

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	56-23 KA-0033-01	2012	31	127

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DESIGN DATA

DESIGN LOADING:
HL-93

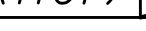
Design Dead Load includes an allowance of 15 psf for a future wearing surface.

UNIT STRESSES:

Concrete (Grade 4.0)	$f'c$	=	4,000 psi
Concrete (Grade 4.0)(AE)	$f'c$	=	4,000 psi
Concrete (Grade 4.0)(AE)(SA)	$f'c$	=	4,000 psi
Prestressed Beam Concrete	$f'c$	=	5,000 psi
Reinforcing Steel (Grade 60)	f_y	=	60 ksi
Prestressed Strand	$\frac{1}{2}" \varnothing$ Grade 270 uncoated 7-wire, low relaxation strand.		

LRFD DESIGN PILE LOAD:

<i>Design Loading (Tons/Pile)</i>	<i>Strength I</i>	<i>Service I</i>	<i>Phi</i>
<i>Abutments</i>	85.4	61.9	0.55

LFD RATING FACTORS			
<i>Truck</i>	<i>Rating Level</i>	<i>Inventory</i>	<i>Operating</i>
<i>HS-20</i>	<i>(36T)</i>	<i>1.42</i>	<i>2.38</i>
<i>Type HET</i>	<i>(110T)</i>		<i>1.28</i>
<i>2002 LFD Rating, 17th Edition AASHTO</i>			

LRFR RATING FACTORS			
<i>Design Load</i>	<i>Rating Level</i>	<i>Inventory</i>	<i>Operating</i>
<i>HL-93 Loading</i>		<i>1.17</i>	<i>1.94</i>
<i>2008 Manual for Bridge Evaluation</i>			

3								
2								
1								
NO.	DATE	REVISIONS				BY	APP'D	
KANSAS DEPARTMENT OF TRANSPORTATION								
Br. No. 56-23-14.43 (I88)					Sta. I24+86.33			
GENERAL NOTES AND QUANTITIES (US-56 over Middle Fork Taury Crk. Dr.)								
Proj. No. 56-23 KA-0033-01					Douglas Co.			
SHEET NO. 1 OF 13		SCALE		APP'D				
DESIGNED	CWM	DETAILED	CWM	QUANTITIES	CWM	CADD	RCJ	
DESIGN CK.	JSR	DETAIL CK.	JSR	QUAN. CK.	JSR	CADD CK.	CWM	

SUMMARY OF QUANTITIES													
<div>Item</div> <div>Location</div>	Excavation		Concrete		Reinforcing Steel		Prestressed Concrete Beams (K4) Lin.Ft.	* Piles (Steel) (HP 12x53) Lin. Ft.	Bridge Backwall Prot. System Sq. Yds.	Abutment Aggregate Drain Cu. Yds.	Bridge Deck Grooving Sq. Yds.	Pre-drilled Pile Holes Lin. Ft.	Slope Protection (Rirap Stone) Cu. Yds.
	Class I Cu. Yds.	Class II Cu. Yds.	Grade 4.0 (AE)(SA) Cu. Yds.	Grade 4.0 (AE) Cu. Yds.	Epoxy Coated (Grade 60) Lbs.	(Grade 60) Lbs.							
Abutment No. 1	110		**	39.1	1,420	3,295		312	75	108		84	380
Abutment No. 2	110		**	39.1	1,420	3,295		304	75	108		84	380
Substr. Total	220			78.2	2,840	6,590		616	150	216		168	760
Superstr. Total			177.0		34,640		486				367		
Total	220		177.0	78.2	37,480	6,590	486	* 616	150	216	367	168	760

***Quantities are included in the Superstr. Total Quantity.*

† Summary of Piling
Abutment No. 1 8 @ 39'-0"
Abutment No. 2 8 @ 38'-0"

* NOTE: Use only HPI2x53
steel pile on this project.

GENERAL NOTES

EMBANKMENT: Complete the embankment at the abutments as shown on the Bridge Excavation sheet prior to driving the abutment piling.

BRIDGE EXCAVATION: Elevation 1012.50 shall designate the Excavation Boundary Plane of Class I and Class II Excavation; Class I above the plane, Class II below the plane. See the Bridge Excavation sheet for the limits of pay excavation.

BACKFILL COMPACTION: Backfill compaction shall be required at abutments.

PILING: Drive all piling to penetrate or bear upon the Lawrence formation. Driving shall stop when in the opinion of the Engineer additional driving may damage the piling. Drive all piling to the Pile Driving Formula Load of:

Abutment No. 1	113.5 Tons
Abutment No. 2	113.5 Tons

As a minimum drive each pile to the load and penetration, but in no case shall the pile be driven to more than 110% of Pile Driving Formula Driving Load. At any location where problems are experienced, pile damage is suspected, or the Pile Driving Formula Load occurs significantly above the design pile tip elevation, the Engineer may request that the Pile Driving Analyzer (PDA) equipment be used.

PRE-DRILLING: Steel piles in Abutments 1 and 2 shall be pre-drilled to elevation 1009.00 to clear heavy gravel, cobbles, and broken concrete. The diameter of the pre-drilled holes is 1'-6". The piles shall be set and driven to the computed bearing value shown. After driving the hole shall be backfilled with sand.

PILING SPLICE LOCATION: Integral pile splice locations and weld testing criteria for Abutments 1 and 2 will follow the "Standard Pile Details" Sheet (BR110).

CONCRETE: Superstructure concrete is bid as Concrete (Grade 4.0)(AE)(SA). Substructure concrete is bid as Concrete (Grade 4.0)(AE). If desired, the Contractor may use Concrete (Grade 4.0) in the footings and in the abutments below the construction joint. Bevel all exposed edges of all concrete with a $\frac{3}{4}$ " triangular molding, except where noted on the plans. Construction joints are optional, but if used, place only at locations shown, or at locations approved by the Engineer.

REINFORCING STEEL: All reinforcing steel dimensions are to the centerline of bars unless otherwise noted. All reinforcing steel, except the spiral bars, shall conform to the requirements of ASTM A615, Grade 60. Spiral bars may meet the requirements of either ASTM A615 (Gr. 40 or 60) or A82, and are included in the bid item "Reinforcing Steel (Gr. 60)".

Where non-coated bars come in contact with epoxy coated bars, they need not be coated.

EXISTING STRUCTURE: Plans of the existing structure are on file and available for inspection by qualified bidders at the State Bridge Office, KDOT, Eisenhower State Office Building, 700 SW Harrison, Topeka, KS.

BRIDGE DECK GROOVING: After the bridge deck has cured, transversely groove the deck in accordance with KDOT Specifications. For phased construction groove each completed phase before opening to traffic. Align the grooves from each adjacent phase across the bridge deck without jogs or discontinuities. For skewed bridges all grooving will be perpendicular to the centerline of the bridge.

CAMBER: Construct the finished deck to plan grade by varying the depth of the fillet over the beam to provide for prestress camber, concrete dead load deflection and, if necessary, vertical curvature. After the prestressed beams are erected measure the camber in the field by taking a profile of each beam. Correct any variation between the actual camber and concrete dead load deflection shown in the plans by varying the depth of the concrete fillets over the beam so that the finished floor is constructed to the theoretical grade. The minimum depth of the slab over the beam shall be $\frac{1}{2}$ inches.

The theoretical amount of concrete required for the fillets is 3.3 Cu. Yds. This amount of concrete is included in the Summary of Quantities. Any additional concrete required to construct the fillets will be subsidiary.

PRESTRESSED BEAM CONCRETE: Use air entrained concrete with select course aggregate as specified in the KDOT Specifications. The release strength and 28 day strength requirements shall be as noted on the plans. Submit mix designs to the Bureau of Materials and Research for approval.

ERECTION ELEVATION CHECKS: After the abutments have cured and before setting any prestressed beams, present verification to the Engineer that the elevations at the bearings match plan elevation ($\pm 1/4"$).

CONTRACTOR CONSTRUCTION STAKING: Contractor Construction Staking for clear span bridges requires two independent surveys. See KDOT Specifications.

ABUTMENT AGGREGATE DRAIN: See the General Notes on the "Abutment Aggregate Drain" sheet.

BRIDGE BACKWALL PROTECTION SYSTEM: See the
General Notes on the "Aggregate Strip Drain" sheet.

BROKEN CONCRETE: Waste the broken concrete from the existing bridge on sites provided by the Contractor and approved by the Engineer.

REMOVAL OF EXISTING STRUCTURES: Removal of existing structure is included in the bid item, "Removal of Existing Structures", Lump Sum. All materials removed from the existing structure shall become the property of the Contractor. Remove this material from the site.

CONCRETE PLACING SEQUENCE: The sequence of placing concrete in the slab and curbs shall be as shown, or the Contractor may submit an alternate placing sequence for review. Submit the alternate placing sequence to the Engineer at the Preconstruction Conference. Include the proposed rate of concrete placement in Cu. Yds./h, the plant capacity, placement direction, construction joint location, a description of the equipment used in placing the concrete, proposed admixtures, and the quantity of concrete in each placing segment. Any additional cost for the Contractor's alternate plan of placing concrete, including admixtures, shall be at the Contractor's expense and shall be considered subsidiary to the bid item, "Concrete (Grade 4.0)(AE)(SA)". Approval of the Contractor's alternate sequence is required prior to placement of concrete in the deck.

Place and hand vibrate all concrete for the pier diaphragms and the abutments above the construction joints to the bottom of the deck just prior to the normal paving train operations. Do this work in a manner to avoid a cold joint in either the abutments or in the diaphragms.

CONSTRUCTION LOADS: Only foot traffic is permitted on the new sub-deck, one-course deck or any concrete overlay during the seven day curing period, keep any exposed deck wet during the 7-day curing period. See KDOT Specifications Section 710 Table 710-2.

DEMOLITION PLANS: This is a Category A Demolition. Submit detailed Demolition Plans to the Field Engineer per KDOT Specifications. No Demolition work will begin without approved Demolition Plans. A Licensed Professional Engineer is not required.

ERECTION PLANS: This is a Category A Structure. Submit detailed Erection Plans to the Field Engineer per KDOT Specifications. A Licensed Professional Engineer is not required.

SLOPE PROTECTION (Riprap Stone): Place Slope Protection (Riprap Stone) to the limits and thicknesses shown on the plans or as directed by the Engineer.

DRIP LINE PROTECTION: Place a 10 foot wide mat of geotextile under the rock/rubble embankment on the berm and berm slopes and centered on the drip lines of the slab.

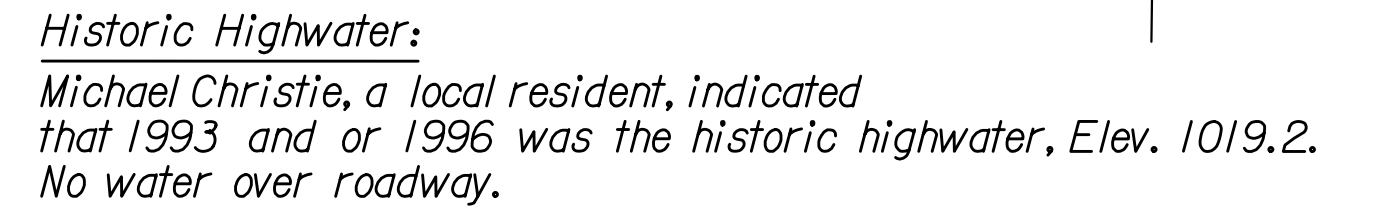
Std. Base File: br301.dgn	Plot Location: Bridge Design
Plotted By: Jruby	
File: 003301-188-01.dgn	
Plot Date: 08-JAN-2013 1449	

73.2' E.N.E.
75.2' E.S.E.
70.5' W.S.W.

18.1' N.N.E.
28.2' S.W.
16.6' S.S.W.

39.8' N.N.W.
76.3' E.S.E.
2.0' N.
6.0' W.

SCALE: 1"=50'


$$\frac{T.O. \text{ Elev.} =}{1017.44}$$

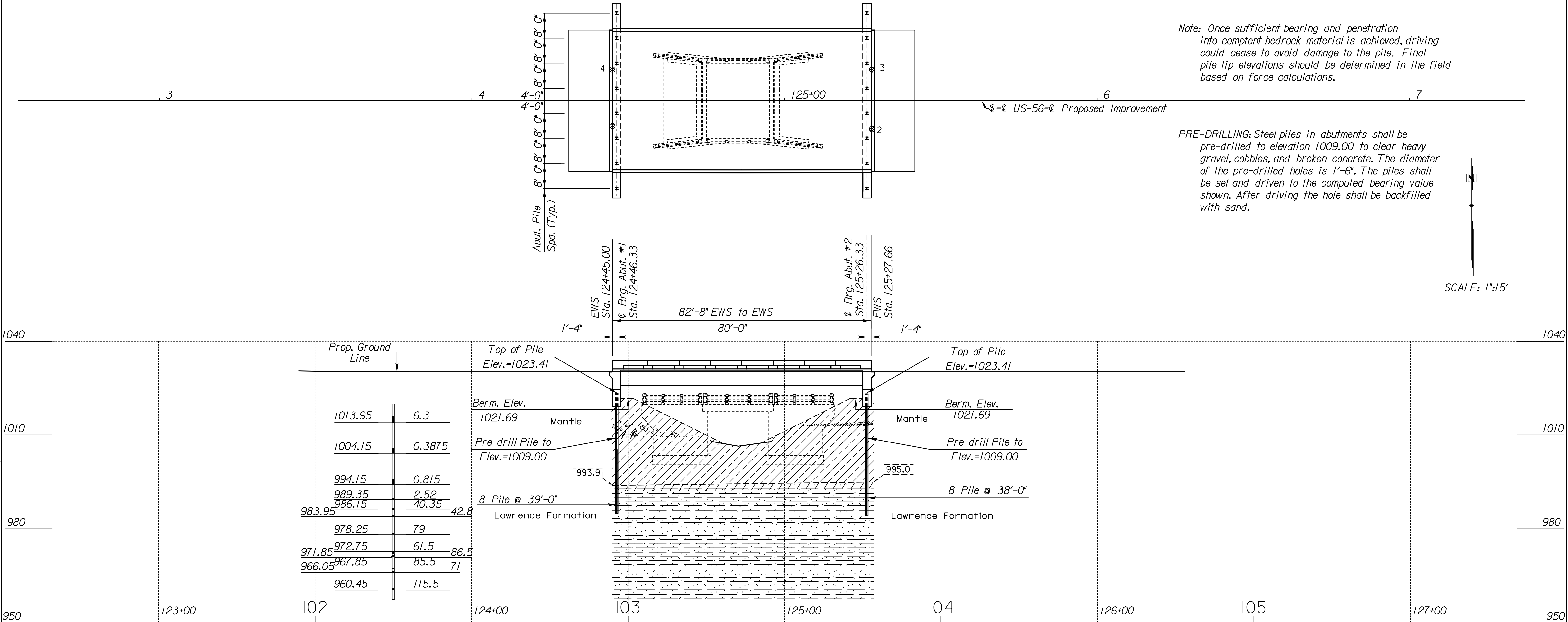
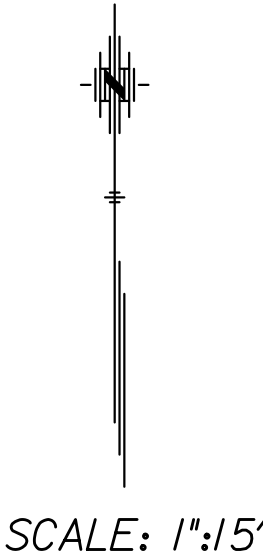
KDOT Graphics Certified 01-08-2013 *Sheet No. 32*

Plotted By: <i>Jruby</i>	Plot Location: <i>Bridge Design</i>
File: <i>003301-188-02.dgn</i>	
Plot Date: <i>08-JAN-2013 14:51</i>	

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	56-23 KA-0033-01	2012	34	127

Note: Once sufficient bearing and penetration into comptent bedrock material is achieved, driving could cease to avoid damage to the pile. Final pile tip elevations should be determined in the field based on force calculations.

PRE-DRILLING: Steel piles in abutments shall be pre-drilled to elevation 1009.00 to clear heavy gravel, cobbles, and broken concrete. The diameter of the pre-drilled holes is 1'-6". The piles shall be set and driven to the computed bearing value shown. After driving the hole shall be backfilled with sand.

