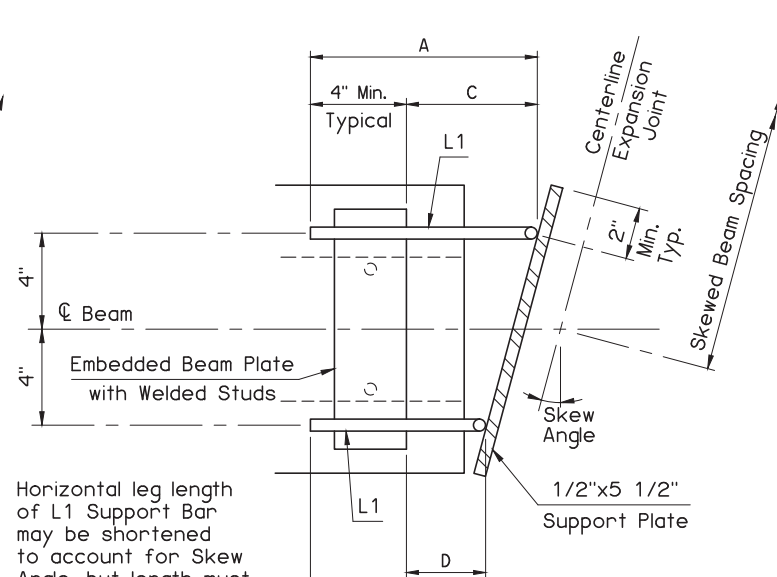


ROLLED BEAMS AND PLATE GIRDERS

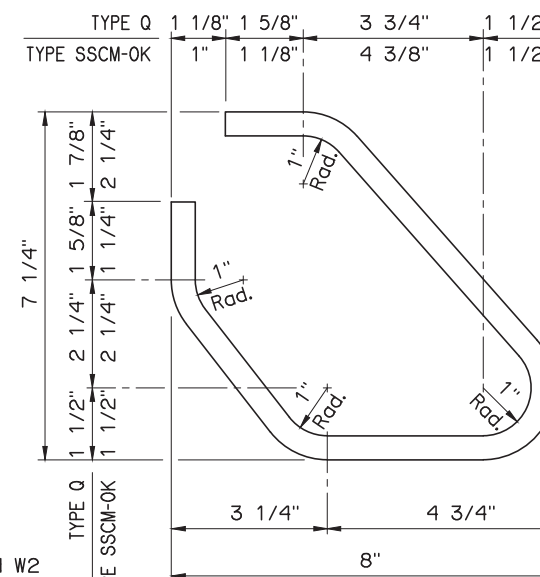


P.C. BEAMS

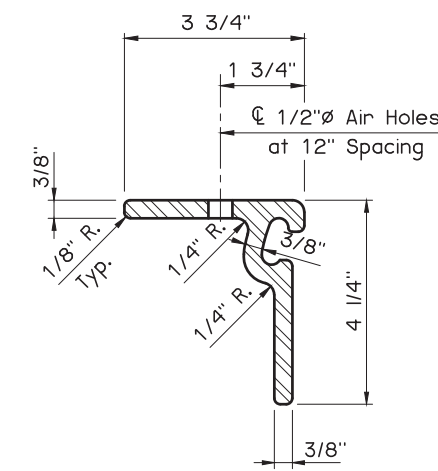
① Horizontal leg length of L1 Support Bar may be shortened to account for Skew Angle, but length must be at least 4" + D(MIN.) dimension shown in L1 SUPPORT BAR PIN DIAMETER SCHEDULE.

SUPPORT PLATE SCHEDULE	
SKEW ANGLE	PLATE LENGTH
0°	1'-0"
1° thru 25°	1'-1"
25° thru 35°	1'-2"
35° thru 45°	1'-4"
45° thru 55°	1'-6"
60° thru 65°	2'-0"
65° thru 70°	2'-4"

NOTE:
Fabricate W1 and W2 bars from W20 Deformed Steel Wire.



W1 ANCHOR BAR DETAIL



WATSON BOWMAN AND ACME TYPE Q STEEL EXTRUSION RECEPTOR DETAIL

SEALED EXPANSION JOINT SUPPORT PLANS

GUIDE FOR SIZING SEALED EXPANSION JOINT SUPPORT MEMBERS

- After determining Skewed Beam Spacing and C, find Support Bar diameter from L1 SUPPORT BAR DIAMETER SCHEDULE.
- Knowing Support Bar diameter, find Pin Diameter from L1 SUPPORT BAR PIN DIAMETER SCHEDULE. Adjust the location of the Embedded Beam Plate for P.C. Beams if actual D dimension is less than D(MIN.) scheduled. No check of D(MIN.) from the end of Rolled Beams and Plate Girders is required.
- Dimension A of Support Bars is 4" minimum plus C or D. Horizontal leg length of L1 Support Bar may be shortened to account for Skew Angle, but length must be at least 4" + D(MIN.) dimension shown in L1 SUPPORT BAR PIN DIAMETER SCHEDULE.
- Dimension B of Support Bar is dependent upon Haunch Thickness as shown in L1 SUPPORT BAR DIMENSION B SCHEDULE.
- Length of Support Plate is dependent upon Skew Angle as shown in SUPPORT PLATE SCHEDULE.

SEALED EXPANSION JOINT NOTES

Use a Sealed Expansion Joint which has a total movement range of 4" and seals the deck to prevent moisture or other contaminants from descending onto the lower structure components.

Provide either the Watson, Bowman and Acme Type Q Steel Extrusion Receptor or the D.S. Brown Type SSCM-OK Steel Extrusion Receptor as shown on this sheet.

MATERIALS

Provide Steel Receptors, Support Plates and L1 Support Bars conforming to AASHTO M270 (ASTM A709), Grade 36, 50 or 50W (Charpy V-Notch testing not required).

Provide W1 and W2 Anchor Bars conforming to AASHTO M225 (ASTM A496). Include all bar dimensions in the shop drawings.

Use Preformed Neoprene Gland lubricant and adhesive in accordance with the manufacturer's published literature.

FABRICATION OF JOINT

Perform welding of Steel Receptors, Support Plates, L1 Support Bars and W1 and W2 Anchor Bars in accordance with Subsection 724.03 of the Specifications.

Apply two shop coats - one an inorganic zinc rich (IZ) primer, the other an inorganic zinc rich (IZ) intermediate coat - to the entire surface of the Steel Receptor, Support Plates, L1 Support Bars and W1 and W2 Anchor Bars. Apply one field application of urethane topcoat to all exposed surfaces after installation. Perform all painting in accordance with Section 512 of the Specifications.

At locations where joint is shown to be mitered at any angle for turn-up at traffic rail or for skew, shop splice Neoprene Gland with heat vulcanizing or other method of equal effectiveness as recommended by the listed joint manufacturer or approved equal and approved by the Engineer.

BASIS OF PAYMENT

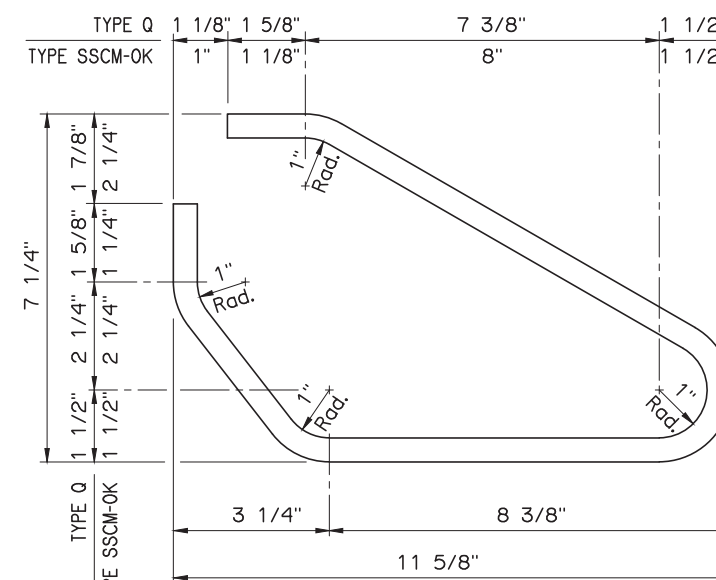
The Department will consider the cost of the complete joint including Neoprene Gland, Support Plates, Steel Receptors, L1 Support Bars, W1 and W2 Anchor Bars, welding, equipment, labor and any other incidentals to be included in the contract unit price of SEALED EXPANSION JOINT.

L1 SUPPORT BAR DIAMETER SCHEDULE		
SKEWED BEAM SPACING	C (MAX.)	SUPPORT BAR DIAMETER
8'-0" or Less	3"	3/4"
	6"	1"
	1'-3"	1 1/4"
	1'-9"	1 1/2"
	2'-0"	1 3/4"
Over 8'-0" to 11'-0"	3"	3/4"
	6"	1"
	1'-0"	1 1/4"
	1'-6"	1 1/2"
	2'-0"	1 3/4"
Over 11'-0" to 14'-0"	6"	1"
	1'-0"	1 1/4"
	1'-6"	1 1/2"
	1'-9"	1 3/4"
	2'-0"	2"
Over 14'-0" to 20'-0"	3"	1"
	9"	1 1/4"
	1'-3"	1 1/2"
	1'-9"	1 3/4"
	2'-0"	2"
Over 20'-0" to 25'-0"	3"	1"
	6"	1 1/4"
	1'-0"	1 1/2"
	1'-6"	1 3/4"
	2'-0"	2"

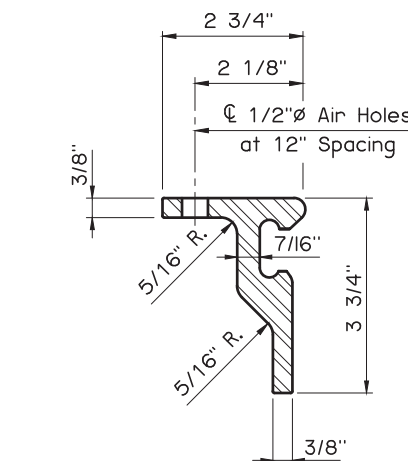
L1 SUPPORT BAR PIN DIAMETER SCHEDULE		
SUPPORT BAR DIAMETER	PIN DIA. ②	D (MIN.) ③
3/4"	2 1/4"	2 3/8"
1"	3"	3"
1 1/4"	3 3/4"	3 5/8"
1 1/2"	4 1/2"	4 1/4"
1 3/4"	5 1/4"	4 7/8"
2"	6"	5 1/2"

L1 SUPPORT BAR DIMENSION B SCHEDULE	
HAUNCH ④ THICKNESS	B ⑤
1"	6 3/4" ⑥
2"	7 1/2" ⑦
3"	8 1/2"
4"	8 1/2"

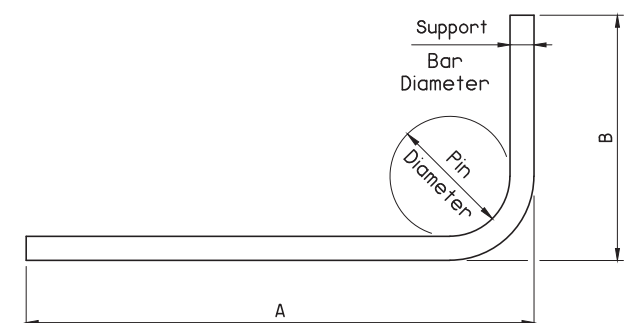
- Pin Diameter shown is based on ASTM A6, Appendix X4 for Grade 36 steel.
- D dimension required to maintain minimum weld of Support Bar to Embedded Beam Plate for P.C. Beams.
- Haunch Thickness measured from top of Beam to bottom of Deck Slab.
- Dimension B assumes an 8" Deck Slab. If a different Deck Slab thickness is used, adjust Dimension B accordingly.
- 1 3/4" and 2" L1 Support Bars cannot be used with 1" Haunch unless L1 Support Bars are hotbent around 3 1/2" Pin maximum.
- 2" L1 Support Bars cannot be used with 2" Haunch unless L1 Support Bars are hotbent around 5 1/2" Pin maximum.



W2 ANCHOR BAR DETAIL



D.S. BROWN TYPE SSCM-OK STEEL EXTRUSION RECEPTOR DETAIL



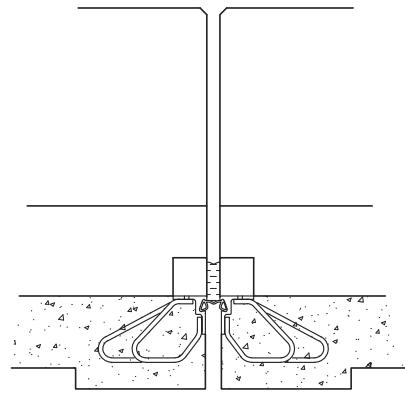
L1 SUPPORT BAR DETAIL

APPROVED BY BRIDGE ENGINEER *St. J.* DATE 12-20-16

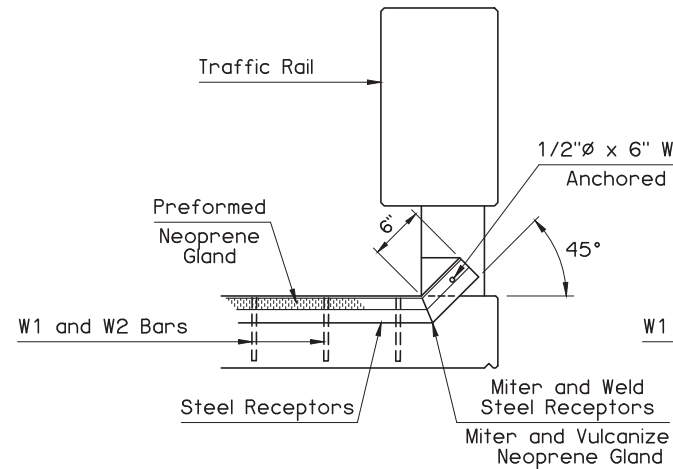
OKLAHOMA DEPT. OF TRANSPORTATION
BRIDGE STANDARD (ENGLISH)

SEALED EXPANSION JOINT DETAILS

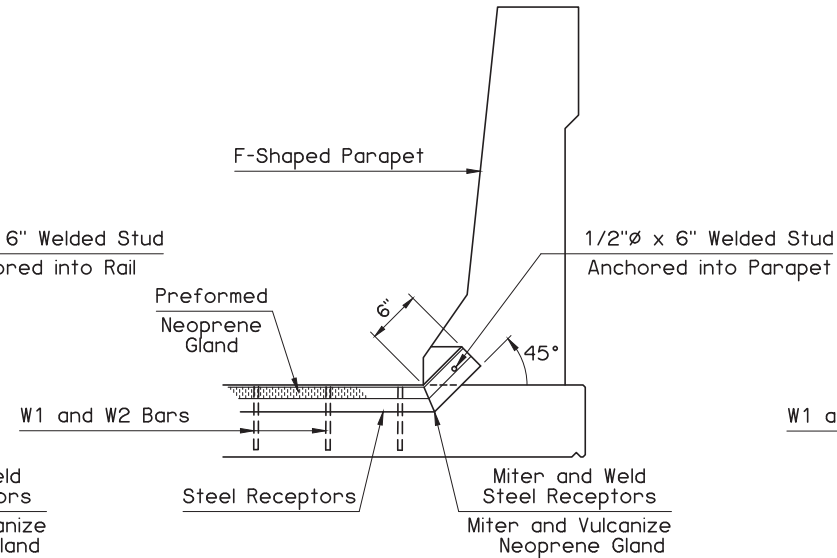
2009 SPECIFICATIONS EJ-DTL 02E B-10E



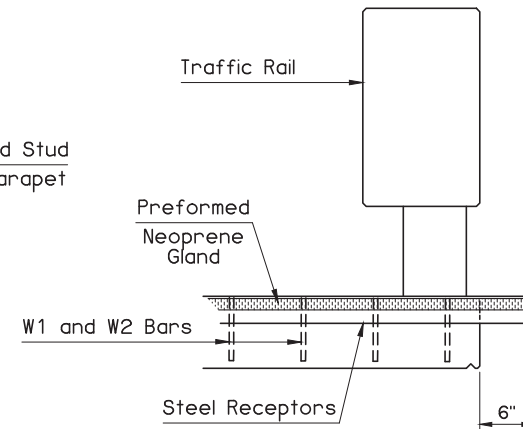
ELEVATION WITHOUT OPENINGS



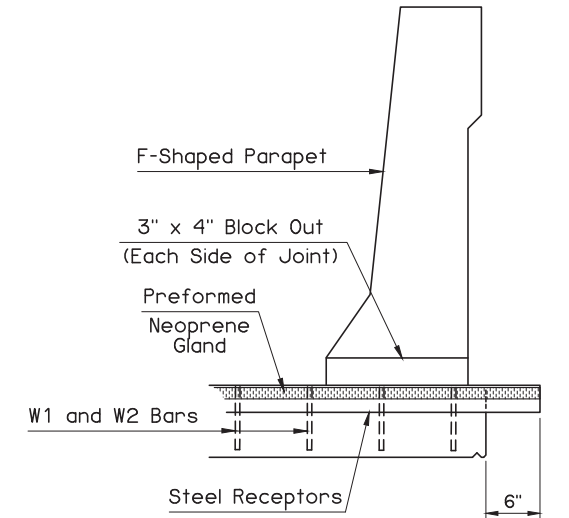
SECTION AT TRAFFIC RAIL WITHOUT OPENINGS



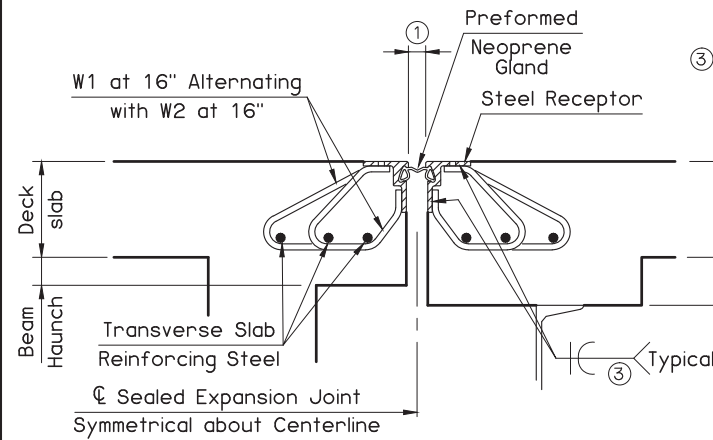
SECTION AT F-SHAPED PARAPET WITHOUT OPENINGS



SECTION AT TRAFFIC RAIL WITH OPENINGS



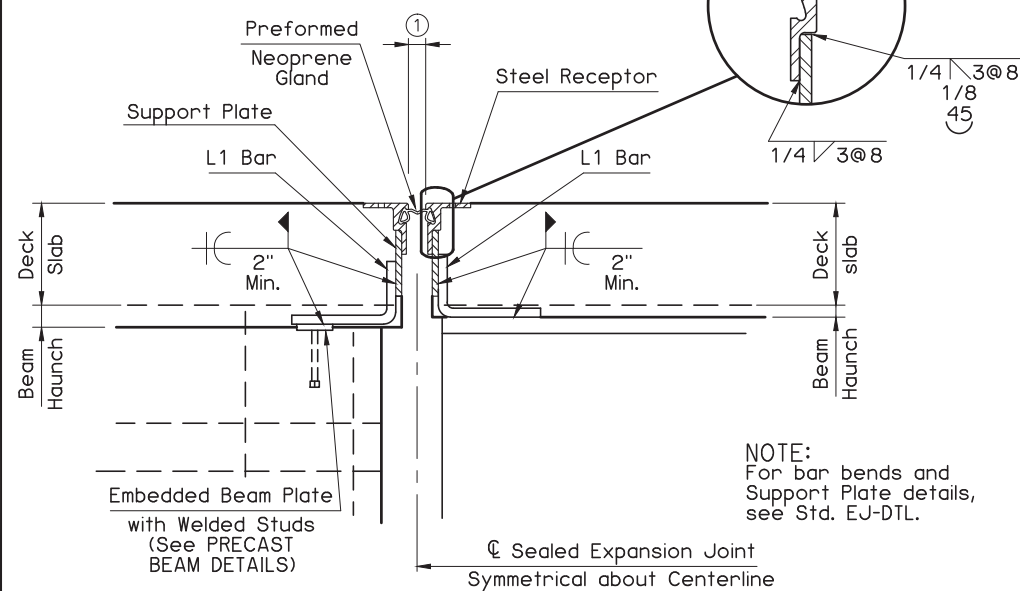
SECTION AT F-SHAPED PARAPET WITH OPENINGS



P.C. BEAMS

ROLLED BEAMS AND PLATE GIRDERS

SECTION A-A



P.C. BEAMS

ROLLED BEAMS AND PLATE GIRDERS

SECTION B-B

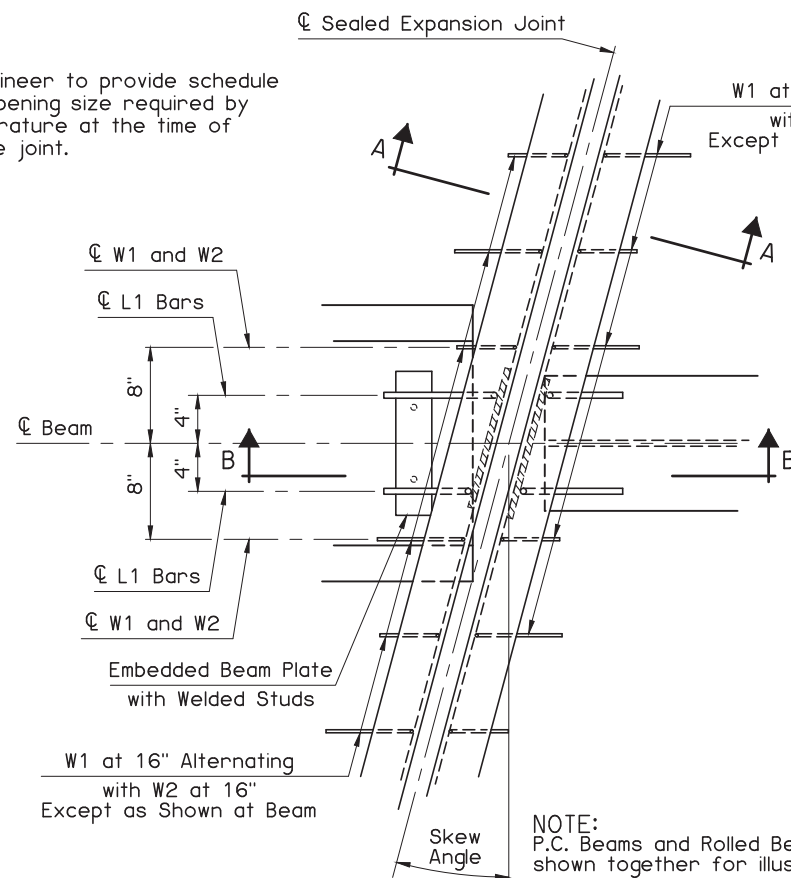
NOTE: For bar bends and Support Plate details, see Std. EJ-DTL.

TEMPERATURE CHANGE PER EVERY 1/8" CHANGE IN BRIDGE LENGTH ②

BEAM TYPE	TOTAL EXPANSION LENGTH				
	100'	200'	300'	400'	500'
CONCRETE	17.3°F	8.7°F	5.8°F	4.3°F	3.5°F
STEEL	16.0°F	8.0°F	5.3°F	4.0°F	3.2°F

② Table is for assisting in determining joint opening size. A nominal 2" joint opening corresponds to 43°F for new prestressed concrete beams and 60°F for steel beams. Decrease opening as temperature rises and increase as temperature drops. Measure change in bridge length parallel to beams. For change in joint opening size measured normal to joint, divide temperature change by cosine of skew angle.

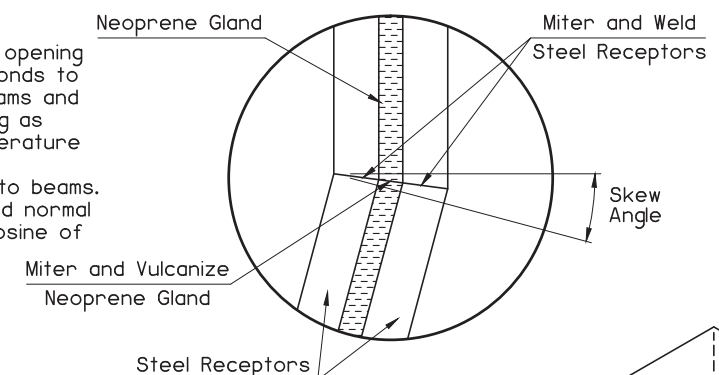
① Design Engineer to provide schedule of joint opening size required by the temperature at the time of setting the joint.



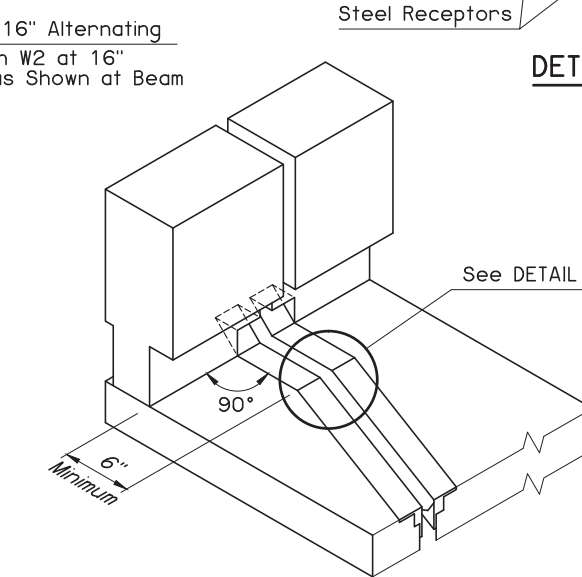
P.C. BEAMS

ROLLED BEAMS AND PLATE GIRDERS

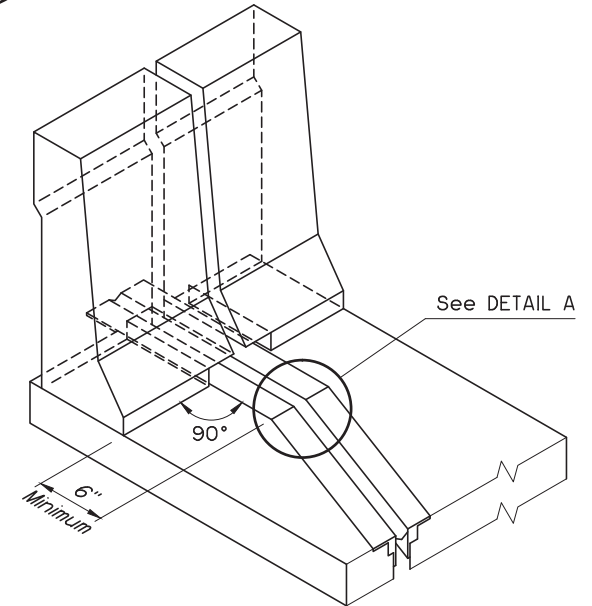
PLAN



DETAIL A



PICTORIAL VIEW OF SEALED JOINT AT TRAFFIC RAIL WITHOUT OPENINGS (F-SHAPED PARAPET SIMILAR)



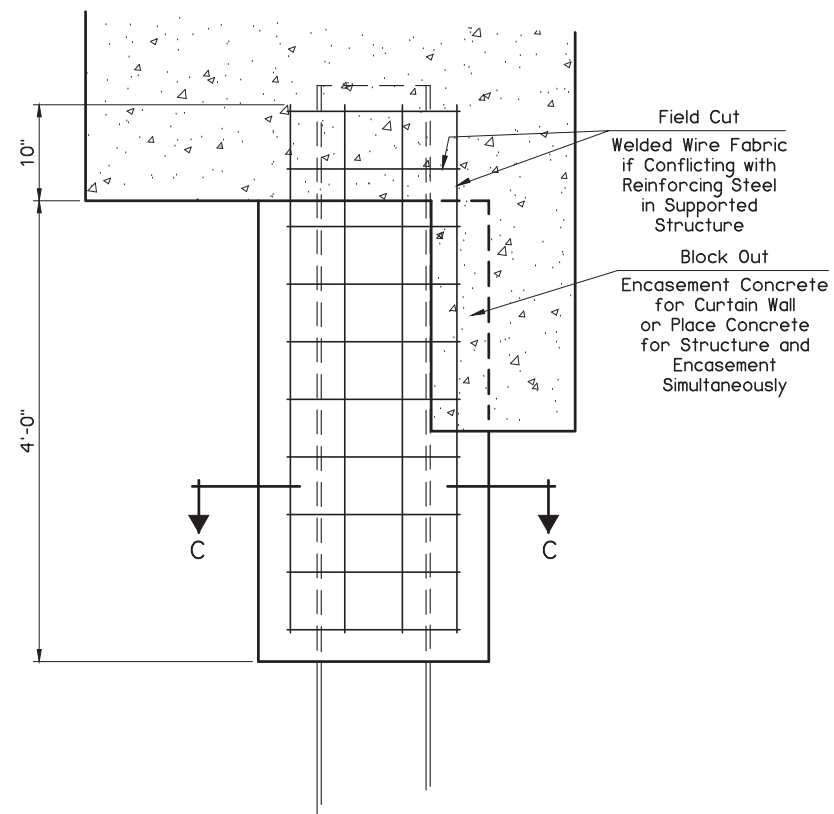
PICTORIAL VIEW OF SEALED JOINT AT F-SHAPED PARAPET WITH OPENINGS (TRAFFIC RAIL SIMILAR)

APPROVED BY BRIDGE ENGINEER *St. J.* DATE 12-20-16

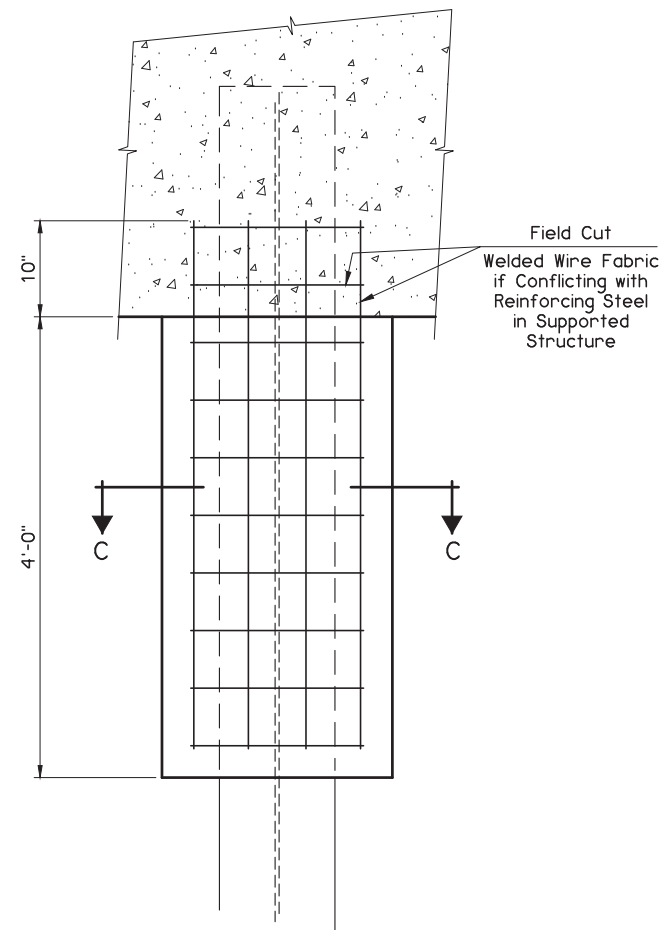
OKLAHOMA DEPT. OF TRANSPORTATION
BRIDGE STANDARD (ENGLISH)

SKewed SEALED EXPANSION JOINT CONVENTIONAL

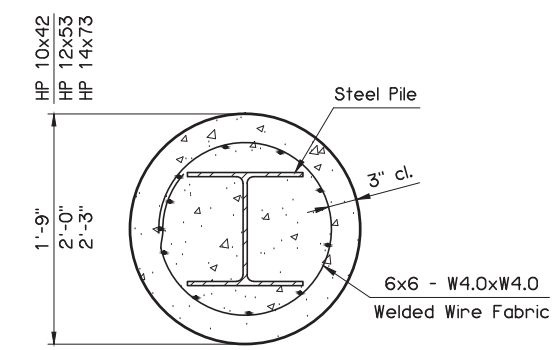
2009 SPECIFICATIONS EJ-SK 04E B-09E



ELEVATION AT CURTAIN WALL



TYPICAL ELEVATION

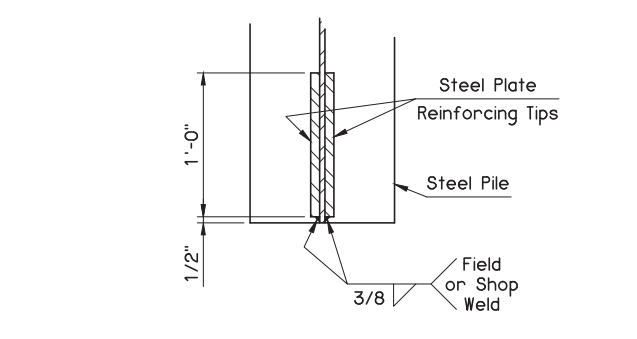


SECTION C-C

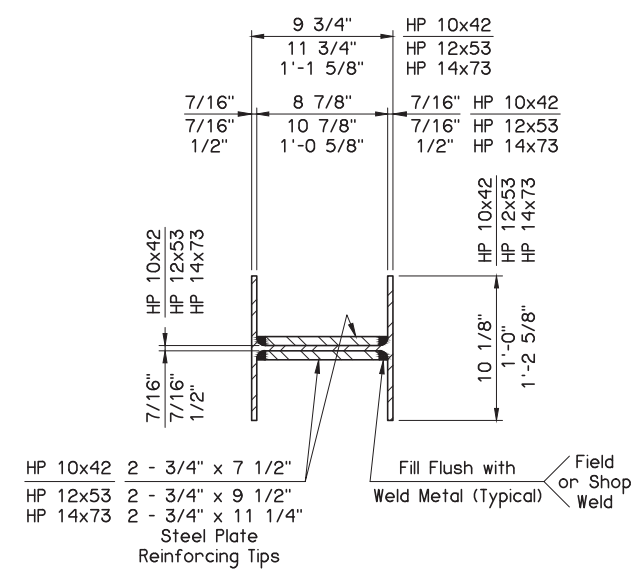
DETAIL OF STEEL PILE ENCASEMENT

NOTE:
Forms for Encasements may be omitted when soil conditions permit. Use only when specified in the plans. The Department considers the cost of Excavation, Forms, Class A Concrete and Welded Wire Fabric Reinforcing Steel for Steel Pile Encasements to be included in the contract unit price of PILES, DRIVEN.

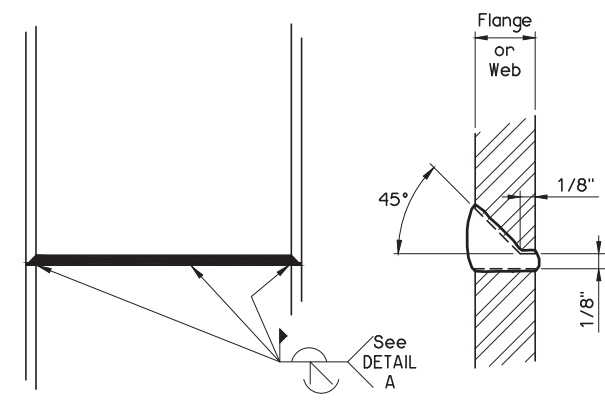
PILE ENCASEMENT QUANTITIES PER PILE				
ITEM	UNIT	HP 10x42	HP 12x53	HP 14x73
CLASS A CONCRETE	C.Y.	0.34	0.45	0.57
REINFORCING STEEL	LB.	16.2	18.3	20.3



SECTION A-A

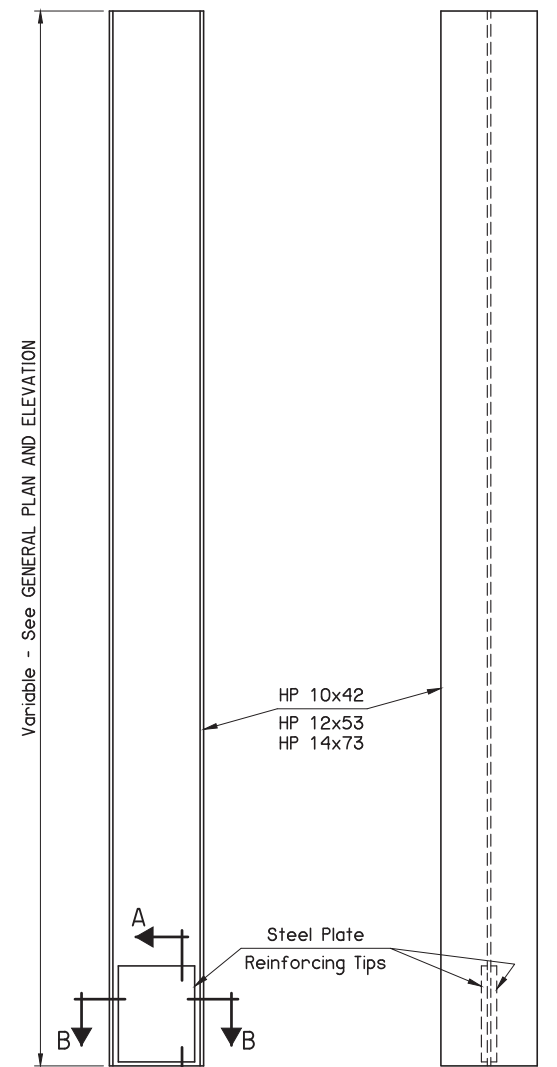


SECTION B-B



DETAIL OF WELDED SPLICE

NOTE:
The Contractor may use an ODOT approved Manufactured Pile Splice as an alternative to the Welded Splice shown.



DETAIL OF PILING

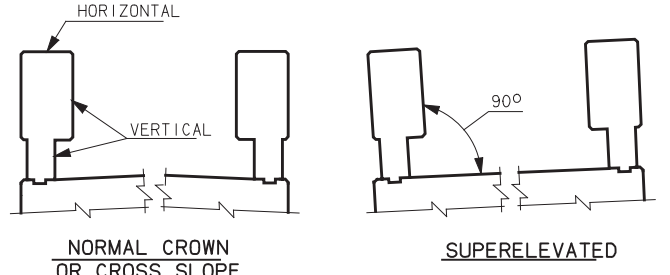
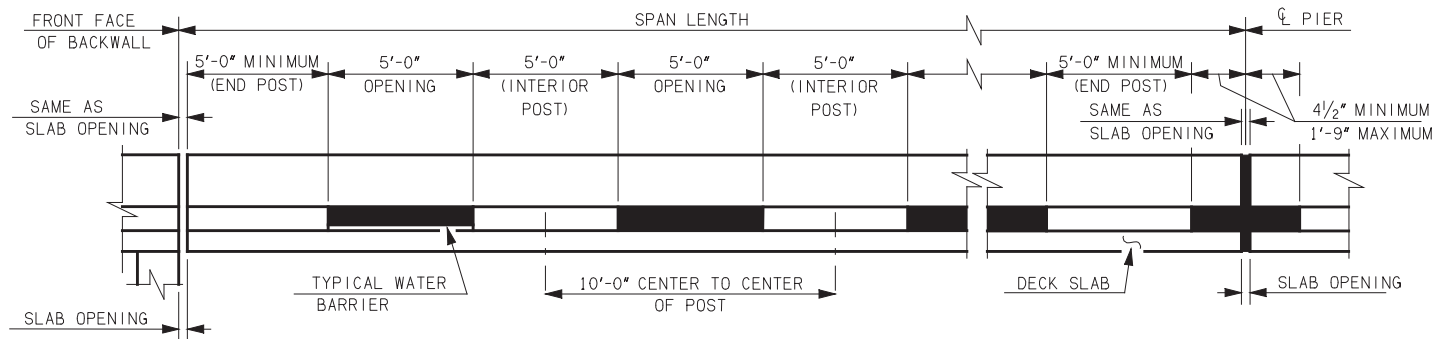
NOTE:
Provide structural steel for Piling and Steel Plate Reinforcing Tips in accordance with AASHTO M270 (ASTM A572), Grade 50. Provide Steel Plate Reinforcing Tips for all Piling unless specifically deleted by notes in the Project Plans and Specifications. The Contractor may use Manufactured Driving Tips as an alternative to the Steel Plate Reinforcing Tips shown with approval by the Bridge Engineer. The Department considers the cost of Steel Plate Reinforcing Tips or Manufactured Driving Tips to be included in the contract unit price of PILES, FURNISHED.

APPROVED BY BRIDGE ENGINEER *St. J.* DATE 12-20-16

OKLAHOMA DEPT. OF TRANSPORTATION
BRIDGE STANDARD (ENGLISH)

STEEL PILING

DESCRIPTION	REVISIONS	DATE



CONCRETE TRAFFIC RAIL NOTES

Construct the Concrete Traffic Rail to meet the requirements of the Standard Specification For Highway Construction (English) as well as the following requirements.

CLASS AA CONCRETE:

Use Class AA Concrete in the Concrete Traffic Rail. All costs of concrete to be included in the price bid per linear foot of "Concrete Rail (TR4)".

REINFORCING STEEL:

All reinforcing steel, except for the S-Bar, used in the Concrete Traffic Rail is to be epoxy coated. When two or more S Bars are used in a continuous rail section, butt their ends together within the center 3'-0" of a rail post. Place and tie all SR1 Bars before the concrete is placed in the deckslab and approach slabs. SR1 Bars will be measured and paid for as "EPOXY COATED REINFORCING STEEL". All other reinforcing steel will not be measured for payment.

GUARDRAIL CONNECTION:

Form or drill holes, as shown, for the connection of the Thrie-Beam Terminal Connection (End Shoe) at the locations shown in the plans or as directed by the Engineer. It is the responsibility of the bridge contractor to provide the holes. The contractor that installs the Guardrail will be responsible for installing the Thrie-Beam Terminal Connection.

CONSTRUCTION JOINTS:

Place a construction joint at each fixed abutment and fixed pier, and at other locations shown in the plans. Place 1/4" thick preformed expansion material in the construction joint such that it covers the entire area of the rail and post in accordance with the details shown.

EXPANSION JOINTS:

At expansion joints in the deckslab or approach slab, match the width of the opening between the ends of the railing with the opening of the expansion joints. Construct the opening between the end post and the joint as shown on the plans within the maximum and minimum dimensions as shown on this sheet.

CONTROL CRACK JOINTS:

When plans call for a control crack joint provide double 3/4" chamfers or 3/4" deep sawcut in accordance with the details shown. All bars shall be continuous through the control crack joints.

CONCRETE RAIL CONSTRUCTION:

Locate posts as shown on this sheet unless shown otherwise in the plans. Construct openings such that the face of the posts are perpendicular to the roadway profile grade.

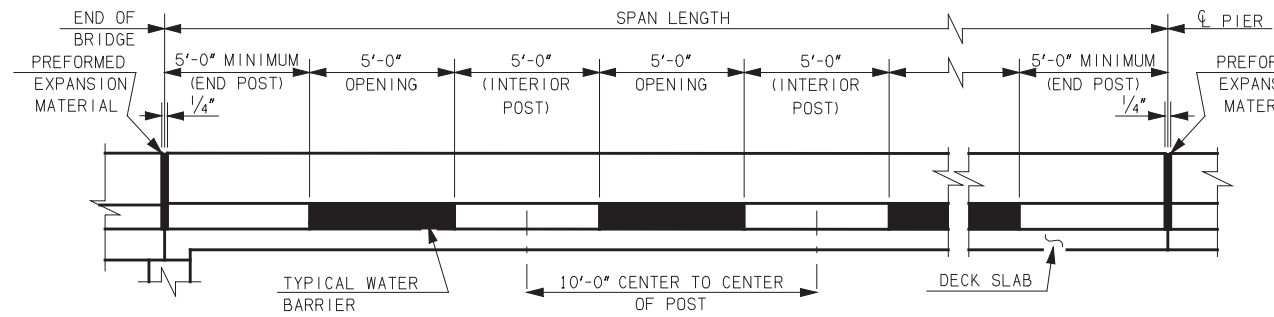
WATER BARRIER:

Provide water barrier at rail openings that would drain onto the undercrossing roadways and sidewalks as shown in plans or as directed by the Engineer. Place the concrete for the water barrier concurrently with the placement of the concrete in the posts. Include all costs of water barriers in the price bid per linear foot of "Concrete Rail (TR4)".

AT EXPANSION ABUTMENTS

AT EXPANSION PIERS

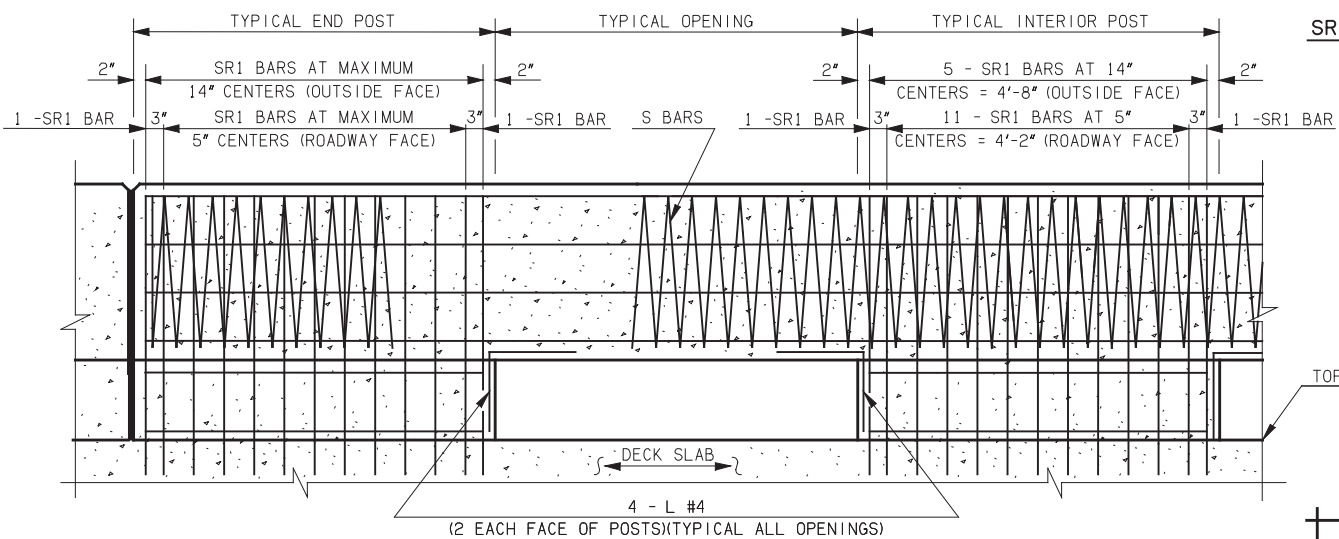
ELEVATION OF RAIL WITH EXPANSION JOINTS



AT FIXED ABUTMENTS

AT FIXED PIERS

ELEVATION OF RAIL WITH FIXED JOINTS

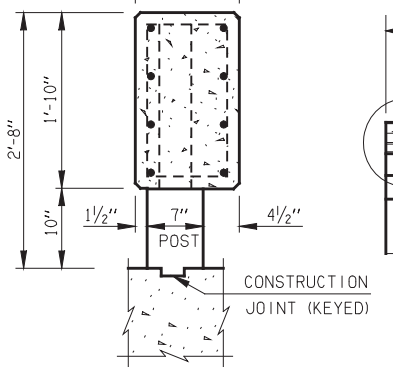


SR1 BARS #5 x 4'-1"

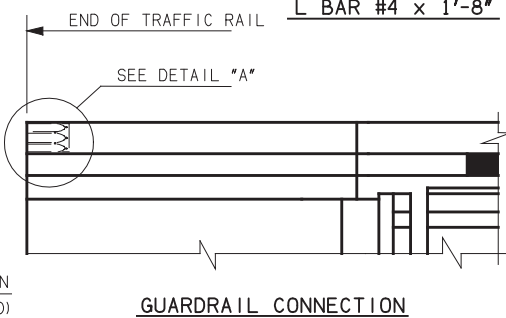
S BAR

T BARS #4 x 7'-0"

L BAR #4 x 1'-8"

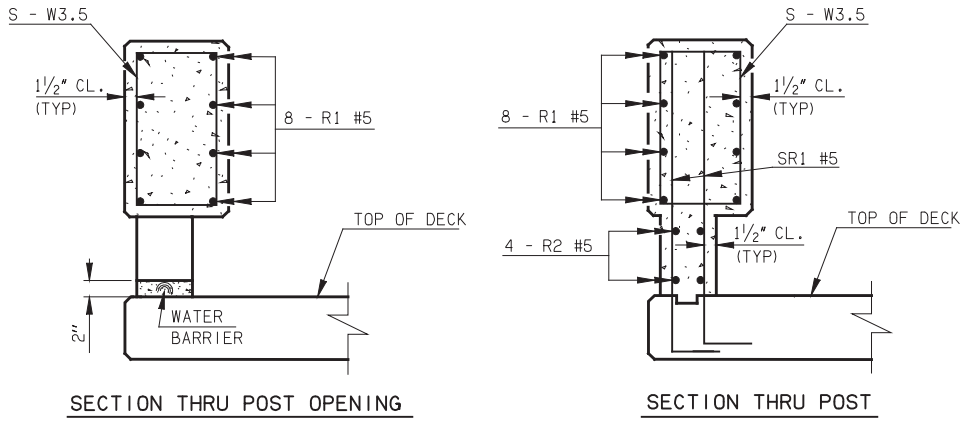


TYPICAL SECTION THRU RAIL



GUARDRAIL CONNECTION

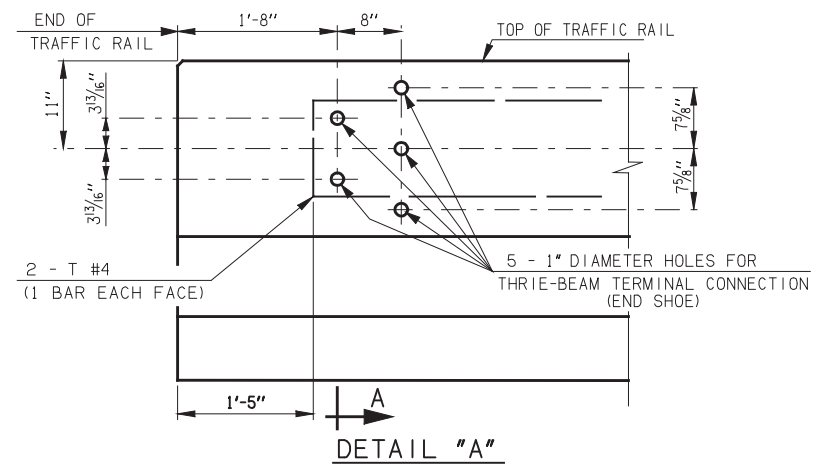
TRAFFIC RAIL REINFORCING



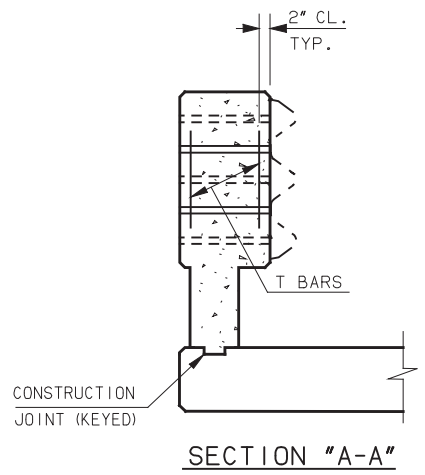
SECTION THRU POST OPENING

SECTION THRU POST

SECTION THRU RAIL AT BRIDGE DECK OR APPROACH SLAB



DETAIL "A"



SECTION "A-A"

BASIS OF PAYMENT		
ITEM NO.	DESCRIPTION	UNIT
504(E)	CONCRETE RAIL (TR4)	L.F.

APPROVED BY BRIDGE ENGINEER: *Kevin A. Smith* DATE 4/2/10

OKLAHOMA DEPT. OF TRANSPORTATION
BRIDGE STANDARD (ENGLISH)

CONCRETE TRAFFIC RAIL (TR4)

FULL CIRCLE STEEL PIPE CULVERT											
PIPE DIAMETER FOR CORRUGATION PATTERN				MIN. COVER	MAXIMUM FILL HEIGHT ABOVE TOP OF PIPE						
					EQUIV. STANDARD GAGE						
2 2/3" x 1/2"	3" x 1"	5" x 1"	6" x 2"	TOP OF PIPE TO TOP OF SUBGRADE	16	14	12	10	8	7	5
18"				12"	61'	67'	86'	90'	94'		
21"				12"	53'	57'	74'	77'	81'		
24"				12"	46'	50'	65'	68'	71'		
27"				12"	41'	44'	57'	60'	63'		
30"				12"	37'	40'	52'	54'	56'		
36"				12"	30'	33'	43'	45'	47'		
	36"			12"	53'	66'	77'	89'	100'		
42"				12"	34'	44'	46'	47'	49'		
	42"			12"	45'	56'	64'	71'	78'		
48"				12"	41'	44'	45'	46'			
	48"			12"	39'	49'	56'	61'	66'		
		48"		12"	49'	52'	56'	61'	66'		
54"				12"		36'	43'	44'	45'		
	54"			12"	35'	44'	51'	55'	58'		
		54"		12"	47'	48'	52'	55'	58'		
60"				12"			42'	43'	43'		
	60"			12"	31'	39'	49'	51'	53'		
		60"		12"	43'	46'	49'	51'	53'		
			60"	12"			46'	68'	90'	96'	106'
66"				12"			42'	43'			
	66"			12"	29'	36'	47'	48'	50'		
		66"		12"	39'	45'	47'	48'	50'		
			66"	12"			42'	62'	78'	82'	90'
72"				12"			42'	42'			
	72"			12"	26'	33'	45'	47'	48'		
		72"		12"	36'	44'	45'	47'	48'	73'	78'
			72"	12"			38'	57'	69'		
78"				12"				42'			
	78"			12"	24'	30'	44'	45'	46'		
		78"		12"	33'	42'	44'	45'	46'		
			78"	12"			35'	53'	63'	66'	70'
84"				12"				42'			
	84"			12"	22'	28'	42'	44'	45'		
		84"		12"	31'	39'	43'	44'	45'		
			84"	12"			33'	49'	59'	61'	64'
90"				12"		26'	39'	44'	44'		
	90"			12"	29'	36'	43'	44'	44'		
		90"		12"		31'	45'	55'	57'	60'	
			96"	12"		24'	36'	43'	44'		
		96"		12"		34'	43'	43'	44'		
			96"	12"		29'	43'	53'	54'	57'	
102"				24"			34'	41'	43'		
	102"			24"		32'	42'	43'	43'		
		108"		24"			32'	39'	43'		
			108"	24"			42'	42'	43'		
				24"			25'	38'	49'	50'	52'
114"				24"			31'	37'	41'		
	114"			24"			40'	42'	42'		
		120"		24"			29'	35'	39'		
			120"	24"			38'	42'	42'		
				24"			23'	34'	45'	48'	49'

FULL CIRCLE ALUMINUM PIPE CULVERT									
PIPE DIAMETER FOR CORRUGATION PATTERN			MIN. COVER	MAXIMUM FILL HEIGHT ABOVE TOP OF PIPE					
				EQUIV. STANDARD GAGE					
2 2/3" x 1/2"	3" x 1"	6" x 1"	TOP OF PIPE TO TOP OF SUBGRADE	16	14	12	10'	8	
18"			12"	36'	36'	63'			
24"			12"	27'	27'	47'	50'		
27"			12"	24'	24'	42'	44'		
30"			12"	22'	21'	37'	39'		
	30"		12"	40'	50'	68'			
36"			12"		18'	32'	33'		
	36"		12"	33'	41'	57'	85'		
		36"	12"	20'					
42"			12"			54'	57'		
	42"		12"	27'	35'	48'	73'		
48"			12"			47'	49'	51'	
	48"		12"	24'	30'	42'	63'	82'	
54"			12"			41'	44'	45'	
	54"		12"	21'	27'	37'	56'	73'	
		54"	12"	29'	42'	67'	66'		
60"			12"			39'	41'		
	60"		12"	19'	24'	33'	24'	66'	
		60"	12"		25'	37'	59'	58'	
66"			12"			36'	37'		
	66"		12"	14'	18'	26'	40'	51'	
		66"	12"		23'	33'	53'	52'	
			72"	12"	28'	27'	41'	54'	
			72"	15"	19'	27'	36'	43'	
			78"	15"	18'	25'	38'	50'	
			78"	15"	17'	25'	32'	40'	
			84"	18"	17'	23'	35'	47'	
			84"	18"		23'	30'	37'	
			90"	18"		21'	33'	43'	
			90"	18"		21'	28'	34'	
			96"	18"		20'	31'	40'	
			96"	18"		19'	26'	32'	
			102"	21"		18'	28'	37'	
			102"	21"		18'	25'	29'	
			108"	21"			27'	35'	
			108"	21"		17'	23'	28'	
			114"	24"			25'	34'	
			114"	24"		16'	21'	26'	
			120"	24"			24'	32'	
			120"	24"			20'	25'	

METAL PIPE ARCH - FILLS TO 10 FT. MAX.					
APPROX. EQUIV. ROUND PIPE	SIZE SPAN x RISE	2 2/3" x 1/2" CORRUGATION PATTERN			
		STEEL		ALUMINUM	
		MIN. GAGE	MIN. COVER	MIN. GAGE	MIN. COVER
15"	17" x 13"	16	12"	16	12"
18"	21" x 15"	16	12"	16	12"
21"	24" x 18"	16	12"	16	12"
24"	28" x 20"	16	12"	14	12"
30"	35" x 24"	14	12"	14	12"
36"	42" x 29"	14	12"	12	15"
42"	49" x 33"	14	12"	12	15"
48"	57" x 38"	12	12"	10	15"
54"	64" x 43"	12	12"	10	18"
60"	71" x 47"	10	12"	8	18"
66"	77" x 52"	8	12"	8	18"
72"	83" x 57"	8	12"	8	18"
3" x 1" & 5" x 1" CORRUGATION PATTERN					
36"	40" x 31"	14	12"		
42"	46" x 36"	14	12"		
48"	53" x 41"	14	12"		
54"	60" x 46"	14	12"	14	15"
60"	66" x 51"	14	12"	14	18"
66"	73" x 55"	14	12"	14	18"
72"	81" x 59"	14	12"	12	21"
78"	87" x 63"	14	12"	12	21"
84"	95" x 67"	12	12"	12	24"
90"	103" x 71"	12	18"	10	24"
96"	112" x 75"	12	18"	10	27"
102"	117" x 79"	12	18"		
108"	128" x 83"	10	24"		
114"	137" x 87"	10	24"		
120"	142" x 91"	10	24"		

WHEN INSTALLED UNDER PAVEMENT INCLUDING ALL P.C. OR A.C. SURFACING UNDER MAINLINE TRAFFIC AND MAJOR STREET RETURNS. A MINIMUM PIPE GAGE OF 16 MAY BE USED FOR INSTALLATION REQUIRING 30 INCH EQUIVALENT ROUND CONDUITS (MAX.) AND LIMITED TO LOW VOLUME COUNTY OR OFF-SYSTEM ROADS, MINOR STREET RETURNS, DRIVEWAYS OR TEMPORARY DETOURS, AS APPROVED BY THE ENGINEER.

