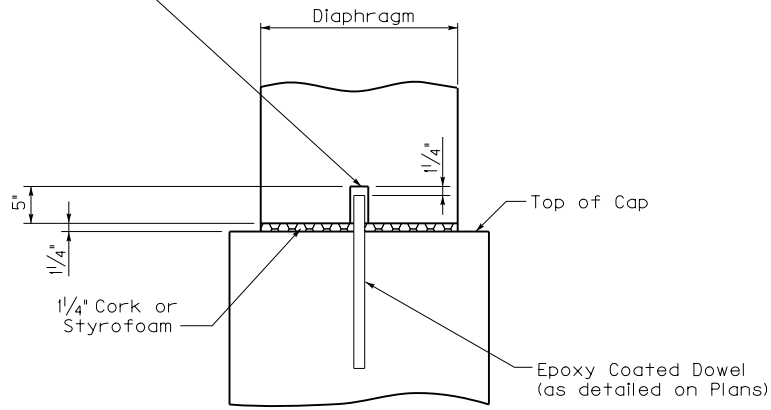
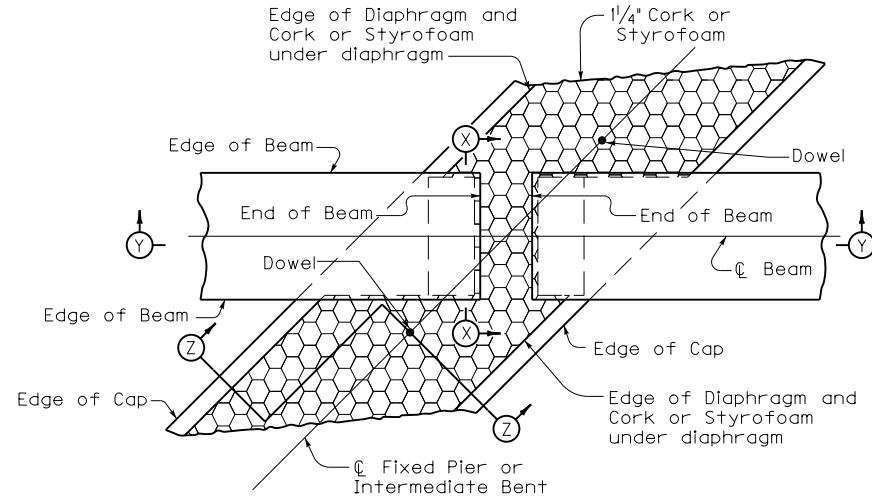


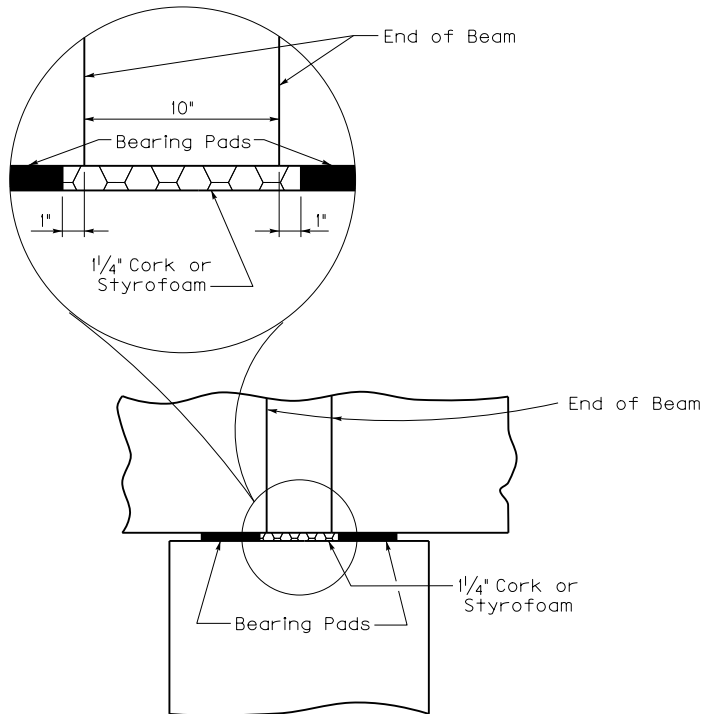
Std. Wt. 2" Commercial Pipe Sleeve closed at one end and 5" long. Secure Pipe Sleeve to prevent floating while placing Concrete. Sleeve is to sit on Cork or Styrofoam. Pipe Sleeve is to be incidental to Diaphragm Concrete.



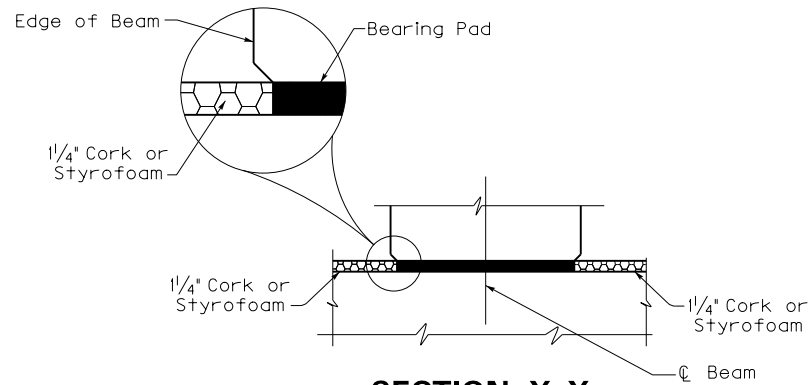
SECTION Z-Z



PLAN



SECTION Y-Y



SECTION X-X

**KENTUCKY
DEPARTMENT OF HIGHWAYS**

BEARING DETAILS

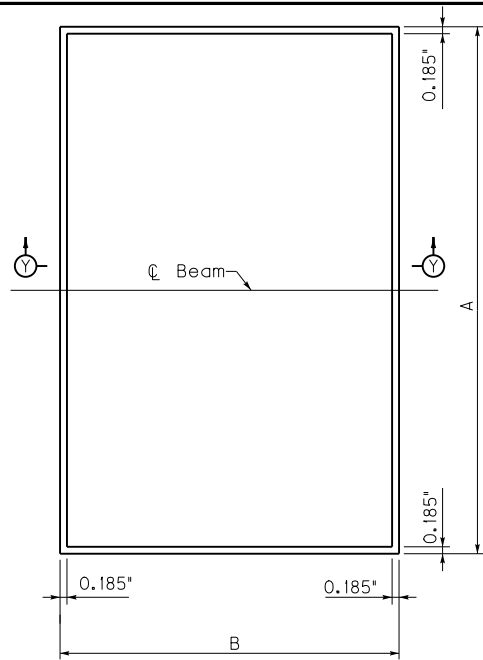
STANDARD DRAWING NO. BBP-002-04

SUBMITTED *12-01-99* DATE

DIRECTOR, DIVISION OF BRIDGE DESIGN

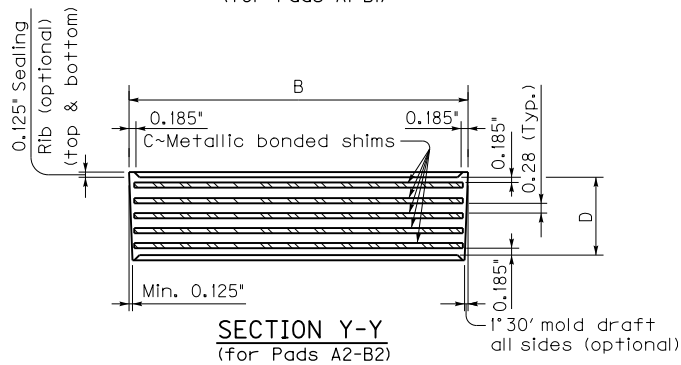
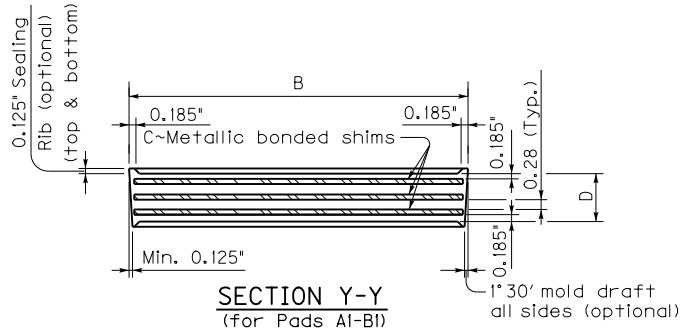
APPROVED *12-01-99* DATE

STATE HIGHWAY ENGINEER



DIMENSIONS FOR BOX-BEAM PADS							
PAD	A	B	C	D	*MAXIMUM REACTION	MAXIMUM MOVEMENT (One Direction)	
A1	1'-10"	7"	3~0.12" x 21.630" x 6.630"	1.290"	173k	0.500"	
A2	1'-10"	7"	5~0.12" x 21.630" x 6.630"	2.090"	173k	0.750"	
B1	11"	7"	3~0.12" x 10.630" x 6.630"	1.290"	69k	0.500"	
B2	11"	7"	5~0.12" x 10.630" x 6.630"	2.090"	69k	0.750"	

* These reactions are based on service loads, use actual reactions to determine anchorage requirements for pads.



GENERAL NOTES

SPECIFICATIONS: Fabricate the Elastomeric Bearing Pads to the design and dimensions as shown on these drawings and to AASHTO LRFD Bridge Construction Specifications, Section 18.

Ensure bearings are low temperature Grade 3 with durometer hardness of 50 and subjected to the load testing requirements corresponding to Design Method A.

Include the price of bearing pads in the bid for the beams.

KENTUCKY DEPARTMENT OF HIGHWAYS		
ELASTOMERIC BEARING PADS FOR BOX BEAMS		
STANDARD DRAWING NO. BBP-003-02		
SUBMITTED	<i>Mark Nite</i>	12-01-11
<small>DIRECTOR DIVISION OF STRUCTURAL DESIGN</small>		<small>DATE</small>
APPROVED	<i>[Signature]</i>	12-01-11
<small>STATE HIGHWAY ENGINEER</small>		<small>DATE</small>

End of Bridge
After cutting prestress strands flush with surface, paint with approved bituminous material.

1/2" x 3" Holes cast in all beams. Fill holes with grout at fixed end and hot-pour crack and joint sealer at expansion end.

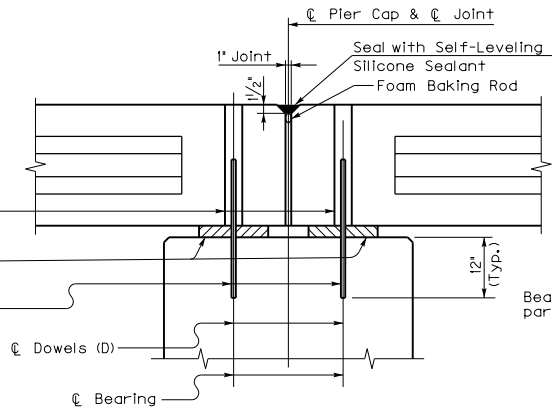
Elastomeric Bearing Pads and/or Cork.

Drill holes for dowels after placing beams and grout dowels into cap

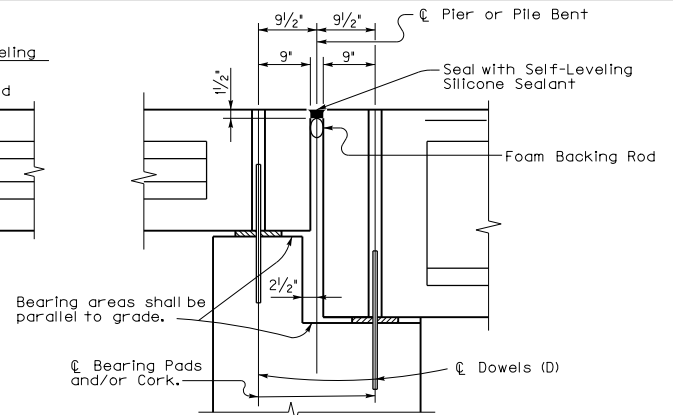
⌀ Dowels (D)

⌀ Bearing

ABUTMENT OR END BENT



PIER OR PILE BENT



STEPPED PIER OR PILE BENT

(Showing Location & Placement of Box Beams)

TYPICAL BEARING DETAILS (NON-COMPOSITE)

End of Bridge
After cutting prestress strands flush with surface, paint with approved bituminous material.

Armored Edge see BJE-001

1/2" x 3" Holes cast in all beams. Fill holes with grout at fixed end and hot-pour crack and joint sealer at expansion end.

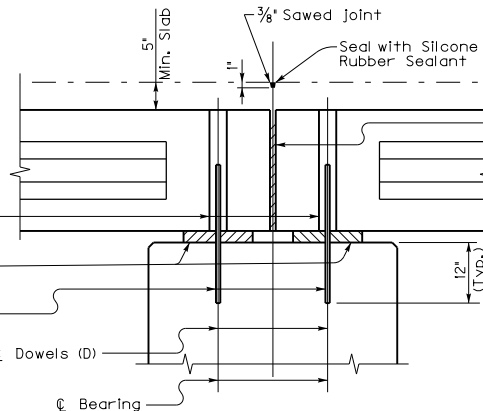
Elastomeric Bearing Pads and/or Cork.

Drill holes for dowels after placing beams and grout dowels into cap

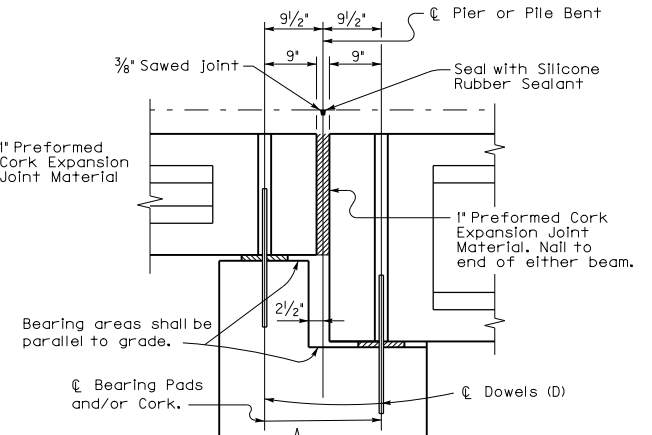
⌀ Dowels (D)

⌀ Bearing

ABUTMENT OR END BENT



PIER OR PILE BENT



STEPPED PIER OR PILE BENT

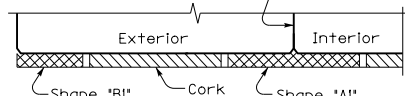
(Showing Location & Placement of Box Beams)

TYPICAL BEARING DETAILS (COMPOSITE)

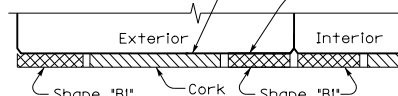
Metal shims may be required between beams of multiple span bridges to align exterior beams.

Preformed Cork Expansion Joint Material 1'-6" wide placed between Bearing Pads and beneath dowel pin holes to prevent the escape of mortar or joint sealer. Cork may be cemented to bottom of beam.

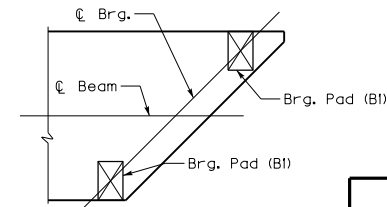
Metal shims (8" x 12") may be required over bearing pads or cork on skewed bridges to insure uniform bearing.



(0° Skew)



(Skewed Spans)



PAD PLACEMENT FOR SKEWS

Pads 'BI' are to always be placed perpendicular to ⌀ beam with center of pad over ⌀ bearing.

For Elastomeric Bearing Pad Details of Shapes AI & BI, see Std. Dwg. BBP-003.

SHOWING PADS FOR BEAM TYPES B27-B42 & CB27-CB42

Use 1/2" x 1'-6" preformed cork for beam types BI2-B21 & CB12-CB21 for bearing.

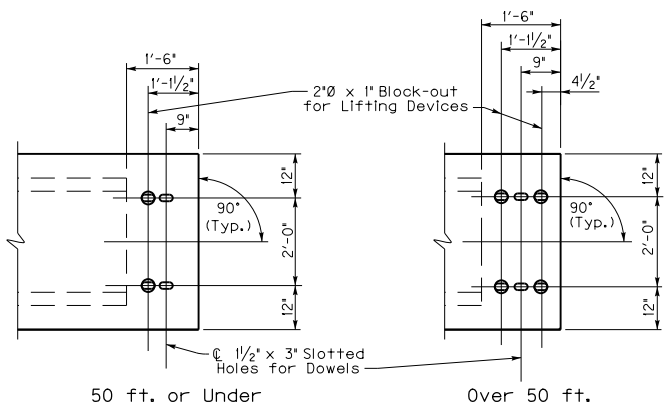
GENERAL NOTES

Provide metal shims conforming to ASTM A36 and galvanize in accordance with ASTM A123. As alternates, cork, polymer, or elastomer shims may be used. Include the cost of furnishing and placing these shims in the price per beam.

KENTUCKY
DEPARTMENT OF HIGHWAYS
BOX BEAM
BEARING
DETAILS

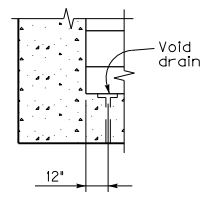
STANDARD DRAWING NO. BDP-002-03

SUBMITTED	<i>[Signature]</i>	12-02-02
DIRECTOR, DIVISION OF BRIDGE DESIGN		DATE
APPROVED	<i>[Signature]</i>	12-02-02
STATE HIGHWAY ENGINEER		DATE



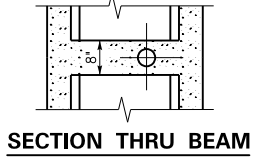
NOTE: Void omitted on 12" beams.

TYPICAL STRAIGHT END



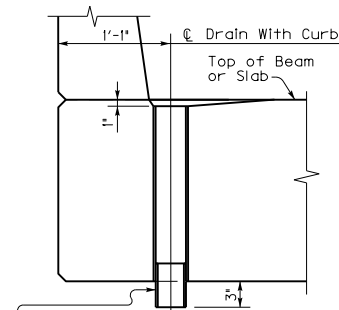
VOID DRAIN DETAIL

Locate two drains at each end of each void. Provide 1"Ø drains of a type approved by the Division of Materials.

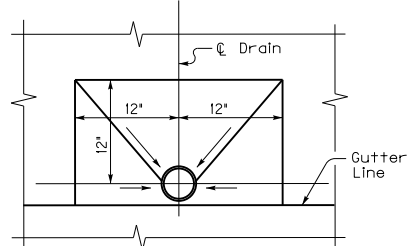


Diaphragms may be omitted if void is cut to allow drain to be encased with a minimum 2" of concrete.

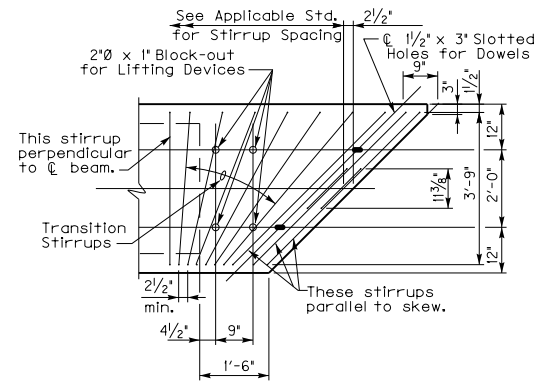
Provide drains on both sides of bridge with normal crown and on low side only for super-elevated bridges. Space drains at maximum 12'-6" on centers with a minimum of one placed each gutter line per span. Omit drains when span crosses over a highway or railroad. Include the cost of pipe and fittings in the price of beam.



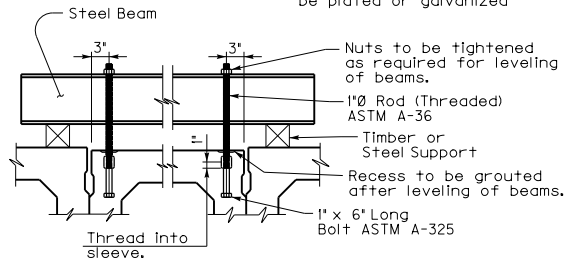
NPS Designation 4 Standard coupling and nipple in accordance with ASTM A53. Nipple to be installed in field.



DRAIN DETAILS
(For Spans With Curbs)

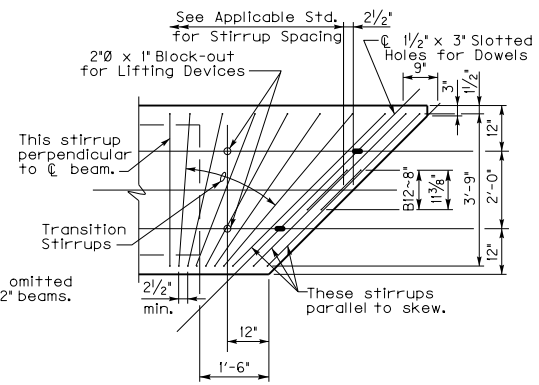
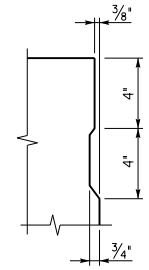


(Right Skew Shown, Left Opposite Hand)



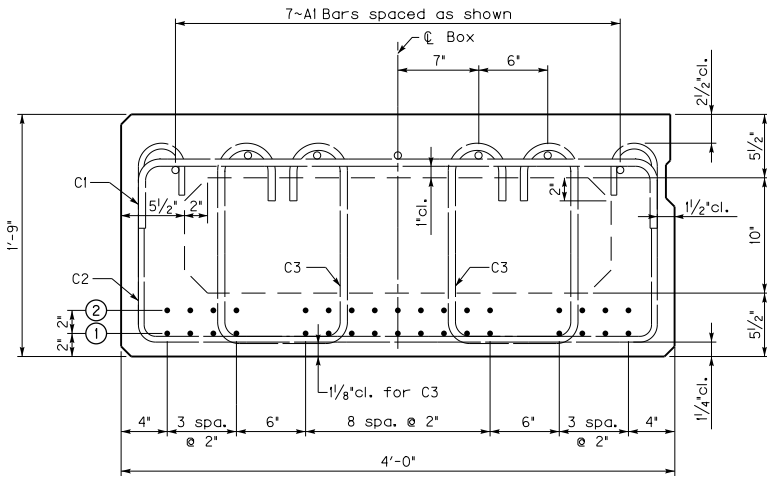
Locate inserts at the center of beams up to 50 ft. and at diaphragm locations of beams over 50 ft. Include the cost of materials and labor involved in leveling beams in the price for beams. Submit alternate leveling devices to the Division of Bridge Design for approval.

NOTE: Omit shear key on exterior face of exterior beam.

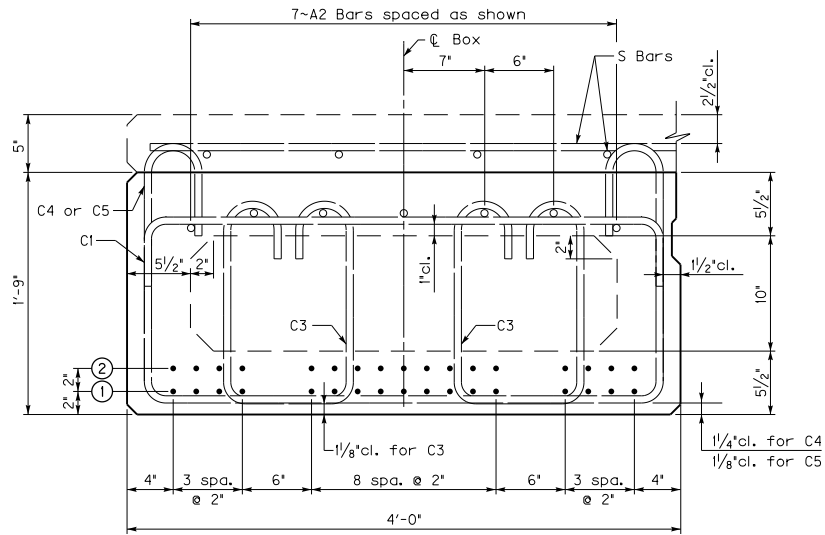


(Right Skew Shown, Left Opposite Hand)

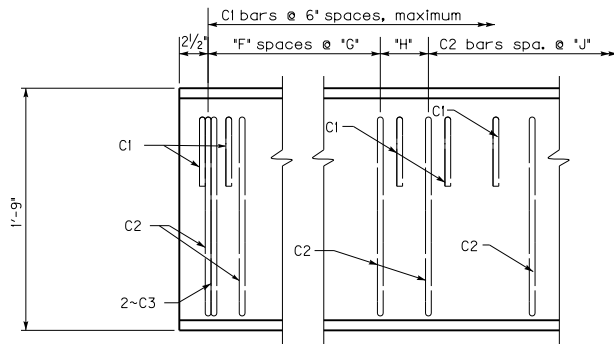
KENTUCKY DEPARTMENT OF HIGHWAYS		
BOX BEAM MISCELLANEOUS DETAILS		
STANDARD DRAWING NO. BDP-003-03		
SUBMITTED	<i>W. Frank</i> DIRECTOR DIVISION OF BRIDGE DESIGN	11-21-07 DATE
APPROVED	<i>Matthew M. [Signature]</i> STATE HIGHWAY ENGINEER	11-21-07 DATE



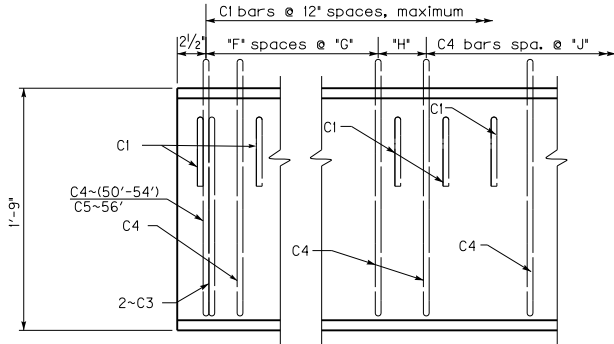
B21 BEAM



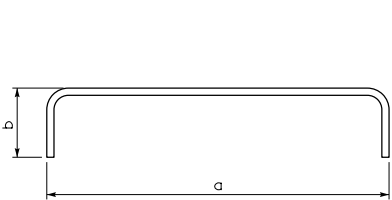
CB21 BEAM



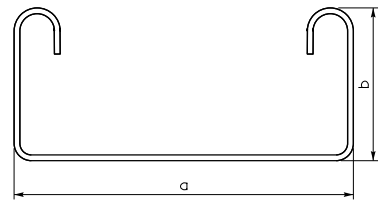
B21 ELEVATION OF 0° SKEW
(Refer to BDP-003, for skewed details)



CB21 ELEVATION OF 0° SKEW
(Refer to BDP-003, for skewed details)



C1(e) Bar



C2(e)-C5(e) Bars

TABLE OF STRAND DATA

Beam Type	Beam Length (feet)	Number of Strands Required	
		Row ①	Row ②
B21	44	17	
	46	17	2
	48	17	4
	50	17	6
CB21	50	17	3
	52	17	4
	54	17	6
	56	17	8

TABLE OF DIMENSION DATA

Beam Type	Beam Length (feet)	"F"	"G"	"H"	"J"
B21	44	6	10'	12 1/2'	14'
	46	6	9'	11 1/2'	13'
	48	7	9'	8'	13'
	50	7	9'	7'	13'
CB21	50	7	9'	10 1/2'	16'
	52	7	9'	14 1/2'	16'
	54	7	9'	10 1/2'	16'
	56	9	8'	13 1/2'	16'

TABLE OF BAR QUANTITIES

Beam Type	Beam Length (feet)	C1	C2	C3	C4	C5
B21	44	89	42	4		
	46	93	47	4		
	48	97	50	4		
	50	101	52	4		
CB21	50	51		4	45	
	52	53		4	46	
	54	55		4	48	
	56	57		4	50	2

DESIGN DATA

Beam Type	Beam Length (feet)	DC kips	DW kips	LL kips	LL+I kips	Δd (in.)	Δc (in.)
B21	44	15.7	1.3	43.9	55.5		
	46	16.4	1.3	44.7	56.5		
	48	17.1	1.4	45.5	57.4		
	50	17.9	1.4	46.3	58.3		
CB21	50	24.1	1.4	46.3	58.3	0.3	1.0
	52	25.0	1.5	47.0	59.1	0.3	1.1
	54	26.0	1.5	47.7	60.0	0.4	1.2
	56	27.0	1.6	48.4	60.7	0.4	1.4

Straight Reinforcement

Mark	Size	Length
A(E)	#5	Beam Length Minus 3'
A2(E)	#4	Beam Length Minus 3'
D(E)	#8	2'-0"

Bent Reinforcement

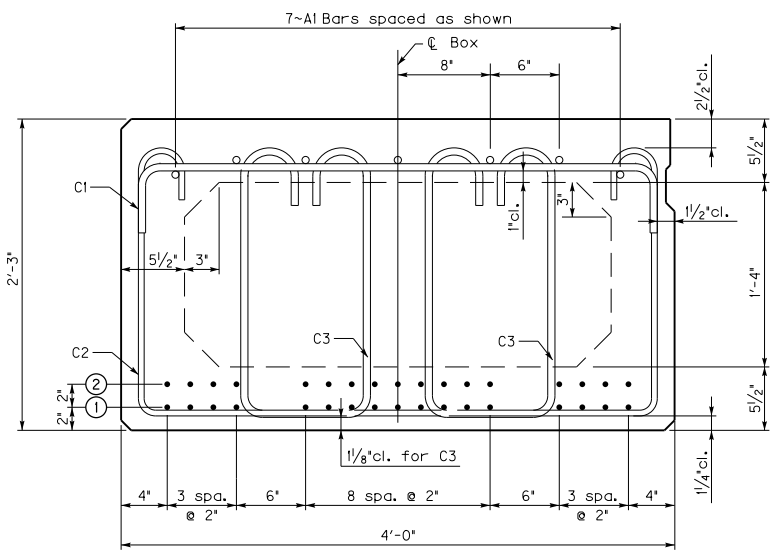
Mark	Size	a	b
C1(e)	#5	3'-9"	6"
C2(e)	#4	3'-9"	1'-5 1/4"
C3(e)	#5	11 3/8"	1'-5 3/8"
C4(e)	#4	3'-9"	1'-10 1/4"
C5(e)	#5	3'-9"	1'-10 3/8"

KENTUCKY
DEPARTMENT OF HIGHWAYS

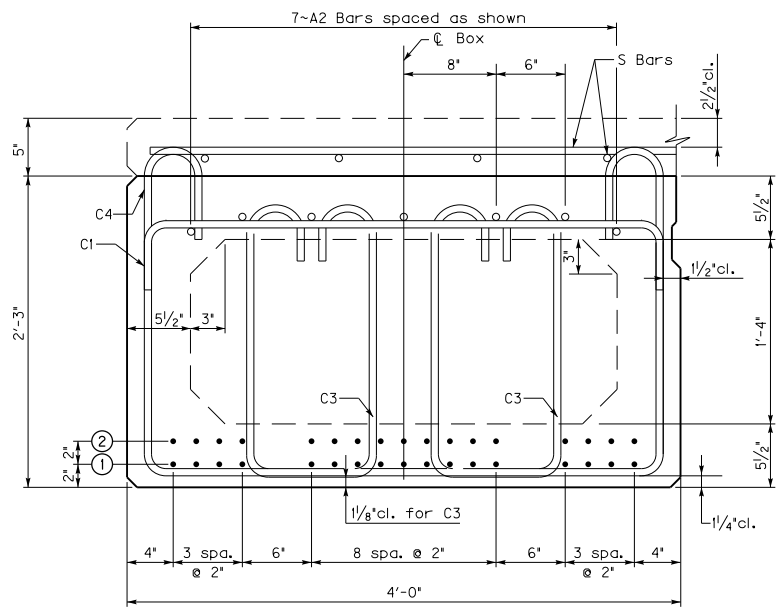
BOX BEAM
B21 & CB21
DETAILS

STANDARD DRAWING NO. BDP-008-04

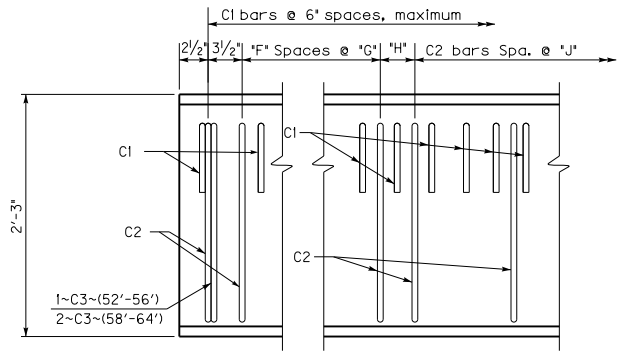
SUBMITTED *Mad* 12-01-11
DIRECTOR DIVISION OF STRUCTURAL DESIGN DATE
APPROVED *Sh* 12-01-11
STATE HIGHWAY ENGINEER DATE



B27 BEAM

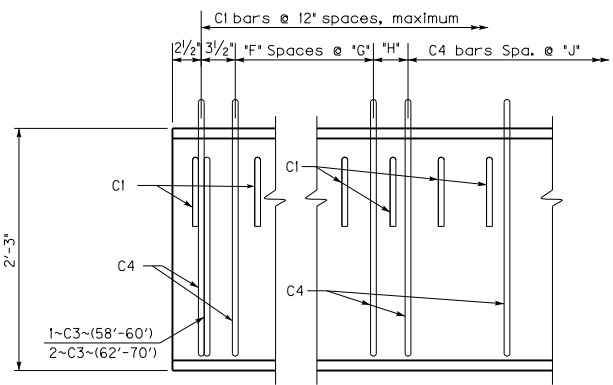


CB27 BEAM



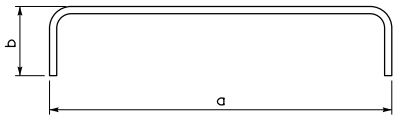
B27 ELEVATION OF 0° SKEW

(Refer to BDP-003, for skewed details)

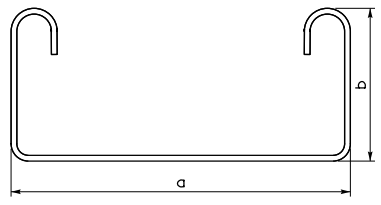


CB27 ELEVATION OF 0° SKEW

(Refer to BDP-003, for skewed details)



C1(e) Bar



C2(e)-C4(e) Bars

TABLE OF STRAND DATA

Beam Type	Beam Length (feet)	Number of Strands Required	
		Row ①	Row ②
B27	52	17	1
	54	17	2
	56	17	3
	58	17	5
	60	17	6
	62	17	8
CB27	64	17	9
	58	17	3
	60	17	4
	62	17	6
	64	17	7
	66	17	9
	68	17	10
	70	17	12

TABLE OF DIMENSION DATA

Beam Type	Beam Length (feet)	"F"	"G"	"H"	"J"
B27	52	5	14"	11"	18"
	54	5	13"	10"	18"
	56	5	13"	13"	18"
	58	5	13"	16"	18"
	60	6	12"	12"	18"
	62	6	12"	13 1/2"	17"
CB27	64	6	12"	8 1/2"	17"
	58	6	12"	18"	21"
	60	6	12"	19 1/2"	21"
	62	6	12"	14"	20"
	64	7	11"	11"	20"
	66	7	11"	13"	20"
	68	7	11"	15"	20"
	70	8	10"	14"	20"

BAR QUANTITIES TABLE DESIGN DATA

Beam Type	Beam Length (feet)	C1	C2	C3	C4	DC k/lps	DW k/lps	LL k/lps	LL+I k/lps	Δd (in.)	Δc (in.)
B27	52	105	40	2		20.6	1.5	47.0	59.1		
	54	109	42	2		21.4	1.5	47.7	60.0		
	56	113	43	2		22.2	1.6	48.4	60.7		
	58	117	44	4		23.0	1.7	49.1	61.5		
	60	121	47	4		23.7	1.7	49.7	62.2		
	62	125	50	4		24.5	1.8	50.4	62.9		
CB27	64	129	52	4		25.3	1.8	51.0	63.6		
	58	59		2	41	30.2	1.7	49.1	61.5	0.3	0.9
	60	61		2	42	31.2	1.7	49.7	62.2	0.3	0.9
	62	63		4	45	32.3	1.8	50.4	62.9	0.3	1.1
	64	65		4	48	33.3	1.8	51.0	63.6	0.4	1.2
	66	67		4	49	34.3	1.9	51.6	64.3	0.4	1.3
	68	69		4	50	35.4	1.9	52.2	65.0	0.5	1.4
	70	71		4	53	36.4	2.0	52.8	65.6	0.5	1.6

Straight Reinforcement

Mark	Size	Length
A1(E)	#5	Beam Length Minus 3'
A2(E)	#4	Beam Length Minus 3'
D(E)	#8	2'-0"

NOTE: A1 and A2 bars are to be lapped 2'-2" when necessary.

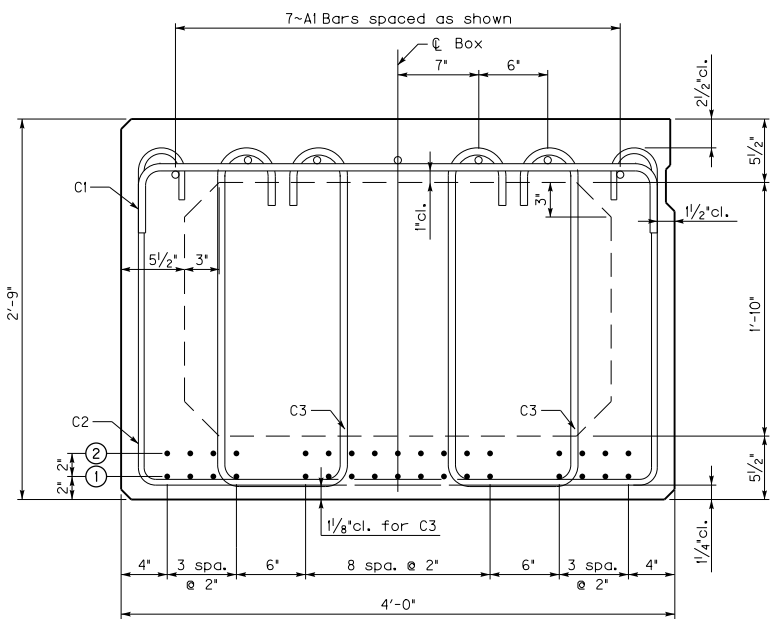
Bent Reinforcement

Mark	Size	a	b
C1(e)	#5	3'-9"	6"
C2(e)	#4	3'-9"	1'-11 1/4"
C3(e)	#5	11 3/8"	1'-11 3/8"
C4(e)	#4	3'-9"	2'-4 1/4"

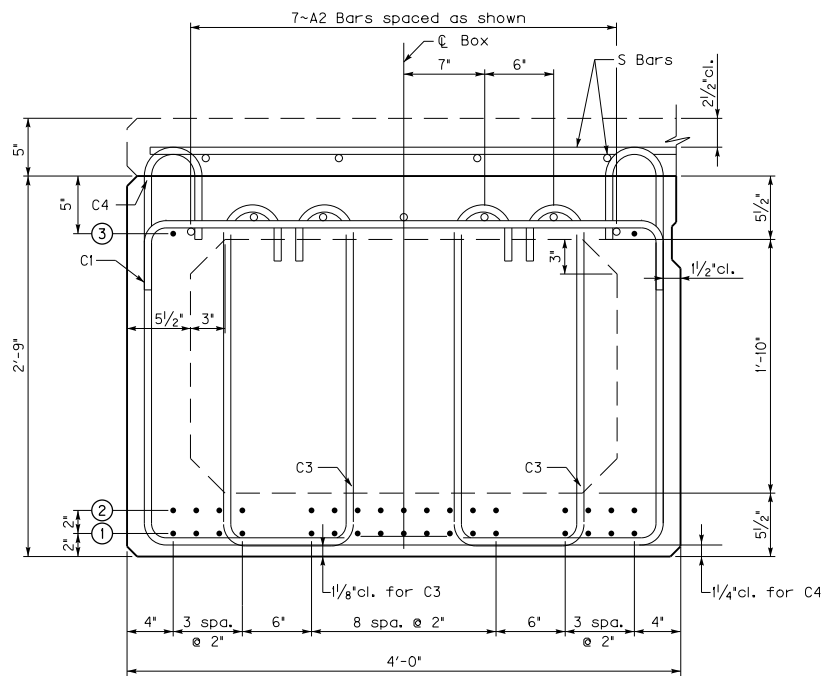
KENTUCKY
DEPARTMENT OF HIGHWAYS

BOX BEAM
B27 & CB27
DETAILS

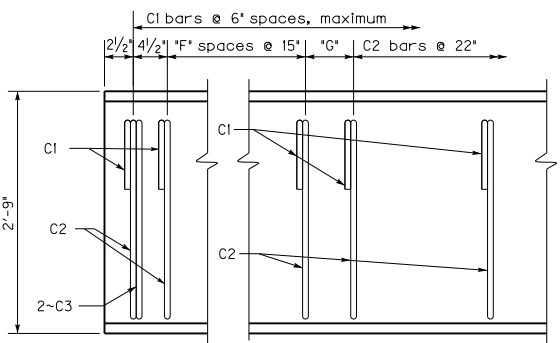
STANDARD DRAWING NO. BDP-009-04
SUBMITTED *Mark Art* 12-01-11
DATE
APPROVED *[Signature]* 12-01-11
DATE
STATE HIGHWAY ENGINEER



B33 BEAM

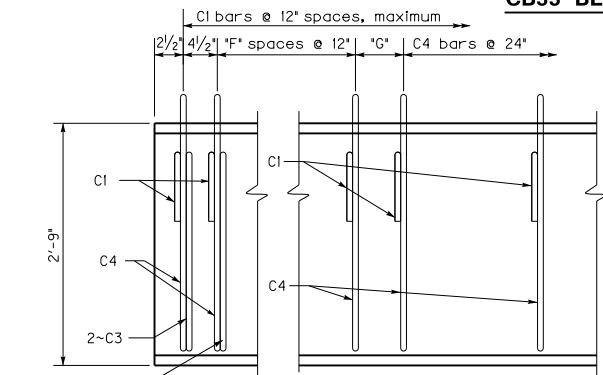


CB33 BEAM



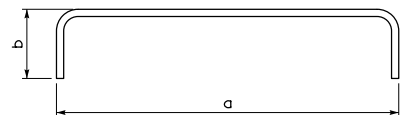
B33 ELEVATION OF 0° SKEW

(Refer to BDP-003, for skewed details)



CB33 ELEVATION OF 0° SKEW

(Refer to BDP-003, for skewed details)



C1(e) Bar



C2(e)-C4(e) Bars

TABLE OF STRAND DATA				
Beam Type	Beam Length (feet)	Number of Strands Required		
		Row ①	Row ②	Row ③
B33	66	17	5	
	68	17	6	
	70	17	7	
	72	17	8	
	74	17	10	
	76	17	11	
CB33	78	17	12	
	72	17	7	
	74	17	9	
	76	17	10	
	78	17	11	
	80	17	13	
	82	17	14	2
	84	17	15	2

TABLE OF DIMENSION DATA				
Beam Type	Beam Length (feet)	"F"	"G"	
B33	66	5	17"	
	68	5	18"	
	70	6	15"	
	72	6	16"	
	74	6	17"	
	76	6	18"	
CB33	78	6	19"	
	72	7	17"	
	74	7	17"	
	76	8	17"	
	78	8	17"	
	80	8	17"	
	82	8	17"	
	84	8	17"	

BAR QUANTITIES TABLE		DESIGN DATA									
Beam Type	Beam Length (feet)	C1	C2	C3	C4	DC klbs	DW klbs	LL klbs	LL+I klbs	Δd (in.)	Δe (in.)
B33	66	133	42	4		28.4	1.9	51.6	64.3		
	68	137	43	4		29.3	1.9	52.2	65.0		
	70	141	45	4		30.2	2.0	52.8	65.6		
	72	145	46	4		31.0	2.0	53.3	66.2		
	74	149	47	4		31.9	2.1	53.9	66.8		
	76	153	48	4		32.7	2.2	54.4	67.5		
CB33	78	157	49	4		33.6	2.2	55.0	68.0		
	72	73		4	46	40.0	2.0	53.3	66.2	0.4	1.1
	74	75		4	47	41.1	2.1	53.9	66.8	0.4	1.2
	76	77		4	49	42.2	2.2	54.4	67.5	0.5	1.3
	78	79		4	50	43.3	2.2	55.0	68.0	0.5	1.4
	80	81		4	51	44.4	2.3	55.5	68.6	0.6	1.5
	82	83		6	52	45.5	2.3	56.1	69.2	0.6	1.4
	84	85		6	53	46.6	2.4	56.6	69.8	0.7	1.5

Straight Reinforcement		
Mark	Size	Length
A1(E)	#5	Beam Length Minus 3'
A2(E)	#4	Beam Length Minus 3'
D(E)	#8	2'-0"

NOTE: A1 and A2 bars are to be lapped 2'-2" when necessary.

Bent Reinforcement			
Mark	Size	a	b
C1(e)	#5	3'-9"	6"
C2(e)	#4	3'-9"	2'-5 1/4"
C3(e)	#5	11 3/8"	2'-5 3/8"
C4(e)	#4	3'-9"	2'-10 1/4"

**KENTUCKY
DEPARTMENT OF HIGHWAYS**

**BOX BEAM
B33 & CB33
DETAILS**

STANDARD DRAWING NO. BDP-010-04

SUBMITTED *Mud* 12-01-11
DIRECTOR CHIEF OF STRUCTURAL DESIGN DATE

APPROVED *[Signature]* 12-01-11
STATE HIGHWAY ENGINEER DATE



STENCIL FOR YEAR AND DESIGN LOADING
When year only is used place year in center of plate



STENCIL FOR DRAWING NUMBER

GENERAL NOTES

STENCILS: Fabricate all stencils from recessed panels with beveled edges with raised letters and figures in accordance with Subsection 601.03.19 of the Specifications.

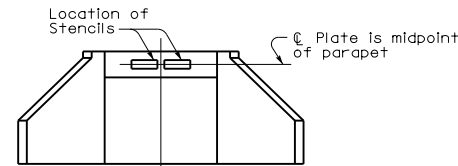
YEAR AND DESIGN LOADING STENCIL: Show the year that the contract is executed and the design load as shown on the contract plans. The design load is required on all structures classified as bridges by Subsection 101.03 of the Specifications and on other structures as referenced on plans.

DRAWING NUMBER STENCIL: Use this stencil on all structures. The number to be placed on the stencil shall be taken from the contract plans.

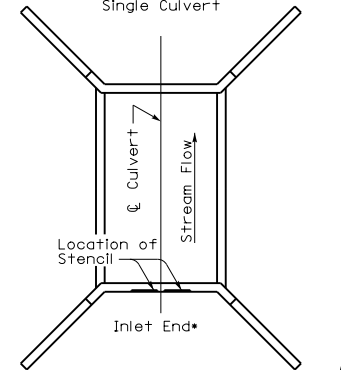
CONTRACTOR STENCIL: Place on all bridges, the name of the prime contractor and subcontractor(s), when applicable, in proximity to other stencils required.



CONTRACTOR STENCIL

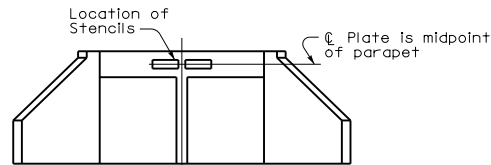


ELEVATION A-A
Single Culvert

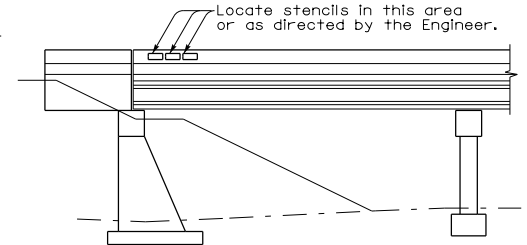


PLAN

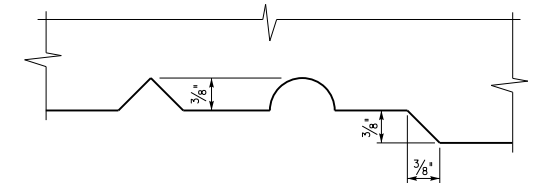
Location of Stencils on all Culverts (Single or Multiple) and Arches



ELEVATION A-A
Multiple span Culvert



LOCATION OF STENCILS ON BRIDGES



TYPE OF LETTERS

* Use the outlet end for outlet only extensions

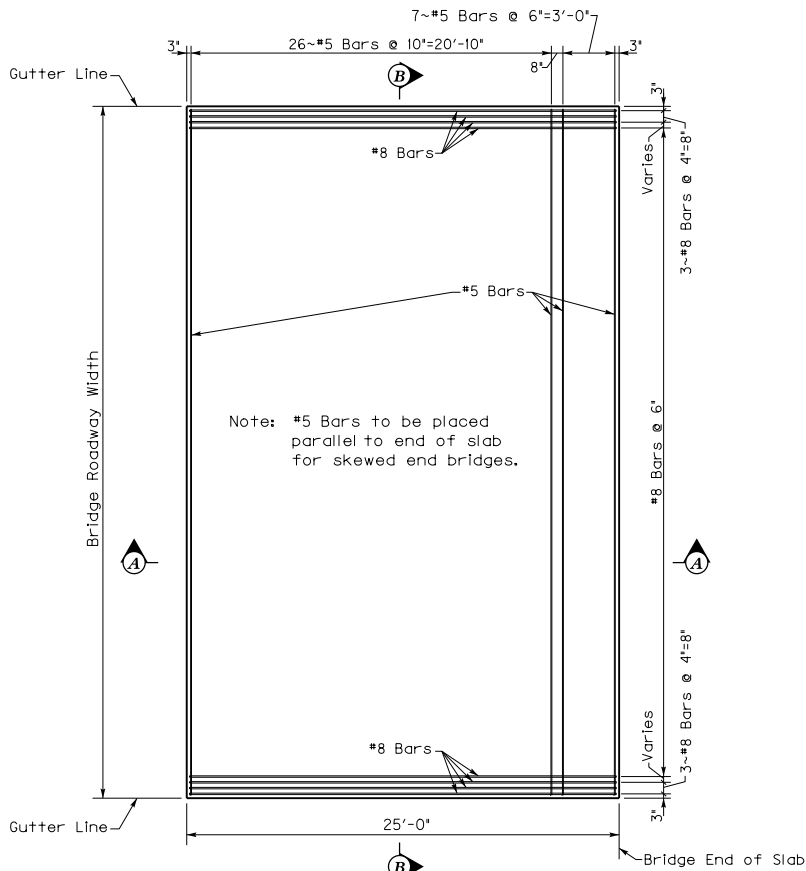
KENTUCKY
DEPARTMENT OF HIGHWAYS

STENCILS
FOR STRUCTURES

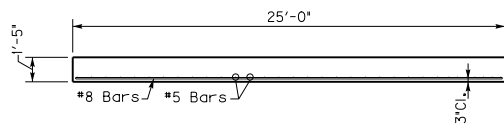
STANDARD DRAWING NO. BGX-006-10

SUBMITTED *Mad. Nite* 12-01-15
DATE DIRECTOR DIVISION OF STRUCTURAL DESIGN

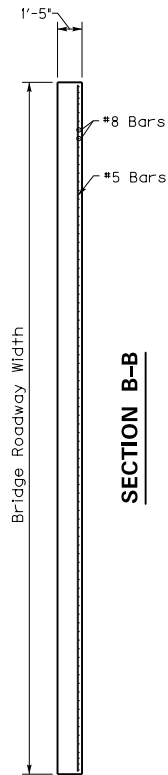
APPROVED *[Signature]* 12-01-15
STATE HIGHWAY ENGINEER DATE



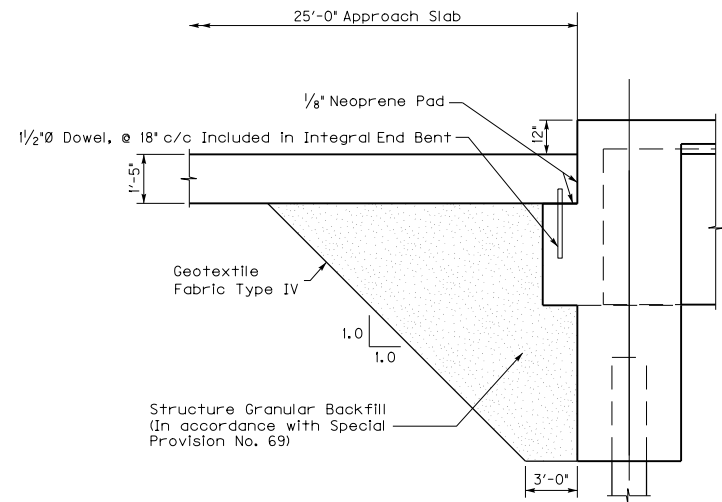
PLAN



SECTION A-A



SECTION B-B



TYPICAL SECTION BRIDGE END

GENERAL NOTES

CROWN: Crown shall conform to the rate of crown at the approach pavement and bridge deck. If the rate of crown at the bridge deck differs from that of approach pavement, a smooth transition shall be provided within the limits of the approach slab.

CONCRETE: Concrete shall be Class 'AA'.

REINFORCEMENT: All steel reinforcement shall be Grade 60 and epoxy coated.

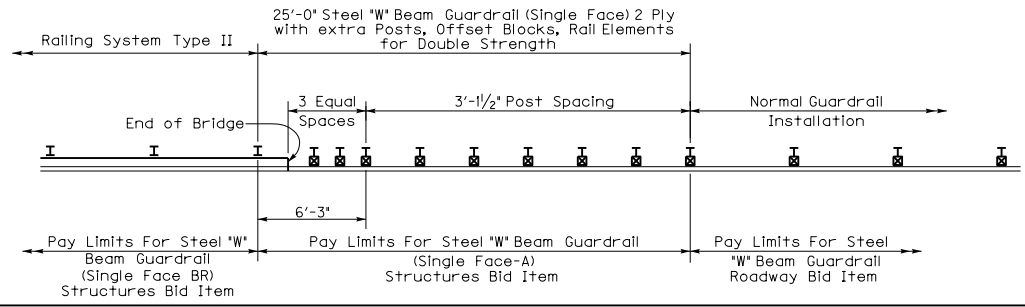
PAYMENT: Include the cost of Class 'AA' Concrete, epoxy-coated steel reinforcement, and all labor and materials required to construct the approach slab in the bid item for Approach Slab.

**KENTUCKY
DEPARTMENT OF HIGHWAYS**

APPROACH SLAB

STANDARD DRAWING NO. BGX-017-02

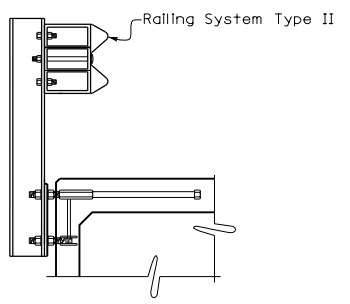
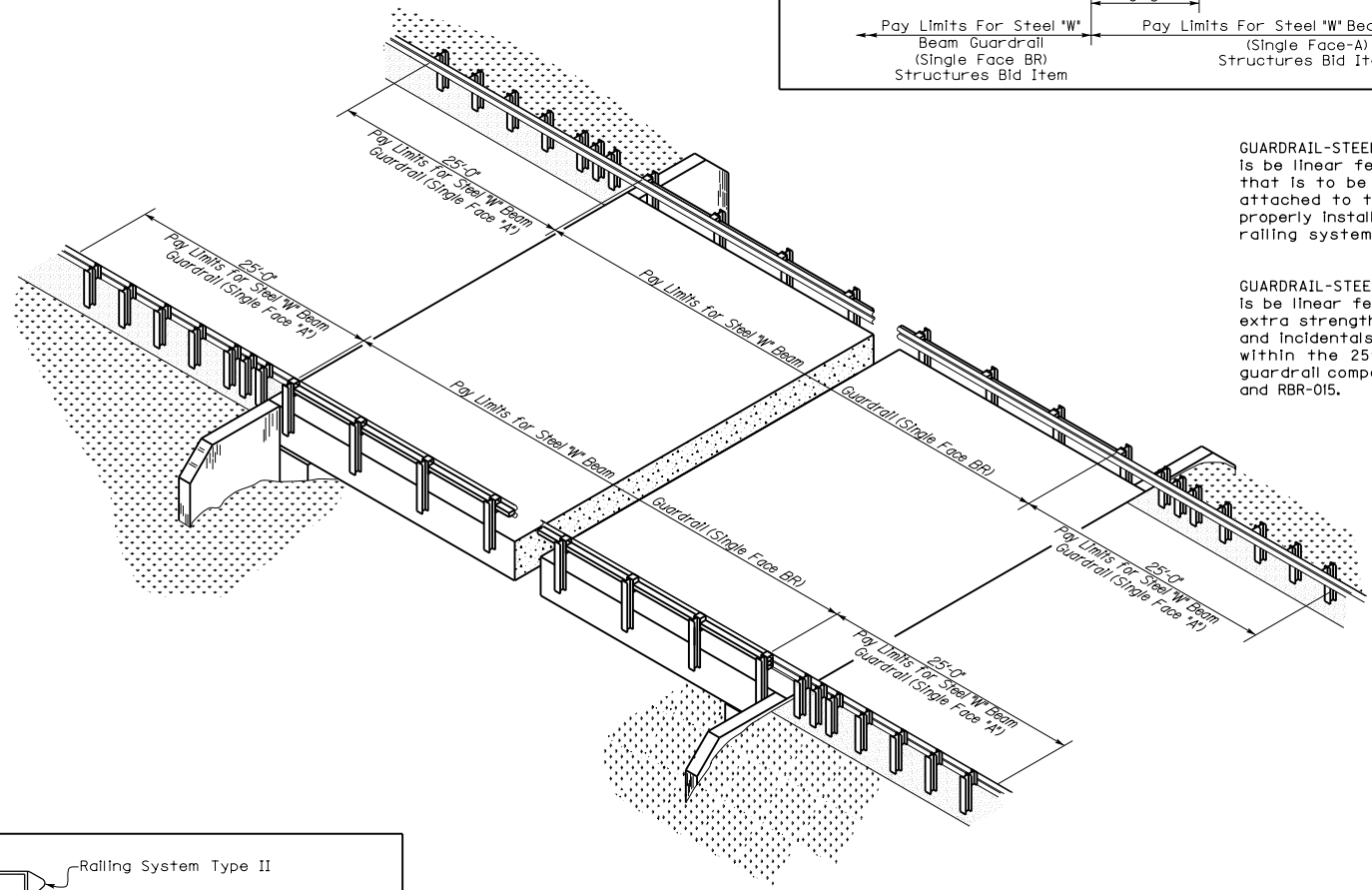
SUBMITTED *Mark White* 12-01-15
DIRECTOR, DIVISION OF STRUCTURAL DESIGN DATE
 APPROVED *[Signature]* 12-01-15
STATE HIGHWAY ENGINEER DATE



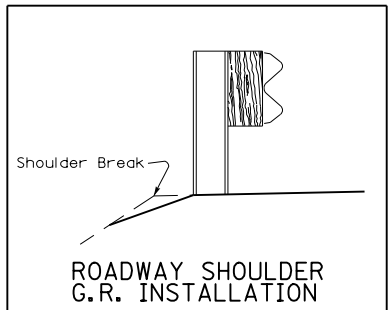
BID ITEM NOTES

GUARDRAIL-STEEL W BEAM (SINGLE FACE BR): The bid unit for this item is be linear feet. This item shall include the Railing System Type II that is to be installed on the bridge between the endmost posts attached to the bridge and all labor and incidentals necessary to properly install the railing system. For non-composite box beams, the railing system is attached to the beam prior to shipment.

GUARDRAIL-STEEL W BEAM (SINGLE FACE A): The bid unit for this item is be linear feet. This item includes the W-Beam guardrail (2 ply for extra strength), guardrail posts, offset blocks, hardware, and labor and incidentals necessary to properly install the approach guardrail within the 25'-0" limits at each corner of the structure. For guardrail components, refer to Standard Drawings RBR-001, RBR-005 and RBR-015.



BRIDGE GUARDRAIL INSTALLATION



KENTUCKY DEPARTMENT OF HIGHWAYS	
RAILING SYSTEM TYPE II GUARDRAIL TREATMENT	
STANDARD DRAWING NO. BHS-007-07	
SUBMITTED: <i>Mark</i>	12-01-15
DIRECTOR OF HIGHWAYS	DATE
APPROVED: <i>[Signature]</i>	12-01-15
STATE HIGHWAY ENGINEER	DATE

General Notes

SPECIFICATIONS: All references to the Specifications are to the current edition of the Kentucky Department of Highways Standard Specifications for Road and Bridge Construction. All references to the AASHTO Specifications are to the current edition of the AASHTO LRFD Bridge Design Specifications.

INSTALLATION PROCEDURE: Seal the ends of the joint seal to prevent the entrance of water and foreign material.

WELDING SPECIFICATIONS: Ensure techniques and welding procedure comply with current joint specification ANSI/AASHTO/AWS D1.5 Bridge Welding Code.

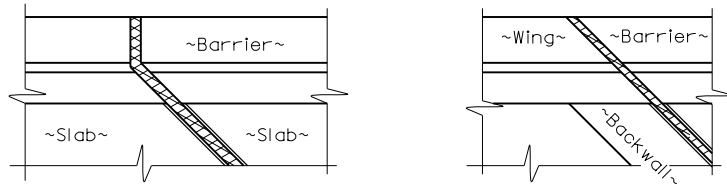
MATERIAL SPECIFICATIONS: Ensure steel material is new, commercial grade steel suitable for welding. Acceptance will be based on visual inspection by the Engineer. Joint sealing material, only, is in accordance with Section 807 of the Specifications. Ensure stud shear connectors conform to ASTM A108 and A29, Grade 1015.

LOCATION: Locate armored edges and/or expansion dams in accordance with detail plans.

PAINT: Clean and paint all structural steel in accordance with the Specifications, except that no field coating will be required.

SHOP DRAWINGS: Contrary to the Specifications, no shop plans are required.

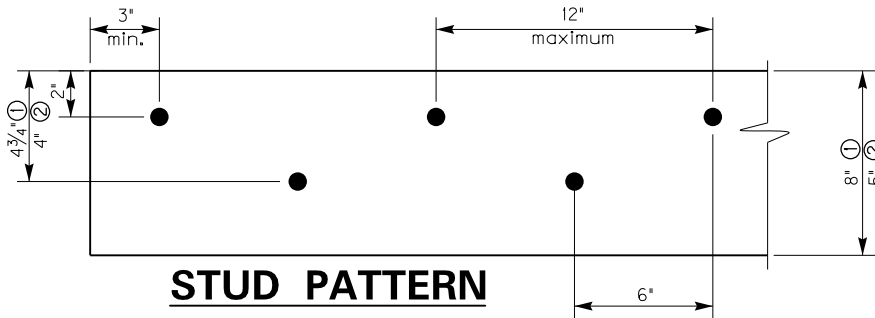
BASIS OF PAYMENT: The accepted quantities of Neoprene Expansion Dam which includes the armored edges & preformed compression joint seal will be paid for at the contract unit price per linear foot for each size, measured along centerline of joint between the vertical faces of the barriers. When only an Armored Edge is required the cost of furnishing and placing the armored edge will be paid for at the contract unit price per linear foot, measured along the Armored Edge between the vertical faces of the barriers. Measure along armored edge from fascia to fascia of slab when used with Type II railing and no curb.



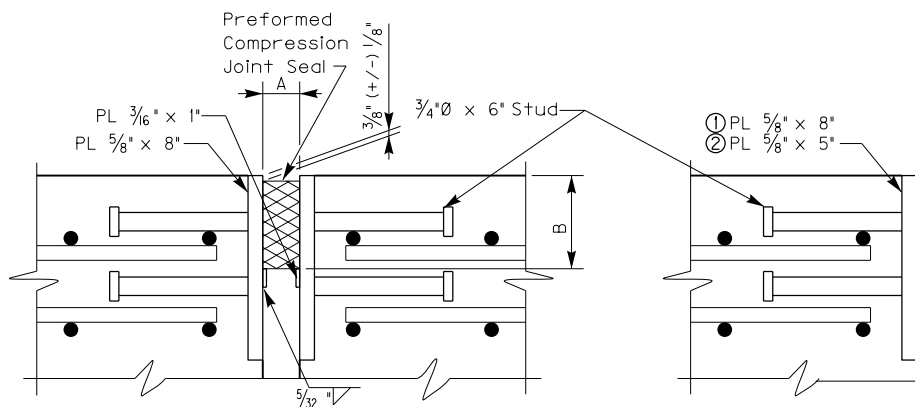
@ Piers or Bents @ Backwall Substructures

TYPICAL BARRIER-JOINT TREATMENTS

Details are for skewed joints



STUD PATTERN



SECTION THROUGH JOINT

"A" - Minimum Joint opening @ 60°F
 "B" - Manufacturer's compressed seal height 1/4".

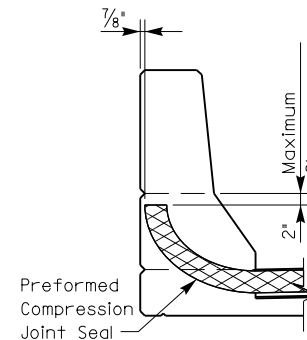
Joint Data		The joint seal supplied must accommodate the required movement shown. Set Dimension A with temperature change increment and as required by the manufacturer to obtain the required movement.
Dim. A @ 60°F (in)	Move-ment (in)	
1 1/2	1	
2	1 1/2	
2 1/2	2	

① Applies to 8" slab thickness ② Applies to 5" slab thickness

Temperature Change Increment per 10°F			
Concrete		Steel	
Span Length (ft)	Increment (in)	Span Length (ft)	Increment (in)
0 - 80	1/32	0 - 60	1/32
81 - 140	1/16	61 - 100	1/16
141 - 200	3/32	101 - 140	3/32
201 - 260	1/8	141 - 180	1/8
261 - 320	5/32		

SECTION THROUGH ARMORED EDGE

① Assembly weight = 18.8 lbs./ft.
 ② Assembly weight = 12.4 lbs./ft.



SECTION THROUGH BARRIER

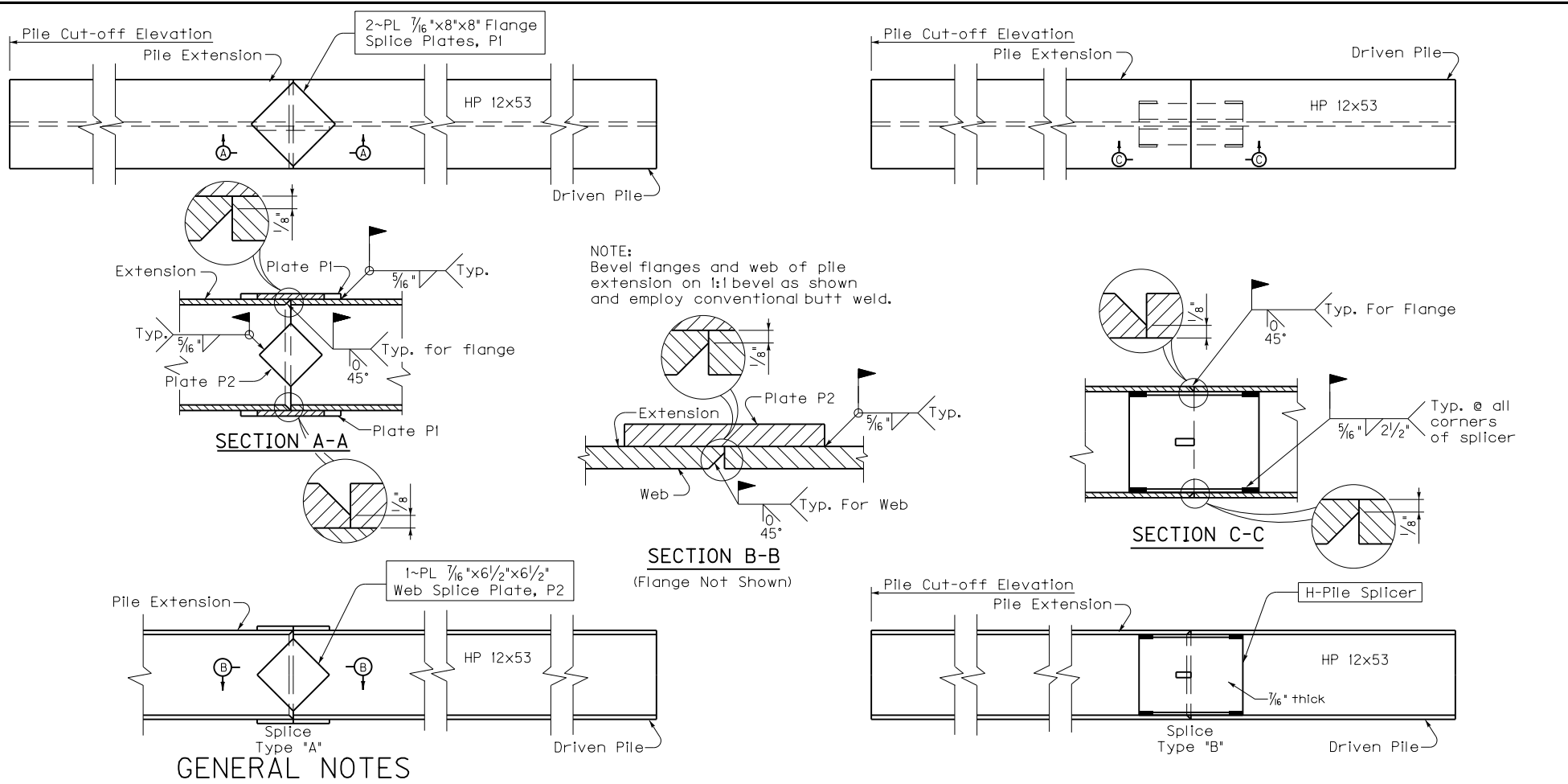
KENTUCKY
DEPARTMENT OF HIGHWAYS

NEOPRENE EXPANSION DAMS AND ARMORED EDGES

STANDARD DRAWING NO. BJE-001-13

SUBMITTED *Mad. Art* DATE 12-01-15
 DIRECTOR DIVISION OF STRUCTURAL DESIGN

APPROVED *[Signature]* DATE 12-01-15
 STATE HIGHWAY ENGINEER



SPECIFICATIONS: Kentucky Department of Highways Standard Specifications for Road and Bridge Construction, current edition.

MATERIALS: Ensure structural steel piles conform to A.S.T.M. A709 Grade 50, current Specifications.

SPLICE PLATES: Ensure all pile splicing options conform to A.S.T.M. A709 Grade 50, current Specifications. In lieu of Splice Option 'A' or Splice option 'B', splice plates may be flame cut from HP12x53 sections. If flange sections are used, the portion cut at the web must be turned outside in order to obtain a tight fit. Grind the edges smooth prior to welding.

SPLICE OPTION 'B': The pile splicer shown in the details for Splice Option 'B' may be Champion H-Pile Splicer, Model HP 30000, or an approved equal. Ensure the splicer is in accordance to the manufacturer's recommendations and subject to the Engineer's approval.

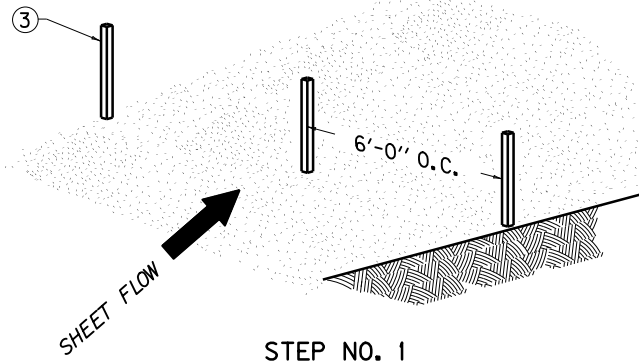
FIELD WELDS: Ensure field welding material and workmanship for all piling conforms to the current Joint Specifications ANSI/AASHTO/AWS D1.5 Bridge Welding Code. Splice piles as indicated above only when driven below cut-off elevation.

PAYMENT: Payment for the piles in accordance with plans and specifications will be made at the contract price per linear foot.

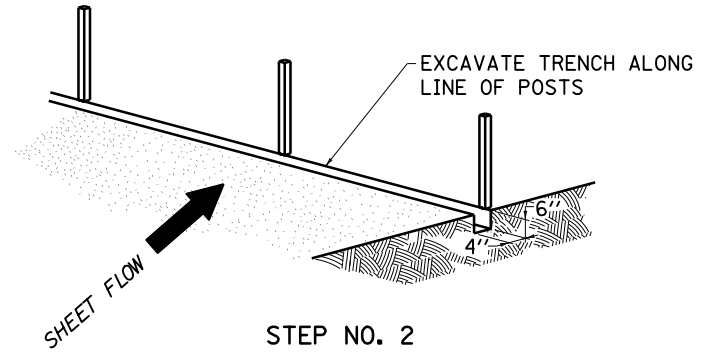
PAINT: No painting is required on steel piles.

MILL TEST REPORTS: Furnish mill test reports in triplicate to the Department showing that all materials furnished conform to the Specifications.

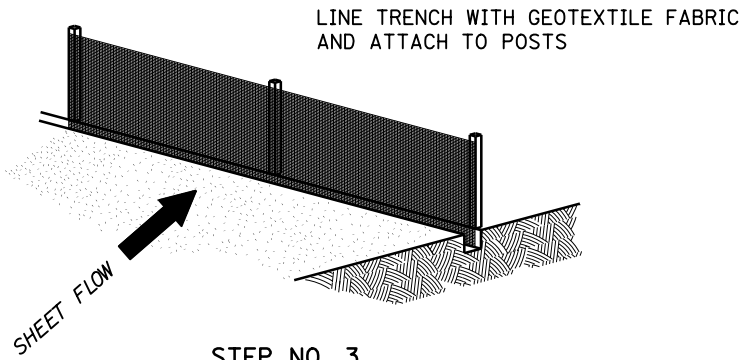
KENTUCKY DEPARTMENT OF HIGHWAYS	
HP12x53 STEEL PILE	
STANDARD DRAWING NO. BPS-003-09	
SUBMITTED <i>Mark Rite</i>	12-01-11
<small>DIRECTOR DIVISION OF STRUCTURAL DESIGN</small>	
APPROVED <i>[Signature]</i>	12-01-11
<small>STATE HIGHWAY ENGINEER</small>	



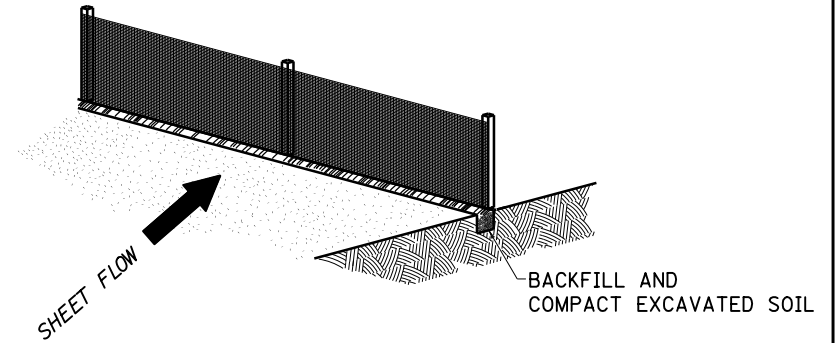
STEP NO. 1



STEP NO. 2



STEP NO. 3



STEP NO. 4

LINE TRENCH WITH GEOTEXTILE FABRIC AND ATTACH TO POSTS

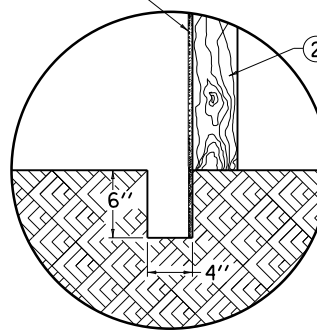
BACKFILL AND COMPACT EXCAVATED SOIL

~ NOTES ~

BID ITEM AND UNIT TO BID
TEMP SILT FENCE LF

1. SEE STANDARD SPECIFICATIONS FOR POST SIZE, GEOTEXTILE FABRIC, WIRE STAPLES AND ALL OTHER PERTINENT INFORMATION.
- ② POSTS MAY BE WOODEN OR METAL T-SECTION.
- ③ POSTS SHALL BE SET 1'-4" DEEP.

GEOTEXTILE FABRIC



SECTIONAL DETAIL

KENTUCKY
DEPARTMENT OF HIGHWAYS

TEMPORARY
SILT FENCE

STANDARD DRAWING NO. RDX-210-03

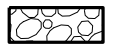
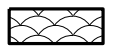
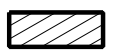

SUBMITTED *William P. Galt* DATE 12-01-15

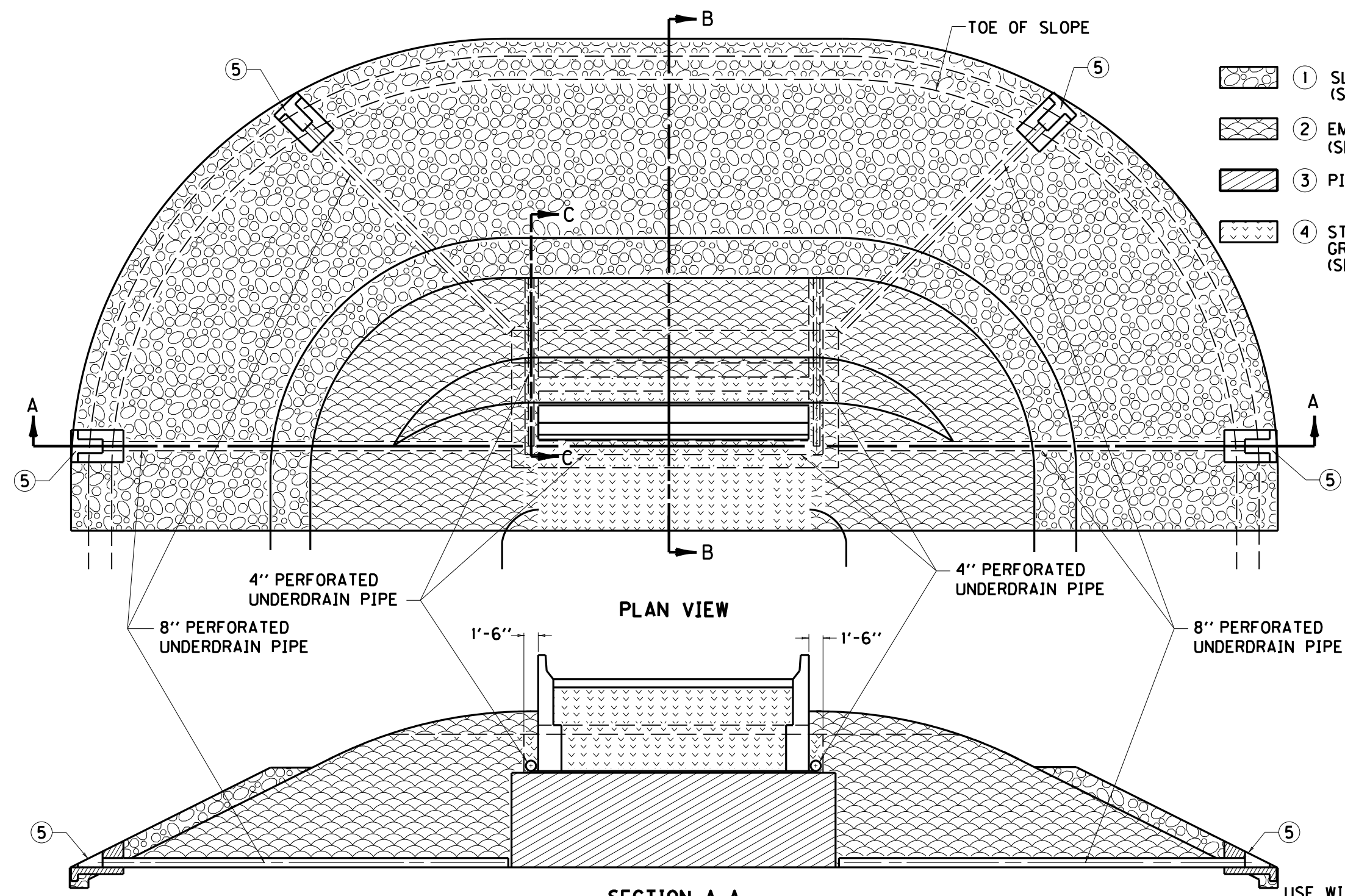
ASST. SUPERVISOR DIVISION OF DESIGN

APPROVED *[Signature]* DATE 12-01-15

STATE HIGHWAY ENGINEER DATE

LEGEND

-  ① SLOPE PROTECTION (SEE BRIDGE PLANS)
-  ② EMBANKMENT (SEE ROADWAY PLANS)
-  ③ PILE CORE
-  ④ STRUCTURE GRANULAR BACKFILL (SEE BRIDGE PLANS)



~ NOTES ~

THE PURPOSE OF THIS DRAWING AND CUR. SEPIA 010 IS TO DEFINE THE LIMITS OF THE FOUR MATERIALS SHOWN. FOR SIMPLICITY PURPOSES, AN END-BENT ON A ZERO DEGREE SKEW IS SHOWN. THE SAME PRINCIPLES WOULD APPLY FOR MORE VARIED STRUCTURES.

- ① SLOPE PROTECTION REQUIRED WHEN AND AS NOTED ON THE PLANS.
- ② GRANULAR OR ROCK EMBANKMENT REQUIRED WHEN AND AS NOTED ON THE PLANS.
- ③ PILE CORE IN ACCORDANCE WITH SPECIAL PROVISION NO. 69.
- ④ STRUCTURE GRANULAR BACKFILL REQUIRED AT ALL TIMES.
- ⑤ FOR HEADWALL CONSTRUCTION SEE CUR. STD. DWG RDP-010. (SEE ROADWAY PLANS)

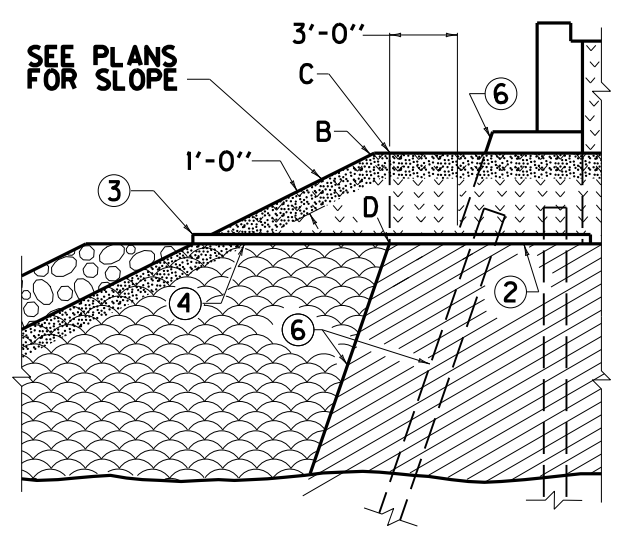
USE WITH CUR. STD. DWG. RDP-010, SEPIA 010

KENTUCKY
DEPARTMENT OF HIGHWAYS

TREATMENT OF EMBANKMENTS AT END-BENTS

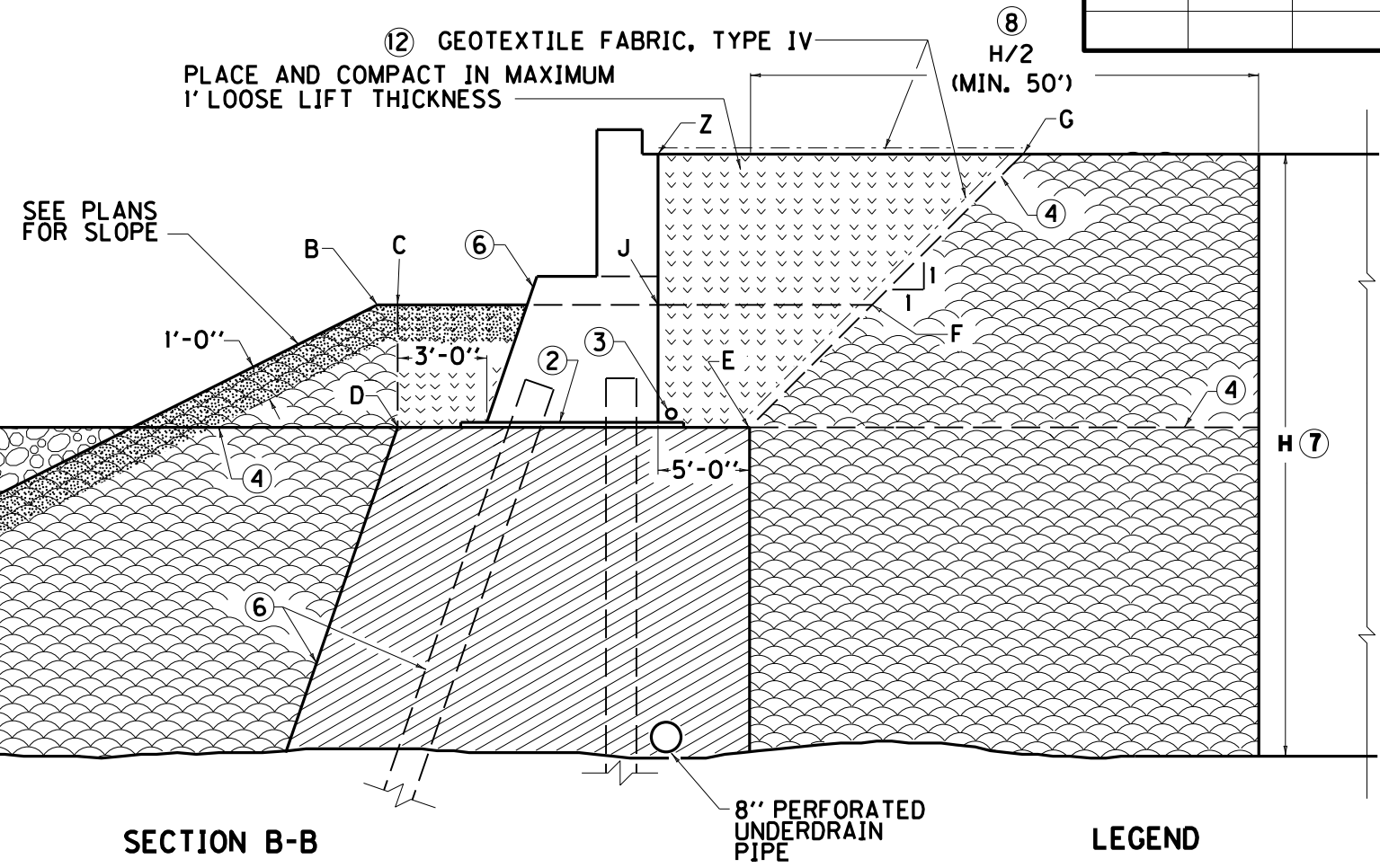
SUBMITTED *William P. Gabel* 1-30-17
DIRECTOR DIVISION OF DESIGN DATE

FILE NAME: C:\P\WORK\JEFF.L\1\051283\SEPIA 006.DGN
 USER: jefl\jefl
 DATE PLOTTED: January 30, 2017
 E-SHEET NAME:
 MicroStation v8.11.7.443



SECTION C-C

SLOPE PROTECTION AS SPECIFIED



SECTION B-B

8" PERFORATED UNDERDRAIN PIPE

ORIGINAL GROUND

LEGEND

- SLOPE PROTECTION (SEE BRIDGE PLANS)
- PILE CORE
- STRUCTURE GRANULAR BACKFILL
- EMBANKMENT

BID ITEMS AND UNIT TO BID
 GRANULAR EMBANKMENT CUYD
 STRUCTURE GRANULAR BACKFILL CUYD

CONSTRUCTION SEQUENCE "A"

1. CONSTRUCT EMBANKMENT TO SLOPES A, B, F, AND G SUCH THAT NO UNCOMPACTED OR LOOSE MATERIAL SHALL REMAIN.
2. EXCAVATE FOR END-BENT TO C, D, E, AND F.
3. INSTALL PILES (OR OTHER FOUNDATION).
4. PLACE 2" MORTAR BED OR ANY CLASS CONCRETE.
5. CONSTRUCT CONCRETE END-BENT.
6. INSTALL 4" PERFORATED UNDERDRAIN PIPE AND BACKFILL.
7. BACKFILL TO C, D, E, F, G, Z, AND J WITH COMPACTED STRUCTURE GRANULAR BACKFILL.

① CONSTRUCTION SEQUENCE "B"

1. CONSTRUCT EMBANKMENT TO TEMPORARY SLOPE ④.
2. INSTALL PILES (OR OTHER FOUNDATION).
3. PLACE 2" MORTAR BED OR ANY CLASS CONCRETE.
4. CONSTRUCT CONCRETE END-BENT.
5. INSTALL 4" PERFORATED UNDERDRAIN PIPE AND BACKFILL.
6. BACKFILL TO FINISHED GRADE IN ACCORDANCE WITH SPECIAL PROVISION NO. 69.

~ NOTES ~

- ① CONSTRUCTION SEQUENCE "B" IS A PERMITTED ALTERNATE ONLY WHEN GRANULAR OR ROCK EMBANKMENT IS UTILIZED.
- ② 2" MORTAR BED OR ANY CLASS CONCRETE.
- ③ 4" PERFORATED UNDERDRAIN PIPE WRAPPED WITH GEOTEXTILE FABRIC FOR DRAINING THE EXCAVATED TRENCH AND STRUCTURE GRANULAR BACKFILL.
- ④ ACCEPTABLE ALTERNATES FOR TEMPORARY SLOPE (CONSTRUCTION SEQUENCE "B").
- ⑤ SHADED PORTIONS AND REPRESENT LIMITS OF NON-ERODIBLE GRANULAR EMBANKMENT IN ACCORDANCE WITH SPECIAL PROVISION NO. 69.
- ⑥ SLOPES ARE EQUAL.
- ⑦ "H" = EMBANKMENT HEIGHT MEASURED FROM SUBGRADE ELEVATION AT POINT ⑦ TO THE LOWEST ELEVATION AT THE TOE OF THE SLOPE.
- ⑧ LIMITS OF EMBANKMENT CONSTRUCTION (H/2 OR 50' MIN.) REQUIRING 2' MAXIMUM LIFT THICKNESS FOR GRANULAR OR ROCK EMBANKMENTS.
9. SEE CURRENT SPECIAL PROVISION NO. 69 FOR CONSTRUCTION AND MATERIAL REQUIREMENTS, METHOD OF MEASUREMENT AND BASIS OF PAYMENT.
10. STRUCTURE GRANULAR BACKFILL PLACED AS A COMPLETE SEPARATE OPERATION AFTER CONSTRUCTION OF ALL OTHER EMBANKMENT.
11. *NO INDIVIDUAL FRAGMENTS LARGER THAN 4 INCHES IN ANY DIMENSION PERMITTED WITHIN 3'-0" OF THE STRUCTURE.*
- ⑫ PLACE GEOTEXTILE FABRIC, TYPE IV PRIOR TO PLACING STRUCTURE GRANULAR BACKFILL AND AGGREGATE BASE COURSE.

USE WITH SEPIA 009
 KENTUCKY
 DEPARTMENT OF HIGHWAYS

TREATMENT OF EMBANKMENTS AT END-BENTS - DETAILS

SUBMITTED *William S. Gallo* DATE 1-30-17

FILE NAME: C:\PW\WORK\JEFF.L\AL\061283\SEPIA 01.DGN
 USER: jefljal
 DATE PLOTTED: January 30, 2017
 E-SHEET NAME:
 MicroStation v8.11.7.443

PRECAST PRESTRESSED BOX BEAMS

COUNTY OF	ITEM NO.	SHEET NO.

General Notes

SPECIFICATIONS: All references to the standard Specifications are to the current edition of the Kentucky Department of Highways Standard Specifications for Road and Bridge Construction, with current supplemental specifications. All references to the AASHTO Specifications are to the current edition of the AASHTO LRFD Bridge Design Specifications, with interims.

DESIGN LOADS: Beam sections are designed for 1.25*HL93 (KYHL93) Live Load.

DESIGN LOAD DISTRIBUTION: Contrary to AASHTO LRFD Bridge Design Specifications, the design moment and shear distribution for all beams is 0.5 lanes.

FUTURE WEARING SURFACE: These beams are designed for a 15 PSF future wearing surface load.

SUBSTRUCTURE DESIGN LOADS: Unfactored design reaction forces per beam end.

DC (kips): Beam, Slab (if applicable), and Type II railing dead loads.

DW (kips): Future wearing surface.

LL (kips): Beam Live Load reaction per lane x Design load distribution.

LL+I (kips): LL with Dynamic load allowance.

DESIGN DEFLECTIONS:

Δ_d (in.): Sum of the downwards deflections caused by the design 5' deck, railing, and future wearing surface. (Positive Downwards)

Δ_c (in.): Upwards midspan camber of the beam caused by prestressing minus the downward deflection of the beam due to self weight. (Positive Upwards)

MATERIAL DESIGN SPECIFICATIONS:

for Steel Reinforcement FY = 60000 PSI

for Prestressed Girder Concrete (Typ. U.N.O.) F' C = 7000 PSI

F' CI = 5500 PSI

for Class "AA" Concrete F' C = 4000 PSI

for Prestressing Steel F' S = 270000 PSI

DESIGN LENGTH: Beam lengths shown in the Standards represent total beam length. Use the next greater designed section for non-Standard lengths.

CONSTRUCTION METHOD: Transferring bond stress to the concrete will not be allowed, nor releasing of end anchors until the concrete has attained a minimum compressive strength of F'CI as shown by standard cylinders made and cured identically with the girders; attain F' C at or prior to 28 days. Apply an initial prestress force of 33817 lbs. per low relaxation strand. Beams with honeycomb of such extent as to affect the strength of resistance to deterioration will not be accepted. The allowance of .0005L (length) is made for shortening of beams due to shrinkage and elastic change. Furnish shop plans showing a detensioning plan by numbering, in sequence, the strand pattern.

PRESTRESSING STRANDS: Ensure prestressing strands to be 1/2" oversize (0.167 sq. in.) uncoated seven-wire stress relieved, low-relaxation strands conforming to AASHTO M 203, Grade 270. If an alternate strand arrangement or strand type is preferred by the Contractor, the designer that developed the original plans will provide the design and also revise the original plans to reflect the changes. These design and plan modifications will be done at the Contractor's expense.

CORROSION INHIBITOR: Provide a corrosion inhibitor for B-type (non-composite) beams from the list of approved materials.

BEVELED EDGES: Bevel all exposed edges 3/4".

BEAM SEALER: For composite box beams (CB Beams), seal the full length of the exterior face of all exterior beams with the extent from the top of the beam to 1'-0" underneath the beam. For non-composite box beams (B beams), seal all faces of all beams, except take care to ensure the grout pockets are not sealed. Use an approved silane sealer as specified by the Division of Structural Design.

REINFORCEMENT: Dimensions shown from the face of concrete to reinforcement are clear distances. Spacing of reinforcement is from center to center of reinforcement. All steel reinforcement is to be epoxy coated in accordance with Section 811.10 of the Specifications. Consider bars marked "C" to be a stirrup for purposes of bend diameters. Non-epoxy reinforcement may be used for fabrication purposes, only, provided that the steel is not used in the top 5 1/2" of the beam and the location of the steel is indicated on the shop drawings.

FABRICATION: Beams shall not be fabricated more than 120 days before the deck is to be poured.

GROUT: Provide non-shrink grout for anchor dowels, shear keys, and tensioning rod block-outs conforming with Section 601.03.03 of the Specifications. When side by side superstructure is utilized, grouting will be completed after lateral tension rods have been fully tightened and before leveling devices have been removed. Include the cost of furnishing and placing grout in the price of beam.

RAILING SYSTEM TYPE II: Furnish this material per these specifications.

ITEM	DESCRIPTION	MATERIAL SPECIFICATION	COATING SPECIFICATION
Post	W6x25	ASTM A36 or A572	A123
Channel	C7x9.8	ASTM A36 or A572	A123
Plate	1/2 "x 7"	ASTM A36 or A572	A123
Tubing	8x4x0.1875	ASTM A500 or A501	A123
Bolts	5/8 "	ASTM A307	A153
Nuts	for 5/8 "	ASTM A563, Grade A or better	A153
Washers	for 5/8 "	ASTM A563, Grade A or better	A153
Stud	1/4 "	ASTM A108 (1045 C.D. Bar)	B633, Type II, Class 25
Ferrule	2 1/2 "x 5"	ASTM A108 (11L17 Steel)	B633, Type II, Class 25
Wire	3/8 "	ASTM A510 (1018 Steel)	B633, Type II, Class 25
Nut	for 1 1/4 " Bolt	ASTM A108 (12L14 Steel)	B633, Type II, Class 25
Nut	for 1 1/4 " Stud	ASTM A325M	B633, Type II, Class 25
Washers	for 1 1/4 " Stud	ASTM A325M	B633, Type II, Class 25

Use the current edition of the references listed below with these standards.

STANDARD DRAWINGS

BBP-003	Elastomeric Bearing Pads
BHS-007	Railing System Type II
BJE-001	Armored Edge & Neoprene Joints
RBR-001	Steel Beam Guardrail
RBR-005	Guardrail Components

SPECIAL NOTES

for Corrosion Inhibitors

KENTUCKY
DEPARTMENT OF HIGHWAYS

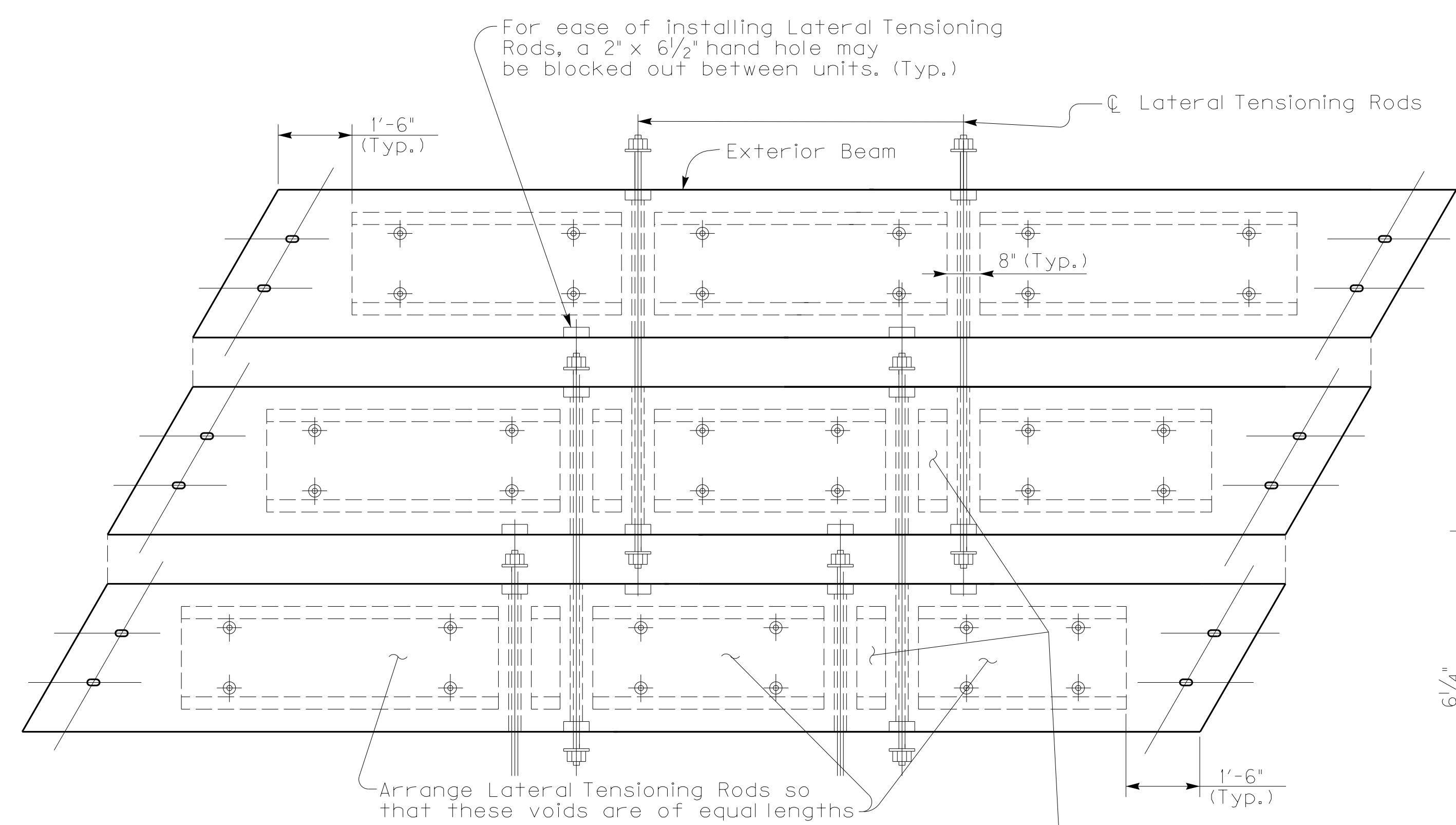
BOX BEAM
GENERAL NOTES
& REFERENCES

SUBMITTED:  3-26-19
DIRECTOR DIVISION OF STRUCTURAL DESIGN DATE

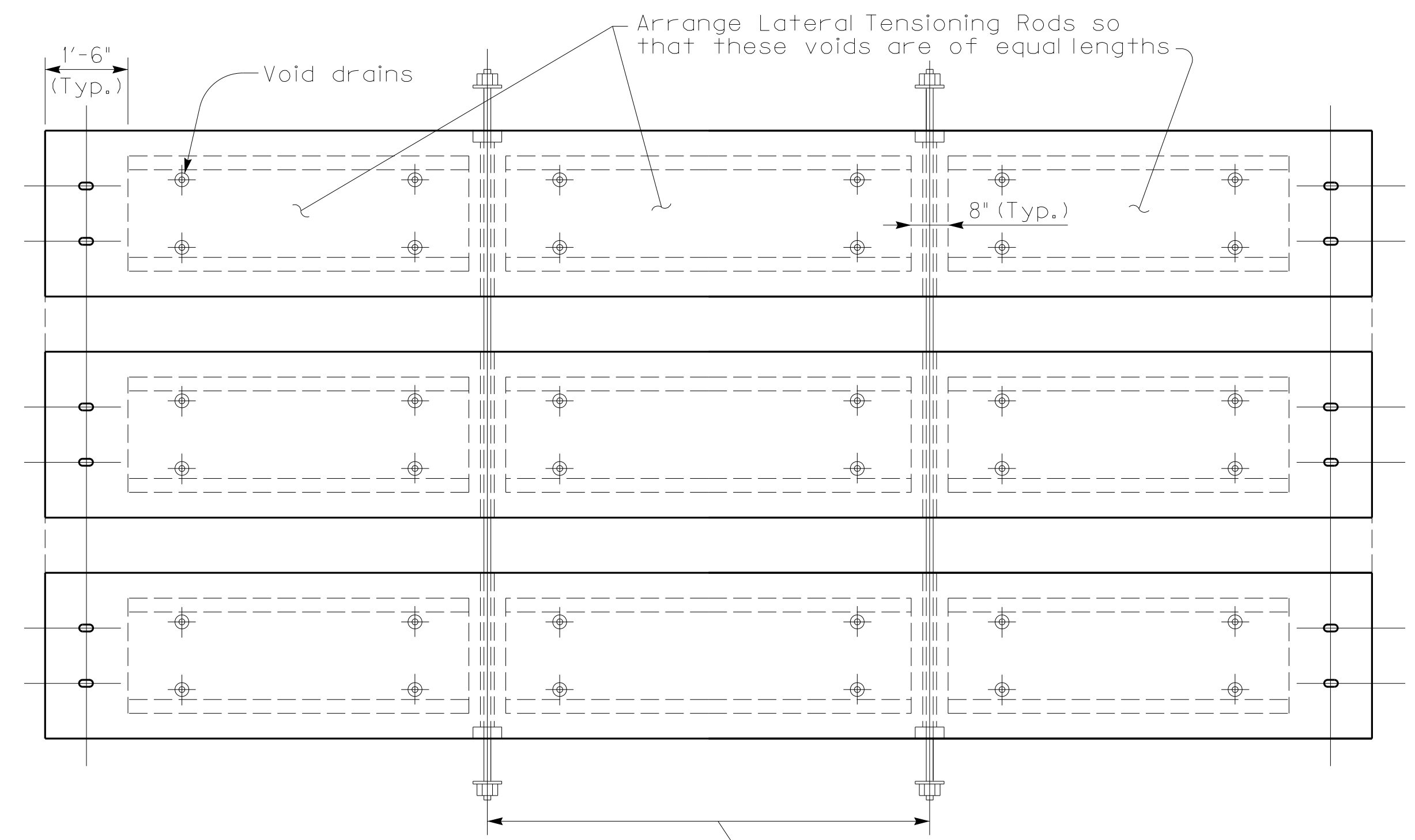
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GENERAL NOTES

LATERAL TENSIONING RODS: After the deck are in place, apply a preliminary tension to the lateral tensioning rods. Perform final tensioning that yields 20,000 psi as developed by a torque of 200 ft./lbs. Provide lateral tensioning rods and plates conforming to ASTM A36 with heavy hex nuts conforming to ASTM A307. All tension rods, plates, and nuts to be galvanized in accordance with ASTM A123 or A153 as applicable.

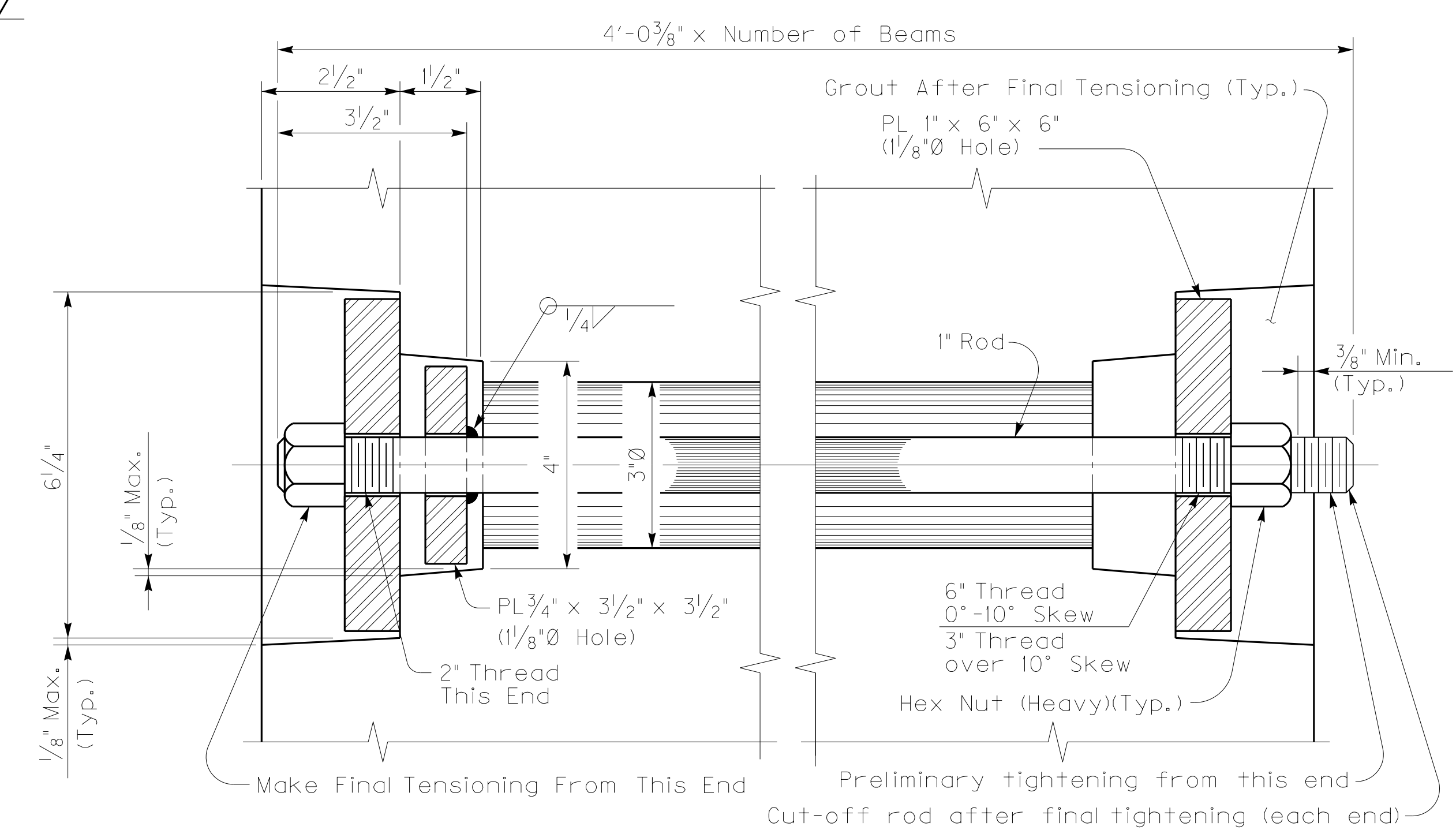


SECTIONAL PLAN SHOWING LATERAL TENSIONING METHOD FOR SKEWED SPANS

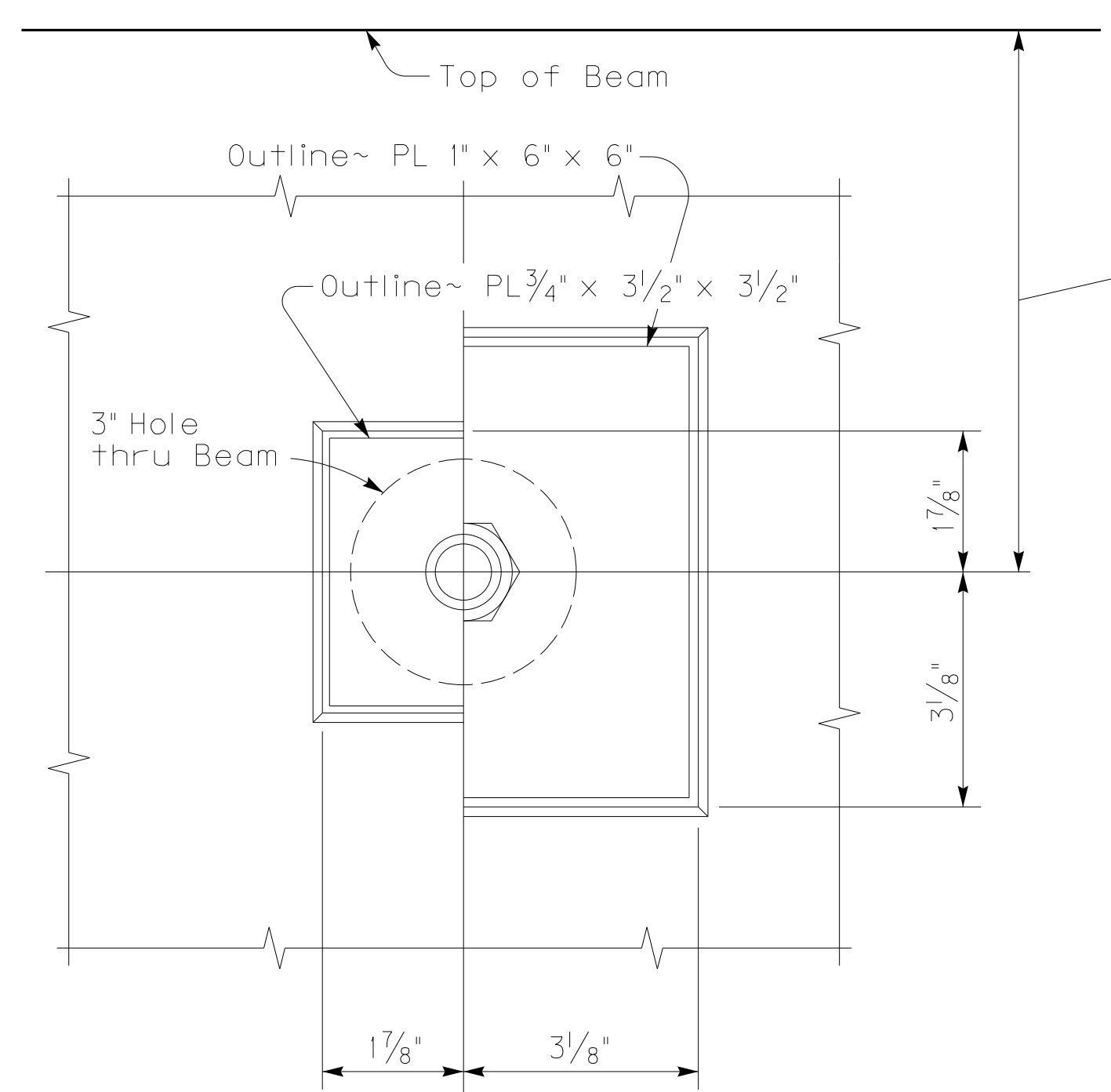


SECTIONAL PLAN SHOWING LATERAL TENSIONING METHOD FOR STRAIGHT SPANS

(The above arrangement is applicable from 0° skews to and including 10° skews)



SECTION THRU LATERAL TENSIONING ROD



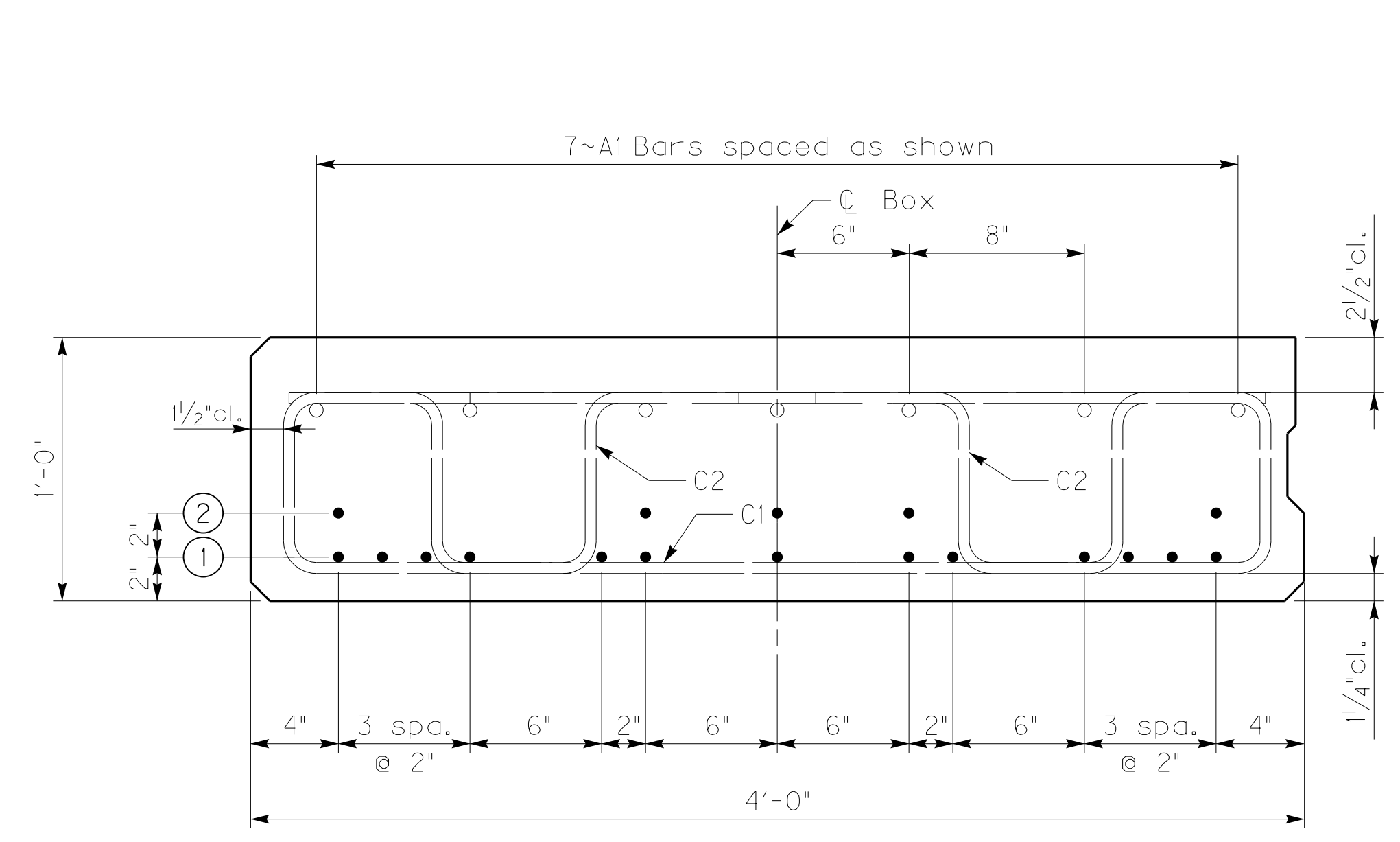
SECTIONAL END PLAN

(Lateral Tension Rod Details)

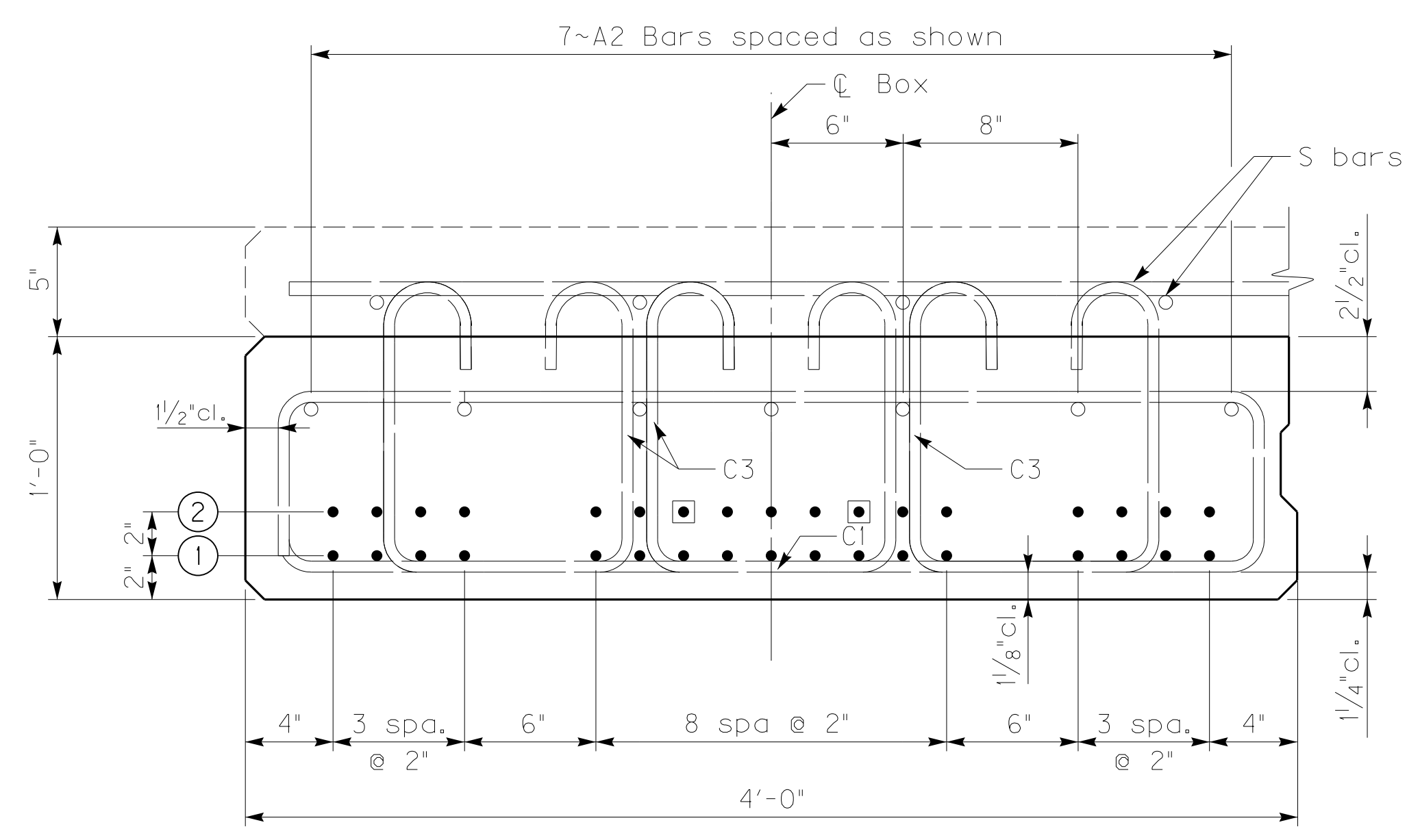
KENTUCKY
DEPARTMENT OF HIGHWAYS

BOX BEAM
TENSION ROD
DETAILS

SUBMITTED: *[Signature]* 2-04-19
ACTING DIRECTOR DIVISION OF HIGHWAY DESIGN DATE

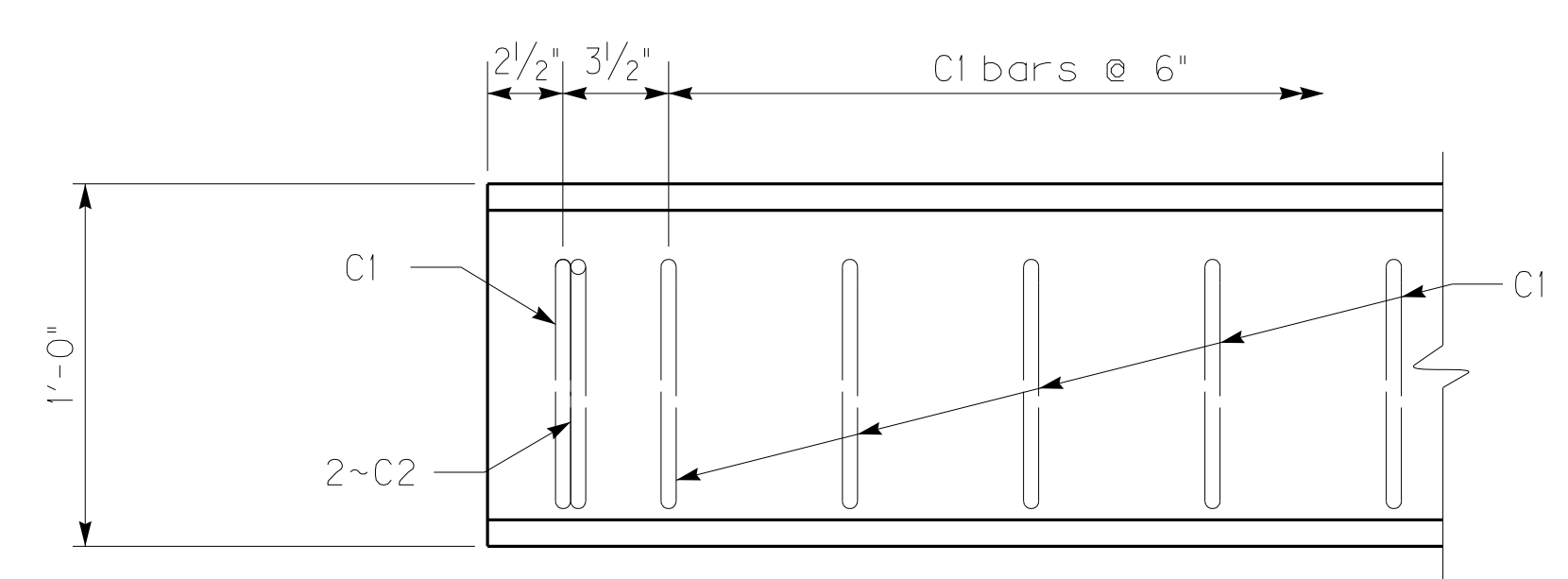


B12 BEAM

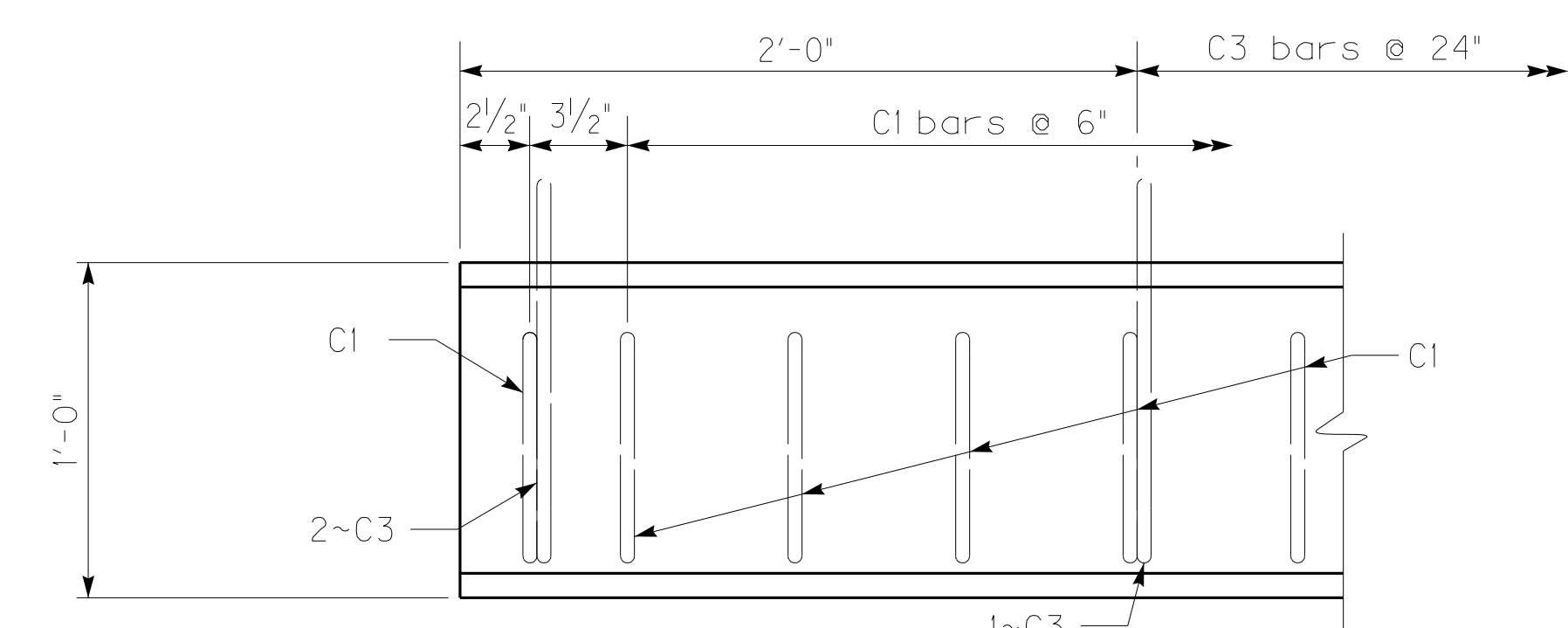


CB12 BEAM

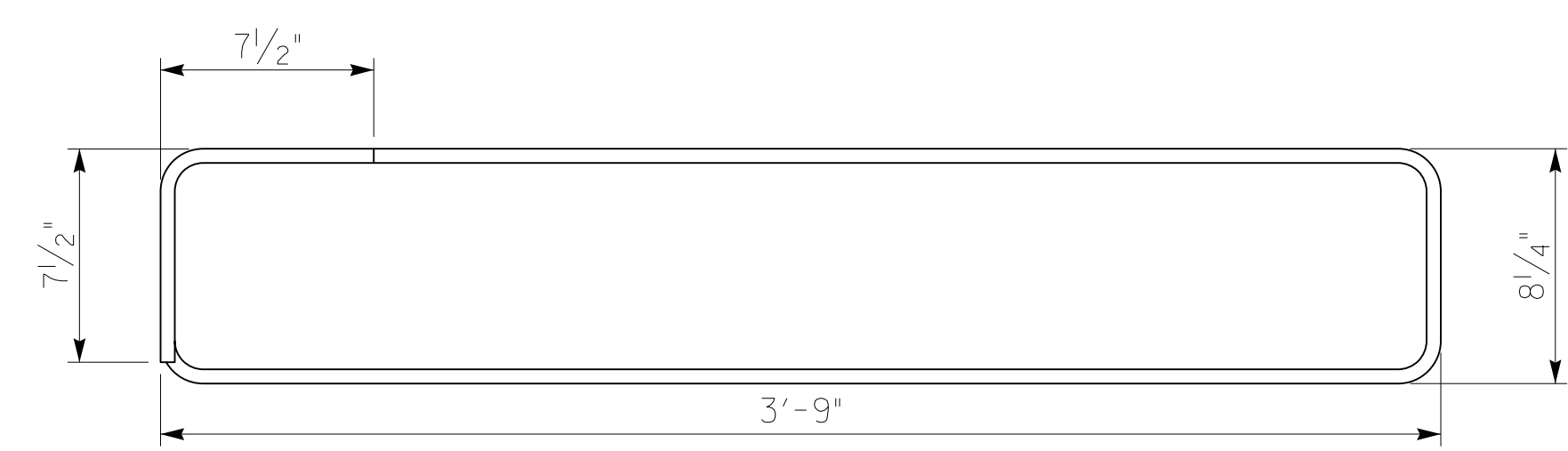
□ Debond these strands 4'-0" at each end of beam ~CB12-34 Only



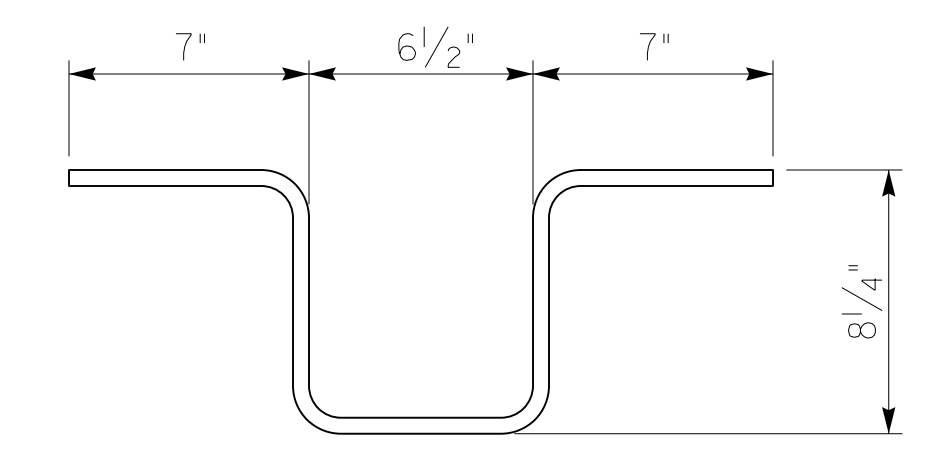
B12 ELEVATION OF 0° SKEW
(Refer to BDP-003, for skewed details)



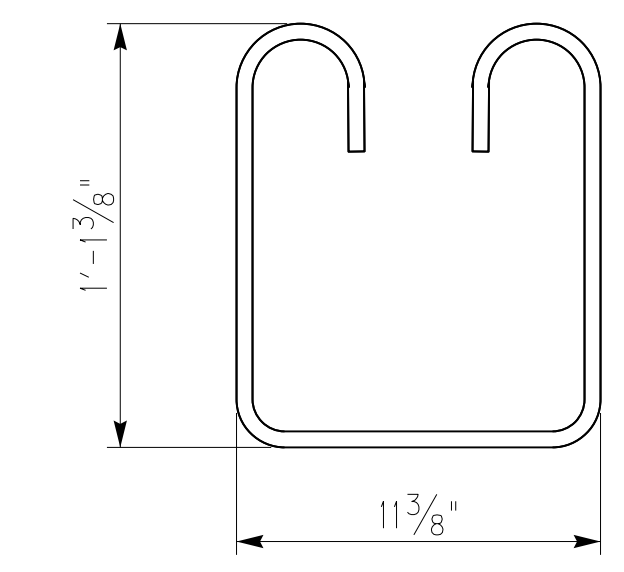
CB12 ELEVATION OF 0° SKEW
(Refer to BDP-003, for skewed details)



C1(e) Bar
#4 Stirrup



C2(e) Bar
#4 Stirrup



C3(e) Bar
#5 Stirrup

TABLE OF STRAND DATA

Beam Type	Beam Length (feet)	Number of Strands Required		Concrete Strength	
		Row ①	Row ②	F'CI (psi)	F'C (psi)
B12	12	9	1		
	14	10	1		
	16	11	1		
	18	12	1		
	20	12	1		
	22	12	2		
	24	13	2		
CB12	26	13	5		
	12	7			
	14	8			
	16	8			
	18	9			
	20	10			
	22	10			
	24	10			
	26	12			
	28	13			
	30	14	9		
32	14	13	6000	7100	
34	15	17	7000	8000	

BAR QUANTITIES DESIGN DATA

Beam Type	Beam Length (feet)	C1	C2	C3	DC (Kips)	DW (Kips)	LL (Kips)	LL+I (Kips)	Δd (in.)	Δ (in.)
B12	12	25	2		3.9	0.4	27.8	36.3		
	14	29	2		4.6	0.4	29.1	37.8		
	16	33	2		5.2	0.5	30.1	39.1		
	18	37	2		5.8	0.5	31.0	40.1		
	20	41	2		6.5	0.6	31.8	41.0		
	22	45	2		7.1	0.6	32.5	41.9		
	24	49	2		7.8	0.7	33.2	42.6		
CB12	26	53	2		8.4	0.7	33.8	43.4		
	12	25		9	5.4	0.4	27.8	36.3	0.1	0.1
	14	29		10	6.3	0.4	29.1	37.8	0.1	0.1
	16	33		11	7.2	0.5	30.1	39.1	0.1	0.2
	18	37		12	8.1	0.5	31.0	40.1	0.1	0.2
	20	41		13	9.0	0.6	31.8	41.0	0.1	0.3
	22	45		14	9.9	0.6	32.5	41.9	0.1	0.3
	24	49		15	10.8	0.7	33.2	42.6	0.1	0.3
	26	53		16	11.6	0.8	33.8	43.4	0.1	0.5
	28	57		17	12.5	0.8	35.1	44.9	0.2	0.5
	30	61		18	13.4	0.9	36.4	46.4	0.2	0.9
32	65		19	14.3	0.9	37.7	48.1	0.2	1.0	
34	69		20	15.2	1.0	38.9	49.6	0.3	1.3	

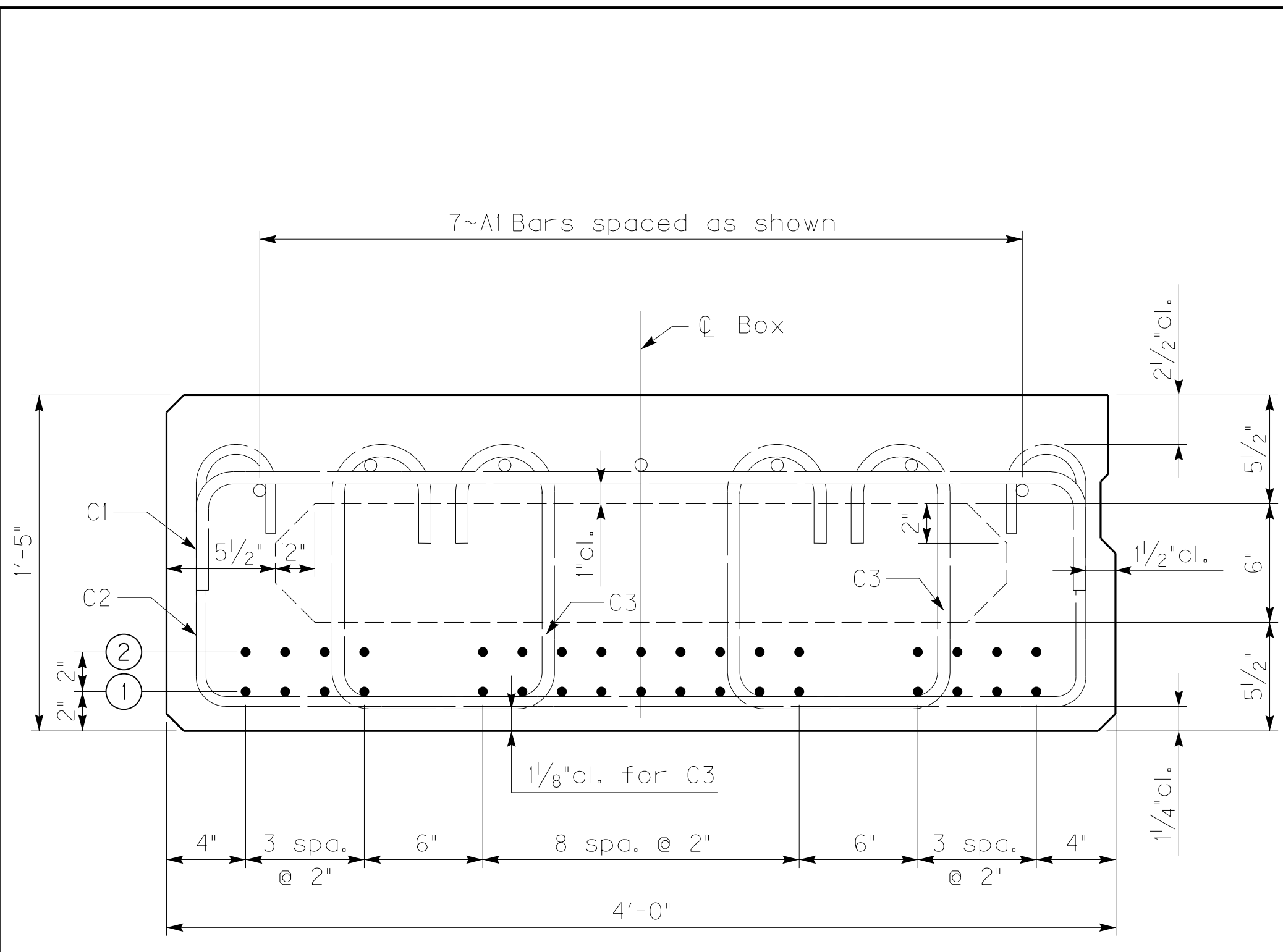
Straight Reinforcement

MARK	SIZE	LENGTH
A1(E)	#5	Beam Length Minus 3"
A2(E)	#4	Beam Length Minus 3"
D(E)	#8	2'-0"

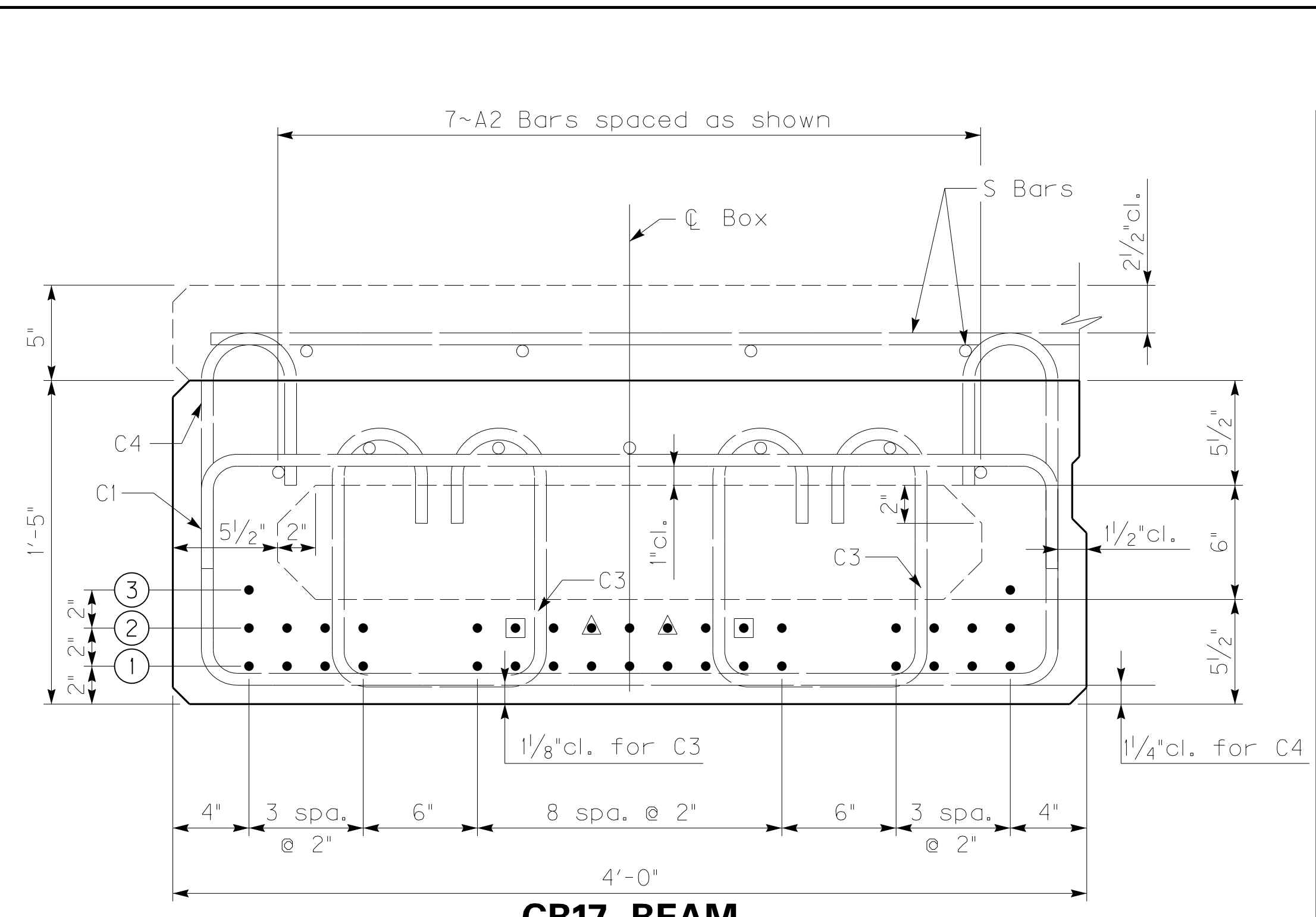
KENTUCKY
DEPARTMENT OF HIGHWAYS

BOX BEAM
B12 & CB12
DETAILS

SUBMITTED:  DATE: 2-04-19
ACTING DIRECTOR DIVISION OF HIGHWAY DESIGN

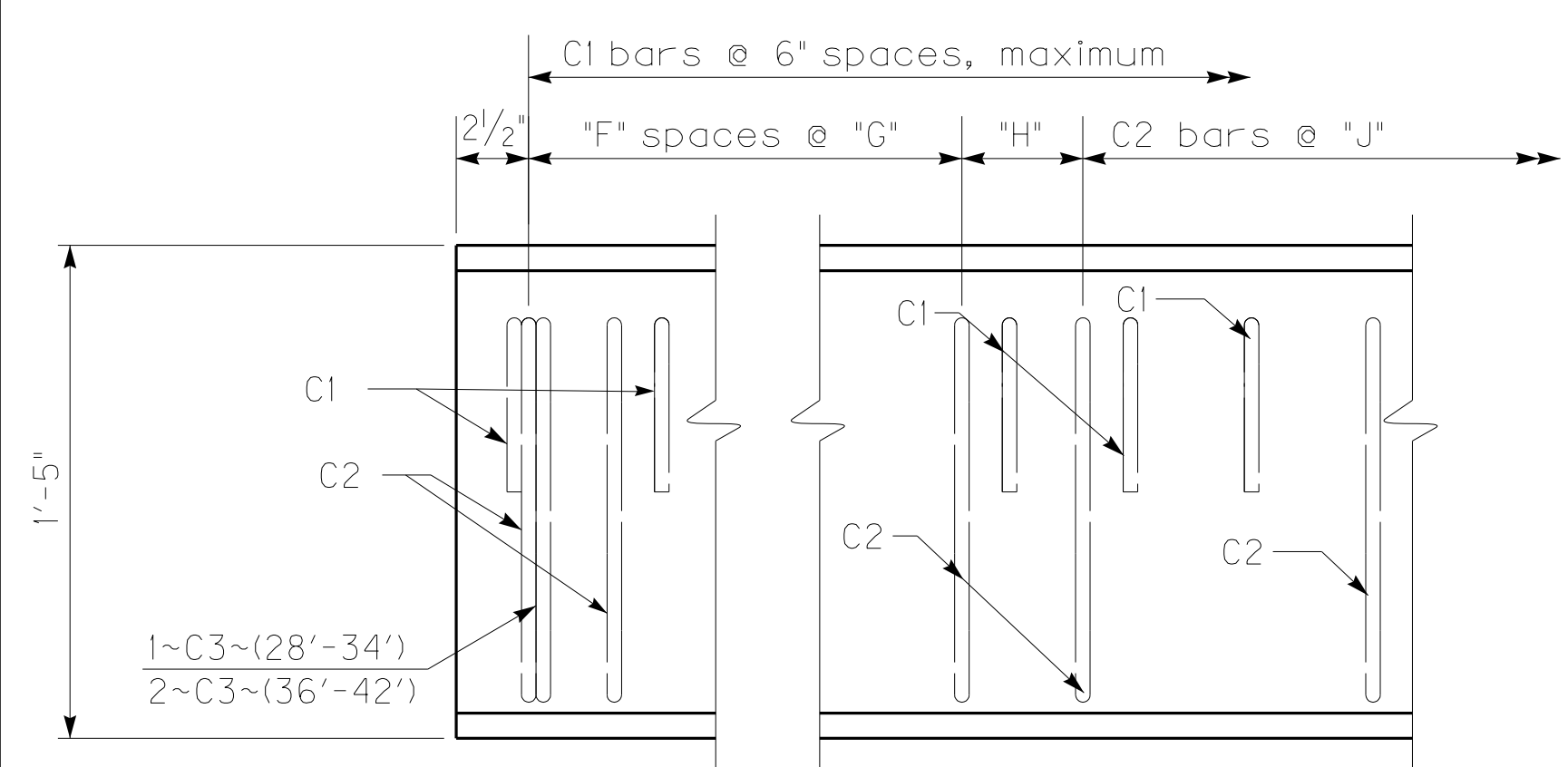


B17 BEAM



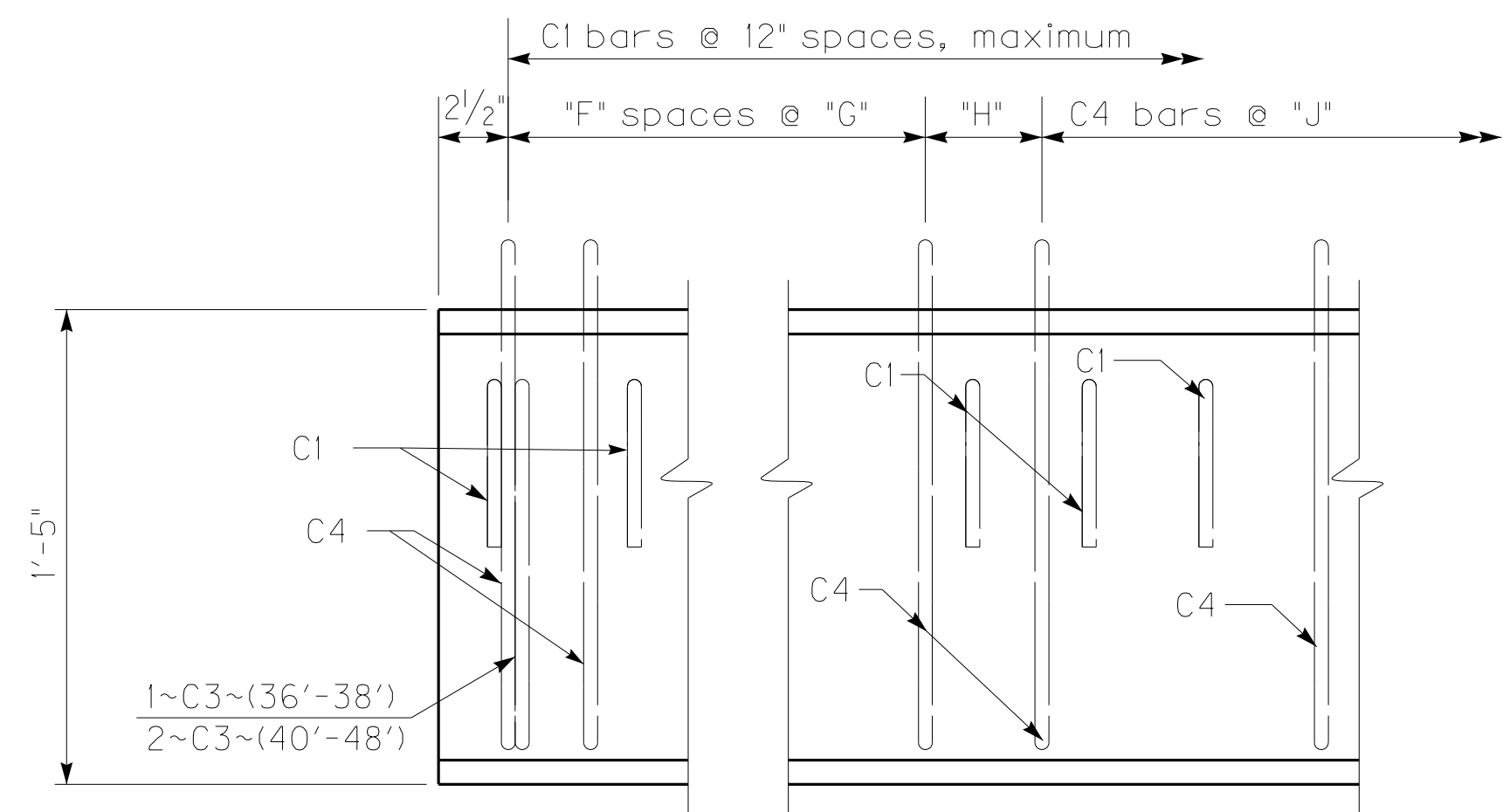
CB17 BEAM

□ Debond these strands 4' each end of beam — CB17-48 Beam Only
 △ Debond these strands 6' each end of beam



B17 ELEVATION OF 0° SKEW

(Refer to BDP-003, for skewed details)



CB17 ELEVATION OF 0° SKEW

(Refer to BDP-003, for skewed details)



C1(e) Bar



C2(e)-C4(e) Bars

TABLE OF STRAND DATA

Beam Type	Beam Length (feet)	Number of Strands Required			Conc. Strength	
		Row ①	Row ②	Row ③	F'CI (psi)	F'C (psi)
B17	28	12				
	30	13				
	32	14				
	34	15				
	36	16				
	38	17	1			
CB17	40	17	3			
	42	17	5			
	36	14				
	38	15				
	40	16				
	42	17	1			
	44	17	2			
	46	17	9		6000	7000
	48	17	17	2	7000	8000

TABLE OF DIMENSION DATA

Beam Type	Beam Length (feet)	"F"	"G"	"H"	"J"				
B17	28	4	9"	8 1/2"	11"				
	30	4	9"	9 1/2"	11"				
	32	4	9"	10 1/2"	11"				
	34	5	8"	7 1/2"	11"				
	36	6	8"	6"	11"				
	38	7	7"	6 1/2"	10"				
CB17	40	7	7"	8 1/2"	10"				
	42	7	7"	5 1/2"	10"				
	36	6	8"	11 1/2"	14"				
	38	6	8"	9 1/2"	14"				
	40	6	8"	7 1/2"	14"				
	42	7	7"	8 1/2"	12"				
	44	8	7"	7 1/2"	12"				
	46	8	7"	7 1/2"	12"				
	48	10	6"	9 1/2"	12"				

TABLE OF BAR QUANTITIES


Beam Type	Beam Length (feet)	C1	C2	C3	C4	DESIGN DATA					
						DC (kips)	DW (kips)	LL (kips)	LL+I (kips)	Δd (in.)	Δc (in.)
B17	28	57	33	2		9.4	0.8	35.1	44.9		
	30	61	35	2		10.1	0.9	36.4	46.4		
	32	65	37	2		10.7	0.9	37.7	48.1		
	34	69	41	2		11.4	1.0	38.9	49.6		
	36	73	44	4		12.1	1.0	40.0	50.9		
	38	77	51	4		12.7	1.1	41.1	52.2		
CB17	40	81	53	4		13.4	1.1	42.1	53.4		
	42	85	56	4		14.1	1.2	43.0	54.5		
	36	37		2	37	16.6	1.0	40.0	50.9	0.2	0.6
	38	39		2	39	17.5	1.1	41.1	52.2	0.2	0.7
	40	41		4	41	18.4	1.1	42.1	53.4	0.2	0.8
	42	43		4	49	19.3	1.2	43.0	54.5	0.3	0.9
	44	45		4	52	20.2	1.3	43.9	55.5	0.3	1.0
	46	47		4	54	21.1	1.3	44.7	56.5	0.3	1.3
	48	49		4	56	22.0	1.4	45.5	57.4	0.4	1.8

Straight Reinforcement			
Mark	Size	Length	
A1(E)	#5	Beam Length Minus 3"	
A2(E)	#4	Beam Length Minus 3"	
D(E)	#8	2'-0"	

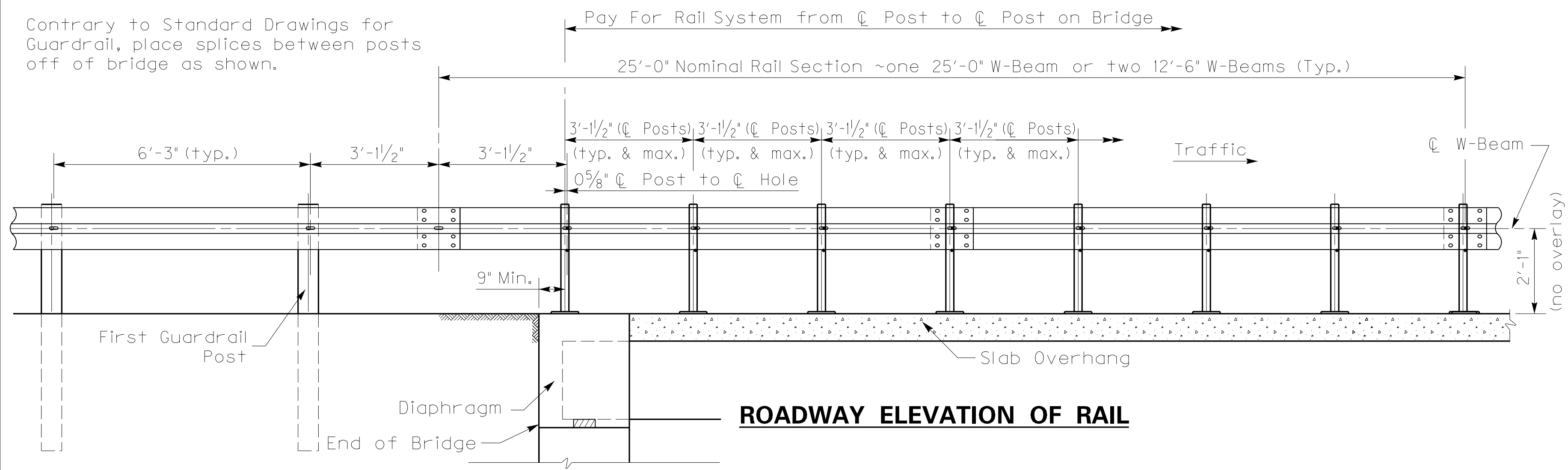
Bent Reinforcement			
Mark	Size	a	b
C1(e)	#5	3'-9"	6"
C2(e)	#4	3'-9"	1'-1 1/4"
C3(e)	#5	11 3/8"	1'-1 3/8"
C4(e)	#4	3'-9"	1'-6 1/4"

KENTUCKY
 DEPARTMENT OF HIGHWAYS

**BOX BEAM
 B17 & CB17
 DETAILS**

SUBMITTED:  DATE: 2-04-19
 ACTING DIRECTOR DIVISION OF HIGHWAY DESIGN

050

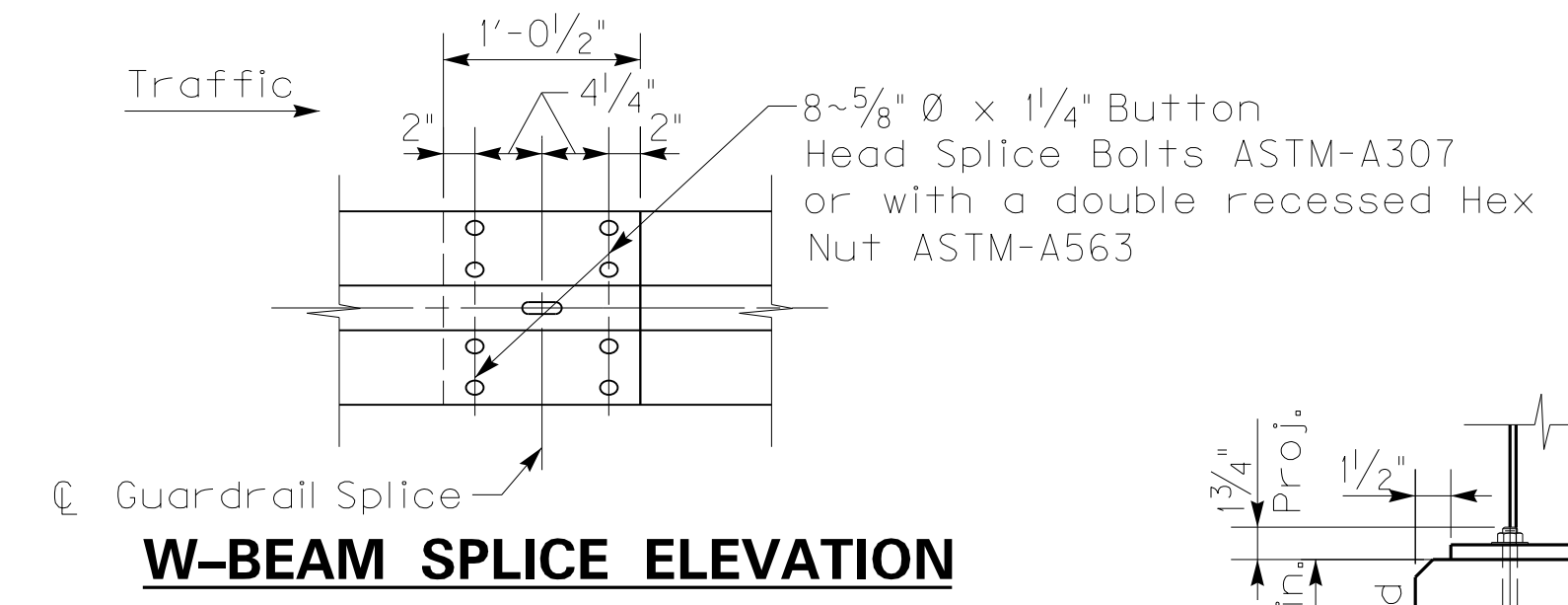
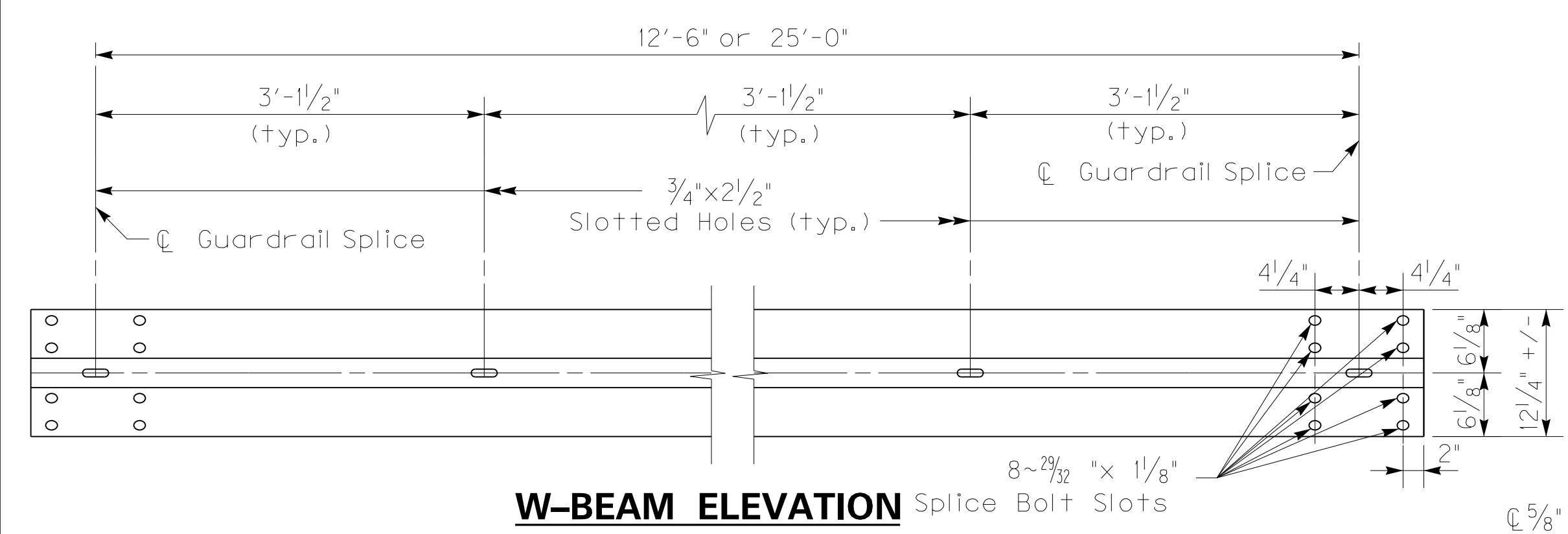


TRANSITION AND END TREATMENT NOTES:
 This traffic railing must be anchored by a minimum of 25 feet of guardrail. This 25 feet at each corner of the bridge is to be paid with the roadway plans. See roadway plans for layout.

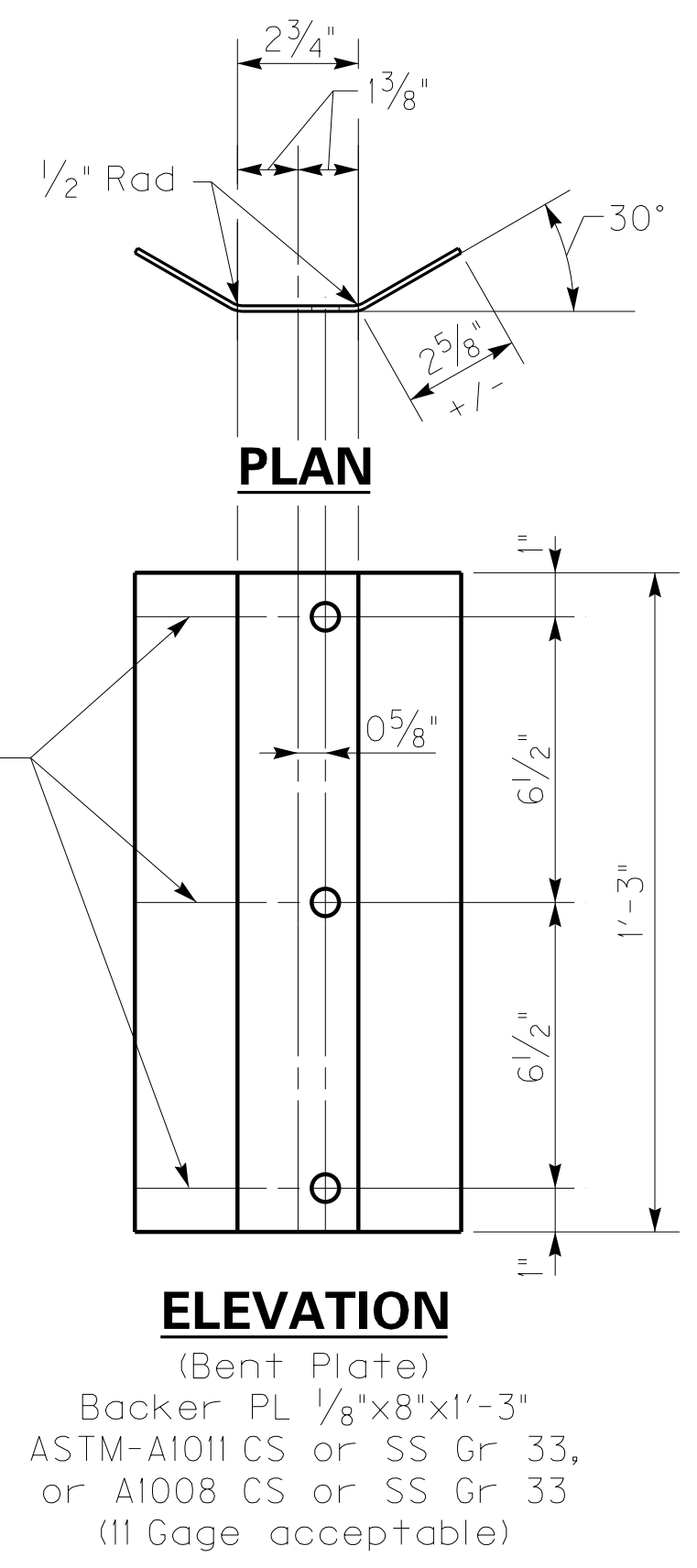
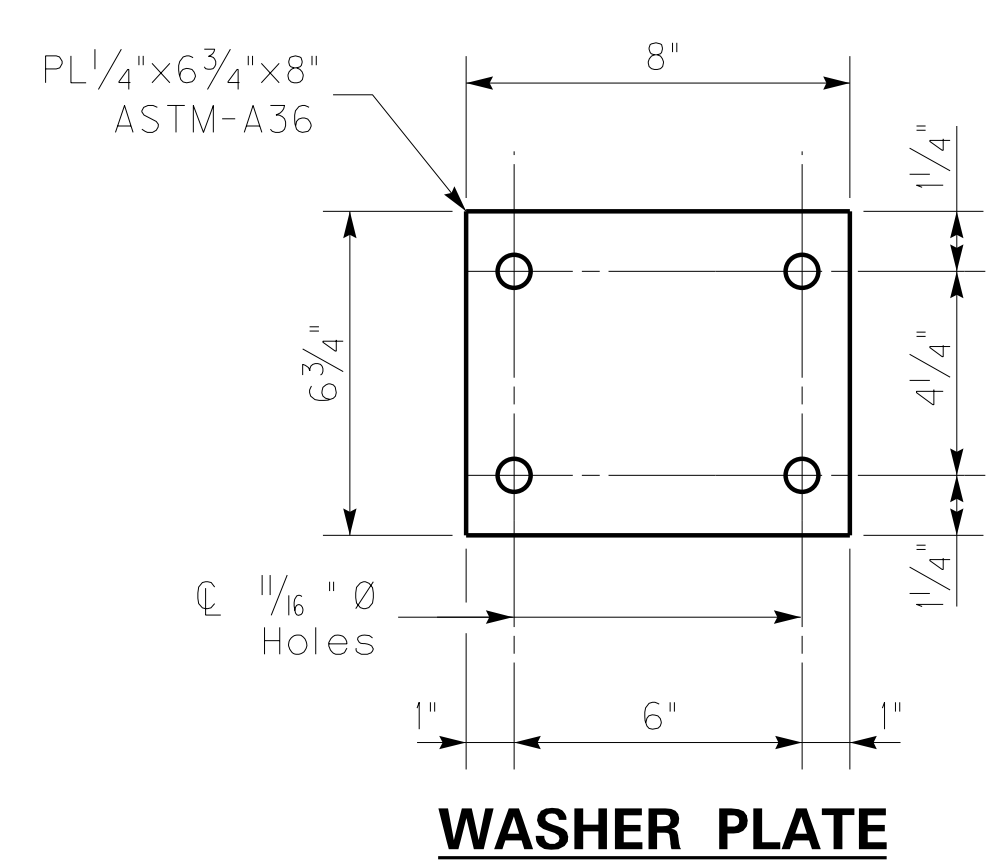
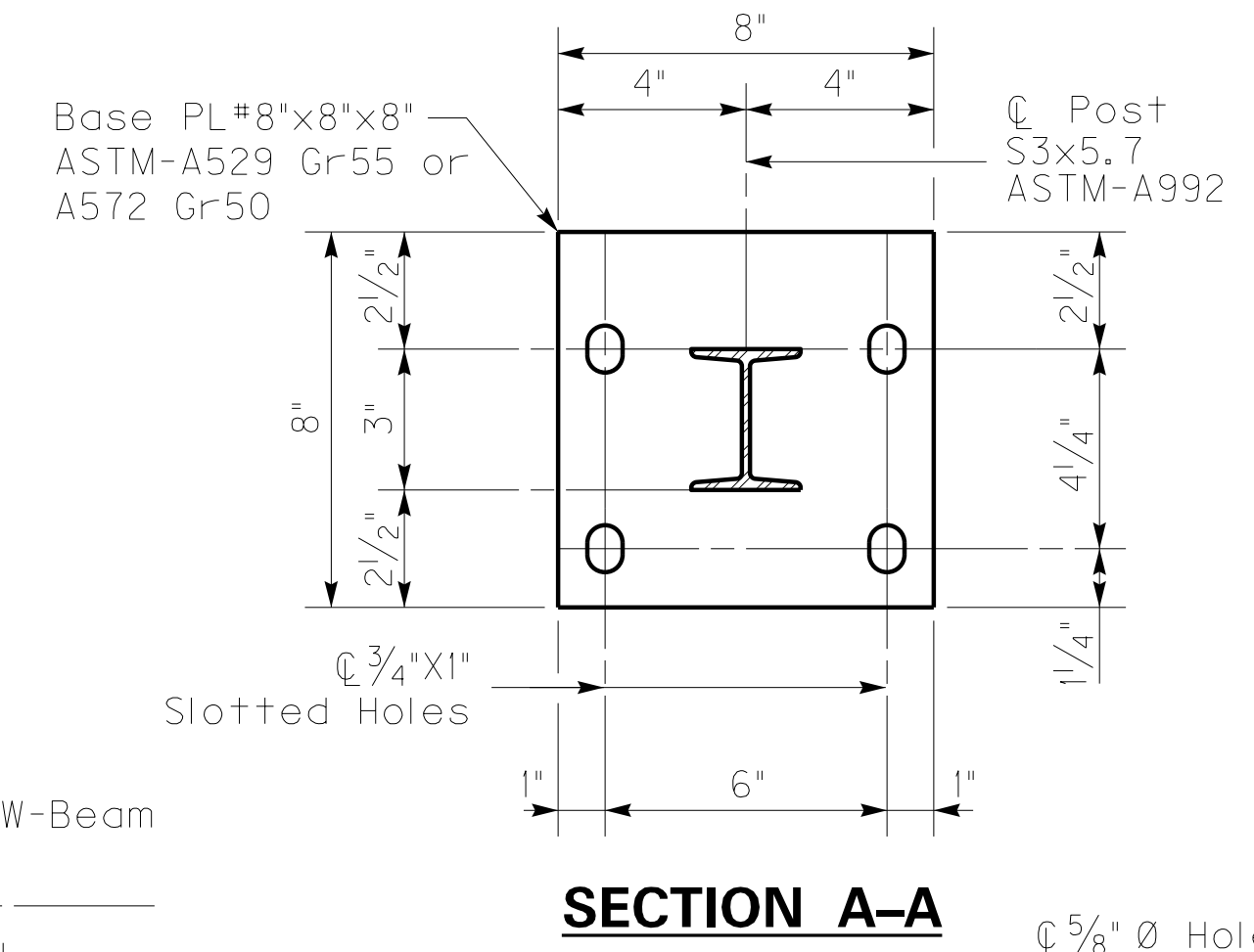
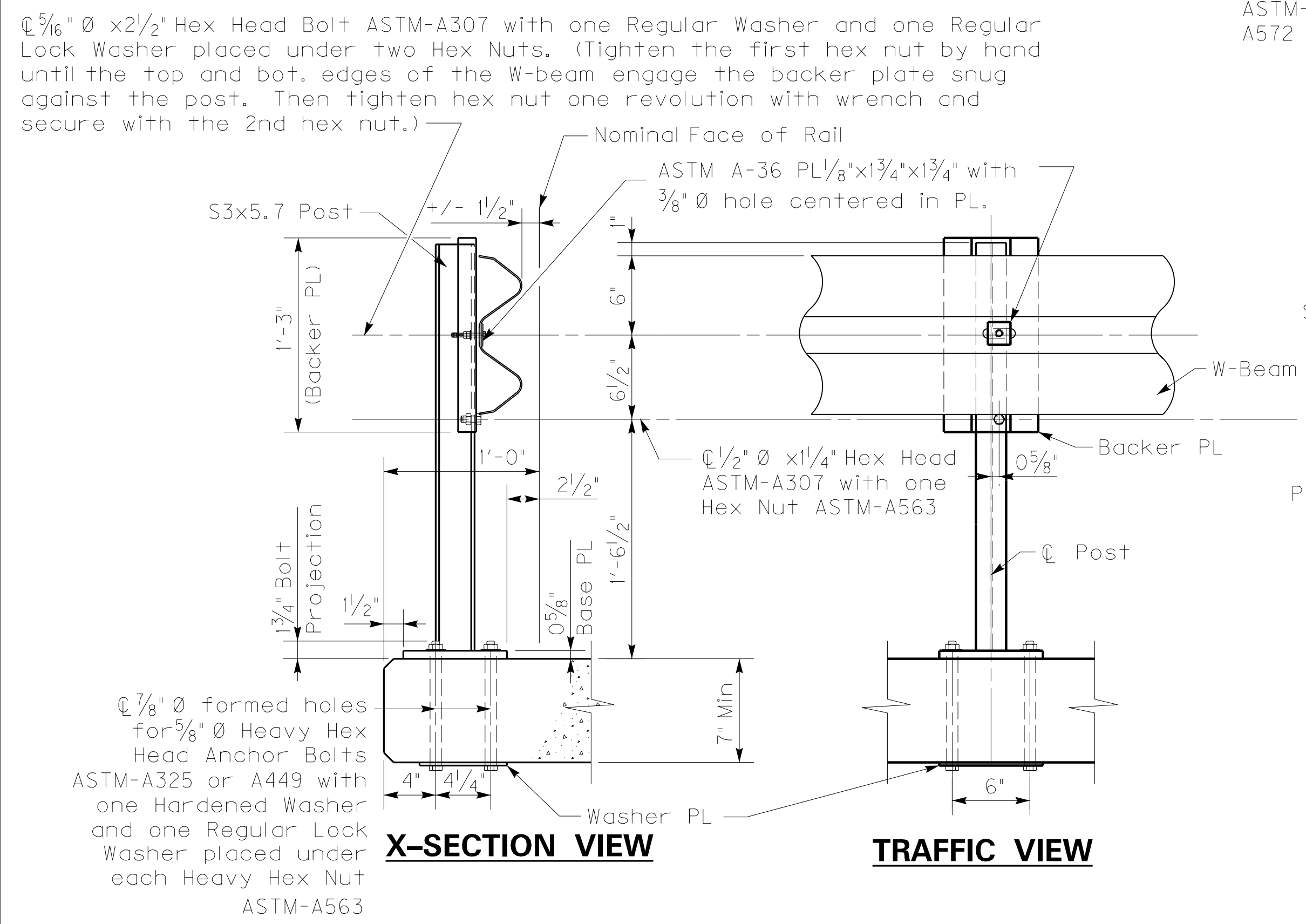
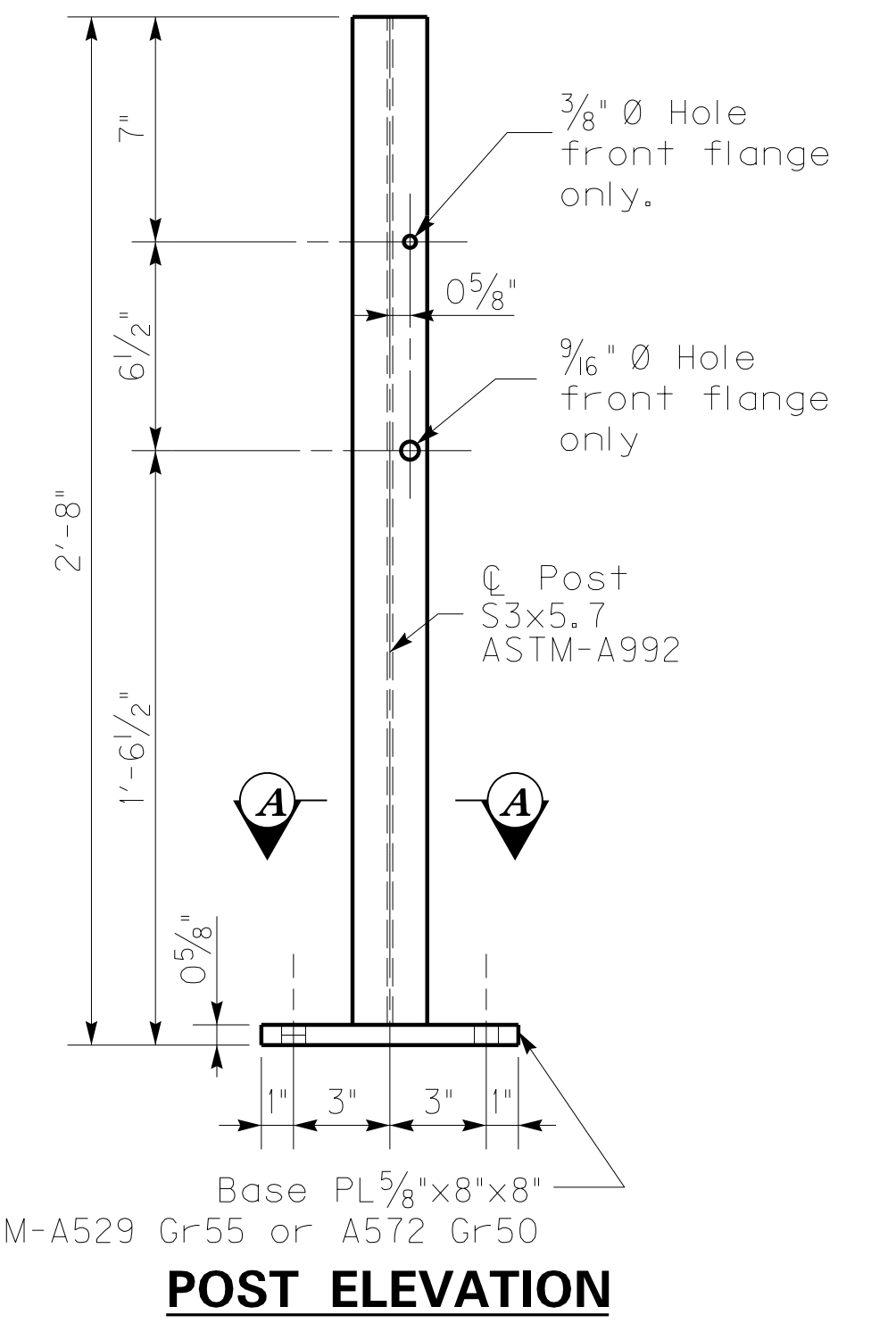
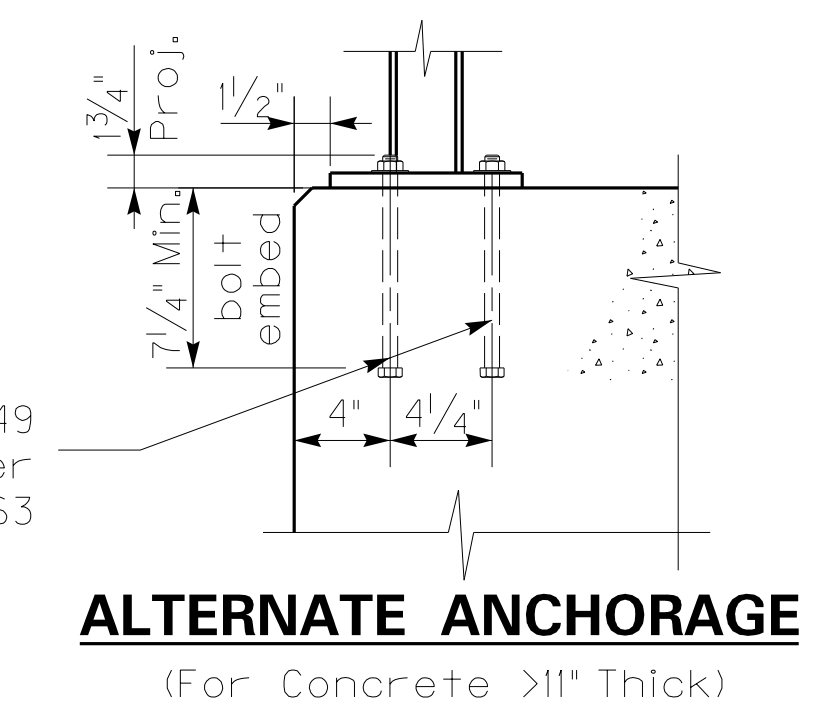
CONSTRUCTION NOTES:
 Face of rail post must be plumb unless otherwise approved by the Engineer. Post must be perpendicular to adjacent roadway grade. Use epoxy mortar with Type III binder conforming to Section 826 and ASTM C881 under post base plates if gaps larger than 1/16" exist. Fully anchored guardrail must be attached to each end of rail. Typical guardrail construction as indicated above and not bridge rail transition or bridge end connector. It is recommended that the bridge plans show rail post locations. Round or chamfer exposed edges of rail posts and backer plate to approximately 1/16" by grinding. Shop drawings are not required.

MATERIAL NOTES:
 Galvanize all steel components. Anchor bolts for base plate must be 5/8" \bar{C} ASTM-A325 or A449 bolts with one hardened washer and one regular lock washer placed under each heavy hex nut. Nuts must conform to A563 requirements. W-beam must meet the requirements of Std. Dwg. RBR-001-12 except as modified in these plans. The contractor may furnish rail elements of 25'-0" or 12'-6" (Nominal) lengths. W-beam must have slotted holes at 3'-1/2".

GENERAL NOTES:
 This railing has been successfully evaluated by full scale crash test to meet MASH TL-3 criteria. This railing can be used for speeds 50 mph and greater. This rail is designed to deflect approximately 4' - 4'-6" as it contains and redirects the errant vehicle. This rail may not be installed on top of or behind curbs that project above finished grade, on bridges with expansion joints providing more than 5" of movement, on retaining walls, or on grade separations and interchanges. Repairs to impact-damaged post and base plate unit are not permitted. Replace all impact-damaged posts with a new post and base plate unit. Average weight of railing with no overlay: 19 plf total.