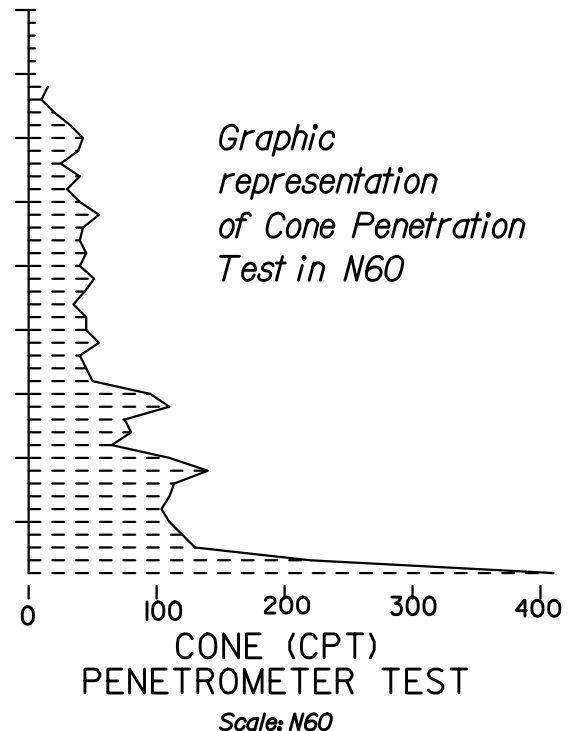
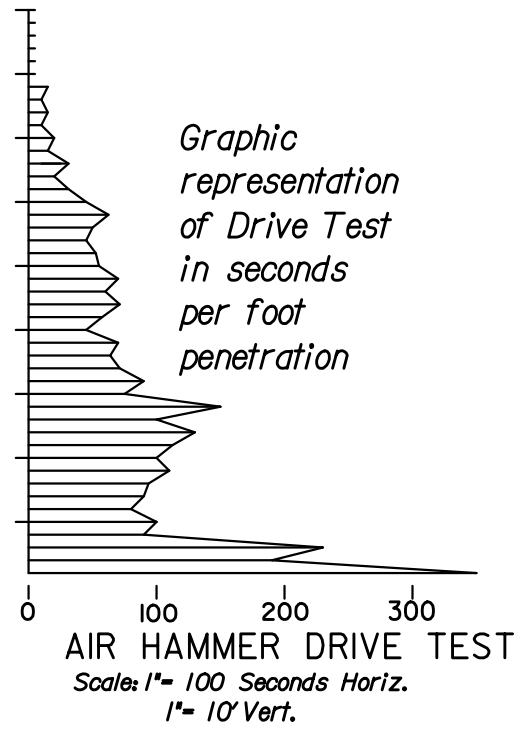
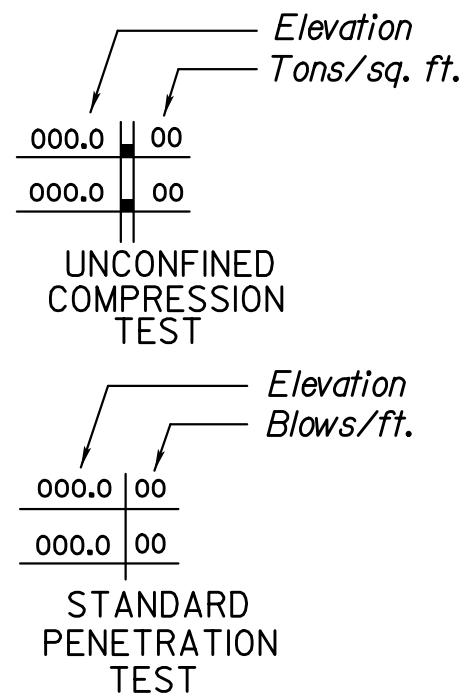


STANDARD GEOLOGIC SYMBOLS GEOLOGIC PROFILE

- SOUNDINGS
- Core drill
 - Power auger
 - Hand tools
 - Air hammer
 - Cone (CPT) penetrometer
 - Shelby tube
 - Water level

000.0 Elevation interpolated or from adjacent soundings

000.0 Actual sounding elevation

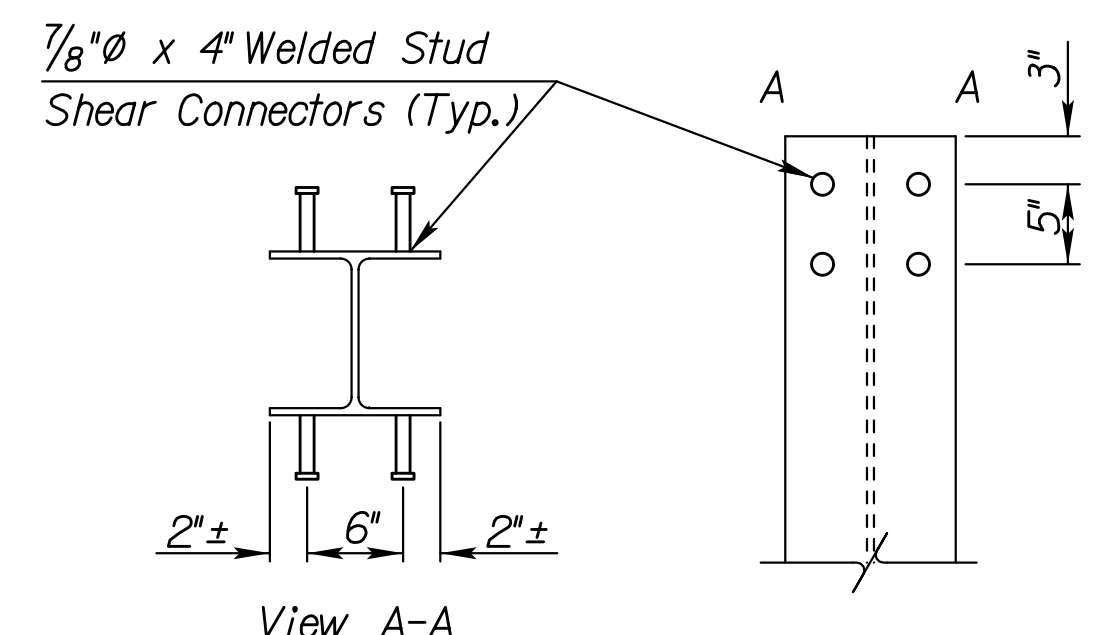
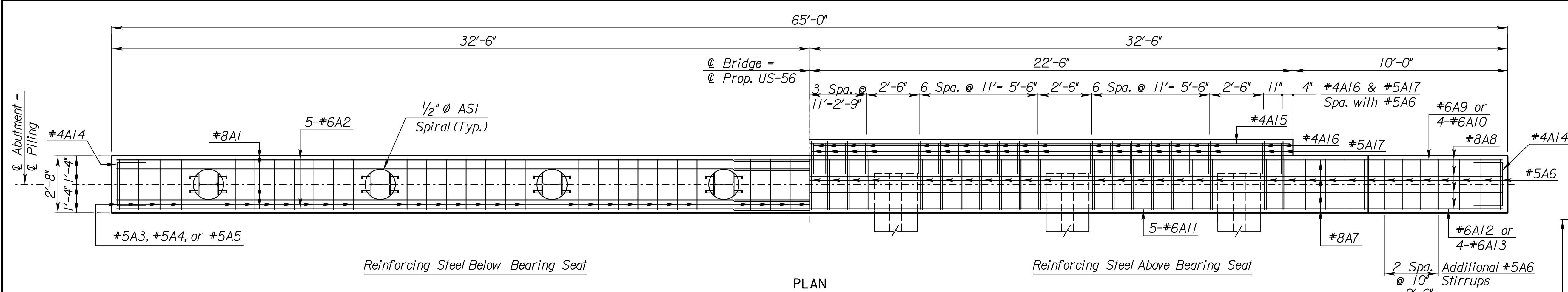


NOTE: Soundings shown on these plans are taken from notes obtained in the field and represent the best information available. Logs of these soundings are in the files of the Kansas Department of Transportation and are available at their offices at Topeka, Kansas for inspection by interested and qualified bidders.

SCALE: 1"= 15' Horiz. 1"= 15' Vert.

3					
2					
1					
NO.	DATE	REVISIONS	BY	APP'D	
KANSAS DEPARTMENT OF TRANSPORTATION					
Br. No. 56-23-14.43 (I88) Sta. 124+86.33					
ENGINEERING GEOLOGY					
(US-56 over Middle Fork Tauy Crk. Dr.)					
Proj. No. 56-23 KA-0033-01 Douglas Co.					
SHEET NO. OF	SCALE	APP'D			
DESIGNED	CEM	DETAILED	CEM	QUANTITIES	RCJ
DESIGN CK.	JSR	DETAIL CK.	JSR	QUAN. CK.	CEM

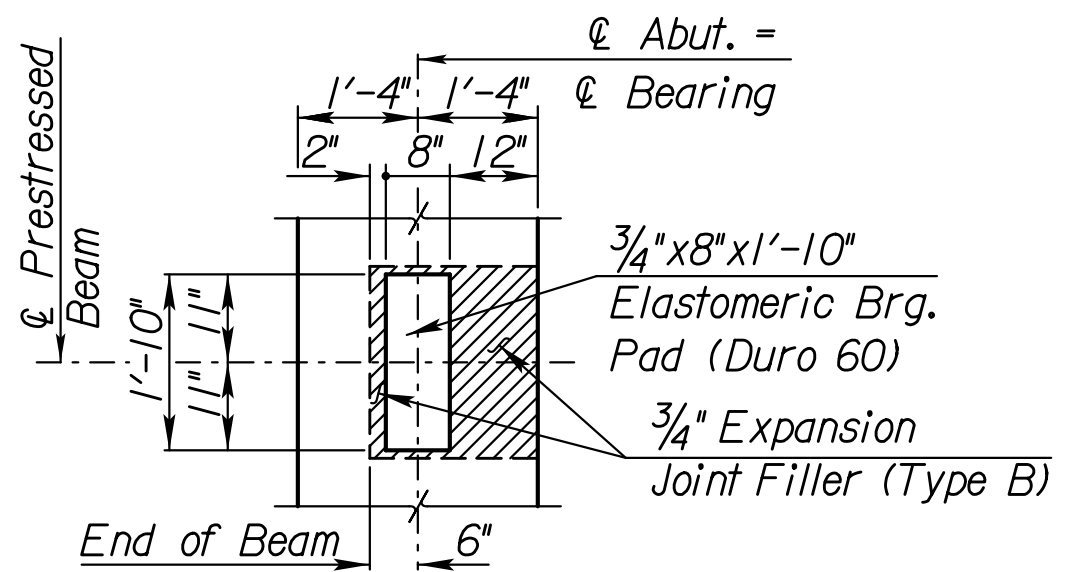
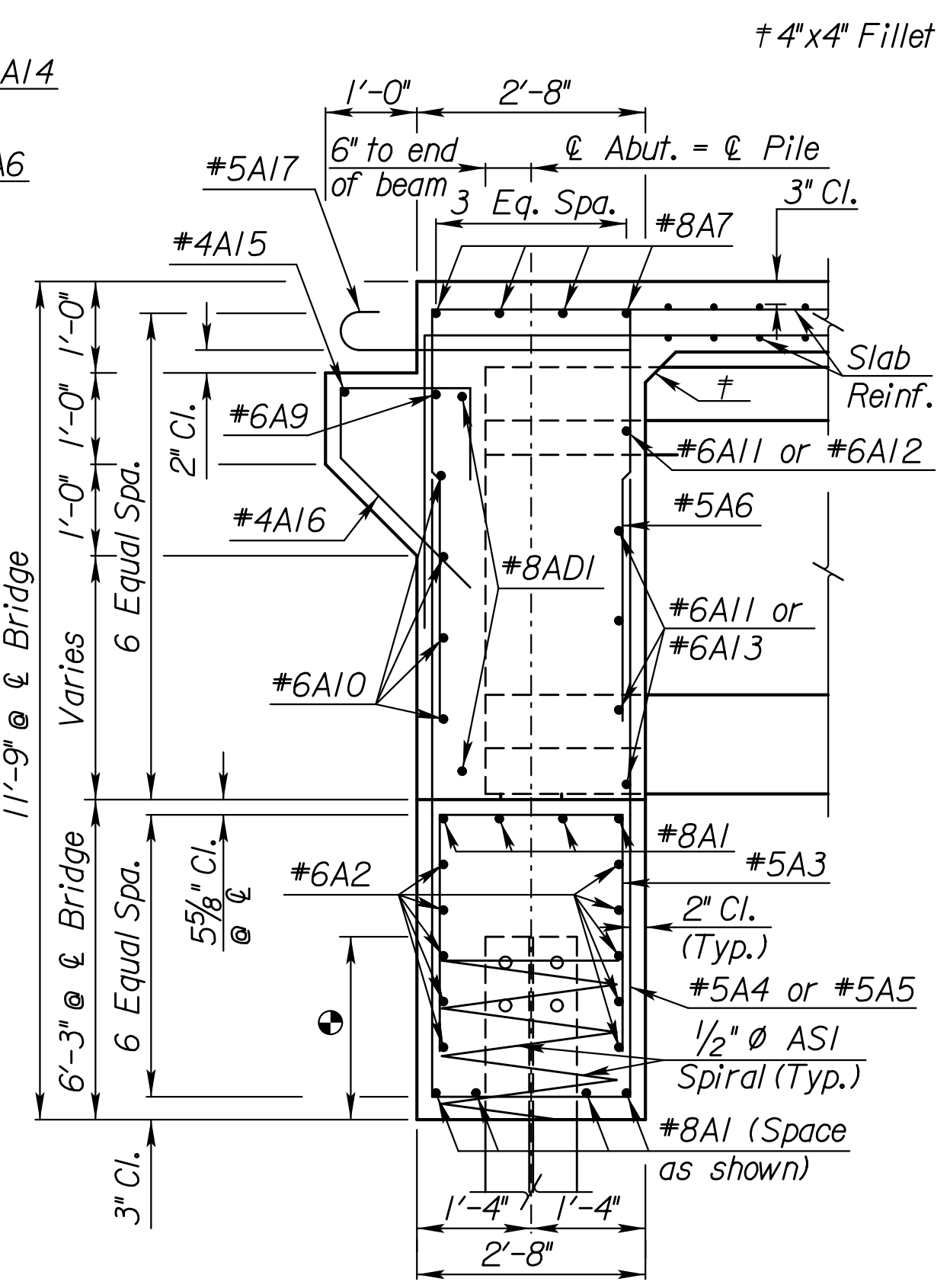
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
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PILE WELDED STUD SHEAR CONNECTOR DETAIL
(8-7/8" x 4" Welded Stud Shear Connectors reqd. per pile.) (Total per Abutment = 64)
Welded Stud Shear Connectors shall be subsidiary to "Piles (Steel)(HPI2x53)".

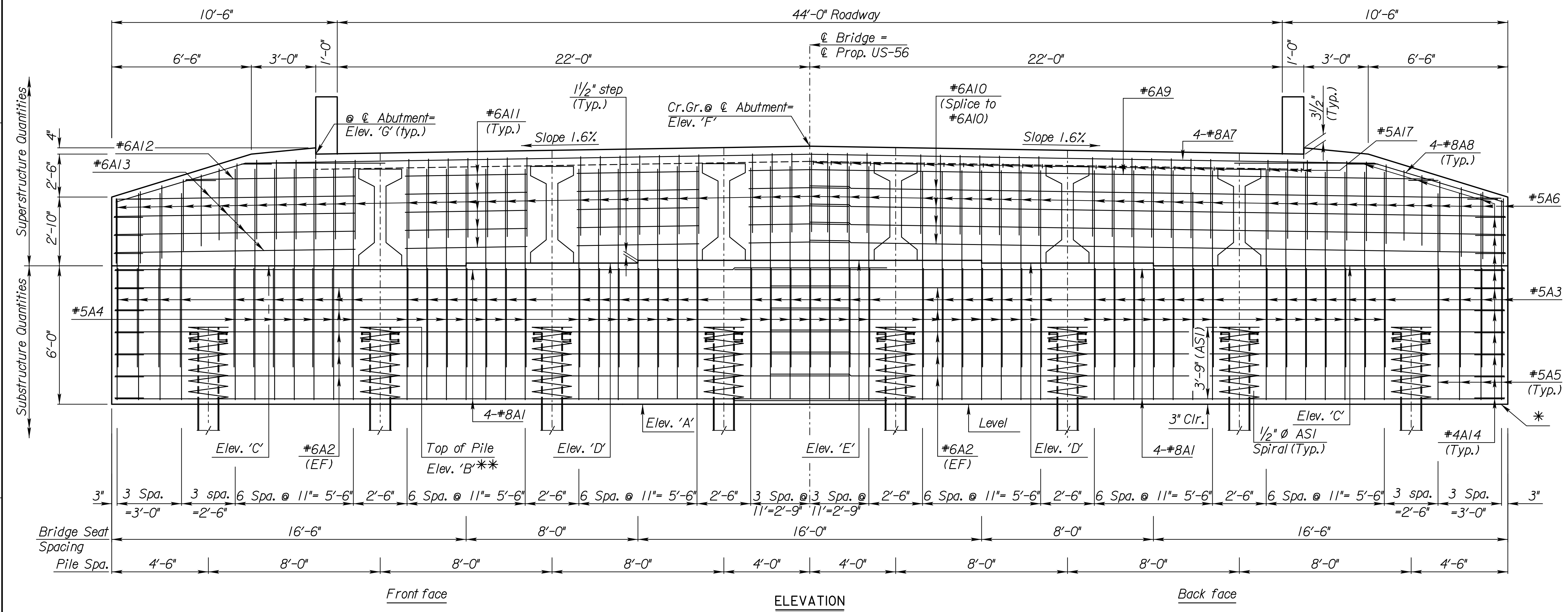
LRFD DESIGN PILE LOAD:
Design Loading (Tons/Pile) Strength I Service I Phi
Abutment 85.4 61.9 0.55

	Elevation
'A'	1019.41
'B'	1023.41
'C'	1025.40
'D'	1025.53
'E'	1025.66
'F'	1031.16
'G'	1030.79



PLAN OF BEARING PADS AT ABUTMENTS
Note: Elastomeric Bearing Pads (Durometer Hardness 60) and Preformed Expansion Joint Filler (Type B) shall be subsidiary to "Prestressed Concrete Beams".

4'-0" Max.
3'-6" Min.
* Paylimits of "Pre-drilled Pile Holes".
** Elevation based on 4'-0" embedment.



NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				
0				

KANSAS DEPARTMENT OF TRANSPORTATION
Br. No. 56-23-14.43 (I88) Sta. 124+86.33
ABUTMENT DETAILS
(US-56 over Middle Fork Tauy Crk. Dr.)
Proj. No. 56-23 KA-0033-01 Douglas Co.
SHEET NO. 5 OF 13 SCALE APP'D
DESIGNED CEM/TAILED CEM/QUANTITIES CEM/CADD RCJ
DESIGN CK. JSR/DETAIL CK. JSR/QUAN. CK. JSR/CADD CK. CEM

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
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GENERAL NOTES

GEOSYNTHETICS: Use material that complies with KDOT Specification Section 1710 Class 2 subsurface drainage fabric. Place the Class 2 subsurface drainage fabric on graded and compacted material shaped as shown. Allow for enough material so that the top can be overlapped and the end folded to completely enclose the aggregate drain. Place the perforated drain pipe and couple to non-perforated pipe as shown. Allow the non-perforated pipe to pass through a hole carefully cut in fabric. Place aggregate within fabric to just leave the top of the pipe visible. Verify the slope of the pipe, that it is not damaged or displaced and that the couplers are firmly coupled. Continue to back fill to the elevation and shape shown. Lap the top of the fabric a minimum of 3'-0", fold and wrap the ends to enclose the drainage materials. Secure the folds and wraps by sewing or approved methods.