GENERAL NOTES

- METAL PIPE FILL HEIGHT DESIGNS ARE BASED ON A CLASS B BEDDING, NEGATIVE PROJECTION, HS-20 LIVE LOADING AND 120 LBS/C.F. SOIL WEIGHT. POLYPROPYLENE PIPE FILL HEIGHTS ARE BASED ON AASHTO M330 FOR POLYPROPYLENE, TYPE S, PIPE WITH OUTER CORRUGATED WALL AND SMOOTH INNER WALL.
- IN THE EVENT LOADS IN EXCESS OF HS-20 ARE TO BE OPERATED OVER OR ADJACENT TO THE PIPE INSTALLATION DURING THE CONSTRUCTION PHASE, THE CONTRACTOR SHALL PROVIDE AND MAINTAIN A MINIMUM OF FOUR FEET OF COVER OVER THE PIPE AT WHEEL OR TRACK PATHS.
- PROPER INSTALLATION PRACTICES MUST BE ADHERED TO AS SHOWN ON ROADWAY STANDARDS SPI-4, FPI-3 AND SPB-1. POLYPROPYLENE PIPE SHALL BE INSTALLED IN ACCORDANCE WITH ASTM D2321.
- ANY PIPE DEFORMED PRIOR TO FINAL ACCEPTANCE SHALL BE REPLACED BY THE CONTRACTOR AT HIS EXPENSE. SURFACE DISTRESS MUST BE REPAIRED TO THE SATISFACTION OF THE ENGINEER OR REPLACED AT THE CONTRACTOR'S EXPENSE.
- MAXIMUM FILL HEIGHTS ARE MEASURED TO TOP OF SUBGRADE (OR BOTTOM OF ASPHALT OR PC PAVEMENT) FOR METAL AND POLYPROPYLENE PIPES.

APPROVED BY ROADWAY ENGINEER: DATE: 04/14/15

ROADWAY DESIGN DIVISION STANDARD

FILL HEIGHT TABLES (METAL & POLYPROPYLENE PIPES)

OKLAHOMA DEPARTMENT OF TRANSPORTATION
2009 SPECIFICATIONS

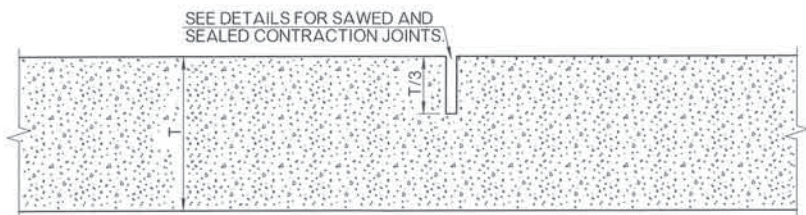
FHTMPP-1 0
R-50

POLY-PROPYLENE PIPE DIAMETER	MAXIMUM FILL HEIGHT OVER CULVERT (FT.)			
	UNDER PAVEMENT		OUTSIDE PAVEMENT	
	95% COMPACT	90% COMPACT	Class C - 85% COMPACT	Class D - 85% COMPACT
18	25	18	16	13
24	22	16	14	12
30	23	17	13	12
36	22	16	11	11
42	22	15	11	11
48	21	15	11	10
60	23	16	11	10

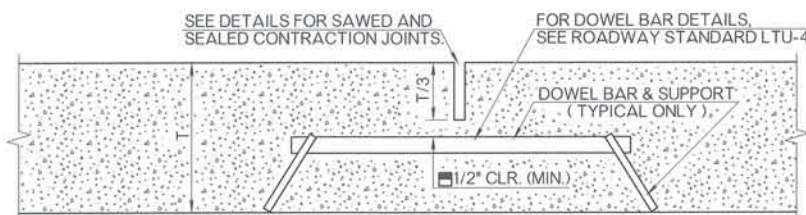
REFER TO ROADWAY DESIGN STANDARD SPB-1 FOR MINIMUM FILL HEIGHT AND OTHER POLYPROPYLENE INSTALLATION DETAILS.

GAGE NUMBER	EQUIVALENT METAL THICKNESS AND GAGE	
	METAL THICKNESS (INCHES)	
	■ STEEL	◆ ALUMINUM
16	0.064	0.060
14	0.079	0.075
12	0.109	0.105
10	0.138	0.135
8	0.168	0.164
7	0.188	----
5	0.218	----

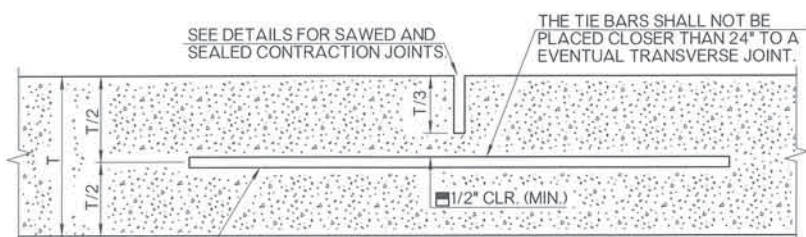
THE THICKNESS OF THE SHEET INCLUDES BOTH THE BASE STEEL AND THE COATING.
THE THICKNESS SHOWN REFERS TO THE CLAD SHEET.



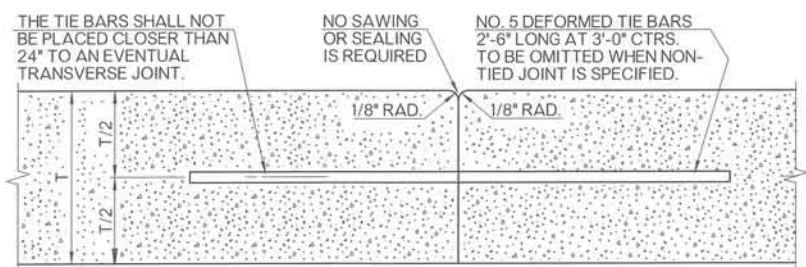
NON-DOWELED CONTRACTION JOINT



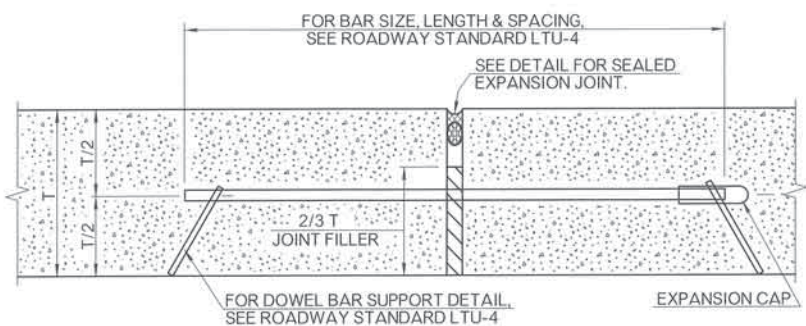
DOWELED CONTRACTION JOINT



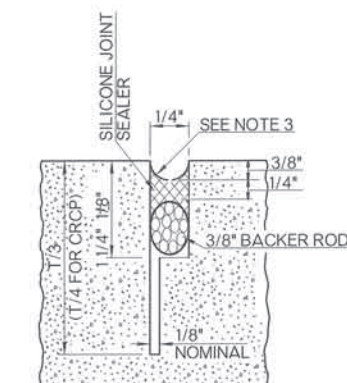
LONGITUDINAL JOINT



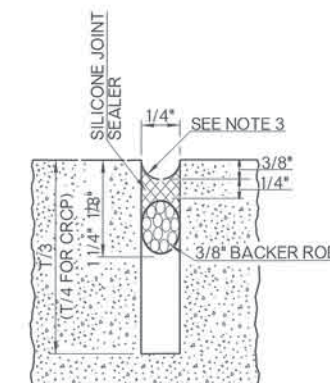
TIED BUTT JOINT AND LONGITUDINAL CONSTRUCTION JOINT



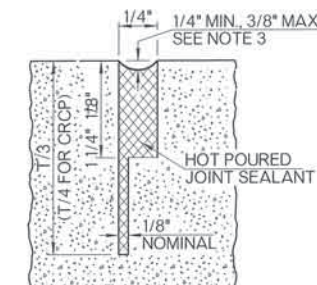
EXPANSION JOINT / ISOLATION JOINT
 OMIT DOWEL BARS, CAPS & SUPPORTS FOR ISOLATION JOINTS



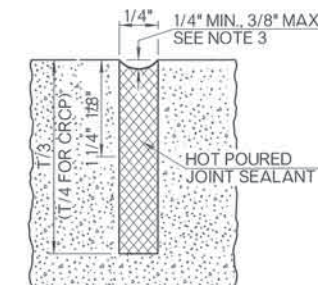
SILICONE SEALANT OPTION



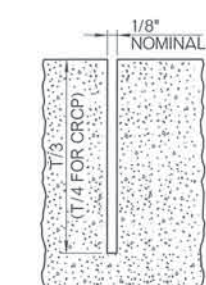
SILICONE SEALANT OPTION



HOT POUR OPTION

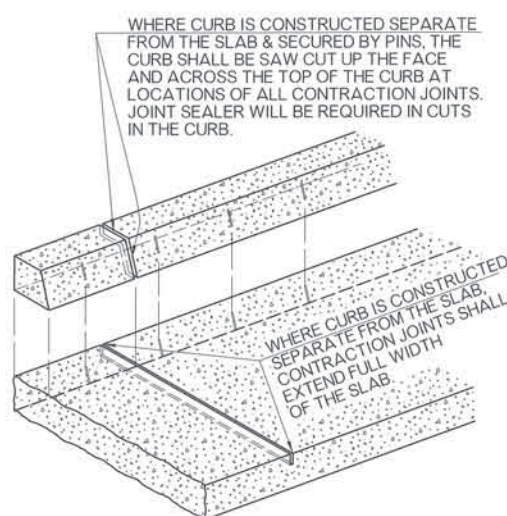


HOT POUR OPTION

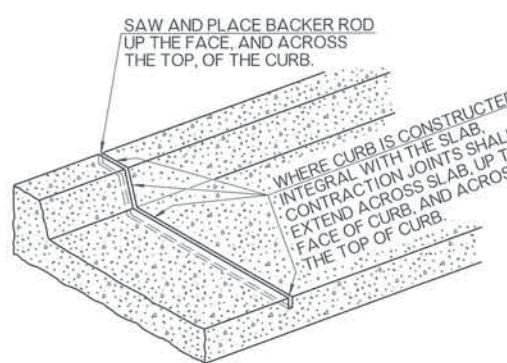


NO SEALANT OPTION

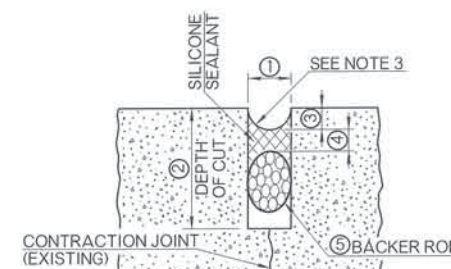
SAWED AND SEALED, CONTRACTION AND LONGITUDINAL JOINTS ALTERNATE DETAILS
 UNLESS OTHERWISE SPECIFIED IN THE PLANS, ONLY THE SILICONE SEALANT OPTIONS WILL BE ALLOWED.



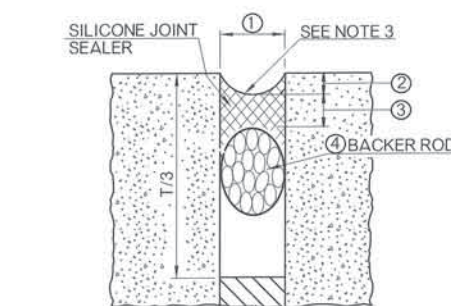
CONTRACTION JOINT WITH SEPARATE CURB



CONTRACTION JOINT WITH INTEGRAL CURB



JOINT REHABILITATION DETAILS



EXPANSION JOINTS / ISOLATION JOINTS
 HOT POURED JOINT SEALANT MAY BE USED IN LIEU OF BACKER ROD AND SILICONE SEALANT, IF APPROVED BY THE ENGINEER

JOINT WIDTH	SEALANT RECESS DEPTH	SILICONE SEALANT THICKNESS	BACKER ROD DIAMETER
①	②	③	④
1/2"	3/8"	1/4"	5/8"
3/4"	3/8"	3/8"	7/8"
1"	3/8"	1/2"	1 1/4"
1 1/2"	1/2"	3/4"	2"
2"	1/2"	3/4"	2 1/2"

EXPANSION OR ISOLATION JOINT WIDTH SHALL BE 1/2", UNLESS OTHERWISE SPECIFIED ON THE PLANS. TABLE VALUES, AS SHOWN THIS TABLE, SHALL BE USED IN THOSE SPECIFIED CASES.

JOINT REHABILITATION TREATMENT TABLE

JOINT WIDTH	DEPTH OF CUT	SEALANT RECESS DEPTH	SEALANT THICKNESS	BACKER ROD DIAMETER
①	②	③	④	⑤
3/8"	1 1/4"	3/8"	3/16"	1/2"
1/2"	1 3/4"	3/8"	1/4"	5/8"
3/4"	1 3/4"	3/8"	3/8"	7/8"
7/8"	1 3/4"	1/2"	7/16"	1"
1"	2"	1/2"	1/2"	1 1/8"
OVER 1"	OVER 2"	1/2"	1/2"	1 1/4"

GENERAL NOTES

- ALL CONSTRUCTION AND MATERIALS REQUIREMENTS SHALL BE IN ACCORDANCE WITH THE 2009 ODOT STANDARD SPECIFICATIONS.
- ALL CONCRETE JOINT SEALING SHALL BE IN ACCORDANCE WITH SECTION 415 OF THE SPECIFICATIONS.
- THE SHAPE FACTOR, COMBINED WITH THE JOINT CLEANLINESS, IS THE CRITICAL COMBINATION NECESSARY TO GUARANTEE DESIRED BONDING AND FUNCTION OF SEALED JOINTS. THE JOINT SHAPE FACTOR IS DEFINED AS THE FINAL PRESSED SHAPE OF THE SILICONE MATERIAL. THE TOOLING OPERATION WILL FIRMLY PRESS THE FRESHLY APPLIED MATERIAL INTIMATELY AGAINST THE CUT SIDES OF THE RECESS AND THE BACKER ROD SURFACES. THE ROUNDED SHAPE ON TOP AND BOTTOM OF THE SILICONE ALLOWS THE SEALANT TO PROPERLY FLEX BUT MAINTAIN ADHERENCE TO THE PAVING. SELF LEVELING SEALANTS WILL BE INSTALLED TO BE FLUSH WITH THE PAVEMENT SURFACE.
- ON JOINTED PORTLAND CEMENT CONCRETE PAVEMENTS, DOWELED CONTRACTION JOINTS SHALL BE USED ON DRIVING LANES ONLY. CONCRETE SHOULDERS SHALL NOT BE DOWELED UNLESS SPECIFIED ON THE PLANS.
- LONGITUDINAL JOINTS BETWEEN PAVEMENT AND TIED CONCRETE SHOULDERS SHALL NOT BE SAWED OR SEALED UNLESS OTHERWISE SHOWN ON THE PLANS.
- ON ALL SAWED JOINTS, THE KERF DEPTH SHALL CLEAR DOWEL BARS, TIE BARS AND/OR REINFORCING STEEL BY A MINIMUM OF 1/2".
- CONTRACTION JOINTS IN JOINTED P. C. PAVEMENT SHALL BE AT APPROXIMATELY 15'-0" CENTERS, UNLESS OTHERWISE SPECIFIED ON THE PLANS.
- TRANSVERSE GROOVING SHALL BE CONSTRUCTED TO THE FOLLOWING DIMENSIONS: 1/8" TO 3/16" WIDE, 1/8" TO 3/16" DEEP, AND EQUALLY SPACED AT 1/2" TO 1" APART. GROOVES SHALL BE NEAT IN APPEARANCE, OF UNIFORM DEPTH, AND LOCATED 1" TO 3" FROM NEAREST CONTRACTION JOINTS.

APPROVED BY ROADWAY ENGINEER: *Calvin F. A.* DATE: 04/14/15
 ROADWAY DESIGN DIVISION STANDARD

DOT JOINTS AND SEALERS - LONGITUDINAL, EXPANSION, & CONTRACTION

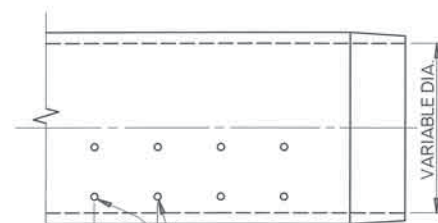
OKLAHOMA DEPARTMENT OF TRANSPORTATION		
STANDARD REVISIONS		
DESCRIPTION	DATE	



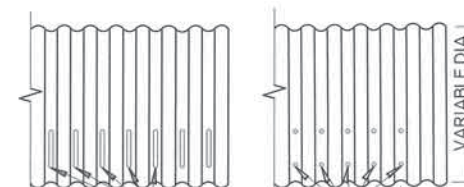
TYPICAL COUPLING FOR PVC PIPE UNDERDRAIN
1/4 SECTION REMOVED



TYPICAL CORRUGATED COUPLING
OR AN APPROVED EQUAL

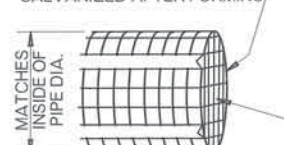


NOTE: PERFORATIONS
 $\frac{3}{16}$ " (MIN.) - $\frac{3}{8}$ " (MAX.)
TO BE PLACED AT 3" C/C



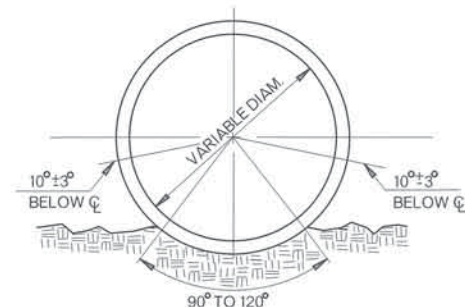
PERFORATIONS SHALL
BE SPACED EVENLY ALONG THE
LENGTH WITH MIN. OPENING AREA
OF 1.0 SQ. INCHES PER LINEAR FOOT

RODENT SCREEN TO BE GALVANIZED AFTER FORMING

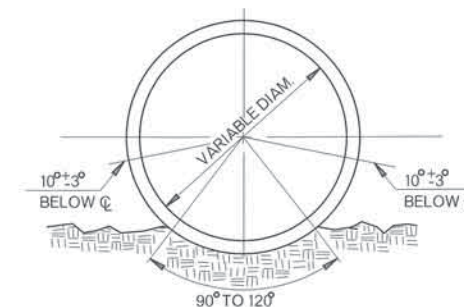


PRESS FIT INTO OUTLET END
OF LATERAL WITH OPEN END
TOWARDS DITCH/SLOPE

TYPICAL RODENT SCREEN



POLYVINYL (PVC) PIPE UNDERDRAIN



CORRUGATED POLYETHYLENE PIPE UNDERDRAIN

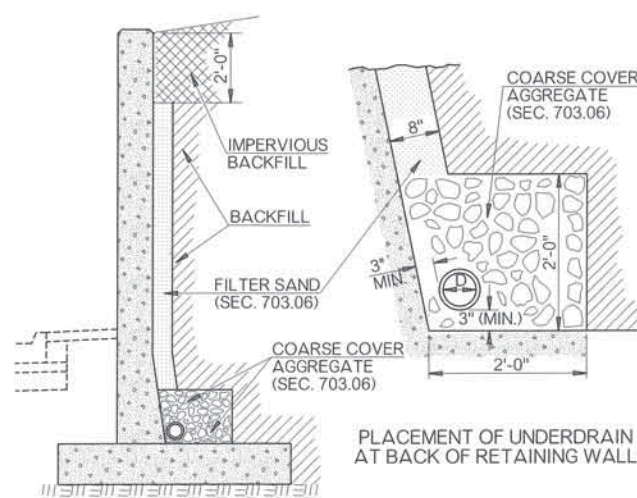
INSTALLATION TECHNIQUE: (12" DIAMETER OR SMALLER)

PERFORATED PIPE UNDERDRAIN, WHEN INSTALLED IN A TRENCH, SHALL BE BEDDED ON 4" OF COARSE COVER AGGREGATE. THE INSTALLED PIPE SHALL THEN BE CAREFULLY BACKFILLED WITH THE REMAINING COARSE COVER AGGREGATE TO 6" ABOVE THE TOP OF THE PIPE. FILTER SAND SHALL BE INSTALLED TO APPROXIMATELY 6" BELOW THE ORIGINAL NATURAL GROUND AS APPROVED BY THE ENGINEER. THE LAYER OF COARSE COVER AGGREGATE SHALL BE PAID FOR AS PIPE UNDERDRAIN COVER MATERIAL AND SHALL CONFORM TO SEC. 703.06. FILTER SAND SHALL BE PAID FOR AS CLASS C STANDARD BEDDING MATERIAL AND SHALL CONFORM TO SEC. 703.06.

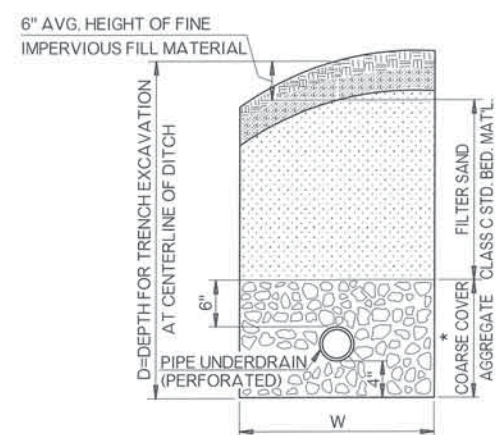
NON-PERFORATED PIPE UNDERDRAIN, WHEN INSTALLED IN A TRENCH, SHALL BE BEDDED IN A 4" LAYER CONSISTING OF COARSE AGGREGATE COVER MATERIAL OR A 50-50 MIX OF COARSE AGGREGATE COVER MATERIAL AND FILTER SAND. THIS LAYER OF COVER MATERIAL SHALL CONFORM TO SEC. 703.06, AND SHALL BE PAID FOR AS PIPE UNDERDRAIN COVER MATERIAL. THE REMAINING BACKFILL MAY BE NATIVE SOIL REMOVED IN THE TRENCHING OPERATION. FILTER SAND OR BACKFILLED ACCORDING TO THE ENGINEER. COST TO BE INCLUDED IN OTHER ITEMS OF WORK. SEE GENERAL NOTE NUMBERS 5 & 6.

GENERAL NOTES

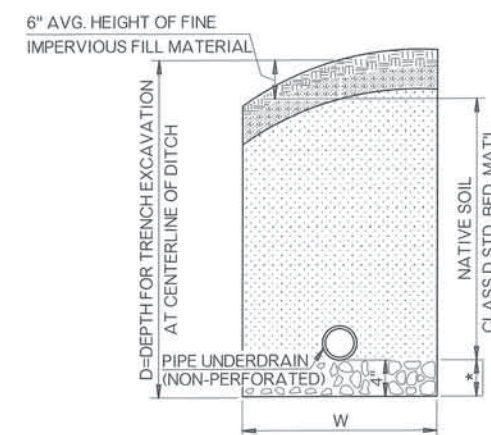
- ALL CONSTRUCTION AND MATERIAL REQUIREMENTS SHALL BE IN ACCORDANCE WITH THE 2009 ODOT STANDARD SPECIFICATIONS.
- THE EXTENT, LOCATION AND DEPTH OF DRAINS MAY BE ADJUSTED BY THE ENGINEER TO SUIT CONDITIONS FOUND DURING CONSTRUCTION.
- COST OF ALL FITTINGS TO BE INCLUDED IN THE PRICE BID PER LINEAR FOOT OF PIPE UNDERDRAIN.
- FOR PIPE UNDERDRAIN OF UP TO 12" IN DIAMETER, W = 24" WITHOUT SHEETING AND SHORING. W = 36" WHEN SHEETING AND SHORING IS USED. SEE ROADWAY STANDARD SPI-4 FOR SHEETING & SHORING NOTES.
- FOR PIPE UNDERDRAIN LARGER THAN 12" IN DIAMETER, SEE ROADWAY STANDARD SPI-4 FOR ADDITIONAL TRENCH EXCAVATION DETAILS.
- NON-PERFORATED UNDERDRAIN PIPES, LARGER THAN 12", SHALL BE TREATED AS PIPE CONDUITS. I.E., PAY ITEMS SHALL CONSIST OF TRENCH EXCAVATION AND BEDDING MATERIAL. SEE STANDARD SPB-1.
- MATERIALS SHOWN HERE ARE TYPICAL ONLY AND ARE NOT THE ONLY CHOICE FOR SUBSURFACE DRAINAGE PURPOSES.
- OUTLET OPENING SHALL HAVE INSTALLED A REMOVABLE RODENT SCREEN HAVING A WIRE MESH DESIGN & 0.23" TO 0.50" (NOM.) SQUARE OPENINGS. SCREEN MATERIAL MAY BE STAINLESS STEEL OR GALVANIZED WITH WIRE THICKNESS OF BETWEEN 0.023" & 0.038", AFTER SHAPING AND FABRICATION. RODENT SCREEN DESIGN SHALL BE APPROVED BY THE ENGINEER.
- THE FINAL SECTION OF THE OUTLET LATERAL CONDUIT SHALL BE NON-PERFORATED, SCHEDULE 40 OR TYPE S HIGH DENSITY POLYETHYLENE AND A MINIMUM 20'-0" IN LENGTH, INCLUDING COUPLINGS.
- FOR DETAILS OF OUTLET LATERAL HEADWALL, SEE ROADWAY STANDARD PED-3.



PLACEMENT OF UNDERDRAIN
AT BACK OF RETAINING WALL



DETAIL
TRENCH EXCAVATION
PERFORATED PIPE
UNDERDRAIN INSTALLATIONS
* PIPE UNDERDRAIN COVER MATERIAL



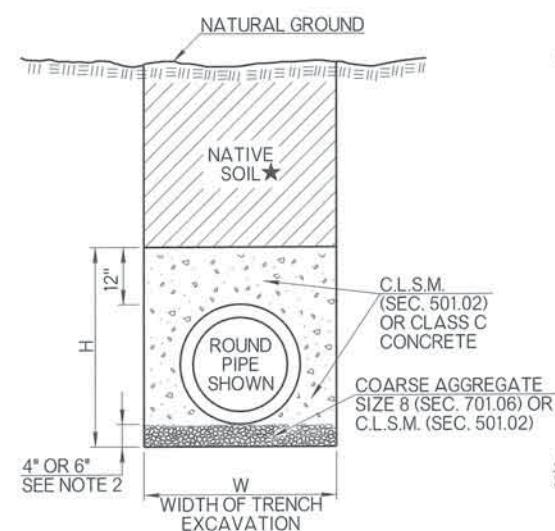
DETAIL
TRENCH EXCAVATION
NON-PERFORATED PIPE
UNDERDRAIN INSTALLATIONS
* PIPE UNDERDRAIN COVER MATERIAL

BASIS OF PAYMENT		
ITEM NO.	ITEM	UNIT
613 (H)	■ PERFORATED PIPE UNDERDRAIN ROUND	LF
613 (I)	■ NON-PERFORATED PIPE UNDERDRAIN RND.	LF
613 (Q)	OUTLET LATERAL HEADWALL	EA
613 (T)	STANDARD BEDDING MATERIAL, CLASS C	CY
613 (U)	PIPE UNDERDRAIN COVER MATERIAL	CY
613 (V)	TRENCH EXCAVATION	CY

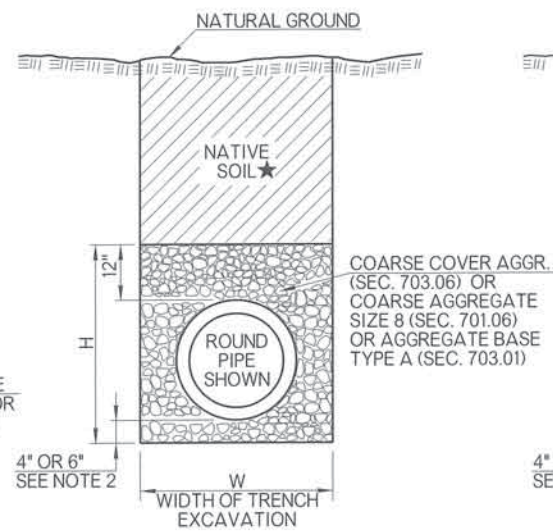
■ DIMENSION TO BE SPECIFIED IN INCHES

APPROVED BY ROADWAY ENGINEER: *Calvin A.* DATE: 02/16/15
ROADWAY DESIGN DIVISION STANDARD
DOT PIPE UNDERDRAIN INSTALLATION

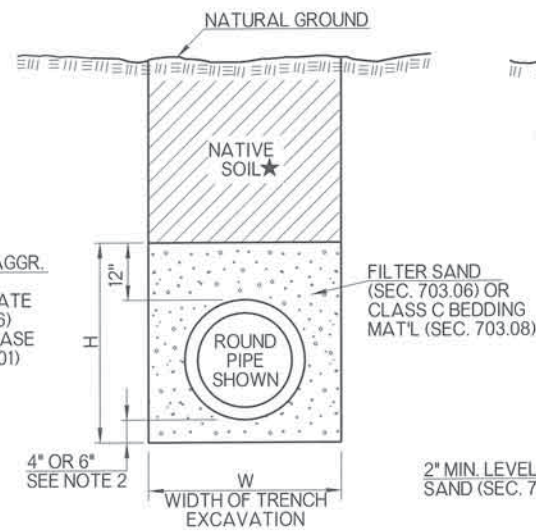
OKLAHOMA DEPARTMENT OF TRANSPORTATION	
STANDARD REVISIONS	
DESCRIPTION	DATE



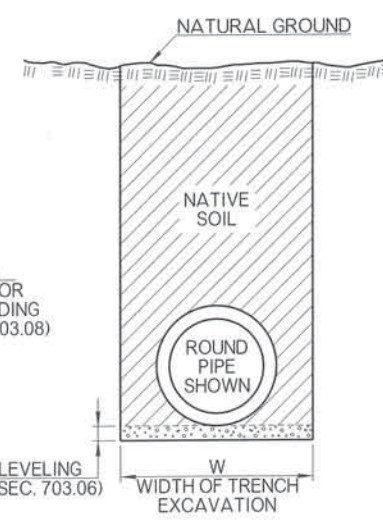
CLASS A BEDDING



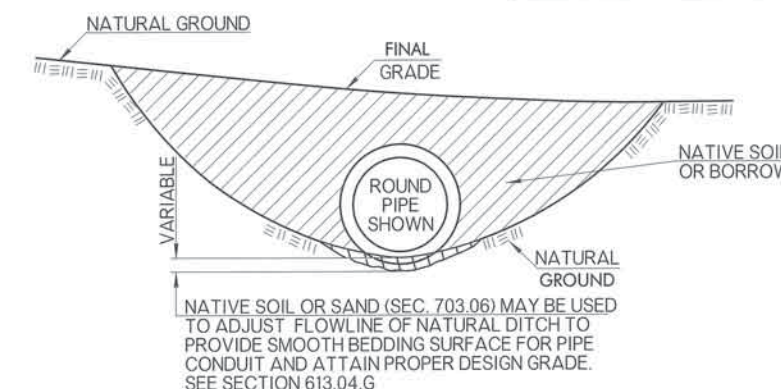
CLASS B BEDDING



CLASS C BEDDING



CLASS D BEDDING ALTERNATE 1



CLASS D BEDDING ALTERNATE 2

GENERAL NOTES

- ALL CONSTRUCTION AND MATERIAL REQUIREMENTS SHALL BE IN ACCORDANCE WITH THE 2009 ODOT STANDARD SPECIFICATIONS.
- EQUIVALENT PIPE SIZES 66 INCHES AND LARGER REQUIRE 6 INCHES OF BEDDING MATERIAL BELOW PIPE CONDUIT.
- NATIVE SOIL FOR BACKFILL, TO BE COMPACTED IN ACCORDANCE WITH SECTION 202.04 OF THE STANDARD SPECIFICATIONS.
- A BETTER CLASS OF BEDDING MAY BE SUBSTITUTED FOR THE NEXT LOWER CLASS. EXAMPLE: CLASS A STANDARD BEDDING CAN BE USED IN LIEU OF CLASS B STANDARD BEDDING.
- FOR TRENCH WIDTH (W), BEDDING HEIGHT (H), PIPE DATA, MULTIPLE PIPE SPACING & BEDDINGS DATA, SEE ROADWAY STANDARDS SPI-4 & FPI-3.
- DATA TABLE WILL DISPLAY 'NA' WHEN PIPE MATERIALS ARE NOT ALLOWED.
- STANDARD BEDDING CLASS D MATERIAL (S) (ALTERNATE 1) WILL BE CONSIDERED AS INCIDENTAL AND NOT BE PAID FOR SEPARATELY. COST FOR BORROW OR FILL MATERIAL, NEEDED FOR ALTERNATE 2, WILL BE INCLUDED IN THE PRICE OF THE PIPE.
- PIPE MATERIAL (S) / PRODUCT (S) NOT SHOWN IN THE PIPE BEDDING TABLE WILL BE EVALUATED AND APPROVED ON A CASE BY CASE BASIS.
- ALL TEMPORARY PIPES SHALL HAVE CLASS D BEDDING UNLESS OTHERWISE SHOWN IN THE PLANS.
- BEDDING MATERIAL TYPE B, C, AND D, SHALL BE PLACED IN 6" LAYERS AND COMPACTED TO THE SPECIFIED DENSITY USING HAND OPERATED EQUIPMENT ONLY.
- ★ WHEN PIPE INSTALLATION IS UNDER PAVING, IN LIEU OF BACKFILLING WITH NATIVE SOIL, PLACE BEDDING MATERIAL ALL THE WAY TO TOP OF TRENCH.
- THE USE OF AN ALTERNATE PIPE AND ITS CORRESPONDING BEDDING MATERIAL WILL BE ACCEPTABLE PROVIDED THE CRITERIA IN THE DESIGN TABLE IS MET
- POLYPROPYLENE PIPE SHALL BE INSTALLED IN ACCORDANCE WITH ASTM D2321.

PIPE BEDDING CLASS/DESIGN TABLE							
TYPE OF PIPE	■ UNDER PAVING				OUTSIDE PAVING		
	CROSS DRAIN (NHS OR ADT > 6000 VPD)	CROSS DRAIN (OTHER)	STORM SEWER (NHS OR ADT > 6000 VPD)	STORM SEWER (OTHER)	CROSS DRAIN	SIDE DRAIN	STORM SEWER
REINFORCED CONCRETE PIPE	B	C	B	C	C	D	C
CORRUGATED GALV. STEEL PIPE (CGSP)	NA	B	NA	B	C	D	C
MILL PRECOATED CGSP	NA	B	NA	B	C	D	C
CORRUGATED GALV. STRUCT. PLATE	NA	B	NA	B	C	D	C
ALUMINIZED TYPE II CSP	NA	B	NA	B	C	D	C
CORRUGATED POLYETHYLENE / PVC	NA	A	NA	A	B	B	B
POLYVINYL CHLORIDE (SC 40/80 PVC)	NA	NA	NA	NA	NA	NA	NA
POLYPROPYLENE PIPE (PP) ▲	NA	B	NA	B	C	D	C

- WHEN THERE IS ANY POSSIBILITY OF THE PAVEMENT BEING WIDENED DURING THE LIFE OF THE DRAINAGE STRUCTURE, THE BEDDING SHALL MEET THE 'UNDER PAVING SECTION' CRITERIA FOR THE FULL EXTENT OF ANY ANTICIPATED EXPANSION TO THE FACILITY.
- ▲ BACKFILL WITH A MINIMUM OF TWO (2) FEET OF APPROVED BACKFILL MATERIAL.

BASIS OF PAYMENT		
ITEM NO.	ITEM	UNIT
613 (R)	STANDARD BEDDING MATERIAL, CLASS A	CY
613 (S)	STANDARD BEDDING MATERIAL, CLASS B	CY
613 (T)	STANDARD BEDDING MATERIAL, CLASS C	CY

APPROVED BY ROADWAY ENGINEER: *Caleb A.* DATE: 04/16/15

ROADWAY DESIGN DIVISION STANDARD

DOT STANDARD PIPE BEDDING

OKLAHOMA DEPARTMENT OF TRANSPORTATION
2009 SPECIFICATIONS

SPB-1	4
R-49	

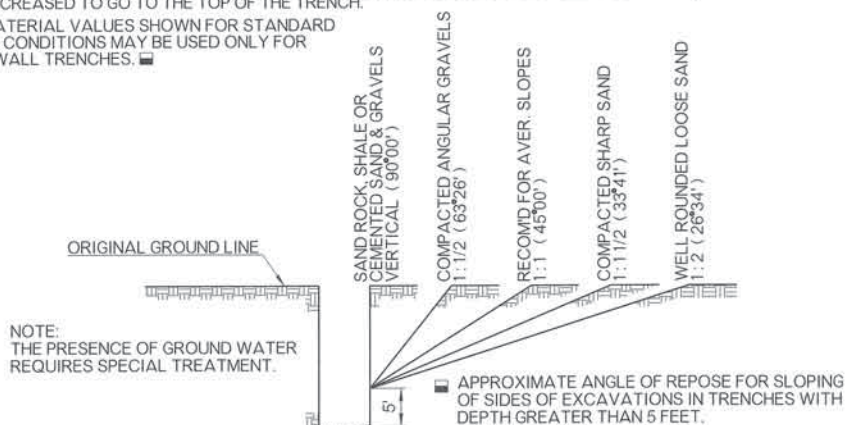
TRENCHING DIMENSIONS AND STANDARD BEDDING MATERIAL QUANTITIES

PIPE DIA. OR DESIGN EQUIV.	H	T	SINGLE PIPE STANDARD TRENCHING		DOUBLE PIPE STANDARD TRENCHING		TRIPLE PIPE STANDARD TRENCHING		SPECIAL TRENCHING SINGLE, DOUBLE & TRIPLE PIPE OPTIONS W+12"	
			W	CY/LF	W	CY/LF	W	CY/LF	ADD'L STANDARD BEDDING MATERIAL	CY/LF
18	3.25	0.208	3.17	0.274	5.67	0.468	8.17	0.663		0.120
24	3.83	0.25	4.00	0.386	7.00	0.629	10.00	0.873		0.142
30	4.42	0.292	4.58	0.474	8.33	0.811	12.08	1.146		0.163
36	5	0.333	6.17	0.751	10.67	1.193	15.17	1.636		0.185
42	5.58	0.375	6.75	0.870	12.00	1.429	17.25	1.989		0.207
48	6.17	0.417	7.33	0.996	13.33	1.688	19.33	2.379		0.228
54	6.75	0.458	7.92	1.126	14.67	1.960	21.42	2.794		0.250
60	7.33	0.5	8.50	1.262	16.00	2.251	23.50	3.238		0.271
66	8.08	0.542	9.08	1.408	17.33	2.565	25.58	3.713		0.299
72	8.67	0.583	9.67	1.564	18.67	2.904	27.67	4.224		0.321
78	9.25	0.625	10.25	1.731	20.00	3.268	29.75	4.771		0.343
84	9.83	0.667	10.83	1.908	21.33	3.657	31.83	5.354		0.364
90	10.42	0.708	11.42	2.096	22.67	4.071	33.92	5.974		0.386
96	11	0.75	12.00	2.296	24.00	4.520	36.00	6.630		0.407

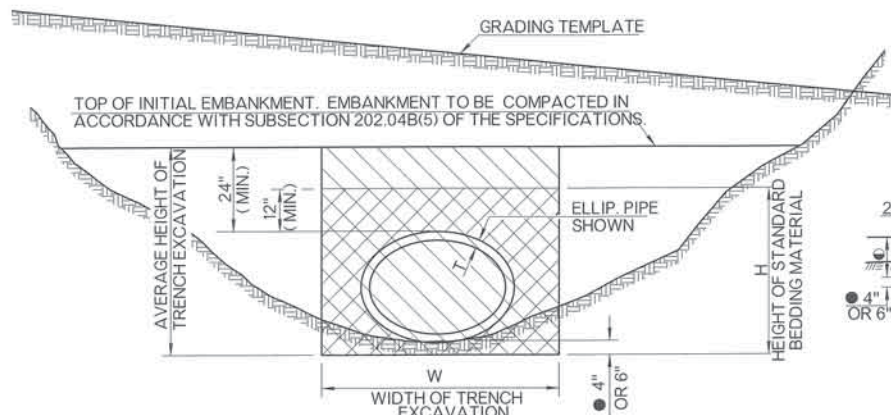
NOTE: QUANTITIES FOR 66" & 78" EQUIV. DIA. ARCH PIPE BASED ON METAL PIPE & ESTIMATED WALL THICKNESS.

FOR PIPES UNDER PAVEMENT, THE H DIMENSION AND THE STANDARD BEDDING MATERIAL QUANTITY, SHALL BE INCREASED TO GO TO THE TOP OF THE TRENCH.

BEDDING MATERIAL VALUES SHOWN FOR STANDARD TRENCHING CONDITIONS MAY BE USED ONLY FOR VERTICAL WALL TRENCHES.

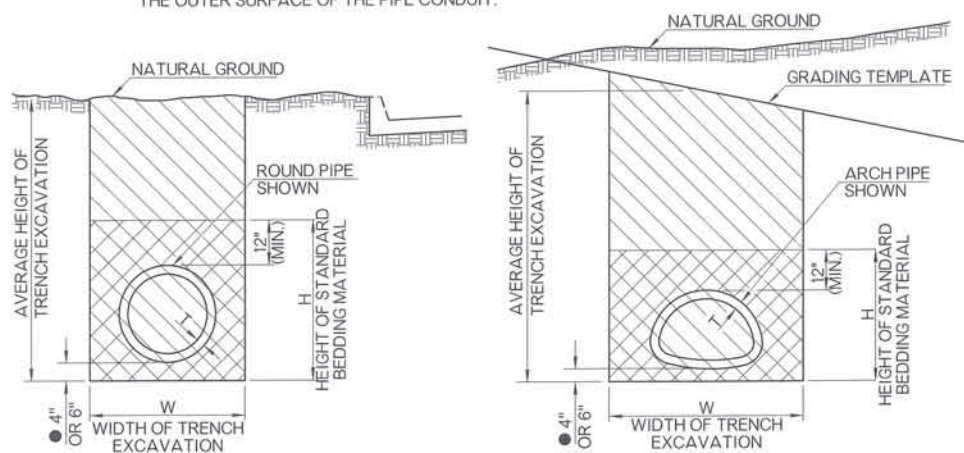


OPTIONAL TRENCHES WITH DEPTH GREATER THAN 5.0 FEET EXCAVATION AND BEDDING MATERIAL WILL BE MEASURED AND PAID FOR AS IF SHEETING & SHORING WAS USED. (SPECIAL TRENCHING=STD. WIDTH TRENCH+12")



METHOD NO. 1
TRENCH EXCAVATION IN EMBANKMENT SECTIONS

LIMITS OF STANDARD BEDDING MATERIAL
LIMITS OF TRENCH EXCAVATION
QUANTITIES FOR BEDDING MATERIAL DO NOT INCLUDE THE SPACE WITHIN AND BOUNDED BY THE OUTER SURFACE OF THE PIPE CONDUIT.

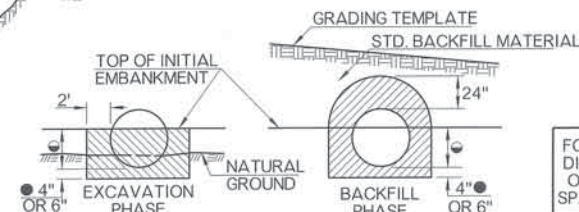


TRENCH EXCAVATION IN CUT SECTIONS

EQUIV. DIA.	REINF. CONC. ARCH PIPE	STEEL ARCH PIPE	ALUMINUM ARCH PIPE	REINF. CONC. ELLIPTICAL PIPE
18"	22" x 13"	21" x 15"	21" x 15"	14" x 23"
21"		24" x 18"	24" x 18"	
24"	28" x 18"	28" x 20"	28" x 20"	19" x 30"
27"				22" x 34"
30"	36" x 22"	35" x 24"	35" x 24"	24" x 38"
36"	43" x 26"	42" x 29"	42" x 29"	29" x 45"
42"	51" x 31"	49" x 33"	49" x 33"	34" x 53"
48"	58" x 36"	57" x 38"	57" x 38"	38" x 60"
54"	65" x 40"	64" x 43"	64" x 43"	43" x 68"
60"	73" x 45"	71" x 47"	71" x 47"	48" x 76"
66"		77" x 52"	77" x 52"	53" x 83"
72"	88" x 54"	83" x 57"	83" x 57"	58" x 91"
78"		87" x 63"	92" x 65"	63" x 98"
84"	102" x 62"	95" x 67"	95" x 67"	68" x 106"
90"	115" x 72"	103" x 71"	103" x 71"	72" x 113"
96"	122" x 77"	112" x 75"	112" x 75"	77" x 121"

▲ STRUCTURAL PLATE ARCH.

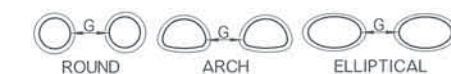
EMBANKMENT HEIGHT PRIOR TO EXCAVATION
PIPE SIZES FROM 18" TO 42" = 30"
PIPE SIZES FROM 48" TO 84" = 2/3 DIAM.
PIPE SIZES LARGER THAN 84" = 60"



METHOD NO. 2
(OPTIONAL INSTALLATION FOR R. C. PIPE)

METHOD NO. 2
(OPTIONAL INSTALLATION FOR R. C. PIPE)

FOR DIA. OR SPAN	CONDUIT SHAPE			DIST.
	ROUND	ARCH	ELLIPTICAL	
UP TO 24"	UP TO 24"	UP TO 36"	UP TO 36"	G
25" TO 72"				D/2"
37" TO 108"	37" TO 108"	37" TO 108"	37" TO 108"	D/3"
OVER 73"	OVER 108"	OVER 108"	OVER 108"	36"

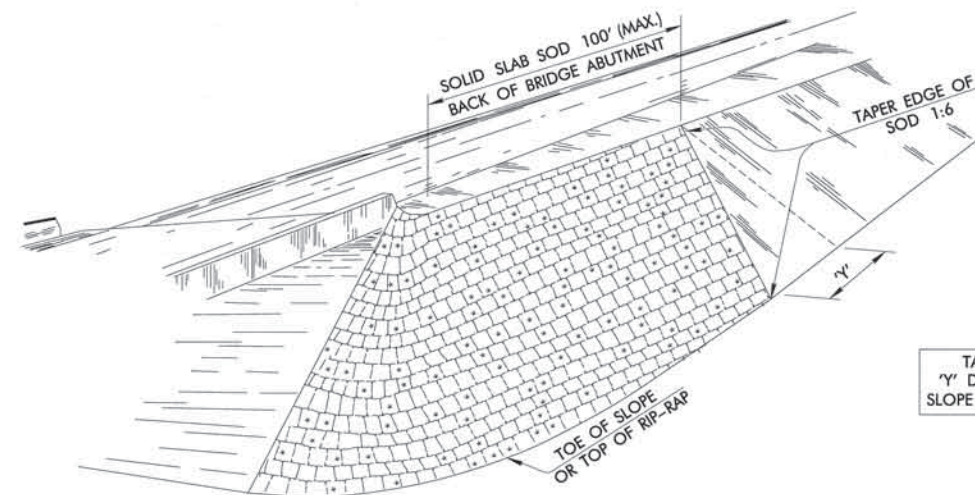


GENERAL NOTES

- ALL CONSTRUCTION AND MATERIAL REQUIREMENTS SHALL BE IN ACCORDANCE WITH THE 2009 ODOT STANDARD SPECIFICATIONS.
- TRENCH EXCAVATION AND BEDDING MATERIAL WILL NOT BE REQUIRED FOR PIPE INSTALLATIONS OF SIDE DRAINS UNLESS OTHERWISE NOTED ON THE PLANS.
- FOR PIPE UNDERDRAIN INSTALLATIONS, SEE ROADWAY STANDARD PUD-3.
- SPECIAL TRENCHING CONDITIONS ARE THOSE AS DEFINED BY O.S.H.A. REGULATIONS, TITLE 29 CFR CHAPTER XVII, PART 1926.650, 1926.651 & 1926.652, SO DEFINED WILL APPLY UNTIL THEY ARE IN CONFLICT WITH CURRENT SPECIFICATIONS. FOR TRENCH DEPTHS OVER FIVE FEET, WHERE O.S.H.A. REGULATIONS FOR SPECIAL TRENCHING ARE APPLIED, QUANTITIES AND DIMENSIONS FOR SPECIAL TRENCHING WILL BE USED FOR COMPUTING QUANTITIES. SEE TABLE OF TRENCHING DIMENSIONS AND STANDARD BEDDING MATERIAL QUANTITIES.
- NORMAL BACKFILLING OPERATIONS SHALL FOLLOW BEDDING AND PIPE INSTALLATION AS CLOSELY AS PRACTICAL. IN NO CASE SHALL A PIPE INSTALLATION SUBJECT TO SUDDEN FLOW DEVELOPMENT BE LEFT WITHOUT SUFFICIENT BACKFILL TO RESTRAIN THE CONDUIT AND PREVENT JOINT SEPARATION AND/OR PIPING SCOUR. PHYSICALLY RESTRAINING THE CONDUIT MAY BE USED TO AUGMENT OR REPLACE THIS IMMEDIATE BACKFILL REQUIREMENT.
- ANY EXCESS EXCAVATION NOT USED FOR BACKFILL WILL BECOME THE PROPERTY OF THE CONTRACTOR AND DISPOSED OF, BY HIM, IN A MANNER APPROVED BY THE ENGINEER.
- STANDARD BEDDING QUANTITIES FOR ROUND PIPE ARE BASED ON AASHTO DESIGNATED CLASS III (WALL B) REINFORCED CONCRETE PIPE.
- WHEN REQUIRED, THE SIDES OF THE TRENCHES SHALL BE SHEETED AND SHORED OR OTHERWISE SUPPORTED WHEN THE TRENCH IS MORE THAN 5.0 FEET IN DEPTH. IN LIEU OF SHEETING, THE SIDES OF THE TRENCH ABOVE THE 5.0 FOOT LEVEL MAY BE SLOPED TO PRECLUDE COLLAPSE, SEE OPTIONAL TRENCHES DETAIL THIS SHEET.
- PROPER COMPACTION OF BACKFILL REQUIRES A VERTICAL WALLED TRENCH TO 24 INCHES ABOVE TOP OF PIPE, REGARDLESS OF EXCAVATION ABOVE THAT ELEVATION.
- EQUIVALENT PIPE SIZES 66 INCHES AND LARGER REQUIRE 6 INCHES OF BEDDING MATERIAL BELOW PIPE CONDUIT.
- ELLIPTICAL PIPE DIMENSIONS CONFORM TO AASHTO M 207, AS DESIGNATED RISE BY SPAN.
- FOR COMPUTING TRENCH EXCAVATION & STANDARD BEDDING QUANTITIES, THE LENGTH OF THE CULVERT SHALL INCLUDE END SECTION AND END TREATMENT LENGTHS.
- MULTIPLE PIPE INSTALLATIONS WILL REQUIRE A MINIMUM OF 12" BETWEEN PIPES FOR PROPER COMPACTION.

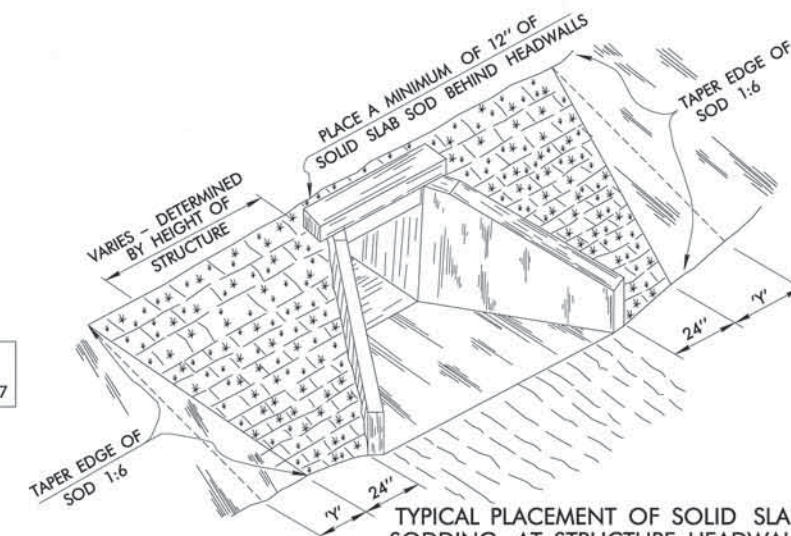
BASIS OF PAYMENT		
ITEM NO.	ITEM	UNIT
613 (R)	STANDARD BEDDING MATERIAL, CLASS A	CY
613 (S)	STANDARD BEDDING MATERIAL, CLASS B	CY
613 (T)	STANDARD BEDDING MATERIAL, CLASS C	CY
613 (V)	TRENCH EXCAVATION	CY

APPROVED BY ROADWAY ENGINEER: *Calvin A.* DATE: 02/10/15
ROADWAY DESIGN DIVISION STANDARD
STANDARD PIPE INSTALLATION



TYPICAL PLACEMENT OF SOLID SLAB SODDING ON FILL SLOPES, APPROACHES TO OVERPASSES AND BRIDGES.

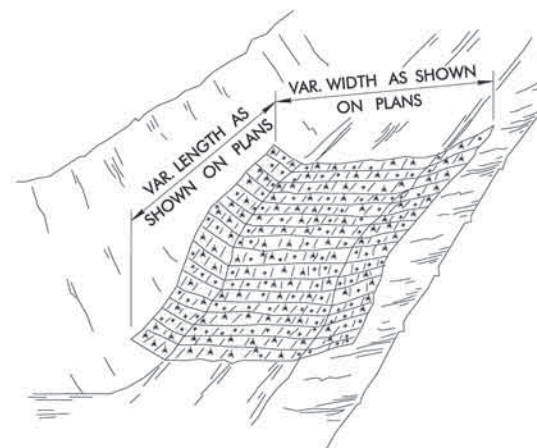
TAPER NOTE
 'Y' DIMENSION =
 SLOPE LENGTH x 0.17



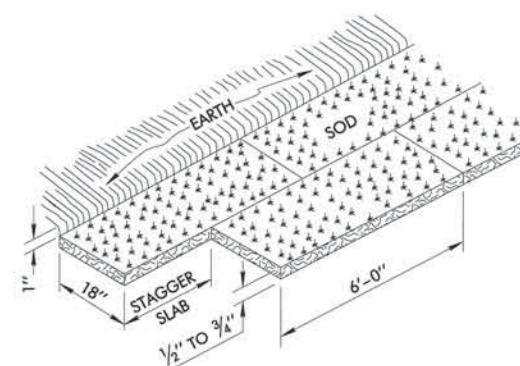
TYPICAL PLACEMENT OF SOLID SLAB SODDING AT STRUCTURE HEADWALLS

GENERAL NOTES

1. ALL CONSTRUCTION AND MATERIAL REQUIREMENTS SHALL BE IN ACCORDANCE WITH THE 2009 ODOT STANDARD SPECIFICATIONS.
2. SOLID SLAB SOD SHALL BE PLACED IN HORIZONTAL ROWS WITH THE LONGEST SIDE OF EACH SLAB RUNNING PARALLEL TO THE ROADWAY, AND THE SLABS IN ALTERNATE ROWS STAGGERED HALF THE LENGTH OF EACH INDIVIDUAL SLAB. ENSURE THE ROWS RUN PARALLEL TO THE ROADWAY.
3. SLABS SHALL BE CUT AND HARVESTED WITH A COMMERCIAL SOD CUTTER TO THE DIMENSIONS SHOWN, THEN LOADED, TRANSPORTED AND HANDLED ON PALLETS.
4. AFTER PLACEMENT OF SOLID SLAB SOD, EARTH AT THE OUTER EDGES OF THE PLACEMENT SHALL BE BACKFILLED AND LOOSELY COMPACTED TO AT LEAST 1" ABOVE THE TOP OF THE SOLID SLAB SODDING.
5. STAKE SOD ON ALL SLOPES 1:2 OR STEEPER, AND ON ANY AREAS THAT ARE IN SUCH CONDITION THAT THERE IS DANGER OF SOD SLIPPING. PERFORM STAKING CONCURRENTLY WITH SOD PLACEMENT AND PRIOR TO TAMPING WITH SOUND WOODEN STAKES APPROXIMATELY 1 INCH SQUARE OR 1 INCH IN DIAMETER AND NOT LESS THAN 12 INCHES IN LENGTH, OR USE METAL STAPLES IN PLACE OF WOODEN STAKES. PLACE, STAKE AND STAPLE THE SOD WHERE NECESSARY, AND AS DETERMINED BY THE ENGINEER.



TYPICAL PLACEMENT OF SOLID SLAB SODDING IN DITCHES



SOLID SLAB SODDING
 (MARCH 1 THRU AUGUST 31)

THE PLACEMENT OF SOLID SLAB SOD SHALL BE RESTRICTED TO THE PERIOD FROM MARCH 1 THRU AUGUST 31, UNLESS OTHERWISE APPROVED BY THE ENGINEER.

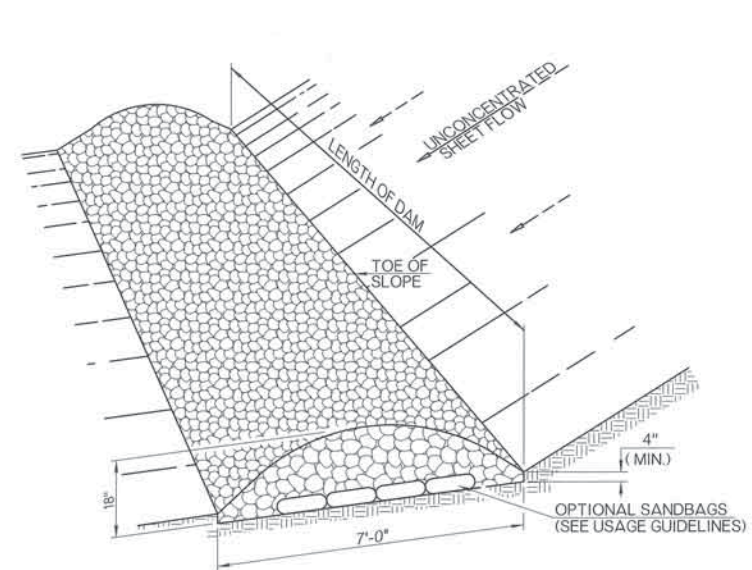
BASIS OF PAYMENT		
ITEM NO.	ITEM	UNIT
230(A)	SOLID SLAB SODDING	S.Y.



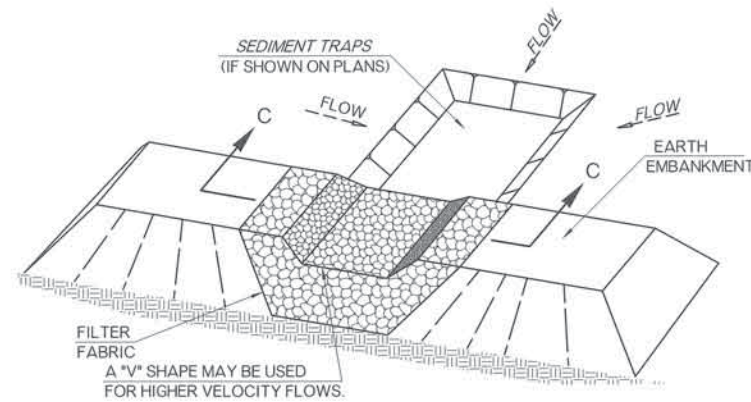
APPROVED BY ROADWAY ENGINEER: *Andy A. Regala* DATE: 6/24/11
 ROADWAY STANDARD

SOLID SLAB SODDING

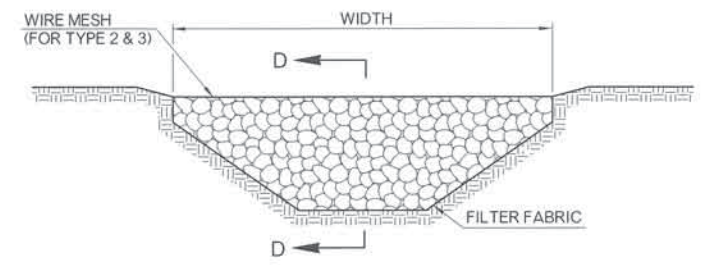
OKLAHOMA DEPARTMENT OF TRANSPORTATION		
STANDARD REVISIONS		
DESCRIPTION	DATE	



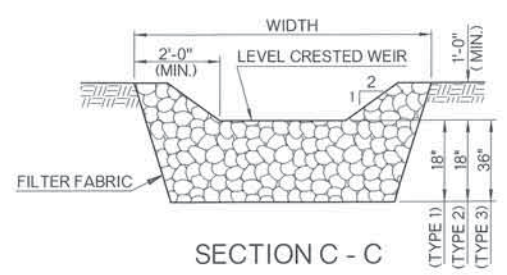
FILTER DAM AT TOE OF SLOPE
 CAN BE USED WHEN TEMPORARY SILT FENCE IS NOT ADEQUATE FOR CONDITIONS. USED WITH ROCK FILTER DAM (TYPE 1) ONLY. ESTIMATED QUANTITY = 0.28 C.Y. PER FOOT OF LENGTH.