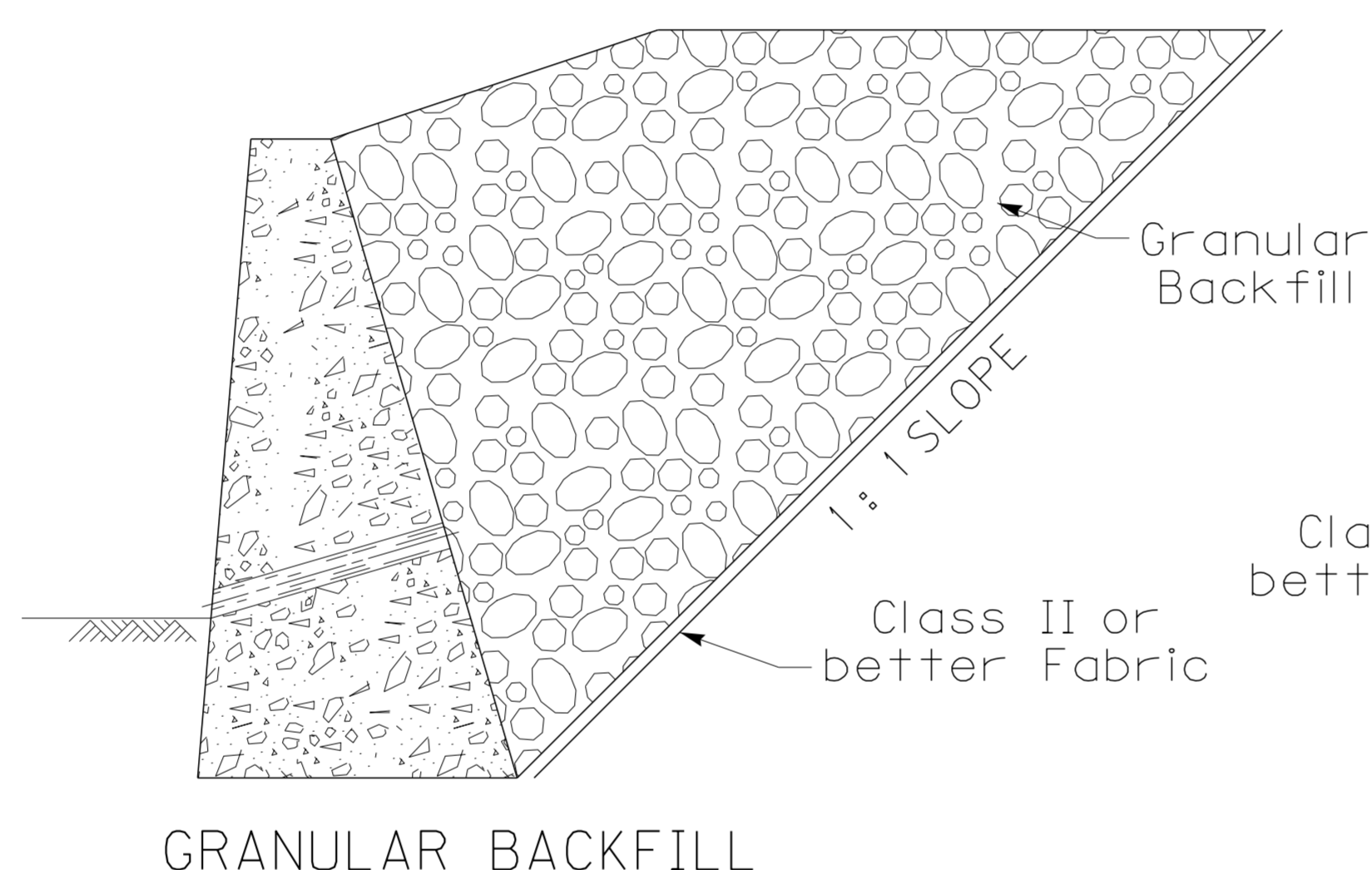
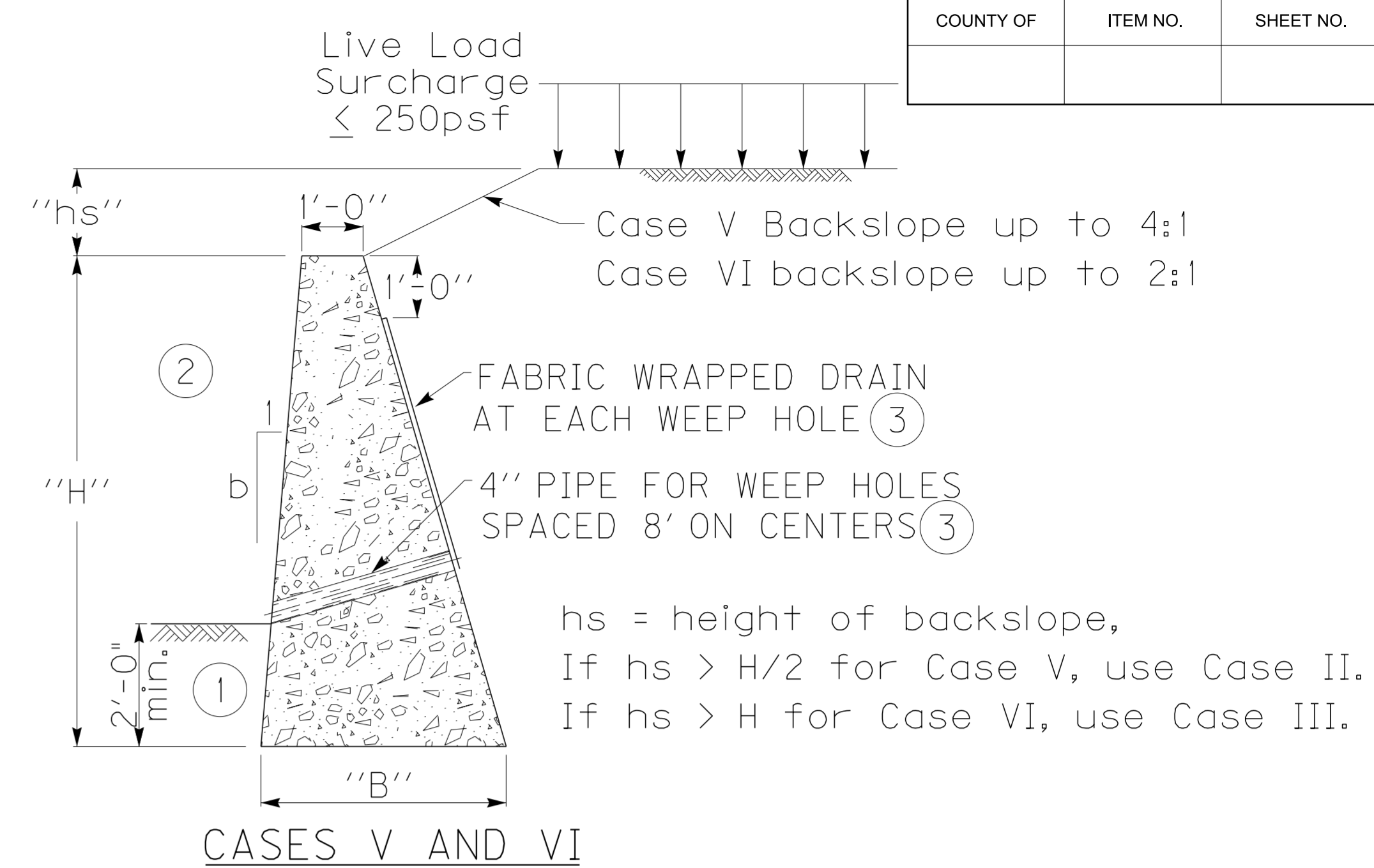
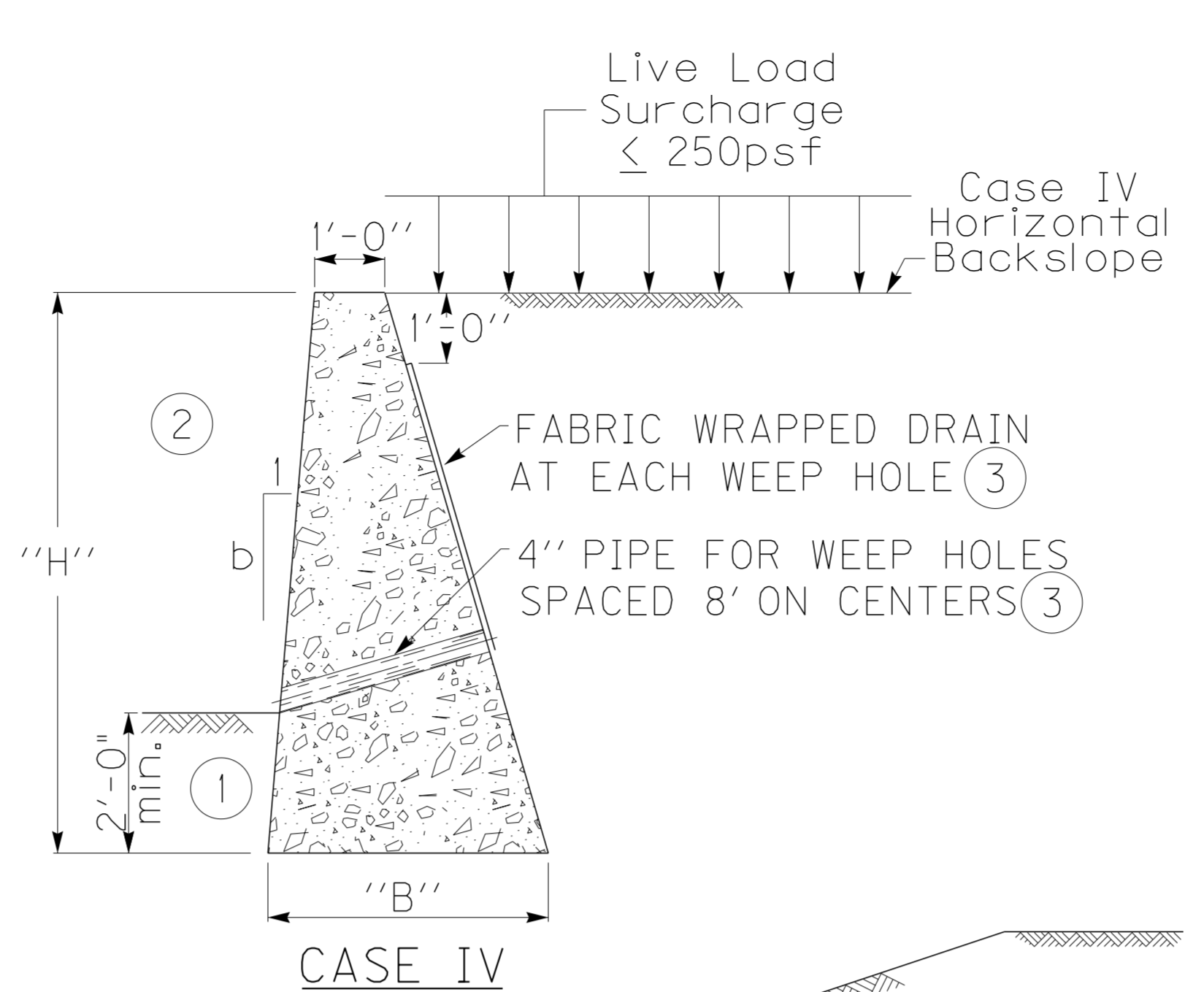
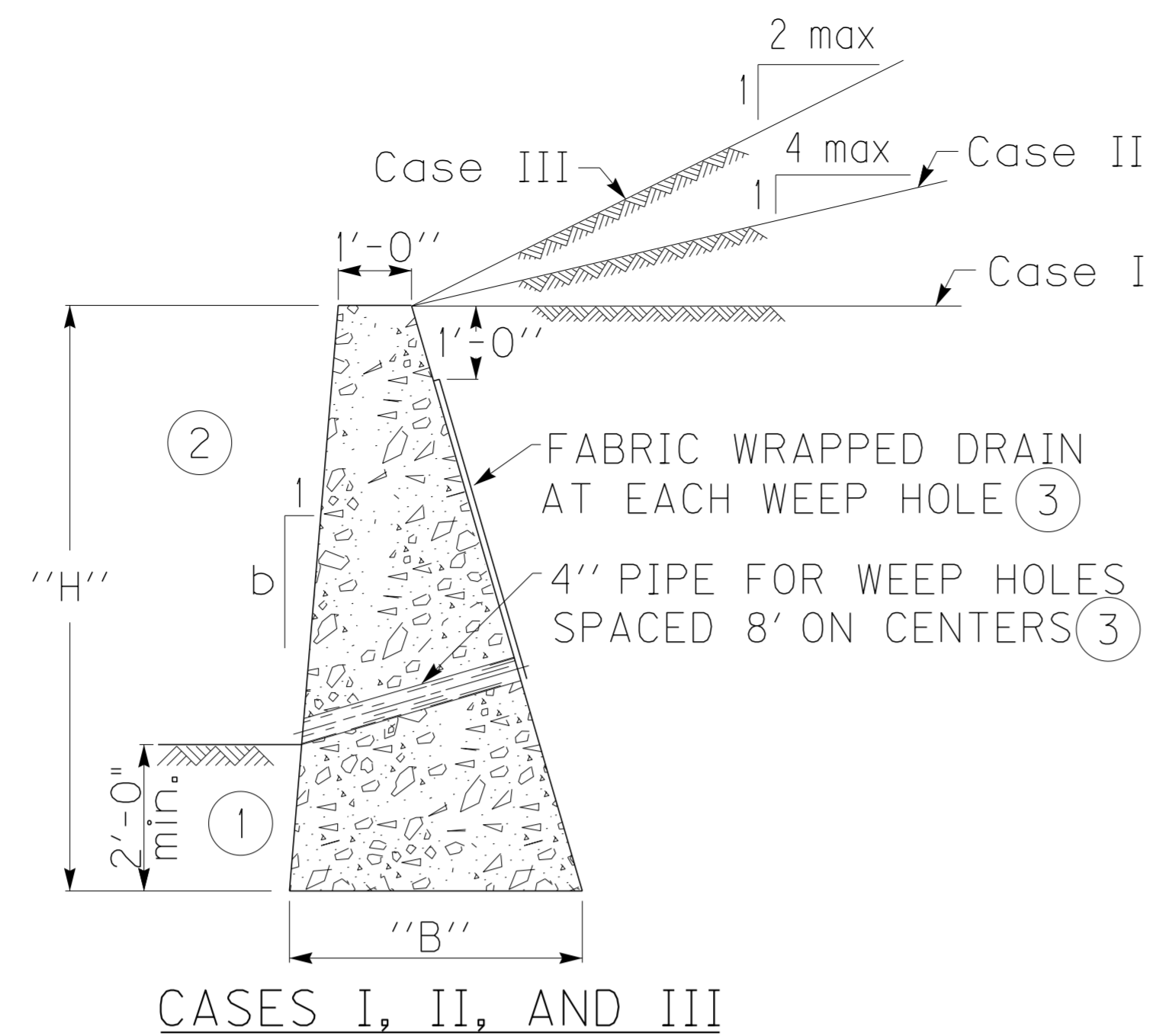


\bar{C} 5/8" \bar{C} Heavy Hex Head Anchor Bolts ASTM-A325 or A449 with one Hardened Washer and one Regular Lock Washer placed under each Heavy Hex Nut ASTM-A563

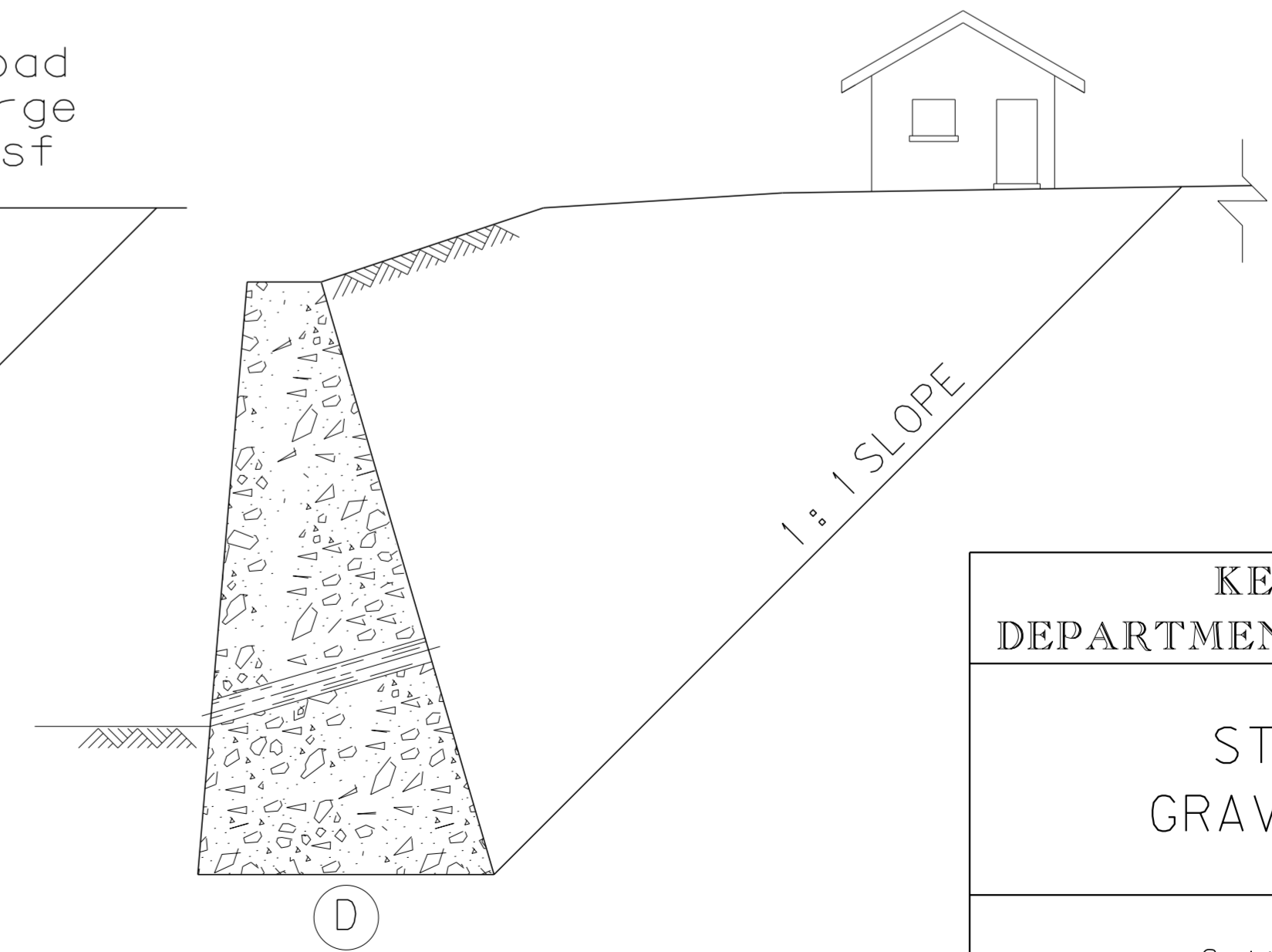
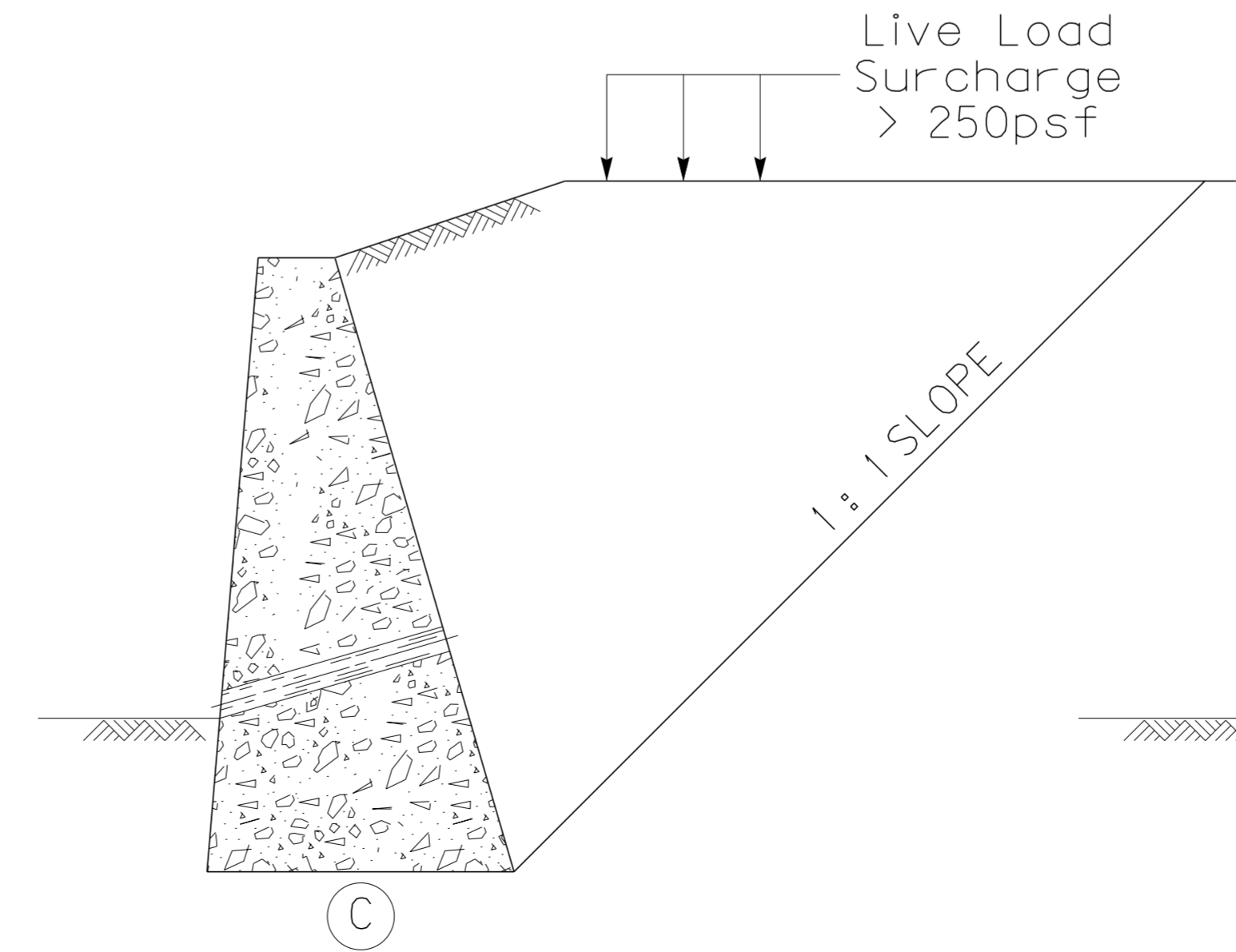
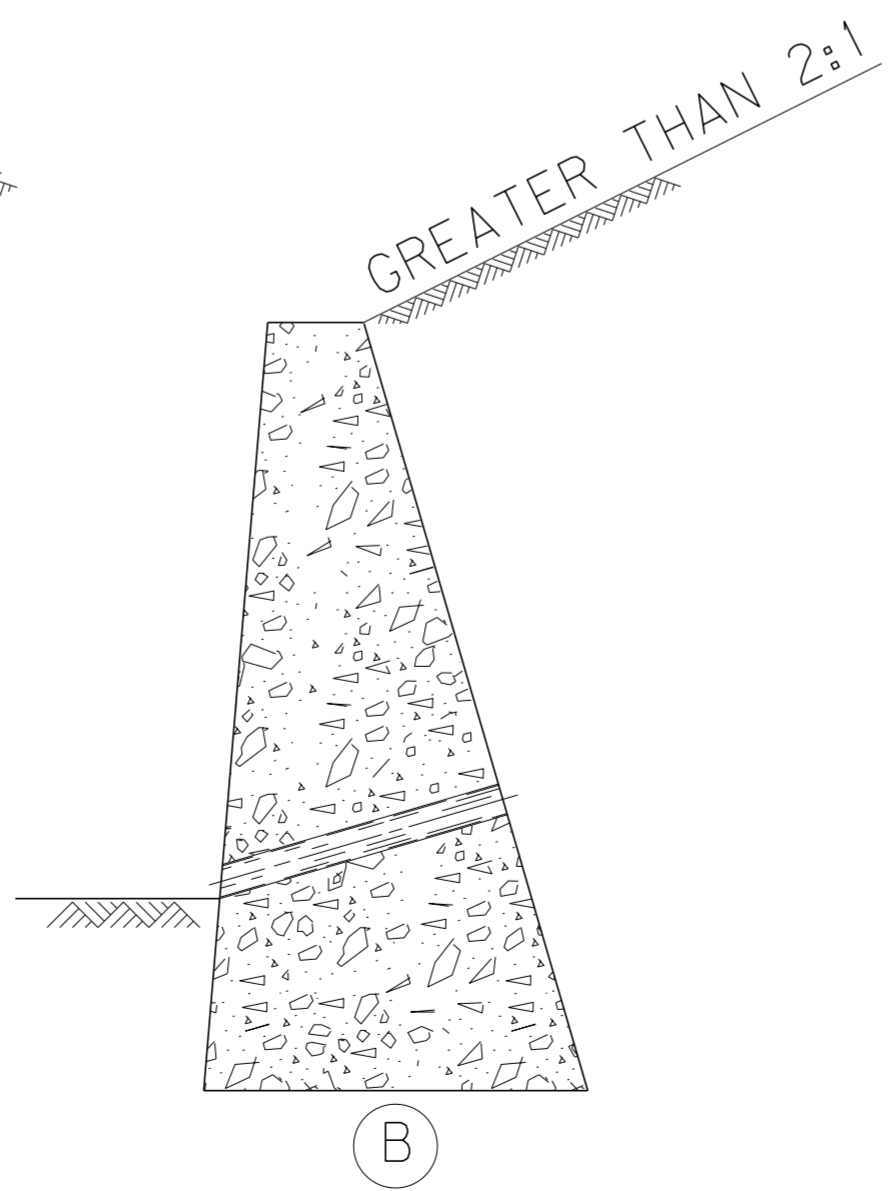
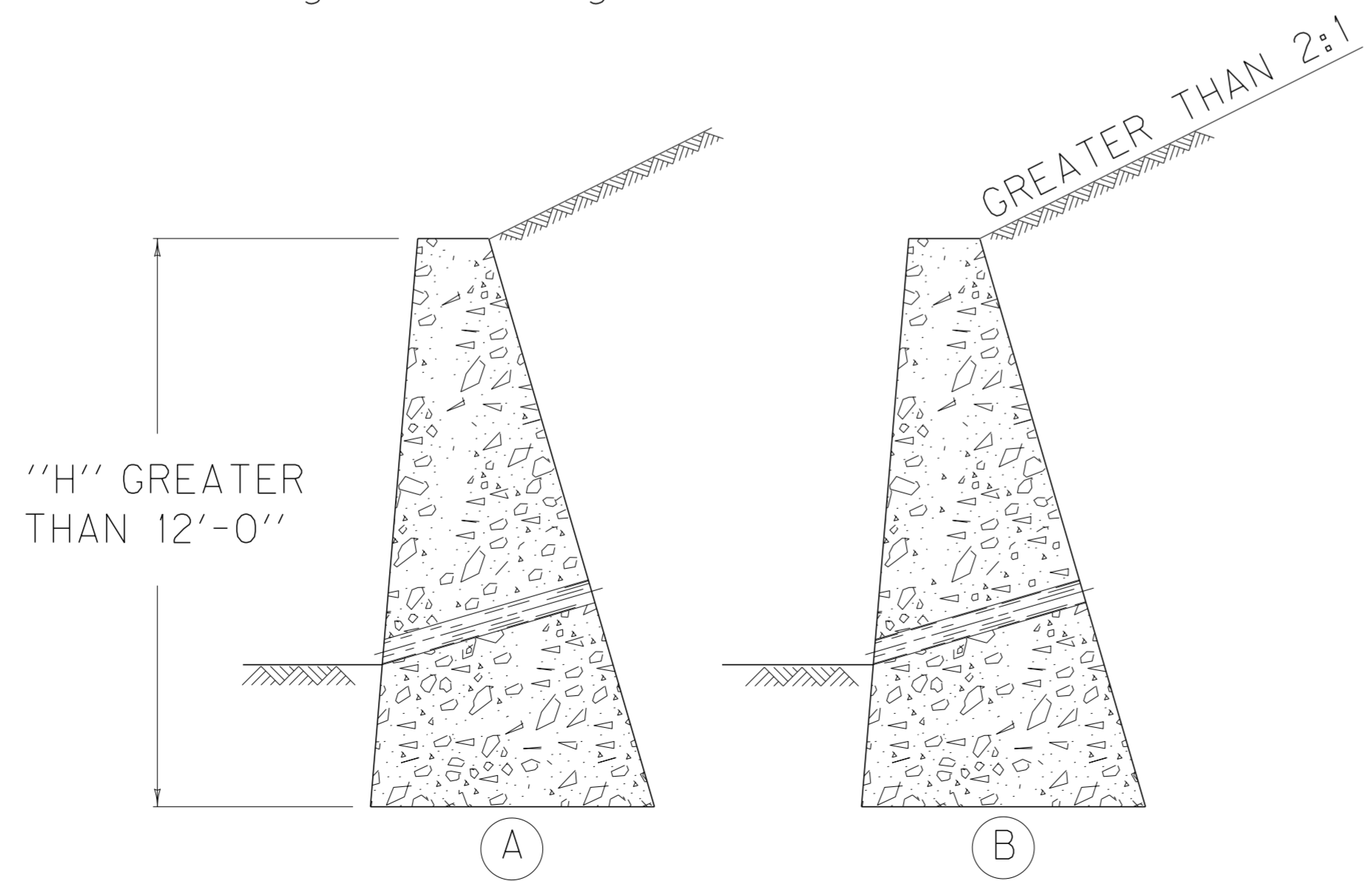
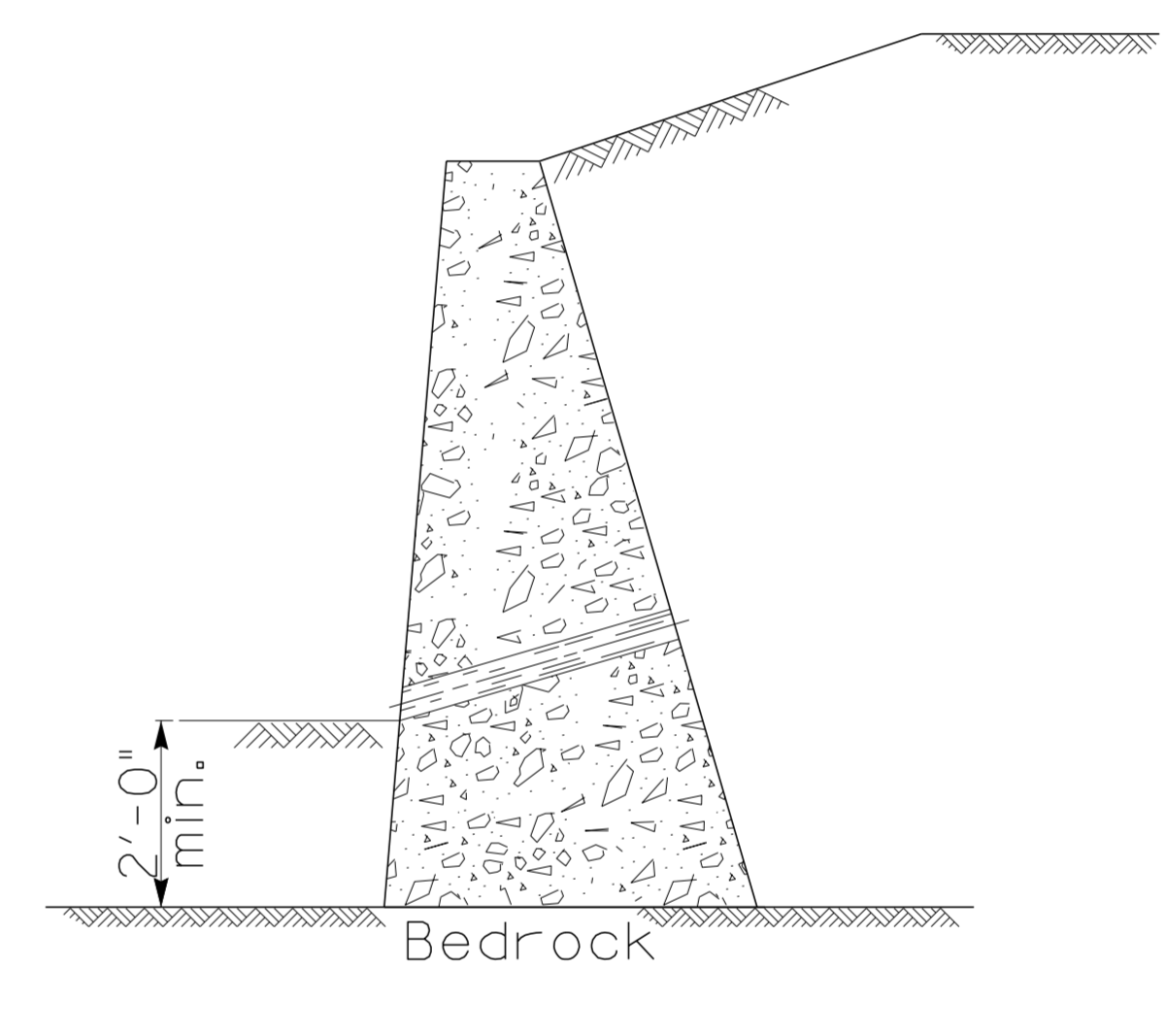
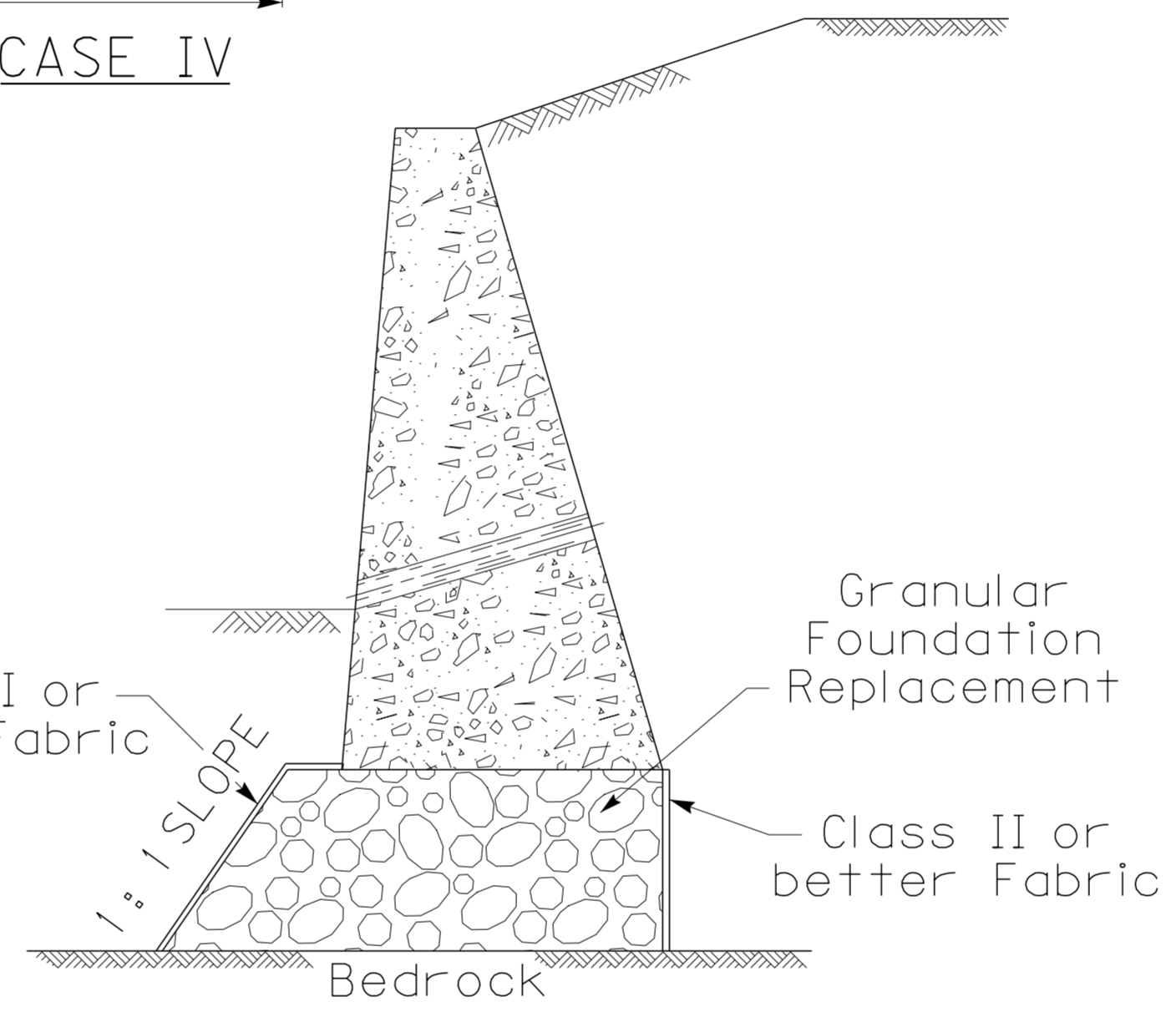


KENTUCKY
 DEPARTMENT OF HIGHWAYS

RAILING SYSTEM
 TYPE T631
 DETAILS



(Required if wall is subject to standing or flowing water regardless of case.)



SPECIAL DESIGNS REQUIRED

STANDARD GRAVITY WALL NOTES

The retaining walls depicted on these drawings shall be used when the height (H) of the wall is 12'-0" or less provided the following conditions are met:

- Case I -Wall backfill slopes down, is level, or slopes up from wall at 20H:1V or flatter slope. This low slope allows for backfills that would be level except for the slope required to facilitate proper drainage.
- Case II -Backfill slopes steeper than 20H:1V but no more than 4H:1V.
- Case III -Backfill slopes steeper than 4H:1V but no more than 2H:1V.
- Case IV -Backfill slopes down, is level, or slopes up from wall at 20H:1V or flatter slope (as needed to facilitate proper drainage) and has a maximum live load surcharge of 250 pounds per square foot applied behind the wall.
- Case V -Broken-back backfill slopes no more than 4H:1V to a level surface (except for slope needed to facilitate proper drainage) and has a maximum live load surcharge of 250 pounds per square foot applied to the level portion of the backfill. If the height of the backfill to the slope break equals or exceeds one-half the height of the wall (hs => H/2), use Case II.
- Case VI -Broken-back backfill slopes up steeper than 4H:1V but no more than 2H:1V to a level surface (except for slope needed to facilitate proper drainage) and has a maximum live load surcharge of 250 pounds per square foot applied to the level portion of the backfill. If the height of the backfill to the slope break equals or exceeds the height of the wall (hs => H), use Case III.

Special Designs shall be required when the following conditions exist:

- Ⓐ Wall height is greater than 12'-0".
- Ⓑ Backfill slopes are steeper than 2H:1V.
- Ⓒ The wall is surcharged with a live load exceeding 250 pounds per square foot within the limits of a 1:1 slope extending from the base of the wall.
- Ⓓ The wall is surcharged with a dead load (i.e., buildings, structures, or other permanent facilities) within the limits of a 1:1 slope extending from the base of the wall.

- ① Minimum embedment value is 2'-0" for all cases.
- ② Batter (b) shall be as follows:
Cases I, II a, and II b - For H < 10'-0" use 12V:1H. For H => 10'-0" use 6V:1H.
Case III - For H < 7'-0" use 12V:1H. For H=> 7'-0" use 6V:1H.
Cases IV, V a, V b, and VI - For H < 6'-0" use 12V:1H. For H=> 6'-0" use 6V:1H.
- ③ Fabric wrapped drains and 4" pipe for weep holes shall be included in the unit price bid for gravity type retaining walls.

Granular backfill, granular foundation replacement to bedrock, or a wall bearing directly on competent un-weathered bedrock is required for the following cases:

- Case II b for H > 9.5'
- Case III - for H > 8'
- Case V b for H > 10.5'
- Case VI for H > 9'

Walls subject to standing or flowing water (adjacent to streams, rivers, ponds, lakes, rivers, detention basins, etc.) shall have granular backfill meeting the requirements below regardless of the Case.

Granular backfill or granular foundation replacement to bedrock (when required) shall meet the requirements of "Granular Embankment" in Section 805 of the Standard Specifications, current edition, except that the maximum size is 4 inches with a minus No. 200 content not exceeding 5.0 percent. Use material that classified as non-erodible, as defined in Section 805 of the Standard Specifications, current edition. Gravels or sands, crushed or uncrushed, shall not be allowed. Place Class II or better Geotextile Fabric in accordance with Sections 214 and 843 of the Standard Specifications, current edition, as shown below, where there is a soil-granular material interface.

H(ft)	Required base width, B(ft)							
	Case I	Case II a	Case II b	Case III	Case IV	Case V a	Case V b	Case VI
3.0	1.50	1.50	1.50	1.50	3.00	3.00	3.00	3.25
3.5	1.75	1.75	1.75	1.75	3.25	3.25	3.25	3.50
4.0	2.00	2.00	2.00	2.00	3.50	3.50	3.50	3.75
4.5	2.25	2.25	2.25	2.25	3.75	4.00	4.00	4.25
5.0	2.50	2.50	2.50	2.50	4.00	4.25	4.25	4.50
5.5	2.75	2.75	2.75	2.75	4.25	4.50	4.50	4.75
6.0	3.00	3.00	3.00	3.00	4.50	4.75	4.75	5.00
6.5	3.25	3.25	3.25	3.25	4.75	5.00	5.00	5.50
7.0	3.50	3.50	3.50	3.50	5.00	5.50	5.50	5.75
7.5	3.75	3.75	3.75	3.75	5.25	5.75	5.75	6.00
8.0	4.00	4.00	4.00	4.00	5.75	6.00	6.00	6.50
8.5	4.25	4.25	4.25	4.25*	6.00	6.25	6.25	6.75
9.0	4.50	4.50	4.50	4.50*	6.25	6.50	6.50	7.00
9.5	4.75	4.75	4.75	4.75*	6.50	6.75	6.75	7.25*
10.0	5.00	5.25	5.00*	5.00*	6.75	7.00	7.00	7.50*
10.5	5.25	5.50	5.25*	5.25*	7.00	7.25	7.25	7.75*
11.0	5.50	5.75	5.50*	5.50*	7.25	7.75	7.50*	8.25*
11.5	5.75	6.00	5.75*	5.75*	7.50	8.25	7.75*	8.50*
12.0	6.00	6.25	6.00*	6.00*	7.75	8.75	8.00*	9.00*

12:1 Batter

6:1 Batter

12:1 Batter

6:1 Batter

* Requires Granular Backfill, Granular Foundation replacement to bedrock, or bearing directly on competent unweathered bedrock.

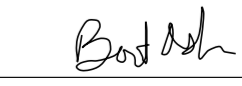
DESIGN PARAMETERS

Large block retaining walls without reinforced backfill are suitable alternatives to Standard Gravity Walls. Approved large block retaining wall suppliers can be found on the Structural Design web site. Contractors shall submit to the Engineer for review and approval a design for a large block wall alternative using the following design parameters unless site-specific geotechnical information is provided. The wall design shall be in accordance with the AASHTO Standard Specifications for Highway Bridges, current edition.

Soil Backfill	c' = 0 psf, φ' = 28°, γ = 120 pcf
Foundation	c = 1200 psf, φ = 0°, γ = 120 pcf
Granular backfill or foundation replacement	c' = 0, φ' = 38°, γ = 115 pcf

Pay Items

Concrete, Class B	Cu. Yd.
Structure Excavation	Cu. Yd.
Granular Embankment (when required)	Cu. Yd.
Geotextile Fabric (when required)	Sq. Yd.

KENTUCKY DEPARTMENT OF HIGHWAYS	
STANDARD GRAVITY WALL	
SUBMITTED 	7-08-19 DATE
071	

General Notes

SPECIFICATIONS: All references to the standard Specifications are to the current edition of the Kentucky Department of Highways Standard Specifications for Road and Bridge Construction, with current supplemental specifications. All references to the AASHTO Specifications are to the current edition of the AASHTO LRFD Bridge Design Specifications, with interims.

DESIGN LOADS: Beam & Slab sections are designed for 1.25*HL93 (KYHL93) Live Load.

DESIGN LOAD DISTRIBUTION: Beams are designed according to the AASHTO LRFD Bridge Design Specifications for beam spacings up to 6ft and overhangs up to 3'-0" with a 9" wide barrier.

FUTURE WEARING SURFACE: These beams are designed for a 15 PSF future wearing surface load.

SUBSTRUCTURE DESIGN LOADS: Unfactored design reaction forces per beam end.

DC (kips): Beam, Slab, Diaphragms, SIP Forms, and assumed railing dead loads of 533 lbs/ft.

DW (kips): Future wearing surface.

LL+I (kips): LL with Dynamic load allowance.

MATERIAL DESIGN SPECIFICATIONS:

for Beam Steel	FY =	50000 PSI
for Steel Reinforcement	FY =	60000 PSI
for Class "AA" Deck Concrete	F'C =	4000 PSI

MATERIAL STEEL	A.S.T.M	AASHTO
High Strength Low Alloy Structural Steel	A709 GR 50	M270 GR 50
Shear Stud Connectors	UNS G 1018	M-169
Sheet lead and Pig Lead	B29-79	

High strength bolts, nuts, and washers F3125 Grade A325 M-164 Type I

All steel in longitudinal rolled wide flange beams shall meet the longitudinal Charpy V-Notch toughness test for non-fracture critical components Zone 2 in accordance with the following:

M270 GR 50 (up to 2" thickness) of 15 ft-lbs at 40° F.

Sampling and testing procedures shall be in accordance with AASHTO T243 current edition, utilizing (H) frequency testing. When plate thickness exceeds 1/2", frequency of testing shall be (P).

HIGH STRENGTH BOLT CONNECTIONS: Unless otherwise specified on the plans, all bolted connections shall be ASTM F3125 Grade A325 3/4" diameter high strength bolts, nuts, and washers. Open holes shall be 1/16" diameter. Type I galvanized bolts shall be used as described in AASHTO M164. All high strength bolted field connections are to be installed with "direct tension indicators" (DTI's) in accordance with the Standard Specifications and ASTM F959. All DTI's shall be manufactured from a steel conforming to the chemical requirements of ASTM A325 for Type I galvanized steel. DTI's shall be installed under the bolt head with the bumps facing the underside of the bolt head. Put a hardened washer under the nut and tension from the nut.

BEVELED EDGES: Bevel all exposed edges 3/4".

REINFORCEMENT: Dimensions shown from the face of concrete to reinforcement are to center of bars unless otherwise shown. Spacing of bars is from center to center of bars. Clear distance to face of concrete is 2" unless otherwise noted. Epoxy coat all bars. Use stirrup bend diameters for all bent bars.

CORROSION PROTECTION: These beams and all steel components are to be hot dip galvanized according to ASTM A123. Weathering Steel is not allowed.

SHEAR CONNECTORS: The minimum length of studs is 6". Provide the necessary length to penetrate at least 2" above bottom of slab.

Include all costs for shear connectors with the price of the steel beams. Including shear connectors, welding and welding material, and materials necessary to field weld or shop weld the shear connectors in place according to the plans and specifications.

If the Contractor wishes to use something other than the stud shear connectors shown on the plans, the proposed arrangement shall be submitted for approval with the shop plans.

Studs shall be welded in accordance with AWS Specifications.

MILL TEST REPORTS: Notarized mill test reports shall be furnished in triplicate to the Department, showing that all material used in the structural steel conform to the requirements of the specifications.

PROHIBITED WELDING: No welding of any nature, other than indicated on the plans, is to be performed without the written consent of the designer, and then only in the manner and at the locations designated in the authorization.

SLAB: Ensure the entire superstructure slab and diaphragms are poured continuously, out to out, before allowing any concrete to set.

SHOP DRAWINGS: The fabricator shall submit all required shop plans, by email, to the design engineer for review. These submissions shall depict the shop plans in .pdf format. As either 11"x17" or 22"x36" sheets. Designers will make review comments on these electronic submissions as needed and shall return them to the fabricator. Upon reconciliation of the designers comments, files shall be returned to the designer and plans will be forwarded to the Division of Structural Designs Shop Plan coordinator for distribution. Only plans submitted directly to the shop plan coordinator will be distributed and only plans electronically stamped "Distributed by The Division of Structural Design" are to be used for fabrication. While this process does not require the submission of paper copies, The Division of Structural Design reserves the right to require such copies on a case by case basis.

When any changes to the design plans are proposed by the Fabricator or Supplier, the shop drawings reflecting these changes shall be submitted to the Design Engineer through the contractor.

DESIGNED BY	J. Van Zee	DATE	5-17
CHECKED			
RECOMMENDED			
APPROVED F.H.W.A.			
REVISED BY	E. Downey		5-17

KENTUCKY DEPARTMENT OF HIGHWAYS	
COMPOSITE STEEL BEAM SUPERSTRUCTURES GENERAL NOTES	
STANDARD DRAWING NO. BDE-001-01	
SUBMITTED	12-02-11
<i>Mark Nitt</i> DIRECTOR DIVISION OF STRUCTURAL DESIGN	
APPROVED	12-02-11
<i>Shih</i> STATE HIGHWAY ENGINEER	
	DATE

DRAWING SCALE: _____

DRAWING SHOWN: _____

TABLE OF BEAM SIZES AND DESIGN DATA (6 FT. MAX. BEAM SPACING WITH 3 FT. MAX. OVERHANG)

BEAM SPAN	ROLLED BEAM		DEFLECTION IN INCHES		SHEAR CONNECTORS				UNFACTORED BEAM END REACTION			LL DIST. FACT. (LANES)		
	BEAM MEMBER	BEAM DEPTH (IN.)	STEEL ONLY	TOTAL DL	# Per Row	Spa. @ Ea. End of Beam	Middle Spacing	ADTT	DC (kips)	DW (kips)	LL+I (kips)	LLDFM	LLDFV	
20' Max.	W18x55	18.1	0.00	0.11	2	10 Spa. @ 5/4"	5 3/4" Spa.	300	11.85	0.90	72.65	0.65	.877	
	W16x77	16.5	0.00	0.09	3	5 Spa. @ 5 3/4"	6" Spa.	Inf.	12.10				71.61	.865
	W14x82	14.3	0.00	0.11	3	14 Spa. @ 5/4"	6" Spa.	450	12.14				72.36	.874
	W12x106	12.9	0.00	0.11	3	14 Spa. @ 5/4"	6" Spa.	400	12.40				71.78	.867
25' Max.	W24x62	23.7	0.02	0.17	2	23 Spa. @ 5/4"	6" Spa.	400	14.75	1.13	74.47	0.65	.860	
	W21x62	21.0	0.03	0.21	2	23 Spa. @ 5/4"	6" Spa.	350	14.75				75.31	.870
	W18x71	18.5	0.03	0.24	2	23 Spa. @ 5/4"	6" Spa.	290	14.86				75.67	.874
	W16x77	16.5	0.04	0.25	3	11 Spa. @ 5/2"	6" Spa.	Inf.	14.96				76.05	.878
	W14x82	14.3	0.05	0.31	3	23 Spa. @ 5/4"	6" Spa.	425	15.01				76.89	.888
	W12x106	12.9	0.05	0.31	3	23 Spa. @ 5/4"	6" Spa.	385	15.33				76.25	.880
	W24x76	23.9	0.04	0.28	2	28 Spa. @ 5/4"	6" Spa.	415	17.78				1.35	80.90
W21x83	21.4	0.05	0.32	2	28 Spa. @ 5/4"	6" Spa.	350	17.89	81.41	.862				
W18x86	18.4	0.06	0.39	3	7 Spa. @ 5 3/4"	6" Spa.	Inf.	17.94	82.40	.872				
W16x100	17.0	0.06	0.40	3	14 Spa. @ 5/2"	6" Spa.	Inf.	18.18	82.26	.871				
W14x120	14.5	0.08	0.45	3	28 Spa. @ 5/4"	6" Spa.	440	18.48	82.48	.873				
30' Max.	W12x120	13.1	0.10	0.57	3	28 Spa. @ 5/4"	6" Spa.	375	18.48	1.58	86.49	0.65	.883	
	W27x84	26.7	0.06	0.39	3	6 Spa. @ 7 3/4"	8" Spa.	Inf.	20.79				86.69	.850
	W24x94	24.3	0.06	0.41	2	24 Spa. @ 5/4"	6" Spa.	420	20.97				87.33	.852
	W21x101	21.4	0.07	0.47	3	7 Spa. @ 6 1/2"	7" Spa.	Inf.	21.10				87.50	.858
	W18x119	19.0	0.09	0.52	3	7 Spa. @ 6"	6 1/2" Spa.	Inf.	21.43				89.15	.860
	W14x132	14.7	0.14	0.76	3	24 Spa. @ 5/4"	6" Spa.	425	21.66				89.00	.876
35' Max.	W12x152	13.7	0.17	0.82	3	24 Spa. @ 5 3/8"	6" Spa.	375	22.03	1.80	90.47	0.65	.874	
	W30x99	29.7	0.07	0.48	3	12 Spa. @ 8"	9" Spa.	Inf.	23.97				91.07	.840
	W27x102	27.1	0.08	0.53	3	20 Spa. @ 7 1/2"	9" Spa.	Inf.	24.03				91.22	.845
	W24x117	24.3	0.09	0.56	3	14 Spa. @ 7"	8" Spa.	Inf.	24.35				92.04	.846
	W21x122	21.7	0.12	0.67	3	16 Spa. @ 6"	7" Spa.	Inf.	24.45				92.79	.854
	W18x130	19.3	0.15	0.81	3	9 Spa. @ 5 1/2"	6" Spa.	Inf.	24.62				93.11	.861
	W14x176	15.2	0.21	0.98	3	19 Spa. @ 5/4"	6" Spa.	425	25.58				93.25	.864
	W12x190	14.4	0.25	1.12	3	19 Spa. @ 5/4"	6" Spa.	375	25.86				93.45	.865
40' Max.	W33x118	32.9	0.09	0.54	3	12 Spa. @ 9"	10" Spa.	Inf.	27.33	2.03	93.45	0.65	.828	
	W30x116	30.0	0.11	0.64	3	21 Spa. @ 8"	10" Spa.	Inf.	27.29				94.36	.836
	W27x129	27.6	0.12	0.68	3	15 Spa. @ 7 1/2"	9" Spa.	Inf.	27.57				94.53	.838
	W24x131	24.5	0.14	0.80	3	16 Spa. @ 7"	8" Spa.	Inf.	27.63				95.48	.846
	W21x147	22.1	0.17	0.91	3	17 Spa. @ 6 1/2"	7" Spa.	Inf.	28.00				95.83	.849
	W18x158	19.7	0.22	1.08	3	10 Spa. @ 5 1/2"	6" Spa.	Inf.	28.25				96.54	.855
45' Max.	W33x130	33.1	0.13	0.74	3	23 Spa. @ 8"	10" Spa.	Inf.	30.60	2.25	97.11	0.65	.828	
	W30x132	30.3	0.15	0.86	3	24 Spa. @ 7 1/2"	9" Spa.	Inf.	30.65				97.86	.834
	W27x146	27.4	0.17	0.89	3	18 Spa. @ 7"	8" Spa.	Inf.	31.02				98.11	.836
	W24x162	25.0	0.20	0.99	3	28 Spa. @ 6 1/2"	8" Spa.	Inf.	31.43				98.43	.839
	W21x182	22.7	0.24	1.11	3	20 Spa. @ 6"	7" Spa.	Inf.	31.95				98.70	.841
	W18x192	20.4	0.30	1.36	3	35 Spa. @ 5/4"	7" Spa.	Inf.	32.19				99.51	.848
	W36x135	35.6	0.17	0.93	3	16 Spa. @ 8 1/4"	10" Spa.	Inf.	33.73				2.48	100.10
W33x141	33.3	0.18	0.99	3	25 Spa. @ 8"	10" Spa.	Inf.	33.91	100.45	.828				
W30x148	30.7	0.21	1.11	3	28 Spa. @ 7 1/4"	9" Spa.	Inf.	34.09	100.97	.832				
W27x178	27.8	0.23	1.10	3	19 Spa. @ 7"	8" Spa.	Inf.	34.96	101.20	.830				
W24x192	25.5	0.27	1.25	3	31 Spa. @ 6 1/2"	8" Spa.	Inf.	35.33	101.10	.834				
50' Max.	W21x223	23.4	0.33	1.35	3	33 Spa. @ 6"	8" Spa.	Inf.	36.21	2.70	102.92	0.65	.833	
	W18x258	21.5	0.40	1.51	3	35 Spa. @ 5 3/4"	7" Spa.	Inf.	37.22				101.21	.834
	W36x150	35.9	0.22	1.17	3	27 Spa. @ 8 1/4"	10" Spa.	Inf.	37.20				102.82	.823
	W33x169	33.8	0.24	1.16	3	18 Spa. @ 8"	9" Spa.	Inf.	37.76				103.60	.822
	W30x173	30.4	0.27	1.32	3	30 Spa. @ 7 1/4"	9" Spa.	Inf.	37.91				103.72	.828
	W27x194	28.1	0.31	1.42	3	21 Spa. @ 7"	8" Spa.	Inf.	38.56				103.58	.829
	W24x229	26.0	0.37	1.51	3	34 Spa. @ 6 1/2"	8" Spa.	Inf.	39.61					.828

DESIGNED BY J. Van Zee DATE 5-17
 CHECKED _____
 RECOMMENDED _____
 APPROVED F.H.A. _____
 REVISED BY E. Downey _____

KENTUCKY
DEPARTMENT OF HIGHWAYS

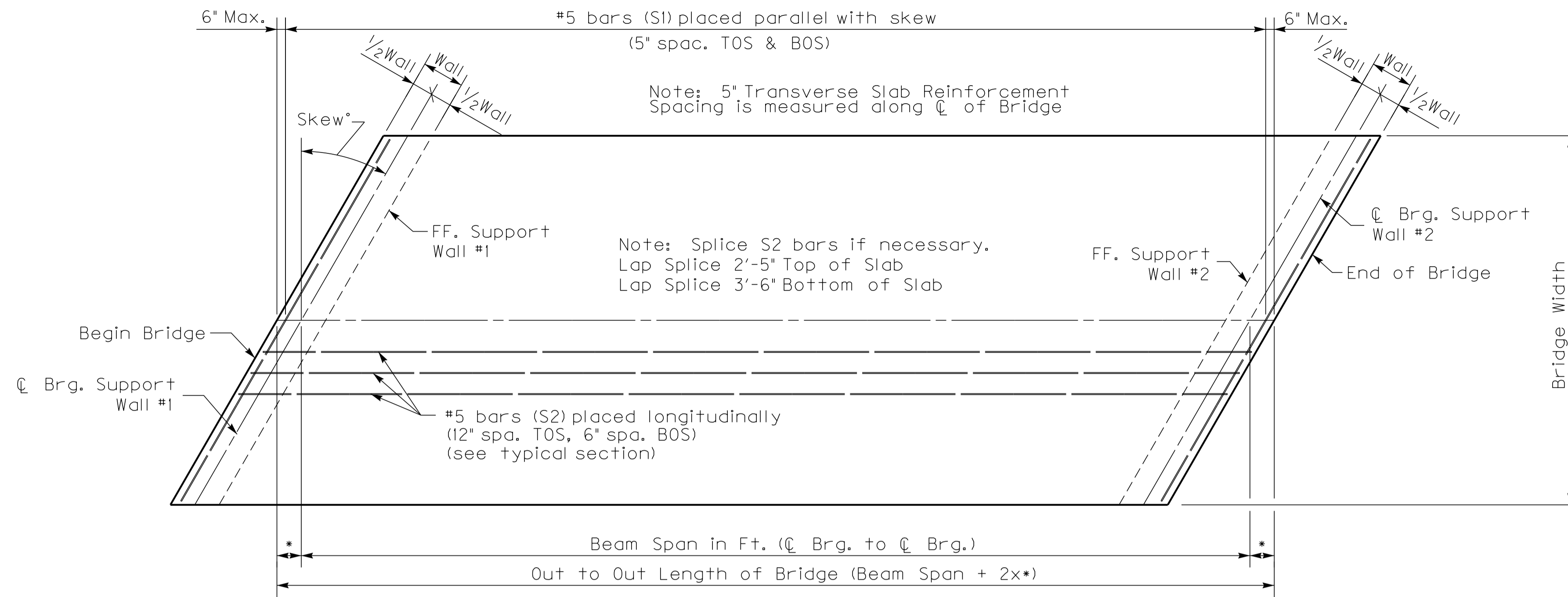
COMPOSITE STEEL BEAM
SUPERSTRUCTURES
BEAM TABLES

STANDARD DRAWING NO. BDE-001-01

SUBMITTED Mark Nitt 12-02-11
 DIRECTOR DIVISION OF STRUCTURAL DESIGN DATE
 APPROVED [Signature] 12-02-11
 STATE HIGHWAY ENGINEER DATE

DRAWING SCALE: _____

DRAWING SHOWN: _____



PLAN OF SLAB

Note: All reinforcing steel shall be epoxy coated.

$$\#5 \text{ Skewed Transverse Bar (S1) Length} = \frac{\text{Bridge Width} - 4'}{\text{SF}}$$

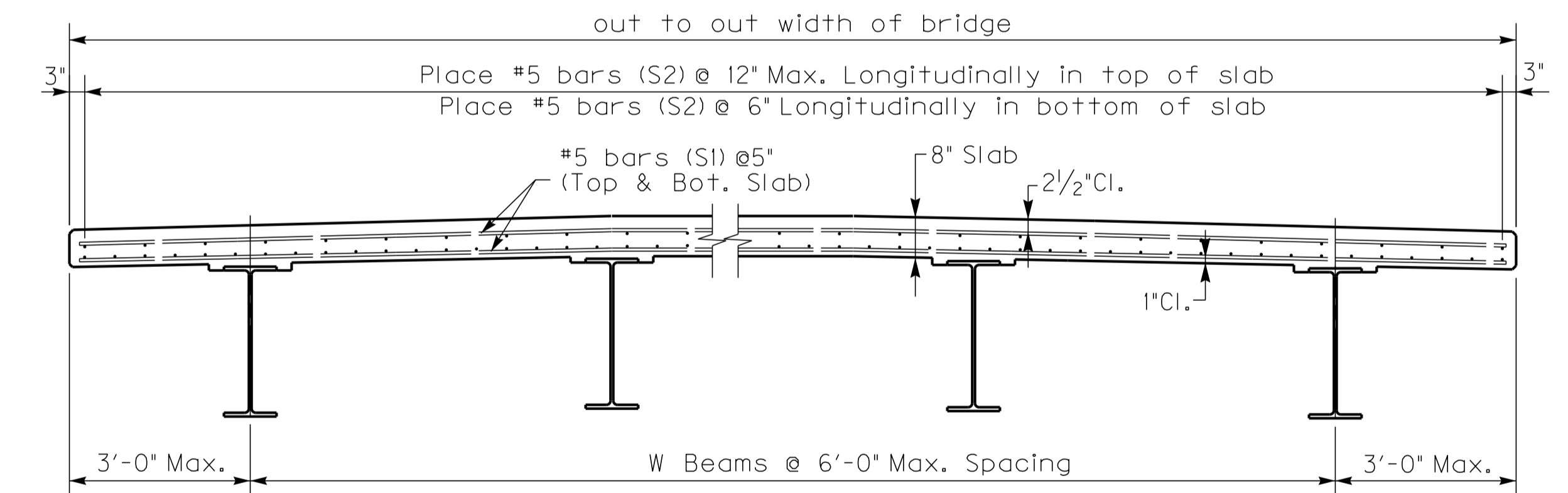
$$* = \frac{1/2 \text{ Wall}}{\text{SF}}$$

Skew Factors	
Skew	SF
0°	1.000
5°	0.996
10°	0.985
15°	0.966
20°	0.940
25°	0.906
30°	0.866
35°	0.819
40°	0.766
45°	0.707

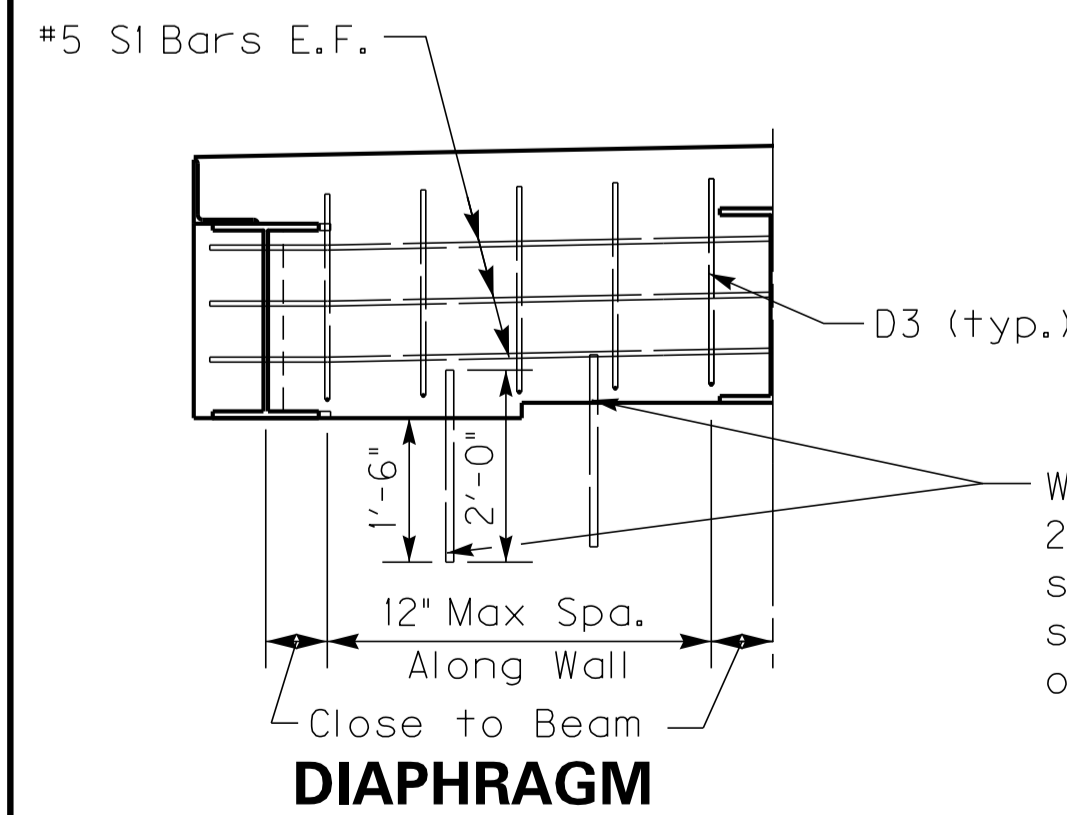
$$\text{Estimate of Steel Quantities} = (\text{Bridge Length} - 4\text{in}) \cdot (\text{Bridge Width} - 4\text{in}) \cdot (3.129 \text{ lb/sq. ft.} + \frac{5.006 \text{ lb/sq. ft.}}{\text{SF}})$$

- Notes:
- 1.) Diaphragm stirrups are to project into the slab regardless of slab forming method.
 - 2.) Place stirrup bars parallel to face of beams.

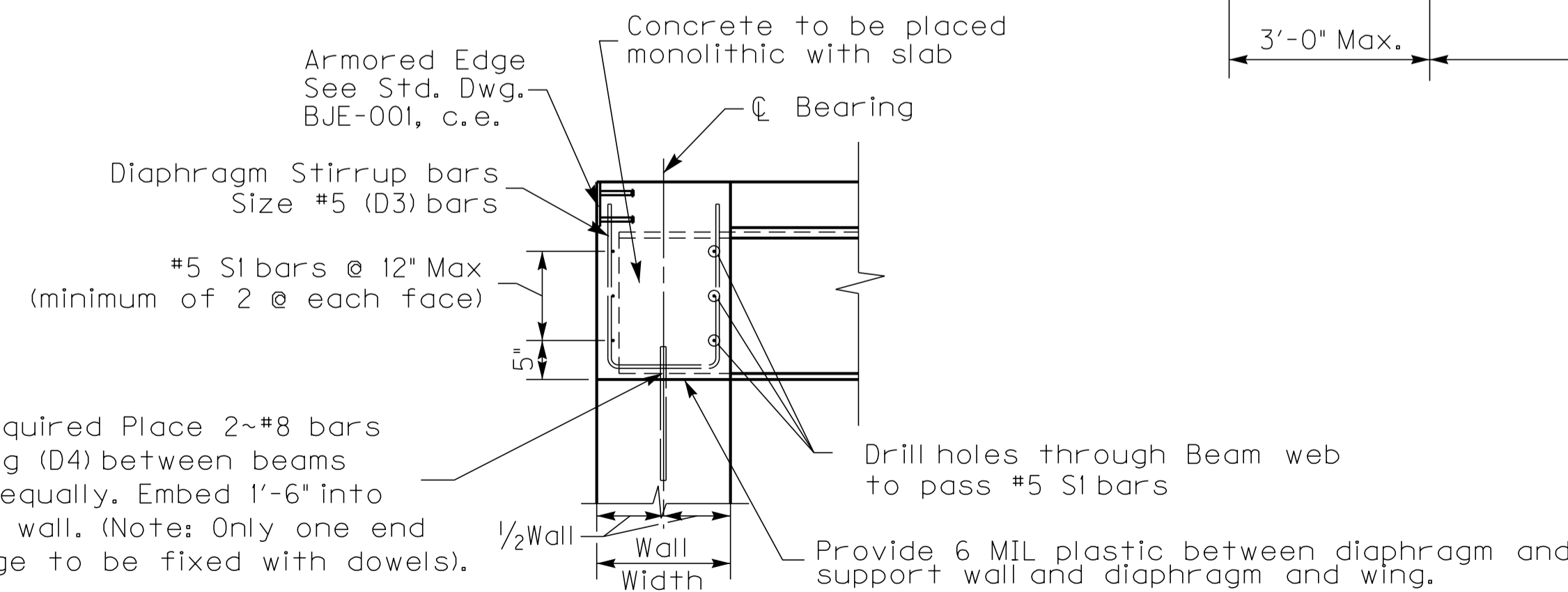
Note: It is recommended a crash tested barrier be attached to the Superstructure to contain all vehicles within the roadway. Recommended barriers include the Type T631 guardrail, Type 3, or 32" Vertical Face railing. See contract documents for required railing and railing drawings for additional reinforcement that may be required to be cast in deck.



TYPICAL SECTION

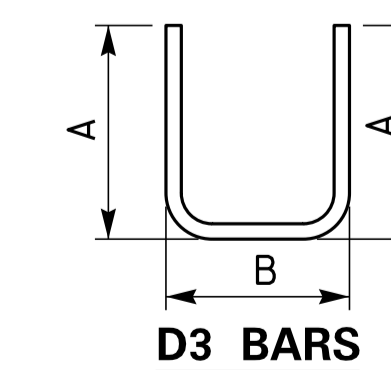


DIAPHRAGM



DIAPHRAGM X-SECTION

(Perpendicular to Diaphragm)



Dim. "A" = Beam Depth + 4"
 Dim. "B" = $\frac{\text{Wall Width} - 4'}{\text{SF}}$

Note: End Diaphragms are required on both ends of Slabs.

DESIGNED BY J. Van Zee
 CHECKED _____
 RECOMMENDED _____
 APPROVED F.H.W.A. _____
 REVISED BY E. Downey

DATE 5-17
 DATE 5-17

KENTUCKY
DEPARTMENT OF HIGHWAYS

COMPOSITE STEEL BEAM
SUPERSTRUCTURES
SLAB DETAILS

STANDARD DRAWING NO. BDE-001-01

SUBMITTED Mark Nite 12-02-11
 DIRECTOR DIVISION OF STRUCTURAL DESIGN DATE

APPROVED [Signature] 12-02-11
 STATE HIGHWAY ENGINEER DATE

DRAWING SCALE: _____

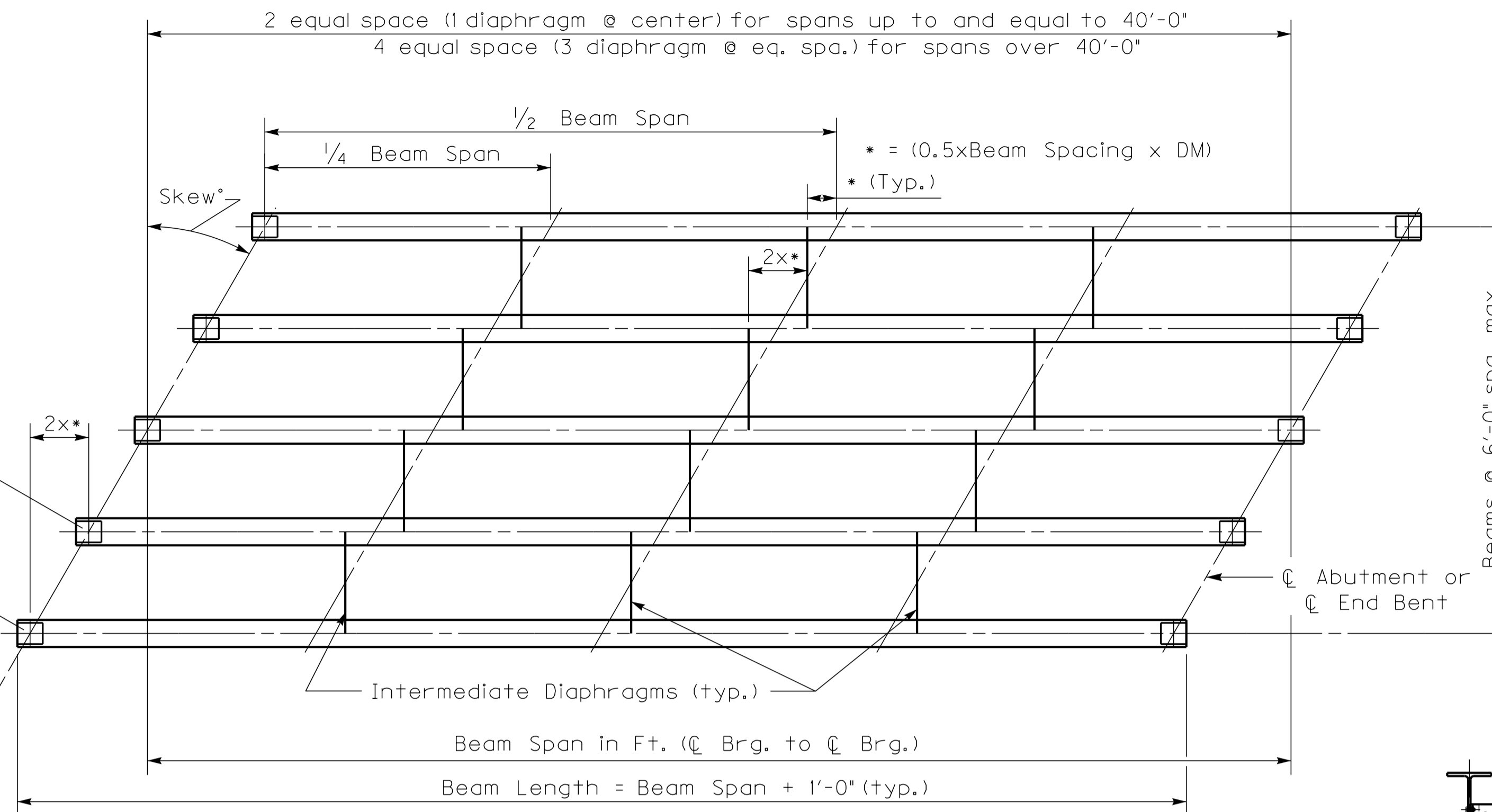
DRAWING SHOWN: _____

Skew Factors		
Skew	SF	DM
0°	1.000	0.000
5°	0.996	0.087
10°	0.985	0.176
15°	0.966	0.268
20°	0.940	0.364
25°	0.906	0.466
30°	0.866	0.577
35°	0.819	0.700
40°	0.766	0.839
45°	0.707	1.000

* = (0.5xBeam Spacing x DM)

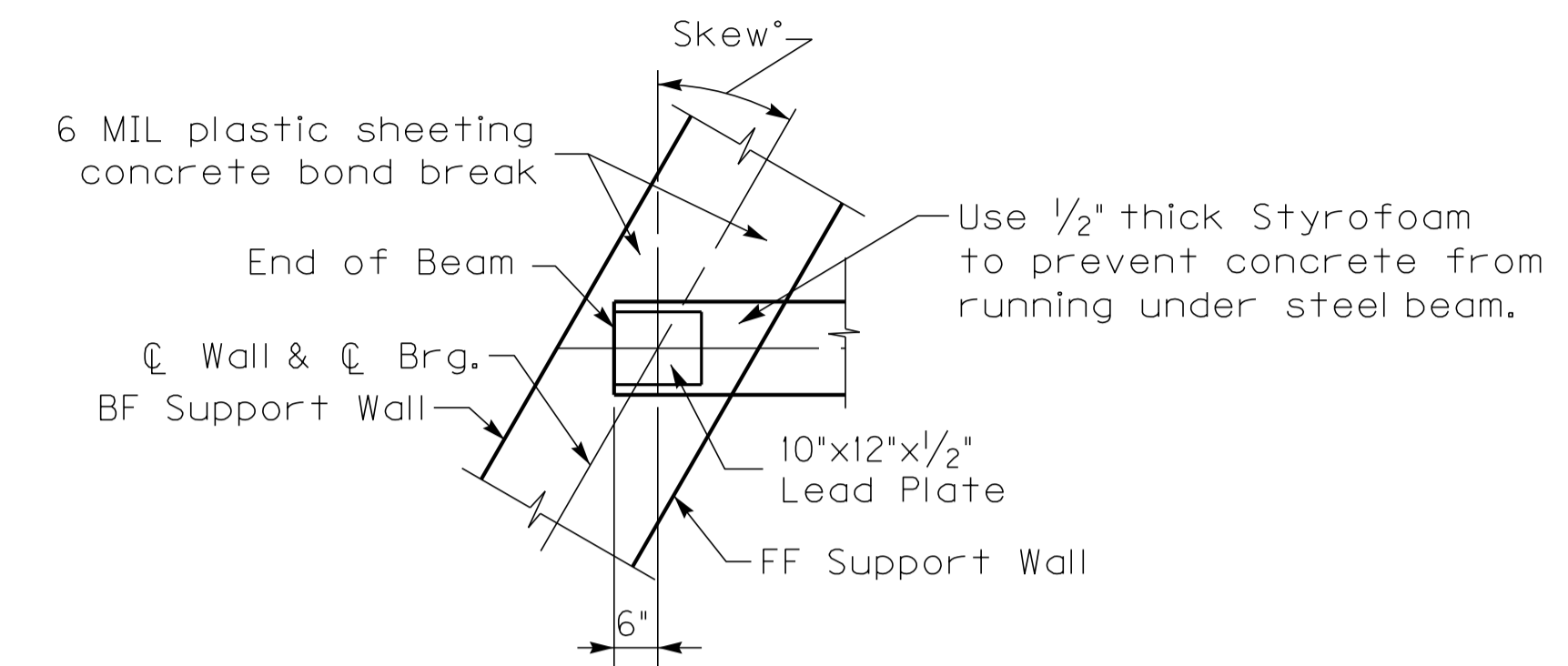
Beam Spacing
SF

℄ Abutment or
℄ End Bent

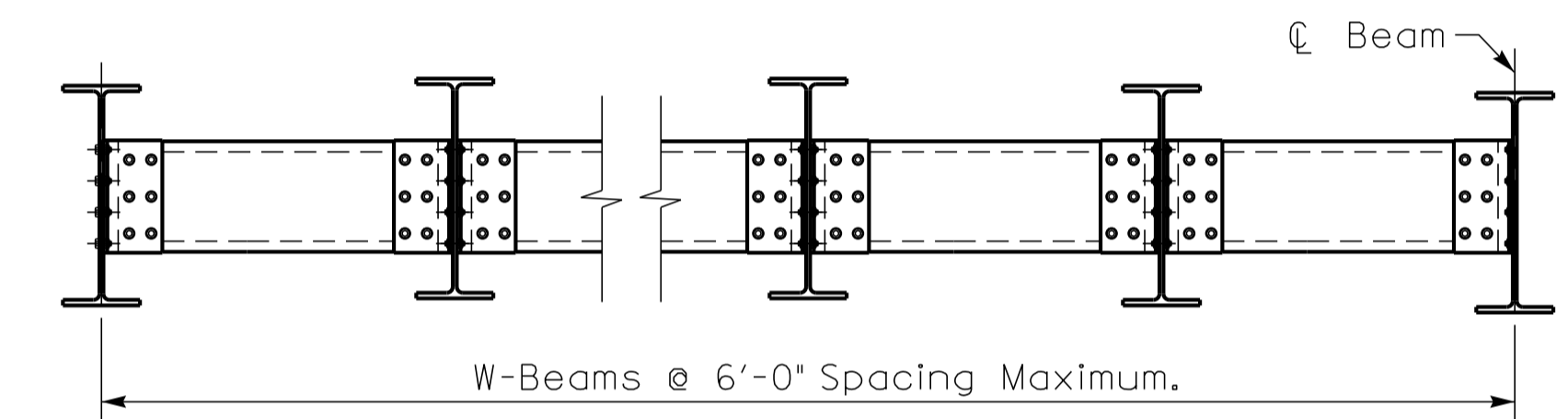


FRAMING PLAN

Note: Place girders with any mill or shop camber bowed up in the middle. Heat cambering is not required.

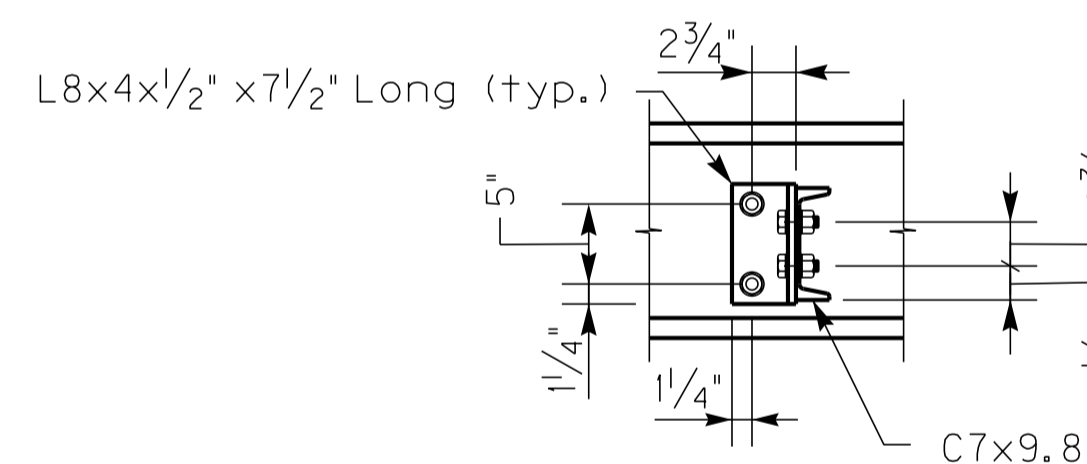


END OF BEAM DETAIL @ SUPPORTS

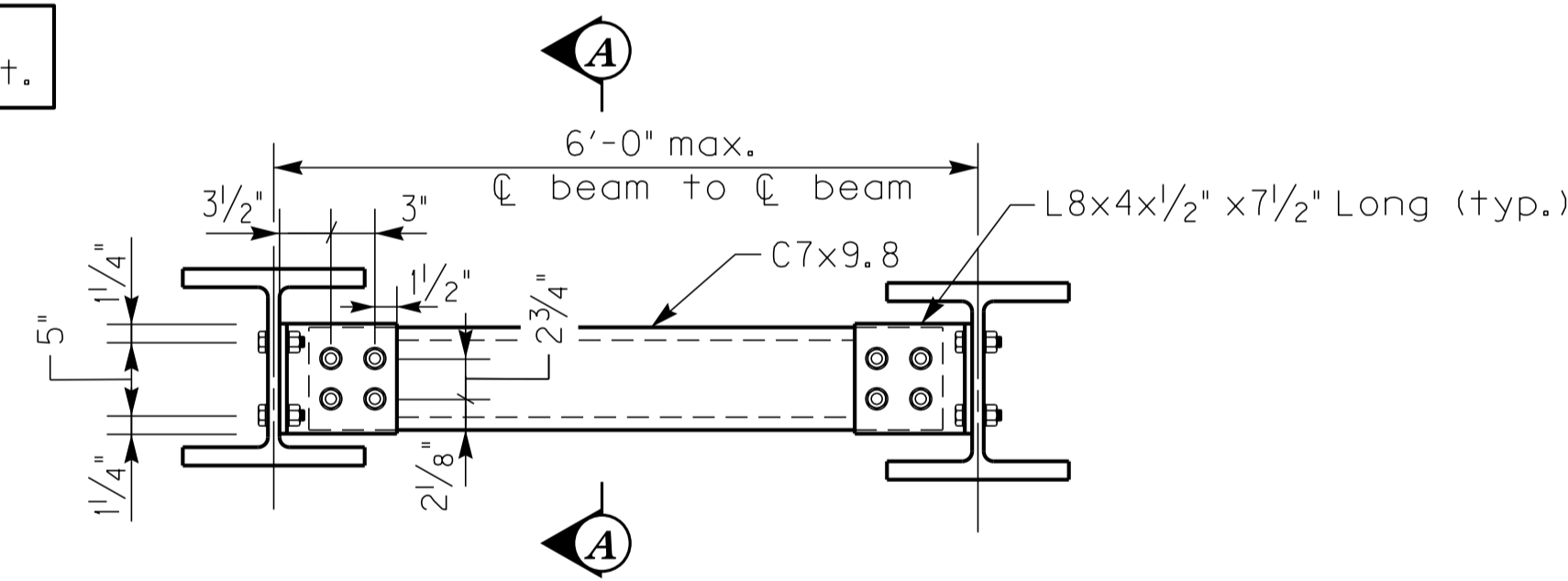


FRAMING TYPICAL

Note: Use 3/4" Bolts with 1/16" Holes Throughout.



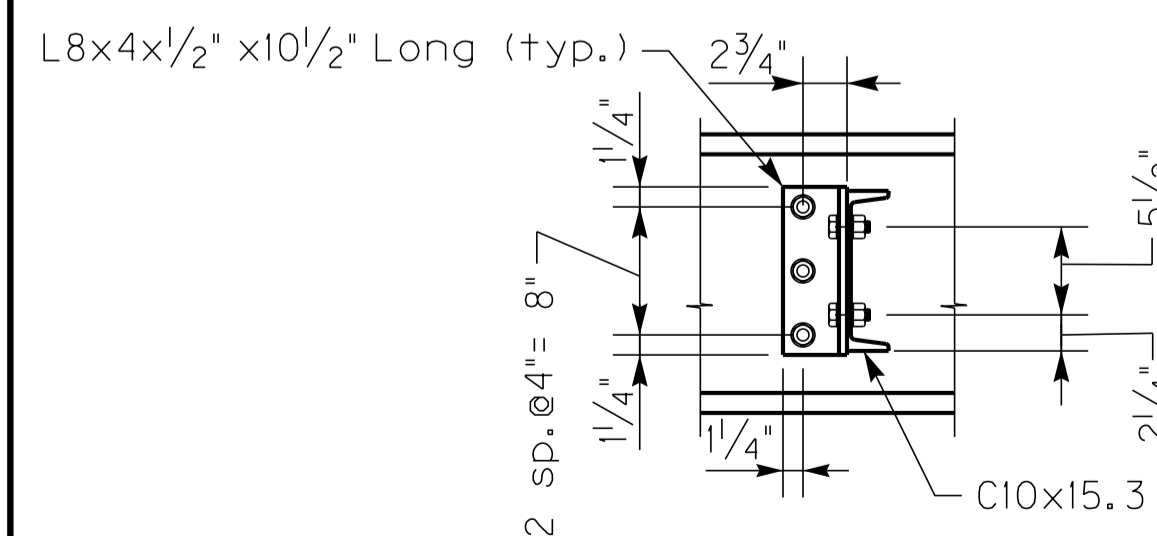
SECTION A-A



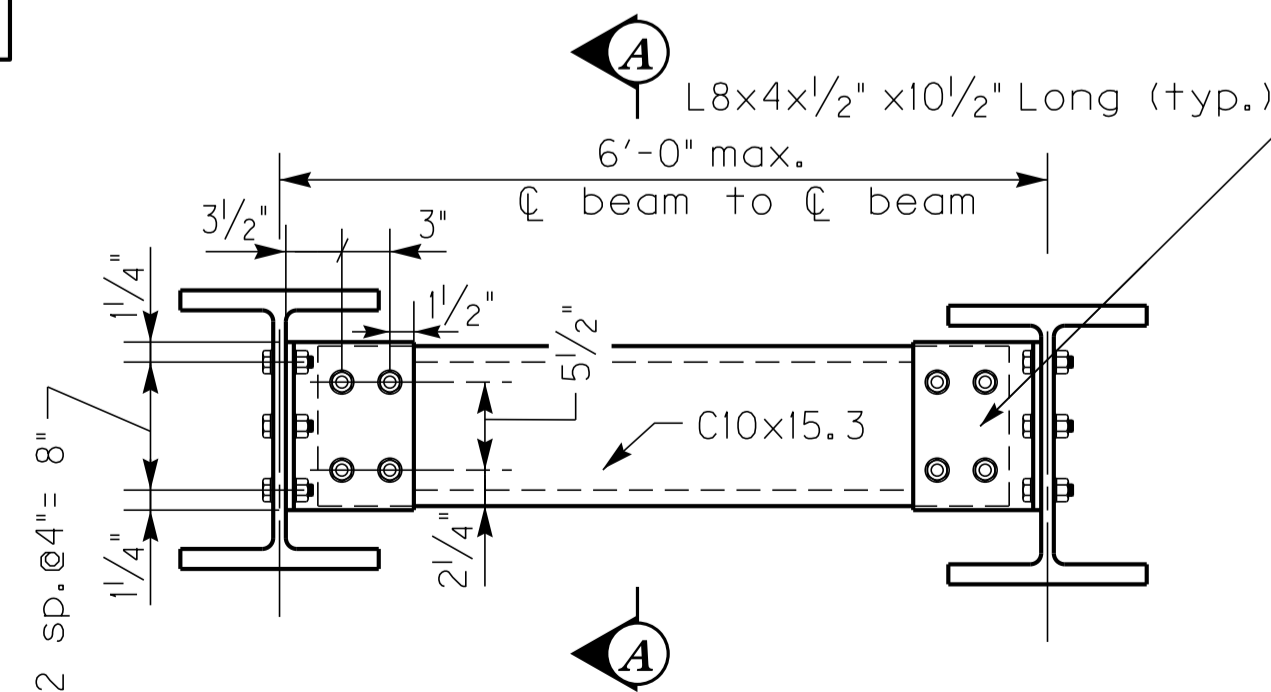
INTERMEDIATE DIAPHRAGM

(for up to 14" beam depth)

Note: Use 3/4" Bolts with 1/16" Holes Throughout.

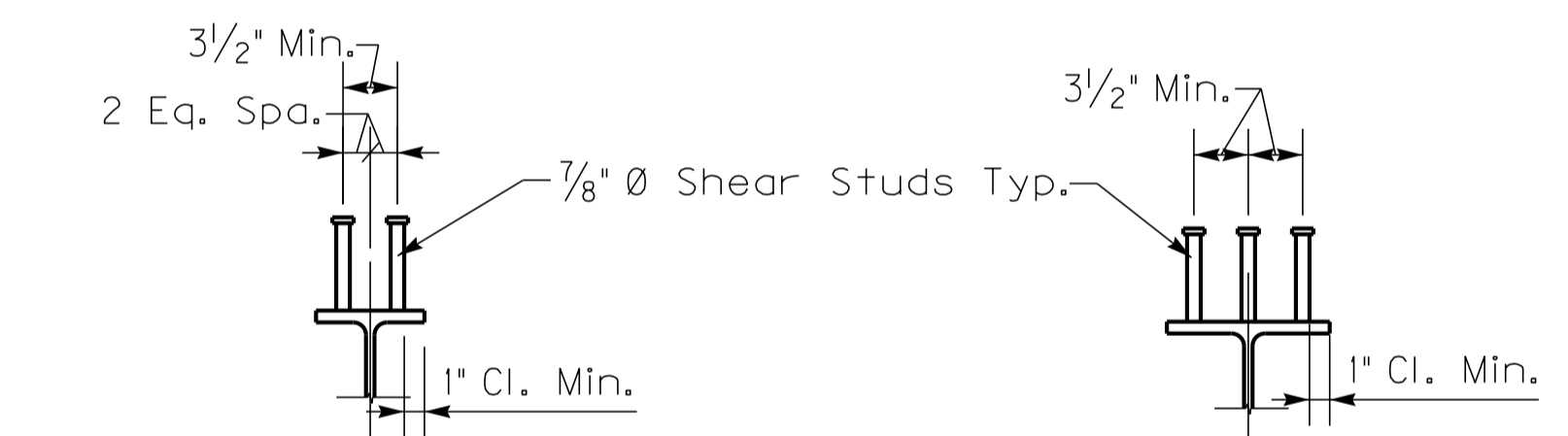


SECTION A-A



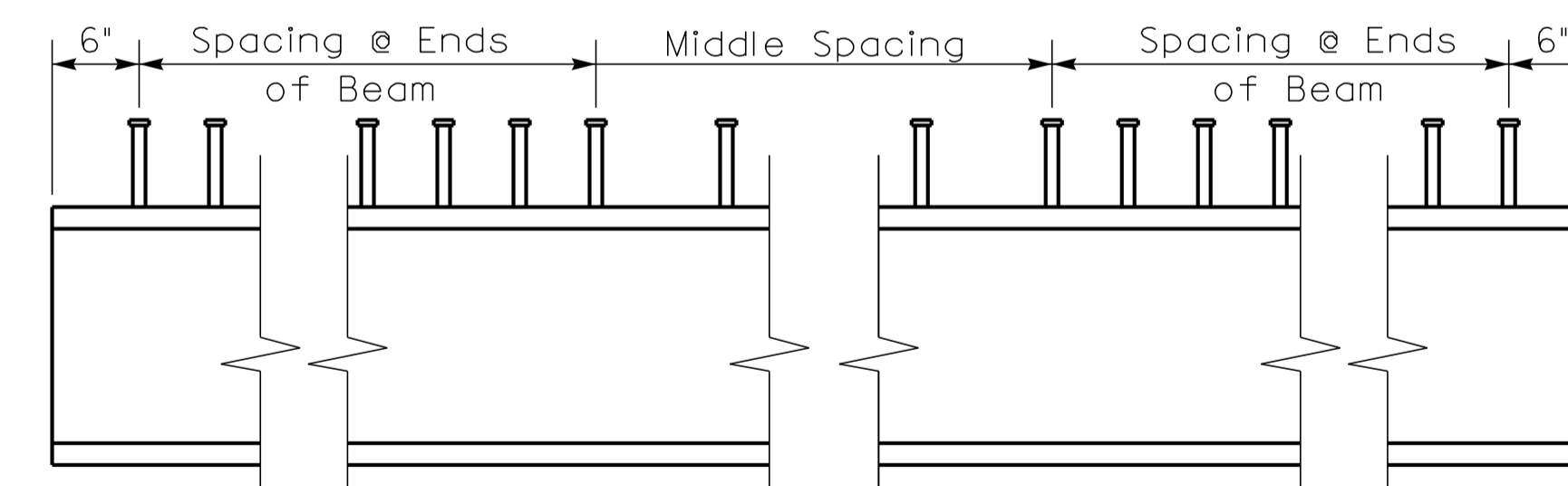
INTERMEDIATE DIAPHRAGM

(for up to 20" beam depth)



BEAM SECTION - 2 SHEAR STUDS PER ROW

BEAM SECTION - 3 SHEAR STUDS PER ROW



SHEAR CONNECTOR LAYOUT

(See Beam Tables for Spacings required and number of shear connectors per row)

DESIGNED BY J. Van Zee
CHECKED
RECOMMENDED
APPROVED F.H.W.A.
REVISED BY E. Downey

DATE 5-17
5-17

KENTUCKY
DEPARTMENT OF HIGHWAYS

**COMPOSITE STEEL BEAM
SUPERSTRUCTURES
FRAMING PLANDIAPHRAGMS**

STANDARD DRAWING NO. BDE-001-01

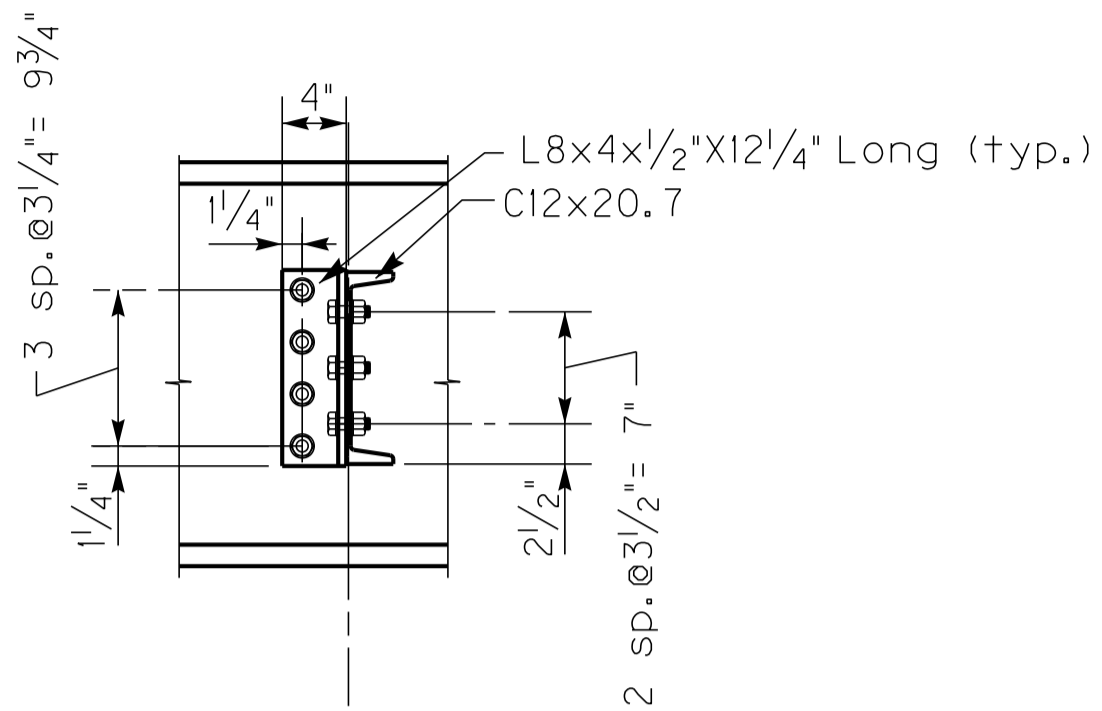
SUBMITTED *Mark Nite* 12-02-11
DIRECTOR DIVISION OF STRUCTURAL DESIGN DATE

APPROVED *Shelby* 12-02-11
STATE HIGHWAY ENGINEER DATE

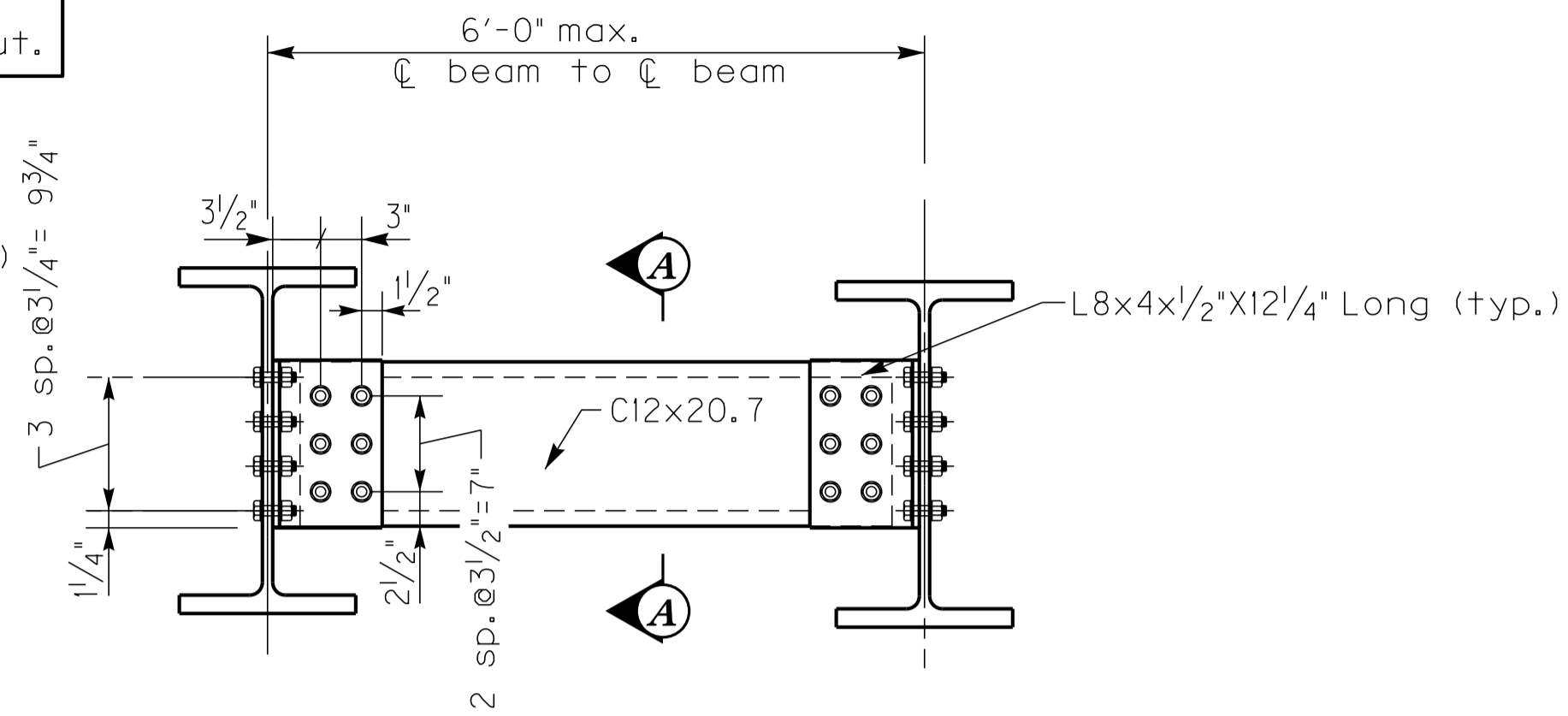
DRAWING SCALE: _____

DRAWING SHOWN: _____

Note: Use $\frac{3}{4}$ " \emptyset Bolts with $\frac{13}{16}$ " \emptyset Holes Throughout.

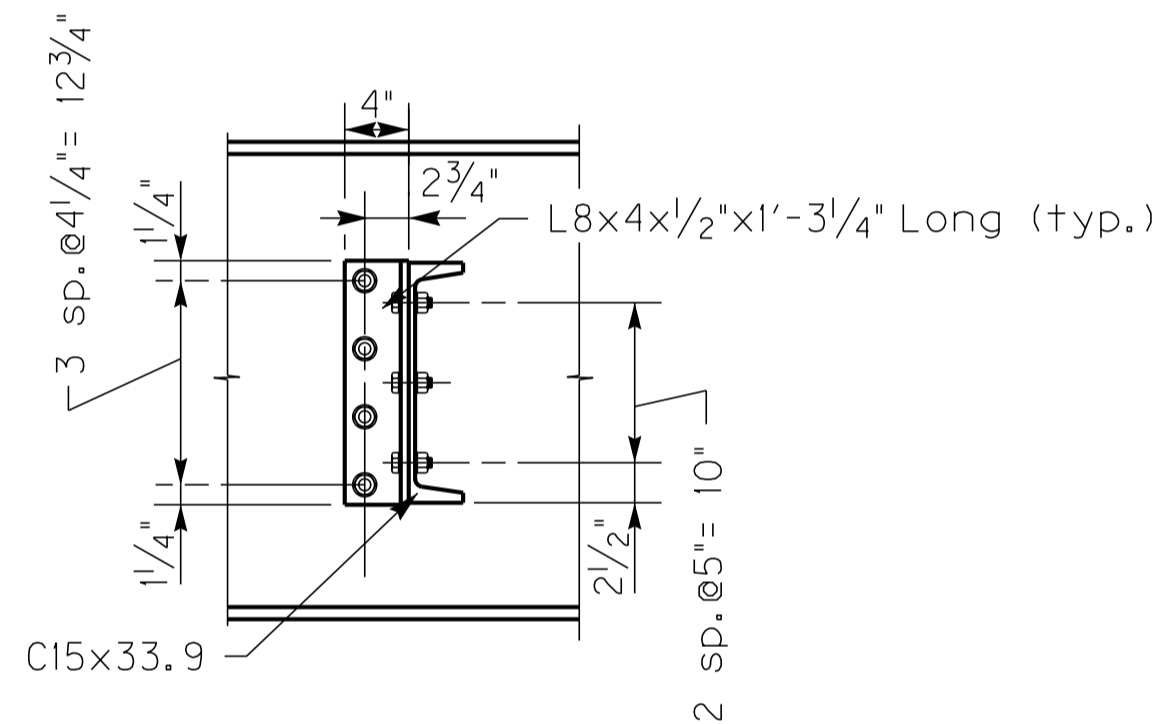


SECTION A-A

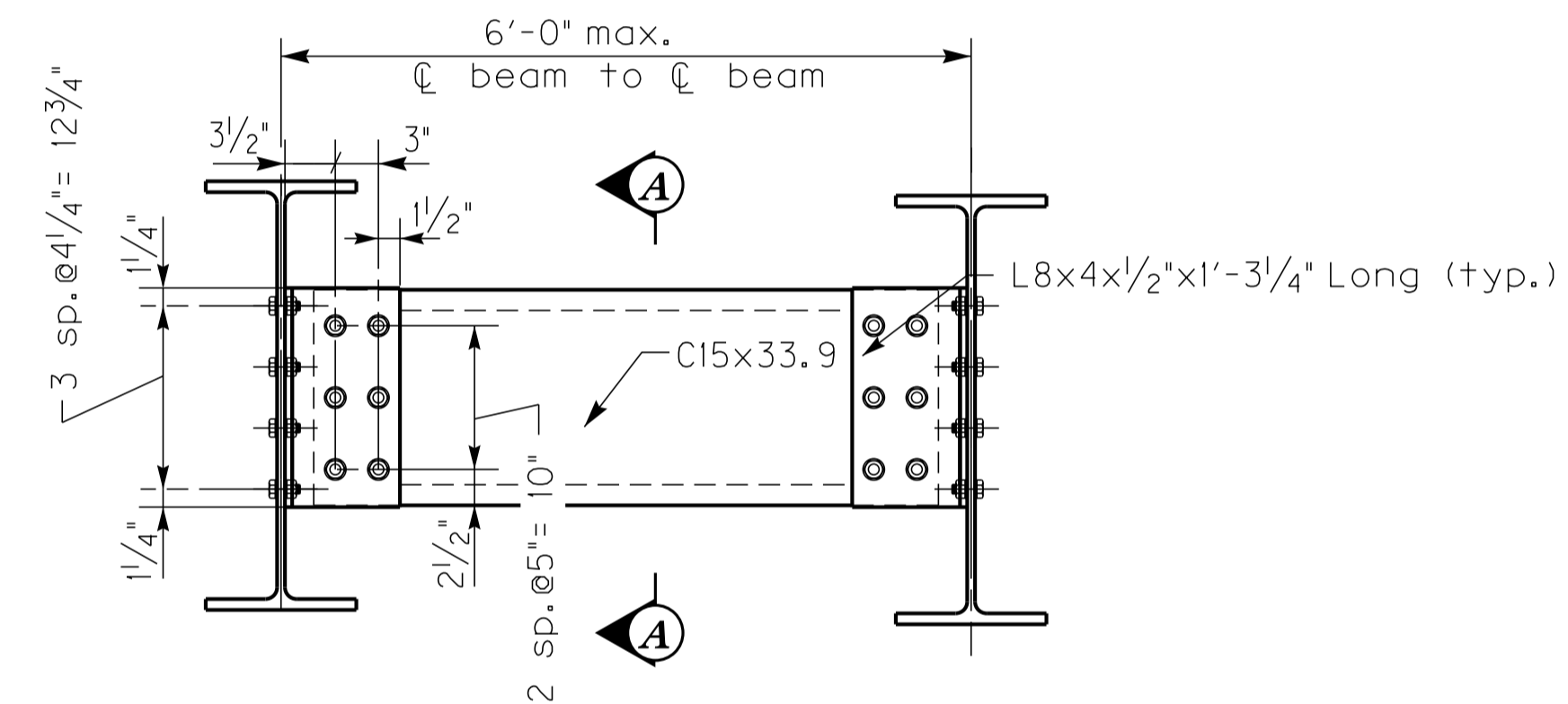


INTERMEDIATE DIAPHRAGM
(for up to 24" beam depth)

Note: Use $\frac{3}{4}$ " \emptyset Bolts with $\frac{13}{16}$ " \emptyset Holes Throughout.

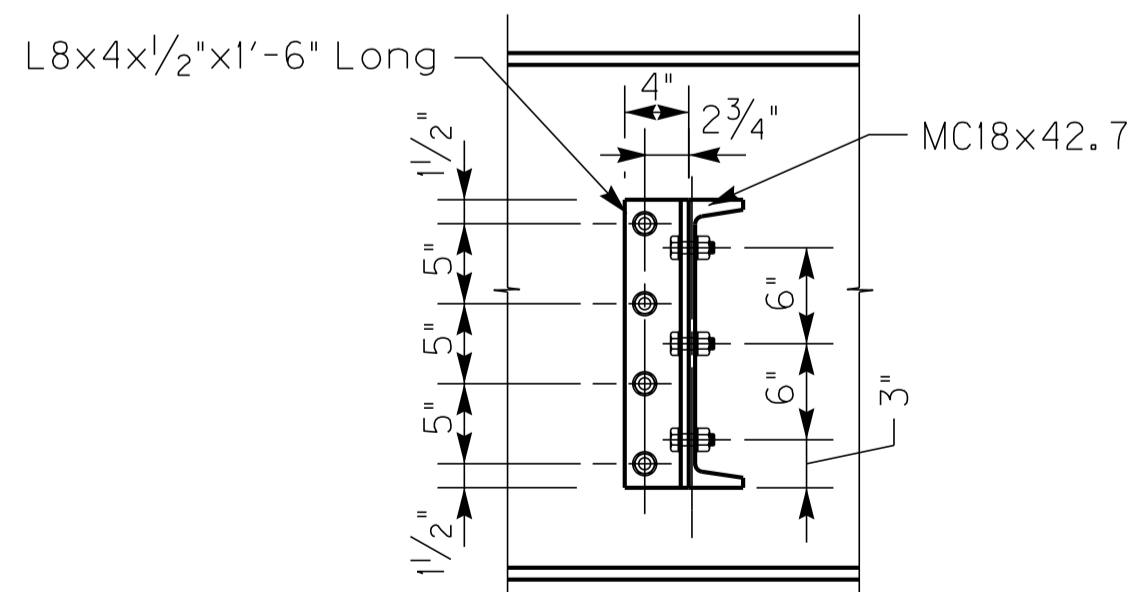


SECTION A-A

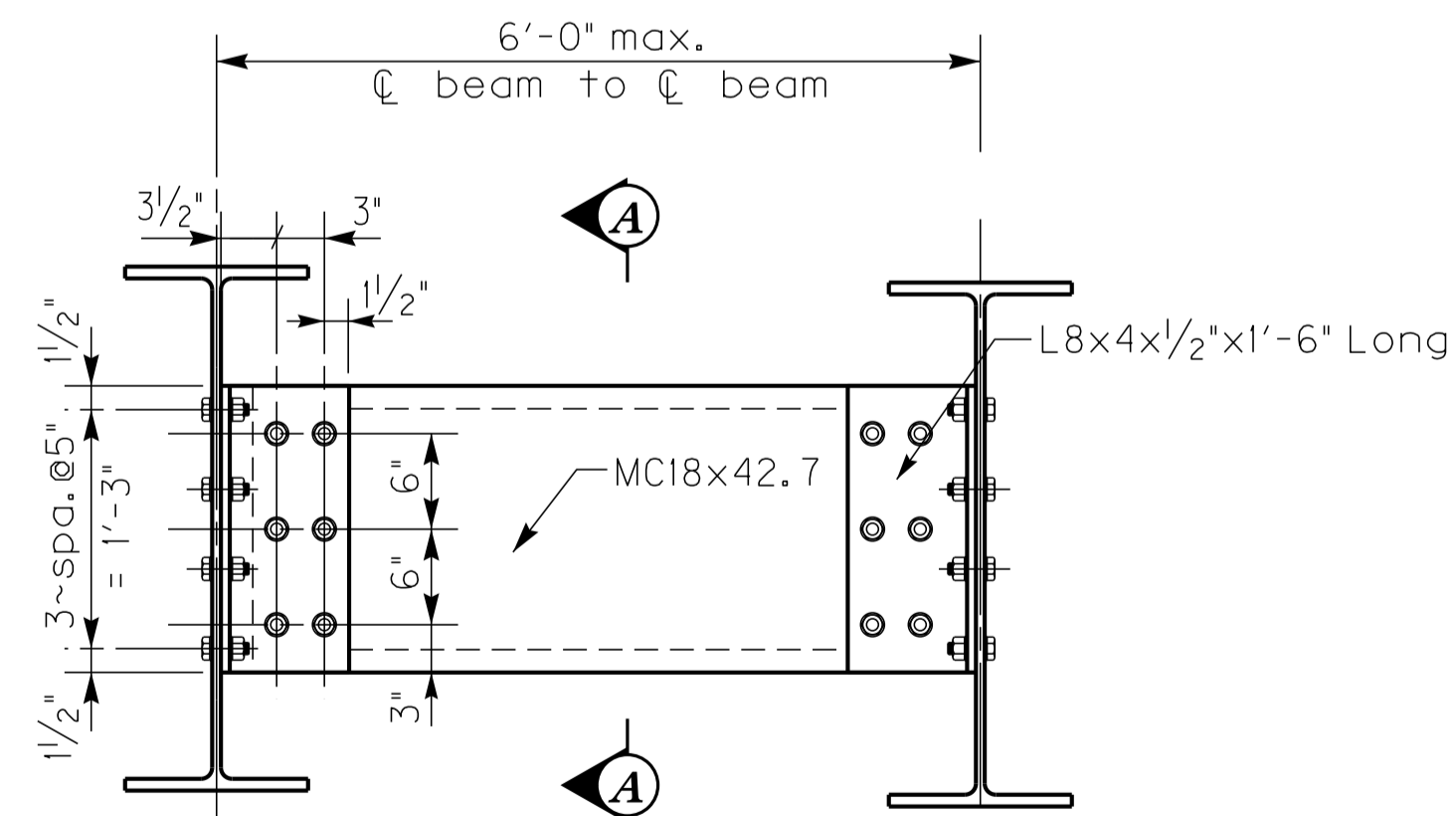


INTERMEDIATE DIAPHRAGM
(for up to 30" beam depth)

Note: Use $\frac{3}{4}$ " \emptyset Bolts with $\frac{13}{16}$ " \emptyset Holes Throughout.



SECTION A-A



INTERMEDIATE DIAPHRAGM
(for up to 36" beam depth)

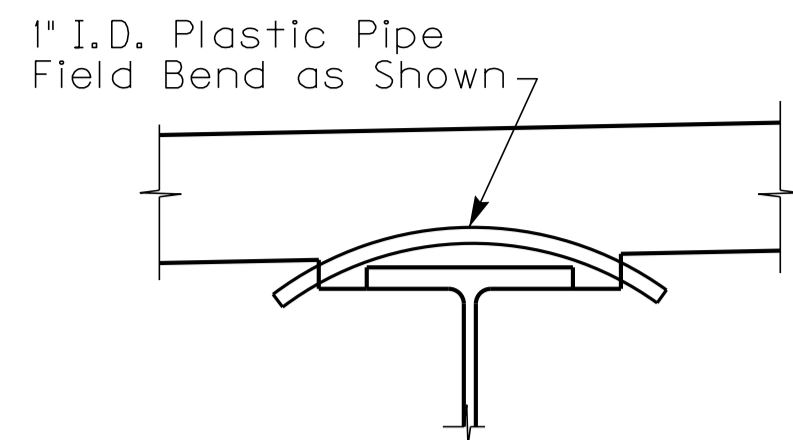
DESIGNED BY J. Van Zee DATE 5-17
 CHECKED _____
 RECOMMENDED _____
 APPROVED F.H.W.A. _____
 REVISED BY E. Downey _____

KENTUCKY
 DEPARTMENT OF HIGHWAYS
**COMPOSITE STEEL BEAM
 SUPERSTRUCTURES
 DIAPHRAGMS CONTINUED**

STANDARD DRAWING NO. BDE-001-01
 SUBMITTED Mark Nite 12-02-11
 DIRECTOR DIVISION OF STRUCTURAL DESIGN DATE
 APPROVED [Signature] 12-02-11
 STATE HIGHWAY ENGINEER DATE

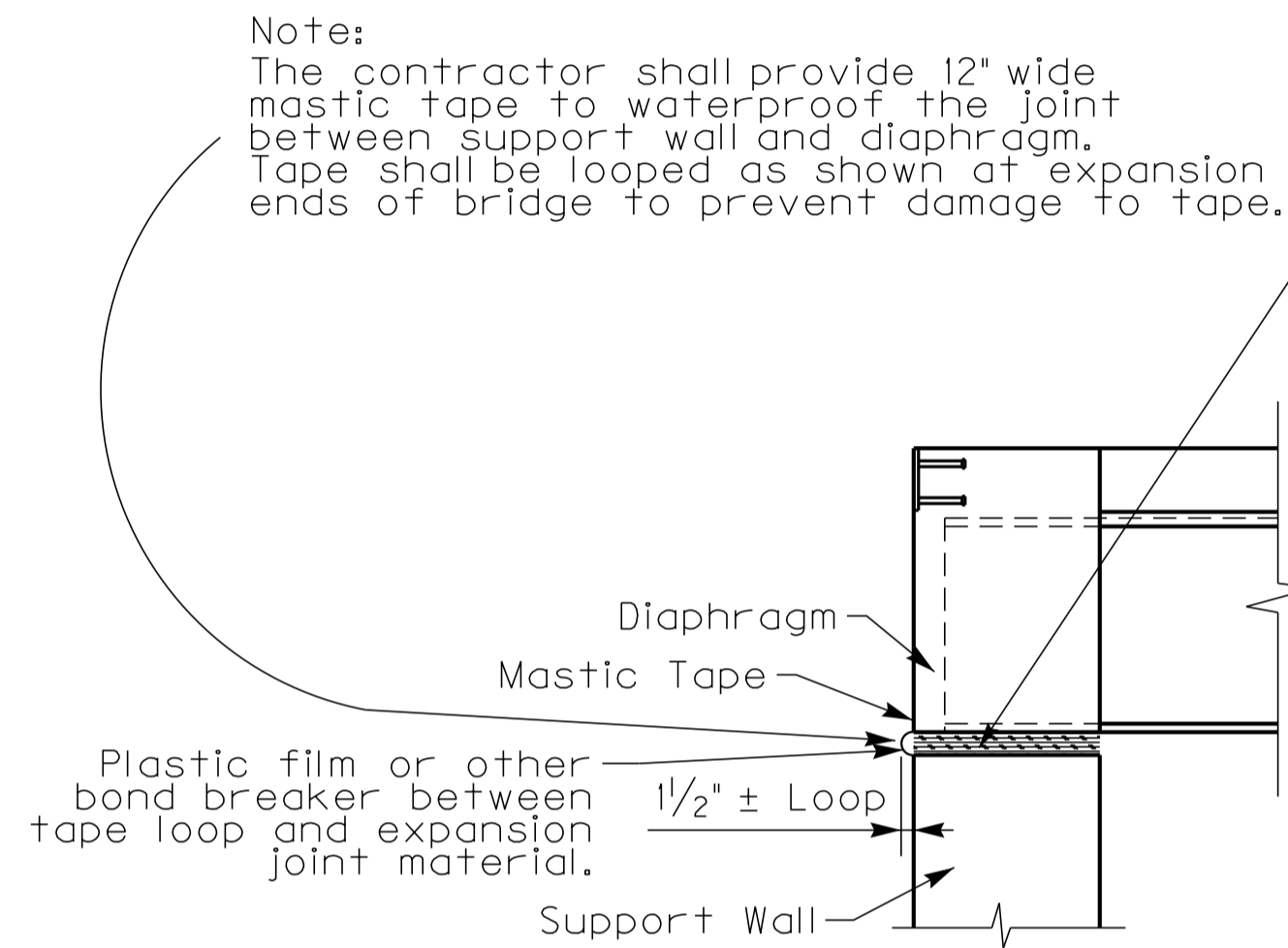
DRAWING SCALE: _____

DRAWING SHOWN: _____

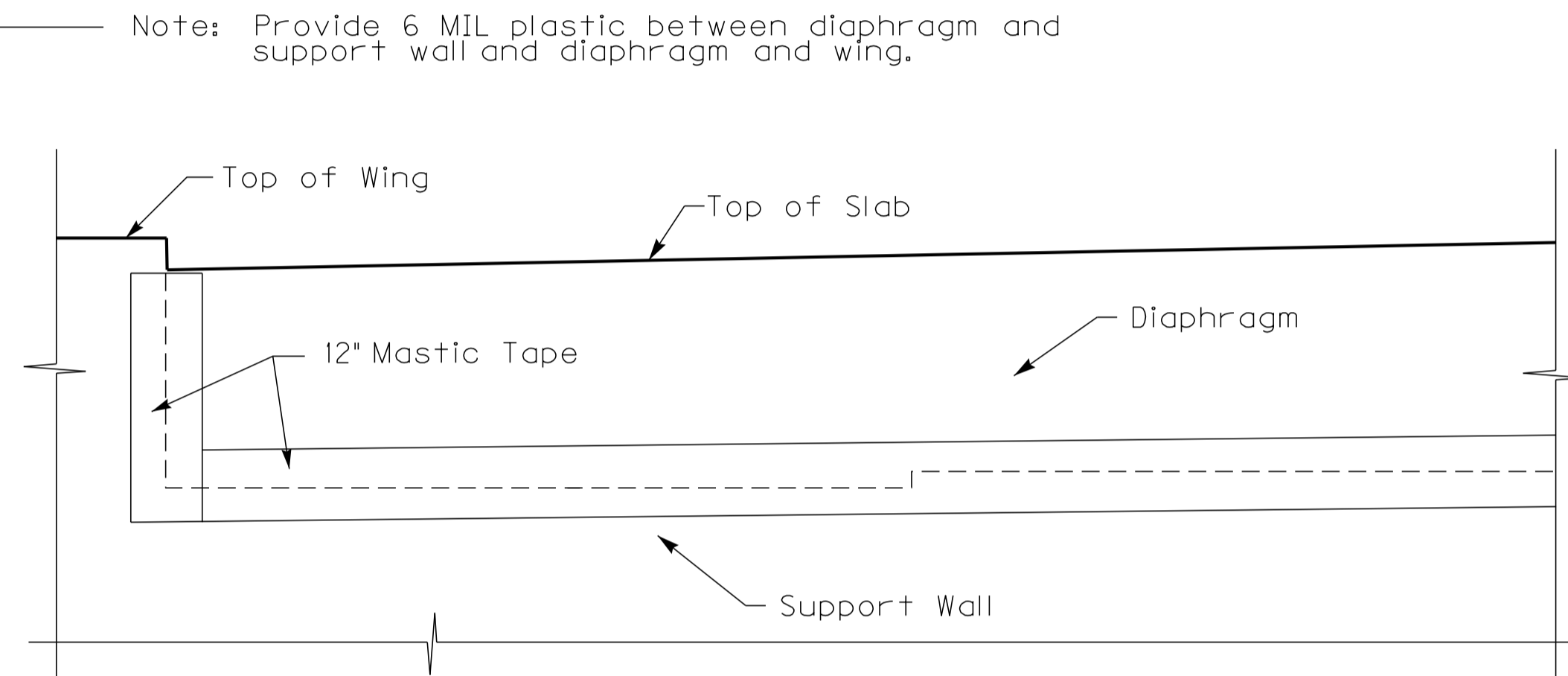


Note: When Slab is used and high water expected over bottom of beam elevation, place 1" plastic pipe above beams 4'-0" from each end. Work and material is incidental to superstructure concrete.

AIR VENT DETAIL



DIAPHRAGM X-SECTION



DIAPHRAGM ELEVATION

GENERAL NOTES

MASTIC TAPE: Mastic Tape used to seal joints is to meet the requirements of ASTM C-877 Type I, II, or III. The joint is to be covered with 12-inch wide mastic tape. Prior to application, the joint surface shall be clean and free of dirt, debris, or deleterious material. Primer, if required by the tape mfr., shall be applied for a minimum width of nine inches on each side of the joint.

Mastic Tape shall be either:

EZ-WRAP RUBBER by PRESS-SEAL GASKET CORPORATION,
SEAL WRAP by MAR MAC MANUFACTURING CO. INC.,
CADILLOC by the UP RUBBER CO. INC.
or approved equal.

Mastic Tape shall cover the joint continuously unless otherwise shown in the plans. Mastic Tape shall be spliced by lapping a minimum of six inches and in accordance with the mfrs. recommendations with the overlap running downhill.

The cost of labor, materials, and incidental items for furnishing and installing Mastic Tape shall be considered incidental to the unit price bid for Concrete Class 'AA' and no separate measurement or payment shall be made.

MASTIC TAPE APPLICATION

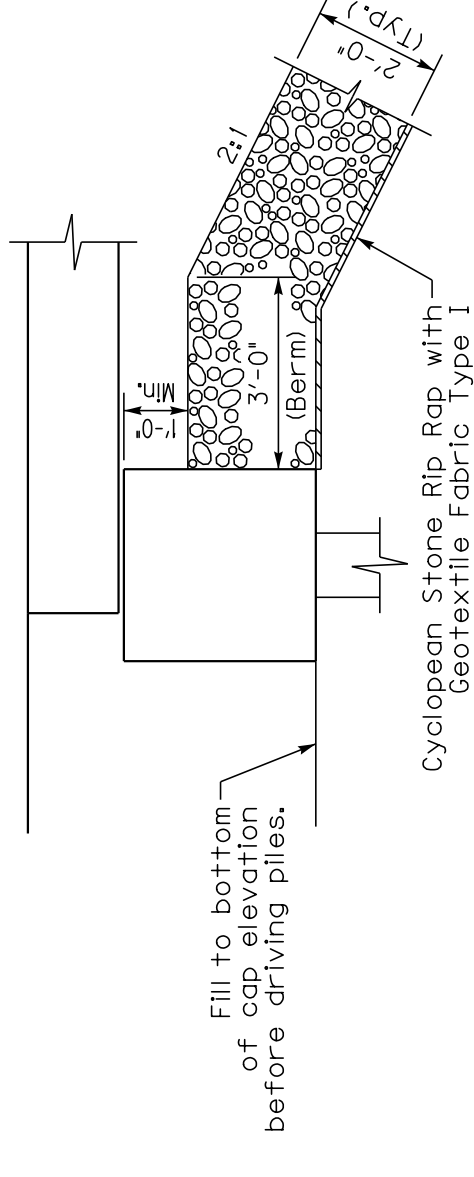
DESIGNED BY J. Van Zee
CHECKED _____
RECOMMENDED _____
APPROVED F.H.W.A. _____
REVISED BY E. Downey

DATE 5-17
DATE 5-17

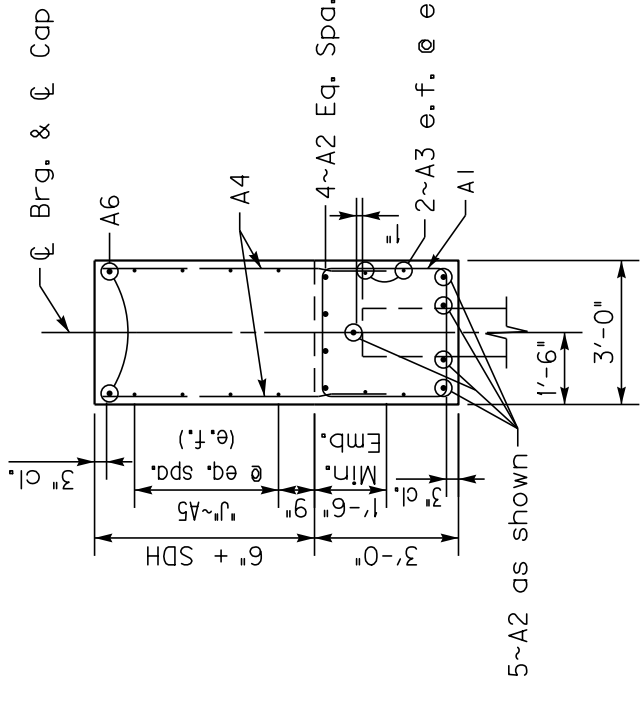
KENTUCKY DEPARTMENT OF HIGHWAYS	
COMPOSITE STEEL BEAM SUPERSTRUCTURES MISCELLANEOUS DETAILS	
STANDARD DRAWING NO. BDE-001-01	
SUBMITTED <u>Mark Nite</u>	12-02-11
DIRECTOR DIVISION OF STRUCTURAL DESIGN	DATE
APPROVED <u>[Signature]</u>	12-02-11
STATE HIGHWAY ENGINEER	DATE

DRAWING SCALE: _____
 DRAWING SHOWN: _____

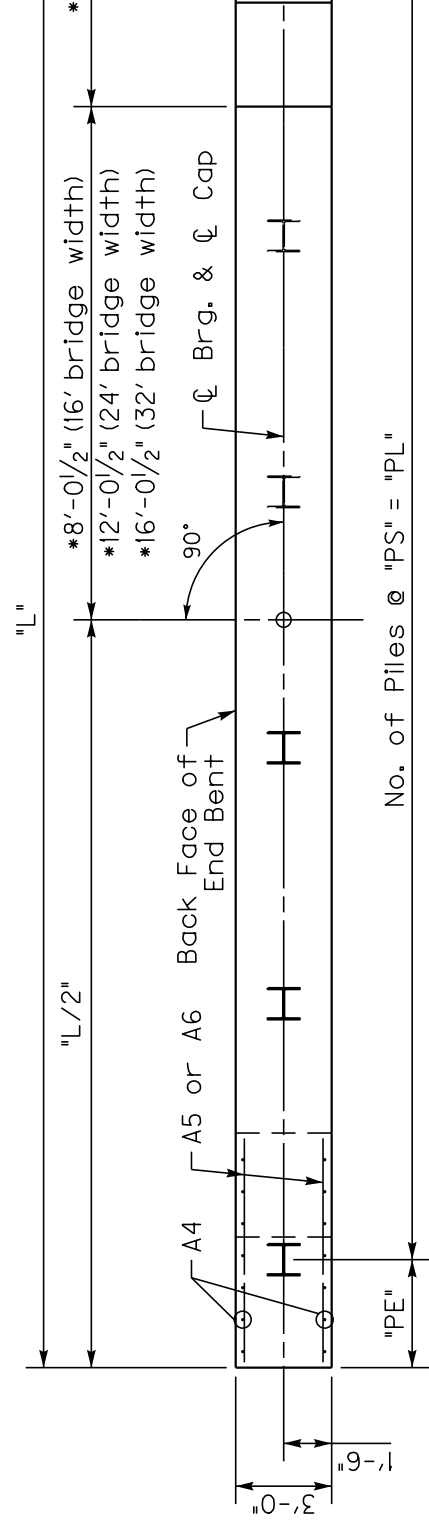
SUPERSTRUCTURE HEIGHT		CAP BILL OF REINFORCEMENT												WING BILL OF REINFORCEMENT								
SDH = Beam+Pad Height + (launch+slab) (if applicable)		16' - 0" BRIDGE WIDTH			24' - 0" BRIDGE WIDTH			32' - 0" BRIDGE WIDTH			32' - 0" BRIDGE WIDTH			REINFORCEMENT								
MARK	TYPE	NO.	SIZE	LENGTH	MARK	TYPE	NO.	SIZE	LENGTH	MARK	TYPE	NO.	SIZE	LENGTH	MARK	TYPE	NO.	SIZE	LENGTH			
H1	A1e	14s	5	11-0	A1e	14s	29	5	11-0	A1e	14s	36	5	11-0	A4e	Str.	12	5	4-0			
	A2e	Str.	9	22-9	A2e	Str.	9	8	30-9	A2e	Str.	9	8	38-9	A5e	Str.	8	5	3-2			
	A3e	Str.	4	22-9	A3e	Str.	4	5	30-9	A3e	Str.	4	5	38-9	A6e	Str.	4	6	3-2			
H2	A1e	14s	24	11-0	A1e	14s	30	5	11-0	A1e	14s	38	5	11-0	A4e	Str.	20	5	4-8			
	A2e	Str.	9	25-5	A2e	Str.	9	8	33-5	A2e	Str.	9	8	41-5	A5e	Str.	12	5	4-6			
	A3e	Str.	4	25-5	A3e	Str.	4	5	33-5	A3e	Str.	4	5	41-5	A6e	Str.	4	6	4-6			
H3	A1e	14s	29	11-0	A1e	14s	36	5	11-0	A1e	14s	43	5	11-0	A4e	Str.	28	5	5-11			
	A2e	Str.	9	30-5	A2e	Str.	9	8	38-5	A2e	Str.	9	8	46-5	A5e	Str.	16	5	7-0			
	A3e	Str.	4	30-5	A3e	Str.	4	5	38-5	A3e	Str.	4	5	46-5	A6e	Str.	4	6	7-5			
BRIDGE WIDTH	PILE LOAD		DIMENSIONS												QUANTITIES							
	SIZE	TONS	NO.	PE	PS	PL	A	B	C	D	E	F	G	H	J	L	WL	WU	WV	WX	CONCRETE (C.Y.)	STEEL (LBS.)
16	H1	92	3	3'-6 1/2"	8'-0"	16'-0"	3 1/2"	4	9"	2'-3"	7	6'-0"	5	2'-0"	2	23'-1"	3'-6"	0	0	9.8	991	
	H2	87	4	2'-4 1/2"	7'-0"	21'-0"	2 1/2"	3	7"	1'-2"	6	5'-0"	3	4'-0"	3	25'-9"	4'-10"	0	0	12.2	1175	
	H3	107	4	3'-4 1/2"	8'-0"	24'-0"	4 1/2"	4	8"	2'-0"	7	6'-0"	7	6'-0"	4	30'-9"	7'-4"	4'-1"	2'-1"	16.8	1527	
24	H1	97	4	3'-6 1/2"	8'-0"	24'-0"	3 1/2"	4	9"	2'-3"	7	6'-0"	3	2'-0"	2	31'-1"	3'-6"	0	0	12.4	1297	
	H2	99	5	2'-10 1/2"	7'-0"	28'-0"	2 1/2"	3	10"	1'-8"	6	5'-0"	5	4'-0"	3	33'-9"	4'-10"	0	0	14.8	1469	
	H3	122	5	3'-4 1/2"	8'-0"	32'-0"	4 1/2"	4	9"	2'-0"	7	6'-0"	7	6'-0"	4	38'-9"	7'-4"	3'-3"	4'-1"	19.4	1833	
32	H1	103	5	3'-6 1/2"	8'-0"	32'-0"	3 1/2"	4	8"	2'-3"	7	6'-0"	3	2'-0"	2	39'-1"	3'-6"	0	0	15.1	1604	
	H2	109	6	3'-4 1/2"	7'-0"	35'-0"	4 1/2"	4	8"	2'-0"	6	5'-0"	5	4'-0"	3	41'-9"	4'-10"	0	0	17.5	1787	
	H3	133	6	3'-4 1/2"	8'-0"	40'-0"	4 1/2"	4	8"	2'-0"	7	6'-0"	7	6'-0"	4	46'-9"	7'-4"	3'-3"	4'-1"	22.1	2139	



SECTION THRU END BENT
 (Showing berm and fill slope)

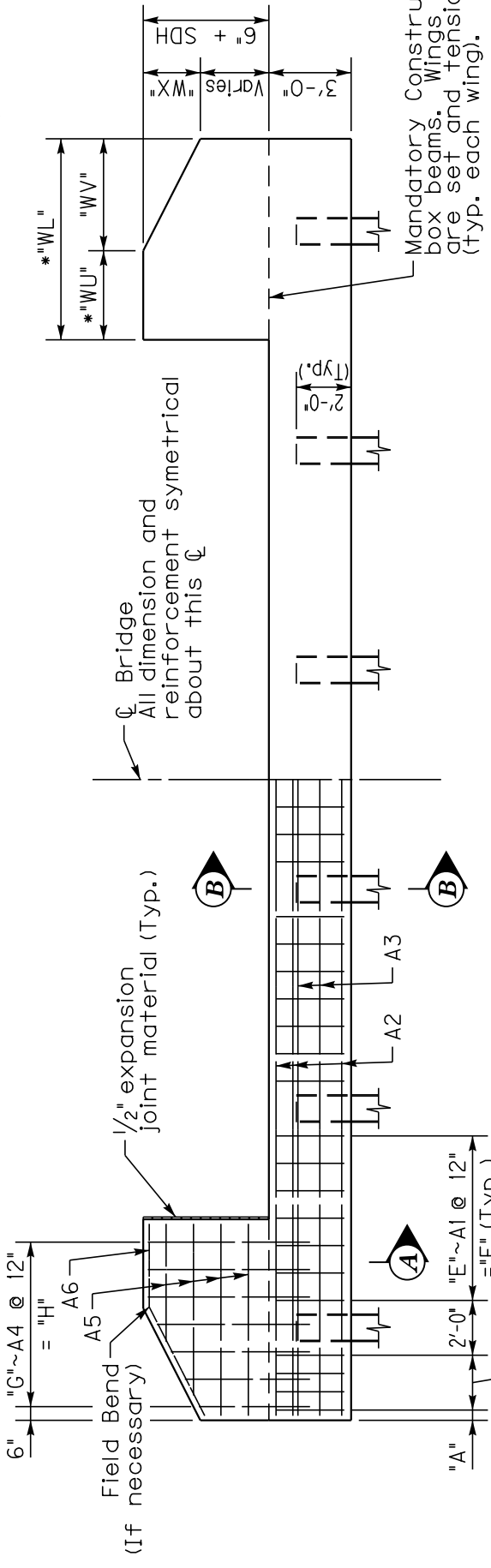


SECTION A-A



PLAN

NOTE: Slope cap as necessary with side by side box beams and step cap seats with rolled steel beams to maintain proper roadway slope.



ELEVATION

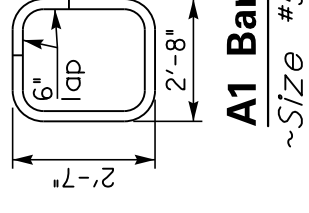
NOTE: Trim A4-A6 bars as necessary.

- NOTES:
- 1) Conform to KYTC, Standard Specifications, Current Edition.
 - 2) Concrete to be Class "A", 3500 psi.
 - 3) Rebar to be epoxy coated A615, Grade 60.
 - 4) Maintain 2" clear cover to reinforcement unless otherwise noted.
 - 5) End Bents are designed for the maximum span of the following steel and concrete beams as shown in the current standards: H1 - B12, CB12, B17, CB17, B21 or rolled steel beams up to 16' nominal depth. H2 - CB21, B27, CB27, B33 or rolled steel beams up to 24' nominal depth. H3 - CB33, B42, CB42 or rolled steel beams up to 36' nominal depth.
 - 6) Piles may be HP12x53 or 16 Steel Pipes with 1/2" wall thickness.
 - 7) Piles driven to rock must be driven to Refusal. Friction Piles must be driven to (Pile Load/0.4) using the Gates Method.
 - 8) Pile load given is Factored Strength Load.
 - 9) Piles must be driven 10' into existing ground or to refusal on bedrock. Piles at wet crossings must be driven to 10' below stream bed or to refusal on bedrock. A minimum pile length of 10' is required in all circumstances.
 - 10) Contractor shall provide a hammer capable of driving the piling to refusal or capacity without encountering excessive blow counts or damaging the pile. Contractor shall be responsible for all damaged piling.

KENTUCKY
 DEPARTMENT OF HIGHWAYS

PILE END BENT
 0° SKEW
 ??

STANDARD DRAWING NO. BDE-001-01
 SUBMITTED *Mark* DIRECTOR DIVISION OF STRUCTURAL DESIGN DATE 12-02-11
 APPROVED *Mike* ENGINEER DATE 12-02-11

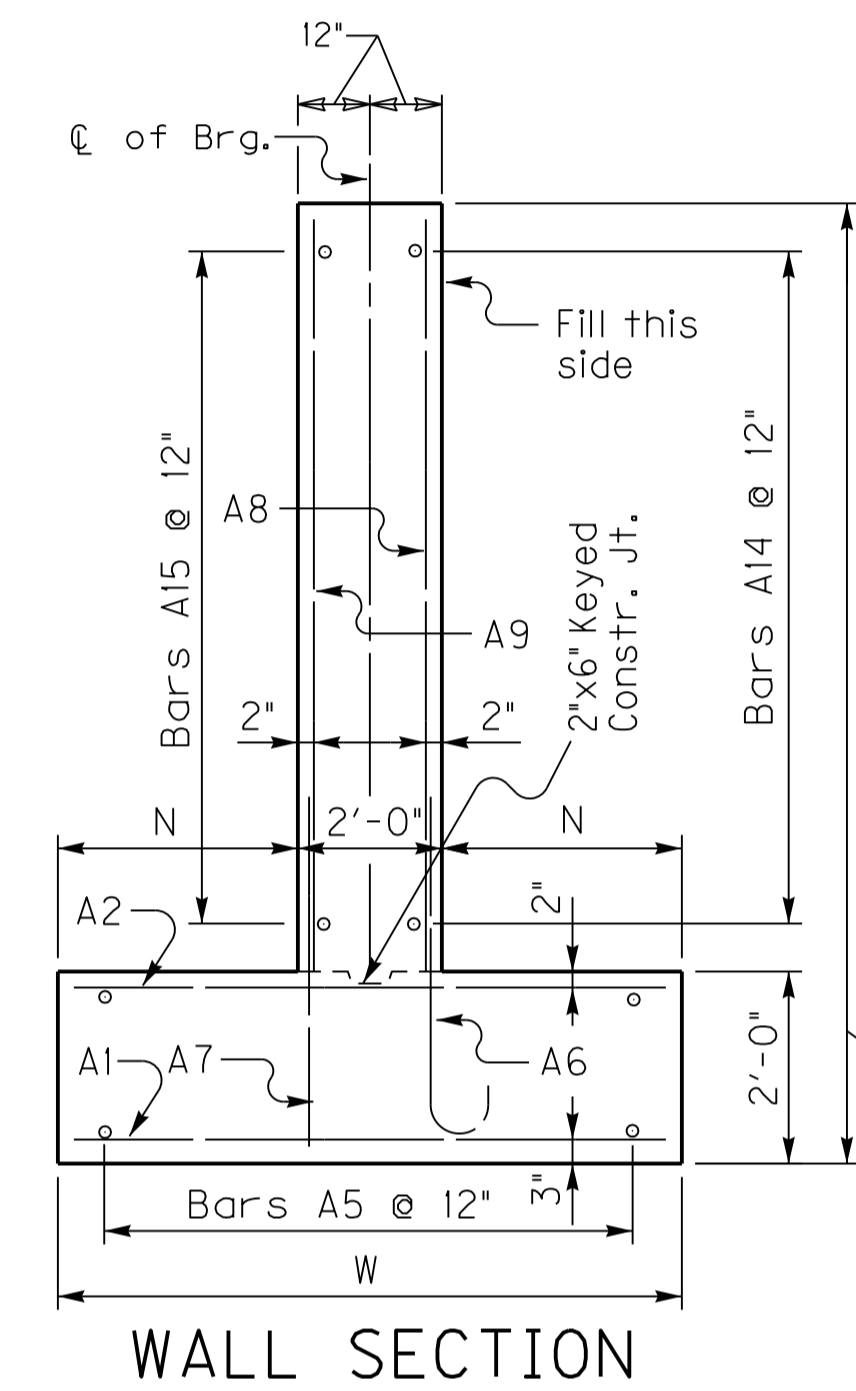
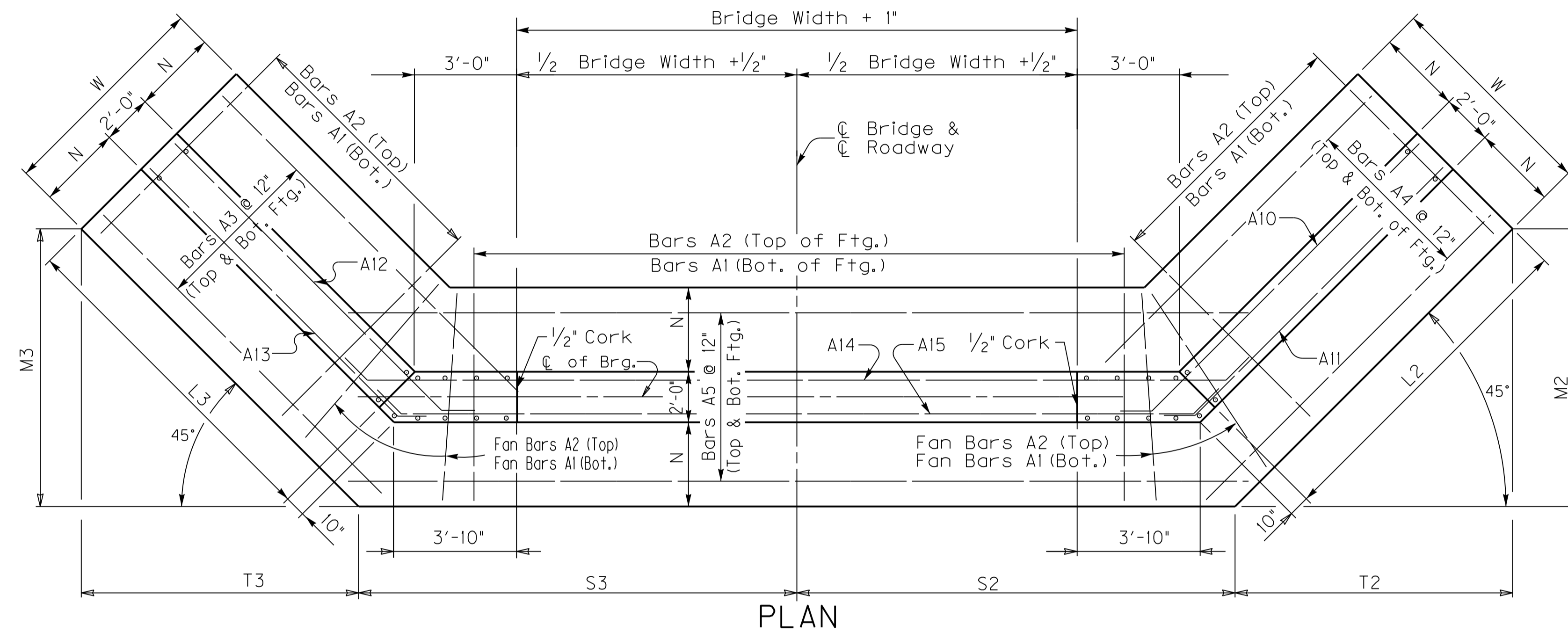


A1 Bar
 ~Size #5~

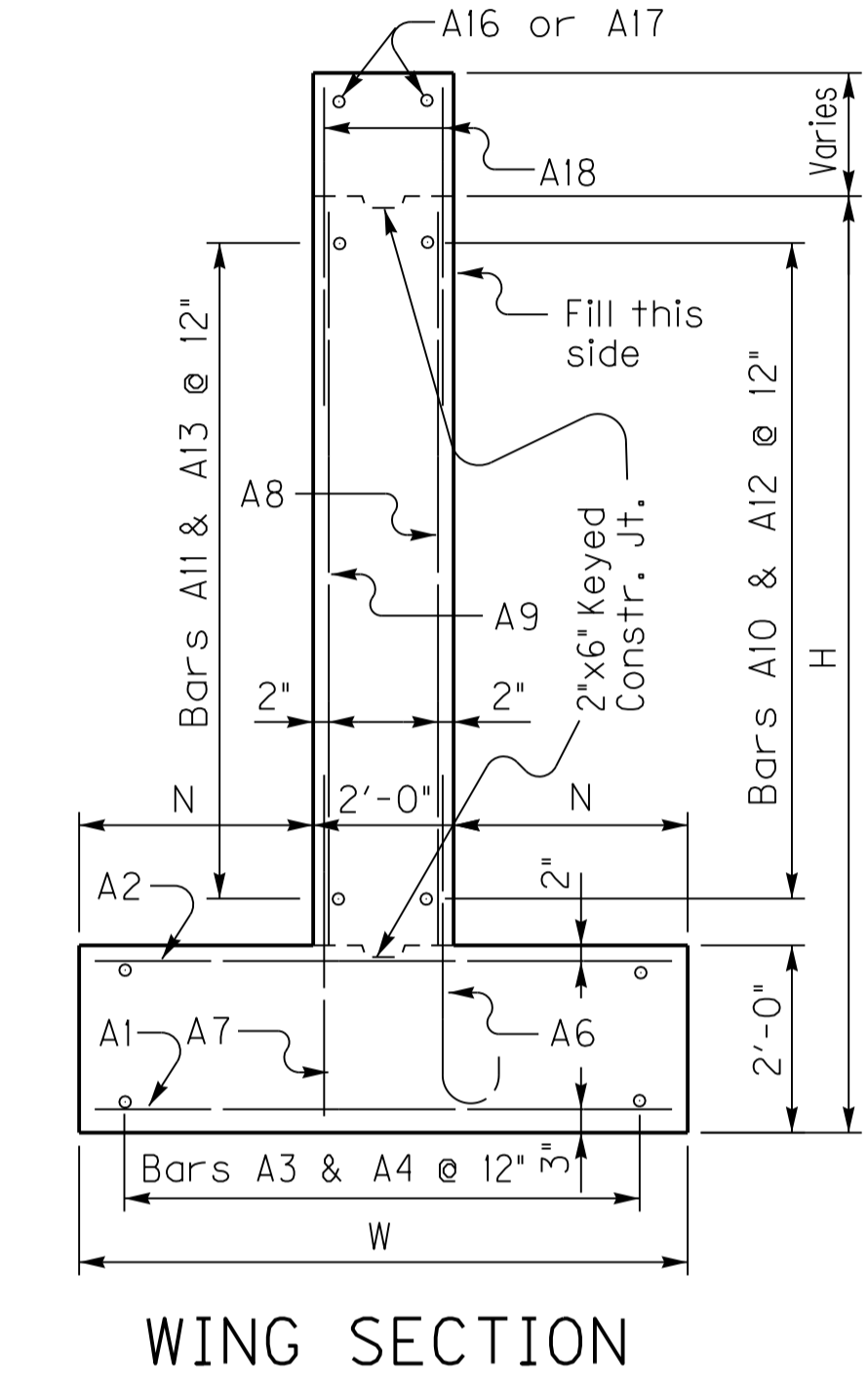
DESIGNED BY J. Van Zee
 CHECKED BY _____
 RECOMMENDED BY _____
 APPROVED F.H.A. BY E. Downey
 REVISOR BY _____
 DATE 5-17

0° SKEW VARIABLE BRIDGE WIDTH 2:1 FILL SLOPES 45° SKEW FROM ROADWAY ON WINGS

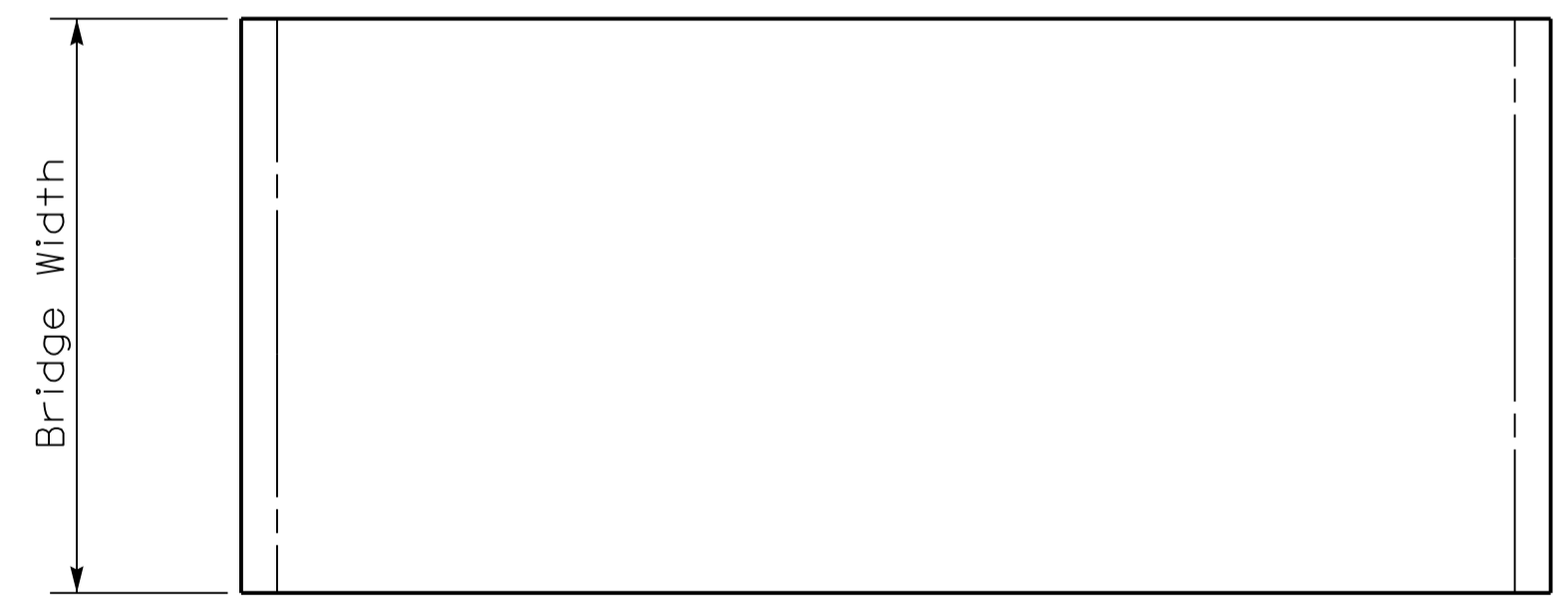
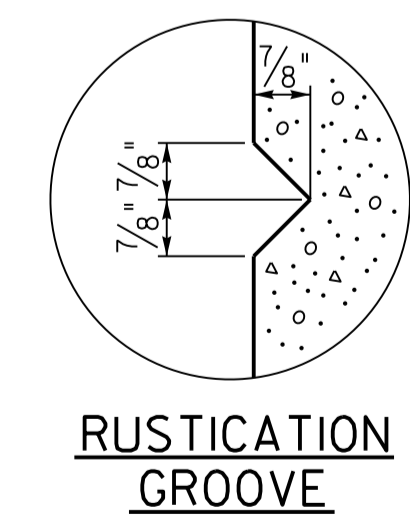
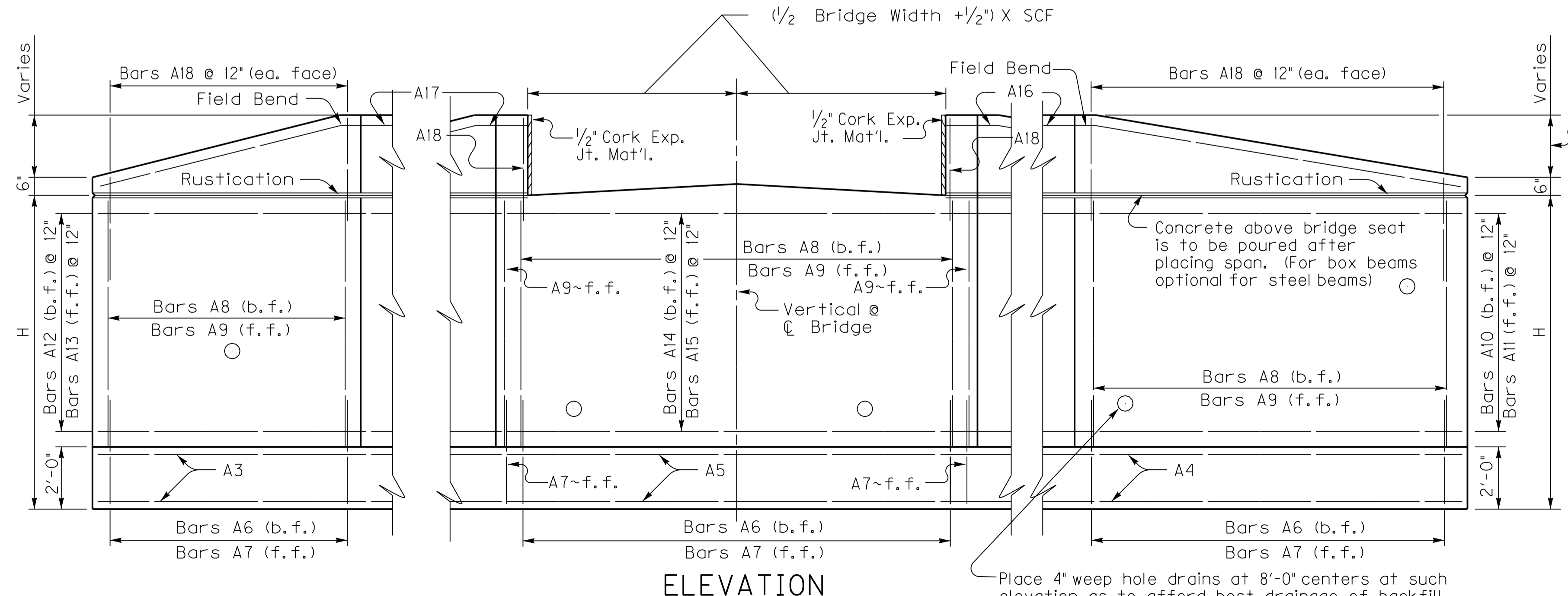
ABUTMENT SKEW CORRECTION FACTOR (SCF) = 1.000



H = Low Bridge Seat. Slope seat for side by side box beams. Step cap as necessary for rolled steel beam superstructures to achieve a 2% cross slope on deck.



Note: Trim A16 & A17 bars if necessary



Place 4" weep hole drains at 8'-0" centers at such elevation as to afford best drainage of backfill, in accordance with the Standard Specifications.

ABUTMENT DETAILS		
SKEW	WIDTH	DATE
0	VAR	October 2018

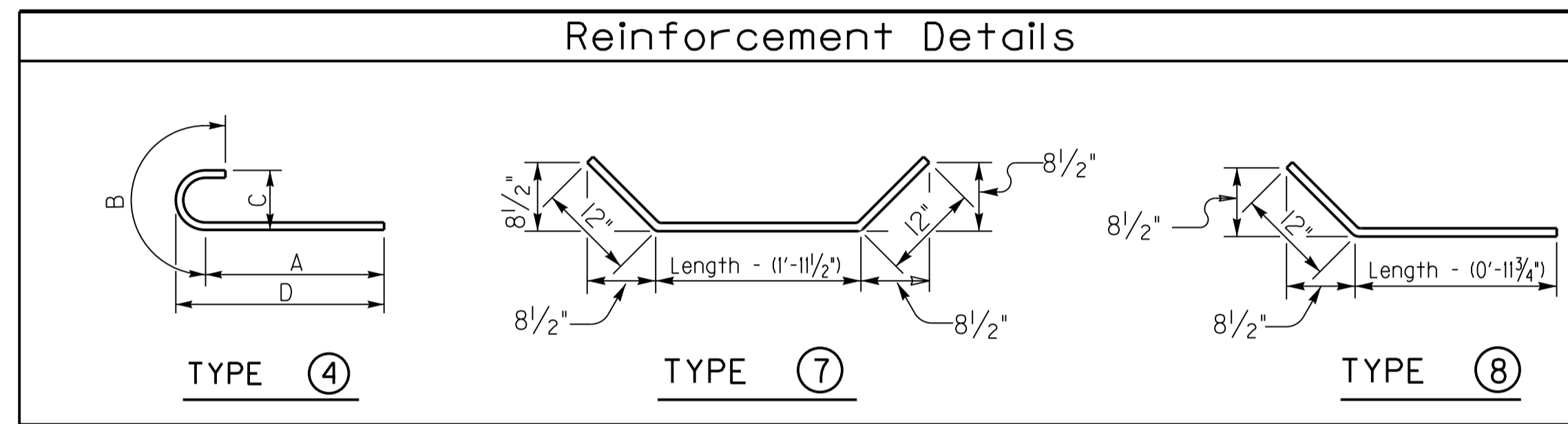
0° SKEW VARIABLE BRIDGE WIDTH 2:1 FILL SLOPES 45° SKEW FROM ROADWAY ON WINGS

Bill of Reinforcement

MARK	A1		A2		A3	A4		A5		A6				A7		A8		A9		A10	A11	A12	A13	A14		A15		A16	A17	A18						
TYPE	Str.		Str.		Str.	Str.		Str.		4				Str.		Str.		Str.		8	8	8	8	7		7		Str.	Str.	Str.						
SIZE	#5		#5		#5	#5		#5		#5				#5		#5		#5		#5	#5	#5	#5	#5		#5		#5	#5	#5						
H	No.	Size	Length ft., in.	Spacing	No.	Size	Length ft., in.	Spacing	No.	Length ft., in.	No.	Length ft., in.	No.	Length ft., in.	No.	Length ft., in.	No.	Length ft., in.	No.	Length ft., in.	No.	Length ft., in.	No.	Length ft., in.	No.	Length ft., in.	No.	Length ft., in.	No.	Length ft., in.						
15-16	60+Nb=	10	11 8 12		60+Nb=	7	11 8 12		24	24 0 24	24	24 0 24	12	4	+Lb=	49+Nb=	9	9 11 12		8	1/8 1 10 0 11 3/4	8	6	52+Nb=	5	4 11 12	49+Nb=	6	12 10 12	52+Nb=	12	10 12 14 24 0 14 22 7 14 24 0 14 22 7 14 12 5 +Lb=	14	9 6 +Lb=	2	25 7 2 25 7 104 5 9
13-14	53+Nb=	9	10 8 12		53+Nb=	7	10 8 12		22	20 9 22	20	9 22	11	11	+Lb=	43+Nb=	8	8 3 12		6	11 1 3 0 8 7 3	4	6	46+Nb=	5	4 11 12	43+Nb=	6	10 10 12	46+Nb=	10	10 12 12 21 0 12 19 7 12 21 0 12 19 7 12 12 5 +Lb=	12	9 6 +Lb=	2	22 7 2 22 7 92 5 9
11-12	49+Nb=	8	9 8 12		49+Nb=	6	9 8 12		20	18 7 20	18	7 20	11	6	+Lb=	39+Nb=	7	7 1 12		5	10 1/2 1 2 0 7 6 2	4	2	42+Nb=	5	4 11 12	39+Nb=	5	8 10 12	42+Nb=	8	10 12 10 19 0 10 17 7 10 19 0 10 17 7 10 12 5 +Lb=	10	9 6 +Lb=	2	20 7 2 20 7 84 5 9
9-10	44+Nb=	7	8 8 12		44+Nb=	5	8 8 12		18	16 4 18	16	4 18	11	1	+Lb=	35+Nb=	6	6 1 12		5	1 1 0 0 6 5 4	4	3	38+Nb=	5	4 11 12	35+Nb=	5	6 10 12	38+Nb=	6	10 12 8 17 0 8 15 7 8 17 0 8 15 7 8 12 6 +Lb=	8	9 6 +Lb=	2	18 7 2 18 7 76 5 9
7-8	34+Nb=	6	7 2 12		34+Nb=	5	7 2 12		16	11 9 16	11	9 16	10	0	+Lb=	27+Nb=	5	5 7 12		4	8 1/2 0 10 0 5 4 11	4	11	30+Nb=	5	4 11 12	27+Nb=	5	4 10 12	30+Nb=	4	10 12 6 13 0 6 11 7 6 13 0 6 11 7 6 12 6 +Lb=	6	9 6 +Lb=	2	14 7 2 14 7 60 5 9
5-6	30+Nb=	5	6 2 12		30+Nb=	5	6 2 12		14	9 7 14	9	7 14	9	7	+Lb=	23+Nb=	5	5 7 12		4	8 1/2 0 10 0 5 4 11	4	11	26+Nb=	5	4 11 12	23+Nb=	5	2 10 12	26+Nb=	2	10 12 4 11 0 4 9 7 4 11 0 4 9 7 4 12 6 +Lb=	4	9 6 +Lb=	2	12 7 2 12 7 52 5 9

Table of Dimensions

H	W		N		M2		M3		T2		T3		L2		L3		S2		S3	
	Length ft., in.	Length ft., in.	Length ft., in.	Length ft., in.	Length ft., in.	Length ft., in.	Length ft., in.	Length ft., in.	Length ft., in.	Length ft., in.	Length ft., in.	Length ft., in.	Length ft., in.	Length ft., in.	Length ft., in.	Length ft., in.	Length ft., in.	Length ft., in.	Length ft., in.	Length ft., in.
15-16	12 0	5 0	16 10 3/4	16 10 3/4	16 10 3/4	16 10 3/4	21	21	5 11 1/4	+0.5Lb=			5 11 1/4	+0.5Lb=						
13-14	11 0	4 6	14 7 5/8	14 7 5/8	14 7 5/8	14 7 5/8	18	18	5 8 3/4	+0.5Lb=			5 8 3/4	+0.5Lb=						
11-12	10 0	4 0	13 7/8	13 7/8	13 7/8	13 7/8	16	16	5 6 3/8	+0.5Lb=			5 6 3/8	+0.5Lb=						
9-10	9 0	3 6	11 6 1/8	11 6 1/8	11 6 1/8	11 6 1/8	14	14	5 3 3/8	+0.5Lb=			5 3 3/8	+0.5Lb=						
7-8	7 6	2 9	8 5 1/2	8 5 1/2	8 5 1/2	8 5 1/2	10	10	5 1/8	+0.5Lb=			5 1/8	+0.5Lb=						
5-6	6 6	2 3	6 10 7/8	6 10 7/8	6 10 7/8	6 10 7/8	8	8	4 9 5/8	+0.5Lb=			4 9 5/8	+0.5Lb=						



*Concrete quantities computed using 21' beam depth on 1/2' pad & Variable Bridge Width

Quantities

H	Concrete*		Reinforcement
	C.Y.		LBS.
5	19.71+(0.71xLb) =		1851+(52.8xLb) =
6	21.47+(0.78xLb) =		1851+(52.8xLb) =
7	29.09+(0.93xLb) =		2651+(68.7xLb) =
8	31.15+(1.01xLb) =		2651+(68.7xLb) =
9	46.58+(1.19xLb) =		4307+(91xLb) =
10	49.23+(1.27xLb) =		4307+(91xLb) =
11	60.56+(1.41xLb) =		6117+(120.4xLb) =
12	63.5+(1.49xLb) =		6117+(120.4xLb) =
13	76.32+(1.64xLb) =		8656+(161xLb) =
14	79.56+(1.71xLb) =		8656+(161xLb) =
15	97.76+(1.86xLb) =		11857+(198.6xLb) =
16	101.44+(1.93xLb) =		11857+(198.6xLb) =

ABUTMENT SKEW CORRECTION FACTOR (SCF) = 1.0

NUMBER OF BARS TO ADD (Nb) = Bridge Width (feet) x SCF (round up to nearest whole number)

LENGTH OF ABUTMENT TO ADD (Lb) = Bridge Width (feet) x SCF (convert decimal to architectural)

(round up to nearest whole number)

(convert decimal to architectural)

GENERAL NOTES

SPECIFICATIONS: Construct abutments according to the current edition of the Kentucky Department of Highways Standard Specifications for Road and Bridge Construction. Abutments are designed for side by side box beams as detailed in Standard Drawings BDP-001 through BDP-012, current edition. Dimensions may be adjusted to allow for any out to out bridge width. Abutments are also adequate for Std. Dwg. slabs or steel beam superstructures

FOUNDATION PRESSURE: Construct abutment footings on solid rock bearing material that can support a pressure of 8000 psf service or 10,800 psf strength factored, as recommended by a geotechnical engineer.

WING LENGTHS: Calculated assuming 21' superstructure depth and stream bank elevation at top of footing.

FOOTING ELEVATION: Construct bottom of footing below the anticipated scour elevation. (This typically entails embedding the footings 1'-0" to 2'-0" into rock and pouring concrete directly against cut rock faces, as recommended by geotechnical engineer.)

NOTE: Distances to bars shown are clear dimensions unless otherwise noted.

MATERIAL SPECIFICATIONS:
 Concrete, Class "A" = 3500 psi
 Steel Reinforcement = Grade 60



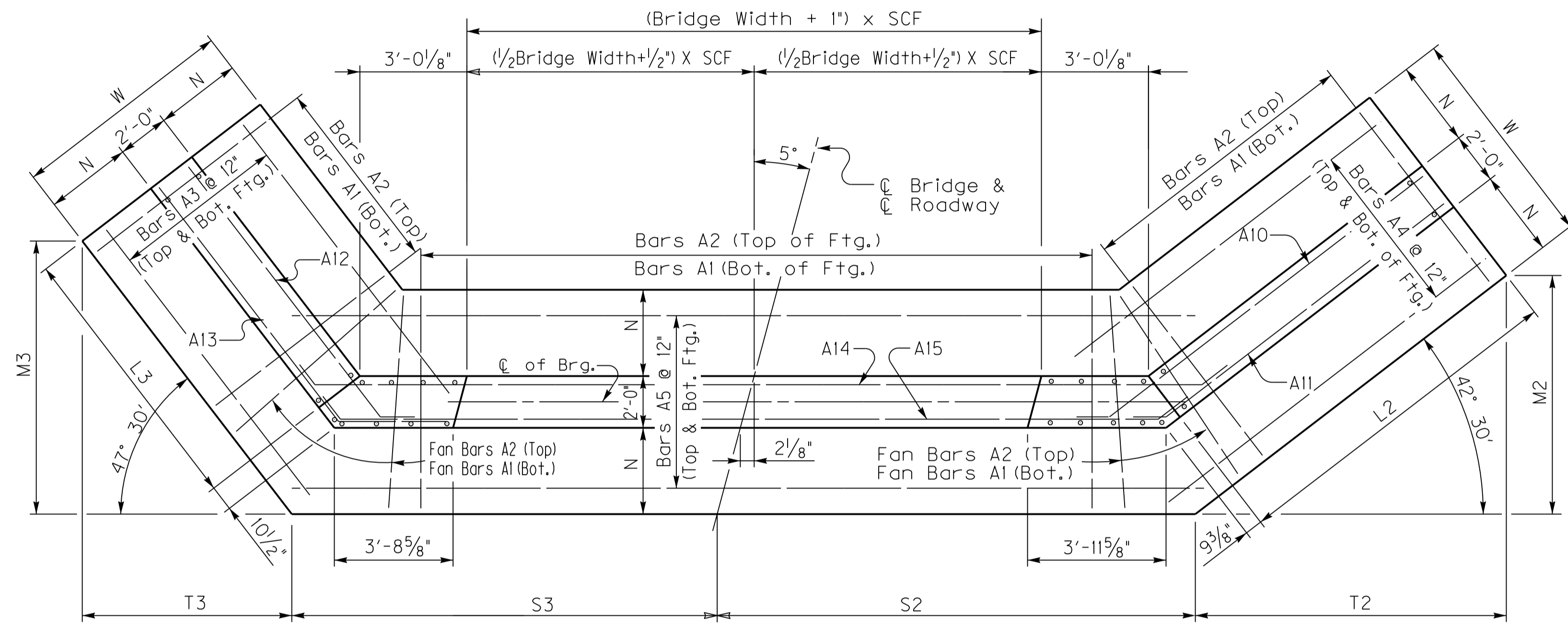
PLAN OF SUPERSTRUCTURE SLAB

ABUTMENT DETAILS

SKEW	WIDTH	DATE
0	VAR	October 2018

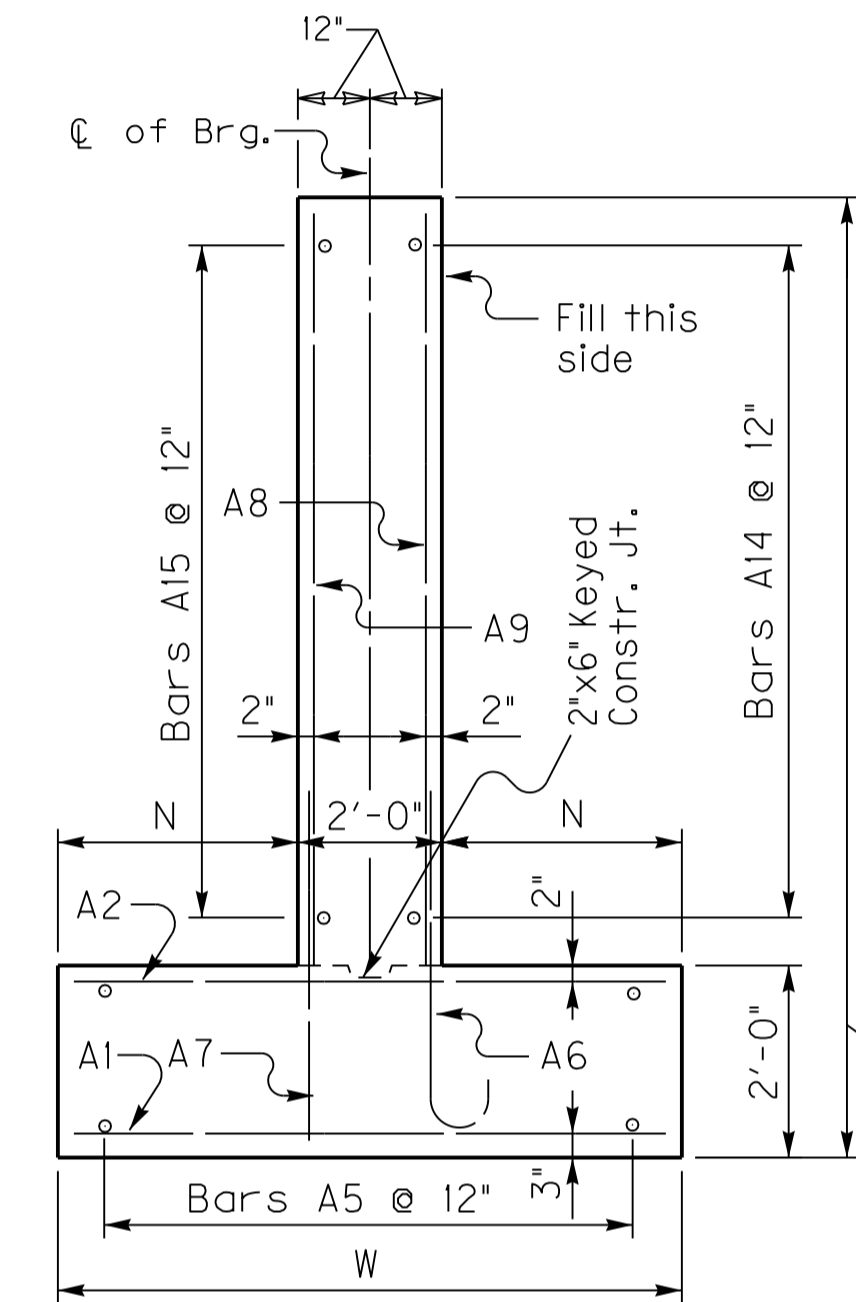
5° SKEW VARIABLE BRIDGE WIDTH 2:1 FILL SLOPES WINGS SKEWED 50% FROM ROADWAY TO BREASTWALL

ABUTMENT SKEW CORRECTION FACTOR (SCF) = 1.004

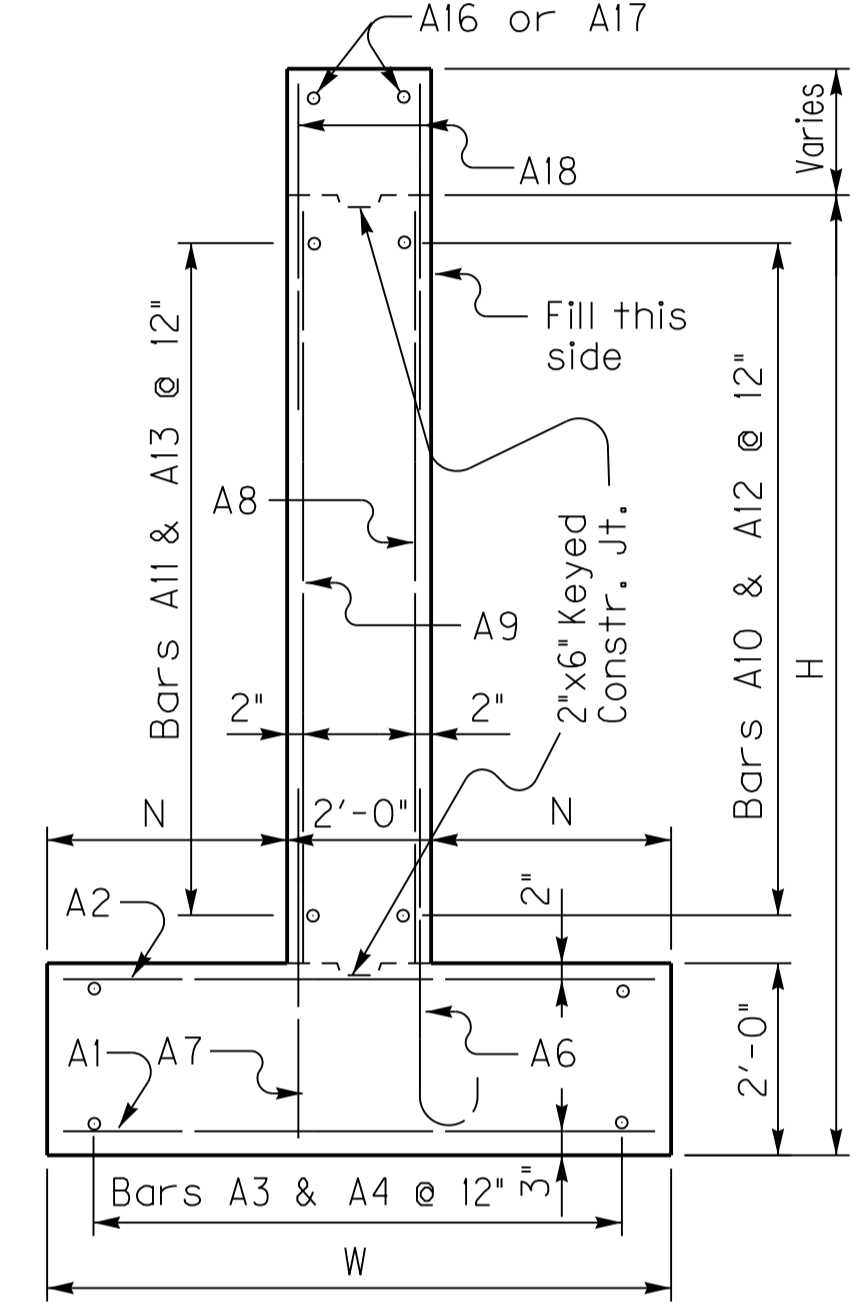


(Left Skew as shown; right skew opp. hand)

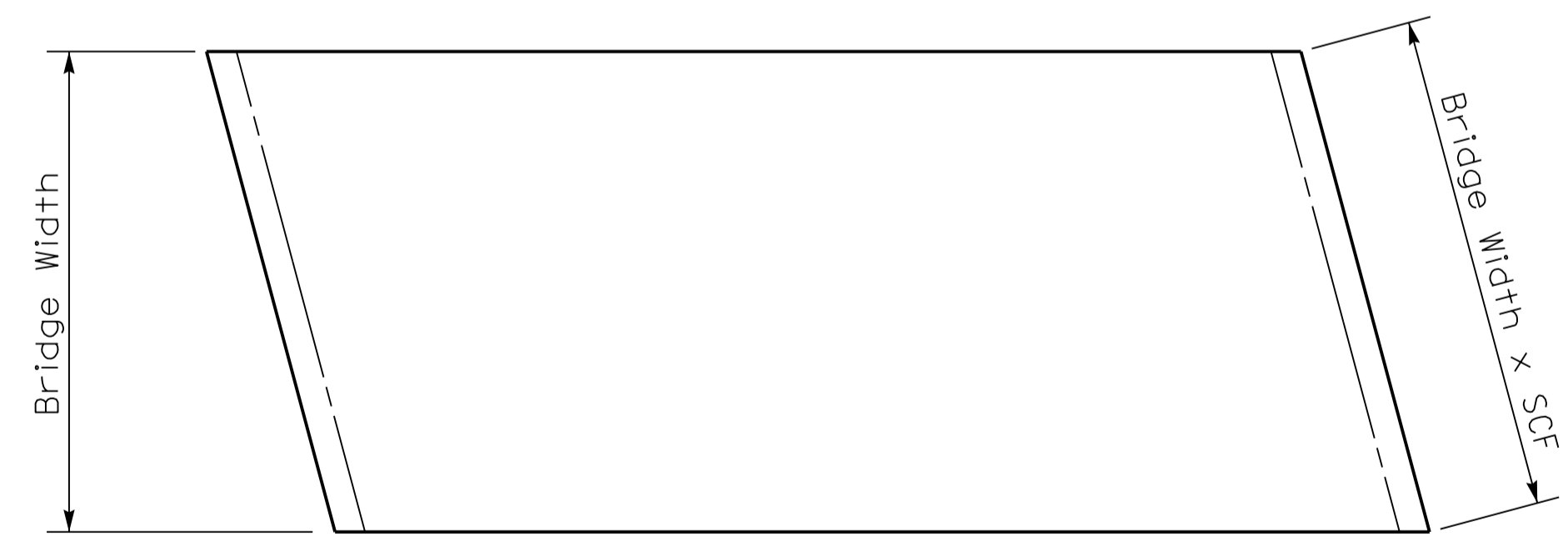
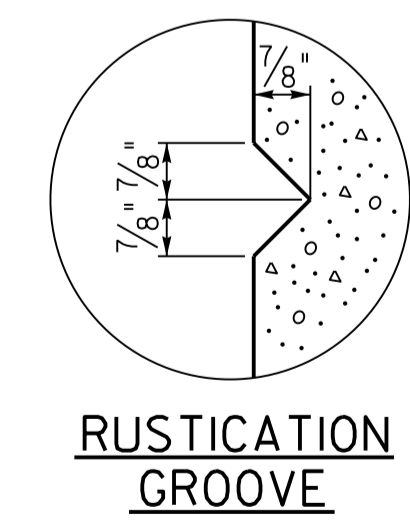
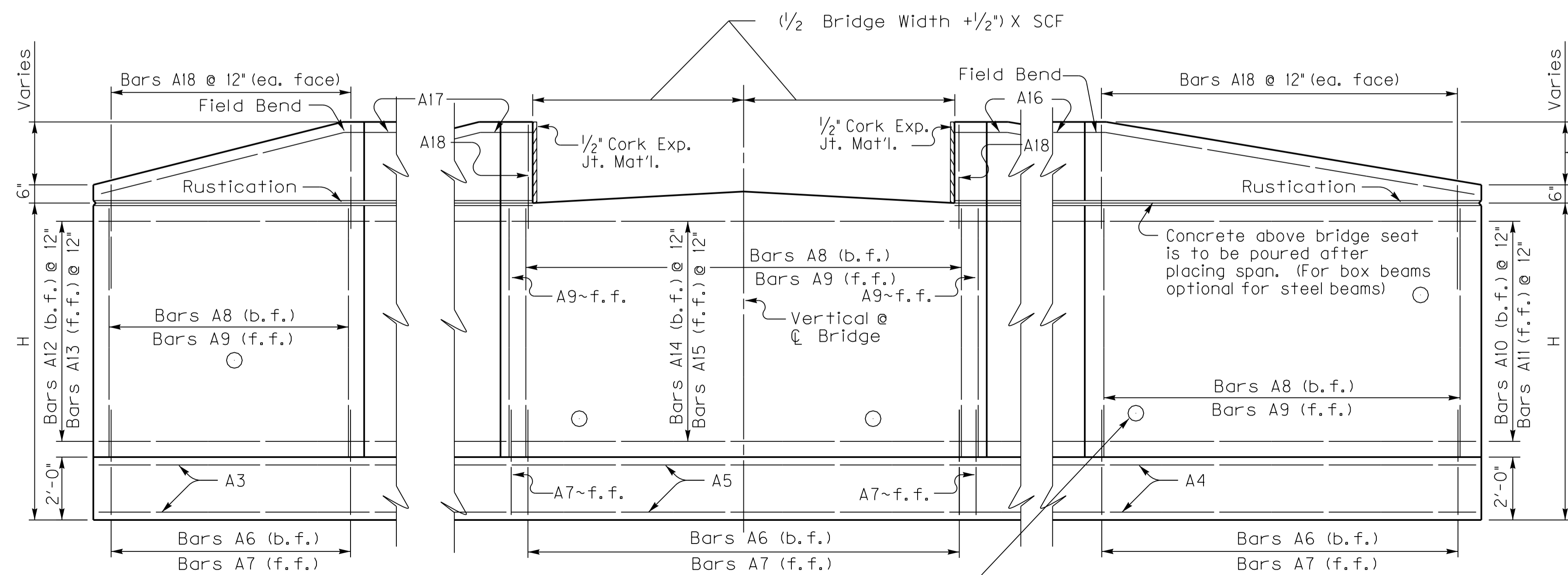
PLAN



H = Low Bridge Seat. Slope seat for side by side box beams. Step cap as necessary for rolled steel beam superstructures to achieve a 2% cross slope on deck.



Note: Trim A16 & A17 bars if necessary



Place 4" weep hole drains at 8'-0" centers at such elevation as to afford best drainage of backfill, in accordance with the Standard Specifications.

ABUTMENT DETAILS		
SKEW	WIDTH	DATE
5	VAR	October 2018

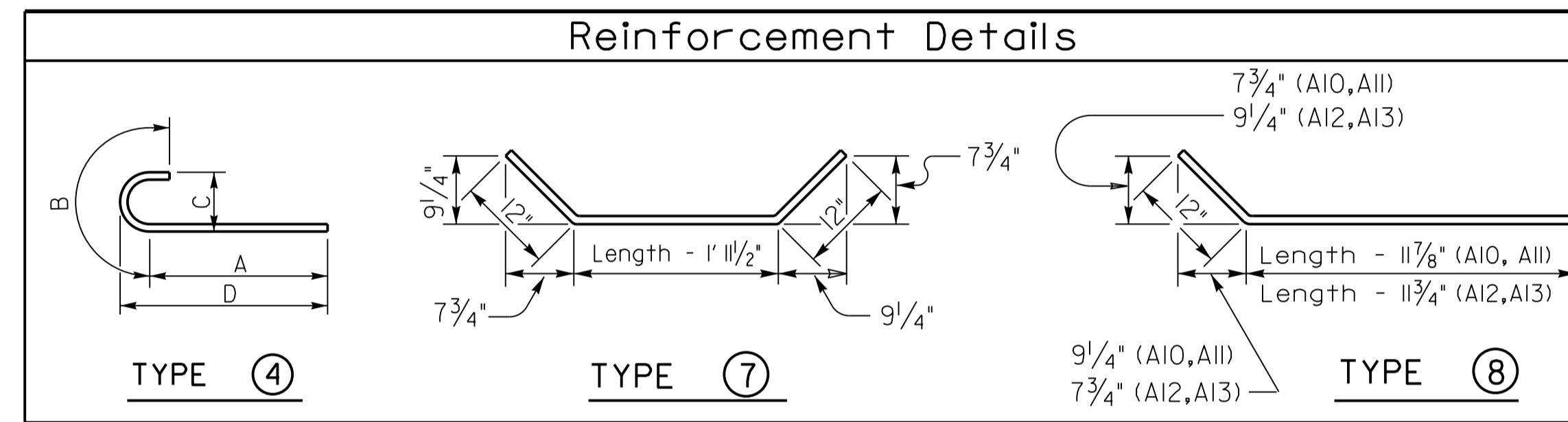
10° SKEW VARIABLE BRIDGE WIDTH 2:1 FILL SLOPES WINGS SKEWED 50% FROM ROADWAY TO BREASTWALL

Bill of Reinforcement

MARK	A1		A2		A3	A4		A5		A6				A7		A8		A9		A10	A11	A12	A13	A14		A15		A16	A17	A18
TYPE	Str.		Str.		Str.	Str.		Str.		4				Str.		Str.		Str.		8	8	8	8	7		7		Str.	Str.	Str.
SIZE	#5		#5		#5	#5		#5		#5				#5		#5		#5		#5	#5	#5	#5	#5		#5		#5	#5	#5
H	No.	Size	Length	Spacing	No.	Size	Length	Spacing	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length
			ft.	in.			ft.	in.		ft.		ft.		ft.		ft.		ft.		ft.		ft.		ft.		ft.		ft.		ft.
15-16	61+Nb=	10 11 8 12	61+Nb=	7 11 8 12	24 22 3	24 25 8	24 12 4	+Lb=		49+Nb=	9 9 11 12	8 1/8	1 10 0 11 3/4	8 6	52+Nb=	5 4 11 12	49+Nb=	6 12 10 12	52+Nb=	12 10 12	14 26 2	14 24 6	14 21 10	14 20 9	14 12 7	+Lb=		14 9 7	+Lb=	
13-14	55+Nb=	9 10 8 12	55+Nb=	7 10 8 12	22 20 1	22 22 6	22 11 11	+Lb=		44+Nb=	8 8 3 12	6 11 1 3 0 8 7 3		47+Nb=	5 4 11 12	44+Nb=	6 10 10 12	47+Nb=	10 10 12	12 23 2	12 21 6	12 19 10	12 18 9	12 12 7	+Lb=		12 9 7	+Lb=		
11-12	48+Nb=	8 9 8 12	48+Nb=	6 9 8 12	20 16 10	20 19 4	20 11 6	+Lb=		38+Nb=	7 7 1 12	5 10 1/2 1 2 0 7 6 2		41+Nb=	5 4 11 12	38+Nb=	5 8 10 12	41+Nb=	8 10 12	10 20 3	10 18 6	10 16 10	10 15 9	10 12 7	+Lb=		10 9 7	+Lb=		
9-10	42+Nb=	7 8 8 12	42+Nb=	5 8 8 12	18 14 7	18 16 2	18 11 1	+Lb=		33+Nb=	6 6 1 12	5 1 1 0 0 6 5 4		36+Nb=	5 4 11 12	33+Nb=	5 6 10 12	36+Nb=	6 10 12	8 17 3	8 15 6	8 14 11	8 13 9	8 12 7	+Lb=		8 9 7	+Lb=		
7-8	35+Nb=	6 7 2 12	35+Nb=	5 7 2 12	16 11 0	16 12 7	16 10 1	+Lb=		27+Nb=	5 5 7 12	4 8 1/2 0 10 0 5 4 11		30+Nb=	5 4 11 12	27+Nb=	5 4 10 12	30+Nb=	4 10 12	6 14 3	6 12 6	6 11 11	6 10 9	6 12 8	+Lb=		6 9 7	+Lb=		
5-6	29+Nb=	5 6 2 12	29+Nb=	5 6 2 12	14 8 9	14 9 5	14 9 8	+Lb=		22+Nb=	5 5 7 12	4 8 1/2 0 10 0 5 4 11		25+Nb=	5 4 11 12	22+Nb=	5 2 10 12	25+Nb=	2 10 12	4 11 3	4 9 6	4 9 11	4 8 9	4 12 8	+Lb=		4 9 7	+Lb=		

Table of Dimensions

H	W	N	M2	M3	T2	T3	L2	L3	S2		S3			
	Length	Length	Length	Length	Length	Length	Length	Length	Length	+Lb/2 =	Length	Length	+Lb/2 =	Length
	ft.	in.	ft.	in.	ft.	in.	ft.	in.	ft.	in.	ft.	in.	ft.	in.
15-16	12 0	5 0	16 5	17 5/8	19 6 7/8	14 3 3/4	23	19	6 10 1/2	+0.5Lb=		5 1 3/8	+0.5Lb=	
13-14	11 0	4 6	14 4 1/2	15 4 1/8	17 1 5/8	12 10 1/2	20	17	6 7 1/4	+0.5Lb=		4 11 5/8	+0.5Lb=	
11-12	10 0	4 0	12 4	12 10 3/8	14 8 3/8	10 9 5/8	17	14	6 4	+0.5Lb=		4 10	+0.5Lb=	
9-10	9 0	3 6	10 3 3/8	11 1 7/8	12 3 1/8	9 4 3/8	14	12	6 3/4	+0.5Lb=		4 8 1/4	+0.5Lb=	
7-8	7 6	2 9	8 2 1/8	8 7 1/8	9 9	7 2 1/2	11	9	5 7 1/8	+0.5Lb=		4 5 5/8	+0.5Lb=	
5-6	6 6	2 3	6 1 5/8	6 10 5/8	7 3 3/4	5 9 1/4	8	7	5 4 5/8	+0.5Lb=		4 3 7/8	+0.5Lb=	



*Concrete quantities computed using 21" beam depth on 1/2" pad & Variable Bridge Width

Quantities

H	Concrete*		Reinforcement	
	C.Y.		LBS.	
5	18.99	+(0.71xLb) =	1788	+(52.8xLb) =
6	20.68	+(0.78xLb) =	1788	+(52.8xLb) =
7	29.2	+(0.93xLb) =	2676	+(68.7xLb) =
8	31.26	+(1.01xLb) =	2676	+(68.7xLb) =
9	44.14	+(1.19xLb) =	4102	+(91xLb) =
10	46.65	+(1.27xLb) =	4102	+(91xLb) =
11	59.21	+(1.41xLb) =	5987	+(120.4xLb) =
12	62.08	+(1.49xLb) =	5987	+(120.4xLb) =
13	78.23	+(1.64xLb) =	8896	+(161xLb) =
14	81.55	+(1.71xLb) =	8896	+(161xLb) =
15	97.96	+(1.86xLb) =	11932	+(198.6xLb) =
16	101.65	+(1.93xLb) =	11932	+(198.6xLb) =

ABUTMENT SKEW CORRECTION FACTOR (SCF) = 1.015

NUMBER OF BARS TO ADD (Nb) = Bridge Width (feet) x SCF (round up to nearest whole number)

LENGTH OF ABUTMENT TO ADD (Lb) = Bridge Width (feet) x SCF (convert decimal to architectural)

GENERAL NOTES

SPECIFICATIONS: Construct abutments according to the current edition of the Kentucky Department of Highways Standard Specifications for Road and Bridge Construction. Abutments are designed for side by side box beams as detailed in Standard Drawings BDP-001 through BDP-012, current edition. Dimensions may be adjusted to allow for any out to out bridge width. Abutments are also adequate for Std. Dwg. slabs or steel beam superstructures

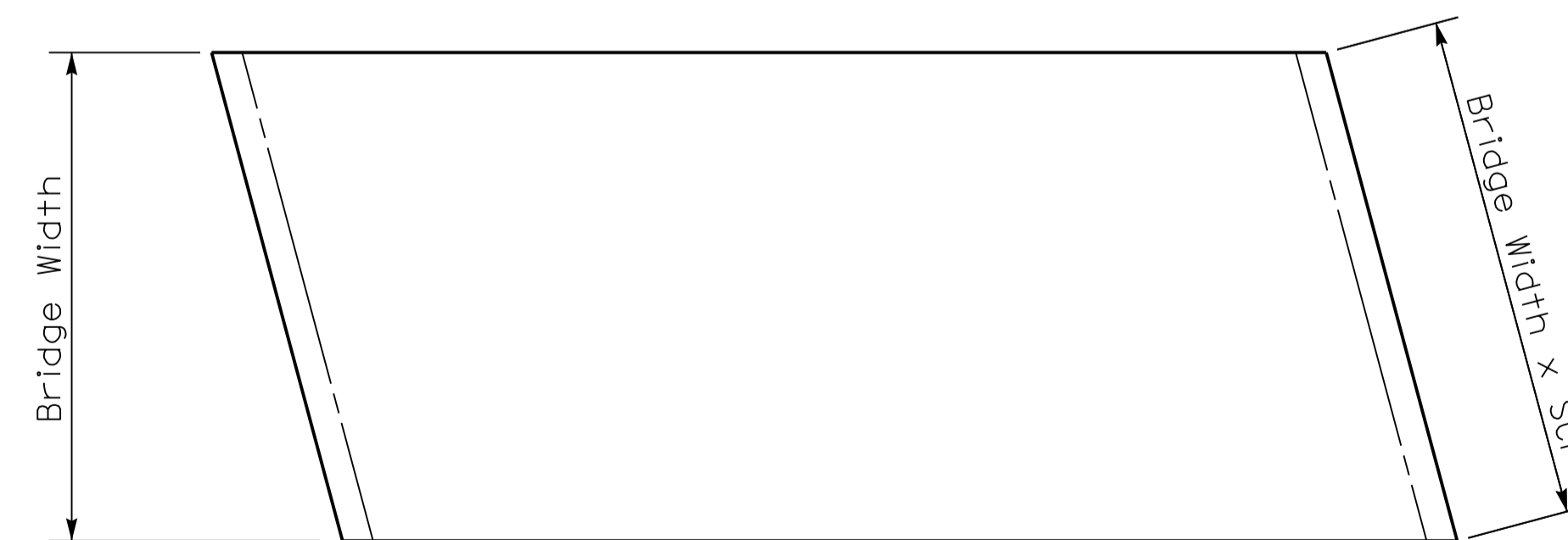
FOUNDATION PRESSURE: Construct abutment footings on solid rock bearing material that can support a pressure of 8000 psf service or 10,800 psf strength factored, as recommended by a geotechnical engineer.

WING LENGTHS: Calculated assuming 21" superstructure depth and stream bank elevation at top of footing.

FOOTING ELEVATION: Construct bottom of footing below the anticipated scour elevation. (This typically entails embedding the footings 1'-0" to 2'-0" into rock and pouring concrete directly against cut rock faces, as recommended by geotechnical engineer.)

NOTE: Distances to bars shown are clear dimensions unless otherwise noted.

MATERIAL SPECIFICATIONS:
 Concrete, Class "A" = 3500 psi
 Steel Reinforcement = Grade 60



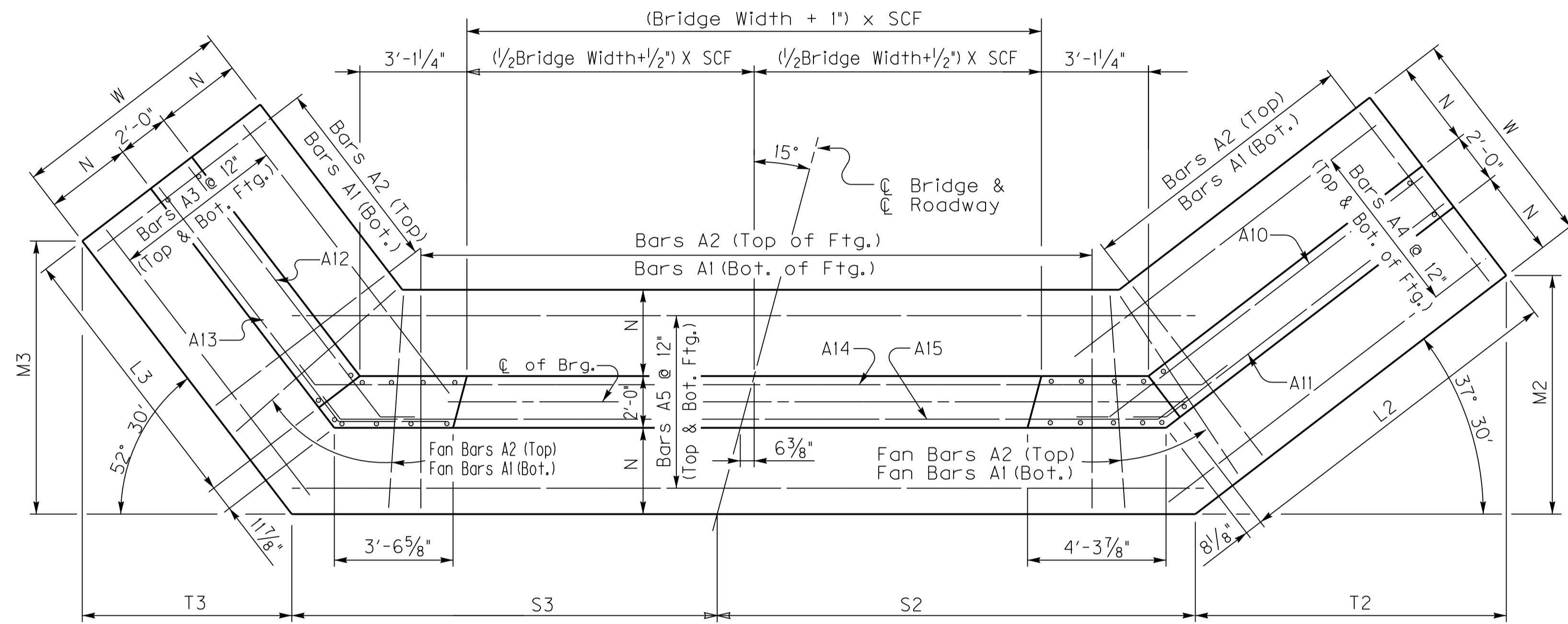
PLAN OF SUPERSTRUCTURE SLAB

ABUTMENT DETAILS

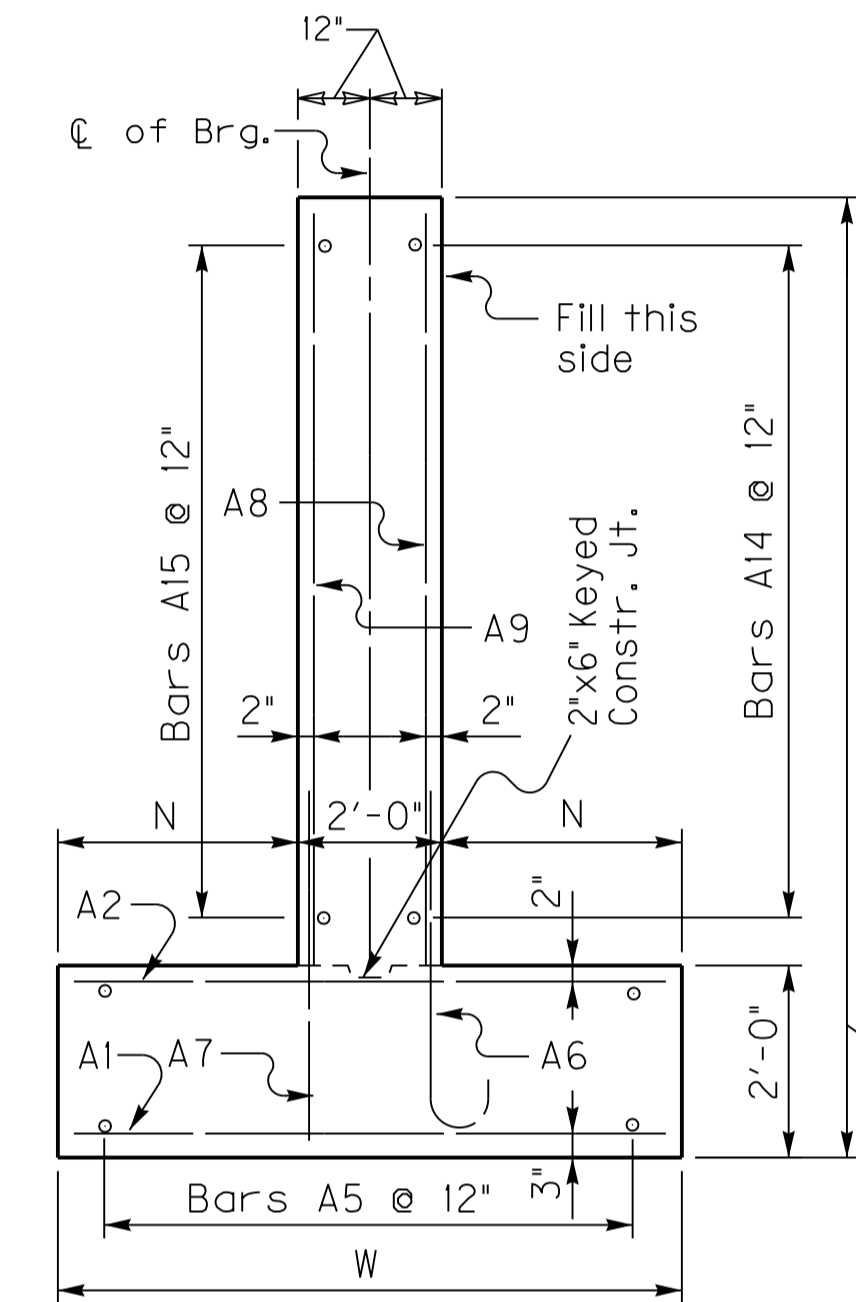
SKEW	WIDTH	DATE
10	VAR	October 2018

15° SKEW VARIABLE BRIDGE WIDTH 2:1 FILL SLOPES WINGS SKEWED 50% FROM ROADWAY TO BREASTWALL

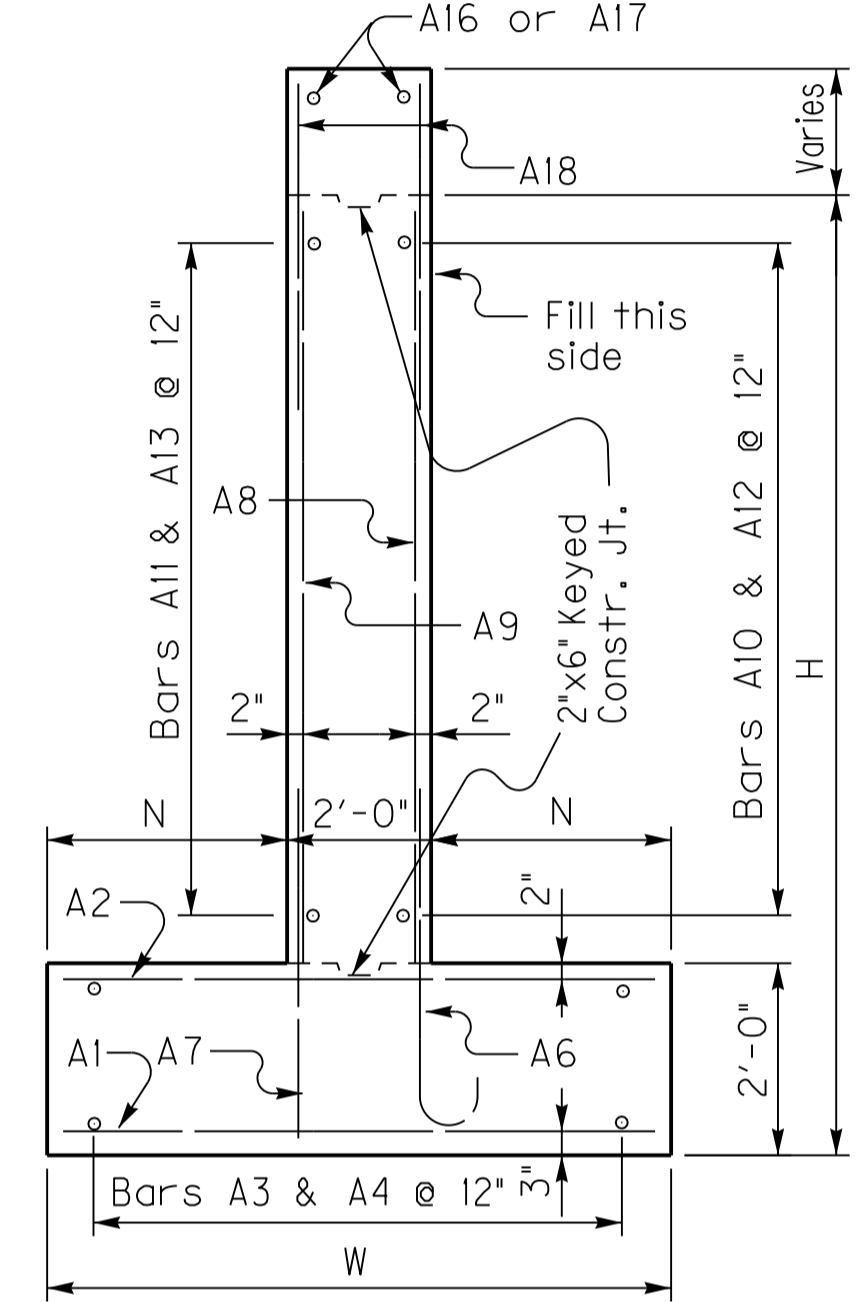
ABUTMENT SKEW CORRECTION FACTOR (SCF) = 1.035



(Left Skew as shown; right skew opp. hand) **PLAN**

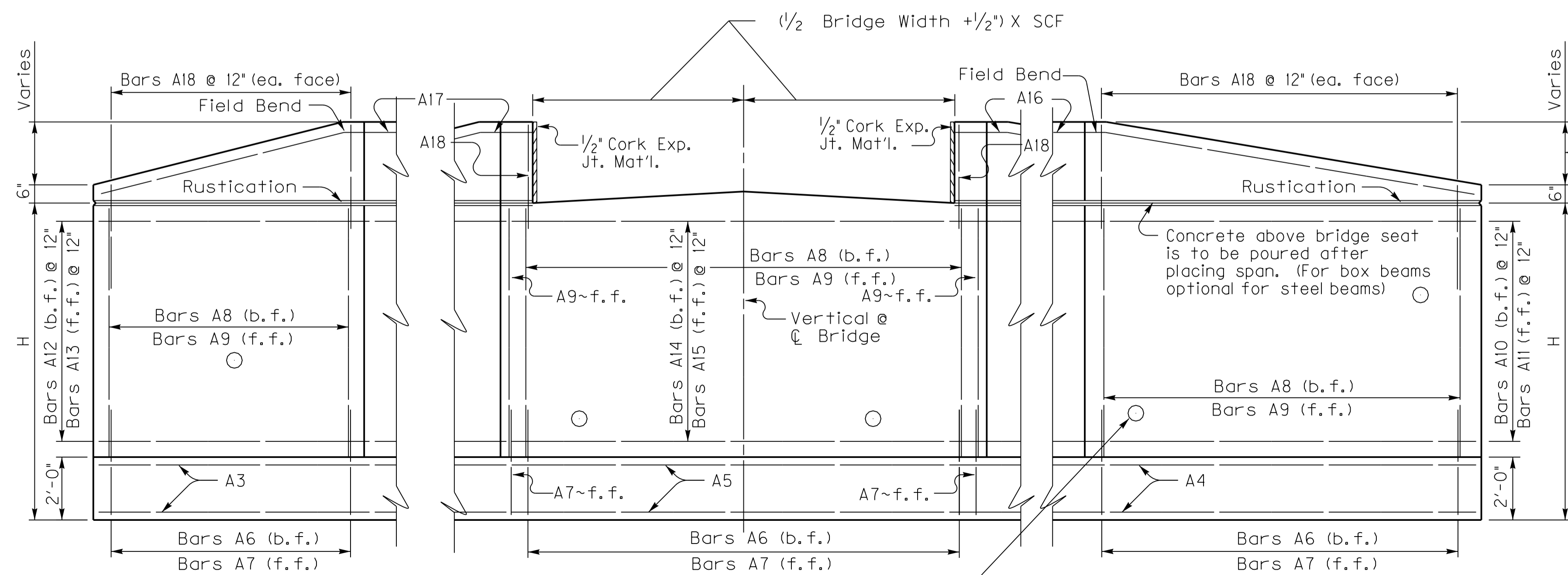


WALL SECTION

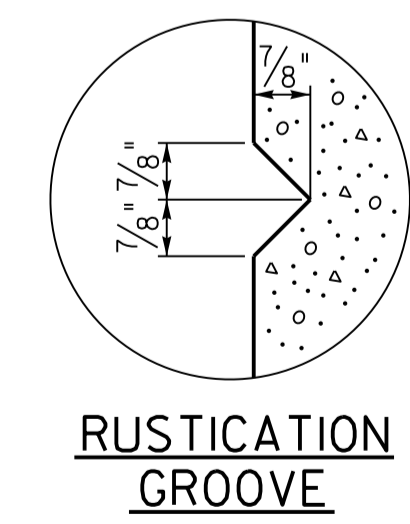


WING SECTION

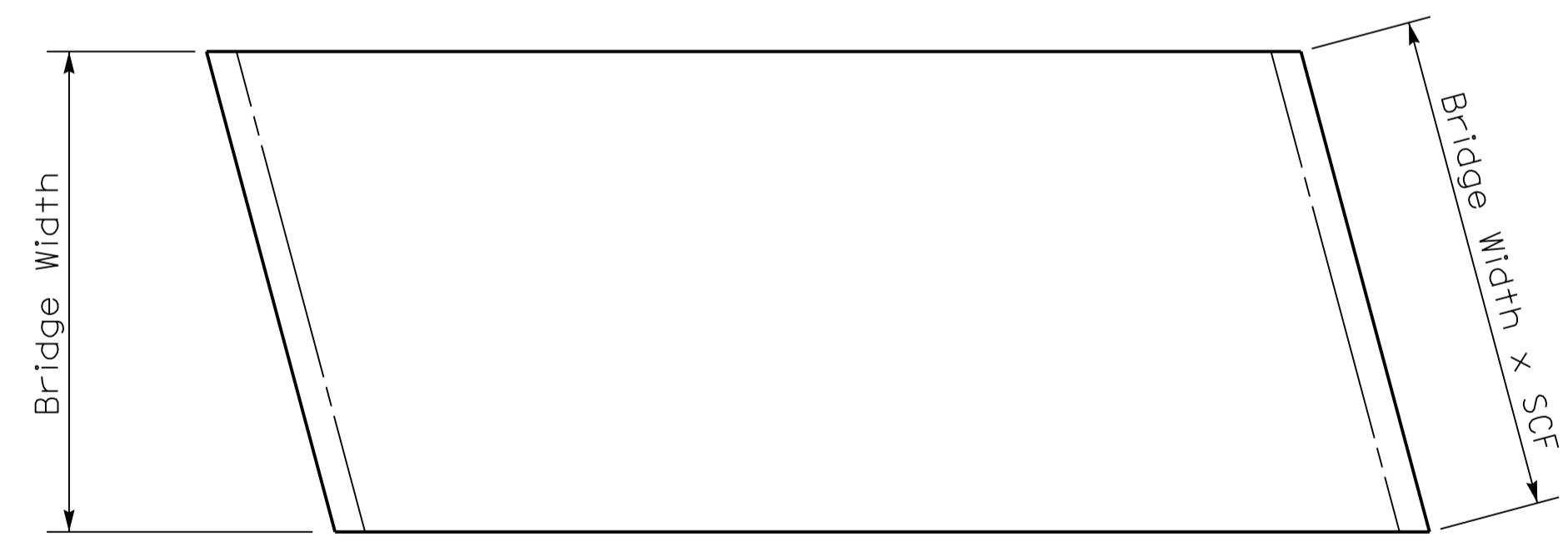
Note: Trim A16 & A17 bars if necessary



ELEVATION



RUSTICATION GROOVE



PLAN OF SUPERSTRUCTURE SLAB

Place 4\" weep hole drains at 8'-0\" centers at such elevation as to afford best drainage of backfill, in accordance with the Standard Specifications.