ABUTMENT AGGREGATE DRAIN: The Bridge Contractor shall excavate to the limits shown on the Bridge Excavation Sheet. Backfill, compact & grade the cohesive soil to the limits shown. Place the bridge backwall protection, geofabric, perforated pipe, alternating layers of aggregate and base course reinforcement as shown. Place the outlet pipe, the CMP, and the backfill. Guide post and coarse aggregate are subsidiary to this bid item. Guide post and coarse aggregate are not required if the CMP empties onto Slope Protection. Enclose the entire Abutment Aggregate Drain with the geotextile

BRIDGE BACKWALL PROTECTION SYSTEM: Apply a non coal-tar Bridge Backwall Protective System to the approach side of the abutments and the wings in accordance with KDOT Specifications and the manufacturer's recommendations. Cover the abutments and wings to the limits shown on the details. Repair any damage done at no charge to the state.

Compact the abutment backfill. See the KDOT Specifications.

Perforated pipe and non-perforated outlet pipe shall be corrugated polyethylene tubing conforming to the KDOT Specifications.

Fit the CMP end section with 1/4" galvanized mesh screen to prevent the entrance of rodents. Seal the joint between the outlet pipe and the end section with a joint sealer. Place Coarse aggregate at the outlet end as shown.

COHESIVE SOILS: Grade the bottom surface of the excavated area to drain as shown. Backfill this area with a cohesive type of soil. The soil will have a Unified Soil Classification of CL, CH, ML or MH according to ASTM D2487. Classification System with a minimum plasticity index of 13. Compact the material to Type A, MR-90 specifications. If the plasticity index cannot be met add and mix Bentonite, to the soil prior to placement and compaction so that the $PI \geq 13$.

AGGREGATE: Use aggregates that complies with KDOT Specifications for SB-1, SB-2 or SB-3.

BASE COURSE REINFORCEMENT: Use "Base Course Reinforcement" that complies with KDOT Specification Section 1710 or approved material. Place this material in uniform layers without gaps or sags per the manufacturer's recommendations.

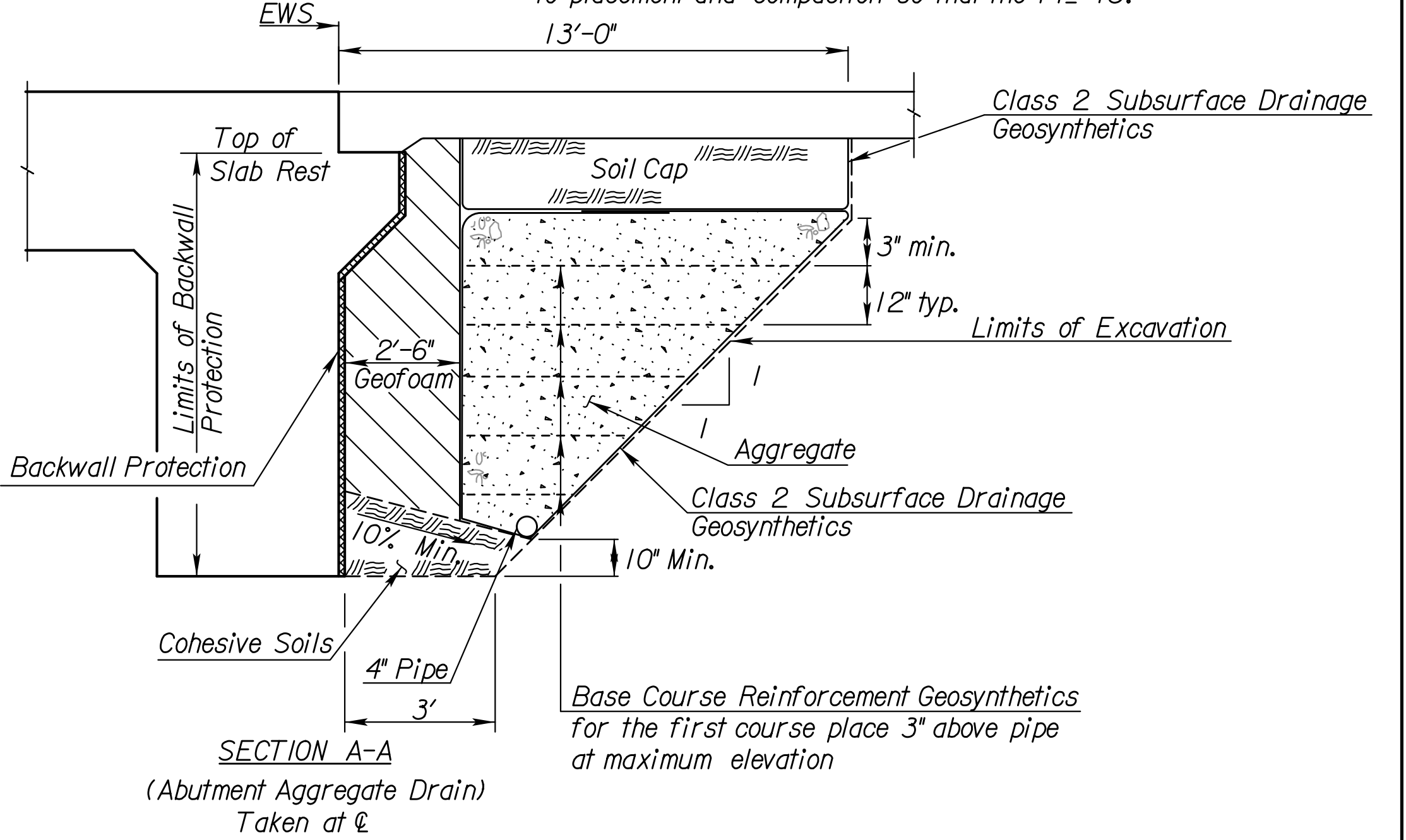
GEOFOAM: Use "Geofoam" that complies with KDOT Specification 07-2005 latest revision or approved material. Bond this material to the back wall protection using materials recommended by the manufacturer.

GEOTEXTILE FABRIC: Use "Geotextile Fabric" that conforms with KDOT Specification 1710 and found on the Prequalified Materials List.

SOIL CAP: The soil will have a Unified Soil Classification of CL or ML according to ASTM D2487. Compact to Type A, MR-90.

PIPE: Place perforated pipe within the limits and use non-perforated pipe outside the limits of the Abutment Aggregate Drain.

* Limits of Bridge Backwall Protection System & Geofoam



SUMMARY OF QUANTITIES (2 Abutments)	
Abutment Aggregate Drain	216 Cu. Yds.
Bridge Backwall Protection System	150 Sq. Yds.
Items subsidiary to Abutment Aggregate Drain	
4" Ø Perforated Pipe	130 Lin. Ft.
4" Ø Outlet Pipe	40 Lin. Ft.
6" Ø CMP	16 Lin. Ft.
Soil Cap	42 Cu. Yds.
Geosynthetics (Class 2 Subsurface Drainage)	670 Sq. Yds.
Geosynthetics (Base Course Reinforcement)	550 Sq. Yds.
Geofoam	100 Cu. Yds.
Items subsidiary to Slope Protection	
Geotextile Fabric	200 Sq. Yds.

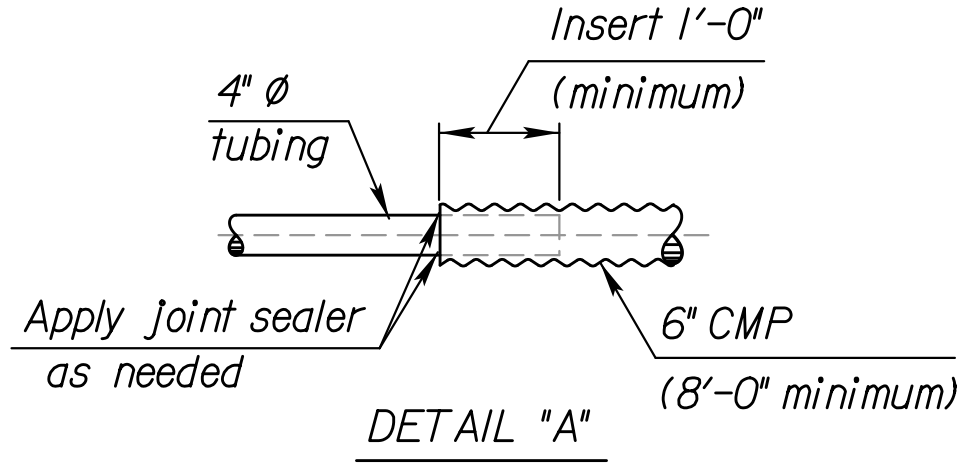
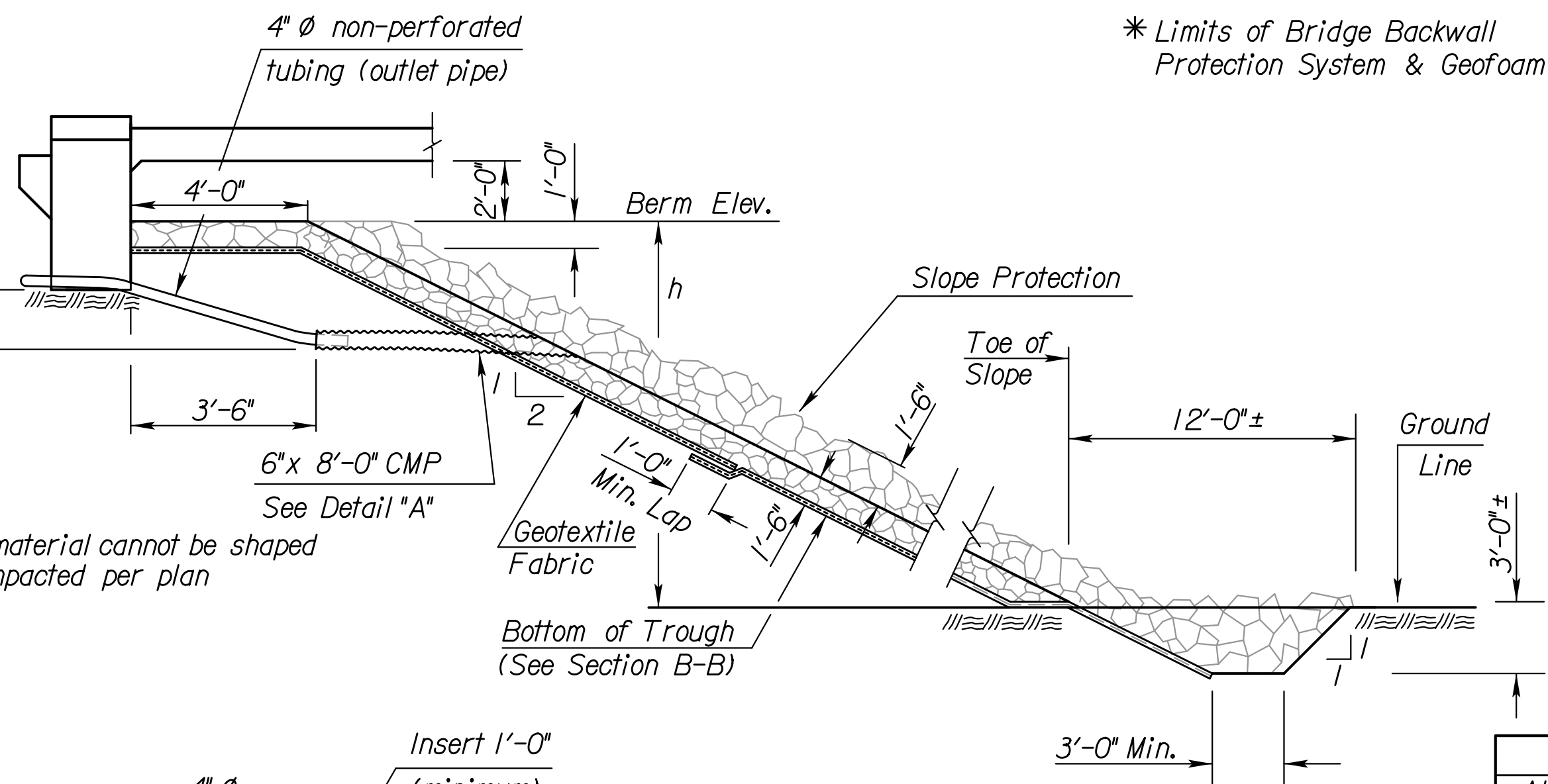
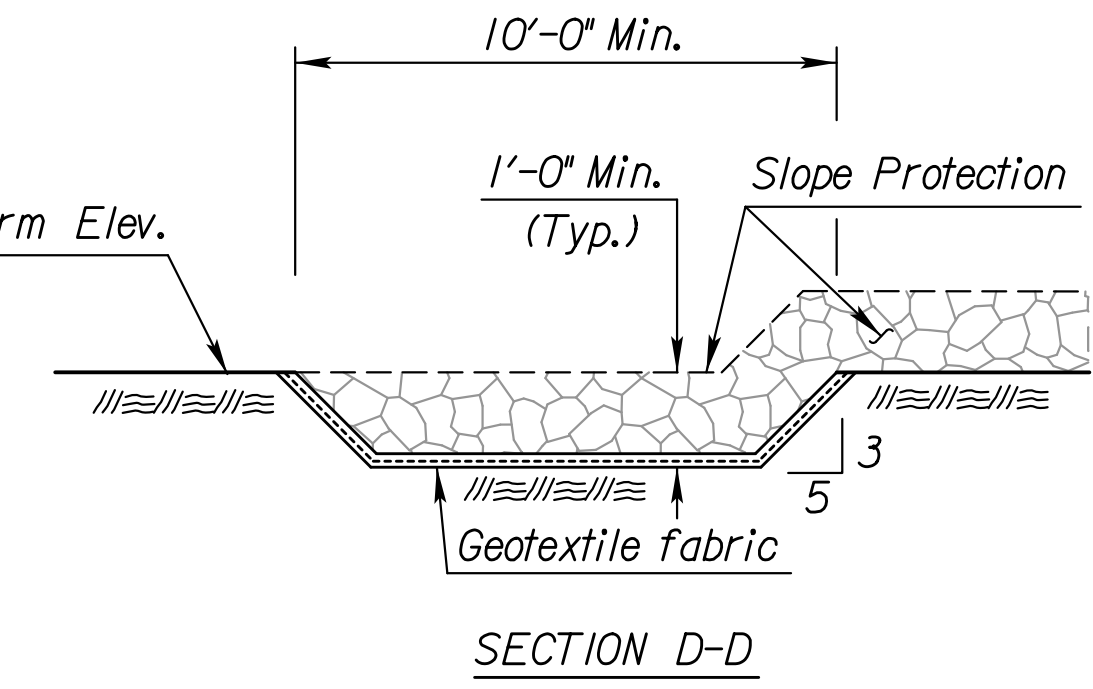
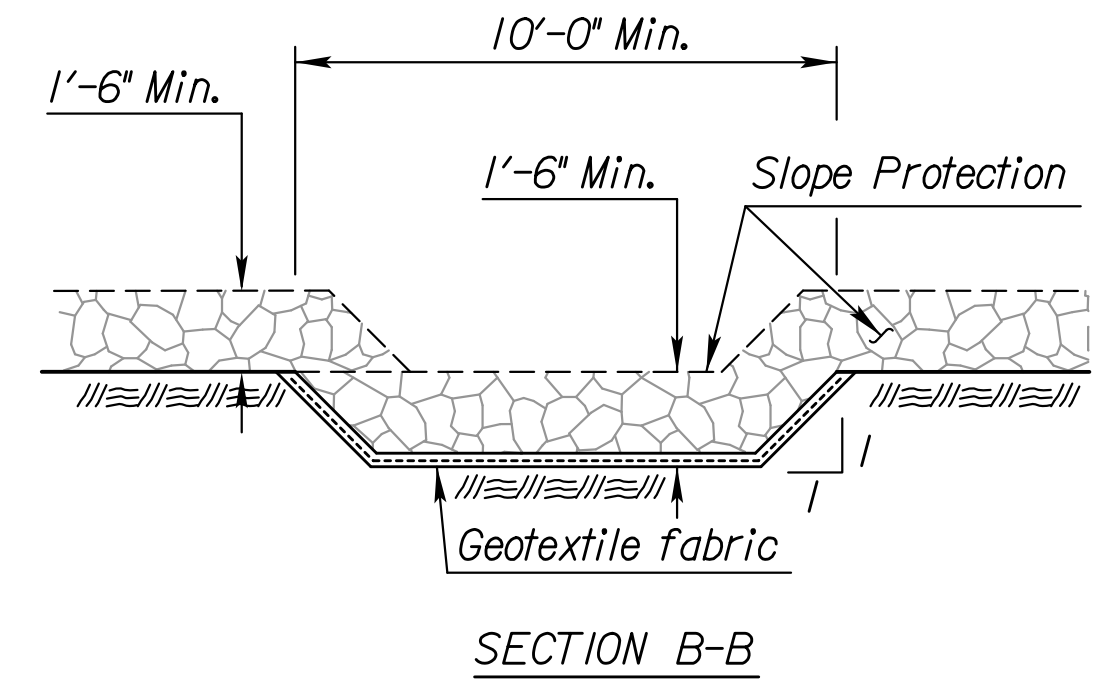
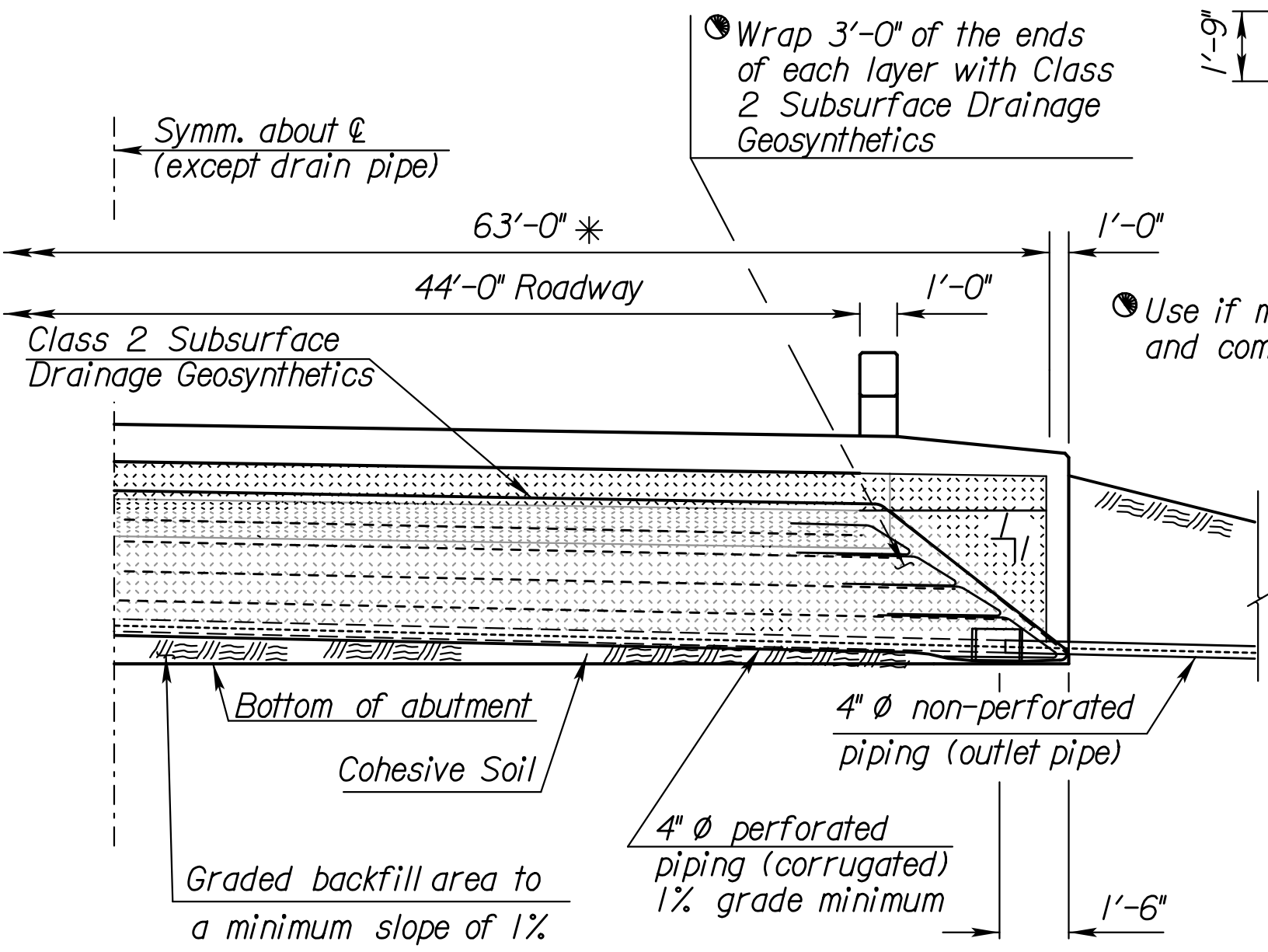
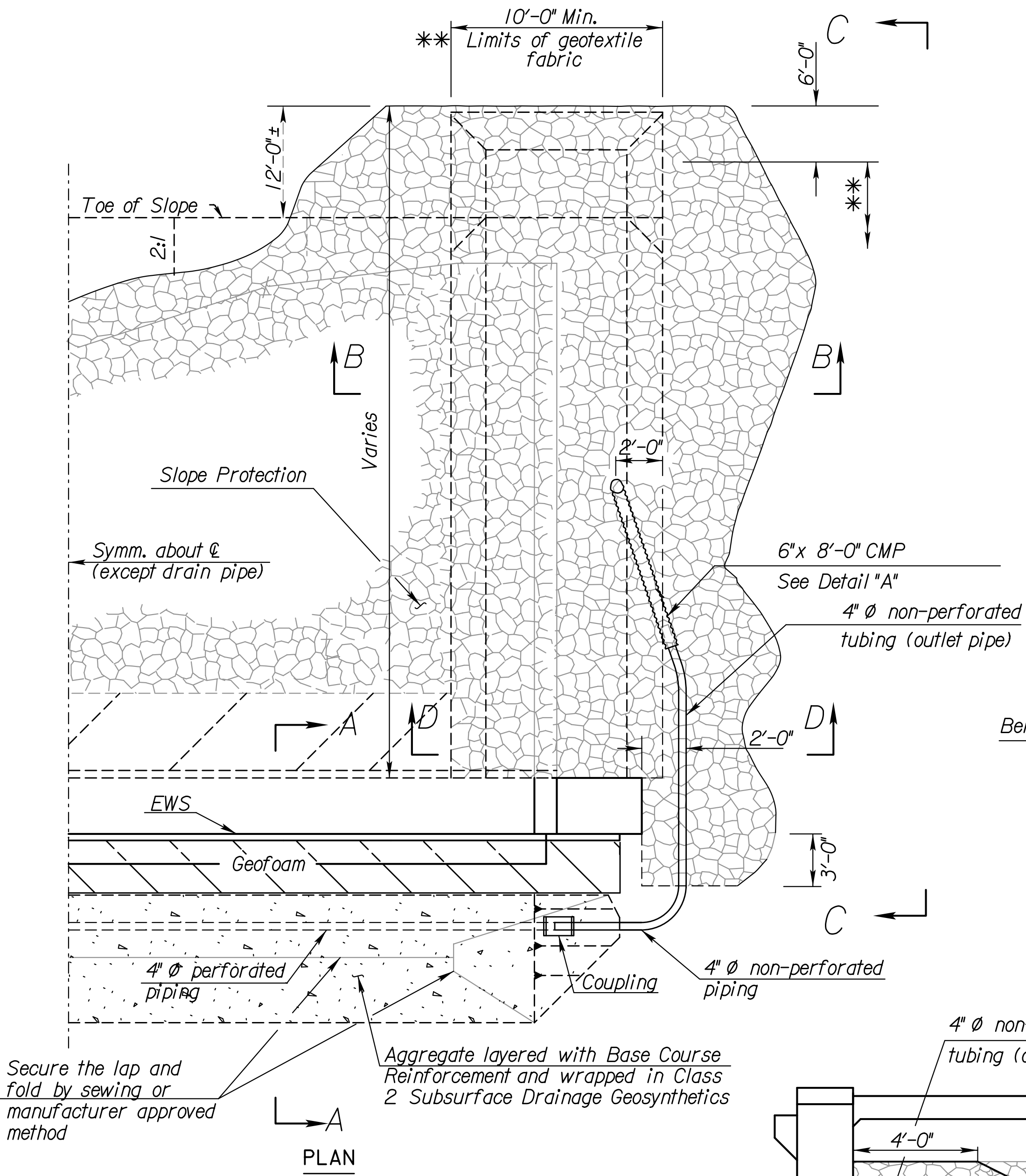
4	7/23/12	Added Soil Cap to Summary	JPJ	TLF
3	4/17/12	Added Aggregate Drain	JPJ	TLF
2	8/3/10	Geotextile In Drip-Line Only	JPJ	TLF
1	7/14/08	Change Type 'C' Compaction to 'B'	JPJ	KFH
NO.	DATE	REVISIONS	BY	APP'D

