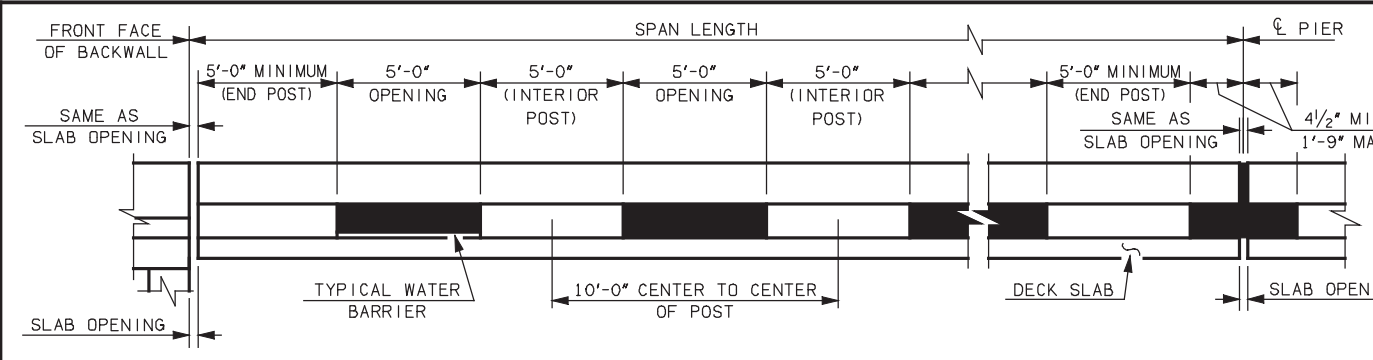


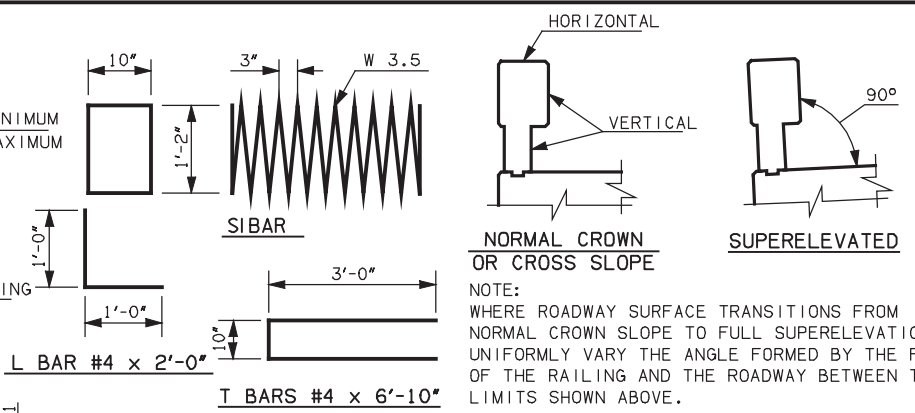
DESCRIPTION	REVISIONS	DATE



AT EXPANSION ABUTMENTS

AT EXPANSION PIERS

ELEVATION OF RAIL WITH EXPANSION JOINTS



NORMAL CROWN OR CROSS SLOPE

SUPERELEVATED

NOTE: WHERE ROADWAY SURFACE TRANSITIONS FROM NORMAL CROWN SLOPE TO FULL SUPERELEVATION, UNIFORMLY VARY THE ANGLE FORMED BY THE FACE OF THE RAILING AND THE ROADWAY BETWEEN THE LIMITS SHOWN ABOVE.

CONCRETE RAIL (TR3) NOTES

CONSTRUCT THE CONCRETE RAIL (TR3) TO MEET THE REQUIREMENTS OF THE STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION (ENGLISH) AS WELL AS THE FOLLOWING REQUIREMENTS:

S-BARS (SPIRAL BARS):
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. S-BARS ARE NOT TO BE EPOXY COATED.

CLASS AA CONCRETE:
CLASS AA CONCRETE SHALL BE USED IN THE CONCRETE RAIL (TR3). ALL COSTS OF CONCRETE TO BE INCLUDED IN THE PRICE BID PER LINEAR FOOT OF "CONCRETE RAIL (TR3)".

SR-BARS (VERTICAL POST BARS):
PLACE AND TIE ALL SRIBARS BEFORE CONCRETE IS PLACED IN THE DECK SLAB, APPROACH SLABS, OR WINGWALLS AS APPLICABLE. ROTATE HORIZONTAL LEGS OF THE SRIBARS TO MAINTAIN CONCRETE COVER IN WINGWALL APPLICATIONS. ALL REINFORCING STEEL SHALL BE EPOXY COATED REINFORCING STEEL AND SHALL BE PAID FOR IN THE PRICE BID PER LB OF "EPOXY COATED REINFORCING STEEL".

WATER BARRIER:
WATER BARRIERS, AS DETAILED, SHALL BE PROVIDED AT RAIL OPENINGS THAT DRAIN ONTO UNDERCROSSING ROADWAYS AND SIDEWALKS AS SHOWN IN THE PLANS AND AT OTHER LOCATIONS AS DIRECTED BY THE ENGINEER. PLACE THE CONCRETE FOR THE WATER BARRIER CONCURRENTLY WITH THE PLACEMENT OF THE CONCRETE IN THE POSTS. INCLUDE THE COST OF WATER BARRIERS IN THE PRICE BID FOR "CONCRETE RAIL (TR3)".

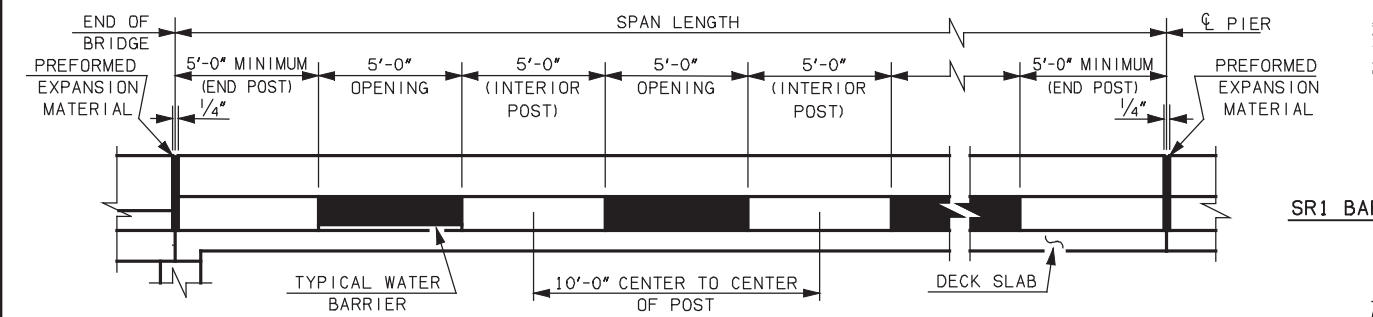
CONCRETE RAIL CONSTRUCTION:
CONSTRUCT RAILING WITHIN THE GUIDELINES AS SHOWN IN THE PLACEMENT DETAILS. LAYOUT THE POSTS AS SHOWN IN THE DETAILS ON THIS SHEET UNLESS OTHERWISE SHOWN IN THE PLANS. CONSTRUCT THE OPENINGS SUCH THAT THE END FACE OF THE POST IS PERPENDICULAR TO THE ROADWAY PROFILE GRADE. FOR RAILS ON A HORIZONTAL CURVE, CONSTRUCT THE RAIL TO THE REQUIRED RADIUS.

CONSTRUCTION JOINTS:
PLACE A CONSTRUCTION JOINT AT EACH FIXED ABUTMENT AND FIXED PIER, AND AT OTHER LOCATIONS AS 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 JOINT. CONSTRUCT THE OPENING BETWEEN THE END POST AND THE EXPANSION 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.

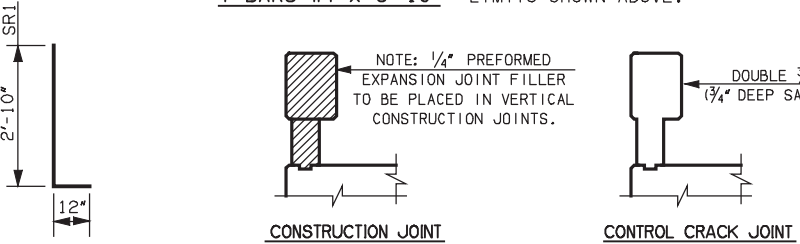
GUARDRAIL CONNECTION:
FORM OR DRILL HOLES, AS SHOWN, FOR THE CONNECTION OF GUARDRAIL BRIDGE CONNECTION AT THE LOCATIONS SHOWN IN THE PLANS OR AS DIRECTED BY THE ENGINEER. IT IS THE RESPONSIBILITY OF THE BRIDGE CONTRACTOR TO PROVIDE THE HOLES. THE CONTRACTOR THAT INSTALLS THE GUARDRAIL WILL BE RESPONSIBLE FOR INSTALLING THE GUARDRAIL BRIDGE CONNECTIONS. INCLUDE THE COST OF "T" BARS IN THE PRICE BID FOR "CONCRETE RAIL (TR3)".



AT FIXED ABUTMENTS

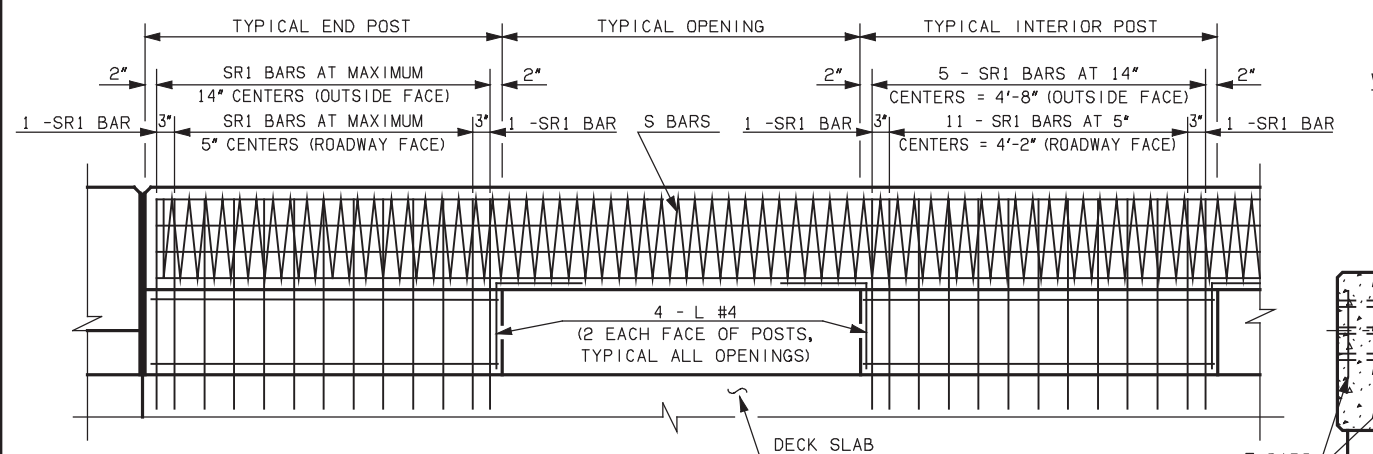
AT FIXED PIERS

ELEVATION OF RAIL WITH FIXED JOINTS

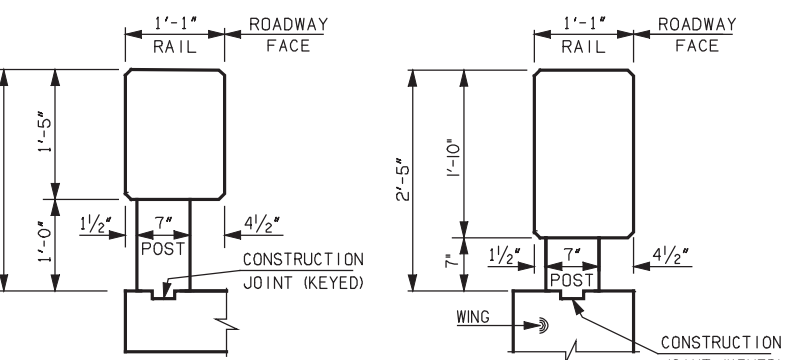


CONSTRUCTION JOINT

CONTROL CRACK JOINT

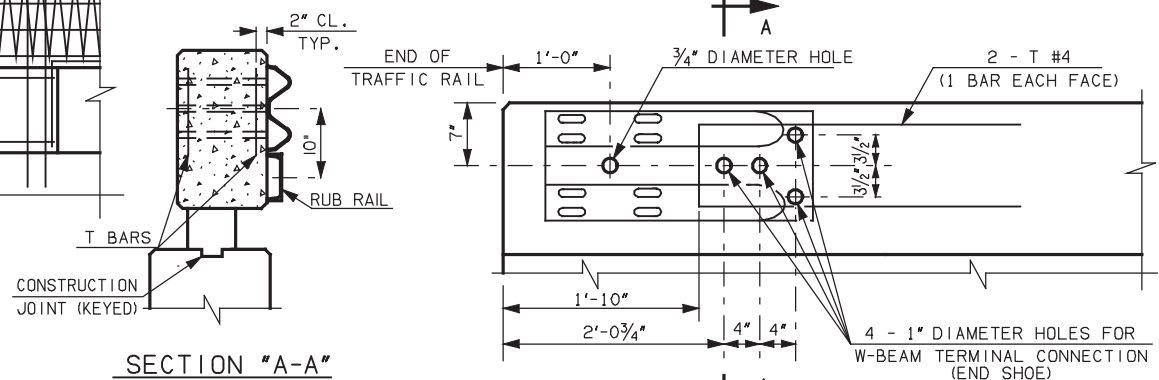


TRAFFIC RAIL REINFORCING



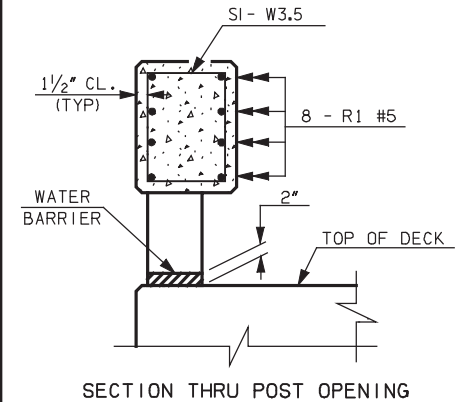
TRAFFIC RAIL DETAIL

TRAFFIC RAIL DETAIL AT WING

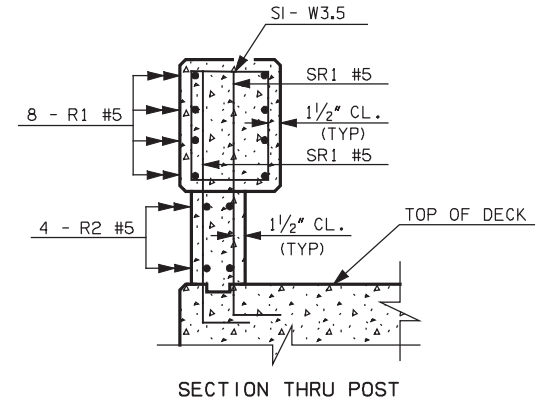


SECTION "A-A"

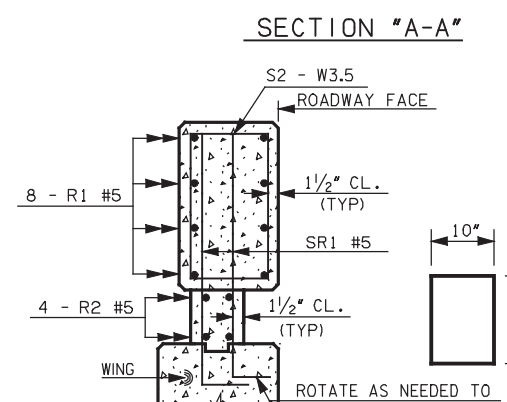
DETAIL "A"



SECTION THRU POST OPENING



SECTION THRU POST



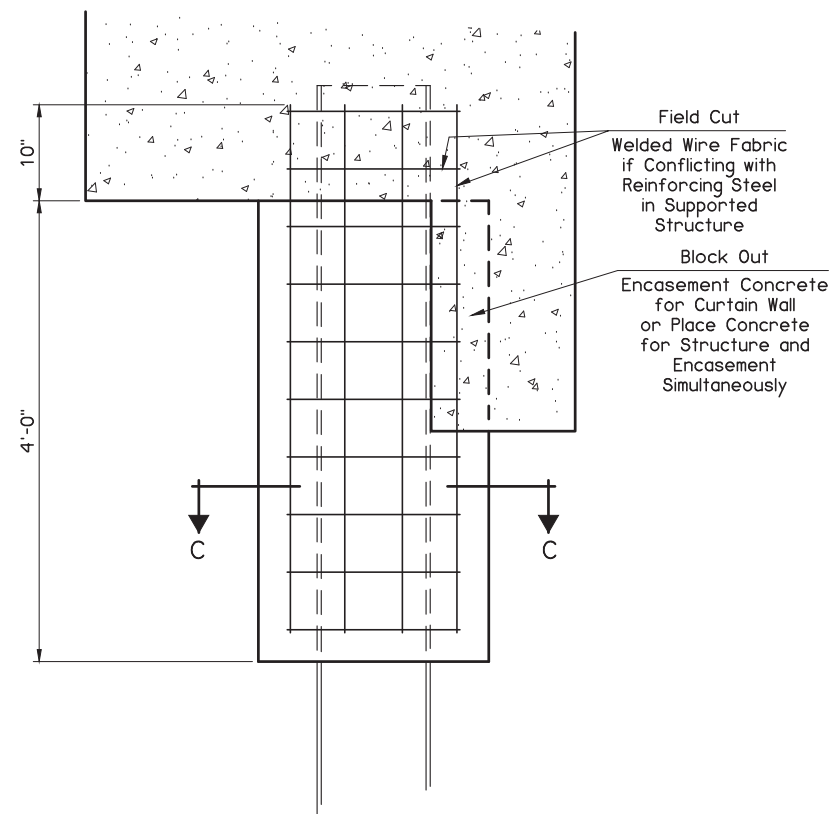
TRAFFIC RAIL SECTION AT WING

SECTION THRU RAIL AT BRIDGE DECK OR APPROACH SLAB

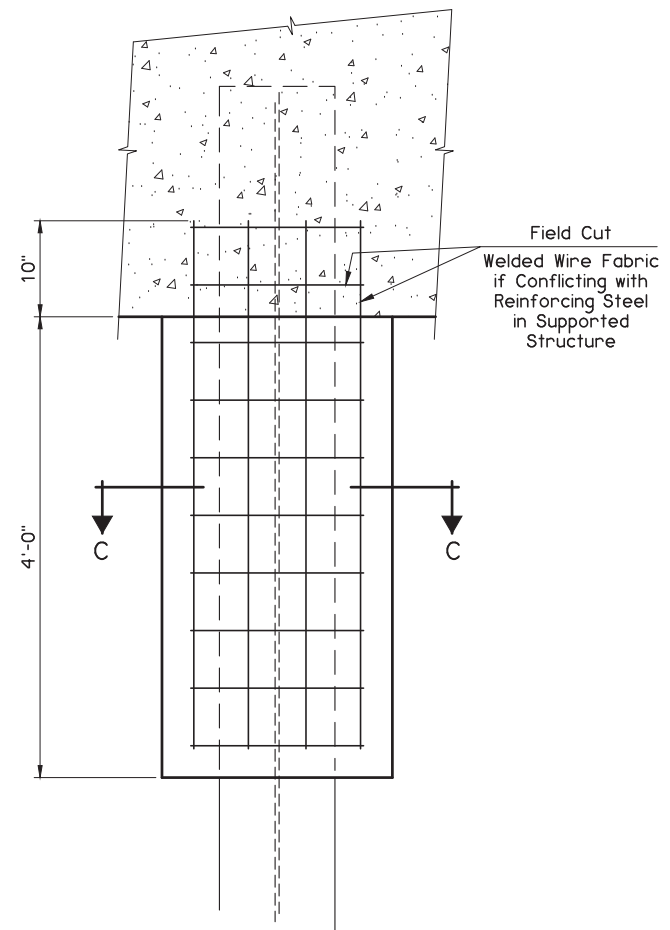
BASIS OF PAYMENT	
DESCRIPTION	UNIT
CONCRETE RAIL (TR3)	L.F.

APPROVED BY BRIDGE ENGINEER: [Signature] DATE: 1/17/13

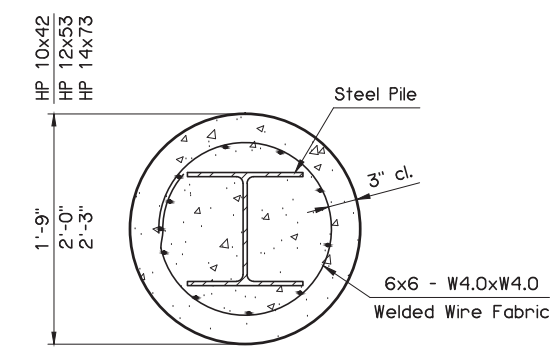
OKLAHOMA DEPT. OF TRANSPORTATION
BRIDGE STANDARD (ENGLISH)
CONCRETE RAIL (TR3)



ELEVATION AT CURTAIN WALL



TYPICAL ELEVATION

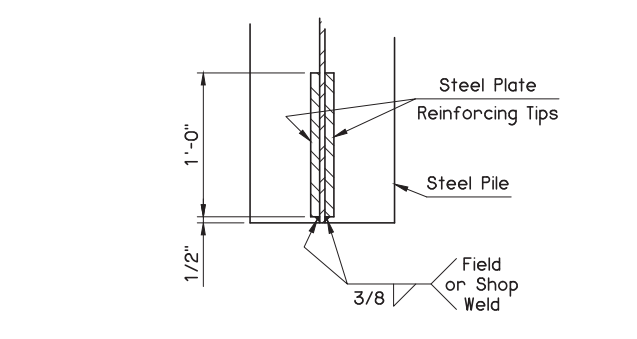


SECTION C-C

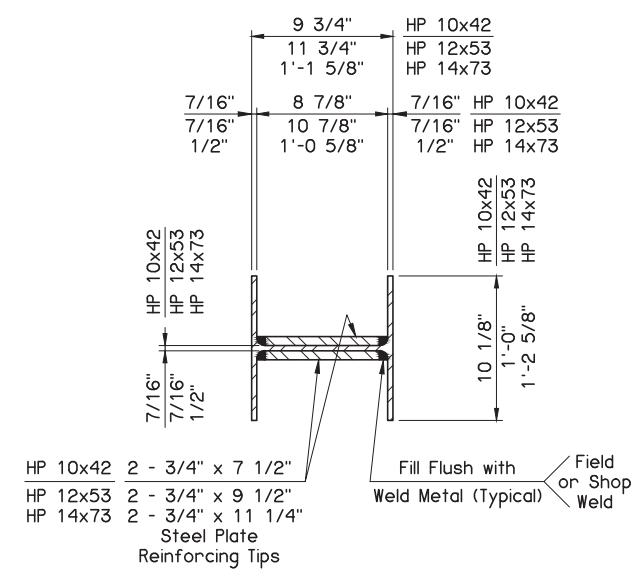
DETAIL OF STEEL PILE ENCASEMENT

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.

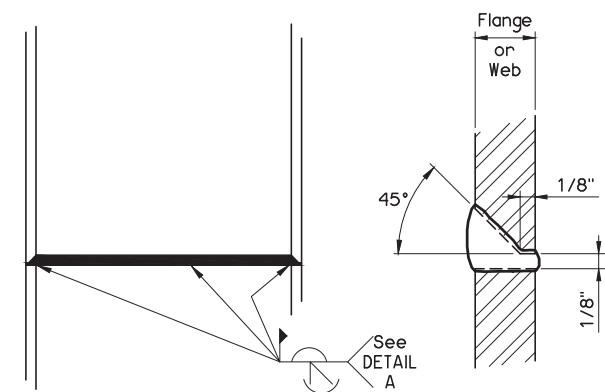
PILE ENCASEMENT QUANTITIES PER PILE				
ITEM	UNIT	HP 10x42	HP 12x53	HP 14x73
CLASS A CONCRETE	C.Y.	0.34	0.45	0.57
REINFORCING STEEL	LB.	16.2	18.3	20.3



SECTION A-A

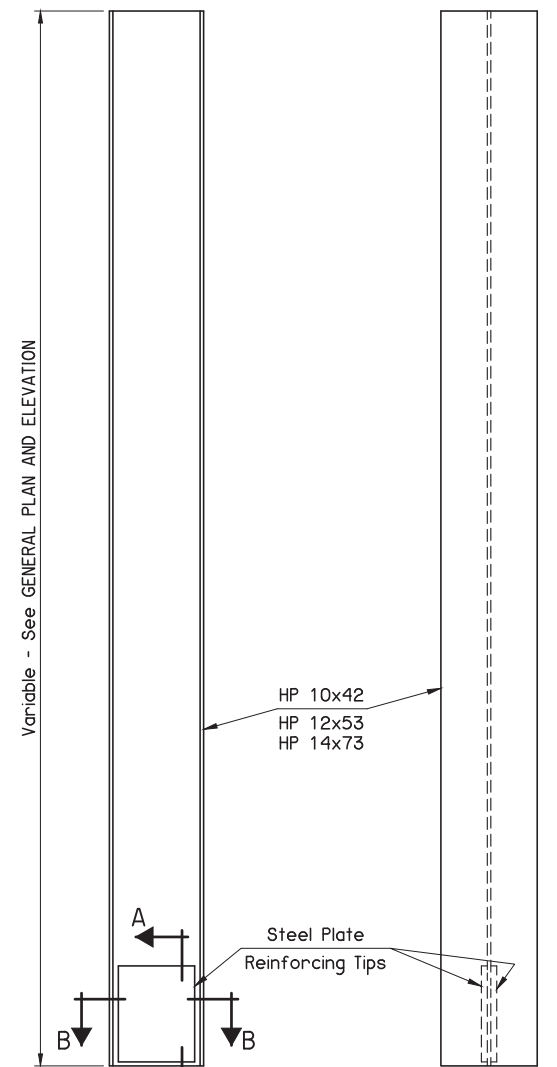


SECTION B-B



DETAIL OF WELDED SPLICE

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



ELEVATION OF WEB

ELEVATION OF FLANGE

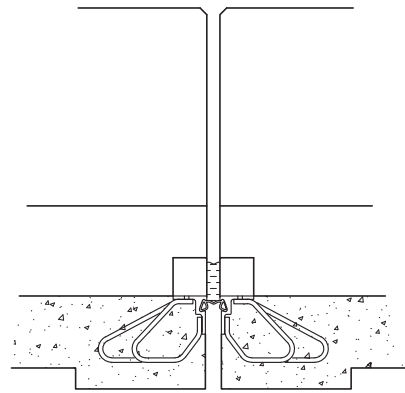
DETAIL OF PILING

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.

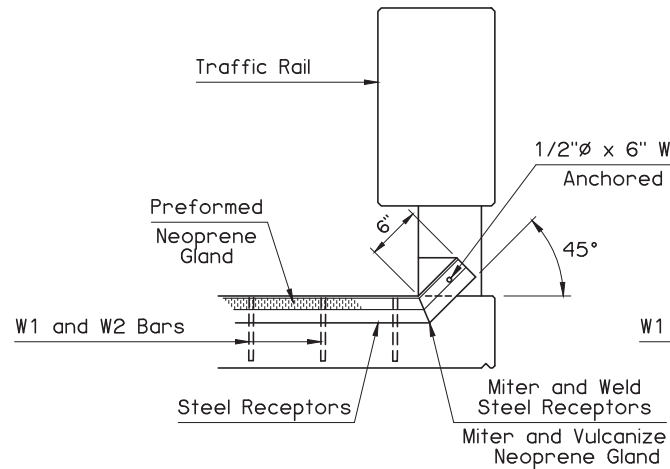
APPROVED BY BRIDGE ENGINEER *Stg Jca* DATE 12-20-16

OKLAHOMA DEPT. OF TRANSPORTATION
BRIDGE STANDARD (ENGLISH)

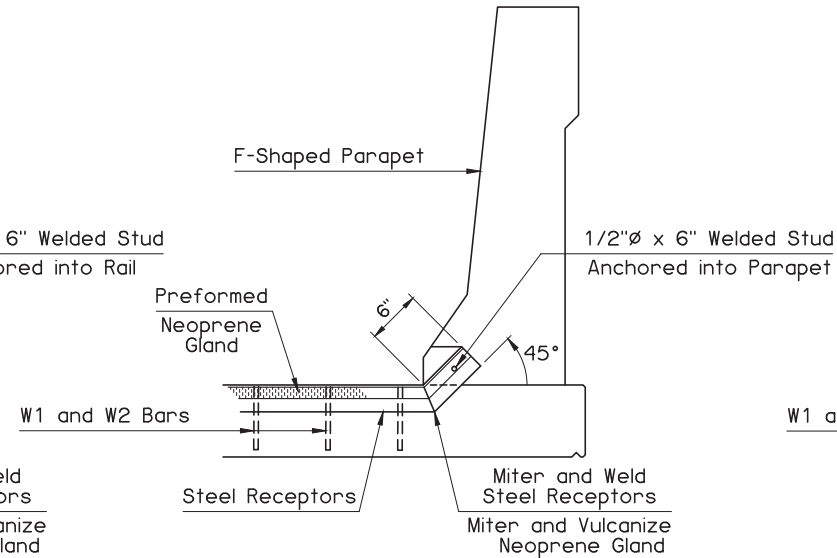
STEEL PILING



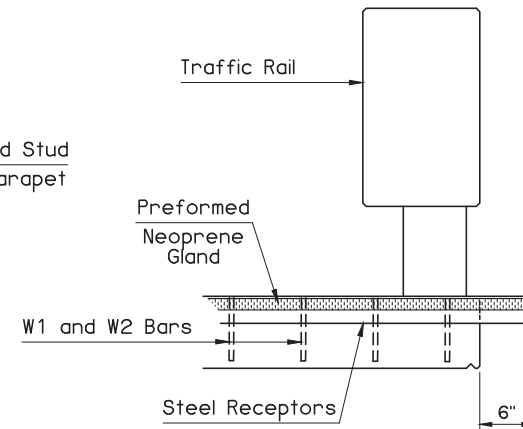
**ELEVATION
WITHOUT OPENINGS**



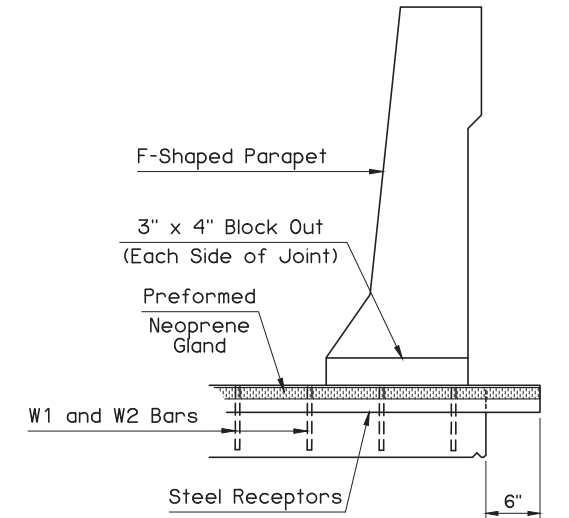
**SECTION AT TRAFFIC RAIL
WITHOUT OPENINGS**



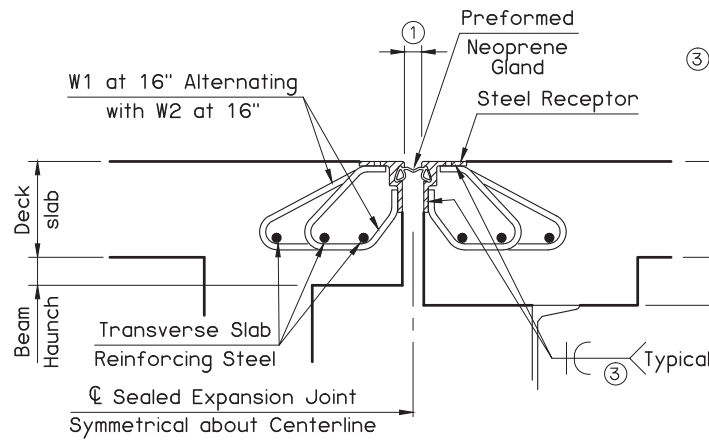
**SECTION AT F-SHAPED PARAPET
WITHOUT OPENINGS**



**SECTION AT TRAFFIC RAIL
WITH OPENINGS**



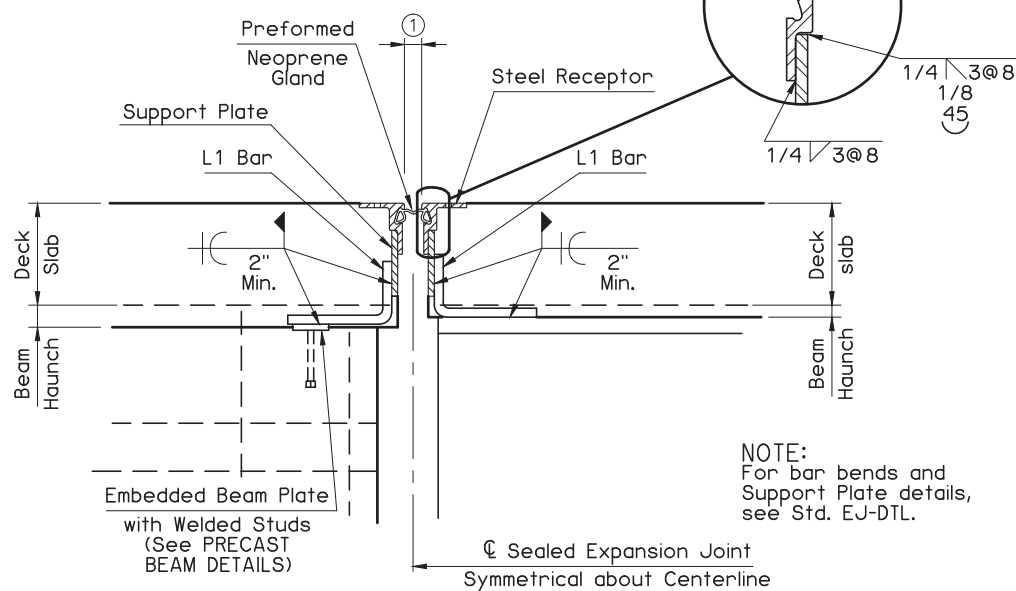
**SECTION AT F-SHAPED PARAPET
WITH OPENINGS**



P.C. BEAMS

**ROLLED BEAMS AND
PLATE GIRDERS**

SECTION A-A



P.C. BEAMS

**ROLLED BEAMS AND
PLATE GIRDERS**

SECTION B-B

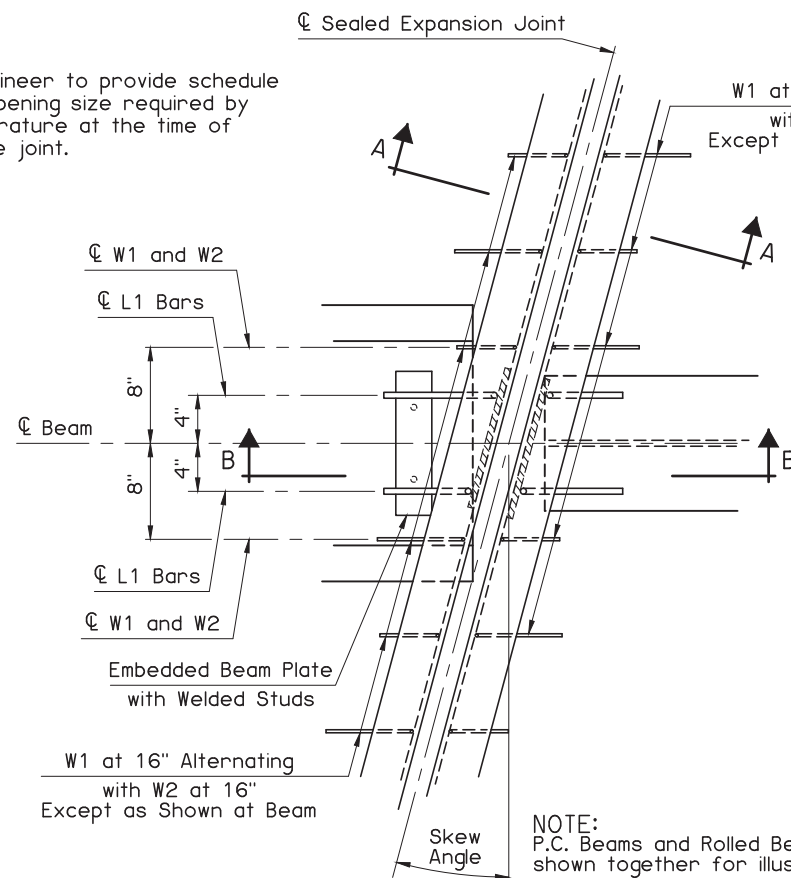
NOTE:
For bar bends and
Support Plate details,
see Std. EJ-DTL.

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

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.

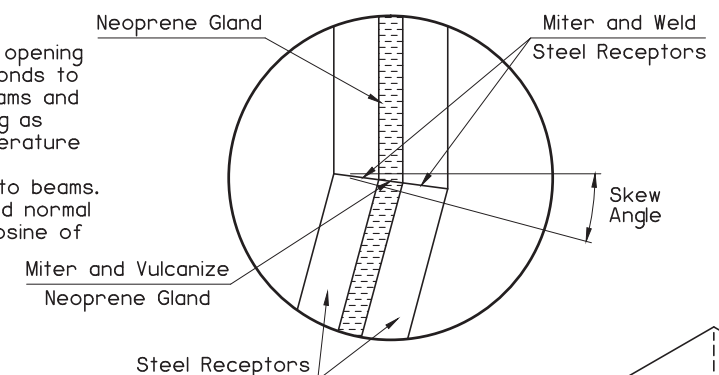
① Design Engineer to provide schedule of joint opening size required by the temperature at the time of setting the joint.



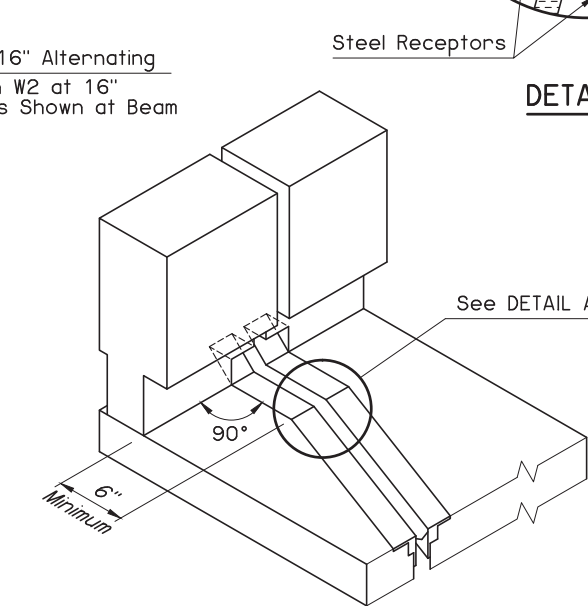
P.C. BEAMS

**ROLLED BEAMS AND
PLATE GIRDERS**

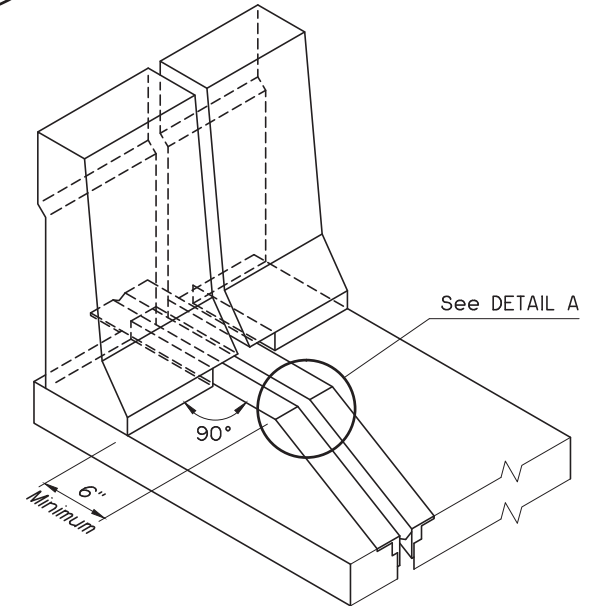
PLAN



DETAIL A



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



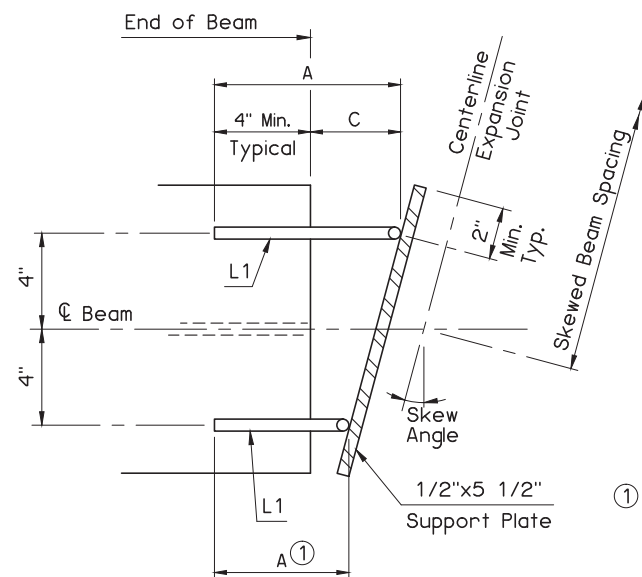
**PICTORIAL VIEW OF SEALED JOINT AT
F-SHAPED PARAPET WITH OPENINGS
(TRAFFIC RAIL SIMILAR)**

APPROVED BY BRIDGE ENGINEER *Stg Jca* DATE 12-20-16

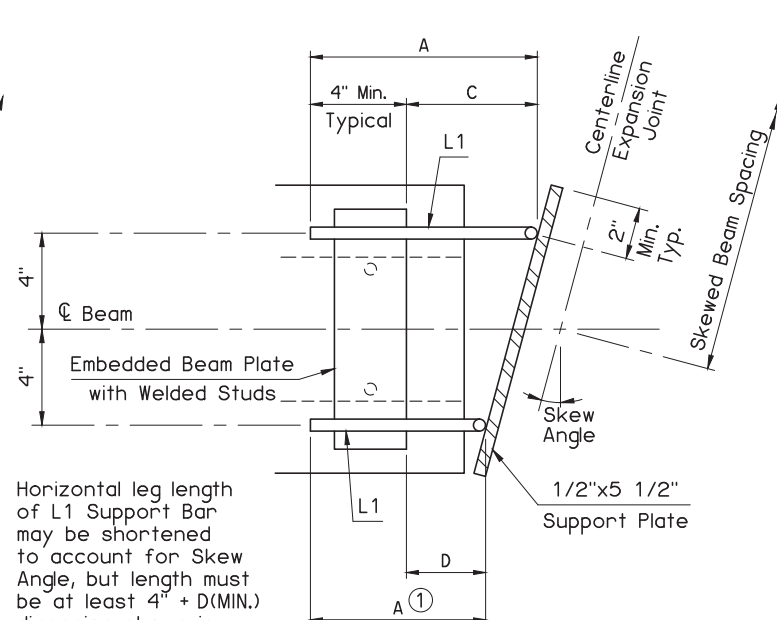
OKLAHOMA DEPT. OF TRANSPORTATION
BRIDGE STANDARD (ENGLISH)

**SKewed SEALED EXPANSION JOINT
CONVENTIONAL**

2009 SPECIFICATIONS EJ-SK 04E
B-09E



ROLLED BEAMS AND PLATE GIRDERS



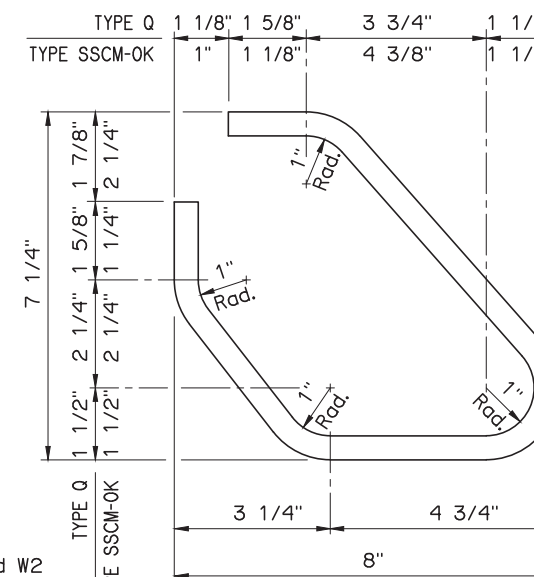
P.C. BEAMS

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.

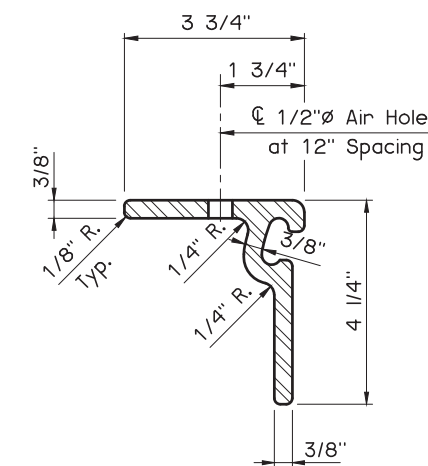
SEALED EXPANSION JOINT SUPPORT PLANS

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

GUIDE FOR SIZING SEALED EXPANSION JOINT SUPPORT MEMBERS

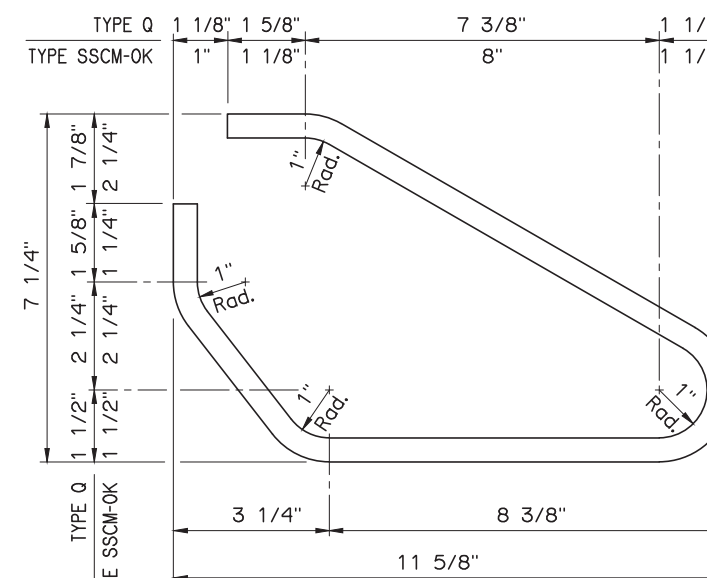
- After determining Skewed Beam Spacing and C, find Support Bar diameter from L1 SUPPORT BAR DIAMETER SCHEDULE.
- Knowing Support Bar diameter, find Pin Diameter from L1 SUPPORT BAR PIN DIAMETER SCHEDULE. Adjust the location of the Embedded Beam Plate for P.C. Beams if actual D dimension is less than 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.

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"

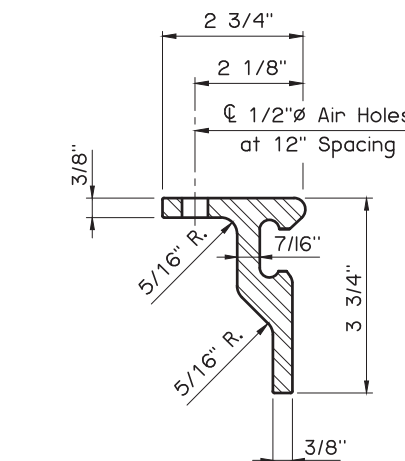
L1 SUPPORT BAR PIN DIAMETER SCHEDULE		
SUPPORT BAR DIAMETER	PIN DIA. ②	D (MIN.) ③
3/4"	2 1/4"	2 3/8"
1"	3"	3"
1 1/4"	3 3/4"	3 5/8"
1 1/2"	4 1/2"	4 1/4"
1 3/4"	5 1/4"	4 7/8"
2"	6"	5 1/2"

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

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

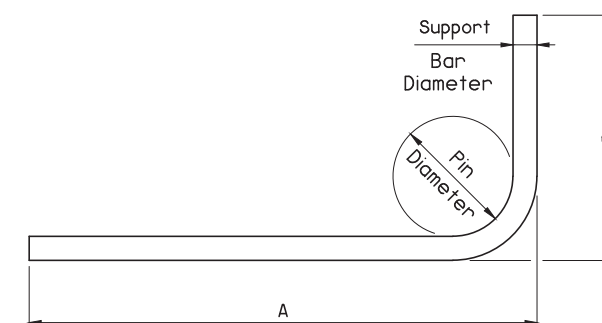
Perform welding of Steel Receptors, Support Plates, L1 Support Bars and W1 and W2 Anchor Bars in accordance with Subsection 724.03 of the Specifications.

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.