ABUTMENT DETAILS		
SKEW	WIDTH	DATE
15	VAR	October 2018

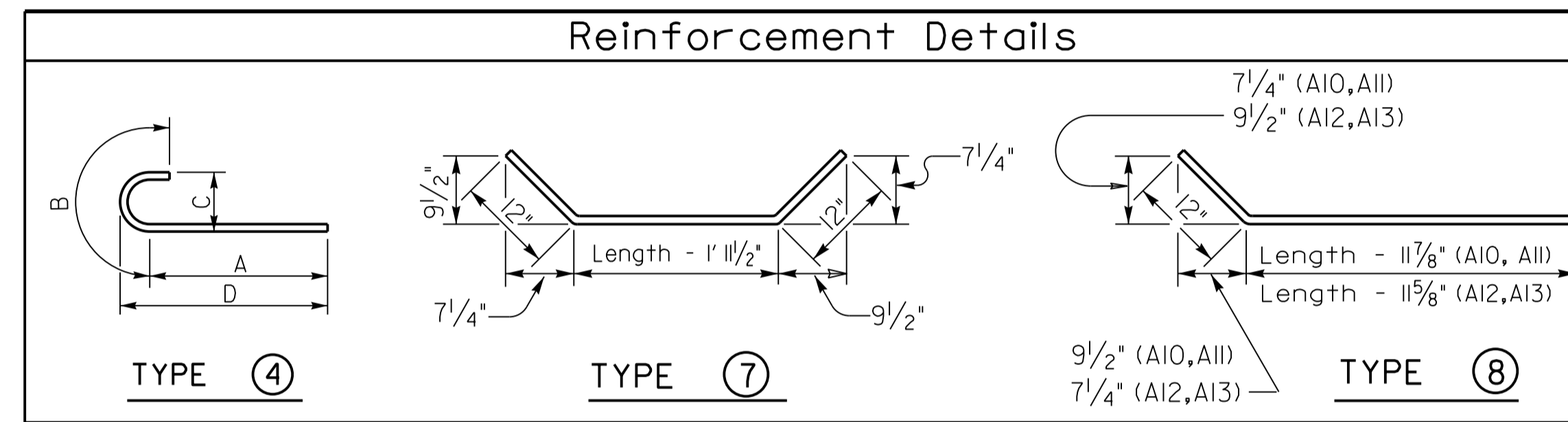
15° SKEW VARIABLE BRIDGE WIDTH 2:1 FILL SLOPES WINGS SKEWED 50% FROM ROADWAY TO BREASTWALL

Bill of Reinforcement

MARK	A1		A2		A3	A4		A5		A6				A7		A8		A9	A10	A11	A12	A13	A14		A15		A16	A17	A18							
TYPE	Str.		Str.		Str.	Str.		Str.		4				Str.		Str.		Str.	8	8	8	8	7		7		Str.	Str.	Str.							
SIZE	#5		#5		#5	#5		#5		#5				#5		#5		#5	#5	#5	#5	#5	#5		#5		#5	#5	#5							
15-16	No.	Size	Length	Spacing	No.	Size	Length	Spacing	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length						
15-16	61+Nb=	10 11 8	12		61+Nb=	7 11 8	12		24 21 5	24 26 7	24 12 5	+Lb=		49+Nb=	9 9 11	12		49+Nb=	6 12 10	12		52+Nb=	12 10 12	14 27 4	14 25 6	14 20 10	14 19 9	14 12 9	+Lb=		14 9 8	+Lb=		2 28 11	2 22 6	105 5 9
13-14	55+Nb=	9 10 8	12		55+Nb=	7 10 8	12		22 19 2	22 23 5	22 12 0	+Lb=		44+Nb=	8 8 3	12		44+Nb=	6 10 10	12		47+Nb=	10 10 12	12 24 4	12 22 6	12 18 10	12 17 9	12 12 9	+Lb=		12 9 8	+Lb=		2 25 11	2 20 6	95 5 9
11-12	49+Nb=	8 9 8	12		49+Nb=	6 9 8	12		20 16 11	20 20 3	20 11 7	+Lb=		39+Nb=	7 7 1	12		39+Nb=	5 8 10	12		42+Nb=	8 10 12	10 21 4	10 19 6	10 16 10	10 15 9	10 12 9	+Lb=		10 9 8	+Lb=		2 22 11	2 18 6	85 5 9
9-10	43+Nb=	7 8 8	12		43+Nb=	5 8 8	12		18 13 8	18 17 1	18 11 2	+Lb=		33+Nb=	6 6 1	12		33+Nb=	5 6 10	12		36+Nb=	6 10 12	8 18 4	8 16 6	8 13 10	8 12 9	8 12 10	+Lb=		8 9 8	+Lb=		2 19 11	2 15 6	73 5 9
7-8	35+Nb=	6 7 2	12		35+Nb=	5 7 2	12		16 11 2	16 12 6	16 10 2	+Lb=		27+Nb=	5 5 7	12		27+Nb=	5 4 10	12		30+Nb=	4 10 12	6 14 4	6 12 6	6 11 10	6 10 9	6 12 10	+Lb=		6 9 8	+Lb=		2 15 11	2 13 6	61 5 9
5-6	30+Nb=	5 6 2	12		30+Nb=	5 6 2	12		14 8 11	14 10 4	14 9 9	+Lb=		23+Nb=	5 5 7	12		23+Nb=	5 4 11	12		26+Nb=	2 10 12	4 12 4	4 10 6	4 9 10	4 8 9	4 12 10	+Lb=		4 9 8	+Lb=		2 13 11	2 11 6	53 5 9

Table of Dimensions

H	W	N	M2	M3	T2	T3	L2	L3	S2		S3	
H	Length	Length	Length	Length	Length	Length	Length	Length	Length	+Lb/2=	Length	Length
	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft.	ft.	ft. in.	ft. in.	ft. in.	ft. in.
15-16	12 0 5 0	16 5/8	17 1/4	20 11/8	13 3/4	24	18	7 4 3/4	+0.5Lb=		4 8 3/4	+0.5Lb=
13-14	11 0 4 6	14 1/2	15 2 7/8	18 4 7/8	11 8 1/4	21	16	7 1 1/8	+0.5Lb=		4 7 3/8	+0.5Lb=
11-12	10 0 4 0	12 2 3/8	13 5 1/2	15 10 3/4	10 3 3/8	18	14	6 9 1/2	+0.5Lb=		4 6	+0.5Lb=
9-10	9 0 3 6	10 3 1/4	10 10 1/2	13 4 5/8	8 4 1/8	15	11	6 5 7/8	+0.5Lb=		4 4 5/8	+0.5Lb=
7-8	7 6 2 9	7 8 1/8	9 0	10 1/8	6 10 7/8	11	9	6 3/8	+0.5Lb=		4 2 5/8	+0.5Lb=
5-6	6 6 2 3	6 4 1/4	7 2 5/8	8 3 3/8	5 6 1/2	9	7	5 8 3/4	+0.5Lb=		4 1 1/4	+0.5Lb=



*Concrete quantities computed using 21' beam depth on 1/2' pad & Variable Bridge Width

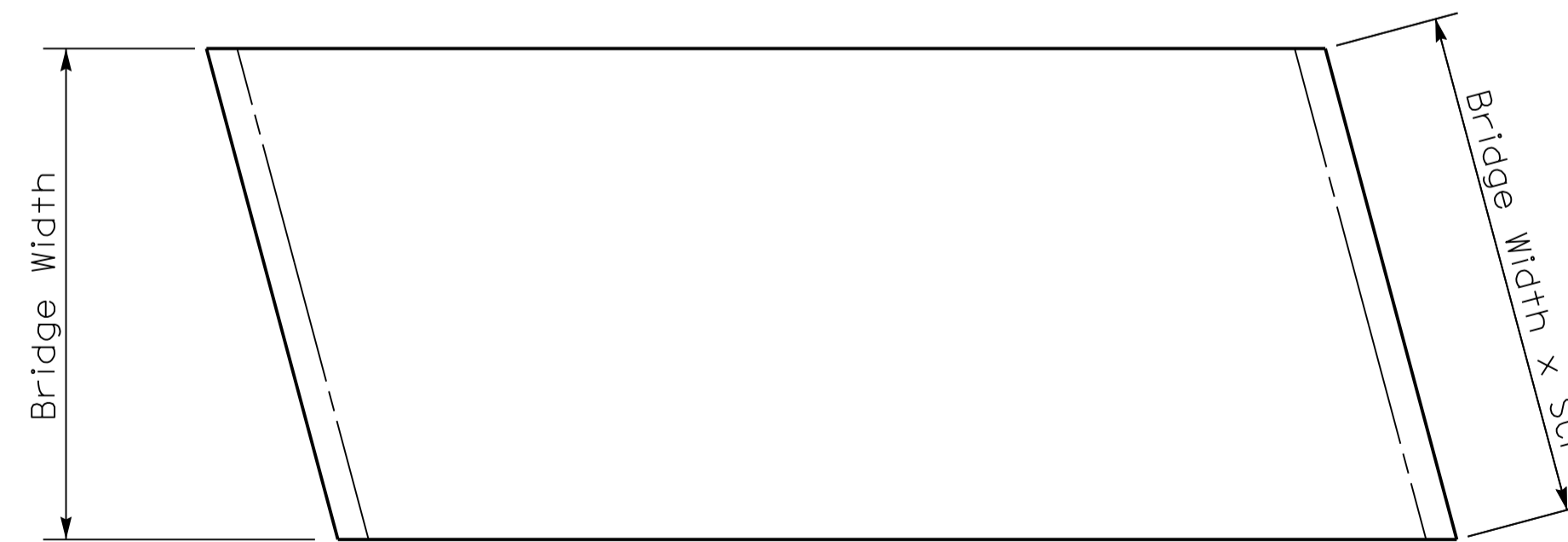
Quantities

H	Concrete* C.Y.	Reinforcement LBS.
5	19.9+(0.71xLb) =	1864+(52.8xLb) =
6	21.68+(0.78xLb) =	1864+(52.8xLb) =
7	29.34+(0.93xLb) =	2687+(68.7xLb) =
8	31.41+(1.01xLb) =	2687+(68.7xLb) =
9	44.31+(1.19xLb) =	4139+(91xLb) =
10	46.83+(1.27xLb) =	4139+(91xLb) =
11	60.91+(1.41xLb) =	6133+(120.4xLb) =
12	63.87+(1.49xLb) =	6133+(120.4xLb) =
13	78.45+(1.64xLb) =	8909+(161xLb) =
14	81.78+(1.71xLb) =	8909+(161xLb) =
15	98.21+(1.86xLb) =	11949+(198.6xLb) =
16	101.91+(1.93xLb) =	11949+(198.6xLb) =

ABUTMENT SKEW CORRECTION FACTOR (SCF) = 1.035

NUMBER OF BARS TO ADD (Nb) = Bridge Width (feet) x SCF (round up to nearest whole number)

LENGTH OF ABUTMENT TO ADD (Lb) = Bridge Width (feet) x SCF (convert decimal to architectural)



PLAN OF SUPERSTRUCTURE SLAB

GENERAL NOTES

SPECIFICATIONS: Construct abutments according to the current edition of the Kentucky Department of Highways Standard Specifications for Road and Bridge Construction. Abutments are designed for side by side box beams as detailed in Standard Drawings BDP-001 through BDP-012, current edition. Dimensions may be adjusted to allow for any out to out bridge width. Abutments are also adequate for Std. Dwg. slabs or steel beam superstructures

FOUNDATION PRESSURE: Construct abutment footings on solid rock bearing material that can support a pressure of 8000 psf service or 10,800 psf strength factored, as recommended by a geotechnical engineer.

WING LENGTHS: Calculated assuming 21' superstructure depth and stream bank elevation at top of footing.

FOOTING ELEVATION: Construct bottom of footing below the anticipated scour elevation. (This typically entails embedding the footings 1'-0" to 2'-0" into rock and pouring concrete directly against cut rock faces, as recommended by geotechnical engineer.)

NOTE: Distances to bars shown are clear dimensions unless otherwise noted.

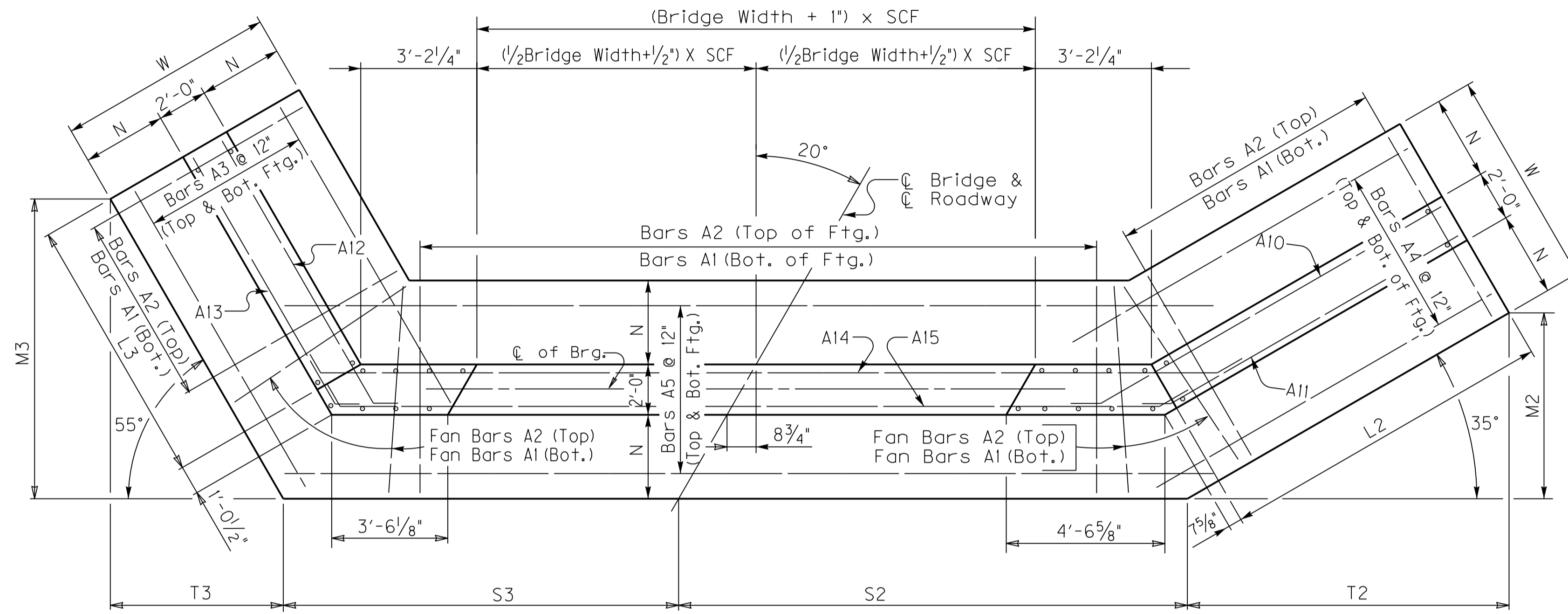
MATERIAL SPECIFICATIONS:
 Concrete, Class "A" = 3500 psi
 Steel Reinforcement = Grade 60

ABUTMENT DETAILS

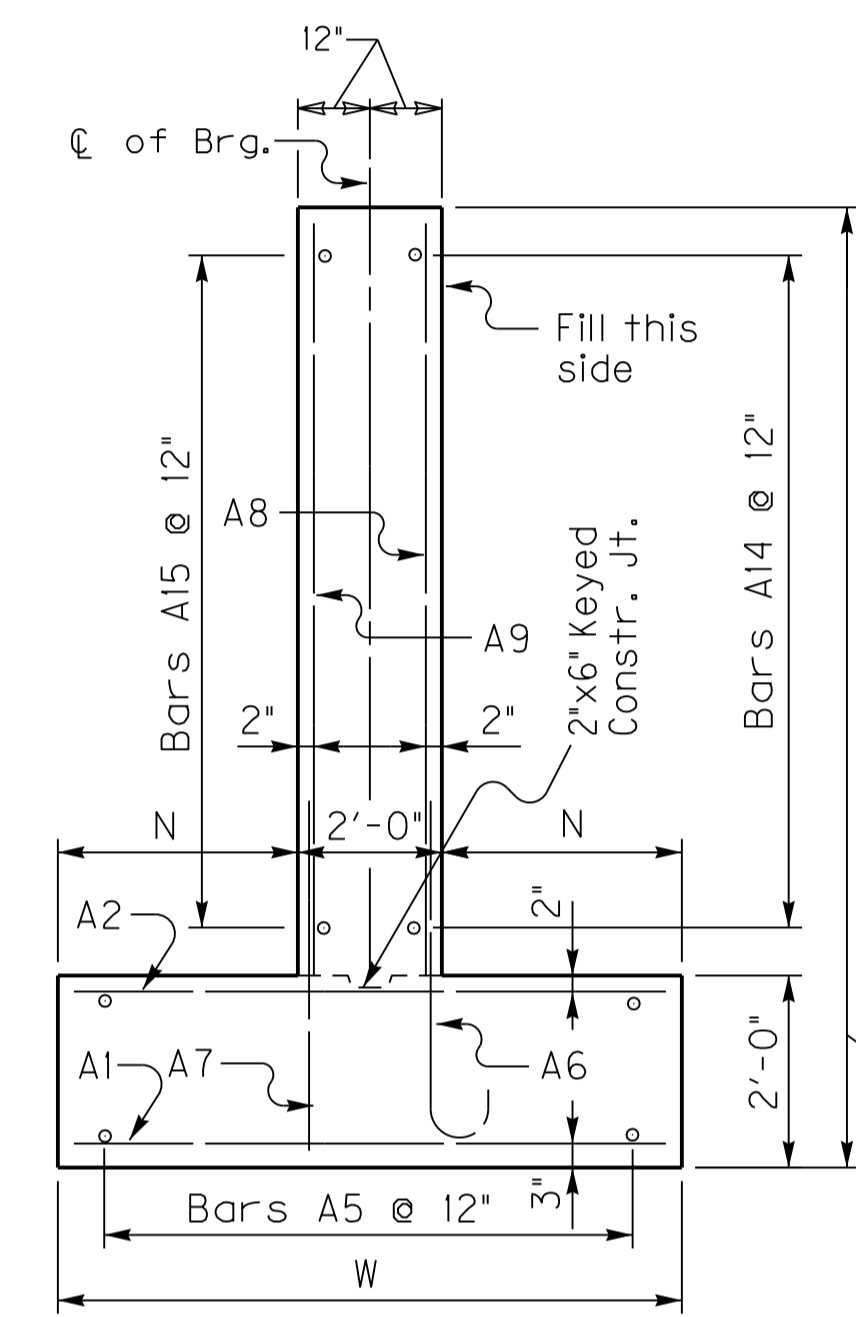
SKEW	WIDTH	DATE
15	VAR	October 2018

20° SKEW VARIABLE BRIDGE WIDTH 2:1 FILL SLOPES WINGS SKEWED 50% FROM ROADWAY TO BREASTWALL

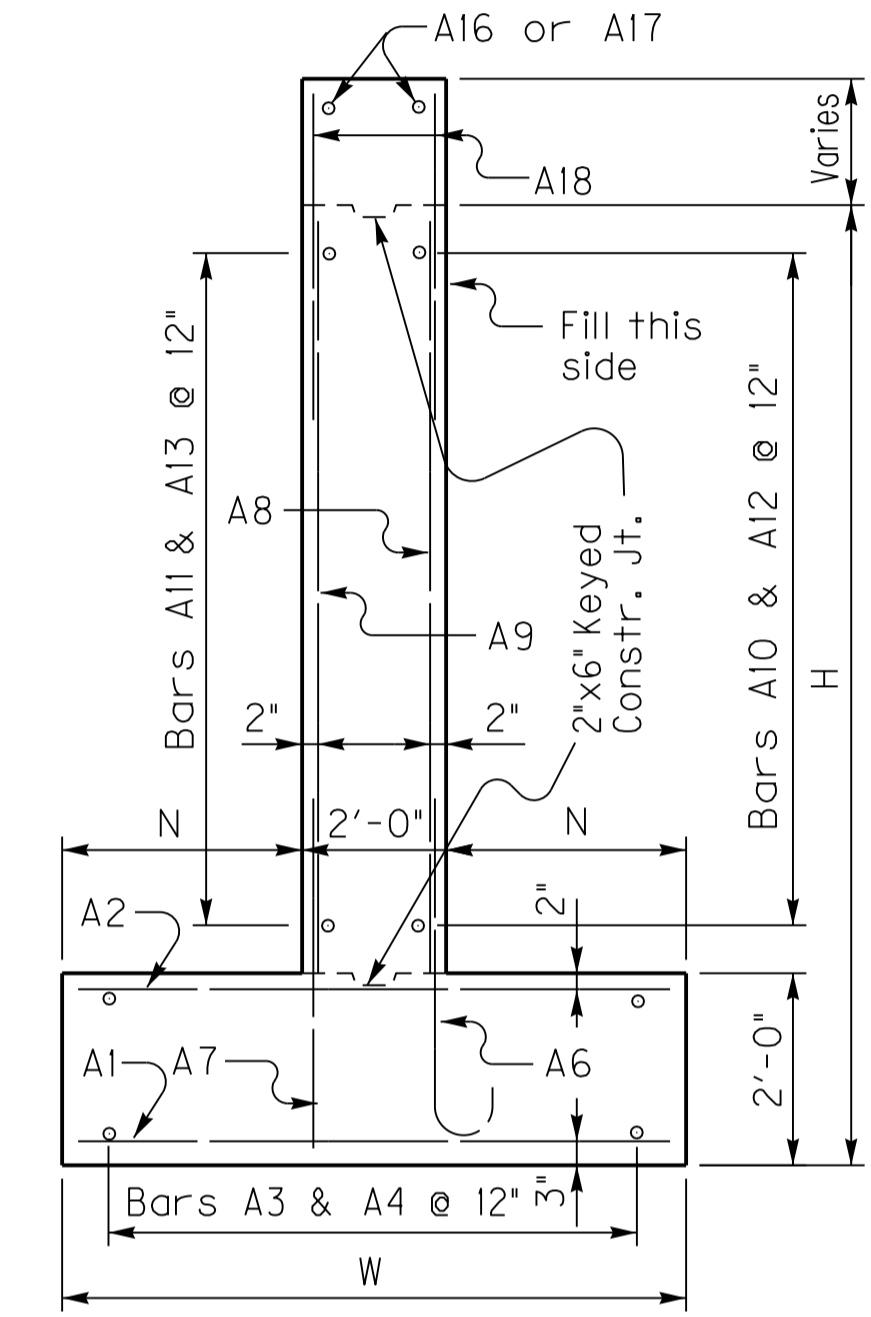
ABUTMENT SKEW CORRECTION FACTOR (SCF) = 1.064



(Left Skew as shown; right skew opp. hand) **PLAN**



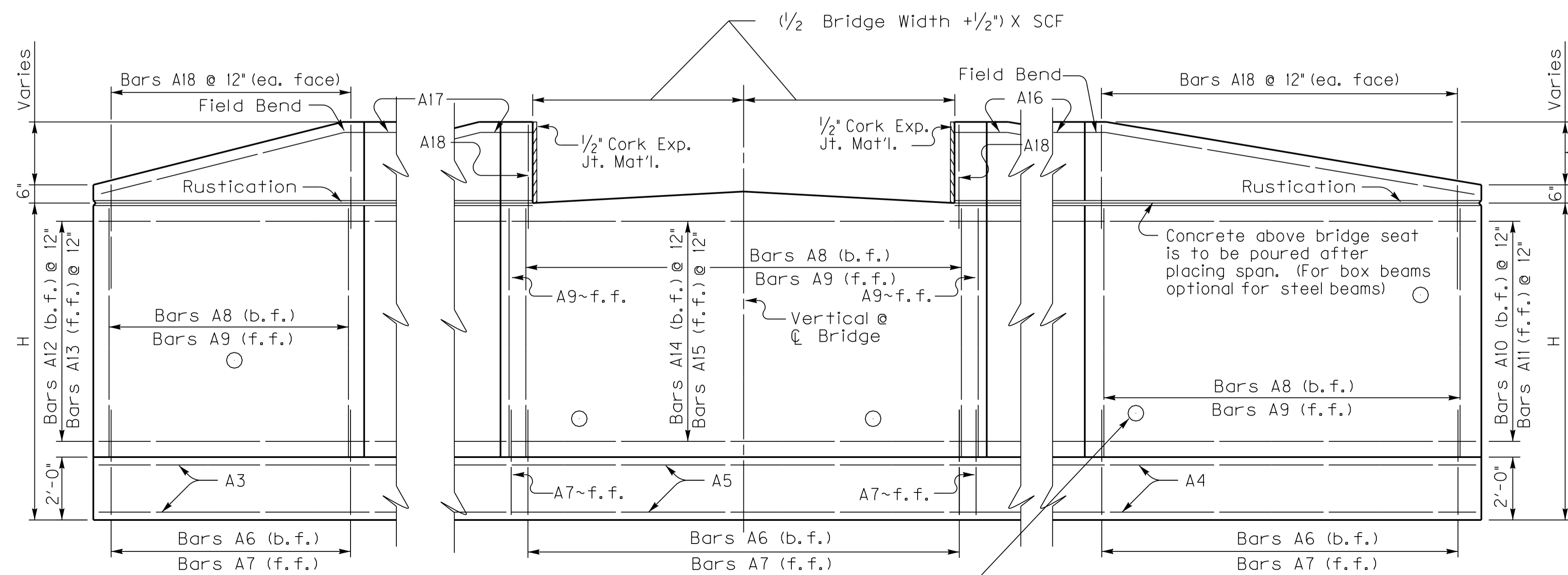
WALL SECTION



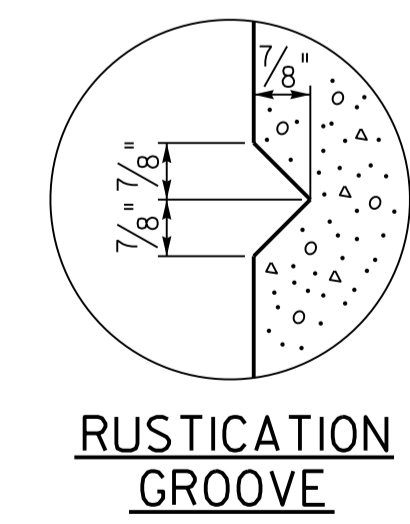
WING SECTION

H = Low Bridge Seat. Slope seat for side by side box beams. Step cap as necessary for rolled steel beam superstructures to achieve a 2% cross slope on deck.

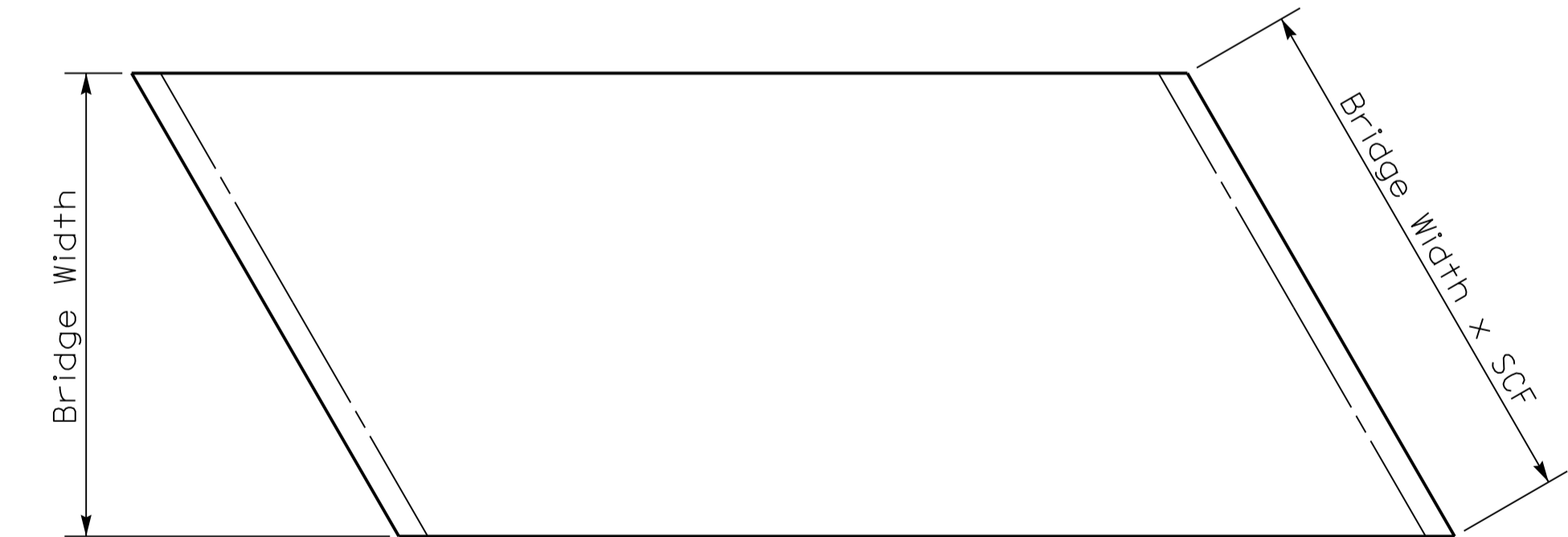
Note: Trim A16 & A17 bars if necessary



ELEVATION



RUSTICATION GROOVE



PLAN OF SUPERSTRUCTURE SLAB

Place 4\"/>

ABUTMENT DETAILS

SKEW	WIDTH	DATE
20	VAR	October 2018

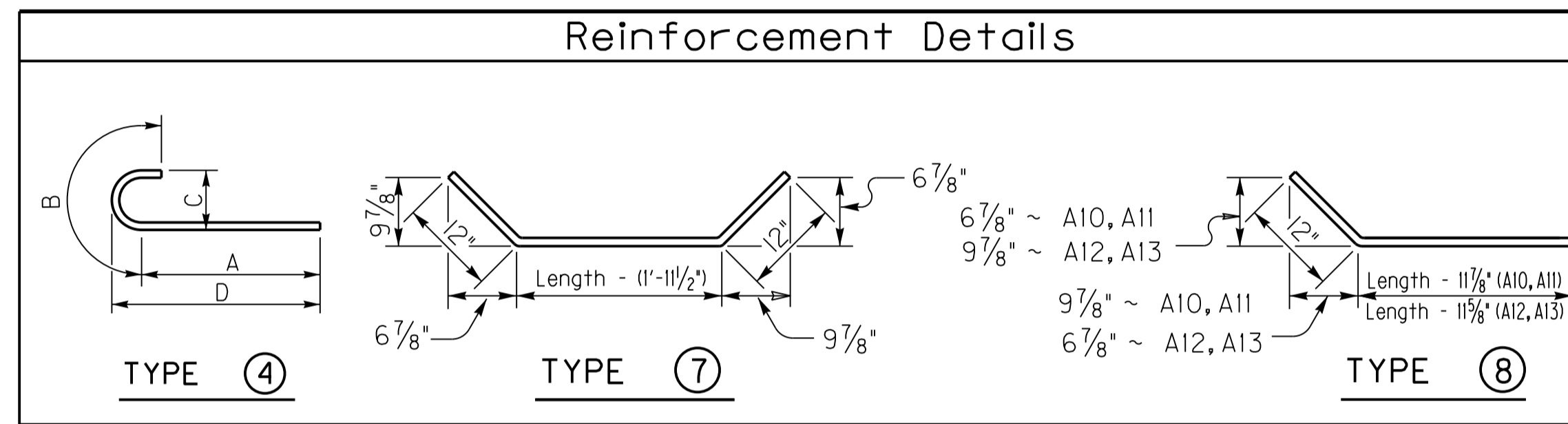
20° SKEW VARIABLE BRIDGE WIDTH 2:1 FILL SLOPES WINGS SKEWED 50% FROM ROADWAY TO BREASTWALL

Bill of Reinforcement

MARK	A1		A2		A3	A4	A5		A6				A7	A8		A9	A10	A11	A12	A13	A14		A15	A16	A17	A18																																																						
TYPE	Str.		Str.		Str.	Str.	Str.		4				Str.	Str.		Str.	8	8	8	8	7		7	Str.	Str.	Str.																																																						
SIZE	#5		#5		#5	#5	#5		#5				#5	#5		#5	#5	#5	#5	#5	#5		#5	#5	#5	#5																																																						
H	No.	Size	Length	Spacing	No.	Size	Length	Spacing	No.	Length	Spacing	No.	Length	Spacing	No.	Length	Spacing	No.	Length	Spacing	No.	Length	Spacing	No.	Length	Spacing																																																						
			ft.	in.			ft.	in.		ft.	in.		ft.	in.		ft.	in.		ft.	in.		ft.	in.		ft.	in.																																																						
15-16	63+Nb=	10	11	8	12	63+Nb=	7	11	8	12	24	21	7	24	28	5	24	12	7	+Lb=		51+Nb=	9	9	11	12	8	1/8	1	10	0	11	3/4	8	6	54+Nb=	5	4	11	12	51+Nb=	6	12	10	12	54+Nb=	12	10	12	14	29	5	14	27	5	14	20	9	14	19	10	14	13	0	+Lb=		14	9	11	+Lb=		2	31	1	2	22	6	109	5	9
13-14	55+Nb=	9	10	8	12	55+Nb=	7	10	8	12	22	18	4	22	24	3	22	12	2	+Lb=		44+Nb=	8	8	3	12	6	11	1	3	0	8	7	3	47+Nb=	5	4	11	12	44+Nb=	6	10	10	12	47+Nb=	10	10	12	12	25	6	12	23	5	12	17	9	12	16	10	12	13	0	+Lb=		12	9	11	+Lb=		2	27	1	2	19	6	95	5	9	
11-12	49+Nb=	8	9	8	12	49+Nb=	6	9	8	12	20	16	1	20	21	1	20	11	9	+Lb=		39+Nb=	7	7	1	12	5	10	1/2	1	2	0	7	6	2	42+Nb=	5	4	11	12	39+Nb=	5	8	10	12	42+Nb=	8	10	12	10	22	6	10	20	5	10	15	9	10	14	10	10	13	1	+Lb=		10	9	11	+Lb=		2	24	1	2	17	6	85	5	9
9-10	43+Nb=	7	8	8	12	43+Nb=	5	8	8	12	18	13	10	18	17	11	18	11	4	+Lb=		34+Nb=	6	6	1	12	5	1	1	0	0	6	5	4	37+Nb=	5	4	11	12	34+Nb=	5	6	10	12	37+Nb=	6	10	12	8	19	6	8	17	5	8	13	9	8	12	10	8	13	1	+Lb=		8	9	11	+Lb=		2	21	1	2	15	6	75	5	9	
7-8	35+Nb=	6	7	2	12	35+Nb=	5	7	2	12	16	10	3	16	13	4	16	10	4	+Lb=		27+Nb=	5	5	7	12	4	8	1/2	0	10	0	5	4	11	30+Nb=	5	4	11	12	27+Nb=	5	4	10	12	30+Nb=	4	10	12	6	15	6	6	13	5	6	10	9	6	9	10	6	13	1	+Lb=		6	9	11	+Lb=		2	17	1	2	12	6	61	5	9
5-6	29+Nb=	5	6	2	12	29+Nb=	5	6	2	12	14	8	0	14	10	2	14	9	11	+Lb=		22+Nb=	5	5	7	12	4	8	1/2	0	10	0	5	4	11	25+Nb=	5	4	11	12	22+Nb=	5	2	10	12	25+Nb=	2	10	12	4	12	6	4	10	5	4	8	9	4	7	10	4	13	1	+Lb=		4	9	11	+Lb=		2	14	1	2	10	6	51	5	9

Table of Dimensions

H	W		N		M2		M3		T2		T3		L2		L3		S2		S3		
	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	
	ft.	in.	ft.	in.	ft.	in.	ft.	in.	ft.	in.	ft.	in.	ft.	in.	ft.	in.	ft.	in.	ft.	in.	
15-16	12	0	5	0	16	2 1/8	17	8 3/4	23	1 1/4	12	5	26	18	7	11 7/8			4	4	+0.5Lb=
13-14	11	0	4	6	13	9 1/2	15	3/4	19	8 3/8	10	6 1/2	22	15	7	7 7/8			4	3	+0.5Lb=
11-12	10	0	4	0	11	11 3/4	13	2 1/2	17	1 3/8	9	3	19	13	7	3 3/4			4	2 1/8	+0.5Lb=
9-10	9	0	3	6	10	2 1/8	11	4 1/4	14	6 3/8	7	11 3/8	16	11	6	11 5/8			4	1 1/8	+0.5Lb=
7-8	7	6	2	9	7	8 1/8	8	7	11	5/8	6	1/8	12	8	6	5 1/2			3	11 3/4	+0.5Lb=
5-6	6	6	2	3	5	11 1/8	6	8 3/4	8	5 5/8	4	8 1/2	9	6	6	1 1/2			3	10 7/8	+0.5Lb=



*Concrete quantities computed using 21" beam depth on 1/2" pad & Variable Bridge Width

Quantities

H	Concrete*		Reinforcement
	C.Y.		LBS.
5	19.26+(0.71xLb) =		1802+(52.8xLb) =
6	20.97+(0.78xLb) =		1802+(52.8xLb) =
7	29.54+(0.93xLb) =		2692+(68.7xLb) =
8	31.63+(1.01xLb) =		2692+(68.7xLb) =
9	45.85+(1.19xLb) =		4226+(91xLb) =
10	48.45+(1.27xLb) =		4226+(91xLb) =
11	61.2+(1.41xLb) =		6144+(120.4xLb) =
12	64.18+(1.49xLb) =		6144+(120.4xLb) =
13	78.78+(1.64xLb) =		8921+(161xLb) =
14	82.13+(1.71xLb) =		8921+(161xLb) =
15	102.49+(1.86xLb) =		12387+(198.6xLb) =
16	106.35+(1.93xLb) =		12387+(198.6xLb) =

ABUTMENT SKEW CORRECTION FACTOR (SCF) = 1.064

NUMBER OF BARS TO ADD (Nb) = Bridge Width (feet) x SCF

(round up to nearest whole number)

LENGTH OF ABUTMENT TO ADD (Lb) = Bridge Width (feet) x SCF

(convert decimal to architectural)

GENERAL NOTES

SPECIFICATIONS: Construct abutments according to the current edition of the Kentucky Department of Highways Standard Specifications for Road and Bridge Construction. Abutments are designed for side by side box beams as detailed in Standard Drawings BDP-001 through BDP-012, current edition. Dimensions may be adjusted to allow for any out to out bridge width. Abutments are also adequate for Std. Dwg. slabs or steel beam superstructures

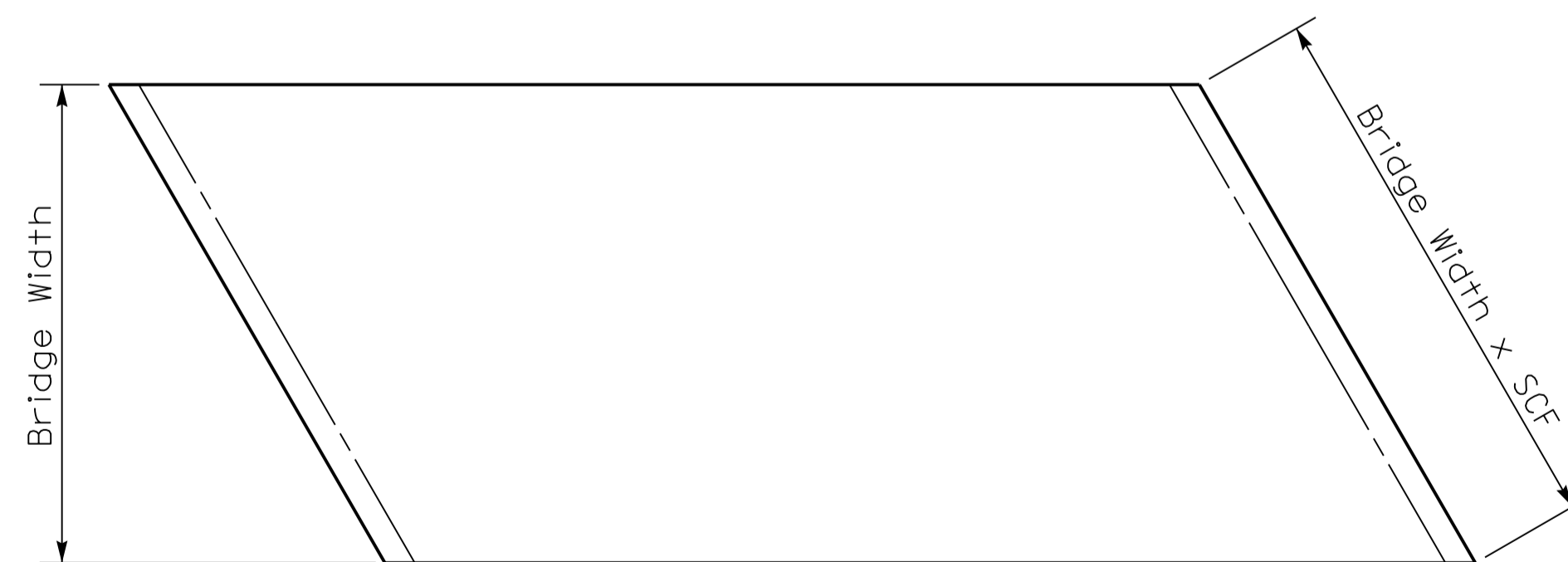
FOUNDATION PRESSURE: Construct abutment footings on solid rock bearing material that can support a pressure of 8000 psf service or 10,800 psf strength factored, as recommended by a geotechnical engineer.

WING LENGTHS: Calculated assuming 21" superstructure depth and stream bank elevation at top of footing.

FOOTING ELEVATION: Construct bottom of footing below the anticipated scour elevation. (This typically entails embedding the footings 1'-0" to 2'-0" into rock and pouring concrete directly against cut rock faces, as recommended by geotechnical engineer.)

NOTE: Distances to bars shown are clear dimensions unless otherwise noted.

MATERIAL SPECIFICATIONS:
 Concrete, Class "A" = 3500 psi
 Steel Reinforcement = Grade 60

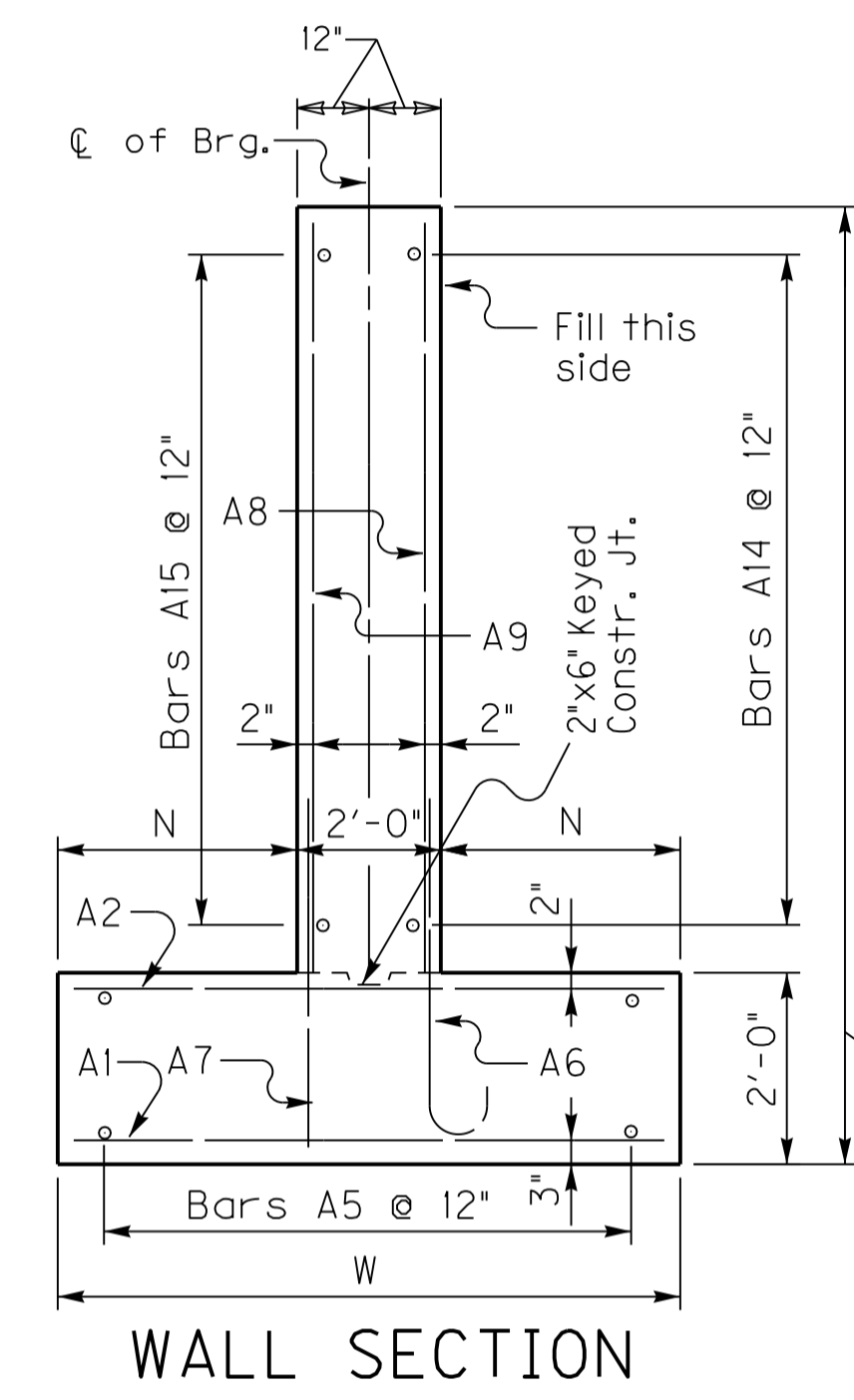
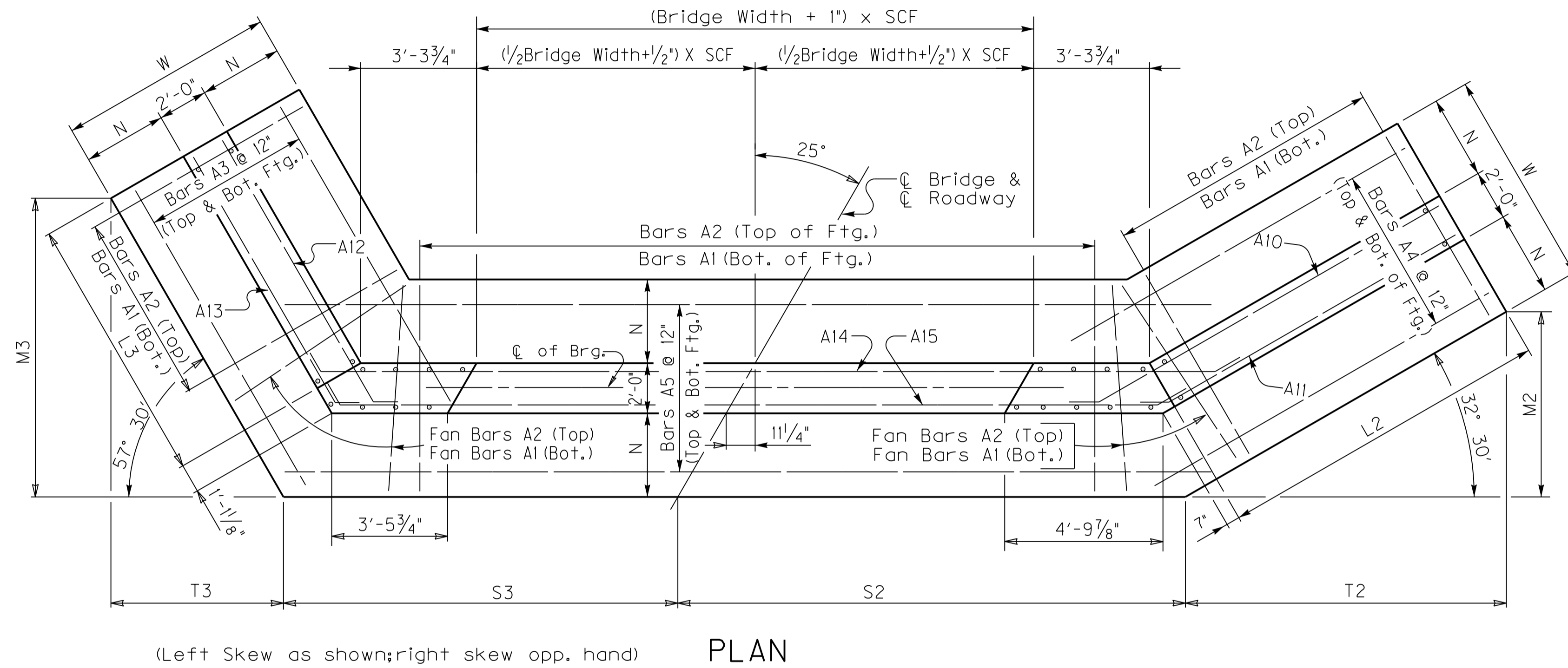


ABUTMENT DETAILS

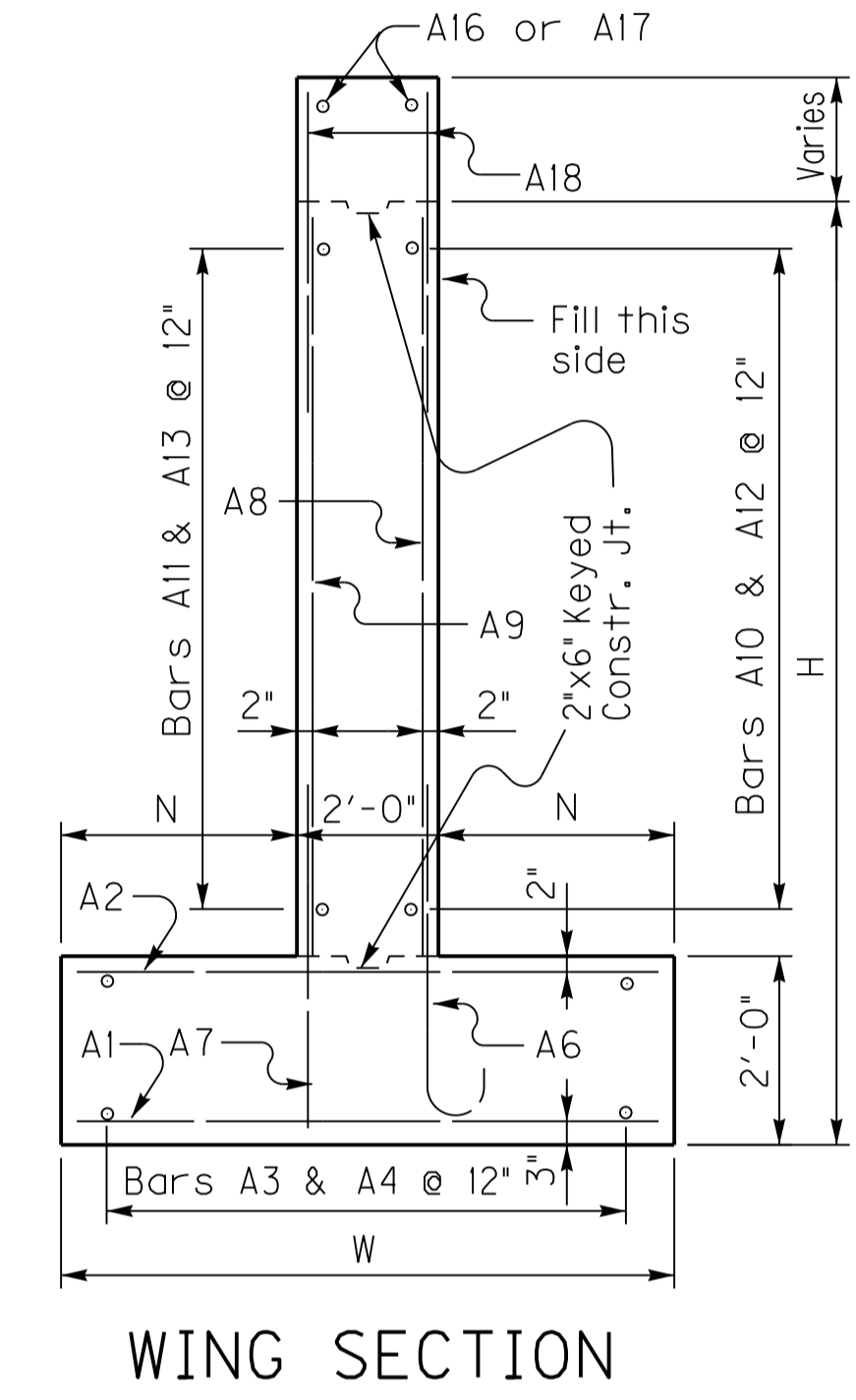
SKEW	WIDTH	DATE
20	VAR	October 2018

25° SKEW VARIABLE BRIDGE WIDTH 2:1 FILL SLOPES WINGS SKEWED 50% FROM ROADWAY TO BREASTWALL

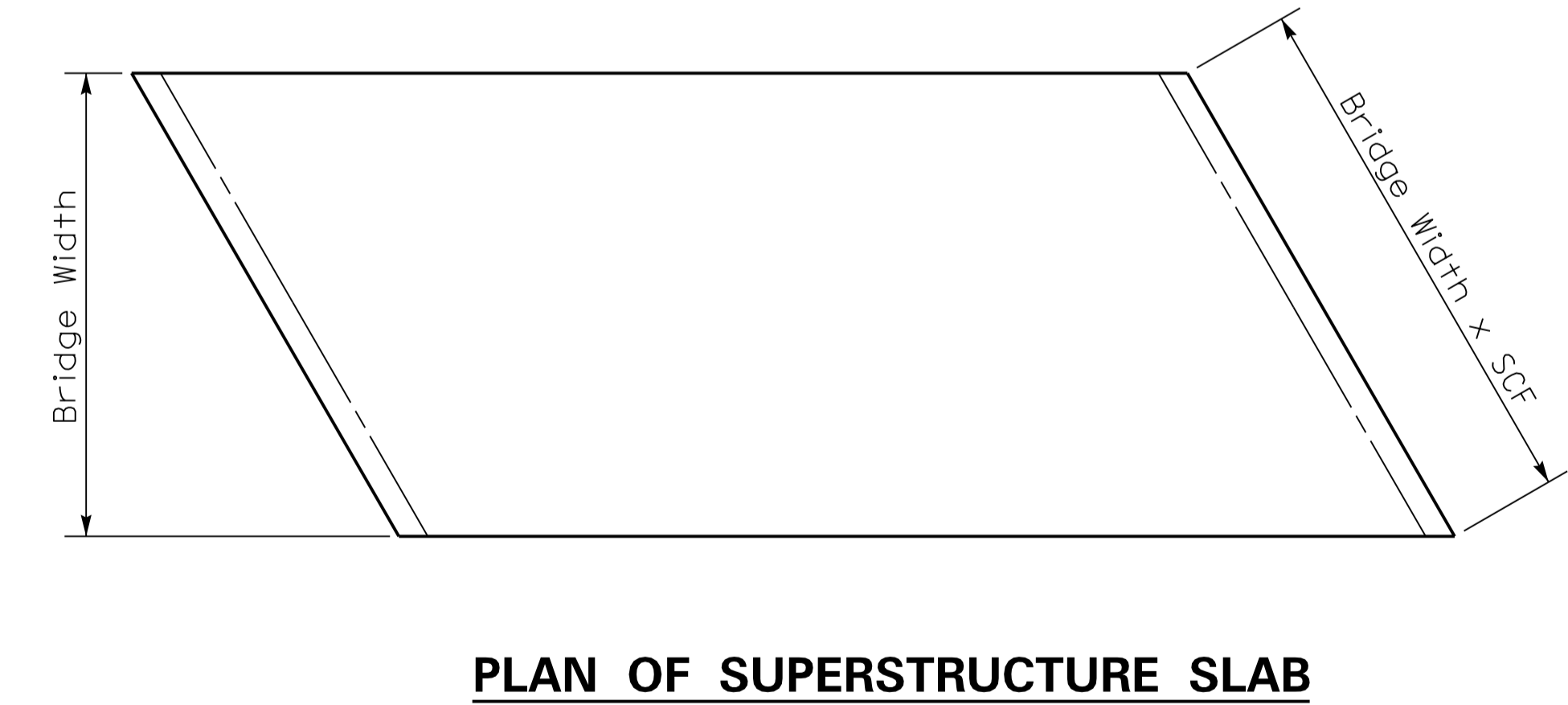
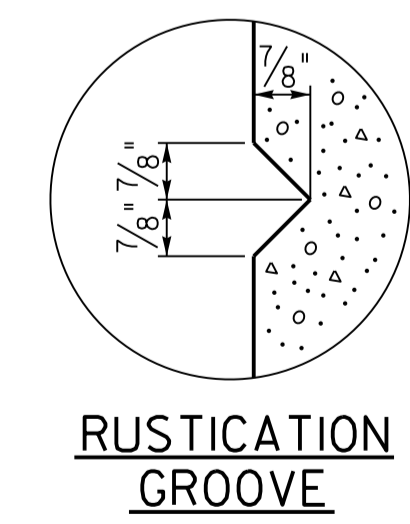
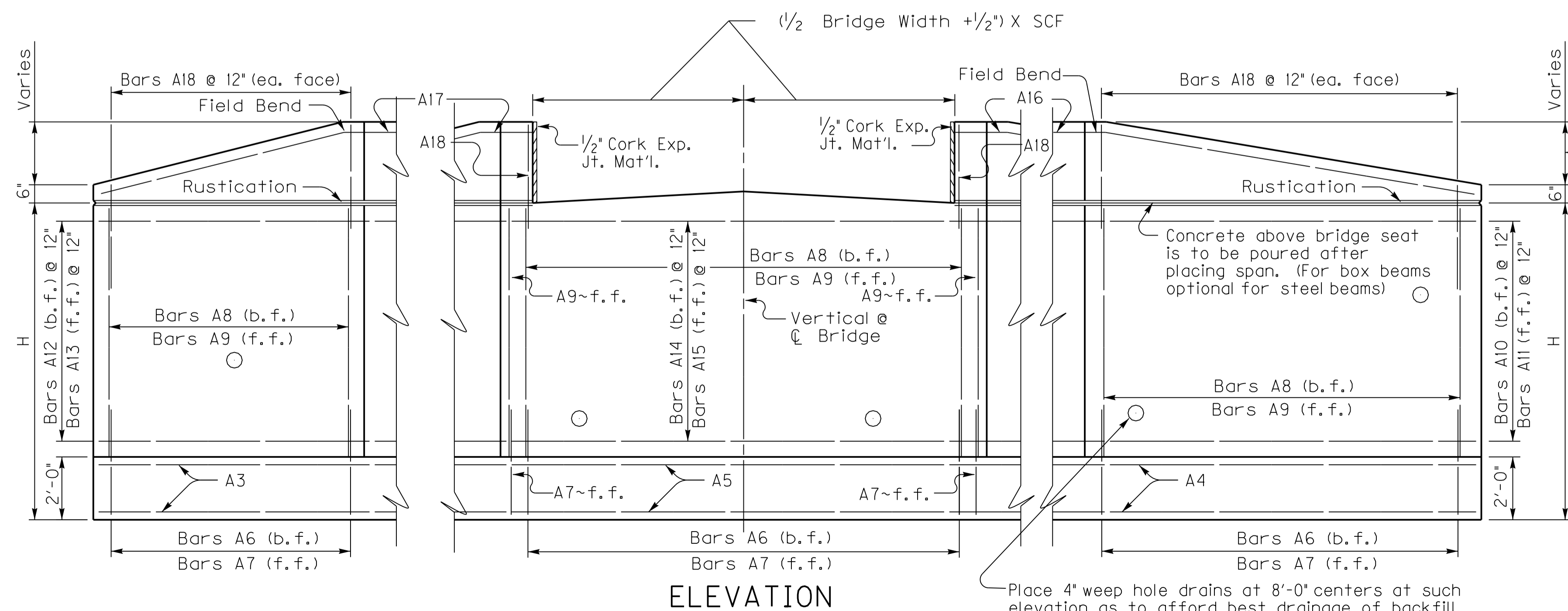
ABUTMENT SKEW CORRECTION FACTOR (SCF) = 1.103



H = Low Bridge Seat. Slope seat for side by side box beams. Step cap as necessary for rolled steel beam superstructures to achieve a 2% cross slope on deck.



Note: Trim A16 & A17 bars if necessary



Place 4" weep hole drains at 8'-0" centers at such elevation as to afford best drainage of backfill, in accordance with the Standard Specifications.

ABUTMENT DETAILS		
SKEW	WIDTH	DATE
25	VAR	October 2018

25° SKEW VARIABLE BRIDGE WIDTH 2:1 FILL SLOPES WINGS SKEWED 50% FROM ROADWAY TO BREASTWALL

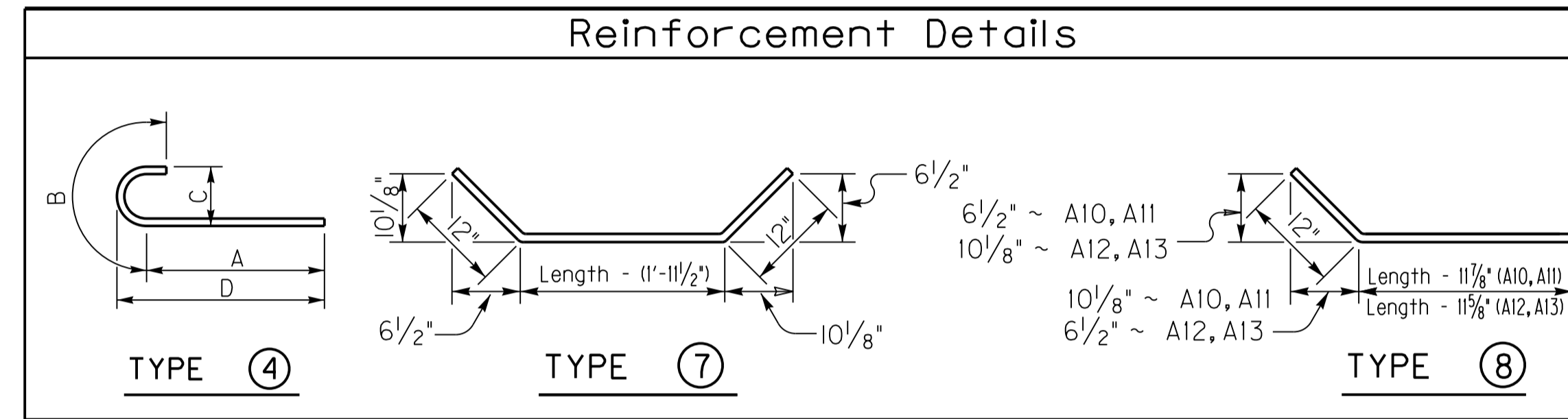
Bill of Reinforcement

MARK	A1		A2			A3	A4		A5		A6				A7			A8			A9			A10	A11	A12	A13	A14			A15			A16	A17	A18
TYPE	Str.		Str.			Str.	Str.		Str.		4				Str.			Str.			Str.			8	8	8	8	7			7			Str.	Str.	Str.
SIZE						#5	#5		#5												#5			#5	#5	#5	#5	#5			#5			#5	#5	#5
H	No.	Size	Length	Length	Length	No.	Length	Length	Length	Length	No.	Length	Length	Length	Length	No.	Length	Length	Length	Length	No.	Length	Length	Length	Length	No.	Length	Length	Length	Length	No.	Length	Length	Length		
15-16	64+Nb=	10 11 8 12	64+Nb=	7 11 8 12	24 20 9 24	29 4 24	12 10	+Lb=		51+Nb=	9 9 11 12	8 1/8	1 10 0 11 3/4	8 6	55+Nb=	5 4 11 12	51+Nb=	6 12 10 12	55+Nb=	12 10 12	14 30 7	14 28 4	14 19 8	14 18 11	14 13 4	+Lb=		14 10 1	+Lb=		2 32 4	2 21 6	11 5 9			
13-14	58+Nb=	9 10 8 12	58+Nb=	7 10 8 12	22 18 6 22	26 2 22	12 5	+Lb=		46+Nb=	8 8 3 12	6 11 1 3 0 8 7 3		50+Nb=	5 4 11 12	46+Nb=	6 10 10 12	50+Nb=	10 10 12	12 27 8	12 25 4	12 17 9	12 16 11	12 13 5	+Lb=		12 10 1	+Lb=		2 29 4	2 19 6	10 5 9				
11-12	51+Nb=	8 9 8 12	51+Nb=	6 9 8 12	20 16 3 20	22 0 20	12 0	+Lb=		40+Nb=	7 7 1 12	5 10 1/2 1 2 0 7 6 2		44+Nb=	5 4 11 12	40+Nb=	5 8 10 12	44+Nb=	8 10 12	10 23 8	10 21 4	10 15 9	10 14 11	10 13 5	+Lb=		10 10 1	+Lb=		2 25 4	2 17 6	8 9 5 9				
9-10	44+Nb=	7 8 8 12	44+Nb=	5 8 8 12	18 12 11 18	18 10 18	11 6	+Lb=		34+Nb=	6 6 1 12	5 1 1 0 0 6 5 4		38+Nb=	5 4 11 12	34+Nb=	5 6 10 12	38+Nb=	6 10 12	8 20 8	8 18 4	8 12 9	8 11 11	8 13 5	+Lb=		8 10 1	+Lb=		2 22 4	2 14 6	7 7 5 9				
7-8	37+Nb=	6 7 2 12	37+Nb=	5 7 2 12	16 10 5 16	14 3 16	10 7	+Lb=		28+Nb=	5 5 7 12	4 8 1/2 0 10 0 5 4 11		32+Nb=	5 4 11 12	28+Nb=	5 4 10 12	32+Nb=	4 10 12	6 16 8	6 14 4	6 10 9	6 9 11	6 13 5	+Lb=		6 10 1	+Lb=		2 18 4	2 12 6	6 5 5 9				
5-6	30+Nb=	5 6 2 12	30+Nb=	5 6 2 12	14 8 1 14	10 1 14	10 2	+Lb=		22+Nb=	5 5 7 12	4 8 1/2 0 10 0 5 4 11		26+Nb=	5 4 11 12	22+Nb=	5 2 10 12	26+Nb=	2 10 12	4 12 8	4 10 4	4 8 9	4 7 11	4 13 5	+Lb=		4 10 1	+Lb=		2 14 4	2 10 6	5 3 5 9				

Table of Dimensions

H	W	N	M2	M3	T2	T3	L2	L3	S2		S3			
	Length	Length	Length	Length	Length	Length	Length	Length	Length	+Lb/2 =	Length	Length	+Lb/2 =	Length
	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.
15-16	12 0	5 0	15 7/4	17 6 3/8	24 5 7/8	11 2 3/8	27	17	8 7 3/8	+0.5Lb=	3 11 1/8	+0.5Lb=		
13-14	11 0	4 6	13 11	15 7 7/8	21 10 1/8	9 11 3/4	24	15	8 3 3/8	+0.5Lb=	3 10 3/4	+0.5Lb=		
11-12	10 0	4 0	11 8 1/4	13 8 7/8	18 4 1/8	8 9	20	13	7 10 7/8	+0.5Lb=	3 10 1/4	+0.5Lb=		
9-10	9 0	3 6	10 0	10 11 3/4	15 8 1/4	6 11 7/8	17	10	7 6 1/4	+0.5Lb=	3 9 3/4	+0.5Lb=		
7-8	7 6	2 9	7 8 3/4	8 11 3/8	12 1 5/8	5 8 3/8	13	8	6 11 1/2	+0.5Lb=	3 9	+0.5Lb=		
5-6	6 6	2 3	5 6	7 3/8	8 7 5/8	4 5 3/4	9	6	6 6 7/8	+0.5Lb=	3 8 1/2	+0.5Lb=		

Reinforcement Details



*Concrete quantities computed using 21' beam depth on 1/2' pad & Variable Bridge Width

Quantities

H	Concrete* C.Y.	Reinforcement LBS.
5	19.48+(0.71xLb) =	1842+(52.8xLb) =
6	21.21+(0.78xLb) =	1842+(52.8xLb) =
7	30.84+(0.93xLb) =	2826+(68.7xLb) =
8	33.02+(1.01xLb) =	2826+(68.7xLb) =
9	46.18+(1.19xLb) =	4287+(91xLb) =
10	48.81+(1.27xLb) =	4287+(91xLb) =
11	63.11+(1.41xLb) =	6360+(120.4xLb) =
12	66.17+(1.49xLb) =	6360+(120.4xLb) =
13	82.69+(1.64xLb) =	9375+(161xLb) =
14	86.2+(1.71xLb) =	9375+(161xLb) =
15	102.99+(1.86xLb) =	12507+(198.6xLb) =
16	106.87+(1.93xLb) =	12507+(198.6xLb) =

ABUTMENT SKEW CORRECTION FACTOR (SCF) = 1.103

NUMBER OF BARS TO ADD (Nb) = Bridge Width (feet) x SCF

(round up to nearest whole number)

LENGTH OF ABUTMENT TO ADD (Lb) = Bridge Width (feet) x SCF

(convert decimal to architectural)

GENERAL NOTES

SPECIFICATIONS: Construct abutments according to the current edition of the Kentucky Department of Highways Standard Specifications for Road and Bridge Construction. Abutments are designed for side by side box beams as detailed in Standard Drawings BDP-001 through BDP-012, current edition. Dimensions may be adjusted to allow for any out to out bridge width. Abutments are also adequate for Std. Dwg. slabs or steel beam superstructures

FOUNDATION PRESSURE: Construct abutment footings on solid rock bearing material that can support a pressure of 8000 psf service or 10,800 psf strength factored, as recommended by a geotechnical engineer.

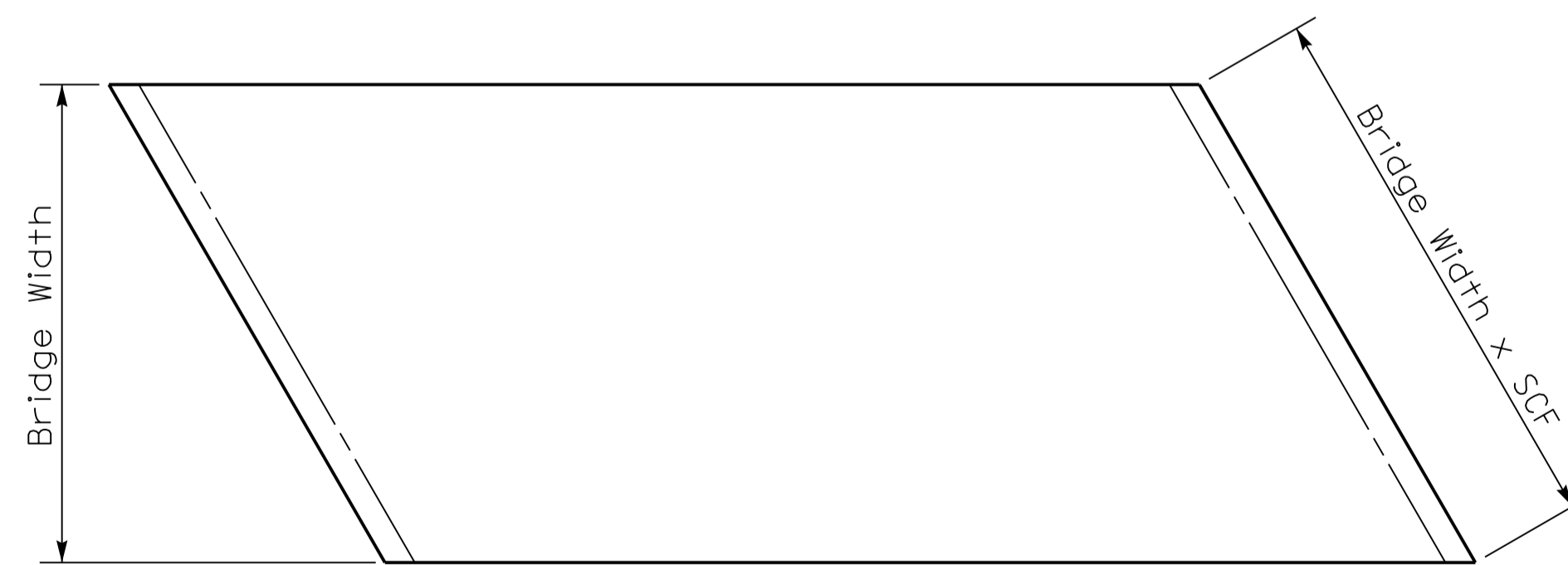
WING LENGTHS: Calculated assuming 21' superstructure depth and stream bank elevation at top of footing.

FOOTING ELEVATION: Construct bottom of footing below the anticipated scour elevation. (This typically entails embedding the footings 1'-0" to 2'-0" into rock and pouring concrete directly against cut rock faces, as recommended by geotechnical engineer.)

NOTE: Distances to bars shown are clear dimensions unless otherwise noted.

MATERIAL SPECIFICATIONS:

Concrete, Class "A" = 3500 psi
Steel Reinforcement = Grade 60



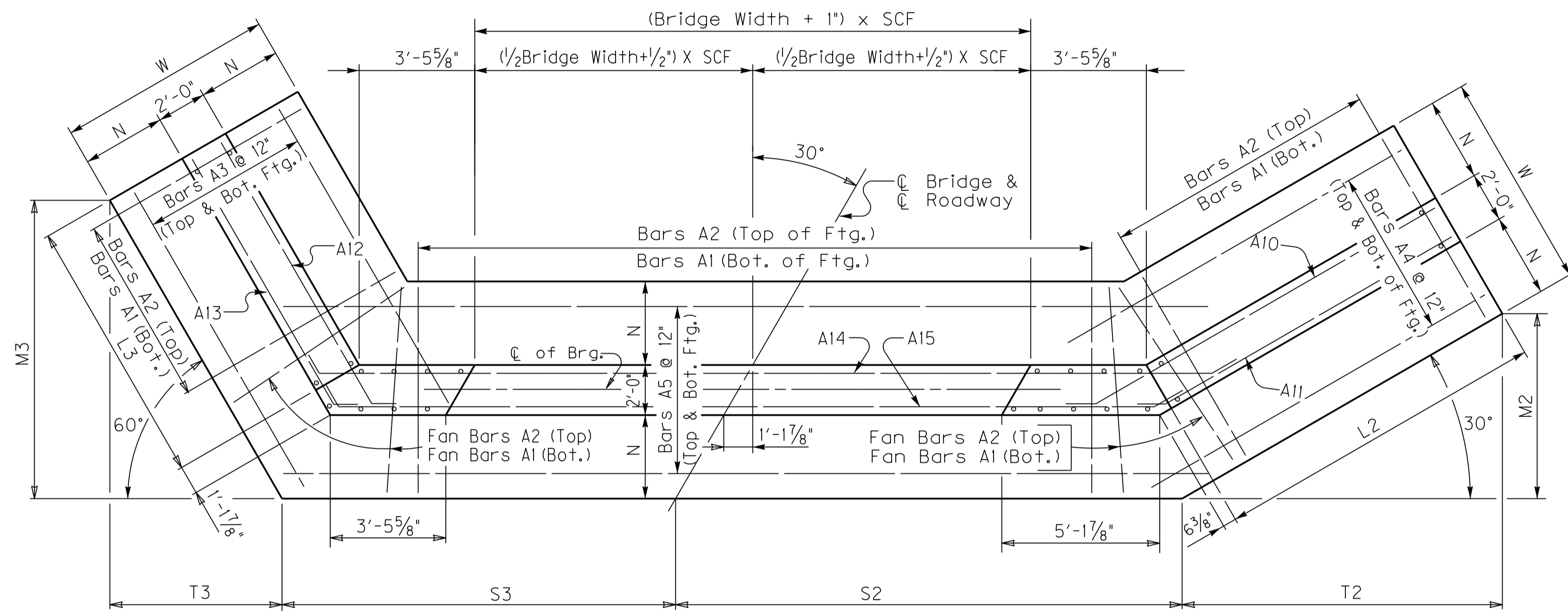
PLAN OF SUPERSTRUCTURE SLAB

ABUTMENT DETAILS

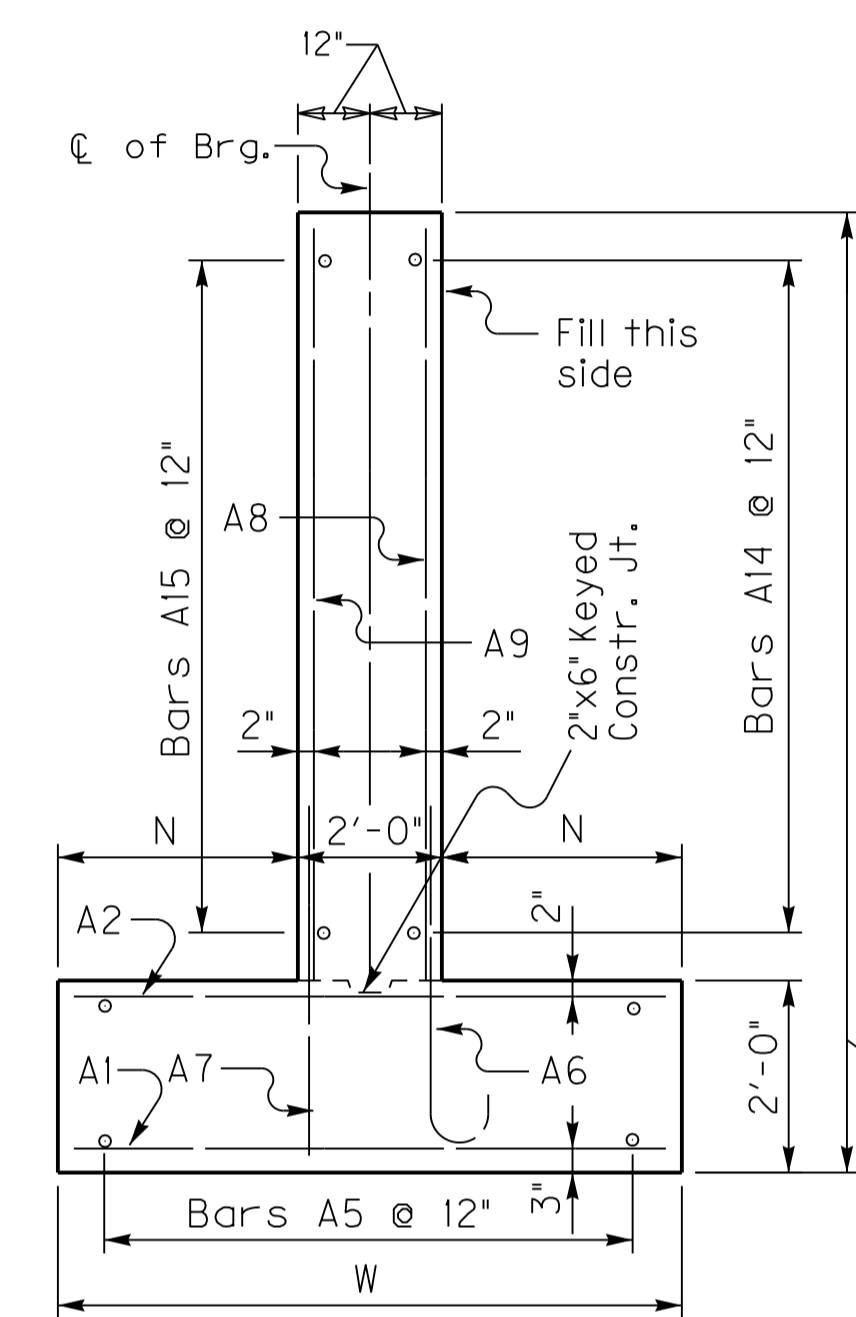
SKEW	WIDTH	DATE
25	VAR	October 2018

30° SKEW VARIABLE BRIDGE WIDTH 2:1 FILL SLOPES WINGS SKEWED 50% FROM ROADWAY TO BREASTWALL

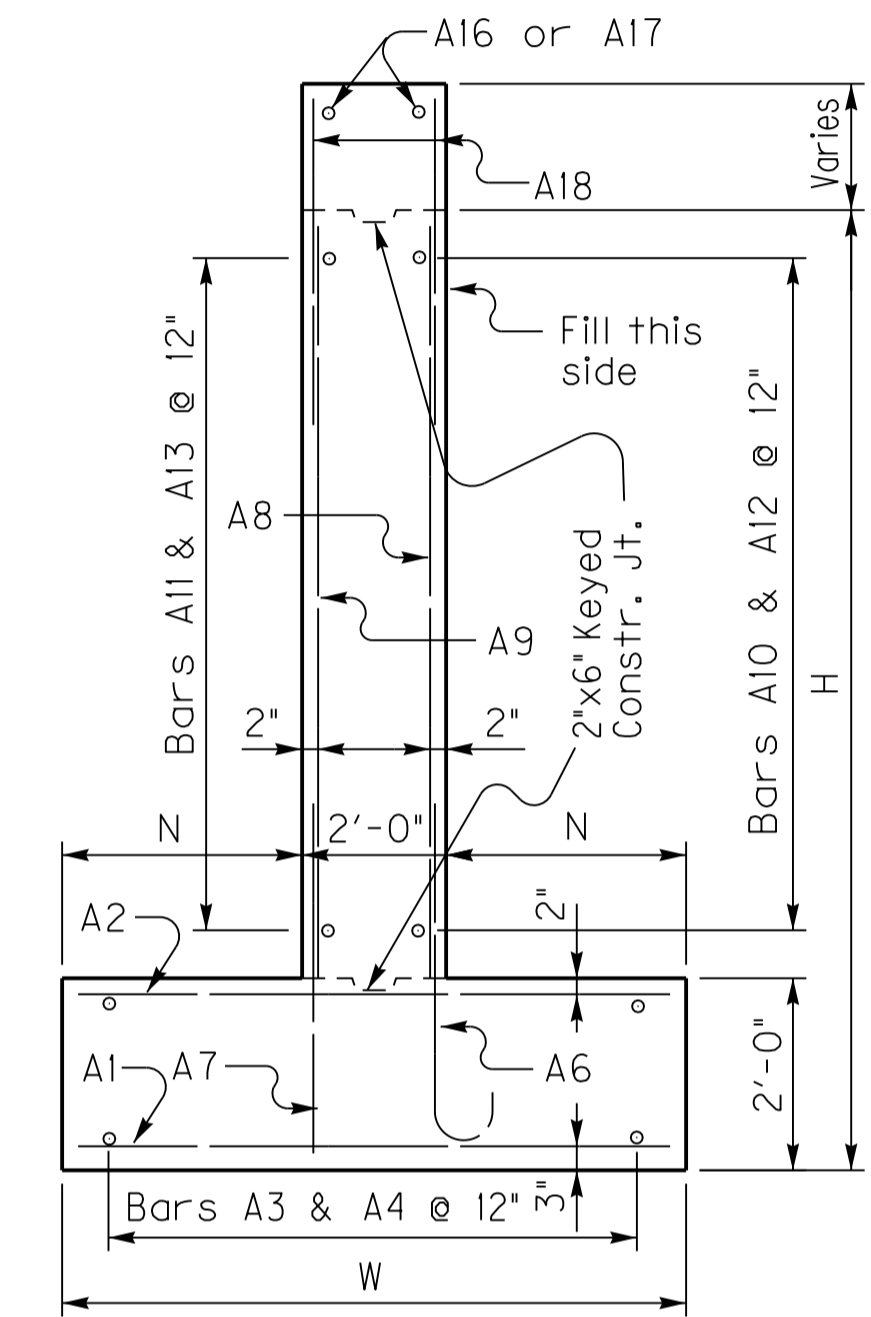
ABUTMENT SKEW CORRECTION FACTOR (SCF) = 1.155



(Left Skew as shown; right skew opp. hand) **PLAN**

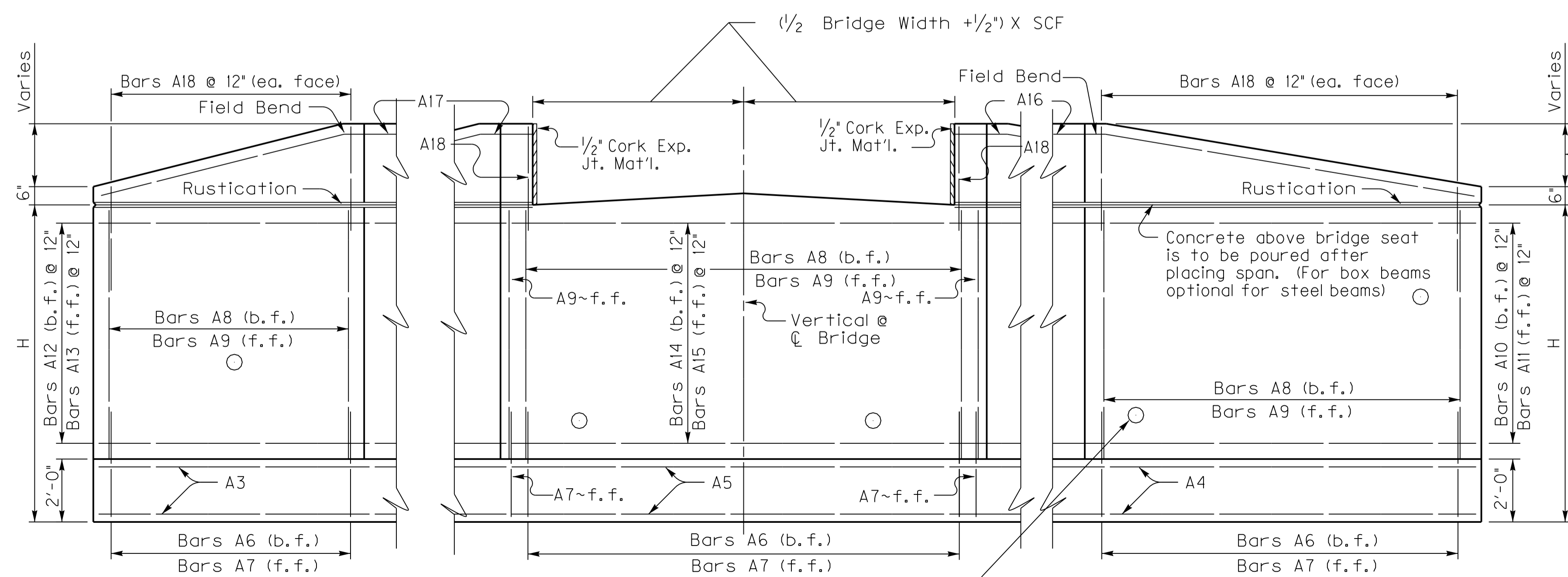


WALL SECTION



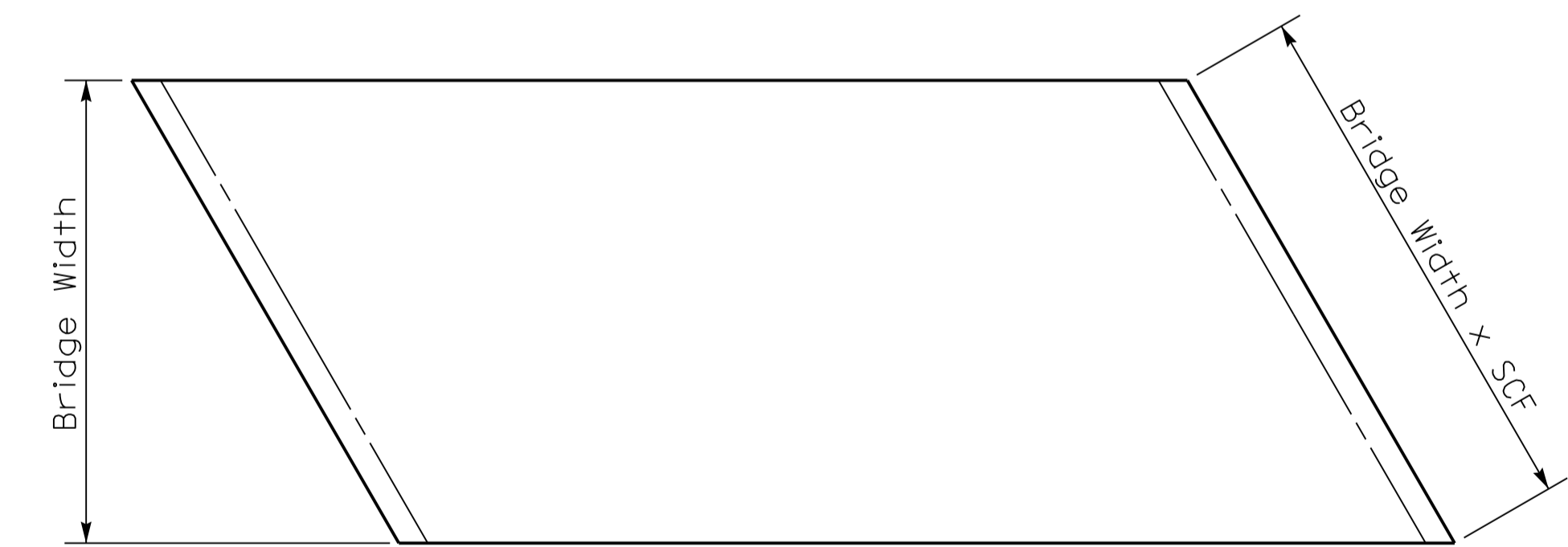
WING SECTION

Note: Trim A16 & A17 bars if necessary



ELEVATION

Place 4" weep hole drains at 8'-0" centers at such elevation as to afford best drainage of backfill, in accordance with the Standard Specifications.



PLAN OF SUPERSTRUCTURE SLAB

ABUTMENT DETAILS

SKEW	WIDTH	DATE
30	VAR	October 2018

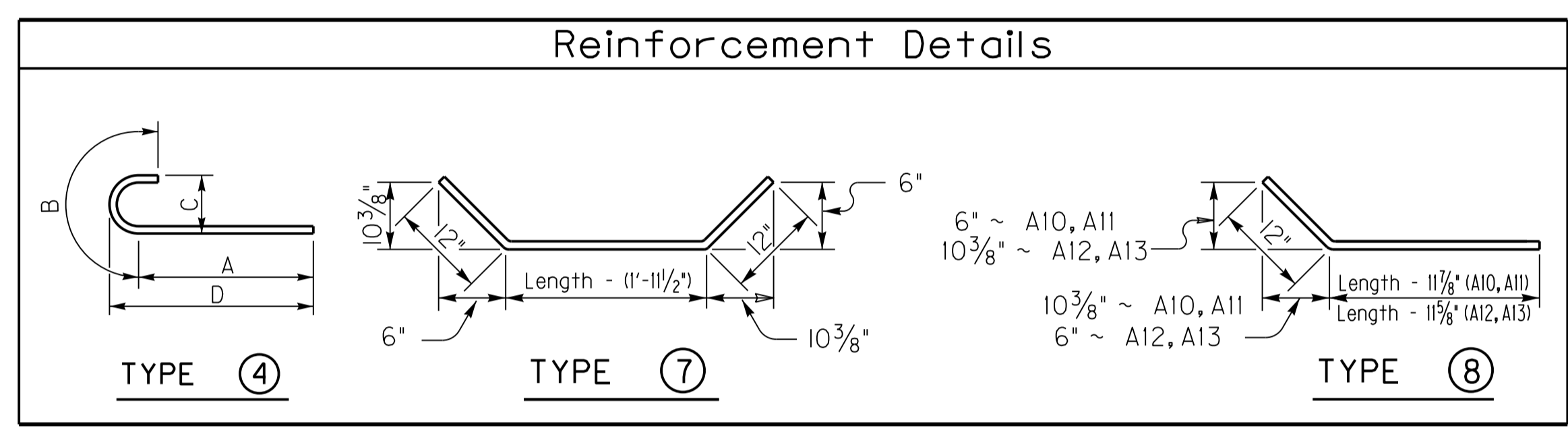
30° SKEW VARIABLE BRIDGE WIDTH 2:1 FILL SLOPES WINGS SKEWED 50% FROM ROADWAY TO BREASTWALL

Bill of Reinforcement

MARK	A1		A2		A3	A4	A5				A6				A7	A8		A9	A10	A11	A12	A13	A14		A15		A16	A17	A18															
	Type	Size	Size	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length															
		No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.															
15-16	Str.	#5	#5	11 8 12	11 8 12	11 8 12	11 8 12	11 8 12	11 8 12	11 8 12	11 8 12	11 8 12	11 8 12	11 8 12	11 8 12	11 8 12	11 8 12	11 8 12	11 8 12	11 8 12	11 8 12	11 8 12	11 8 12	11 8 12	11 8 12	11 8 12	11 8 12	11 8 12	11 8 12	11 8 12	11 8 12	11 8 12	11 8 12	11 8 12	11 8 12	11 8 12	11 8 12	11 8 12	11 8 12	11 8 12	11 8 12	11 8 12	11 8 12	11 8 12

Table of Dimensions

H	W	N	M2	M3	T2	T3	L2	L3	S2				S3						
	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	
		ft.	in.	ft.	in.	ft.	in.	ft.	in.	ft.	in.	ft.	in.	ft.	in.	ft.	in.	ft.	in.
15-16	12 0	5 0	15 5/4	18 25/8	26 8 7/8	10 6 1/4	29	17	9 5 1/8	+0.5Lb=		3 6 7/8	+0.5Lb=						



•Concrete quantities computed using 21" beam depth on 1/2" pad & Variable Bridge Width

Quantities

H	Concrete*		Reinforcement
	C.Y.		LBS.
5	20.57+(0.71xLb) =		1928+(52.8xLb) =
6	22.4+(0.78xLb) =		1928+(52.8xLb) =
7	31.2+(0.93xLb) =		2849+(68.7xLb) =
8	33.4+(1.01xLb) =		2849+(68.7xLb) =
9	47.91+(1.19xLb) =		4426+(91xLb) =
10	50.63+(1.27xLb) =		4426+(91xLb) =
11	63.62+(1.41xLb) =		6401+(120.4xLb) =
12	66.71+(1.49xLb) =		6401+(120.4xLb) =
13	83.28+(1.64xLb) =		9432+(161xLb) =
14	86.81+(1.71xLb) =		9432+(161xLb) =
15	107.56+(1.86xLb) =	13008	(198.6xLb) =
16	111.61+(1.93xLb) =	13008	(198.6xLb) =

ABUTMENT SKEW CORRECTION FACTOR (SCF) = 1.155

NUMBER OF BARS TO ADD (Nb) = Bridge Width (feet) x SCF (round up to nearest whole number)

LENGTH OF ABUTMENT TO ADD (Lb) = Bridge Width (feet) x SCF (convert decimal to architectural)

GENERAL NOTES

SPECIFICATIONS: Construct abutments according to the current edition of the Kentucky Department of Highways Standard Specifications for Road and Bridge Construction. Abutments are designed for side by side box beams as detailed in Standard Drawings BDP-001 through BDP-012, current edition. Dimensions may be adjusted to allow for any out to out bridge width. Abutments are also adequate for Std. Dwg. slabs or steel beam superstructures

FOUNDATION PRESSURE: Construct abutment footings on solid rock bearing material that can support a pressure of 8000 psf service or 10,800 psf strength factored, as recommended by a geotechnical engineer.

WING LENGTHS: Calculated assuming 21" superstructure depth and stream bank elevation at top of footing.

FOOTING ELEVATION: Construct bottom of footing below the anticipated scour elevation. (This typically entails embedding the footings 1'-0" to 2'-0" into rock and pouring concrete directly against cut rock faces, as recommended by geotechnical engineer.)

NOTE: Distances to bars shown are clear dimensions unless otherwise noted.

MATERIAL SPECIFICATIONS:
 Concrete, Class "A" = 3500 psi
 Steel Reinforcement = Grade 60



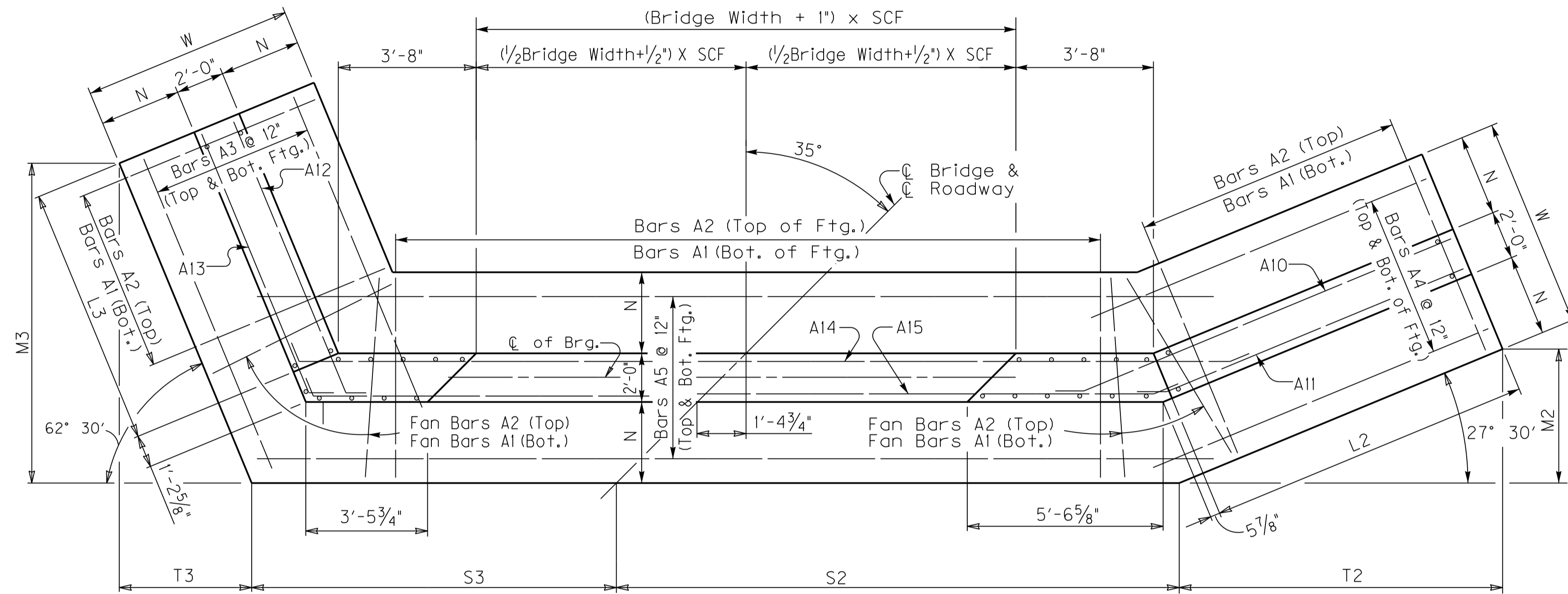
PLAN OF SUPERSTRUCTURE SLAB

ABUTMENT DETAILS

SKEW	WIDTH	DATE
30	VAR	October 2018

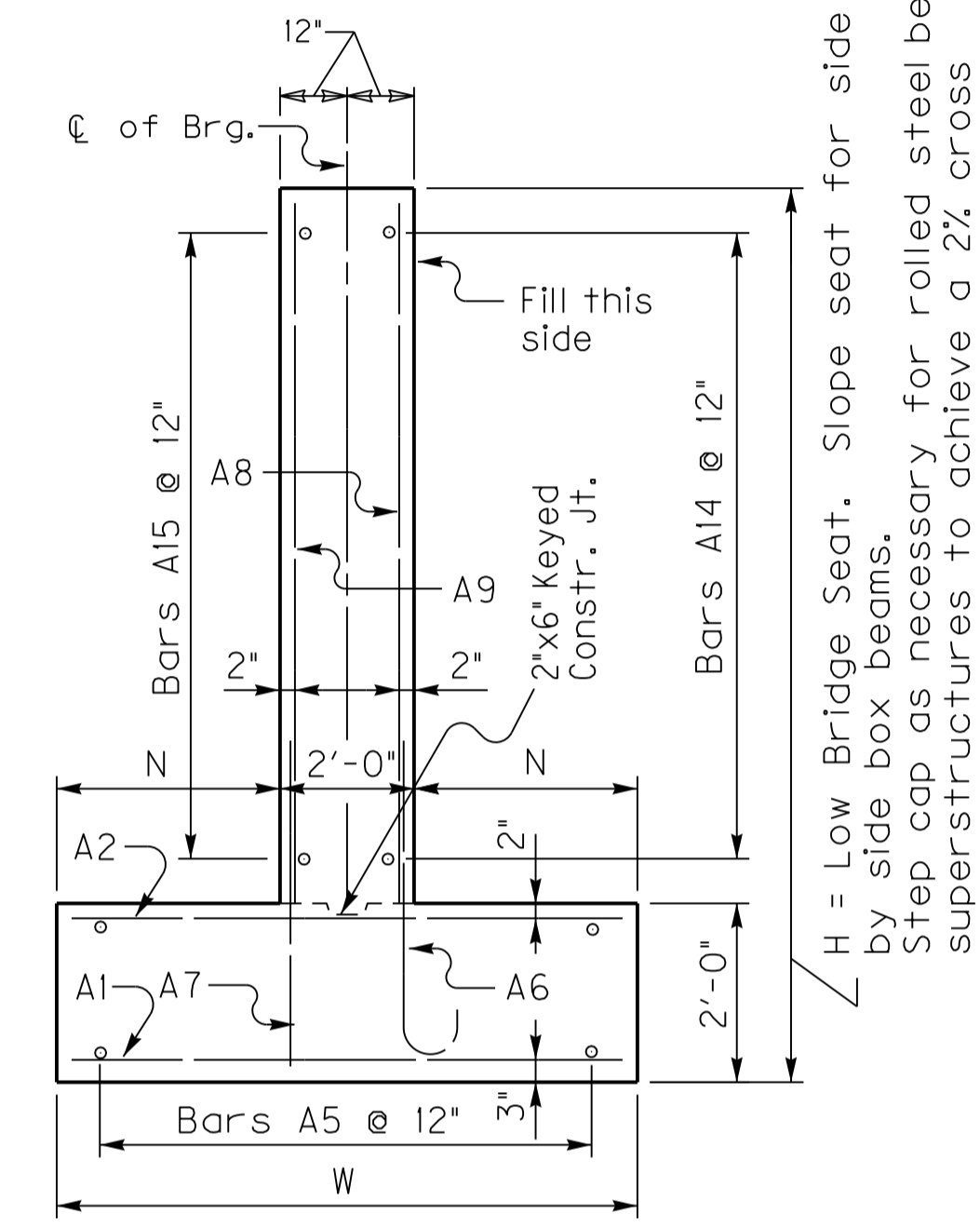
35° SKEW VARIABLE BRIDGE WIDTH 2:1 FILL SLOPES WINGS SKEWED 50% FROM ROADWAY TO BREASTWALL

ABUTMENT SKEW CORRECTION FACTOR (SCF) = 1.221

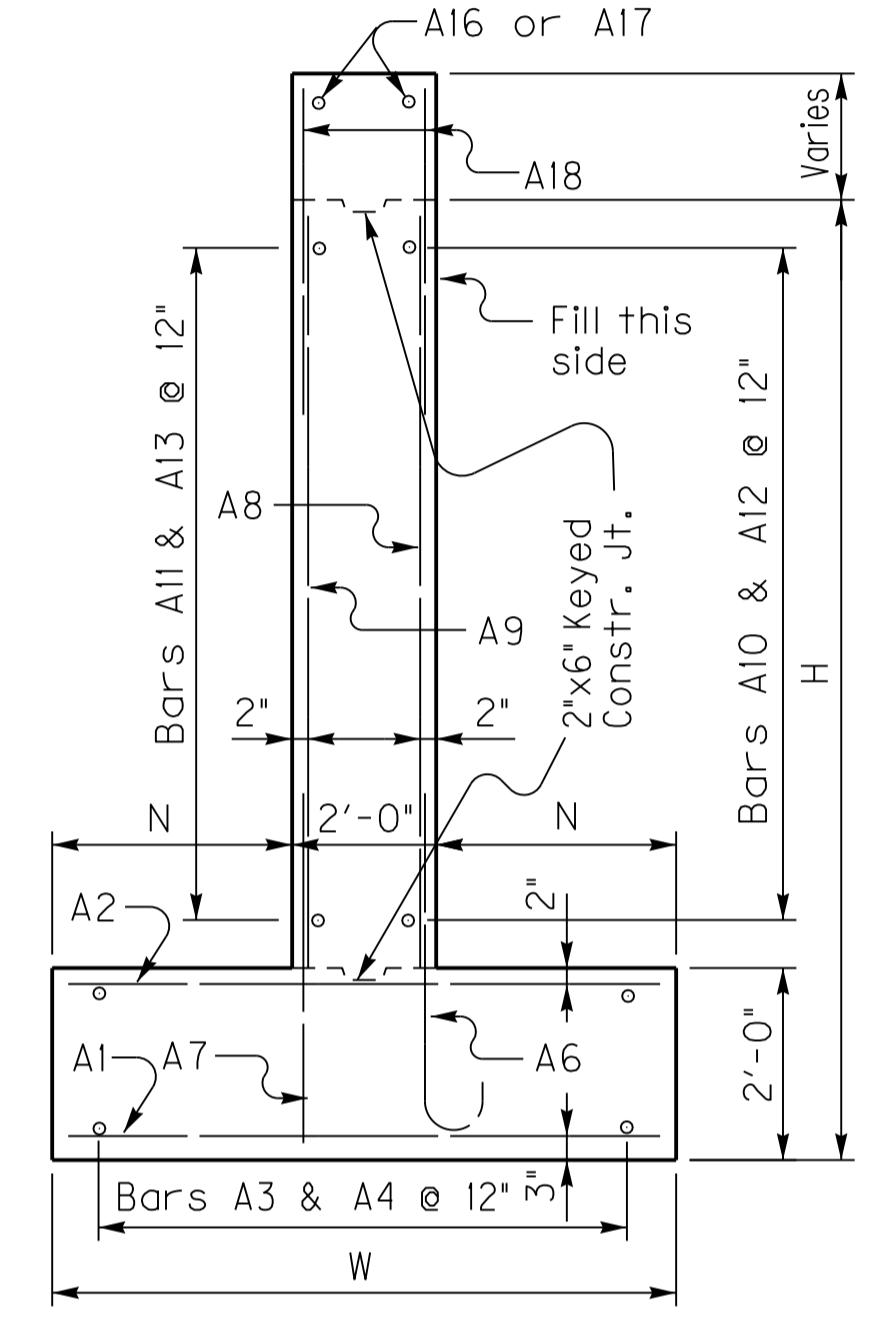


(Left Skew as shown; right skew opp. hand)

PLAN

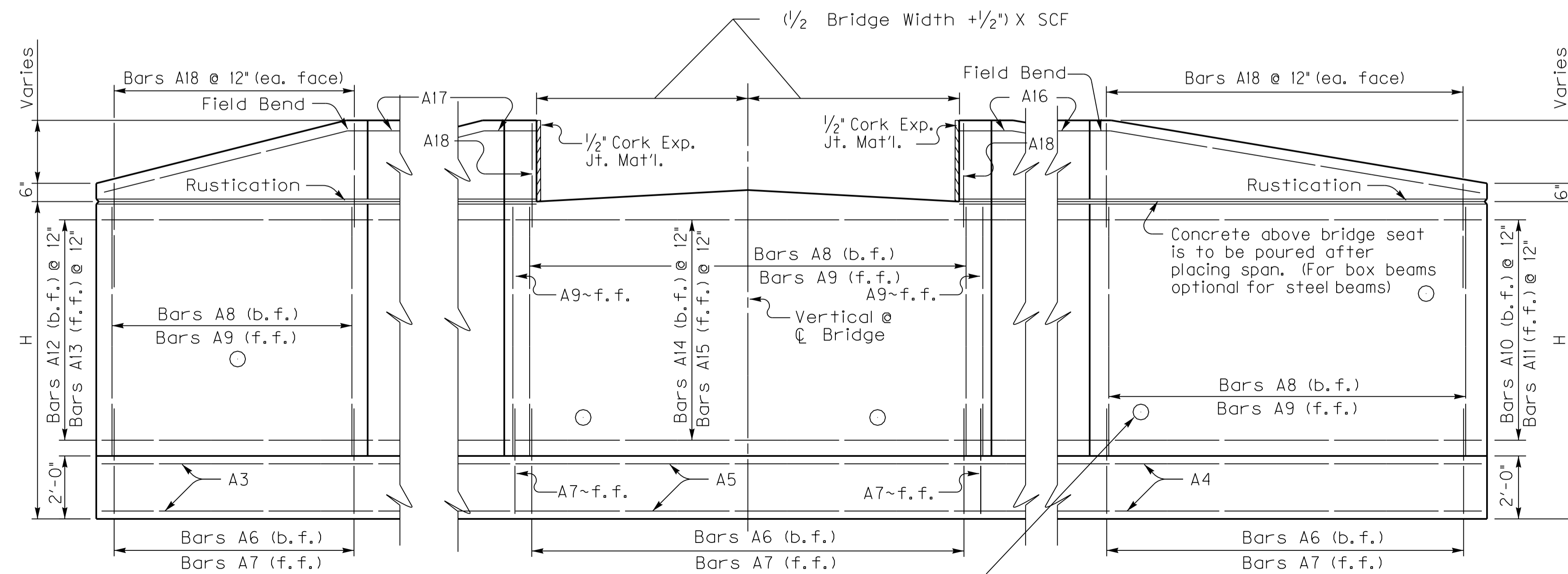


WALL SECTION



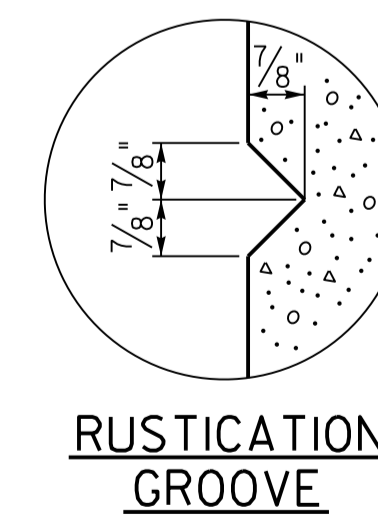
WING SECTION

Note: Trim A16 & A17 bars if necessary

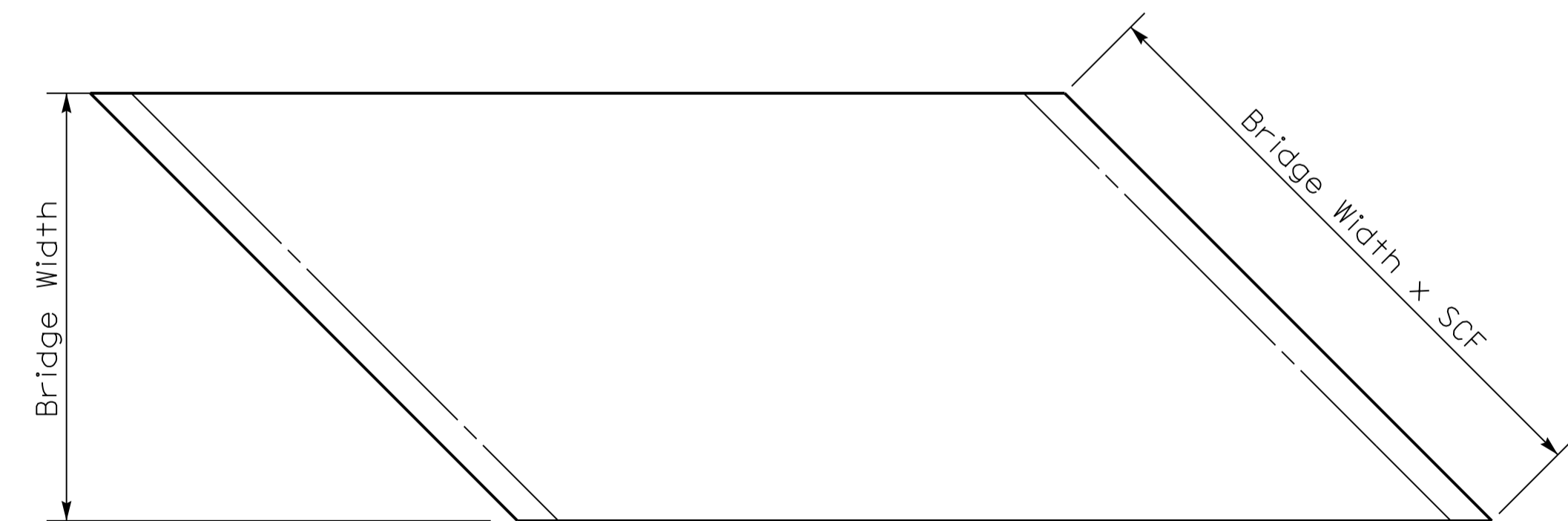


ELEVATION

Place 4\"/>



RUSTICATION GROOVE



PLAN OF SUPERSTRUCTURE SLAB

ABUTMENT DETAILS

SKEW	WIDTH	DATE
35	VAR	October 2018

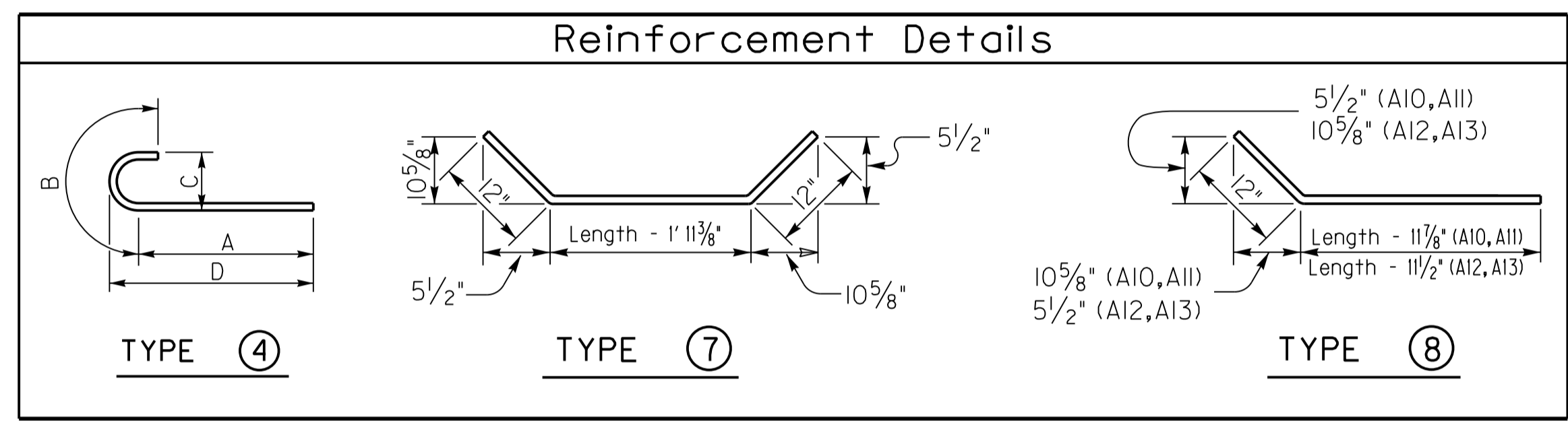
35° SKEW VARIABLE BRIDGE WIDTH 2:1 FILL SLOPES WINGS SKEWED 50% FROM ROADWAY TO BREASTWALL

Bill of Reinforcement

MARK	A1				A2				A3		A4				A5				A6				A7				A8				A9		A10	A11	A12	A13	A14				A15				A16	A17	A18																																	
TYPE	Str.				Str.				Str.		Str.				Str.				4				Str.				Str.				Str.		8	8	8	8	7				7				Str.	Str.	Str.																																	
SIZE	#5				#5				#5		#5				#5				#5				#5				#5		#5	#5	#5	#5	#5				#5				#5	#5	#5																																					
H	No.	Size	Length	Spacing	No.	Size	Length	Spacing	No.	Length	No.	Length	No.	Length	No.	Length	"	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length																						
15-16	68+Nb=	10	11	8	12	68+Nb=	7	11	8	12	24	20	2	24	34	1	24	13	6	+Lb=		56+Nb=	9	9	11	12	8	1/8	1	10	0	11	3/4	8	6	59+Nb=	5	4	11	12	56+Nb=	6	12	10	12	59+Nb=	12	10	12	14	36	1	14	33	3	14	18	8	14	18	0	14	14	5	+Lb=		14	10	10	+Lb=		2	37	11	2	20	7	121	5	9
13-14	62+Nb=	9	10	8	12	62+Nb=	7	10	8	12	22	17	10	22	30	0	22	13	1	+Lb=		50+Nb=	8	8	3	12	6	11	1	3	0	8	7	3	53+Nb=	5	4	11	12	50+Nb=	6	10	10	12	53+Nb=	10	10	12	12	32	1	12	29	3	12	16	8	12	16	0	12	14	6	+Lb=		12	10	10	+Lb=		2	33	11	2	18	7	109	5	9	
11-12	54+Nb=	8	9	8	12	54+Nb=	6	9	8	12	20	15	6	20	24	10	20	12	8	+Lb=		43+Nb=	7	7	1	12	5	10	1/2	1	2	0	7	6	2	46+Nb=	5	4	11	12	43+Nb=	5	8	10	12	46+Nb=	8	10	12	10	27	1	10	24	3	10	14	8	10	14	0	10	14	6	+Lb=		10	10	10	+Lb=		2	28	11	2	16	7	95	5	9
9-10	48+Nb=	7	8	8	12	48+Nb=	5	8	8	12	18	13	3	18	21	9	18	12	3	+Lb=		38+Nb=	6	6	1	12	5	1	1	0	0	6	5	4	41+Nb=	5	4	11	12	38+Nb=	5	6	10	12	41+Nb=	6	10	12	8	24	1	8	21	3	8	12	8	8	12	0	8	14	6	+Lb=		8	10	10	+Lb=		2	25	11	2	14	7	85	5	9	
7-8	40+Nb=	6	7	2	12	40+Nb=	5	7	2	12	16	10	8	16	16	1	16	11	4	+Lb=		31+Nb=	5	5	7	12	4	8	1/2	0	10	0	5	4	11	34+Nb=	5	4	11	12	31+Nb=	5	4	10	12	34+Nb=	4	10	12	6	19	2	6	16	3	6	10	8	6	10	0	6	14	6	+Lb=		6	10	10	+Lb=		2	20	11	2	12	7	71	5	9
5-6	33+Nb=	5	6	2	12	33+Nb=	5	6	2	12	14	8	4	14	11	11	14	10	11	+Lb=		25+Nb=	5	5	7	12	4	8	1/2	0	10	0	5	4	11	28+Nb=	5	4	11	12	25+Nb=	5	2	10	12	28+Nb=	2	10	12	4	15	2	4	12	3	4	8	8	4	8	0	4	14	6	+Lb=		4	10	10	+Lb=		2	16	11	2	10	7	59	5	9

Table of Dimensions

H	W			N			M2	M3	T2		T3	L2		L3	S2				S3					
	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length		
	ft.	in.	ft.	in.	ft.	in.	ft.	in.	ft.	in.	ft.	in.	ft.	in.	ft.	in.	ft.	in.	ft.	in.	ft.	in.	ft.	in.
15-16	12	0	5	0	15	6 3/4	17	11 1/2	29	10 7/8	9	4 1/4	32	16	10	3 7/8	+0.5Lb=				3 3/4 +0.5Lb=			
13-14	11	0	4	6	13	8	15	11	26	3	8	3 3/8	28	14	9	10 1/4	+0.5Lb=				3 1 1/4 +0.5Lb=			
11-12	10	0	4	0	11	3 5/8	13	10 1/2	21	8 1/2	7	2 5/8	23	12	9	4 5/8	+0.5Lb=				3 1 7/8 +0.5Lb=			
9-10	9	0	3	6	9	10 1/4	11	10	18	11 1/4	6	1 7/8	20	10	8	10 7/8	+0.5Lb=				3 2 3/8 +0.5Lb=			
7-8	7	6	2	9	7	5 1/2	9	7 7/8	14	4	5	1 1/4	15	8	8	2 3/8	+0.5Lb=				3 3 1/4 +0.5Lb=			
5-6	6	6	2	3	5	6 3/4	7	7 3/8	10	8 1/8	3	1 1/2	11	6	7	8 3/4	+0.5Lb=				3 3 3/4 +0.5Lb=			



*Concrete quantities computed using 21" beam depth on 1/2" pad & Variable Bridge Width

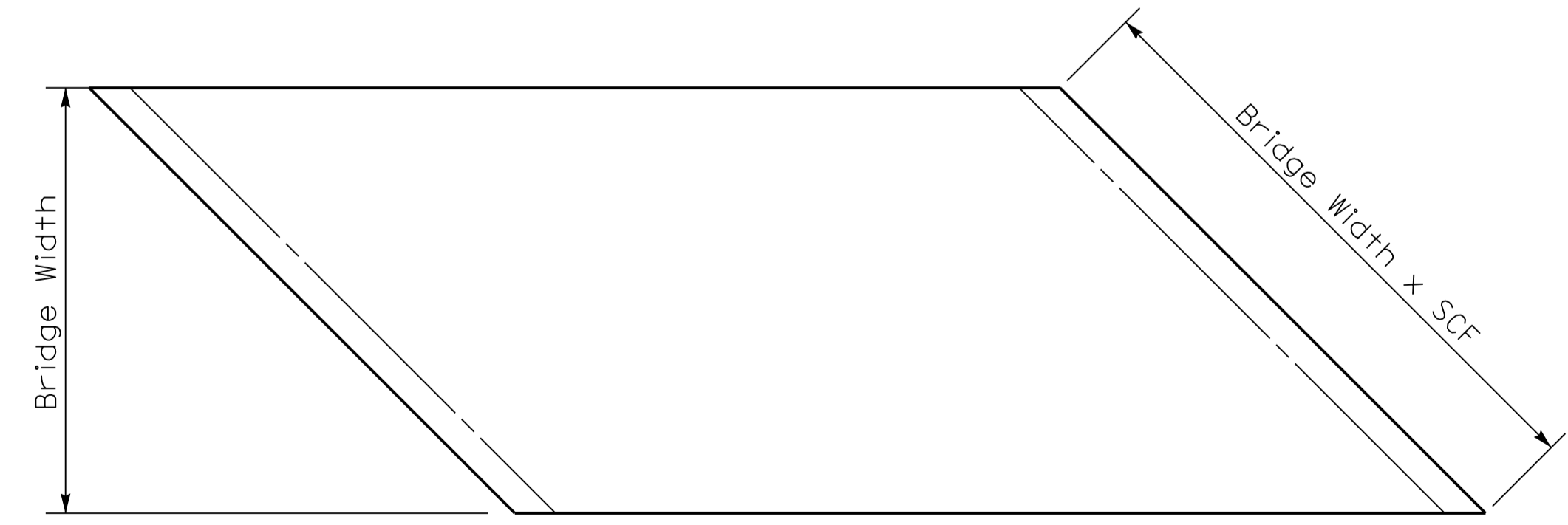
Quantities

H	Concrete*		Reinforcement
	C.Y.		LBS.
5	21.74+(0.71xLb) =		2032+(52.8xLb) =
6	23.67+(0.78xLb) =		2032+(52.8xLb) =
7	33.71+(0.93xLb) =		3062+(68.7xLb) =
8	36.09+(1.01xLb) =		3062+(68.7xLb) =
9	51.05+(1.19xLb) =		4695+(91xLb) =
10	53.95+(1.27xLb) =		4695+(91xLb) =
11	67.29+(1.41xLb) =		6745+(120.4xLb) =
12	70.56+(1.49xLb) =		6745+(120.4xLb) =
13	89.22+(1.64xLb) =		10057+(161xLb) =
14	93.01+(1.71xLb) =		10057+(161xLb) =
15	112.3+(1.86xLb) =		13480+(198.6xLb) =
16	116.54+(1.93xLb) =		13480+(198.6xLb) =

ABUTMENT SKEW CORRECTION FACTOR (SCF) = 1.221

NUMBER OF BARS TO ADD (Nb) = Bridge Width (feet) x SCF (round up to nearest whole number)

LENGTH OF ABUTMENT TO ADD (Lb) = Bridge Width (feet) x SCF (convert decimal to architectural)



PLAN OF SUPERSTRUCTURE SLAB

GENERAL NOTES

SPECIFICATIONS: Construct abutments according to the current edition of the Kentucky Department of Highways Standard Specifications for Road and Bridge Construction. Abutments are designed for side by side box beams as detailed in Standard Drawings BDP-001 through BDP-012, current edition. Dimensions may be adjusted to allow for any out to out bridge width. Abutments are also adequate for Std. Dwg. slabs or steel beam superstructures

FOUNDATION PRESSURE: Construct abutment footings on solid rock bearing material that can support a pressure of 8000 psf service or 10,800 psf strength factored, as recommended by a geotechnical engineer.

WING LENGTHS: Calculated assuming 21" superstructure depth and stream bank elevation at top of footing.

FOOTING ELEVATION: Construct bottom of footing below the anticipated scour elevation. (This typically entails embedding the footings 1'-0" to 2'-0" into rock and pouring concrete directly against cut rock faces, as recommended by geotechnical engineer.)

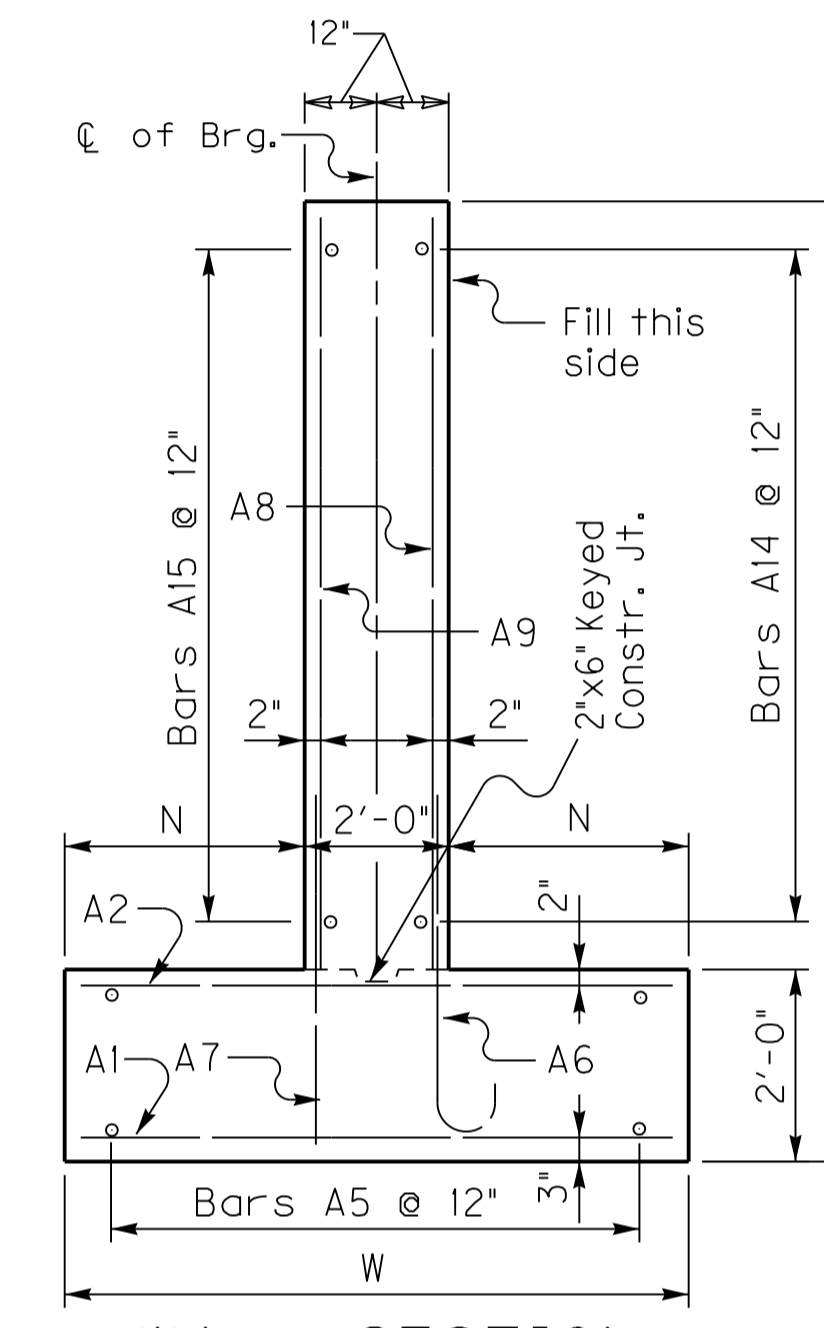
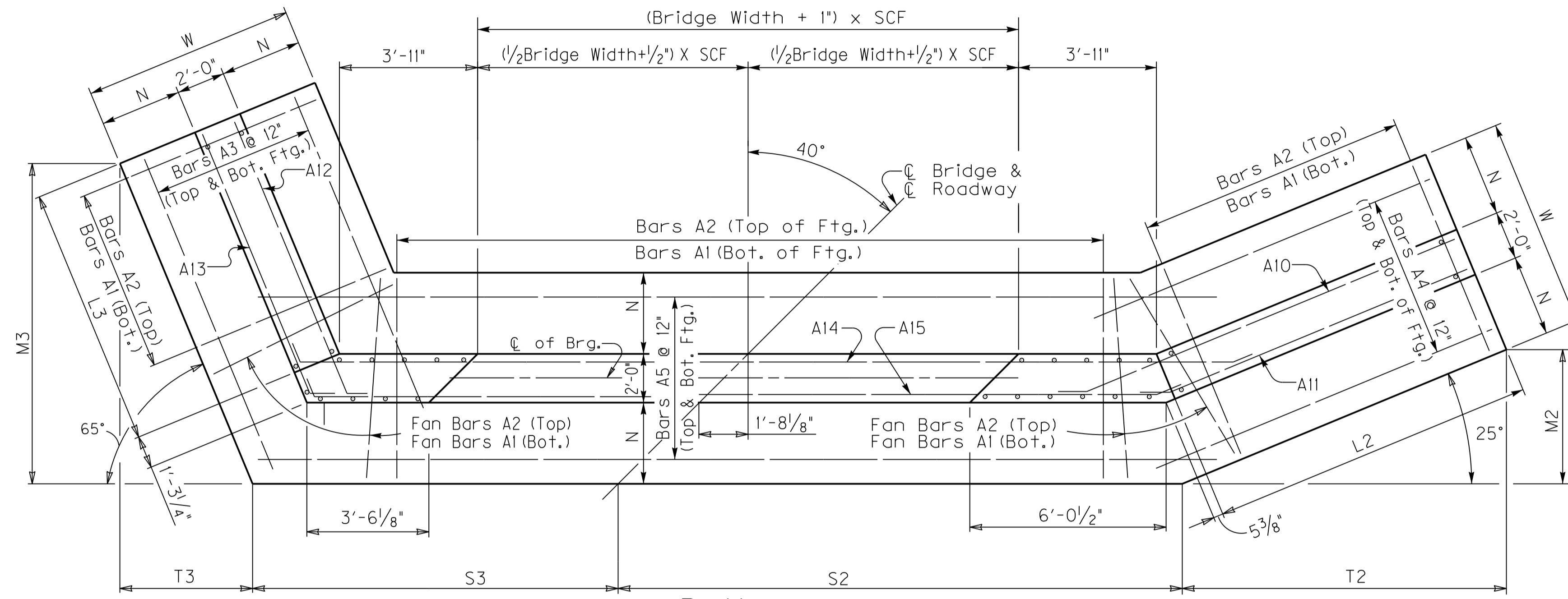
NOTE: Distances to bars shown are clear dimensions unless otherwise noted.

MATERIAL SPECIFICATIONS:
 Concrete, Class "A" = 3500 psi
 Steel Reinforcement = Grade 60

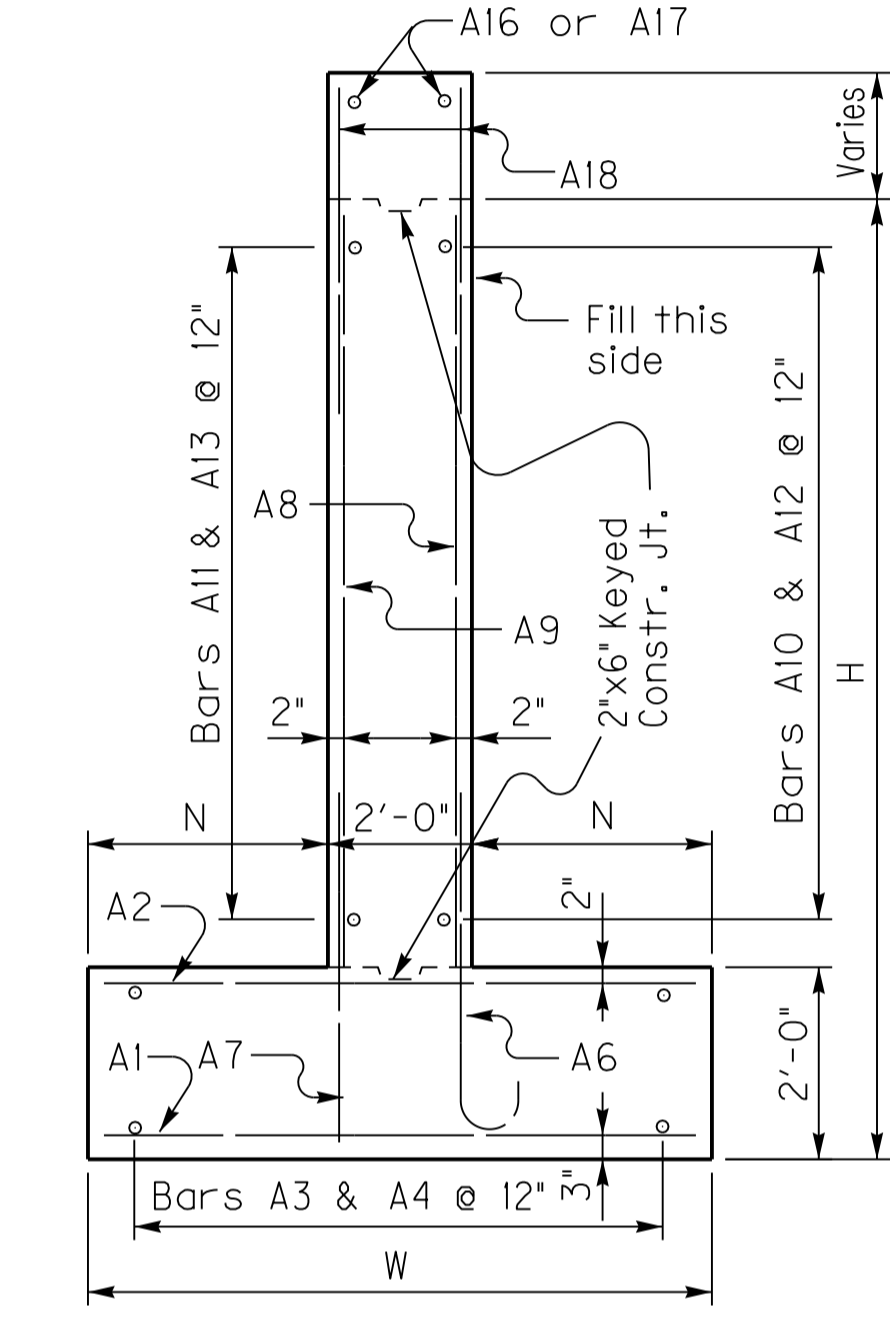
ABUTMENT DETAILS		
SKEW	WIDTH	DATE
35	VAR	October 2018

40° SKEW VARIABLE BRIDGE WIDTH 2:1 FILL SLOPES WINGS SKEWED 50% FROM ROADWAY TO BREASTWALL

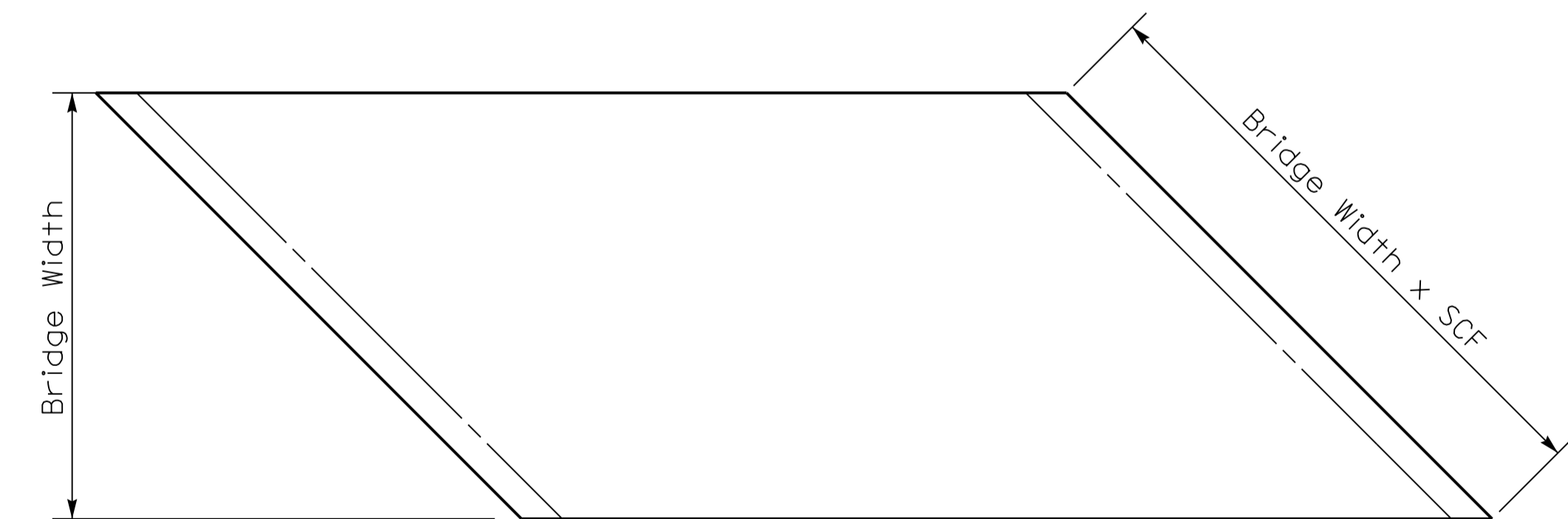
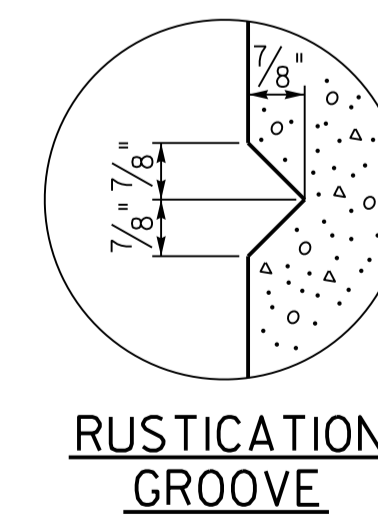
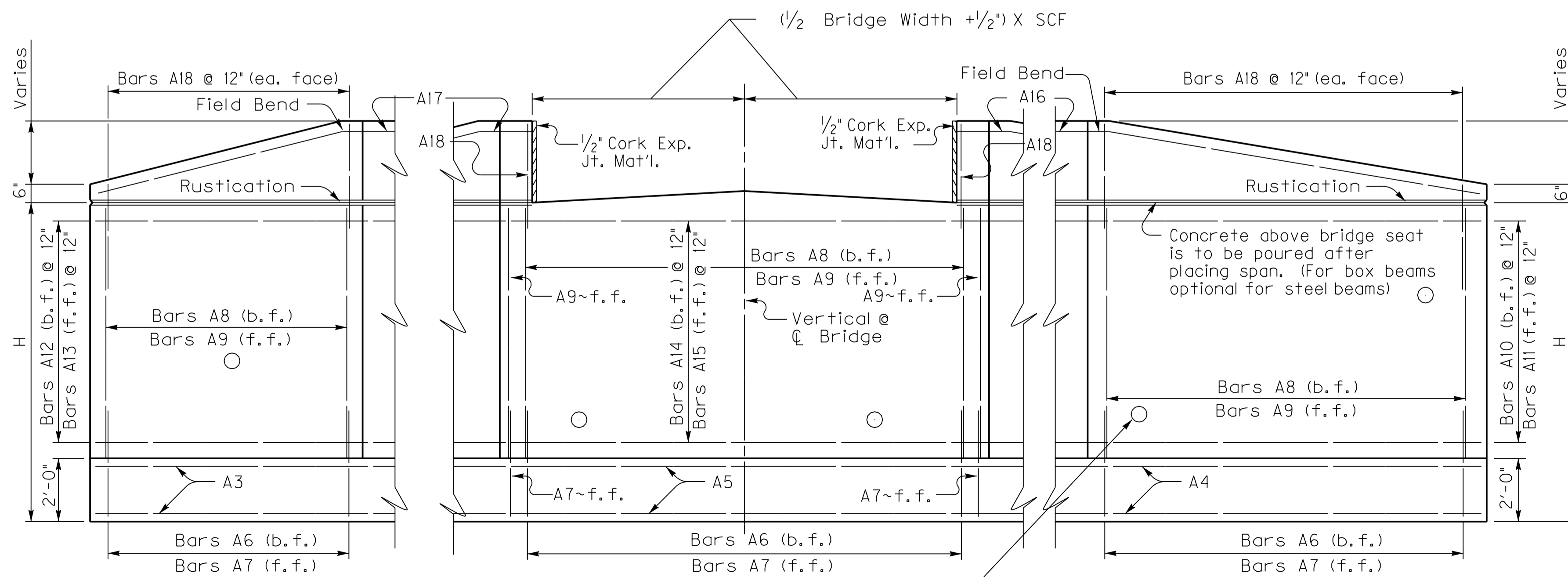
ABUTMENT SKEW CORRECTION FACTOR (SCF) = 1.305



H = Low Bridge Seat. Slope seat for side by side box beams. Step cap as necessary for rolled steel beam superstructures to achieve a 2% cross slope on deck.



Note: Trim A16 & A17 bars if necessary



Place 4" weep hole drains at 8'-0" centers at such elevation as to afford best drainage of backfill, in accordance with the Standard Specifications.

ABUTMENT DETAILS

SKEW	WIDTH	DATE
40	VAR	October 2018

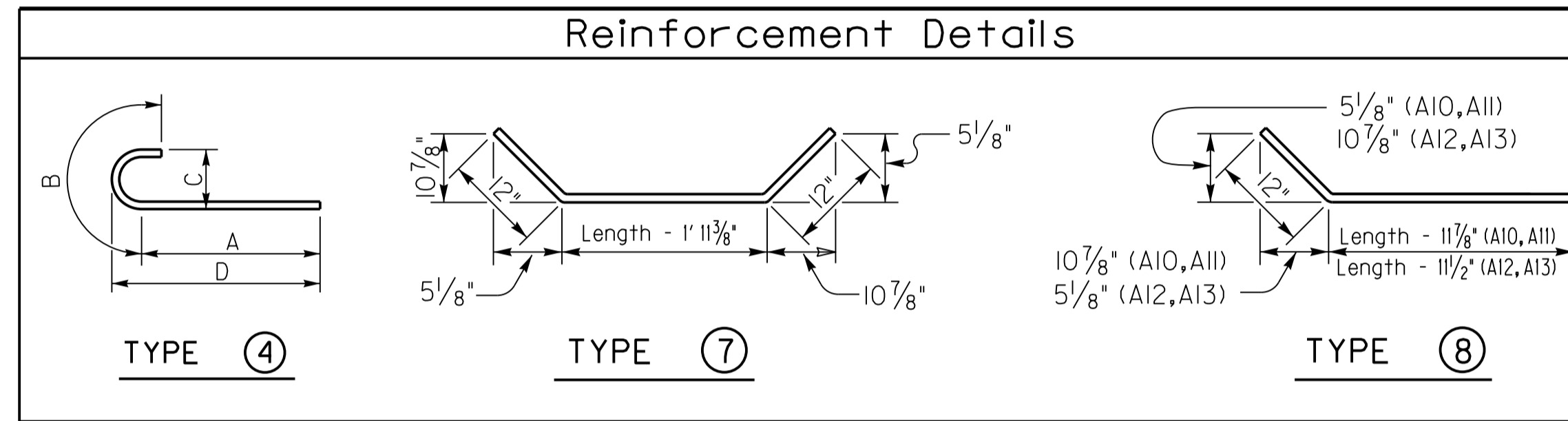
40° SKEW VARIABLE BRIDGE WIDTH 2:1 FILL SLOPES WINGS SKEWED 50% FROM ROADWAY TO BREASTWALL

Bill of Reinforcement

MARK	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11	A12	A13	A14	A15	A16	A17	A18												
TYPE	Str.		Str.		Str.		Str.		Str.		Str.		Str.		Str.		Str.													
SIZE	#5		#5		#5		4		#5		#5		#5		#5		#5													
H	No.	Size	Length ft., in.	Spacing	No.	Size	Length ft., in.	Spacing	No.	Size	Length ft., in.	Spacing	No.	Size	Length ft., in.	Spacing	No.	Size	Length ft., in.	Spacing										
15-16	72+Nb=	10 11 8 12	72+Nb=	7 11 8 12	24 20 4	24 37 0	24 14 0	+Lb=	59+Nb=	9 9 11 12	8 1/8	1 10 0 11 3/4	8 6	63+Nb=	5 4 11 12	59+Nb=	6 12 10 12	63+Nb=	12 10 12	14 39 4	14 36 3	14 18 6	14 18 0	14 15 3	+Lb=	14 11 5	+Lb=	2 41 5	2 20 8	128 5 9
13-14	64+Nb=	9 10 8 12	64+Nb=	7 10 8 12	22 18 0	22 31 11	22 13 7	+Lb=	52+Nb=	8 8 3 12	6 11 1 3 0 8 7 3		56+Nb=	5 4 11 12	52+Nb=	6 10 10 12	56+Nb=	10 10 12	12 34 4	12 31 3	12 16 6	12 16 0	12 15 3	+Lb=	12 11 5	+Lb=	2 36 5	2 18 8	114 5 9	
11-12	57+Nb=	8 9 8 12	57+Nb=	6 9 8 12	20 15 8	20 26 9	20 13 2	+Lb=	45+Nb=	7 7 1 12	5 10 1/2	1 2 0 7 6 2	49+Nb=	5 4 11 12	45+Nb=	5 8 10 12	49+Nb=	8 10 12	10 29 5	10 26 3	10 14 6	10 14 0	10 15 3	+Lb=	10 11 5	+Lb=	2 31 5	2 16 8	100 5 9	
9-10	51+Nb=	7 8 8 12	51+Nb=	5 8 8 12	18 13 4	18 23 8	18 12 9	+Lb=	40+Nb=	6 6 1 12	5 1 1 0 0 6 5 4		44+Nb=	5 4 11 12	40+Nb=	5 6 10 12	44+Nb=	6 10 12	8 26 5	8 23 3	8 12 7	8 12 0	8 15 4	+Lb=	8 11 5	+Lb=	2 28 5	2 14 8	90 5 9	
7-8	42+Nb=	6 7 2 12	42+Nb=	5 7 2 12	16 10 9	16 18 0	16 11 10	+Lb=	33+Nb=	5 5 7 12	4 8 1/2	0 10 0 5 4 11	37+Nb=	5 4 11 12	33+Nb=	5 4 10 12	37+Nb=	4 10 12	6 21 5	6 18 3	6 10 7	6 10 0	6 15 4	+Lb=	6 11 5	+Lb=	2 23 5	2 12 8	76 5 9	
5-6	35+Nb=	5 6 2 12	35+Nb=	5 6 2 12	14 8 6 14	12 10 14 11 5	+Lb=	26+Nb=	5 5 7 12	4 8 1/2	0 10 0 5 4 11		30+Nb=	5 4 11 12	26+Nb=	5 2 10 12	30+Nb=	2 10 12	4 16 5 4	4 13 3 4	4 8 7 4	4 8 0 4	4 15 4	+Lb=	4 11 5	+Lb=	2 18 5	2 10 8	62 5 9	

Table of Dimensions

H	W	N	M2	M3	T2	T3	L2	L3	S2		S3		
	Length ft., in.	Length ft., in.	Length ft., in.	Length ft., in.	Length ft., in.	Length ft., in.	Length ft., in.	Length ft., in.	Length ft., in.	+Lb/ 2 =	Length ft., in.	Length ft., in.	+Lb/ 2 =
15-16	12 0 5 0	15 5 3/8	18 6 1/2	33 1 1/2	8 7 3/4	35	16	11 4 3/4	+0.5Lb=	2 6 5/8	+0.5Lb=		
13-14	11 0 4 6	13 3 1/2	16 5 1/4	28 6	7 8	30	14	10 10 3/8	+0.5Lb=	2 7 7/8	+0.5Lb=		
11-12	10 0 4 0	11 1 1/2	14 4 1/8	23 10 3/8	6 8 1/4	25	12	10 4	+0.5Lb=	2 9 1/8	+0.5Lb=		
9-10	9 0 3 6	9 9 3/4	12 2 7/8	21 1/2	5 8 1/2	22	10	9 9 5/8	+0.5Lb=	2 10 3/8	+0.5Lb=		
7-8	7 6 2 9	7 7 1/2	9 11 7/8	16 4 3/8	4 7 7/8	17	8	9 1/8	+0.5Lb=	3 1/8	+0.5Lb=		
5-6	6 6 2 3	5 5 5/8	7 10 3/4	11 8 3/4	3 8 1/8	12	6	8 5 3/4	+0.5Lb=	3 1 3/8	+0.5Lb=		



*Concrete quantities computed using 21" beam depth on 1/2" pad & Variable Bridge Width

Quantities

H	Concrete*	Reinforcement
	C.Y.	LBS.
5	23.01+(0.71xLb) =	2143+(52.8xLb) =
6	25.06+(0.78xLb) =	2143+(52.8xLb) =
7	36.35+(0.93xLb) =	3263+(68.7xLb) =
8	38.92+(1.01xLb) =	3263+(68.7xLb) =
9	54.35+(1.19xLb) =	4975+(91xLb) =
10	57.43+(1.27xLb) =	4975+(91xLb) =
11	71.15+(1.41xLb) =	7104+(120.4xLb) =
12	74.61+(1.49xLb) =	7104+(120.4xLb) =
13	93.64+(1.64xLb) =	10462+(161xLb) =
14	97.62+(1.71xLb) =	10462+(161xLb) =
15	119.24+(1.86xLb) =	14253+(198.6xLb) =
16	123.73+(1.93xLb) =	14253+(198.6xLb) =

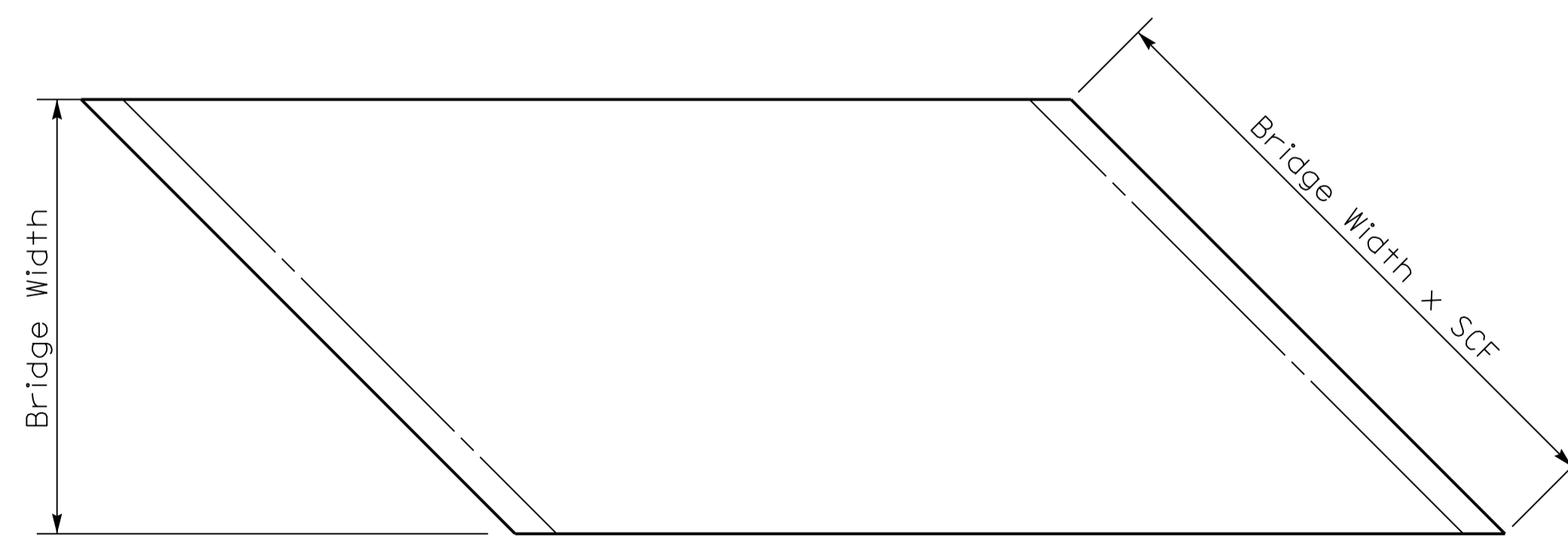
ABUTMENT SKEW CORRECTION FACTOR (SCF) = 1.305

NUMBER OF BARS TO ADD (Nb) = Bridge Width (feet) x SCF

(round up to nearest whole number)

LENGTH OF ABUTMENT TO ADD (Lb) = Bridge Width (feet) x SCF

(convert decimal to architectural)



PLAN OF SUPERSTRUCTURE SLAB

GENERAL NOTES

SPECIFICATIONS: Construct abutments according to the current edition of the Kentucky Department of Highways Standard Specifications for Road and Bridge Construction. Abutments are designed for side by side box beams as detailed in Standard Drawings BDP-001 through BDP-012, current edition. Dimensions may be adjusted to allow for any out to out bridge width. Abutments are also adequate for Std. Dwg. slabs or steel beam superstructures

FOUNDATION PRESSURE: Construct abutment footings on solid rock bearing material that can support a pressure of 8000 psf service or 10,800 psf strength factored, as recommended by a geotechnical engineer.

WING LENGTHS: Calculated assuming 21" superstructure depth and stream bank elevation at top of footing.

FOOTING ELEVATION: Construct bottom of footing below the anticipated scour elevation. (This typically entails embedding the footings 1'-0" to 2'-0" into rock and pouring concrete directly against cut rock faces, as recommended by geotechnical engineer.)

NOTE: Distances to bars shown are clear dimensions unless otherwise noted.

MATERIAL SPECIFICATIONS:

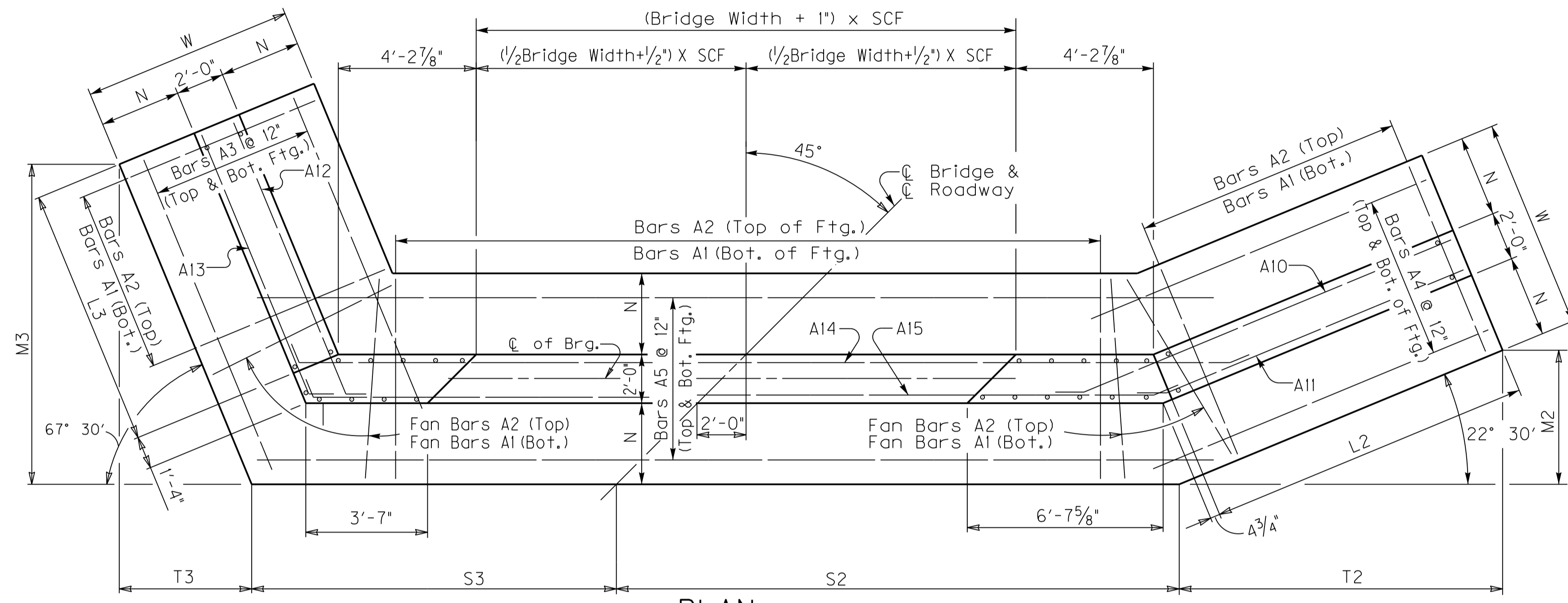
Concrete, Class "A" = 3500 psi
Steel Reinforcement = Grade 60

ABUTMENT DETAILS

SKEW	WIDTH	DATE
40	VAR	October 2018

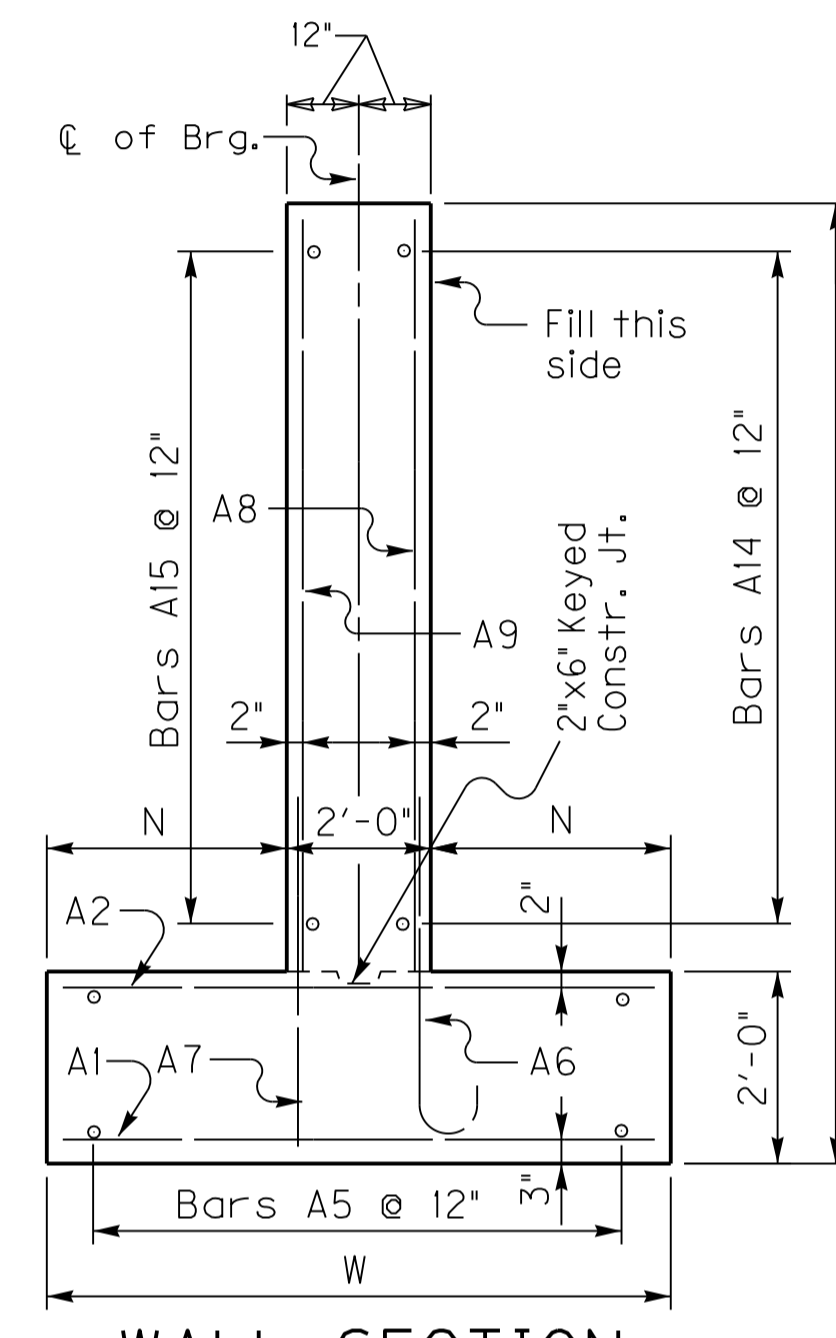
45° SKEW VARIABLE BRIDGE WIDTH 2:1 FILL SLOPES WINGS SKEWED 50% FROM ROADWAY TO BREASTWALL

ABUTMENT SKEW CORRECTION FACTOR (SCF) = 1.414



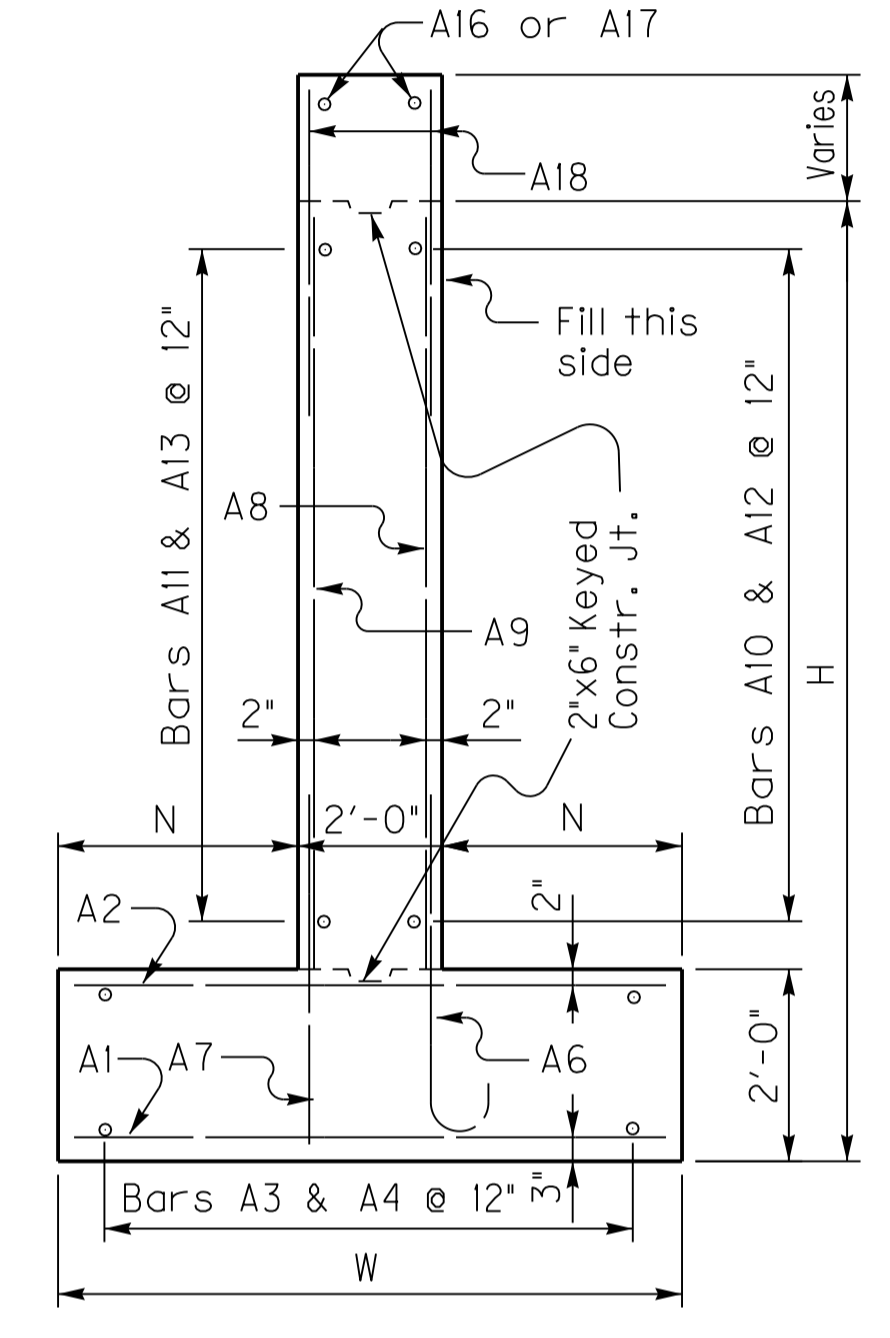
(Left Skew as shown; right skew opp. hand)

PLAN



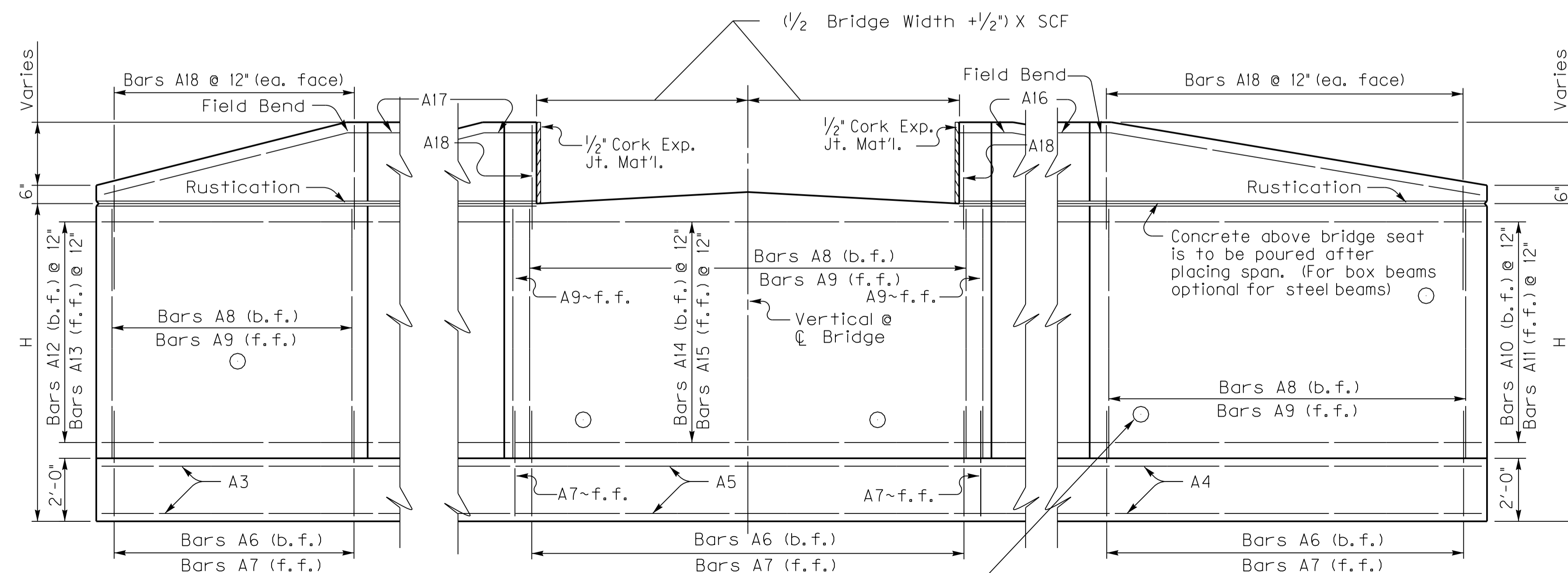
WALL SECTION

H = Low Bridge Seat. Slope seat for side by side box beams. Step cap as necessary for rolled steel beam superstructures to achieve a 2% cross slope on deck.



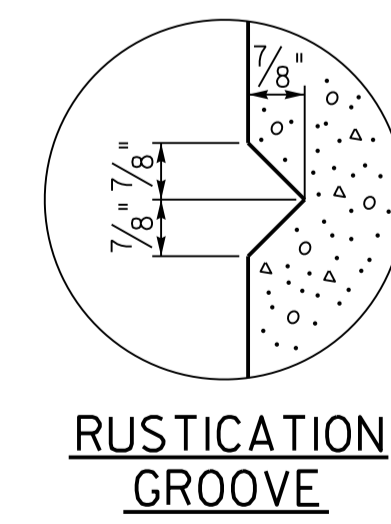
WING SECTION

Note: Trim A16 & A17 bars if necessary

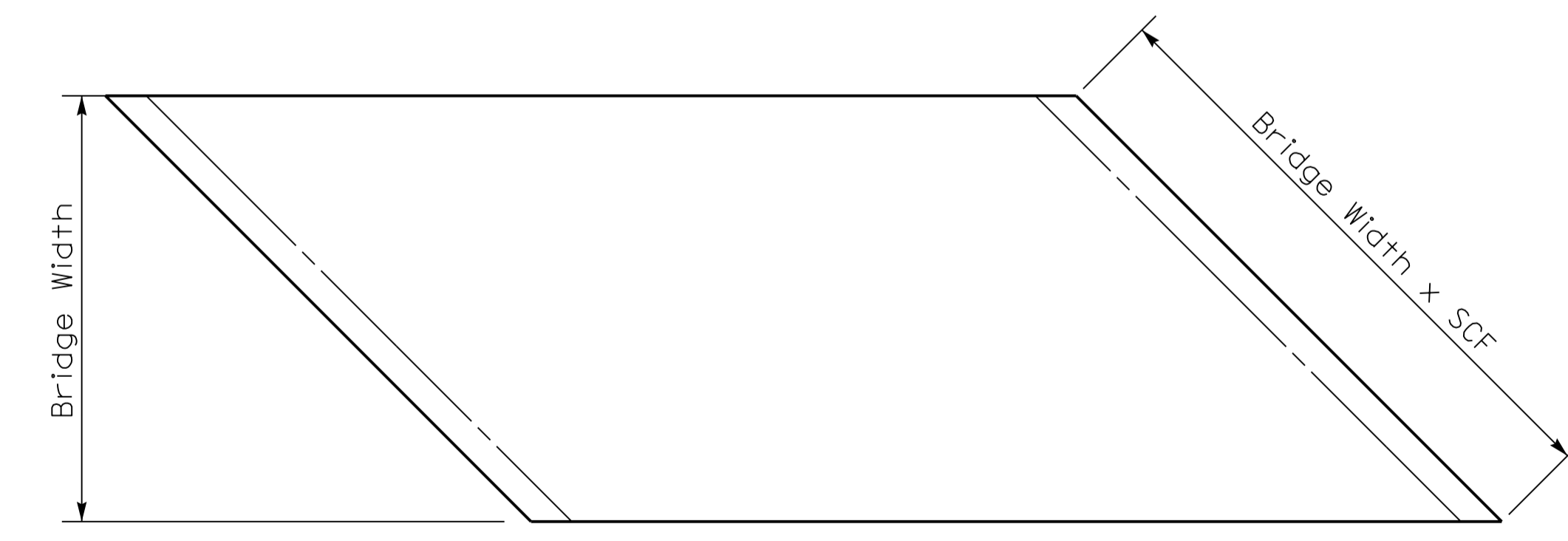


ELEVATION

Place 4\"/>



RUSTICATION GROOVE



PLAN OF SUPERSTRUCTURE SLAB

ABUTMENT DETAILS

SKEW	WIDTH	DATE
45	VAR	October 2018

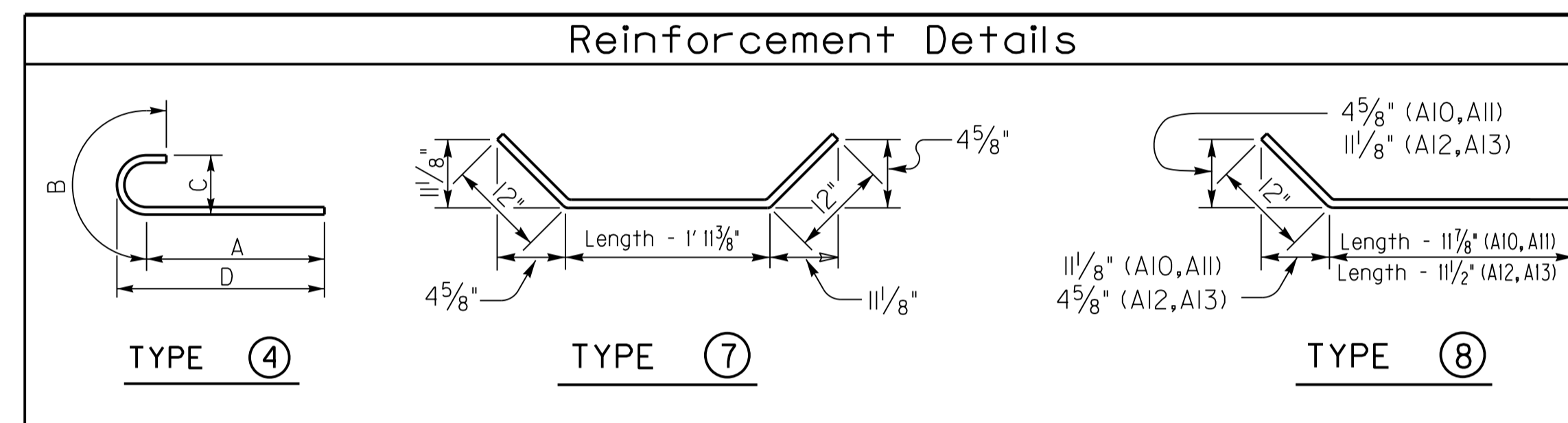
45° SKEW VARIABLE BRIDGE WIDTH 2:1 FILL SLOPES WINGS SKEWED 50% FROM ROADWAY TO BREASTWALL

Bill of Reinforcement

MARK	A1		A2		A3	A4		A5		A6				A7		A8		A9	A10	A11	A12	A13	A14		A15		A16	A17	A18	
TYPE	Str.		Str.		Str.	Str.		Str.		4				Str.		Str.		Str.	8	8	8	8	7		7		Str.	Str.	Str.	
SIZE	#5		#5		#5	#5		#5		#5				#5		#5		#5	#5	#5	#5	#5	#5		#5		#5	#5	#5	
H	No.	Size	Length ft., in.	Spacing	No.	Size	Length ft., in.	Spacing	No.	Length ft., in.	No.	Length ft., in.	No.	Length ft., in.	No.	Length ft., in.	No.	Length ft., in.	No.	Length ft., in.	No.	Length ft., in.	No.	Length ft., in.	No.	Length ft., in.	No.	Length ft., in.	No.	Length ft., in.
15-16	75+Nb=	10 11 8 12	75+Nb=	7 11 8 12	24 20 6	24 38 11	24 14 8	+Lb=	62+Nb=	9 9 11 12	8 1/8	1 10 0 11 3/4	8 6	66+Nb=	5 4 11 12	62+Nb=	6 12 10 12	66+Nb=	12 10 12	14 41 8	14 38 2	14 18 6	14 18 1	14 16 2	+Lb=	14 12 1	+Lb=	2 43 11	2 20 10	134 5 9
13-14	68+Nb=	9 10 8 12	68+Nb=	7 10 8 12	22 18 2	22 34 10	22 14 3	+Lb=	56+Nb=	8 8 3 12 6	11 1 3 0 8 7 3	60+Nb=	5 4 11 12	56+Nb=	6 10 10 12	60+Nb=	10 10 12	60+Nb=	12 37 9	12 34 2	12 16 6	12 16 1	12 16 3	+Lb=	12 12 1	+Lb=	2 39 11	2 18 10	122 5 9	
11-12	60+Nb=	8 9 8 12	60+Nb=	6 9 8 12	20 15 10	20 29 9	20 13 10	+Lb=	49+Nb=	7 7 1 12 5	10 1/2 1 2 0 7 6 2	53+Nb=	5 4 11 12	49+Nb=	5 8 10 12	53+Nb=	8 10 12	53+Nb=	10 32 9	10 29 2	10 14 6	10 14 1	10 16 3	+Lb=	10 12 1	+Lb=	2 34 11	2 16 10	108 5 9	
9-10	52+Nb=	7 8 8 12	52+Nb=	5 8 8 12	18 13 6	18 24 8	18 13 5	+Lb=	42+Nb=	6 6 1 12 5	1 1 0 0 6 5 4	46+Nb=	5 4 11 12	42+Nb=	5 6 10 12	46+Nb=	6 10 12	46+Nb=	8 27 9	8 24 2	8 12 6	8 12 1	8 16 4	+Lb=	8 12 1	+Lb=	2 29 11	2 14 10	94 5 9	
7-8	44+Nb=	6 7 2 12	44+Nb=	5 7 2 12	16 10 11	16 18 11	16 12 7	+Lb=	35+Nb=	5 5 7 12 4	8 1/2 0 10 0 5 4 11	39+Nb=	5 4 11 12	35+Nb=	5 4 10 12	39+Nb=	4 10 12	39+Nb=	6 22 10	6 19 2	6 10 6	6 10 1	6 16 4	+Lb=	6 12 1	+Lb=	2 24 11	2 12 10	80 5 9	
5-6	36+Nb=	5 6 2 12	36+Nb=	5 6 2 12	14 8 7	14 13 9	14 12 1	+Lb=	28+Nb=	5 5 7 12 4	8 1/2 0 10 0 5 4 11	32+Nb=	5 4 11 12	28+Nb=	5 2 10 12	32+Nb=	2 10 12	32+Nb=	4 17 10	4 14 2	4 8 6	4 8 1	4 16 4	+Lb=	4 12 1	+Lb=	2 19 11	2 10 10	66 5 9	

Table of Dimensions

H	W	N	M2	M3	T2	T3	L2	L3	S2		S3			
Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	+Lb/2 =	Length	Length	+Lb/2 =	Length
ft., in.	ft., in.	ft., in.	ft., in.	ft., in.	ft., in.	ft., in.	ft., in.	ft., in.	ft., in.	ft., in.	ft., in.	ft., in.	ft., in.	ft., in.
15-16	12 0	5 0	14 8 1/4	19 1 1/4	35 5 5/8	7 11	37	16	12 8 3/8	+0.5Lb=	1 11 3/4	+0.5Lb=		
13-14	11 0	4 6	13 1 1/2	16 11 3/8	31 8 1/4	7 1/4	33	14	12 1 1/8	+0.5Lb=	2 1 3/4	+0.5Lb=		
11-12	10 0	4 0	11 2	14 9 1/2	26 11 5/8	6 1 1/2	28	12	11 6	+0.5Lb=	2 3 3/4	+0.5Lb=		
9-10	9 0	3 6	9 2 5/8	12 7 5/8	22 3 3/8	5 2 3/4	23	10	10 10 3/4	+0.5Lb=	2 5 3/4	+0.5Lb=		
7-8	7 6	2 9	7 3	10 3 7/8	17 6	4 3 3/8	18	8	10 0	+0.5Lb=	2 8 3/4	+0.5Lb=		
5-6	6 6	2 3	5 3 5/8	8 2	12 9 1/2	3 4 5/8	13	6	9 4 3/4	+0.5Lb=	2 10 3/4	+0.5Lb=		



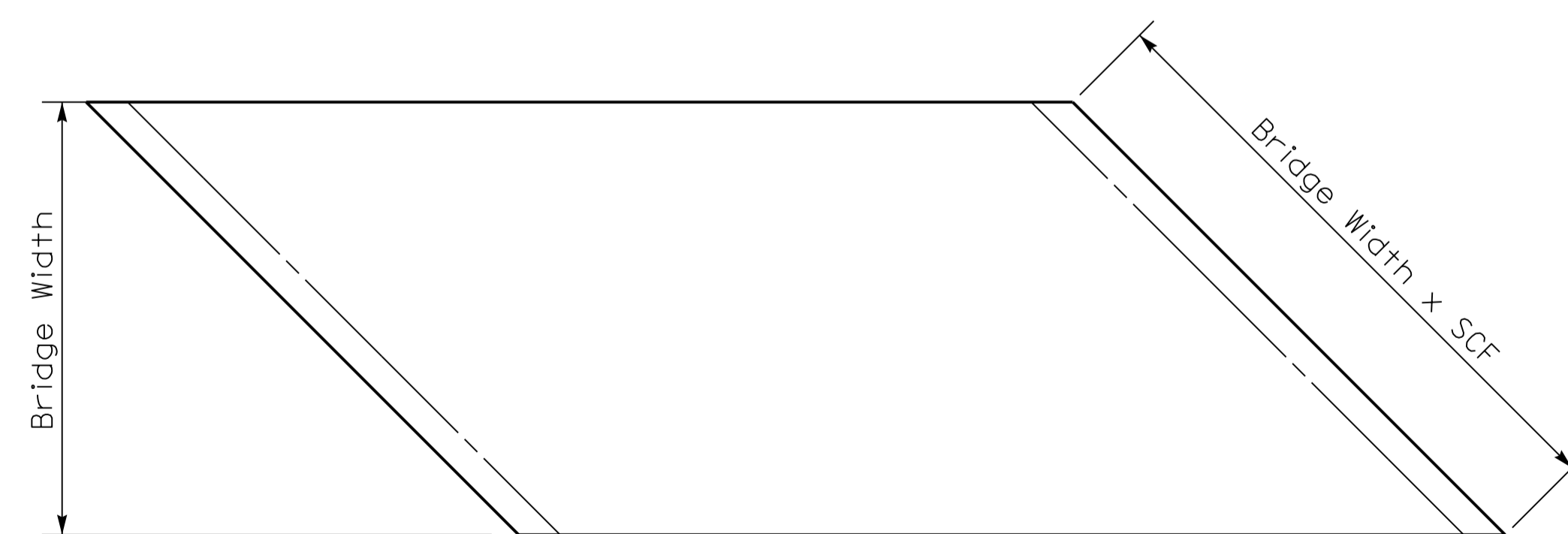
*Concrete quantities computed using 21" beam depth on 1/2" pad & Variable Bridge Width

Quantities		
H	Concrete* C.Y.	Reinforcement LBS.
5	24.42+(0.71xLb) =	2258+(52.8xLb) =
6	26.59+(0.78xLb) =	2258+(52.8xLb) =
7	38.13+(0.93xLb) =	3425+(68.7xLb) =
8	40.82+(1.01xLb) =	3425+(68.7xLb) =
9	56.56+(1.19xLb) =	5154+(91xLb) =
10	59.77+(1.27xLb) =	5154+(91xLb) =
11	76.76+(1.41xLb) =	7598+(120.4xLb) =
12	80.49+(1.49xLb) =	7598+(120.4xLb) =
13	100.06+(1.64xLb) =	11157+(161xLb) =
14	104.31+(1.71xLb) =	11157+(161xLb) =
15	124.53+(1.86xLb) =	14883+(198.6xLb) =
16	129.22+(1.93xLb) =	14883+(198.6xLb) =

ABUTMENT SKEW CORRECTION FACTOR (SCF) = 1.414

NUMBER OF BARS TO ADD (Nb) = Bridge Width (feet) x SCF (round up to nearest whole number)

LENGTH OF ABUTMENT TO ADD (Lb) = Bridge Width (feet) x SCF (convert decimal to architectural)



GENERAL NOTES

SPECIFICATIONS: Construct abutments according to the current edition of the Kentucky Department of Highways Standard Specifications for Road and Bridge Construction. Abutments are designed for side by side box beams as detailed in Standard Drawings BDP-001 through BDP-012, current edition. Dimensions may be adjusted to allow for any out to out bridge width. Abutments are also adequate for Std. Dwg. slabs or steel beam superstructures

FOUNDATION PRESSURE: Construct abutment footings on solid rock bearing material that can support a pressure of 8000 psf service or 10,800 psf strength factored, as recommended by a geotechnical engineer.

WING LENGTHS: Calculated assuming 21" superstructure depth and stream bank elevation at top of footing.

FOOTING ELEVATION: Construct bottom of footing below the anticipated scour elevation. (This typically entails embedding the footings 1'-0" to 2'-0" into rock and pouring concrete directly against cut rock faces, as recommended by geotechnical engineer.)

NOTE: Distances to bars shown are clear dimensions unless otherwise noted.