KANSAS DEPARTMENT OF TRANSPORTATION
Br. No. 56-23-14.43 (I88) S+a. I24+86.33

ABUTMENT
AGGREGATE DRAIN

Proj. No. 56-23 KA-0033-01 Douglas Co.

SHEET NO. 6 OF 13	SCALE	APP'D
DESIGNED	CEM/DETAILED	LRR/QUANTITIES
DESIGN CK.	JSR/DETAIL CK.	JSR/QUAN. CK.

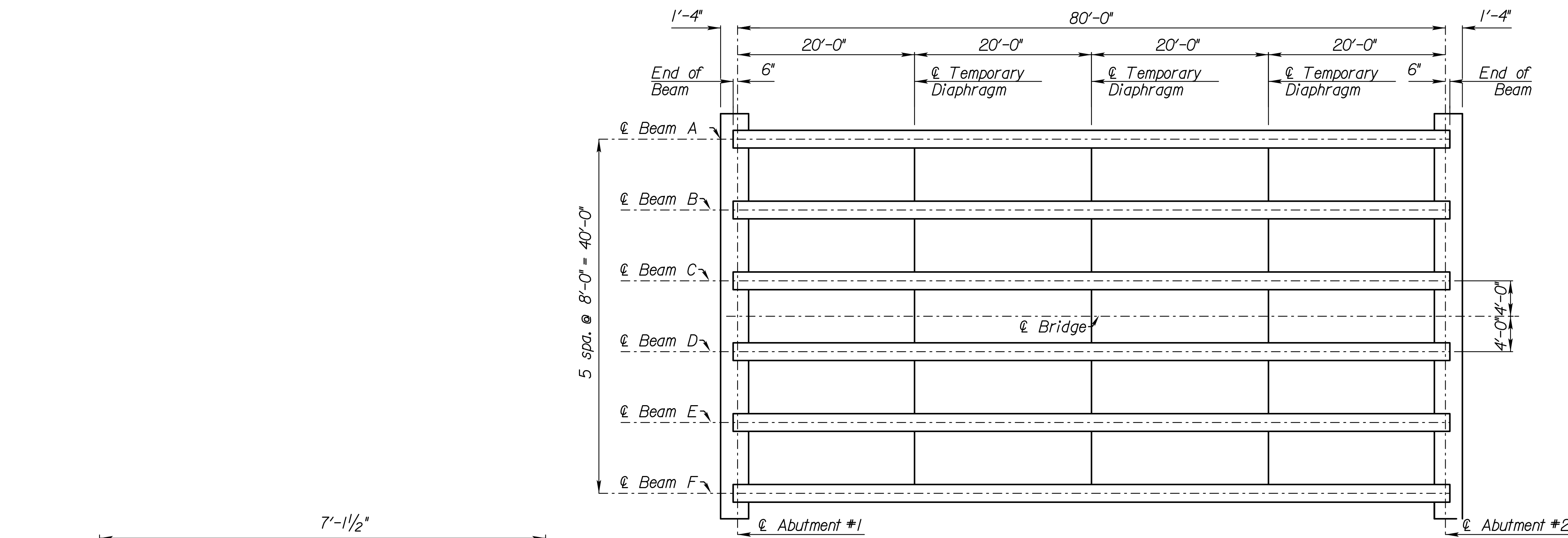


Note: Place the CMP flowline 1'-0" above ditch flowline, toe of sideslope, or as shown on the Construction Layout. For stream crossings place outlet on downstream side of bridge.

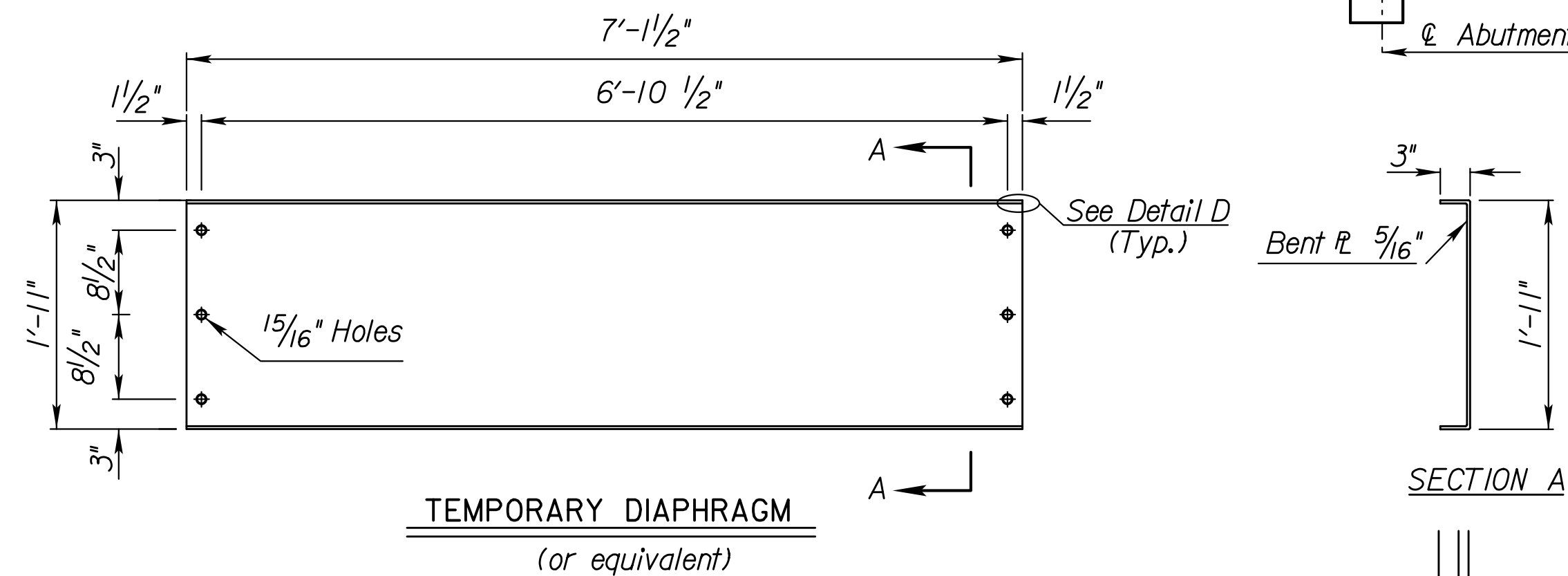
Std. Base File: br104g.dgn
Plotted By: Jrb
File: 003301-188-06.dgn
Plot Date: 08-JAN-2013 14:51

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KANSAS	56-23 KA-0033-01	2012	37	127

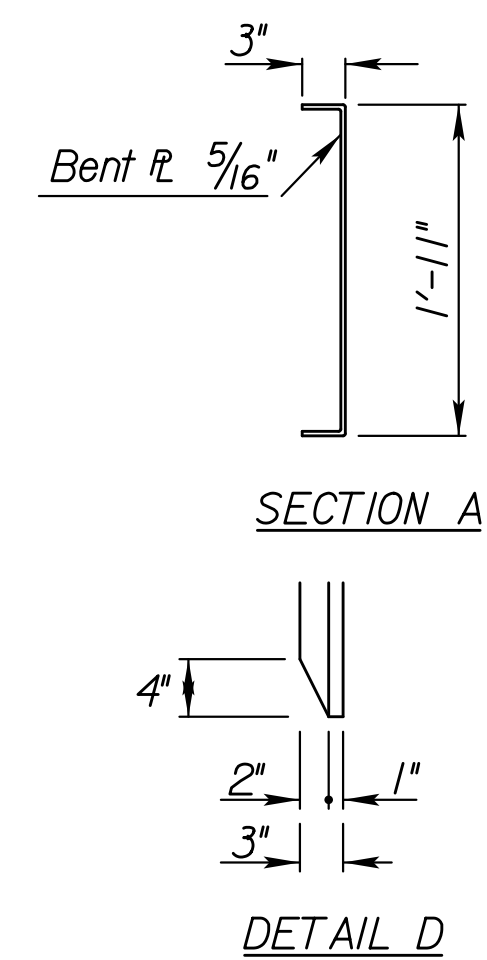
TEMPORARY DIAPHRAGMS: Use galvanized ASTM A709 Gr. 36 steel for all angles and bent plates for temporary diaphragms. All bolts, nuts, and washers for fasteners shall conform to the heavy hex structural requirements of ASTM A325, Type 1. Use hardened steel washers over any oversized holes. Use $\frac{5}{16}$ " plate washers over any slotted holes along with hardened washers under the turned elements. Use the turn-of-the-nut tightening method. DT's are not required. Install the temporary diaphragms, as shown in the details, prior to placing any superstructure concrete. Leave the temporary diaphragms in place until the concrete diaphragms and deck have cured. Remove the angles from the beams and fill the holes in the prestressed beams with an approved epoxy grout. The bent plate diaphragms, angles, nuts, bolts, and washers shall remain the property of the Contractor. Submit shop drawings of the temporary diaphragms to the KDOT Bridge Section for review and approval. The material, equipment, and labor necessary for the installation of the temporary diaphragms, including filling the bolt holes, shall not be paid for directly, but shall be subsidiary to the bid item "Prestressed Concrete Beams".