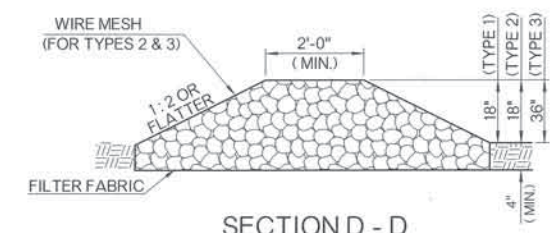
FILTER DAM AT SEDIMENT TRAP
 ROCK FILTER DAM (TYPE 1, 2, OR 3)



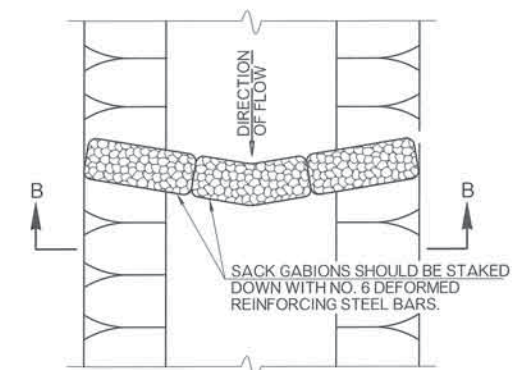
FILTER DAM AT CHANNEL SECTION
 ROCK FILTER DAM (TYPE 1, 2, OR 3)



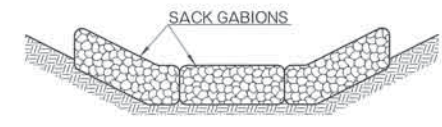
SECTION C - C



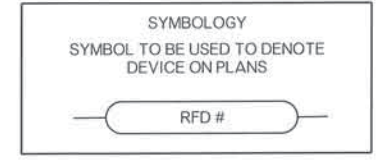
SECTION D - D



PLAN VIEW



SECTION B - B



ROCK FILTER DAM USAGE GUIDELINES

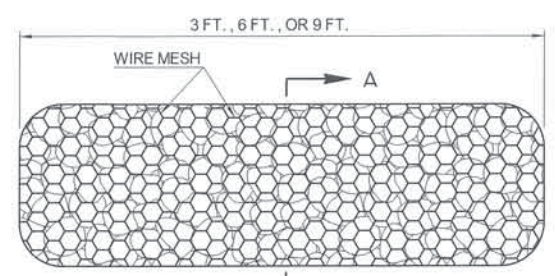
ROCK FILTER DAMS SHOULD BE USED WHEN SIGNIFICANT AMOUNTS OF SEDIMENT ARE ANTICIPATED, TO DISSIPATE THE ENERGY OF FLOWING WATER AND COLLECT SEDIMENT NEAR THE TOE OF SLOPES, AT UPSTREAM AND DOWNSTREAM DRAINAGE STRUCTURES, IN ROADWAY DITCHES AND IN SMALL CHANNELS, AS SHOWN IN PLANS OR AS DIRECTED BY THE ENGINEER.

TYPE 1 (18 IN. HIGH WITH NO WIRE MESH): TYPE 1 SHOULD BE USED AT THE TOE OF SLOPES, AROUND INLETS, IN SMALL DITCHES AND AT DIKE OR SWALE OUTLETS. THIS TYPE OF DAM IS RECOMMENDED TO CONTROL EROSION FROM A DRAINAGE AREA OF 5 ACRES OR LESS. TYPE 1 SHOULD NOT BE USED IN CONCENTRATED HIGH VELOCITY FLOWS (APPROX. 7.9 FT./SEC. OR MORE) IN WHICH ROCK WASH OUT MAY OCCUR. SANDBAGS MAY BE USED AT THE EMBEDDED FOUNDATION (4 IN. DEEP (MIN.)) FOR BETTER FILTERING EFFICIENCY OF LOW FLOWS.

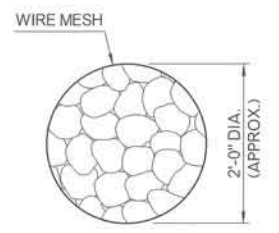
TYPE 2 (18 IN. HIGH WITH WIRE MESH): TYPE 2 SHOULD BE USED IN DITCHES AND AT DIKES OR SWALE OUTLETS.

TYPE 3 (3 FT. HIGH WITH WIRE MESH): TYPE 3 SHOULD BE USED IN STREAM FLOW AND SHOULD BE SECURED TO THE STREAM BED.

TYPE 4 (SACK GABIONS): TYPE 4 SHOULD BE USED IN DITCHES AND SMALLER CHANNELS TO FORM AN EROSION CONTROL DAM.



SACK GABIONS
 ROCK FILTER DAM (TYPE 4)



SECTION A - A

GENERAL NOTES

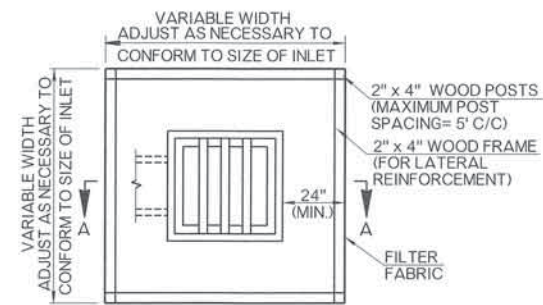
- ALL CONSTRUCTION AND MATERIAL REQUIREMENTS SHALL BE IN ACCORDANCE WITH THE 2009 ODOT STANDARD SPECIFICATIONS.
- MATERIALS SPECIFICATIONS FOR FILTER FABRIC, STONE FILL FOR GABIONS (ROCK) AND WIRE MESH, SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATION SECTIONS 712.02, 713.03 AND 732.09, RESPECTIVELY.
- SPECIFIC DIMENSIONS OF ROCK FILTER DAMS OR SEDIMENT TRAPS SHALL BE SHOWN ON THE PLANS.
- ROCK FILTER DAM TYPES 2 & 3 SHALL BE SECURED WITH WIRE MESH. THE ROCK SHALL BE PLACED ON THE MESH TO THE HEIGHT & SLOPES SPECIFIED. THE MESH SHALL BE FOLDED AT THE UPSTREAM SIDE OVER THE ROCK AND TIGHTLY SECURED TO ITSELF ON THE DOWNSTREAM SIDE USING WIRE TIES OR HOG RINGS. IN STREAM USE, THE MESH SHALL BE SECURED OR STAKED TO THE STREAM BED PRIOR TO ROCK PLACEMENT.
- A MINIMUM DISTANCE OF 12 INCHES SHALL BE MAINTAINED BETWEEN TOP OF ROCK FILTER DAM WEIR AND TOP EMBANKMENT FOR FILTER DAMS AT SEDIMENTATION TRAPS. ROCK FILTER DAMS SHALL BE EMBEDDED A MINIMUM OF 4 INCHES INTO THE EXISTING GROUND.

BASIS OF PAYMENT		
ITEM NO.	ITEM	UNIT
221 (G)	TEMPORARY ROCK FILTER DAM (TYPE 1)	CY
221 (G)	TEMPORARY ROCK FILTER DAM (TYPE 2)	CY
221 (G)	TEMPORARY ROCK FILTER DAM (TYPE 3)	CY
221 (G)	TEMPORARY ROCK FILTER DAM (TYPE 4)	CY

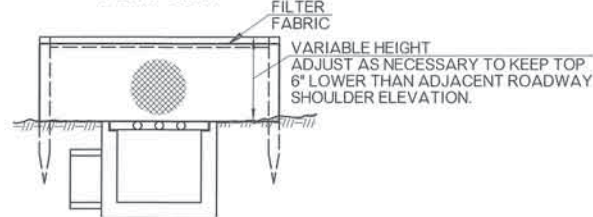
COST OF FILTER DAM (ALL TYPES) TO INCLUDE ALL MATERIAL AND LABOR REQUIRED FOR CONSTRUCTION.

APPROVED BY ROADWAY ENGINEER: *Callie F. A.* DATE: *04/16/15*
 ROADWAY DESIGN DIVISION STANDARD
TEMPORARY ROCK FILTER DAMS

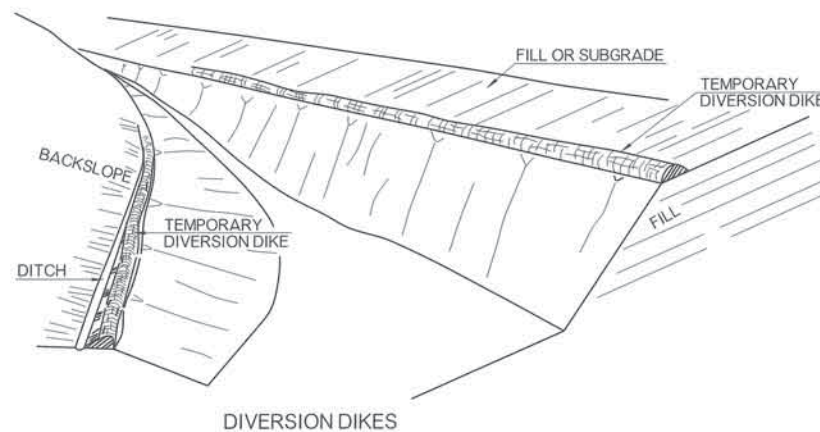
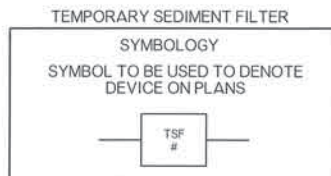
OKLAHOMA DEPARTMENT OF TRANSPORTATION	
STANDARD REVISIONS	
DESCRIPTION	DATE



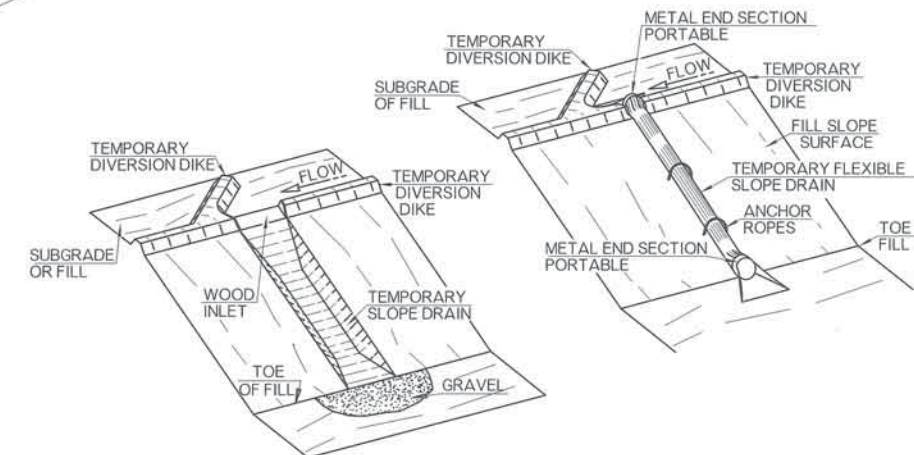
PLAN VIEW



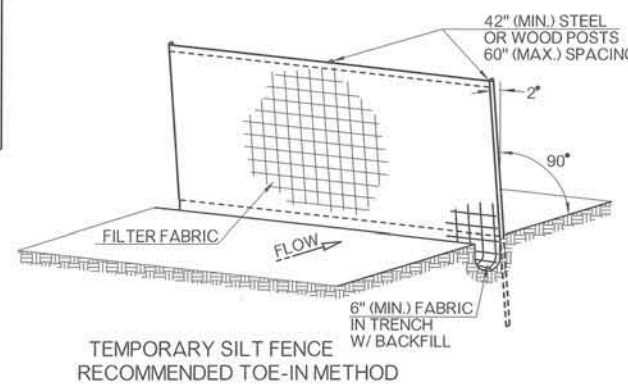
SECTION A - A
SEDIMENT FILTER



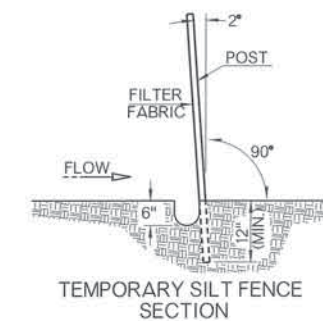
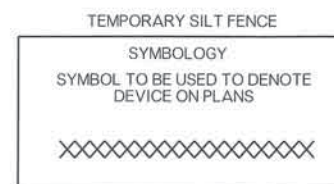
DIVERSION DIKES



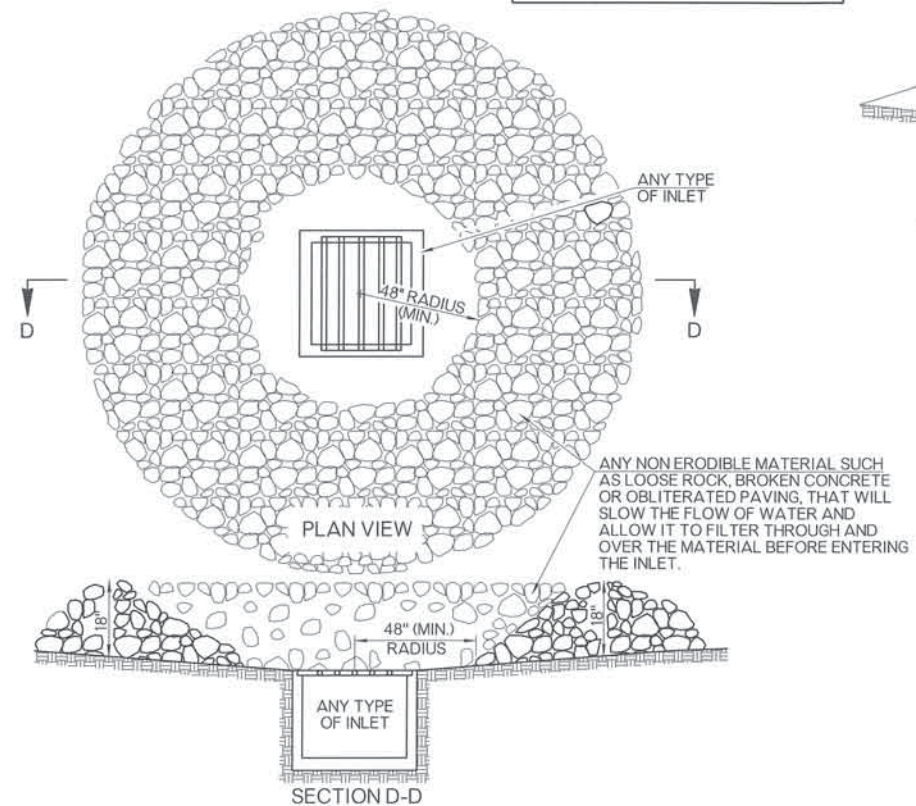
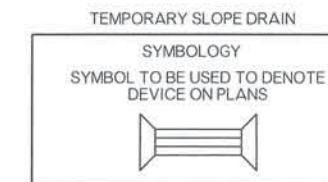
SLOPE DRAINS



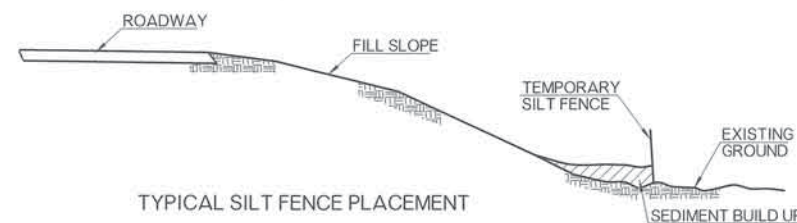
TEMPORARY SILT FENCE
RECOMMENDED TOE-IN METHOD



TEMPORARY SILT FENCE SECTION



SECTION D-D
SEDIMENT FILTER
(TYPE II)



TYPICAL SILT FENCE PLACEMENT

- GENERAL NOTES
- ALL CONSTRUCTION AND MATERIAL REQUIREMENTS SHALL BE IN ACCORDANCE WITH THE 2009 ODOT STANDARD SPECIFICATIONS.
 - COST OF TEMPORARY DIVERSION DIKES TO BE INCLUDED IN PRICE BID FOR OTHER ITEMS OF WORK.

BASIS OF PAYMENT		
ITEM NO.	ITEM	UNIT
221 (A)	TEMPORARY SLOPE DRAINS	LF
221 (C)	TEMPORARY SILT FENCE	LF
221 (D)	TEMPORARY SEDIMENT FILTER	EA

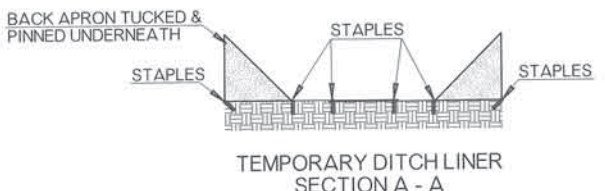
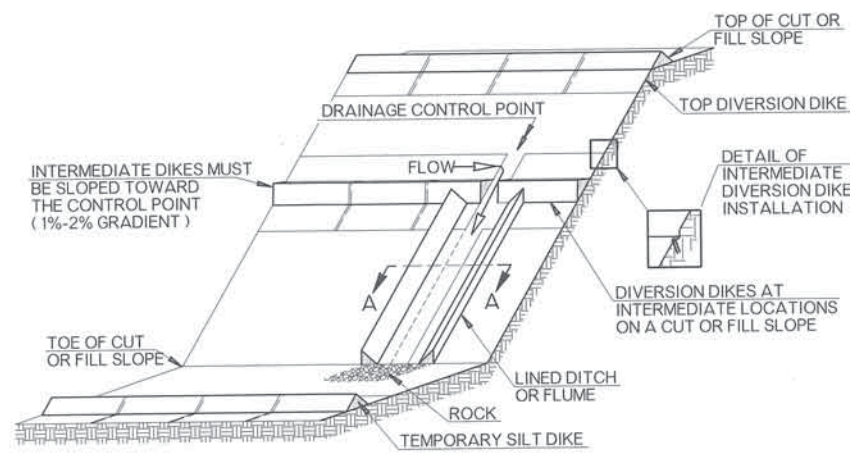
APPROVED BY ROADWAY ENGINEER: *Calvin A.* DATE: *08/11/15*

ROADWAY DESIGN DIVISION STANDARD

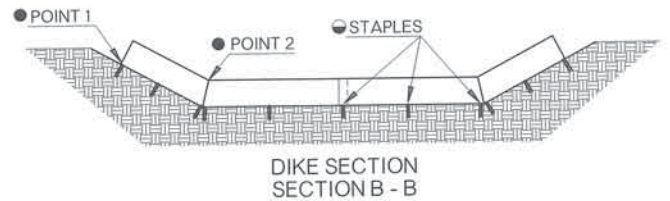
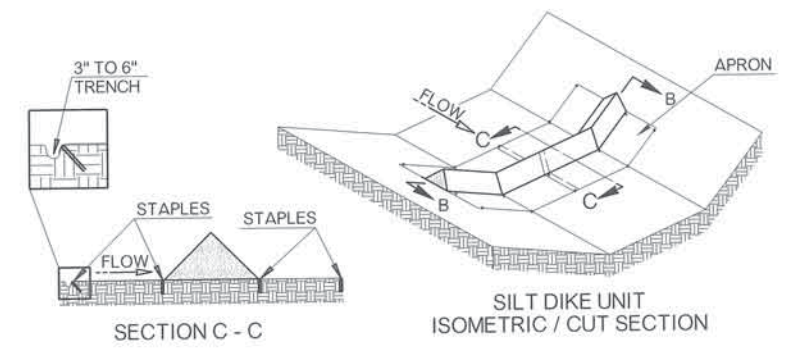
DOT

TEMPORARY SEDIMENT CONTROLS

OKLAHOMA DEPARTMENT OF TRANSPORTATION		
STANDARD REVISIONS		
DESCRIPTION	DATE	

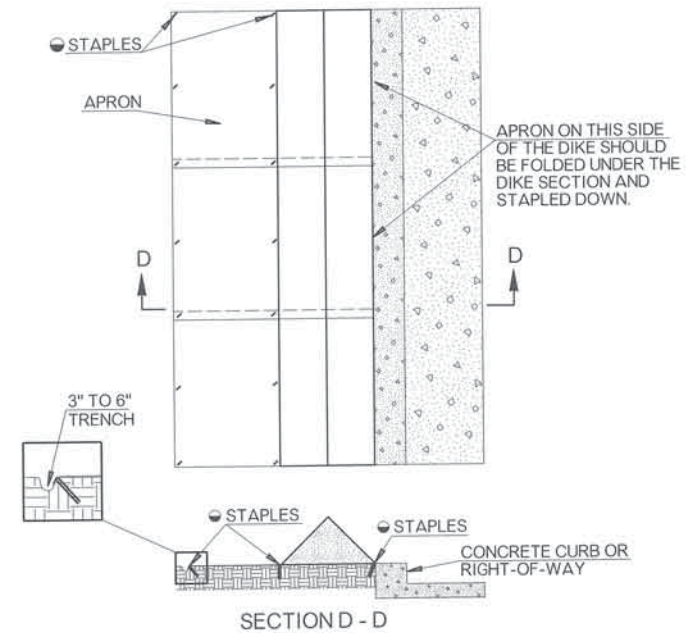


TEMPORARY SILT DIKE INSTALLATION FOR DIVERSION DIKES AND / OR DITCH LINER

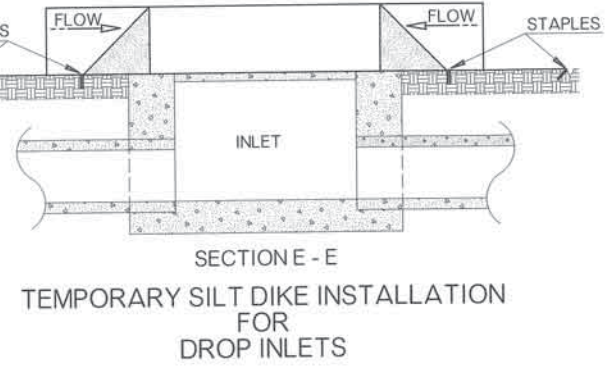
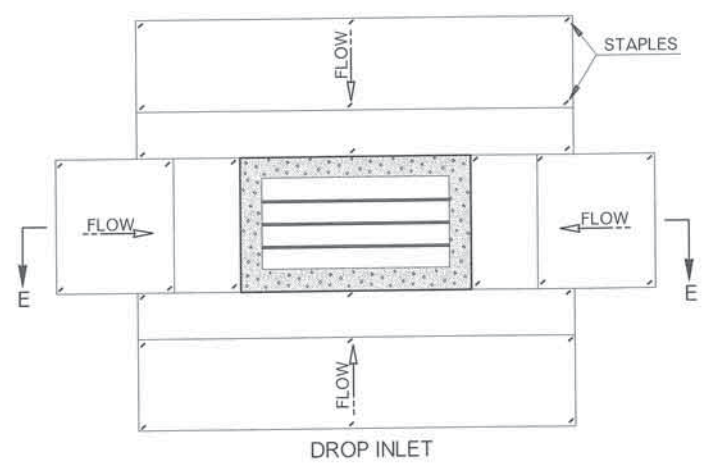


TEMPORARY SILT DIKE INSTALLATION FOR ROADWAY DITCH OR DRAINAGE DITCH

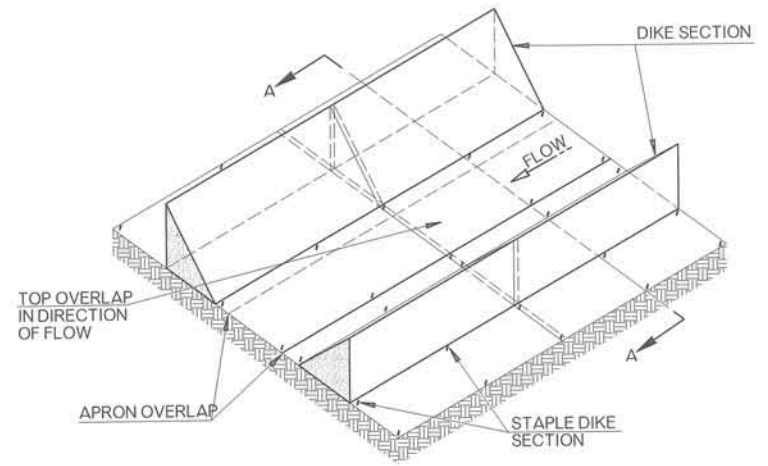
- POINT "1" MUST BE HIGHER THAN POINT "2" TO ENSURE THAT WATER FLOWS OVER THE DIKE AND NOT AROUND THE ENDS.
- STAPLES SHALL BE PLACED WHERE THE UNITS OVERLAP AND IN THE CENTER OF THE UNIT AS SHOWN ON THE DIAGRAM.



TEMPORARY SILT DIKE INSTALLATION FOR CONTINUOUS BARRIER

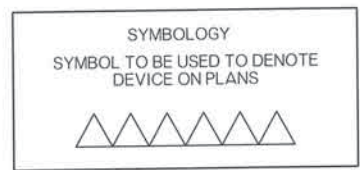


TEMPORARY SILT DIKE INSTALLATION FOR DROP INLETS



TEMPORARY SILT DIKE INSTALLATION FOR TEMPORARY DITCH LINER

- GENERAL NOTES
1. ALL CONSTRUCTION AND MATERIAL REQUIREMENTS SHALL BE IN ACCORDANCE WITH THE 2009 ODOT STANDARD SPECIFICATIONS.
 2. THIS WORK SHALL CONSIST OF FURNISHING, INSTALLING, AND MAINTAINING THE TEMPORARY SILT DIKE. THE DIKES SHALL BE USED AS A CONTINUOUS LINE BARRIER AT THE TOE OF SLOPE OR ACROSS THE ROADWAY DITCH TO CONTAIN SEDIMENT AND MINIMIZE EROSION, OR AS DIRECTED BY THE ENGINEER. THESE DIKES SHALL BE INSTALLED AND LOCATED AS SOON AS CONSTRUCTION WILL ALLOW OR AS DIRECTED BY THE ENGINEER.
 3. TEMPORARY SILT DIKE SHALL BE TRIANGULAR SHAPED HAVING A HEIGHT OF AT LEAST 8" TO 10" IN THE CENTER WITH EQUAL SIDES AND A 16" TO 20" BASE. THE TRIANGULAR SHAPED INNER MATERIAL SHALL BE URETHANE FOAM MEETING THE REQUIREMENTS FOR ASTM D3574. THE OUTER COVER SHALL BE A WOVEN GEOTEXTILE FABRIC PLACED AROUND THE INNER MATERIAL & ALLOWED TO EXTEND BEYOND BOTH SIDES OF THE TRIANGLE 24" TO 36". THIS FABRIC SHOULD BE MILDEW RESISTANT, ROT-PROOF AND RESISTANT TO HEAT AND ULTRAVIOLET RADIATION MEETING REQUIREMENTS FOR SEDIMENT CONTROL IN AASHTO M 288. THE DIKES SHALL BE ATTACHED TO THE GROUND WITH WIRE STAPLES. THE STAPLES SHALL BE NO. 11 GAUGE WIRE AND BE AT LEAST 6" TO 8" LONG. STAPLES SHALL BE PLACED AS SHOWN ON THESE DETAILS.
 4. ACCEPTED TEMPORARY SILT DIKE, MEASURED AS PROVIDED ABOVE, WILL BE PAID FOR AT THE CONTRACT UNIT PRICE BID FOR TEMPORARY SILT DIKE. PRICE BID WILL INCLUDE THE COST OF FURNISHING THE DIKES, INSTALLING, MAINTAINING AND REMOVAL WHEN DIRECTED BY THE ENGINEER.



NOTE: SILT DIKE SHOULD ONLY BE USED FOR DROP INLETS IN SUMP LOCATIONS. FOR DROP INLETS ON GRADE, USE SEDIMENT TRAPS OR OTHER CONTROLS.

BASIS OF PAYMENT		
ITEM NO.	ITEM	UNIT
221 (F)	TEMPORARY SILT DIKE	LF

NOTE: SILT DIKES ARE ONLY FURNISHED IN 7' INCREMENTS.

APPROVED BY ROADWAY ENGINEER: *Calvin F. A.* DATE: *02/11/15*
 ROADWAY DESIGN DIVISION STANDARD

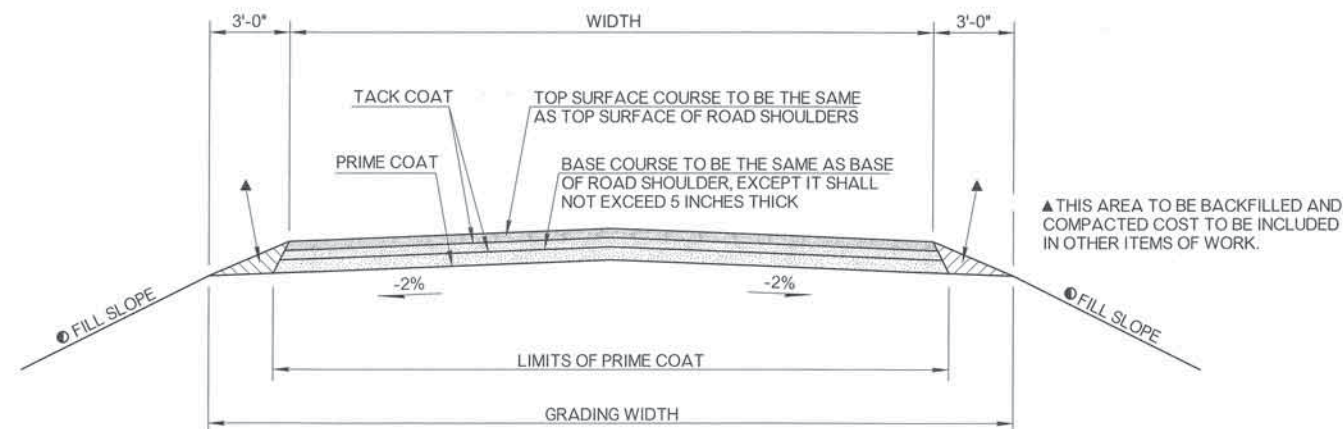
DOT

OKLAHOMA DEPARTMENT OF TRANSPORTATION
 2009 SPECIFICATIONS

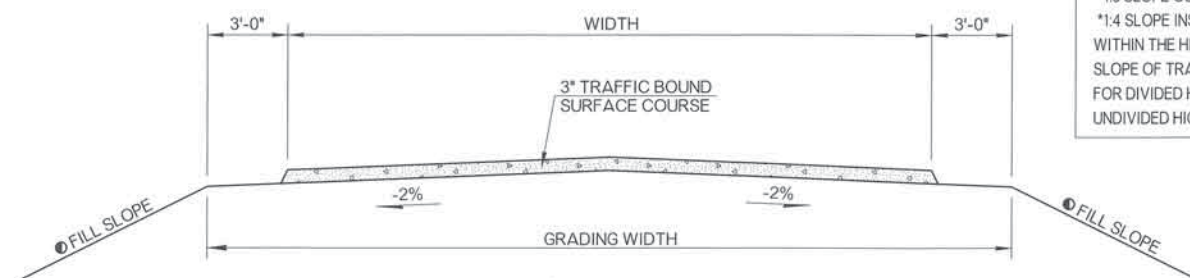
TEMPORARY SILT DIKE

TSD-2	0
R-6	

OKLAHOMA DEPARTMENT OF TRANSPORTATION	
STANDARD REVISIONS	
DESCRIPTION	DATE

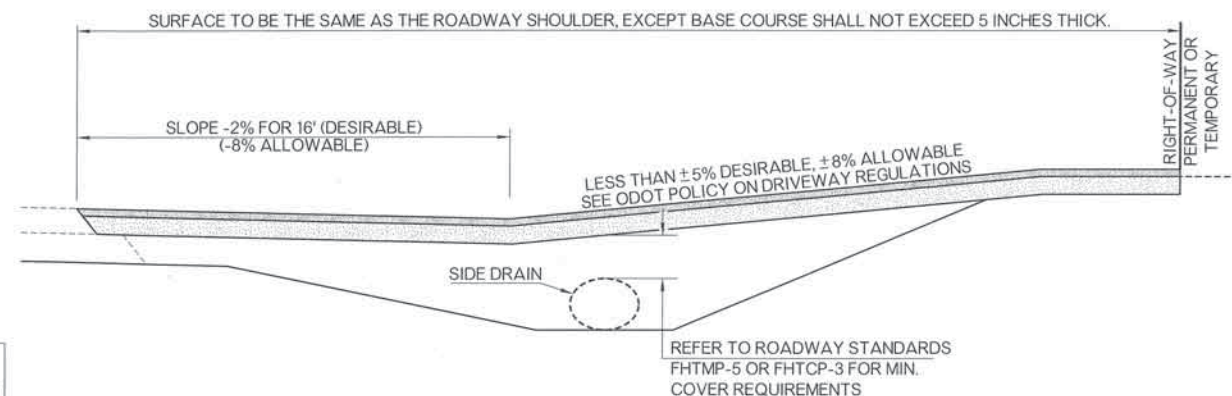


TYPICAL SECTION OF ASPHALT RETURN/DRIVE

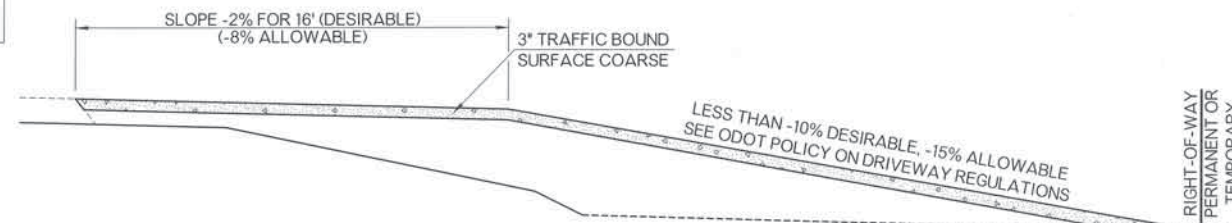


TYPICAL SECTION OF T.B.S.C. RETURN/DRIVE

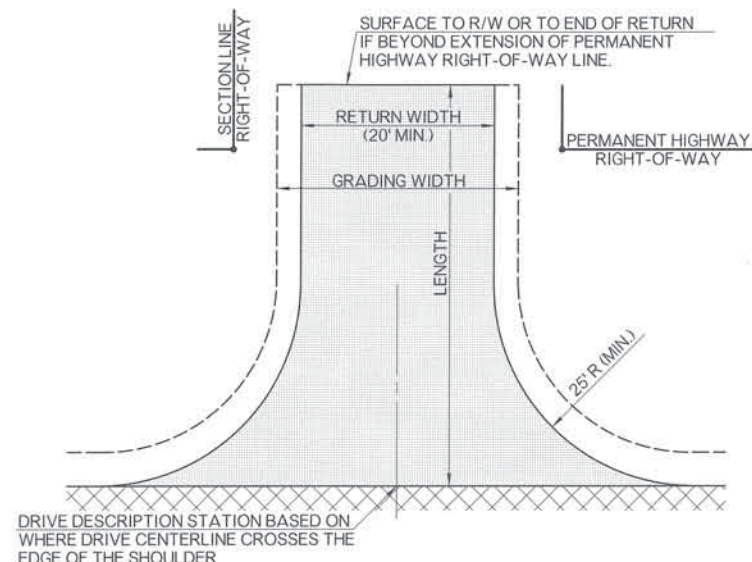
FILL SLOPE NOTES:
 FILL SLOPE AS SHOWN IN TYPICAL SECTIONS SHALL NOT EXCEED:
 *1:3 SLOPE OUTSIDE HIGHWAY CLEARZONE
 *1:4 SLOPE INSIDE HIGHWAY CLEARZONE
 WITHIN THE HIGHWAY CLEARZONE, ADJUST SLOPE OF TRAFFIC APPROACH END TO 1:10 FOR DIVIDED HIGHWAYS AND 1:6 FOR UNDIVIDED HIGHWAYS.



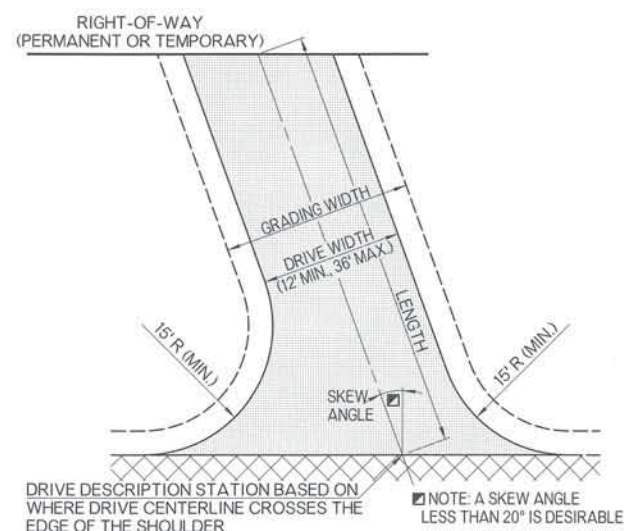
PROFILE OF TYPICAL ASPHALT RETURN/DRIVE ON ROADWAY CUT SECTION



PROFILE OF TYPICAL T.B.S.C. RETURN/DRIVE ON ROADWAY FILL SECTION

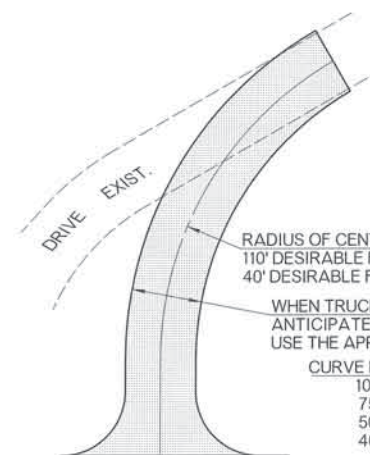


PLAN TYPICAL SECTION LINE RETURN



PLAN TYPICAL DRIVE ON SKEW

NOTE: A SKEW ANGLE LESS THAN 20° IS DESIRABLE.



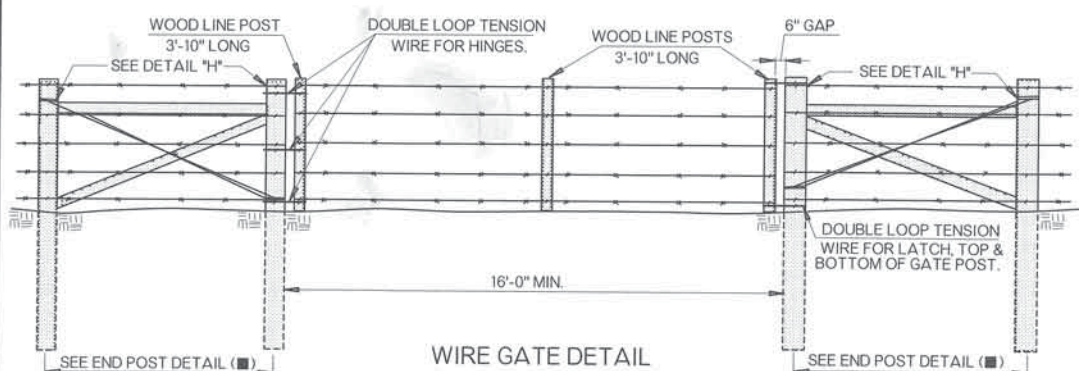
SECTION LINE OR DRIVE WITH CURVED ALIGNMENT

PROPOSED DRIVES AND RETURNS SHALL MATCH EXISTING EXCEPT WHEN SKEW ANGLE EXCEEDS 20 DEGREES; IT IS THEN DESIRED TO SHIFT THE LOCATION AND CONSTRUCT USING CURVED ALIGNMENT

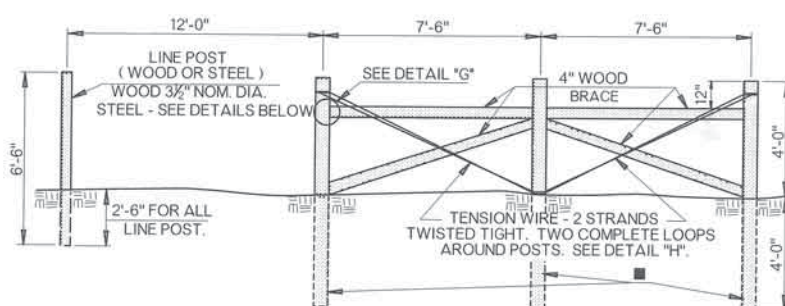
USEFUL ABBREVIATIONS FOR PLAN SHEETS:

ASPH	ASPHALT
T.B.S.C.	TRAFFIC BOUND SURFACE COARSE
CONC.	CONCRETE
SEC. RET.	SECTION LINE RETURN
FIELD ENT.	FIELD ENTRANCE
PVT. DRIVE	PRIVATE DRIVE
COMM. DRIVE	COMMERCIAL DRIVE
W/S.D.	WITH SIDE DRAIN
AS DIKE	AS DIKE ACROSS DITCH

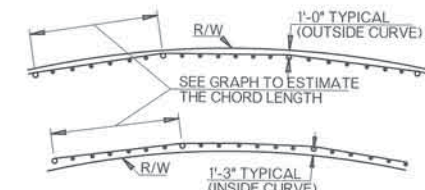
APPROVED BY ROADWAY ENGINEER: *Callan F. A.* DATE: 04/16/15
 ROADWAY DESIGN DIVISION STANDARD
DOT RURAL DRIVEWAY INSTALLATION



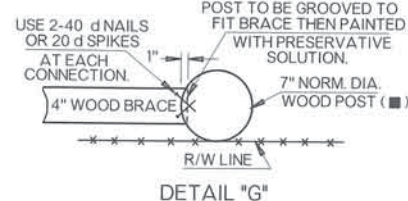
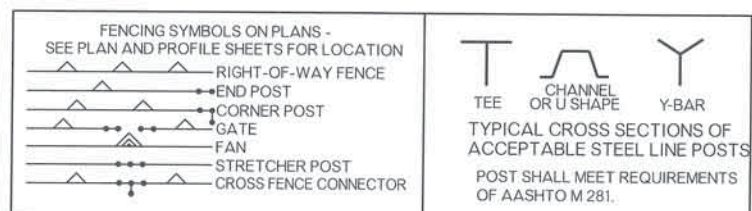
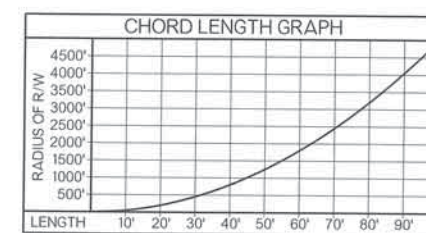
WIRE GATE DETAIL
LOCATION OF GATES TO BE DETERMINED BY THE ENGINEER. OTHER TYPES OF GATES MAY BE SUBSTITUTED FOR THE WIRE GATE, SUCH AS PREFABRICATED PIPE TUBING TYPES OR RANCH STYLE METAL PANEL TYPE, IF APPROVED BY THE ENGINEER. COST OF WIRE GATE SHALL BE INCLUDED IN THE PRICE BID FOR FENCE.



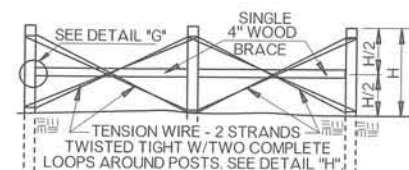
CORNER & STRETCHER POSTS DETAIL
USE STRETCHER DETAILS AT ALL CORNERS, BENDS IN R/W, ON HILL TOPS, IN VALLEYS OR DEEP DEPRESSIONS, AND AT 500' MAXIMUM SPACING.



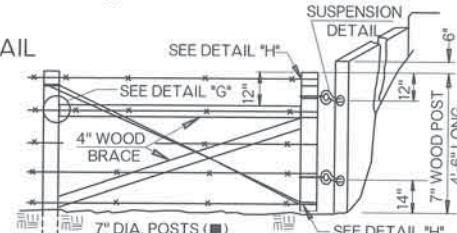
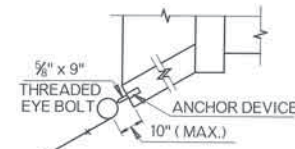
TYPICAL PLACEMENT FOR FENCE ALONG CURVES (WHEN R/W RADIUS IS LESS THAN 5000')



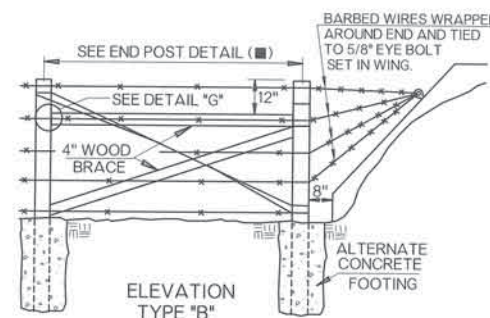
IF 3 1/2" DIA. x 8'-0" LONG GALV. STEEL (SCH. 40) PIPE IS USED AS ALTERNATIVE POST (■), THEN 2" DIA. GALV. STEEL PIPES (SCH. 40) WILL BE USED AS BRACING AND ATTACHED USING STANDARD CHAIN LINK FENCE HARDWARE MEETING THE REQUIREMENTS OF AASHTO M 181 & ASTM A53. SEE CHAINLINK DETAILS ON ROADWAY STANDARD RWF3-2.



CORNER & STRETCHER POSTS DETAIL ALTERNATIVE

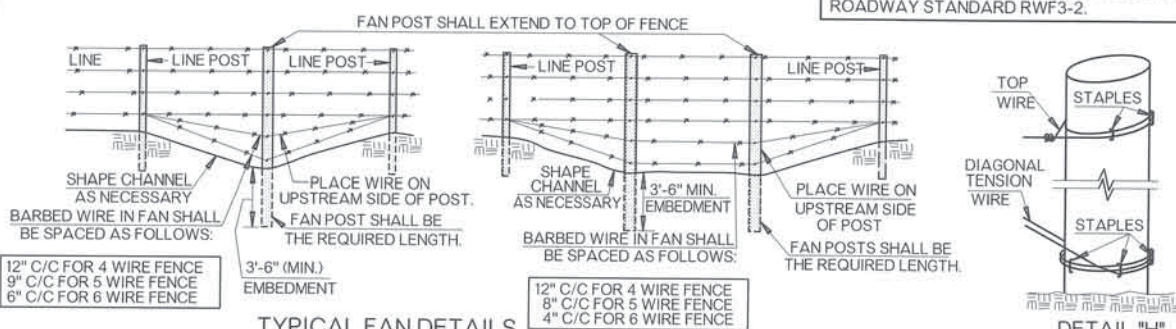


ELEVATION TYPE "A"

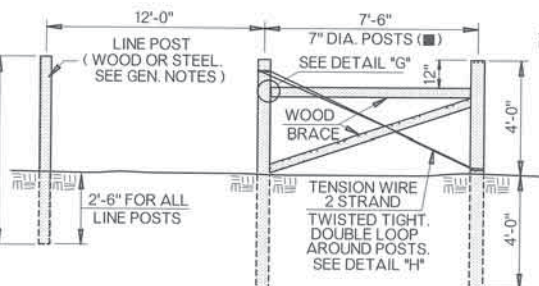


ELEVATION TYPE "B"

CONNECTIONS AT CULVERTS

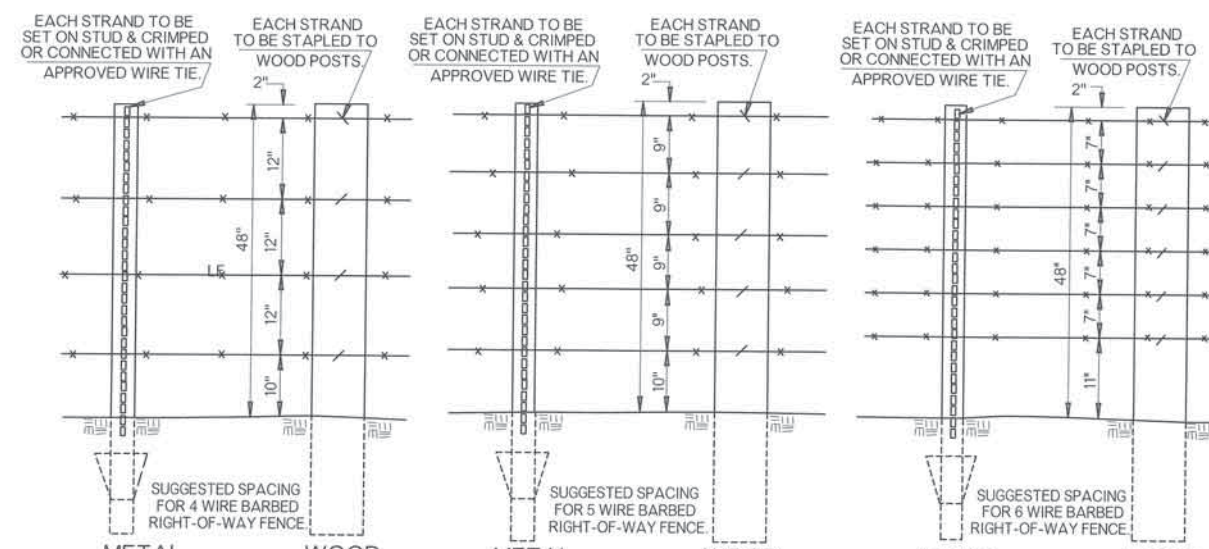


TYPICAL FAN DETAILS (FOR SMALL DRAINS AND IRREGULAR TERRAIN)



END POST DETAIL

USE FOR CROSS FENCE CONNECTIONS.
NOTE: ALL WIRES SHALL MAKE TWO COMPLETE WRAPS AROUND END POST, THEN AROUND THEMSELVES TWO TURNS. USE EXTRA STAPLES ON END POSTS. SEE DETAIL "H".



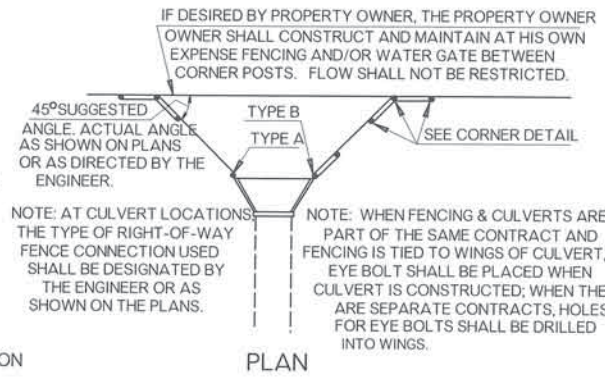
METAL WOOD 4 WIRE DETAIL

METAL WOOD 5 WIRE DETAIL

METAL WOOD 6 WIRE DETAIL



ALTERNATE POST OPTION 3 1/2" DIA. X 8'-0" LG. CAPPED GALV. SCH. 40 STEEL PIPE



PLAN

- GENERAL NOTES**
- ALL CONSTRUCTION AND MATERIAL REQUIREMENTS SHALL BE IN ACCORDANCE WITH THE 2009 ODOT STANDARD SPECIFICATIONS.
 - FENCE, IN GENERAL, SHALL BE ON OUTSIDE OF POSTS AWAY FROM CENTERLINE OF HIGHWAY AND CONSTRUCTED ON THE PERMANENT RIGHT-OF-WAY (EXCEPTIONS ARE CORNERS AND CURVES).
 - HINGES AND LOOP LATCH ON WIRE GATES SHALL BE FABRICATED FROM TENSION WIRE. THE HINGES (3 PER POST) SHALL BE FORMED OF DOUBLE LOOPS ON THE GATE POST. THE LOOP HINGES AROUND THE WIRE GATE POST SHALL BE FORMED LOOSE FOR EASE OF MOVEMENT. THE TOP 2 (TOP AND BOTTOM) LOOP STRETCHER POSTS TO BE USED IN GENERAL AT HILL TOPS AND AT BOTTOM OF VALLEYS AND AT A MAXIMUM OF 500 FEET APART.
 - ALL MISCELLANEOUS HARDWARE SHALL BE FURNISHED GALVANIZED OR ALUMINUM COATED. ALL ALTERNATIVE METAL PIPE POSTS SHALL BE CAPPED.

BASIS OF PAYMENT

ITEM NO.	ITEM	UNIT
624 (C)	FENCE-STYLE SWF (● BARBED WIRE)	LF
624 (C)	FENCE-STYLE SWF (● SMOOTH WIRE)	LF
624 (C)	FENCE-STYLE SWF (● BARBLESS WIRE)	LF

● NUMBER OF STRANDS

APPROVED BY ROADWAY ENGINEER: *Calvin A.* DATE: *02/11/15*
ROADWAY DESIGN DIVISION STANDARD
DOT RIGHT-OF-WAY FENCE STYLE SWF (STRAND WIRE FENCE)
OKLAHOMA DEPARTMENT OF TRANSPORTATION 2009 SPECIFICATIONS
RWF2-2 1
R-67

ALL GENERAL NOTES SHOWN BELOW SHALL APPLY TO ALL OF THE STANDARD DRAWINGS IN TCS SERIES

DESCRIPTION	REVISIONS	DATE
MODIFIED NOTES		3/15/2011

CONTRACTOR

ON CONSTRUCTION PROJECTS IT WILL BE THE CONTRACTORS RESPONSIBILITY TO INSTALL THE NECESSARY TRAFFIC CONTROL BEFORE CONSTRUCTION BEGINS.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING ALL DEVICES TO ASSURE A HIGH DEGREE OF BOTH DAY AND NIGHT VISIBILITY, WHICH WILL INCLUDE ANY WASHING, REPLACEMENT AND/OR REPOSITIONING WHERE DEEMED NECESSARY BY THE ENGINEER.

THE CONTRACTOR SHALL REPAIR OR REPLACE ANY NEW OR EXISTING PERMANENT STATE OWNED SIGNS WHICH ARE DAMAGED DUE TO HIS NEGLIGENCE OR CARELESS HANDLING DURING THE CONSTRUCTION OF THIS PROJECT. THIS SHALL BE DONE AT THE CONTRACTORS EXPENSE.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING TEMPORARY TRAFFIC CONTROL WORK ZONE AND EXISTING PAVEMENT MARKINGS ON ALL ROADWAYS OPEN TO TRAFFIC WITHIN THE PROJECT. SUFFICIENT QUANTITIES HAVE BEEN PROVIDED FOR MAINTAINING PAVEMENT MARKINGS FOR PRESCRIBED DETOUR ROUTES WHEN DEEMED NECESSARY BY THE ENGINEER.

SIGN MATERIALS

ALL SIGN BLANK MATERIALS SHALL BE THE OPTION OF THE CONTRACTOR BUT SHALL BE OF SUCH MATERIAL THAT WILL RETAIN A SATISFACTORY APPEARANCE THROUGHOUT THE LIFE OF THE PROJECT.

ALL SIGNS, LIGHTS, FLAGS, ETC. SHALL CONFORM IN SIZE, SHAPE, COLOR, LEGENDS AND APPLICATIONS TO THE STANDARDS SET FORTH IN THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES AND/OR OKLAHOMA STATE STANDARD DRAWINGS FOR SIGNS. STANDARD DRAWINGS ARE AVAILABLE FROM THE DEPARTMENT OF TRANSPORTATION. INTERPRETATIONS THAT MAY BE NECESSARY SHALL BE REFERRED TO THE ENGINEER.

SIGN SHEETING

REFLECTORIZATION OF TRAFFIC CONTROL DEVICES SHALL BE BY MEANS OF WIDE ANGLE, FLAT TOP REFLECTIVE SHEETING MEETING THE REQUIREMENTS OF 2009, OKLAHOMA STANDARD SPECIFICATIONS.

SIGN INSTALLATION

ALL SIGNS SHALL BE SECURELY PLACED OR WEIGHTED TO PREVENT BLOWING OVER. ROCKS, BROKEN CONCRETE OR OTHER SUCH OBJECTS SHALL NOT BE CONSIDERED AN ACCEPTABLE SUBSTITUTE FOR SAND BAGS WHEN USED TO OBTAIN ADDED STABILITY FOR MOVABLE SIGNS AND BARRICADES.

SPACING OF SIGNING, ON THE PLANS OR TCS STANDARDS, SHOULD BE NO LESS THAN THE DISTANCES SHOWN. THE DISTANCE BETWEEN SIGNS SHOULD BE INCREASED ON HIGH SPEED OR MORE HEAVILY TRAVELED HIGHWAYS, OR WHERE SIGHT DISTANCE IS RESTRICTED.

IN ALL CONSTRUCTION ZONES, THE 48 INCH X 48 INCH WARNING SIGNS SHALL HAVE ATTACHED THERETO FLORESCENT FLAGS AND TYPE "A" WARNING LIGHTS. THIS SHALL ALSO APPLY WHEN SIGNS ARE USED ON BOTH SIDES OF THE ROADWAY. ADDITIONAL FLASHING LIGHTS MAY BE REQUIRED WHEN SO DESIRED BY THE ENGINEER.

ALL DIAMOND SHAPED CONSTRUCTION WARNING SIGNS ON EXPRESSWAYS OR FREEWAYS SHALL BE 48 INCH X 48 INCH, WITH THE APPROPRIATE ADVISORY SIGN WHERE REQUIRED UNLESS OTHERWISE NOTED IN THE PLANS.

DUE TO THE TEMPORARY NATURE OF CONSTRUCTION, SIGNS WHICH ARE 33 S.F. AND OVER WILL HAVE NO REINFORCING STEEL IN THEIR FOOTINGS.

ALL SIGNS AND SIGN ASSEMBLIES WITH A TOTAL SURFACE AREA OF 10 S.F. OR MORE SHALL BE INSTALLED ON TWO (2) POSTS. THE EXCEPTION BEING SINGLE ROUTE MARKER ASSEMBLIES.

SIGNS MOUNTED ON BARRICADES SHALL BE MOUNTED AS HIGH AS NECESSARY TO BE VISIBLE.

BARRICADES

ONE (1) WING BARRICADE SHALL BE SET ON EACH SIDE OF THE ROADWAY IN ADVANCE OF THE FIRST ADVANCE WARNING SIGN, THE EXCEPTIONS ARE MINOR CROSS STREETS AND SECTION LINE ROADS WHICH INTERSECT THE WORK AREA.

WING BARRICADES SHALL BE INSTALLED ON TWO (2) BREAKAWAY POSTS.

WORK DURATION

THE FIVE CATEGORIES OF WORK DURATION AND THEIR TIME AT A LOCATION SHALL BE:
 A) LONG-TERM STATIONARY IS WORK THAT OCCUPIES A LOCATION MORE THAN 3 DAYS.
 B) INTERMEDIATE-TERM STATIONARY IS WORK THAT OCCUPIES A LOCATION MORE THAN ONE DAYLIGHT PERIOD UP TO 3 DAYS, OR NIGHTTIME WORKLASTING MORE THAN 1 HOUR.
 C) SHORT-TERM STATIONARY IS DAYTIME WORK THAT OCCUPIES A LOCATION FOR MORE THAN 1 HOUR WITHIN A SINGLE DAYLIGHT PERIOD.
 D) SHORT DURATION IS WORK THAT OCCUPIES A LOCATION UP TO 1 HOUR.
 E) MOBILE IS WORK THAT MOVES INTERMITTENTLY OR CONTINUOUSLY.

LIGHTING

TYPE "A" WARNING LIGHTS SHALL BE USED ON BARRICADES (AS REQUIRED) AND WARNING SIGNS.

TYPE "C" WARNING LIGHTS MAY BE USED ON VERTICAL PANELS (OPTIONAL).

CONSTRUCTION NOTES

SHOULD THE REQUIRED WORK ON ANY PROJECT, INCLUDING ANY TRAFFIC CONTROL, OVERLAP OR OTHERWISE INTERFERE WITH THE ON-GOING WORK OR TRAFFIC CONTROL OF ANOTHER PROJECT, IT SHALL BE THE RESPONSIBILITY OF THE RESPECTIVE CONTRACTORS TO COORDINATE THEIR WORK ACTIVITIES TO FACILITATE THE SAFE MOVEMENT OF TRAFFIC THROUGHOUT OR AROUND THEIR COLLECTIVE WORK AREAS. ANY SUCH RECOMMENDED CHANGES SHALL BE SUBMITTED IN WRITING TO EACH PROJECT RESIDENT ENGINEER FOR REVIEW AND APPROVAL.