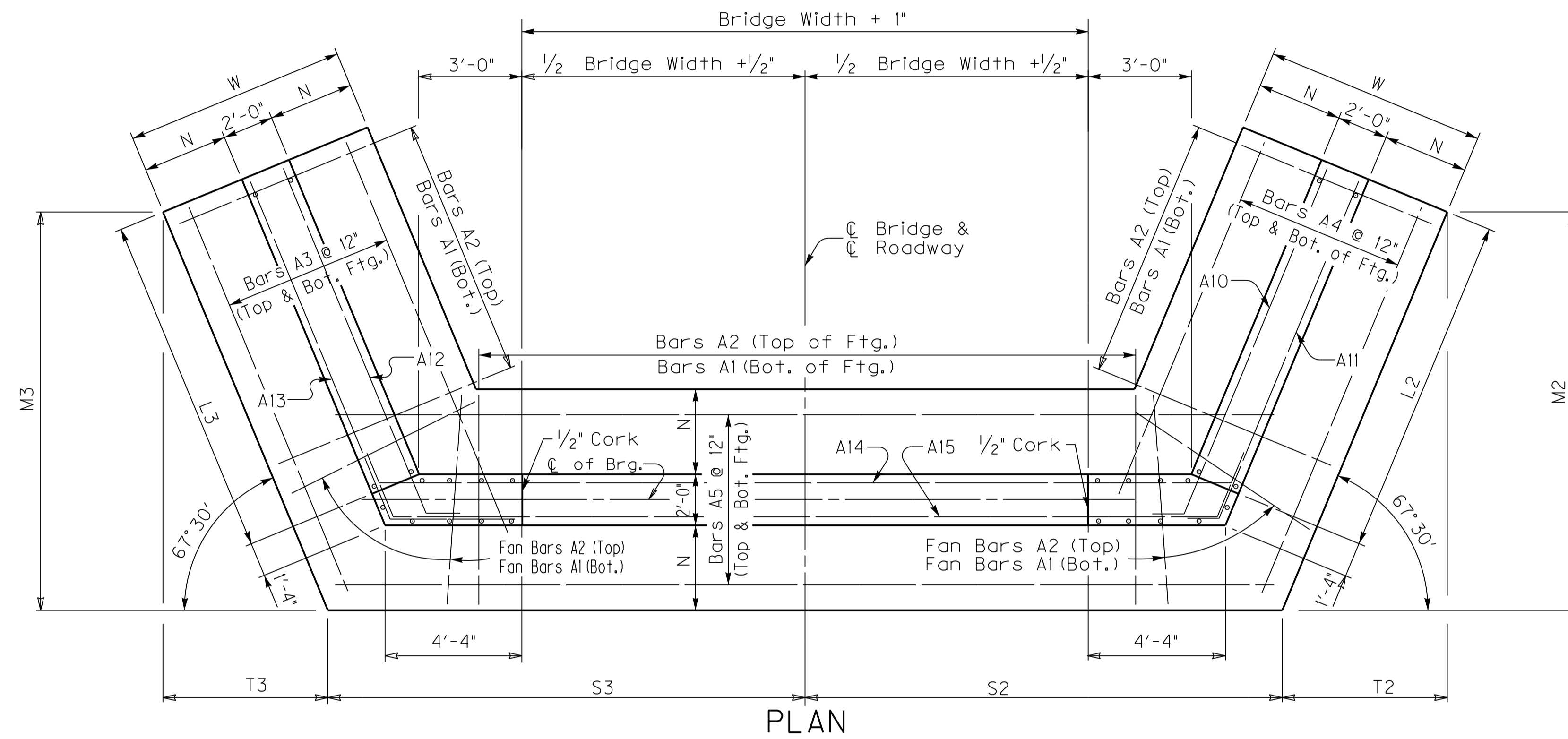
MATERIAL SPECIFICATIONS:
 Concrete, Class "A" = 3500 psi
 Steel Reinforcement = Grade 60

ABUTMENT DETAILS

SKEW	WIDTH	DATE
45	VAR	October 2018

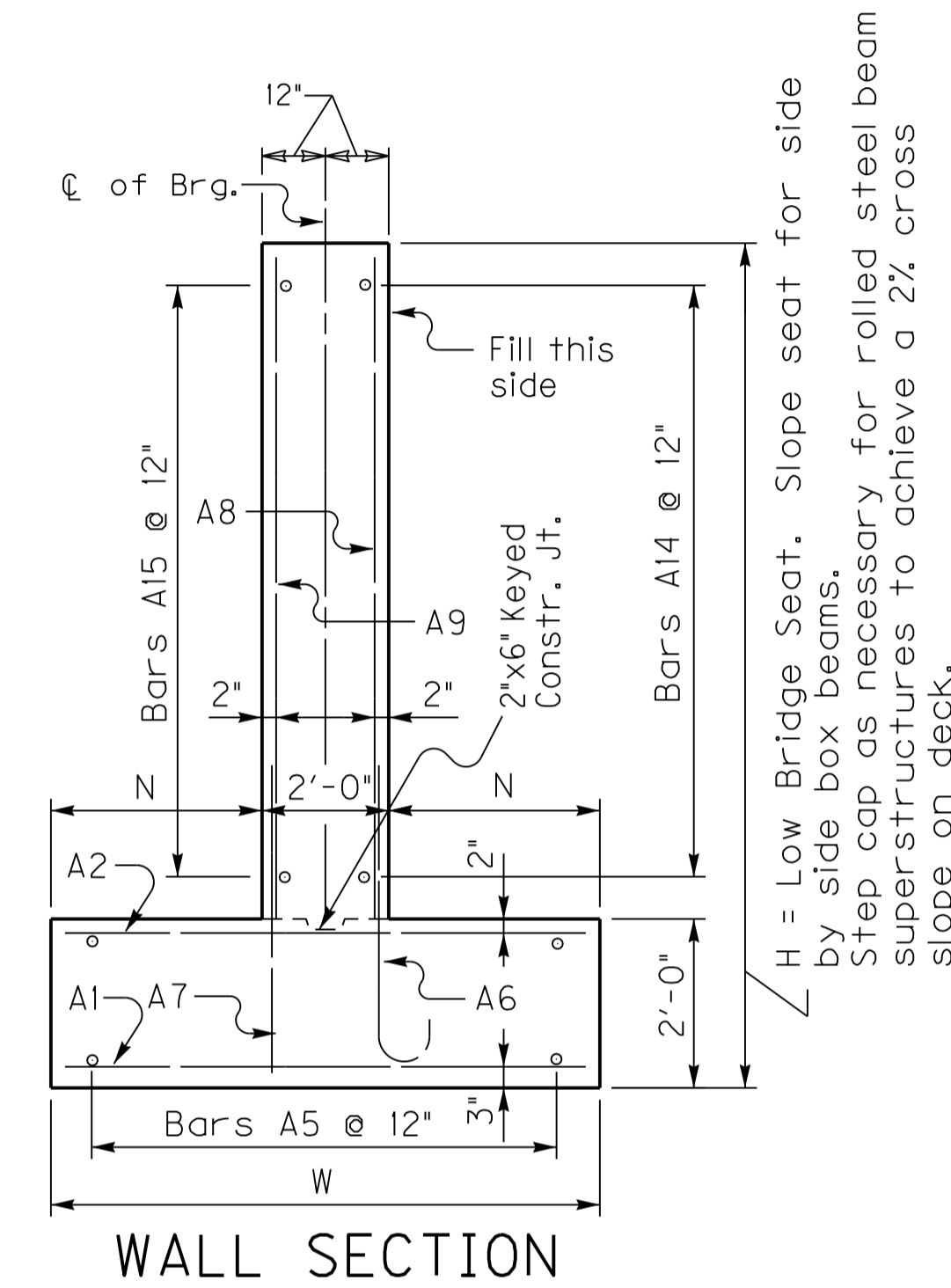
0° SKEW VARIABLE BRIDGE WIDTH 2:1 FILL SLOPES 22.5° SKEW FROM ROADWAY ON WINGS

ABUTMENT SKEW CORRECTION FACTOR (SCF) = 1.000

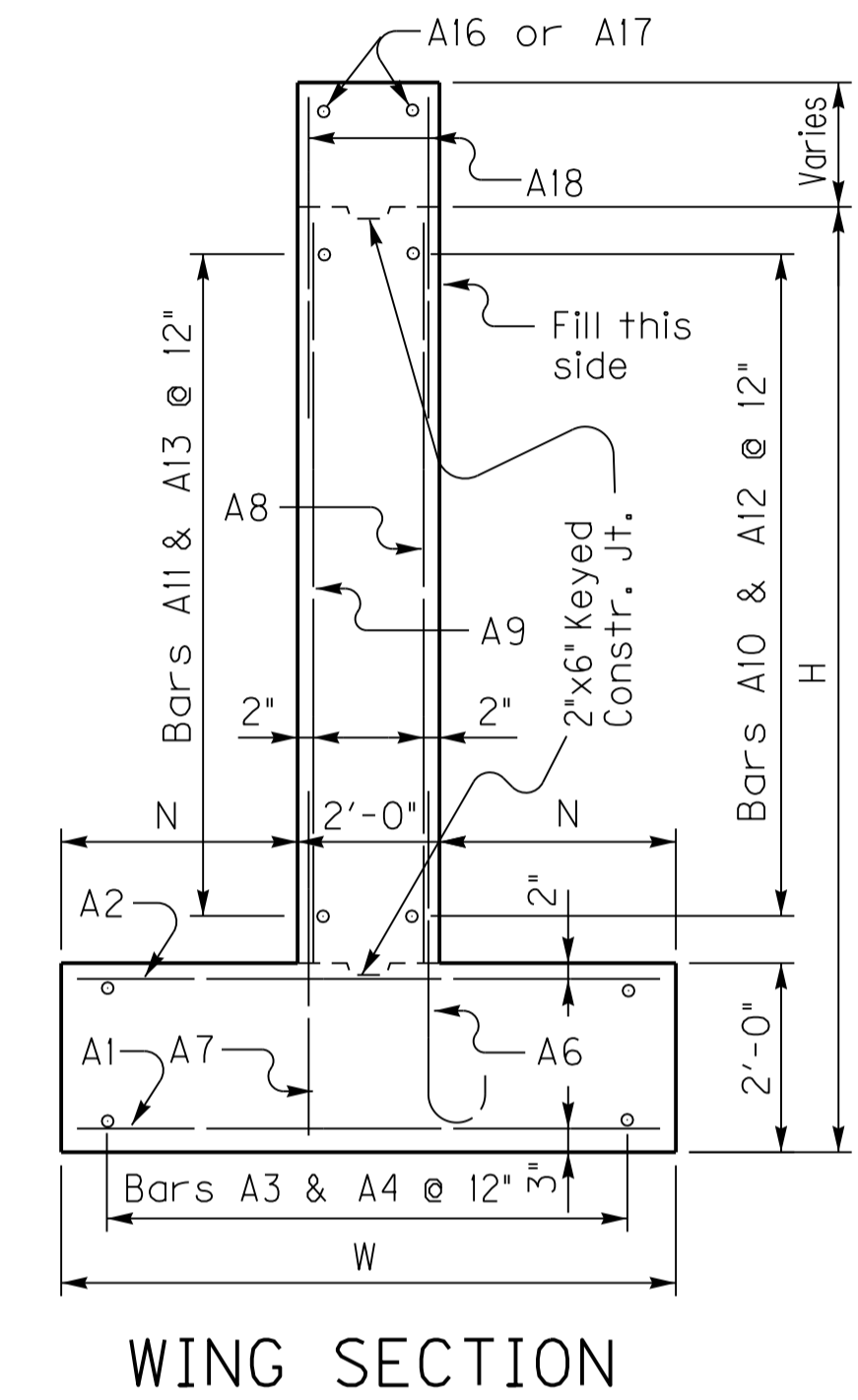


PLAN

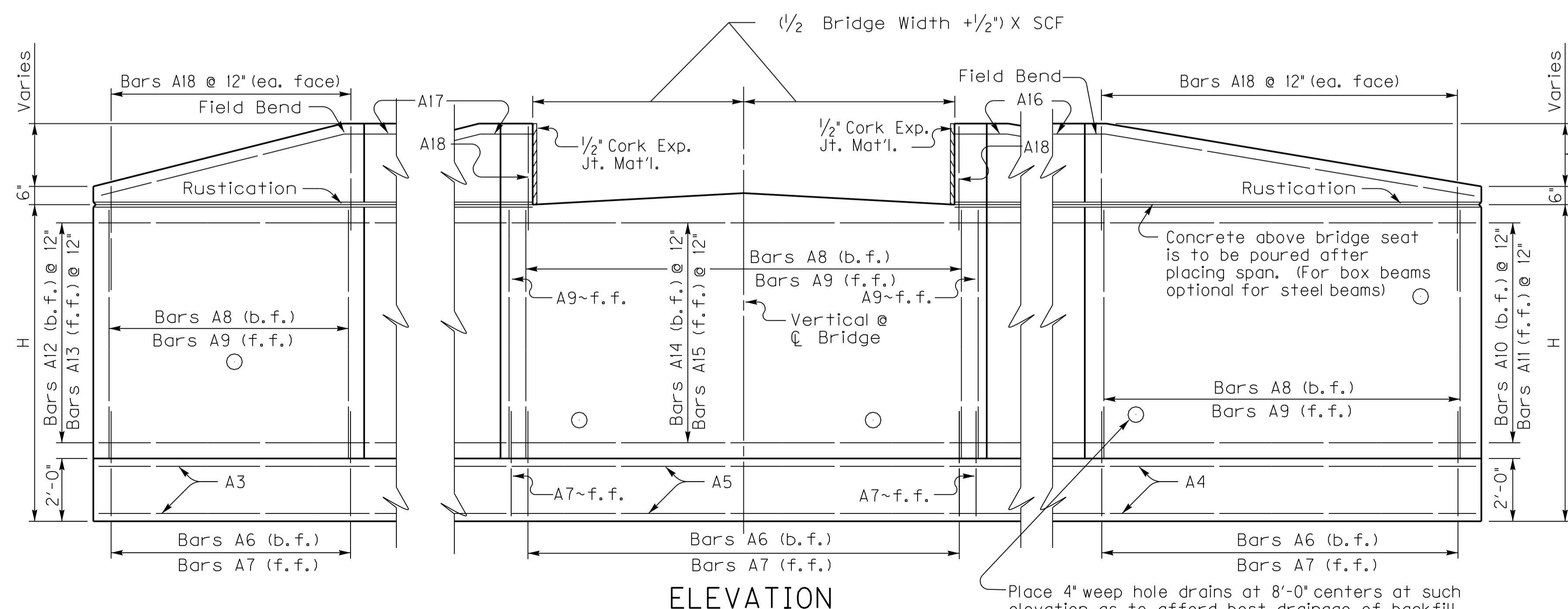
Note: Trim A16 & A17 bars if necessary



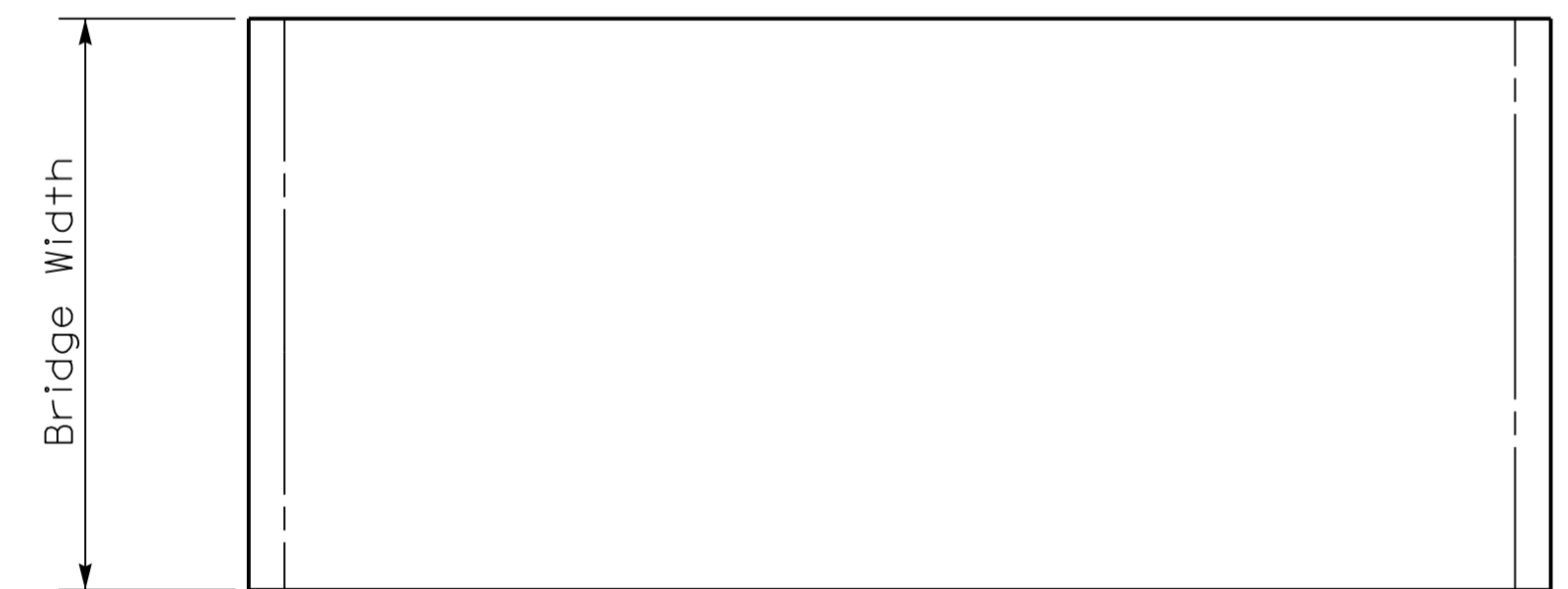
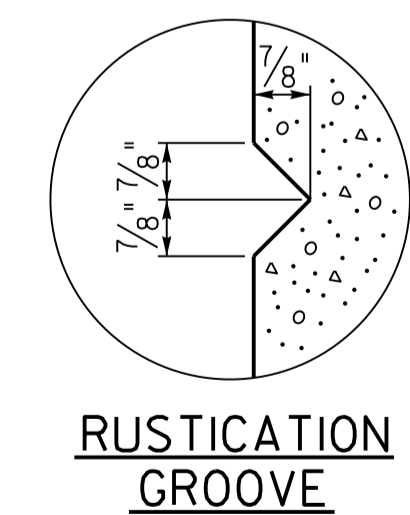
WALL SECTION



WING SECTION



ELEVATION



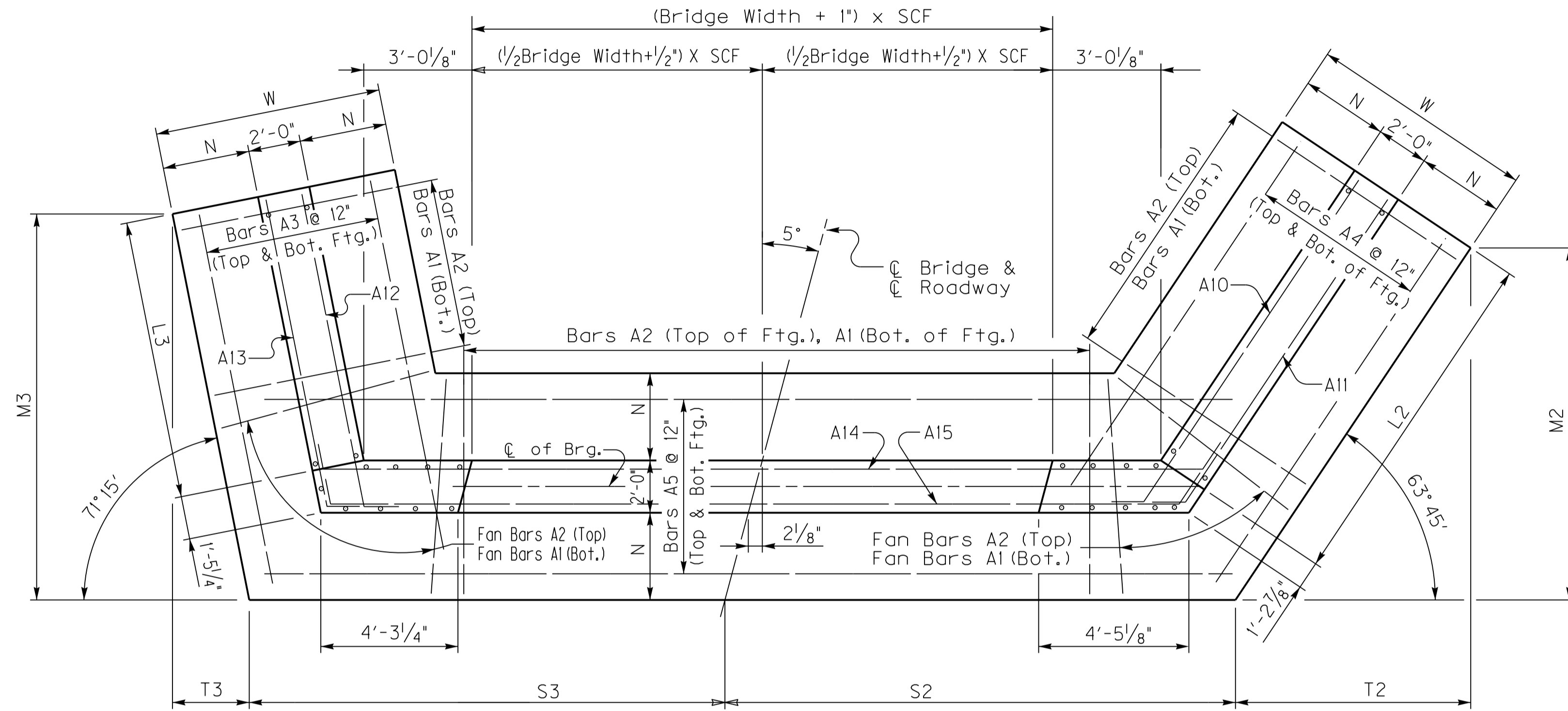
PLAN OF SUPERSTRUCTURE SLAB

ABUTMENT DETAILS

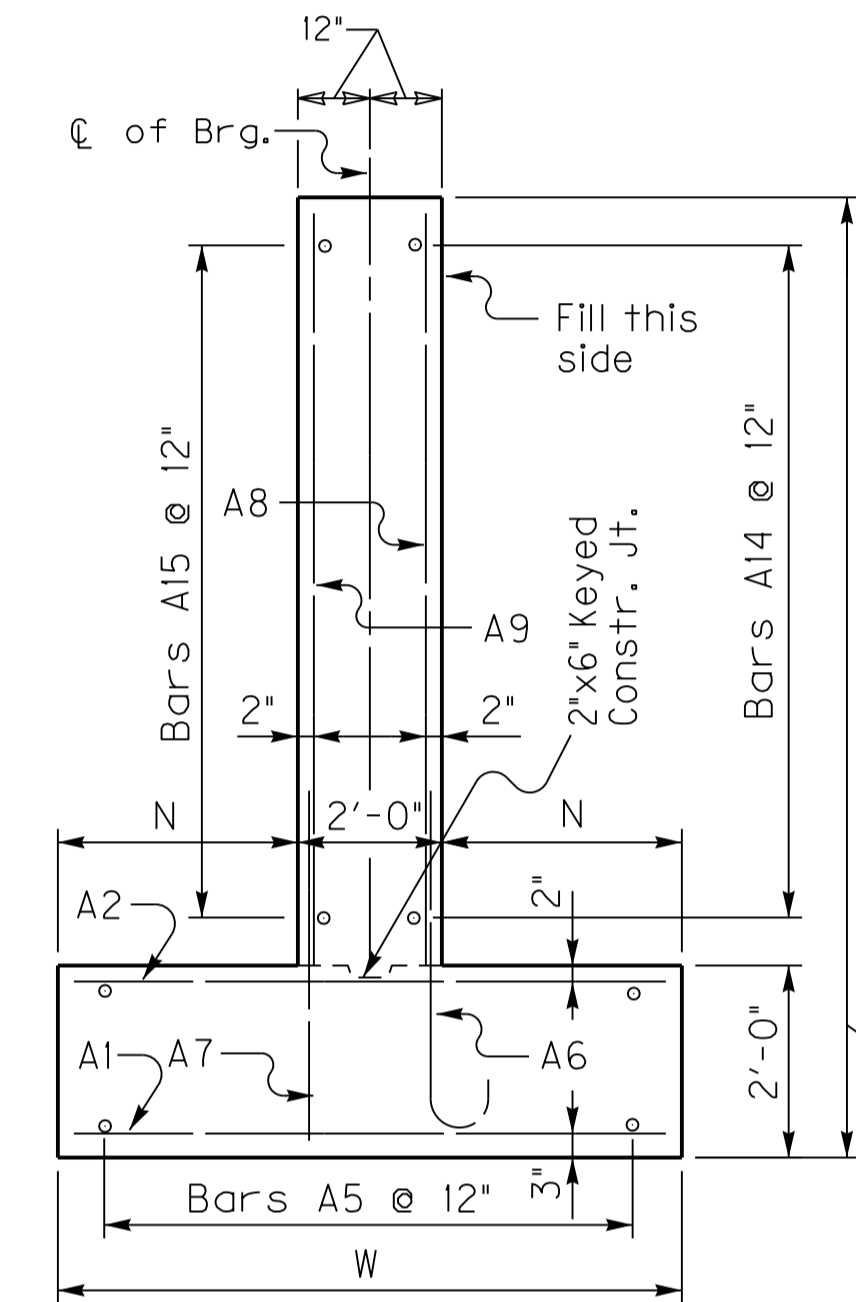
SKEW	WIDTH	DATE
0	VAR	October 2018

5° SKEW VARIABLE BRIDGE WIDTH 2:1 FILL SLOPES WINGS SKEWED 25% FROM ROADWAY TO BREASTWALL

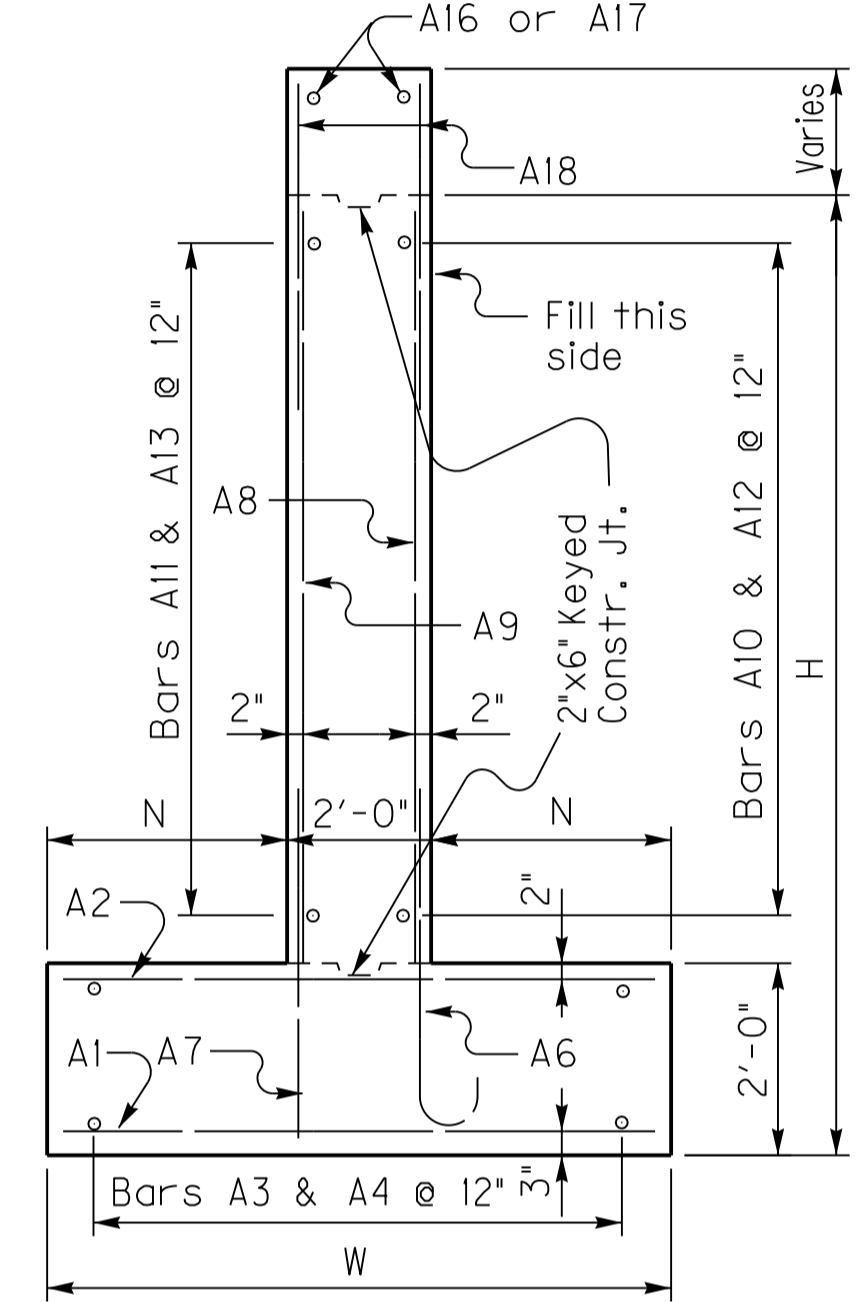
ABUTMENT SKEW CORRECTION FACTOR (SCF) = 1.004



(Left Skew as shown; right skew opp. hand) **PLAN**

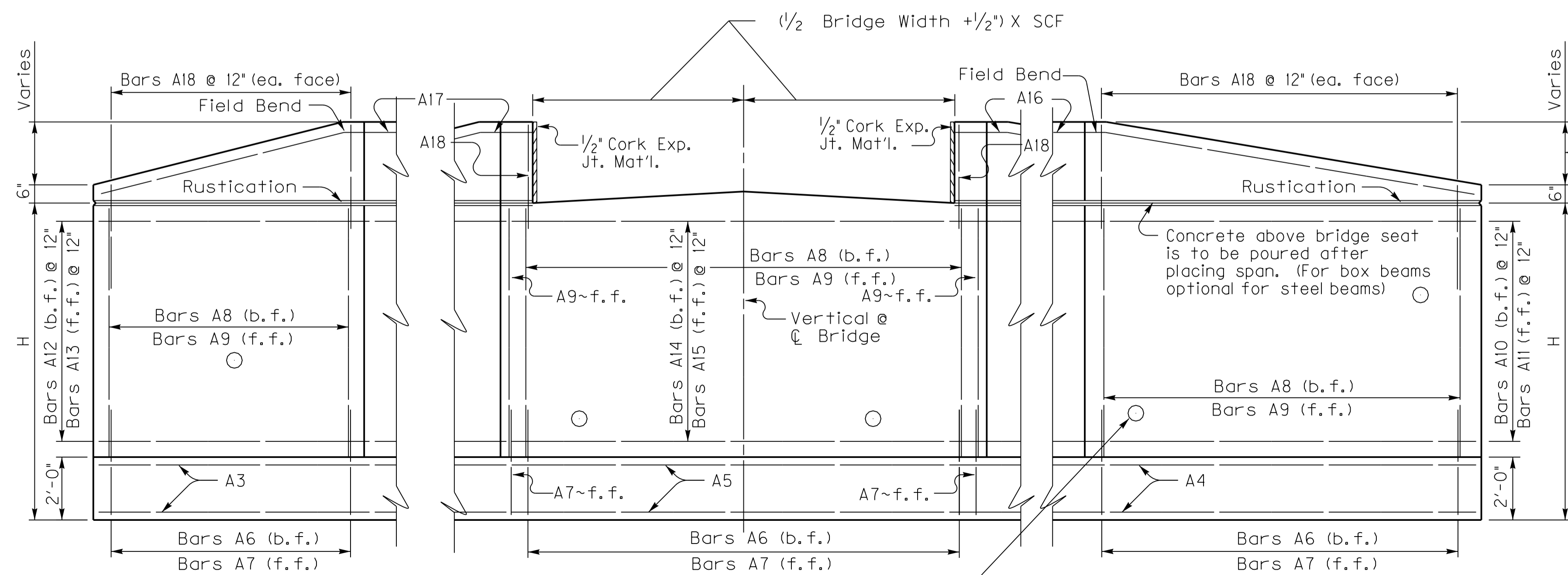


WALL SECTION

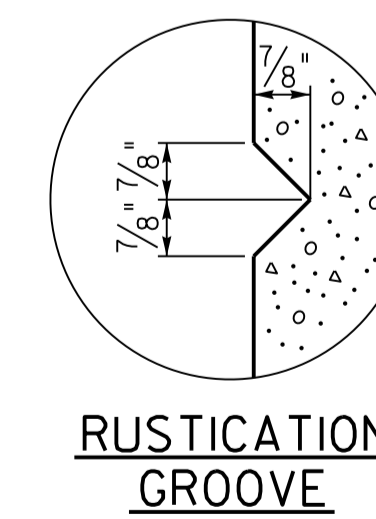


WING SECTION

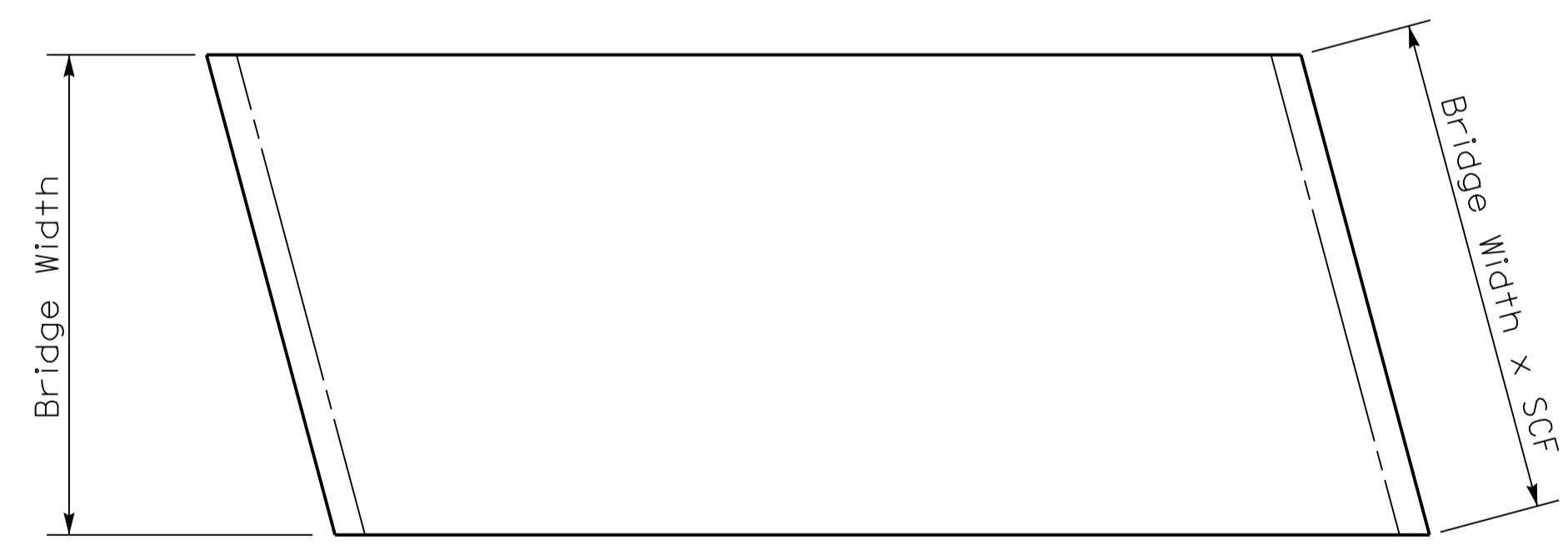
Note: Trim A16 & A17 bars if necessary



ELEVATION



RUSTICATION GROOVE



PLAN OF SUPERSTRUCTURE SLAB

Place 4" weep hole drains at 8'-0" centers at such elevation as to afford best drainage of backfill, in accordance with the Standard Specifications.

ABUTMENT DETAILS

SKEW	WIDTH	DATE
5	VAR	October 2018

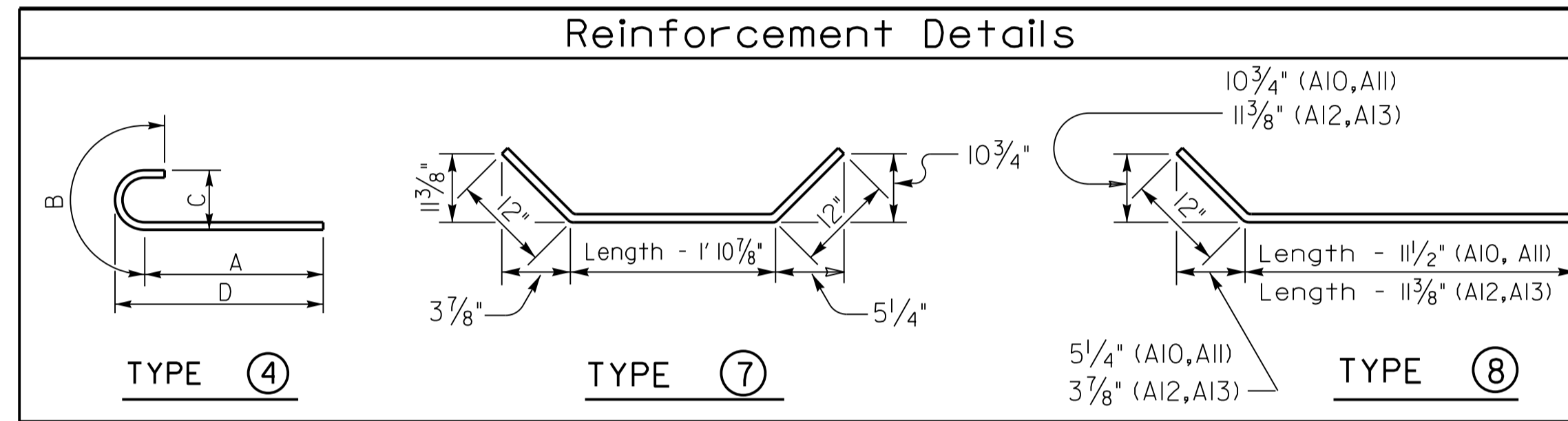
5° SKEW VARIABLE BRIDGE WIDTH 2:1 FILL SLOPES WINGS SKEWED 25% FROM ROADWAY TO BREASTWALL

Bill of Reinforcement

MARK	A1		A2		A3		A4		A5		A6				A7		A8		A9		A10	A11	A12	A13	A14		A15		A16	A17	A18			
TYPE	Str.		Str.		Str.		Str.		Str.		4				Str.		Str.		Str.		8	8	8	8	7		7		Str.	Str.	Str.			
SIZE	#5		#5		#5		#5		#5		#5				#5		#5		#5		#5	#5	#5	#5	#5		#5		#5	#5	#5			
H	No.	Size	Length	Spacing	No.	Size	Length	Spacing	No.	Length	Spacing	No.	Length	Spacing	No.	Length	Spacing	No.	Length	Spacing	No.	Length	Spacing	No.	Length	Spacing	No.	Length	Spacing	No.	Length	Spacing		
15-16	70+Nb=	10 11 8 12	70+Nb=	7 11 8 12	24 26 10	24 27 3	24 15 5	+Lb=		52+Nb=	9 9 11 12	8 1/8	1 10 0	11 3/4	8 6	57+Nb=	5 4 11 12	52+Nb=	6 12 10 12	57+Nb=	12 10 12	14 25 6	14 24 11	14 24 6	14 24 2	14 11 7	+Lb=		14 10 4	+Lb=		2 28 7	2 27 7	112 5 9
13-14	63+Nb=	9 10 8 12	63+Nb=	7 10 8 12	22 23 6	22 23 11	22 14 9	+Lb=		46+Nb=	8 8 3 12	6 11 1 3 0	8 7 3	51+Nb=	5 4 11 12	46+Nb=	6 10 10 12	51+Nb=	10 10 12	12 22 7	12 21 11	12 21 6	12 21 2	12 11 7	+Lb=		12 10 4	+Lb=		2 25 7	2 24 7	100 5 9		
11-12	54+Nb=	8 9 8 12	54+Nb=	6 9 8 12	20 19 1	20 19 7	20 14 1	+Lb=		38+Nb=	7 7 1 12	5 10 1/2	1 2 0 7	6 2	43+Nb=	5 4 11 12	38+Nb=	5 8 10 12	43+Nb=	8 10 12	10 18 7	10 17 11	10 17 6	10 17 2	10 11 7	+Lb=		10 10 4	+Lb=		2 21 7	2 20 7	84 5 9	
9-10	48+Nb=	7 8 8 12	48+Nb=	5 8 8 12	18 16 9	18 17 4	18 13 5	+Lb=		34+Nb=	6 6 1 12	5 1 1 0 0	6 5 4	39+Nb=	5 4 11 12	34+Nb=	5 6 10 12	39+Nb=	6 10 12	8 16 7	8 15 11	8 15 6	8 15 2	8 11 7	+Lb=		8 10 4	+Lb=		2 19 7	2 18 7	76 5 9		
7-8	39+Nb=	6 7 2 12	39+Nb=	5 7 2 12	16 13 2	16 12 9	16 12 3	+Lb=		27+Nb=	5 5 7 12	4 8 1/2 0	10 0 5 4	11	32+Nb=	5 4 11 12	27+Nb=	5 4 10 12	32+Nb=	4 10 12	6 12 7	6 11 11	6 12 6	6 12 2	6 11 7	+Lb=		6 10 4	+Lb=		2 15 7	2 15 7	62 5 9	
5-6	34+Nb=	5 6 2 12	34+Nb=	5 6 2 12	14 10 9	14 10 5	14 11 7	+Lb=		23+Nb=	5 5 7 12	4 8 1/2 0	10 0 5 4	11	28+Nb=	5 4 11 12	23+Nb=	5 2 10 12	28+Nb=	2 10 12	4 10 7	4 9 11 4	10 6 4	10 2 4	11 7	+Lb=		4 10 4	+Lb=		2 13 7	2 13 7	54 5 9	

Table of Dimensions

H	W	N	M2	M3	T2	T3	L2	L3	S2		S3			
	Length	Length	Length	Length	Length	Length	Length	Length	Length	+Lb/2 =	Length	Length	+Lb/2 =	Length
	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.
15-16	12 0	5 0	24 6 3/8	25 7	12 1 1/8	8 8 1/4	23	22	8 1/4	+0.5Lb=		7 5 1/2	+0.5Lb=	
13-14	11 0	4 6	21 6 3/4	22 4 7/8	10 7 5/8	7 7 1/4	20	19	7 8	+0.5Lb=		7 1 3/4	+0.5Lb=	
11-12	10 0	4 0	17 8 3/8	18 3 1/4	8 8 3/4	6 2 1/2	16	15	7 3 3/4	+0.5Lb=		6 9 7/8	+0.5Lb=	
9-10	9 0	3 6	15 7 1/2	16 1/2	7 8 1/2	5 5 3/8	14	13	6 11 1/2	+0.5Lb=		6 6 1/8	+0.5Lb=	
7-8	7 6	2 9	11 7 3/8	12 8 1/4	5 8 3/4	4 3 3/4	10	10	6 5 1/8	+0.5Lb=		6 1/2	+0.5Lb=	
5-6	6 6	2 3	9 6 1/2	10 5 1/2	4 8 1/2	3 6 5/8	8	8	6 7/8	+0.5Lb=		5 8 3/4	+0.5Lb=	



*Concrete quantities computed using 21' beam depth on 1/2' pad & Variable Bridge Width

Quantities

H	Concrete*		Reinforcement	
	C.Y.		LBS.	
5	20.61	+(0.71xLb) =	1993	+(52.8xLb) =
6	22.45	+(0.78xLb) =	1993	+(52.8xLb) =
7	30.23	+(0.93xLb) =	2857	+(68.7xLb) =
8	32.37	+(1.01xLb) =	2857	+(68.7xLb) =
9	46.71	+(1.19xLb) =	4466	+(91xLb) =
10	49.36	+(1.27xLb) =	4466	+(91xLb) =
11	60.69	+(1.41xLb) =	6377	+(120.4xLb) =
12	63.64	+(1.49xLb) =	6377	+(120.4xLb) =
13	83.39	+(1.64xLb) =	9769	+(161xLb) =
14	86.93	+(1.71xLb) =	9769	+(161xLb) =
15	105.73	+(1.86xLb) =	13211	+(198.6xLb) =
16	109.71	+(1.93xLb) =	13211	+(198.6xLb) =

ABUTMENT SKEW CORRECTION FACTOR (SCF) = 1.004

NUMBER OF BARS TO ADD (Nb) = Bridge Width (feet) x SCF

(round up to nearest whole number)

LENGTH OF ABUTMENT TO ADD (Lb) = Bridge Width (feet) x SCF

(convert decimal to architectural)

GENERAL NOTES

SPECIFICATIONS: Construct abutments according to the current edition of the Kentucky Department of Highways Standard Specifications for Road and Bridge Construction. Abutments are designed for side by side box beams as detailed in Standard Drawings BDP-001 through BDP-012, current edition. Dimensions may be adjusted to allow for any out to out bridge width. Abutments are also adequate for Std. Dwg. slabs or steel beam superstructures

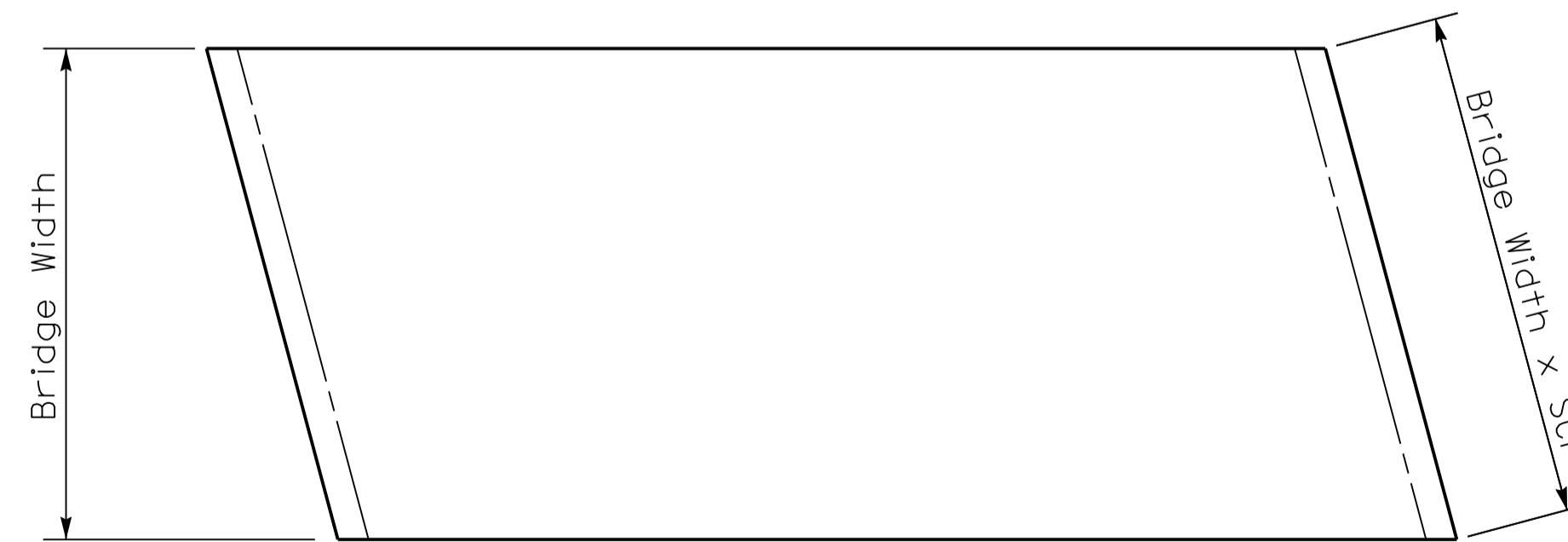
FOUNDATION PRESSURE: Construct abutment footings on solid rock bearing material that can support a pressure of 8000 psf service or 10,800 psf strength factored, as recommended by a geotechnical engineer.

WING LENGTHS: Calculated assuming 21' superstructure depth and stream bank elevation at top of footing.

FOOTING ELEVATION: Construct bottom of footing below the anticipated scour elevation. (This typically entails embedding the footings 1'-0" to 2'-0" into rock and pouring concrete directly against cut rock faces, as recommended by geotechnical engineer.)

NOTE: Distances to bars shown are clear dimensions unless otherwise noted.

MATERIAL SPECIFICATIONS:
 Concrete, Class "A" = 3500 psi
 Steel Reinforcement = Grade 60

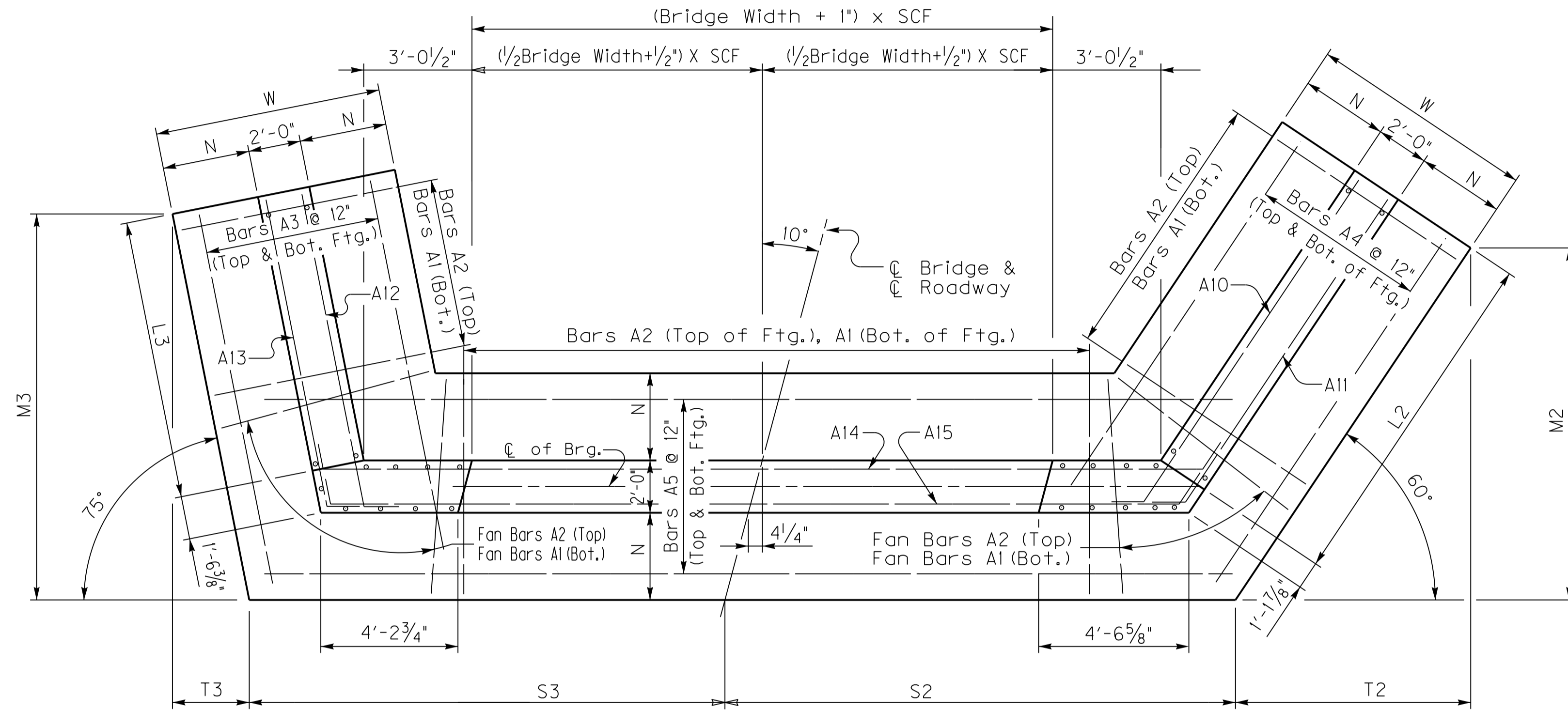


ABUTMENT DETAILS

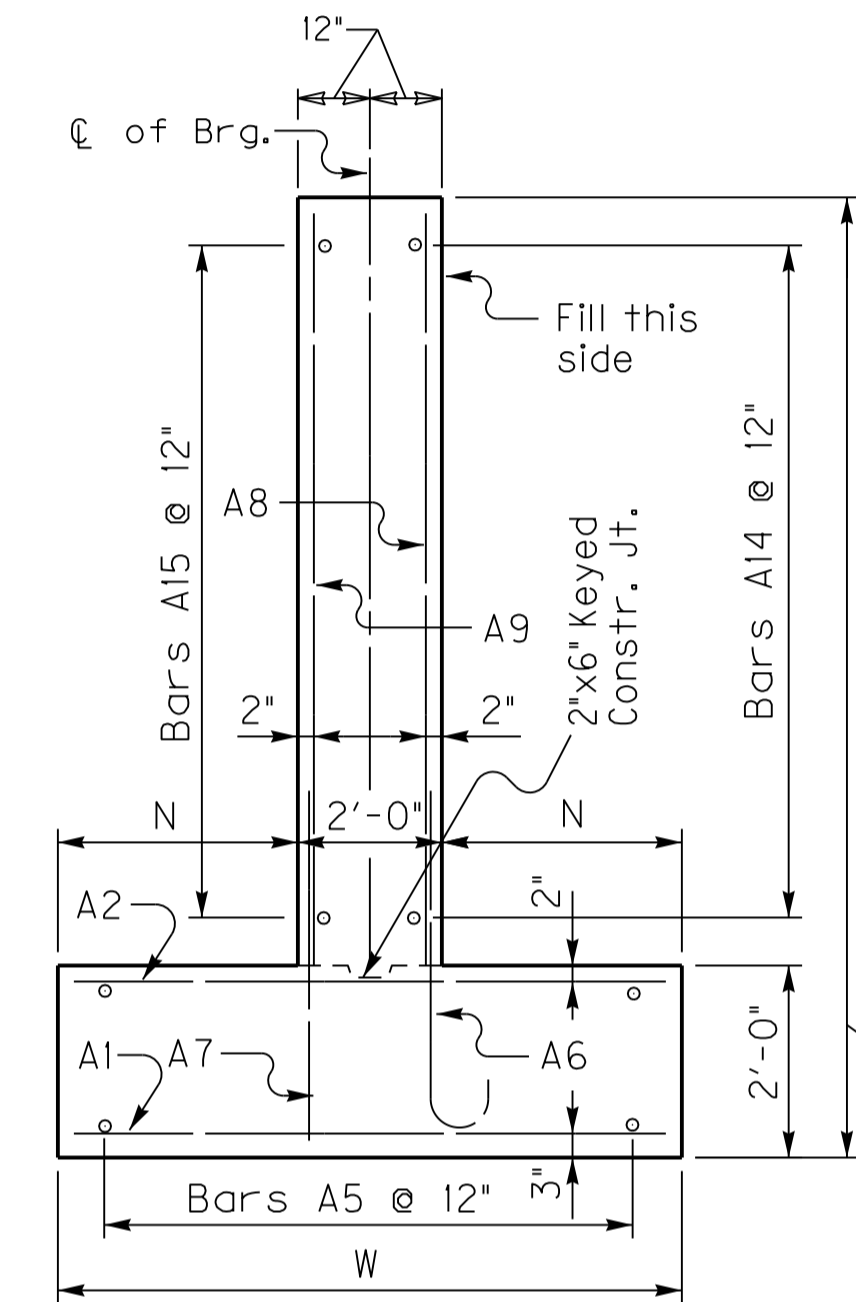
SKEW	WIDTH	DATE
5	VAR	October 2018

10° SKEW VARIABLE BRIDGE WIDTH 2:1 FILL SLOPES WINGS SKEWED 25% FROM ROADWAY TO BREASTWALL

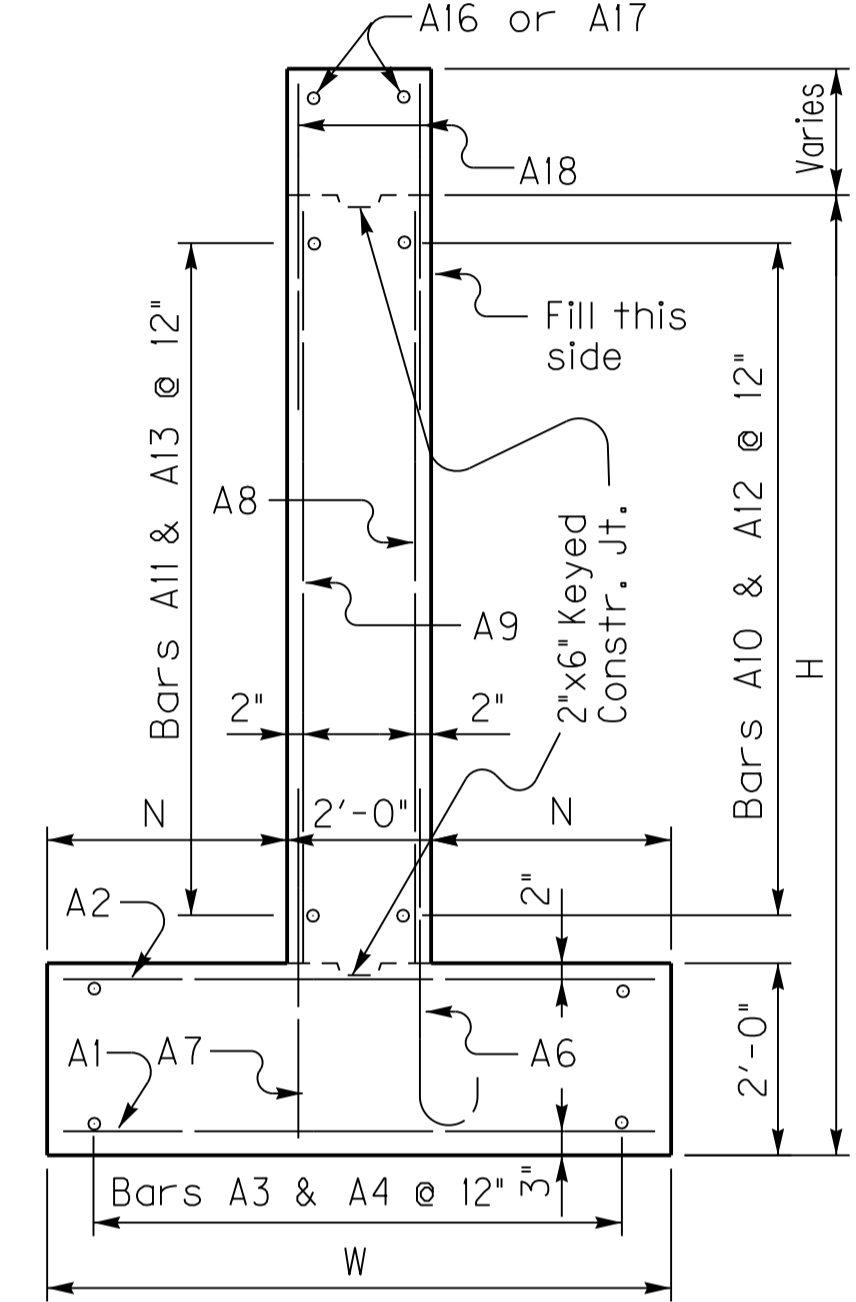
ABUTMENT SKEW CORRECTION FACTOR (SCF) = 1.015



(Left Skew as shown; right skew opp. hand) **PLAN**

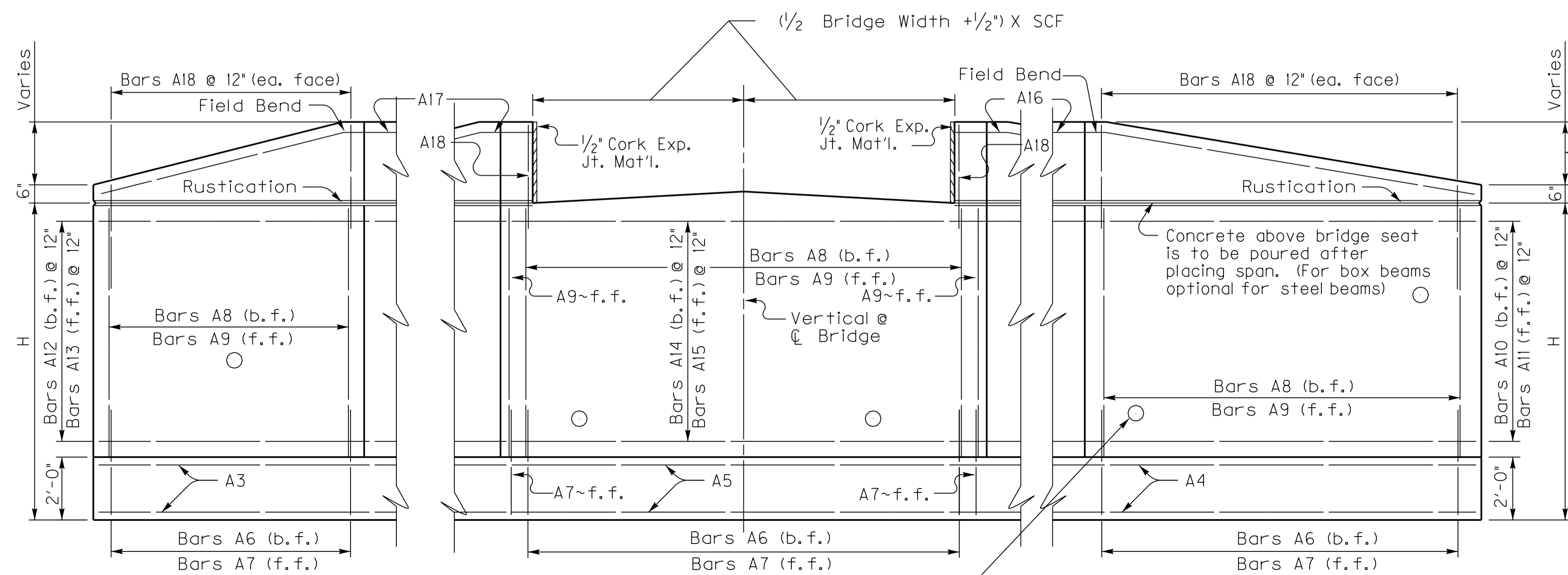


WALL SECTION

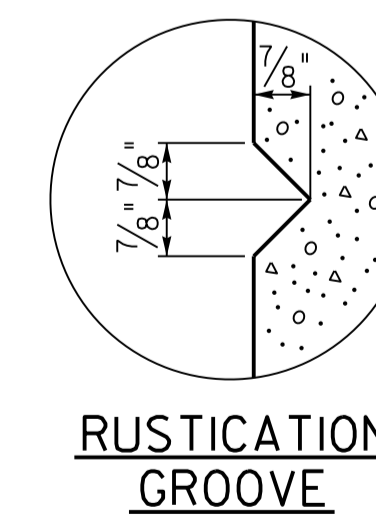


WING SECTION

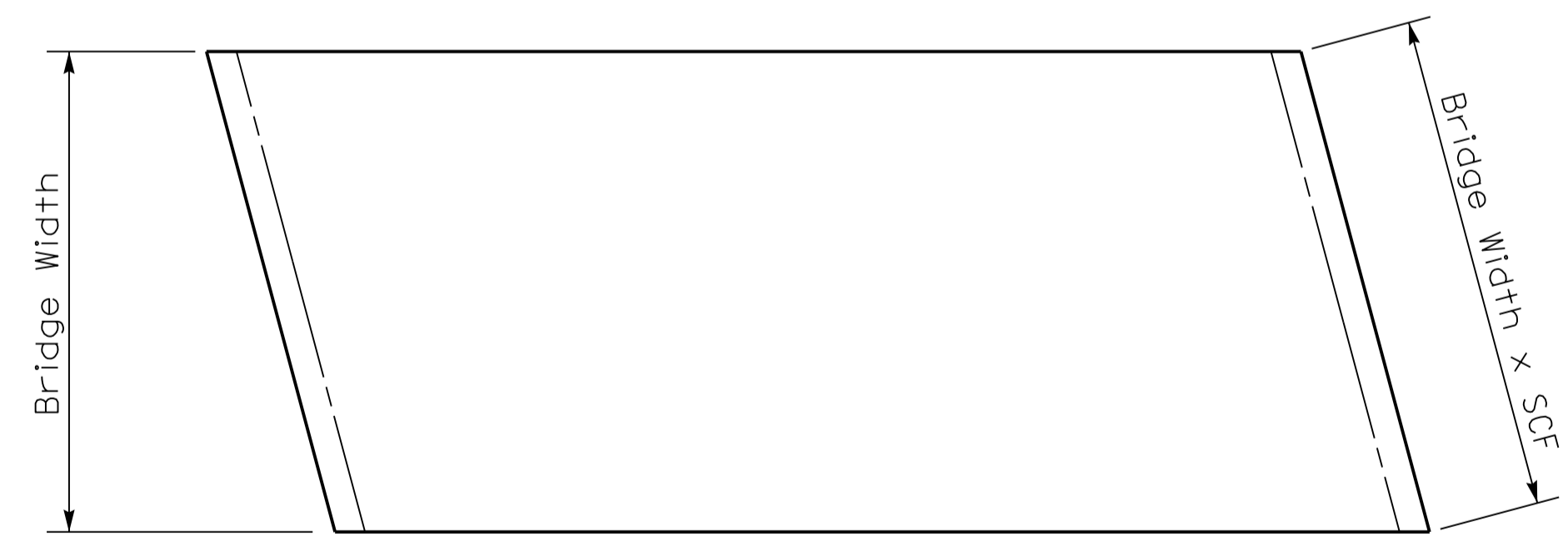
Note: Trim A16 & A17 bars if necessary



ELEVATION



RUSTICATION GROOVE



PLAN OF SUPERSTRUCTURE SLAB

Place 4\"/>

ABUTMENT DETAILS

SKEW	WIDTH	DATE
10	VAR	October 2018

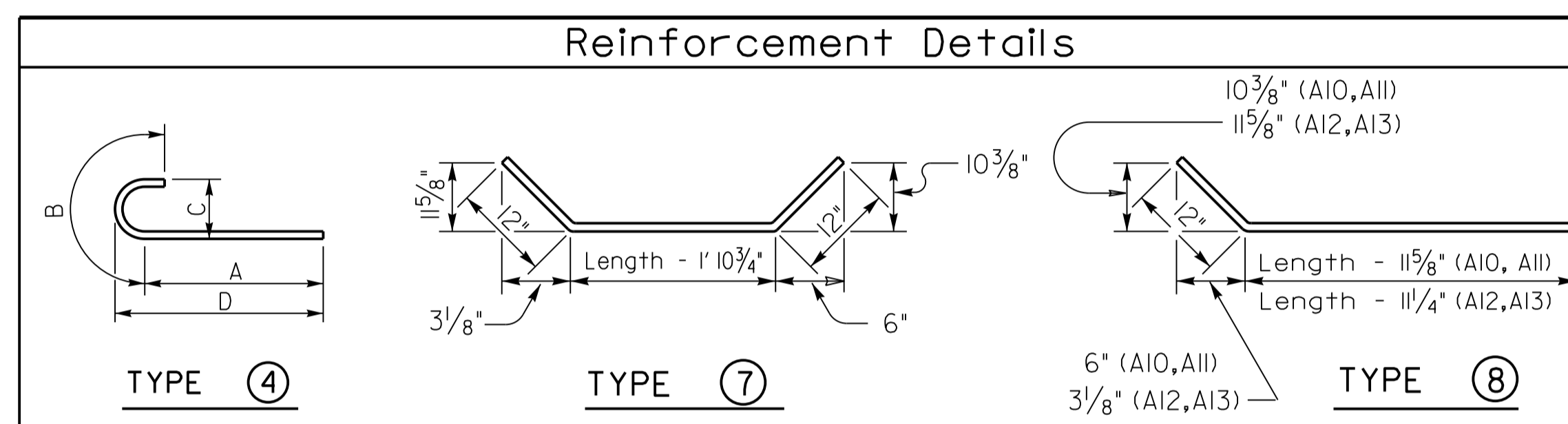
10° SKEW VARIABLE BRIDGE WIDTH 2:1 FILL SLOPES WINGS SKEWED 25% FROM ROADWAY TO BREASTWALL

Bill of Reinforcement

MARK	A1		A2		A3	A4		A5		A6				A7		A8		A9	A10	A11	A12	A13	A14		A15		A16	A17	A18			
TYPE	Str.		Str.		Str.	Str.		Str.		4				Str.		Str.		Str.	8	8	8	8	7		7		Str.	Str.	Str.			
SIZE	#5		#5		#5	#5		#5		#5				#5		#5		#5	#5	#5	#5	#5	#5		#5		#5	#5	#5			
H	No.	Size	Length	Spacing	No.	Size	Length	Spacing	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length				
			ft.	in.			ft.	in.		ft.		ft.		ft.		ft.		ft.		ft.		ft.		ft.		ft.		ft.				
15-16	71+Nb=	10 11 8 12	71+Nb=	7 11 8 12	24 26 2	24 27 11	24 15 6	+Lb=		52+Nb=	9 9 11 12	8 1/8 1 10 0 11 3/4	8 6	57+Nb=	5 4 11 12	52+Nb=	6 12 10 12	57+Nb=	12 10 12	14 26 8	14 25 11	14 23 6	14 23 3	14 11 8	+Lb=		14 10 5	+Lb=		2 29 8	2 26 8	112 5 9
13-14	63+Nb=	9 10 8 12	63+Nb=	7 10 8 12	22 22 9	22 24 8	22 14 10	+Lb=		46+Nb=	8 8 3 12	6 11 1 3 0 8 7 3	51+Nb=	5 4 11 12	46+Nb=	6 10 10 12	51+Nb=	10 10 12	12 23 8	12 22 11	12 20 6	12 20 3	12 11 8	+Lb=		12 10 5	+Lb=		2 26 8	2 23 8	100 5 9	
11-12	55+Nb=	8 9 8 12	55+Nb=	6 9 8 12	20 19 5	20 20 5	20 14 2	+Lb=		39+Nb=	7 7 1 12	5 10 1/2 1 2 0 7 6 2	44+Nb=	5 4 11 12	39+Nb=	5 8 10 12	44+Nb=	8 10 12	10 19 8	10 18 11	10 17 6	10 17 3	10 11 8	+Lb=		10 10 5	+Lb=		2 22 8	2 20 8	86 5 9	
9-10	49+Nb=	7 8 8 12	49+Nb=	5 8 8 12	18 16 0	18 18 1	18 13 6	+Lb=		34+Nb=	6 6 1 12	5 1 1 0 0 6 5 4	39+Nb=	5 4 11 12	34+Nb=	5 6 10 12	39+Nb=	6 10 12	8 17 8	8 16 11	8 14 6	8 14 3	8 11 8	+Lb=		8 10 5	+Lb=		2 20 8	2 17 8	76 5 9	
7-8	40+Nb=	6 7 2 12	40+Nb=	5 7 2 12	16 12 4	16 13 6	16 12 4	+Lb=		27+Nb=	5 5 7 12	4 8 1/2 0 10 0 5 4 11	32+Nb=	5 4 11 12	27+Nb=	5 4 10 12	32+Nb=	4 10 12	6 13 8	6 12 11	6 11 6	6 11 3	6 11 8	+Lb=		6 10 5	+Lb=		2 16 8	2 14 8	62 5 9	
5-6	34+Nb=	5 6 2 12	34+Nb=	5 6 2 12	14 10 0	14 11 3	14 11 8	+Lb=		23+Nb=	5 5 7 12	4 8 1/2 0 10 0 5 4 11	28+Nb=	5 4 11 12	23+Nb=	5 2 10 12	28+Nb=	2 10 12	4 11 8	4 10 11	4 9 6	4 9 3	4 11 8	+Lb=		4 10 5	+Lb=		2 14 8	2 12 8	54 5 9	

Table of Dimensions

H	W	N	M2	M3	T2	T3	L2	L3	S2		S3	
	Length	Length	Length	Length	Length	Length	Length	Length	Length	+Lb/2 =	Length	Length
	ft.	in.	ft.	in.	ft.	in.	ft.	in.	ft.	in.	ft.	in.
15-16	12 0	5 0	24 3 3/8	25 5 5/8	14 1/4	6 9 7/8	24	21	8 4 3/8	+0.5Lb=	7 2 3/4	+0.5Lb=
13-14	11 0	4 6	21 5 1/4	22 2 1/2	12 4 1/2	5 11 3/8	21	18	7 11 7/8	+0.5Lb=	6 11 1/8	+0.5Lb=
11-12	10 0	4 0	17 8 5/8	18 11 1/4	10 2 3/4	5 7 7/8	17	15	7 7 3/8	+0.5Lb=	6 7 5/8	+0.5Lb=
9-10	9 0	3 6	15 8 7/8	15 8 9 1	4 2 3/8	15	12	7 2 3/4	+0.5Lb=	6 4 1/8	+0.5Lb=	
7-8	7 6	2 9	11 10 7/8	12 2 5/8	6 10 1/2	3 3 1/4	11	9	6 8	+0.5Lb=	5 10 3/4	+0.5Lb=
5-6	6 6	2 3	9 11 9 11	5 8 3/4	2 7 7/8	9	7	6 3 1/2	+0.5Lb=	5 7 1/4	+0.5Lb=	



*Concrete quantities computed using 21" beam depth on 1/2" pad & Variable Bridge Width

Quantities

H	Concrete*	Reinforcement
	C.Y.	LBS.
5	20.69+(0.71xLb) =	1998+(52.8xLb) =
6	22.53+(0.78xLb) =	1998+(52.8xLb) =
7	30.33+(0.93xLb) =	2878+(68.7xLb) =
8	32.46+(1.01xLb) =	2878+(68.7xLb) =
9	46.82+(1.19xLb) =	4497+(91xLb) =
10	49.48+(1.27xLb) =	4497+(91xLb) =
11	62.34+(1.41xLb) =	6520+(120.4xLb) =
12	65.36+(1.49xLb) =	6520+(120.4xLb) =
13	83.54+(1.64xLb) =	9776+(161xLb) =
14	87.08+(1.71xLb) =	9776+(161xLb) =
15	105.9+(1.86xLb) =	13292+(198.6xLb) =
16	109.89+(1.93xLb) =	13292+(198.6xLb) =

ABUTMENT SKEW CORRECTION FACTOR (SCF) = 1.015

NUMBER OF BARS TO ADD (Nb) = Bridge Width (feet) x SCF (round up to nearest whole number)

LENGTH OF ABUTMENT TO ADD (Lb) = Bridge Width (feet) x SCF (convert decimal to architectural)

GENERAL NOTES

SPECIFICATIONS: Construct abutments according to the current edition of the Kentucky Department of Highways Standard Specifications for Road and Bridge Construction. Abutments are designed for side by side box beams as detailed in Standard Drawings BDP-001 through BDP-012, current edition. Dimensions may be adjusted to allow for any out to out bridge width. Abutments are also adequate for Std. Dwg. slabs or steel beam superstructures

FOUNDATION PRESSURE: Construct abutment footings on solid rock bearing material that can support a pressure of 8000 psf service or 10,800 psf strength factored, as recommended by a geotechnical engineer.

WING LENGTHS: Calculated assuming 21" superstructure depth and stream bank elevation at top of footing.

FOOTING ELEVATION: Construct bottom of footing below the anticipated scour elevation. (This typically entails embedding the footings 1'-0" to 2'-0" into rock and pouring concrete directly against cut rock faces, as recommended by geotechnical engineer.)

NOTE: Distances to bars shown are clear dimensions unless otherwise noted.

MATERIAL SPECIFICATIONS:
 Concrete, Class "A" = 3500 psi
 Steel Reinforcement = Grade 60

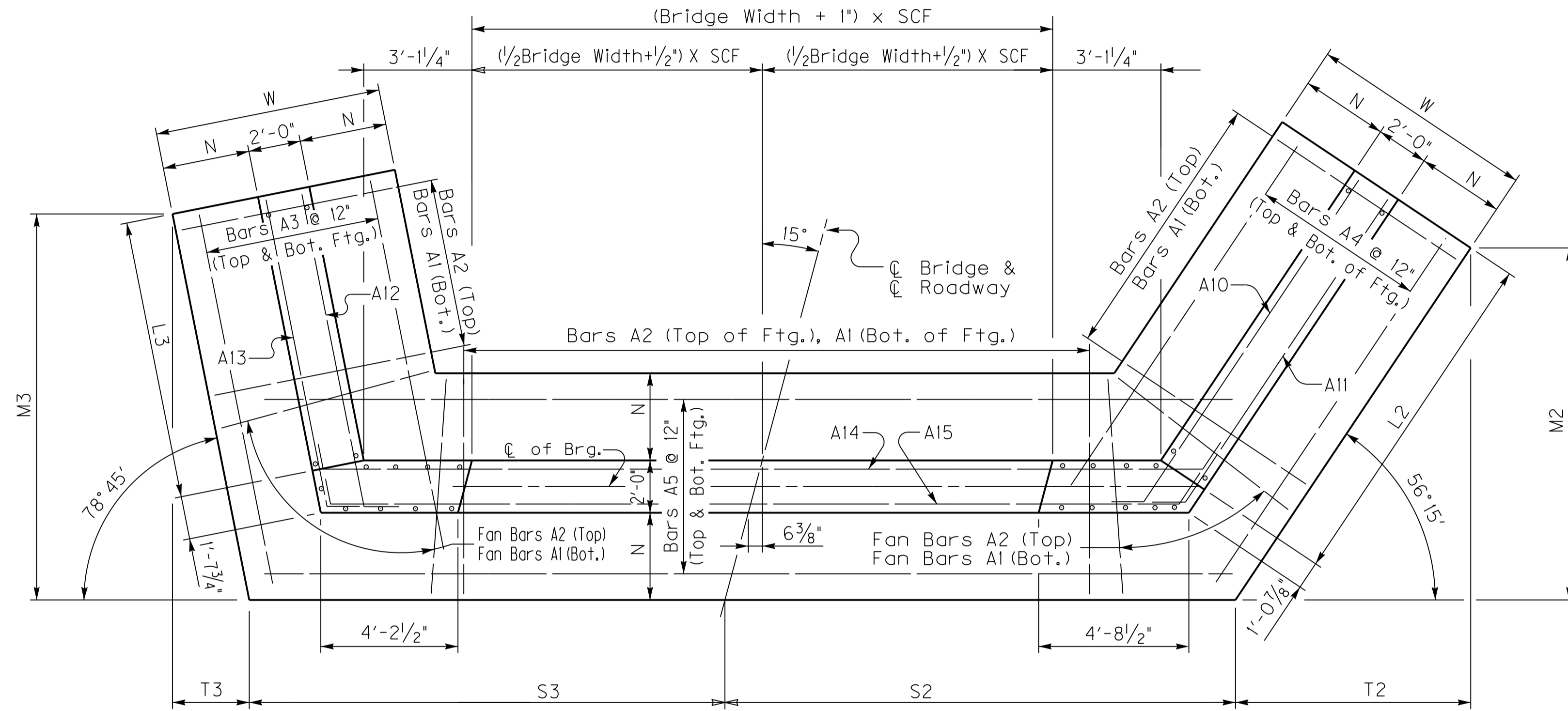


ABUTMENT DETAILS

SKEW	WIDTH	DATE
10	VAR	October 2018

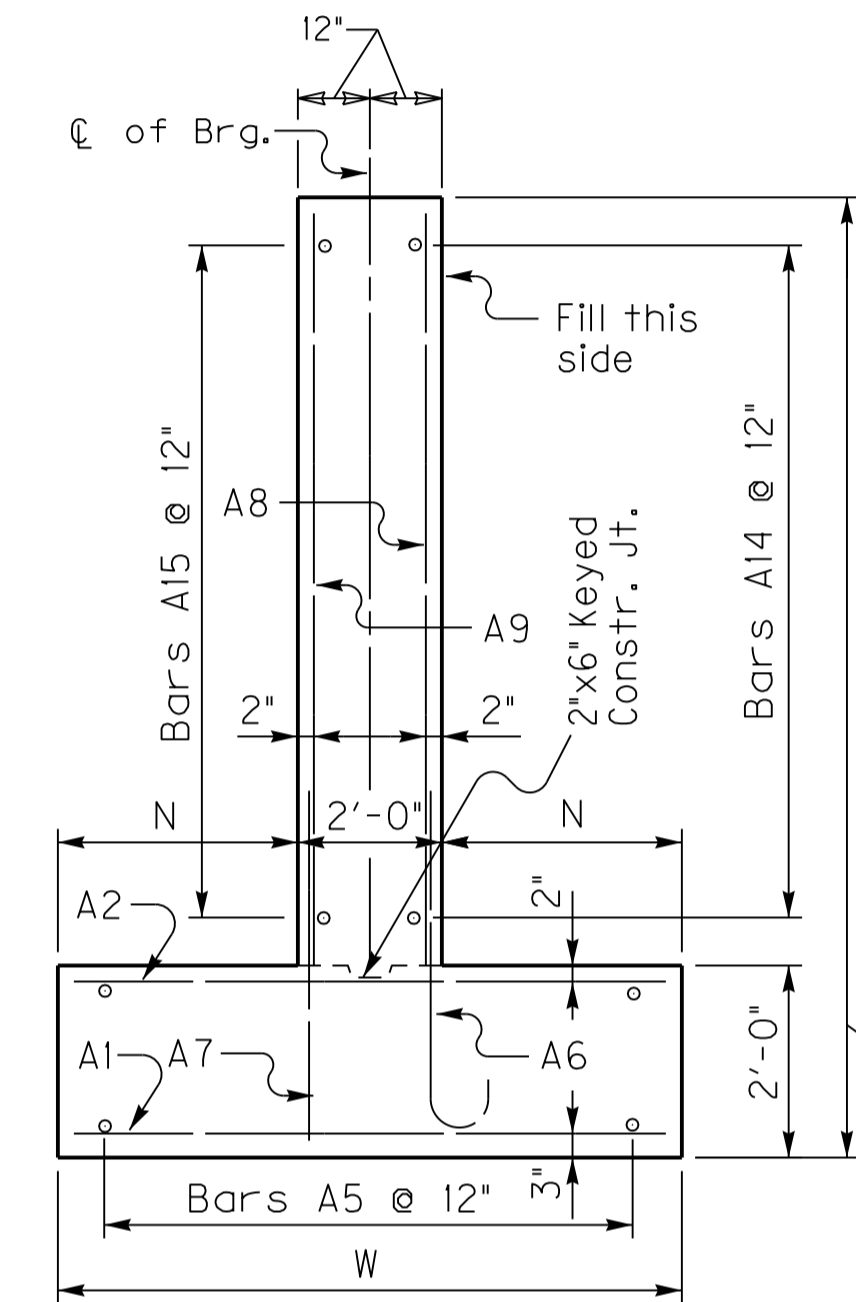
15° SKEW VARIABLE BRIDGE WIDTH 2:1 FILL SLOPES WINGS SKEWED 25% FROM ROADWAY TO BREASTWALL

ABUTMENT SKEW CORRECTION FACTOR (SCF) = 1.035

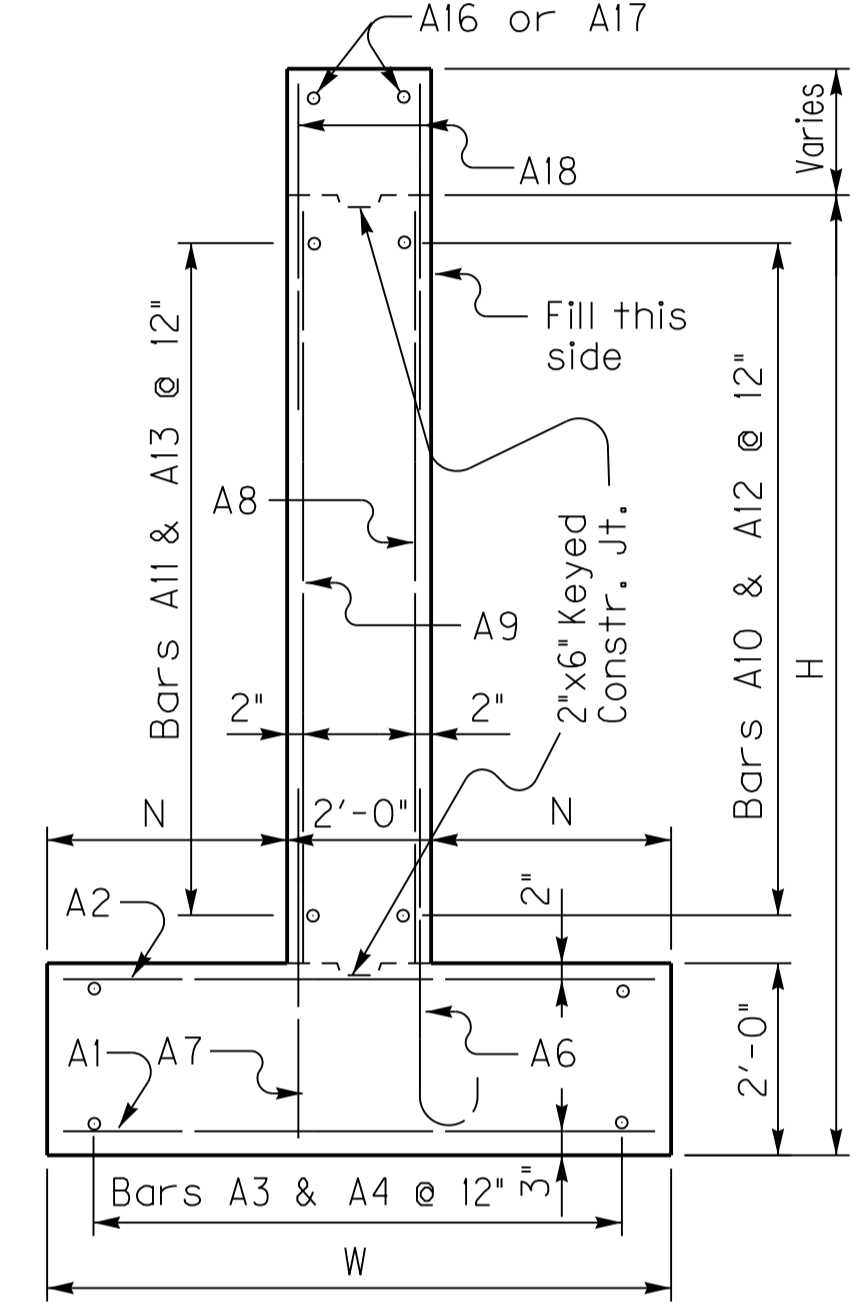


(Left Skew as shown; right skew opp. hand)

PLAN

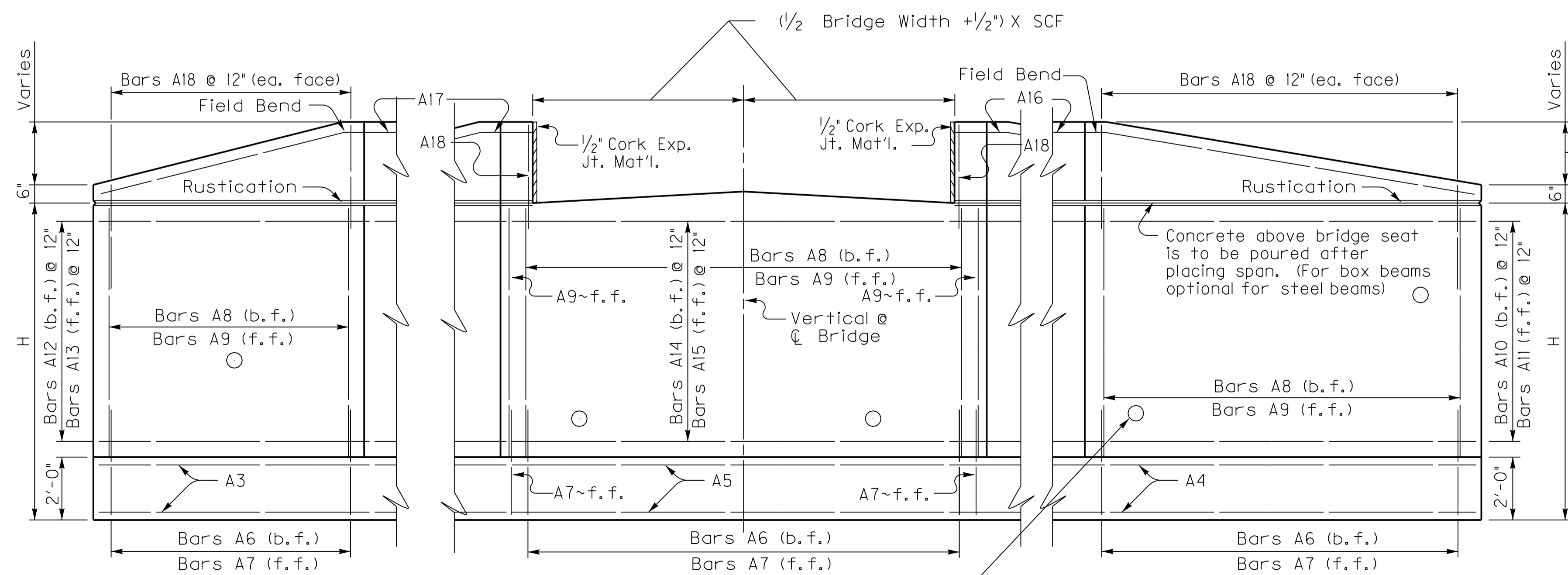


WALL SECTION

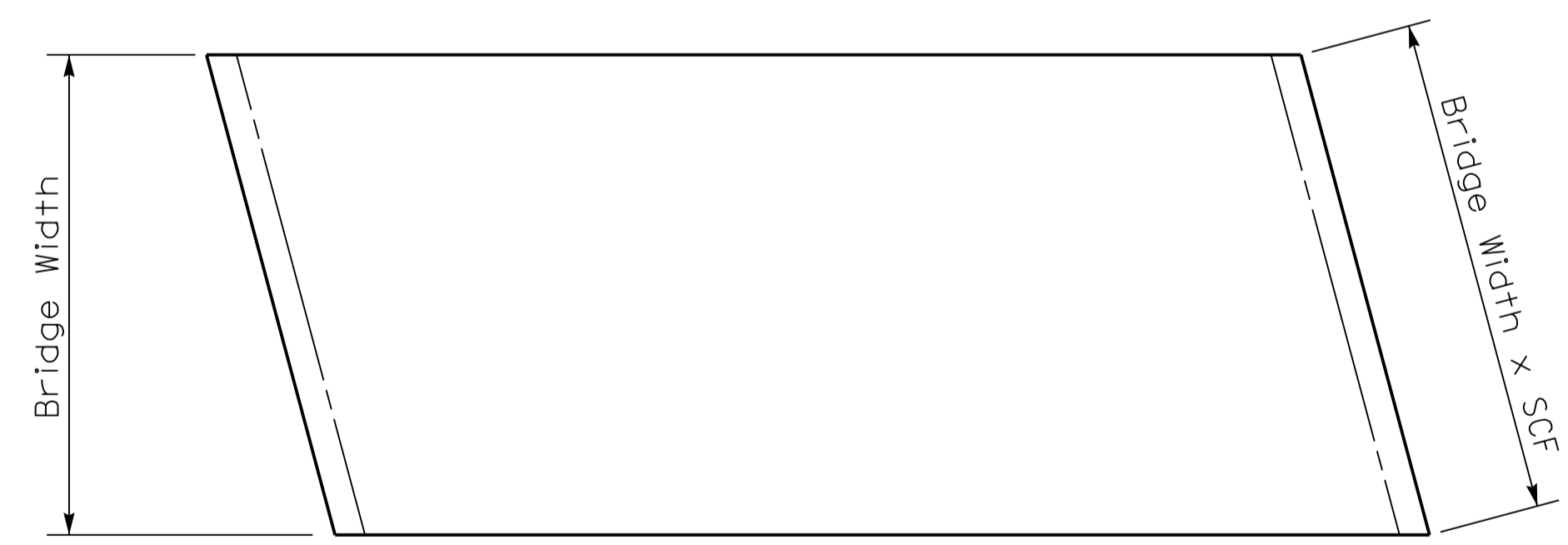
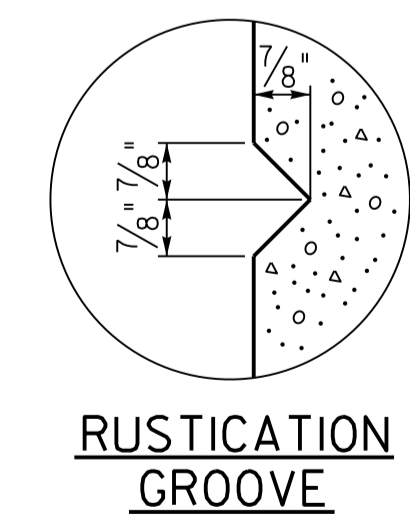


WING SECTION

Note: Trim A16 & A17 bars if necessary



ELEVATION



PLAN OF SUPERSTRUCTURE SLAB

Place 4\" weep hole drains at 8'-0\" centers at such elevation as to afford best drainage of backfill, in accordance with the Standard Specifications.

ABUTMENT DETAILS

SKEW	WIDTH	DATE
15	VAR	October 2018

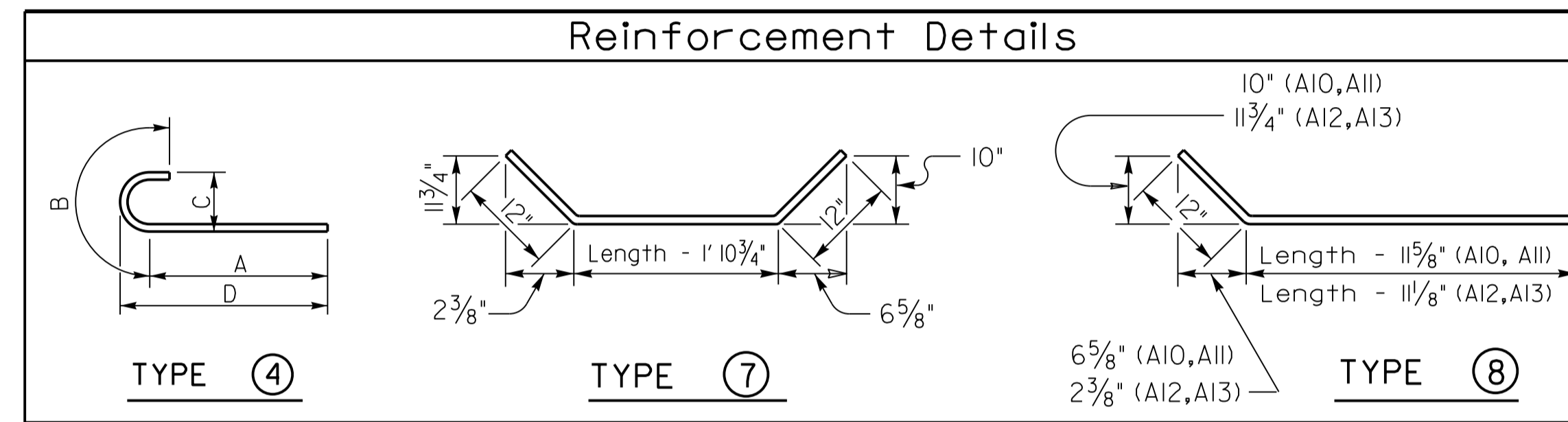
15° SKEW VARIABLE BRIDGE WIDTH 2:1 FILL SLOPES WINGS SKEWED 25% FROM ROADWAY TO BREASTWALL

Bill of Reinforcement

MARK	A1		A2		A3	A4		A5		A6				A7		A8		A9	A10	A11	A12	A13	A14		A15		A16	A17	A18	
TYPE	Str.		Str.		Str.	Str.		Str.		4				Str.		Str.		Str.	8	8	8	8	7		7		Str.	Str.	Str.	
SIZE	#5		#5		#5	#5		#5		#5				#5		#5		#5	#5	#5	#5	#5	#5		#5		#5	#5	#5	
H	No.	Size	Length	Spacing	No.	Size	Length	Spacing	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length
			ft.	in.			ft.	in.		ft.		ft.		ft.		ft.		ft.		ft.		ft.		ft.		ft.		ft.		ft.
15-16	71+Nb=	10 11 8 12	71+Nb=	7 11 8 12	24 25 6 12	24 28 8 12	24 15 8 12	+Lb=		52+Nb=	9 9 11 12	8 1/8 1 10 0 11 3/4 8 6	57+Nb=	5 4 11 12	52+Nb=	6 12 10 12	57+Nb=	12 10 12	14 27 9 14 26 10 14 22 6 14 22 4 14 11 10 +Lb=	14 10 7 +Lb=		2 30 8 2 25 9 113 5 9								
13-14	64+Nb=	9 10 8 12	64+Nb=	7 10 8 12	22 22 1 22 25 5 22 14 11 +Lb=		46+Nb=	8 8 3 12 6 11 1 3 0 8 7 3	51+Nb=	5 4 11 12	46+Nb=	6 10 10 12	51+Nb=	10 10 12	12 24 9 12 23 10 12 19 6 12 19 4 12 11 10 +Lb=	12 10 7 +Lb=		2 27 8 2 22 9 101 5 9												
11-12	56+Nb=	8 9 8 12	56+Nb=	6 9 8 12	20 18 8 20 21 2 20 14 3 +Lb=		39+Nb=	7 7 1 12 5 10 1/2 1 2 0 7 6 2	44+Nb=	5 4 11 12	39+Nb=	5 8 10 12	44+Nb=	8 10 12	10 20 9 10 19 10 10 16 6 10 16 4 10 11 10 +Lb=	10 10 7 +Lb=		2 23 8 2 19 9 87 5 9												
9-10	49+Nb=	7 8 8 12	49+Nb=	5 8 8 12	18 16 3 18 17 11 18 13 7 +Lb=		34+Nb=	6 6 1 12 5 1 1 0 0 6 5 4	39+Nb=	5 4 11 12	34+Nb=	5 6 10 12	39+Nb=	6 10 12	8 17 9 8 16 10 8 14 6 8 14 4 8 11 10 +Lb=	8 10 7 +Lb=		2 20 8 2 17 9 77 5 9												
7-8	41+Nb=	6 7 2 12	41+Nb=	5 7 2 12	16 12 7 16 14 4 16 12 6 +Lb=		28+Nb=	5 5 7 12 4 8 1/2 0 10 0 5 4 11	33+Nb=	5 4 11 12	28+Nb=	5 4 10 12	33+Nb=	4 10 12	6 14 9 6 13 10 6 11 6 6 11 4 6 11 11 +Lb=	6 10 7 +Lb=		2 17 8 2 14 9 65 5 9												
5-6	35+Nb=	5 6 2 12	35+Nb=	5 6 2 12	14 10 2 14 11 1 14 11 10 +Lb=		23+Nb=	5 5 7 12 4 8 1/2 0 10 0 5 4 11	28+Nb=	5 4 11 12	23+Nb=	5 2 10 12	28+Nb=	2 10 12	4 11 9 4 10 10 4 9 6 4 9 4 4 11 11 +Lb=	4 10 7 +Lb=		2 14 8 2 12 9 55 5 9												

Table of Dimensions

H	W	N	M2	M3	T2	T3	L2	L3	S2		S3			
	Length	Length	Length	Length	Length	Length	Length	Length	Length	+Lb/2 =	Length	Length	+Lb/2 =	Length
	ft.	in.	ft.	in.	ft.	in.	ft.	in.	ft.	in.	ft.	in.	ft.	in.
15-16	12 0	5 0	23 10 3/4	25 3	15 11 5/8	5 1/4	25	20	8 9 1/4	+0.5Lb=		7 1/4	+0.5Lb=	
13-14	11 0	4 6	21 2 7/8	21 10 7/8	14 1 7/8	4 4 1/4	22	17	8 4 3/8	+0.5Lb=		6 8 7/8	+0.5Lb=	
11-12	10 0	4 0	17 7 5/8	18 6 3/4	11 9 3/8	3 8 1/4	18	14	7 11 5/8	+0.5Lb=		6 5 5/8	+0.5Lb=	
9-10	9 0	3 6	14 11	16 2 3/8	9 11 5/8	3 2 5/8	15	12	7 6 3/4	+0.5Lb=		6 2 1/4	+0.5Lb=	
7-8	7 6	2 9	12 1 1/8	12 7 3/4	8 7/8	2 6 1/4	12	9	6 11 1/2	+0.5Lb=		5 9 1/4	+0.5Lb=	
5-6	6 6	2 3	9 4 1/2	10 3 3/8	6 3 1/8	2 1/2	9	7	6 6 3/4	+0.5Lb=		5 6	+0.5Lb=	



*Concrete quantities computed using 21' beam depth on 1/2' pad & Variable Bridge Width

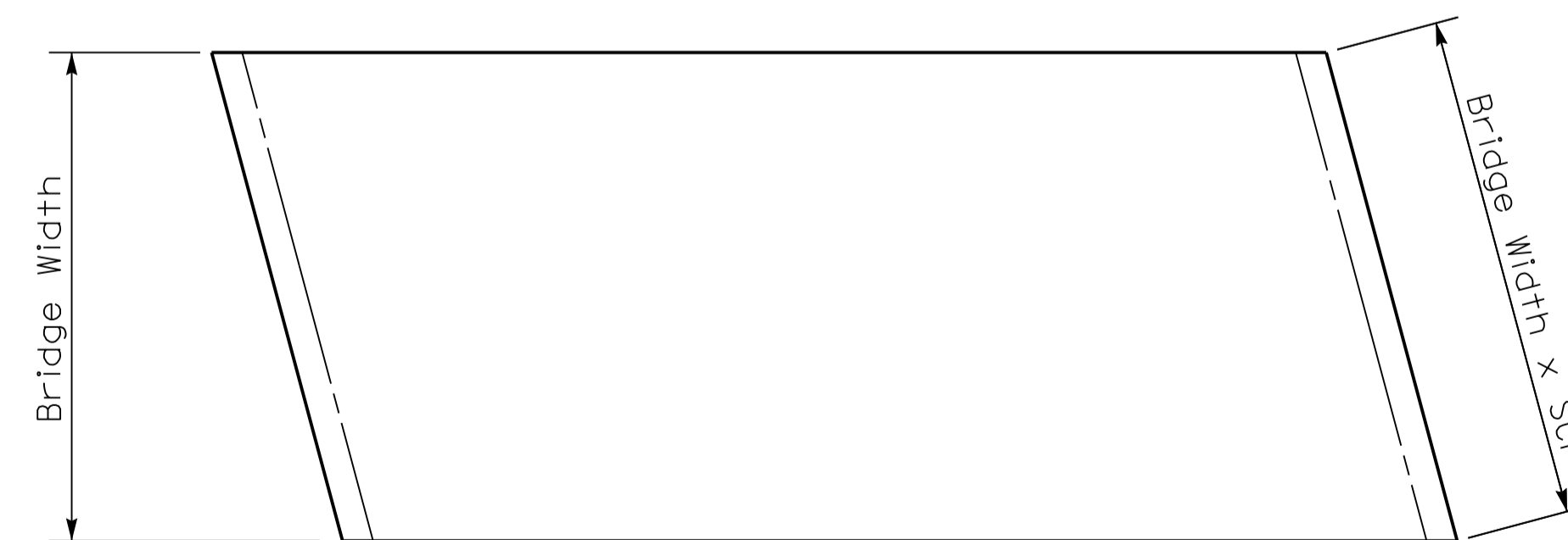
Quantities

H	Concrete*	Reinforcement
	C.Y.	LBS.
5	20.81+(0.71xLb) =	2021+(52.8xLb) =
6	22.67+(0.78xLb) =	2021+(52.8xLb) =
7	31.51+(0.93xLb) =	2974+(68.7xLb) =
8	33.73+(1.01xLb) =	2974+(68.7xLb) =
9	47.01+(1.19xLb) =	4510+(91xLb) =
10	49.68+(1.27xLb) =	4510+(91xLb) =
11	62.56+(1.41xLb) =	6573+(120.4xLb) =
12	65.6+(1.49xLb) =	6573+(120.4xLb) =
13	83.79+(1.64xLb) =	9849+(161xLb) =
14	87.35+(1.71xLb) =	9849+(161xLb) =
15	106.18+(1.86xLb) =	13311+(198.6xLb) =
16	110.18+(1.93xLb) =	13311+(198.6xLb) =

ABUTMENT SKEW CORRECTION FACTOR (SCF) = 1.035

NUMBER OF BARS TO ADD (Nb) = Bridge Width (feet) x SCF (round up to nearest whole number)

LENGTH OF ABUTMENT TO ADD (Lb) = Bridge Width (feet) x SCF (convert decimal to architectural)



PLAN OF SUPERSTRUCTURE SLAB

GENERAL NOTES

SPECIFICATIONS: Construct abutments according to the current edition of the Kentucky Department of Highways Standard Specifications for Road and Bridge Construction. Abutments are designed for side by side box beams as detailed in Standard Drawings BDP-001 through BDP-012, current edition. Dimensions may be adjusted to allow for any out to out bridge width. Abutments are also adequate for Std. Dwg. slabs or steel beam superstructures

FOUNDATION PRESSURE: Construct abutment footings on solid rock bearing material that can support a pressure of 8000 psf service or 10,800 psf strength factored, as recommended by a geotechnical engineer.

WING LENGTHS: Calculated assuming 21' superstructure depth and stream bank elevation at top of footing.

FOOTING ELEVATION: Construct bottom of footing below the anticipated scour elevation. (This typically entails embedding the footings 1'-0" to 2'-0" into rock and pouring concrete directly against cut rock faces, as recommended by geotechnical engineer.)

NOTE: Distances to bars shown are clear dimensions unless otherwise noted.

MATERIAL SPECIFICATIONS:

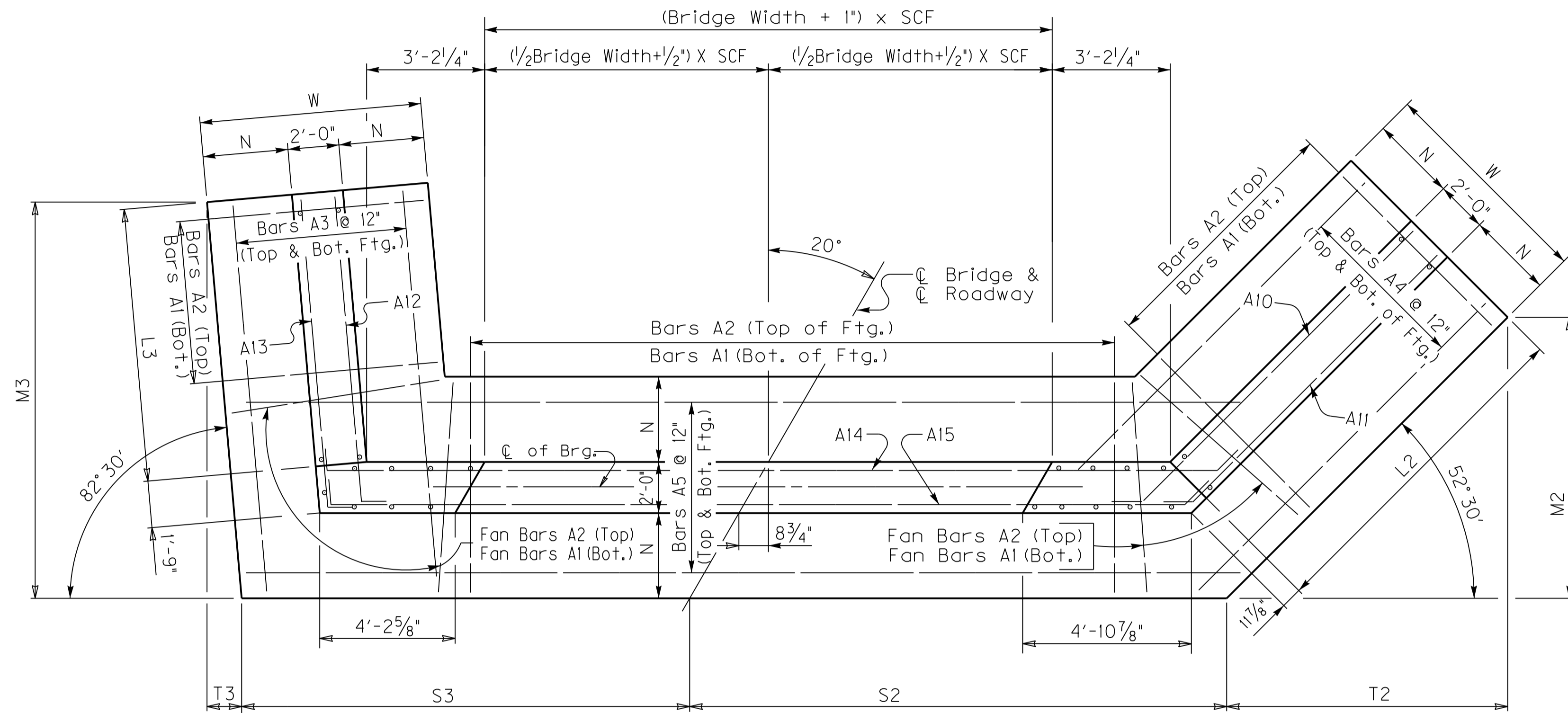
Concrete, Class "A" = 3500 psi
Steel Reinforcement = Grade 60

ABUTMENT DETAILS

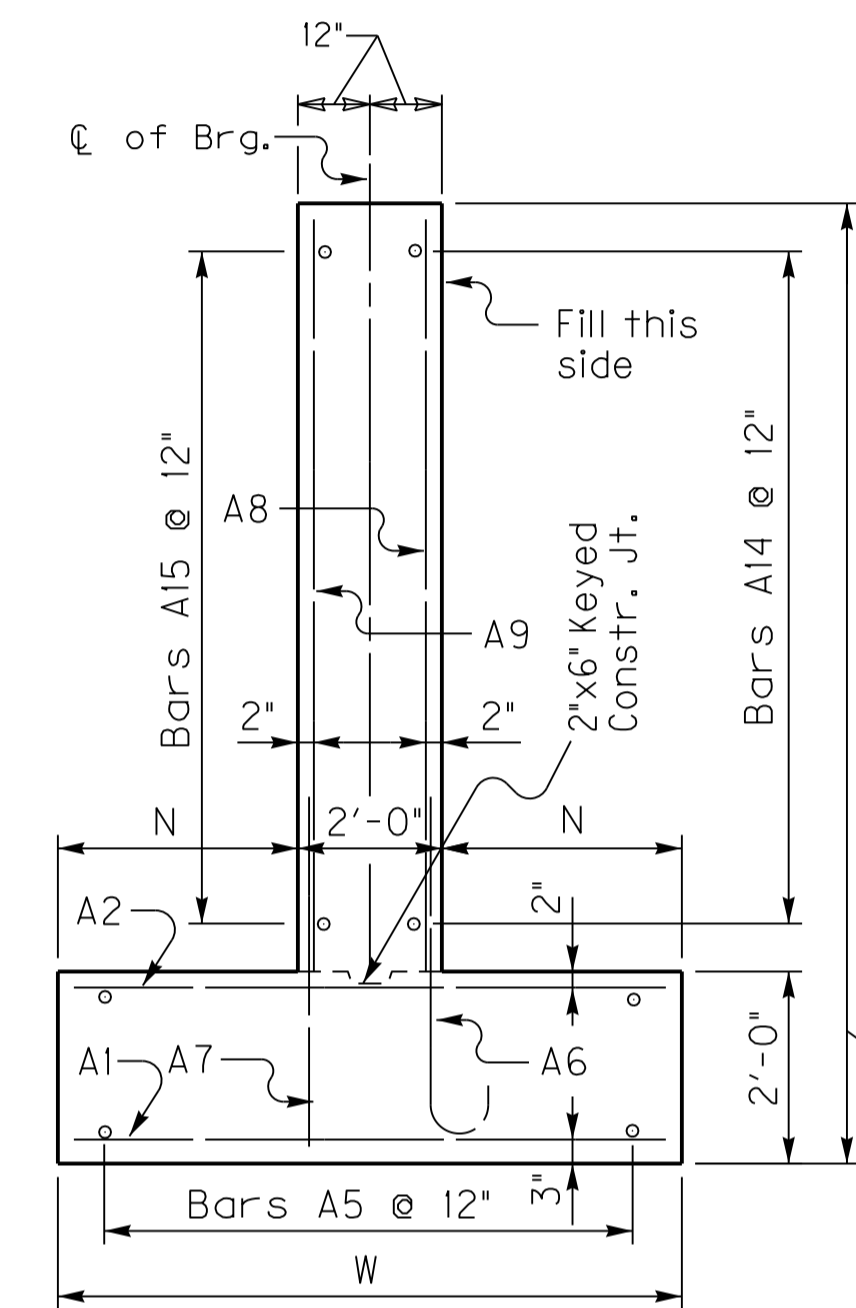
SKEW	WIDTH	DATE
15	VAR	October 2018

20° SKEW VARIABLE BRIDGE WIDTH 2:1 FILL SLOPES WINGS SKEWED 25% FROM ROADWAY TO BREASTWALL

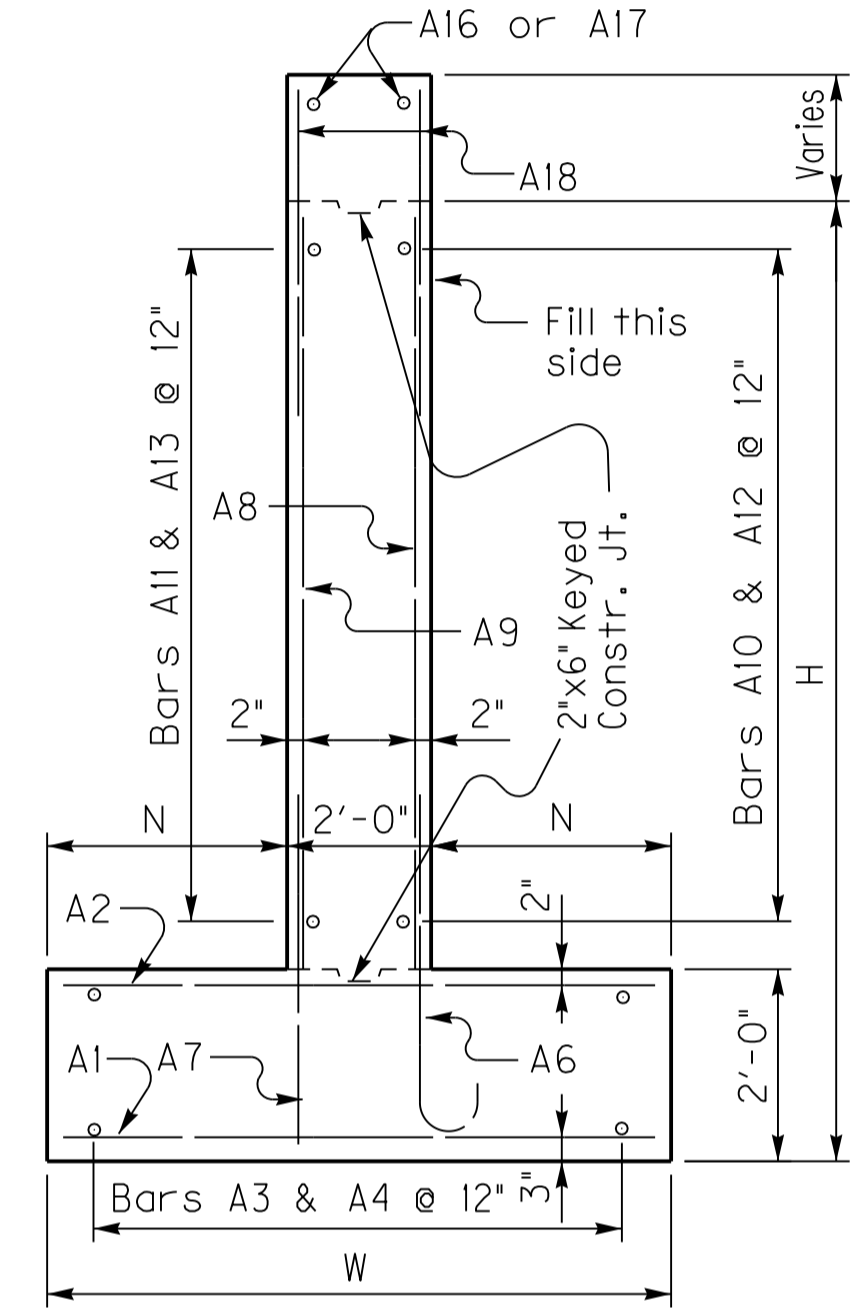
ABUTMENT SKEW CORRECTION FACTOR (SCF) = 1.064



(Left Skew as shown; right skew opp. hand) **PLAN**



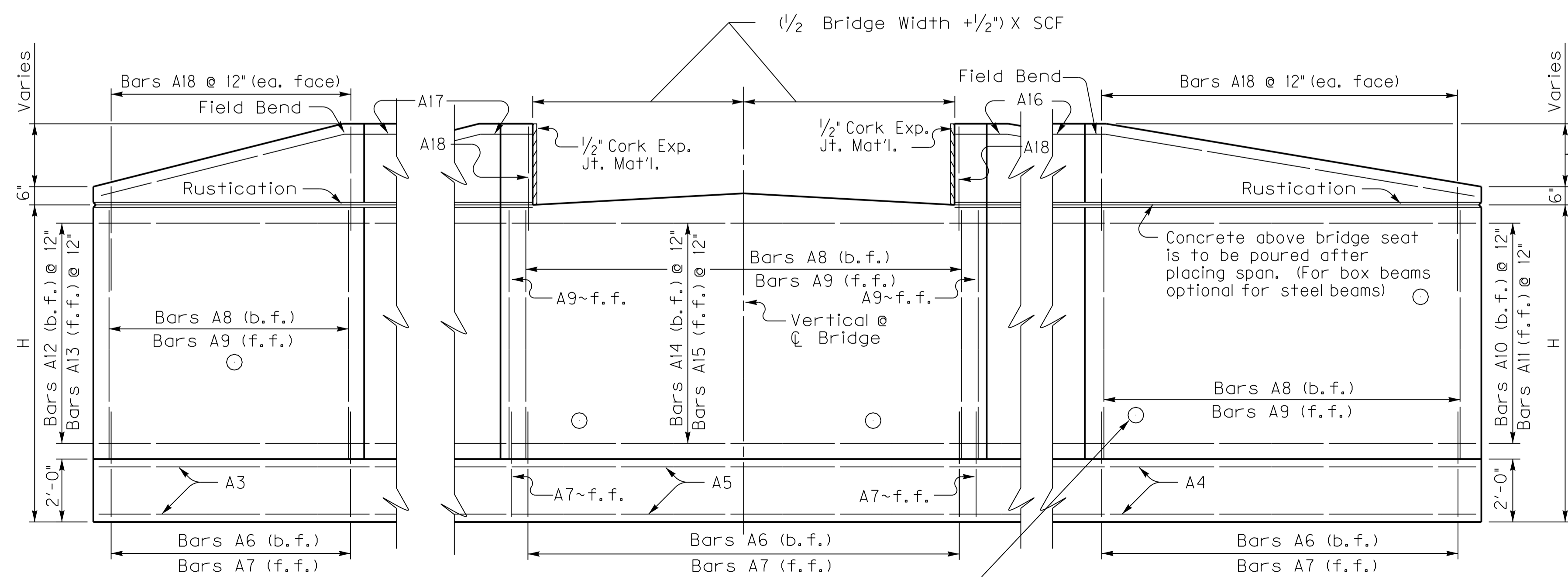
WALL SECTION



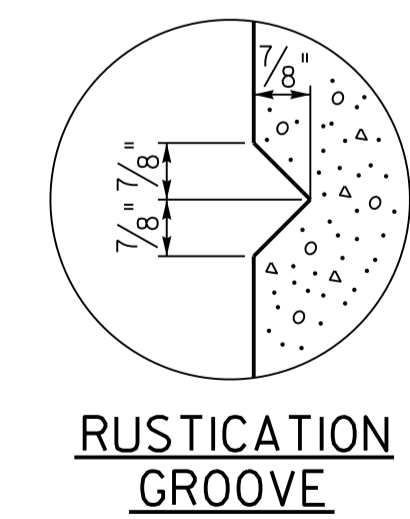
WING SECTION

H = Low Bridge Seat. Slope seat for side by side box beams. Step cap as necessary for rolled steel beam superstructures to achieve a 2% cross slope on deck.

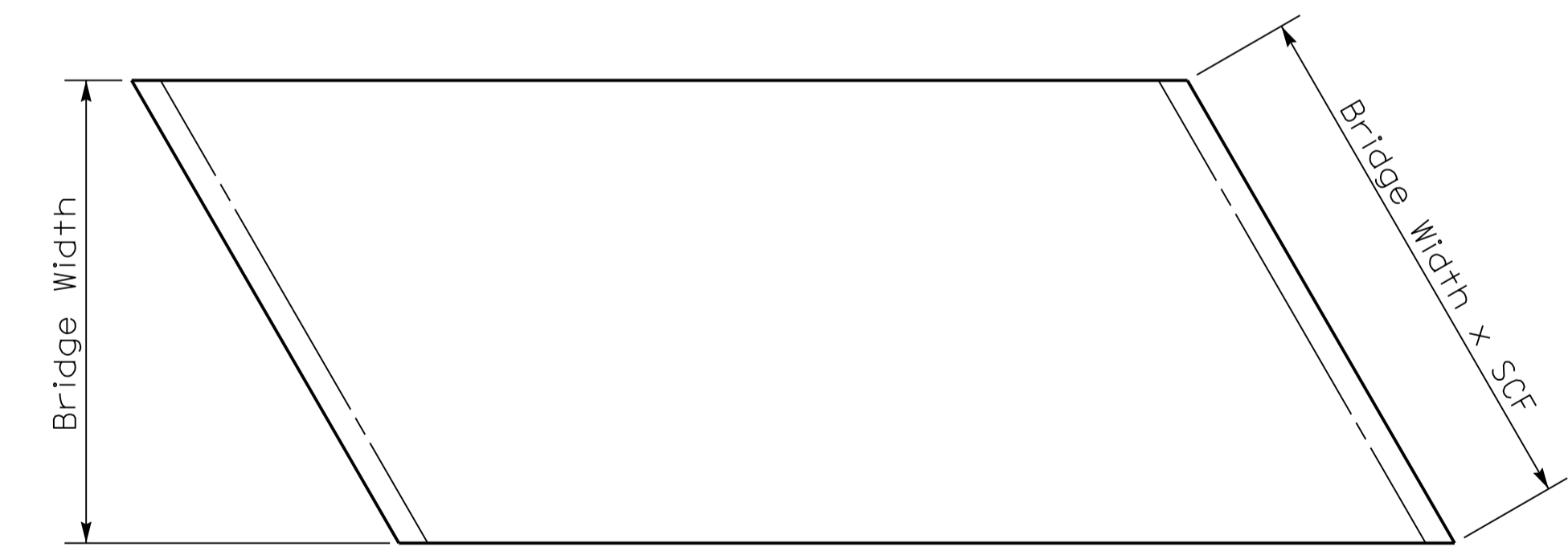
Note: Trim A16 & A17 bars if necessary



ELEVATION



RUSTICATION GROOVE



PLAN OF SUPERSTRUCTURE SLAB

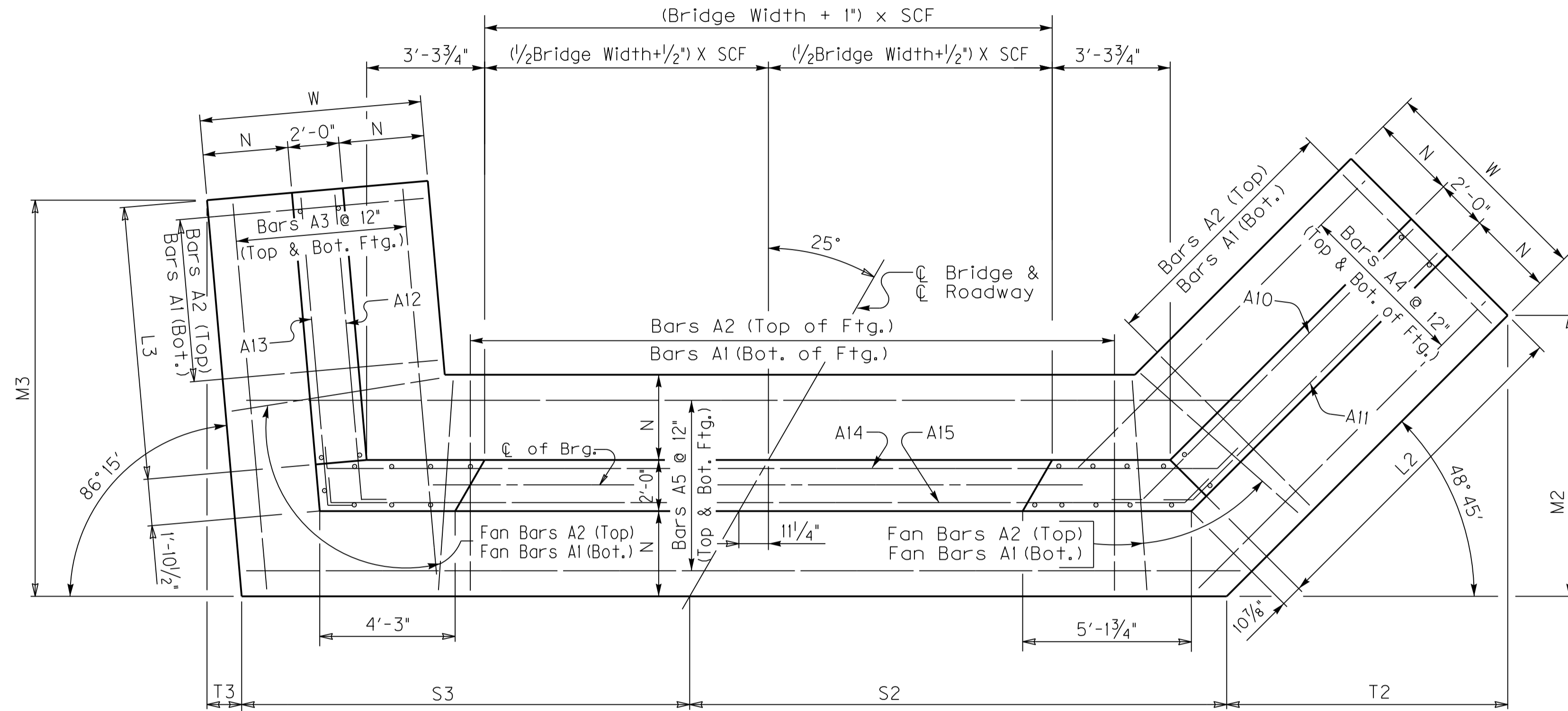
Place 4\" weep hole drains at 8'-0\" centers at such elevation as to afford best drainage of backfill, in accordance with the Standard Specifications.

ABUTMENT DETAILS

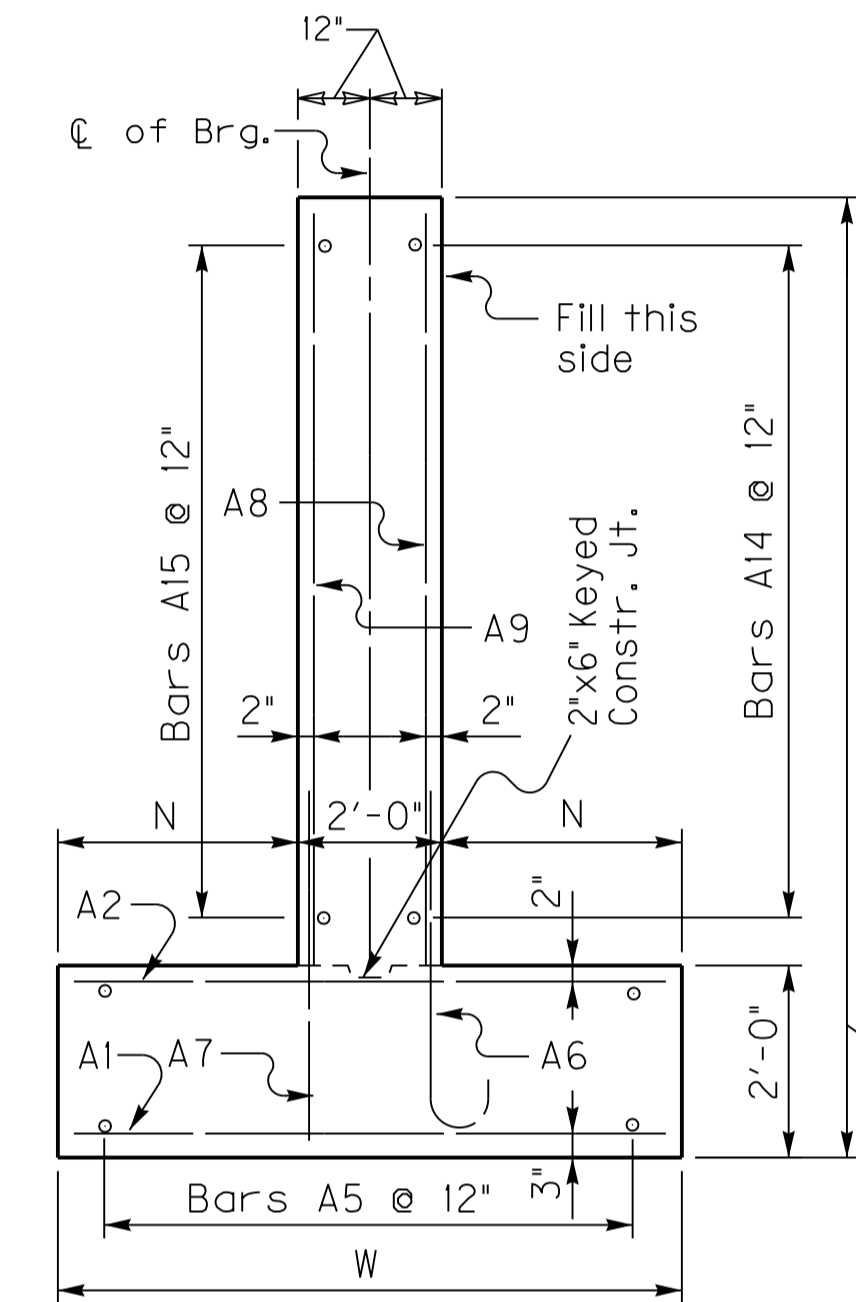
SKEW	WIDTH	DATE
20	VAR	October 2018

25° SKEW VARIABLE BRIDGE WIDTH 2:1 FILL SLOPES WINGS SKEWED 25% FROM ROADWAY TO BREASTWALL

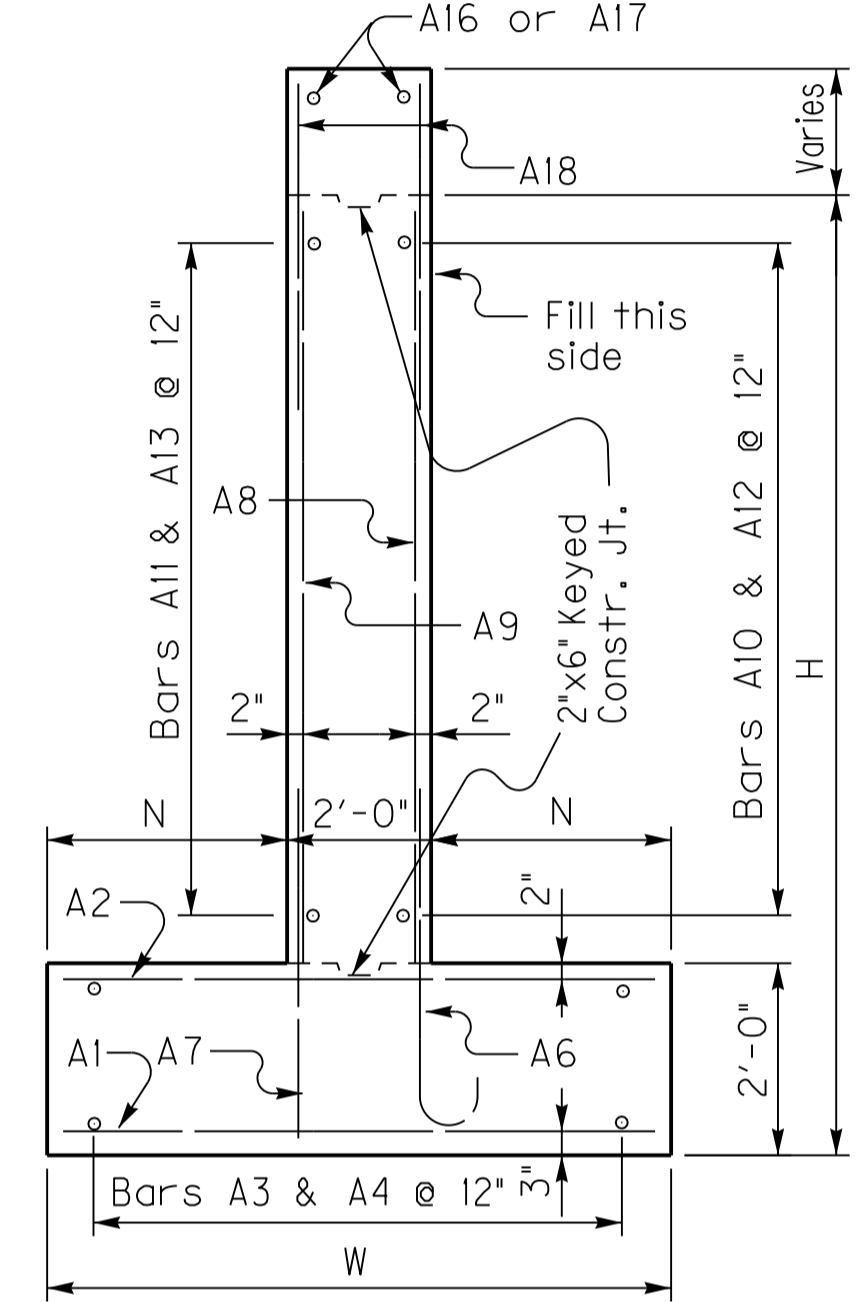
ABUTMENT SKEW CORRECTION FACTOR (SCF) = 1.103



(Left Skew as shown; right skew opp. hand) **PLAN**



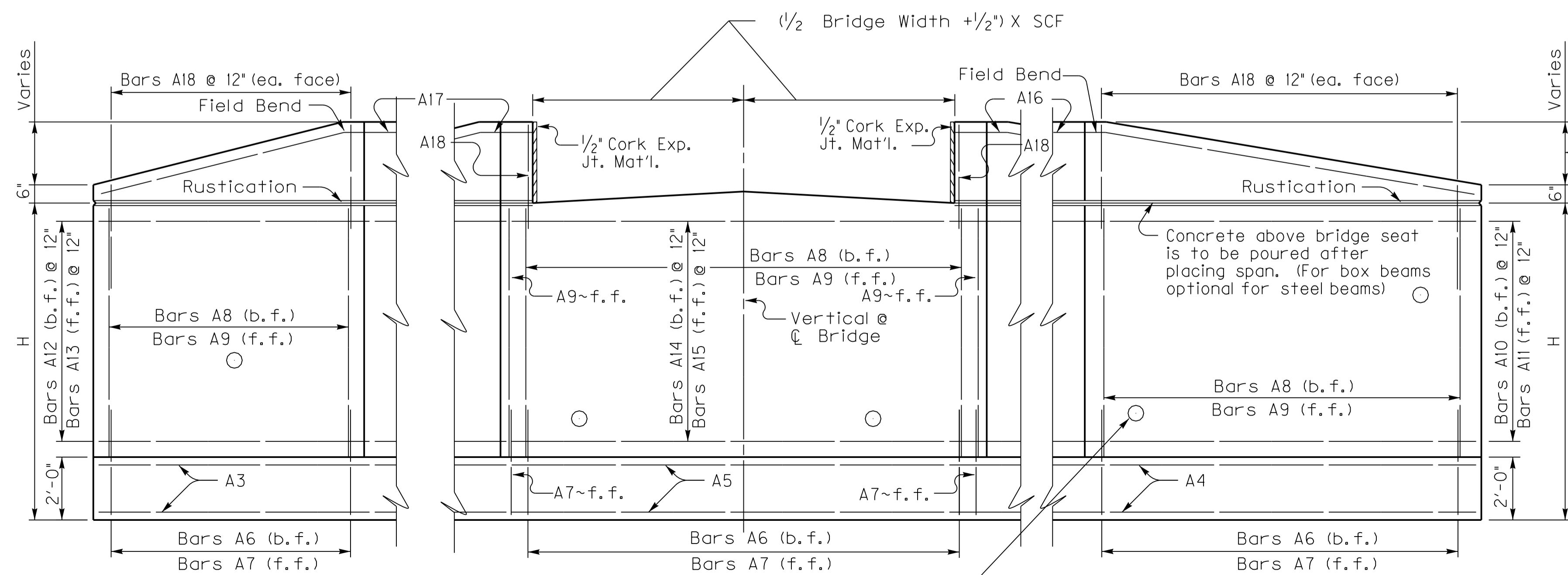
WALL SECTION



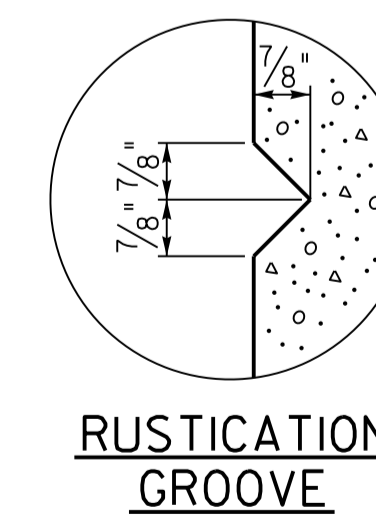
WING SECTION

H = Low Bridge Seat. Slope seat for side by side box beams. Step cap as necessary for rolled steel beam superstructures to achieve a 2% cross slope on deck.

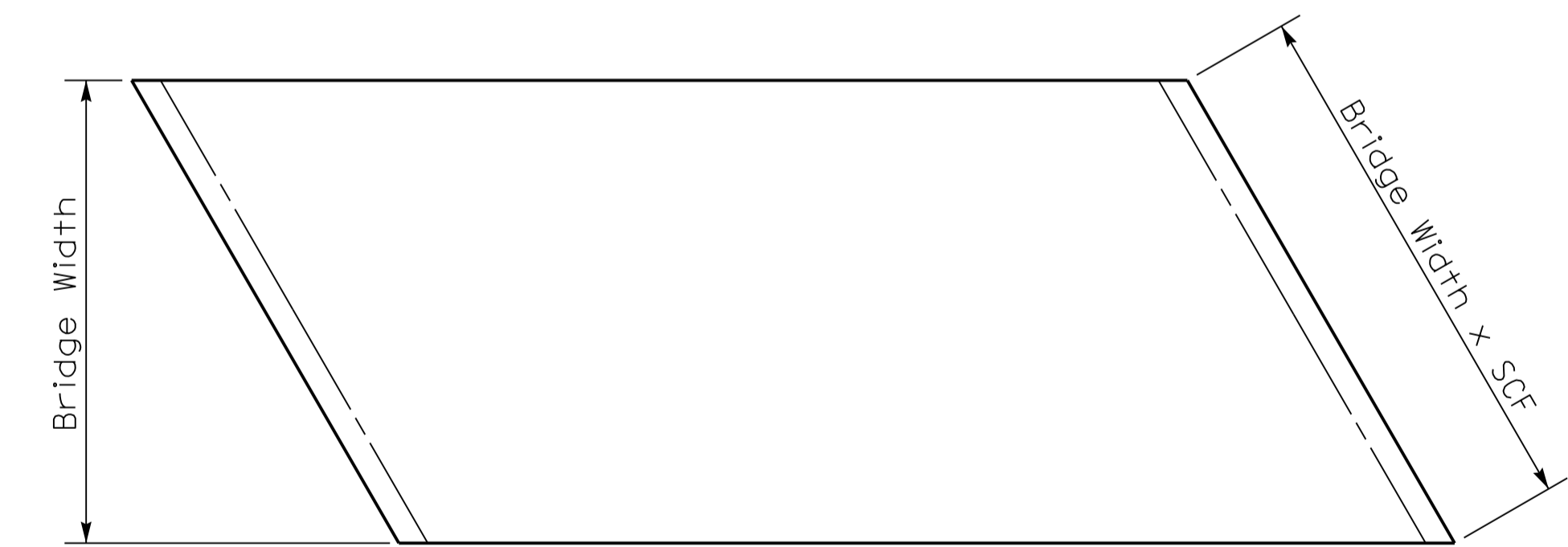
Note: Trim A16 & A17 bars if necessary



ELEVATION



RUSTICATION GROOVE



PLAN OF SUPERSTRUCTURE SLAB

Place 4\" weep hole drains at 8'-0\" centers at such elevation as to afford best drainage of backfill, in accordance with the Standard Specifications.

ABUTMENT DETAILS

SKEW	WIDTH	DATE
25	VAR	October 2018

25° SKEW VARIABLE BRIDGE WIDTH 2:1 FILL SLOPES WINGS SKEWED 25% FROM ROADWAY TO BREASTWALL

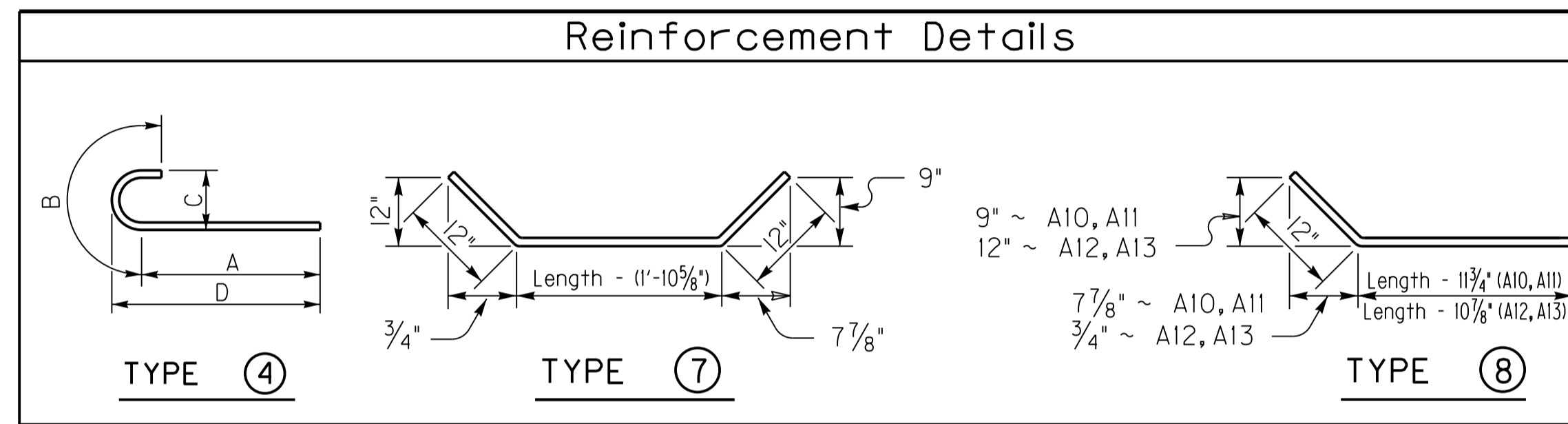
Bill of Reinforcement

MARK	A1		A2				A3	A4	A5				A6				A7	A8			A9	A10	A11	A12	A13	A14			A15			A16	A17	A18				
TYPE	Str.		Str.				Str.	Str.	Str.				4				Str.	Str.			Str.	8	8	8	8	7			7			Str.	Str.	Str.				
SIZE							#5	#5	#5												#5	#5	#5	#5	#5			#5			#5	#5	#5					
H	No.	Size	Length	Spacing	No.	Size	Length	Spacing	No.	Length	Spacing	No.	Length	Spacing	No.	Length	Spacing	No.	Length	Spacing	No.	Length	Spacing	No.	Length	Spacing	No.	Length	Spacing	No.	Length	Spacing	No.	Length	Spacing	No.	Length	Spacing
15-16	74+Nb=	10 11 8 12	74+Nb=	7 11 8 12	24 25 3	24 31 2	24 16 2	+Lb=	54+Nb=	9 9 11 12	8 1/8	1 10 0	11 3/4	8 6	60+Nb=	5 4 11 12	54+Nb=	6 12 10 12	60+Nb=	12 10 12	14 30 11	14 29 8	14 21 6	14 21 6	14 12 5	+Lb=	14 11 0	+Lb=	2 34 0	2 25 0	118 5 9							
13-14	67+Nb=	9 10 8 12	67+Nb=	7 10 8 12	22 21 9	22 28 0	22 15 6	+Lb=	48+Nb=	8 8 3 12	6 11 1 3 0	8 7 3	54+Nb=	5 4 11 12	48+Nb=	6 10 10 12	54+Nb=	10 10 12	54+Nb=	12 10 12	12 27 11	12 26 8	12 18 6	12 18 7	12 12 5	+Lb=	12 11 0	+Lb=	2 31 0	2 22 0	106 5 9							
11-12	60+Nb=	8 9 8 12	60+Nb=	6 9 8 12	20 19 4	20 23 9	20 14 9	+Lb=	42+Nb=	7 7 1 12	5 10 1/2	1 2 0	7 6 2	48+Nb=	5 4 11 12	42+Nb=	5 8 10 12	48+Nb=	8 10 12	10 23 11	10 22 8	10 16 6	10 16 7	10 12 5	+Lb=	10 11 0	+Lb=	2 27 0	2 20 0	94 5 9								
9-10	52+Nb=	7 8 8 12	52+Nb=	5 8 8 12	18 15 10	18 20 6	18 14 1	+Lb=	36+Nb=	6 6 1 12	5 1 1 0 0	6 5 4	42+Nb=	5 4 11 12	36+Nb=	5 6 10 12	42+Nb=	6 10 12	42+Nb=	6 10 12	8 20 11	8 19 8	8 13 6	8 13 7	8 12 5	+Lb=	8 11 0	+Lb=	2 24 0	2 17 0	82 5 9							
7-8	44+Nb=	6 7 2 12	44+Nb=	5 7 2 12	16 13 2	16 16 0	16 13 0	+Lb=	30+Nb=	5 5 7 12	4 8 1/2	0 10 0	5 4 11	36+Nb=	5 4 11 12	30+Nb=	5 4 10 12	36+Nb=	4 10 12	6 16 11	6 15 8	6 11 6	6 11 7	6 12 5	+Lb=	6 11 0	+Lb=	2 20 0	2 15 0	70 5 9								
5-6	37+Nb=	5 6 2 12	37+Nb=	5 6 2 12	14 9 8	14 12 9	14 12 4	+Lb=	24+Nb=	5 5 7 12	4 8 1/2	0 10 0	5 4 11	30+Nb=	5 4 11 12	24+Nb=	5 2 10 12	30+Nb=	2 10 12	4 13 11	4 12 8	4 8 6	4 8 7	4 12 5	+Lb=	4 11 0	+Lb=	2 17 0	2 12 0	58 5 9								

Table of Dimensions

H	W	N	M2	M3	T2	T3	L2	L3	S2			S3		
	Length	Length	Length	Length	Length	Length	Length	Length	Length	+Lb/2	Length	Length	+Lb/2	Length
	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft.	ft.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.
15-16	12 0	5 0	23 5/4	25 6	20 6 5/8	1 8	28	19	9 9 1/2	+0.5Lb=	6 7 3/4	+0.5Lb=		
13-14	11 0	4 6	21 1/8	22 1/2	18 5 1/8	1 5 3/8	25	16	9 4	+0.5Lb=	6 5	+0.5Lb=		
11-12	10 0	4 0	17 10	19 6 7/8	15 7 5/8	1 3 3/8	21	14	8 10 1/2	+0.5Lb=	6 2 1/8	+0.5Lb=		
9-10	9 0	3 6	15 4 7/8	16 1 3/8	13 6 1/8	1 5 1/8	18	11	8 5	+0.5Lb=	5 11 3/8	+0.5Lb=		
7-8	7 6	2 9	12 1 3/4	13 5	10 7 3/4	0 10 1/2	14	9	7 8 5/8	+0.5Lb=	5 7 1/8	+0.5Lb=		
5-6	6 6	2 3	9 8 5/8	9 11 1/2	8 6 1/4	0 7 7/8	11	6	7 3 1/8	+0.5Lb=	5 4 1/4	+0.5Lb=		

Reinforcement Details



*Concrete quantities computed using 21' beam depth on 1/2' pad & Variable Bridge Width

Quantities

H	Concrete*	Reinforcement
	C.Y.	LBS.
5	22.04+(0.71xLb) =	2131+(52.8xLb) =
6	24.01+(0.78xLb) =	2131+(52.8xLb) =
7	34.1+(0.93xLb) =	3195+(68.7xLb) =
8	36.51+(1.01xLb) =	3195+(68.7xLb) =
9	50.24+(1.19xLb) =	4790+(91xLb) =
10	53.1+(1.27xLb) =	4790+(91xLb) =
11	67.85+(1.41xLb) =	7067+(120.4xLb) =
12	71.15+(1.49xLb) =	7067+(120.4xLb) =
13	88.13+(1.64xLb) =	10316+(161xLb) =
14	91.87+(1.71xLb) =	10316+(161xLb) =
15	111.07+(1.86xLb) =	13872+(198.6xLb) =
16	115.26+(1.93xLb) =	13872+(198.6xLb) =

ABUTMENT SKEW CORRECTION FACTOR (SCF) = 1.103

NUMBER OF BARS TO ADD (Nb) = Bridge Width (feet) x SCF

(round up to nearest whole number)

LENGTH OF ABUTMENT TO ADD (Lb) = Bridge Width (feet) x SCF

(convert decimal to architectural)

GENERAL NOTES

SPECIFICATIONS: Construct abutments according to the current edition of the Kentucky Department of Highways Standard Specifications for Road and Bridge Construction. Abutments are designed for side by side box beams as detailed in Standard Drawings BDP-001 through BDP-012, current edition. Dimensions may be adjusted to allow for any out to out bridge width. Abutments are also adequate for Std. Dwg. slabs or steel beam superstructures

FOUNDATION PRESSURE: Construct abutment footings on solid rock bearing material that can support a pressure of 8000 psf service or 10,800 psf strength factored, as recommended by a geotechnical engineer.

WING LENGTHS: Calculated assuming 21' superstructure depth and stream bank elevation at top of footing.

FOOTING ELEVATION: Construct bottom of footing below the anticipated scour elevation. (This typically entails embedding the footings 1'-0" to 2'-0" into rock and pouring concrete directly against cut rock faces, as recommended by geotechnical engineer.)

NOTE: Distances to bars shown are clear dimensions unless otherwise noted.

MATERIAL SPECIFICATIONS:
 Concrete, Class "A" = 3500 psi
 Steel Reinforcement = Grade 60



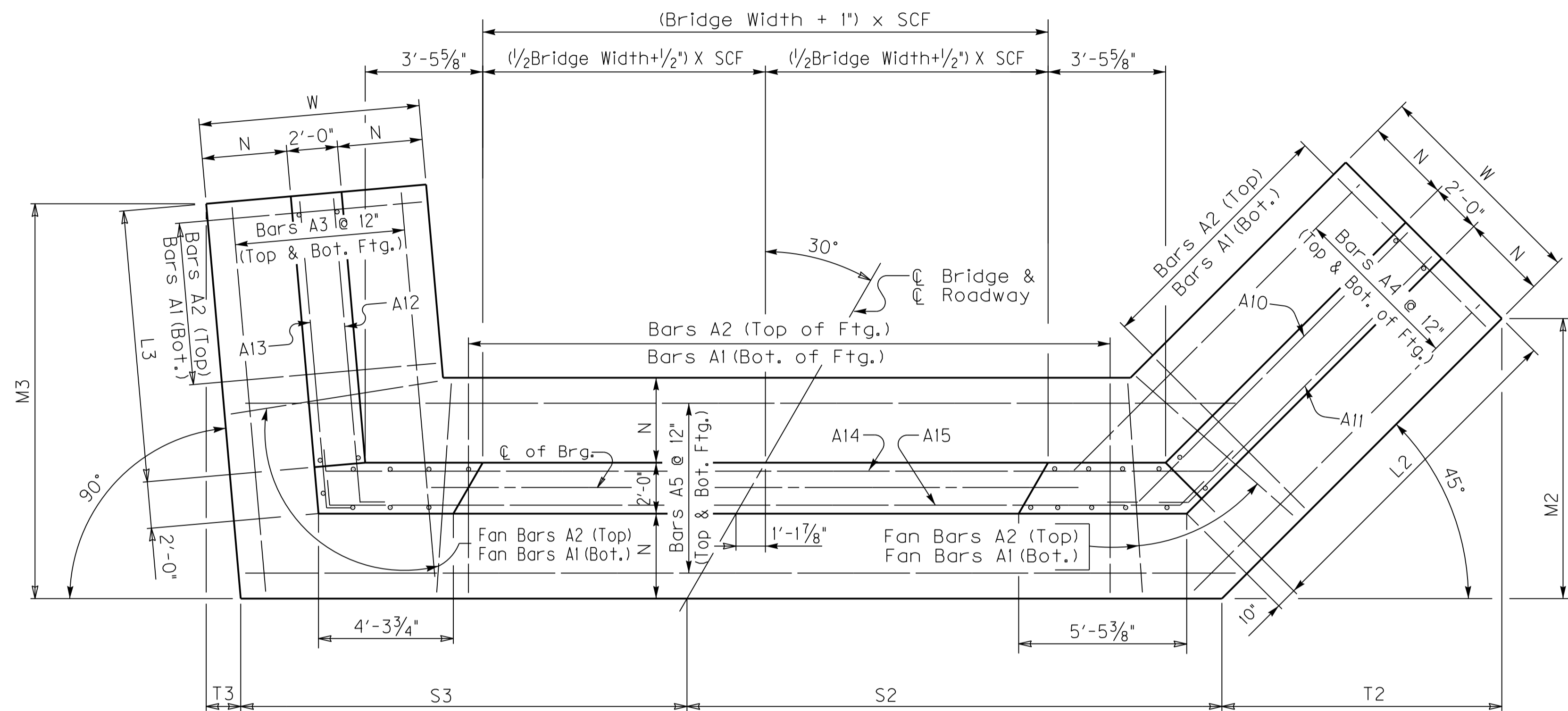
PLAN OF SUPERSTRUCTURE SLAB

ABUTMENT DETAILS

SKEW	WIDTH	DATE
25	VAR	October 2018

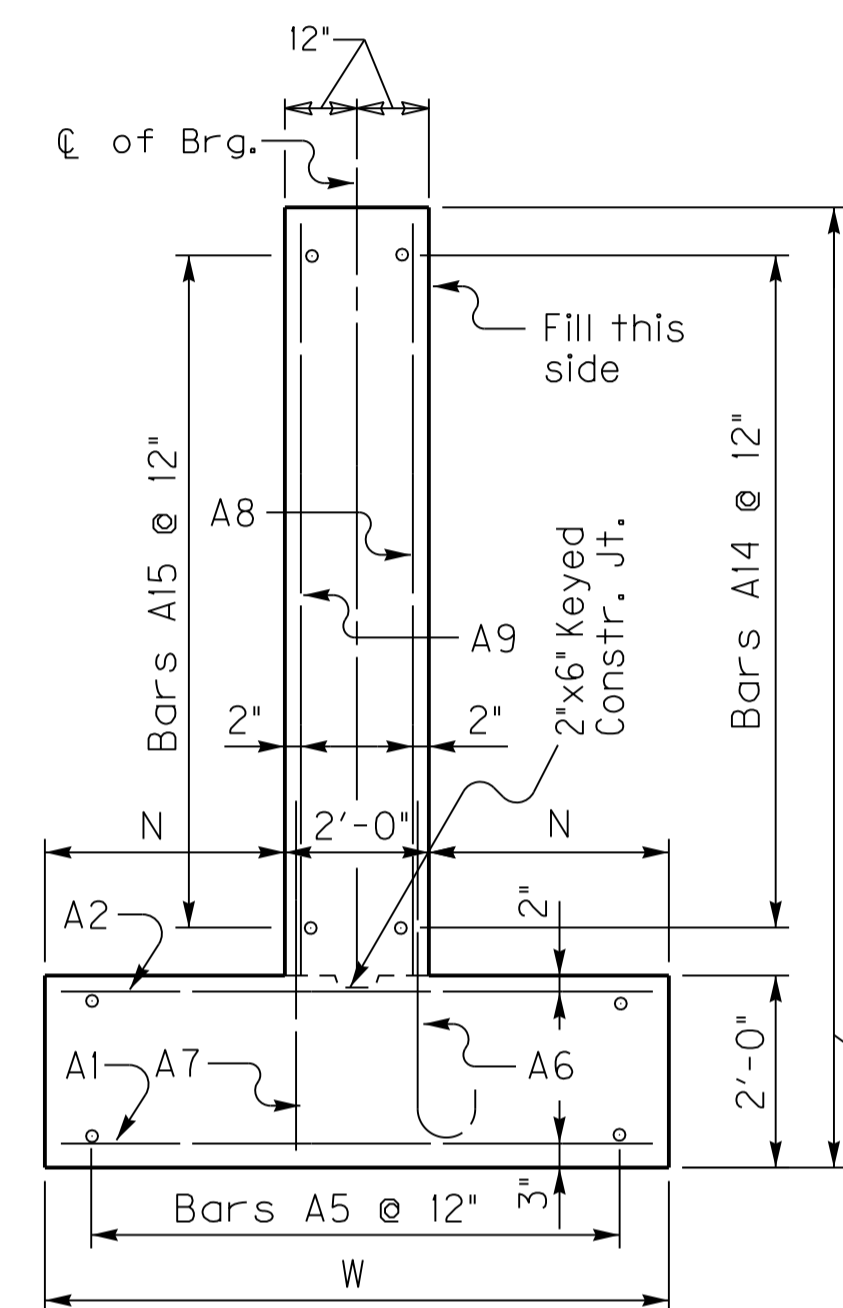
30° SKEW VARIABLE BRIDGE WIDTH 2:1 FILL SLOPES WINGS SKEWED 25% FROM ROADWAY TO BREASTWALL

ABUTMENT SKEW CORRECTION FACTOR (SCF) = 1.155

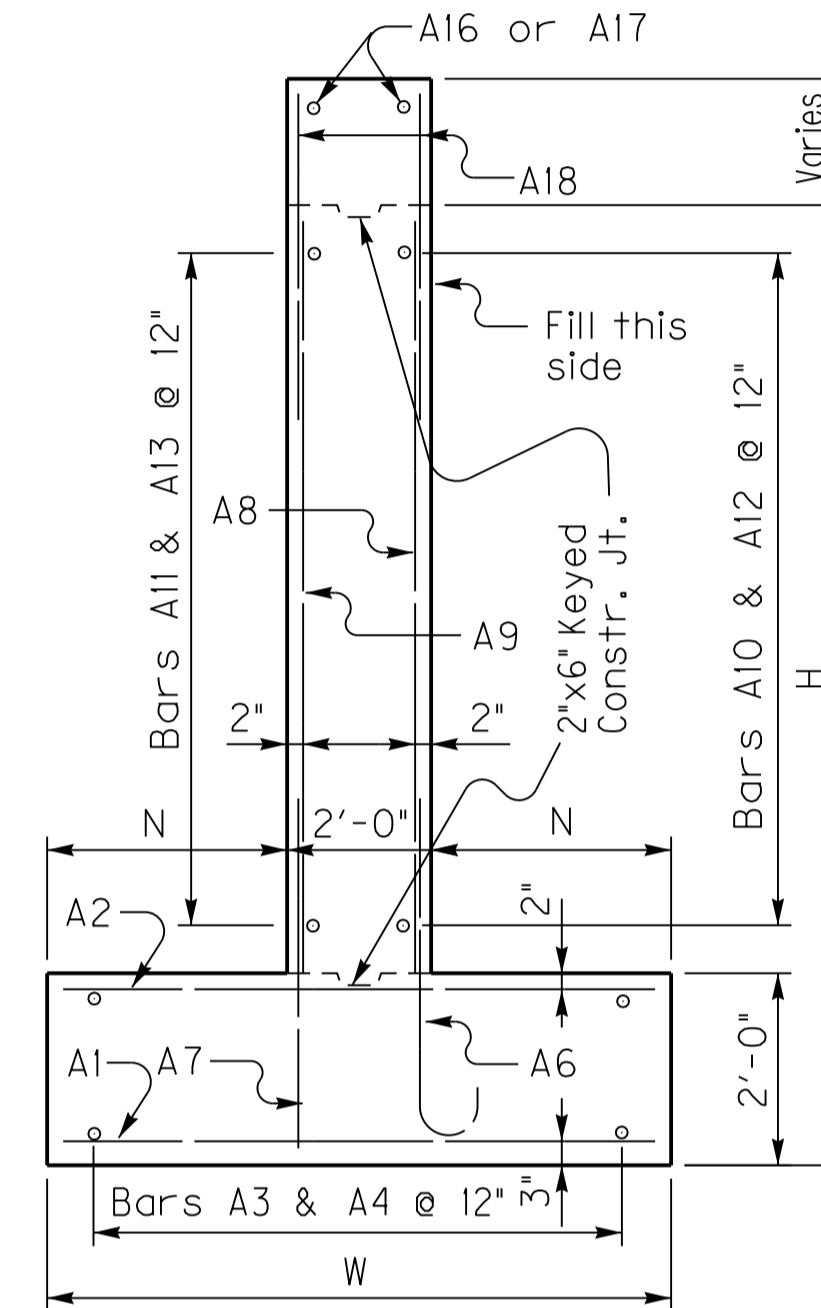


(Left Skew as shown; right skew opp. hand)

PLAN



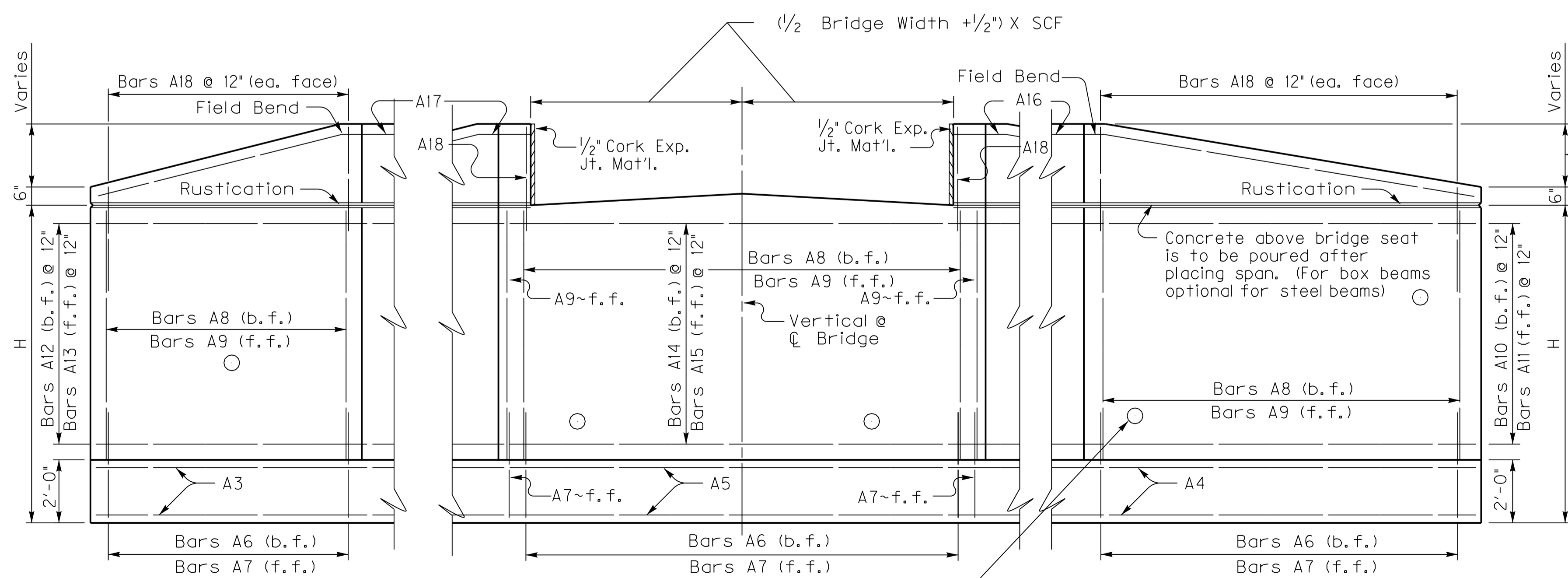
WALL SECTION



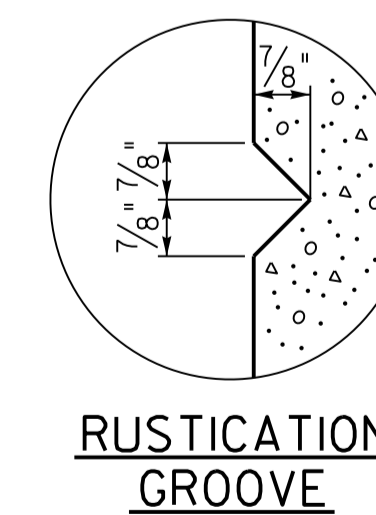
WING SECTION

H = Low Bridge Seat. Slope seat for side by side box beams. Step cap as necessary for rolled steel beam superstructures to achieve a 2% cross slope on deck.

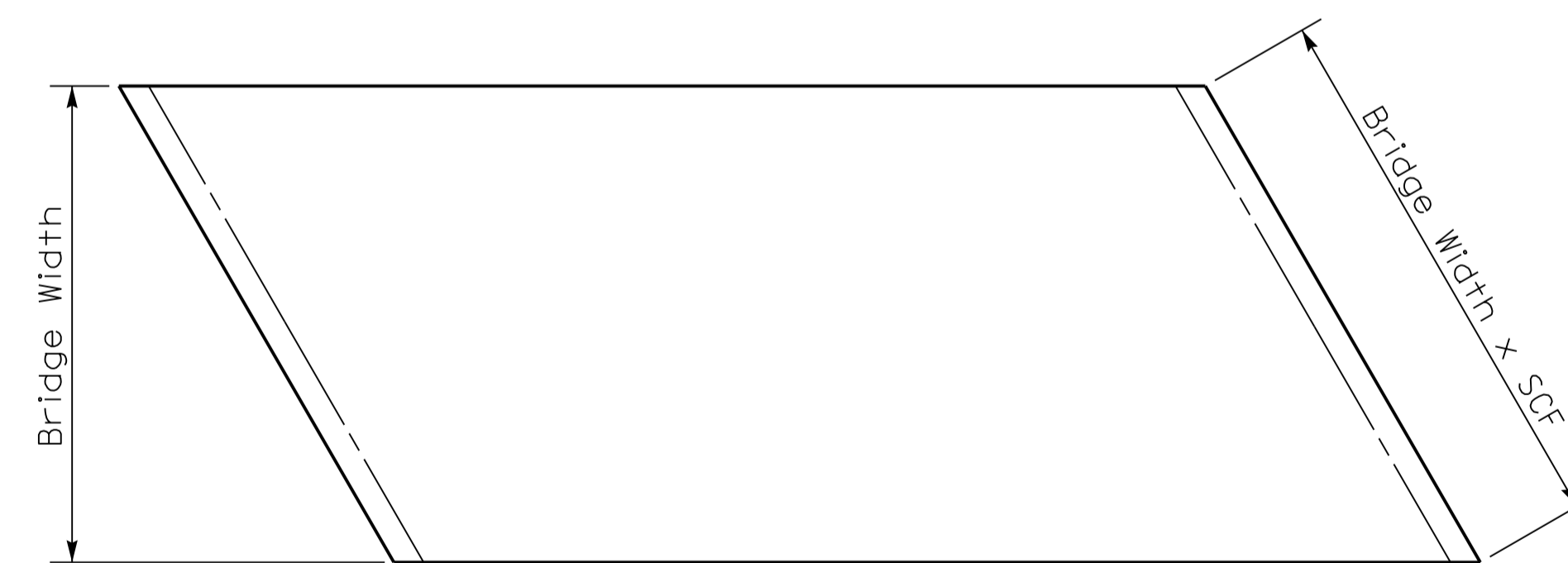
Note: Trim A16 & A17 bars if necessary



ELEVATION



RUSTICATION GROOVE



PLAN OF SUPERSTRUCTURE SLAB

Place 4\" weep hole drains at 8'-0\" centers at such elevation as to afford best drainage of backfill, in accordance with the Standard Specifications.

ABUTMENT DETAILS

SKEW	WIDTH	DATE
30	VAR	October 2018

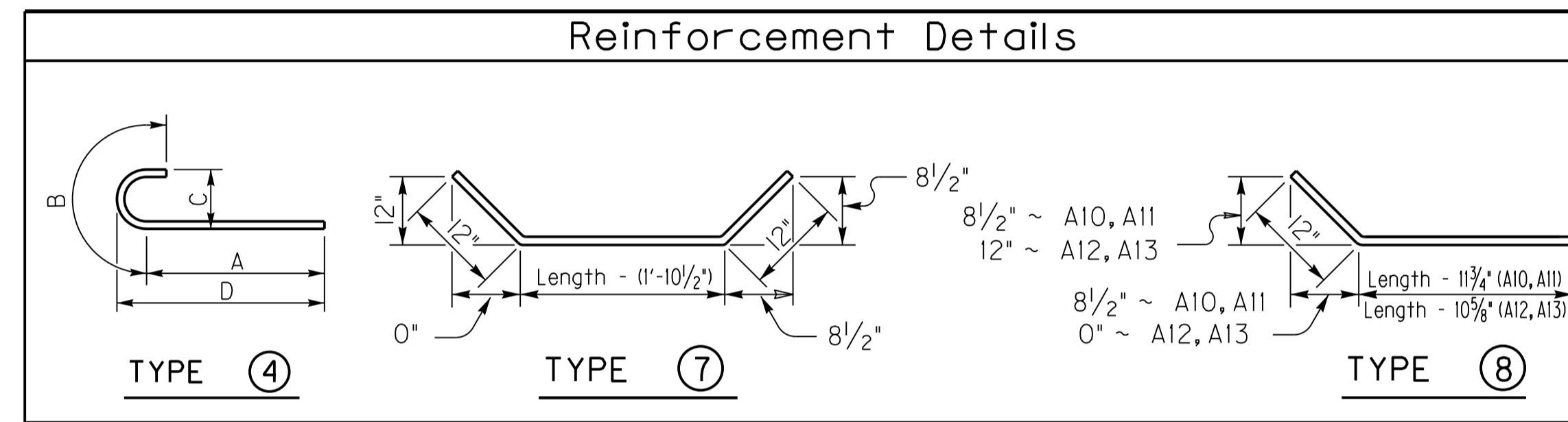
30° SKEW VARIABLE BRIDGE WIDTH 2:1 FILL SLOPES WINGS SKEWED 25% FROM ROADWAY TO BREASTWALL

Bill of Reinforcement

MARK	A1		A2		A3	A4		A5		A6				A7		A8		A9		A10	A11	A12	A13	A14		A15		A16	A17	A18	
TYPE	Str.		Str.		Str.	Str.		Str.		4				Str.		Str.		Str.		8	8	8	8	7		7		Str.	Str.	Str.	
SIZE	#5		#5		#5	#5		#5		#5				#5		#5		#5		#5	#5	#5	#5	#5		#5		#5	#5	#5	
H	No.	Size	Length	Spacing	No.	Size	Length	Spacing	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	
			ft.	in.			ft.	in.		ft.		ft.		ft.		ft.		ft.		ft.		ft.		ft.		ft.		ft.		ft.	
15-16	77+Nb=	10 11 8 12	77+Nb=	7 11 8 12	24 25 8 12	24 33 0	24 16 7	+Lb=		57+Nb=	9 9 11 12	8 1/8 1 10 0 11 3/4 8 6	62+Nb=	5 4 11 12	57+Nb=	6 12 10 12	62+Nb=	12 10 12	14 33 0	14 31 7	14 21 6	14 21 8	14 12 10	+Lb=		14 11 4	+Lb=		2 36 2	2 25 3	124 5 9
13-14	68+Nb=	9 10 8 12	68+Nb=	7 10 8 12	22 22 2	22 28 9	22 15 11	+Lb=		50+Nb=	8 8 3 12	6 11 1 3 0 8 7 3	55+Nb=	5 4 11 12	50+Nb=	6 10 10 12	55+Nb=	10 10 12	12 29 0	12 27 7	12 18 6	12 18 8	12 12 10	+Lb=		12 11 4	+Lb=		2 32 2	2 22 3	110 5 9
11-12	61+Nb=	8 9 8 12	61+Nb=	6 9 8 12	20 19 8	20 24 7	20 15 2	+Lb=		44+Nb=	7 7 1 12	5 10 1/2 1 2 0 7 6 2	49+Nb=	5 4 11 12	44+Nb=	5 8 10 12	49+Nb=	8 10 12	10 25 0	10 23 7	10 16 6	10 16 8	10 12 10	+Lb=		10 11 4	+Lb=		2 28 2	2 20 3	98 5 9
9-10	54+Nb=	7 8 8 12	54+Nb=	5 8 8 12	18 16 2	18 21 4	18 14 6	+Lb=		38+Nb=	6 6 1 12	5 1 1 0 0 6 5 4	43+Nb=	5 4 11 12	38+Nb=	5 6 10 12	43+Nb=	6 10 12	8 22 0	8 20 7	8 13 6	8 13 8	8 12 10	+Lb=		8 11 4	+Lb=		2 25 2	2 17 3	86 5 9
7-8	44+Nb=	6 7 2 12	44+Nb=	5 7 2 12	16 13 5	16 15 9	16 13 5	+Lb=		31+Nb=	5 5 7 12	4 8 1/2 0 10 0 5 4 11	36+Nb=	5 4 11 12	31+Nb=	5 4 10 12	36+Nb=	4 10 12	6 17 0	6 15 7	6 11 6	6 11 8	6 12 11	+Lb=		6 11 4	+Lb=		2 20 2	2 15 3	72 5 9
5-6	37+Nb=	5 6 2 12	37+Nb=	5 6 2 12	14 9 11	14 12 7	14 12 8	+Lb=		25+Nb=	5 5 7 12	4 8 1/2 0 10 0 5 4 11	30+Nb=	5 4 11 12	25+Nb=	5 2 10 12	30+Nb=	2 10 12	4 14 0	4 12 7	4 8 6	4 8 8	4 12 11	+Lb=		4 11 4	+Lb=		2 17 2	2 12 3	60 5 9

Table of Dimensions

H	W	N	M2	M3	T2	T3	L2	L3	S2		S3					
	Length	Length	Length	Length	Length	Length	Length	Length	Length	+Lb/2 =	Length	Length	+Lb/2 =	Length		
	ft.	in.	ft.	in.	ft.	in.	ft.	in.	ft.	in.	ft.	in.	ft.	in.	ft.	in.
15-16	12 0	5 0	23 3/8	26 0	23 3/8	0 0	30	19	10 5/2	+0.5Lb=		6 5 5/8	+0.5Lb=			
13-14	11 0	4 6	20 3/2	22 6	20 3/2	0 0	26	16	9 11 1/2	+0.5Lb=		6 3 3/8	+0.5Lb=			
11-12	10 0	4 0	17 3/4	20 0	17 3/4	0 0	22	14	9 5 1/2	+0.5Lb=		6 5 5/8	+0.5Lb=			
9-10	9 0	3 6	15 1/2	16 6	15 1/2	0 0	19	11	8 11 5/8	+0.5Lb=		5 10	+0.5Lb=			
7-8	7 6	2 9	11 3/2	13 9	11 3/2	0 0	14	9	8 2 5/8	+0.5Lb=		5 6 1/4	+0.5Lb=			
5-6	6 6	2 3	9 1/4	10 3	9 1/4	0 0	11	6	7 8 3/4	+0.5Lb=		5 3 3/4	+0.5Lb=			



*Concrete quantities computed using 21' beam depth on 1/2' pad & Variable Bridge Width

Quantities

H	Concrete*	Reinforcement
	C.Y.	LBS.
5	22.36+(0.71xLb) =	2163+(52.8xLb) =
6	24.35+(0.78xLb) =	2163+(52.8xLb) =
7	34.5+(0.93xLb) =	3232+(68.7xLb) =
8	36.93+(1.01xLb) =	3232+(68.7xLb) =
9	52.02+(1.19xLb) =	4969+(91xLb) =
10	54.98+(1.27xLb) =	4969+(91xLb) =
11	69.94+(1.41xLb) =	7260+(120.4xLb) =
12	73.33+(1.49xLb) =	7260+(120.4xLb) =
13	90.51+(1.64xLb) =	10566+(161xLb) =
14	94.36+(1.71xLb) =	10566+(161xLb) =
15	115.71+(1.86xLb) =	14465+(198.6xLb) =
16	120.07+(1.93xLb) =	14465+(198.6xLb) =

ABUTMENT SKEW CORRECTION FACTOR (SCF) = 1.155

NUMBER OF BARS TO ADD (Nb) = Bridge Width (feet) x SCF

(round up to nearest whole number)

LENGTH OF ABUTMENT TO ADD (Lb) = Bridge Width (feet) x SCF

(convert decimal to architectural)

GENERAL NOTES

SPECIFICATIONS: Construct abutments according to the current edition of the Kentucky Department of Highways Standard Specifications for Road and Bridge Construction. Abutments are designed for side by side box beams as detailed in Standard Drawings BDP-001 through BDP-012, current edition. Dimensions may be adjusted to allow for any out to out bridge width. Abutments are also adequate for Std. Dwg. slabs or steel beam superstructures

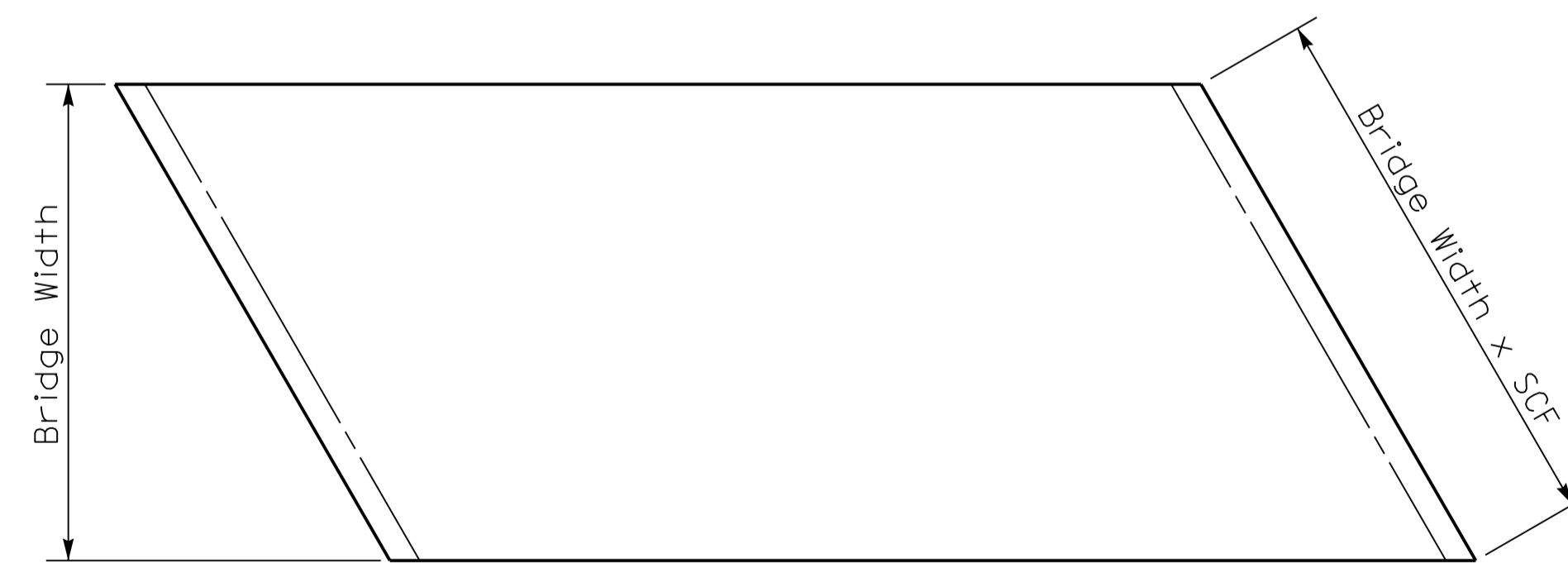
FOUNDATION PRESSURE: Construct abutment footings on solid rock bearing material that can support a pressure of 8000 psf service or 10,800 psf strength factored, as recommended by a geotechnical engineer.

WING LENGTHS: Calculated assuming 21' superstructure depth and stream bank elevation at top of footing.

FOOTING ELEVATION: Construct bottom of footing below the anticipated scour elevation. (This typically entails embedding the footings 1'-0" to 2'-0" into rock and pouring concrete directly against cut rock faces, as recommended by geotechnical engineer.)

NOTE: Distances to bars shown are clear dimensions unless otherwise noted.

MATERIAL SPECIFICATIONS:
 Concrete, Class "A" = 3500 psi
 Steel Reinforcement = Grade 60

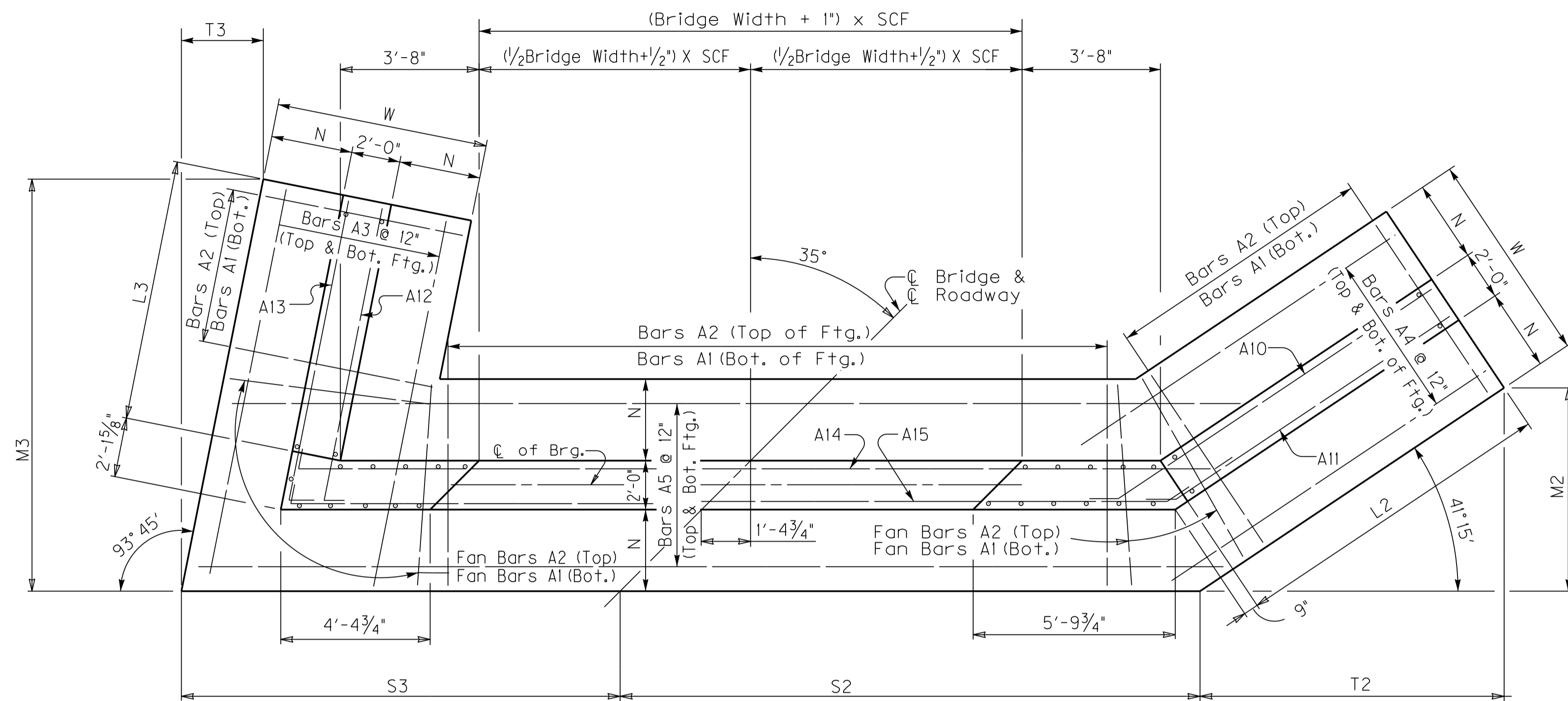


ABUTMENT DETAILS

SKEW	WIDTH	DATE
30	VAR	October 2018

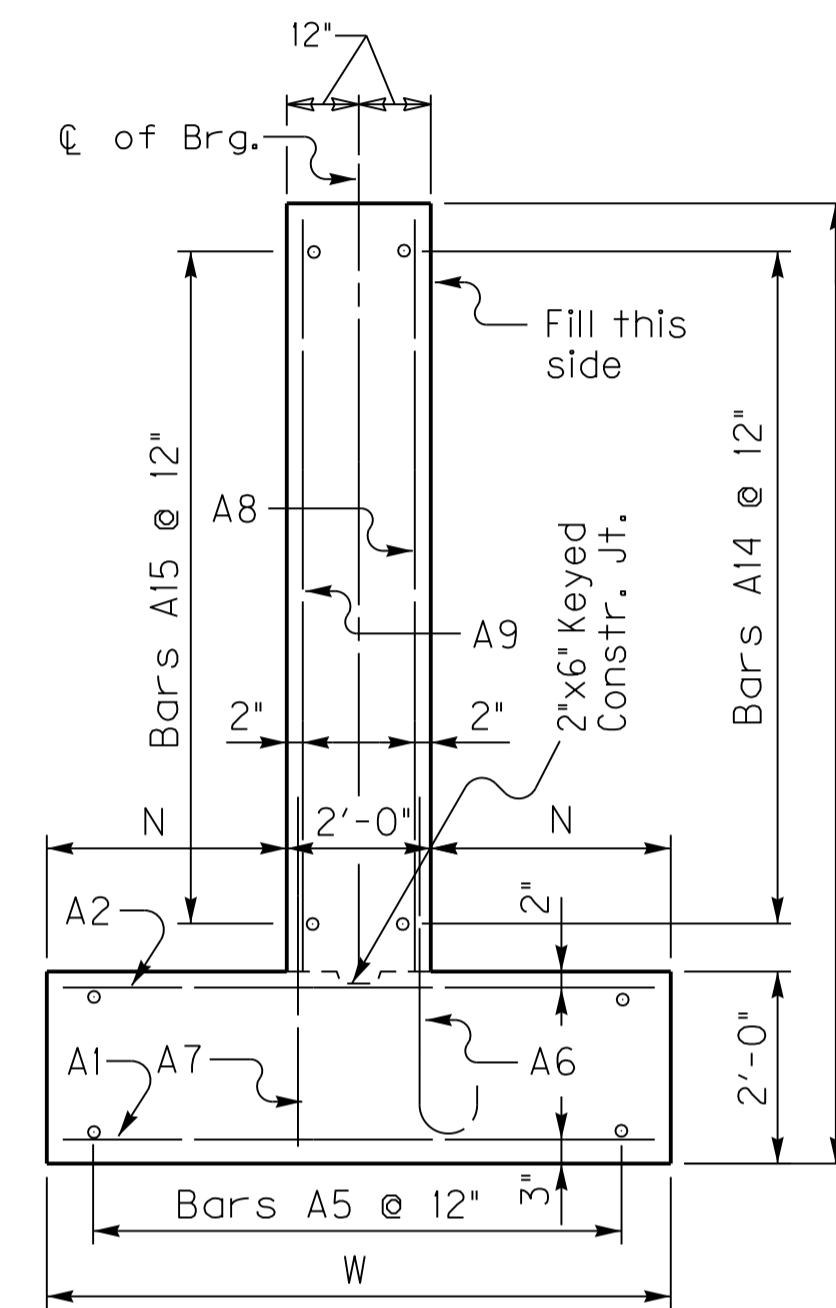
35° SKEW VARIABLE BRIDGE WIDTH 2:1 FILL SLOPES WINGS SKEWED 25% FROM ROADWAY TO BREASTWALL

ABUTMENT SKEW CORRECTION FACTOR (SCF) = 1.221



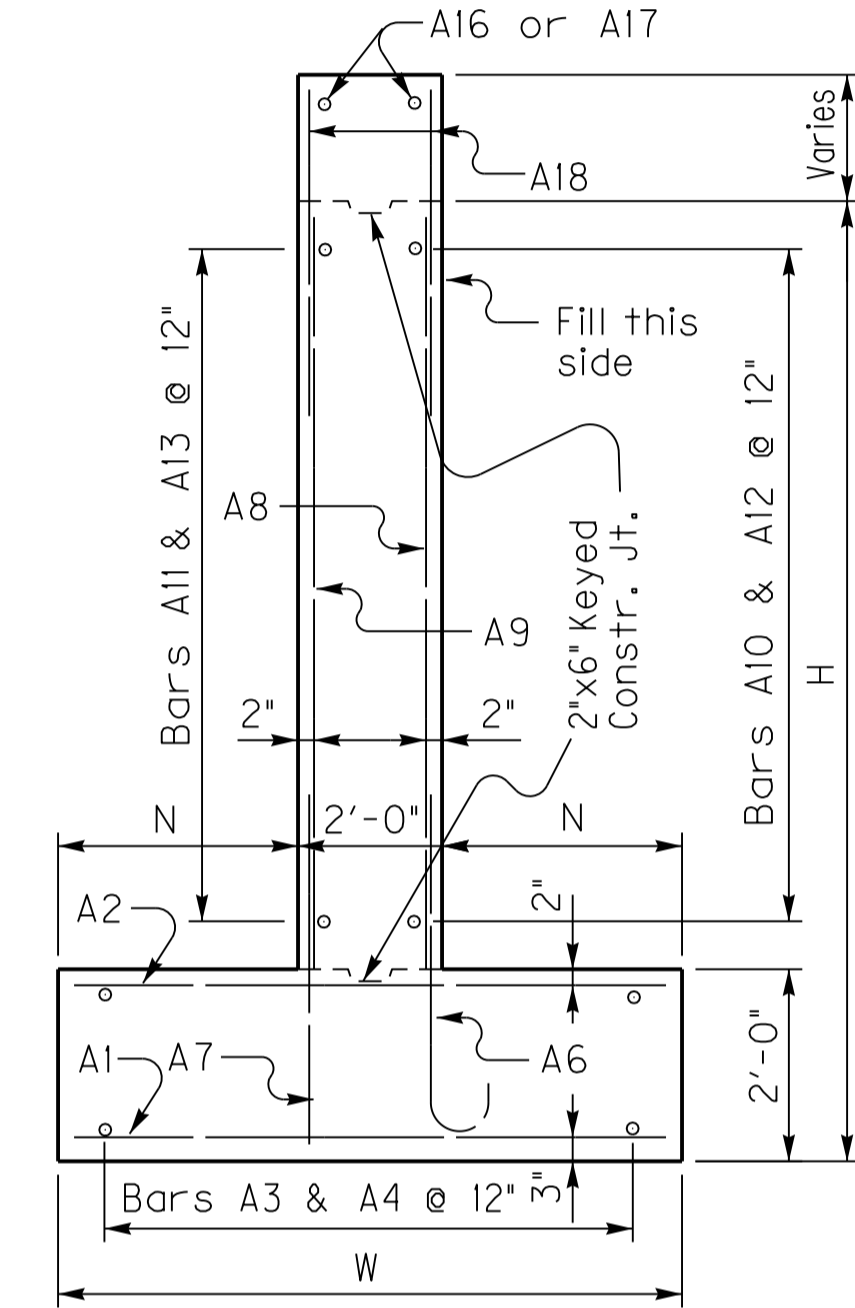
(Left Skew as shown; right skew opp. hand)

PLAN



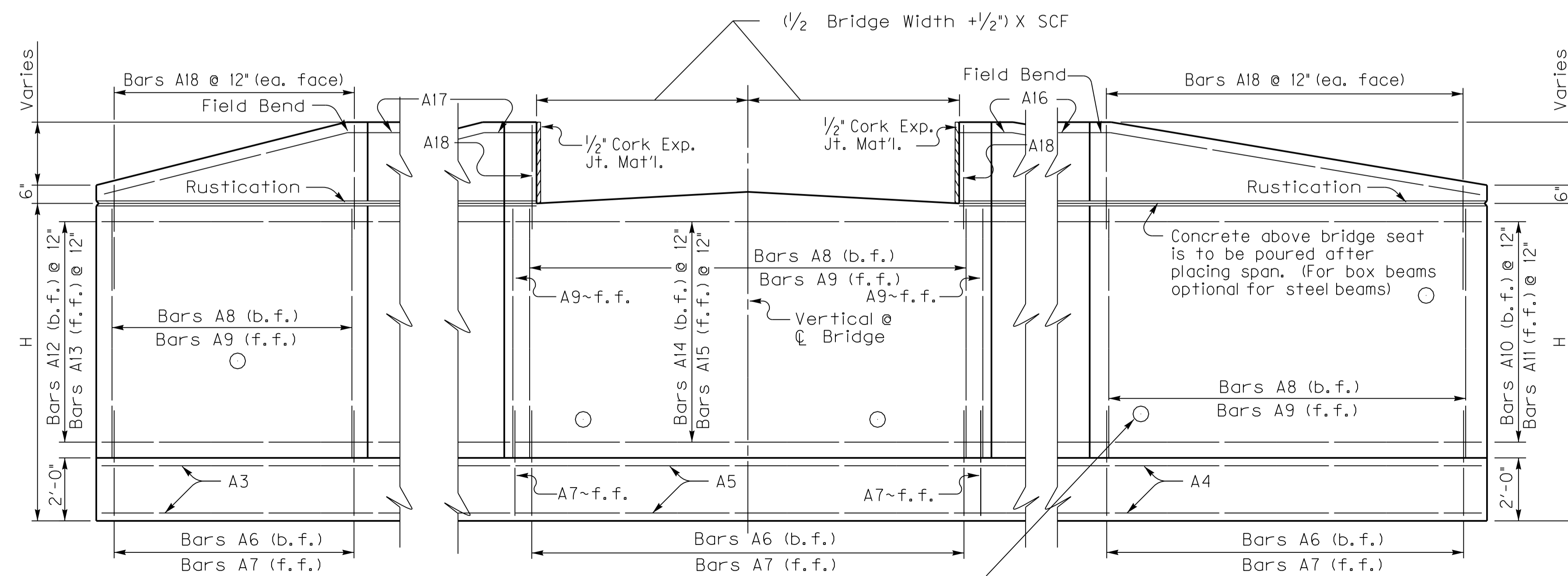
WALL SECTION

H = Low Bridge Seat. Slope seat for side by side box beams. Step cap as necessary for rolled steel beam superstructures to achieve a 2% cross slope on deck.

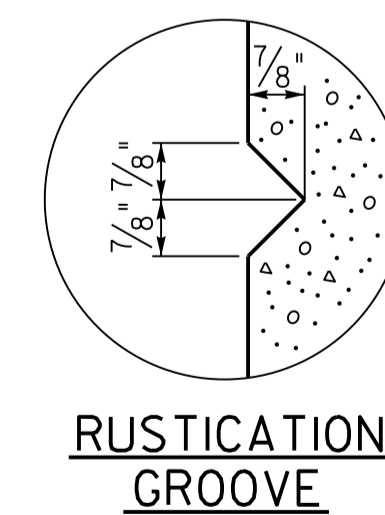


WING SECTION

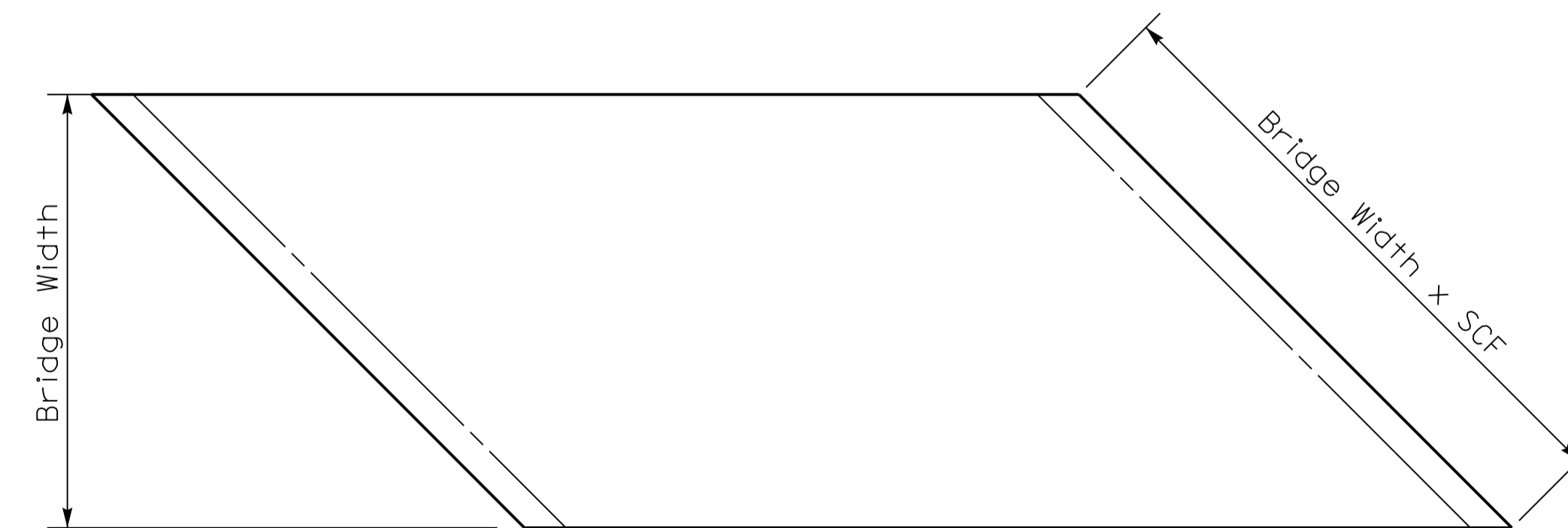
Note: Trim A16 & A17 bars if necessary
Trim A3 bars as necessary



ELEVATION



RUSTICATION GROOVE



PLAN OF SUPERSTRUCTURE SLAB

Place 4" weep hole drains at 8'-0" centers at such elevation as to afford best drainage of backfill, in accordance with the Standard Specifications.