FRAMING PLAN

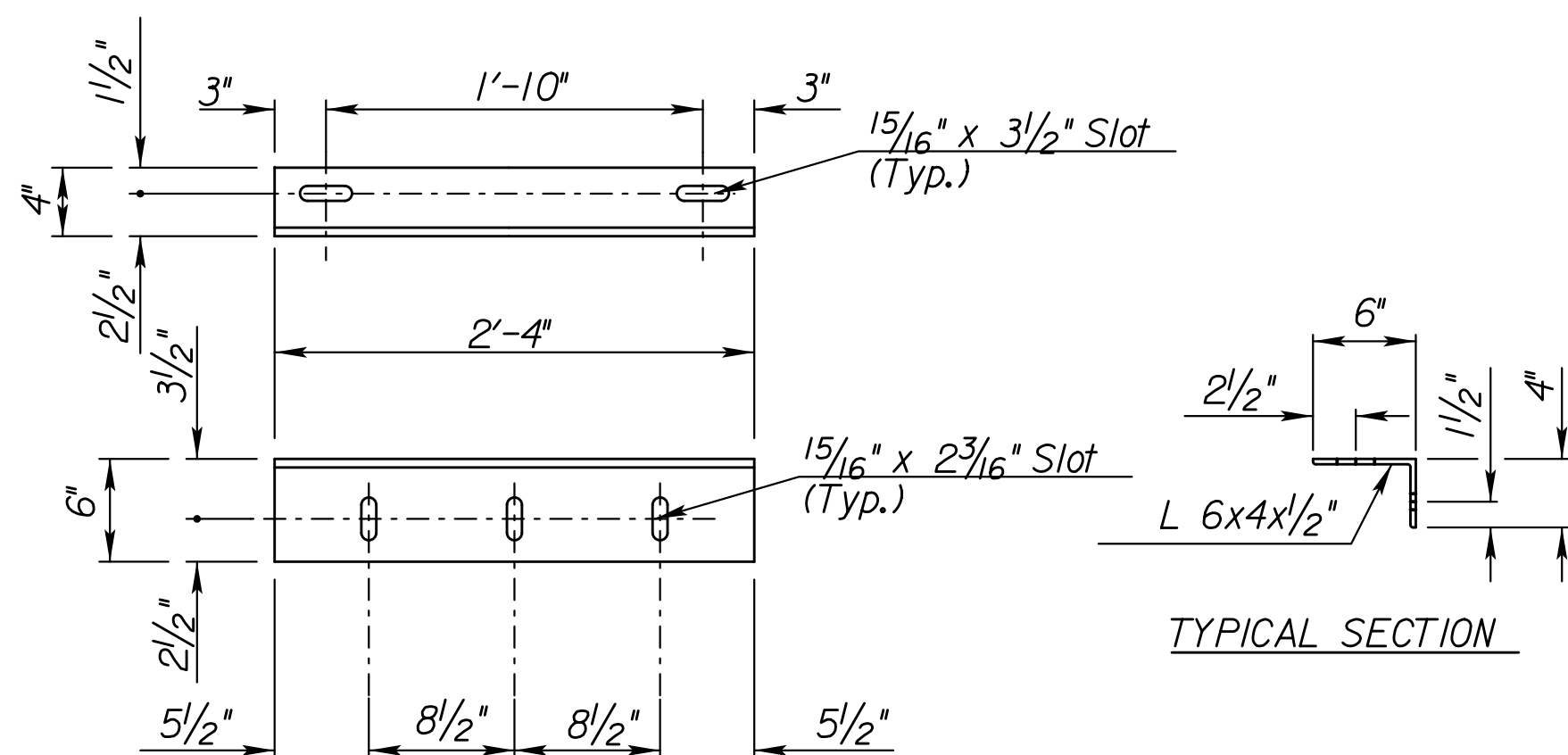


TEMPORARY DIAPHRAGM
(or equivalent)



SECTION A

DETAIL D

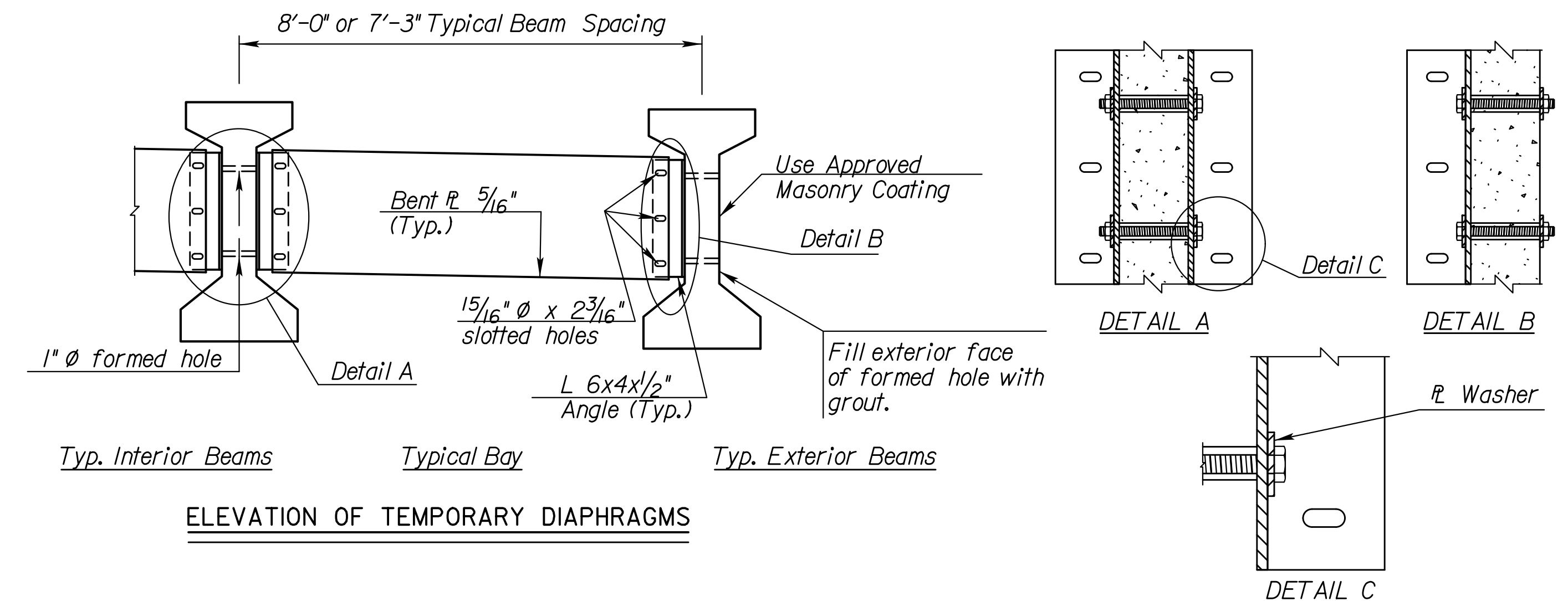


TYPICAL SECTION

2' - 4" CONNECTION ANGLE
(30 each Req'd.)
(Weight = 37.8 Lb. each)

CONNECTION ANGLE DETAILS

(or equivalent)



ELEVATION OF TEMPORARY DIAPHRAGMS

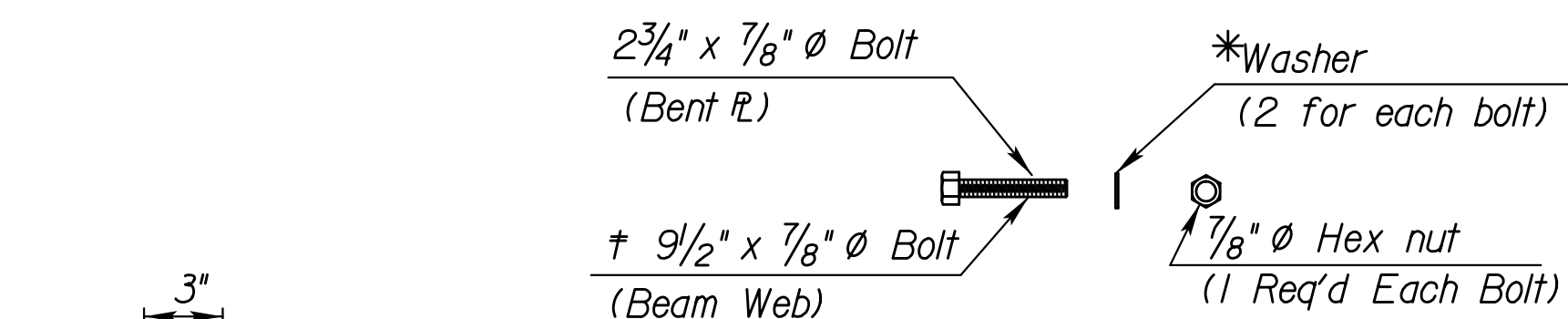


PLATE WASHER

FASTENER DETAILS

*Plate washers required for slotted holes.

† Verify per beam type.

3				
2				
1	7-30-08	New Base Sheet	JPJ	LRR
NO.	DATE	REVISIONS	BY	APP'D

KANSAS DEPARTMENT OF TRANSPORTATION

Br. No. 56-23-14.43 (I88) Sta. 124+86.33

FRAMING PLAN
& TEMPORARY DIAPHRAGM DETAILS

Proj. No. 56-23 KA-0033-01 Douglas Co.

SHEET NO. 7 OF 13	SCALE	APP'D	
DESIGNED CEM	DETAILED CEM	QUANTITIES CEM	CADD RCJ
DESIGN CK. JSR	DETAIL CK. JSR	QUAN. CK. JSR	CADD CK. CEM

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	56-23 KA-0033-OI	2012	38	127

GENERAL NOTES

Fabricate the precast prestressed beams in accordance with the KDOT Specifications. Submit shop drawings in accordance with the KDOT Specifications except nine sets are required.

Use air entrained concrete. The KDOT Materials Section shall approve the mix design. Unless otherwise shown on the plans, $f'c = 5,000$ psi and $f'c$ at release = 4,300 psi.

Use reinforcing steel conforming to the requirements of ASTM A615, Grade 60. The reinforcing steel shown shall be uncoated unless otherwise indicated.

Use $\frac{1}{2}$ " nominal diameter (unless otherwise indicated), uncoated, seven-wire, low relaxation prestressing tendons conforming to the requirements of ASTM A416, Grade 270.

Use bolts having an ultimate strength 50% in excess of the manufacturer's safe load. All items (except the tendons) cast-in or inserted in prestressed beams shall be epoxy coated or galvanized. Show Formed Holes on shop drawings. All bolts, nuts and washers shall be subsidiary to the bid item, "Prestressed Concrete Beams".

Show on the shop drawings any hardware, holes or other appurtenances that are required to be incorporated into the girder to construct the girder or for any temporary works needed to construct the bridge (e.g. safety railing pockets).

After beams are in the final position, remove lifting devices. See "Lifting Device" detail below. Removal of the lifting devices, coating and grouting shall be subsidiary to the bid item: "Prestressed Concrete Beams".

Use elastomeric bearing pads conforming to the KDOT Specifications. Bearing pads and Type B expansion joint material shall be subsidiary to the bid item, "Prestressed Concrete Beams".

The beam lengths shown on the design plans are net lengths measured horizontally along the beam centerline. The beam manufacturer shall make necessary allowances for grade, and for shortening due to elastic shortening, creep and shrinkage.

The beams shall reasonably conform to the lines and dimensions shown on the design plans and be within the tolerances specified in the latest publication of AASHTO, "Tentative Standards for Prestressed Piles, Slab, I-Beams and Box Bridges and an Interim Manual for Inspection of Such Construction", except as modified by this sheet or the KDOT Specifications.

Bevel all exposed edges of beams except the tops and ends with a $\frac{3}{4}$ " triangular molding or round the edges to a $\frac{3}{4}$ " radius. Round the angle of intersection between the web and the flanges.

Apply an initial force of 1,000 to 3,000 pounds to each strand to take up any slack in the cables. Unless otherwise noted on the plans, apply a force of 31,000 pounds to each strand. Stress harped strands to a magnitude such that they are tensioned to 31,000 pounds after they are in position.

Strike off level and apply a wire brush or stiff broom finish to the tops of the beams. Apply the finish transverse to the length of the beam. (Note: When using precast panels for deck construction, the outside 5" on each side of the top flange shall be finished smooth with a steel trowel.)

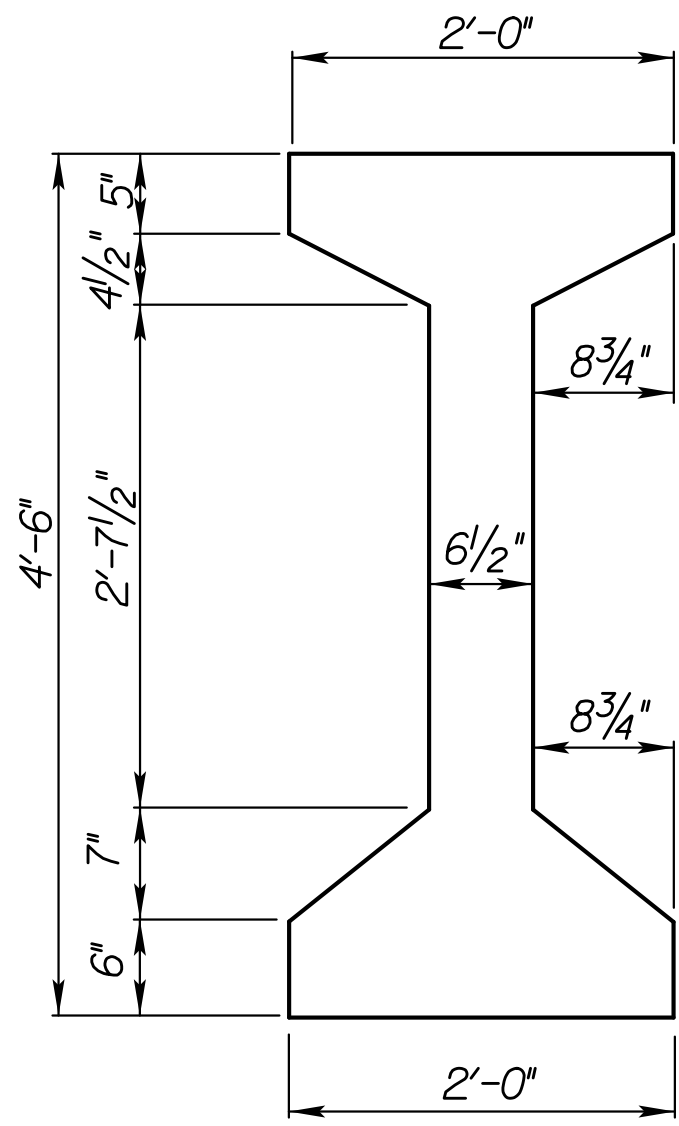
At approximately the time of initial set, brush the top of the beam transversely with a coarse wire brush to remove all laitance.

Fill trapped air holes and surface voids on the exterior face of the exterior beams with an approved concrete masonry coating. This work shall conform to KDOT Specifications. This work shall be subsidiary to the bid item, "Prestressed Concrete Beams".

Defension strands in a sequence which minimizes lateral eccentricity. Show the method and sequence of strand release on the shop drawings. Use extreme care when lifting, handling, storing and transporting beams. Use the lifting system shown or an alternate system approved by the Engineer. Keep the beam in an upright position at all times. Support the beam on bearing points positioned directly below the designated lifting points or designated bearing points.

Do not place the bridge slab before the beams are 28 days old. Pour diaphragms as detailed in the bridge plans.

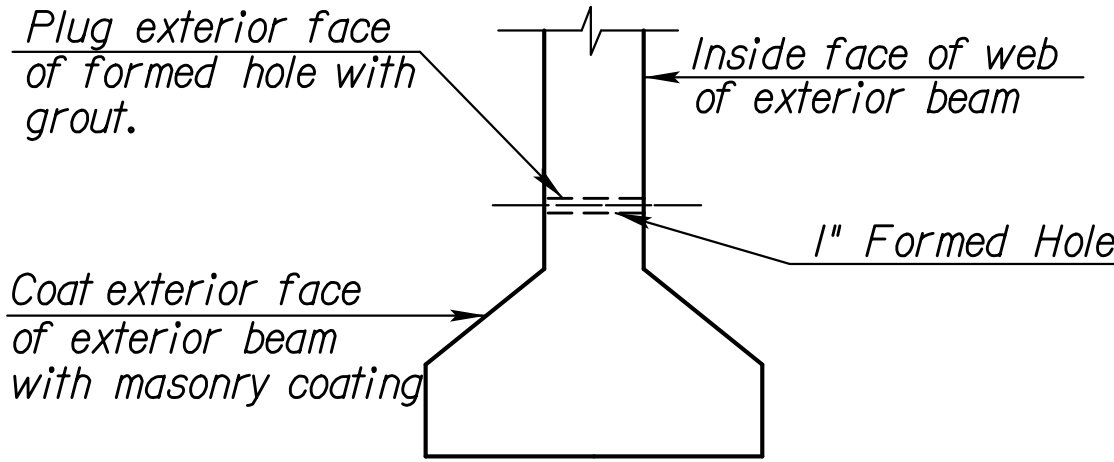
Stencil with paint the following information on the webs approximately 5'-0" from one end of the beam: date of concrete placement, date of strand release, and beam mark.



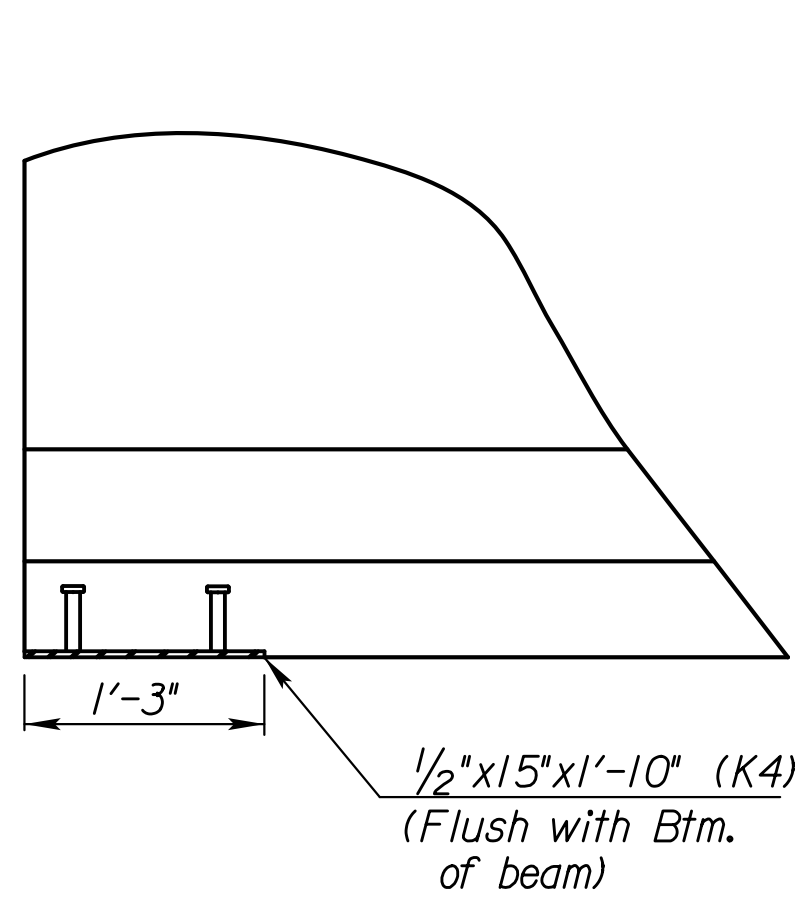
TYPE K4

Area	644 In. ²
IcG	236,105 In. ⁴
Y Bot	25.89 In.
Vol./Surf. Area	3.65 In.
Wt./Ft.	671 Lbs.

