CONCRETE
(frangible post in crossovers, medians, & sidewalks)



ALUMINUM SLEEVE & BASE PLATE DETAILS
(DOUBLE BEVELED SLOTS)



0.0149" Thick Alum. Strip - 2 Req'd Per Base
BOLT KEEPER PLATE DETAIL

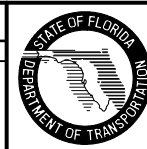
SLIP BASE DETAILS

Column Size	Sleeve I.D. (Max)	Sleeve Height 'H'	Weld 'W'	Base Plate		Radius 'R'	Base Bolt		Base Plate Torque		Hole Size 'D'
				'L'	'T'		Size	Length	Ft-lbs	In-lbs	
4 x 1/4	4 1/16	6	5/8	8	3/4	11/32	5/8	3	29	345	11/16
4 1/2 x 1/4	4 9/16	6	5/8	8	7/8	11/32	5/8	3 1/4	29	345	11/16
5 x 1/4	5 1/16	7	5/8	8	7/8	11/32	5/8	3 1/4	29	345	11/16
6 x 1/4	6 1/16	8	11/16	9	1	13/32	3/4	3 1/2	46	554	13/16

Note: Unless notes otherwise, all dimensions are in inches.

BASE AND FOUNDATION DETAILS

REVISIONS			
DATE	BY	DESCRIPTION	DATE
01/01/09	DYW	Modified 'DRIVEN POST DETAIL IN CONCRETE' detail.	



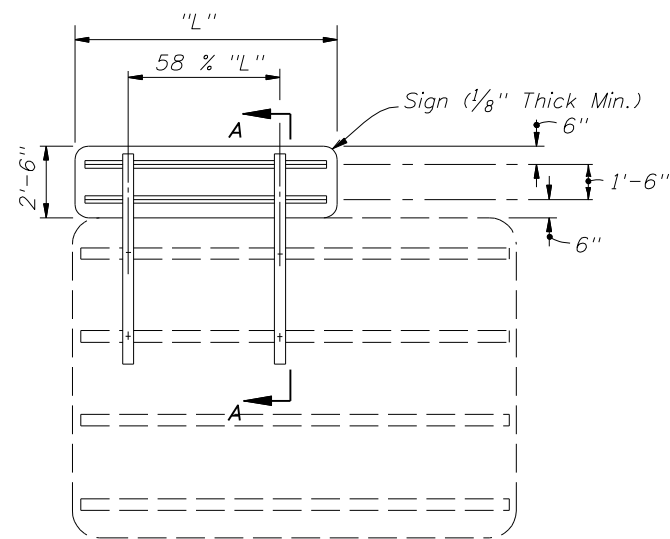
2008 Interim Design Standard

SINGLE COLUMN GROUND SIGNS

Interim Date: 01/01/09

Sheet No.: 5 of 8

Index No.: 11860

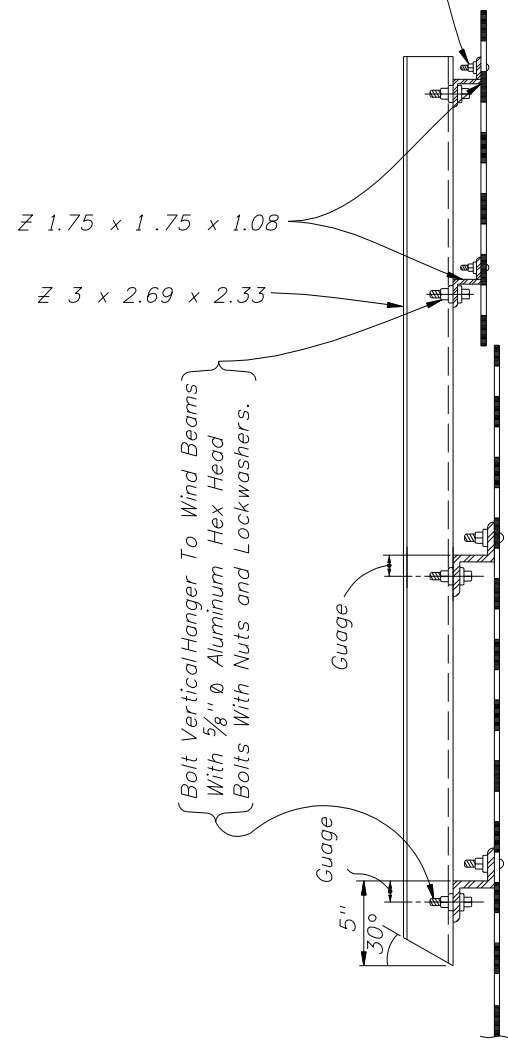


NOTE: Exit numbering panel shall be located to the right side for right exit and to the left for left exit.

Mounting of Exit Numbering Panels To Highway Signs

ELEVATION

Bolt Sign to Zee Using 1/4" ϕ Aluminum Flat Head Bolts, Nuts and Lock Washers (Typ.) 12" Max Spacing



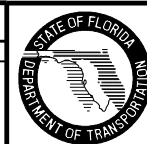
SECTION AA

GENERAL NOTES

DESIGN SPECIFICATION: Design according to FDOT Structures Manual (current edition) Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, AASHTO 2001.
 SHEETS AND PLATES: Material used shall meet the requirements of Aluminum Association Alloy 6061-T6 and ASTM B209.
 MATERIALS: All aluminum materials shall meet the requirements of the Aluminum Association Alloy 6061-T6 and also the following ASTM specifications for the following: Sheets and plates B209; extruded shapes B221 and standard structural shapes B308.
 ALUMINUM BOLTS, NUTS & LOCK WASHERS: Aluminum bolts shall meet the requirements of the Aluminum Association Alloy 2024-T4 (ASTM F468). The bolts shall have an anodic coating of at least .0002" thick and be chromate sealed. Lock washers shall meet the requirement of Aluminum Association Alloy 7075-T6 (ASTM B221). Nuts shall meet the requirement of Aluminum Association Alloy 6262-T9 (ASTM F467) or 6061-T6.
 SIGN FACE: All sign face corners shall be rounded. See sign layout sheet for dimension "L" and sign face details. For mounting details refer to Index No. 11300.

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
11/05/08	C.H.	3/8" Bolt size changed to 5/8" in SECTION AA.			



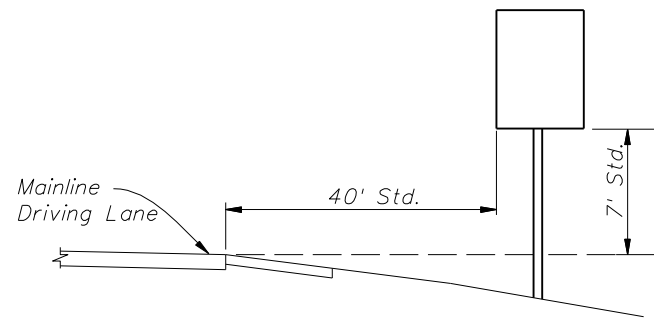
2008 Interim Design Standard

MOUNTING EXIT NUMBERING PANELS TO HIGHWAY SIGNS

Interim Date	Sheet No.
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Index No.	
13417	

CASE I

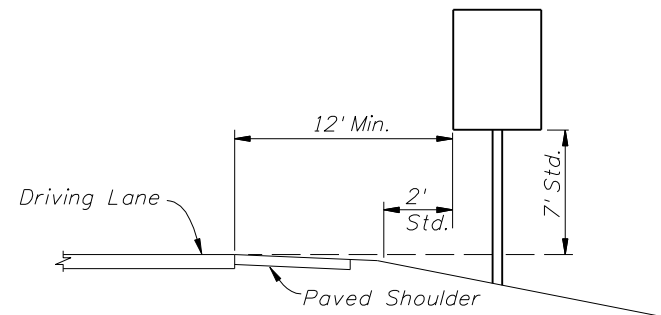
For Use On Freeway And Expressway Systems For Signs On Mainline.



For Median Installation:
If Median Width Does Not Allow Std. Offset From Both Roadways, Center Sign In Median.

CASE II

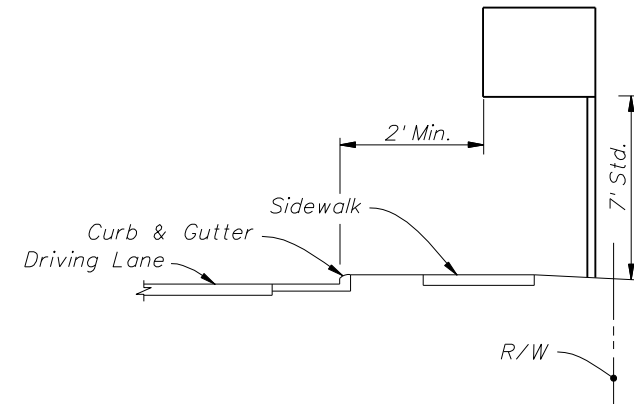
For Use In All Rural Roads And On Freeway And Expressway Ramps.



14' Horizontal Clearance Standard On All Freeway And Expressway Ramps.

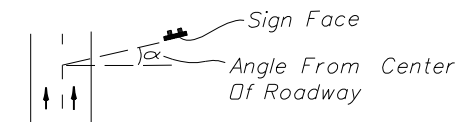
CASE III

For Use On All Roads With Signs Mounted Behind Sidewalk.



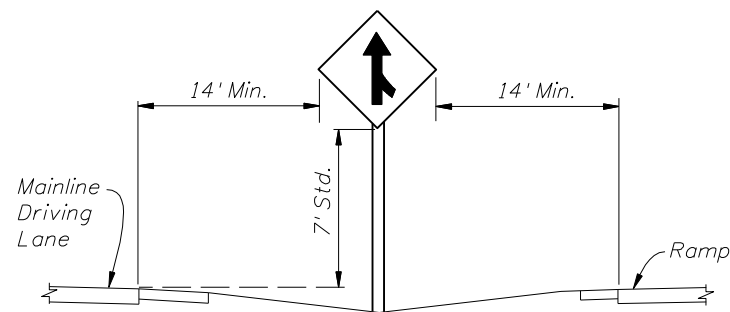
GENERAL NOTES:

1. 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 sign.
2. It shall be the CONTRACTORS responsibility to verify the length of sign supports in the field prior to fabrication.
3. 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.



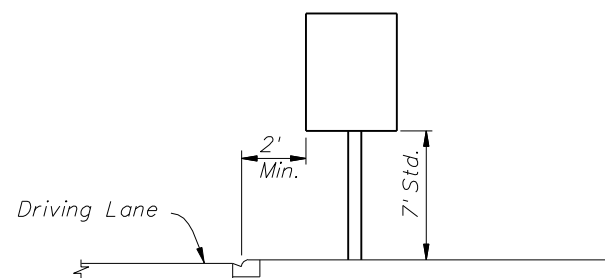
CASE IV (MERGE SIGN)

For Use On All Rural, Freeway And Expressway Systems.



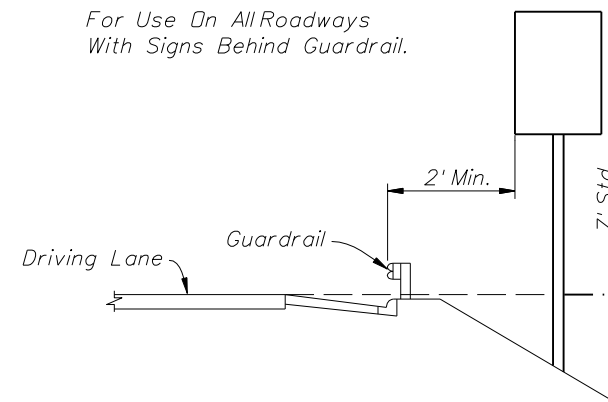
CASE V

For Use In Business Or Residential Areas Only.



CASE VI

For Use On All Roadways With Signs Behind Guardrail.



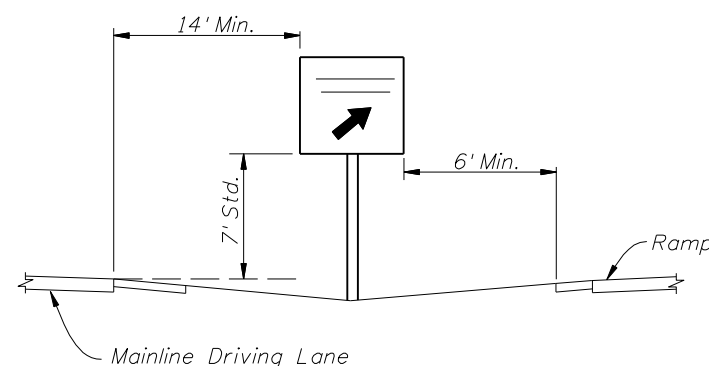
4. The setback for stop and yield signs may be reduced to 3' minimum from the driving lane if required for visibility in business or residential sections with no curb and speeds of 30 MPH or less.
5. The mounting heights are measured from the bottom of the sign panel to a horizontal line extended from 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	
Rural	5'
Urban (including residential with parking and /or 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.

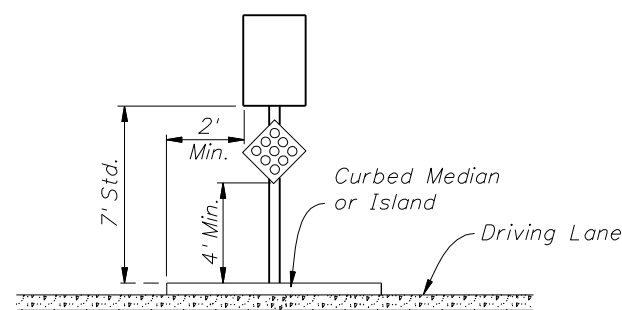
CASE VII (REST AREA & EXIT GORE SIGNS)

For Use On All Freeway And Expressway Systems



CASE VIII

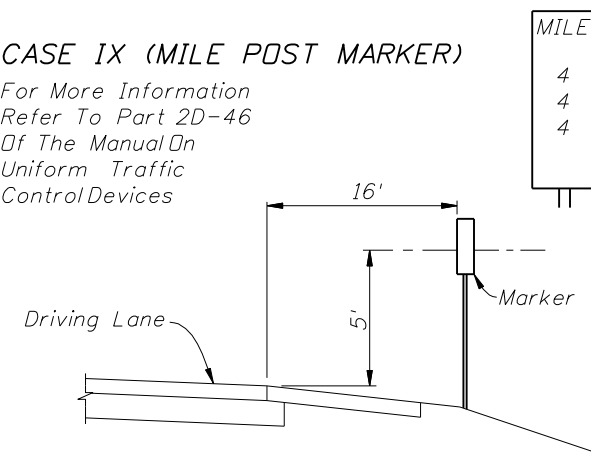
Sign On Island or Curbed Median



Center Sign Column On Island

CASE IX (MILE POST MARKER)

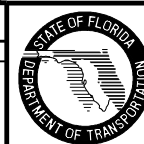
For More Information Refer To Part 2D-46 Of The Manual On Uniform Traffic Control Devices



6. Sign supports should never be placed in the bottom of ditches where erosion might affect the proper operation of the breakaway feature.
7. 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.

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
11/20/08	C.H.	Revise Case II Notes and offset Case VIII Title and Notes and dimensions.			

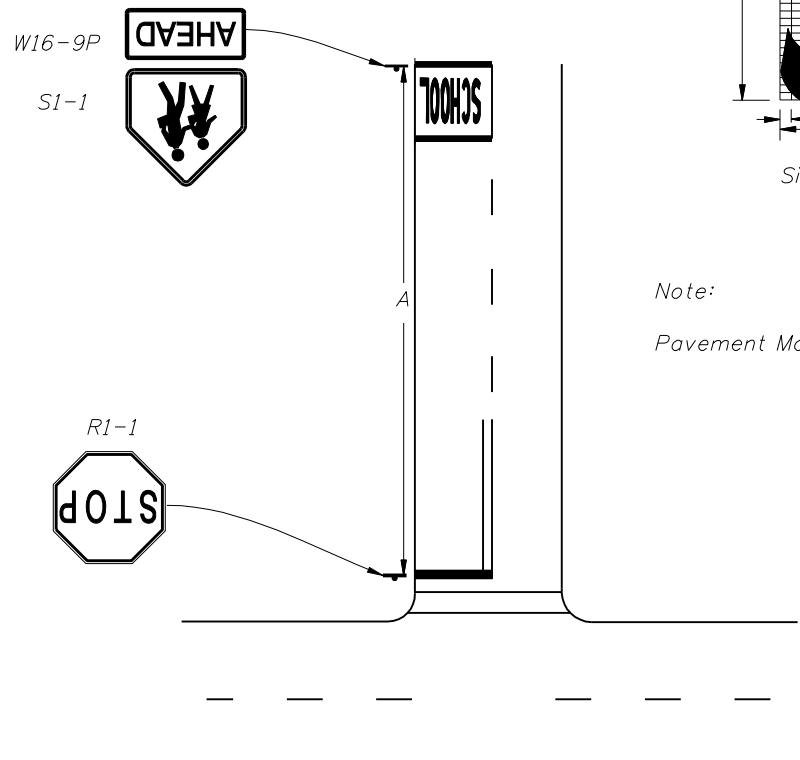
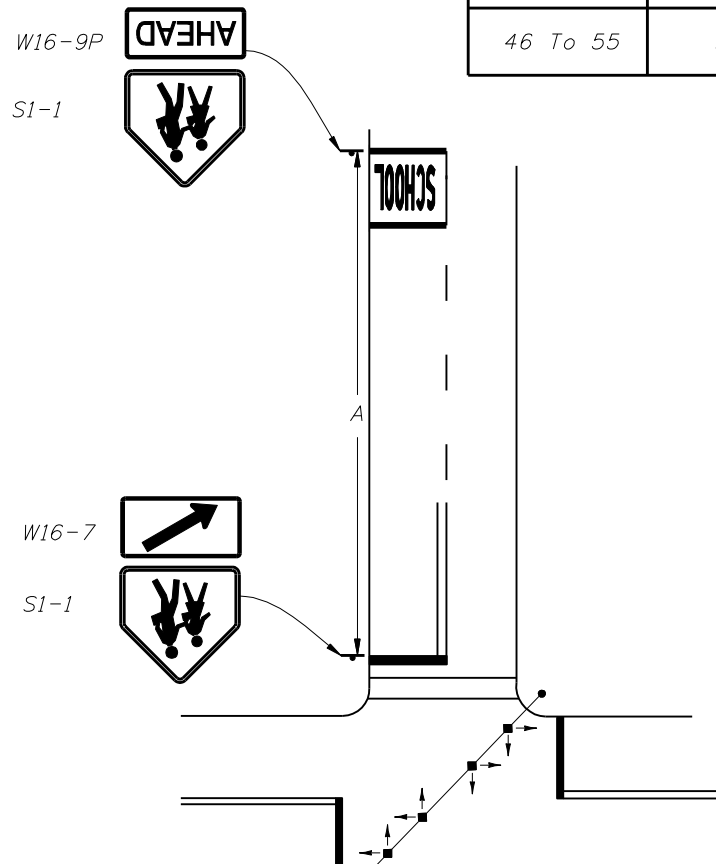


2008 Interim Design Standard

TYPICAL SECTIONS FOR PLACEMENT OF SINGLE & MULTI-COLUMN SIGNS

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Index No.	
17302	

Approach Speed (MPH)	Distance A (FT.)
25 or Less	200
26 To 35	250
36 To 45	300
46 To 55	325

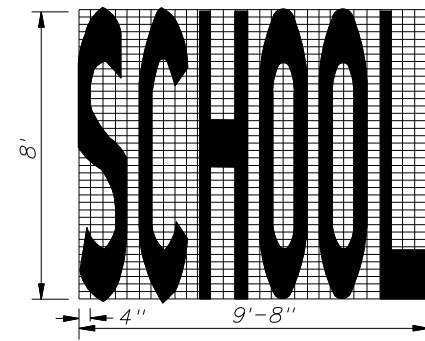


"No Right Turn On Red" Signs may be erected as deemed necessary by the local traffic engineers.

1. TRAFFIC CONTROL DEVICES FOR A SCHOOL CROSSWALK AT A SIGNALIZED INTERSECTION

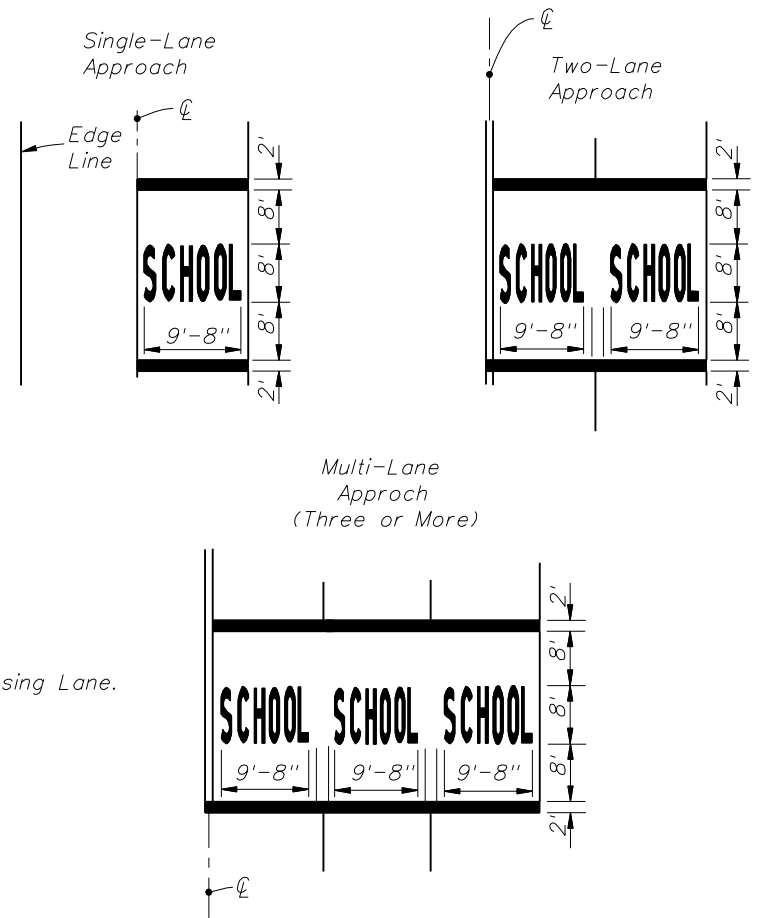
Note: Special speed restrictions are not normally applicable to these two cases.

2. TRAFFIC CONTROL DEVICES FOR A SCHOOL CROSSWALK AT A STOP CONTROLLED INTERSECTION



Single-Lane Pavement Marking
33 s.f.

Note:
Pavement Marking Should Not Extend Into Opposing Lane.



PAVEMENT MARKINGS

Notes:

Signs shall be erected in accordance with index No. 17302.

When computing pavement message quantities do not include transverse lines.

School crosswalk widths at intersections shall be 6' minimum 10' standard without public sidewalk curb ramps 10' minimum with public sidewalk curb ramps.

For additional marking information, see Index 17346, Sheet 2.



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SCHOOL SIGNS & MARKINGS

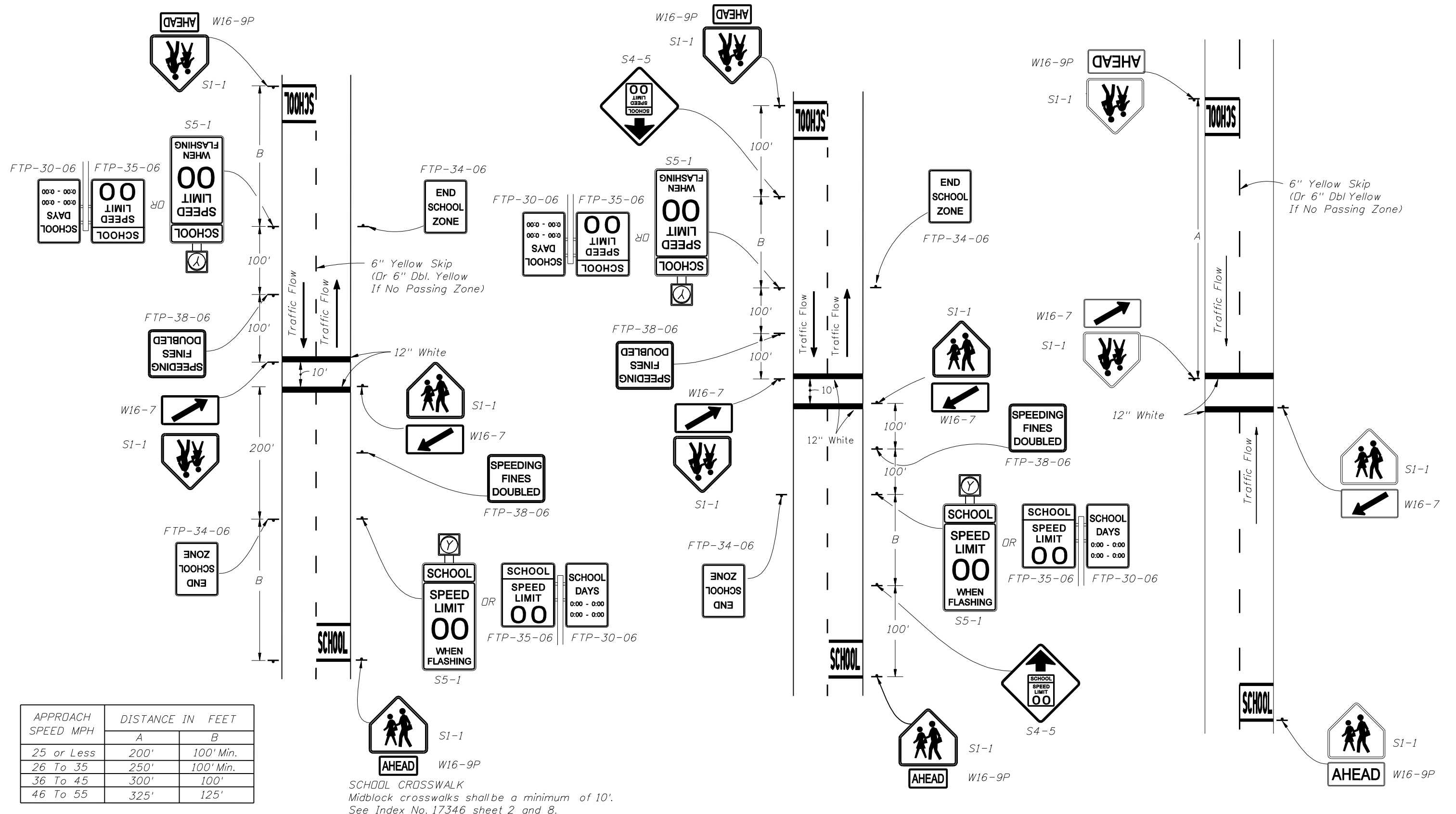
Interim Date 01/01/09 Sheet No. 1 of 6

Index No. 17344

3. TRAFFIC CONTROL DEVICES FOR REDUCED SPEED ZONE AT A SCHOOL CROSSWALK 2 LANES-2 WAY TRAFFIC (40 MPH OR LESS) (MIDBLOCK OR ON THRU STREET AT AN INTERSECTION)

4. TRAFFIC CONTROL DEVICES FOR REDUCED SPEED ZONE AT A SCHOOL CROSSWALK 2 LANES-2 WAY TRAFFIC (45 MPH OR GREATER) (MIDBLOCK OR ON THRU STREET AT AN INTERSECTION)

5. TRAFFIC CONTROL DEVICES FOR A SCHOOL CROSSWALK WITHOUT A SPEED REDUCTION (2 LANE-2 WAY TRAFFIC)

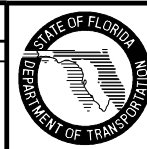


APPROACH SPEED MPH	DISTANCE IN FEET	
	A	B
25 or Less	200'	100' Min.
26 To 35	250'	100' Min.
36 To 45	300'	100'
46 To 55	325'	125'

SCHOOL CROSSWALK
Midblock crosswalks shall be a minimum of 10'.
See Index No. 17346 sheet 2 and 8.

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
11/05/08	C.H.	Sheet completely revised signs and spacing added, revised notes.			

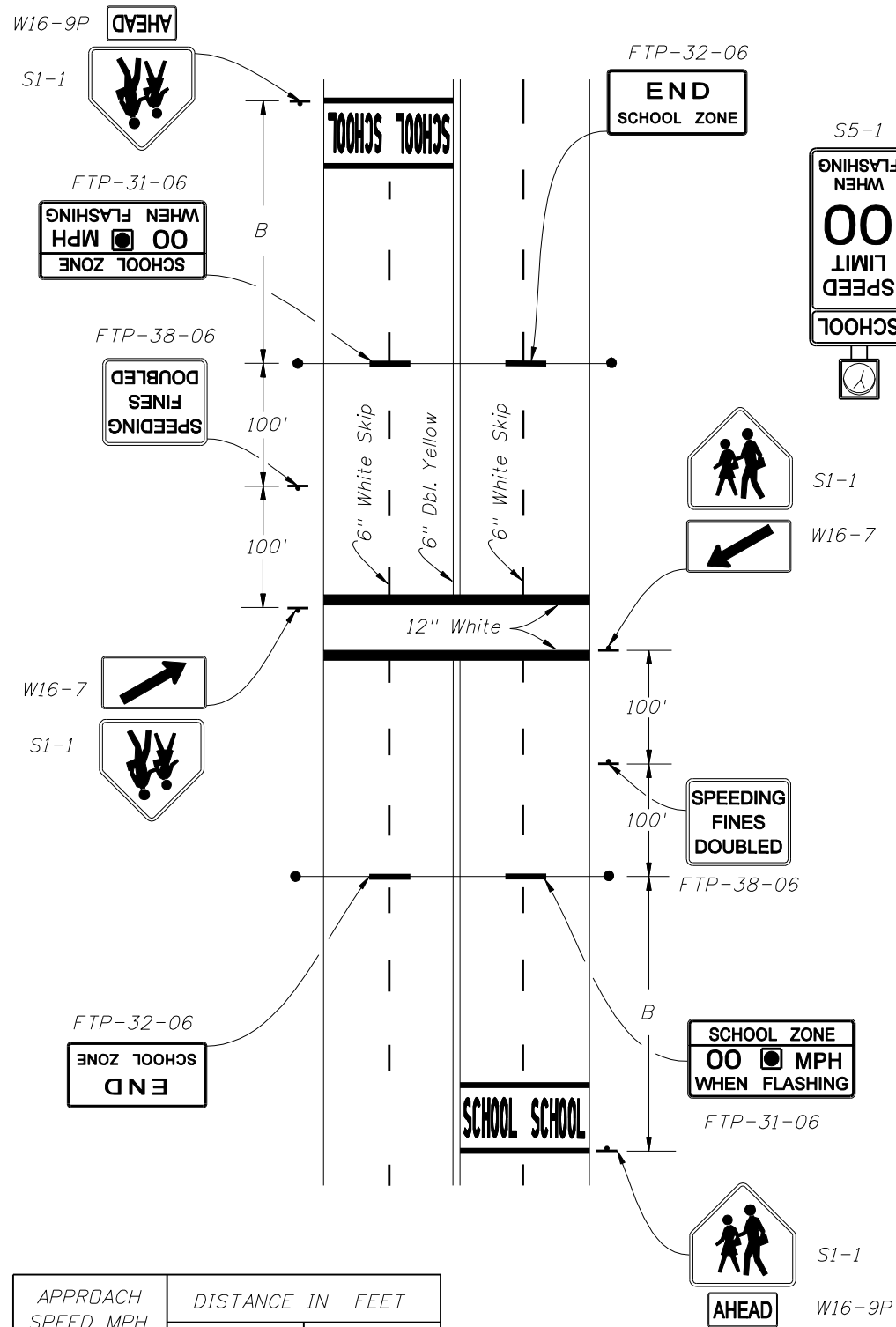


2008 Interim Design Standard

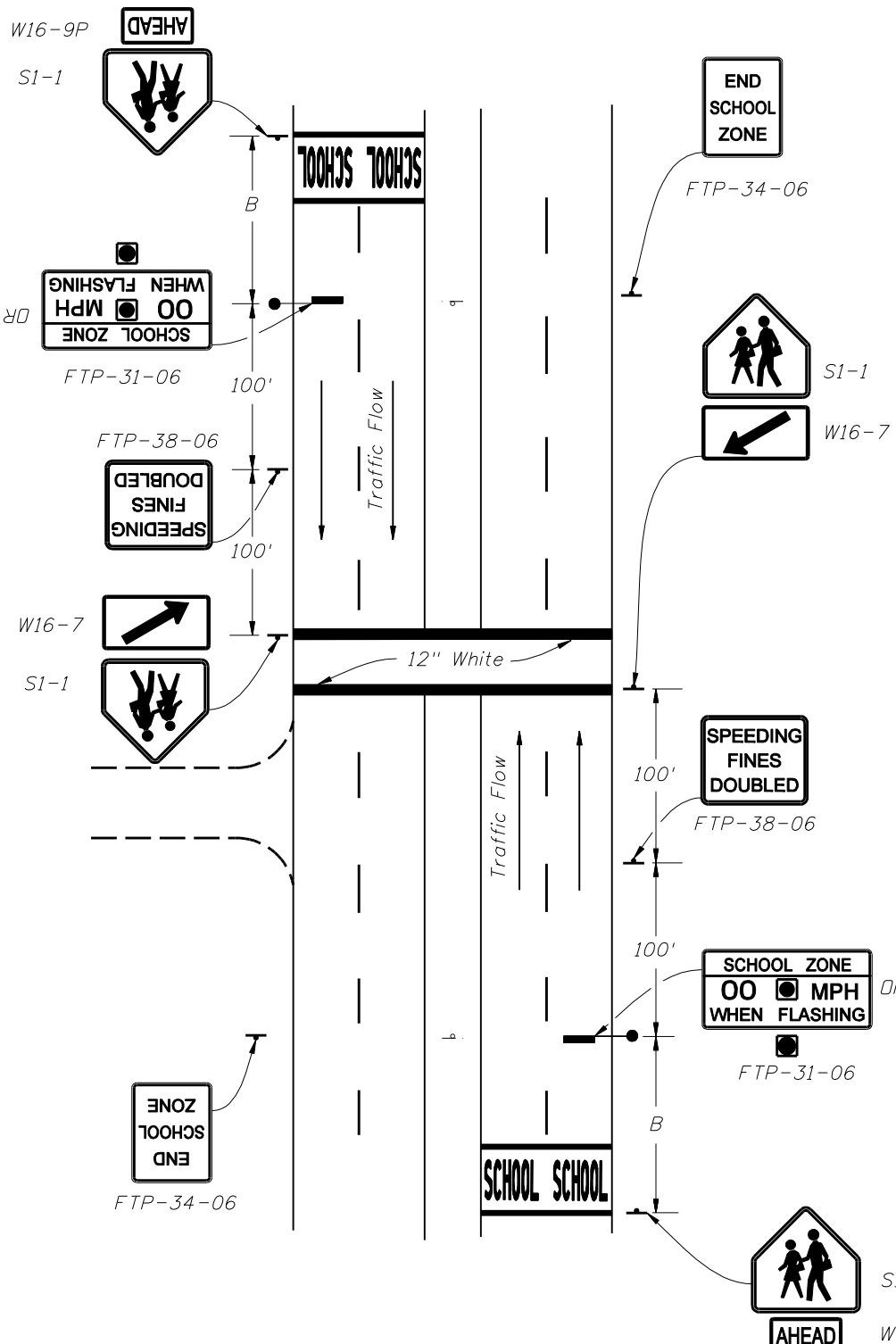
SCHOOL SIGNS & MARKINGS

Interim Date 01/01/09	Sheet No. 2 of 6
Index No. 17344	

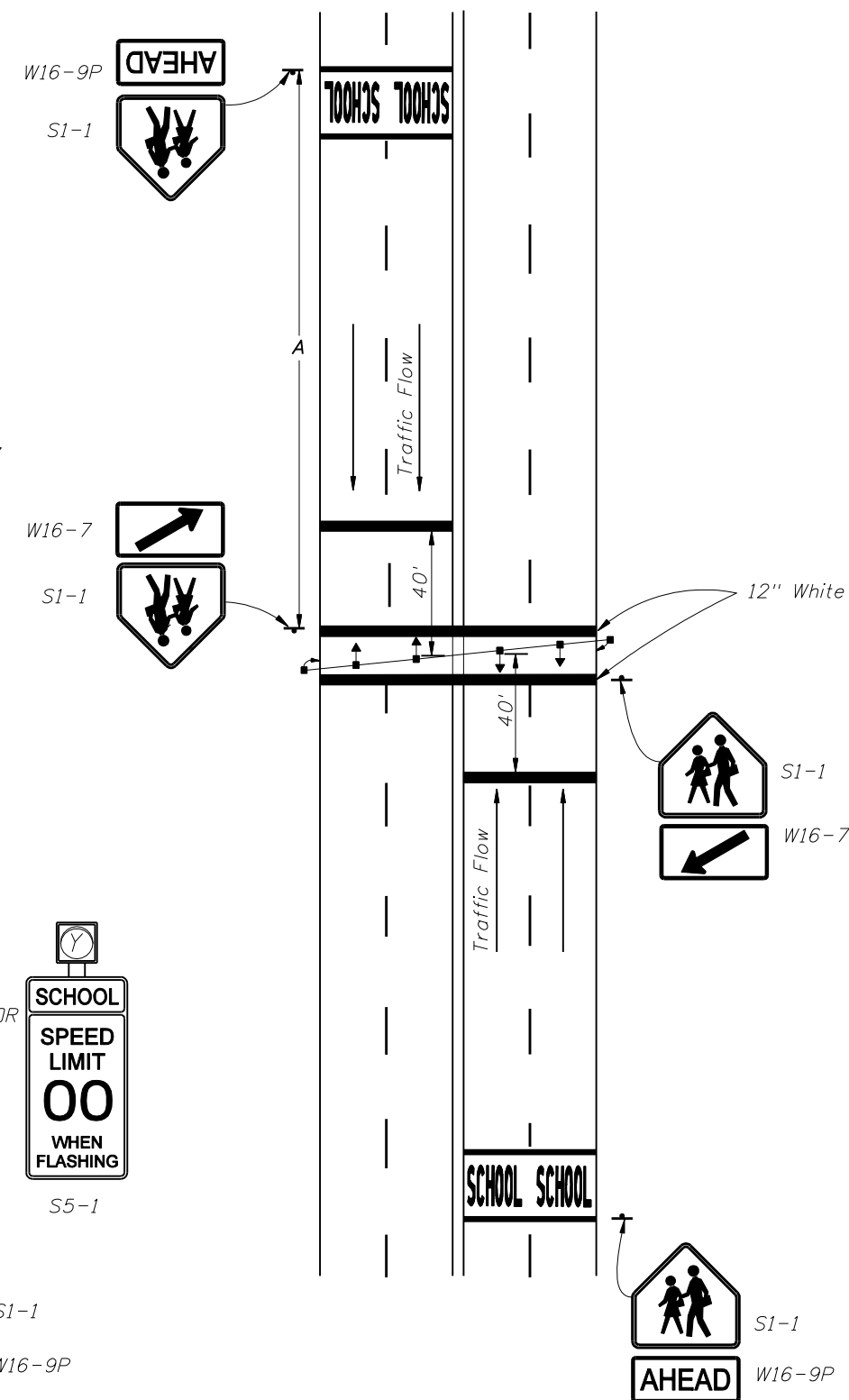
6. TRAFFIC CONTROL DEVICES FOR A REDUCED SPEED ZONE AT A SCHOOL CROSSWALK WITH OVERHEAD FLASHING BEACON SPEED LIMIT SIGNS (4 LANES UNDIVIDED-2 WAY TRAFFIC) (MIDBLOCK OR ON THRU STREET AT AN INTERSECTION)



7. TRAFFIC CONTROL DEVICES FOR A REDUCED SPEED ZONE AT A SCHOOL CROSSWALK WITH OVERHEAD OR GROUND MOUNTED FLASHING BEACON SPEED LIMIT SIGNS (4 LANES DIVIDED-2 WAY TRAFFIC)



8. TRAFFIC CONTROL DEVICES FOR SIGNALIZED MIDBLOCK SCHOOL CROSSWALK



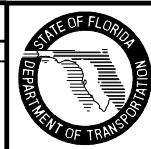
APPROACH SPEED MPH	DISTANCE IN FEET	
	A	B
25 or Less	200'	100' Min.
26 To 35	250'	100' Min.
36 To 45	300'	100'
46 To 55	325'	125'

SCHOOL CROSSWALK
Midblock crosswalk shall be a minimum of 10'.
See Index No. 17346, Sheet 2 and 8.

NOTE- CONDITION 7:
Where engineering judgement determines the overhead structure is not suitable or cannot be installed due to site restrictions, S5-1 with flashing beacons on each side of the road may be substituted for the overhead structure.

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
11/05/08	C.H.	Sheet completely revised.			



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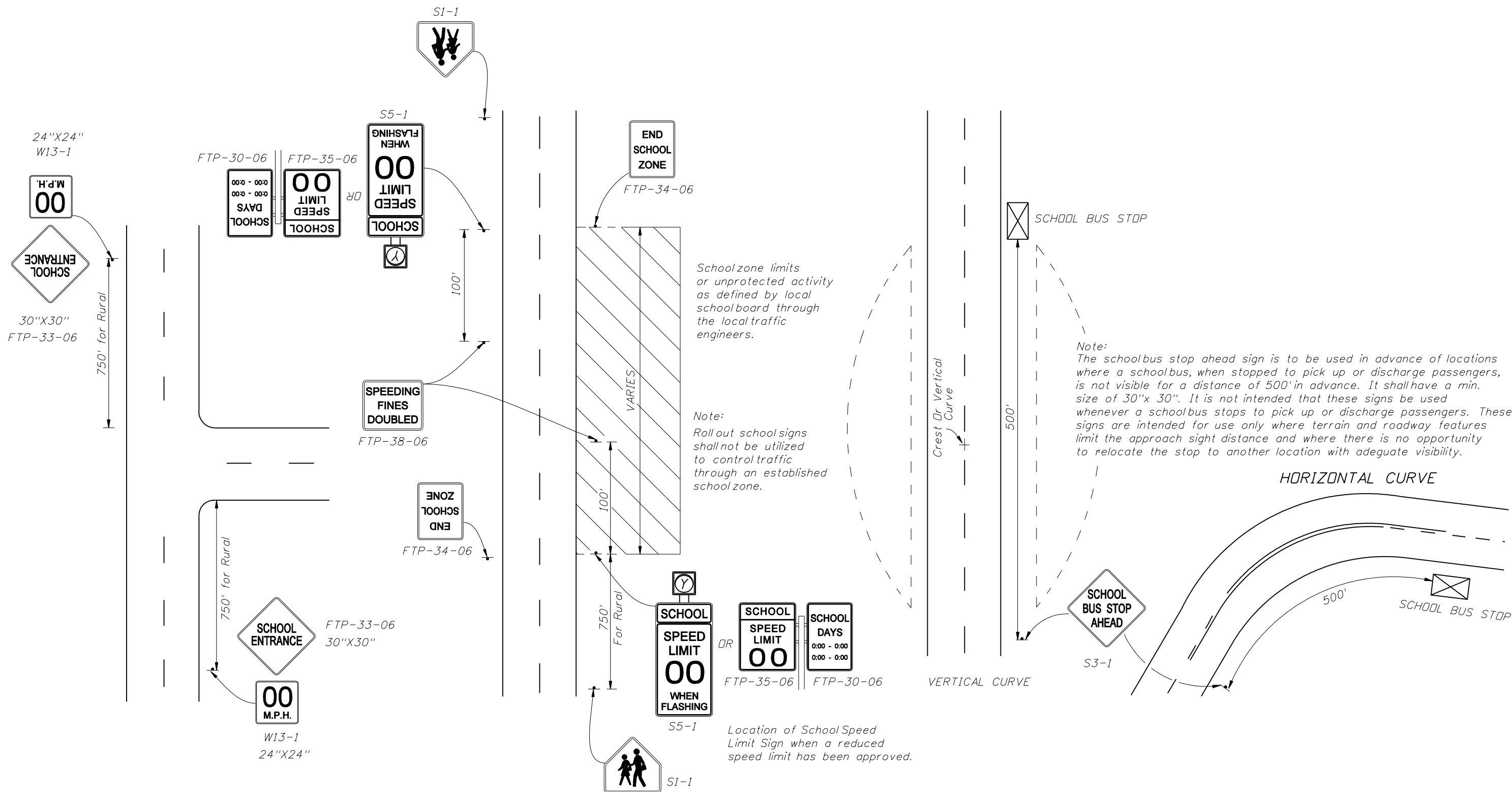
SCHOOL SIGNS & MARKINGS

Interim Date	Sheet No.
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17344	

9. TRAFFIC CONTROL DEVICES AT SCHOOL ENTRANCES WITH LOW VOLUMES OF WALKING STUDENTS

10. TRAFFIC CONTROL DEVICES FOR A TYPICAL SCHOOL ZONE FRONTING THE SCHOOL PROPERTY

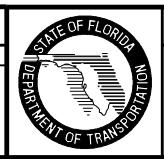
11. SCHOOL BUS STOP



These signs are intended for use only at those few locations where the school entrance is not evident to the motorist, and must be approved in advance by the responsible traffic engineering authority.

REVISIONS

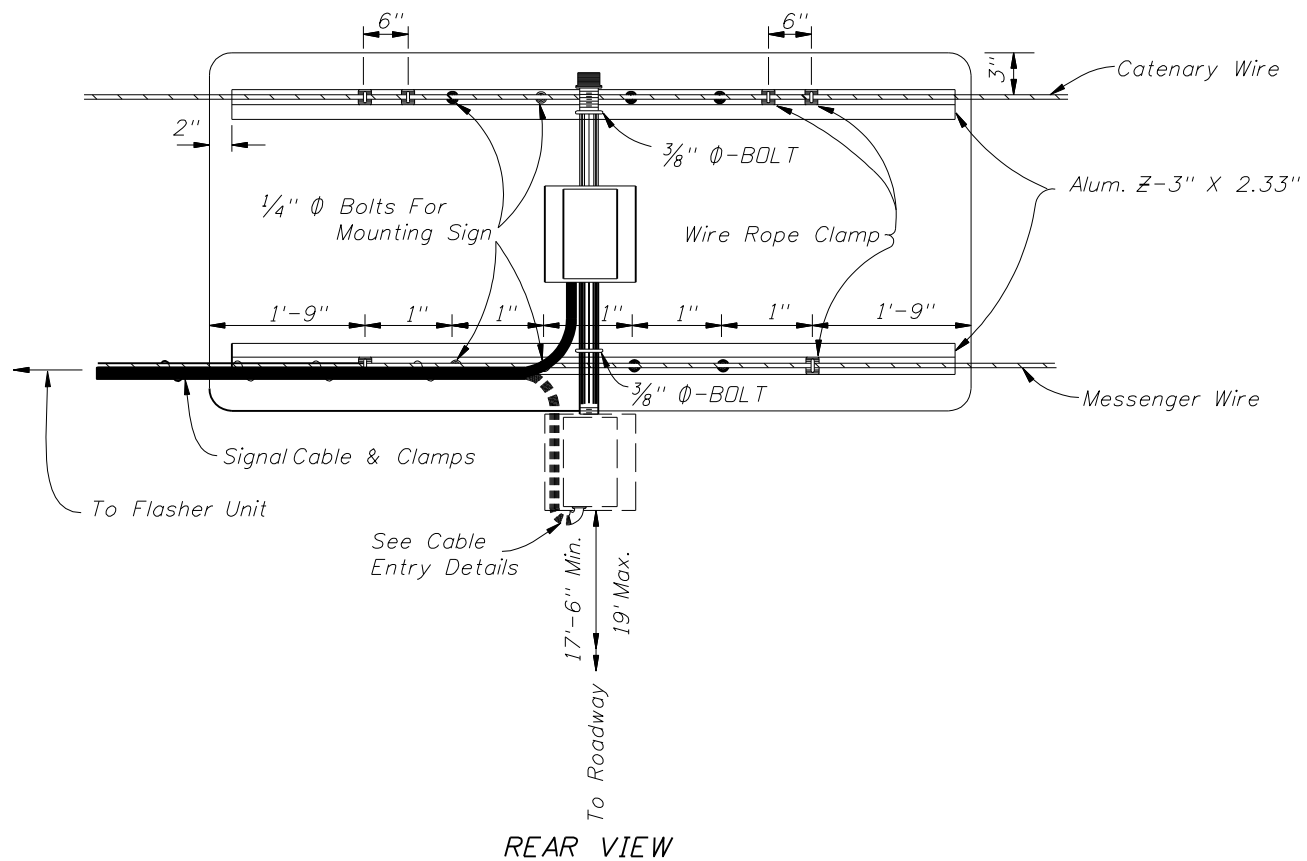
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
11/05/08	C.H.	Sheet completely revised.			



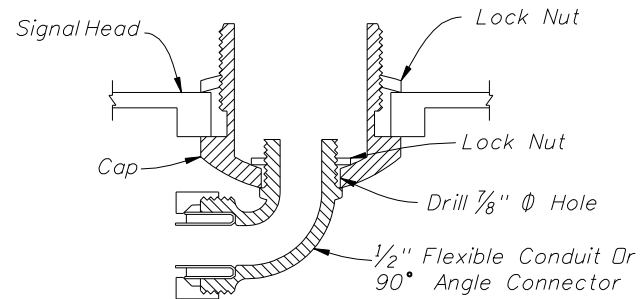
2008 Interim Design Standard

SCHOOL SIGNS & MARKINGS

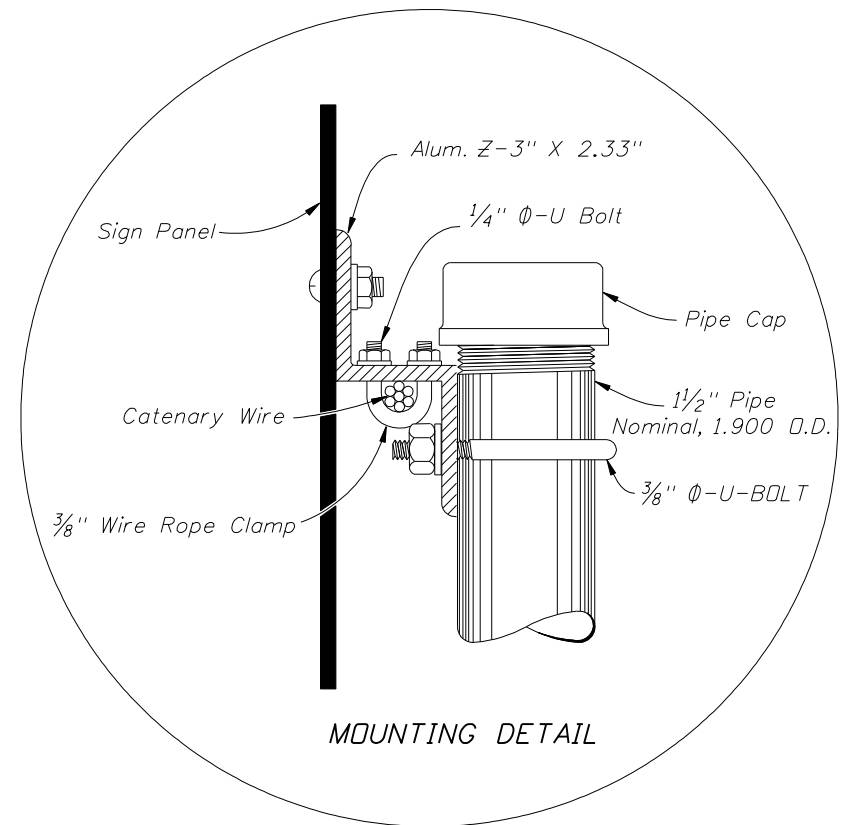
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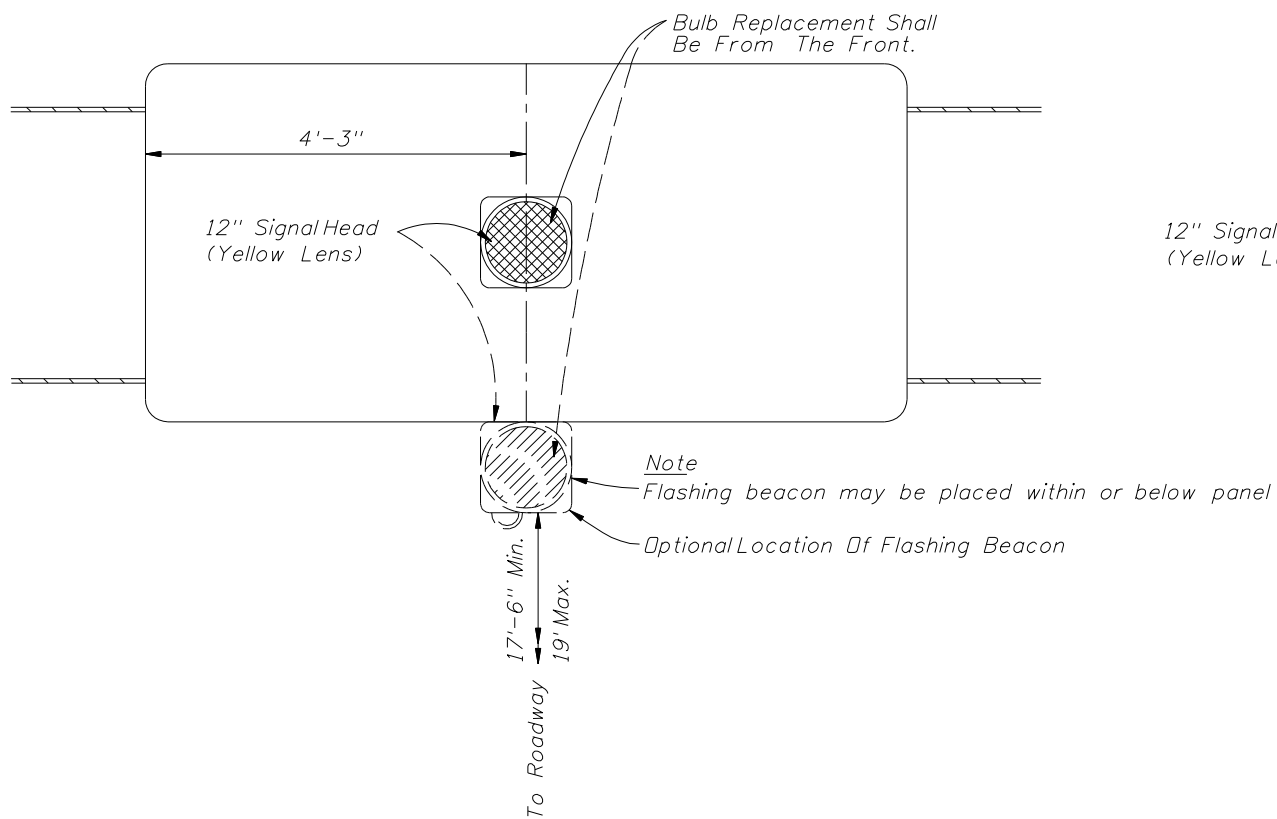
REAR VIEW



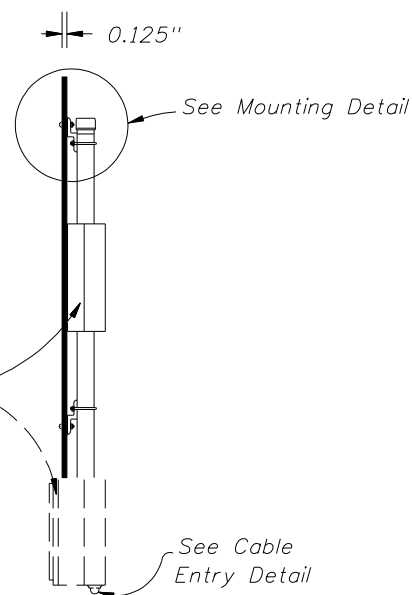
CABLE ENTRY DETAIL



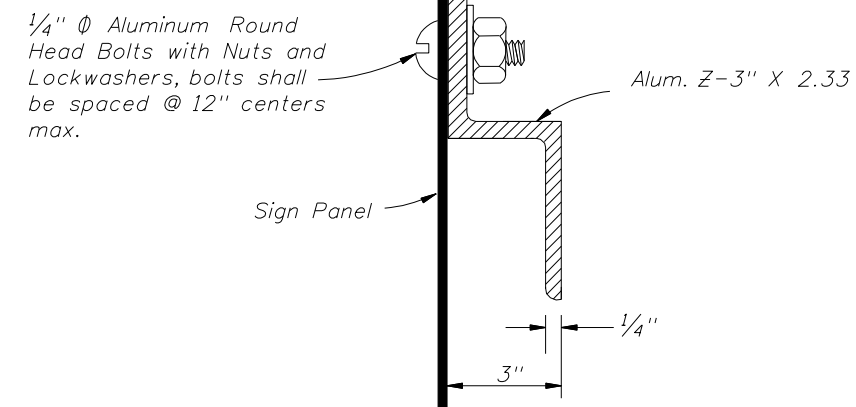
MOUNTING DETAIL



FRONT VIEW



SIDE VIEW



Z SECTION DETAIL

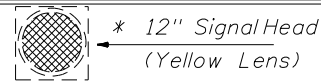
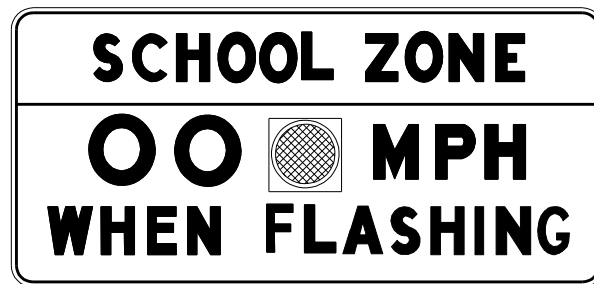
Flasher unit and cabinet to be placed on the strain pole supporting overhead sign assembly or on service pole. The flasher unit not to overhang private property or sidewalk.



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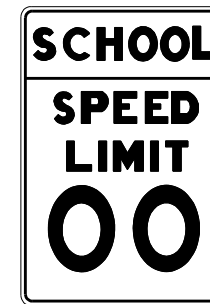
FTP-31-06

OVERHEAD STANDARD

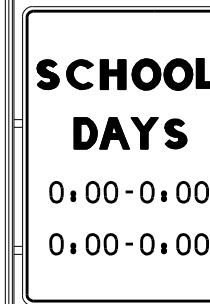
* Flashing Beacon May Be Placed Within Or Below Panel



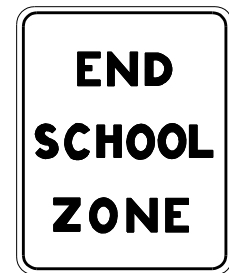
FTP-33-06



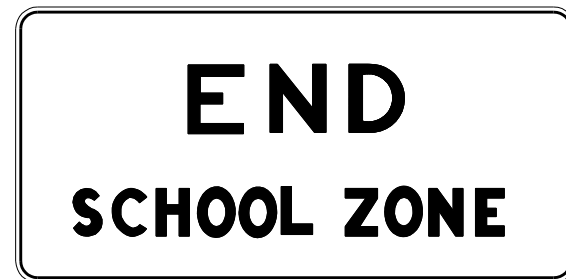
FTP-35-06



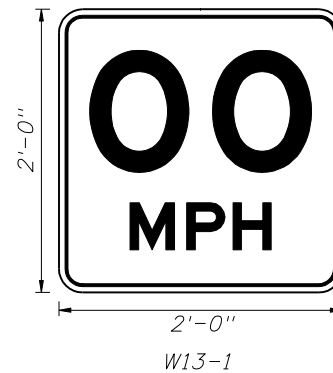
FTP-30-06



FTP-34-06



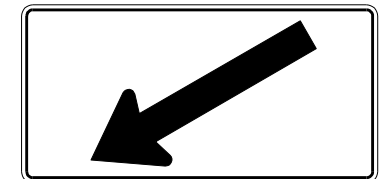
FTP-32-06



SPEED LIMIT ASSEMBLY



S1-1



W16-7



W16-9P



FTP-38-06



S4-5



S3-1

12" Signal Head (Yellow Lens)



S5-1

Ground Mount Standard

Notes:

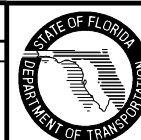
1. Standard size signs should be used whenever possible. Minimum sizes may be used only on low volume, low speed (less than 35 mph) streets. Special sizes should be used on expressway facilities where special emphasis is needed.
2. The value of the actual school zone speed limit shall be determined by the District Traffic Operations Engineer in cooperation with local school superintendents. In no case shall it be less than the 15 mph min. as set by law.
3. See Index No. 17355 for sign details.
4. When fluorescent yellow-green background color is used, a systematic approach featuring one background color within a zone or area should be used. The mixing of standard yellow and fluorescent yellow green background within a zone should be avoided.

Note:

Existing ground mount school speed limit signs utilizing a single 8" min. size beacon or two 6" min. size beacons inside the sign border are considered meeting the standard. However, replacement or upgrading of these school speed limit signs shall conform to the above standard. Numerical speed limit displayed shall be established by appropriate regulatory authorities.

REVISIONS

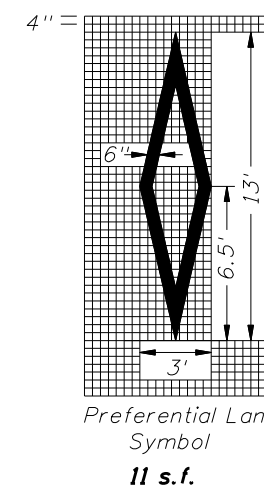
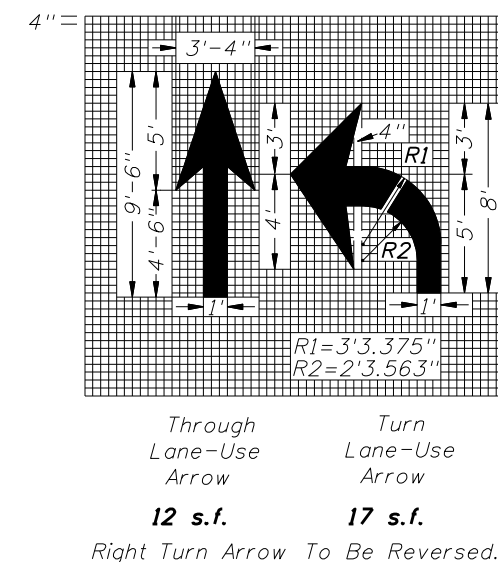
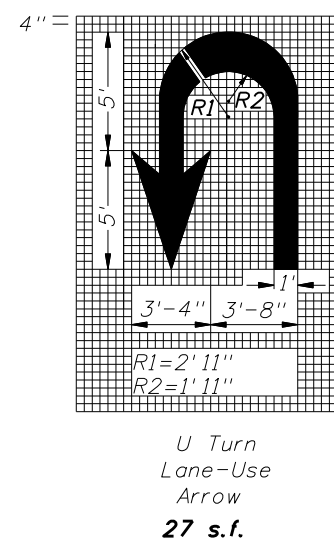
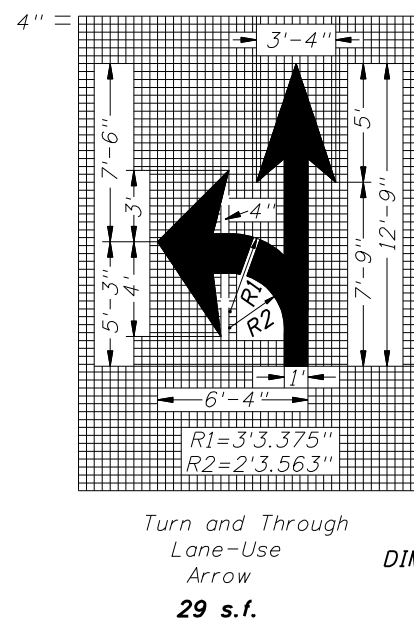
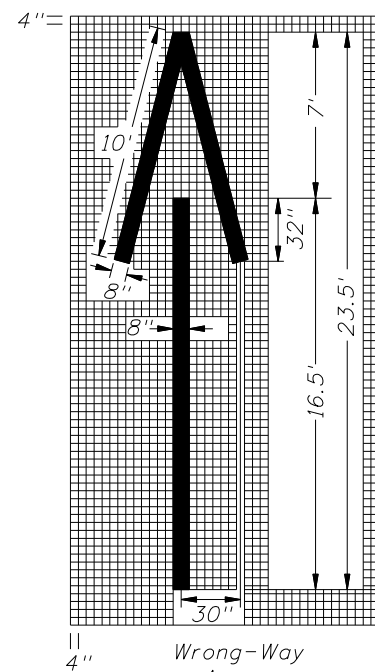
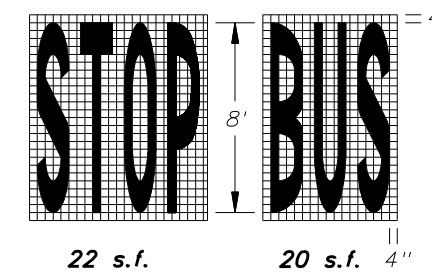
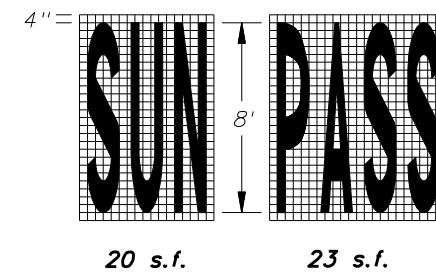
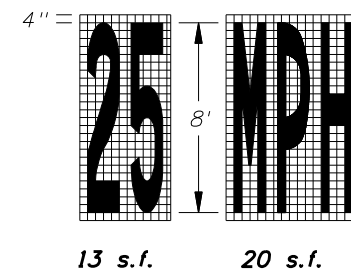
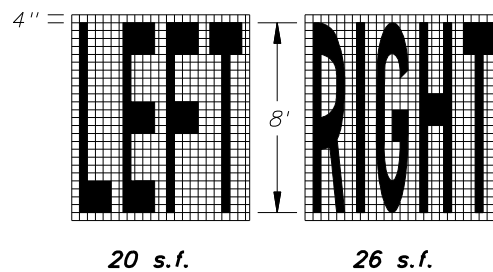
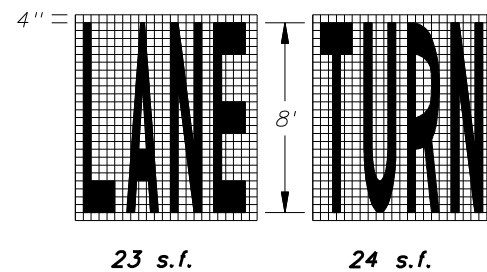
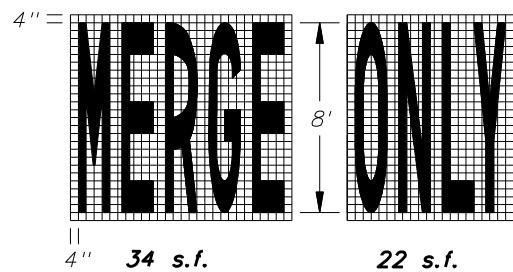
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
11/05/08	C.H.	Sheet completely revised new signs added.			



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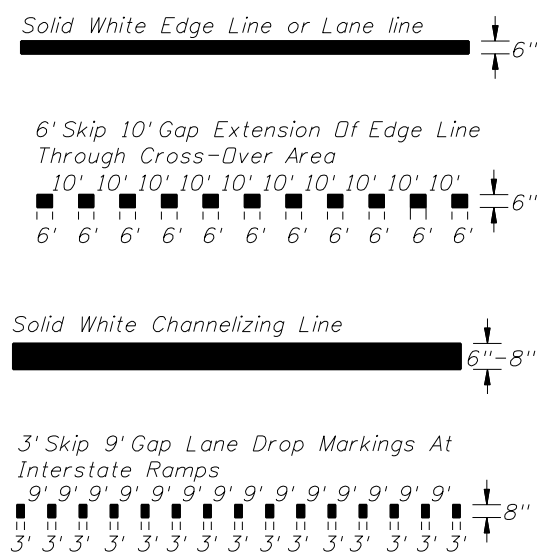
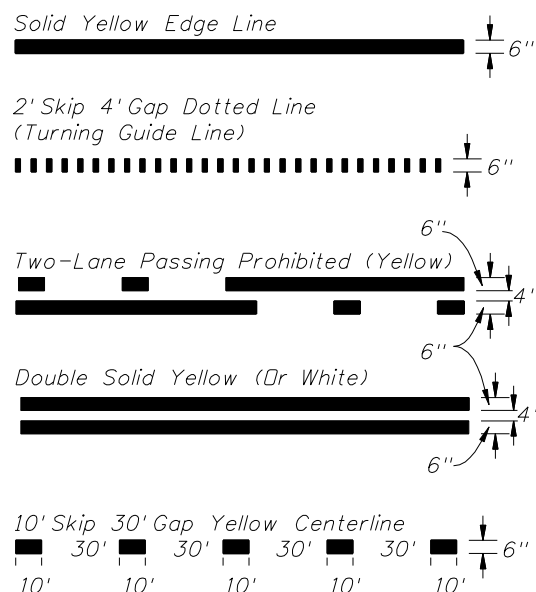
DIMENSIONS ARE WITHIN 1" ±

PAVEMENT ARROW AND MESSAGE DETAILS
TYPES OF PERMANENT LONGITUDINAL LINES

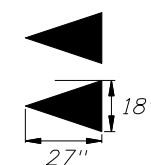
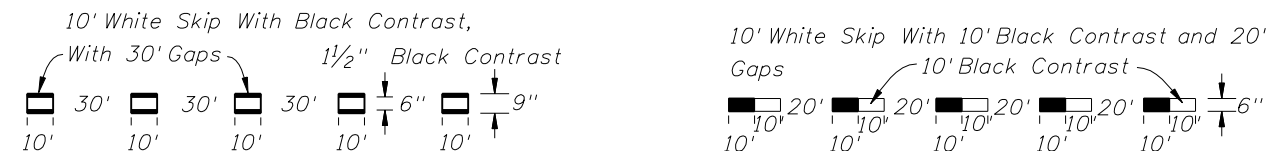
NOTE: When arrow and pavement message are used together, the arrow shall be located down stream of the pavement message and shall be separated from the pavement message by a distance of 25' (Base of the arrow to the base of the message). Stop message shall be placed 25' from back of stop line.

BASIC COLOR RULE:

White lines separate traffic in the same direction. Yellow lines separate traffic in opposing directions. Yellow dotted lines may be used in special cases. Black may be used in combination with white for skip lines where a light-colored pavement does not provide sufficient contrast with the markings.



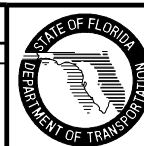
CONTRAST MARKINGS



Yield Lines 5-18" X 27" White triangles facing traffic equally spaced within travel lane with 1 additional triangle using same spacing when a bike lane is present.

REVISIONS

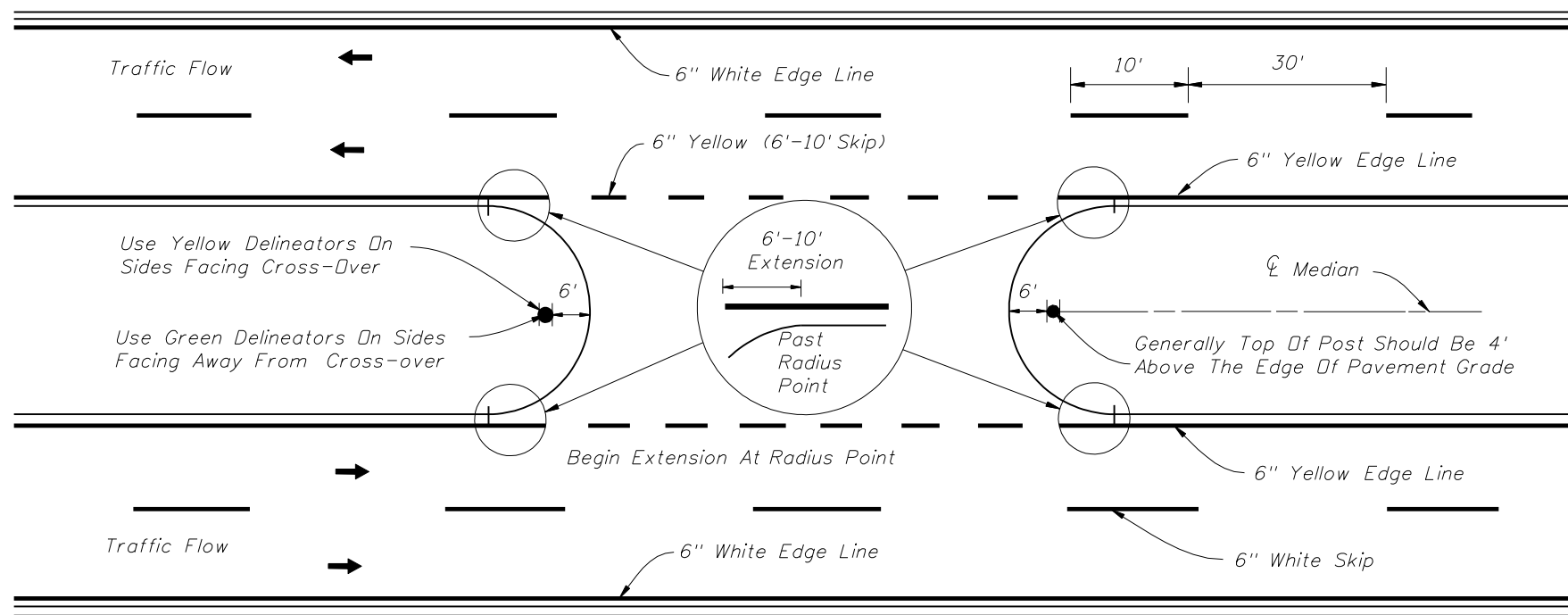
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
11/05/08	C.H.	Sheet completely revised new details added sheet renumbered to 1 of 14.			



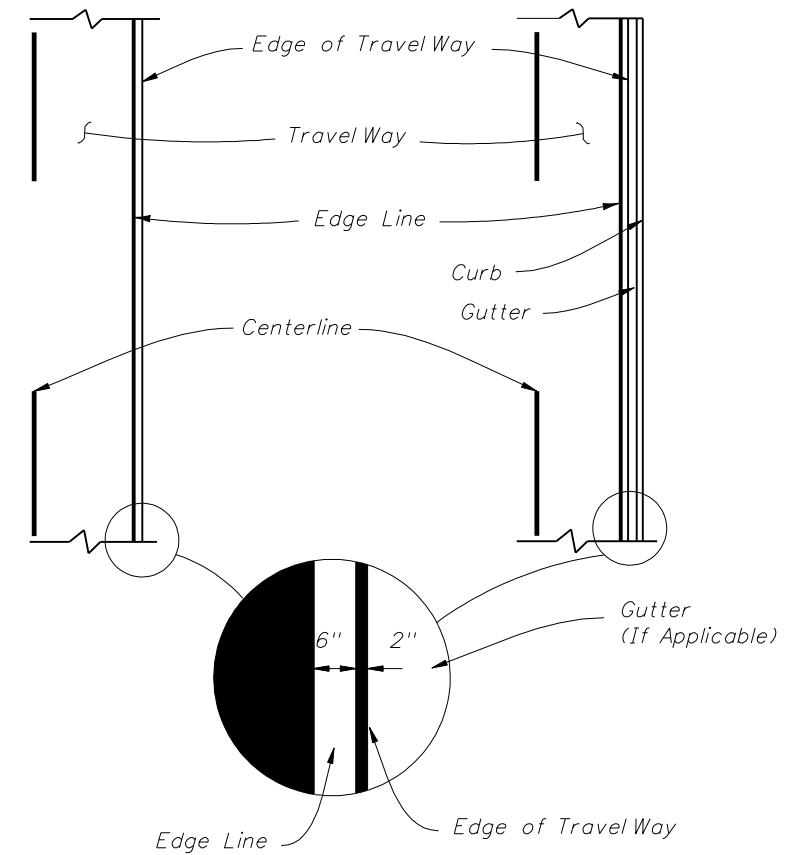
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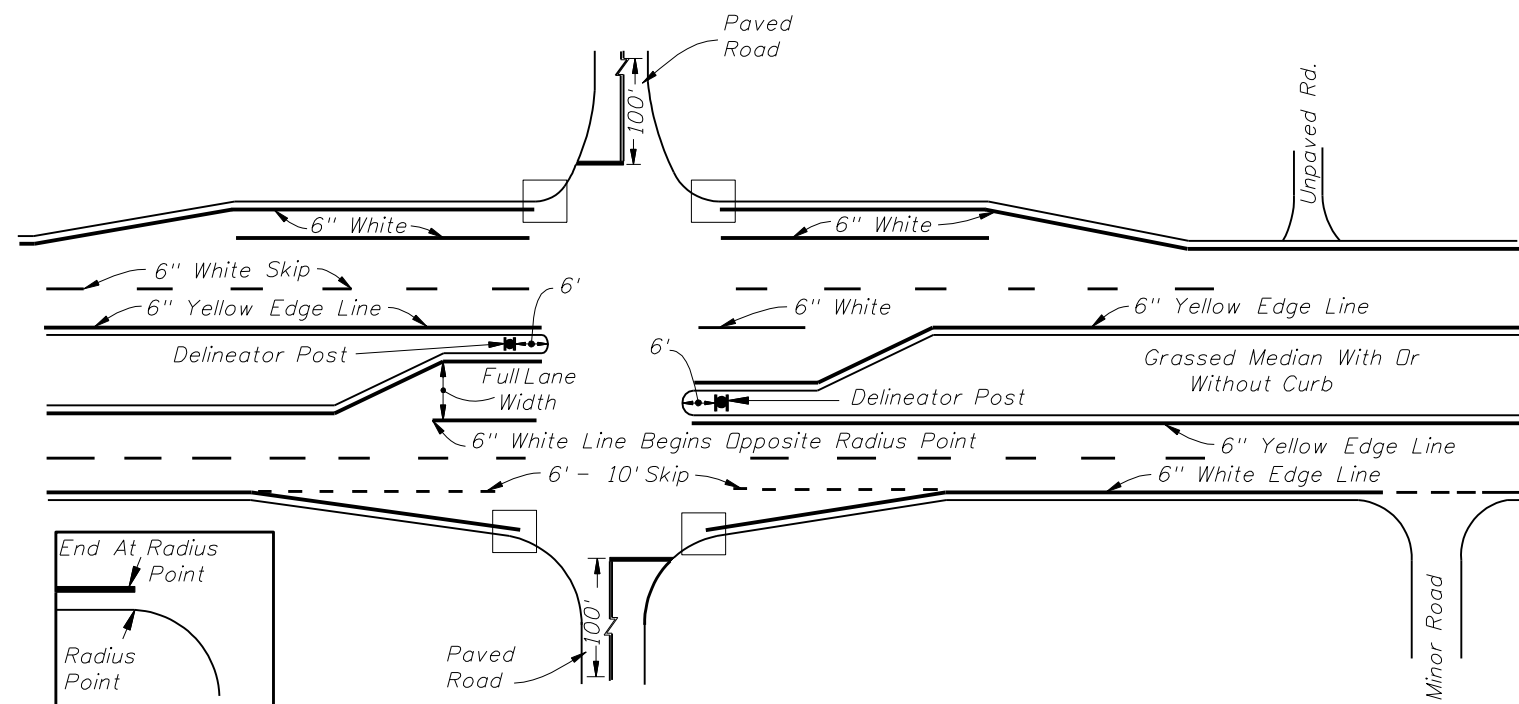
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PAVEMENT MARKINGS AND DELINEATORS FOR MEDIAN CROSS-OVER



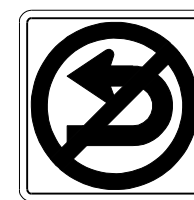
PLACEMENT OF EDGE LINES



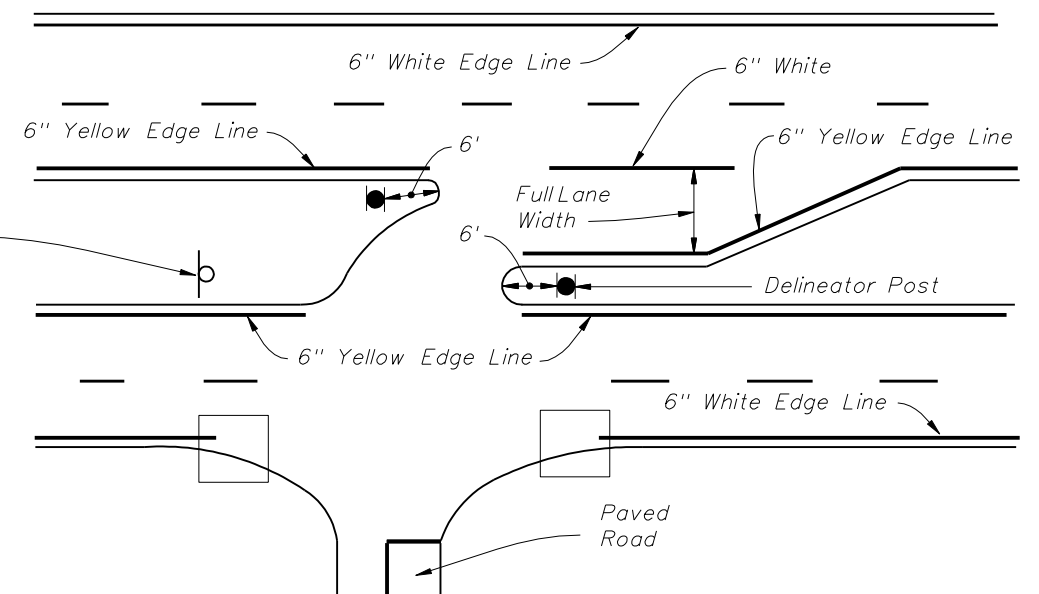
PAVEMENT MARKINGS FOR INTERSECTIONS WITH MAJOR AND MINOR ROADS

NOTE:

Markings applied to median noses shall be yellow in color.

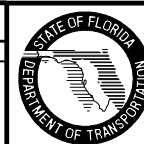


R3-4



REVISIONS

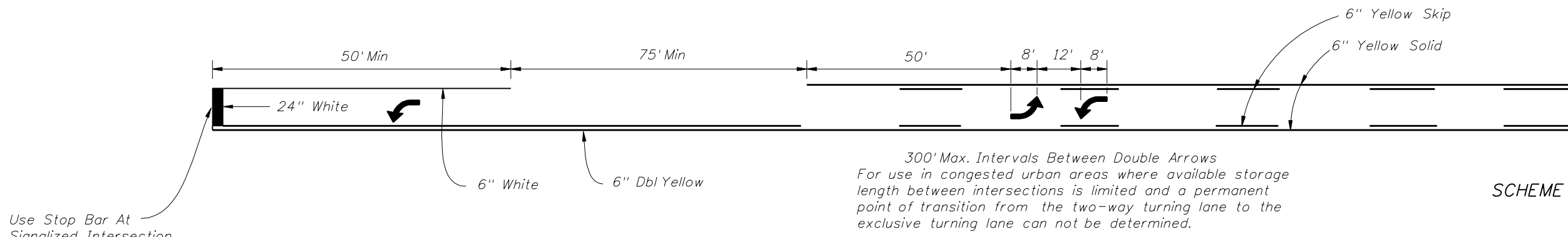
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
11/05/08	C.H.	Sheet completely revised sheet number changed to 2 of 14.			



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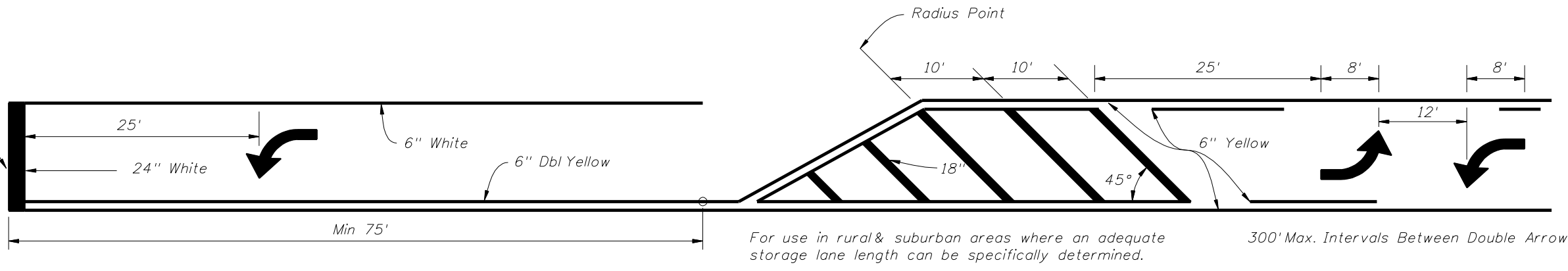
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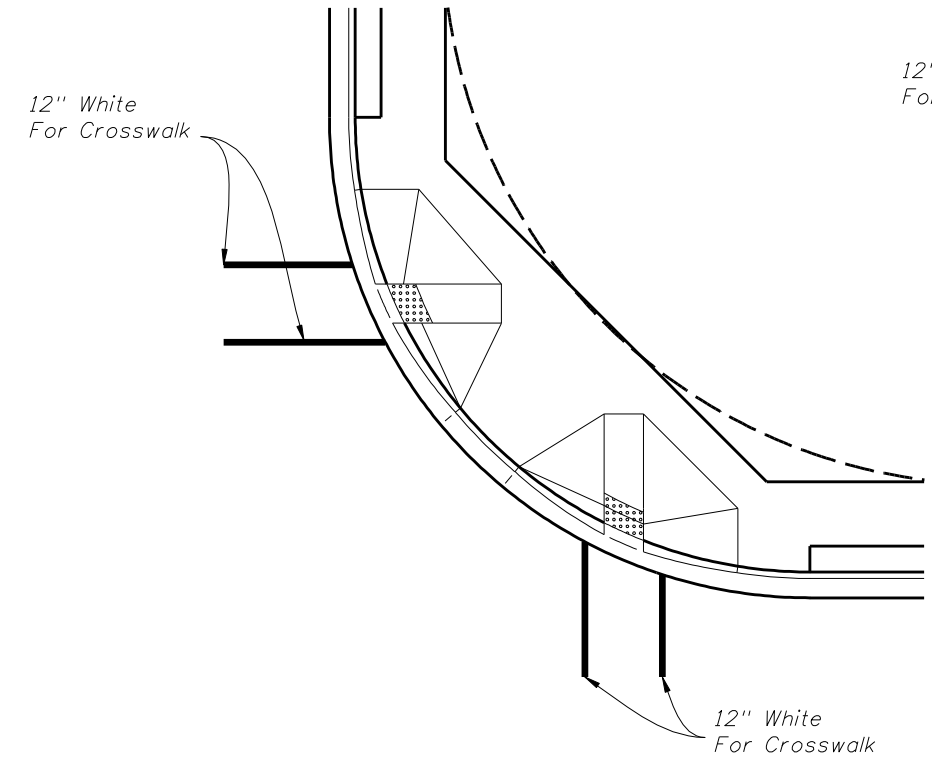
SCHEME ONE

Use Stop Bar At Signalized Intersection Only

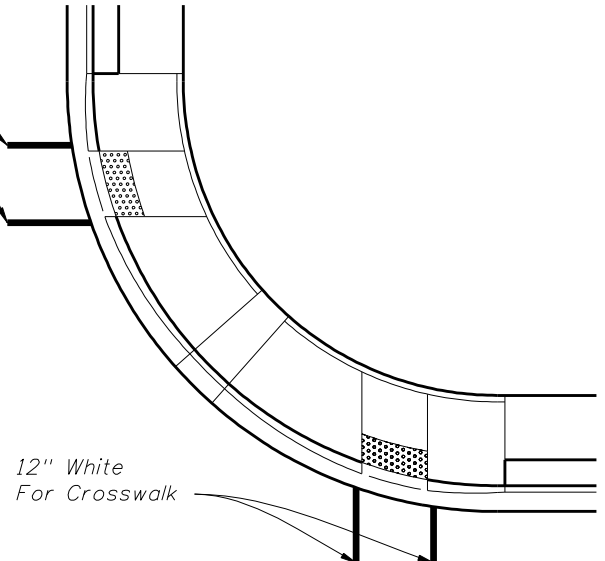


(WITH SINGLE LANE LEFT TURN CHANNELIZATION)
TWO WAY LEFT TURN LANE

SCHEME TWO



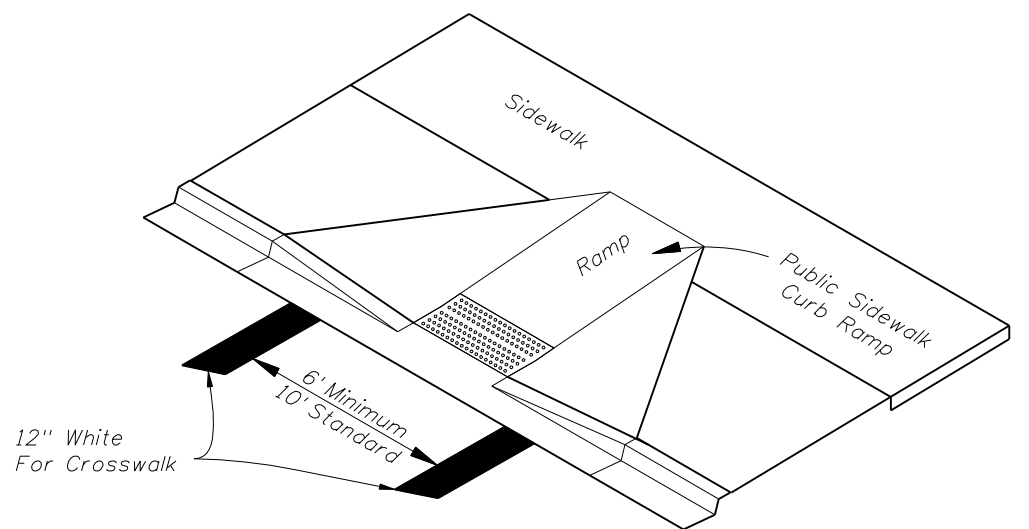
12" White For Crosswalk



12" White For Crosswalk

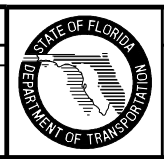
12" White For Crosswalk

TYPICAL CROSSWALK MARKINGS FOR CURB RAMPS



12" White For Crosswalk

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
11/05/08	C.H.	Sheet number changed to 3 of 14.			

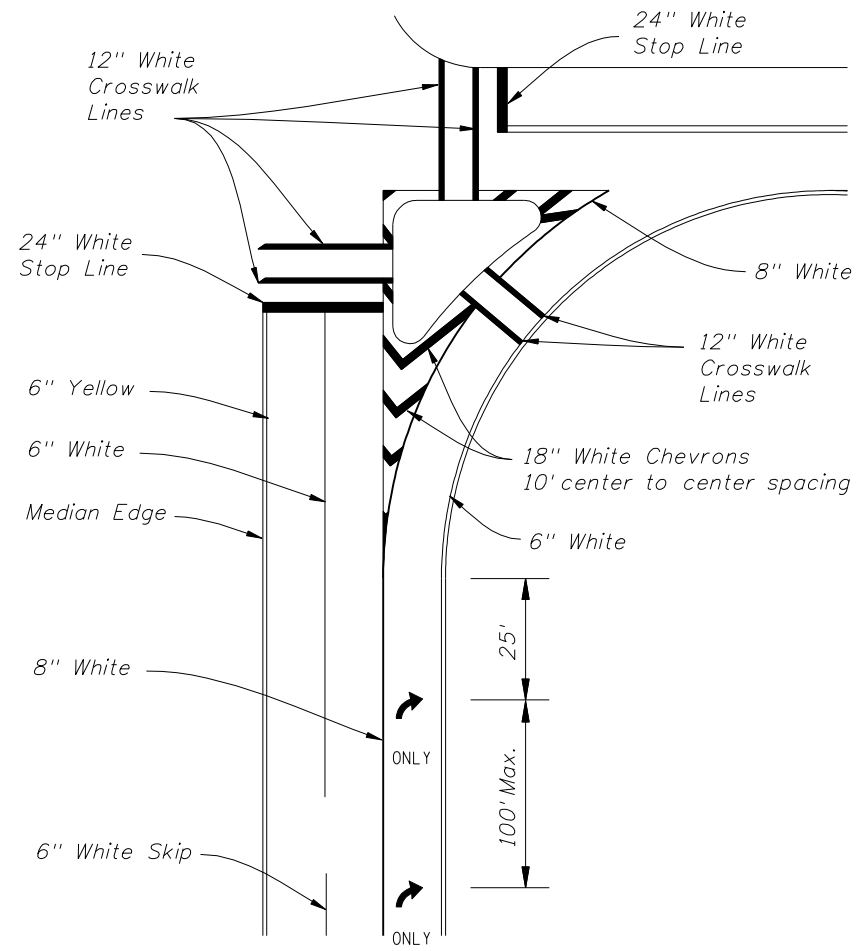


6'-10' Skip
6" White

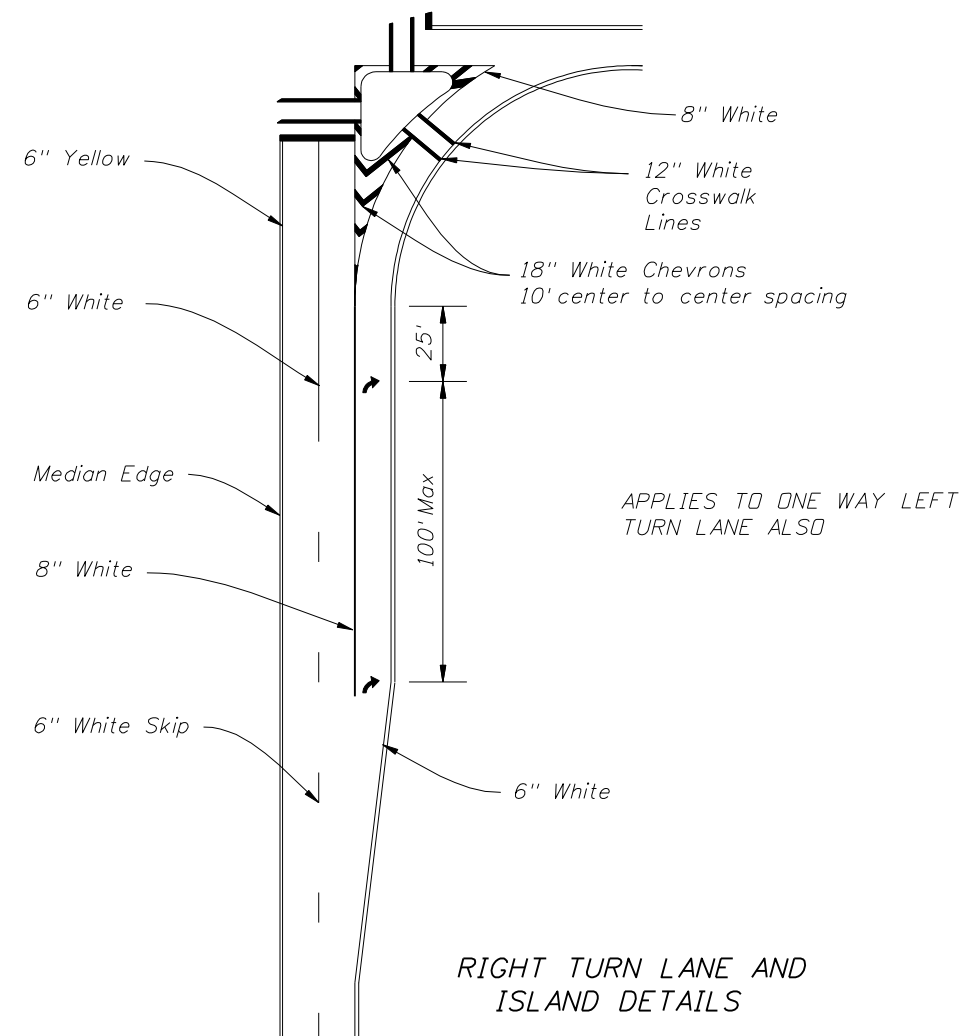
These markings may be used for locations with restricted left turn lengths, only when called for in plans.