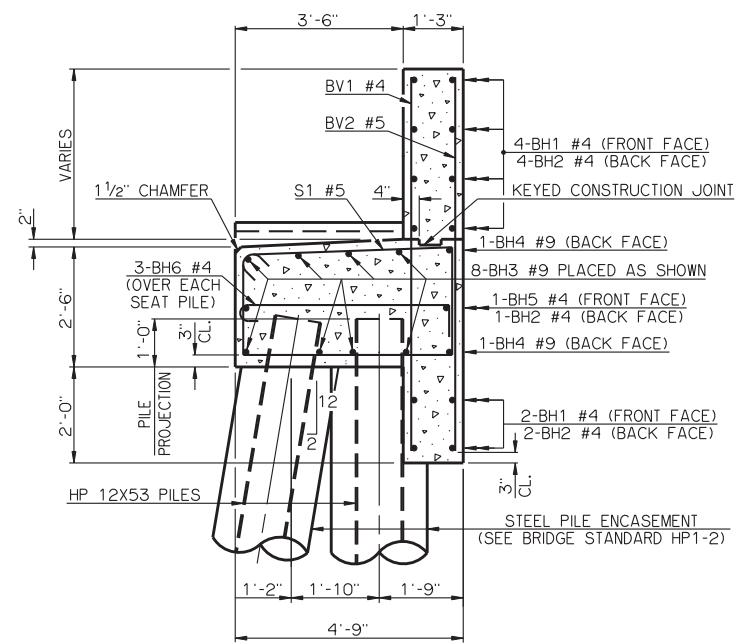
L1 SUPPORT BAR DETAIL

APPROVED BY BRIDGE ENGINEER *Stg* DATE 12-20-16

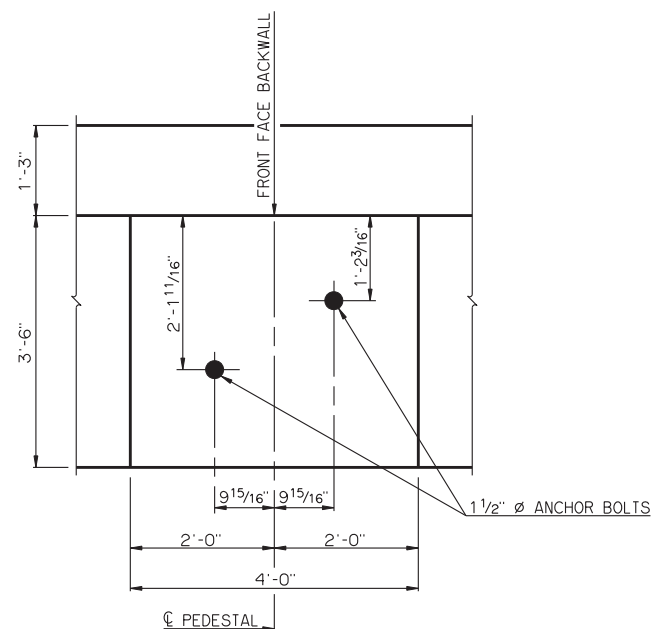
OKLAHOMA DEPT. OF TRANSPORTATION
BRIDGE STANDARD (ENGLISH)

SEALED EXPANSION JOINT DETAILS

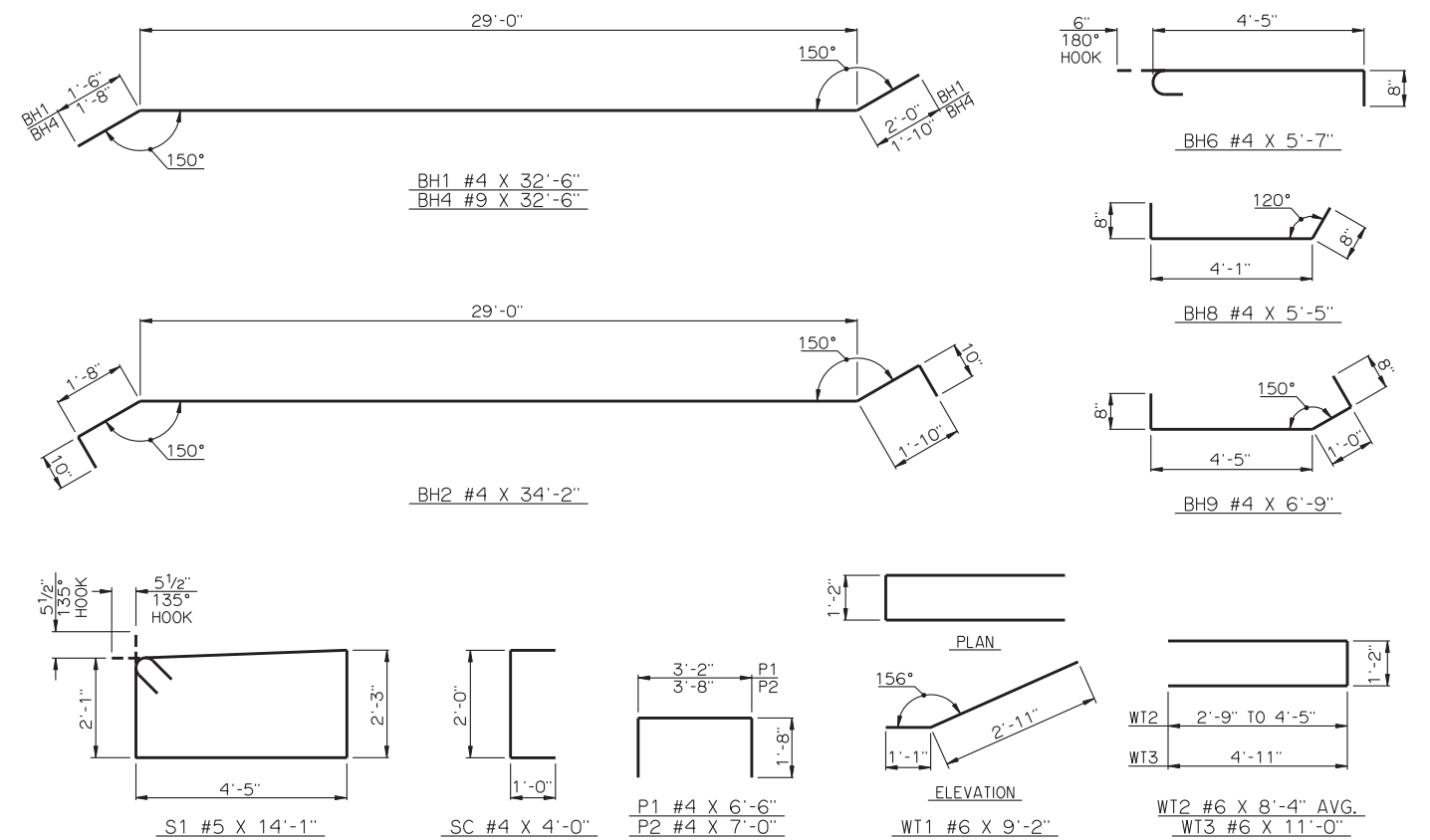
2009 SPECIFICATIONS EJ-DTL 02E B-10E



TYPICAL SECTION THRU ABUTMENT



DETAIL OF PEDESTAL WITH LAYOUT OF ANCHOR BOLTS



DETAILS OF BENT REINFORCING STEEL

BAR LIST - ONE ABUTMENT						
MARK	NO.	SIZE	FORM	LENGTH	LENGTH VARIATION	
	BH1	6	#4	BNT.	32'-6"	-
	BH2	7	#4	BNT.	34'-2"	-
①	BH3	8	#9	STR.	31'-6" AVG.	30'-7" TO 32'-5"
	BH4	2	#9	BNT.	32'-6"	-
	BH5	1	#4	STR.	30'-7"	-
	BH6	15	#4	BNT.	5'-7"	-
	BH7	2	#9	STR.	12'-9"	-
	BH8	3	#4	BNT.	5'-5"	-
	BH9	3	#4	BNT.	6'-9"	-
②	BV1	30	#4	STR.	7'-8" AVG.	7'-6" TO 7'-10"
②	BV2	30	#5	STR.	7'-8" AVG.	7'-6" TO 7'-10"
	BV3	8	#6	STR.	7'-6"	-
	P1	15	#4	BNT.	6'-6"	-
	P2	12	#4	BNT.	7'-0"	-
	S1	38	#5	BNT.	14'-1"	-
	SC	6	#4	BNT.	4'-0"	-
	WT1	2	#6	BNT.	9'-2"	-
③	WT2	4	#6	BNT.	8'-4" AVG.	6'-8" TO 10'-0"
	WT3	18	#6	BNT.	11'-0"	-

- ① NO. INCLUDES TWO SETS OF 4 BARS
- ② NO. INCLUDES TWO SETS OF 15 BARS
- ③ NO. INCLUDES TWO SETS OF 2 BARS

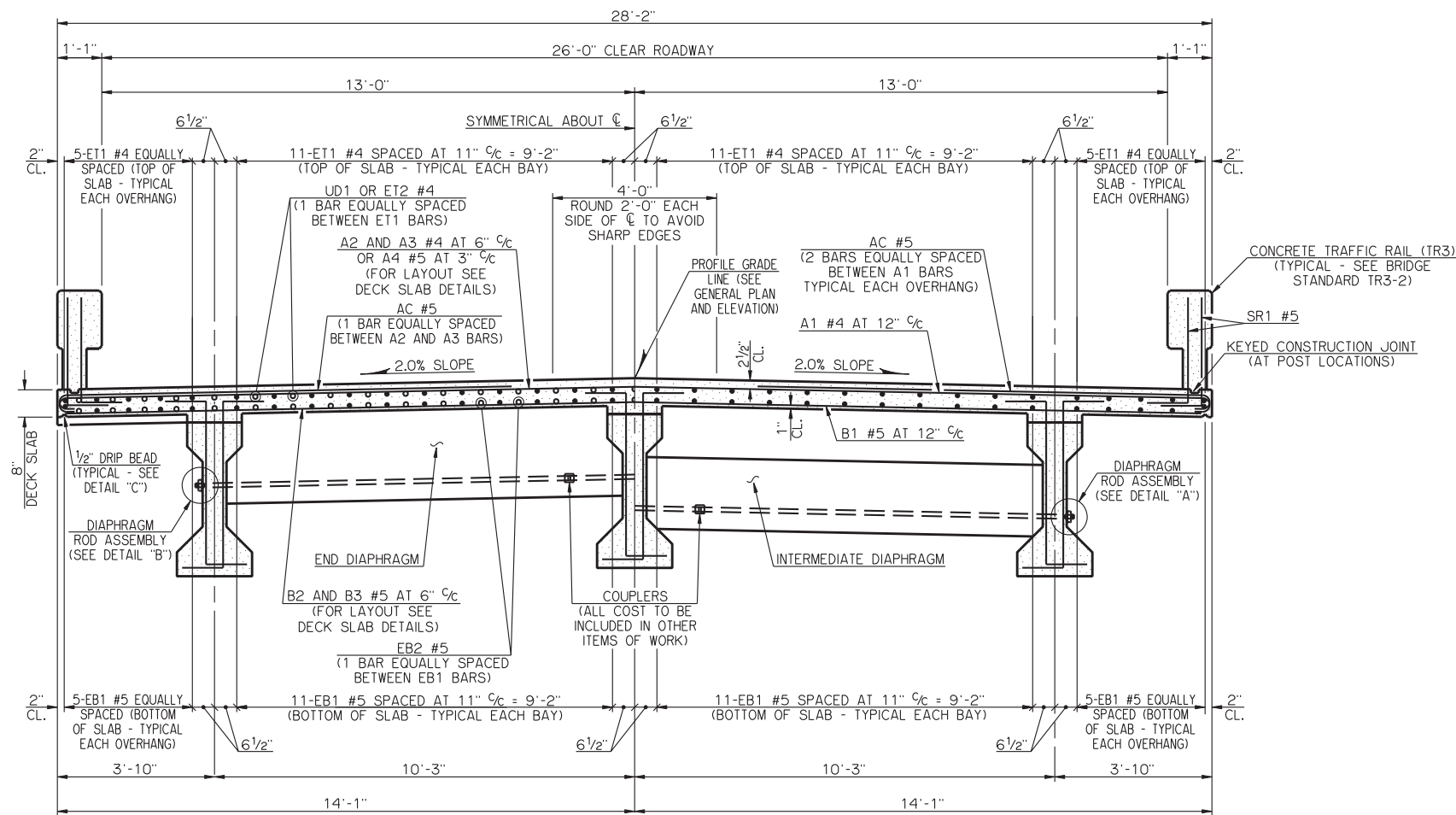
APPROVED BY BRIDGE ENGINEER *Robert J. Hush* DATE 10-31-2011

OKLAHOMA DEPARTMENT OF TRANSPORTATION
COUNTY BRIDGE STANDARD (ENGLISH)

ABUTMENT DETAILS
TYPE II AND TYPE B P.C. BEAMS
(SHEET NO. 2 OF 2)

26' CLEAR ROADWAY - CONVENTIONAL - SKEWED 30°

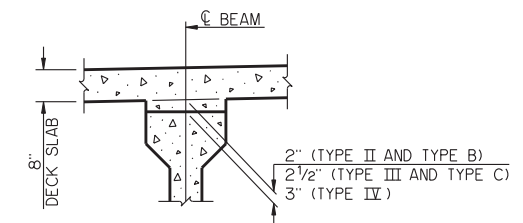
2009 SPECIFICATIONS CB26-C-SK30-ABUT-PC2-2 02E CB-196E



HALF SECTION OF END ZONE REINFORCING AT END DIAPHRAGM

HALF SECTION OF TYPICAL REINFORCING AT INTERMEDIATE DIAPHRAGM

TYPICAL CROSS SECTION

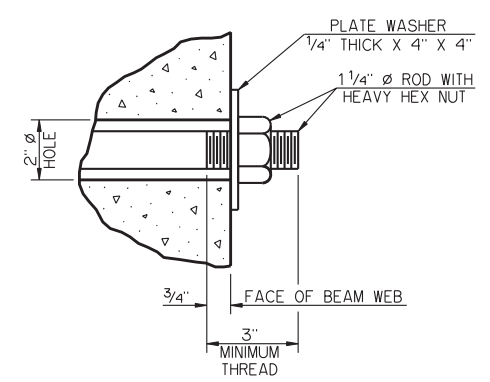


DETAIL OF HAUNCH

PLAN QUANTITIES FOR "CLASS AA CONCRETE" INCLUDE HAUNCHES OVER BEAMS. HAUNCH HEIGHT SHOWN IS AT CENTERLINE BEARING ONLY, MEASURED FROM BOTTOM OF DECK SLAB TO TOP OF BEAM, AND VARIES ACROSS THE SPAN. HAUNCH HEIGHT TO BE DETERMINED AFTER ERECTION OF BEAMS TO PROVIDE FOR DEAD LOAD DEFLECTION AND GRADE ADJUSTMENT, BUT THE PAY QUANTITY WILL BE AS SHOWN IN THE PLANS.

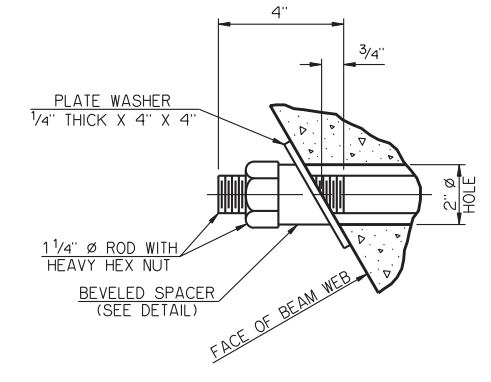
NOTES

- ROTATE HOOKS ON A4 AND AC BARS TO MAINTAIN MINIMUM CLEARANCE.
- DO NOT PLACE THE CONCRETE FOR THE DECK SLAB OR APPLY OTHER MASSIVE LOADS TO THE BEAMS, INTERMEDIATE DIAPHRAGMS OR END DIAPHRAGMS UNTIL THE CONCRETE IN THE INTERMEDIATE AND END DIAPHRAGMS HAS BEEN IN PLACE A MINIMUM OF 10 DAYS OR AT THE DISCRETION OF THE ENGINEER. THIS TIME MAY BE SHORTENED IF THE CONCRETE HAS ATTAINED 80% OF THE SPECIFIED COMPRESSIVE STRENGTH.
- STAY-IN-PLACE STEEL DECK FORMS MAY BE USED IF THE MINIMUM DECK SLAB THICKNESS OF 8" IS OBTAINED BY MEASURING FROM THE TOP OF THE DECK SLAB TO THE TOP PORTION OF THE STEEL CORRUGATION. NO ADDITIONAL CONCRETE WEIGHT OF THE DECK SLAB IS PERMITTED. ADDITIONAL STEEL WEIGHT OF THE DECK FORMS SHALL NOT EXCEED 5 PSF. STAY-IN-PLACE PRESTRESSED CONCRETE DECK FORMS MAY BE USED IF THE FOLLOWING CONDITIONS ARE MET:
 - 1) SHOP DRAWINGS AND STRUCTURAL CALCULATIONS FOR THE FORMS ARE SUBMITTED TO THE BRIDGE ENGINEER FOR APPROVAL.
 - 2) A NEW STRUCTURAL DESIGN, STRUCTURAL CALCULATIONS, AND A NEW REINFORCING SCHEDULE FOR THE DECK SLAB ARE SUBMITTED TO THE BRIDGE ENGINEER FOR APPROVAL.
 - 3) SHOP DRAWINGS, NEW DECK SLAB REINFORCING SCHEDULE AND STRUCTURAL DESIGNS AND CALCULATIONS SHALL BE PREPARED BY AND SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF OKLAHOMA.
- ALL COSTS ASSOCIATED WITH THE USE OF STAY-IN-PLACE FORMS, INCLUDING ALL PROFESSIONAL SERVICES, MATERIAL, LABOR, EQUIPMENT AND INCIDENTALS, SHALL BE AT THE CONTRACTOR'S EXPENSE. FOR ADDITIONAL INFORMATION CONCERNING THE USE OF STAY-IN-PLACE FORMS, SEE SECTION 502 OF THE STANDARD SPECIFICATIONS.



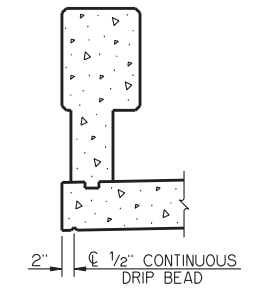
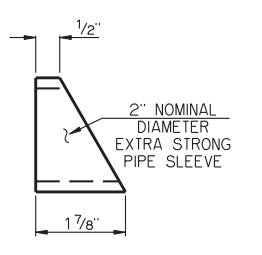
DETAIL "A"

STRUCTURAL STEEL FOR DIAPHRAGM RODS AND PLATE WASHERS SHALL CONFORM TO AASHTO M 270 (ASTM A 709), GRADE 50W, WEATHERING STEEL (CHARPY V-NOTCH TESTING NOT REQUIRED). A #10 REINFORCING STEEL BAR CONFORMING TO AASHTO M 31, GRADE 60 AND THREADED AT BOTH ENDS AS SHOWN MAY BE SUBSTITUTED FOR THE DIAPHRAGM ROD. HEX NUTS SHALL CONFORM TO AASHTO M 291 (ASTM A 563), PROPERTY CLASS 8S3 OR 10S3. STRUCTURAL STEEL FOR BEVELED SPACER SHALL CONFORM TO ASTM A 53, GRADE B. PAINT EXPOSED PARTS OF DIAPHRAGM RODS, PLATE WASHERS, HEX NUTS AND BEVELED SPACERS WITH TWO (2) COATS OF ZINC-RICH PAINT (6 MIL MINIMUM THICKNESS) AFTER ASSEMBLY. ALL COST OF DIAPHRAGM RODS, PLATE WASHERS, HEX NUTS AND BEVELED SPACERS SHALL BE INCLUDED IN UNIT PRICE BID PER POUND OF "STRUCTURAL STEEL."



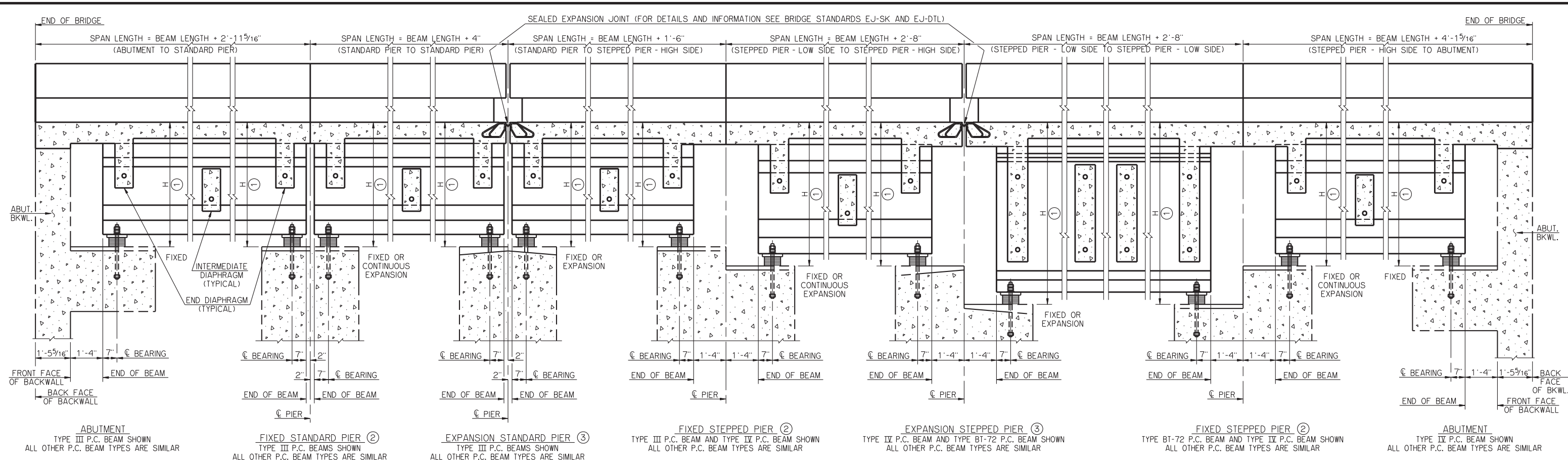
DETAIL "B"

DETAIL OF BEVELED SPACER

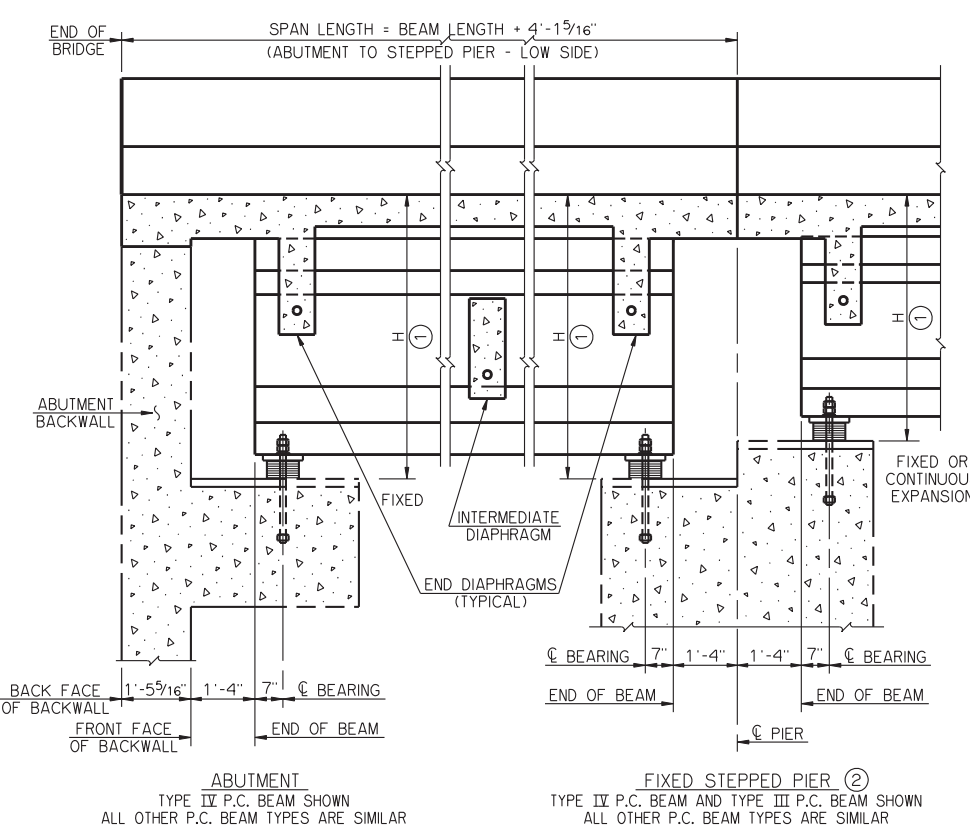


DETAIL "C"

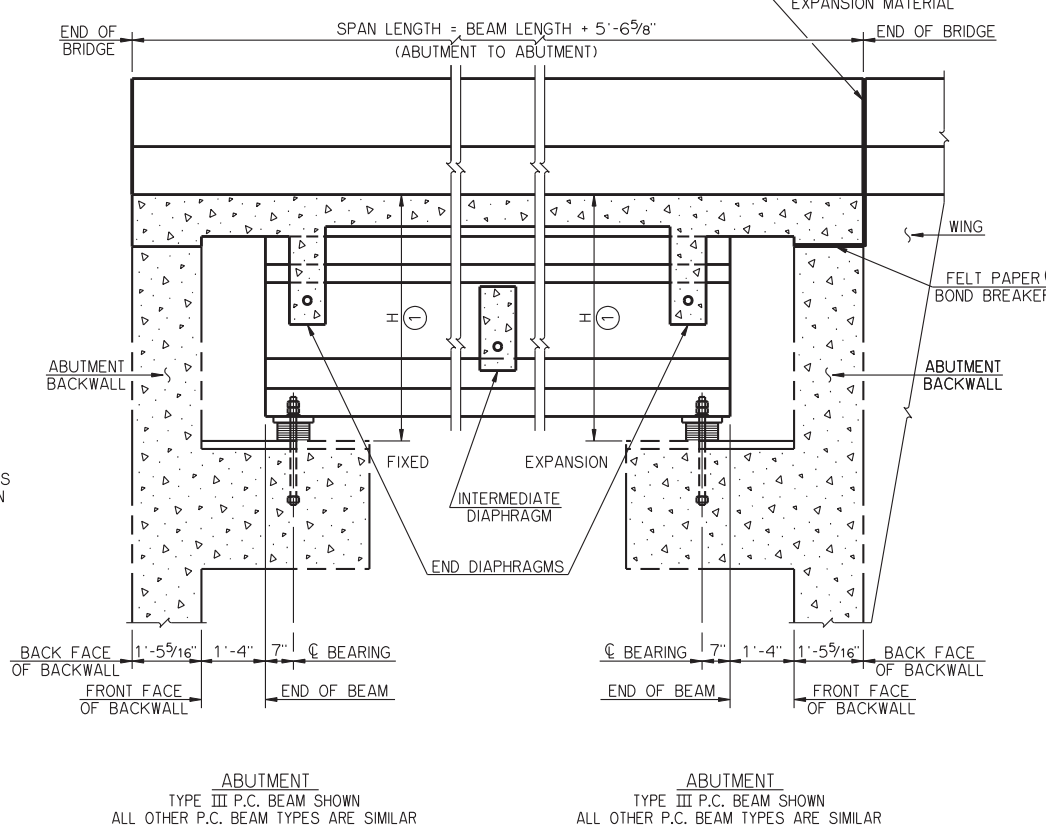
APPROVED BY BRIDGE ENGINEER *Robert J. Dush* DATE 9-9-2011
 OKLAHOMA DEPARTMENT OF TRANSPORTATION
 COUNTY BRIDGE STANDARD (ENGLISH)
TYPICAL CROSS SECTION
TYPE II, B, III, C AND IV P.C. BEAMS
 26' CLEAR ROADWAY - CONVENTIONAL - SKEWED 30°
 2009 SPECIFICATIONS CB26-C-SK30-XSECT-PC234 01E
 CB-223E



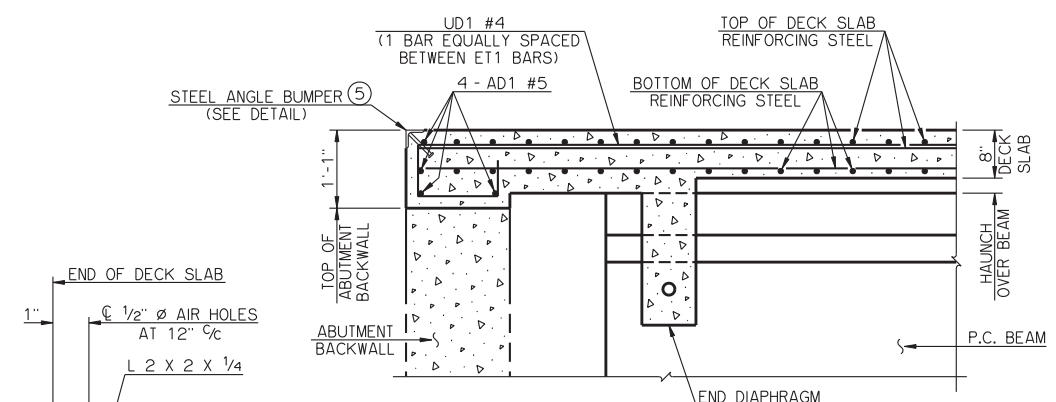
LONGITUDINAL SECTION



LONGITUDINAL SECTION

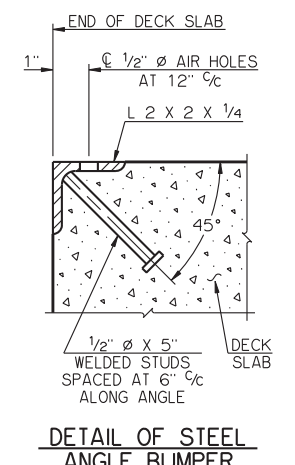


LONGITUDINAL SECTION



TYPICAL SLAB REINFORCING AT ABUTMENT BACKWALL

- DIMENSION IS FROM TOP OF DECK SLAB TO BOTTOM OF BEARING ASSEMBLY AT C BEARING.
- FIXED PIER DESIGNATION INDICATES CONTINUOUS DECK SLAB OVER PIER. ENGINEER SHALL DETERMINE WHETHER FIXED OR EXPANSION BEARING ASSEMBLIES ARE REQUIRED.
- EXPANSION PIER DESIGNATION INDICATES EXPANSION JOINT IN DECK SLAB OVER PIER. EXPANSION PIER REQUIRES EXPANSION BEARING ASSEMBLIES IN AT LEAST ONE OF THE SPANS. ENGINEER SHALL DETERMINE WHETHER FIXED OR EXPANSION BEARING ASSEMBLIES ARE REQUIRED IN THE ADJACENT SPAN.
- AT EXPANSION ABUTMENTS, FELT PAPER BOND BREAKER SHALL BE PLACED ON TOP OF THE BACKWALL FOR THE FULL WIDTH OF THE DECK SLAB, AND 3/4" THICK POLYSTYRENE PREFORMED EXPANSION MATERIAL SHALL BE PLACED BETWEEN THE END OF THE DECK SLAB AND THE ENDS OF THE WINGS AND BETWEEN THE ENDS OF THE CONCRETE TRAFFIC RAILS (TR3) ON THE DECK SLAB AND WINGS. ALL COST TO BE INCLUDED IN OTHER ITEMS OF WORK.
- STEEL ANGLE BUMPERS SHALL BE OMITTED FROM ENDS OF DECK SLABS ADJOINING AN APPROACH ROADWAY COMPRISED OF ASPHALT OR P.C. CONCRETE PAVEMENT.



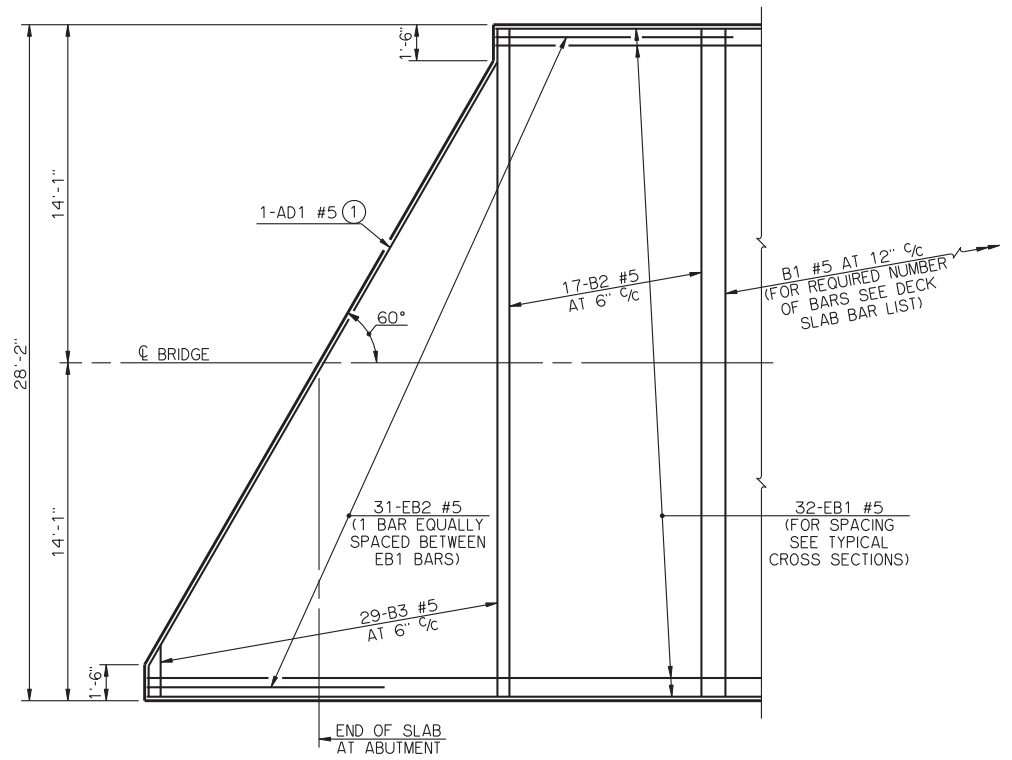
DETAIL OF STEEL ANGLE BUMPER

SCHEDULE FOR DIMENSION H	
P.C. BEAM	H
TYPE II	4'-3 1/8"
TYPE B	4'-1 1/8"
TYPE III	5'-0 1/8"
TYPE C	4'-7 1/8"
TYPE IV	5'-9 3/8"
TYPE BT-72	7'-4 3/8"
TYPE J	7'-5 1/8"

APPROVED BY BRIDGE ENGINEER *Robert Duch* DATE **9-9-2011**
 OKLAHOMA DEPARTMENT OF TRANSPORTATION
 COUNTY BRIDGE STANDARD (ENGLISH)

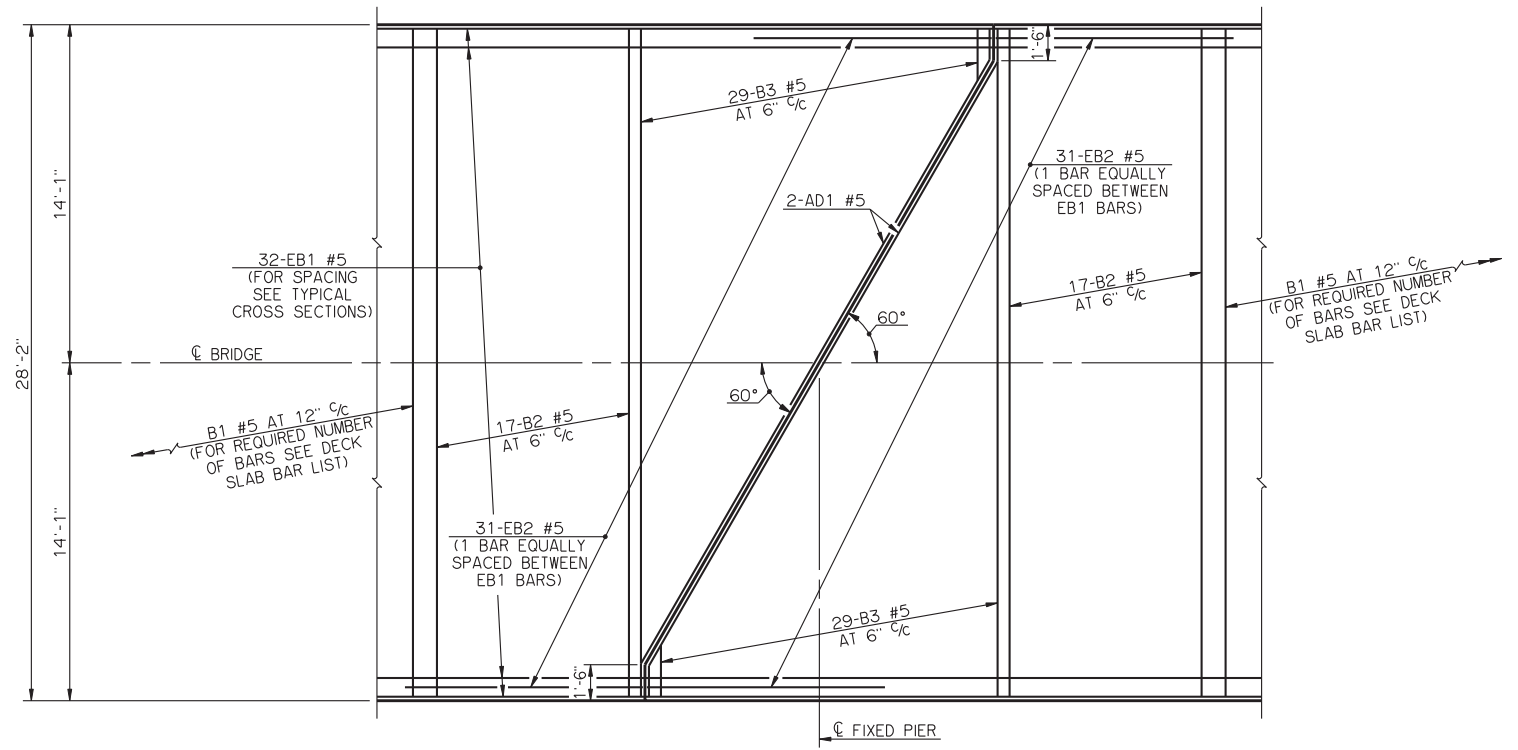
**LONGITUDINAL SECTION
 P.C. BEAMS**

26' CLEAR ROADWAY - CONVENTIONAL - SKEWED 30°

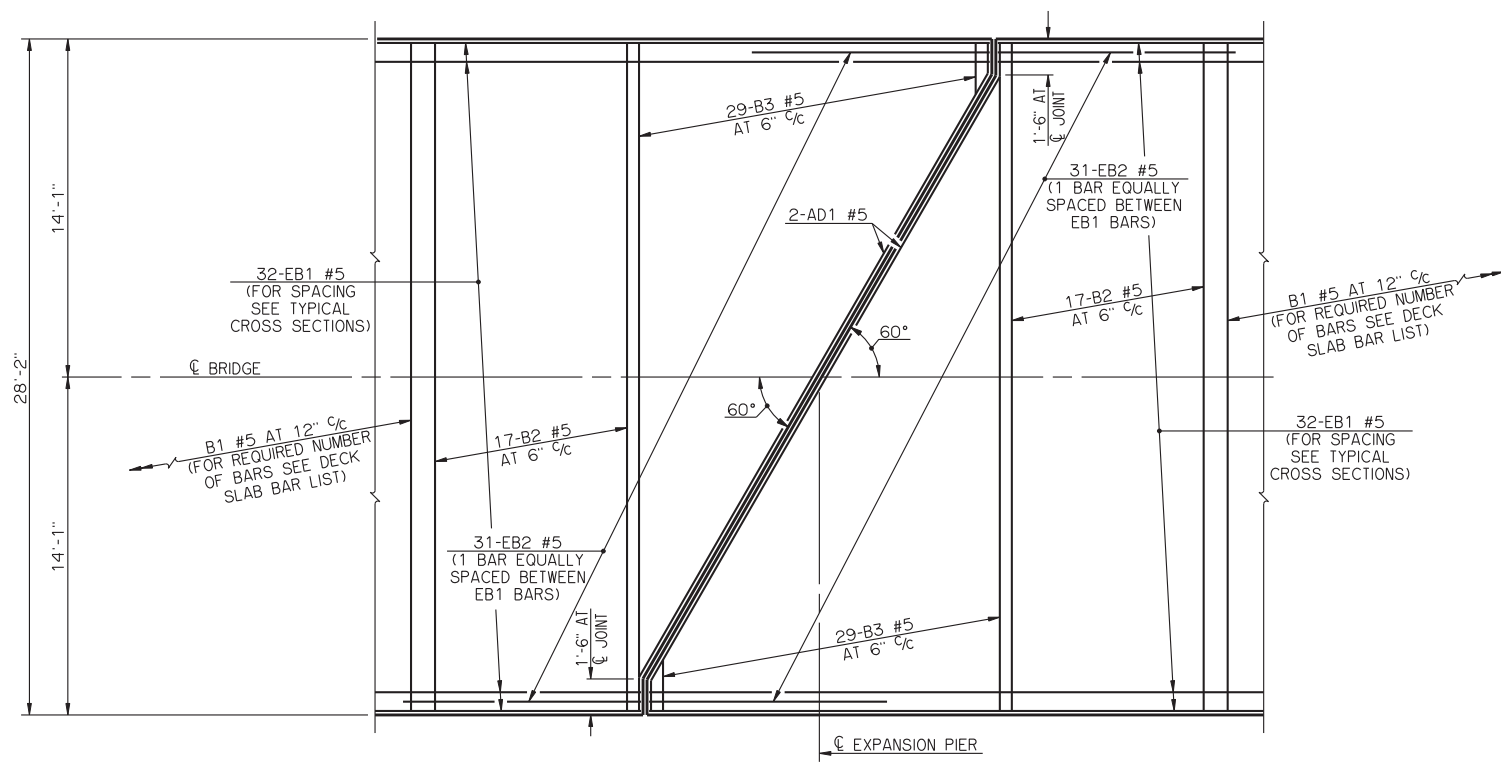


PLAN OF DECK SLAB WITH TYPICAL BOTTOM LAYER OF END ZONE REINFORCING STEEL AT ABUTMENT

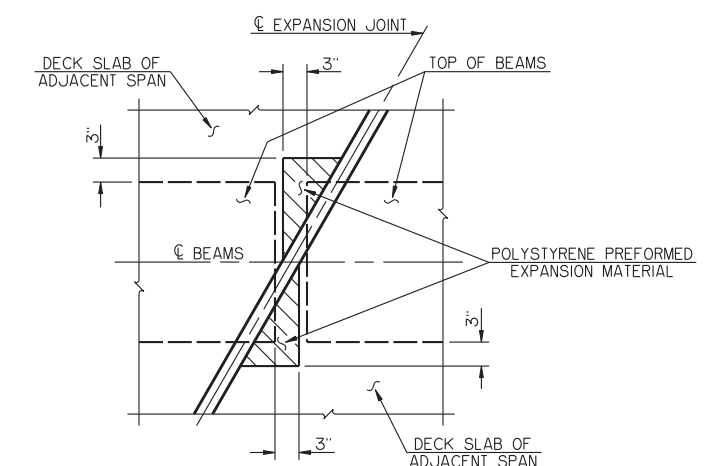
① SEE DETAIL "TYPICAL SLAB REINFORCING AT ABUTMENT BACKWALL" ON LONGITUDINAL SECTION SHEET FOR LAYOUT OF AD1 BARS.



PLAN OF DECK SLAB WITH TYPICAL BOTTOM LAYER OF END ZONE REINFORCING STEEL AT FIXED PIER



PLAN OF DECK SLAB WITH TYPICAL BOTTOM LAYER OF END ZONE REINFORCING STEEL AT EXPANSION PIER



PLAN OF BEAM CORNERS AT SKEWED EXPANSION JOINT

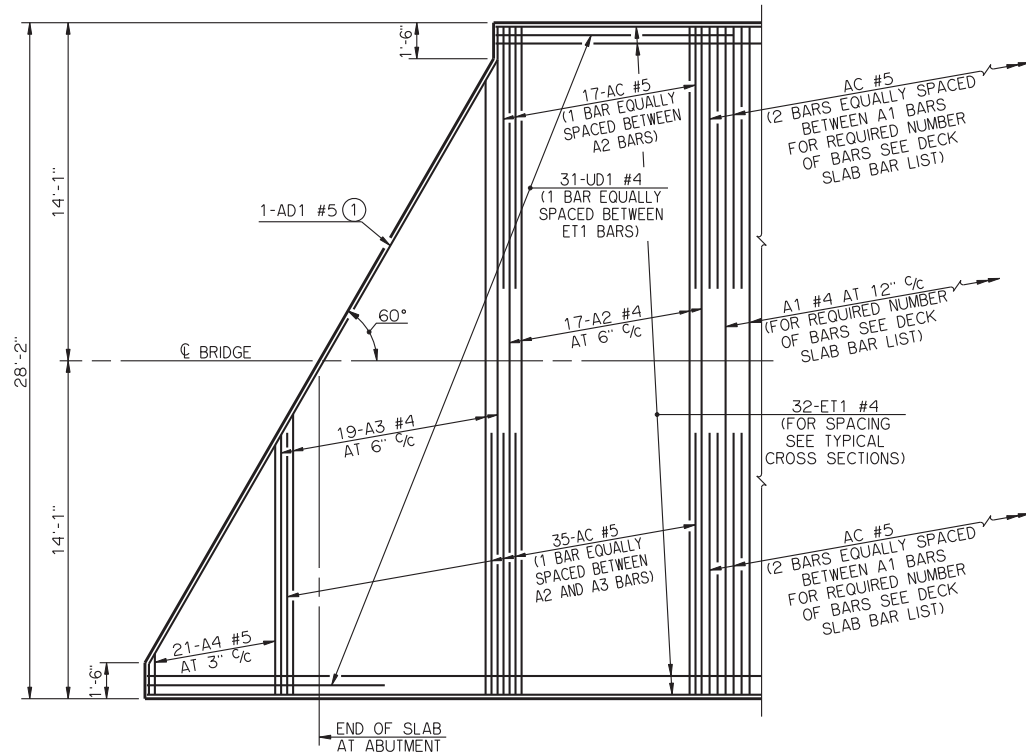
WHERE THE TOP CORNER OF A BEAM PROJECTS UNDER THE DECK SLAB OF THE ADJACENT SPAN, 1/2" POLYSTYRENE PREFORMED EXPANSION MATERIAL SHALL BE PLACED BETWEEN THE TOP OF THE BEAM AND THE BOTTOM OF THE DECK SLAB IN THE HATCHED AREAS SHOWN ABOVE. ALL COST TO BE INCLUDED IN OTHER ITEMS OF WORK.

NOTES

PLAN VIEWS SHOWN WITH LEFT FORWARD SKEW, RIGHT FORWARD SKEW WILL BE OPPOSITE HAND.

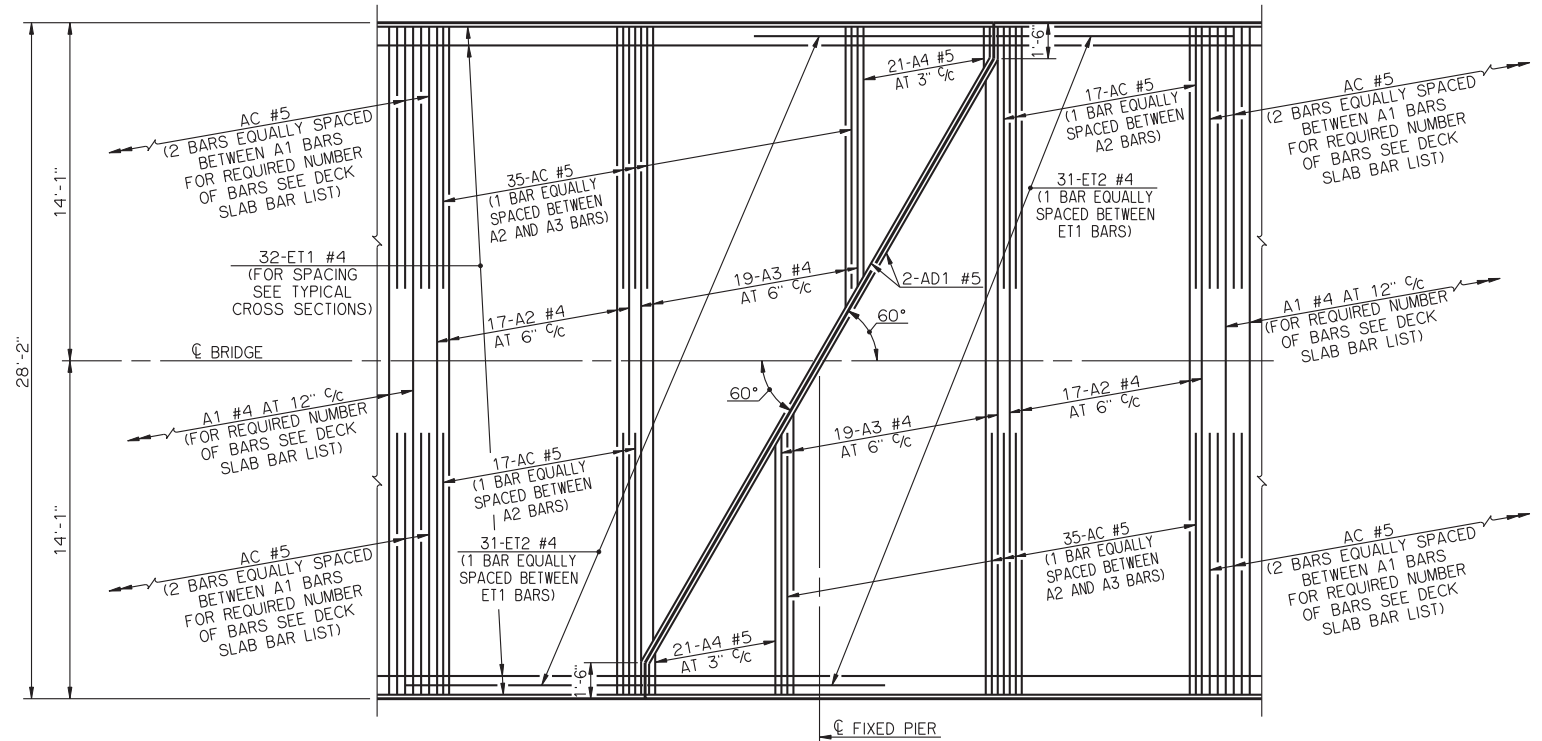
THE B1 AND B2 BARS ARE SHOWN FOR SPAN LENGTHS OF 33'-0" OR GREATER. FOR SPAN LENGTHS OF LESS THAN 33'-0", THE B1 BARS WILL BE OMITTED, AND THE TOTAL NUMBER OF B2 BARS SPACED AT 6" c/c WITHIN THE END ZONES OF THE DECK SLAB WILL BE THE AMOUNT GIVEN IN THE DECK SLAB BAR LIST.

APPROVED BY BRIDGE ENGINEER *Robert J. Duch* DATE 9-9-2011
 OKLAHOMA DEPARTMENT OF TRANSPORTATION
 COUNTY BRIDGE STANDARD (ENGLISH)
DECK SLAB DETAILS
 (SHEET NO. 1 OF 2)
 26' CLEAR ROADWAY - CONVENTIONAL - SKEWED 30°
 2009 SPECIFICATIONS CB26-C-SK30-DKSLB-1 01E CB-232E

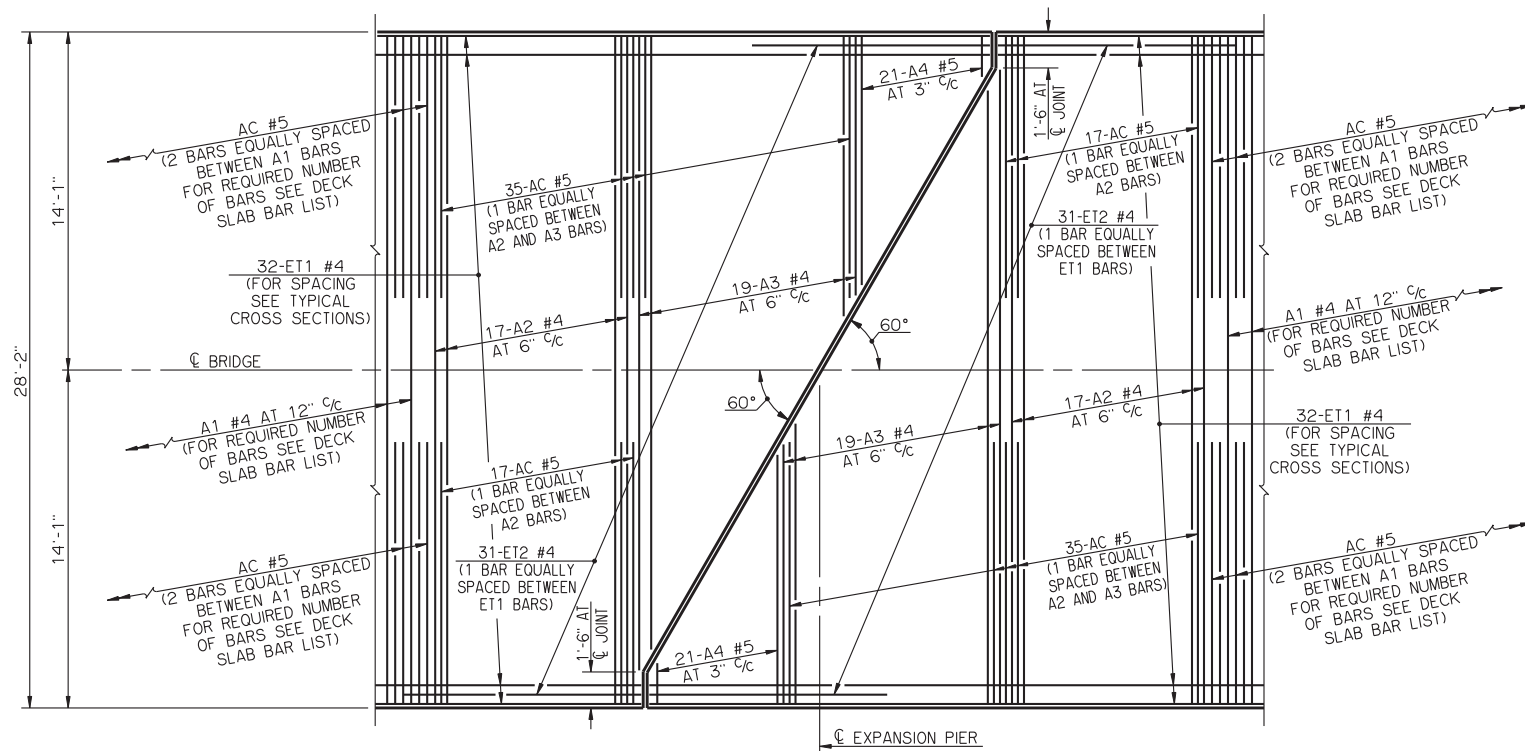


PLAN OF DECK SLAB WITH TYPICAL TOP LAYER OF END ZONE REINFORCING STEEL AT ABUTMENT

① SEE DETAIL "TYPICAL SLAB REINFORCING AT ABUTMENT BACKWALL" ON LONGITUDINAL SECTION SHEET FOR LAYOUT OF AD1 BARS.



PLAN OF DECK SLAB WITH TYPICAL TOP LAYER OF END ZONE REINFORCING STEEL AT FIXED PIER



PLAN OF DECK SLAB WITH TYPICAL TOP LAYER OF END ZONE REINFORCING STEEL AT EXPANSION PIER

NOTES

PLAN VIEWS SHOWN WITH LEFT FORWARD SKEW, RIGHT FORWARD SKEW WILL BE OPPOSITE HAND.

THE A1, A2 AND AC BARS ARE SHOWN FOR SPAN LENGTHS OF 33'-0" OR GREATER. FOR SPAN LENGTHS OF LESS THAN 33'-0", THE A1 BARS WILL BE OMITTED, AND THE TOTAL NUMBER OF A2 BARS SPACED AT 6" c/c WITHIN THE END ZONES OF THE DECK SLAB WILL BE THE AMOUNT GIVEN IN THE DECK SLAB BAR LIST. ADDITIONALLY, THE TOTAL NUMBER OF AC BARS EQUALLY SPACED BETWEEN THE A2 AND A3 BARS WITHIN THE END ZONES OF THE DECK SLAB WILL BE THE AMOUNT GIVEN IN THE DECK SLAB BAR LIST.

APPROVED BY BRIDGE ENGINEER *Robert J. Dusch* DATE 9-9-2011
 OKLAHOMA DEPARTMENT OF TRANSPORTATION
 COUNTY BRIDGE STANDARD (ENGLISH)
DECK SLAB DETAILS
 (SHEET NO. 2 OF 2)
 26' CLEAR ROADWAY - CONVENTIONAL - SKEWED 30°
 2009 SPECIFICATIONS CB26-C-SK30-DKSLB-2 01E
 CB-233E

BAR LIST - DECK SLAB											
			SPAN TYPE								
			ABUTMENT TO ABUTMENT			ABUTMENT TO FIXED PIER			ABUTMENT TO EXPANSION PIER		
MARK	SIZE	FORM	NUMBER	LENGTH	VARIANCE	NUMBER	LENGTH	VARIANCE	NUMBER	LENGTH	VARIANCE
A1	#4	BNT.	FOR SL < 32: 0	28'-10"	-	FOR SL < 32: 0	28'-10"	-	FOR SL < 32: 0	28'-10"	-
			FOR SL ≥ 32: SL - 32			FOR SL ≥ 32: SL - 32			FOR SL ≥ 32: SL - 32		
A2	#4	BNT.	FOR SL < 32: (2 x SL) - 29	28'-10"	-	FOR SL < 32: (2 x SL) - 29	28'-10"	-	FOR SL < 32: (2 x SL) - 29	28'-10"	-
			FOR SL ≥ 32: 34			FOR SL ≥ 32: 34			FOR SL ≥ 32: 34		
A3	#4	BNT.	38	19'-2" AVG.	11'-4" TO 27'-0"	38	19'-2" AVG.	11'-4" TO 27'-0"	38	19'-2" AVG.	11'-4" TO 27'-0"
A4	#5	BNT.	42	6'-8" AVG.	2'-4" TO 11'-0"	42	6'-8" AVG.	2'-4" TO 11'-0"	42	6'-8" AVG.	2'-4" TO 11'-0"
AC	#5	BNT.	(4 x SL) - 20	11'-6"	-	(4 x SL) - 20	11'-6"	-	(4 x SL) - 20	11'-6"	-
AD1	#5	BNT.	8	31'-9"	-	6	31'-9"	-	5	31'-9"	-
B1	#5	STR.	FOR SL < 32: 0	27'-10"	-	FOR SL < 32: 0	27'-10"	-	FOR SL < 32: 0	27'-10"	-
			FOR SL ≥ 32: SL - 32			FOR SL ≥ 32: SL - 32			FOR SL ≥ 32: SL - 32		
B2	#5	STR.	FOR SL < 32: (2 x SL) - 29	27'-10"	-	FOR SL < 32: (2 x SL) - 29	27'-10"	-	FOR SL < 32: (2 x SL) - 29	27'-10"	-
			FOR SL ≥ 32: 34			FOR SL ≥ 32: 34			FOR SL ≥ 32: 34		
B3	#5	STR.	58	14'-4" AVG.	2'-2" TO 26'-6"	58	14'-4" AVG.	2'-2" TO 26'-6"	58	14'-4" AVG.	2'-2" TO 26'-6"
EB1	#5	STR.	32	SPAN LENGTH - 2"	-	32	SPAN LENGTH - 1" ③	-	32	SPAN LENGTH - 3"	-
EB2	#5	STR.	62	9'-11"	-	62	9'-11"	-	62	9'-11"	-
ET1	#4	STR.	32	SPAN LENGTH - 2"	-	32	SPAN LENGTH - 1" ③	-	32	SPAN LENGTH - 3"	-
ET2	#4	STR.	-	-	-	31	9'-11"	-	31	9'-11"	-
SR1	#5	BNT.	36 x IP + 7.5 x EP ⑦	3'-10"	-	36 x IP + 7.5 x EP ⑦	3'-10"	-	36 x IP + 7.5 x EP ⑦	3'-10"	-
UD1	#4	BNT.	62	12'-3"	-	31	12'-3"	-	31	12'-3"	-

- ① SL = NUMBER OF FEET IN SPAN LENGTH. EXAMPLE: FOR SPAN LENGTH = 31'-8", SL = 31.
- ② THE LENGTHS SHOWN DO NOT INCLUDE LAP SPLICES. THE LENGTH OF ALL REQUIRED LAP SPLICES SHALL BE ADDED TO THE LENGTHS SHOWN. THE MINIMUM LAP SPLICE LENGTH FOR #5 REINFORCING STEEL BARS SHALL BE 2'-6"; AND THE MINIMUM LAP SPLICE LENGTH FOR #4 REINFORCING STEEL BARS SHALL BE 1'-8". THE LAP SPLICES SHALL BE STAGGERED.
- ③ THE LONGITUDINAL REINFORCING STEEL SHALL BE CONTINUOUS THRU ALL CONSTRUCTION JOINTS AT FIXED PIERS. TO DETERMINE THE ACTUAL REINFORCING STEEL BAR LENGTH, COMBINE THE LENGTHS SHOWN FOR ALL SPAN TYPES OCCURRING BETWEEN AN ABUTMENT AND EXPANSION PIER OR BETWEEN TWO EXPANSION PIERS CONTAINED WITHIN THE BRIDGE INCLUDING ALL REQUIRED LAP SPLICE LENGTHS. NO LAP SPLICE SHALL BE PLACED WITHIN 10'-0" OF THE CENTERLINE OF FIXED PIERS.
- ④ NUMBER INCLUDES TWO SETS OF 19 BARS.
- ⑤ NUMBER INCLUDES TWO SETS OF 21 BARS.
- ⑥ NUMBER INCLUDES TWO SETS OF 29 BARS.
- ⑦ CALCULATION IN TABLE SHALL BE ROUNDED UP TO THE NEAREST NUMBER OF BARS.