ABUTMENT DETAILS

SKEW	WIDTH	DATE
35	VAR	October 2018

35° SKEW VARIABLE BRIDGE WIDTH 2:1 FILL SLOPES WINGS SKEWED 25% FROM ROADWAY TO BREASTWALL

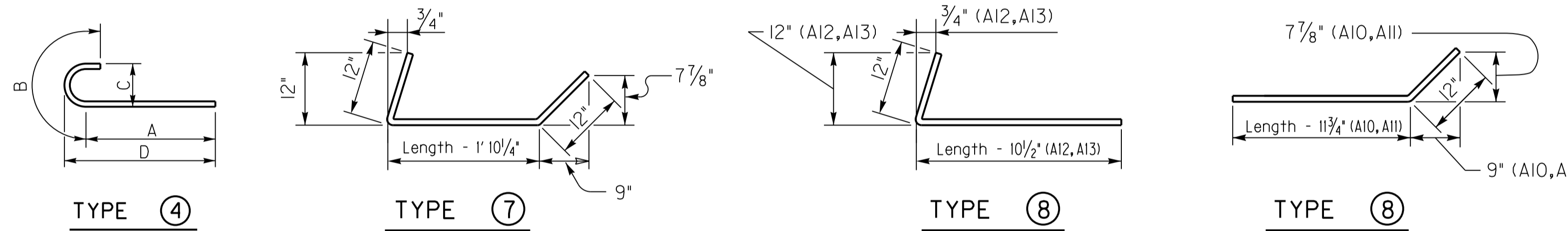
Bill of Reinforcement

MARK	A1				A2				A3	A4				A5				A6				A7				A8				A9				A10	A11	A12	A13	A14				A15				A16	A17	A18																																
TYPE	Str.				Str.				Str.	Str.				Str.				Str.				Str.				Str.				Str.				Str.				Str.				Str.				Str.	Str.	Str.																																
SIZE	#5				#5				#5	#5				#5				#5				#5				#5				#5				#5				#5				#5				#5	#5	#5																																
15-16	81+Nb=	10	11	8	12	81+Nb=	7	11	8	12	24	26	1	24	35	9	24	17	2	+Lb=		60+Nb=	9	9	11	12	8	1/8	1	10	0	11	3/4	8	6	66+Nb=	5	4	11	12	60+Nb=	6	12	10	12	66+Nb=	12	10	12	14	36	2	14	34	7	14	21	5	14	21	9	14	13	5	+Lb=		14	11	10	+Lb=		2	39	6	2	25	5	130	5	9
13-14	72+Nb=	9	10	8	12	72+Nb=	7	10	8	12	22	22	7	22	31	7	22	16	5	+Lb=		53+Nb=	8	8	3	12	6	11	1	3	0	8	7	3	59+Nb=	5	4	11	12	53+Nb=	6	10	10	12	59+Nb=	10	10	12	12	32	2	12	30	7	12	18	5	12	18	9	12	13	5	+Lb=		12	11	10	+Lb=		2	35	6	2	22	5	116	5	9	
11-12	64+Nb=	8	9	8	12	64+Nb=	6	9	8	12	20	20	0	20	26	5	20	15	8	+Lb=		46+Nb=	7	7	1	12	5	10	1/2	1	2	0	7	6	2	52+Nb=	5	4	11	12	46+Nb=	5	8	10	12	52+Nb=	8	10	12	10	27	2	10	25	7	10	16	5	10	16	9	10	13	5	+Lb=		10	11	10	+Lb=		2	30	6	2	20	5	102	5	9
9-10	55+Nb=	7	8	8	12	55+Nb=	5	8	8	12	18	16	6	18	22	2	18	15	0	+Lb=		39+Nb=	6	6	1	12	5	1	1	0	0	6	5	4	45+Nb=	5	4	11	12	39+Nb=	5	6	10	12	45+Nb=	6	10	12	8	23	2	8	21	7	8	13	5	8	13	9	8	13	5	+Lb=		8	11	10	+Lb=		2	26	6	2	17	5	88	5	9	
7-8	46+Nb=	6	7	2	12	46+Nb=	5	7	2	12	16	13	9	16	16	7	16	13	11	+Lb=		32+Nb=	5	5	7	12	4	8	1/2	0	10	0	5	4	11	38+Nb=	5	4	11	12	32+Nb=	5	4	10	12	38+Nb=	4	10	12	6	18	2	6	16	7	6	11	5	6	11	9	6	13	5	+Lb=		6	11	10	+Lb=		2	21	6	2	15	5	74	5	9
5-6	39+Nb=	5	6	2	12	39+Nb=	5	6	2	12	14	10	2	14	13	5	14	13	2	+Lb=		26+Nb=	5	5	7	12	4	8	1/2	0	10	0	5	4	11	32+Nb=	5	4	11	12	26+Nb=	5	2	10	12	32+Nb=	2	10	12	4	15	2	4	13	7	4	8	5	4	8	9	4	13	5	+Lb=		4	11	10	+Lb=		2	18	6	2	12	5	62	5	9

Table of Dimensions

H	W	N	M2	M3	T2	T3	L2	L3	S2			S3		
	Length	Length	Length	Length	Length	Length	Length	Length	Length	+Lb/2 =	Length	Length	+Lb/2 =	Length
	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.
15-16	12 0	5 0	23 6	26 5	26 9 1/2	1 8 3/4	33	19	11 3	+0.5Lb=		6 3 3/8	+0.5Lb=	
13-14	11 0	4 6	20 8 3/4	22 10 3/4	23 7 3/4	1 6	29	16	10 8 1/2	+0.5Lb=		6 1 1/4	+0.5Lb=	
11-12	10 0	4 0	17 3 3/4	20 4 3/8	19 8 7/8	1 4	24	14	10 2 1/8	+0.5Lb=		5 11	+0.5Lb=	
9-10	9 0	3 6	14 6 5/8	16 10	16 7 1/8	1 1 1/4	20	11	9 7 5/8	+0.5Lb=		5 8 3/4	+0.5Lb=	
7-8	7 6	2 9	11 7/8	14 1/2	12 7 1/2	0 11	15	9	8 9 7/8	+0.5Lb=		5 5 1/2	+0.5Lb=	
5-6	6 6	2 3	8 11 5/8	10 6 1/8	10 2 3/4	0 8 1/4	12	6	8 3 1/2	+0.5Lb=		5 3 1/4	+0.5Lb=	

Reinforcement Details



Quantities

H	Concrete*		Reinforcement	
	C.Y.		LBS.	
5	23.58+(0.71xLb) =		2265+(52.8xLb) =	
6	25.67+(0.78xLb) =		2265+(52.8xLb) =	
7	36.04+(0.93xLb) =		3363+(68.7xLb) =	
8	38.58+(1.01xLb) =		3363+(68.7xLb) =	
9	53.94+(1.19xLb) =		5110+(91xLb) =	
10	57+(1.27xLb) =		5110+(91xLb) =	
11	73.69+(1.41xLb) =		7612+(120.4xLb) =	
12	77.27+(1.49xLb) =		7612+(120.4xLb) =	
13	96.54+(1.64xLb) =		11200+(161xLb) =	
14	100.64+(1.71xLb) =		11200+(161xLb) =	
15	122.51+(1.86xLb) =		15233+(198.6xLb) =	
16	127.13+(1.93xLb) =		15233+(198.6xLb) =	

*Concrete quantities computed using 21" beam depth on 1/2" pad & Variable Bridge Width

ABUTMENT SKEW CORRECTION FACTOR (SCF) = 1.221

NUMBER OF BARS TO ADD (Nb) = Bridge Width (feet) x SCF

(round up to nearest whole number)

LENGTH OF ABUTMENT TO ADD (Lb) = Bridge Width (feet) x SCF

(convert decimal to architectural)

GENERAL NOTES

SPECIFICATIONS: Construct abutments according to the current edition of the Kentucky Department of Highways Standard Specifications for Road and Bridge Construction. Abutments are designed for side by side box beams as detailed in Standard Drawings BDP-001 through BDP-012, current edition. Dimensions may be adjusted to allow for any out to out bridge width. Abutments are also adequate for Std. Dwg. slabs or steel beam superstructures

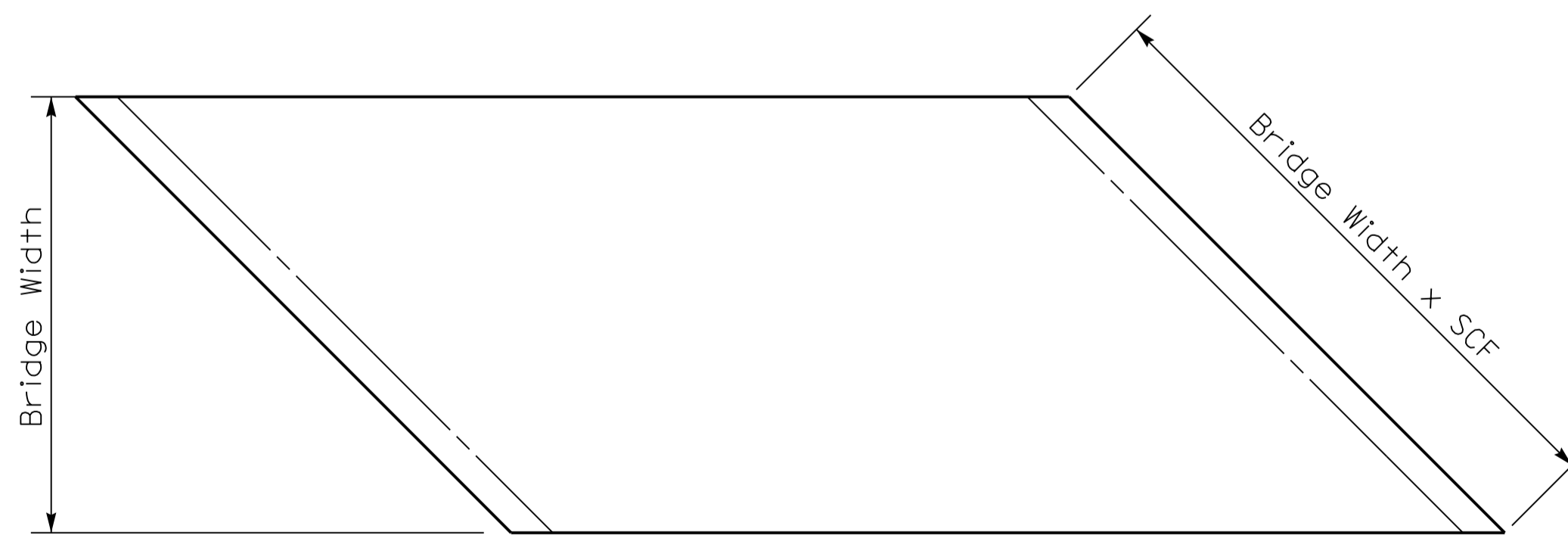
FOUNDATION PRESSURE: Construct abutment footings on solid rock bearing material that can support a pressure of 8000 psf service or 10,800 psf strength factored, as recommended by a geotechnical engineer.

WING LENGTHS: Calculated assuming 21" superstructure depth and stream bank elevation at top of footing.

FOOTING ELEVATION: Construct bottom of footing below the anticipated scour elevation. (This typically entails embedding the footings 1'-0" to 2'-0" into rock and pouring concrete directly against cut rock faces, as recommended by geotechnical engineer.)

NOTE: Distances to bars shown are clear dimensions unless otherwise noted.

MATERIAL SPECIFICATIONS:
Concrete, Class "A" = 3500 psi
Steel Reinforcement = Grade 60



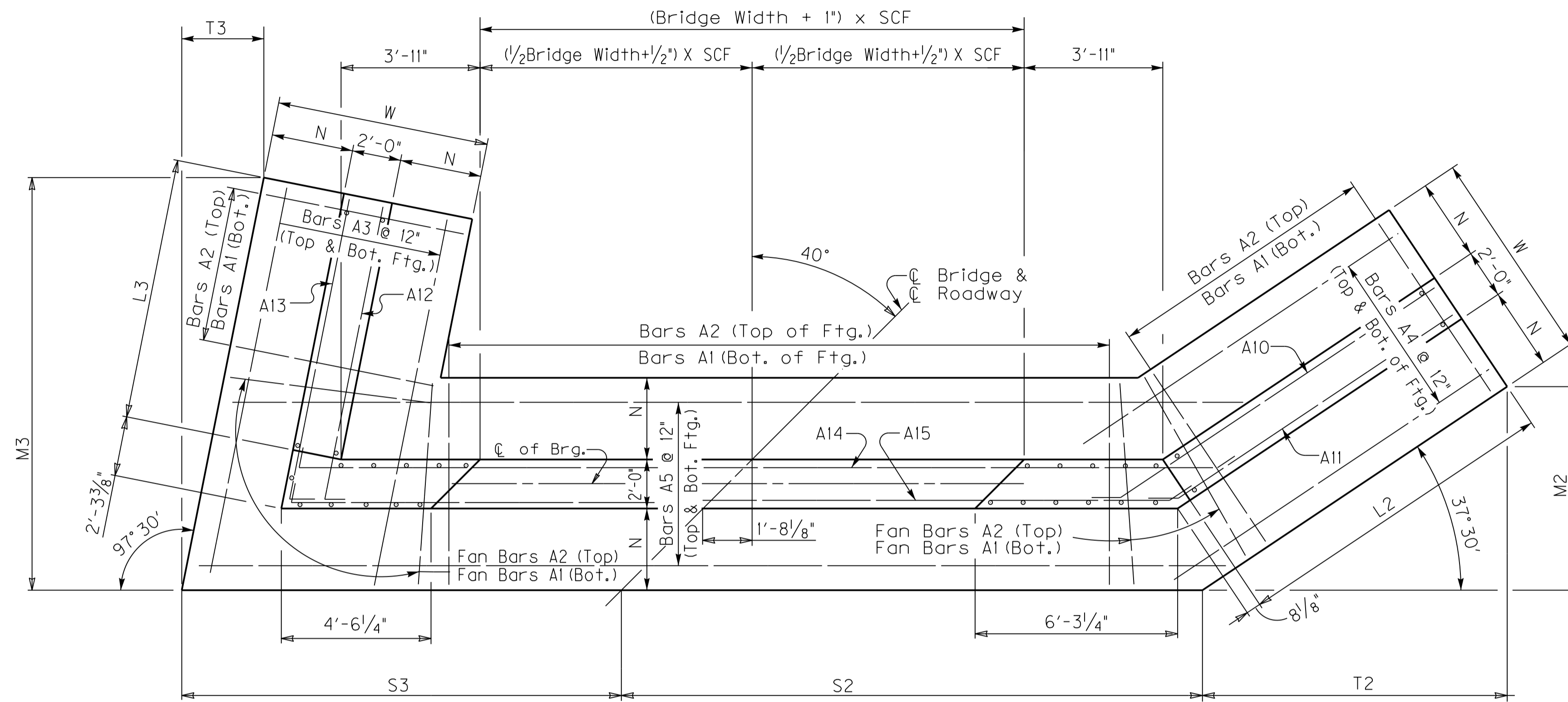
PLAN OF SUPERSTRUCTURE SLAB

ABUTMENT DETAILS

SKEW	WIDTH	DATE
35	VAR	October 2018

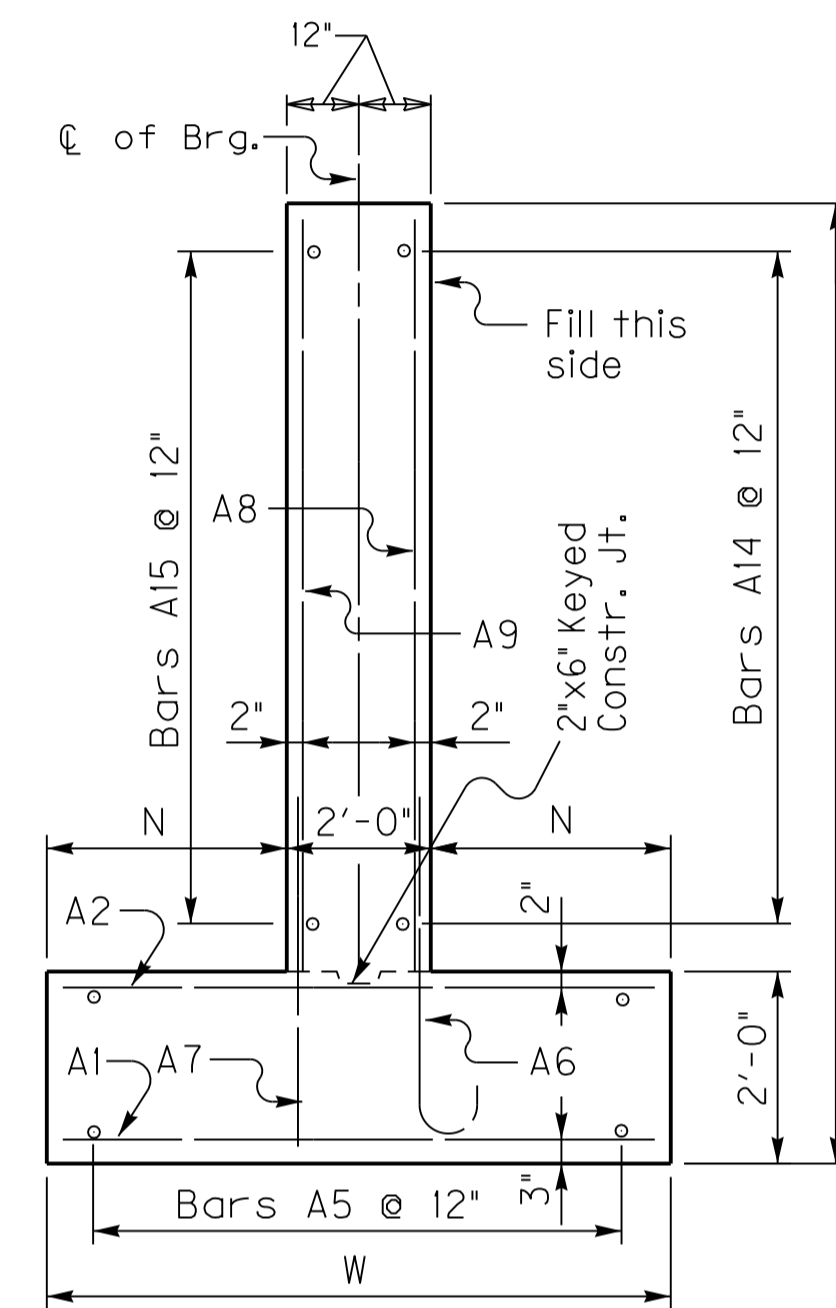
40° SKEW VARIABLE BRIDGE WIDTH 2:1 FILL SLOPES WINGS SKEWED 25% FROM ROADWAY TO BREASTWALL

ABUTMENT SKEW CORRECTION FACTOR (SCF) = 1.305



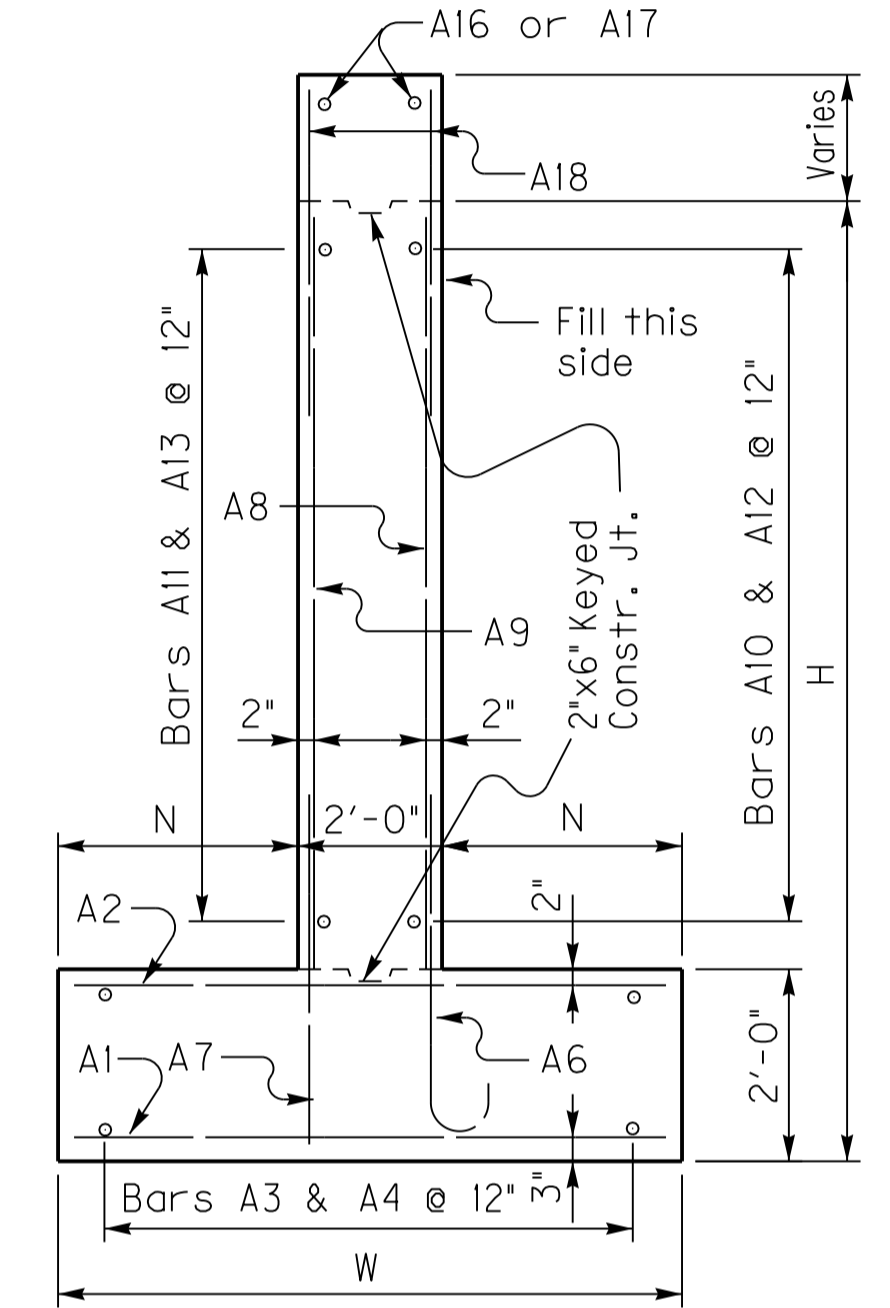
(Left Skew as shown; right skew opp. hand)

PLAN



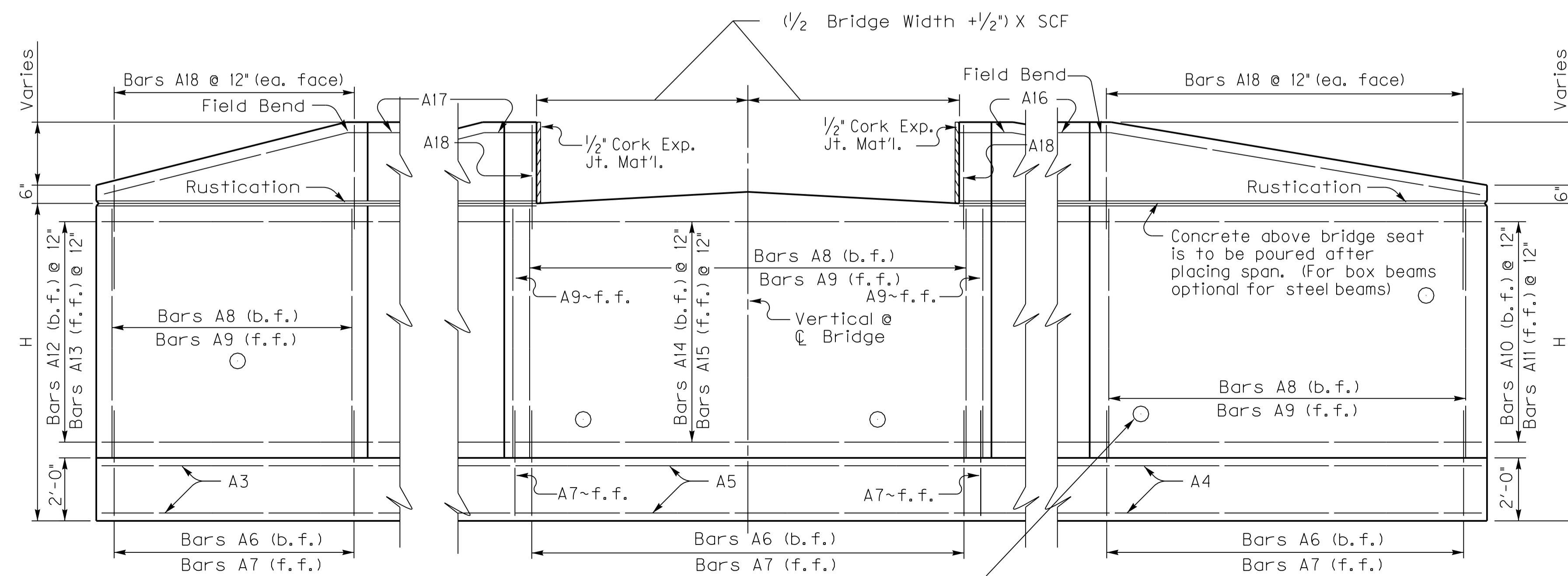
WALL SECTION

H = Low Bridge Seat. Slope seat for side by side box beams. Step cap as necessary for rolled steel beam superstructures to achieve a 2:1 cross slope on deck.



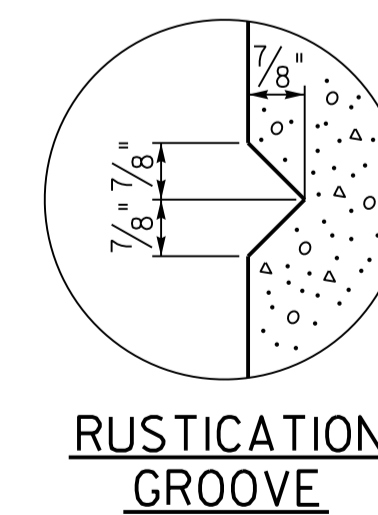
WING SECTION

Note: Trim A16 & A17 bars if necessary
Trim A3 bars as necessary

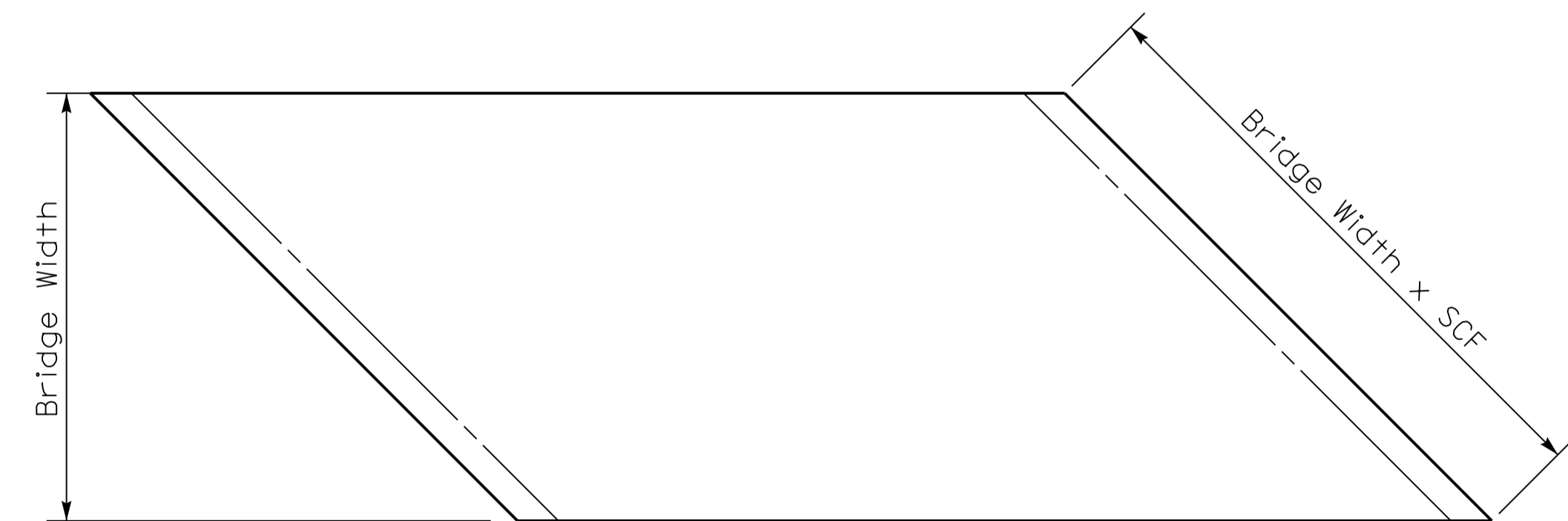


ELEVATION

Place 4" weep hole drains at 8'-0" centers at such elevation as to afford best drainage of backfill, in accordance with the Standard Specifications.



RUSTICATION GROOVE



PLAN OF SUPERSTRUCTURE SLAB

ABUTMENT DETAILS

SKEW	WIDTH	DATE
40	VAR	October 2018

40° SKEW VARIABLE BRIDGE WIDTH 2:1 FILL SLOPES WINGS SKEWED 25% FROM ROADWAY TO BREASTWALL

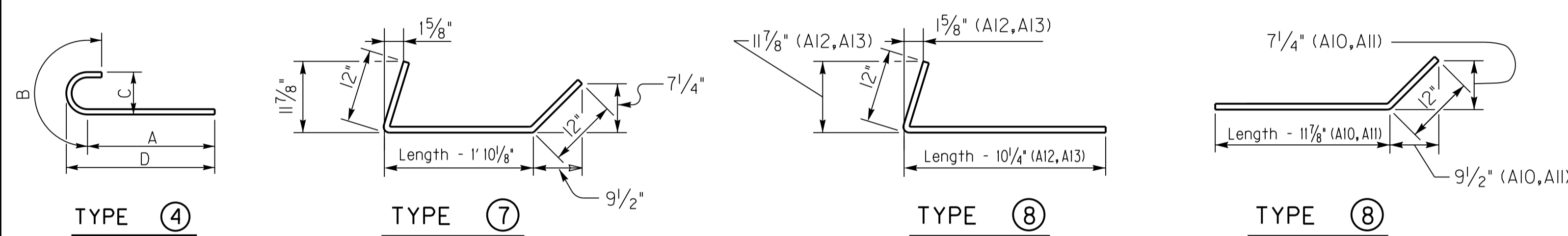
Bill of Reinforcement

MARK	A1		A2		A3	A4		A5		A6				A7		A8		A9	A10	A11	A12	A13	A14		A15		A16	A17	A18	
TYPE	Str.		Str.		Str.	Str.		Str.		4				Str.		Str.		Str.	8	8	8	8	7		7		Str.	Str.	Str.	
SIZE	#5		#5		#5	#5		#5		#5				#5		#5		#5	#5	#5	#5	#5	#5		#5		#5	#5	#5	
H	No.	Size	Length	Spacing	No.	Size	Length	Spacing	No.	Length	Spacing	No.	Length	Spacing	No.	Length	Spacing	No.	Length	Spacing	No.	Length	Spacing	No.	Length	Spacing	No.	Length	Spacing	
15-16	85+Nb=	10 11 8 12	85+Nb=	7 11 8 12	24 26 7	24 38 7	24 17 10	+Lb=		63+Nb=	9 9 11 12	8 1/8 1 10 0	11 3/4 8 6	69+Nb=	5 4 11 12	63+Nb=	6 12 10 12	69+Nb=	12 10 12	14 39 4	14 37 6	14 21 6	14 21 11	14 14 1	14 14 1	+Lb=		2 42 10	2 25 9	138 5 9
13-14	76+Nb=	9 10 8 12	76+Nb=	7 10 8 12	22 23 0	22 33 5	22 17 1	+Lb=		55+Nb=	8 8 3 12	6 11 1 3 0	8 7 3	61+Nb=	5 4 11 12	55+Nb=	6 10 10 12	61+Nb=	10 10 12	12 34 4	12 32 6	12 18 6	12 18 11	12 14 1	+Lb=		2 37 10	2 22 9	122 5 9	
11-12	67+Nb=	8 9 8 12	67+Nb=	6 9 8 12	20 20 5	20 28 3	20 16 4	+Lb=		48+Nb=	7 7 1 12	5 10 1/2 1 2 0	7 6 2	54+Nb=	5 4 11 12	48+Nb=	5 8 10 12	54+Nb=	8 10 12	10 29 4	10 27 6	10 16 6	10 16 11	10 14 1	+Lb=		2 32 10	2 20 9	108 5 9	
9-10	59+Nb=	7 8 8 12	59+Nb=	5 8 8 12	18 16 10	18 24 1	18 15 7	+Lb=		41+Nb=	6 6 1 12	5 1 1 0 0	6 5 4	47+Nb=	5 4 11 12	41+Nb=	5 6 10 12	47+Nb=	6 10 12	8 25 4	8 23 6	8 13 6	8 13 11	8 14 2	+Lb=		2 28 10	2 17 9	94 5 9	
7-8	49+Nb=	6 7 2 12	49+Nb=	5 7 2 12	16 14 1	16 18 6	16 14 7	+Lb=		34+Nb=	5 5 7 12	4 8 1/2 0 10 0	5 4 11	40+Nb=	5 4 11 12	34+Nb=	5 4 10 12	40+Nb=	4 10 12	6 20 4	6 18 6	6 11 5	6 11 11	6 14 2	+Lb=		2 23 10	2 15 9	80 5 9	
5-6	41+Nb=	5 6 2 12	41+Nb=	5 6 2 12	14 10 6	14 14 4	14 13 10	+Lb=		27+Nb=	5 5 7 12	4 8 1/2 0 10 0	5 4 11	33+Nb=	5 4 11 12	27+Nb=	5 2 10 12	33+Nb=	2 10 12	4 16 4	4 14 6	4 8 5	4 8 11	4 14 2	+Lb=		2 19 10	2 12 9	66 5 9	

Table of Dimensions

H	W	N	M2	M3	T2	T3	L2	L3	S2		S3	
	Length	Length	Length	Length	Length	Length	Length	Length	Length	+Lb/2	Length	Length
	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.
15-16	12 0 5 0	23 4 3/8	26 9	30 5 3/8	3 6 1/4	36	19	12 2 5/8	+0.5Lb=		6 1	+0.5Lb=
13-14	11 0 4 6	20 2 5/8	23 2 1/2	26 4 1/8	3 5/8	31	16	11 7 7/8	+0.5Lb=		5 11 1/8	+0.5Lb=
11-12	10 0 4 0	17 3/4	20 8	22 2 7/8	2 8 5/8	26	14	11 1/2	+0.5Lb=		5 9 3/8	+0.5Lb=
9-10	9 0 3 6	14 6 3/8	17 1 1/2	18 1 1/4	2 3	22	11	10 5 3/8	+0.5Lb=		5 7 1/2	+0.5Lb=
7-8	7 6 2 9	11 4	14 3 1/2	14 9/4	1 10 5/8	17	9	9 6 7/8	+0.5Lb=		5 4 7/8	+0.5Lb=
5-6	6 6 2 3	8 9/2	10 9	11 5 1/2	1 5	13	6	8 11 3/4	+0.5Lb=		5 3	+0.5Lb=

Reinforcement Details



Quantities

H	Concrete*	Reinforcement
	C.Y.	LBS.
5	24.9+(0.71xLb) =	2378+(52.8xLb) =
6	27.11+(0.78xLb) =	2378+(52.8xLb) =
7	38.74+(0.93xLb) =	3585+(68.7xLb) =
8	41.47+(1.01xLb) =	3585+(68.7xLb) =
9	57.31+(1.19xLb) =	5417+(91xLb) =
10	60.57+(1.27xLb) =	5417+(91xLb) =
11	77.63+(1.41xLb) =	7970+(120.4xLb) =
12	81.4+(1.49xLb) =	7970+(120.4xLb) =
13	101.07+(1.64xLb) =	11721+(161xLb) =
14	105.36+(1.71xLb) =	11721+(161xLb) =
15	129.56+(1.86xLb) =	16006+(198.6xLb) =
16	134.44+(1.93xLb) =	16006+(198.6xLb) =

ABUTMENT SKEW CORRECTION FACTOR (SCF) = 1.305

NUMBER OF BARS TO ADD (Nb) = Bridge Width (feet) x SCF (round up to nearest whole number)

LENGTH OF ABUTMENT TO ADD (Lb) = Bridge Width (feet) x SCF (convert decimal to architectural)

(round up to nearest whole number)

(convert decimal to architectural)

*Concrete quantities computed using 21" beam depth on 1/2" pad & Variable Bridge Width

GENERAL NOTES

SPECIFICATIONS: Construct abutments according to the current edition of the Kentucky Department of Highways Standard Specifications for Road and Bridge Construction. Abutments are designed for side by side box beams as detailed in Standard Drawings BDP-001 through BDP-012, current edition. Dimensions may be adjusted to allow for any out to out bridge width. Abutments are also adequate for Std. Dwg. slabs or steel beam superstructures

FOUNDATION PRESSURE: Construct abutment footings on solid rock bearing material that can support a pressure of 8000 psf service or 10,800 psf strength factored, as recommended by a geotechnical engineer.

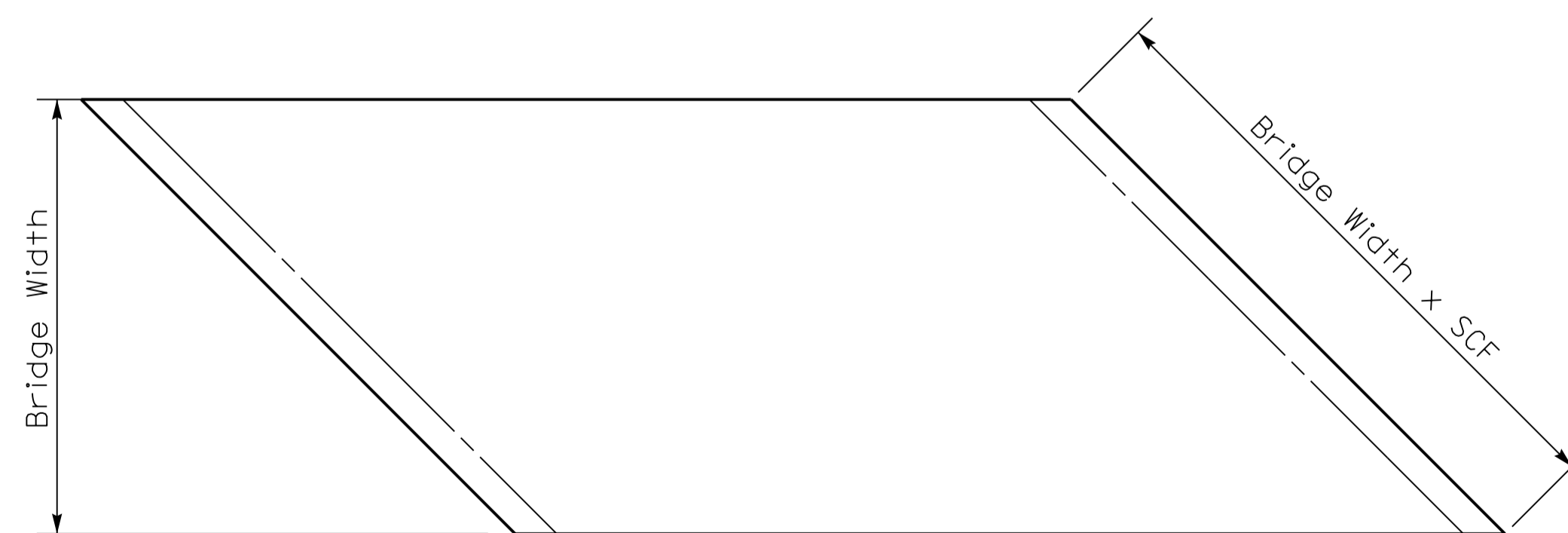
WING LENGTHS: Calculated assuming 21" superstructure depth and stream bank elevation at top of footing.

FOOTING ELEVATION: Construct bottom of footing below the anticipated scour elevation. (This typically entails embedding the footings 1'-0" to 2'-0" into rock and pouring concrete directly against cut rock faces, as recommended by geotechnical engineer.)

NOTE: Distances to bars shown are clear dimensions unless otherwise noted.

MATERIAL SPECIFICATIONS:

Concrete, Class "A" = 3500 psi
Steel Reinforcement = Grade 60



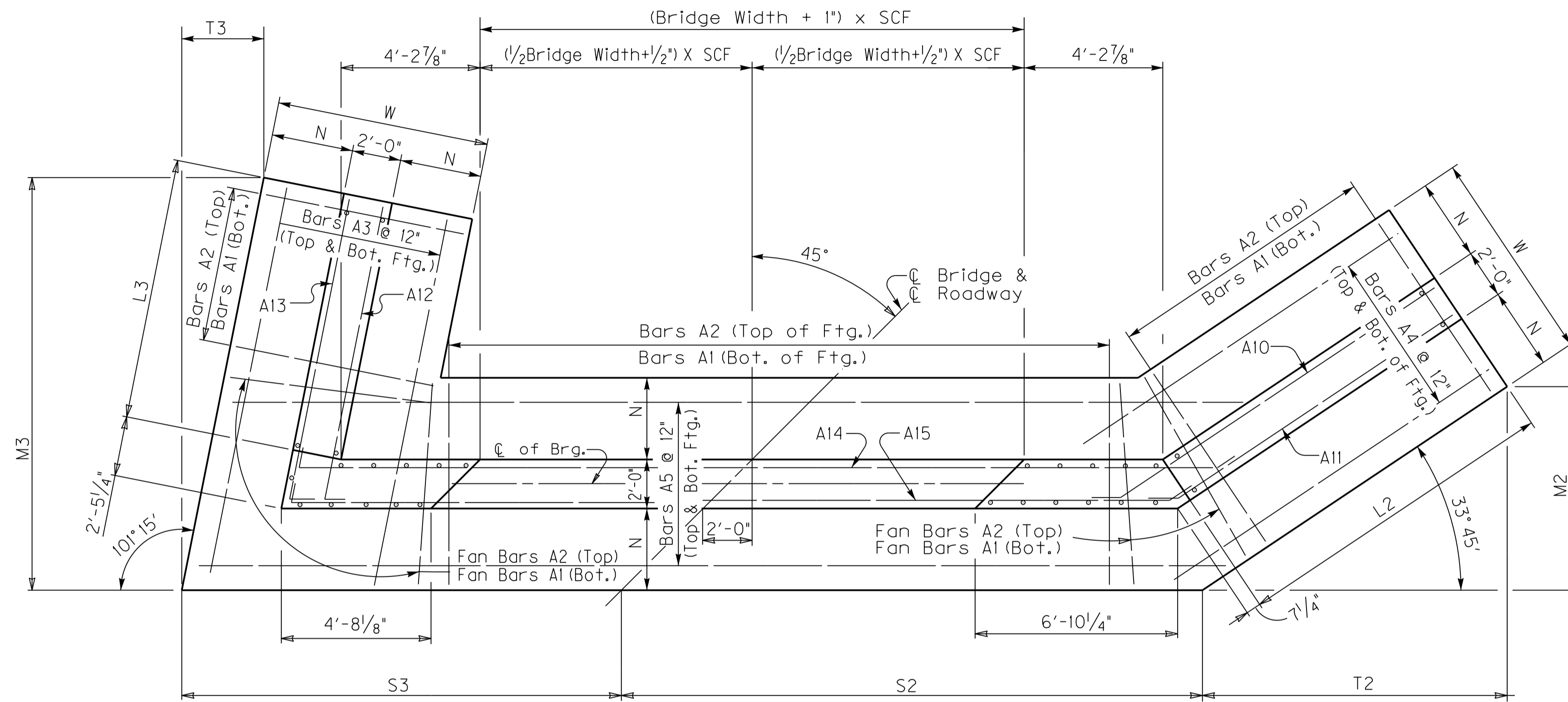
PLAN OF SUPERSTRUCTURE SLAB

ABUTMENT DETAILS

SKEW	WIDTH	DATE
40	VAR	October 2018

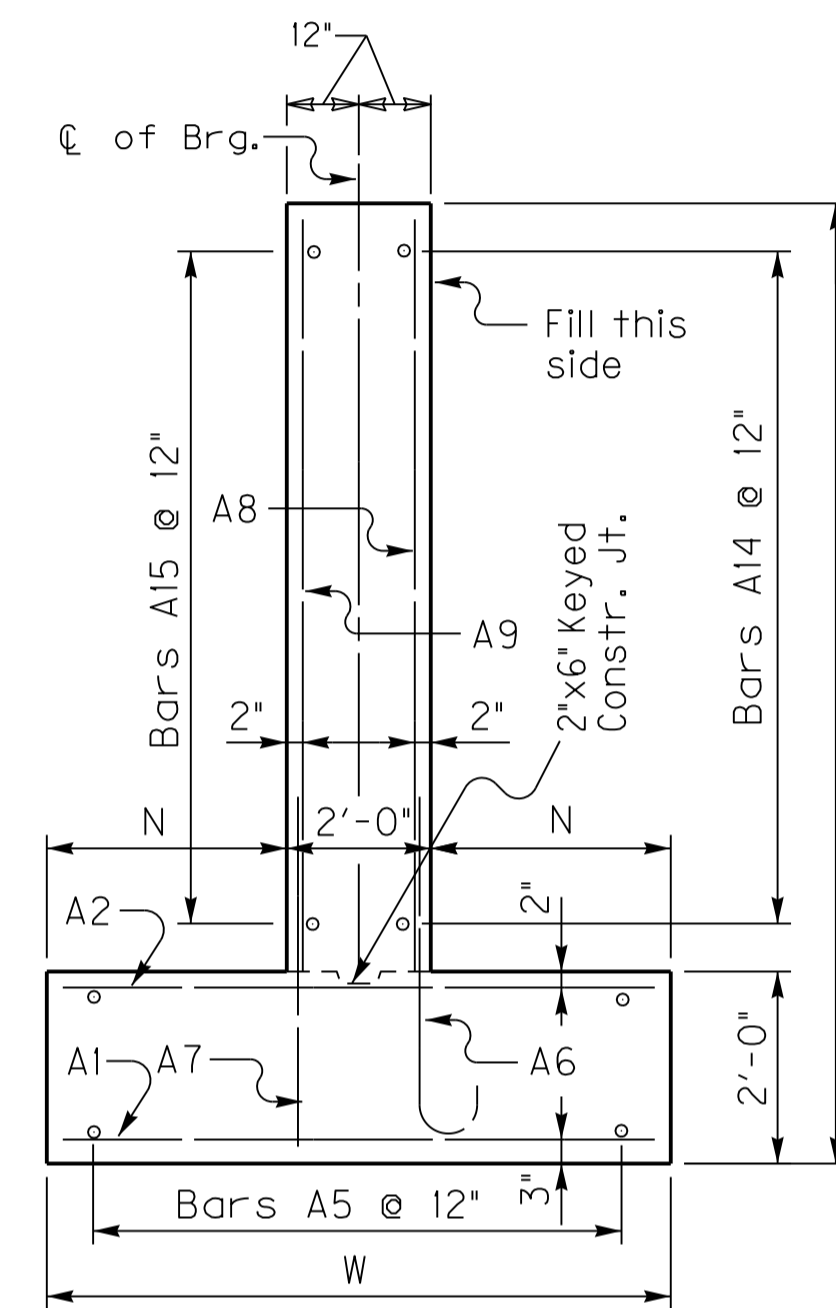
45° SKEW VARIABLE BRIDGE WIDTH 2:1 FILL SLOPES WINGS SKEWED 25% FROM ROADWAY TO BREASTWALL

ABUTMENT SKEW CORRECTION FACTOR (SCF) = 1.414



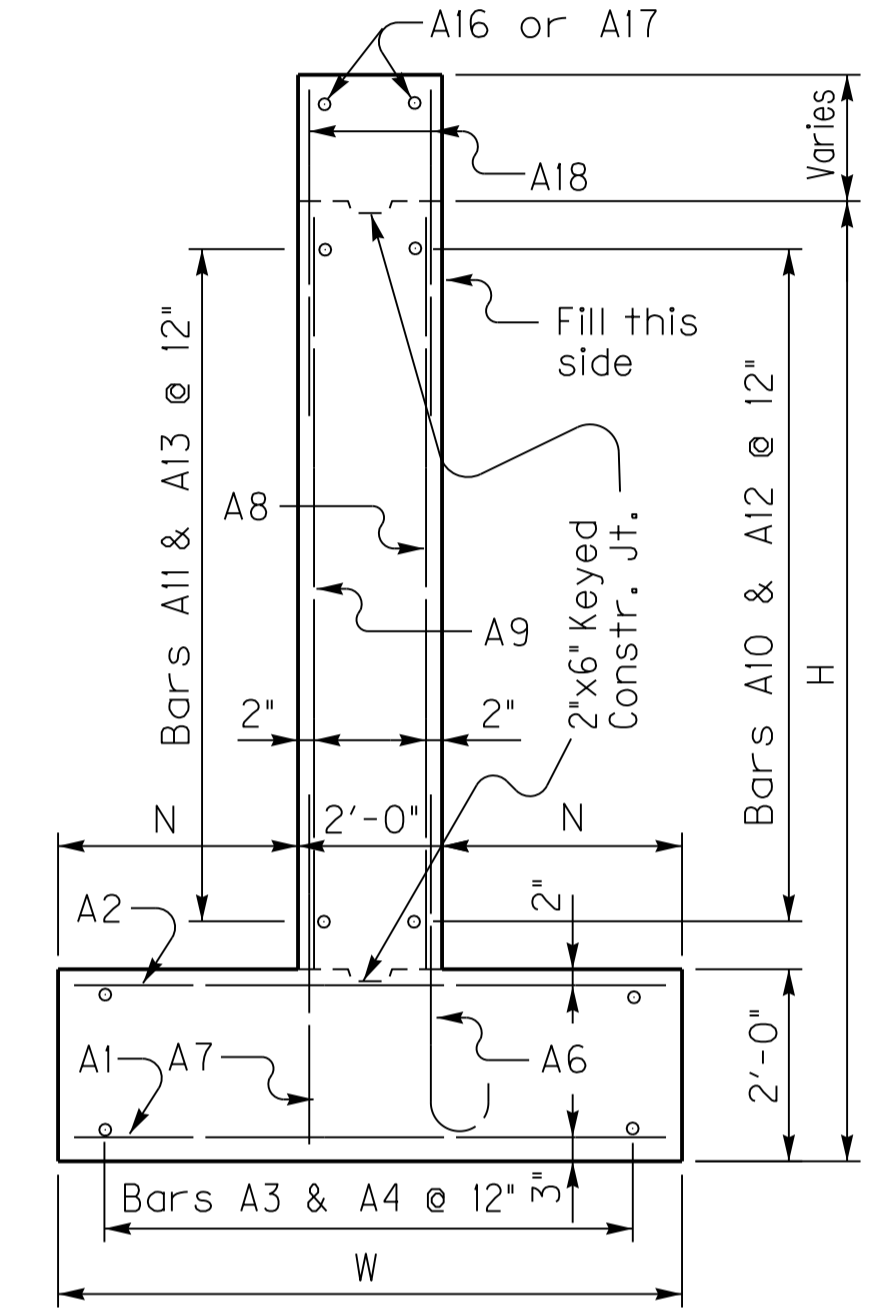
(Left Skew as shown; right skew opp. hand)

PLAN



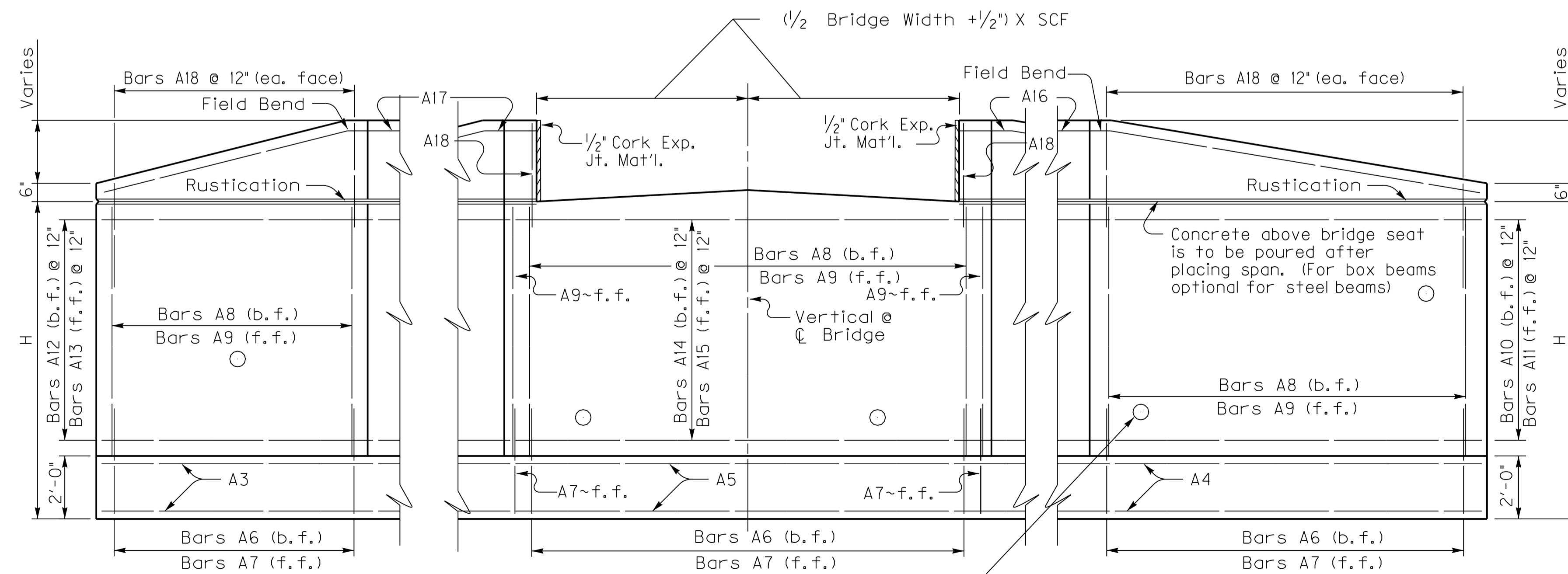
WALL SECTION

H = Low Bridge Seat. Slope seat for side by side box beams. Step cap as necessary for rolled steel beam superstructures to achieve a 2% cross slope on deck.



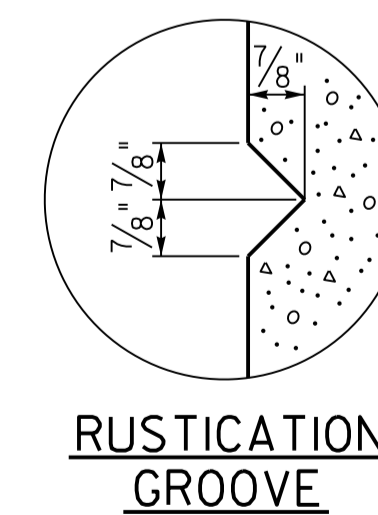
WING SECTION

Note: Trim A16 & A17 bars if necessary
Trim A3 bars as necessary

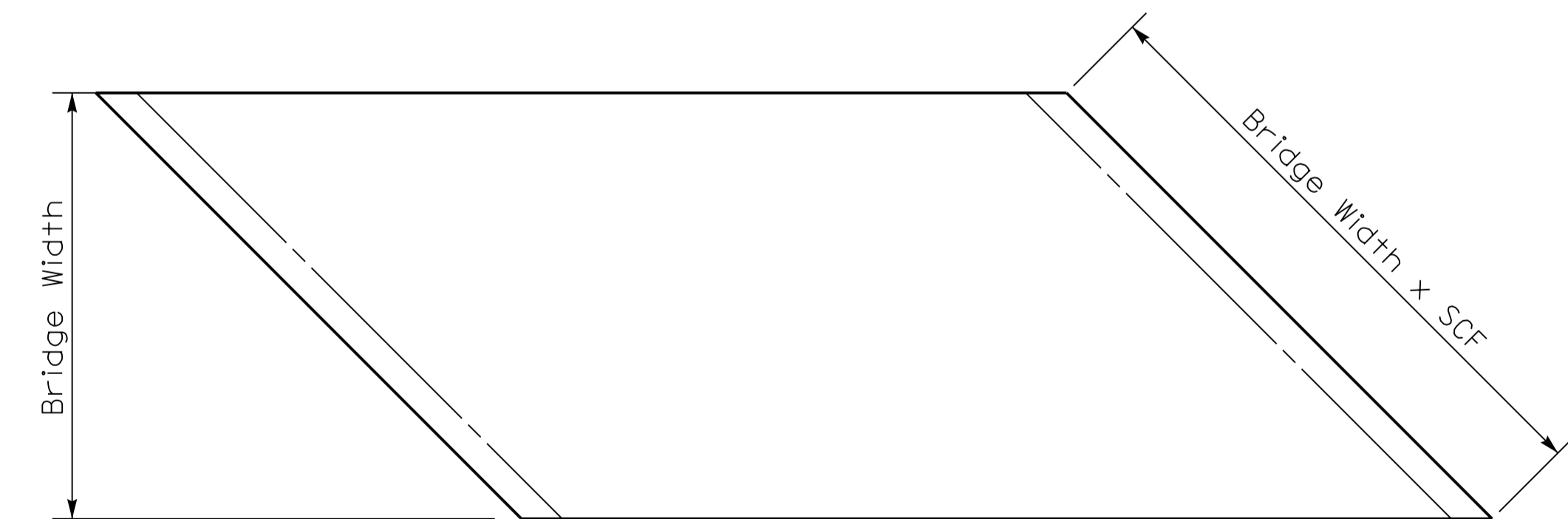


ELEVATION

Place 4\" weep hole drains at 8'-0\" centers at such elevation as to afford best drainage of backfill, in accordance with the Standard Specifications.



RUSTICATION GROOVE



PLAN OF SUPERSTRUCTURE SLAB

ABUTMENT DETAILS

SKEW	WIDTH	DATE
45	VAR	October 2018

45° SKEW VARIABLE BRIDGE WIDTH 2:1 FILL SLOPES WINGS SKEWED 25% FROM ROADWAY TO BREASTWALL

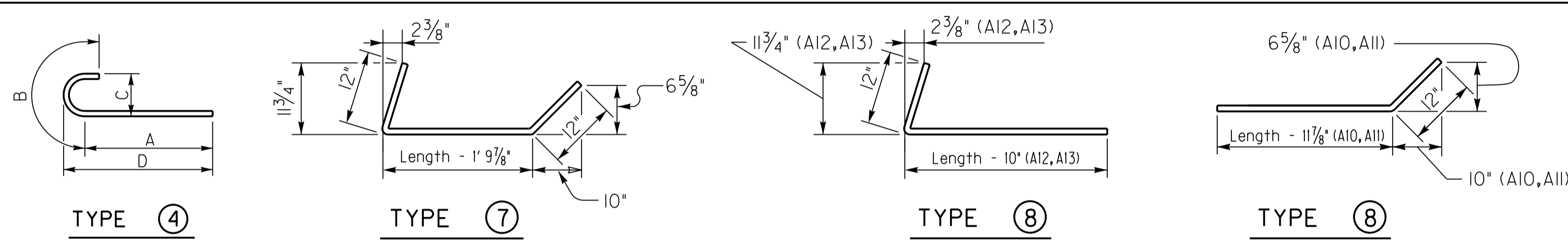
Bill of Reinforcement

MARK	A1		A2		A3	A4		A5		A6				A7		A8		A9		A10	A11	A12	A13	A14		A15		A16	A17	A18			
TYPE	Str.		Str.		Str.	Str.		Str.		4				Str.		Str.		Str.		8	8	8	8	7		7		Str.	Str.	Str.			
SIZE					#5	#5		#5										#5		#5	#5	#5	#5	#5		#5		#5	#5	#5			
H	No.	Size	Length ft., in.	Spacing	No.	Size	Length ft., in.	Spacing	No.	Length ft., in.	No.	Length ft., in.	No.	Length ft., in.	No.	Length ft., in.	No.	Length ft., in.	No.	Length ft., in.	No.	Length ft., in.	No.	Length ft., in.	No.	Length ft., in.	No.	Length ft., in.	No.	Length ft., in.			
15-16	88+Nb=	10 11 8 12	88+Nb=	7 11 8 12	24 26 1	24 41 4	24 18 9	+Lb=		66+Nb=	9 9 11 12	8 1/8 1 10 0	11 3/4 8 6		72+Nb=	5 4 11 12	66+Nb=	6 12 10 12	72+Nb=	12 10 12	14 42 6	14 40 5	14 20 6	14 21 1	14 15 0	+Lb=		14 13 1	+Lb=		2 46 4	2 25 0	144 5 9
13-14	79+Nb=	9 10 8 12	79+Nb=	7 10 8 12	22 22 6	22 36 3	22 18 0	+Lb=		58+Nb=	8 8 3 12	6 11 1 3 0	8 7 3		64+Nb=	5 4 11 12	58+Nb=	6 10 10 12	64+Nb=	10 10 12	12 37 7	12 35 5	12 17 6	12 18 1	12 15 0	+Lb=		12 13 1	+Lb=		2 41 4	2 22 0	128 5 9
11-12	70+Nb=	8 9 8 12	70+Nb=	6 9 8 12	20 19 11	20 31 1	20 17 2	+Lb=		51+Nb=	7 7 1 12	5 10 1/2 1 2 0	7 6 2		57+Nb=	5 4 11 12	51+Nb=	5 8 10 12	57+Nb=	8 10 12	10 32 7	10 30 5	10 15 6	10 16 1	10 15 0	+Lb=		10 13 1	+Lb=		2 36 4	2 20 0	114 5 9
9-10	59+Nb=	7 8 8 12	59+Nb=	5 8 8 12	18 16 3	18 24 11	18 16 5	+Lb=		42+Nb=	6 6 1 12	5 1 1 0 0	6 5 4		48+Nb=	5 4 11 12	42+Nb=	5 6 10 12	48+Nb=	6 10 12	8 26 7	8 24 5	8 12 6	8 13 1	8 15 1	+Lb=		8 13 1	+Lb=		2 30 4	2 17 0	96 5 9
7-8	50+Nb=	6 7 2 12	50+Nb=	5 7 2 12	16 13 5	16 19 4	16 15 5	+Lb=		35+Nb=	5 5 7 12	4 8 1/2 0 10 0	5 4 11		41+Nb=	5 4 11 12	35+Nb=	5 4 10 12	41+Nb=	4 10 12	6 21 7	6 19 5	6 10 6	6 11 1	6 15 1	+Lb=		6 13 1	+Lb=		2 25 4	2 15 0	82 5 9
5-6	42+Nb=	5 6 2 12	42+Nb=	5 6 2 12	14 10 10	14 14 2	14 14 8	+Lb=		28+Nb=	5 5 7 12	4 8 1/2 0 10 0	5 4 11		34+Nb=	5 4 11 12	28+Nb=	5 2 10 12	34+Nb=	2 10 12	4 16 7	4 14 5	4 8 6	4 9 1	4 15 1	+Lb=		4 13 1	+Lb=		2 20 4	2 13 0	68 5 9

Table of Dimensions

H	W		N		M2		M3		T2		T3		L2		L3		S2		S3	
	Length ft., in.	Length ft., in.	Length ft., in.	Length ft., in.	Length ft., in.	Length ft., in.	Length ft., in.	Length ft., in.	Length ft., in.	Length ft., in.	Length ft., in.	Length ft., in.	Length ft., in.	Length ft., in.	Length ft., in.	Length ft., in.	Length ft., in.	Length ft., in.	Length ft., in.	Length ft., in.
15-16	12 0	5 0	22 10 8	26 1/4	34 2 3/8	5 2 1/8	39	18	13 5 1/8	+0.5Lb=		5 10	+0.5Lb=							
13-14	11 0	4 6	19 11 7/8	22 5 3/4	29 10 7/8	4 5 5/8	34	15	12 9 1/4	+0.5Lb=		5 8 5/8	+0.5Lb=							
11-12	10 0	4 0	17 1 1/2	19 11	25 7 1/2	3 11 1/2	29	13	12 1 1/2	+0.5Lb=		5 7 3/8	+0.5Lb=							
9-10	9 0	3 6	13 8 1/2	16 4 5/8	20 6 1/8	3 3 1/8	23	10	11 5 5/8	+0.5Lb=		5 6	+0.5Lb=							
7-8	7 6	2 9	10 9 5/8	13 6 1/4	16 2	2 8 1/4	18	8	10 5 7/8	+0.5Lb=		5 4 1/8	+0.5Lb=							
5-6	6 6	2 3	7 11 1/4	10 11 5/8	11 10 5/8	2 2 1/8	13	6	9 10 1/8	+0.5Lb=		5 2 3/4	+0.5Lb=							

Reinforcement Details



Quantities

H	Concrete*		Reinforcement	
	C.Y.	LBS.	C.Y.	LBS.
5	25.56+(0.71xLb) =	2445+(52.8xLb) =		
6	27.83+(0.78xLb) =	2445+(52.8xLb) =		
7	39.56+(0.93xLb) =	3668+(68.7xLb) =		
8	42.35+(1.01xLb) =	3668+(68.7xLb) =		
9	58.33+(1.19xLb) =	5496+(91xLb) =		
10	61.64+(1.27xLb) =	5496+(91xLb) =		
11	81.84+(1.41xLb) =	8376+(120.4xLb) =		
12	85.81+(1.49xLb) =	8376+(120.4xLb) =		
13	105.88+(1.64xLb) =	12251+(161xLb) =		
14	110.37+(1.71xLb) =	12251+(161xLb) =		
15	134.98+(1.86xLb) =	16645+(198.6xLb) =		
16	140.07+(1.93xLb) =	16645+(198.6xLb) =		

ABUTMENT SKEW CORRECTION FACTOR (SCF) = 1.414

NUMBER OF BARS TO ADD (Nb) = Bridge Width (feet) x SCF (round up to nearest whole number)

LENGTH OF ABUTMENT TO ADD (Lb) = Bridge Width (feet) x SCF (convert decimal to architectural)

(round up to nearest whole number)

(convert decimal to architectural)

*Concrete quantities computed using 21" beam depth on 1/2" pad & Variable Bridge Width

GENERAL NOTES

SPECIFICATIONS: Construct abutments according to the current edition of the Kentucky Department of Highways Standard Specifications for Road and Bridge Construction. Abutments are designed for side by side box beams as detailed in Standard Drawings BDP-001 through BDP-012, current edition. Dimensions may be adjusted to allow for any out to out bridge width. Abutments are also adequate for Std. Dwg. slabs or steel beam superstructures

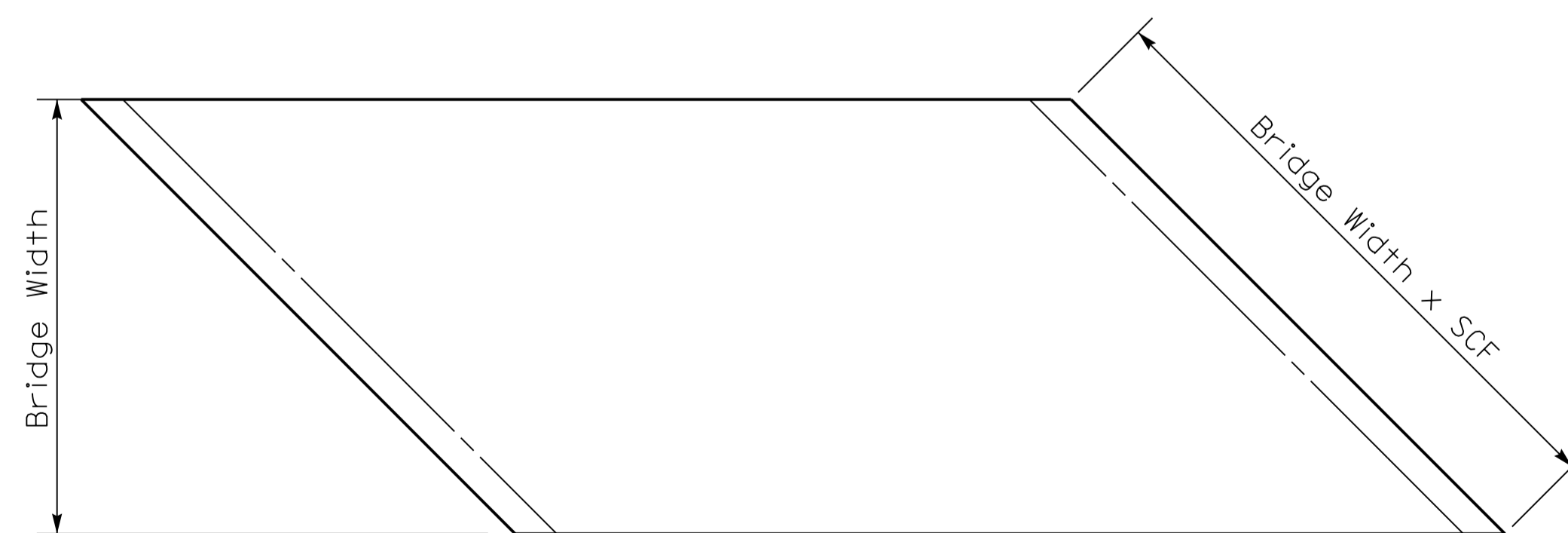
FOUNDATION PRESSURE: Construct abutment footings on solid rock bearing material that can support a pressure of 8000 psf service or 10,800 psf strength factored, as recommended by a geotechnical engineer.

WING LENGTHS: Calculated assuming 21" superstructure depth and stream bank elevation at top of footing.

FOOTING ELEVATION: Construct bottom of footing below the anticipated scour elevation. (This typically entails embedding the footings 1'-0" to 2'-0" into rock and pouring concrete directly against cut rock faces, as recommended by geotechnical engineer.)

NOTE: Distances to bars shown are clear dimensions unless otherwise noted.

MATERIAL SPECIFICATIONS:
 Concrete, Class "A" = 3500 psi
 Steel Reinforcement = Grade 60



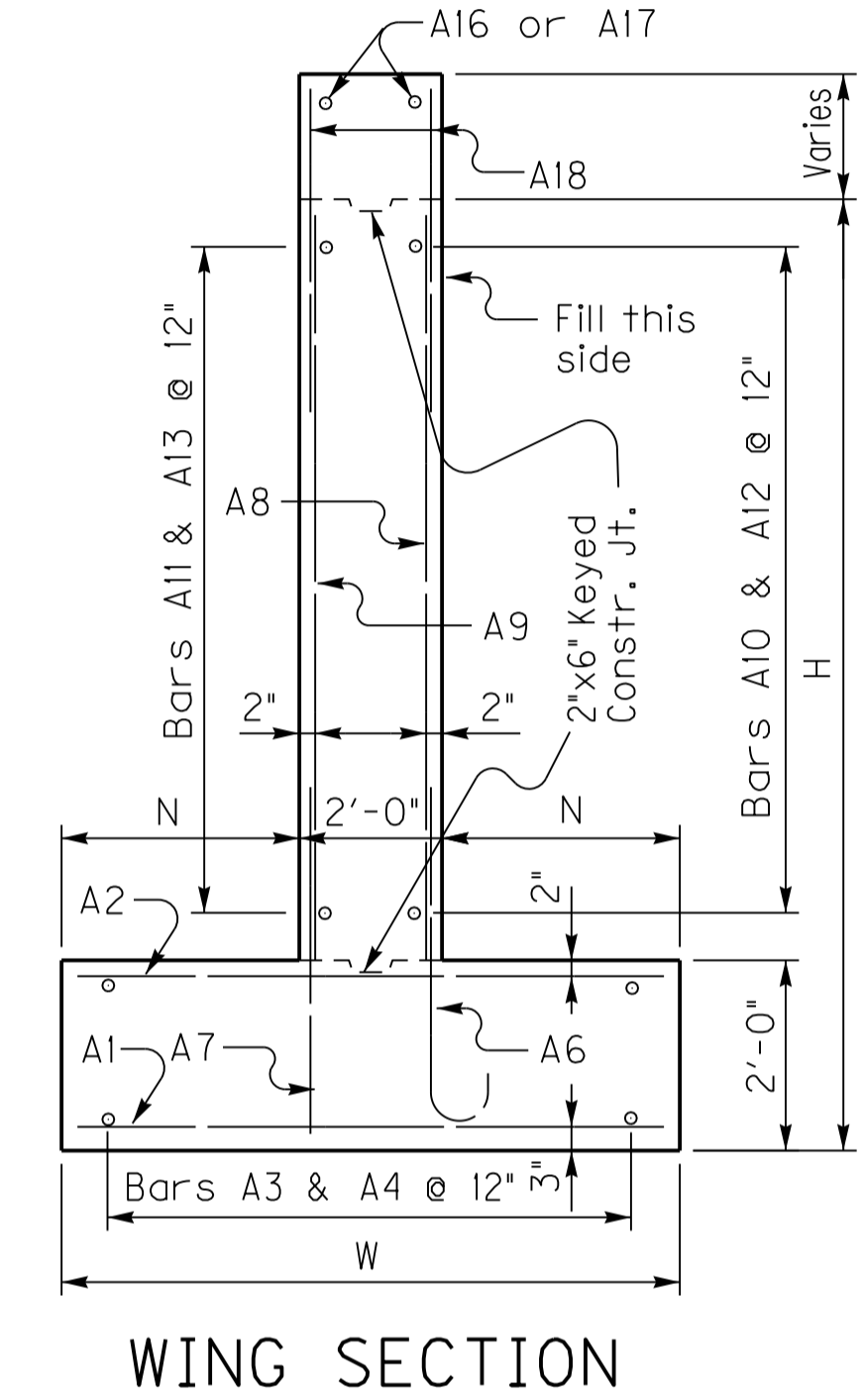
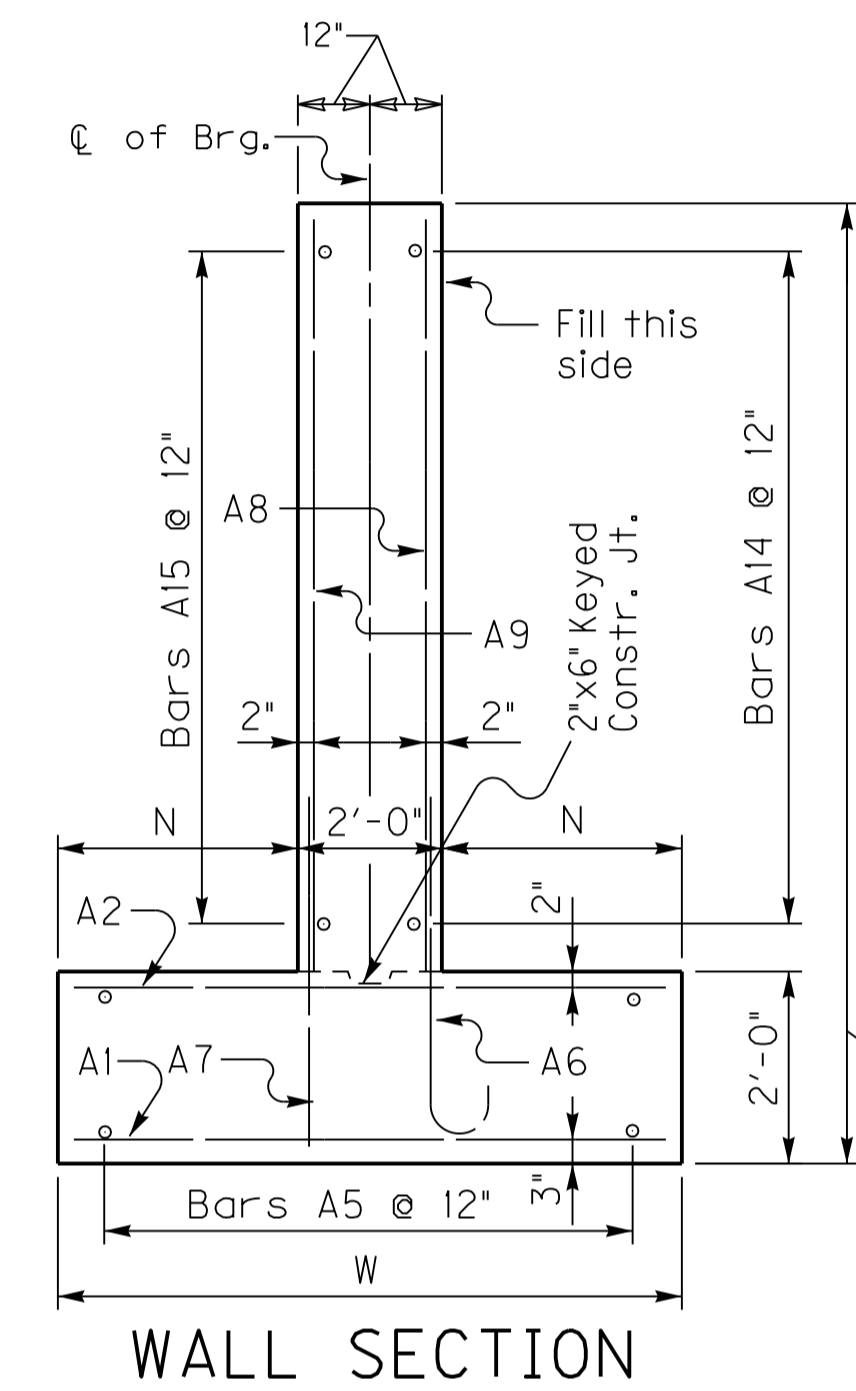
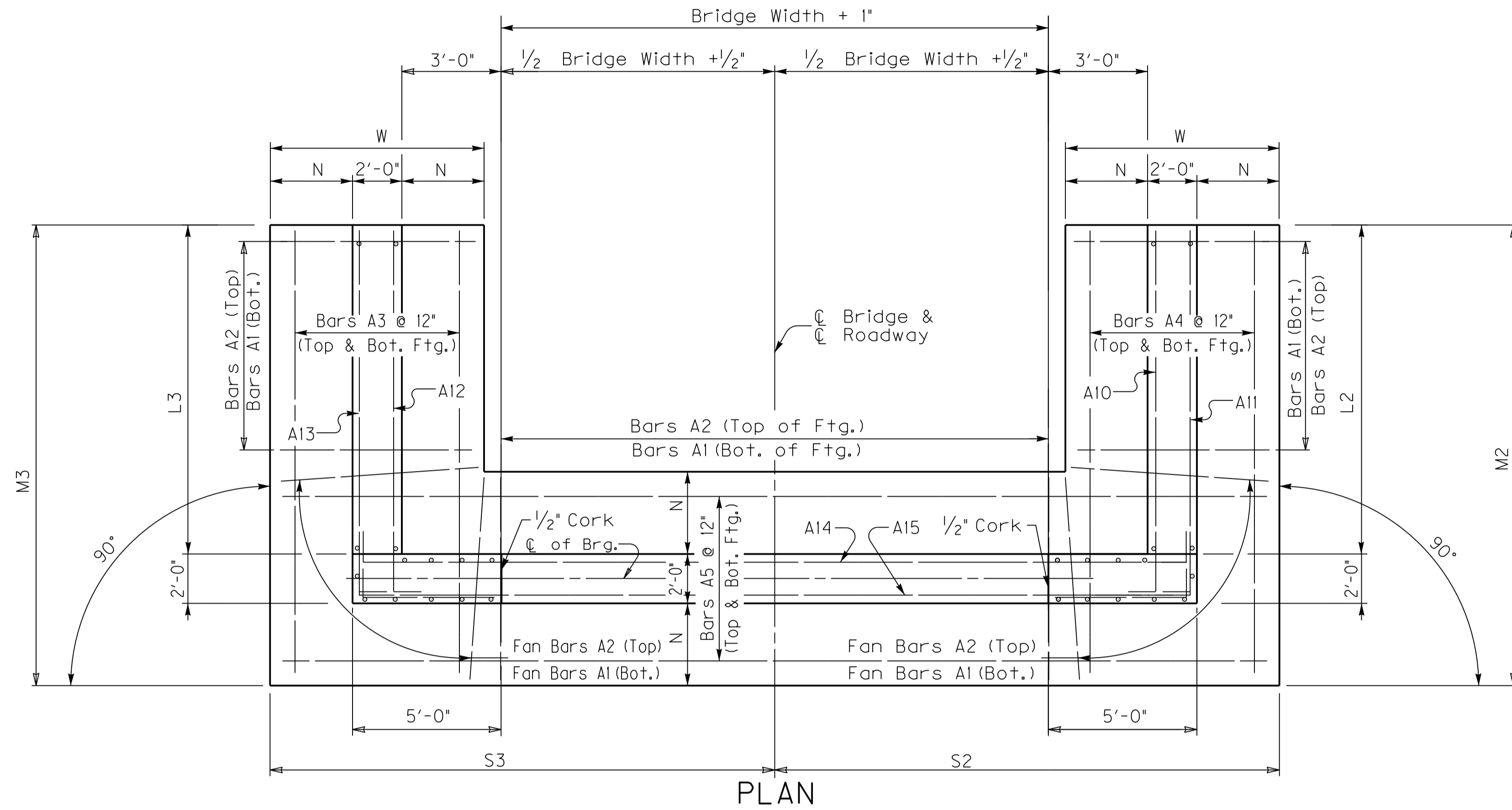
PLAN OF SUPERSTRUCTURE SLAB

ABUTMENT DETAILS

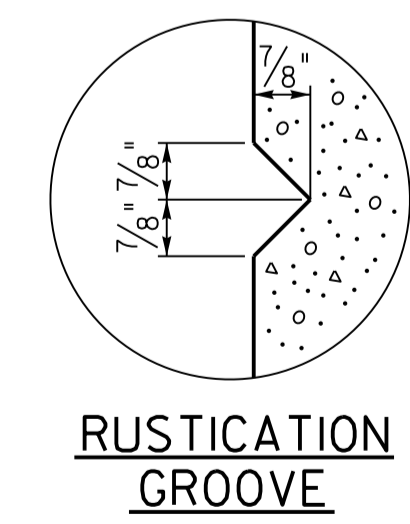
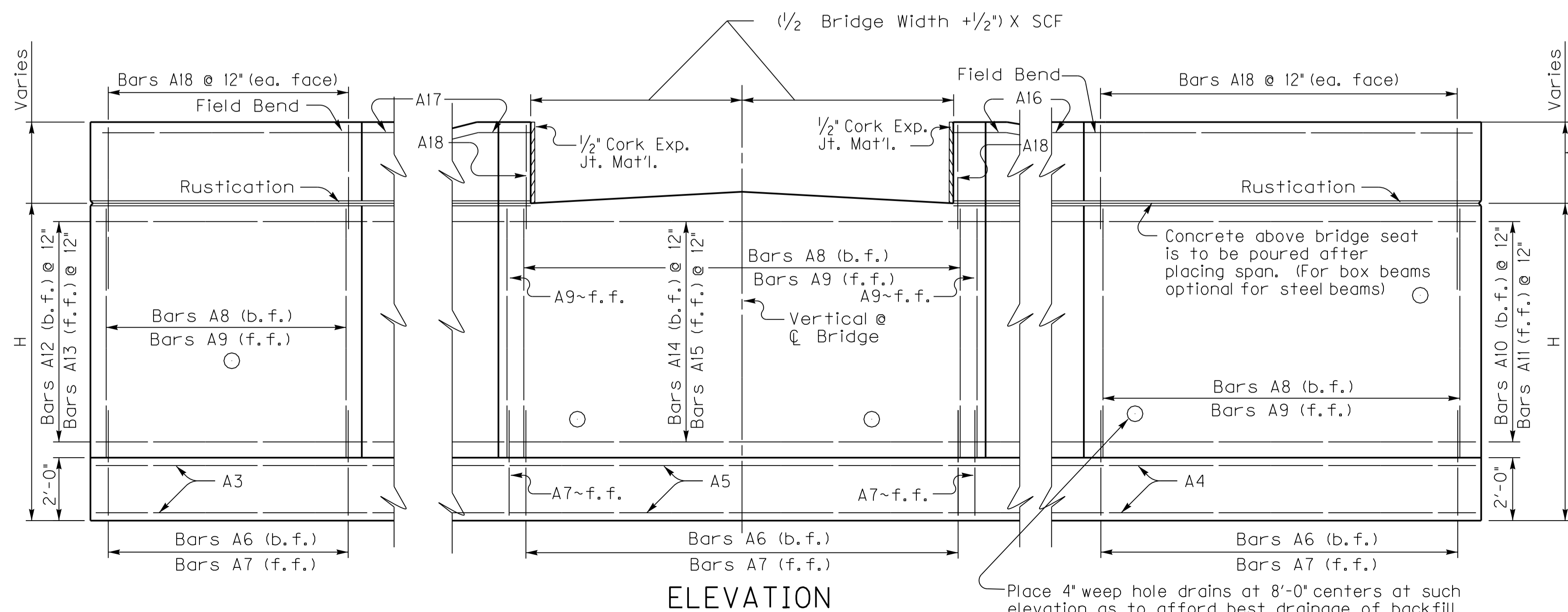
SKEW	WIDTH	DATE
45	VAR	October 2018

0° SKEW VARIABLE BRIDGE WIDTH 2:1 FILL SLOPES WINGS PARALLEL TO ROADWAY

ABUTMENT SKEW CORRECTION FACTOR (SCF) = 1.000



Note: Trim A16 & A17 bars if necessary



PLAN OF SUPERSTRUCTURE SLAB

ABUTMENT DETAILS		
SKEW	WIDTH	DATE
0	VAR	October 2018

0° SKEW VARIABLE BRIDGE WIDTH 2:1 FILL SLOPES WINGS PARALLEL TO ROADWAY

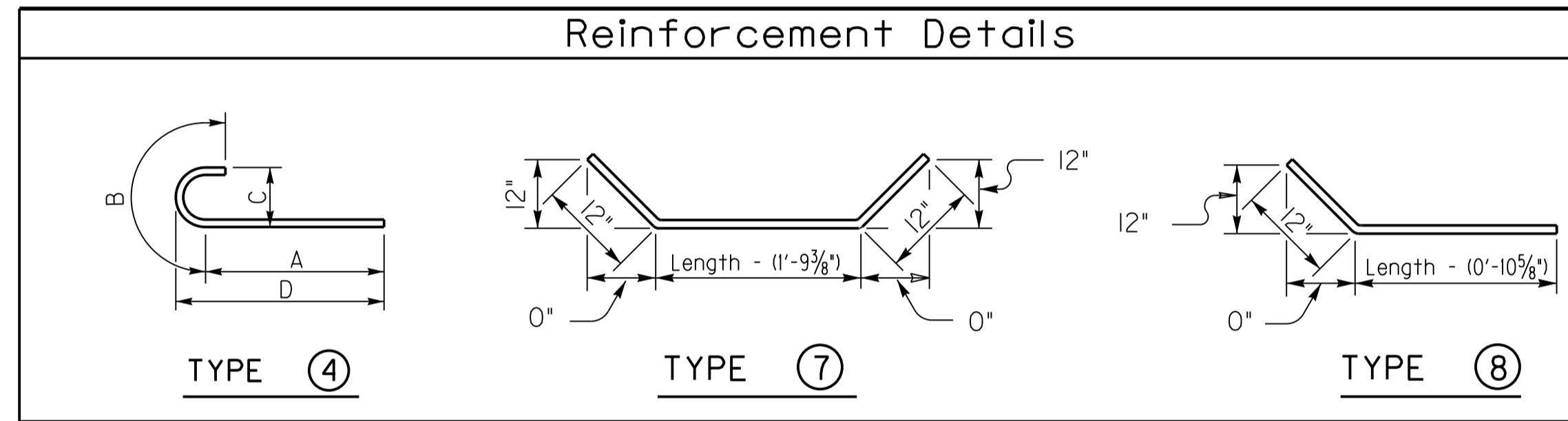
Bill of Reinforcement

MARK	A1		A2		A3	A4		A5		A6				A7		A8		A9	A10	A11	A12	A13	A14		A15		A16	A17	A18																																																			
TYPE	Str.		Str.		Str.	Str.		Str.		4				Str.		Str.		Str.	8	8	8	8	7		7		Str.	Str.	Str.																																																			
SIZE	#5		#5		#5	#5		#5		#5				#5		#5		#5	#5	#5	#5	#5	#5		#5		#5	#5	#5																																																			
H	No.	Size	Length	Spacing	No.	Size	Length	Spacing	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length																																																				
			ft.	in.			ft.	in.		ft.		ft.		ft.		ft.		ft.		ft.		ft.		ft.		ft.		ft.																																																				
15-16	91+Nb=	10	11	8	12	91+Nb=	7	11	8	12	24	34	8	24	34	8	24	19	9	+Lb=		63+Nb=	9	9	11	12	8	1/8	1	10	0	11	3/4	8	6	71+Nb=	5	4	11	12	63+Nb=	6	12	10	12	71+Nb=	12	10	12	14	30	6	14	30	8	14	30	6	14	30	8	14	11	5	+Lb=		14	11	5	+Lb=		2	34	11	2	34	11	137	5	9
13-14	83+Nb=	9	10	8	12	83+Nb=	7	10	8	12	22	31	2	22	31	2	22	18	9	+Lb=		57+Nb=	8	8	3	12	6	11	1	3	0	8	7	3	65+Nb=	5	4	11	12	57+Nb=	6	10	10	12	65+Nb=	10	10	12	12	27	6	12	27	8	12	27	6	12	27	8	12	11	5	+Lb=		2	31	11	2	31	11	125	5	9						
11-12	73+Nb=	8	9	8	12	73+Nb=	6	9	8	12	20	26	8	20	26	8	20	17	9	+Lb=		49+Nb=	7	7	1	12	5	10	1/2	1	2	0	7	6	2	57+Nb=	5	4	11	12	49+Nb=	5	8	10	12	57+Nb=	8	10	12	10	23	6	10	23	8	10	23	6	10	11	5	+Lb=		2	27	11	2	27	11	110	5	9								
9-10	63+Nb=	7	8	8	12	63+Nb=	5	8	8	12	18	22	2	18	22	2	18	16	9	+Lb=		41+Nb=	6	6	1	12	5	1	1	0	0	6	5	4	49+Nb=	5	4	11	12	41+Nb=	5	6	10	12	49+Nb=	6	10	12	8	19	6	8	19	8	8	19	6	8	19	8	8	11	5	+Lb=		8	11	5	+Lb=		2	23	11	2	23	11	94	5	9	
7-8	50+Nb=	6	7	2	12	50+Nb=	5	7	2	12	16	16	5	16	16	5	16	15	3	+Lb=		31+Nb=	5	5	7	12	4	8	1/2	0	10	0	5	4	11	39+Nb=	5	4	11	12	31+Nb=	5	4	10	12	39+Nb=	4	10	12	6	14	6	6	14	8	6	14	8	6	11	5	+Lb=		6	11	5	+Lb=		2	18	11	2	18	11	74	5	9			
5-6	42+Nb=	5	6	2	12	42+Nb=	5	6	2	12	14	12	11	14	12	11	14	14	3	+Lb=		25+Nb=	5	5	7	12	4	8	1/2	0	10	0	5	4	11	33+Nb=	5	4	11	12	25+Nb=	5	2	10	12	33+Nb=	2	10	12	4	11	6	4	11	8	4	11	6	4	11	8	4	11	5	+Lb=		4	11	5	+Lb=		2	15	11	2	15	11	62	5	9

Table of Dimensions

H	W	N	M2	M3	T2	T3	L2	L3	S2		S3												
	Length	Length	Length	Length	Length	Length	Length	Length	Length	+Lb/2 =	Length	Length	+Lb/2 =	Length									
	ft.	in.	ft.	in.	ft.	in.	ft.	in.	ft.	in.	ft.	in.	ft.	in.									
15-16	12	0	5	0	35	0	35	0	0	0	0	0	10	1/2	+0.5Lb=		10	1/2	+0.5Lb=				
13-14	11	0	4	6	31	6	31	6	0	0	0	0	25	25	9	6 1/2	+0.5Lb=		9	6 1/2	+0.5Lb=		
11-12	10	0	4	0	27	0	27	0	0	0	0	0	21	21	9	1/2	+0.5Lb=		9	1/2	+0.5Lb=		
9-10	9	0	3	6	22	6	22	6	0	0	0	0	17	17	8	6 1/2	+0.5Lb=		8	6 1/2	+0.5Lb=		
7-8	7	6	2	9	16	9	16	9	0	0	0	0	12	12	7	9 1/2	+0.5Lb=		7	9 1/2	+0.5Lb=		
5-6	6	6	2	3	13	3	13	3	0	0	0	0	9	9	7	3 1/2	+0.5Lb=		7	3 1/2	+0.5Lb=		

Reinforcement Details



*Concrete quantities computed using 21' beam depth on 1/2' pad & Variable Bridge Width

Quantities

H	Concrete*		Reinforcement	
	C.Y.		LBS.	
5	24.52+(0.71xLb) =		2346+(52.8xLb) =	
6	26.6+(0.78xLb) =		2346+(52.8xLb) =	
7	37.32+(0.93xLb) =		3489+(68.7xLb) =	
8	39.84+(1.01xLb) =		3489+(68.7xLb) =	
9	59.68+(1.19xLb) =		5624+(91xLb) =	
10	62.94+(1.27xLb) =		5624+(91xLb) =	
11	82.06+(1.41xLb) =		8428+(120.4xLb) =	
12	85.92+(1.49xLb) =		8428+(120.4xLb) =	
13	108.01+(1.64xLb) =		12499+(161xLb) =	
14	112.46+(1.71xLb) =		12499+(161xLb) =	
15	133.47+(1.86xLb) =		16606+(198.6xLb) =	
16	138.37+(1.93xLb) =		16606+(198.6xLb) =	

ABUTMENT SKEW CORRECTION FACTOR (SCF) = 1.0

NUMBER OF BARS TO ADD (Nb) = Bridge Width (feet) x SCF

(round up to nearest whole number)

LENGTH OF ABUTMENT TO ADD (Lb) = Bridge Width (feet) x SCF

(convert decimal to architectural)

GENERAL NOTES

SPECIFICATIONS: Construct abutments according to the current edition of the Kentucky Department of Highways Standard Specifications for Road and Bridge Construction. Abutments are designed for side by side box beams as detailed in Standard Drawings BDP-001 through BDP-012, current edition. Dimensions may be adjusted to allow for any out to out bridge width. Abutments are also adequate for Std. Dwg. slabs or steel beam superstructures

FOUNDATION PRESSURE: Construct abutment footings on solid rock bearing material that can support a pressure of 8000 psf service or 10,800 psf strength factored, as recommended by a geotechnical engineer.

WING LENGTHS: Calculated assuming 21' superstructure depth and stream bank elevation at top of footing.

FOOTING ELEVATION: Construct bottom of footing below the anticipated scour elevation. (This typically entails embedding the footings 1'-0" to 2'-0" into rock and pouring concrete directly against cut rock faces, as recommended by geotechnical engineer.)

NOTE: Distances to bars shown are clear dimensions unless otherwise noted.

MATERIAL SPECIFICATIONS:
 Concrete, Class "A" = 3500 psi
 Steel Reinforcement = Grade 60



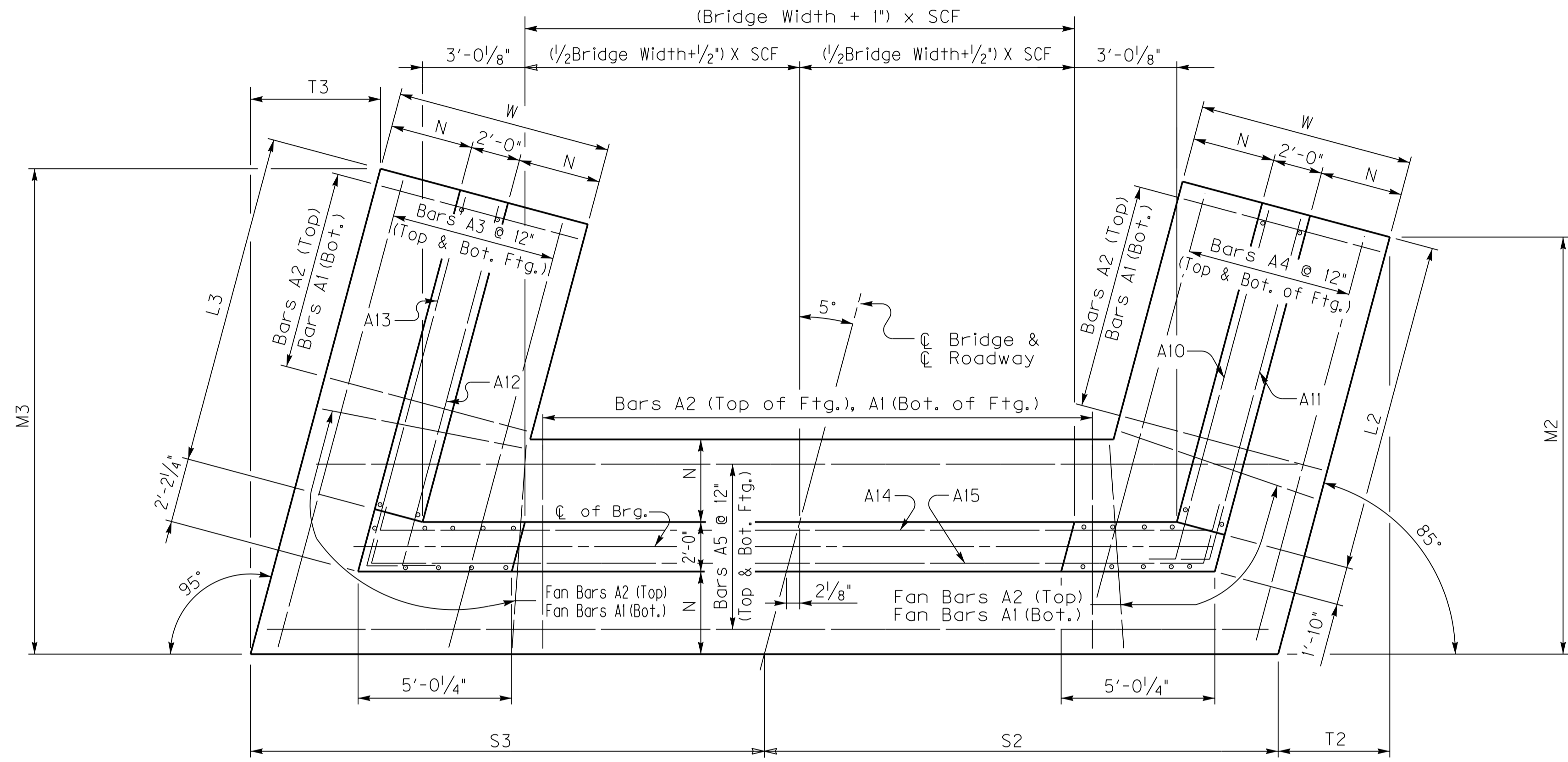
PLAN OF SUPERSTRUCTURE SLAB

ABUTMENT DETAILS

SKEW	WIDTH	DATE
0	VAR	October 2018

5° SKEW VARIABLE BRIDGE WIDTH 2:1 FILL SLOPES WINGS PARALLEL TO ROADWAY

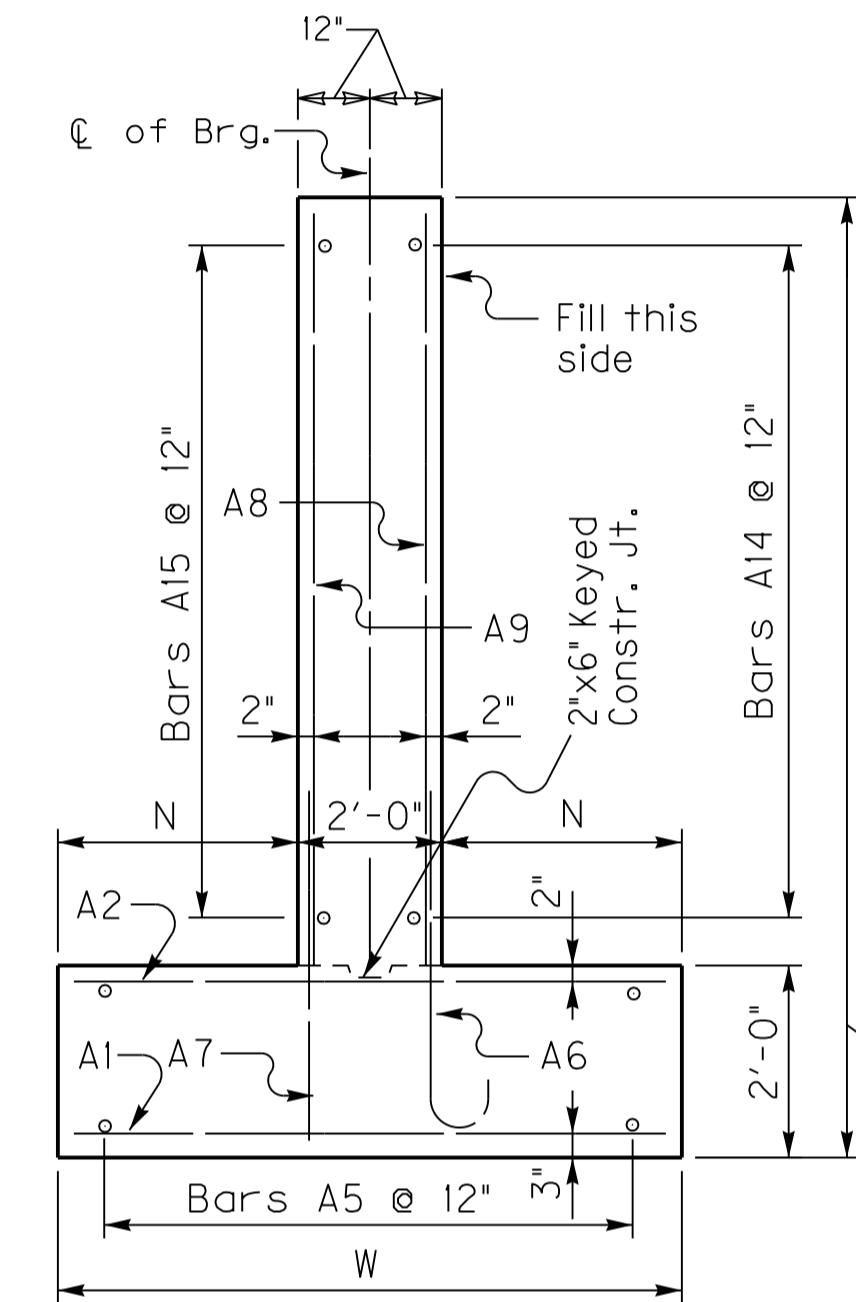
ABUTMENT SKEW CORRECTION FACTOR (SCF) = 1.004



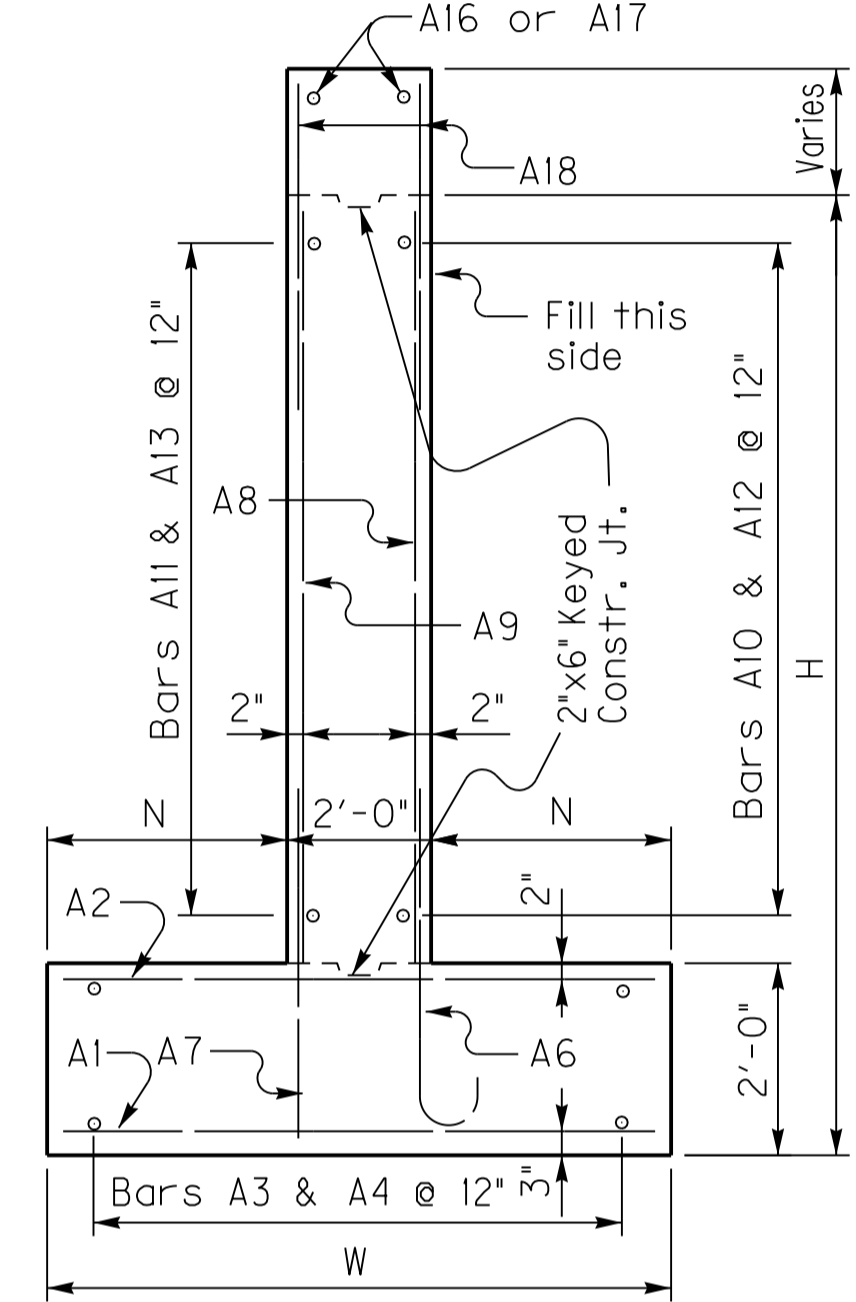
(Left Skew as shown; right skew opp. hand)

PLAN

Note: Trim A16 & A17 bars if necessary
Trim A3 bars as necessary

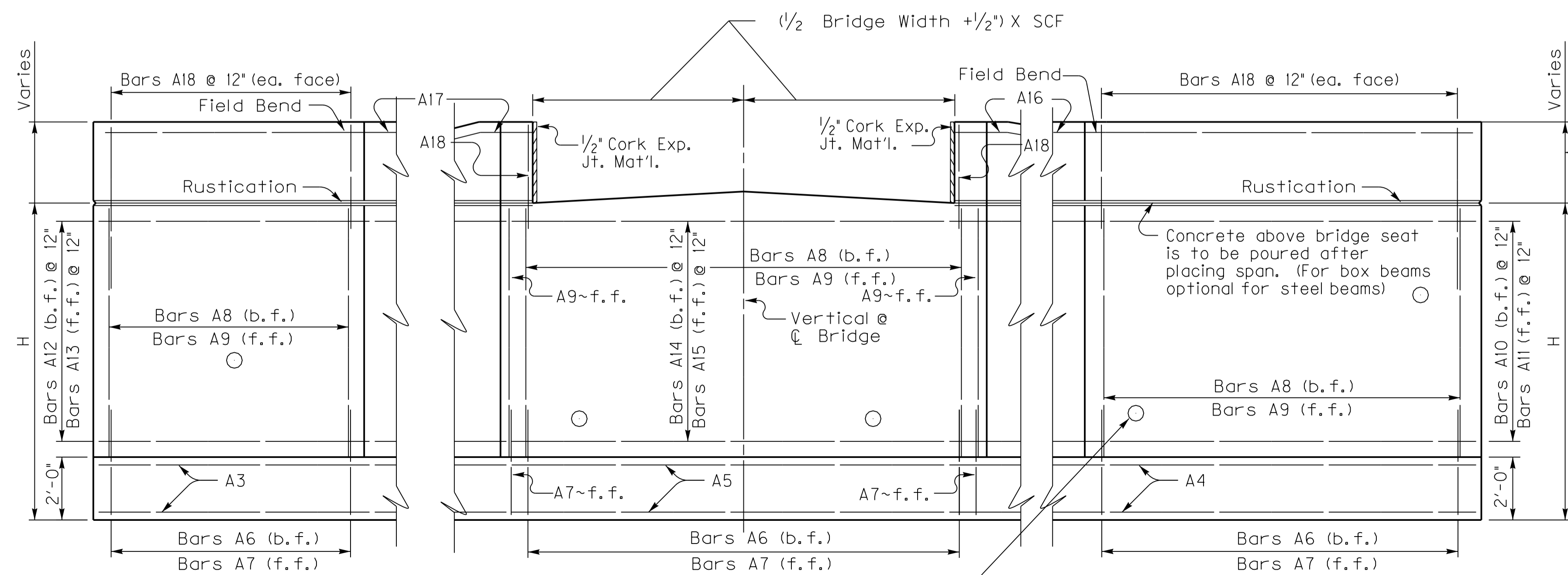


WALL SECTION

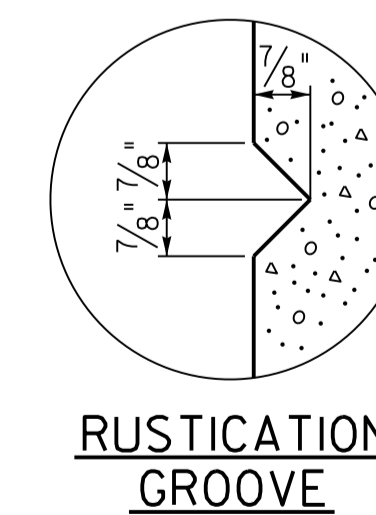


WING SECTION

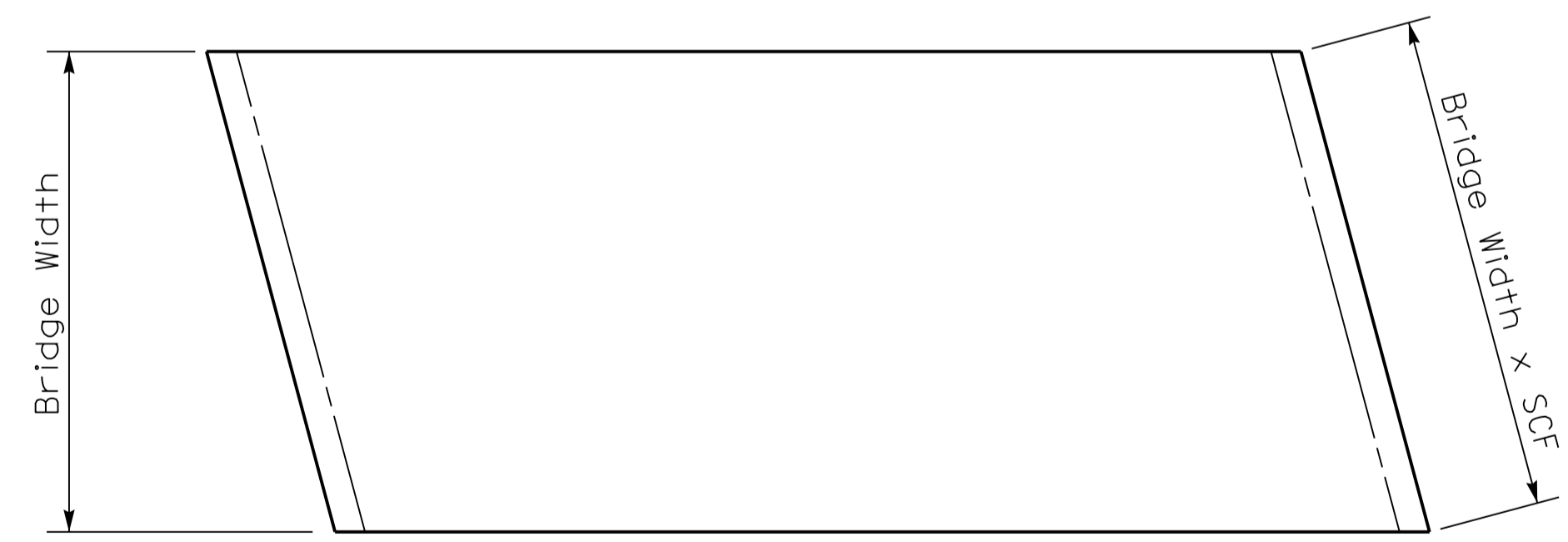
H = Low Bridge Seat. Slope seat for side by side box beams. Step cap as necessary for rolled steel beam superstructures to achieve a 2% cross slope on deck.



ELEVATION



RUSTICATION GROOVE



PLAN OF SUPERSTRUCTURE SLAB

Place 4" weep hole drains at 8'-0" centers at such elevation as to afford best drainage of backfill, in accordance with the Standard Specifications.

ABUTMENT DETAILS

SKEW	WIDTH	DATE
5	VAR	October 2018

5° SKEW VARIABLE BRIDGE WIDTH 2:1 FILL SLOPES WINGS PARALLEL TO ROADWAY

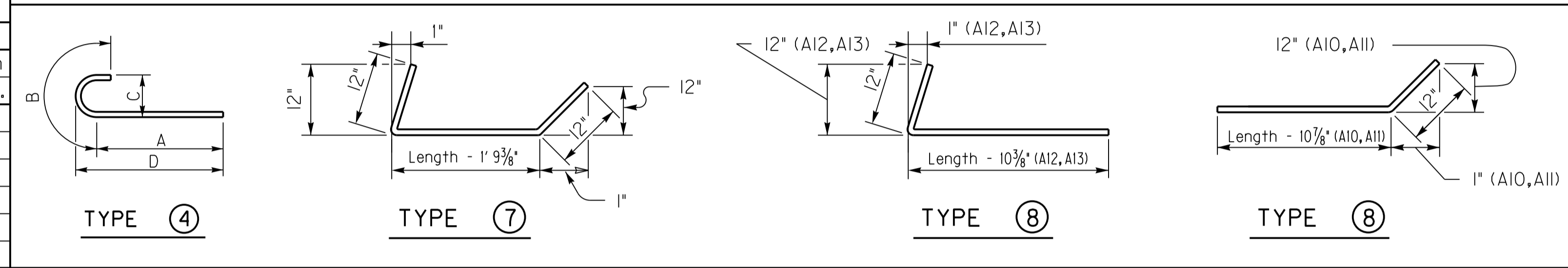
Bill of Reinforcement

MARK	A1		A2		A3	A4		A5		A6				A7		A8		A9	A10	A11	A12	A13	A14		A15		A16	A17	A18		
TYPE	Str.		Str.		Str.	Str.		Str.		4				Str.		Str.		Str.	8	8	8	8	7		7		Str.	Str.	Str.		
SIZE	#5		#5		#5	#5		#5		#5				#5		#5		#5	#5	#5	#5	#5	#5		#5		#5	#5	#5		
H	No.	Size	Length	Spacing	No.	Size	Length	Spacing	No.	Length	"	Length	"	No.	Size	Length	Spacing	No.	Size	Length	Spacing	No.	Length	"	Length	"	No.	Length	"		
15-16	93+Nb=	10 11 8 12	93+Nb=	7 11 8 12	24 36 3	24 35 1	24 19 9	+Lb=	65+Nb=	9 9 11 12	8 1/8	1 10 0	11 3/4	8 6	73+Nb=	5 4 11 12	65+Nb=	6 12 10 12	73+Nb=	12 10 12	14 31 6	14 31 6	14 31 5	14 31 10	14 11 5	+Lb=	14 11 5	+Lb=	2 35 9	2 36 1	141 5 9
13-14	83+Nb=	9 10 8 12	83+Nb=	7 10 8 12	22 31 9	22 30 8	22 18 9	+Lb=	57+Nb=	8 8 3 12	6 11 1 3 0	8 7 3	65+Nb=	5 4 11 12	57+Nb=	6 10 10 12	65+Nb=	10 10 12	65+Nb=	12 10 12	12 27 6	12 27 6	12 27 5	12 27 10	12 11 5	+Lb=	12 11 5	+Lb=	2 31 9	2 32 1	125 5 9
11-12	73+Nb=	8 9 8 12	73+Nb=	6 9 8 12	20 27 2	20 26 2	20 17 9	+Lb=	49+Nb=	7 7 1 12	5 10 1/2	1 2 0	7 6 2	57+Nb=	5 4 11 12	49+Nb=	5 8 10 12	57+Nb=	8 10 12	10 23 6	10 23 6	10 23 5	10 23 10	10 11 5	+Lb=	10 11 5	+Lb=	2 27 9	2 28 1	109 5 9	
9-10	63+Nb=	7 8 8 12	63+Nb=	5 8 8 12	18 22 8	18 21 9	18 16 9	+Lb=	41+Nb=	6 6 1 12	5 1 1 0 0	6 5 4	49+Nb=	5 4 11 12	41+Nb=	5 6 10 12	49+Nb=	6 10 12	49+Nb=	8 19 6	8 19 6	8 19 5	8 19 10	8 11 5	+Lb=	8 11 5	+Lb=	2 23 9	2 24 1	93 5 9	
7-8	50+Nb=	6 7 2 12	50+Nb=	5 7 2 12	16 16 10	16 16 0	16 15 3	+Lb=	31+Nb=	5 5 7 12	4 8 1/2	0 10 0	5 4 11	39+Nb=	5 4 11 12	31+Nb=	5 4 10 12	39+Nb=	4 10 12	6 14 6	6 14 6	6 14 5	6 14 10	6 11 5	+Lb=	6 11 5	+Lb=	2 18 9	2 19 1	73 5 9	
5-6	42+Nb=	5 6 2 12	42+Nb=	5 6 2 12	14 13 3	14 12 7	14 14 3	+Lb=	25+Nb=	5 5 7 12	4 8 1/2	0 10 0	5 4 11	33+Nb=	5 4 11 12	25+Nb=	5 2 10 12	33+Nb=	2 10 12	4 11 6	4 11 6	4 11 5	4 11 10	4 11 5	+Lb=	4 11 5	+Lb=	2 15 9	2 16 1	61 5 9	

Table of Dimensions

H	W	N	M2	M3	T2	T3	L2	L3	S2		S3	
Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	+Lb/2 =	Length	Length
ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.
15-16	12 0	5 0	35 3/8	36 6	3 1	3 2 3/8	29	29	10 1	+0.5Lb=	10 1	+0.5Lb=
13-14	11 0	4 6	30 10	31 11 5/8	2 8 3/8	2 9 5/8	25	25	9 6 7/8	+0.5Lb=	9 6 7/8	+0.5Lb=
11-12	10 0	4 0	26 4 3/4	27 5 3/8	2 3 3/4	2 4 3/4	21	21	9 7/8	+0.5Lb=	9 7/8	+0.5Lb=
9-10	9 0	3 6	21 11 1/2	22 11	1 11	2 0	17	17	8 6 7/8	+0.5Lb=	8 6 7/8	+0.5Lb=
7-8	7 6	2 9	16 3 1/2	17 1 3/8	1 5 1/8	1 6	12	12	7 9 7/8	+0.5Lb=	7 9 7/8	+0.5Lb=
5-6	6 6	2 3	12 10 7/8	13 7	1 1 1/2	1 2 1/4	9	9	7 3 7/8	+0.5Lb=	7 3 7/8	+0.5Lb=

Reinforcement Details



Quantities

H	Concrete* C.Y.	Reinforcement LBS.
5	24.56+(0.71xLb) =	2339+(52.8xLb) =
6	26.64+(0.78xLb) =	2339+(52.8xLb) =
7	37.36+(0.93xLb) =	3482+(68.7xLb) =
8	39.89+(1.01xLb) =	3482+(68.7xLb) =
9	59.73+(1.19xLb) =	5619+(91xLb) =
10	63+(1.27xLb) =	5619+(91xLb) =
11	82.12+(1.41xLb) =	8421+(120.4xLb) =
12	85.99+(1.49xLb) =	8421+(120.4xLb) =
13	108.08+(1.64xLb) =	12500+(161xLb) =
14	112.53+(1.71xLb) =	12500+(161xLb) =
15	137.59+(1.86xLb) =	17030+(198.6xLb) =
16	142.63+(1.93xLb) =	17030+(198.6xLb) =

*Concrete quantities computed using 21" beam depth on 1/2" pad & Variable Bridge Width

ABUTMENT SKEW CORRECTION FACTOR (SCF) = 1.004

NUMBER OF BARS TO ADD (Nb) = Bridge Width (feet) x SCF (round up to nearest whole number)

LENGTH OF ABUTMENT TO ADD (Lb) = Bridge Width (feet) x SCF (convert decimal to architectural)

GENERAL NOTES

SPECIFICATIONS: Construct abutments according to the current edition of the Kentucky Department of Highways Standard Specifications for Road and Bridge Construction. Abutments are designed for side by side box beams as detailed in Standard Drawings BDP-001 through BDP-012, current edition. Dimensions may be adjusted to allow for any out to out bridge width. Abutments are also adequate for Std. Dwg. slabs or steel beam superstructures

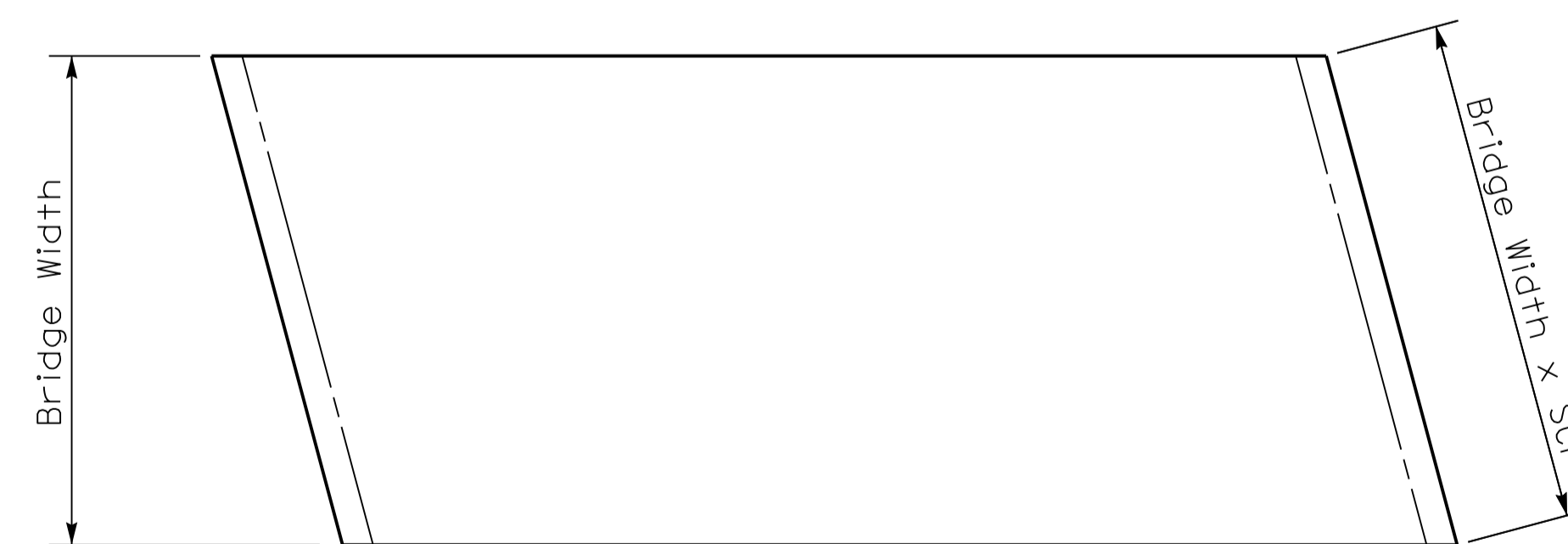
FOUNDATION PRESSURE: Construct abutment footings on solid rock bearing material that can support a pressure of 8000 psf service or 10,800 psf strength factored, as recommended by a geotechnical engineer.

WING LENGTHS: Calculated assuming 21" superstructure depth and stream bank elevation at top of footing.

FOOTING ELEVATION: Construct bottom of footing below the anticipated scour elevation. (This typically entails embedding the footings 1'-0" to 2'-0" into rock and pouring concrete directly against cut rock faces, as recommended by geotechnical engineer.)

NOTE: Distances to bars shown are clear dimensions unless otherwise noted.

MATERIAL SPECIFICATIONS:
Concrete, Class "A" = 3500 psi
Steel Reinforcement = Grade 60



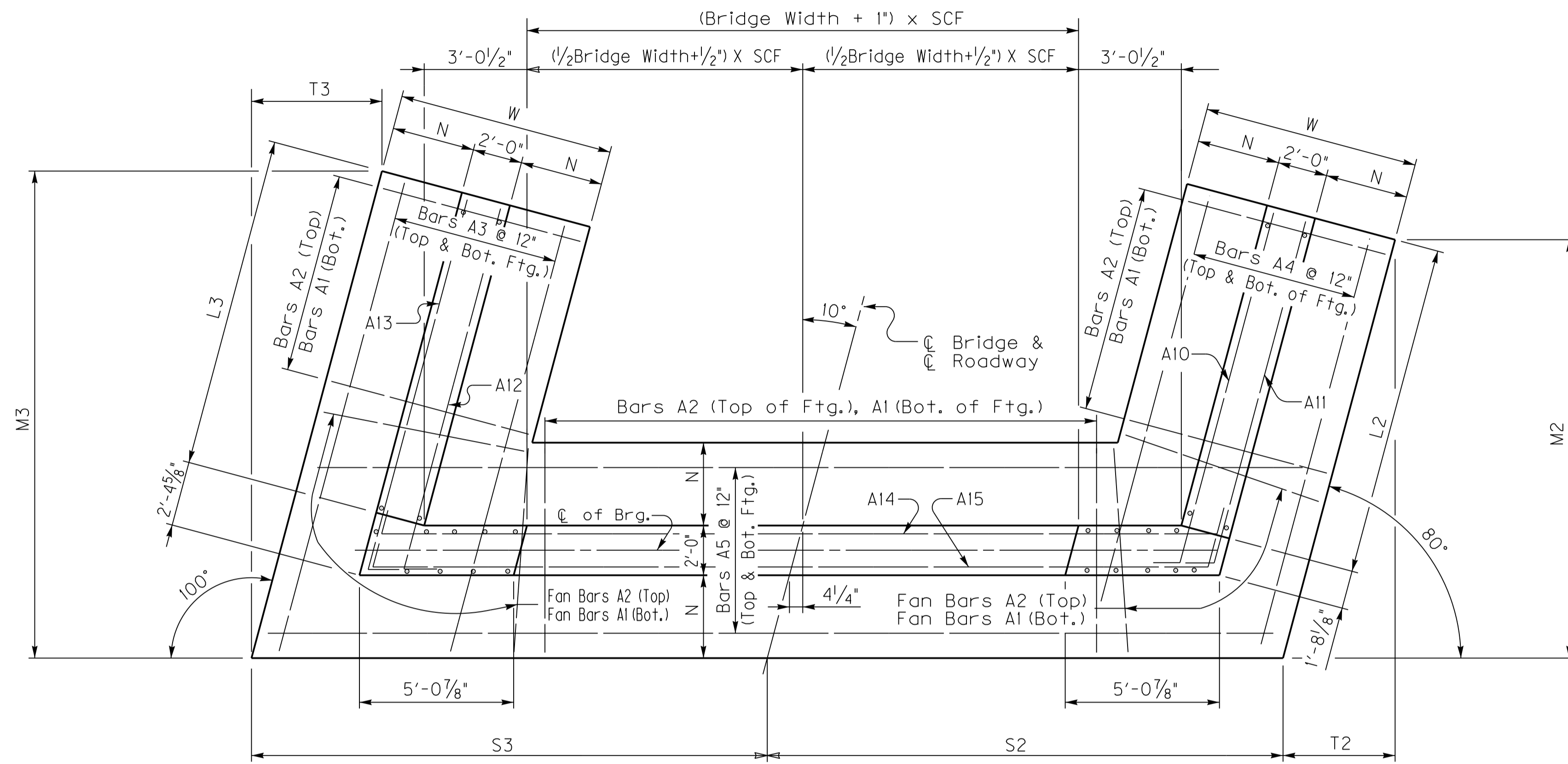
PLAN OF SUPERSTRUCTURE SLAB

ABUTMENT DETAILS

SKEW	WIDTH	DATE
5	VAR	October 2018

10° SKEW VARIABLE BRIDGE WIDTH 2:1 FILL SLOPES WINGS PARALLEL TO ROADWAY

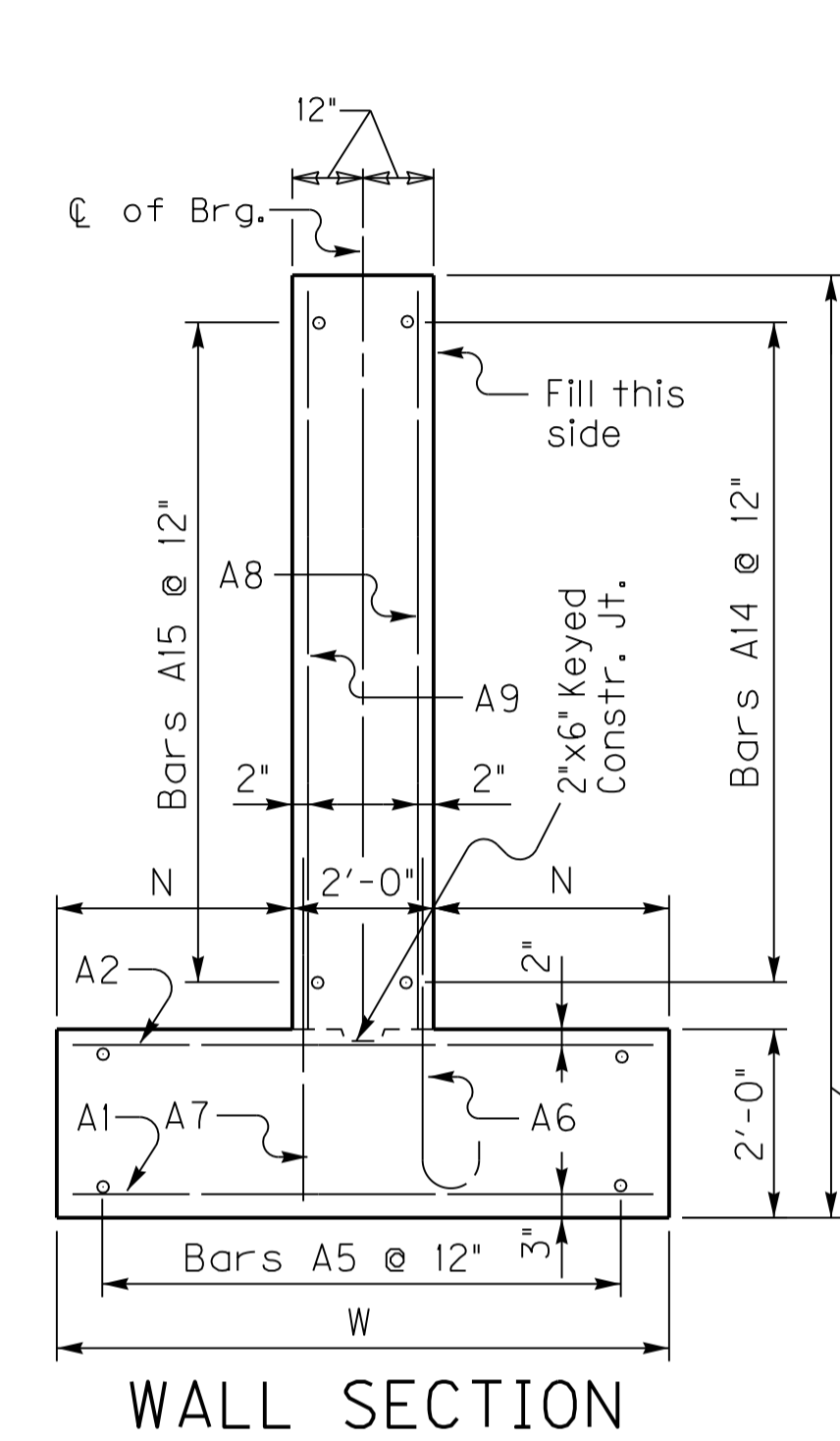
ABUTMENT SKEW CORRECTION FACTOR (SCF) = 1.015



(Left Skew as shown; right skew opp. hand)

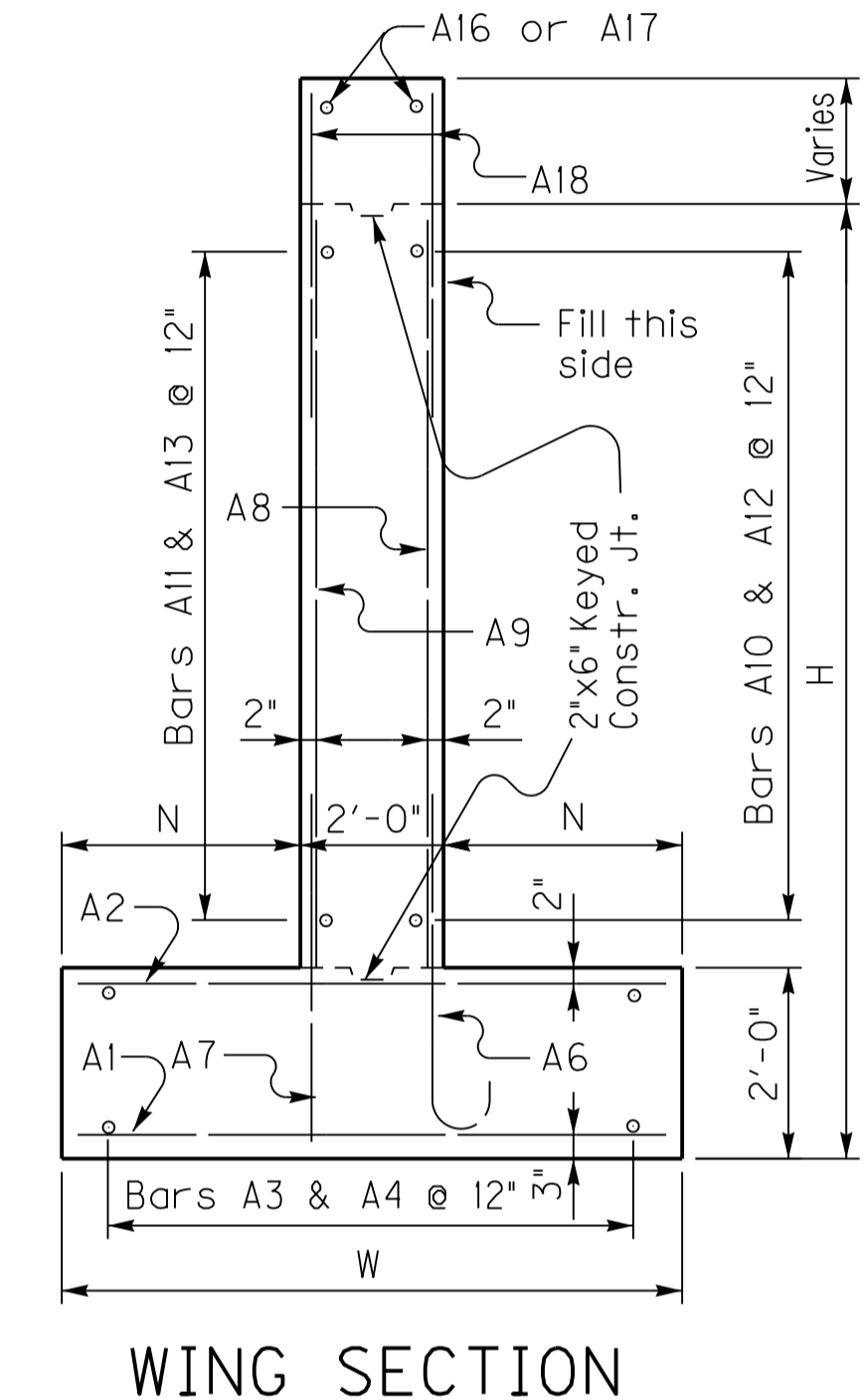
PLAN

Note: Trim A16 & A17 bars if necessary
Trim A3 bars as necessary

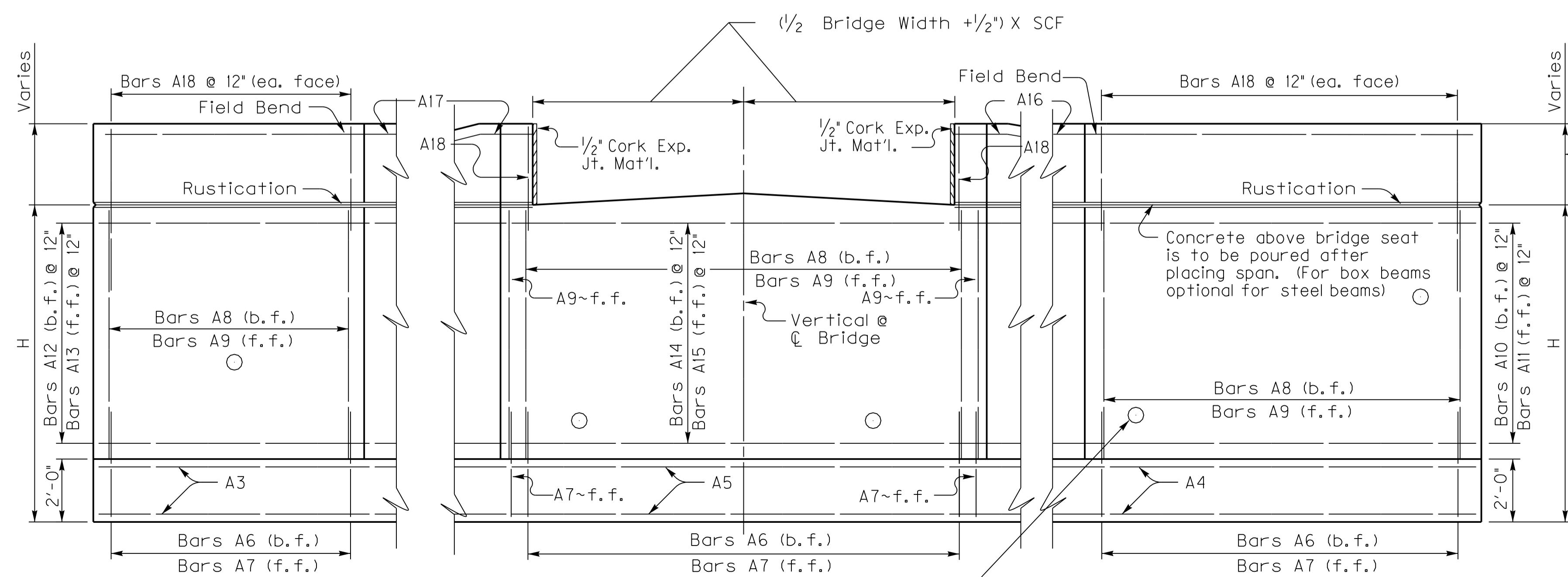


WALL SECTION

H = Low Bridge Seat. Slope seat for side by side box beams. Step cap as necessary for rolled steel beam superstructures to achieve a 2% cross slope on deck.

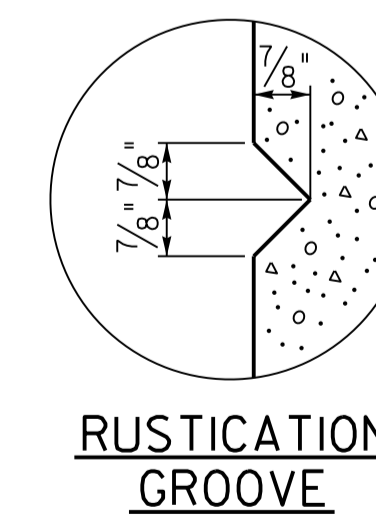


WING SECTION

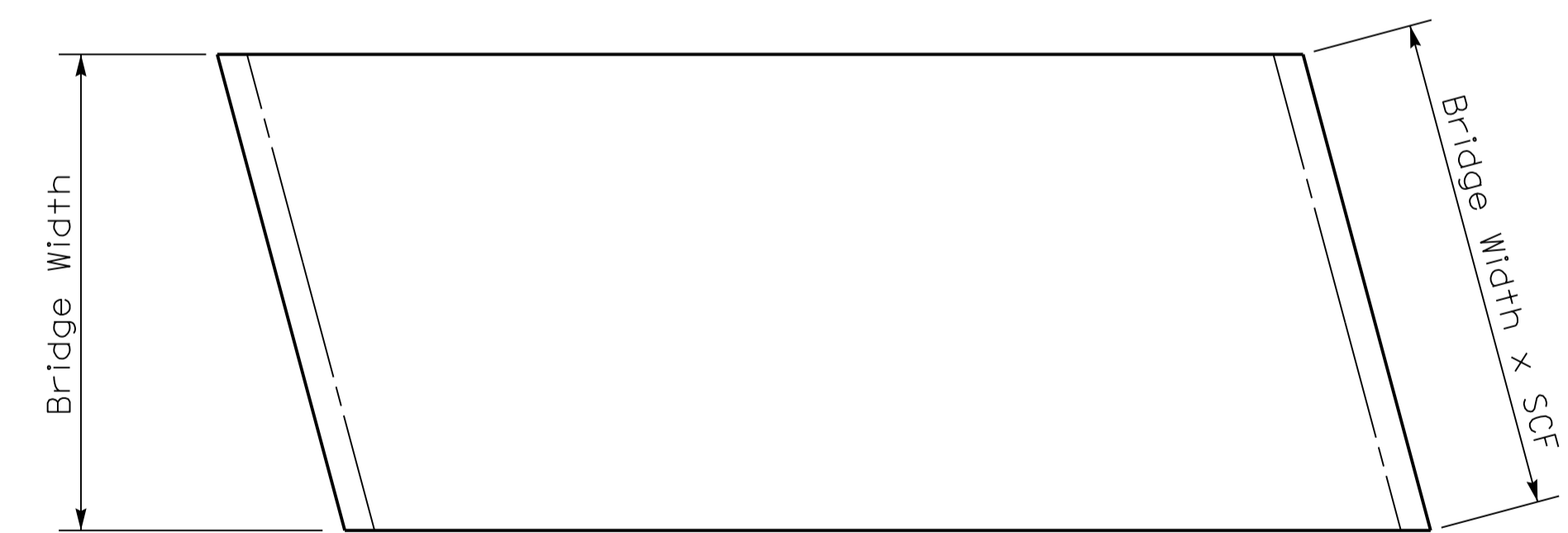


ELEVATION

Place 4\" weep hole drains at 8'-0\" centers at such elevation as to afford best drainage of backfill, in accordance with the Standard Specifications.



RUSTICATION GROOVE



PLAN OF SUPERSTRUCTURE SLAB

ABUTMENT DETAILS

SKEW	WIDTH	DATE
10	VAR	October 2018

10° SKEW VARIABLE BRIDGE WIDTH 2:1 FILL SLOPES WINGS PARALLEL TO ROADWAY

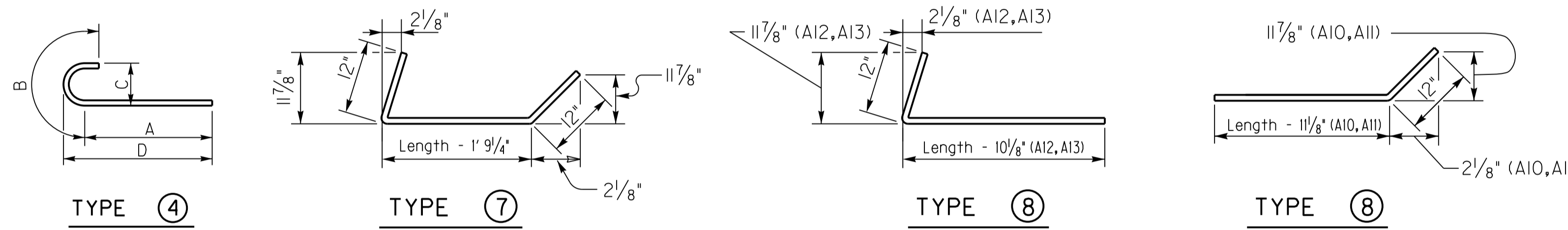
Bill of Reinforcement

MARK	A1		A2		A3	A4		A5		A6				A7		A8		A9	A10	A11	A12	A13	A14		A15		A16	A17	A18		
TYPE	Str.		Str.		Str.	Str.		Str.		4				Str.		Str.		Str.	8	8	8	8	7		7		Str.	Str.	Str.		
SIZE					#5	#5		#5										#5	#5	#5	#5	#5	#5		#5		#5	#5	#5		
H	No.	Size	Length	Spacing	No.	Size	Length	Spacing	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	Spacing	No.	Length	Spacing	No.	Length	Spacing	No.	Length	Spacing	No.	Length	Spacing
			ft.	in.			ft.	in.		ft.		ft.		ft.		ft.		ft.			ft.		ft.		ft.		ft.		ft.		ft.
15-16	95+Nb=	10 11 8 12	95+Nb=	7 11 8 12	24 37 11	24 35 7	24 19 11	+Lb=		67+Nb=	9 9 11 12	8 1/8 1 10 0 11 3/4 8 6	75+Nb=	5 4 11 12	67+Nb=	6 12 10 12	75+Nb=	12 10 12	14 32 6	14 32 5	14 32 6	14 33 0	14 11 6	+Lb=		14 11 6	+Lb=		2 36 8	2 37 5	145 5 9
13-14	85+Nb=	9 10 8 12	85+Nb=	7 10 8 12	22 33 4	22 31 2	22 18 10	+Lb=		59+Nb=	8 8 3 12 6 11 1 3 0 8 7 3	67+Nb=	5 4 11 12	59+Nb=	6 10 10 12	67+Nb=	10 10 12	12 28 6	12 28 5	12 28 6	12 29 0	12 11 6	+Lb=		12 11 6	+Lb=		2 32 8	2 33 5	129 5 9	
11-12	75+Nb=	8 9 8 12	75+Nb=	6 9 8 12	20 28 9	20 26 9	20 17 10	+Lb=		51+Nb=	7 7 1 12 5 10 1/2 1 2 0 7 6 2	59+Nb=	5 4 11 12	51+Nb=	5 8 10 12	59+Nb=	8 10 12	10 24 6	10 24 5	10 24 6	10 25 0	10 11 6	+Lb=		10 11 6	+Lb=		2 28 8	2 29 5	113 5 9	
9-10	65+Nb=	7 8 8 12	65+Nb=	5 8 8 12	18 24 2	18 22 4	18 16 10	+Lb=		43+Nb=	6 6 1 12 5 1 1 0 0 6 5 4	51+Nb=	5 4 11 12	43+Nb=	5 6 10 12	51+Nb=	6 10 12	8 20 6	8 20 5	8 20 6	8 21 0	8 11 6	+Lb=		8 11 6	+Lb=		2 24 8	2 25 5	97 5 9	
7-8	52+Nb=	6 7 2 12	52+Nb=	5 7 2 12	16 18 3	16 16 8	16 15 5	+Lb=		33+Nb=	5 5 7 12 4 8 1/2 0 10 0 5 4 11	41+Nb=	5 4 11 12	33+Nb=	5 4 10 12	41+Nb=	4 10 12	6 15 6	6 15 5	6 15 6	6 16 0	6 11 6	+Lb=		6 11 6	+Lb=		2 19 8	2 20 5	77 5 9	
5-6	42+Nb=	5 6 2 12	42+Nb=	5 6 2 12	14 13 8	14 12 3	14 14 5	+Lb=		25+Nb=	5 5 7 12 4 8 1/2 0 10 0 5 4 11	33+Nb=	5 4 11 12	25+Nb=	5 2 10 12	33+Nb=	2 10 12	4 11 6	4 11 5	4 11 6	4 12 0	4 11 6	+Lb=		4 11 6	+Lb=		2 15 8	2 16 5	61 5 9	

Table of Dimensions

H	W	N	M2	M3	T2	T3	L2	L3	S2		S3					
	Length	Length	Length	Length	Length	Length	Length	Length	Length	+Lb/2 =	Length	Length	+Lb/2 =	Length		
	ft.	in.	ft.	in.	ft.	in.	ft.	in.	ft.	in.	ft.	in.	ft.	in.	ft.	in.
15-16	12 0	5 0	35 4	37 9/8	6 2 3/4	6 7 7/8	30	30	10 2 3/8	+0.5Lb=		10 2 3/8	+0.5Lb=			
13-14	11 0	4 6	30 11 3/4	33 2 3/4	5 5 1/2	5 10 3/8	26	26	9 8 1/4	+0.5Lb=		9 8 1/4	+0.5Lb=			
11-12	10 0	4 0	26 7 1/2	28 8 1/2	4 8 3/8	5 3 3/4	22	22	9 2 1/8	+0.5Lb=		9 2 1/8	+0.5Lb=			
9-10	9 0	3 6	22 3 1/4	24 2 1/8	3 11 1/8	4 3 1/8	18	18	8 8 1/8	+0.5Lb=		8 8 1/8	+0.5Lb=			
7-8	7 6	2 9	16 8 3/4	18 4 1/2	2 11 3/8	3 2 7/8	13	13	7 11	+0.5Lb=		7 11	+0.5Lb=			
5-6	6 6	2 3	12 4 1/2	13 10 1/4	2 2 1/8	2 5 1/4	9	9	7 4 7/8	+0.5Lb=		7 4 7/8	+0.5Lb=			

Reinforcement Details



Quantities

H	Concrete*	Reinforcement
	C.Y.	LBS.
5	24.66+(0.71xLb) =	2345+(52.8xLb) =
6	26.75+(0.78xLb) =	2345+(52.8xLb) =
7	39.68+(0.93xLb) =	3655+(68.7xLb) =
8	42.36+(1.01xLb) =	3655+(68.7xLb) =
9	62.59+(1.19xLb) =	5836+(91xLb) =
10	66.02+(1.27xLb) =	5836+(91xLb) =
11	85.46+(1.41xLb) =	8700+(120.4xLb) =
12	89.48+(1.49xLb) =	8700+(120.4xLb) =
13	111.88+(1.64xLb) =	12859+(161xLb) =
14	116.49+(1.71xLb) =	12859+(161xLb) =
15	141.86+(1.86xLb) =	17469+(198.6xLb) =
16	147.06+(1.93xLb) =	17469+(198.6xLb) =

ABUTMENT SKEW CORRECTION FACTOR (SCF) = 1.015

NUMBER OF BARS TO ADD (Nb) = Bridge Width (feet) x SCF (round up to nearest whole number)

LENGTH OF ABUTMENT TO ADD (Lb) = Bridge Width (feet) x SCF (convert decimal to architectural)

(round up to nearest whole number)

(convert decimal to architectural)

*Concrete quantities computed using 21" beam depth on 1/2" pad & Variable Bridge Width

GENERAL NOTES

SPECIFICATIONS: Construct abutments according to the current edition of the Kentucky Department of Highways Standard Specifications for Road and Bridge Construction. Abutments are designed for side by side box beams as detailed in Standard Drawings BDP-001 through BDP-012, current edition. Dimensions may be adjusted to allow for any out to out bridge width. Abutments are also adequate for Std. Dwg. slabs or steel beam superstructures

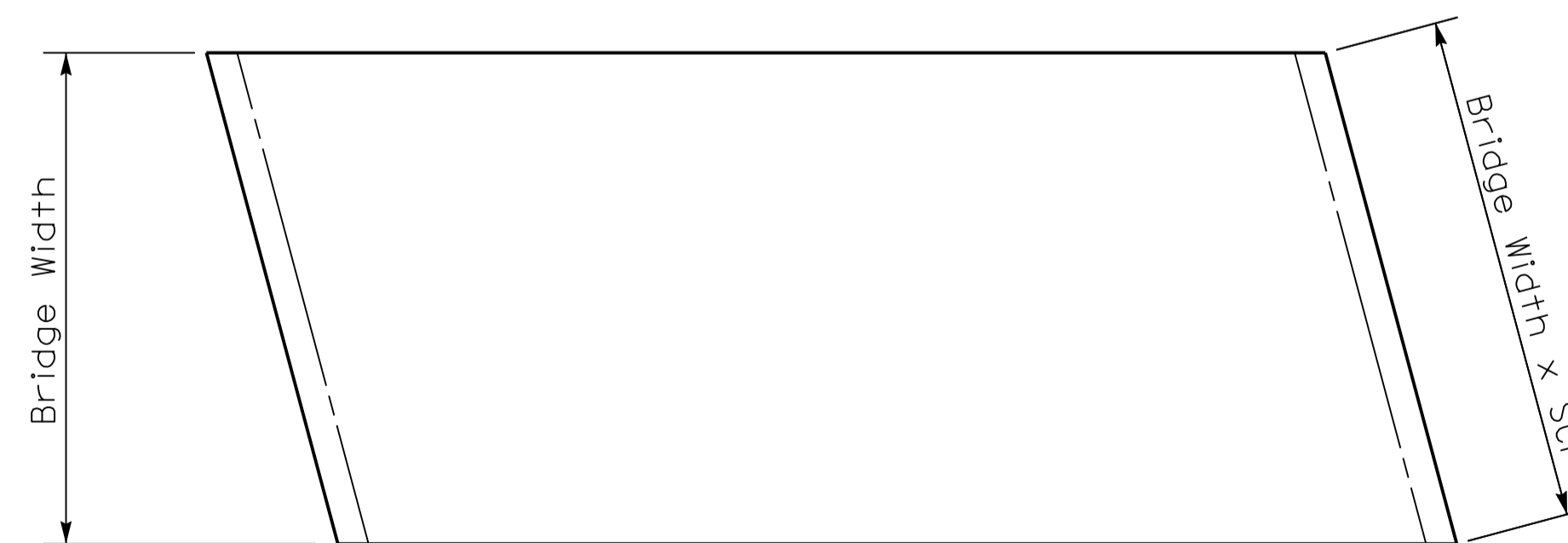
FOUNDATION PRESSURE: Construct abutment footings on solid rock bearing material that can support a pressure of 8000 psf service or 10,800 psf strength factored, as recommended by a geotechnical engineer.

WING LENGTHS: Calculated assuming 21" superstructure depth and stream bank elevation at top of footing.

FOOTING ELEVATION: Construct bottom of footing below the anticipated scour elevation. (This typically entails embedding the footings 1'-0" to 2'-0" into rock and pouring concrete directly against cut rock faces, as recommended by geotechnical engineer.)

NOTE: Distances to bars shown are clear dimensions unless otherwise noted.

MATERIAL SPECIFICATIONS:
 Concrete, Class "A" = 3500 psi
 Steel Reinforcement = Grade 60



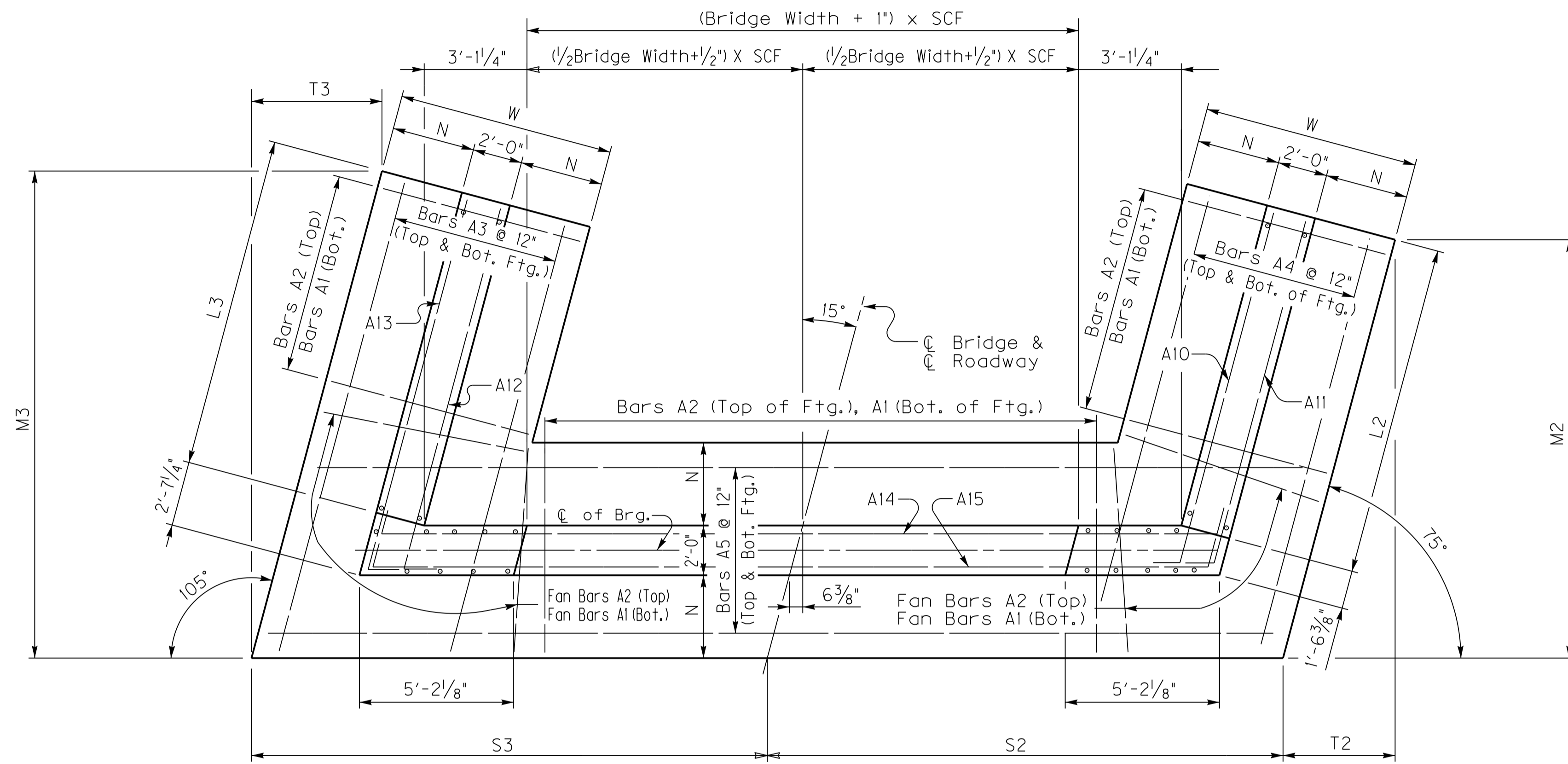
PLAN OF SUPERSTRUCTURE SLAB

ABUTMENT DETAILS

SKEW	WIDTH	DATE
10	VAR	October 2018

15° SKEW VARIABLE BRIDGE WIDTH 2:1 FILL SLOPES WINGS PARALLEL TO ROADWAY

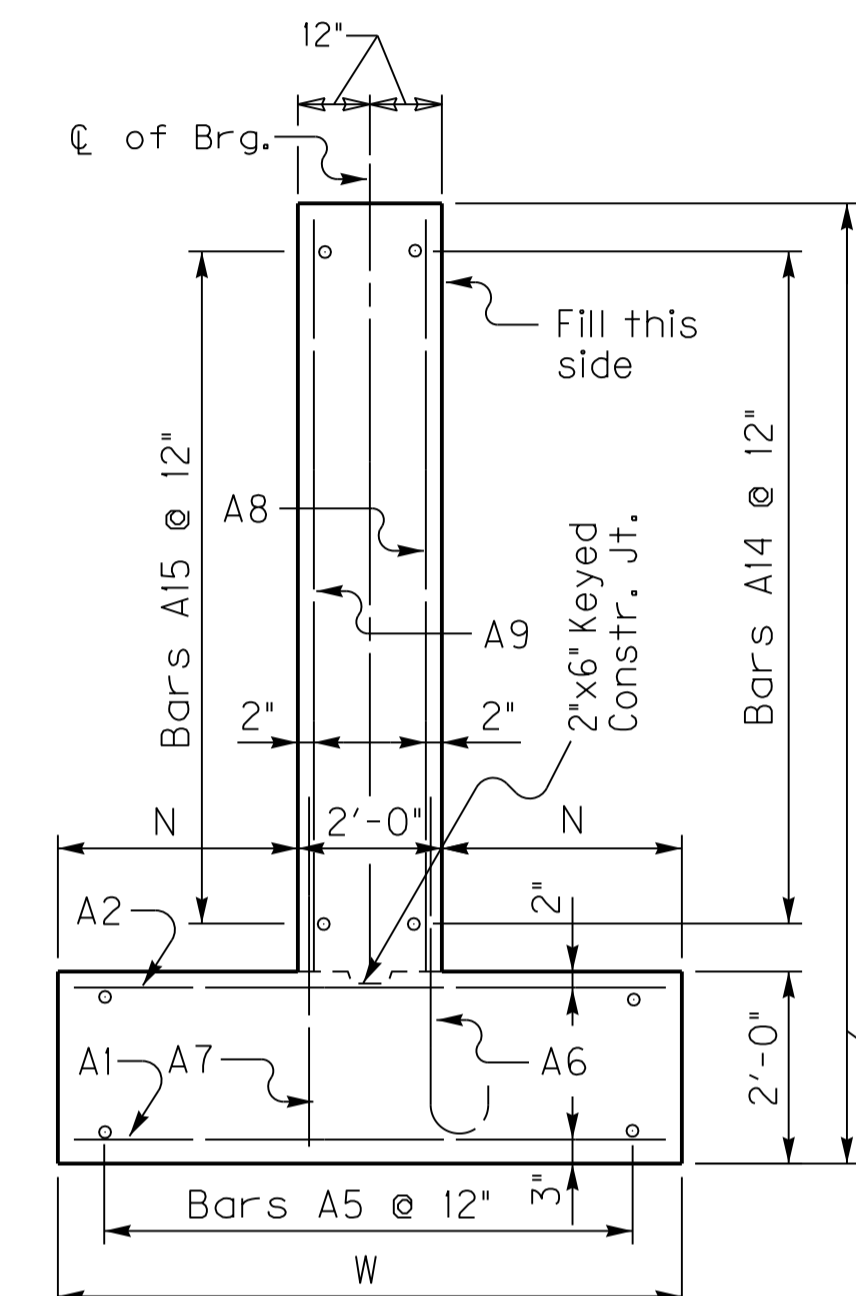
ABUTMENT SKEW CORRECTION FACTOR (SCF) = 1.035



(Left Skew as shown; right skew opp. hand)

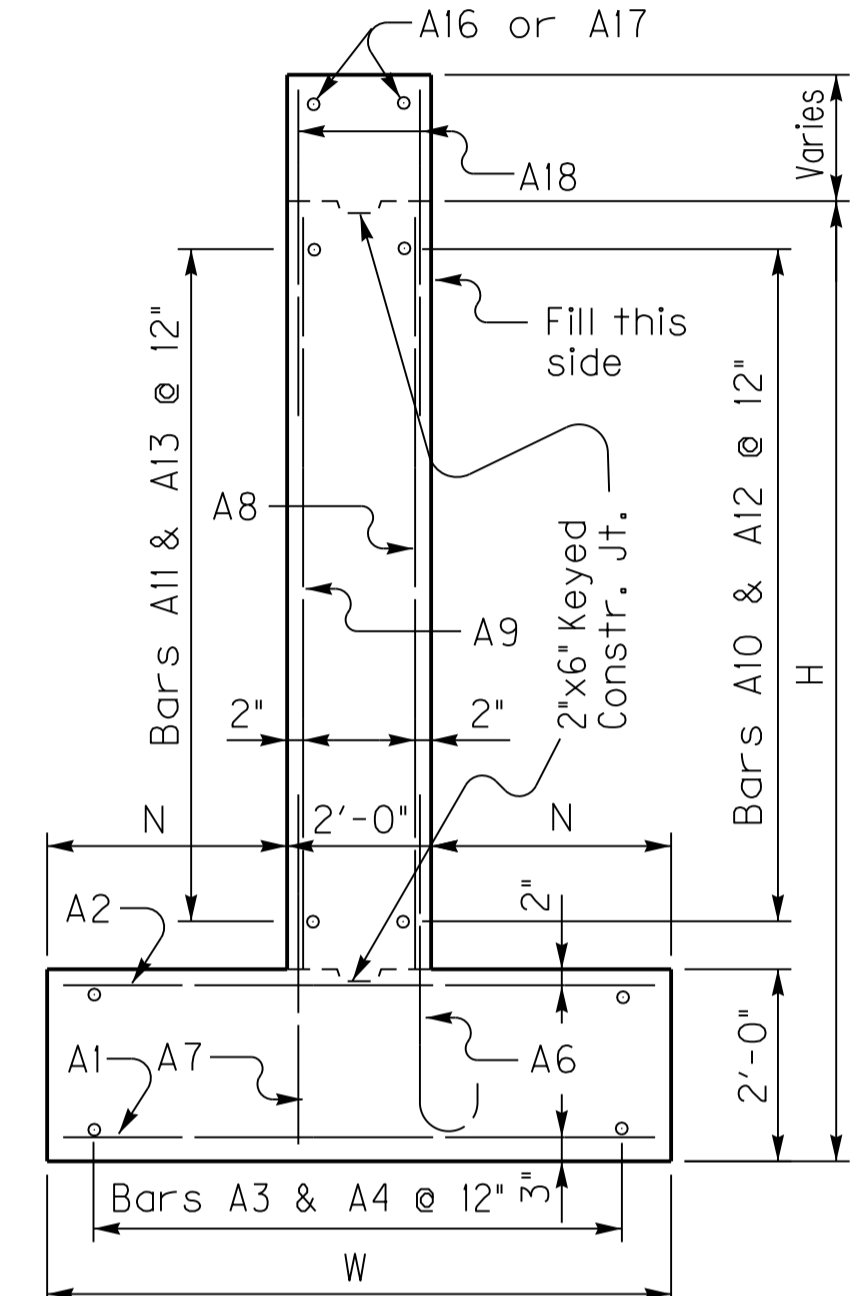
PLAN

Note: Trim A16 & A17 bars if necessary
Trim A3 bars as necessary

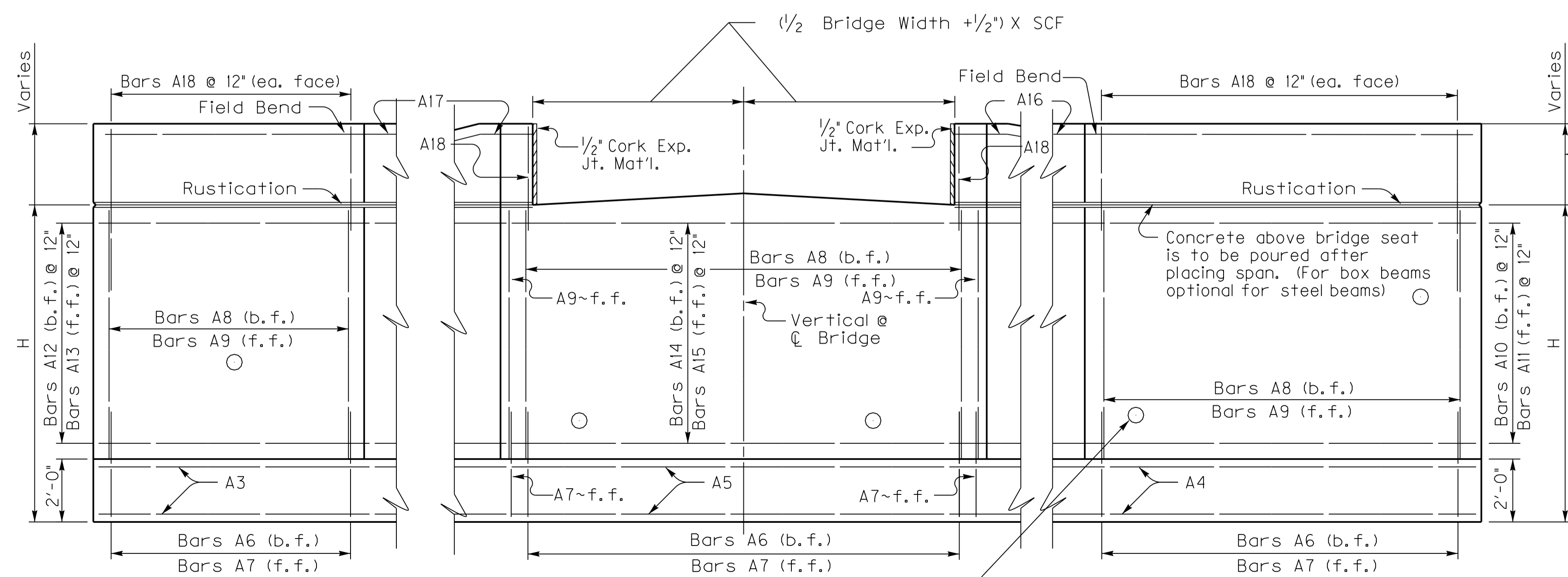


WALL SECTION

H = Low Bridge Seat. Slope seat for side by side box beams. Step cap as necessary for rolled steel beam superstructures to achieve a 2% cross slope on deck.

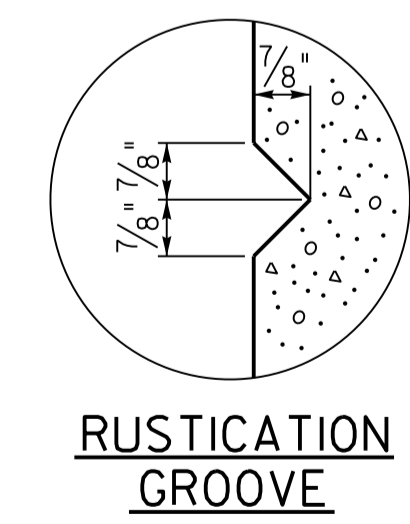


WING SECTION

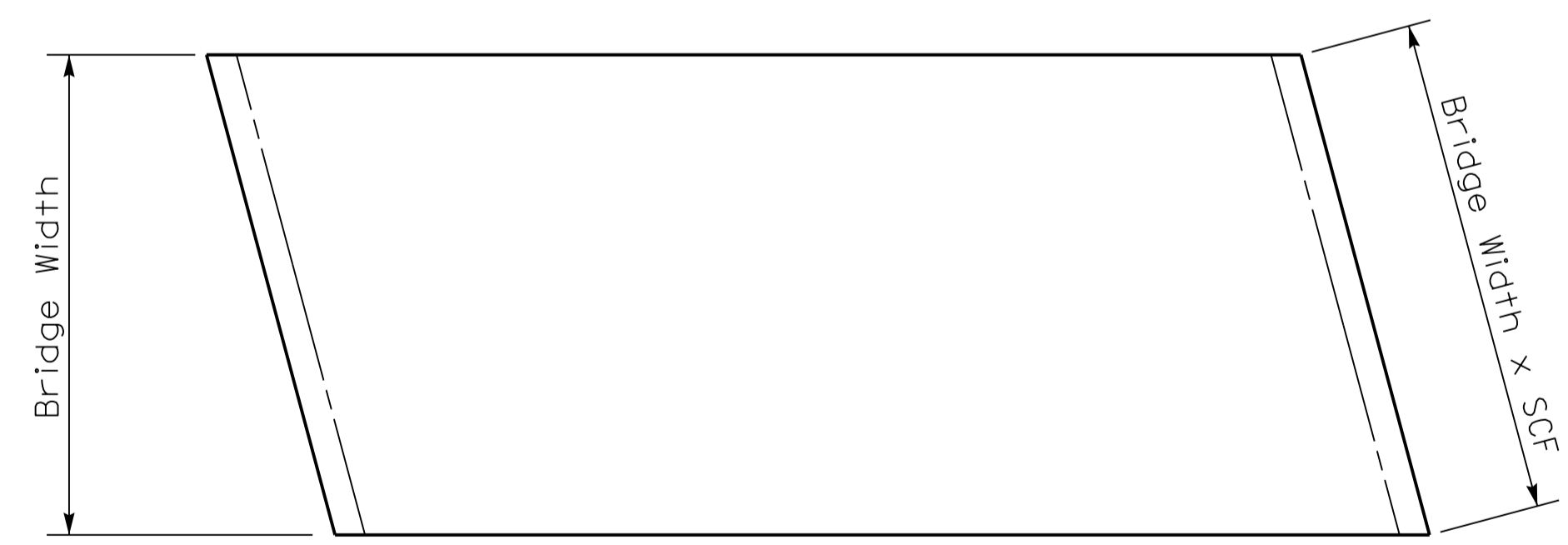


ELEVATION

Place 4\" weep hole drains at 8'-0\" centers at such elevation as to afford best drainage of backfill, in accordance with the Standard Specifications.



RUSTICATION GROOVE



PLAN OF SUPERSTRUCTURE SLAB

ABUTMENT DETAILS

SKEW	WIDTH	DATE
15	VAR	October 2018

15° SKEW VARIABLE BRIDGE WIDTH 2:1 FILL SLOPES WINGS PARALLEL TO ROADWAY

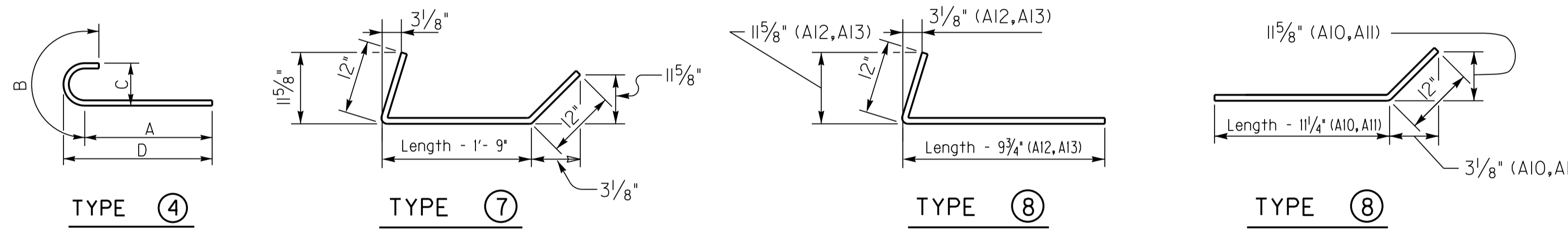
Bill of Reinforcement

MARK	A1		A2		A3	A4		A5		A6				A7		A8		A9	A10	A11	A12	A13	A14		A15		A16	A17	A18
TYPE	Str.		Str.		Str.	Str.		Str.		4				Str.		Str.		Str.	8	8	8	8	7		7		Str.	Str.	Str.
SIZE	#5		#5		#5	#5		#5		#5				#5		#5		#5	#5	#5	#5	#5	#5		#5		#5	#5	#5
H	No.	Size	Length	Spacing	No.	Size	Length	Spacing	No.	Length	Spacing	No.	Length	Spacing	No.	Length	Spacing	No.	Length	Spacing	No.	Length	Spacing	No.	Length	Spacing	No.	Length	Spacing
15-16	96+Nb=	10 11 8 12	96+Nb=	7 11 8 12	24 38 8	24 35 2	24 20 2	+Lb=	67+Nb=	9 9 11 12	8 1/8 1 10 0	11 3/4 8 6	75+Nb=	5 4 11 12	67+Nb=	6 12 10 12	75+Nb=	12 10 12	14 32 6	14 32 3	14 32 7	14 33 3	14 11 8	+Lb=	14 11 8	+Lb=	2 36 8	2 37 8	145 5 9
13-14	86+Nb=	9 10 8 12	86+Nb=	7 10 8 12	22 34 0	22 30 9	22 19 2	+Lb=	59+Nb=	8 8 3 12	6 11 1 3 0	8 7 3	67+Nb=	5 4 11 12	59+Nb=	6 10 10 12	67+Nb=	10 10 12	12 28 6	12 28 3	12 28 7	12 29 3	12 11 8	+Lb=	12 11 8	+Lb=	2 32 8	2 33 8	129 5 9
11-12	76+Nb=	8 9 8 12	76+Nb=	6 9 8 12	20 29 4	20 26 5	20 18 1	+Lb=	51+Nb=	7 7 1 12	5 10 1/2 1 2 0	7 6 2	59+Nb=	5 4 11 12	51+Nb=	5 8 10 12	59+Nb=	8 10 12	10 24 6	10 24 3	10 24 7	10 25 3	10 11 8	+Lb=	10 11 8	+Lb=	2 28 8	2 29 8	113 5 9
9-10	66+Nb=	7 8 8 12	66+Nb=	5 8 8 12	18 24 8	18 22 0	18 17 1	+Lb=	43+Nb=	6 6 1 12	5 1 1 0 0	6 5 4	51+Nb=	5 4 11 12	43+Nb=	5 6 10 12	51+Nb=	6 10 12	8 20 6	8 20 3	8 20 7	8 21 3	8 11 8	+Lb=	8 11 8	+Lb=	2 24 8	2 25 8	97 5 9
7-8	53+Nb=	6 7 2 12	53+Nb=	5 7 2 12	16 18 9	16 16 4	16 15 8	+Lb=	33+Nb=	5 5 7 12	4 8 1/2 0 10 0	5 4 11	41+Nb=	5 4 11 12	33+Nb=	5 4 10 12	41+Nb=	4 10 12	6 15 6	6 15 3	6 15 6	6 16 3	6 11 8	+Lb=	6 11 8	+Lb=	2 19 8	2 20 8	77 5 9
5-6	45+Nb=	5 6 2 12	45+Nb=	5 6 2 12	14 15 2	14 13 0	14 14 8	+Lb=	27+Nb=	5 5 7 12	4 8 1/2 0 10 0	5 4 11	35+Nb=	5 4 11 12	27+Nb=	5 2 10 12	35+Nb=	2 10 12	4 12 6	4 12 3	4 12 6	4 13 3	4 11 8	+Lb=	4 11 8	+Lb=	2 16 8	2 17 8	65 5 9

Table of Dimensions

H	W	N	M2	M3	T2	T3	L2	L3	S2		S3			
	Length	Length	Length	Length	Length	Length	Length	Length	Length	+Lb/2 =	Length	Length	+Lb/2 =	Length
	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.
15-16	12 0 5 0	34 2	37 9 1/2	9 1 1/8	10 1 1/2	30	30	10 4 3/4	+0.5Lb=	10 4 3/4	+0.5Lb=			
13-14	11 0 4 6	29 11 1/8	33 3 1/2	8 1/4	8 11	26	26	9 10 1/2	+0.5Lb=	9 10 1/2	+0.5Lb=			
11-12	10 0 4 0	25 8 3/8	28 9 5/8	6 10 5/8	7 8 5/8	22	22	9 4 3/8	+0.5Lb=	9 4 3/8	+0.5Lb=			
9-10	9 0 3 6	21 5 1/2	24 3 3/4	5 9	6 6 1/8	18	18	8 10 1/8	+0.5Lb=	8 10 1/8	+0.5Lb=			
7-8	7 6 2 9	16 7/8	18 6 3/8	4 3 3/4	4 11 5/8	13	13	8 3/4	+0.5Lb=	8 3/4	+0.5Lb=			
5-6	6 6 2 3	12 9 3/4	15 1/8	3 5 1/8	4 1/4	10	10	7 6 5/8	+0.5Lb=	7 6 5/8	+0.5Lb=			

Reinforcement Details



Quantities

H	Concrete*	Reinforcement
	C.Y.	LBS.
5	26.58+(0.71xLb) =	2501+(52.8xLb) =
6	28.83+(0.78xLb) =	2501+(52.8xLb) =
7	39.9+(0.93xLb) =	3683+(68.7xLb) =
8	42.6+(1.01xLb) =	3683+(68.7xLb) =
9	62.86+(1.19xLb) =	5875+(91xLb) =
10	66.3+(1.27xLb) =	5875+(91xLb) =
11	85.77+(1.41xLb) =	8757+(120.4xLb) =
12	89.81+(1.49xLb) =	8757+(120.4xLb) =
13	112.24+(1.64xLb) =	12937+(161xLb) =
14	116.87+(1.71xLb) =	12937+(161xLb) =
15	142.27+(1.86xLb) =	17564+(198.6xLb) =
16	147.48+(1.93xLb) =	17564+(198.6xLb) =

*Concrete quantities computed using 21" beam depth on 1/2" pad & Variable Bridge Width

ABUTMENT SKEW CORRECTION FACTOR (SCF) = 1.035

NUMBER OF BARS TO ADD (Nb) = Bridge Width (feet) x SCF (round up to nearest whole number)

LENGTH OF ABUTMENT TO ADD (Lb) = Bridge Width (feet) x SCF (convert decimal to architectural)

GENERAL NOTES

SPECIFICATIONS: Construct abutments according to the current edition of the Kentucky Department of Highways Standard Specifications for Road and Bridge Construction. Abutments are designed for side by side box beams as detailed in Standard Drawings BDP-001 through BDP-012, current edition. Dimensions may be adjusted to allow for any out to out bridge width. Abutments are also adequate for Std. Dwg. slabs or steel beam superstructures

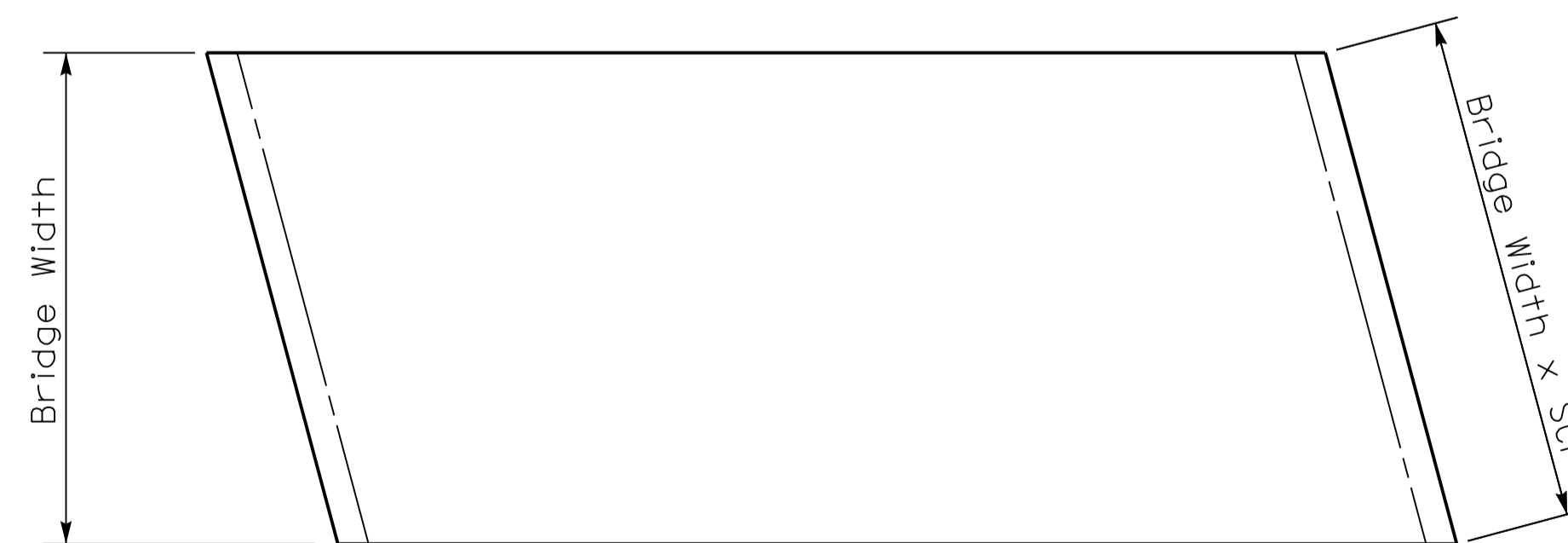
FOUNDATION PRESSURE: Construct abutment footings on solid rock bearing material that can support a pressure of 8000 psf service or 10,800 psf strength factored, as recommended by a geotechnical engineer.

WING LENGTHS: Calculated assuming 21" superstructure depth and stream bank elevation at top of footing.

FOOTING ELEVATION: Construct bottom of footing below the anticipated scour elevation. (This typically entails embedding the footings 1'-0" to 2'-0" into rock and pouring concrete directly against cut rock faces, as recommended by geotechnical engineer.)

NOTE: Distances to bars shown are clear dimensions unless otherwise noted.

MATERIAL SPECIFICATIONS:
Concrete, Class "A" = 3500 psi
Steel Reinforcement = Grade 60



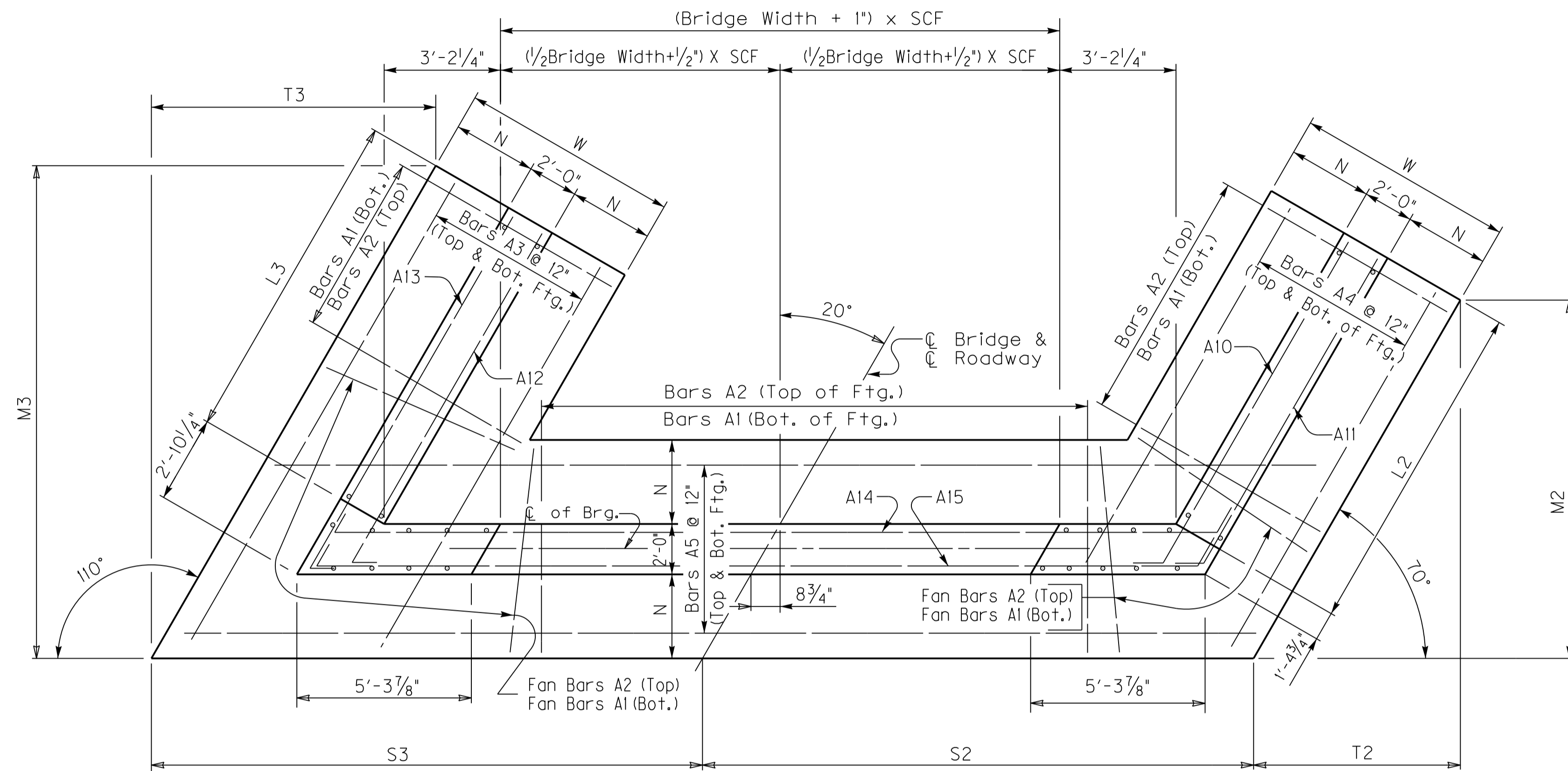
PLAN OF SUPERSTRUCTURE SLAB

ABUTMENT DETAILS

SKEW	WIDTH	DATE
15	VAR	October 2018

20° SKEW VARIABLE BRIDGE WIDTH 2:1 FILL SLOPES WINGS PARALLEL TO ROADWAY

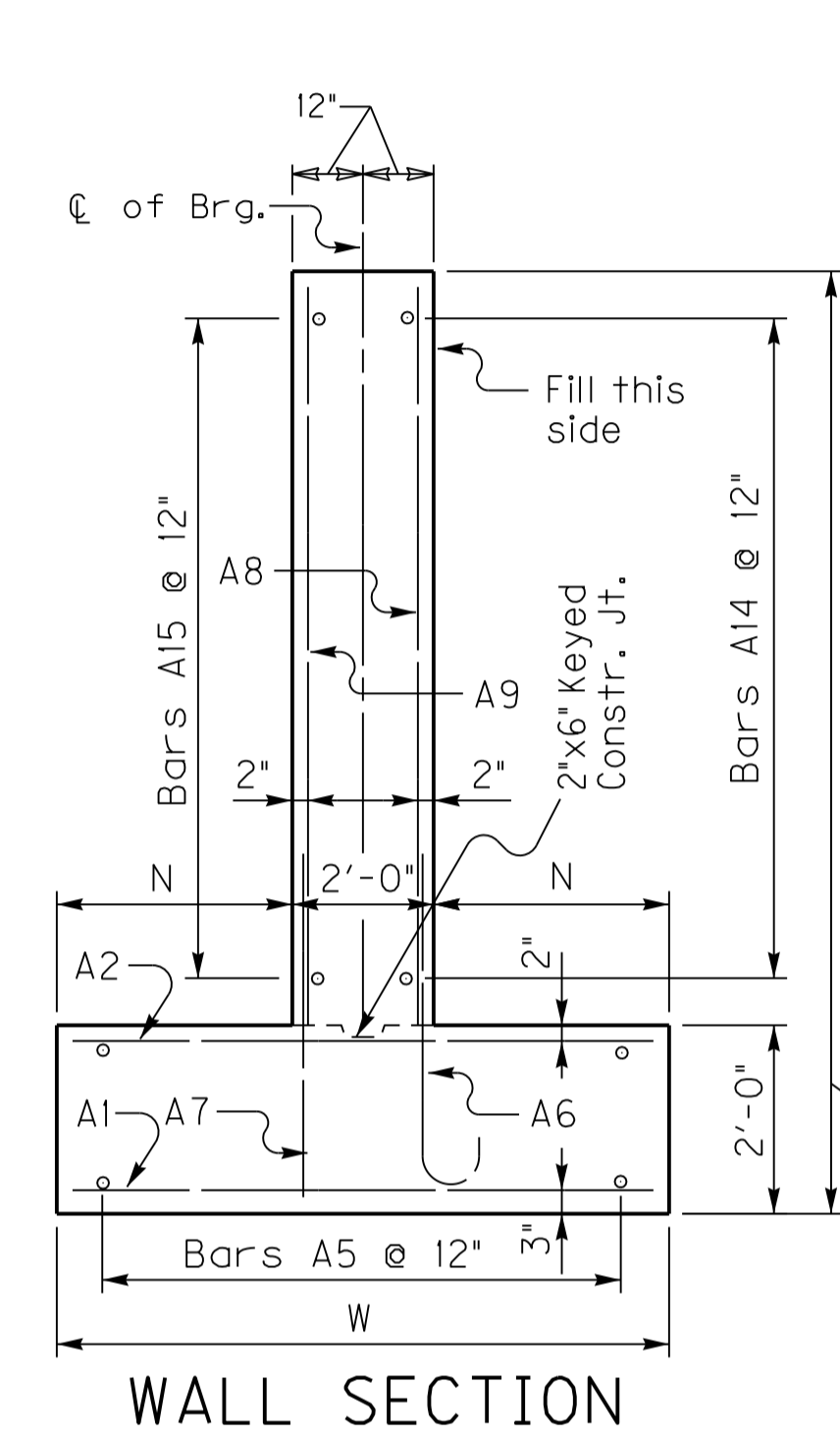
ABUTMENT SKEW CORRECTION FACTOR (SCF) = 1.064



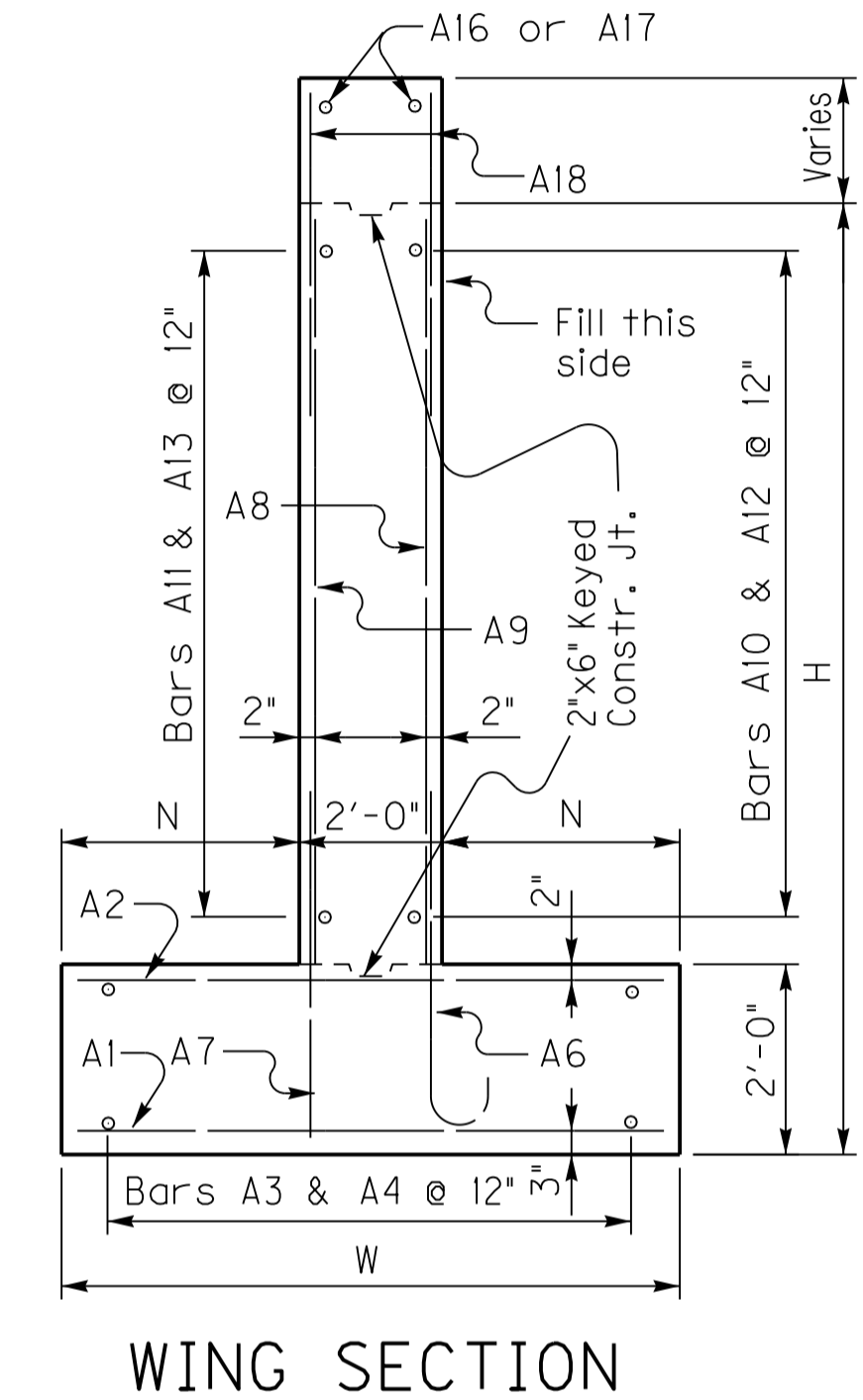
(Left Skew as shown; right skew opp. hand)

PLAN

Note: Trim A16 & A17 bars if necessary
Trim A3 bars as necessary

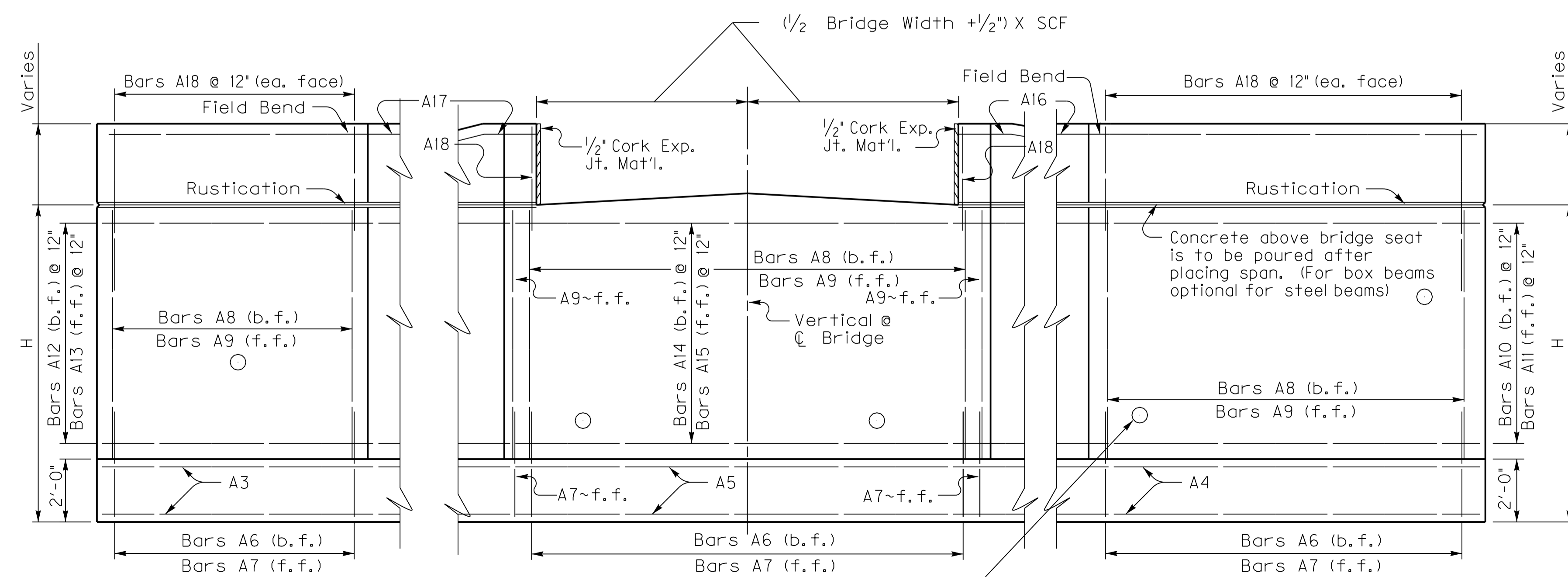


WALL SECTION



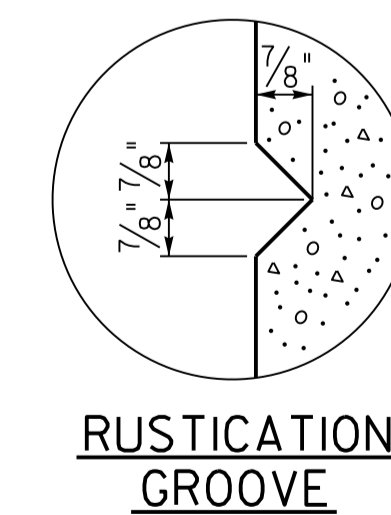
WING SECTION

H = Low Bridge Seat. Slope seat for side by side box beams. Step cap as necessary for rolled steel beam superstructures to achieve a 2% cross slope on deck.