TYPICAL BEAM SECTIONS

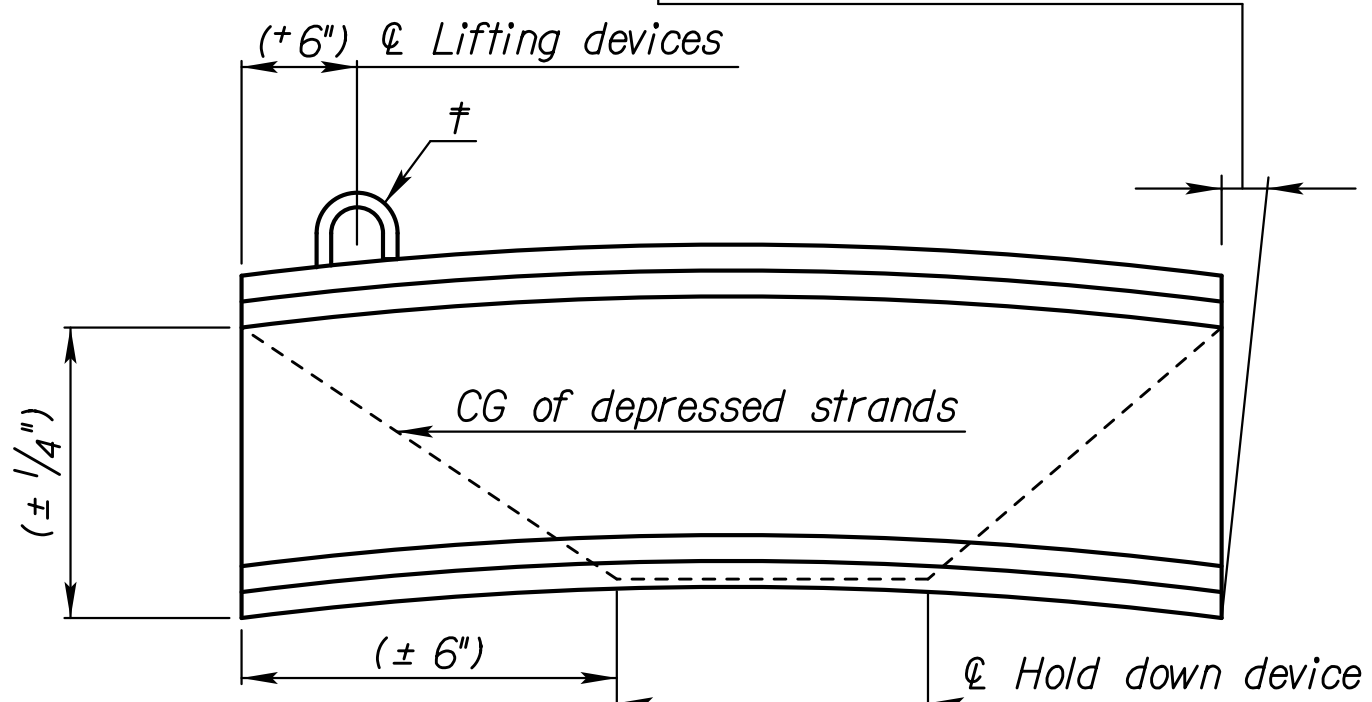


DETAIL OF FORMED HOLE(S)
(See Beam Detail sheet for locations)



ELEVATION

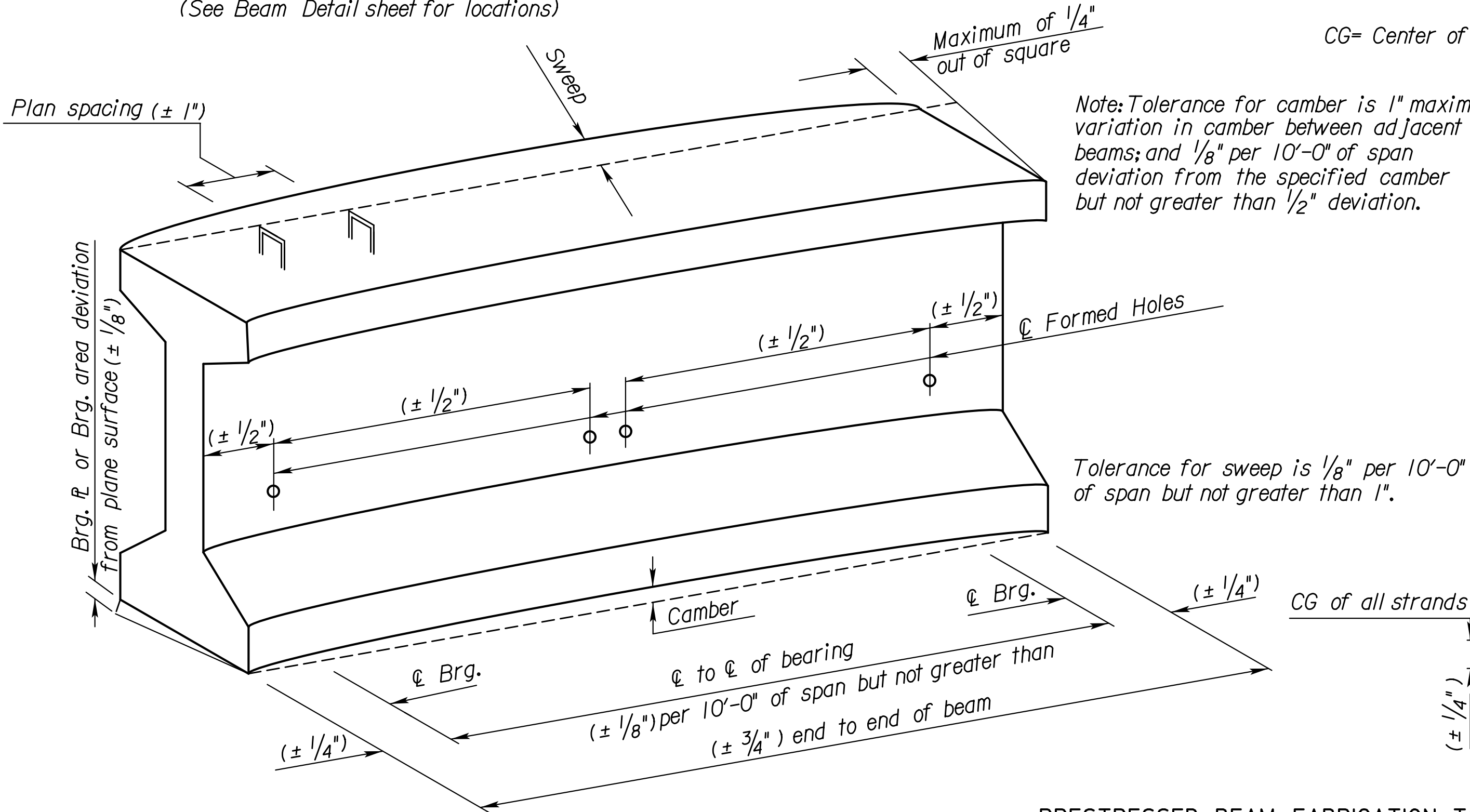
Maximum deviation from plane normal to axis of beam $\frac{1}{8}$ " per Ft. of beam height.



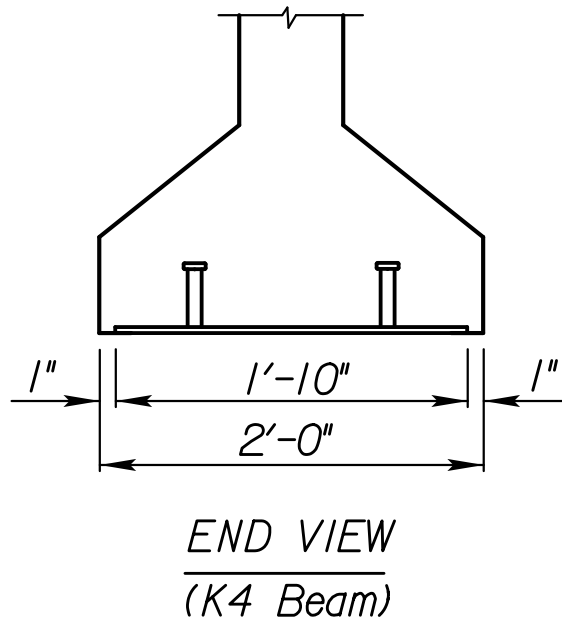
ELEVATION

Note: Dimensions shown in parentheses are tolerances only.

CG= Center of Gravity



PRESTRESSED BEAM FABRICATION TOLERANCES



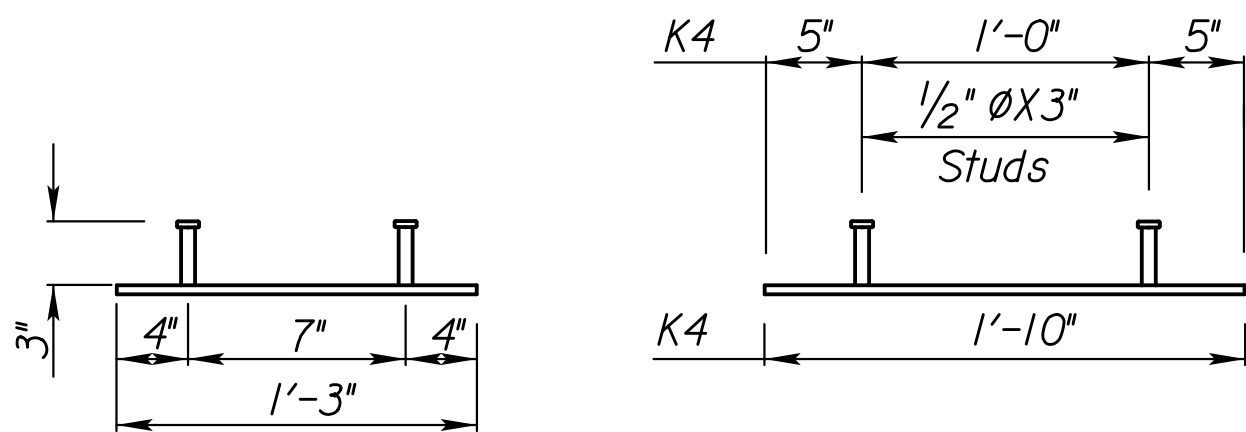
END VIEW
(K4 Beam)

Note: Stud welding will be in accordance with the latest edition of AWS D1.1.

Use plate conforming to the requirements of ASTM A709 Grade 36. The stud anchors will be made of material as specified for Shear Connector Studs in the KDOT Specifications.

The exposed surface of the bearing plates shall be galvanized.

All work and material to install the bearing plates shall be subsidiary to the bid item "Prestressed Concrete Beam".

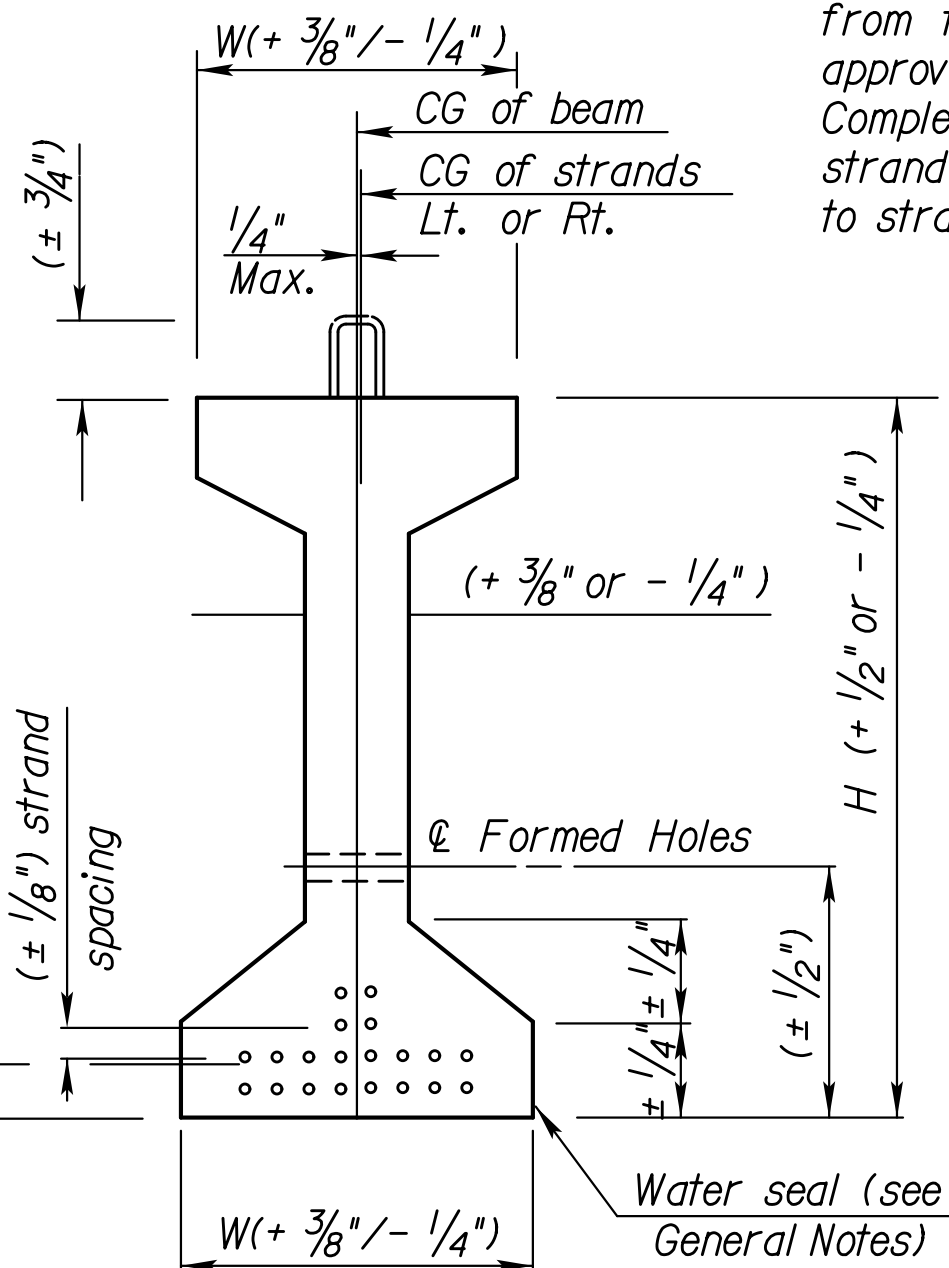


ELEV. OF BRG. PLATE

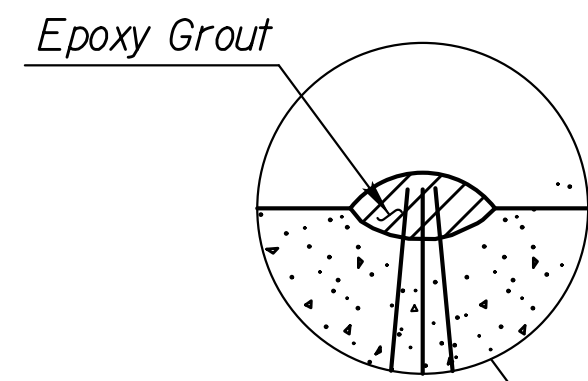
TYPICAL SECTION

BEARING PLATE DETAILS

† Remove lifting device within $\frac{1}{2}$ " from top of beam. Coat area with approved epoxy bonding agent. Completely cover remaining exposed strands and fill depressions adjacent to strands with approved epoxy grout.