IP = NUMBER OF INTERIOR POSTS IN CONCRETE TRAFFIC RAIL (TR3) CALCULATED AS FOLLOWS:

FOR ABUTMENT TO EXPANSION PIER OR FIXED PIER TO EXPANSION PIER:
IP = INTEGER AMOUNT OF (SPAN LENGTH - 15.375)/10

FOR EXPANSION PIER TO EXPANSION PIER:
IP = INTEGER AMOUNT OF (SPAN LENGTH - 15.75)/10

FOR ALL OTHER CASES:
IP = INTEGER AMOUNT OF (SPAN LENGTH - 15)/10

EP = TOTAL LENGTH OF END POSTS IN CONCRETE TRAFFIC RAIL (TR3) CALCULATED AS FOLLOWS:

FOR ABUTMENT TO EXPANSION PIER OR FIXED PIER TO EXPANSION PIER:
EP = SPAN LENGTH - 5.375 - (10 x IP)

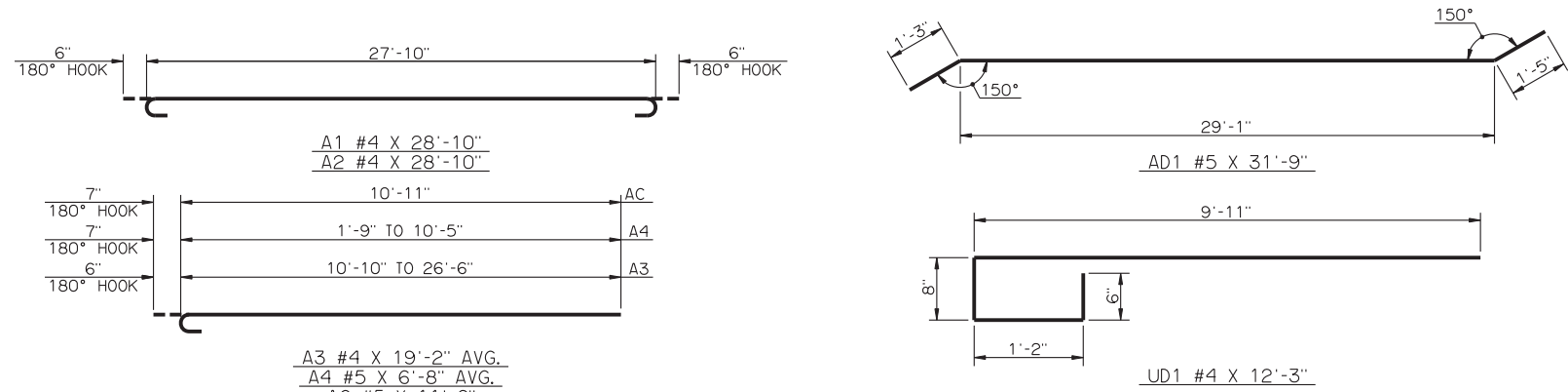
FOR EXPANSION PIER TO EXPANSION PIER:
EP = SPAN LENGTH - 5.75 - (10 x IP)

FOR ALL OTHER CASES:
EP = SPAN LENGTH - 5 - (10 x IP)

EXAMPLE: FOR FIXED PIER TO EXPANSION PIER WITH SPAN LENGTH = 80'-4"
IP = (80.34 - 15.375)/10 = 6
EP = 80.34 - 5.375 - (10 x 6) = 14.97

FOR ADDITIONAL DETAILS AND INFORMATION, SEE BRIDGE STANDARD TR3-2. SR1 BARS SHALL NOT BE EPOXY COATED AS INDICATED ON THE BRIDGE STANDARD.

BAR LIST - DECK SLAB											
			SPAN TYPE								
			FIXED PIER TO FIXED PIER			FIXED PIER TO EXPANSION PIER			EXPANSION PIER TO EXPANSION PIER		
MARK	SIZE	FORM	NUMBER	LENGTH	VARIANCE	NUMBER	LENGTH	VARIANCE	NUMBER	LENGTH	VARIANCE
A1	#4	BNT.	FOR SL < 32: 0	28'-10"	-	FOR SL < 32: 0	28'-10"	-	FOR SL < 32: 0	28'-10"	-
			FOR SL ≥ 32: SL - 32			FOR SL ≥ 32: SL - 32			FOR SL ≥ 32: SL - 32		
A2	#4	BNT.	FOR SL < 32: (2 x SL) - 29	28'-10"	-	FOR SL < 32: (2 x SL) - 29	28'-10"	-	FOR SL < 32: (2 x SL) - 29	28'-10"	-
			FOR SL ≥ 32: 34			FOR SL ≥ 32: 34			FOR SL ≥ 32: 34		
A3	#4	BNT.	38	19'-2" AVG.	11'-4" TO 27'-0"	38	19'-2" AVG.	11'-4" TO 27'-0"	38	19'-2" AVG.	11'-4" TO 27'-0"
A4	#5	BNT.	42	6'-8" AVG.	2'-4" TO 11'-0"	42	6'-8" AVG.	2'-4" TO 11'-0"	42	6'-8" AVG.	2'-4" TO 11'-0"
AC	#5	BNT.	(4 x SL) - 20	11'-6"	-	(4 x SL) - 20	11'-6"	-	(4 x SL) - 20	11'-6"	-
AD1	#5	BNT.	4	31'-9"	-	3	31'-9"	-	2	31'-9"	-
B1	#5	STR.	FOR SL < 32: 0	27'-10"	-	FOR SL < 32: 0	27'-10"	-	FOR SL < 32: 0	27'-10"	-
			FOR SL ≥ 32: SL - 32			FOR SL ≥ 32: SL - 32			FOR SL ≥ 32: SL - 32		
B2	#5	STR.	FOR SL < 32: (2 x SL) - 29	27'-10"	-	FOR SL < 32: (2 x SL) - 29	27'-10"	-	FOR SL < 32: (2 x SL) - 29	27'-10"	-
			FOR SL ≥ 32: 34			FOR SL ≥ 32: 34			FOR SL ≥ 32: 34		
B3	#5	STR.	58	14'-4" AVG.	2'-2" TO 26'-6"	58	14'-4" AVG.	2'-2" TO 26'-6"	58	14'-4" AVG.	2'-2" TO 26'-6"
EB1	#5	STR.	32	SPAN LENGTH ③	-	32	SPAN LENGTH - 2" ③	-	32	SPAN LENGTH - 4"	-
EB2	#5	STR.	62	9'-11"	-	62	9'-11"	-	62	9'-11"	-
ET1	#4	STR.	32	SPAN LENGTH ③	-	32	SPAN LENGTH - 2" ③	-	32	SPAN LENGTH - 4"	-
ET2	#4	STR.	62	9'-11"	-	62	9'-11"	-	62	9'-11"	-
SR1	#5	BNT.	36 x IP + 7.5 x EP ⑦	3'-10"	-	36 x IP + 7.5 x EP ⑦	3'-10"	-	36 x IP + 7.5 x EP ⑦	3'-10"	-
UD1	#4	BNT.	-	-	-	-	-	-	-	-	-



DETAILS OF BENT REINFORCING STEEL

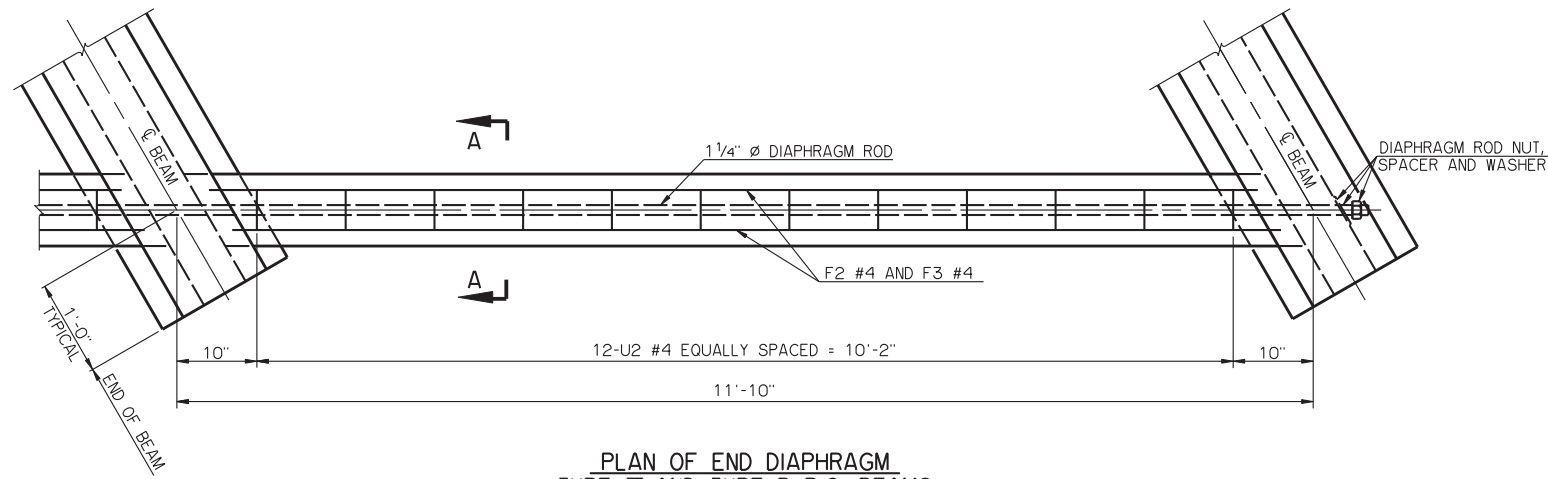
APPROVED BY BRIDGE ENGINEER *Robert J. Dush* DATE 9-9-2011

OKLAHOMA DEPARTMENT OF TRANSPORTATION
COUNTY BRIDGE STANDARD (ENGLISH)

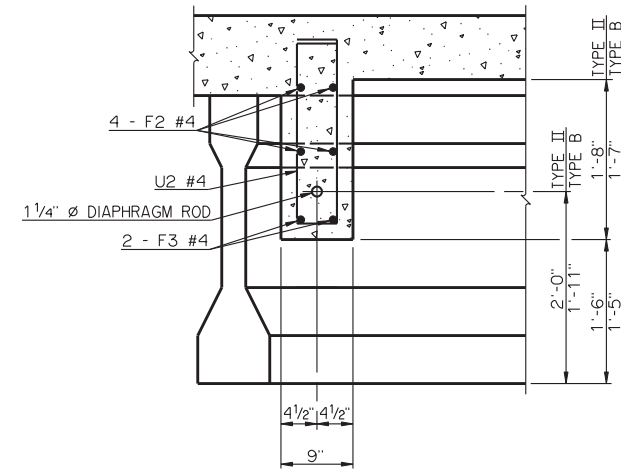
DECK SLAB BAR LIST

26' CLEAR ROADWAY - CONVENTIONAL - SKEWED 30°

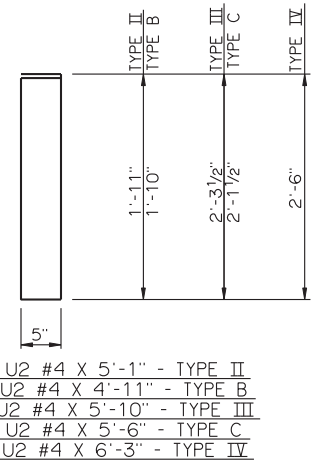
2009 SPECIFICATIONS CB26-C-SK30-DKSLB-BLIST 01E CB-236E



PLAN OF END DIAPHRAGM
TYPE II AND TYPE B P.C. BEAMS
 LEFT FORWARD SKEW SHOWN, RIGHT FORWARD SKEW OPPOSITE HAND

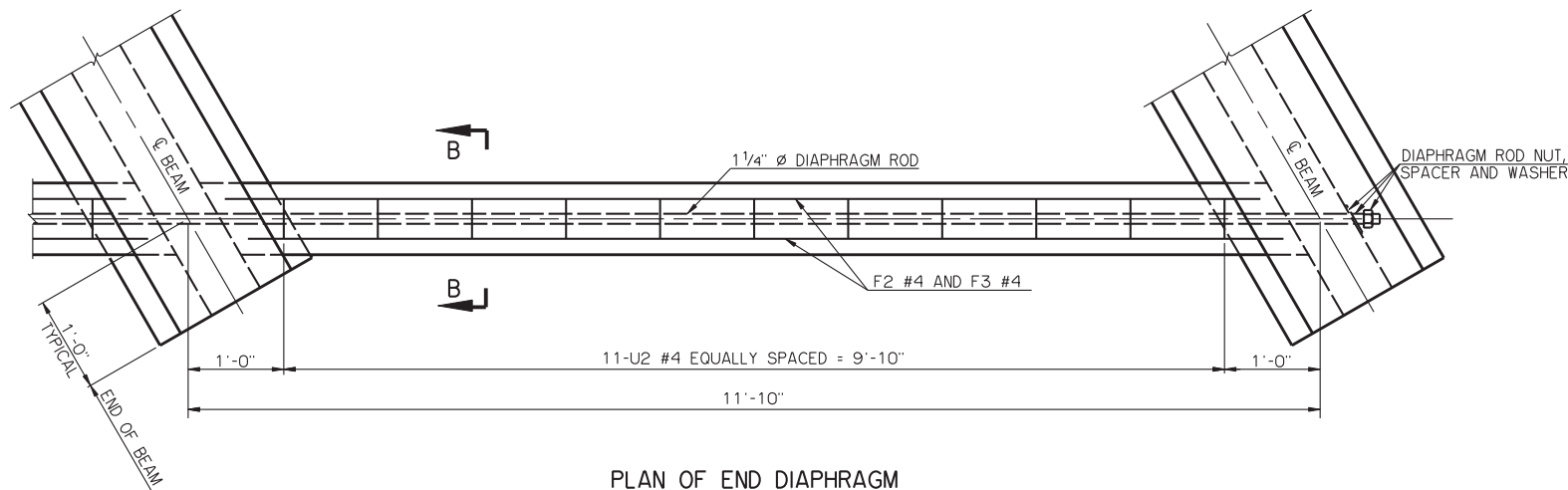


SECTION A-A

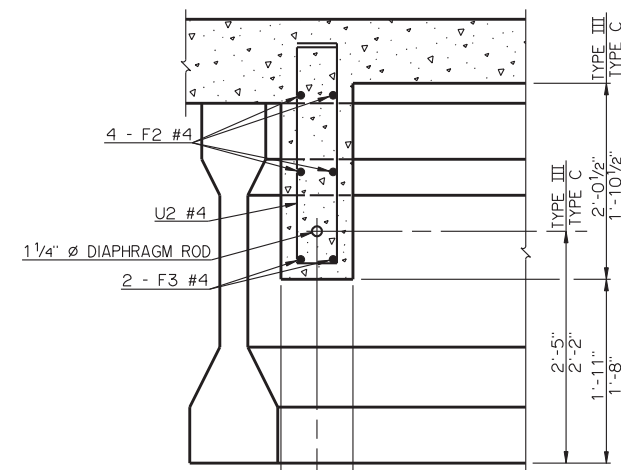


DETAILS OF BENT REINFORCING STEEL

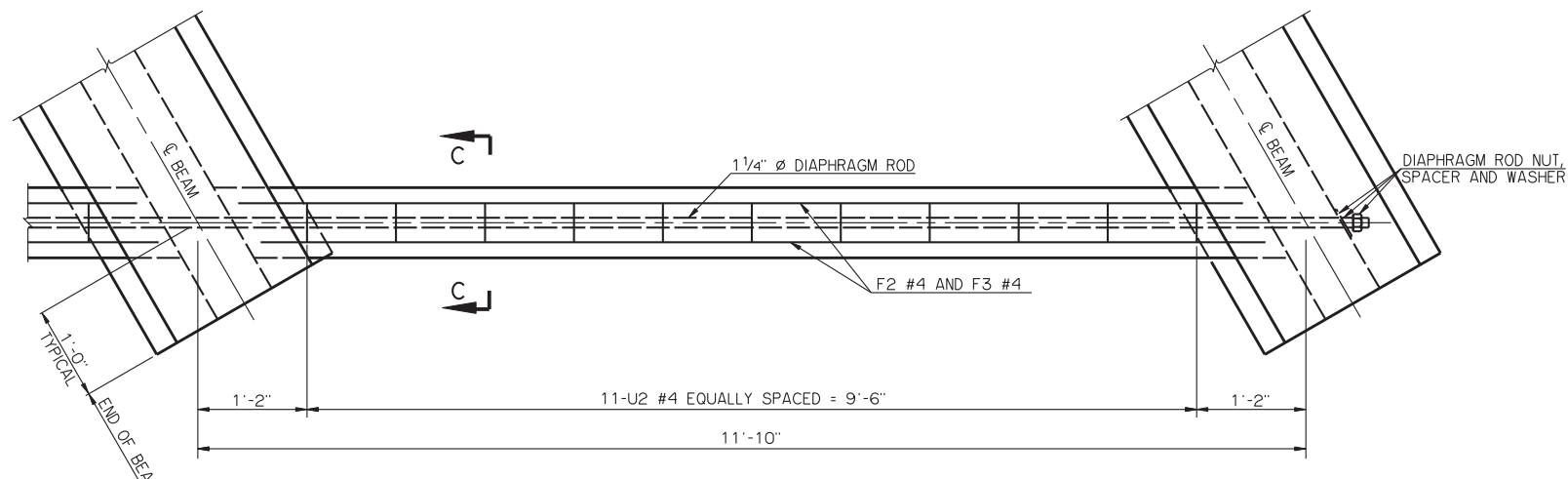
- U2 #4 X 5'-1" - TYPE II
- U2 #4 X 4'-11" - TYPE B
- U2 #4 X 5'-10" - TYPE III
- U2 #4 X 5'-6" - TYPE C
- U2 #4 X 6'-3" - TYPE IV



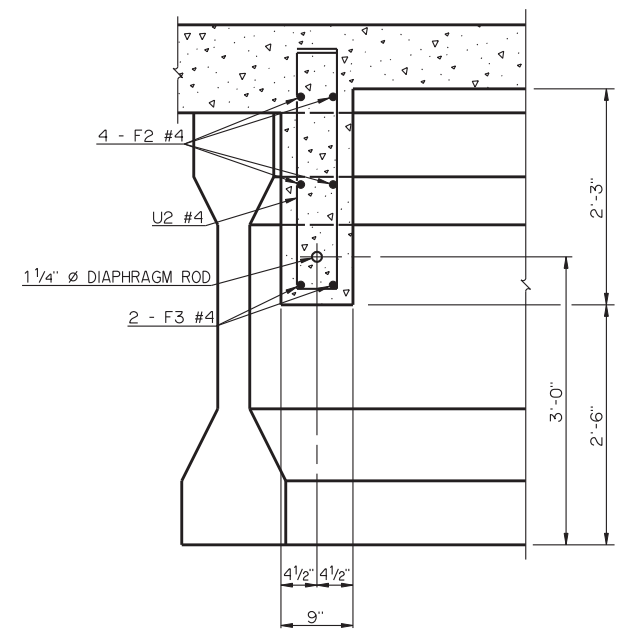
PLAN OF END DIAPHRAGM
TYPE III AND TYPE C P.C. BEAMS
 LEFT FORWARD SKEW SHOWN, RIGHT FORWARD SKEW OPPOSITE HAND



SECTION B-B



PLAN OF END DIAPHRAGM
TYPE IV P.C. BEAM
 LEFT FORWARD SKEW SHOWN, RIGHT FORWARD SKEW OPPOSITE HAND



SECTION C-C

BAR LIST - ONE END DIAPHRAGM					
P.C. BEAM	MARK	NO.	SIZE	FORM	LENGTH
TYPE II	U2	12	#4	BNT.	5'-1"
	F2	4	#4	STR.	10'-4"
	F3	2	#4	STR.	10'-11"
TYPE B	U2	12	#4	BNT.	4'-11"
	F2	4	#4	STR.	10'-4"
	F3	2	#4	STR.	10'-11"
TYPE III	U2	11	#4	BNT.	5'-10"
	F2	4	#4	STR.	10'-0"
	F3	2	#4	STR.	10'-10"
TYPE C	U2	11	#4	BNT.	5'-6"
	F2	4	#4	STR.	10'-2"
	F3	2	#4	STR.	10'-10"
TYPE IV	U2	11	#4	BNT.	6'-3"
	F2	4	#4	STR.	9'-7"
	F3	2	#4	STR.	10'-9"

APPROVED BY BRIDGE ENGINEER *Robert J. Dusch* DATE 9-9-2011
 OKLAHOMA DEPARTMENT OF TRANSPORTATION
 COUNTY BRIDGE STANDARD (ENGLISH)
END DIAPHRAGM DETAILS
TYPE II, B, III, C AND IV P.C. BEAMS
 26' CLEAR ROADWAY - CONVENTIONAL - SKEWED 30°
 2009 SPECIFICATIONS CB26-C-SK30-DIA-END-PC234 01E
 CB-240E

SUMMARY OF QUANTITIES - SUPERSTRUCTURE (PER SPAN)

SPAN	PRESTRESSED CONCRETE BEAM TYPE	ABUTMENT TO ABUTMENT							ABUTMENT TO STANDARD PIER							ABUTMENT TO STEPPED PIER									
		PRESTRESSED CONCRETE BEAMS (TYPE 1)	SAW-CUT GROOVING	CONCRETE RAIL (TR3)	STRUCTURAL STEEL (2)	WEATHERING STEEL FIXED BEARING ASSEMBLY (3)	WEATHERING STEEL EXPANSION BEARING ASSEMBLY (3)	CLASS AA CONCRETE	REINFORCING STEEL (4)	PRESTRESSED CONCRETE BEAMS (TYPE 1)	SAW-CUT GROOVING	CONCRETE RAIL (TR3)	STRUCTURAL STEEL (2)	WEATHERING STEEL FIXED BEARING ASSEMBLY (3)	WEATHERING STEEL EXPANSION BEARING ASSEMBLY (3)	CLASS AA CONCRETE	REINFORCING STEEL (5)	PRESTRESSED CONCRETE BEAMS (TYPE 1)	SAW-CUT GROOVING	CONCRETE RAIL (TR3)	STRUCTURAL STEEL (2)	WEATHERING STEEL FIXED BEARING ASSEMBLY (3)	WEATHERING STEEL EXPANSION BEARING ASSEMBLY (3)	CLASS AA CONCRETE	REINFORCING STEEL (5)
		(LF)	(SY)	(LF)	(LB)	(EA)	(EA)	(CY)	(LB)	(LF)	(SY)	(LF)	(LB)	(EA)	(EA)	(CY)	(LB)	(LF)	(SY)	(LF)	(LB)	(EA)	(EA)	(CY)	(LB)
30'	II	89.00	83.3	70.5	580	3	3	29.5	9,260	89.00	76.9	65.3	450	3	3	26.9	8,860	89.00	79.8	67.6	450	3	3	27.9	9,050
	B	89.00	83.3	70.5	580	3	3	29.3	9,250	89.00	76.9	65.3	450	3	3	26.7	8,850	89.00	79.8	67.6	450	3	3	27.7	9,040
35'	II	104.00	95.5	80.5	580	3	3	33.0	10,170	104.00	89.2	75.3	450	3	3	30.4	9,600	104.00	92.0	77.6	450	3	3	31.4	9,800
	B	104.00	95.5	80.5	580	3	3	32.9	10,160	104.00	89.2	75.3	450	3	3	30.2	9,590	104.00	92.0	77.6	450	3	3	31.2	9,790
40'	II	119.00	107.8	90.5	580	3	3	36.5	10,910	119.00	101.4	85.3	450	3	3	33.9	10,510	119.00	104.2	87.6	450	3	3	34.9	10,700
	B	119.00	107.8	90.5	580	3	3	36.4	10,900	119.00	101.4	85.3	450	3	3	33.7	10,500	119.00	104.2	87.6	450	3	3	34.8	10,690
45'	II	134.00	120.0	100.5	580	3	3	40.1	11,820	134.00	113.6	95.3	450	3	3	37.4	11,260	134.00	116.5	97.6	450	3	3	38.4	11,450
	B	134.00	120.0	100.5	580	3	3	39.9	11,810	134.00	113.6	95.3	450	3	3	37.3	11,250	134.00	116.5	97.6	450	3	3	38.3	11,450
50'	II	149.00	132.2	110.5	580	3	3	43.6	12,570	149.00	125.8	105.3	450	3	3	40.9	12,220	149.00	128.7	107.6	450	3	3	42.0	12,420
	B	149.00	132.2	110.5	580	3	3	43.4	12,560	149.00	125.8	105.3	450	3	3	40.8	12,220	149.00	128.7	107.6	450	3	3	41.8	12,410
55'	II	164.00	144.4	120.5	580	3	3	47.1	13,470	164.00	138.1	115.3	450	3	3	44.5	12,970	164.00	140.9	117.6	450	3	3	45.5	13,170
	B	164.00	144.4	120.5	580	3	3	46.9	13,470	164.00	138.1	115.3	450	3	3	44.3	12,960	164.00	140.9	117.6	450	3	3	45.3	13,160
60'	II	179.00	156.7	130.5	580	3	3	50.6	14,340	179.00	150.3	125.3	450	3	3	48.0	13,880	179.00	153.1	127.6	450	3	3	49.0	14,070
	C	179.00	156.7	130.5	580	3	3	51.3	14,340	179.00	150.3	125.3	450	3	3	48.6	13,880	179.00	153.1	127.6	450	3	3	49.7	14,070
65'	III	194.00	168.9	140.5	580	3	3	55.3	15,260	194.00	162.5	135.3	450	3	3	52.6	14,640	194.00	165.3	137.6	450	3	3	53.7	14,830
	C	194.00	168.9	140.5	580	3	3	54.8	15,240	194.00	162.5	135.3	450	3	3	52.2	14,620	194.00	165.3	137.6	450	3	3	53.2	14,820
70'	III	209.00	181.1	150.5	580	3	3	58.8	16,010	209.00	174.7	145.3	450	3	3	56.1	15,600	209.00	177.6	147.6	450	3	3	57.2	15,800
	C	209.00	181.1	150.5	580	3	3	58.4	15,990	209.00	174.7	145.3	450	3	3	55.7	15,590	209.00	177.6	147.6	450	3	3	56.8	15,780
75'	III	224.00	193.3	160.5	580	3	3	62.4	16,910	224.00	186.9	155.3	450	3	3	59.7	16,350	224.00	189.8	157.6	450	3	3	60.8	16,550
	C	224.00	193.3	160.5	580	3	3	61.9	16,900	224.00	186.9	155.3	450	3	3	59.2	16,340	224.00	189.8	157.6	450	3	3	60.3	16,530
80'	III	239.00	205.5	170.5	580	3	3	65.9	17,660	239.00	199.2	165.3	450	3	3	63.3	17,260	239.00	202.0	167.6	450	3	3	64.3	17,450
	IV	239.00	205.5	170.5	590	3	3	67.0	17,680	239.00	199.2	165.3	460	3	3	64.3	17,270	239.00	202.0	167.6	460	3	3	65.4	17,470
85'	III	254.00	217.8	180.5	580	3	3	69.5	18,570	254.00	211.4	175.3	450	3	3	66.8	18,010	254.00	214.2	177.6	450	3	3	67.9	18,200
	IV	254.00	217.8	180.5	590	3	3	70.6	18,580	254.00	211.4	175.3	460	3	3	67.9	18,020	254.00	214.2	177.6	460	3	3	69.0	18,220
90'	IV	269.00	230.0	190.5	590	3	3	74.2	19,330	269.00	223.6	185.3	460	3	3	71.5	18,930	269.00	226.5	187.6	460	3	3	72.6	19,120
95'	IV	284.00	242.2	200.5	590	3	3	77.8	20,240	284.00	235.8	195.3	460	3	3	75.1	19,680	284.00	238.7	197.6	460	3	3	76.2	19,870
100'	IV	299.00	254.4	210.5	590	3	3	81.4	20,980	299.00	248.1	205.3	460	3	3	78.7	20,580	299.00	250.9	207.6	460	3	3	79.8	20,770
105'	IV	314.00	266.7	220.5	690	3	3	86.1	22,030	314.00	260.3	215.3	560	3	3	83.4	21,530	314.00	263.1	217.6	560	3	3	84.5	21,720
110'	BT-72	329.00	278.9	230.5	1,100	3	3	101.4	24,010	329.00	272.5	225.3	970	3	3	98.6	23,670	329.00	275.3	227.6	970	3	3	99.8	23,860
	J	329.00	278.9	230.5	1,100	3	3	101.4	24,010	329.00	272.5	225.3	970	3	3	98.6	23,670	329.00	275.3	227.6	970	3	3	99.8	23,860
115'	BT-72	344.00	291.1	240.5	1,100	3	3	105.2	25,030	344.00	284.7	235.3	970	3	3	102.4	24,410	344.00	287.6	237.6	970	3	3	103.6	24,610
	J	344.00	291.1	240.5	1,100	3	3	105.2	25,030	344.00	284.7	235.3	970	3	3	102.4	24,410	344.00	287.6	237.6	970	3	3	103.6	24,610
120'	BT-72	359.00	303.3	250.5	1,100	3	3	109.0	25,780	359.00	296.9	245.3	970	3	3	106.2	25,320	359.00	299.8	247.6	970	3	3	107.4	25,510
	J	359.00	303.3	250.5	1,100	3	3	109.0	25,780	359.00	296.9	245.3	970	3	3	106.2	25,320	359.00	299.8	247.6	970	3	3	107.4	25,510
125'	J	374.00	315.5	260.5	1,100	3	3	112.8	26,690	374.00	309.2	255.3	970	3	3	110.0	26,070	374.00	312.0	257.6	970	3	3	111.2	26,260
130'	J	389.00	327.8	270.5	1,100	3	3	116.6	27,440	389.00	321.4	265.3	970	3	3	113.8	26,970	389.00	324.2	267.6	970	3	3	115.0	27,170
135'	J	404.00	340.0	280.5	1,100	3	3	120.4	28,340	404.00	333.6	275.3	970	3	3	117.6	27,720	404.00	336.5	277.6	970	3	3	118.8	27,920

- PRESTRESSED CONCRETE BEAM TYPE SHALL BE TYPE II, TYPE B, TYPE III, TYPE C, TYPE IV, TYPE 72 BT OR TYPE J BT AS APPLICABLE.
- QUANTITIES SHOWN INCLUDE WEIGHT OF STEEL ANGLE BUMPERS AT ABUTMENT ENDS OF DECK SLAB. FOR EACH STEEL ANGLE BUMPER OMITTED FROM END OF DECK SLAB, DEDUCT 130 POUNDS FROM THE QUANTITIES SHOWN.
- PROVIDE AND INSTALL FIXED OR EXPANSION BEARING ASSEMBLIES OF THE SIZE, SHAPE AND LOCATION AS DETAILED IN THE PLANS. SEE SUMMARY FOR THE ESTIMATED TOTAL AMOUNT OF STRUCTURAL STEEL PER EACH FIXED OR EXPANSION BEARING ASSEMBLY. ALL COST OF PROVIDING AND INSTALLING THE FIXED OR EXPANSION BEARING ASSEMBLIES INCLUDING THE COST OF STEEL REINFORCED ELASTOMERIC BEARING PADS, ANCHOR PLATES, CONTACT PLATES, CONTACT ANGLES, ANCHOR BOLTS, NUTS, WASHERS, MATERIAL, LABOR, EQUIPMENT AND INCIDENTALS SHALL BE INCLUDED IN THE UNIT PRICE BID PER EACH OF "WEATHERING STEEL FIXED BEARING ASSEMBLY" OR "WEATHERING STEEL EXPANSION BEARING ASSEMBLY."
- QUANTITY INCLUDES PROVISION FOR LAP SPLICES REQUIRED IN THE LONGITUDINAL REINFORCING STEEL AS FOLLOWS:
30' THRU 55' SPANS - NO LAP SPLICES
60' THRU 110' SPANS - 1 LAP SPLICE
115' THRU 135' SPANS - 2 LAP SPLICES
- QUANTITY INCLUDES PROVISION FOR LAP SPLICES REQUIRED IN THE LONGITUDINAL REINFORCING STEEL AS FOLLOWS:
30' THRU 45' SPANS - 1/2 LAP SPLICE
50' THRU 65' SPANS - 1 LAP SPLICE
70' THRU 105' SPANS - 1 1/2 LAP SPLICES
110' THRU 135' SPANS - 2 LAP SPLICES
LAP SPLICES ACCOUNT FOR ADJACENT SPAN COMBINATIONS AND ARE APPROXIMATE. PAYMENT FOR "REINFORCING STEEL" WILL BE BASED ON PLAN QUANTITY.

SUMMARY OF QUANTITIES - BEARING ASSEMBLY STRUCTURAL STEEL (PER EACH ASSEMBLY)		
PRESTRESSED CONCRETE BEAM TYPE	SPAN	WEATHERING STEEL FIXED OR EXPANSION BEARING ASSEMBLY (LB)
II AND B	30' THRU 60'	150
III AND C	60' AND 65'	160
	70' THRU 85'	170
IV AND BT-72	80' THRU 90'	190
	95' THRU 110'	200
	115' AND 120'	210
J	110' THRU 135'	220

SUMMARY OF QUANTITIES SEALED EXPANSION JOINT (PER EXPANSION JOINT)		
ITEM	UNIT	TOTAL
SEALED EXPANSION JOINT	LF	33.06

NOTES

QUANTITY CALCULATIONS ASSUME ALL PIERS ARE FIXED PIERS. ANY ADJUSTMENTS TO THE QUANTITIES OF "SAW-CUT GROOVING", "CONCRETE RAIL (TR3)", "CLASS AA CONCRETE" AND "REINFORCING STEEL" NECESSARY TO ACCOUNT FOR EXPANSION JOINT OPENINGS WITHIN THE BRIDGE ARE MINOR AND HAVE NOT BEEN CONSIDERED. PAYMENT FOR "SAW-CUT GROOVING", "CONCRETE RAIL (TR3)", "CLASS AA CONCRETE" AND "REINFORCING STEEL" WILL BE BASED ON PLAN QUANTITY.

APPROVED BY BRIDGE ENGINEER <i>Robert J. Duch</i>	DATE 9-9-2011
OKLAHOMA DEPARTMENT OF TRANSPORTATION COUNTY BRIDGE STANDARD (ENGLISH)	
SUPERSTRUCTURE QUANTITIES P.C. BEAMS (SHEET NO. 1 OF 2)	
26' CLEAR ROADWAY - CONVENTIONAL - SKEWED 30°	
2009 SPECIFICATIONS	CB26-C-SK30-SPR-QUAN-PCB-1 01E CB-254E

SUMMARY OF QUANTITIES - SUPERSTRUCTURE (PER SPAN)

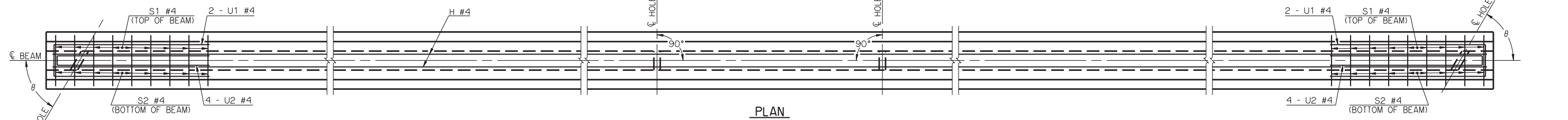
SPAN	PRESTRESSED CONCRETE BEAM TYPE	STANDARD PIER TO STANDARD PIER							STANDARD PIER TO STEPPED PIER							STEPPED PIER TO STEPPED PIER						
		PRESTRESSED CONCRETE BEAMS (TYPE ①) (LF)	SAW-CUT GROOVING (SY)	CONCRETE RAIL (TR3) (LF)	STRUCTURAL STEEL (LB)	WEATHERING STEEL FIXED OR EXPANSION BEARING ASSEMBLY ② (EA)	CLASS AA CONCRETE (CY)	REINFORCING STEEL ③ (LB)	PRESTRESSED CONCRETE BEAMS (TYPE ①) (LF)	SAW-CUT GROOVING (SY)	CONCRETE RAIL (TR3) (LF)	STRUCTURAL STEEL (LB)	WEATHERING STEEL FIXED OR EXPANSION BEARING ASSEMBLY ② (EA)	CLASS AA CONCRETE (CY)	REINFORCING STEEL ③ (LB)	PRESTRESSED CONCRETE BEAMS (TYPE ①) (LF)	SAW-CUT GROOVING (SY)	CONCRETE RAIL (TR3) (LF)	STRUCTURAL STEEL (LB)	WEATHERING STEEL FIXED OR EXPANSION BEARING ASSEMBLY ② (EA)	CLASS AA CONCRETE (CY)	REINFORCING STEEL ③ (LB)
30'	II	89.00	70.6	60.0	320	6	24.2	8,280	89.00	73.4	62.4	320	6	25.2	8,530	89.00	76.3	64.7	320	6	26.2	8,720
	B	89.00	70.6	60.0	320	6	24.1	8,270	89.00	73.4	62.4	320	6	25.1	8,520	89.00	76.3	64.7	320	6	26.1	8,710
35'	II	104.00	82.8	70.0	320	6	27.7	9,080	104.00	85.6	72.4	320	6	28.8	9,270	104.00	88.5	74.7	320	6	29.8	9,470
	B	104.00	82.8	70.0	320	6	27.6	9,070	104.00	85.6	72.4	320	6	28.6	9,270	104.00	88.5	74.7	320	6	29.6	9,460
40'	II	119.00	95.0	80.0	320	6	31.3	9,980	119.00	97.9	82.4	320	6	32.3	10,180	119.00	100.7	84.7	320	6	33.3	10,370
	B	119.00	95.0	80.0	320	6	31.1	9,980	119.00	97.9	82.4	320	6	32.1	10,170	119.00	100.7	84.7	320	6	33.1	10,360
45'	II	134.00	107.2	90.0	320	6	34.8	10,730	134.00	110.1	92.4	320	6	35.8	10,930	134.00	112.9	94.7	320	6	36.8	11,120
	B	134.00	107.2	90.0	320	6	34.6	10,720	134.00	110.1	92.4	320	6	35.6	10,920	134.00	112.9	94.7	320	6	36.7	11,120
50'	II	149.00	119.4	100.0	320	6	38.3	11,700	149.00	122.3	102.4	320	6	39.3	11,890	149.00	125.2	104.7	320	6	40.3	12,090
	B	149.00	119.4	100.0	320	6	38.2	11,690	149.00	122.3	102.4	320	6	39.2	11,890	149.00	125.2	104.7	320	6	40.2	12,080
55'	II	164.00	131.7	110.0	320	6	41.8	12,450	164.00	134.5	112.4	320	6	42.8	12,640	164.00	137.4	114.7	320	6	43.9	12,840
	B	164.00	131.7	110.0	320	6	41.7	12,440	164.00	134.5	112.4	320	6	42.7	12,630	164.00	137.4	114.7	320	6	43.7	12,830
60'	II	179.00	143.9	120.0	320	6	45.4	13,350	179.00	146.7	122.4	320	6	46.4	13,550	179.00	149.6	124.7	320	6	47.4	13,740
	C	179.00	143.9	120.0	320	6	45.9	13,350	179.00	146.7	122.4	320	6	47.0	13,550	179.00	149.6	124.7	320	6	48.1	13,740
65'	III	194.00	156.1	130.0	320	6	49.9	14,110	194.00	159.0	132.4	320	6	51.0	14,310	194.00	161.8	134.7	320	6	52.0	14,500
	C	194.00	156.1	130.0	320	6	49.5	14,100	194.00	159.0	132.4	320	6	50.5	14,290	194.00	161.8	134.7	320	6	51.6	14,490
70'	III	209.00	168.3	140.0	320	6	53.5	15,080	209.00	171.2	142.4	320	6	54.5	15,280	209.00	174.0	144.7	320	6	55.6	15,470
	C	209.00	168.3	140.0	320	6	53.0	15,060	209.00	171.2	142.4	320	6	54.1	15,260	209.00	174.0	144.7	320	6	55.1	15,450
75'	III	224.00	180.6	150.0	320	6	57.0	15,830	224.00	183.4	152.4	320	6	58.1	16,020	224.00	186.3	154.7	320	6	59.1	16,220
	C	224.00	180.6	150.0	320	6	56.6	15,810	224.00	183.4	152.4	320	6	57.6	16,010	224.00	186.3	154.7	320	6	58.7	16,200
80'	III	239.00	192.8	160.0	320	6	60.6	16,730	239.00	195.6	162.4	320	6	61.6	16,930	239.00	198.5	164.7	320	6	62.7	17,120
	IV	239.00	192.8	160.0	330	6	61.6	16,750	239.00	195.6	162.4	330	6	62.7	16,940	239.00	198.5	164.7	330	6	63.8	17,140
85'	III	254.00	205.0	170.0	320	6	64.1	17,480	254.00	207.9	172.4	320	6	65.2	17,680	254.00	210.7	174.7	320	6	66.2	17,870
	IV	254.00	205.0	170.0	330	6	65.2	17,500	254.00	207.9	172.4	330	6	66.3	17,690	254.00	210.7	174.7	330	6	67.4	17,890
90'	IV	269.00	217.2	180.0	330	6	68.8	18,400	269.00	220.1	182.4	330	6	69.9	18,600	269.00	222.9	184.7	330	6	71.0	18,790
95'	IV	284.00	229.4	190.0	330	6	72.4	19,150	284.00	232.3	192.4	330	6	73.5	19,350	284.00	235.2	194.7	330	6	74.6	19,540
100'	IV	299.00	241.7	200.0	330	6	76.0	20,060	299.00	244.5	202.4	330	6	77.1	20,250	299.00	247.4	204.7	330	6	78.2	20,450
105'	IV	314.00	253.9	210.0	430	6	80.7	21,000	314.00	256.7	212.4	430	6	81.8	21,200	314.00	259.6	214.7	430	6	82.9	21,390
110'	BT-72	329.00	266.1	220.0	840	6	95.8	23,140	329.00	269.0	222.4	840	6	97.0	23,340	329.00	271.8	224.7	840	6	98.2	23,530
	J	329.00	266.1	220.0	840	6	95.8	23,140	329.00	269.0	222.4	840	6	97.0	23,340	329.00	271.8	224.7	840	6	98.2	23,530
115'	BT-72	344.00	278.3	230.0	840	6	99.6	23,890	344.00	281.2	232.4	840	6	100.8	24,080	344.00	284.0	234.7	840	6	102.0	24,280
	J	344.00	278.3	230.0	840	6	99.6	23,890	344.00	281.2	232.4	840	6	100.8	24,080	344.00	284.0	234.7	840	6	102.0	24,280
120'	BT-72	359.00	290.6	240.0	840	6	103.4	24,790	359.00	293.4	242.4	840	6	104.6	24,990	359.00	296.3	244.7	840	6	105.8	25,180
	J	359.00	290.6	240.0	840	6	103.4	24,790	359.00	293.4	242.4	840	6	104.6	24,990	359.00	296.3	244.7	840	6	105.8	25,180
125'	J	374.00	302.8	250.0	840	6	107.2	25,540	374.00	305.6	252.4	840	6	108.4	25,740	374.00	308.5	254.7	840	6	109.6	25,930
130'	J	389.00	315.0	260.0	840	6	111.0	26,450	389.00	317.9	262.4	840	6	112.2	26,640	389.00	320.7	264.7	840	6	113.4	26,840
135'	J	404.00	327.2	270.0	840	6	114.8	27,200	404.00	330.1	272.4	840	6	116.0	27,390	404.00	332.9	274.7	840	6	117.2	27,590

- ① PRESTRESSED CONCRETE BEAM TYPE SHALL BE TYPE II, TYPE B, TYPE III, TYPE C, TYPE IV, TYPE 72 BT OR TYPE J BT AS APPLICABLE.
- ② PROVIDE AND INSTALL FIXED OR EXPANSION BEARING ASSEMBLIES OF THE SIZE, SHAPE AND LOCATION AS DETAILED IN THE PLANS. SEE SUMMARY FOR THE ESTIMATED TOTAL AMOUNT OF STRUCTURAL STEEL PER EACH FIXED OR EXPANSION BEARING ASSEMBLY. ALL COST OF PROVIDING AND INSTALLING THE FIXED OR EXPANSION BEARING ASSEMBLIES INCLUDING THE COST OF STEEL REINFORCED ELASTOMERIC BEARING PADS, ANCHOR PLATES, CONTACT PLATES, CONTACT ANGLES, ANCHOR BOLTS, NUTS, WASHERS, MATERIAL, LABOR, EQUIPMENT AND INCIDENTALS SHALL BE INCLUDED IN THE UNIT PRICE BID PER EACH OF "WEATHERING STEEL FIXED BEARING ASSEMBLY" OR "WEATHERING STEEL EXPANSION BEARING ASSEMBLY."
- ③ QUANTITY INCLUDES PROVISION FOR LAP SPLICES REQUIRED IN THE LONGITUDINAL REINFORCING STEEL AS FOLLOWS:
 30' THRU 45' SPANS - 1/2 LAP SPLICE
 50' THRU 65' SPANS - 1 LAP SPLICE
 70' THRU 105' SPANS - 1 1/2 LAP SPLICES
 110' THRU 135' SPANS - 2 LAP SPLICES
 LAP SPLICES ACCOUNT FOR ADJACENT SPAN COMBINATIONS AND ARE APPROXIMATE. PAYMENT FOR "REINFORCING STEEL" WILL BE BASED ON PLAN QUANTITY.

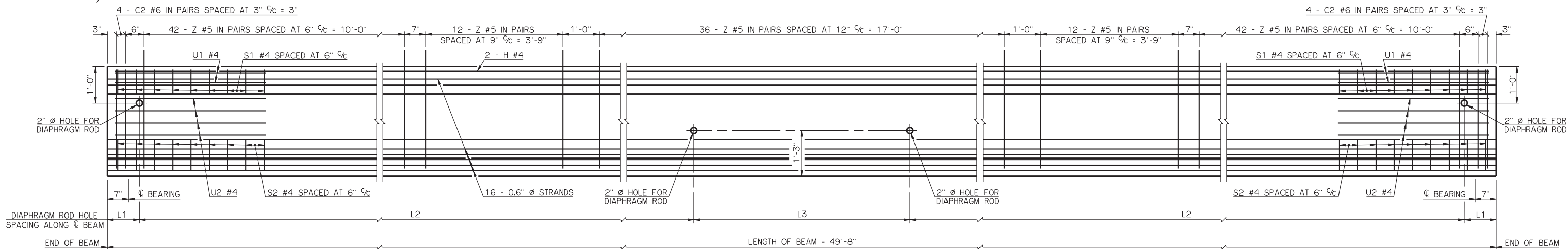
NOTES

QUANTITY CALCULATIONS ASSUME ALL PIERS ARE FIXED PIERS. ANY ADJUSTMENTS TO THE QUANTITIES OF "SAW-CUT GROOVING"; "CONCRETE RAIL (TR3)"; "CLASS AA CONCRETE" AND "REINFORCING STEEL" NECESSARY TO ACCOUNT FOR EXPANSION JOINT OPENINGS WITHIN THE BRIDGE ARE MINOR AND HAVE NOT BEEN CONSIDERED. PAYMENT FOR "SAW-CUT GROOVING"; "CONCRETE RAIL (TR3)"; "CLASS AA CONCRETE" AND "REINFORCING STEEL" WILL BE BASED ON PLAN QUANTITY.

APPROVED BY BRIDGE ENGINEER	<i>Robert A. Dusch</i>	DATE	9-9-2011
OKLAHOMA DEPARTMENT OF TRANSPORTATION COUNTY BRIDGE STANDARD (ENGLISH)			
SUPERSTRUCTURE QUANTITIES			
P.C. BEAMS			
(SHEET NO. 2 OF 2)			
26' CLEAR ROADWAY - CONVENTIONAL - SKEWED 30°			
2009 SPECIFICATIONS	CB26-C-SK30-SPR-QUAN-PCB-2	01E	CB-255E

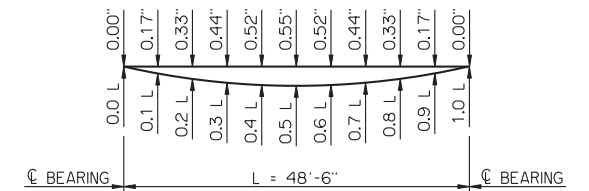


PLAN
C2 BARS, Z BARS, STRANDS AND ENCASED PLATES NOT SHOWN



ELEVATION
ENCASED PLATES NOT SHOWN

DIAPHRAGM ROD HOLE SCHEDULE				
BRIDGE SKEW	θ	L1	L2	L3
0°	90°	10 1/2"	23'-11 1/2"	0'-0"
30° LEFT FORWARD	60°	1'-0"	20'-10 1/2"	5'-11"
30° RIGHT FORWARD	120°	1'-0"	20'-10 1/2"	5'-11"



DEAD LOAD DEFLECTIONS

THE DEAD LOAD DEFLECTIONS SHOWN ABOVE AT THE TENTH POINTS ARE THE INITIAL THEORETICAL BEAM DEFLECTIONS DUE TO THE DIAPHRAGMS, A 5 PSF STEEL SIP FORMS ALLOWANCE, DECK SLAB, HAUNCH AND CONCRETE TRAFFIC RAIL (TR3). THE DEAD LOAD DEFLECTIONS SHALL BE ACCOUNTED FOR IN THE HAUNCH DEPTH CALCULATIONS.

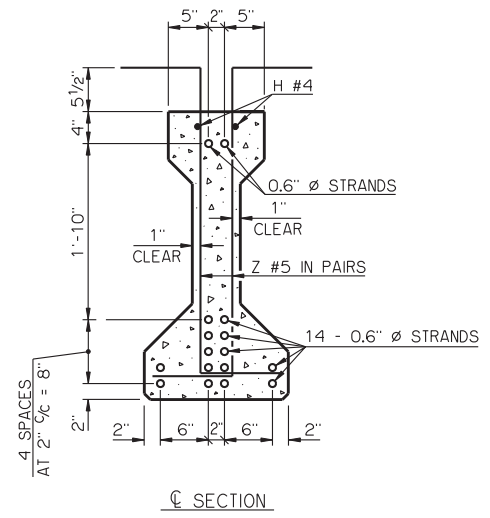
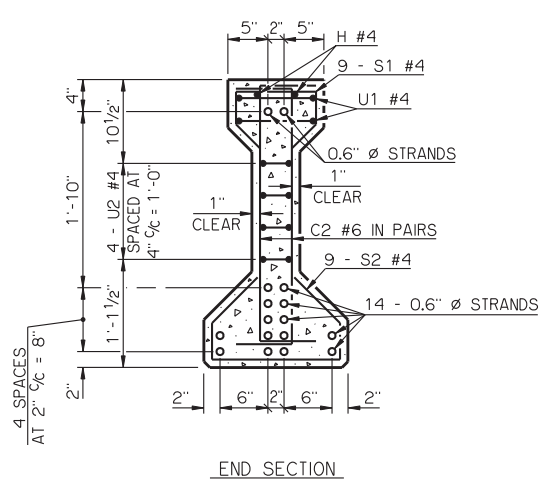
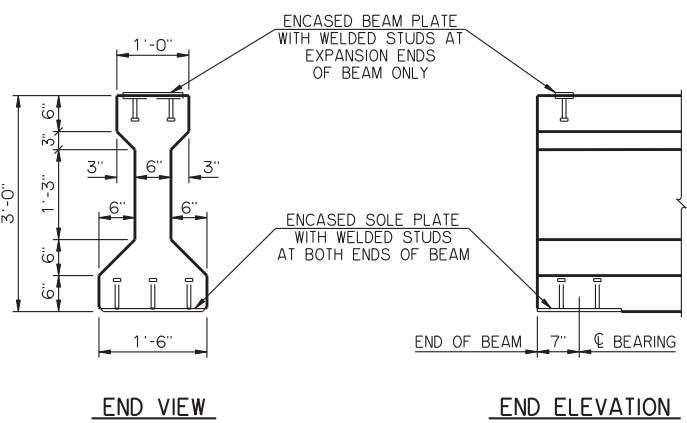
MATERIAL PROPERTIES

THE COMPRESSIVE STRENGTH OF THE CONCRETE IN THE P.C. BEAM SHALL BE NO LESS THAN 5,250 PSI AT THE TIME OF TRANSFER OF THE PRESTRESSING FORCE AND NO LESS THAN 7,000 PSI AT 28 DAYS AFTER THE POURING OF THE CONCRETE.

THE TYPE OF PRESTRESSING STRANDS REQUIRED IN THE P.C. BEAM SHALL BE LOW RELAXATION 7-WIRE STRAND WITH A NOMINAL DIAMETER OF 0.6 INCHES AND AN ULTIMATE TENSILE STRENGTH OF 270 KSI.

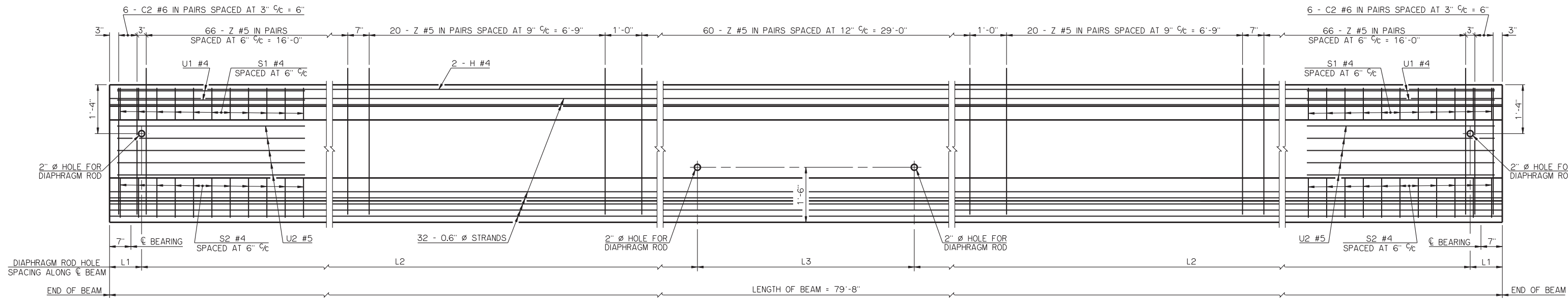
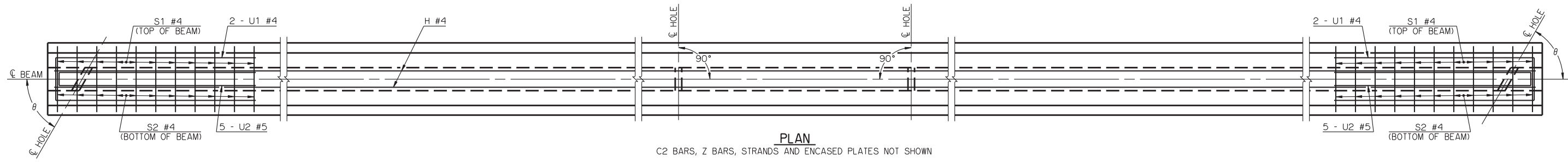
LFD OPERATING RATING - HS 29.0

THE LFD OPERATING RATING SHOWN ABOVE IS FOR THE P.C. BEAM ONLY AND APPLIES ONLY TO THE P.C. BEAMS OF A BRIDGE CONSTRUCTED IN STRICT CONFORMANCE TO ALL RELEVANT DETAILS CONTAINED IN THE COMPLETE SET OF COUNTY BRIDGE STANDARDS AND TO THE ODOT STANDARD SPECIFICATIONS.