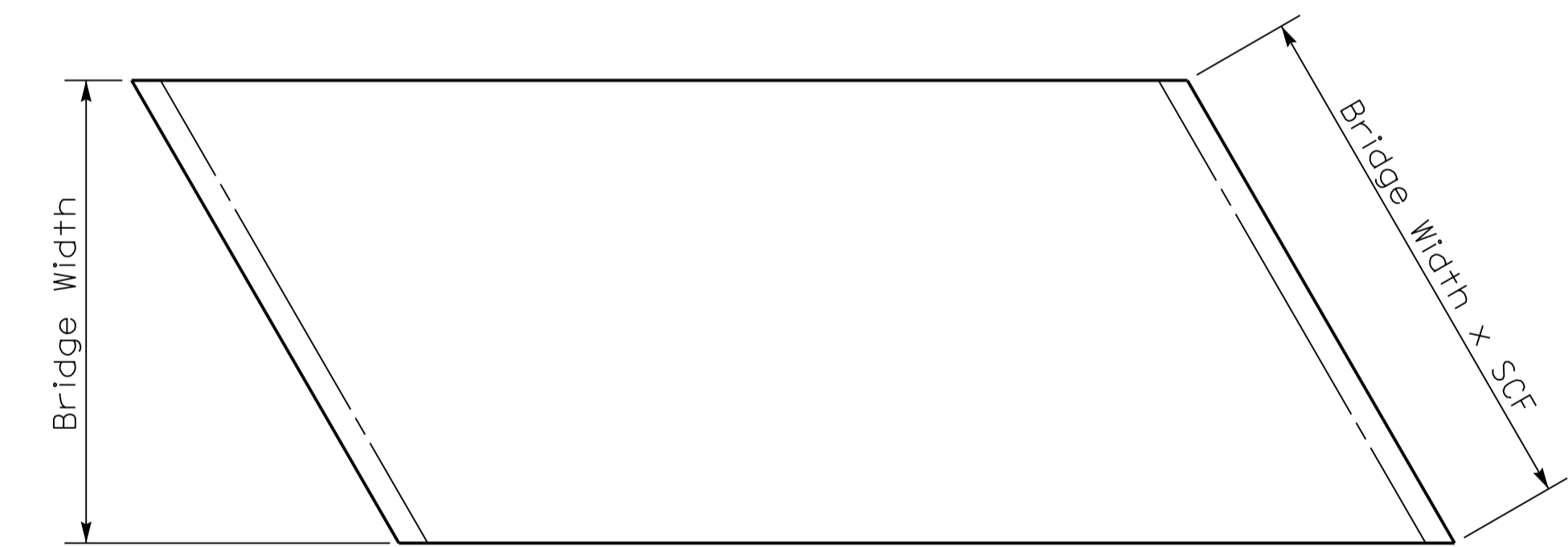


ELEVATION

Place 4\" weep hole drains at 8'-0\" centers at such elevation as to afford best drainage of backfill, in accordance with the Standard Specifications.



RUSTICATION GROOVE



PLAN OF SUPERSTRUCTURE SLAB

ABUTMENT DETAILS

SKEW	WIDTH	DATE
20	VAR	October 2018

20° SKEW VARIABLE BRIDGE WIDTH 2:1 FILL SLOPES WINGS PARALLEL TO ROADWAY

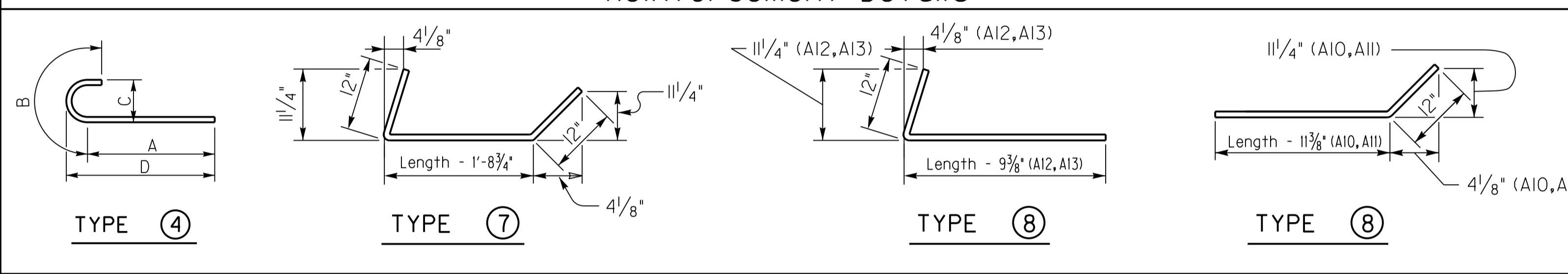
Bill of Reinforcement

MARK	A1		A2		A3	A4		A5		A6				A7		A8		A9	A10	A11	A12	A13	A14		A15		A16	A17	A18									
TYPE	Str.		Str.		Str.	Str.		Str.		4				Str.		Str.		Str.	8	8	8	8	7		7		Str.	Str.	Str.									
SIZE	#5		#5		#5	#5		#5		#5				#5		#5		#5	#5	#5	#5	#5	#5		#5		#5	#5	#5									
H	No.	Size	Length ft., in.	Spacing	No.	Size	Length ft., in.	Spacing	No.	Length ft., in.	Spacing	No.	Length ft., in.	Spacing	No.	Length ft., in.	Spacing	No.	Length ft., in.	Spacing	No.	Length ft., in.	Spacing	No.	Length ft., in.	Spacing	No.	Length ft., in.	Spacing	No.	Length ft., in.	Spacing	No.	Length ft., in.	Spacing	No.	Length ft., in.	Spacing
15-16	99+Nb=	10 11 8 12	99+Nb=	7 11 8 12	24 40 6	24 35 9	24 20 8	+Lb=	69+Nb=	9 9 11 12	8 1/8 1 10 0	11 3/4 8 6	77+Nb=	5 4 11 12	69+Nb=	6 12 10 12	77+Nb=	12 10 12	14 33 6	14 33 1	14 33 7	14 34 5	14 11 11	+Lb=	14 11 11	+Lb=	2 37 8	2 39 1	151 5 9									
13-14	89+Nb=	9 10 8 12	89+Nb=	7 10 8 12	22 35 9	22 31 5	22 19 7	+Lb=	61+Nb=	8 8 3 12	6 11 1 3 0	8 7 3	69+Nb=	5 4 11 12	61+Nb=	6 10 10 12	69+Nb=	10 10 12	12 29 6	12 29 1	12 29 7	12 30 5	12 11 11	+Lb=	12 11 11	+Lb=	2 33 8	2 35 1	135 5 9									
11-12	79+Nb=	8 9 8 12	79+Nb=	6 9 8 12	20 31 1	20 27 0	20 18 7	+Lb=	53+Nb=	7 7 1 12	5 10 1/2 1 2 0	7 6 2	61+Nb=	5 4 11 12	53+Nb=	5 8 10 12	61+Nb=	8 10 12	10 25 6	10 25 1	10 25 7	10 26 5	10 11 11	+Lb=	10 11 11	+Lb=	2 29 8	2 31 1	119 5 9									
9-10	66+Nb=	7 8 8 12	66+Nb=	5 8 8 12	18 25 4	18 21 8	18 17 6	+Lb=	43+Nb=	6 6 1 12	5 1 1 0 0	6 5 4	51+Nb=	5 4 11 12	43+Nb=	5 6 10 12	51+Nb=	6 10 12	8 20 6	8 20 1	8 20 6	8 21 5	8 11 11	+Lb=	8 11 11	+Lb=	2 24 8	2 26 1	99 5 9									
7-8	55+Nb=	6 7 2 12	55+Nb=	5 7 2 12	16 20 4	16 17 1	16 16 1	+Lb=	35+Nb=	5 5 7 12	4 8 1/2 0 10 0	5 4 11	43+Nb=	5 4 11 12	35+Nb=	5 4 10 12	43+Nb=	4 10 12	6 16 6	6 16 1	6 16 6	6 17 5	6 11 11	+Lb=	6 11 11	+Lb=	2 20 8	2 22 1	83 5 9									
5-6	45+Nb=	5 6 2 12	45+Nb=	5 6 2 12	14 15 8	14 12 9	14 15 0	+Lb=	27+Nb=	5 5 7 12	4 8 1/2 0 10 0	5 4 11	35+Nb=	5 4 11 12	27+Nb=	5 2 10 12	35+Nb=	2 10 12	4 12 6	4 12 1	4 12 6	4 13 5	4 11 11	+Lb=	4 11 11	+Lb=	2 16 8	2 18 1	67 5 9									

Table of Dimensions

H	W	N	M2	M3	T2	T3	L2	L3	S2		S3		
	Length ft., in.	Length ft., in.	Length ft., in.	Length ft., in.	Length ft., in.	Length ft., in.	Length ft., in.	Length ft., in.	Length ft., in.	+Lb/ 2 =	Length ft., in.	Length ft., in.	+Lb/ 2 =
15-16	12 0	5 0	33 8/8	38 6/4	12 3 3/8	14 1/4	31	31	10 8 1/4	+0.5Lb=	10 8 1/4	+0.5Lb=	
13-14	11 0	4 6	29 7 3/4	34 1 1/8	10 9 1/2	12 4 7/8	27	27	10 1 7/8	+0.5Lb=	10 1 7/8	+0.5Lb=	
11-12	10 0	4 0	25 6 3/4	29 8	9 3 5/8	10 9 5/8	23	23	9 7 1/2	+0.5Lb=	9 7 1/2	+0.5Lb=	
9-10	9 0	3 6	20 6 3/8	24 3 1/2	7 5 5/8	8 10 1/8	18	18	9 1 1/8	+0.5Lb=	9 1 1/8	+0.5Lb=	
7-8	7 6	2 9	16 3 3/8	19 6 3/8	5 11 1/8	7 1 1/4	14	14	8 3 1/2	+0.5Lb=	8 3 1/2	+0.5Lb=	
5-6	6 6	2 3	12 2 3/8	15 1 1/4	4 5 1/4	5 6	10	10	7 9 1/8	+0.5Lb=	7 9 1/8	+0.5Lb=	

Reinforcement Details



Quantities

H	Concrete*	Reinforcement
	C.Y.	LBS.
5	26.83+(0.71xLb) =	2525+(52.8xLb) =
6	29.11+(0.78xLb) =	2525+(52.8xLb) =
7	42.4+(0.93xLb) =	3877+(68.7xLb) =
8	45.27+(1.01xLb) =	3877+(68.7xLb) =
9	63.26+(1.19xLb) =	5905+(91xLb) =
10	66.72+(1.27xLb) =	5905+(91xLb) =
11	89.38+(1.41xLb) =	9102+(120.4xLb) =
12	93.59+(1.49xLb) =	9102+(120.4xLb) =
13	116.36+(1.64xLb) =	13384+(161xLb) =
14	121.16+(1.71xLb) =	13384+(161xLb) =
15	146.89+(1.86xLb) =	18106+(198.6xLb) =
16	152.28+(1.93xLb) =	18106+(198.6xLb) =

ABUTMENT SKEW CORRECTION FACTOR (SCF) = 1.064

NUMBER OF BARS TO ADD (Nb) = Bridge Width (feet) x SCF

(round up to nearest whole number)

LENGTH OF ABUTMENT TO ADD (Lb) = Bridge Width (feet) x SCF

(convert decimal to architectural)

*Concrete quantities computed using 21" beam depth on 1/2" pad & Variable Bridge Width

GENERAL NOTES

SPECIFICATIONS: Construct abutments according to the current edition of the Kentucky Department of Highways Standard Specifications for Road and Bridge Construction. Abutments are designed for side by side box beams as detailed in Standard Drawings BDP-001 through BDP-012, current edition. Dimensions may be adjusted to allow for any out to out bridge width. Abutments are also adequate for Std. Dwg. slabs or steel beam superstructures

FOUNDATION PRESSURE: Construct abutment footings on solid rock bearing material that can support a pressure of 8000 psf service or 10,800 psf strength factored, as recommended by a geotechnical engineer.

WING LENGTHS: Calculated assuming 21" superstructure depth and stream bank elevation at top of footing.

FOOTING ELEVATION: Construct bottom of footing below the anticipated scour elevation. (This typically entails embedding the footings 1'-0" to 2'-0" into rock and pouring concrete directly against cut rock faces, as recommended by geotechnical engineer.)

NOTE: Distances to bars shown are clear dimensions unless otherwise noted.

MATERIAL SPECIFICATIONS:
 Concrete, Class "A" = 3500 psi
 Steel Reinforcement = Grade 60



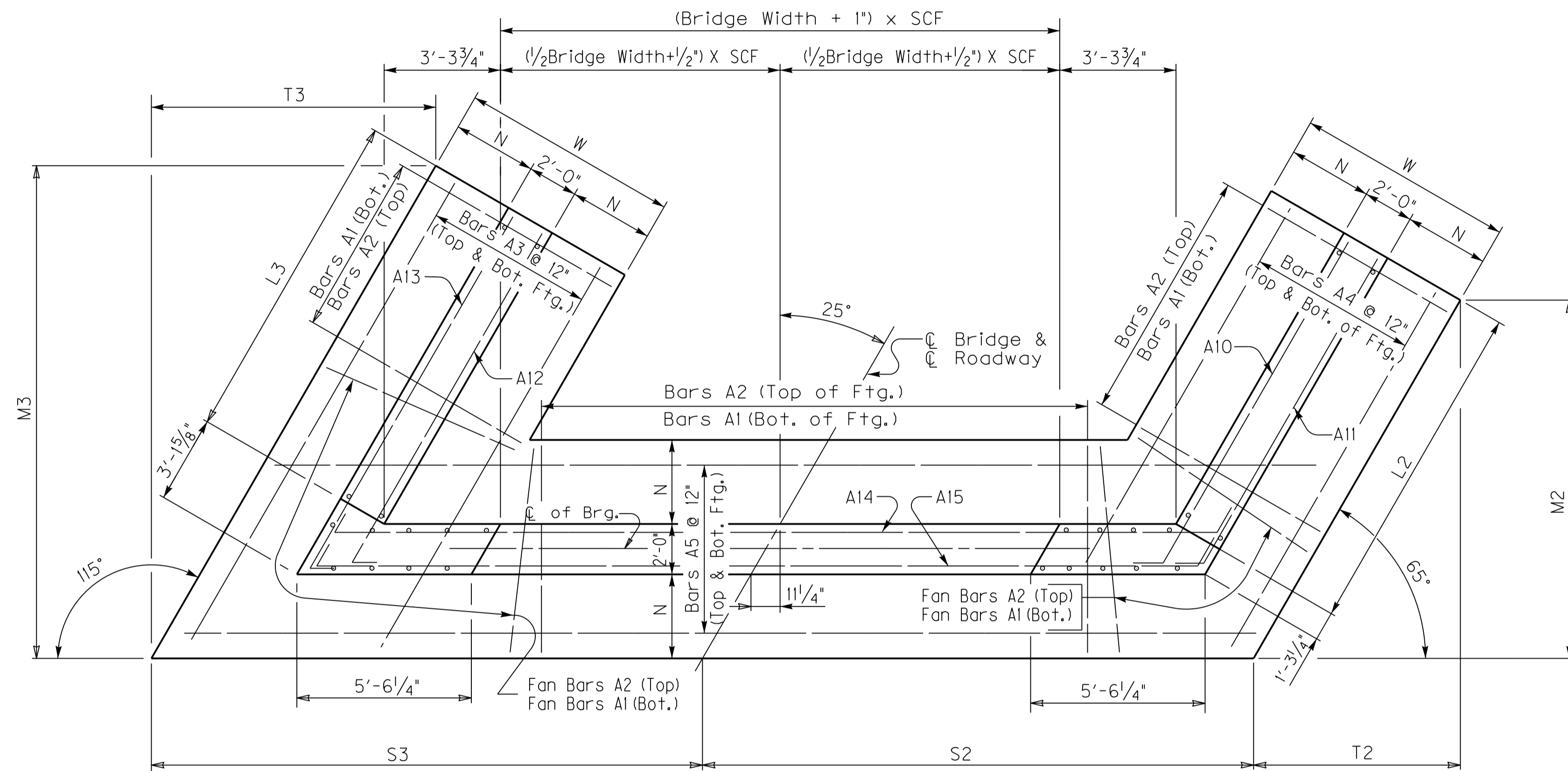
PLAN OF SUPERSTRUCTURE SLAB

ABUTMENT DETAILS

SKEW	WIDTH	DATE
20	VAR	October 2018

25° SKEW VARIABLE BRIDGE WIDTH 2:1 FILL SLOPES WINGS PARALLEL TO ROADWAY

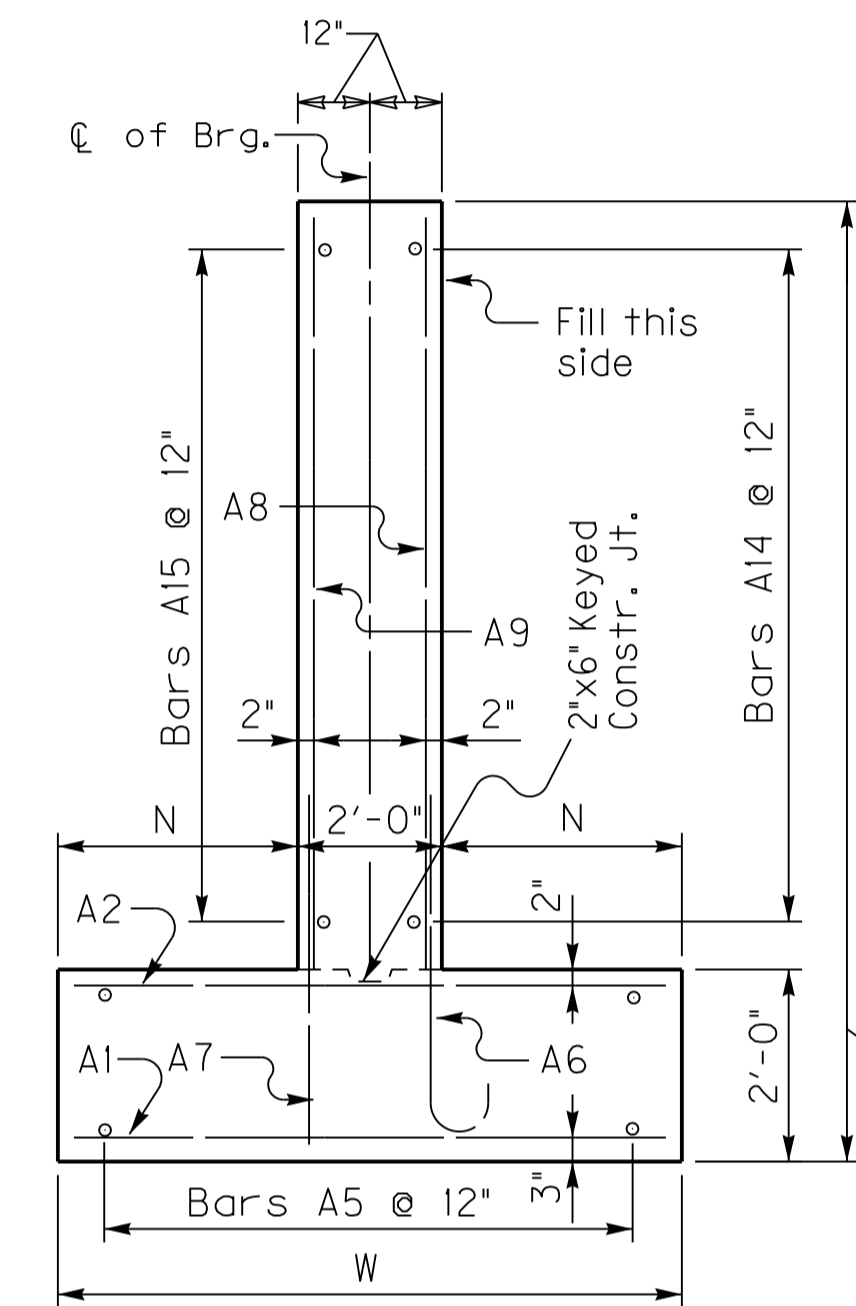
ABUTMENT SKEW CORRECTION FACTOR (SCF) = 1.103



(Left Skew as shown; right skew opp. hand)

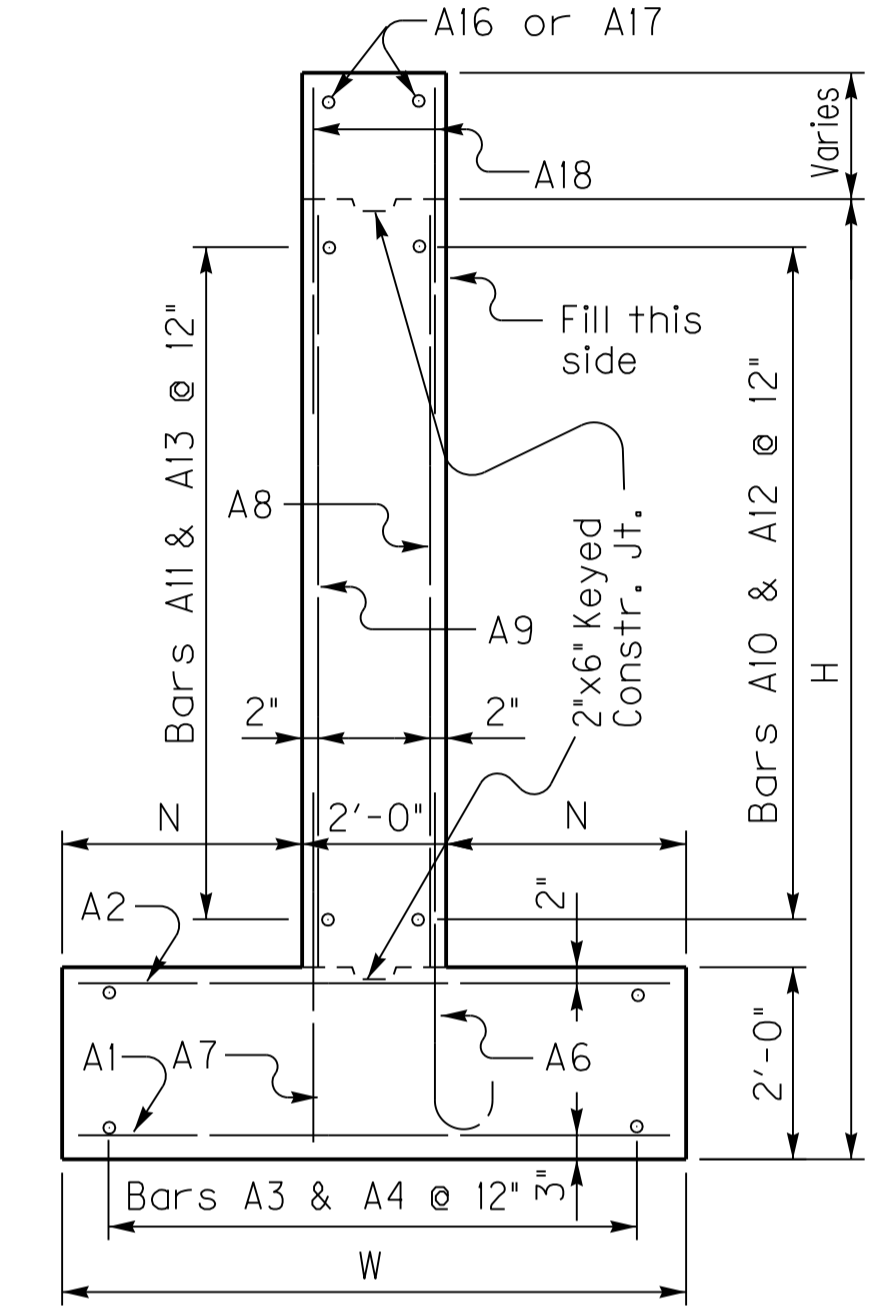
PLAN

Note: Trim A16 & A17 bars if necessary
Trim A3 bars as necessary

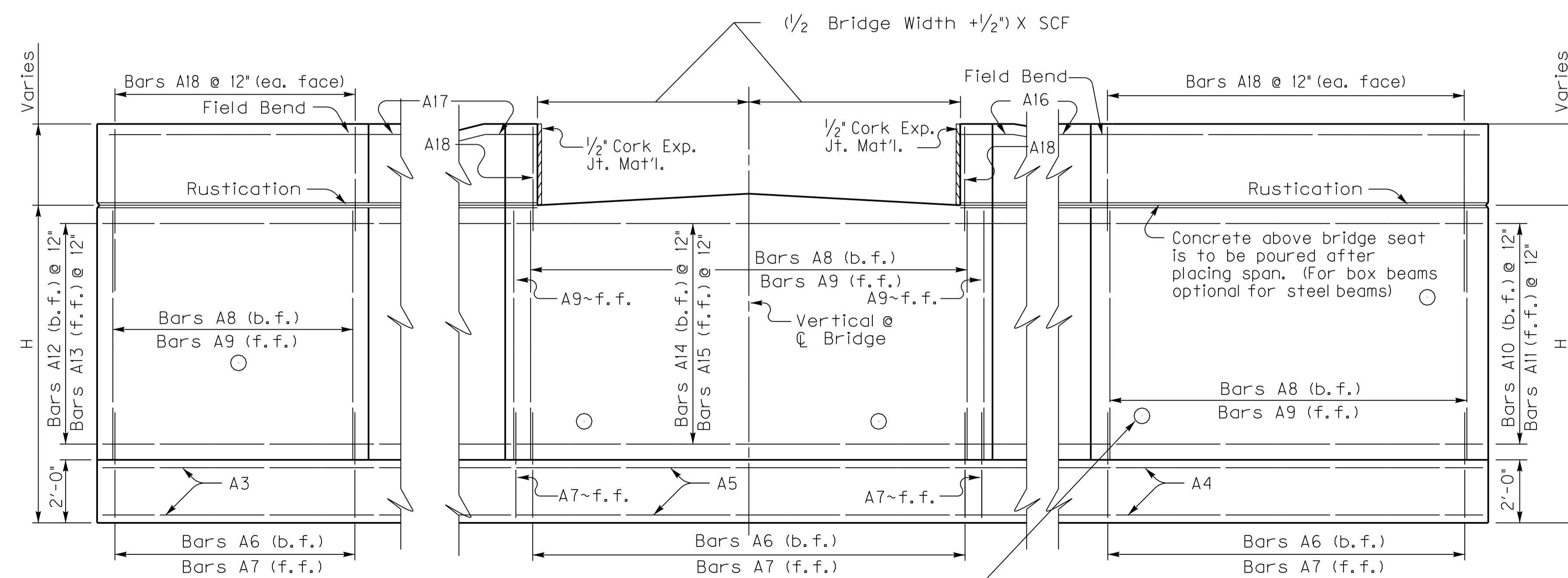


WALL SECTION

H = Low Bridge Seat. Slope seat for side by side box beams. Step cap as necessary for rolled steel beam superstructures to achieve a 2% cross slope on deck.

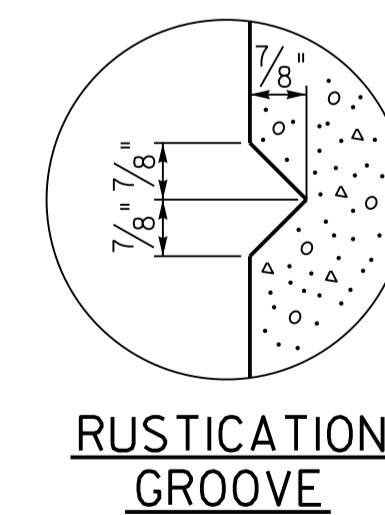


WING SECTION

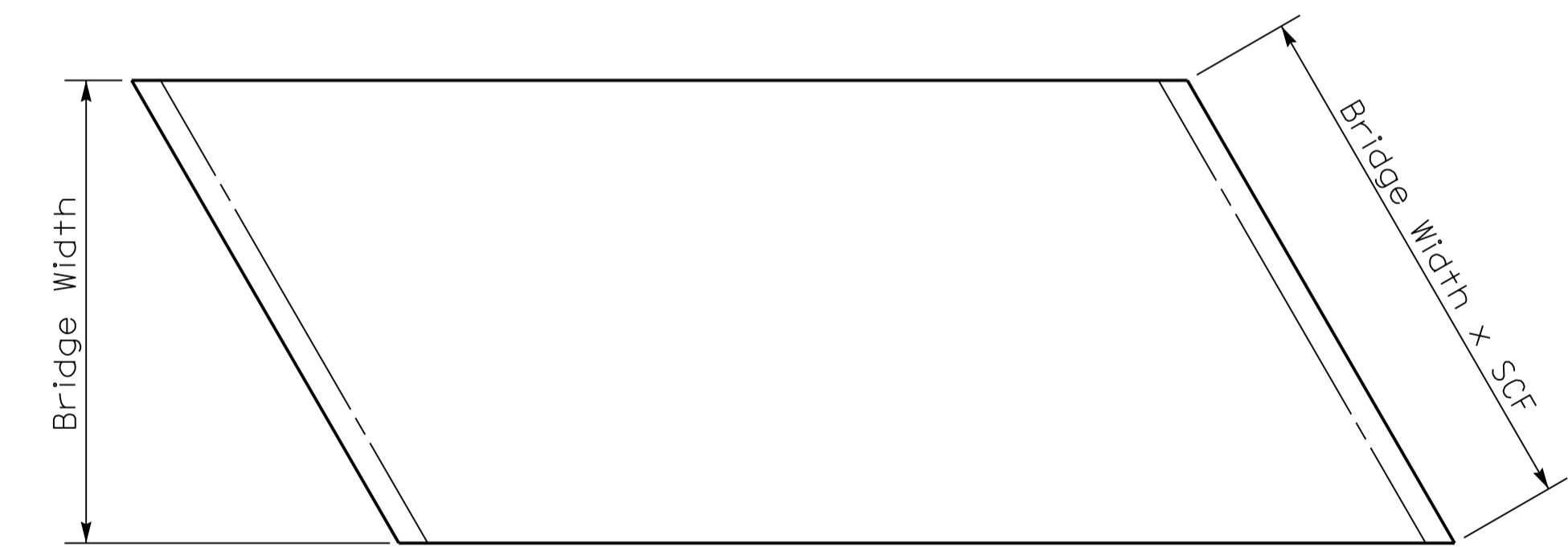


ELEVATION

Place 4\" weep hole drains at 8'-0\" centers at such elevation as to afford best drainage of backfill, in accordance with the Standard Specifications.



RUSTICATION GROOVE



PLAN OF SUPERSTRUCTURE SLAB

ABUTMENT DETAILS

SKEW	WIDTH	DATE
25	VAR	October 2018

25° SKEW VARIABLE BRIDGE WIDTH 2:1 FILL SLOPES WINGS PARALLEL TO ROADWAY

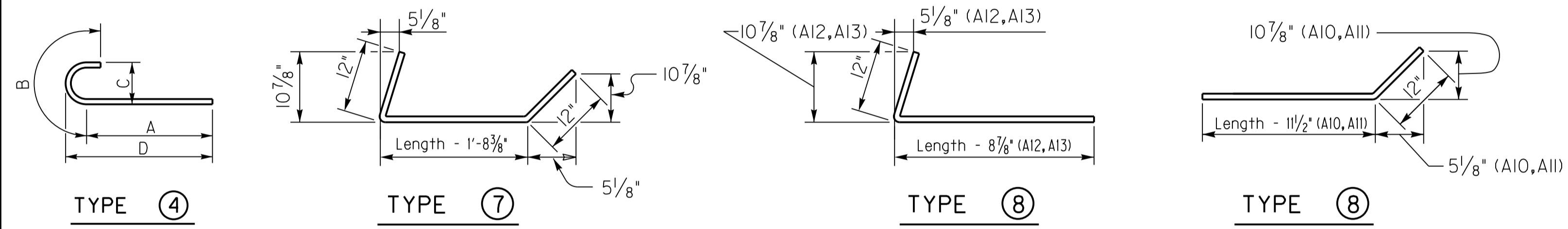
Bill of Reinforcement

MARK	A1		A2		A3	A4	A5		A6				A7	A8		A9	A10	A11	A12	A13	A14		A15	A16	A17	A18				
	No.	Length ft., in.	No.	Length ft., in.	No.	Length ft., in.	No.	Length ft., in.	No.	Length ft., in.	No.	Length ft., in.	No.	Length ft., in.	No.	Length ft., in.	No.	Length ft., in.	No.	Length ft., in.	No.	Length ft., in.	No.	Length ft., in.	No.	Length ft., in.				
15-16	103+Nb=	10 11 8 12	103+Nb=	7 11 8 12	24 42 5	24 36 4	24 21 4	+Lb=	71+Nb=	9 9 11	12 8 1/8	1 10 0	11 3/4 8 6	80+Nb=	5 4 11 12	71+Nb=	6 12 10 12	80+Nb=	12 10 12	14 34 6	14 34 0	14 34 8	14 35 8	14 12 4	+Lb=	14 12 4	+Lb=	2 38 8	2 40 7	156 5 9
13-14	93+Nb=	9 10 8 12	93+Nb=	7 10 8 12	22 37 8	22 32 0	22 20 3	+Lb=	63+Nb=	8 8 3	12 6 11 1	3 0 8 7 3	72+Nb=	5 4 11 12	63+Nb=	6 10 10 12	72+Nb=	10 10 12	12 30 6	12 30 0	12 30 8	12 31 8	12 12 4	+Lb=	12 12 4	+Lb=	2 34 8	2 36 7	140 5 9	
11-12	82+Nb=	8 9 8 12	82+Nb=	6 9 8 12	20 32 10	20 27 8	20 19 2	+Lb=	55+Nb=	7 7 1	12 5 10 1/2	1 2 0 7 6 2	64+Nb=	5 4 11 12	55+Nb=	5 8 10 12	64+Nb=	8 10 12	10 26 6	10 26 0	10 26 8	10 27 8	10 12 4	+Lb=	10 12 4	+Lb=	2 30 8	2 32 7	124 5 9	
9-10	70+Nb=	7 8 8 12	70+Nb=	5 8 8 12	18 27 1	18 22 4	18 18 0	+Lb=	45+Nb=	6 6 1	12 5 1 1	0 0 6 5 4	54+Nb=	5 4 11 12	45+Nb=	5 6 10 12	54+Nb=	6 10 12	8 21 7	8 21 0	8 21 8	8 22 8	8 12 4	+Lb=	8 12 4	+Lb=	2 25 8	2 27 7	104 5 9	
7-8	59+Nb=	6 7 2 12	59+Nb=	5 7 2 12	16 22 0	16 17 9	16 16 7	+Lb=	37+Nb=	5 5 7	12 4 8 1/2	0 10 0 5 4 11	46+Nb=	5 4 11 12	37+Nb=	5 4 10 12	46+Nb=	4 10 12	6 17 7	6 17 0	6 17 8	6 18 8	6 12 4	+Lb=	6 12 4	+Lb=	2 21 8	2 23 7	88 5 9	
5-6	49+Nb=	5 6 2 12	49+Nb=	5 6 2 12	14 17 3	14 13 6	14 15 6	+Lb=	29+Nb=	5 5 7	12 4 8 1/2	0 10 0 5 4 11	38+Nb=	5 4 11 12	29+Nb=	5 2 10 12	38+Nb=	2 10 12	4 13 7	4 13 0	4 13 8	4 14 8	4 12 4	+Lb=	4 12 4	+Lb=	2 17 8	2 19 7	72 5 9	

Table of Dimensions

H	W	N	M2	M3	T2	T3	L2	L3	S2			S3		
	Length ft., in.	Length ft., in.	Length ft., in.	Length ft., in.	Length ft., in.	Length ft., in.	Length ft., in.	Length ft., in.	Length ft., in.	+Lb/2 =	Length ft., in.	Length ft., in.	+Lb/2 =	Length ft., in.
15-16	12 0 5 0	33 1/2	38 11 1/2	15 4 7/8	18 2	32	32	11 1	11 1	+0.5Lb=	38 11 1/2	11 1	+0.5Lb=	38 11 1/2
13-14	11 0 4 6	29 1/2	34 7 1/2	13 7	16 1 3/4	28	28	10 6 3/8	10 6 3/8	+0.5Lb=	34 7 1/2	10 6 3/8	+0.5Lb=	34 7 1/2
11-12	10 0 4 0	25 2 5/8	30 3 1/2	11 9 1/8	14 1 1/2	24	24	9 11 3/4	9 11 3/4	+0.5Lb=	30 3 1/2	9 11 3/4	+0.5Lb=	30 3 1/2
9-10	9 0 3 6	20 4 3/4	25 1/2	9 6 1/8	11 8 1/8	19	19	9 5 1/8	9 5 1/8	+0.5Lb=	25 1/2	9 5 1/8	+0.5Lb=	25 1/2
7-8	7 6 2 9	16 4	20 4 1/4	7 7 3/8	9 5 7/8	15	15	8 7 1/8	8 7 1/8	+0.5Lb=	20 4 1/4	8 7 1/8	+0.5Lb=	20 4 1/4
5-6	6 6 2 3	12 5 1/8	16 1/8	5 9 1/2	7 5 5/8	11	11	8 1/2	8 1/2	+0.5Lb=	16 1/8	8 1/2	+0.5Lb=	16 1/8

Reinforcement Details



Quantities

H	Concrete*	Reinforcement
	C.Y.	LBS.
5	28.92+(0.71xLb) =	2717+(52.8xLb) =
6	31.37+(0.78xLb) =	2717+(52.8xLb) =
7	45.02+(0.93xLb) =	4118+(68.7xLb) =
8	48.07+(1.01xLb) =	4118+(68.7xLb) =
9	66.5+(1.19xLb) =	6216+(91xLb) =
10	70.14+(1.27xLb) =	6216+(91xLb) =
11	93.16+(1.41xLb) =	9465+(120.4xLb) =
12	97.54+(1.49xLb) =	9465+(120.4xLb) =
13	120.67+(1.64xLb) =	13914+(161xLb) =
14	125.64+(1.71xLb) =	13914+(161xLb) =
15	151.73+(1.86xLb) =	18748+(198.6xLb) =
16	157.3+(1.93xLb) =	18748+(198.6xLb) =

*Concrete quantities computed using 21" beam depth on 1/2" pad & Variable Bridge Width

ABUTMENT SKEW CORRECTION FACTOR (SCF) = 1.103

NUMBER OF BARS TO ADD (Nb) = Bridge Width (feet) x SCF (round up to nearest whole number)

LENGTH OF ABUTMENT TO ADD (Lb) = Bridge Width (feet) x SCF (convert decimal to architectural)

GENERAL NOTES

SPECIFICATIONS: Construct abutments according to the current edition of the Kentucky Department of Highways Standard Specifications for Road and Bridge Construction. Abutments are designed for side by side box beams as detailed in Standard Drawings BDP-001 through BDP-012, current edition. Dimensions may be adjusted to allow for any out to out bridge width. Abutments are also adequate for Std. Dwg. slabs or steel beam superstructures

FOUNDATION PRESSURE: Construct abutment footings on solid rock bearing material that can support a pressure of 8000 psf service or 10,800 psf strength factored, as recommended by a geotechnical engineer.

WING LENGTHS: Calculated assuming 21" superstructure depth and stream bank elevation at top of footing.

FOOTING ELEVATION: Construct bottom of footing below the anticipated scour elevation. (This typically entails embedding the footings 1'-0" to 2'-0" into rock and pouring concrete directly against cut rock faces, as recommended by geotechnical engineer.)

NOTE: Distances to bars shown are clear dimensions unless otherwise noted.

MATERIAL SPECIFICATIONS:
 Concrete, Class "A" = 3500 psi
 Steel Reinforcement = Grade 60

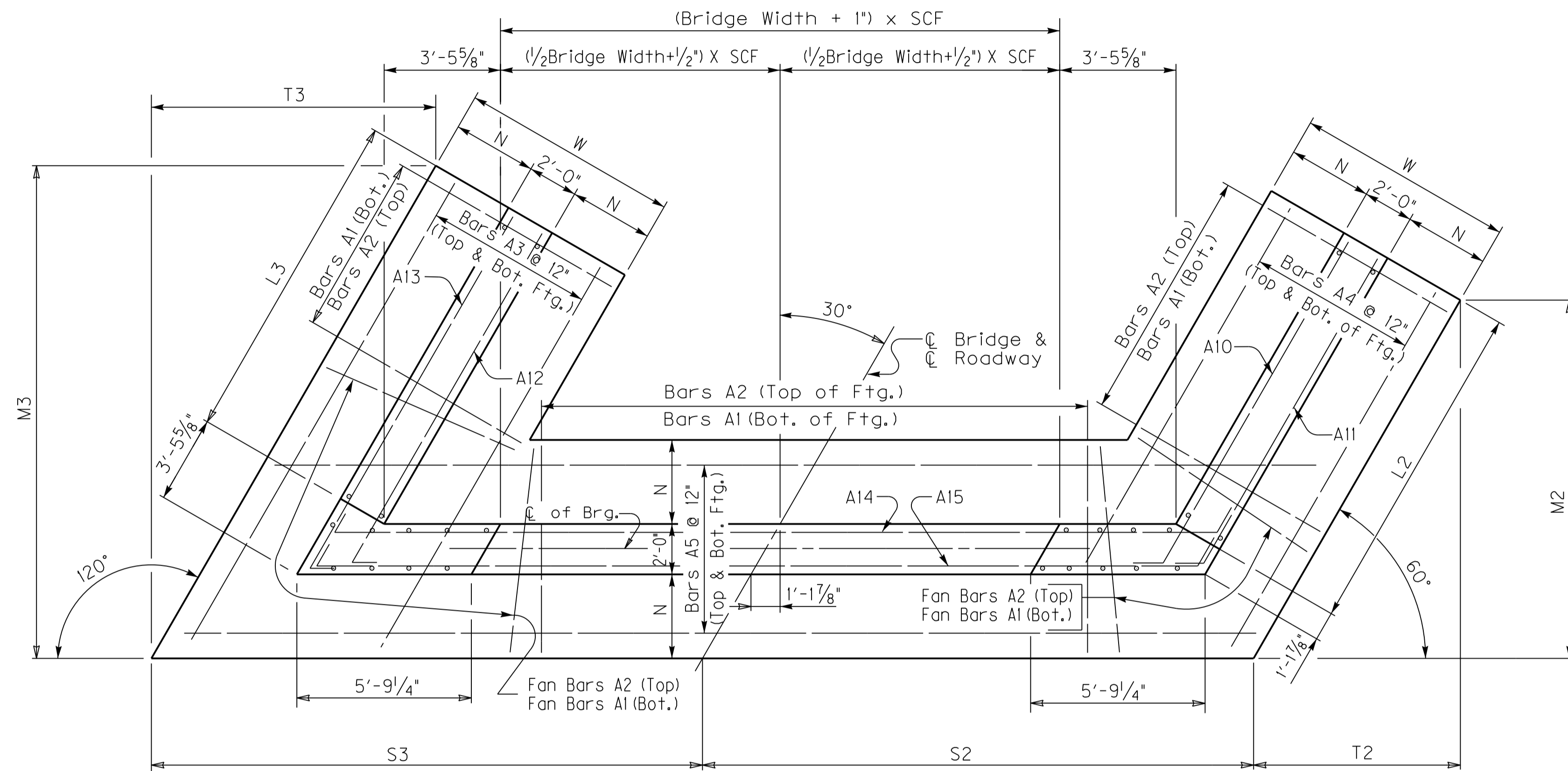


PLAN OF SUPERSTRUCTURE SLAB

ABUTMENT DETAILS		
SKEW	WIDTH	DATE
25	VAR	October 2018

30° SKEW VARIABLE BRIDGE WIDTH 2:1 FILL SLOPES WINGS PARALLEL TO ROADWAY

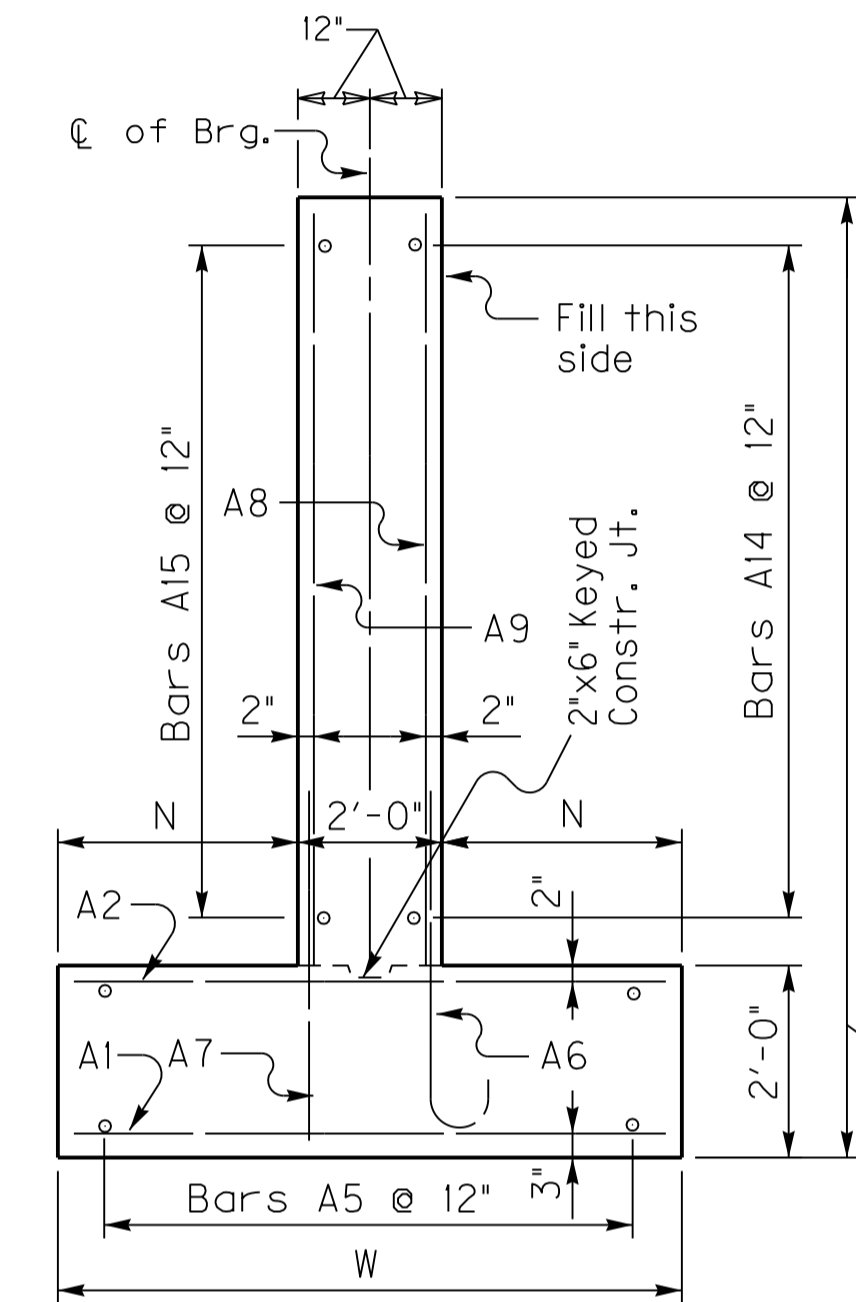
ABUTMENT SKEW CORRECTION FACTOR (SCF) = 1.155



(Left Skew as shown; right skew opp. hand)

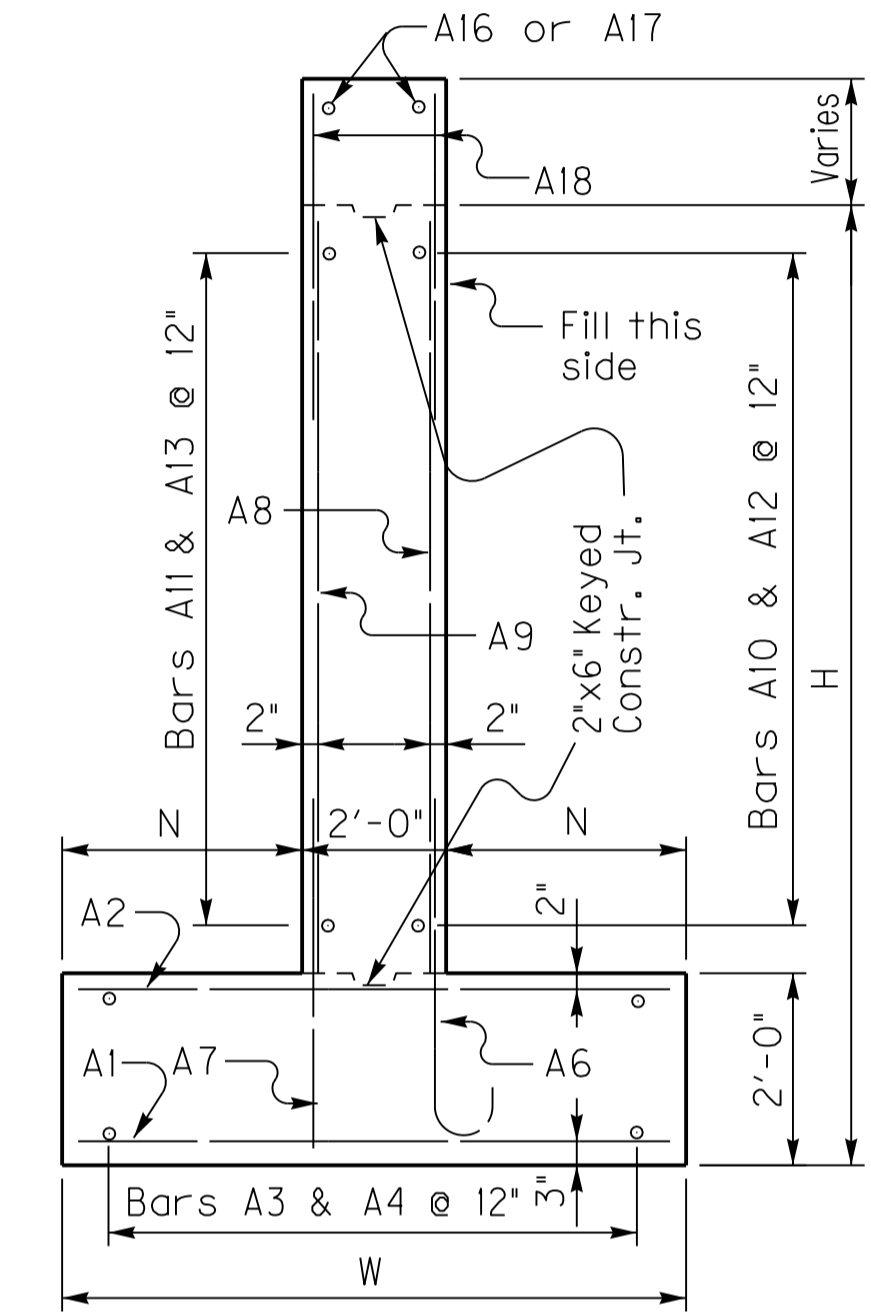
PLAN

Note: Trim A16 & A17 bars if necessary
Trim A3 bars as necessary

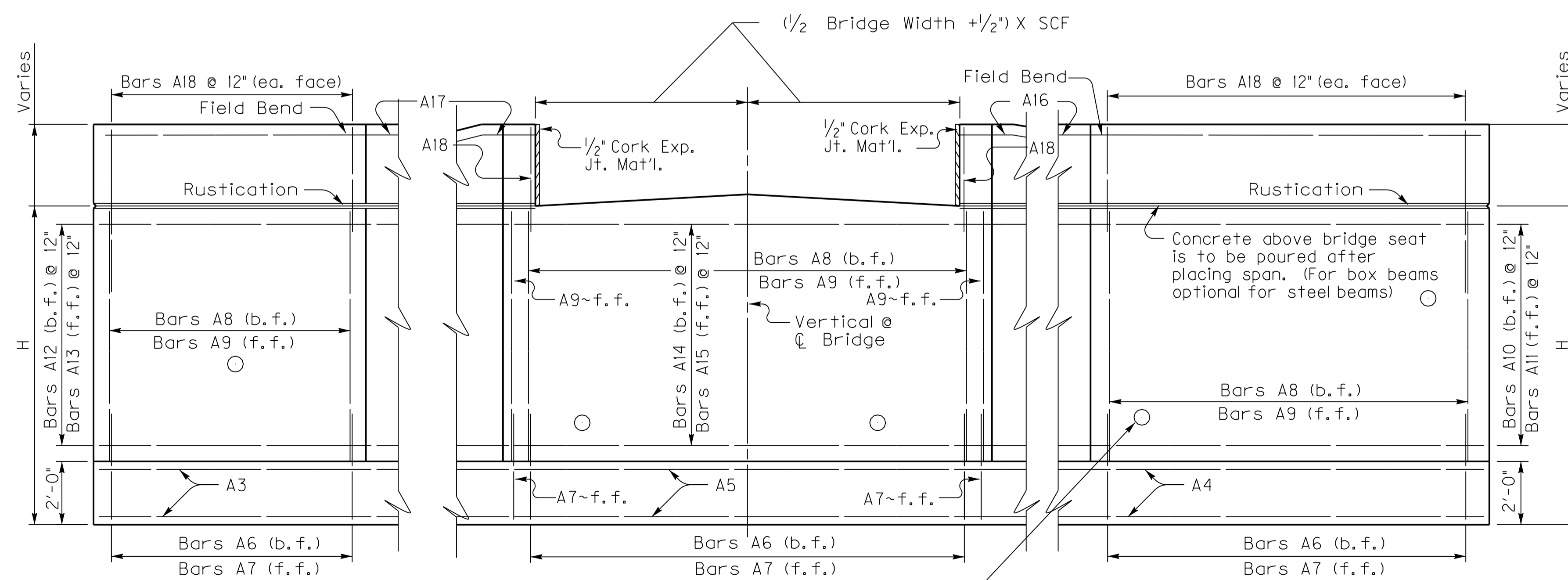


WALL SECTION

H = Low Bridge Seat. Slope seat for side by side box beams. Step cap as necessary for rolled steel beam superstructures to achieve a 2% cross slope on deck.



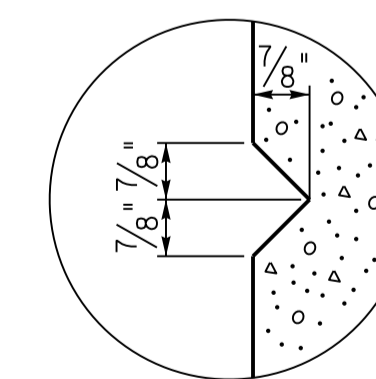
WING SECTION



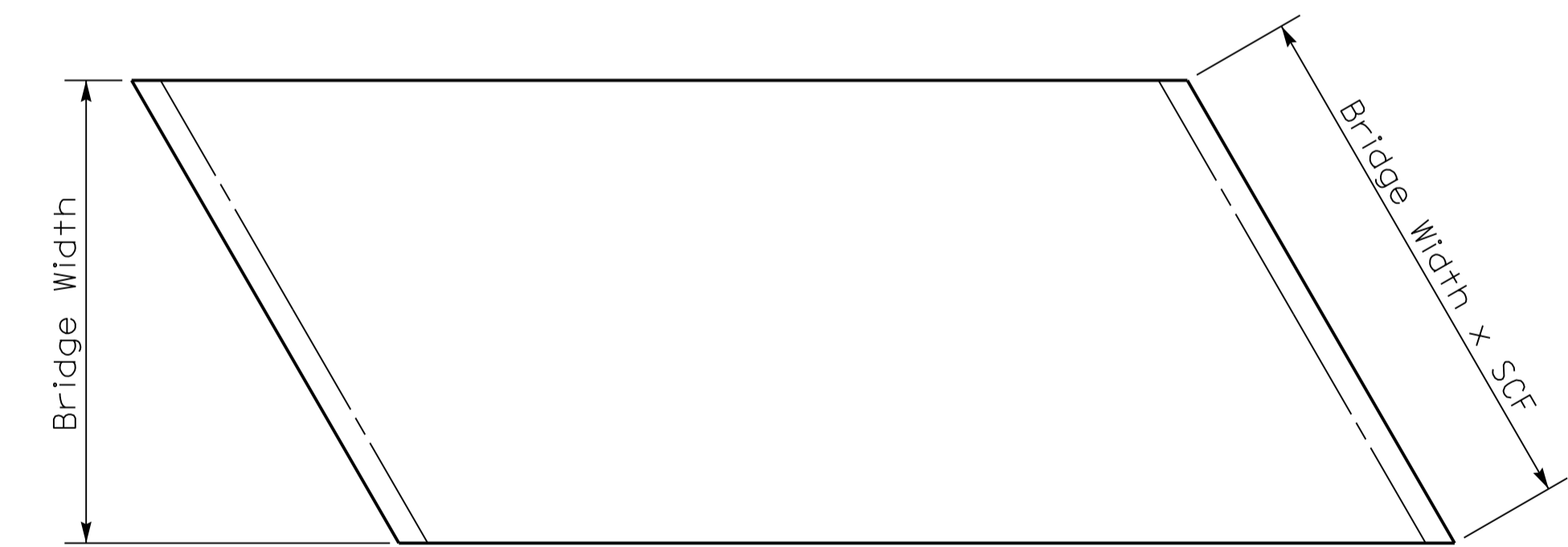
ELEVATION

Place 4\" weep hole drains at 8'-0\" centers at such elevation as to afford best drainage of backfill, in accordance with the Standard Specifications.

Depth of int. beam, bearing pad, haunch, and slab when req.



RUSTICATION GROOVE



PLAN OF SUPERSTRUCTURE SLAB

ABUTMENT DETAILS

SKEW	WIDTH	DATE
30	VAR	October 2018

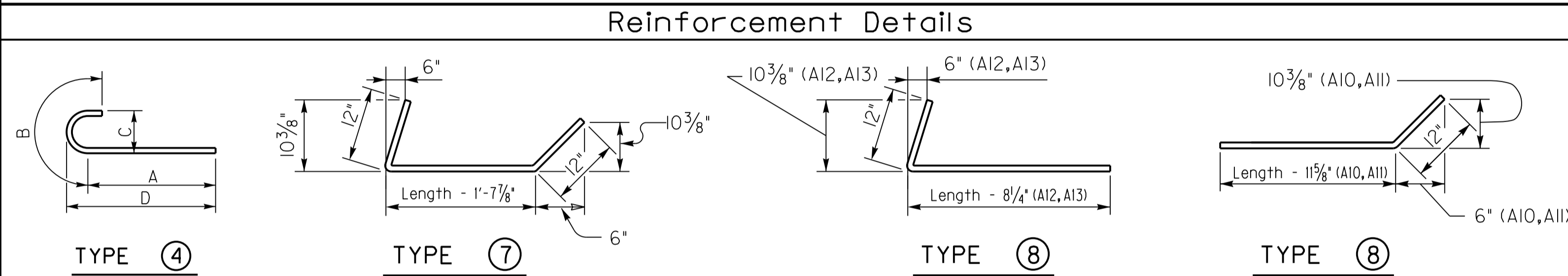
30° SKEW VARIABLE BRIDGE WIDTH 2:1 FILL SLOPES WINGS PARALLEL TO ROADWAY

Bill of Reinforcement

MARK	A1		A2		A3	A4	A5		A6				A7	A8		A9	A10	A11	A12	A13	A14		A15	A16	A17	A18		
	Type	Size	Type	Size	Type	Type	Type	Type	Type	Type	Type	Type	Type	Type	Type	Type	Type	Type	Type	Type	Type	Type	Type	Type	Type	Type		
15-16	108+Nb=	10 11 8 12	108+Nb=	7 11 8 12	24 45 6	24 37 11	24 22 3	+Lb=	76+Nb=	9 9 11 12	8 1/8 1 10 0 8 7 3	85+Nb=	5 4 11 12	76+Nb=	6 12 10 12	85+Nb=	12 10 12	14 36 8	14 35 11	14 36 8	14 37 11	14 12 9	+Lb=	14 12 9	+Lb=	2 40 10	2 43 2	165 5 9
13-14	96+Nb=	9 10 8 12	96+Nb=	7 10 8 12	22 39 8	22 32 8	22 21 1	+Lb=	66+Nb=	8 8 3 12 6 11 1 3 0 8 7 3	75+Nb=	5 4 11 12	66+Nb=	6 10 10 12	75+Nb=	10 10 12	12 31 8	12 30 11	12 31 8	12 32 11	12 12 9	+Lb=	12 12 9	+Lb=	2 35 10	2 38 2	145 5 9	
11-12	86+Nb=	8 9 8 12	86+Nb=	6 9 8 12	20 34 9	20 28 5	20 19 11	+Lb=	58+Nb=	7 7 1 12 5 10 1/2 1 2 0 7 6 2	67+Nb=	5 4 11 12	58+Nb=	5 8 10 12	67+Nb=	8 10 12	10 27 8	10 26 11	10 27 8	10 28 11	10 12 9	+Lb=	10 12 9	+Lb=	2 31 10	2 34 2	129 5 9	
9-10	73+Nb=	7 8 8 12	73+Nb=	5 8 8 12	18 28 11	18 23 1	18 18 10	+Lb=	48+Nb=	6 6 1 12 5 1 1 0 0 6 5 4	57+Nb=	5 4 11 12	48+Nb=	5 6 10 12	57+Nb=	6 10 12	8 22 8	8 21 11	8 22 8	8 23 11	8 12 9	+Lb=	8 12 9	+Lb=	2 26 10	2 29 2	109 5 9	
7-8	62+Nb=	6 7 2 12	62+Nb=	5 7 2 12	16 23 9	16 18 6	16 17 4	+Lb=	40+Nb=	5 5 7 12 4 8 1/2 0 10 0 5 4 11	49+Nb=	5 4 11 12	40+Nb=	5 4 10 12	49+Nb=	4 10 12	6 18 8	6 17 11	6 18 8	6 19 11	6 12 9	+Lb=	6 12 9	+Lb=	2 22 10	2 25 2	93 5 9	
5-6	50+Nb=	5 6 2 12	50+Nb=	5 6 2 12	14 17 10	14 13 3	14 16 2	+Lb=	30+Nb=	5 5 7 12 4 8 1/2 0 10 0 5 4 11	39+Nb=	5 4 11 12	30+Nb=	5 2 10 12	39+Nb=	2 10 12	4 13 8	4 12 11	4 13 8	4 14 11	4 12 9	+Lb=	4 12 9	+Lb=	2 17 10	2 20 2	73 5 9	

Table of Dimensions

H	W		N		M2		M3		T2		T3		L2		L3		S2		S3	
	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length
15-16	12 0	5 0	32 11 3/8	39 11 3/8	19 1/4	23 3/4	34	34	11 7/8	+0.5Lb=	11 7/8	+0.5Lb=	11 7/8	+0.5Lb=	11 7/8	+0.5Lb=	11 7/8	+0.5Lb=	11 7/8	+0.5Lb=
13-14	11 0	4 6	28 4 3/8	34 10 3/8	16 4 1/2	20 1 1/2	29	29	11 1/4	+0.5Lb=	11 1/4	+0.5Lb=	11 1/4	+0.5Lb=	11 1/4	+0.5Lb=	11 1/4	+0.5Lb=	11 1/4	+0.5Lb=
11-12	10 0	4 0	24 7 3/4	30 7 3/4	14 2 3/4	17 8 3/8	25	25	10 5/4	+0.5Lb=	10 5/4	+0.5Lb=	10 5/4	+0.5Lb=	10 5/4	+0.5Lb=	10 5/4	+0.5Lb=	10 5/4	+0.5Lb=
9-10	9 0	3 6	20 7/8	25 6 7/8	11 7	14 9 1/8	20	20	9 10 3/8	+0.5Lb=	9 10 3/8	+0.5Lb=	9 10 3/8	+0.5Lb=	9 10 3/8	+0.5Lb=	9 10 3/8	+0.5Lb=	9 10 3/8	+0.5Lb=
7-8	7 6	2 9	16 2 3/4	20 1 3/4	9 4 1/2	12 1 3/8	16	16	9 0	+0.5Lb=	9 0	+0.5Lb=	9 0	+0.5Lb=	9 0	+0.5Lb=	9 0	+0.5Lb=	9 0	+0.5Lb=
5-6	6 6	2 3	11 7 7/8	15 10 7/8	6 8 3/4	9 2 1/8	11	11	8 5	+0.5Lb=	8 5	+0.5Lb=	8 5	+0.5Lb=	8 5	+0.5Lb=	8 5	+0.5Lb=	8 5	+0.5Lb=



Quantities

H	Concrete*	Reinforcement
	C.Y.	LBS.
5	29.38+(0.71xLb) =	2774+(52.8xLb) =
6	31.87+(0.78xLb) =	2774+(52.8xLb) =
7	47.78+(0.93xLb) =	4359+(68.7xLb) =
8	51.01+(1.01xLb) =	4359+(68.7xLb) =
9	69.91+(1.19xLb) =	6526+(91xLb) =
10	73.73+(1.27xLb) =	6526+(91xLb) =
11	97.12+(1.41xLb) =	9903+(120.4xLb) =
12	101.69+(1.49xLb) =	9903+(120.4xLb) =
13	125.19+(1.64xLb) =	14434+(161xLb) =
14	130.35+(1.71xLb) =	14434+(161xLb) =
15	160.85+(1.86xLb) =	19807+(198.6xLb) =
16	166.75+(1.93xLb) =	19807+(198.6xLb) =

*Concrete quantities computed using 21" beam depth on 1/2" pad & Variable Bridge Width

ABUTMENT SKEW CORRECTION FACTOR (SCF) = 1.155

NUMBER OF BARS TO ADD (Nb) = Bridge Width (feet) x SCF (round up to nearest whole number)

LENGTH OF ABUTMENT TO ADD (Lb) = Bridge Width (feet) x SCF (convert decimal to architectural)

GENERAL NOTES

SPECIFICATIONS: Construct abutments according to the current edition of the Kentucky Department of Highways Standard Specifications for Road and Bridge Construction. Abutments are designed for side by side box beams as detailed in Standard Drawings BDP-001 through BDP-012, current edition. Dimensions may be adjusted to allow for any out to out bridge width. Abutments are also adequate for Std. Dwg. slabs or steel beam superstructures

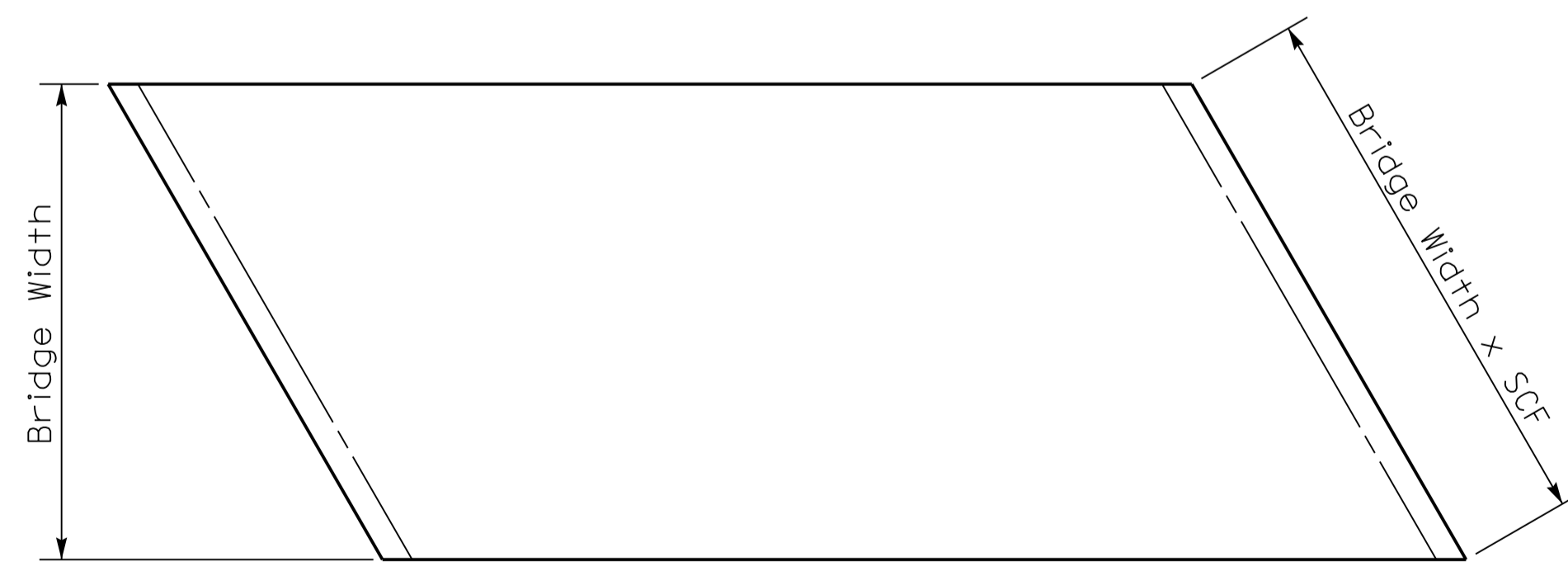
FOUNDATION PRESSURE: Construct abutment footings on solid rock bearing material that can support a pressure of 8000 psf service or 10,800 psf strength factored, as recommended by a geotechnical engineer.

WING LENGTHS: Calculated assuming 21" superstructure depth and stream bank elevation at top of footing.

FOOTING ELEVATION: Construct bottom of footing below the anticipated scour elevation. (This typically entails embedding the footings 1'-0" to 2'-0" into rock and pouring concrete directly against cut rock faces, as recommended by geotechnical engineer.)

NOTE: Distances to bars shown are clear dimensions unless otherwise noted.

MATERIAL SPECIFICATIONS:
 Concrete, Class "A" = 3500 psi
 Steel Reinforcement = Grade 60



PLAN OF SUPERSTRUCTURE SLAB

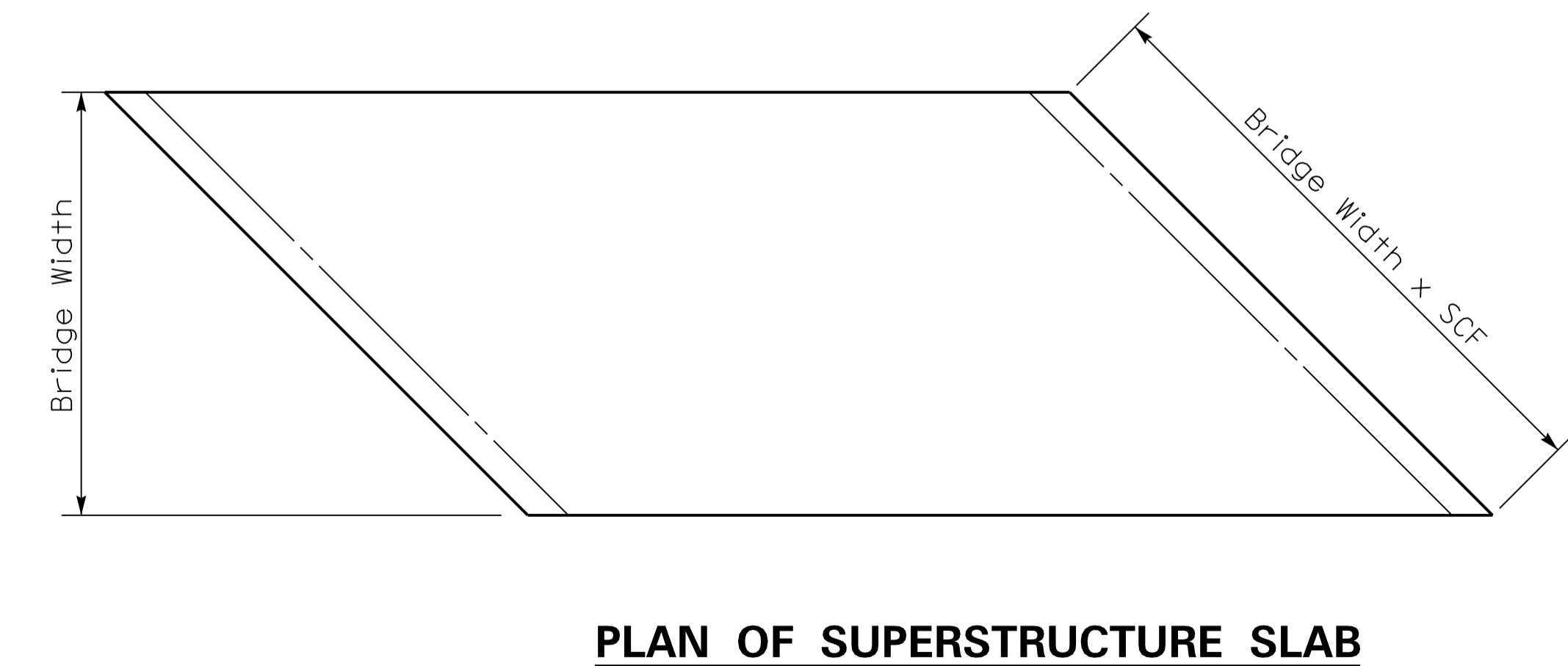
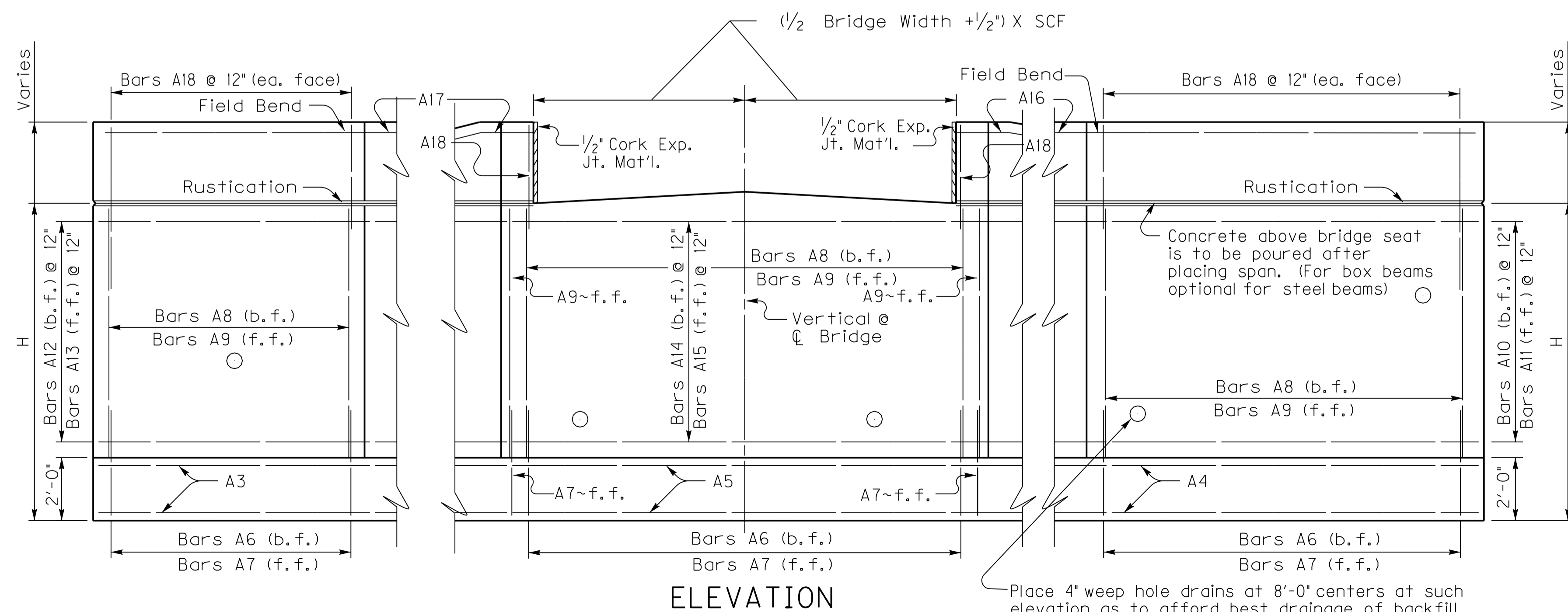
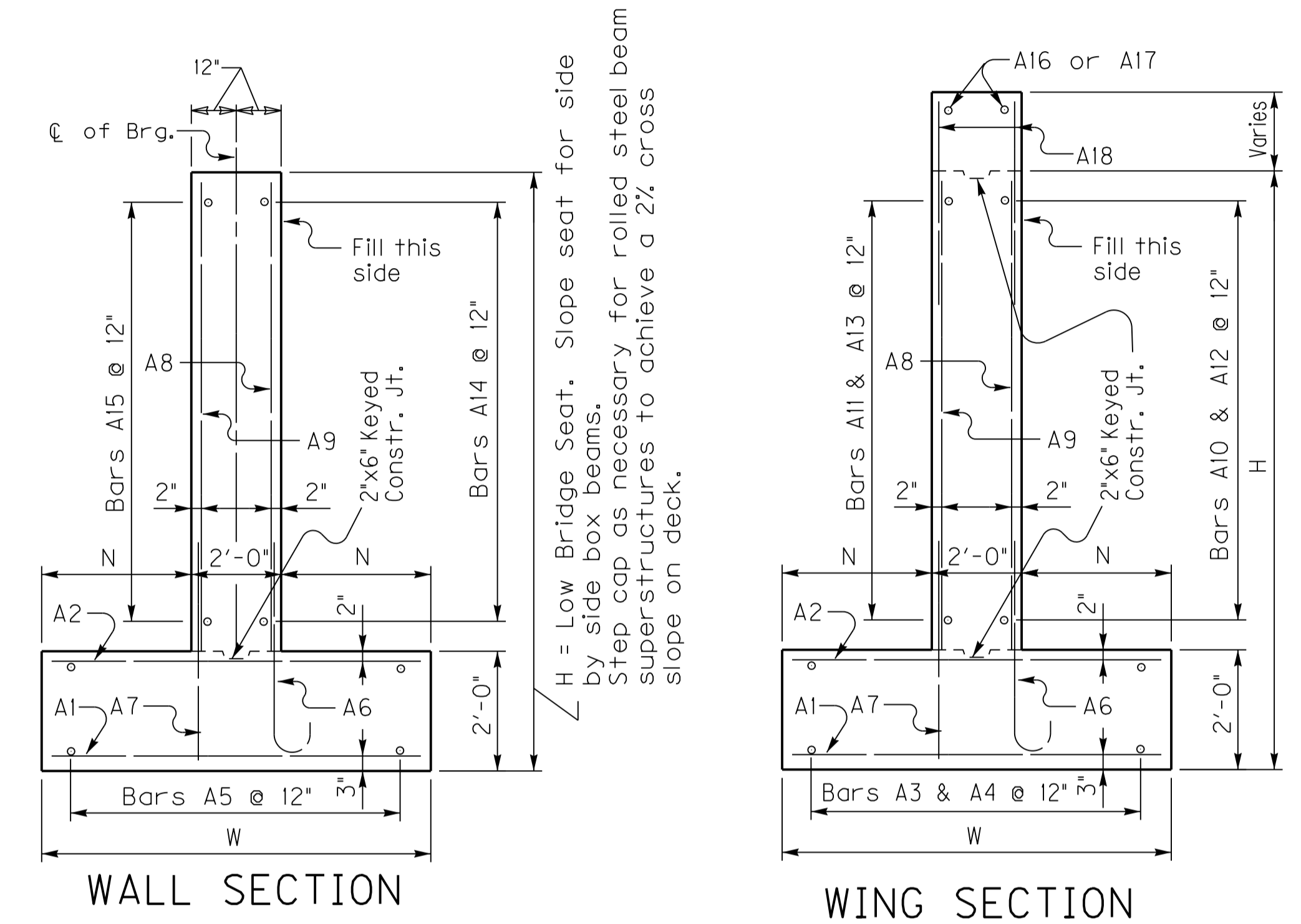
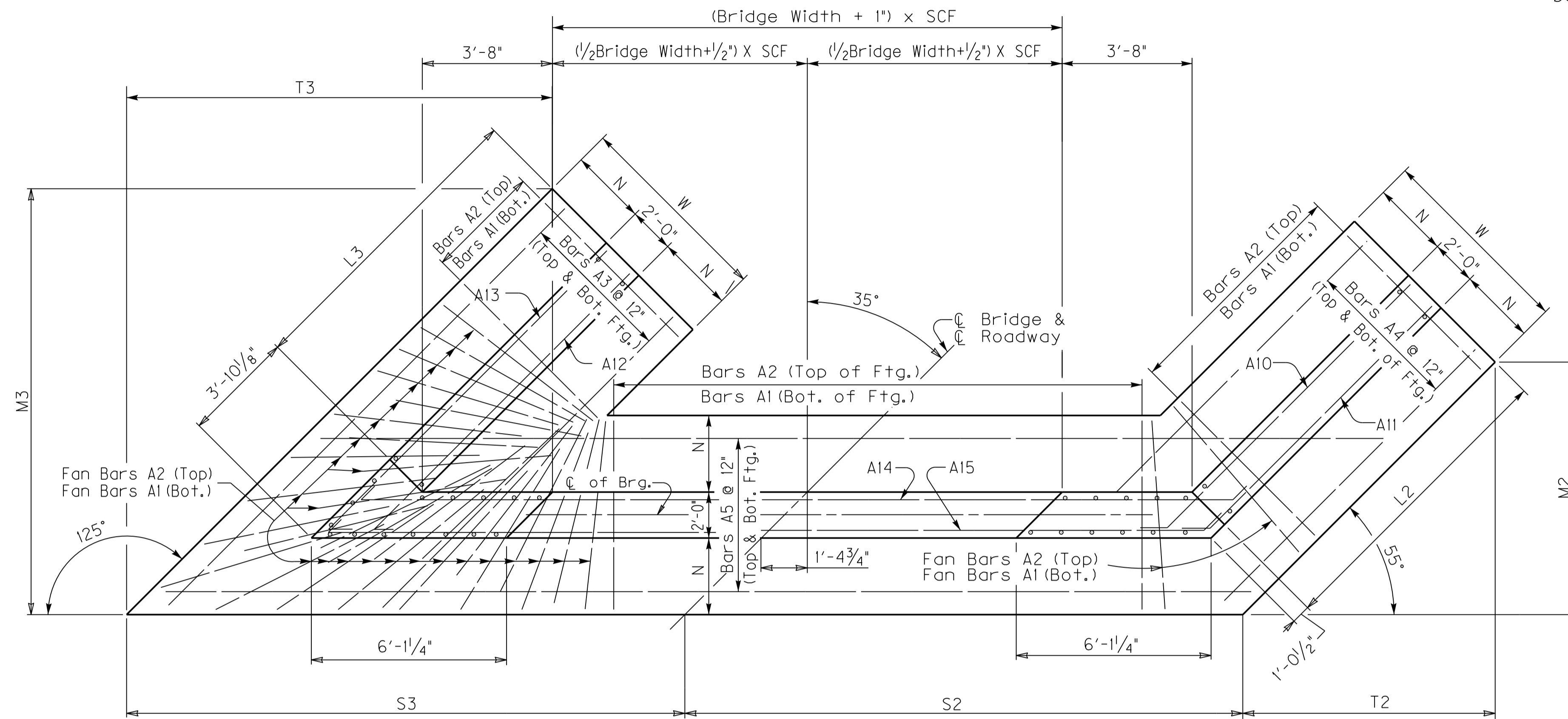
ABUTMENT DETAILS

SKEW	WIDTH	DATE
30	VAR	October 2018

35° SKEW VARIABLE BRIDGE WIDTH 2:1 FILL SLOPES WINGS PARALLEL TO ROADWAY

ABUTMENT SKEW CORRECTION FACTOR (SCF) = 1.221

For fanning A1 & A2 bars with an acute angle, space @ 12" at face of toe, then as you get closer to the corner start pulling every other bar back toward the heel. (Similar to as shown)



ABUTMENT DETAILS

SKEW	WIDTH	DATE
35	VAR	October 2018

35° SKEW VARIABLE BRIDGE WIDTH 2:1 FILL SLOPES WINGS PARALLEL TO ROADWAY

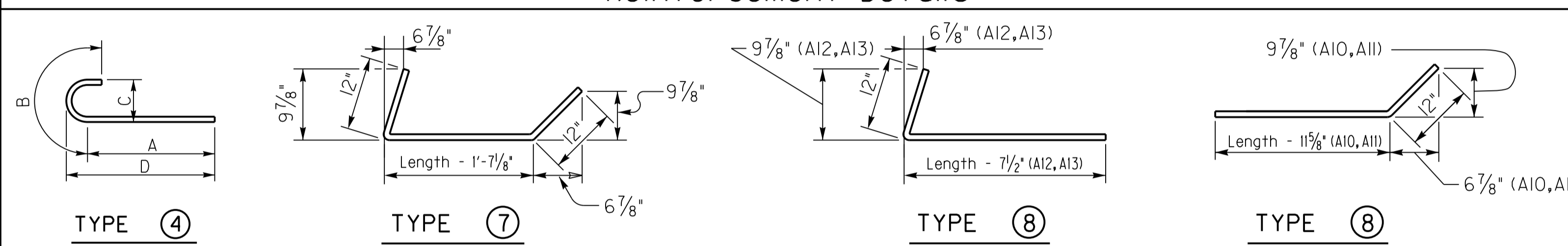
Bill of Reinforcement

MARK	A1		A2		A3	A4	A5		A6				A7	A8		A9	A10	A11	A12	A13	A14		A15	A16	A17	A18					
TYPE	Str.		Str.		Str.	Str.	Str.		4				Str.	Str.		Str.	8	8	8	8	7		7	Str.	Str.	Str.					
SIZE	#5		#5		#5	#5	#5		#5				#5	#5		#5	#5	#5	#5	#5	#5		#5	#5	#5	#5					
H	No.	Size	Length ft., in.	Spacing	No.	Size	Length ft., in.	Spacing	No.	Length ft., in.	No.	Length ft., in.	No.	Length ft., in.	No.	Length ft., in.	Spacing	No.	Length ft., in.	Spacing	No.	Length ft., in.	Spacing	No.	Length ft., in.	Spacing					
15-16	115+Nb=	10 11 8 12	115+Nb=	7 11 8 12	24 48 9	24 39 7	24 23 5	+Lb=	80+Nb=	9 9 11 12	8 1/8	1 10 0	11 3/4	8 6	90+Nb=	5 4 11 12	80+Nb=	6 12 10 12	90+Nb=	12 10 12	14 38 9	14 37 10	14 38 10	14 40 4	14 13 4	+Lb=	14 13 4	+Lb=	2 43 1	2 45 10	175 5 9
13-14	102+Nb=	9 10 8 12	102+Nb=	7 10 8 12	22 42 9	22 34 4	22 22 3	+Lb=	70+Nb=	8 8 3 12	6 11 1 3 0	8 7 3	80+Nb=	5 4 11 12	70+Nb=	6 10 10 12	80+Nb=	10 10 12	80+Nb=	12 10 12	12 33 9	12 32 10	12 33 10	12 35 4	12 13 4	+Lb=	12 13 4	+Lb=	2 38 1	2 40 10	155 5 9
11-12	90+Nb=	8 9 8 12	90+Nb=	6 9 8 12	20 36 10	20 29 1	20 21 0	+Lb=	60+Nb=	7 7 1 12	5 10 1/2	1 2 0	7 6 2	70+Nb=	5 4 11 12	60+Nb=	5 8 10 12	70+Nb=	8 10 12	10 28 9	10 27 10	10 28 10	10 30 4	10 13 4	+Lb=	10 13 4	+Lb=	2 33 1	2 35 10	135 5 9	
9-10	77+Nb=	7 8 8 12	77+Nb=	5 8 8 12	18 30 10	18 23 10	18 19 9	+Lb=	50+Nb=	6 6 1 12	5 1 1 0 0	6 5 4	60+Nb=	5 4 11 12	50+Nb=	5 6 10 12	60+Nb=	6 10 12	8 23 9	8 22 10	8 23 10	8 25 4	8 13 4	+Lb=	8 13 4	+Lb=	2 28 1	2 30 10	115 5 9		
7-8	66+Nb=	6 7 2 12	66+Nb=	5 7 2 12	16 25 7	16 19 3	16 18 4	+Lb=	42+Nb=	5 5 7 12	4 8 1/2	0 10 0	5 4 11	52+Nb=	5 4 11 12	42+Nb=	5 4 10 12	52+Nb=	4 10 12	6 19 9	6 18 10	6 19 10	6 21 4	6 13 4	+Lb=	6 13 4	+Lb=	2 24 1	2 26 10	99 5 9	
5-6	53+Nb=	5 6 2 12	53+Nb=	5 6 2 12	14 19 8	14 14 0	14 17 1	+Lb=	32+Nb=	5 5 7 12	4 8 1/2	0 10 0	5 4 11	42+Nb=	5 4 11 12	32+Nb=	5 2 10 12	42+Nb=	2 10 12	4 14 9	4 13 10	4 14 10	4 16 4	4 13 4	+Lb=	4 13 4	+Lb=	2 19 1	2 21 10	79 5 9	

Table of Dimensions

H	W	N	M2	M3	T2	T3	L2	L3	S2		S3			
Length ft., in.	Length ft., in.	Length ft., in.	Length ft., in.	Length ft., in.	Length ft., in.	Length ft., in.	Length ft., in.	Length ft., in.	Length ft., in.	+Lb/ 2 =	Length ft., in.	Length ft., in.	+Lb/ 2 =	Length ft., in.
15-16	12 0	5 0	32 5 3/4	40 6	22 8 7/8	28 4 3/8	36	36	12 3 1/8	+0.5Lb=	40 6	12 3 1/8	+0.5Lb=	
13-14	11 0	4 6	28 2	35 7 1/2	19 8 5/8	24 11 3/8	31	31	11 7 3/4	+0.5Lb=	31	11 7 3/4	+0.5Lb=	
11-12	10 0	4 0	23 10 1/4	30 8 7/8	16 8 1/2	21 6 1/4	26	26	11 1/2	+0.5Lb=	11 1/2	+0.5Lb=		
9-10	9 0	3 6	19 6 5/8	25 10 1/4	13 8 1/4	18 1 1/4	21	21	10 5 1/8	+0.5Lb=	10 5 1/8	+0.5Lb=		
7-8	7 6	2 9	15 11 3/8	21 4 3/4	11 2	14 11 7/8	17	17	9 6 1/8	+0.5Lb=	9 6 1/8	+0.5Lb=		
5-6	6 6	2 3	11 7 3/4	16 6 1/4	8 1 7/8	11 6 3/4	12	12	8 10 7/8	+0.5Lb=	8 10 7/8	+0.5Lb=		

Reinforcement Details



Quantities

H	Concrete* C.Y.	Reinforcement LBS.
5	31.7+(0.71xLb) =	2972+(52.8xLb) =
6	34.39+(0.78xLb) =	2972+(52.8xLb) =
7	50.7+(0.93xLb) =	4623+(68.7xLb) =
8	54.13+(1.01xLb) =	4623+(68.7xLb) =
9	73.52+(1.19xLb) =	6860+(91xLb) =
10	77.54+(1.27xLb) =	6860+(91xLb) =
11	101.33+(1.41xLb) =	10338+(120.4xLb) =
12	106.09+(1.49xLb) =	10338+(120.4xLb) =
13	133.58+(1.64xLb) =	15348+(161xLb) =
14	139.09+(1.71xLb) =	15348+(161xLb) =
15	170.28+(1.86xLb) =	20987+(198.6xLb) =
16	176.52+(1.93xLb) =	20987+(198.6xLb) =

ABUTMENT SKEW CORRECTION FACTOR (SCF) = 1.221

NUMBER OF BARS TO ADD (Nb) = Bridge Width (feet) x SCF

(round up to nearest whole number)

LENGTH OF ABUTMENT TO ADD (Lb) = Bridge Width (feet) x SCF

(convert decimal to architectural)

*Concrete quantities computed using 21" beam depth on 1/2" pad & Variable Bridge Width

GENERAL NOTES

SPECIFICATIONS: Construct abutments according to the current edition of the Kentucky Department of Highways Standard Specifications for Road and Bridge Construction. Abutments are designed for side by side box beams as detailed in Standard Drawings BDP-001 through BDP-012, current edition. Dimensions may be adjusted to allow for any out to out bridge width. Abutments are also adequate for Std. Dwg. slabs or steel beam superstructures

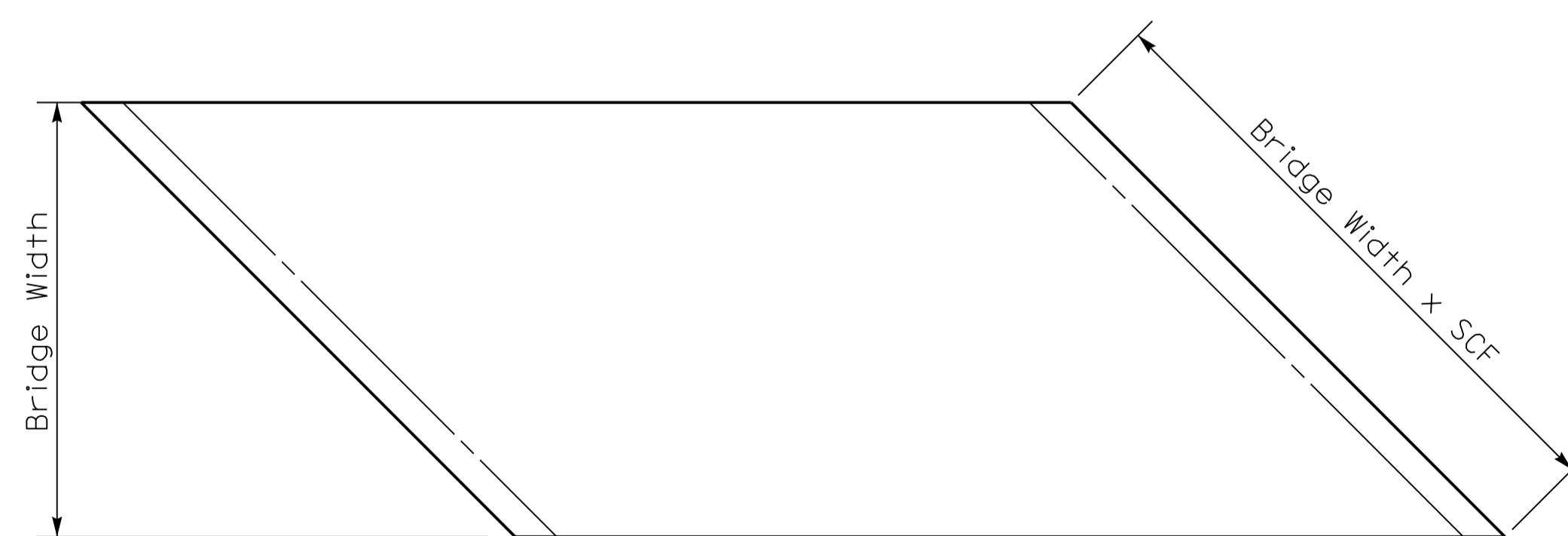
FOUNDATION PRESSURE: Construct abutment footings on solid rock bearing material that can support a pressure of 8000 psf service or 10,800 psf strength factored, as recommended by a geotechnical engineer.

WING LENGTHS: Calculated assuming 21" superstructure depth and stream bank elevation at top of footing.

FOOTING ELEVATION: Construct bottom of footing below the anticipated scour elevation. (This typically entails embedding the footings 1'-0" to 2'-0" into rock and pouring concrete directly against cut rock faces, as recommended by geotechnical engineer.)

NOTE: Distances to bars shown are clear dimensions unless otherwise noted.

MATERIAL SPECIFICATIONS:
Concrete, Class "A" = 3500 psi
Steel Reinforcement = Grade 60



PLAN OF SUPERSTRUCTURE SLAB

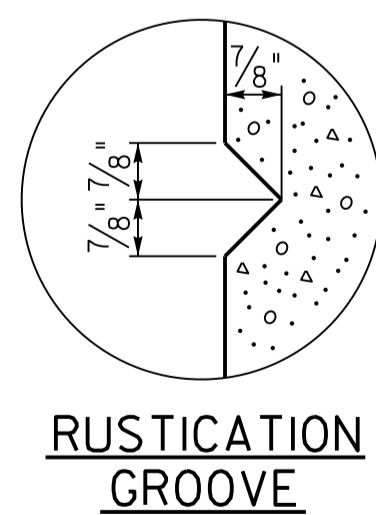
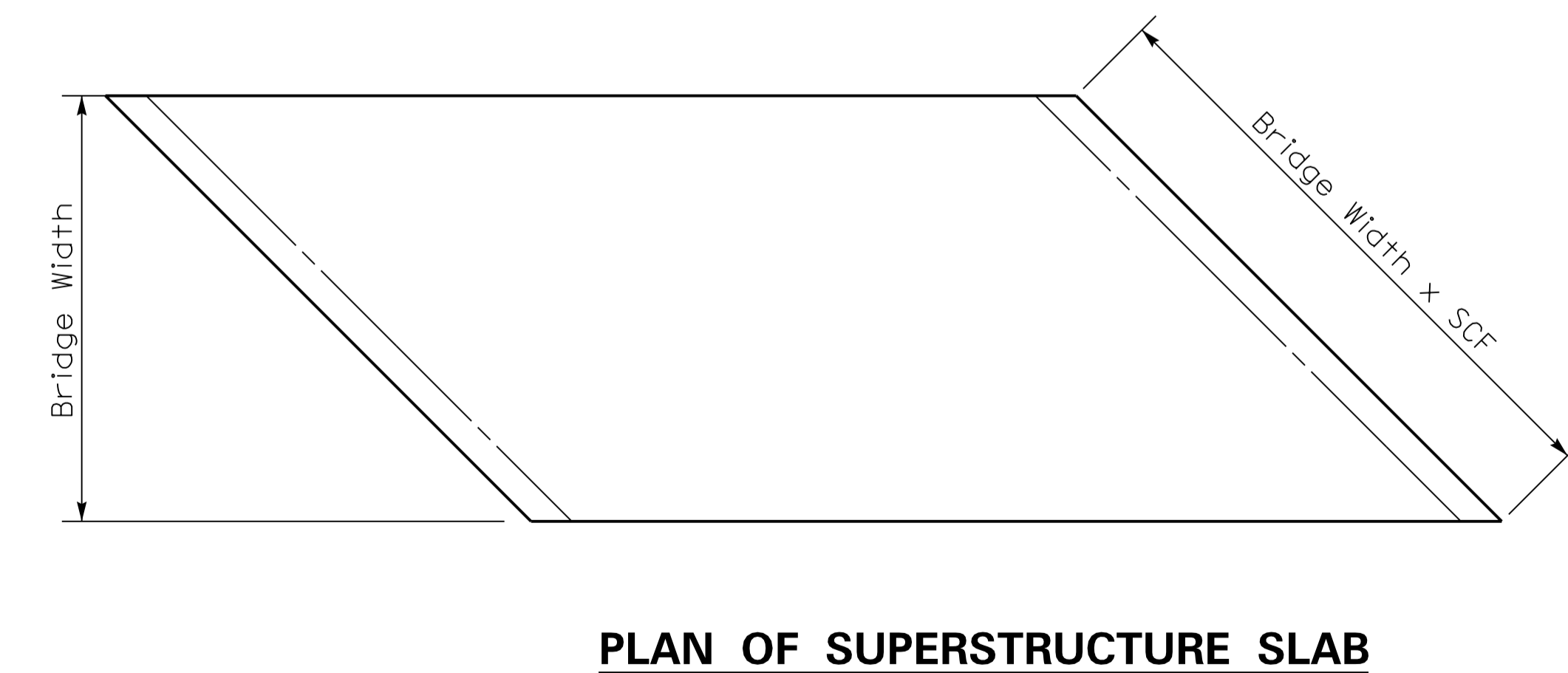
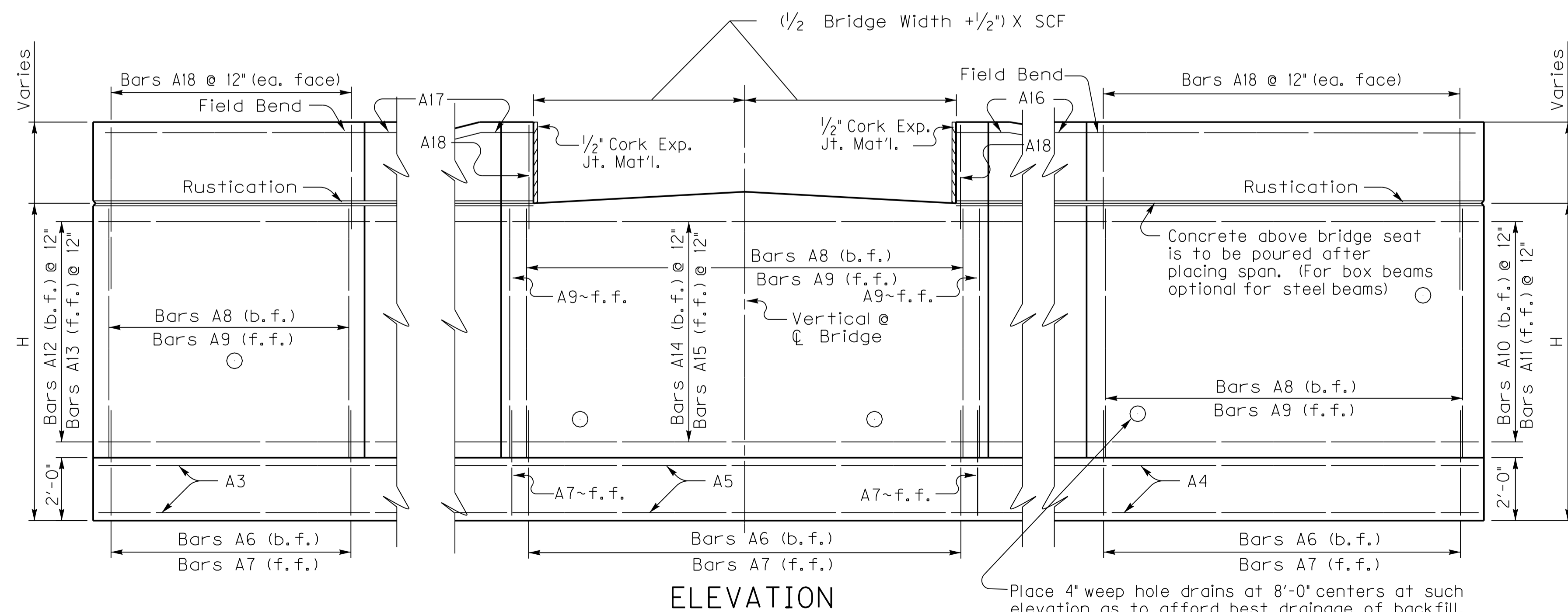
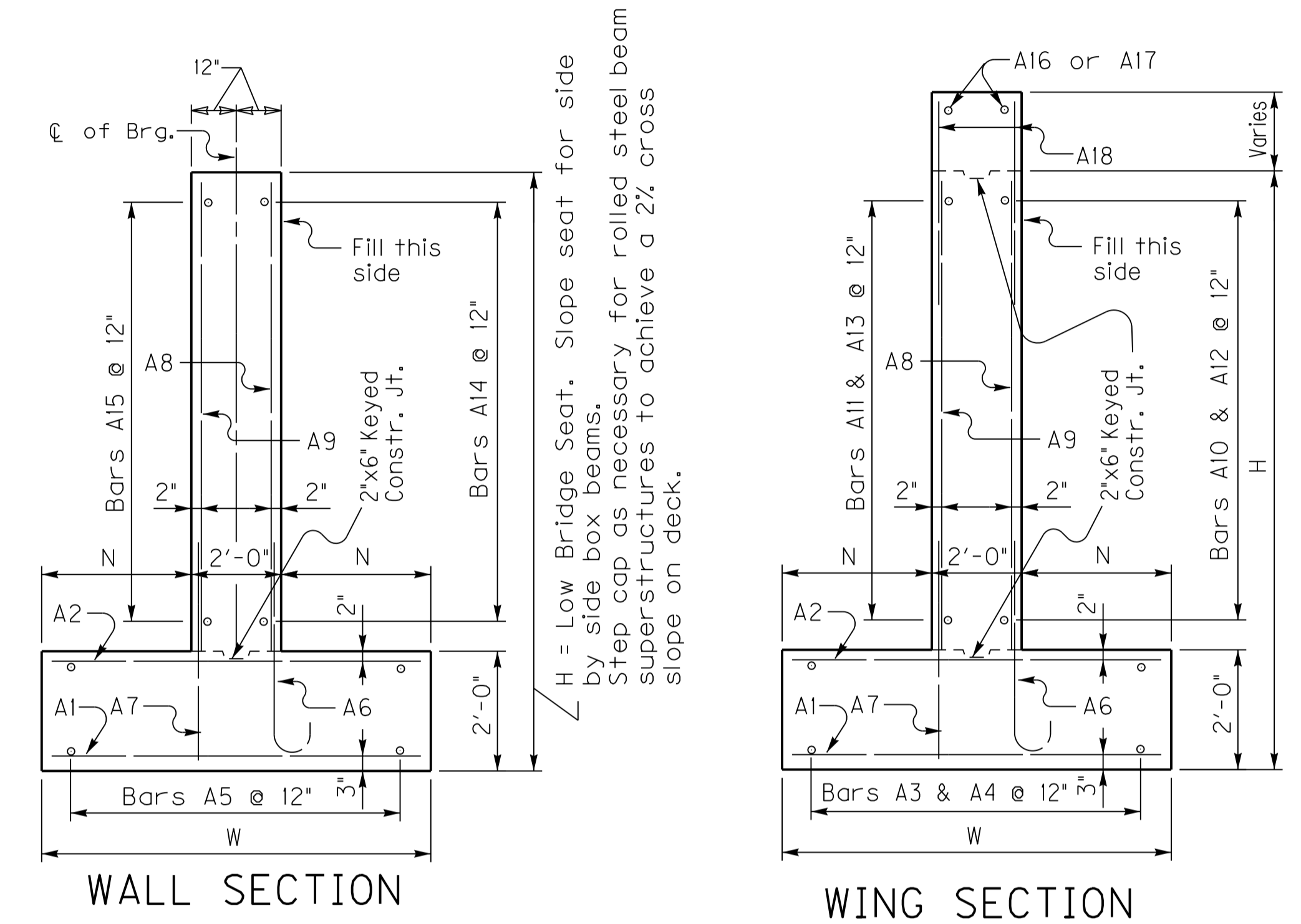
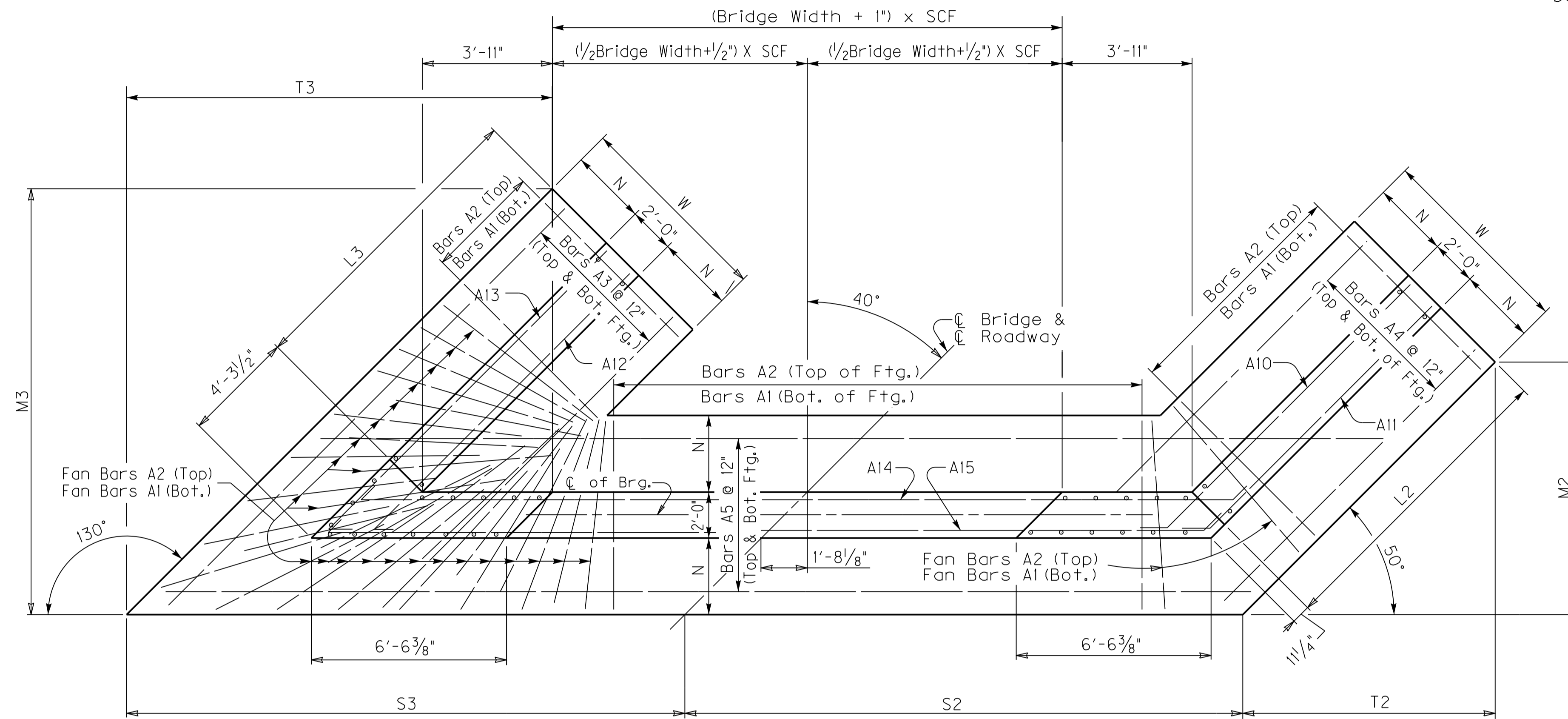
ABUTMENT DETAILS

SKEW	WIDTH	DATE
35	VAR	October 2018

40° SKEW VARIABLE BRIDGE WIDTH 2:1 FILL SLOPES WINGS PARALLEL TO ROADWAY

ABUTMENT SKEW CORRECTION FACTOR (SCF) = 1.305

For fanning A1 & A2 bars with an acute angle, space @ 12" at face of toe, then as you get closer to the corner start pulling every other bar back toward the heel. (Similar to as shown)



ABUTMENT DETAILS		
SKEW	WIDTH	DATE
40	VAR	October 2018

40° SKEW VARIABLE BRIDGE WIDTH 2:1 FILL SLOPES WINGS PARALLEL TO ROADWAY

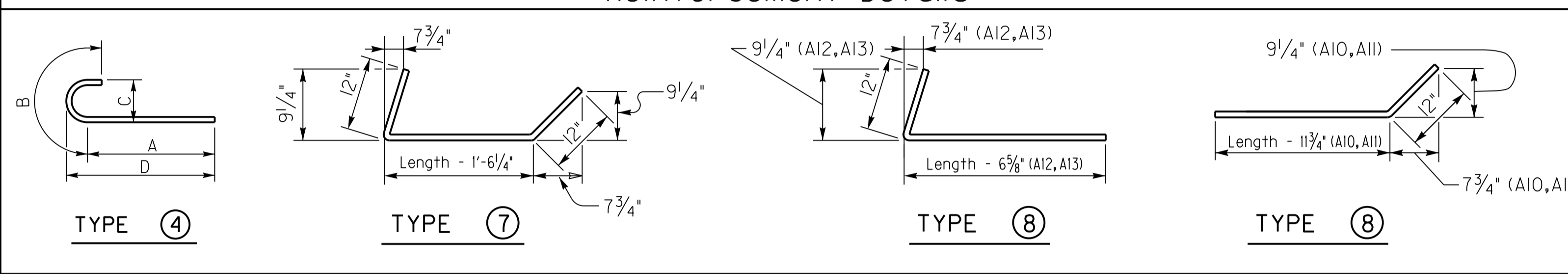
Bill of Reinforcement

MARK	A1		A2		A3	A4		A5		A6				A7		A8		A9		A10	A11	A12	A13	A14		A15		A16	A17	A18		
TYPE	Str.		Str.		Str.	Str.		Str.		4				Str.		Str.		Str.		8	8	8	8	7		7		Str.	Str.	Str.		
SIZE	#5		#5		#5	#5		#5		#5				#5		#5		#5		#5	#5	#5	#5	#5		#5		#5	#5	#5		
H	No.	Size	Length	Spacing	No.	Size	Length	Spacing	No.	Length	Spacing	No.	Length	Spacing	No.	Length	Spacing	No.	Length	Spacing	No.	Length	Spacing	No.	Length	Spacing	No.	Length	Spacing	No.	Length	Spacing
15-16	122+Nb=	10 11 8 12	122+Nb=	7 11 8 12	24 52 3	24 41 3	24 25 0	+Lb=	84+Nb=	9 9 11 12	8 1/8 1 10 0	11 3/4 8 6	95+Nb=	5 4 11 12	84+Nb=	6 12 10 12	95+Nb=	12 10 12	14 40 10	14 39 9	14 41 0	14 42 8	14 14 1	+Lb=	14 14 1	+Lb=	2 45 5	2 48 9	185 5 9			
13-14	109+Nb=	9 10 8 12	109+Nb=	7 10 8 12	22 46 2	22 36 1	22 23 8	+Lb=	74+Nb=	8 8 3 12	6 11 1 3 0	8 7 3	85+Nb=	5 4 11 12	74+Nb=	6 10 10 12	85+Nb=	10 10 12	12 35 10	12 34 9	12 35 11	12 37 8	12 14 1	+Lb=	12 14 1	+Lb=	2 40 5	2 43 9	165 5 9			
11-12	97+Nb=	8 9 8 12	97+Nb=	6 9 8 12	20 40 1	20 30 10	20 22 5	+Lb=	64+Nb=	7 7 1 12	5 10 1/2 1 2 0	7 6 2	75+Nb=	5 4 11 12	64+Nb=	5 8 10 12	75+Nb=	8 10 12	10 30 10	10 29 9	10 30 11	10 32 8	10 14 1	+Lb=	10 14 1	+Lb=	2 35 5	2 38 9	145 5 9			
9-10	84+Nb=	7 8 8 12	84+Nb=	5 8 8 12	18 34 0	18 25 7	18 21 1	+Lb=	54+Nb=	6 6 1 12	5 1 1 0 0	6 5 4	65+Nb=	5 4 11 12	54+Nb=	5 6 10 12	65+Nb=	6 10 12	8 25 11	8 24 9	8 25 11	8 27 8	8 14 1	+Lb=	8 14 1	+Lb=	2 30 5	2 33 9	125 5 9			
7-8	70+Nb=	6 7 2 12	70+Nb=	5 7 2 12	16 27 7	16 20 0	16 19 6	+Lb=	44+Nb=	5 5 7 12	4 8 1/2 0 10 0	5 4 11	55+Nb=	5 4 11 12	44+Nb=	5 4 10 12	55+Nb=	4 10 12	6 20 11	6 19 9	6 20 11	6 22 8	6 14 1	+Lb=	6 14 1	+Lb=	2 25 5	2 28 9	105 5 9			
5-6	58+Nb=	5 6 2 12	58+Nb=	5 6 2 12	14 21 7	14 14 9	14 18 3	+Lb=	34+Nb=	5 5 7 12	4 8 1/2 0 10 0	5 4 11	45+Nb=	5 4 11 12	34+Nb=	5 2 10 12	45+Nb=	2 10 12	4 15 11	4 14 9	4 15 11	4 17 8	4 14 1	+Lb=	4 14 1	+Lb=	2 20 5	2 23 9	85 5 9			

Table of Dimensions

H	W	N	M2	M3	T2	T3	L2	L3	S2		S3			
	Length	Length	Length	Length	Length	Length	Length	Length	Length	+Lb/2 =	Length	Length	+Lb/2 =	Length
	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft.	ft.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.
15-16	12 0 5 0	31 7 3/8	40 7 1/4	26 6 1/4	34 7/8	38	38	13 1 1/4	+0.5Lb=	13 1 1/4	+0.5Lb=			
13-14	11 0 4 6	27 7 1/4	35 11 1/2	23 1 7/8	30 2 1/8	33	33	12 5 1/2	+0.5Lb=	12 5 1/2	+0.5Lb=			
11-12	10 0 4 0	23 7 1/8	31 3 5/8	19 9 1/2	26 3 1/4	28	28	11 9 5/8	+0.5Lb=	11 9 5/8	+0.5Lb=			
9-10	9 0 3 6	19 7 26 7 7/8	16 5 1/4	22 4 3/8	23	23	11 1 3/4	+0.5Lb=	11 1 3/4	+0.5Lb=				
7-8	7 6 2 9	15 5 7/8	21 7 1/8	12 11 3/8	18 1 3/8	18	18	10 2	+0.5Lb=	10 2	+0.5Lb=			
5-6	6 6 2 3	11 5 3/4	16 11 1/4	9 7 1/2	14 2 5/8	13	13	9 6 1/4	+0.5Lb=	9 6 1/4	+0.5Lb=			

Reinforcement Details



Quantities

H	Concrete*	Reinforcement
	C.Y.	LBS.
5	34.19+(0.71xLb) =	3202+(52.8xLb) =
6	37.09+(0.78xLb) =	3202+(52.8xLb) =
7	53.82+(0.93xLb) =	4894+(68.7xLb) =
8	57.46+(1.01xLb) =	4894+(68.7xLb) =
9	80.09+(1.19xLb) =	7447+(91xLb) =
10	84.47+(1.27xLb) =	7447+(91xLb) =
11	108.97+(1.41xLb) =	11097+(120.4xLb) =
12	114.1+(1.49xLb) =	11097+(120.4xLb) =
13	142.31+(1.64xLb) =	16337+(161xLb) =
14	148.17+(1.71xLb) =	16337+(161xLb) =
15	180.08+(1.86xLb) =	22188+(198.6xLb) =
16	186.69+(1.93xLb) =	22188+(198.6xLb) =

*Concrete quantities computed using 21" beam depth on 1/2" pad & Variable Bridge Width

ABUTMENT SKEW CORRECTION FACTOR (SCF) = 1.305

NUMBER OF BARS TO ADD (Nb) = Bridge Width (feet) x SCF (round up to nearest whole number)

LENGTH OF ABUTMENT TO ADD (Lb) = Bridge Width (feet) x SCF (convert decimal to architectural)

GENERAL NOTES

SPECIFICATIONS: Construct abutments according to the current edition of the Kentucky Department of Highways Standard Specifications for Road and Bridge Construction. Abutments are designed for side by side box beams as detailed in Standard Drawings BDP-001 through BDP-012, current edition. Dimensions may be adjusted to allow for any out to out bridge width. Abutments are also adequate for Std. Dwg. slabs or steel beam superstructures

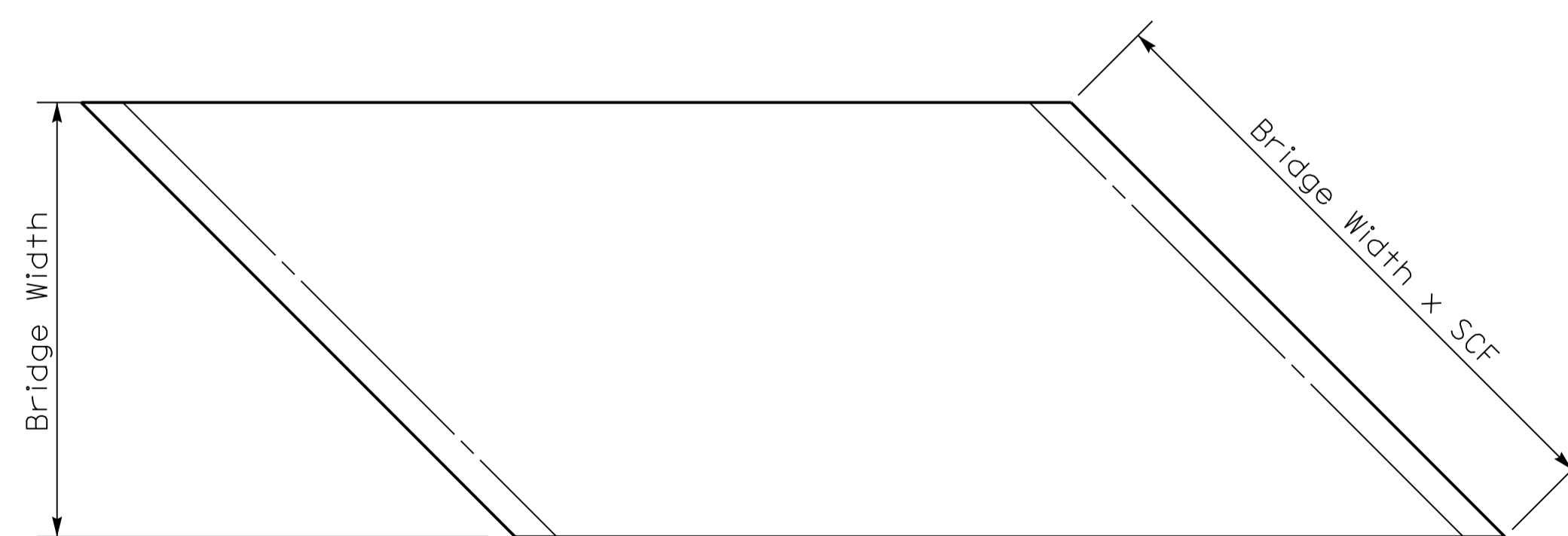
FOUNDATION PRESSURE: Construct abutment footings on solid rock bearing material that can support a pressure of 8000 psf service or 10,800 psf strength factored, as recommended by a geotechnical engineer.

WING LENGTHS: Calculated assuming 21" superstructure depth and stream bank elevation at top of footing.

FOOTING ELEVATION: Construct bottom of footing below the anticipated scour elevation. (This typically entails embedding the footings 1'-0" to 2'-0" into rock and pouring concrete directly against cut rock faces, as recommended by geotechnical engineer.)

NOTE: Distances to bars shown are clear dimensions unless otherwise noted.

MATERIAL SPECIFICATIONS:
 Concrete, Class "A" = 3500 psi
 Steel Reinforcement = Grade 60



PLAN OF SUPERSTRUCTURE SLAB

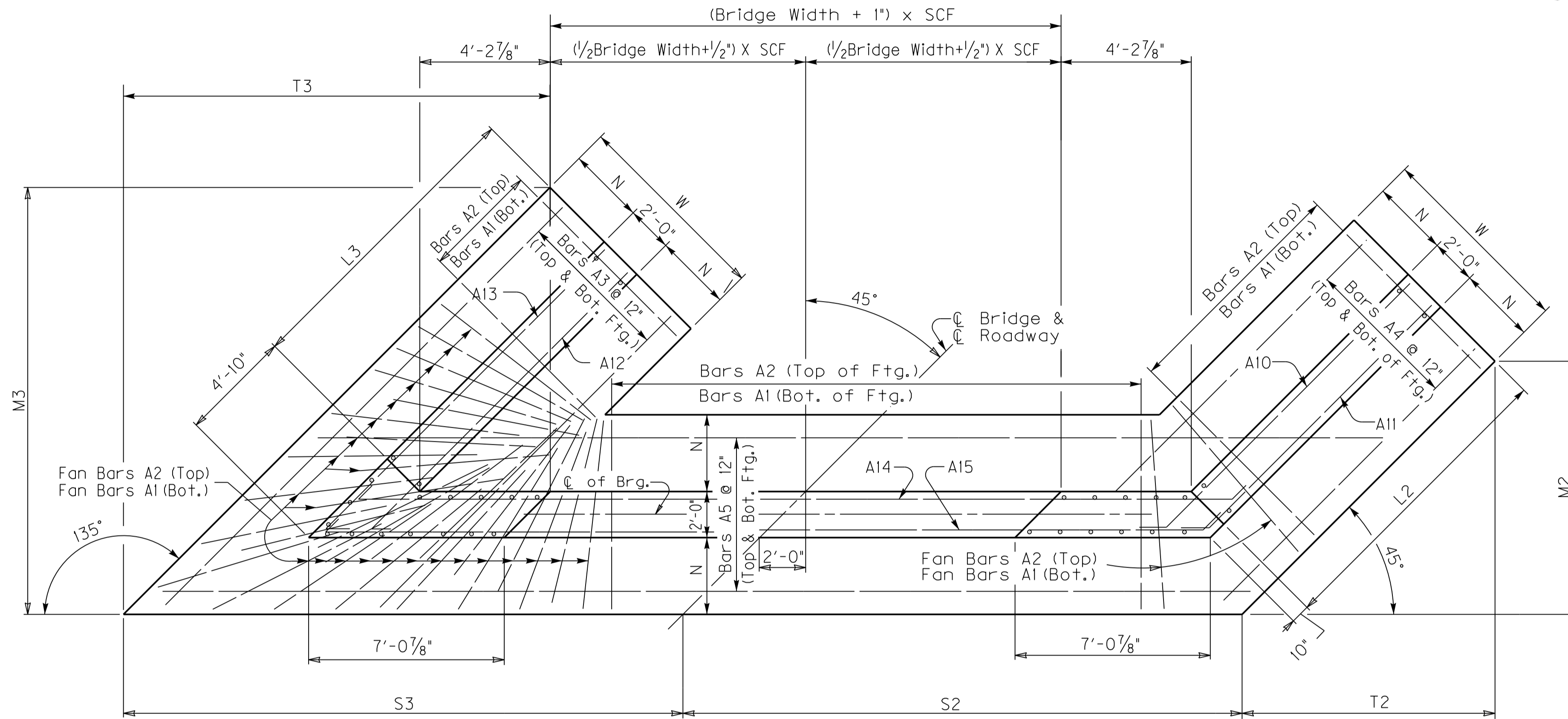
ABUTMENT DETAILS

SKEW	WIDTH	DATE
40	VAR	October 2018

45° SKEW VARIABLE BRIDGE WIDTH 2:1 FILL SLOPES WINGS PARALLEL TO ROADWAY

ABUTMENT SKEW CORRECTION FACTOR (SCF) = 1.414

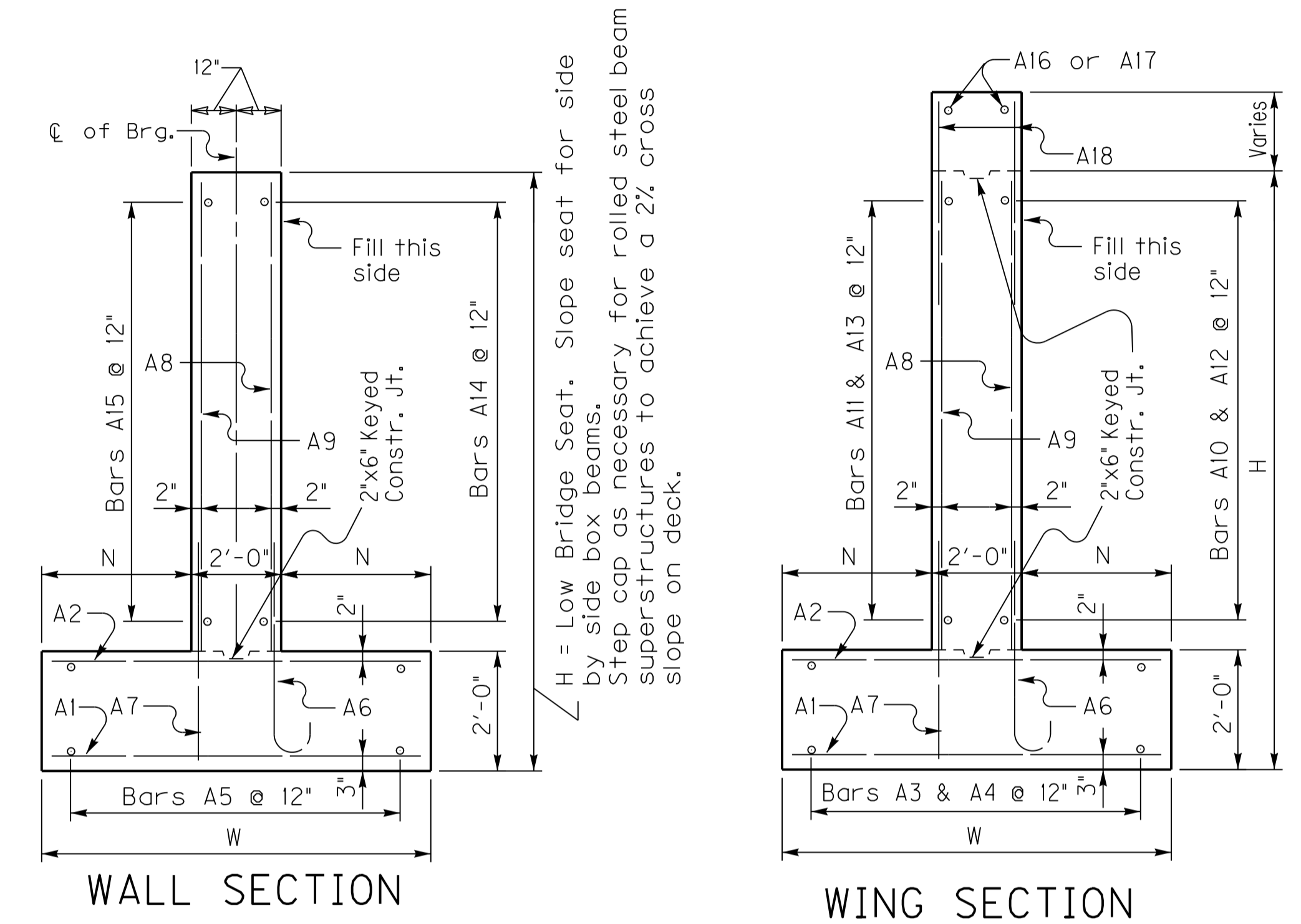
For fanning A1 & A2 bars with an acute angle, space @ 12" at face of toe, then as you get closer to the corner start pulling every other bar back toward the heel. (Similar to as shown)



(Left Skew as shown; right skew opp. hand)

PLAN

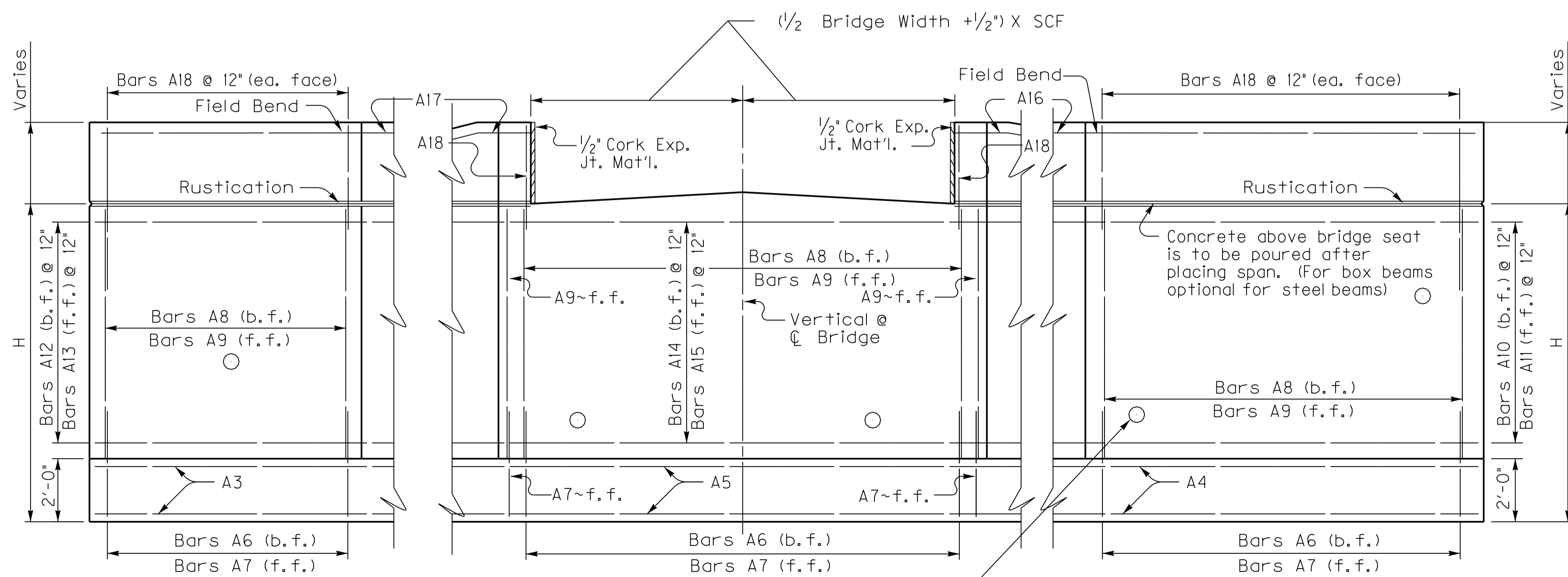
Note: Trim A16 & A17 bars if necessary
Trim A3 bars as necessary



WALL SECTION

WING SECTION

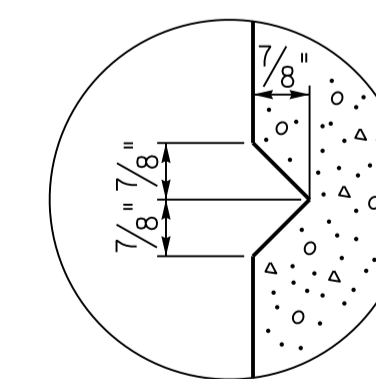
H = Low Bridge Seat. Slope seat for side by side box beams. Step cap as necessary for rolled steel beam superstructures to achieve a 2:1 cross slope on deck.



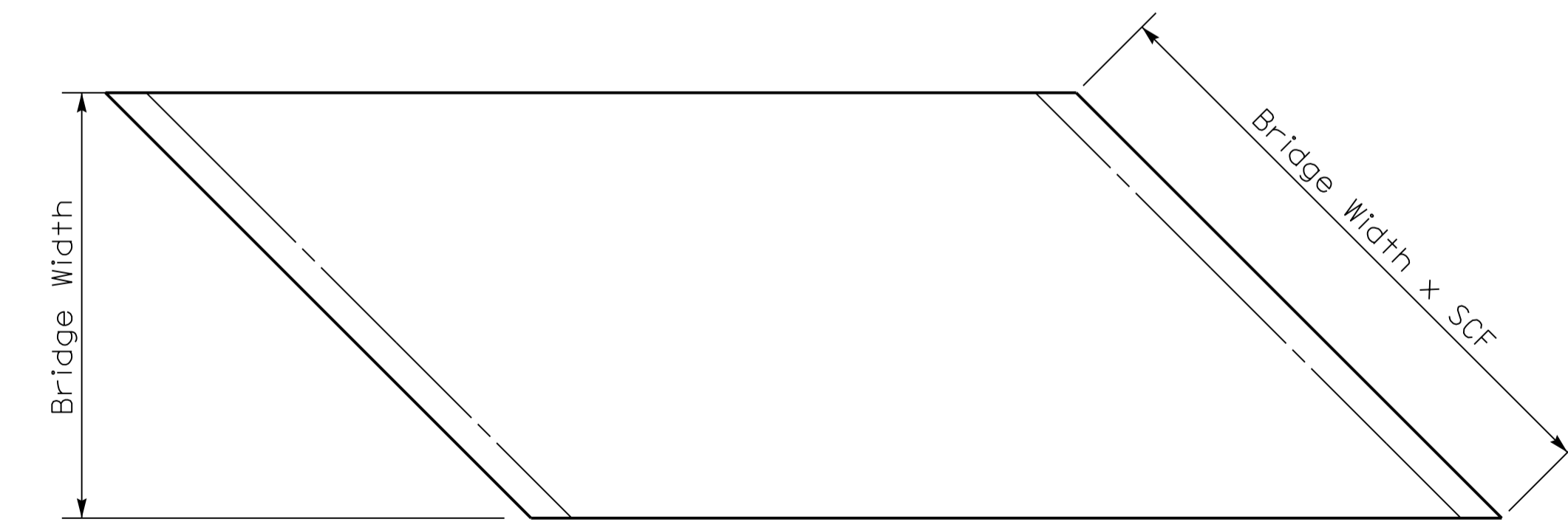
ELEVATION

Place 4" weep hole drains at 8'-0" centers at such elevation as to afford best drainage of backfill, in accordance with the Standard Specifications.

Depth of int. beam, bearing pad, haunch, and slab when req.



RUSTICATION GROOVE



PLAN OF SUPERSTRUCTURE SLAB

ABUTMENT DETAILS

SKEW	WIDTH	DATE
45	VAR	October 2018

45° SKEW VARIABLE BRIDGE WIDTH 2:1 FILL SLOPES WINGS PARALLEL TO ROADWAY

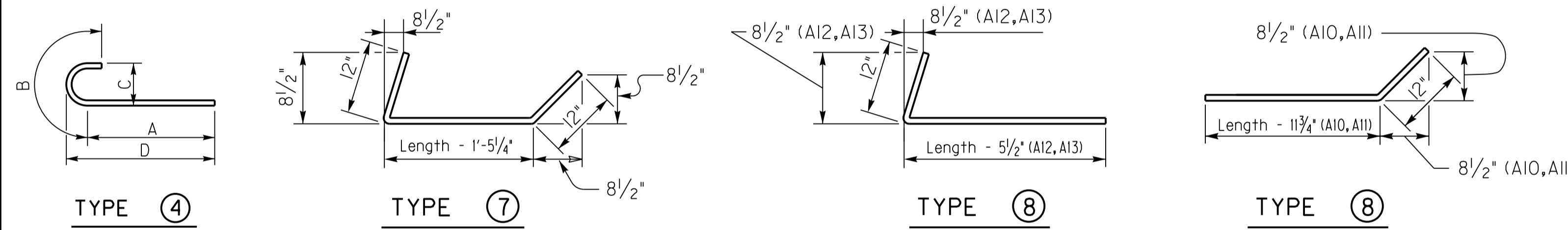
Bill of Reinforcement

MARK	A1		A2		A3	A4		A5		A6				A7		A8		A9	A10	A11	A12	A13	A14		A15		A16	A17	A18
TYPE	Str.		Str.		Str.	Str.		Str.		4				Str.		Str.		Str.	8	8	8	8	7		7		Str.	Str.	Str.
SIZE	#5		#5		#5	#5		#5		#5				#5		#5		#5	#5	#5	#5	#5	#5		#5		#5	#5	#5
H	No.	Size	Length	Spacing	No.	Size	Length	Spacing	No.	Length	Spacing	No.	Length	Spacing	No.	Length	Spacing	No.	Length	Spacing	No.	Length	Spacing	No.	Length	Spacing	No.	Length	Spacing
15-16	131+Nb=	10 11 8 12	131+Nb=	7 11 8 12	24 57 0	24 44 0	24 27 0	+Lb=	91+Nb=	9 9 11 12	8 1/8 1 10 0	11 3/4 8 6	102+Nb=	5 4 11 12	91+Nb=	6 12 10 12	102+Nb=	12 10 12	14 44 0	14 42 7	14 44 0	14 46 0	14 15 0	+Lb=	14 15 0	+Lb=	2 48 10	2 52 10	200 5 9
13-14	119+Nb=	9 10 8 12	119+Nb=	7 10 8 12	22 50 10	22 38 9	22 25 7	+Lb=	81+Nb=	8 8 3 12	6 11 1 3 0	8 7 3	92+Nb=	5 4 11 12	81+Nb=	6 10 10 12	92+Nb=	10 10 12	12 39 0	12 37 7	12 39 0	12 41 0	12 15 0	+Lb=	12 15 0	+Lb=	2 43 10	2 47 10	180 5 9
11-12	104+Nb=	8 9 8 12	104+Nb=	6 9 8 12	20 43 7	20 32 7	20 24 2	+Lb=	69+Nb=	7 7 1 12	5 10 1/2 1 2 0	7 6 2	80+Nb=	5 4 11 12	69+Nb=	5 8 10 12	80+Nb=	8 10 12	10 33 0	10 31 7	10 33 0	10 35 0	10 15 0	+Lb=	10 15 0	+Lb=	2 37 10	2 41 10	156 5 9
9-10	91+Nb=	7 8 8 12	91+Nb=	5 8 8 12	18 37 5	18 27 4	18 22 9	+Lb=	59+Nb=	6 6 1 12	5 1 1 0 0	6 5 4	70+Nb=	5 4 11 12	59+Nb=	5 6 10 12	70+Nb=	6 10 12	8 28 0	8 26 7	8 28 0	8 30 0	8 15 0	+Lb=	8 15 0	+Lb=	2 32 10	2 36 10	136 5 9
7-8	75+Nb=	6 7 2 12	75+Nb=	5 7 2 12	16 29 10	16 20 9	16 21 1	+Lb=	47+Nb=	5 5 7 12	4 8 1/2 0 10 0	5 4 11	58+Nb=	5 4 11 12	47+Nb=	5 4 10 12	58+Nb=	4 10 12	6 22 0	6 20 7	6 22 0	6 24 0	6 15 0	+Lb=	6 15 0	+Lb=	2 26 10	2 30 10	112 5 9
5-6	62+Nb=	5 6 2 12	62+Nb=	5 6 2 12	14 23 8	14 15 7	14 19 8	+Lb=	37+Nb=	5 5 7 12	4 8 1/2 0 10 0	5 4 11	48+Nb=	5 4 11 12	37+Nb=	5 2 10 12	48+Nb=	2 10 12	4 17 0	4 15 7	4 17 0	4 19 0	4 15 0	+Lb=	4 15 0	+Lb=	2 21 10	2 25 10	92 5 9

Table of Dimensions

H	W	N	M2	M3	T2	T3	L2	L3	S2		S3			
	Length	Length	Length	Length	Length	Length	Length	Length	Length	+Lb/2 =	Length	Length	+Lb/2 =	Length
	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.
15-16	12 0	5 0	31 1/2	40 11/4	31 1/2	40 11/4	41	41	14 2 3/8	+0.5Lb=	14 2 3/8	+0.5Lb=		
13-14	11 0	4 6	27 4 3/8	36 6 5/8	27 4 3/8	36 6 5/8	36	36	13 5 7/8	+0.5Lb=	13 5 7/8	+0.5Lb=		
11-12	10 0	4 0	22 11 5/8	31 5 1/2	22 11 5/8	31 5 1/2	30	30	12 9 1/2	+0.5Lb=	12 9 1/2	+0.5Lb=		
9-10	9 0	3 6	19 3 1/2	27 3/4	19 3 1/2	27 3/4	25	25	12 1	+0.5Lb=	12 1	+0.5Lb=		
7-8	7 6	2 9	14 9 7/8	21 6 1/2	14 9 7/8	21 6 1/2	19	19	11 1/4	+0.5Lb=	11 1/4	+0.5Lb=		
5-6	6 6	2 3	11 1 3/4	17 1 7/8	11 1 3/4	17 1 7/8	14	14	10 3 3/4	+0.5Lb=	10 3 3/4	+0.5Lb=		

Reinforcement Details



Quantities

H	Concrete*	Reinforcement
	C.Y.	LBS.
5	36.9+(0.71xLb) =	3443+(52.8xLb) =
6	40.03+(0.78xLb) =	3443+(52.8xLb) =
7	57.21+(0.93xLb) =	5214+(68.7xLb) =
8	61.08+(1.01xLb) =	5214+(68.7xLb) =
9	86.98+(1.19xLb) =	8069+(91xLb) =
10	91.74+(1.27xLb) =	8069+(91xLb) =
11	117.01+(1.41xLb) =	11902+(120.4xLb) =
12	122.51+(1.49xLb) =	11902+(120.4xLb) =
13	155.06+(1.64xLb) =	17799+(161xLb) =
14	161.45+(1.71xLb) =	17799+(161xLb) =
15	194.42+(1.86xLb) =	23895+(198.6xLb) =
16	201.55+(1.93xLb) =	23895+(198.6xLb) =

ABUTMENT SKEW CORRECTION FACTOR (SCF) = 1.414

NUMBER OF BARS TO ADD (Nb) = Bridge Width (feet) x SCF (round up to nearest whole number)

LENGTH OF ABUTMENT TO ADD (Lb) = Bridge Width (feet) x SCF (convert decimal to architectural)

*Concrete quantities computed using 21" beam depth on 1/2" pad & Variable Bridge Width

GENERAL NOTES

SPECIFICATIONS: Construct abutments according to the current edition of the Kentucky Department of Highways Standard Specifications for Road and Bridge Construction. Abutments are designed for side by side box beams as detailed in Standard Drawings BDP-001 through BDP-012, current edition. Dimensions may be adjusted to allow for any out to out bridge width. Abutments are also adequate for Std. Dwg. slabs or steel beam superstructures

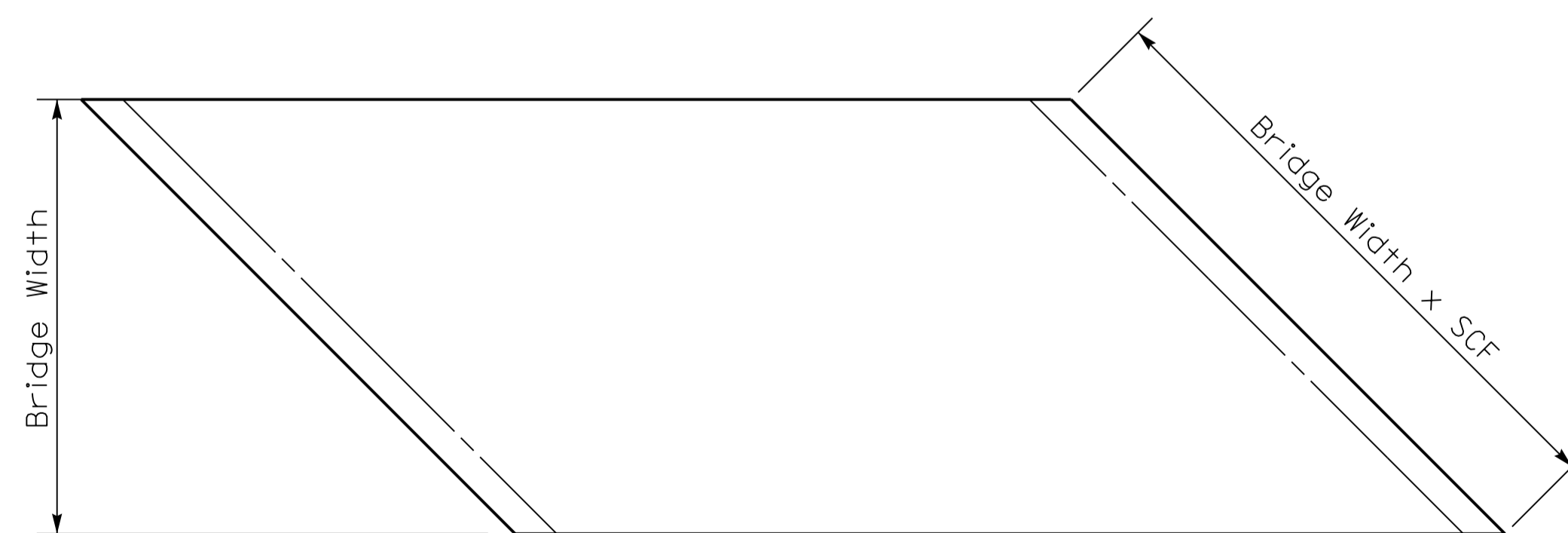
FOUNDATION PRESSURE: Construct abutment footings on solid rock bearing material that can support a pressure of 8000 psf service or 10,800 psf strength factored, as recommended by a geotechnical engineer.

WING LENGTHS: Calculated assuming 21" superstructure depth and stream bank elevation at top of footing.

FOOTING ELEVATION: Construct bottom of footing below the anticipated scour elevation. (This typically entails embedding the footings 1'-0" to 2'-0" into rock and pouring concrete directly against cut rock faces, as recommended by geotechnical engineer.)

NOTE: Distances to bars shown are clear dimensions unless otherwise noted.

MATERIAL SPECIFICATIONS:
 Concrete, Class "A" = 3500 psi
 Steel Reinforcement = Grade 60



PLAN OF SUPERSTRUCTURE SLAB

ABUTMENT DETAILS

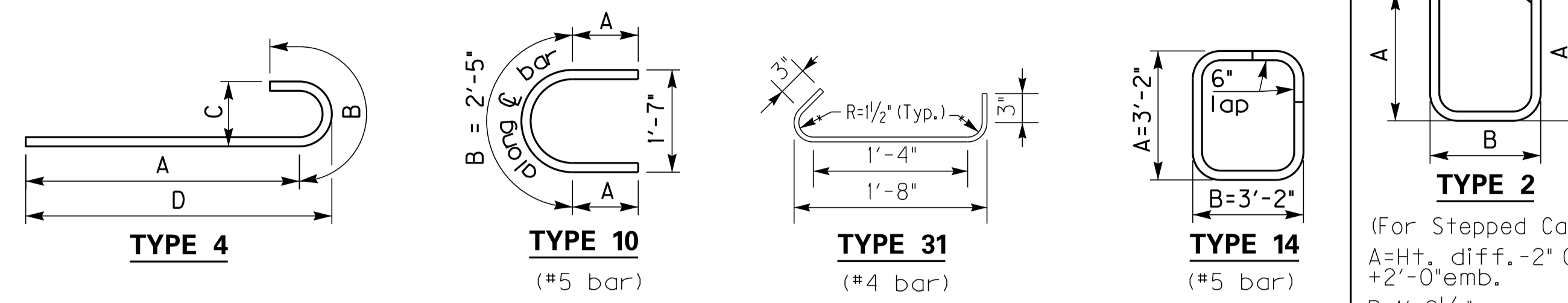
SKEW	WIDTH	DATE
45	VAR	October 2018

0° SKEW 16'-0" - 17'-6" BRIDGE WIDTH (No Seismic Load)

Bill of Reinforcement

MARK	P1		P2		P3		P4				P5				P6		P7		P8		P9(e)		P10(e)		P11(e)	
	TYPE	Str.	Str.	Str.	Type 4				Type 10				Str.	Type 31	Str.	Str.	Str.	Str.	Str.	Str.	Str.	Str.	Type 14	Type 14		
SIZE	No.	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length		
10-11	30	8 12 8	26	5 19 8	12	30	5 12 8	8	42	8 8 10 8	7 5 1 5	0 8 7 9	10	5 7 5 12	2 6	10	5 13 0	12	35	2 5 5	42	8 8 0 8	8 18 8	4 18 8	19 13 2	
12-13	30	8 12 8	26	5 19 8	12	30	5 12 8	8	42	8 8 10 8	7 5 1 5	0 8 7 9	14	5 7 5 12	2 6	14	5 13 0	12	49	2 5 5	42	8 10 0 8	8 18 8	4 18 8	19 13 2	
14-15	30	8 12 8	26	5 19 8	12	30	5 12 8	8	42	8 8 10 8	7 5 1 5	0 8 7 9	18	5 7 5 12	2 6	18	5 13 0	12	63	2 5 5	42	8 12 0 8	8 18 8	4 18 8	19 13 2	
16-17	30	8 12 8	26	5 19 8	12	30	5 12 8	8	42	8 8 10 8	7 5 1 5	0 8 7 9	22	5 7 5 12	2 6	22	5 13 0	12	77	2 5 5	42	8 14 0 8	8 18 8	4 18 8	19 13 2	
18-19	30	8 12 8	26	5 19 8	12	30	5 12 8	8	42	8 8 10 8	7 5 1 5	0 8 7 9	26	5 7 5 12	2 6	26	5 13 0	12	91	2 5 5	42	8 16 0 8	8 18 8	4 18 8	19 13 2	
20-21	30	8 12 8	26	5 19 8	12	30	5 12 8	8	42	8 8 10 8	7 5 1 5	0 8 7 9	30	5 7 5 12	2 6	30	5 13 0	12	105	2 5 5	42	8 18 0 8	8 18 8	4 18 8	19 13 2	
22-23	30	8 12 8	26	5 19 8	12	30	5 12 8	8	42	8 8 10 8	7 5 1 5	0 8 7 9	34	5 7 5 12	2 6	34	5 13 0	12	119	2 5 5	42	8 20 0 8	8 18 8	4 18 8	19 13 2	
24-25	30	8 12 8	26	5 19 8	12	30	5 12 8	8	42	8 8 10 8	7 5 1 5	0 8 7 9	38	5 7 5 12	2 6	38	5 13 0	12	133	2 5 5	42	8 22 0 8	8 18 8	4 18 8	19 13 2	

Reinforcement Details

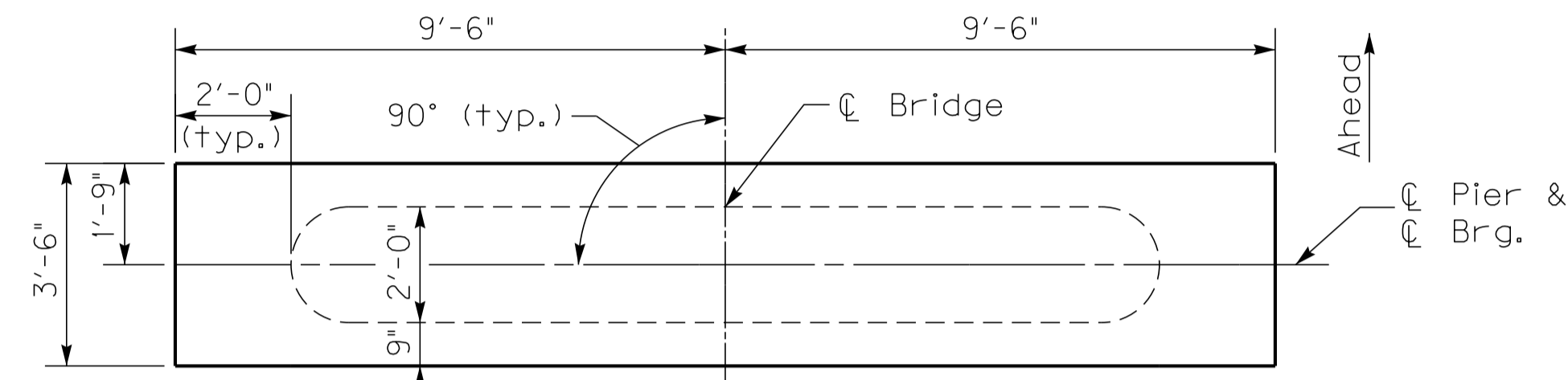


DIMENSIONS TABLE										QUANTITIES		
H	A	B	C	D	H	CONCRETE CLASS "A"	STEEL REINFORCEMENT EPOXY COATED	STEEL REINFORCEMENT	H			
						CU. YDS. (1)	LBS.	LBS.				
10-11	2 6	2 6	10 0	5 6	10-11	38.3	740	4113				
12-13	2 6	2 6	10 0	5 6	12-13	40.5	740	4446				
14-15	2 6	2 6	10 0	5 6	14-15	42.6	740	4779				
16-17	2 6	2 6	10 0	5 6	16-17	44.8	740	5112				
18-19	2 6	2 6	10 0	5 6	18-19	47	740	5445				
20-21	2 6	2 6	10 0	5 6	20-21	49.1	740	5778				
22-23	2 6	2 6	10 0	5 6	22-23	51.3	740	6111				
24-25	2 6	2 6	10 0	5 6	24-25	53.4	740	6444				

Note: All bars in cap shall be epoxy coated.

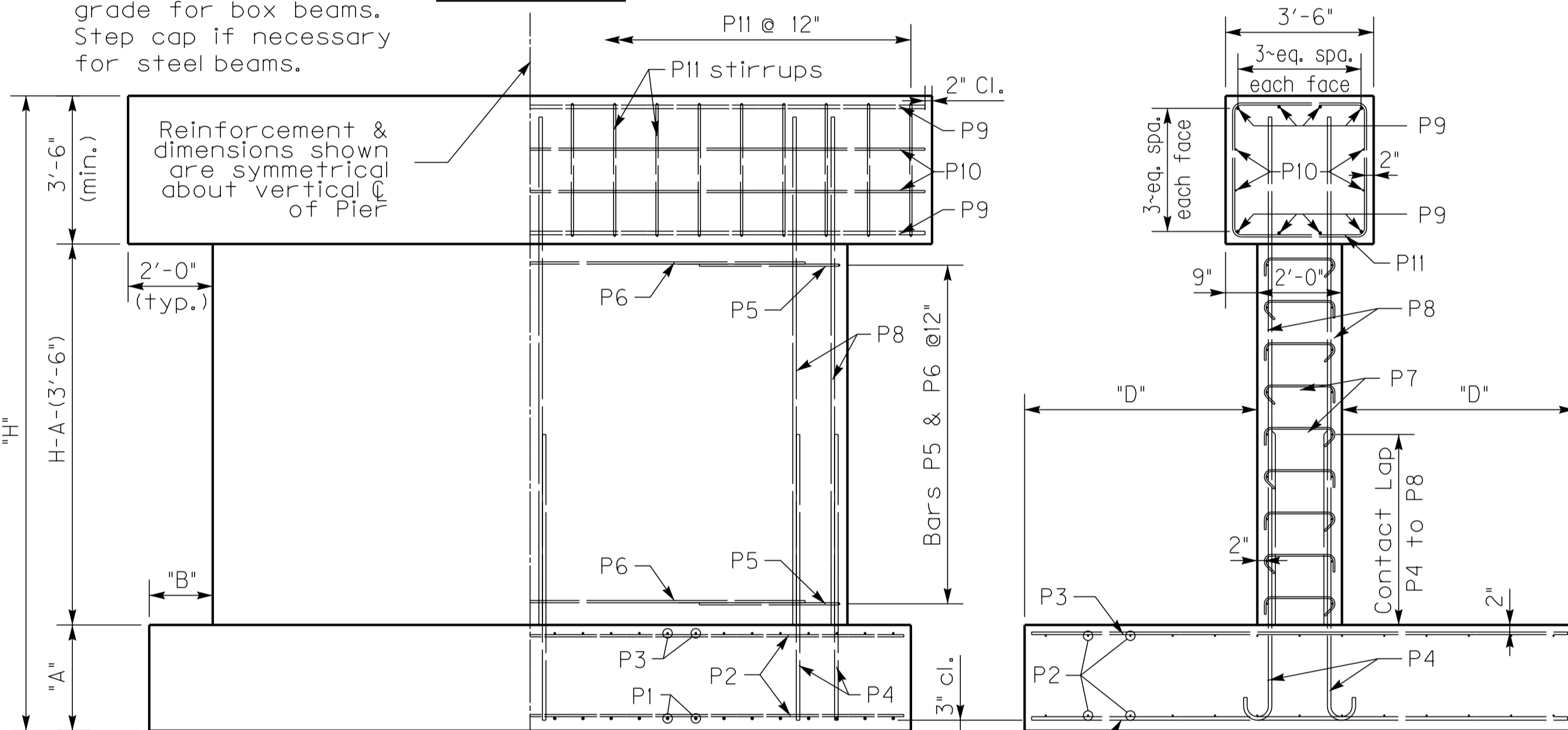
Note: All concrete shall be Class "A"

(1) Quantity is based on taller height. Reduce by 1.0 cubic yd. for shorter height.



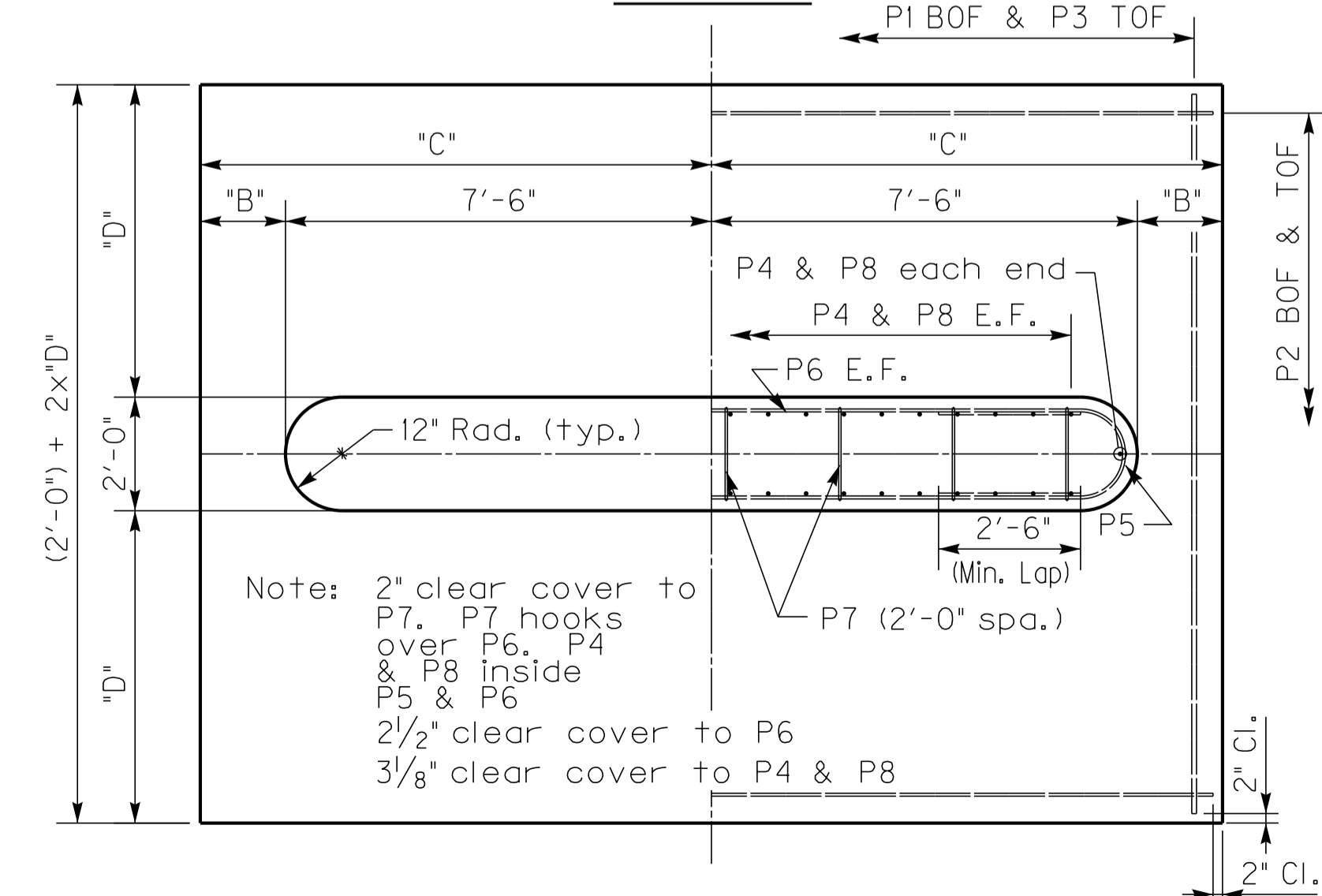
Note: Grade cap to roadway grade for box beams. Step cap if necessary for steel beams.

PLAN OF CAP

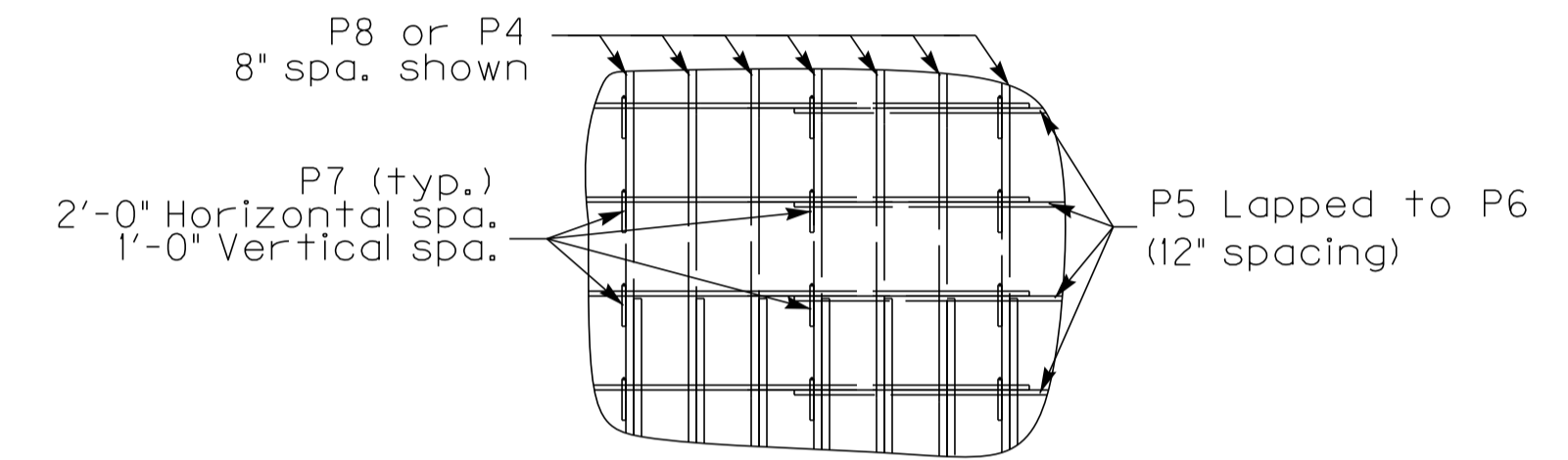


ELEVATION

END ELEVATION

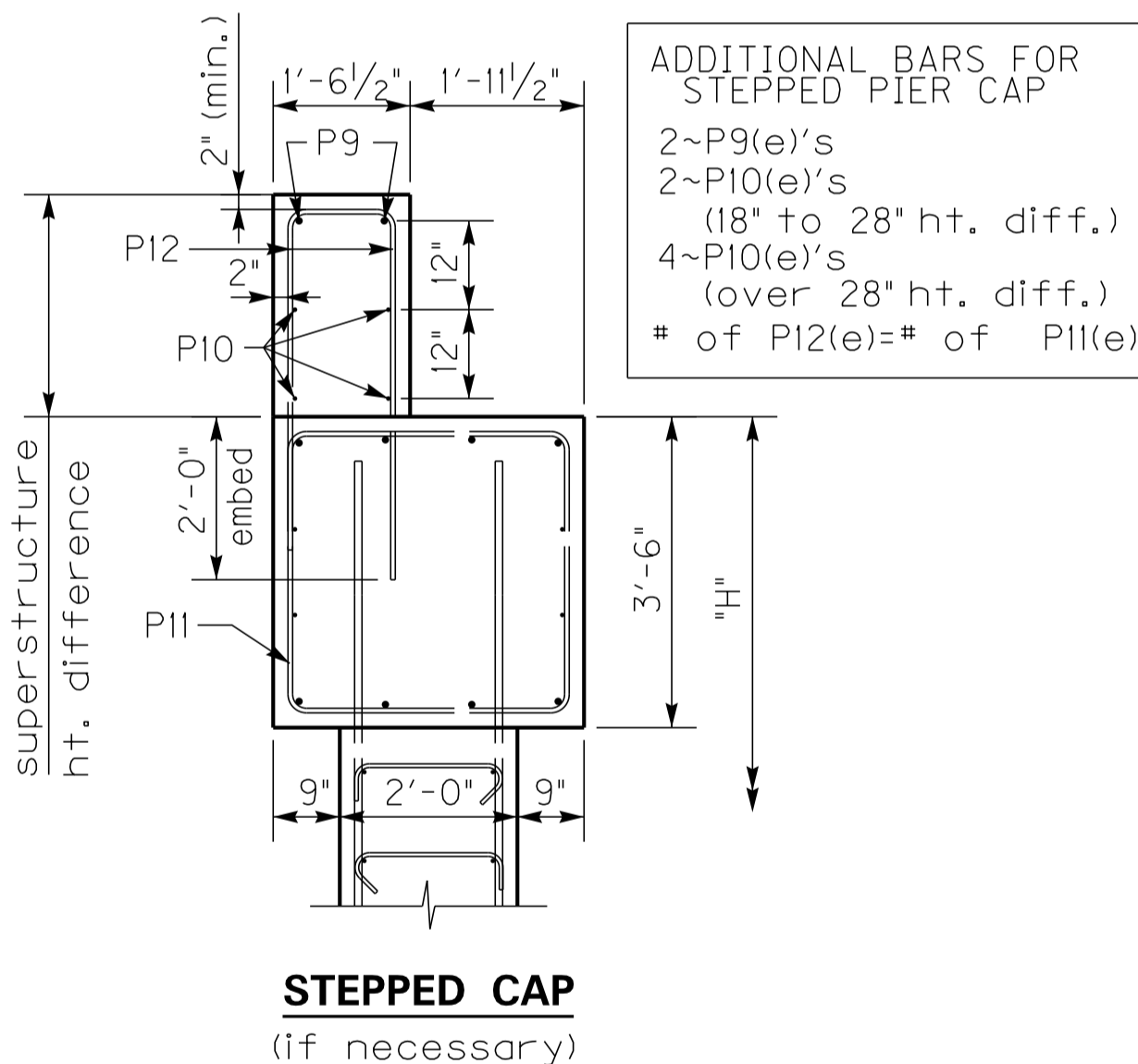


PLAN OF FOOTING



P7 BAR PLACEMENT

(alternate 90° & 135° bar ends)



STEPPED CAP

(if necessary)

GENERAL NOTES

SPECIFICATIONS: Construct piers according to the current edition of the Kentucky Department of Highways Standard Specifications for Road and Bridge Construction. Piers are designed for side by side box beams as detailed in Standard Drawings BDP-001 through BDP-012, current edition. They may be slightly modified to allow for 17'-6" rolled steel beam bridge width.

FOUNDATION PRESSURE: Construct pier footings on solid rock bearing material that can support a pressure of 8000 psf service or 10,800 psf strength factored, as recommended by a geotechnical engineer.

DESIGN LOADS: Pier is designed for the CB42 beam superstructure with 3-97 foot spans. Pier is designed to handle a half a 97 foot span for thermal load with expansion bearings under the beams. Pier is designed for 100 mph wind. Wind on superstructure is for 1-97' span longitudinal and transverse. Pier is designed for stream flow of 10 ft./sec. up to the top of the pier. It is not designed for flow acting on the superstructure. Pier is not designed for earthquake loading.

DESIGN APPLICABILITY: Consult with a structural engineer to determine if these details are applicable for any particular project.

FOOTING ELEVATION: Construct bottom of footing below the anticipated scour elevation. (This typically entails embedding the footings 1'-0" to 2'-0" into rock and pouring concrete directly against cut rock faces, as recommended by geotechnical engineer.)

NOTE: Distances to bars shown are clear dimensions unless otherwise noted.

MATERIAL SPECIFICATIONS:
 Concrete, Class "A" = 3500 psi
 Steel Reinforcement = Grade 60

PIER DETAILS

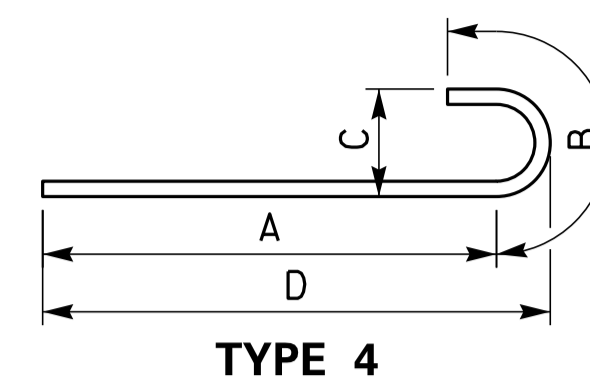
SKEW	WIDTH	DATE
0	16	July 2017

0° SKEW 24'-0" - 25'-6" BRIDGE WIDTH (No Seismic Load)

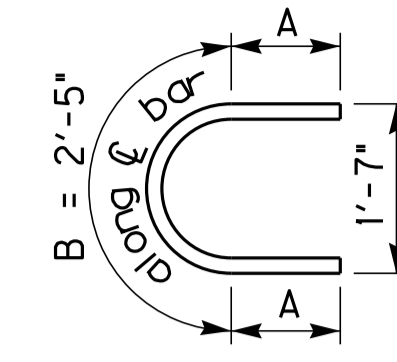
Bill of Reinforcement

MARK TYPE SIZE	P1		P2		P3		P4				P5				P6		P7		P8		P9(e)		P10(e)		P11(e)																															
	Str.		Str.		Str.		Type 4				Type 10				Str.		Type 31		Str.		Str.		Str.		Type 14																															
H	No.	Size	Length	Spacing	No.	Size	Length	Spacing	No.	Size	Length	Spacing	No.	Size	Length	Spacing	No.	Size	Length	Spacing	No.	Size	Length	Spacing	No.	Size	Length	Spacing																												
10-11	40	8	12	8	26	6	26	2	12	40	5	12	8	8	60	8	8	10	8	7	5	1	5	0	8	7	9	10	5	7	5	12	2	6	10	5	19	0	12	50	2	5	60	8	8	0	8	8	26	8	4	26	8	27	13	2
12-13	40	8	12	8	26	6	26	2	12	40	5	12	8	8	60	8	8	10	8	7	5	1	5	0	8	7	9	14	5	7	5	12	2	6	14	5	19	0	12	70	2	5	60	8	10	0	8	8	26	8	4	26	8	27	13	2
14-15	40	8	12	8	26	6	26	2	12	40	5	12	8	8	60	8	8	10	8	7	5	1	5	0	8	7	9	18	5	7	5	12	2	6	18	5	19	0	12	90	2	5	60	8	12	0	8	8	26	8	4	26	8	27	13	2
16-17	40	8	12	8	26	6	26	2	12	40	5	12	8	8	60	8	8	10	8	7	5	1	5	0	8	7	9	22	5	7	5	12	2	6	22	5	19	0	12	110	2	5	60	8	14	0	8	8	26	8	4	26	8	27	13	2
18-19	40	8	12	8	26	6	26	2	12	40	5	12	8	8	60	8	8	10	8	7	5	1	5	0	8	7	9	26	5	7	5	12	2	6	26	5	19	0	12	130	2	5	60	8	16	0	8	8	26	8	4	26	8	27	13	2
20-21	40	8	12	8	26	6	26	2	12	40	5	12	8	8	60	8	8	10	8	7	5	1	5	0	8	7	9	30	5	7	5	12	2	6	30	5	19	0	12	150	2	5	60	8	18	0	8	8	26	8	4	26	8	27	13	2
22-23	40	8	12	8	26	6	26	2	12	40	5	12	8	8	60	8	8	10	8	7	5	1	5	0	8	7	9	34	5	7	5	12	2	6	34	5	19	0	12	170	2	5	60	8	20	0	8	8	26	8	4	26	8	27	13	2
24-25	40	8	12	8	26	6	26	2	12	40	5	12	8	8	60	8	8	10	8	7	5	1	5	0	8	7	9	38	5	7	5	12	2	6	38	5	19	0	12	190	2	5	60	8	22	0	8	8	26	8	4	26	8	27	13	2

Reinforcement Details

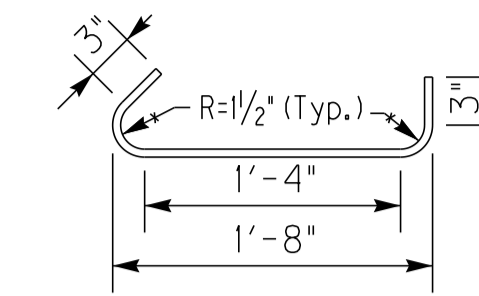


TYPE 4



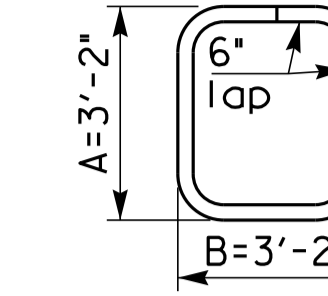
TYPE 10

(#5 bar)



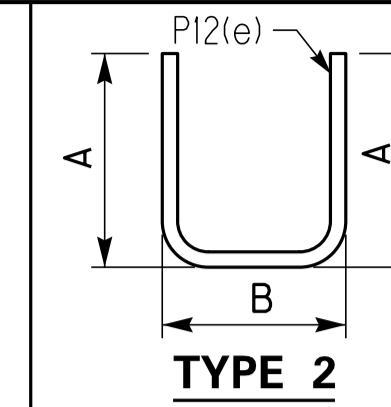
TYPE 31

(#4 bar)



TYPE 14

(#5 bar)



TYPE 2

(For Stepped Cap)
A=Ht. diff. -2" Cl.
+2'-0" emb.
B=1'-2 1/2"

DIMENSIONS TABLE

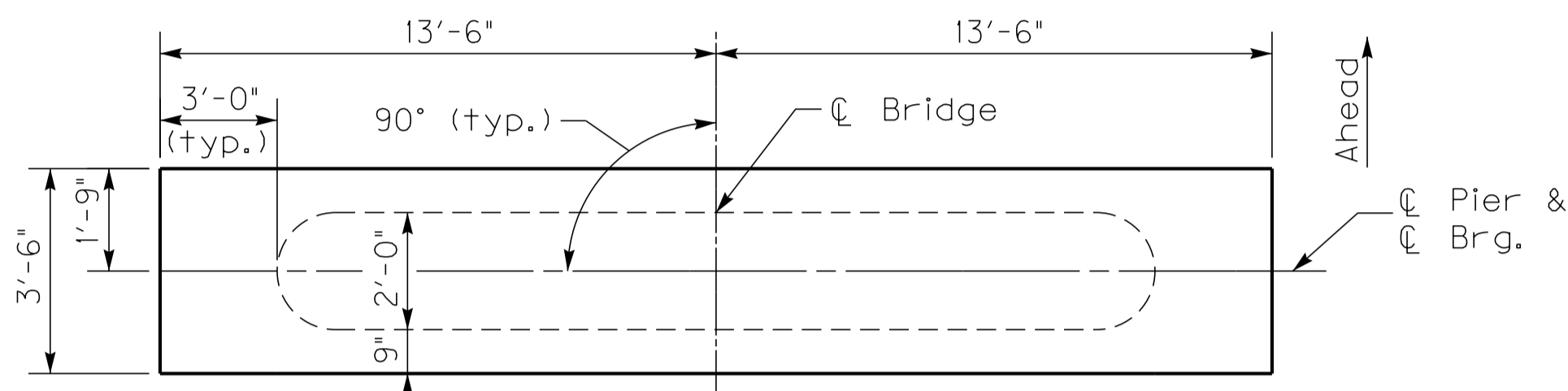
H	A				B				C				D				H	CONCRETE CLASS "A" CU. YDS. (1)	STEEL REINFORCEMENT EPOXY COATED LBS.	STEEL REINFORCEMENT LBS.
	ft.	in.	ft.	in.	ft.	in.	ft.	in.	ft.	in.	ft.	in.	ft.	in.						
10-11	2	6	2	9	13	3	5	6	10-11	52.2	1055	5973								
12-13	2	6	2	9	13	3	5	6	12-13	55.3	1055	6438								
14-15	2	6	2	9	13	3	5	6	14-15	58.3	1055	6902								
16-17	2	6	2	9	13	3	5	6	16-17	61.4	1055	7366								
18-19	2	6	2	9	13	3	5	6	18-19	64.4	1055	7830								
20-21	2	6	2	9	13	3	5	6	20-21	67.5	1055	8295								
22-23	2	6	2	9	13	3	5	6	22-23	70.5	1055	8759								
24-25	2	6	2	9	13	3	5	6	24-25	73.6	1055	9223								

QUANTITIES

Note: All bars in cap shall be epoxy coated.

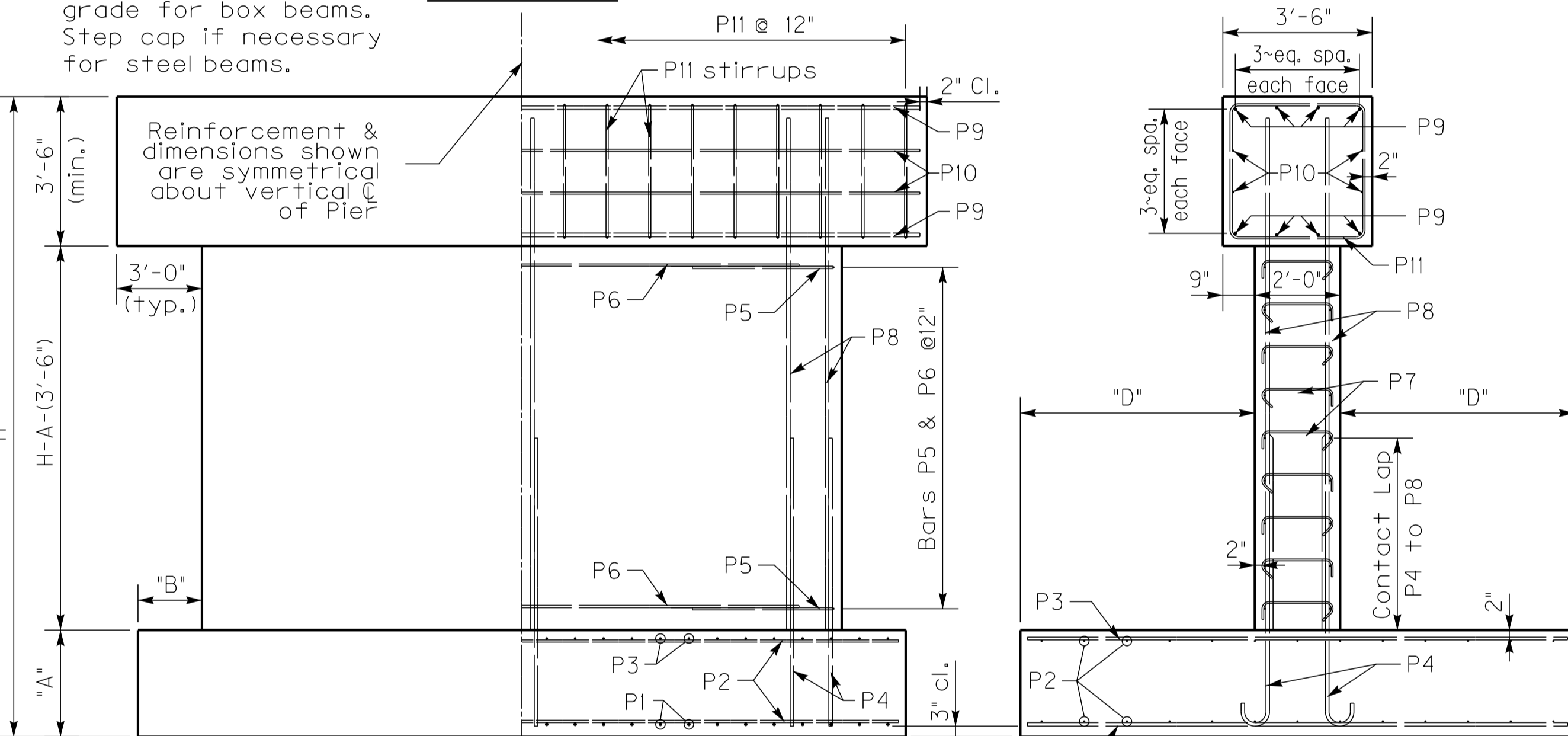
Note: All concrete shall be Class "A"

(1) Quantity is based on taller height. Reduce by 1.5 cubic yard for shorter height.



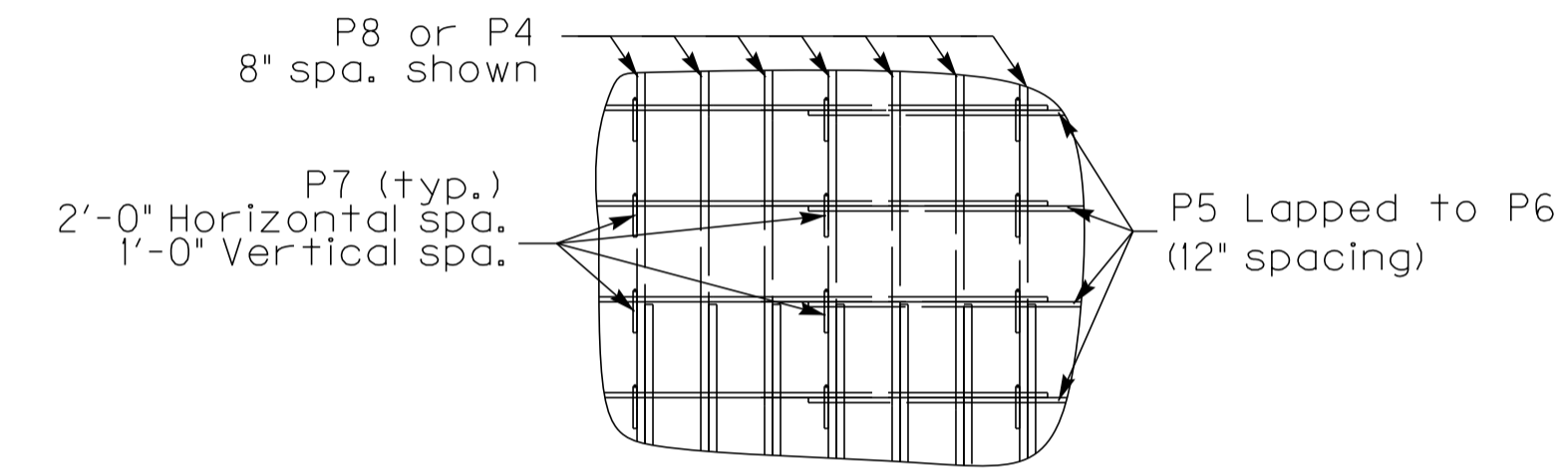
PLAN OF CAP

Note: Grade cap to roadway grade for box beams. Step cap if necessary for steel beams.



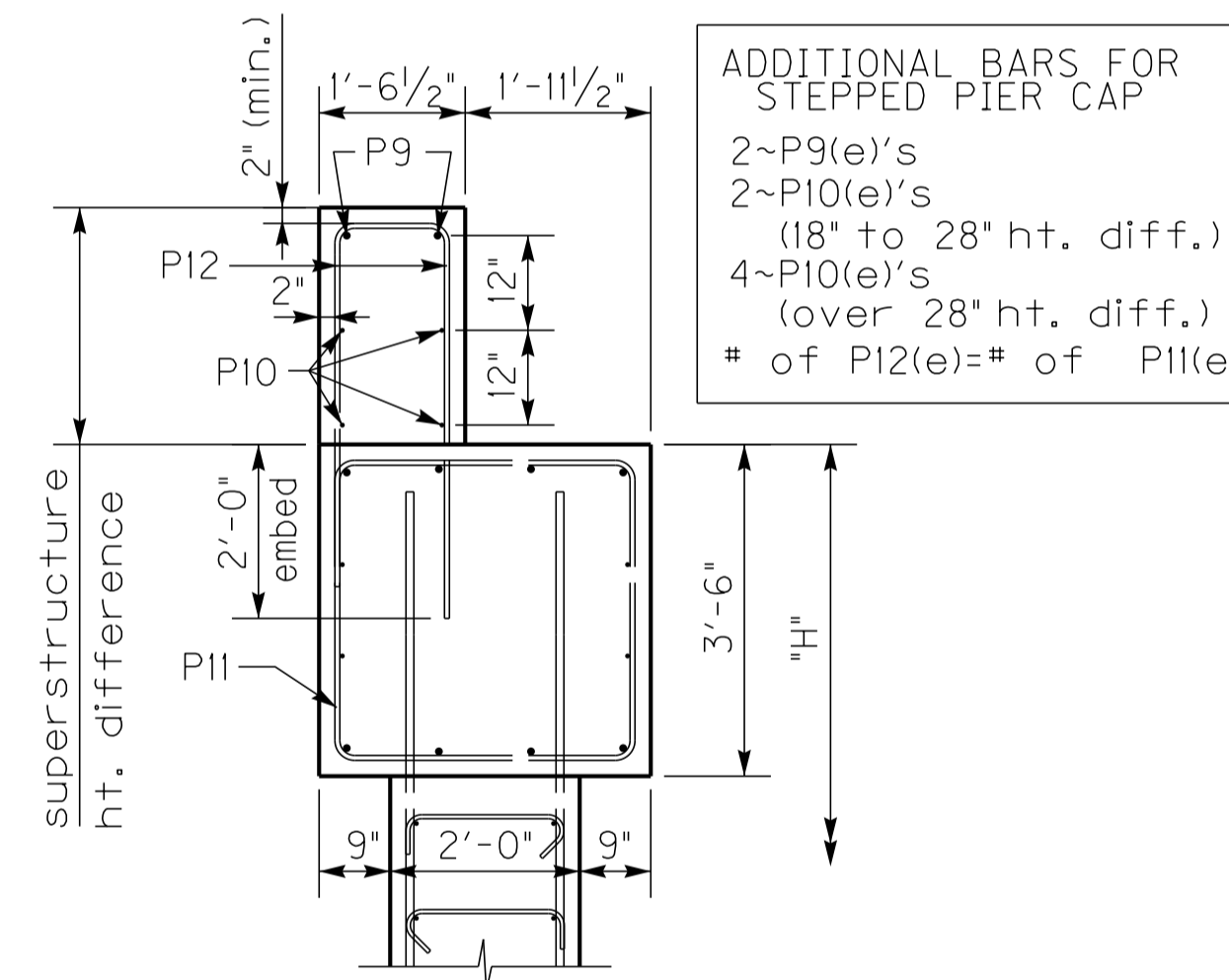
ELEVATION

END ELEVATION



P7 BAR PLACEMENT

(alternate 90° & 135° bar ends)



STEPPED CAP

(if necessary)

ADDITIONAL BARS FOR STEPPED PIER CAP
2~P9(e)'s
2~P10(e)'s (18" to 28" ht. diff.)
4~P10(e)'s (over 28" ht. diff.)
of P12(e)=# of P11(e)

GENERAL NOTES

SPECIFICATIONS: Construct piers according to the current edition of the Kentucky Department of Highways Standard Specifications for Road and Bridge Construction. Piers are designed for side by side box beams as detailed in Standard Drawings BDP-001 through BDP-012, current edition. They may be slightly modified to allow for 25'-6" rolled steel beam bridge width.

FOUNDATION PRESSURE: Construct pier footings on solid rock bearing material that can support a pressure of 8000 psf service or 10,800 psf strength factored, as recommended by a geotechnical engineer.

DESIGN LOADS: Pier is designed for the CB42 beam superstructure with 3-97 foot spans. Pier is designed to handle a half a 97 foot span for thermal load with expansion bearings under the beams. Pier is designed for 100 mph wind. Wind on superstructure is for 1-97' span longitudinal and transverse. Pier is designed for stream flow of 10 ft./sec. up to the top of the pier. It is not designed for flow acting on the superstructure. Pier is not designed for earthquake loading.

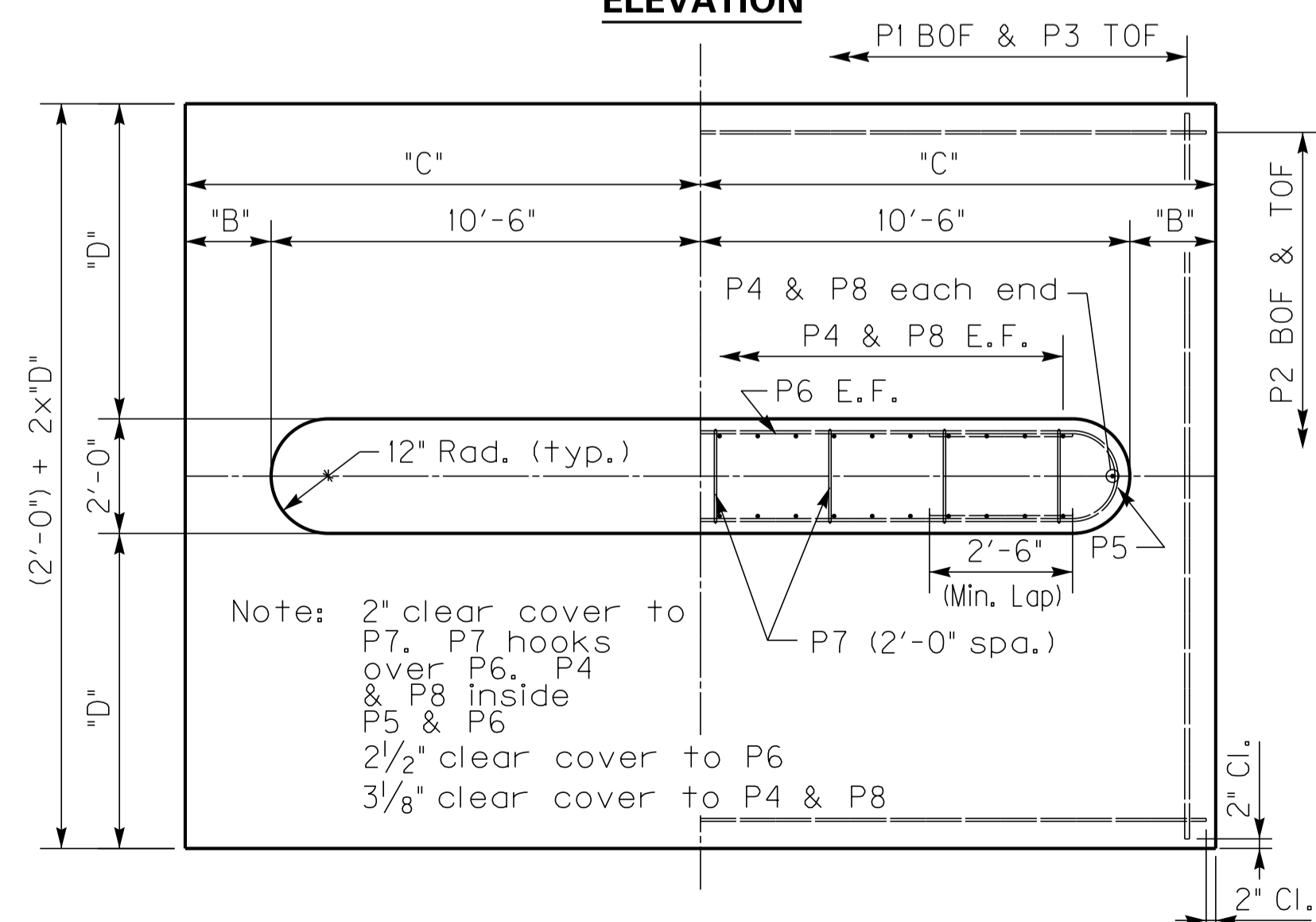
DESIGN APPLICABILITY: Consult with a structural engineer to determine if these details are applicable for any particular project.