ALL TRAFFIC CONTROL DEVICES NOT REQUIRED FOR THE SAFE CONDUCT OF TRAFFIC THROUGH THE TEMPORARY TRAFFIC CONTROL ZONE SHALL BE PROMPTLY REMOVED, COMPLETELY COVERED, TURNED AWAY FROM TRAFFIC OR OTHERWISE TAKEN OUT OF SERVICE. DEVICES SHALL NOT BE STORED ALONG THE ROADWAY WITHIN 15 FEET (15') OF AN OPEN DRIVING LANE, EITHER BEFORE OR AFTER THEY ARE TO BE USED UNLESS PROTECTED BY GUARDRAIL, BRIDGE RAIL, AND/OR BARRIERS INSTALLED FOR OTHER PURPOSES. THESE DEVICES SHALL BE REMOVED FROM THE TEMPORARY TRAFFIC CONTROL ZONE WHEN THE ENGINEER DETERMINES THEY ARE NO LONGER NEEDED. WHERE THERE IS INSUFFICIENT RIGHT-OF-WAY TO PROVIDE FOR THIS 15 FEET (15') SETBACK, THE CONTRACTOR SHALL DETERMINE ALTERNATE LOCATIONS AND REQUEST THE ENGINEERS APPROVAL TO USE THEM.

TRAFFIC CONTROL DEVICES, WARNING DEVICES, AND BARRIERS SHALL BE KEPT IN CORRECT POSITION, PROPERLY DIRECTED, CLEARLY VISIBLE AND CLEAN AT ALL TIMES. DAMAGED, DEFACED OR DIRTY DEVICES OR BARRICADES SHALL IMMEDIATELY BE REPAIRED, REPLACED OR CLEANED BY THE CONTRACTOR AND APPROVED FOR USE BY THE ENGINEER.

NO EQUIPMENT OR VEHICLES BELONGING TO THE CONTRACTOR, HIS SUB-CONTRACTORS OR EMPLOYEES SHALL BE PARKED OR STOPPED WITHIN 30 FEET (30') OF A LANE CARRYING TRAFFIC, AT ANY TIME, UNLESS REQUIRED BY ONGOING WORK OPERATIONS.

ALL DETOURS AND DIVERSIONS SHOULD BE IN PLACE, WITH SIGNING, STRIPING AND CHANNELIZING DEVICES, AS SHOWN IN THE PLANS OR STANDARD DRAWINGS, BEFORE THEY ARE OPENED TO TRAFFIC.

WHEN IT BECOMES NECESSARY TO CLOSE THE ROAD TO THROUGH TRAFFIC, NO LESS THAN SEVEN DAYS PRIOR TO THE CLOSURE, THE CONTRACTOR SHALL NOTIFY THE FOLLOWING INDIVIDUALS OR AGENCIES DESCRIBING THE AFFECTED ROAD AND THE APPROXIMATE DURATION OF THE CLOSURE. THOSE TO BE NOTIFIED INCLUDE BUT ARE NOT LIMITED TO 1) LOCAL LAW ENFORCEMENT OFFICIALS, 2) LOCAL FIRE OFFICIALS, 3) AMBULANCE SERVICES, 4) LOCAL SCHOOL SUPERINTENDENT, 5) UNITED STATES POSTAL SERVICE, AND 6) CITY OR COUNTY ROAD SUPERINTENDENT.

ALL TEMPORARY TRAFFIC CONTROL DEVICES, AND THEIR CONDITIONS THROUGHOUT THE LIFE OF THE CONSTRUCTION PROJECT, SHALL MEET O.D.O.T.'S LATEST "QUALITY STANDARDS FOR TEMPORARY TRAFFIC CONTROL DEVICES". THE O.D.O.T. RESIDENT ENGINEER WILL MAKE FINAL DECISION OF ALL TEMPORARY TRAFFIC CONTROL DEVICES BASED ON THE O.D.O.T. GUIDELINES.

NO GENDER BIAS SIGNS ARE ALLOWED.

ARROW DISPLAY

USE OF AN ARROW DISPLAY, IN THE ARROW OR CHEVRON MODE, SHALL BE LIMITED TO STATIONARY OR MOVING LANE CLOSURES.

AN ARROW DISPLAY, IN THE CAUTION MODE, SHALL BE USED ONLY FOR SHOULDER WORK, BLOCKING THE SHOULDER, ROADSIDE WORK NEAR THE SHOULDER, OR FOR MOBILE OPERATIONS (I.E. STRIPING).

AN ARROW DISPLAY IN THE ARROW OR CHEVRON MODE, SHALL NOT BE USED ON A TWO-LANE, TWO-WAY ROADWAY FOR TEMPORARY ONE-LANE OPERATION.

AN ARROW DISPLAY SHALL NOT BE USED ON A MULTI-LANE ROADWAY TO LATERALLY SHIFT TRAFFIC.

CHANNELIZING DEVICES

IN THOSE AREAS WHERE DRIVERS ARE ASKED TO MAKE A DECISION OR MUST BE GUIDED THROUGH A PRECISE MOVEMENT, BY USE OF CHANNELIZING DEVICES, IT IS ESPECIALLY IMPORTANT TO PROVIDE A CLEARLY DEFINED PATH. EXAMPLES OF THIS COULD BE IN DELINEATING A TEMPORARY GORE OR TURNING RADIUS. IN SUCH AREAS THE SPACING OF CHANNELIZING DEVICES MAY BE REDUCED TO 10 FEET FOR SPEEDS OF 40 M.P.H. OR LESS, AND 20 FEET FOR SPEEDS GREATER THAN 40 M.P.H.

WHEN CHANNELIZING DEVICES ARE USED TO DIRECT TRAFFIC ACROSS EXISTING LANE LINES OR EDGE LINES, THE SPACING BETWEEN CHANNELIZING DEVICES SHALL BE REDUCED 50%. SPACING SHOULD ALSO BE REDUCED WHEN CHANNELIZING DEVICES ARE PLACED ON CURVES, HILLS, OR NEXT TO POTENTIAL HAZARDS.

ALL TRAFFIC CONTROL CHANNELIZING DEVICES SHALL MEET MUTCD COLOR REQUIREMENTS.

FLAGGERS

FLAGGERS MUST BE CLEARLY VISIBLE TO APPROACHING TRAFFIC FOR A DISTANCE SUFFICIENT TO PERMIT PROPER RESPONSE BY MOTORISTS TO THE FLAGGING INSTRUCTIONS, AND TO PERMIT TRAFFIC TO REDUCE SPEED OR STOP BEFORE ENTERING THE TEMPORARY TRAFFIC CONTROL ZONE. FLAGGERS SHALL BE POSITIONED TO MAINTAIN MAXIMUM COLOR CONTRAST BETWEEN THE FLAGGER'S REFLECTIVE CLOTHING AND EQUIPMENT AND THE WORK AREA BACKGROUND.

DURING HOURS OF DARKNESS, FLAGGER STATIONS SHALL BE ILLUMINATED SUCH THAT THE FLAGGER WILL BE CLEARLY VISIBLE TO APPROACHING TRAFFIC. LIGHTS TO BE USED FOR ILLUMINATING THE STATION SHALL BE APPROVED BY THE ENGINEER. REFLECTORIZED PADDLES AND REFLECTORIZED VESTS, SHIRTS OR JACKETS SHALL BE USED FOR NIGHTTIME FLAGGING.

UNLESS OTHERWISE SPECIFIED IN THE PLANS, THE COST OF FLAGGING OPERATIONS SHALL BE INCLUDED IN OTHER ITEMS OF WORK.

MINIMUM STANDARDS FOR TRAFFIC CONTROL DEVICES

- (1) WARNING LIGHTS (TYPE A FLASHERS AND TYPE C STEADY BURN)
 - (A) NOT LESS THAN NINETY (90) PERCENT OF THE TOTAL NUMBER OF LIGHTS BEING USED AT ANY ONE TIME SHALL BE FULLY OPERATIONAL.
 - (B) NOT MORE THAN THREE (3) LIGHTS ADJACENT TO ONE ANOTHER SHALL BE FAILING.
- (2) ARROW DISPLAY
 - (A) WHEN IN ARROW MODE, NO MORE THAN TWO (2) LAMPS IN THE STEM AND ZERO (0) LAMPS IN THE HEAD SHALL BE FAILING. THE DIMMING FUNCTION SHALL BE OPERATING PROPERLY.
 - (B) WHEN IN CAUTION MODE (CORNERS), A MINIMUM OF FOUR (4) LAMPS SHALL BE OPERATIONAL. THE DIMMING FUNCTION SHALL BE OPERATING PROPERLY.
 - (C) ANY LAMP WHICH IS LIGHTED BUT IMPROPERLY ALIGNED SHALL NOT BE CONSIDERED OPERATIONAL.
- (3) CHANGEABLE MESSAGE SIGNS
 - (A) NOT LESS THAN NINETY (90) PERCENT OF THE PIXELS SHALL BE FUNCTIONAL IN EACH CHARACTER MODULE.
 - (B) NO SANDBAG BALLASTING OVER 3 FEET IN HEIGHT.
- (4) PAVEMENT MARKING TAPE
 - (A) NOT MORE THAN TEN (10) PERCENT OF ALL TAPE, PAINT, MESSAGE OR SYMBOL SHALL BE MISSING.
 - (B) NOT MORE THAN TWO (2) CONSECUTIVE DASHED LINES SHALL BE MISSING.
 - (C) NOT MORE THAN FIFTY (50) CONTINUOUS FEET OF A SOLID LINE SHALL BE MISSING.
- (5) CONSTRUCTION ZONE PAVEMENT MARKERS
 - (A) NOT MORE THAN TEN (10) PERCENT OF THE TOTAL NUMBER OF MARKERS SHALL BE MISSING.
 - (B) NOT MORE THAN THREE (3) CONSECUTIVE MARKERS SHALL BE MISSING.

STRIPING

WHENEVER THE WORK CAUSES THE OBLITERATION OF PAVEMENT MARKINGS, EITHER TEMPORARY OR PERMANENT MARKINGS SHALL BE IN PLACE PRIOR TO OPENING THE ROADWAY TO TRAFFIC. CENTERLINE PAVEMENT MARKINGS SHALL BE PROVIDED AT ALL TIMES FOR ROADWAYS OPEN TO TRAFFIC.

THE APPLICATION SURFACES FOR PAVEMENT MARKINGS SHALL BE FREE OF DUST, DIRT, MOISTURE OR OTHER FOREIGN MATTER WHICH WOULD INTERFERE WITH ADHESION. INSTALLATION OF ALL PAVEMENT MARKINGS SHALL BE IN ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATIONS.

ALL TEMPORARY PAVEMENT MARKINGS SHALL BE REMOVED IMMEDIATELY AHEAD OF THE PERMANENT STRIPING OPERATIONS OR RE-STRIPING FOR FOLLOWING CONSTRUCTION PHASES.

WHEN REMOVABLE PAVEMENT MARKINGS TAPE IS TO BE INSTALLED ON NEW CONCRETE PAVEMENT, THE CURING COMPOUND SHALL BE REMOVED PRIOR TO INSTALLATION.

IF REMOVABLE PAVEMENT MARKING TAPE IS INSTALLED IN ACCORDANCE WITH THE MANUFACTURERS SPECIFICATIONS AND FAILS DURING THE FIRST SIX MONTHS OF SERVICE, IT SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE. REPLACEMENT SHALL BE ACCOMPLISHED IN A TIMELY MANNER UPON BEING NOTIFIED, BY THE ENGINEER, OF SUCH FAILURE.

PILOT CAR

WHEN LANE CLOSURES ARE REQUIRED ON TWO-LANE /TWO-WAY ROADWAYS, THE CONTRACTOR MAY, AT HIS OPTION, UTILIZE A PILOT CAR. IF THE CONTRACTOR ELECTS TO USE A PILOT CAR, CHANNELIZING DEVICES ALONG THE CENTERLINE WILL NOT BE REQUIRED. THE PILOT CAR OPERATOR SHALL BE IN RADIO CONTACT WITH PERSONNEL IN THE TEMPORARY TRAFFIC CONTROL ZONE. MAXIMUM SPEED OF THE PILOT CAR THROUGH THE WORK AREA SHALL BE 25 M.P.H. FULL COMPENSATION FOR FURNISHING AND OPERATING THE PILOT CAR, (INCLUDING DRIVER, RADIOS, AND ANY OTHER EQUIPMENT OR LABOR REQUIRED) SHALL BE CONSIDERED AS INCLUDED IN THE COST OF OTHER ITEMS OF WORK.

MISCELLANEOUS

TRAFFIC CONDITIONS MAY NECESSITATE CHANGES IN THE USE AND/OR QUANTITIES OF THE TRAFFIC CONTROL DEVICES AS SHOWN IN THE PLANS OR IN THE STANDARDS. ANY SUCH CHANGES ARE SUBJECT TO APPROVAL BY THE ENGINEER.

ALL CHANNELIZING DEVICES PROVIDED ON THIS PROJECT SHALL BE IN GOOD CONDITION AND SHALL BE APPROVED FOR USE ON THIS PROJECT BY THE ENGINEER.

THE REGULATORY SPEED LIMITS THROUGH THE WORK ZONE MAY BE ADJUSTED AT THE DISCRETION OF THE ENGINEER WITH THE DOCUMENTED APPROVAL OF THE DIVISION ENGINEER IN ACCORDANCE WITH TITLE 47 OF THE OKLAHOMA MOTOR VEHICLE LAWS.

THE TERMINATION AREA EXTENDS FROM THE DOWNSTREAM END OF THE WORK AREA TO THE TEMPORARY TRAFFIC CONTROL DEVICE SUCH AS "END ROAD WORK" SIGNS, IF POSTED, A SPEED SIGN, OR OTHER SIGNS MAY BE USED TO INFORM ROAD USERS THAT THEY CAN RESUME NORMAL OPERATIONS.

THE CONSTRUCTION SIGNING AND BARRICADE CONTRACTOR SHOULD AFFIX THEIR COMPANY NAME AND/OR LOGO INCONSPICUOUSLY ON EACH TRAFFIC CONTROL DEVICE.



APPROVED BY TRAFFIC ENGINEER: *Shelf Gray* DATE: 3/21/11

TRAFFIC STANDARD
 TRAFFIC CONTROL STANDARD
 TRAFFIC CONTROL CONSTRUCTION NOTES

2009 SPECIFICATIONS

TCS1-1	01
T-501	

\$\$\$date\$\$\$

DESCRIPTION	REVISIONS	DATE
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TAPER LENGTH CRITERIA FOR WORK ZONES

SPEED LIMIT M.P.H.	*L* FORMULA	*L* TAPER LENGTH (MINIMUM) (FT)			NUMBER OF CHANNELIZING DEVICES REQUIRED (MINIMUM)			SPACING CHANNELIZING DEVICES (MAXIMUM)		MAXIMUM HORIZONTAL ALIGNMENT THRU DETOUR (DEGREE) (S=0)	SPEED LIMIT M.P.H.
		10' OFFSET	11' OFFSET	12' OFFSET	10' OFFSET	11' OFFSET	12' OFFSET	① THRU TAPER SECTION (FT.)	② THRU TANGENT SECTION (FT.)		
20	$L = \frac{W \times S^2}{60}$	70	75	80	5	5	5	20	40	—	20
25		105	115	125	6	6	6	25	50	—	25
30		150	165	180	6	7	7	30	60	15	30
35		205	225	245	7	8	8	35	70	11	35
40	$L = W \times S$	265	295	320	8	9	9	40	80	8	40
45		450	495	540	11	12	13	45	90	6	45
50		500	550	600	11	12	13	50	100	5	50
55		550	605	660	12	14	15	50	100	4	55
60		600	660	720	13	15	16	50	100	3	60
65		650	715	780	14	16	17	50	100	2.5	65
70		700	770	840	15	17	18	50	100	2	70
75		750	825	900	16	18	19	50	100	1.8	75

NOTES:

① RECOMMENDED SIGNING TO BE USED THRU LANE TAPER IS (1) CW1-8 ON EVERY OTHER DRUM.

② RECOMMENDED SIGNING TO BE USED THRU TANGENT LANES IS (1) R4-7A(R) OR (1) R4-7A(L) (AS APPLIES) ON EVERY OTHER DRUM.

L = TAPER LENGTH IN FEET
W = WIDTH OF OFFSET IN FEET
S = POSTED SPEED OR OFF-PEAK 85 PERCENTILE SPEED IN MPH

TYPE OF TAPER
UPSTREAM TAPERS
MERGING TAPER
SHIFTING TAPER
SHOULDER TAPER
TWO-WAY TRAFFIC TAPER

TAPER LENGTH
L MINIMUM
1/2 L MINIMUM
1/3 L MINIMUM
100 FEET MAXIMUM

DOWNSTREAM TAPERS
(USE IS OPTIONAL)
100 FEET PER LANE

FLARE RATES FOR CONCRETE MEDIAN BARRIER IN TEMPORARY TRAFFIC CONTROL ZONES

SPEED *	FLARE RATE (MINIMUM)
40 M.P.H.	9 TO 1
45 M.P.H.	10 TO 1
50 M.P.H.	11 TO 1
55 M.P.H.	12 TO 1
60 M.P.H.	13 TO 1
65 M.P.H.	14 TO 1
70 M.P.H.	15 TO 1
75 M.P.H.	16 TO 1

* POSTED SPEED LIMIT PRIOR TO CONSTRUCTION

PAVEMENT MARKINGS THROUGH TEMPORARY TRAFFIC CONTROL ZONE

	DRIVING SURFACE	FLEX TAB MARKERS	TAPE (REMOVABLE)	TAPE (NON-REMOVABLE)	PAINT	CONSTRUCTION ZONE PAVEMENT MARKERS
	EXISTING PAVEMENT TO BE LEFT IN PLACE THRU THE NEXT PHASE	X	X			X
	INTERMEDIATE LIFT	X	X	X	X	X
	MILLED SURFACE	X	X	X	X	X
	FINAL LIFT	X	X			
CONCRETE	EXISTING PAVEMENT TO BE REMOVED OR OVERLAYED IN THE NEXT PHASE	X	X	X	X	X
	EXISTING PAVEMENT TO BE LEFT IN PLACE THRU THE NEXT PHASE	X	X			X
	FINAL SURFACE	X	X		X	X

NOTE: USE OF NON-REMOVABLE TAPE (FOILBACK) SHALL BE LIMITED TO THOSE CONDITIONS SHOWN IN THE TABLE.

RECOMMENDED CLEAR ZONE DISTANCE (FT) (CONSTRUCTION WORK ZONES)

DESIGN SPEED	DESIGN ADT	FILL SLOPES			CUT SLOPES		
		6:1 OR FLATTER	5:1 OR 4:1	3:1	3:1	4:1 OR 5:1	6:1 OR FLATTER
40 MPH OR LESS	UNDER 750	4	4	SEE NOTE 3	4	4	4
	750-1500	5	6		5	5	5
	1500-6000	6	7		6	6	6
	OVER 6000	7	8		7	7	7
45-50 MPH	UNDER 750	5	6		4	4	5
	750-1500	7	8		5	6	7
	1500-6000	8	10		6	7	8
	OVER 6000	10	12		7	9	10
55 MPH	UNDER 750	6	7		4	5	5
	750-1500	8	10		5	7	8
	1500-6000	10	12	7	8	10	
	OVER 6000	11	13	8	10	11	
60 MPH	UNDER 750	8	10	5	6	7	
	750-1500	10	13	6	8	10	
	1500-6000	13	16 *	7	9	12	
	OVER 6000	15	18 *	10	12	13	
65-70 MPH	UNDER 750	9	10	5	7	7	
	750-1500	12	14	6	9	10	
	1500-6000	14	17 *	8	11	13	
	OVER 6000	15	19 *	11	13	14	

NOTES:

* THE CLEAR ZONE MAY BE LIMITED TO 15 FEET FOR PRACTICALITY AND TO PROVIDE A CONSISTENT ROADWAY TEMPLATE.

(1) ALL DISTANCES ARE MEASURED FROM EDGE OF THE TRAVEL LANE.

(2) FOR CLEAR ZONES, THE "DESIGN ADT" WILL BE THE TOTAL ADT ON TWO-WAY ROADWAYS AND DIRECTIONAL ADT ON ONE-WAY ROADWAYS (E.G., RAMPS AND ONE ROADWAY OF A DIVIDED HIGHWAY).

(3) FILL SLOPES WHICH ARE 3:1 OR STEEPER ARE CRITICAL AND MAY REQUIRE A BARRIER. THEREFORE THERE IS NOT A CLEAR ZONE APPLICATION.

STOPPING SIGHT DISTANCE AS A FUNCTION OF SPEED

SPEED * (MPH)	LENGTH (FEET)
20 M.P.H.	115
25 M.P.H.	155
30 M.P.H.	200
35 M.P.H.	250
40 M.P.H.	305
45 M.P.H.	360
50 M.P.H.	425
55 M.P.H.	495
60 M.P.H.	570
65 M.P.H.	645
70 M.P.H.	730
75 M.P.H.	820

* POSTED SPEED, OFF-PEAK 85th PERCENTILE SPEED PRIOR TO WORK STARTING, OR THE ANTICIPATED OPERATING SPEED.

RECOMMENDED DISTANCE BETWEEN SIGNS (MIN.)

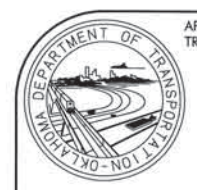
ROAD TYPE	A (FT)	B (FT)	C (FT)
URBAN (LOW SPEED)	100	100	100
URBAN (HIGH SPEED)	350	350	350
RURAL	500	500	500
EXPRESSWAY /FREEWAY	1,000	1,500	2,640

CROSSOVER CRITERIA FOR WORK ZONES

WIDTH OF MEDIAN (W) (FT)	LATERAL SHIFT - (P) (FT)	LENGTH OF CROSSOVER - LC * (FT)											
		V.	30 M.P.H.	35 M.P.H.	40 M.P.H.	45 M.P.H.	50 M.P.H.	55 M.P.H.	60 M.P.H.	65 M.P.H.	70 M.P.H.	75 M.P.H.	
		D.	15°	11°	8°	6°	5°	4°	3°	2.5°	2°	1.8°	
20	32	R.	382	521	716	955	1146	1433	1910	2292	2865	3183	
30	42		219	256	301	348	382	427	493	541	605	637	
40	52		250	293	344	398	437	489	565	619	692	730	
50	62		277	325	382	443	485	543	628	688	770	812	
60	72		301	354	417	483	529	593	685	751	841	886	
70	82		324	381	448	519	570	638	738	809	905	955	
80	92		344	405	478	554	608	681	787	863	966	1,018	
90	102		363	428	505	586	643	720	833	914	1,023	1,078	
100	112		381	450	531	616	676	758	877	962	1,076	1,135	
110	122		398	470	555	644	708	793	918	1,007	1,127	1,189	
120	132		414	489	578	672	738	827	958	1,050	1,176	1,240	
			429	508	601	698	767	860	995	1,092	1,223	1,290	

* CROSSOVER = REVERSE CURVE CONNECTION TYING TWO (2) PARALLEL ROADWAYS.

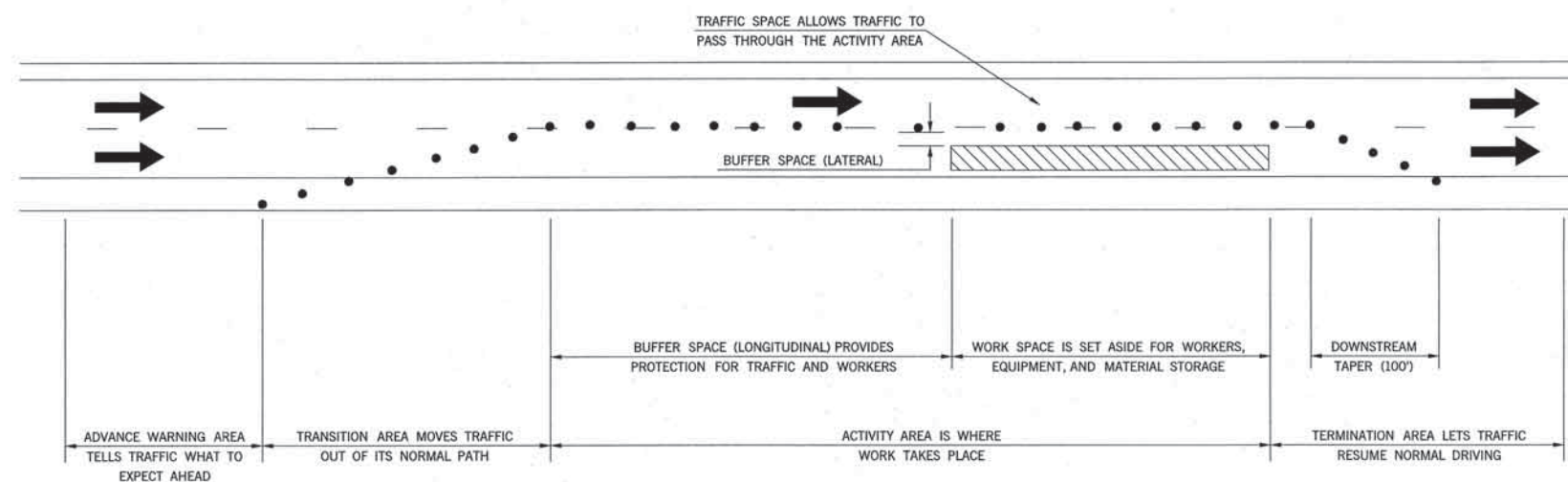
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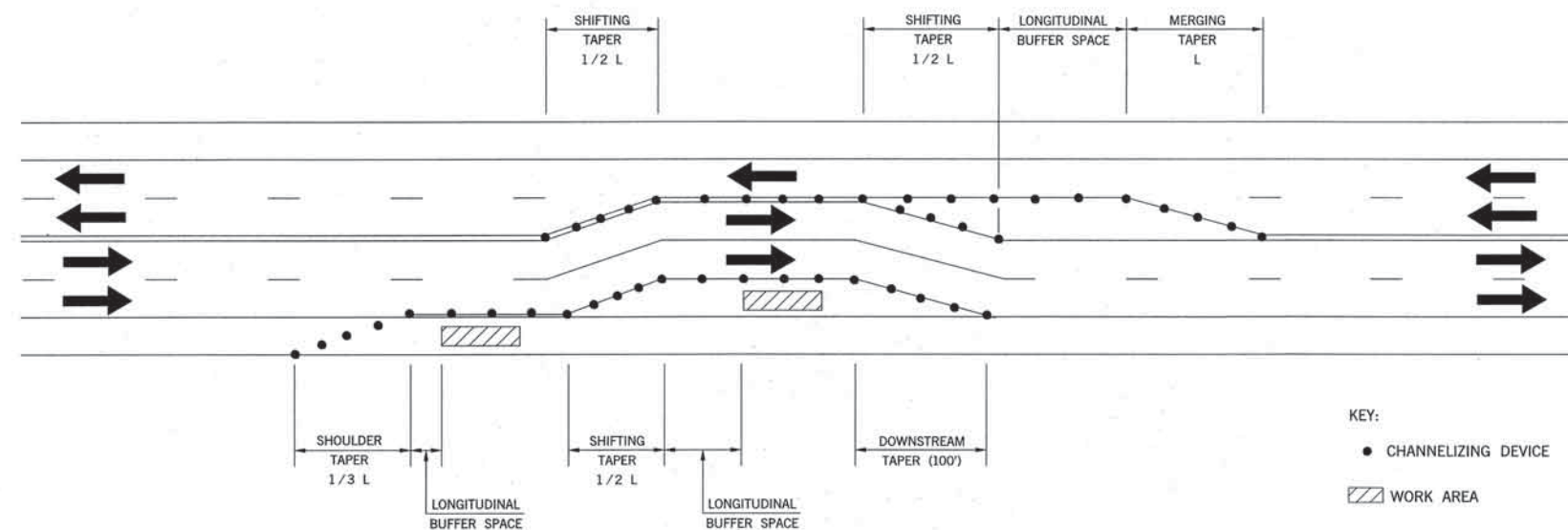
APPROVED BY TRAFFIC ENGINEER: *David Smith* DATE: 6/23/10

**TRAFFIC STANDARD
TRAFFIC CONTROL STANDARD
TRAFFIC CONTROL TABLES AND CHARTS**

DESCRIPTION	REVISIONS	DATE
CHANGED TRANSITION NOTATION		5/31/2011



COMPONENT PARTS OF A TEMPORARY TRAFFIC CONTROL ZONE



TAPERS AND BUFFER SPACE

TEMPORARY TRAFFIC CONTROL ELEMENTS



APPROVED BY TRAFFIC ENGINEER: *[Signature]* DATE: 5/31/2011

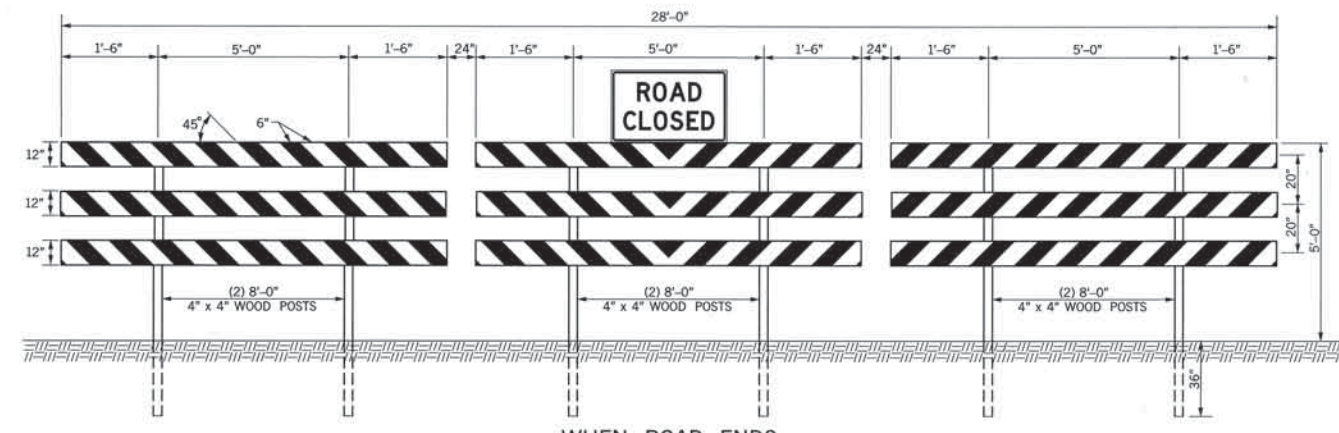
TRAFFIC STANDARD
TRAFFIC CONTROL STANDARD
TEMPORARY TRAFFIC CONTROL ELEMENTS

2009 SPECIFICATIONS

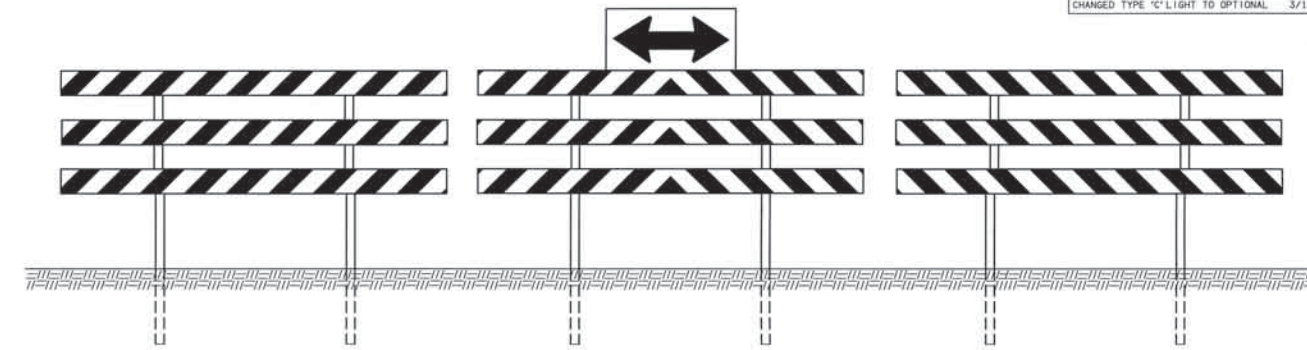
TCS3-1	01
T-503	

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DESCRIPTION	REVISIONS	DATE
CHANGED TYPE 'C' LIGHT TO OPTIONAL		3/15/2011



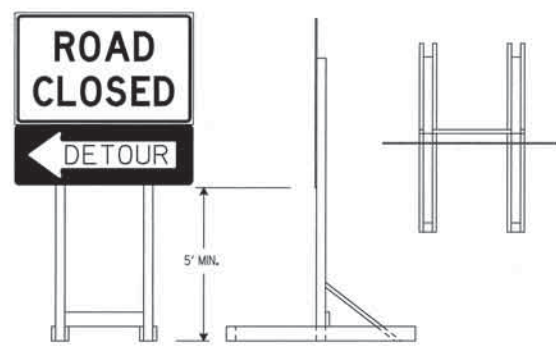
WHEN ROAD ENDS
PERMANENT TYPE III(A/B) BARRICADE
(DIMENSIONS ARE TYPICAL FOR BOTH BARRICADES)



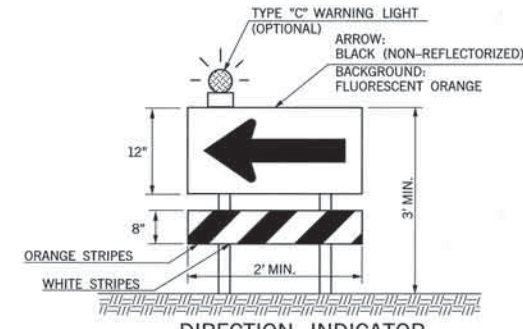
FOR T-INTERSECTIONS

NOTES: A PERMANENT BARRICADE TYPE III(A) SHALL CONSIST OF NINE (9) PANELS AND SIX (6) POSTS.
TYPICAL INSTALLATION AS SHOWN IS FOR AN ABSOLUTE CLOSURE.
BARRICADES SHOULD NOT BE PLACED PARALLEL TO TRAFFIC IF NOT OUTSIDE OF CLEAR ZONE.

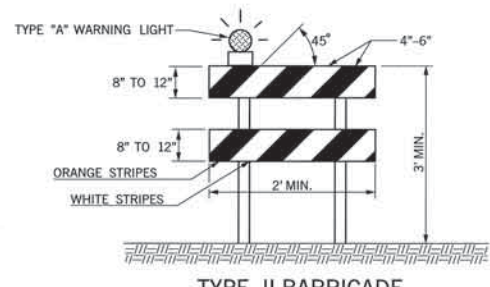
PERMANENT BARRICADE TYPE III(B) WILL BE IDENTICAL TO TYPE III(A) WITH NINE (9) ADDITIONAL REFLECTORIZED 3/4"x12" LUMBER PANELS ATTACHED TO THE BACK SIDE OF THE BARRICADE.
COLOR: BACKGROUND - WHITE (REFLECTORIZED)
DIAGONAL STRIPES - RED (REFLECTORIZED)



LONG INTERMEDIATE TERM STATIONARY PORTABLE SIGN SUPPORTS
5 Foot Mounting Height
(SKID MOUNTED)
(SHALL BE PLACED BEHIND TYPE III BARRICADE)



DIRECTION INDICATOR BARRICADE



TYPE II BARRICADE

NOTES: FOR WOODEN BARRICADES NOMINAL LUMBER DIMENSIONS WILL BE SATISFACTORY.
FOR RAILS LESS THAN 3 FEET LONG, 4 INCH WIDE STRIPES SHALL BE USED.
TYPE III BARRICADES SHALL BE CONSTRUCTED USING A MINIMUM OF TWO (2) POSTS.
FOR WOODEN BARRICADES, PANEL THICKNESS SHALL NOT EXCEED ONE-HALF INCH (1/2").
BARRICADES SHOULD NOT BE PLACED PARALLEL TO TRAFFIC IF NOT OUTSIDE OF CLEAR ZONE.

PROJECTS WITH WORK LIMITS OF 2.0 MILES OR MORE IN LENGTH WILL REQUIRE THE G20-1A SIGN. THE SIGN (G20-1A) WILL BE REQUIRED ON ONE SIDE OF A 2-LANE ROADWAY AND BOTH SIDES OF A DIVIDED HIGHWAY.
ALL BARRICADE STRIPES SHALL BE RETROREFLECTIVE.
COLOR: BACKGROUND - WHITE (REFLECTORIZED)
DIAGONAL STRIPES - FLUORESCENT ORANGE (REFLECTORIZED)

IF BARRICADES ARE USED TO CHANNELIZE PEDESTRIANS, THERE SHALL BE CONTINUOUS DETECTABLE BOTTOM AND TOP RAILS WITH NO GAPS BETWEEN INDIVIDUAL BARRICADES TO BE DETECTABLE TO USERS OF LONG CANES. THE BOTTOM OF THE BOTTOM RAIL SHALL BE NO HIGHER THAN 6 INCHES ABOVE THE GROUND SURFACE. THE TOP OF THE TOP RAIL SHALL BE NO LOWER THAN 36 INCHES ABOVE THE GROUND SURFACE.

SIGNS MOUNTED ON TYPE III BARRICADES SHOULD NOT COVER MORE THAN 50 PERCENT OF THE TOP TWO RAILS OR 33 PERCENT OF THE TOTAL AREA OF THE THREE RAILS
SIGNS MOUNTED ON BARRICADES, OR OTHER PORTABLE SUPPORTS, SHALL BE NO LESS THAN 1' ABOVE THE TRAVELED WAY.

SANDBAGS MAY BE PLACED ON LOWER PARTS OF THE FRAME OR THE STAYS OF BARRICADES TO PROVIDE THE REQUIRED BALLAST.

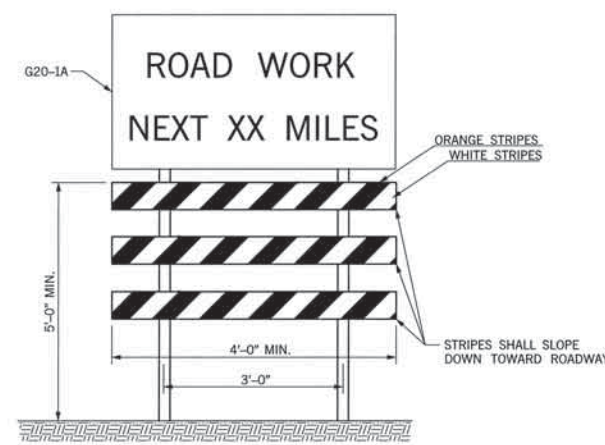
BALLAST SHALL NOT BE PLACED ON TOP OF ANY STRIPED RAIL. BARRICADES SHALL NOT BE BALLASTED BY NONDEFORMABLE OBJECTS SUCH AS ROCKS OR CHUNKS OF CONCRETE. BALLAST SHALL NOT EXTEND INTO THE ACCESSIBLE PASSAGE WIDTH OF 60".

DIRECTION INDICATOR BARRICADE SHALL CONSIST OF A ONE-DIRECTION LARGE ARROW (W1-6) SIGN MOUNTED ABOVE A DIAGONAL STRIPED, HORIZONTALLY ALIGNED, RETROREFLECTIVE RAIL.

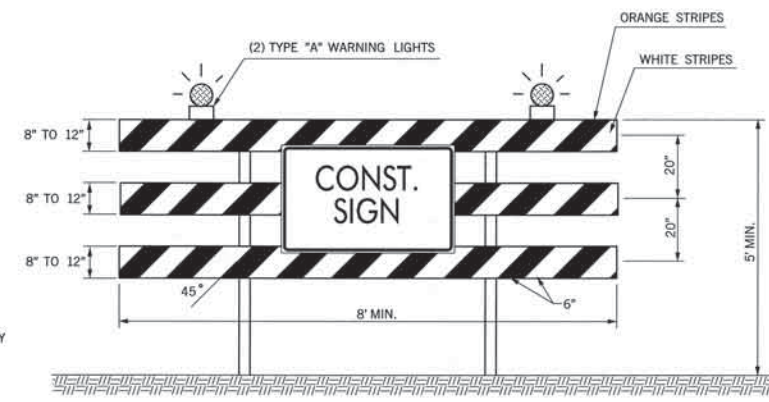
WHERE BARRICADES EXTEND ENTIRELY ACROSS A ROADWAY, THE STRIPES SHOULD SLOPE DOWNWARD IN THE DIRECTION TOWARD WHICH ROAD USERS MUST TURN.

WHERE BOTH RIGHT AND LEFT TURNS ARE PROVIDED, THE BARRICADE STRIPES SHOULD SLOPE DOWNWARD IN BOTH DIRECTIONS FROM THE CENTER OF THE BARRICADE OR BARRICADES.

WHERE NO TURNS ARE INTENDED, THE STRIPES SHOULD BE POSITIONED TO SLOPE DOWNWARD TOWARD THE CENTER OF THE BARRICADE OR BARRICADES.

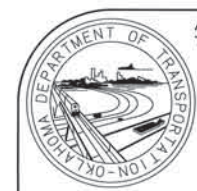


WING BARRICADE



TYPE III BARRICADE

BASIS OF PAYMENT		
ITEM NO.	ITEM	UNIT
880(B)	CONSTRUCTION SIGNS	SD
880(C)	CONSTRUCTION BARRICADES	SD
880(E)	WARNING LIGHTS	SD



APPROVED BY TRAFFIC ENGINEER: *[Signature]* DATE: 3/21/11

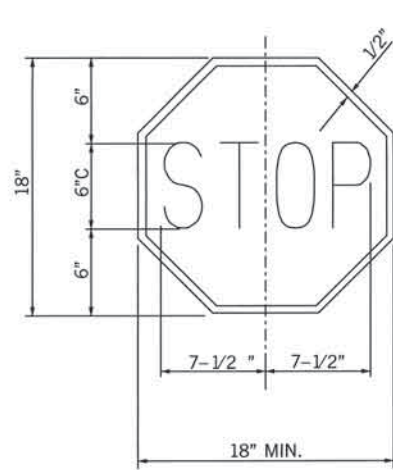
TRAFFIC STANDARD
TRAFFIC CONTROL STANDARD
TRAFFIC CONTROL DEVICES

2009 SPECIFICATIONS

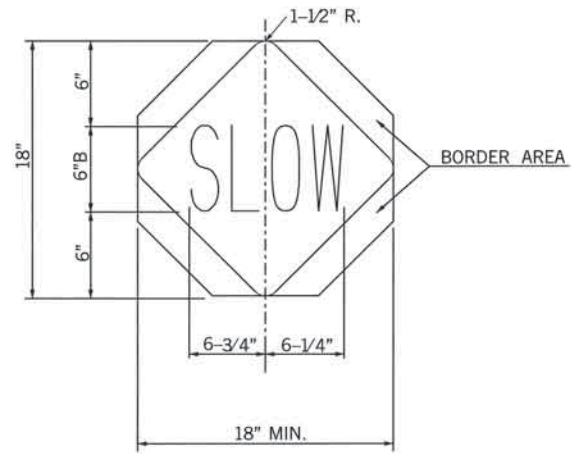
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DESCRIPTION	REVISIONS	DATE

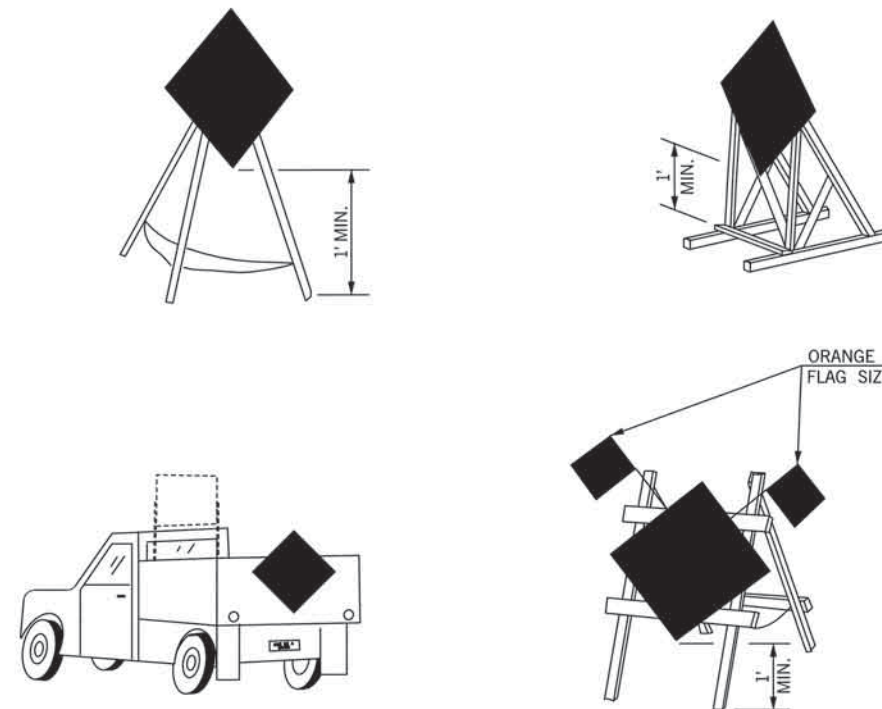


STOP:
 LEGEND AND BORDER: WHITE (REFLECTORIZED)
 BACKGROUND: RED (REFLECTORIZED)



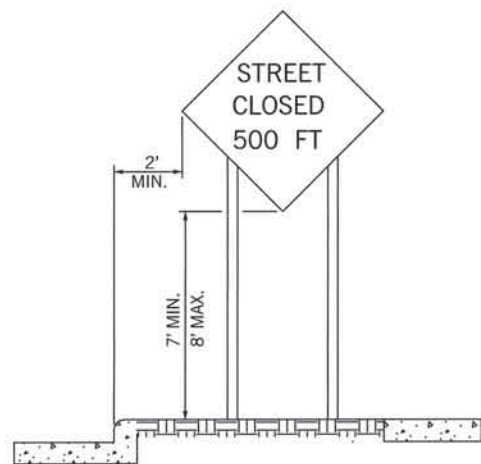
SLOW:
 LEGEND AND BORDER AREA: BLACK (NON-REFLECTORIZED)
 BACKGROUND: ORANGE (REFLECTORIZED)

STOP-SLOW PADDLE

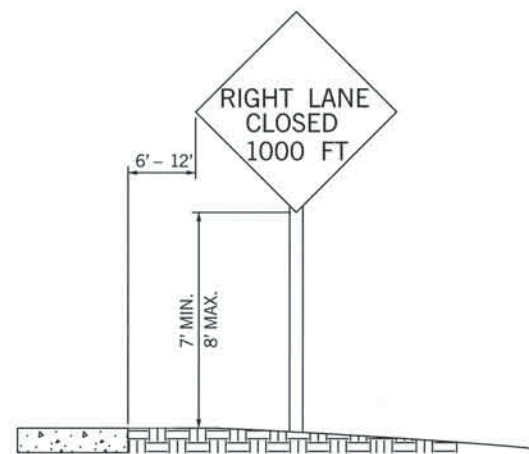


NOTE:
 THE BOTTOM OF SIGNS MOUNTED
 ON BARRICADES OR TEMPORARY
 SUPPORTS SHALL NOT BE LESS THAN
 1 FOOT ABOVE THE TRAVELED WAY.

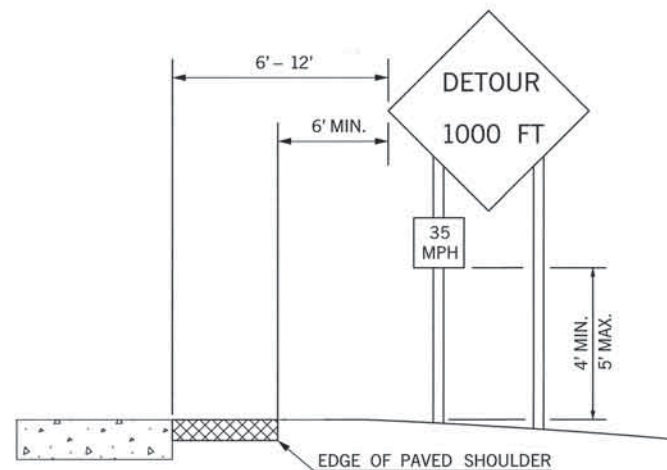
**PORTABLE AND TEMPORARY MOUNTINGS
 METHODS OF MOUNTING SIGNS OTHER THAN ON POSTS**



**URBAN DISTRICT
 (WITH CURB)**



**URBAN DISTRICT
 (WITHOUT CURB)**



**RURAL DISTRICT WITH
 ADVISORY SPEED PLATE**



RURAL DISTRICT

HEIGHT AND LATERAL LOCATIONS OF SIGNS – TYPICAL INSTALLATIONS



APPROVED BY
 TRAFFIC ENGINEER: *David G. Smith* DATE: 6/23/10

TRAFFIC STANDARD

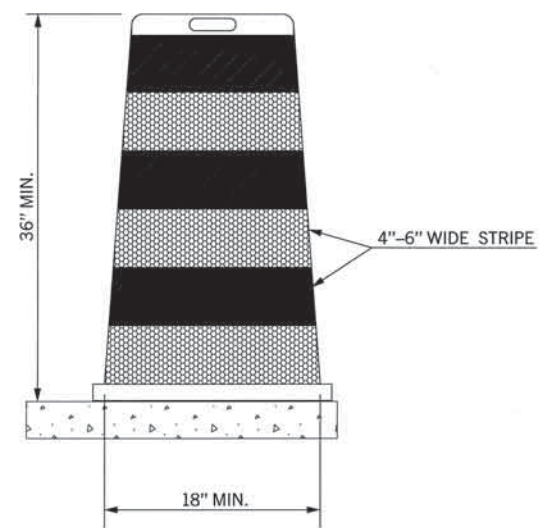
TRAFFIC CONTROL STANDARD
 TYPICAL SIGN INSTALLATION

2009 SPECIFICATIONS

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T-505

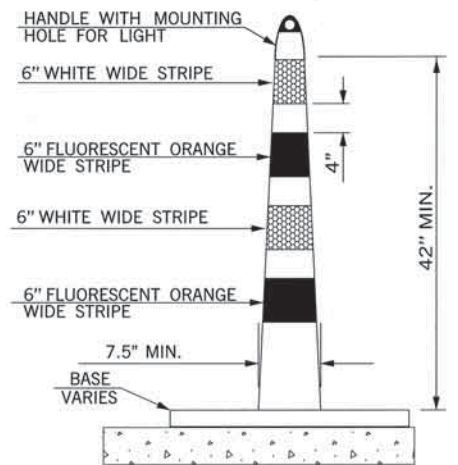
DESCRIPTION	REVISIONS	DATE
ADD NOTE TO VERTICAL PANEL		07/19/10
CHANGED TYPE "C" LIGHT TO OPTIONAL		3/15/2011



DRUM

NOTES:

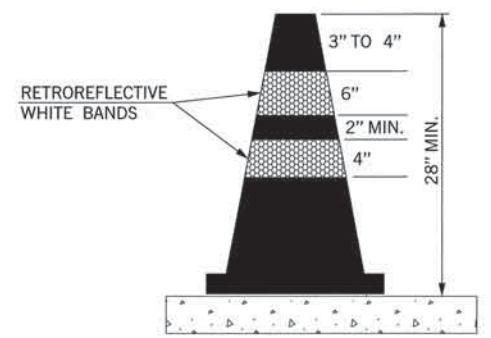
METAL DRUMS SHALL NOT BE USED.
 EACH DRUM SHALL HAVE A MINIMUM OF TWO (2) FLUORESCENT ORANGE STRIPES ALTERNATING WITH A MINIMUM OF TWO (2) WHITE STRIPES. THESE STRIPES SHALL CONSIST OF RETROREFLECTIVE SHEETING.
 BALLAST SHALL NOT BE PLACED ON TOP OF A DRUM.
 DRUMS SHALL NOT BE USED TO DELINEATE AN EDGE DROP OFF IF THEY MUST BE PLACED IN THE DROP OFF AREA BELOW THE LEVEL OF THE DRIVING SURFACE.



CHANNELIZER CONE

NOTES:

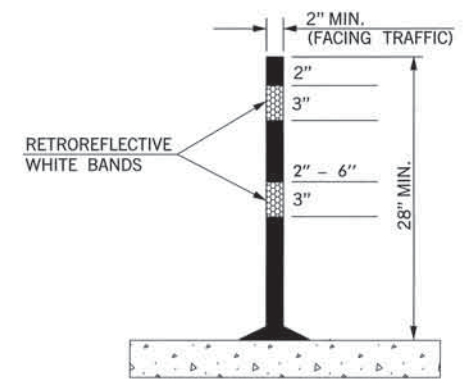
CHANNELIZER CONES USED ON HIGH SPEED ROADWAYS, ON ALL HIGHWAYS DURING NIGHTTIME, OR WHENEVER MORE CONSPICUOUS GUIDANCE IS NEEDED SHALL BE A MINIMUM OF 42 INCHES HIGH.
 EACH CHANNELIZER CONES SHALL HAVE A MINIMUM OF TWO (2) FLUORESCENT ORANGE STRIPES ALTERNATING WITH A MINIMUM OF TWO (2) WHITE STRIPES. THESE STRIPES SHALL CONSIST OF RETROREFLECTIVE SHEETING.
 BASE SHALL WEIGH 30 LBS. OR MORE.



CONE

NOTES:

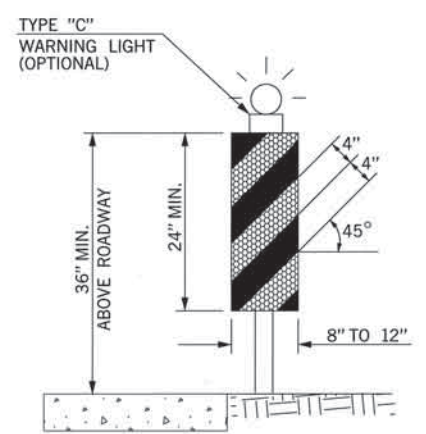
CONES USED ON HIGH SPEED ROADWAYS, ON ALL HIGHWAYS DURING NIGHTTIME, OR WHENEVER MORE CONSPICUOUS GUIDANCE IS NEEDED SHALL BE A MINIMUM OF 28 INCHES HIGH.
 CONES SHALL BE PREDOMINANTLY ORANGE, WITH WHITE RETROREFLECTIVE SHEETING.



TUBE CHANNELIZER

NOTES:

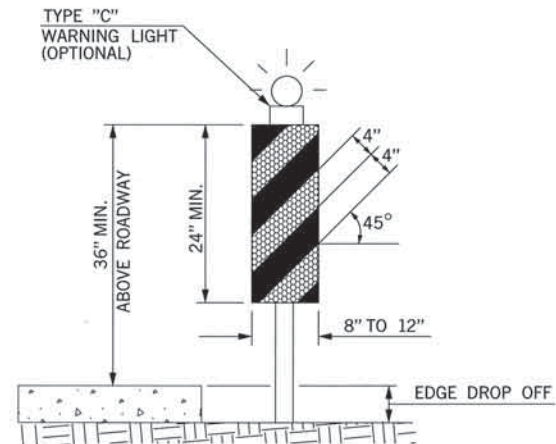
TUBE CHANNELIZERS USED ON HIGH SPEED ROADWAYS, ON ALL HIGHWAYS DURING NIGHTTIME, OR WHENEVER MORE CONSPICUOUS GUIDANCE IS NEEDED SHALL BE A MINIMUM OF 28 INCHES HIGH.
 TUBE CHANNELIZERS SHALL BE PREDOMINANTLY ORANGE, WITH WHITE RETROREFLECTIVE SHEETING.



**VERTICAL PANEL
W/O DROP OFF**

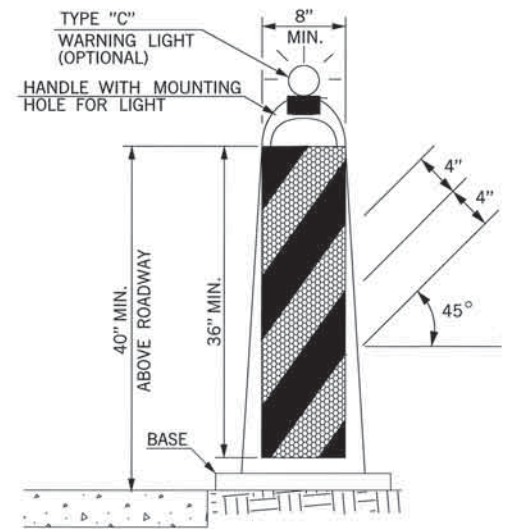
NOTES:

PANEL STRIPE WIDTHS SHALL BE 6 INCHES EXCEPT WHERE PANEL LENGTHS ARE LESS THAN 36 INCHES, THEN 4 INCH WIDE STRIPES MAY BE USED.
 MARKINGS FOR VERTICAL PANELS SHALL BE ALTERNATING FLUORESCENT ORANGE AND WHITE RETROREFLECTORIZED STRIPES (SLOPING DOWNWARD AT AN ANGLE OF 45 DEGREES IN THE DIRECTION TRAFFIC IS TO PASS).
 SHALL HAVE A MINIMUM OF TWO (2) FULL FLUORESCENT ORANGE STRIPES.



**VERTICAL PANEL
W/DROP OFF**

ON UNDIVIDED HIGHWAYS, VERTICAL PANELS SHALL HAVE A MINIMUM OF 192 SQUARE INCHES OF RETROREFLECTIVE SHEETING ON EACH PANEL (FRONT AND BACK). WHEN USED ON HIGH SPEED ROADWAYS, VERTICAL PANELS SHALL HAVE MINIMUM OF 270 SQUARE INCHES OF RETROREFLECTIVE SHEETING ON EACH PANEL (FRONT AND BACK). THIS SHALL CONSTITUTE ONE (1) COMPLETE VERTICAL PANEL.
 ON DIVIDED HIGHWAYS A VERTICAL PANEL MAY HAVE SHEETING ON ONLY ONE SIDE.



STACKABLE VERTICAL PANEL

NOTES:

(1) VERTICAL PANEL SIGNS SHALL BE MOUNTED BACK TO BACK WHEN USED FOR TWO-WAY TRAFFIC.
 (2) BASE SHALL BE NO LARGER THAN 28" LONG BY 20" WIDE, AND 2" THICK.
 (3) BASE SHALL WEIGHT 30 LBS. OR MORE.
 (4) THESE DEVICES SHALL BE CONSTRUCTED OF A MATERIAL THAT CAN BE STRUCK WITHOUT DAMAGING VEHICLES ON IMPACT.