6" Dbl Yellow

RESTRICTED LEFT TURN MARKING



RIGHT TURN LANE DROP AND ISLAND DETAILS
LEFT TURN LANE DROP IS MIRROR IMAGE



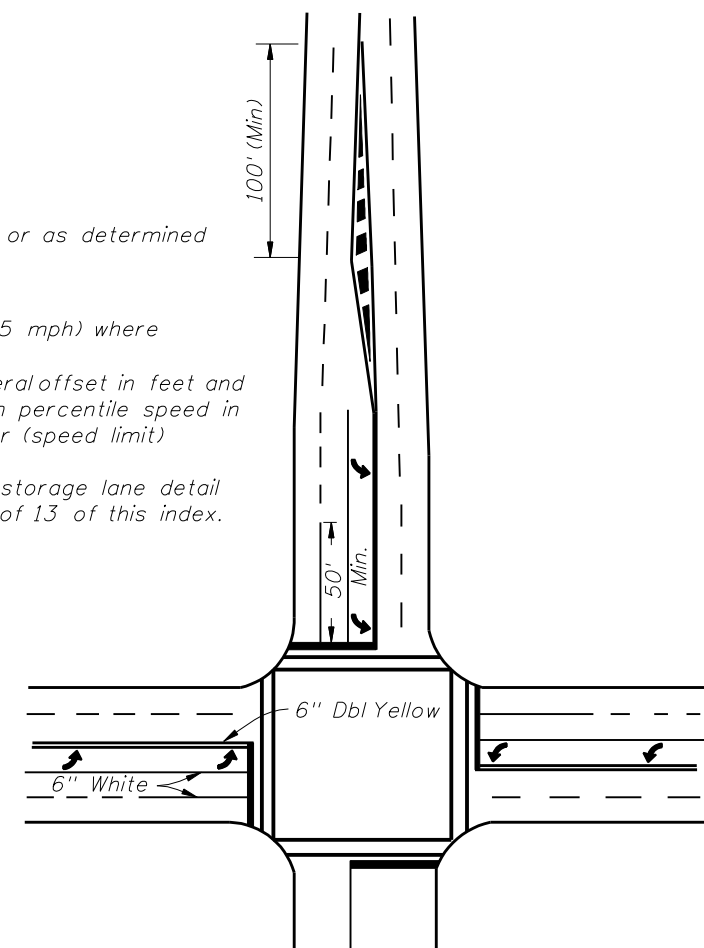
RIGHT TURN LANE AND ISLAND DETAILS

100' Minimum or as determined by $L=WS$

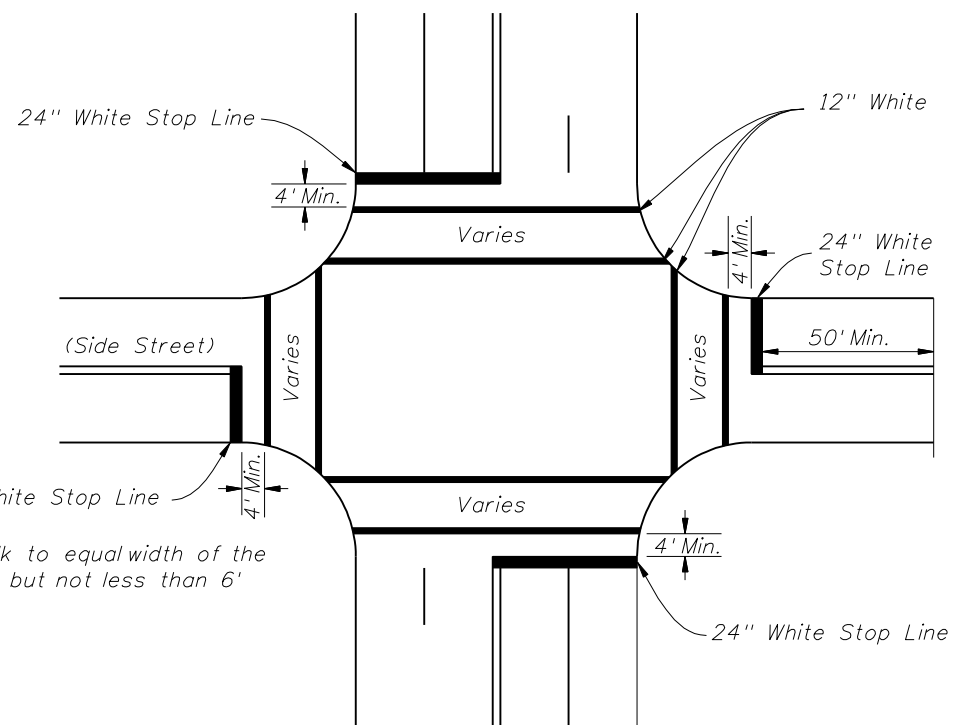
$$(L = \frac{WS^2}{60} < 45 \text{ mph}) \text{ where}$$

W is the lateral offset in feet and S is the 85th percentile speed in miles per hour (speed limit)

For left turn storage lane detail see sheet 2 of 13 of this index.



TYPICAL INTERSECTION 2 THRU LANES PLUS LEFT TURN LANE, WITH CROSSWALK



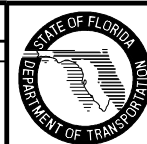
STOP BARS, CROSSWALKS AND DOUBLE CENTER LINE DETAILS

NOTES:

1. When public sidewalk curb ramps are present, refer Index 17344 and Index No. 304 for crosswalk widths.
2. Double yellow longitudinal center lines on all roadway approaches shall be extended back 100' for projects involving intersection improvements only.
3. When specified, "stop" message shall be placed 25' back of stop lines.

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11/05/08	C.H.	Sheet completely revised sheet number changed to 4 of 14.			



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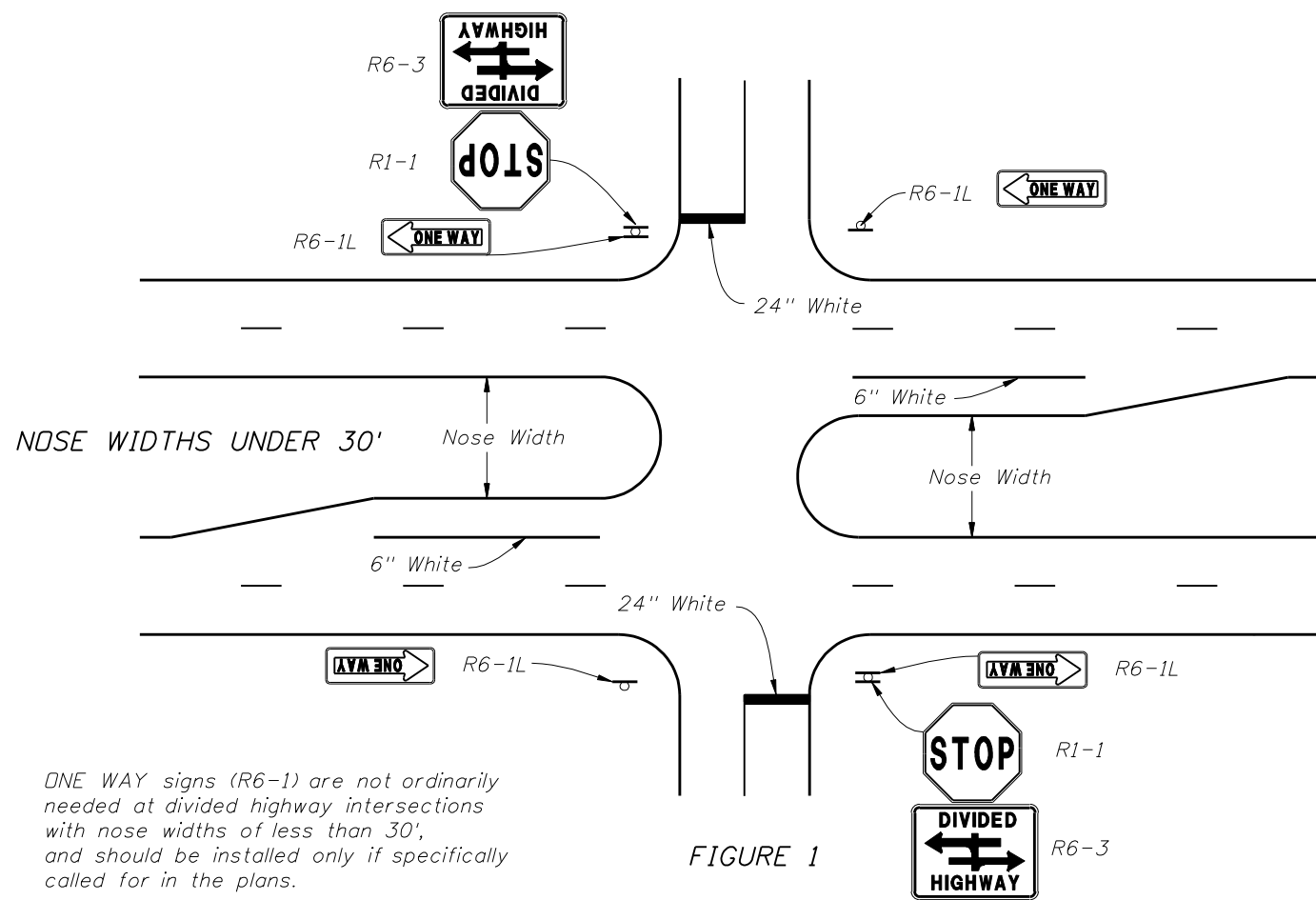


FIGURE 1

ONE WAY signs (R6-1) are not ordinarily needed at divided highway intersections with nose widths of less than 30', and should be installed only if specifically called for in the plans.

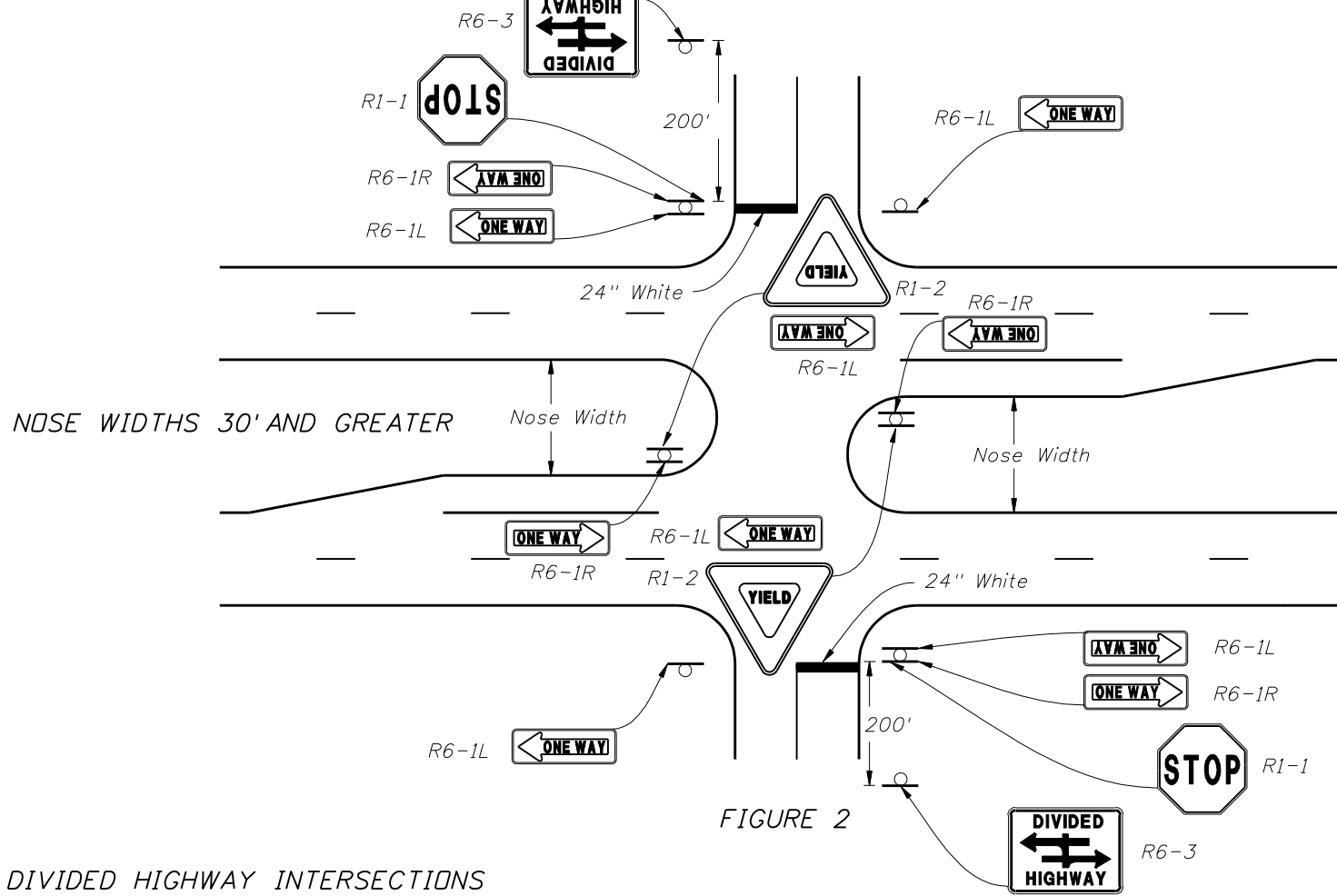
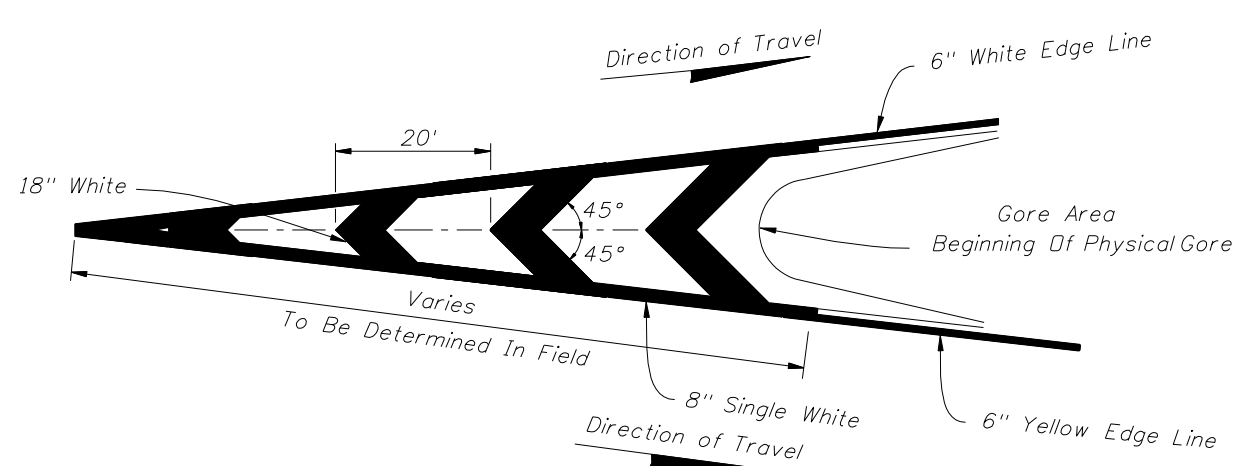
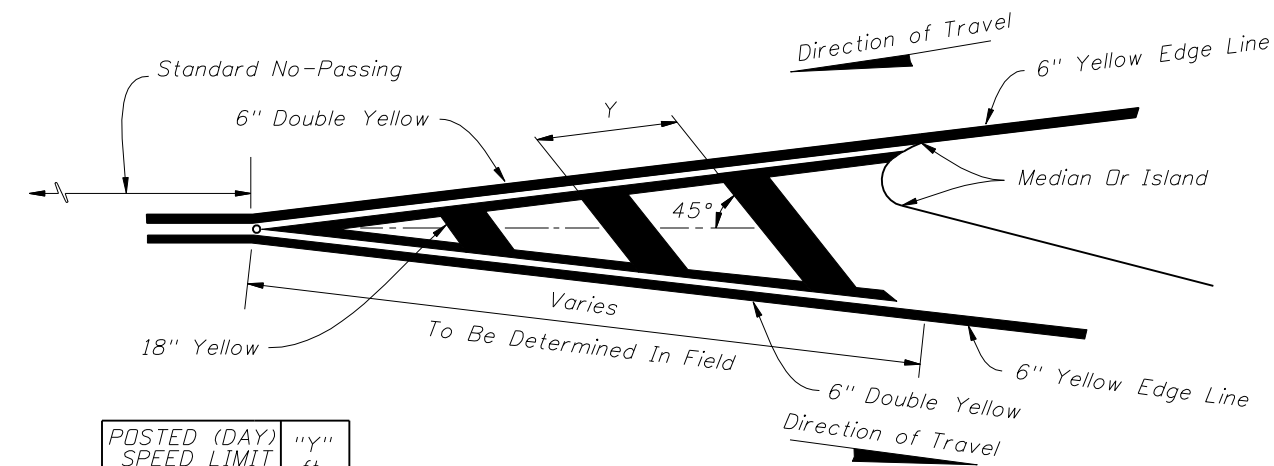


FIGURE 2

ONE-WAY SIGNS ON DIVIDED HIGHWAY INTERSECTIONS



PAVEMENT MARKINGS FOR TRAFFIC CHANNELIZATION AT GORE
(TRAFFIC FLOWS IN SAME DIRECTION)

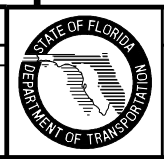


POSTED (DAY) SPEED LIMIT MPH	"Y" ft.
30 OR LESS	10
35	20
40	20
45	30
50 OR MORE	40

PAVEMENT MARKING FOR TRAFFIC SEPARATION
(TRAFFIC FLOWS IN OPPOSING DIRECTIONS)

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
11/05/08	C.H.	New signs added to sheet, sheet numbers changed to 5 of 14.			

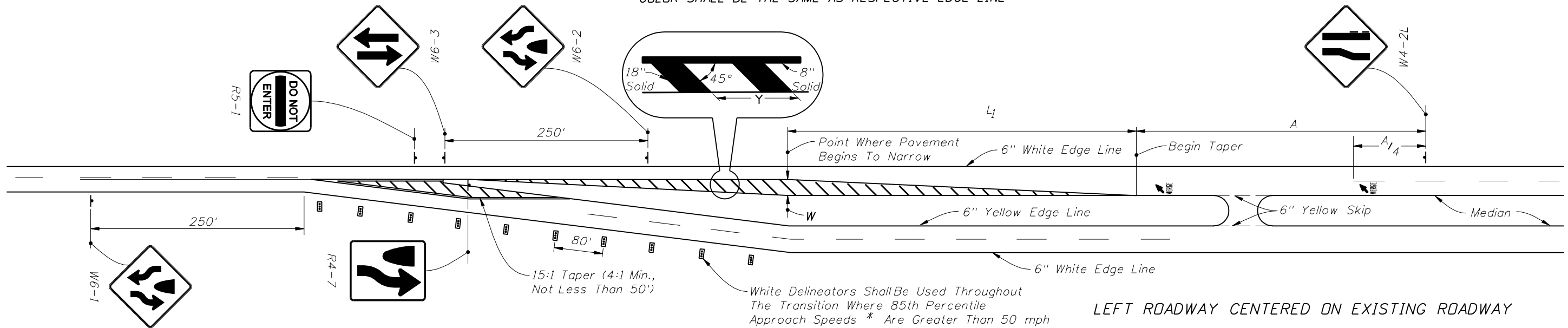


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TYPICAL TRANSITION MARKING
 COLOR SHALL BE THE SAME AS RESPECTIVE EDGE LINE

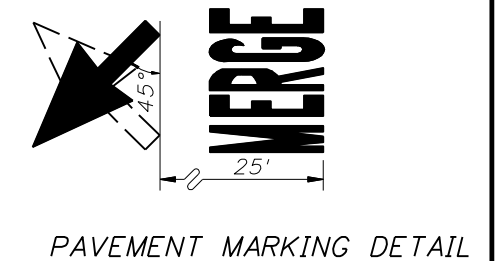
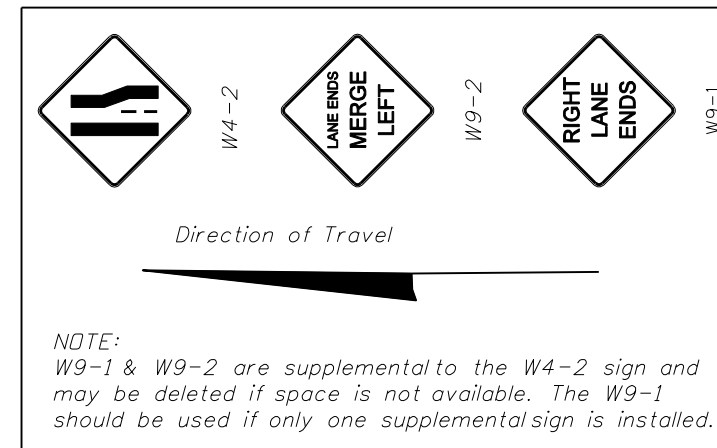


LEFT ROADWAY CENTERED ON EXISTING ROADWAY

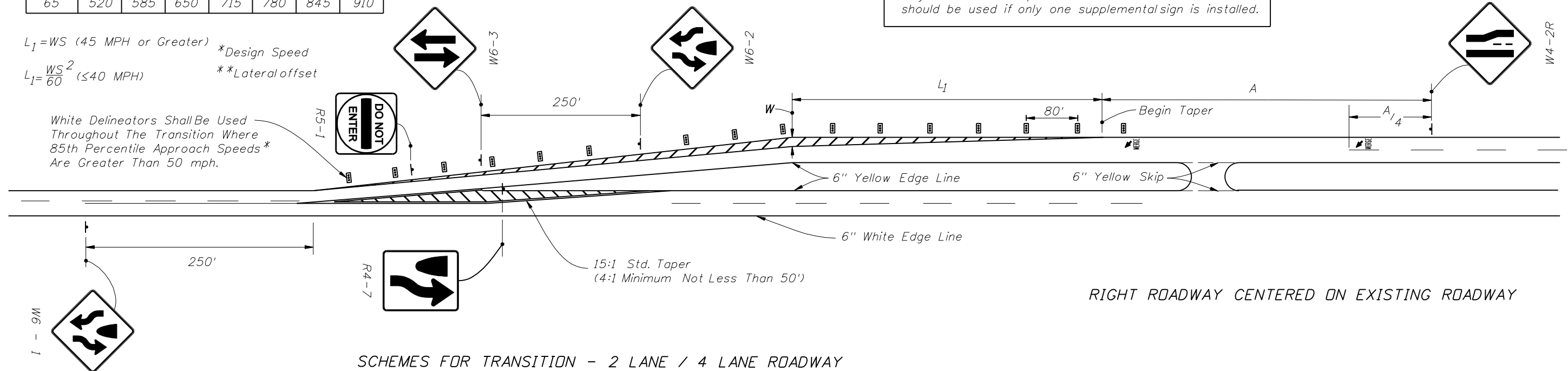
** S \ ** W	TRANSITION DISTANCE L ₁ (FEET)						
MPH	8	9	10	11	12	13	14
30	120	135	150	165	180	195	210
35	165	185	205	225	245	265	285
40	215	240	270	295	320	350	375
45	360	405	450	495	540	585	630
50	400	450	500	550	600	650	700
55	440	495	550	605	660	715	770
60	480	540	600	660	720	780	840
65	520	585	650	715	780	845	910

SPEED MPH	"A" (FT.)
55	950
50	850
45	750
40	650
30	450

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



$L_1 = WS$ (45 MPH or Greater) *Design Speed
 $L_1 = \frac{WS^2}{60}$ (<40 MPH) **Lateral offset

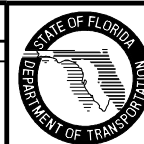


RIGHT ROADWAY CENTERED ON EXISTING ROADWAY

SCHEMES FOR TRANSITION - 2 LANE / 4 LANE ROADWAY

REVISIONS

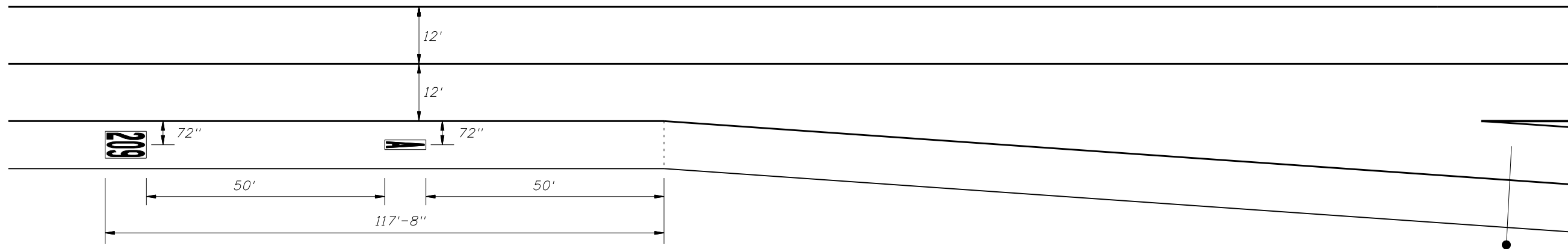
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
11/05/08	C.H.	Sign W4-2 L and R changed delineator symbols changed and sheet number changed to 6 of 14.			



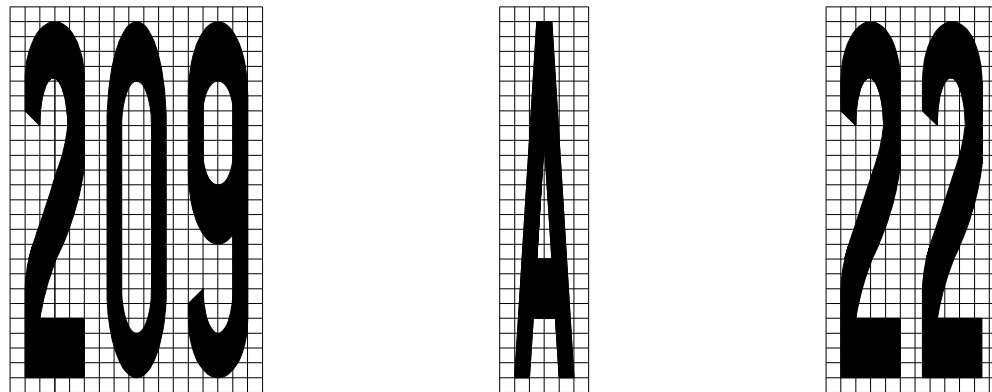
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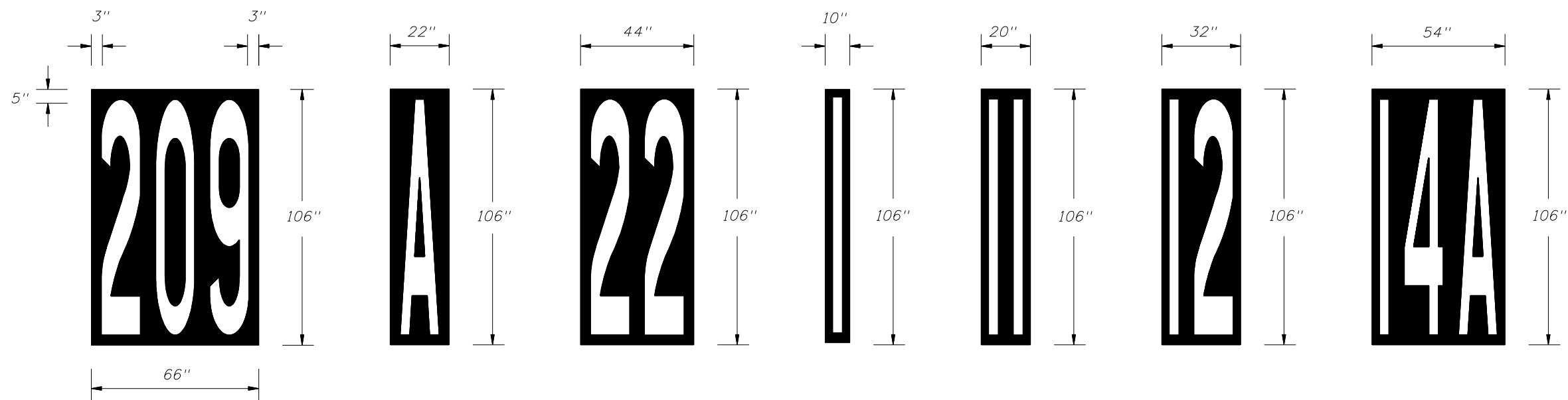
LAYOUT FOR 1, 2 AND 3 DIGIT NUMBERS AND LETTERS



MESSAGE SIZE AND SPACING

NOTES:

1. Messages shall meet requirements of Specification Section 971-7 and Section 711.
2. The thickness of the preformed message shall be 125 mils.
3. The message shall consist of white letters and numbers with black contrasting material. The black material shall meet the mat dimensions shown and have a minimum skid resistance value of 55 BPN.
4. The "EXIT NUMBER" position remains the same (117'-8") from the beginning of taper regardless of the number of lines of information.



MAT DIMENSIONS

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
11/05/08	C.H.	Sheet number changed to 7 of 14.			

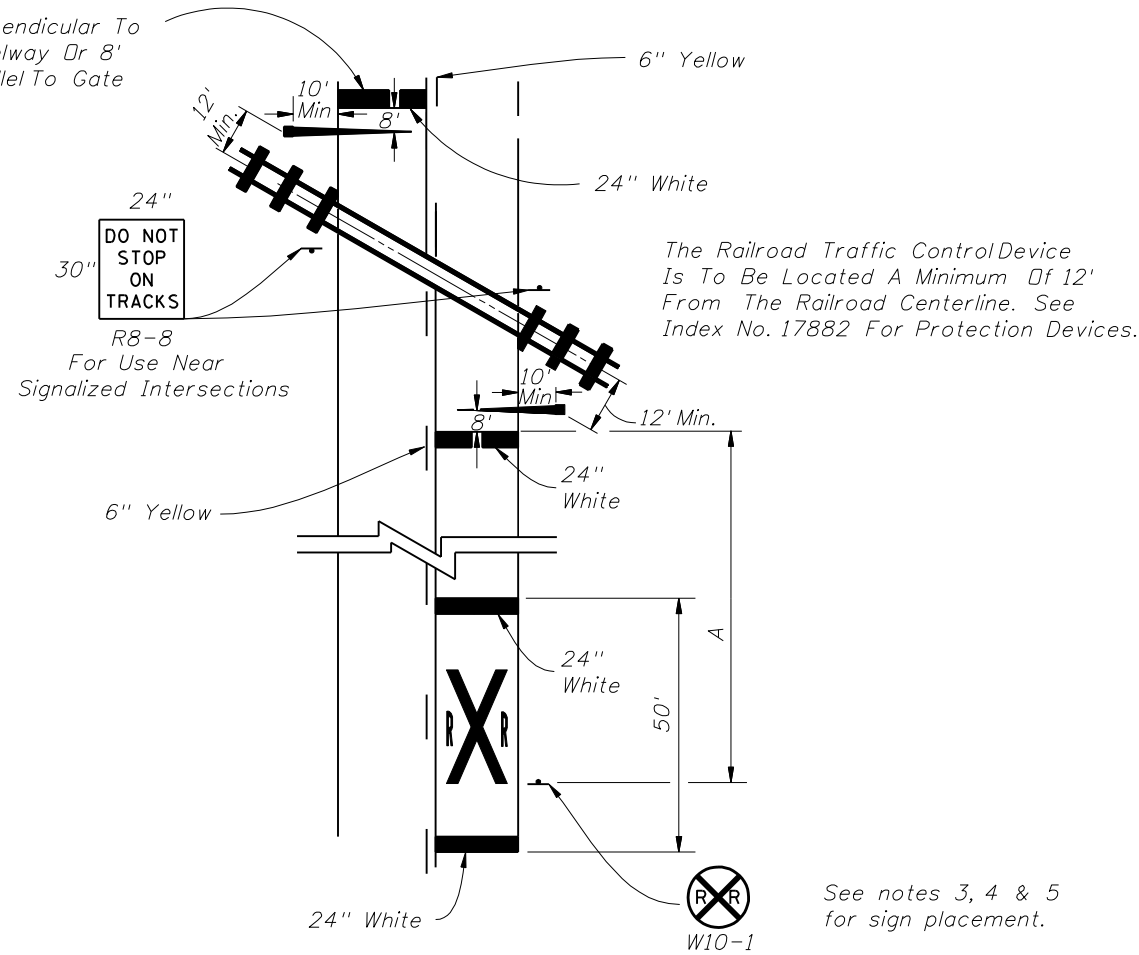


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SPECIAL MARKING AREAS

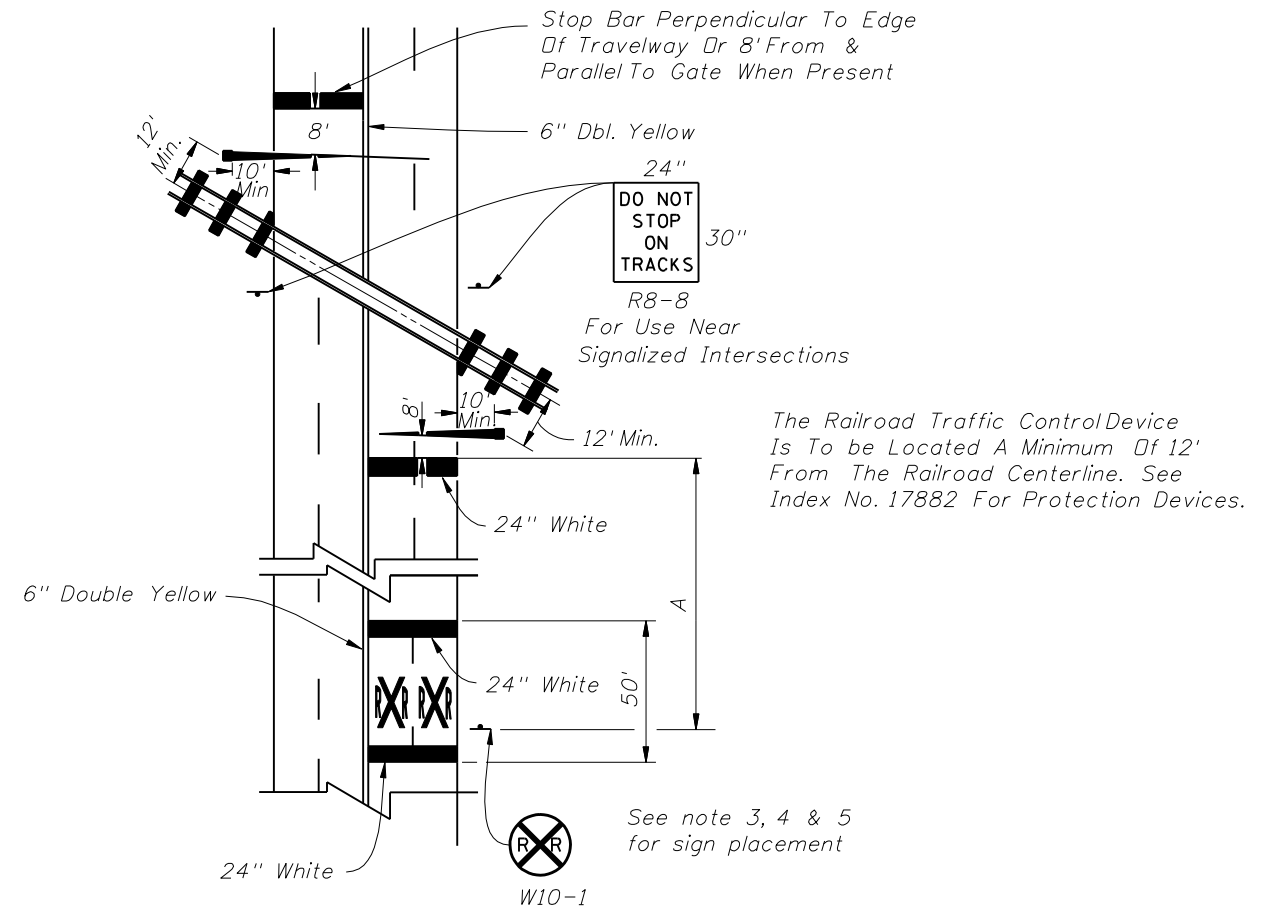
Interim Date	Sheet No.
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Stop Bar Perpendicular To Edge Of Travelway Or 8' From & Parallel To Gate When Present.

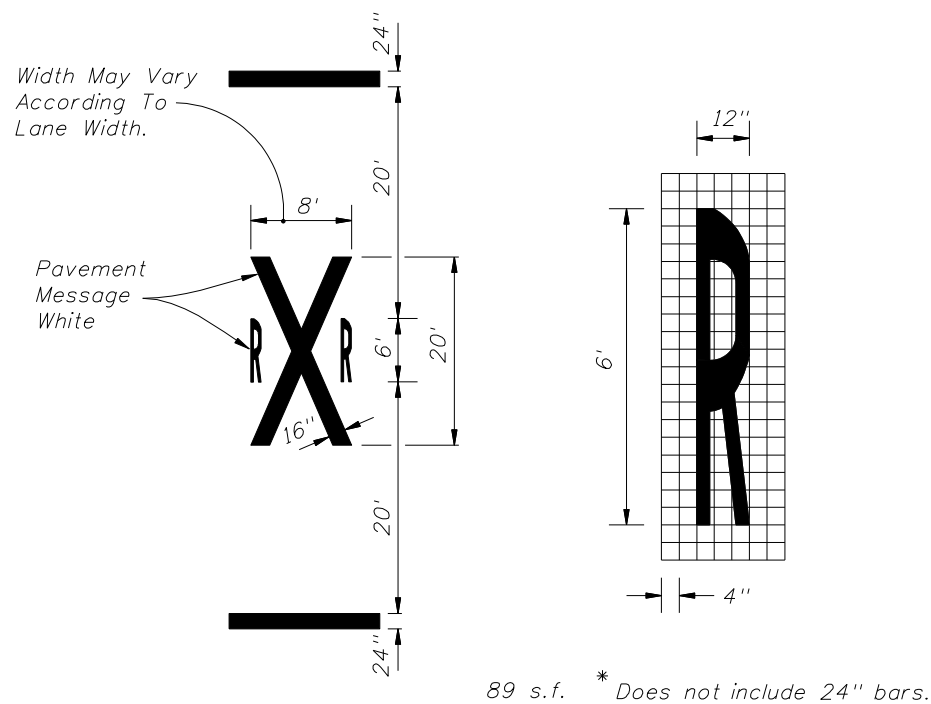


RAILROAD CROSSING AT 2-LANE ROADWAY

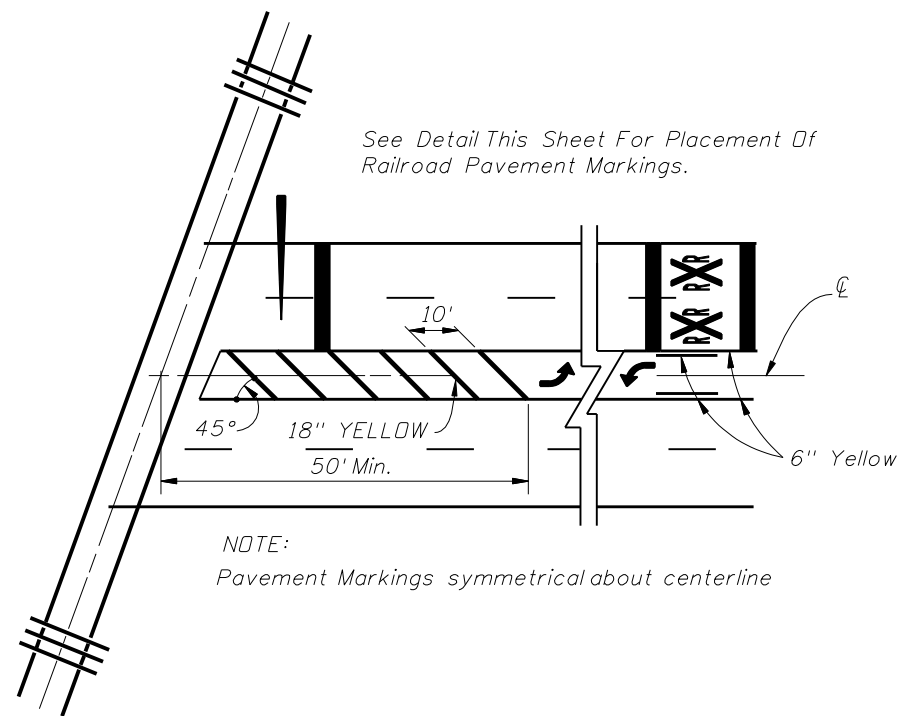
Stop Bar Perpendicular To Edge Of Travelway Or 8' From & Parallel To Gate When Present



RAILROAD CROSSING AT 4-LANE ROADWAY



TYPICAL PAVEMENT MARKINGS FOR R/R CROSSING



PAVEMENT MARKINGS FOR TERMINATION OF TWO WAY LEFT TURN AT R/R CROSSINGS

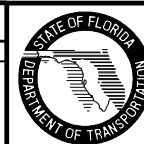
NOTES:

- When computing pavement messages, quantities do not include transverse lines.
- When dynamic devices are not present or are to be installed, the crossbuck shall be located at the future location of the RR gate or signal and gate in accordance with Index No. 17882.
- Placement of sign W10-1 in a residential or business district, where low speeds are prevalent, the W10-1 sign may be placed a minimum distance of 100' from the crossing. Where street intersections occur between the RR pavement message and the tracks an additional W10-1 sign & additional Pavement message should be used.
- Recommended location for FTP-61-06 or FTP-62-06 sign, 100' urban & 300' rural in advance of the crossings.
- A portion of the pavement marking symbol should be directly opposite the W10-1 sign.

SPEED MPH	" A " IN FT.
60	400
55	325
50	250
45	175
40	125
35	100
URBAN	85 MIN.

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
11/05/08	C.H.	Sheet number changed to 8 of 14.			



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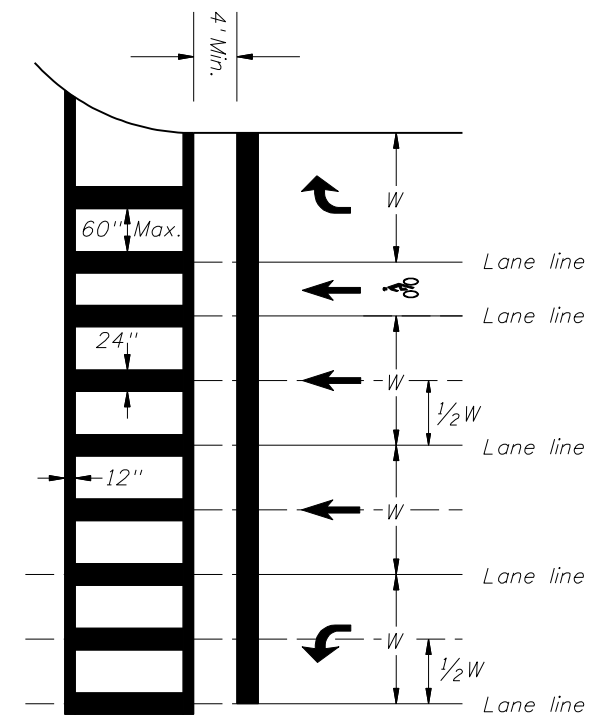
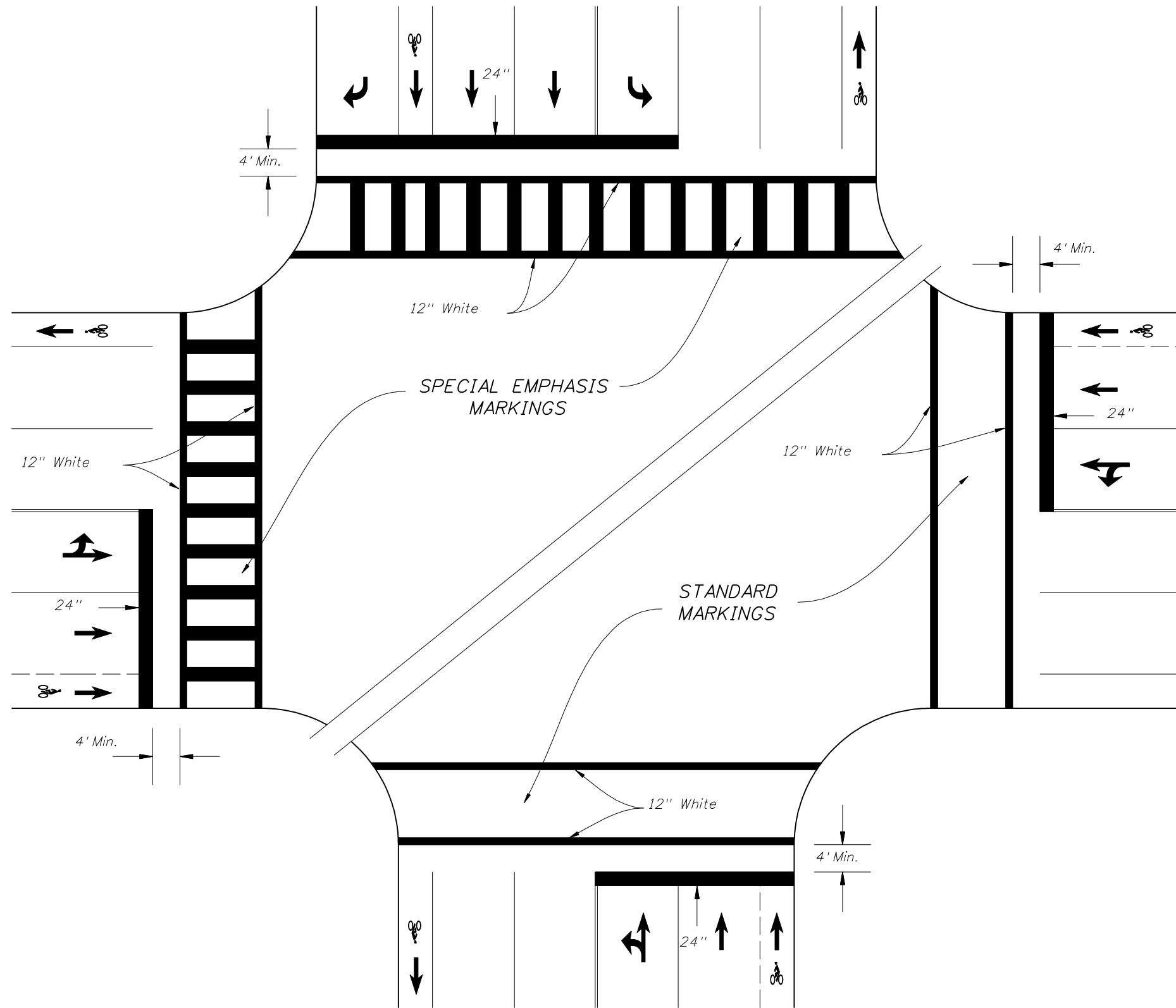
SPECIAL MARKING AREAS

Interim Date 01/01/09 Sheet No. 8 of 14

Index No. 17346

GENERAL NOTES

1. For traffic and pedestrian signal installation, refer to Index No. 17721 through 17890.
2. For public sidewalk curb ramps, refer to Index No. 304.
3. For pavement marking and sign installation, refer to Indexes 11200 through 17356.
4. Crosswalk minimum widths: Intersection Crosswalk 6'.
Midblock Crosswalk 10'.
5. All crosswalk markings shall be white.
6. Longitudinal lines in Special Emphasis Crosswalk shall be 24" wide and spaced to avoid the wheelpath of vehicles as shown in detail. The maximum space between markings shall not exceed 60". A longitudinal marking shall be centered at each lane line. Additional longitudinal markings shall be placed at the center of each lane (1/2W).

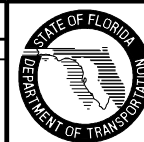


SPECIAL EMPHASIS CROSSWALK MARKING DETAIL

SPECIAL EMPHASIS AND STANDARD CROSSWALKS SIGNALIZED OR STOP SIGN CONTROLLED INTERSECTION

REVISIONS

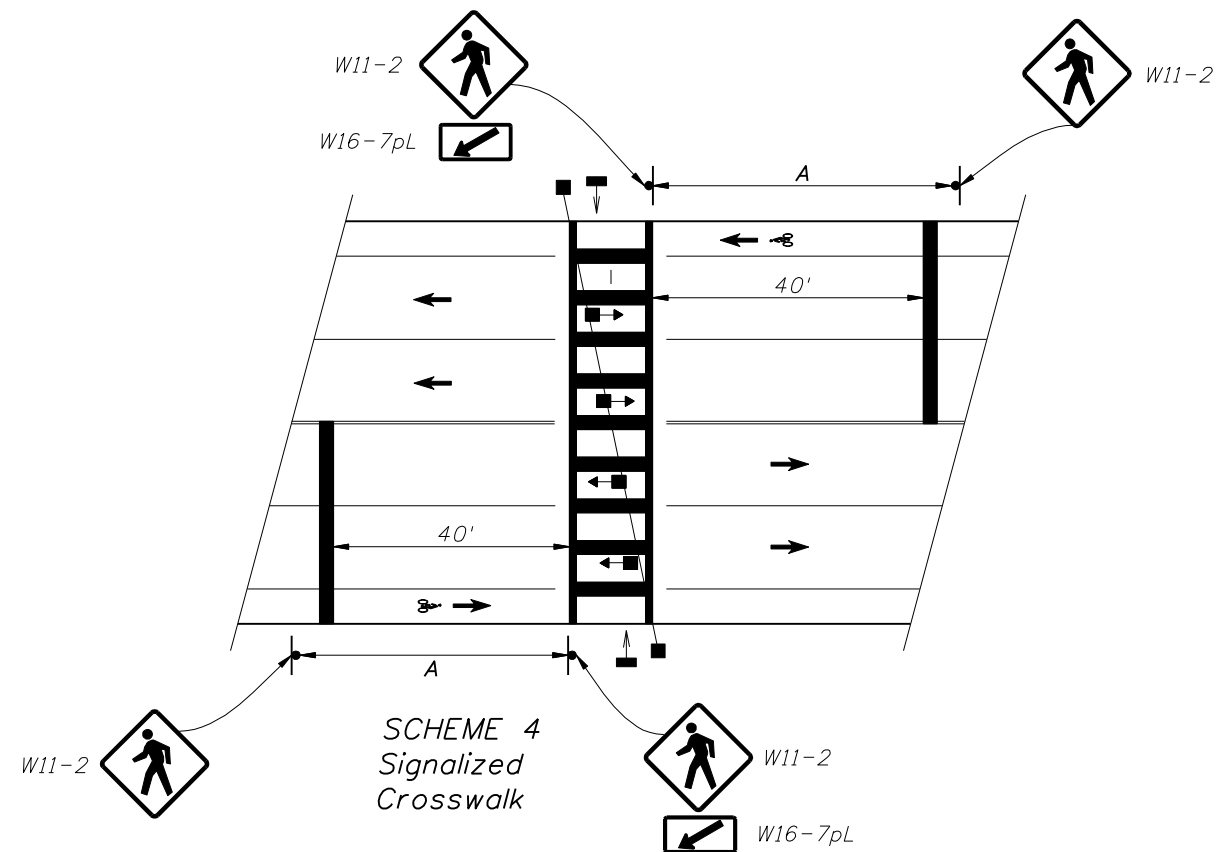
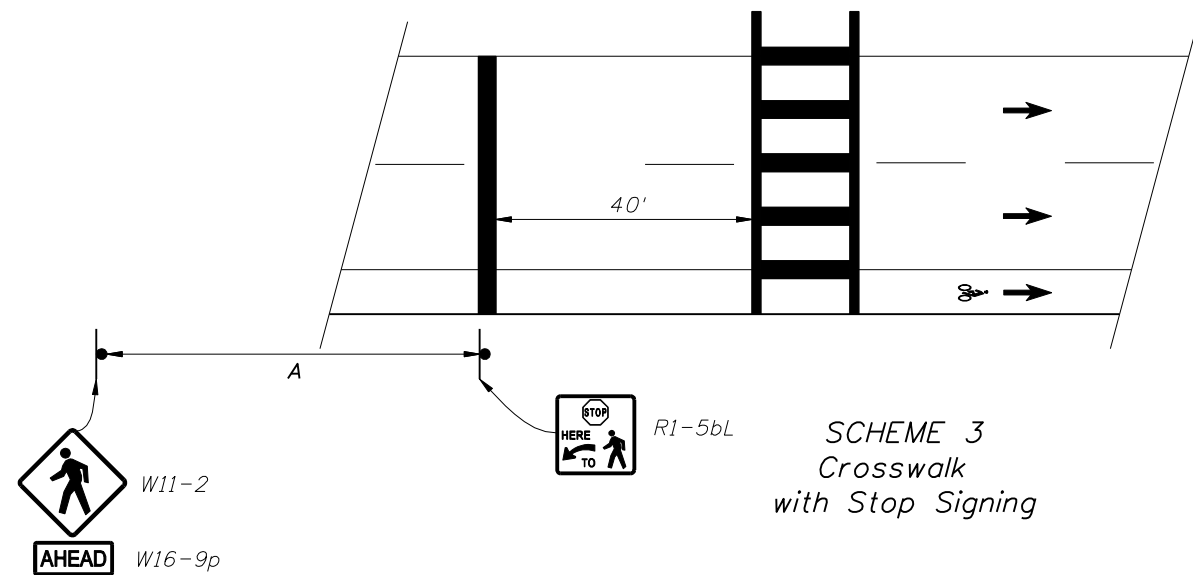
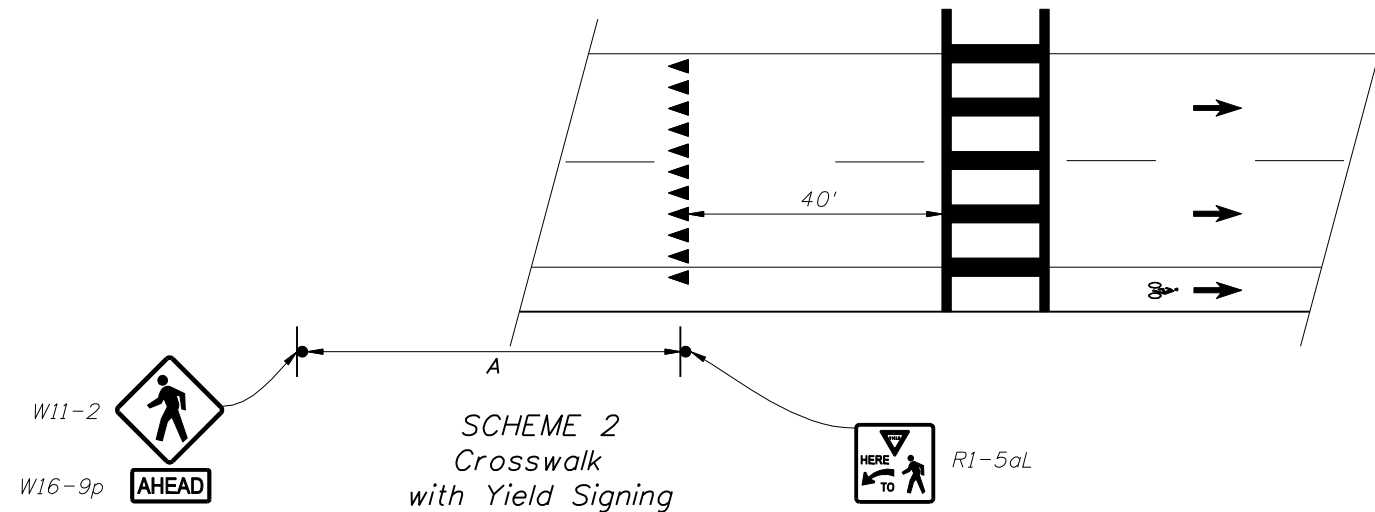
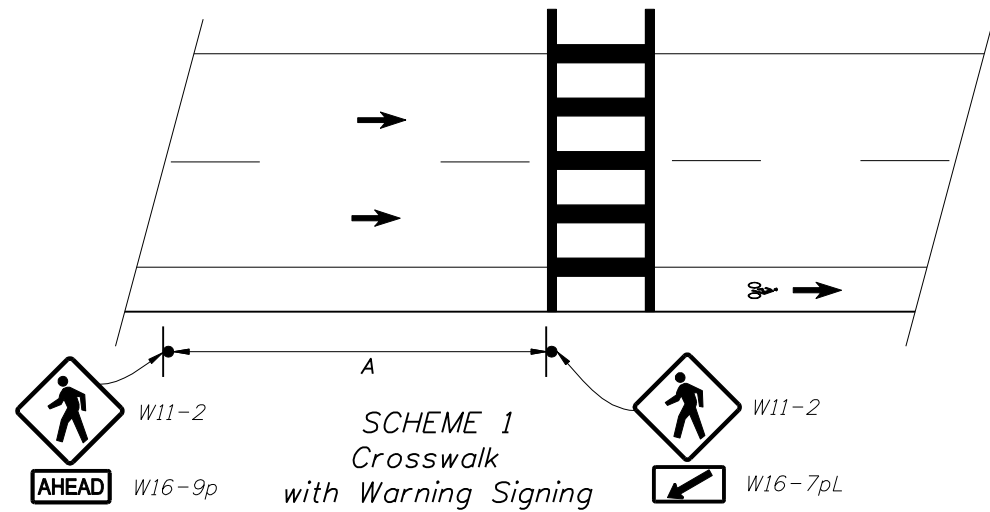
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
11/05/08	C.H.	Sheet completely revised sheet number changed to 9 of 14.			



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SPECIAL MARKING AREAS

Interim Date	Sheet No.
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17346	

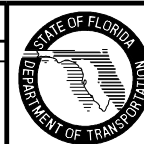


APPROACH SPEED MPH	A-SUGGESTED DISTANCE (Ft.)
25 Or Less	200
26 To 35	250
36 To 45	300
46 To 55	325

- Plans shall indicate which crosswalk scheme is to be used.
- The details shown do not depict the signing and markings for multi-lane roadways with divided medians. For these applications, additional signs shall be installed on the median side.
- All mid-block crosswalks shall use high emphasis crosswalk markings.
- Crosswalk marking should utilize preformed marking materials.

REVISIONS

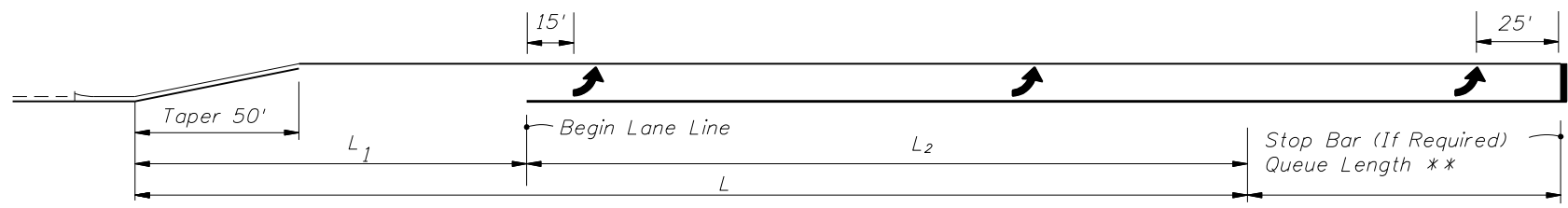
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
11/05/08	C.H.	New sheet added to SPECIAL MARKINGS AREAS.			



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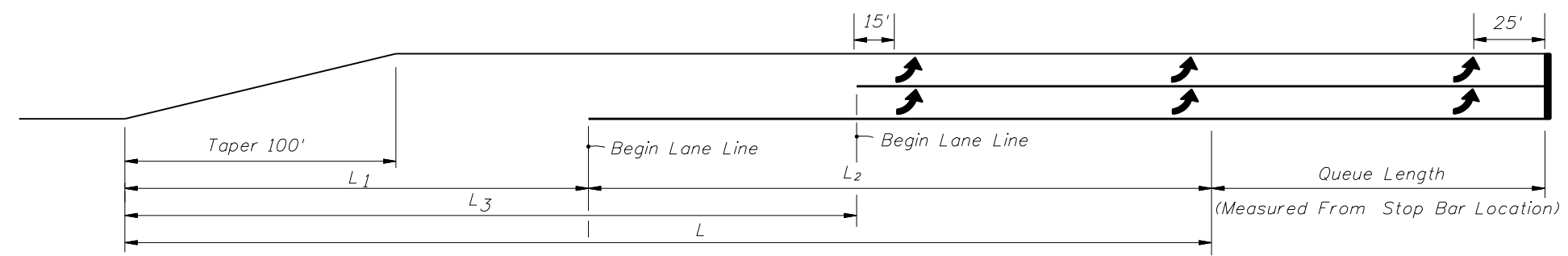
SPECIAL MARKING AREAS

Interim Date: 01/01/09
Sheet No.: 10 of 14
Index No.: 17346

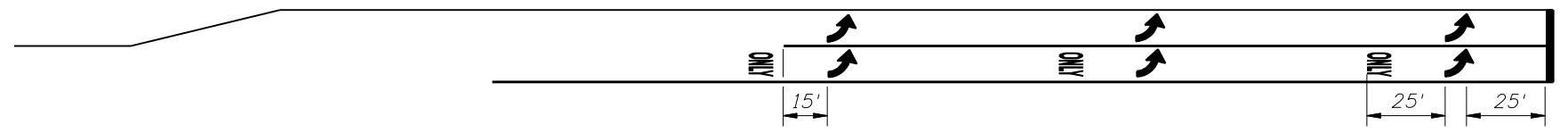


SINGLE LEFT TURNS

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

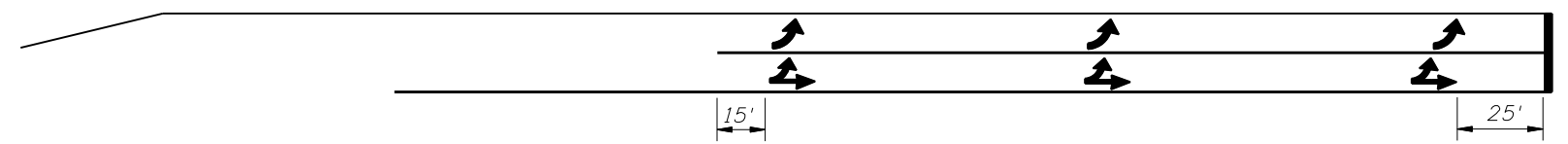


DOUBLE LEFT TURNS



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

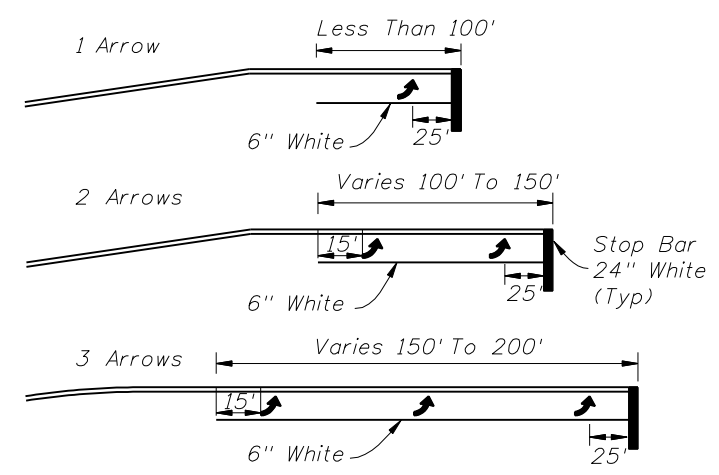
Through Lane Becomes Exclusive Left Turn



Through Lane Becomes Optional Left Turn

DOUBLE LEFT TURN MARKINGS

TURN LANES • CURBED AND UNCURBED MEDIANS							
Design Speed (mph)	Clearance Distance L_1	URBAN CONDITIONS			RURAL CONDITIONS		
		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'



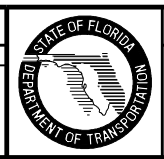
Arrow should be evenly spaced between first and last arrow. Turn lanes longer than 200' add one arrow for each 100' additional length.

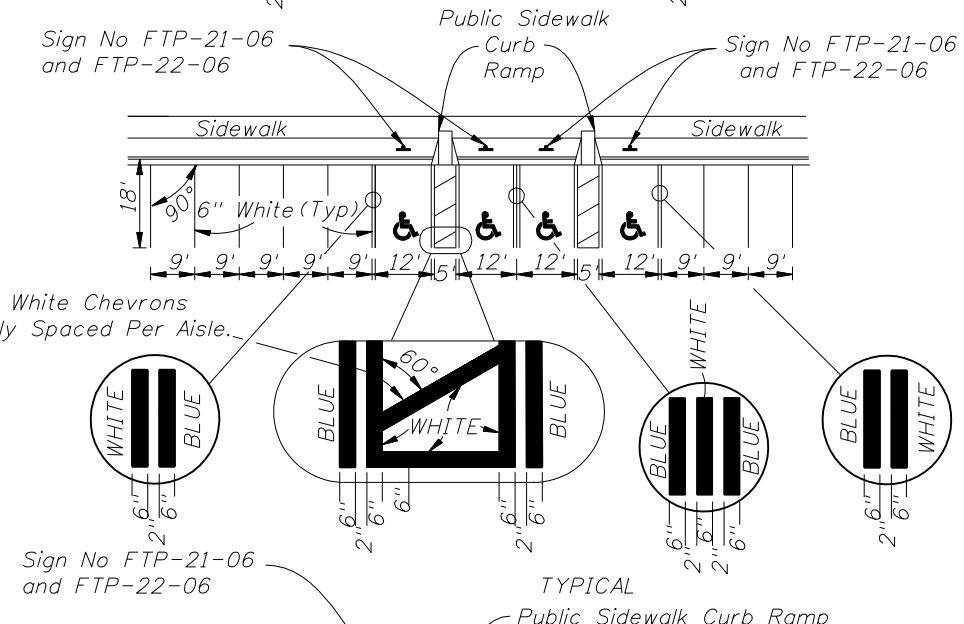
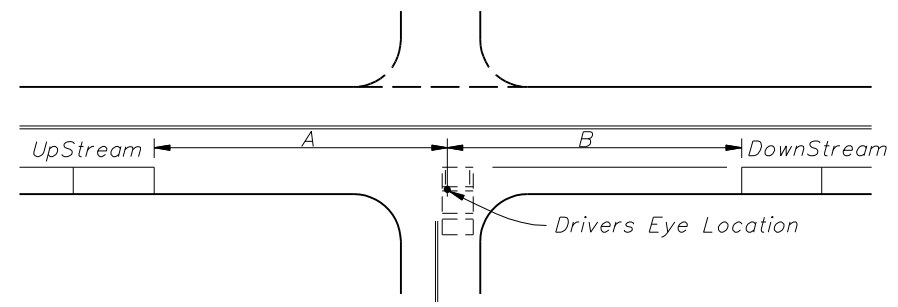
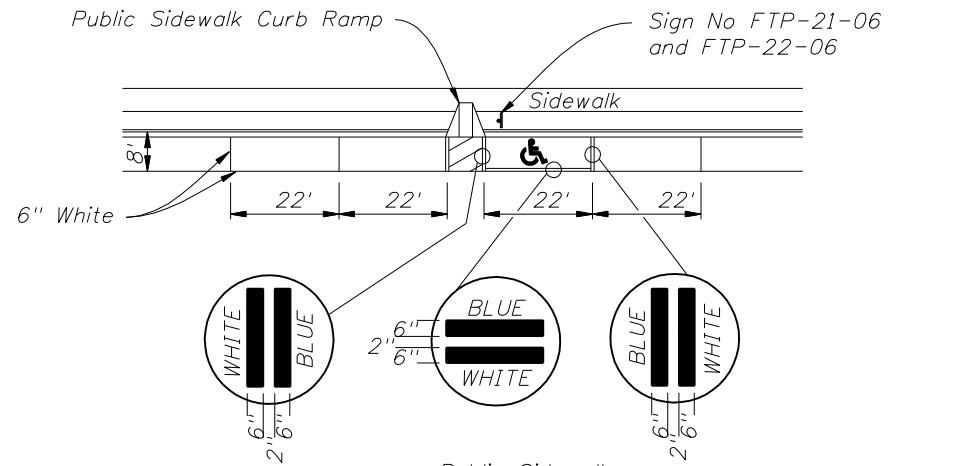
ARROW SPACING

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.

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
11/05/08	C.H.	Sheet number changed to 11 of 14.			

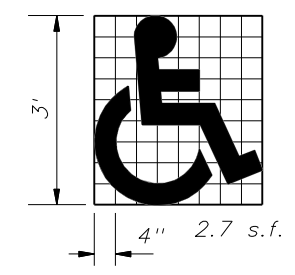
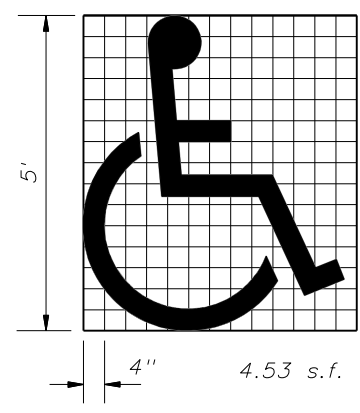




SPEED MPH	UP STREAM (A)	DOWN STREAM (B)	
		2 LANE	4 LANE
0-30	85'	60'	45'
35	100'	70'	50'

- NOTES**
- Distances measured longitudinally along the street from driver location of entering vehicle to end of parking restriction.
 - Distances applicable to intersecting street, major driveways and other driveways to the extent practical.
 - For nonsignalized intersections, the values above shall be compared with the values for signalized intersections and the maximum restrictions implemented. These restrictions apply to both accessible and nonaccessible parking.

MINIMUM PARKING RESTRICTION FOR NONSIGNALIZED INTERSECTIONS

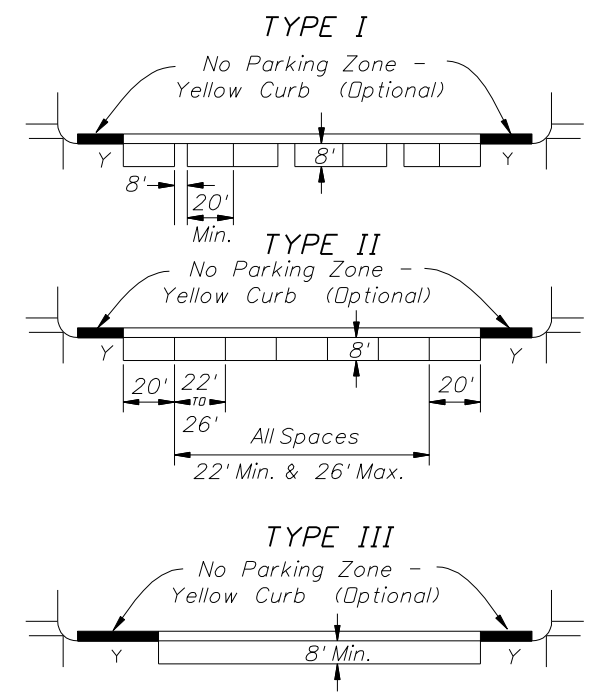


Use of pavement symbol in accessible parking spaces is optional, when used the symbol shall be 3' or 5' high and white in color.

UNIVERSAL SYMBOL OF ACCESSIBILITY

GENERAL NOTES (Signalized & Nonsignalized)

- For entrances to a one-way street, the downstream restriction may be reduced to 20'.
- Parking shall not be allowed within 20' of a crosswalk.
- All parking lane markings shall be 6" white.
- Parking lane lines shall be broken at driveways.
- Refer to Chapter 316, Fla. Statutes, for laws governing parking spaces.
- Where curb and gutter is used, the gutter pan width may be included as part of the minimum width of parking lane, but desirably the lane width should be in addition to that of the gutter pan.



SPEED LIMIT MPH	SIGNALIZED INTERSECTIONS	DISTANCE FROM CURB RADIUS (Y)
0-30	30'	
35	50'	

PARKING RESTRICTION (FT.) FOR SIGNALIZED INTERSECTION

- NOTES:**
- Parking restrictions measured from curb radius point.
 - Restrictions for accessible parking are the same as those applied to nonsignalized intersections.

MINIMUM PARKING RESTRICTION FOR SIGNALIZED INTERSECTION

- NOTES:**
- Dimensions are to the centerline of markings.
 - An Access Aisle is required for each accessible space when angle parking is used.
 - Criteria for pavement markings only, not public sidewalk curb ramp locations. For ramp locations refer to plans.
 - Blue pavement markings shall be tinted to match shade 15180 of Federal Standards 595a.
 - The FTP-22-06 panel shall be mounted below the FTP-21-06 sign.

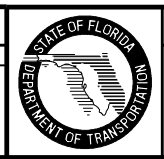
PAVEMENT MARKING FOR PUBLIC SIDEWALK CURB RAMP IN REST AREAS

* FOR ACCESSIBLE MARKINGS - SEE ABOVE

"DIMENSIONS"					
Δ°	"A"	"B"	"C"	"D"	"E"
45°	19'-1"	12'-9"	7'-0"	27'-0"	17'-0"
60°	20'-1"	10'-5"	5'-9"	23'-2"	13'-10"

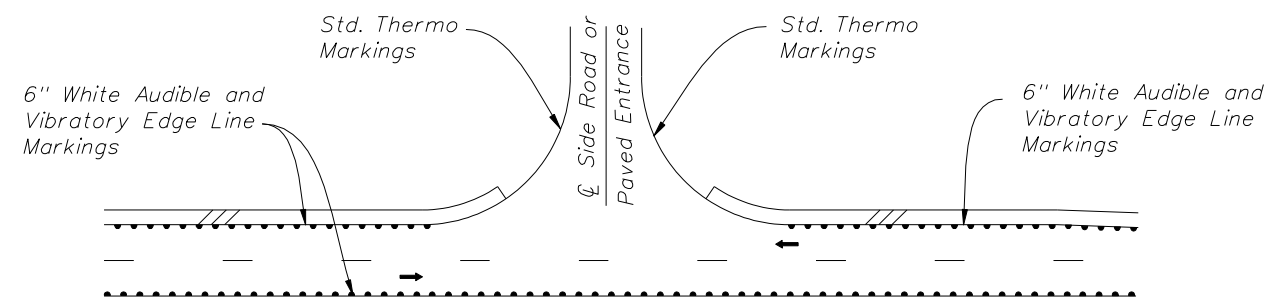
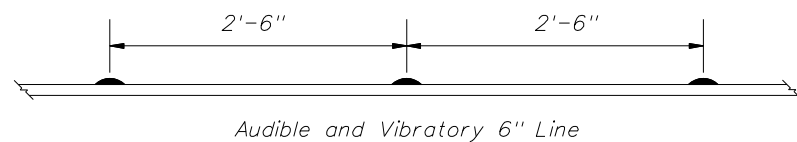
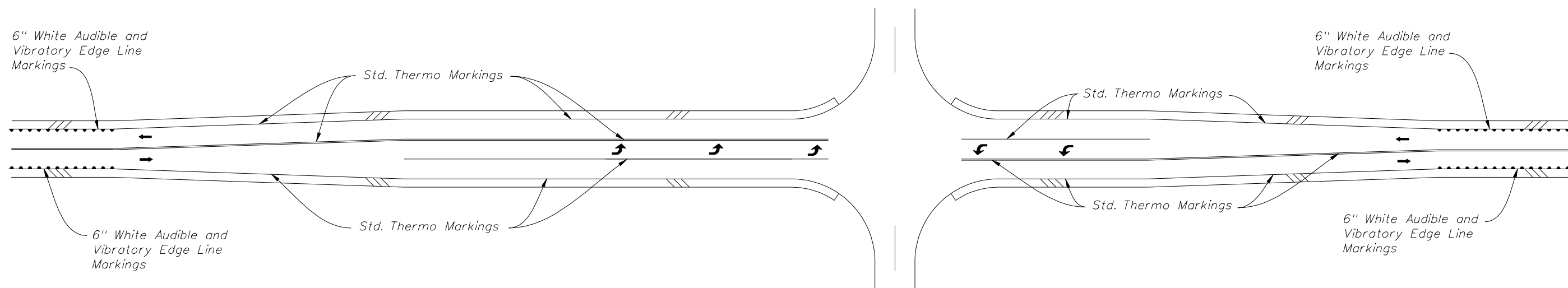
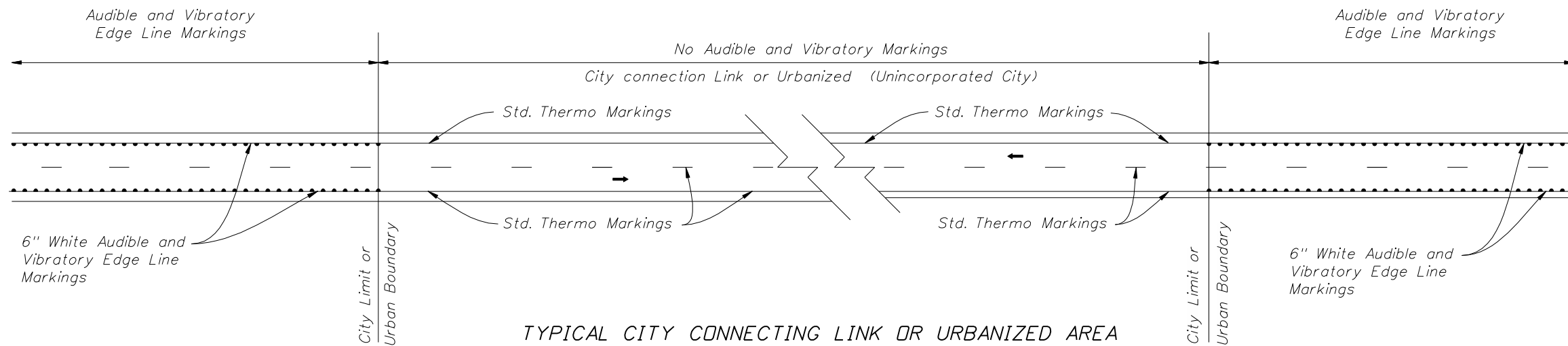
REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
01/01/08	C.H.	Dimensions and details added to clarify ramp striping.			
11/05/08	C.H.	Sheet number changed to 12 of 14.			



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SPECIAL MARKING AREAS (PARKING)

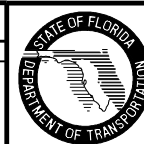


AUDIBLE AND VIBRATORY MARKINGS

2 LANE ROADWAYS

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
11/05/08	XXX	Sheet number changed to 13 of 14.			



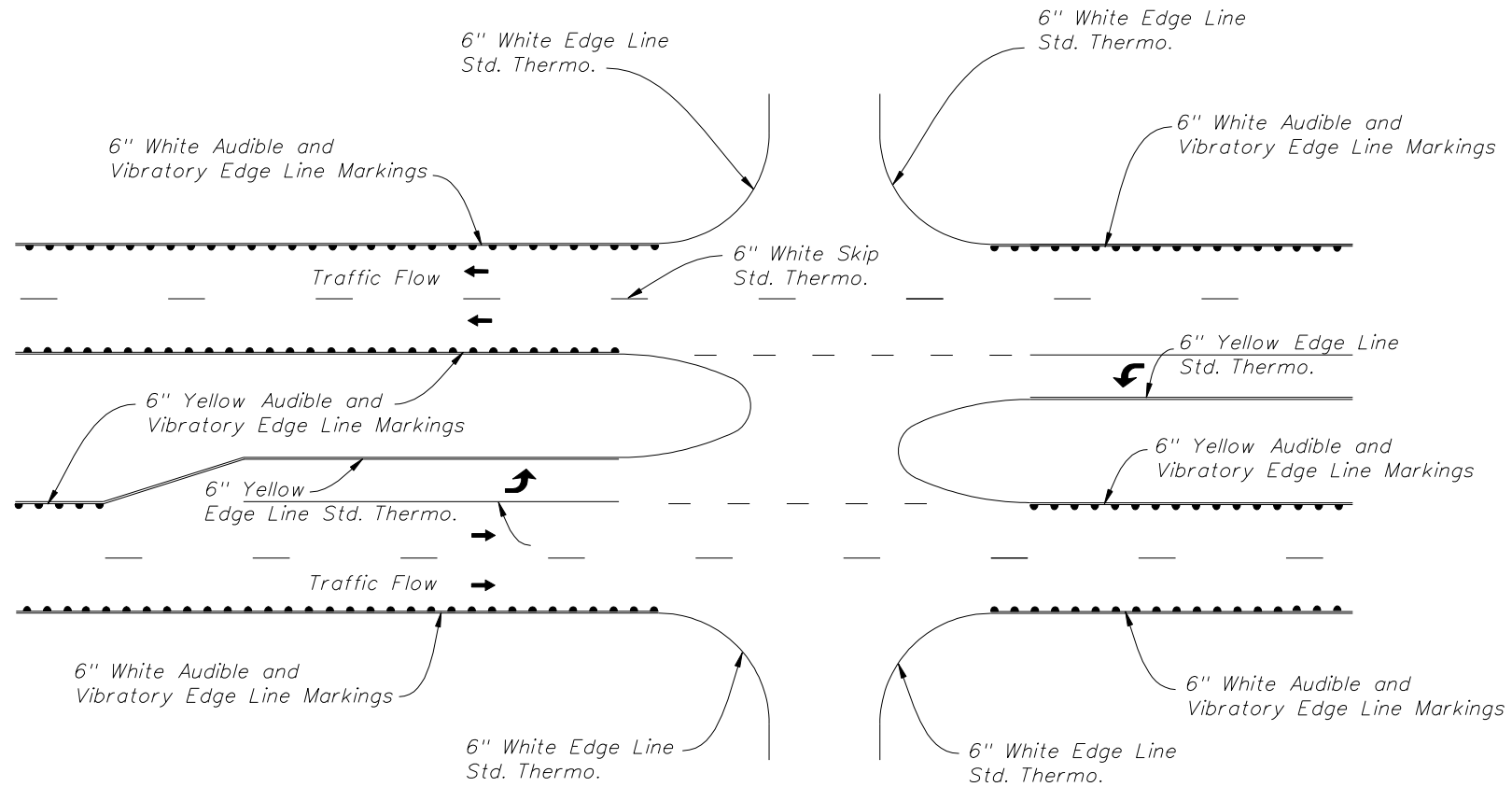
2008 Interim Design Standard

SPECIAL MARKING AREAS

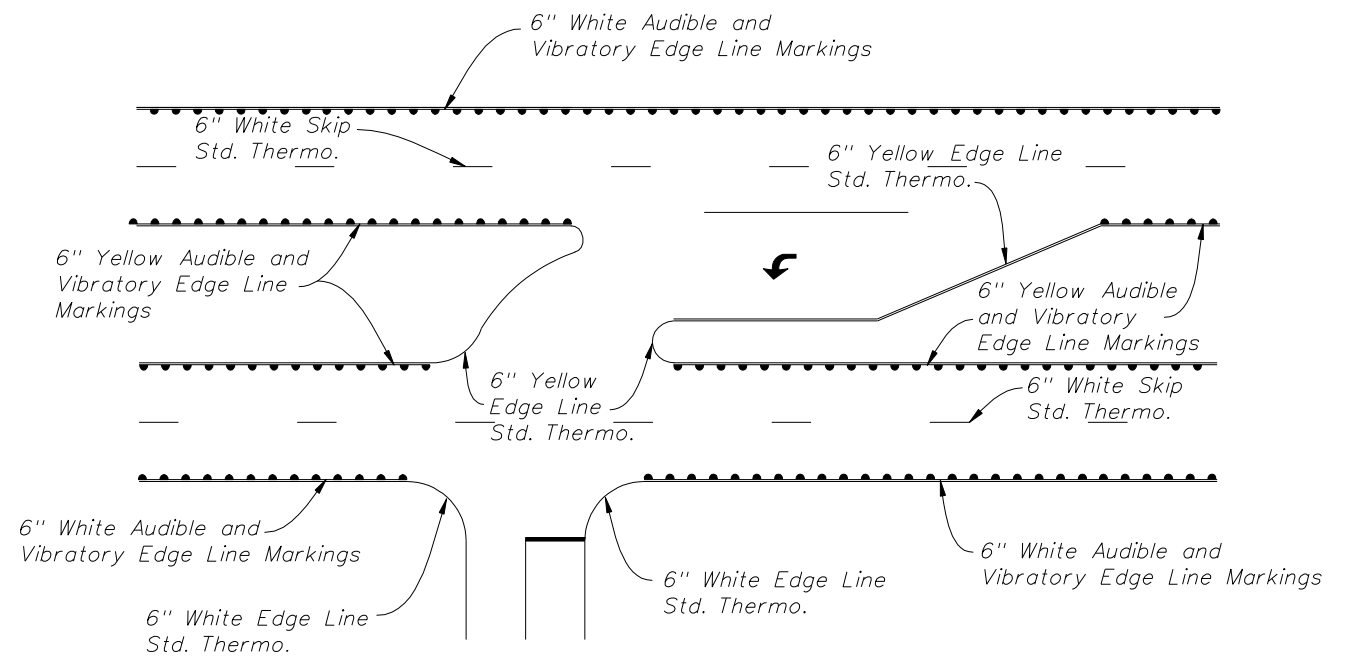
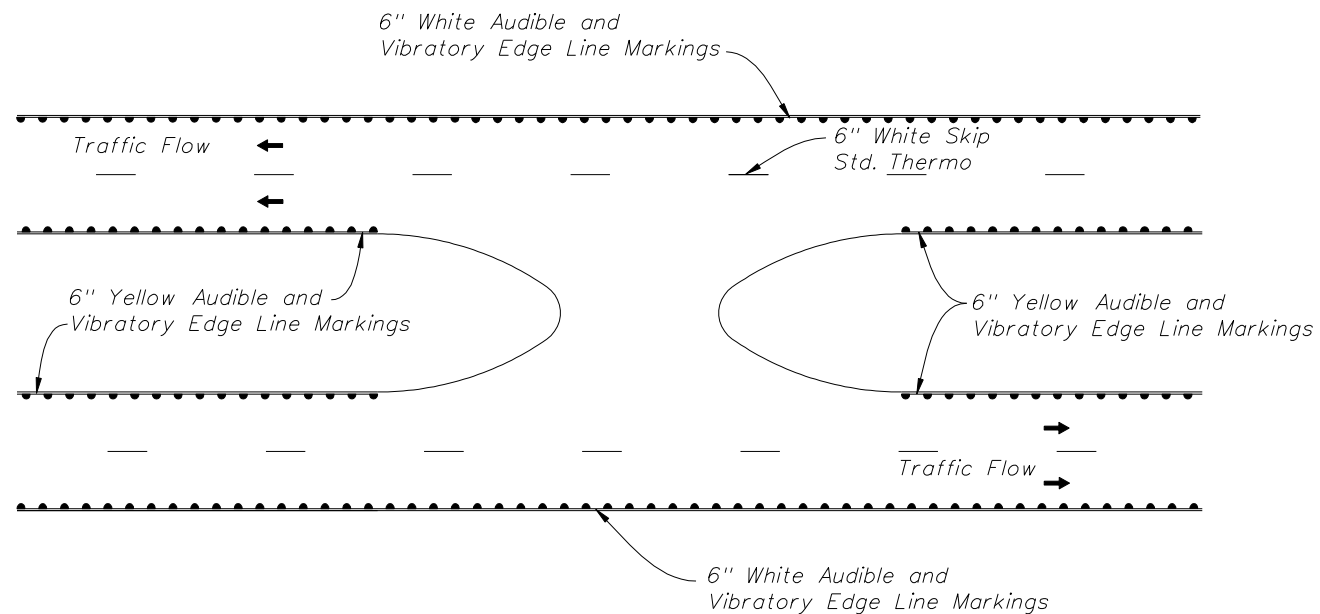
Interim Date
01/01/09

Sheet No.
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17346



1. The Contractor Shall Adjust The Maintenance Of Traffic During Installation To Provide Sufficient Time For The Markings To Bear Traffic.
2. The Height Of The Transverse Bar For Markings Shall Be 0.45 To 0.55 Inches Above The Pavement Surface At The Edge Of The Marking.
3. Transverse Bars Shall Be Evenly Spaced In The Marking At Intervals Of 30 Inches Center To Center.
4. The Transverse Bar May Have A Drainage Channel On Each Bar. The Width Of The Drainage Channel May Not Exceed 0.25 Inches At The Bottom Of The Channel.
5. Audible And Vibratory Markings Shall Only Be Installed On Centerline Markings Of Two Lane Roads When Shown In The Plans.
6. When Raised Pavement Markers Conflict With The Installation Of The Centerline Markings, The Contractor Shall Be Responsible For Removing And Replacing The Raised Pavement Markings. The Additional Expenses Associated With The Raised Pavement Markings Shall Be Included In The Cost Of The Marking.
7. Grinding Is An Acceptable Method Of Removal Of The Existing Markings Where Markings Are Installed As Replacement Markings.
8. The Specifications Allow The Audible Markings To Utilize A Flat Base Line Or An Inverted Rib Profile Base Line.

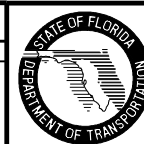


AUDIBLE AND VIBRATORY MARKINGS

MULTI-LANE ROADWAYS

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
07/01/08	C.H.	New sheet added detailing Audible and Vibratory markings.			
11/05/08	C.H.	Sheet number changed to 14 of 14.			