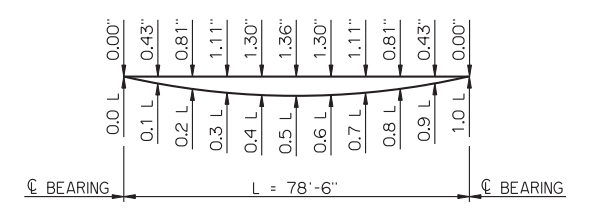


BEAM SECTIONS
(16 - 0.6" Ø STRANDS)

APPROVED BY BRIDGE ENGINEER *Robert J. Dusch* DATE 9-9-2011
 OKLAHOMA DEPARTMENT OF TRANSPORTATION
 COUNTY BRIDGE STANDARD (ENGLISH)
P.C. BEAM DETAILS
TYPE II - 50' SPAN
 26' CLEAR ROADWAY - CONVENTIONAL - SKEWED 0° AND 30°
 2009 SPECIFICATIONS CB26-C-SKO.30-PCB-II-50 01E
 CB-263E



DIAPHRAGM ROD HOLE SCHEDULE				
BRIDGE SKEW	θ	L1	L2	L3
0°	90°	10'-1/2"	38'-11 1/2"	0'-0"
30° LEFT FORWARD	60°	1'-0"	35'-10 1/2"	5'-11"
30° RIGHT FORWARD	120°	1'-0"	35'-10 1/2"	5'-11"



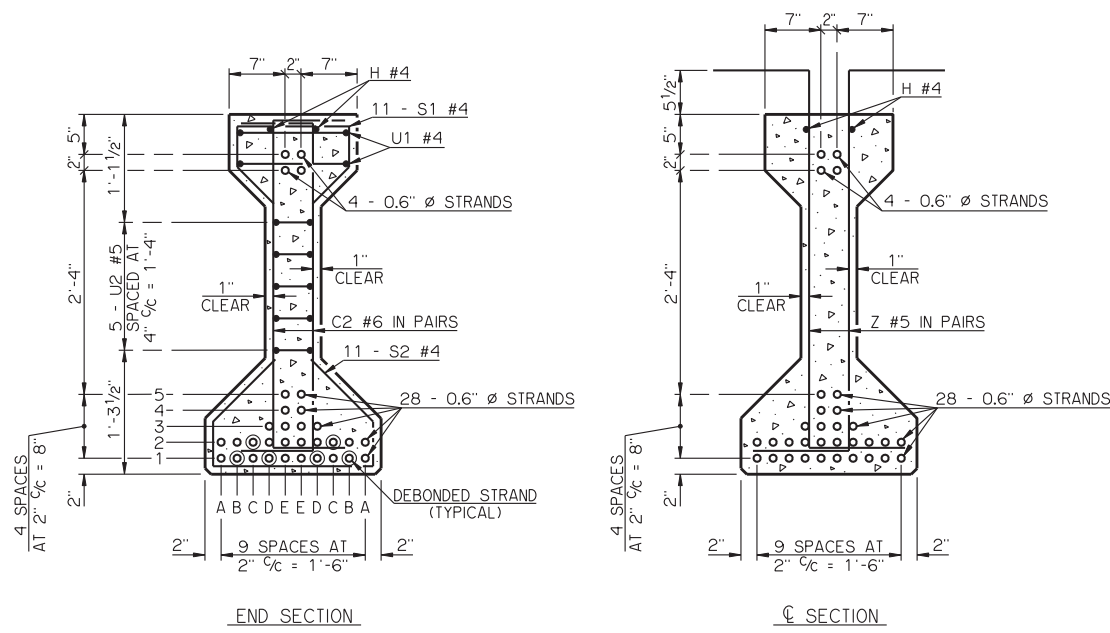
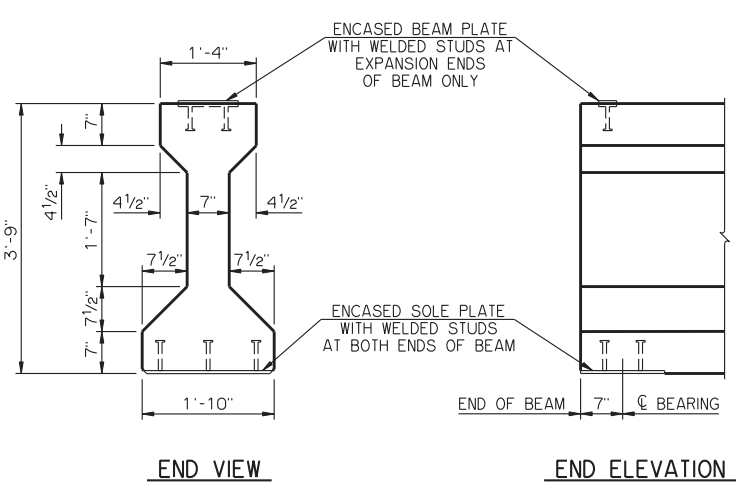
MATERIAL PROPERTIES

THE COMPRESSIVE STRENGTH OF THE CONCRETE IN THE P.C. BEAM SHALL BE NO LESS THAN 6,300 PSI AT THE TIME OF TRANSFER OF THE PRESTRESSING FORCE AND NO LESS THAN 9,000 PSI AT 28 DAYS AFTER THE POURING OF THE CONCRETE.

THE TYPE OF PRESTRESSING STRANDS REQUIRED IN THE P.C. BEAM SHALL BE LOW RELAXATION 7-WIRE STRAND WITH A NOMINAL DIAMETER OF 0.6 INCHES AND AN ULTIMATE TENSILE STRENGTH OF 270 KSI.

LFD OPERATING RATING - HS 43.8

THE LFD OPERATING RATING SHOWN ABOVE IS FOR THE P.C. BEAM ONLY AND APPLIES ONLY TO THE P.C. BEAMS OF A BRIDGE CONSTRUCTED IN STRICT CONFORMANCE TO ALL RELEVANT DETAILS CONTAINED IN THE COMPLETE SET OF COUNTY BRIDGE STANDARDS AND TO THE ODOT STANDARD SPECIFICATIONS.



BEAM SECTIONS
(32 - 0.6" ϕ STRANDS)

DEBOND SCHEDULE	
DEBOND PAIR	DEBOND LENGTH FROM END OF BEAM
B1	11'-0"
D1	11'-0"
C2	30'-0"

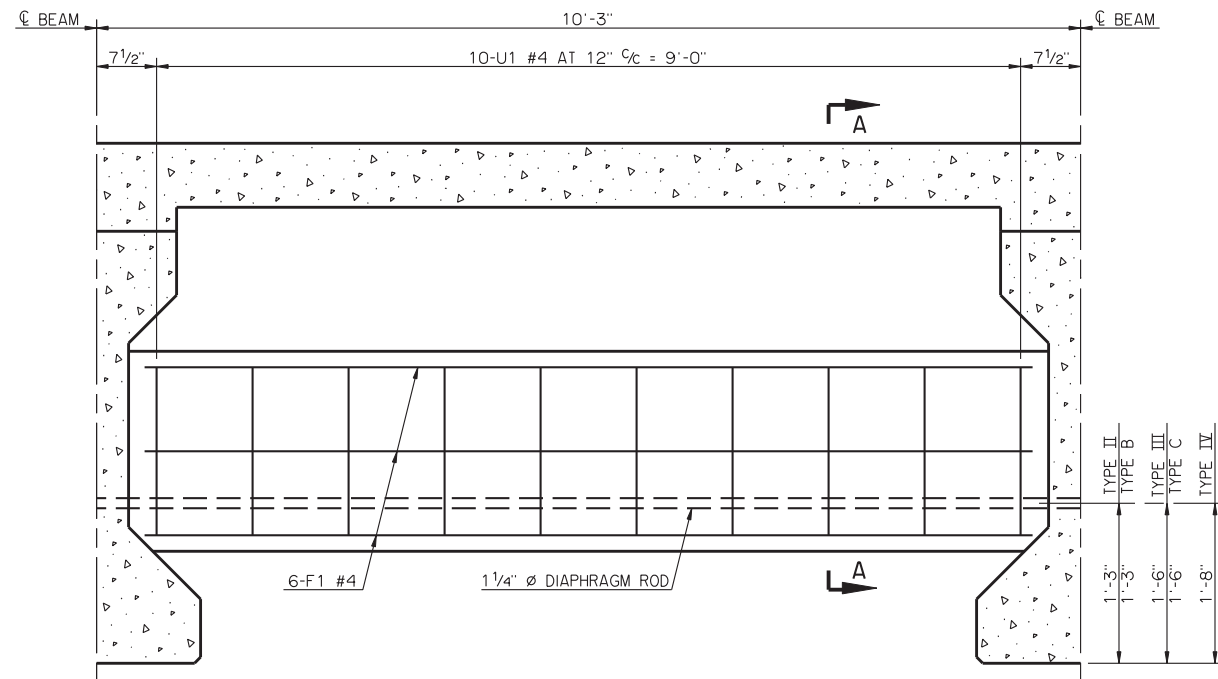
APPROVED BY BRIDGE ENGINEER *Robert J. Duch* DATE 9-9-2011

OKLAHOMA DEPARTMENT OF TRANSPORTATION
COUNTY BRIDGE STANDARD (ENGLISH)

P.C. BEAM DETAILS
TYPE III - 80' SPAN

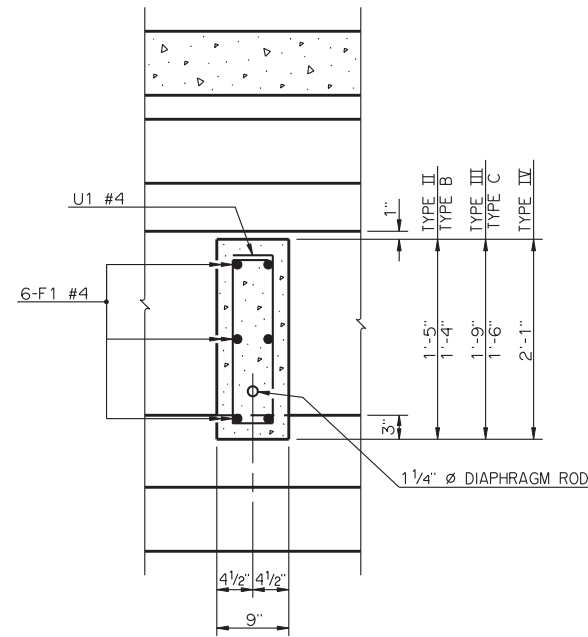
26' CLEAR ROADWAY - CONVENTIONAL - SKEWED 0° AND 30°

2009 SPECIFICATIONS CB26-C-SKO.30-PCB-III-80 01E CB-279E

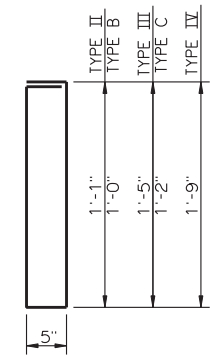


**ELEVATION OF INTERMEDIATE DIAPHRAGM
TYPE II, B, III, C AND IV P.C. BEAMS**

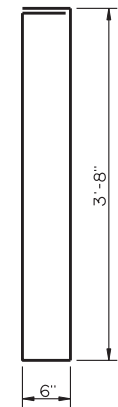
FOR SPANS OF 100' OR LESS IN LENGTH - INCLUDE ONE LINE OF INTERMEDIATE DIAPHRAGMS PER SPAN.
FOR SPANS OVER 100' IN LENGTH - INCLUDE TWO LINES OF INTERMEDIATE DIAPHRAGMS PER SPAN.



SECTION A-A

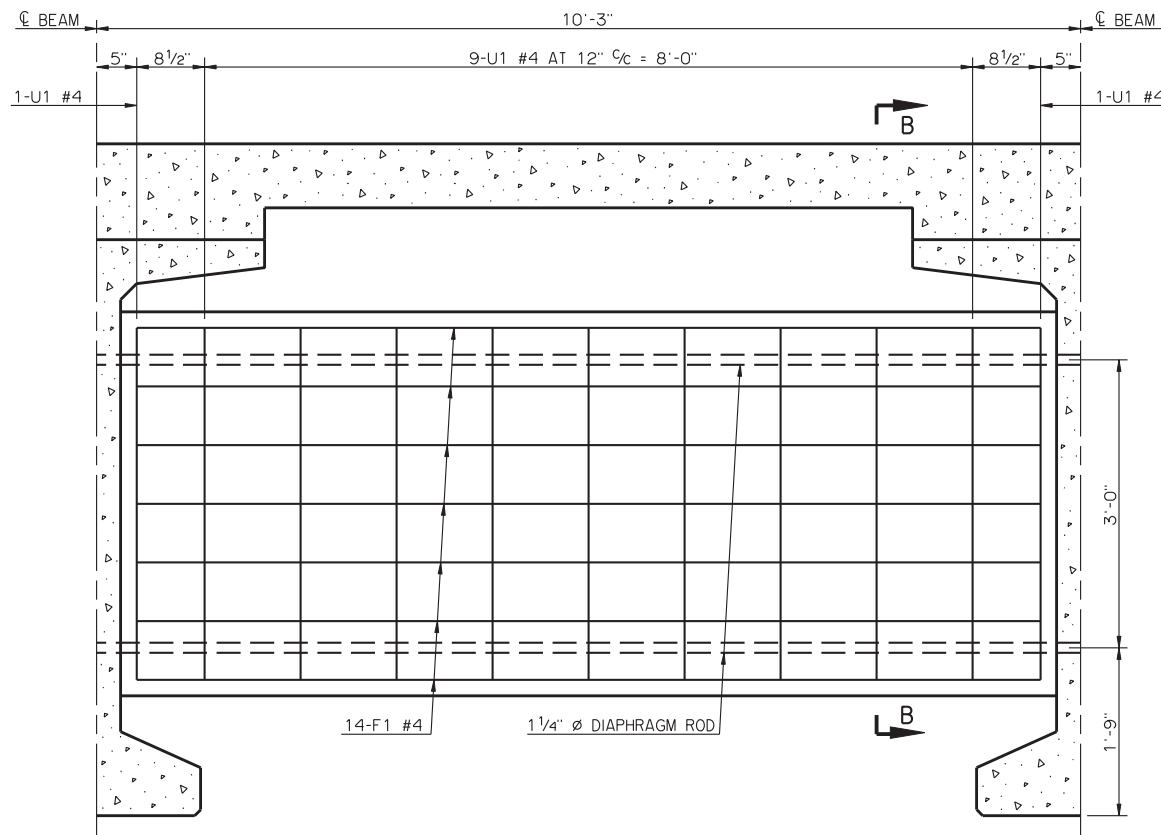


- U1 #4 X 3'-5" - TYPE II
- U1 #4 X 3'-3" - TYPE B
- U1 #4 X 4'-1" - TYPE III
- U1 #4 X 3'-7" - TYPE C
- U1 #4 X 4'-9" - TYPE IV



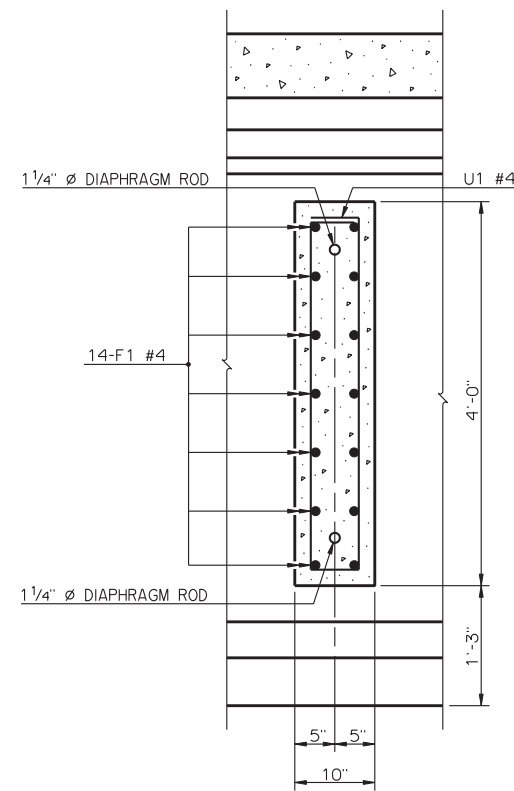
- U1 #4 X 8'-10" - TYPE BT-72 AND TYPE J

DETAILS OF BENT REINFORCING STEEL



**ELEVATION OF INTERMEDIATE DIAPHRAGM
TYPE BT-72 AND TYPE J P.C. BEAMS**

FOR ALL SPAN LENGTHS - INCLUDE TWO LINES OF INTERMEDIATE DIAPHRAGMS PER SPAN.



SECTION B-B

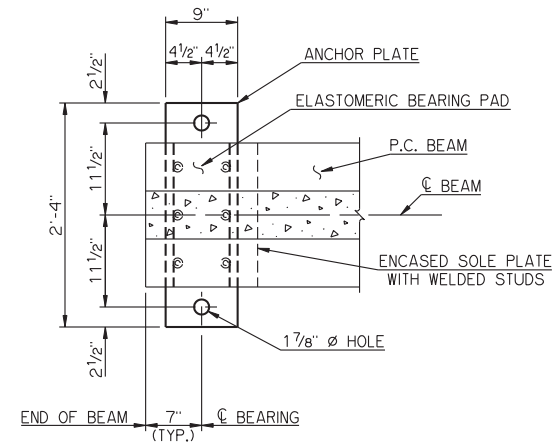
BAR LIST - ONE INTERMEDIATE DIAPHRAGM					
P.C. BEAM	MARK	NO.	SIZE	FORM	LENGTH
TYPE II	U1	10	#4	BNT.	3'-5"
	F1	6	#4	STR.	9'-5"
TYPE B	U1	10	#4	BNT.	3'-3"
	F1	6	#4	STR.	9'-4"
TYPE III	U1	10	#4	BNT.	4'-1"
	F1	6	#4	STR.	9'-4"
TYPE C	U1	10	#4	BNT.	3'-7"
	F1	6	#4	STR.	9'-4"
TYPE IV	U1	10	#4	BNT.	4'-9"
	F1	6	#4	STR.	9'-3"
TYPE BT-72	U1	11	#4	BNT.	8'-10"
	F1	14	#4	STR.	9'-5"
TYPE J	U1	11	#4	BNT.	8'-10"
	F1	14	#4	STR.	9'-5"

APPROVED BY BRIDGE ENGINEER *Robert J. Duch* DATE 9-9-2011

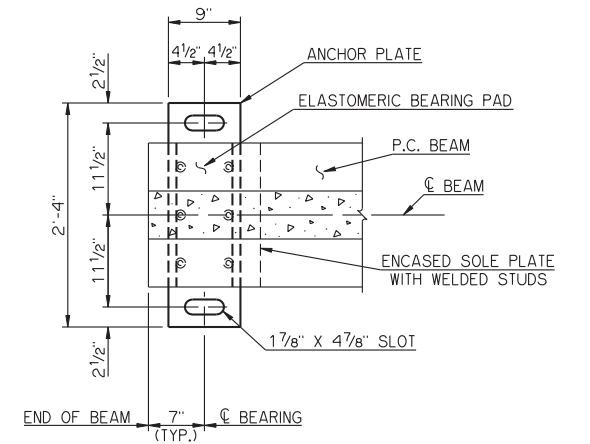
OKLAHOMA DEPARTMENT OF TRANSPORTATION
COUNTY BRIDGE STANDARD (ENGLISH)

**INTERMEDIATE DIAPHRAGM DETAILS
P.C. BEAMS**

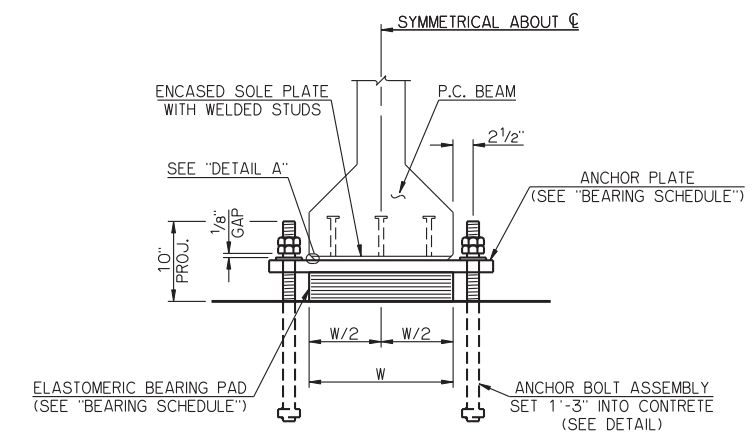
26' CLEAR ROADWAY - CONVENTIONAL - SKEWED 0° AND 30°



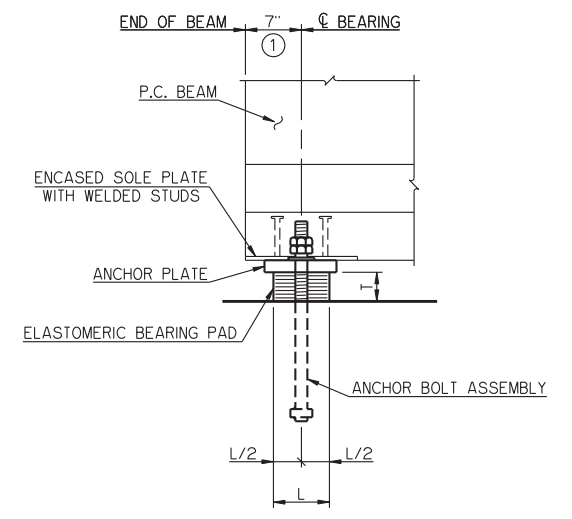
FIXED BEARING PLAN
ANCHOR BOLT ASSEMBLIES NOT SHOWN



EXPANSION BEARING PLAN
ANCHOR BOLT ASSEMBLIES NOT SHOWN

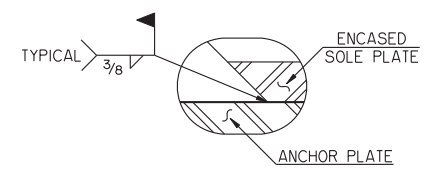


END VIEW

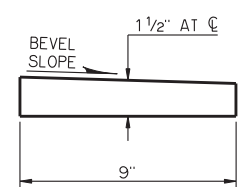


SIDE VIEW

BEARING DETAILS

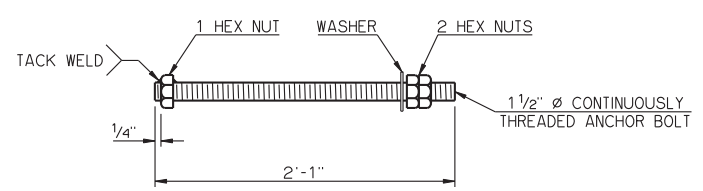


DETAIL A



BEVELED ANCHOR PLATE DETAIL

BEVELED ANCHOR PLATE IS REQUIRED WHEN ANGLE BETWEEN UNDERSIDE OF BEAM AND HORIZONTAL EXCEEDS 1.0%. BEVEL SLOPE TO MATCH ANGLE BETWEEN BEAM AND HORIZONTAL. PAINT THICKER EDGE RED.



ANCHOR BOLT ASSEMBLY DETAIL

NOTES

STRUCTURAL STEEL FOR ANCHOR PLATES AND CONTINUOUSLY THREADED ANCHOR BOLTS SHALL CONFORM TO AASHTO M 270 (ASTM A 709), GRADE 50W, WEATHERING STEEL (CHARPY V-NOTCH TESTING NOT REQUIRED). HEX NUTS SHALL CONFORM TO AASHTO M 291 (ASTM A 563). WASHERS SHALL CONFORM TO AASHTO M 293 (ASTM F 436), TYPE 3. ANCHOR BOLT ASSEMBLIES SHALL BE GALVANIZED, AND ALL OTHER STEEL PARTS COMPRISING THE BEARING ASSEMBLIES SHALL BE PAINTED WITH THE IZ-E-U PAINT SYSTEM.

① ANCHOR BOLTS SHALL BE CENTERED IN SLOTS DURING SETTING OF BEAMS. DIMENSION MAY VARY AT EXPANSION BEARING DEPENDING ON TEMPERATURE AT THE TIME OF BEAM SETTING.

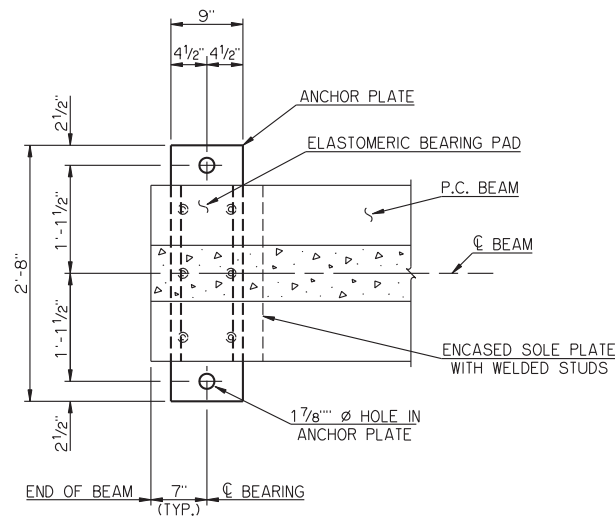
SPAN	ANCHOR PLATE	60 DUROMETER ELASTOMERIC BEARING PAD			MAXIMUM EXPANSION LENGTH WITHOUT BONDING
		SIZE (T X L X W)	COVER LAYER	INNER LAYER	
30'	1 1/2" X 9" X 2'-4"	3 5/8" X 6 1/4" X 1'-6"	2-1/4"	6-3/8"	160'
35'	1 1/2" X 9" X 2'-4"	3 5/8" X 6 1/4" X 1'-6"	2-1/4"	6-3/8"	185'
40'	1 1/2" X 9" X 2'-4"	3 5/8" X 6 1/2" X 1'-6"	2-1/4"	6-3/8"	205'
45'	1 1/2" X 9" X 2'-4"	3 5/8" X 6 3/4" X 1'-6"	2-1/4"	6-3/8"	220'
50'	1 1/2" X 9" X 2'-4"	3 5/8" X 7" X 1'-6"	2-1/4"	6-3/8"	235'
55'	1 1/2" X 9" X 2'-4"	3 5/8" X 7" X 1'-6"	2-1/4"	6-3/8"	260'
60'	1 1/2" X 9" X 2'-4"	3 5/8" X 7" X 1'-6"	2-1/4"	6-3/8"	285'

APPROVED BY BRIDGE ENGINEER *Robert J. Dusch* DATE 9-9-2011

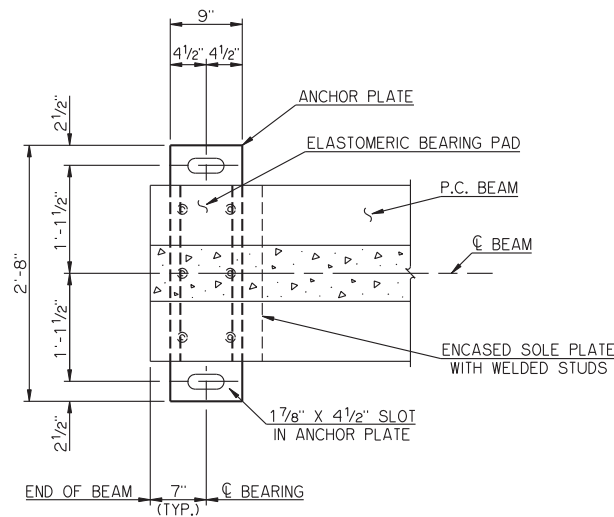
OKLAHOMA DEPARTMENT OF TRANSPORTATION
COUNTY BRIDGE STANDARD (ENGLISH)

BEARING DETAILS
TYPE II AND TYPE B P.C. BEAMS

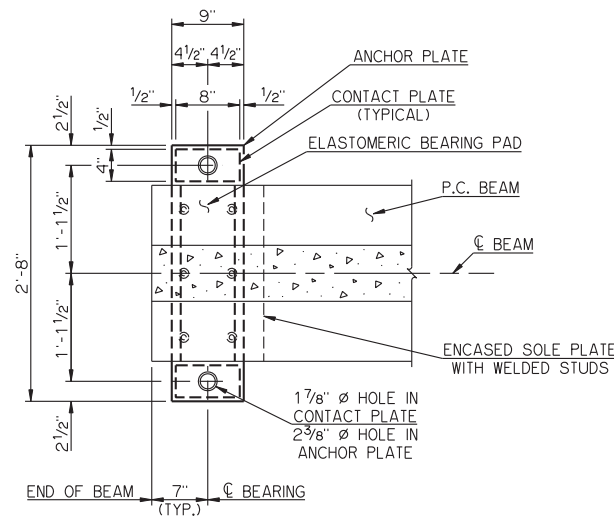
26' CLEAR ROADWAY - CONVENTIONAL - SKEWED 0° AND 30°



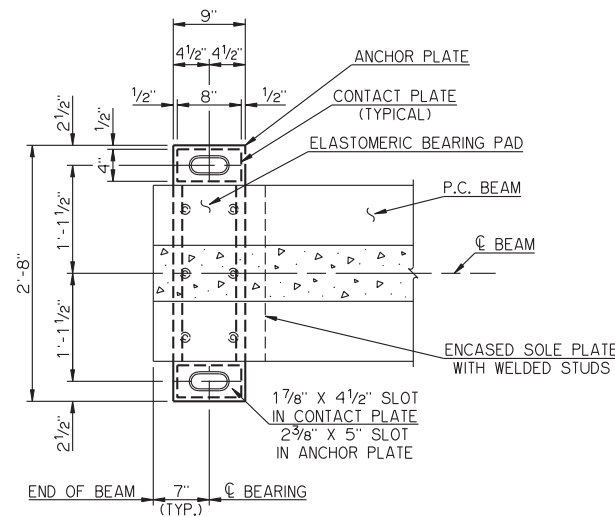
FIXED BEARING PLAN
ANCHOR BOLT ASSEMBLIES NOT SHOWN



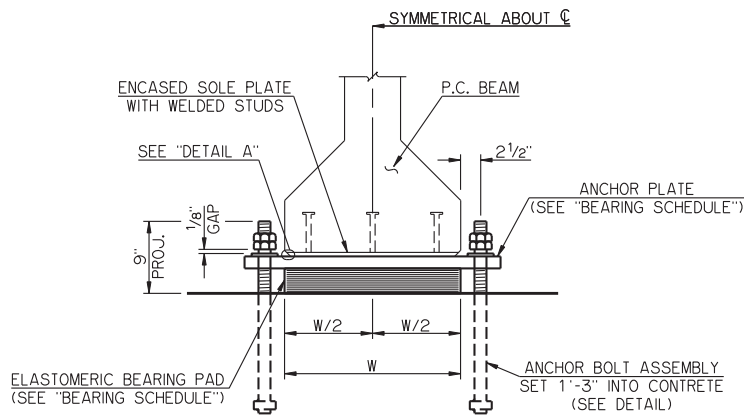
EXPANSION BEARING PLAN
ANCHOR BOLT ASSEMBLIES NOT SHOWN



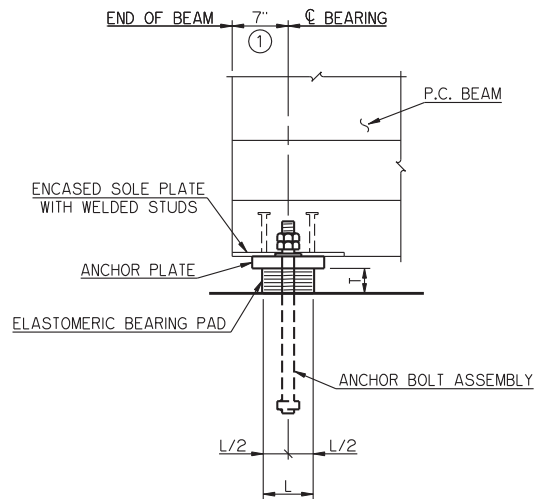
FIXED BEARING PLAN
ANCHOR BOLT ASSEMBLIES NOT SHOWN



EXPANSION BEARING PLAN
ANCHOR BOLT ASSEMBLIES NOT SHOWN

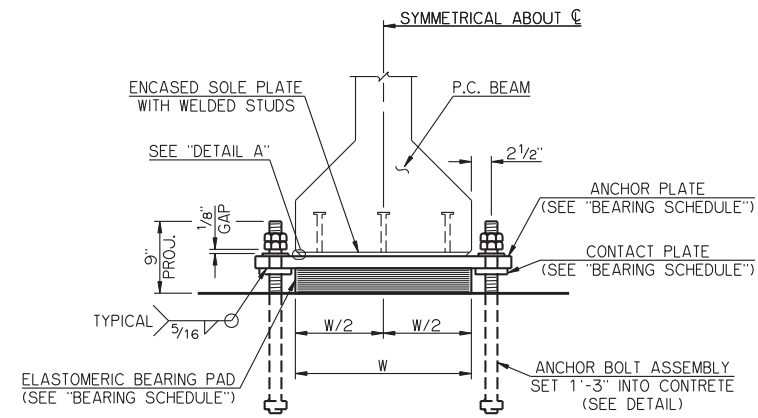


END VIEW

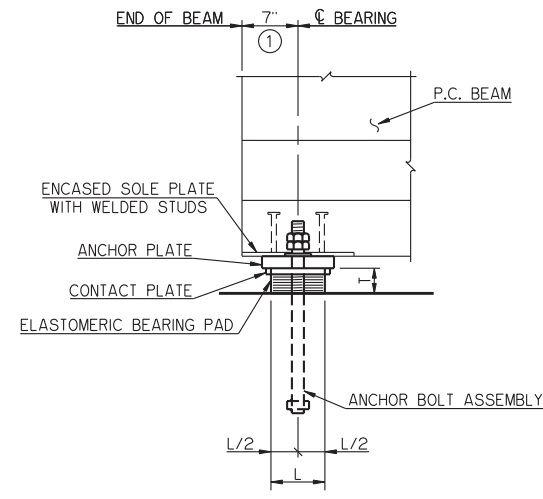


SIDE VIEW

BEARING DETAILS
60' AND 65' SPANS

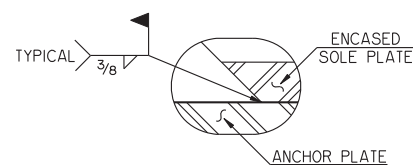


END VIEW

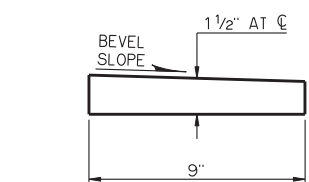


SIDE VIEW

BEARING DETAILS
70' THRU 85' SPANS

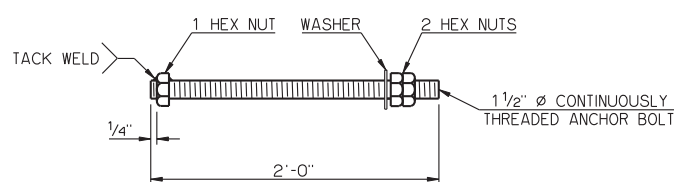


DETAIL A



BEVELED ANCHOR PLATE DETAIL

BEVELED ANCHOR PLATE IS REQUIRED WHEN ANGLE BETWEEN UNDERSIDE OF BEAM AND HORIZONTAL EXCEEDS 1.0%. BEVEL SLOPE TO MATCH ANGLE BETWEEN BEAM AND HORIZONTAL. PAINT THICKER EDGE RED.



ANCHOR BOLT ASSEMBLY DETAIL

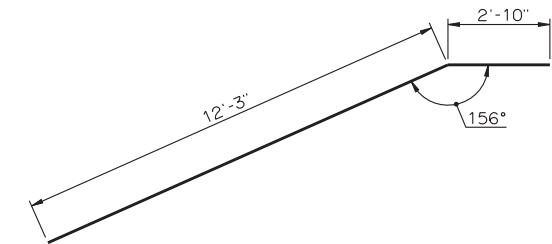
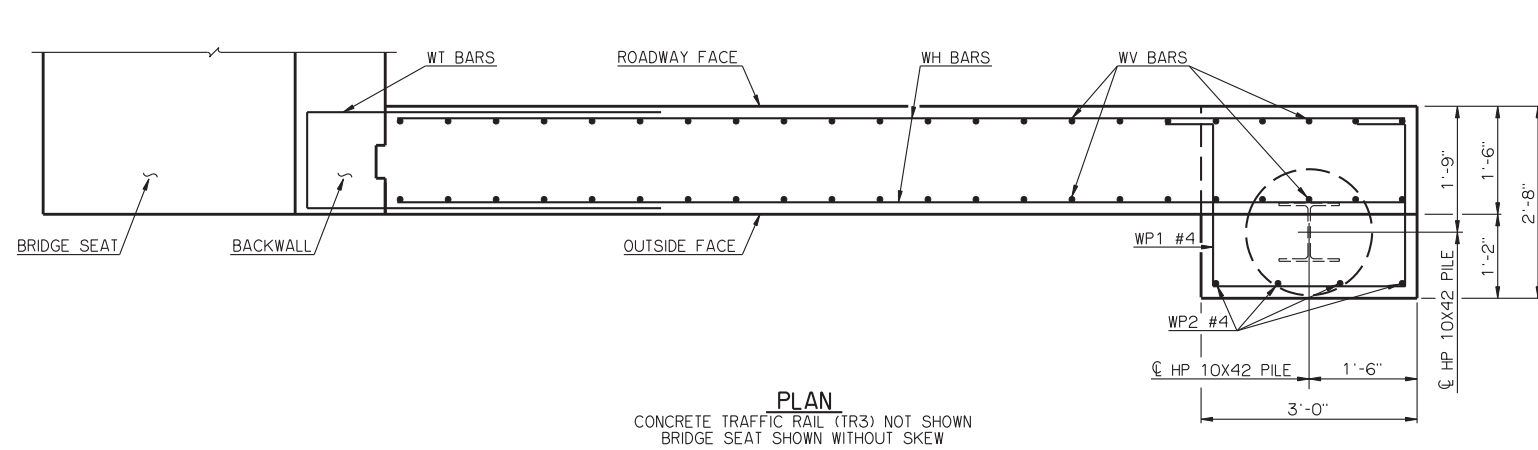
SPAN	ANCHOR PLATE	CONTACT PLATE	60 DUROMETER ELASTOMERIC BEARING PAD			MAXIMUM EXPANSION LENGTH WITHOUT BONDING	
			SIZE (T X L X W)	COVER LAYER	INNER LAYER		
60'	1 1/2" X 9" X 2'-8"	---	3 1/8" X 6 1/2" X 1'-10"	2-1/4"	5-3/8"	6-1/8"	235'
65'	1 1/2" X 9" X 2'-8"	---	3 1/8" X 6 1/2" X 1'-10"	2-1/4"	5-3/8"	6-1/8"	255'
70'	1 1/2" X 9" X 2'-8"	1/2" X 4" X 8"	3 1/8" X 6 1/2" X 1'-10"	2-1/4"	5-3/8"	6-1/8"	260'
75'	1 1/2" X 9" X 2'-8"	1/2" X 4" X 8"	3 1/8" X 6 3/4" X 1'-10"	2-1/4"	5-3/8"	6-1/8"	260'
80'	1 1/2" X 9" X 2'-8"	1/2" X 4" X 8"	3 1/8" X 6 3/4" X 1'-10"	2-1/4"	5-3/8"	6-1/8"	260'
85'	1 1/2" X 9" X 2'-8"	3/4" X 4" X 8"	3 1/8" X 6 3/4" X 1'-10"	2-1/4"	5-3/8"	6-1/8"	260'

NOTES

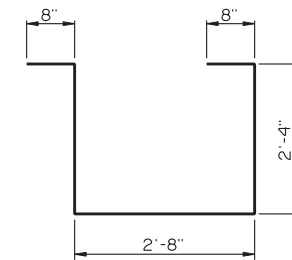
STRUCTURAL STEEL FOR ANCHOR PLATES, CONTACT PLATES AND CONTINUOUSLY THREADED ANCHOR BOLTS SHALL CONFORM TO AASHTO M 270 (ASTM A 709), GRADE 50W, WEATHERING STEEL (CHARPY V-NOTCH TESTING NOT REQUIRED). HEX NUTS SHALL CONFORM TO AASHTO M 291 (ASTM A 563). WASHERS SHALL CONFORM TO AASHTO M 293 (ASTM F 436), TYPE 3. ANCHOR BOLT ASSEMBLIES SHALL BE GALVANIZED, AND ALL OTHER STEEL PARTS COMPRISING THE BEARING ASSEMBLIES SHALL BE PAINTED WITH THE IZ-E-U PAINT SYSTEM.

① ANCHOR BOLTS SHALL BE CENTERED IN SLOTS DURING SETTING OF BEAMS. DIMENSION MAY VARY AT EXPANSION BEARING DEPENDING ON TEMPERATURE AT THE TIME OF BEAM SETTING.

APPROVED BY BRIDGE ENGINEER *Robert Duch* DATE 9-9-2011
 OKLAHOMA DEPARTMENT OF TRANSPORTATION
 COUNTY BRIDGE STANDARD (ENGLISH)
BEARING DETAILS
TYPE III AND TYPE C P.C. BEAMS
 26' CLEAR ROADWAY - CONVENTIONAL - SKEWED 0° AND 30°
 2009 SPECIFICATIONS CB26-C-SKO.30-BRG-PC3 01E
 CB-360E

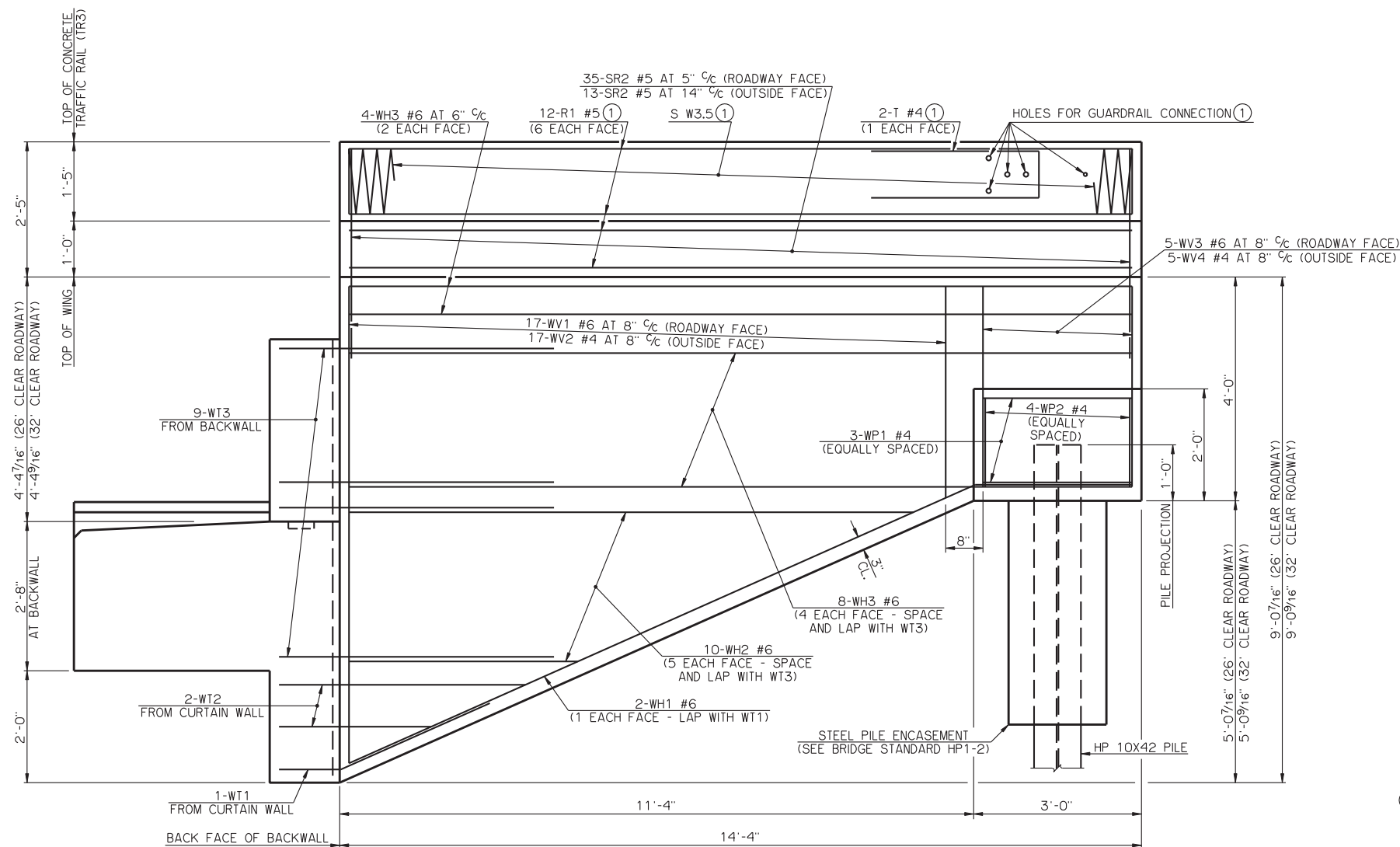
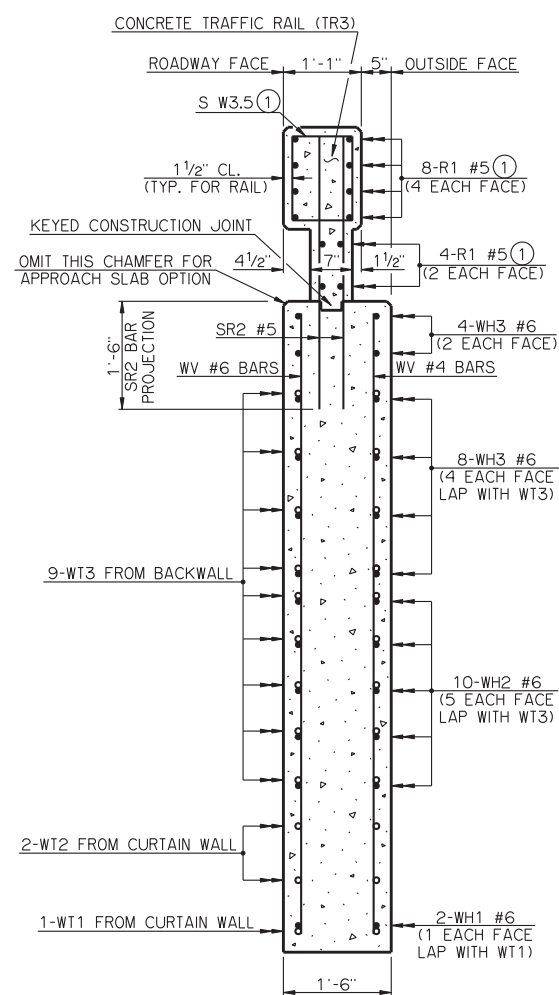


WH1 #6 X 15'-1"



WP1 #4 X 8'-8"

DETAILS OF BENT REINFORCING STEEL



BAR LIST - ONE WING					
MARK	NO.	SIZE	FORM	LENGTH	LENGTH VARIATION
SR2	48	#5	STR.	3'-9"	-
WH1	2	#6	BNT.	15'-1"	-
WH2	10	#6	STR.	7'-3" AVG.	4'-3" TO 10'-3"
WH3	12	#6	STR.	14'-0"	-
WV1	17	#6	STR.	6'-2" AVG.	3'-9" TO 8'-7"
WV2	17	#4	STR.	6'-2" AVG.	3'-9" TO 8'-7"
WV3	5	#6	STR.	3'-7"	-
WV4	5	#4	STR.	3'-7"	-
WP1	3	#4	BNT.	8'-8"	-
WP2	4	#4	STR.	1'-7"	-

(2) NO. INCLUDES TWO SETS OF 5 BARS

SUMMARY OF QUANTITIES - ONE WING			
ITEM	UNIT	TOTAL	
SUBSTRUCTURE EXCAVATION, COMMON	CY	15.00	
CONCRETE RAIL (TR3)	LF	14.40	(3)
CLASS A CONCRETE	CY	5.10	
REINFORCING STEEL	LB	890.00	
PILES, FURNISHED (HP 10X42)	LF	-	
PILES, DRIVEN (HP 10X42)	LF	-	

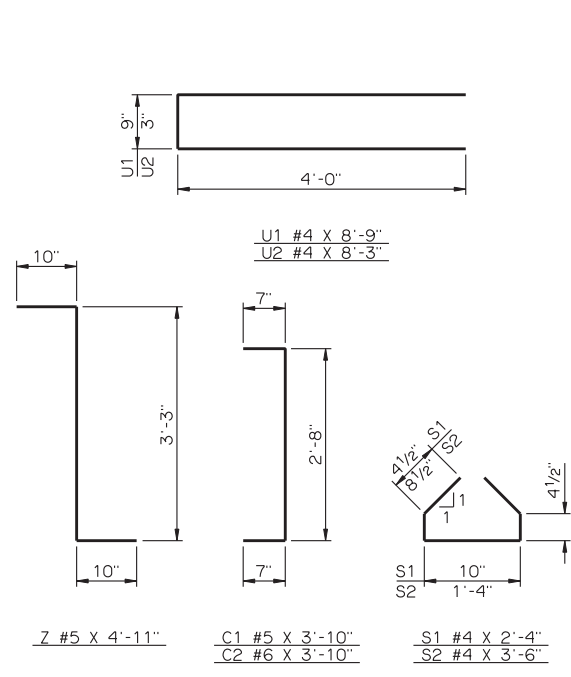
(3) QUANTITY INCLUDES ALL COST OF CONCRETE TRAFFIC RAIL (TR3) INCLUDING R1, S AND T REINFORCING STEEL BARS AND CONCRETE.