TYPICAL SECTION

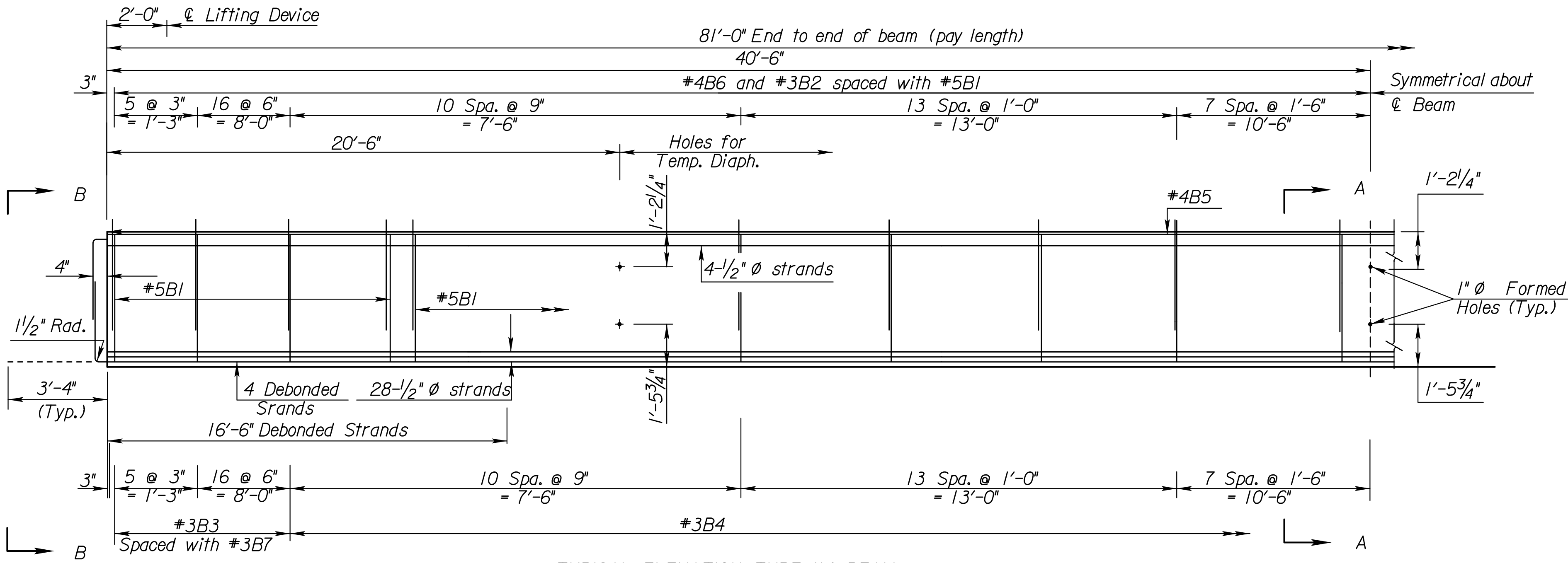


LIFTING DEVICE

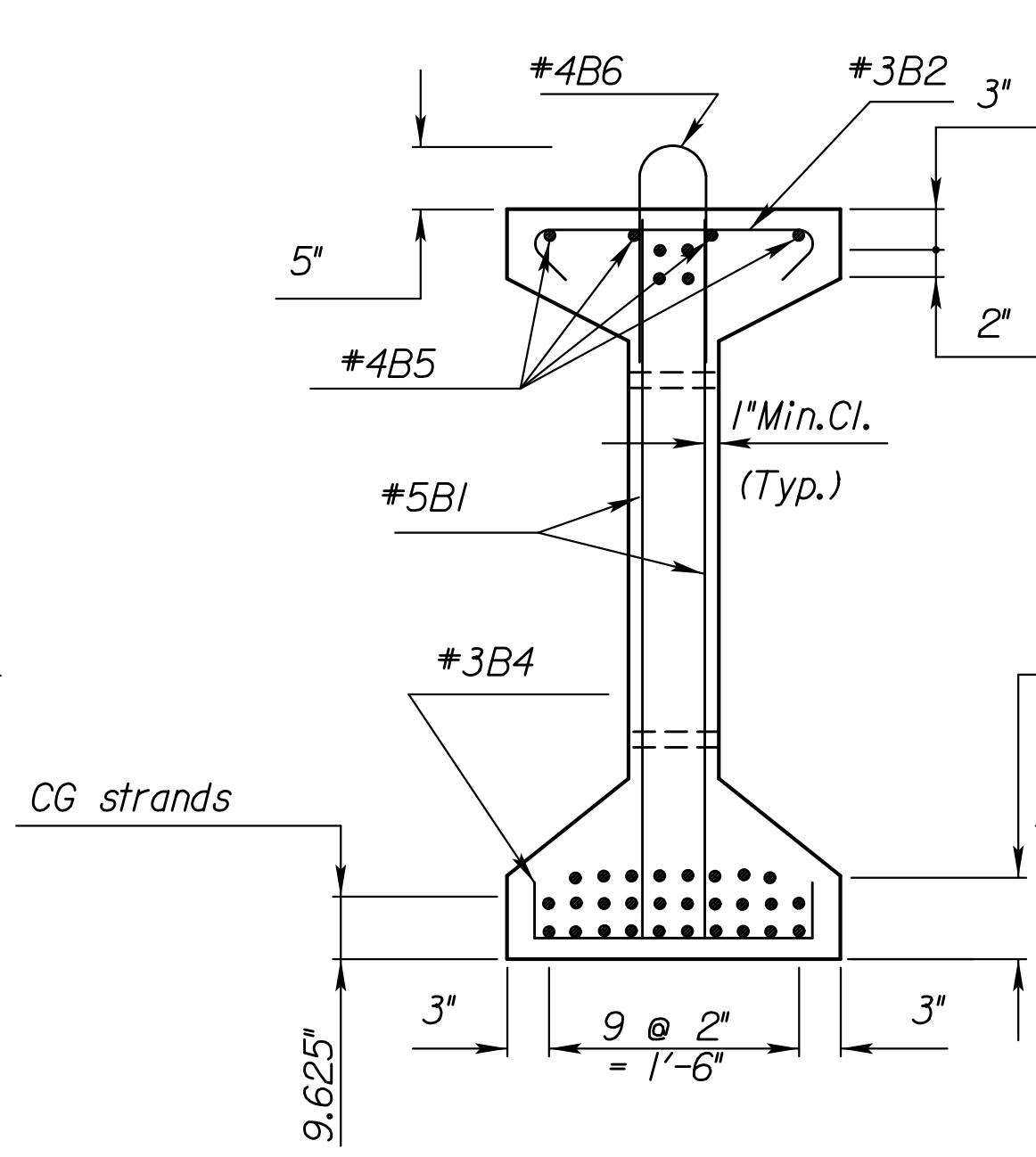
5	2/21/12	Change Bearing & Thickness	JPJ	TLF
4	9/22/10	Prepare for WWF option	JPJ	TLF
3	7/22/08	Revision for Formed Holes only	JPJ	KFH
2	2/28/07	Separated Beam Sections	JPJ	KFH
1	1-31-06	General Note Changes & Grouting	JPJ	KFH
NO.	DATE	REVISIONS	BY	APP'D

KANSAS DEPARTMENT OF TRANSPORTATION			
Br. No. 56-23-14.43 (I88)		Sta. 124+86.33	
STANDARD PRESTRESSED CONCRETE BEAM DETAILS			
Proj. No. 56-23 KA-0033-OI		Douglas Co.	
FHWA APPROVAL		10-11-10 APP'D	
DESIGNED		Terry L. Fleck	
CEM/DETAILED		RCJ	
JSR/DETAIL CK.		LRRI/QUAN CK.	
DESIGN CK.		JSR/TRACE CK.	

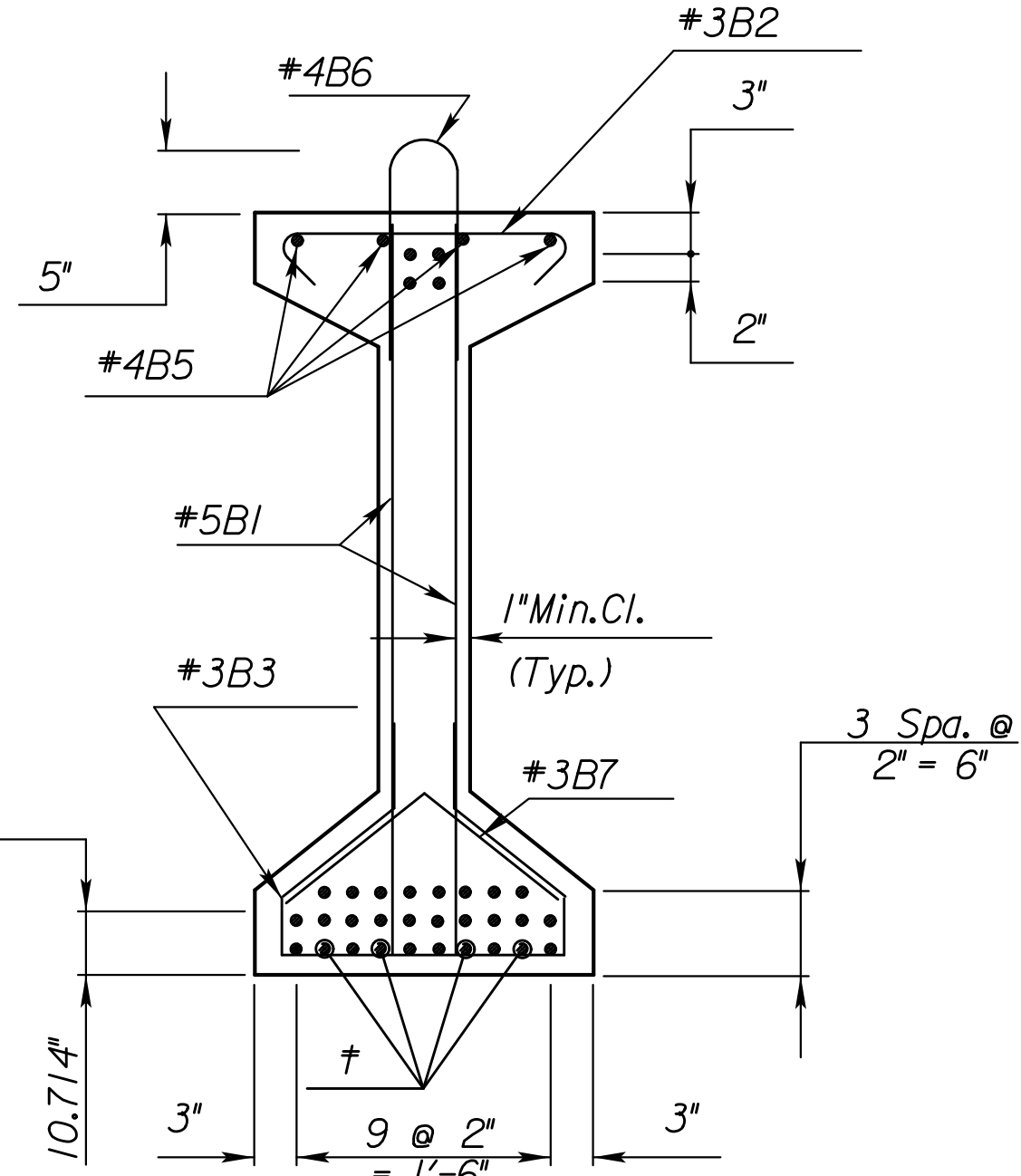
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	56-23 KA-0033-01	2012	39	127



TYPICAL ELEVATION TYPE K4 BEAM



SECTION A-A



SECTION B-B

† Debonded Strands

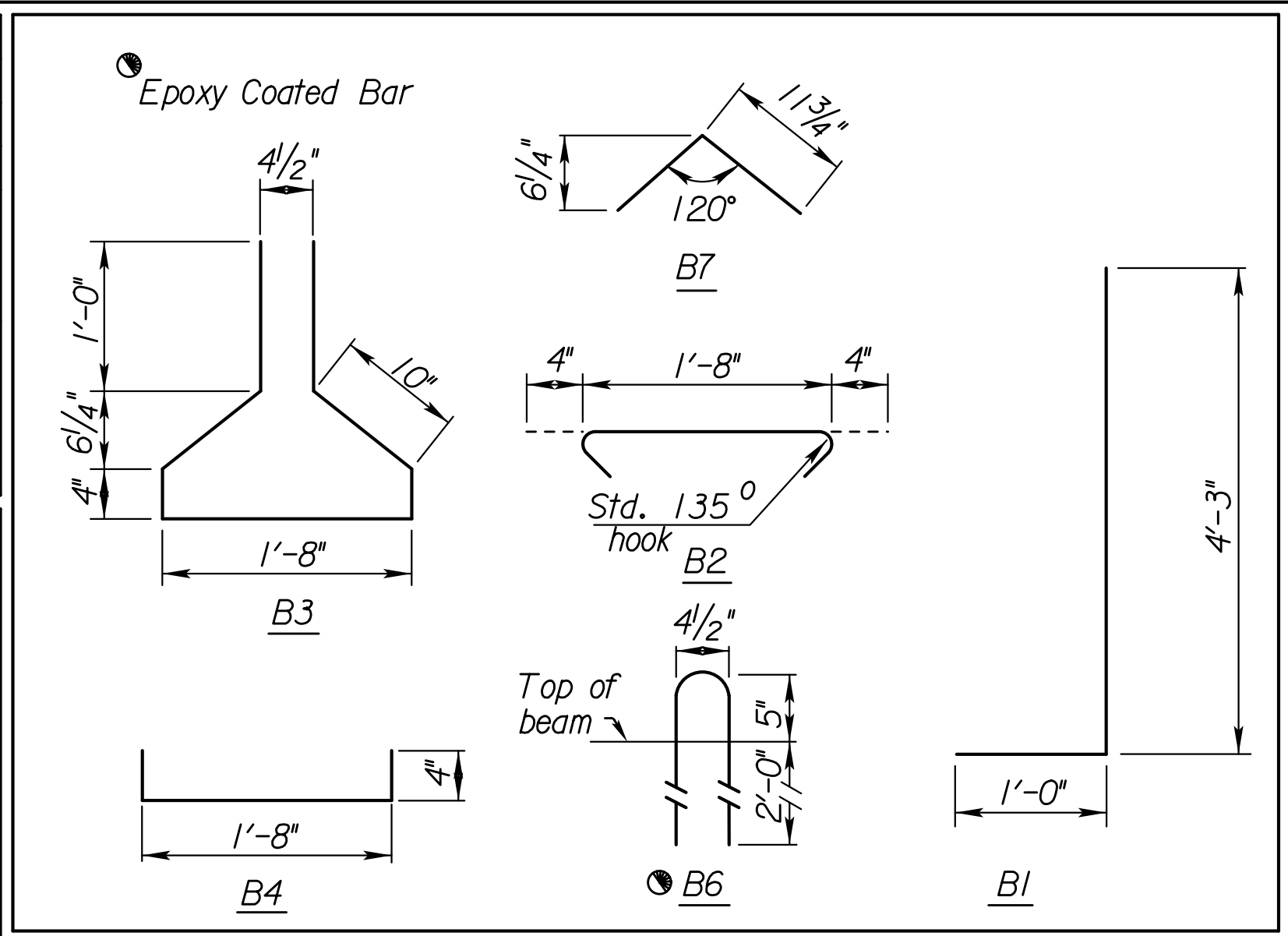
NOTE: During transportation and construction only, support beams on bearing points a maximum of 5 Ft. from the beam end. The Fabricator shall show the proposed support locations on the shop drawings.

† If Welded Wire Fabric (WWF) is used in-lieu of reinforcing steel bars shown on this sheet, the spacing of wires for the WWF shall be equal or less than the vertical bars shown in the typical beam section above. The equivalent A_s for the WWF shall be equal to or greater than typical beam section above.

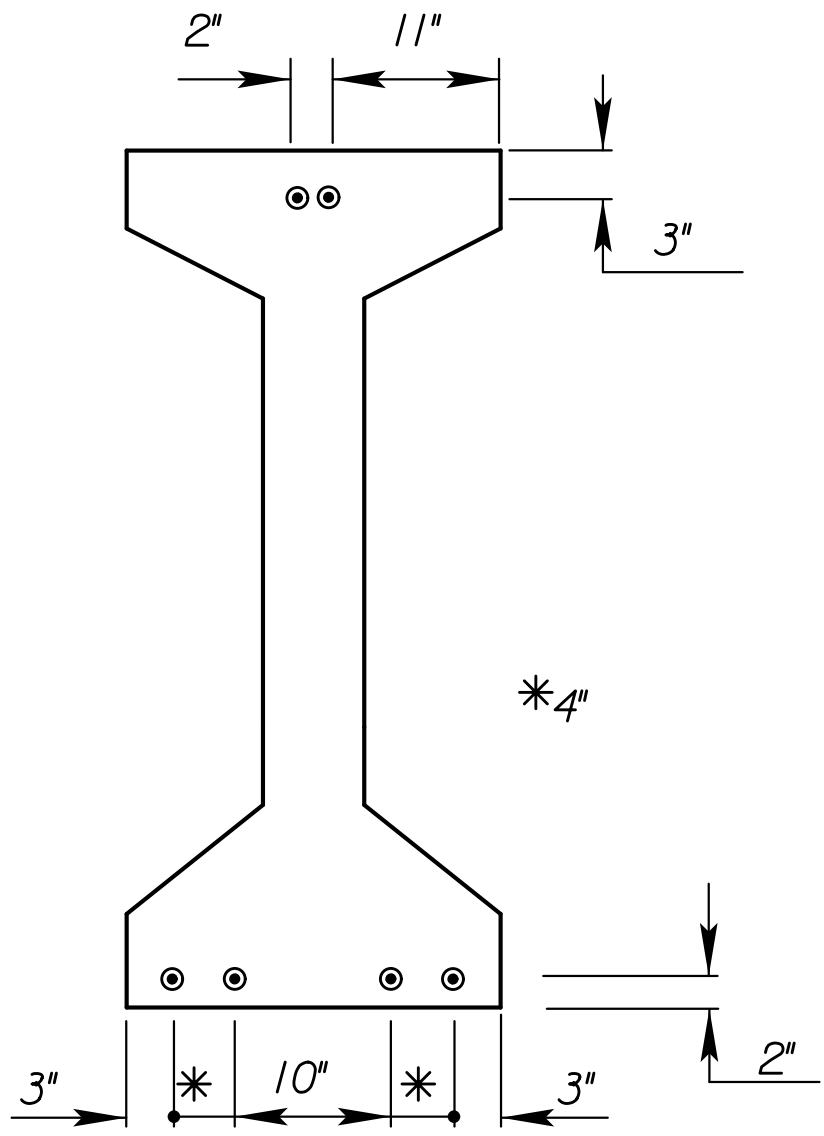
NOTE: Extend 6 strands 3'-4" beyond the end of the beam. Strands not shown shall be cut flush with the end of the beam. See "Strand Extension Details".