KEY:

	FLUORESCENT ORANGE (REFLECTORIZED)
	WHITE (REFLECTORIZED)

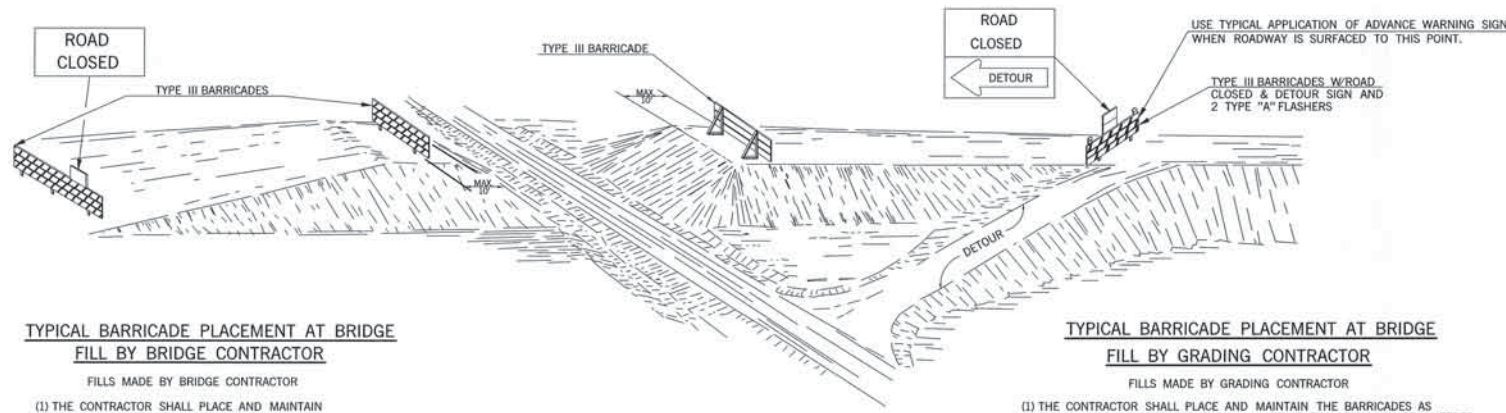
BASIS OF PAYMENT		
ITEM NO.	ITEM	UNIT
880(D)	VERTICAL PANEL	SD
880(E)	WARNING LIGHTS	SD
880(F)	DRUMS	SD
880(G)	TUBE CHANNELIZERS	SD
880(H)	CONES	SD
880(I)	CHANNELIZER CONES	SD



APPROVED BY TRAFFIC ENGINEER: *[Signature]* DATE: 3/21/11

TRAFFIC STANDARD
CHANNELIZING DEVICES

\$\$\$date\$\$\$

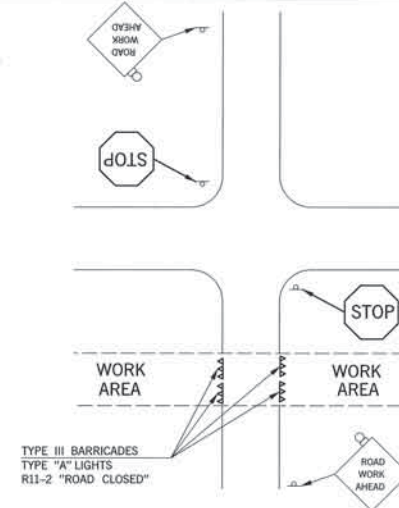


TYPICAL BARRICADE PLACEMENT AT BRIDGE FILL BY BRIDGE CONTRACTOR

- FILLS MADE BY BRIDGE CONTRACTOR
- (1) THE CONTRACTOR SHALL PLACE AND MAINTAIN THE BARRICADES AS SHOWN UNTIL THEY ARE NO LONGER NEEDED.
 - (2) THE CONTRACTOR SHALL NOTIFY THE ENGINEER PRIOR TO REMOVAL OF THE BARRICADES.
 - (3) THE ENGINEER SHALL NOTIFY THE GRADING CONTRACTOR TO FURNISH AND ERECT HIS BARRICADES "IMMEDIATELY" AFTER THE BRIDGE CONTRACTOR REMOVES HIS BARRICADES. THE GRADING CONTRACTOR SHALL MAINTAIN HIS BARRICADES UNTIL FINAL INSPECTION OR UNTIL THEY ARE NO LONGER NEEDED.
 - (4) BARRICADES AT BRIDGE FILL SHALL BE IN PLACE AND MAINTAINED AT ALL TIMES UNTIL OPENED TO TRAFFIC. HOWEVER, BARRICADES MAY BE REMOVED OR ADJUSTED, AS NEEDED, TO ALLOW ACCESS TO THE WORK AREA.

TYPICAL BARRICADE PLACEMENT AT BRIDGE FILL BY GRADING CONTRACTOR

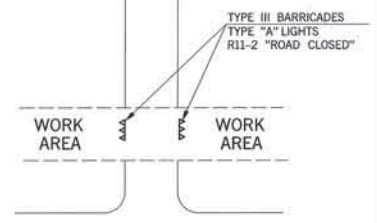
- FILLS MADE BY GRADING CONTRACTOR
- (1) THE CONTRACTOR SHALL PLACE AND MAINTAIN THE BARRICADES AS SHOWN UNTIL FINAL INSPECTION OR UNTIL THEY ARE NO LONGER NEEDED.
 - (2) THE CONTRACTOR SHALL NOTIFY THE ENGINEER PRIOR TO REMOVAL OF THE BARRICADES.
 - (3) IF THE BRIDGE WORK ORDER IS ISSUED PRIOR TO COMPLETION OF THE GRADING CONTRACT, THE BRIDGE CONTRACTOR SHALL MAKE ARRANGEMENTS WITH THE GRADING CONTRACTOR TO ASSUME RESPONSIBILITY FOR PROTECTION OF THE BRIDGE WORK AREA. THIS WILL INCLUDE FURNISHING, INSTALLING, AND MAINTAINING ALL BARRICADES AND SIGNS NECESSARY TO PROVIDE THAT PROTECTION UNTIL THE BRIDGE IS COMPLETED AND THE FINAL INSPECTION IS COMPLETED.
 - (4) IF THE BRIDGE WORK ORDER HAS NOT BEEN ISSUED PRIOR TO THE FINAL INSPECTION OF THE GRADING, THEN THE GRADING CONTRACTOR SHALL MAKE ARRANGEMENTS WITH THE OKLAHOMA DEPARTMENT OF TRANSPORTATION FOR STATE FORCES TO SUPPLY, INSTALL AND MAINTAIN ANY NECESSARY TRAFFIC CONTROL DEVICES NEEDED TO PROTECT THE WORK AREA. THESE STATE OWNED DEVICES SHALL REMAIN IN PLACE UNTIL SUCH TIME THAT THE BRIDGE WORK ORDER IS ISSUED. AT THAT TIME THE BRIDGE CONTRACTOR SHALL ASSUME RESPONSIBILITY FOR TRAFFIC CONTROL AND REPLACE THE STATE OWNED DEVICES WITH HIS OWN.
 - (5) SUFFICIENT NUMBER OF TYPE II BARRICADES WITH SIGNS SHALL BE USED TO COMPLETELY CLOSE THE WORK AREA TO THROUGH TRAFFIC.
 - (6) BARRICADES AT BRIDGE FILL SHALL BE IN PLACE AND MAINTAINED AT ALL TIMES UNTIL OPENED TO TRAFFIC. HOWEVER, BARRICADES MAY BE REMOVED OR ADJUSTED, AS NEEDED, TO ALLOW ACCESS TO THE WORK AREA.



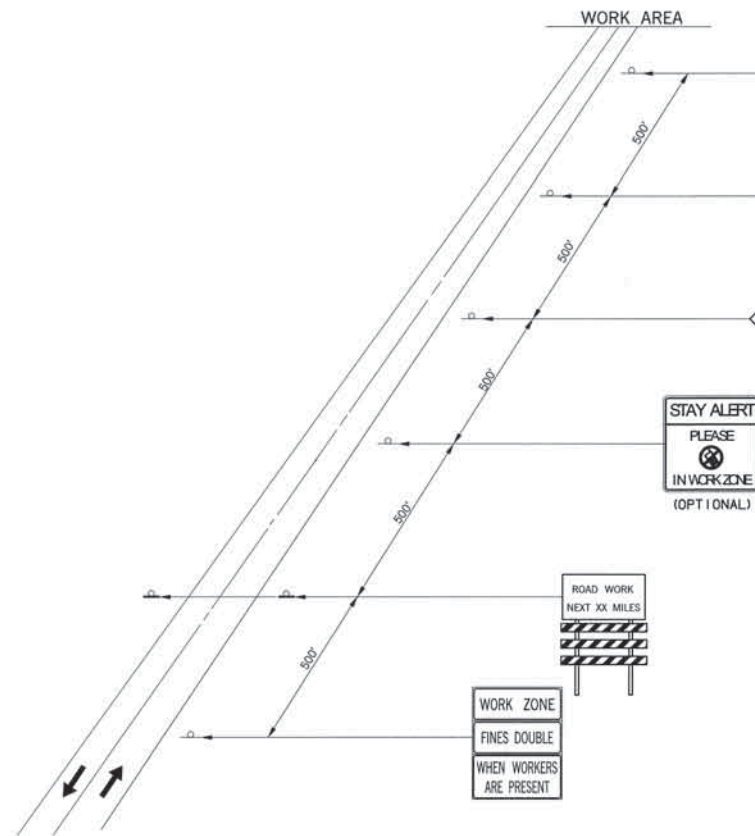
TYPICAL SIGN PLACEMENT FOR INTERSECTING ROADS AND STREETS

DESCRIPTION	REVISIONS	DATE
MODIFIED NOTE		3/16/2011
ADD "NO CELL PHONE" USAGE IN WORK ZONE DISTANCE SIGN TO WARNING SIGNS		4/2/2013

- NOTES:
- (1) SIGNS SHOWN FOR ONE DIRECTION OF TRAVEL ONLY.
 - (2) FLASHING WARNING LIGHTS SHALL BE USED TO CALL ATTENTION TO THE EARLY WARNING SIGNS.
 - (3) WARNING LIGHTS SHOULD BE USED TO MARK CHANNELIZING DEVICES AT NIGHT AS NEEDED.
 - (4) PLACEMENT OF TYPE III BARRICADES SHALL BE APPROVED BY THE ENGINEER.
 - (5) TYPE II BARRICADES, DRUMS AND/OR VERTICAL PANELS MAY BE SUBSTITUTED FOR TYPE III BARRICADES TO AVOID OBSTRUCTING THE MOTORIST'S VIEW.
 - (6) IF TWO OR MORE DRIVEWAYS ARE IN CLOSE PROXIMITY, THE BARRICADES BETWEEN THE DRIVEWAYS MAY BE OMITTED AT THE DISCRETION OF THE ENGINEER.
 - (7) THE "ROAD WORK AHEAD" SIGN, WHICH SERVES AS A GENERAL WARNING OF OBSTRUCTIONS OR RESTRICTIONS, SHALL BE LOCATED ON ALL INTERSECTING ROADS AND STREETS.



TYPICAL SIGN PLACEMENT FOR PRIVATE DRIVE OR RESIDENCE



TYPICAL APPLICATION ADVANCE WARNING SIGNS ON 2-LANE HIGHWAY

TYPICAL CONSTRUCTION WARNING SIGNS WITH MESSAGES OTHER THAN DETAILED ON STANDARD DRAWINGS SHALL BE CONSTRUCTED USING THE LARGEST POSSIBLE LETTER SIZE. SIGN SIZE AND COLOR SHALL BE THE SAME AS OTHER CONSTRUCTION WARNING SIGNS USED FOR SIMILAR CONDITIONS.

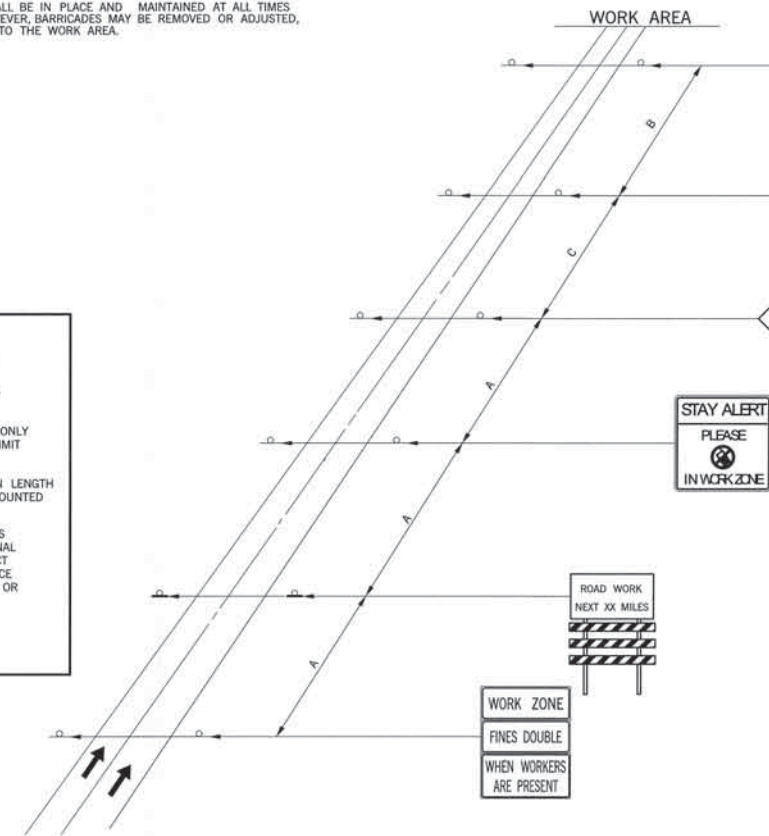
FINES DOUBLE IN WORK ZONE SIGNS ARE TO BE USED ONLY ON STATE OR FEDERAL HIGHWAYS WHERE THE SPEED LIMIT IS REDUCED OR AS DIRECTED BY THE ENGINEER.

PROJECTS WITH WORK LIMITS OF 1.0 MILES OR MORE IN LENGTH WILL REQUIRE THE Q20-1A SIGN. THE SIGN SHALL BE MOUNTED AS SHOWN ON TCS4-1 (LATEST REVISION).

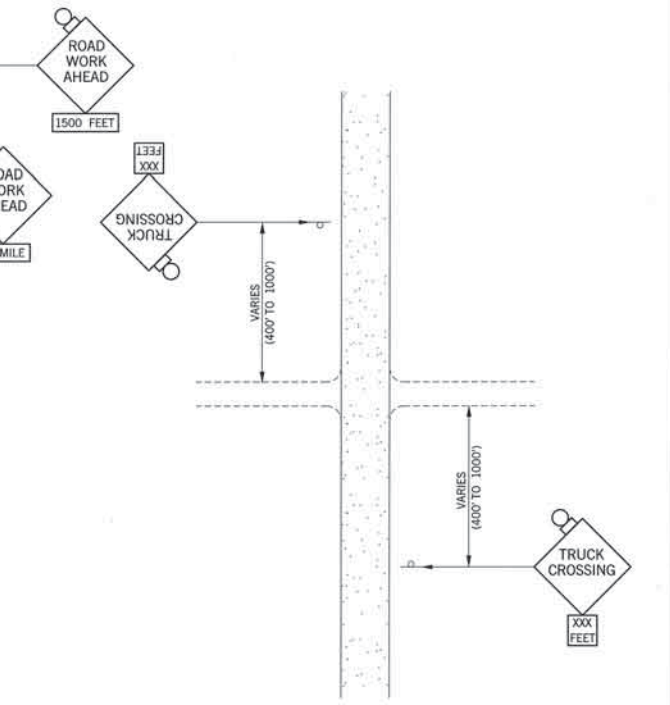
WARNING SIGNS SHOWN ARE "ADVANCE" WARNING SIGNS AND ARE REQUIRED ON ALL STATE HIGHWAYS. ADDITIONAL WARNING SIGNS MAY BE REQUIRED WITHIN THE PROJECT LIMITS TO WARN DRIVERS OF SPECIFIC HAZARDS. ADVANCE "WARNING SIGNS" MAY CHANGE AS CONDITIONS CHANGE OR AS DIRECTED BY THE ENGINEER.

PROJECT WORK OF 1.0 MILE OR MORE IN LENGTH WILL REQUIRE SIGNS CS-14 AND R2-1 TO BE PLACED EVERY 1/2 MILE THROUGH WORK ZONE.

ROAD TYPE	DISTANCE BETWEEN SIGNS SHALL BE A (MIN.)		
	A (FT)	B (FT)	C (FT)
URBAN (LOW SPEED)	100	100	100
URBAN (HIGH SPEED)	350	350	350
RURAL	500	500	500
EXPRESSWAY /FREEWAY	1,000	1,500	2,640



TYPICAL APPLICATION ADVANCE WARNING SIGNS ON A DIVIDED HIGHWAY



TYPICAL APPLICATION ADVANCE SIGNING WHERE TRUCKS ARE CROSSING



APPROVED BY TRAFFIC ENGINEER: *David S. ...* DATE: 4/18/2013

TRAFFIC STANDARD TRAFFIC CONTROL STANDARD PLACEMENT OF ADVANCE WARNING SIGNS

2009 SPECIFICATIONS

TCS7-1	02
	T-507

SSdateSS



ROAD CLOSED

R11-2 48 x 30 10.00 SF

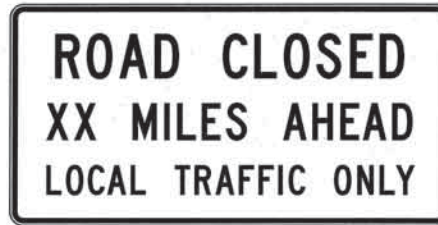
COLOR:
LEGEND AND BORDER:
BLACK (NON-REFLECTORIZED)
BACKGROUND:
WHITE (REFLECTORIZED)



LANE CLOSED

R11-2(LANE) 48 x 30 10.00 SF

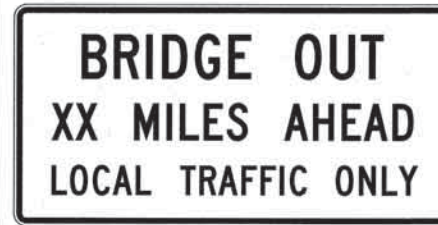
COLOR:
LEGEND AND BORDER:
BLACK (NON-REFLECTORIZED)
BACKGROUND:
WHITE (REFLECTORIZED)



ROAD CLOSED XX MILES AHEAD

R11-3a 60 x 30 12.50 SF

COLOR:
LEGEND AND BORDER:
BLACK (NON-REFLECTORIZED)
BACKGROUND:
WHITE (REFLECTORIZED)



BRIDGE OUT XX MILES AHEAD

R11-3b 60 x 30 12.50 SF

COLOR:
LEGEND AND BORDER:
BLACK (NON-REFLECTORIZED)
BACKGROUND:
WHITE (REFLECTORIZED)



ROAD CLOSED TO THRU TRAFFIC

R11-4 60 x 30 12.50 SF

COLOR:
LEGEND AND BORDER:
BLACK (NON-REFLECTORIZED)
BACKGROUND:
WHITE (REFLECTORIZED)



DETOUR SIGN

M4-8 24 x 12 2.00 SF
M4-8E 30 x 15 3.13 SF

COLOR:
LEGEND AND BORDER:
BLACK (NON-REFLECTORIZED)
BACKGROUND:
FLUORESCENT ORANGE
(REFLECTORIZED)



DETOUR SIGN

M4-9(R) 30 x 24 5.00 SF
M4-9(R)E 48 x 36 12.00 SF
M4-9(R)F 60 x 48 20.00 SF

COLOR:
LEGEND AND BORDER:
BLACK (NON-REFLECTORIZED)
BACKGROUND:
FLUORESCENT ORANGE
(REFLECTORIZED)



DETOUR SIGN

M4-9(L) 30 x 24 5.00 SF
M4-9(L)E 48 x 36 12.00 SF
M4-9(L)F 60 x 48 20.00 SF

COLOR:
LEGEND AND BORDER:
BLACK (NON-REFLECTORIZED)
BACKGROUND:
FLUORESCENT ORANGE
(REFLECTORIZED)



DETOUR SIGN

M4-9(V) 30 x 24 5.00 SF
M4-9(V)E 48 x 36 12.00 SF
M4-9(V)F 60 x 48 20.00 SF

COLOR:
LEGEND AND BORDER:
BLACK (NON-REFLECTORIZED)
BACKGROUND:
FLUORESCENT ORANGE
(REFLECTORIZED)



DETOUR SIGN

M4-10(R) 48 x 18 6.00 SF

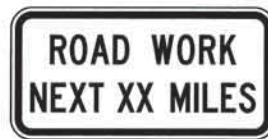
COLOR:
LEGEND AND BORDER:
BLACK (NON-REFLECTORIZED)
BACKGROUND:
FLUORESCENT ORANGE
(REFLECTORIZED)



DETOUR SIGN

M4-10(L) 48 x 18 6.00 SF

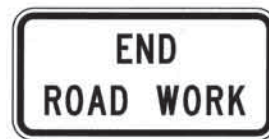
COLOR:
LEGEND AND BORDER:
BLACK (NON-REFLECTORIZED)
BACKGROUND:
FLUORESCENT ORANGE
(REFLECTORIZED)



ROAD WORK NEXT XX MILES SIGN

G20-1A 36 x 18 4.50 SF

COLOR:
LEGEND AND BORDER:
BLACK (NON-REFLECTORIZED)
BACKGROUND:
FLUORESCENT ORANGE
(REFLECTORIZED)



END ROAD WORK SIGN

G20-2A 36 x 18 4.50 SF

COLOR:
LEGEND AND BORDER:
BLACK (NON-REFLECTORIZED)
BACKGROUND:
FLUORESCENT ORANGE
(REFLECTORIZED)



PILOT CAR FOLLOW ME SIGN

G20-4 36 x 18 4.50 SF

COLOR:
LEGEND AND BORDER:
BLACK (NON-REFLECTORIZED)
BACKGROUND:
FLUORESCENT ORANGE
(REFLECTORIZED)

NOTES:
WORD SIGNS MAY BE USED IF SYMBOL SIGNS ARE NOT AVAILABLE EITHER IN "STANDARD HIGHWAY SIGNS MANUAL" OR IN THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (MUTCD) (CURRENT EDITION).

ALL DIAMOND SHAPE CONSTRUCTION WARNING SIGNS SHALL BE 48 INCHES X 48 INCHES UNLESS OTHERWISE NOTED IN THE PLANS.

BASIS OF PAYMENT		
ITEM NO.	ITEM	UNIT
880(B)	CONSTRUCTION SIGNS	SD



APPROVED BY
TRAFFIC ENGINEER: *David Gandy* DATE: 3/21/11

TRAFFIC STANDARD
TRAFFIC CONTROL STANDARD
CONSTRUCTION SIGNS

2009 SPECIFICATIONS

TCS9-1 01
T-509

TRFPC36 M:\2009 Standards TC\1510.dgn 8:27:40 AM 6/23/2010 R:\TRAF PLOT\eroy.pen R:\TRAF PLOT\bw.cb



TURN LEFT

W1-1(L) 48 x 48 16.00 SF

COLOR:
SYMBOL AND BORDER:
BLACK (NON-REFLECTORIZED)
BACKGROUND:
FLUORESCENT ORANGE
(REFLECTORIZED)



TURN RIGHT

W1-1(R) 48 x 48 16.00 SF

COLOR:
SYMBOL AND BORDER:
BLACK (NON-REFLECTORIZED)
BACKGROUND:
FLUORESCENT ORANGE
(REFLECTORIZED)



CURVE LEFT

W1-2(L) 48 x 48 16.00 SF

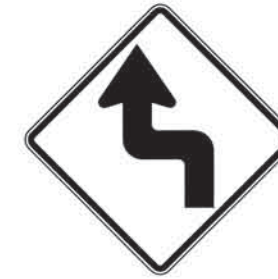
COLOR:
SYMBOL AND BORDER:
BLACK (NON-REFLECTORIZED)
BACKGROUND:
FLUORESCENT ORANGE
(REFLECTORIZED)



CURVE RIGHT

W1-2(R) 48 x 48 16.00 SF

COLOR:
SYMBOL AND BORDER:
BLACK (NON-REFLECTORIZED)
BACKGROUND:
FLUORESCENT ORANGE
(REFLECTORIZED)



LEFT REVERSE TURN

W1-3(L) 48 x 48 16.00 SF

COLOR:
SYMBOL AND BORDER:
BLACK (NON-REFLECTORIZED)
BACKGROUND:
FLUORESCENT ORANGE
(REFLECTORIZED)



RIGHT REVERSE TURN

W1-3(R) 48 x 48 16.00 SF

COLOR:
SYMBOL AND BORDER:
BLACK (NON-REFLECTORIZED)
BACKGROUND:
FLUORESCENT ORANGE
(REFLECTORIZED)



LEFT REVERSE CURVE

W1-4(L) 48 x 48 16.00 SF

COLOR:
SYMBOL AND BORDER:
BLACK (NON-REFLECTORIZED)
BACKGROUND:
FLUORESCENT ORANGE
(REFLECTORIZED)



RIGHT REVERSE CURVE

W1-4(R) 48 x 48 16.00 SF

COLOR:
SYMBOL AND BORDER:
BLACK (NON-REFLECTORIZED)
BACKGROUND:
FLUORESCENT ORANGE
(REFLECTORIZED)



LEFT REVERSE CURVE

W1-4B(L) 48 x 48 16.00 SF

COLOR:
SYMBOL AND BORDER:
BLACK (NON-REFLECTORIZED)
BACKGROUND:
FLUORESCENT ORANGE
(REFLECTORIZED)



RIGHT REVERSE CURVE

W1-4B(R) 48 x 48 16.00 SF

COLOR:
SYMBOL AND BORDER:
BLACK (NON-REFLECTORIZED)
BACKGROUND:
FLUORESCENT ORANGE
(REFLECTORIZED)



LEFT REVERSE CURVE

W1-4C(L) 48 x 48 16.00 SF

COLOR:
SYMBOL AND BORDER:
BLACK (NON-REFLECTORIZED)
BACKGROUND:
FLUORESCENT ORANGE
(REFLECTORIZED)



RIGHT REVERSE CURVE

W1-4C(R) 48 x 48 16.00 SF

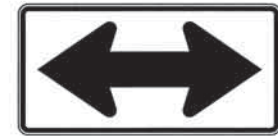
COLOR:
SYMBOL AND BORDER:
BLACK (NON-REFLECTORIZED)
BACKGROUND:
FLUORESCENT ORANGE
(REFLECTORIZED)



ARROW

W1-6 48 x 24 8.00 SF
W1-6E 60 x 30 12.50 SF

COLOR:
SYMBOL AND BORDER:
BLACK (NON-REFLECTORIZED)
BACKGROUND:
FLUORESCENT ORANGE
(REFLECTORIZED)



DOUBLE ARROW

W1-7 48 x 24 8.00 SF
W1-7E 60 x 30 12.50 SF

COLOR:
SYMBOL AND BORDER:
BLACK (NON-REFLECTORIZED)
BACKGROUND:
FLUORESCENT ORANGE
(REFLECTORIZED)

DESCRIPTION	REVISIONS	DATE

NOTES:
WORD SIGNS MAY BE USED IF SYMBOL SIGNS ARE NOT AVAILABLE EITHER IN "STANDARD HIGHWAY SIGNS MANUAL" OR IN THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (MUTCD) (CURRENT EDITION).

ALL DIAMOND SHAPE CONSTRUCTION WARNING SIGNS SHALL BE 48 INCHES X 48 INCHES UNLESS OTHERWISE NOTED IN THE PLANS.

* SUPPLEMENTAL SIGNS SHALL ONLY BE USED IN CONJUNCTION WITH DIAMOND SHAPE CONSTRUCTION WARNING SIGNS. THE SIZE OF SUPPLEMENTAL SIGNS SHALL BE APPROPRIATE FOR USE WITH A 48 INCH X 48 INCH WARNING SIGN UNLESS OTHERWISE NOTED IN THE PLANS.

BASIS OF PAYMENT		
ITEM NO.	ITEM	UNIT
880(B)	CONSTRUCTION SIGNS	SD



APPROVED BY
TRAFFIC ENGINEER: *David J. Smith* DATE: 6/23/10

TRAFFIC STANDARD

TRAFFIC CONTROL STANDARD
CONSTRUCTION SIGNS

2009 SPECIFICATIONS

TCS10-1 00
T-510

DESCRIPTION	REVISIONS	DATE



ROAD WORK SIGN

W20-1 48 x 48 16.00 SF
 COLOR:
 LEGEND AND BORDER:
 BLACK (NON-REFLECTORIZED)
 BACKGROUND:
 FLUORESCENT ORANGE (REFLECTORIZED)



DETOUR SIGN

W20-2 48 x 48 16.00 SF
 COLOR:
 LEGEND AND BORDER:
 BLACK (NON-REFLECTORIZED)
 BACKGROUND:
 FLUORESCENT ORANGE (REFLECTORIZED)



ROAD CLOSED SIGN

W20-3 48 x 48 16.00 SF
 COLOR:
 LEGEND AND BORDER:
 BLACK (NON-REFLECTORIZED)
 BACKGROUND:
 FLUORESCENT ORANGE (REFLECTORIZED)



STREET CLOSED SIGN

W20-3A 48 x 48 16.00 SF
 COLOR:
 LEGEND AND BORDER:
 BLACK (NON-REFLECTORIZED)
 BACKGROUND:
 FLUORESCENT ORANGE (REFLECTORIZED)



ONE LANE ROAD SIGN

W20-4 48 x 48 16.00 SF
 COLOR:
 LEGEND AND BORDER:
 BLACK (NON-REFLECTORIZED)
 BACKGROUND:
 FLUORESCENT ORANGE (REFLECTORIZED)



LEFT LANE CLOSED SIGN

W20-5(L) 48 x 48 16.00 SF
 COLOR:
 LEGEND AND BORDER:
 BLACK (NON-REFLECTORIZED)
 BACKGROUND:
 FLUORESCENT ORANGE (REFLECTORIZED)



RIGHT LANE CLOSED SIGN

W20-5(R) 48 x 48 16.00 SF
 COLOR:
 LEGEND AND BORDER:
 BLACK (NON-REFLECTORIZED)
 BACKGROUND:
 FLUORESCENT ORANGE (REFLECTORIZED)



FLAGGER SIGN

W20-7 48 x 48 16.00 SF
 COLOR:
 LEGEND AND BORDER:
 BLACK (NON-REFLECTORIZED)
 BACKGROUND:
 FLUORESCENT ORANGE (REFLECTORIZED)



FLAGGER SIGN

W20-7a 48 x 48 16.00 SF
 COLOR:
 LEGEND AND BORDER:
 BLACK (NON-REFLECTORIZED)
 BACKGROUND:
 FLUORESCENT ORANGE (REFLECTORIZED)



WORKERS SIGN

W21-1 48 x 48 16.00 SF
 COLOR:
 LEGEND AND BORDER:
 BLACK (NON-REFLECTORIZED)
 BACKGROUND:
 FLUORESCENT ORANGE (REFLECTORIZED)



FRESH OIL SIGN

W21-2 48 x 48 16.00 SF
 COLOR:
 LEGEND AND BORDER:
 BLACK (NON-REFLECTORIZED)
 BACKGROUND:
 FLUORESCENT ORANGE (REFLECTORIZED)



ROAD MACHINERY AHEAD SIGN

W21-3 48 x 48 16.00 SF
 COLOR:
 LEGEND AND BORDER:
 BLACK (NON-REFLECTORIZED)
 BACKGROUND:
 FLUORESCENT ORANGE (REFLECTORIZED)

NOTES:
 WORD SIGNS MAY BE USED IF SYMBOL SIGNS ARE NOT AVAILABLE EITHER IN "STANDARD HIGHWAY SIGNS MANUAL" OR IN THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (MUTCD) (CURRENT EDITION).

ALL DIAMOND SHAPE CONSTRUCTION WARNING SIGNS SHALL BE 48 INCHES X 48 INCHES UNLESS OTHERWISE NOTED IN THE PLANS.

* SUPPLEMENTAL SIGNS SHALL ONLY BE USED IN CONJUNCTION WITH DIAMOND SHAPE CONSTRUCTION WARNING SIGNS. THE SIZE OF SUPPLEMENTAL SIGNS SHALL BE APPROPRIATE FOR USE WITH A 48 INCH x 48 INCH WARNING SIGN UNLESS OTHERWISE NOTED IN THE PLANS.

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BASIS OF PAYMENT		
ITEM NO.	ITEM	UNIT
880(B)	CONSTRUCTION SIGNS	SD



APPROVED BY
 TRAFFIC ENGINEER: *David Smith* DATE: 6/23/10

TRAFFIC STANDARD
 TRAFFIC CONTROL STANDARD
 CONSTRUCTION SIGNS

2009 SPECIFICATIONS

TCS14-1	00
T-514	

DESCRIPTION	REVISIONS	DATE
ADDED NO CELL PHONE USE IN WORK ZONE		4/2/2013



SHOULDER WORK SIGN

W21-5 48 x 48 16.00 SF

COLOR:
LEGEND AND BORDER:
BLACK (NON-REFLECTORIZED)
BACKGROUND:
FLUORESCENT ORANGE (REFLECTORIZED)



SURVEY CREW SIGN

W21-6 48 x 48 16.00 SF

COLOR:
LEGEND AND BORDER:
BLACK (NON-REFLECTORIZED)
BACKGROUND:
FLUORESCENT ORANGE (REFLECTORIZED)



UTILITY WORK AHEAD SIGN

W21-7 48 x 48 16.00 SF

COLOR:
LEGEND AND BORDER:
BLACK (NON-REFLECTORIZED)
BACKGROUND:
FLUORESCENT ORANGE (REFLECTORIZED)



MOWING AHEAD SIGN

W21-8 48 x 48 16.00 SF

COLOR:
LEGEND AND BORDER:
BLACK (NON-REFLECTORIZED)
BACKGROUND:
FLUORESCENT ORANGE (REFLECTORIZED)



BRIDGE REPAIR SIGN

W21-9 48 x 48 16.00 SF

COLOR:
LEGEND AND BORDER:
BLACK (NON-REFLECTORIZED)
BACKGROUND:
FLUORESCENT ORANGE (REFLECTORIZED)



MATERIAL ON SHOULDER SIGN

W21-10 48 x 48 16.00 SF

COLOR:
LEGEND AND BORDER:
BLACK (NON-REFLECTORIZED)
BACKGROUND:
FLUORESCENT ORANGE (REFLECTORIZED)



MATERIAL ON ROADWAY SIGN

W21-11 48 x 48 16.00 SF

COLOR:
LEGEND AND BORDER:
BLACK (NON-REFLECTORIZED)
BACKGROUND:
FLUORESCENT ORANGE (REFLECTORIZED)



BLASTING ZONE AHEAD SIGN

W22-1 48 x 48 16.00 SF

COLOR:
LEGEND AND BORDER:
BLACK (NON-REFLECTORIZED)
BACKGROUND:
FLUORESCENT ORANGE (REFLECTORIZED)



CELL TELEPHONES SIGN

W22-2 36 x 30 7.50 SF
W22-2E 42 x 36 10.50 SF

COLOR:
LEGEND AND BORDER:
BLACK (NON-REFLECTORIZED)
BACKGROUND:
FLUORESCENT ORANGE (REFLECTORIZED)



END BLASTING ZONE SIGN

W22-3 36 x 30 7.50 SF
W22-3E 42 x 36 10.50 SF

COLOR:
LEGEND AND BORDER:
BLACK (NON-REFLECTORIZED)
BACKGROUND:
FLUORESCENT ORANGE (REFLECTORIZED)

NOTES:
WORD SIGNS MAY BE USED IF SYMBOL SIGNS ARE NOT AVAILABLE EITHER IN "STANDARD HIGHWAY SIGNS MANUAL" OR IN THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (MUTCD) (CURRENT EDITION).

ALL DIAMOND SHAPE CONSTRUCTION WARNING SIGNS SHALL BE 48 INCHES X 48 INCHES UNLESS OTHERWISE NOTED IN THE PLANS.

* SUPPLEMENTAL SIGNS SHALL ONLY BE USED IN CONJUNCTION WITH DIAMOND SHAPE CONSTRUCTION WARNING SIGNS. THE SIZE OF SUPPLEMENTAL SIGNS SHALL BE APPROPRIATE FOR USE WITH A 48 INCH X 48 INCH WARNING SIGN UNLESS OTHERWISE NOTED IN THE PLANS.



BORDER
R=1.5"
TH=0.75"
IN=0.75"
NO CELL PHONE WORK ZONE

■ COLOR:
LEGEND AND BORDER:
BLACK (NON-REFLECTORIZED)
BACKGROUND:
FLUORESCENT YELLOW (REFLECTORIZED)

○ COLOR: SYMBOL
LEGEND AND BORDER:
BLACK (NON-REFLECTORIZED)
BACKGROUND:
WHITE (REFLECTORIZED)

▲ COLOR:
LEGEND AND BORDER:
BLACK (NON-REFLECTORIZED)
BACKGROUND:
FLUORESCENT ORANGE (REFLECTORIZED)

BASIS OF PAYMENT

ITEM NO.	ITEM	UNIT
880(B)	CONSTRUCTION SIGNS	SD



APPROVED BY: _____ DATE: _____
TRAFFIC ENGINEER:

TRAFFIC STANDARD
TRAFFIC CONTROL STANDARD
CONSTRUCTION SIGNS

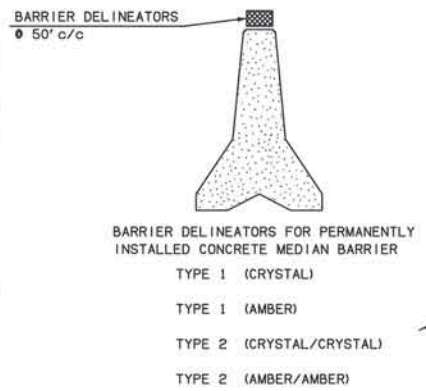
2009 SPECIFICATIONS

TCS15-1 01
T-515

DESCRIPTION	REVISIONS	DATE

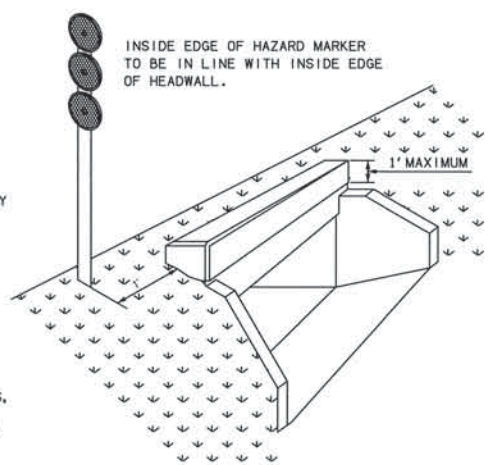
ELIMINATE NORMAL DELINEATOR WHEN CODE 3 IS WITHIN 1/4 SPACING DISTANCE

BARRIER DELINEATOR SHALL BE PLACED AT 50' c/c (MAX). DELINEATOR SHALL HAVE 6" (MIN.) REFLECTIVE AREA. SEE THE 2009 STANDARD SPECIFICATIONS FOR DETAILS. DELINEATOR TO BE INSTALLED AS RECOMMENDED BY THE MANUFACTURER. ALL DELINEATION WILL BE EITHER JD-2/JD-1 MANUFACTURED BY VEGA CORPORATION OR ASTRO OPTICS OR APPROVED EQUAL.

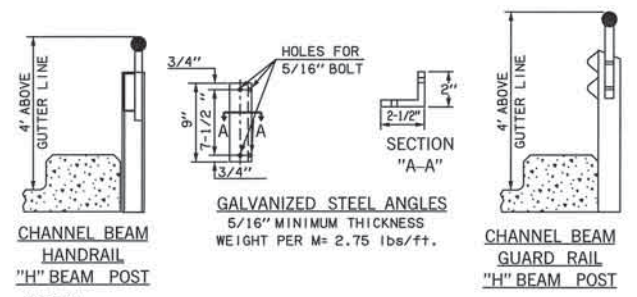
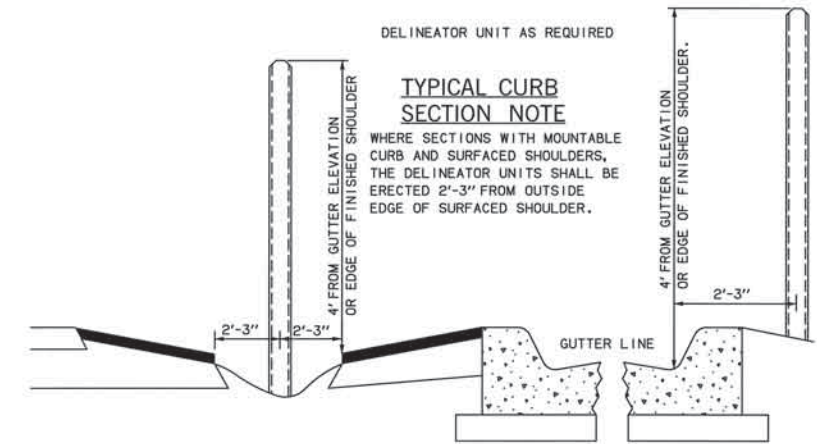


NOTE 1: FASTENING DEVICES MAY BE ALUMINUM BOLTS, NUTS, AND WASHERS OR ALUMINUM OR STEEL FASTENERS UTILIZING A SWEDGED COLLAR OR ALUMINUM OR STEEL BLIND OR PULL RIVETS OF THE SELF PLUGGING TYPE (PULL PIN, CLIPPED FLUSH, REMAINS IN RIVET WHEN FINISHED). ALL NUTS SHALL BE SELF LOCKING.

WHEN HEADWALL IS 2'-3" OR LESS FROM EDGE OF SHOULDER, USE MONODIRECTIONAL CODE 3 AMBER HAZARD MARKER FOR ONE-WAY ROADWAY (NON-EXPRESSWAY) AND FOR TWO-WAY ROADWAY, USE BI-DIRECTIONAL CODE 3 AMBER HAZARD MARKERS PLACED AT APPROACH END OF HEADWALL.

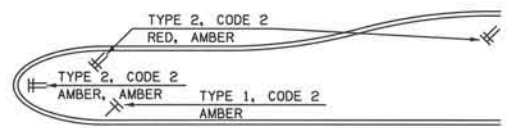


NOTE 3: WHEN BOLTS AND NUTS ARE USED FOR DELINEATOR ASSEMBLIES, THE BOLT ENDS ARE TO BE SUFFICIENTLY DEFORMED TO RESIST VANDALISM. SEE NOTE 1 FOR FASTENING DEVICES.

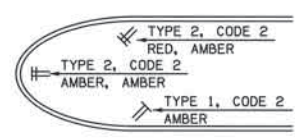


NOTE 2: FOR ATTACHING DELINEATOR POSTS TO GALVANIZED STEEL ANGLES, USE 5/16" X 3/4" GALVANIZED STEEL BOLTS. FOR ATTACHING DELINEATOR POST OR GALVANIZED STEEL ANGLES TO ALUMINUM OR "H" BEAM HANDRAIL POST, USE 5/16" X 1" GALVANIZED STEEL BOLTS. FOR ATTACHING GALVANIZED STEEL ANGLES TO CONCRETE POSTS, USE TWO 5/16" X 2" GALVANIZED STEEL EXPANSION SLEEVES AND WASHERS FOR EACH BOLT.

TYPE 2 DELINEATORS SHALL BE THE SAME AS SHOWN ABOVE EXCEPT THAT REFLECTORS ARE MOUNTED ON BOTH SIDES OF THE POST. COLOR OF THE REFLECTORS SHALL BE IN CONFORMANCE WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, LATEST REVISION.



TYPICAL DELINEATOR PLACEMENT AT MEDIAN OPENINGS



RADIUS IN FEET UP TO AND INCLUDING	SPACING ON CURVE	SPACING IN ADVANCE AND BEYOND CURVES		
		FIRST	SECOND	THIRD
2500'	100'	200'	200'	200'
1000'	90'	150'	200'	200'
900'	85'	150'	200'	200'
800'	80'	150'	200'	200'
700'	75'	100'	200'	200'
600'	70'	100'	150'	200'
500'	65'	75'	125'	200'
400'	55'	50'	100'	200'
300'	50'	50'	100'	175'
250'	40'	50'	100'	150'
200'	35'	30'	50'	125'
150'	30'	20'	50'	90'
50'	20'	20'	50'	90'

ON ONE-WAY ROADWAY (NON-FREWAYS), CONSTRUCT MONO-DIRECTIONAL TYPE 1, CODE 1 DELINEATORS ON OUTSIDE OF CURVES HAVING A RADIUS OF 2500' OR LESS.

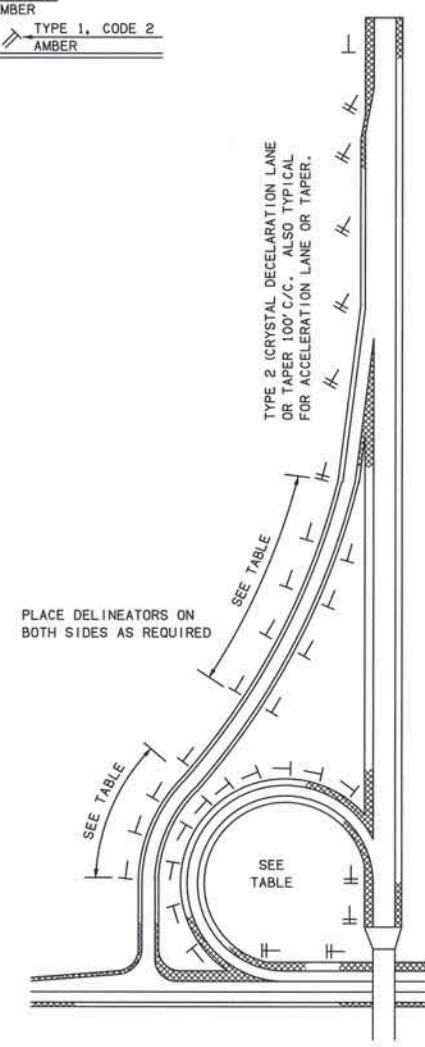
ON TWO-WAY ROADWAYS, CONSTRUCT BI-DIRECTIONAL TYPE 2, CODE 1 DELINEATORS ON OUTSIDE OF CURVES HAVING A RADIUS OF 2500' OR LESS.

ON FREEWAYS, CONSTRUCT MONO-DIRECTIONAL TYPE 1, CODE 1 DELINEATORS ON RIGHT SIDE OF ROADWAYS AT 528' SPACING ON THROUGH LANE.

EXCEPT ON FREEWAYS, DELINEATOR SPACING ON THRU LANE CURVES SHALL BE BASED ON CENTERLINE OF SURVEY OR CONSTRUCTION BASE LINE. PLACEMENT SHALL BE EVENLY SPACED AS REQUIRED IN TABLE.

MATERIALS SPECIFICATIONS

THE WEIGHT OF EACH POST BEFORE GALVANIZING & PUNCHING SHALL BE 1.12 lbs/ft. THE WEIGHT TOLERANCE SHALL BE ±3-1/2%.

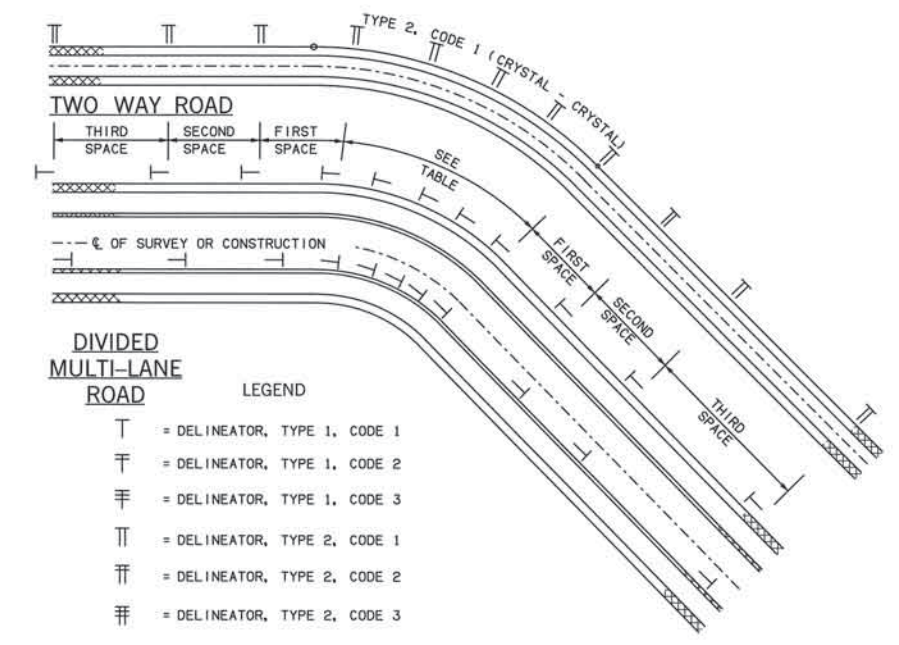


TYPICAL DELINEATOR SPACING FOR INTERCHANGE RAMP

DELINATORS SHALL NORMALLY BE PLACED ON THE RIGHT SIDE OF RAMPS EXCEPT WHEN REQUIRED OUTSIDE OF CURVE.

WHEN RADIUS ON RAMP CURVES IS LESS THAN 2500', DELINEATORS SHALL BE PLACED ON OUTSIDE OF CURVE AND SPACED AS SHOWN ON TABLE FOR "SPACING ON CURVES", OR OMIT DELINEATORS WHEN W1-8 CHEVRON SIGNS ARE SPECIFIED.

MAXIMUM SPACING OF DELINEATORS ON RAMPS SHALL BE 100'.



LENGTH OF CURVE / REQUIRED SPACING + 7 = TOTAL POSTS REQUIRED FOR CURVE AND RUNOUT SPACINGS

BASIS OF PAYMENT		
ITEM NO.	ITEM	UNIT
853	DELINATORS	EA



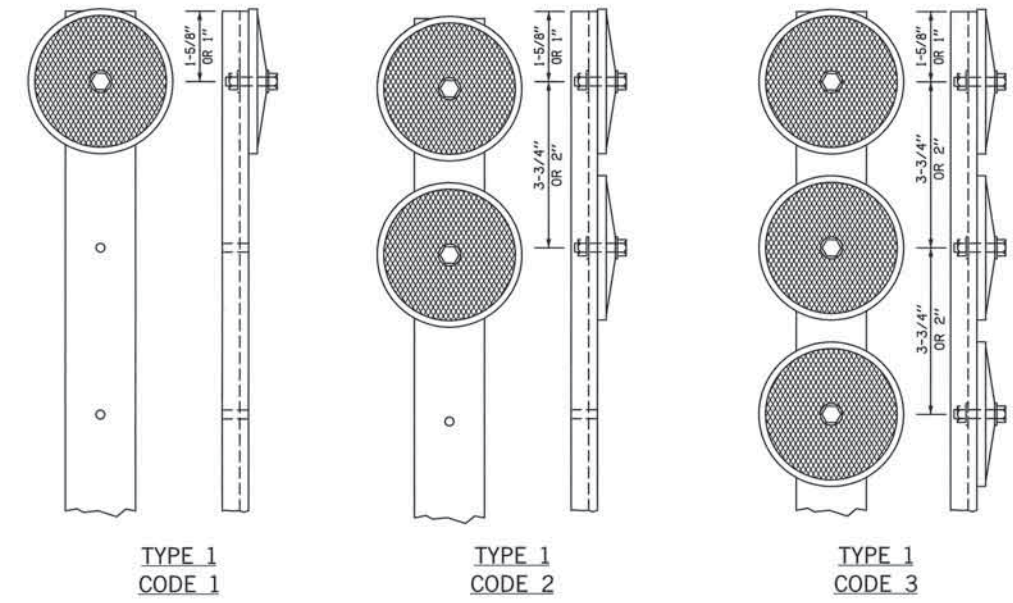
APPROVED BY TRAFFIC ENGINEER: *David J. Smith* DATE: 3/12/2010

TRAFFIC STANDARD
STANDARD DELINEATOR UNITS

2009 SPECIFICATIONS

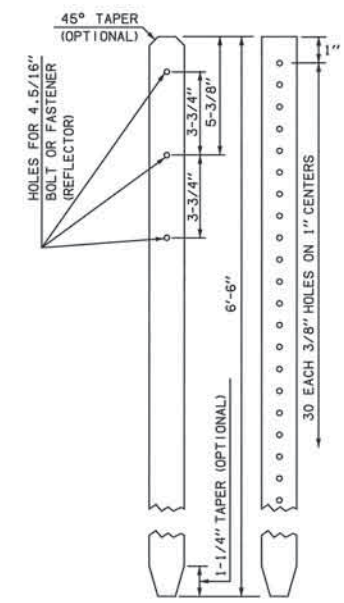
DU1-1	00
T-109	

DESCRIPTION	REVISIONS	DATE



TYPE 1 CODE 1 **TYPE 1 CODE 2** **TYPE 1 CODE 3**

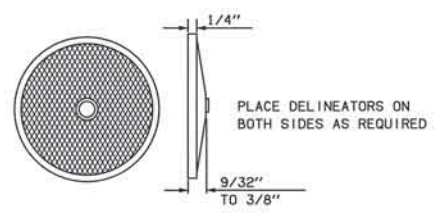
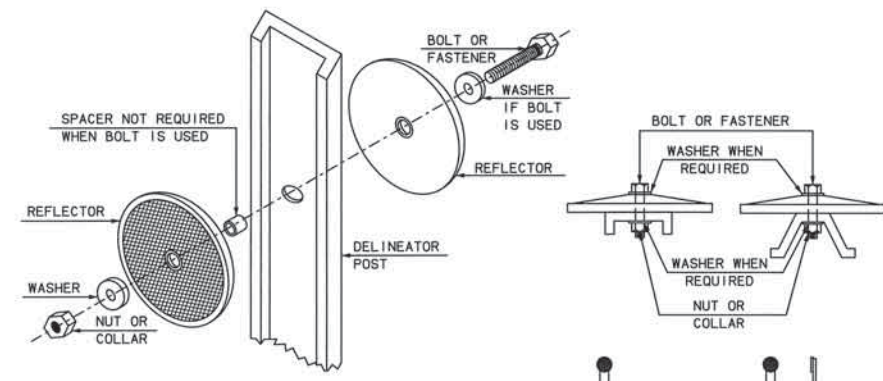
TYPE 2 DELINEATORS SHALL BE THE SAME AS SHOWN ABOVE EXCEPT THAT REFLECTORS ARE MOUNTED ON BOTH SIDES OF THE POST. COLOR OF THE REFLECTORS SHALL BE IN CONFORMANCE WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, LATEST REVISION.



MATERIALS SPECIFICATIONS

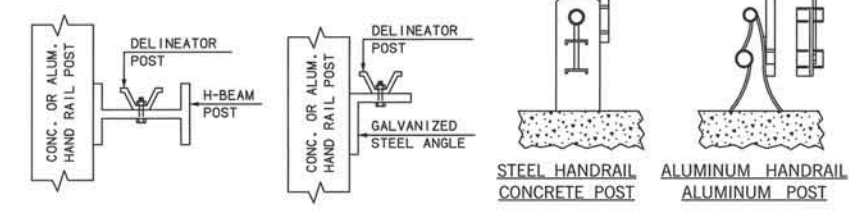
THE WEIGHT OF EACH POST BEFORE GALVANIZING & PUNCHING SHALL BE 1.12 lbs/ft. THE WEIGHT TOLERANCE SHALL BE ±3-1/2%.

NOTE 1:
FASTENING DEVICES MAY BE ALUMINUM BOLTS, NUTS, AND WASHERS OR ALUMINUM OR STEEL FASTENERS UTILIZING A SWEDGED COLLAR OR ALUMINUM OR STEEL BLIND OR PULL RIVETS OF THE SELF PLUGGING TYPE (PULL PIN, CLIPPED FLUSH, REMAINS IN RIVET WHEN FINISHED). ALL NUTS SHALL BE SELF LOCKING.

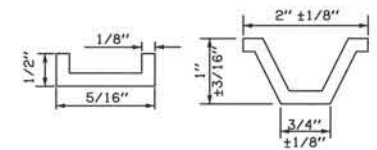


CENTER MOUNT REFLECTOR

NOTE 3:
WHEN BOLTS AND NUTS ARE USED FOR DELINEATOR ASSEMBLIES, THE BOLT ENDS ARE TO BE SUFFICIENTLY DEFORMED TO RESIST VANDALISM. SEE NOTE 1 FOR FASTENING DEVICES.



NOTE 2:
FOR ATTACHING DELINEATOR POSTS TO GALVANIZED STEEL ANGLES, USE 5/16" X 3/4" GALVANIZED STEEL BOLTS. FOR ATTACHING DELINEATORS POST OR GALVANIZED STEEL ANGLES TO ALUMINUM OR "H" BEAM HANDRAIL POST, USE 5/16" X 1" GALVANIZED STEEL BOLTS. FOR ATTACHING GALVANIZED STEEL ANGLES TO CONCRETE POSTS, USE TWO 5/16" X 2" GALVANIZED STEEL EXPANSION SLEEVES AND WASHERS FOR EACH BOLT.



ALTERNATE POST SECTIONS

THE CONTRACTOR MAY USE EITHER TYPE OF POST, BUT ONLY ONE TYPE SHALL BE USED THROUGHOUT THE PROJECT. THE CONTRACTOR SHALL FURNISH THE CORRECT SIZE FASTENING DEVICES AND NECESSARY SPACERS.

BASIS OF PAYMENT		
ITEM NO.	ITEM	UNIT
853	DELINEATORS	EA

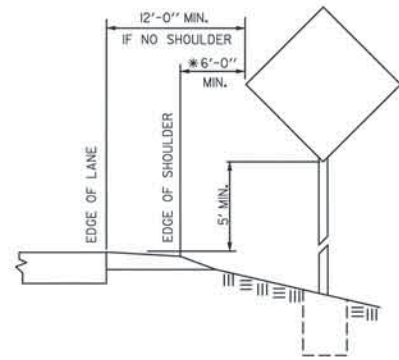


APPROVED BY
TRAFFIC ENGINEER: *[Signature]* DATE: 8/3/2010

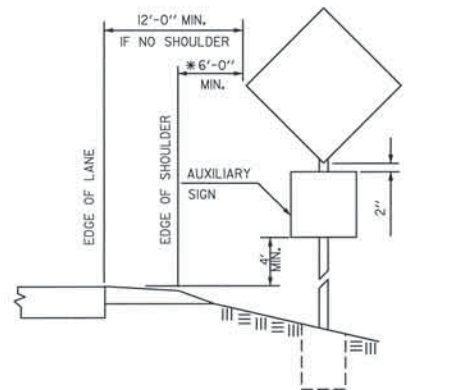
TRAFFIC STANDARD
STANDARD DELINEATOR UNITS

2009 SPECIFICATIONS

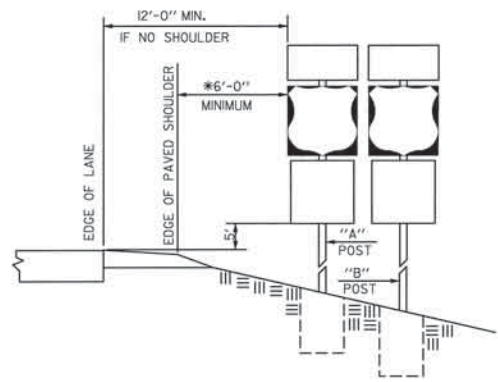
DU2-1	00
T-110	



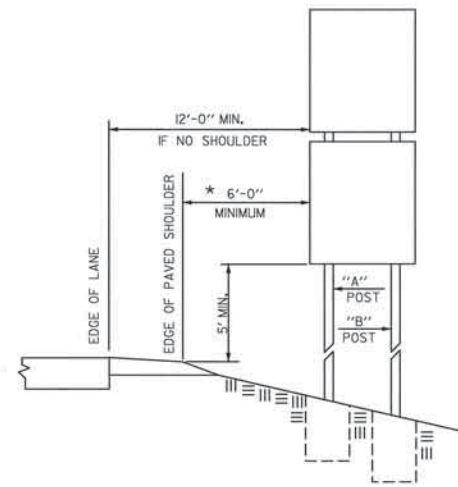
SINGLE POST (RURAL)



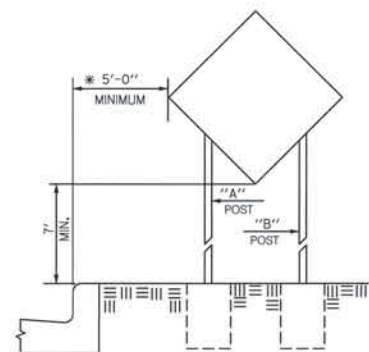
SINGLE POST WITH AUXILIARY SIGN (RURAL)



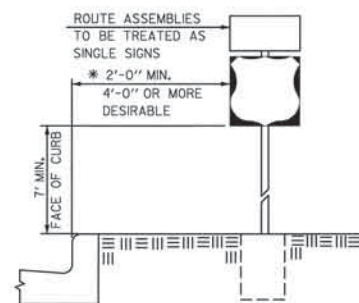
ROADSIDE ASSEMBLY (RURAL)



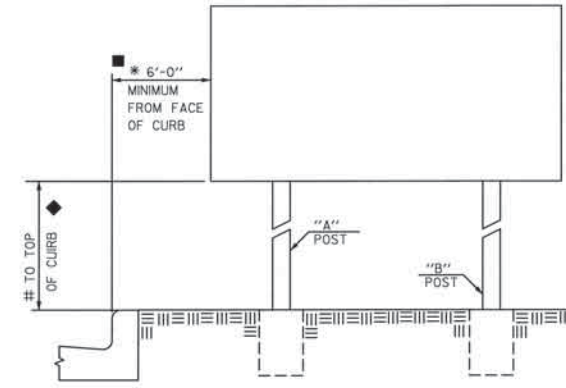
DOUBLE POST MAXIMUM & MINIMUM SPEED LIMIT SIGNS (RURAL)



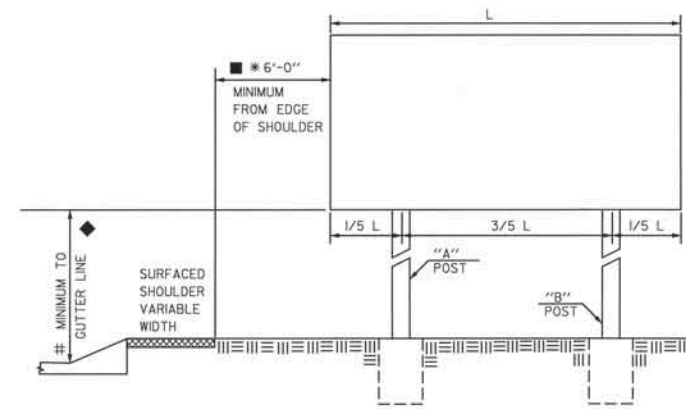
BUSINESS, COMMERCIAL OR RESIDENTIAL AREA



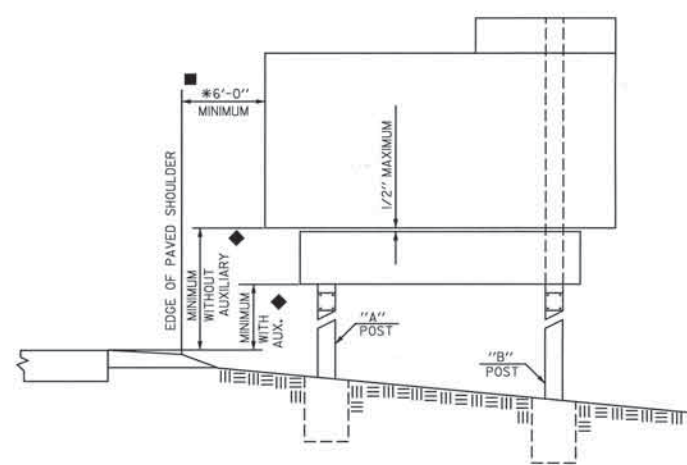
BUSINESS, COMMERCIAL OR RESIDENTIAL AREA



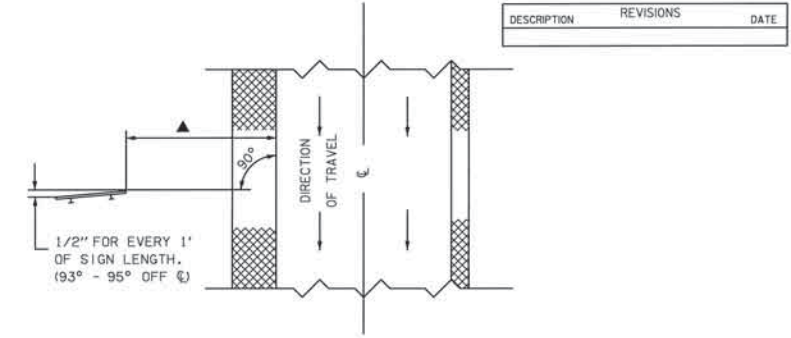
INFORMATION SIGN WITH NON-MOUNTABLE CURB



INFORMATION SIGN WITH MOUNTABLE CURB



FREEWAY OR EXPRESSWAY SIGN (WITH OR WITHOUT AUXILIARY SIGN)



SIGN POSITIONING DETAIL

*1 SIGNS SHALL BE SO POSITIONED TO ELIMINATE OR MINIMIZE SPECULAR REFLECTION. DUE TO THE NUMEROUS VARIATIONS IN ROAD CURVES AND GRADES, THIS GENERAL RULE MAY NOT ALWAYS BE APPLICABLE, AND SIGNS SHALL BE POSITIONED AS DETERMINED BY THE ENGINEER.