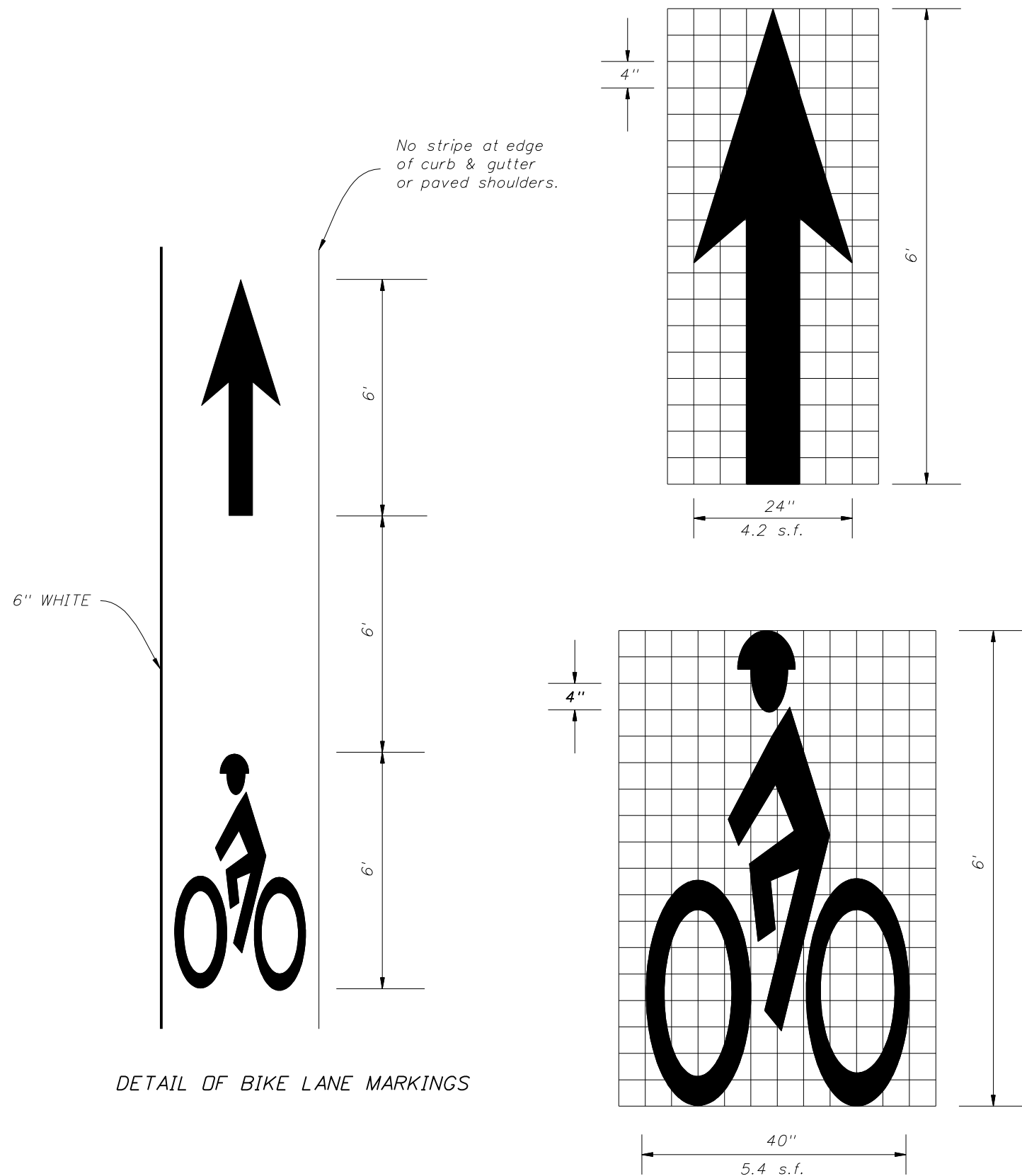
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SPECIAL MARKING AREAS

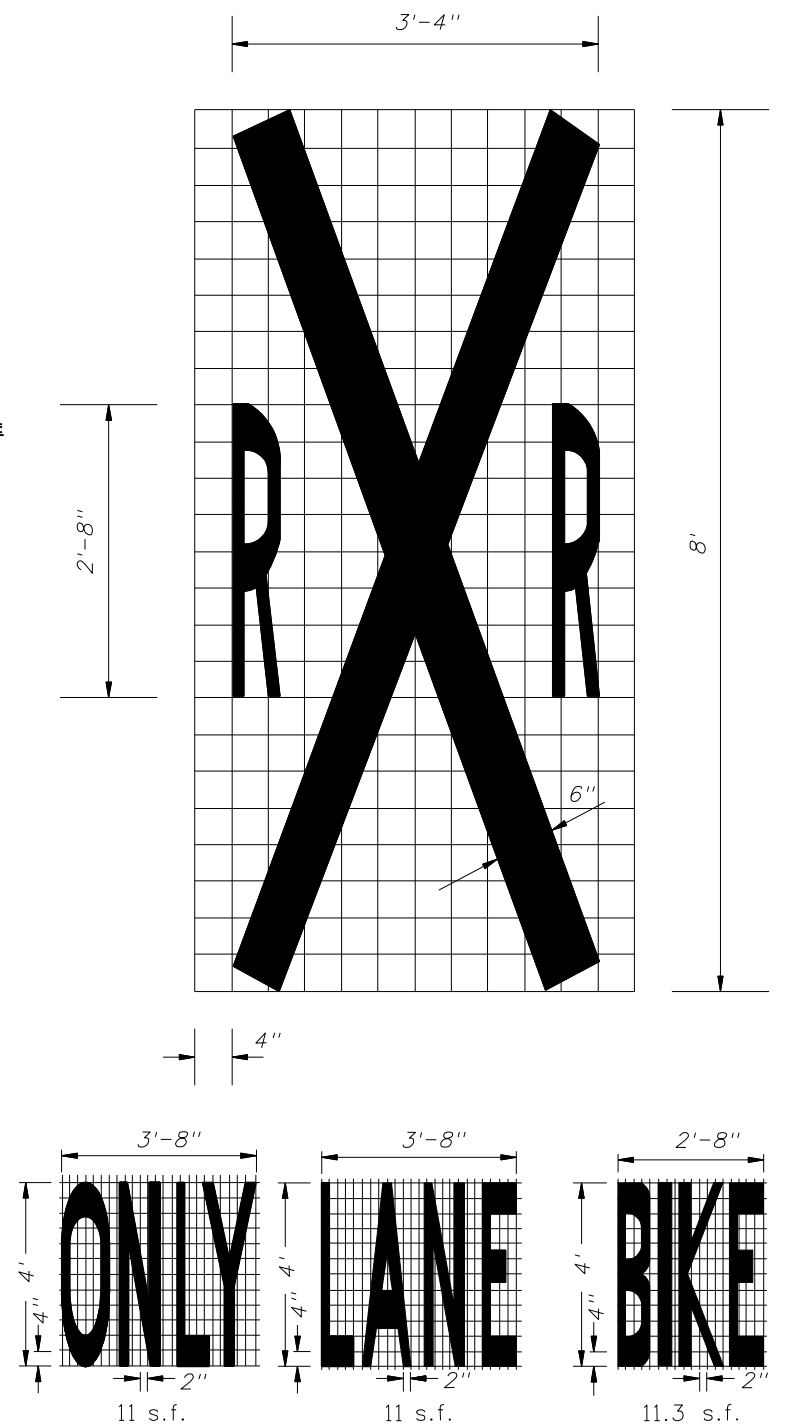
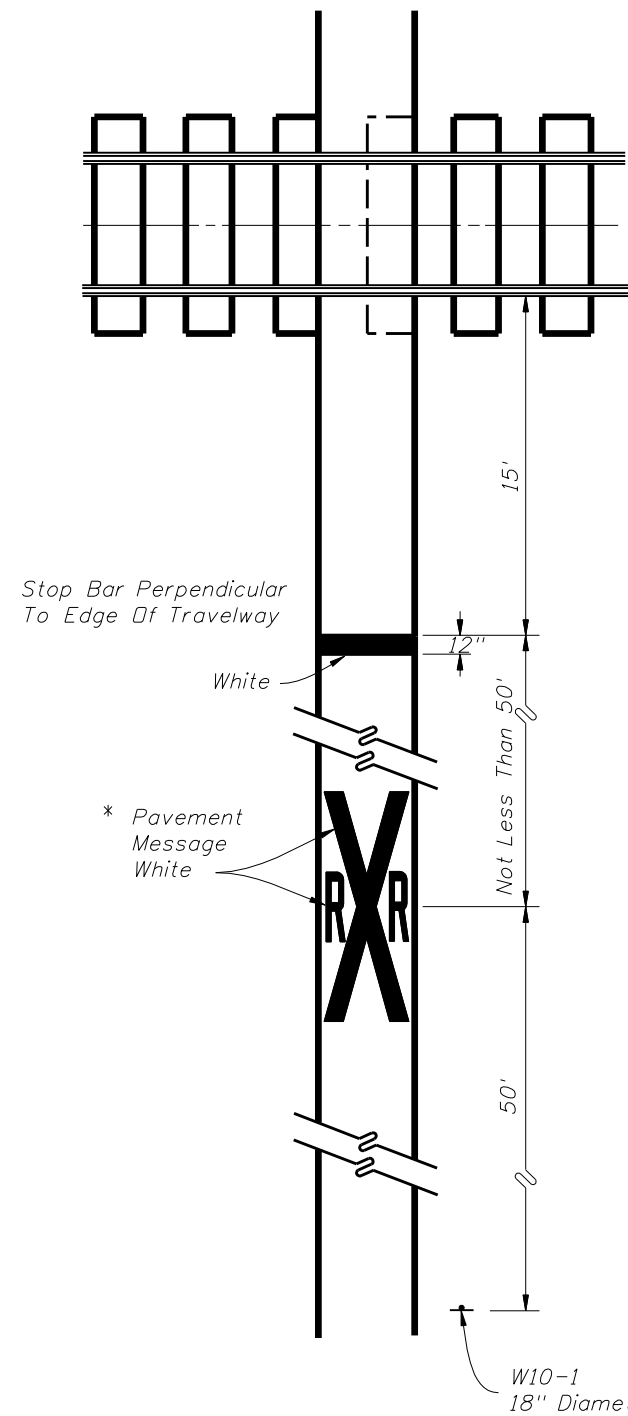
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1. Recommended spacing of symbols: Immediately after intersections and major driveways and at a maximum spacing of 600 feet for urban sections and 1320 feet for rural sections.

2. All pavement markings and pavement messages shall be white.



DETAIL OF BIKE LANE MARKINGS



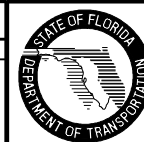
PAVEMENT MESSAGE DETAILS

* NOTE

3. When used on a bike lane (adjacent to vehicle lane) markings shall be placed adjacent to markings for vehicles & W10-1 sign shall be sized and placed for vehicles.

REVISIONS

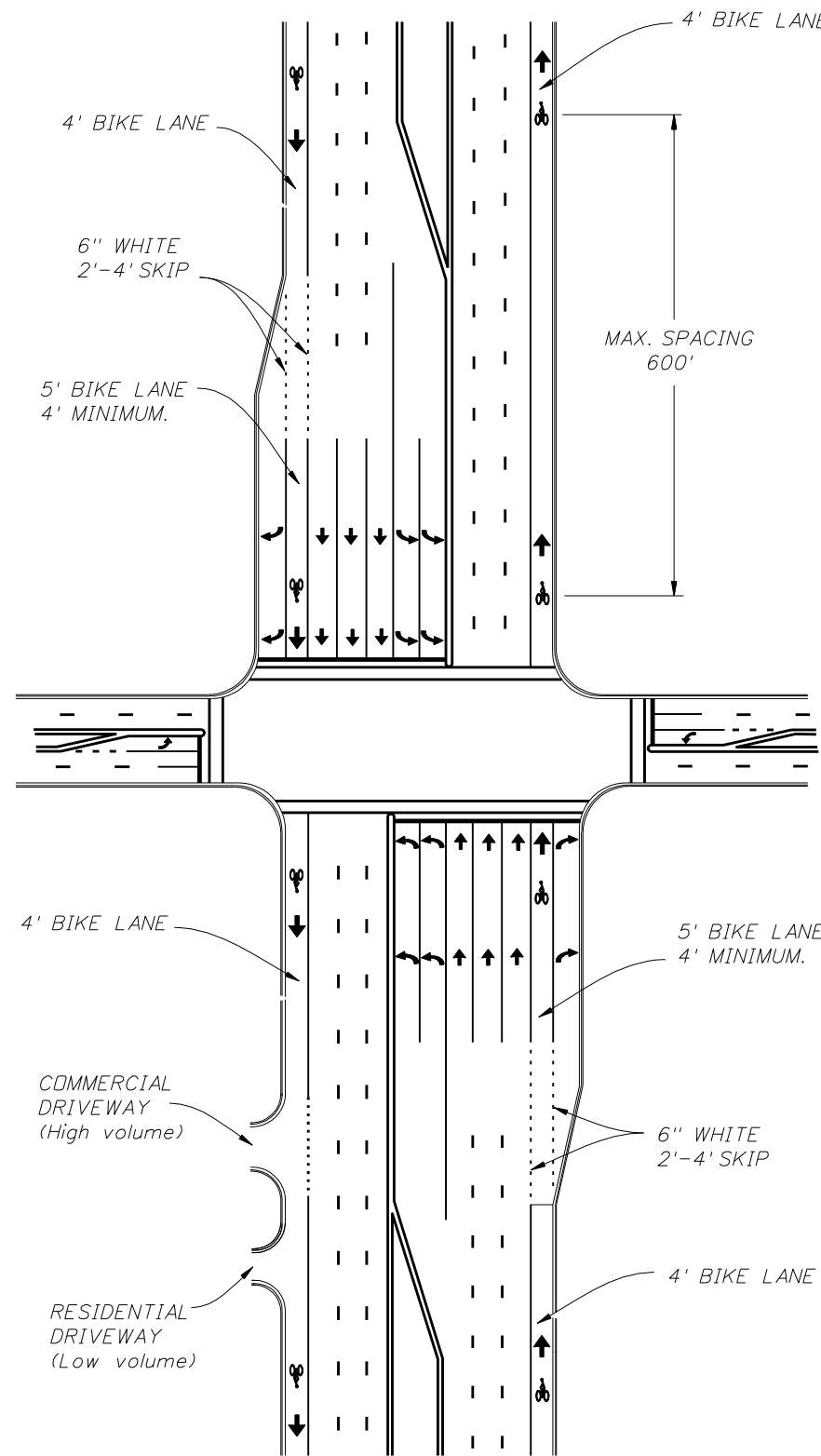
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
11/05/08	C.H.	Sheet 10 of 14 removed from SPECIAL MARKING AREAS index 17346 and added as new Index 17347 BICYCLE MARKINGS sheet 1.			



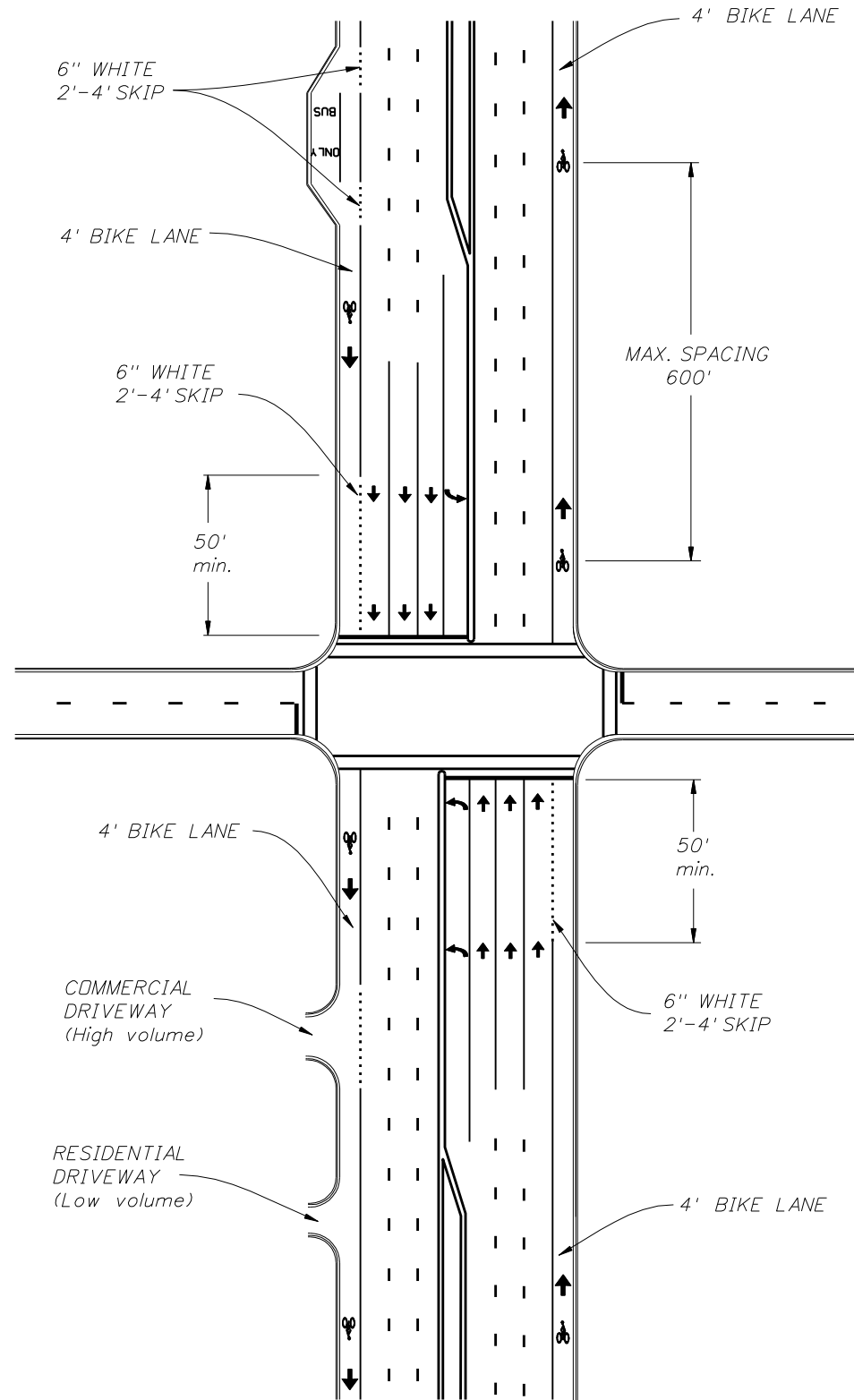
2008 Interim Design Standard

BICYCLE MARKINGS

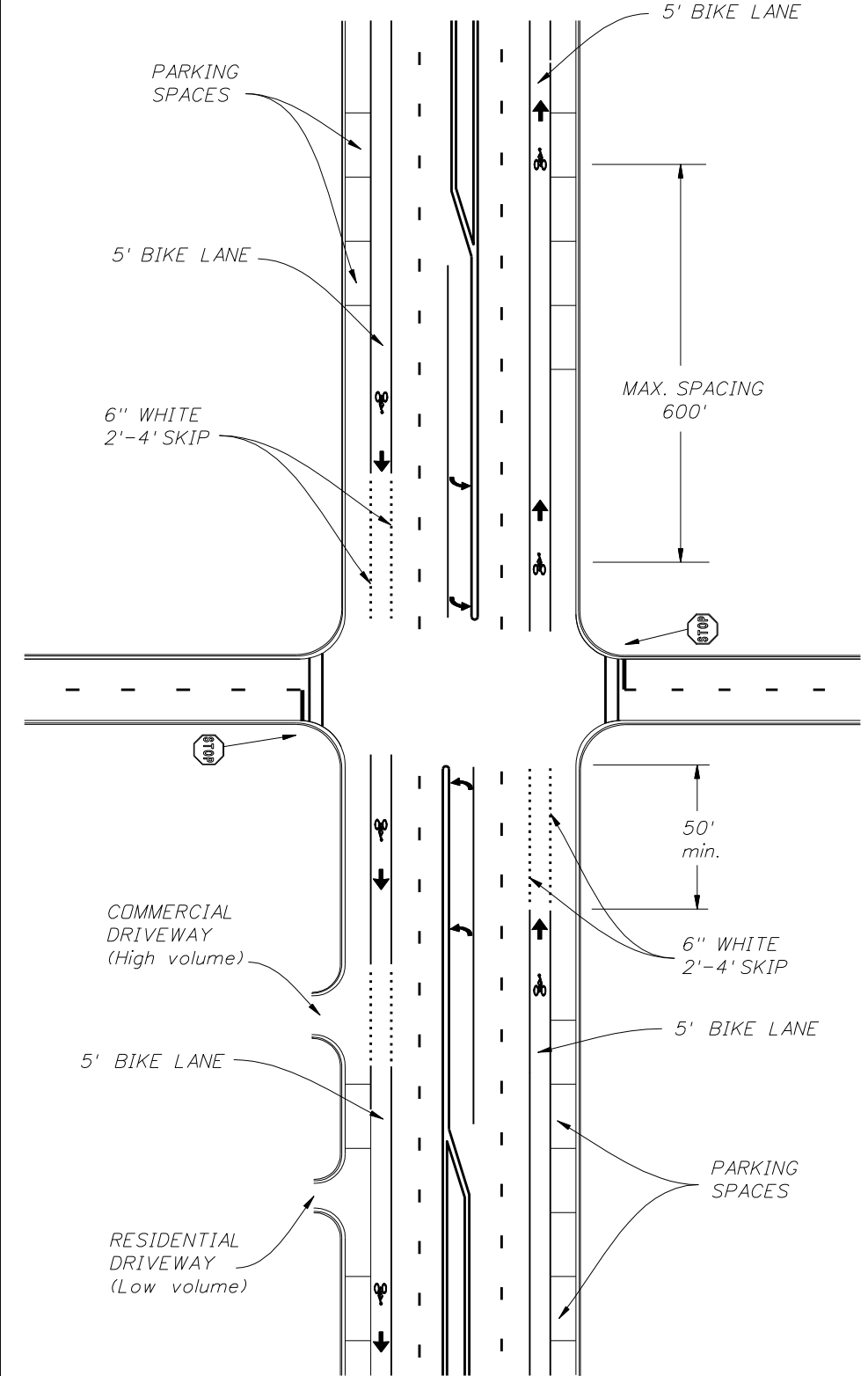
Interim Date	Sheet No.
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MAJOR INTERSECTION WITH SEPARATE RIGHT TURN LANE URBAN TYPICAL SECTION (CURB AND GUTTER)



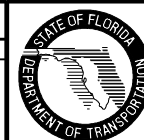
MAJOR INTERSECTION, NO RIGHT TURN LANE PLUS BUSBAY URBAN TYPICAL SECTION (CURB AND GUTTER)



MAJOR WITH LOCAL STREET INTERSECTION, NO RIGHT TURN LANE, ON STREET PARKING URBAN TYPICAL SECTION (CURB AND GUTTER)

REVISIONS

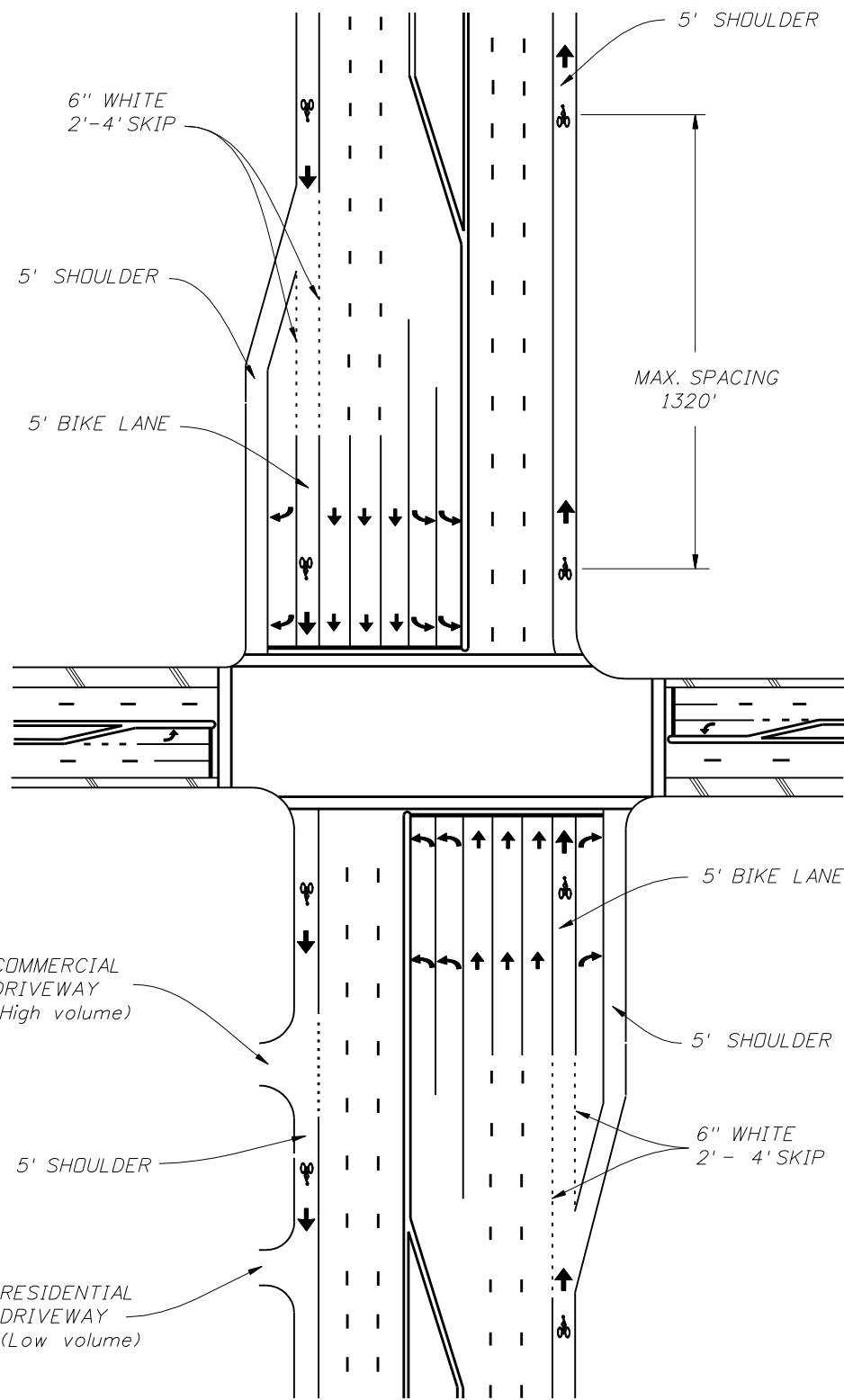
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
11/05/08	C.H.	Sheet 12 of 14 removed from SPECIAL MARKING AREAS Index 17346 and added as new Index 17347 BICYCLE MARKINGS Sheet 2 of 4.			



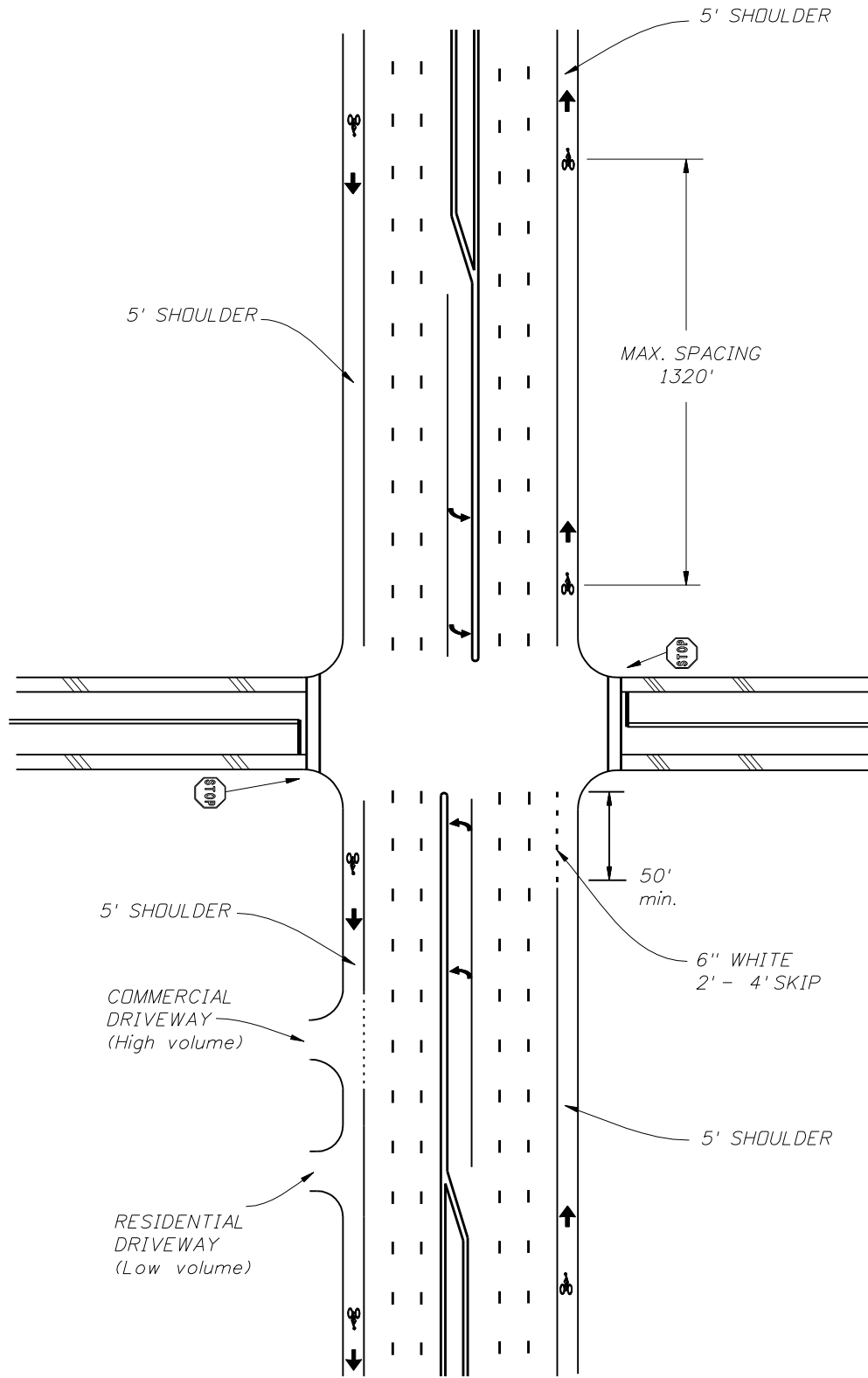
2008 Interim Design Standard

BICYCLE MARKINGS

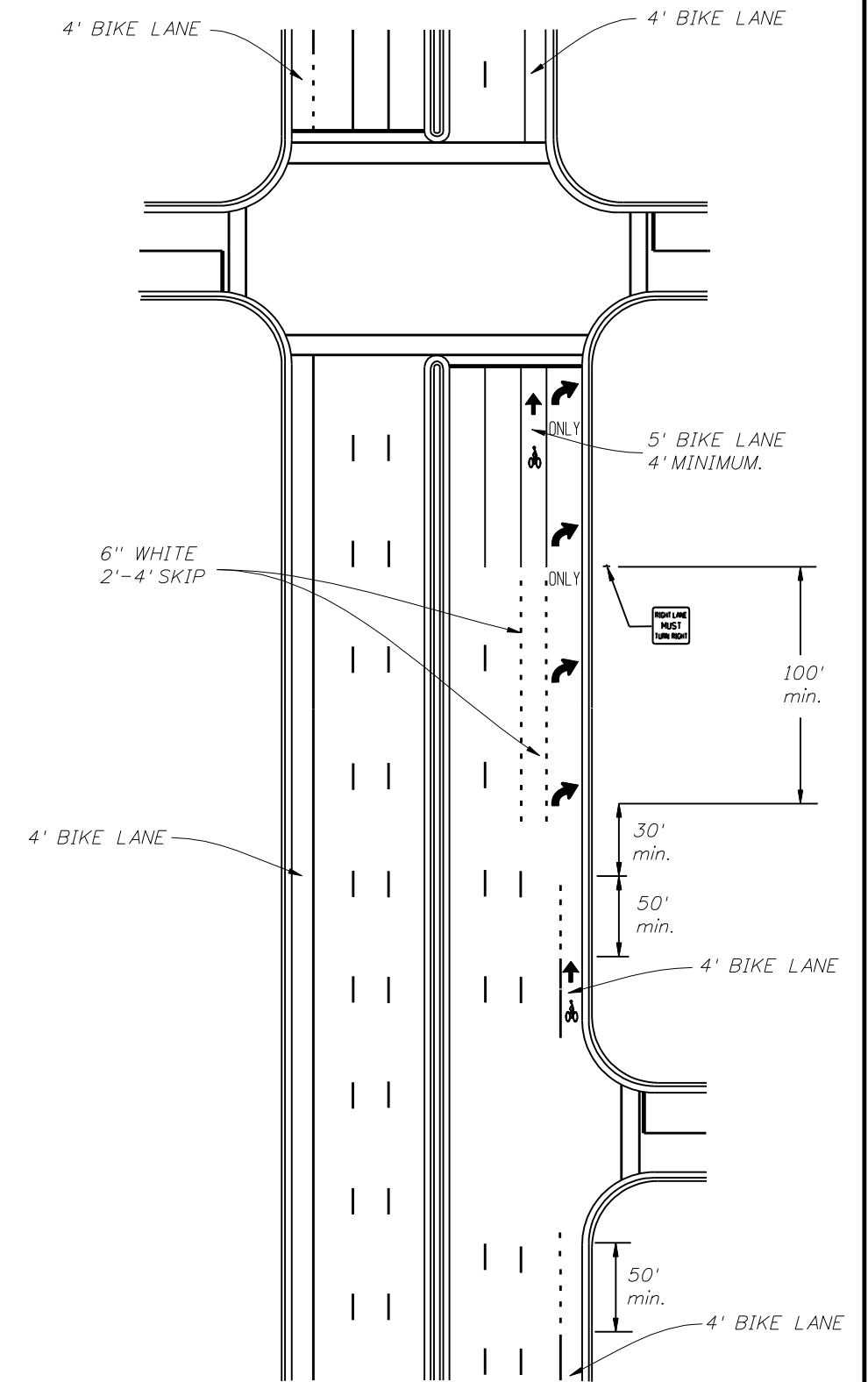
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MAJOR INTERSECTION WITH DESIGNATED SHOULDER, AND SEPARATE RIGHT TURN LANE RURAL TYPICAL SECTION (PAVED SHOULDER)



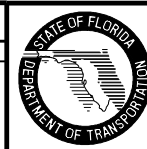
MAJOR WITH LOCAL STREET INTERSECTION, DESIGNATED SHOULDER, AND NO RIGHT TURN LANE RURAL TYPICAL SECTION (PAVED SHOULDER)



MAJOR INTERSECTION WITH RIGHT TURN DROP LANE AND DESIGNATED OR UNDESIGNATED BIKE LANE URBAN TYPICAL SECTION (CURB AND GUTTER)

REVISIONS

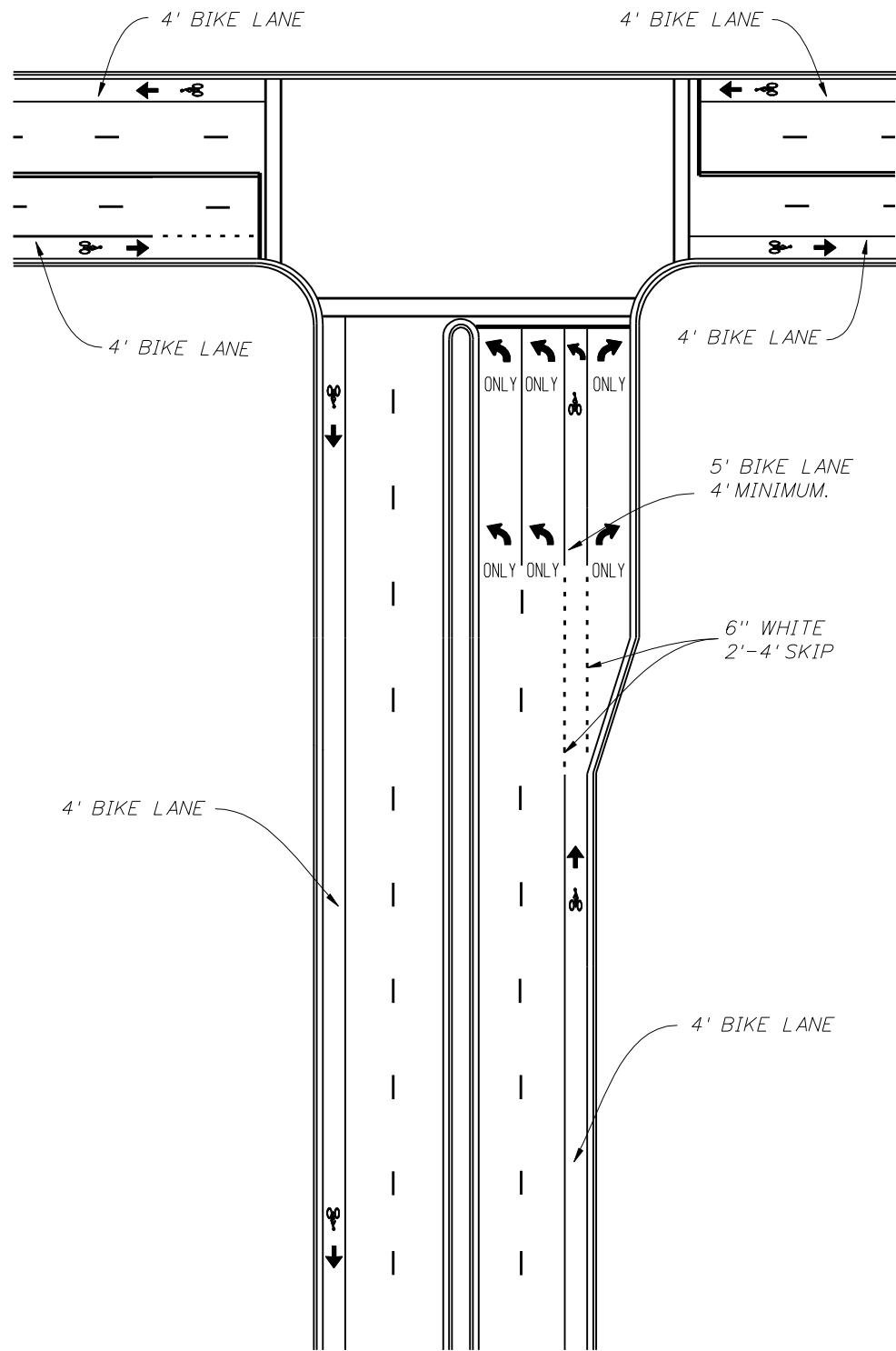
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
11/05/08	C.H.	Sheet 13 of 14 removed from SPECIAL MARKING AREAS Index 17346 and added to new Index 17347 BICYCLE MARKINGS sheet 3 of 4.			



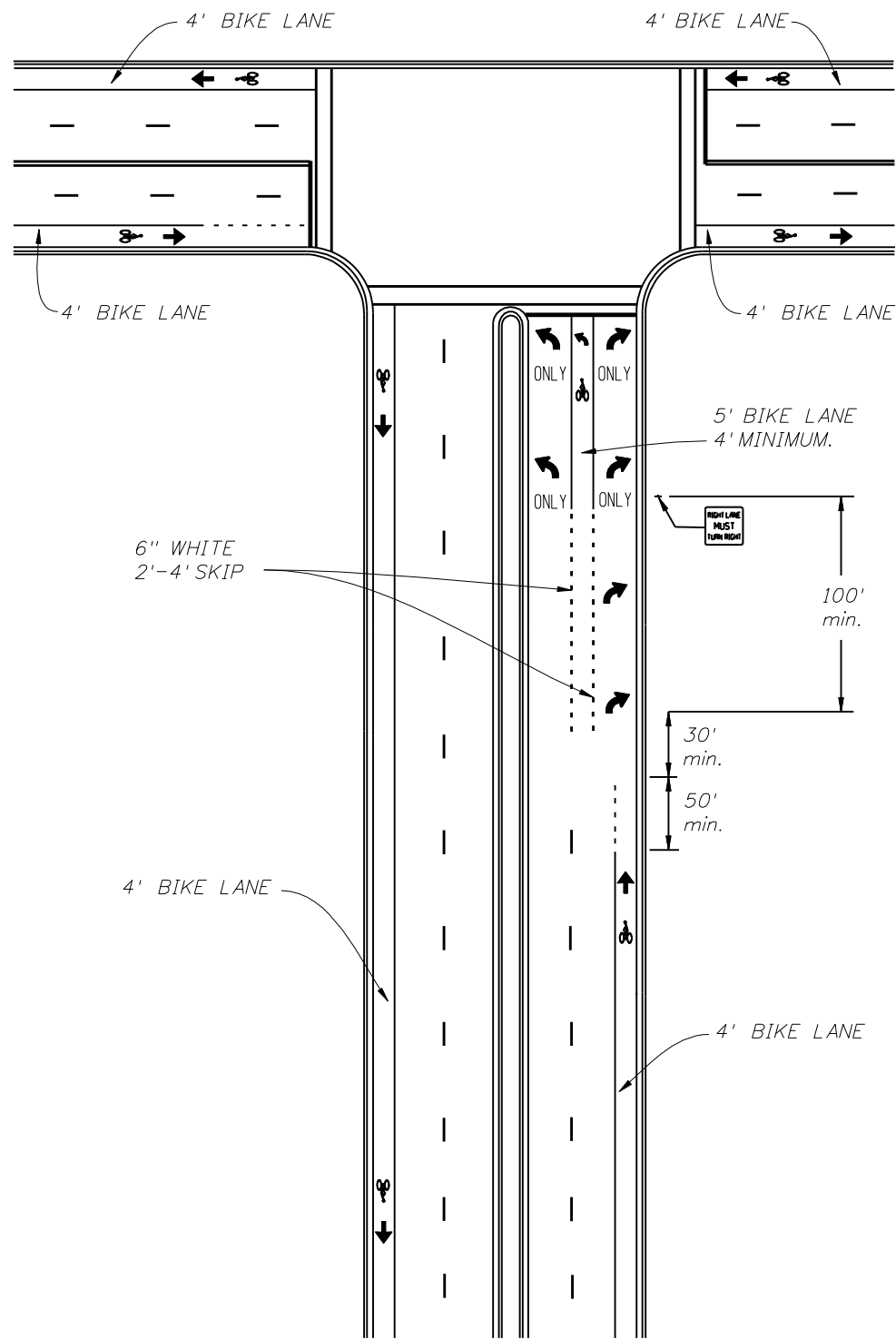
2008 Interim Design Standard

BICYCLE MARKINGS

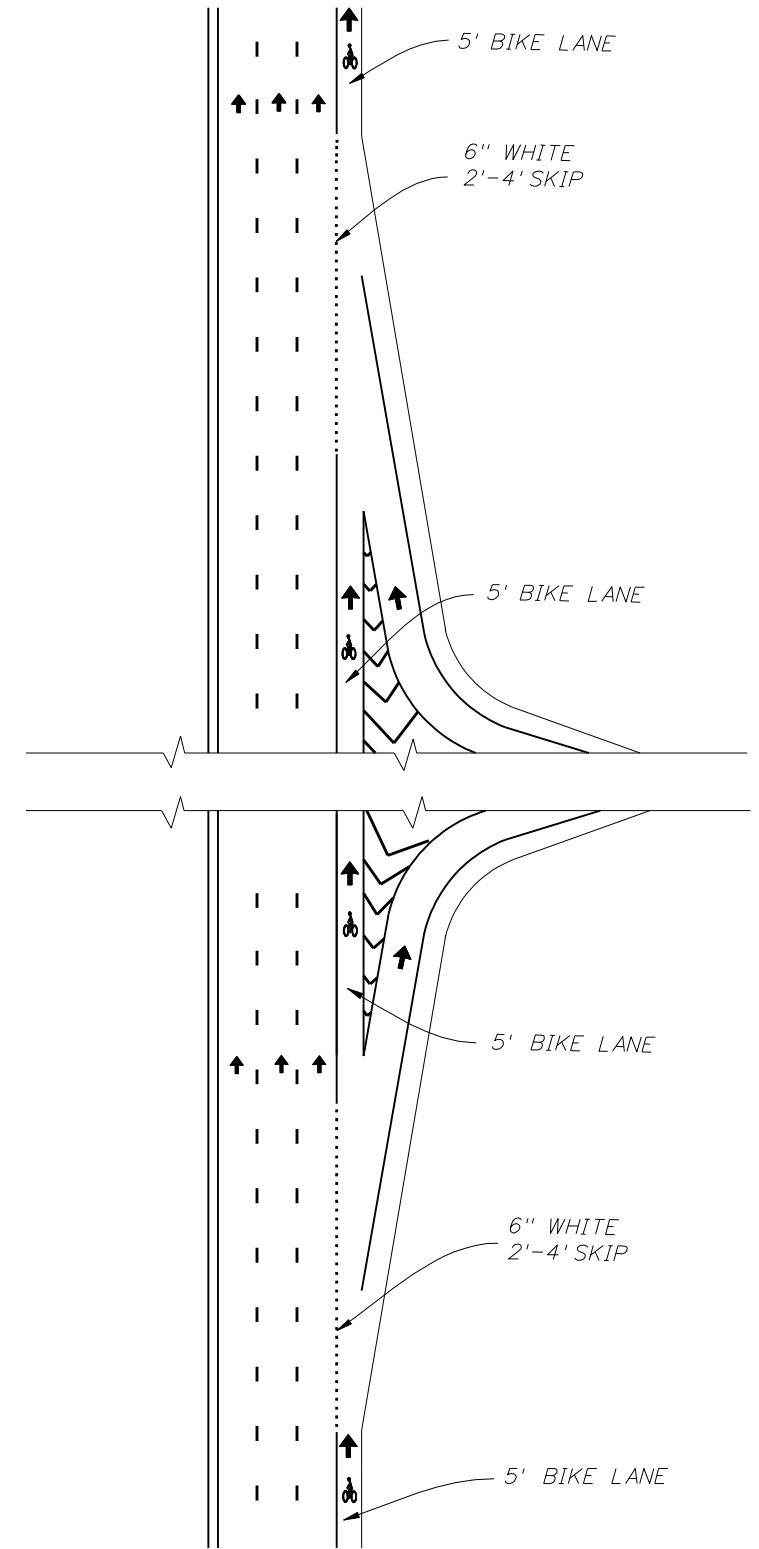
Interim Date	Sheet No.
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"TEE" INTERSECTION WITH SEPARATE RIGHT TURN LANE URBAN TYPICAL SECTION (CURB & GUTTER)



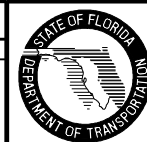
"TEE" INTERSECTION WITH RIGHT TURN DROP LANE URBAN TYPICAL SECTION (CURB & GUTTER)



INTERCHANGE RAMPS RURAL TYPICAL SECTION (PAVED SHOULDER)

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
11/05/08	C.H.	Sheet 14 of 14 removed from SPECIAL MARKING AREAS Index 17346 and added as new Index 17347 BICYCLE MARKINGS sheet 4 of 4.			



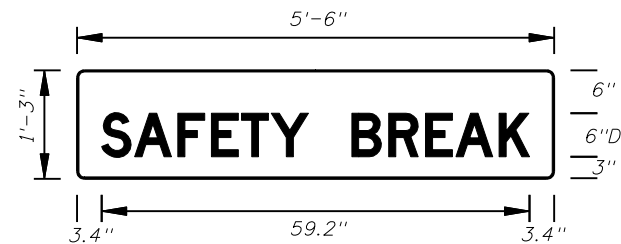
2008 Interim Design Standard

BICYCLE MARKINGS

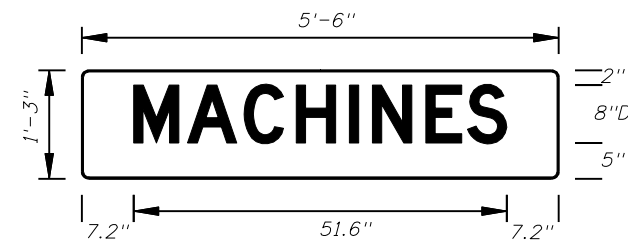
Interim Date	Sheet No.
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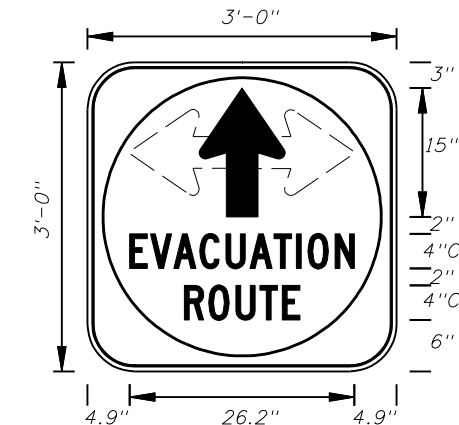
FTP-74-06
5'-6" X 2'-6"
4" Radii 3/4" Border
6" Series D Legend
Blue Background
White Legend and Border



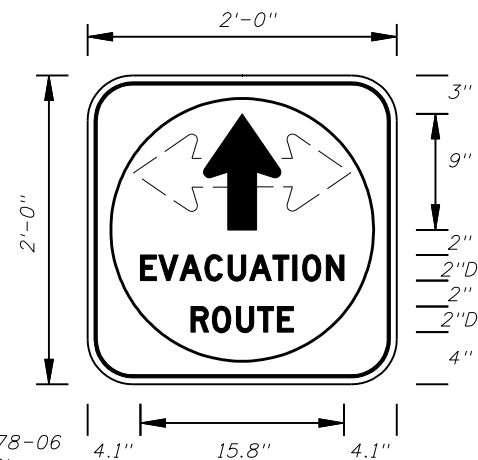
FTP-75-06
5'-6" X 1'-3"
1" Radii
6" Series D Legend
Blue Background
White Legend



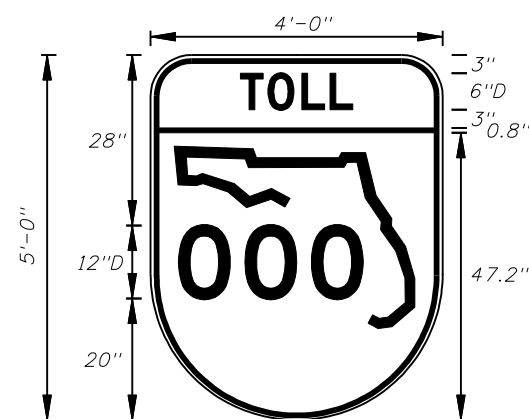
FTP-76-06
5'-6" X 1'-3"
1" Radii
8" Series D Legend
Blue Background
White Legend



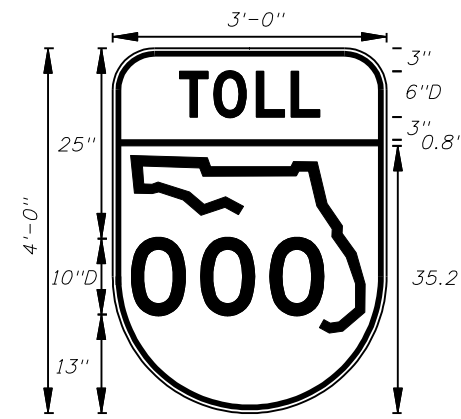
FTP-77-06
3' X 3'
5" Radii 3/4" Border
4" Series C Legend
White Background with Blue Circle Background
White Legend and Black Border



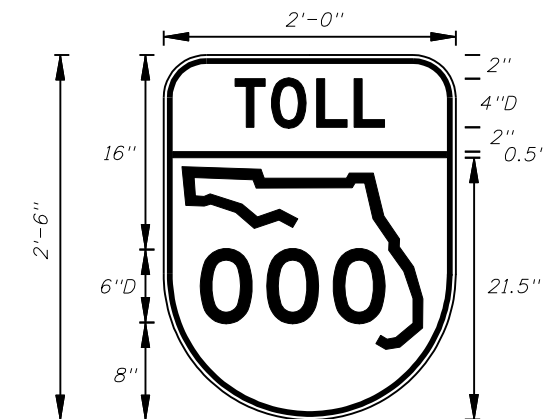
FTP-78-06
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3" Radii 3/4" Border
2" Series D Legend
White Background with Blue Circle Background
White Legend and Black Border



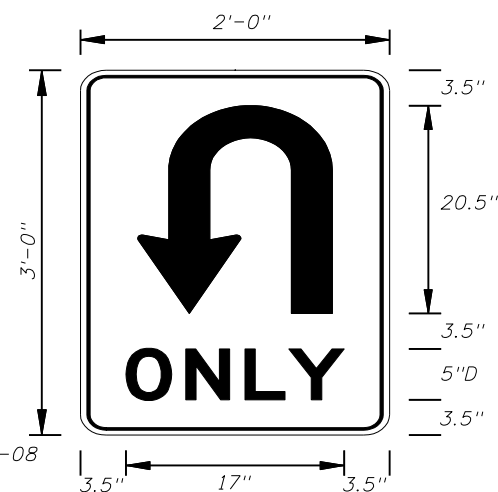
FTP-79-06
4' X 5'
6" Radii 3/4" Border
6" and 12" Series D Legend
Top Green Background with White Legend and Black Border
Bottom White Background with Black Legend and Border



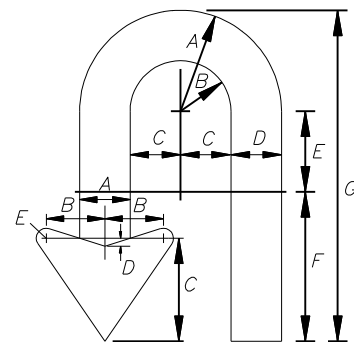
FTP-80-06
3' X 4'
5" Radii 3/4" Border
6" and 10" Series D Legend
Top Green Background with White Legend and Black Border
Bottom White Background with Black Legend and Border



FTP-81-06
2' X 2'-6"
3" Radii 3/4" Border
4" and 6" Series D Legend
Top Green Background with White Legend and Black Border
Bottom White Background with Black Legend and Border



FTP-82-08
2' X 3'
1.5" Radii
5" Series D Legend
White Background
Black Legend and Border

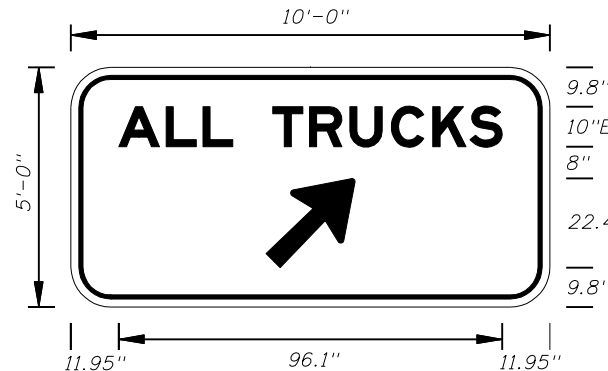


ARROW BODY

A	B	C	D	E	F	G
6.25	3.125	3.125	3.125	5	9.25	20.5

ARROW HEAD

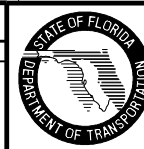
A	B	C	D	E
3.125	3.625	6.375	.5	.625



FTP-83-08
10'-0" X 5'-0"
8" Radii
10" Series E Legend
Green Background
White Legend

REVISIONS

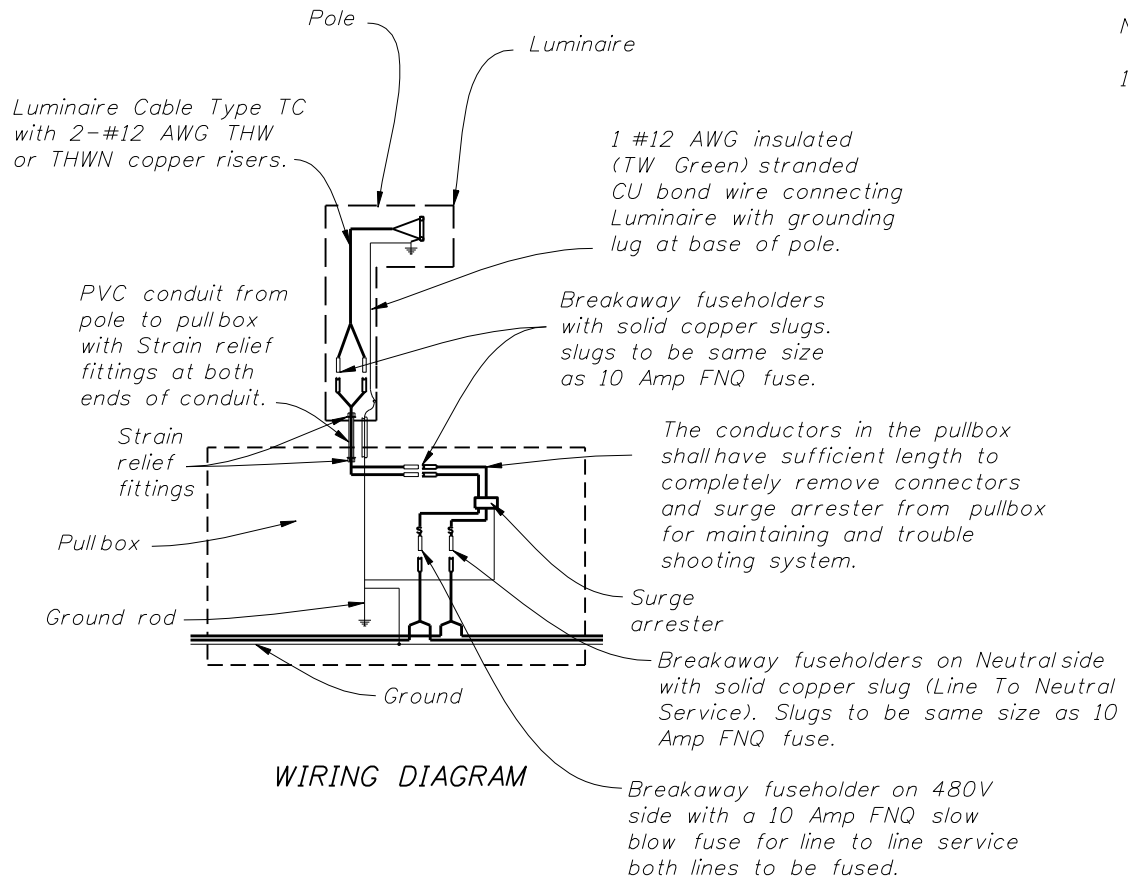
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
11/05/08	C.H.	Sign FTP-82-08 and arrow detail for sign added, sign FTP-83-08 added.			



2008 Interim Design Standard

SPECIAL SIGN DETAILS

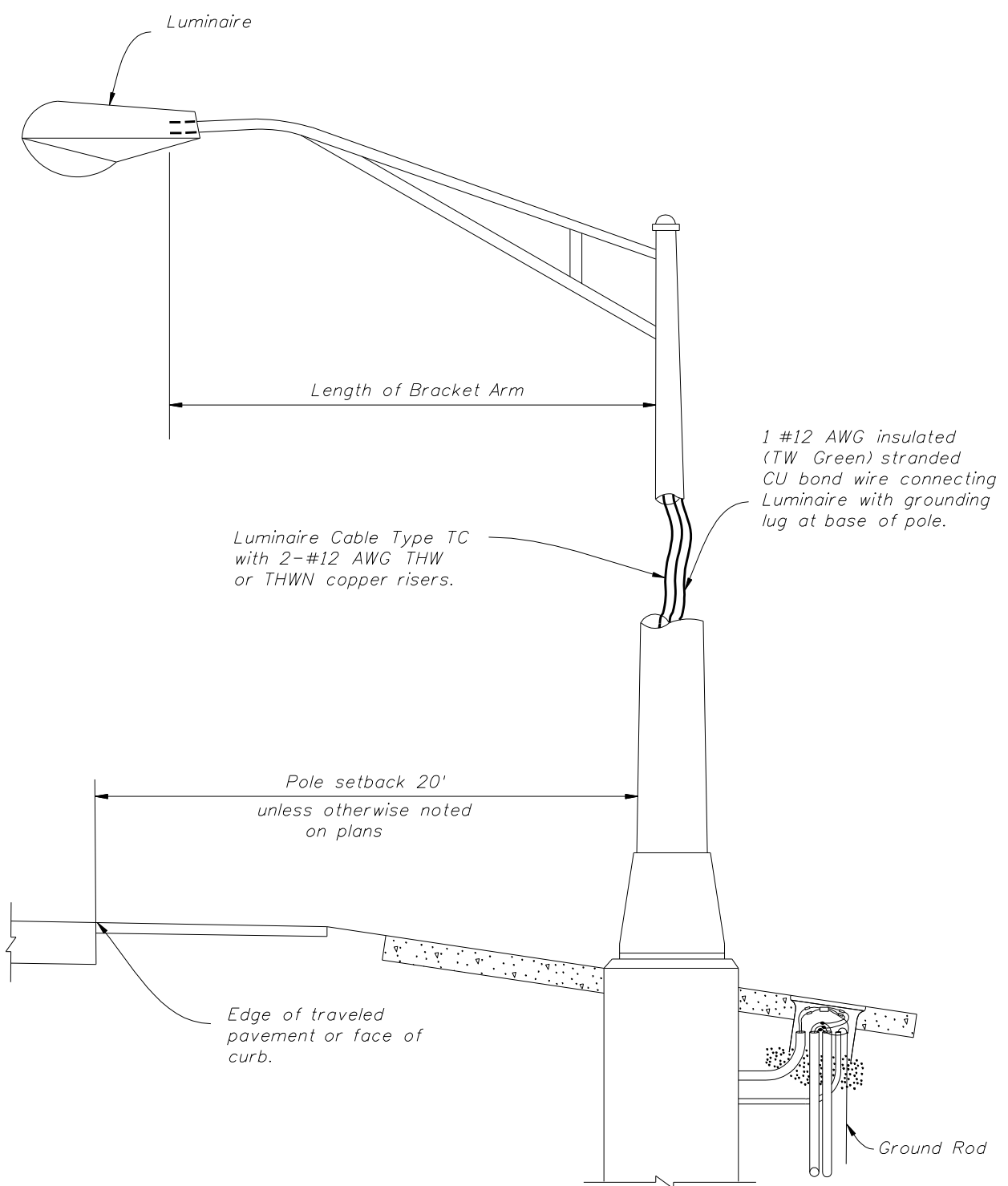
Interim Date	Sheet No.
01/01/09	9 of 11
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17355	



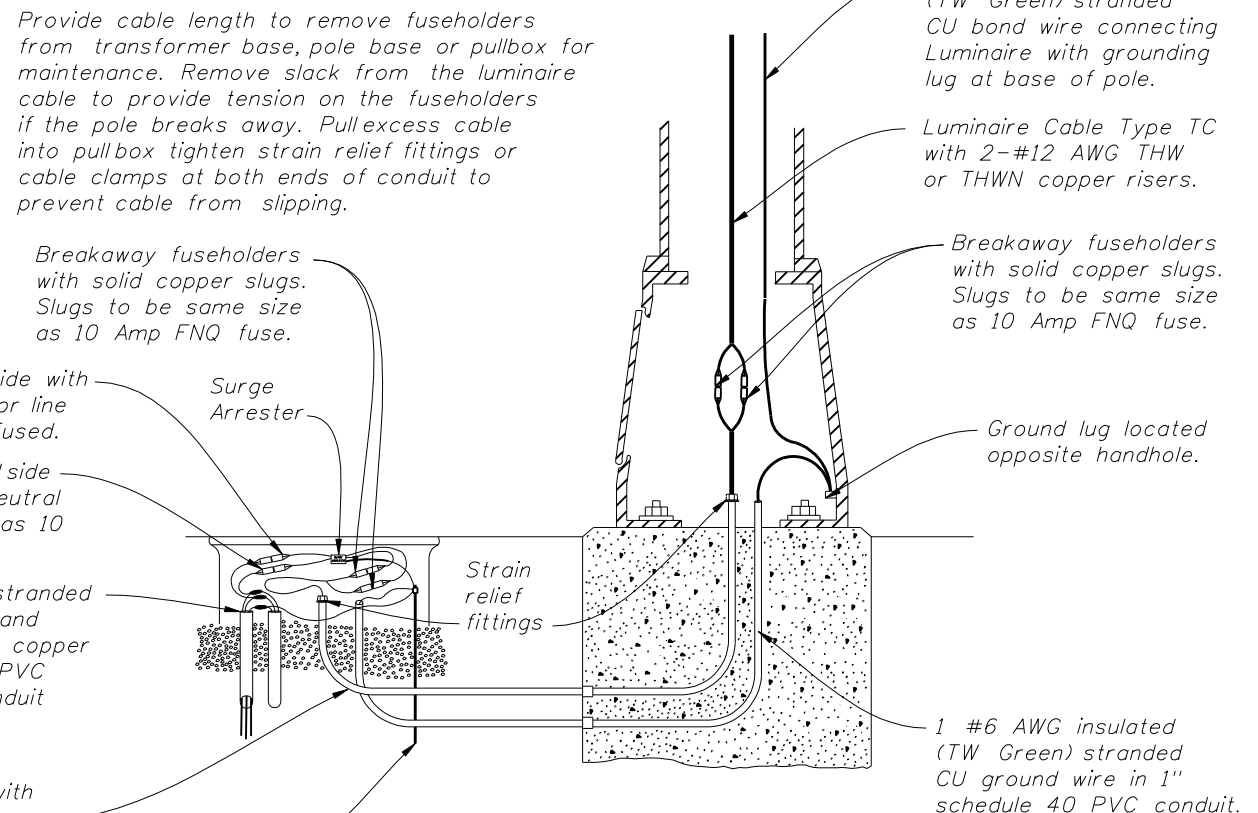
WIRING DIAGRAM

NOTES:

1. Barrier wall or bridge mounted poles: The wiring shall be in accordance with Section 992 of the Standard Specifications.



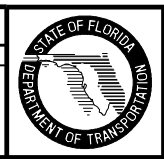
METAL POLE DETAIL



METAL POLE WIRING DETAIL

WIRING DETAILS

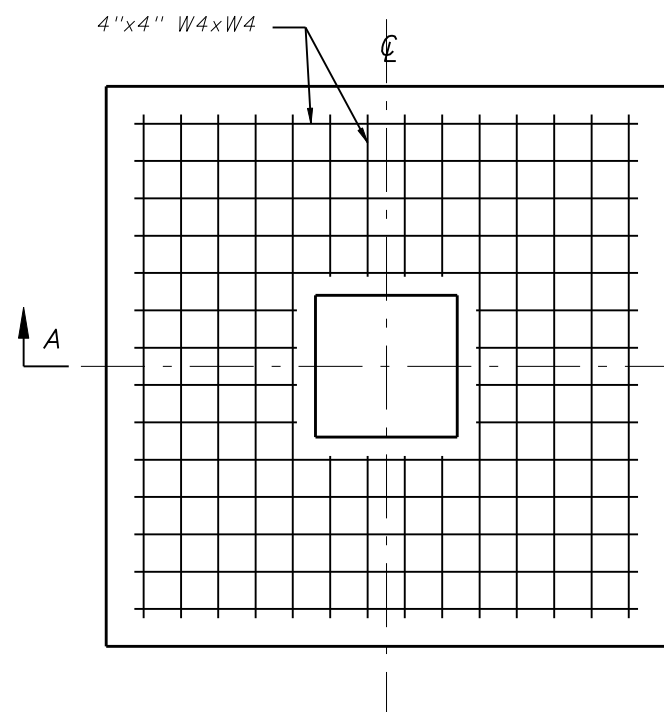
DATE		BY		DESCRIPTION	
11/05/08	C.H.	Concrete pole detail deleted from sheet, remaining details rearranged note added to METAL POLE DETAIL AND WIRING DIAGRAM.			



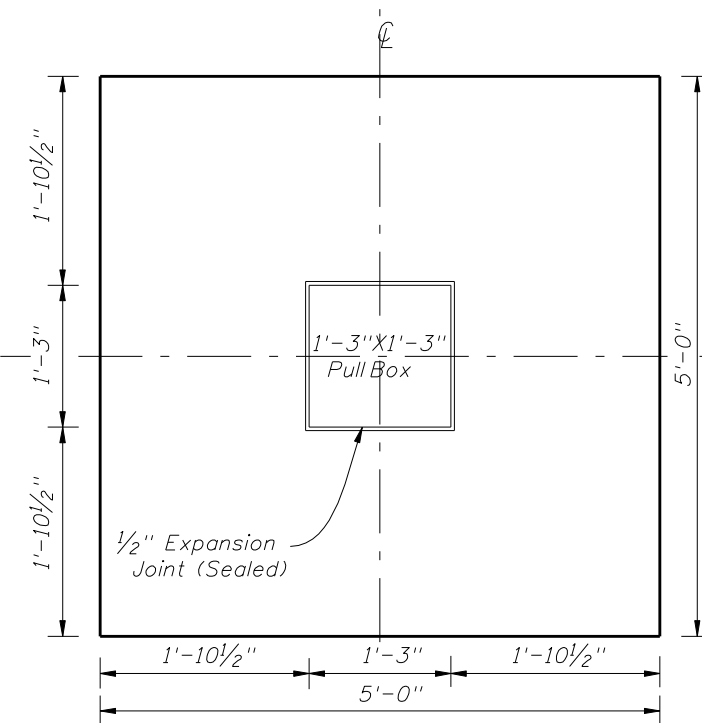
2008 Interim Design Standard

CONVENTIONAL LIGHTING

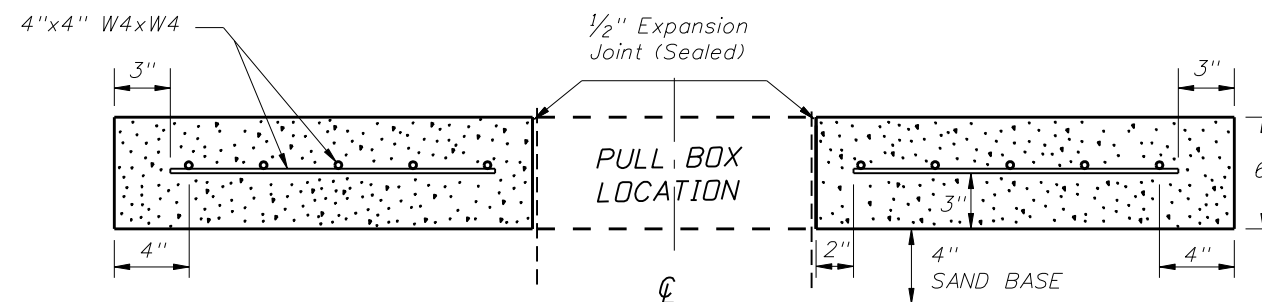
Interim Date	Sheet No.
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17500	



REINFORCEMENT LAYOUT



SLAB DIMENSIONS




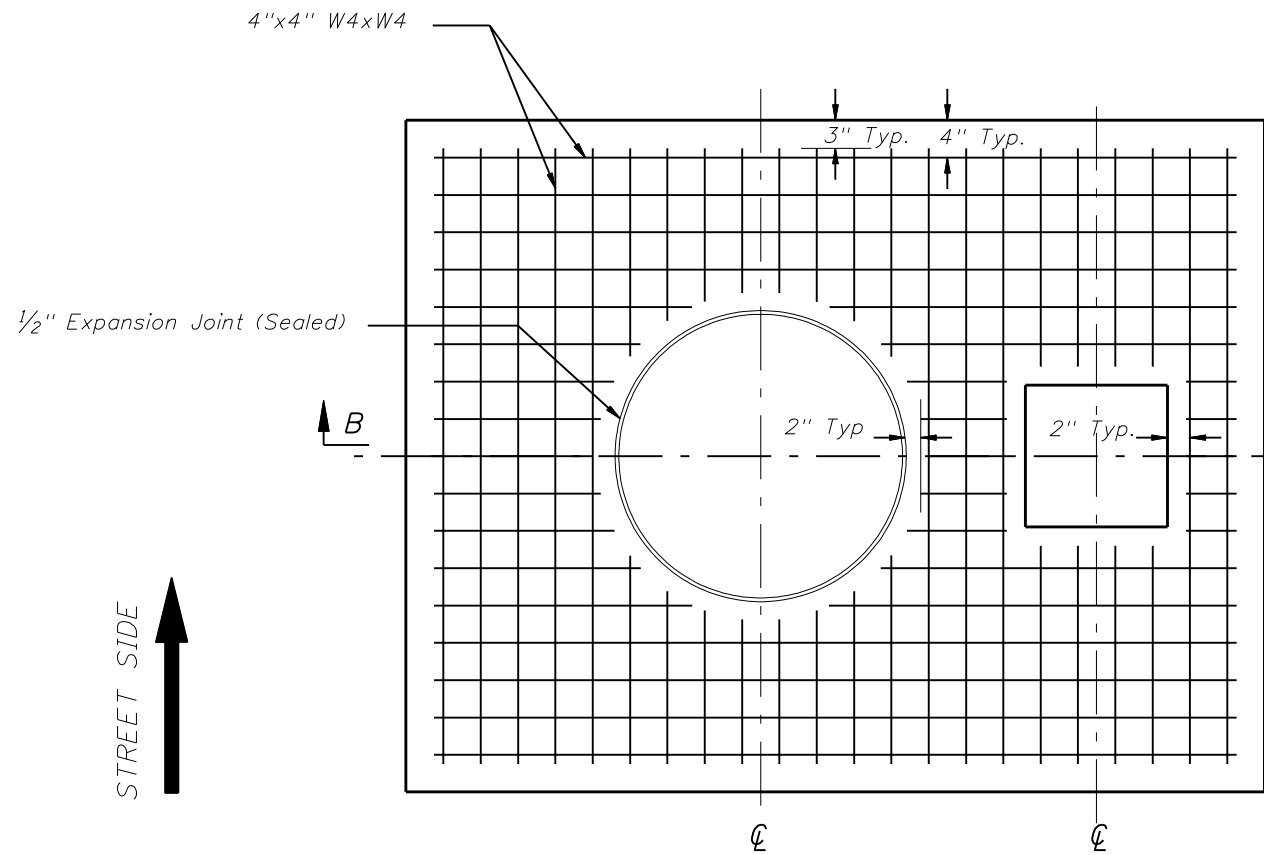
SECTION A-A

NOTES:

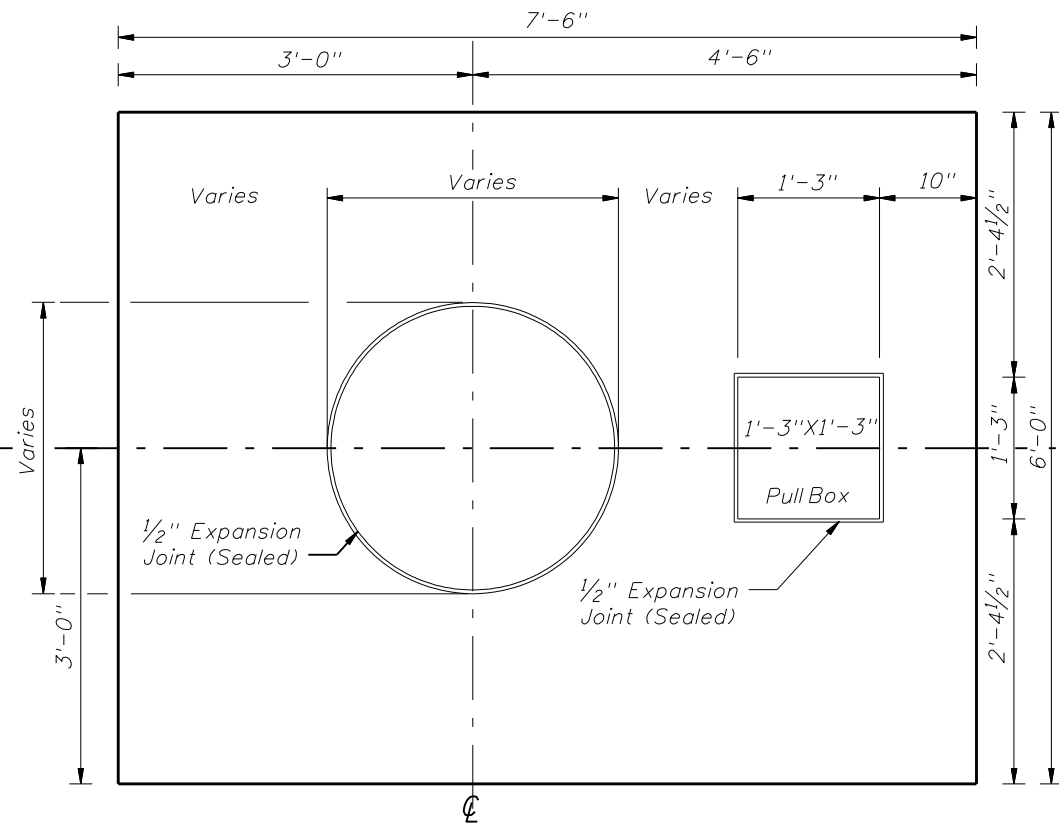
1. Use clean free draining sand less than 5% passing No. 200 sieve for base (4").
2. Welded wire fabric shall meet the requirements of ASTM A185.
3. Concrete shall be Class NS with a minimum strength at 28 days of $f'c=2.5$ ksi.
4. Outside edges of slab shall be cast against formwork.
5. The pull box shown is 1'-3" x 1'-3"; others approved under Section 635 of the Standard Specifications may be used.
6. Slabs to be placed around all Poles and Pull Boxes in rural allocations. In urban areas or where space is limited slab dimensions may be adjusted as shown in the plans.
7. Concrete and reinforcing for slabs around poles and pull boxes shall be included in the price for pull box or pole.
8. The 1/2" thick expansion joint between the pole shaft and slab and the pull box and slab shall be sealed with a hot poured elastic joint sealer.

SLAB DETAILS FOR INTERMEDIATE PULLBOX LOCATIONS

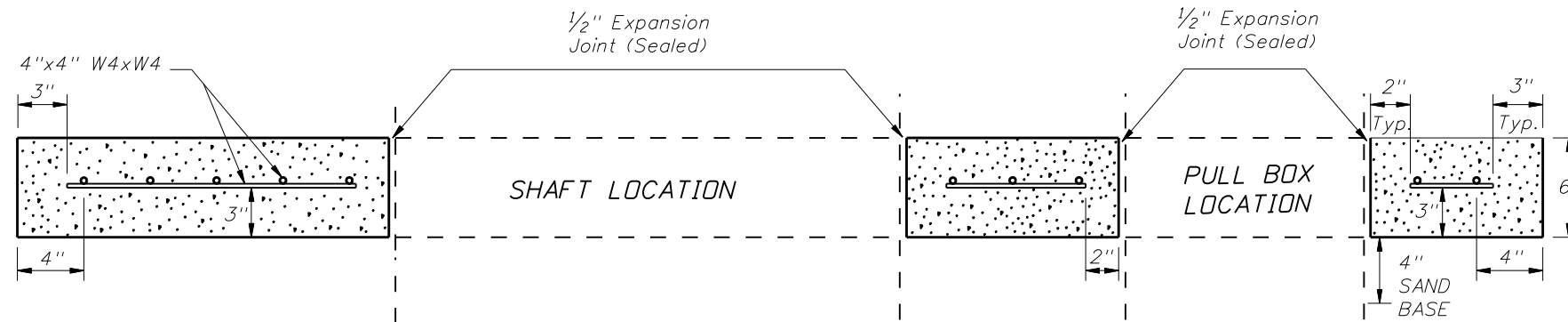
REVISIONS							2008 Interim Design Standard		Interim Date	Sheet No.
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION		CONVENTIONAL LIGHTING		01/01/09	2 of 3
11/05/08	C.H.	Note 7 class I concrete (Miscellaneous) revised to Concrete and reinforcing for slabs around poles and pull boxes shall be included in the price for pull box or pole.							Index No.	17500



REINFORCEMENT LAYOUT



SLAB DIMENSIONS



SECTION B-B

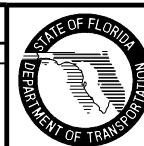
NOTES:

1. Use clean free draining sand less than 5% passing No. 200 sieve for base (4").
2. Welded wire fabric shall meet the requirements of ASTM A185.
3. Concrete shall be Class NS with a minimum strength at 28 days of $f'c=2.5$ ksi.
4. Outside edges of slab shall be cast against formwork.
5. The pull box shown is 1'-3" x 1'-3"; others approved under Section 635 of the Standard Specifications may be used.
6. Slabs to be placed around all Poles and Pull Boxes in rural locations. In urban areas or where space is limited slab dimensions may be adjusted as shown in the plans.

7. Concrete and reinforcing for slabs around poles and pull boxes shall be included in the price for pull box or pole.
8. The 1/2" thick expansion joint between the pole shaft and slab and the pull box and slab shall be sealed with a hot poured elastic joint sealer.

SLAB DETAILS FOR POLE AND PULL BOX LOCATIONS

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
11/05/08	C.H.	Note 7 Class I Concrete (Miscellaneous) revised to Concrete and reinforcing for slabs around poles and pull boxes shall be included in the price for pull box or pole.			



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CONVENTIONAL LIGHTING

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HIGHMAST LIGHTING NOTES:

- 1) High Mast materials:
 - a. Pole: ASTM A1011 Grade 50, 55, 60 or 65 (Less than 1/4") 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 A709 Grade 36 or ASTM A36
 - c. Weld Metal: E70XX
 - d. Anchor Bolts: ASTM F1554 Grade 55 with ASTM A563, Grade A heavy-hex nuts and ASTM F436 Type I washers.
 - e. Handhole: ASTM A709 Grade 36 or ASTM A36 Frame with ASTM A36 cover.
 - f. Caps: ASTM A1011 Grade 50, 55, 60 or 65 or ASTM B209.
 - g. Nut Covers: ASTM B26 (319-F)
 - h. Stainless Steel Screws: AISI Type 316
- 2) Reinforcing steel: ASTM A615, Grade 60.
- 3) Concrete: Class IV (Drilled Shaft) with a minimum 4,000 psi compressive strength at 28 days for all environmental classifications.
- 4) Welding: American Welding Society Structural Welding Code (Steel) ANSI/AWS D1.1 (Current edition).
- 5) Galvanization:
 - a. Nuts, Bolts, Washers and Threaded Bars/Studs: ASTM F2329.
 - b. Other items (Including Pole): ASTM A123
- 6) Hole diameters for anchor bolts: not greater than the bolt diameter plus 1/2".
- 7) Poles: Tapered with the diameter changing at a rate of 0.14 inch per foot with a minimum 16-sided pole shaft and only one longitudinal seam weld. Circumferentially welded pole shaft butt splices and laminated pole shafts are not permitted. Longitudinal seam welds within 6 inches of pole to base must be complete penetration welds. Longitudinal seam welds at telescopic field joints must be complete penetration welds for the splice length plus 6 inches.
- 8) 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.
- 9) Furnish each pole with a 2"x4" (max.) aluminum identification tag. Submit details for approval. Secure to pole with 0.124" 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 Mounting Height, Manufacturer's Name, Certification Number and QPL Number.
- 10) Manufacturers seeking approval of a Highmast Lighting structural assembly (exclude lowering system) for inclusion on the Qualified Products List must submit a QPL Production Evaluation Application along with drawings showing the product meets all specified requirements of this Index.
- 11) 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.

DESIGN CRITERIA:

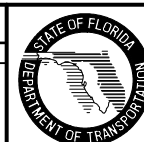
- 1) Designed in accordance with the FDOT Structures Manual.
- 2) Poles are designed to support the following:
 - a. (1) cylindrical head assembly with a maximum effective projected area of 6 Sq. ft. (Cd=1) and 340 lbs (Max).
 - b. (8) cylindrical luminaires with a maximum effective projected area of 3.0 Sq. ft (Cd=0.5) and 77 lbs. each.
- 3) Foundation design based upon the following soil criteria:
 - Classification = Cohesionless (Fine Sand)
 - Friction Angle = 30 Degrees (30°)
 - Unit Weight = 50 lbs./cu. Ft. (assumed saturated)

Only in cases where the Designer considers the soil types at the specific site location to be of lesser strength properties should an analysis be required. Auger borings, SPT borings or CPT soundings may be utilized as needed to verify the assumed soil properties, and at relatively uniform sites, a single boring or sounding may cover several foundations. Furthermore, borings in the area that were performed for other purposes may be used to confirm the assumed soil properties.
- 4) Foundation applies only to slopes of 1:4 or flatter. Provide a minimum 24" shaft projection on the high side.
- 5) Poles are designed for 6 mil galvanization thickness.

STANDARD POLE DESIGN NOTES

REVISIONS

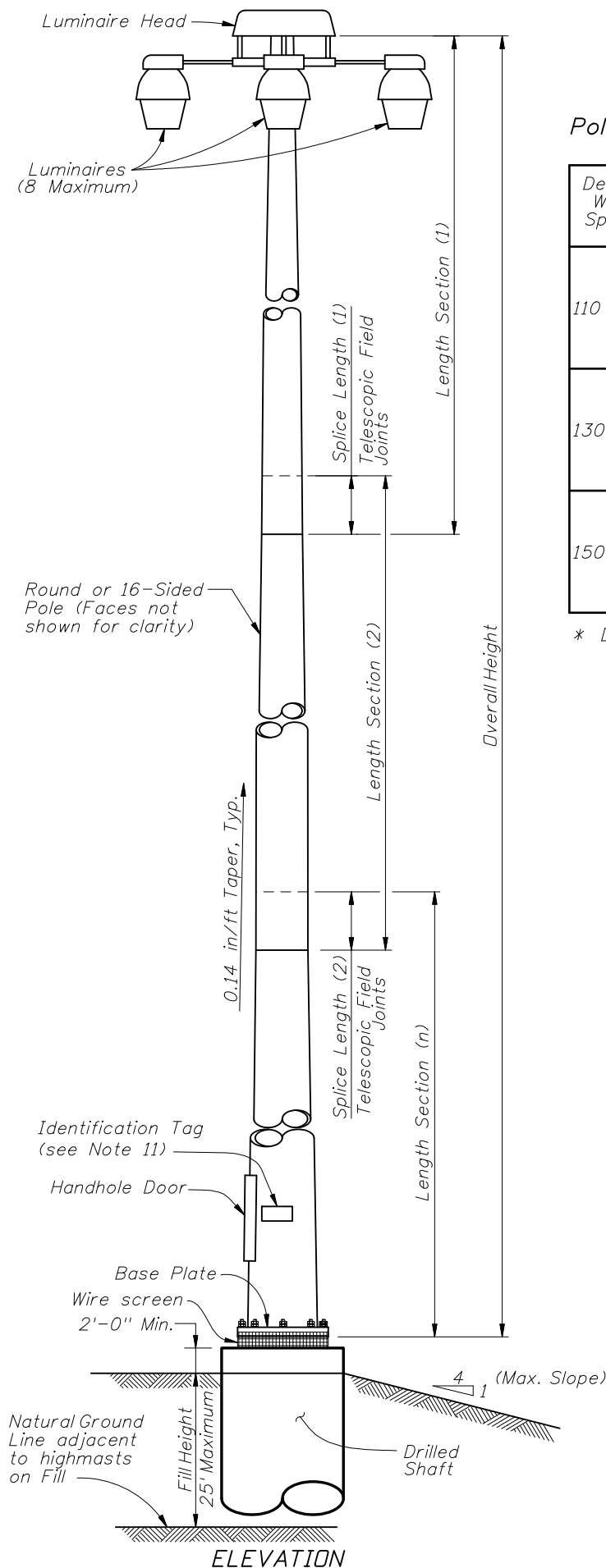
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
01/01/08	DYW	Changed Note 9, Renumbered Notes 10 thru 12. Added Notes 10 & 11.	01/01/09	CBH	Deleted grout pad notes, added CSL tube note.
07/01/08	DYW	Changed notes 11 & 12.			



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HIGHMAST LIGHTING

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Pole Design Table*

Design Wind Speed	Pole Overall Height	Section 1 (Top)					Section 2					Section 3				
		Length.	Wall Th.	Minimum Splice L.	Tip Dia.	Base Dia.	Length.	Wall Th.	Minimum Splice L.	Tip Dia.	Base Dia.	Length.	Wall Th.	Minimum Splice L.	Tip Dia.	Base Dia.
110 mph	80 ft	42'-0"	0.250"	2'-0"	5.313"	11.219"	40'-0"	0.250"	---	10.375"	16.000"	---	---	---	---	---
	100 ft	24'-6"	0.179"	2'-0"	6.406"	9.844"	40'-0"	0.250"	2'-6"	9.188"	14.781"	40'-0"	0.250"	---	13.875"	19.500"
	120 ft	44'-9"	0.250"	2'-0"	6.250"	12.531"	40'-0"	0.250"	2'-9"	11.688"	17.313"	40'-0"	0.313"	---	16.375"	22.000"
130 mph	80 ft	42'-0"	0.250"	2'-0"	5.281"	11.188"	40'-0"	0.313"	---	10.375"	16.000"	---	---	---	---	---
	100 ft	24'-6"	0.179"	2'-0"	6.906"	10.344"	40'-0"	0.250"	2'-6"	9.656"	15.281"	40'-0"	0.313"	---	14.375"	20.000"
	120 ft	45'-6"	0.250"	2'-6"	9.250"	15.625"	40'-0"	0.250"	3'-0"	14.719"	20.344"	40'-0"	0.313"	---	19.375"	25.000"
150 mph	80 ft	42'-3"	0.250"	2'-3"	7.281"	13.219"	40'-0"	0.313"	---	12.375"	18.000"	---	---	---	---	---
	100 ft	24'-6"	0.250"	2'-0"	8.188"	11.625"	40'-0"	0.313"	2'-6"	10.781"	16.406"	40'-0"	0.375"	---	15.375"	21.000"
	120 ft	46'-6"	0.250"	3'-0"	12.406"	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	Base Plate Diameter	Base Plate Thickness	"TW"	"BW"	Bolt Circle	No. Bolts	Bolt Diameter	Bolt Embedment
110 mph	80 ft	30.0"	2.500"	0.375"	0.188"	23.0"	8	1.75"	38"
	100 ft	33.5"	2.500"	0.375"	0.188"	26.5"	8	1.75"	42"
	120 ft	36.0"	2.750"	0.375"	0.250"	29.0"	8	1.75"	45"
130 mph	80 ft	30.0"	2.500"	0.438"	0.250"	23.0"	8	1.75"	43"
	100 ft	34.0"	2.750"	0.438"	0.250"	27.0"	8	1.75"	50"
	120 ft	41.0"	3.250"	0.500"	0.250"	33.0"	8	2.00"	52"
150 mph	80 ft	32.0"	2.750"	0.500"	0.250"	25.0"	8	1.75"	49"
	100 ft	37.0"	3.000"	0.563"	0.313"	29.0"	8	2.00"	53"
	120 ft	46.0"	3.250"	0.563"	0.313"	37.0"	10	2.25"	57"

Shaft Design Table

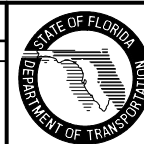
Design Wind Speed.	Pole Overall Height	Shaft Diameter	Shaft Length	Longitudinal Reinforcement
110 mph	80 ft	4'-0"	13'-0"	14 - # 11
	100 ft	4'-0"	15'-0"	14 - # 11
	120 ft	4'-6"	16'-0"	16 - # 11
130 mph	80 ft	4'-0"	14'-0"	14 - # 11
	100 ft	4'-0"	16'-0"	14 - # 11
	120 ft	4'-6"	18'-0"	16 - # 11
150 mph	80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

POLE DESIGN TABLES

REVISIONS

DATE	BY	DESCRIPTION
01/01/08	DYW	Added ID Plate to ELEVATION, Changed dimensions in 'Base Plate Thickness' column.
01/01/09	CBH	Deleted grout pad, added wire screen, changed drilled shaft reinforcing.