APPROVED BY BRIDGE ENGINEER *Robert J. Dusch* DATE 9-9-2011

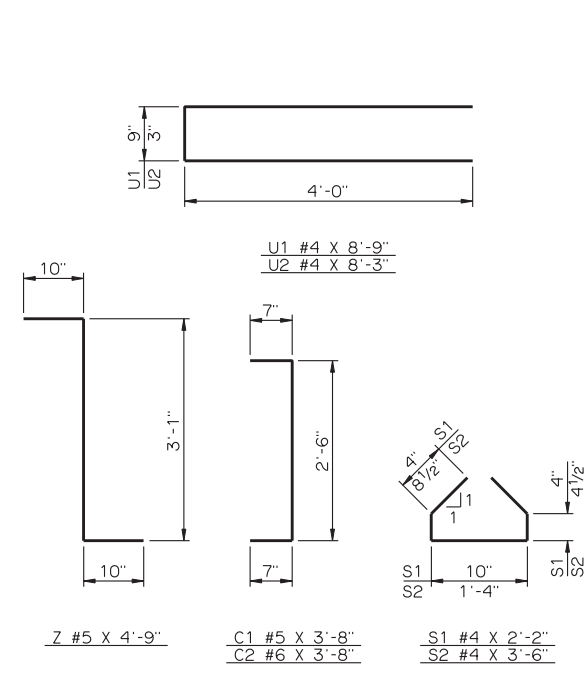
OKLAHOMA DEPARTMENT OF TRANSPORTATION
 COUNTY BRIDGE STANDARD (ENGLISH)

**WING DETAILS
 TYPE II AND TYPE B P.C. BEAMS**

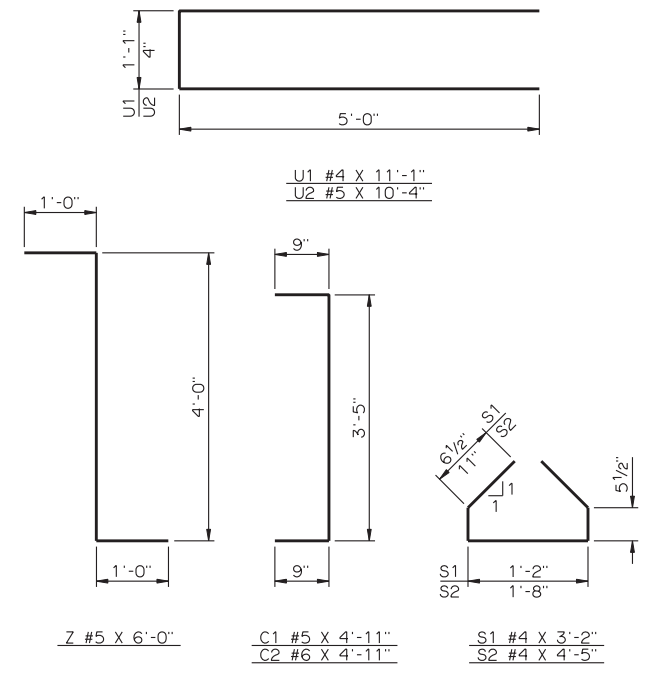
26' AND 32' CLEAR ROADWAYS - CONVENTIONAL - SKEWED 30°



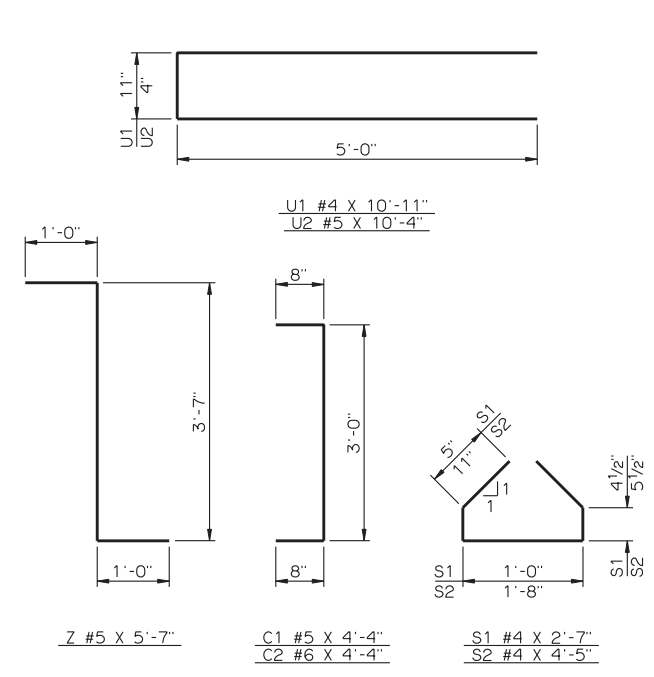
TYPE II P.C. BEAMS



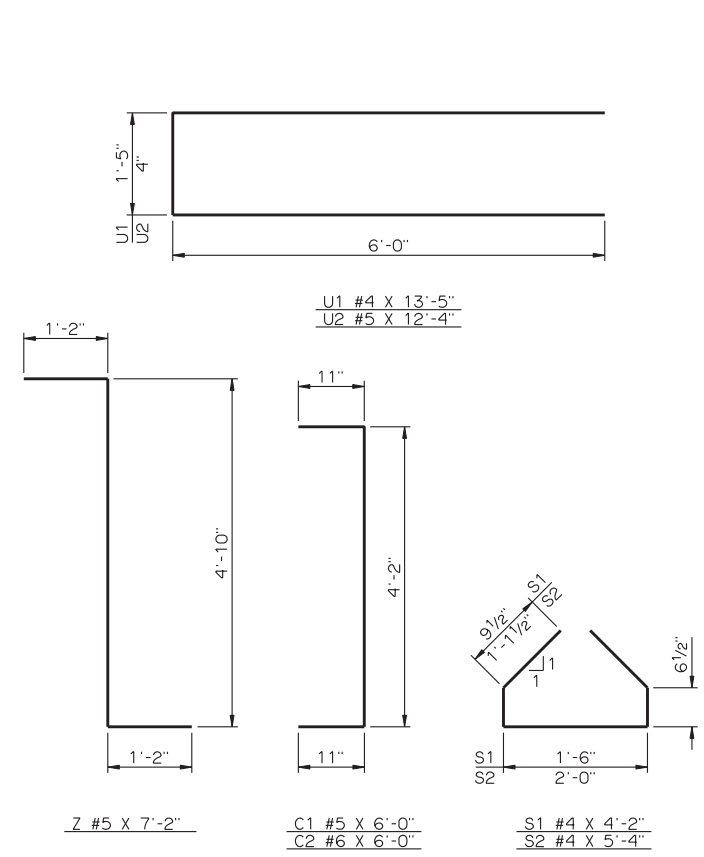
TYPE B P.C. BEAMS



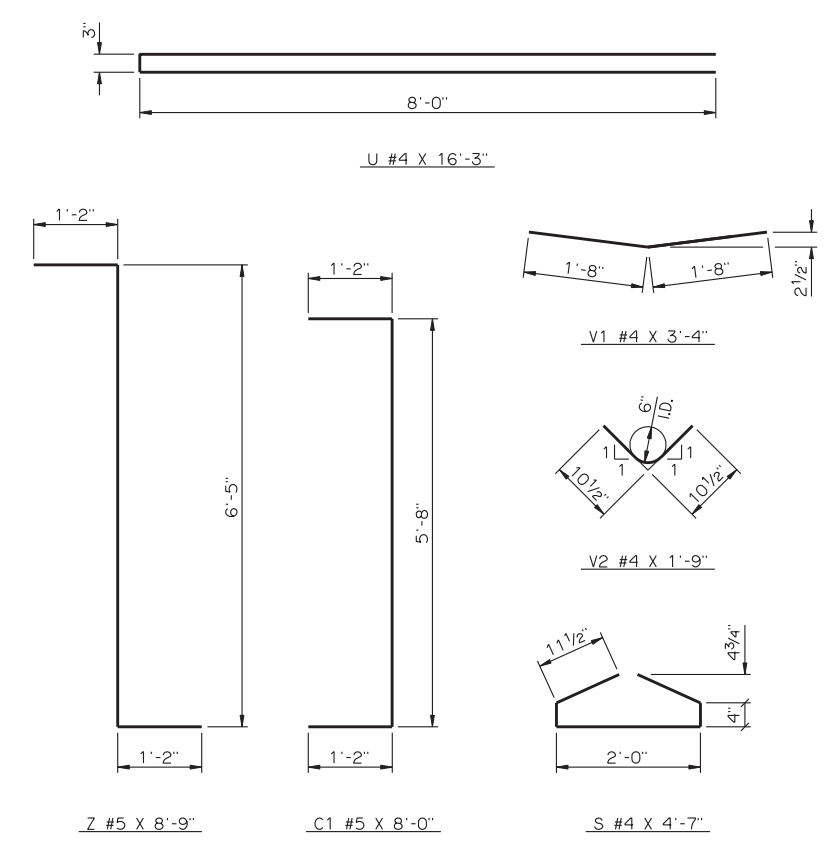
TYPE III P.C. BEAMS



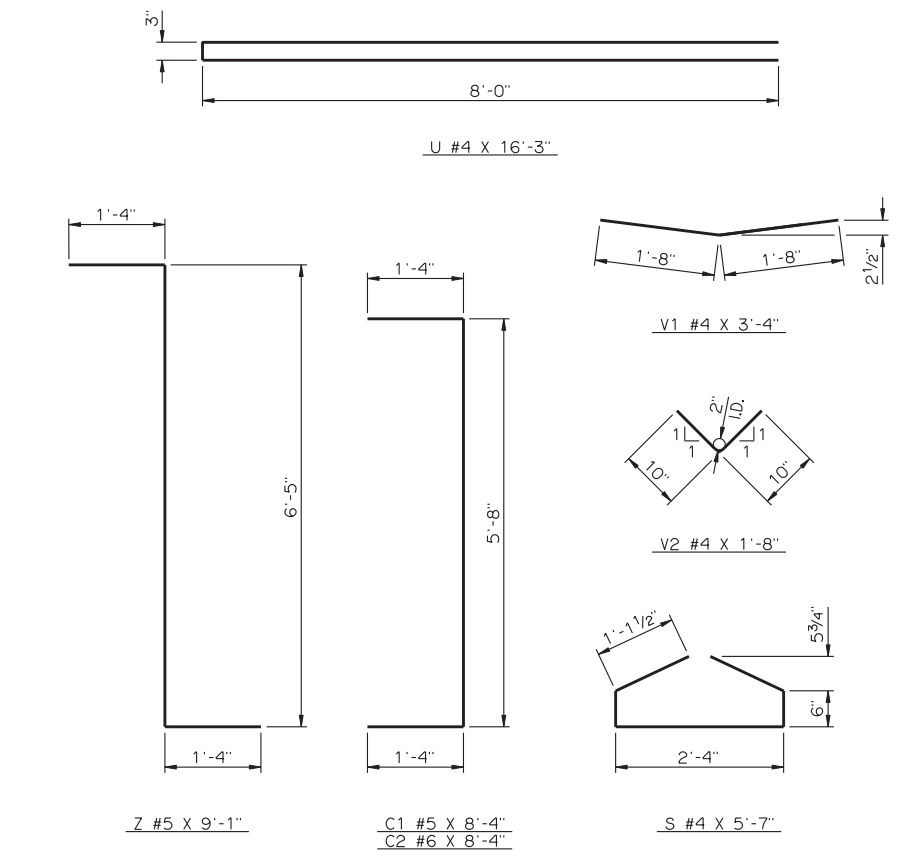
TYPE C P.C. BEAMS



TYPE IV P.C. BEAMS



TYPE BT-72 P.C. BEAMS



TYPE J P.C. BEAMS

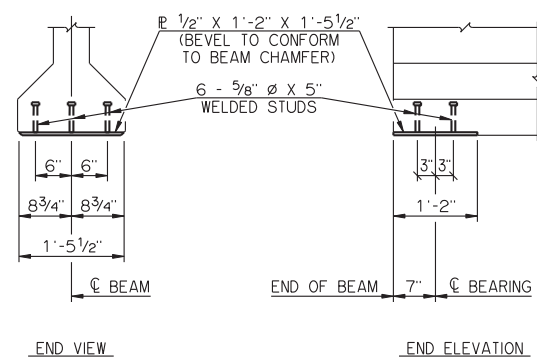
DETAILS OF BENT REINFORCING STEEL

APPROVED BY BRIDGE ENGINEER *Robert Dusch* DATE 9-9-2011

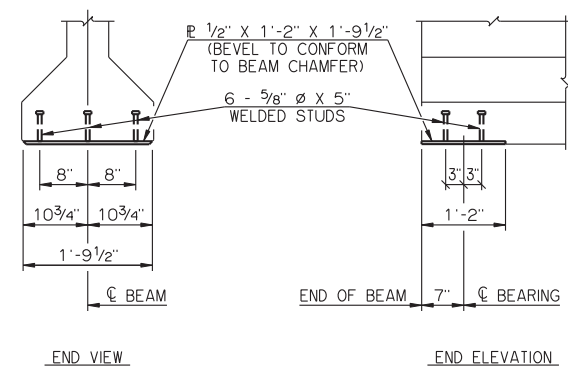
OKLAHOMA DEPARTMENT OF TRANSPORTATION
COUNTY BRIDGE STANDARD (ENGLISH)

P.C. BEAM DETAILS
TYPE II, B, III, C, IV, BT-72 AND J P.C. BEAMS
(SHEET NO. 1 OF 2)

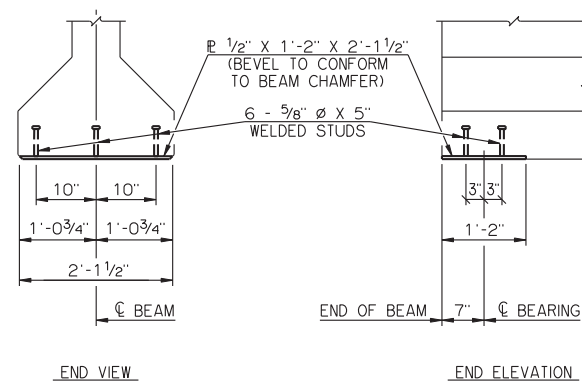
26' AND 32' CLEAR ROADWAYS - CONVENTIONAL AND INTEGRAL - SKEWED 0° AND 30°
2009 SPECIFICATIONS CB26.32-C.I.-SKO.30-PCB-DTL-1 01E
CB-958E



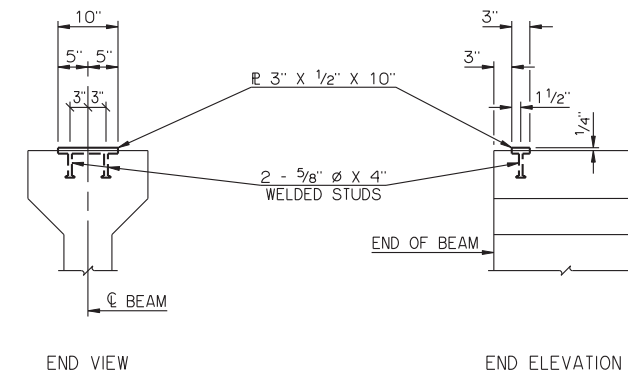
TYPE II AND TYPE B P.C. BEAMS



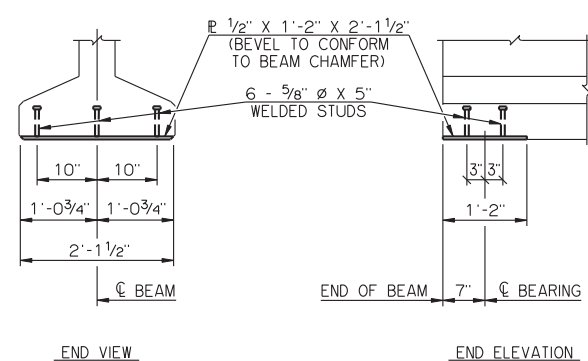
TYPE III AND TYPE C P.C. BEAMS



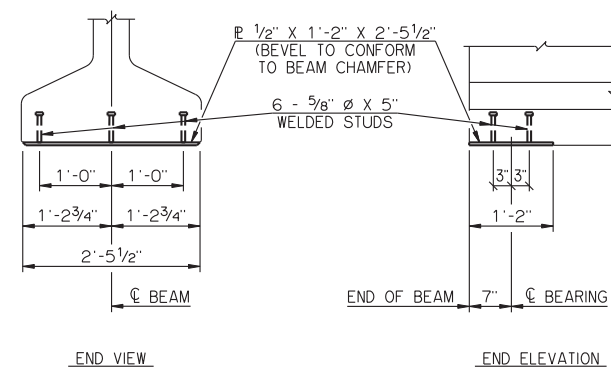
TYPE IV P.C. BEAMS



ENCASED BEAM PLATE DETAILS

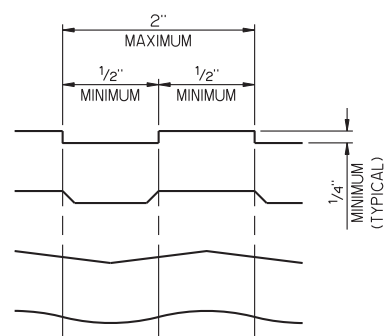


TYPE BT-72 P.C. BEAMS



TYPE J P.C. BEAMS

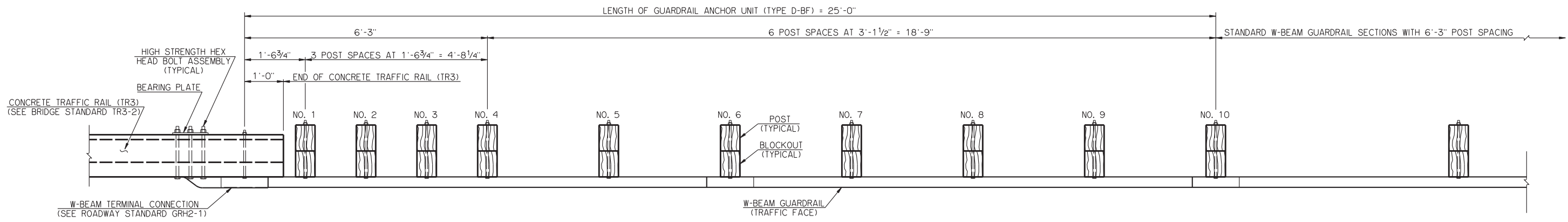
ENCASED SOLE PLATE DETAILS



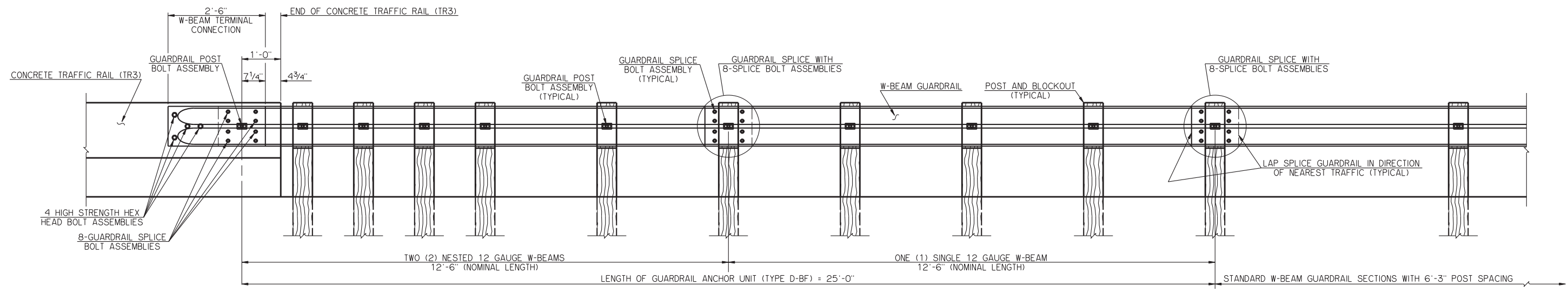
INTENTIONALLY ROUGHENED SURFACE EXAMPLES

TOP SURFACE OF P.C. BEAMS SHALL BE INTENTIONALLY ROUGHENED TO A MINIMUM HEIGHT OF 1/4" OVER A MAXIMUM PITCH OF 2" MEASURED LONGITUDINALLY ALONG THE LENGTH OF THE BEAM. THE CREST AND TROUGH ASSOCIATED WITH THE HEIGHT SHALL NOT BE LESS THAN 1/2" AND SHALL EXTEND THE FULL WIDTH OF THE TOP FLANGE. ROUGHENED SURFACE MAY BE OBTAINED BY A SPECIAL TROWEL AS SHOWN IN THE EXAMPLES, BY CLEANING THE CONCRETE SURFACE WITH A STIFF WIRE BRUSH OR BLASTING TO THE EXTENT THAT AGGREGATE IS EXPOSED TO A HEIGHT OF 1/4", OR BY ANOTHER METHOD APPROVED BY THE ENGINEER.

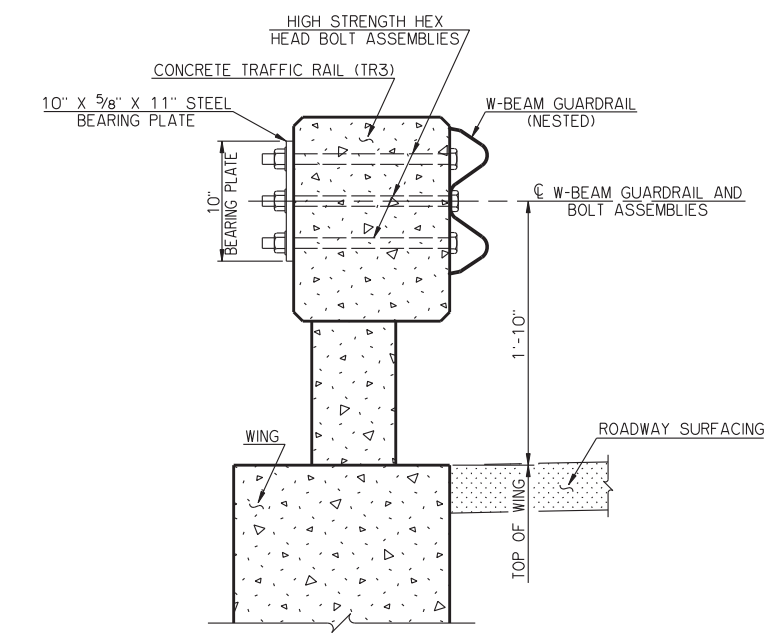
APPROVED BY BRIDGE ENGINEER *Robert D. Smith* DATE 9-9-2011
 OKLAHOMA DEPARTMENT OF TRANSPORTATION
 COUNTY BRIDGE STANDARD (ENGLISH)
 P.C. BEAM DETAILS
 TYPE II, B, III, C, IV, BT-72 AND J P.C. BEAMS
 (SHEET NO. 2 OF 2)
 26' AND 32' CLEAR ROADWAYS - CONVENTIONAL AND INTEGRAL - SKEWED 0° AND 30°
 2009 SPECIFICATIONS CB26.32-C.I.-SKO.30-PCB-DTL-2 01E
 CB-959E



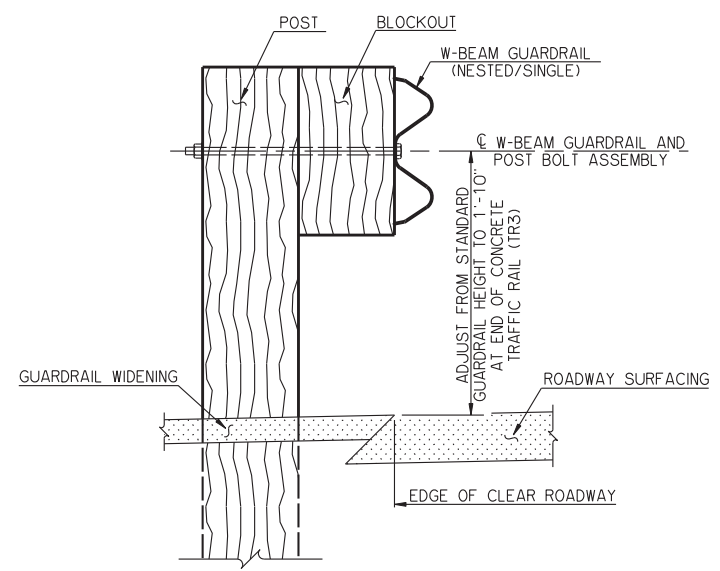
PLAN



ELEVATION



SECTION THRU GUARDRAIL BRIDGE CONNECTION AT CONCRETE TRAFFIC RAIL (TR3)



SECTION THRU GUARDRAIL BRIDGE CONNECTION AT GUARDRAIL POST AND BLOCKOUT

NOTES

1. ALL CONSTRUCTION AND MATERIAL REQUIREMENTS SHALL BE IN ACCORDANCE WITH THE ODOT 2009 STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION.
2. SEE ROADWAY STANDARDS GRH1-1 AND GRH2-1 FOR DETAILS OF GUARDRAIL, W-BEAM TERMINAL CONNECTION, POSTS, BLOCKOUTS, BOLT ASSEMBLIES AND HARDWARE NOT SHOWN. SEE "STATE" BRIDGE STANDARD TR3-2 FOR DETAILS OF CONCRETE TRAFFIC RAIL (TR3) NOT SHOWN.
3. ALL GUARDRAIL, METAL POSTS, BEARING PLATES, BOLTS, WASHERS AND NUTS SHALL BE GALVANIZED AFTER FABRICATION.
4. ANY FIELD CUTS OR HOLES MADE IN GALVANIZED MATERIALS SHALL BE COATED WITH A ZINC OXIDE PAINT SATISFYING SECTION 730.02 OF THE STANDARD SPECIFICATIONS.
5. ALL SPLICE BOLT ASSEMBLIES SHALL BE 5/8" DIAMETER BUTTON HEAD BOLTS WITH RECESSED NUTS AS SHOWN ON ROADWAY STANDARDS GRH1-1 OR GRH2-1. ALL POST BOLT ASSEMBLIES SHALL BE 5/8" DIAMETER BUTTON HEAD BOLTS WITH 1 3/4" OUTSIDE DIAMETER WASHERS AND RECESSED NUTS AS SHOWN ON ROADWAY STANDARDS GRH1-1 OR GRH2-1.
6. ALL HIGH STRENGTH HEX HEAD BOLT ASSEMBLIES SHALL BE 7/8" DIAMETER X 1'-4" LONG BOLTS WITH TWO WASHERS AND ONE NUT. ALL NUTS SHALL BE TIGHTENED WITH THE TURN-OF-THE-NUT METHOD TO BETWEEN 1/12 TURN AND 1/4 TURN IN EXCESS OF SNUG TIGHT.
7. THE PAY ITEM "GUARDRAIL ANCHOR UNIT (TYPE D-BF)" INCLUDES ALL COST OF MATERIAL AND INSTALLATION OF THE GUARDRAIL ANCHOR UNIT - BRIDGE CONNECTION INCLUDING THE COST OF POST AND BLOCKOUT NOS. 1 THRU 10, SINGLE AND NESTED W-BEAM GUARDRAIL, W-BEAM TERMINAL CONNECTION, SPLICE BOLT ASSEMBLIES, POST BOLT ASSEMBLIES, HIGH STRENGTH HEX HEAD BOLT ASSEMBLIES, BEARING PLATE, GALVANIZING, PAINTING, MATERIAL, LABOR, EQUIPMENT AND INCIDENTALS.

APPROVED BY BRIDGE ENGINEER *Robert J. Dusch* DATE 9-9-2011

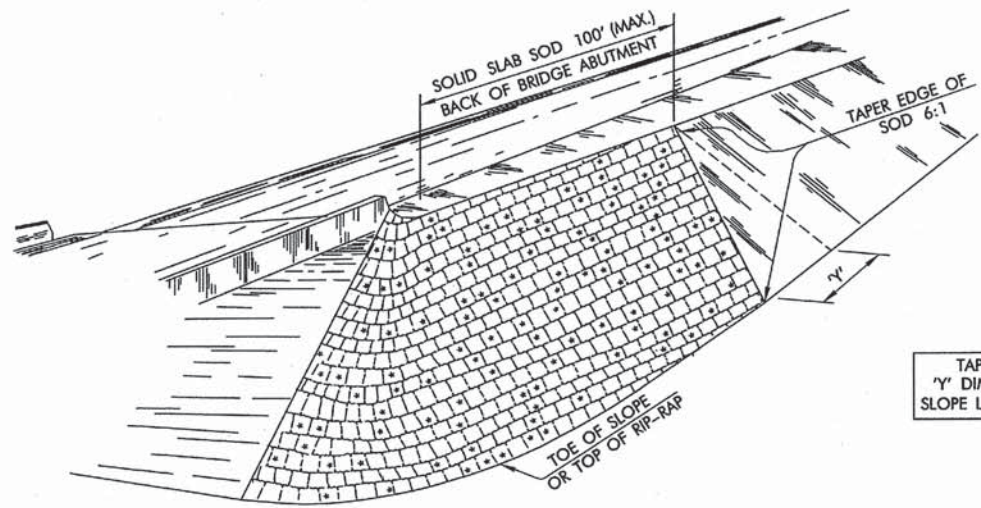
OKLAHOMA DEPARTMENT OF TRANSPORTATION
COUNTY BRIDGE STANDARD (ENGLISH)

GUARDRAIL ANCHOR UNIT - BRIDGE CONNECTION

BASIS OF PAYMENT		
ITEM NO.	ITEM	UNIT
623(F)	GUARDRAIL ANCHOR UNIT (TYPE D-BF)	EA

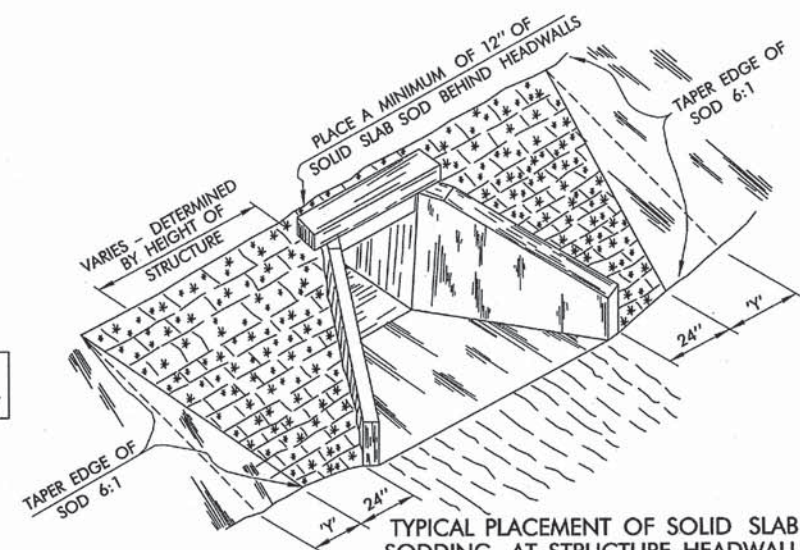
26' AND 32' CLEAR ROADWAYS - CONVENTIONAL AND INTEGRAL - SKEWED 0° AND 30°
2009 SPECIFICATIONS CB26.32-C.I-SKO.30-GRAU-BC OOE
CB-969E

REVISIONS	
DESCRIPTION	DATE



TAPER NOTE
 'Y' DIMENSION =
 SLOPE LENGTH x 0.17

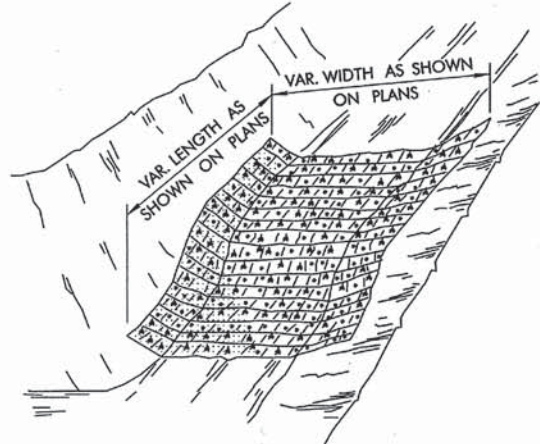
TYPICAL PLACEMENT OF SOLID SLAB SODDING ON FILL SLOPES, APPROACHES TO OVERPASSES AND BRIDGES.



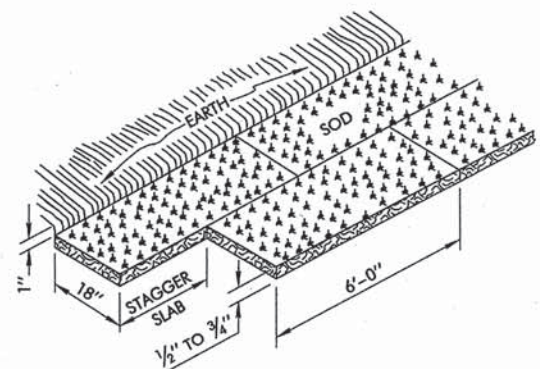
TYPICAL PLACEMENT OF SOLID SLAB SODDING AT STRUCTURE HEADWALLS

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

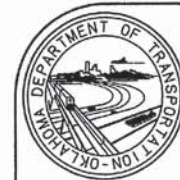


SOLID SLAB SODDING (MARCH 1 THRU AUGUST 31)

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.



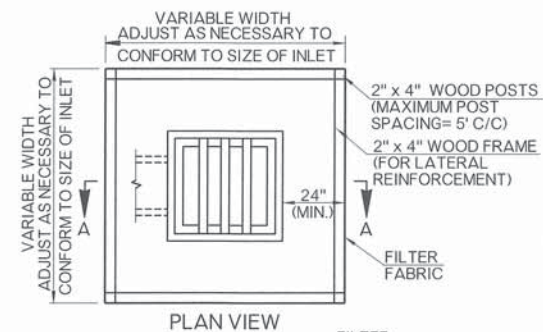
APPROVED BY ROADWAY ENGINEER: *Penelope A. Rogers* DATE: 12/2/09
 ROADWAY STANDARD

SOLID SLAB SODDING

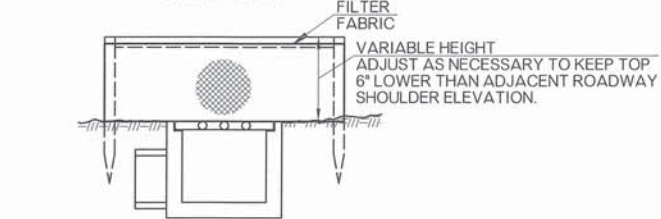
2009 SPECIFICATIONS

SSS-1	0
R-3	

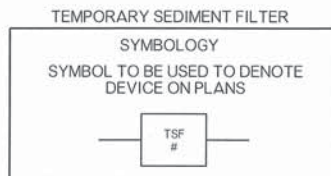
OKLAHOMA DEPARTMENT OF TRANSPORTATION		
STANDARD REVISIONS		
DESCRIPTION	DATE	



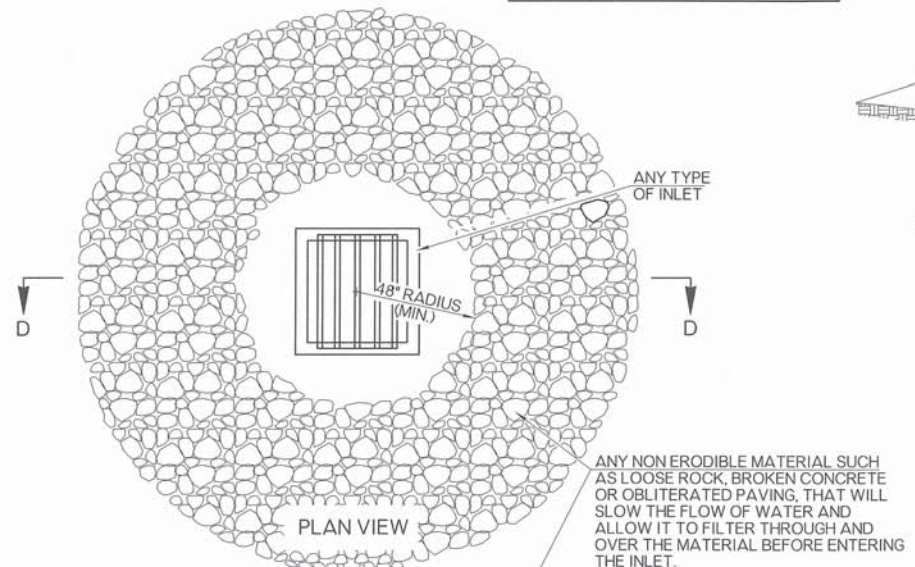
PLAN VIEW



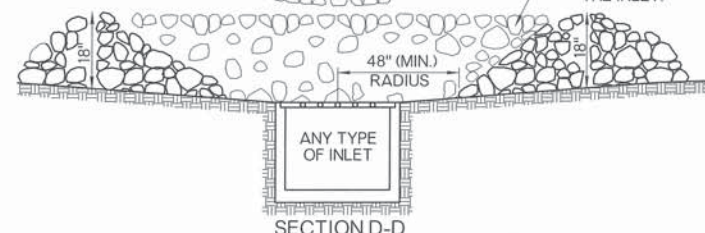
SECTION A - A
SEDIMENT FILTER



TEMPORARY SEDIMENT FILTER
SYMBOL TO BE USED TO DENOTE
DEVICE ON PLANS

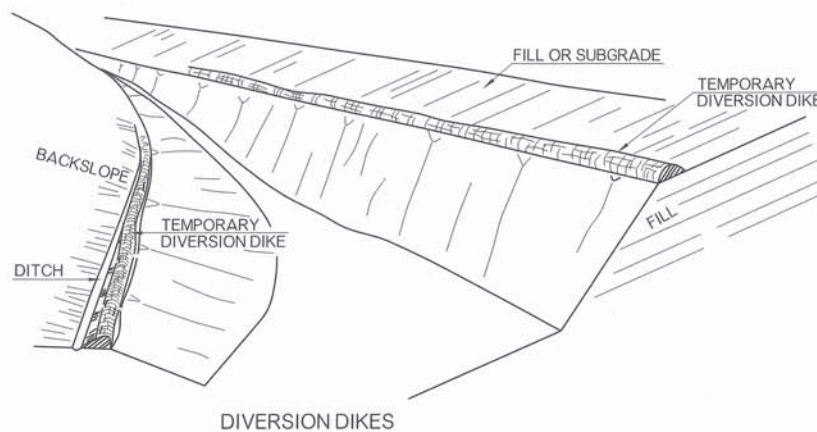


PLAN VIEW

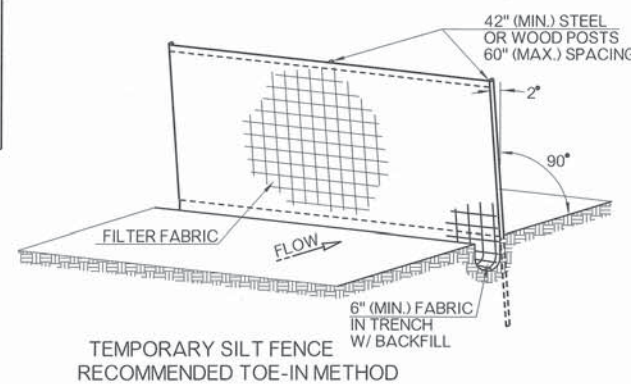


SECTION D-D
SEDIMENT FILTER
(TYPE II)

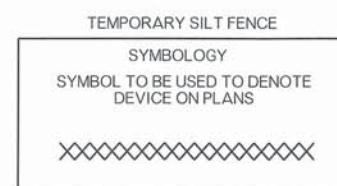
ANY NON-ERODIBLE MATERIAL SUCH
AS LOOSE ROCK, BROKEN CONCRETE
OR OBLITERATED PAVING, THAT WILL
SLOW THE FLOW OF WATER AND
ALLOW IT TO FILTER THROUGH AND
OVER THE MATERIAL BEFORE ENTERING
THE INLET.



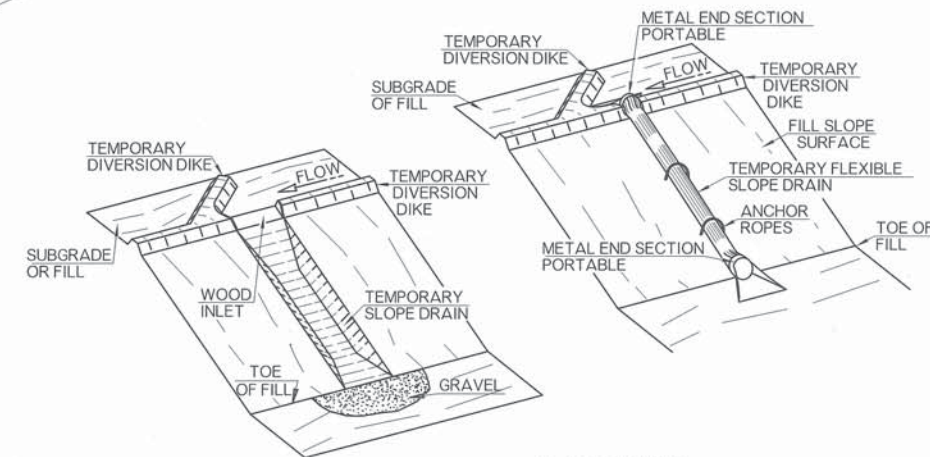
DIVERSION DIKES



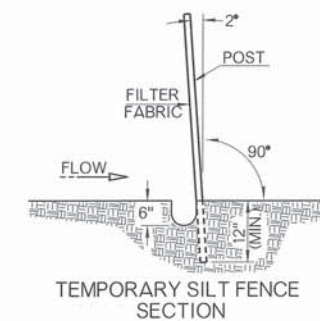
TEMPORARY SILT FENCE
RECOMMENDED TOE-IN METHOD



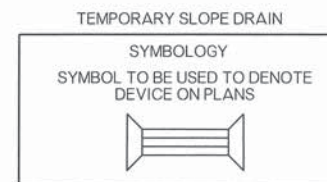
TEMPORARY SILT FENCE
SYMBOL TO BE USED TO DENOTE
DEVICE ON PLANS



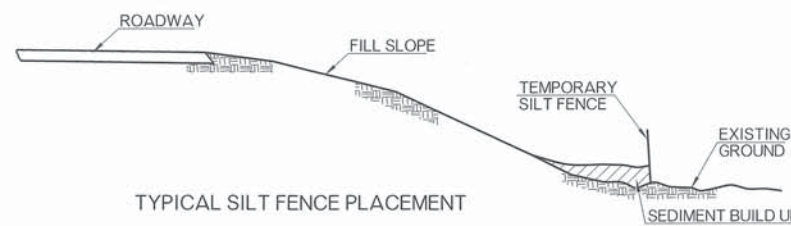
SLOPE DRAINS



TEMPORARY SILT FENCE
SECTION



TEMPORARY SLOPE DRAIN
SYMBOL TO BE USED TO DENOTE
DEVICE ON PLANS



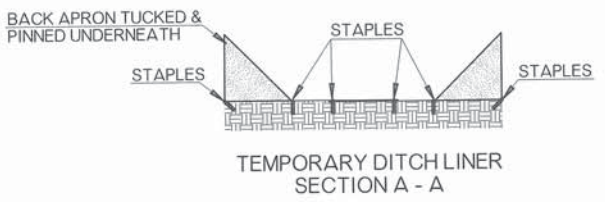
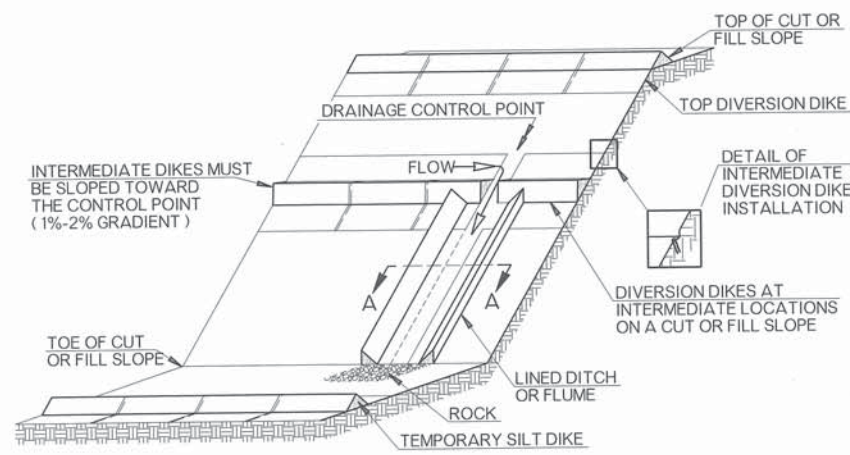
TYPICAL SILT FENCE PLACEMENT

- 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.

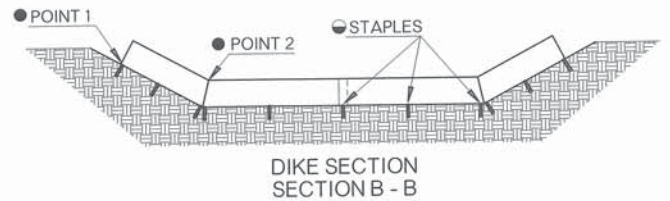
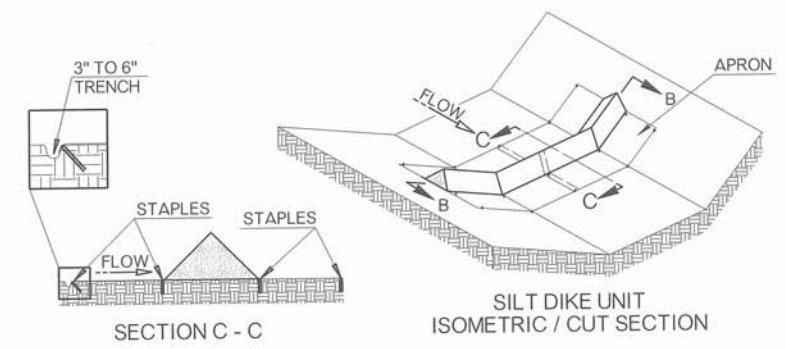
BASIS OF PAYMENT		
ITEM NO.	ITEM	UNIT
221 (A)	TEMPORARY SLOPE DRAINS	LF
221 (C)	TEMPORARY SILT FENCE	LF
221 (D)	TEMPORARY SEDIMENT FILTER	EA

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	

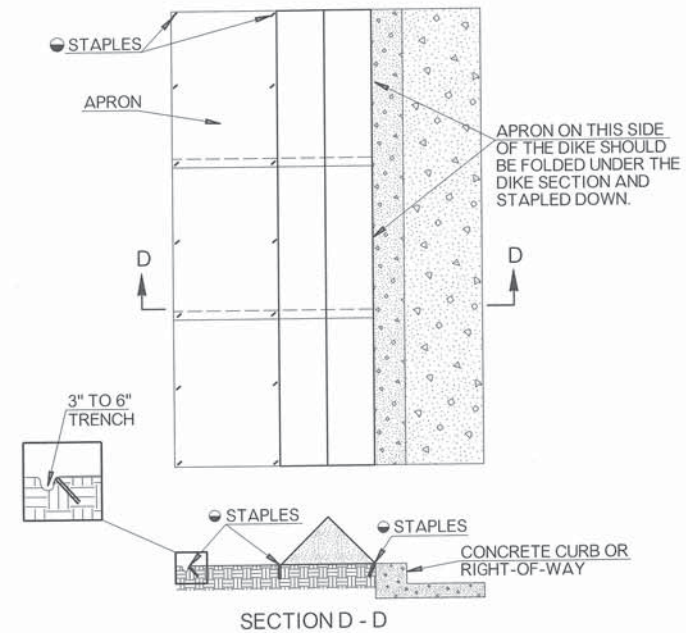


TEMPORARY SILT DIKE INSTALLATION FOR DIVERSION DIKES AND / OR DITCH LINER

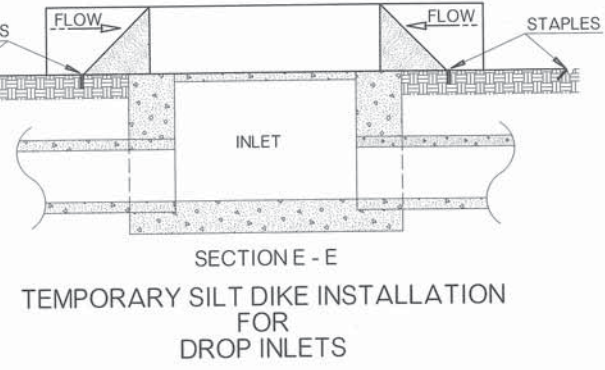
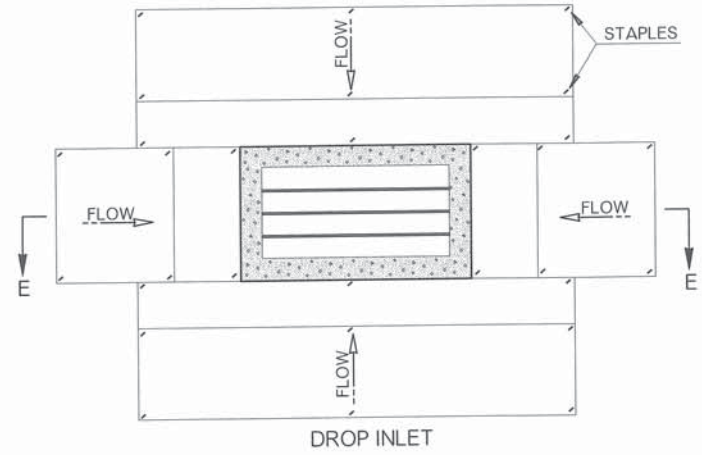


TEMPORARY SILT DIKE INSTALLATION FOR ROADWAY DITCH OR DRAINAGE DITCH

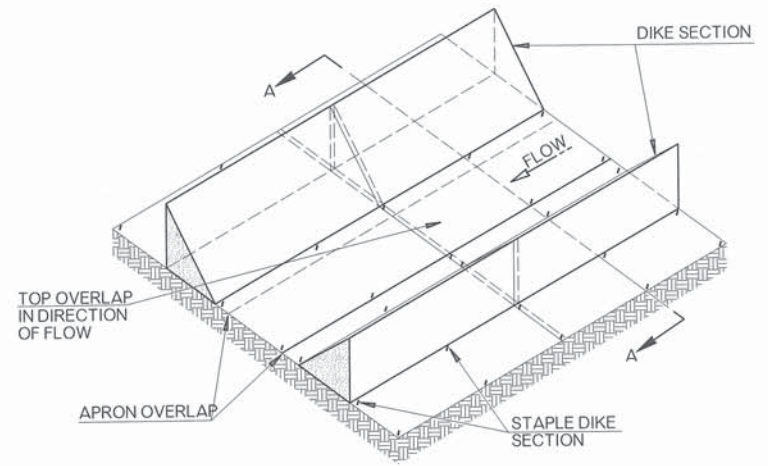
- POINT "1" MUST BE HIGHER THAN POINT "2" TO ENSURE THAT WATER FLOWS OVER THE DIKE AND NOT AROUND THE ENDS.
- STAPLES SHALL BE PLACED WHERE THE UNITS OVERLAP AND IN THE CENTER OF THE UNIT AS SHOWN ON THE DIAGRAM.



TEMPORARY SILT DIKE INSTALLATION FOR CONTINUOUS BARRIER



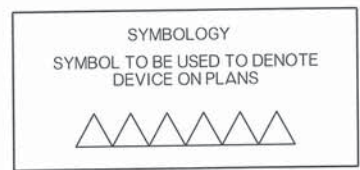
TEMPORARY SILT DIKE INSTALLATION FOR DROP INLETS



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.

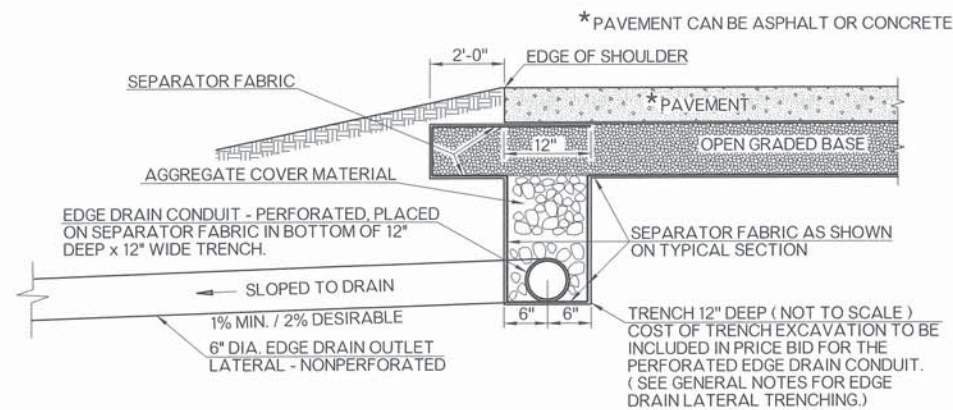
APPROVED BY ROADWAY ENGINEER: *Caleb F. A.* DATE: *04/14/15*
 ROADWAY DESIGN DIVISION STANDARD

TEMPORARY SILT DIKE

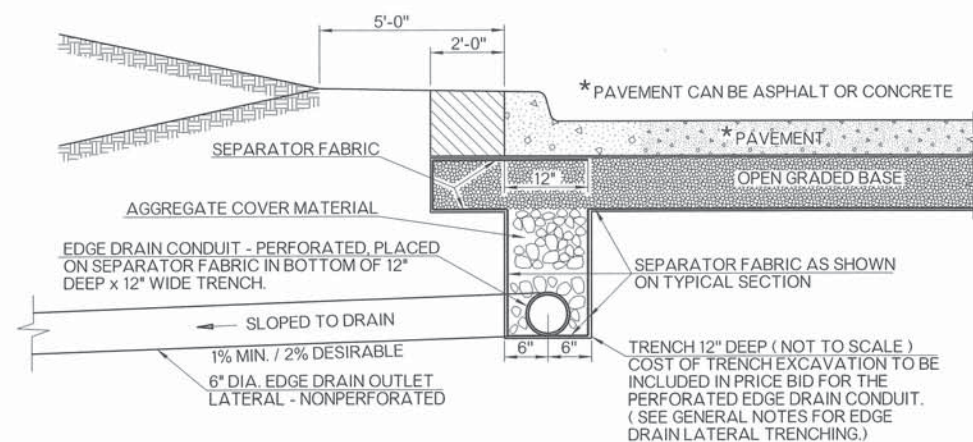
OKLAHOMA DEPARTMENT OF TRANSPORTATION
2009 SPECIFICATIONS

TSD-2	0
R-6	

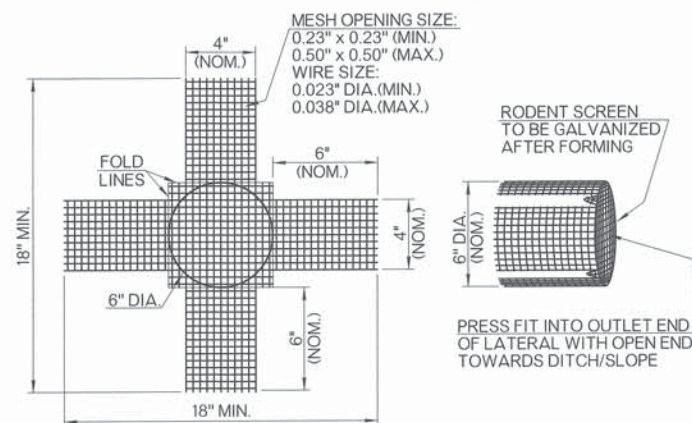
OKLAHOMA DEPARTMENT OF TRANSPORTATION		
STANDARD REVISIONS		
DESCRIPTION	DATE	



EDGE DRAIN INSTALLATION - OPEN TYPICAL SECTION

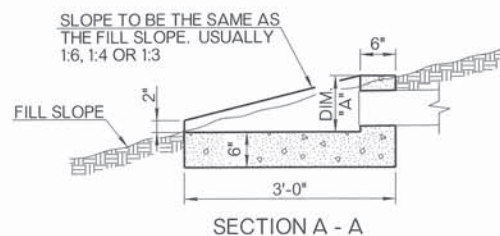


EDGE DRAIN INSTALLATION - CURBED TYPICAL SECTION



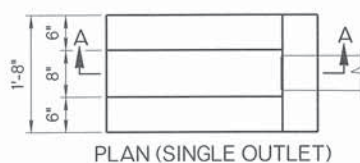
RODENT SCREEN DETAIL

THIS RODENT SCREEN DETAIL IS TYPICAL ONLY AND OTHER DESIGN LAYOUT PATTERNS MAY BE ALLOWED IF APPROVED BY THE ENGINEER. NO TOLERANCE SHALL BE ALLOWED ON MATERIAL SPECIFICATIONS. RODENT SCREEN DIMENSIONS WILL CHANGE PROPORTIONATELY FOR ALTERNATE SIZE OUTLET LATERAL CONDUIT.

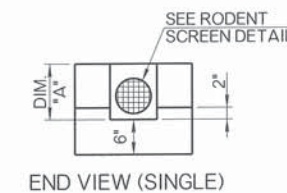


SECTION A - A

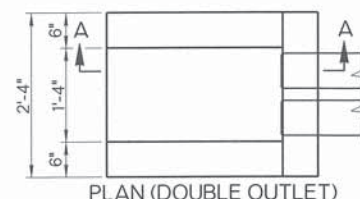
FILL SLOPE	DIM. "A"	CLASS A CONCRETE QUANTITY	
		SINGLE OUTLET	DOUBLE OUTLET
1:3	1'-0"	0.18 C.Y.	0.23 C.Y.
1:4	9 1/2"	0.17 C.Y.	0.21 C.Y.
1:6	7"	0.16 C.Y.	0.19 C.Y.



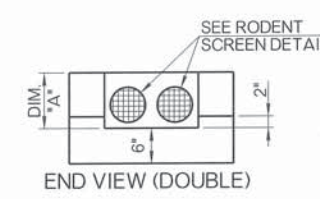
PLAN (SINGLE OUTLET)



END VIEW (SINGLE)



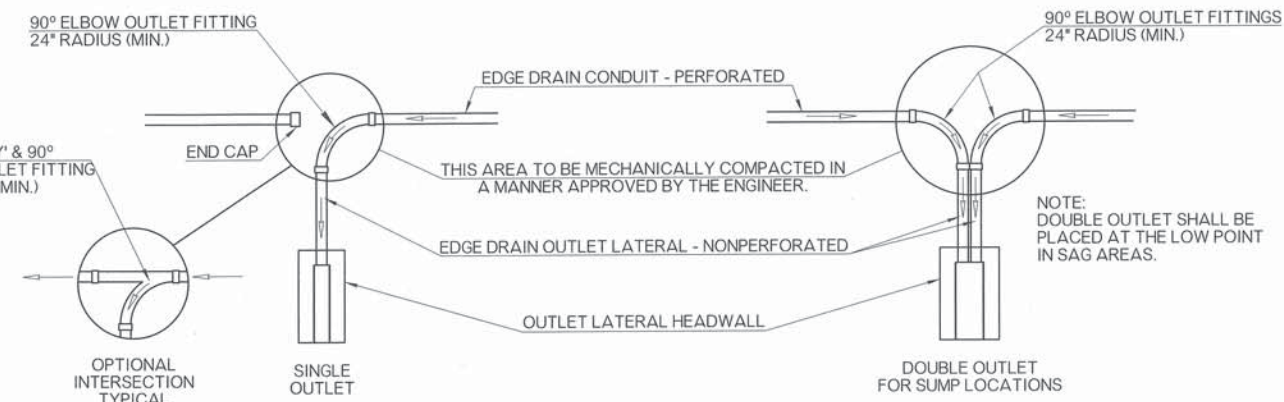
PLAN (DOUBLE OUTLET)



END VIEW (DOUBLE)

OUTLET LATERAL HEADWALL

NOTE: OPENING FOR LATERAL PIPE WILL VARY IN SIZE AND SHAPE, DEPENDING ON THE SIZE OF THE OUTLET LATERAL PIPE AND THE SLOPE OF THE STRUCTURE. THE OUTLET LATERAL PIPE SHALL BE CUT TO CONFORM TO THE TOP SURFACE OF THE OUTLET HEADWALL.



OUTLET LATERAL CONNECTIONS - PLAN

GENERAL NOTES

- ALL CONSTRUCTION AND MATERIAL REQUIREMENTS SHALL BE IN ACCORDANCE WITH THE 2009 ODOT STANDARD SPECIFICATIONS.
- INSTALLATION OF OUTLET LATERAL PIPES SHOULD BE SCHEDULED CONCURRENT WITH THE INSTALLATION OF PAVEMENT EDGE DRAIN.
- PAVEMENT EDGE DRAIN CONDUIT SHALL NOT BE LEFT IN PLACE LONGER THAN 48 HOURS WITHOUT BEING CONNECTED TO OUTLET LATERAL PIPES.
- OUTLET ELBOWS (90°) SHALL BE USED WHEN PIPE EDGE DRAIN SLOPE EXCEEDS TWO (2) PERCENT.
- CONNECTION OF THE OUTLET LATERAL PIPE TO THE OUTLET FITTING SHALL BE DONE IN A MANNER APPROVED BY THE ENGINEER. COST OF ALL CAPS, FITTINGS, LATERAL PIPE, BONDING MATERIALS, RODENT SCREENS, TRENCHING AND BACKFILLING NEEDED TO INSTALL OUTLET LATERAL PIPE SHALL BE INCLUDED IN THE PRICE BID FOR EDGE DRAIN OUTLET LATERAL (NON-PERFORATED).
- EDGE DRAINS AND OUTLET LATERALS SHALL BE LOCATED ON LOW SIDE OF SUPER ELEVATED SECTIONS AT CURVES. OUTLET LATERALS ARE TO BE PLACED AT 300' INTERVALS ON GRADE OR AS APPROVED BY THE ENGINEER.
- PRICE BID FOR OUTLET LATERAL HEADWALL INCLUDES SURFACE PREPARATION, CLASS A CONCRETE, LABOR AND ANY INCIDENTALS NECESSARY FOR CONSTRUCTION.
- CLASS A CONCRETE SHALL MEET REQUIREMENTS OF SECTION 509 OF THE SPECIFICATIONS.
- AGGREGATE COVER MATERIAL SHALL MEET THE REQUIREMENTS OF SECTION 701.06 OF THE SPECIFICATIONS, AGGREGATE NO. 57. COST OF AGGREGATE COVER MATERIAL TO BE INCLUDED IN PRICE BID FOR EDGE DRAIN CONDUIT - PERFORATED.
- DETAILS ON THIS SHEET ARE BASED ON 6" DIA. EDGE DRAIN CONDUIT. THE CONTRACTOR SHALL MAKE ALL NECESSARY ADJUSTMENTS TO ACCOMMODATE OTHER SIZE EDGE DRAINS.

BASIS OF PAYMENT		
ITEM NO.	ITEM	UNIT
613 (J)	EDGE DRAIN CONDUIT - PERFORATED	LF
613 (K)	EDGE DRAIN OUTLET LATERAL - NONPERFORATED	LF
613 (Q)	OUTLET LATERAL HEADWALL	EA

APPROVED BY ROADWAY ENGINEER: *Calhof* DATE: 01/14/15
 ROADWAY DESIGN DIVISION STANDARD

DOT PAVEMENT EDGE DRAIN

OKLAHOMA DEPARTMENT OF TRANSPORTATION
 2009 SPECIFICATIONS

PED-3	2
	R-20

OKLAHOMA DEPARTMENT OF TRANSPORTATION	
STANDARD REVISIONS	
DESCRIPTION	DATE

DIMENSIONS OF END SECTIONS FOR ROUND METAL PIPE								
PIPE DIA.	GA.	A	B	H	L	W	APPROX. SLOPE	BODY TYPE
12"	16	6"	6"	6"	21"	24"	1:2 1/2	1 PC.
15"	16	7"	8"	6"	26"	30"	1:2 1/2	1 PC.
18"	16	8"	10"	6"	31"	36"	1:2 1/2	1 PC.
21"	16	9"	12"	6"	36"	42"	1:2 1/2	1 PC.
24"	16	10"	13"	6"	41"	48"	1:2 1/2	1 PC.
30"	14	12"	16"	8"	51"	60"	1:2 1/2	1 PC.
36"	14	14"	19"	9"	60"	72"	1:2 1/2	2 PC.
42"	12	16"	22"	11"	69"	84"	1:2 1/2	2 PC.
48"	12	18"	27"	12"	78"	90"	1:2 1/4	2 PC.
54"	12	18"	30"	12"	84"	102"	1:2	2 PC.
60"	12	18"	33"	12"	87"	114"	1:1 3/4	3 PC.
66"	12	18"	36"	12"	87"	120"	1:1 1/2	3 PC.
72"	12	18"	39"	12"	87"	126"	1:1 1/3	3 PC.
78"	12	18"	42"	12"	87"	132"	1:1 1/4	3 PC.
84"	12	18"	45"	12"	87"	138"	1:1 1/6	3 PC.