*2 IF FURTHER CLARIFICATION OF VERTICAL AND LATERAL CLEARANCES IS REQUIRED, SEE THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (LATEST REVISION).

◆ WHEN LATERAL CLEARANCE OF STANDARD OR SPECIAL INFORMATION GUIDE SIGNS IS 30' OR GREATER (AS REQUIRED BY CLEAR ZONE) FROM THE EDGE LINE, THE MINIMUM VERTICAL CLEARANCE IS 7'. IF AN AUXILIARY SIGN IS MOUNTED BELOW A STANDARD OR SPECIAL INFORMATION GUIDE SIGN, THE RECOMMEND VERTICAL CLEARANCE FOR THE STANDARD OR SPECIAL INFORMATION GUIDE SIGN IS MINIMUM 8' AND THE AUXILIARY SIGN IS MINIMUM 5'.

* THE MINIMUM LATERAL CLEARANCE OF THE SIGN FROM THE EDGE OF SHOULDER OR FACE OF CURB SHALL BE AS SHOWN ON THIS STANDARD DRAWING UNLESS OTHERWISE SHOWN OR NOTED ON PLANS. WHEN SIGNS ARE NOTED TO BE PLACED 5' TO 9' FROM SHOULDER, THE TOLERANCE SHALL BE THE DISTANCE SHOWN +2'.

IN INSTANCES WHERE THE LATERAL CLEARANCE SHOWN CAUSES THE FOOTING TO BE LOCATED UNDESIRABLY, SUCH AS THE BOTTOM OF DITCHES, ETC., THE LOCATION MAY BE ADJUSTED OUTWARD FROM THE ROADWAY IF NECESSARY AT THE DISCRETION OF THE ENGINEER.

IN RURAL AREAS THERE SHALL BE A 12' MINIMUM FROM TRAVELWAY (EDGE LINE) TO THE EDGE OF THE SIGN IF NO SHOULDER EXISTS.

■ NORMALLY, ON FREEWAY AND EXPRESSWAY MAINLINE, STANDARD OR SPECIAL INFORMATION SIGNS SHALL BE LOCATED WITH A LATERAL CLEARANCE OF 10' FROM THE FACE OF NON-MOUNTABLE CURBS OR GUARD RAILS, 20' FROM EDGE OF SHOULDER. IN ALL CASES EXCEPT WHEN SIGN SUPPORTS ARE PROTECTED BY BARRIERS, SIGNS SHALL HAVE A LATERAL CLEARANCE OF 30' OR GREATER (AS REQUIRED BY CLEAR ZONE) FROM EDGE OF DRIVING LANE.

ALONG INTERCHANGE RAMP THE LATERAL CLEARANCE SHALL NORMALLY BE 10' OR GREATER (AS REQUIRED BY CLEAR ZONE).

▲ WHEN LATERAL CLEARANCE IS 30'-0" OR GREATER FROM EDGE OF PAVEMENT, THE SIGN IS TO BE APPROXIMATELY PERPENDICULAR TO ROADWAY.

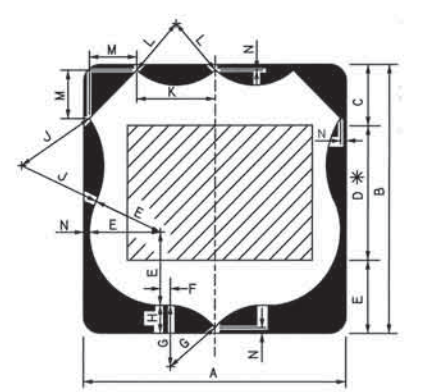
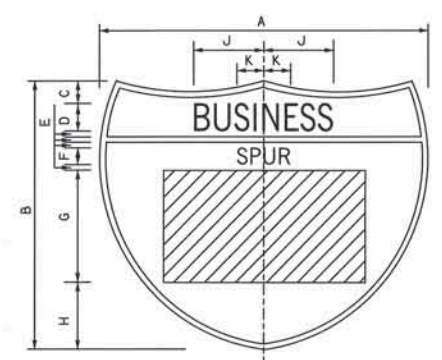
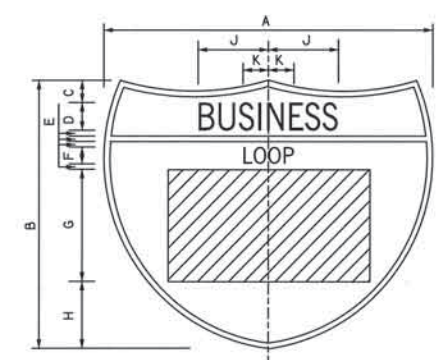
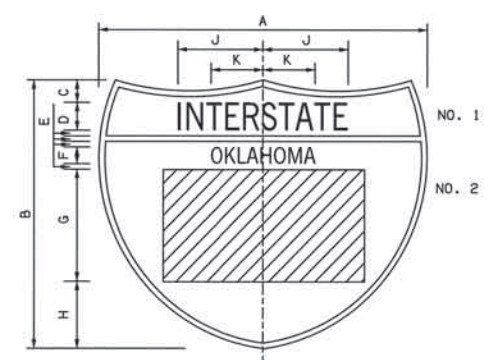
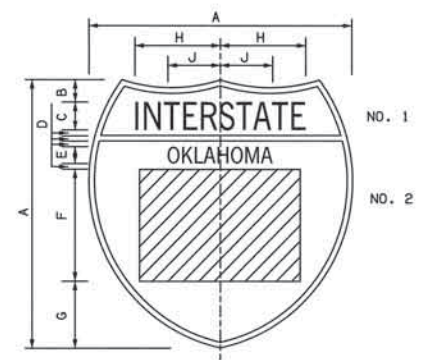


APPROVED BY TRAFFIC ENGINEER: *David Smith* DATE: 8/31/2010

TRAFFIC STANDARD

TYPICAL INSTALLATIONS OF GROUND MOUNTED SIGNS

DESCRIPTION	REVISIONS	DATE
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COLOR: LEGEND AND BORDER...WHITE (REFLECTORIZED)
 NO. 1.....RED (TRANSPARENT REFLECTORIZED)
 NO. 2.....BLUE (TRANSPARENT REFLECTORIZED)

COLOR: LEGEND AND BORDER...WHITE (REFLECTORIZED)
 NO. 1.....RED (TRANSPARENT REFLECTORIZED)
 NO. 2.....BLUE (TRANSPARENT REFLECTORIZED)

COLOR: LEGEND AND BORDER...WHITE (REFLECTORIZED)
 BACKGROUND.....GREEN (TRANSPARENT REFLECTORIZED)

COLOR: LEGEND AND BORDER...WHITE (REFLECTORIZED)
 BACKGROUND.....GREEN (TRANSPARENT REFLECTORIZED)

* OPTICALLY SPACE NUMERALS ABOUT VERTICAL CENTERLINE.
 COLOR: LEGEND AND BORDER.....BLACK (NON-REFLECTORIZED)
 BACKGROUND.....WHITE (REFLECTORIZED)

SIGN SIZE	DIMENSIONS (INCHES)										BLANK STD.
	A	B	C	D	E	F	G	H	J	K	
24" X 24"	24	2	2-1/2C	1/2	1-1/2D	100	6	7-13/16	5-9/64	B-24(M)	
36" X 36"	36	3	3-3/4C	3/4	2-1/4D	150	9	11-11/16	7-5/32	B-36(M)	

SIGN SIZE	DIMENSIONS (INCHES)										BLANK STD.
	A	B	C	D	E	F	G	H	J	K	
30" X 24"	30	24	2	2-1/2C	1/2	1-1/2D	100	6	7-13/16	5-9/64	B-30(24M)
45" X 36"	45	36	3	3-3/4C	3/4	2-1/4D	150	9	11-11/16	7-5/32	B-45(36M)

SIGN SIZE	DIMENSIONS (INCHES)										BLANK STD.
	A	B	C	D	E	F	G	H	J	K	
24" X 24"	24	24	2	2-1/2C	1/2	1-1/2D	100	6	6-15/16	2-9/32	B-24(M)
36" X 36"	36	36	3	3-3/4C	3/4	2-1/4D	150	9	9-19/32	3-15/32	B-36(M)
30" X 24"	30	24	2	2-1/2C	1/2	1-1/2D	100	6	6-15/16	2-9/32	B-30(24M)
45" X 36"	45	36	3	3-3/4C	3/4	2-1/4D	150	9	9-19/32	3-15/32	B-45(36M)

SIGN SIZE	DIMENSIONS (INCHES)										BLANK STD.
	A	B	C	D	E	F	G	H	J	K	
24" X 24"	24	24	2	2-1/2C	1/2	1-1/2D	100	6	6-15/16	2-7/16	B-24(M)
36" X 36"	36	36	3	3-3/4C	3/4	2-1/4D	150	9	9-19/32	3-11/16	B-36(M)
30" X 24"	30	24	2	2-1/2C	1/2	1-1/2D	100	6	6-15/16	2-7/16	B-30(24M)
45" X 36"	45	36	3	3-3/4C	3/4	2-1/4D	150	9	9-19/32	3-11/16	B-45(36M)

SIGN SIZE	DIMENSIONS (INCHES)										BLANK STD.
	A	B	C	D	E	F	G	H	J	K	
24" X 24"	24	24	2	5-1/2	120	6-1/2	1	5-1/2	2-1/2	7-1/2	7
36" X 36"	36	36	3	8-1/4	180	9-3/4	1-1/2	8-1/4	3-3/4	11-1/4	10-1/2

SIGN SIZE	DIMENSIONS (IN)			BLANK STD.
	L	M	N	
24" X 24"	5-1/2	4-1/2	1/2	B-24(S)
36" X 36"	8-1/4	6-3/4	3/4	B-36(S)

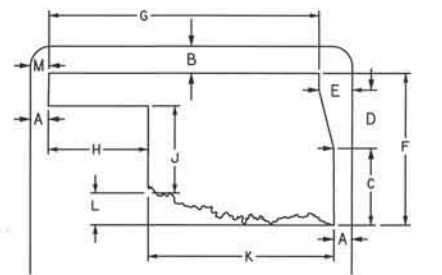
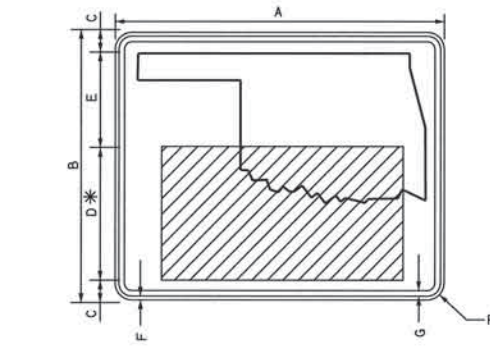
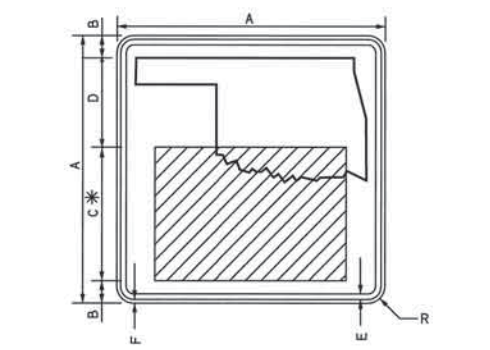
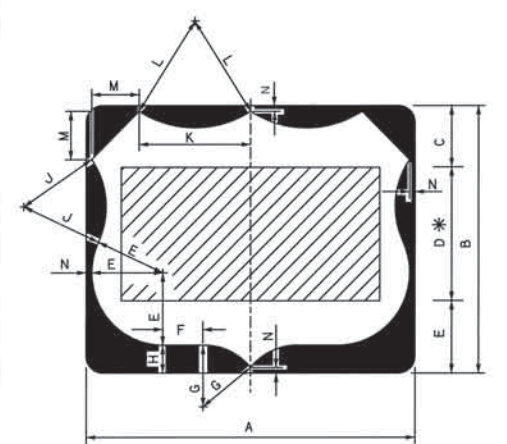
24" X 24" IM1-1(2) 4.00 SQ. FT.
 36" X 36" IM1-1E(2) 9.00 SQ. FT.

30" X 24" IM1-1(3) 5.00 SQ. FT.
 45" X 36" IM1-1E(3) 11.25 SQ. FT.

24" X 24" LM1-2(2) 4.00 SQ. FT.
 36" X 36" LM1-2E(2) 9.00 SQ. FT.
 30" X 24" LM1-2(3) 5.00 SQ. FT.
 40" X 36" LM1-2E(3) 11.25 SQ. FT.

24" X 24" LM1-3(2) 4.00 SQ. FT.
 36" X 36" LM1-3E(2) 9.00 SQ. FT.
 30" X 24" LM1-3(3) 5.00 SQ. FT.
 40" X 36" LM1-3E(3) 11.25 SQ. FT.

24" X 24" M1-4(2) 4.00 SQ. FT.
 36" X 36" M1-4E(2) 9.00 SQ. FT.



STATE OUTLINE

* OPTICALLY SPACE NUMERALS ABOUT VERTICAL CENTERLINE.
 COLOR: LEGEND AND BORDER.....BLACK (NON-REFLECTORIZED)
 BACKGROUND.....WHITE (REFLECTORIZED)

* OPTICALLY SPACE NUMERALS ABOUT VERTICAL CENTERLINE.
 COLOR: LEGEND AND BORDER.....BLACK (NON-REFLECTORIZED)
 BACKGROUND.....WHITE (REFLECTORIZED)

* OPTICALLY SPACE NUMERALS ABOUT VERTICAL CENTERLINE.
 COLOR: LEGEND AND BORDER.....BLACK (NON-REFLECTORIZED)
 BACKGROUND.....WHITE (REFLECTORIZED)

SIGN SIZE	1 & 2 DIGITS		3 DIGITS	
	12" NUMERALS	18" NUMERALS	12" NUMERALS	18" NUMERALS
24" X 24"	24	36	30	45
BLANK STD.	B-24(S)	B-36(S)	B-30(24)	B-45(36)
A	2"	3"	2.5"	2.5"
B	3"	3"	3"	3"
C	6.5"	9.75"	8.1"	13"
D	4"	6.1"	5.1"	8.1"
E	2.3"	4.6"	3.8"	4.7"
F	11.7"	17.6"	14.7"	23.5"
G	18.8"	28.3"	23.5"	37.7"
H	6"	9"	7.5"	12"
J	5"	7.6"	6.4"	10.2"
K	14"	21"	17.5"	28"
L	3.3"	5"	4.2"	6.7"
M	2.1"	3.1"	2.6"	2.6"

STATE OUTLINE TABLE

SIGN SIZE	DIMENSIONS (INCHES)										BLANK STD.
	A	B	C	D	E	F	G	H	J	K	
30" X 24"	30	24	3	5-1/2	120	6-1/2	4	5-1/2	2-1/2	7-1/2	10
45" X 36"	45	36	3	8-1/4	180	9-3/4	5-1/2	8-1/4	3-3/4	11-1/4	15

SIGN SIZE	DIMENSIONS (INCHES)										STATE OUTLINE	BLANK STD.
	A	B	C	D	E	F	R					
24" X 24"	24	3	120	6	3/8	1/4	1-1/2	1	B-24(S)			
36" X 36"	36	3	180	12	3/4	3/8	2-1/4	1	B-36(S)			

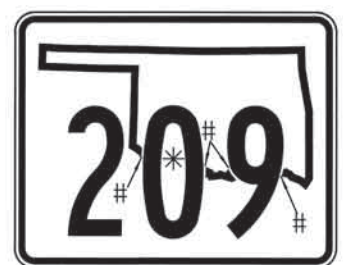
SIGN SIZE	DIMENSIONS (INCHES)										STATE OUTLINE	BLANK STD.
	A	B	C	D	E	F	G	R				
30" X 24"	30	24	3	120	6	1/4	3/8	1-1/2	1	B-30(24)		
45" X 36"	45	36	3	180	12	3/8	3/4	2-1/4	1-1/4	B-45(36)		

SIGN SIZE	DIMENSIONS (IN)			BLANK STD.
	L	M	N	
30" X 24"	9-1/2	4-1/2	1/2	B-24(S)
45" X 36"	14-1/4	6-3/4	3/4	B-36(S)

30" X 24" M1-4(3) 5.00 SQ. FT.
 45" X 36" M1-4E(3) 11.25 SQ. FT.

24" X 24" M1-6(2) 4.00 SQ. FT.
 36" X 36" M1-6E(2) 9.00 SQ. FT.

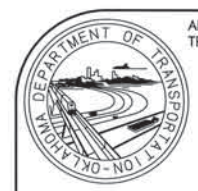
30" X 24" M1-6(3) 5.00 SQ. FT.
 45" X 36" M1-6E(3) 11.25 SQ. FT.



STATE OUTLINE IS NOT TO COME WITHIN .3" OF TEXT.
 * STATE OUTLINE IS TO BE REMOVED FROM INSIDE OF TEXT.

TEXT GAP DETAIL

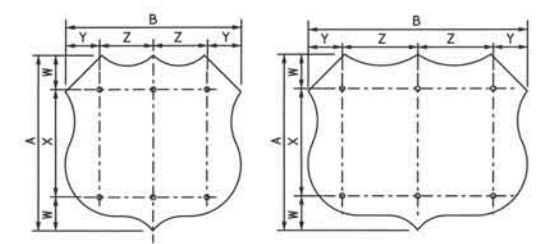
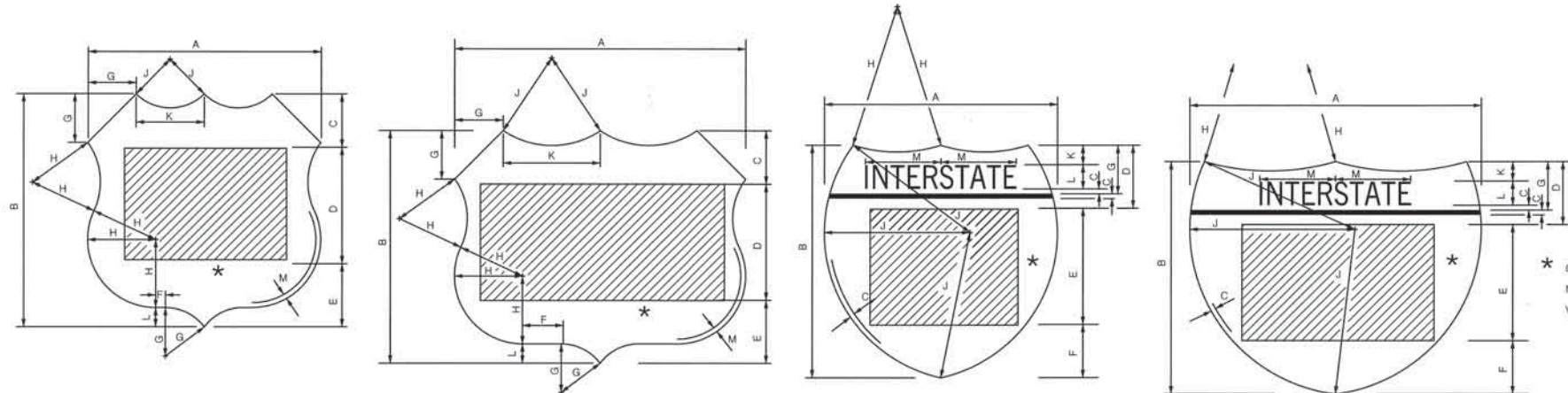
BASIS OF PAYMENT		
ITEM NO.	ITEM	UNIT
B50(A)	SHEET ALUMINUM SIGNS	SF



APPROVED BY TRAFFIC ENGINEER: *David J. Smith* DATE: 8/3/2010

TRAFFIC STANDARD
 ROUTE MARKER SIGN DETAILS
 (ROUTE ASSEMBLY)

DESCRIPTION	REVISIONS	DATE
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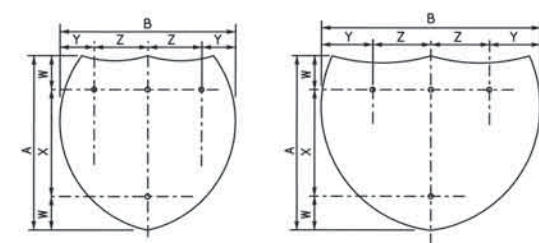


	24" X 24"	24" X 30"	36" X 36"	36" X 45"	48" X 48"	48" X 60"
A	24	24	36	36	48	48
B	24	30	36	45	48	60
W	4-1/2	4-1/2	7	7	9	9
X	15	15	22	22	30	30
Y	4-1/2	4-1/2	7	7	9	9
Z	7-1/2	10-1/2	11	15-1/2	15	21

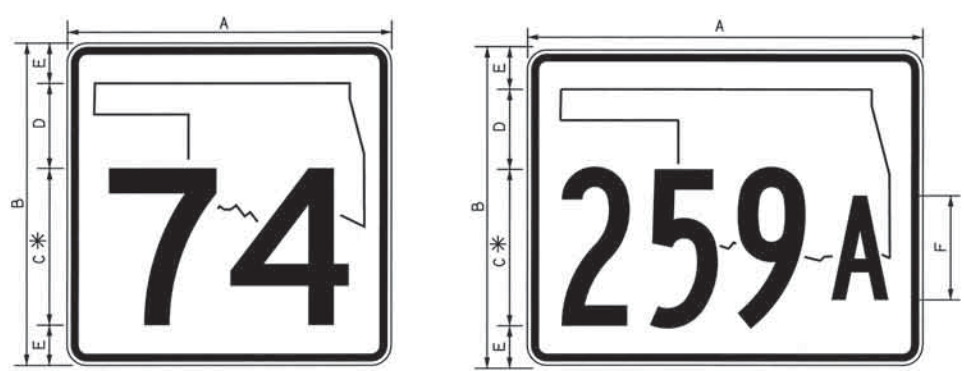
SIGN DIMENSIONS (INCHES)												
	A	B	C	D	E	F	G	H	J	K	M	
1 OR 2 DIGITS	24	24	5-1/2	12D	6-1/2	1	5	7	5	7	2	1-1/2
1 OR 2 DIGITS	36	36	8-1/4	18D	9-3/4	1-1/2	7-1/2	10-1/2	7-1/2	10-1/2	3	3/4
1 OR 2 DIGITS	48	48	11	24D	13	2	10	14	10	14	4	1
3 DIGITS	30	24	5-1/2	12D	6-1/2	4	5	7	9	10	2	1-2
3 DIGITS	45	36	8-1/4	18D	9-3/4	5-1/2	7-1/2	10-1/2	13-1/2	15	3	3/4
3 DIGITS	60	48	11	24D	13	8	10	14	18	20	4	1

SIGN DIMENSIONS (INCHES)												
	A	B	C	D	E	F	G	H	J	K	L	M
1 OR 2 DIGITS	24	24	1/2	6-1/2	12D	5-1/2	5	15	15	2	2-1/2C	7-13/16
1 OR 2 DIGITS	36	36	3/4	9-3/4	18D	8-1/4	7-1/2	22-1/2	22-1/2	3	3-3/4C	11-11/16
1 OR 2 DIGITS	48	48	1	13	24D	11	10	30	30	4	5C	15-9/16
3 DIGITS	30	24	1/2	6-1/2	10D	7-1/2	5	24	17	2	2-1/2C	7-13/16
3 DIGITS	45	36	3/4	9-3/4	16D	10-1/4	7-1/2	36	25-1/2	3	3-3/4C	11-11/16
3 DIGITS	60	48	1	13	20D	15	10	48	34	4	5C	15-9/16

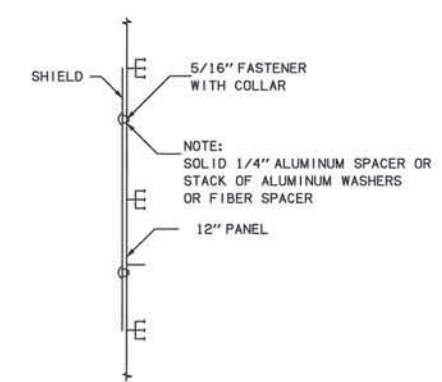
* OPTICALLY SPACE NUMERALS ABOUT VERT. CENTERLINE.



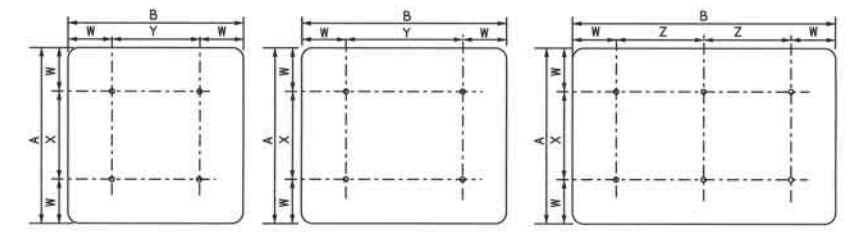
	24" X 24"	24" X 30"	36" X 36"	36" X 45"	48" X 48"	48" X 60"
A	24	24	36	36	48	48
B	24	30	36	45	48	60
W	4-1/2	4-1/2	7	7	9	9
X	15	15	22	22	30	30
Y	4-1/2	5	7	10-1/2	9	10
Z	7-1/2	10	11	12	15	20



	1 & 2 DIGITS		3 DIGITS		3 DIGITS WITH A "LETTER"	
	12" NUMERALS	18" NUMERALS	12" NUMERALS	18" NUMERALS	12" NUMERALS	18" NUMERALS
A	24	36	30	45	30	45
B	24	36	24	36	24	36
C	12D	18D	12B	18B	12B	18B
D	6	12	6	12	6	12
E	3	3	3	3	3	3
F	-	-	-	-	8B	12B



TYPICAL MOUNTING DETAIL



	24" X 24"	30" X 30"	36" X 36"	24" X 30"	30" X 36"	36" X 42"	24" X 38-1/4"	30" X 45"	36" X 54"	24" X 43-1/2"	30" X 54"	36" X 66"
A	24	30	36	24	30	36	24	30	36	24	30	36
B	24	30	36	30	36	42	38-1/4	45	54	43-1/2	54	66
W	6	7-1/2	9	6	7-1/2	9	6	7-1/2	9	6	7-1/2	9
X	12	15	18	12	15	18	12	15	18	12	15	18
Y	12	15	18	18	21	24	-	-	-	-	-	-
Z	-	-	-	-	-	-	13-1/8	15	18	15-3/4	19-1/2	24

GENERAL CONSTRUCTION NOTES:

INTERSTATE, U.S., AND STATE ROUTE SHIELDS FOR USE ON GUIDE SIGNS SHALL BE CUT FROM 0.063" THICK ALUMINUM OR 16 GAUGE GALVANIZED STEEL SHEET TO THE DIMENSIONS SHOWN WITH 3/8" DIAMETER MOUNTING HOLES PUNCHED OR DRILLED PRIOR TO APPLICATION OF REFLECTIVE SHEETING SIGN FACE.

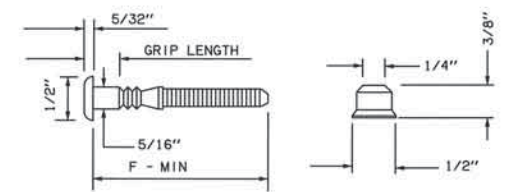
REFLECTIVE SHEETING FOR SIGN FACES SHALL BE TYPE III (OKLAHOMA STANDARD SPECIFICATIONS).

U.S. AND STATE SHIELD FACES SHALL HAVE A WHITE REFLECTIVE BACKGROUND WITH BLACK SCREENED NUMERALS.

INTERSTATE ROUTE SHIELDS SHALL BE REFLECTIVE RED, WHITE, AND BLUE AS SPECIFIED IN THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (LATEST REVISION).

ALL PROCESS INKS USED FOR SCREENING FACES SHALL BE AS RECOMMENDED BY THE MANUFACTURER OF THE REFLECTIVE SHEETING.

ROUTE SHIELDS FOR GUIDE SIGNS SHALL BE PAID FOR IN PRICE BID FOR PANEL SIGNS UNLESS OTHERWISE NOTED IN PLANS.



GRIP LENGTH = .422" - .515"
F - MIN = 2"

5/16" ALUMINUM, GALVANIZED STEEL, STAINLESS STEEL OR CADMIUM PLATED BOLTS WITH COMPATIBLE SELF-LOCKING STOP NUTS MAY BE USED.

5/16" FASTENER AND COLLAR (TYPICAL)

BASIS OF PAYMENT		
ITEM NO.	ITEM	UNIT
850(A)	SHEET ALUMINUM SIGNS	SF



APPROVED BY TRAFFIC ENGINEER: *[Signature]* DATE: 8/3/2010

TRAFFIC STANDARD
ROUTE MARKER SIGN DETAILS
(GUIDE SIGN)

2009 SPECIFICATIONS

DESCRIPTION	REVISIONS	DATE
CHANGED SIGN SQ.FT.		7/08/2011

JCT

21" X 15"	M2-1	2.19 SQ. FT.
21" X 15"	IM2-1	2.19 SQ. FT.
21" X 15"	LM2-1	2.19 SQ. FT.
30" X 21"	M2-1E	4.38 SQ. FT.
30" X 21"	IM2-1E	4.38 SQ. FT.
30" X 21"	LM2-1E	4.38 SQ. FT.

NORTH

24" X 12"	M3-1	2.00 SQ. FT.
36" X 18"	M3-1E	4.50 SQ. FT.
24" X 12"	IM OR LM3-1	2.00 SQ. FT.
36" X 18"	IM OR LM3-1E	4.50 SQ. FT.

EAST

24" X 12"	M3-2	2.00 SQ. FT.
36" X 18"	M3-2E	4.50 SQ. FT.
24" X 12"	IM OR LM3-2	2.00 SQ. FT.
36" X 18"	IM OR LM3-2E	4.50 SQ. FT.

SOUTH

24" X 12"	M3-3	2.00 SQ. FT.
36" X 18"	M3-3E	4.50 SQ. FT.
24" X 12"	IM OR LM3-3	2.00 SQ. FT.
36" X 18"	IM OR LM3-3E	4.50 SQ. FT.

WEST

24" X 12"	M3-4	2.00 SQ. FT.
36" X 18"	M3-4E	4.50 SQ. FT.
24" X 12"	IM OR LM3-4	2.00 SQ. FT.
36" X 18"	IM OR LM3-4E	4.50 SQ. FT.

BY-PASS

24" X 12"	M4-2	2.00 SQ. FT.
36" X 18"	M4-2E	4.50 SQ. FT.

BUSINESS

24" X 12"	M4-3	2.00 SQ. FT.
36" X 18"	M4-3E	4.50 SQ. FT.

TRUCK

24" X 12"	M4-4	2.00 SQ. FT.
36" X 18"	M4-4E	4.50 SQ. FT.

TO

24" X 12"	M4-5	2.00 SQ. FT.
36" X 18"	M4-5E	4.50 SQ. FT.
24" X 12"	IM OR LM4-5	2.00 SQ. FT.
36" X 18"	IM OR LM4-5E	4.50 SQ. FT.

END

24" X 12"	M4-6	2.00 SQ. FT.
36" X 18"	M4-6E	4.50 SQ. FT.
24" X 12"	IM OR LM4-6	2.00 SQ. FT.
36" X 18"	IM OR LM4-6E	4.50 SQ. FT.



21" X 15"	M5-1(R)	2.19 SQ. FT.
21" X 15"	IM5-1(R)	2.19 SQ. FT.
21" X 15"	LM5-1(R)	2.19 SQ. FT.



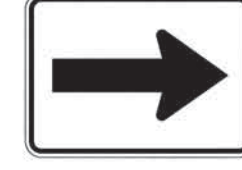
21" X 15"	M5-1(L)	2.19 SQ. FT.
21" X 15"	IM5-1(L)	2.19 SQ. FT.
21" X 15"	LM5-1(L)	2.19 SQ. FT.



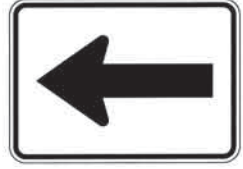
21" X 15"	M5-2(R)	2.19 SQ. FT.
21" X 15"	IM5-2(R)	2.19 SQ. FT.
21" X 15"	LM5-2(R)	2.19 SQ. FT.



21" X 15"	M5-2(L)	2.19 SQ. FT.
21" X 15"	IM5-2(L)	2.19 SQ. FT.
21" X 15"	LM5-2(L)	2.19 SQ. FT.



21" X 15"	M6-1(R)	2.19 SQ. FT.
21" X 15"	IM6-1(R)	2.19 SQ. FT.
21" X 15"	LM6-1(R)	2.19 SQ. FT.
30" X 21"	M6-1E(R)	4.38 SQ. FT.
30" X 21"	IM6-1E(R)	4.38 SQ. FT.
30" X 21"	LM6-1E(R)	4.38 SQ. FT.



21" X 15"	M6-1(L)	2.19 SQ. FT.
21" X 15"	IM6-1(L)	2.19 SQ. FT.
21" X 15"	LM6-1(L)	2.19 SQ. FT.
30" X 21"	M6-1E(L)	4.38 SQ. FT.
30" X 21"	IM6-1E(L)	4.38 SQ. FT.
30" X 21"	LM6-1E(L)	4.38 SQ. FT.



21" X 15"	M6-2(R)	2.19 SQ. FT.
21" X 15"	IM6-2(R)	2.19 SQ. FT.
21" X 15"	LM6-2(R)	2.19 SQ. FT.
30" X 21"	M6-2E(R)	4.38 SQ. FT.
30" X 21"	IM6-2E(R)	4.38 SQ. FT.
30" X 21"	LM6-2E(R)	4.38 SQ. FT.



21" X 15"	M6-2(L)	2.19 SQ. FT.
21" X 15"	IM6-2(L)	2.19 SQ. FT.
21" X 15"	LM6-2(L)	2.19 SQ. FT.
30" X 21"	M6-2E(L)	4.38 SQ. FT.
30" X 21"	IM6-2E(L)	4.38 SQ. FT.
30" X 21"	LM6-2E(L)	4.38 SQ. FT.



21" X 15"	M6-3	2.19 SQ. FT.
21" X 15"	IM6-3	2.19 SQ. FT.
21" X 15"	LM6-3	2.19 SQ. FT.
30" X 21"	M6-3E	4.38 SQ. FT.
30" X 21"	IM6-3E	4.38 SQ. FT.
30" X 21"	LM6-3E	4.38 SQ. FT.

CODE DESIGNATIONS

"M" SERIES: FOR USE ON U.S. AND STATE ROUTES
 SYMBOL AND BORDER: BLACK (NON-REFLECTORIZED)
 BACKGROUND: WHITE (REFLECTORIZED)
 "IM" SERIES: FOR USE ON INTERSTATE ROUTES
 SYMBOL AND BORDER: WHITE (REFLECTORIZED)
 BACKGROUND: BLUE (TRANSPARENT REFLECTORIZED)

"LM" SERIES: FOR USE ON OFF INTERSTATE BUSINESS ROUTES
 SYMBOL AND BORDER: WHITE (REFLECTORIZED)
 BACKGROUND: GREEN (TRANSPARENT REFLECTORIZED)

COLORS

M SERIES LEGEND AND BORDER: BLACK (NON-REFLECTORIZED)
 IM SERIES LEGEND AND BORDER: WHITE (REFLECTORIZED)
 LM SERIES LEGEND AND BORDER: WHITE (REFLECTORIZED)
 M SERIES BACKGROUND: WHITE (REFLECTORIZED)
 IM SERIES BACKGROUND: BLUE (TRANSPARENT REFLECTORIZED)
 LM SERIES BACKGROUND: GREEN (TRANSPARENT REFLECTORIZED)

BASIS OF PAYMENT		
ITEM NO.	ITEM	UNIT
850(A)	SHEET ALUMINUM SIGNS	SF

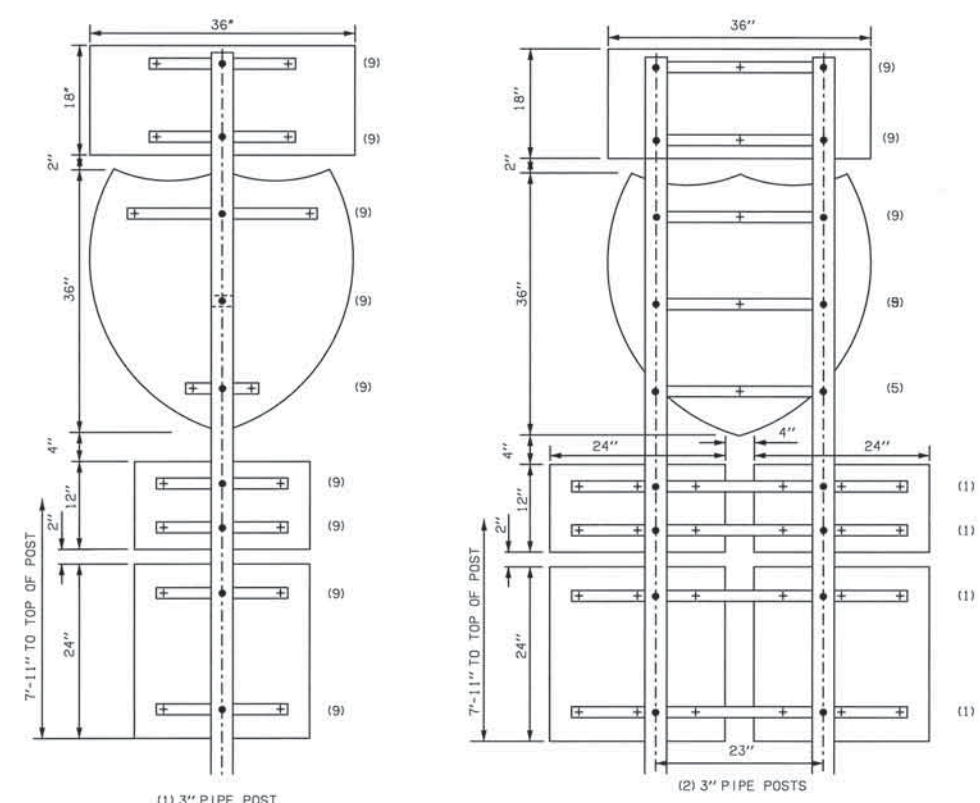


APPROVED BY TRAFFIC ENGINEER: *[Signature]* DATE: 7/27/2011

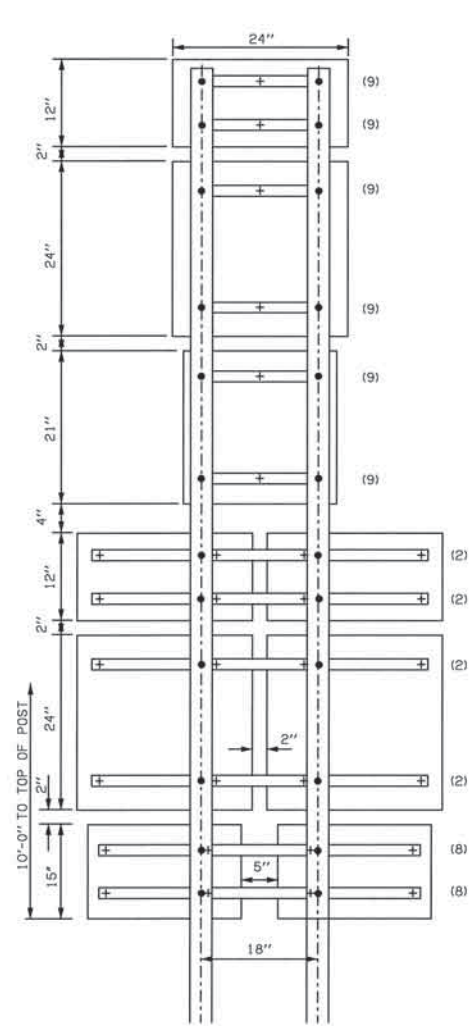
**TRAFFIC STANDARD
 ROUTE MARKER SIGN DETAILS
 (M-SERIES)**

2009 SPECIFICATIONS

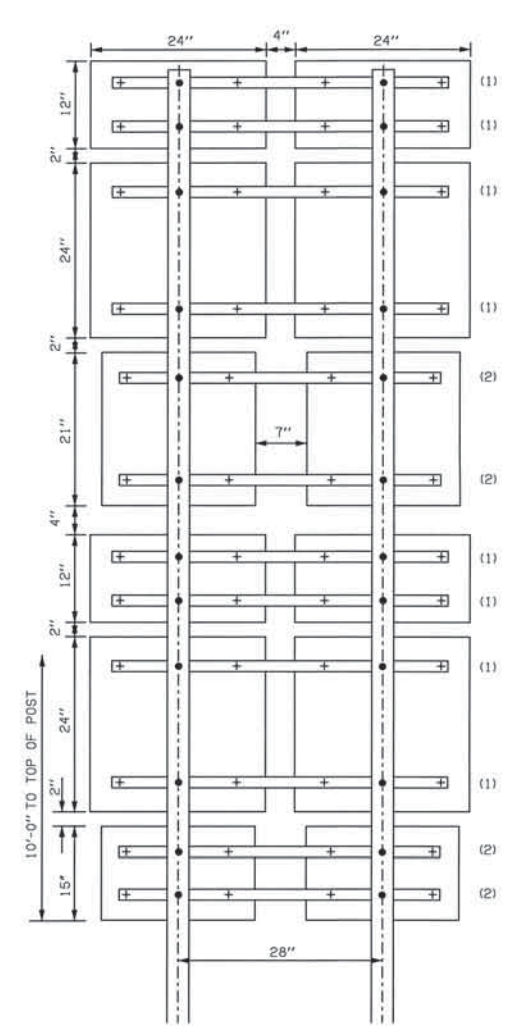
DESCRIPTION	REVISIONS	DATE



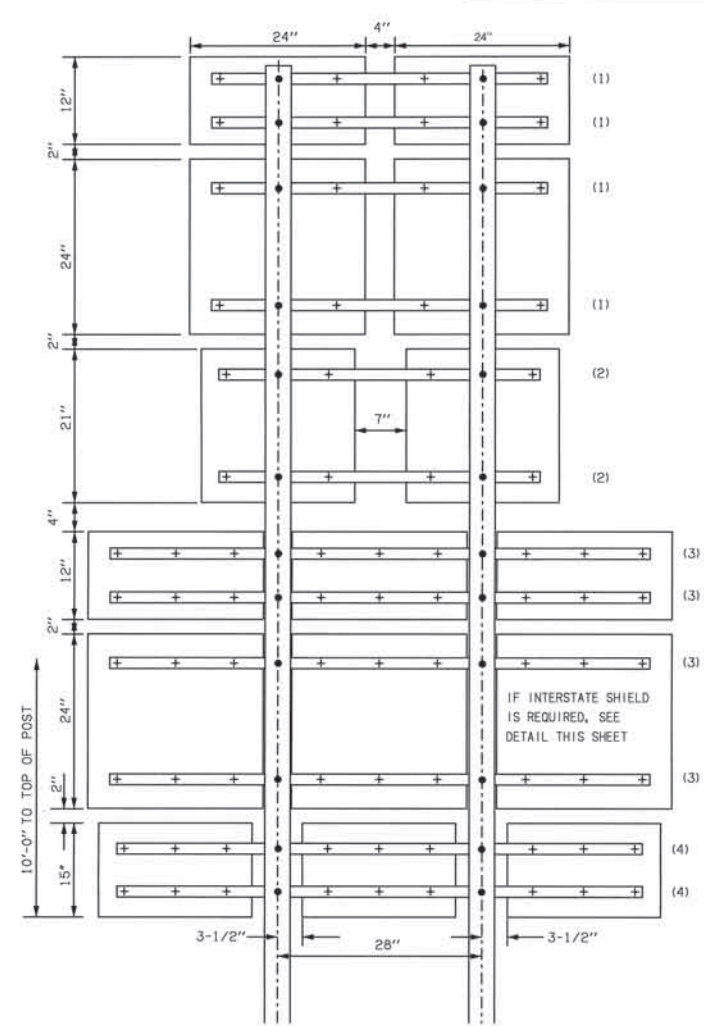
TYPICAL DETAIL FOR MOUNTING
36" ROUTE MARKER WITH 24"
ROUTE MARKER



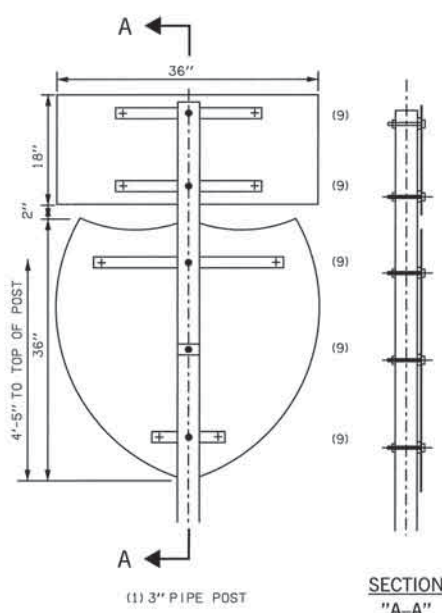
(2) 3" PIPE POSTS
TYPICAL MOUNTING DETAILS FOR
THREE (3) 24" ROUTE MARKERS



(2) 3-1/2" PIPE POSTS
TYPICAL MOUNTING DETAILS FOR
FOUR (4) 24" ROUTE MARKERS

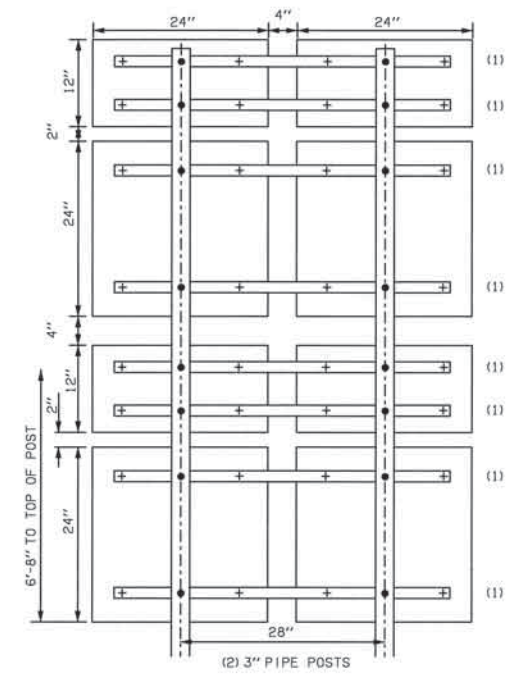


(2) 4" PIPE POSTS
TYPICAL MOUNTING DETAILS FOR
FIVE (5) 24" ROUTE MARKERS

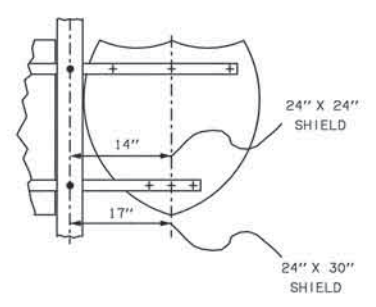


(1) 3" PIPE POST
36" ROUTE MARKER
ASSEMBLY

SECTION
"A-A"



(2) 3" PIPE POSTS
TYPICAL MOUNTING DETAIL
FOR FOUR (4) 24" ROUTE MARKERS



TYPICAL MOUNTING DETAILS FOR
24" INTERSTATE SHIELD ON THREE
ROUTE MARKER ASSEMBLY

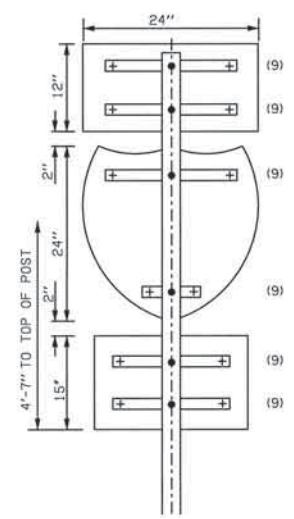
BRACKET ARM NO.	BRACKET LENGTH
1	46"
2	44"
3	74"
4	72"
5	26"
6	50"
7	56"
8	42"
9	SEE STDS. SBS2-1- & SBS4-1- (LATEST REVISION)



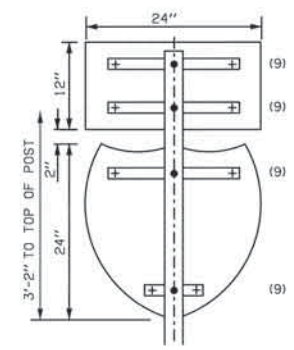
APPROVED BY
TRAFFIC ENGINEER: *Chad J. Smith* DATE: 8/3/2010

TRAFFIC STANDARD
ROUTE MARKER SIGN DETAILS
(POSTS & BRACKET DETAILS)

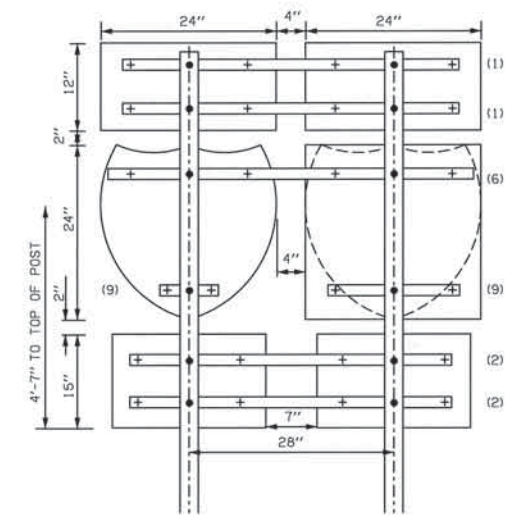
DESCRIPTION	REVISIONS	DATE
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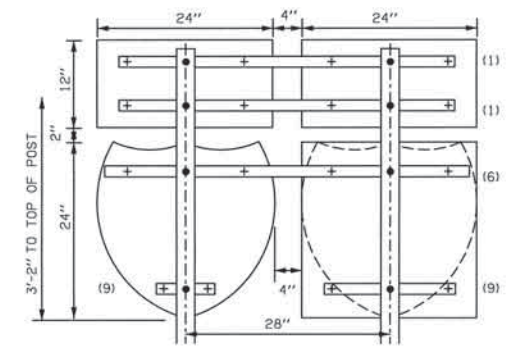
(1) 2" SQUARE TUBE POST
(1) 2-1/2" PIPE POST
24" ROUTE MARKER ASSEMBLY



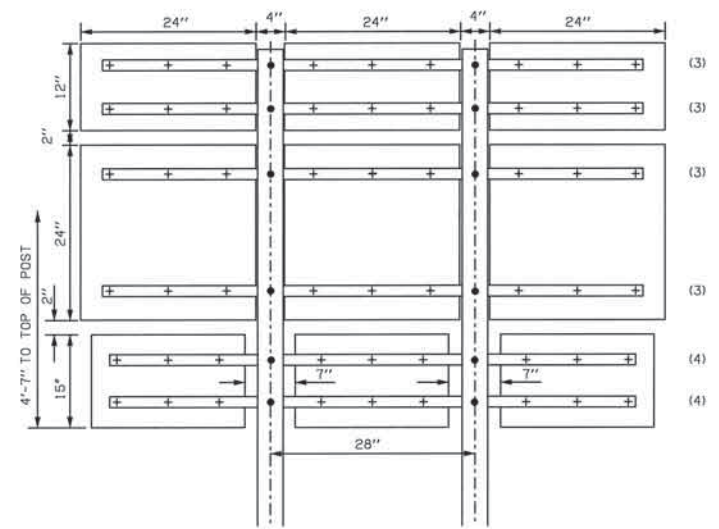
(1) 2" SQUARE TUBE POST
(1) 2-1/2" PIPE POST
24" ROUTE MARKER ASSEMBLY



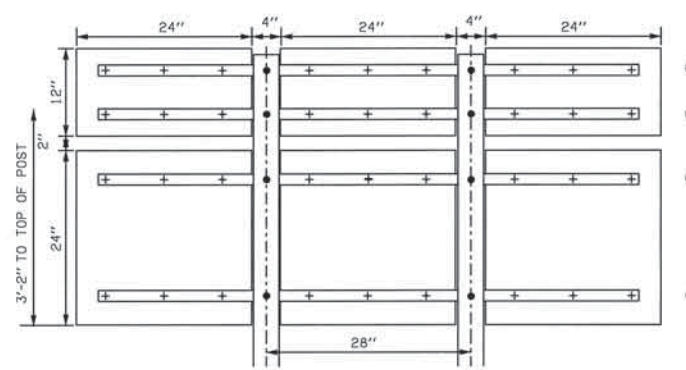
(2) 2" SQUARE TUBE POSTS
(2) 2-1/2" PIPE POSTS
TYPICAL ROUTE MARKER ASSEMBLY FOR TWO (2) 24" ROUTE MARKERS



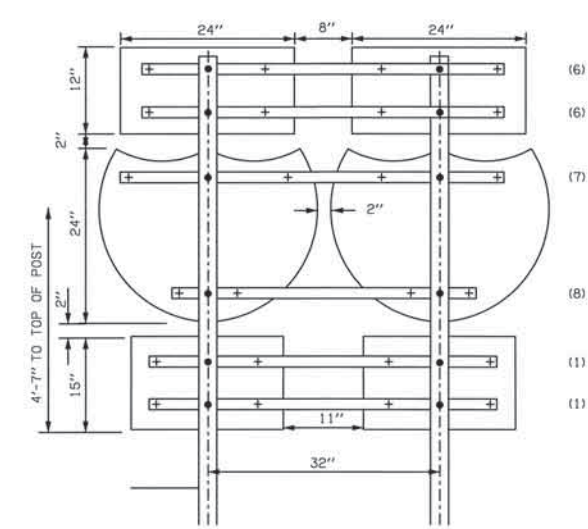
(2) 2" SQUARE TUBE POSTS
(2) 2-1/2" PIPE POSTS
TYPICAL ROUTE MARKER ASSEMBLY FOR TWO (2) 24" ROUTE MARKERS



(2) 2" SQUARE TUBE POSTS
(2) 2-1/2" PIPE POSTS
TYPICAL MOUNTING DETAILS FOR THREE (3) 24" ROUTE MARKERS



(2) 2" SQUARE TUBE POSTS
(2) 2-1/2" PIPE POSTS
TYPICAL MOUNTING DETAILS FOR THREE (3) 24" ROUTE MARKERS



(2) 2" SQUARE TUBE POSTS
(2) 2-1/2" PIPE POSTS
TYPICAL MOUNTING DETAILS FOR TWO (2) 24" ROUTE MARKERS USING 24" X 30" SHIELDS

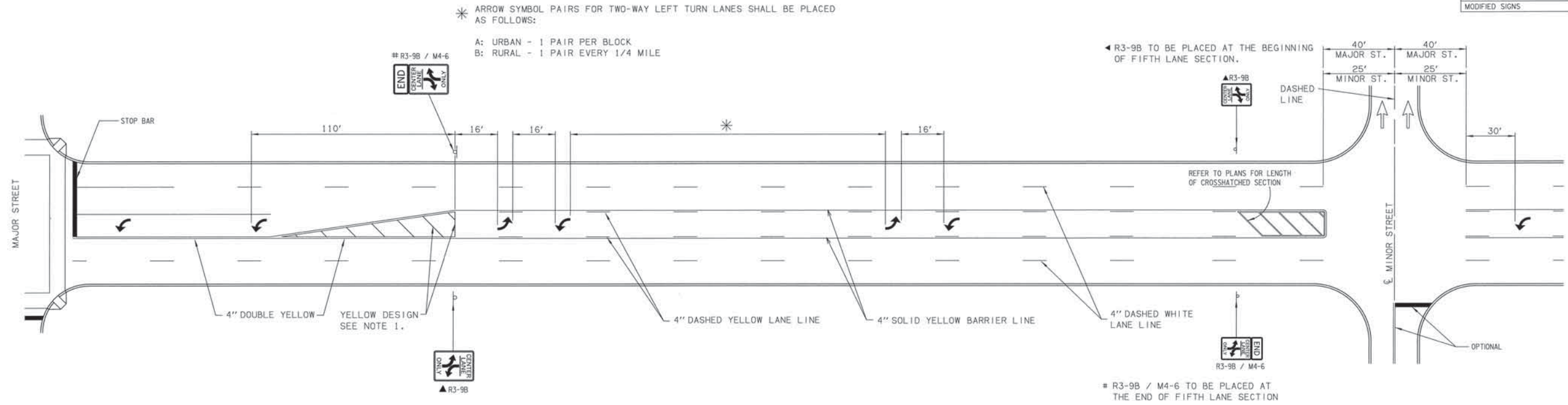
BRACKET ARM NO.	BRACKET LENGTH
1	46"
2	44"
3	74"
4	72"
5	26"
6	50"
7	56"
8	42"
9	SEE STDS. SBS2-1-, & SBS4-1- (LATEST REVISION)



APPROVED BY: *David Smith* DATE: 8/3/2010
TRAFFIC ENGINEER:

TRAFFIC STANDARD
ROUTE MARKER SIGN DETAILS
(POST & BRACKET DETAILS)