DATE	BY	DESCRIPTION

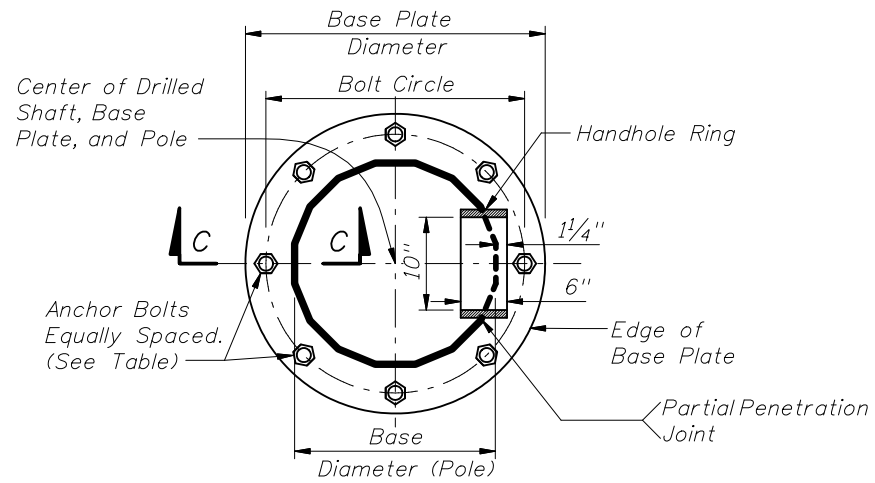


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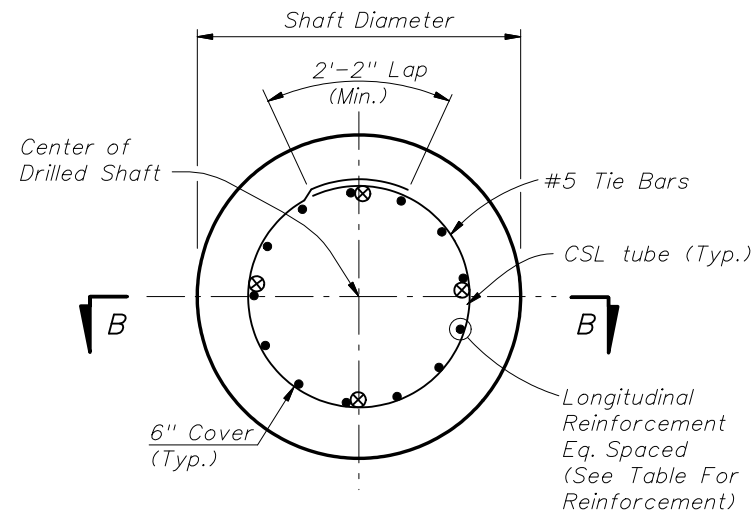
HIGHMAST LIGHTING

Interim Date 01/01/09 Sheet No. 4 of 7

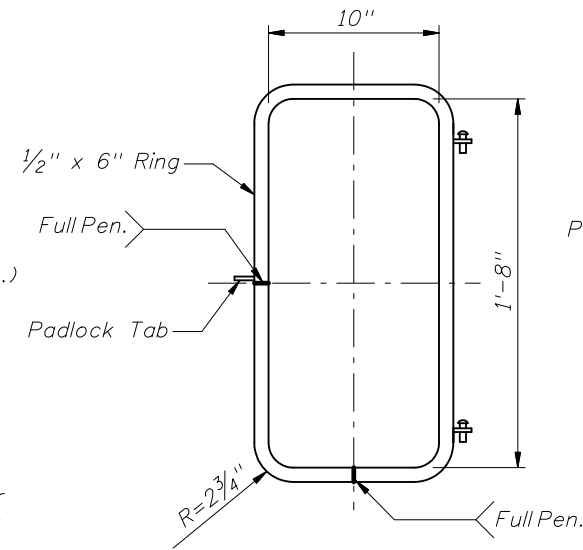
Index No. 17502



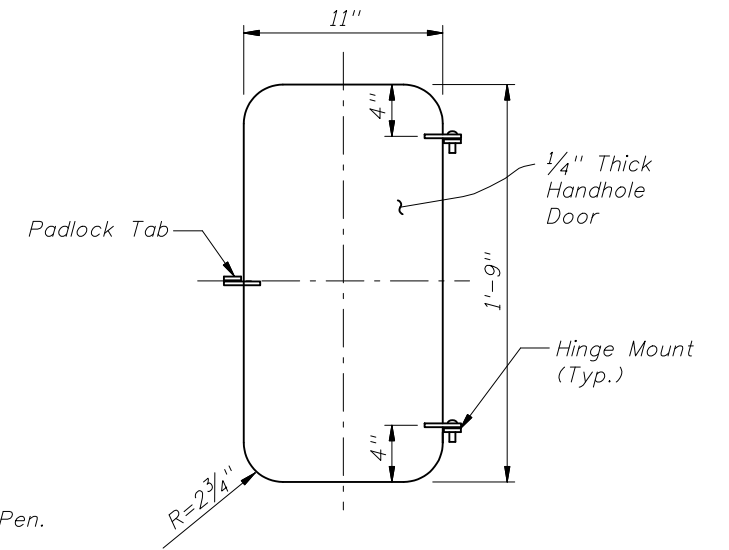
SECTION A-A
(T = Wall Thickness)



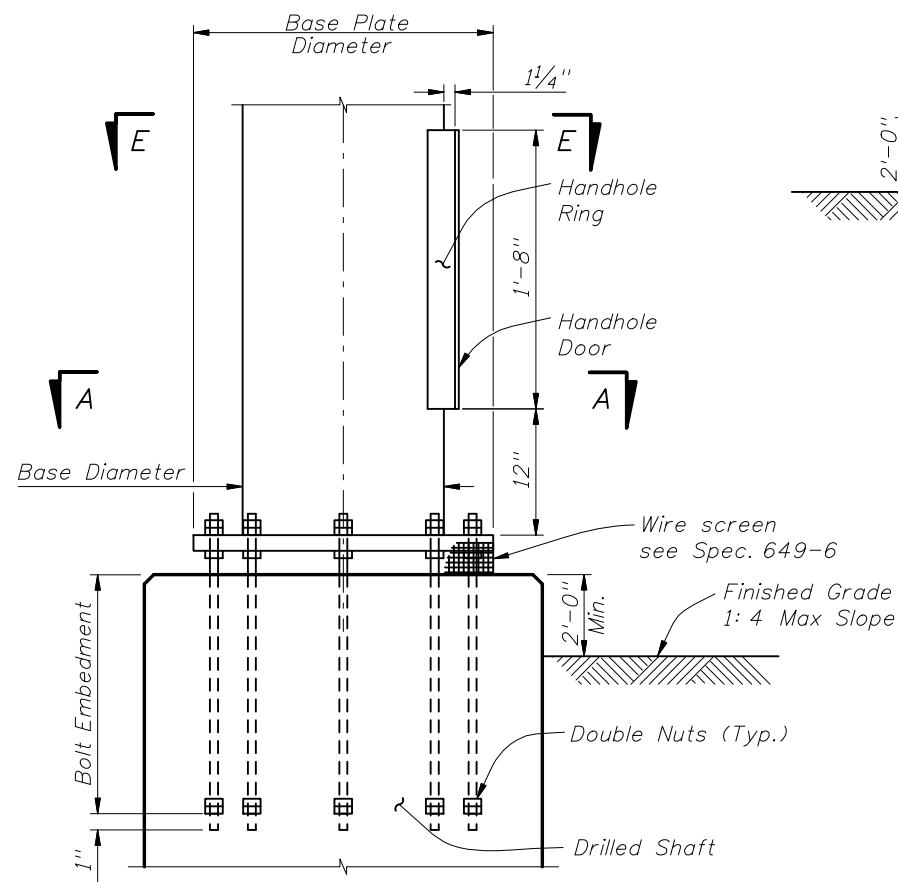
FOUNDATION PLAN
(Anchor Bolts and Conduits Not Shown)



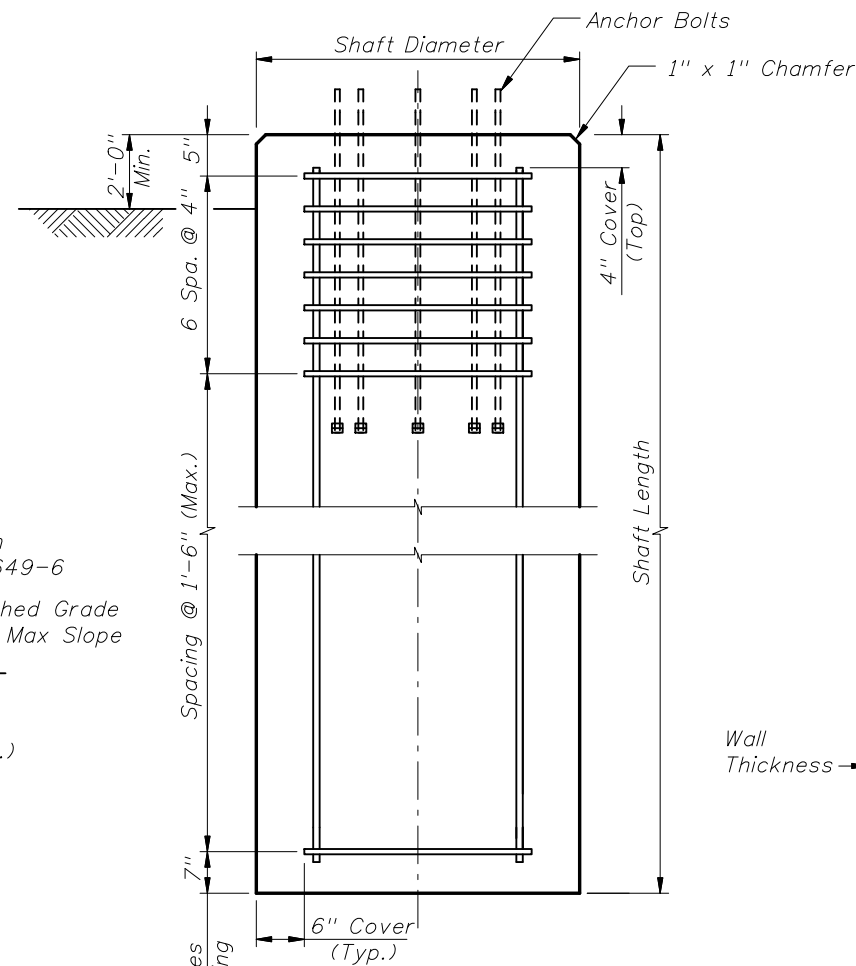
HANDHOLE RING



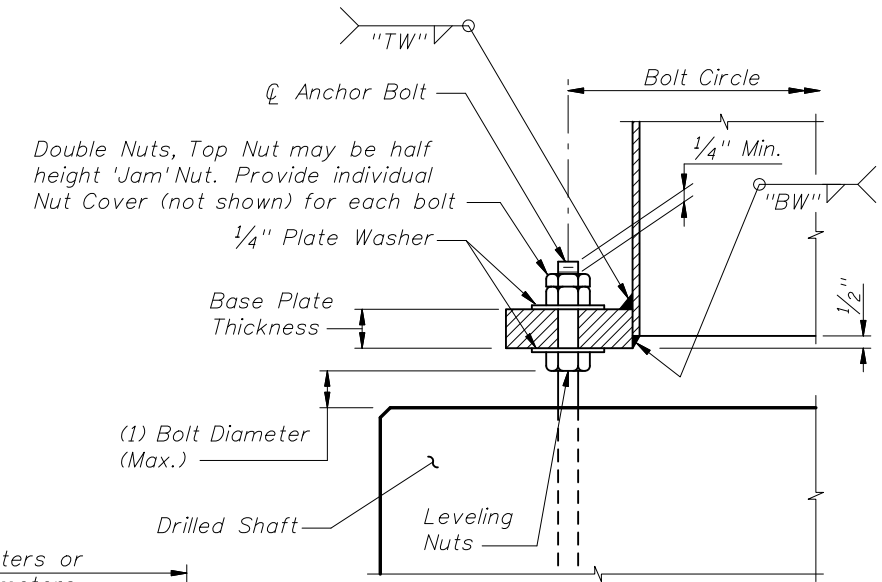
HANDHOLE DOOR



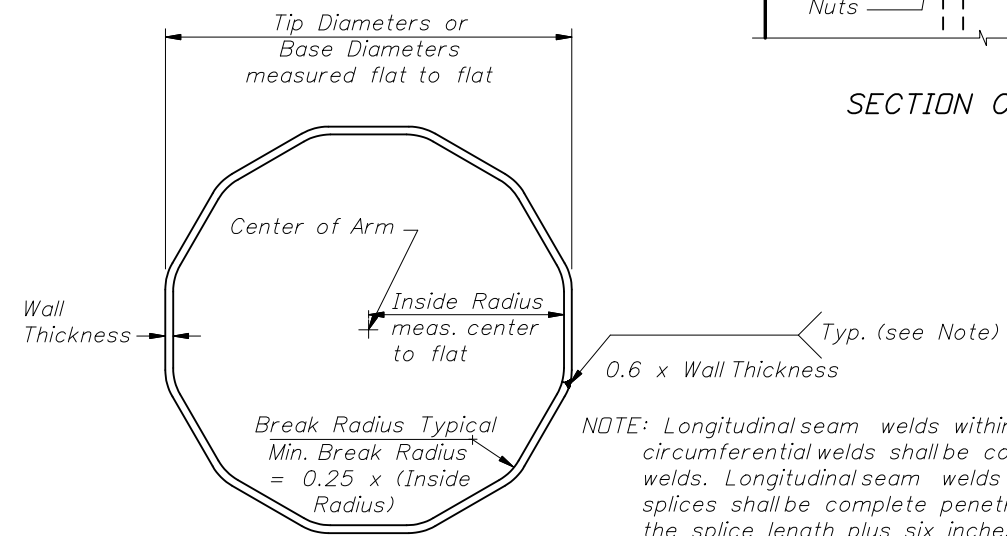
BASE PLATE AND ANCHORAGE ELEVATION
(Conduits Not Shown)



SECTION B-B
(Conduits Not Shown)



SECTION C-C



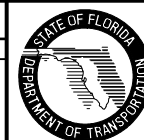
SECTION E-E

NOTE: Longitudinal seam welds within six inches of circumferential welds shall be complete penetration welds. Longitudinal seam welds at telescopic field splices shall be complete penetration welds for the splice length plus six inches. For tubes greater than 70" in circumference, two longitudinal seam welds are allowed.

POLE FOUNDATION

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
01/01/08	DYW	Changed Weld symbol in SECTION A-A, Added Padlock Tab to HANDHOLE RING.	01/01/09	CBH	Deleted grout pad, added wire screen and CSL tubes.
07/01/08	DYW	Added SECTION E-E, washer for Base Plate.			

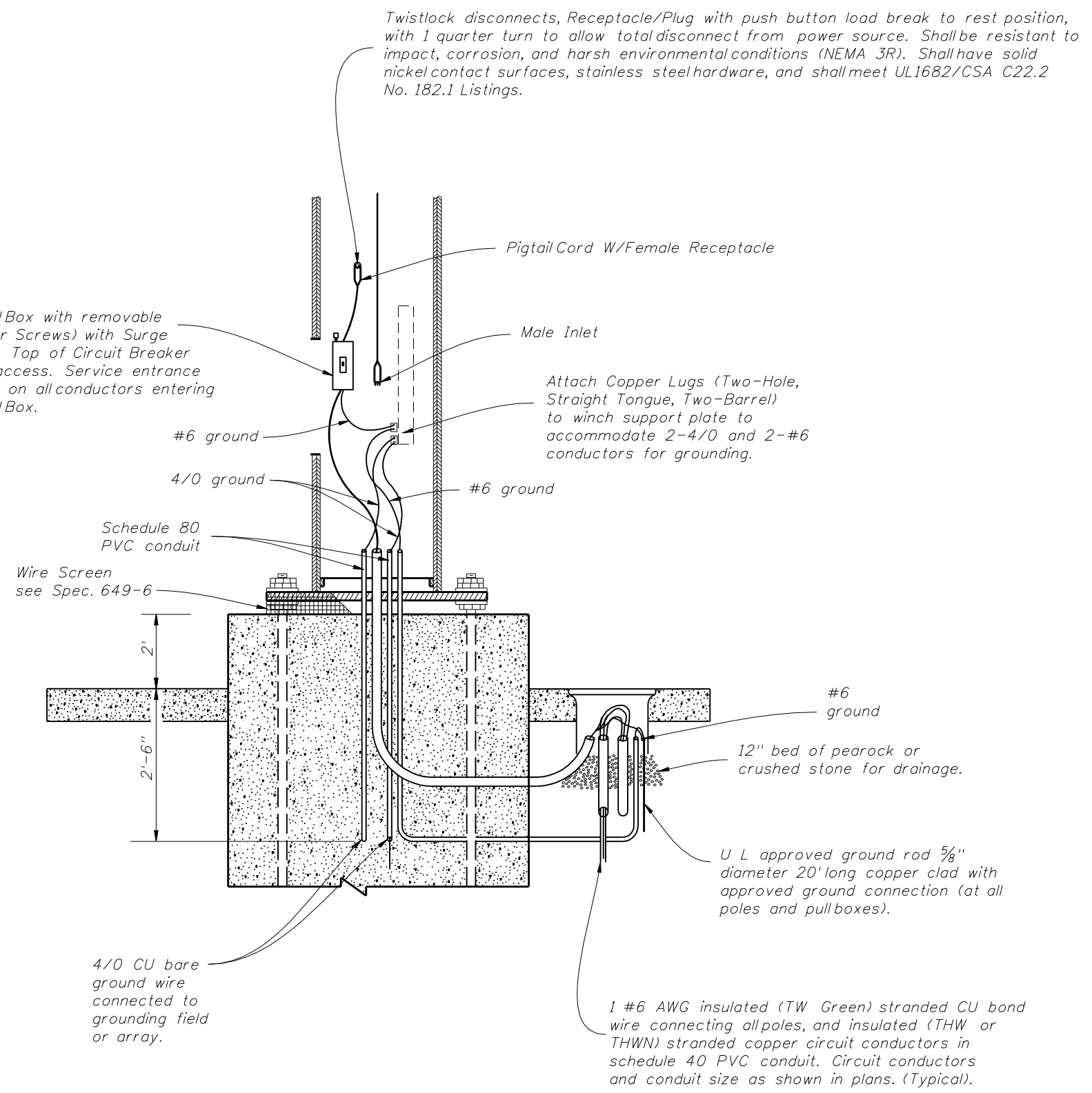
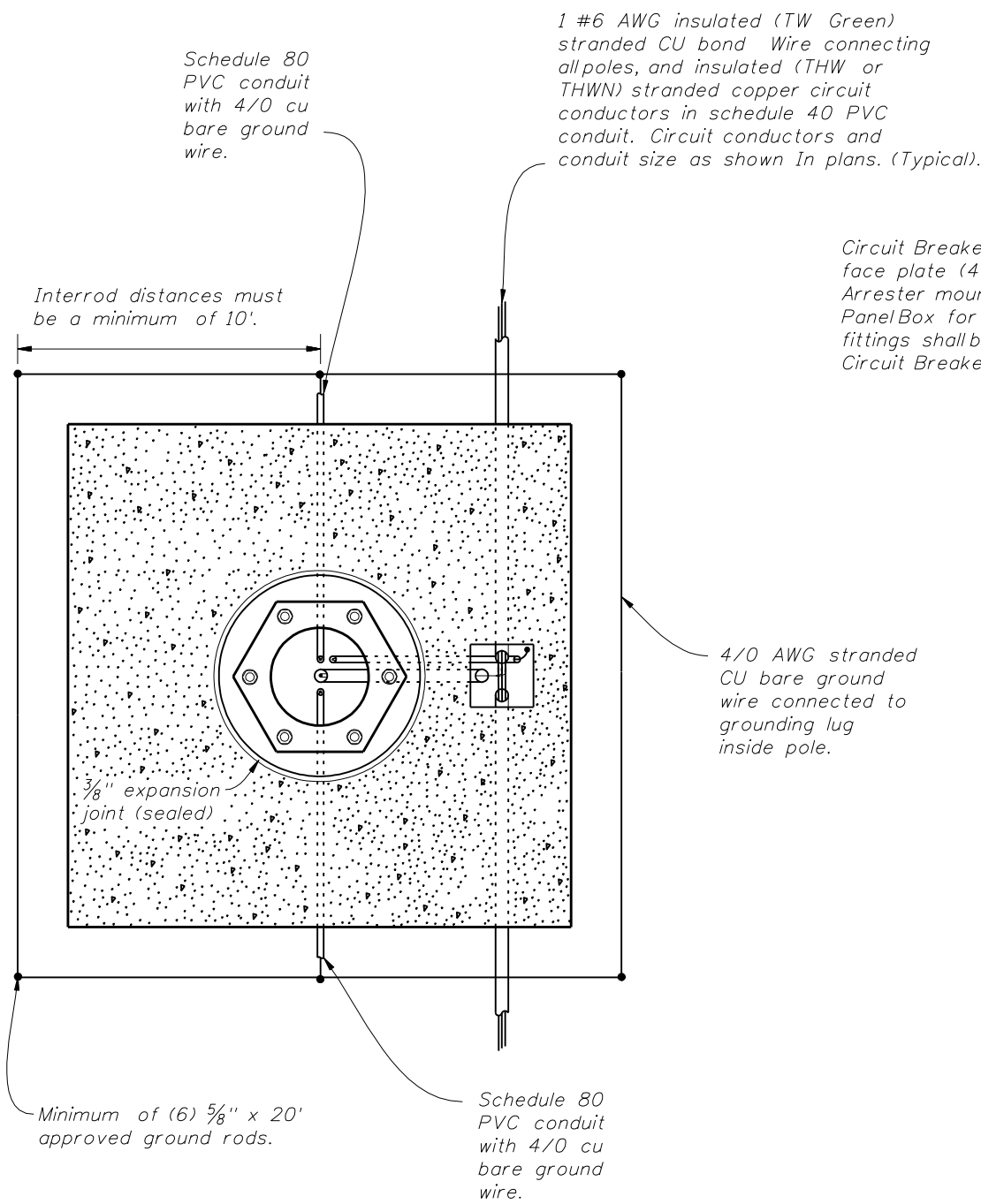


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HIGHMAST LIGHTING

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Index No. 17502

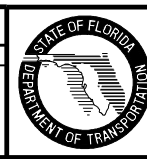


NOTES:

1. 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.
2. Slabs to be placed around all Poles and Pull Boxes.
3. For Pull Boxes between Poles refer to Index 17500.

WIRING DETAILS

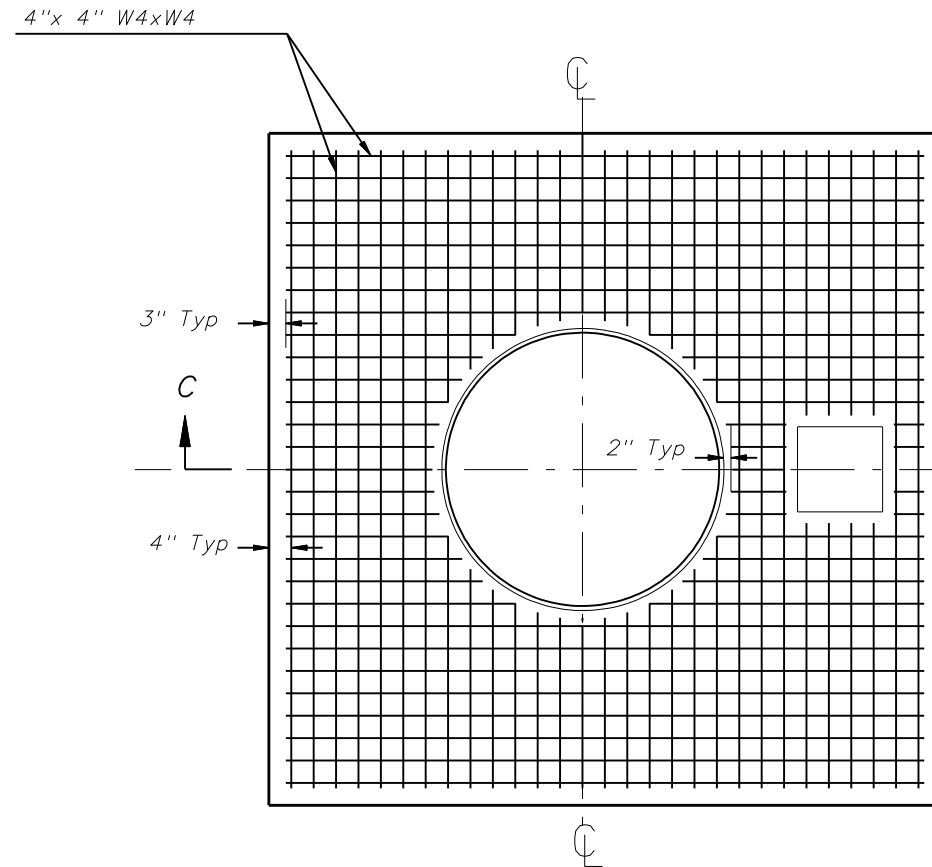
REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
11/05/08	C.H.	Grout notes and details removed, new wire screen Spec.649-6 added.			



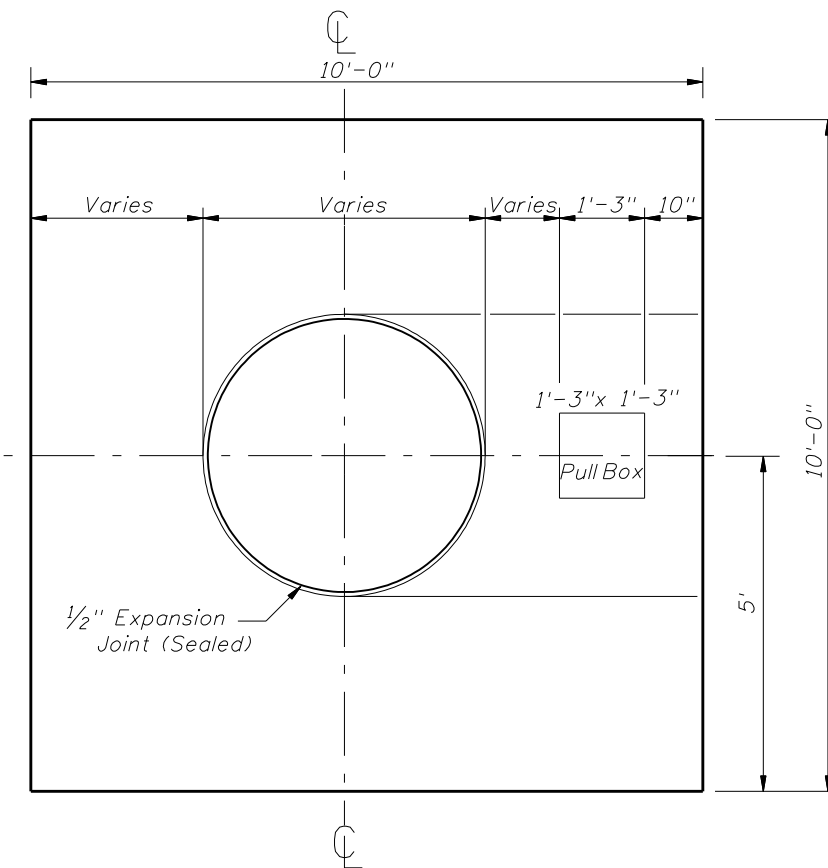
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HIGHMAST LIGHTING

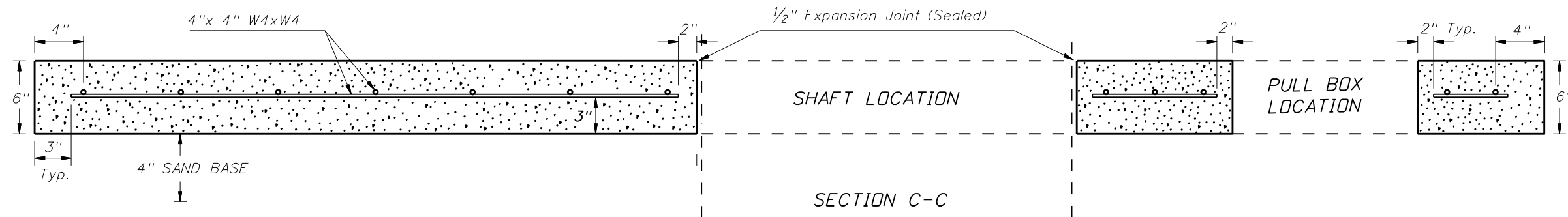
Interim Date	Sheet No.
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Index No.	
17502	



REINFORCEMENT LAYOUT



SLAB DIMENSIONS



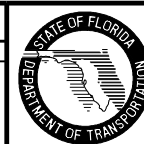
NOTES:

1. Use clean free draining sand less than 5% passing No. 200 sieve for base (4").
2. Welded wire fabric shall meet the requirements of ASTM A185.
3. Concrete shall be Nonstructural with a minimum strength at 28 days of $f'c=2.5$ ksi.
4. Outside edges of slab shall be cast against formwork.
5. The pullbox shown is 1'-3" x 1'-3"; others approved under Section 635 of the Standard Specifications may be used.
6. Slabs to be placed around all Poles and Pull Boxes in rural locations. In urban areas or where space is limited slab dimensions may be adjusted as shown in the plans.
7. Concrete and reinforcing for slabs around poles and pullboxes shall be included in the price of pole or pullbox.
8. The 1/2" thick expansion joint between the pole shaft and slab and the pullbox and slab shall be sealed with a hot poured elastic joint sealer.

SLAB DETAILS

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
11/05/08	C.H.	Concrete class changed to Concrete NS in note 3. Revised note 7 to concrete and reinforcing for slabs shall be included in the price for pole.			



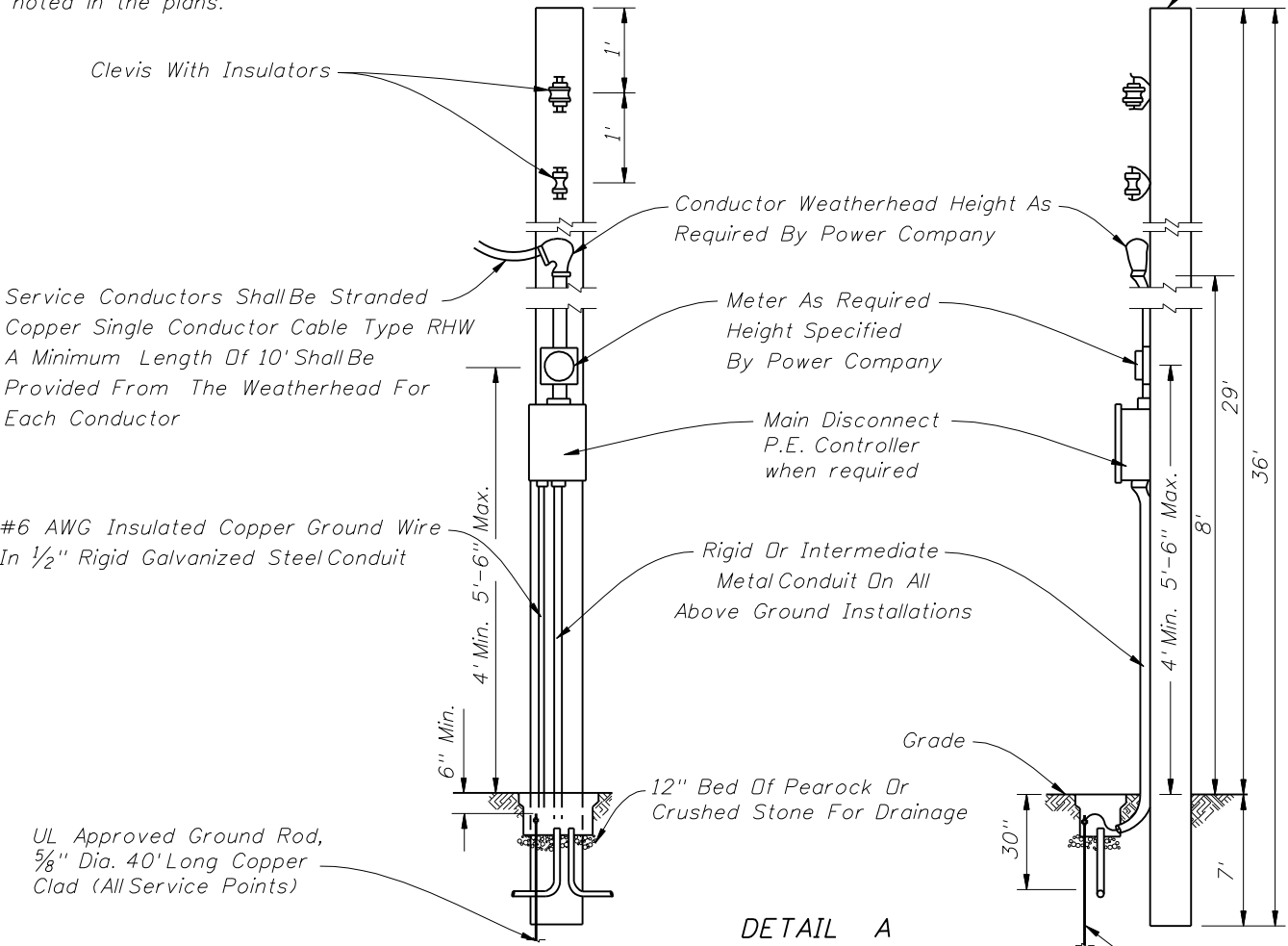
2008 Interim Design Standard

HIGHMAST LIGHTING

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NOTE :

It shall be the contractor's responsibility to provide a complete service assembly as per the plans and service specifications. The service installation shall meet the requirements of the national electric code and applicable local codes. Shop drawings are not required for service equipment, unless noted in the plans.



DETAIL A

AERIAL FEED

SERVICE SPECIFICATIONS

1. The main disconnect shall be NEMA 3R, pole mounted.
2. The enclosure door shall be lockable by padlock and four keys provided to the maintaining agency. The door shall have a minimum of three hinges and be latchable. No screws to be used to attach door.
3. 480 Volt minimum rating bolt-in type breakers shall be used.
4. Busbar to be copper coated and have a minimum rating of 100 amps. When main breaker exceeds 100 amps busbar to match breaker amperage.
5. Locate Contactor, Transformer, P.E. Controller, and H.D.A. Switch inside enclosure. The enclosure to be sized to accommodate as many breakers as called for and all other service equipment.
6. The enclosure to be rigidly attached to the pole face.
7. A 600 Volt lightning protector shall be wired inside the enclosure.
8. A main breaker is required in all service panels with 2 or more feeder breakers.
9. All service equipment shall be U. L. approved.

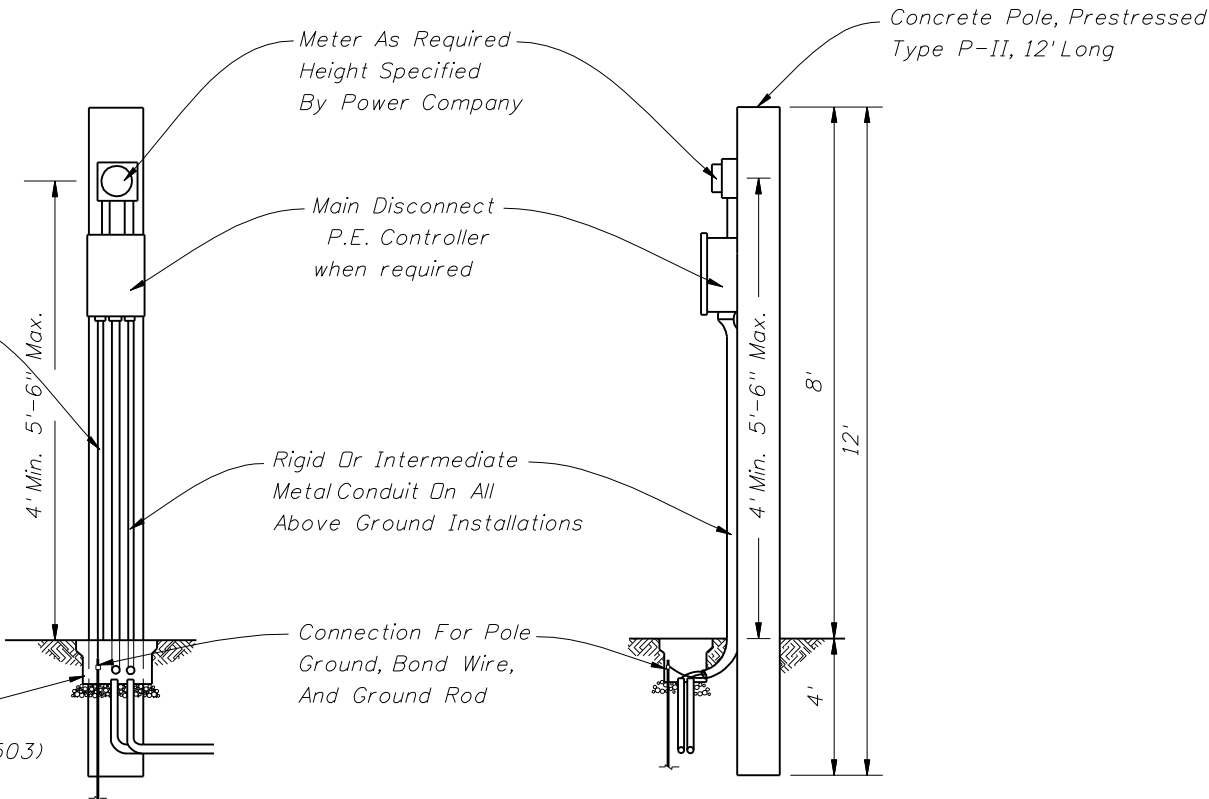
Concrete Pole Prestressed Type P-II, 36' Long

#6 AWG Insulated Copper Ground Wire In 1/2" Rigid Galvanized Steel Conduit

U.L. Approved Ground Rod, 5/8" Dia. 40' Long Copper Clad (All Service Points)

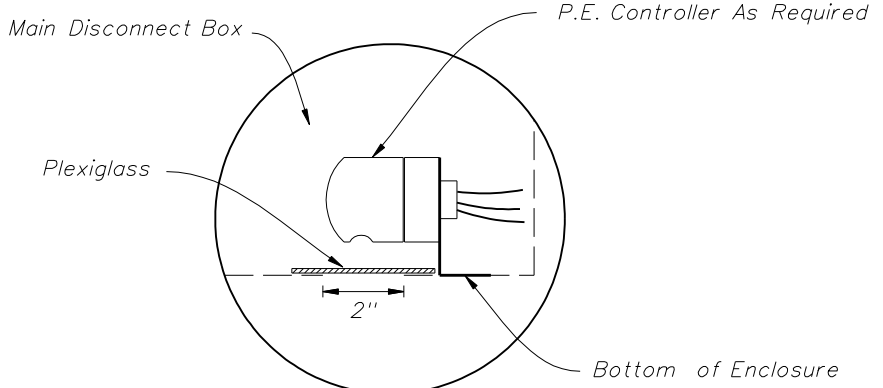
NOTES:

1. Photo Electric Control as required.
2. All neutral wires to have White insulation, do not use White or Green insulated wires for ungrounded conductors.
3. A Pull Box is required at each service point.



DETAIL B

UNDERGROUND FEED



Cut a 2" hole in the bottom of the Main Disconnect Box for the operation and mounting of the P.E. controller. Use plexiglass and a clear silicone sealant to cover hole, install P.E. Controller.

PHOTO ELECTRIC CONTROLLER DETAIL

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
11/05/08	C.H.	Dimensions 5'-6" added for height of meter base. Pole type changed from Type N to Type P.			



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SERVICE POINT DETAILS

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SIGN LIGHTING INSTALLATION

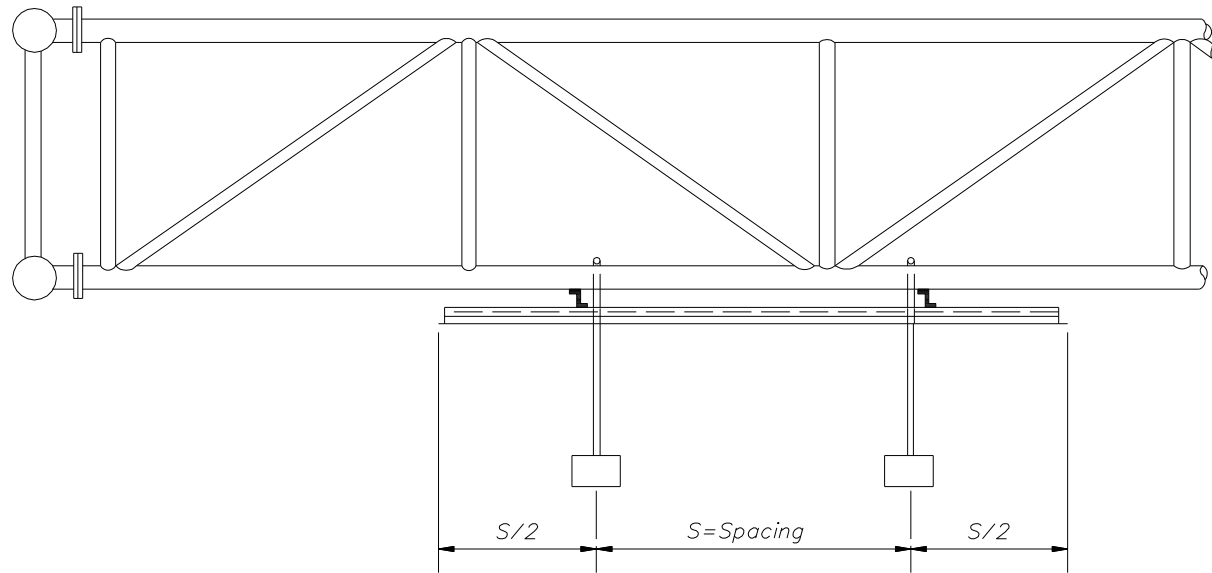
Roadway Lighting included in contract:

The power for the sign lighting shall be provided from the roadway lighting circuit. The lighting plans shall indicate the sign location and a pull box location for connection to the sign lights. The lighting contractor shall install pull box and loop 2' of lighting circuit conductors in the pull box for connection by the signing contractor.

The signing contractor shall furnish and install luminaires, Nema 3R enclosure, 30 amp breaker, conduit, conductors and all other electrical equipment necessary for connection to the lighting circuit.

Roadway Lighting not included in contract:

The signing plans shall include pay item numbers to furnish and install conduit, conductors, ground rods, pull boxes and service point equipment. The signing plans shall indicate the location of the service point equipment and circuit runs. The signing contractor shall provide all electrical equipment necessary for connection of the sign lights.

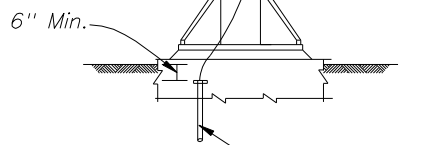
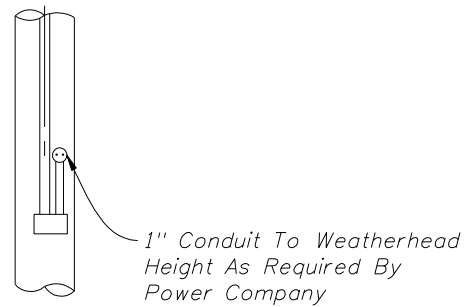
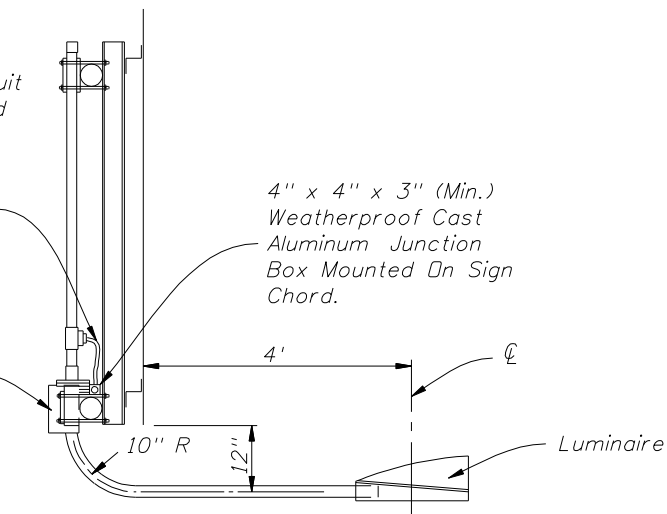


PLACEMENT OF SIGN LIGHTS

1. Luminaire shall be mounted so the lamp center is 4' in front of the sign face.
2. Luminaire shall be mounted so the back of the fixture is placed 1' below the bottom edge of the sign face.
3. Luminaires from manufacturers who recommended their fixture be tilted shall be mounted on a bracket which provides this recommended tilt.
4. Photometric data for the Induction luminaire proposed for sign lighting shall be submitted for approval to the District Lighting Engineer, Florida Department Of Transportation.

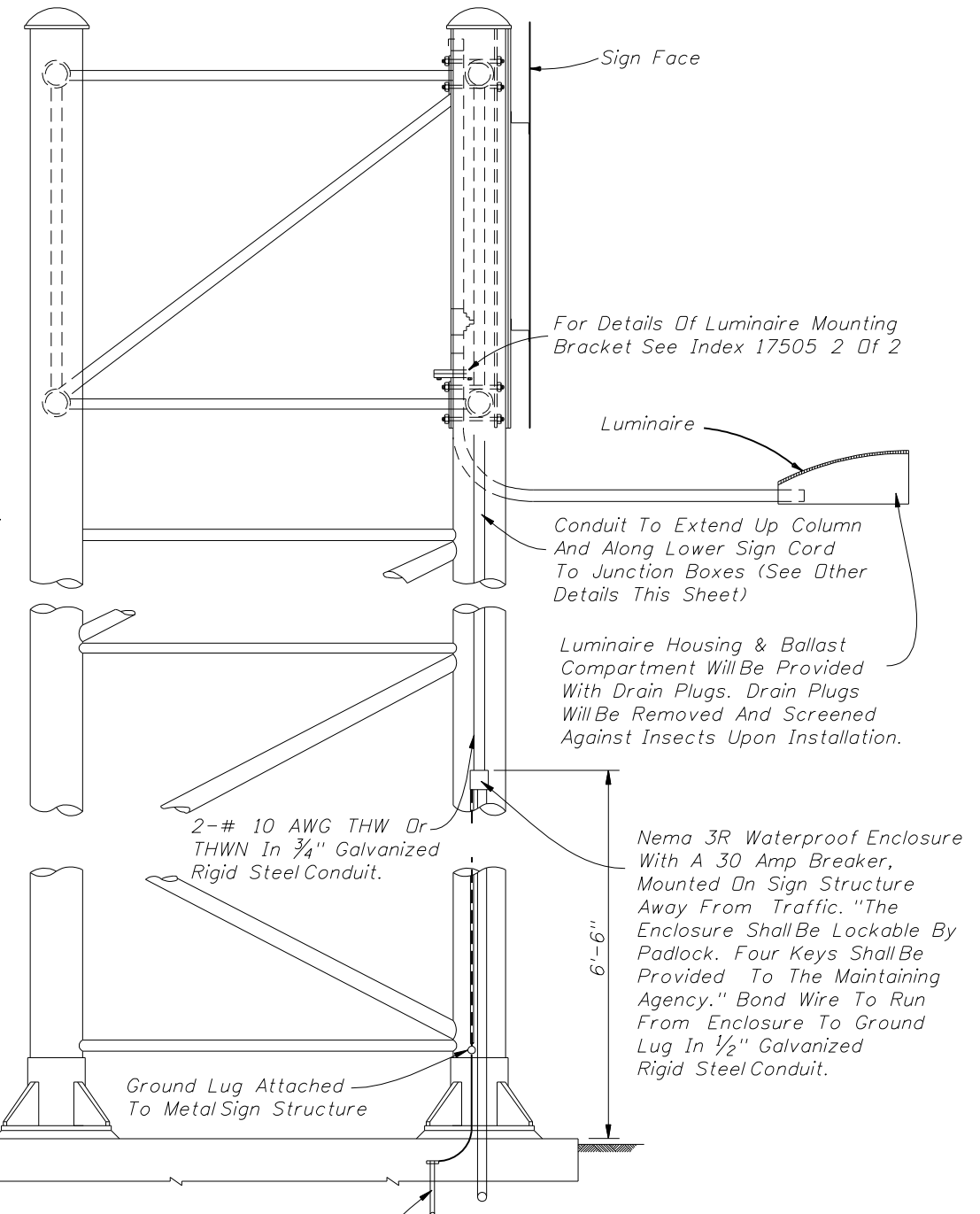
Use 3/4" Liquid Tight Flexible Conduit From Junction Box To Ballast And From Junction Box To Tee In Luminaire Bracket. Conduit Shall Be Of Sufficient Length To Allow Rotation Of Luminaire Bracket 90 In Either Direction.

Ballast Shall Be Mounted To Sign Chord With Stainless Steel Band. Bracket For Ballast To Be Fabricated From Galvanized Steel Plate For Steel Sign Structures And Aluminum Plate For Aluminum Sign Structures. (Submittal Data Required)



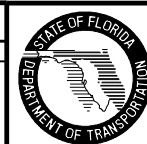
PLAN
OVERHEAD POWER SUPPLY

U.L. Approved Ground Rod 5/8" x 20' Copper Clad With Approved Ground Connection To Be Placed In Pull Box For Inspection Purposes. Splices To Be Made With Compression Sleeves Then Properly Insulated & waterproofed



REVISIONS

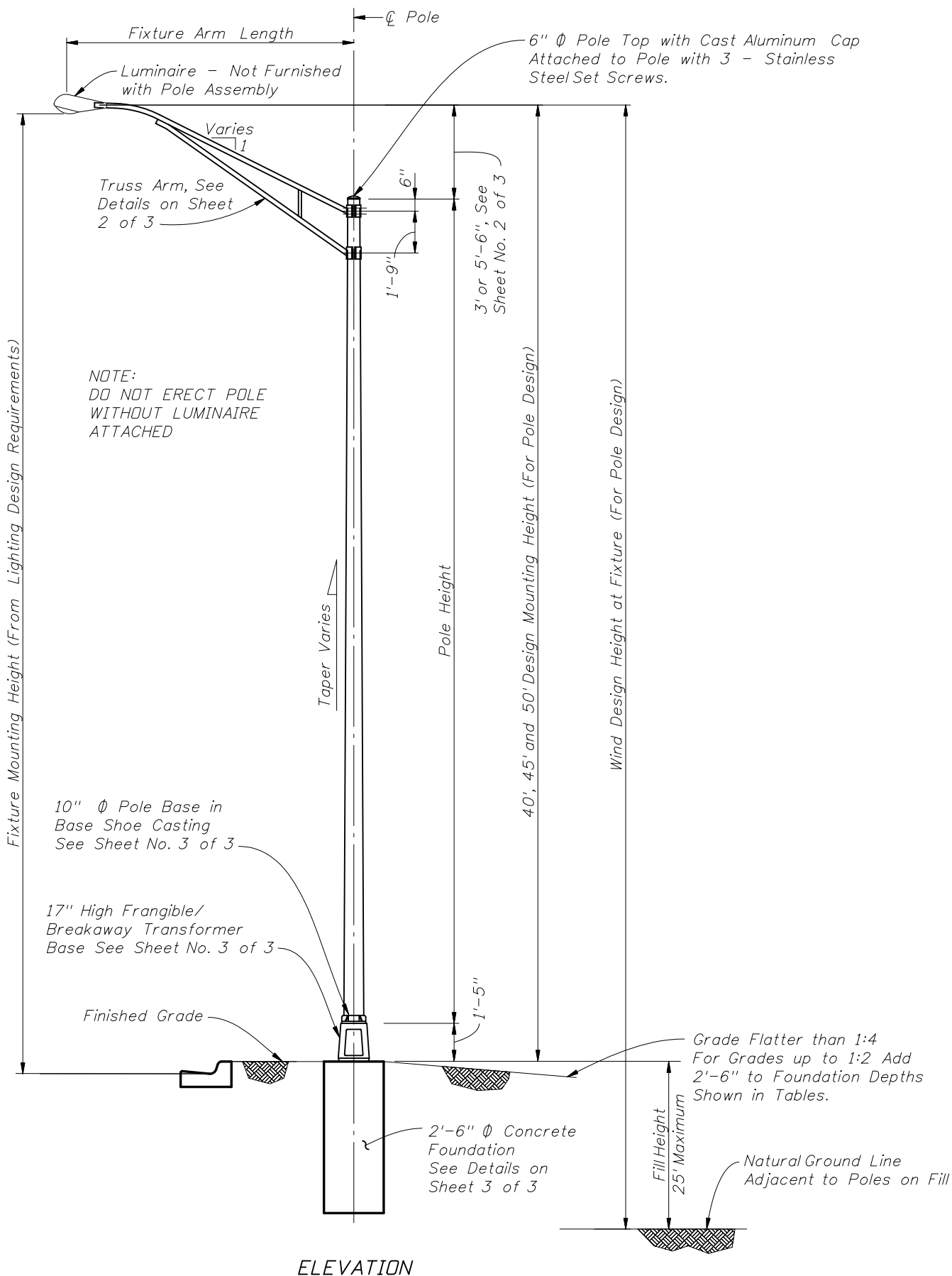
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
11/05/08	C.H.	Mercury Vapor Luminaires changed to Induction Luminaires. Luminaire Chart Deleted, dimensions revised on spacing detail note added to structure detail.			



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EXTERNAL LIGHTING FOR SIGNS

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ROADWAY ALUMINUM LIGHTING POLE NOTES

- 1) Designed in accordance with FDOT Structures Manual (current edition).
- 2) All tables were developed assuming the following Luminaire properties: Effective Projected Area of 1.55 ft (includes wind drag coefficient) and 75 pounds (max.)
- 3) Perform all welding in accordance with the American Welding Society Structural Welding Code Aluminum) ANSI/AWS D1.2 (current edition).
- 4) See Standard Index No. 17500 for grounding and wiring details.
- 5) Foundation Materials:
 - a. Reinforcing Steel: ASTM A615 Grade 60.
 - b. Concrete: Class I.
 - c. Anchor Bolts: ASTM F1554 Grade 55 with ASTM A563 Grade DH nuts and ASTM F436 Type 1 washers (all galvanized in accordance with ASTM F2329-05.)
- 6) Light Pole Specifications:
 - a. Poles: ASTM B221, Alloy 6063-T6.
 - b. Arm Tube Extrusions: ASTM B221 - Alloy 6063-T6.
 - c. Finish: For pole and arms; 50 grit satin rubbed finish.
 - d. Pole Connection Extrusions, Bars and Plates: ASTM B221 - Alloy 6063-T6.
 - e. Shoe Base Casting: ASTM B26 - Alloy 356-T6 or ASTM B108 - Alloy 356-T6.
 - f. Aluminum Caps and Covers: ASTM B-26(319-F).
 - g. Frangible/Breakaway Transformer Base Casting: ASTM B26 - Alloy 356-T6 or ASTM B108 - Alloy 356-T6.
 - h. Weld Metal: ER4043.
 - i. Shoe Base Connection Bolts: ASTM A325 Type 1 with ASTM A563 Grade DH nuts and ASTM F436 Type 1 washers (all galvanized in accordance with ASTM F2329).
 - j. Stainless Steel Fasteners and Hardware: AISI Grade 304.
 - k. Aluminum alloy 6063: T4 condition and heat treated in accordance with ASTM B597 to T6.
- 7) Pole Notes:
 - a. Tapered as required to provide a top outside diameter (D.D.) of 6" with a base D.D. of 10". Portions of the shaft near the base shoe and at the arm connections may be held constant at 10" and 6" respectively to simplify fabrication.
 - b. Transverse welds are allowed only at the base.
 - c. Poles constructed out of two or more sections with overlapping splices are not permitted.
 - d. Equip poles with a damping device if the pole location is within 5 miles of the coastline.
- 8) Furnish each pole with a 2"x4" (max) aluminum identification tag. Submit details for approval. Secure to Transformer Base with 0.125" stainless steel rivets or screws. Locate Identification Tag on the inside of base and visible from the door opening. Include the following information: Financial Project ID, Pole Design Designation (ie. Pole Pay Item number), Manufacturer's Name & Certification number, Pay Item number.
- 9) Manufacturers seeking approval of a Standard Roadway Aluminum Lighting Pole assembly for inclusion on the Qualified Products List must submit a QPL Product Evaluation Application along with design documentation and drawings showing the product meets all specified requirements of this Index.
 - a. For Clamp and Frangible Transformer Base Design, provide design calculation and/or test results indicating that the components are capable of providing the required capacity. Certify that the frangible Transformer Base conforms to the current FHWA required AASHTO Frangibility Requirements, tested under NCHRP Report 350 Guideline.
 - b. For Alternate foundations: Include design calculations and drawings showing that the product meets the requirements of this index, FDOT Structures Manual and Specification 715.

NOTE:
STANDARD ROADWAY ALUMINUM LIGHTING NOT TO BE USED ON BRIDGES OR WALLS.

ELEVATION AND NOTES

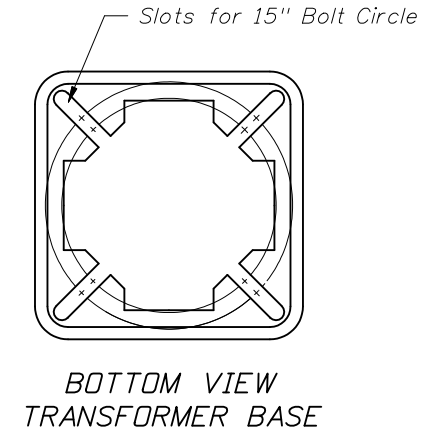
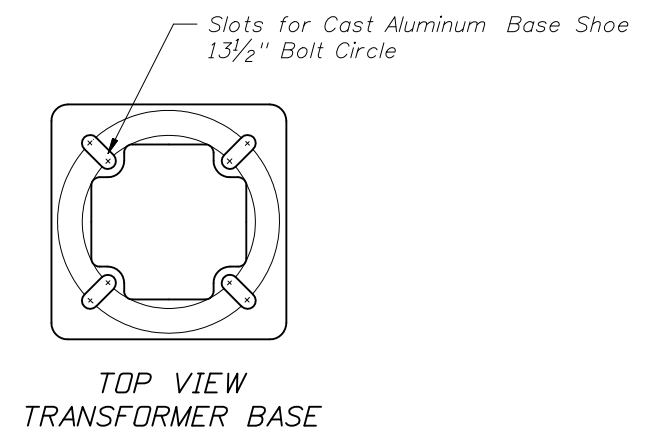
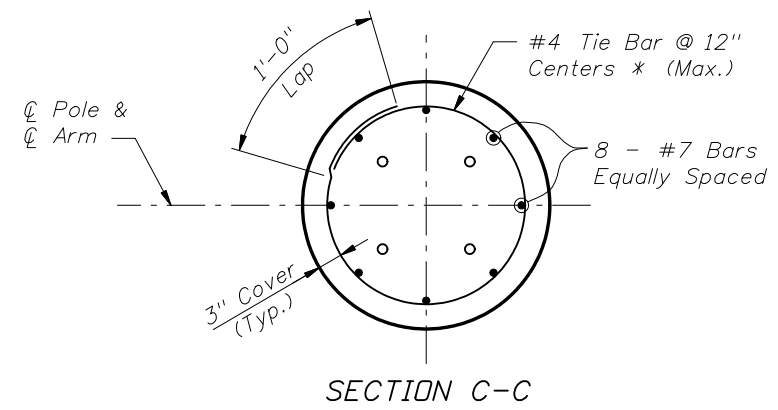
REVISIONS			
DATE	BY	DESCRIPTION	
07/01/08	DYW	Modified QPL Criteria.	
01/01/09	DYW	Modified concrete classification.	



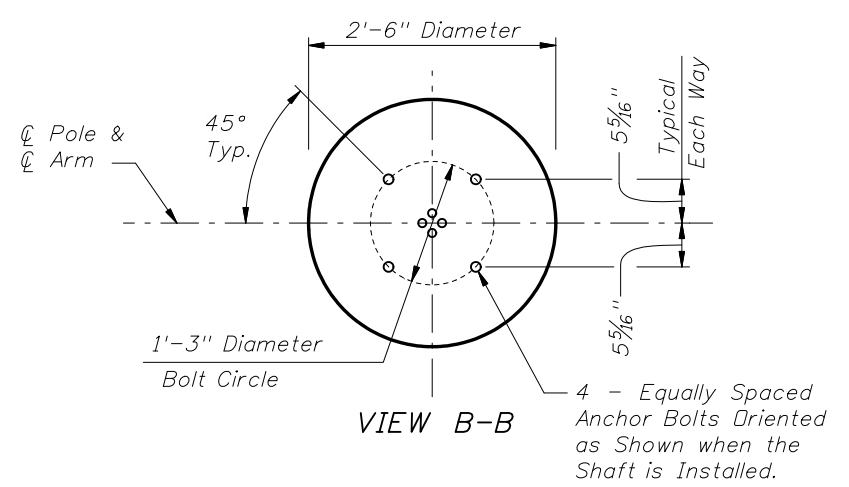
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STANDARD ROADWAY ALUMINUM LIGHTING

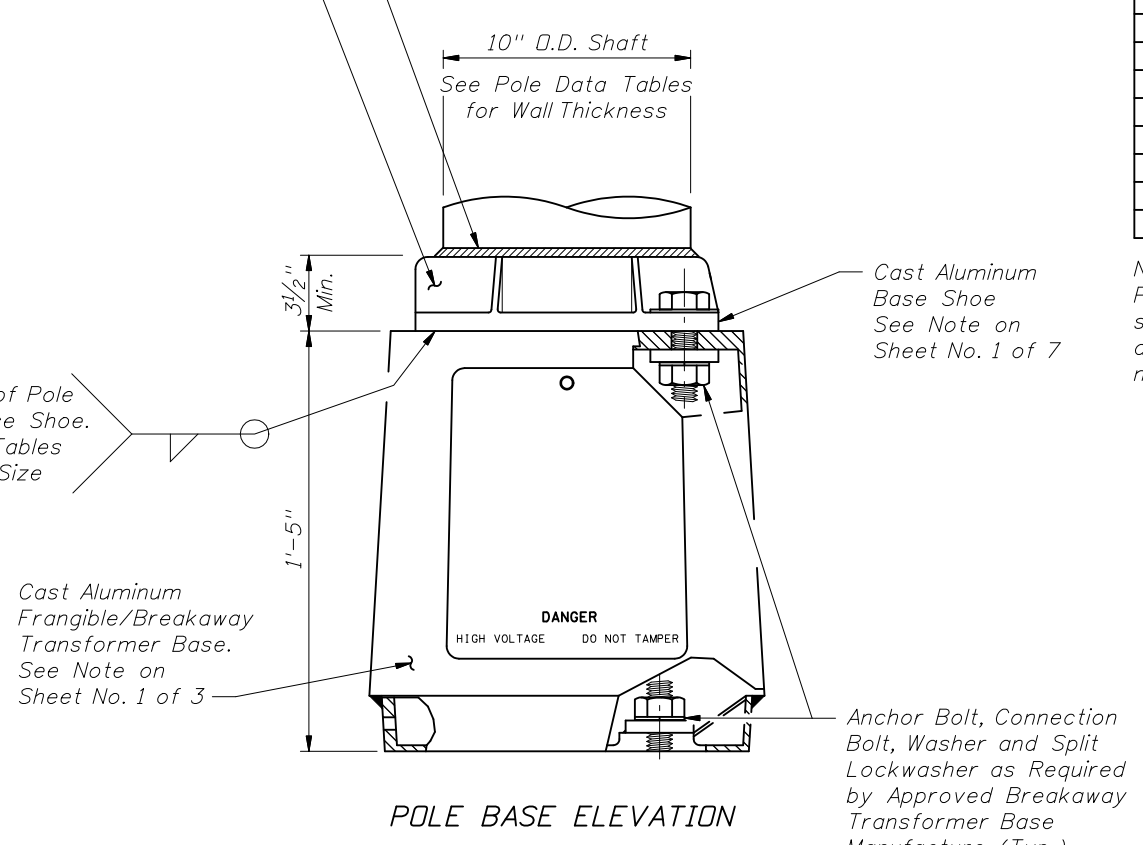
Interim Date	Sheet No.
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FOUNDATION NOTES:
 The foundations for Standard Roadway Aluminum Lighting Poles are pre-designed and are based upon the following conservative soil criteria which covers the great majority of soil types found in Florida:
 Classification = Cohesionless (Fine Sand)
 Friction Angle = 30 Degrees (30°)
 Unit Weight = 50 lbs./cu. ft. (assumed saturated)
 Only in cases where the Designer considers the soil types at the specific site location to be of lesser strength properties should an analysis be required. Auger borings, SPT borings or CPT soundings may be utilized as needed to verify the assumed soil properties, and at relatively uniform sites, a single boring or sounding may cover several foundations. Furthermore, borings in the area that were performed for other purposes may be used to confirm the assumed soil properties.

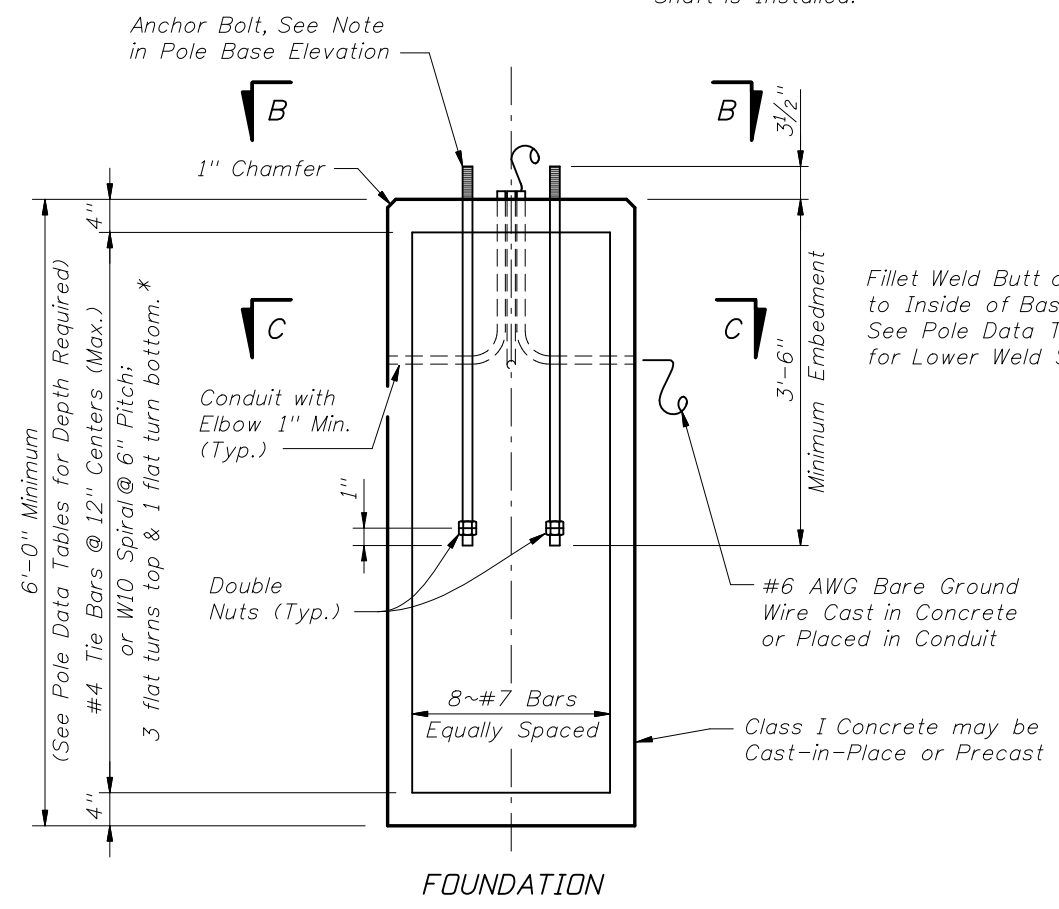


Cast Aluminum Pressure Mounted Nut Cover - Bolted Attachment Optional
 Fillet Weld Outside of Pole to Inside of Base Shoe. See Pole Data Tables for Upper Weld Size.



POLE TABLE					
WIND SPEED (MPH)	ARM LENGTH (FT)	DESIGN MOUNTING HEIGHT (FT)	POLE WALL (IN)	UPPER WELD (IN)	LOWER WELD (IN)
110	8, 10, 12 & 15	40 & 45	0.156	0.156	0.156
110	8, 10, 12 & 15	50	0.188	0.188	0.188
130	8, 10 & 12	40	0.156	0.156	0.156
130	15	40	0.188	0.188	0.188
130	8, 10, & 12	45	0.188	0.188	0.188
130	15	45	0.250	0.250	0.250
130	8, 10, 12 & 15	50	0.250	0.250	0.250
150	8, 10, & 12	40	0.188	0.188	0.188
150	15	40	0.250	0.250	0.250
150	8, 10, 12 & 15	45	0.250	0.250	0.250
150	8, 10, 12 & 15	50	0.313	0.313	0.313

NOTE:
 Pole wall thicknesses shown in the POLE TABLE are nominals and shall be within the Aluminum Association Tolerances. Thicker walls are permitted and tapered walls may be used provided the minimum Aluminum Association thicknesses are not violated.

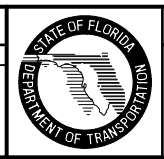


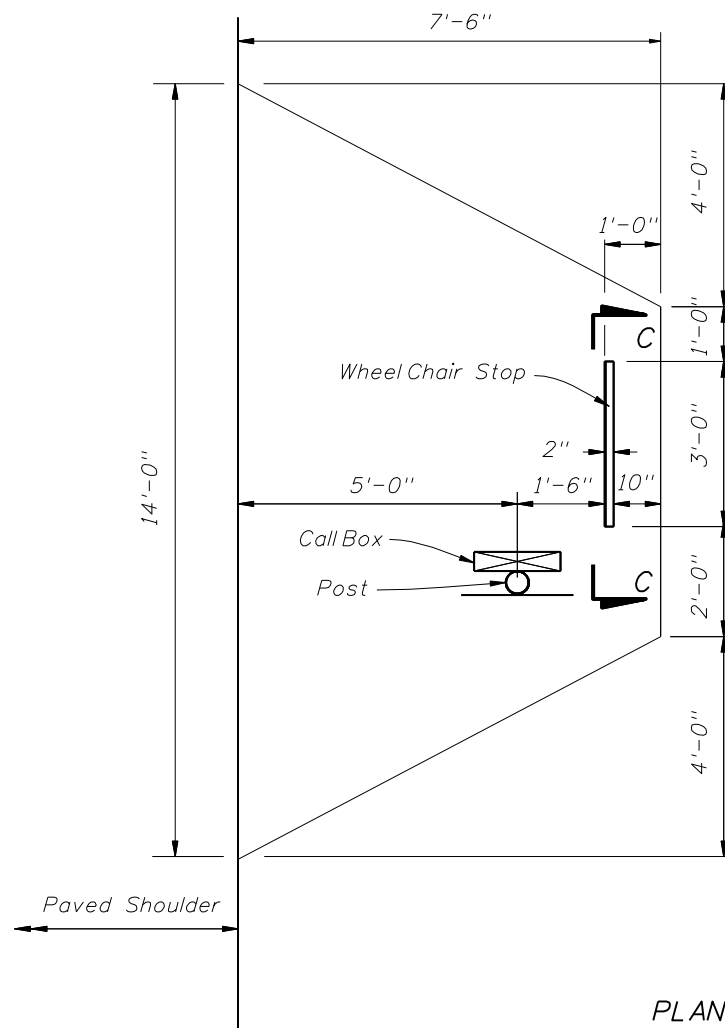
- * Shop-weld assemblies of foundation stirrup reinforcing bars are permitted in reinforced concrete foundation provided that:
1. The reinforcing bars conform to ASTM Specification A706/706M.
 2. The holding wires conform to ASTM Specification A82 or A496.
 3. The Shop welding is performed by machines under a continuous, controlled process, approved by the Engineer.
 4. Quality control tests are performed on shop-welded specimens and the test results are available, upon request, to the Engineer.

FOUNDATION TABLE		
WIND SPEED (MPH)	DESIGN MOUNTING HEIGHT (FT)	TOTAL DEPTH (FT) *
110	40	7
110	45 & 50	8
130	40 & 45	8
130	50	9
150	40 & 45	9
150	50	10

* Depths shown in table are for grades flatter than 1:4, for grades up to 1:2 add 2'-6" to foundation depths shown in table.

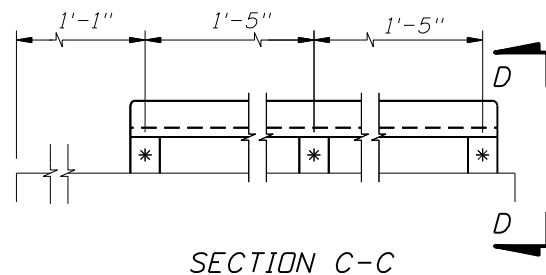
REVISIONS			
DATE	BY	DESCRIPTION	
01/01/08	DYW	Added 1" dimension to FOUNDATION detail. Changed 'Class I ... note on FOUNDATION detail.	
01/01/09	DYW	Modified concrete classification.	





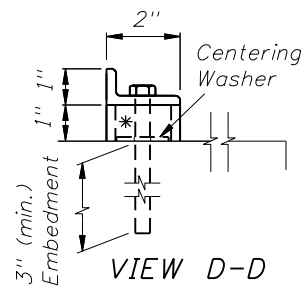
PLAN

CallBox Attachment To Slab
As Per Manufacturer's Recommendation.



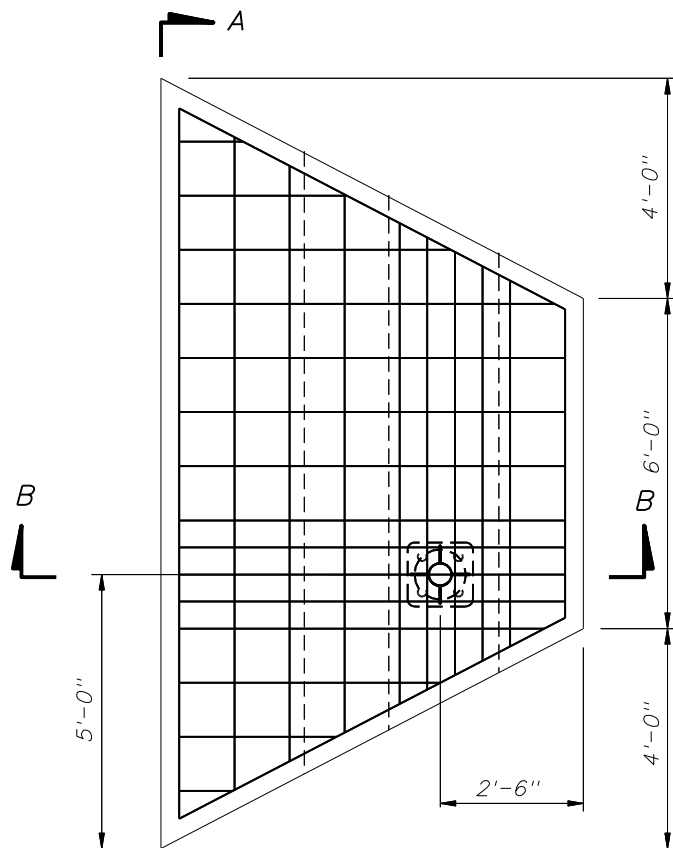
SECTION C-C

2" x 1" x 1/4" Galv. Angle And
3-3/8" ϕ x 5" Galvanized Steel Expansion
Anchor Bolt With 3" Min. Embedment

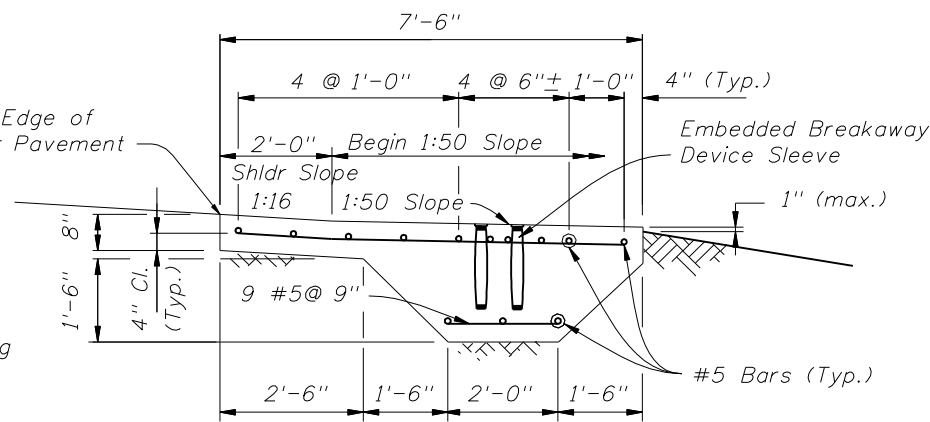


VIEW D-D

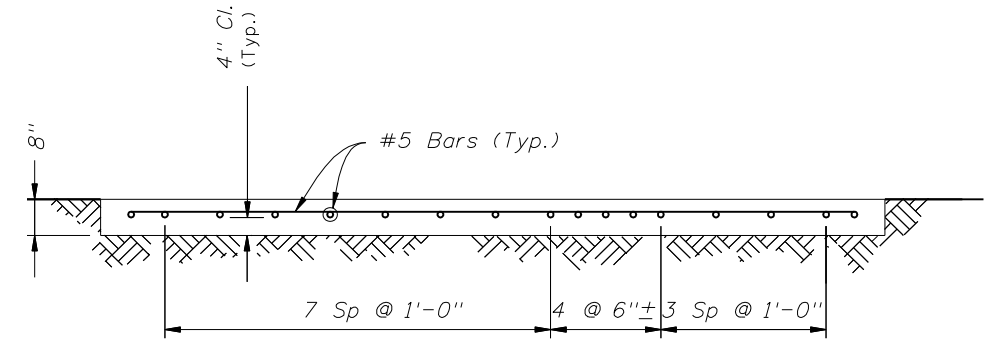
* 1 1/2" ϕ x 1" High
Galvanized Steel Pipe Spacer



SECTION A-A



SECTION B-B



SECTION A-A

MOTORIST AID CALL BOX CONCRETE PAD QUANTITIES

Concrete : 3.5 c.y. (each)
Reinforcing Steel: 243 lb (each)

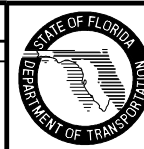
GENERAL NOTES

1. Design Specifications: AASHTO Standard Specifications For Highway Bridges (Current Edition and approved revisions thereto).
2. Concrete: Concrete strength shall be Class I ($f'c=3,000$ psi).
3. Reinforcing Steel: Reinforcing Steel shall conform to ASTM A615, Grade 60.
4. Payment: Concrete Pad and Foundation shall be included in the contract unit price of call box assembly or terminal. It shall also include all labor, materials, and installation of embedded breakaway device sleeves, and miscellaneous galvanized steel for wheel chair stop and attachments.
5. Breakaway Device shall be paid for under CallBox Assembly.

WHEEL CHAIR STOP DETAIL

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
11/05/08	C.H.	Note 2 Class II Concrete Changed to Class I Concrete. Note 4 Changed for payment of Concrete, Reinforcing steel and additional items.			



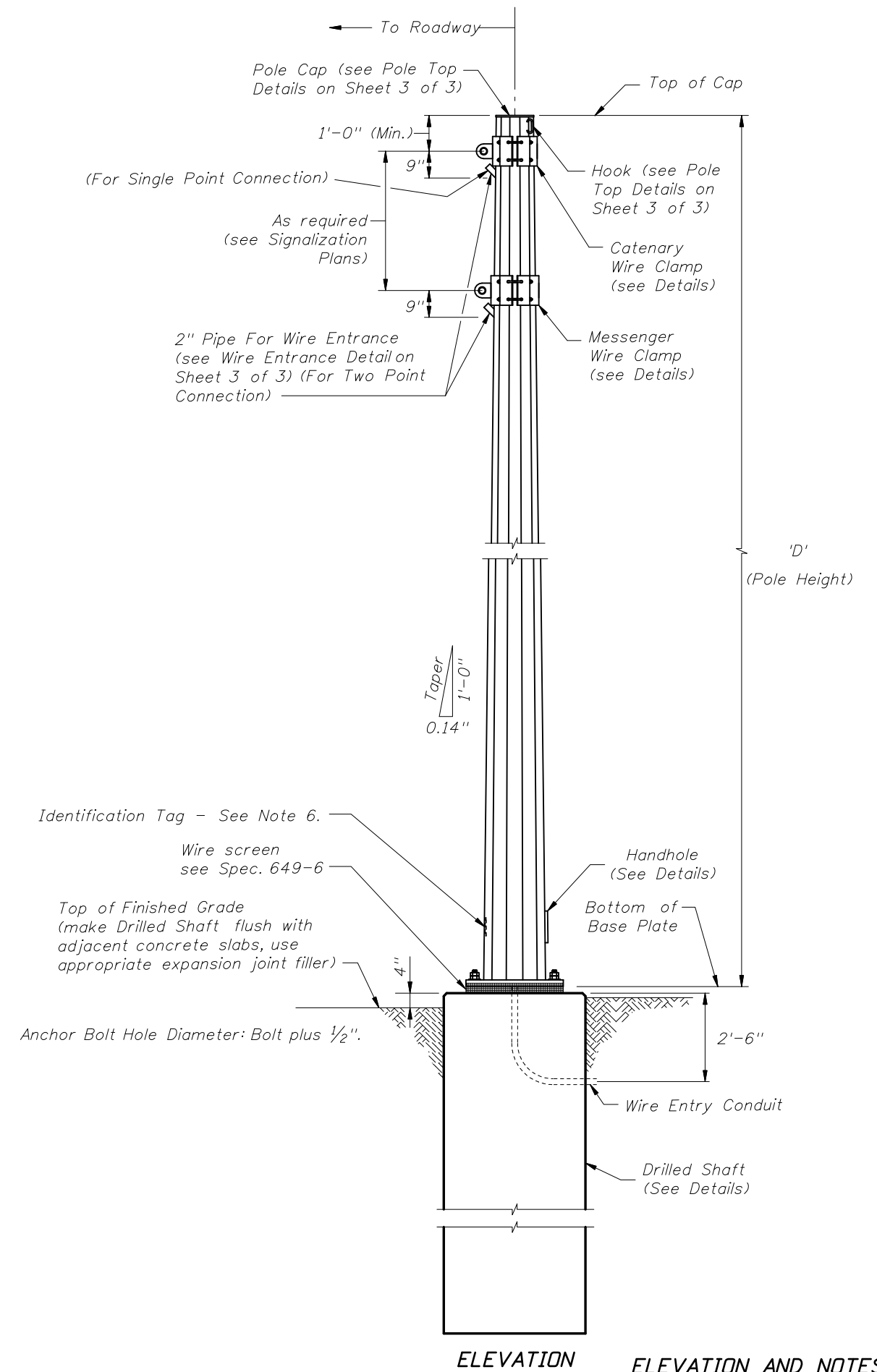
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MOTORIST AID CALL BOX

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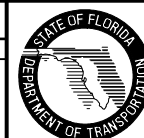
STEEL STRAIN POLE NOTES

- 1) Designed in accordance with FDOT Structures Manual and the 2001 (4th) Edition AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals and Interims.
- 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 ASTM F436 Type 1 washers (all galvanized in accordance with ASTM F2329)
- 5) Strain Pole Specifications:
 - a. Poles: ASTM A1011 Grade 50, 55, 60 or 65 (less than 1/4") 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 1. Hole Diameter: Bolt diameter plus 1/16".
 - e. Base Plate: Hole Diameter; anchor bolt diameter plus 1/2".
 - 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 & Certification number and QPL number.
- 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) Manufacturers seeking approval of a steel strain pole assembly for inclusion on the Qualified Products List must submit a QPL Product Evaluation Application along with drawings showing the product meets all specified requirements of this 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.



REVISIONS

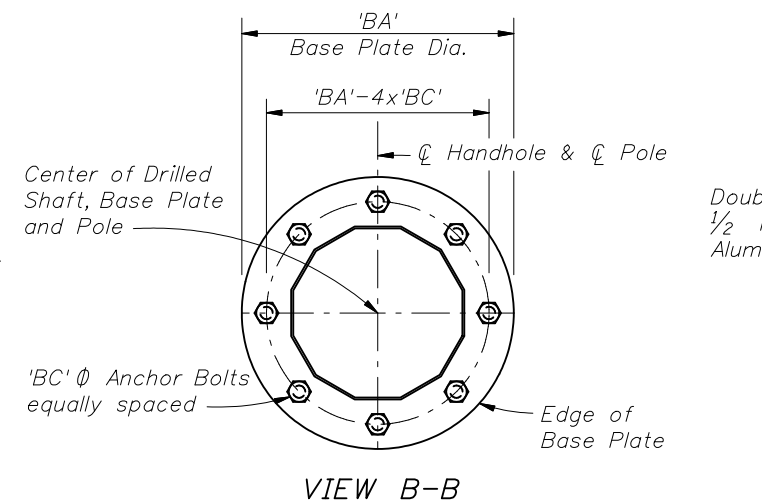
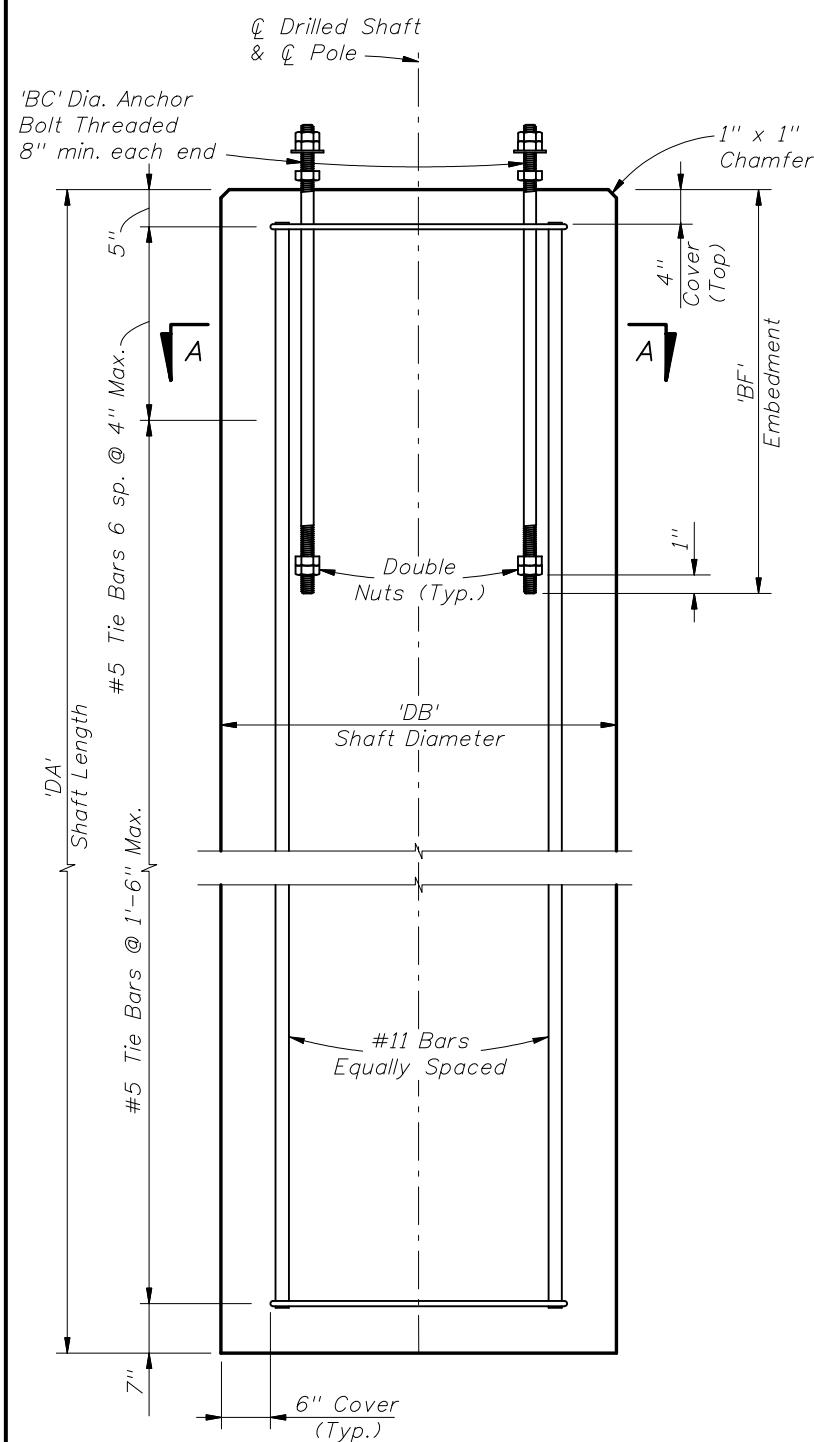
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
01/01/08	DYW	Changed Note 5i, 6f and 7. Renumbered Note 8 & 9. Added Note 8.			
01/01/09	CBH	Deleted grout pad, added wire screen and CSL tube note.			



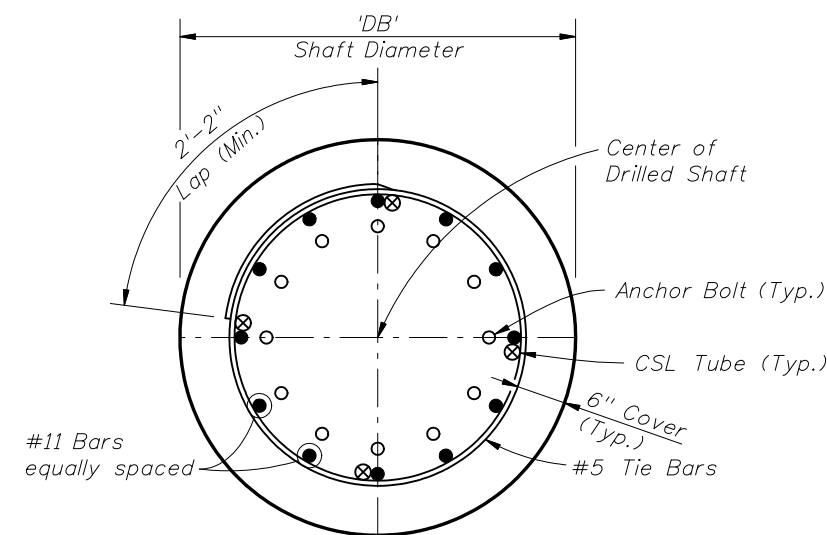
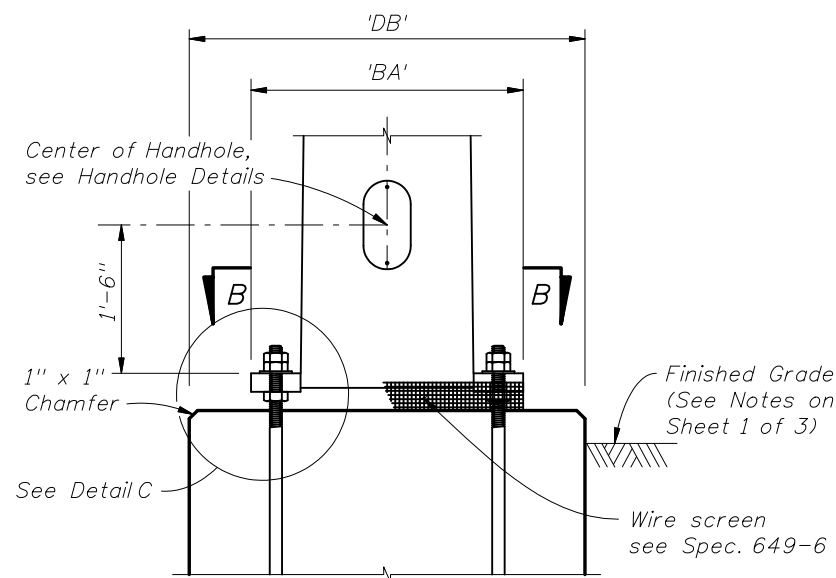
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STEEL STRAIN POLE

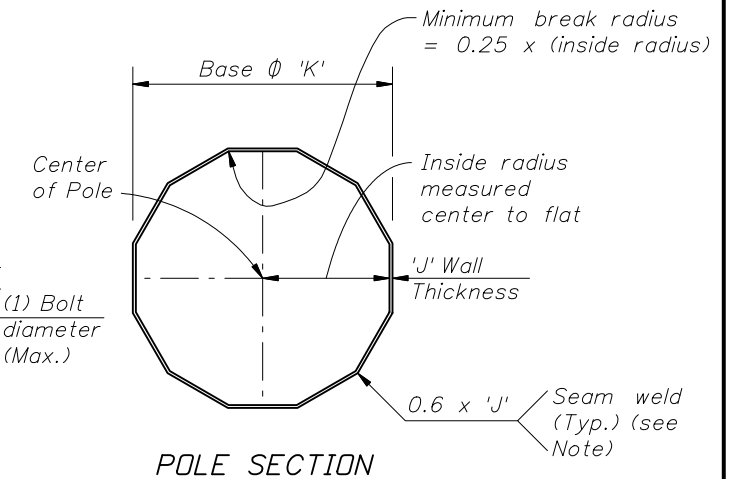
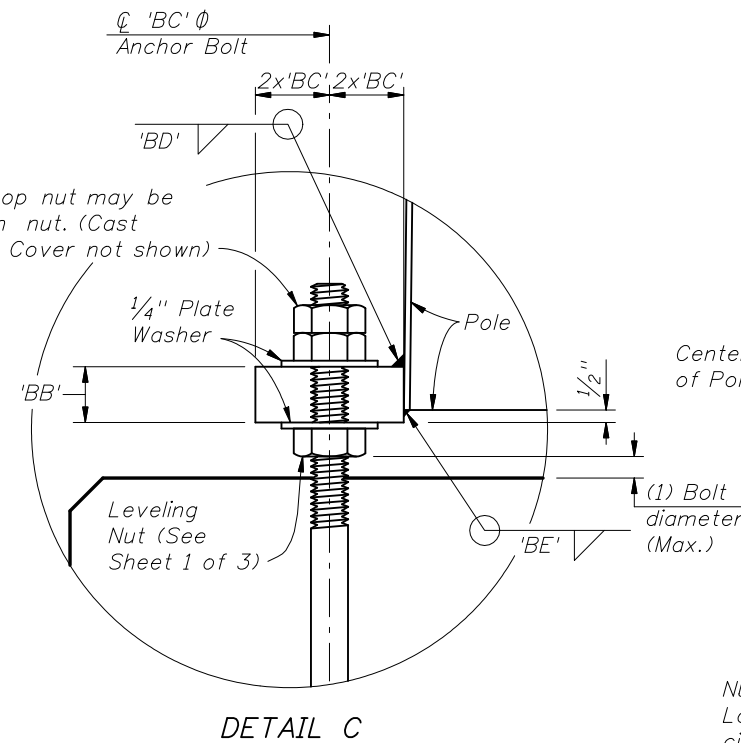
Interim Date	Sheet No.
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NOTE: Number of bolts shown for illustration purposes only.



(Number of bars shown is for illustration purposes only)



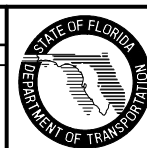
NOTE: Longitudinal seam welds within 6" of circumferential welds shall be complete penetration welds.

POLE TYPE	MAXIMUM ALLOWABLE MOMENT (kip-ft)	POLE		BASE CONNECTION							SHAFT		
		J (in.)	K (in.)	No. of Bolts	BA (in.)	BB (in.)	BC (in.)	BD (in.)	BE (in.)	BF (in.)	DA (ft)	DB (ft)	No. of #11 bars
PS-IV	95.4	0.250	14	8	25	2.25	3/8	1/16	3/16	57	15.0	3.5	10
PS-V	158.9	0.313	16	10	28	2.50	1/2	1/2	1/4	56	16.5	3.5	10
PS-VI	203.6	0.313	18	12	30	2.50	1/2	1/2	1/4	55	17.0	3.5	10
PS-VII	280.3	0.313	21	14	33	2.50	1/2	3/16	1/4	56	17.0	4.0	14
PS-VIII	338.0	0.313	23	16	35	2.50	1/2	3/16	1/4	55	18.0	4.0	14
PS-IX	400.9	0.313	25	12	39	2.75	3/4	3/16	1/4	57	17.5	4.5	16
PS-X	469.1	0.313	27	14	41	2.75	3/4	3/16	1/4	56	18.5	4.5	16

FOUNDATION NOTES:
 The foundations for SteelStrain Poles are designed based upon the following conservative soil criteria which covers the great majority of soil types found in Florida:
 Classification = Cohesionless (Fine Sand)
 Friction Angle = 30 Degrees (30°)
 Unit Weight = 50 lbs./cu. ft. (assumed saturated)
 Only in cases where the Designer considers the soil types at the specific site location to be of lesser strength properties should an analysis be required. Auger borings, SPT borings or CPT soundings may be utilized as needed to verify the assumed soil properties, and at relatively uniform sites, a single boring or sounding may cover several foundations. Furthermore, borings in the area that were performed for other purposes may be used to confirm the assumed soil properties.