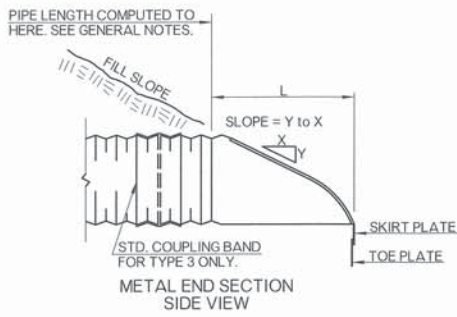
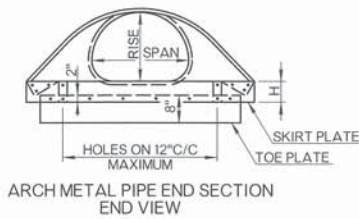
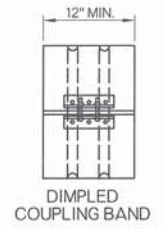
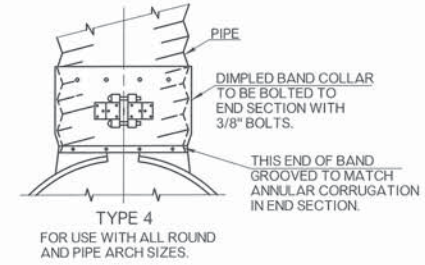
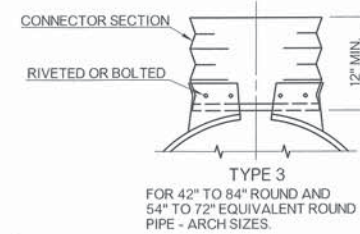
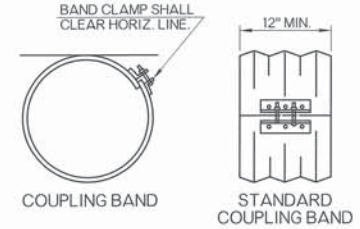
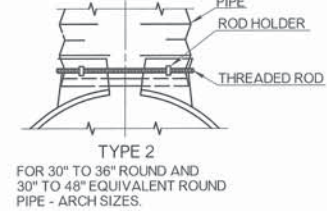
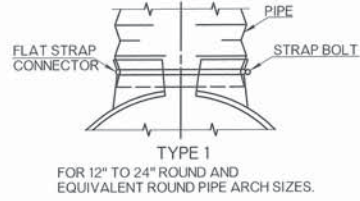
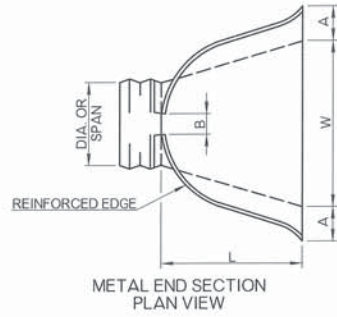
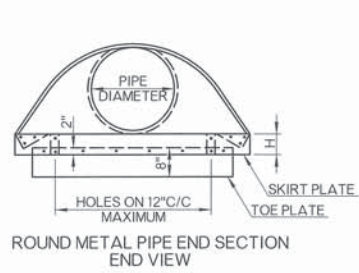
DIMENSIONS OF END SECTIONS FOR METAL PIPE - ARCH									
SPAN x RISE	EQUIV. ROUND	GA.	A	B	H	L	W	APPROX. SLOPE	BODY TYPE
17" x 13"	15"	16	7"	9"	6"	19"	30"	1:2 1/2	1 PC.
21" x 15"	18"	16	7"	10"	6"	23"	36"	1:2 1/2	1 PC.
24" x 18"	21"	16	8"	12"	6"	28"	42"	1:2 1/2	1 PC.
28" x 20"	24"	#16	9"	14"	6"	32"	48"	1:2 1/2	1 PC.
35" x 24"	30"	14	10"	16"	6"	39"	60"	1:2 1/2	1 PC.
42" x 29"	36"	#14	12"	18"	8"	46"	75"	1:2 1/2	1 PC.
49" x 33"	42"	12	13"	21"	9"	53"	85"	1:2 1/2	2 PC.
57" x 38"	48"	12	18"	26"	12"	63"	90"	1:2 1/2	2 PC.
64" x 43"	54"	12	18"	30"	12"	70"	102"	1:2 1/4	2 PC.
71" x 47"	60"	12	18"	33"	12"	77"	114"	1:2 1/4	3 PC.
77" x 52"	66"	12	18"	36"	12"	77"	126"	1:2	3 PC.
83" x 57"	72"	12	18"	39"	12"	77"	138"	1:2	3 PC.

FOR ALUMINUM END SECTIONS THE 28" x 20" SHALL BE 14 GAGE AND THE 42" x 29" SHALL BE 12 GAGE.

DIMENSIONS OF PRECAST END SECTIONS FOR ROUND PIPE											
DIAMETER	R3	R4	R5	T	K	J	C	D	E	W	SLOPE
18"	3"	3"	6"	2 1/2"	9"	2.25'	3.83'	6.08'	3.00'	1:3	
24"	3"	3"	7"	3"	9 1/2"	3.63'	2.50'	6.12'	4.00'	1:3	
30"	3"	3"	8"	3 1/2"	12"	4.50'	1.65'	6.16'	5.00'	1:3	
36"	3"	3"	10 1/2"	4"	15"	5.25'	2.90'	8.15'	6.00'	1:3	
42"	3"	3"	10 1/2"	4 1/2"	21"	5.25'	2.92'	8.17'	6.50'	1:3	
48"	6"	6"	14"	5"	24"	6.00'	2.17'	8.17'	7.00'	1:3	
54"	6"	6"	-	5 1/2"	27"	5.42'	2.92'	8.33'	7.50'	1:2 1/2	
60"	6"	6"	-	6"	30"	5.00'	3.25'	8.25'	8.00'	1:2	
66"	6"	6"	-	6 1/2"	24"	6.50'	1.75'	8.25'	8.50'	1:2	
72"	6"	6"	-	7"	24"	6.50'	1.75'	8.25'	9.00'	1:2	

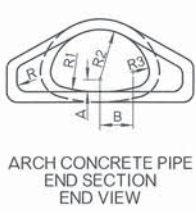
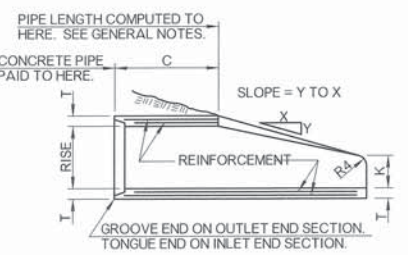
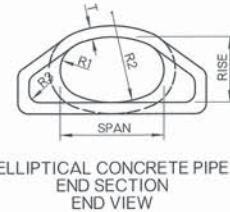
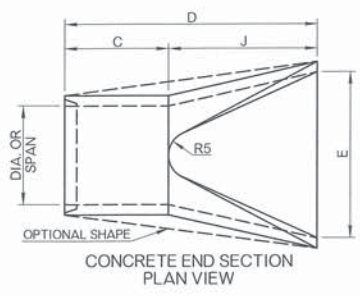
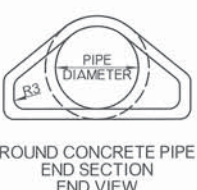
APPROX. EQUIV. DIAMETER	DIMENSIONS OF PRECAST END SECTIONS FOR ELLIPTICAL PIPE													
	RISE	SPAN	R1	R2	R3	R4	R5	T	K	J	C	D	E	SLOPE
18"	14"	23"	6"	20"	3"	3"	6"	2 3/4"	8"	2.25'	3.75'	6.00'	3.00'	1:3
24"	19"	30"	8 1/4"	26 1/4"	3"	3"	7"	3 1/4"	8 1/2"	3.25'	2.75'	6.00'	4.00'	1:3
30"	24"	38"	10 1/4"	32 3/4"	3"	3"	9"	3 3/4"	9 1/2"	4.50'	1.50'	6.00'	5.00'	1:3
36"	29"	45"	12 1/4"	39 1/4"	3"	3"	12"	4 1/2"	11 1/4"	5.00'	3.00'	8.00'	6.00'	1:3
42"	34"	53"	14 1/2"	46"	6"	6"	13"	5"	15 3/4"	5.00'	3.00'	8.00'	6.50'	1:3
48"	38"	60"	16 1/2"	51 1/2"	6"	6"	14"	5 1/2"	21"	5.00'	3.00'	8.00'	7.00'	1:3
54"	43"	68"	18 3/4"	58 1/2"	6"	6"	16"	6"	25 1/2"	5.00'	3.00'	8.00'	7.50'	1:3
60"	48"	76"	20 3/4"	65"	6"	6"	36 1/16"	6 1/2"	30"	5.00'	3.25'	8.25'	8.00'	1:2
66"	53"	83"	22 3/4"	71 1/2"	6"	6"	36 1/8"	7 1/2"	24"	6.50'	1.75'	8.25'	8.50'	1:2
72"	58"	91"	24 3/4"	78"	6"	6"	38"	7 1/2"	24"	6.50'	1.75'	8.25'	9.00'	1:2

APPROX. EQUIV. DIAMETER	DIMENSIONS OF PRECAST END SECTIONS FOR ARCH PIPE																
	SPAN	RISE	A	B	R	R1	R2	R3	R4	R5	T	K	J	C	D	E	SLOPE
18"	22"	13"	1 1/4"	5 3/4"	2"	27 1/2"	13 3/4"	5 1/4"	3"	13"	2 1/2"	7"	2.25'	3.75'	6.08'	3.00'	1:3
24"	28"	18"	3 7/8"	9 21/32"	3"	40 11/16"	14 9/16"	4 19/32"	3"	16 13/16"	3"	9 1/2"	3.58'	2.50'	6.08'	4.00'	1:3
30"	36"	22"	3 3/4"	12 3/32"	3"	51"	18 3/4"	6 1/32"	3"	18 1/2"	3 1/2"	12"	4.50'	1.58'	6.08'	5.00'	1:3
36"	43"	26"	4 1/8"	15 1/2"	6"	62"	22 1/2"	6 3/8"	3"	24 5/16"	4"	15"	5.25'	2.90'	8.15'	6.00'	1:3
42"	51"	31"	5 1/8"	18"	6"	73"	26 1/4"	7 9/16"	3"	27 1/2"	4 1/2"	21"	5.25'	2.92'	8.17'	6.50'	1:3
48"	58"	36"	6"	20 1/2"	6"	84"	30"	8 3/4"	3"	28 1/2"	5"	24"	6.00'	2.17'	8.17'	7.00'	1:3
54"	65"	40"	6 5/8"	22 11/16"	6"	92 1/2"	33 3/8"	9 13/16"	6"	33 1/8"	5 1/2"	27"	5.42'	2.92'	8.34'	7.50'	1:2.4
60"	73"	45"	7 1/2"	25 9/32"	6"	105"	37 1/2"	11 7/32"	6"	33 1/16"	6"	30"	5.00'	3.25'	8.25'	8.00'	1:2
72"	88"	54"	9"	31 7/16"	6"	126"	45"	12 9/16"	6"	38 15/16"	7"	24"	6.50'	1.75'	8.25'	9.00'	1:2



TYPICAL METAL END SECTION CONNECTIONS

- GENERAL NOTES**
- ALL CONSTRUCTION AND MATERIAL REQUIREMENTS SHALL BE IN ACCORDANCE WITH THE 2009 ODOT STANDARD SPECIFICATIONS.
 - CULVERT END SECTIONS SHALL BE OF THE SAME MATERIAL AND SHAPE (ROUND, ARCH, OR ELLIPTICAL) AS THE PIPE ON WHICH THEY ARE INSTALLED.
 - DIMENSIONS SHOWN FOR END SECTIONS ARE SUBJECT TO MANUFACTURER TOLERANCES.
 - TOE PLATE WILL BE REQUIRED ON ALL METAL END SECTIONS UNLESS SOLID ROCK IS ENCOUNTERED. HOLES IN TOE PLATE TO BE PUNCHED TO MATCH HOLES IN SKIRT PLATE. 3/8" BOLTS TO BE FURNISHED. LENGTH OF TOE PLATES FOR ROUND PIPE END SECTIONS SHALL BE W=10" FOR 12" TO 30" DIAMETER PIPE. W=20" FOR 36" TO 84" DIAMETER PIPE. LENGTH OF TOE PLATES FOR ARCH PIPE END SECTIONS SHALL BE W=10" FOR A RISE OF 13" TO 29" AND W=20" FOR A RISE OF 33" TO 57".
 - CONNECTOR SECTION, SKIRT PLATE, AND TOE PLATE ON METAL END SECTIONS SHALL BE THE SAME GAGE AND MATERIAL AS THE SKIRT AND SHALL BE INCLUDED IN PRICE BID FOR END SECTION.
 - IF TYPE 3 METAL END SECTION IS USED AS OPTIONAL PIPE, THE LENGTH OF PIPE TO BE REDUCED BY 12" FOR EACH END SECTION. IF CONCRETE PIPE OPTION IS USED, THE LENGTH OF PIPE TO BE REDUCED BY THE C DIMENSION FOR EACH END SECTION.



BASIS OF PAYMENT		
ITEM NO.	ITEM	UNIT
613 (L)	▼ PREFAB. CULVERT END SECTION, ROUND	EA
613 (L)	▼ PREFAB. CULVERT END SECTION, ARCH	EA
613 (L)	▼ PREFAB. CULVERT END SECTION, ELLIPTICAL	EA

▼END SECTION DIMENSIONS SHALL BE SPECIFIED.

APPROVED BY ROADWAY ENGINEER: *Calvin F. A.* DATE: 04/14/15
 ROADWAY DESIGN DIVISION STANDARD
DOT PREFABRICATED CULVERT END SECTIONS
 OKLAHOMA DEPARTMENT OF TRANSPORTATION
 2009 SPECIFICATIONS

STANDARD REVISIONS	
DESCRIPTION	DATE

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	CY/LF	W	CY/LF	W	CY/LF	W+12"
	IN	FT.	FT.	FT.	FT.	FT.	FT.	FT.	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	2.252	23.50	3.240	0.271
66	8.08	0.542	9.08	1.408	17.33	2.564	25.58	3.713	0.292
72	8.67	0.583	9.67	1.564	18.67	2.898	27.67	4.213	0.313
78	9.25	0.625	10.25	1.731	20.00	3.254	29.75	4.738	0.334
84	9.83	0.667	10.83	1.909	21.33	3.632	31.83	5.289	0.355
90	10.42	0.708	11.42	2.100	22.67	4.032	33.92	5.866	0.376
96	11	0.75	12.00	2.306	24.00	4.454	36.00	6.470	0.397

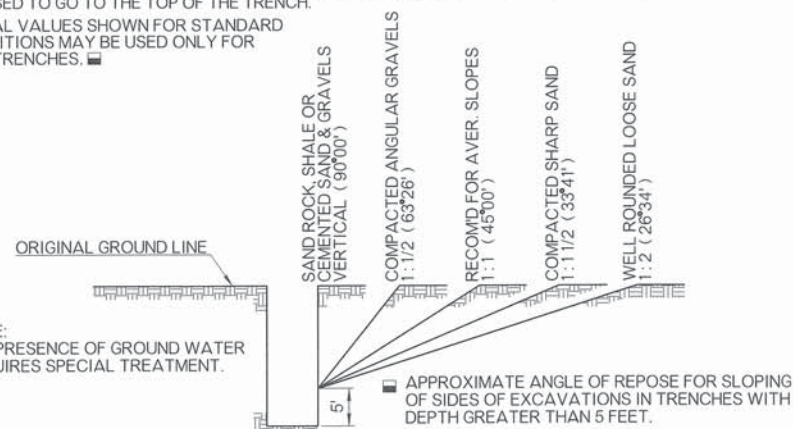
PIPE DIA. OR DESIGN EQUIV.	H	T	SINGLE PIPE STANDARD TRENCHING		DOUBLE PIPE STANDARD TRENCHING		TRIPLE PIPE STANDARD TRENCHING		SPECIAL TRENCHING SINGLE, DOUBLE & TRIPLE PIPE OPTIONS
			W	CY/LF	W	CY/LF	W	CY/LF	W+12"
18	2.88	0.208	3.50	0.271	6.33	0.471	9.17	0.671	0.106
21	3.08	0.229	4.12	0.338	7.29	0.567	10.46	0.796	0.114
24	3.33	0.250	4.38	0.374	7.75	0.624	11.13	0.874	0.123
30	3.79	0.291	6.10	0.603	10.13	0.915	14.16	1.227	0.140
36	4.20	0.333	6.81	0.700	11.67	1.097	16.53	1.493	0.156
42	4.69	0.375	7.50	0.813	13.17	1.308	18.83	1.802	0.173
48	5.17	0.416	8.21	0.941	14.67	1.548	21.00	2.157	0.190
54	5.65	0.458	8.93	1.084	15.67	1.818	23.00	2.567	0.207
60	6.13	0.500	9.65	1.242	16.67	2.118	25.00	2.992	0.225
66	6.61	0.542	10.37	1.406	17.67	2.448	27.00	3.432	0.242
72	7.09	0.583	11.10	1.576	18.67	2.808	29.00	3.887	0.259
78	7.57	0.625	11.83	1.752	19.67	3.198	31.00	4.357	0.276
84	8.05	0.667	12.56	1.934	20.67	3.618	33.00	4.842	0.293
90	8.53	0.708	13.30	2.122	21.67	4.058	35.00	5.342	0.310
96	9.01	0.750	14.03	2.316	22.67	4.518	37.00	5.857	0.327

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	CY/LF	W	CY/LF	W	CY/LF	W+12"
18	2.96	0.229	3.62	0.282	6.54	0.487	9.46	0.691	0.109
24	3.46	0.27	4.54	0.387	8.04	0.640	11.54	0.893	0.128
30	3.96	0.312	6.29	0.629	10.51	0.954	14.74	1.28	0.147
36	4.50	0.375	7.00	0.743	12.00	1.153	17.00	1.564	0.167
42	5.00	0.416	7.75	0.862	13.64	1.379	19.53	1.896	0.185
48	5.42	0.458	8.50	0.996	15.00	1.632	22.00	2.264	0.203
54	5.92	0.5	9.25	1.135	16.33	1.912	24.33	2.668	0.221
60	6.42	0.541	10.00	1.280	17.67	2.218	26.67	3.108	0.238
66	6.91	0.583	10.75	1.432	19.00	2.540	29.00	3.582	0.256
72	7.41	0.625	11.50	1.590	20.33	2.878	31.33	4.092	0.273
78	7.91	0.667	12.25	1.754	21.67	3.232	33.67	4.636	0.290
84	8.41	0.708	13.00	1.924	23.00	3.602	36.00	5.204	0.307
90	8.91	0.750	13.75	2.100	24.33	3.988	38.33	5.796	0.324
96	9.41	0.791	14.50	2.282	25.67	4.388	40.67	6.412	0.341

NOTE: QUANTITIES FOR 66" & 78" EQUIV. DIAM. 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.

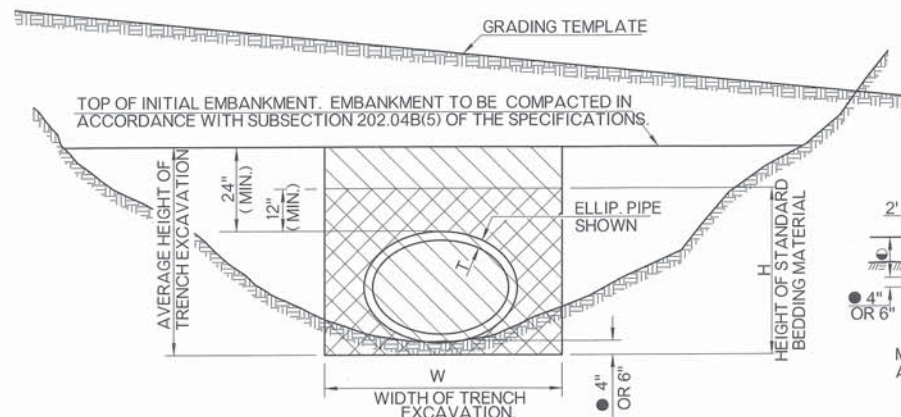


- OPTIONAL TRENCHES WITH DEPTH GREATER THAN 5.0 FEET EXCAVATION AND BEDDING MATERIAL WILL BE MEASURED AND PAID FOR AS IF SHEETING & SHORING WAS USED. (SPECIAL TRENCHING=STD. WIDTH TRENCH+12")

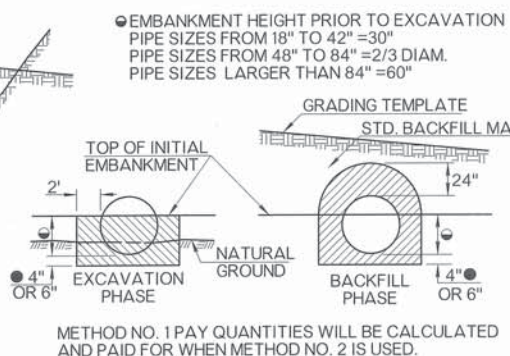
TRENCH EXCAVATION IN CUT SECTIONS

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.



METHOD NO. 1
TRENCH EXCAVATION IN EMBANKMENT SECTIONS



METHOD NO. 1 PAY QUANTITIES WILL BE CALCULATED AND PAID FOR WHEN METHOD NO. 2 IS USED.

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

FOR DIA. OR SPAN	CONDUIT SHAPE			DIST.
	ROUND	ARCH	ELLIPTICAL	G
UP TO 24"	UP TO 36"	UP TO 36"		12"
25" TO 72"				D/2"
OVER 73"	37" TO 108"	37" TO 108"		D/3"
	OVER 108"	OVER 108"		36"



DOUBLE PIPE INSTALLATION (USED WITH CET END TREATMENTS)

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.

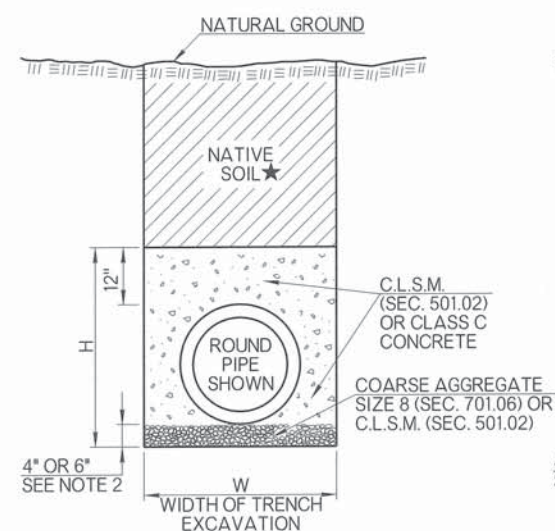
BASIS OF PAYMENT		
ITEM NO.	ITEM	UNIT
613 (R)	STANDARD BEDDING MATERIAL, CLASS A	CY
613 (S)	STANDARD BEDDING MATERIAL, CLASS B	CY
613 (T)	STANDARD BEDDING MATERIAL, CLASS C	CY
613 (V)	TRENCH EXCAVATION	CY

APPROVED BY ROADWAY ENGINEER: *Calvin A.* DATE: *02/10/15*

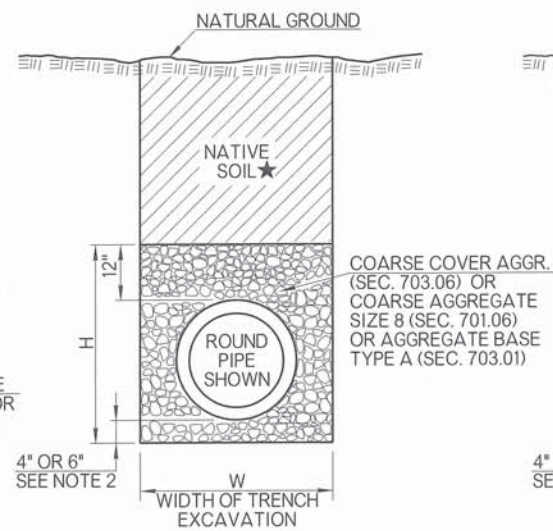
ROADWAY DESIGN DIVISION STANDARD

DOT STANDARD PIPE INSTALLATION

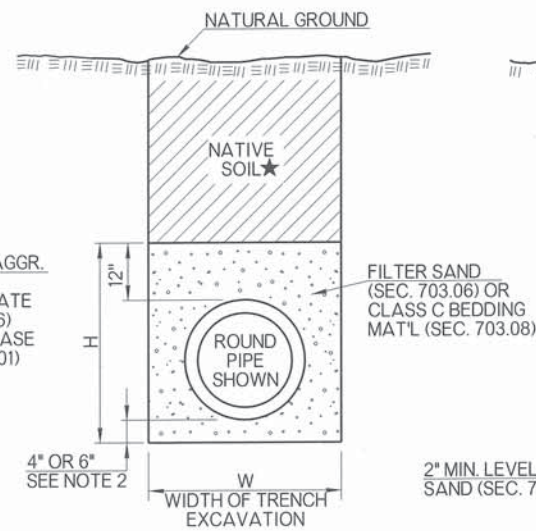
STANDARD REVISIONS	
DESCRIPTION	DATE



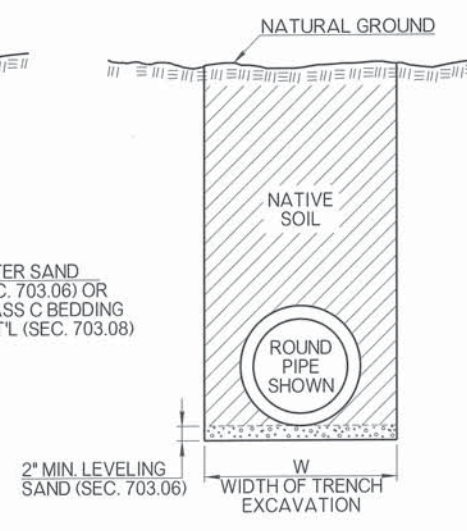
CLASS A BEDDING



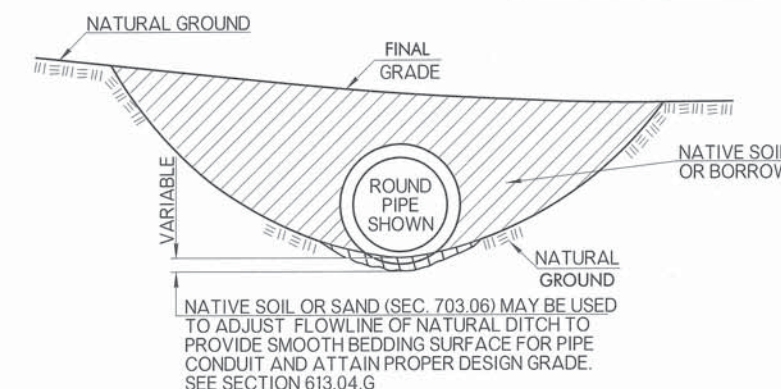
CLASS B BEDDING



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	

FULL CIRCLE STEEL PIPE CULVERT table with columns for PIPE DIAMETER FOR CORRUGATION PATTERN, MIN. COVER, and MAXIMUM FILL HEIGHT ABOVE TOP OF PIPE.

FULL CIRCLE ALUMINUM PIPE CULVERT table with columns for PIPE DIAMETER FOR CORRUGATION PATTERN, MIN. COVER, and MAXIMUM FILL HEIGHT ABOVE TOP OF PIPE.

METAL PIPE ARCH - FILLS TO 10 FT. MAX. table with columns for APPROX. EQUIV. ROUND PIPE, SIZE SPAN x RISE, and CORRUGATION PATTERN.

WHEN INSTALLED UNDER PAVEMENT INCLUDING ALL P.C. OR A.C. SURFACING UNDER MAINLINE TRAFFIC AND MAJOR STREET RETURNS...

GENERAL NOTES

- 1. METAL PIPE FILL HEIGHT DESIGNS ARE BASED ON A CLASS B BEDDING...
2. IN THE EVENT LOADS IN EXCESS OF HS-20 ARE TO BE OPERATED OVER OR ADJACENT TO THE PIPE INSTALLATION...
3. PROPER INSTALLATION PRACTICES MUST BE ADHERED TO AS SHOWN ON ROADWAY STANDARDS...
4. ANY PIPE DEFORMED PRIOR TO FINAL ACCEPTANCE SHALL BE REPLACED BY THE CONTRACTOR...
5. MAXIMUM FILL HEIGHTS ARE MEASURED TO TOP OF SUBGRADE OR BOTTOM OF ASPHALT OR PC PAVEMENT...

POLY-PROPYLENE PIPE DIAMETER table with columns for MAXIMUM FILL HEIGHT OVER CULVERT (FT.) and UNDER/OUTSIDE PAVEMENT.

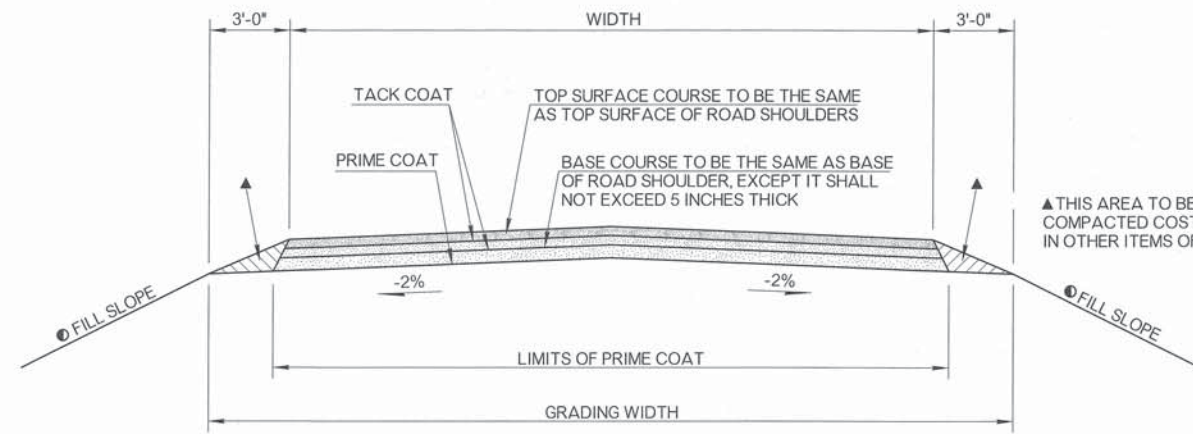
REFER TO ROADWAY DESIGN STANDARD SPB-1 FOR MINIMUM FILL HEIGHT AND OTHER POLYPROPYLENE INSTALLATION DETAILS.

EQUIVALENT METAL THICKNESS AND GAGE table with columns for GAGE NUMBER and METAL THICKNESS (INCHES).

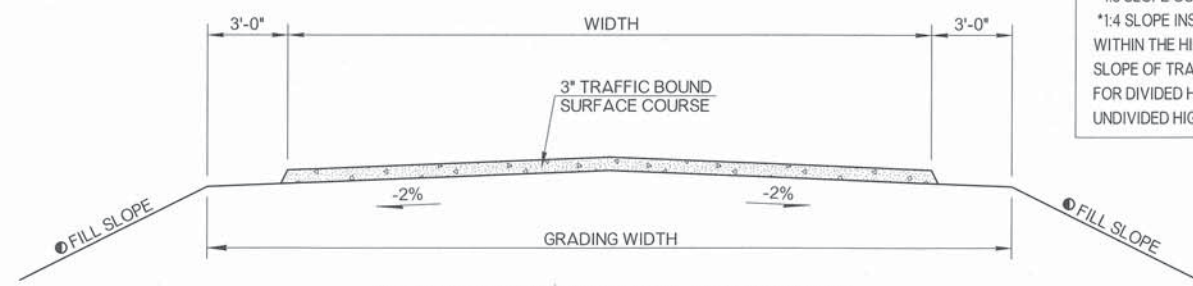
THE THICKNESS OF THE SHEET INCLUDES BOTH THE BASE STEEL AND THE COATING.
THE THICKNESS SHOWN REFERS TO THE CLAD SHEET.

APPROVED BY ROADWAY ENGINEER: [Signature] DATE: 04/14/15
ROADWAY DESIGN DIVISION STANDARD

OKLAHOMA DEPARTMENT OF TRANSPORTATION	
STANDARD REVISIONS	
DESCRIPTION	DATE

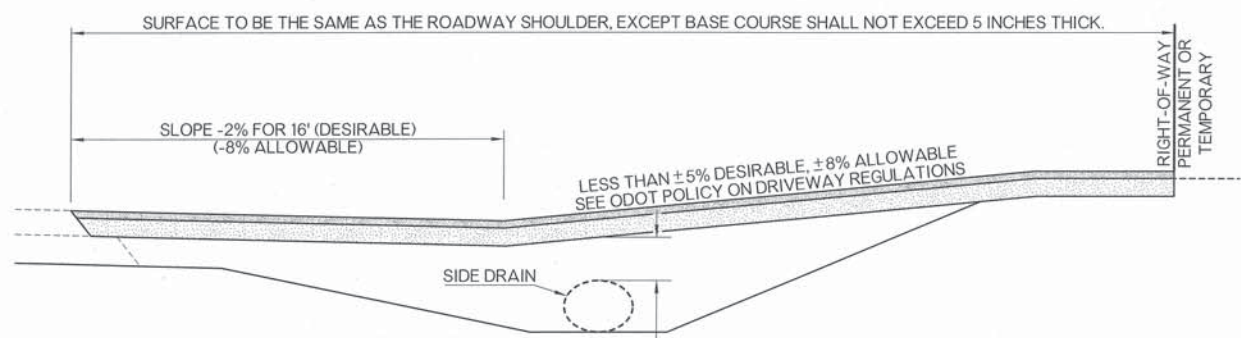


TYPICAL SECTION OF ASPHALT RETURN/DRIVE

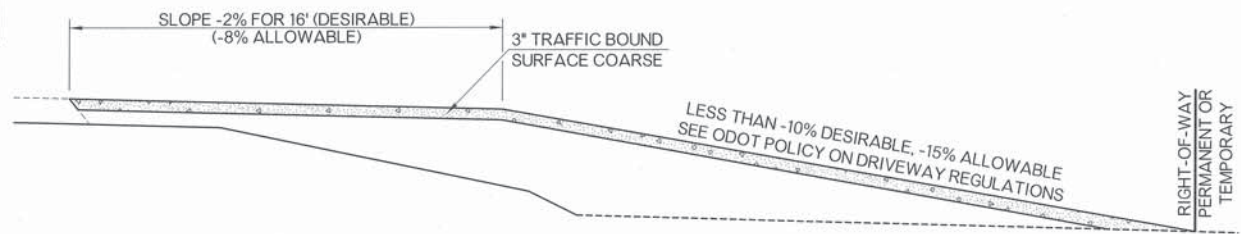


TYPICAL SECTION OF T.B.S.C. RETURN/DRIVE

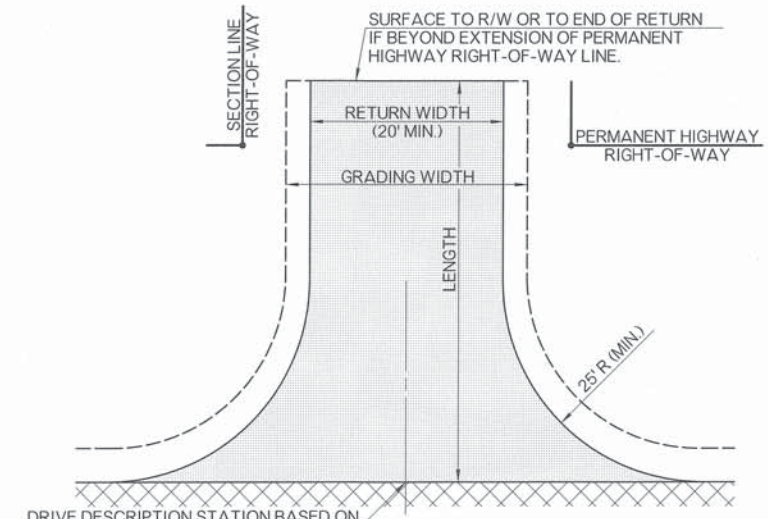
FILL SLOPE NOTES:
 FILL SLOPE AS SHOWN IN TYPICAL SECTIONS SHALL NOT EXCEED:
 *1:3 SLOPE OUTSIDE HIGHWAY CLEARZONE
 *1:4 SLOPE INSIDE HIGHWAY CLEARZONE
 WITHIN THE HIGHWAY CLEARZONE, ADJUST SLOPE OF TRAFFIC APPROACH END TO 1:10 FOR DIVIDED HIGHWAYS AND 1:6 FOR UNDIVIDED HIGHWAYS.



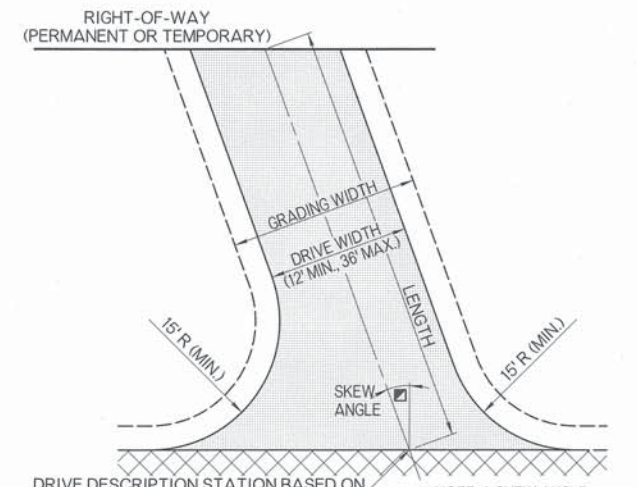
PROFILE OF TYPICAL ASPHALT RETURN/DRIVE ON ROADWAY CUT SECTION



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

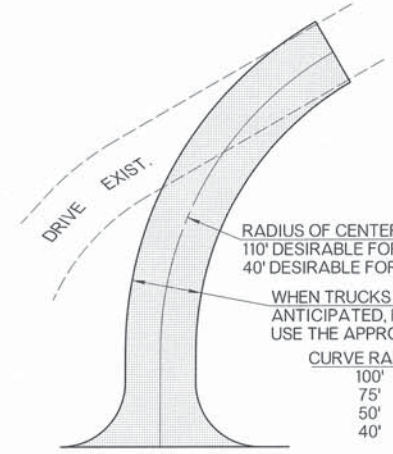


PLAN TYPICAL SECTION LINE RETURN



PLAN TYPICAL DRIVE ON SKEW

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



SECTION LINE OR DRIVE WITH CURVED ALIGNMENT

CURVE RADIUS	MIN. WIDTH
100'	14'
75'	16'
50'	18'
40'	20'

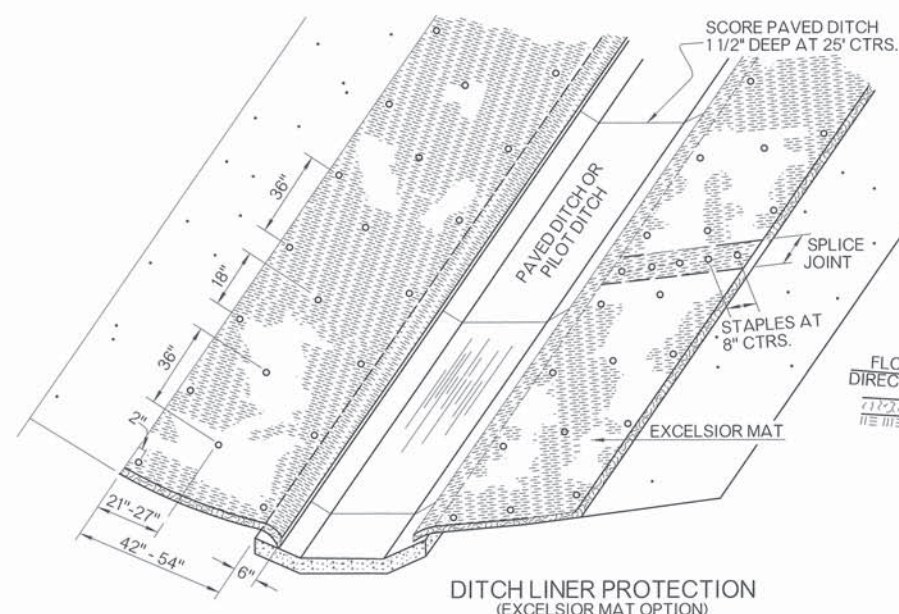
PROPOSED DRIVES AND RETURNS SHALL MATCH EXISTING EXCEPT WHEN SKEW ANGLE EXCEEDS 20 DEGREES; IT IS THEN DESIRED TO SHIFT THE LOCATION AND CONSTRUCT USING CURVED ALIGNMENT

USEFUL ABBREVIATIONS FOR PLAN SHEETS:

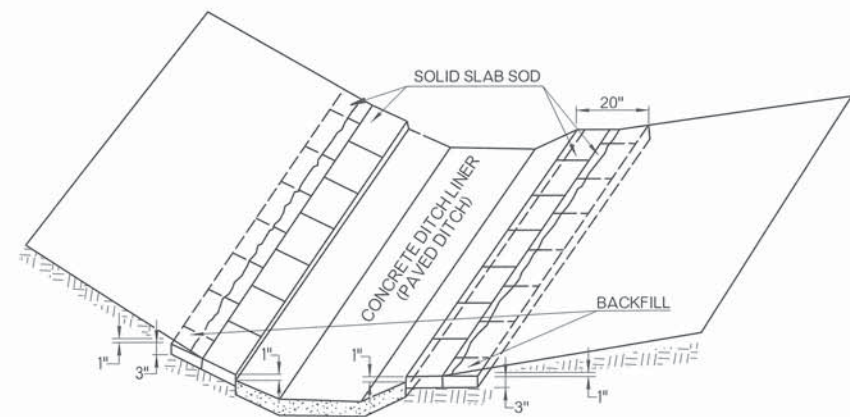
ASPH	ASPHALT
T.B.S.C.	TRAFFIC BOUND SURFACE COARSE
CONC.	CONCRETE
SEC. RET.	SECTION LINE RETURN
FIELD ENT.	FIELD ENTRANCE
PVT. DRIVE	PRIVATE DRIVE
COMM. DRIVE	COMMERCIAL DRIVE
W/S.D.	WITH SIDE DRAIN
AS DIKE	AS DIKE ACROSS DITCH

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

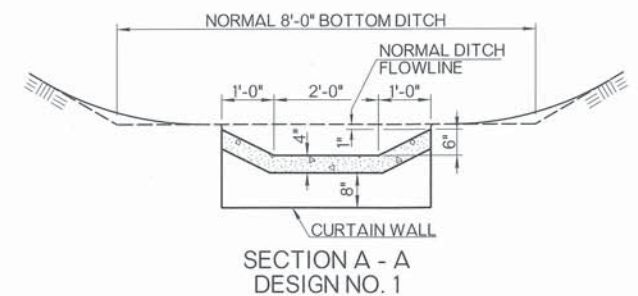
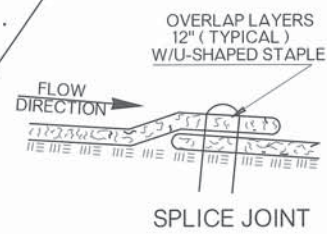
OKLAHOMA DEPARTMENT OF TRANSPORTATION	
STANDARD REVISIONS	
DESCRIPTION	DATE



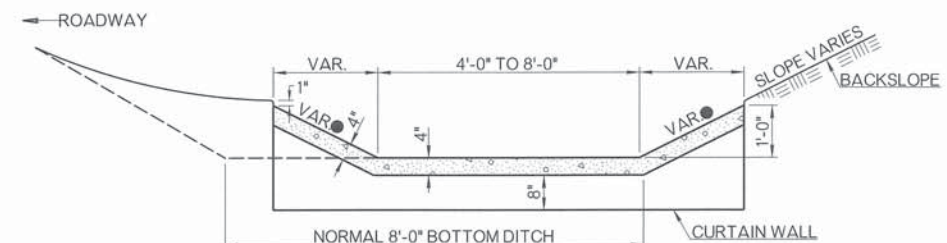
DITCH LINER PROTECTION
(EXCELSIOR MAT OPTION)



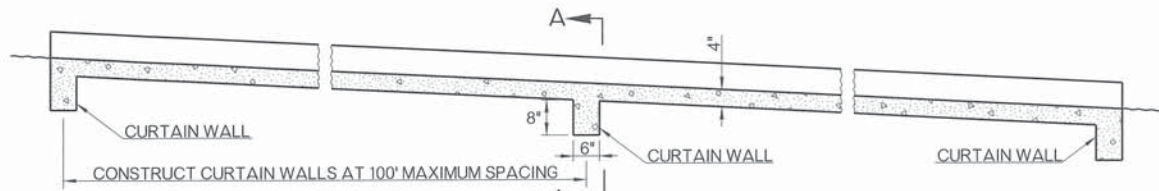
DITCH LINER PROTECTION
(SOLID SLAB SOD OPTION)



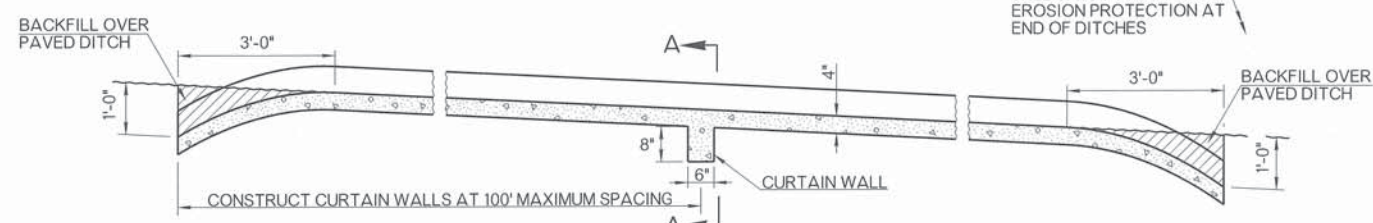
SECTION A - A
DESIGN NO. 1



SECTION A - A
DESIGN NO. 2



LONGITUDINAL SECTION WITH CURTAIN WALLS



OPTIONAL LONGITUDINAL SECTION WITH BURIED ENDS
(BURIED ENDS SHALL NOT BE USED ADJACENT TO DRAINAGE STRUCTURES)

DESIGN NO. 1 - A PAVED PILOT DITCH TO BE PLACED 6" BELOW THE NORMAL FLOWLINE AND IN THE CENTER OF A STANDARD DITCH

DESIGN NO. 2 - A DITCH THAT IS PAVED AND HAVING THE SAME FLOWLINE AS A STANDARD UNPAVED DITCH

GENERAL NOTES

- ALL CONSTRUCTION AND MATERIAL REQUIREMENTS SHALL BE IN ACCORDANCE WITH THE 2009 ODOT STANDARD SPECIFICATIONS.
- ALL COST OF ADDITIONAL BORROW OR EXCAVATION, REQUIRED FOR INSTALLING PAVED DITCH, SHALL BE INCLUDED IN PRICE BID FOR CLASS C CONCRETE.
- THE DITCH SHALL BE WATERED, AND COMPACTED, BEFORE PLACING CLASS C CONCRETE.
- DITCH LINER PROTECTION MAY BE EITHER EXCELSIOR MAT, OR SOLID SLAB SOD, AND SHALL BE MEASURED BY THE LINEAR FOOT OF DITCH (PAVED DITCH), IN PLACE.

QUANTITIES OF CLASS C CONCRETE PER LF OF PAVED DITCH											
QUANTITIES IN CUBIC YARDS											
DESIGN NO. 1						DESIGN NO. 2					
BOTTOM WIDTH	2'-0"	3'-0"	4'-0"	5'-0"	6'-0"	4'-0"	5'-0"	6'-0"	7'-0"	8'-0"	
K 1	.0522	.0645	.0769	.0892	.1016	.1274	.1397	.1521	.1644	.1768	DES. DES. DES. 2A 2B 2C
K 2	.0586	.0709	.0832	.0955	.1078	.1790	.1913	.2036	.2159	.2282	
● VARIABLE AS SHOWN ON PLANS						K 1	.1045	.1168	.1292	.1415	.1539
DESIGN 2A = 1:3 SLOPES						K 2	.1357	.1480	.1603	.1726	.1850
DESIGN 2B = 1:2 SLOPES						K 1	.0923	.1048	.1172	.1295	.1479
DESIGN 2C = 1:1 SLOPES						K 2	.1105	.1228	.1352	.1476	.1600
TOTAL CLASS C CONC. = (LENGTH OF PAVED DITCH) (K1) + (NO. OF CURT. WALLS) (K2)											
K1=CU. YDS. OF CONCRETE PER LINEAR FOOT											
K2=CU. YDS. OF CONCRETE PER CURTAIN WALL											

BASIS OF PAYMENT		
ITEM NO.	ITEM	UNIT
509 (D)	CLASS C CONCRETE	CY
229	DITCH LINER PROTECTION	LF

APPROVED BY ROADWAY ENGINEER: *Calvin H.* DATE: 02/16/15

ROADWAY DESIGN DIVISION STANDARD

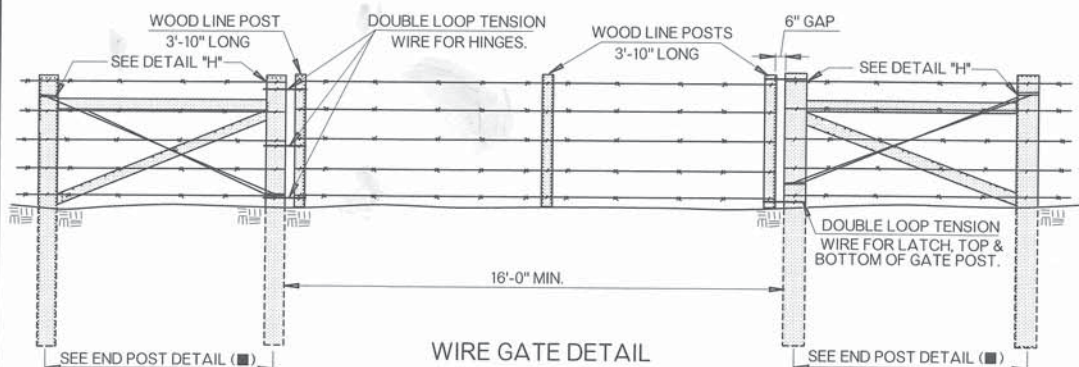
DOT

PAVED DITCHES AND FLUMES

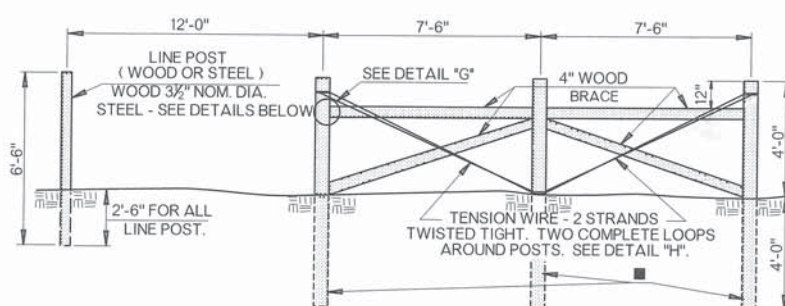
OKLAHOMA DEPARTMENT OF TRANSPORTATION
2009 SPECIFICATIONS

DC-3	2
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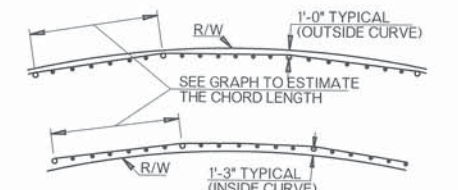
R-64



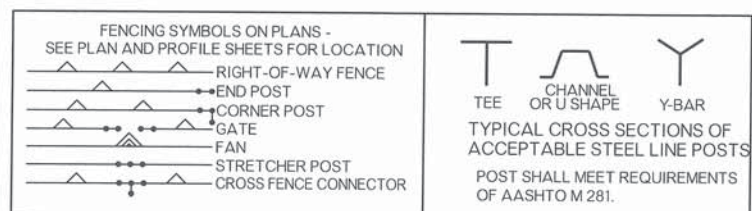
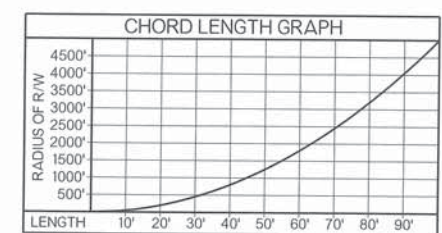
WIRE GATE DETAIL
LOCATION OF GATES TO BE DETERMINED BY THE ENGINEER. OTHER TYPES OF GATES MAY BE SUBSTITUTED FOR THE WIRE GATE, SUCH AS PREFABRICATED PIPE TUBING TYPES OR RANCH STYLE METAL PANEL TYPE, IF APPROVED BY THE ENGINEER. COST OF WIRE GATE SHALL BE INCLUDED IN THE PRICE BID FOR FENCE.



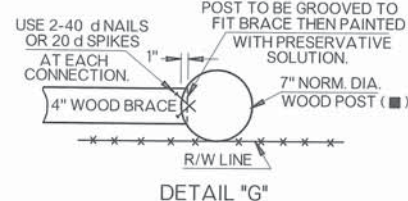
CORNER & STRETCHER POSTS DETAIL
USE STRETCHER DETAILS AT ALL CORNERS, BENDS IN R/W, ON HILL TOPS, IN VALLEYS OR DEEP DEPRESSIONS, AND AT 500' MAXIMUM SPACING.



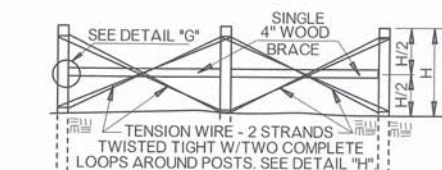
TYPICAL PLACEMENT FOR FENCE ALONG CURVES (WHEN R/W RADIUS IS LESS THAN 5000')



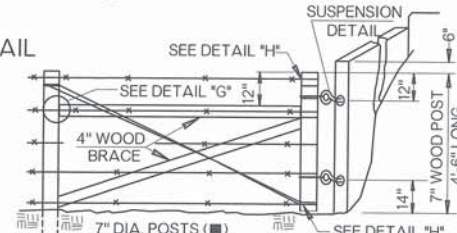
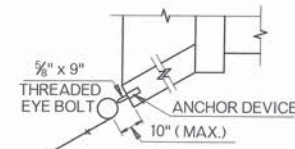
TYPICAL CROSS SECTIONS OF ACCEPTABLE STEEL LINE POSTS
POST SHALL MEET REQUIREMENTS OF AASHTO M 281.



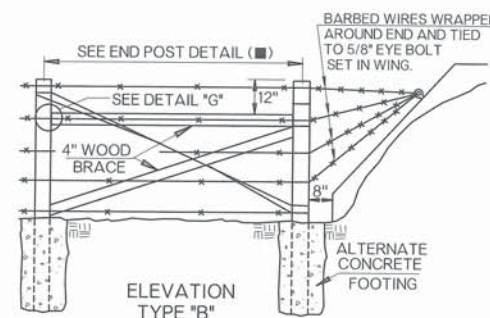
IF 3/2" DIA. x 8'-0" LONG GALV. STEEL (SCH. 40) PIPE IS USED AS ALTERNATIVE POST (■), THEN 2" DIA. GALV. STEEL PIPES (SCH. 40) WILL BE USED AS BRACING AND ATTACHED USING STANDARD CHAIN LINK FENCE HARDWARE MEETING THE REQUIREMENTS OF AASHTO M 181 & ASTM A53. SEE CHAINLINK DETAILS ON ROADWAY STANDARD RWF3-2.