FOOTING ELEVATION: Construct bottom of footing below the anticipated scour elevation. (This typically entails embedding the footings 1'-0" to 2'-0" into rock and pouring concrete directly against cut rock faces, as recommended by geotechnical engineer.)

NOTE: Distances to bars shown are clear dimensions unless otherwise noted.

MATERIAL SPECIFICATIONS:

Concrete, Class "A" = 3500 psi
Steel Reinforcement = Grade 60



PLAN OF FOOTING

Note: 2" clear cover to P7. P7 hooks over P6. P4 & P8 inside P5 & P6
2 1/2" clear cover to P6
3/8" clear cover to P4 & P8

PIER DETAILS

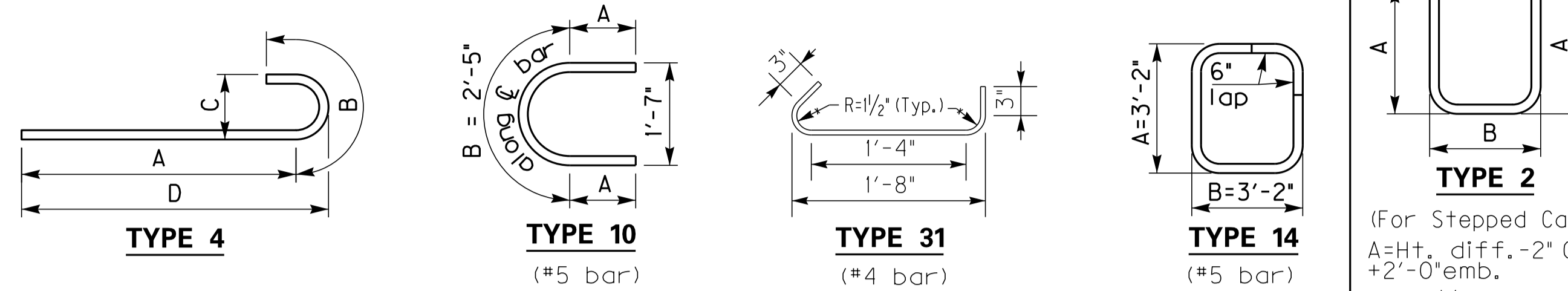
SKEW	WIDTH	DATE
0	24	July 2017

0° SKEW 32'-0" - 33'-6" BRIDGE WIDTH (No Seismic Load)

Bill of Reinforcement

MARK	P1		P2		P3		P4				P5				P6		P7		P8		P9(e)		P10(e)		P11(e)																													
	TYPE	Str.	Str.	Str.	Type 4				Type 10				Str.	Type 31	Str.	Str.	Str.	Str.	Str.	Str.	Str.	Str.	Type 14	Type 14																														
SIZE	No.	Size	Length	Spacing	No.	Size	Length	Spacing	No.	Size	Length	Spacing	No.	Size	Length	Spacing	No.	Size	Length	Spacing	No.	Size	Length	Spacing	No.	Size	Length	Spacing																										
10-11	52	8	12	8	26	6	34	2	12	52	5	12	8	84	8	10	8	7	5	1	5	0	8	7	9	10	5	7	5	12	2	6	10	5	27	0	12	70	2	5	84	8	10	0	8	8	34	8	4	34	8	35	13	2
12-13	52	8	12	8	26	6	34	2	12	52	5	12	8	84	8	10	8	7	5	1	5	0	8	7	9	14	5	7	5	12	2	6	14	5	27	0	12	98	2	5	84	8	10	0	8	8	34	8	4	34	8	35	13	2
14-15	52	8	12	8	26	6	34	2	12	52	5	12	8	84	8	10	8	7	5	1	5	0	8	7	9	18	5	7	5	12	2	6	18	5	27	0	12	126	2	5	84	8	12	0	8	8	34	8	4	34	8	35	13	2
16-17	52	8	12	8	26	6	34	2	12	52	5	12	8	84	8	10	8	7	5	1	5	0	8	7	9	22	5	7	5	12	2	6	22	5	27	0	12	154	2	5	84	8	14	0	8	8	34	8	4	34	8	35	13	2
18-19	52	8	12	8	26	6	34	2	12	52	5	12	8	84	8	10	8	7	5	1	5	0	8	7	9	26	5	7	5	12	2	6	26	5	27	0	12	182	2	5	84	8	16	0	8	8	34	8	4	34	8	35	13	2
20-21	52	8	12	8	26	6	34	2	12	52	5	12	8	84	8	10	8	7	5	1	5	0	8	7	9	30	5	7	5	12	2	6	30	5	27	0	12	210	2	5	84	8	18	0	8	8	34	8	4	34	8	35	13	2
22-23	52	8	12	8	26	6	34	2	12	52	5	12	8	84	8	10	8	7	5	1	5	0	8	7	9	34	5	7	5	12	2	6	34	5	27	0	12	238	2	5	84	8	20	0	8	8	34	8	4	34	8	35	13	2
24-25	52	8	12	8	26	6	34	2	12	52	5	12	8	84	8	10	8	7	5	1	5	0	8	7	9	38	5	7	5	12	2	6	38	5	27	0	12	266	2	5	84	8	22	0	8	8	34	8	4	34	8	35	13	2

Reinforcement Details

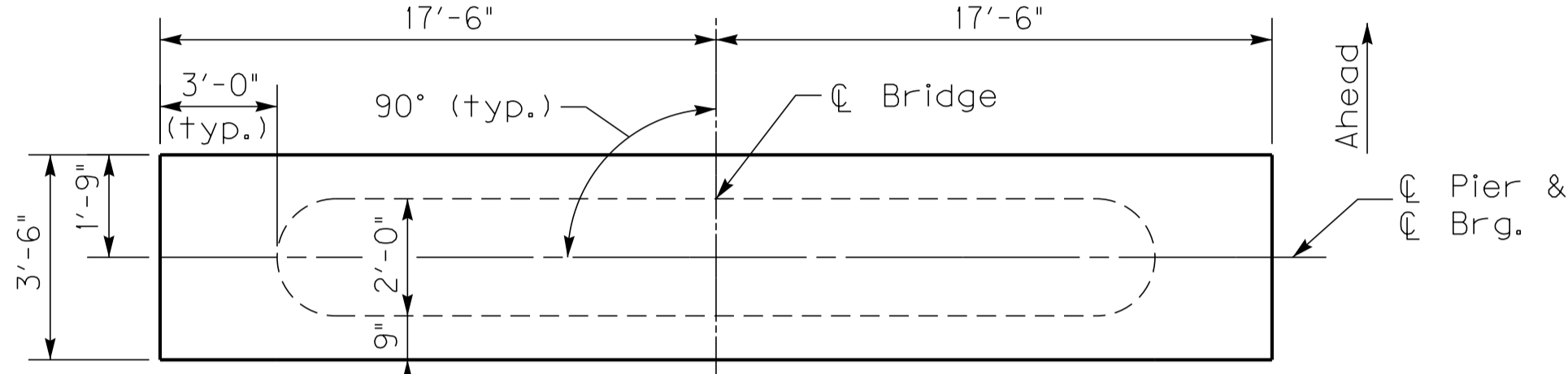


DIMENSIONS TABLE						QUANTITIES						
						CONCRETE CLASS "A"	STEEL REINFORCEMENT EPOXY COATED	STEEL REINFORCEMENT				
H	A	B	C	D	H	CU. YDS. (1)	LBS.	LBS.				
10-11	2	6	2	9	17	3	5	6	10-11	68.8	1370	8051
12-13	2	6	2	9	17	3	5	6	12-13	73	1370	8691
14-15	2	6	2	9	17	3	5	6	14-15	77.2	1370	9330
16-17	2	6	2	9	17	3	5	6	16-17	81.5	1370	9969
18-19	2	6	2	9	17	3	5	6	18-19	85.7	1370	10608
20-21	2	6	2	9	17	3	5	6	20-21	89.9	1370	11247
22-23	2	6	2	9	17	3	5	6	22-23	94.2	1370	11887
24-25	2	6	2	9	17	3	5	6	24-25	98.4	1370	12526

Note: All bars in cap shall be epoxy coated.

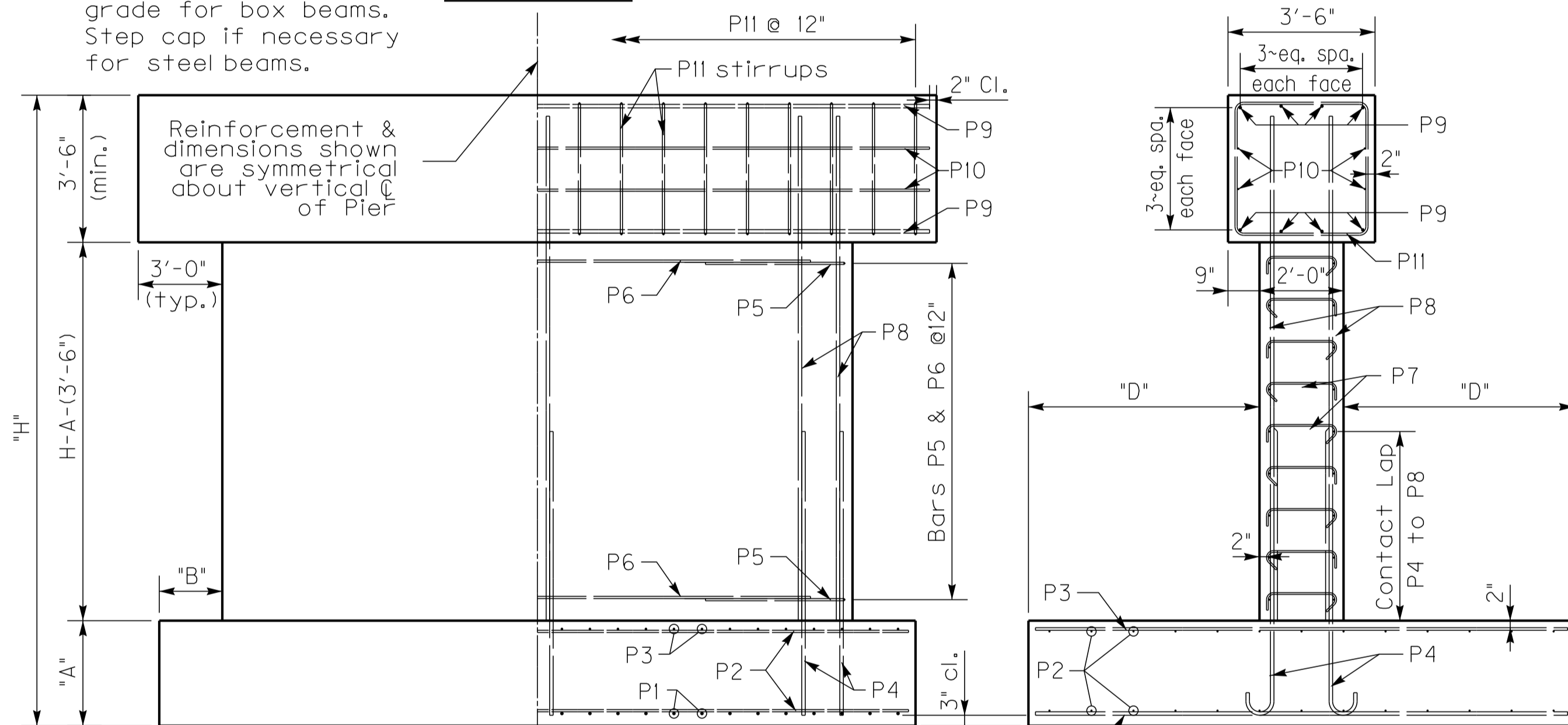
Note: All concrete shall be Class "A"

Quantity is based on taller height. Reduce by 2.1 cubic yard for shorter height.



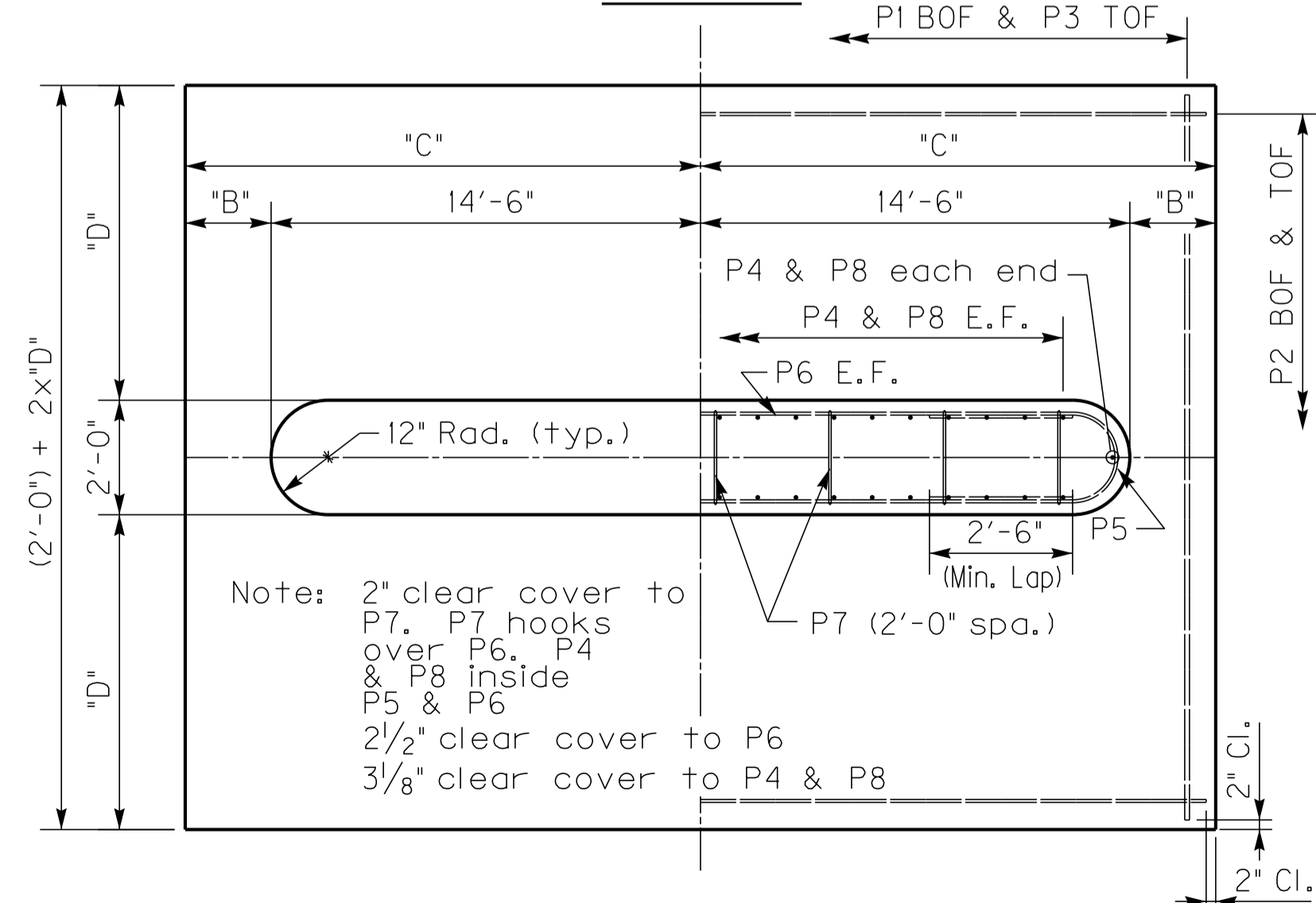
PLAN OF CAP

Note: Grade cap to roadway grade for box beams. Step cap if necessary for steel beams.



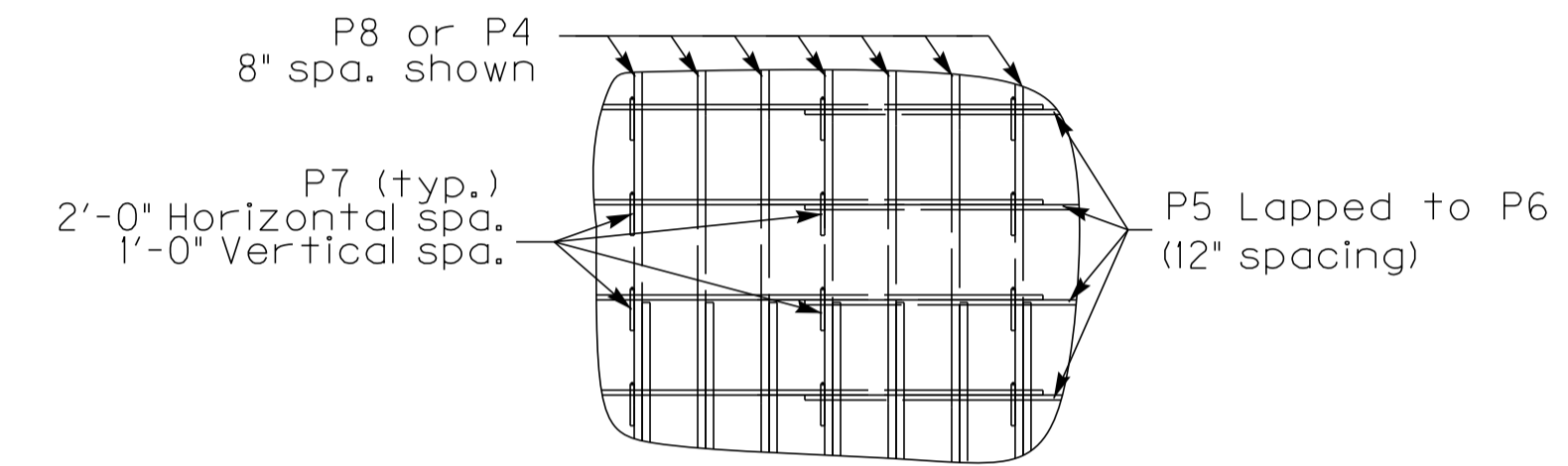
ELEVATION

END ELEVATION



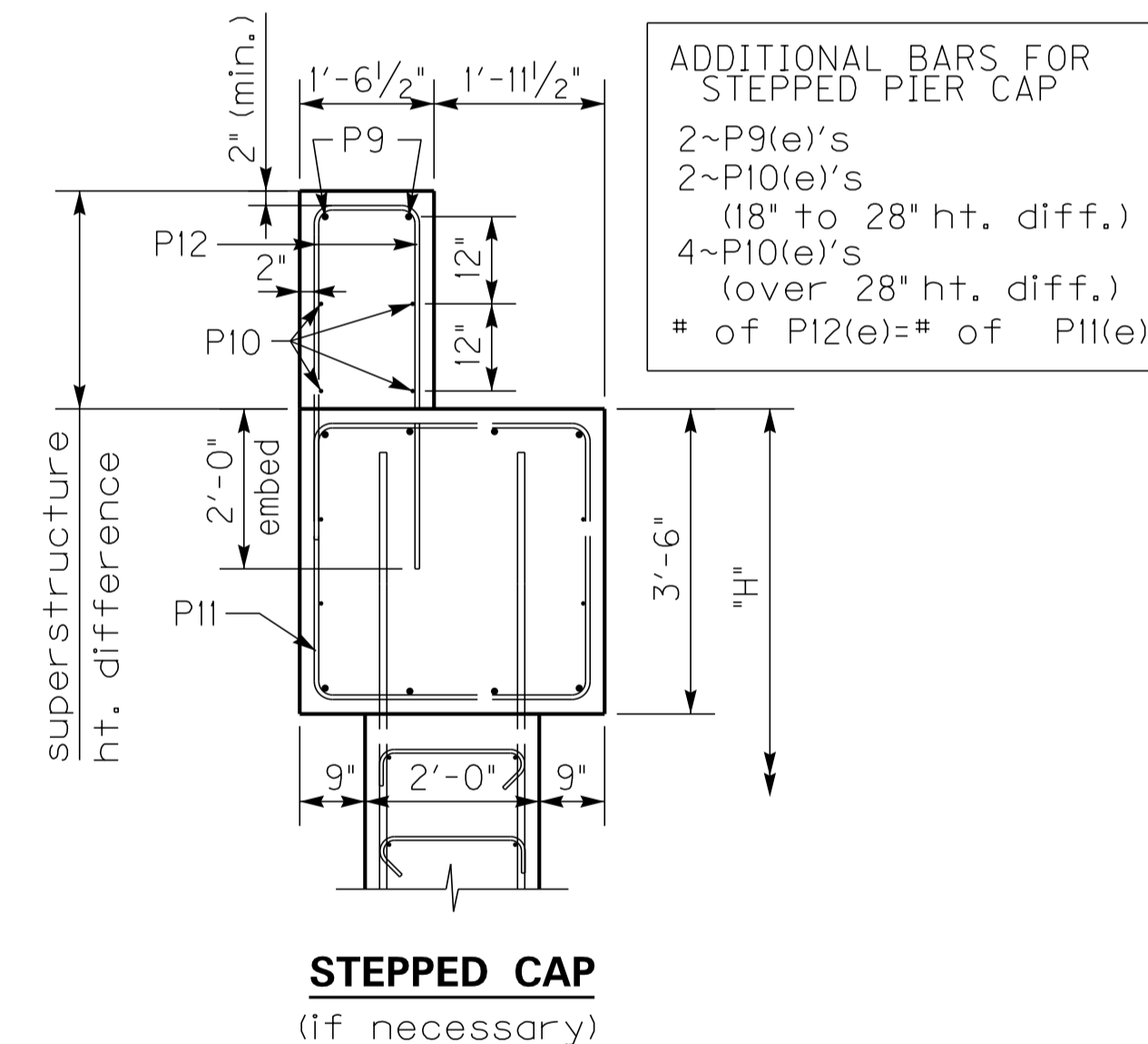
PLAN OF FOOTING

Note: 2" clear cover to P7. P7 hooks over P6. P4 & P8 inside P5 & P6
2 1/2" clear cover to P6
3/8" clear cover to P4 & P8



P7 BAR PLACEMENT

(alternate 90° & 135° bar ends)



STEPPED CAP

(if necessary)

ADDITIONAL BARS FOR STEPPED PIER CAP
2~P9(e)'s
2~P10(e)'s (18" to 28" ht. diff.)
4~P10(e)'s (over 28" ht. diff.)
of P12(e)=# of P11(e)

GENERAL NOTES

SPECIFICATIONS: Construct piers according to the current edition of the Kentucky Department of Highways Standard Specifications for Road and Bridge Construction. Piers are designed for side by side box beams as detailed in Standard Drawings BDP-001 through BDP-012, current edition. They may be slightly modified to allow for 33'-6" rolled steel beam bridge width.

FOUNDATION PRESSURE: Construct pier footings on solid rock bearing material that can support a pressure of 8000 psf service or 10,800 psf strength factored, as recommended by a geotechnical engineer.

DESIGN LOADS: Pier is designed for the CB42 beam superstructure with 3-97 foot spans. Pier is designed to handle a half a 97 foot span for thermal load with expansion bearings under the beams. Pier is designed for 100 mph wind. Wind on superstructure is for 1-97' span longitudinal and transverse. Pier is designed for stream flow of 10 ft./sec. up to the top of the pier. It is not designed for flow acting on the superstructure. Pier is not designed for earthquake loading.

DESIGN APPLICABILITY: Consult with a structural engineer to determine if these details are applicable for any particular project.

FOOTING ELEVATION: Construct bottom of footing below the anticipated scour elevation. (This typically entails embedding the footings 1'-0" to 2'-0" into rock and pouring concrete directly against cut rock faces, as recommended by geotechnical engineer.)

NOTE: Distances to bars shown are clear dimensions unless otherwise noted.

MATERIAL SPECIFICATIONS:
Concrete, Class "A" = 3500 psi
Steel Reinforcement = Grade 60

PIER DETAILS

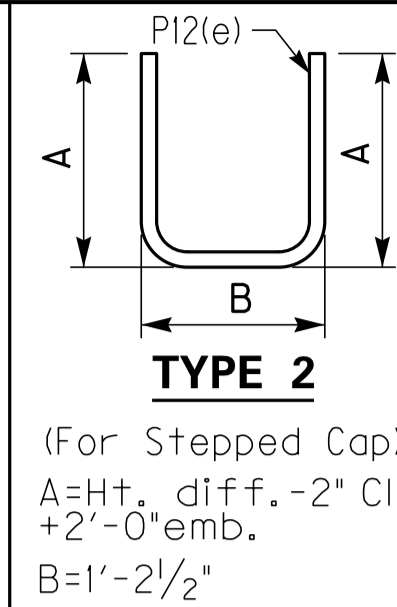
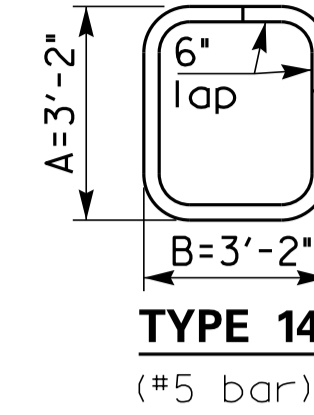
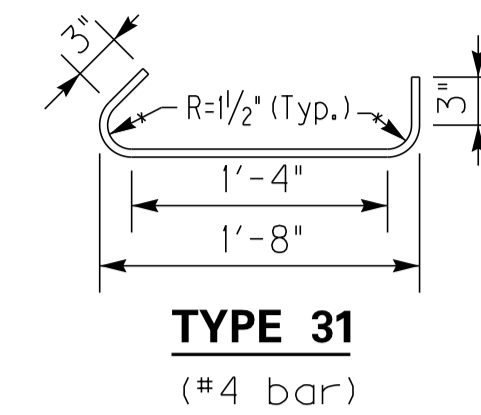
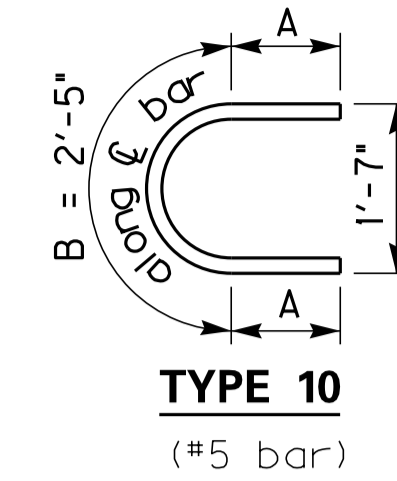
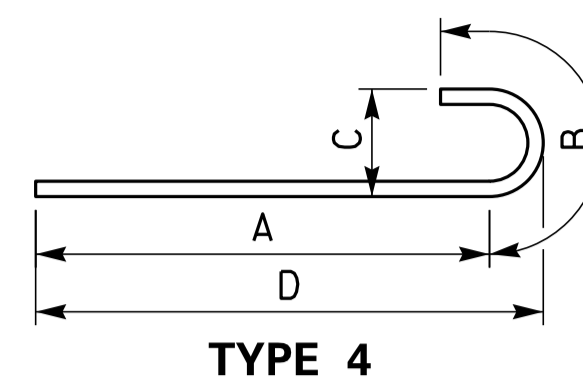
SKEW	WIDTH	DATE
0	32	July 2017

15° SKEW 16'-0" - 17'-6" BRIDGE WIDTH (No Seismic Load)

Bill of Reinforcement

MARK	P1		P2		P3		P4				P5				P6		P7		P8		P9(e)		P10(e)		P11(e)																													
	Type	Str.	Str.	Str.	Type 4				Type 10				Str.	Type 31	Str.	Str.	Str.	Str.	Str.	Str.	Str.	Str.	Type 14	Type 14	Type 14																													
SIZE	No.	Size	Length	Spacing	No.	Size	Length	Spacing	No.	Size	Length	Spacing	No.	Size	Length	Spacing	No.	Size	Length	Spacing	No.	Size	Length	Spacing	No.	Size	Length	Spacing																										
10-11	29	#8	12	2	26	#5	19	2	12	29	#5	12	2	42	#8	10	8	7	5	1	5	0	8	7	9	10	5	7	5	12	2	6	10	5	13	0	12	35	2	5	42	#8	8	0	8	8	20	2	4	20	2	20	13	2
12-13	29	#8	12	2	26	#5	19	2	12	29	#5	12	2	42	#8	10	8	7	5	1	5	0	8	7	9	14	5	7	5	12	2	6	14	5	13	0	12	49	2	5	42	#8	10	0	8	8	20	2	4	20	2	20	13	2
14-15	29	#8	12	2	26	#5	19	2	12	29	#5	12	2	42	#8	10	8	7	5	1	5	0	8	7	9	18	5	7	5	12	2	6	18	5	13	0	12	63	2	5	42	#8	12	0	8	8	20	2	4	20	2	20	13	2
16-17	29	#8	12	2	26	#5	19	2	12	29	#5	12	2	42	#8	10	8	7	5	1	5	0	8	7	9	22	5	7	5	12	2	6	22	5	13	0	12	77	2	5	42	#8	14	0	8	8	20	2	4	20	2	20	13	2
18-19	29	#8	12	2	26	#5	19	2	12	29	#5	12	2	42	#8	10	8	7	5	1	5	0	8	7	9	26	5	7	5	12	2	6	26	5	13	0	12	91	2	5	42	#8	16	0	8	8	20	2	4	20	2	20	13	2
20-21	29	#8	12	2	26	#5	19	2	12	29	#5	12	2	42	#8	10	8	7	5	1	5	0	8	7	9	30	5	7	5	12	2	6	30	5	13	0	12	105	2	5	42	#8	18	0	8	8	20	2	4	20	2	20	13	2
22-23	29	#8	12	2	26	#5	19	2	12	29	#5	12	2	42	#8	10	8	7	5	1	5	0	8	7	9	34	5	7	5	12	2	6	34	5	13	0	12	119	2	5	42	#8	20	0	8	8	20	2	4	20	2	20	13	2
24-25	29	#8	12	2	26	#5	19	2	12	29	#5	12	2	42	#8	10	8	7	5	1	5	0	8	7	9	38	5	7	5	12	2	6	38	5	13	0	12	133	2	5	42	#8	22	0	8	8	20	2	4	20	2	20	13	2

Reinforcement Details



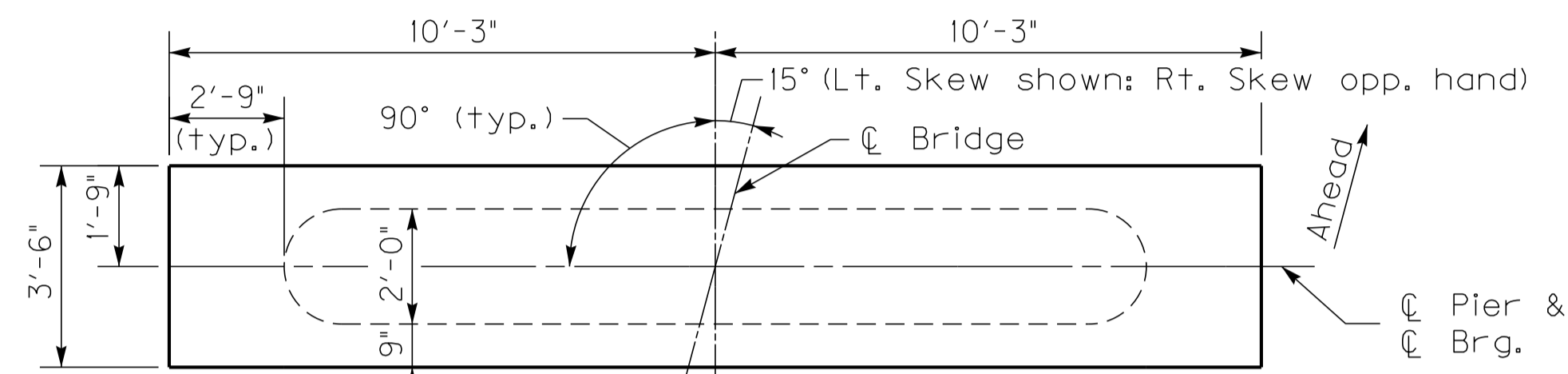
DIMENSIONS TABLE

H	A				H	CONCRETE CLASS "A"	STEEL REINFORCEMENT EPOXY COATED	STEEL REINFORCEMENT
	ft.	in.	ft.	in.				
10-11	2	6	2	3	10-11	37.5	792	3998
12-13	2	6	2	3	12-13	39.7	792	4331
14-15	2	6	2	3	14-15	41.8	792	4665
16-17	2	6	2	3	16-17	44	792	4998
18-19	2	6	2	3	18-19	46.2	792	5331
20-21	2	6	2	3	20-21	48.3	792	5664
22-23	2	6	2	3	22-23	50.5	792	5997
24-25	2	6	2	3	24-25	52.6	792	6330

Note: All bars in cap shall be epoxy coated.

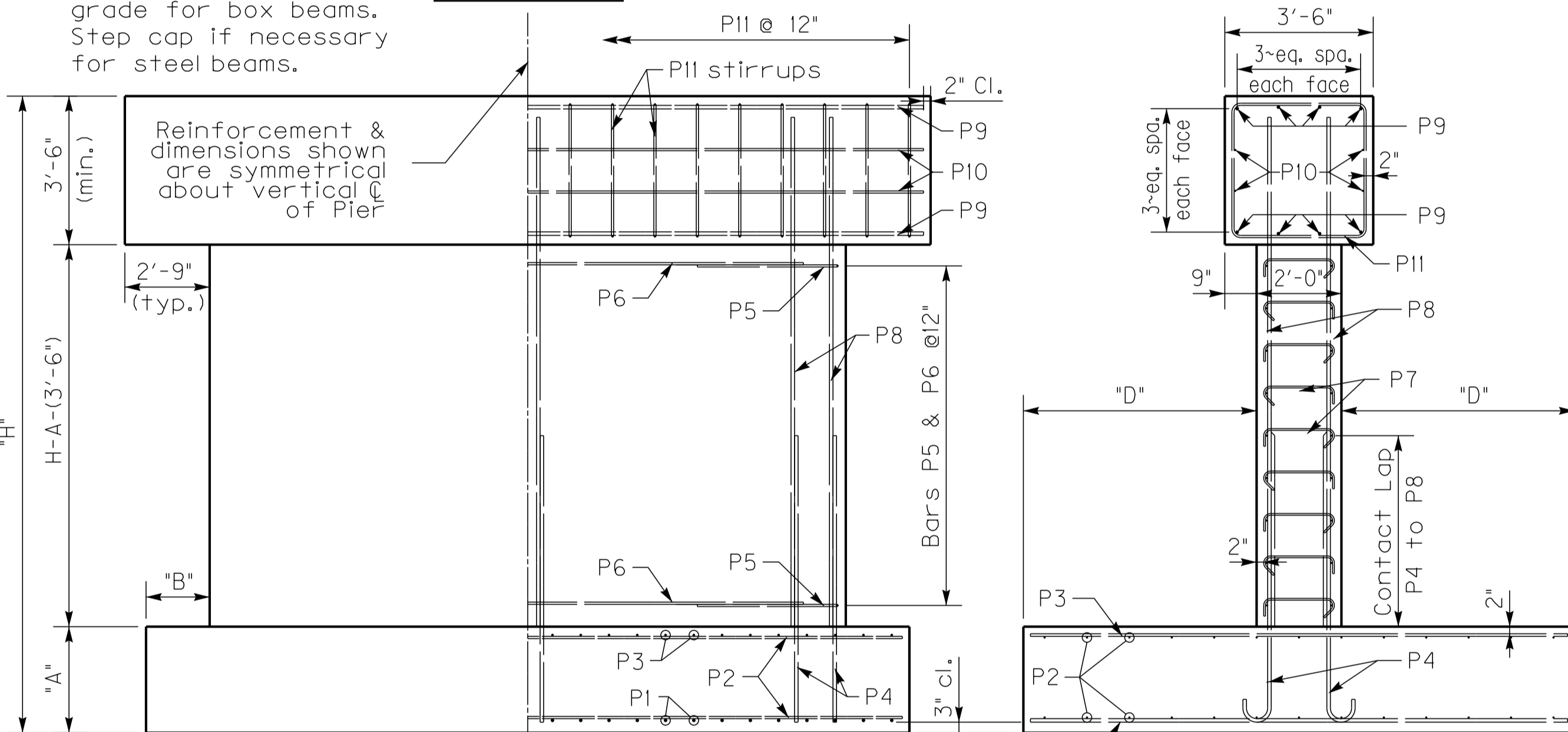
Note: All concrete shall be Class "A"

(1) Quantity is based on taller height. Reduce by 1.0 cubic yd. for shorter height.



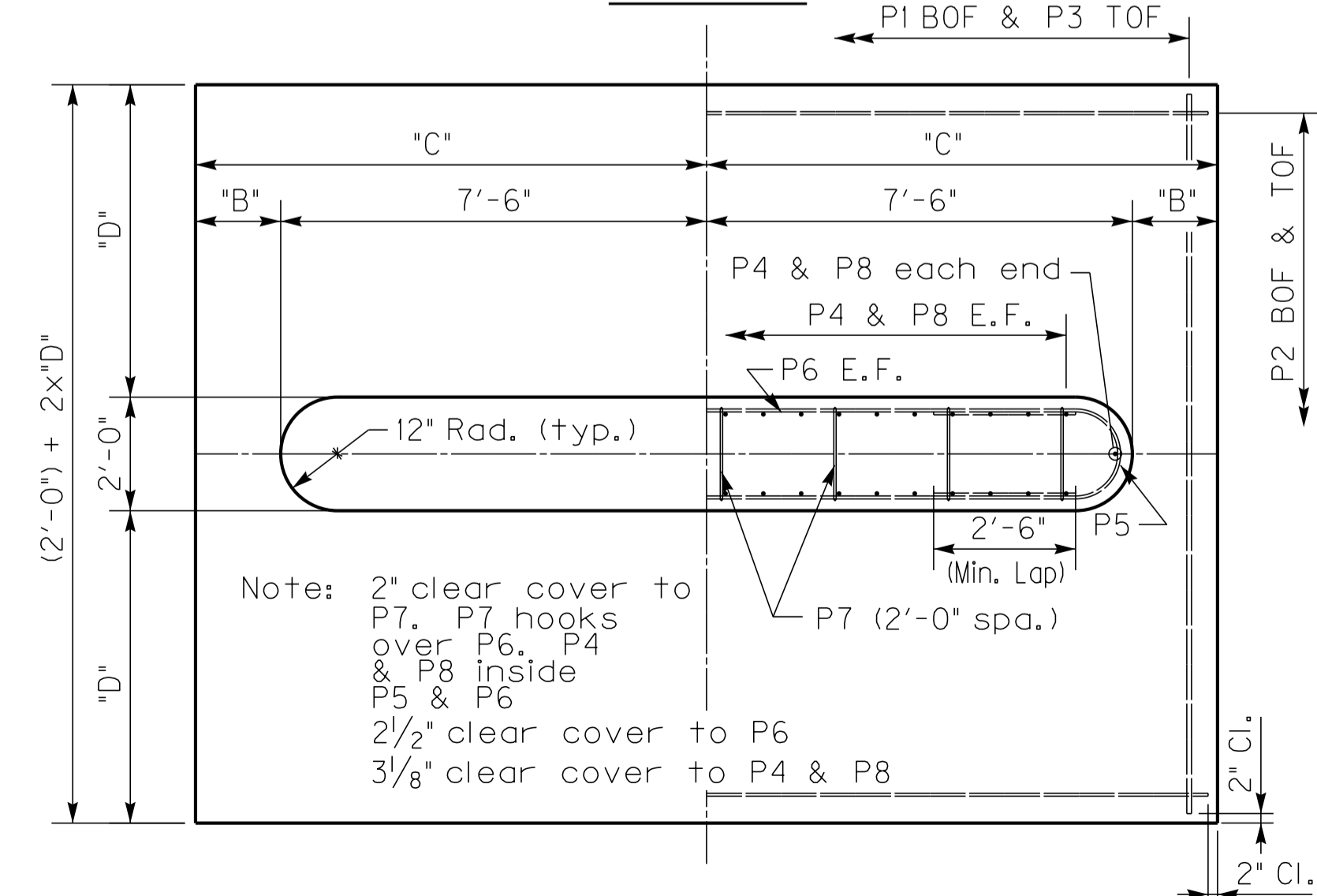
PLAN OF CAP

Note: Grade cap to roadway grade for box beams. Step cap if necessary for steel beams.



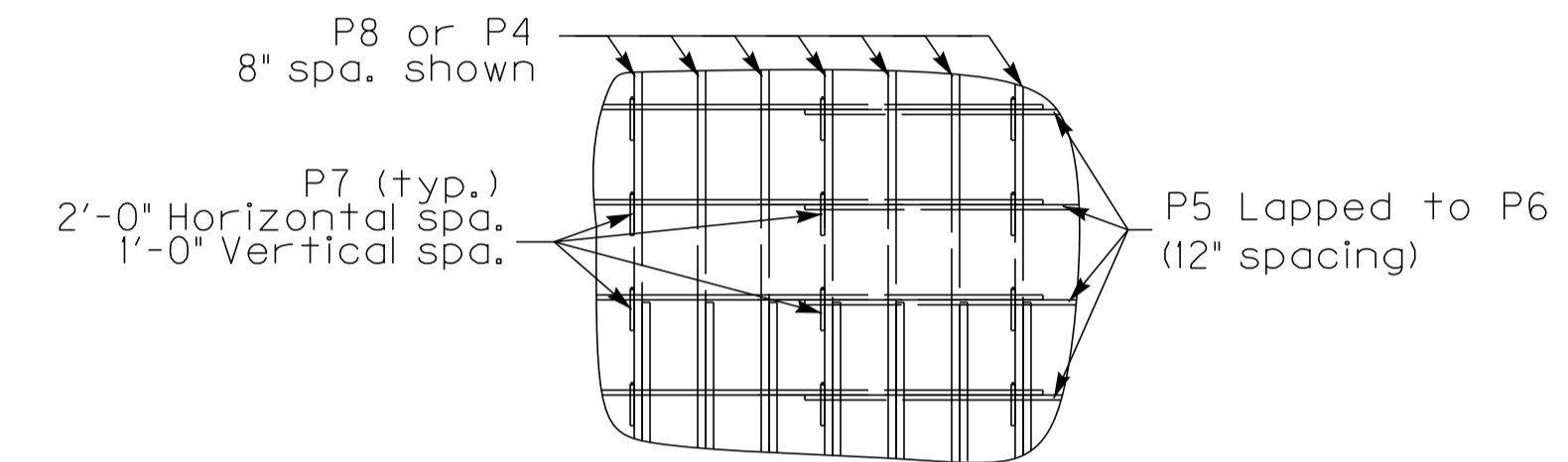
ELEVATION

END ELEVATION



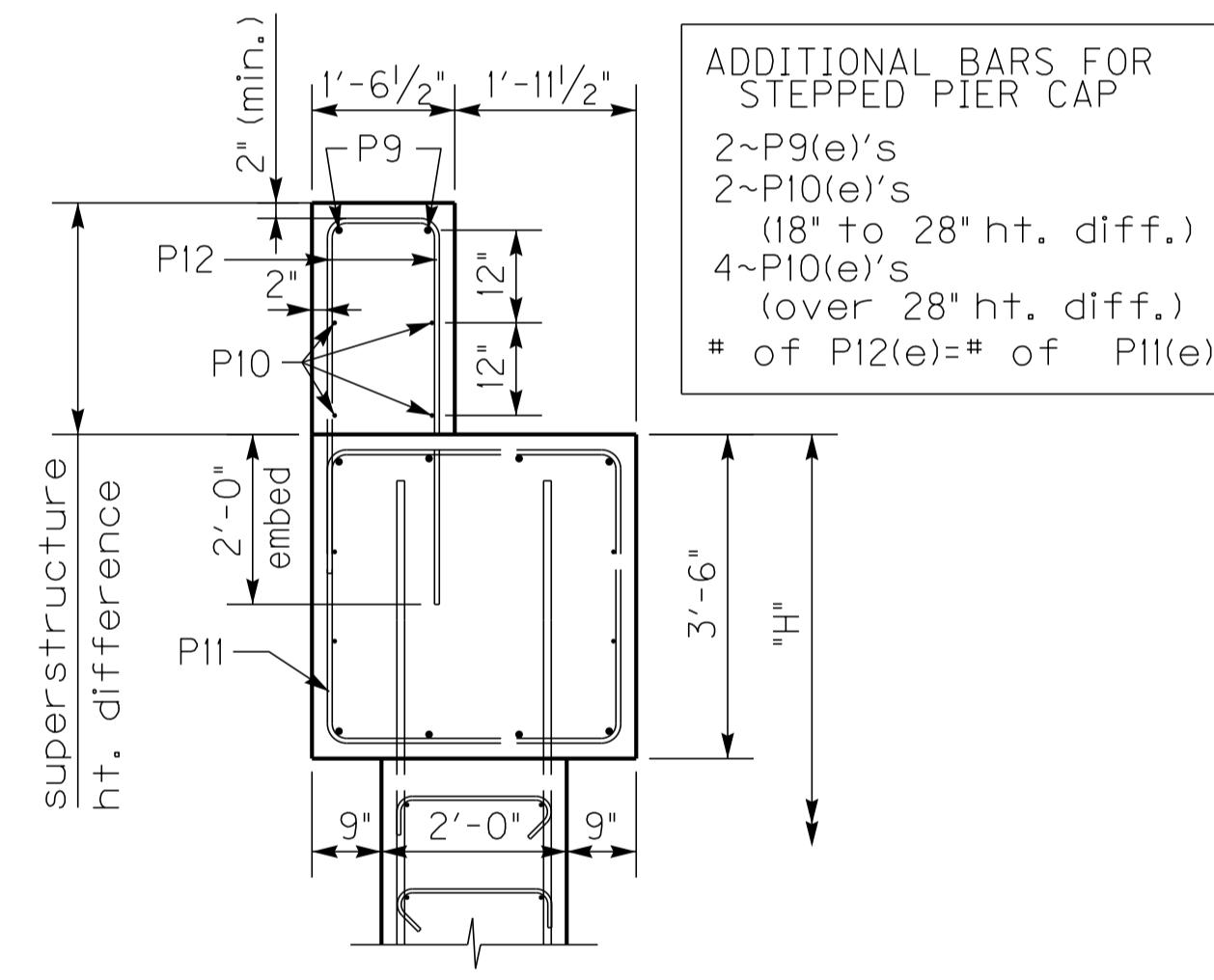
PLAN OF FOOTING

Note: 2" clear cover to P7. P7 hooks over P6. P4 & P8 inside P5 & P6
2 1/2" clear cover to P6
3/8" clear cover to P4 & P8



P7 BAR PLACEMENT

(alternate 90° & 135° bar ends)



STEPPED CAP

(if necessary)

ADDITIONAL BARS FOR STEPPED PIER CAP
2~P9(e)'s
2~P10(e)'s (18" to 28" ht. diff.)
4~P10(e)'s (over 28" ht. diff.)
of P12(e)=# of P11(e)

GENERAL NOTES

SPECIFICATIONS: Construct piers according to the current edition of the Kentucky Department of Highways Standard Specifications for Road and Bridge Construction. Piers are designed for side by side box beams as detailed in Standard Drawings BDP-001 through BDP-012, current edition. They may be slightly modified to allow for 17'-6" rolled steel beam bridge width.

FOUNDATION PRESSURE: Construct pier footings on solid rock bearing material that can support a pressure of 8000 psf service or 10,800 psf strength factored, as recommended by a geotechnical engineer.

DESIGN LOADS: Pier is designed for the CB42 beam superstructure with 3-97 foot spans. Pier is designed to handle a half a 97 foot span for thermal load with expansion bearings under the beams. Pier is designed for 100 mph wind. Wind on superstructure is for 1-97' span longitudinal and transverse. Pier is designed for stream flow of 10 ft./sec. up to the top of the pier. It is not designed for flow acting on the superstructure. Pier is not designed for earthquake loading.

DESIGN APPLICABILITY: Consult with a structural engineer to determine if these details are applicable for any particular project.

FOOTING ELEVATION: Construct bottom of footing below the anticipated scour elevation. (This typically entails embedding the footings 1'-0" to 2'-0" into rock and pouring concrete directly against cut rock faces, as recommended by geotechnical engineer.)

NOTE: Distances to bars shown are clear dimensions unless otherwise noted.

MATERIAL SPECIFICATIONS:
Concrete, Class "A" = 3500 psi
Steel Reinforcement = Grade 60

PIER DETAILS

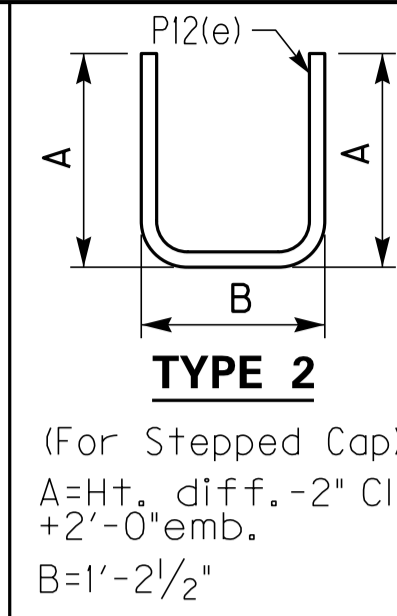
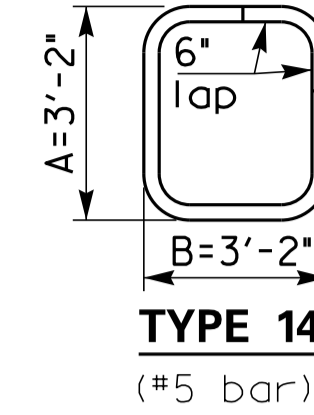
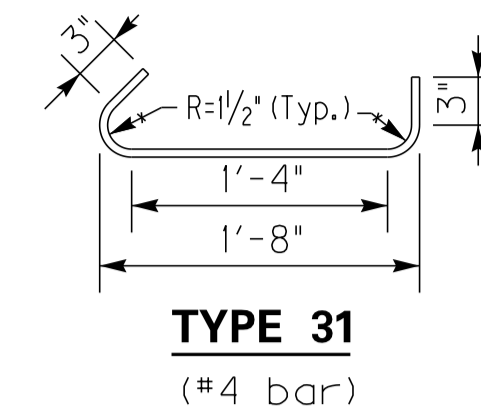
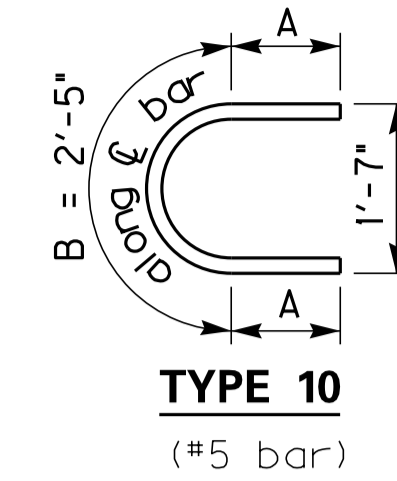
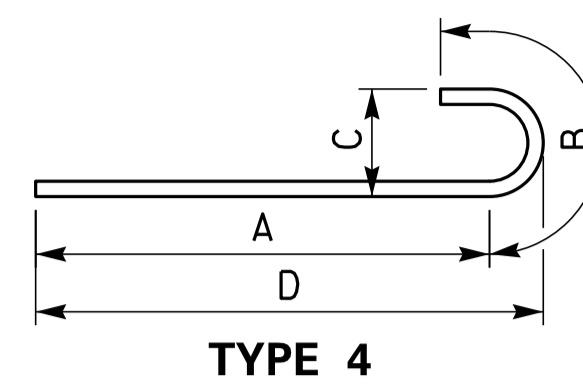
SKUEW	WIDTH	DATE
15	16	July 2017

15° SKEW 24'-0" - 25'-6" BRIDGE WIDTH (No Seismic Load)

Bill of Reinforcement

MARK	P1		P2		P3		P4				P5				P6		P7		P8		P9(e)		P10(e)		P11(e)																															
	Str.		Str.		Str.		Type 4				Type 10				Str.		Type 31		Str.		Str.		Str.		Type 14																															
TYPE	Str.		Str.		Str.		Type 4				Type 10				Str.		Type 31		Str.		Str.		Str.		Type 14																															
SIZE	Str.		Str.		Str.		Type 4				Type 10				Str.		Type 31		Str.		Str.		Str.		Type 14																															
H	No.	Size	Length	Spacing	No.	Size	Length	Spacing	No.	Size	Length	Spacing	No.	Size	Length	Spacing	No.	Size	Length	Spacing	No.	Size	Length	Spacing	No.	Size	Length	Spacing																												
10-11	43	#8	12	8	26	#5	28	2	12	43	#5	12	8	64	#8	8	10	8	7	5	1	5	0	8	7	9	10	5	7	5	12	2	6	10	5	20	6	12	55	2	5	5	64	8	8	0	8	8	28	2	4	28	2	28	13	2
12-13	43	#8	12	8	26	#5	28	2	12	43	#5	12	8	64	#8	8	10	8	7	5	1	5	0	8	7	9	14	5	7	5	12	2	6	14	5	20	6	12	77	2	5	64	8	10	0	8	8	28	2	4	28	2	28	13	2	
14-15	43	#8	12	8	26	#5	28	2	12	43	#5	12	8	64	#8	8	10	8	7	5	1	5	0	8	7	9	18	5	7	5	12	2	6	18	5	20	6	12	99	2	5	64	8	12	0	8	8	28	2	4	28	2	28	13	2	
16-17	43	#8	12	8	26	#5	28	2	12	43	#5	12	8	64	#8	8	10	8	7	5	1	5	0	8	7	9	22	5	7	5	12	2	6	22	5	20	6	12	121	2	5	64	8	14	0	8	8	28	2	4	28	2	28	13	2	
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20-21	43	#8	12	8	26	#5	28	2	12	43	#5	12	8	64	#8	8	10	8	7	5	1	5	0	8	7	9	30	5	7	5	12	2	6	30	5	20	6	12	165	2	5	64	8	18	0	8	8	28	2	4	28	2	28	13	2	
22-23	43	#8	12	8	26	#5	28	2	12	43	#5	12	8	64	#8	8	10	8	7	5	1	5	0	8	7	9	34	5	7	5	12	2	6	34	5	20	6	12	187	2	5	64	8	20	0	8	8	28	2	4	28	2	28	13	2	
24-25	43	#8	12	8	26	#5	28	2	12	43	#5	12	8	64	#8	8	10	8	7	5	1	5	0	8	7	9	38	5	7	5	12	2	6	38	5	20	6	12	209	2	5	64	8	22	0	8	8	28	2	4	28	2	28	13	2	

Reinforcement Details



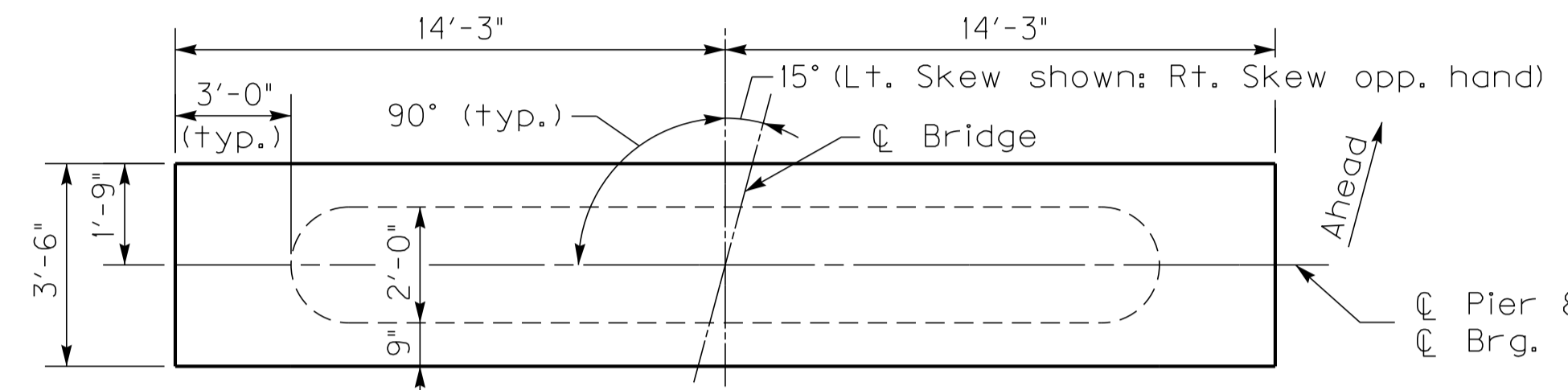
DIMENSIONS TABLE										
H	A	B	C	D						
ft.	in.	ft.	in.	ft.	in.					
10-11	2	6	3	0	14	3	5	6		
12-13	2	6	3	0	14	3	5	6		
14-15	2	6	3	0	14	3	5	6		
16-17	2	6	3	0	14	3	5	6		
18-19	2	6	3	0	14	3	5	6		
20-21	2	6	3	0	14	3	5	6		
22-23	2	6	3	0	14	3	5	6		
24-25	2	6	3	0	14	3	5	6		

QUANTITIES							
H	CONCRETE CLASS "A"			STEEL REINFORCEMENT EPOXY COATED		STEEL REINFORCEMENT	
	CU. YDS. (1)	LBS.	LBS.	LBS.	LBS.	LBS.	LBS.
10-11	55.9	1107	6060				
12-13	59.2	1107	6555				
14-15	62.5	1107	7051				
16-17	65.7	1107	7546				
18-19	69	1107	8041				
20-21	72.3	1107	8536				
22-23	75.5	1107	9031				
24-25	78.8	1107	9527				

Note: All bars in cap shall be epoxy coated.

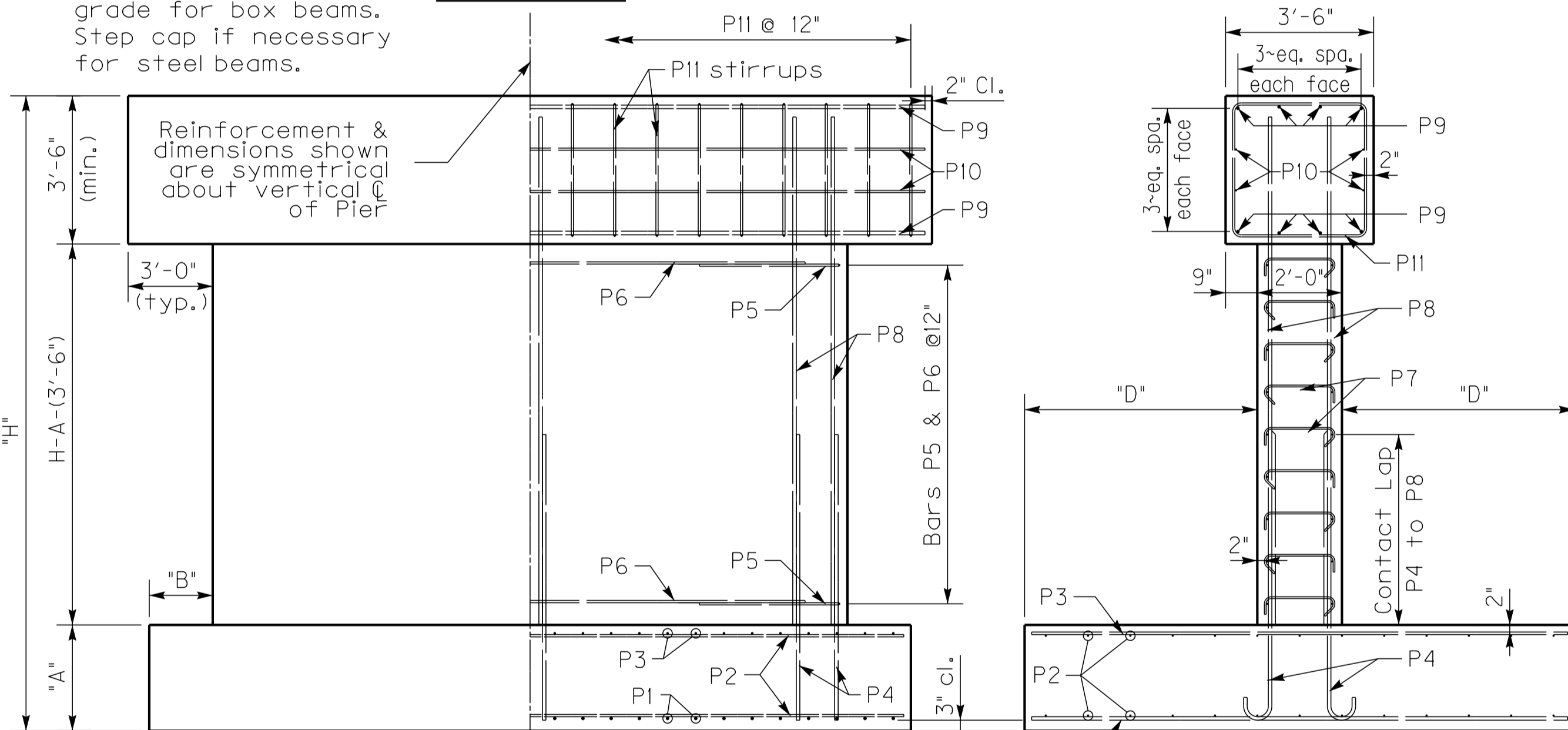
Note: All concrete shall be Class "A"

(1) Quantity is based on taller height. Reduce by 1.6 cubic yard for shorter height.



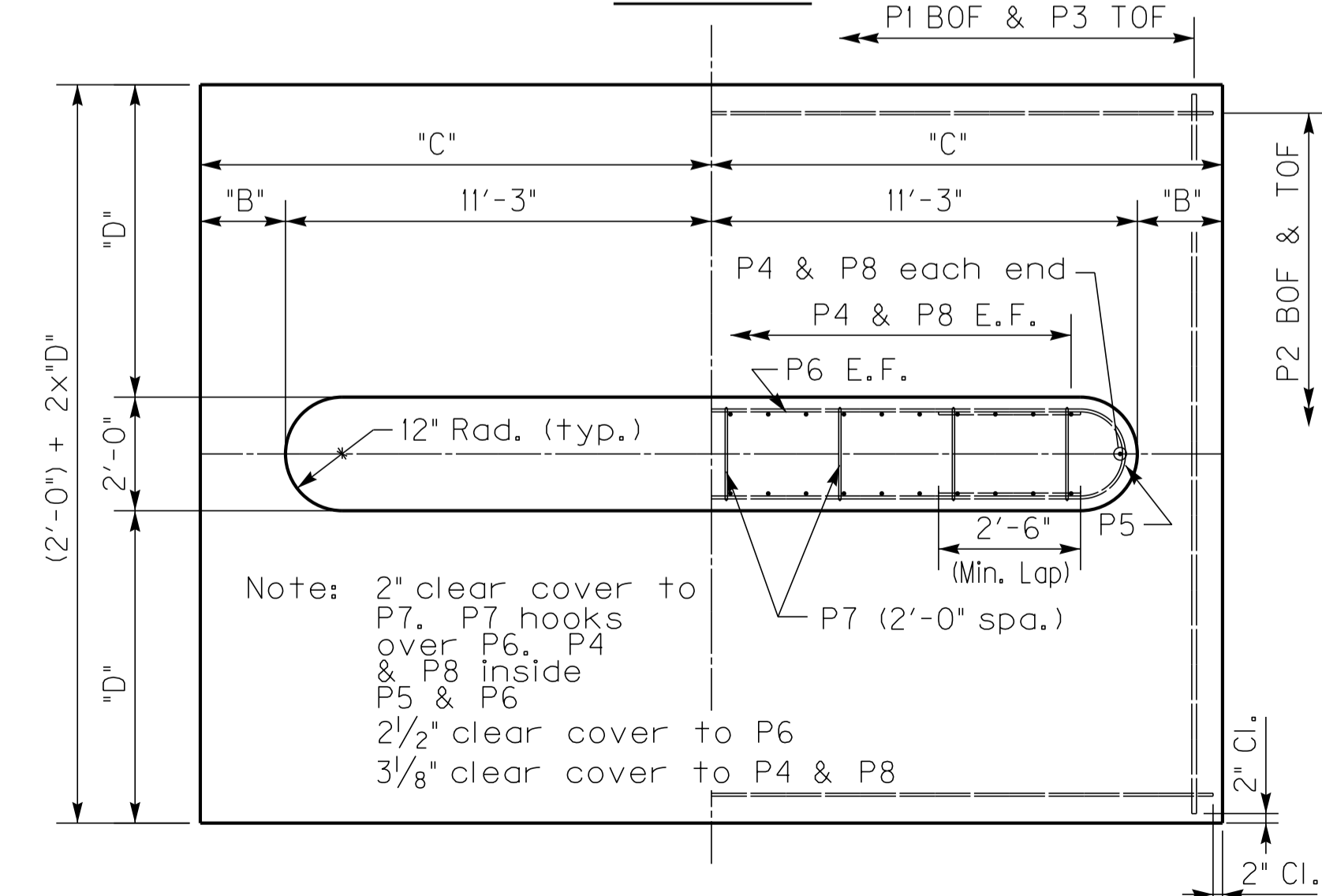
PLAN OF CAP

Note: Grade cap to roadway grade for box beams. Step cap if necessary for steel beams.



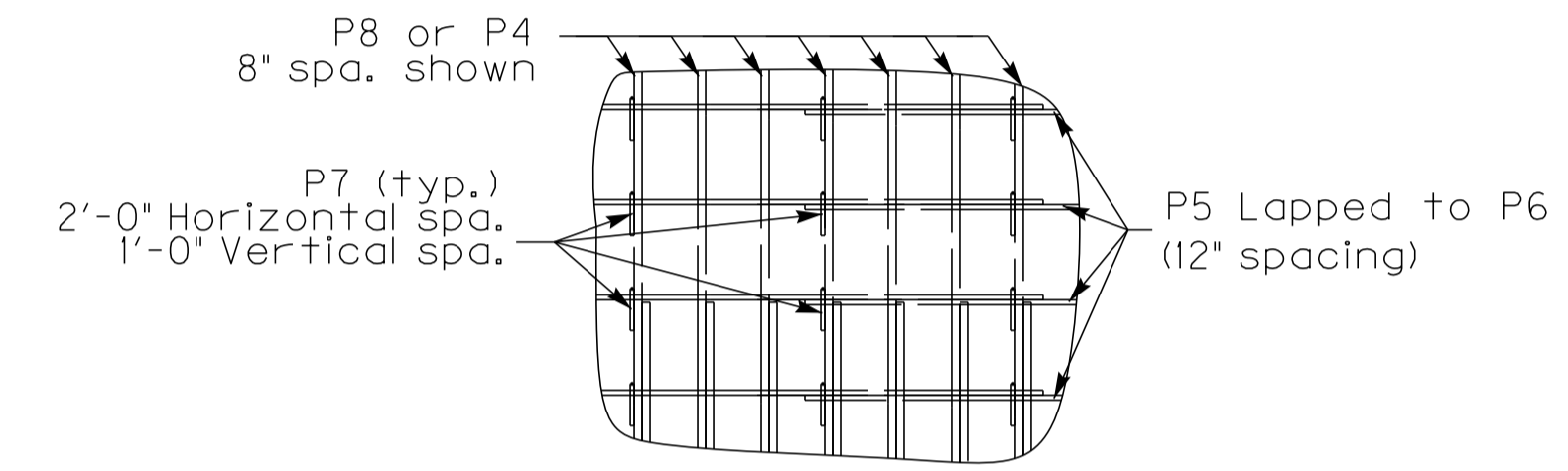
ELEVATION

END ELEVATION



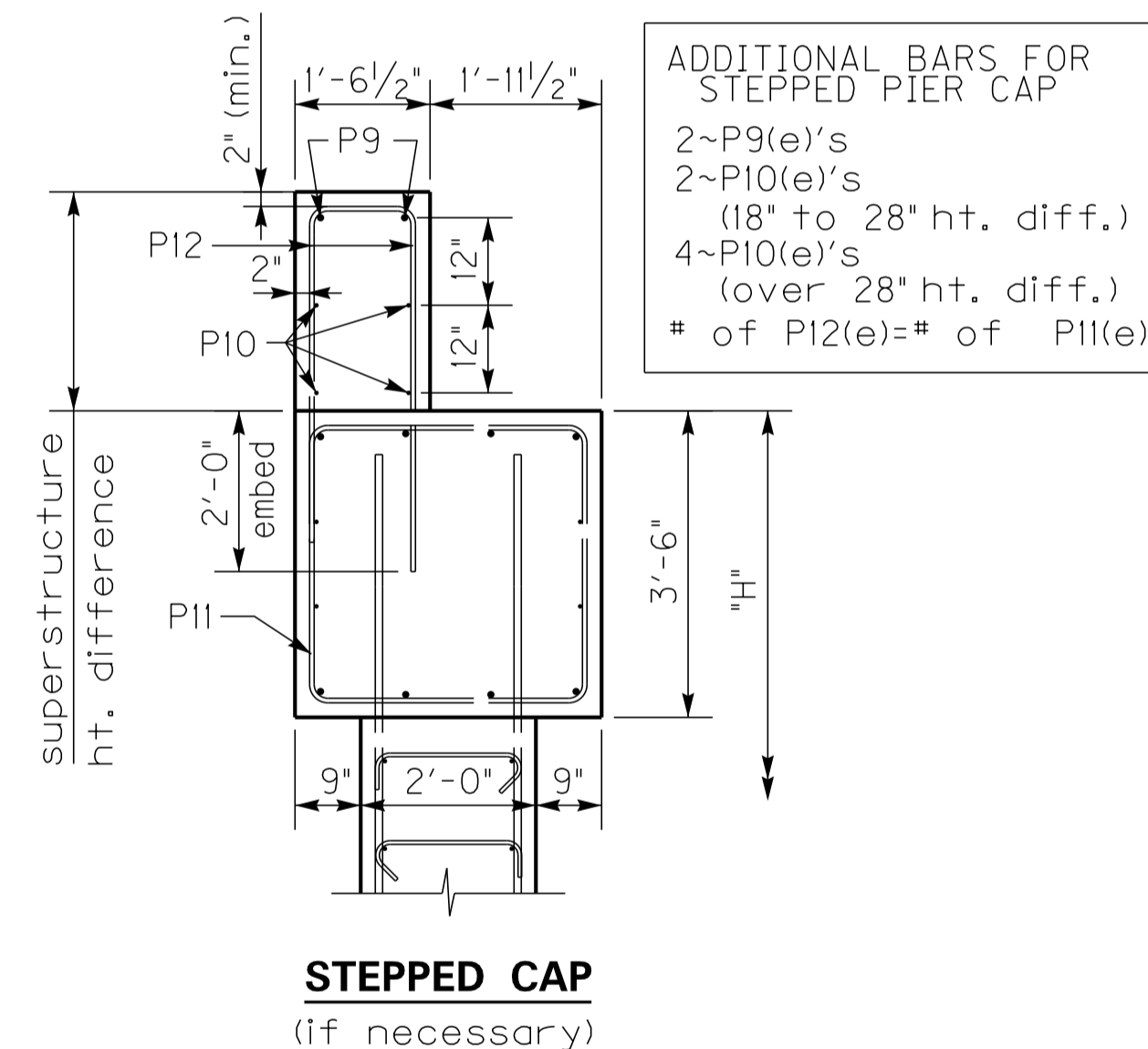
PLAN OF FOOTING

Note: 2" clear cover to P7. P7 hooks over P6. P4 & P8 inside P5 & P6
2 1/2" clear cover to P6
3/8" clear cover to P4 & P8



P7 BAR PLACEMENT

(alternate 90° & 135° bar ends)



STEPPED CAP

(if necessary)

ADDITIONAL BARS FOR STEPPED PIER CAP
2~P9(e)'s
2~P10(e)'s (18" to 28" ht. diff.)
4~P10(e)'s (over 28" ht. diff.)
of P12(e)=# of P11(e)

GENERAL NOTES

SPECIFICATIONS: Construct piers according to the current edition of the Kentucky Department of Highways Standard Specifications for Road and Bridge Construction. Piers are designed for side by side box beams as detailed in Standard Drawings BDP-001 through BDP-012, current edition. They may be slightly modified to allow for 25'-6" rolled steel beam bridge width.

FOUNDATION PRESSURE: Construct pier footings on solid rock bearing material that can support a pressure of 8000 psf service or 10,800 psf strength factored, as recommended by a geotechnical engineer.

DESIGN LOADS: Pier is designed for the CB42 beam superstructure with 3-97 foot spans. Pier is designed to handle a half a 97 foot span for thermal load with expansion bearings under the beams. Pier is designed for 100 mph wind. Wind on superstructure is for 1-97' span longitudinal and transverse. Pier is designed for stream flow of 10 ft./sec. up to the top of the pier. It is not designed for flow acting on the superstructure. Pier is not designed for earthquake loading.

DESIGN APPLICABILITY: Consult with a structural engineer to determine if these details are applicable for any particular project.

FOOTING ELEVATION: Construct bottom of footing below the anticipated scour elevation. (This typically entails embedding the footings 1'-0" to 2'-0" into rock and pouring concrete directly against cut rock faces, as recommended by geotechnical engineer.)

NOTE: Distances to bars shown are clear dimensions unless otherwise noted.

MATERIAL SPECIFICATIONS:
Concrete, Class "A" = 3500 psi
Steel Reinforcement = Grade 60

PIER DETAILS

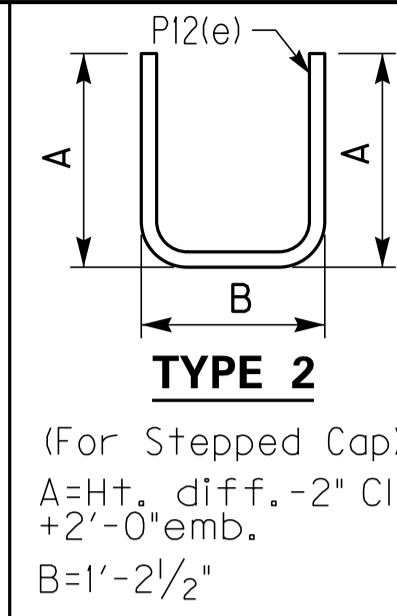
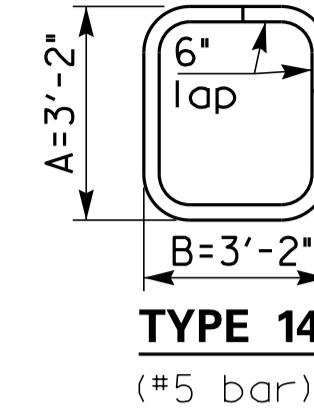
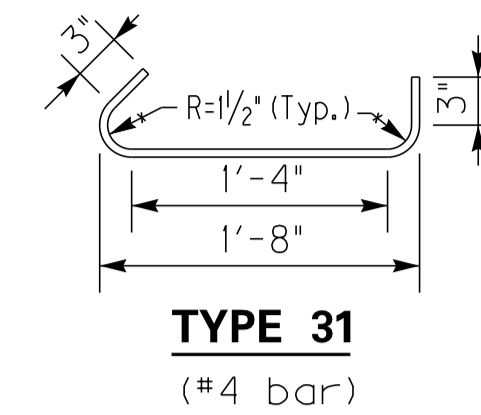
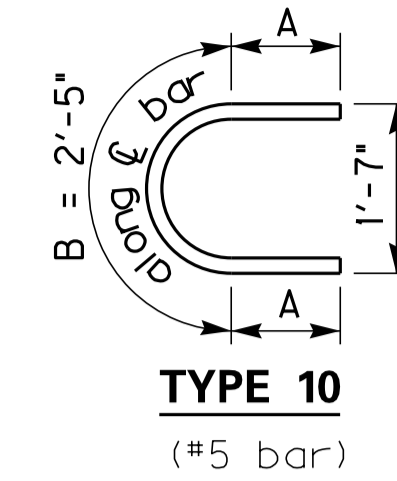
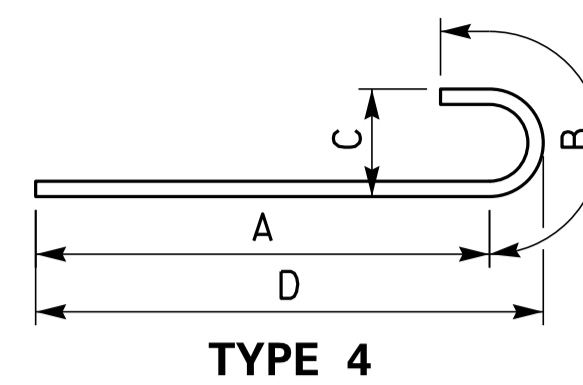
SKEW	WIDTH	DATE
15	24	July 2017

15° SKEW 32'-0" - 33'-6" BRIDGE WIDTH (No Seismic Load)

Bill of Reinforcement

MARK	P1	P2	P3	P4				P5				P6	P7	P8	P9(e)	P10(e)	P11(e)																																					
TYPE	Str.	Str.	Str.	Type 4				Type 10				Str.	Type 31	Str.	Str.	Type 14																																						
SIZE																																																						
H	No.	Size	Length	No.	Size	Length	No.	Size	Length	No.	Size	Length	No.	Size	Length	No.	Size	Length																																				
		ft.	in.			ft.	in.					ft.	in.					ft.	in.																																			
10-11	55	8	12	26	6	36	2	12	55	5	12	8	90	8	8	10	8	7	5	1	5	0	8	7	9	10	5	7	5	12	2	6	10	5	29	0	12	75	2	5	90	8	8	0	8	8	36	8	4	36	8	37	13	2
12-13	55	8	12	26	6	36	2	12	55	5	12	8	90	8	8	10	8	7	5	1	5	0	8	7	9	14	5	7	5	12	2	6	14	5	29	0	12	105	2	5	90	8	10	0	8	8	36	8	4	36	8	37	13	2
14-15	55	8	12	26	6	36	2	12	55	5	12	8	90	8	8	10	8	7	5	1	5	0	8	7	9	18	5	7	5	12	2	6	18	5	29	0	12	135	2	5	90	8	12	0	8	8	36	8	4	36	8	37	13	2
16-17	55	8	12	26	6	36	2	12	55	5	12	8	90	8	8	10	8	7	5	1	5	0	8	7	9	22	5	7	5	12	2	6	22	5	29	0	12	165	2	5	90	8	14	0	8	8	36	8	4	36	8	37	13	2
18-19	55	8	12	26	6	36	2	12	55	5	12	8	90	8	8	10	8	7	5	1	5	0	8	7	9	26	5	7	5	12	2	6	26	5	29	0	12	195	2	5	90	8	16	0	8	8	36	8	4	36	8	37	13	2
20-21	55	8	12	26	6	36	2	12	55	5	12	8	90	8	8	10	8	7	5	1	5	0	8	7	9	30	5	7	5	12	2	6	30	5	29	0	12	225	2	5	90	8	18	0	8	8	36	8	4	36	8	37	13	2
22-23	55	8	12	26	6	36	2	12	55	5	12	8	90	8	8	10	8	7	5	1	5	0	8	7	9	34	5	7	5	12	2	6	34	5	29	0	12	255	2	5	90	8	20	0	8	8	36	8	4	36	8	37	13	2
24-25	55	8	12	26	6	36	2	12	55	5	12	8	90	8	8	10	8	7	5	1	5	0	8	7	9	38	5	7	5	12	2	6	38	5	29	0	12	285	2	5	90	8	22	0	8	8	36	8	4	36	8	37	13	2

Reinforcement Details



DIMENSIONS TABLE

H	A	B	C	D				
ft.	in.	ft.	in.	ft.	in.			
10-11	2	6	2	9	18	3	5	6
12-13	2	6	2	9	18	3	5	6
14-15	2	6	2	9	18	3	5	6
16-17	2	6	2	9	18	3	5	6
18-19	2	6	2	9	18	3	5	6
20-21	2	6	2	9	18	3	5	6
22-23	2	6	2	9	18	3	5	6
24-25	2	6	2	9	18	3	5	6

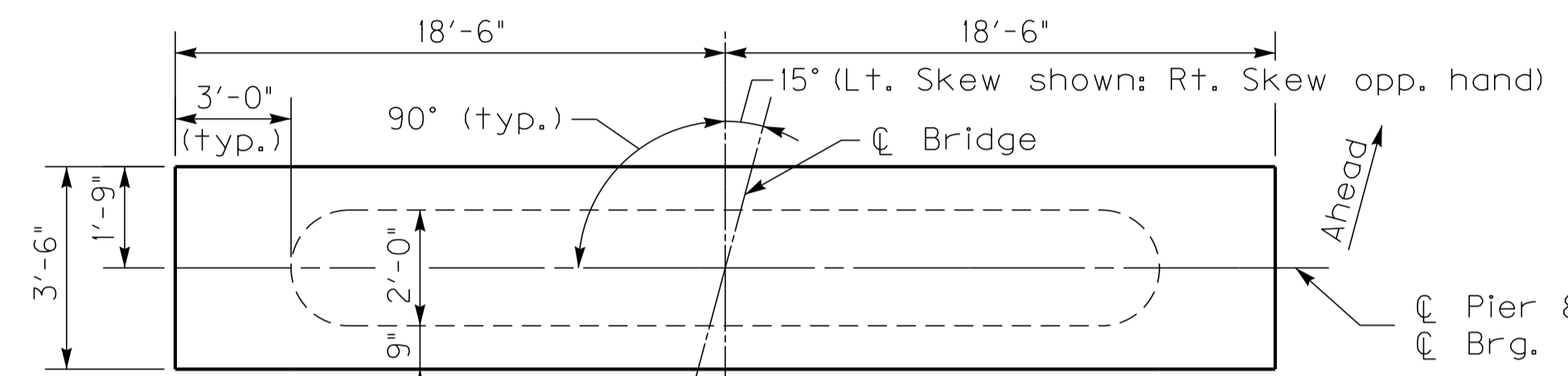
QUANTITIES

H	CONCRETE CLASS "A"		STEEL REINFORCEMENT EPOXY COATED		STEEL REINFORCEMENT	
	CU. YDS. (1)	LBS.	LBS.	LBS.		
10-11	72.9	1449	8570			
12-13	77.4	1449	9253			
14-15	82	1449	9936			
16-17	86.5	1449	10619			
18-19	91	1449	11302			
20-21	95.5	1449	11985			
22-23	100.1	1449	12668			
24-25	104.6	1449	13351			

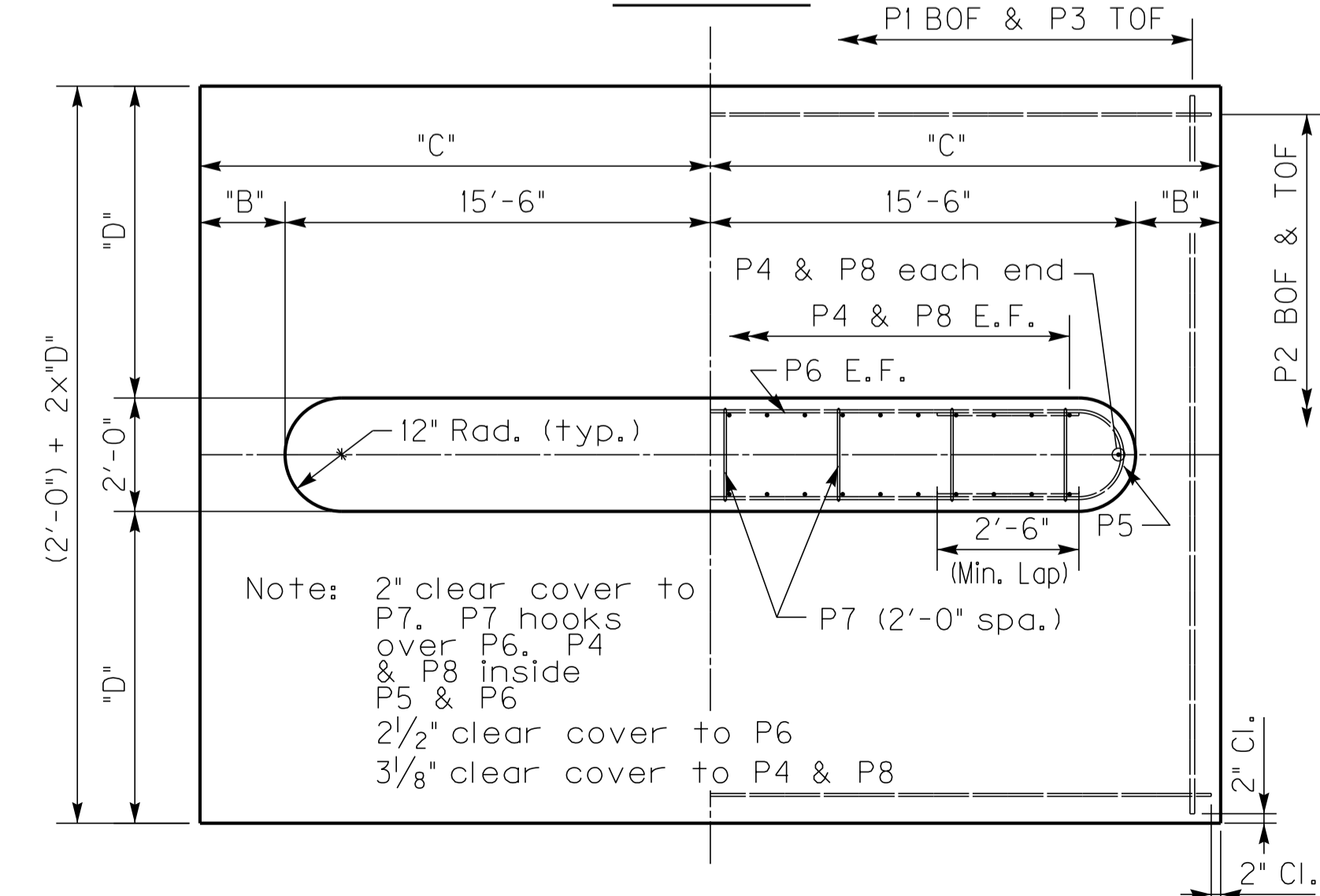
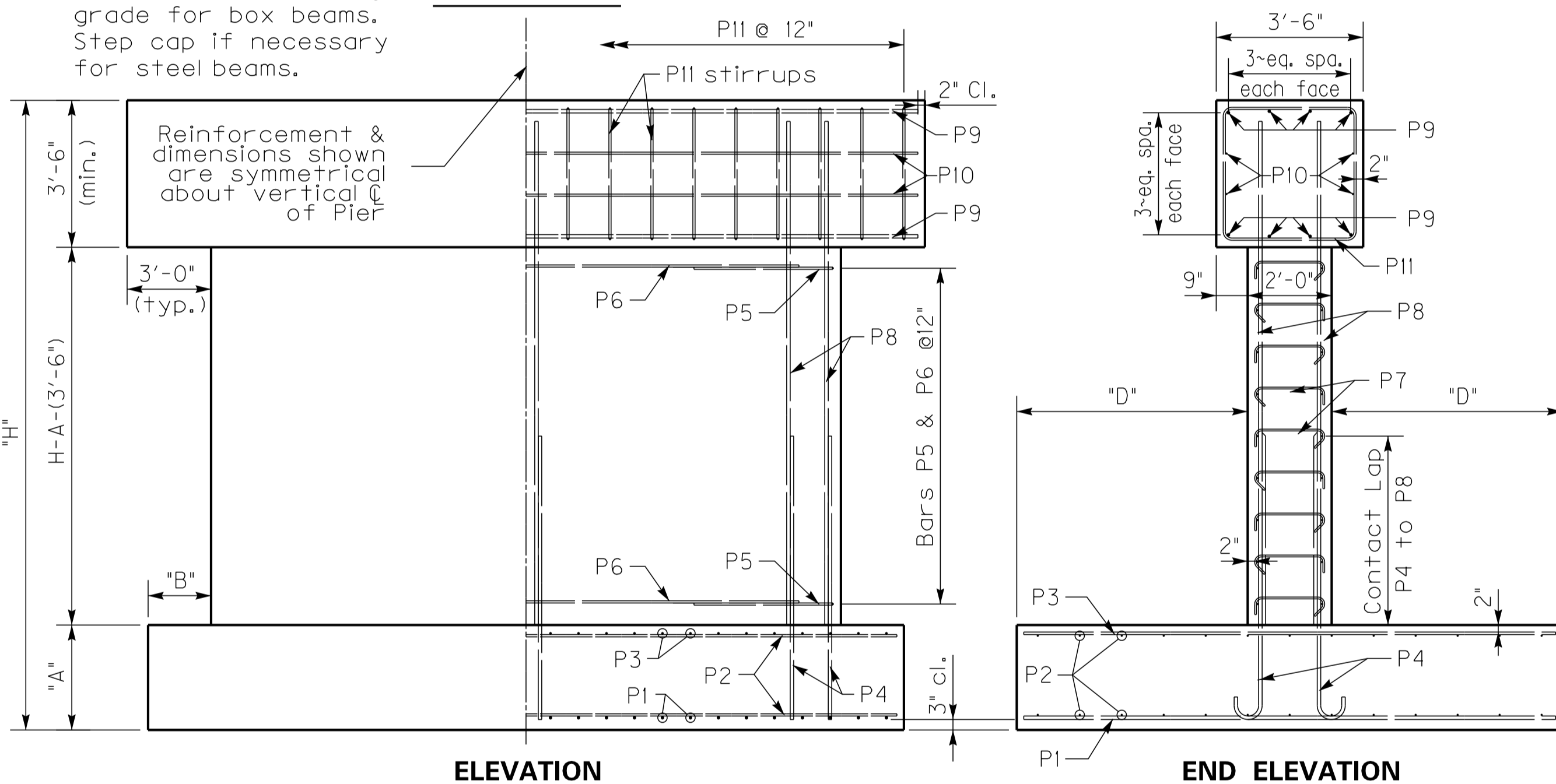
Note: All bars in cap shall be epoxy coated.

Note: All concrete shall be Class "A"

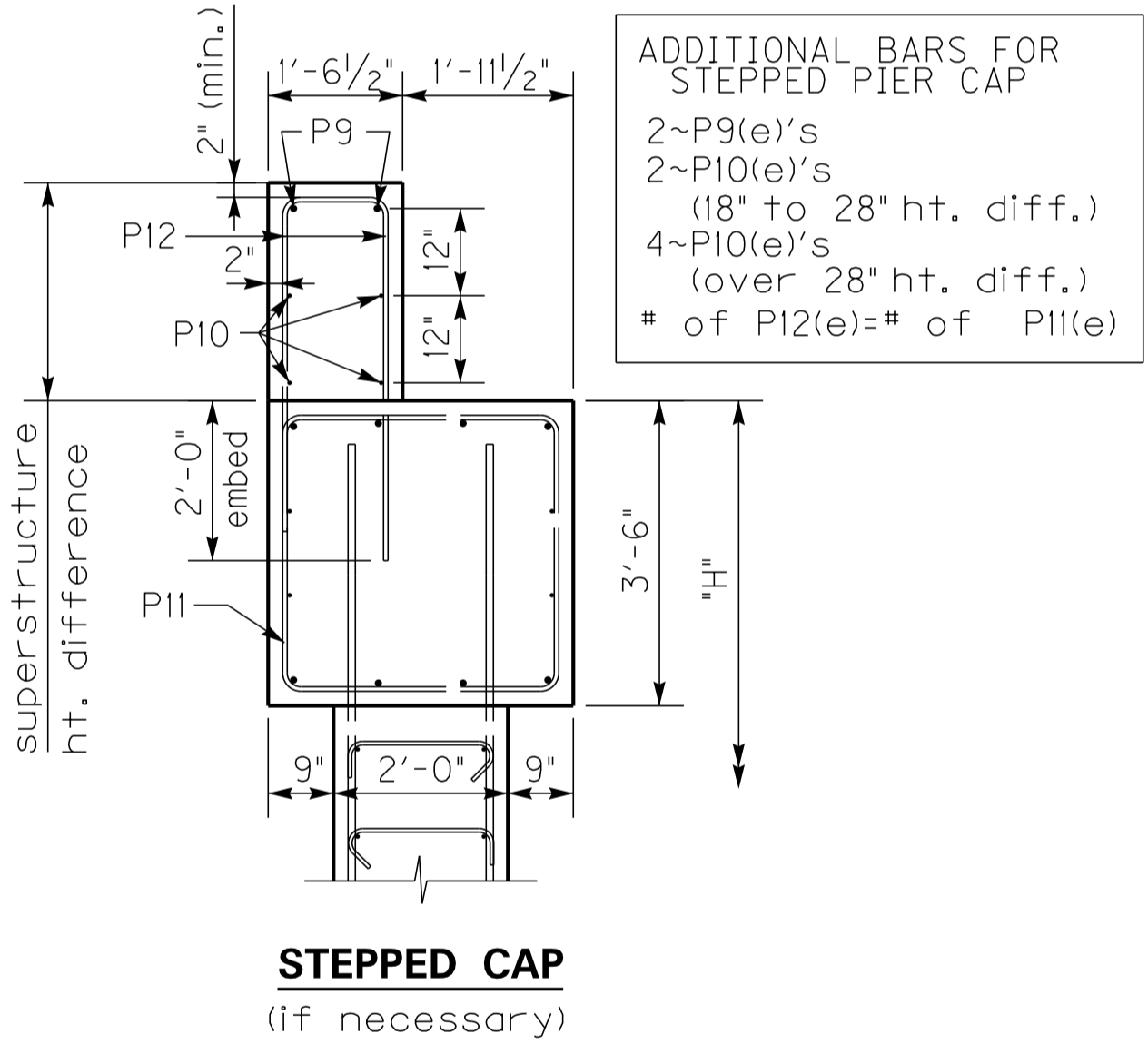
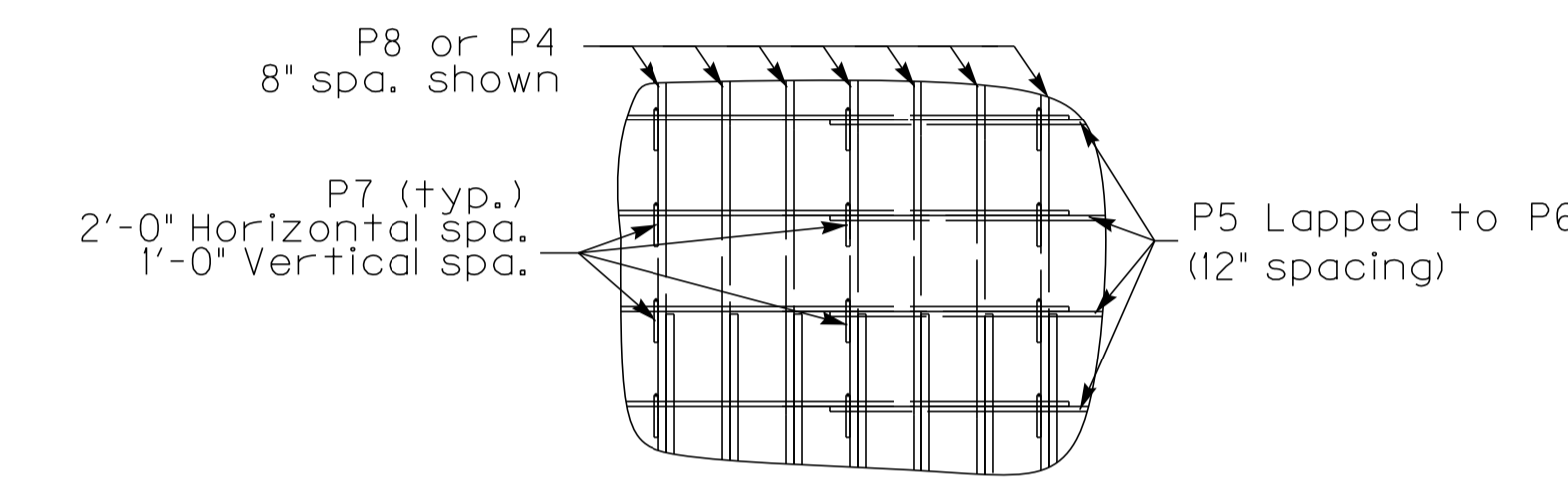
(1) Quantity is based on taller height. Reduce by 2.2 cubic yard for shorter height.



Note: Grade cap to roadway grade for box beams. Step cap if necessary for steel beams.



Note: 2" clear cover to P7. P7 hooks over P6. P4 & P8 inside P5 & P6
2 1/2" clear cover to P6
3/8" clear cover to P4 & P8



GENERAL NOTES

SPECIFICATIONS: Construct piers according to the current edition of the Kentucky Department of Highways Standard Specifications for Road and Bridge Construction. Piers are designed for side by side box beams as detailed in Standard Drawings BDP-001 through BDP-012, current edition. They may be slightly modified to allow for 33'-6" rolled steel beam bridge width.

FOUNDATION PRESSURE: Construct pier footings on solid rock bearing material that can support a pressure of 8000 psf service or 10,800 psf strength factored, as recommended by a geotechnical engineer.

DESIGN LOADS: Pier is designed for the CB42 beam superstructure with 3-97 foot spans. Pier is designed to handle a half a 97 foot span for thermal load with expansion bearings under the beams. Pier is designed for 100 mph wind. Wind on superstructure is for 1-97' span longitudinal and transverse. Pier is designed for stream flow of 10 ft./sec. up to the top of the pier. It is not designed for flow acting on the superstructure. Pier is not designed for earthquake loading.

DESIGN APPLICABILITY: Consult with a structural engineer to determine if these details are applicable for any particular project.

FOOTING ELEVATION: Construct bottom of footing below the anticipated scour elevation. (This typically entails embedding the footings 1'-0" to 2'-0" into rock and pouring concrete directly against cut rock faces, as recommended by geotechnical engineer.)

NOTE: Distances to bars shown are clear dimensions unless otherwise noted.

MATERIAL SPECIFICATIONS:
Concrete, Class "A" = 3500 psi
Steel Reinforcement = Grade 60

PIER DETAILS

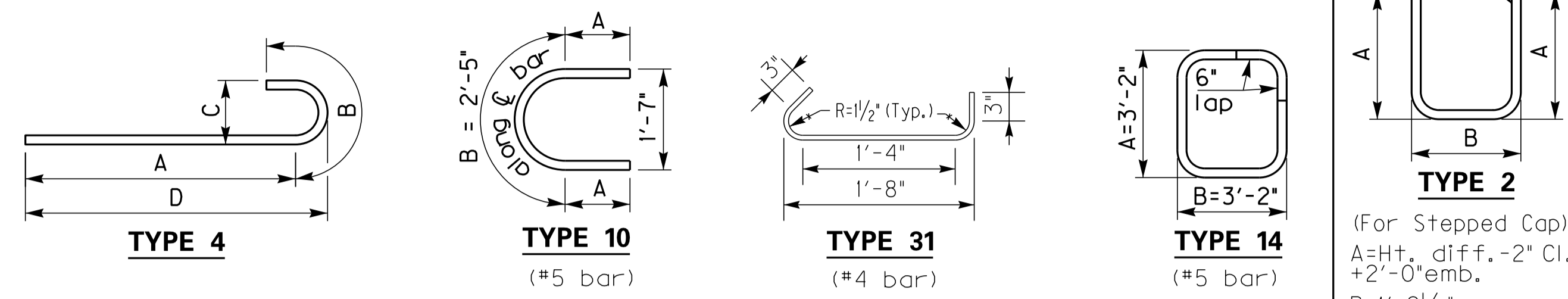
SKEW	WIDTH	DATE
15	32	July 2017

30° SKEW 16'-0" - 17'-6" BRIDGE WIDTH (No Seismic Load)

Bill of Reinforcement

MARK	P1		P2		P3		P4				P5				P6		P7		P8		P9(e)		P10(e)		P11(e)			
	TYPE	Str.	Str.	Str.	Type 4				Type 10				Str.	Type 31	Str.	Str.	Str.	Str.	Str.	Str.	Str.	Str.	Type 14	Type 14	Type 14			
SIZE	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length		
H		ft., in.		ft., in.		ft., in.		ft., in.		ft., in.		ft., in.		ft., in.		ft., in.		ft., in.		ft., in.		ft., in.		ft., in.		ft., in.		
10-11	32	8 12 2 8	26	5 21 2 12	32	5 12 2 8	48	8 10 8 7	5	1 5 0 8	7	9 9 18	10	5 7 5 12	2	6 10	5	15 0 12	40	2 5 48	8	8 0 8	8	23 8	4	23 8	24	13 2
12-13	32	8 12 2 8	26	5 21 2 12	32	5 12 2 8	48	8 10 8 7	5	1 5 0 8	7	9 9 18	14	5 7 5 12	2	6 14	5	15 0 12	56	2 5 48	8	10 0 8	8	23 8	4	23 8	24	13 2
14-15	32	8 12 2 8	26	5 21 2 12	32	5 12 2 8	48	8 10 8 7	5	1 5 0 8	7	9 9 18	18	5 7 5 12	2	6 18	5	15 0 12	72	2 5 48	8	12 0 8	8	23 8	4	23 8	24	13 2
16-17	32	8 12 2 8	26	5 21 2 12	32	5 12 2 8	48	8 10 8 7	5	1 5 0 8	7	9 9 22	5	7 5 12	2	6 22	5	15 0 12	88	2 5 48	8	14 0 8	8	23 8	4	23 8	24	13 2
18-19	32	8 12 2 8	26	5 21 2 12	32	5 12 2 8	48	8 10 8 7	5	1 5 0 8	7	9 9 26	5	7 5 12	2	6 26	5	15 0 12	104	2 5 48	8	16 0 8	8	23 8	4	23 8	24	13 2
20-21	32	8 12 2 8	26	5 21 2 12	32	5 12 2 8	48	8 10 8 7	5	1 5 0 8	7	9 9 30	5	7 5 12	2	6 30	5	15 0 12	120	2 5 48	8	18 0 8	8	23 8	4	23 8	24	13 2
22-23	32	8 12 2 8	26	5 21 2 12	32	5 12 2 8	48	8 10 8 7	5	1 5 0 8	7	9 9 34	5	7 5 12	2	6 34	5	15 0 12	136	2 5 48	8	20 0 8	8	23 8	4	23 8	24	13 2
24-25	32	8 12 2 8	26	5 21 2 12	32	5 12 2 8	48	8 10 8 7	5	1 5 0 8	7	9 9 38	5	7 5 12	2	6 38	5	15 0 12	152	2 5 48	8	22 0 8	8	23 8	4	23 8	24	13 2

Reinforcement Details

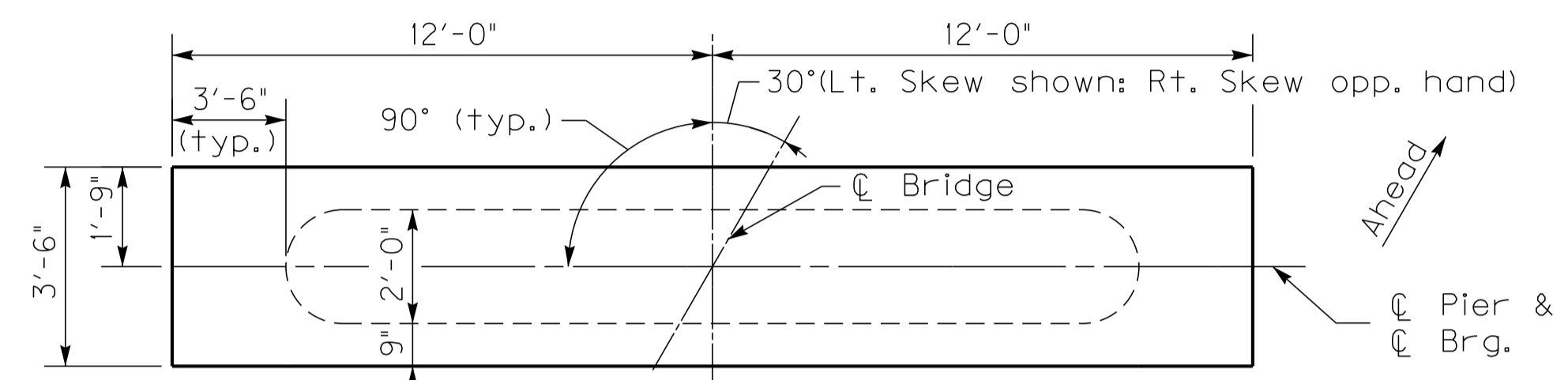


DIMENSIONS TABLE		QUANTITIES						
		CONCRETE CLASS "A"	STEEL REINFORCEMENT EPOXY COATED	STEEL REINFORCEMENT				
H	A	B	C	D	H	CU. YDS. (1)	LBS.	LBS.
10-11	2 6 2 3	10 9 5 3	10-11	42.2	937	4489		
12-13	2 6 2 3	10 9 5 3	12-13	44.7	937	4866		
14-15	2 6 2 3	10 9 5 3	14-15	47.1	937	5242		
16-17	2 6 2 3	10 9 5 3	16-17	49.6	937	5619		
18-19	2 6 2 3	10 9 5 3	18-19	52.1	937	5996		
20-21	2 6 2 3	10 9 5 3	20-21	54.5	937	6373		
22-23	2 6 2 3	10 9 5 3	22-23	57	937	6750		
24-25	2 6 2 3	10 9 5 3	24-25	59.4	937	7126		

Note: All bars in cap shall be epoxy coated.

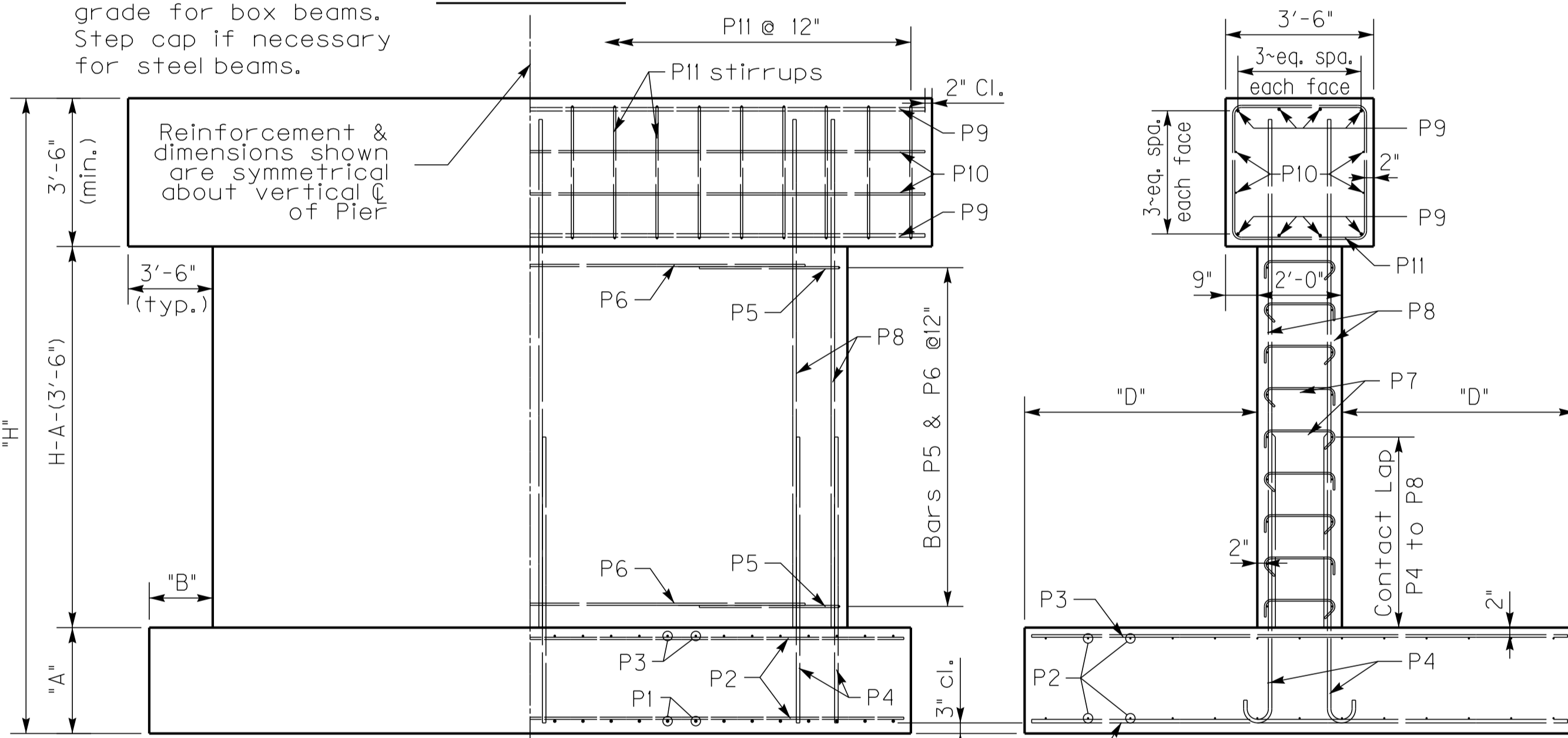
Note: All concrete shall be Class "A"

(1) Quantity is based on taller height. Reduce by 1.2 cubic yd. for shorter height.



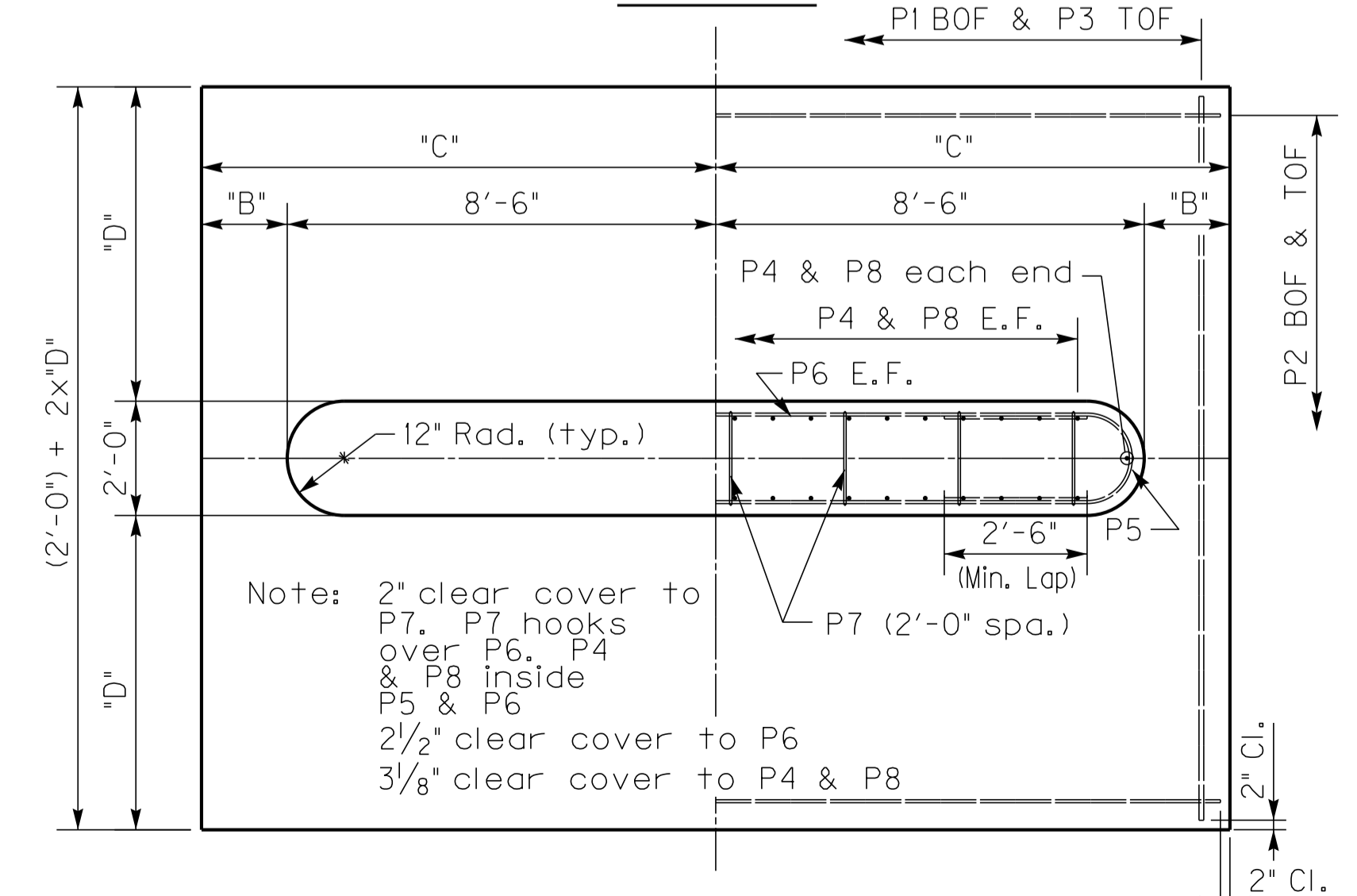
Note: Grade cap to roadway grade for box beams. Step cap if necessary for steel beams.

PLAN OF CAP

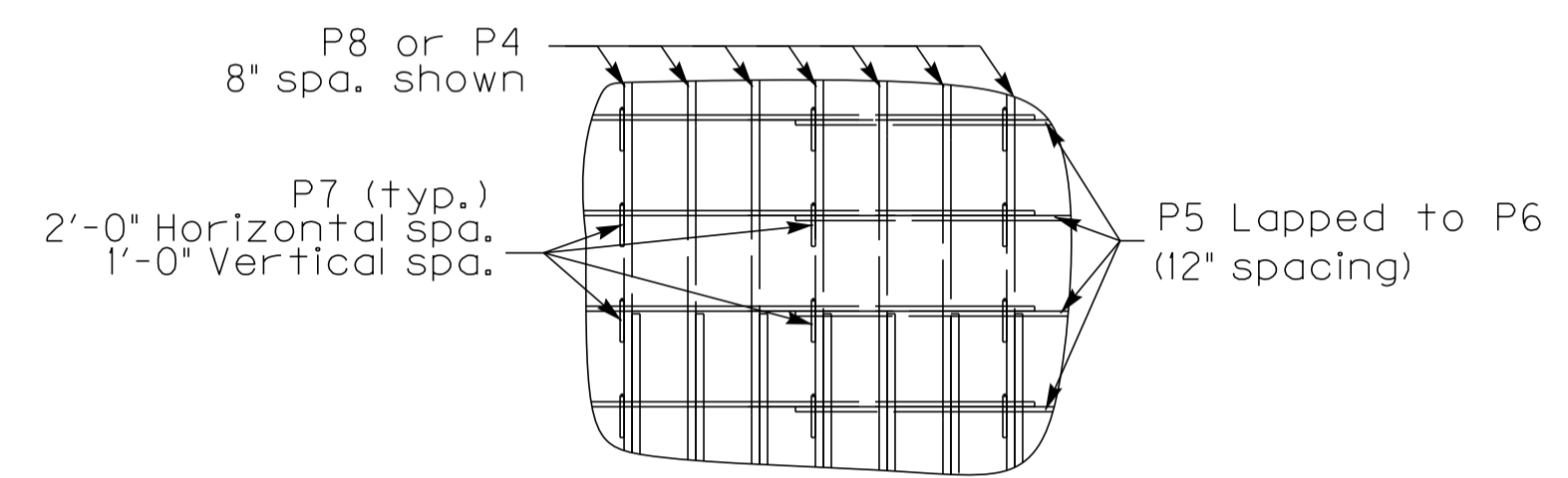


ELEVATION

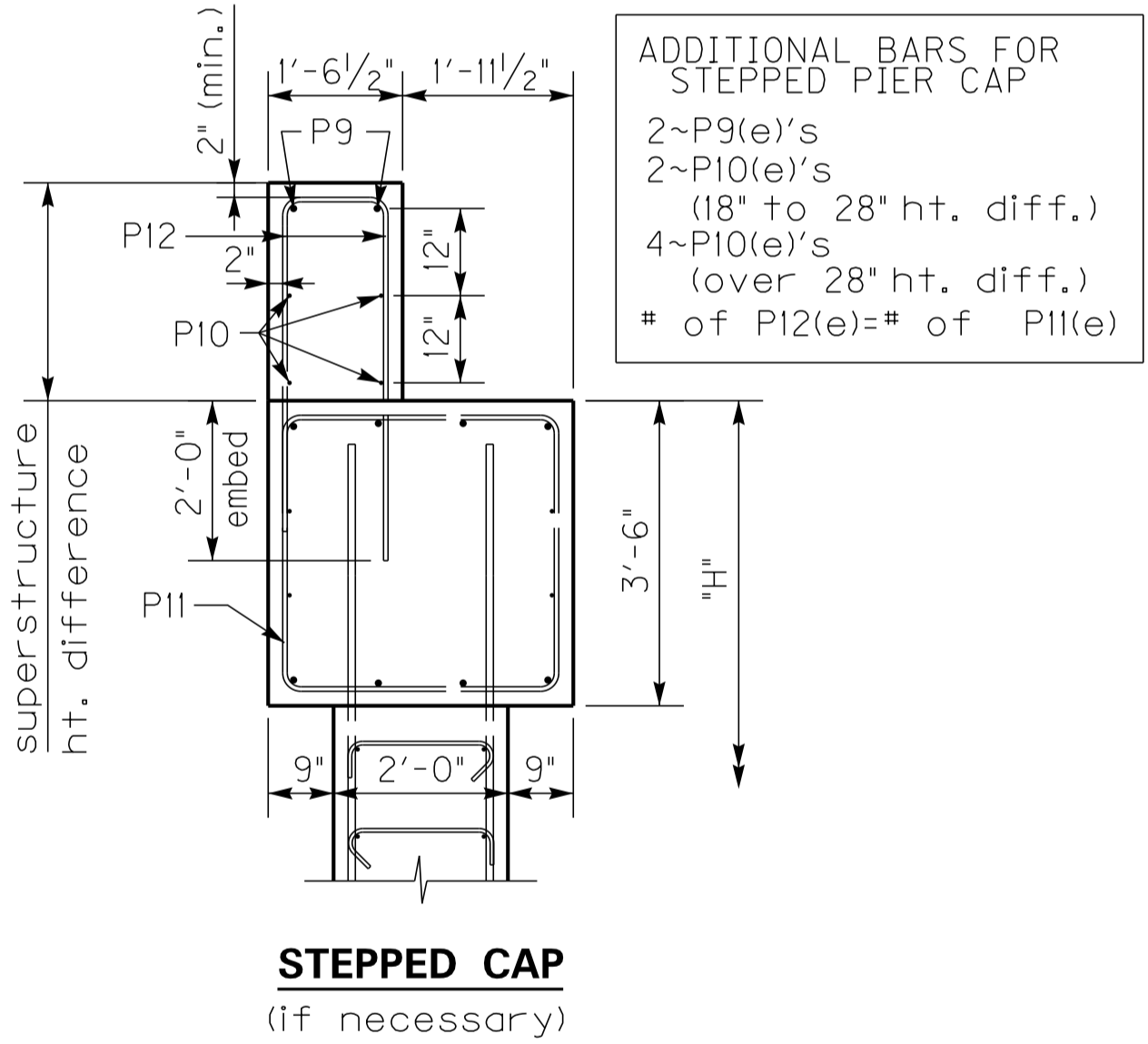
END ELEVATION



PLAN OF FOOTING



P7 BAR PLACEMENT



STEPPED CAP
(if necessary)

ADDITIONAL BARS FOR STEPPED PIER CAP
 2~P9(e)'s
 2~P10(e)'s (18" to 28" ht. diff.)
 4~P10(e)'s (over 28" ht. diff.)
 # of P12(e)=# of P11(e)

GENERAL NOTES

SPECIFICATIONS: Construct piers according to the current edition of the Kentucky Department of Highways Standard Specifications for Road and Bridge Construction. Piers are designed for side by side box beams as detailed in Standard Drawings BDP-001 through BDP-012, current edition. They may be slightly modified to allow for 17'-6" rolled steel beam bridge width.

FOUNDATION PRESSURE: Construct pier footings on solid rock bearing material that can support a pressure of 8000 psf service or 10,800 psf strength factored, as recommended by a geotechnical engineer.

DESIGN LOADS: Pier is designed for the CB42 beam superstructure with 3-97 foot spans. Pier is designed to handle a half a 97 foot span for thermal load with expansion bearings under the beams. Pier is designed for 100 mph wind. Wind on superstructure is for 1-97' span longitudinal and transverse. Pier is designed for stream flow of 10 ft./sec. up to the top of the pier. It is not designed for flow acting on the superstructure. Pier is not designed for earthquake loading.

DESIGN APPLICABILITY: Consult with a structural engineer to determine if these details are applicable for any particular project.

FOOTING ELEVATION: Construct bottom of footing below the anticipated scour elevation. (This typically entails embedding the footings 1'-0" to 2'-0" into rock and pouring concrete directly against cut rock faces, as recommended by geotechnical engineer.)

NOTE: Distances to bars shown are clear dimensions unless otherwise noted.

MATERIAL SPECIFICATIONS:
 Concrete, Class "A" = 3500 psi
 Steel Reinforcement = Grade 60

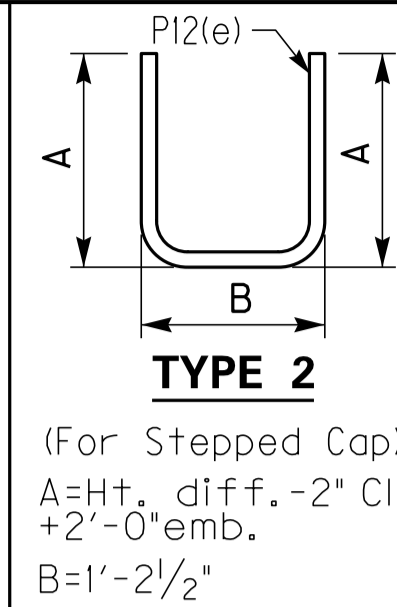
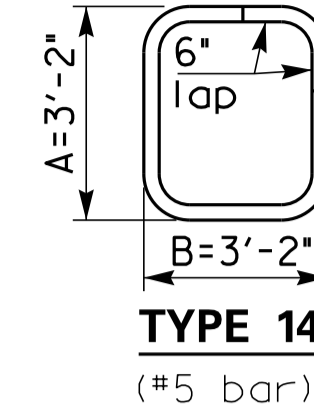
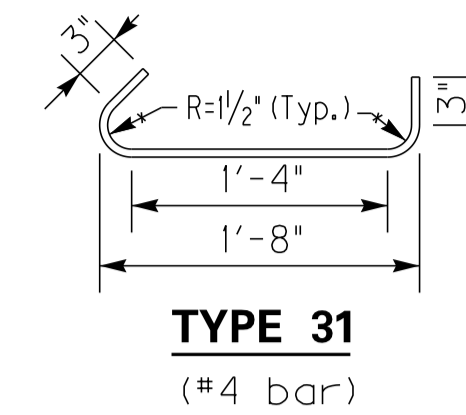
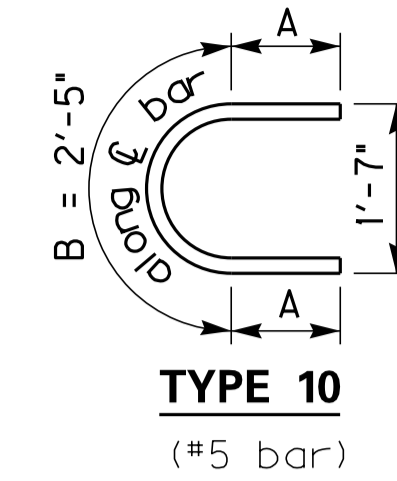
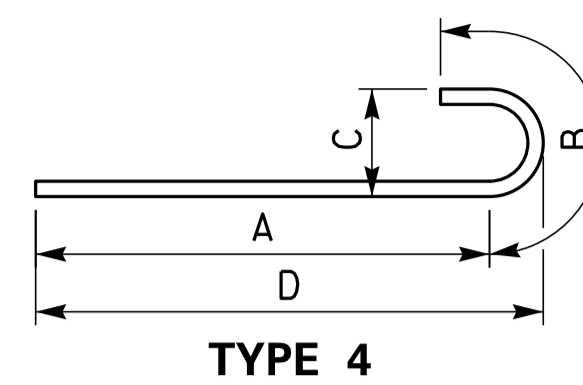
PIER DETAILS		
SKEW	WIDTH	DATE
30	16	July 2017

30° SKEW 24'-0" - 25'-6" BRIDGE WIDTH (No Seismic Load)

Bill of Reinforcement

MARK	P1		P2		P3		P4				P5				P6		P7		P8		P9(e)		P10(e)		P11(e)			
	TYPE	Str.	Str.	Str.	Type 4				Type 10				Str.	Type 31	Str.	Str.	Str.	Str.	Str.	Str.	Str.	Type 14	Str.	Str.	Type 14			
SIZE	No.	Length	Length	No.	Length	Length	No.	Length	Length	No.	Length	Length	No.	Length	Length	No.	Length	Length	No.	Length	Length	No.	Length	Length	No.	Length	Length	
H		ft.	ft.		ft.	ft.		ft.	ft.		ft.	ft.		ft.	ft.		ft.	ft.		ft.	ft.		ft.	ft.		ft.	ft.	
10-11	47	8 12 8	26	6 31 2 12	47	5 12 8 8	76	8 8 10 8	7 5 1 5 0	8 7 9 9	10	5 7 5 12 2	6	10	5 24 0 12	65	2 5 5	76	8 8 0 8	8	32 8	4	32 8	33	13 2			
12-13	47	8 12 8	26	6 31 2 12	47	5 12 8 8	76	8 8 10 8	7 5 1 5 0	8 7 9 9	14	5 7 5 12 2	6	14	5 24 0 12	91	2 5 5	76	8 10 0 8	8	32 8	4	32 8	33	13 2			
14-15	47	8 12 8	26	6 31 2 12	47	5 12 8 8	76	8 8 10 8	7 5 1 5 0	8 7 9 9	18	5 7 5 12 2	6	18	5 24 0 12	117	2 5 5	76	8 12 0 8	8	32 8	4	32 8	33	13 2			
16-17	47	8 12 8	26	6 31 2 12	47	5 12 8 8	76	8 8 10 8	7 5 1 5 0	8 7 9 9	22	5 7 5 12 2	6	22	5 24 0 12	143	2 5 5	76	8 14 0 8	8	32 8	4	32 8	33	13 2			
18-19	47	8 12 8	26	6 31 2 12	47	5 12 8 8	76	8 8 10 8	7 5 1 5 0	8 7 9 9	26	5 7 5 12 2	6	26	5 24 0 12	169	2 5 5	76	8 16 0 8	8	32 8	4	32 8	33	13 2			
20-21	47	8 12 8	26	6 31 2 12	47	5 12 8 8	76	8 8 10 8	7 5 1 5 0	8 7 9 9	30	5 7 5 12 2	6	30	5 24 0 12	195	2 5 5	76	8 18 0 8	8	32 8	4	32 8	33	13 2			
22-23	47	8 12 8	26	6 31 2 12	47	5 12 8 8	76	8 8 10 8	7 5 1 5 0	8 7 9 9	34	5 7 5 12 2	6	34	5 24 0 12	221	2 5 5	76	8 20 0 8	8	32 8	4	32 8	33	13 2			
24-25	47	8 12 8	26	6 31 2 12	47	5 12 8 8	76	8 8 10 8	7 5 1 5 0	8 7 9 9	38	5 7 5 12 2	6	38	5 24 0 12	247	2 5 5	76	8 22 0 8	8	32 8	4	32 8	33	13 2			

Reinforcement Details



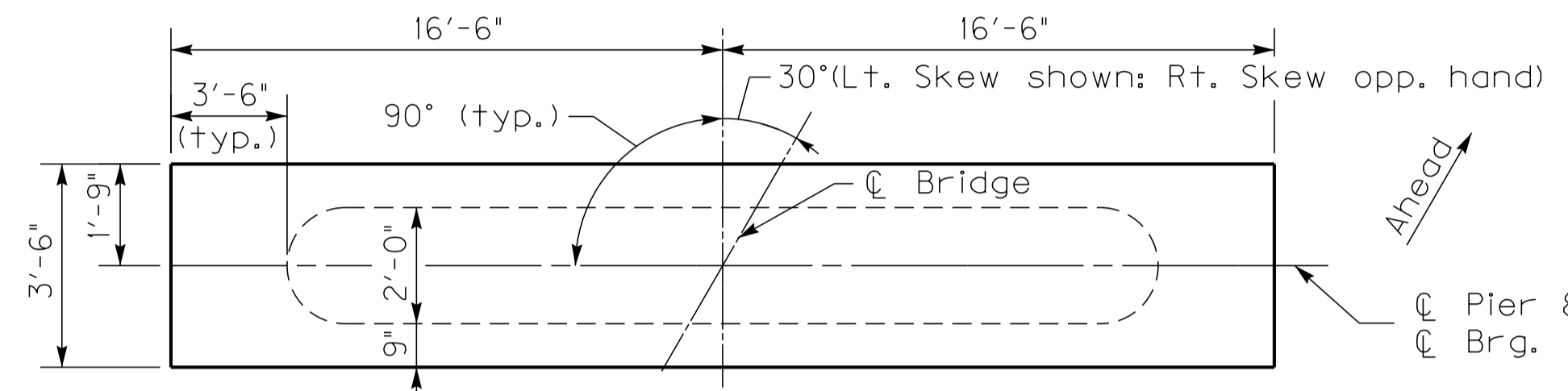
DIMENSIONS TABLE

MARK	TYPE	DIMENSIONS					H	QUANTITIES				
		A	B	C	D	CONCRETE CLASS "A"		STEEL REINFORCEMENT EPOXY COATED	STEEL REINFORCEMENT			
		ft.	ft.	ft.	ft.	ft.	CU. YDS. (1)	LBS.	LBS.			
10-11	2	6	2	9	15	9	5	6	10-11	63	1291	7298
12-13	2	6	2	9	15	9	5	6	12-13	66.8	1291	7878
14-15	2	6	2	9	15	9	5	6	14-15	70.5	1291	8459
16-17	2	6	2	9	15	9	5	6	16-17	74.3	1291	9039
18-19	2	6	2	9	15	9	5	6	18-19	78.1	1291	9620
20-21	2	6	2	9	15	9	5	6	20-21	81.9	1291	10200
22-23	2	6	2	9	15	9	5	6	22-23	85.7	1291	10781
24-25	2	6	2	9	15	9	5	6	24-25	89.5	1291	11362

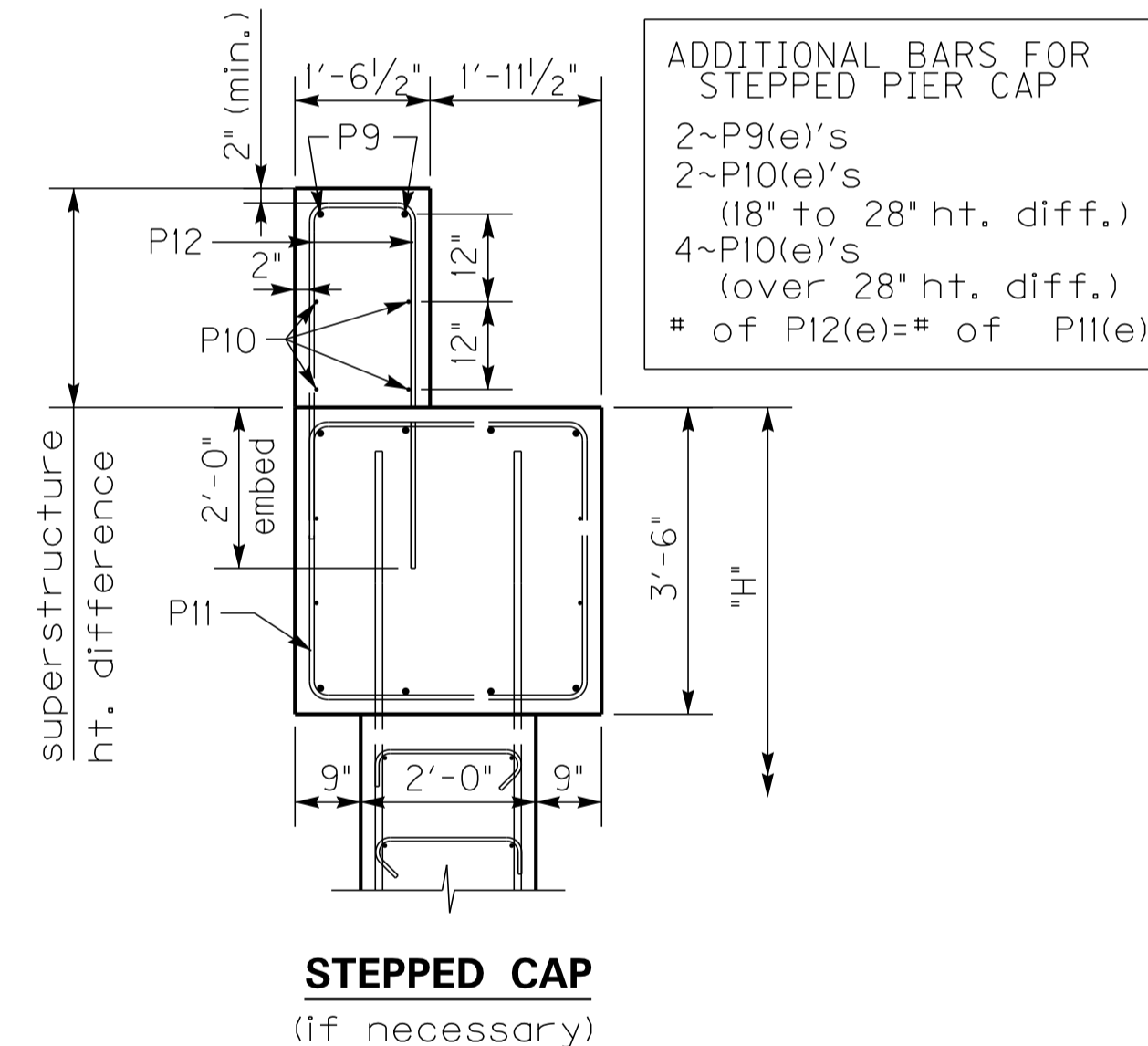
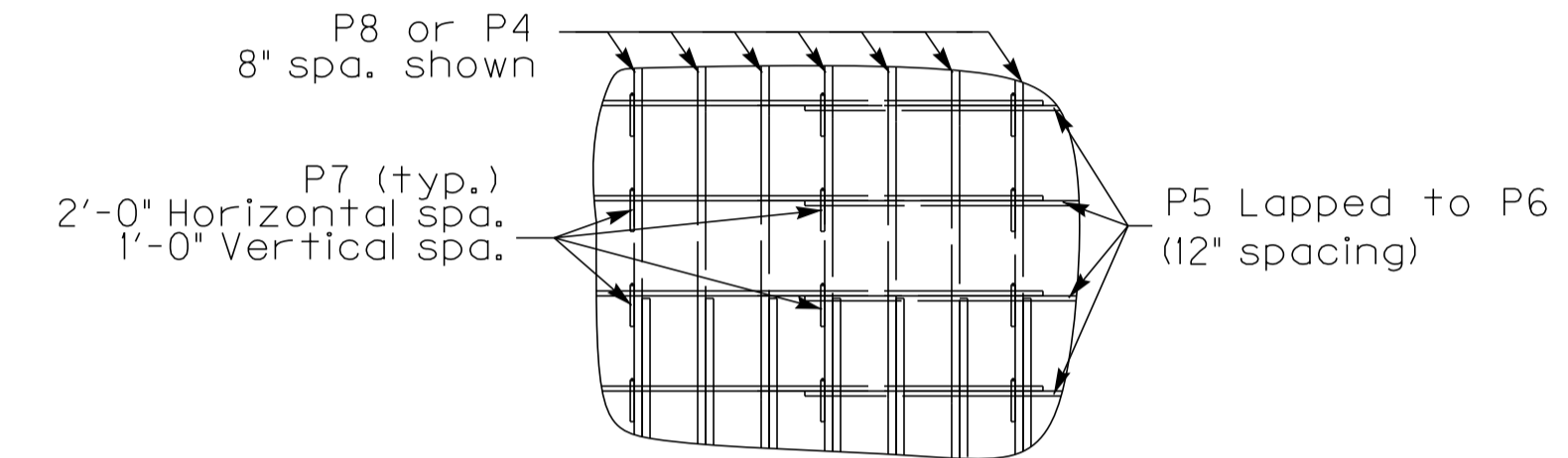
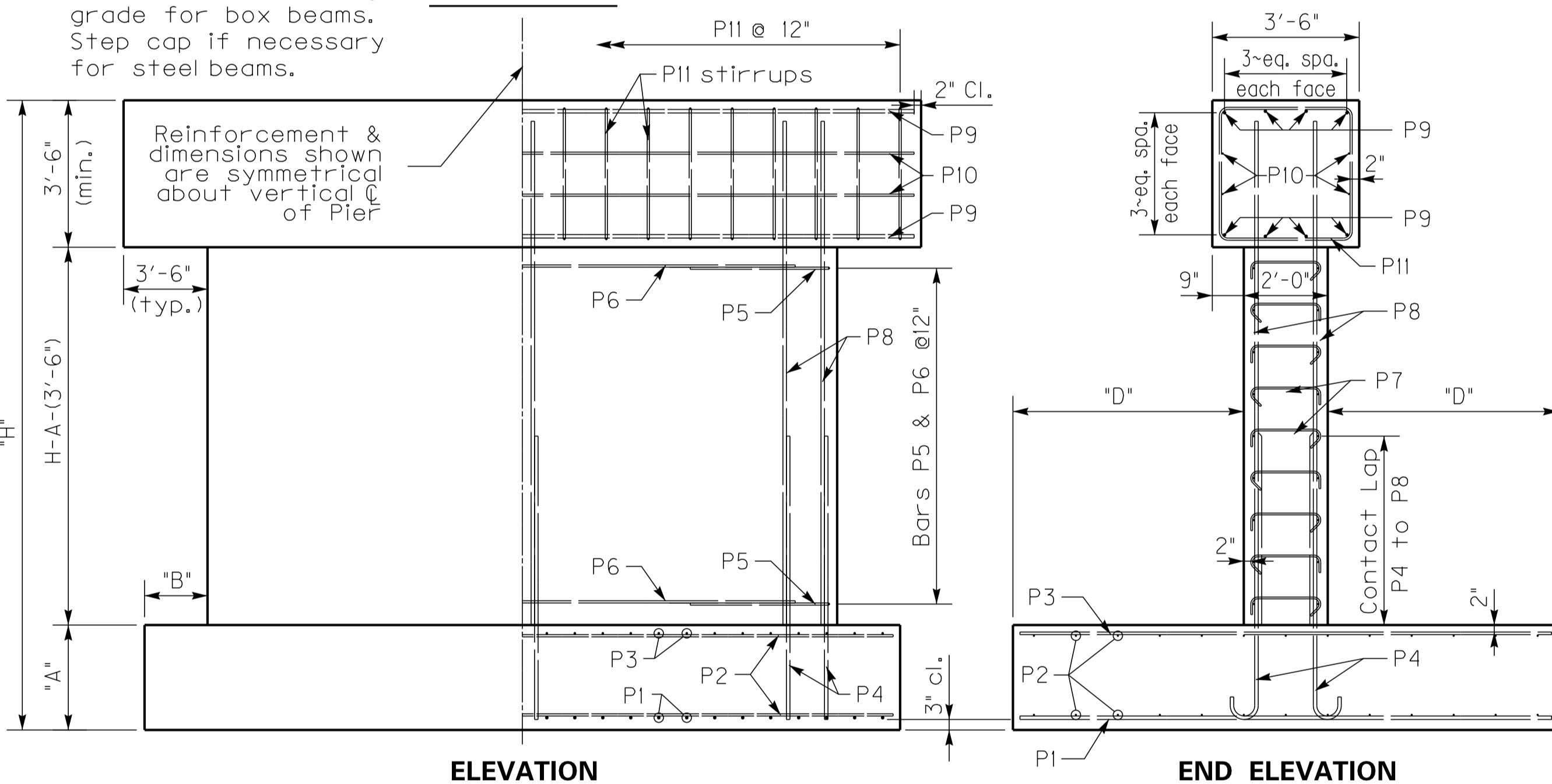
Note: All bars in cap shall be epoxy coated.

Note: All concrete shall be Class "A"

(1) Quantity is based on taller height. Reduce by 1.9 cubic yd. for shorter height.



Note: Grade cap to roadway grade for box beams. Step cap if necessary for steel beams.



ADDITIONAL BARS FOR STEPPED PIER CAP
2~P9(e)'s
2~P10(e)'s (18" to 28" ht. diff.)
4~P10(e)'s (over 28" ht. diff.)
of P12(e)=# of P11(e)

GENERAL NOTES

SPECIFICATIONS: Construct piers according to the current edition of the Kentucky Department of Highways Standard Specifications for Road and Bridge Construction. Piers are designed for side by side box beams as detailed in Standard Drawings BDP-001 through BDP-012, current edition. They may be slightly modified to allow for 25'-6" rolled steel beam bridge width.

FOUNDATION PRESSURE: Construct pier footings on solid rock bearing material that can support a pressure of 8000 psf service or 10,800 psf strength factored, as recommended by a geotechnical engineer.

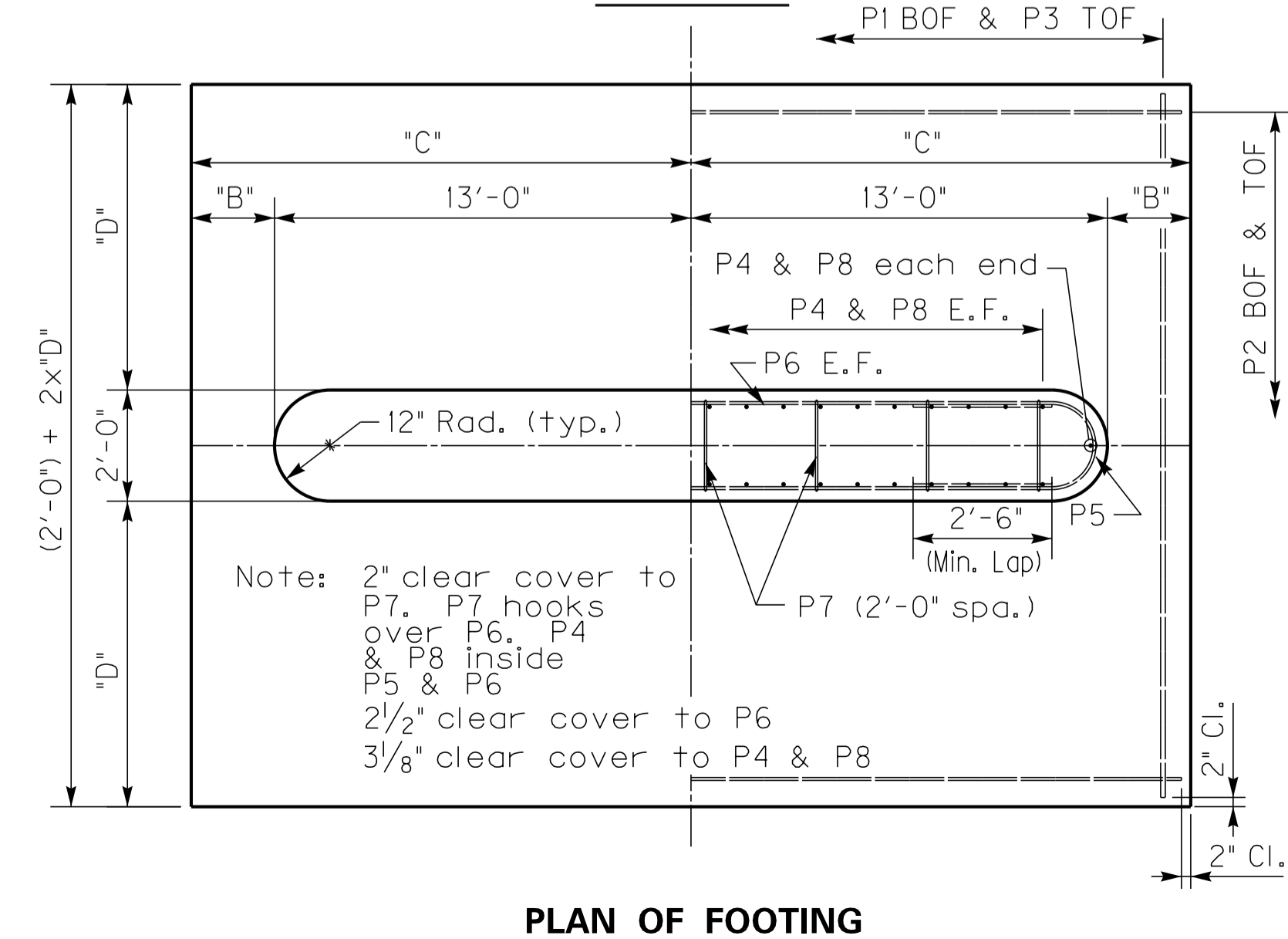
DESIGN LOADS: Pier is designed for the CB42 beam superstructure with 3-97 foot spans. Pier is designed to handle a half a 97 foot span for thermal load with expansion bearings under the beams. Pier is designed for 100 mph wind. Wind on superstructure is for 1-97' span longitudinal and transverse. Pier is designed for stream flow of 10 ft./sec. up to the top of the pier. It is not designed for flow acting on the superstructure. Pier is not designed for earthquake loading.

DESIGN APPLICABILITY: Consult with a structural engineer to determine if these details are applicable for any particular project.

FOOTING ELEVATION: Construct bottom of footing below the anticipated scour elevation. (This typically entails embedding the footings 1'-0" to 2'-0" into rock and pouring concrete directly against cut rock faces, as recommended by geotechnical engineer.)

NOTE: Distances to bars shown are clear dimensions unless otherwise noted.

MATERIAL SPECIFICATIONS:
Concrete, Class "A" = 3500 psi
Steel Reinforcement = Grade 60



Note: 2" clear cover to P7. P7 hooks over P6. P4 & P8 inside P5 & P6
2 1/2" clear cover to P6
3/8" clear cover to P4 & P8

PIER DETAILS

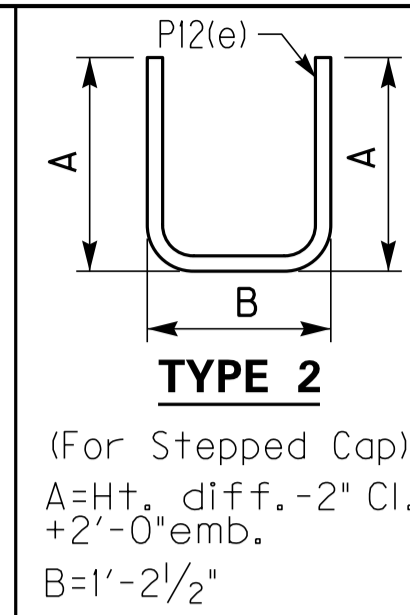
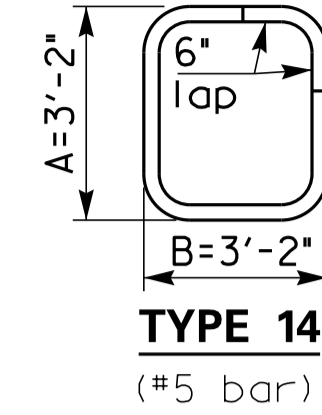
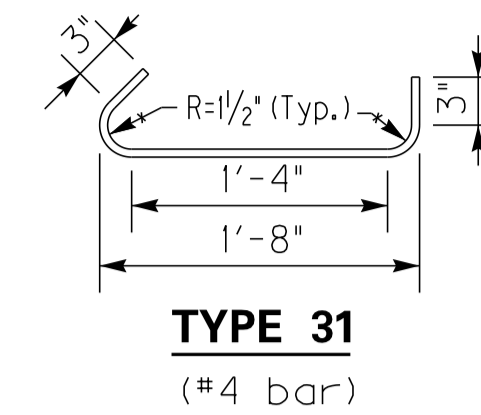
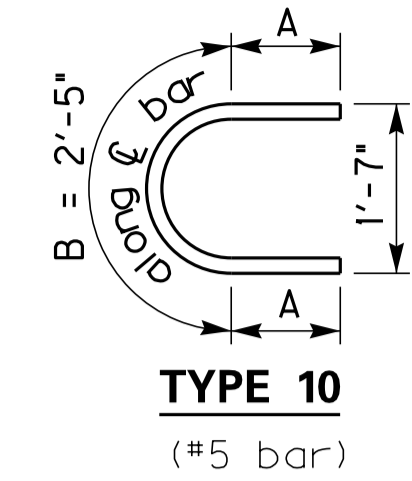
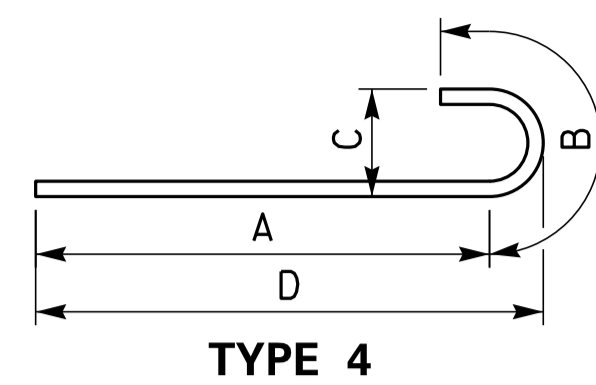
SKEW	WIDTH	DATE
30	24	July 2017

30° SKEW 32'-0" - 33'-6" BRIDGE WIDTH (No Seismic Load)

Bill of Reinforcement

MARK	P1		P2		P3		P4				P5				P6		P7		P8		P9(e)		P10(e)		P11(e)	
	Str.		Str.		Str.		Type 4				Type 10				Str.		Type 31		Str.		Str.		Type 14			
TYPE																										
SIZE	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length
10-11	61	8 12 8	26	6 40 2 12	61	5 12 8	104	8 8 10 8	7 5 1 5	0 8 7 9	10	5 7 5 12	2 6	10	5 33 6	12	85	2 5	104	8 8 0 8	8 42 2	4	42 2	42	13 2	
12-13	61	8 12 8	26	6 40 2 12	61	5 12 8	104	8 8 10 8	7 5 1 5	0 8 7 9	14	5 7 5 12	2 6	14	5 33 6	12	119	2 5	104	8 10 0 8	8 42 2	4	42 2	42	13 2	
14-15	61	8 12 8	26	6 40 2 12	61	5 12 8	104	8 8 10 8	7 5 1 5	0 8 7 9	18	5 7 5 12	2 6	18	5 33 6	12	153	2 5	104	8 12 0 8	8 42 2	4	42 2	42	13 2	
16-17	61	8 12 8	26	6 40 2 12	61	5 12 8	104	8 8 10 8	7 5 1 5	0 8 7 9	22	5 7 5 12	2 6	22	5 33 6	12	187	2 5	104	8 14 0 8	8 42 2	4	42 2	42	13 2	
18-19	61	8 12 8	26	6 40 2 12	61	5 12 8	104	8 8 10 8	7 5 1 5	0 8 7 9	26	5 7 5 12	2 6	26	5 33 6	12	221	2 5	104	8 16 0 8	8 42 2	4	42 2	42	13 2	
20-21	61	8 12 8	26	6 40 2 12	61	5 12 8	104	8 8 10 8	7 5 1 5	0 8 7 9	30	5 7 5 12	2 6	30	5 33 6	12	255	2 5	104	8 18 0 8	8 42 2	4	42 2	42	13 2	
22-23	61	8 12 8	26	6 40 2 12	61	5 12 8	104	8 8 10 8	7 5 1 5	0 8 7 9	34	5 7 5 12	2 6	34	5 33 6	12	289	2 5	104	8 20 0 8	8 42 2	4	42 2	42	13 2	
24-25	61	8 12 8	26	6 40 2 12	61	5 12 8	104	8 8 10 8	7 5 1 5	0 8 7 9	38	5 7 5 12	2 6	38	5 33 6	12	323	2 5	104	8 22 0 8	8 42 2	4	42 2	42	13 2	

Reinforcement Details



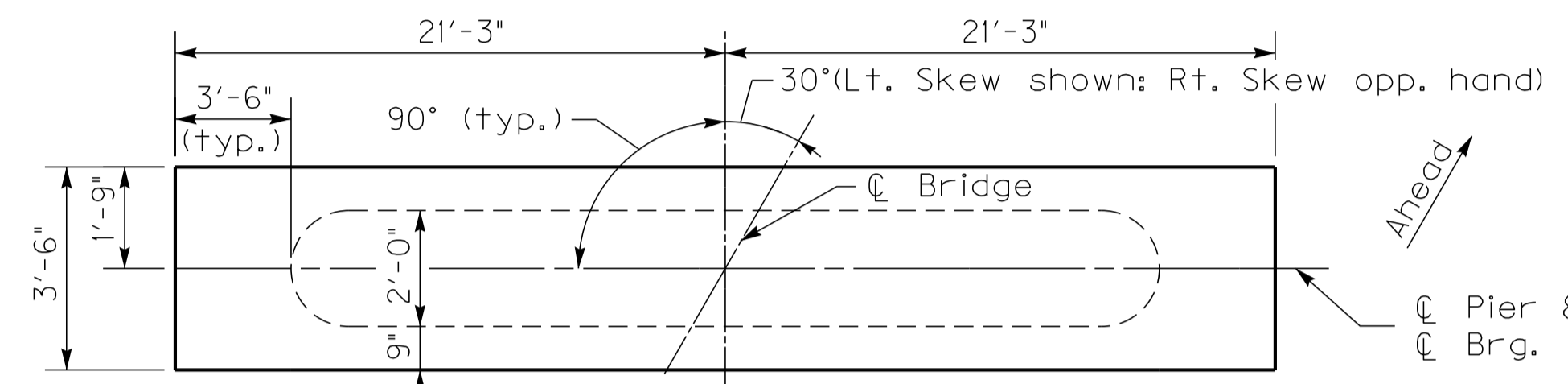
DIMENSIONS TABLE					
H	A	B	C	D	H
10-11	2 6	2 6	2 0	3 5	6
12-13	2 6	2 6	2 0	3 5	6
14-15	2 6	2 6	2 0	3 5	6
16-17	2 6	2 6	2 0	3 5	6
18-19	2 6	2 6	2 0	3 5	6
20-21	2 6	2 6	2 0	3 5	6
22-23	2 6	2 6	2 0	3 5	6
24-25	2 6	2 6	2 0	3 5	6

QUANTITIES			
H	CONCRETE CLASS "A"		STEEL REINFORCEMENT EPOXY COATED
	CU. YDS. (1)		LBS.
10-11	82	1658	9704
12-13	87.2	1658	10487
14-15	92.4	1658	11271
16-17	97.6	1658	12054
18-19	102.8	1658	12837
20-21	108	1658	13620
22-23	113.2	1658	14404
24-25	118.4	1658	15187

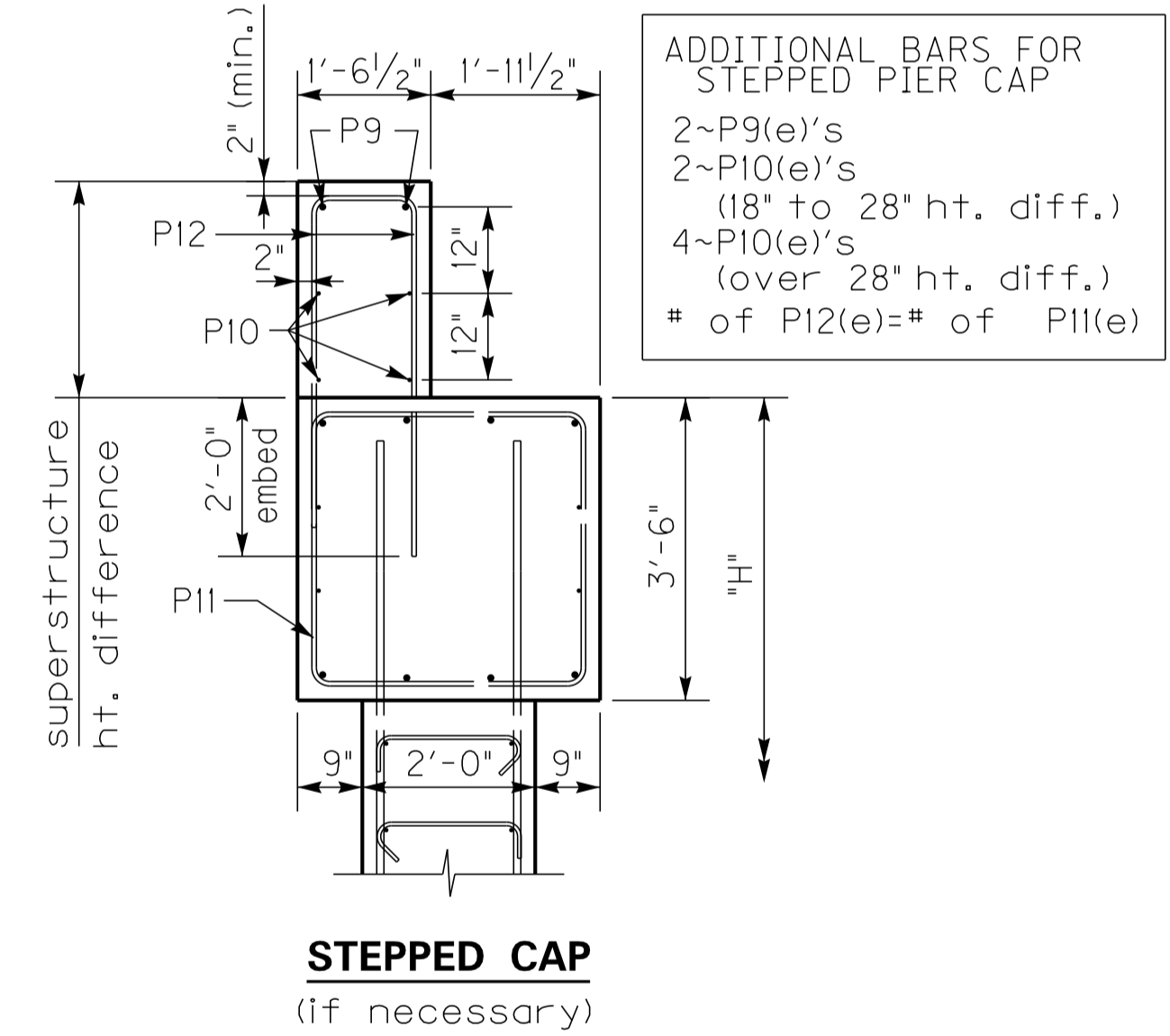
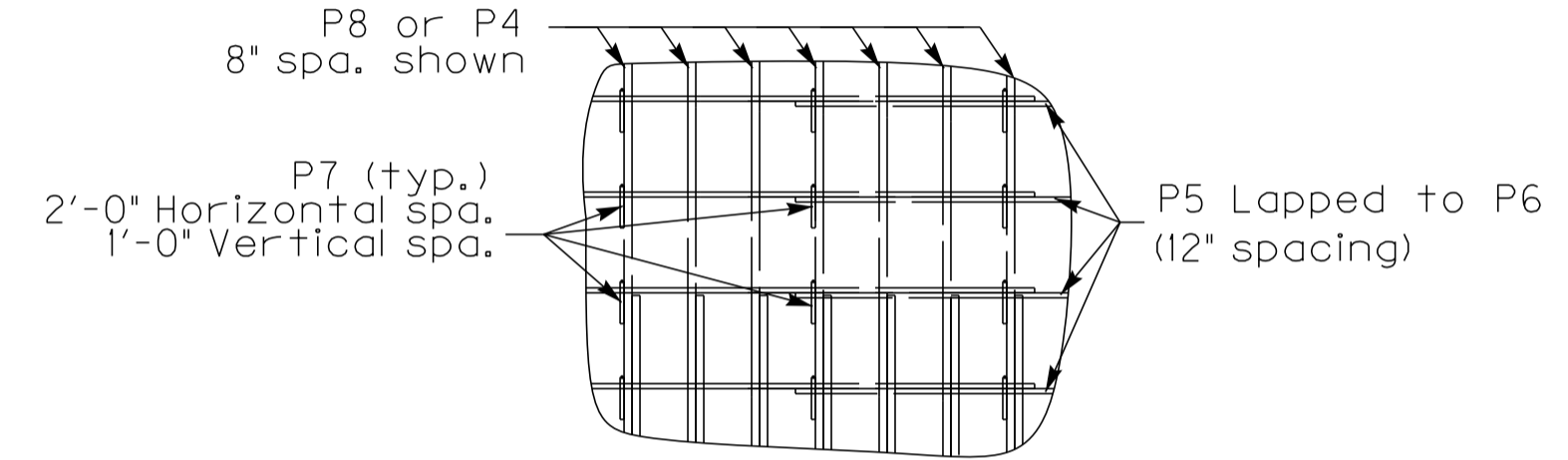
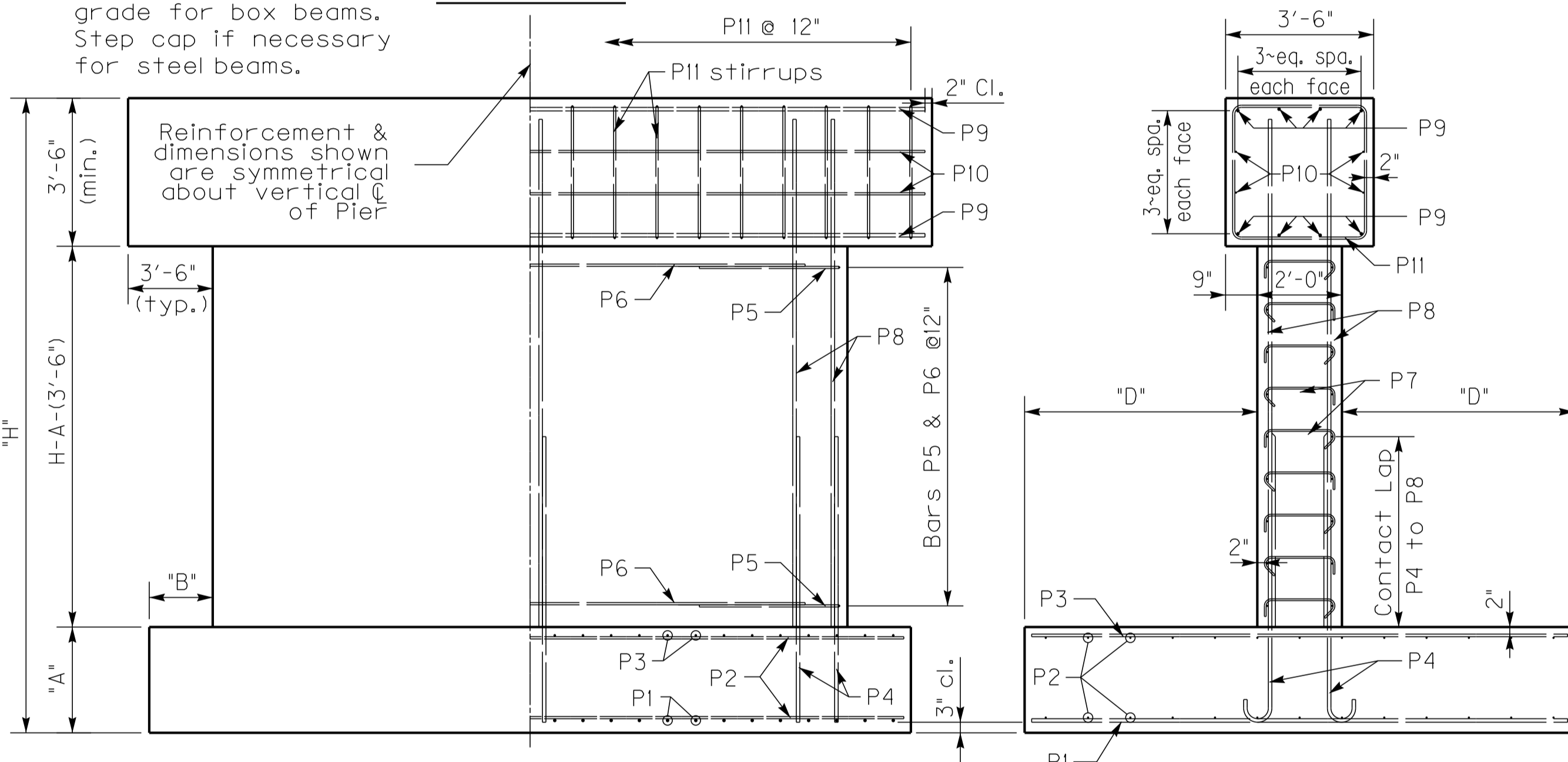
Note: All bars in cap shall be epoxy coated.

Note: All concrete shall be Class "A"

(1) Quantity is based on taller height. Reduce by 2.6 cubic yd. for shorter height.



Note: Grade cap to roadway grade for box beams. Step cap if necessary for steel beams.



ADDITIONAL BARS FOR STEPPED PIER CAP
 2~P9(e)'s
 2~P10(e)'s (18" to 28" ht. diff.)
 4~P10(e)'s (over 28" ht. diff.)
 # of P12(e) = # of P11(e)

GENERAL NOTES

SPECIFICATIONS: Construct piers according to the current edition of the Kentucky Department of Highways Standard Specifications for Road and Bridge Construction. Piers are designed for side by side box beams as detailed in Standard Drawings BDP-001 through BDP-012, current edition. They may be slightly modified to allow for 33'-6" rolled steel beam bridge width.

FOUNDATION PRESSURE: Construct pier footings on solid rock bearing material that can support a pressure of 8000 psf service or 10,800 psf strength factored, as recommended by a geotechnical engineer.

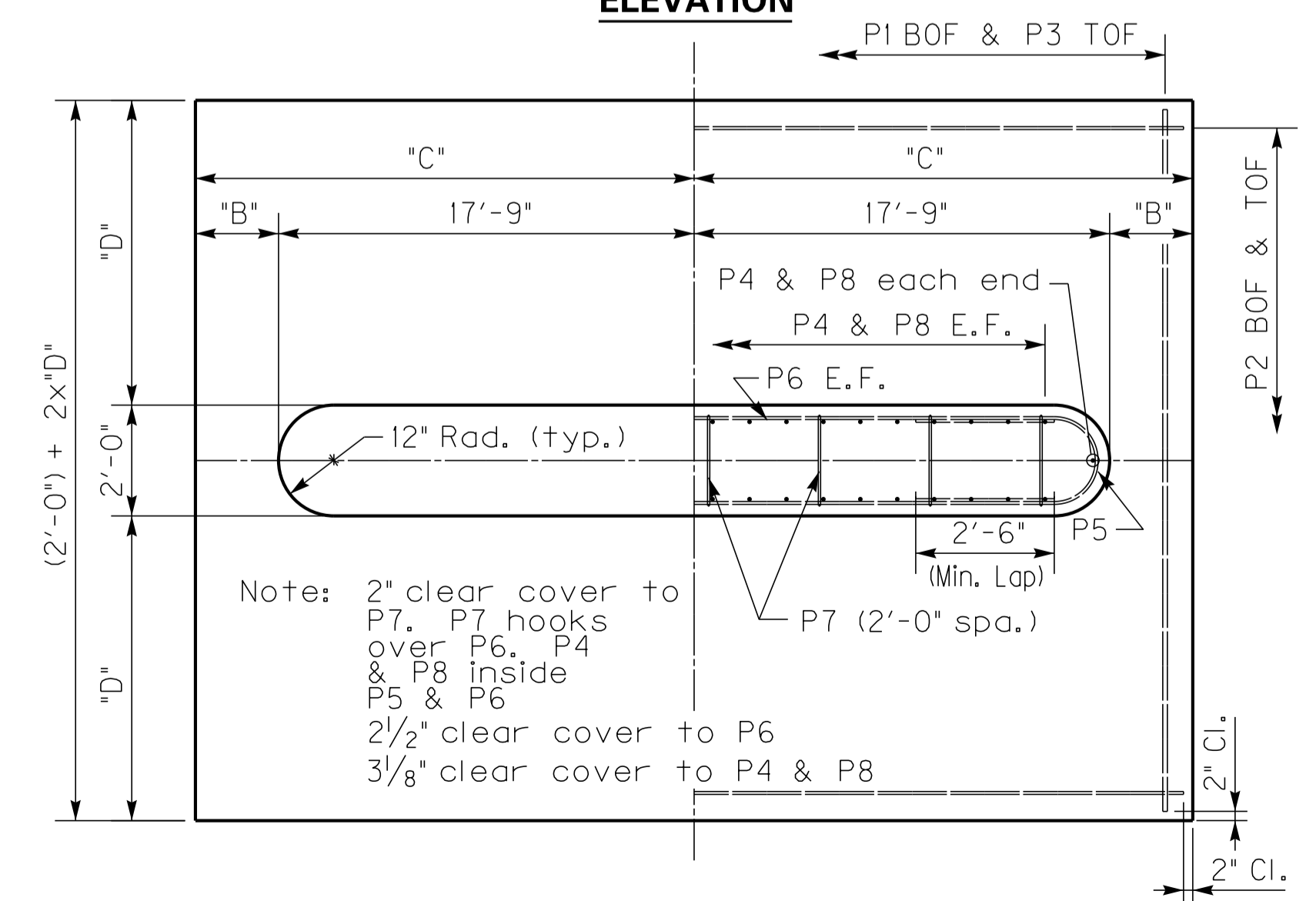
DESIGN LOADS: Pier is designed for the CB42 beam superstructure with 3-97 foot spans. Pier is designed to handle a half a 97 foot span for thermal load with expansion bearings under the beams. Pier is designed for 100 mph wind. Wind on superstructure is for 1-97' span longitudinal and transverse. Pier is designed for stream flow of 10 ft./sec. up to the top of the pier. It is not designed for flow acting on the superstructure. Pier is not designed for earthquake loading.

DESIGN APPLICABILITY: Consult with a structural engineer to determine if these details are applicable for any particular project.

FOOTING ELEVATION: Construct bottom of footing below the anticipated scour elevation. (This typically entails embedding the footings 1'-0" to 2'-0" into rock and pouring concrete directly against cut rock faces, as recommended by geotechnical engineer.)

NOTE: Distances to bars shown are clear dimensions unless otherwise noted.

MATERIAL SPECIFICATIONS:
 Concrete, Class "A" = 3500 psi
 Steel Reinforcement = Grade 60



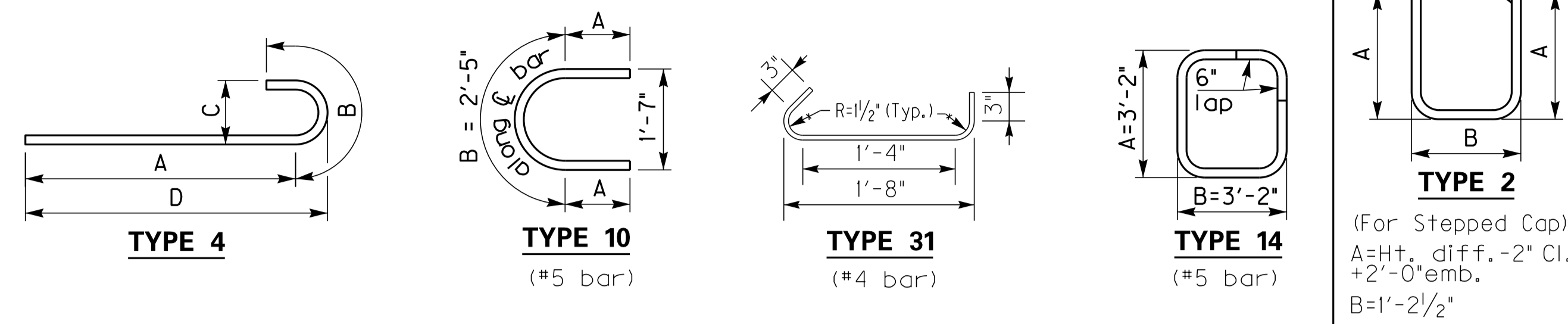
PIER DETAILS		
SKEW	WIDTH	DATE
30	32	July 2017

45° SKEW 16'-0" - 17'-6" BRIDGE WIDTH (No Seismic Load)

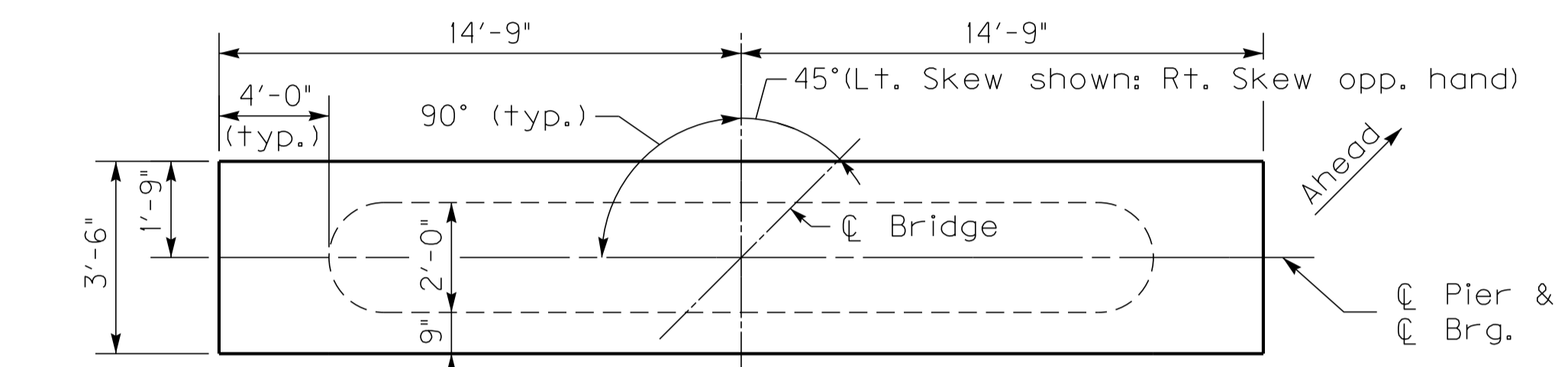
Bill of Reinforcement

MARK	P1		P2		P3		P4				P5				P6		P7		P8		P9(e)		P10(e)		P11(e)																														
	TYPE	Str.	Str.	Str.	Type 4				Type 10				Str.	Type 31	Str.	Str.	Str.	Str.	Str.	Str.	Str.	Str.	Type 14	Type 14																															
H	No.	Size	Length	Spacing	No.	Size	Length	Spacing	No.	Size	Length	Spacing	No.	Size	Length	Spacing	No.	Size	Length	Spacing	No.	Size	Length	Spacing	No.	Size	Length	Spacing																											
10-11	40	7	10	8	22	6	26	8	12	40	5	10	8	62	8	8	10	8	7	5	1	5	0	8	7	9	10	5	7	5	12	2	6	10	5	19	6	12	50	2	5	62	8	8	0	8	8	29	2	4	29	2	29	13	2
12-13	40	7	10	8	22	6	26	8	12	40	5	10	8	62	8	8	10	8	7	5	1	5	0	8	7	9	14	5	7	5	12	2	6	14	5	19	6	12	70	2	5	62	8	10	0	8	8	29	2	4	29	2	29	13	2
14-15	40	7	10	8	22	6	26	8	12	40	5	10	8	62	8	8	10	8	7	5	1	5	0	8	7	9	18	5	7	5	12	2	6	18	5	19	6	12	90	2	5	62	8	12	0	8	8	29	2	4	29	2	29	13	2
16-17	40	7	10	8	22	6	26	8	12	40	5	10	8	62	8	8	10	8	7	5	1	5	0	8	7	9	22	5	7	5	12	2	6	22	5	19	6	12	110	2	5	62	8	14	0	8	8	29	2	4	29	2	29	13	2
18-19	40	7	10	8	22	6	26	8	12	40	5	10	8	62	8	8	10	8	7	5	1	5	0	8	7	9	26	5	7	5	12	2	6	26	5	19	6	12	130	2	5	62	8	16	0	8	8	29	2	4	29	2	29	13	2
20-21	40	7	10	8	22	6	26	8	12	40	5	10	8	62	8	8	10	8	7	5	1	5	0	8	7	9	30	5	7	5	12	2	6	30	5	19	6	12	150	2	5	62	8	18	0	8	8	29	2	4	29	2	29	13	2
22-23	40	7	10	8	22	6	26	8	12	40	5	10	8	62	8	8	10	8	7	5	1	5	0	8	7	9	34	5	7	5	12	2	6	34	5	19	6	12	170	2	5	62	8	20	0	8	8	29	2	4	29	2	29	13	2
24-25	40	7	10	8	22	6	26	8	12	40	5	10	8	62	8	8	10	8	7	5	1	5	0	8	7	9	38	5	7	5	12	2	6	38	5	19	6	12	190	2	5	62	8	22	0	8	8	29	2	4	29	2	29	13	2

Reinforcement Details

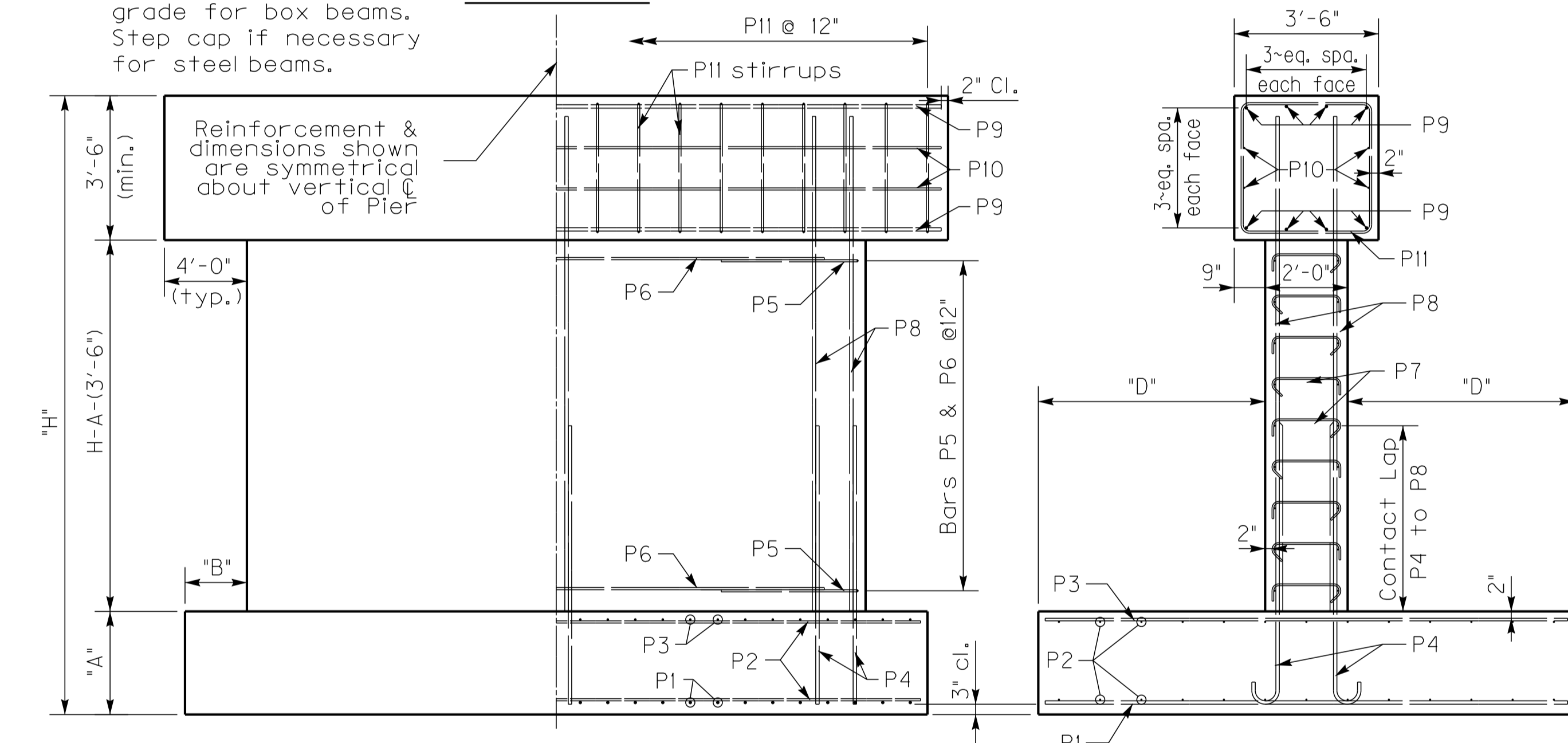


DIMENSIONS TABLE						QUANTITIES		
H	A	B	C	D	H	CONCRETE CLASS "A"	STEEL REINFORCEMENT EPOXY COATED	STEEL REINFORCEMENT
						CU. YDS. (1)	LBS.	LBS.
10-11	2	6	2	9	13	6	4	6
12-13	2	6	2	9	13	6	4	6
14-15	2	6	2	9	13	6	4	6
16-17	2	6	2	9	13	6	4	6
18-19	2	6	2	9	13	6	4	6
20-21	2	6	2	9	13	6	4	6
22-23	2	6	2	9	13	6	4	6
24-25	2	6	2	9	13	6	4	6



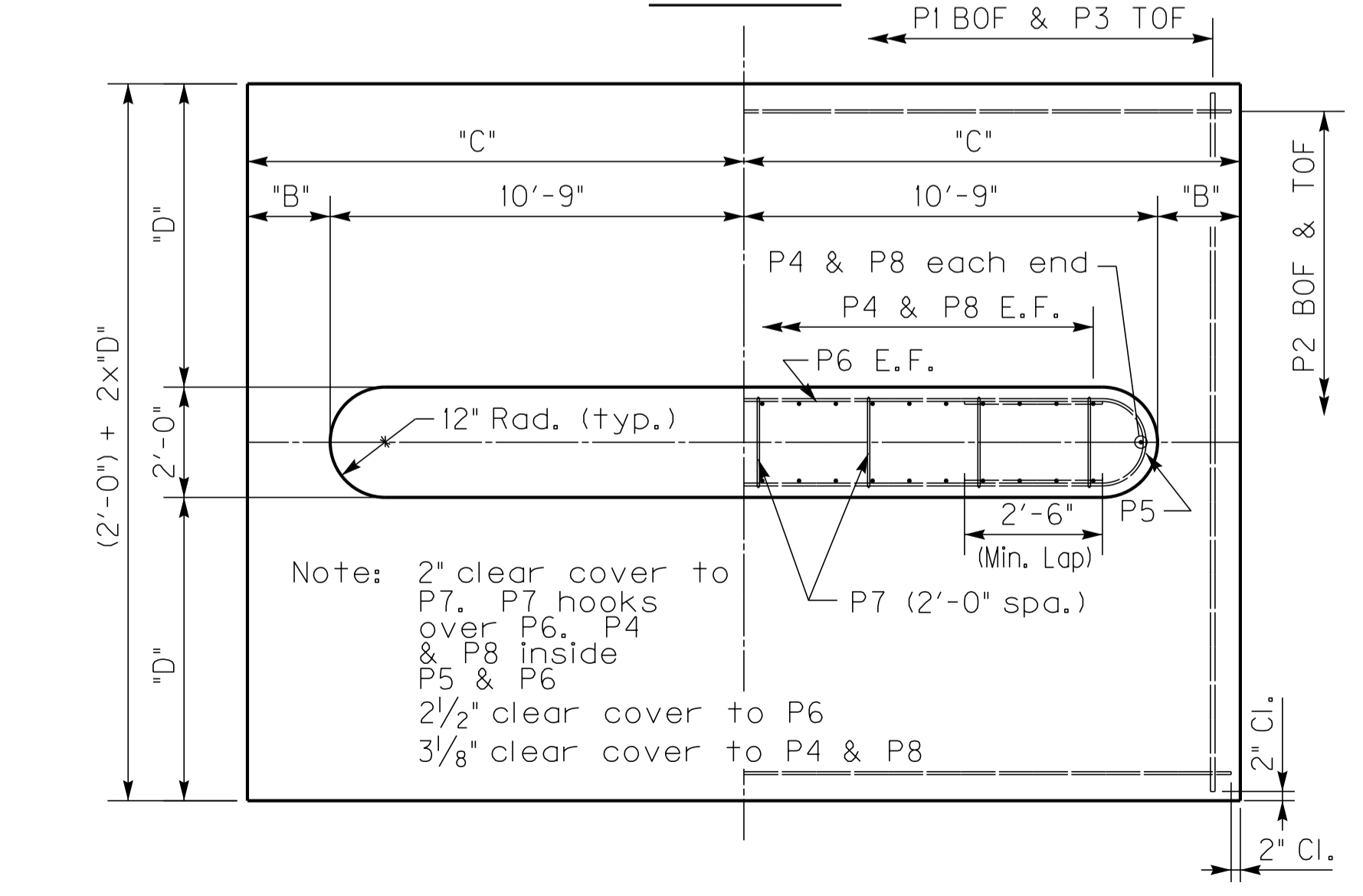
Note: Grade cap to roadway grade for box beams. Step cap if necessary for steel beams.

PLAN OF CAP



ELEVATION

END ELEVATION

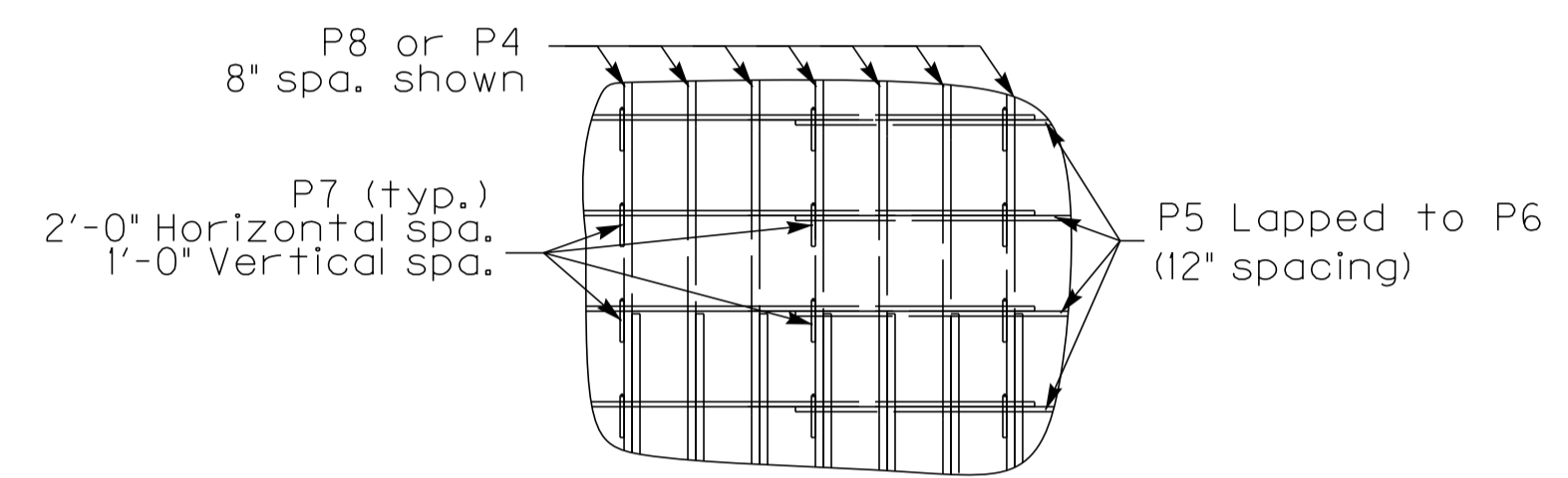


PLAN OF FOOTING

Note: All bars in cap shall be epoxy coated.

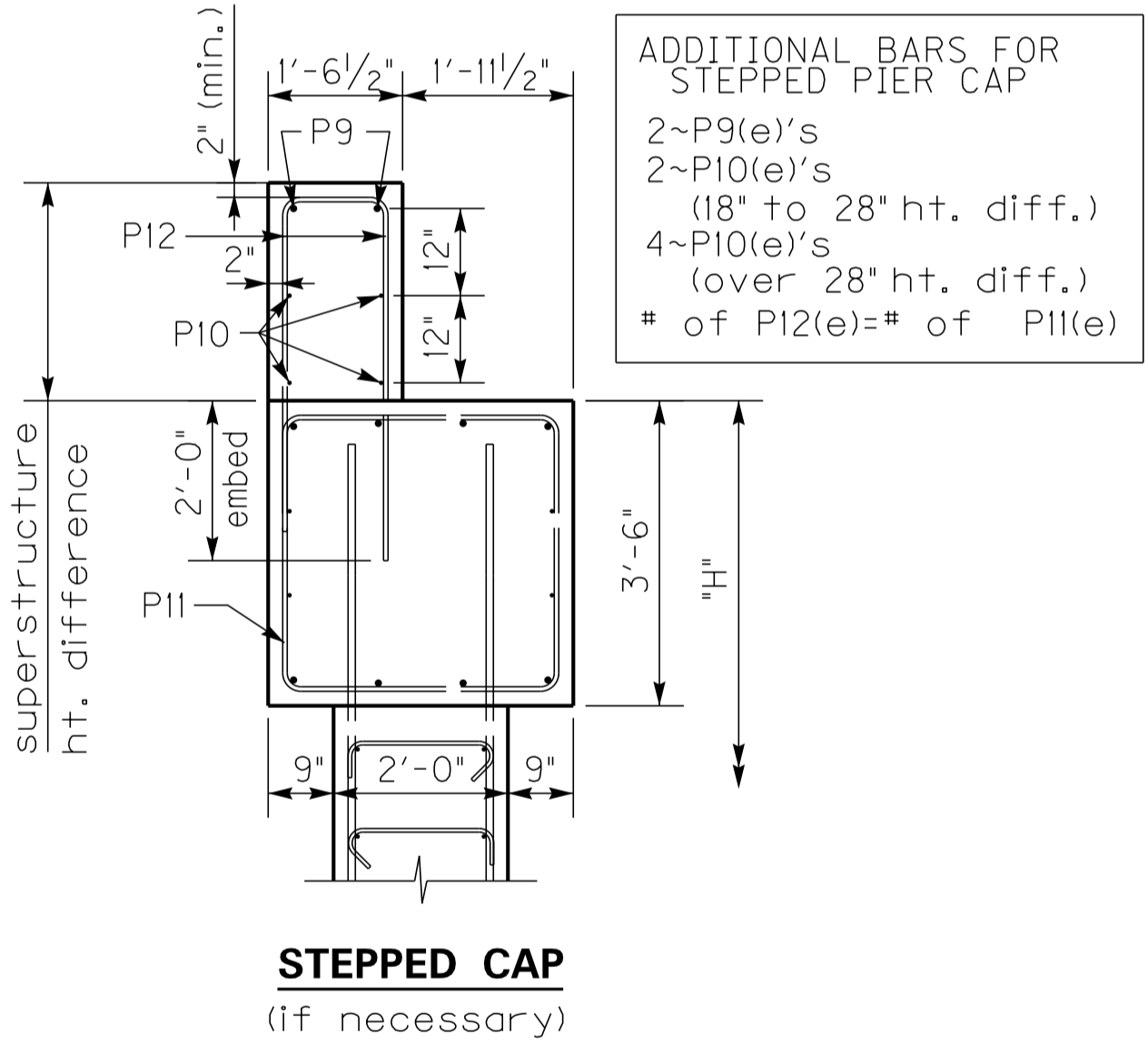
Note: All concrete shall be Class "A"

(1) Quantity is based on taller height. Reduce by 1.5 cubic yd. for shorter height.



P7 BAR PLACEMENT

(alternate 90° & 135° bar ends)



STEPPED CAP
(if necessary)

ADDITIONAL BARS FOR STEPPED PIER CAP
 2~P9(e)'s
 2~P10(e)'s (18" to 28" ht. diff.)
 4~P10(e)'s (over 28" ht. diff.)
 # of P12(e)=# of P11(e)

GENERAL NOTES

SPECIFICATIONS: Construct piers according to the current edition of the Kentucky Department of Highways Standard Specifications for Road and Bridge Construction. Piers are designed for side by side box beams as detailed in Standard Drawings BDP-001 through BDP-012, current edition. They may be slightly modified to allow for 17'-6" rolled steel beam bridge width.

FOUNDATION PRESSURE: Construct pier footings on solid rock bearing material that can support a pressure of 8000 psf service or 10,800 psf strength factored, as recommended by a geotechnical engineer.

DESIGN LOADS: Pier is designed for the CB42 beam superstructure with 3-97 foot spans. Pier is designed to handle a half a 97 foot span for thermal load with expansion bearings under the beams. Pier is designed for 100 mph wind. Wind on superstructure is for 1-97' span longitudinal and transverse. Pier is designed for stream flow of 10 ft./sec. up to the top of the pier. It is not designed for flow acting on the superstructure. Pier is not designed for earthquake loading.

DESIGN APPLICABILITY: Consult with a structural engineer to determine if these details are applicable for any particular project.

FOOTING ELEVATION: Construct bottom of footing below the anticipated scour elevation. (This typically entails embedding the footings 1'-0" to 2'-0" into rock and pouring concrete directly against cut rock faces, as recommended by geotechnical engineer.)

NOTE: Distances to bars shown are clear dimensions unless otherwise noted.