BASE AND FOUNDATION DETAILS AND TABLE OF VARIABLES

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
01/01/08	DYW	Changed number of bolts in VIEW B-B, number of rebar in SECTION A-A & note in DETAIL C. Changed '#9.' to '#10...' in SECTION A-A. Changed TABLE OF STRAIN POLE VARIABLES (removed 6 lines).	07/01/08	DYW	Changed foundation standoff distance and added washer for base plate.
			01/01/09	CBH	Deleted grout pad. Added wire screen and CSL tubes. Changed drilled shaft reinforcing.



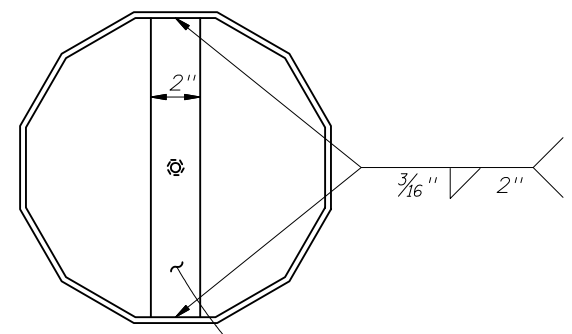
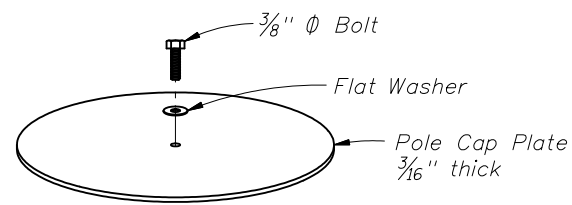
2008 Interim Design Standard

STEEL STRAIN POLE

Interim Date 01/01/09

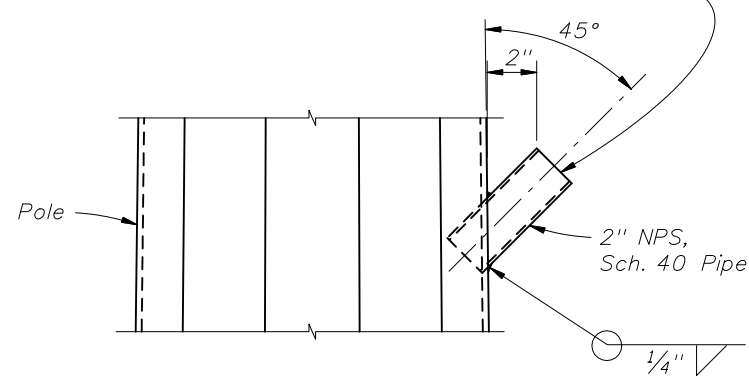
Sheet No. 2 of 3

Index No. 17723

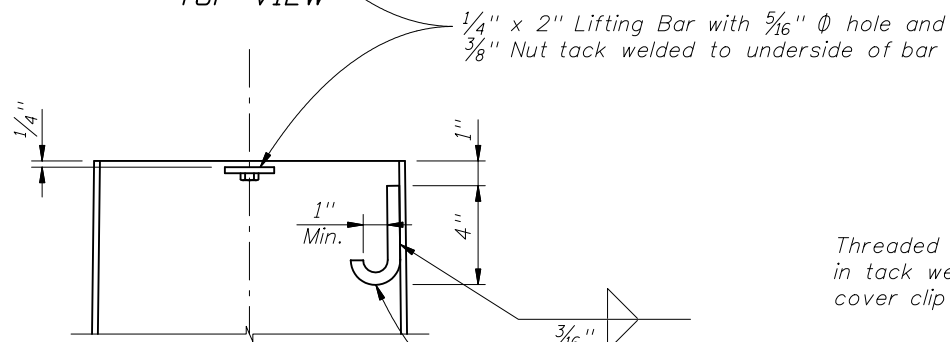


TOP VIEW

NOTE: A properly sized Service Head (Weather Head), shall be installed and fastened securely on to the standard pipe for each pole location. At locations other than service entrance, the service head face is to be left closed to outside atmosphere. Service entrance installation per Index No. 17727.



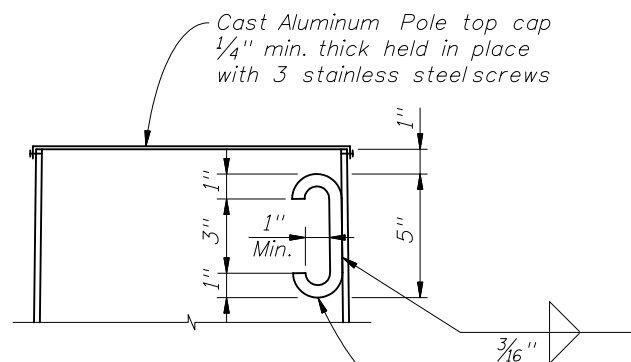
WIRE ENTRANCE DETAILS



POLE TOP CUT-AWAY (Option 'a')

1/4" x 2" Lifting Bar with 5/16" ϕ hole and 3/8" Nut tack welded to underside of bar

'J' Hook for wiring, 1/2" ϕ commercial grade hot rolled bar welded to inside of pole.

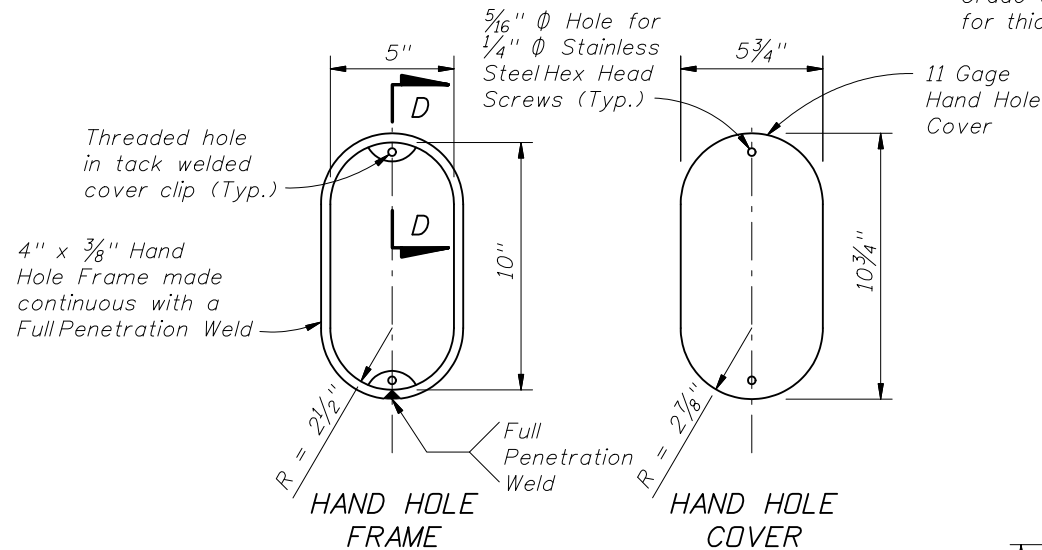


POLE TOP CUT-AWAY (Option 'b')

Cast Aluminum Pole top cap 1/4" min. thick held in place with 3 stainless steel screws

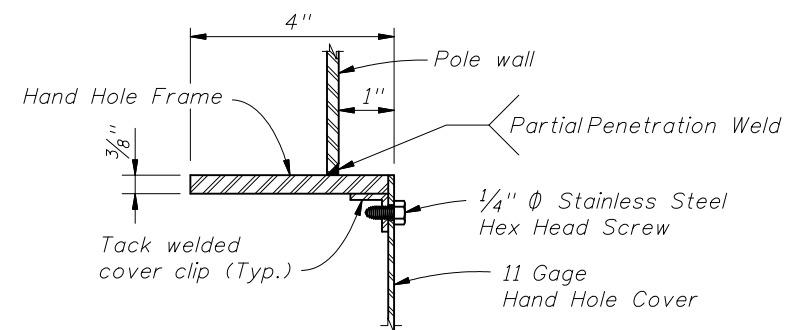
'C' Hook for wiring and lifting, 1/2" ϕ commercial grade hot rolled bar welded to inside of pole.

POLE TOP NOTE:
Any combination of the above two options may be used, provided both lifting and wiring is accommodated.

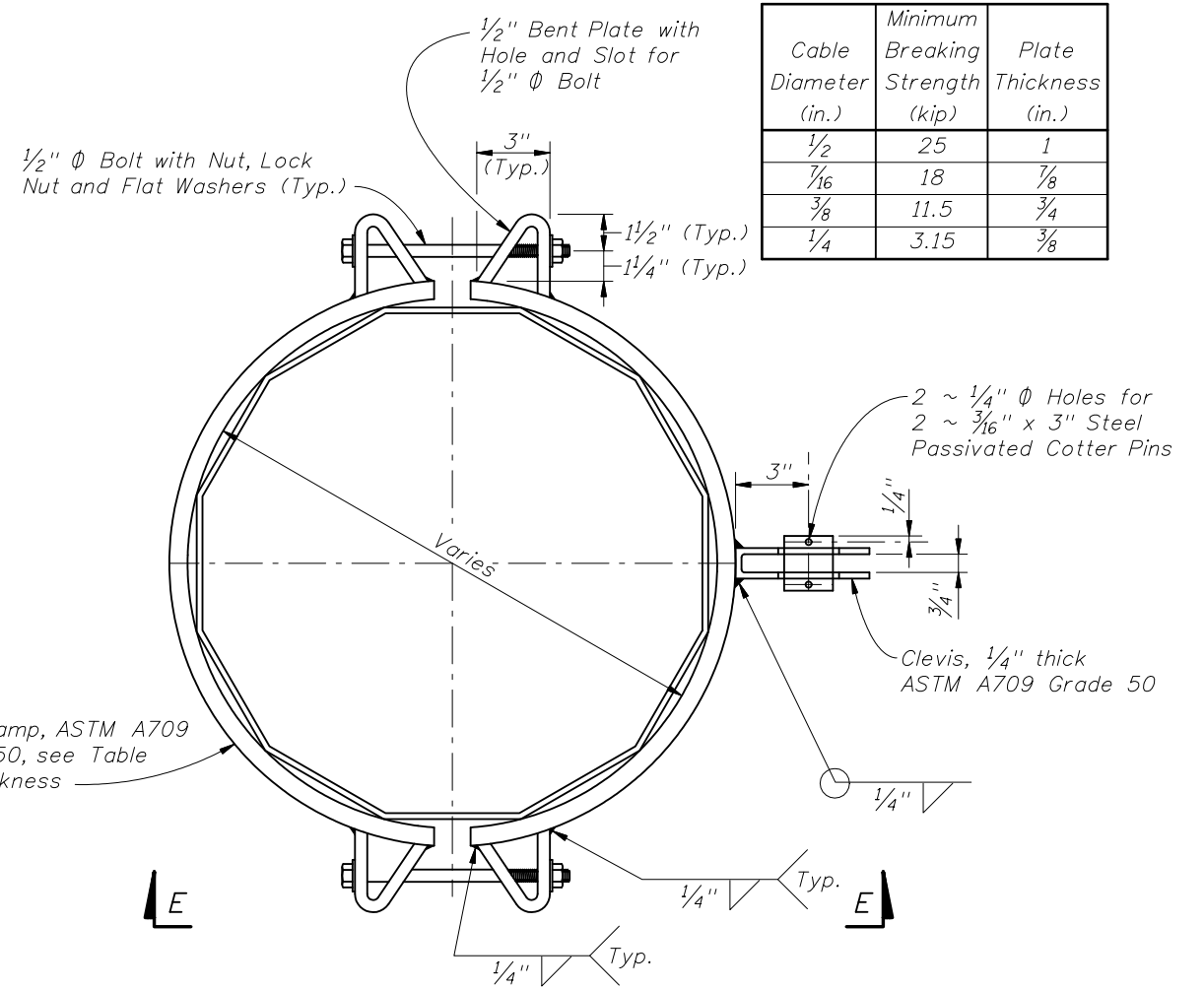


HAND HOLE FRAME

HAND HOLE COVER



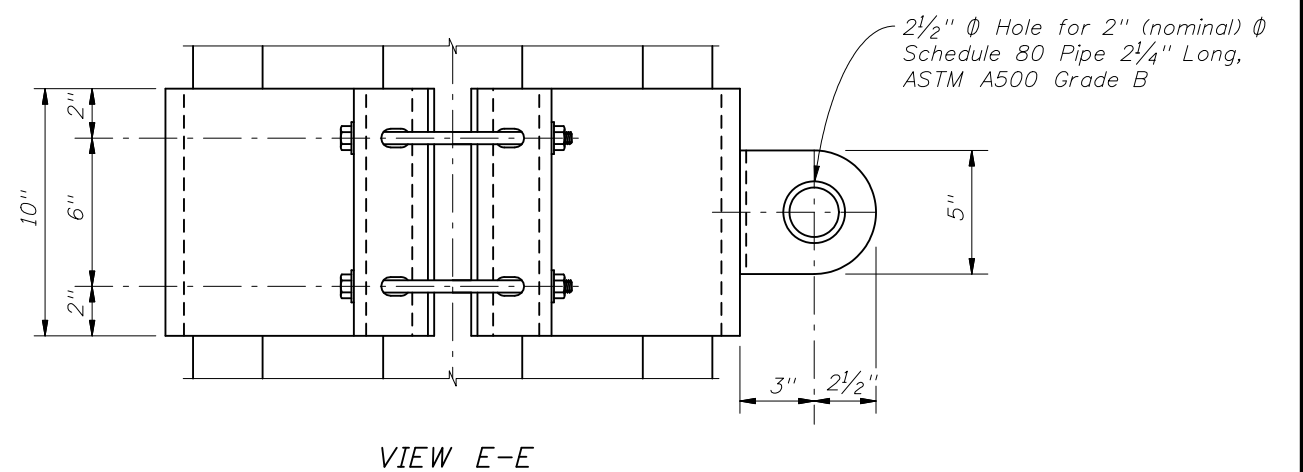
SECTION D-D (thru Hand Hole)



CATENARY AND MESSENGER WIRE CLAMPS

NOTE: Clamps have been sized for Design Cable Loads shown in the Table, and a Maximum Pole Diameter at the Clamp location of 2'-1".

Cable Diameter (in.)	Minimum Breaking Strength (kip)	Plate Thickness (in.)
1/2	25	1
7/16	18	7/8
3/8	11.5	3/4
1/4	3.15	3/8

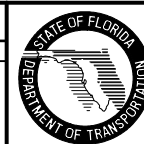


VIEW E-E

ATTACHMENT DETAILS

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
01/01/08	DYW	Changed note in VIEW E-E.			
07/01/08	DYW	Added Cable Clamp thickness and changed weld criteria.			
01/01/09	CBH	Changed clevis size.			



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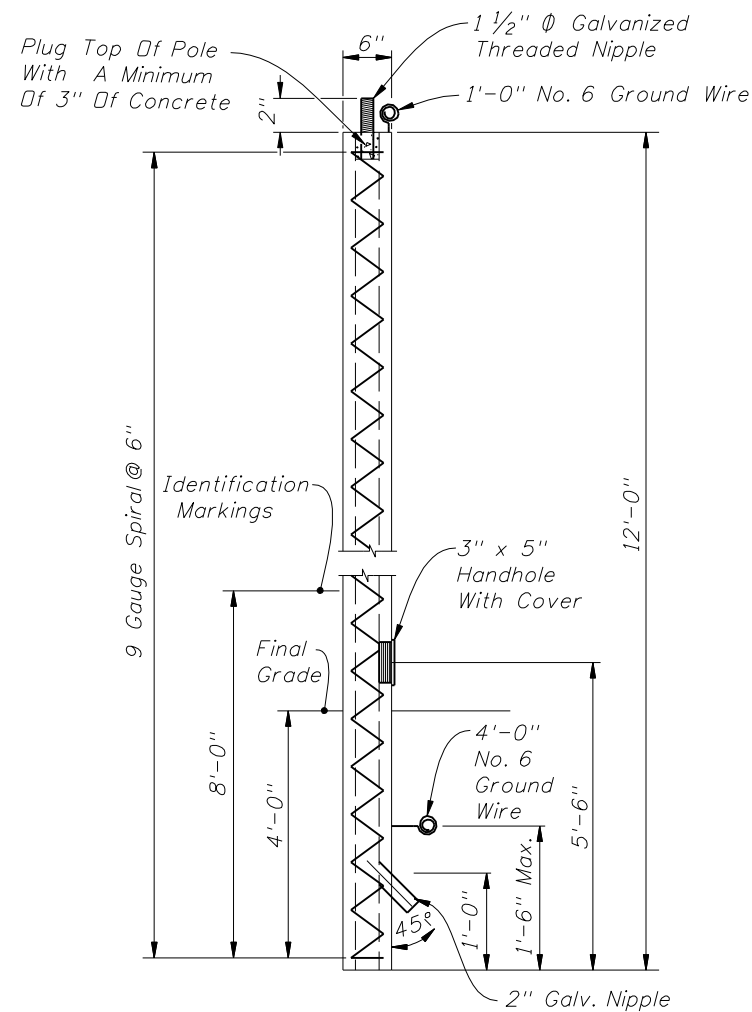
STEEL STRAIN POLE

Interim Date 01/01/09 Sheet No. 3 of 3

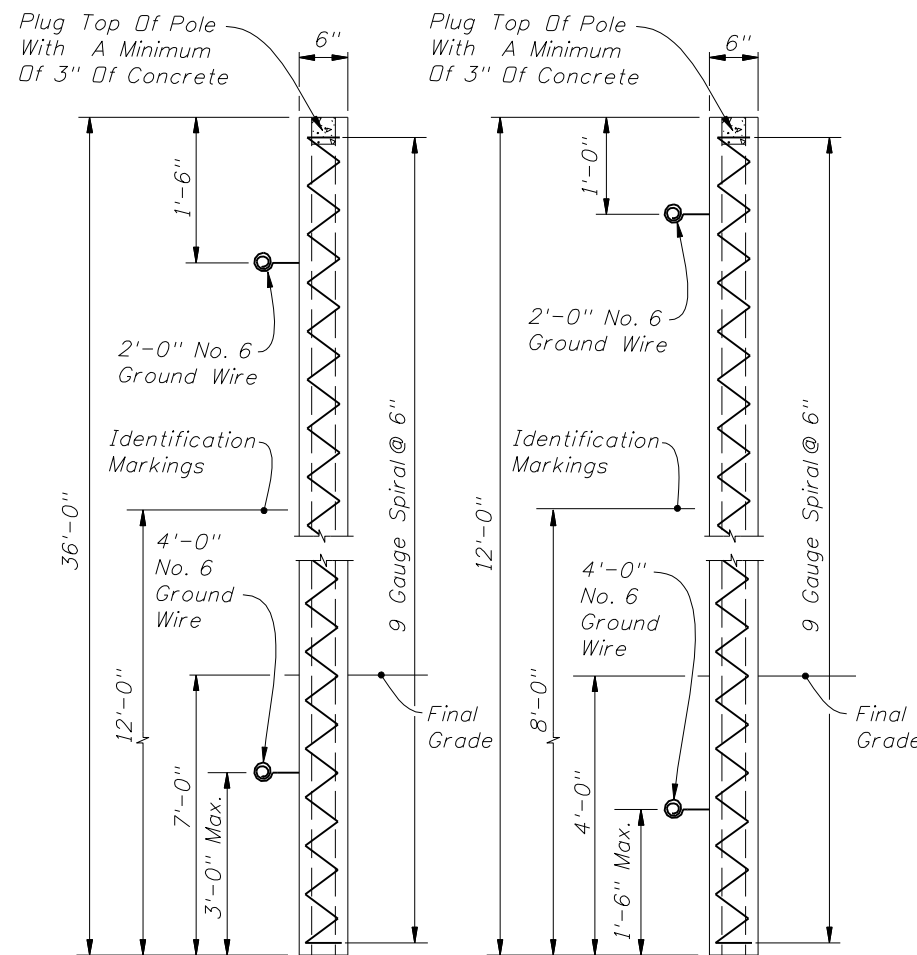
Index No. 17723

TYPE OF POLE	CONCRETE POLE **	
	SIZE AT TOP (T)	SHEAR REINFORCING
Type P-II	6" x 6"	9 Gauge Spiral @ 6"
Type P-III	6" x 6"	6 Gauge Spiral @ 6"
Type P-IV	8" x 8"	5 Gauge Spiral @ 6"
Type P-V	10" x 10"	5 Gauge Spiral @ 6"
Type P-VI	12" x 12"	5 Gauge Spiral @ 6"
Type P-VII	14" x 14"	5 Gauge Spiral @ 6"
Type P-VIII	16" x 16"	5 Gauge Spiral @ 6"

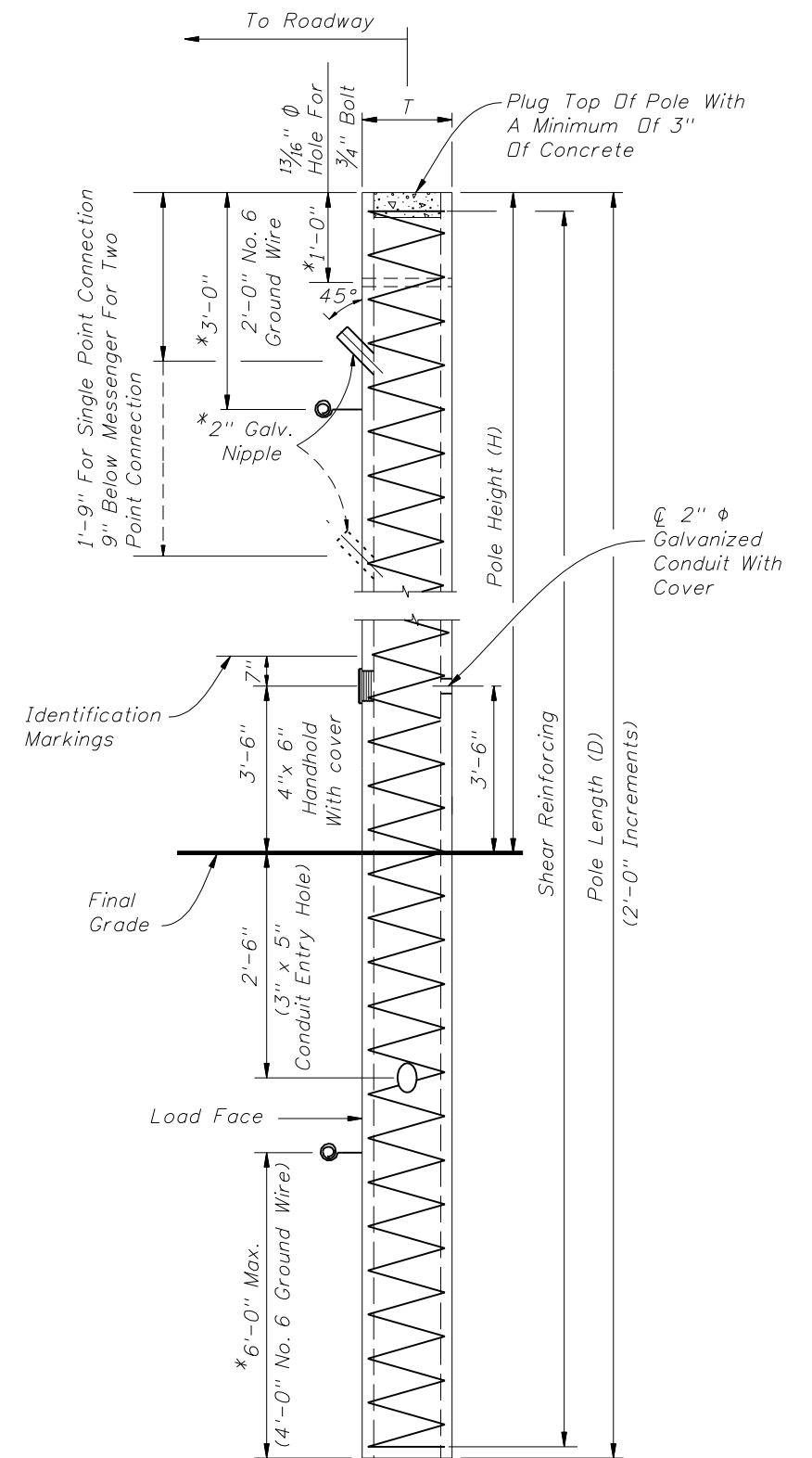
** Round poles require the same taper as square poles and top diameter not less than 1.4 times the top width (dimension "T") of a square pole.



TYPE P-II PEDESTAL POLE



TYPE P-II SERVICE POLE



TYPE P-III LIGHTING AND ITS POLES
TYPES P-IV THROUGH P-VIII STRAIN POLES

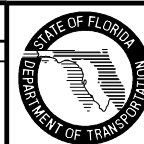
(For Installation, refer to Roadway and Traffic Design Standard, Index No. 17504)

* Do not apply these items to Type P-III Lighting and ITS Poles. Establish bolt hole locations, ground wire location and conduit location as shown in the plans.

Ref. Index 17900 and Sec. 744 for modifications to Type P-III poles used at traffic monitoring sites.

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
01/01/08	C.H.	Round pole note revised: pole height dimensions added to Types P-III through P-VIII. Copper Ground wire note changed.			
07/01/08	C.H.	Notes and pole detail titles revised.			
11/05/08	C.H.	Copper Ground wire note changed.			



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CONCRETE POLES

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DESIGN NOTES:

Design according to FDOT Structures Manual (current edition) and the 2001 edition of the AASHTO "Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals" with Interim.

Manufacturers seeking approval of a prestressed concrete pole for inclusion on the Qualified Products List must submit a QPL Products Evaluation Application along with design documentation and drawings showing the product meets all specified requirements of this Index.

Place the prestressing symmetrically about one axis. Supply a sufficient amount of prestressing to provide a calculated compressive stress of 1.0 ksi for Type P-II pole (12 ft) and 1.8 ksi for Type P-II (36 ft) pole and Type P-III pole at the top of pole after all losses.

Design concrete Strain poles using Class V Special with strength of 6 ksi minimum at 28 days and 4 ksi minimum at transfer of the Prestressing force.

Reinforcing steel shall be A615 Grade 60. Provide a minimum area of non-prestressed reinforcement equal to 0.33% of the concrete area.

Prestressed Strands shall be A416 Grade 270 stress relieved or low relaxation.

One turn required for spiral splices and two turns required at the top and bottom of poles. Spiral shall be manufactured from cold-drawn steel wire meeting the requirements of ASTM A82.

Use cover plates made of non-corrosive materials and attached to the pole using lead anchors or threaded inserts embedded in the pole and round head chrome plated screws.

Attach ground wires to the reinforcing steel in the pole as necessary to prevent the ground wire from being displaced during concreting operations.

Identify concrete poles as to pole manufacturer, Department's pole type, length and Qualified Product List qualification number by inset numerals 1" in height inscribed on the same face of the pole as the handhole and ground wire.

Provide a Class 3 Surface Finish as specified in Section 400-15.2.4 of the Standard Specifications.

Provide a minimum cover of 1".

Provide all poles with a total taper of 0.162 IN/FT.

INSTALLATION NOTES:

Attach span wire assemblies (consisting of the catenary wire, the messenger wire, and the tether wire) to the concrete poles in accordance with Section 634 of the Standard Specifications.

If a two point attachment is required by the plans, provide an eye bolt hole for the messenger wire, or field drill one at the location indicated in the plans. Field drill the eyebolt hole for the tether wire, when required, prior to installation.

Rake pole back from the span wire as necessary to achieve a final rake of $1/2 \pm 1/4$ inch per foot.

H (feet)	TYPE OF STRAIN POLE				
	P-IV (k-ft)	P-V (k-ft)	P-VI (k-ft)	P-VII (k-ft)	P-VIII (k-ft)
20	21	86	121	165	204
22	24	90	126	171	210
24	26	93	131	176	215
26	29	97	135	182	221
28	32	101	140	187	227
30	34	104	144	192	232
32	37	108	149	197	238
34	39	111	153	202	243
36	41	114	157	207	248
38	44	117	161	212	253
40	46	120	165	217	258
42	48	123	169	221	263
44	50	126	173	226	268
46	52	129	177	230	272
48	54	132	180	235	277
50	56	135	184	239	281

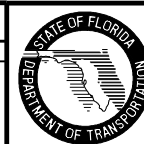
TABLE I shall be used for checking allowable stress in concrete for Dead Load. $MS \geq MDL$, where MDL = moment due to dead load only.

H (feet)	TYPE OF STRAIN POLE				
	P-IV (k-ft)	P-V (k-ft)	P-VI (k-ft)	P-VII (k-ft)	P-VIII (k-ft)
20	43	138	198	273	346
22	48	145	206	283	357
24	53	151	215	294	369
26	58	158	224	304	381
28	63	165	232	315	392
30	68	172	241	325	404
32	73	178	250	335	415
34	77	185	258	346	427
36	82	192	267	356	439
38	87	199	276	367	450
40	92	205	284	377	462
42	97	212	293	387	474
44	102	219	302	398	485
46	107	226	310	408	497
48	112	232	319	419	508
50	117	239	328	429	520

TABLE II shall be used for checking ultimate moment strength under factored loading combinations of dead load plus wind load, and is the Nominal Moment Strength (Mn) multiplied by Strength Reduction factor ($\phi = 0.9$) $\phi Mn \geq Mu = 1.3 (MDL + MWL)$, where MDL = moment due to dead load, and MWL = moment due to wind load.

REVISIONS

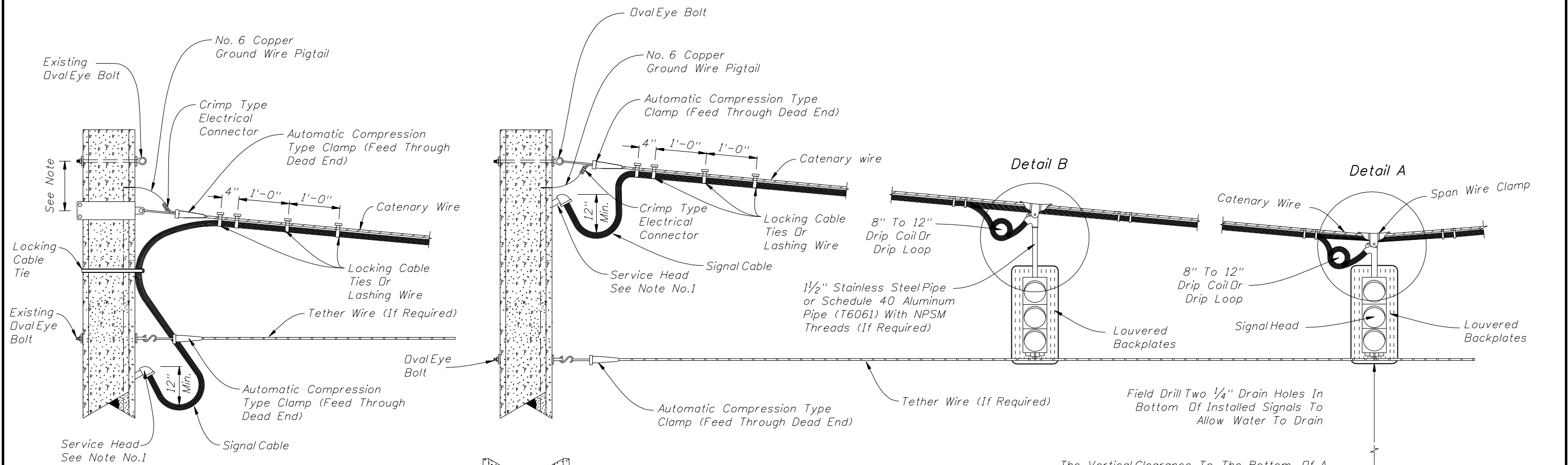
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
01/01/08	C.H.	D (feet) changed to H (feet) in both tables.			
07/01/08	C.H.	Notes revised and rearranged.			
11/05/08	C.H.	Notes revised total pole taper changed from 0.152 to 0.162 in/ft.			



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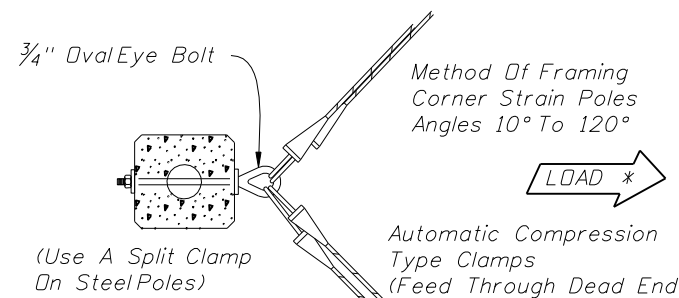
CONCRETE POLES

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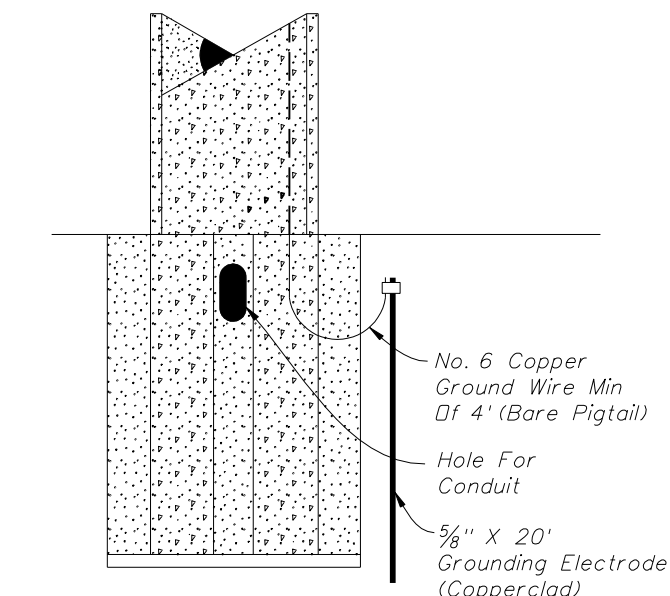


RETROFIT INSTALLATION

Note:
Clamp location shall be adjusted to compensate for reduced sag and vertical clearance to bottom of signal head.



* The load face of pole shall be perpendicular to load.



**PRESTRESSED CONCRETE POLE
NEW CONSTRUCTION**

Notes:

1. With the approval of the resident engineer, the service head hole for joint use poles may be drilled by the utility company at an angle of 90° but not less than 45° to the face of the pole.
2. Lashing wire should normally be used for distances of 12' or greater.
3. All hardware for signal attachment shall be stainless steel.
4. Meet all grounding requirements of Section 620 of the Standard Specifications.

Detail A Or B *
Balancer
Tri-Stud Or
Threaded
Adapter

Detail A or B
Disconnect Box

Detail A
Bottom Hub
Tri-Stud
With Hardware

Detail B *
Bottom Hub
1 1/2" NPSM
Threads

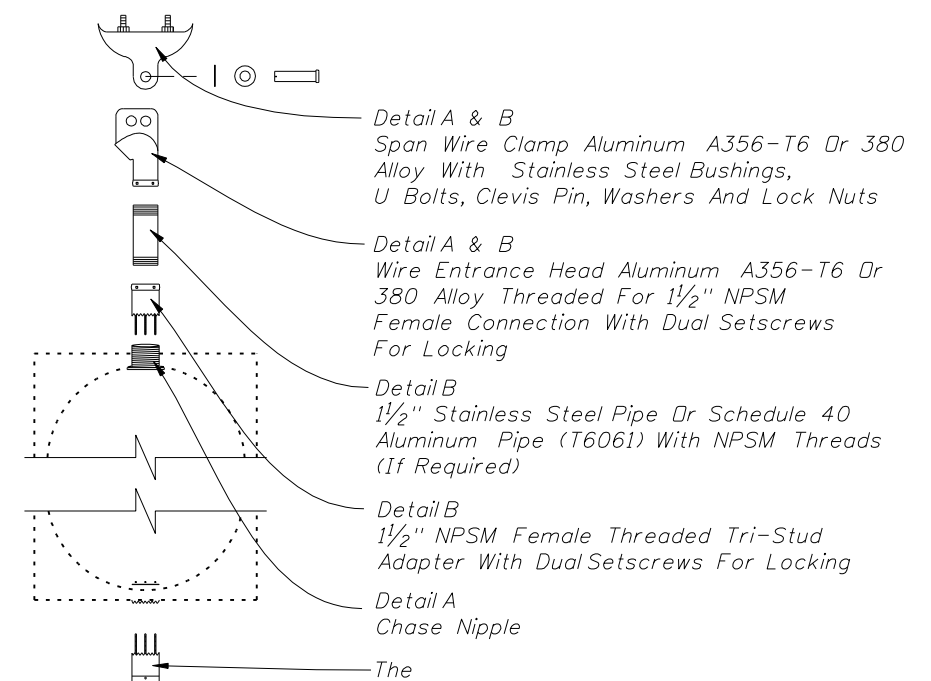
Detail B *
Stainless Steel Pipe
Or Schedule 40
Aluminum (T6061)
1 1/2" NPSM Threads

Detail B
Female Threaded
Tri-Stud Adapter

Detail A or B
Tether Clamp

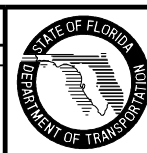
* For long pipe hangers a wire entrance head may be substituted for balancer and the drop pipe installed above the disconnect box.

The Vertical Clearance To The Bottom Of A Vertical Or Horizontal Vehicular Signal Head Shall Not Be Less Than 17'-6", And The Maximum Height Shall Be 19' for Vertical Heads.



SINGLE POINT ATTACHMENT

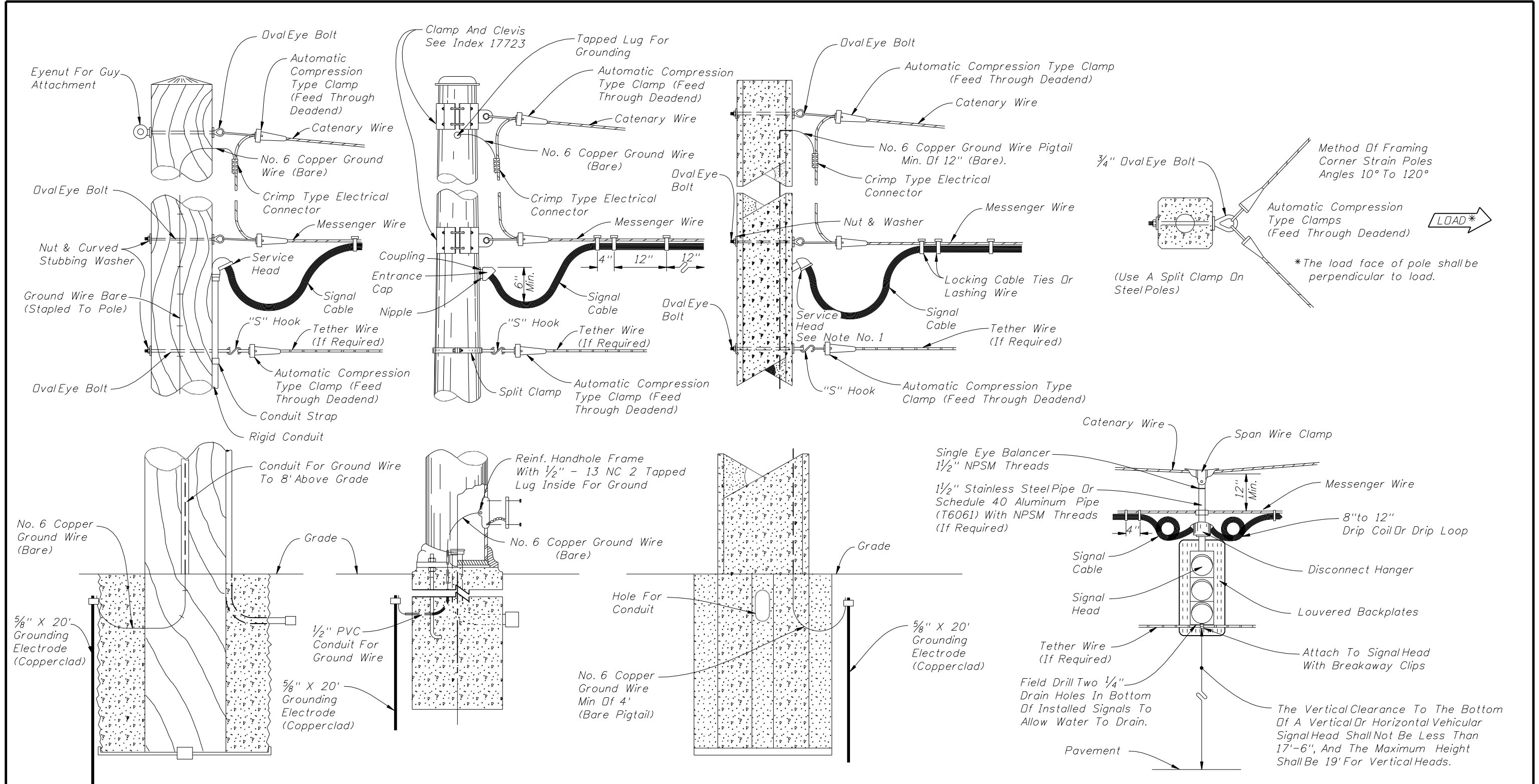
REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
07/01/08	C.H.	Schedule 40 aluminum pipe (T6061) added as alternate to stainless steel pipe on assembly details and signal head notes.			
11/05/08	C.H.	Back Plates added to Signal head Detail. Vertical Clearance note Revised.			



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**SIGNAL CABLE & SPAN WIRE
INSTALLATION DETAILS**

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WOOD POLE

STEEL POLE

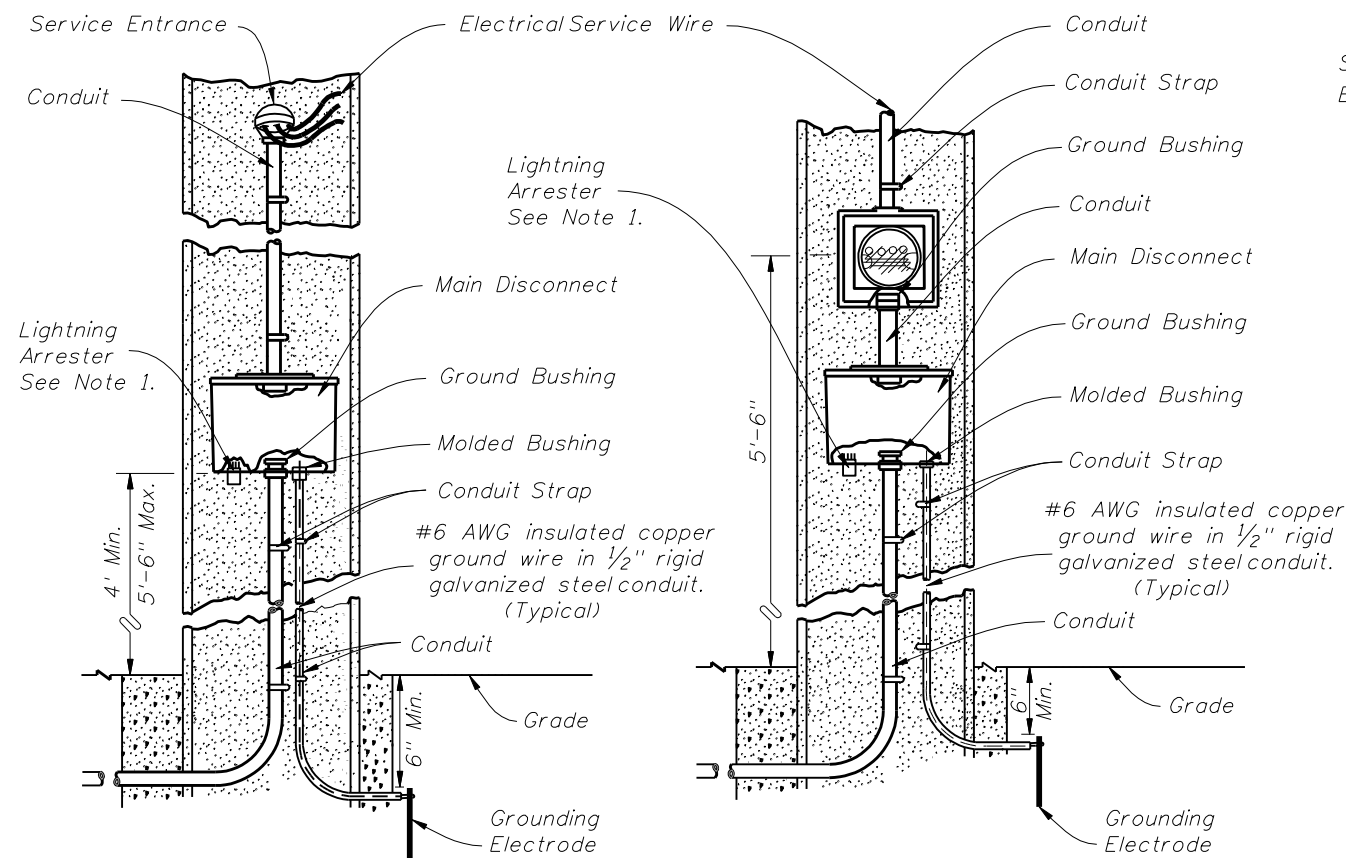
PRESTRESSED CONCRETE POLE

Notes:

1. With the approval of the resident engineer, the service head hole for joint use poles may be drilled by the utility company at an angle of 90° but not less than 45° to the face of the pole.
2. Lashing wire should normally be used for distances of 12' or greater.
3. The overlapped connection of adjustable hangers shall use a minimum of 2 bolts with a minimum spacing of 2" between bolts.
4. Meet all grounding requirements of Section 620 of the Standard Specifications.

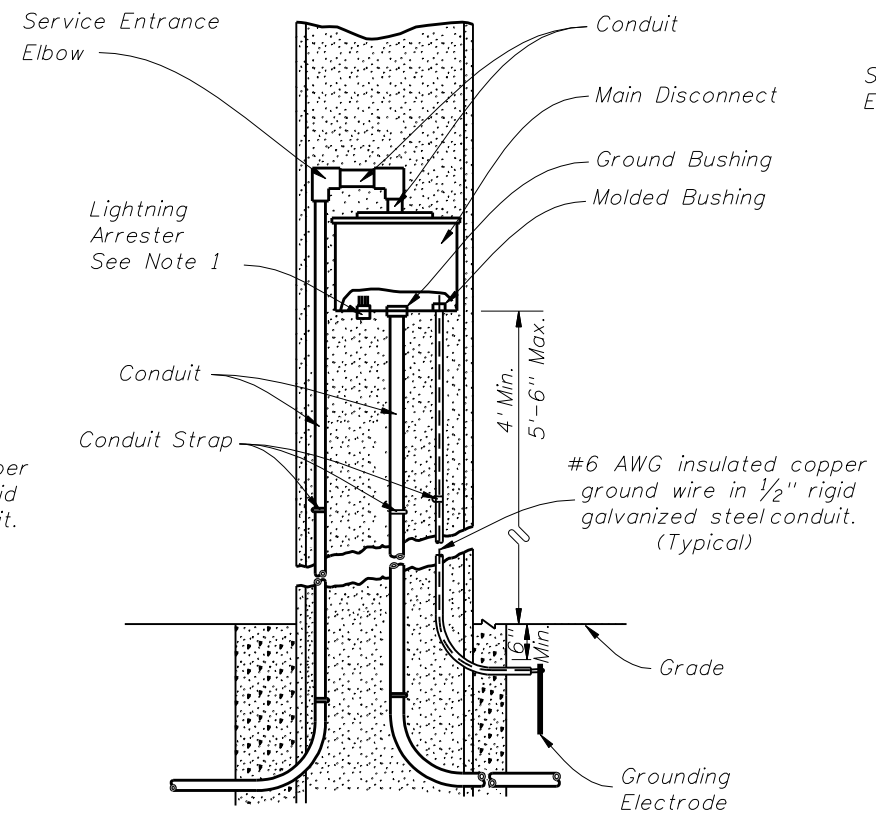
TWO POINT ATTACHMENT

REVISIONS			REVISIONS			STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION	2008 Interim Design Standard		Interim Date	Sheet No.
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION		SIGNAL CABLE & SPAN WIRE INSTALLATION DETAILS		01/01/09	2 of 2
07/01/08	C.H.	Schedule 40 aluminum pipe (T6061) added as alternate to stainless steel pipe on assembly details and signal head notes.							Index No.	
07/01/08	C.H.	Back Plates added to Signal Head details. Vertical Clearance note Revised.							17727	

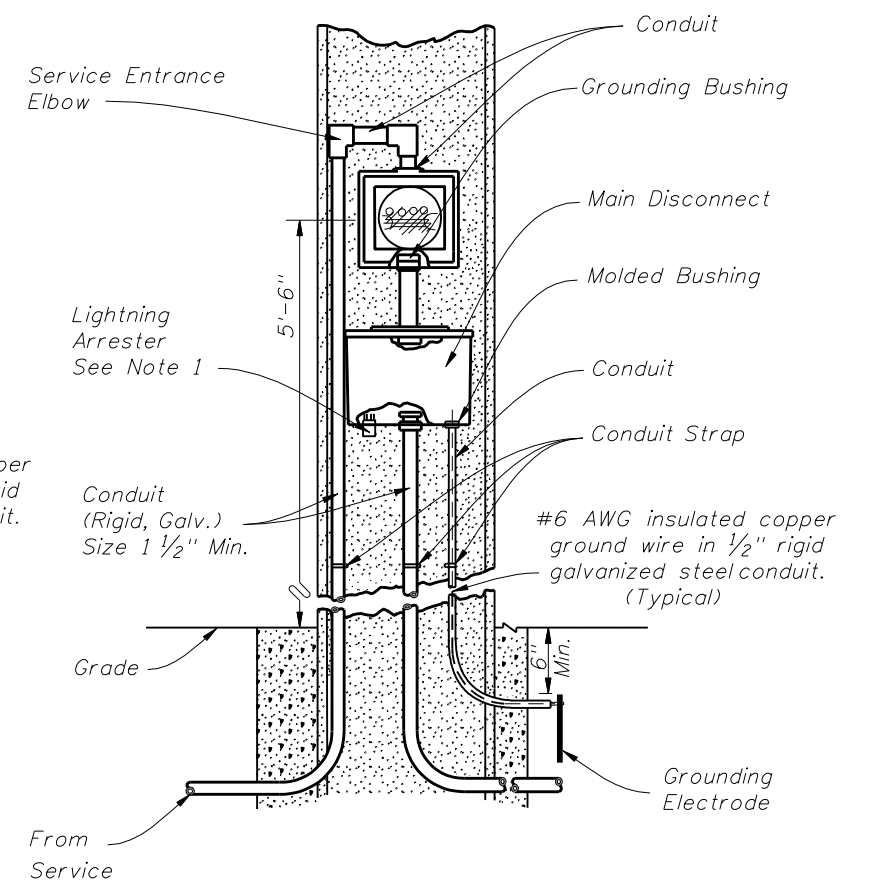


AERIAL FEED
(NO METER USED)
FIGURE A

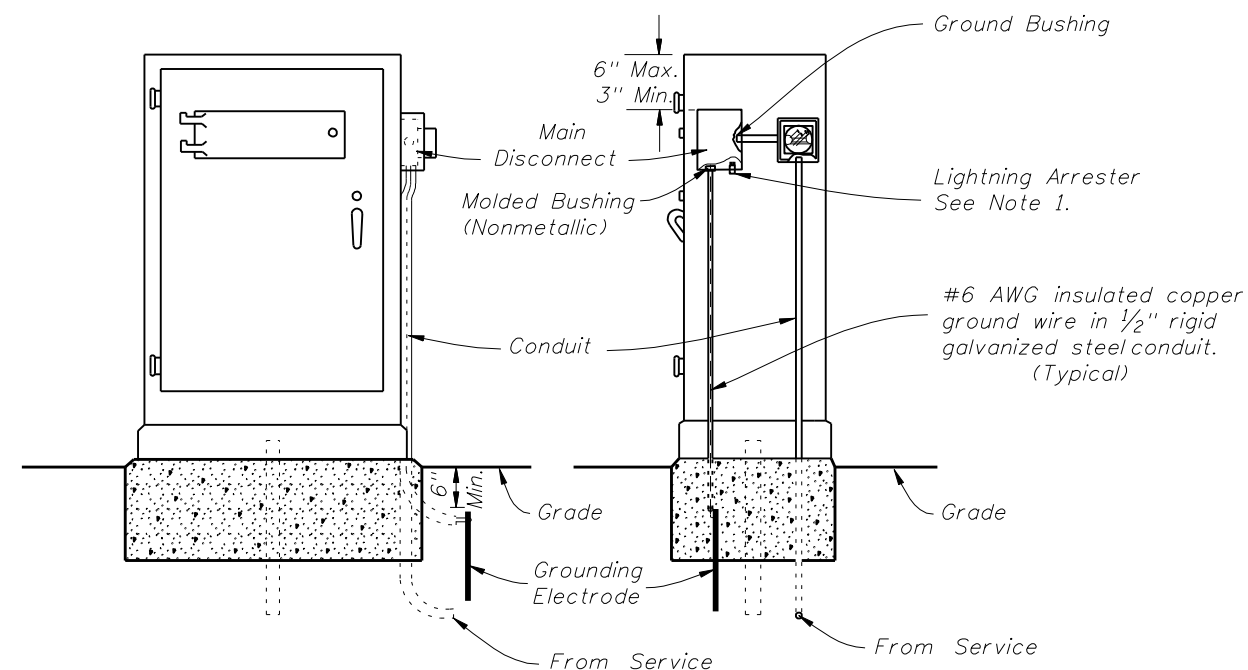
AERIAL FEED
(METER USED)
FIGURE B



UNDERGROUND FEED
(NO METER USED)
FIGURE C



TYPE "B" UNDERGROUND FEED
(METER USED)
FIGURE D



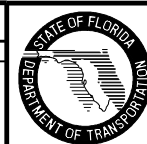
UNDERGROUND CABINET MOUNTED
(METER USED)
FIGURE E

NOTES:

1. The lightning arrester can be located on the side or bottom of the main disconnect enclosure at the Contractor's Option.
2. Liquidtight flexible conduit is approved for use from the electrical disconnect to the cabinet when both are installed on the same pole.
3. Bond all elements together to form an Intersection Grounding Network in accordance with Section 620 of the Department's current Standard Specifications for Road and Bridge Construction. The bond wire shall be run in conduit with the Electrical Service Wire or Signal Cable.
4. Meet all grounding requirements of Section 620 of the Standard Specifications.
5. The Main Disconnect shall be lockable by padlock and four keys provided to the maintaining agency. The door shall have a minimum of three hinges and be lockable. No screws to be used to attach door.
6. The Main Disconnect shall be Nema 3R or better.

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
11/05/08	C.H.	Notes 5 and 6 added to notes.			



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ELECTRIC POWER SERVICE

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POLE SELECTION TABLE - SINGLE ARM - WITH & WITHOUT LUMINAIRE

Arm Type	D1	D3	D5	D6	D7
Pole Type	S1 & S21 Lum	S2 & S22 Lum	S3 & S23 Lum	S4 & S24 Lum	S6

POLE SELECTION TABLE - DOUBLE ARM - WITHOUT LUMINAIRE

Arm Type	D1 - D1	D3 - D1	D5 - D2	D6 - D2	D4 - D4	D5 - D4	D6 - D4	D5 - D5	D6 - D5	D6 - D6
Pole Type	S1	S2	S3	S4	S3	S4	S4	S4	S4	S5

Arm 1 is listed first

ARM DESIGN TABLE - ALL CASES

ARM TYPE	ARM LENGTH	MAST ARM				ARM EXTENSION				ARM CONNECTION & WELDS				
		FA/SA (ft)	FB/SB (in)	FC/SC (in)	FD/SD (in)	FE/SE (ft)	FF/SF (in)	FG/SG (in)	FH/SH (in)	HT (in)	FJ/SJ (in)	FK/SK (in)	FM/SM (in)	FQ/SQ (in)
D1	36'-0"	36	8.96	14	0.1793	-	-	-	-	20	25	2.5	0.125	0.313
D2	36'-0"	36	8.96	14	0.1793	-	-	-	-	30	36	3	0.125	0.313
D3	46'-0"	36.3	8.92	14	0.1793	11.7	13.36	15	0.313	20	25	2.5	0.25	0.375
D4	46'-0"	36.3	8.92	14	0.1793	11.7	13.36	15	0.313	30	36	3	0.25	0.375
D5	60'-0"	36	7.96	13	0.1793	26	12.36	16	0.375	30	36	3	0.313	0.563
D6	70'-6"	39.4	9.49	15	0.1793	33.1	14.37	19	0.375	30	36	3	0.313	0.563
D7	78'-0"	40	8.44	14	0.1793	40.0	13.40	19	0.375	30	34	3	0.313	0.625

Arm Camber Angle = 2 degrees

POLE, CONNECTION AND SHAFT DESIGN TABLE - SINGLE & DOUBLE ARM

POLE TYPE	UA(ft)	UC(in)	UD(in)	UE(in)	UG(ft)	UPRIGHT BASE CONNECTION						CONNECTION PLATE DATA								DRILLED SHAFT DATA					
						No. Bolts	BA (in)	BB (in)	BC (in)	BD (in)	BE (in)	BF (in)	HT (in)	FJ/SJ (in)	FL/SL (in)	FN/SN (in)	FO/SD (in)	FP/SP (in)	FR/SR (in)	FS/SS (in)	FT/ST (in)	DA (ft)	DB (ft)	RA	RB
S1	24	12.64	16	0.375	-	6	30	1.75	1.75	0.375	0.313	36	20	25	0.75	0.438	15.5	1	2	8	0.438	13	3.5	11	10
S2	24	14.64	18	0.375	-	6	32	1.75	1.75	0.375	0.313	36	20	25	0.75	0.438	15.5	1	2	8	0.438	13	4	11	14
S3	24	17.64	21	0.375	-	6	37	1.75	2	0.375	0.313	40	30	36	0.75	0.438	22	1.25	2.5	12.5	0.438	15	4	11	14
S4	24	22.64	26	0.375	-	6	42	1.75	2	0.375	0.313	40	30	36	0.75	0.438	22	1.25	2	12.5	0.438	17	4.5	11	16
S5	24	23.64	27	0.375	-	6	45	1.75	2.25	0.375	0.313	45	30	36	0.75	0.438	22	1.25	2	12.5	0.438	19	4.5	11	16
S6	24	21.64	25	0.375	-	6	41	1.75	2	0.375	0.313	40	30	34	0.75	0.5	16.5	1.25	2	12.5	0.5	15	4.5	11	16
S21 Lum	39	10.54	16	0.375	37.5	6	30	1.75	1.75	0.375	0.313	40	20	25	0.75	0.438	11.5	1	2	8	0.438	13	3.5	11	10
S22 Lum	39	12.54	18	0.375	37.5	6	32	1.75	1.75	0.375	0.313	40	20	25	0.75	0.438	12.5	1	2	8	0.438	13	4	11	14
S23 Lum	39	15.54	21	0.375	37.5	6	37	1.75	2	0.375	0.313	40	30	36	0.75	0.438	15	1.25	2.5	12.5	0.438	14	4	11	14
S24 Lum	39	20.54	26	0.375	37.5	6	42	1.75	2	0.375	0.313	40	30	36	0.75	0.438	17	1.25	2	12.5	0.438	15	4.5	11	16

LUMINAIRE AND LUMINAIRE CONNECTION

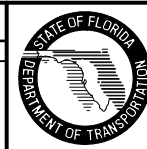
LA(ft)	LB(ft)	LC(in)	LD(in)	LE	LF(ft)	LG(in)	LH(in)	LJ(in)	LK(in)	LL(deg)	UG(ft)
40	10	3	0.125	0.5	8	0.5	0.75	0.25	0.25	0	37.5

NOTES:

1. Work this Index with Index No. 17745.
2. Standard Mast Arm "D" Assemblies are designed to Loading Trees as indicated in Plans Preparation Manual.
3. Design Speed = 150 mph with Signal Backplates

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
01/01/08	DYW	Updated assembly dimensions.			
01/01/09	CBH	Changed drilled shaft reinforcing.			



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STANDARD MAST ARM "D" ASSEMBLIES

Interim Date	Sheet No.
01/01/09	1 of 3
Index No.	
17743	

POLE SELECTION TABLE - SINGLE ARM - WITH & WITHOUT LUMINAIRE					
Arm Type	E1	E3	E5	E6	E7
Pole Type	T1 & T21 Lum	T2 & T22 Lum	T3 & T23 Lum	T4 & T24 Lum	T6

POLE SELECTION TABLE - DOUBLE ARM - WITHOUT LUMINAIRE										
Arm Type	E1 - E1	E3 - E1	E5 - E2	E6 - E2	E4 - E4	E5 - E4	E6 - E4	E5 - E5	E6 - E5	E6 - E6
Pole Type	T1	T2	T3	T4	T3	T4	T4	T4	T4	T5

Arm 1 is listed first

ARM DESIGN TABLE - ALL CASES														
ARM TYPE	ARM LENGTH	MAST ARM				ARM EXTENSION				ARM CONNECTION & WELDS				
		FA/SA (ft)	FB/SB (in)	FC/SC (in)	FD/SD (in)	FE/SE (ft)	FF/SF (in)	FG/SG (in)	FH/SH (in)	HT (in)	FJ/SJ (in)	FK/SK (in)	FM/SM (in)	FQ/SQ (in)
E1	36'-0"	36.0	5.96	11	0.25	-	-	-	-	22	22	2	0.187	0.313
E2	36'-0"	36.0	5.96	11	0.25	-	-	-	-	30	32	2.75	0.187	0.313
E3	46'-0"	36.3	7.06	12.14	0.25	11.7	11.36	13	0.313	22	22	2	0.25	0.375
E4	46'-0"	36.3	7.06	12.14	0.25	11.7	11.36	13	0.313	30	32	2.75	0.25	0.375
E5	60'-0"	36.0	6.10	11.14	0.25	26	10.36	14	0.375	30	32	2.75	0.313	0.5
E6	70'-6"	39.4	6.63	12.15	0.25	33.1	11.37	16	0.375	30	32	2.75	0.313	0.563
E7	78'-0"	40.0	7.50	13.10	0.1793	40	12.40	18	0.375	30	32	2.5	0.313	0.563

Arm Camber Angle = 2 degrees

POLE, CONNECTION AND SHAFT DESIGN TABLE - SINGLE & DOUBLE ARM																									
POLE TYPE	UA(ft)	UC(in)	UD(in)	UE(in)	UG(ft)	UPRIGHT BASE CONNECTION						CONNECTION PLATE DATA								DRILLED SHAFT DATA					
						No. Bolts	BA (in)	BB (in)	BC (in)	BD (in)	BE (in)	BF (in)	HT (in)	FJ/SJ (in)	FL/SL (in)	FN/SN (in)	FO/SD (in)	FP/SP (in)	FR/SR (in)	FS/SS (in)	FT/ST (in)	DA (ft)	DB (ft)	RA	RB
T1	24	10.64	14	0.375	-	6	26	1.75	1.5	0.375	0.313	36	22	22	0.5	0.375	14	1	2.0	9	0.375	12	3.5	11	10
T2	24	12.64	16	0.375	-	6	28	1.75	1.5	0.375	0.313	36	22	22	0.5	0.375	14	1	2.0	9	0.375	14	3.5	11	10
T3	24	15.64	19	0.375	-	6	35	1.75	2	0.375	0.313	40	30	32	0.75	0.375	19.5	1.25	2.0	12.5	0.375	15	4	11	14
T4	24	18.64	22	0.5	-	6	38	1.75	2	0.5	0.438	40	30	32	0.75	0.375	19.5	1.25	2.0	12.5	0.375	19	4	11	14
T5	24	18.64	22	0.5	-	6	38	1.75	2	0.5	0.438	40	30	32	0.75	0.375	19.5	1.25	2.0	12.5	0.375	21	4	11	14
T6	24	18.64	22	0.375	-	6	38	1.75	2	0.375	0.313	40	30	32	0.75	0.438	15	1.25	2.0	12.5	0.438	18	4	11	14
T21 Lum	39	8.54	14	0.375	37.5	6	26	1.75	1.5	0.375	0.313	40	22	22	0.5	0.375	10	1	2.0	9	0.375	12	3.5	11	10
T22 Lum	39	10.54	16	0.375	37.5	6	30	1.75	1.75	0.375	0.313	40	22	22	0.5	0.375	11	1	2.0	9	0.375	13	3.5	11	10
T23 Lum	39	13.54	19	0.375	37.5	6	35	1.75	2	0.375	0.313	40	30	32	0.75	0.375	13	1.25	2.25	12.5	0.375	14	4	11	14
T24 Lum	39	16.54	22	0.375	37.5	6	38	1.75	2	0.375	0.313	40	30	32	0.75	0.375	15	1.25	2.0	12.5	0.375	17	4	11	14

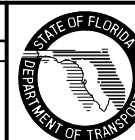
LUMINAIRE AND LUMINAIRE CONNECTION											
LA(ft)	LB(ft)	LC(in)	LD(in)	LE	LF(ft)	LG(in)	LH(in)	LJ(in)	LK(in)	LL(deg)	UG(ft)
40	10	3	0.125	0.5	8	0.5	0.75	0.25	0.25	0	37.5

NOTES:

1. Work this Index with Index No. 17745.
2. Standard Mast Arm "E" Assemblies are designed to Loading Trees as indicated in Plans Preparation Manual.
3. Design Speed = 130 mph with Signal Backplates or 150 mph without Signal Backplates

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
01/01/08	DYW	Updated assembly dimensions.			
07/01/08	DYW	Updated assembly dimensions.			
01/01/09	CBH	Changed drilled shaft reinforcing. Changed T3-BF.			



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STANDARD MAST ARM "E" ASSEMBLIES

Interim Date	Sheet No.
01/01/09	2 of 3
Index No.	
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POLE SELECTION TABLE - SINGLE ARM - WITH & WITHOUT LUMINAIRE					
Arm Type	F1	F3	F5	F6	F7
Pole Type	W1 & W21 Lum	W2 & W22 Lum	W3 & W23 Lum	W4 & W24 Lum	W6

POLE SELECTION TABLE - DOUBLE ARM - WITHOUT LUMINAIRE										
Arm Type	F1 - F1	F3 - F1	F5 - F2	F6 - F2	F4 - F4	F5 - F4	F6 - F4	F5 - F5	F6 - F5	F6 - F6
Pole Type	W1	W2	W3	W4	W3	W4	W4	W4	W4	W5

Arm 1 is listed first

ARM DESIGN TABLE - ALL CASES														
ARM TYPE	ARM LENGTH	MAST ARM				ARM EXTENSION				ARM CONNECTION & WELDS				
		FA/SA (ft)	FB/SB (in)	FC/SC (in)	FD/SD (in)	FE/SE (ft)	FF/SF (in)	FG/SG (in)	FH/SH (in)	HT (in)	FJ/SJ (in)	FK/SK (in)	FM/SM (in)	FQ/SQ (in)
F1	36'-0"	36	5.96	11	0.1793	-	-	-	-	20	20	2	0.125	0.25
F2	36'-0"	36	5.96	11	0.1793	-	-	-	-	29	29	2.25	0.125	0.25
F3	46'-0"	36.3	5.92	11	0.1793	11.7	10.36	12	0.25	20	20	2	0.188	0.313
F4	46'-0"	36.3	5.92	11	0.1793	11.7	10.36	12	0.25	29	29	2.25	0.188	0.313
F5	60'-0"	36	5.96	11	0.1793	26.0	10.36	14	0.313	29	29	2.25	0.25	0.375
F6	70'-6"	39.4	5.49	11	0.1793	33.1	10.37	15	0.313	29	29	2.25	0.25	0.438
F7	78'-0"	40	6.43	12	0.1793	40.0	11.26	17	0.313	29	29	2.25	0.25	0.438

POLE, CONNECTION AND SHAFT DESIGN TABLE - SINGLE & DOUBLE ARM																									
POLE TYPE	UA(ft)	UC(in)	UD(in)	UE(in)	UG(ft)	UPRIGHT BASE CONNECTION							CONNECTION PLATE DATA								DRILLED SHAFT DATA				
						No. Bolts	BA (in)	BB (in)	BC (in)	BD (in)	BE (in)	BF (in)	HT (in)	FJ/SJ (in)	FL/SL (in)	FN/SN (in)	FO/SD (in)	FP/SP (in)	FR/SR (in)	FS/SS (in)	FT/ST (in)	DA (ft)	DB (ft)	RA	RB
W1	24.0	9.64	13	0.375	-	6	25	1.5	1.5	0.375	0.313	36	20	20	0.5	0.313	13	0.75	2.0	8.5	0.313	12	3.5	11	10
W2	24.0	11.64	15	0.375	-	6	27	1.5	1.5	0.375	0.313	36	20	20	0.5	0.313	14	0.75	2.0	8.5	0.313	14	3.5	11	10
W3	24.0	14.64	18	0.375	-	6	32	1.5	1.75	0.375	0.313	36	29	29	0.5	0.313	17.5	1	2.0	12.5	0.313	15	4	11	14
W4	24.0	17.64	21	0.375	-	6	35	1.5	1.75	0.375	0.313	36	29	29	0.5	0.313	17.5	1	2.0	12.5	0.313	19	4	11	14
W5	24.0	17.64	21	0.375	-	6	35	1.5	1.75	0.375	0.313	36	29	29	0.5	0.313	17.5	1	2.0	12.5	0.313	21	4	11	14
W6	24.0	17.64	21	0.375	-	6	35	1.5	1.75	0.375	0.313	36	29	29	0.5	0.375	14	1.25	2.0	12	0.375	18	4	11	14
W21 Lum	39.0	7.54	13	0.375	37.5	6	25	1.5	1.5	0.375	0.313	36	20	20	0.5	0.313	9	0.75	2.0	8.5	0.313	10	3.5	11	10
W22 Lum	39.0	9.54	15	0.375	37.5	6	27	1.5	1.5	0.375	0.313	36	20	20	0.5	0.313	10	0.75	2.0	8.5	0.313	13	3.5	11	10
W23 Lum	39.0	12.54	18	0.375	37.5	6	32	1.5	1.75	0.375	0.313	36	29	29	0.5	0.313	11.5	1	2.0	12.5	0.313	14	4	11	14
W24 Lum	39.0	15.54	21	0.375	37.5	6	35	1.5	1.75	0.375	0.313	36	29	29	0.5	0.313	13	1	2.0	12.5	0.313	17	4	11	14

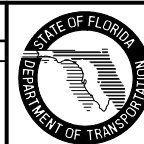
LUMINAIRE AND LUMINAIRE CONNECTION											
LA(ft)	LB(ft)	LC(in)	LD(in)	LE	LF(ft)	LG(in)	LH(in)	LJ(in)	LK(in)	LL(deg)	UG(ft)
40	10	3	0.125	0.5	8	0.5	0.75	0.25	0.25	0	37.5

NOTES:

1. Work this Index with Index No. 17745.
2. Standard Mast Arm "F" Assemblies are designed to Loading Trees as indicated in Plans Preparation Manual.
3. Design Speed = 110 mph with SignalBackplates or 130 mph without SignalBackplates.

REVISIONS

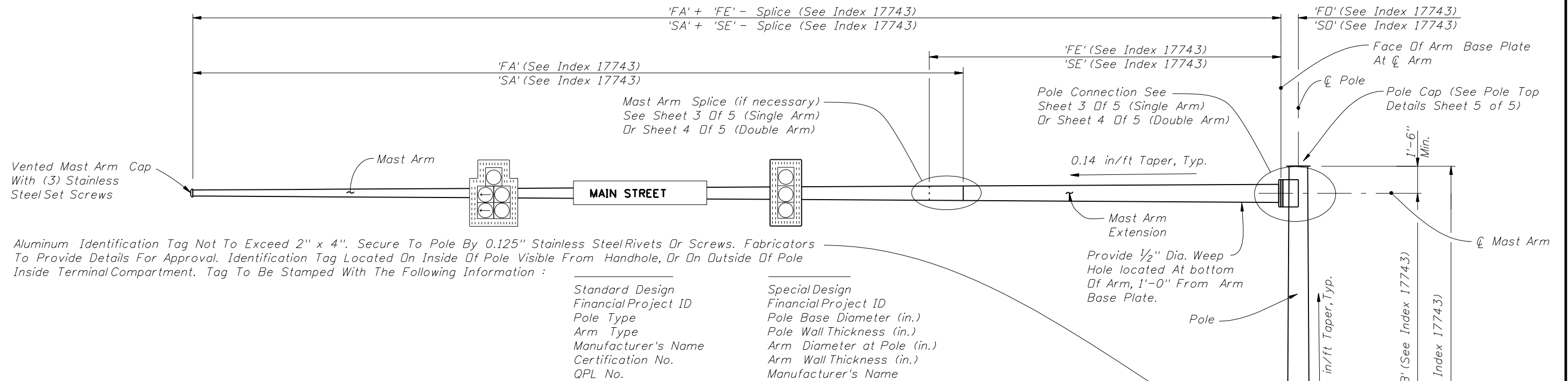
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
01/01/08	DYW	Updated assembly dimensions.			
07/01/08	DYW	Updated assembly dimensions.			
01/01/09	CBH	Changed drilled shaft reinforcing.			



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STANDARD MAST ARM "F" ASSEMBLIES

Interim Date	Sheet No.
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Aluminum Identification Tag Not To Exceed 2" x 4". Secure To Pole By 0.125" Stainless Steel Rivets Or Screws. Fabricators To Provide Details For Approval. Identification Tag Located On Inside Of Pole Visible From Handhole, Or On Outside Of Pole Inside Terminal Compartment. Tag To Be Stamped With The Following Information :

Standard Design	Special Design
Financial Project ID	Financial Project ID
Pole Type	Pole Base Diameter (in.)
Arm Type	Pole Wall Thickness (in.)
Manufacturer's Name	Arm Diameter at Pole (in.)
Certification No.	Arm Wall Thickness (in.)
QPL No.	Manufacturer's Name

MAST ARM ASSEMBLIES GENERAL NOTES

1) Signal Structure Materials shall be as follows:

- Poles & Mast Arms → ASTM A1011 Grade 50, 55, 60 or 65 (less than 1/4") 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)
- Steel Plates → ASTM A36
- Weld Metal → E70XX
- Bolts (except Anchor Bolts) → ASTM A325 Type 1
- Anchor Bolts → ASTM F1554 Grade 55 ksi
- Nuts for Anchor Bolts → ASTM A563 Grade A Heavy Hex
- Washers for Anchor Bolts → ASTM F436 Type 1
- Handhole Frame → ASTM A709 Grade 36 ksi or ASTM A36
- Handhole Cover → ASTM A1011 Grade 50, 55, 60 or 65 ksi
- Caps → ASTM A1011 Grade 50, 55, 60 or 65 ksi or ASTM B209
- Nut Covers → ASTM B26 (319-F)
- Stainless Steel Screws → AISI Type 316
- Threaded Bars/Studs → ASTM A36 or ASTM A307

2) Reinforcing Steel shall be ASTM A615 Grade 60 ksi.

3) Concrete shall be Class IV (Drilled Shaft) with a minimum 28-day compressive strength of 4,000 psi for all environmental classifications.

4) All welding shall conform to American Welding Society Structural Welding Code (Steel) ANSI/AWS D1.1 (current edition).

5) All steel items shall be galvanized as follows:
 All Nuts, Bolts, Washers and Threaded Bars/Studs → F2329
 All other steel items (including Pole & Mast Arm) → ASTM A123

6) Locate handhole 180° from arm on single arm poles or 180° from first arm of double arm poles or see special instructions on Mast Arm Tabulation Sheet.

7) Except for Anchor Bolts, all bolt hole diameters shall be equal to the bolt diameter plus 1/16", prior to galvanizing. Hole diameters for Anchor Bolts shall not exceed the bolt diameter plus 1/2".

8) Sign Panels and Signals attached to the Mast Arm shall be centered in elevation on the arm. Sign Panels shall be aluminum. Wire access holes shall not exceed 1 1/2" in diameter.

9) Mast Arms and Poles shall be tapered with the diameter changing at a rate of 0.14 inch per foot.

10) The Pole shall be installed vertically. Camber shall be accounted for in the Mast Arm connection as detailed.

11) If a Mast Arm damping device is required by the Engineer, it shall be installed within eight feet of the Mast Arm tip.

12) Design according to FDOT Structures Manual (current edition). Alternate Designs for Special Mast Arm Assemblies are not allowed.

13) Provide "J", "S" or "C"-Hook at top of pole for signal cable support.

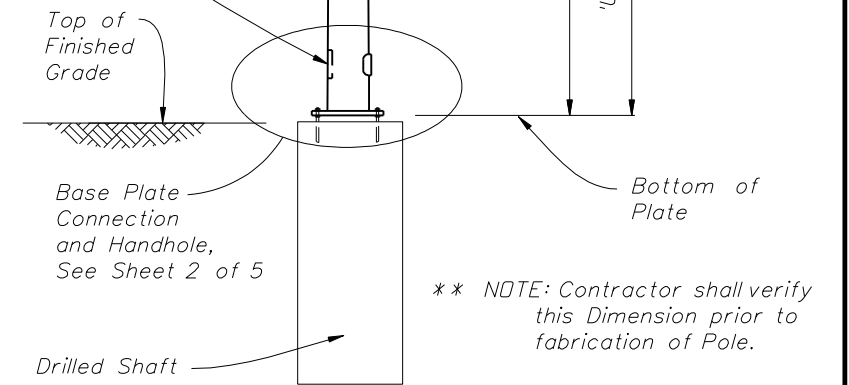
14) First and Second Arm Camber Angle = 2°.

15) Details for the Ground Rod, Signal and Sign Locations, Signal Head attachment, Sign Attachment, Pedestrian Head Attachment, and Foundation Conduit are not shown for clarity.

16) 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.

17) Manufacturers seeking approval of a steel mast arm assembly for inclusion on the Qualified Products List must submit a QPL Product Evaluation Application along with design documentation and drawings showing the product meets all specified requirements of this Index and Index 17743.

18) 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.

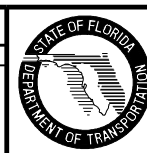


ELEVATION VIEW

(Single Arm Shown, Double Arm Similar)
(Luminaire Arm Not Shown)

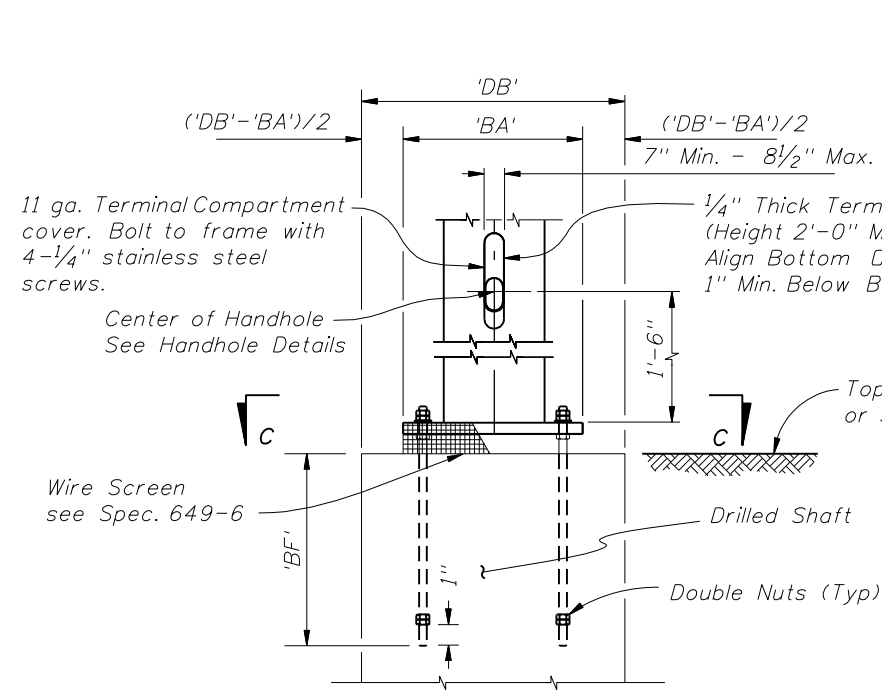
TYPICAL ELEVATION AND NOTES

REVISIONS						2008 Interim Design Standard		Interim Date	Sheet No.
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION			01/01/09	1 of 5
01/01/08	C.H.	QPL added to Standard Design Notes 14 & 19 revised: Note 17 is new							
07/01/08	C.H.	Revised Note 17.							
11/05/08	C.H.	Note 19 was deleted, and Back Plates were added to signal head details.							

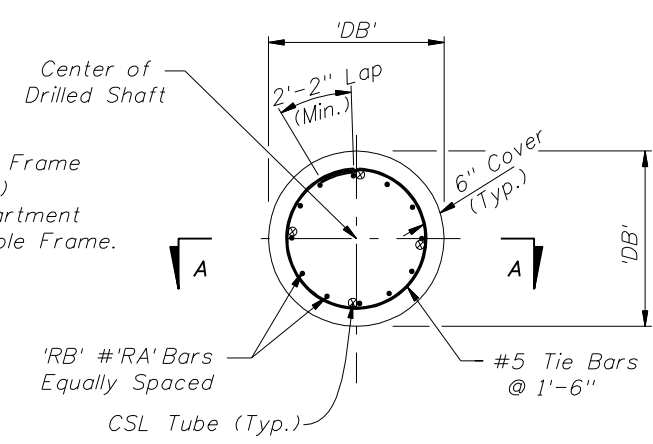


MAST ARM ASSEMBLIES

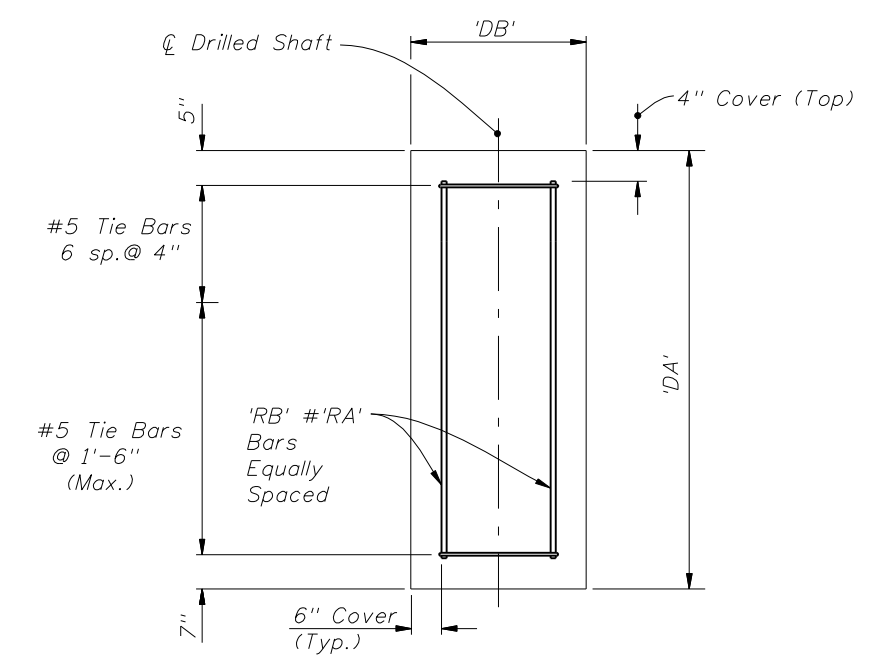
Index No.
17745



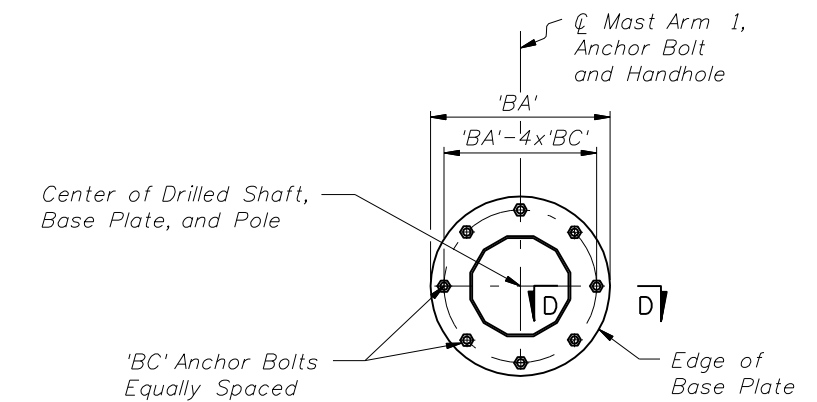
BASE PLATE AND ANCHORAGE ELEVATION
(Reinforcement Not Shown)



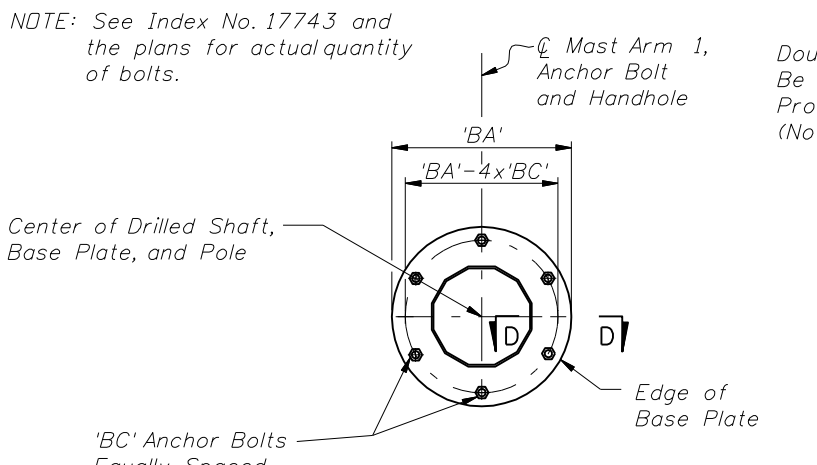
FOUNDATION PLAN



SECTION A-A

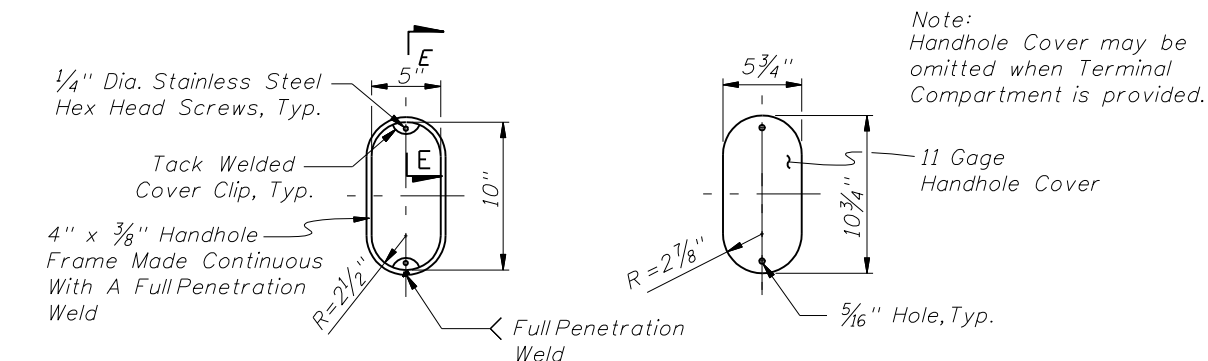


SECTION C-C
Alternate Detail
(8 Anchor Bolts)



SECTION C-C
(6 Anchor Bolts)

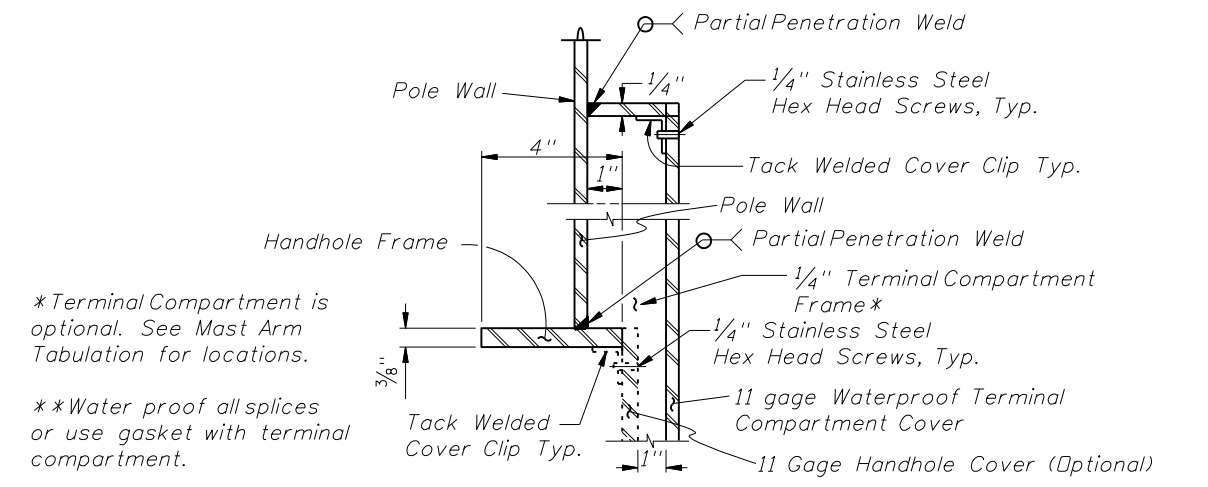
NOTE: See Index No. 17743 and the plans for actual quantity of bolts.



HANDHOLE FRAME
(w/ Terminal Compartment Omitted)

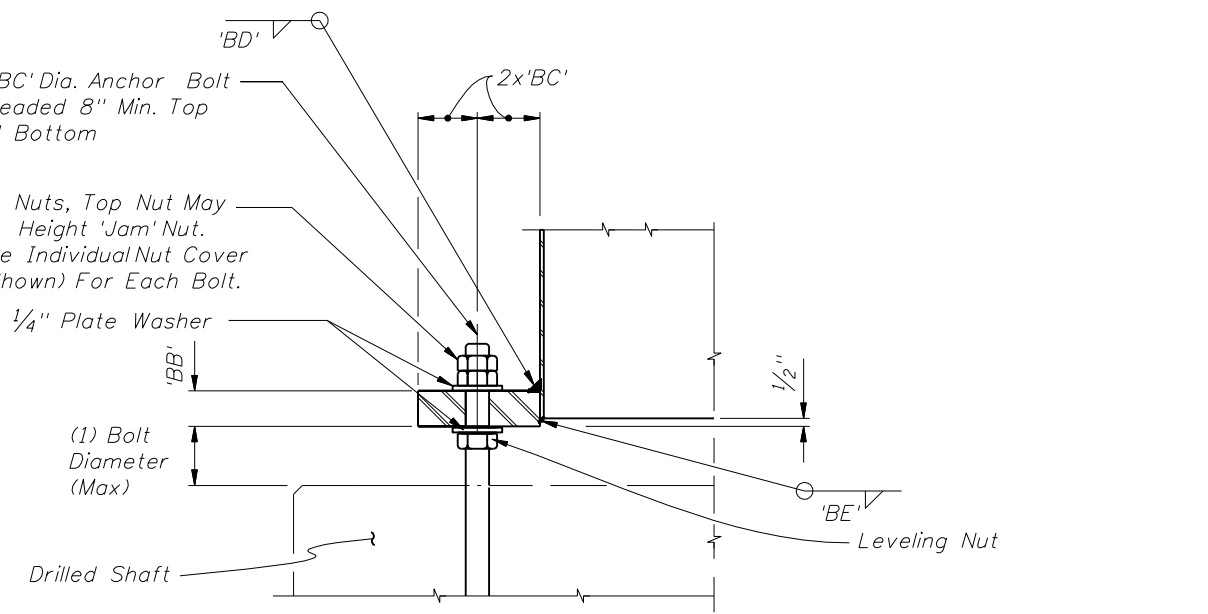
HANDHOLE COVER

Note: Handhole Cover may be omitted when Terminal Compartment is provided.



SECTION E-E
(Thru Handhole & Terminal Compartment)

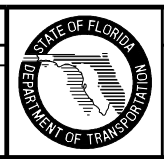
* Terminal Compartment is optional. See Mast Arm Tabulation for locations.
** Water proof all splices or use gasket with terminal compartment.



SECTION D-D

TYPICAL FOUNDATION AND BASE PLATE DETAILS

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
01/01/08	C.H.	Revised foundation reinforcing details.	11/05/08	C.H.	Grout Pad notes and details removed CSL tubes added to FOUNDATION PLAN. Wire Screen Spec. 649-6 added to Base Plate and Anchorage Elevation Detail.
07/01/08	C.H.	Section AA, Section DD and Foundation Plan details revised.			