Welded Wire Fabric Equivalent Steel A_s †						
Size	3"	6"	9"	12"	15"	18"
#3	0.440	0.220	0.147	0.110	0.088	0.073
#4	0.800	0.400	0.267	0.200	0.160	0.133
#5	1.234	0.617	0.411	0.308	0.247	0.206
#6	1.761	0.880	0.587	0.440	0.352	0.293

BILL OF REINFORCING STEEL					
Beam (1 Listed-x Reqd.)					
Straight bars				Bent bars	
Mark	No.	Size	Length	Mark	No.
B5	12	#4	28'-7"	B2	103
				B3	44
				B4	59
				B7	44
				B6	103
				B1	206



BILL OF MATERIAL		
Item	Unit	Quantity
Prestressed concrete beams (K4)	Lin.Ft.	486
The following quantities are given for information only and shall not be paid for directly but shall be made subsidiary to the bid item "Prestressed Concrete Beams"		
Beam concrete (f'_c = 5000 PSI) (f'_{ci} = 4300 PSI)	Cu.Yds.	80.5
Approx. Wt. per 81'-0" beam	Tons	27.18
1/2" Ø Prestressing strand (270 KSI low relaxation f_y = 243 KSI)	Lin.Ft.	15792
Epoxy reinforcing steel (f_y =60,000 PSI)	Lbs.	2060
Reinforcing steel (f_y =60,000 PSI)	Lbs.	8380
Elastomeric Brg. pads (3/4" x 8" x 1'-10")	Each	12
1" Ø Formed Hole	Each	36
Lifting devices	Each	12
Bearing plates (1/2" x 15" x 1'-10")	Each	12



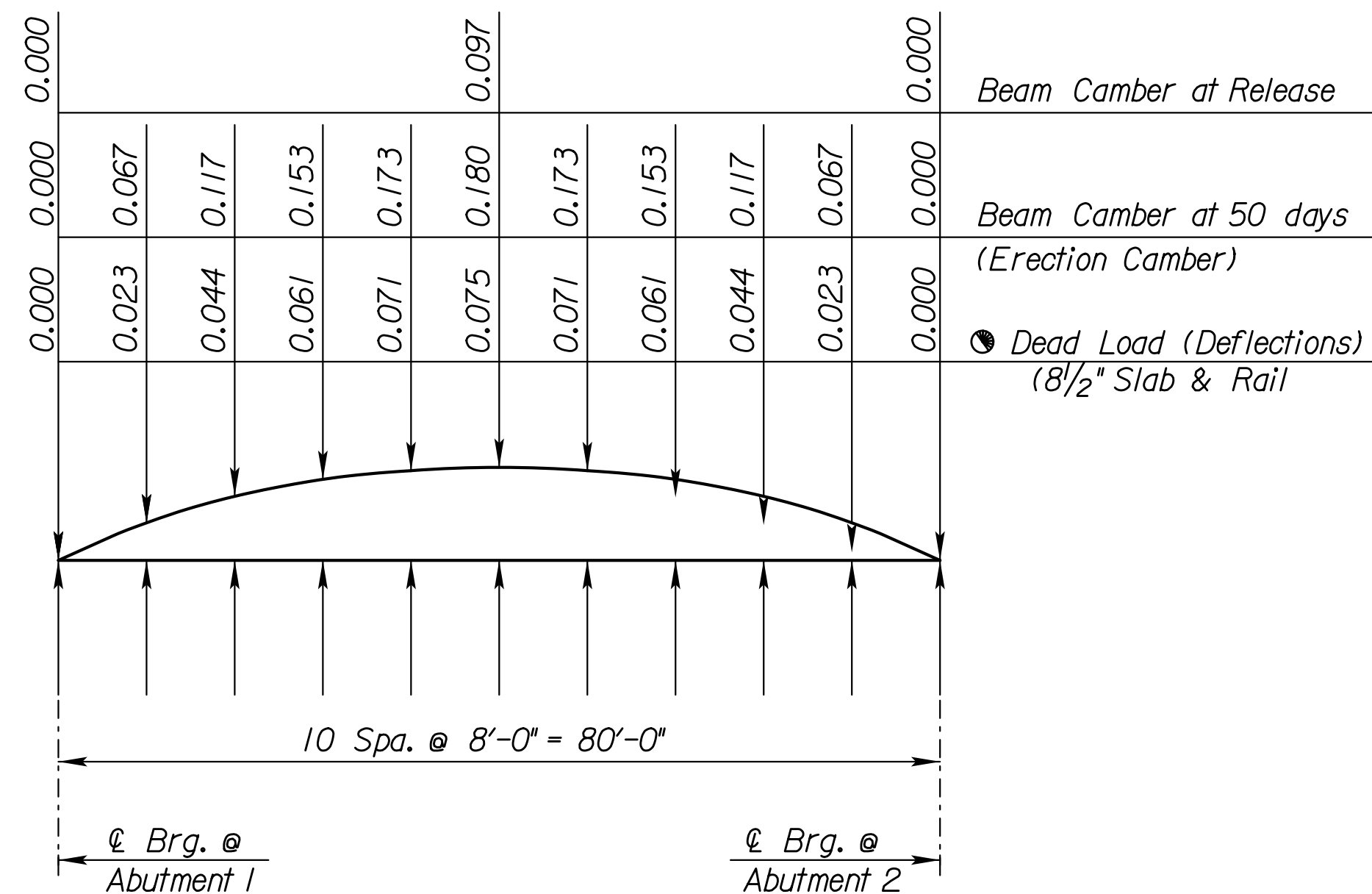
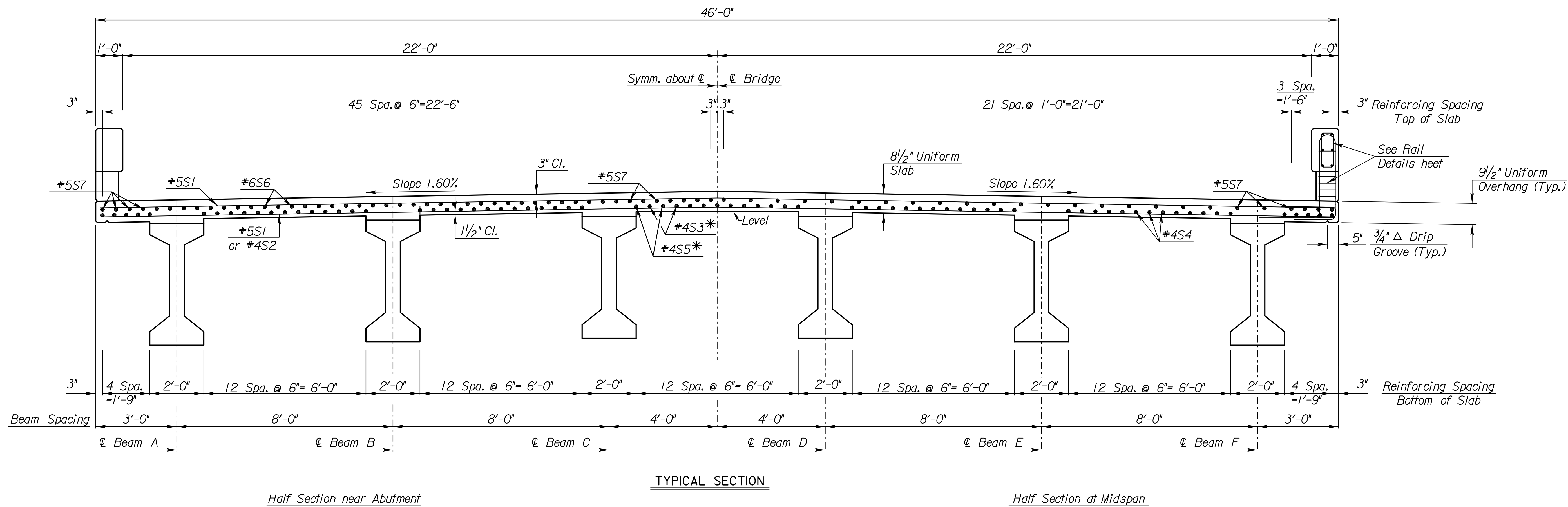
STRAND EXTENSION DETAIL

(81'-0" span beams)

NO.	DATE	REVISIONS	BY	APP'D
4				
3				
2				
1				
KANSAS DEPARTMENT OF TRANSPORTATION				
Br. No. 56-23-14.43 (I88) S+a. I24+86.33				
K-4 BEAM DETAILS				
Proj. No. 56-23 KA-0033-01 Douglas Co.				
SHEET NO. 9 OF 13 DATE 4-26-11 APP'D Terry L. Fleck				
DESIGNED CEM	DETAILED CEM	QUANTITIES CEM	CADD JSR	RCJ
DESIGN CK. JSR	DETAIL CK. JSR	QUAN. CK. JSR	CADD CK. JSR	CEM

*All #4S3 & #4S5 alternating at abutments
(See Slab Detail Sheet)

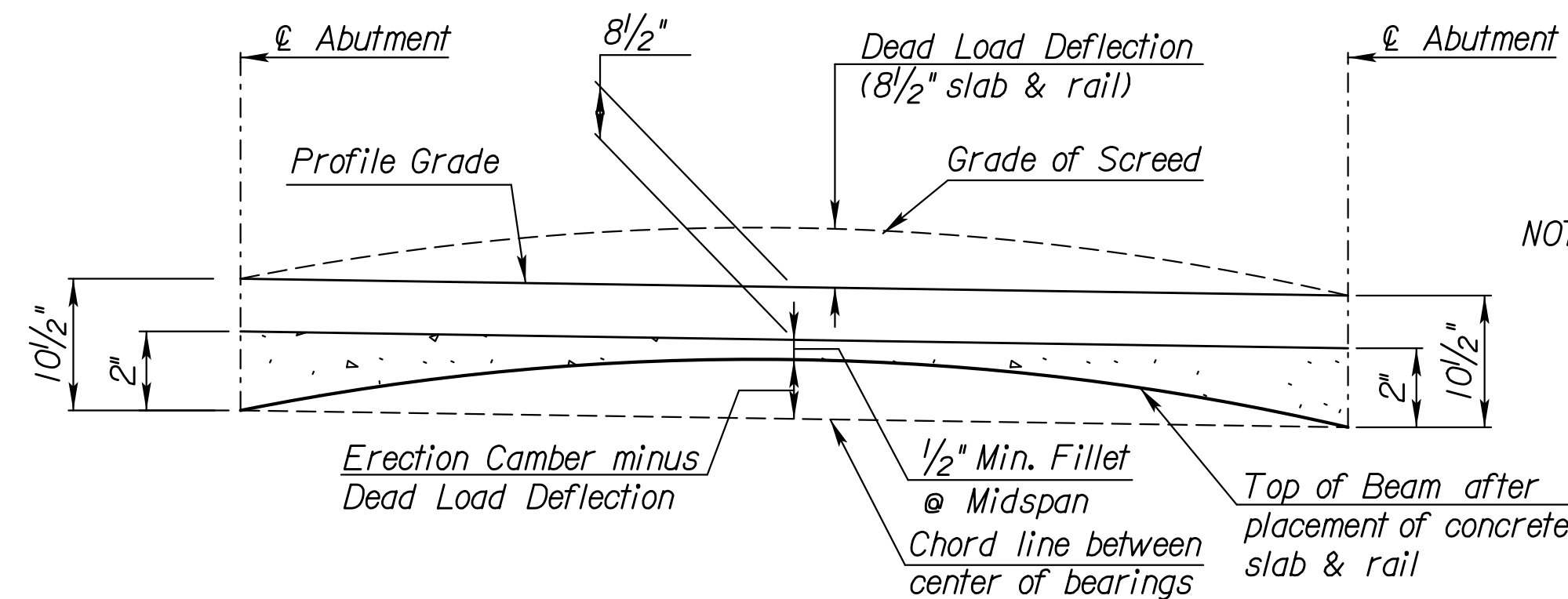
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	56-23 KA-0033-01	2012	41	127



BEAM CAMBER AND DEAD LOAD DEFLECTIONS

Given in feet
Beam Concrete $E_c = 3.778 \times 10^6 \text{ psi}$
 $E_s = 4.074 \times 10^6 \text{ psi}$

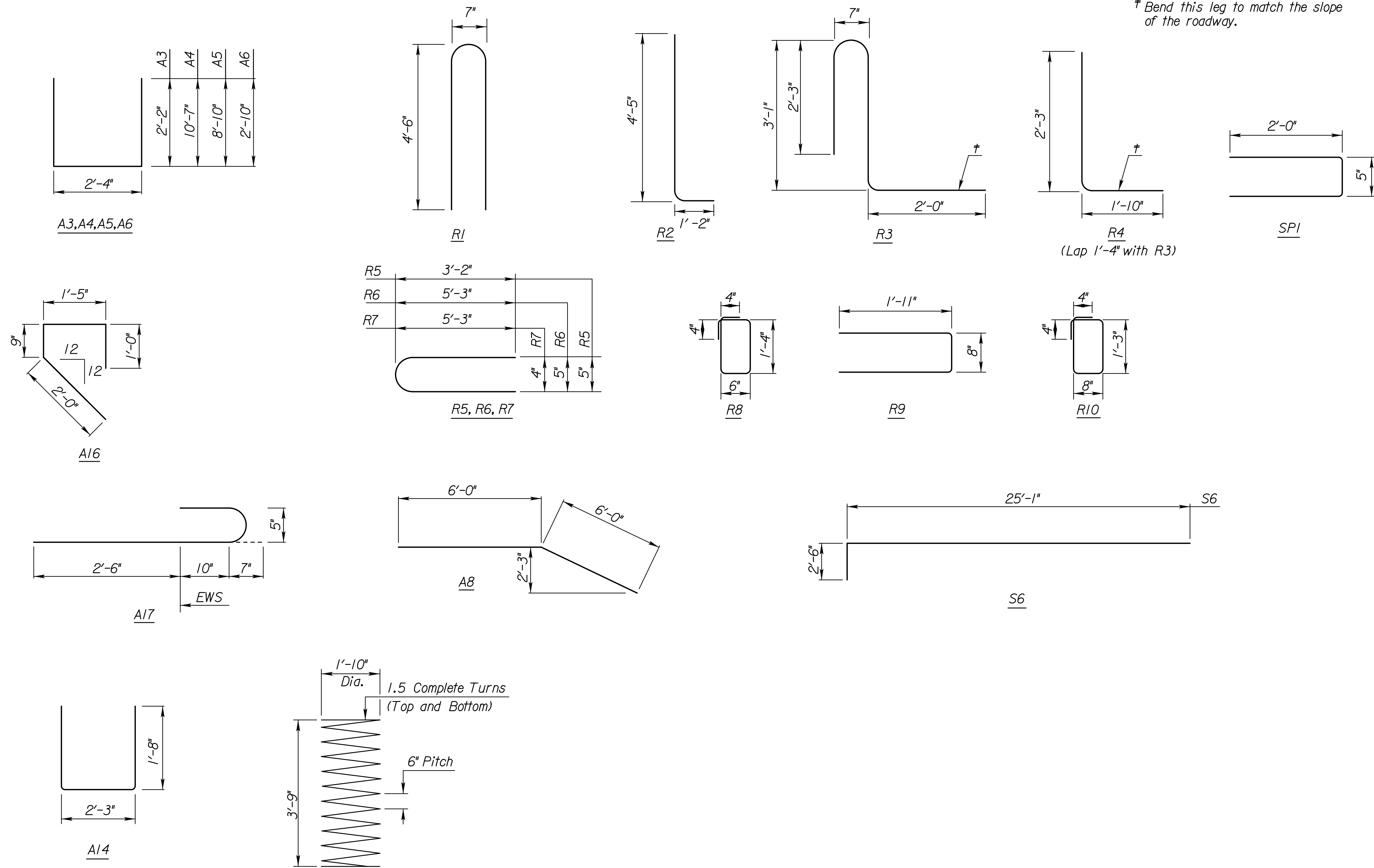
Dead Load Deflections are Downward.



VARIABLE FILLET DIAGRAM
(Along C of Beam)

3				
2				
1				
NO.	DATE	REVISIONS	BY	APP'D
KANSAS DEPARTMENT OF TRANSPORTATION				
Br. No. 56-23-14.43 (I88)			Sta. 124+86.33	
SUPERSTRUCTURE DETAILS				
Proj. No. 56-23 KA-0033-01			Douglas Co.	
SHEET NO. 11 OF 13		SCALE		APP'D
DESIGNED	CEM	DETAILED	CEM	QUANTITIES
DESIGN CK.	JSR	DETAIL CK.	JSR	QUAN. CK.
				CADD
				CADD CK.
				RCJ

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	56-23 KA-0033-01	2012	43	127



BILL OF REINFORCING STEEL Grade 60									
Straight Bars					Bent Bars				
Mark	Size	Number	Length	Mark	Size	Number	Length		
Epoxy Coated	A7	#8	8	52'-0"	A8	#8	16	12'-0"	
	AD1	#8	4	45'-0"					
					R1	#7	24	9'-3"	
	A9	#6	2	57'-6"	R2	#7	4	5'-7"	
	A10	#6	16	33'-8"	R3	#7	124	7'-6"	
	A11	#6	50	5'-8"					
	A12	#6	4	8'-0"	S6	#6	84	27'-7"	
	A13	#6	16	11'-2"					
	R11	#6	24	8'-4"	A4	#5	98	23'-6"	
	R12	#6	72	9'-8"	A5	#5	16	20'-0"	
					A6	#5	122	8'-0"	
					A17	#5	78	3'-11"	
	S1	#5	200	45'-8"	R5	#5	8	6'-6"	
	S7	#5	100	42'-5"	R6	#5	8	10'-8"	
					SP1	#5	70	4'-5"	
	A15	#4	4	23'-5"					
	S2	#4	132	23'-11"	A14	#4	52	5'-7"	
	S3	#4	75	30'-0"	A16	#4	78	5'-2"	
	S4	#4	75	36'-4"	R4	#4	124	4'-1"	
	S5	#4	75	20'-0"	R7	#4	4	10'-8"	
					R8	#3	228	4'-4"	
					R9	#3	112	4'-6"	
					R10	#3	28	4'-6"	
	Non-Epoxy	A1	#8	32	35'-0"	A3	#5	114	6'-8"
A2		#6	40	33'-11"	AS1	1/2" Ø	16	*	

* See Bending Diagram

3				
2				
1	4-12-93	Current Release		
NO.	DATE	REVISIONS	BY	APP'D
<p align="center">KANSAS DEPARTMENT OF TRANSPORTATION</p> <p align="center">Br. No. 56-23-14.43 (188) Sta. 124+86.33</p> <p align="center">BILL OF REINFORCING STEEL & BENDING DIAGRAM</p> <p align="center">Proj. No. 56-23 KA-0033-01 Douglas Co.</p>				
SHEET NO. 13 OF 13	SCALE	APP'D		
DESIGNED CEM	DETAILED CEM	QUANTITIES CEM	CADD RCJ	RCJ
DESIGN CK. JSR	DETAIL CK. JSR	QUAN. CK. JSR	CADD CK. CEM	CEM

KDOT Graphics Certified 01-08-2013 *Sheet No. 43*

KDOT Graphics Certified

Std. Base File:	br182g.dgn
Plotted By:	jruby
File:	003301-188-13.dgn
Plot Date:	08-JAN-2013 14:51

BENDING DIAGRAMS

All dimensions are out to out of bars.