CORNER & STRETCHER POSTS DETAIL ALTERNATIVE

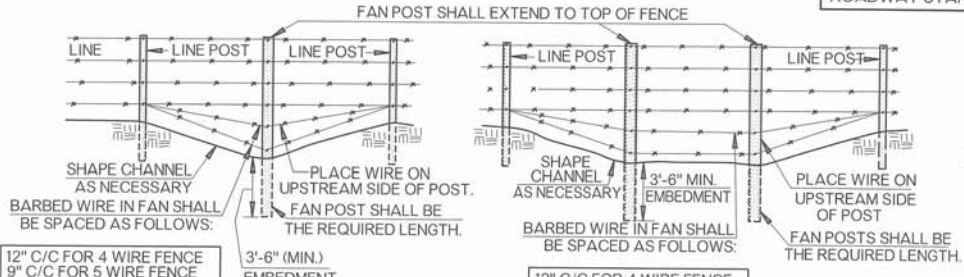


ELEVATION TYPE "A"

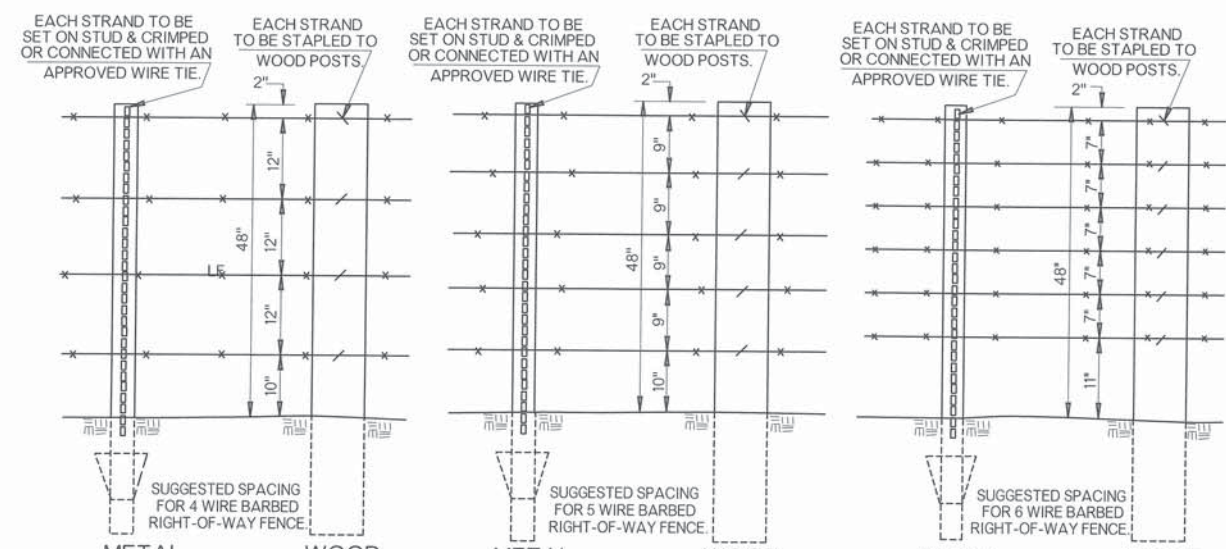


ELEVATION TYPE "B"

CONNECTIONS AT CULVERTS



TYPICAL FAN DETAILS
(FOR SMALL DRAINS AND IRREGULAR TERRAIN)

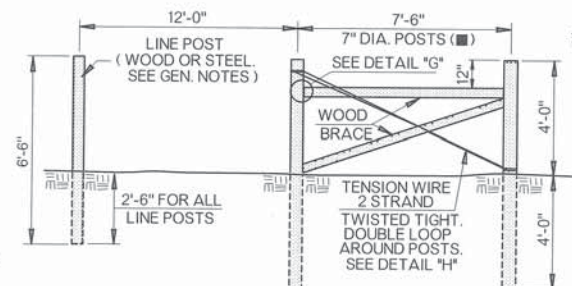


METAL WOOD
4 WIRE DETAIL

METAL WOOD
5 WIRE DETAIL

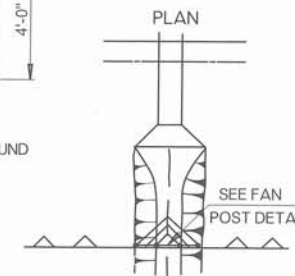
METAL WOOD
6 WIRE DETAIL

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

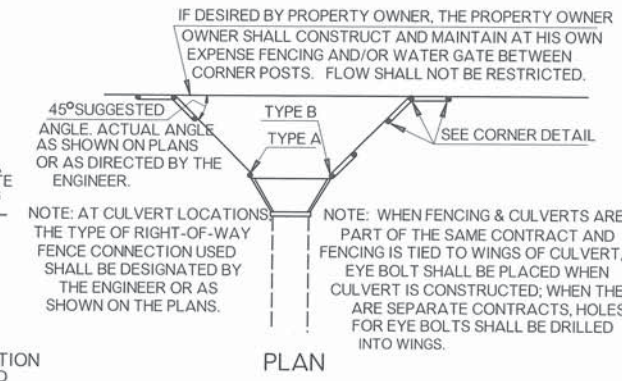


END POST DETAIL

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".



PLAN



NOTE: AT CULVERT LOCATIONS THE TYPE OF RIGHT-OF-WAY FENCE CONNECTION USED SHALL BE DESIGNATED BY THE ENGINEER OR AS SHOWN ON THE PLANS.

NOTE: WHEN FENCING & CULVERTS ARE PART OF THE SAME CONTRACT AND FENCING IS TIED TO WINGS OF CULVERT, EYE BOLT SHALL BE PLACED WHEN CULVERT IS CONSTRUCTED; WHEN THEY ARE SEPARATE CONTRACTS, HOLES FOR EYE BOLTS SHALL BE DRILLED INTO WINGS.

- 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

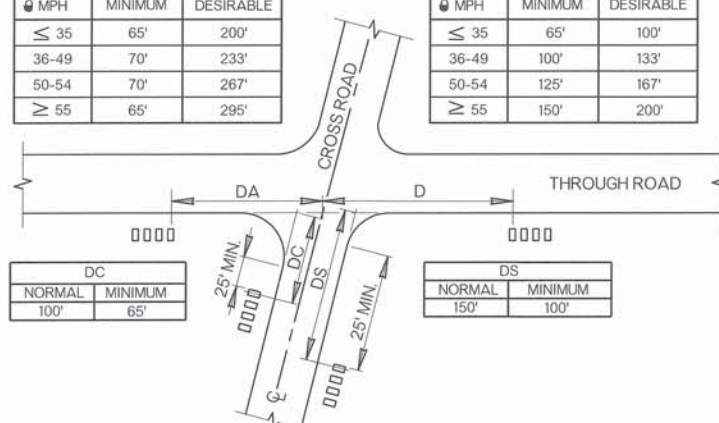
APPROVED BY ROADWAY ENGINEER: *Calvin A.* DATE: 02/11/15
ROADWAY DESIGN DIVISION STANDARD
DOT RIGHT-OF-WAY FENCE STYLE SWF (STRAND WIRE FENCE)
OKLAHOMA DEPARTMENT OF TRANSPORTATION 2009 SPECIFICATIONS
RWF2-2 1
R-67

OKLAHOMA DEPARTMENT OF TRANSPORTATION		
STANDARD REVISIONS		
DESCRIPTION	DATE	

● SPEED FACTOR MAY BE DESIGN SPEED, OBSERVED SPEED OR ASSIGNED SPEED BASED UPON PREDICTABLE GROWTH FACTORS OR PENDING IMPROVEMENTS.

THRU ROAD SPEED MPH	DA		THRU ROAD SPEED MPH	D	
	MINIMUM	DESIRABLE		MINIMUM	DESIRABLE
≤ 35	65'	200'	≤ 35	65'	100'
36-49	70'	233'	36-49	100'	133'
50-54	70'	267'	50-54	125'	167'
≥ 55	65'	295'	≥ 55	150'	200'

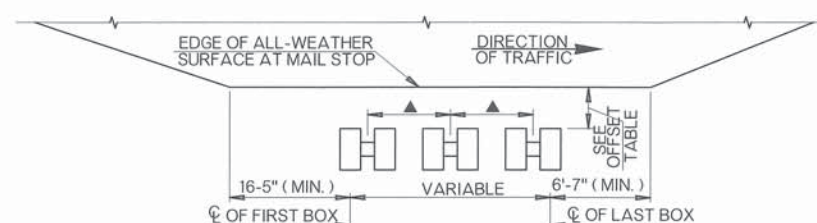
DC	DS	
	NORMAL	MINIMUM
100'	100'	100'
65'	65'	100'



SUGGESTED MINIMUM CLEARANCE DISTANCES TO NEAREST MAILBOX IN MAIL STOPS AT INTERSECTIONS

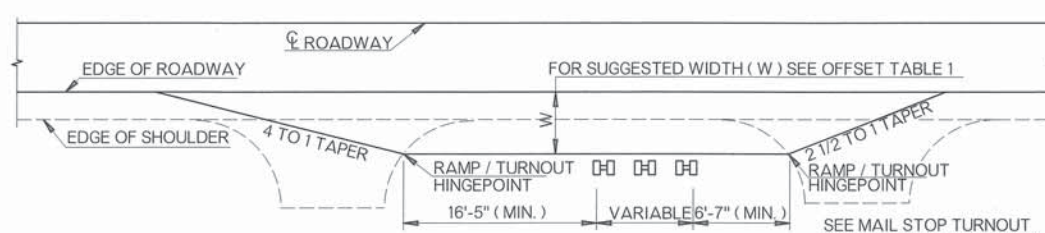
HIGHWAY TYPE AND TRAFFIC CONDITIONS	OFFSET TABLE			
	WIDTH OF ALL-WEATHER SURFACE OF TURNOUT OR AVAILABLE SHOULDER AT MAILBOX		DISTANCE ROADSIDE FACE OF MAILBOX IS TO BE OFFSET BEHIND EDGE OF TURNOUT OR USABLE SHOULDER	
	PREFERRED	MINIMUM	PREFERRED	MINIMUM
RURAL HIGHWAY ADT OVER 10,000 VPD	12'	8'	8' TO 12'	0
RURAL HIGHWAY ADT 1,500 TO 10,000 VPD	12'	8'	8' TO 12'	0
RURAL HIGHWAY ADT 400 TO 1,500 VPD	10'	8'	8' TO 12'	0
RURAL ROAD ADT UNDER 400 VPD	8'	6'	8' TO 12'	10"
RURAL ROAD ADT UNDER 50 VPD SPEED 40 MPH OR LESS	6'	2'	8' TO 12'	0
RESIDENTIAL STREET WITHOUT CURB OR ALL-WEATHER SHOULDER	6'	0	8' TO 12'	10" ●
CURBED STREET	NOT APPLICABLE		8" TO 12" BEHIND FACE OF CURB	6" BEHIND FACE OF CURB

ADT-AVERAGE DAILY TRAFFIC, THROUGH ROAD ONLY
 VPD-VEHICLES PER DAY
 ● IF TURNOUT IS PROVIDED, THIS MAY BE REDUCED TO ZERO.



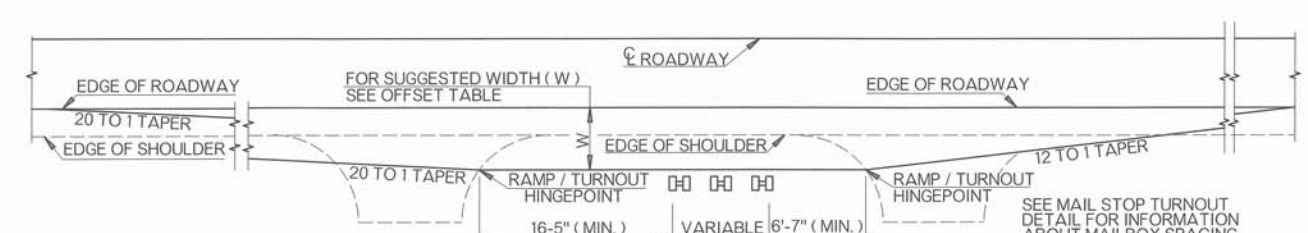
MAIL STOP TURNOUT DETAIL

▲ RECOMMENDED MINIMUM SPACING IS 3/4 OF THE DIMENSION FROM THE GROUND LINE TO THE BOTTOM OF THE MAILBOX



MAIL STOP LAYOUT

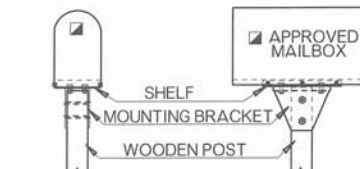
FOR ROADS CARRYING TRAFFIC AT 40 MPH OR LESS OR FOR LOCAL AND COLLECTOR ROADS



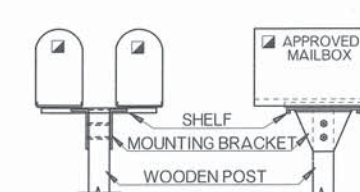
MAIL STOP LAYOUT

ROADS CARRYING TRAFFIC AT SPEED OVER 40 MPH

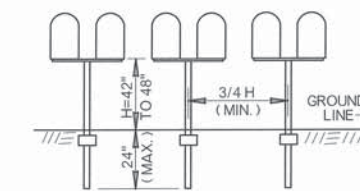
MAILBOX DESIGN TYPE	DIMENSIONS (NOM.)		
	LENGTH	WIDTH	HEIGHT
1	19"	6 1/2"	8 1/2"
1-A	21"	8"	10 1/2"
2	23 1/2"	11 1/2"	13 1/2"



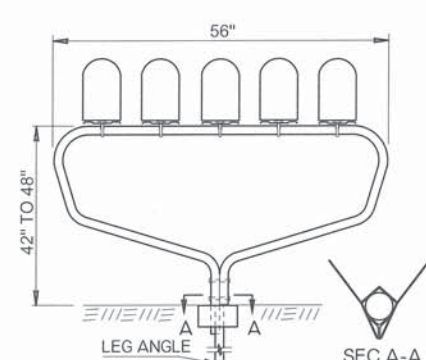
MAILBOX INSTALLATION - SINGLE WOODEN POST SUPPORT & BRACKET ASSEMBLY DETAILS



MAILBOX INSTALLATION - MULTIPLE (DOUBLE OR TWIN BOX)



POST SPACING DETAIL MULTIPLE BOX INSTALLATION SINGLE POST SERIES



MAILBOX INSTALLATION - MULTIPLE (MULTIPLE BOX SUPPORT DETAILS) MAXIMUM NUMBER OF MAILBOXES = 5

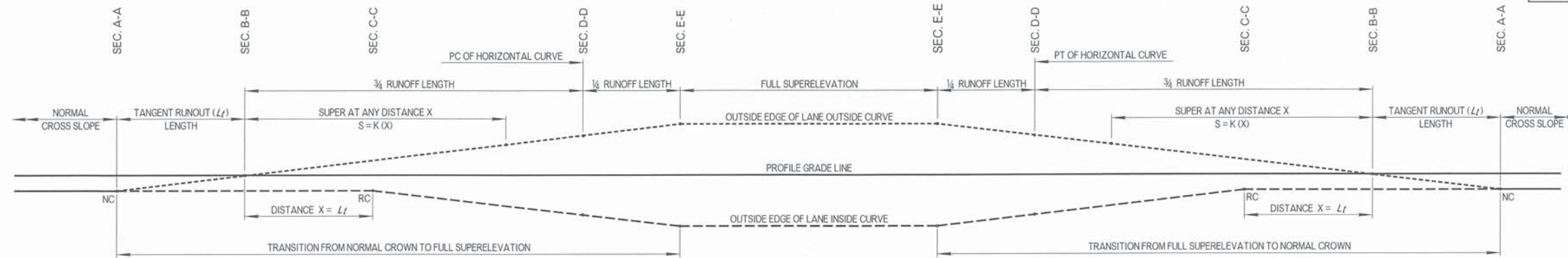
- GENERAL NOTES
- ALL CONSTRUCTION AND MATERIAL REQUIREMENTS SHALL BE IN ACCORDANCE WITH THE 2009 ODOT STANDARD SPECIFICATIONS.
 - MAILBOX INSTALLATION, SINGLE OR MULTIPLE TYPE, SHALL BE OF A DESIGN AND MATERIAL THAT HAS BEEN CRASH TESTED AND APPROVED. OTHER DESIGNS OR MAILBOX TYPES SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL.
 - IF MAILBOX IS INSTALLED IN AN AREA WITH GUARDRAIL, MAILBOX AND/OR POST ASSEMBLY SHOULD BE BEHIND OR FLUSH WITH FACE OF RAIL.
 - PRODUCER AND CONTRACTOR SHALL AVOID PATENT INFRINGEMENT OF THE MAILBOX SUPPORT ASSEMBLY AND SHALL SAVE THE STATE HARMLESS IN THE USE OF ANY MAILBOX SUPPORT ASSEMBLY.
 - ALTERNATE WOODEN POST SUPPORT INSTALLATIONS MAY BE USED IN LIEU OF METAL PIPE SUPPORT UNITS IF WOODEN COMPONENTS CONFORM TO CURRENT SPECIFICATIONS.
 - PRICE OF EACH MAILBOX INSTALLATION, SINGLE OR MULTIPLE, INCLUDES PAYMENT FOR INSTALLATION OF THE POST SYSTEM, SUPPORT POST, ALL ATTACHMENT HARDWARE AND MOUNTING OF THE MAILBOX. PAYMENT FOR THE MAILBOX WILL BE PAID FOR BY THE EACH AND SEPARATELY FROM THE SUPPORT SYSTEM.
 - IF MAILBOX IS INSTALLED BEHIND CURB, ANY SIDEWALKS WILL REQUIRE A MINIMUM 3'-0" OF USABLE SPACE BEHIND THE MAILBOX.

BASIS OF PAYMENT		
ITEM NO.	ITEM	UNIT
629 (A)	MAILBOX INSTALLATION - SINGLE	EA
629 (B)	MAILBOX INSTALLATION - MULTIPLE	EA
629 (C)	MAILBOX	EA
629 (D)	REMOVAL OF MAILBOX INSTALLATION	EA
629 (E)	REMOVE AND RESET MAILBOX	EA

MAILBOX DESIGN TYPE(S) AND LOCATION(S) SHALL BE SPECIFIED IN THE PLANS.

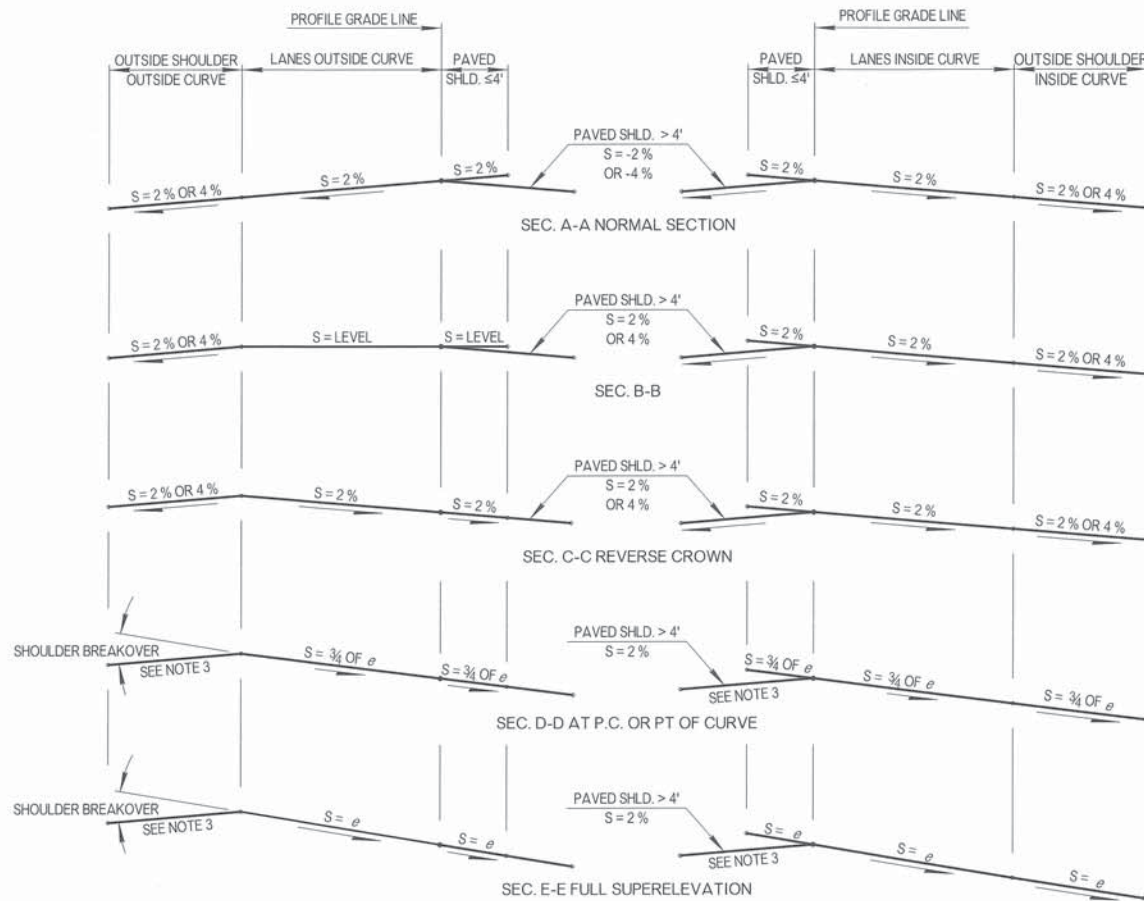
APPROVED BY ROADWAY ENGINEER: *Calvin A.* DATE: 02/11/15
 ROADWAY DESIGN DIVISION STANDARD
DOT MAILBOX INSTALLATION

OKLAHOMA DEPARTMENT OF TRANSPORTATION		
STANDARD REVISIONS		
DESCRIPTION	DATE	

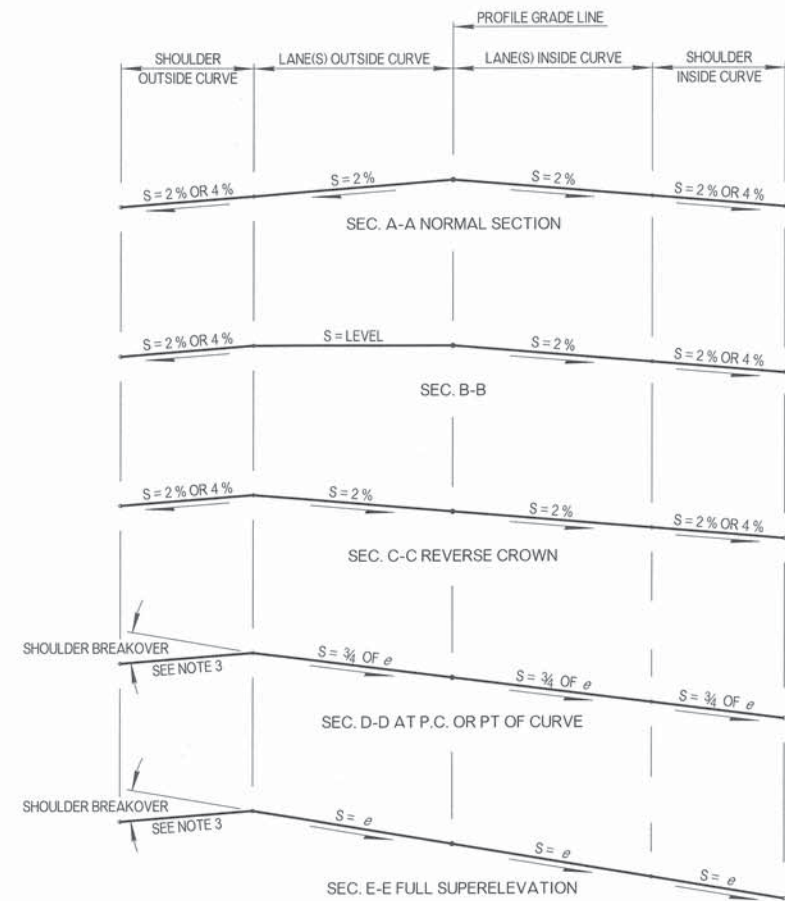


PROFILE FOR UNDIVIDED (CROWN SECTION) AND DIVIDED HIGHWAYS
PROFILE GRADE IS FINISH GRADE LINE

RUNOFF LENGTH ADJUSTMENTS		
NUMBER OF LANES ROTATED n_f	ADJUSTMENT FACTOR b_w	LENGTH INCREASE RELATIVE TO 1 LANE $= n_f b_w$
1.0	1.00	1.00
1.5	0.83	1.25
2.0	0.75	1.50
2.5	0.70	1.75
3.0	0.67	2.00
3.5	0.64	2.25



TYPICAL SECTIONS FOR DIVIDED HIGHWAYS
NOTE: FOR DIVIDED HIGHWAYS WITH MEDIAN WIDTH GREATER THAN 46 FEET, TREAT EACH DIRECTION AS A SEPARATE ROADWAY.
PROFILE GRADE IS FINISH GRADE LINE



TYPICAL SECTIONS FOR UNDIVIDED HIGHWAYS
PROFILE GRADE IS FINISH GRADE LINE

SUPERELEVATION NOMENCLATURE
 b_w = ADJUSTMENT FACTOR FOR ROTATED LANES.
 e_d = DESIGN SUPERELEVATION RATE (%)
 L_r = MINIMUM LENGTH OF SUPERELEVATION RUNOFF.
 L_t = MINIMUM LENGTH OF TANGENT RUNOUT.
 n_f = NUMBER OF LANES ROTATED.
 NC = NORMAL CROWN.
 RC = REVERSE CROWN
 S = CROSS SLOPE (%).
 V_d = DESIGN SPEED (MILES PER HOUR)
 $K = \frac{e_d \cdot D \cdot L_r}{L_r}$ (FT/FT)

- GENERAL NOTES**
- THIS STANDARD DRAWING PROVIDES BASIC GUIDELINES FOR SUPERELEVATION DEVELOPMENT FOR TWO OR FOUR LANE, OPEN ROADWAY CONDITIONS ONLY; FOR OTHER SUPERELEVATION DESIGN CRITERIA, SEE THE 2011 AASHTO 'A POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS'.
 - FOR CURVES WITH SPIRALS, RUNOFF LENGTH IS EQUAL TO SPIRAL LENGTH, WITH FULL SUPERELEVATION REACHED AT S.C. OR C.S. OF CURVE. CHECK RAMP GRADES AND SUPERELEVATION TRANSITIONS AT RAMP TERMINALS DURING STAKING AND MAKE ADJUSTMENTS AS REQUIRED TO OBTAIN SMOOTH PROFILES FOR BOTH EDGES OF THE RAMP PAVEMENT. CROSSOVER CROWN LINE BREAKOVER SHALL NOT EXCEED 5.0% (CALCULATED AS THE ALGEBRAIC DIFFERENCE IN CROSS SLOPES OF ADJACENT PAVEMENTS), WITHOUT THE APPROVAL OF ODOT ENGINEER.
 - IF PRACTICAL THE SHOULDER BREAKOVER SHOULD NOT EXCEED 0.07 FEET PER FOOT, CALCULATED AS THE ALGEBRAIC DIFFERENCE IN CROSS SLOPE OF PAVEMENT AND SHOULDER SURFACES. IT IS ACCEPTABLE FOR THE BREAKOVER TO BE 8%. ROTATE SHOULDER TO MAINTAIN DESIRABLE BREAKOVER. CONTINUOUS SHOULDER CROSS SLOPE SHOULD BE AT LEAST 1% TO INSURE PROPER DRAINAGE.
 - CROSS SLOPE (S) IS NORMALLY SET AT 3/4 (75%) SUPER AT THE P.C. AND PT OF A CURVE, HOWEVER THE DESIGNER MAY ADJUST THIS PERCENTAGE TO BE FROM 60% TO 90%, TO ACCOMMODATE SITE CONDITIONS.
 - THE SUPERELEVATION TABLE FOR LOW SPEED URBAN STREETS MAY BE USED WHERE THE DESIGN SPEED IS NOT GREATER THAN 45 MPH.

SUPERELEVATION RATE GUIDELINES

$e_{max} = 6.0\%$ ELEVATED OR INTERMITTENTLY ELEVATED ROADWAYS (BRIDGES, BOXES), ROADWAYS WITH FREQUENT SLOW MOVING VEHICLES, URBAN STREETS WHERE ROADSIDE DEVELOPMENT PRECLUDES HIGHER SUPERELEVATION RATE

$e_{max} = 8.0\%$ DEPRESSED OR GROUND-LEVEL ROADWAYS; ROADWAYS ON STEEP OR LONG DOWNGRADES, ROADWAYS WHERE DRAINAGE CONSIDERATIONS ARE PRIMARY LOW VOLUME GRAVEL-SURFACED ROADS

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

DOT

SUPERELEVATION

OKLAHOMA DEPARTMENT OF TRANSPORTATION	
STANDARD REVISIONS	
DESCRIPTION	DATE


SUPERELEVATION e_s	SUPERELEVATION TABLE (LOW SPEED URBAN STREETS)																				SUPERELEVATION e_s	
	$V_d = 15$ mph			$V_d = 20$ mph			$V_d = 25$ mph			$V_d = 30$ mph			$V_d = 35$ mph			$V_d = 40$ mph			$V_d = 45$ mph			
	RADIUS (FT.)		L_r (FT.)	RADIUS (FT.)		L_r (FT.)	RADIUS (FT.)		L_r (FT.)	RADIUS (FT.)		L_r (FT.)	RADIUS (FT.)		L_r (FT.)	RADIUS (FT.)		L_r (FT.)	RADIUS (FT.)			L_r (FT.)
	$n_{f=1}$	$n_{f=2}$		$n_{f=1}$	$n_{f=2}$		$n_{f=1}$	$n_{f=2}$		$n_{f=1}$	$n_{f=2}$		$n_{f=1}$	$n_{f=2}$		$n_{f=1}$	$n_{f=2}$		$n_{f=1}$	$n_{f=2}$		
-2.0% (NC)	50	31	46	107	32	49	198	34	51	333	36	55	510	39	58	762	41	62	1,039	44	67	-2.0% (NC)
2.0% (RC)	44	31	46	92	32	49	165	34	51	273	36	55	408	39	58	593	41	62	794	44	67	2.0% (RC)
2.2%	44	34	51	91	36	54	134	38	57	270	40	60	404	43	64	586	46	68	785	49	73	2.2%
2.4%	44	37	55	91	39	58	163	41	62	268	44	65	400	46	70	580	50	74	776	53	80	2.4%
2.6%	44	40	60	90	42	63	161	45	67	265	47	71	396	50	75	573	54	81	767	58	87	2.6%
2.8%	43	43	65	89	45	68	160	48	72	263	51	76	393	54	81	567	58	87	758	62	93	2.8%
3.0%	43	46	69	89	49	73	159	51	77	261	55	82	389	58	87	561	62	93	750	67	100	3.0%
3.2%	43	49	74	88	52	78	158	55	82	259	58	87	385	62	93	556	66	99	742	71	107	3.2%
3.4%	43	52	78	88	55	83	157	58	87	256	62	93	382	66	99	550	70	106	734	76	113	3.4%
3.6%	42	55	83	87	58	88	155	62	93	254	65	98	378	70	105	544	74	112	726	80	120	3.6%
3.8%	42	58	88	87	62	92	154	65	98	252	69	104	375	74	110	539	79	118	718	84	127	3.8%
4.0%	42	62	92	86	65	97	153	69	103	250	73	109	371	77	116	533	83	124	711	89	133	4.0%
4.2%	41	65	97	85	68	102	153	72	108	248	76	115	368	81	122	528	87	130	703	93	140	4.2%
4.4%	41	68	102	85	71	107	152	75	113	246	80	120	365	85	128	523	91	137	696	98	147	4.4%
4.6%	41	71	106	84	75	112	151	79	118	244	84	125	361	89	134	518	95	143	689	102	153	4.6%
4.8%	41	74	111	84	78	117	150	82	123	242	87	131	358	93	139	513	99	149	682	107	160	4.8%
5.0%	41	77	115	83	81	122	149	86	129	240	91	136	355	97	145	508	103	155	675	111	167	5.0%
5.2%	40	80	120	83	84	126	148	89	134	238	95	142	352	101	151	503	108	161	668	116	173	5.2%
5.4%	40	83	125	82	88	131	147	93	139	236	98	147	349	105	157	498	112	168	662	120	180	5.4%
5.6%	40	86	129	82	91	136	146	96	144	234	102	153	346	108	163	494	116	174	655	124	187	5.6%
5.8%	40	89	134	81	94	141	145	99	149	233	105	158	343	112	168	489	120	180	649	129	193	5.8%
6.0%	39	92	138	81	97	146	144	103	154	231	109	164	340	116	174	485	124	186	643	133	200	6.0%

NOTES - LOW-SPEED URBAN STREETS TABLE

1. THE VALUES LISTED ON THIS TABLE WERE CALCULATED USING DISTRIBUTION METHOD 2.
2. SUPERELEVATION MAY BE OPTIONAL ON LOW-SPEED URBAN STREETS.
3. THE SUPERELEVATION RUNOFF LENGTH (L_r) WAS BASED ON THE NUMBER OF LANES ROTATED. SINGLE LANE ROTATED IS TYPICAL OF 2 LANE HIGHWAYS, AND TWO LANES ROTATED IS TYPICAL OF 4 LANE HIGHWAYS.
4. FOR THE TANGENT RUNOUT LENGTH (L_t), USE THE FORMULA: $\frac{2.0\% (D)}{K}$, WHERE K IS $\frac{e \times (D)}{L_r (FT)}$.
5. VALUES OF RADIUS AND SUPERELEVATION RUNOFF LENGTHS SHALL NOT BE INTERPOLATED OR ROUNDED UP.

APPROVED BY ROADWAY ENGINEER: *Caleb F. A.* DATE: 04/14/15

ROADWAY DESIGN DIVISION STANDARD

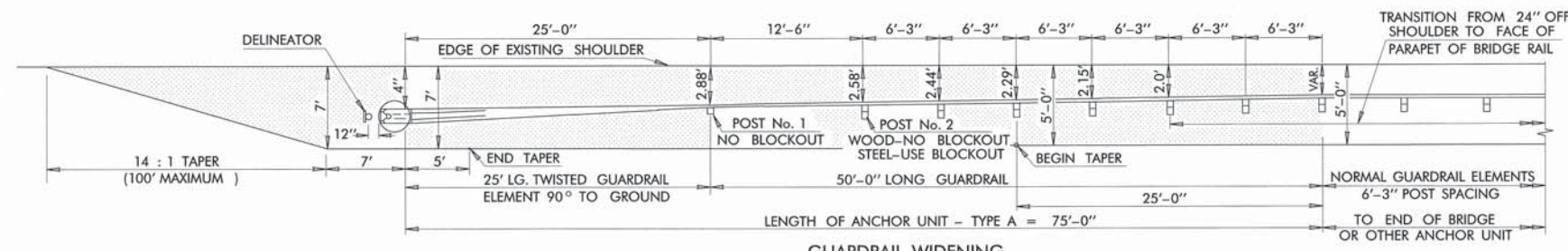


SUPERELEVATION TABLE
LOW SPEED URBAN STREETS

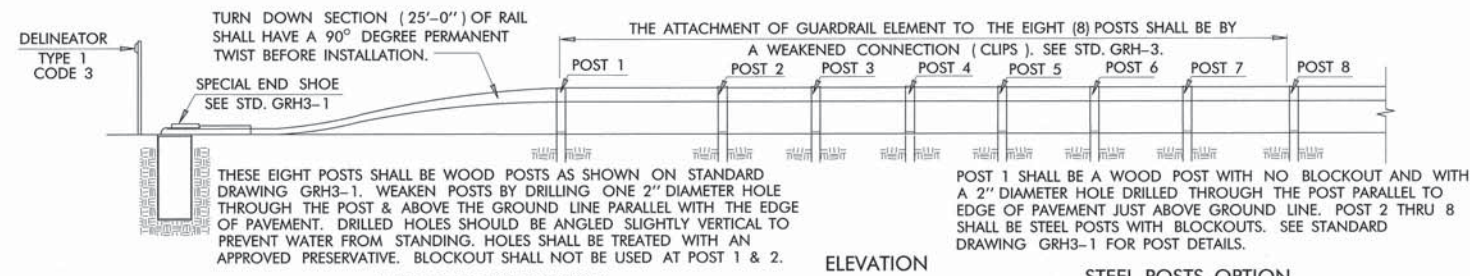
OKLAHOMA DEPARTMENT OF TRANSPORTATION
2009 SPECIFICATIONS

SUEL2-3	2
R-71	

DESCRIPTION	REVISIONS	DATE



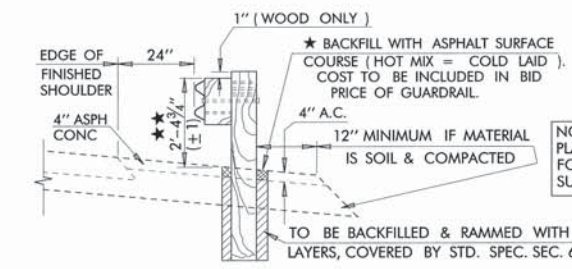
GUARDRAIL WIDENING



WOOD POSTS OPTION

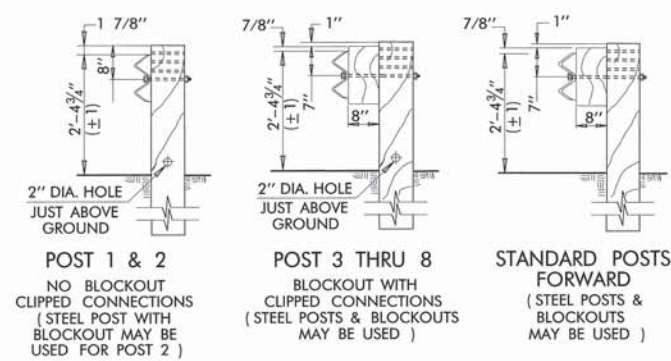
ANCHOR UNIT - TYPE A

STEEL POSTS OPTION

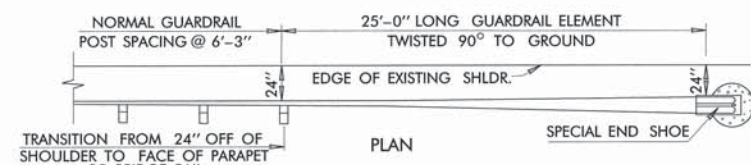


DETAIL OF GUARDRAIL POST IN SHOULDER BASE WIDENING

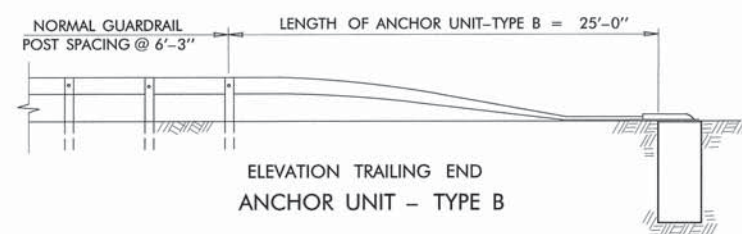
- ★ SEE 2009 STD. SPECIFICATIONS-SEC. 411, ASPH SURFACE COURSE (HOT MIX-COLD LAID)
- ★ MEASURE DIRECTLY BELOW RAIL, GUARDRAIL TO BE INSTALLED THIS DIMENSION. WHEN INSTALLING GUARDRAIL IN AN AREA WITH NO SHOULDER WIDENING THE RAIL HEIGHT SHALL BE MEASURED AS FOLLOWS: FOR NEGATIVE GRADE SHOULDERS, MEASURE 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.



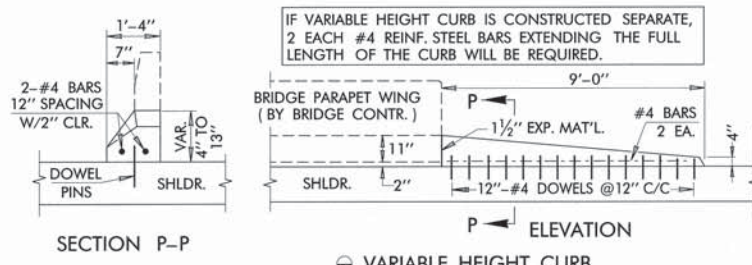
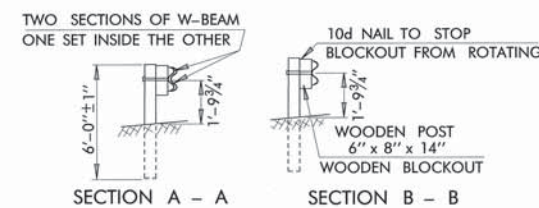
ANCHOR UNIT - TYPE A - APPROACH END



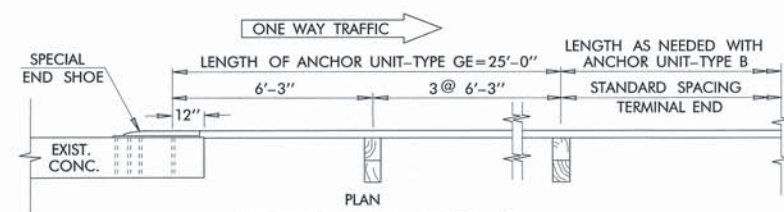
ONE WAY TRAFFIC →



ELEVATION TRAILING END ANCHOR UNIT - TYPE B



● VARIABLE HEIGHT CURB



ANCHOR UNIT - TYPE GE ONLY TO BE USED AT EXITTING ENDS OF ONE WAY BRIDGES

GENERAL NOTES

- ALL CONSTRUCTION AND MATERIAL REQUIREMENTS SHALL BE IN ACCORDANCE WITH THE 2009 ENGLISH STANDARD SPECIFICATIONS.
- THE BRIDGE CONTRACTOR SHALL PROVIDE HOLES FOR THE CONNECTION OF W-BEAM TERMINAL CONNECTOR (SPECIAL END SHOE) TO BRIDGE RAIL AND SLOPED FACE PARAPET. RETROFIT CONNECTIONS FOR GUARDRAIL (SPECIAL END SHOE) SHALL BE FIELD DRILLED BY THE SURFACING CONTRACTOR.
- GUARDRAIL COMPONENTS SHALL MEET NCHRP-350, THE APPLICABLE STANDARDS OF "A GUIDE TO STANDARDIZED HIGHWAY BARRIER RAIL HARDWARE" PREPARED AND APPROVED BY THE AASHTO-ARTBA-AGC JOINT COMMITTEE, TECHNICAL BULLETIN NO. 268 B.
- POST SPACING AND FACE OF RAIL ALIGNMENT REMAINS THE SAME.

BASIS OF PAYMENT		
ITEM NO.	ITEM	UNIT
623.06(F)	GUARDRAIL ANCHOR UNIT (TYPE ▲)	EA.

▲ TYPE OF GUARDRAIL ANCHOR UNIT TO BE SPECIFIED.



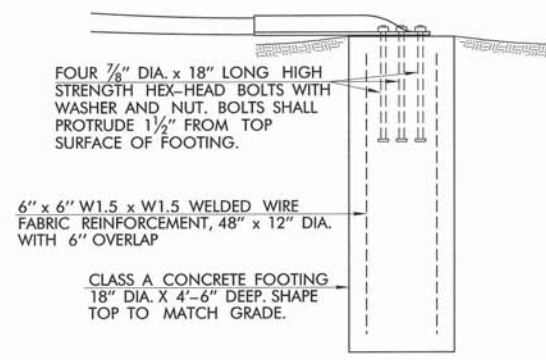
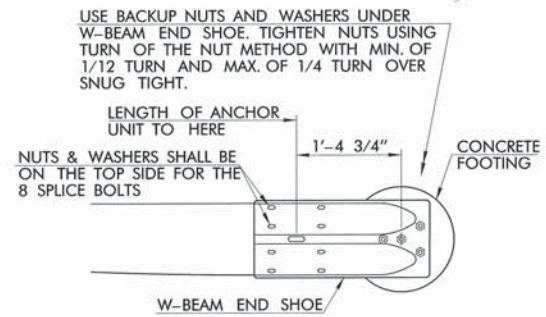
APPROVED BY TRAFFIC ENGINEER: *Daniel Smith* DATE: 4/9/12

TRAFFIC MAINTENANCE STANDARD
GUARDRAIL ANCHOR UNITS
(1 OF 2)
(27 3/4" SYSTEM)

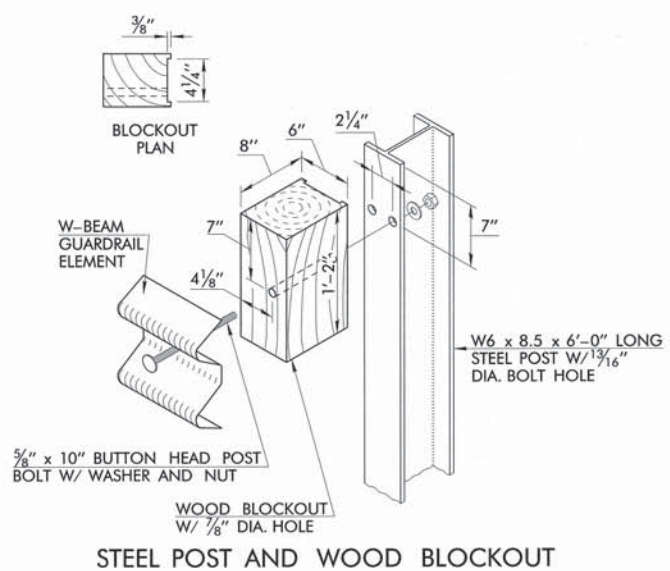
2009 SPECIFICATIONS

GRAU1-1	00
M-025	

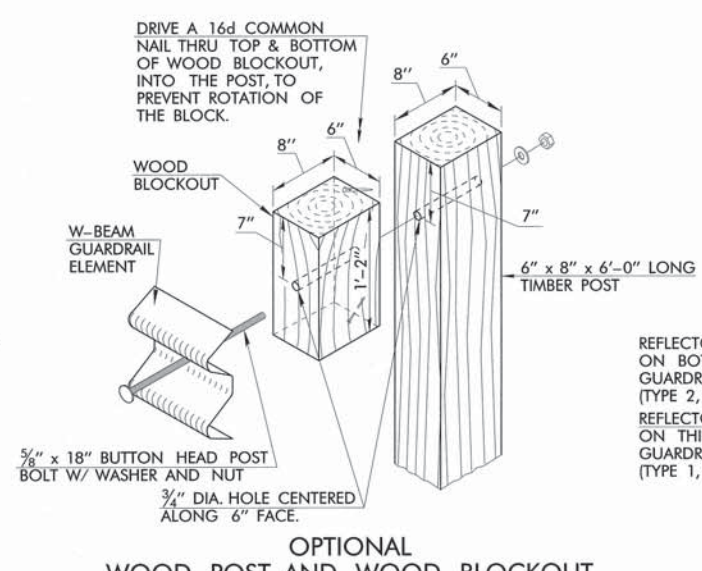
DESCRIPTION	REVISIONS	DATE



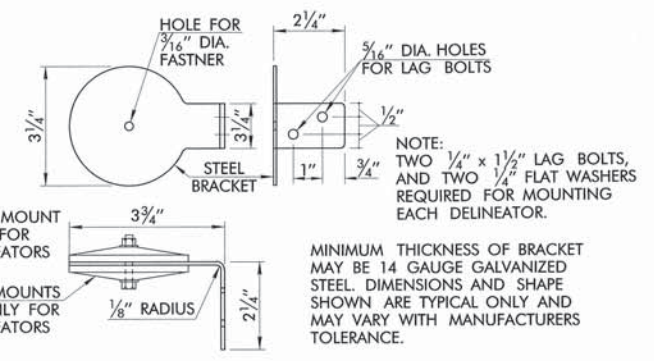
GROUND ANCHOR FOOTING DETAIL



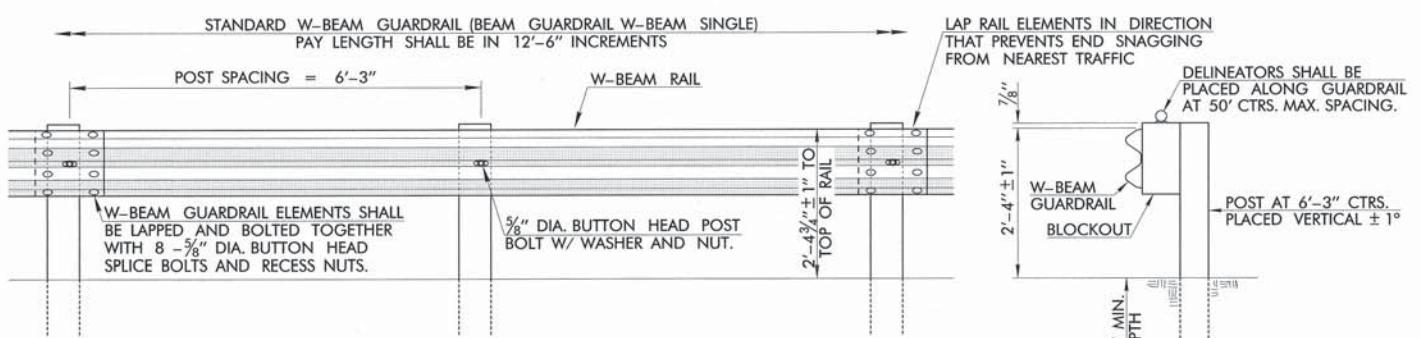
STEEL POST AND WOOD BLOCKOUT



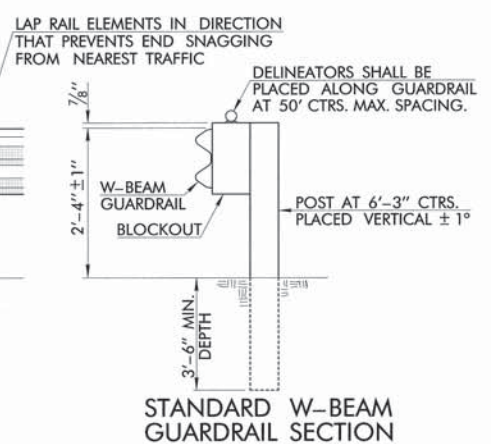
OPTIONAL WOOD POST AND WOOD BLOCKOUT



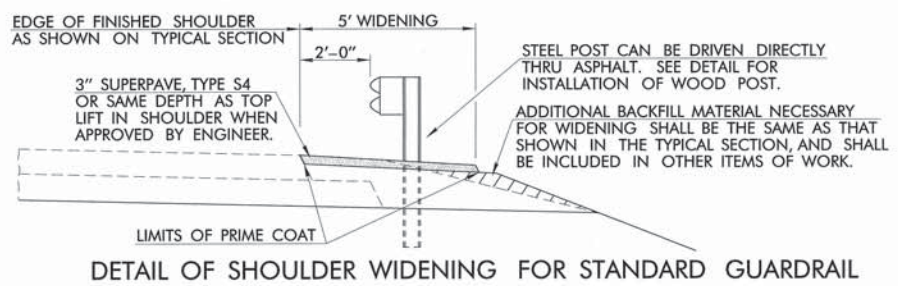
TYPICAL BRACKET FOR MOUNTING 3 1/4" ROUND DELINEATOR TO GUARD RAIL BLOCKOUT



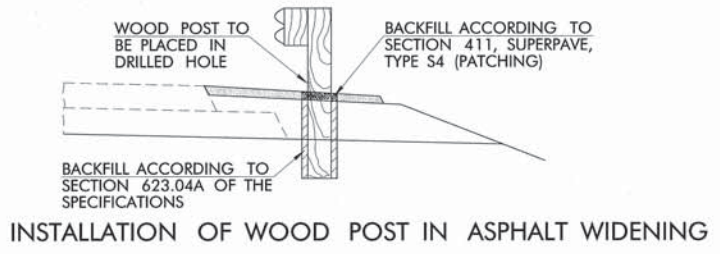
STANDARD W-BEAM GUARDRAIL ELEVATION



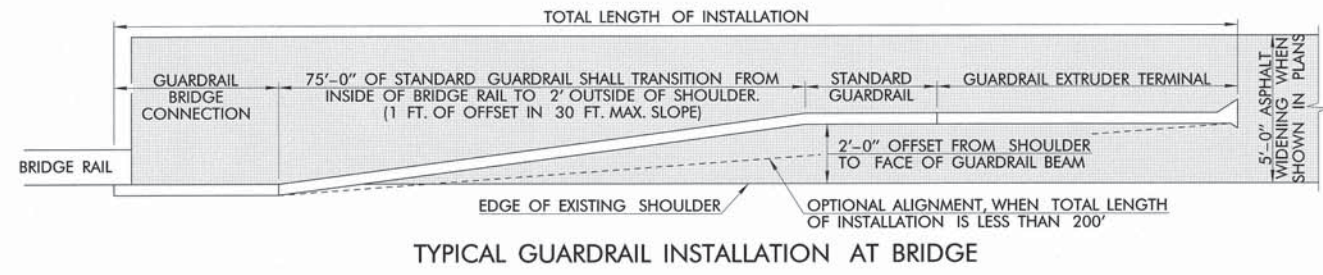
STANDARD W-BEAM GUARDRAIL SECTION



DETAIL OF SHOULDER WIDENING FOR STANDARD GUARDRAIL



INSTALLATION OF WOOD POST IN ASPHALT WIDENING



TYPICAL GUARDRAIL INSTALLATION AT BRIDGE

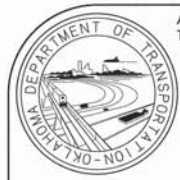
OPTIONAL TYPE POSTS OR BLOCKOUTS FOR STANDARD GUARDRAIL

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 RECYCLED MATERIAL, RUBBER, PLASTIC AND COMPOSITE PRODUCTS) 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 NHCRC-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. WOOD POSTS AND BLOCKOUTS 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 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).

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

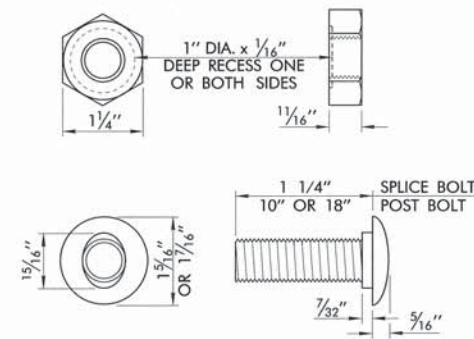
NOTE: PAYITEM GUARDRAIL ANCHOR UNIT TYPE B INCLUDES ALL LABOR AND MATERIALS TO INSTALL 25'-0" TWISTED RAIL ELEMENT, W-BEAM END SHOE, CONC. FOOTING, AND FOUR ANCHOR BOLTS.