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MAST ARM ASSEMBLIES

Interim Date: 01/01/09
Sheet No.: 2 of 5
Index No.: 17745

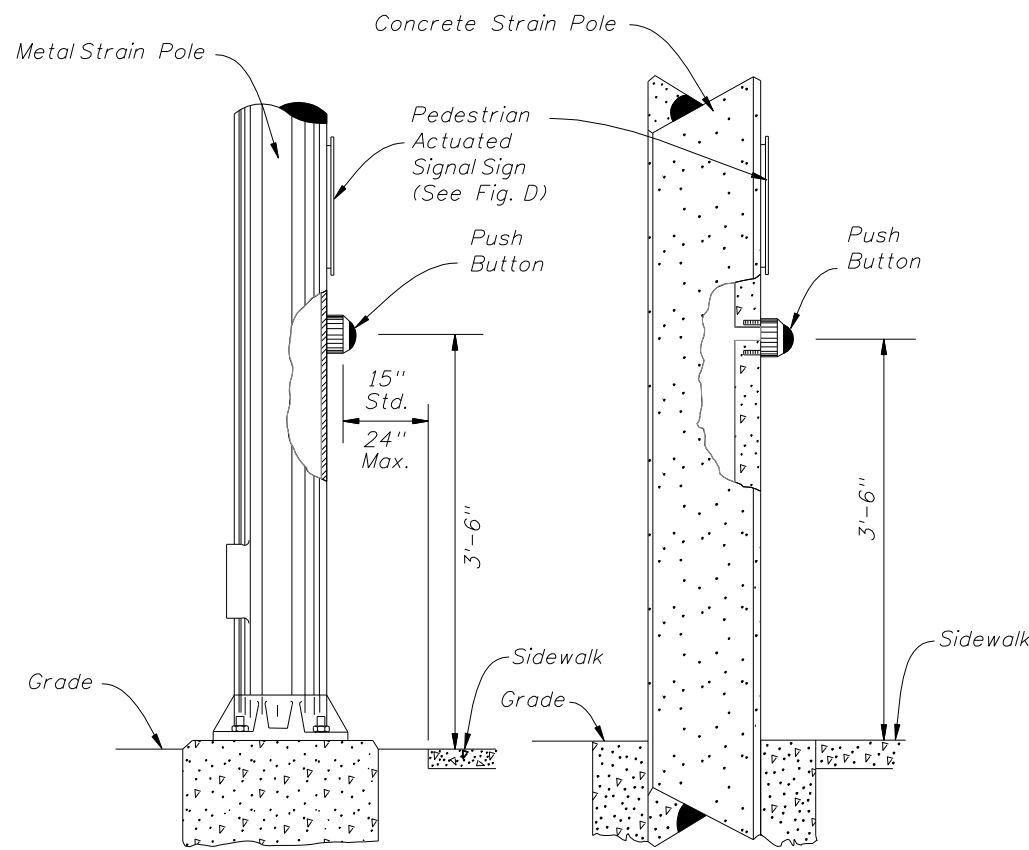


FIGURE A
POLE MOUNTED
DETECTOR STATION

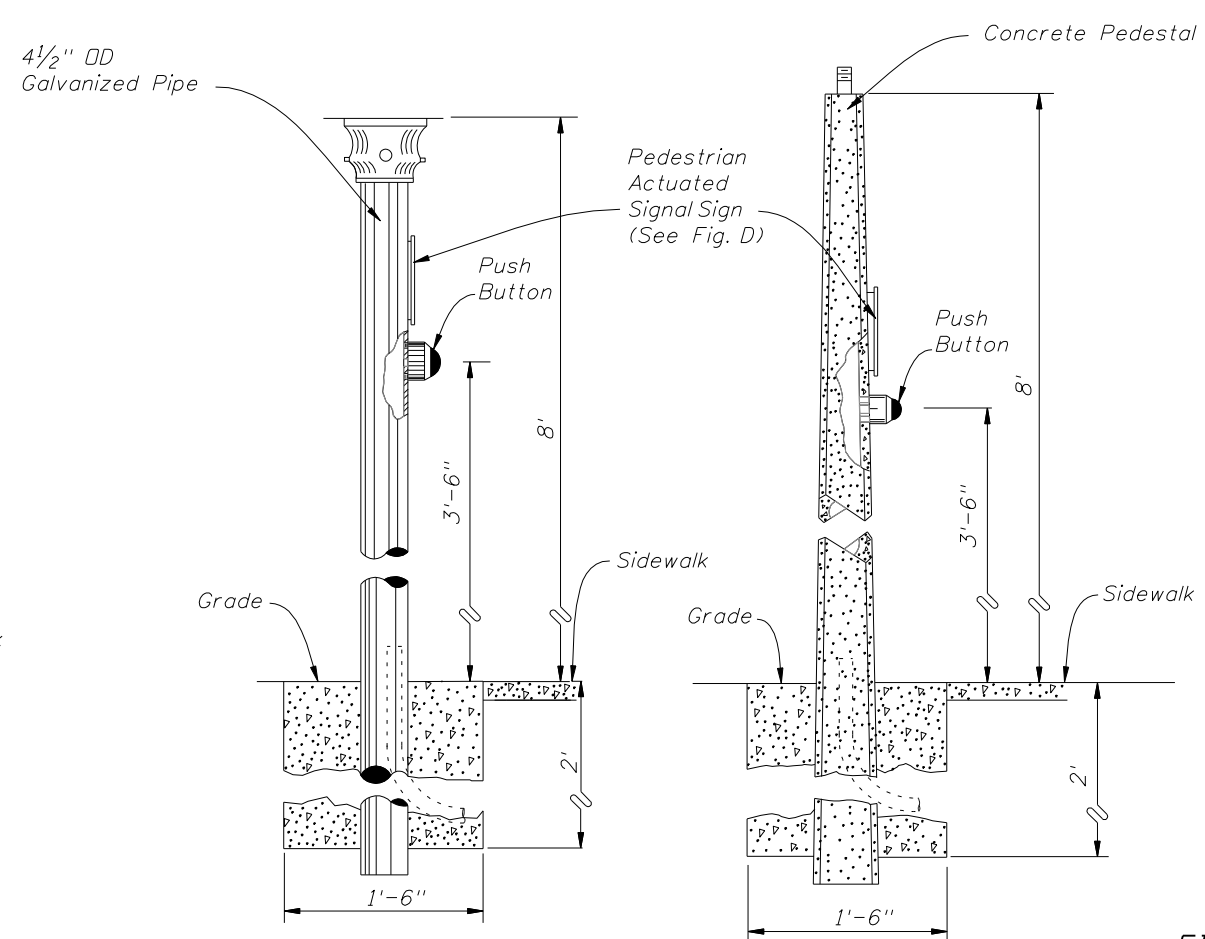


FIGURE B
PEDESTAL STATION
DETECTOR STATION

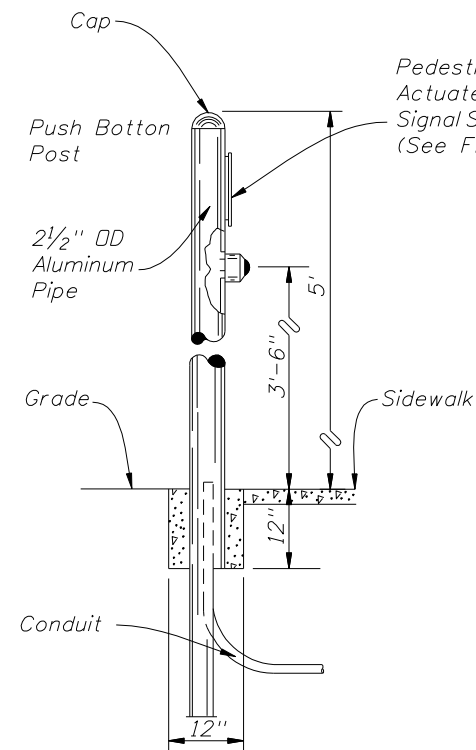
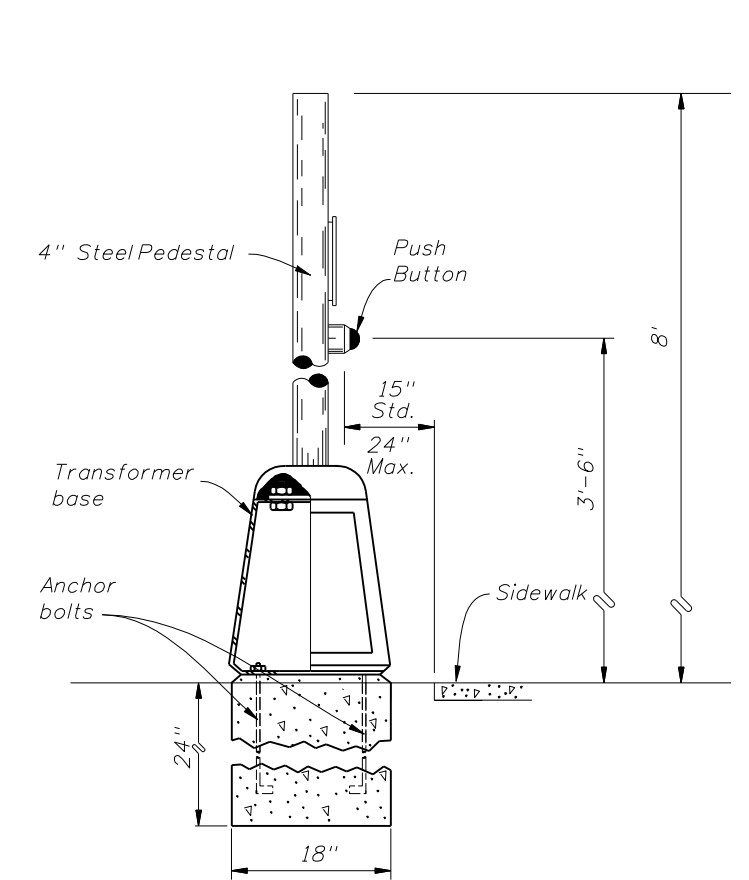


FIGURE C
POST DETECTOR STATION
DETECTOR STATION

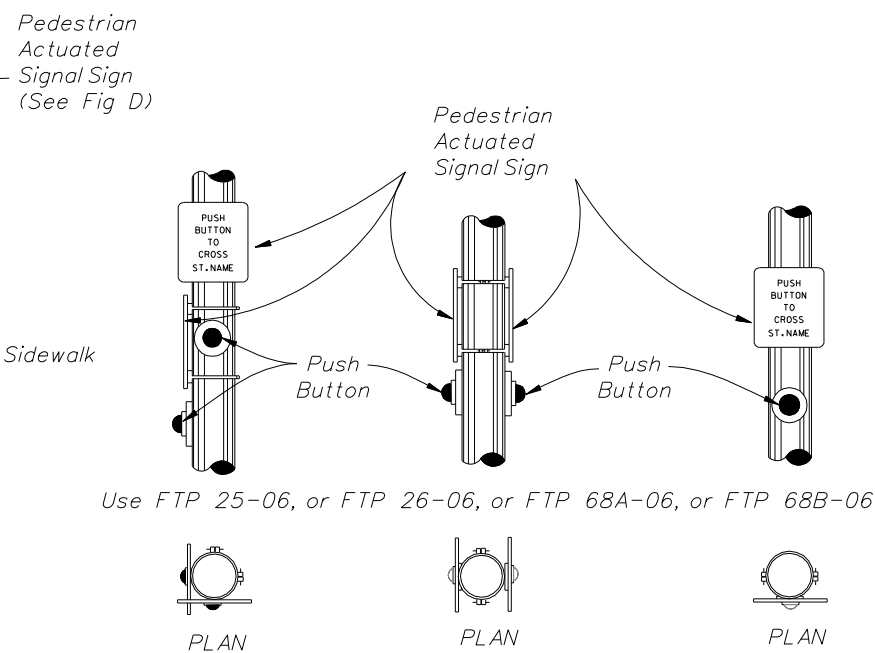


FIGURE D

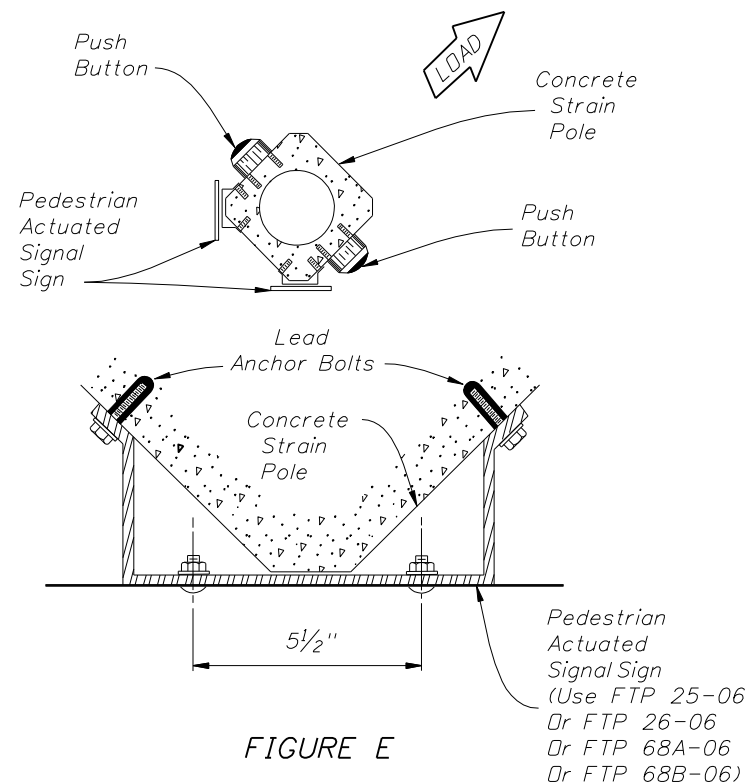


FIGURE E

Notes:

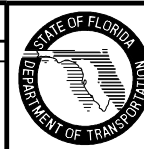
1. Signs shall be mounted above detectors, explaining their purpose and use.
2. The positioning of pedestrian push button should clearly indicate which crosswalk signal is actuated by each push button.
3. Push buttons and signs are to be mounted in accordance with Standard Specifications, section 665.
4. Meet all grounding requirements of Section 620 of the Standard Specifications.
5. A 30"X48" landing is required centered on each push button.

Note To Designers:

The designer should ensure the distance to the Push Button in Figure A & B is maintained. This distance can vary depending on post or pedestal type or whether a frangible base is used and sidewalk configuration. This is specified to meet Americans with Disabilities Act.

REVISIONS

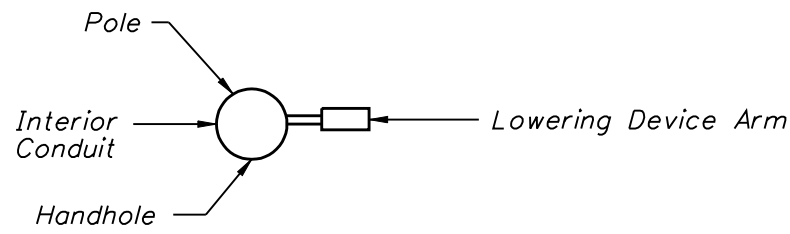
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
01/01/08	C.H.	Dimensions revised on Figures A & B.			
01/01/08	C.H.	Dimensions revised on Figures A & B. Note 5 revised and Note to Designers revised.			



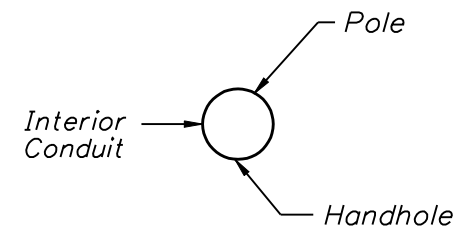
2008 Interim Design Standard

PEDESTRIAN DETECTOR
ASSEMBLY INSTALLATION DETAILS

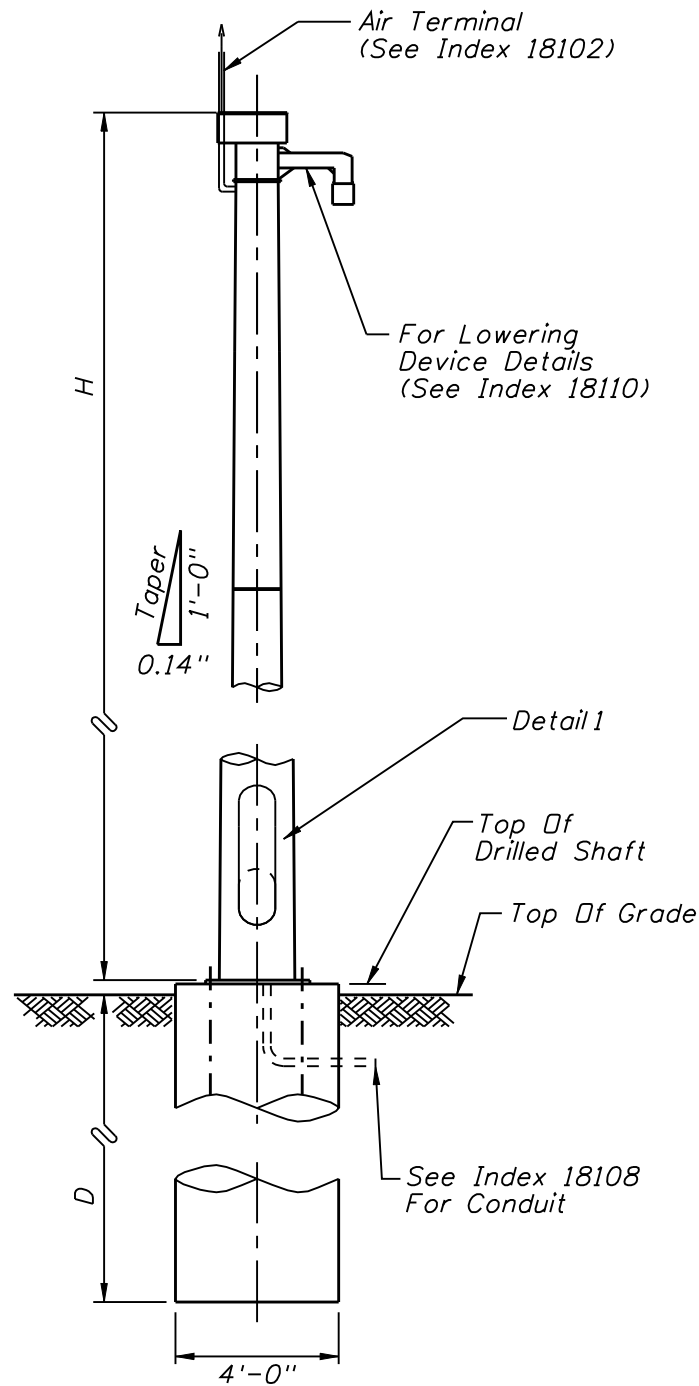
Interim Date	Sheet No.
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17784	



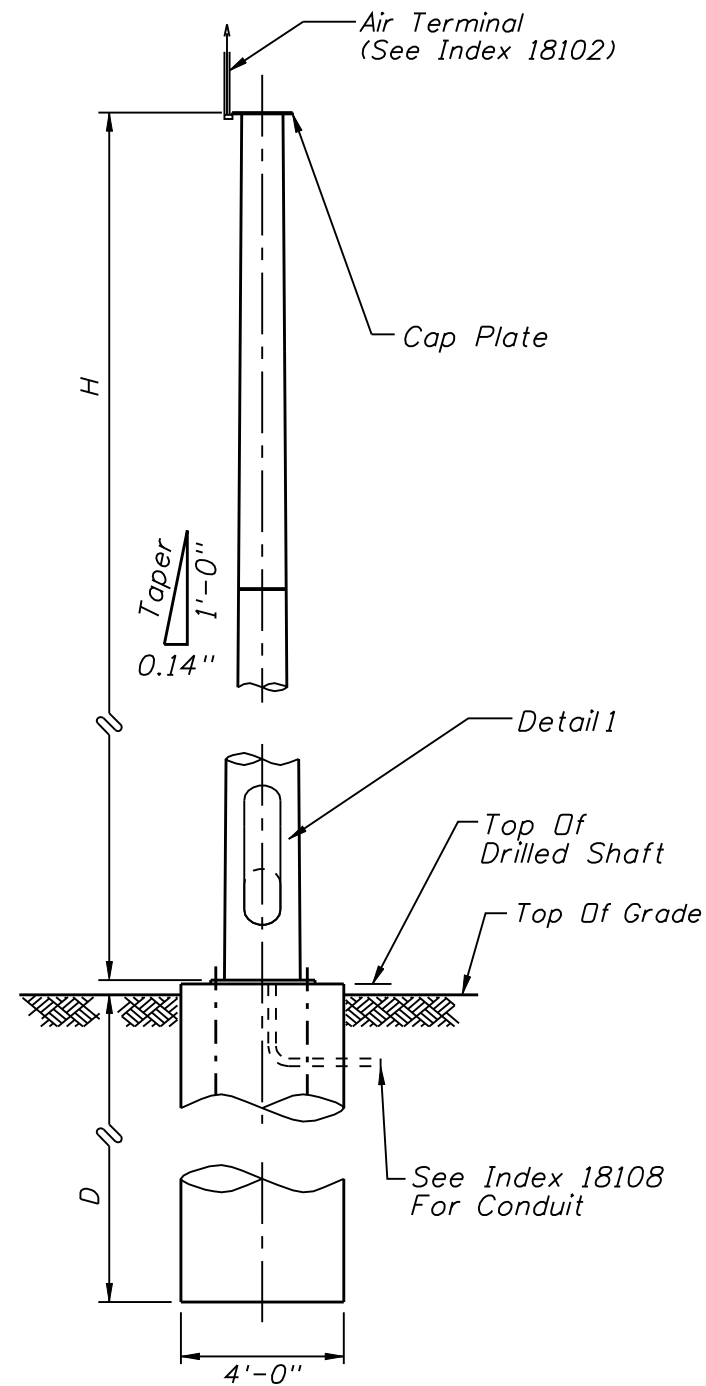
ORIENTATION VIEW



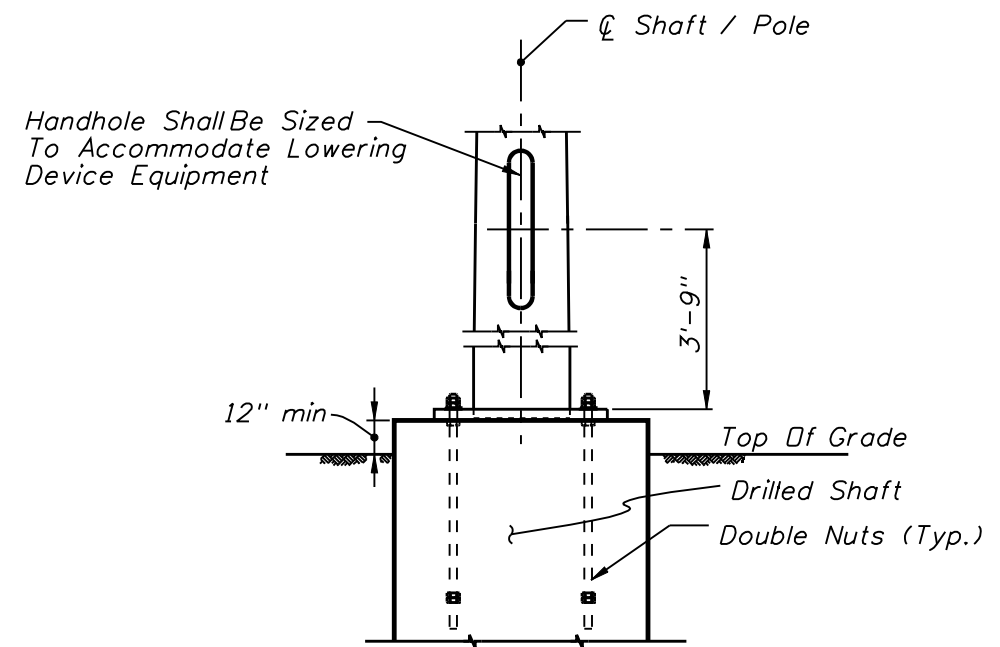
ORIENTATION VIEW



WITH LOWERING DEVICE



WITHOUT LOWERING DEVICE



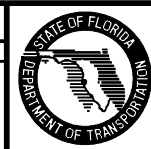
DETAIL 1

H (ft)	D (ft)
50	8
55	8.5
60	9
65	9.5
70	10

Not To Scale

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
11/24/08	RGM	Sheets were reordered. Added table for H and D, and diameter for foundation.			



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STEEL CCTV POLE

Interim Date	Sheet No.
01/01/09	1 of 2
Index No.	
18111	

DESIGN NOTES:

Design according to FDOT Structures Manual (current edition) and the AASHTO "Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals" 5th Edition with Interims.

Maximum 1" deflection in 40mph wind (3 second gust).

Manufacturers seeking approval for inclusion on the Qualified Products List must submit a QPL Production Evaluation Application along with design documentation and drawings showing pole and foundation meet all specified requirements of this Standard.

Perform all welding in accordance with the American Welding Society Structural Welding Code (Steel) ANSI/AWS D1.1 (current edition).

Foundation Materials:

Reinforcing Steel: ASTM A615 Grade 60
 Concrete: Class V Special or Class VI with 4 ksi minimum strength at transfer.
 Anchor Bolts: ASTM F1554 Grade 55 with ASTM A563 Grade A heavy-hex nuts.
 ASTM F436 Type 1 washers.
 ASTM F2329 galvanization.

Foundation design based upon the following soil criteria:
 Classification = Cohesionless (Fine Sand)
 Friction Angle = 30 Degrees (30°)
 Unit Weight = 50 lbs./cu. Ft. (assumed saturated)

Only in cases where the Designer considers the soil types at the specific site location to be of lesser strength properties should an analysis be required. Auger borings, SPT borings or CPT soundings may be utilized as needed to verify the assumed soil properties, and at relatively uniform sites, a single boring or sounding may cover several foundations. Furthermore, borings in the area that were performed for other purposes may be used to confirm the assumed soil properties.

Pole:

Round or 16 sided.
 Tapered 0.14 inches per foot.
 Transverse welds only allowed at the base.
 Two or more sections with overlapping splices not permitted.
 No laminated tubes.
 Only one longitudinal seam weld permitted.
 Longitudinal seam welds within 6" of complete penetration pole to base welds shall be complete penetration welds.
 Identification tag:
 Aluminum, secured to pole with stainless steel screws.
 Locate inside pole and visible from handhole.
 Provide Financial Project ID, pole height, manufacturer's name & certification number, and QPL number.

Pole Specifications:

ASTM A1011 Grade 50, 55, 60 or 65 (less than 1/4") or
 ASTM A572 Grade 50, 60 or 65 (greater than 1/4") or
 ASTM A595 Grade A (55 ksi yield) or Grade B (60 ksi yield).
 Steel Plates and Pole Cap: ASTM A36.
 Weld Metal: E70XX.
 Bolts: ASTM A325, Type 1.
 Handhole frame: ASTM A709 Grade 36 or ASTM A36.
 Handhole cover: ASTM A1011 Grade 50, 55, 60 or 65.
 Stainless steel screws: AISI Type 316.
 Galvanization:
 Nuts, bolts and washers: ASTM F2329.
 All other steel: ASTM A123.

One hundred percent of full-penetration groove welds and a random 25% of partial penetration groove welds shall be inspected. Full-penetration groove weld inspection shall be performed by nondestructive methods of radiography or ultrasonics.

INSTALLATION NOTES:

Cable Supports: Electrical Cable Guides and Eyebolts.
 Locate top and bottom electrical guides within the pole aligned with each other.
 Position one cable guide 2" below the handhole.
 Position other cable guide 1" directly below the top of the tenon.
 Position eyebolt 2-3/4" below the top of the handhole.
 Install pole plumb.

Lowering Device Installation Notes:

Design tenon dimensions to facilitate lowering device component installation. Locate slots parallel to the pole centerline for mounting the lowering device. Bolt a tenon to the pole top with mounting holes and slot as required for the mounting of the lowering device.

Place all electrical wire in interior conduit to prevent them from interfering with or being damaged by the lowering cable that moves within the pole.

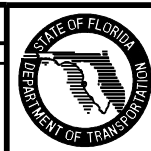
Mount lowering arm perpendicular to the roadway or as shown in the plans.

Position CCTV pole so that the camera can be safely lowered without requiring lane closures.

Include a lowering device (including top J-box), mounting hardware, lowering cable, contact block, waterproof electrical connectors, camera J-box and housing.

REVISIONS

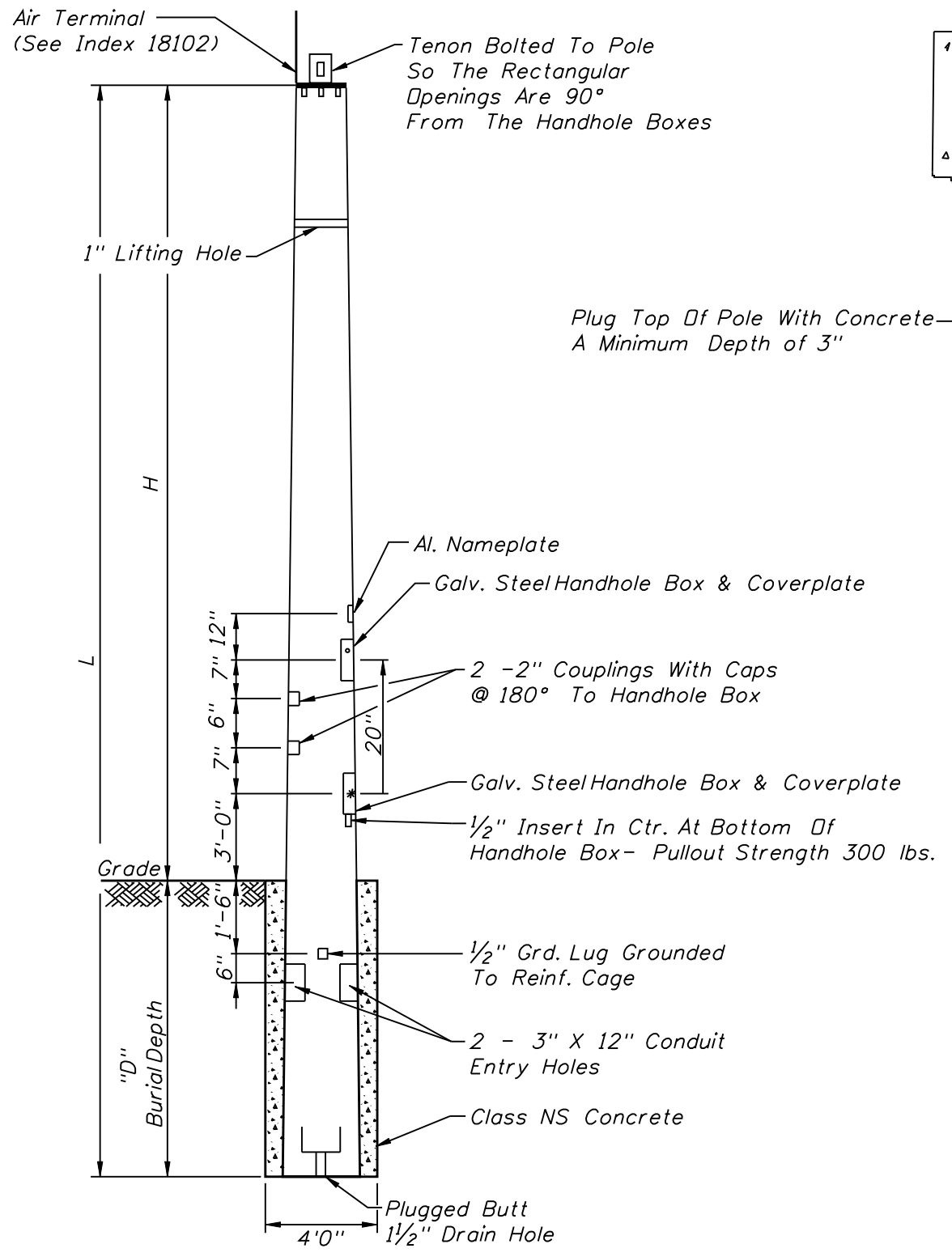
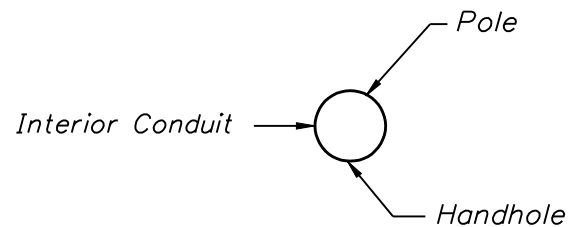
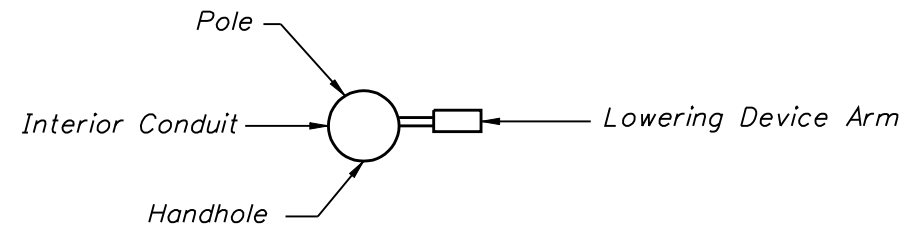
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
11/24/08	RGM	Sheets reordered and notes completely revised.			



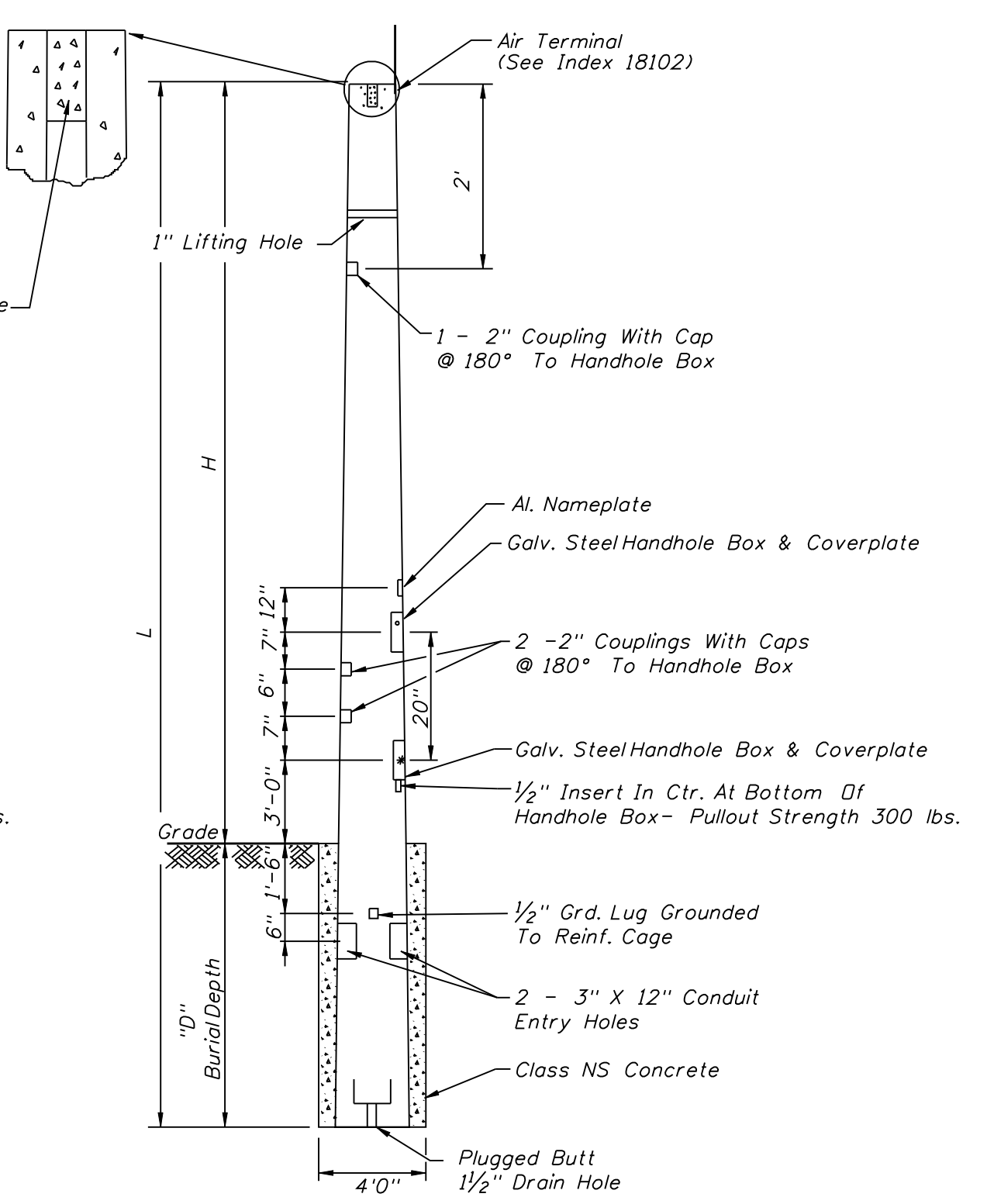
2008 Interim Design Standard

STEEL CCTV POLE

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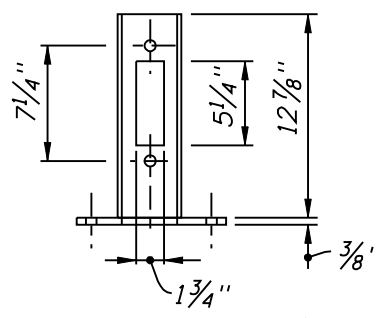


WITH LOWERING DEVICE



WITHOUT LOWERING DEVICE

Not To Scale



TENON DETAIL

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
11/24/08	RGM	Replaced "Concrete" with "Class NS Concrete", added plan views.			



2008 Interim Design Standard

CONCRETE CCTV POLE

Interim Date	Sheet No.
01/01/09	1 of 2
Index No.	
18113	

DESIGN NOTES:

Design according to FDOT Structures Manual current edition and the fifth edition of the AASHTO "Standard Specifications for Structural Supports for Highway Signs, Luminaries and Traffic Signals" with Interims.

Manufacturers seeking approval for inclusion on the Qualified Products List must submit a QPL Product Evaluation Application along with design documentation and drawings showing the product meets all specified requirements of this Standard.

Place prestressing symmetrically about both axis.

Use Class V Special Concrete or Class VI Concrete with 4 ksi minimum strength of transfer.

Use A615 Grade 60 reinforcing steel. Provide a minimum of non-prestressed reinforcement equal to 0.33% of the concrete area.

Use A416 Grade 270 stress relieved or low-lax prestressing strands.

One turn required for spiral splices and two turns required at the top and bottom of poles. Manufacture spirals from cold-drawn ASTM A82 steel wire.

Identify poles as to manufacturer, length, QPL qualification number by inset numerals 1" in height inscribed on the same face of the pole as the handhole and ground wire.

Provide a Class 3 surface finish.

Provide a 1" minimum cover.

Foundation design based upon the following soil criteria:

Classification = Cohesionless (Fine Sand)

Friction Angle = 30 Degrees (30°)

Unit Weight = 50 lbs./cu. Ft. (assumed saturated)

Only in cases where the Designer considers the soil types at the specific site location to be of lesser strength properties should an analysis be required. Auger borings, SPT borings or CPT soundings may be utilized as needed to verify the assumed soil properties, and at relatively uniform sites, a single boring or sounding may cover several foundations. Furthermore, borings in the area that were performed for other purposes may be used to confirm the assumed soil properties.

LOWERING DEVICE INSTALLATION NOTES:

Place all electrical wire in interior conduit to prevent them from interfering with or being damaged by the lowering cable that moves within the pole.

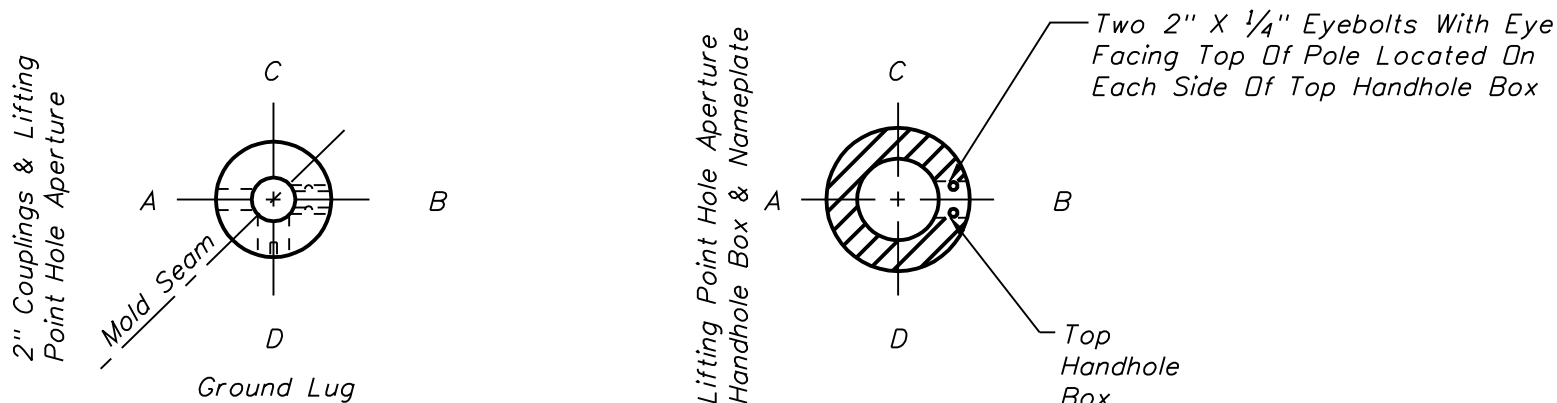
Mount lowering arm perpendicular to the roadway or as shown in the plans. Position the CCTV pole so that the camera can be safely lowered without requiring lane closures.

Include a lowering device (including top J-box), mounting hardware, lowering cable, contact block, waterproof electrical connectors, camera J-box and housing.

SPECIFICATIONS:

Pole Top:	8 1/4" Dia.
Pole Butt:	(0.2 X L) + 8 1/4"
Pole Taper:	0.2 in./ft. nominal
Defl Spec:	1" Max. in 40mph wind (3 second gust)
Max. Camera EPA:	5.60 Sq. Ft. Total
Max. Camera Wgt:	240 lbs. Total

L (ft)	H (ft)	D (ft)
58	50	8
63.5	55	8.5
69	60	9
74.5	65	9.5
80	70	10



TOP VIEW

**SECTIONAL VIEW THROUGH
TOP HAND HOLE BOX**

Not To Scale

REVISIONS

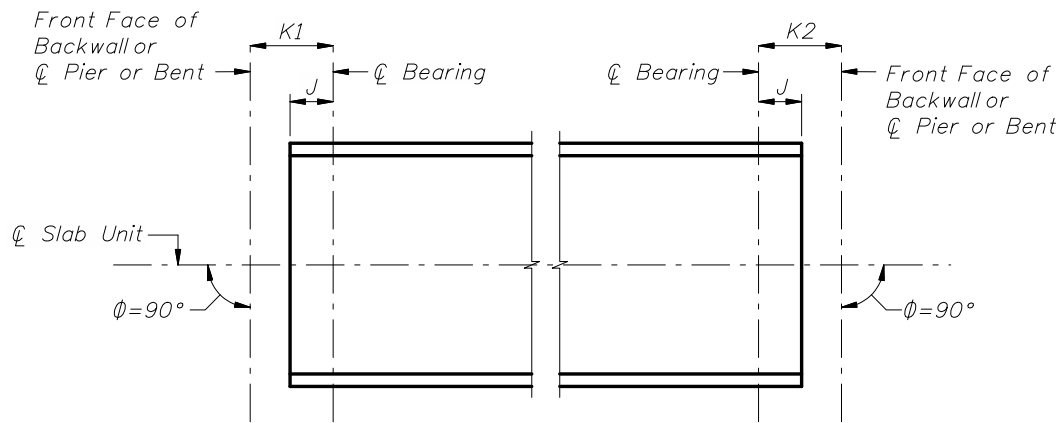
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
11/24/08	RGM	Added table for L, H and D; Notes completely revised.			



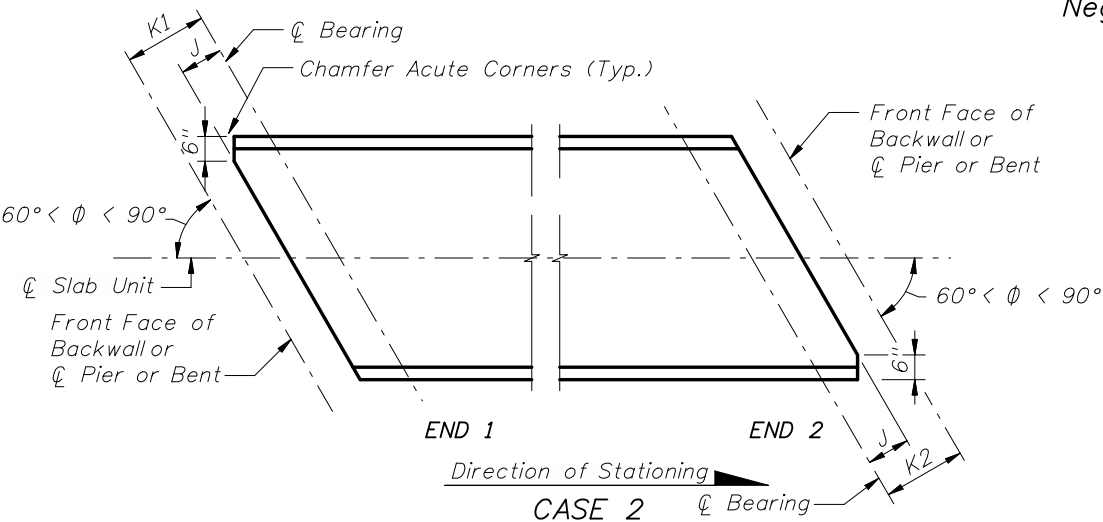
2008 Interim Design Standard

CONCRETE CCTV POLE

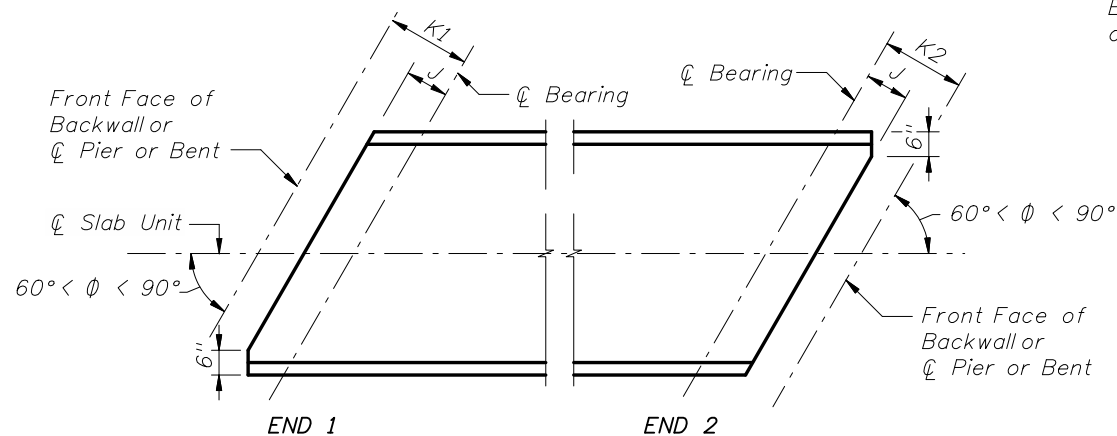
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END 1 Direction of Stationing END 2
CASE 1

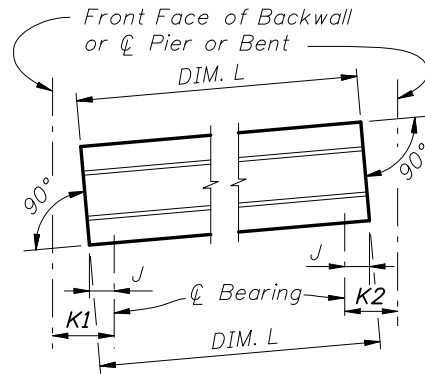


END 1 Direction of Stationing END 2
CASE 2

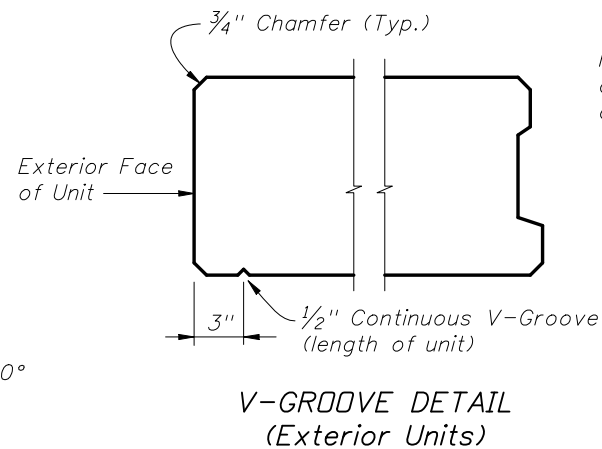


END 1 Direction of Stationing END 2
CASE 3

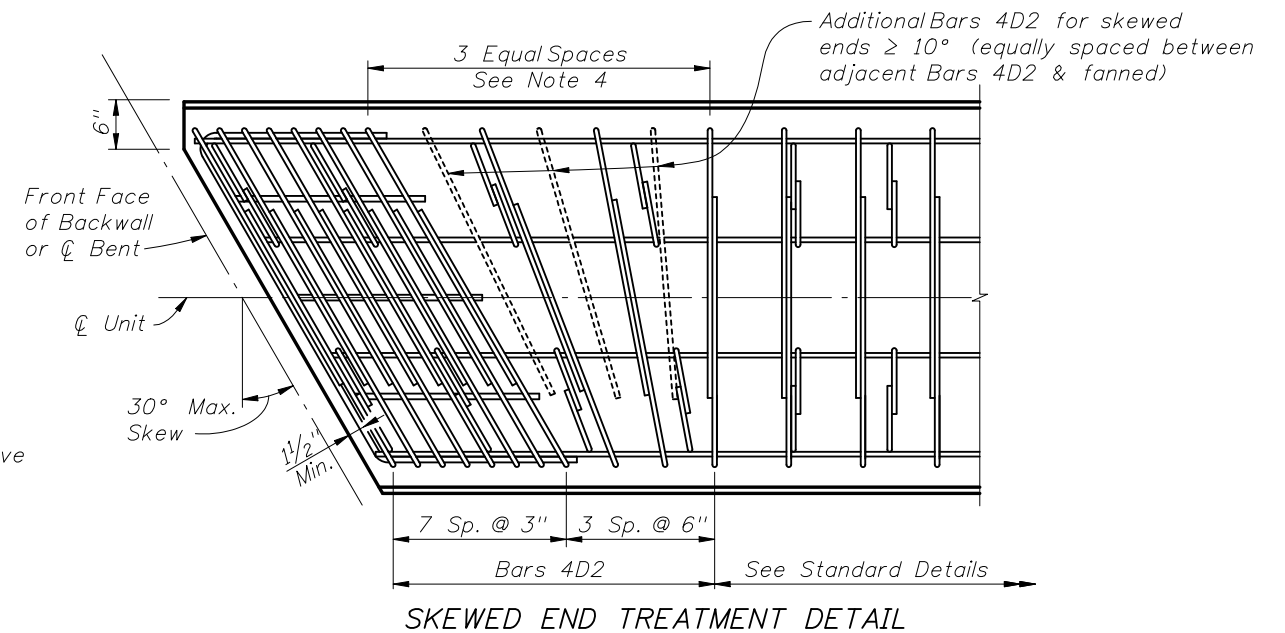
SCHEMATIC PLAN VIEWS AT SLAB ENDS



SCHEMATIC SIDE ELEVATION OF SLAB UNITS
(Positive Grade shown, Negative Grade or Horizontal Grade similar)



V-GROOVE DETAIL
(Exterior Units)



SKewed END TREATMENT DETAIL

GENERAL NOTES

- All bar dimensions are out-to-out.
- Strands N shall be ASTM A416, Grade 250 or 270, 3/8" ϕ or larger, stressed to 10,000 lbs. each.
- Unless otherwise noted, the minimum concrete cover for reinforcing steel shall be 2".
- For slab units with skewed end conditions, the end reinforcement, defined as Bars 4D2 and Y within the limits of the first 2'-0", shall be placed parallel to the skewed ends of the slab unit. The next three - Bars 4D2 & 4K shall be fanned to perpendicular to the longitudinal axis of the slab unit. Provide additional Bars 4D2 for end skews $\geq 10^\circ$. (See "SKEWED END TREATMENT DETAIL")
- Bars 4D1, 4D2 & 4K shall be placed and tied to Strands N and a fully bonded strand in the bottom row. (See "STRAND PATTERNS")
- At the option of the Contractor deformed welded wire reinforcement (ASTM A497) may be used in lieu of Bars 4D and 4K. Submit details to the Engineer for approval.
- For referenced Dimensions, Angles and Case Numbers see Table of Variables in Structures Plans.
- Top surface of the slab units shall be raked transversely to provide a roughened surface with 1/4" amplitude. For proper bonding of the deck overlay, clean the top surface of the Prestressed Slab Units and thoroughly soak with potable water for a minimum of 4 hrs. then remove all excess surface water immediately prior to placement of the overlay.
- Cut strands 1" beyond the face of the slab unit.
- Use the same thickness of slab units within each span.
- Provide reinforced concrete keeper blocks on the low side of Prestressed Slab Units (PSU) when the cross slope or grade exceeds 3%.

INSTRUCTIONS TO DESIGNER:

To limit Bursting Forces the maximum prestress force at the slab unit ends from fully bonded strands must be limited to the following:

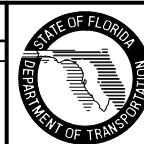
Slab Unit Type	Max. Bonded Prestress Force	Index No.	Last Revision Date
12" or 15" X 48"	1110 Kips	20354 & 20364	01/01/09
12" or 15" X 60"	1310 Kips	20355 & 20365	01/01/09

No losses shall be applied when calculating the Bonded Prestress Force. The reinforcing in the ends of the beams must not be modified without the approval of the State Structures Design Engineer.

Avoid placing slab units within the limits of superelevation transitions because the cross slope for individual and adjacent slab units must be constant from begin span to end span. Slight superelevation transitions may be accommodated by increasing the slab overlay thickness across the width of the span.

REVISIONS

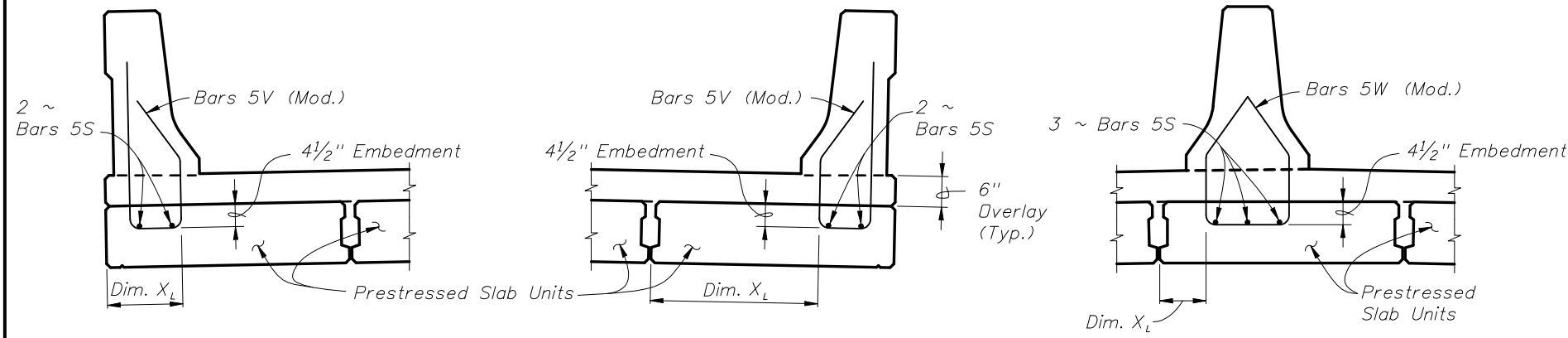
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
01/01/09	TJB	New Design Standard			



2008 Interim Design Standard

PRESTRESSED SLAB UNITS
DETAILS AND NOTES

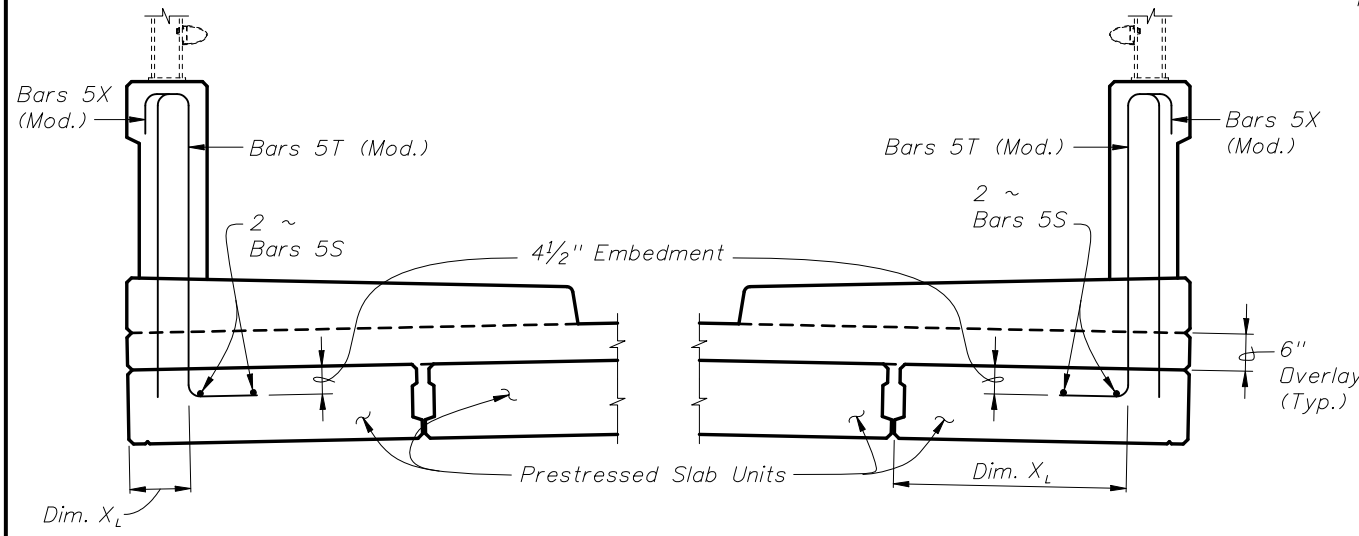
Interim Date	Sheet No.
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20350	



CASE "LEFT"
F SHAPE TRAFFIC RAILING (LOOKING AHEAD STATION)
(Index No. 420 - 32" F Shape shown)
(Index No. 425 - 42" F Shape similar)

CASE "RIGHT"
TRAFFIC RAILING (MEDIAN 32" F SHAPE)
(Index No. 421)

(Railing on Exterior Units shown, Railing on Interior Units similar)



CASE "LEFT"
VERTICAL SHAPE TRAFFIC RAILING (LOOKING AHEAD STATION)
(Index No. 423 - 32" Vertical Shape shown)
(Index No. 422 - 42" Vertical Shape similar)

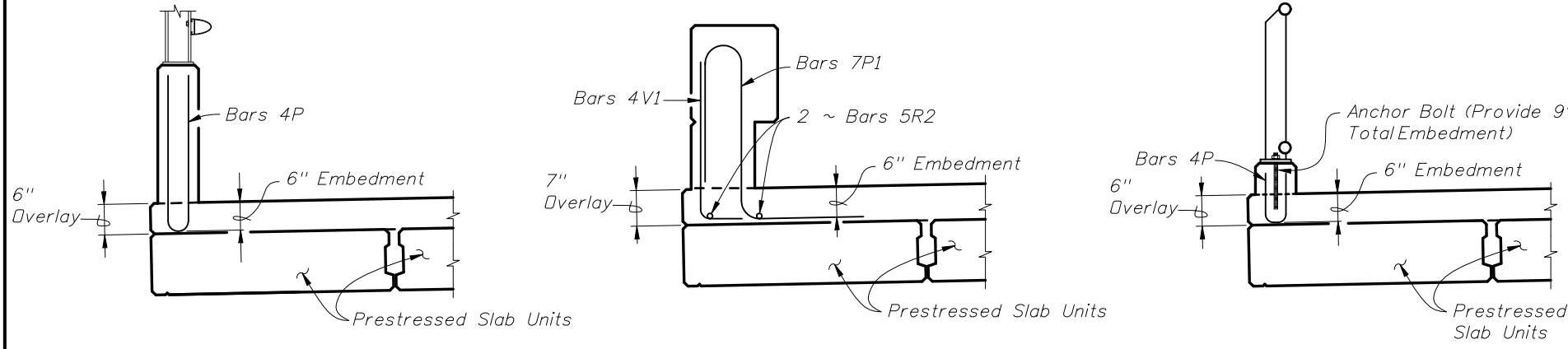
CASE "RIGHT"

NOTES:
Work this sheet with the Prestressed Slab Unit - Table of Variables and Prestressed Slab Unit - Traffic Railing Reinforcement Layout Table (if required) in the Structures Plans.

Contractor should notify the Precaster how the Traffic Railing bars are to be placed either vertical (plumb) or perpendicular to the cross slope to allow proper placement of the modified railing bars.

Modified Bars 5T & 5X for Index Nos. 422 & 423 shall be placed vertical (plumb) to the cross slope.

On skewed Prestressed Slab Units place the bottom leg of vertical railing bars parallel to transverse slab reinforcement bars at unit ends.

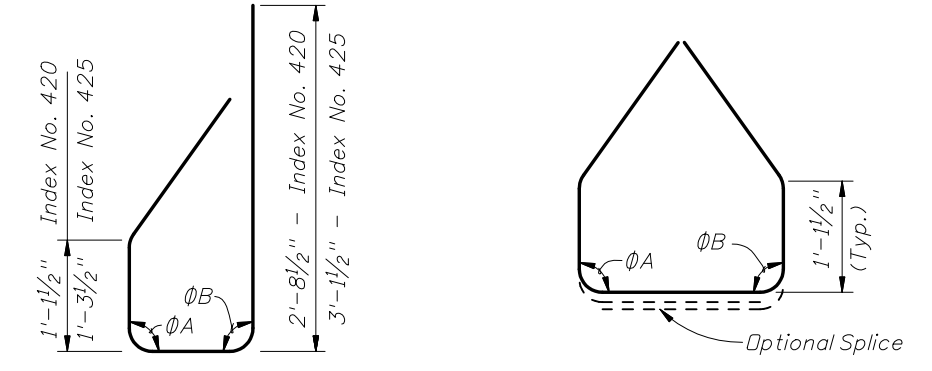


PEDESTRIAN/BICYCLE RAILING DETAIL
(Index No. 820)

TRAFFIC RAILING - (CORRAL SHAPE)
(Index No. 424)

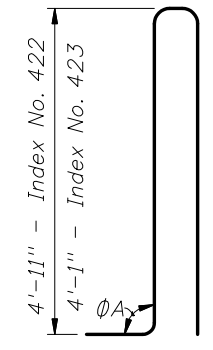
BRIDGE PEDESTRIAN/BICYCLE PICKET RAILING
(Index Nos. 851 & 861)

RAILING REINFORCING MODIFIED BAR LAYOUT

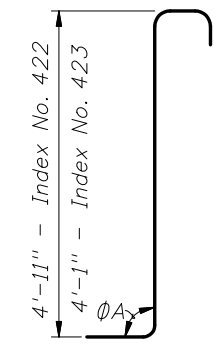


STIRRUP
BAR 5V (MOD.)
INDEX NOS. 420 OR 425

STIRRUP
BAR 5W (MOD.)
INDEX NO. 421



STIRRUP
BAR 5T (MOD.)
INDEX NOS. 422 OR 423

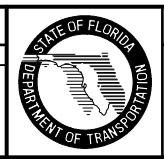


STIRRUP
BAR 5X (MOD.)
INDEX NOS. 422 OR 423

REINFORCING STEEL NOTES:

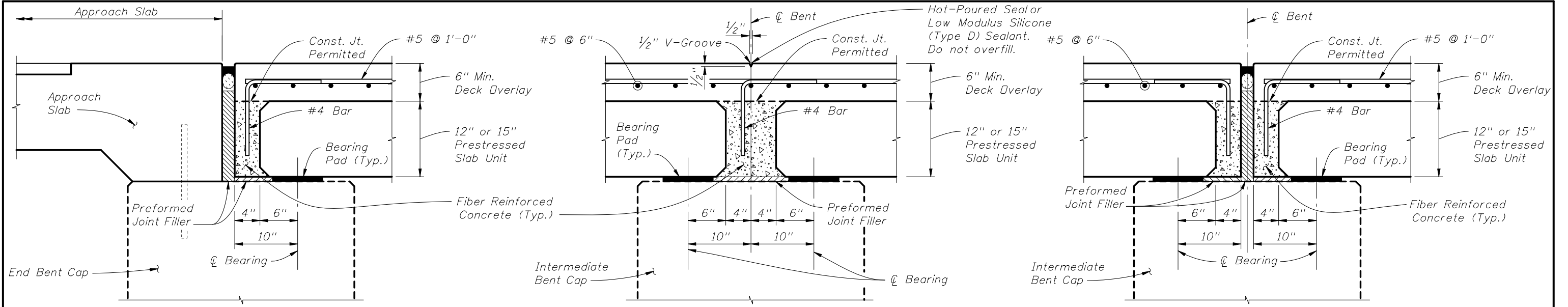
1. Bar dimensions shown are out to out.
2. For the other dimensions and angles ϕA and ϕB see the referenced Index.
3. Adjust the dimension shown for Bars 5V, 5T, 5W, 5X, 4V & 7P as required when the 6" Min. Overlay is thickened to accommodate superelevation transition.
4. The 4'-11" (Index No. 422), 4'-1" (Index No. 423) vertical dimension shown for Bars 5T and 5X is based on a 6" thick deck overlay with a 6" thick x 6' wide raised sidewalk on low side of the deck with a 2% deck cross slope and a counter 2% raised sidewalk cross slope. If the raised sidewalk thickness, width, or cross slope vary from the above amounts, adjust this dimension accordingly to achieve a 4 1/2" embedment ($\pm 1/2$ " into the slab units. See Structures Plans, Superstructure and Approach Slab Sheets.
5. All reinforcing steel at the open joints shall have a 2" minimum cover.
6. Bars 5S may be continuous or spliced at the mid point of the slab unit. Bar splices for Bars 5S shall be a minimum of 2'-0".
7. Welded Wire Reinforcement is not permitted for Bars 5W (Mod.) on precast slab units.
8. Strands N may be used in lieu of Bar 5S or 5R to anchor stirrup Bars 5T, 5V, 5W & 5X within 2" of the 90° corner bend.

REVISIONS			
DATE	BY	DESCRIPTION	
01/01/09	TJB	New Design Standard	



2008 Interim Design Standard
**PRESTRESSED SLAB UNITS
DETAILS AND NOTES**

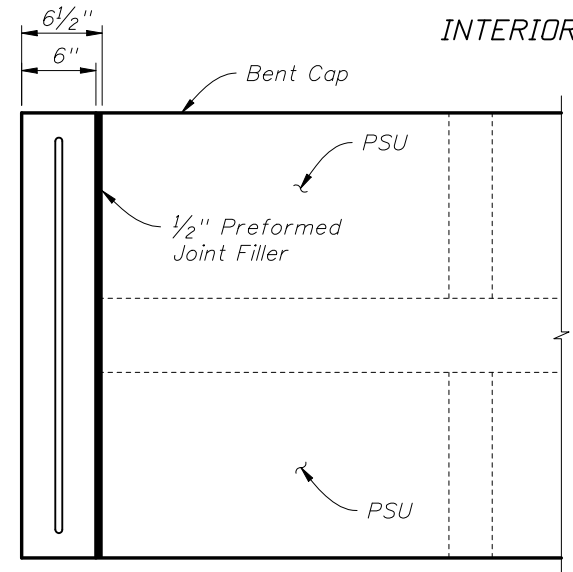
Interim Date
01/01/09
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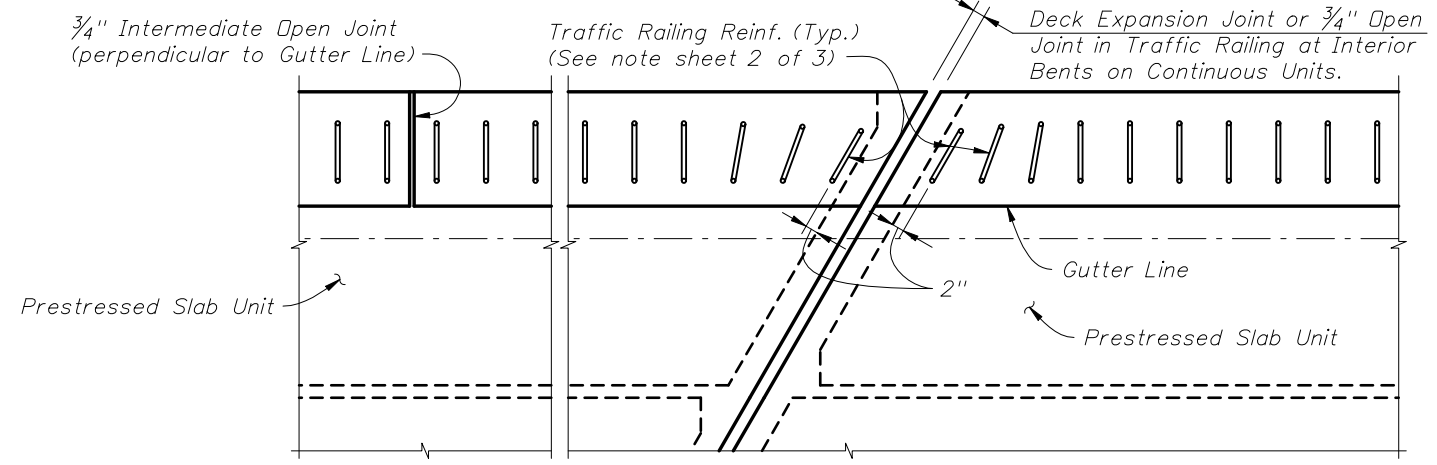
JOINT DETAIL AT BEGIN/END BRIDGE

JOINT DETAIL AT INTERIOR BENTS ON CONTINUOUS UNITS

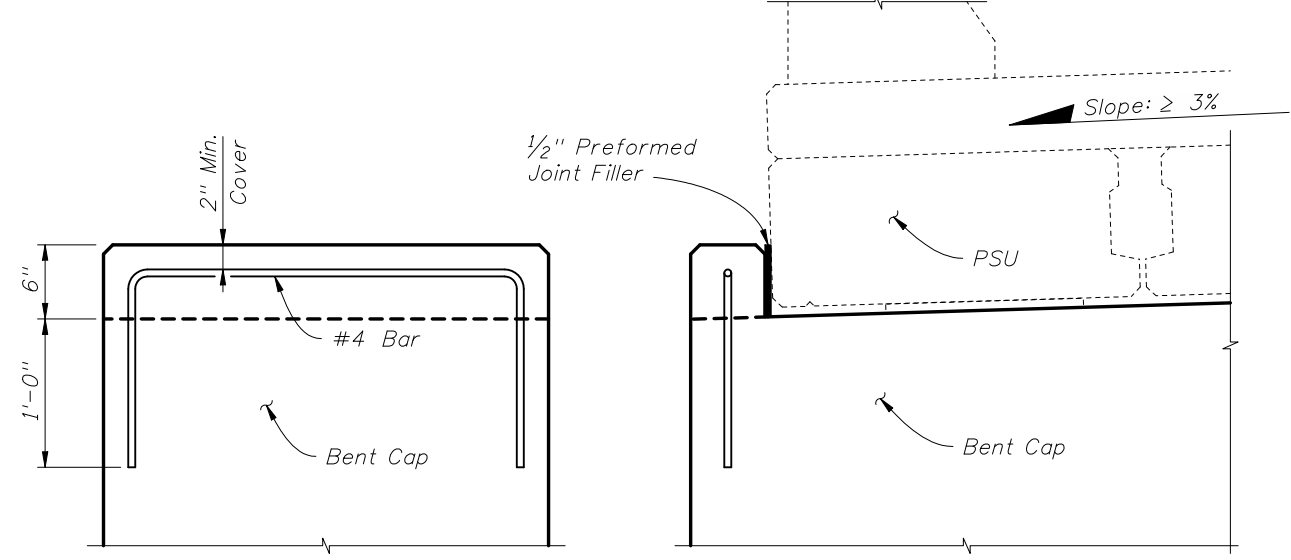
JOINT DETAIL AT EXPANSION INTERIOR BENTS



PARTIAL PLAN



PARTIAL PLAN VIEW OF DECK SHOWING EXPANSION JOINT TREATMENT ON SKEWED BRIDGE (INTERMEDIATE JOINT IS SIMILAR)

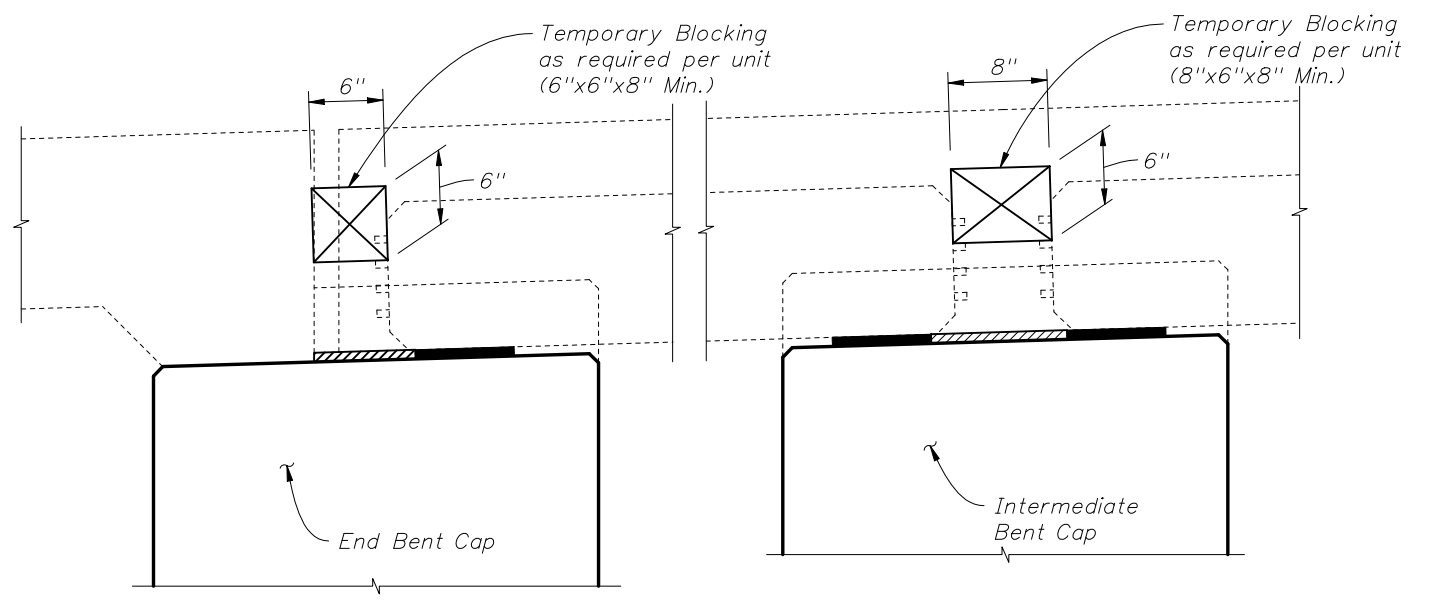


END VIEW

PARTIAL ELEVATION

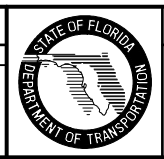
KEEPER BLOCK DETAILS

Use keeper blocks on low end of bent caps when cross slope is $\geq 3\%$.



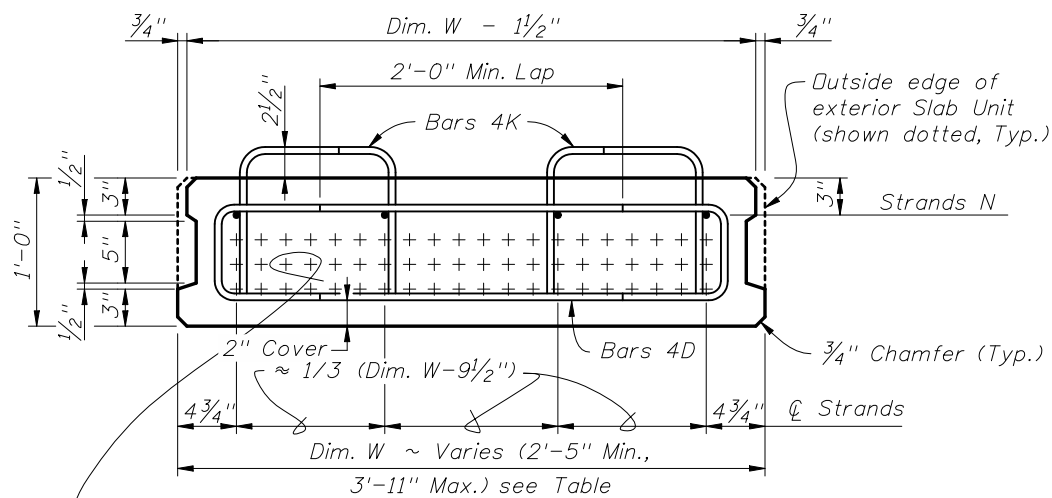
TEMPORARY BLOCKING

REVISIONS			
DATE	BY	DESCRIPTION	DATE
01/01/09	TJB	New Design Standard.	

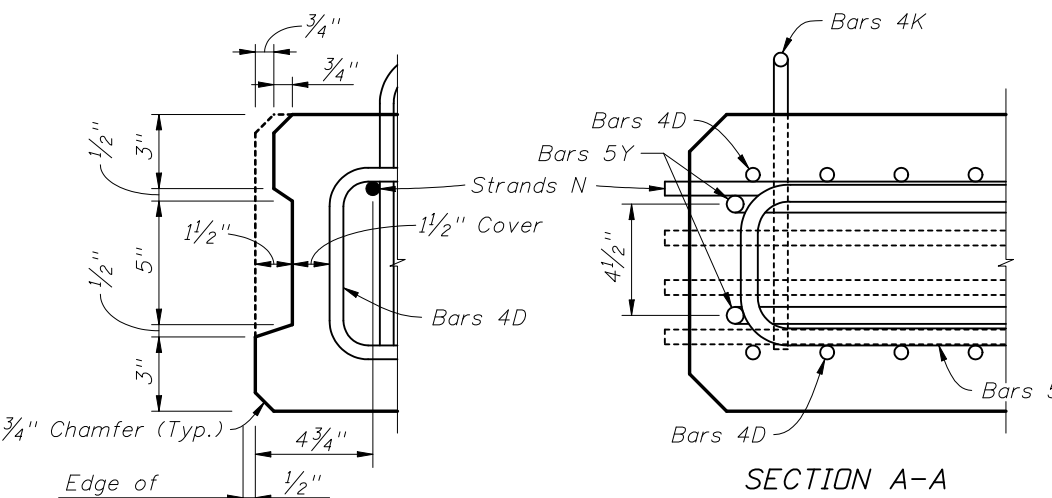


2008 Interim Design Standard
**PRESTRESSED SLAB UNITS
 DETAILS AND NOTES**

Interim Date: 01/01/09
 Sheet No.: 3 of 3
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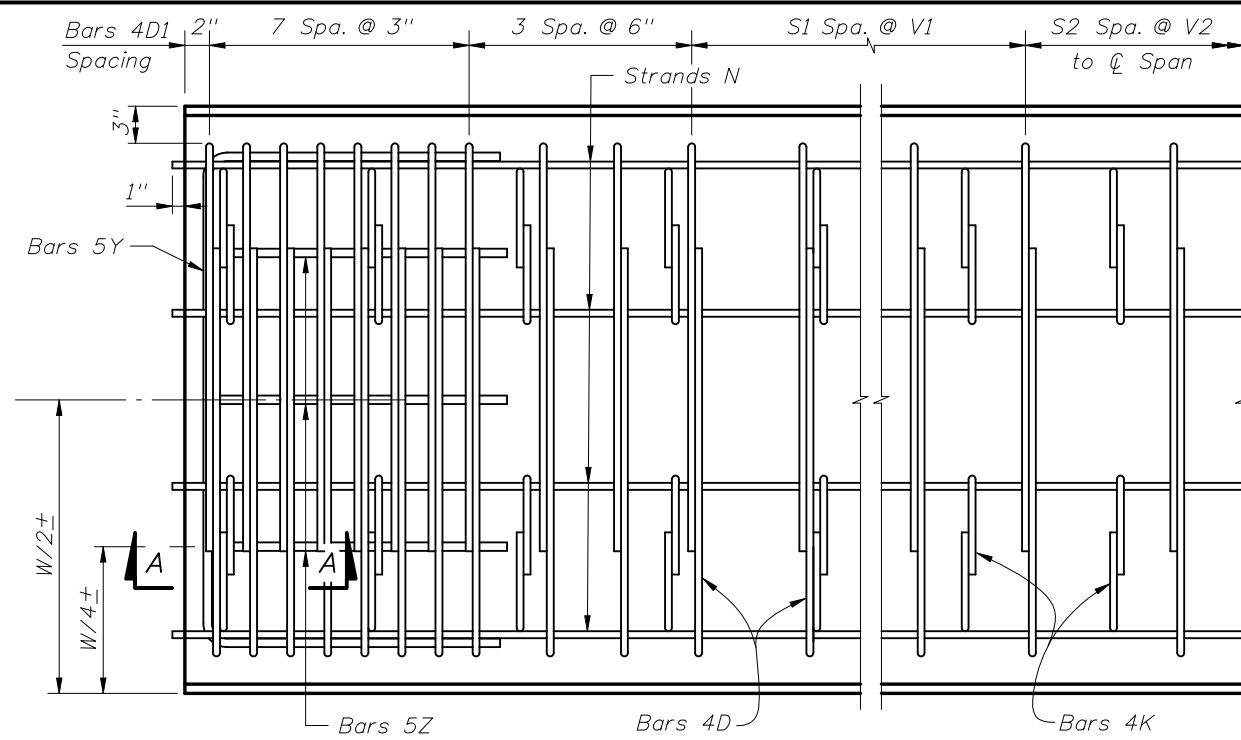


TYPICAL SECTION

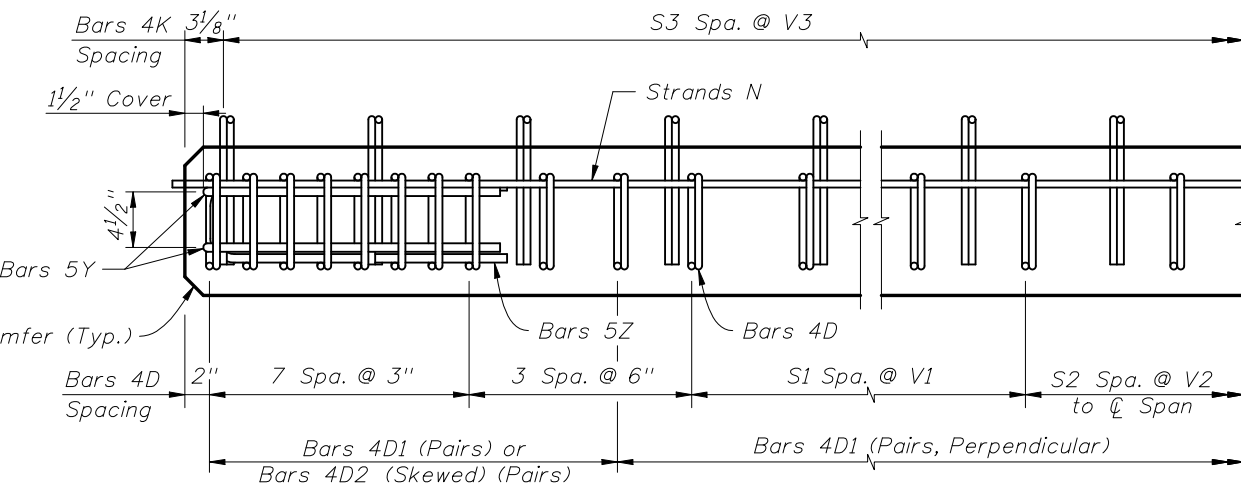


KEYWAY DETAIL

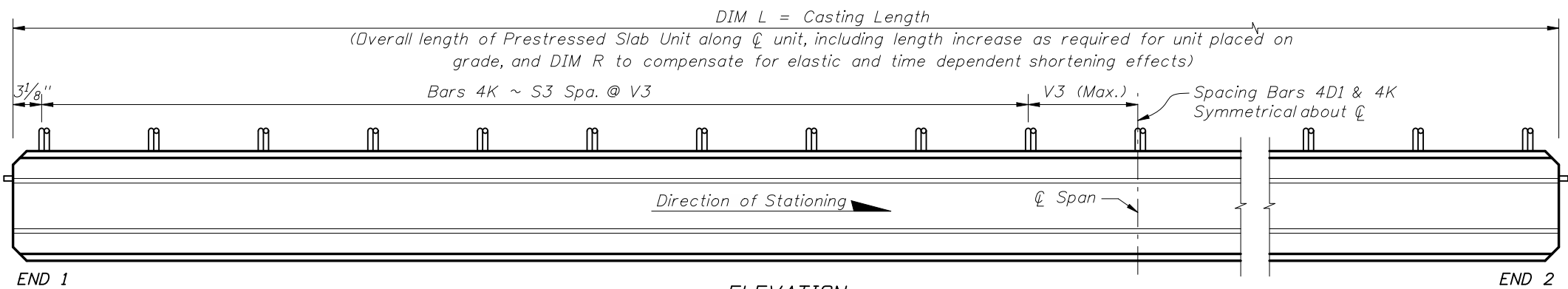
SECTION A-A



PLAN AT END OF PRESTRESSED SLAB UNIT



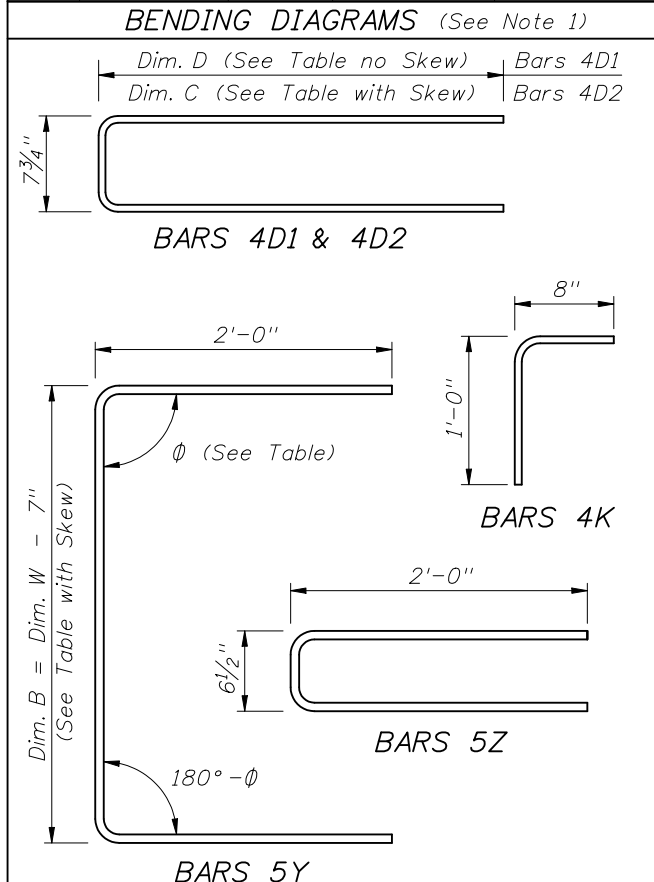
ELEVATION AT END OF PRESTRESSED SLAB UNIT



ELEVATION

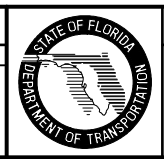
BILL OF REINFORCING STEEL FOR ONE UNIT ONLY

MARK	NOTE NUMBERS	SIZE	NUMBER REQUIRED	LENGTH (NOTE 1)
D1	5	4	See Table	See Table
D2	4, 5	4	40 *	See Table
Y	4	5	4	See Table
K	4, 5	4	See Table	1'-8"
N	2, 8	3/8" \emptyset Strands	4	Dim. L + 2"
Z	-	5	6	4'-7"



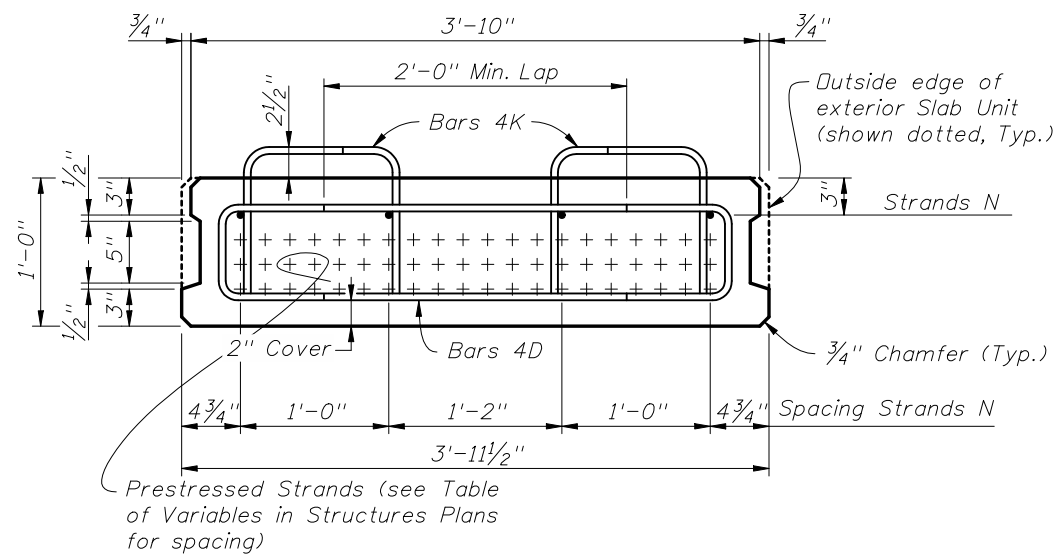
NOTES:
 Work this Index with Index No. 20350 and Prestressed Custom Width Slab Units - Table of Variables in Structures Plans.
 For referenced notes, see Index No. 20350.
 For Dimensions B, C, D, L, R, W, V1 thru V3 and number of spaces S1 thru S3, see Prestressed Slab Units - Table of Variables in Structures Plans.
 * See Note 4 for additional Bars 4D2 for skewed units.