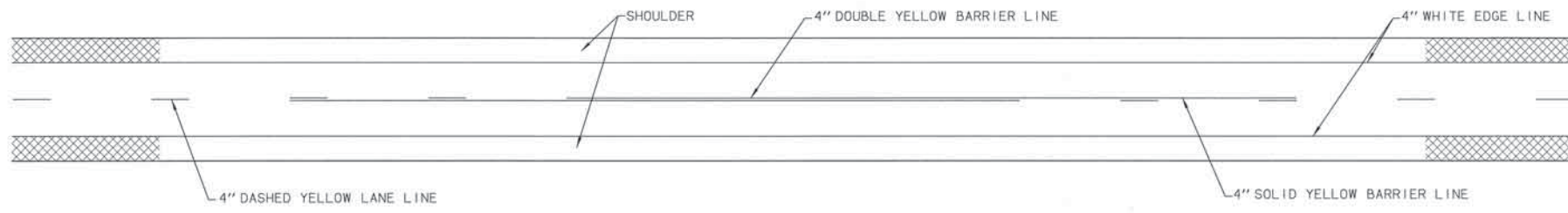
DESCRIPTION	REVISIONS	DATE
ADDED GENERAL NOTE L		7/08/2011
MODIFIED SIGNS		4/10/2012



FIFTH LANE PAVEMENT MARKING DETAIL (URBAN)

GENERAL NOTE

- 1. WIDTH OF DIAGONALS ARE AS FOLLOWS:
 ≥ 45 MPH - 12" WIDE
 < 45 MPH - 8" WIDE



TWO LANE RURAL ROADWAY PAVEMENT MARKINGS

BASIS OF PAYMENT		
ITEM NO.	ITEM	UNIT
854(A)	TRAFFIC STRIPE (PAINT) (4" WIDE)	LF
854(B)	TRAFFIC STRIPE (PAINT) (ARROW, WORDS, OR SYMBOLS)	EA
855(A)	TRAFFIC STRIPE (PLASTIC) (4" WIDE)	LF
855(A)	TRAFFIC STRIPE (PLASTIC) (6" WIDE)	LF
855(A)	TRAFFIC STRIPE (PLASTIC) (8" WIDE)	LF
855(A)	TRAFFIC STRIPE (PLASTIC) (24" WIDE)	LF
855(B)	TRAFFIC STRIPE (PLASTIC) (ARROW)	EA
856(A)	TRAFFIC STRIPE (MULTI-POLYMER) (4" WIDE)	LF
856(A)	TRAFFIC STRIPE (MULTI-POLYMER) (6" WIDE)	LF
856(A)	TRAFFIC STRIPE (MULTI-POLYMER) (8" WIDE)	LF
856(A)	TRAFFIC STRIPE (MULTI-POLYMER) (24" WIDE)	LF
856(B)	TRAFFIC STRIPE (MULTI-POLYMER) (SYMBOLS, WORDS, ETC)	EA



APPROVED BY
 TRAFFIC ENGINEER: *David Smay* DATE: 4/9/12

TRAFFIC STANDARD
 PAVEMENT MARKING
 (FIFTH LANE AND TWO LANE RURAL)

DESCRIPTION	REVISIONS	DATE



STOP

R1-1	30 x 30	5.18 SF
R1-1E	36 x 36	7.46 SF
R1-1F	48 x 48	13.26 SF

COLOR:
LEGEND AND BORDER:
WHITE (REFLECTORIZED)
BACKGROUND:
RED (TRANSPARENT REFLECTORIZED)



YIELD

R1-2	36 x 36 x 36	3.90 SF
R1-2E	48 x 48 x 48	6.93 SF
R1-2F	60 x 60 x 60	10.83 SF

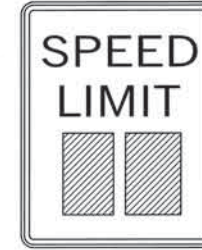
COLOR:
LEGEND AND BORDER:
RED (TRANSPARENT REFLECTORIZED)
BACKGROUND:
WHITE (REFLECTORIZED)



ALL-WAY

R1-3P	18 x 6	0.75 SF
R1-3PE	30 x 12	2.50 SF

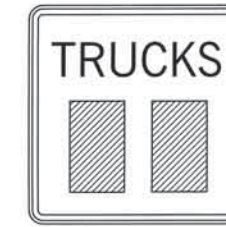
COLOR:
LEGEND AND BORDER:
WHITE (REFLECTORIZED)
BACKGROUND:
RED (TRANSPARENT REFLECTORIZED)



SPEED LIMIT

R2-1()	24 x 30	5.00 SF
R2-1E()	36 x 48	12.00 SF
R2-1F()	48 x 60	20.00 SF

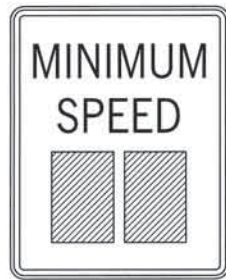
COLOR:
LEGEND AND BORDER:
BLACK (NON-REFLECTORIZED)
BACKGROUND:
WHITE (REFLECTORIZED)



TRUCK SPEED LIMIT

R2-2P()	24 x 24	4.00 SF
R2-2PE()	36 x 36	9.00 SF
R2-2PF()	48 x 48	16.00 SF

COLOR:
LEGEND AND BORDER:
BLACK (NON-REFLECTORIZED)
BACKGROUND:
WHITE (REFLECTORIZED)



MINIMUM SPEED LIMIT

R2-4P()	24 x 30	5.00 SF
R2-4PE()	36 x 48	12.00 SF
R2-4PF()	48 x 60	20.00 SF

COLOR:
LEGEND AND BORDER:
BLACK (NON-REFLECTORIZED)
BACKGROUND:
WHITE (REFLECTORIZED)



NO RIGHT TURN

R3-1	24 x 24	4.00 SF
R3-1E	36 x 36	9.00 SF
R3-1F	48 x 48	16.00 SF

COLOR:
ARROW AND BORDER:
BLACK (NON-REFLECTORIZED)
CIRCLE AND DIAGONAL:
RED (TRANSPARENT REFLECTORIZED)
BACKGROUND:
WHITE (REFLECTORIZED)



NO LEFT TURN

R3-2	24 x 24	4.00 SF
R3-2E	36 x 36	9.00 SF
R3-2F	48 x 48	16.00 SF

COLOR:
ARROW AND BORDER:
BLACK (NON-REFLECTORIZED)
CIRCLE AND DIAGONAL:
RED (TRANSPARENT REFLECTORIZED)
BACKGROUND:
WHITE (REFLECTORIZED)



NO TURN

R3-3	24 x 24	4.00 SF
R3-3E	36 x 36	9.00 SF
R3-3F	48 x 48	16.00 SF

COLOR:
LEGEND AND BORDER:
BLACK (NON-REFLECTORIZED)
BACKGROUND:
WHITE (REFLECTORIZED)



NO U TURN

R3-4	24 x 24	4.00 SF
R3-4E	36 x 36	9.00 SF
R3-4F	48 x 48	16.00 SF

COLOR:
ARROW AND BORDER:
BLACK (NON-REFLECTORIZED)
CIRCLE AND DIAGONAL:
RED (TRANSPARENT REFLECTORIZED)
BACKGROUND:
WHITE (REFLECTORIZED)



LEFT TURN ONLY

R3-5(L)	30 x 36	7.50 SF
---------	---------	---------

COLOR:
LEGEND AND BORDER:
BLACK (NON-REFLECTORIZED)
BACKGROUND:
WHITE (REFLECTORIZED)



RIGHT TURN ONLY

R3-5(R)	30 x 36	7.50 SF
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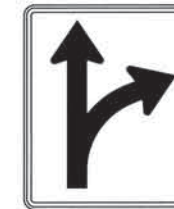
COLOR:
LEGEND AND BORDER:
BLACK (NON-REFLECTORIZED)
BACKGROUND:
WHITE (REFLECTORIZED)



LANE-LEFT

R3-6(L)	30 x 36	7.50 SF
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COLOR:
LEGEND AND BORDER:
BLACK (NON-REFLECTORIZED)
BACKGROUND:
WHITE (REFLECTORIZED)



LANE-RIGHT

R3-6(R)	30 x 36	7.50 SF
---------	---------	---------

COLOR:
LEGEND AND BORDER:
BLACK (NON-REFLECTORIZED)
BACKGROUND:
WHITE (REFLECTORIZED)

BASIS OF PAYMENT

ITEM NO.	ITEM	UNIT
850(A)	SHEET ALUMINUM SIGNS	SF

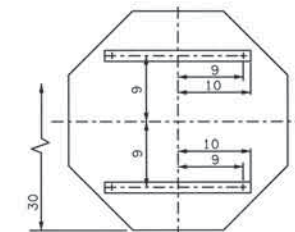


APPROVED BY
TRAFFIC ENGINEER: *David G. Smith* DATE: 8/3/2010

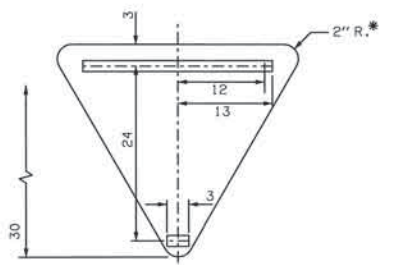
TRAFFIC STANDARD
REGULATORY SIGN DETAILS
(R-SERIES)

2009 SPECIFICATIONS

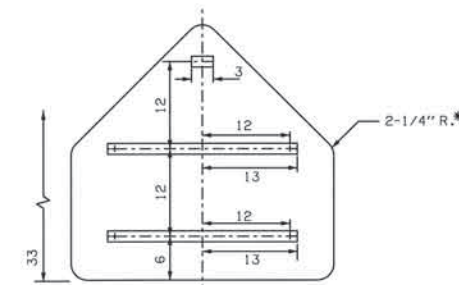
DESCRIPTION	REVISIONS	DATE



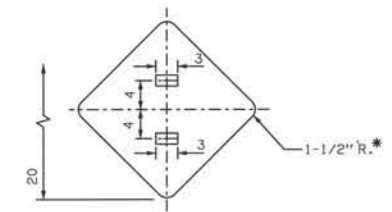
B-30(O)
(1) 2" SQUARE TUBE POST
(1) 2" PIPE POST



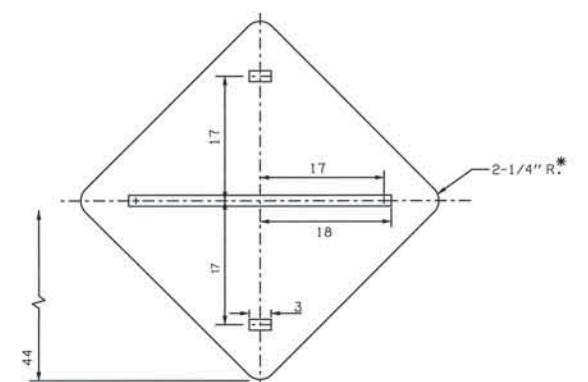
B-36(T)
(1) 2" SQUARE TUBE POST
(1) 2" PIPE POST



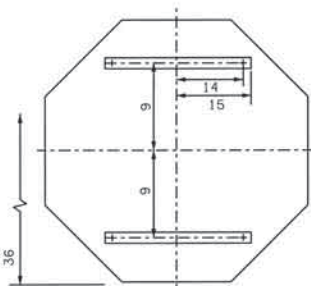
B-36(P)
(1) 2" SQUARE TUBE POST
(1) 2" PIPE POST



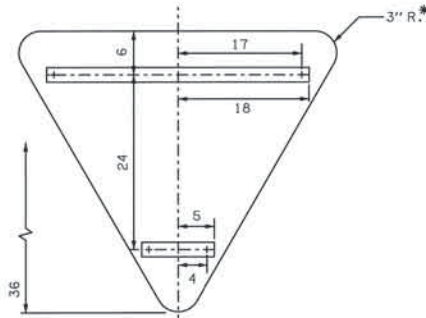
B-18(D)
(1) 2" SQUARE TUBE POST
(1) 1-1/2" PIPE POST



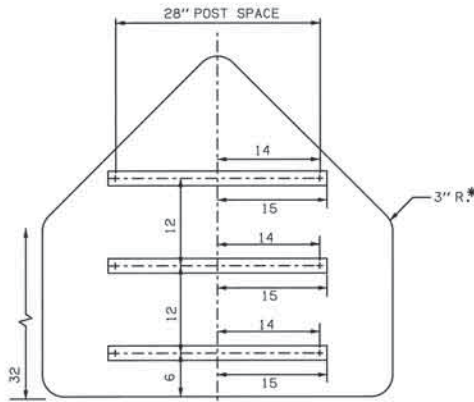
B-36(D)
(1) 2" SQUARE TUBE POST
(1) 1-1/2" PIPE POST



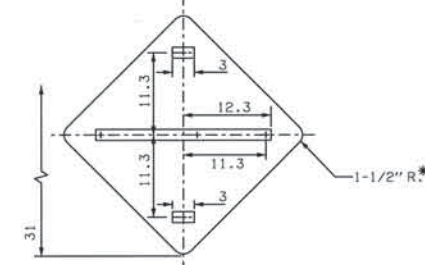
B-36(O)
(1) 2" SQUARE TUBE POST
(1) 2-1/2" PIPE POST



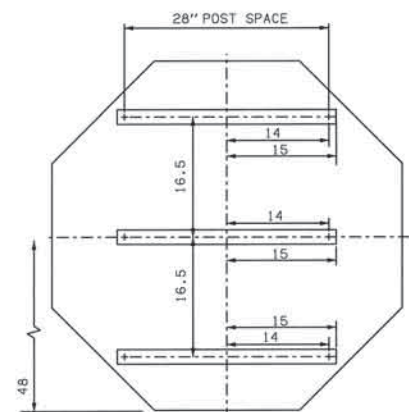
B-48(T)
(2) 2" SQUARE TUBE POSTS
(1) 2-1/2" PIPE POST



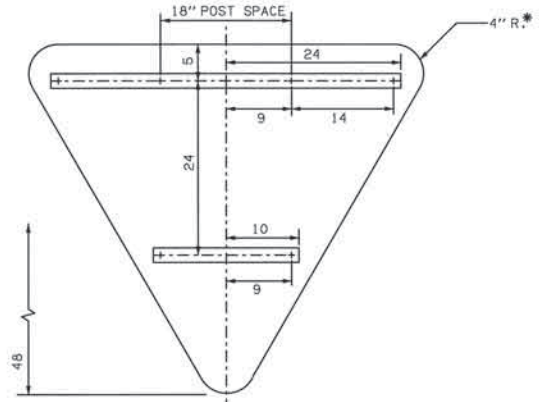
B-48(P)
(2) 2" SQUARE TUBE POSTS
(2) 2" PIPE POSTS



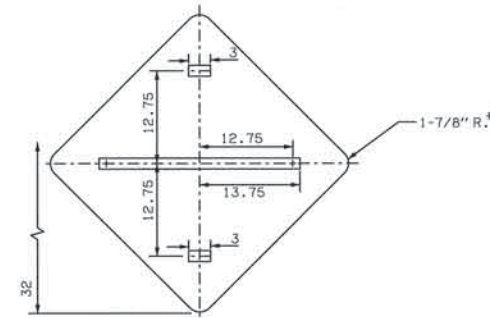
B-24(D)
(1) 2" SQUARE TUBE POST
(1) 2" PIPE POST



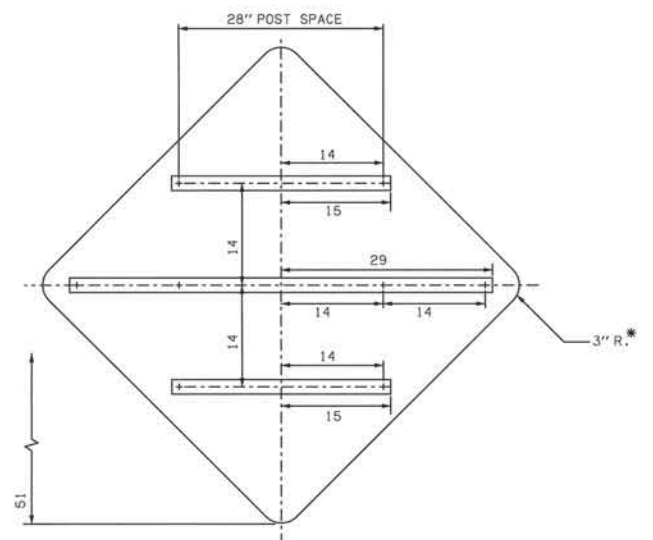
B-48(O)
(2) 2" SQUARE TUBE POSTS
(2) 2-1/2" PIPE POSTS



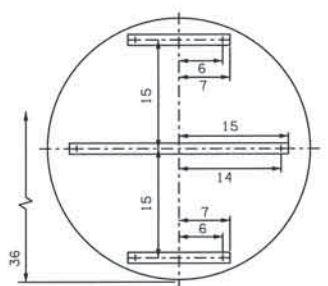
B-60(T)
(2) 2" SQUARE TUBE POSTS
(2) 2" PIPE POSTS



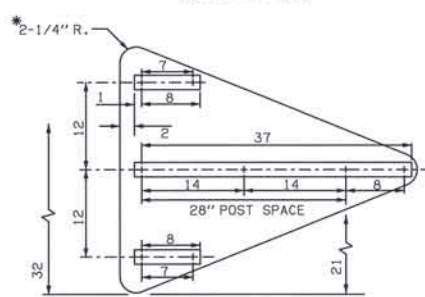
B-30(D)
(1) 2" SQUARE TUBE POST
(1) 2" PIPE POST



B-48(D)
(2) 2" SQUARE TUBE POSTS
(2) 2-1/2" PIPE POSTS



B-36(R)
(1) 2" SQUARE TUBE POST
(1) 2-1/2" PIPE POST



B-4836(T)
(2) 2" SQUARE TUBE POSTS
(2) 2" PIPE POSTS

CONSTRUCTION NOTES:

- (1) ALL FLAT SHEET SIGNS SHALL USE GALVANIZED STEEL POSTS.
- (2) THICKNESS OF MATERIALS FOR FLAT SHEET SIGNS SHALL BE AS FOLLOWS, DETERMINED BY THE LONGEST DIMENSION OF THE SIGN UNLESS OTHERWISE SPECIFIED.

ALUMINUM ALLOY 6061-T6 OR 5052-H38	GALVANIZED STEEL
0.063" FOR SIGNS THROUGH 24"	16 GAUGE FOR SIGNS THROUGH 24"
0.080" FOR SIGNS 25" THROUGH 35"	14 GAUGE FOR SIGNS 25" THROUGH 35"
0.100" FOR SIGNS 36" AND LARGER	12 GAUGE FOR SIGNS 36" AND LARGER
- (3) SIGN BRACKETS SHALL BE GALVANIZED STEEL OR ALUMINUM. HOLES FOR MOUNTING BRACKETS TO SIGN SHALL BE 5/16" D. HOLES FOR MOUNTING SIGN AND BRACKETS TO POST SHALL BE 3/8" D. HOLES SHALL BE PUNCHED BEFORE GALVANIZING. SIZE OF BRACKETS SHALL BE AS FOLLOWS: SIGNS THROUGH 36" SHALL USE A GALVANIZED STEEL OR ALUMINUM CHANNEL 1-1/2" X 1/2" X 1/8". SIGNS LARGER THAN 36" SHALL USE A GALVANIZED STEEL OR ALUMINUM CHANNEL 2" X 1/2" X 1/8". ALUMINUM SIGN BRACKETS SHALL BE ALLOY 6061-T6, 6062-T6 OR 6063-T6.
- (4) ALL BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED STEEL OR CADMIUM PLATED. ALL BOLT ENDS SHALL BE SUFFICIENTLY BRADDED AFTER INSTALLATION TO MINIMIZE REMOVAL BY VANDALISM.
- (5) ALL POSTS SHALL EXTEND 2" ABOVE THE TOP SIGN BRACKET, BUT NOT ABOVE THE TOP OF THE SIGN.
- * (6) CORNER RADIUS FOR ALL FLAT SHEET SIGNS SHALL BE AS SHOWN.
- (7) ALL DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.



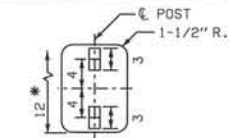
APPROVED BY: *[Signature]* DATE: 8/3/2010
TRAFFIC ENGINEER

TRAFFIC STANDARD

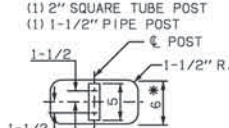
SIGN BLANK AND BRACKET DETAILS

2009 SPECIFICATIONS

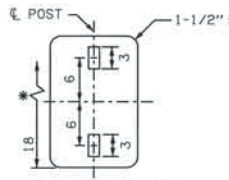
SBS1-1	00
T-130	



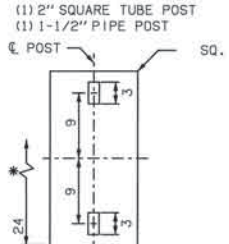
B-0912 ■



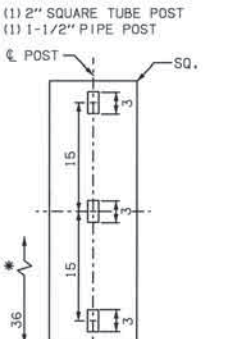
B-1206 ■



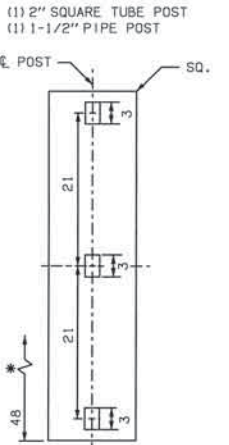
B-1218 ■



B-1224 ■

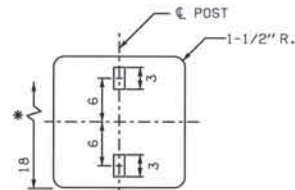


B-1236 ■



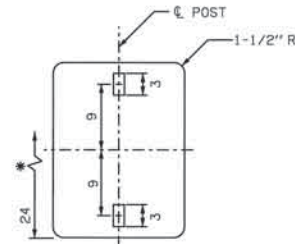
B-1248 ■

(1) 2" SQUARE TUBE POST
(1) 1-1/2" PIPE POST



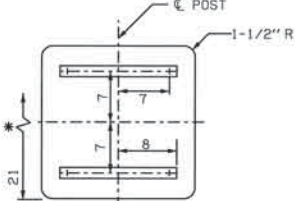
B-18(S) ■

(1) 2" SQUARE TUBE POST
(1) 1-1/2" PIPE POST



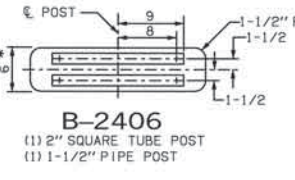
B-1824 ■

(1) 2" SQUARE TUBE POST
(1) 1-1/2" PIPE POST



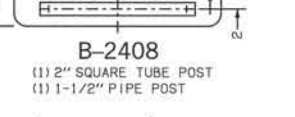
B-21(S) ■

(1) 2" SQUARE TUBE POST
(1) 1-1/2" PIPE POST



B-2406 ■

(1) 2" SQUARE TUBE POST
(1) 1-1/2" PIPE POST



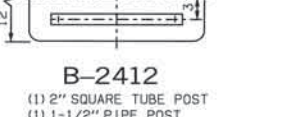
B-2408 ■

(1) 2" SQUARE TUBE POST
(1) 1-1/2" PIPE POST



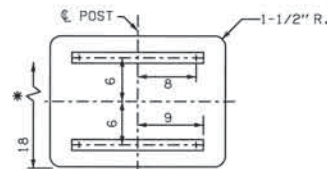
B-2410 ■

(1) 2" SQUARE TUBE POST
(1) 1-1/2" PIPE POST



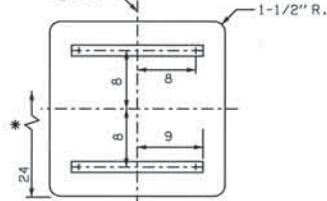
B-2412 ■

(1) 2" SQUARE TUBE POST
(1) 1-1/2" PIPE POST



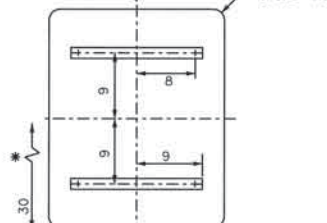
B-2418 ■

(1) 2" SQUARE TUBE POST
(1) 1-1/2" PIPE POST



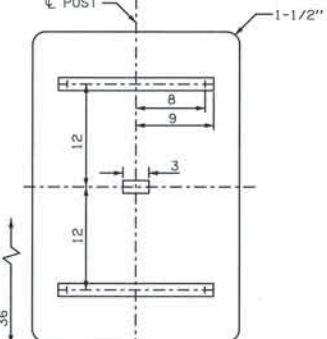
B-24(S) ■

(1) 2" SQUARE TUBE POST
(1) 2" PIPE POST



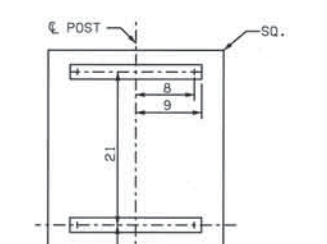
B-2430 ■

(1) 2" SQUARE TUBE POST
(1) 2" PIPE POST



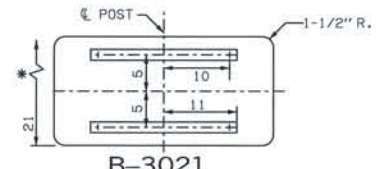
B-2436 ■

(1) 2" SQUARE TUBE POST
(1) 2-1/2" PIPE POST



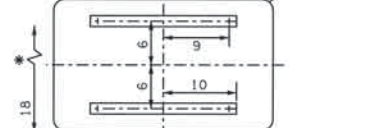
B-2448 ■

(1) 2" SQUARE TUBE POST
(1) 2-1/2" PIPE POST



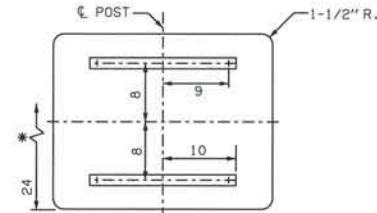
B-3021 ■

(1) 2" SQUARE TUBE POST
(1) 1-1/2" PIPE POST



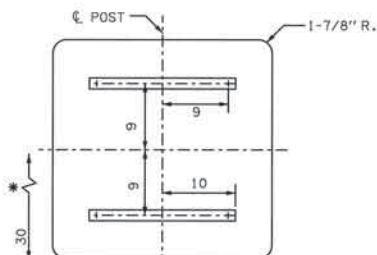
B-3018 ■

(1) 2" SQUARE TUBE POST
(1) 1-1/2" PIPE POST



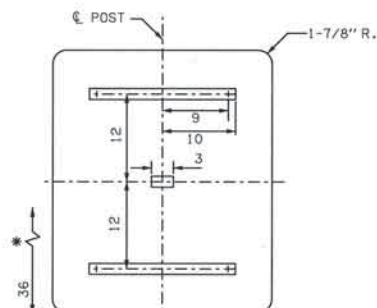
B-3024 ■

(1) 2" SQUARE TUBE POST
(1) 2" PIPE POST



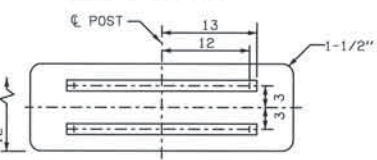
B-30(S) ■

(1) 2" SQUARE TUBE POST
(1) 2" PIPE POST



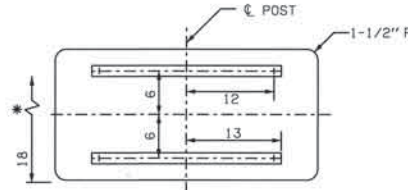
B-3036 ■

(1) 2" SQUARE TUBE POST
(1) 2-1/2" PIPE POST



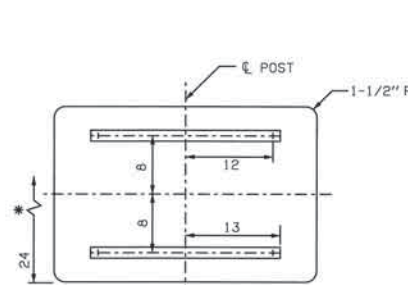
B-3612 ■

(1) 2" SQUARE TUBE POST
(1) 2" PIPE POST



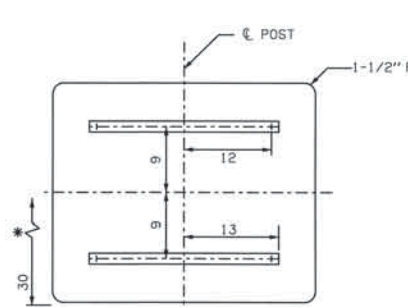
B-3618 ■

(1) 2" SQUARE TUBE POST
(1) 2" PIPE POST



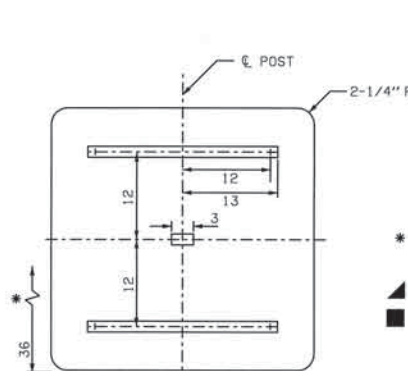
B-3624 ■

(1) 2" SQUARE TUBE POST
(1) 2" PIPE POST



B-3630 ■

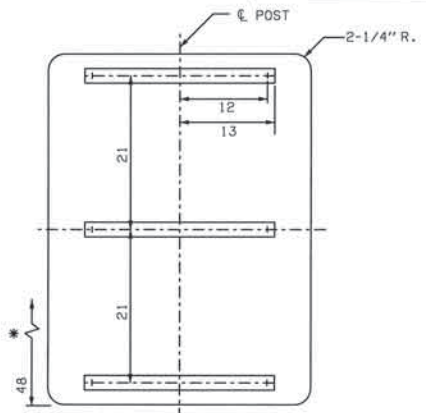
(1) 2" SQUARE TUBE POST
(1) 2-1/2" PIPE POST



B-36(S) ■

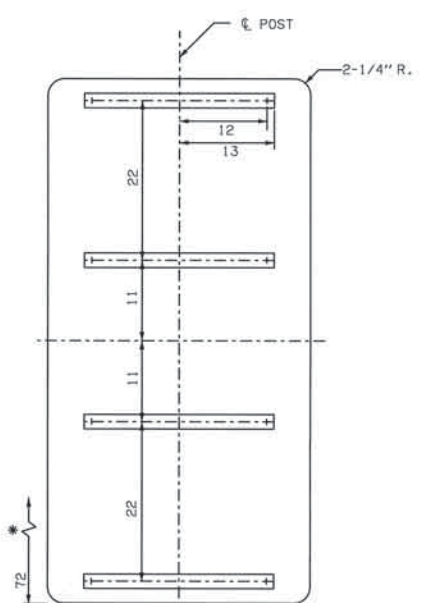
(1) 2" SQUARE TUBE POST
(1) 2-1/2" PIPE POST

DESCRIPTION	REVISIONS	DATE



B-3648 ■

(2) 2" SQUARE TUBE POSTS
(1) 3" PIPE POST



B-3672 ■

(1) 3-1/2" PIPE POST

NOTES:
 * ALL POSTS SHALL EXTEND 2" ABOVE THE TOP SIGN BRACKET, BUT NOT ABOVE THE TOP OF THE SIGN.
 ▲ SIGN BLANK THICKNESS SHALL BE .060" ALUMINUM OR 16 GAUGE STEEL.
 ■ VERTICAL SIGN BRACKET ONLY.
 ALL DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

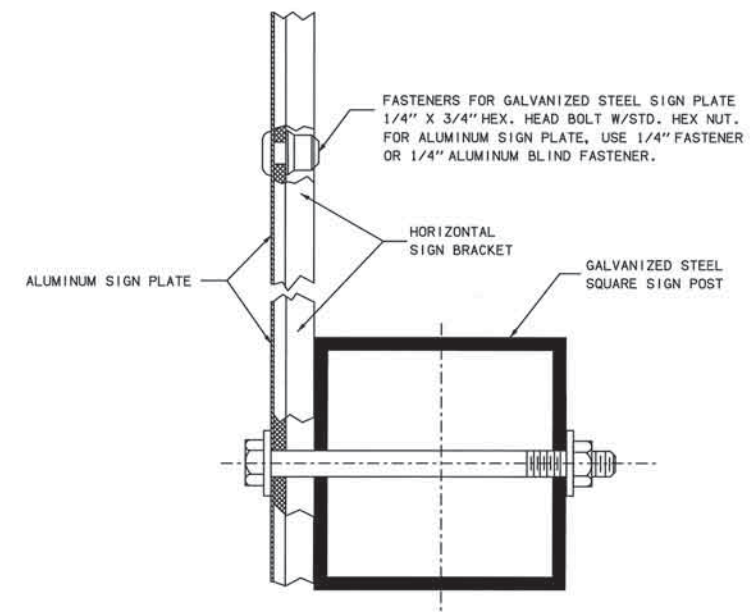


APPROVED BY
 TRAFFIC ENGINEER: *Dwight Smith* DATE: 8/31/2010

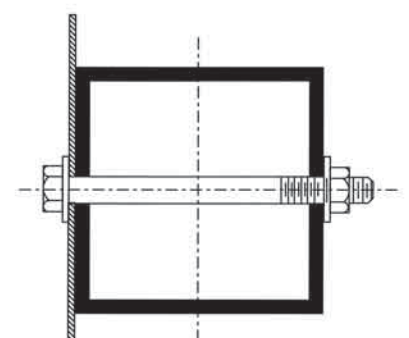
TRAFFIC STANDARD

SIGN BLANK AND BRACKET DETAILS

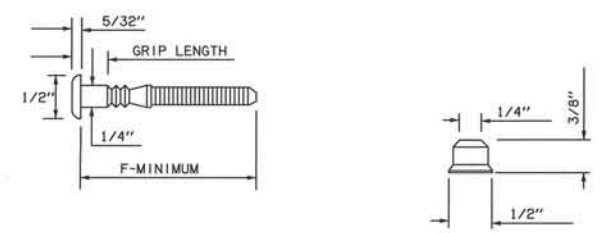
DESCRIPTION	REVISIONS	DATE



TOP VIEW

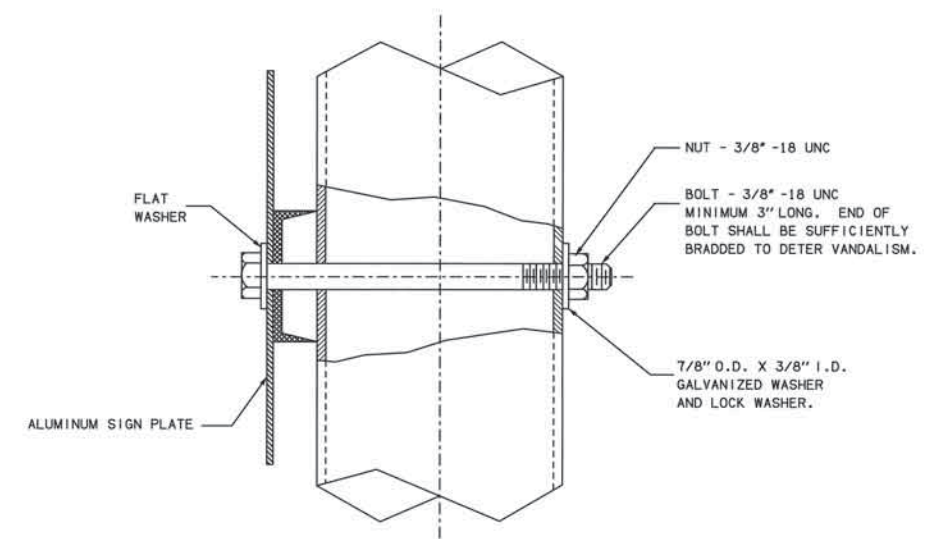


TOP VIEW



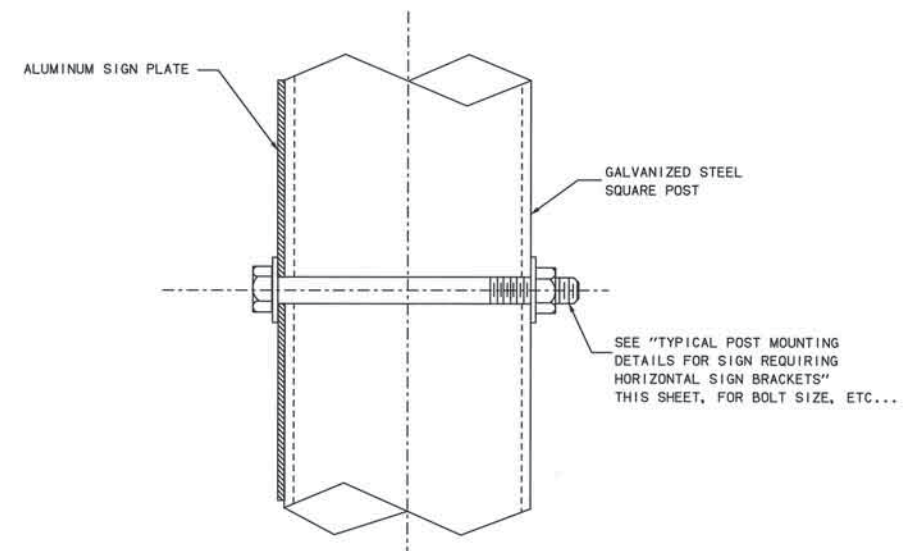
1/4" FASTENER AND 1/4" COLLAR (TYPICAL)

GRIP NO.	GRIP LENGTH (INCHES)	F-MIN.
2	0.094 - 0.156	1-7/16"
3	0.157 - 0.218	1-1/2"
4	0.219 - 0.281	1-9/16"
5	0.282 - 0.343	1-5/8"
6	0.344 - 0.406	1-11/16"
17	0.407 - 1.093	2-3/8"



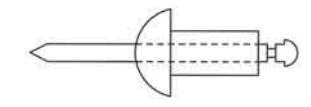
SIDE VIEW

TYPICAL POST MOUNTING DETAILS FOR SIGN REQUIRING HORIZONTAL SIGN BRACKETS



SIDE VIEW

TYPICAL POST MOUNTING DETAILS FOR SIGN 18" WIDE AND UNDER



ALUMINUM ALLOY BODY AND MANDREL. GRIP RANGE 1/16" TO 1/4".

1/4" BLIND FASTENERS

NOTE: ALL NUTS SHALL BE SELF-LOCKING.



APPROVED BY TRAFFIC ENGINEER: *David J. Smith* DATE: 8/31/2010

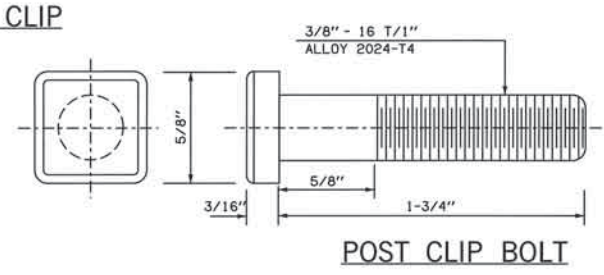
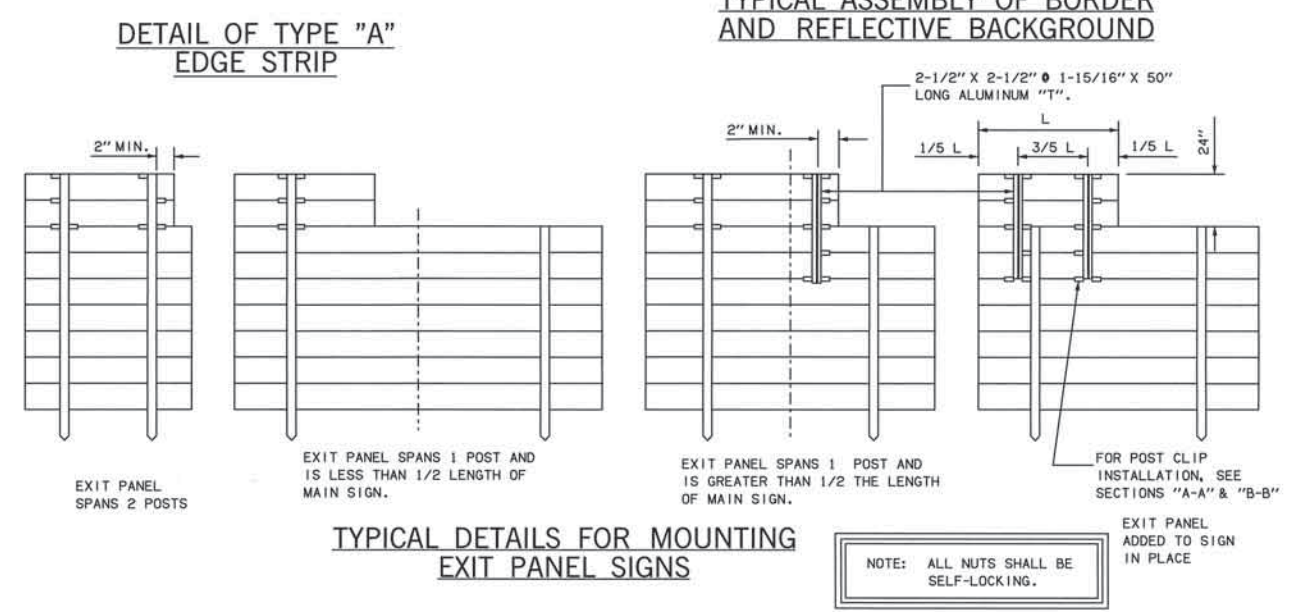
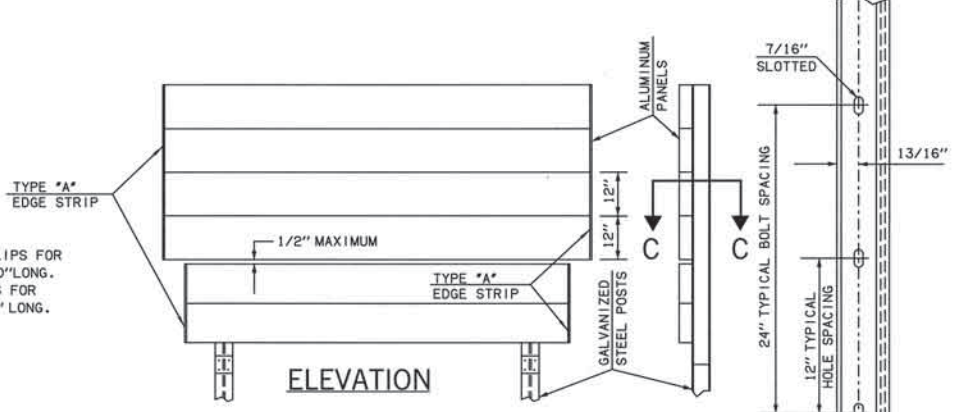
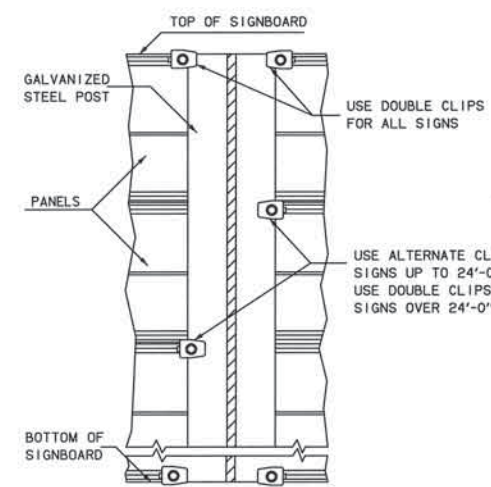
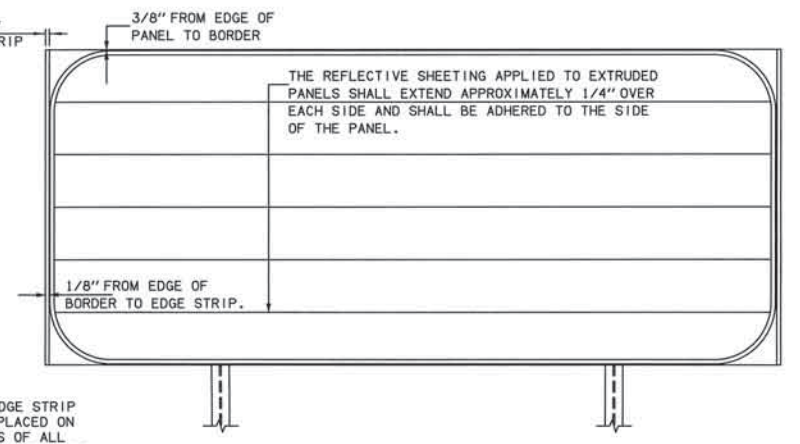
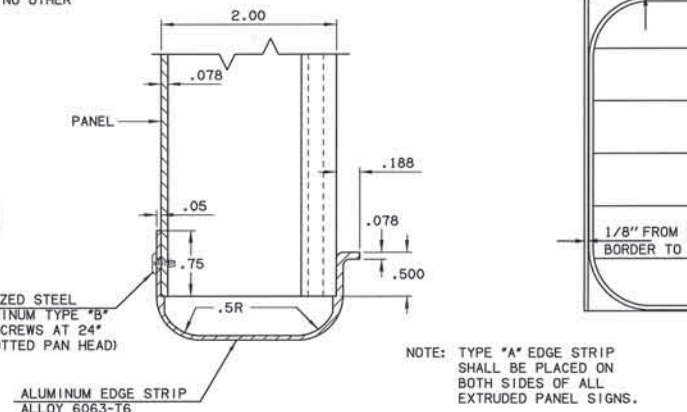
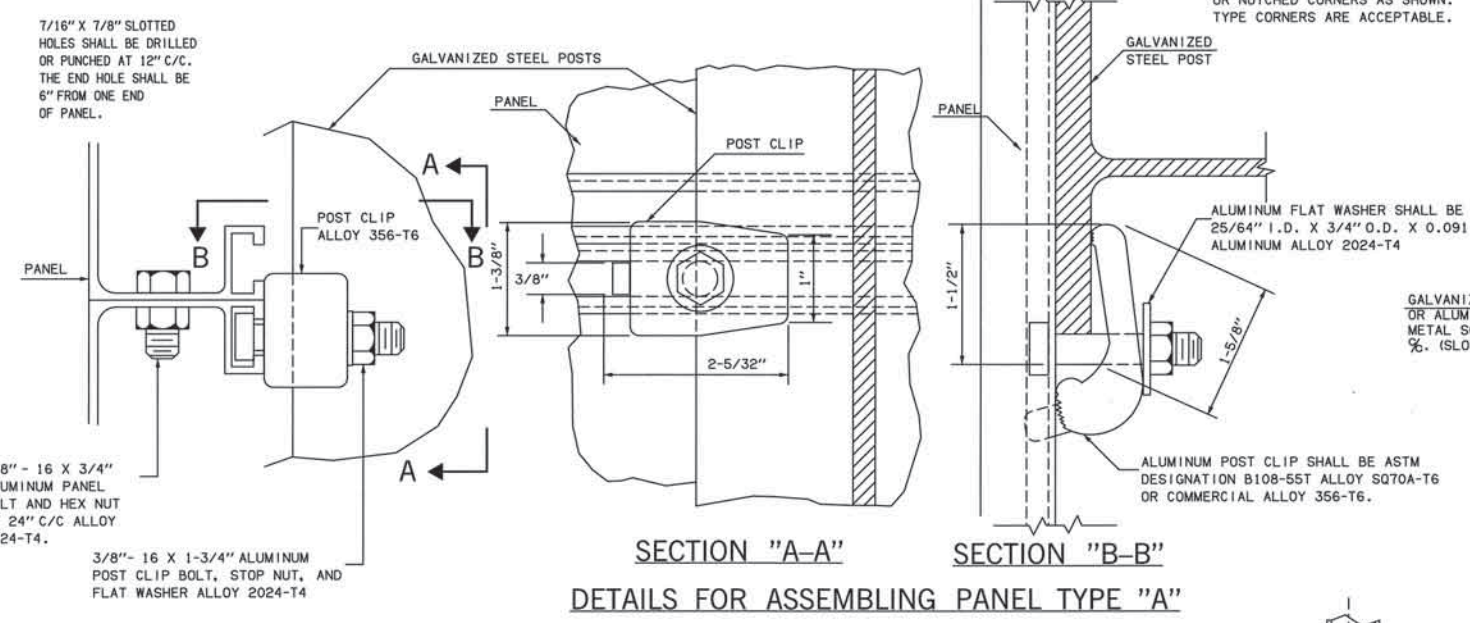
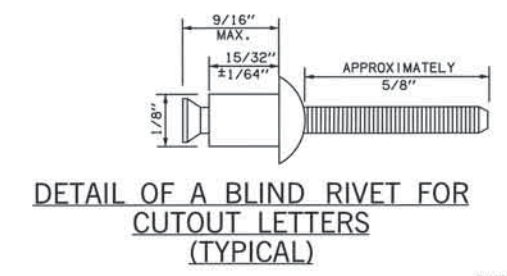
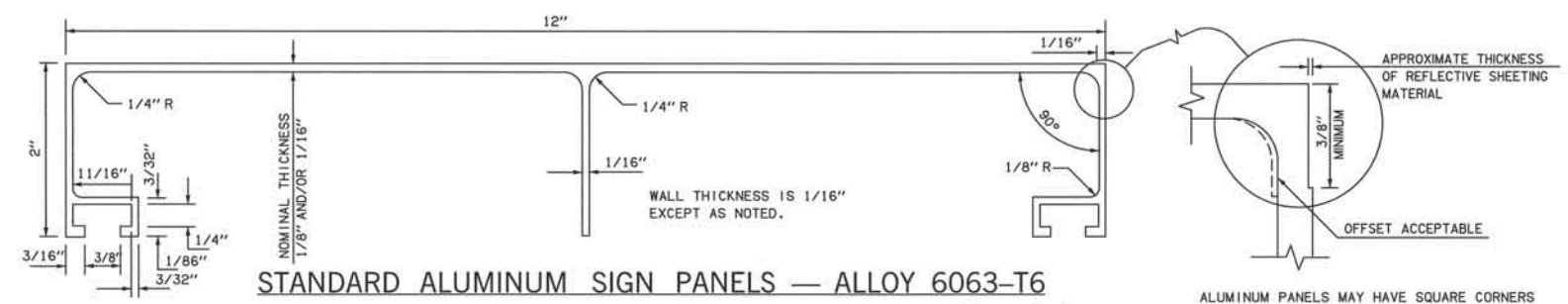
TRAFFIC STANDARD

SHEET SIGN ASSEMBLY DETAILS (SQUARE TUBE)

2009 SPECIFICATIONS

SSA1-1	00
T-139	

DESCRIPTION	REVISIONS	DATE
DETAIL TYPE "A" EDGE STRIP		8/12/02



NOTES:

EXIT NUMBER SIGNS SHALL BE MOUNTED ON THE EXTREME RIGHT OF GUIDE SIGNS FOR RIGHT EXITS OR EXTREME LEFT FOR LEFT EXITS.

EXIT NUMBER SIGN PANEL SHALL BE BOLTED TO MAIN SIGN -- SEE SECTION "C-C" THIS SHEET.

EDGE OF EXIT NUMBER SIGN SHOULD NOT EXTEND BEYOND EDGE OF MAIN SIGN.

"T" BRACES AND POST CLIPS SHALL BE PAID FOR IN PRICE BID FOR OTHER ITEMS OF WORK.

GALVANIZED STEEL "T" BRACES MAY BE SUBSTITUTED FOR ALUMINUM.

BASIS OF PAYMENT		
ITEM NO.	ITEM	UNIT
850(B)	EXTRUDED ALUMINUM PANEL SIGNS	SF



APPROVED BY TRAFFIC ENGINEER: *Charles Amick* DATE: 8/31/2010

TRAFFIC STANDARD
ALUMINUM SIGN PANELS AND ASSEMBLY DETAILS

DESCRIPTION	REVISIONS	DATE
MODIFIED GENERAL NOTE 4.		7/08/2011
REISSUED		4/10/2012

WINDLOAD COORDINATES FOR SQUARE POST AT 90 MPH

SIGN CENTROID	ALLOWABLE SIGN AREA (FT ²) PER SINGLE POST *							
	FHWA APPROVED FOR: 2 POST PER SIGN				FHWA APPROVED FOR: 1 POST PER SIGN			
	1 1/2"x12ga perf.	1 3/4"x14ga perf.	1 3/4"x12ga perf.	2"x14ga perf.	2"x12ga perf.	2 1/4"x14ga perf.	2 1/4"x12ga perf.	2 1/2"x12ga perf.
16.5'	3.46	3.90	4.85	5.19	6.48	6.67	8.34	10.44
16'	3.57	4.02	5.00	5.36	6.68	6.88	8.60	10.76
15.5'	3.68	4.15	5.17	5.53	6.90	7.11	8.88	11.11
15'	3.81	4.29	5.34	5.71	7.13	7.34	9.17	11.48
14.5'	3.94	4.44	5.52	5.91	7.37	7.60	9.49	11.87
14'	4.08	4.59	5.72	6.12	7.64	7.87	9.83	12.30
13.5'	4.23	4.76	5.93	6.35	7.92	8.16	10.19	12.75
13'	4.39	4.95	6.16	6.59	8.22	8.47	10.59	13.24
12.5'	4.57	5.15	6.41	6.86	8.55	8.81	11.01	13.77
12'	4.76	5.36	6.67	7.14	8.91	9.18	11.47	14.35
11.5'	4.96	5.59	6.96	7.45	9.30	9.58	11.97	14.97
11'	5.19	5.85	7.28	7.79	9.72	10.01	12.51	15.65
10.5'	5.44	6.13	7.63	8.16	10.18	10.49	13.11	16.40
10'	5.71	6.43	8.01	8.57	10.69	11.01	13.76	17.22
9.5'	6.01	6.77	8.43	9.02	11.25	11.59	14.49	18.12
9'	6.34	7.15	8.90	9.52	11.88	12.24	15.29	19.13
8.5'	6.72	7.57	9.42	10.08	12.58	12.96	16.19	20.26
8'	7.14	8.04	10.01	10.71	13.36	13.77	17.20	21.52

* USE A MULTIPLIER OF 2 OR 3 FOR 2 & 3 POST INSTALLATIONS.

GENERAL NOTES

- POST TUBE SHALL MEET ASTM A1011 GRADE 50. POST TUBE GALVANIZED AS PER ASTM A653 GRADE 90.
- HEAVY DUTY ANCHOR TUBE SHALL MEET ASTM A500 GRADE B STRUCTURAL TUBE AND STEEL SHALL BE HOT DIP GALVANIZED PER ASTM A123.
- THE UPPER SIGN POST SHALL TELESCOPE INSIDE THE ANCHOR TUBE A MINIMUM OF 12". ANCHOR TUBE SHALL BE MINIMUM OF 30" WITH 3" MAXIMUM AS SHOWN IN DETAILS.
- THE CONCRETE FOOTING SHALL BE CLASS "C" CONCRETE OR AS DIRECTED BY THE ENGINEER. CONCRETE INCLUDED IN THE COST OF SQUARE TUBE POST.
- THE NON-REINFORCED CIRCULAR CONCRETE FOOTING, ANCHOR TUBE AND HARDWARE SHALL BE INCLUDED IN THE UNIT PRICE BID FOR THE SQUARE TUBE POST.
- SEE STANDARD DRAWINGS SSA1-1, MSD5-1, MSD6-1, SBS1-1, SBS2-1, AND SBS3-1 (LATEST REVISION) FOR PROPER BRACKET PLACEMENT ON THE SIGN AND POST SPACING FOR TWO POST INSTALLATION.
- FOR VERTICAL AND LATERAL CLEARANCE, SEE STANDARD DRAWING GMS1-1, AND GMS2-1-(LATEST REVISION).
- SIGNS SHALL BE ATTACHED TO THE POSTS WITH BOLTS AS SHOWN ON STANDARD DRAWING SSA1-1-(LATEST REVISION).

BASIS OF PAYMENT		
ITEM NO.	ITEM	UNIT
851(C)	SQUARE TUBE POST	LF

APPROVED BY TRAFFIC ENGINEER: *Theresa Gray* DATE: 4/17/12

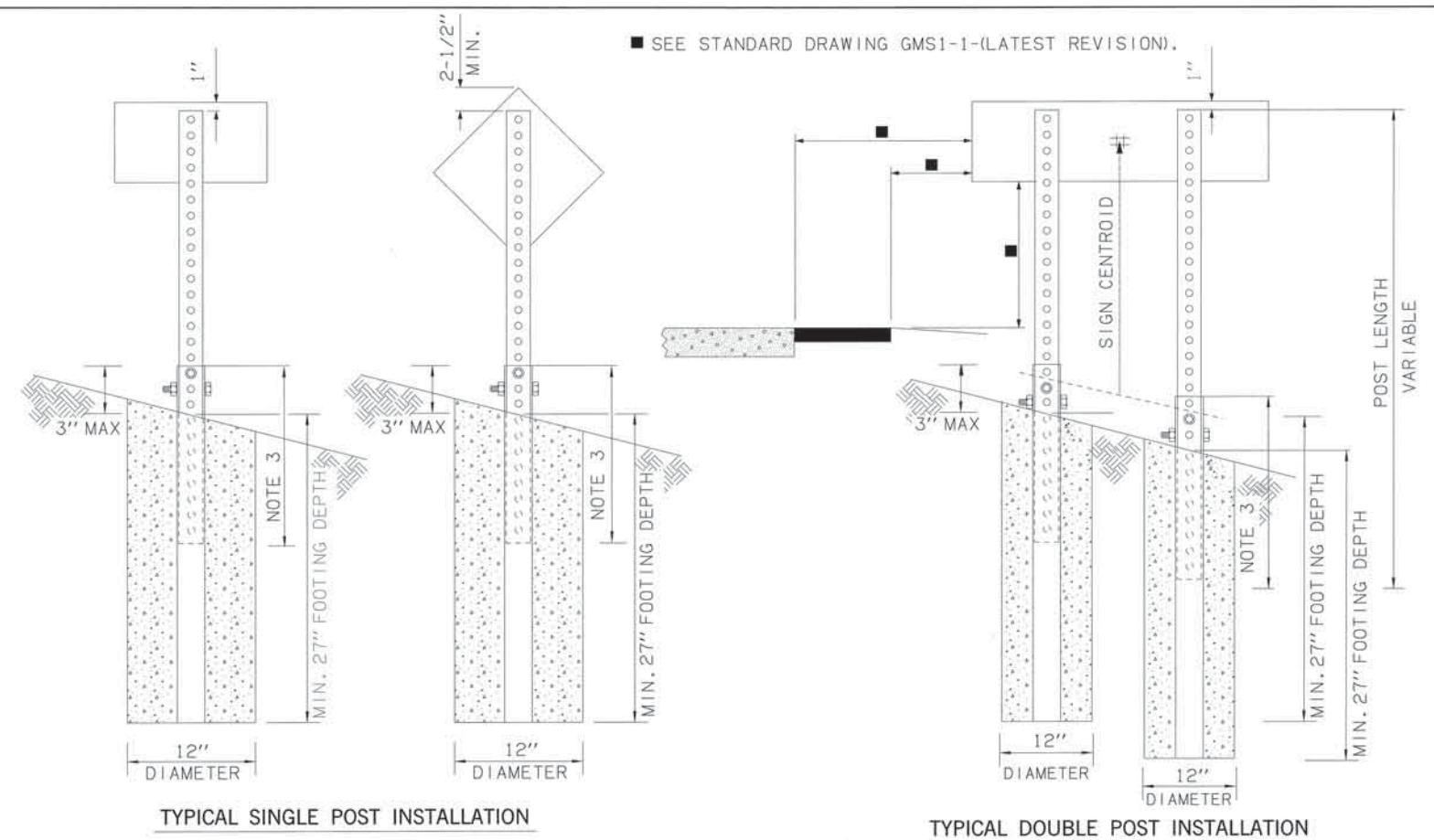


TRAFFIC STANDARD
SQUARE TUBE POST DETAILS

2009 SPECIFICATIONS

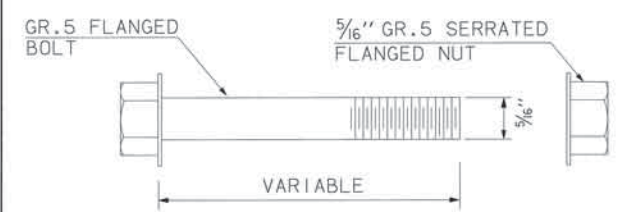
SSP1-1	02
T-138	

SEE STANDARD DRAWING GMS1-1-(LATEST REVISION).