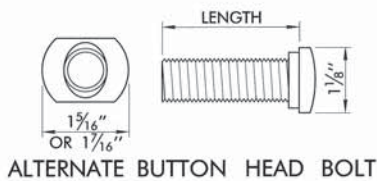
APPROVED BY TRAFFIC ENGINEER: *Daryl Smaly* DATE: 4/9/12
TRAFFIC MAINTENANCE STANDARD

GUARDRAIL AND HARDWARE
(1 OF 3)
(27 3/4" SYSTEM)

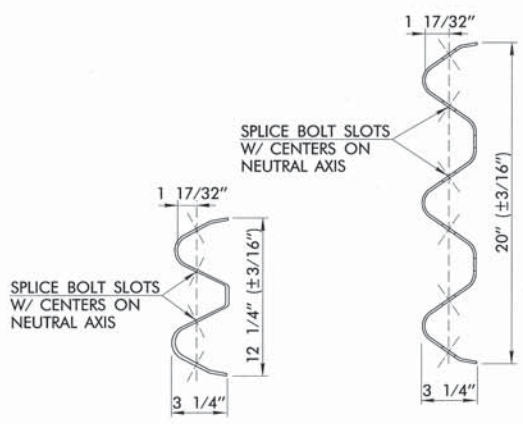
DESCRIPTION	REVISIONS	DATE



5/8" DIA. BUTTON HEAD BOLT & RECESS NUT

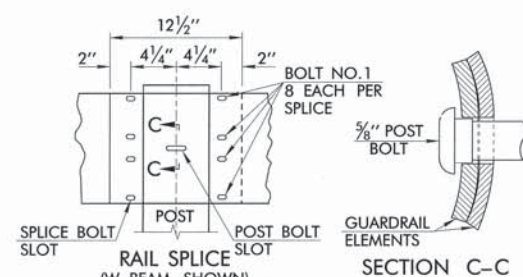


ALTERNATE BUTTON HEAD BOLT



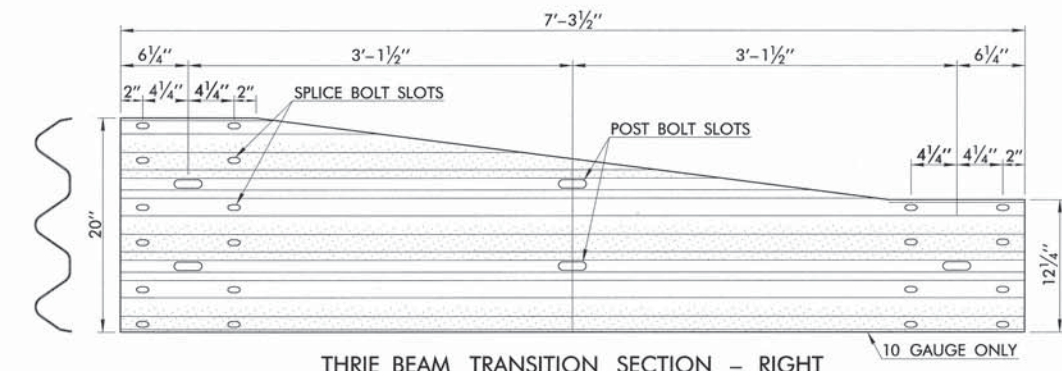
W-BEAM GUARDRAIL SECTION

THRIE BEAM GUARDRAIL SECTION

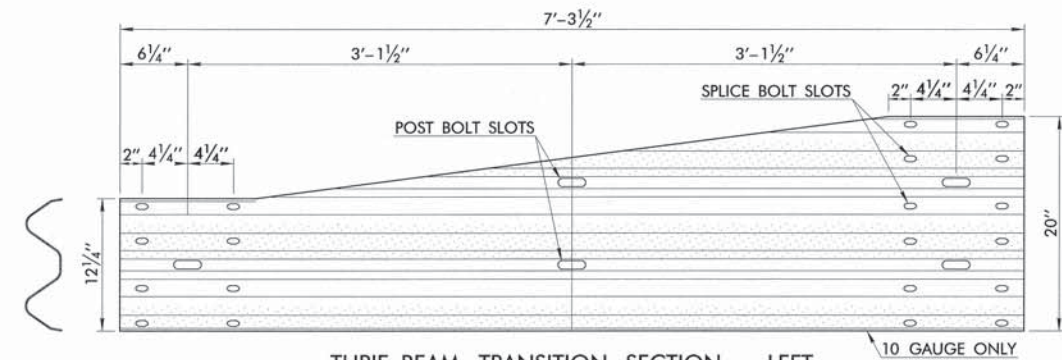


RAIL SPLICE (W-BEAM SHOWN)
 GUARDRAIL SHALL BE LAPPED IN THE DIRECTION OF NEAREST TRAFFIC AT ALL LOCATIONS WHERE SPLICES OCCUR (EXCEPT AT NARROW OR ONE LANE BRIDGE APPROACHES, WHERE LAPS SHALL BE TOWARD THE BRIDGE ON BOTH SIDES OF THE APPROACH ROADWAY).

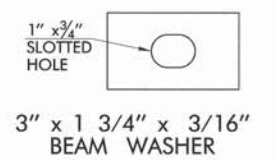
RAIL SPLICE



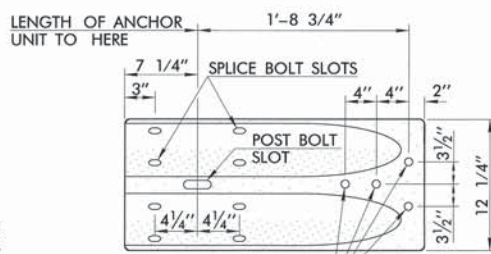
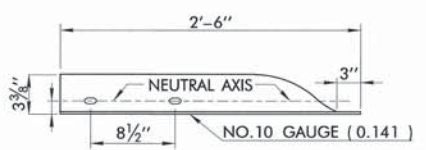
THRIE BEAM TRANSITION SECTION - RIGHT (THRIE BEAM TO W-BEAM CONNECTION)



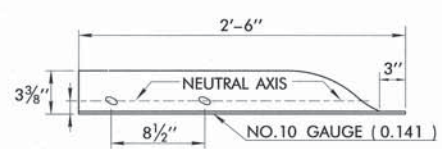
THRIE BEAM TRANSITION SECTION - LEFT (THRIE BEAM TO W-BEAM CONNECTION)



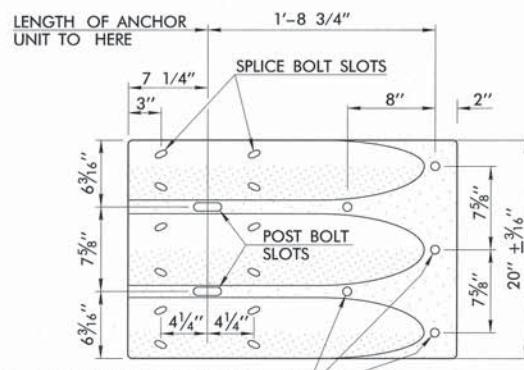
3" x 1 3/4" x 3/16" BEAM WASHER



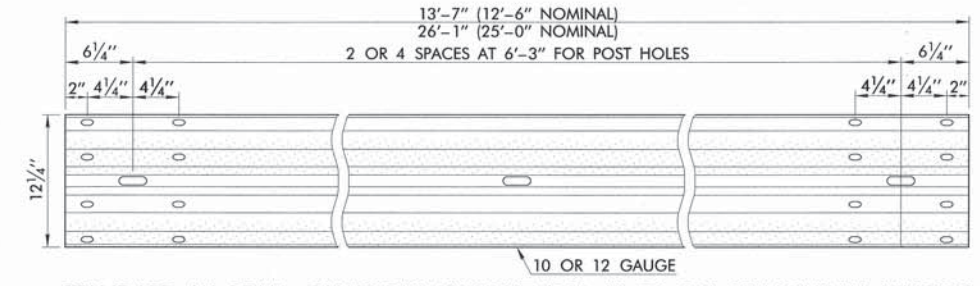
W-BEAM TERMINAL CONNECTION (END SHOE)
 4 - 1" HOLES FOR 7/8" DIA. BOLTS WITH NUTS AND STEEL WASHERS.



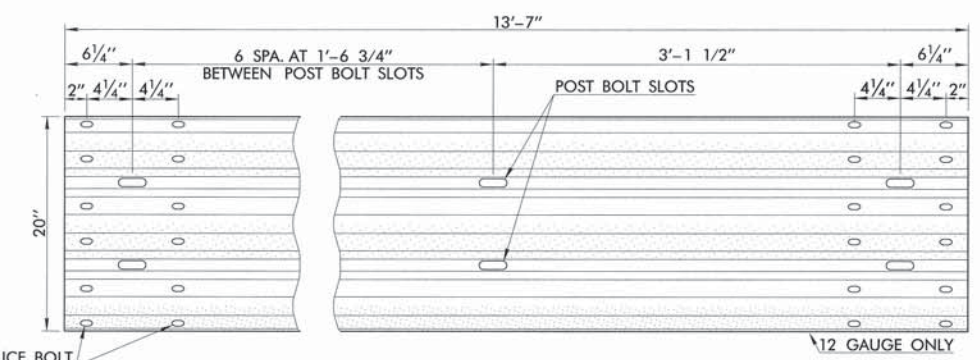
NO. 10 GAUGE (0.141)



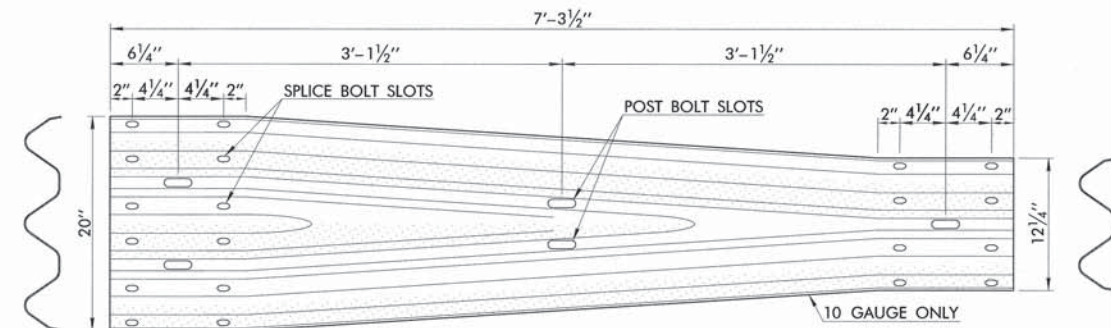
THRIE BEAM TERMINAL CONNECTION 10 GAUGE ONLY (END SHOE)
 5 - 1" HOLES FOR 7/8" DIA. BOLTS WITH NUTS AND STEEL WASHERS.



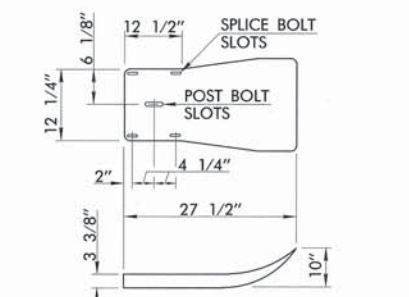
STANDARD W-BEAM GUARDRAIL ELEMENT (12'-6" OR 25'-0" NOMINAL LENGTH)



THRIE BEAM GUARDRAIL ELEMENT FOR BRIDGE CONNECTION



THRIE BEAM TRANSITION SECTION (6'-3" NOMINAL LENGTH) (THRIE BEAM TO W-BEAM CONNECTION)



W-BEAM END SECTION (FLARED)

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



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

TRAFFIC MAINTENANCE STANDARD

GUARDRAIL AND HARDWARE
 (2 OF 3)
 (27 3/4" SYSTEM)

2009 SPECIFICATIONS

GRH2-1	00
	M-028

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: *Sheldon Gray* DATE: 3/21/11

TRAFFIC STANDARD
 TRAFFIC CONTROL STANDARD
 TRAFFIC CONTROL CONSTRUCTION NOTES

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
100 FEET PER LANE

DOWNSTREAM TAPERS
(USE IS OPTIONAL)

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
ASPHALT	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
	INTERMEDIATE LIFT	X	X	X	X	X
	MILLED SURFACE	X	X	X	X	X
CONCRETE	FINAL LIFT	X	X			
	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.

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.

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

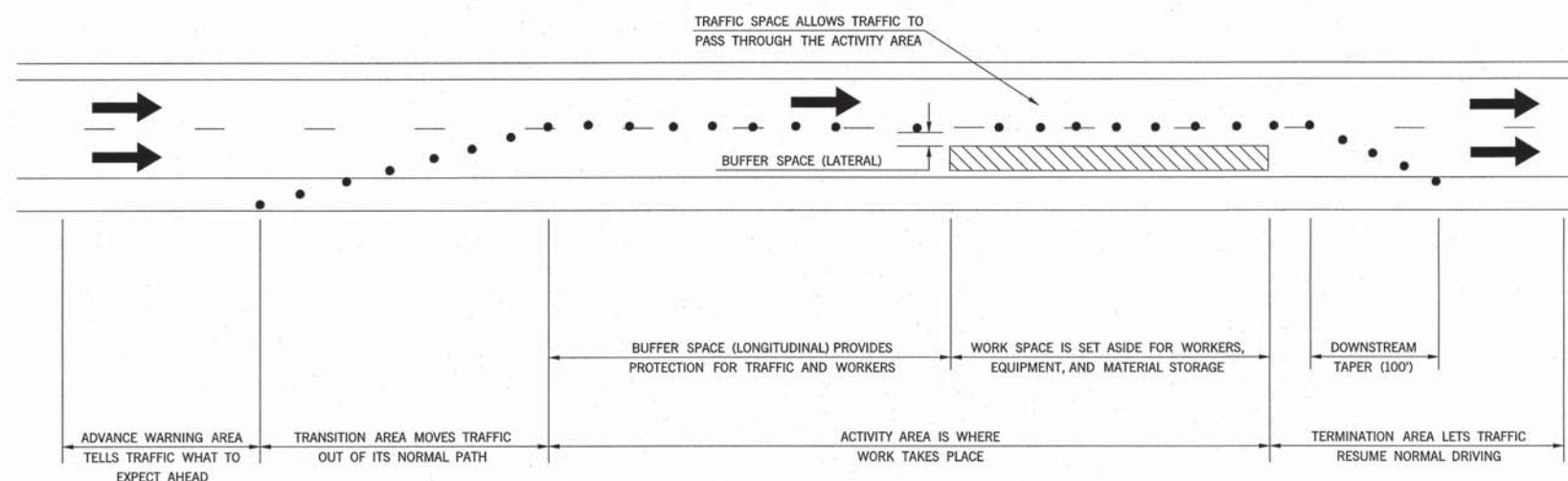


APPROVED BY
TRAFFIC ENGINEER: *David Smith* DATE: 6/23/10

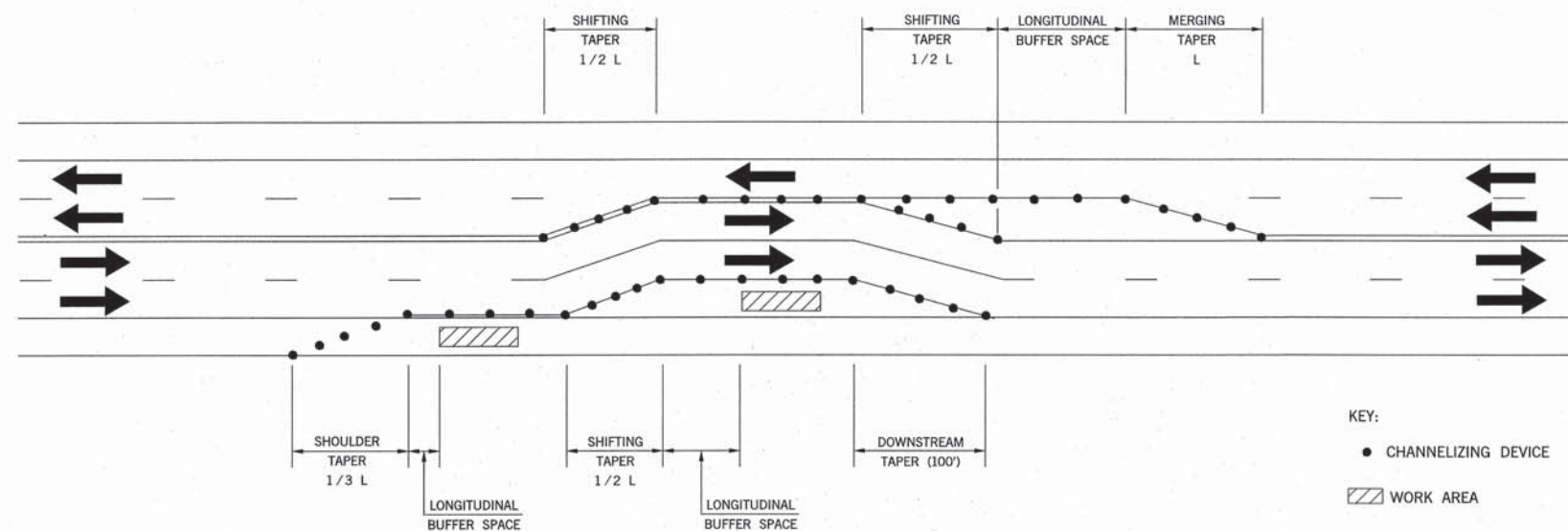
**TRAFFIC STANDARD
TRAFFIC CONTROL STANDARD
TRAFFIC CONTROL TABLES AND CHARTS**

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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

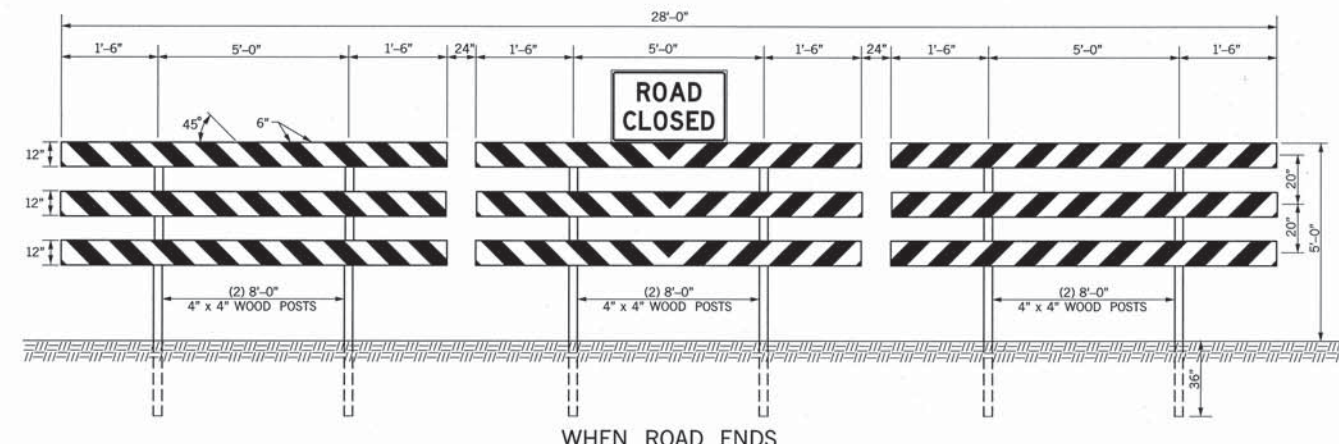
TRAFFIC STANDARD
TRAFFIC CONTROL STANDARD
TEMPORARY TRAFFIC CONTROL ELEMENTS

2009 SPECIFICATIONS

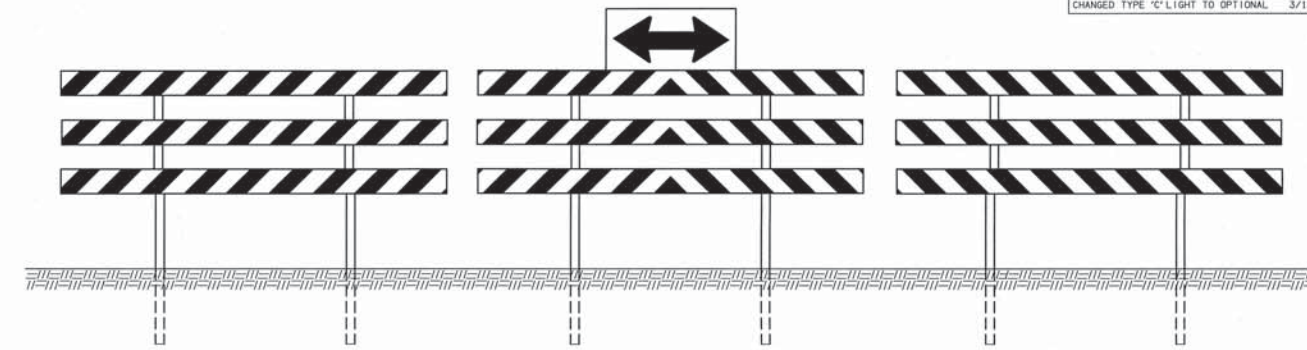
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DESCRIPTION	REVISIONS	DATE
CHANGED TYPE 'C' LIGHT TO OPTIONAL		3/16/2011



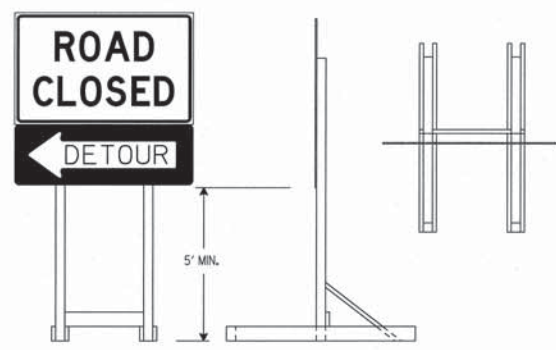
PERMANENT TYPE III(A/B) BARRICADE
(DIMENSIONS ARE TYPICAL FOR BOTH BARRICADES)



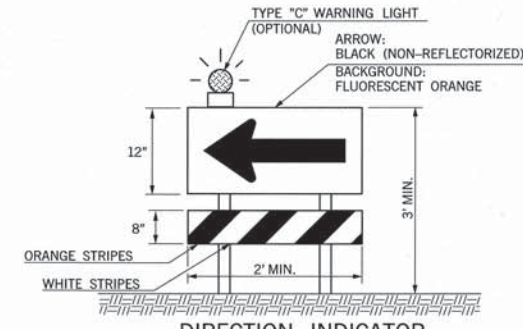
FOR T-INTERSECTIONS

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.

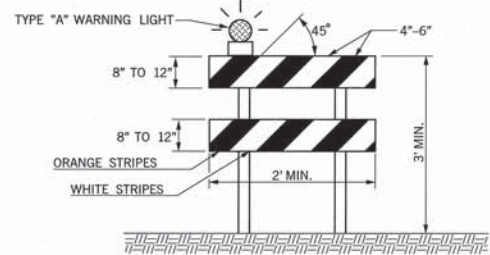
PERMANENT BARRICADE TYPE III(B) WILL BE IDENTICAL TO TYPE III(A) WITH NINE (9) ADDITIONAL REFLECTORIZED 3/4"x12" LUMBER PANELS ATTACHED TO THE BACK SIDE OF THE BARRICADE.
COLOR: BACKGROUND - WHITE (REFLECTORIZED)
DIAGONAL STRIPES - RED (REFLECTORIZED)



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.

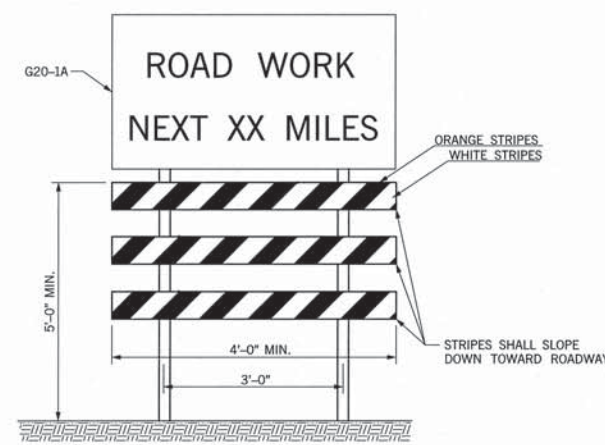
BALLAST SHALL NOT BE PLACED ON TOP OF ANY STRIPED RAIL. BARRICADES SHALL NOT BE BALLASTED BY NONDEFORMABLE OBJECTS SUCH AS ROCKS OR CHUNKS OF CONCRETE. BALLAST SHALL NOT EXTEND INTO THE ACCESSIBLE PASSAGE WIDTH OF 60".

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

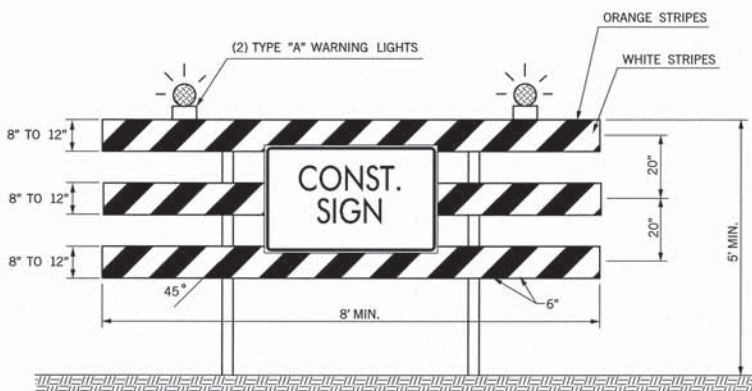
WHERE BARRICADES EXTEND ENTIRELY ACROSS A ROADWAY, THE STRIPES SHOULD SLOPE DOWNWARD IN THE DIRECTION TOWARD WHICH ROAD USERS MUST TURN.

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.

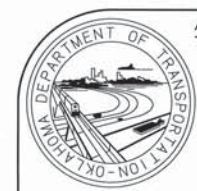


WING BARRICADE



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

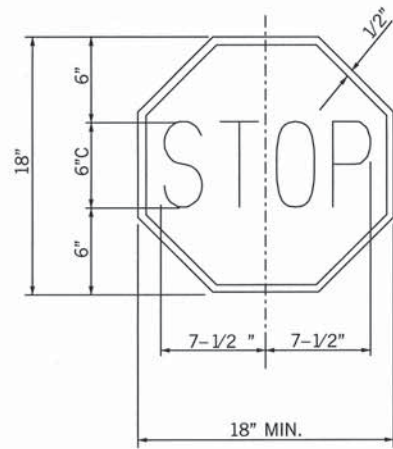
TRAFFIC STANDARD
TRAFFIC CONTROL STANDARD
TRAFFIC CONTROL DEVICES

2009 SPECIFICATIONS

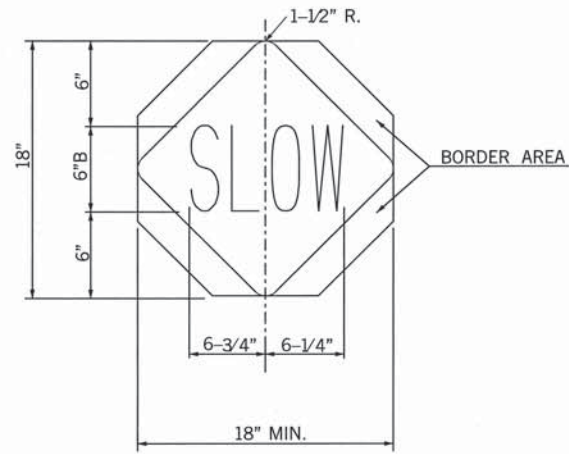
TCS4-1	01
	T-504

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

DESCRIPTION	REVISIONS	DATE

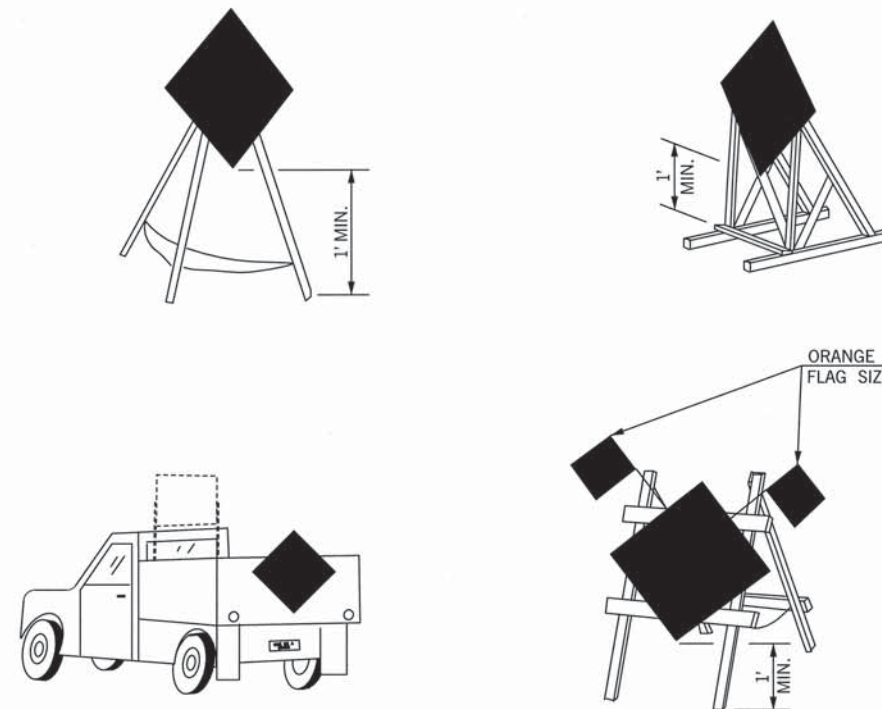


STOP:
 LEGEND AND BORDER: WHITE (REFLECTORIZED)
 BACKGROUND: RED (REFLECTORIZED)



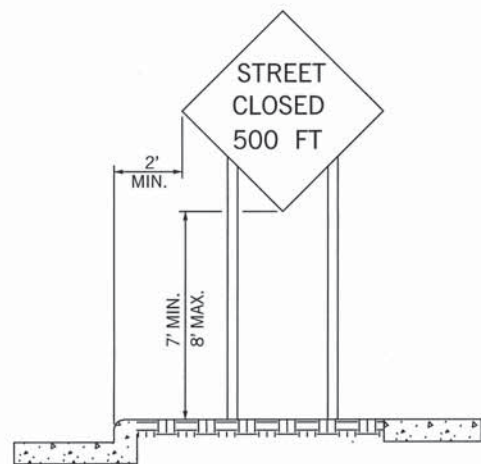
SLOW:
 LEGEND AND BORDER AREA: BLACK (NON-REFLECTORIZED)
 BACKGROUND: ORANGE (REFLECTORIZED)

STOP-SLOW PADDLE

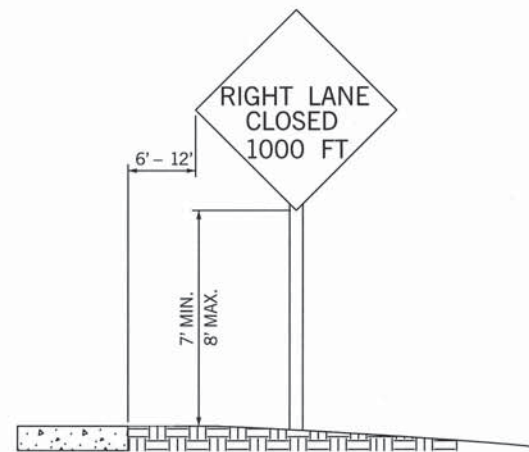


NOTE:
 THE BOTTOM OF SIGNS MOUNTED
 ON BARRICADES OR TEMPORARY
 SUPPORTS SHALL NOT BE LESS THAN
 1 FOOT ABOVE THE TRAVELED WAY.

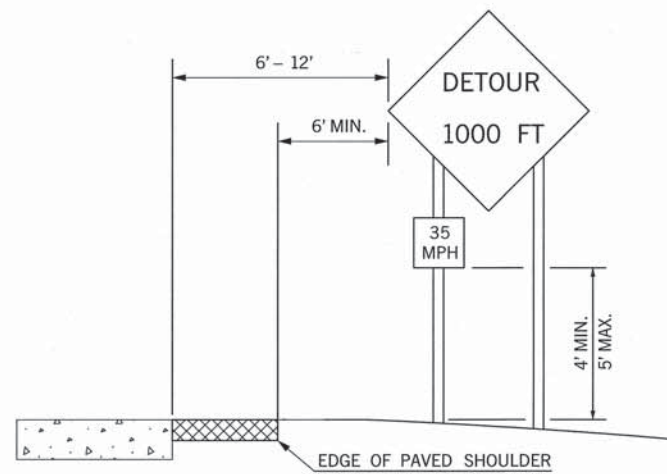
**PORTABLE AND TEMPORARY MOUNTINGS
 METHODS OF MOUNTING SIGNS OTHER THAN ON POSTS**



**URBAN DISTRICT
 (WITH CURB)**



**URBAN DISTRICT
 (WITHOUT CURB)**



**RURAL DISTRICT WITH
 ADVISORY SPEED PLATE**



RURAL DISTRICT

HEIGHT AND LATERAL LOCATIONS OF SIGNS – TYPICAL INSTALLATIONS

TRFFC36 M:\2009_Standards_TC\505.dgn 8:24:30 AM 6/23/2010 R:\TBAF_PLOT\teroy.pen R:\TBAF_PLOT\bw.ctb



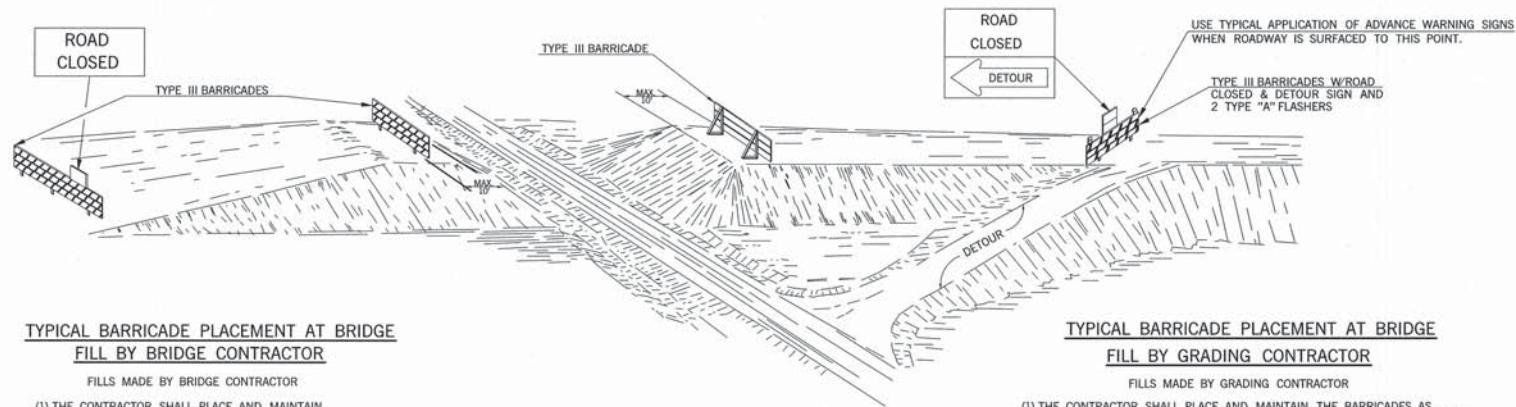
APPROVED BY
 TRAFFIC ENGINEER: *[Signature]* DATE: 6/23/10

TRAFFIC STANDARD

TRAFFIC CONTROL STANDARD
 TYPICAL SIGN INSTALLATION

2009 SPECIFICATIONS

TCSS-1	00
T-505	

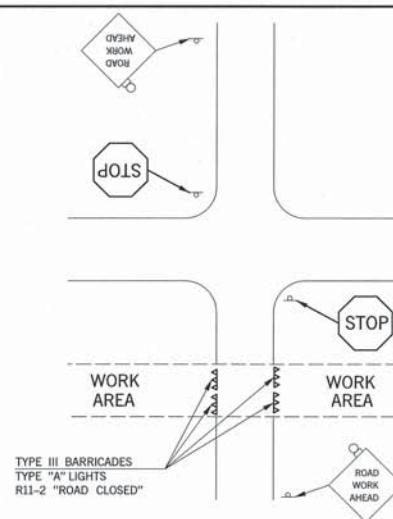


TYPICAL BARRICADE PLACEMENT AT BRIDGE FILL BY BRIDGE CONTRACTOR

- 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

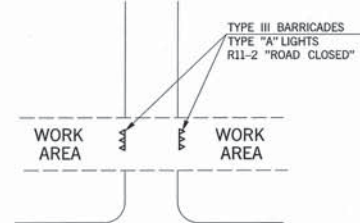
- FILLS MADE BY GRADING CONTRACTOR
- (1) THE CONTRACTOR SHALL PLACE AND MAINTAIN THE BARRICADES AS SHOWN UNTIL FINAL INSPECTION OR UNTIL THEY ARE NO LONGER NEEDED.
 - (2) THE CONTRACTOR SHALL NOTIFY THE ENGINEER PRIOR TO REMOVAL OF THE BARRICADES.
 - (3) IF THE BRIDGE WORK ORDER IS ISSUED PRIOR TO COMPLETION 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.



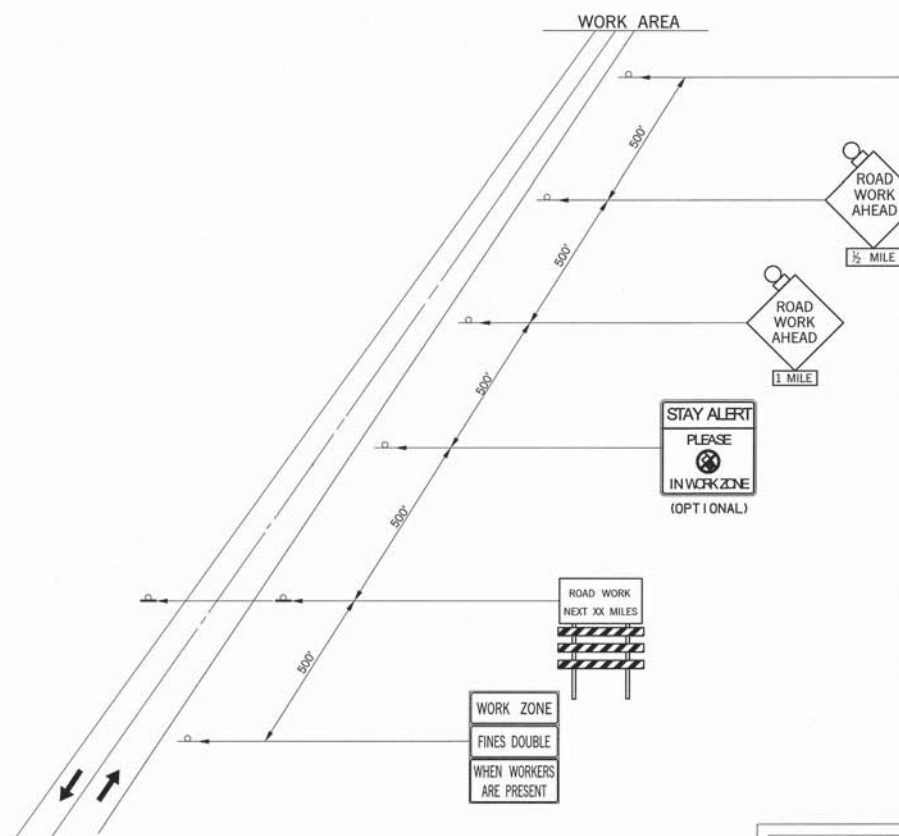
TYPICAL SIGN PLACEMENT FOR INTERSECTING ROADS AND STREETS

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 MOTORISTS 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.

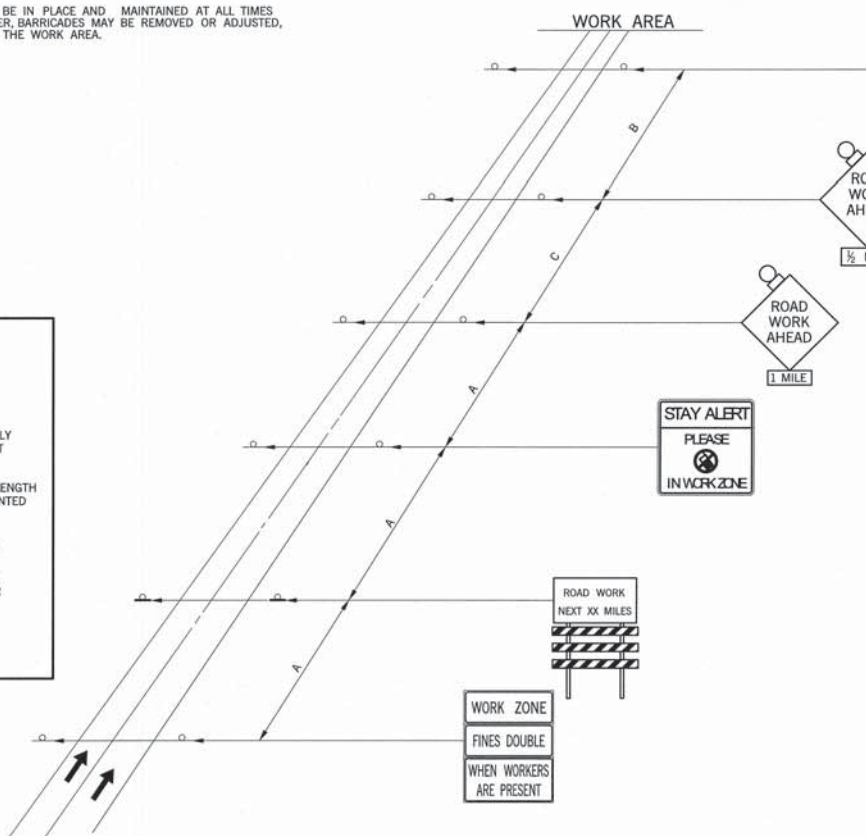
FINES DOUBLE IN WORK ZONE SIGNS ARE TO BE USED ONLY ON STATE OR FEDERAL HIGHWAYS WHERE THE SPEED LIMIT IS REDUCED OR AS DIRECTED BY THE ENGINEER.

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).

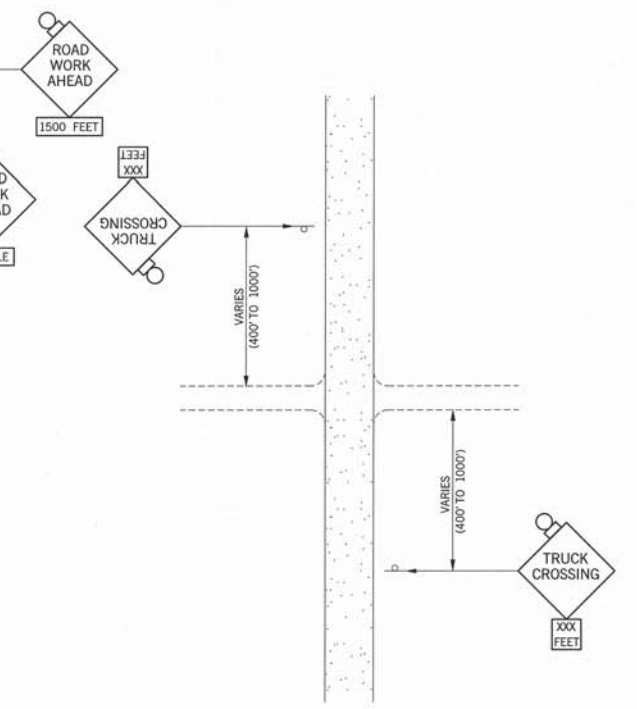
WARNING SIGNS SHOWN ARE "ADVANCE" WARNING SIGNS AND ARE REQUIRED ON ALL STATE HIGHWAYS. ADDITIONAL WARNING SIGNS MAY BE REQUIRED WITHIN THE PROJECT LIMITS TO WARN DRIVERS OF SPECIFIC HAZARDS. ADVANCE "WARNING SIGNS" MAY CHANGE AS CONDITIONS CHANGE OR AS DIRECTED BY THE ENGINEER.

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

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



ROAD CLOSED

R11-2 48 x 30 10.00 SF

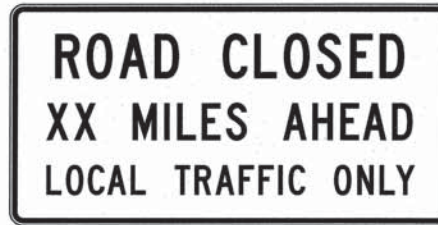
COLOR:
LEGEND AND BORDER:
BLACK (NON-REFLECTORIZED)
BACKGROUND:
WHITE (REFLECTORIZED)



LANE CLOSED

R11-2(LANE) 48 x 30 10.00 SF

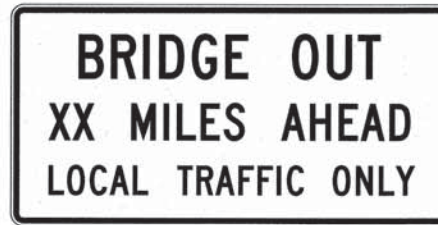
COLOR:
LEGEND AND BORDER:
BLACK (NON-REFLECTORIZED)
BACKGROUND:
WHITE (REFLECTORIZED)



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

DESCRIPTION	REVISIONS	DATE

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



TURN LEFT

W1-1(L) 30 x 30 6.25 SF
W1-1E(L) 36 x 36 9.00 SF

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



TURN RIGHT

W1-1(R) 30 x 30 6.25 SF
W1-1E(R) 36 x 36 9.00 SF

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



CURVE LEFT

W1-2(L) 30 x 30 6.25 SF
W1-2E(L) 36 x 36 9.00 SF

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



CURVE RIGHT

W1-2(R) 30 x 30 6.25 SF
W1-2E(R) 36 x 36 9.00 SF

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



LEFT REVERSE TURN

W1-3(L) 30 x 30 6.25 SF
W1-3E(L) 36 x 36 9.00 SF

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



RIGHT REVERSE TURN

W1-3(R) 30 x 30 6.25 SF
W1-3E(R) 36 x 36 9.00 SF

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



LEFT REVERSE CURVE

W1-4(L) 30 x 30 6.25 SF
W1-4E(L) 36 x 36 9.00 SF

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



RIGHT REVERSE CURVE

W1-4(R) 30 x 30 6.25 SF
W1-4E(R) 36 x 36 9.00 SF

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



WINDING ROAD

W1-5(R) 30 x 30 6.25 SF
W1-5E(R) 36 x 36 9.00 SF

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



WINDING ROAD

W1-5(L) 30 x 30 6.25 SF
W1-5E(L) 36 x 36 9.00 SF

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



CHEVRON

W1-8 18 x 24 3.00 SF
W1-8E 30 x 36 7.50 SF
W1-8F 36 x 48 12.00 SF

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



CROSS ROAD

W2-1 30 x 30 6.25 SF
W2-1E 36 x 36 9.00 SF

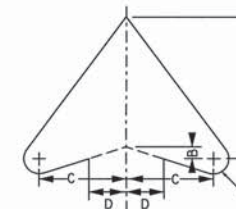
COLOR:
SYMBOL AND BORDER:
BLACK (NON-REFLECTORIZED)
BACKGROUND:
FLUORESCENT YELLOW
(REFLECTORIZED)



SIDE ROAD

W2-2 30 x 30 6.25 SF
W2-2E 36 x 36 9.00 SF

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



SIGN SIZE	DIMENSIONS				
	A	B	C	D	E
30" X 20"	8-7/8"	11/16"	5"	2-3/16"	7/8"
36" X 36"	10-5/8"	13/16"	6"	2-5/8"	1-1/16"
48" X 48"	14-5/16"	1-1/16"	8"	3-1/4"	1-3/8"

* ARROW DETAIL

BASIS OF PAYMENT

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



APPROVED BY: *[Signature]* DATE: 8/3/2012
TRAFFIC ENGINEER

TRAFFIC STANDARD
WARNING SIGN DETAILS
(W-SERIES)

2009 SPECIFICATIONS

DESCRIPTION	REVISIONS	DATE



T - SYMBOL

W2-4	30 x 30	6.25 SF
W2-4E	36 x 36	9.00 SF

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



STOP AHEAD

W3-1	30 x 30	6.25 SF
W3-1E	48 x 48	16.00 SF

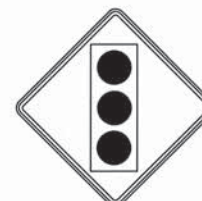
COLOR:
BORDER AND ARROW:
BLACK (NON-REFLECTORIZED)
BACKGROUND:
FLUORESCENT YELLOW
(REFLECTORIZED)
SYMBOL:
WHITE BORDER ON RED BACKGROUND
(REFLECTORIZED)



YIELD AHEAD

W3-2	30 x 30	6.25 SF
W3-2E	48 x 48	16.00 SF

COLOR:
BORDER AND ARROW:
BLACK (NON-REFLECTORIZED)
BACKGROUND:
FLUORESCENT YELLOW
(REFLECTORIZED)
SYMBOL:
WHITE BORDER ON RED BACKGROUND
(REFLECTORIZED)



SIGNAL AHEAD

W3-3	30 x 30	6.25 SF
W3-3E	48 x 48	16.00 SF

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



SPEED REDUCTION

W3-5	36 x 36	9.00 SF
W3-5E	48 x 48	16.00 SF

COLOR:
BORDER AND ARROW:
BLACK (NON-REFLECTORIZED)
BACKGROUND:
FLUORESCENT YELLOW
(REFLECTORIZED)
SYMBOL:
BLACK BORDER AND TEXT ON
WHITE BACKGROUND (REFLECTORIZED)

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)



SPEED REDUCTION

W3-5a	36 x 36	9.00 SF
W3-5aE	48 x 48	16.00 SF

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



LEFT MERGE

W4-1(L)	36 x 36	9.00 SF
W4-1E(L)	48 x 48	16.00 SF

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



RIGHT MERGE

W4-1(R)	36 x 36	9.00 SF
W4-1E(R)	48 x 48	16.00 SF

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



LEFT LANE ENDS

W4-2(L)	36 x 36	9.00 SF
W4-2E(L)	48 x 48	16.00 SF

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



RIGHT LANE ENDS

W4-2(R)	36 x 36	9.00 SF
W4-2E(R)	48 x 48	16.00 SF

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



RIGHT ADDED LANE

W4-3(R)	36 x 36	9.00 SF
W4-3E(R)	48 x 48	16.00 SF

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



LEFT ADDED LANE

W4-3(L)	36 x 36	9.00 SF
W4-3E(L)	48 x 48	16.00 SF

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



DIVIDED HIGHWAY

W6-1	36 x 36	9.00 SF
W6-1E	48 x 48	16.00 SF

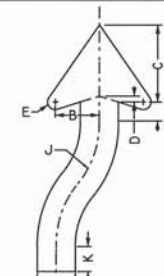
COLOR:
SYMBOL AND BORDER:
BLACK (NON-REFLECTORIZED)
BACKGROUND:
FLUORESCENT YELLOW
(REFLECTORIZED)



DIVIDED HIGHWAY

W6-2	36 x 36	9.00 SF
W6-2E	48 x 48	16.00 SF

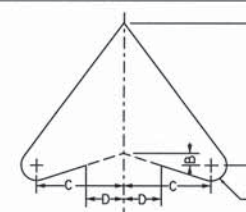
COLOR:
SYMBOL AND BORDER:
BLACK (NON-REFLECTORIZED)
BACKGROUND:
FLUORESCENT YELLOW
(REFLECTORIZED)



SIGN SIZE	DIMENSIONS						
	A	B	C	D	E	F	G
36" X 36"	4"	4-5/8"	8-1/8"	5/8"	13/16"	4"	12"
48" X 48"	5-1/4"	6"	10-5/8"	13/16"	1-1/16"	5-1/4"	15-3/4"

SIGN SIZE	DIMENSIONS			
	H	I	J	K
36" X 36"	30"	2"	10"	2-1/2"
48" X 48"	39-5/16"	2-5/8"	13-1/8"	3-5/16"

ARROW AND ISLAND DETAILS FOR W6-1, W6-1E, W6-2 AND W6-2E



SIGN SIZE	DIMENSIONS				
	A	B	C	D	E
30" X 20"	8-7/8"	11/16"	5"	2-3/16"	7/8"
36" X 36"	10-5/8"	13/16"	6"	2-5/8"	1-1/16"
48" X 48"	14-5/16"	1-1/16"	8"	3-1/4"	1-3/8"

* ARROW DETAIL

BASIS OF PAYMENT

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



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

TRAFFIC STANDARD
WARNING SIGN DETAILS
(W-SERIES)

2009 SPECIFICATIONS

WSD2-1 00

T-117

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

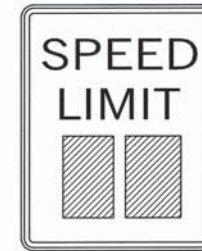
COLOR:
LEGEND AND BORDER:
RED (TRANSPARENT REFLECTORIZED)
BACKGROUND:
WHITE (REFLECTORIZED)



ALL-WAY

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

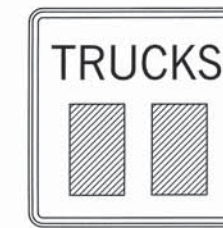
COLOR:
LEGEND AND BORDER:
WHITE (REFLECTORIZED)
BACKGROUND:
RED (TRANSPARENT REFLECTORIZED)



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

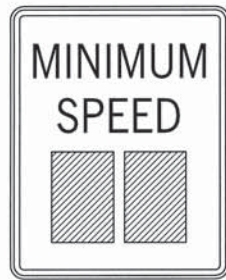
COLOR:
LEGEND AND BORDER:
BLACK (NON-REFLECTORIZED)
BACKGROUND:
WHITE (REFLECTORIZED)



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

BASIS OF PAYMENT

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



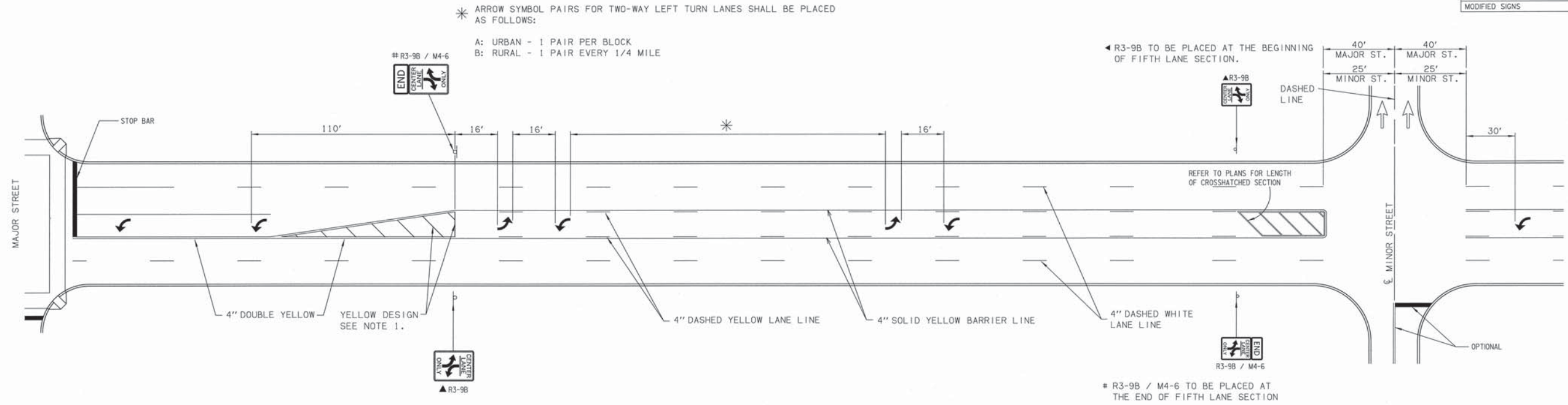
APPROVED BY
TRAFFIC ENGINEER: *David G. Smith* DATE: 8/3/2010

TRAFFIC STANDARD
REGULATORY SIGN DETAILS
(R-SERIES)

2009 SPECIFICATIONS

RSD1-1	00
T-114	

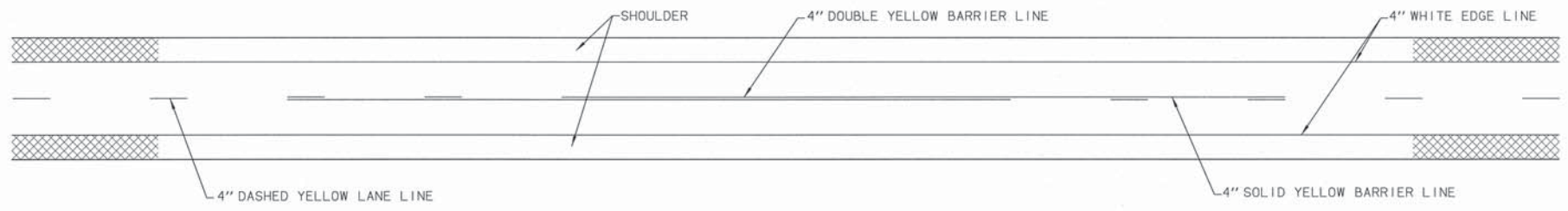
DESCRIPTION	REVISIONS	DATE
ADDED GENERAL NOTE L		7/08/2011
MODIFIED SIGNS		4/10/2012



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: *[Signature]* DATE: 4/9/12

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