REVISIONS			
DATE	BY	DESCRIPTION	
01/01/09	TJB	New Design Standard	

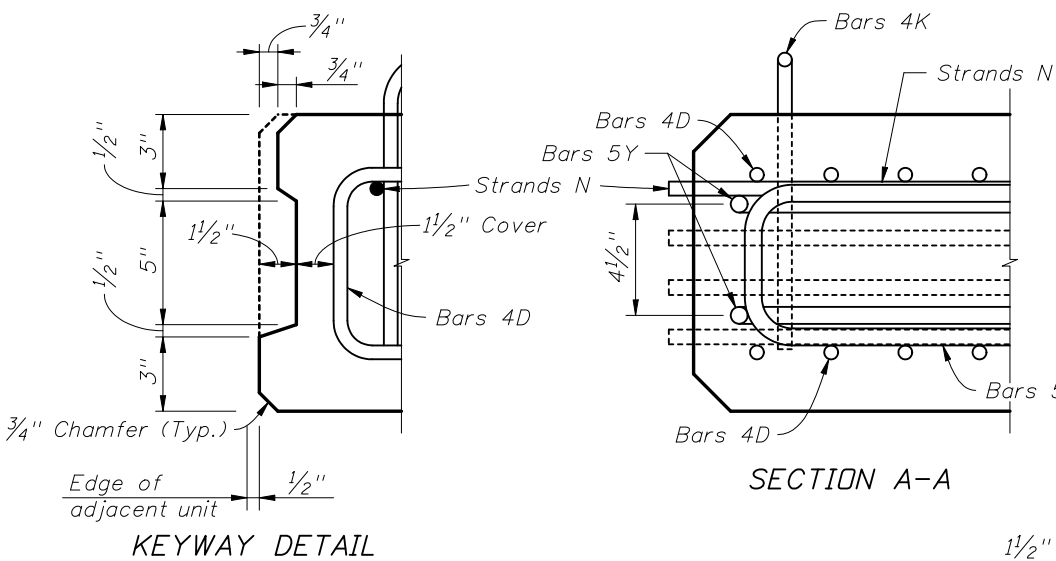


2008 Interim Design Standard
12" CUSTOM WIDTH PRESTRESSED SLAB UNIT
STANDARD DETAILS

Interim Date: 01/01/09
 Sheet No.: 1 of 1
 Index No.: **20353**

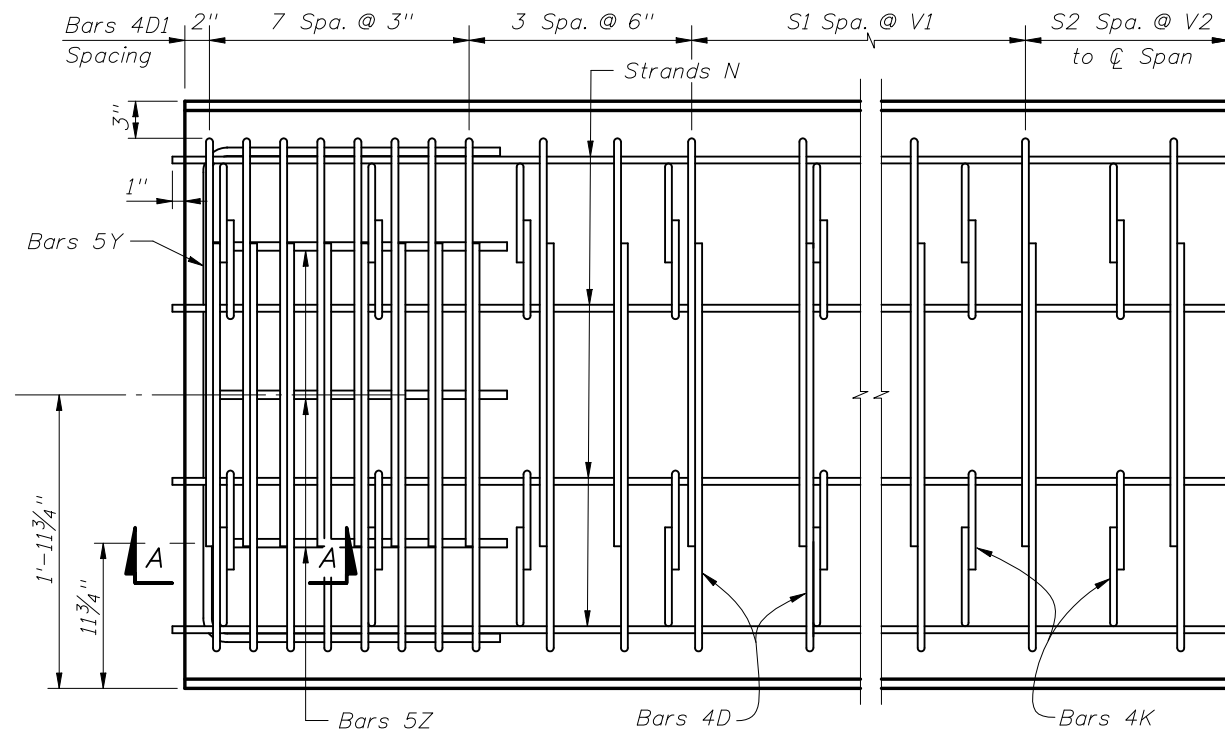


TYPICAL SECTION

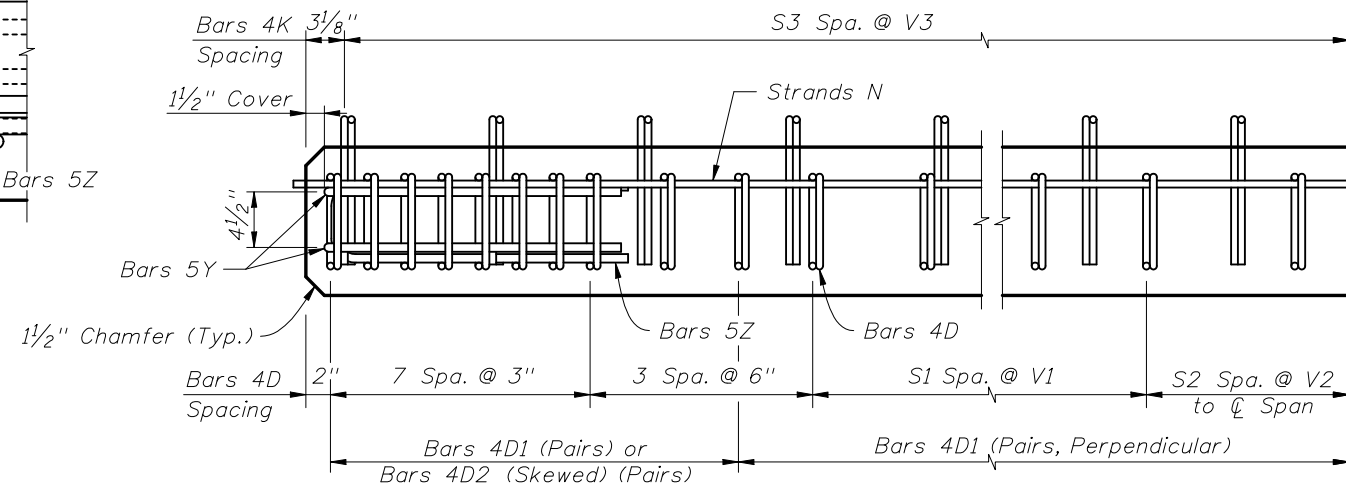


KEYWAY DETAIL

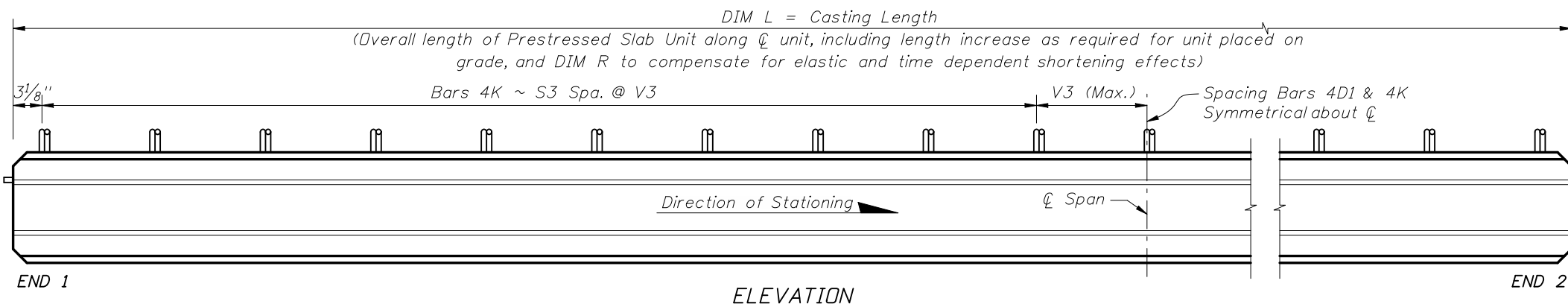
SECTION A-A



PLAN AT END OF PRESTRESSED SLAB UNIT



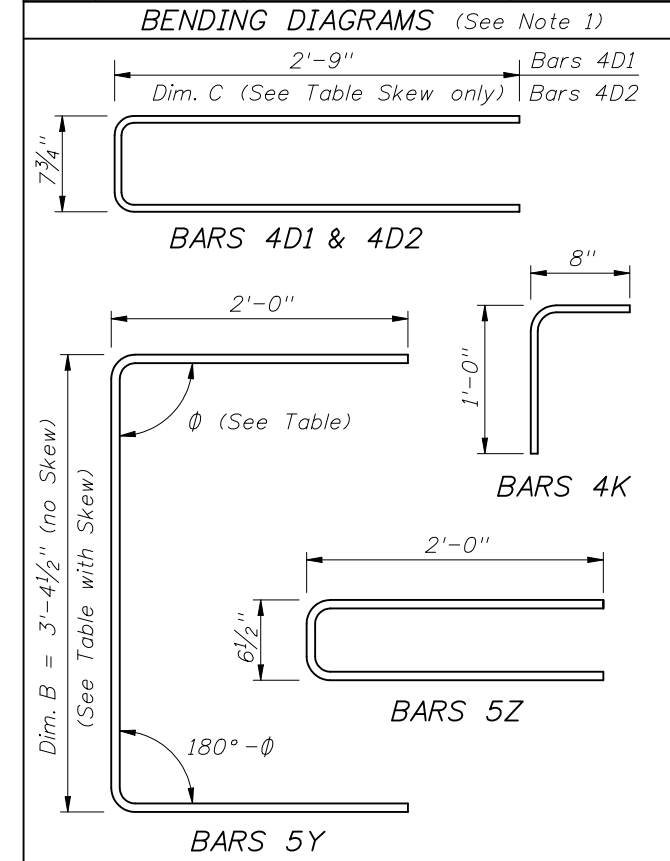
ELEVATION AT END OF PRESTRESSED SLAB UNIT



ELEVATION

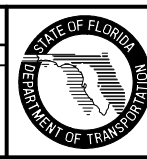
BILL OF REINFORCING STEEL FOR ONE UNIT ONLY

MARK	NOTE NUMBERS	SIZE	NUMBER REQUIRED	LENGTH (NOTE 1)
D1	5	4	See Table	6'-2"
D2	4, 5	4	40 *	See Table
Y	4	5	4	See Table
K	4, 5	4	See Table	1'-8"
N	2, 8	3/8" \emptyset Strands	4	Dim. L + 2"
Z	-	5	6	4'-7"



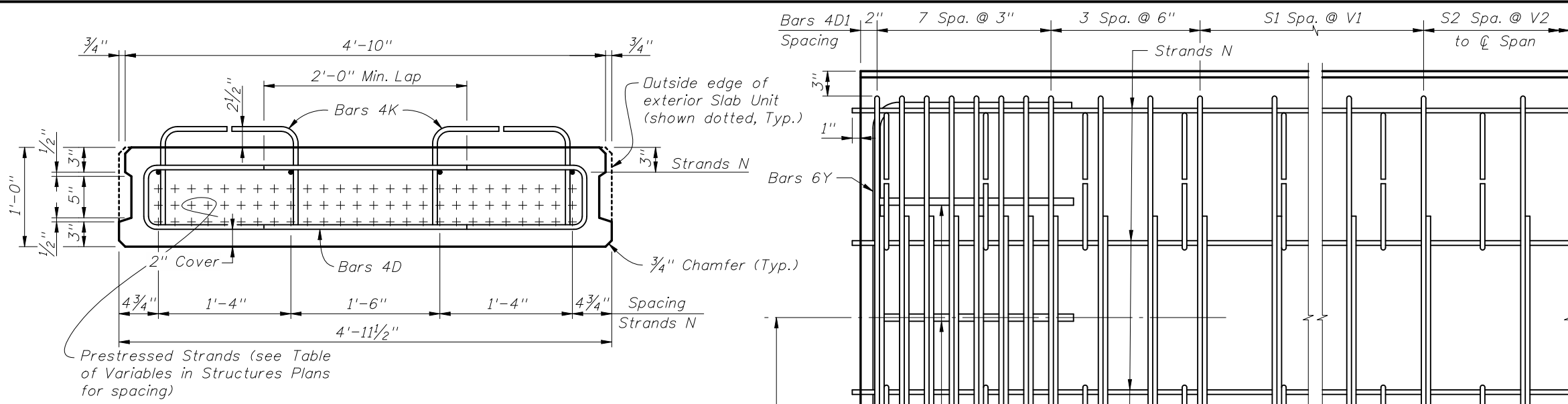
NOTES:
 Work this Index with Index No. 20350. and Prestressed Slab Units - Table of Variables in Structures Plans.
 For referenced notes, see Index No. 20350.
 For Dimensions B, C, L, R, V1 thru V3 and number of spaces S1 thru S3, see Prestressed Slab Units - Table of Variables in Structures Plans.
 * See Note 4 for additional Bars 4D2 for skewed units

REVISIONS			
DATE	BY	DESCRIPTION	DATE
01/01/09	TJB	New Design Standard	

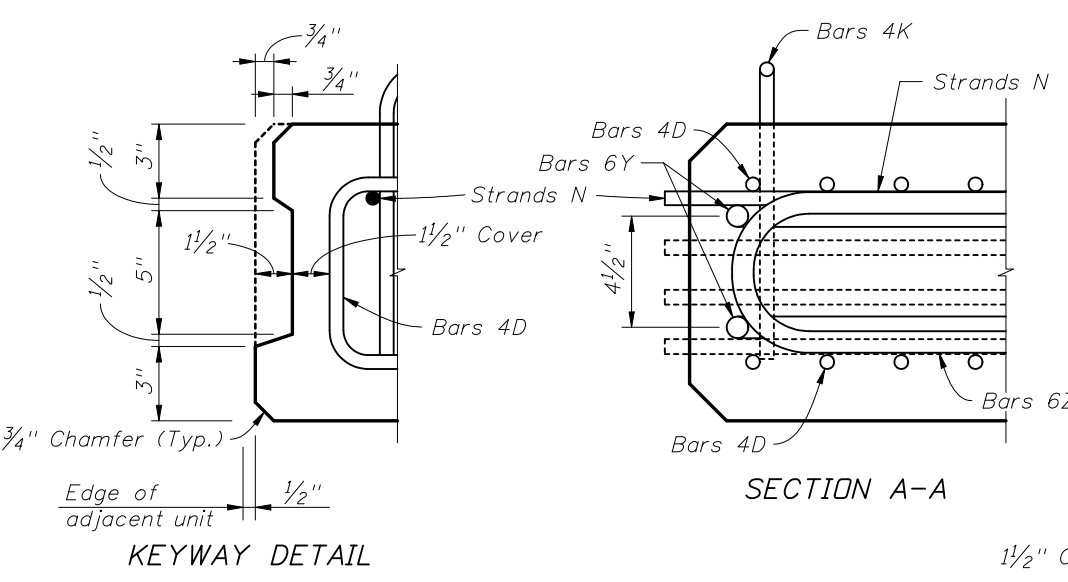


2008 Interim Design Standard
12"x48" PRESTRESSED SLAB UNIT STANDARD DETAILS

Interim Date: 01/01/09
 Sheet No.: 1 of 1
 Index No.: **20354**

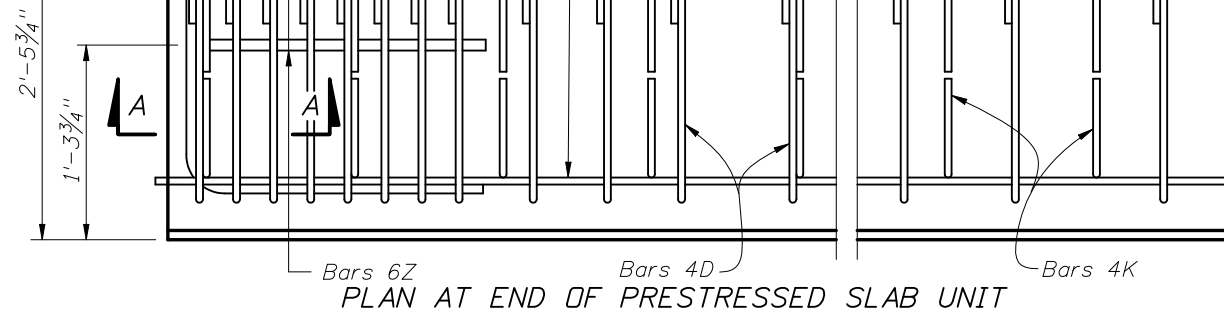


TYPICAL SECTION

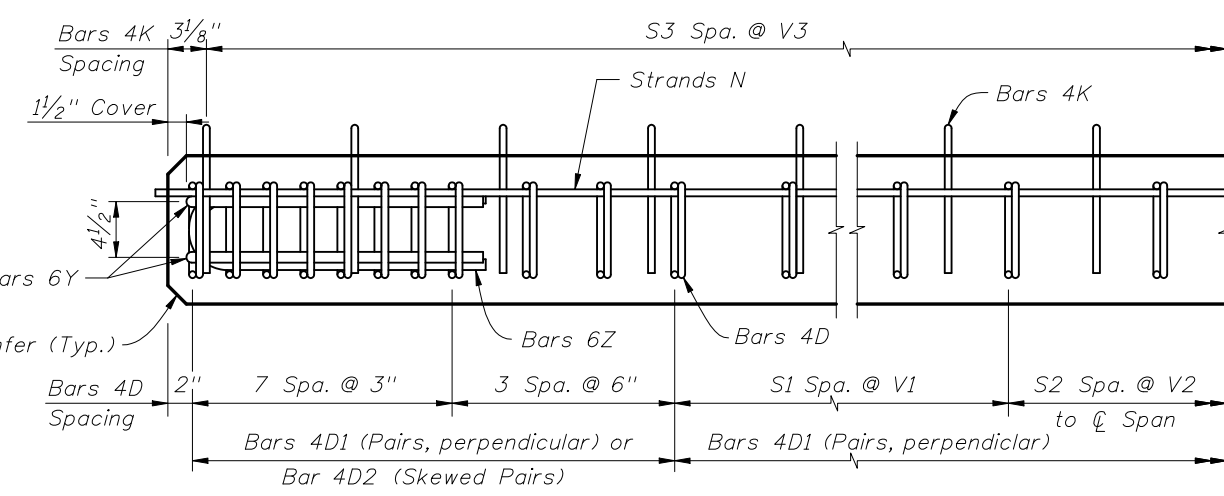


SECTION A-A

KEYWAY DETAIL



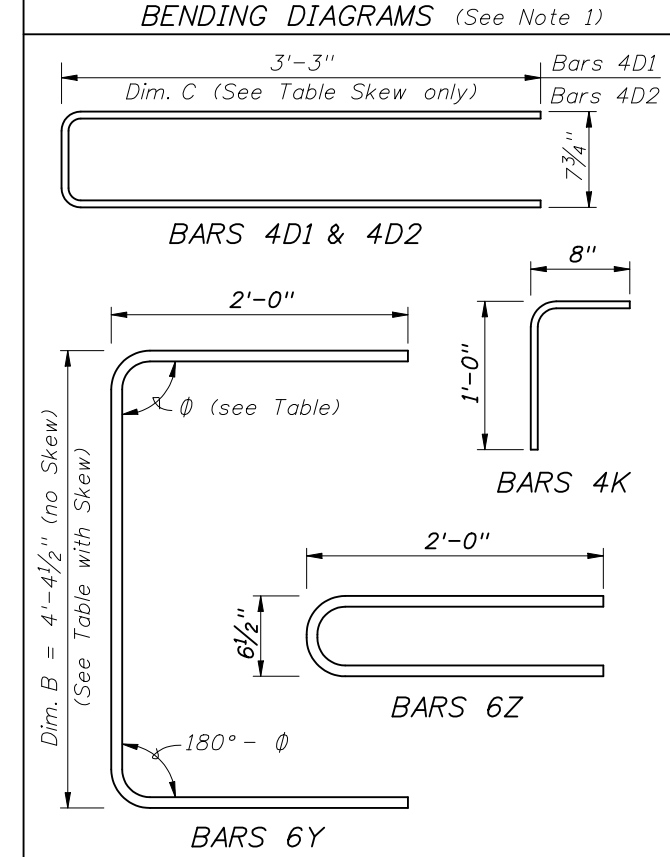
PLAN AT END OF PRESTRESSED SLAB UNIT



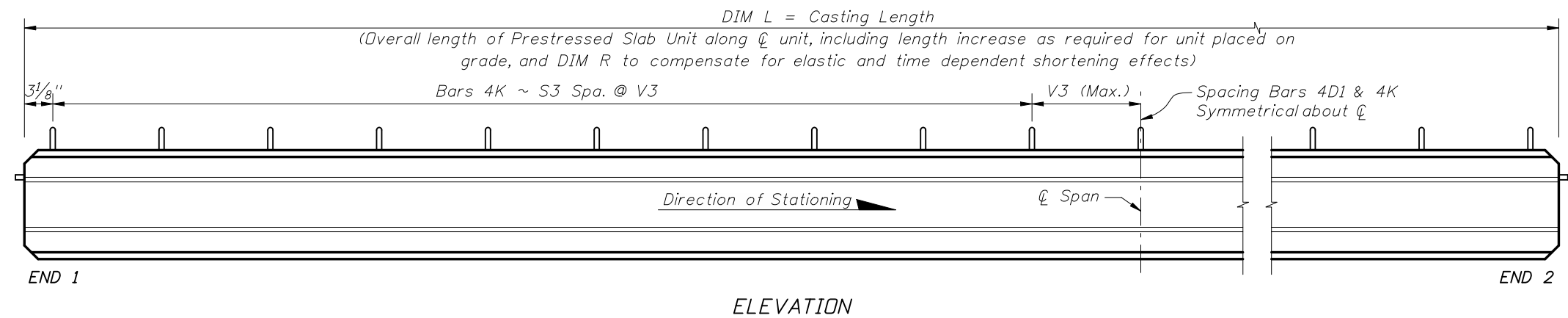
ELEVATION AT END OF PRESTRESSED SLAB UNIT

BILL OF REINFORCING STEEL FOR ONE UNIT ONLY

MARK	NOTE NUMBERS	SIZE	NUMBER REQUIRED	LENGTH (NOTE 1)
D1	5	4	See Table	7'-2"
D2	4, 5	4	40*	See Table
Y	4	6	4	See Table
K	4, 5	4	See Table	1'-8"
N	2, 8	3/8" ϕ Strands	4	Dim. L + 2"
Z	-	6	6	4'-7"

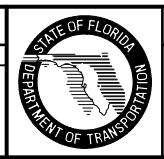


NOTES:
 Work this Index with Index No. 20350 and Prestressed Slab Units - Table of Variables in Structures Plans.
 For referenced notes, see Index No. 20350.
 For Dimensions B, C, L, R, V1 thru V3 and number of spaces S1 thru S3, see Prestressed Slab Units - Table of Variables in Structures Plans.
 * See Note 4 for additional Bars 4D2 for skewed units



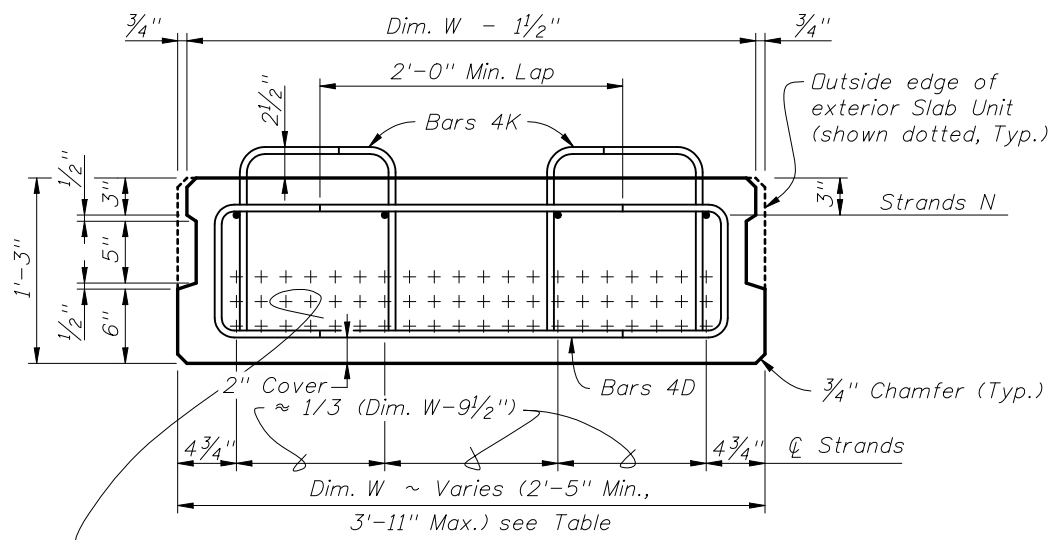
ELEVATION

REVISIONS			
DATE	BY	DESCRIPTION	DATE
01/01/09	TJB	New Design Standard	

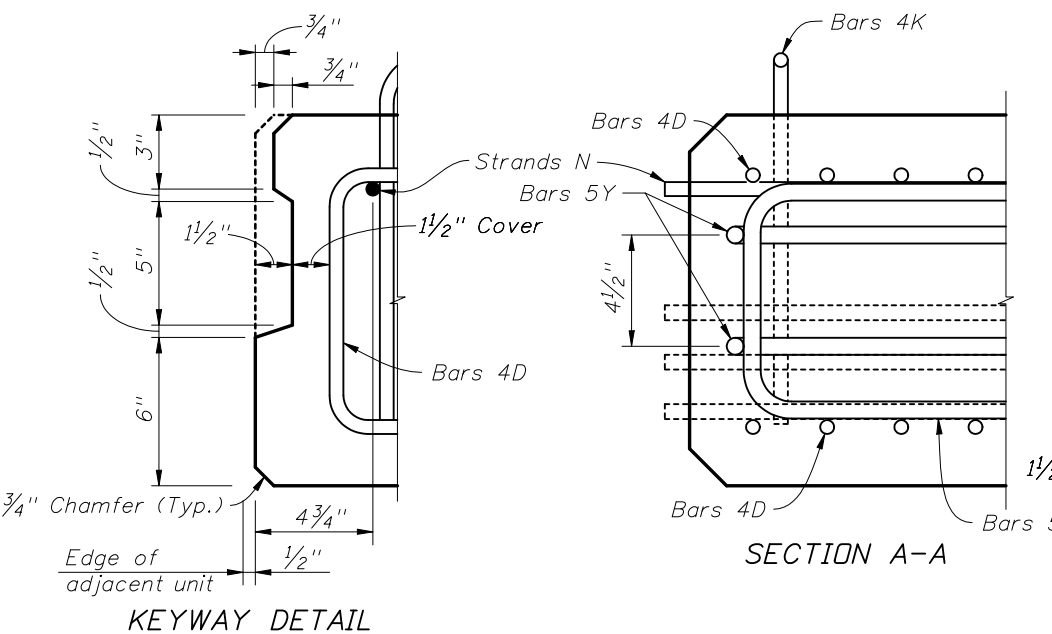


2008 Interim Design Standard
12"x60" PRESTRESSED SLAB UNIT STANDARD DETAILS

Interim Date 01/01/09	Sheet No. 1 of 1
Index No. 20355	

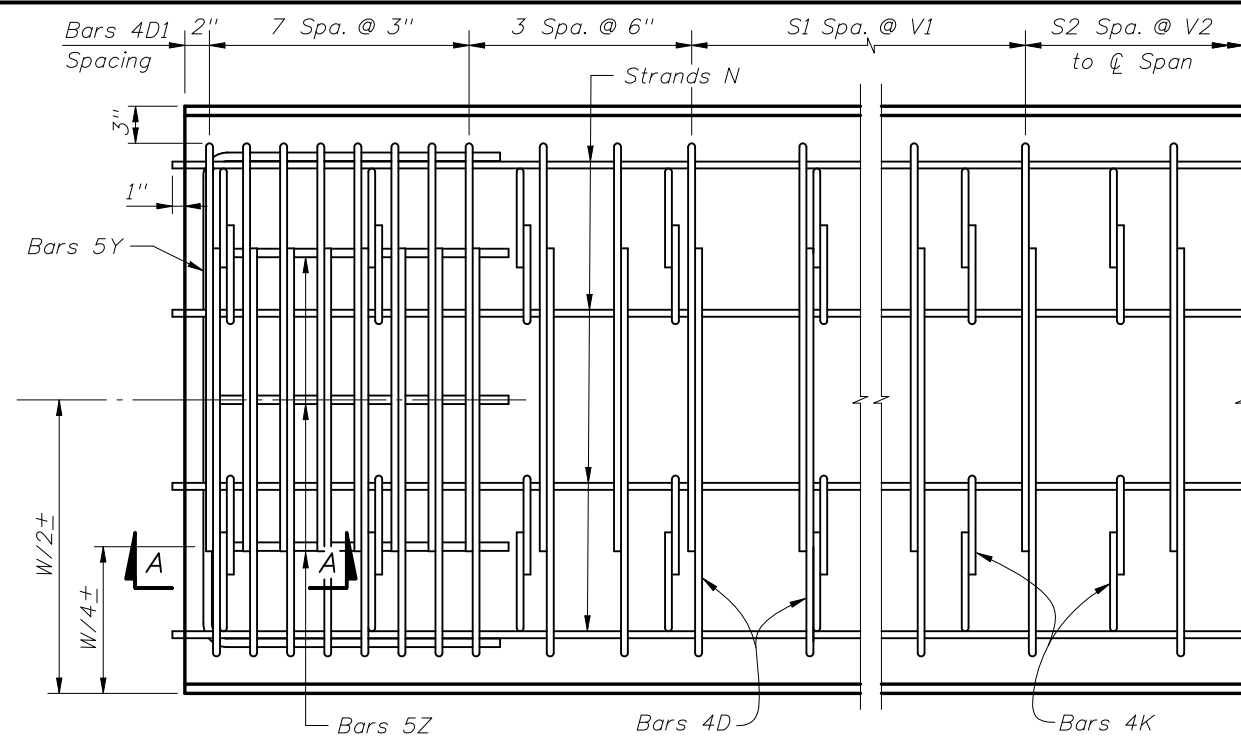


TYPICAL SECTION

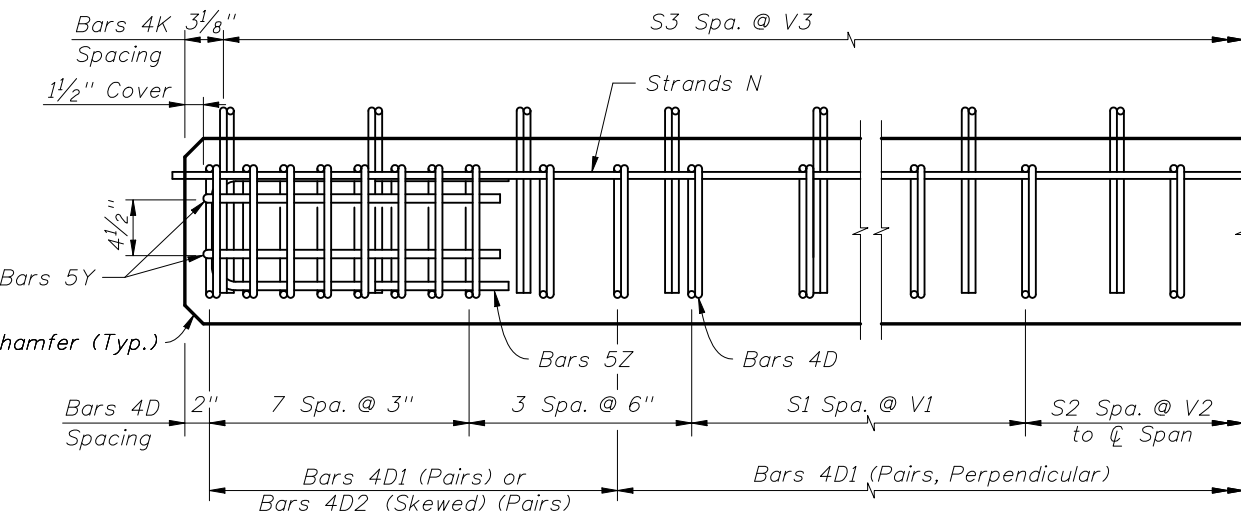


KEYWAY DETAIL

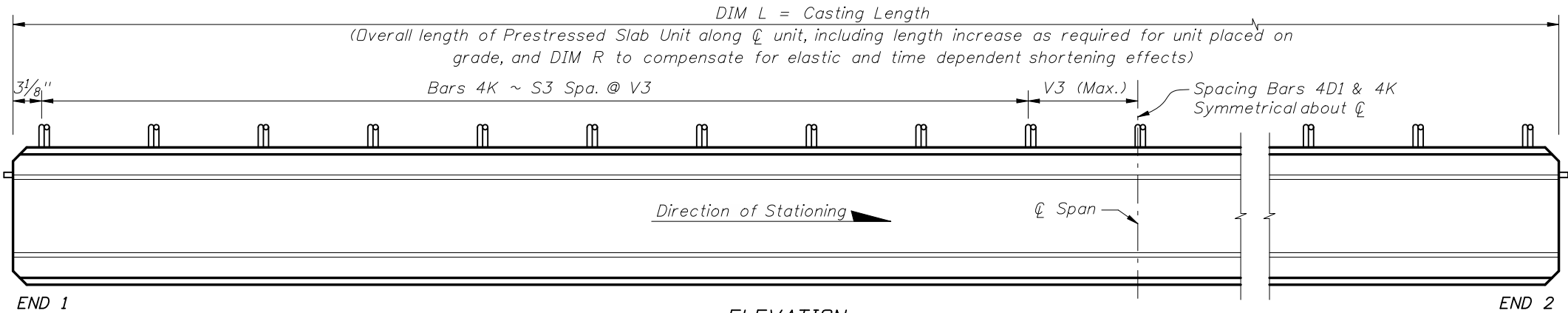
SECTION A-A



PLAN AT END OF PRESTRESSED SLAB UNIT



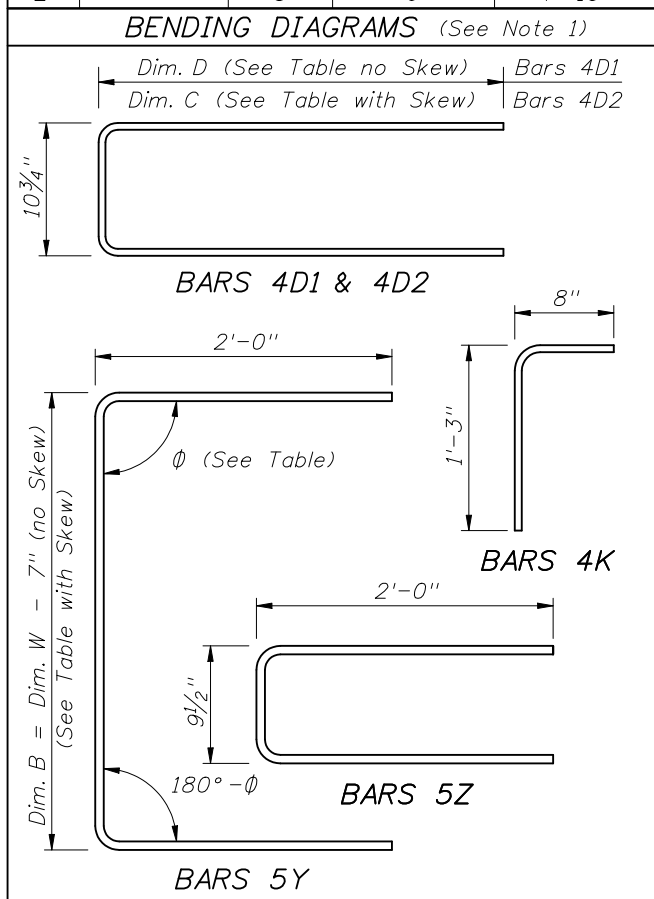
ELEVATION AT END OF PRESTRESSED SLAB UNIT



ELEVATION

BILL OF REINFORCING STEEL FOR ONE UNIT ONLY

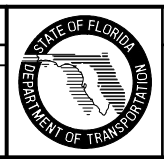
MARK	NOTE NUMBERS	SIZE	NUMBER REQUIRED	LENGTH (NOTE 1)
D1	5	4	See Table	See Table
D2	4, 5	4	40 *	See Table
Y	4	5	4	See Table
K	4, 5	4	See Table	1'-11"
N	2, 8	3/8" ϕ Strands	4	Dim. L + 2"
Z	-	5	6	4'-10"



NOTES:
 Work this Index with Index No. 20350 and Prestressed Custom Width Slab Units - Table of Variables in Structures Plans.
 For referenced notes, see Index No. 20350.
 For Dimensions B, C, D, L, R, W, V1 thru V3 and number of spaces S1 thru S3, see Prestressed Slab Units - Table of Variables in Structures Plans.

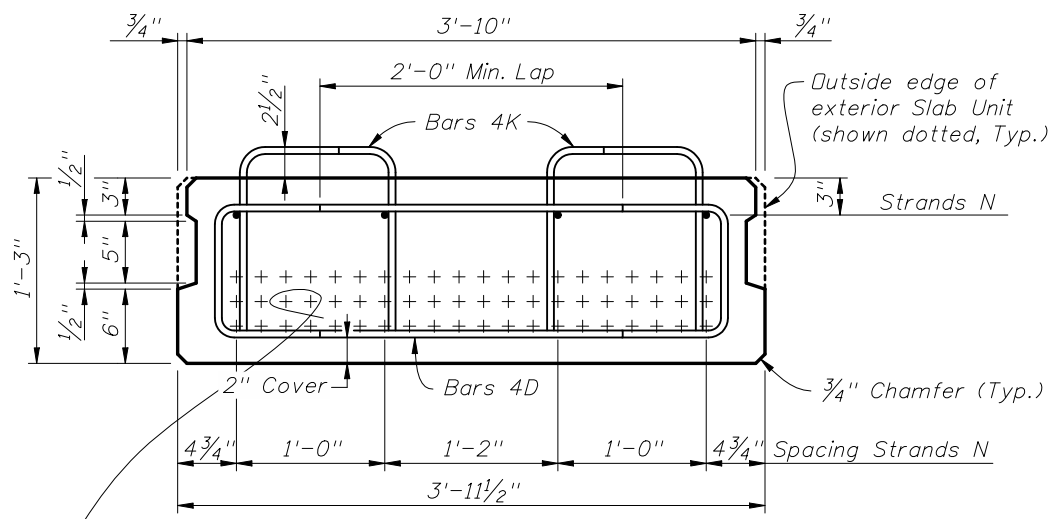
* See Note 4 for additional Bars 4D2 for skewed units.

REVISIONS			
DATE	BY	DESCRIPTION	DATE
01/01/09	TJB	New Design Standard	

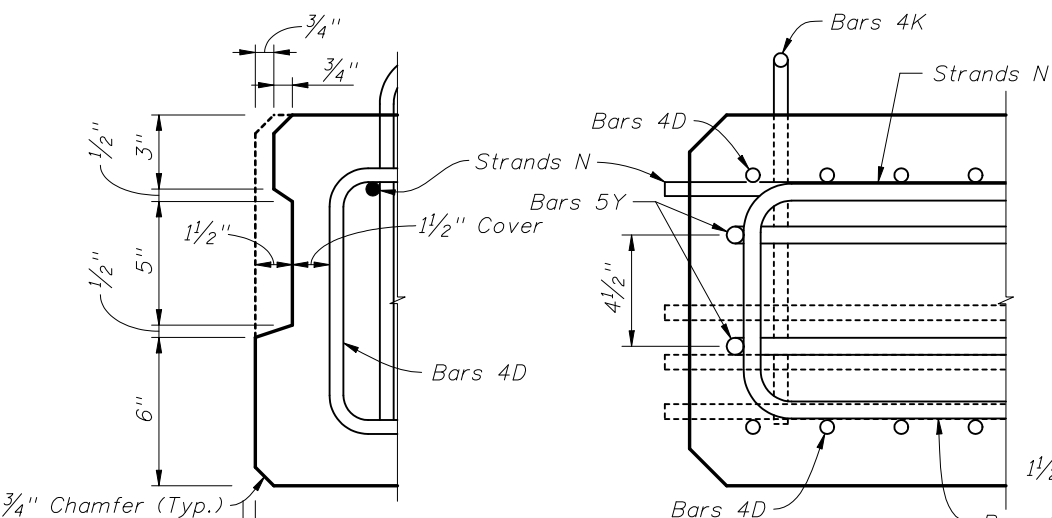


2008 Interim Design Standard
15" CUSTOM WIDTH PRESTRESSED SLAB UNIT
 STANDARD DETAILS

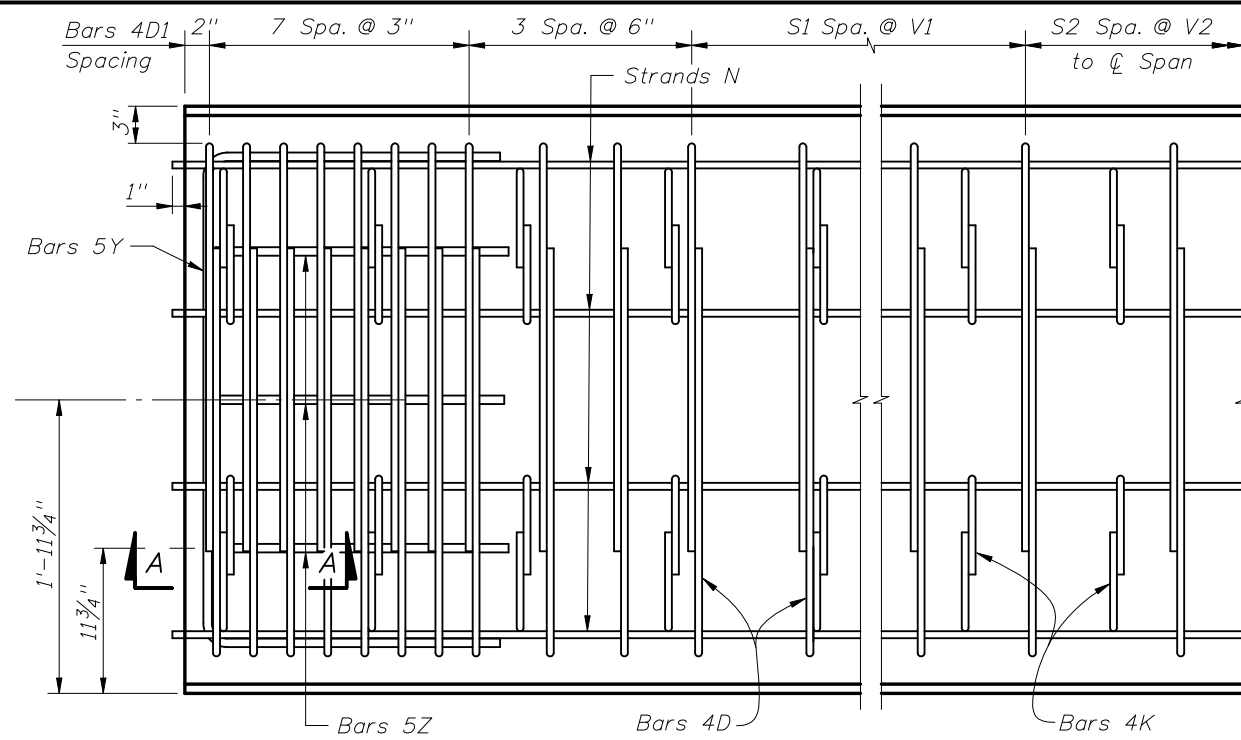
Interim Date: 01/01/09
 Sheet No.: 1 of 1
 Index No.: **20363**



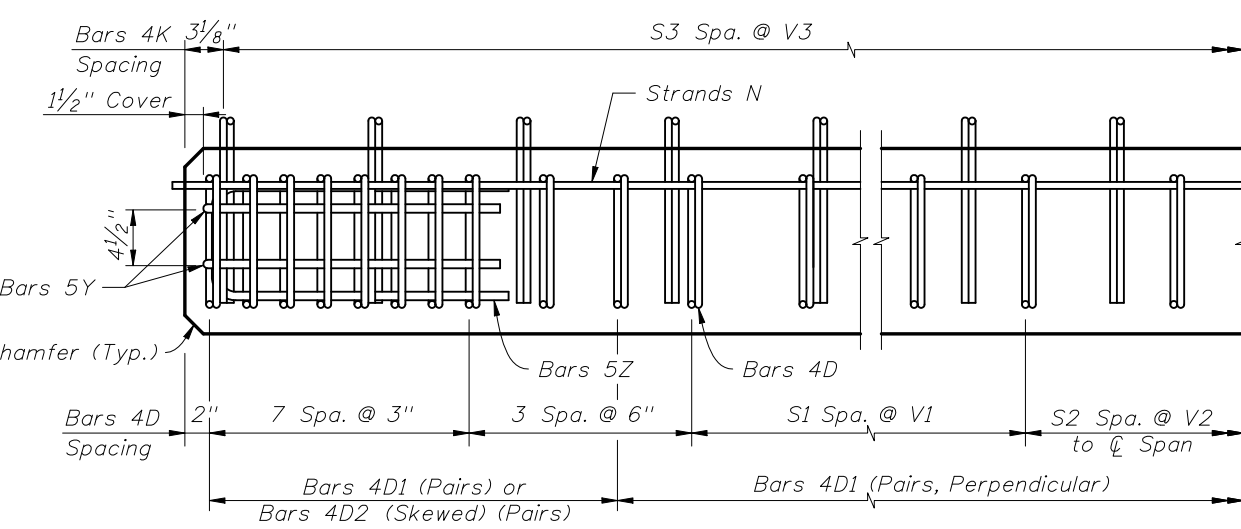
TYPICAL SECTION



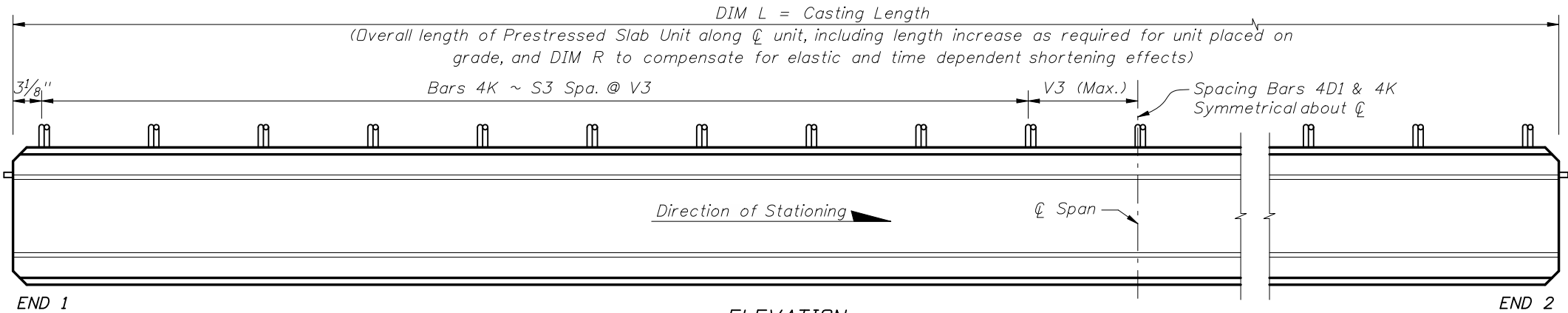
KEYWAY DETAIL



PLAN AT END OF PRESTRESSED SLAB UNIT



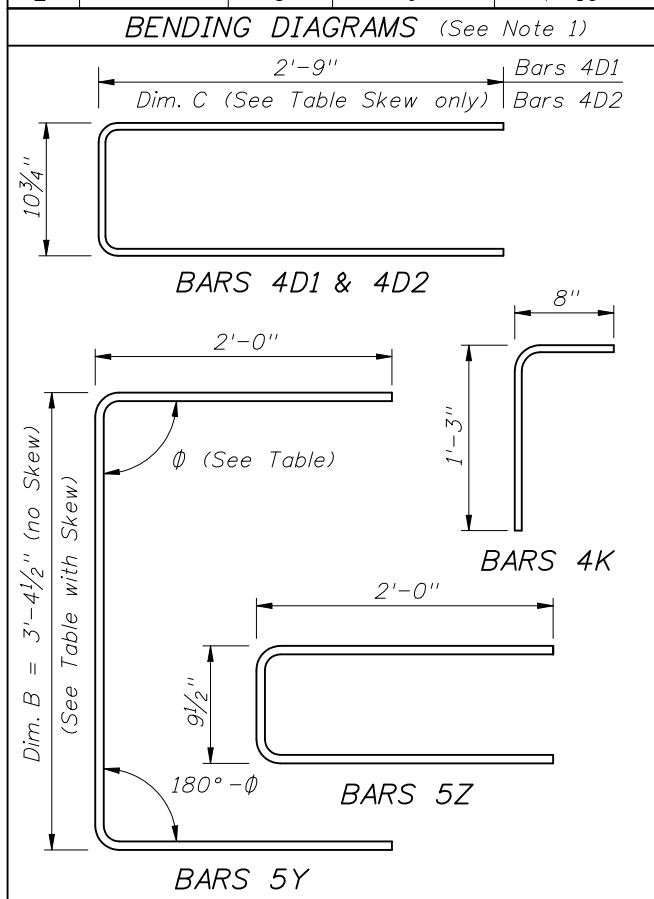
ELEVATION AT END OF PRESTRESSED SLAB UNIT



ELEVATION

BILL OF REINFORCING STEEL FOR ONE UNIT ONLY

MARK	NOTE NUMBERS	SIZE	NUMBER REQUIRED	LENGTH (NOTE 1)
D1	5	4	See Table	6'-5"
D2	4, 5	4	40 *	See Table
Y	4	5	4	See Table
K	4, 5	4	See Table	1'-11"
N	2, 8	3/8" ϕ Strands	4	Dim. L + 2"
Z	-	5	6	4'-10"

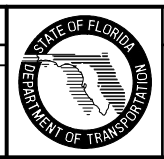


NOTES:
 Work this Index with Index No. 20350. and Prestressed Slab Units - Table of Variables in Structures Plans.

For referenced notes, see Index No. 20350.
 For Dimensions B, C, L, R, V1 thru V3 and number of spaces S1 thru S3, see Prestressed Slab Units - Table of Variables in Structures Plans.

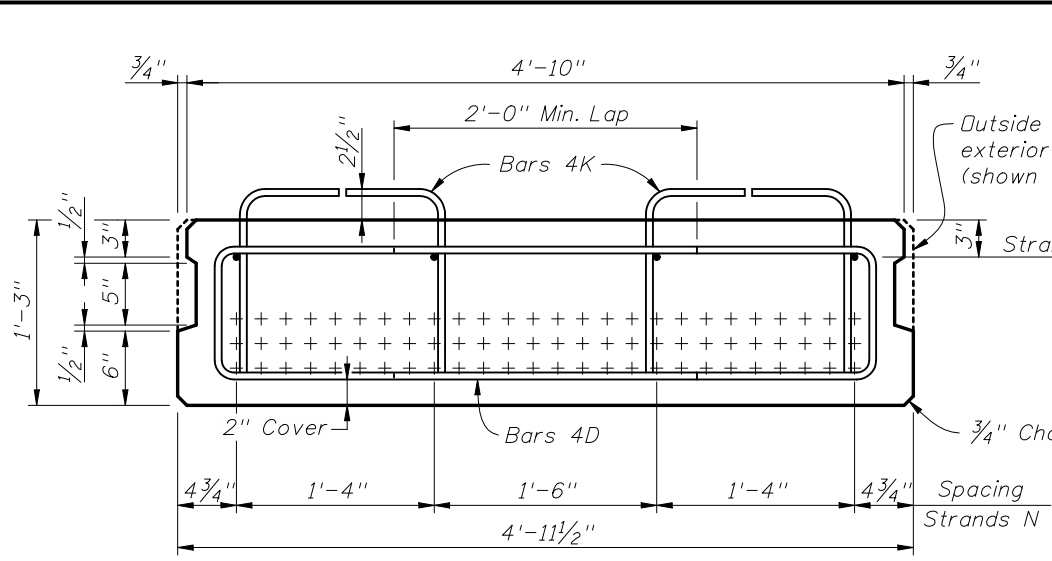
* See Note 4 for additional Bars 4D2 for skewed units

REVISIONS			
DATE	BY	DESCRIPTION	DATE
01/01/09	TJB	New Design Standard	

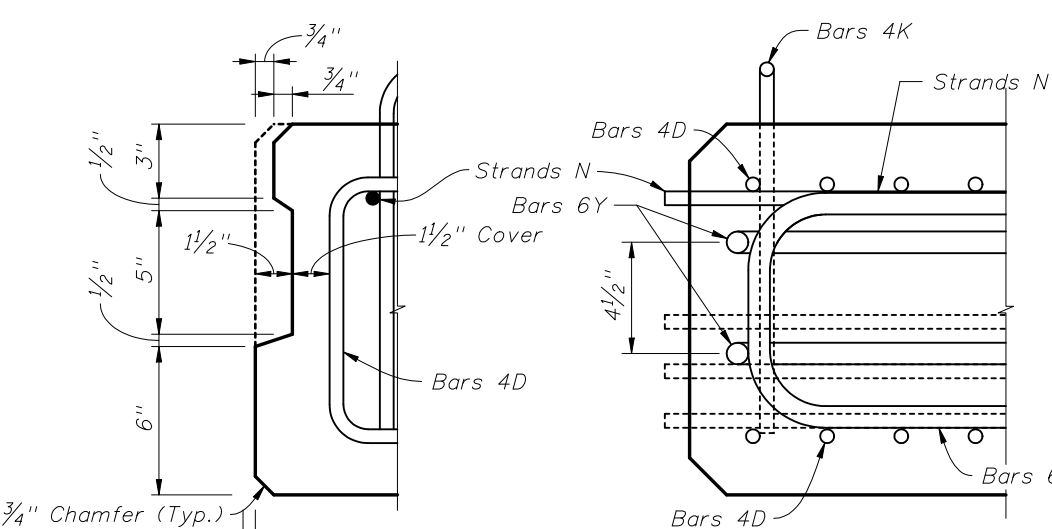


2008 Interim Design Standard
15"x48" PRESTRESSED SLAB UNIT
STANDARD DETAILS

Interim Date
 01/01/09
 Sheet No.
 1 of 1
 Index No.
20364

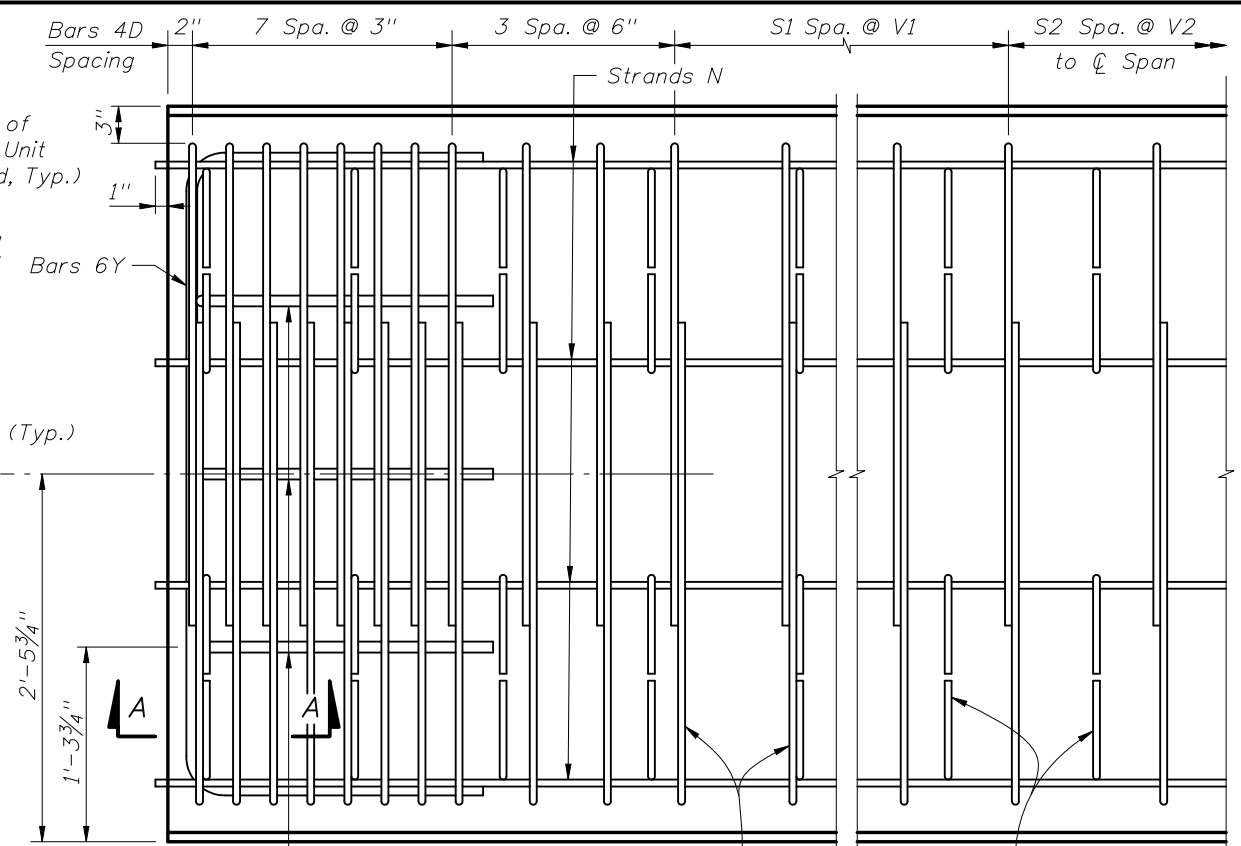


TYPICAL SECTION

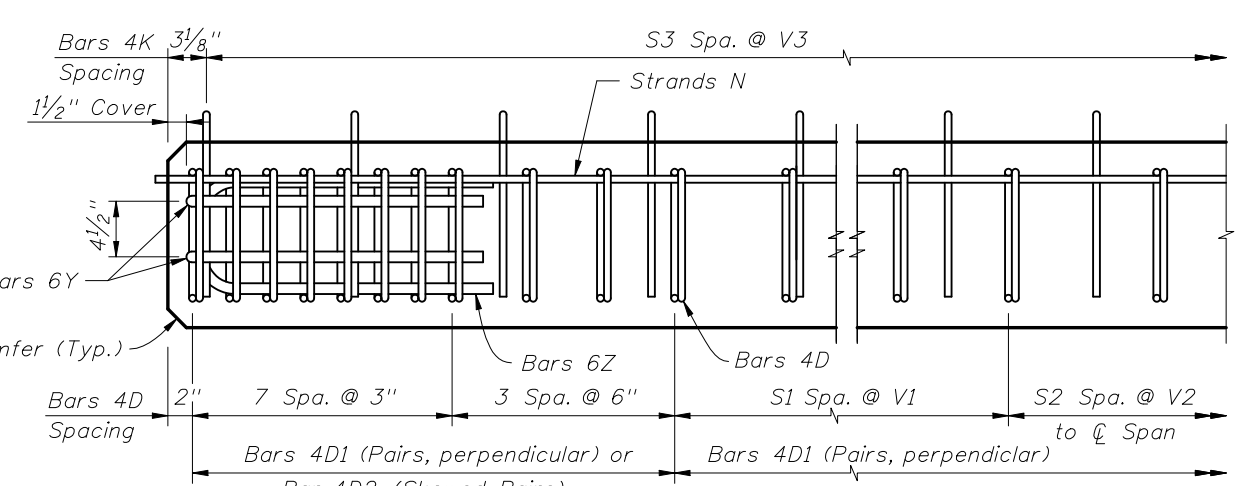


SECTION A-A

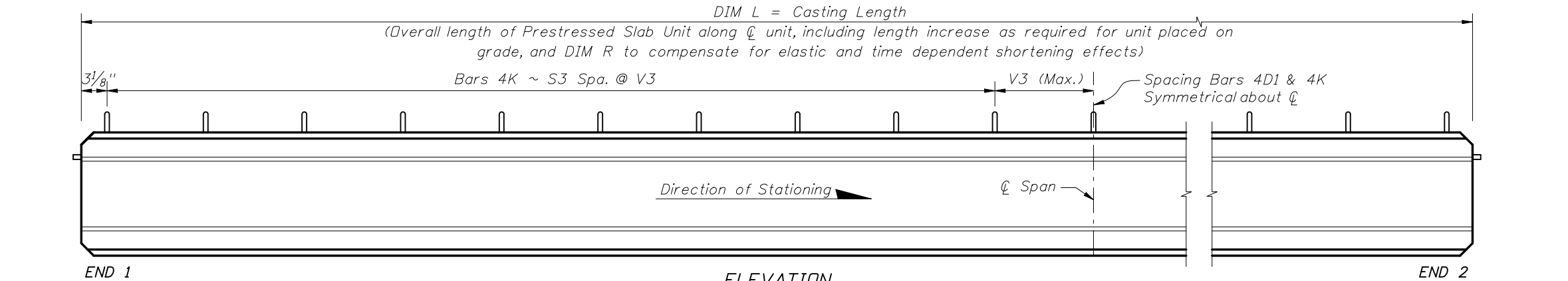
KEYWAY DETAIL



PLAN AT END OF PRESTRESSED SLAB UNIT



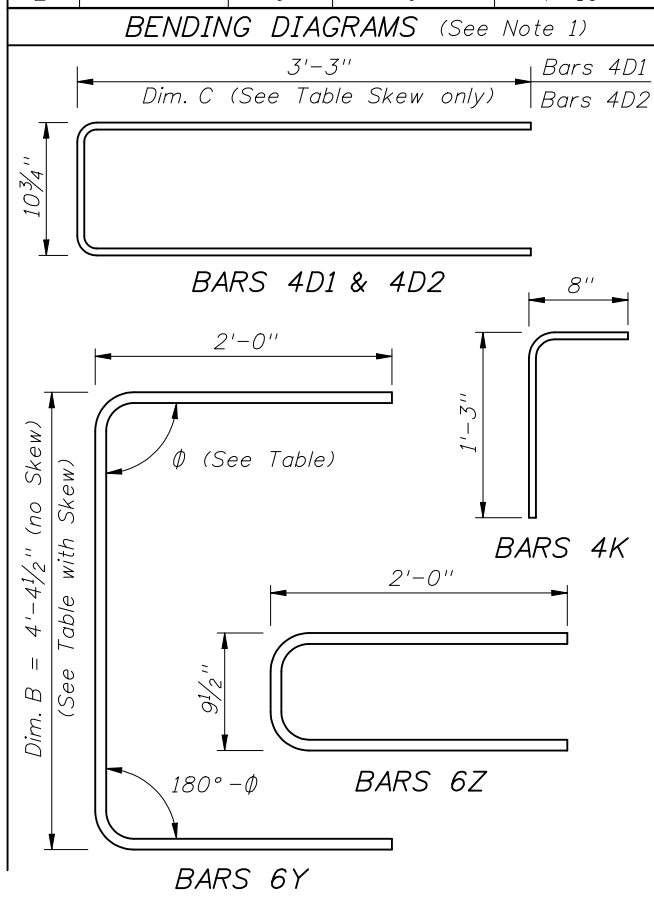
ELEVATION AT END OF PRESTRESSED SLAB UNIT



ELEVATION

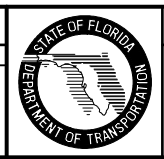
BILL OF REINFORCING STEEL FOR ONE UNIT ONLY

MARK	NOTE NUMBERS	SIZE	NUMBER REQUIRED	LENGTH (NOTE 1)
D1	5	4	See Table	7'-5"
D2	4, 5	4	40*	See Table
Y	4	6	4	See Table
K	4, 5	4	See Table	1'-11"
N	2, 8	3/8" \emptyset Strands	4	Dim. L + 2"
Z	-	6	6	4'-10"



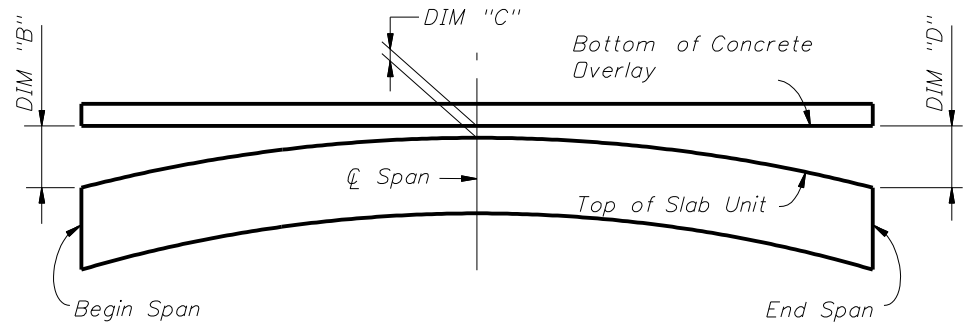
NOTES:
 Work this Index with Index No. 20350 and Prestressed Slab Units - Table of Variables in Structures Plans.
 For referenced notes, see Index No. 20350.
 For Dimensions B, C, L, R, V1 thru V3 and number of spaces S1 thru S3, see Prestressed Slab Units - Table of Variables in Structures Plans.
 * See Note 4 for additional Bars 4D2 for skewed units

REVISIONS			
DATE	BY	DESCRIPTION	DATE
01/01/09	TJB	New Design Standard	

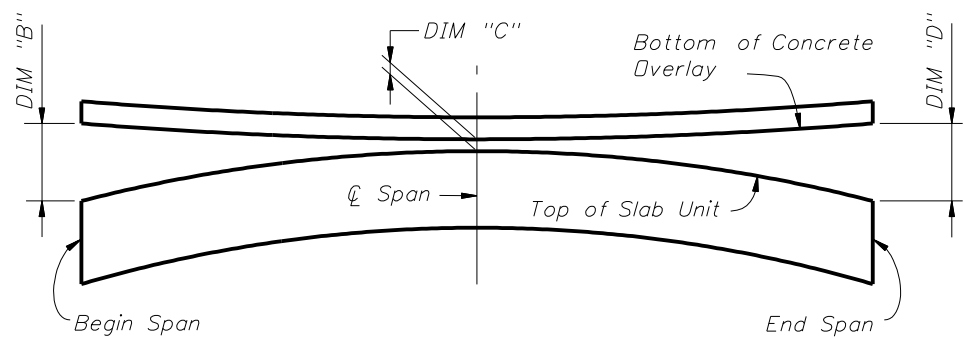


2008 Interim Design Standard
**15"x60" PRESTRESSED SLAB UNIT
 STANDARD DETAILS**

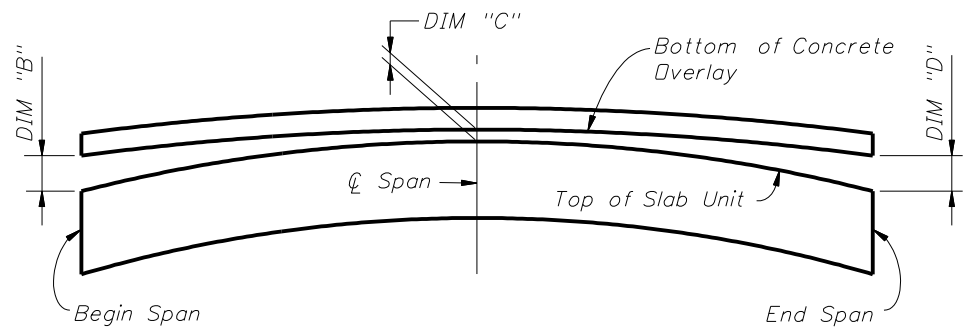
Interim Date 01/01/09	Sheet No. 1 of 1
Index No. 20365	



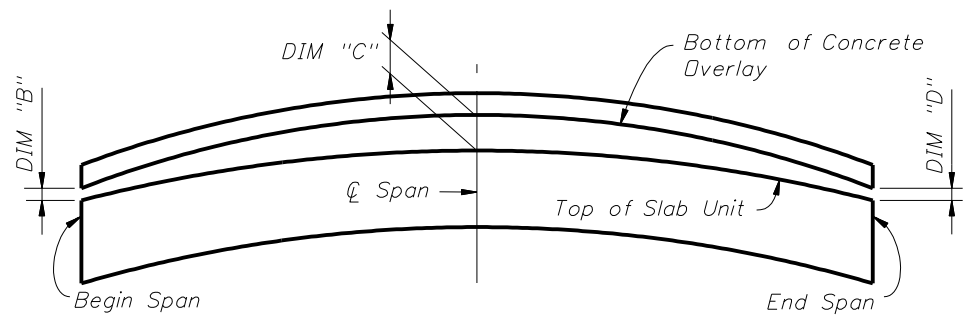
BUILD-UP DIAGRAM FOR TANGENT SPANS
(ALONG ϕ SLAB UNIT) (CASE 1)



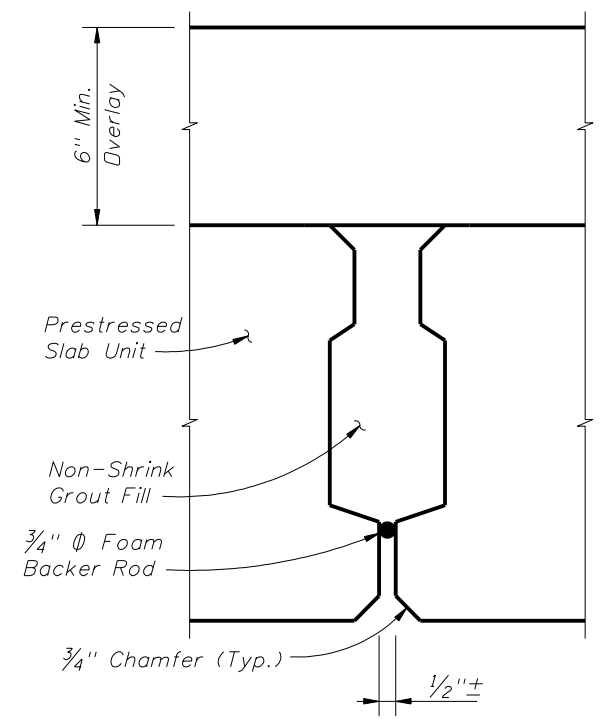
BUILD-UP DIAGRAM FOR SAG VERTICAL CURVE SPANS
- CONTROL AT ϕ SPAN
(ALONG ϕ SLAB UNIT) (CASE 2)



BUILD-UP DIAGRAM FOR CREST VERTICAL CURVE SPANS
- CONTROL AT ϕ SPAN
(ALONG ϕ SLAB UNIT) (CASE 3)

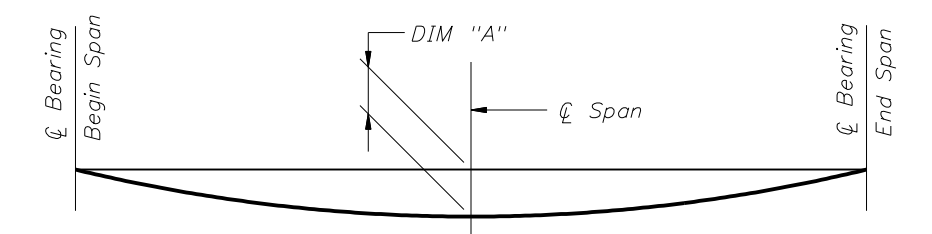


BUILD-UP DIAGRAM FOR CREST VERTICAL CURVE SPANS
- CONTROL AT BEGIN OR END SPAN
(ALONG ϕ SLAB UNIT) (CASE 4)

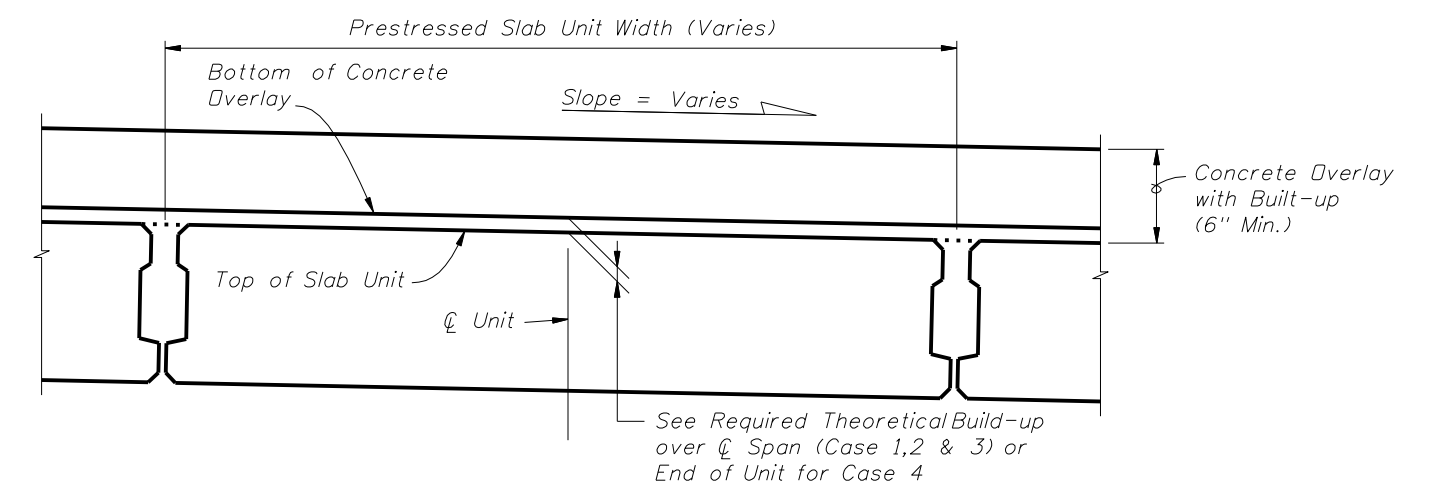


KEYWAY DETAIL

PRESTRESSED SLAB UNIT CAMBER AND BUILD-UP NOTES:
The build-up values given in the table are based on theoretical unit cambers. The Contractor shall monitor unit cambers for the purpose of predicting camber values at the time of the deck pour. If the predicted cambers based on field measurements differ more than $\pm 1/2$ " from the theoretical "Net Unit Camber @ 120 Days" shown in the table, propose modified build-up dimensions as required and submit to the Engineer for approval a minimum of 21 days prior to casting overlay concrete.



DEAD LOAD DEFLECTION DIAGRAM

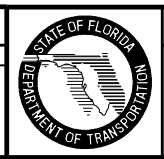


BUILD-UP OVER SLAB UNITS

INSTRUCTIONS TO DESIGNER:
Although not shown here in the Diagrams or Notes, the effect of Horizontal Curvature, when present, needs to be considered for the Build-up Calculations.

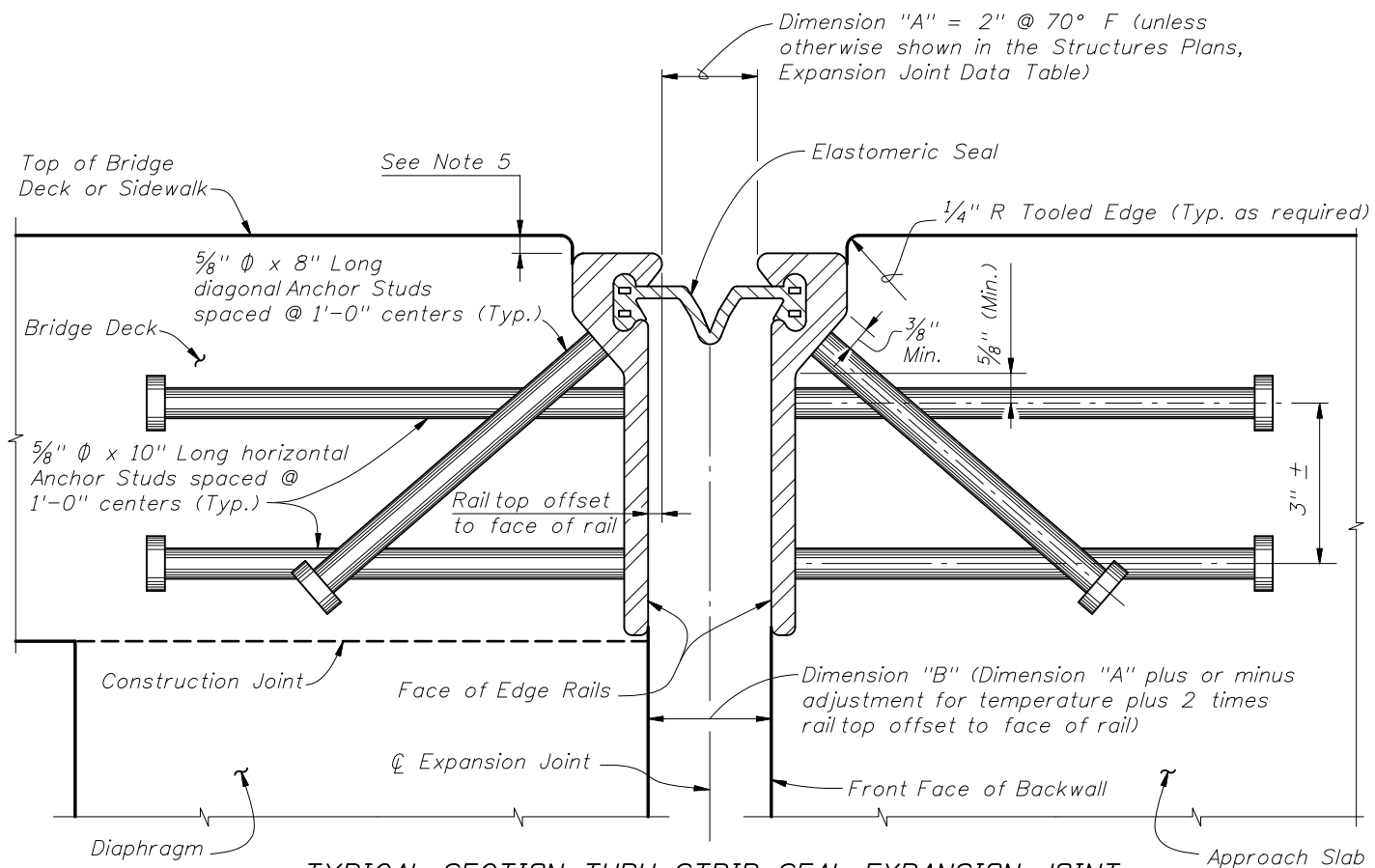
NOTE:
Work this Index with the Build-up and Deflection Data Table for Prestressed Slab Units in Structures Plans.

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
01/01/09	TJB	New Design Standard			

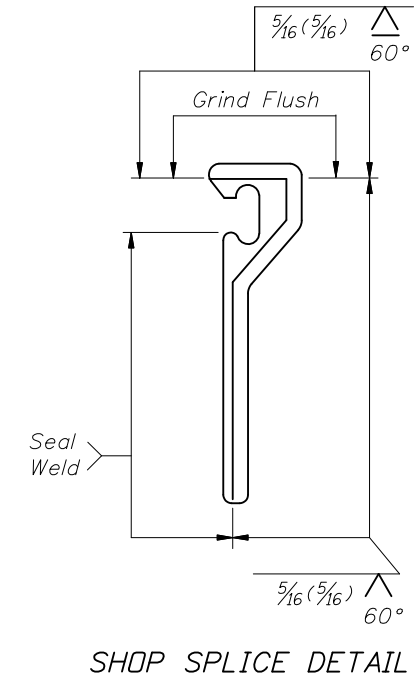


2008 Interim Design Standard
BUILD-UP & DEFLECTION DATA FOR PRESTRESSED SLAB UNITS

Interim Date: 01/01/09
Sheet No.: 1 of 1
Index No.: 20399



TYPICAL SECTION THRU STRIP SEAL EXPANSION JOINT
 (Begin or End Concrete Girder Bridge shown,
 Intermediate Supports and Steel Girder Bridge similar.
 Reinforcing Steel and Girder details not shown for clarity.)



GENERAL NOTES:

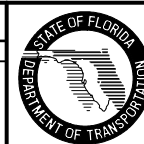
1. Furnish Strip Seal Expansion Joint Systems in accordance with Specification Section 458, ASTM D5973 and the AASHTO LRFD Bridge Design Specifications.
2. Furnish solid steel Edge Rails in accordance with ASTM A709, Grade 36, 50 or 50(W) that are extruded, hot rolled and or machined. Furnish Edge Rails with a minimum mass of 19.2 lb/ft excluding studs, a minimum height of 8", a minimum thickness of 1/2" and a maximum top surface (riding surface) width of 2". Shape of Edge Rail shown is representative, minor variations depending on manufacturer are permitted. Edge Rails manufactured from bent plate or built up pieces are not acceptable.
3. Furnish Anchor Studs in accordance with ASTM A108. Electric arc end-weld Anchor Studs with complete fusion. Anchor Studs may be piggy backed to achieve required lengths.
4. When required, furnish 1/4" thick slip resistant steel Sidewalk Cover Plates in accordance with ASTM A709, Grade 36 or 50, with a minimum coefficient of friction on the top surface of 0.8 in a dry condition as determined by ASTM F1677 or F1679 and 0.68 or 0.52 in a wet condition as determined by ASTM F1679 or ASTM F1677 (respectively); that incorporate an anti-slip steel surface consisting of a random hatch matrix or other suitable pattern. Do not use diamond plate or surface applied slip resistant tapes, films, nonmetallic coatings or other similar materials. Furnish flat head Stainless Steel Sleeve Anchors in accordance with ASTM F593 Group 1 Alloy 304 for attaching Sidewalk Cover Plates. Install Sleeve Anchors in accordance with manufacturer's recommendations.
5. Recess the Edge Rail below the concrete surface in accordance with Specification Section 458.
6. Refer to Specification 458 and the Expansion Joint Data Table in the Structures Plans for installation and fabrication requirements and adjustments to Dimension "A".
7. Manufacturers seeking approval of Strip Seal Expansion Joint Systems for inclusion on the Qualified Products List as pre-approved designs must submit application along with design documentation showing the expansion joint meets the specification, geometric and material requirements specified herein. Include installation details consisting of temporary or sacrificial support brackets, bolts, clamps, etc. that are compatible with decks constructed with or without blockouts.

INSTRUCTIONS TO DESIGNER:

Complete the Expansion Joint Data Table in Structures Plans with project specific information.

REVISIONS

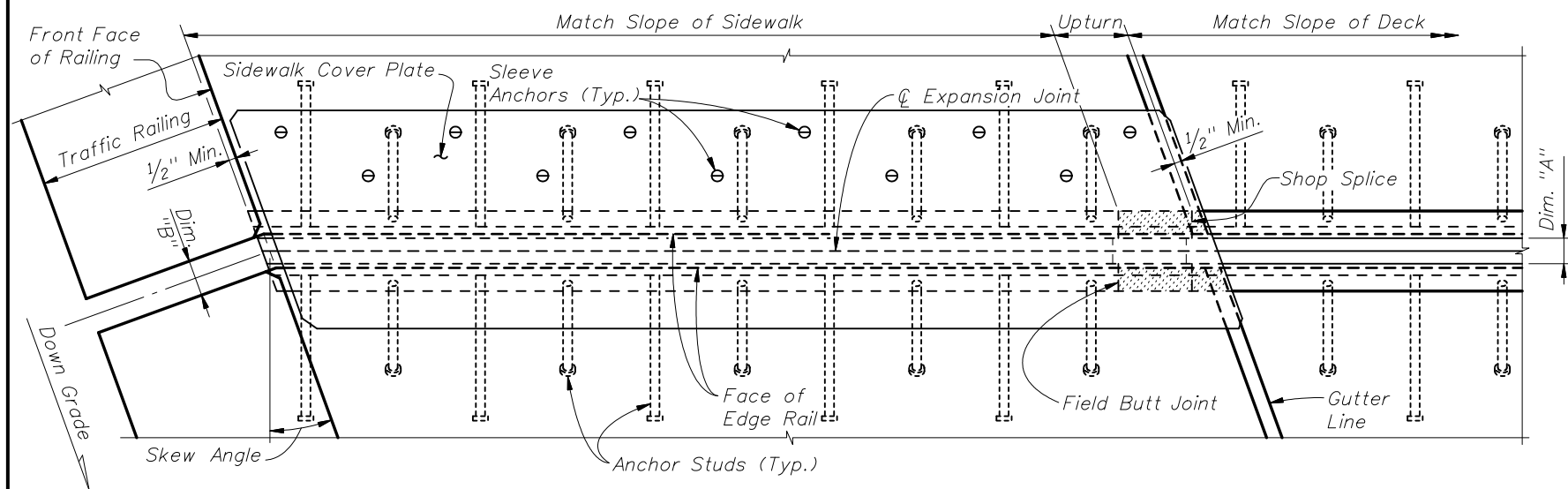
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
01/01/09	SJN	Removed notes that repeated information in Specification 458. Added Notes 5 & 6. Changed Dimension "A" note in TYPICAL SECTION.			



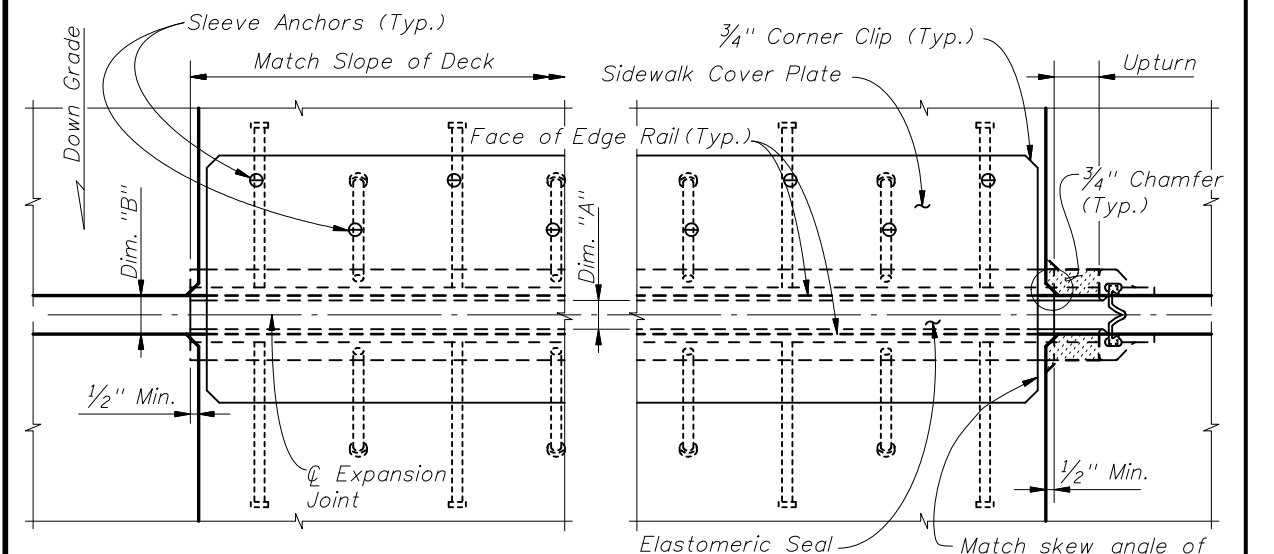
2008 Interim Design Standard

STRIP SEAL EXPANSION JOINT

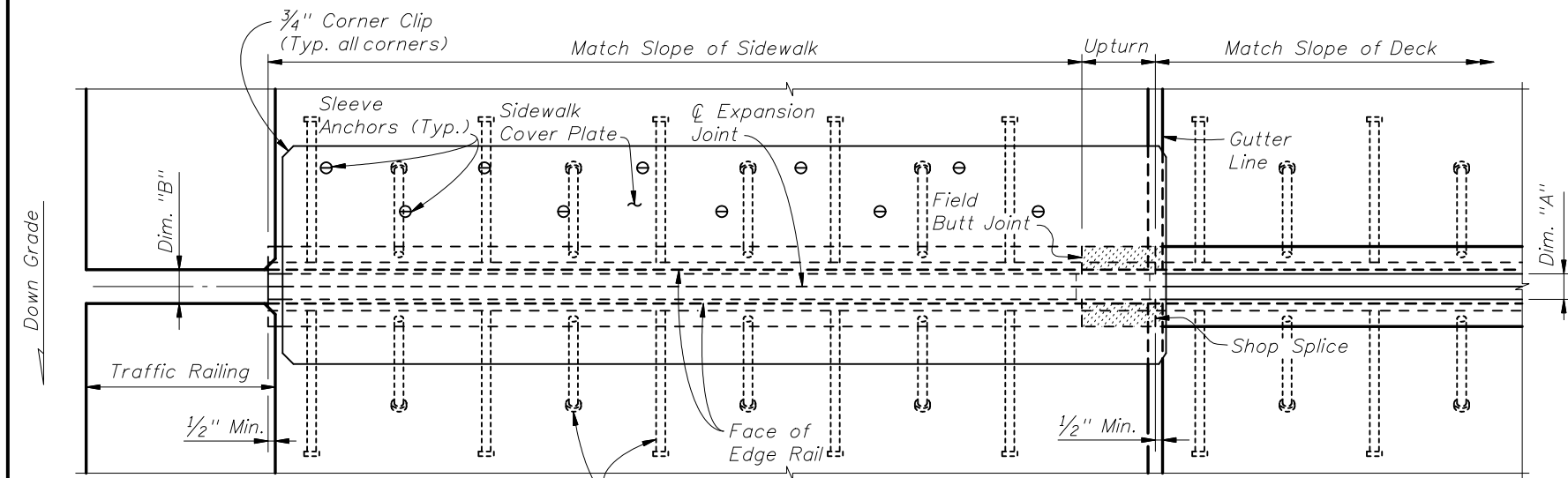
Interim Date	Sheet No.
01/01/09	1 of 3
Index No.	
21100	



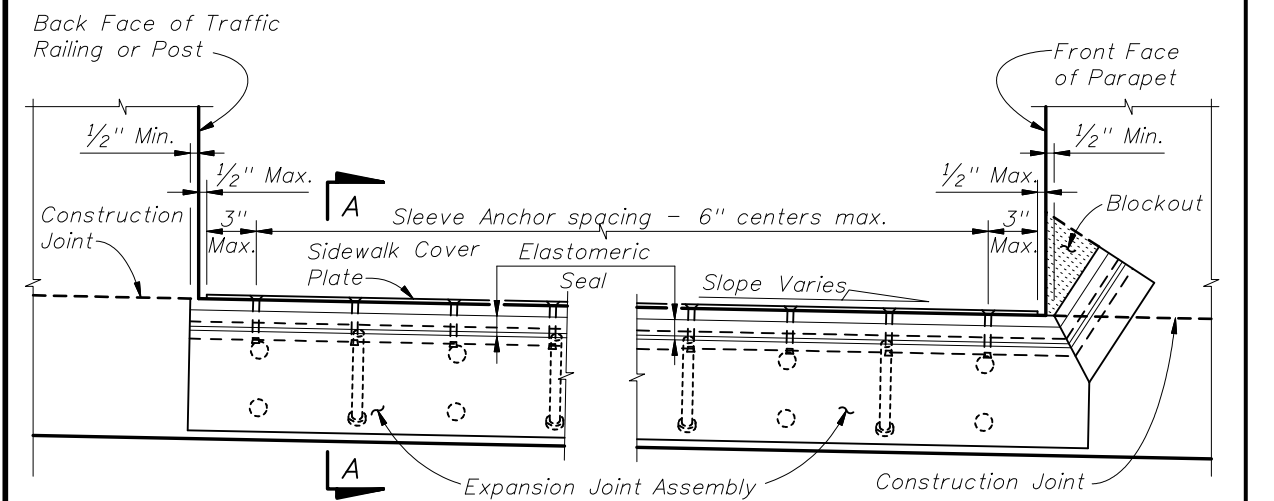
PARTIAL PLAN VIEW OF SKEWED JOINTS



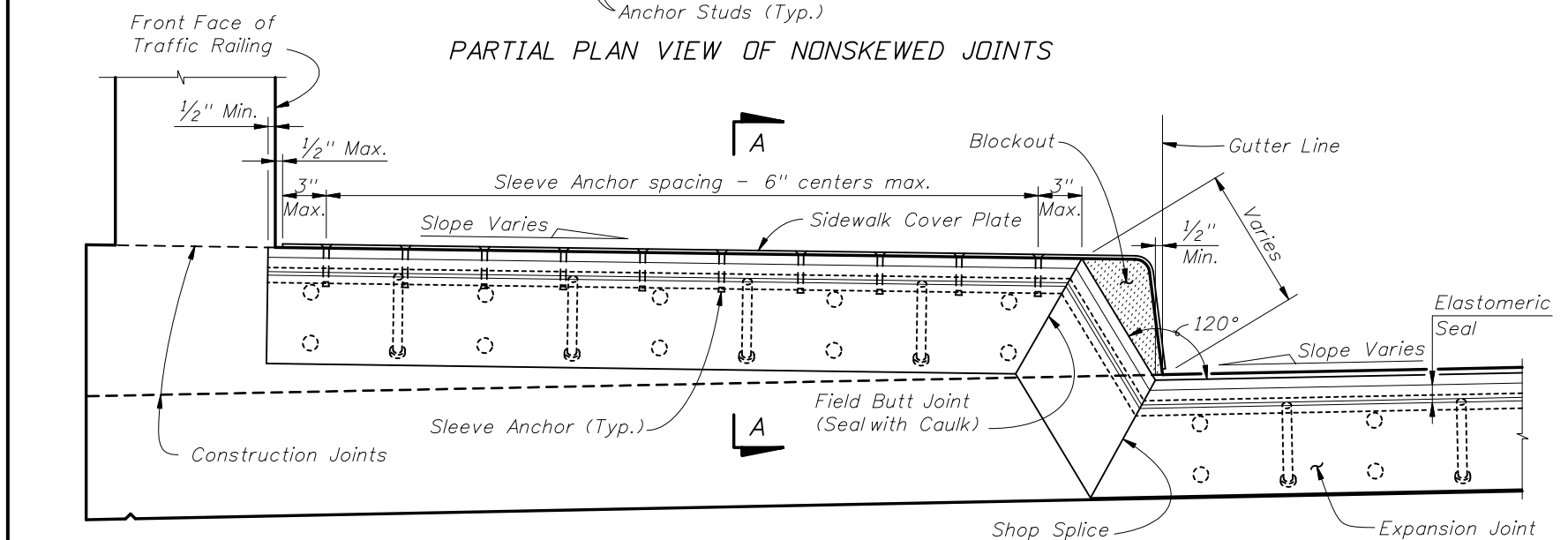
PARTIAL PLAN VIEW



PARTIAL PLAN VIEW OF NONSKEWED JOINTS



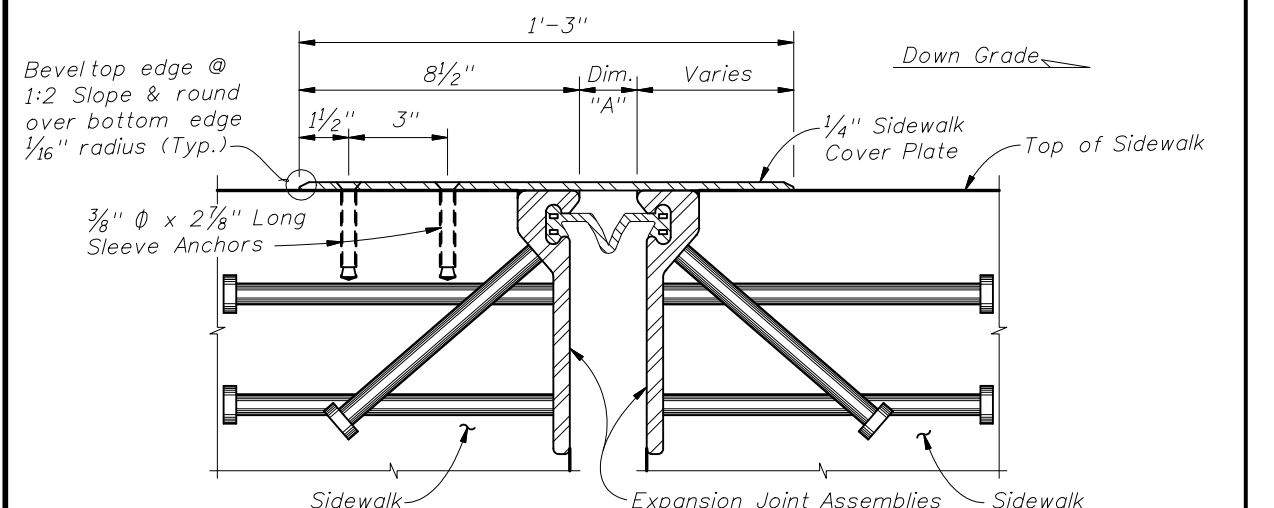
PARTIAL SECTION ALONG Q JOINT



PARTIAL SECTION ALONG Q JOINT

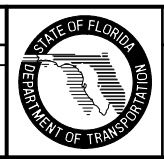
RAISED SIDEWALK DETAIL

FLUSH SIDEWALK DETAIL



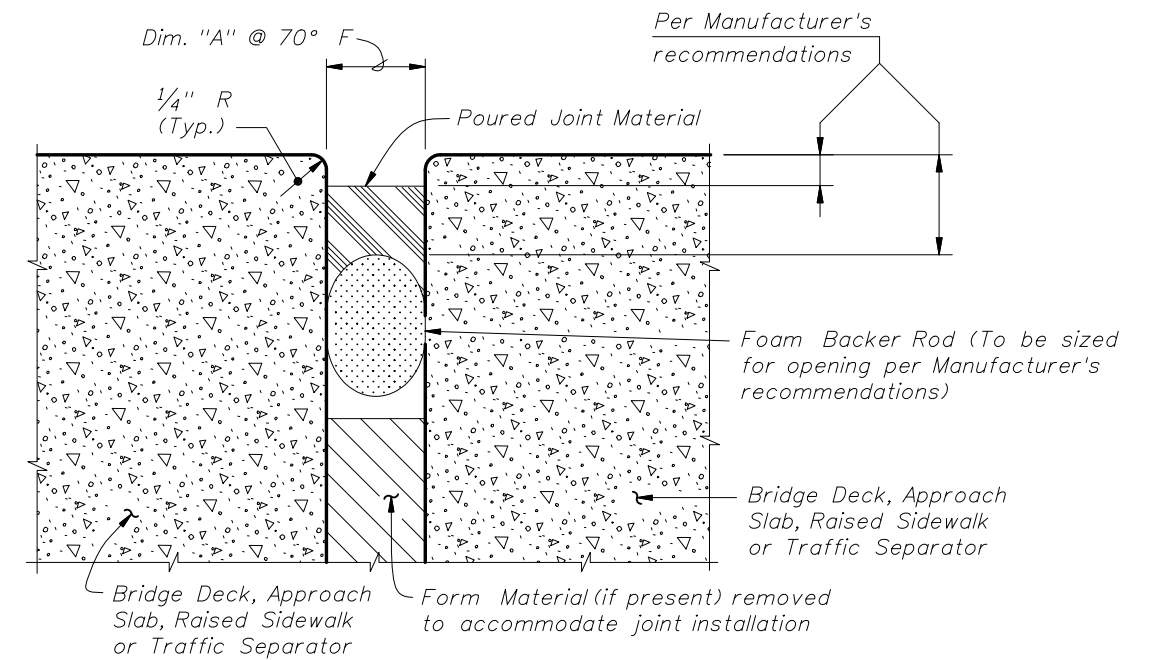
SECTION A-A

REVISIONS			
DATE	BY	DESCRIPTION	
01/01/09	SJN	Changed edge treatment of sidewalk cover plate in Section A-A.	