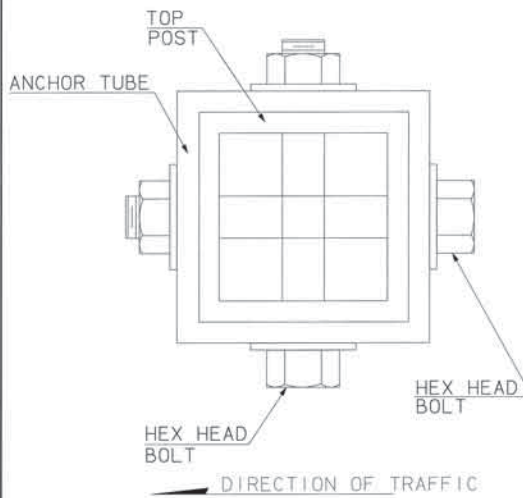


TYPICAL SINGLE POST INSTALLATION

TYPICAL DOUBLE POST INSTALLATION

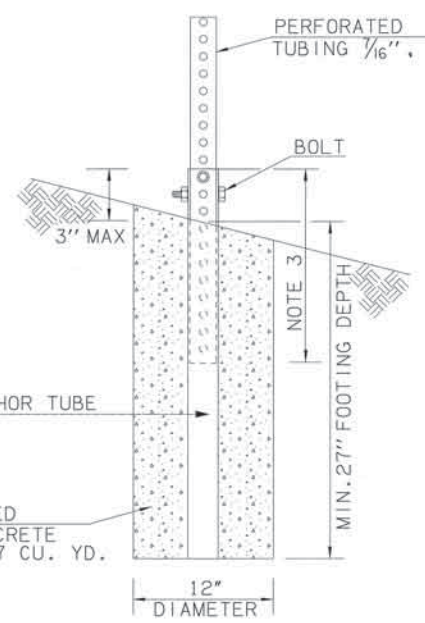


BOLT DESIGN

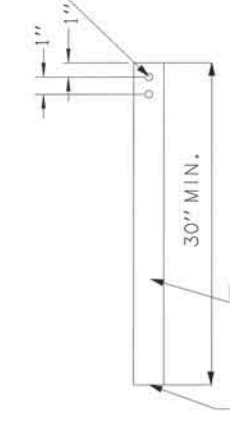


ANCHOR TUBE DETAILS WITH CONCRETE FOOTING

NON-PERFORATED ANCHOR TUBE SHALL HAVE TWO (2) 1/16" DIAMETER HOLES SPACED 1" ON CENTER ALONG THE CENTERLINE OF EACH OF THE FOUR SIDES.



ANCHOR TUBE DETAILS WITH CONCRETE FOOTING



HEAVY DUTY ANCHOR TUBE

- DRAWING NOT TO SCALE -



TWO-WAY TRAFFIC

W6-3	36 x 36	9.00 SF
W6-3E	48 x 48	16.00 SF

COLOR:
BORDER AND ARROW:
BLACK (NON-REFLECTORIZED)
BACKGROUND:
FLOURESCENT YELLOW
(REFLECTORIZED)



SLIPPERY WHEN WET

W8-5	30 x 30	6.25 SF
W8-5E	36 x 36	9.00 SF
W8-5F	48 x 48	16.00 SF

COLOR:
BORDER AND SYMBOL:
BLACK (NON-REFLECTORIZED)
BACKGROUND:
FLOURESCENT YELLOW
(REFLECTORIZED)



TRUCK CROSSING

W8-6	36 x 36	9.00 SF
W8-6F	48 x 48	16.00 SF

COLOR:
BORDER AND LEGEND:
BLACK (NON-REFLECTORIZED)
BACKGROUND:
FLOURESCENT YELLOW
(REFLECTORIZED)



BRIDGE ICES BEFORE ROAD

W8-13	30 x 30	6.25 SF
W8-13E	36 x 36	9.00 SF
W8-13F	48 x 48	16.00 SF

COLOR:
BORDER AND LEGEND:
BLACK (NON-REFLECTORIZED)
BACKGROUND:
FLOURESCENT YELLOW
(REFLECTORIZED)

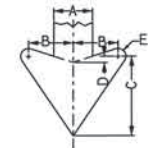


RAILROAD ADVANCE WARNING

W10-1	36 DIA	7.07 SF
W10-1E	48 DIA	12.57 SF

COLOR:
BORDER, LEGEND AND SYMBOL:
BLACK (NON-REFLECTORIZED)
BACKGROUND:
FLOURESCENT YELLOW
(REFLECTORIZED)

DESCRIPTION	REVISIONS	DATE
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ARROW DIMENSIONS				
A	B	C	D	E
6"	5-3/16"	9-1/8"	11/16"	7/8"

ARROW DETAILS FOR W13-6 & W13-7



PEDESTRAIN CROSSING

W11-2	30 x 30	6.25 SF
W11-2E	36 x 36	9.00 SF

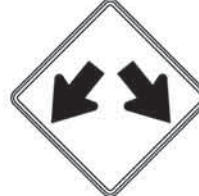
COLOR:
BORDER AND SYMBOL:
BLACK (NON-REFLECTORIZED)
BACKGROUND:
FLOURESCENT YELLOW
(REFLECTORIZED)



TRUCK CROSSING

W11-10	30 x 30	6.25 SF
W11-10E	36 x 36	9.00 SF
W11-10F	48 x 48	16.00 SF

COLOR:
BORDER AND SYMBOL:
BLACK (NON-REFLECTORIZED)
BACKGROUND:
FLOURESCENT YELLOW
(REFLECTORIZED)



DOUBLE ARROW

W12-1	30 x 30	6.25 SF
W12-1E	36 x 36	9.00 SF

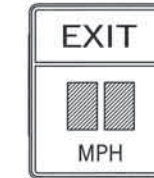
COLOR:
BORDER AND ARROW:
BLACK (NON-REFLECTORIZED)
BACKGROUND:
FLOURESCENT YELLOW
(REFLECTORIZED)



ADVISORY SPEED

W13-1P	18 x 18	2.25 SF
W13-1PE	24 x 24	4.00 SF
W13-1PF	30 x 30	6.25 SF

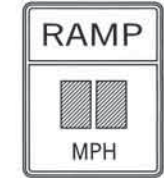
COLOR:
BORDER AND LEGEND:
BLACK (NON-REFLECTORIZED)
BACKGROUND:
FLOURESCENT YELLOW
(REFLECTORIZED)



ADVISORY EXIT SPEED

W13-2	24 x 30	5.00 SF
W13-2E	36 x 48	12.00 SF
W13-2F	48 x 60	20.00 SF

COLOR:
BORDER AND LEGEND:
BLACK (NON-REFLECTORIZED)
BACKGROUND:
FLOURESCENT YELLOW
(REFLECTORIZED)



ADVISORY RAMP SPEED

W13-3	24 x 30	5.00 SF
W13-3E	36 x 48	12.00 SF
W13-3F	48 x 60	20.00 SF

COLOR:
BORDER AND LEGEND:
BLACK (NON-REFLECTORIZED)
BACKGROUND:
FLOURESCENT YELLOW
(REFLECTORIZED)



ADVISORY EXIT SPEED

W13-6E	36 x 60	15.00 SF
W13-6F	48 x 84	28.00 SF

COLOR:
BORDER AND ARROW:
BLACK (NON-REFLECTORIZED)
BACKGROUND:
FLOURESCENT YELLOW
(REFLECTORIZED)



ADVISORY RAMP SPEED

W13-7E	36 x 60	15.00 SF
W13-7F	48 x 84	28.00 SF

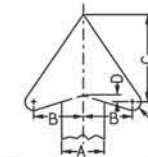
COLOR:
BORDER AND ARROW:
BLACK (NON-REFLECTORIZED)
BACKGROUND:
FLOURESCENT YELLOW
(REFLECTORIZED)



ARROW

W16-7p	24 x 12	2.00 SF
W16-7pE	30 x 18	3.75 SF

COLOR:
BORDER AND ARROW:
BLACK (NON-REFLECTORIZED)
BACKGROUND:
FLOURESCENT YELLOW
(REFLECTORIZED)



SIGN SIZE	DIMENSIONS				
	A	B	C	D	E
30" x 30"	3-3/4"	4-5/16"	7-5/8"	9/16"	3/4"
36" x 36"	4-1/2"	5-3/16"	9-1/8"	11/16"	7/8"
48" x 48"	6"	6-7/8"	12-3/16"	15/16"	1-3/16"

ARROW DETAILS FOR W6-3 & W6-3E

SIGNS	MARGIN	BORDER	BLANK
30 x 30	.500	.750	B-30(D)
36 x 36	.625	.875	B-36(D)
48 x 48	.750	1.250	B-48(D)

BASIS OF PAYMENT

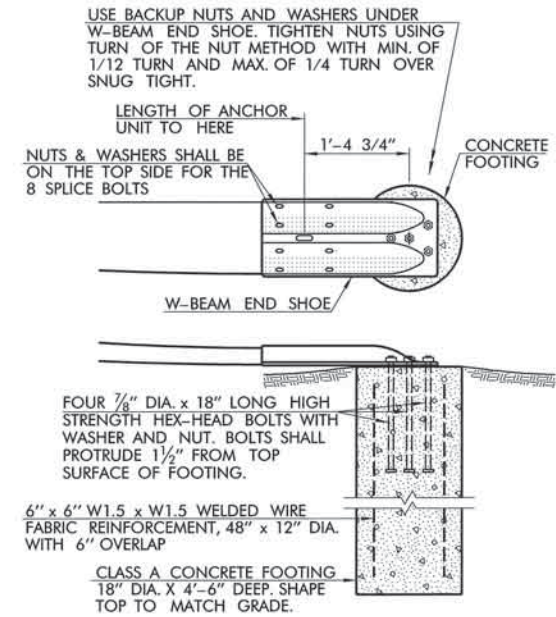
ITEM NO.	ITEM	UNIT
850(A)	SHEET ALUMINUM SIGNS	SF



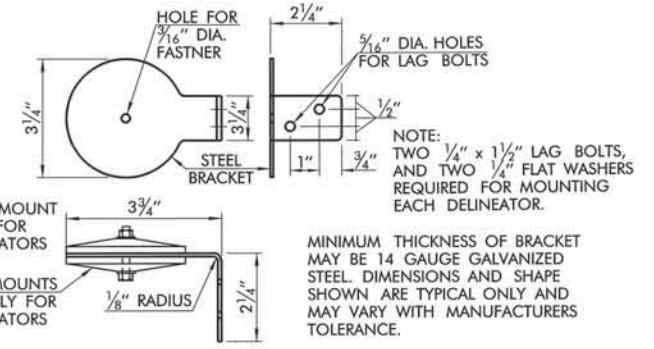
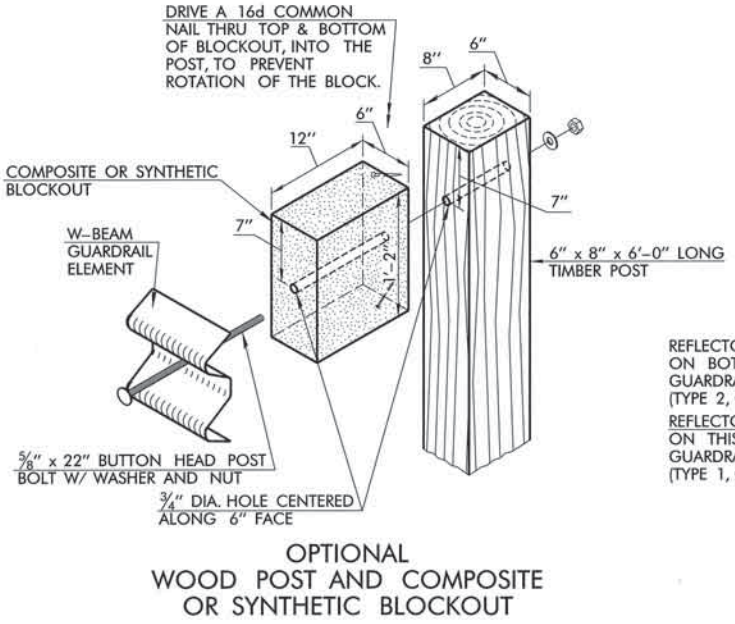
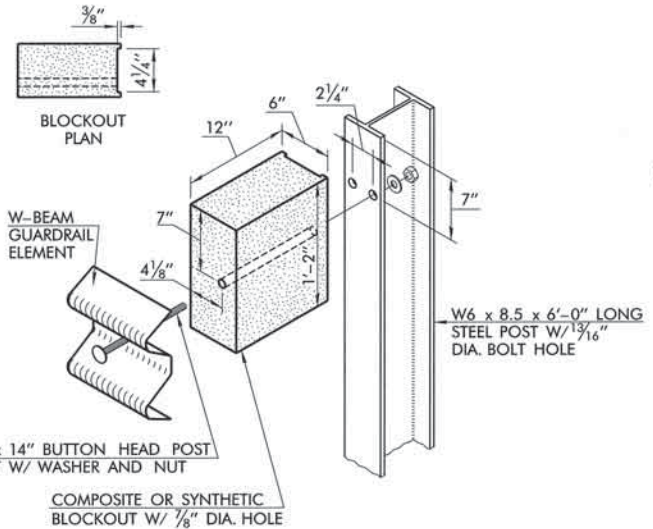
APPROVED BY
TRAFFIC ENGINEER: *David J. Smith* DATE: 8/31/2010

TRAFFIC STANDARD WARNING SIGN DETAILS (W-SERIES)

REVISIONS	DATE
DESCRIPTION	

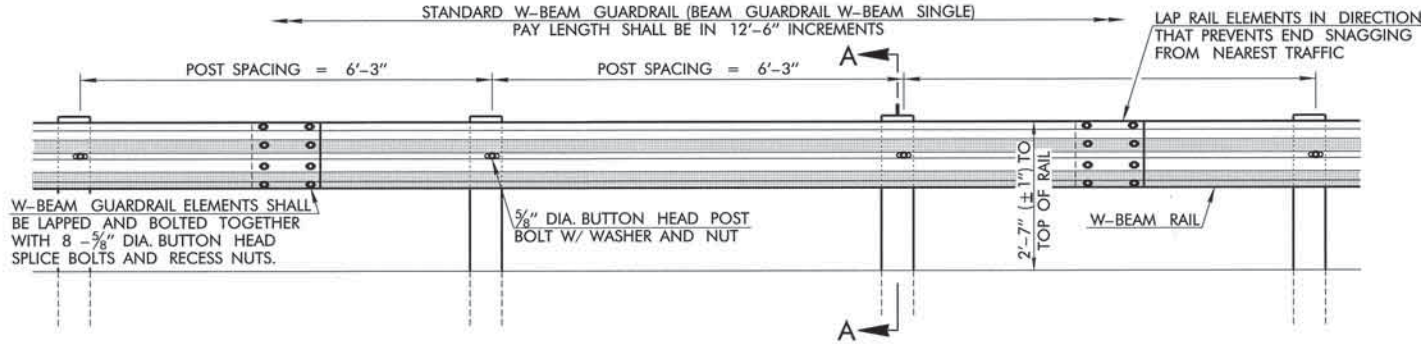


GROUND ANCHOR FOOTING DETAIL

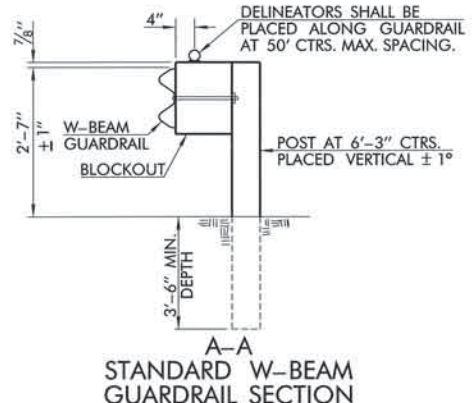


TYPICAL BRACKET FOR MOUNTING 3/4" ROUND DELINEATOR TO GUARD RAIL BLOCKOUT

CONTRACTOR MAY USE ALTERNATE DELINEATORS LISTED ON TRAFFIC ENGINEERING DIVISIONS QUALIFIED PRODUCTS LIST (QPL). THE USE OF ALTERNATE DELINEATORS (NOT DESCRIBED IN THIS STANDARD) MUST BE APPROVED BY THE RESIDENT ENGINEER.



STANDARD W-BEAM GUARDRAIL ELEVATION

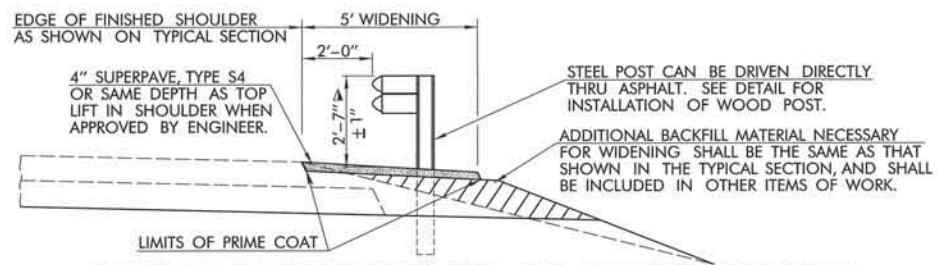


OPTIONAL TYPE POSTS OR BLOCKOUTS FOR STANDARD GUARDRAIL

THE CONTRACTOR MAY, AT HIS OPTION, SELECT AND USE ONE OF THE TYPE POSTS AND BLOCKOUTS SHOWN ABOVE, OR AN APPROVED ALTERNATE. THIS POST & BLOCKOUT CHOICE MUST BE USED ON THE ENTIRE PROJECT. ALTERNATE POST (INCLUDING SPECIAL SHAPES) MAY BE USED UPON THE APPROVAL OF THE ENGINEER. ALTERNATE BLOCKOUTS SUCH AS WOOD MAY BE USED IF PRODUCT HAS BEEN EVALUATED AND APPROVED BY ODOT.

GENERAL NOTES

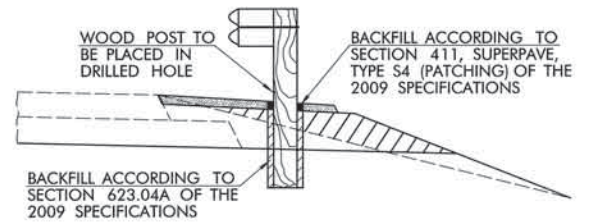
1. ALL CONSTRUCTION AND MATERIAL REQUIREMENTS SHALL BE IN ACCORDANCE WITH THE 2009 ODOT STANDARD SPECIFICATIONS.
2. STANDARD GUARDRAIL WITH 6'-3" POST SPACING MEETS NHCPR-350, TEST LEVEL 3. IF A RIGID HAZARD IS TO BE LEFT BEHIND THE GUARDRAIL, WITHIN 3'-0" OF THE RAIL, CONSIDER USING A DIFFERENT TREATMENT.
3. IF OPTIONAL WOOD POSTS AND BLOCKOUTS ARE USED, THEN THEY SHALL BE STRESS GRADE 1200F.
4. ALL STANDARD GUARDRAIL AND GUARDRAIL EXTRUDER TERMINALS SHALL BE OFFSET SO THAT RAIL FACE IS TWO FEET OUTSIDE THE SHOULDER. FOR TRANSITION FROM BRIDGE RAIL TO TWO FOOT OFFSET, BEGINNING AT THE GUARDRAIL BRIDGE CONNECTION, TRANSITION THE STANDARD GUARDRAIL, AT A 30:1 TAPER, UNTIL THE RAIL REACHES THE OFFSET DISTANCE.
5. ALL GUARDRAIL, METAL POSTS, PLATES AND HARDWARE SHALL BE GALVANIZED AFTER FABRICATION.
6. ANY FIELD CUTS OR HOLES DRILLED IN GALVANIZED MATERIALS SHALL BE COATED WITH A ZINC OXIDE PAINT. SEE SECTION 730 OF THE 2009 SPECIFICATIONS.
7. GUARDRAIL DELINEATORS (TYPE 2, CODE 1) WILL BE REQUIRED FOR ALL TWO-LANE ROADWAYS. ALL OTHER ROADWAYS WILL REQUIRE GUARDRAIL DELINEATORS (TYPE 1, CODE 1).



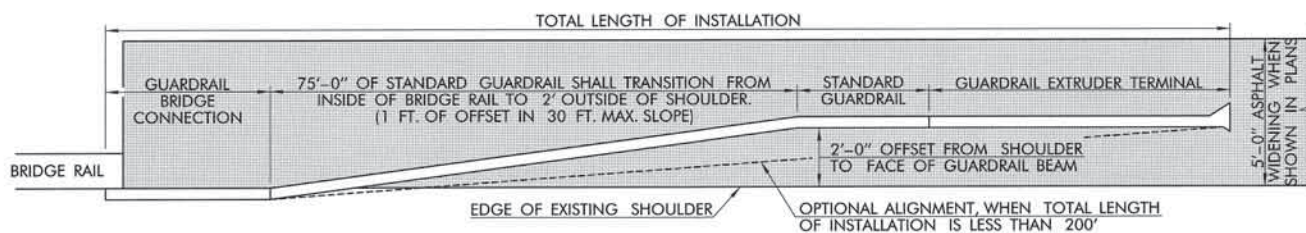
DETAIL OF SHOULDER WIDENING FOR STANDARD GUARDRAIL

MEASURE FROM TOP OF RAIL, GUARDRAIL TO BE INSTALLED WITH THIS DIMENSION. WHEN INSTALLING GUARDRAIL IN AN AREA WITH NO SHOULDER WIDENING, THE RAIL HEIGHT SHALL BE MEASURED AS FOLLOWS:

- FOR NEGATIVE GRADE SHOULDERS, MEASURE TO A LINE FROM THE SHOULDER ON THE SAME SLOPE AS THE SHOULDER.
- FOR POSITIVE GRADE & LEVEL SHLDRS, MEASURE FROM A LINE LEVEL WITH THE EDGE OF SHOULDER.



INSTALLATION OF WOOD POST IN ASPHALT WIDENING



TYPICAL GUARDRAIL INSTALLATION AT BRIDGE

BASIS OF PAYMENT		
ITEM NO.	ITEM	UNIT
623(A)	BEAM GUARDRAIL W-BEAM SINGLE	L.F.
623(F)	GUARDRAIL TRAIL END TURNDOWN (31")	EA.
853	GUARDRAIL DELINEATORS (TYPE 1, CODE 1)	EA.
853	GUARDRAIL DELINEATORS (TYPE 2, CODE 1)	EA.

NOTE: PAY ITEM GUARDRAIL ANCHOR UNIT-TURN DOWN INCLUDES ALL LABOR AND MATERIALS TO INSTALL 25'-0" TWISTED RAIL ELEMENT, W-BEAM END SHOE, CONC. FOOTING, AND FOUR ANCHOR BOLTS.

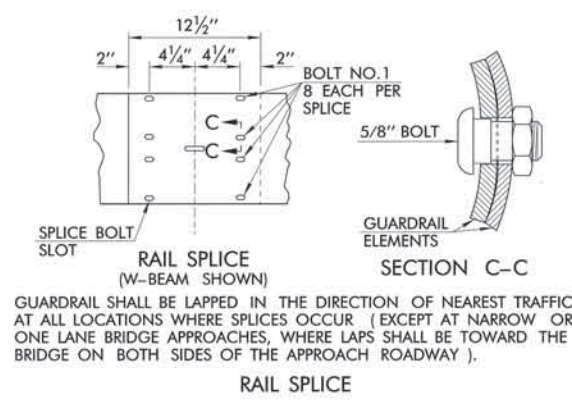
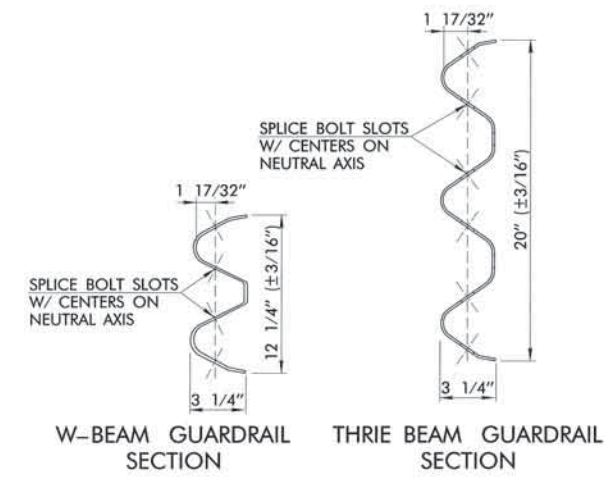
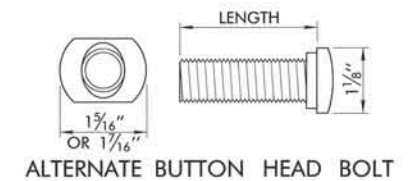
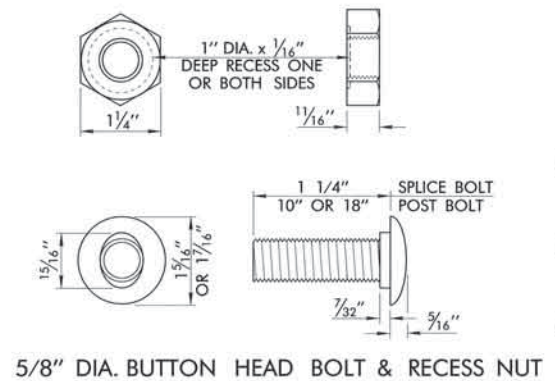


APPROVED BY TRAFFIC ENGINEER: *[Signature]* DATE: 4/9/2012

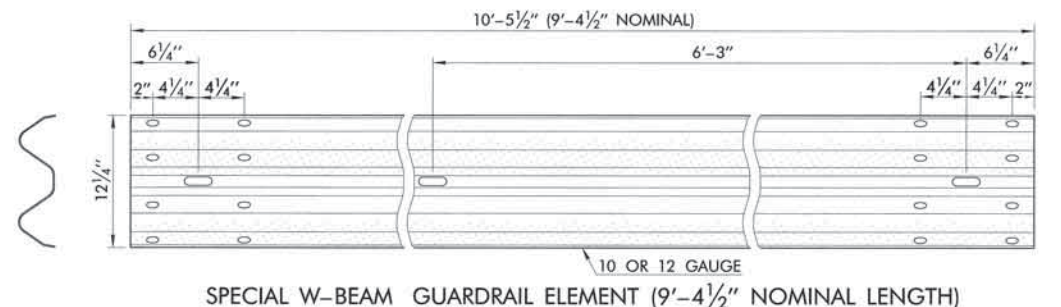
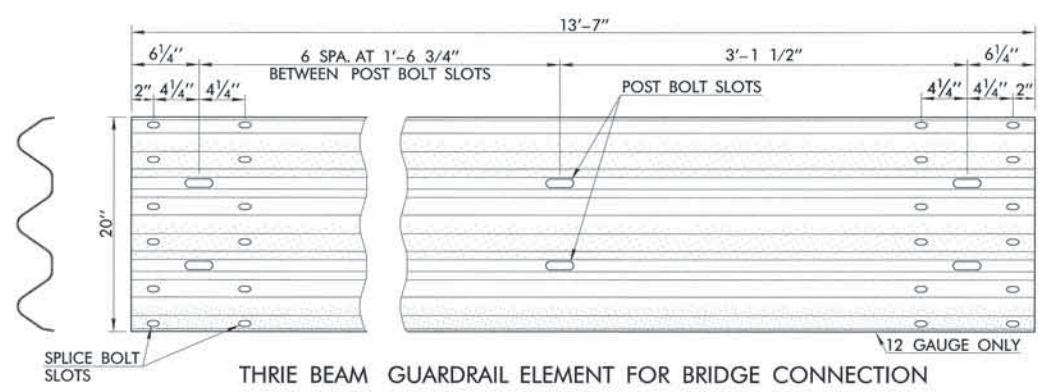
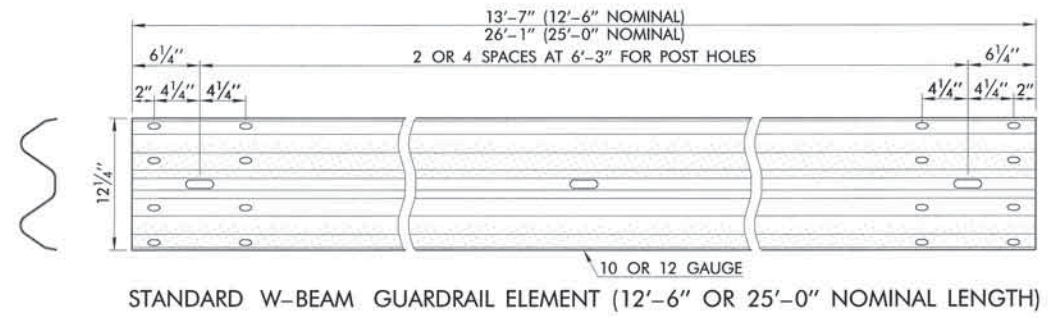
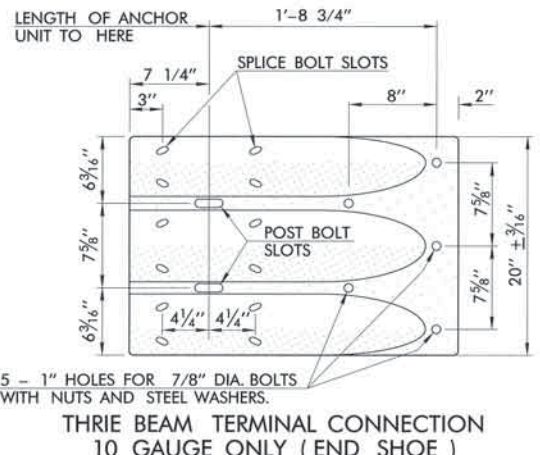
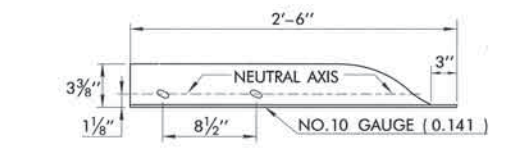
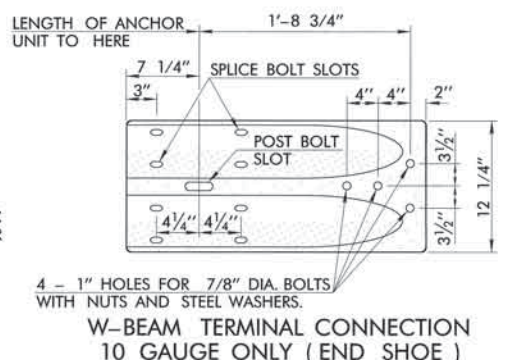
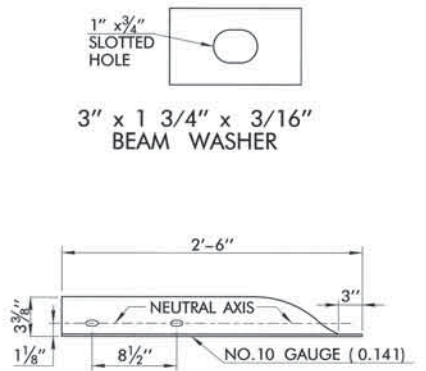
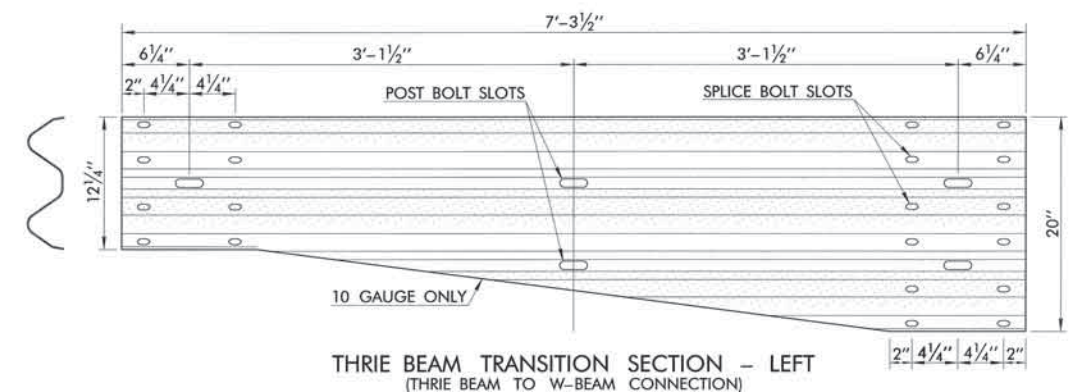
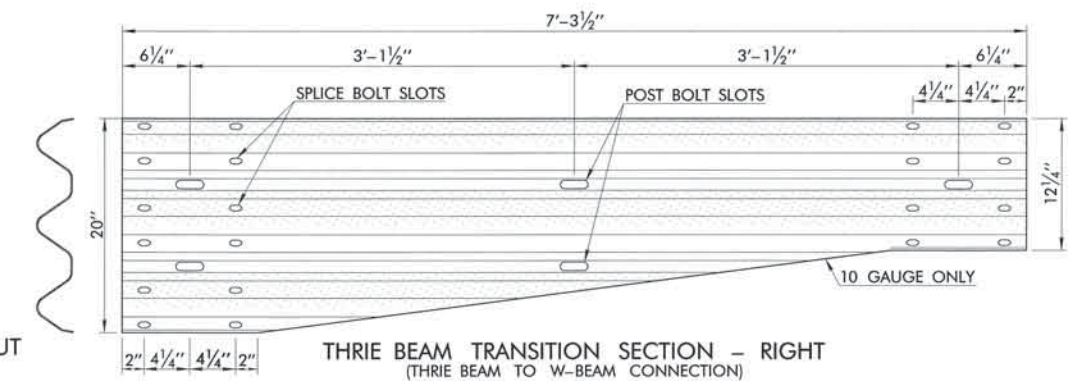
TRAFFIC STANDARD
GUARDRAIL AND HARDWARE
(1 OF 2)
(31" SYSTEM)

2009 SPECIFICATIONS

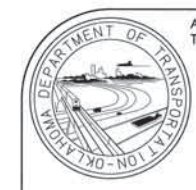
DESCRIPTION	REVISIONS	DATE



GUARDRAIL SHALL BE LAPPED IN THE DIRECTION OF NEAREST TRAFFIC AT ALL LOCATIONS WHERE SPLICES OCCUR (EXCEPT AT NARROW OR ONE LANE BRIDGE APPROACHES, WHERE LAPS SHALL BE TOWARD THE BRIDGE ON BOTH SIDES OF THE APPROACH ROADWAY).



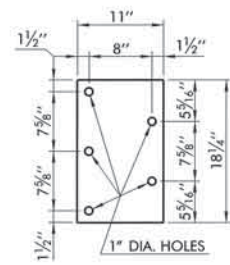
- GENERAL NOTES**
1. ALL CONSTRUCTION AND MATERIAL REQUIREMENTS SHALL BE IN ACCORDANCE WITH THE 2009 ODOT STANDARD SPECIFICATIONS.
 2. ALL GUARDRAIL BEAMS, END SHOES, AND END SECTIONS ON THIS STANDARD DRAWING SHALL BE IN ACCORDANCE WITH AASHTO M 180.
 3. ALL SPLICE BOLT SLOTS SHALL BE 29/32" WIDE x 1 1/8" LONG.
 4. ALL POST BOLT SLOTS SHALL BE 3/4" WIDE x 2 1/2" LONG.



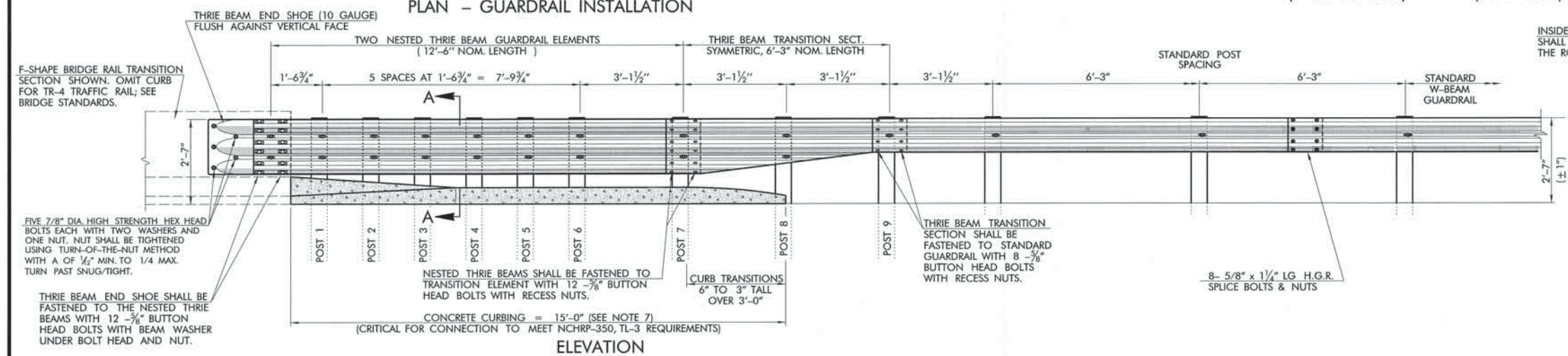
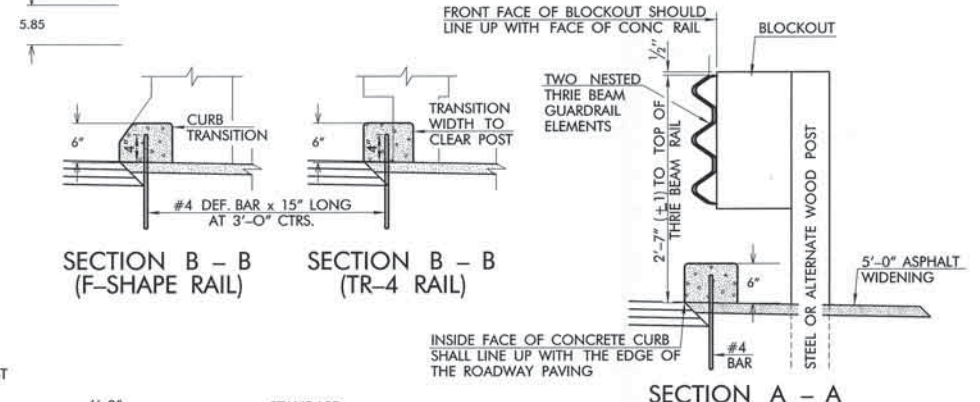
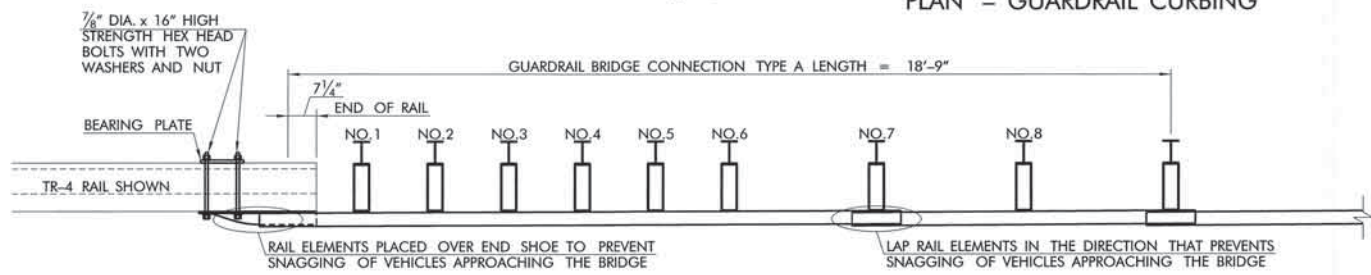
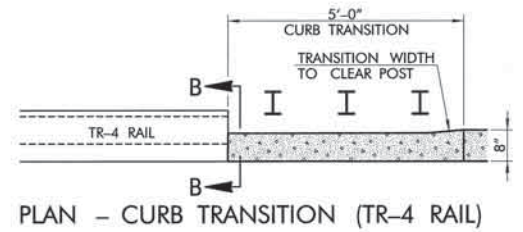
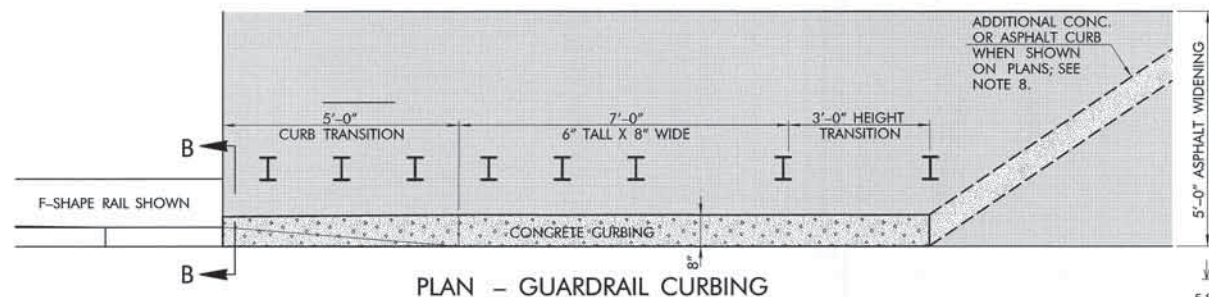
APPROVED BY: *Charles Smith* DATE: 9/9/12
TRAFFIC ENGINEER

TRAFFIC STANDARD
GUARDRAIL AND HARDWARE
(2 OF 2)
(31" SYSTEM)

DESCRIPTION	REVISIONS	DATE
REVISED NOTE 8 & GUARDRAIL PAY ITEM		4/2/2013
REVISED THRIE BEAM TO W-BEAM SPACING		6/18/2013



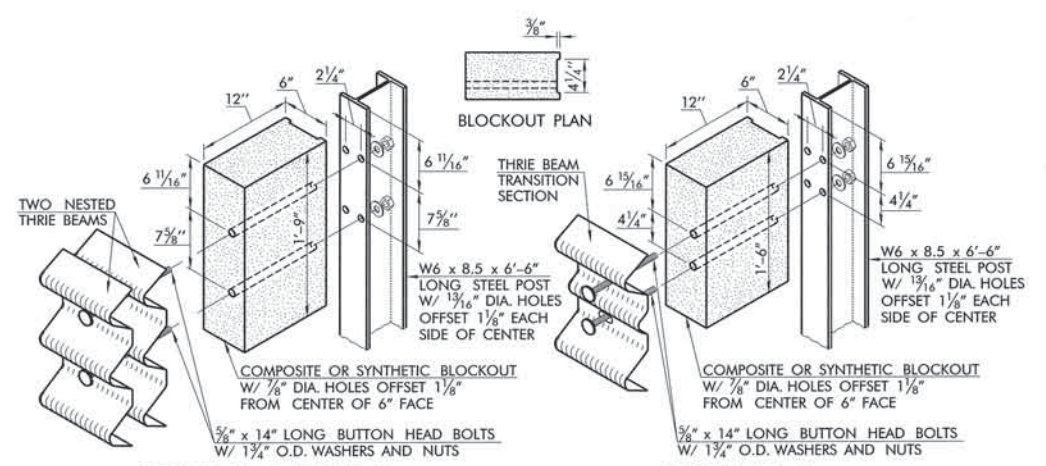
BEARING PLATE
BEARING PLATE SHALL BE 3/8" THICK, GRADE 36 STRUCTURAL STEEL MEETING REQUIREMENTS OF AASHTO M270.



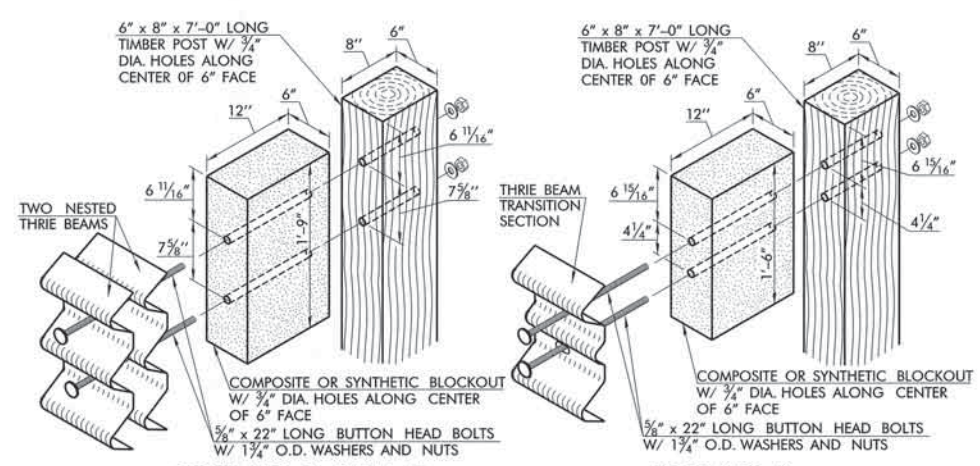
GENERAL NOTES

- ALL CONSTRUCTION AND MATERIAL REQUIREMENTS SHALL BE IN ACCORDANCE WITH THE 2009 ODOT STANDARD SPECIFICATIONS.
- ALL GUARDRAIL, METAL POSTS, BEARING PLATES, BOLTS, WASHERS, AND NUTS SHALL BE GALVANIZED AFTER FABRICATION.
- ANY FIELD CUTS OR HOLES DRILLED IN GALVANIZED MATERIALS SHALL BE COATED WITH A ZINC OXIDE PAINT, ACCORDING TO SECTION 730.06 OF THE SPECIFICATIONS.
- ALTERNATIVE POSTS MAY BE USED IN LIEU OF THE POSTS SHOWN ON THIS STANDARD, IF THEY ARE CERTIFIED AS NCHRP-350, TL-3, TESTED AND APPROVED BY THE ENGINEER.
- WOOD BLOCKOUTS MAY BE USED IN LIEU OF COMPOSITE OR SYNTHETIC BLOCKOUTS, IF BLOCKOUT IS ODOT APPROVED.
- FOR DETAILS OF GUARDRAIL HARDWARE INCLUDING THRIE BEAM GUARDRAIL ELEMENT, THRIE BEAM TRANSITION SECTION, END SHOE, BEAM WASHER, BUTTON HEAD BOLTS & RECESS NUTS, SEE TRAFFIC STANDARD GHW2-1.
- PAY ITEM 'GUARDRAIL BRIDGE CONNECTION-THRIE BEAM' INCLUDES ALL COST OF MATERIALS AND INSTALLATION OF THE THRIE BEAM RAIL ELEMENTS, TRANSITION SECTION, END SHOE, POSTS, BLOCKOUTS, CONCRETE CURB, BEARING PLATE, BOLTS, WASHERS AND NUTS SHOWN ON DETAILS.
- PAY ITEM 'GUARDRAIL CURBING' INCLUDES ALL COST OF MATERIALS AND INSTALLATION OF CLASS A CONCRETE CURB AND #4 BARS AS SHOWN ON DETAILS WHEN ADDITIONAL LENGTH IS REQUIRED.

BASIS OF PAYMENT		
ITEM NO.	ITEM	UNIT
623(1)	GUARDRAIL BRIDGE CONN-THRIE BEAM (31")	EA.
623	(PL) GUARDRAIL CURBING	EA.



POST NO. 1 THRU 7
STEEL POST AND COMPOSITE OR SYNTHETIC BLOCKOUT



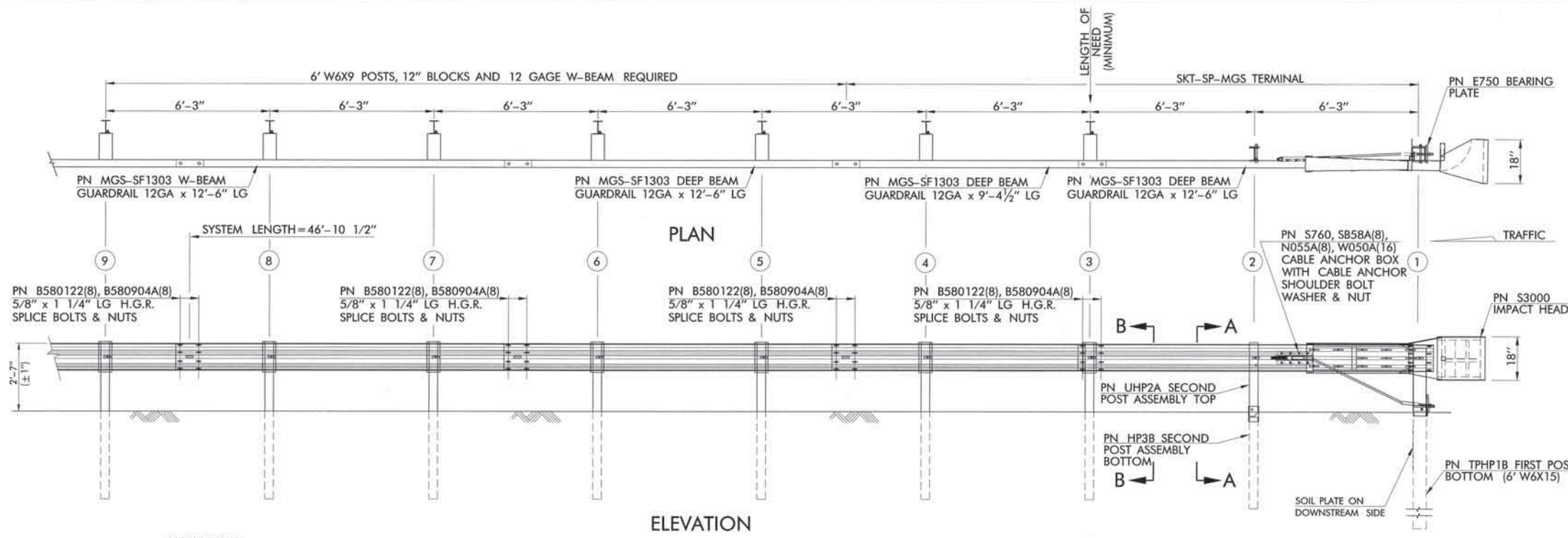
POST NO. 1 THRU 7
OPTIONAL WOOD POST AND COMPOSITE OR SYNTHETIC BLOCKOUT



APPROVED BY: *David Smith*
TRAFFIC ENGINEER: DATE: 6/18/2013

TRAFFIC STANDARD
GUARDRAIL BRIDGE CONNECTION-
THRIE BEAM
(31" SYSTEM)

DESCRIPTION	REVISIONS	DATE

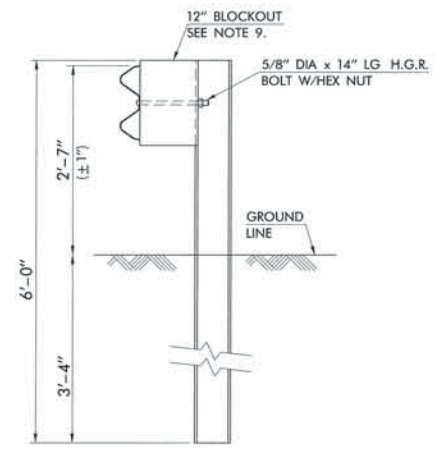


BILL OF MATERIAL

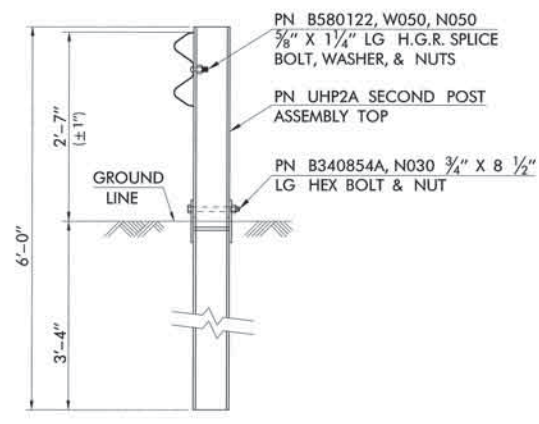
PN	QTY	DESCRIPTION
S3000	1	IMPACT HEAD
MGS-SF1303	1	W-BEAM GUARDRAIL END SECTION, 12 Ga.
TPHP1A	1	FIRST POST TOP (6X6X1/8" Tube)
TPHP1B	1	FIRST POST BOTTOM (6' W6X15)
UHP2A	1	SECOND POST ASSEMBLY TOP
HP3B	1	SECOND POST ASSEMBLY BOTTOM
E750	1	BEARING PLATE
S760	1	CABLE ANCHOR BOX
E770	1	BCT CABLE ANCHOR ASSEMBLY
B5160104A	2	5/16 x 1 HEX BOLT GRD 5
W0516	4	5/16 WASHER
N0516	2	5/16 HEX NUT
B580122	25	5/8 Dia. x 1 1/4 SPLICE BOLT (POST #2)
B580904A	2	5/8 Dia. x 9 HEX BOLT GRD 5
W050	3	5/8 WASHER
N050	26	5/8 Dia. H.G.R. NUT
B340854A	1	3/4 Dia. x 8 1/2 HEX BOLT GRD A449
N030	1	3/4 Dia. HEX NUT
N100	1	1 ANCHOR CABLE HEX NUT
W100	1	1 ANCHOR CABLE WASHER
SB58A	8	CABLE ANCHOR BOX SHOULDER BOLT
N055A	8	1/2 A325 STRUCTURAL NUT
W050A	16	1 1/16 OD x 9/16 ID A325 STR. WASHER

GENERAL NOTES

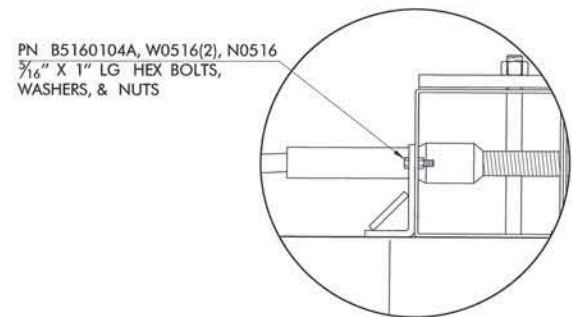
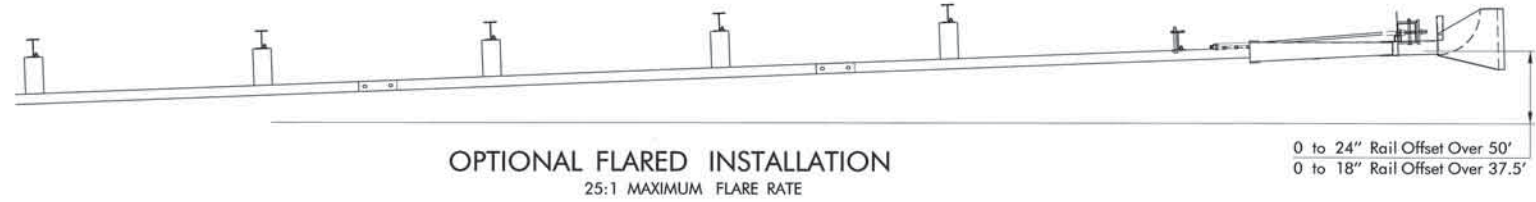
- ALL CONSTRUCTION AND MATERIAL REQUIREMENTS SHALL BE IN ACCORDANCE WITH THE 2009 ODOT STANDARD SPECIFICATIONS.
- ALL BOLTS, NUTS, CABLE ASSEMBLIES, CABLE ANCHORS AND BEARING PLATES SHALL BE GALVANIZED.
- THE LOWER SECTIONS OF THE POSTS 1 & 2 SHALL NOT PROTRUDE MORE THAN 4 IN ABOVE THE GROUND (MEASURED ALONG A 5' CORD). SITE GRADING MAY BE NECESSARY TO MEET THIS REQUIREMENT.
- THE LOWER SECTIONS OF THE HINGED POSTS SHOULD NOT BE DRIVEN WITH THE UPPER POST ATTACHED. IF THE POST IS PLACED IN A DRILLED HOLE, THE BACKFILL MATERIAL MUST BE SATISFACTORILY COMPACTED TO PREVENT SETTLEMENT.
- WHEN COMPETENT ROCK IS ENCOUNTERED, A 12" DIA POST HOLE, 20 IN. DEEP CORED INTO THE ROCK SURFACE MAY BE USED IF APPROVED BY THE ENGINEER FOR POST 1. GRANULAR MATERIAL WILL BE PLACED IN THE BOTTOM OF THE HOLE, APPROXIMATELY 2.5" DEEP TO PROVIDE DRAINAGE. THE FIRST POST CAN BE FIELD CUT TO LENGTH, PLACED IN THE HOLE AND BACKFILLED WITH SUITABLE BACKFILL. THE SOIL PLATE MAY BE TRIMMED IF REQUIRED.
- A SITE EVALUATION SHOULD BE CONSIDERED IF THERE IS LESS THAN 25' BETWEEN THE OUTLET SIDE OF THE TERMINAL AND ANY ADJACENT DRIVING LANE.
- THE BREAKAWAY CABLE ASSEMBLY MUST BE TAUT. A LOCKING DEVICE (VICE GRIPS OR CHANNEL LOCK PLIERS) SHOULD BE USED TO PREVENT THE CABLE FROM TWISTING WHEN TIGHTENING NUTS.
- EXTRUDER TYPE TERMINALS SHALL NOT BE INSTALLED WHEN ADJACENT DRIVING LANES ARE WITHIN 25 FEET (HORIZONT.) OF EXTRUSION SIDE OF THE EXTRUDER TERMINAL.
- RECYCLED COMPOSITE (PLASTIC) OR WOOD BLOCKOUTS MAY BE USED THROUGHOUT THE LENGTH OF THE TERMINAL, IF APPROVED BY THE ENGINEER.



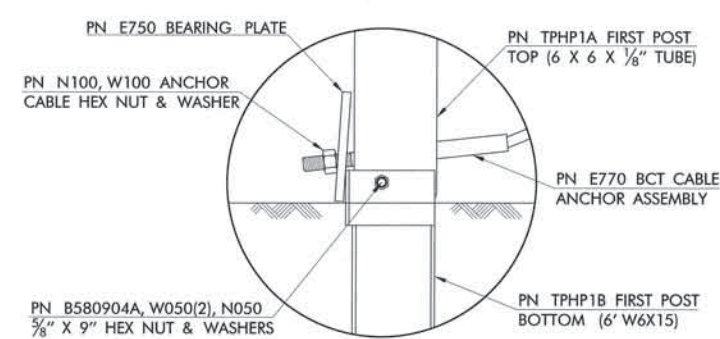
SECTION B-B
TYP AT POSTS #3 THRU #8



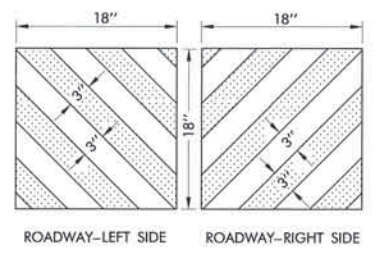
SECTION A-A
POST #2



IMPACT HEAD CONNECTION DETAIL



POST #1 CONNECTION DETAIL



REFLECTIVE MARKER DETAIL

REFLECTIVE MARKER

- REFLECTORIZED MARKER(S) SHOULD BE ATTACHED TO THE VERTICAL END (12" x 24" FACE - TYP.) OF THE G.E.T PRIOR TO INSTALLATION.
- ATTACHMENT SURFACE SHOULD BE THOROUGHLY CLEANED & DRY BEFORE ATTACHING ADHESIVE MARKER (STICK-ON SHEETING).
- ATTACHED ADHESIVE SHEETING SHOULD BE FREE OF AIR BUBBLES WITH ALL EDGES FIRMLY BONDED.
- STRIPING PATTERN MAY CONSIST OF 3" OR 4" STRIPES.

BASIS OF PAYMENT

ITEM NO.	ITEM	UNIT
623(G)	GUARDRAIL END TREATMENT (31")	EA.



APPROVED BY
TRAFFIC ENGINEER: *David Smith* DATE: 4/19/12
TRAFFIC STANDARD

GUARDRAIL END TREATMENT
(SKT-SP-MGS EXTRUDER TERMINAL)
(31" SYSTEM)