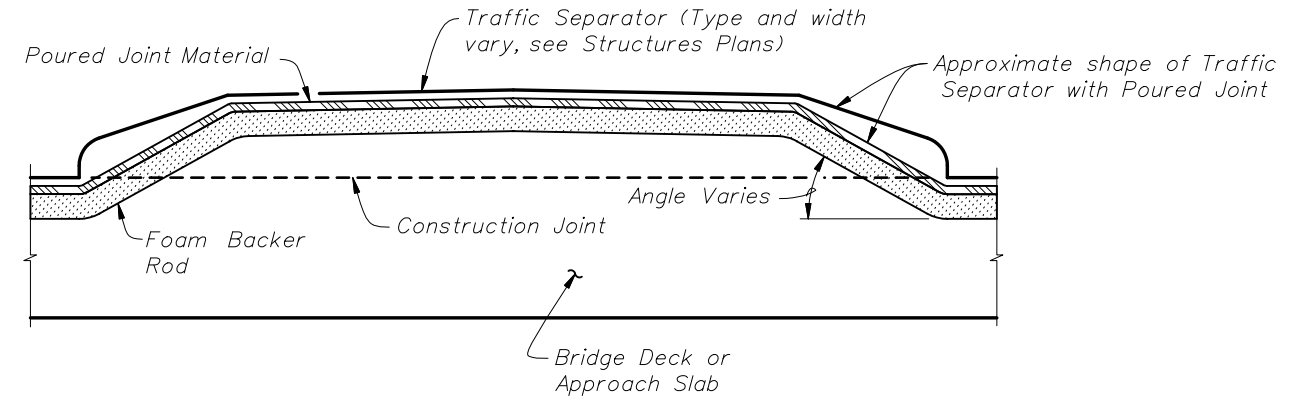


GENERAL NOTES:

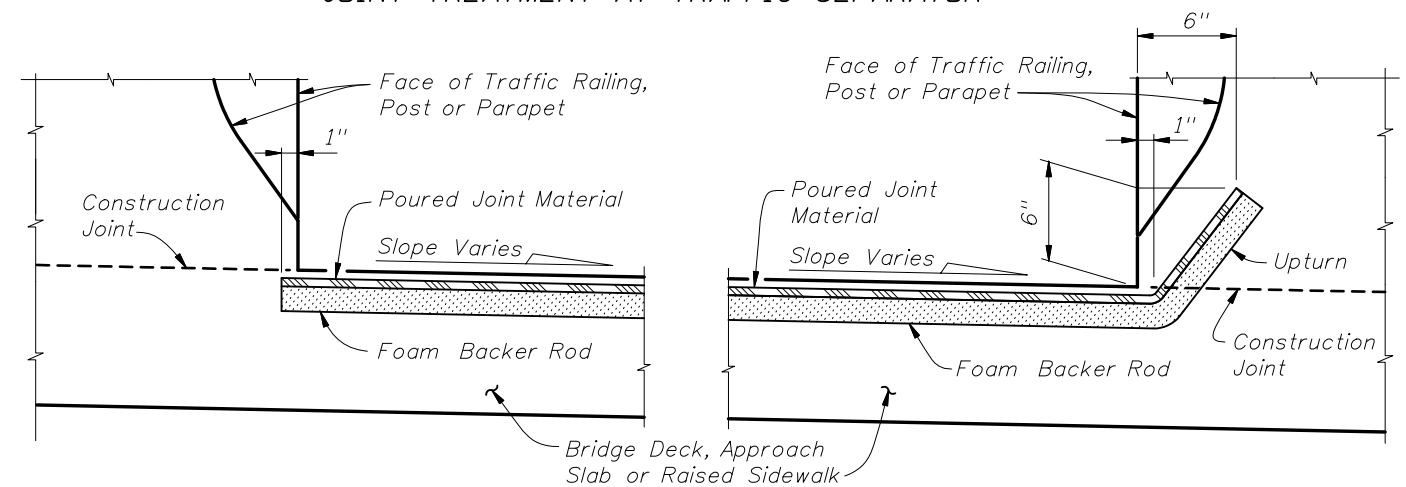
1. Furnish Poured Joint With Backer Rod Expansion Joint Systems in accordance with Specification Section 458 and 932. Furnish joint systems consisting of Poured Joint Material, Foam Backer Rods, Sidewalk Cover Plates (as required) and all associated miscellaneous components.
2. When required, furnish 1/4" thick slip resistant steel Sidewalk Cover Plates in accordance with ASTM A709, Grade 36 or 50, with a minimum coefficient of friction after galvanizing on the top surface of 0.8 in a dry condition as determined by ASTM F1677 or F1679 and 0.68 or 0.52 in a wet condition as determined by ASTM F1679 or ASTM F1677 (respectively); that incorporate an anti-slip steel surface consisting of a random hatch matrix or other suitable pattern. Do not use diamond plate or surface applied slip resistant tapes, films, nonmetallic coatings or other similar materials. Furnish flat head Stainless Steel Sleeve Anchors in accordance with ASTM F593 Group 1 Alloy 304 for attaching Sidewalk Cover Plates. Install Sleeve Anchors in accordance with manufacturer's recommendations.
3. Hot-dip galvanize Sidewalk Cover Plates after shop fabrication in accordance with Section 962 of the Specifications and manufacturer's recommendations.
4. Submit shop drawings for Sidewalk Cover Plates (as required) showing all materials and project specific details and dimensions.
5. Manufacturers seeking approval of Poured Joint with Backer Rod Expansion Joint Systems for inclusion on the Qualified Products List as pre-approved designs must submit application along with design documentation showing the expansion joint meets the specification, geometric and material requirements specified herein.
6. Refer to Specification Section 458 for installation and construction requirements.
7. Refer to the Structures Plans, Poured Expansion Joint Data Table for Dim. "A" @ 70° F.



TYPICAL SECTION THRU JOINT



PARTIAL SECTION ALONG C/J JOINT, JOINT TREATMENT AT TRAFFIC SEPARATOR



PARTIAL SECTION ALONG C/J JOINT JOINT TREATMENT AT HIGH SIDE OF DECK WITH SLOPES 2% OR GREATER

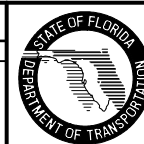
PARTIAL SECTION ALONG C/J JOINT JOINT TREATMENT AT LOW SIDE OF DECK OR HIGH SIDE OF DECK WITH SLOPES < 2%

INSTRUCTIONS TO DESIGNER:

Allow for a minimum (fully closed) opening of 50% of Dimension "A" and a maximum opening of 3" (measured in the direction of travel).

REVISIONS

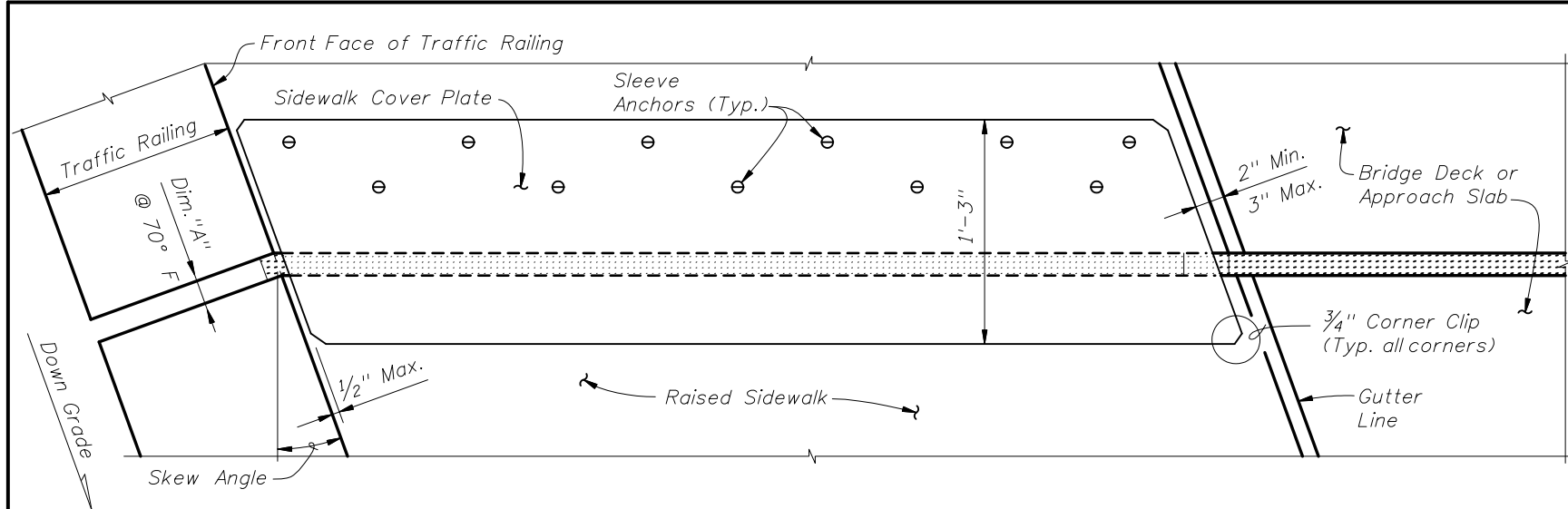
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
01/01/09	SJN	Removed notes that repeated information found in Specification 458. Added notes 6 and 7 to GENERAL NOTES.			



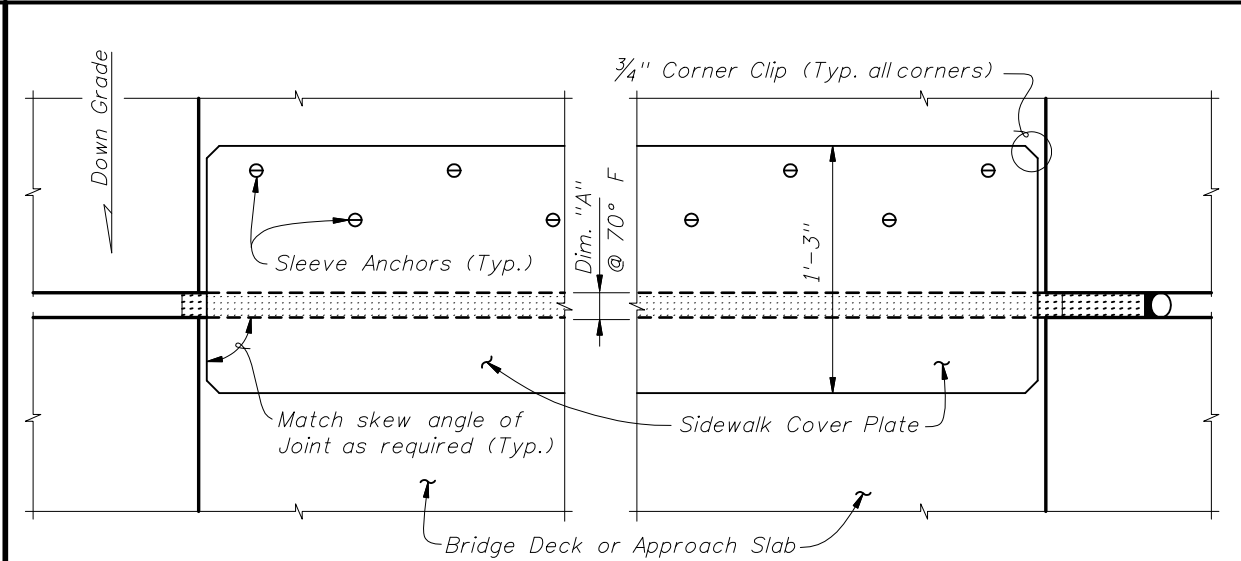
2008 Interim Design Standard

POURED JOINT WITH BACKER ROD EXPANSION JOINT SYSTEM

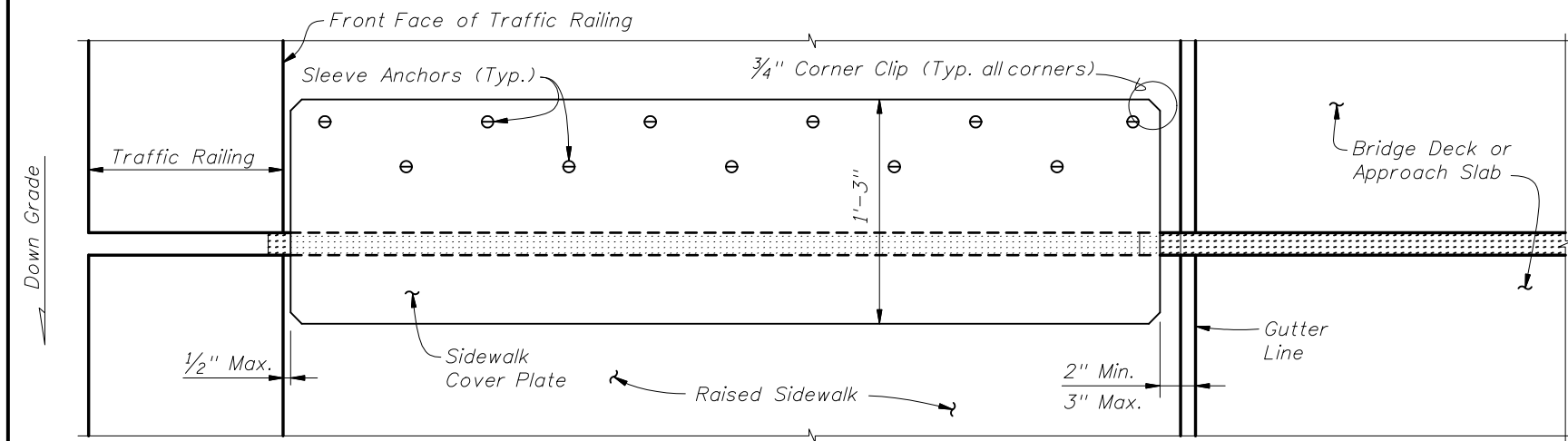
Interim Date	Sheet No.
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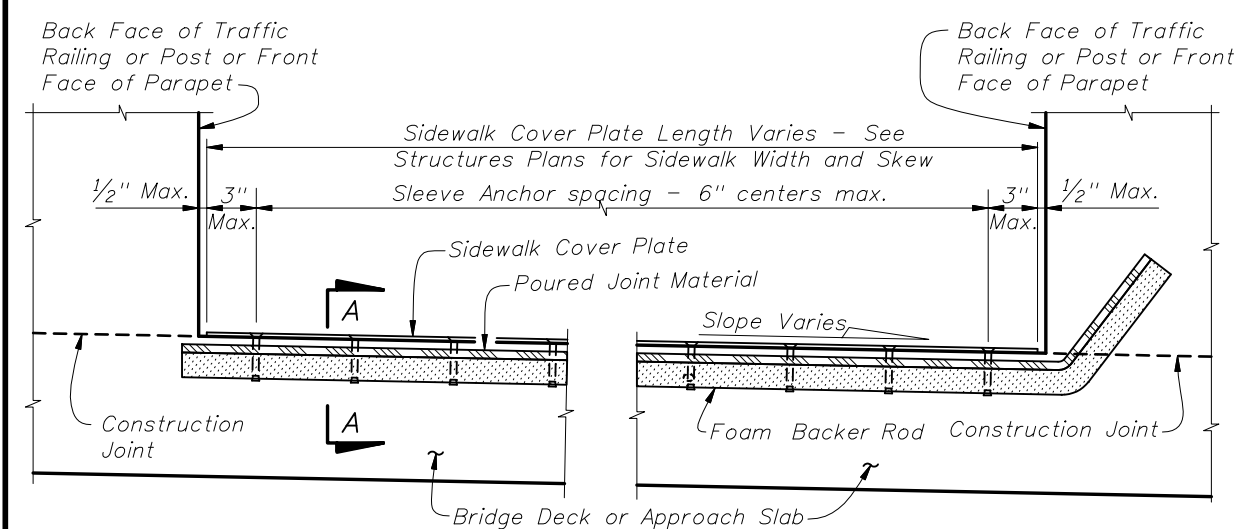
PARTIAL PLAN VIEW OF SKEWED JOINTS



PARTIAL PLAN VIEW

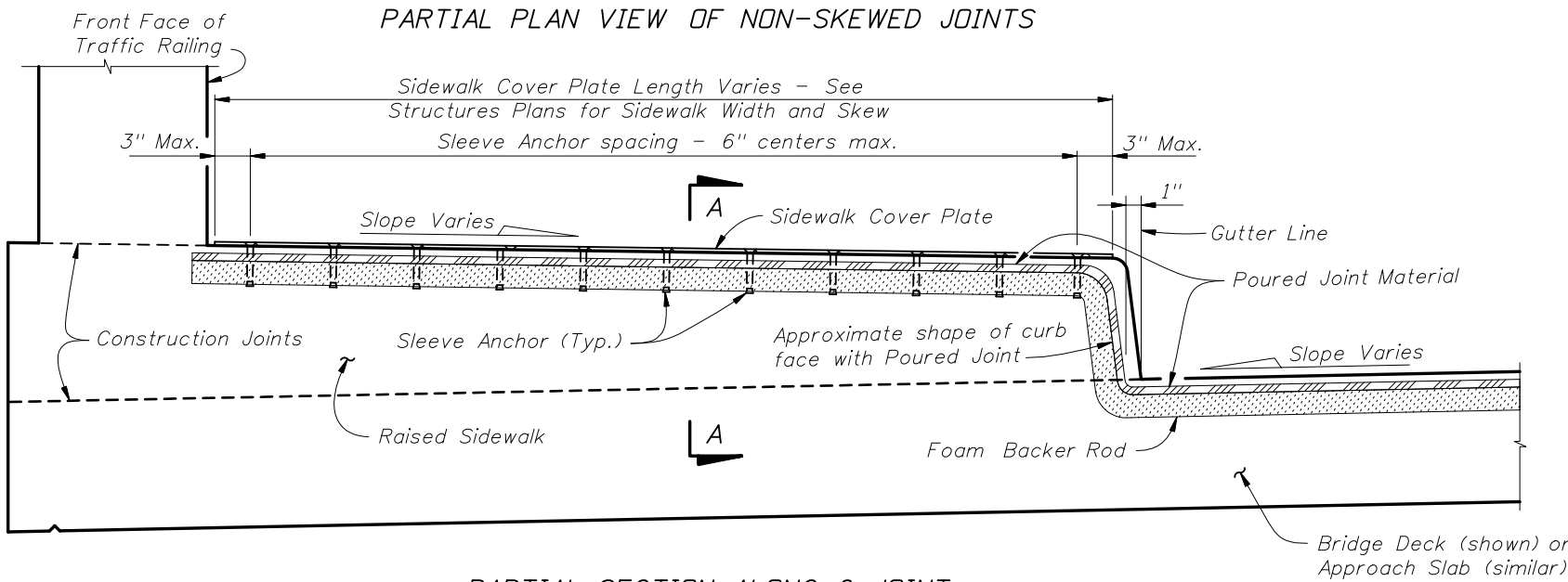


PARTIAL PLAN VIEW OF NON-SKEWED JOINTS



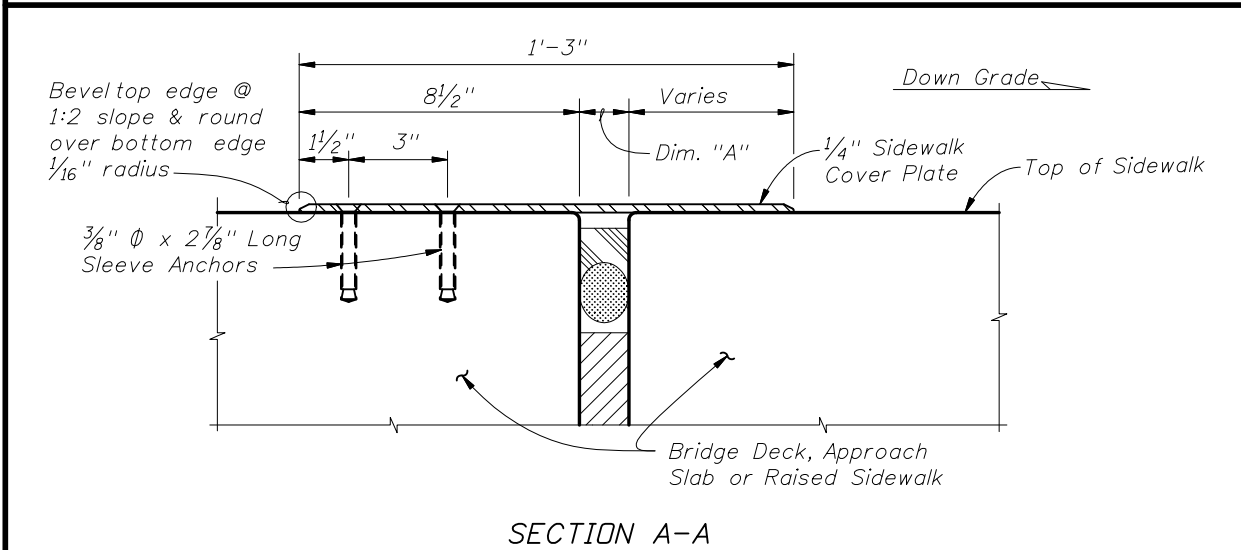
PARTIAL SECTION ALONG Q JOINT

FLUSH SIDEWALK DETAIL



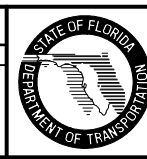
PARTIAL SECTION ALONG Q JOINT

RAISED SIDEWALK DETAIL



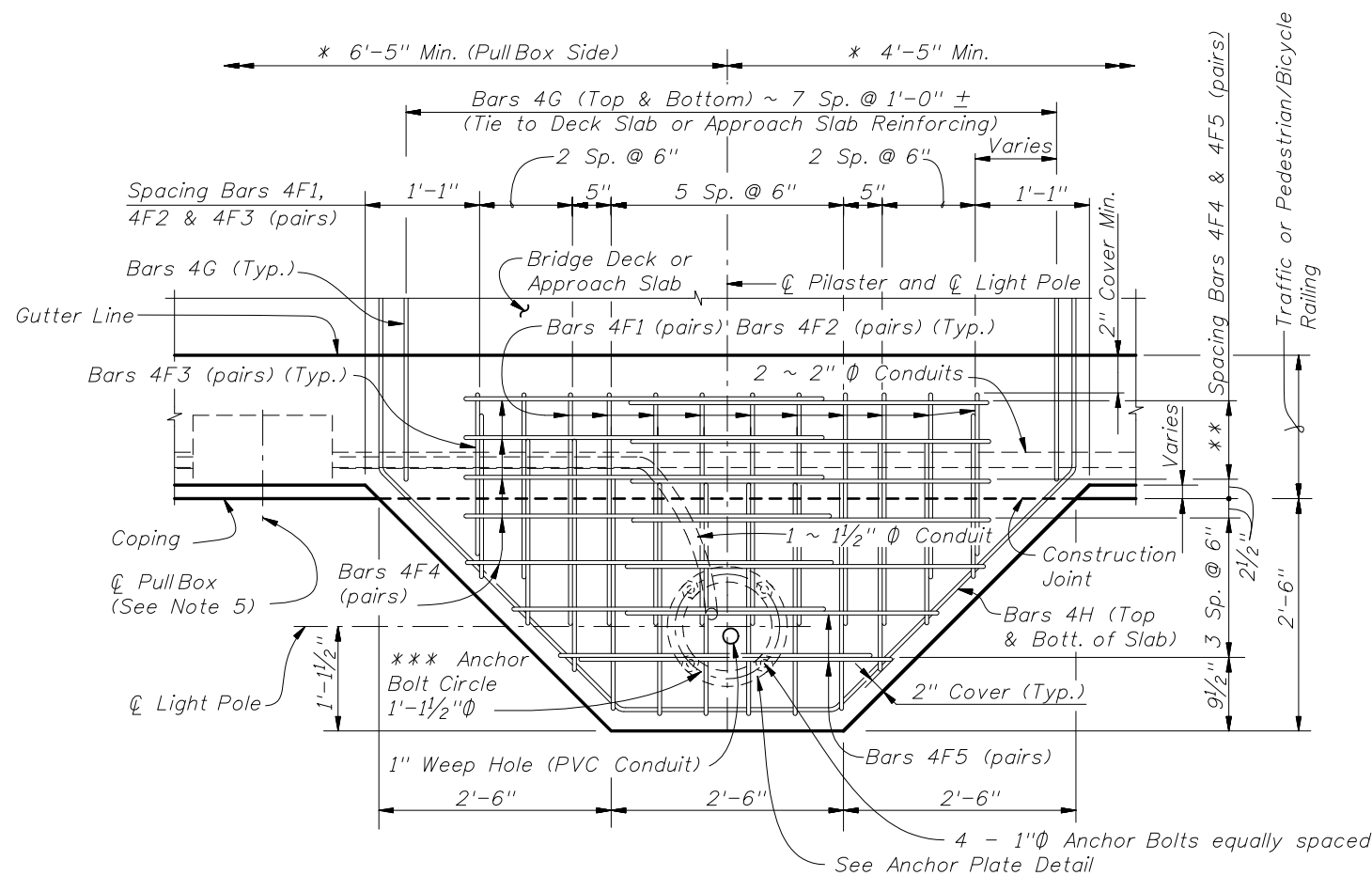
SECTION A-A

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
01/01/09	SJN	Changed edge treatment on sidewalk cover plate in Section A-A.			



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**POURED JOINT WITH BACKER ROD
 EXPANSION JOINT SYSTEM**

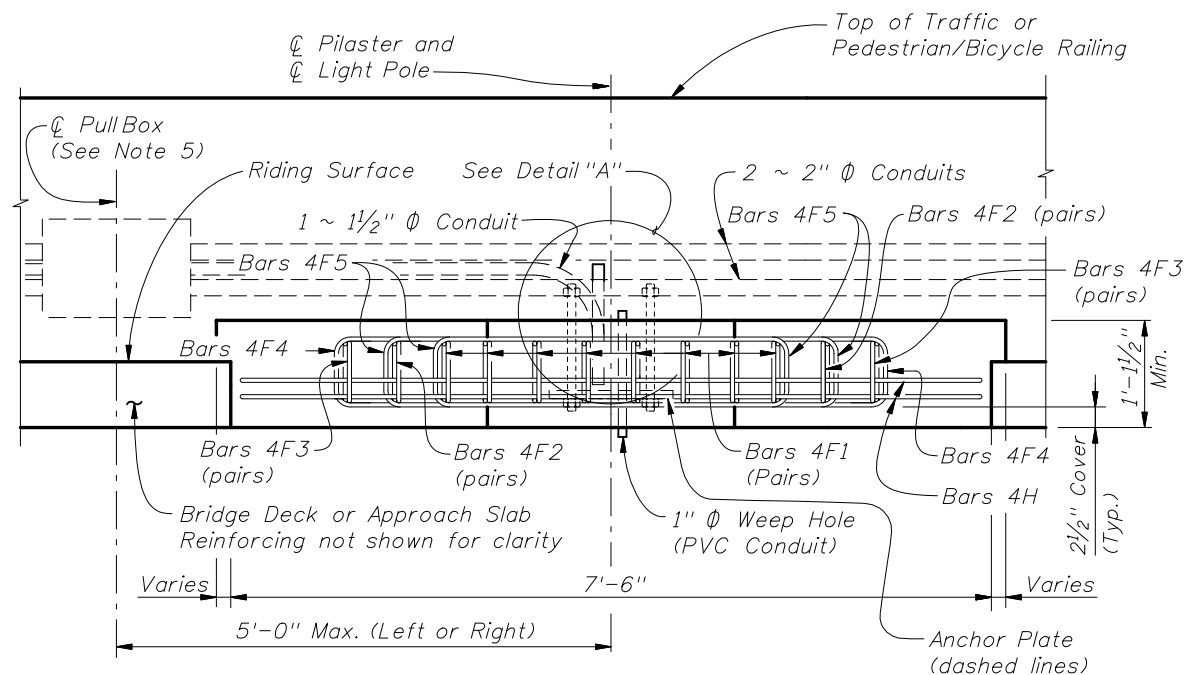
Interim Date
 01/01/09
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* Slip Forming Method of Construction is not allowed within the limits shown.
 ** For Index No. 820 - Pedestrian/Bicycle Railing, this dimension is 4 1/2". For all other Railings, this dimension is 2 Eq. Sp. @ 6" Max.
 *** Anchor Bolt pattern orientation shall be as shown.

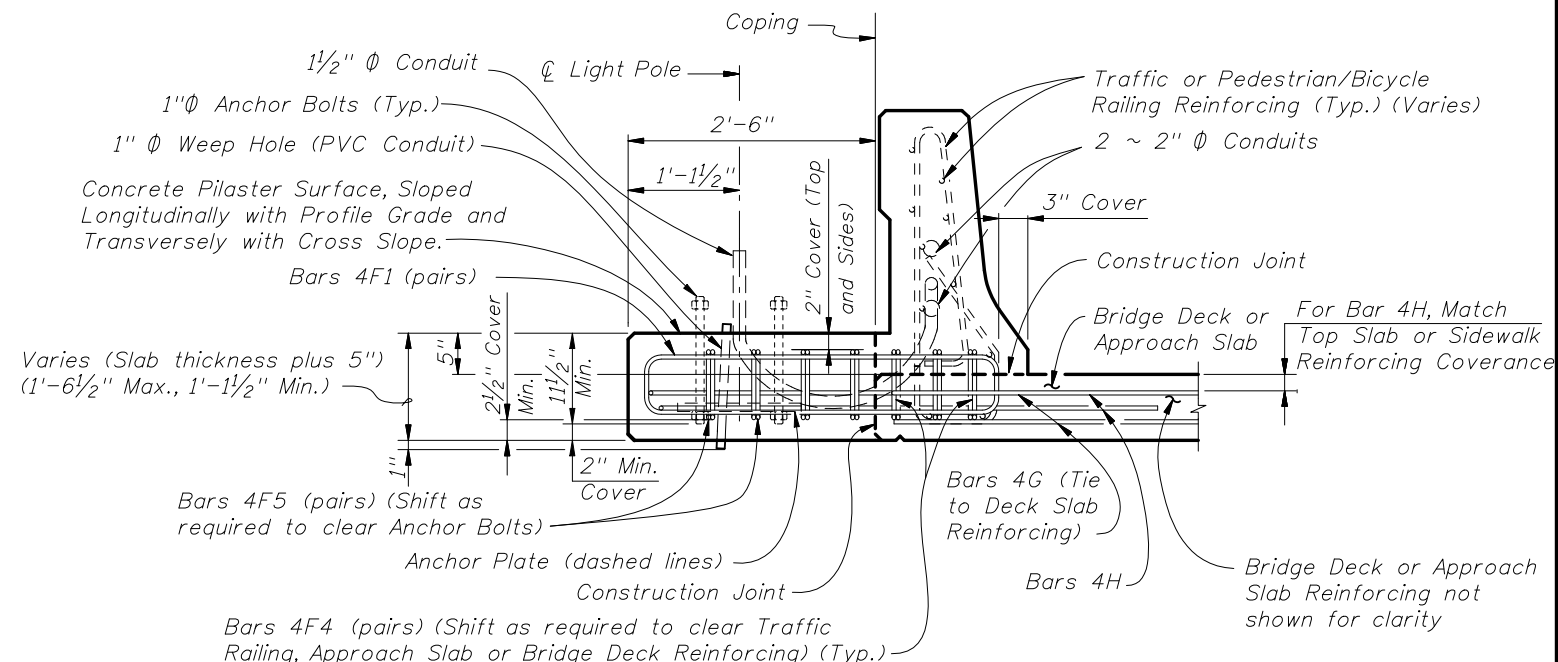
PLAN VIEW

(Anchor Plate not shown for clarity)

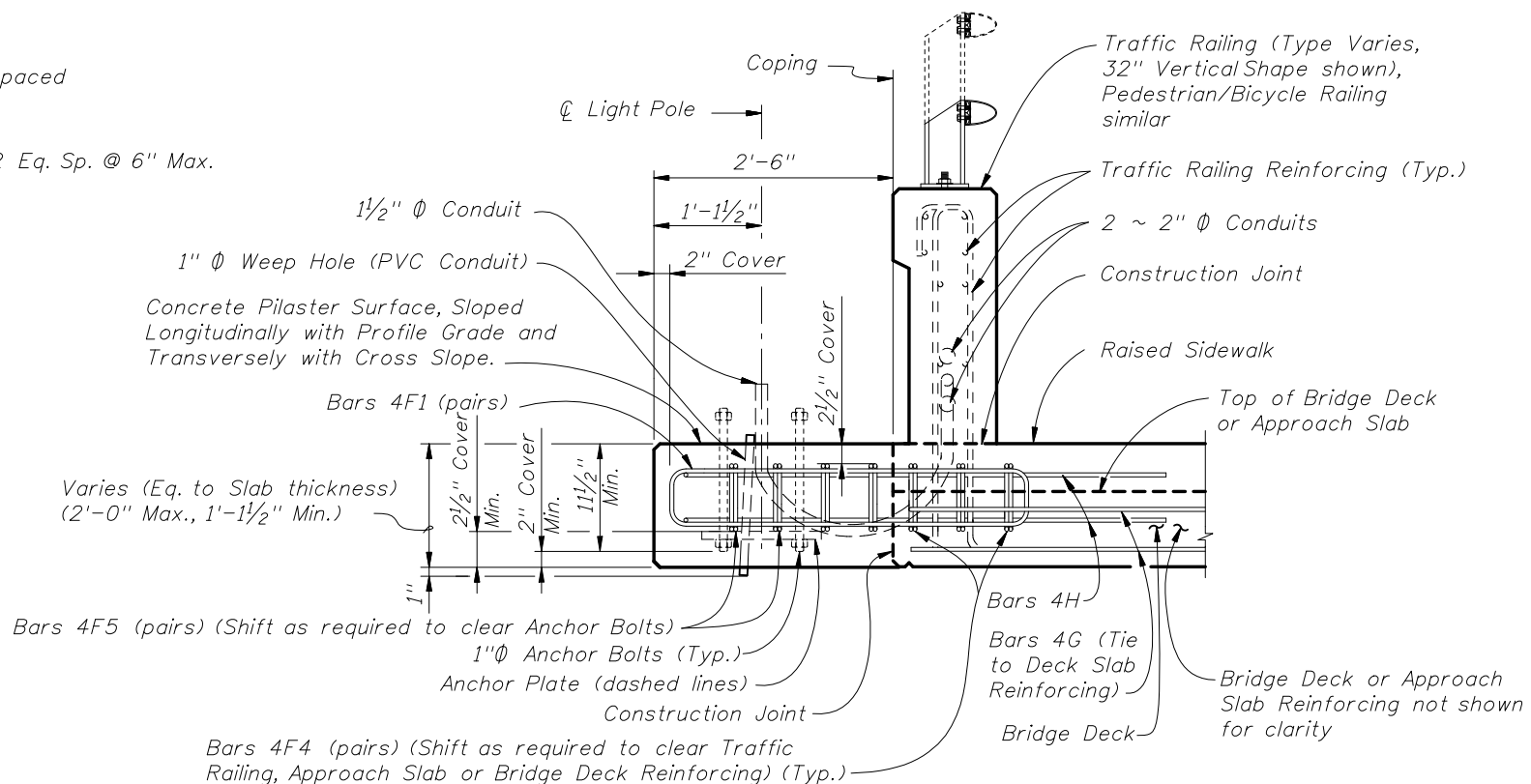


ELEVATION VIEW

(Bars 4G not shown for clarity)



TYPICAL SECTION AT LIGHT POLE PILASTER FOR APPROACH SLAB OR BRIDGE DECK THICKNESS LESS THAN 1'-1/2".



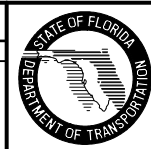
TYPICAL SECTION AT LIGHT POLE PILASTER FOR APPROACH SLAB OR BRIDGE DECK THICKNESS 1'-1/2" OR GREATER

CROSS REFERENCE: For Detail "A", Anchor Plate Detail and Light Pole Pilaster Notes, see Sheet 2.

NOTE: Anchor Bolt, Nuts, Washers and Anchor Plate are dashed for clarity.

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
01/01/08	DYW	Added "Anchor Plate (dashed lines) (provide Design)" to ELEVATION VIEW and TYPICAL SECTION'S.			
01/01/09	DYW	Added design of anchor bolts and accessories.			



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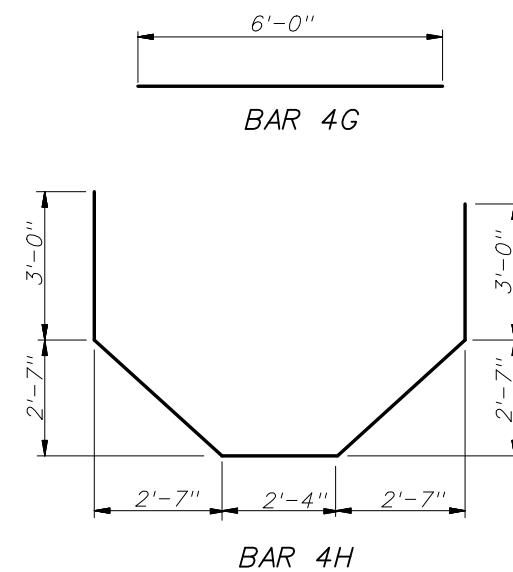
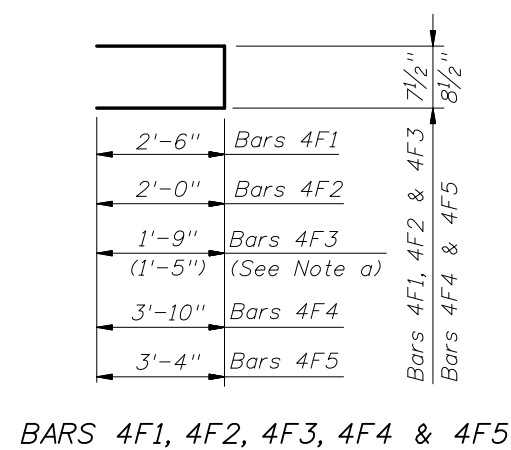
LIGHT POLE PILASTER

Interim Date	Sheet No.
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Index No.	
21200	

CONVENTIONAL REINFORCING STEEL BENDING DIAGRAMS

REINFORCING STEEL NOTES:

- a. When Pilaster is attached to Pedestrian/Bicycle Railing - Index No. 820 and the Bridge Deck or Approach Slab thickness is less than 1'-1 1/2", Bars 4F3 shall have leg length and bar length shown in parentheses.
- b. The number of bars shown in parentheses is for Bars 4F4 when Pilaster is attached to Pedestrian/Bicycle Railing - Index No. 820, and the Bridge Deck or Approach Slab thickness is less than 1'-1 1/2".
- c. Lap Splices for Bars 4F1, 4F2 & 4F3 shall be a minimum of 1'-4". Lap Splices for Bars 4F4 & 4F5 shall be minimum of 1'-8".
- d. All bar dimensions in the bending diagrams are out to out.



BILL OF REINFORCING STEEL

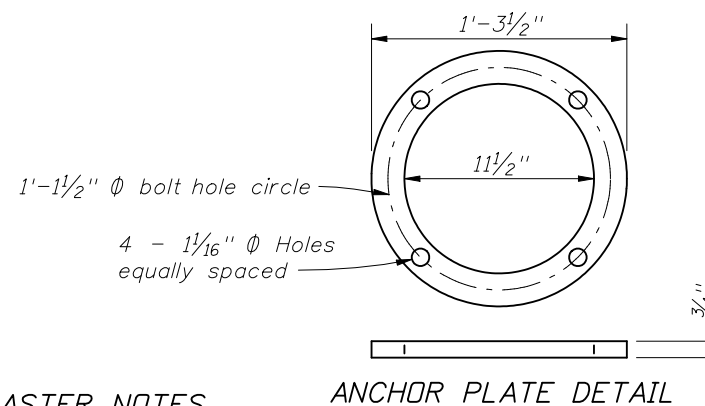
MARK	SIZE	NO. REQD.	LENGTH	NOTES
F1	4	16	5'-8"	c
F2	4	4	4'-8"	c
F3	4	4	4'-2" (3'-6")	a, c
F4	4	10 (8)	8'-5"	b, c
F5	4	4	7'-5"	c
G	4	16	6'-0"	-
H	4	2	15'-8"	-

INSTRUCTIONS TO DESIGNER:

In order to minimize vibration of Light Poles due to traffic, locate pilasters near substructure supports.

Locate ϕ Pilaster minimum 3'-10" away from ϕ Traffic Railing Open Joint and edge of End Bent Wingwall.

Design of the additional Bridge Deck Reinforcement is based on the minimum transverse top slab reinforcing required by Structures Design Guidelines.



ESTIMATED LIGHT POLE PILASTER QUANTITIES PER LIGHT POLE PILASTER

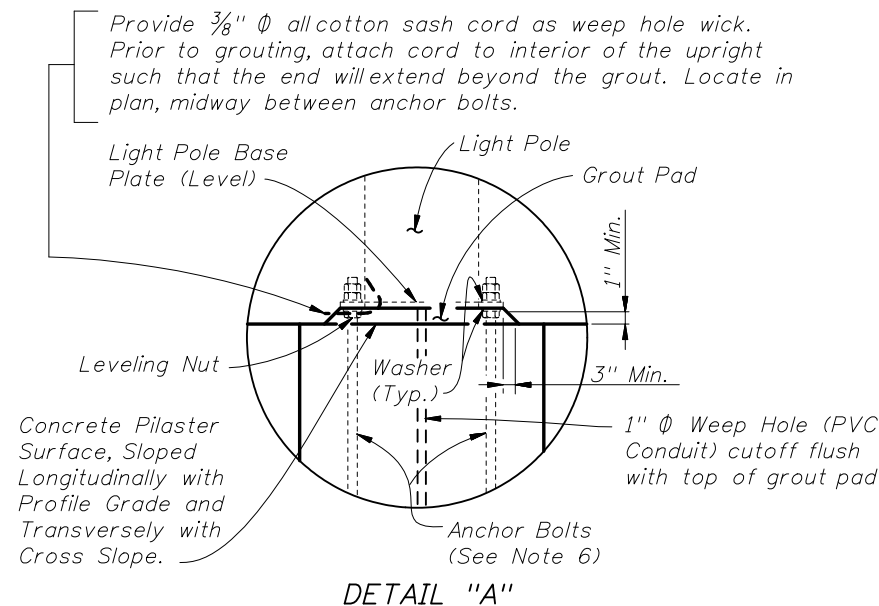
ITEM	UNIT	QUANTITY
Concrete Per Pilaster Thickness	CY/In.	0.040
Reinforcing Steel	Lb.	244.16 (231.19)

(The Reinforcing Steel quantity shown in parenthesis is for a Pilaster attached to Pedestrian/Bicycle Railing - Index No. 820 with Bridge Deck or Approach Slab thinner than 1'-1 1/2")

LIGHT POLE PILASTER NOTES

- Concrete and Reinforcing Steel required for the construction of the Pilaster shall meet the same requirements as the Traffic Railing or Pedestrian/Bicycle Railing the Pilaster is attached to. Grout shall comply with Specification Section 934.
- Light Pole Pilaster may be used with the following:
 Index No. 420 - Traffic Railing (32" F Shape),
 Index No. 422 - Traffic Railing (42" Vertical Shape),
 Index No. 423 - Traffic Railing (32" Vertical Shape),
 Index No. 424 - Traffic Railing (Corral Shape),
 Index No. 425 - Traffic Railing (42" F Shape),
 Index No. 820 - Pedestrian/Bicycle Railing,
 Index No. 821 - Aluminum Pedestrian/Bicycle Bullet Railing for Traffic Railing (32" F Shape), or
 Index No. 5210 - Traffic Railing /Sound Barrier (Bridge).
 Unless otherwise noted, Traffic Railing (32" F Shape) is shown in all Views and Sections on Sheet 1 of 2. The Pilaster details for other Traffic Railings or Pedestrian/Bicycle Railing are similar.
- The Pilaster and Deck are designed to resist the following Working Loads from the Light Pole applied at the top of the Pilaster:
 Axial Dead Load = 1.560 Kip
 Wind Load Moment about Transverse Axis = 40.60 Kip-Ft.
 Wind Load Moment about Longitudinal Axis = 28.30 Kip-Ft.
 Deadload Moment about Longitudinal Axis = 1.690 Kip-Ft.
 Maximum Shear = 1.380 Kip
 Torsion about Pole Axis = 3.560 Kip-Ft.

- Materials:
 Anchor Bolts: ASTM F1554 Grade 55.
 Nuts: ASTM A563 Grade a Heavy-Hex.
 Washers: ASTM F436 Type 1.
 All Nuts, Bolts and Washers shall be galvanized by ASTM F2329.
 Anchor Plate: ASTM A 709 Grade 36 or ASTM A36.
- For Conduit, Pull Box, Expansion/Deflection Fitting and adjacent Reinforcing Steel Details, see Utility Conduit Detail Sheets.
- Anchor Bolts must be installed plumb.
- PAYMENT: The cost of Anchor Bolts, Nuts, Washers and Anchor Plates shall be included in the Bid Price for Light Poles. The cost of all Labor, Concrete and Reinforcing Steel required for the Construction of the Pilasters, Grout Pads, Pull Boxes, and Miscellaneous Hardware required for the completion of the Electrical System, shall be included in the Bid Price for the Traffic Railing or Pedestrian/Bicycle Railing the Pilaster is attached to.

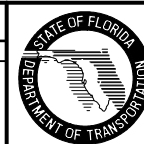


DETAIL "A"

CROSS REFERENCE:
For location of Detail "A" see Sheet 1.

REVISIONS

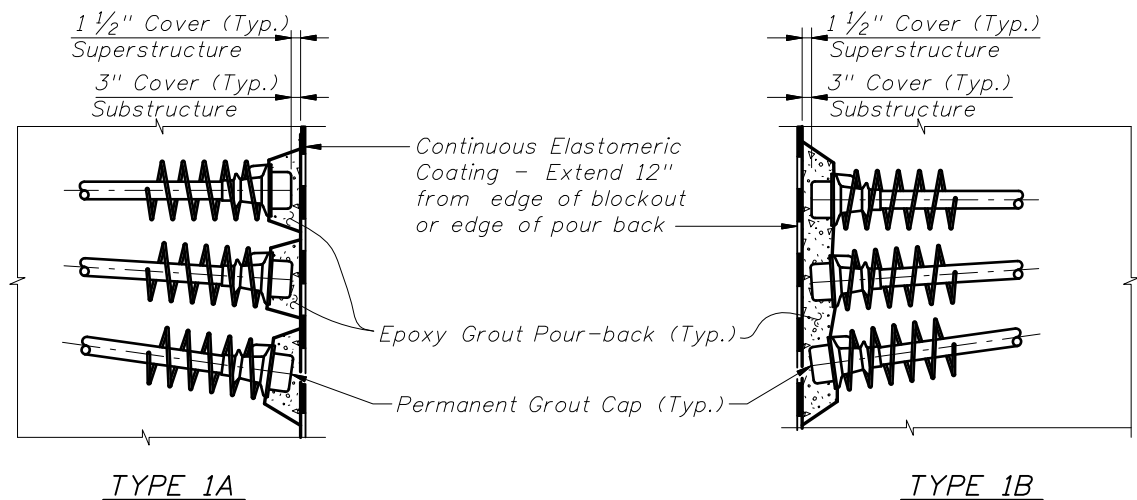
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
01/01/09	DYW	Added design of anchor bolts and accessories.			



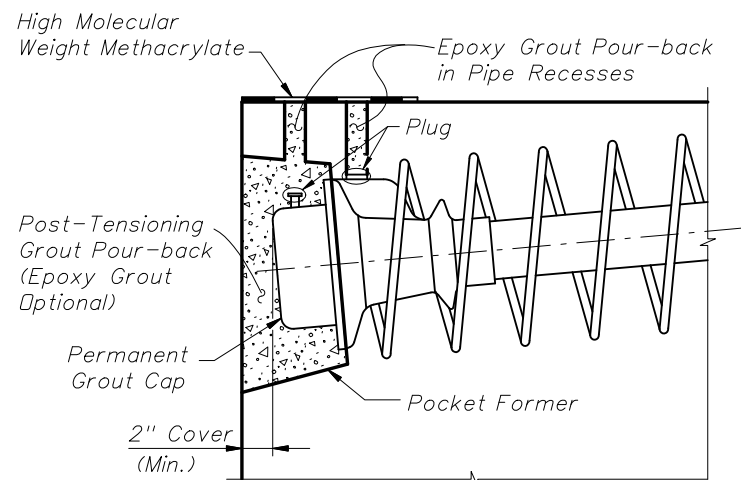
2008 Interim Design Standard

LIGHT POLE PILASTER

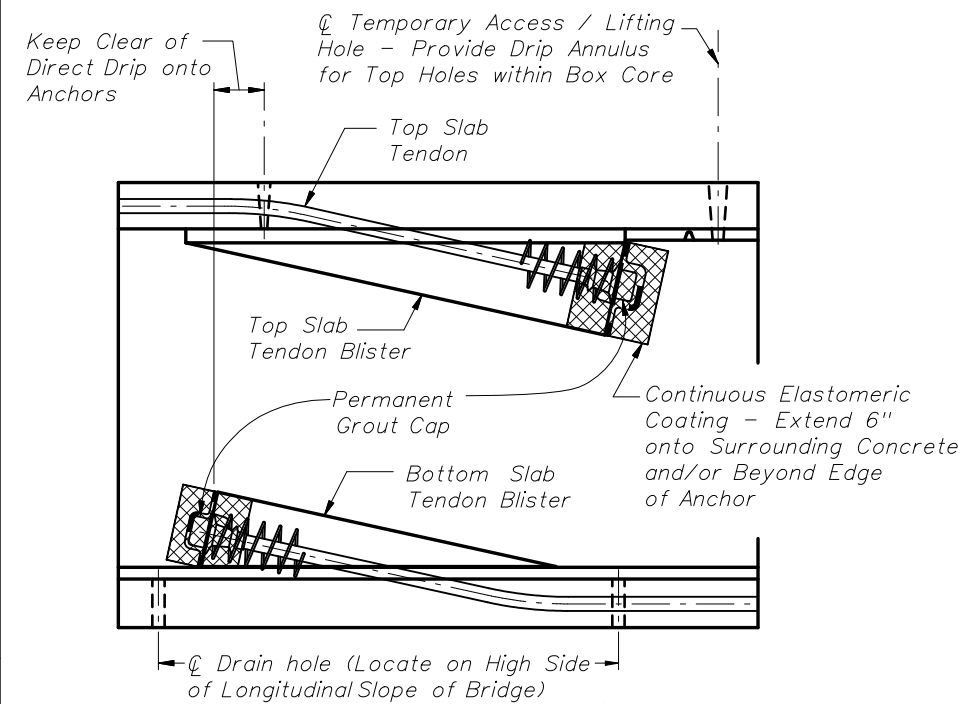
Interim Date	Sheet No.
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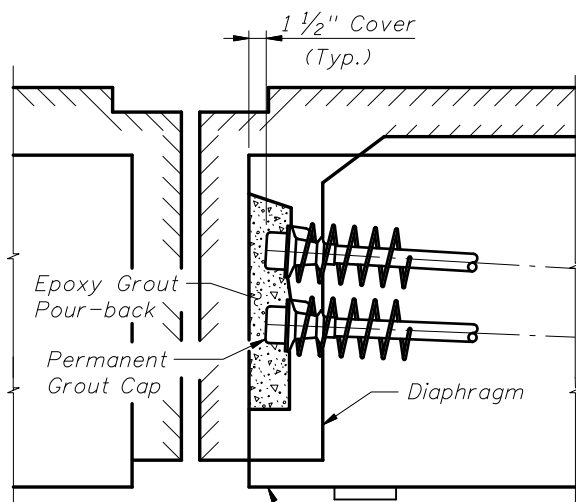
TYPE 1A **TYPE 1B**
TYPICAL ALTERNATE POUR-BACK TREATMENTS FOR ANCHOR PROTECTION ON EXPOSED SURFACES AND EXPANSION JOINTS



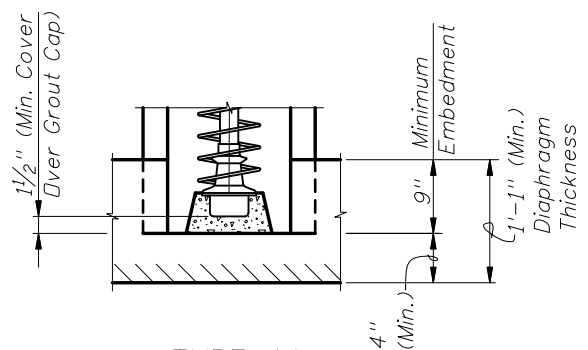
TYPE 2
TOP INSPECTED ANCHOR PROTECTION



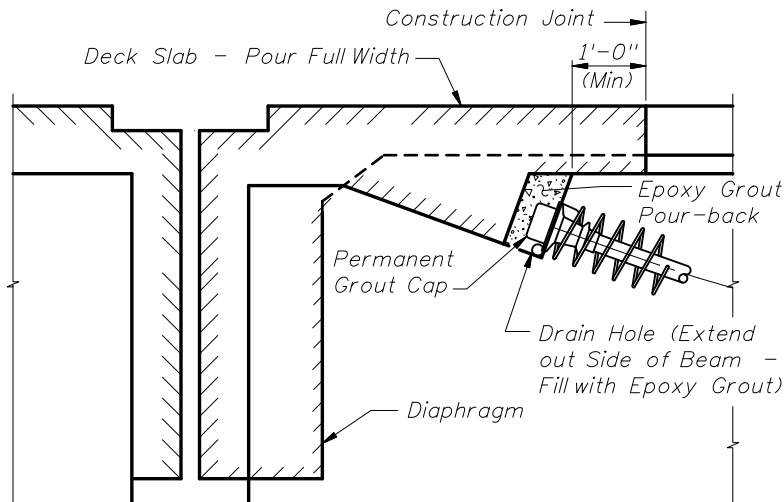
TYPE 3
ANCHOR PROTECTION FOR INTERIOR ANCHORS IN CELLULAR BOXES ON BLISTERS OR PIER SEGMENTS (NOT FOR USE IN EXPANSION JOINTS)



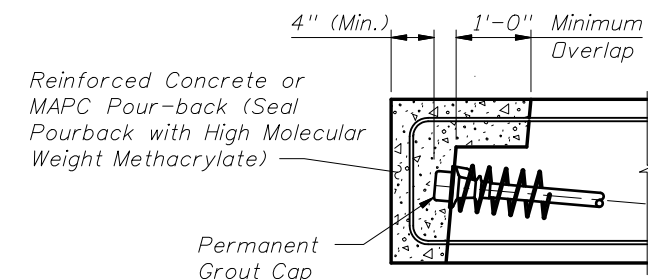
TYPE 4A



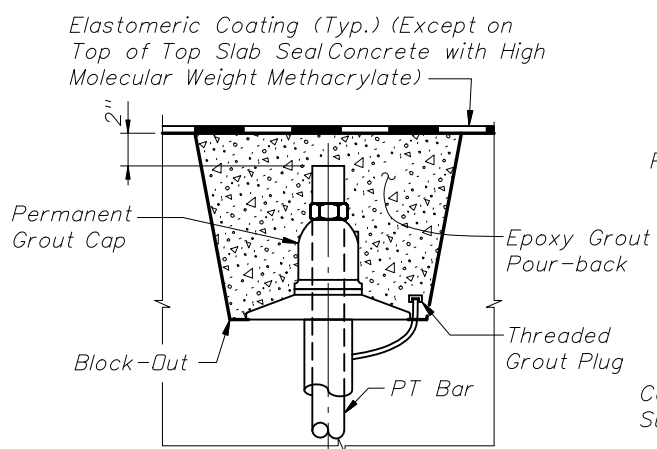
TYPE 4A
ANCHOR PROTECTION FOR POST-TENSIONED I-GIRDERS & BULB-T'S



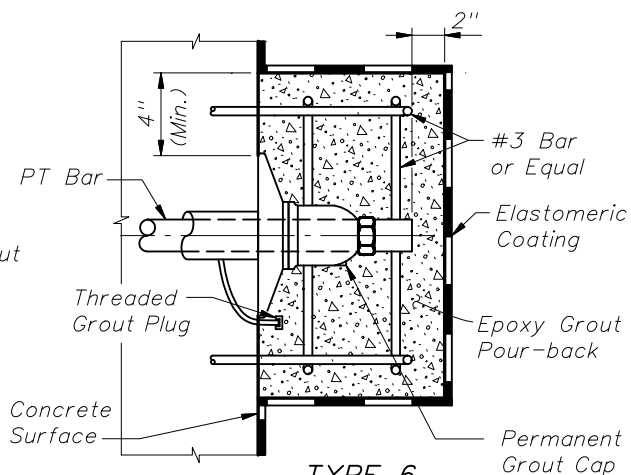
TYPE 4B



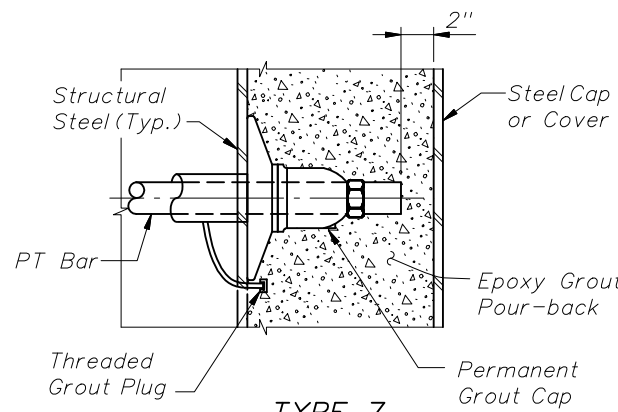
TYPE 8
FLAT SLAB ANCHOR PROTECTION



TYPE 5

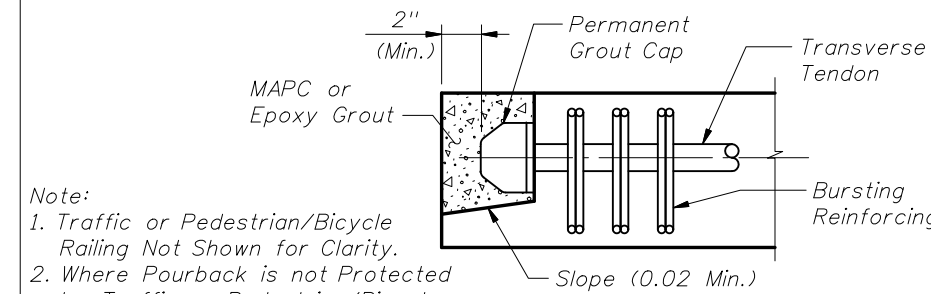


TYPE 6
ANCHOR PROTECTION FOR PT BARS



TYPE 7

Note: Extend elastomeric coating 12" onto concrete edges or 12" beyond edge of anchor pour-back.

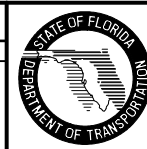


Note:
 1. Traffic or Pedestrian/Bicycle Railing Not Shown for Clarity.
 2. Where Pourback is not Protected by Traffic or Pedestrian/Bicycle Railing, Coat Pourback with High Molecular Weight Methacrylate.

TYPE 9
TRANSVERSE TENDON ANCHOR PROTECTION

REVISIONS

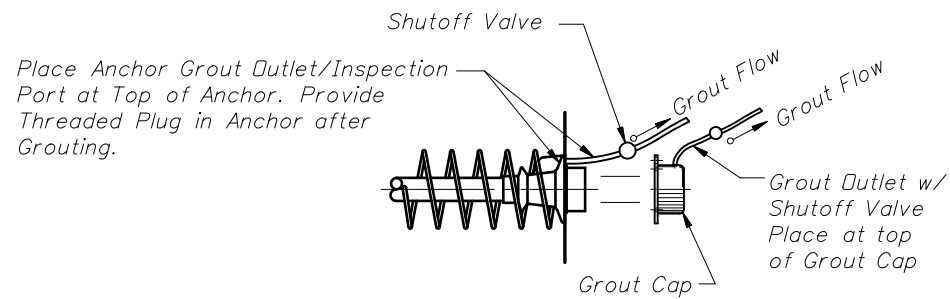
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
01/01/09	SJN	Changed "Methyl Methacrylate" to "High Molecular Weight Methacrylate".			



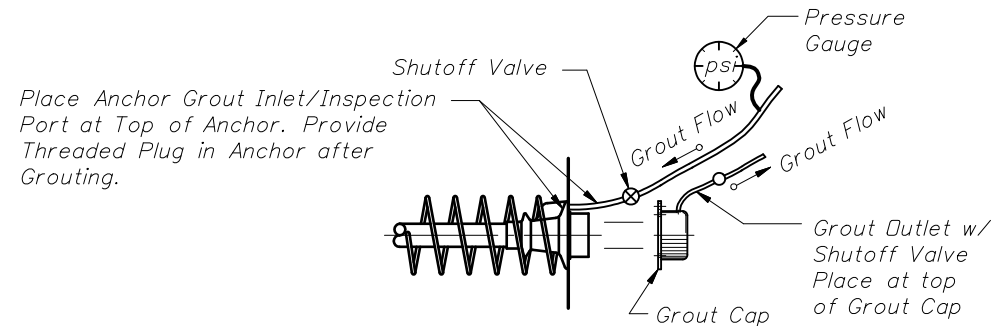
2008 Interim Design Standard

POST-TENSIONING ANCHORAGE PROTECTION

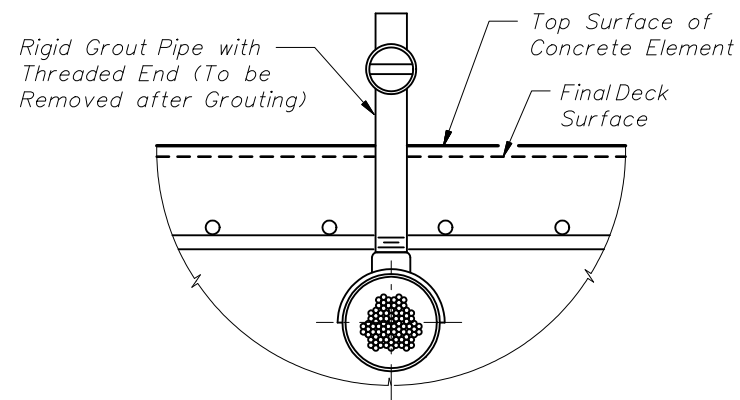
Interim Date: 01/01/09
 Sheet No.: 1 of 1
 Index No.: 21802



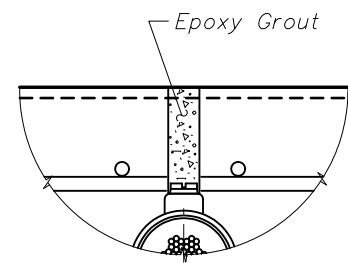
DETAIL A - FACE INSPECTED ANCHOR WITH GROUT OUTLET



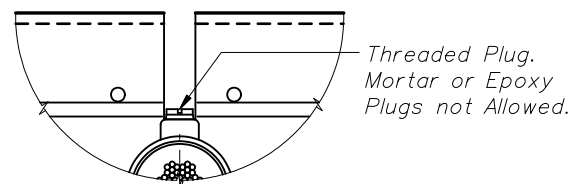
FACE INSPECTED ANCHOR WITH GROUT INLET



1 GROUT OUTLET CONNECTION TO TENDON



3 FILLING POCKET

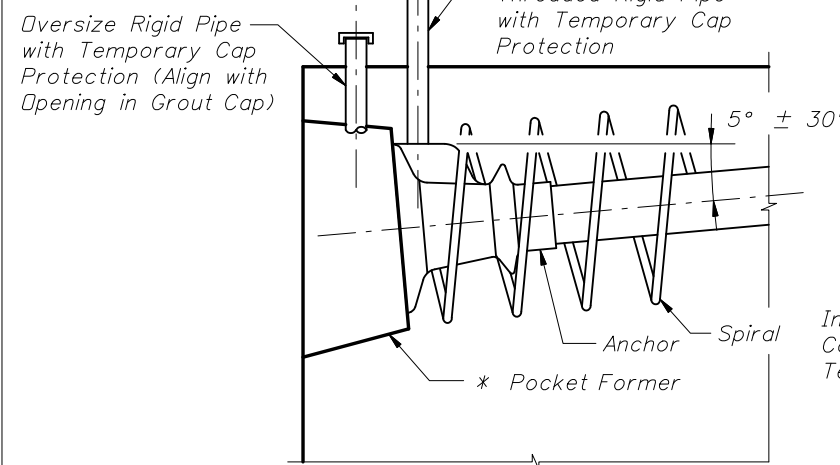


2 POCKET PREPARATION

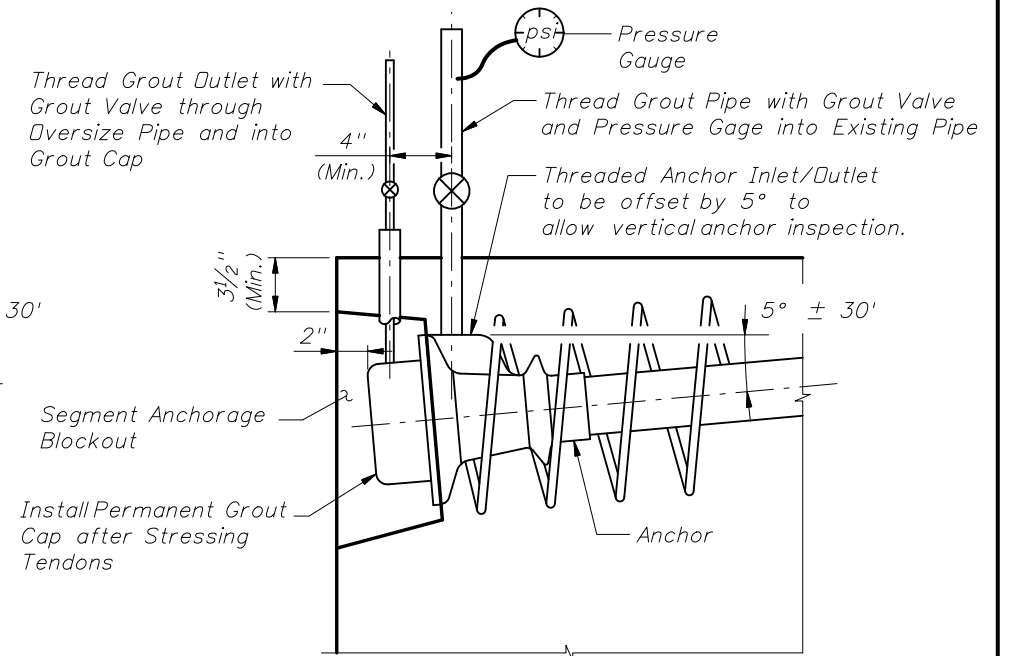
PROCEDURE

1. Remove Rigid Grout Pipe.
2. Inspect Tendon for Voids as Necessary.
3. Vacuum Grout as Required and Allow Grout to Cure. Remove Pipe used for Vacuum Grouting.
4. Clean Threads and Rethread as Required.
5. Install Threaded Plug into Outlet to Form a Tight Fit.
6. Over-Ream Hole (1/4" ϕ Over-Ream) Clean and Roughen Sides.
7. Fill Pocket with Epoxy Grout.

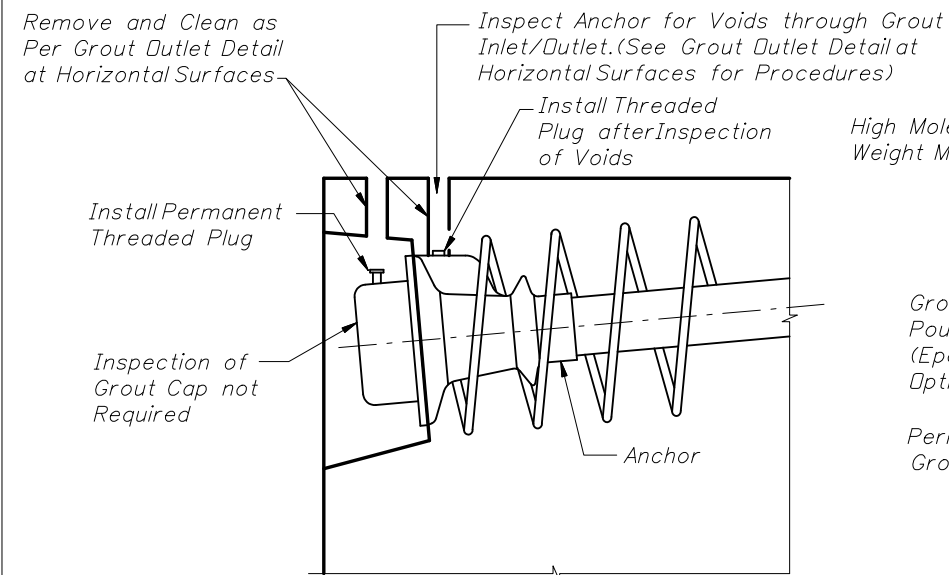
GROUT OUTLET DETAIL AT HORIZONTAL SURFACES



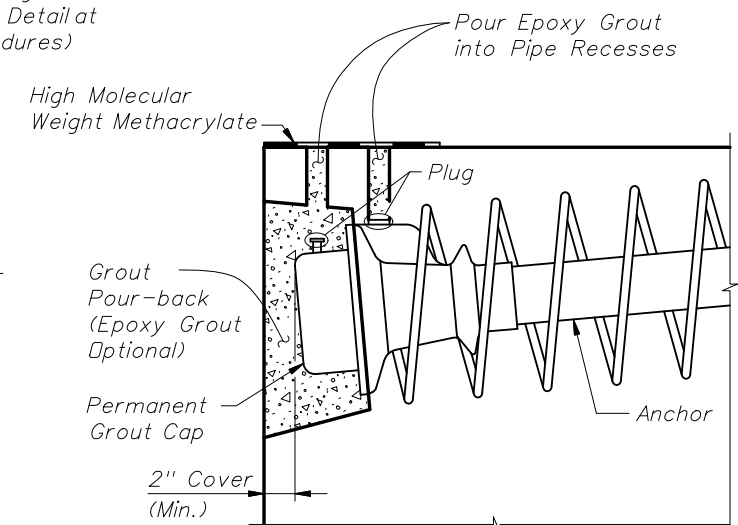
1 INSTALLATION & SHIPPING



2 GROUTING



3 INSPECTION



4 PROTECTION

NOTES

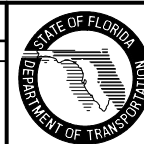
1. Holes used for the Inspection and Grout Inlets/Outlets may be Formed using Tapered Pipes or Mandrels.

TOP INSPECTED ANCHOR WITH GROUT INLET INSTALLATION, GROUTING, INSPECTION & PROTECTION

- * Round Pocket Former - Gravity Fed Placement of Grout Acceptable
- Modified Square Pocket Former - Gravity Fed Placement of Grout Acceptable
- Square Pocket Former - Vacuum Grouting Required

REVISIONS

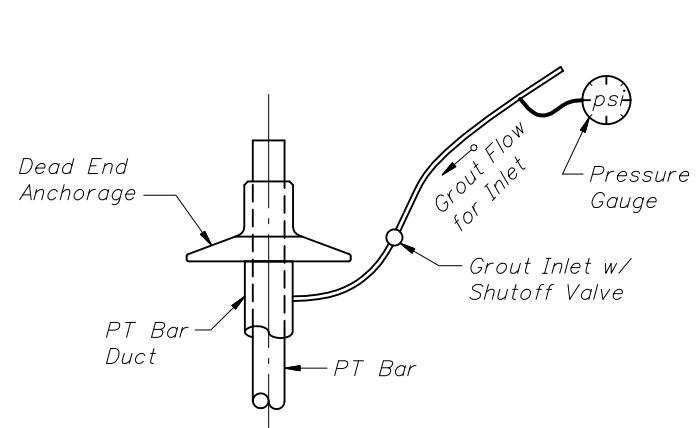
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
01/01/09	SJN	Revised callouts for Grout Outlets; Changed "Methyl Methacrylate" to "High Molecular Weight Methacrylate".			



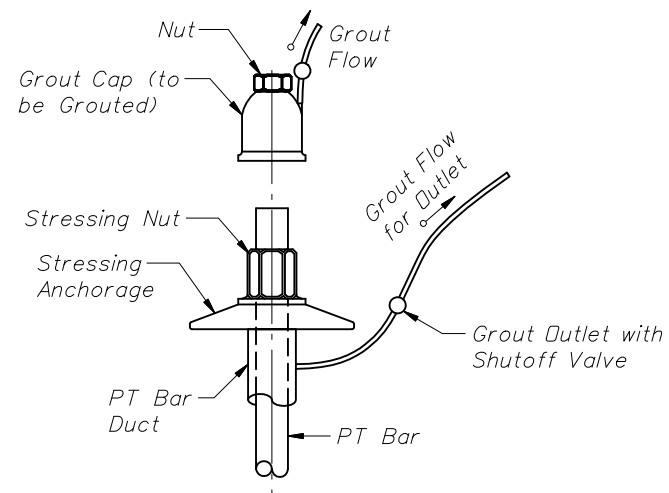
2008 Interim Design Standard

POST-TENSIONING ANCHORAGE AND GROUTING DETAILS

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21803	

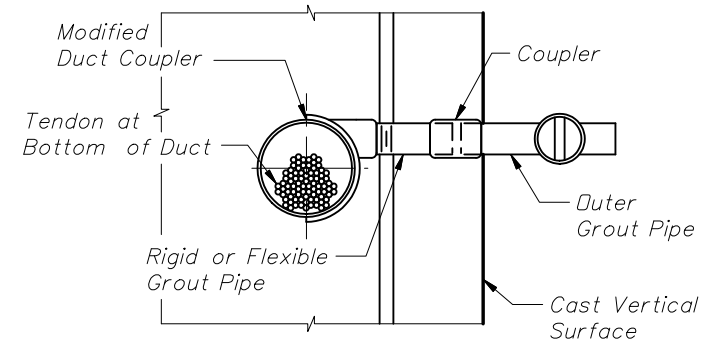


PT BAR
ANCHORAGE NON-STRESSING END

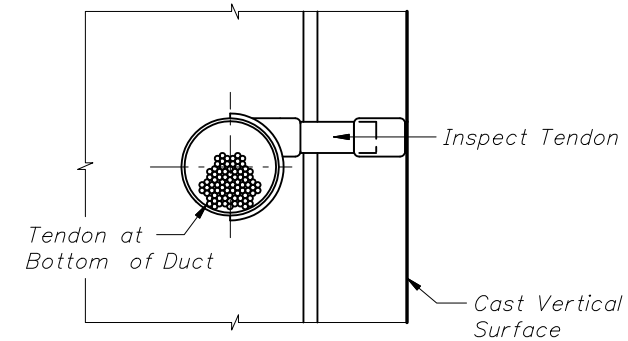


PT BAR
ANCHORAGE STRESSING END

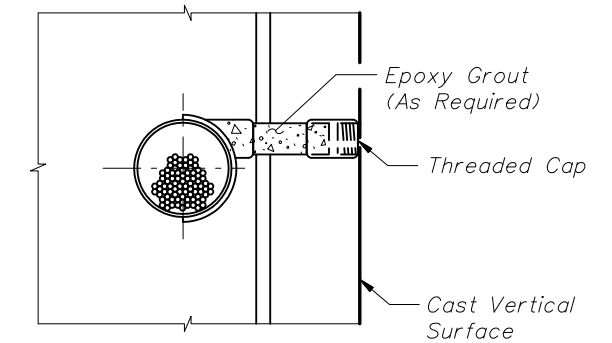
NOTE:
Stressing Anchorage or Nut to allow for Flow of Grout into Cap.



① GROUT OUTLET CONNECTION TO TENDON



② POCKET PREPARATION

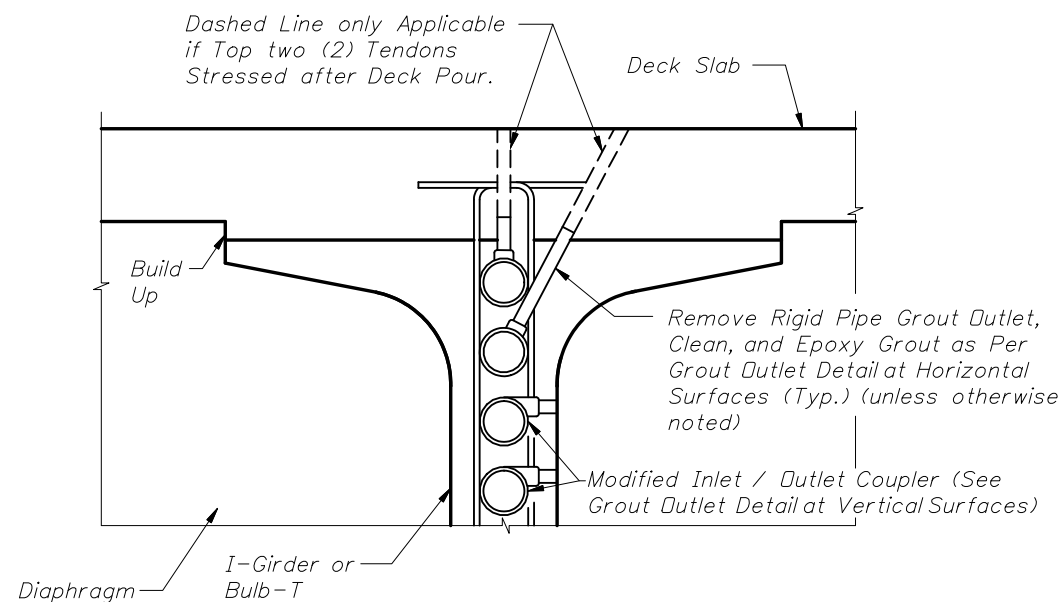


③ FILLING POCKET

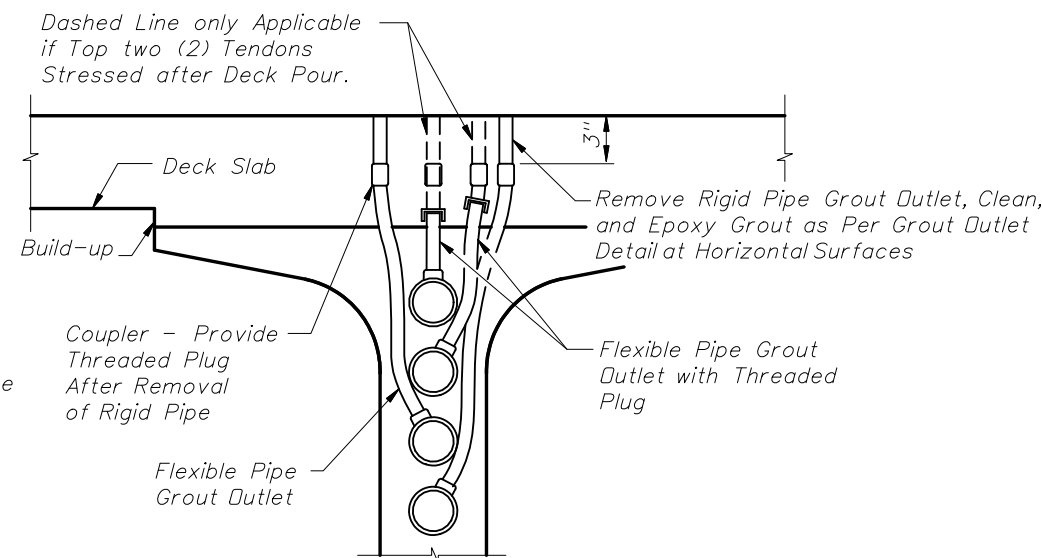
PROCEDURE

1. Remove Rigid Grout Pipe. or Drill Grout in Flexible Pipe.
2. Inspect Tendon for Voids as Necessary.
3. Vacuum Grout as Required and Allow Grout to Cure for 24 hr. (min.). Remove Pipe used for Vacuum Grouting.
4. Plug Recess with Threaded Cap on Inside Surfaces of Box Sections and Inside (nonfascia) Surfaces of I-Girders. For all other Surfaces, Plug Recess with both Threaded Cap and Epoxy Grout.

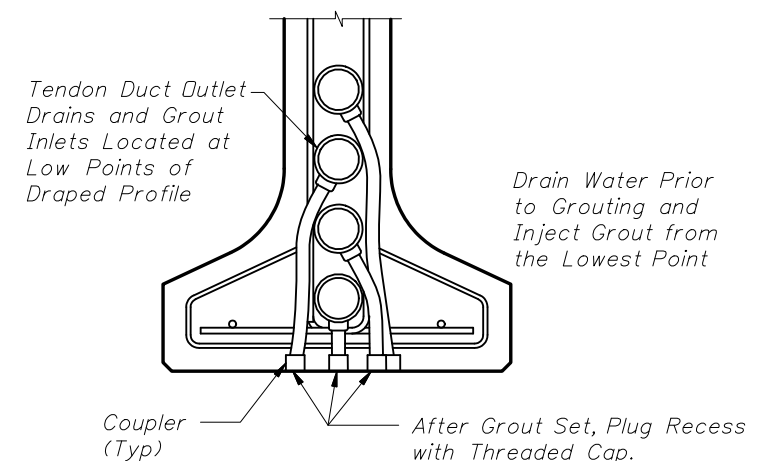
GROUT OUTLET DETAIL AT VERTICAL SURFACES



HIGH POINT INSPECTION
LOCATION AT GROUT OUTLET



Web Reinforcing not Shown for Clarity
TENDONS AT 3' TO 6'
FROM HIGH POINTS (GROUT OUTLET)

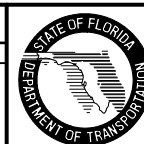


TENDONS AT LOW POINTS
(GROUT INLET / DRAIN)

Details Shown for I-Girders/Bulb-T's - Details for C.I.P. Boxes with Internal Tendons Similar

REVISIONS

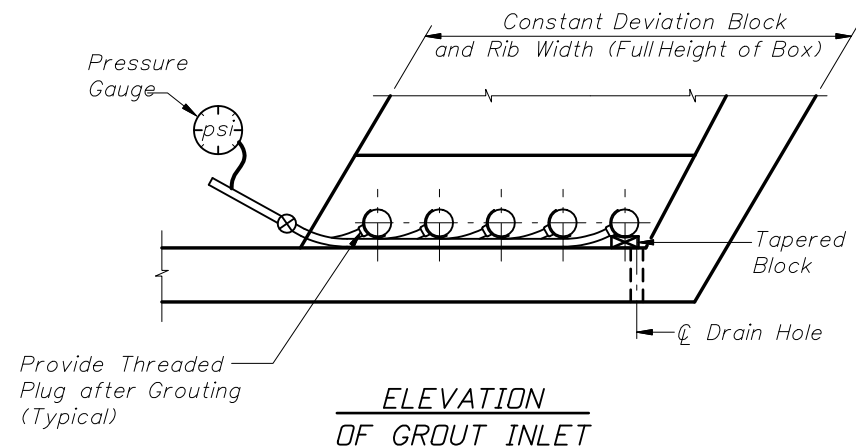
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
01/01/09	SJN	Revised callouts for Grout Outlets.			



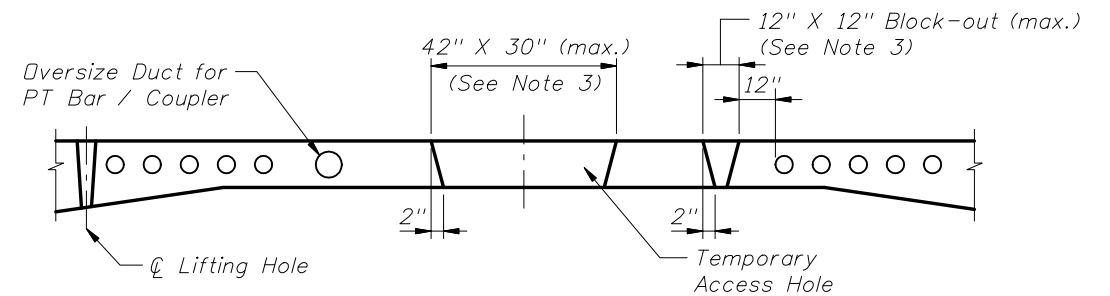
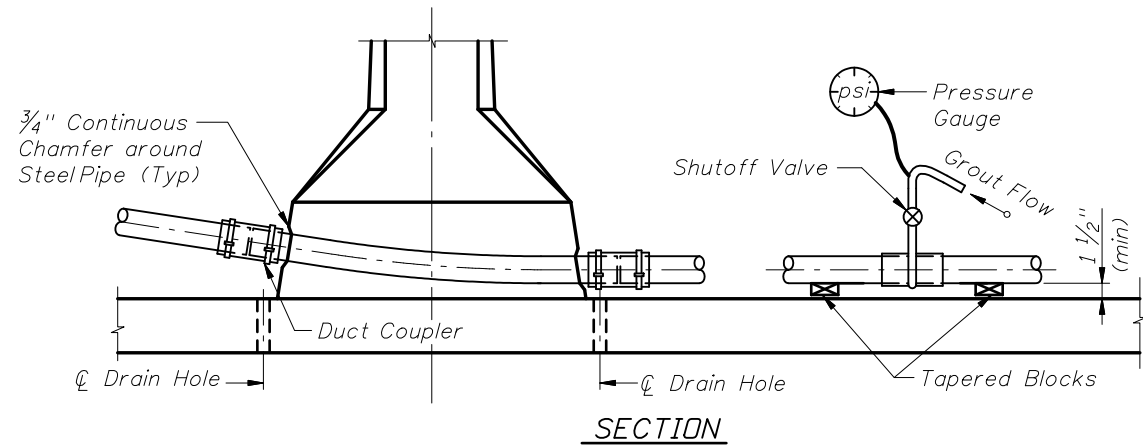
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**POST-TENSIONING ANCHORAGE
AND GROUTING DETAILS**

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NOTES:
Place Tapered Blocks Under Each Tendon to be Grouted to Raise Duct off Tendon Strands. Center Strands within Duct before Grouting. Blocks Shall be Removed after Grout has Set. Blocks Shall not Damage or Permanently Deform Duct.



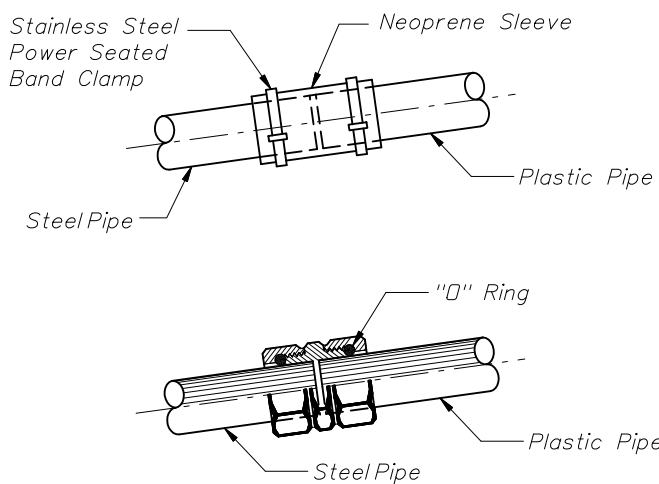
TEMPORARY ACCESS HOLES

Notes: Temporary Access Holes

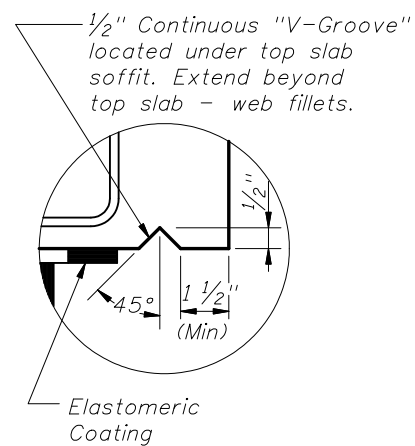
1. Temporary access holes to facilitate access for erection, jacking and grouting operations inside the box during construction are allowed. The access holes shall be limited to a maximum size of 42" wide x 30" long and shall be limited to (1) per span.
2. Slab block-outs for temporary / permanent longitudinal post-tensioning bars are not allowed. Temporary / permanent PT bars in the top slab shall be placed in oversized ducts in the slab to accommodate both the bar and coupler.
3. In lieu of (1) 42" x 30" temporary access hole, a maximum of 2 top slab blockouts (12" x 12" (max.)) between the webs is allowed for construction per span. Block-outs shall be a minimum of 12" from the nearest duct or anchor and shall be located as to prevent direct drip onto bottom slab anchors.

Notes: Repair of Temporary Access Holes, Block-outs, and Lifting Holes

1. Form all large blockouts with tapered sides.
2. Immediately before casting the concrete, mechanically clean the mating concrete surfaces to remove any laitance and to expose small aggregate.
3. Repair all holes and blockouts with Magnesium Ammonium Phosphate Concrete within 24 hours of cleaning concrete.
4. After completion of the deck grooving, coat the repaired and surrounding concrete surfaces with High Molecular Weight Methacrylate.
5. Alternately, epoxy grout may be used to repair holes. High Molecular Weight Methacrylate is not required with epoxy grout.



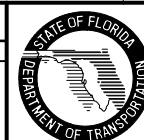
DUCT COUPLER DETAIL
Use Approved Duct Couplers with Post-Tensioned System



DETAIL OF DRIP LEDGE AT ABUTMENTS AND EXPANSION JOINTS FOR SEGMENTAL AND CAST-IN-PLACE BOX CONSTRUCTION

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
01/01/08	SJN	Deleted Shrink Wrap from Duct Coupler Detail with Neoprene Sleeve.	01/01/09	SJN	Revised Duct Coupler callouts; Changed "MethylMethacrylate" to "High Molecular Weight Methacrylate".



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