MATERIAL SPECIFICATIONS:
 Concrete, Class "A" = 3500 psi
 Steel Reinforcement = Grade 60

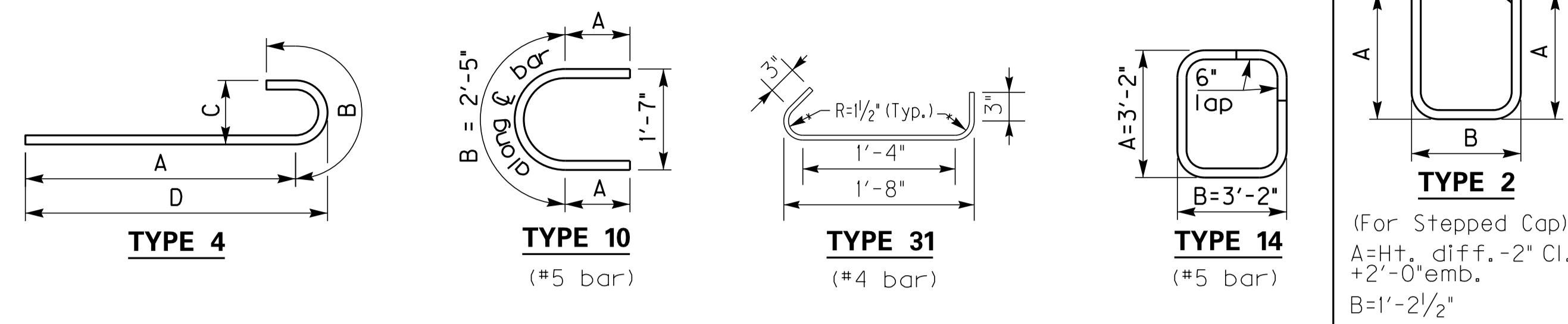
PIER DETAILS		
SKIEW	WIDTH	DATE
45	16	July 2017

45° SKEW 24'-0" - 25'-6" BRIDGE WIDTH (No Seismic Load)

Bill of Reinforcement

MARK	P1		P2		P3		P4				P5				P6		P7		P8		P9(e)		P10(e)		P11(e)									
	TYPE	Str.	Str.	Str.	Type 4				Type 10				Str.	Type 31	Str.	Str.	Str.	Str.	Str.	Str.	Str.	Str.	Type 14	Type 14										
SIZE	No.	Length	Spacing	No.	Length	Spacing	No.	Length	Spacing	No.	Length	Spacing	No.	Length	Spacing	No.	Length	Spacing	No.	Length	Spacing	No.	Length	Spacing	No.	Length	Spacing							
10-11	56	7 1/2	2 8	26	6 3/4	2 12	56	5 1/2	2 8	94	8 8	10 8	8 7 5	1 5 0	8 7 9	10	5 7 5	12 2	6	10	5 30	6	12	80	2 5	94	8 8	0 8	8 8	40	2 4	40	2 40	13 2
12-13	56	7 1/2	2 8	26	6 3/4	2 12	56	5 1/2	2 8	94	8 8	10 8	8 7 5	1 5 0	8 7 9	14	5 7 5	12 2	6	14	5 30	6	12	112	2 5	94	8 10	0 8	8 8	40	2 4	40	2 40	13 2
14-15	56	7 1/2	2 8	26	6 3/4	2 12	56	5 1/2	2 8	94	8 8	10 8	8 7 5	1 5 0	8 7 9	18	5 7 5	12 2	6	18	5 30	6	12	144	2 5	94	8 12	0 8	8 8	40	2 4	40	2 40	13 2
16-17	56	7 1/2	2 8	26	6 3/4	2 12	56	5 1/2	2 8	94	8 8	10 8	8 7 5	1 5 0	8 7 9	22	5 7 5	12 2	6	22	5 30	6	12	176	2 5	94	8 14	0 8	8 8	40	2 4	40	2 40	13 2
18-19	56	7 1/2	2 8	26	6 3/4	2 12	56	5 1/2	2 8	94	8 8	10 8	8 7 5	1 5 0	8 7 9	26	5 7 5	12 2	6	26	5 30	6	12	208	2 5	94	8 16	0 8	8 8	40	2 4	40	2 40	13 2
20-21	56	7 1/2	2 8	26	6 3/4	2 12	56	5 1/2	2 8	94	8 8	10 8	8 7 5	1 5 0	8 7 9	30	5 7 5	12 2	6	30	5 30	6	12	240	2 5	94	8 18	0 8	8 8	40	2 4	40	2 40	13 2
22-23	56	7 1/2	2 8	26	6 3/4	2 12	56	5 1/2	2 8	94	8 8	10 8	8 7 5	1 5 0	8 7 9	34	5 7 5	12 2	6	34	5 30	6	12	272	2 5	94	8 20	0 8	8 8	40	2 4	40	2 40	13 2
24-25	56	7 1/2	2 8	26	6 3/4	2 12	56	5 1/2	2 8	94	8 8	10 8	8 7 5	1 5 0	8 7 9	38	5 7 5	12 2	6	38	5 30	6	12	304	2 5	94	8 22	0 8	8 8	40	2 4	40	2 40	13 2

Reinforcement Details

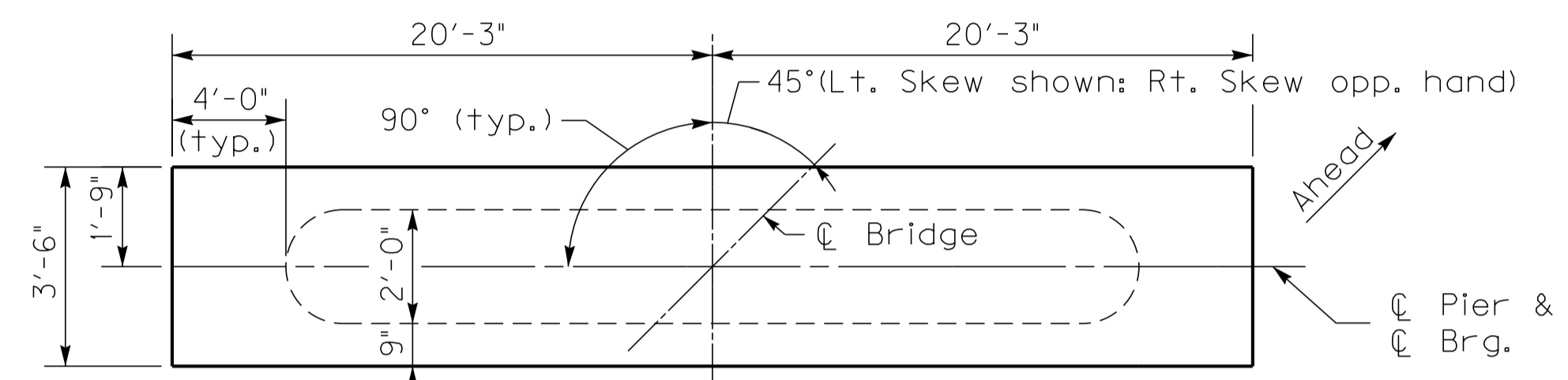


DIMENSIONS TABLE						QUANTITIES		
H	A	B	C	D	H	CONCRETE CLASS "A"	STEEL REINFORCEMENT EPOXY COATED	STEEL REINFORCEMENT
						CU. YDS. (1)	LBS.	LBS.
10-11	2 6	2 6	18 9	5 3	10-11	74.4	1580	8329
12-13	2 6	2 6	18 9	5 3	12-13	79.2	1580	9049
14-15	2 6	2 6	18 9	5 3	14-15	83.9	1580	9757
16-17	2 6	2 6	18 9	5 3	16-17	88.7	1580	10471
18-19	2 6	2 6	18 9	5 3	18-19	93.4	1580	11184
20-21	2 6	2 6	18 9	5 3	20-21	98.2	1580	11898
22-23	2 6	2 6	18 9	5 3	22-23	102.9	1580	12612
24-25	2 6	2 6	18 9	5 3	24-25	107.7	1580	13326

Note: All bars in cap shall be epoxy coated.

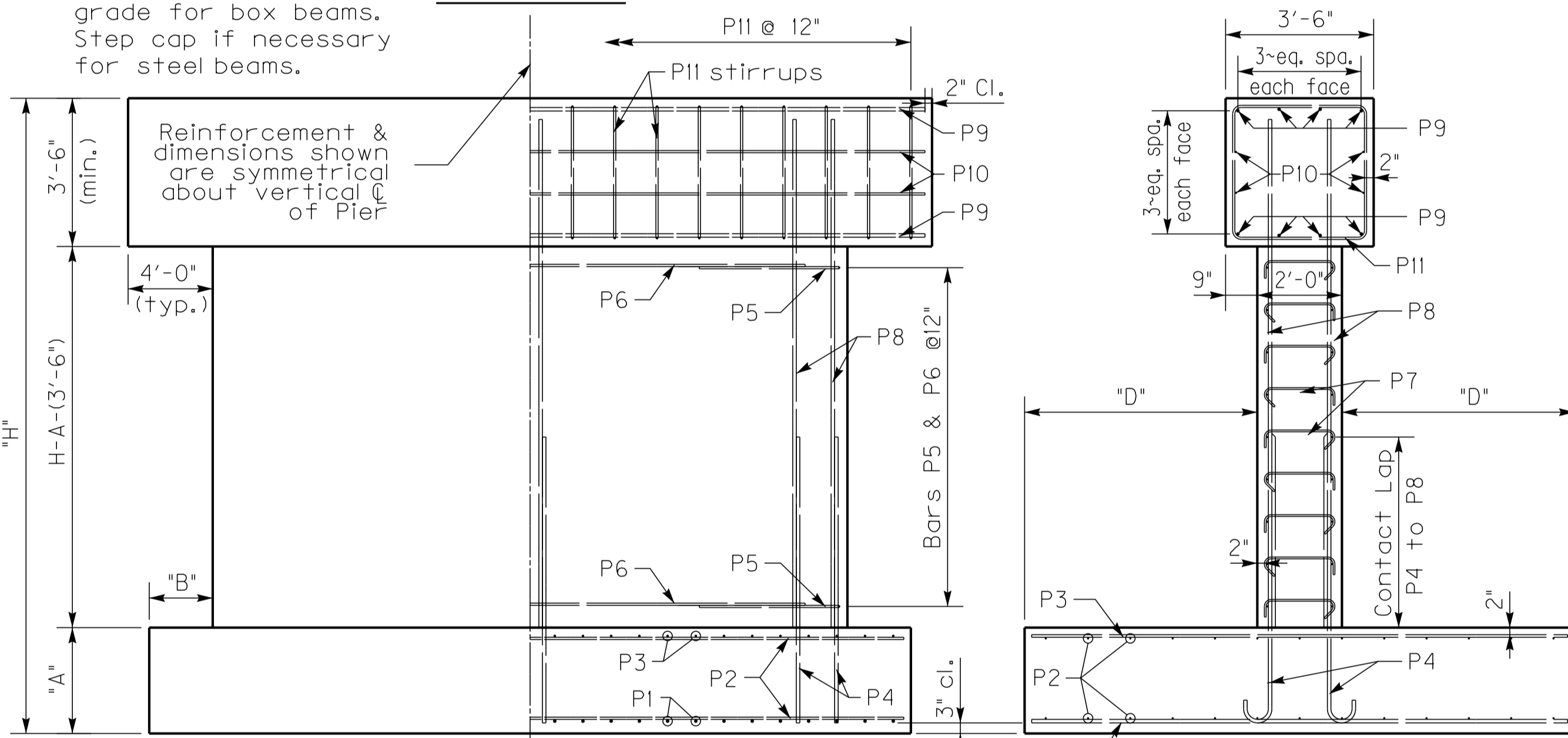
Note: All concrete shall be Class "A"

(1) Quantity is based on taller height. Reduce by 2.3 cubic yd. for shorter height.



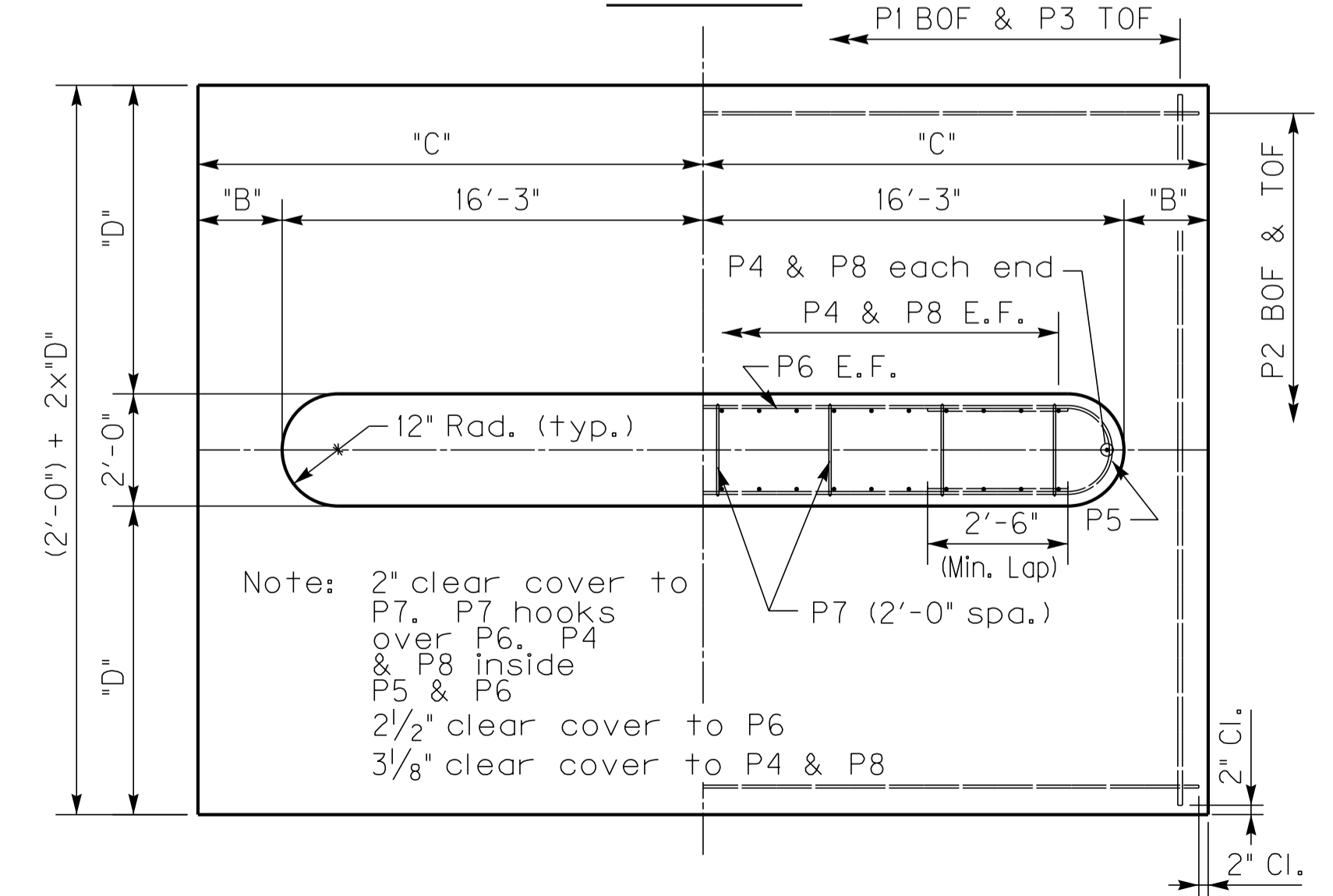
PLAN OF CAP

Note: Grade cap to roadway grade for box beams. Step cap if necessary for steel beams.



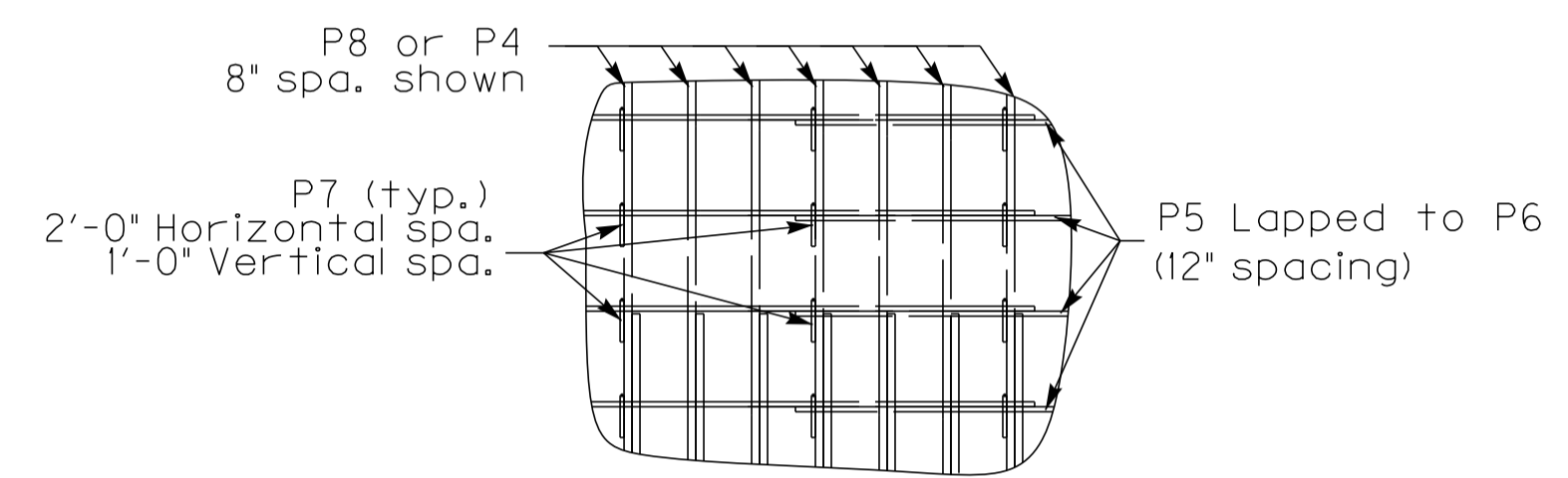
ELEVATION

END ELEVATION



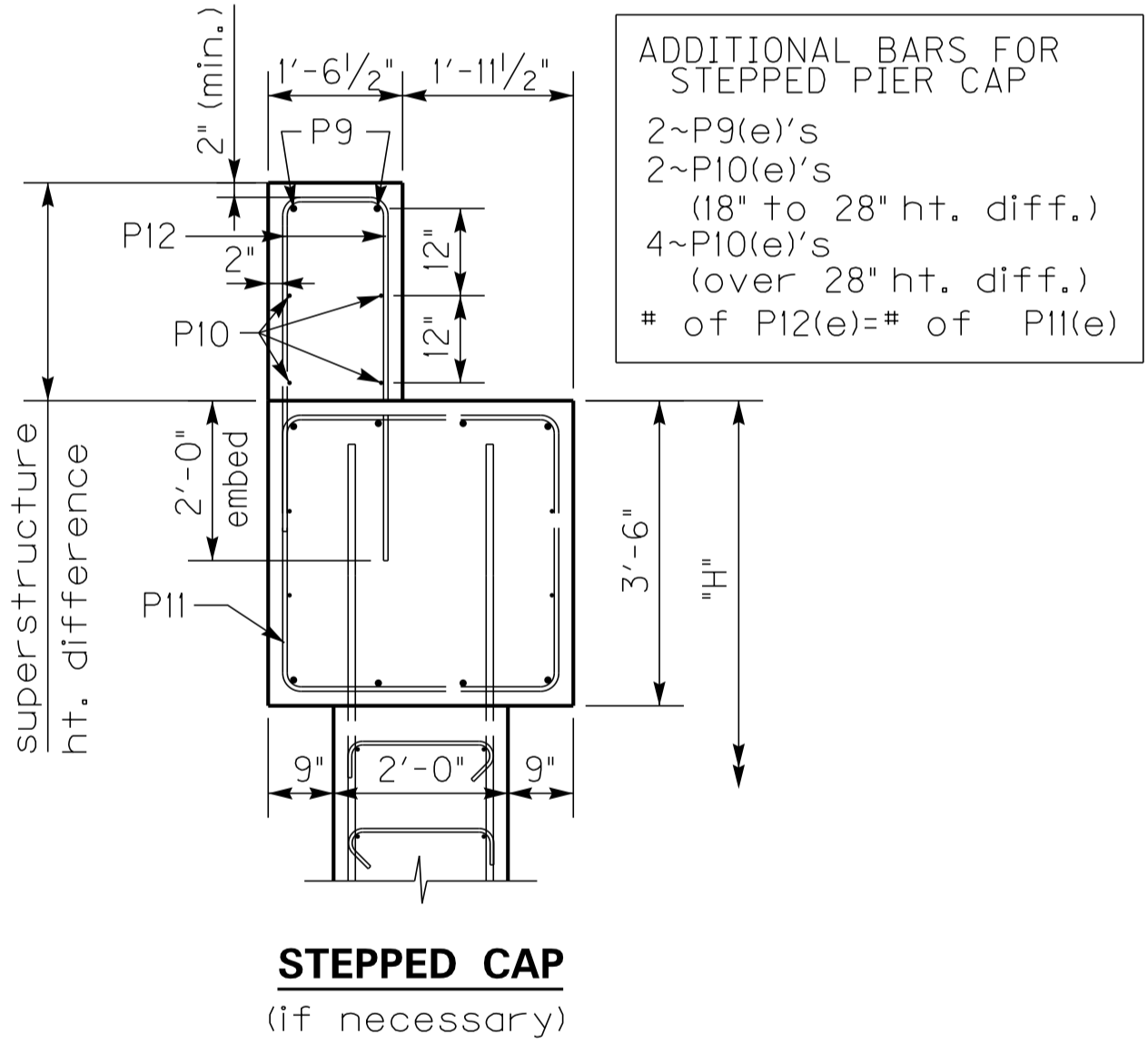
PLAN OF FOOTING

Note: 2" clear cover to P7. P7 hooks over P6. P4 & P8 inside P5 & P6. 2 1/2" clear cover to P6. 3/8" clear cover to P4 & P8.



P7 BAR PLACEMENT

(alternate 90° & 135° bar ends)



STEPPED CAP

(if necessary)

ADDITIONAL BARS FOR STEPPED PIER CAP
 2~P9(e)'s
 2~P10(e)'s (18" to 28" ht. diff.)
 4~P10(e)'s (over 28" ht. diff.)
 # of P12(e)=# of P11(e)

GENERAL NOTES

SPECIFICATIONS: Construct piers according to the current edition of the Kentucky Department of Highways Standard Specifications for Road and Bridge Construction. Piers are designed for side by side box beams as detailed in Standard Drawings BDP-001 through BDP-012, current edition. They may be slightly modified to allow for 25'-6" rolled steel beam bridge width.

FOUNDATION PRESSURE: Construct pier footings on solid rock bearing material that can support a pressure of 8000 psf service or 10,800 psf strength factored, as recommended by a geotechnical engineer.

DESIGN LOADS: Pier is designed for the CB42 beam superstructure with 3-97 foot spans. Pier is designed to handle a half a 97 foot span for thermal load with expansion bearings under the beams. Pier is designed for 100 mph wind. Wind on superstructure is for 1-97' span longitudinal and transverse. Pier is designed for stream flow of 10 ft./sec. up to the top of the pier. It is not designed for flow acting on the superstructure. Pier is not designed for earthquake loading.

DESIGN APPLICABILITY: Consult with a structural engineer to determine if these details are applicable for any particular project.

FOOTING ELEVATION: Construct bottom of footing below the anticipated scour elevation. (This typically entails embedding the footings 1'-0" to 2'-0" into rock and pouring concrete directly against cut rock faces, as recommended by geotechnical engineer.)

NOTE: Distances to bars shown are clear dimensions unless otherwise noted.

MATERIAL SPECIFICATIONS:
 Concrete, Class "A" = 3500 psi
 Steel Reinforcement = Grade 60

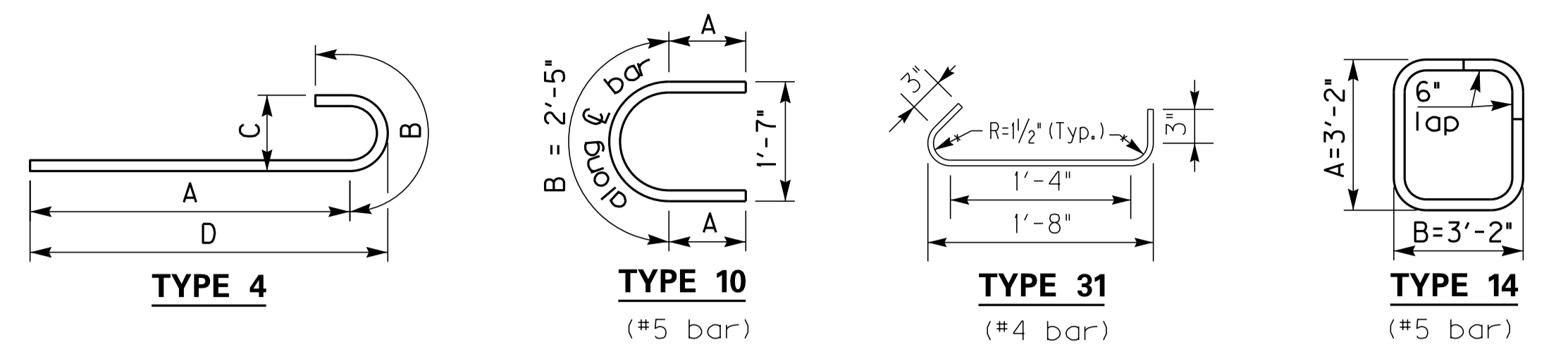
PIER DETAILS		
SKEW	WIDTH	DATE
45	24	July 2017

45° SKEW 32'-0" - 33'-6" BRIDGE WIDTH (No Seismic Load)

Bill of Reinforcement

MARK	P1		P2		P3		P4				P5				P6		P7		P8		P9(e)		P10(e)		P11(e)										
	TYPE	Str.	Str.	Str.	Type 4				Type 10				Str.	Type 31	Str.	Str.	Str.	Str.	Str.	Str.	Str.	Str.	Type 14	Type 14											
SIZE	No.	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length										
10-11	72	7 1/2	8 8	26	5 47	8 12	72	5 12	8 8	126	8 8	10 8	8 7	5 1	5 0	8 7	9 14	5 7	5 12	2 6	10 5	4 10	0 12	105	2 5	126	8 8	0 8	8 8	5 1	2 4	5 1	2 5	13	2
12-13	72	7 1/2	8 8	26	5 47	8 12	72	5 12	8 8	126	8 8	10 8	8 7	5 1	5 0	8 7	9 14	5 7	5 12	2 6	14 5	4 10	0 12	147	2 5	126	8 10	0 8	8 8	5 1	2 4	5 1	2 5	13	2
14-15	72	7 1/2	8 8	26	5 47	8 12	72	5 12	8 8	126	8 8	10 8	8 7	5 1	5 0	8 7	9 18	5 7	5 12	2 6	18 5	4 10	0 12	189	2 5	126	8 12	0 8	8 8	5 1	2 4	5 1	2 5	13	2
16-17	72	7 1/2	8 8	26	5 47	8 12	72	5 12	8 8	126	8 8	10 8	8 7	5 1	5 0	8 7	9 22	5 7	5 12	2 6	22 5	4 10	0 12	231	2 5	126	8 14	0 8	8 8	5 1	2 4	5 1	2 5	13	2
18-19	72	7 1/2	8 8	26	5 47	8 12	72	5 12	8 8	126	8 8	10 8	8 7	5 1	5 0	8 7	9 26	5 7	5 12	2 6	26 5	4 10	0 12	273	2 5	126	8 16	0 8	8 8	5 1	2 4	5 1	2 5	13	2
20-21	72	7 1/2	8 8	26	5 47	8 12	72	5 12	8 8	126	8 8	10 8	8 7	5 1	5 0	8 7	9 30	5 7	5 12	2 6	30 5	4 10	0 12	315	2 5	126	8 18	0 8	8 8	5 1	2 4	5 1	2 5	13	2
22-23	72	7 1/2	8 8	26	5 47	8 12	72	5 12	8 8	126	8 8	10 8	8 7	5 1	5 0	8 7	9 34	5 7	5 12	2 6	34 5	4 10	0 12	357	2 5	126	8 20	0 8	8 8	5 1	2 4	5 1	2 5	13	2
24-25	72	7 1/2	8 8	26	5 47	8 12	72	5 12	8 8	126	8 8	10 8	8 7	5 1	5 0	8 7	9 38	5 7	5 12	2 6	38 5	4 10	0 12	399	2 5	126	8 22	0 8	8 8	5 1	2 4	5 1	2 5	13	2

Reinforcement Details



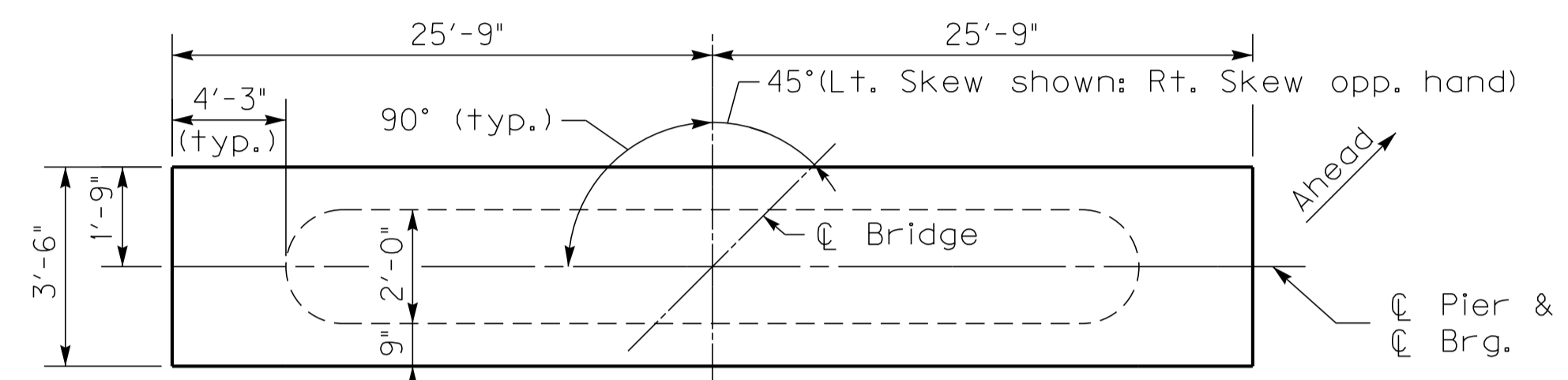
DIMENSIONS TABLE

MARK	TYPE	H	A				B	C	D	H	QUANTITIES		
			ft.	in.	ft.	in.					ft.	in.	ft.
10-11	2	6	2	6	24	0	5	6	10-11	98.1	2013	10477	
12-13	2	6	2	6	24	0	5	6	12-13	104.4	2013	11422	
14-15	2	6	2	6	24	0	5	6	14-15	110.7	2013	12367	
16-17	2	6	2	6	24	0	5	6	16-17	117	2013	13313	
18-19	2	6	2	6	24	0	5	6	18-19	123.4	2013	14278	
20-21	2	6	2	6	24	0	5	6	20-21	129.7	2013	15204	
22-23	2	6	2	6	24	0	5	6	22-23	136	2013	16149	
24-25	2	6	2	6	24	0	5	6	24-25	142.3	2013	17094	

Note: All bars in cap shall be epoxy coated.

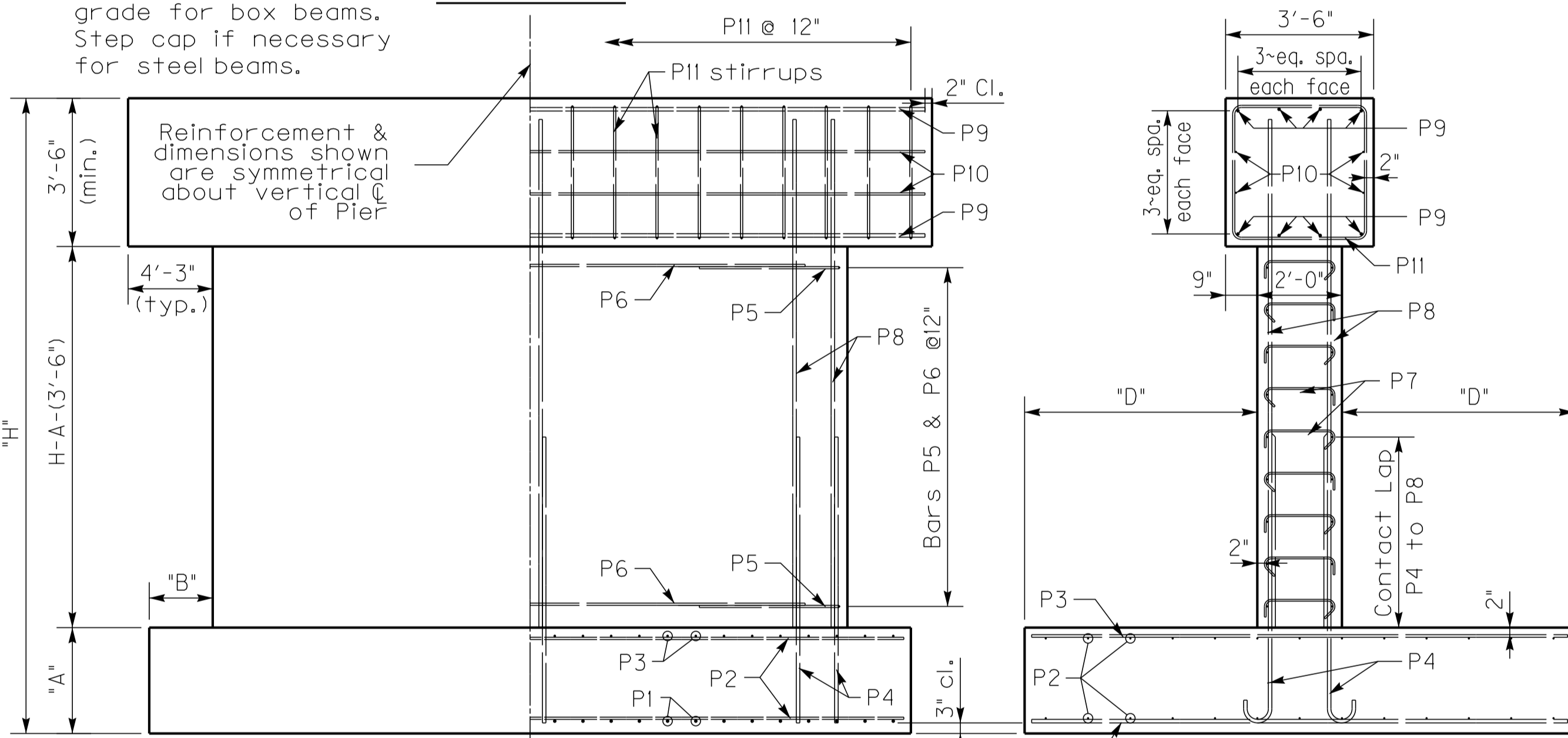
Note: All concrete shall be Class "A"

(1) Quantity is based on taller height. Reduce by 3.1 cubic yd. for shorter height.



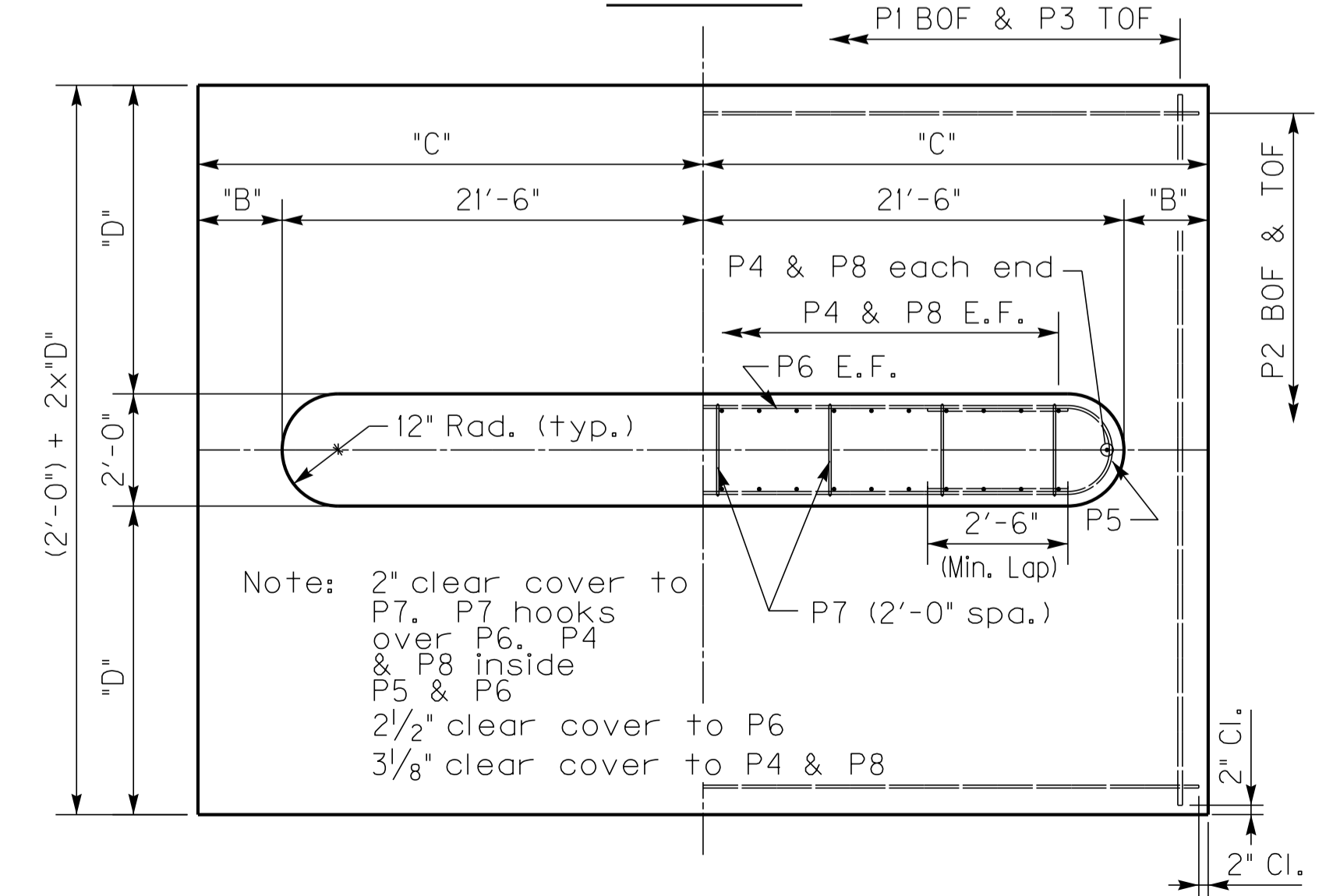
PLAN OF CAP

Note: Grade cap to roadway grade for box beams. Step cap if necessary for steel beams.



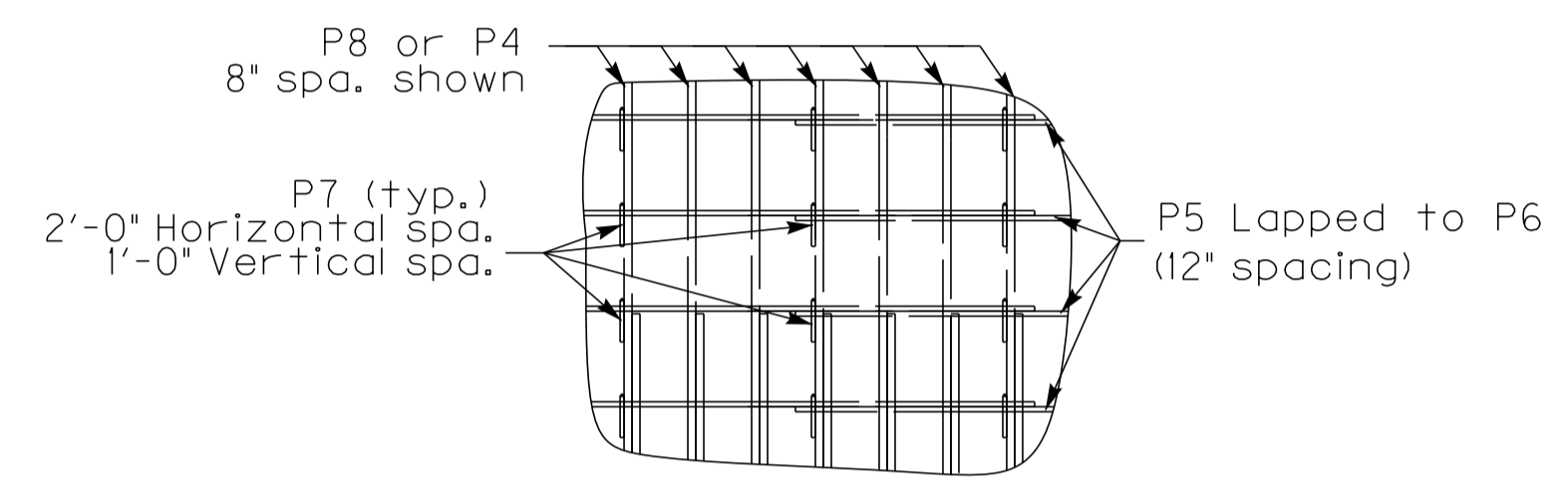
ELEVATION

END ELEVATION



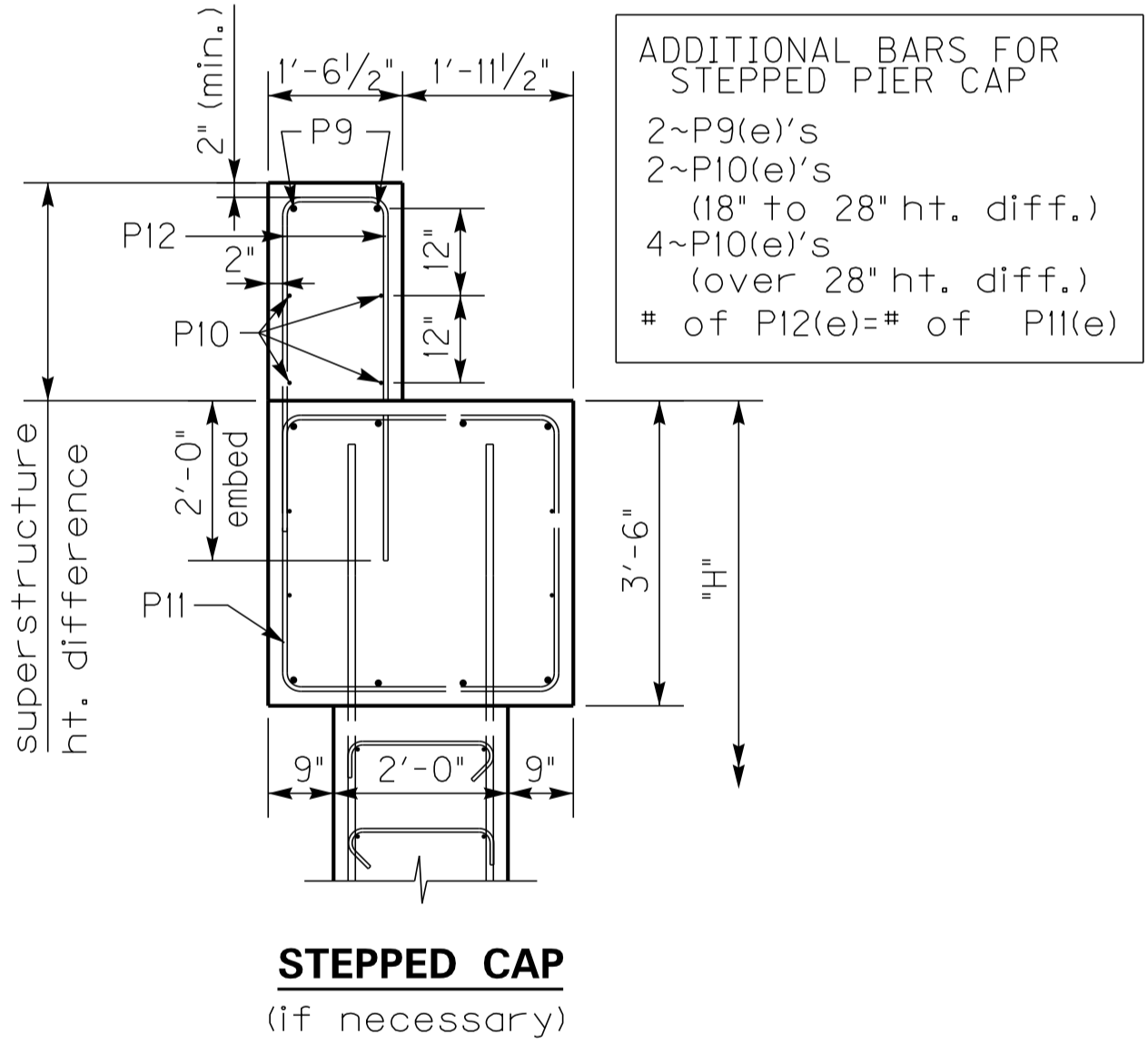
PLAN OF FOOTING

Note: 2" clear cover to P7. P7 hooks over P6. P4 & P8 inside P5 & P6
2 1/2" clear cover to P6
3/8" clear cover to P4 & P8



P7 BAR PLACEMENT

(alternate 90° & 135° bar ends)



STEPPED CAP

(if necessary)

ADDITIONAL BARS FOR STEPPED PIER CAP
2~P9(e)'s
2~P10(e)'s (18" to 28" ht. diff.)
4~P10(e)'s (over 28" ht. diff.)
of P12(e)=# of P11(e)

GENERAL NOTES

SPECIFICATIONS: Construct piers according to the current edition of the Kentucky Department of Highways Standard Specifications for Road and Bridge Construction. Piers are designed for side by side box beams as detailed in Standard Drawings BDP-001 through BDP-012, current edition. They may be slightly modified to allow for 33'-6" rolled steel beam bridge width.

FOUNDATION PRESSURE: Construct pier footings on solid rock bearing material that can support a pressure of 8000 psf service or 10,800 psf strength factored, as recommended by a geotechnical engineer.

DESIGN LOADS: Pier is designed for the CB42 beam superstructure with 3-97 foot spans. Pier is designed to handle a half a 97 foot span for thermal load with expansion bearings under the beams. Pier is designed for 100 mph wind. Wind on superstructure is for 1-97' span longitudinal and transverse. Pier is designed for stream flow of 10 ft./sec. up to the top of the pier. It is not designed for flow acting on the superstructure. Pier is not designed for earthquake loading.

DESIGN APPLICABILITY: Consult with a structural engineer to determine if these details are applicable for any particular project.

FOOTING ELEVATION: Construct bottom of footing below the anticipated scour elevation. (This typically entails embedding the footings 1'-0" to 2'-0" into rock and pouring concrete directly against cut rock faces, as recommended by geotechnical engineer.)

NOTE: Distances to bars shown are clear dimensions unless otherwise noted.

MATERIAL SPECIFICATIONS:
Concrete, Class "A" = 3500 psi
Steel Reinforcement = Grade 60

PIER DETAILS

SKEW	WIDTH	DATE
45	32	July 2017

General Notes

SPECIFICATIONS: All references to the standard Specifications are to the current edition of the Kentucky Department of Highways Standard Specifications for Road and Bridge Construction, with current supplemental specifications. All references to the AASHTO Specifications are to the current edition of the AASHTO LRFD Bridge Design Specifications, with interims.

DESIGN LOADS: Beam sections are designed for H20 Live Load. The fatigue truck is also set at H20.

DESIGN LOAD DISTRIBUTION: Contrary to AASHTO LRFD Bridge Design Specifications, the design moment and shear distribution for all beams is 0.6 lanes.

FUTURE WEARING SURFACE: These beams are designed for a 15 PSF future wearing surface load.

SUBSTRUCTURE DESIGN LOADS: Unfactored design reaction forces per beam end.

DC (kips): Beam, Slab, and assumed Type III railing dead loads.

DW (kips): Future wearing surface.

LL+I (kips): LL with Dynamic load allowance.

MATERIAL DESIGN SPECIFICATIONS:

for Beam Steel FY = 50000 PSI

for Steel Reinforcement FY = 60000 PSI

for Class "AA" Deck Concrete F'c = 4000 PSI

MATERIAL STEEL
High Strength Low Alloy
Structural Steel

A.S.T.M AASHTO
•A709 GR 50 •M270 GR 50

High strength bolts, nuts, and washers F3125 Grade A325 M-164 Type 1
Sheet lead and Pig lead B29-79

All steel in longitudinal rolled wide flange beams shall meet the longitudinal Charpy V-Notch toughness test for non-fracture critical components Zone 2 in accordance with the following:

M270 GR 50 (up to 2" thickness) of 15 ft-lbs at 40° F.

Sampling and testing procedures shall be in accordance with AASHTO T243 current edition, utilizing (H) frequency testing. When plate thickness exceeds 1/2", frequency of testing shall be (P).

HIGH STRENGTH BOLT CONNECTIONS: Unless otherwise specified on the plans, all bolted connections shall be ASTM F3125 Grade A325 3/4" diameter high strength bolts, nuts, and washers. Open holes shall be 1/16" diameter. Type 1 galvanized bolts shall be used as described in AASHTO M164. All high strength bolted field connections are to be installed with "direct tension indicators" (DTI's) in accordance with the Standard Specifications and ASTM F959. All DTI's shall be manufactured from a steel conforming to the chemical requirements of ASTM A325 for Type 1 galvanized steel. DTI's shall be installed under the bolt head with the bumps facing the underside of the bolt head. Put a hardened washer under the nut and tension from the nut.

BEVELED EDGES: Bevel all exposed edges 3/4".

REINFORCEMENT: Dimensions shown from the face of concrete to reinforcement are clear distances. Spacing of reinforcement is from center to center of reinforcement. All steel reinforcement is to be epoxy coated in accordance with Section 811.10 of the Specifications.

CORROSION PROTECTION: These beams and all steel components are to be hot dip galvanized. If hot dip galvanizing is cost prohibitive then all steel components must be painted. Unpainted weathering steel is not recommended within 10 feet of moving water. Additionally these beams do not meet fatigue design requirements of unpainted weathering steel.

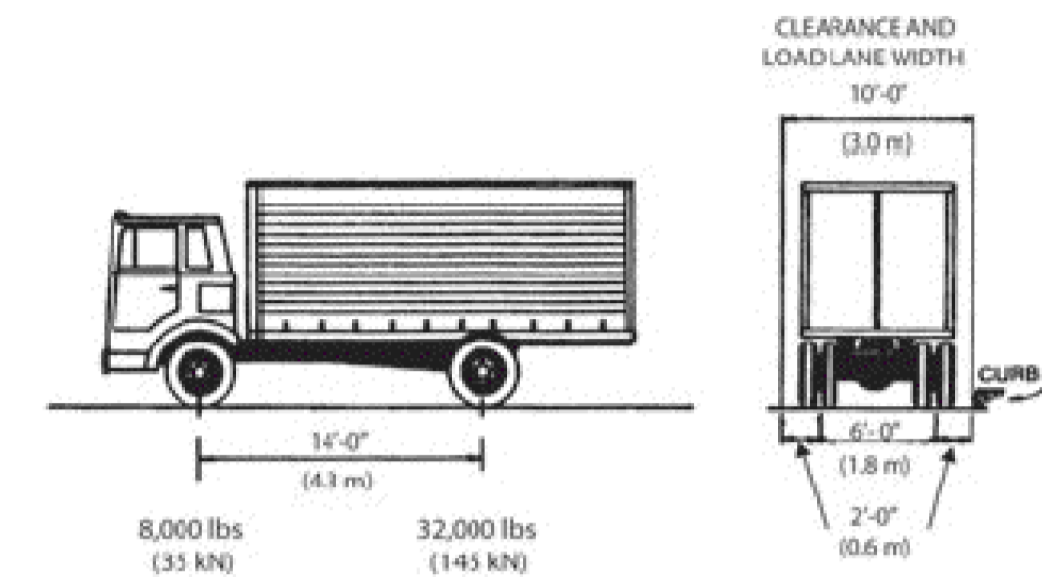
BRIDGE DECK: A galvanized steel metal grid deck may be substituted for the 8" concrete deck. This will improve the load rating, but smaller beams are not to be used.

TABLE OF BEAM SIZES AND DESIGN DATA (4 FT. MAX. BEAM SPACING)

BEAM SPAN	ROLLED BEAM		DEFLECTION IN INCHES		UNFACTORED BEAM END REACTION		
	BEAM MEMBER	BEAM DEPTH (IN.)	STEEL ONLY	TOTAL DL	DC (kips)	DW (kips)	LL+I (kips)
15' Max.	W16x40	16.0	0.00	0.06	5.39	0.45	25.96
	W14x43	13.7	0.01	0.07	5.42		
	W12x50	12.2	0.01	0.08	5.48		
	W10x60	10.2	0.01	0.08	5.56		
20' Max.	W18x50	18.0	0.01	0.12	7.17	0.60	27.45
	W16x57	16.4	0.01	0.12	7.25		
	W14x61	13.9	0.02	0.15	7.29		
	W12x65	12.1	0.02	0.18	7.34		
	W10x77	10.6	0.03	0.21	7.47		
25' Max.	W21x55	20.8	0.02	0.20	8.94	0.75	28.34
	W18x65	18.4	0.02	0.21	9.07		
	W16x67	16.3	0.03	0.24	9.10		
	W14x74	14.2	0.04	0.29	9.19		
	W12x79	12.4	0.05	0.35	9.26		
30' Max.	W21x73	21.2	0.04	0.30	10.93	0.90	28.94
	W18x76	18.2	0.05	0.36	10.98		
	W16x77	16.5	0.06	0.43	11.00		
	W14x90	14.0	0.07	0.49	11.20		
	W12x96	12.7	0.09	0.59	11.30		
35' Max.	W24x94	24.3	0.05	0.34	13.07	1.05	29.37
	W21x101	21.4	0.06	0.38	13.20		
	W18x97	18.6	0.08	0.52	13.13		
	W14x109	14.3	0.12	0.75	13.35		
40' Max.	W24x104	24.1	0.08	0.51	15.09	1.20	29.69
	W21x111	21.5	0.10	0.60	15.23		
	W18x130	19.3	0.12	0.66	15.63		
	W14x145	14.8	0.19	0.97	15.94		
	W12x159	15.0	0.30	1.42	18.20		
45' Max.	W27x102	27.1	0.11	0.70	16.87	1.35	29.93
	W24x104	24.1	0.13	0.81	16.92		
	W21x122	21.7	0.15	0.87	17.34		
	W18x143	19.5	0.19	0.96	17.83		
	W14x159	15.0	0.30	1.42	18.20		
50' Max.	W30x116	30.0	0.13	0.79	19.06	1.50	30.13
	W27x129	27.6	0.15	0.83	19.40		
	W24x131	24.5	0.18	0.99	19.45		
	W21x147	22.1	0.22	1.12	19.86		
	W18x175	20.0	0.27	1.22	20.58		
55' Max.	W33x130	33.1	0.16	0.87	21.32	1.65	30.29
	W30x148	30.7	0.18	0.89	21.83		
	W27x146	27.4	0.21	1.05	21.77		
	W24x146	24.7	0.26	1.30	21.77		
	W21x166	22.5	0.31	1.42	22.34		
60' Max.	W33x152	33.5	0.21	1.04	23.90	1.80	30.43
	W30x173	30.4	0.24	1.05	24.54		
	W27x161	27.6	0.29	1.36	24.17		
	W24x176	25.2	0.35	1.53	24.63		
	W21x201	23.0	0.42	1.69	25.40		

H-20

DESIGN LOAD



These beams were sized according to H-20 truck design. This does not meet federal minimum design HL-93 nor KY minimum KYHL-93.

Use of these beams will limit the loaded size of trucks allowed to cross the bridge.

This is suitable for very low volume roads with little potential for future development. These beams can handle a loaded school bus, but are not suitable for a loaded gravel truck or concrete truck. They are not suitable for typical trucks associated with construction, agriculture, or coal.

REVISION		DATE
DATE: May 2017	CHECKED BY	
DESIGNED BY: Carl Van Zee	Joseph Van Zee	
DETAILED BY: Carl Van Zee	Joseph Van Zee	

Commonwealth of Kentucky
DEPARTMENT OF HIGHWAYS

COUNTY	
ROUTE	CROSSING

H20 Steel Beam Standards

PREPARED BY	SHEET NO.
Division of	S1
Structural Design	DRAWING NO.

ITEM NUMBER

FILE NAME: j:\Standard Drawing Revision Work\2020 revised Std. Drawings\Standard Steel Spans\Std Steel Drawings.dgn
 USER: Joseph.vanzee
 DATE PLOTTED: 02-MAY-2017
 E-SHEET NAME: 26817-S1
 MicroStation v8.11.7.180

General Notes

SPECIFICATIONS: All references to the standard Specifications are to the current edition of the Kentucky Department of Highways Standard Specifications for Road and Bridge Construction, with current supplemental specifications. All references to the AASHTO Specifications are to the current edition of the AASHTO LRFD Bridge Design Specifications, with interims.

DESIGN LOADS: Beam sections are designed for 1.25•HL93 (KYHL93) Live Load.

DESIGN LOAD DISTRIBUTION: Contrary to AASHTO LRFD Bridge Design Specifications, the design moment and shear distribution for all beams is 0.6 lanes.

FUTURE WEARING SURFACE: These beams are designed for a 15 PSF future wearing surface load.

SUBSTRUCTURE DESIGN LOADS: Unfactored design reaction forces per beam end.

DC (kips): Beam, Slab, and assumed Type III railing dead loads.
 DW (kips): Future wearing surface.
 LL+I (kips): LL with Dynamic load allowance.

MATERIAL DESIGN SPECIFICATIONS:

for Beam Steel FY = 50000 PSI
 for Steel Reinforcement FY = 60000 PSI

 for Class "AA" Deck Concrete F'C = 4000 PSI

MATERIAL STEEL

High Strength Low Alloy A.S.T.M AASHTO
 Structural Steel •A709 GR 50 •M270 GR 50

High strength bolts, nuts, and washers F3125 Grade A325 M-164 Type 1

Sheet lead and Pig lead B29-79

All steel in longitudinal rolled wide flange beams shall meet the longitudinal Charpy V-Notch toughness test for non-fracture critical components Zone 2 in accordance with the following:

M270 GR 50 (up to 2" thickness) of 15 ft-lbs at 40° F.

Sampling and testing procedures shall be in accordance with AASHTO T243 current edition, utilizing (H) frequency testing. When plate thickness exceeds 1/2", frequency of testing shall be (P).

HIGH STRENGTH BOLT CONNECTIONS: Unless otherwise specified on the plans, all bolted connections shall be ASTM F3125 Grade A325 3/4" diameter high strength bolts, nuts, and washers. Open holes shall be 1/16" diameter. Type 1 galvanized bolts shall be used as described in AASHTO M164. All high strength bolted field connections are to be installed with "direct tension indicators" (DTI's) in accordance with the Standard Specifications and ASTM F959. All DTI's shall be manufactured from a steel conforming to the chemical requirements of ASTM A325 for Type 1 galvanized steel. DTI's shall be installed under the bolt head with the bumps facing the underside of the bolt head. Put a hardened washer under the nut and tension from the nut.

BEVELED EDGES: Bevel all exposed edges 3/4".

REINFORCEMENT: Dimensions shown from the face of concrete to reinforcement are clear distances. Spacing of reinforcement is from center to center of reinforcement. All steel reinforcement is to be epoxy coated in accordance with Section 811.10 of the Specifications.

CORROSION PROTECTION: These beams and all steel components are to be hot dip galvanized. If hot dip galvanizing is cost prohibitive then all steel components must be painted. Unpainted weathering steel is not recommended within 10 feet of moving water. Additionally these beams do not meet fatigue design requirements of unpainted weathering steel.

BRIDGE DECK: A galvanized steel metal grid deck may be substituted for the 8" concrete deck. This will improve the load rating, but smaller beams are not to be used.

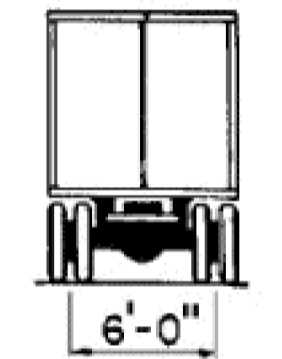
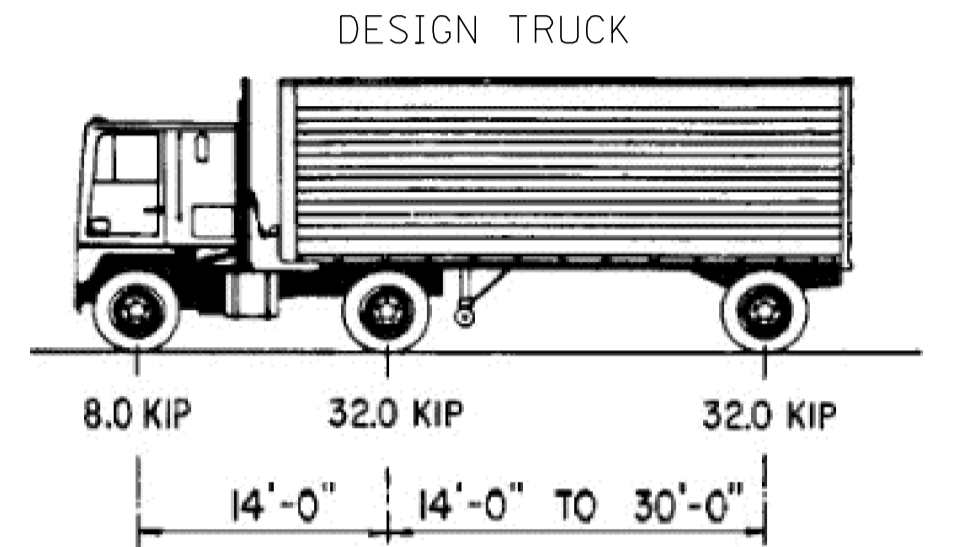
TABLE OF BEAM SIZES AND DESIGN DATA (4 FT. MAX. BEAM SPACING)

BEAM SPAN	ROLLED BEAM		DEFLECTION IN INCHES		UNFACTORED BEAM END REACTION		
	BEAM MEMBER	BEAM DEPTH (IN.)	STEEL ONLY	TOTAL DL	DC (kips)	DW (kips)	LL+I (kips)
15' Max.	W18x50	18.0	0.00	0.03	5.54	0.45	46.82
	W16x50	16.3	0.00	0.03	5.54		
	W14x53	13.9	0.01	0.06	5.56		
	W12x58	12.2	0.01	0.06	5.60		
	W10x77	10.6	0.01	0.07	5.76		
20' Max.	W18x65	18.2	0.00	0.08	7.41	0.60	49.69
	W16x67	16.3	0.00	0.09	7.44		
	W14x74	14.2	0.00	0.11	7.51		
	W12x79	12.4	0.00	0.13	7.56		
	W10x100	11.1	0.00	0.14	7.79		
25' Max.	W24x76	23.9	0.02	0.11	9.29	0.75	51.96
	W21x93	21.6	0.02	0.11	9.52		
	W18x76	18.2	0.02	0.18	9.29		
	W16x89	16.8	0.03	0.18	9.47		
	W14x99	14.2	0.03	0.21	9.59		
30' Max.	W24x103	24.5	0.03	0.16	11.49	0.90	56.68
	W21x101	21.4	0.03	0.20	11.46		
	W18x97	18.6	0.04	0.28	11.39		
	W14x145	14.8	0.06	0.31	12.16		
35' Max.	W27x129	27.6	0.04	0.20	13.79	1.05	61.07
	W24x117	24.3	0.05	0.26	13.57		
	W21x122	21.7	0.06	0.32	13.67		
	W18x143	19.5	0.07	0.35	14.05		
	W14x176	15.2	0.10	0.47	18.33		
40' Max.	W30x148	30.7	0.05	0.25	16.09	1.20	64.66
	W27x146	27.4	0.06	0.30	16.06		
	W24x146	24.7	0.07	0.36	16.06		
	W21x147	22.1	0.09	0.46	16.07		
	W18x192	20.4	0.11	0.45	17.01		
45' Max.	W33x130	33.1	0.07	0.39	17.63	1.35	67.72
	W30x132	30.3	0.08	0.45	17.68		
	W27x129	27.6	0.10	0.54	17.59		
	W24x146	24.7	0.11	0.58	18.00		
	W21x166	22.5	0.14	0.63	18.46		
50' Max.	W36x150	35.9	0.10	0.45	20.05	1.50	70.41
	W33x152	33.5	0.10	0.50	20.1		
	W30x148	30.7	0.12	0.60	19.98		
	W27x146	27.4	0.14	0.71	19.95		
55' Max.	W24x162	25.0	0.17	0.80	20.35	1.65	72.83
	W36x160	36.0	0.13	0.62	22.27		
	W33x169	33.8	0.14	0.65	22.51		
	W30x173	30.4	0.17	0.74	22.66		
	W27x178	27.8	0.20	0.87	22.80		
60' Max.	W24x192	25.5	0.24	0.99	23.17	1.80	75.05
	W36x194	36.5	0.18	0.73	25.3		
	W33x201	33.7	0.19	0.77	25.52		
	W30x173	30.4	0.24	1.05	24.66		
	W27x194	28.1	0.28	1.13	25.31		

KY-HL93 (1.25XHL93)

DESIGN LOAD

From AASHTO design code ->
 Vehicular Live Loading designated HL-93 shall consist of design truck or design tandem plus design lane load.



DESIGN TANDEM

Shall consist of a pair of 25,000 pound axles spaced at 4'-0" apart. Transverse wheel spacing is 6'-0".

DESIGN LANE LOAD

The design lane load shall consist of a load of 640 pound/ foot uniformly distributed in the longitudinal direction. Transversely the load is to be uniformly distributed over a 10'-0" width.

The current KY design standard for state roads is to increase the federal minimum (HL-93) by 25% (KY-HL93).

REVISION		DATE
DATE: May 2017	CHECKED BY	
DESIGNED BY: Carl Van Zee	Joseph Van Zee	
DETAILED BY: Carl Van Zee	Joseph Van Zee	

Commonwealth of Kentucky DEPARTMENT OF HIGHWAYS

COUNTY	
ROUTE	CROSSING

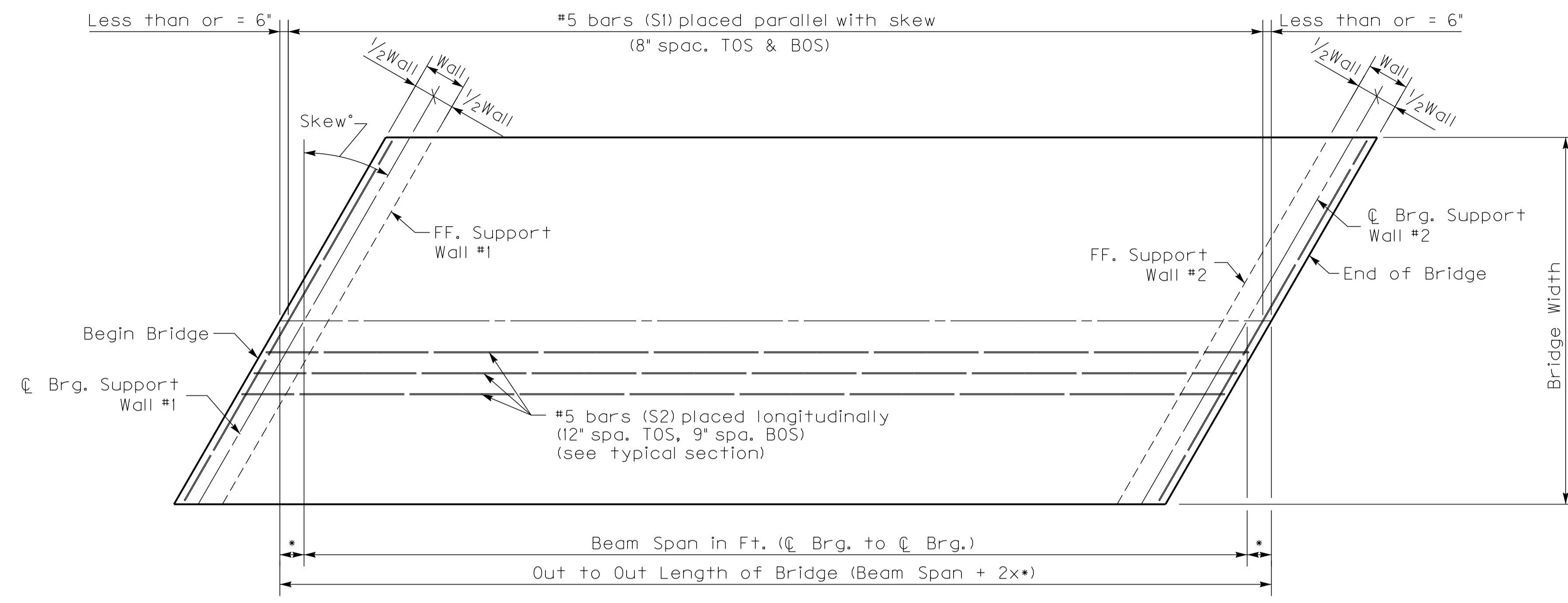
KYHL-93 Steel Beam Standards

PREPARED BY	SHEET NO.
Division of Structural Design	S2
	DRAWING NO.

ITEM NUMBER

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 USER: Joseph.vanzee
 DATE PLOTTED: 02-MAY-2017
 E-SHEET NAME: 26817-S1
 MicroStation v8.11.7.180

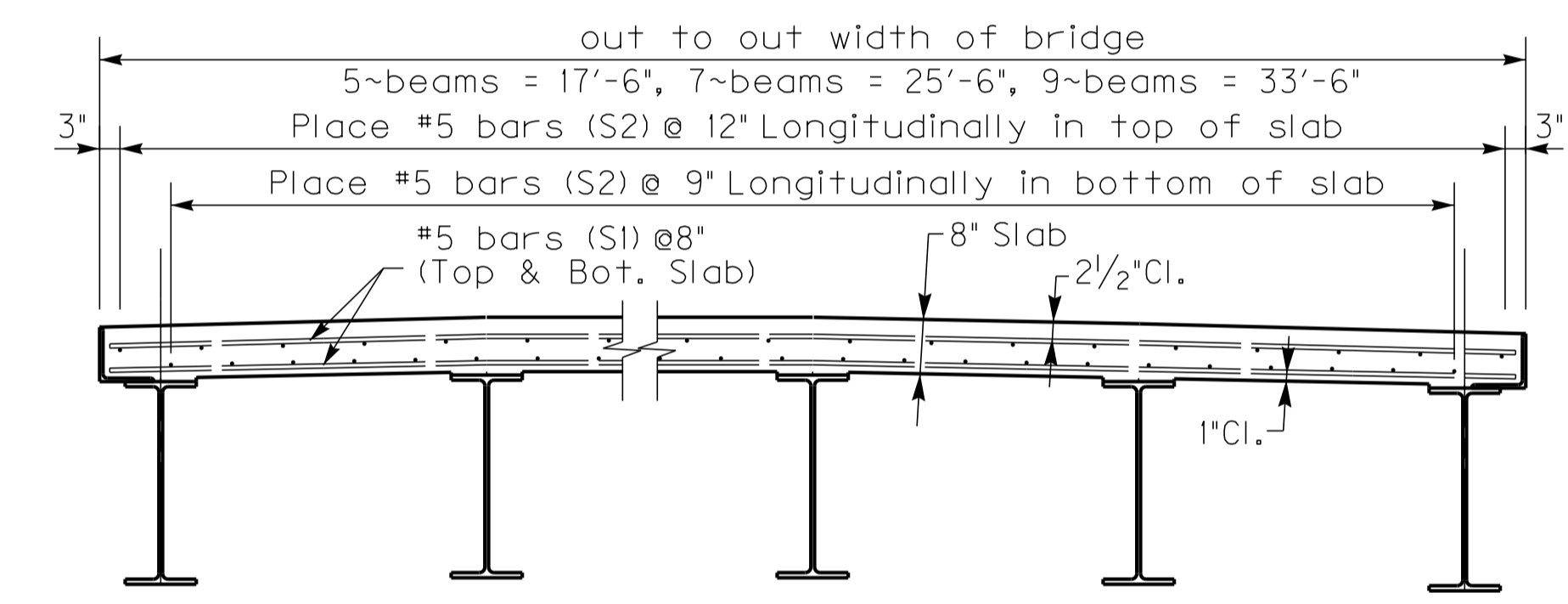
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 DATE PLOTTED: 02-MAY-2017
 E-SHEET NAME: 26817-S1
 MicroStation v8.11.7.180



PLAN OF SLAB

Note: All reinforcing steel shall be epoxy coated.

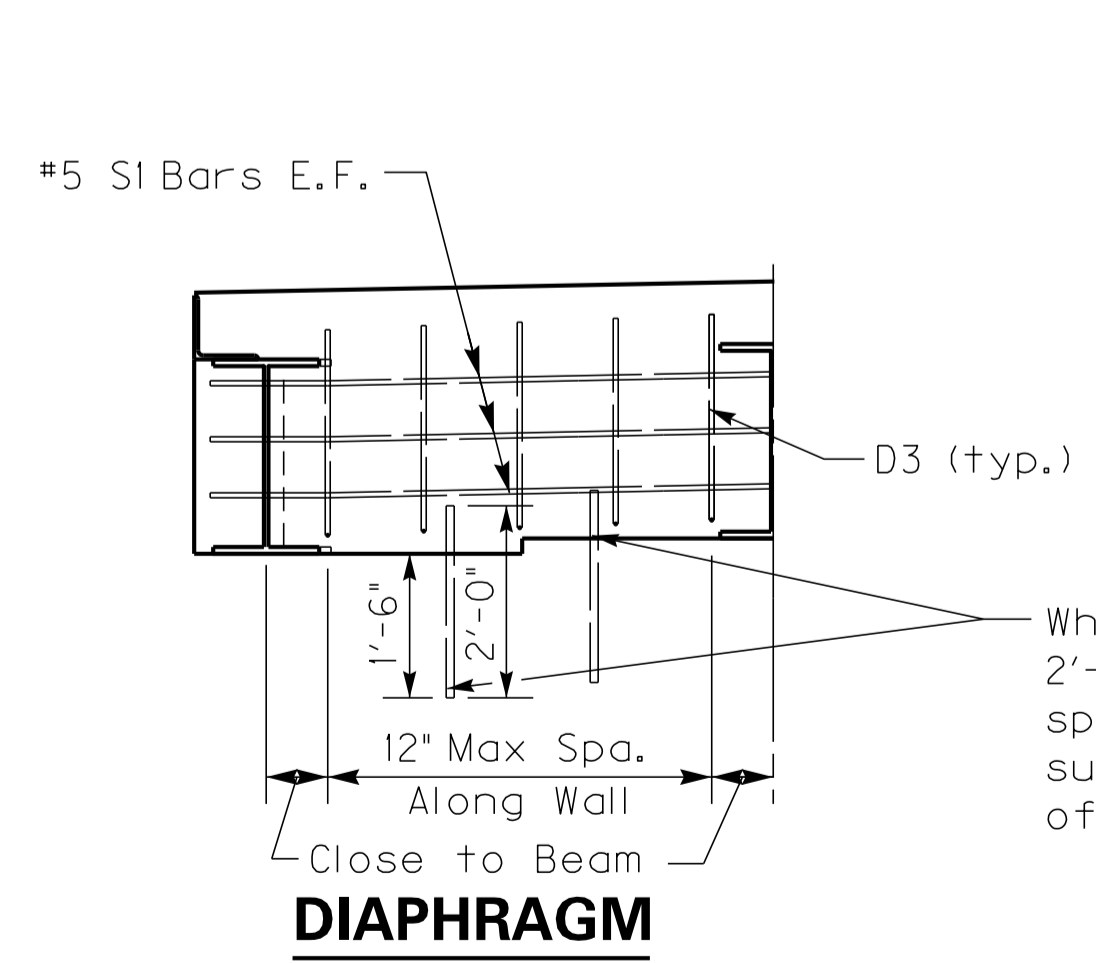
- #5 Skewed Transverse Bar (S1) Length
 0° Skew -> Bridge Width - 4"
 15° Skew -> ((Bridge Width - 4") x 1.035)
 30° Skew -> ((Bridge Width - 4") x 1.155) - 3/8"
 45° Skew -> ((Bridge Width - 4") x 1.414) - 5/8"
- * 0° skew, 1/2 Wall
 15° skew, 1/2 Wall x 1.035
 30° skew, 1/2 Wall x 1.155
 45° skew, 1/2 Wall x 1.414



TYPICAL SECTION

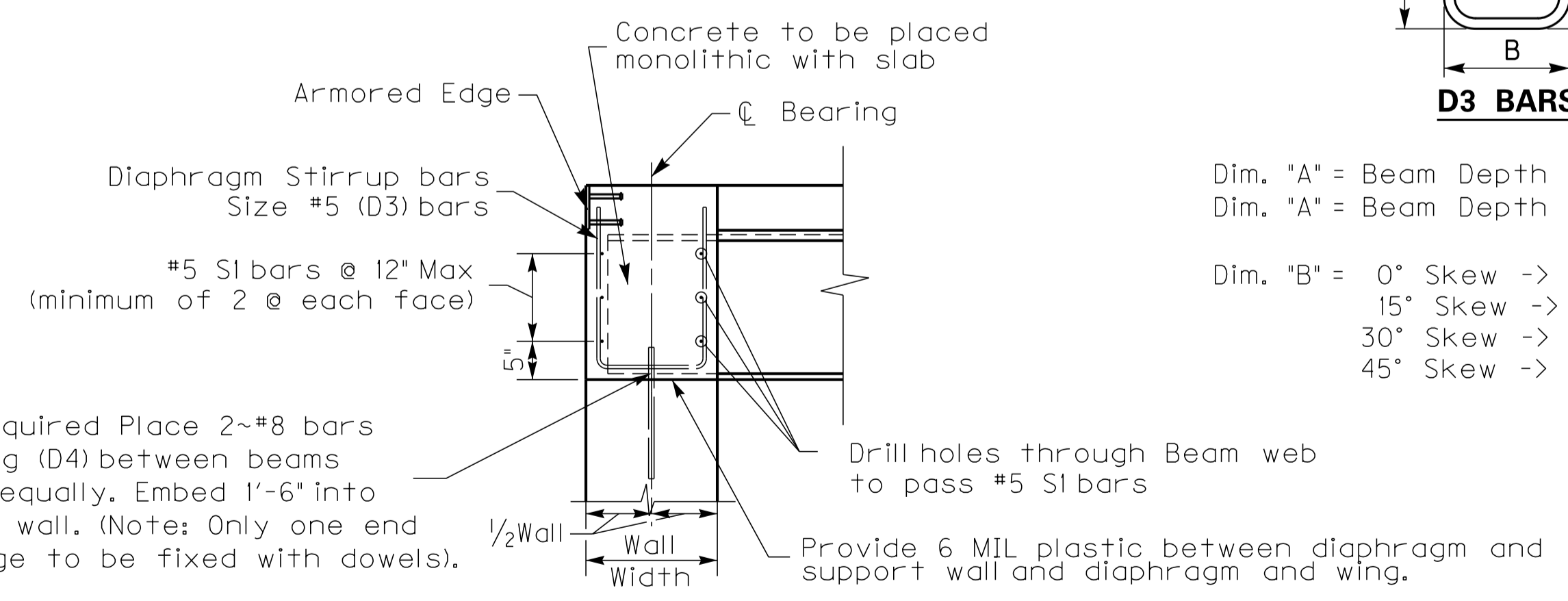
Note: It is recommended a crash tested barrier be attached to the Superstructure to contain all vehicles within the roadway. Recommended barriers include the Type T631 guardrail, Type 3, or 32" Vertical Face railing.

- Notes: 1.) Diaphragm stirrups are to project into the slab regardless of slab forming method.
 2.) Place stirrup bars parallel to face of beams.



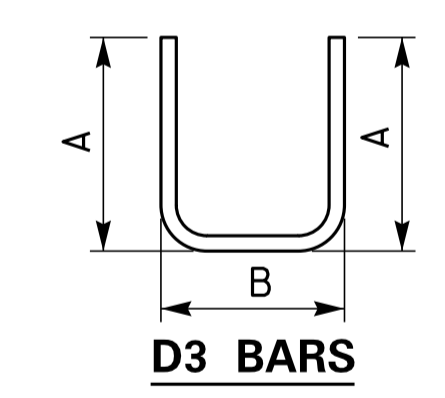
DIAPHRAGM

Note: End Diaphragms are required on both Grid Deck and Slabs.



DIAPHRAGM X-SECTION

(Perpendicular to Diaphragm)



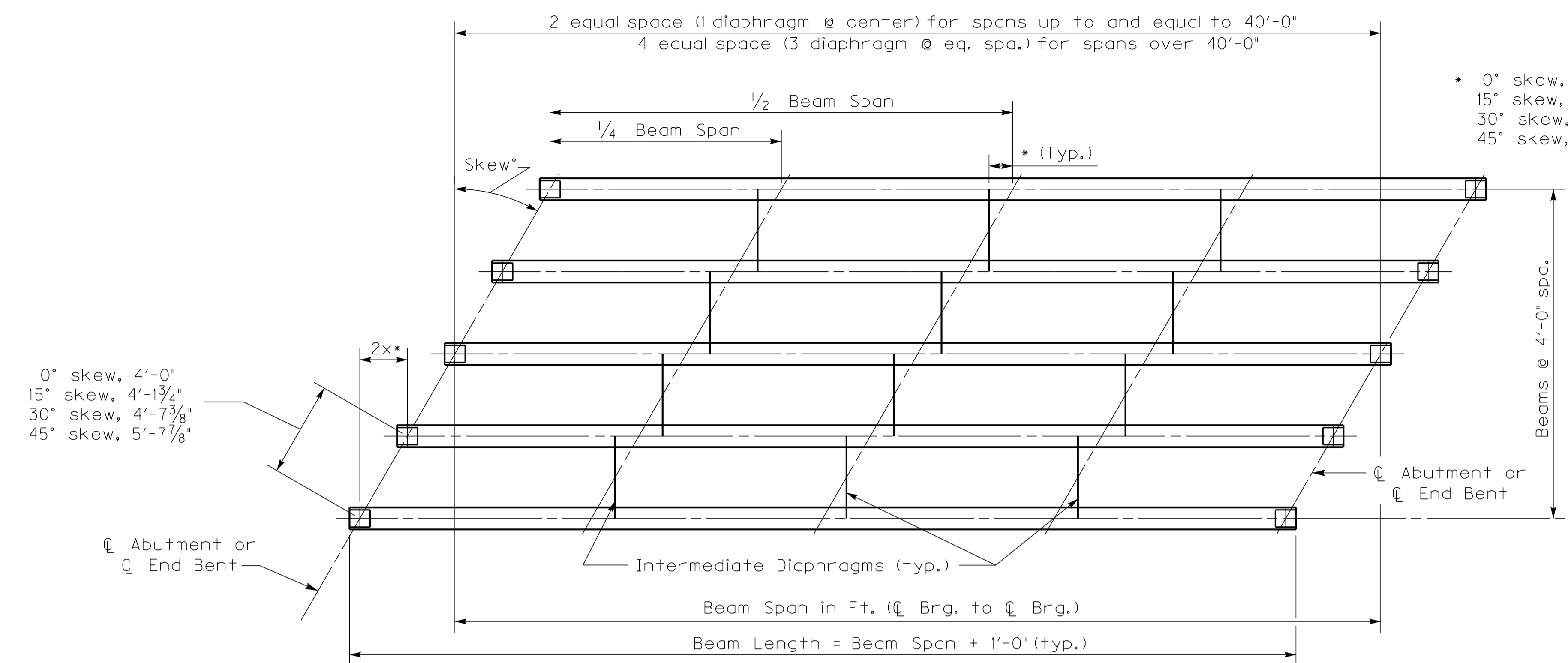
D3 BARS

Dim. "A" = Beam Depth + 4" for Slab
 Dim. "A" = Beam Depth - 4" for Grid Deck.

Dim. "B" = 0° Skew -> (Wall Width - 4")
 15° Skew -> (Wall Width - 4") x 1.035
 30° Skew -> (Wall Width - 4") x 1.155
 45° Skew -> (Wall Width - 4") x 1.414

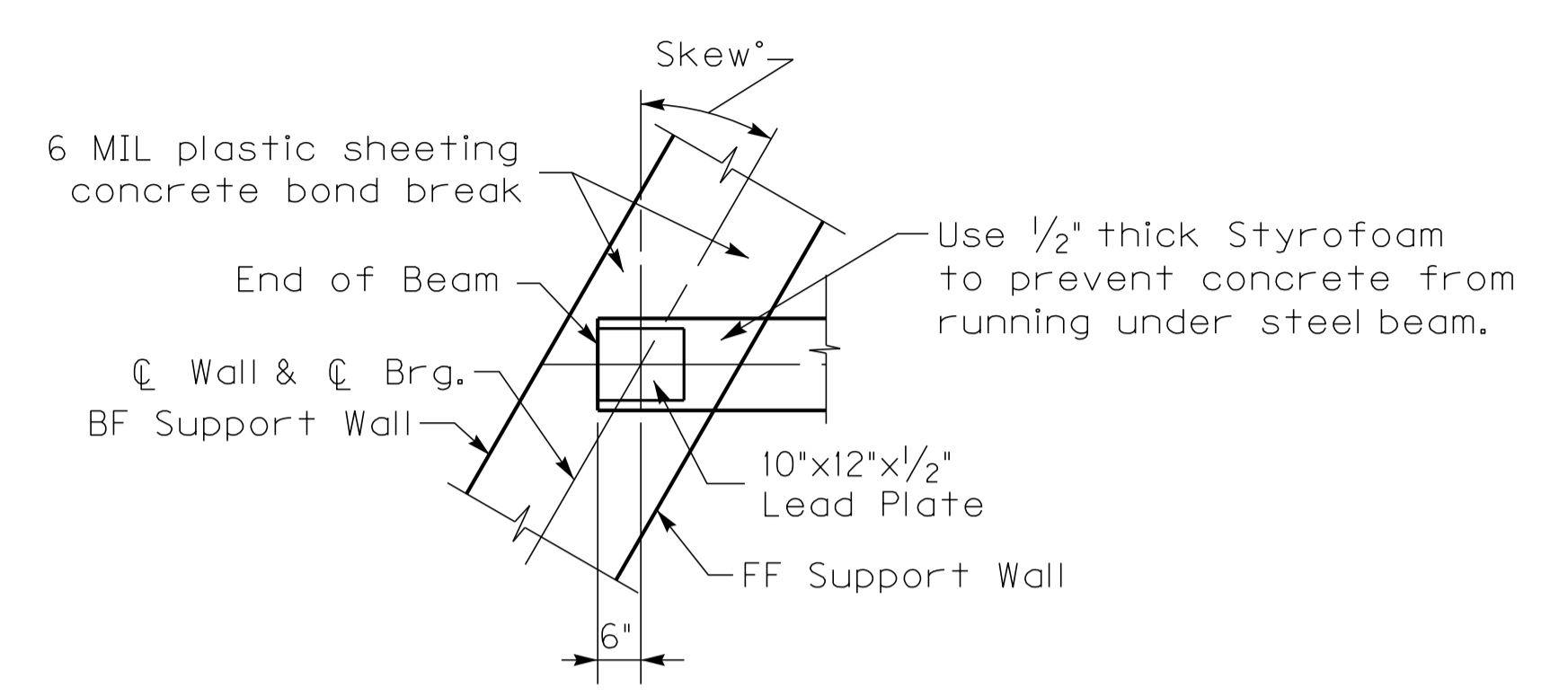
REVISION		DATE
DATE: May 2017	CHECKED BY: Joseph Van Zee	
DESIGNED BY: Carl Van Zee	Joseph Van Zee	
DETAILED BY: Carl Van Zee	Joseph Van Zee	
Commonwealth of Kentucky DEPARTMENT OF HIGHWAYS		
COUNTY		
ROUTE	CROSSING	
Slab and End Diaphragm Details		
ITEM NUMBER	PREPARED BY	SHEET NO.
	Division of Structural Design	S3
		DRAWING NO.

FILE NAME: J:\Standard Drawing Revision Work\2020 revised Std. Drawings\Standard Steel Spans\Std Steel Drawings.dgn
 USER: Joseph.vanZee
 DATE PLOTTED: 02-MAY-2017
 E-SHEET NAME: 26817-S1
 MicroStation v8.11.7.180

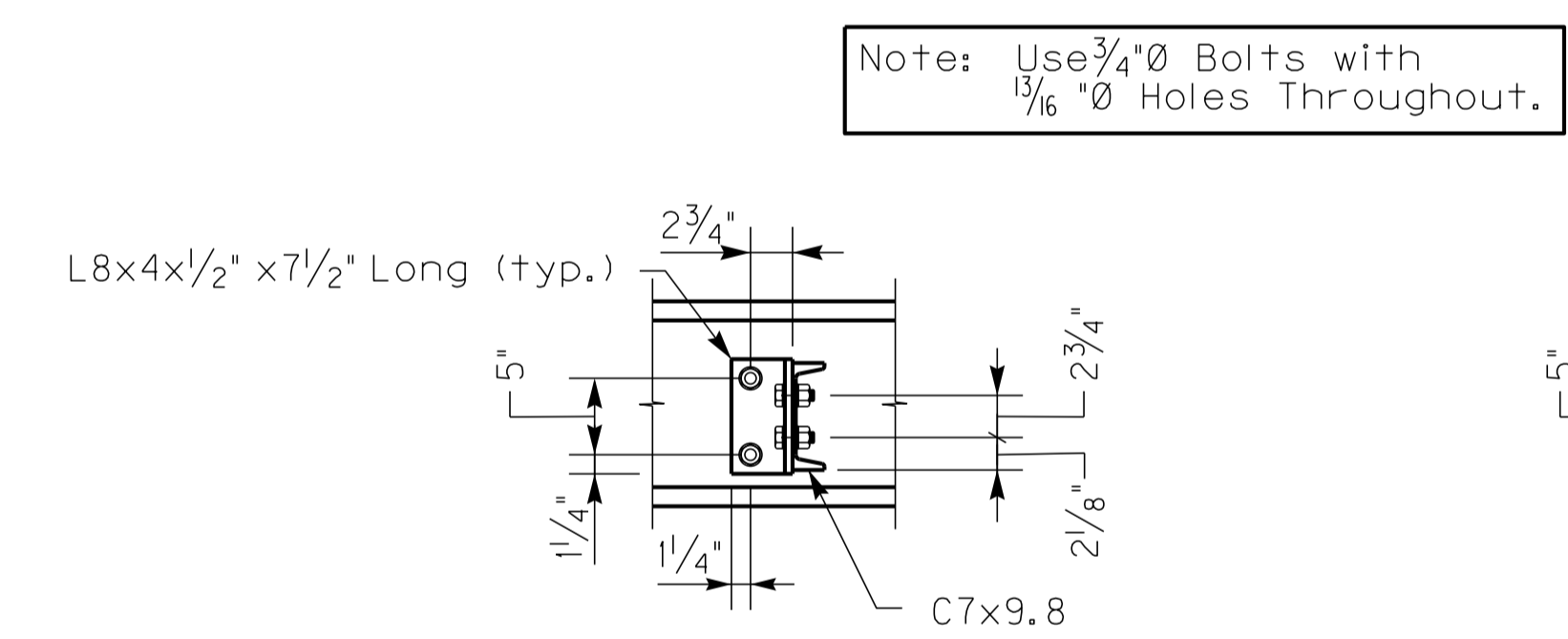


FRAMING PLAN

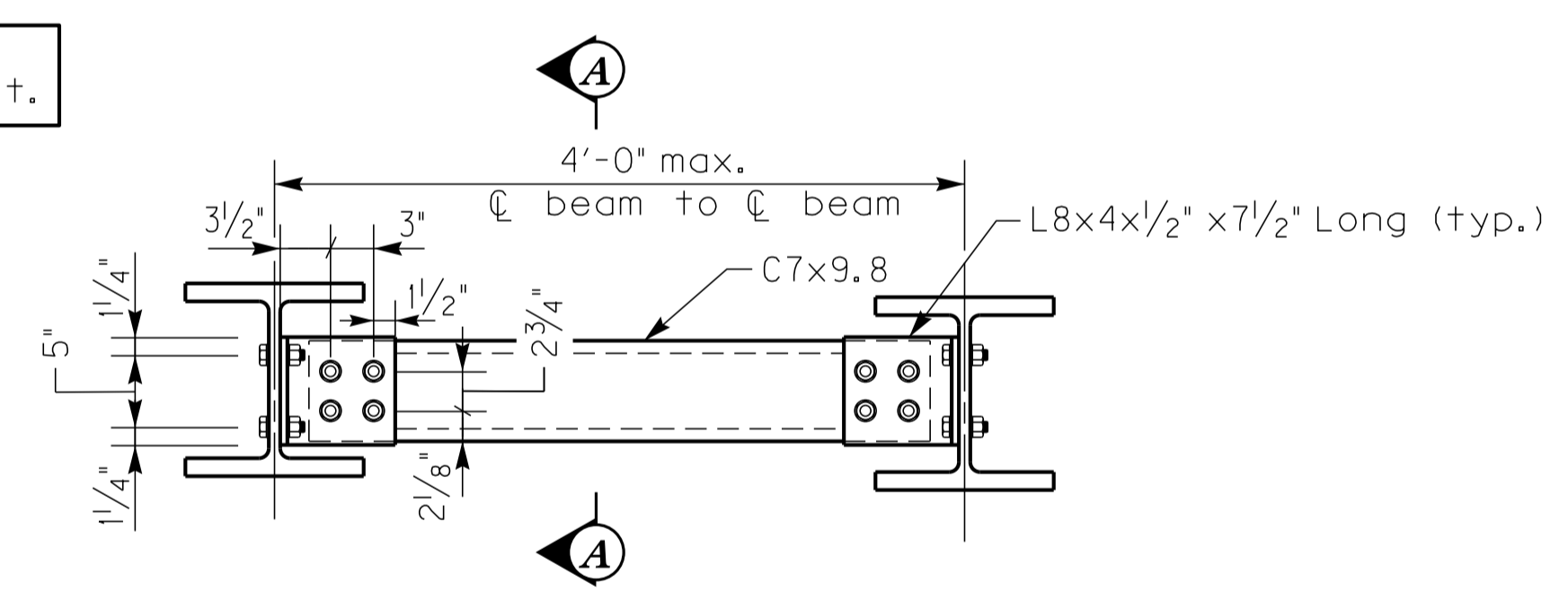
Note: Place girders with any mill or shop camber bowed up in the middle. Heat cambering is not required.



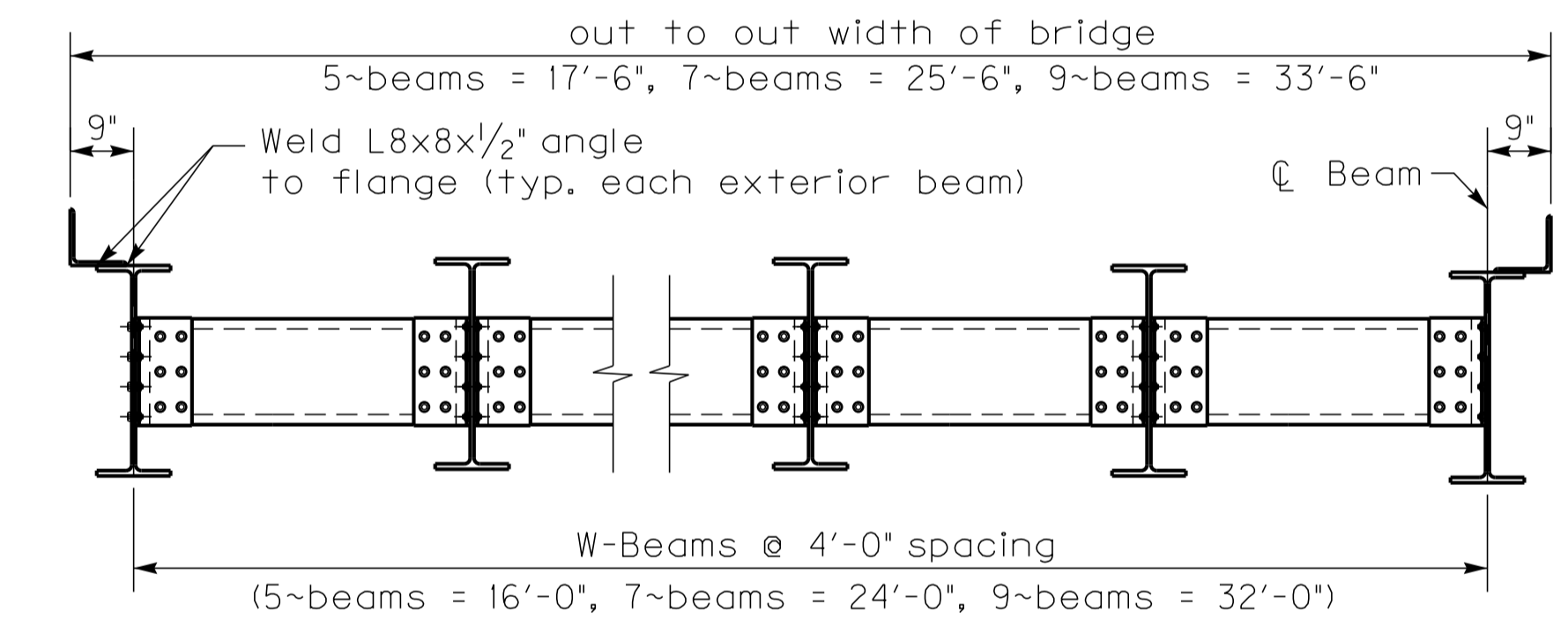
END OF BEAM DETAIL @ SUPPORTS



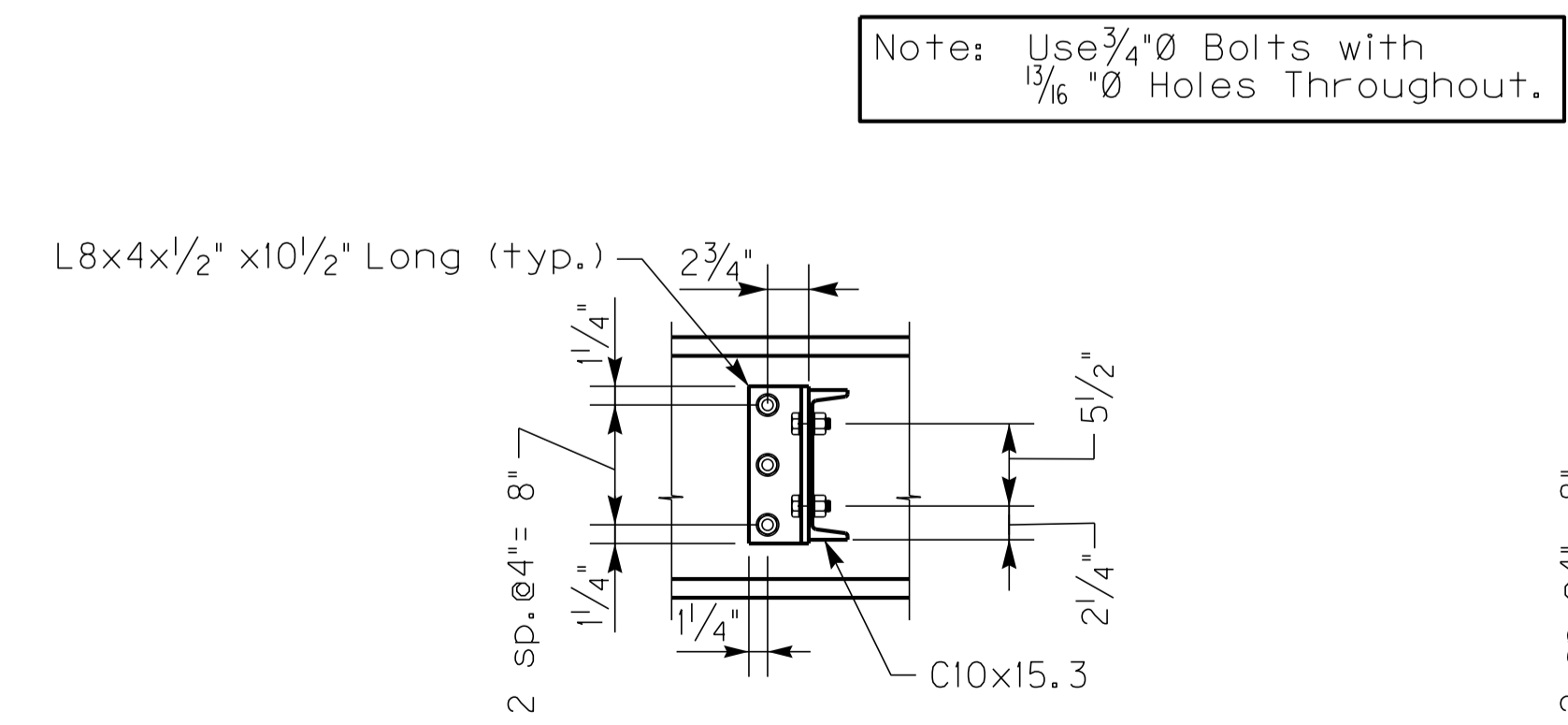
SECTION A-A



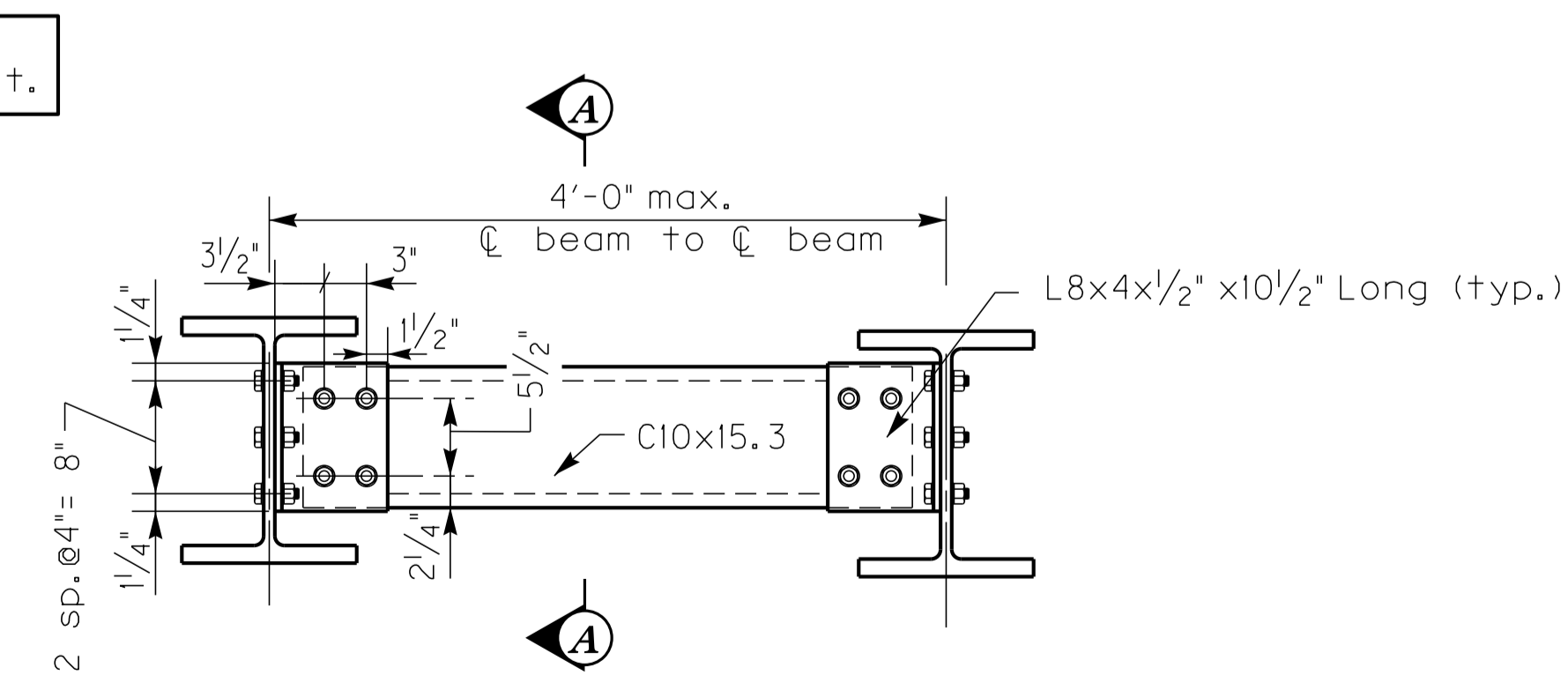
INTERMEDIATE DIAPHRAGM
 (for up to 14" beam depth)



FRAMING TYPICAL



SECTION A-A

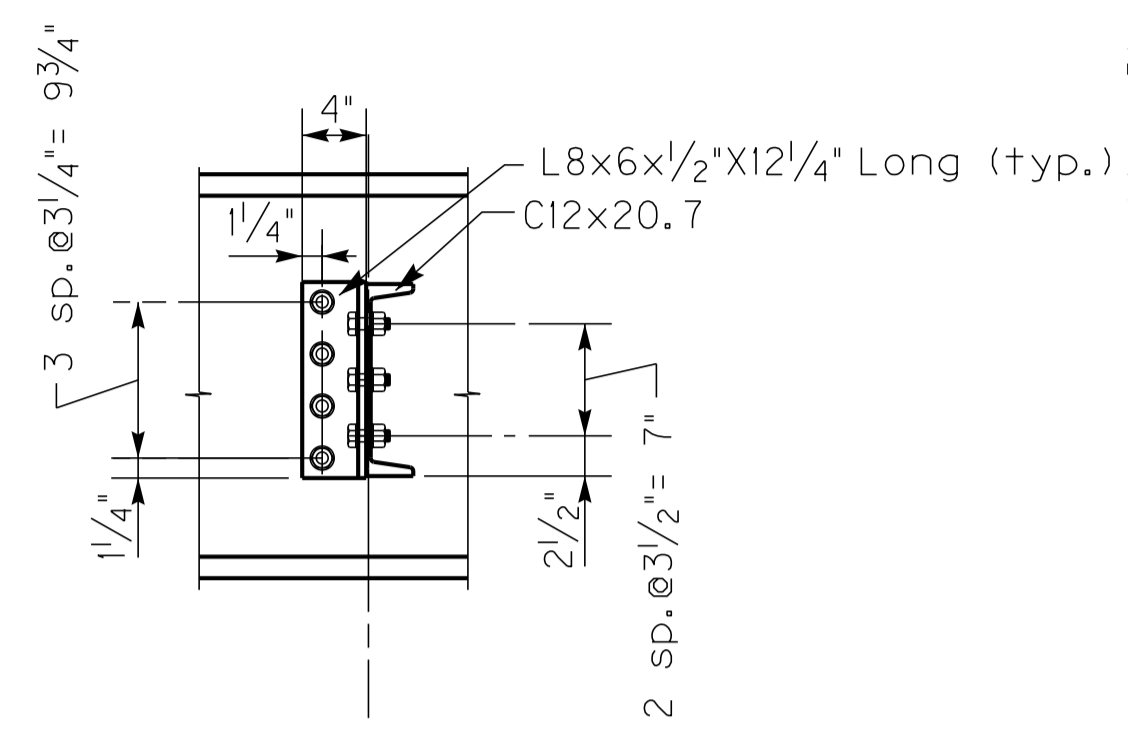


INTERMEDIATE DIAPHRAGM
 (for up to 20" beam depth)

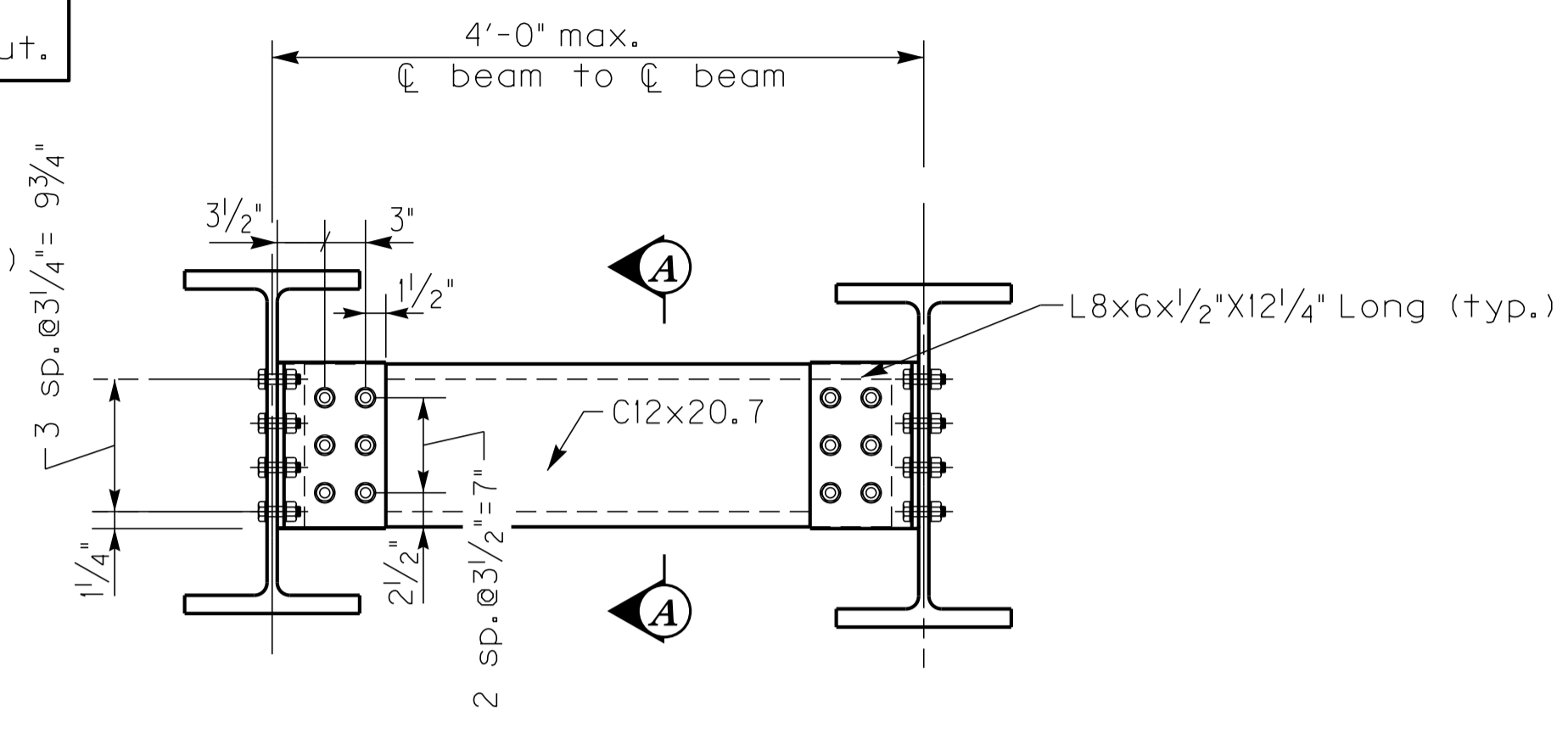
REVISION		DATE
DATE: May 2017	CHECKED BY: Joseph Van Zee	
DESIGNED BY: Carl Van Zee	DETAILED BY: Carl Van Zee	
Commonwealth of Kentucky DEPARTMENT OF HIGHWAYS		
COUNTY		
ROUTE	CROSSING	
Rolled Steel Diaphragm Details		
ITEM NUMBER	PREPARED BY: Division of Structural Design	SHEET NO. S4
		DRAWING NO.

MicroStation v8.11.7.180 E-SHEET NAME: 26817-S1 USER: Joseph.vanZee DATE PLOTTED: 02-MAY-2017 FILE NAME: J:\Standard Drawing Revision Work\2020 revised Std. Drawings\Standard Steel Spans\Std Steel Drawings.dgn

Note: Use $\frac{3}{4}$ " \emptyset Bolts with $\frac{13}{16}$ " \emptyset Holes Throughout.

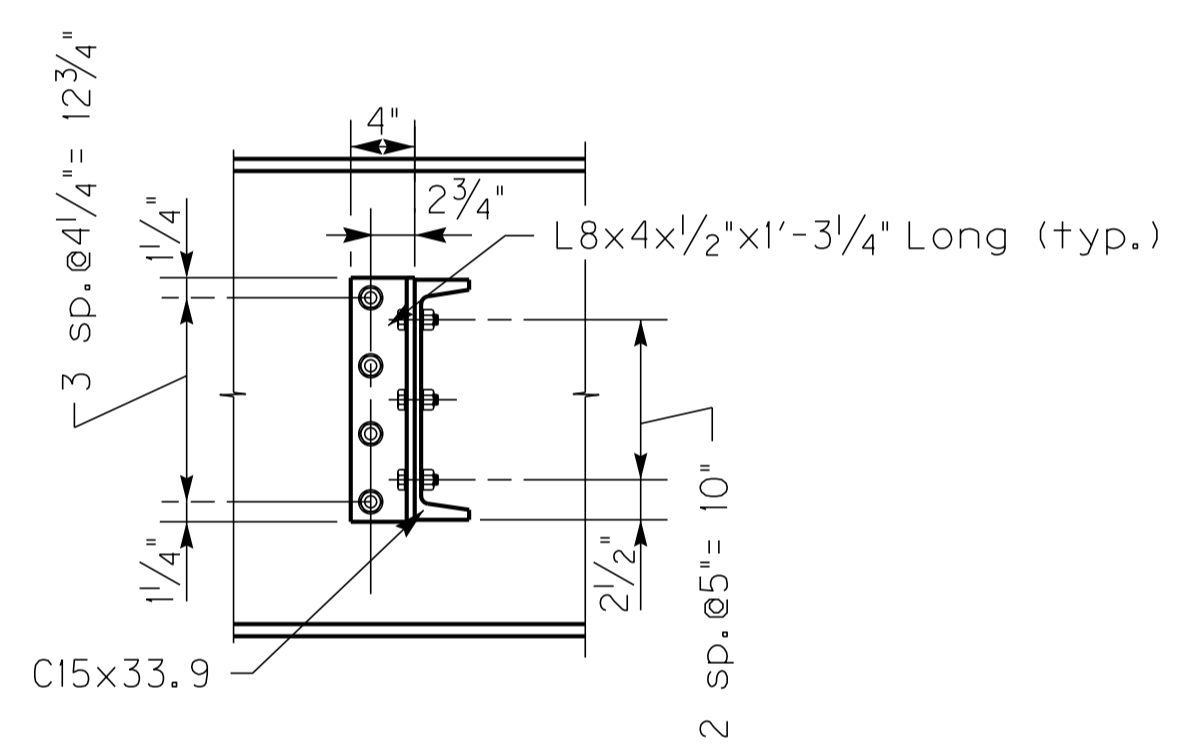


SECTION A-A

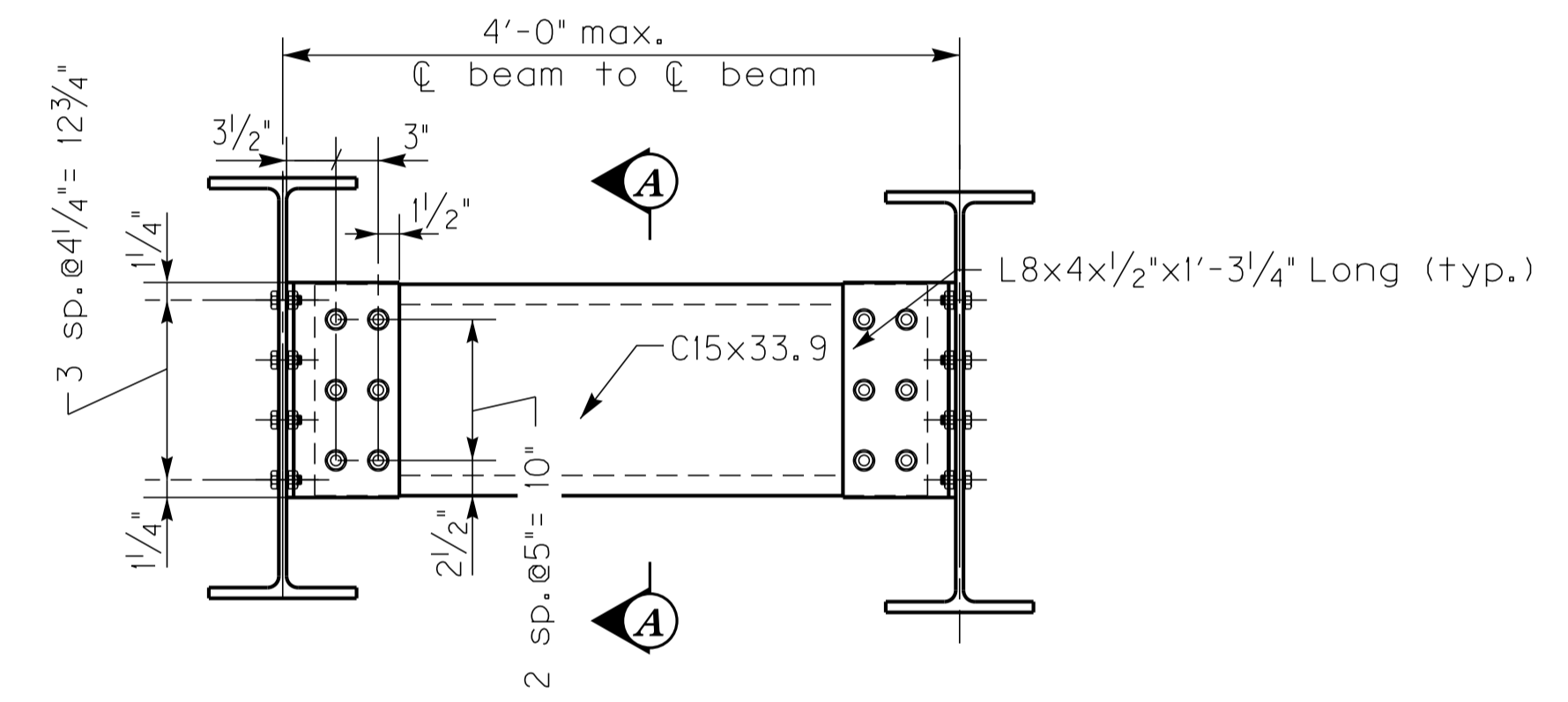


INTERMEDIATE DIAPHRAGM
(for up to 24" beam depth)

Note: Use $\frac{3}{4}$ " \emptyset Bolts with $\frac{13}{16}$ " \emptyset Holes Throughout.

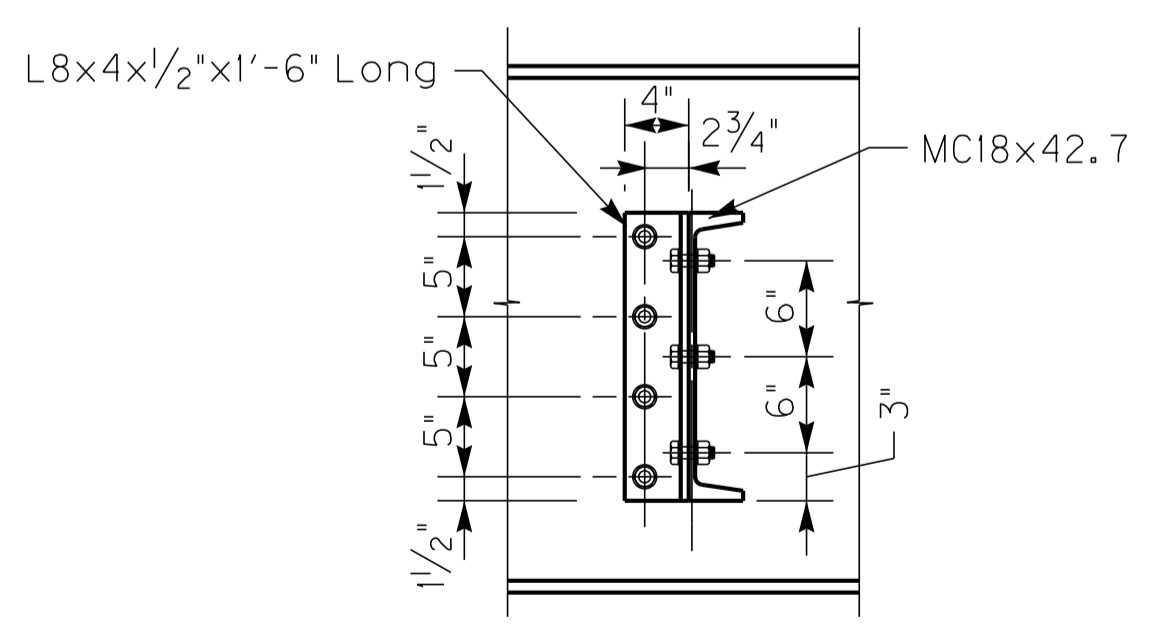


SECTION A-A

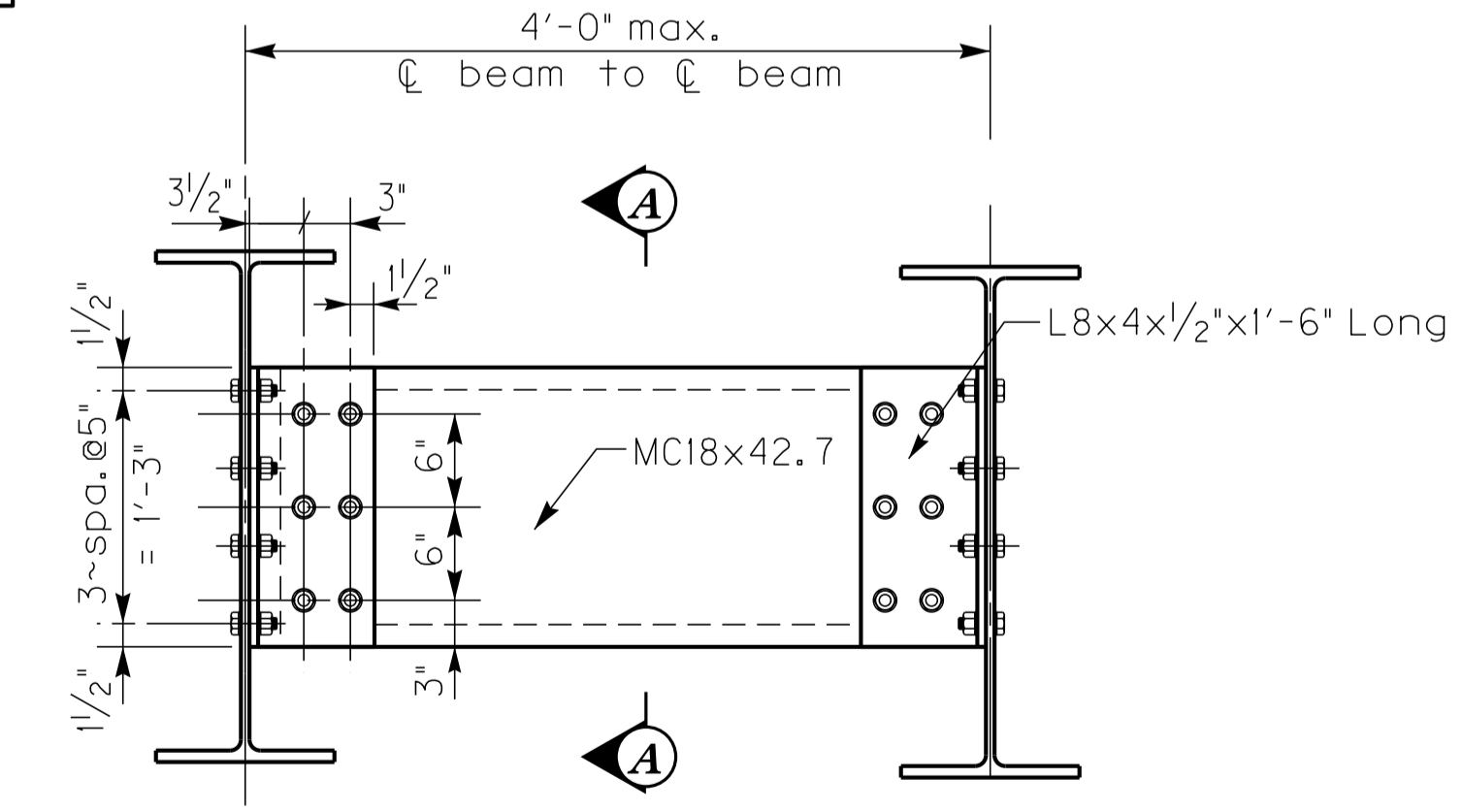


INTERMEDIATE DIAPHRAGM
(for up to 30" beam depth)

Note: Use $\frac{3}{4}$ " \emptyset Bolts with $\frac{13}{16}$ " \emptyset Holes Throughout.

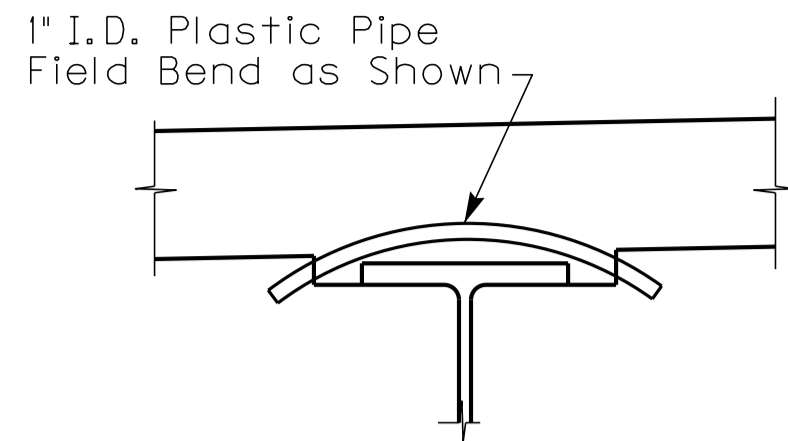


SECTION A-A



INTERMEDIATE DIAPHRAGM
(for up to 36" beam depth)

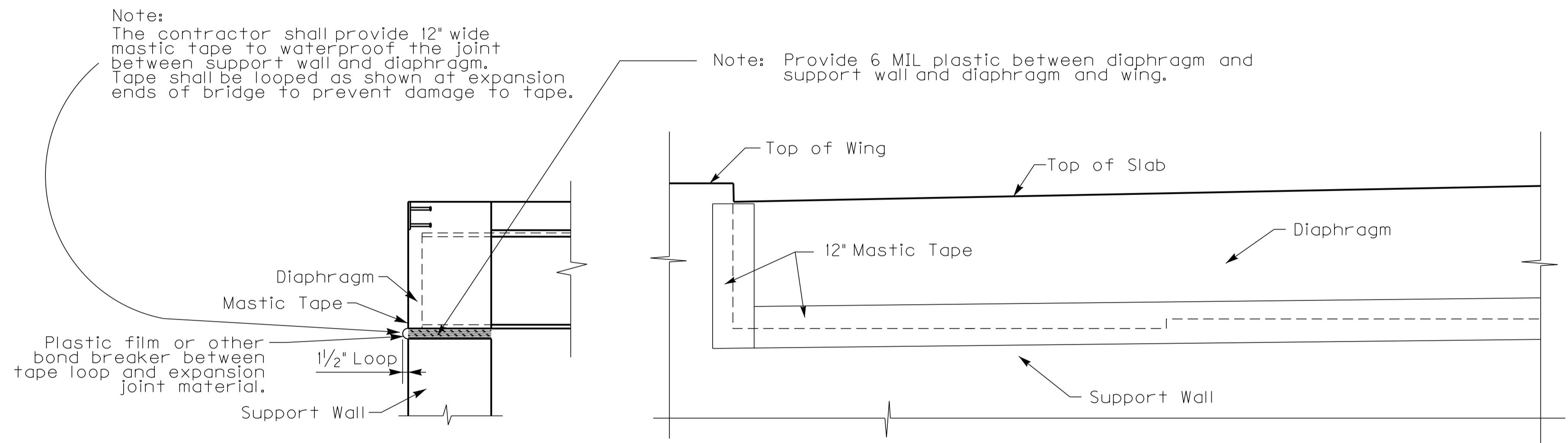
REVISION		DATE
DATE: May 2017	CHECKED BY	
DESIGNED BY: Carl Van Zee	Joseph Van Zee	
DETAILED BY: Carl Van Zee	Joseph Van Zee	
Commonwealth of Kentucky DEPARTMENT OF HIGHWAYS		
COUNTY		
ROUTE	CROSSING	
Rolled Steel Diaphragm Details		
ITEM NUMBER	PREPARED BY	SHEET NO.
	Division of	S5
	Structural Design	DRAWING NO.



1" I.D. Plastic Pipe
Field Bend as Shown

Note: When Slab is used and high water expected over bottom of beam elevation, place 1" plastic pipe above beams 4'-0" from each end. Work and material is incidental to superstructure concrete.

AIR VENT DETAIL



Note: The contractor shall provide 12" wide mastic tape to waterproof the joint between support wall and diaphragm. Tape shall be looped as shown at expansion ends of bridge to prevent damage to tape.

Note: Provide 6 MIL plastic between diaphragm and support wall and diaphragm and wing.

Plastic film or other bond breaker between tape loop and expansion joint material.

DIAPHRAGM X-SECTION

DIAPHRAGM ELEVATION

GENERAL NOTES

MASTIC TAPE: Mastic Tape used to seal joints is to meet the requirements of ASTM C-877 Type I, II, or III. The joint is to be covered with 12-inch wide mastic tape. Prior to application, the joint surface shall be clean and free of dirt, debris, or deleterious material. Primer, if required by the tape mfg., shall be applied for a minimum width of nine inches on each side of the joint.

Mastic Tape shall cover the joint continuously unless otherwise shown in the plans. Mastic Tape shall be spliced by lapping a minimum of six inches and in accordance with the mfgs. recommendations with the overlap running downhill.

Mastic Tape shall be either:

The cost of labor, materials, and incidental items for furnishing and installing Mastic Tape shall be considered incidental to the unit price bid for Concrete Class 'AA' and no separate measurement or payment shall be made.

- EZ-WRAP RUBBER by PRESS-SEAL GASKET CORPORATION,
- SEAL WRAP by MAR MAC MANUFACTURING CO. INC. ,
- CADILLOC by the UP RUBBER CO. INC.
- or approved equal.

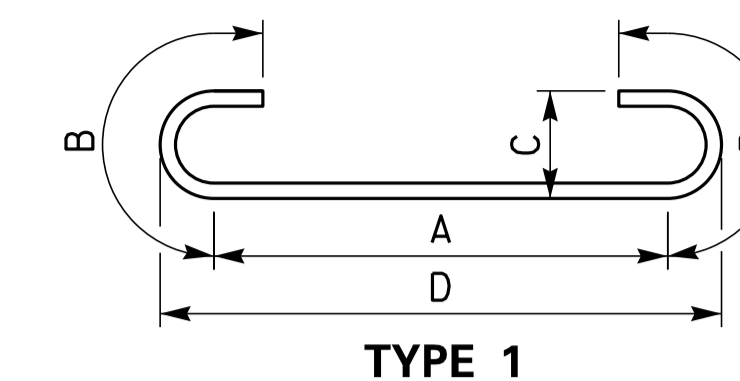
MASTIC TAPE APPLICATION

REVISION		DATE
DATE: May 2017	CHECKED BY	
DESIGNED BY: Carl Van Zee	Joseph Van Zee	
DETAILED BY: Carl Van Zee	Joseph Van Zee	
Commonwealth of Kentucky		
DEPARTMENT OF HIGHWAYS		
COUNTY		
ROUTE	CROSSING	
Air Vent and Mastic Tape Details		
ITEM NUMBER	PREPARED BY	SHEET NO.
	Division of	S6
	Structural Design	DRAWING NO.

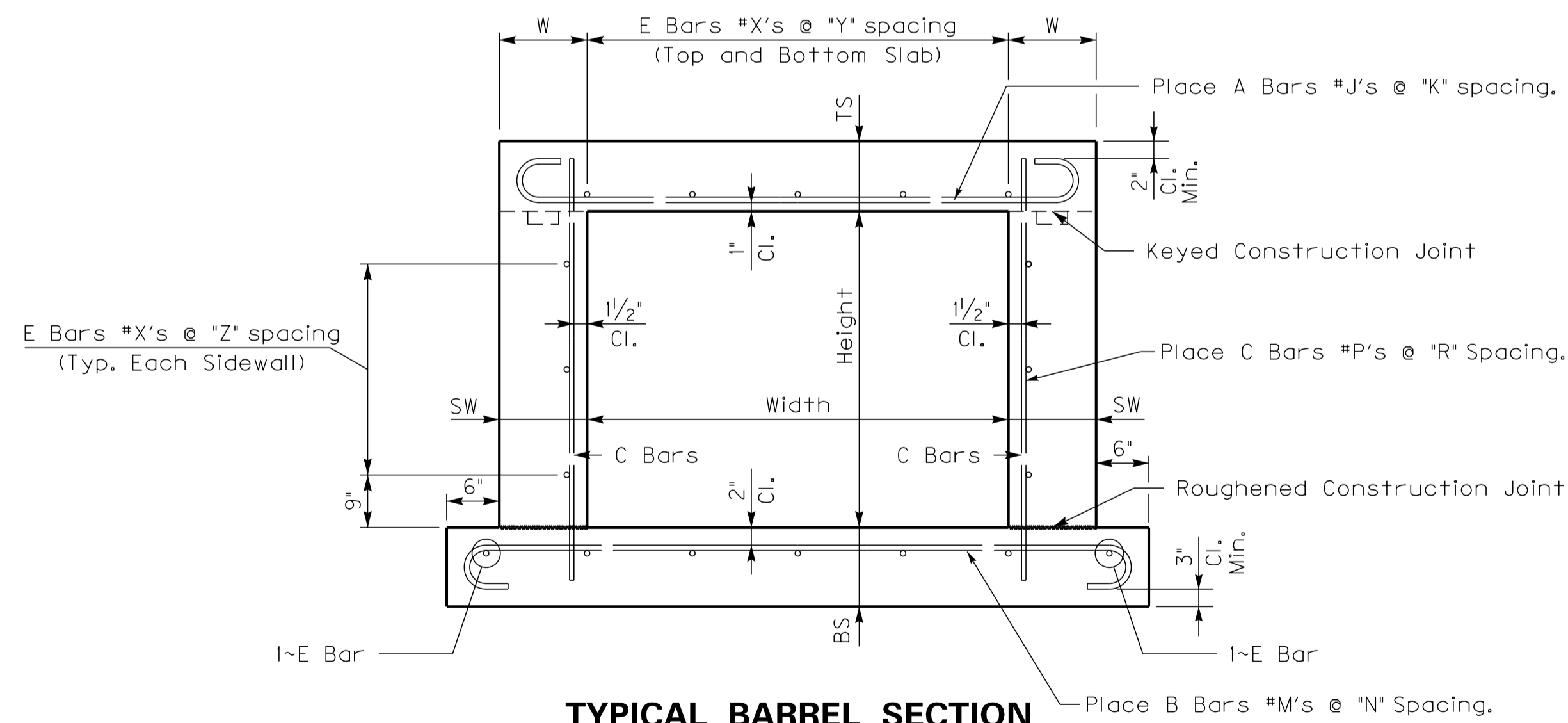
4'-0" Width x 4'-0" Height

Fill Height (Ft.)	Top Slab										Bottom Slab										Sidewall					Mark "E" Distribution				Quantities		
	TS	J	K	Mark	Type	Length	A	B	C	D	BS	M	N	Mark	Type	Length	A	B	C	D	SW	P	R	Mark	Type	Length	W	X	Y	Z	Concrete CY/LF	Steel LBS/LF
0-2	8"	5	6"	A	1	6-7	4-11	0-10	0-5	5-4	9"	5	6"	B	1	7-7	5-11	0-10	0-5	6-4	10"	5	12"	C	Str	5-0	10"	5	12"	12"	0.58	61
2.01-5	8"	5	7"	A	1	6-7	4-11	0-10	0-5	5-4	9"	5	7"	B	1	7-7	5-11	0-10	0-5	6-4	10"	5	12"	C	Str	5-0	10"	5	12"	12"	0.58	57
5-10	8"	5	9"	A	1	6-7	4-11	0-10	0-5	5-4	9"	5	9"	B	1	7-7	5-11	0-10	0-5	6-4	10"	5	12"	C	Str	5-0	10"	5	12"	12"	0.58	52
10-15	8"	5	7"	A	1	6-7	4-11	0-10	0-5	5-4	9"	5	7"	B	1	7-7	5-11	0-10	0-5	6-4	10"	5	12"	C	Str	5-0	10"	5	12"	12"	0.58	57
15-20	8"	5	6"	A	1	6-7	4-11	0-10	0-5	5-4	9"	5	6"	B	1	7-7	5-11	0-10	0-5	6-4	10"	5	12"	C	Str	5-0	10"	5	12"	12"	0.58	61
20-25	8"	5	5"	A	1	6-7	4-11	0-10	0-5	5-4	9"	5	5"	B	1	7-7	5-11	0-10	0-5	6-4	10"	5	12"	C	Str	5-0	10"	5	12"	12"	0.58	67
25-30	9"	5	5"	A	1	6-7	4-11	0-10	0-5	5-4	10"	5	5"	B	1	7-7	5-11	0-10	0-5	6-4	10"	5	12"	C	Str	5-2	10"	5	12"	12"	0.62	68
30-35	9"	6	5"	A	1	6-10	4-10	1-0	0-6	5-4	10"	6	5"	B	1	7-10	5-10	1-0	0-6	6-4	10"	5	12"	C	Str	5-2	10"	5	12"	12"	0.62	85
35-40	10"	6	5"	A	1	6-10	4-10	1-0	0-6	5-4	11"	6	5"	B	1	7-10	5-10	1-0	0-6	6-4	10"	5	12"	C	Str	5-4	10"	5	12"	12"	0.65	85

NOTE:
A & B bars may need to be rotated to maintain shown clearances.



NOTE:
Bar Dimensions are per bar.



TYPICAL BARREL SECTION

DATE 11/2017
 DRAWN E. Downey
 CHECKED J. Van Zee
 RECOMMENDED _____
 APPROVED F.H.W.A. _____
 REVISED BY _____

KENTUCKY DEPARTMENT OF HIGHWAYS	
STANDARD CULVERT 4'-0" WIDTH	
STANDARD DRAWING NO. B...-001-01	
SUBMITTED _____ DIRECTOR DIVISION OF STRUCTURAL DESIGN	11-01-17 DATE
APPROVED _____ STATE HIGHWAY ENGINEER	11-01-17 DATE

6'-0" Width x 4'-0" Height

Fill Height (Ft.)	Top Slab										Bottom Slab								Sidewall					Mark "E" Distribution				Quantities				
	TS	J	K	Mark	Type	Length	A	B	C	D	BS	M	N	Mark	Type	Length	A	B	C	D	SW	P	R	Mark	Type	Length	W	X	Y	Z	Concrete CY/LF	Steel LBS/LF
0-2	9"	5	5"	A	1	8-7	6-11	0-10	0-5	7-4	10"	5	5"	B	1	9-7	7-11	0-10	0-5	8-4	10"	5	12"	C	Str	5-2	10"	5	12"	12"	0.73	82
2.01-5	9"	5	5"	A	1	8-7	6-11	0-10	0-5	7-4	10"	5	5"	B	1	9-7	7-11	0-10	0-5	8-4	10"	5	12"	C	Str	5-2	10"	5	12"	12"	0.73	82
5-10	8"	5	6"	A	1	8-7	6-11	0-10	0-5	7-4	9"	5	6"	B	1	9-7	7-11	0-10	0-5	8-4	10"	5	12"	C	Str	5-0	10"	5	12"	12"	0.68	74
10-15	9"	5	5"	A	1	8-7	6-11	0-10	0-5	7-4	10"	5	5"	B	1	9-7	7-11	0-10	0-5	8-4	10"	5	12"	C	Str	5-2	10"	5	12"	12"	0.73	82
15-20	9"	6	5"	A	1	8-10	6-10	1-0	0-6	7-4	10"	6	5"	B	1	9-10	7-10	1-0	0-6	8-4	10"	5	12"	C	Str	5-2	10"	5	12"	12"	0.73	104
20-25	10"	6	5"	A	1	8-10	6-10	1-0	0-6	7-4	11"	6	5"	B	1	9-10	7-10	1-0	0-6	8-4	10"	5	12"	C	Str	5-4	10"	5	12"	12"	0.78	104
25-30	11"	7	6"	A	1	9-1	6-9	1-2	0-7	7-4	12"	7	6"	B	1	10-1	7-9	1-2	0-7	8-4	10"	5	12"	C	Str	5-6	10"	5	12"	12"	0.83	115
30-35	12"	8	6"	A	1	9-2	6-8	1-3	0-8	7-4	13"	8	6"	B	1	10-2	7-8	1-3	0-8	8-4	10"	5	12"	C	Str	5-8	10"	5	12"	12"	0.88	141
35-40	13"	8	5"	A	1	9-2	6-8	1-3	0-8	7-4	14"	8	5"	B	1	10-2	7-8	1-3	0-8	8-4	10"	5	12"	C	Str	5-10	10"	5	12"	12"	0.93	162

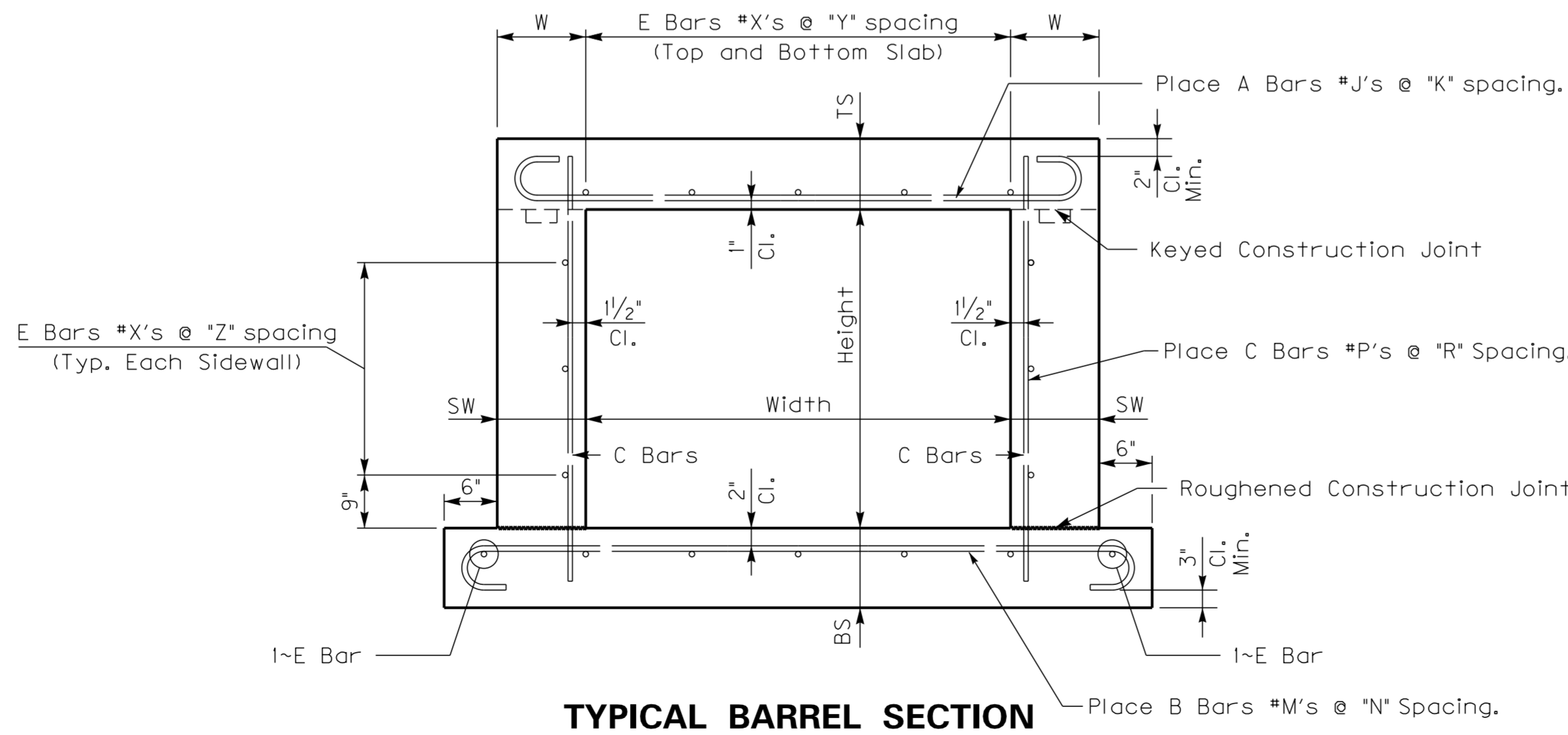
6'-0" Width x 6'-0" Height

Fill Height (Ft.)	Top Slab										Bottom Slab								Sidewall					Mark "E" Distribution				Quantities				
	TS	J	K	Mark	Type	Length	A	B	C	D	BS	M	N	Mark	Type	Length	A	B	C	D	SW	P	R	Mark	Type	Length	W	X	Y	Z	Concrete CY/LF	Steel LBS/LF
0-2	9"	5	5"	A	1	8-7	6-11	0-10	0-5	7-4	10"	5	5"	B	1	9-7	7-11	0-10	0-5	8-4	10"	5	12"	C	Str	7-2	10"	5	12"	12"	0.86	90
2.01-5	9"	5	5"	A	1	8-7	6-11	0-10	0-5	7-4	10"	5	5"	B	1	9-7	7-11	0-10	0-5	8-4	10"	5	12"	C	Str	7-2	10"	5	12"	12"	0.86	90
5-10	8"	5	6"	A	1	8-7	6-11	0-10	0-5	7-4	9"	5	6"	B	1	9-7	7-11	0-10	0-5	8-4	10"	5	12"	C	Str	7-0	10"	5	12"	12"	0.81	82
10-15	9"	5	5"	A	1	8-7	6-11	0-10	0-5	7-4	10"	5	5"	B	1	9-7	7-11	0-10	0-5	8-4	10"	5	12"	C	Str	7-2	10"	5	12"	12"	0.86	90
15-20	9"	6	5"	A	1	8-10	6-10	1-0	0-6	7-4	10"	6	5"	B	1	9-10	7-10	1-0	0-6	8-4	10"	5	11"	C	Str	7-2	10"	5	12"	12"	0.86	113
20-25	10"	6	5"	A	1	8-10	6-10	1-0	0-6	7-4	11"	6	5"	B	1	9-10	7-10	1-0	0-6	8-4	10"	5	10"	C	Str	7-4	10"	5	12"	12"	0.91	115
25-30	11"	7	5"	A	1	9-1	6-9	1-2	0-7	7-4	12"	7	5"	B	1	10-1	7-9	1-2	0-7	8-4	10"	5	9"	C	Str	7-6	10"	5	12"	12"	0.96	145
30-35	12"	8	5"	A	1	9-2	6-8	1-3	0-8	7-4	13"	8	5"	B	1	10-2	7-8	1-3	0-8	8-4	10"	5	8"	C	Str	7-8	10"	5	12"	12"	1.01	178
35-40	14"	7	5"	A	1	9-1	6-9	1-2	0-7	7-4	15"	7	5"	B	1	10-1	7-9	1-2	0-7	8-4	10"	5	7"	C	Str	8-0	10"	5	12"	12"	1.11	152

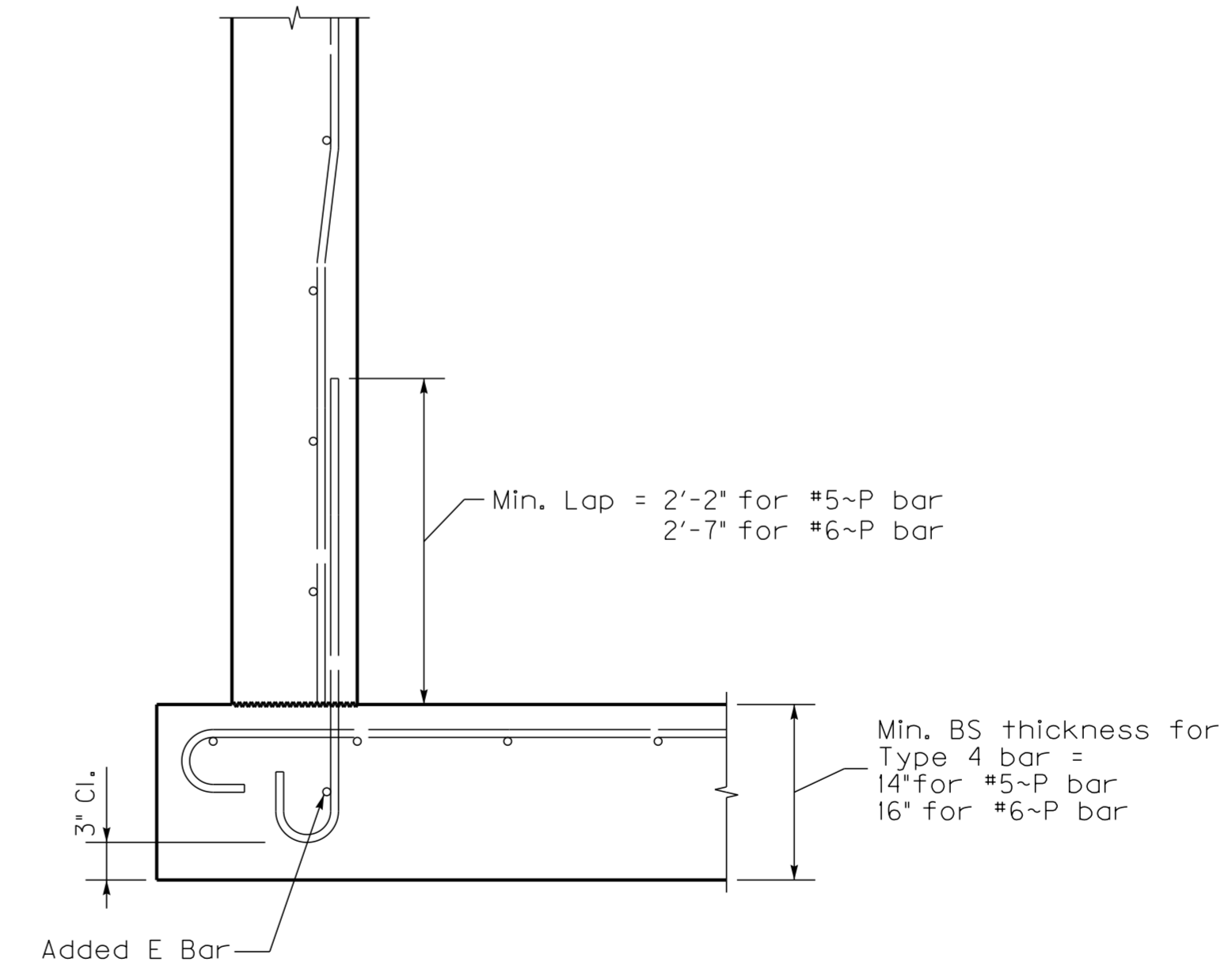
6'-0" Width x 8'-0" Height

Fill Height (Ft.)	Top Slab										Bottom Slab								Sidewall					Mark "E" Distribution				Quantities				
	TS	J	K	Mark	Type	Length	A	B	C	D	BS	M	N	Mark	Type	Length	A	B	C	D	SW	P	R	Mark	Type	Length	W	X	Y	Z	Concrete CY/LF	Steel LBS/LF
0-2	9"	5	5"	A	1	8-7	6-11	0-10	0-5	7-4	10"	5	5"	B	1	9-7	7-11	0-10	0-5	8-4	10"	5	12"	C	Str	9-2	10"	5	12"	12"	0.98	99
2.01-5	9"	5	5"	A	1	8-7	6-11	0-10	0-5	7-4	10"	5	5"	B	1	9-7	7-11	0-10	0-5	8-4	10"	5	12"	C	Str	9-2	10"	5	12"	12"	0.98	99
5-10	8"	5	5"	A	1	8-7	6-11	0-10	0-5	7-4	9"	5	5"	B	1	9-7	7-11	0-10	0-5	8-4	10"	5	10"	C	Str	9-0	10"	5	12"	12"	0.93	102
10-15	9"	5	5"	A	1	8-7	6-11	0-10	0-5	7-4	10"	5	5"	B	1	9-7	7-11	0-10	0-5	8-4	10"	5	9"	C	Str	9-2	10"	5	12"	12"	0.98	105
15-20	9"	6	5"	A	1	8-10	6-10	1-0	0-6	7-4	10"	6	5"	B	1	9-10	7-10	1-0	0-6	8-4	10"	5	8"	C	Str	9-2	10"	5	12"	12"	0.98	130
20-25	10"	6	5"	A	1	8-10	6-10	1-0	0-6	7-4	11"	6	5"	B	1	9-10	7-10	1-0	0-6	8-4	10"	5	7"	C	Str	9-4	10"	5	12"	12"	1.03	135
25-30	11"	8	6"	A	1	9-2	6-8	1-3	0-8	7-4	12"	8	6"	B	1	10-2	7-8	1-3	0-8	8-4	10"	5	6"	C	Str	9-6	10"	5	12"	12"	1.08	177
30-35	12"	8	5"	A	1	9-2	6-8	1-3	0-8	7-4	13"	8	5"	B	1	10-2	7-8	1-3	0-8	8-4	10"	5	5"	C	Str	9-8	10"	5	12"	12"	1.13	206
35-40	14"	8	5"	A	1	9-2	6-8	1-3	0-8	7-4	15"	8	5"	B	1	10-2	7-8	1-3	0-8	8-4	10"	6	6"	C	Str	10-0	10"	5	12"	12"	1.23	218

NOTE:
Bar Dimensions are per bar.



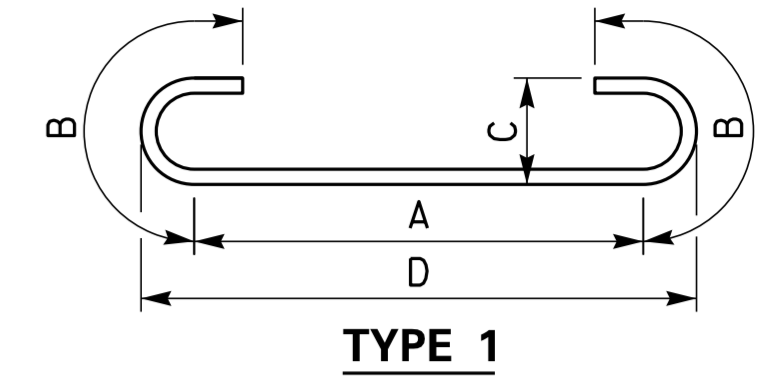
TYPICAL BARREL SECTION



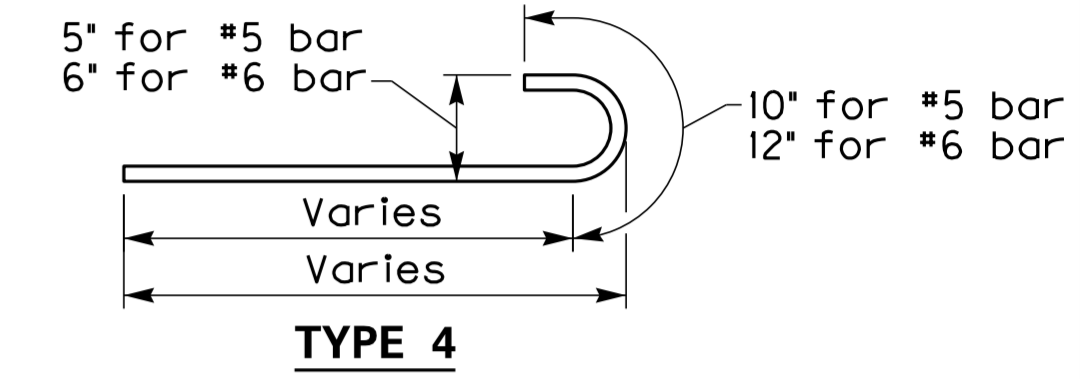
OPTIONAL HOOK DETAIL

NOTE:
The contractor will not be paid additionally if optional hook detail is used.

NOTE:
A & B bars may need to be rotated to maintain shown clearances.



TYPE 1



TYPE 4

DATE 11/2017
DRAWN E. Downey
CHECKED J. Van Zee
RECOMMENDED
APPROVED F.H.W.A.
REVISED BY

KENTUCKY
DEPARTMENT OF HIGHWAYS

**STANDARD CULVERT
6'-0" WIDTH**

STANDARD DRAWING NO. B--002-01

SUBMITTED 11-01-17
DIRECTOR DIVISION OF STRUCTURAL DESIGN DATE
APPROVED 11-01-17
STATE HIGHWAY ENGINEER DATE

8'-0" Width x 4'-0" Height

Fill Height (Ft.)	Top Slab										Bottom Slab										Sidewall					Mark "E" Distribution				Quantities		
	TS	J	K	Mark	Type	Length	A	B	C	D	BS	M	N	Mark	Type	Length	A	B	C	D	SW	P	R	Mark	Type	Length	W	X	Y	Z	Concrete CY/LF	Steel LBS/LF
0-2	10"	6	6"	A	1	10-10	8-10	1-0	0-6	9-4	11"	6	6"	B	1	11-10	9-10	1-0	0-6	10-4	10"	5	12"	C	Str	5-4	10"	5	12"	12"	0.91	109
2.01-5	10"	6	5"	A	1	10-10	8-10	1-0	0-6	9-4	11"	6	5"	B	1	11-10	9-10	1-0	0-6	10-4	10"	5	12"	C	Str	5-4	10"	5	12"	12"	0.91	123
5-10	10"	5	5"	A	1	10-7	8-11	0-10	0-5	9-4	11"	5	5"	B	1	11-7	9-11	0-10	0-5	10-4	10"	5	12"	C	Str	5-4	10"	5	12"	12"	0.91	96
10-15	10"	6	5"	A	1	10-10	8-10	1-0	0-6	9-4	11"	6	5"	B	1	11-10	9-10	1-0	0-6	10-4	10"	5	12"	C	Str	5-4	10"	5	12"	12"	0.91	123
15-20	10"	7	5"	A	1	11-1	8-9	1-2	0-7	9-4	11"	7	5"	B	1	12-1	9-9	1-2	0-7	10-4	10"	5	12"	C	Str	5-4	10"	5	12"	12"	0.91	155
20-25	12"	7	5"	A	1	11-1	8-9	1-2	0-7	9-4	13"	7	5"	B	1	12-1	9-9	1-2	0-7	10-4	10"	5	12"	C	Str	5-8	10"	5	12"	12"	1.04	155
25-30	13"	8	5"	A	1	11-2	8-8	1-3	0-8	9-4	14"	8	5"	B	1	12-2	9-8	1-3	0-8	10-4	10"	5	12"	C	Str	5-10	10"	5	12"	12"	1.10	192
30-35	15"	8	5"	A	1	11-2	8-8	1-3	0-8	9-4	16"	8	5"	B	1	12-2	9-8	1-3	0-8	10-4	10"	5	12"	C	Str	6-2	10"	5	12"	12"	1.23	192
35-40	16"	9	5"	A	1	12-2	8-4 1/4	1-11	0-11 3/4	9-4	17"	9	5"	B	1	13-2	9-4 1/4	1-11	0-11 3/4	10-4	10"	5	11"	C	Str	6-4	10"	5	12"	12"	1.29	251

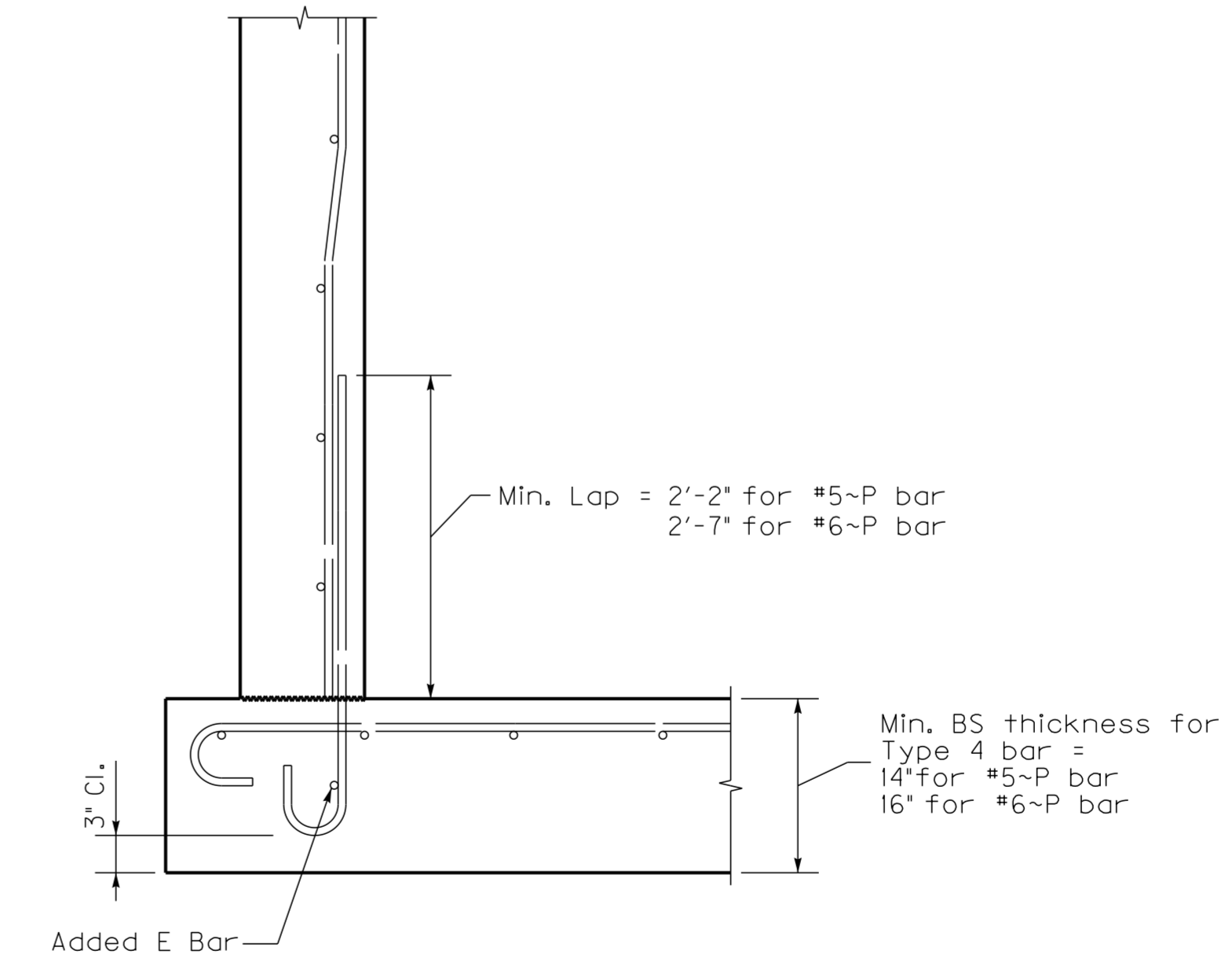
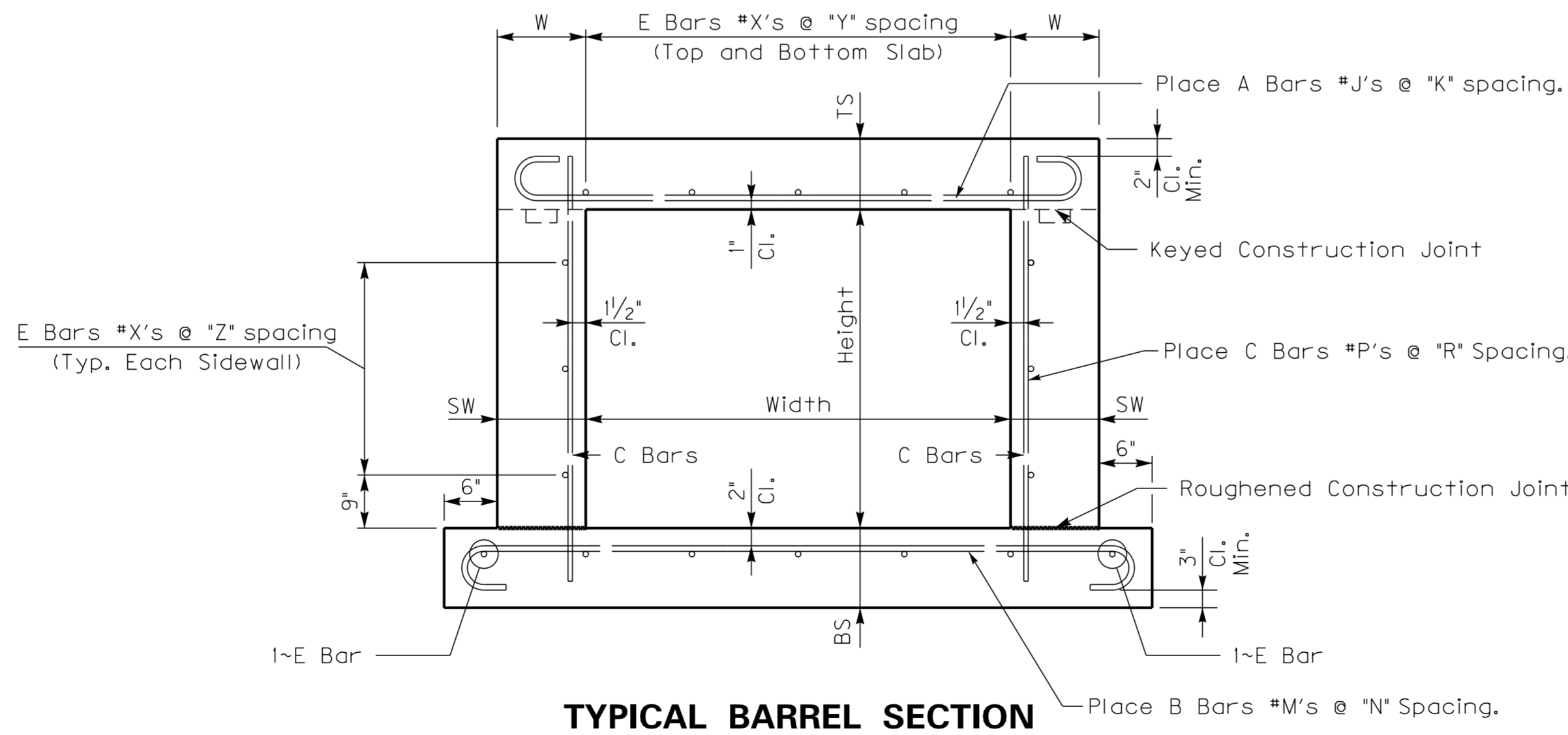
8'-0" Width x 6'-0" Height

Fill Height (Ft.)	Top Slab										Bottom Slab										Sidewall					Mark "E" Distribution				Quantities		
	TS	J	K	Mark	Type	Length	A	B	C	D	BS	M	N	Mark	Type	Length	A	B	C	D	SW	P	R	Mark	Type	Length	W	X	Y	Z	Concrete CY/LF	Steel LBS/LF
0-2	10"	6	6"	A	1	10-10	8-10	1-0	0-6	9-4	11"	6	6"	B	1	11-10	9-10	1-0	0-6	10-4	10"	5	12"	C	Str	7-4	10"	5	12"	12"	1.04	117
2.01-5	10"	6	5"	A	1	10-10	8-10	1-0	0-6	9-4	11"	6	5"	B	1	11-10	9-10	1-0	0-6	10-4	10"	5	12"	C	Str	7-4	10"	5	12"	12"	1.04	131
5-10	10"	5	5"	A	1	10-7	8-11	0-10	0-5	9-4	11"	5	5"	B	1	11-7	9-11	0-10	0-5	10-4	10"	5	12"	C	Str	7-4	10"	5	12"	12"	1.04	105
10-15	10"	6	5"	A	1	10-10	8-10	1-0	0-6	9-4	11"	6	5"	B	1	11-10	9-10	1-0	0-6	10-4	10"	5	12"	C	Str	7-4	10"	5	12"	12"	1.04	131
15-20	10"	7	5"	A	1	11-1	8-9	1-2	0-7	9-4	11"	7	5"	B	1	12-1	9-9	1-2	0-7	10-4	10"	5	11"	C	Str	7-4	10"	5	12"	12"	1.04	164
20-25	12"	7	5"	A	1	11-1	8-9	1-2	0-7	9-4	13"	7	5"	B	1	12-1	9-9	1-2	0-7	10-4	10"	5	9"	C	Str	7-8	10"	5	12"	12"	1.16	169
25-30	14"	8	6"	A	1	11-2	8-8	1-3	0-8	9-4	15"	8	6"	B	1	12-2	9-8	1-3	0-8	10-4	10"	5	8"	C	Str	8-0	10"	5	12"	12"	1.29	184
30-35	15"	9	5"	A	1	12-2	8-4 1/4	1-11	0-11 3/4	9-4	16"	9	5"	B	1	13-2	9-4 1/4	1-11	0-11 3/4	10-4	10"	5	8"	C	Str	8-2	10"	5	12"	12"	1.35	266
35-40	17"	10	7"	A	1	12-7	8-2 3/4	2-2	1-1 1/4	9-4	18"	10	7"	B	1	13-7	9-2 3/4	2-2	1-1 1/4	10-4	10"	5	7"	C	Str	8-6	10"	5	12"	12"	1.48	258

8'-0" Width x 8'-0" Height

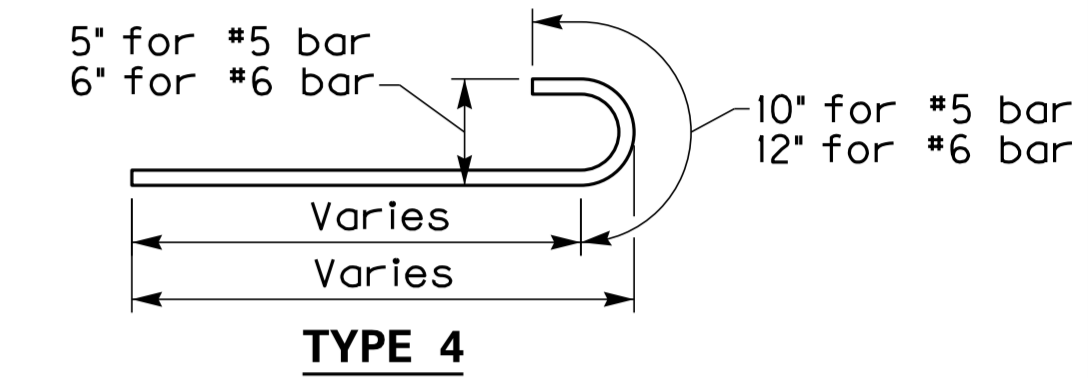
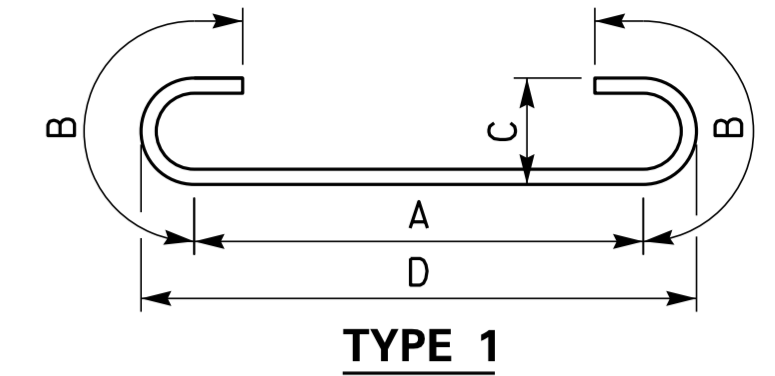
Fill Height (Ft.)	Top Slab										Bottom Slab										Sidewall					Mark "E" Distribution				Quantities		
	TS	J	K	Mark	Type	Length	A	B	C	D	BS	M	N	Mark	Type	Length	A	B	C	D	SW	P	R	Mark	Type	Length	W	X	Y	Z	Concrete CY/LF	Steel LBS/LF
0-2	10"	6	6"	A	1	10-10	8-10	1-0	0-6	9-4	11"	6	6"	B	1	11-10	9-10	1-0	0-6	10-4	10"	5	12"	C	Str	9-4	10"	5	12"	12"	1.16	126
2.01-5	10"	6	5"	A	1	10-10	8-10	1-0	0-6	9-4	11"	6	5"	B	1	11-10	9-10	1-0	0-6	10-4	10"	5	12"	C	Str	9-4	10"	5	12"	12"	1.16	139
5-10	10"	5	5"	A	1	10-7	8-11	0-10	0-5	9-4	11"	5	5"	B	1	11-7	9-11	0-10	0-5	10-4	10"	5	10"	C	Str	9-4	10"	5	12"	12"	1.16	117
10-15	10"	6	5"	A	1	10-10	8-10	1-0	0-6	9-4	11"	6	5"	B	1	11-10	9-10	1-0	0-6	10-4	10"	5	9"	C	Str	9-4	10"	5	12"	12"	1.16	146
15-20	11"	7	5"	A	1	11-1	8-9	1-2	0-7	9-4	12"	7	5"	B	1	12-1	9-9	1-2	0-7	10-4	10"	5	7"	C	Str	9-6	10"	5	12"	12"	1.22	186
20-25	12"	8	5"	A	1	11-2	8-8	1-3	0-8	9-4	13"	8	5"	B	1	12-2	9-8	1-3	0-8	10-4	10"	5	7"	C	Str	9-8	10"	5	12"	12"	1.28	222
25-30	14"	8	5"	A	1	11-2	8-8	1-3	0-8	9-4	15"	8	5"	B	1	12-2	9-8	1-3	0-8	10-4	10"	5	5"	C	Str	10-0	10"	5	12"	12"	1.41	238
30-35	15"	9	5"	A	1	12-2	8-4 1/4	1-11	0-11 3/4	9-4	16"	9	5"	B	1	13-2	9-4 1/4	1-11	0-11 3/4	10-4	10"	6	6"	C	Str	10-2	10"	5	12"	12"	1.47	306
35-40	17"	9	5"	A	1	12-2	8-4 1/4	1-11	0-11 3/4	9-4	18"	9	5"	B	1	13-2	9-4 1/4	1-11	0-11 3/4	10-4	10"	6	5"	C	Str	10-6	10"	5	12"	12"	1.60	321

NOTE:
Bar Dimensions are per bar.



NOTE:
The contractor will not be paid additionally if optional hook detail is used.

NOTE:
A & B bars may need to be rotated to maintain shown clearances.



DATE 11/2017
DRAWN E. Downey
CHECKED J. Van Zee
RECOMMENDED
APPROVED F.H.W.A.
REVISED BY

KENTUCKY
DEPARTMENT OF HIGHWAYS

**STANDARD CULVERT
8'-0" WIDTH**

STANDARD DRAWING NO. B--003-01

SUBMITTED 11-01-17
DIRECTOR DIVISION OF STRUCTURAL DESIGN DATE

APPROVED 11-01-17
STATE HIGHWAY ENGINEER DATE

10'-0" Width x 4'-0" Height

Fill Height (Ft.)	Top Slab										Bottom Slab										Sidewall					Mark "E" Distribution				Quantities		
	TS	J	K	Mark	Type	Length	A	B	C	D	BS	M	N	Mark	Type	Length	A	B	C	D	SW	P	R	Mark	Type	Length	W	X	Y	Z	Concrete CY/LF	Steel LBS/LF
0-2	10"	7	6"	A	1	13-1	10-9	1-2	0-7	11-4	11"	7	6"	B	1	14-1	11-9	1-2	0-7	12-4	10"	5	12"	C	Str	5-4	10"	5	10"	12"	1.04	160
2.01-5	10"	7	5"	A	1	13-1	10-9	1-2	0-7	11-4	11"	7	5"	B	1	14-1	11-9	1-2	0-7	12-4	10"	5	12"	C	Str	5-4	10"	5	12"	12"	1.04	178
5-10	10"	7	5"	A	1	13-1	10-9	1-2	0-7	11-4	11"	7	5"	B	1	14-1	11-9	1-2	0-7	12-4	10"	5	12"	C	Str	5-4	10"	5	12"	12"	1.04	178
10-15	10"	7	5"	A	1	13-1	10-9	1-2	0-7	11-4	11"	7	5"	B	1	14-1	11-9	1-2	0-7	12-4	10"	5	12"	C	Str	5-4	10"	5	12"	12"	1.04	178
15-20	12"	7	5"	A	1	13-1	10-9	1-2	0-7	11-4	13"	7	5"	B	1	14-1	11-9	1-2	0-7	12-4	10"	5	12"	C	Str	5-8	10"	5	12"	12"	1.19	179
20-25	14"	8	5"	A	1	13-2	10-8	1-3	0-8	11-4	15"	8	5"	B	1	14-2	11-8	1-3	0-8	12-4	10"	5	12"	C	Str	6-0	10"	5	12"	12"	1.34	222
25-30	16"	9	6"	A	1	14-2	10-4 1/4	1-11	0-11 3/4	11-4	17"	9	6"	B	1	15-2	11-4 1/4	1-11	0-11 3/4	12-4	10"	5	12"	C	Str	6-4	10"	5	12"	12"	1.49	247
30-35	17"	10	5"	A	1	14-7	10-2 3/4	2-2	1-1 1/4	11-4	18"	10	5"	B	1	15-7	11-2 3/4	2-2	1-1 1/4	12-4	10"	5	12"	C	Str	6-6	10"	5	12"	12"	1.57	360
35-40	18"	11	5"	A	1	15-3	10-5 1/4	2-5	1-2 3/4	11-8	19"	11	5"	B	1	16-3	11-5 1/4	2-5	1-2 3/4	12-8	12"	5	12"	C	Str	6-8	12"	5	12"	12"	1.73	449

10'-0" Width x 6'-0" Height

Fill Height (Ft.)	Top Slab										Bottom Slab										Sidewall					Mark "E" Distribution				Quantities		
	TS	J	K	Mark	Type	Length	A	B	C	D	BS	M	N	Mark	Type	Length	A	B	C	D	SW	P	R	Mark	Type	Length	W	X	Y	Z	Concrete CY/LF	Steel LBS/LF
0-2	10"	7	6"	A	1	13-1	10-9	1-2	0-7	11-4	11"	7	6"	B	1	14-1	11-9	1-2	0-7	12-4	10"	5	12"	C	Str	7-4	10"	5	10"	12"	1.17	169
2.01-5	10"	7	5"	A	1	13-1	10-9	1-2	0-7	11-4	11"	7	5"	B	1	14-1	11-9	1-2	0-7	12-4	10"	5	12"	C	Str	7-4	10"	5	12"	12"	1.17	187
5-10	10"	7	5"	A	1	13-1	10-9	1-2	0-7	11-4	11"	7	5"	B	1	14-1	11-9	1-2	0-7	12-4	10"	5	12"	C	Str	7-4	10"	5	12"	12"	1.17	187
10-15	10"	7	5"	A	1	13-1	10-9	1-2	0-7	11-4	11"	7	5"	B	1	14-1	11-9	1-2	0-7	12-4	10"	5	12"	C	Str	7-4	10"	5	12"	12"	1.17	187
15-20	12"	8	5"	A	1	13-2	10-8	1-3	0-8	11-4	13"	8	5"	B	1	14-2	11-8	1-3	0-8	12-4	10"	5	11"	C	Str	7-8	10"	5	12"	12"	1.32	231
20-25	14"	8	5"	A	1	13-2	10-8	1-3	0-8	11-4	15"	8	5"	B	1	14-2	11-8	1-3	0-8	12-4	10"	5	9"	C	Str	8-0	10"	5	12"	12"	1.47	236
25-30	16"	9	5"	A	1	14-2	10-4 1/4	1-11	0-11 3/4	11-4	17"	9	5"	B	1	15-2	11-4 1/4	1-11	0-11 3/4	12-4	10"	5	8"	C	Str	8-4	10"	5	12"	12"	1.62	304
30-35	17"	10	5"	A	1	14-7	10-2 3/4	2-2	1-1 1/4	11-4	18"	10	5"	B	1	15-7	11-2 3/4	2-2	1-1 1/4	12-4	10"	5	7"	C	Str	8-6	10"	5	12"	12"	1.69	381
35-40	19"	11	5"	A	1	15-3	10-5 1/4	2-5	1-2 3/4	11-8	20"	11	5"	B	1	16-3	11-5 1/4	2-5	1-2 3/4	12-8	12"	5	8"	C	Str	8-10	12"	5	12"	12"	1.96	467

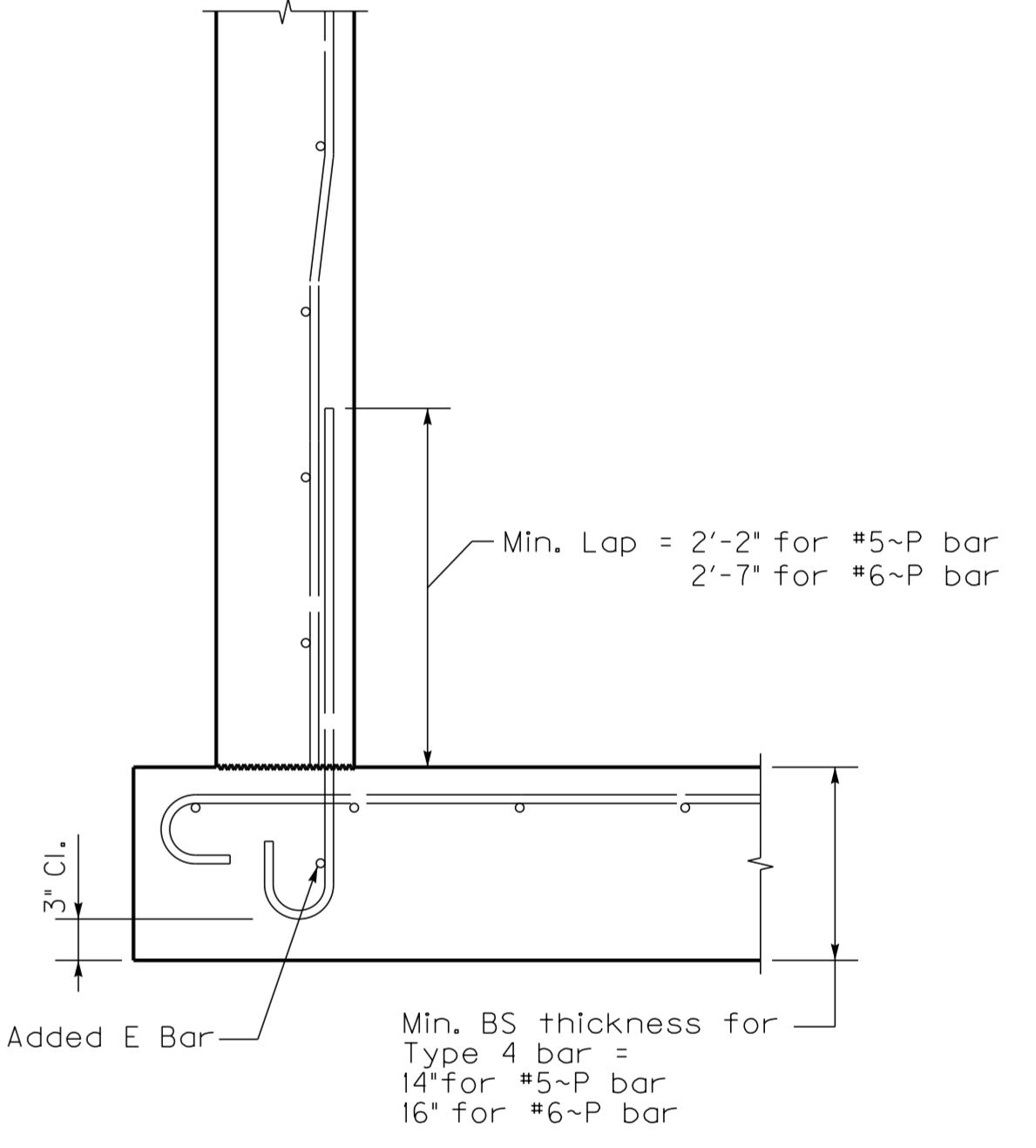
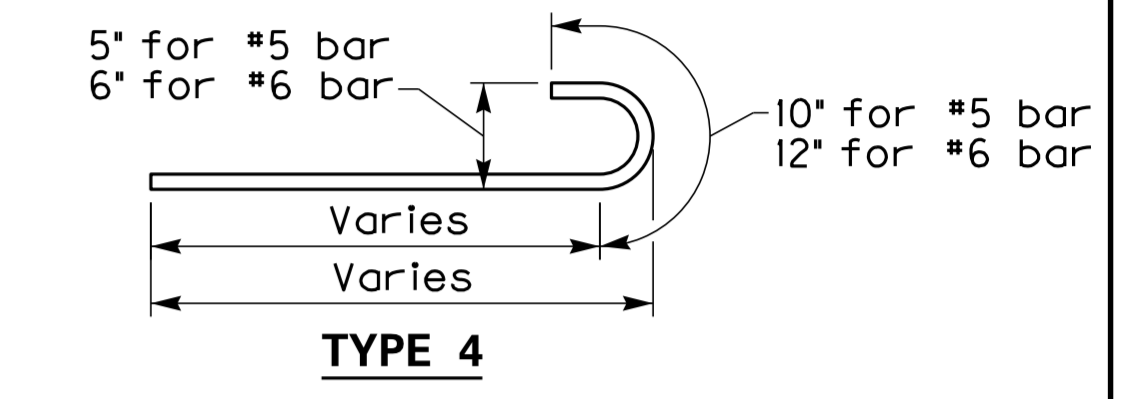
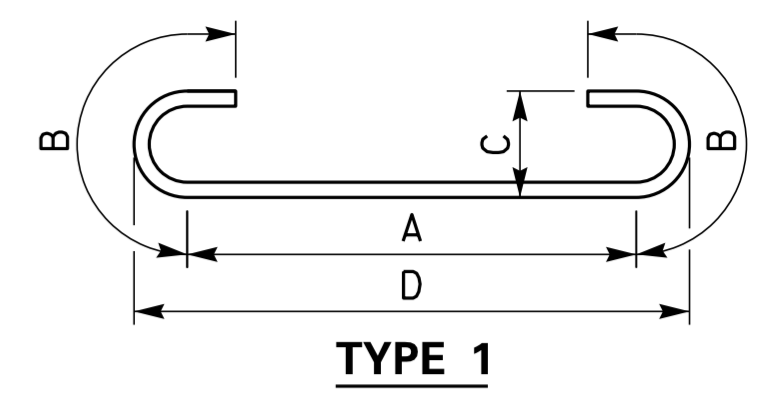
10'-0" Width x 8'-0" Height

Fill Height (Ft.)	Top Slab										Bottom Slab										Sidewall					Mark "E" Distribution				Quantities		
	TS	J	K	Mark	Type	Length	A	B	C	D	BS	M	N	Mark	Type	Length	A	B	C	D	SW	P	R	Mark	Type	Length	W	X	Y	Z	Concrete CY/LF	Steel LBS/LF
0-2	10"	7	6"	A	1	13-1	10-9	1-2	0-7	11-4	11"	7	6"	B	1	14-1	11-9	1-2	0-7	12-4	10"	5	12"	C	Str	9-4	10"	5	10"	12"	1.29	177
2.01-5	10"	7	5"	A	1	13-1	10-9	1-2	0-7	11-4	11"	7	5"	B	1	14-1	11-9	1-2	0-7	12-4	10"	5	12"	C	Str	9-4	10"	5	12"	12"	1.29	195
5-10	10"	7	5"	A	1	13-1	10-9	1-2	0-7	11-4	11"	7	5"	B	1	14-1	11-9	1-2	0-7	12-4	10"	5	10"	C	Str	9-4	10"	5	12"	12"	1.29	199
10-15	10"	7	5"	A	1	13-1	10-9	1-2	0-7	11-4	11"	7	5"	B	1	14-1	11-9	1-2	0-7	12-4	10"	5	9"	C	Str	9-4	10"	5	12"	12"	1.29	202
15-20	12"	8	5"	A	1	13-2	10-8	1-3	0-8	11-4	13"	8	5"	B	1	14-2	11-8	1-3	0-8	12-4	10"	5	8"	C	Str	9-8	10"	5	12"	12"	1.44	248
20-25	15"	8	6"	A	1	13-2	10-8	1-3	0-8	11-4	16"	8	6"	B	1	14-2	11-8	1-3	0-8	12-4	10"	5	7"	C	Str	10-2	10"	5	12"	12"	1.66	225
25-30	16"	9	5"	A	1	14-2	10-4 1/4	1-11	0-11 3/4	11-4	17"	9	5"	B	1	15-2	11-4 1/4	1-11	0-11 3/4	12-4	10"	5	5"	C	Str	10-4	10"	5	12"	12"	1.74	333
30-35	18"	10	5"	A	1	14-11	10-6 3/4	2-2	1-1 1/4	11-8	19"	10	5"	B	1	15-11	11-6 3/4	2-2	1-1 1/4	12-8	12"	5	6"	C	Str	10-8	12"	5	12"	12"	2.03	406
35-40	19"	11	5"	A	1	15-3	10-5 1/4	2-5	1-2 3/4	11-8	20"	11	5"	B	1	16-3	11-5 1/4	2-5	1-2 3/4	12-8	12"	5	5"	C	Str	10-10	12"	5	12"	12"	2.10	498

10'-0" Width x 10'-0" Height

Fill Height (Ft.)	Top Slab										Bottom Slab										Sidewall					Mark "E" Distribution				Quantities		
	TS	J	K	Mark	Type	Length	A	B	C	D	BS	M	N	Mark	Type	Length	A	B	C	D	SW	P	R	Mark	Type	Length	W	X	Y	Z	Concrete CY/LF	Steel LBS/LF
0-2	10"	7	6"	A	1	13-1	10-9	1-2	0-7	11-4	11"	7	6"	B	1	14-1	11-9	1-2	0-7	12-4	10"	5	11"	C	Str	11-4	10"	5	10"	12"	1.41	188
2.01-5	10"	7	5"	A	1	13-1	10-9	1-2	0-7	11-4	11"	7	5"	B	1	14-1	11-9	1-2	0-7	12-4	10"	5	9"	C	Str	11-4	10"	5	12"	12"	1.41	211
5-10	10"	7	5"	A	1	13-1	10-9	1-2	0-7	11-4	11"	7	5"	B	1	14-1	11-9	1-2	0-7	12-4	10"	5	7"	C	Str	11-4	10"	5	12"	12"	1.41	220
10-15	11"	7	5"	A	1	13-1	10-9	1-2	0-7	11-4	12"	7	5"	B	1	14-1	11-9	1-2	0-7	12-4	10"	5	6"	C	Str	11-6	10"	5	12"	12"	1.49	228
15-20	13"	7	5"	A	1	13-1	10-9	1-2	0-7	11-4	14"	7	5"	B	1	14-1	11-9	1-2	0-7	12-4	10"	6	7"	C	Str	11-10	10"	5	12"	12"	1.64	241
20-25	15"	8	5"	A	1	13-6	11-0	1-3	0-8	11-8	16"	8	5"	B	1	14-6	12-0	1-3	0-8	12-8	12"	6	7"	C	Str	12-2	12"	5	12"	12"	1.94	289
25-30	17"	10	7"	A	1	14-11	10-6 3/4	2-2	1-1 1/4	11-8	18"	10	7"	B	1	15-11	11-6 3/4	2-2	1-1 1/4	12-8	12"	6	6"	C	Str	12-6	12"	5	12"	12"	2.10	349
30-35	18"	10	5"	A	1	15-5	11-0 3/4	2-2	1-1 1/4	12-2	19"	10	5"	B	1	16-5	12-0 3/4	2-2	1-1 1/4	13-2	15"	6	7"	C	Str	12-8	15"	5	12"	12"	2.42	441
35-40	20"	11	5"	A	1	15-9	10-11 1/4	2-5	1-2 3/4	12-2	21"	11	5"	B	1	16-9	11-11 1/4	2-5	1-2 3/4	13-2	15"	6	6"	C	Str	13-0	15"	5	12"	12"	2.58	539

NOTE:
A & B bars may need to be rotated to maintain shown clearances.



OPTIONAL HOOK DETAIL

12'-0" Width x 4'-0" Height

Fill Height (Ft.)	Top Slab										Bottom Slab										Sidewall					Mark "E" Distribution				Quantities		
	TS	J	K	Mark	Type	Length	A	B	C	D	BS	M	N	Mark	Type	Length	A	B	C	D	SW	P	R	Mark	Type	Length	W	X	Y	Z	Concrete CY/LF	Steel LBS/LF
0-2	11"	7	5"	A	1	15-1	12-9	1-2	0-7	13-4	12"	7	5"	B	1	16-1	13-9	1-2	0-7	14-4	10"	5	12"	C	Str	5-6	12"	5	10"	12"	1.26	207
2.01-5	11"	7	5"	A	1	15-1	12-9	1-2	0-7	13-4	12"	7	5"	B	1	16-1	13-9	1-2	0-7	14-4	10"	5	12"	C	Str	5-6	10"	5	12"	12"	1.26	203
5-10	11"	8	5"	A	1	15-2	12-8	1-3	0-8	13-4	12"	8	5"	B	1	16-2	13-8	1-3	0-8	14-4	10"	5	12"	C	Str	5-6	10"	5	12"	12"	1.26	250
10-15	11"	8	5"	A	1	15-2	12-8	1-3	0-8	13-4	12"	8	5"	B	1	16-2	13-8	1-3	0-8	14-4	10"	5	12"	C	Str	5-6	10"	5	12"	12"	1.26	250
15-20	14"	8	5"	A	1	15-2	12-8	1-3	0-8	13-4	15"	8	5"	B	1	16-2	13-8	1-3	0-8	14-4	10"	5	12"	C	Str	6-0	10"	5	12"	12"	1.52	252
20-25	16"	9	6"	A	1	16-2	12-4 1/4	1-11	0-11 3/4	13-4	17"	9	6"	B	1	17-2	13-4 1/4	1-11	0-11 3/4	14-4	10"	5	12"	C	Str	6-4	10"	5	12"	12"	1.70	278
25-30	17"	10	5"	A	1	16-7	12-2 3/4	2-2	1-1 1/4	13-4	18"	10	5"	B	1	17-7	13-2 3/4	2-2	1-1 1/4	14-4	10"	5	12"	C	Str	6-6	10"	5	12"	12"	1.78	405
30-35	19"	11	5"	A	1	17-3	12-5 1/4	2-5	1-2 3/4	13-8	20"	11	5"	B	1	18-3	13-5 1/4	2-5	1-2 3/4	14-8	12"	5	12"	C	Str	6-10	12"	5	12"	12"	2.05	505
35-40	22"	11	5"	A	1	17-9	12-11 1/4	2-5	1-2 3/4	14-2	23"	11	5"	B	1	18-9	13-11 1/4	2-5	1-2 3/4	15-2	15"	5	12"	C	Str	7-4	15"	5	12"	12"	2.46	519

12'-0" Width x 6'-0" Height

Fill Height (Ft.)	Top Slab										Bottom Slab										Sidewall					Mark "E" Distribution				Quantities		
	TS	J	K	Mark	Type	Length	A	B	C	D	BS	M	N	Mark	Type	Length	A	B	C	D	SW	P	R	Mark	Type	Length	W	X	Y	Z	Concrete CY/LF	Steel LBS/LF
0-2	11"	7	5"	A	1	15-1	12-9	1-2	0-7	13-4	12"	7	5"	B	1	16-1	13-9	1-2	0-7	14-4	10"	5	12"	C	Str	7-6	12"	5	10"	12"	1.38	215
2.01-5	11"	7	5"	A	1	15-1	12-9	1-2	0-7	13-4	12"	7	5"	B	1	16-1	13-9	1-2	0-7	14-4	10"	5	12"	C	Str	7-6	10"	5	12"	12"	1.38	211
5-10	11"	8	5"	A	1	15-2	12-8	1-3	0-8	13-4	12"	8	5"	B	1	16-2	13-8	1-3	0-8	14-4	10"	5	12"	C	Str	7-6	10"	5	12"	12"	1.38	259
10-15	11"	8	5"	A	1	15-2	12-8	1-3	0-8	13-4	12"	8	5"	B	1	16-2	13-8	1-3	0-8	14-4	10"	5	12"	C	Str	7-6	10"	5	12"	12"	1.38	259
15-20	14"	8	5"	A	1	15-2	12-8	1-3	0-8	13-4	15"	8	5"	B	1	16-2	13-8	1-3	0-8	14-4	10"	5	10"	C	Str	8-0	10"	5	12"	12"	1.64	263
20-25	16"	9	5"	A	1	16-2	12-4 1/4	1-11	0-11 3/4	13-4	17"	9	5"	B	1	17-2	13-4 1/4	1-11	0-11 3/4	14-4	10"	5	9"	C	Str	8-4	10"	5	12"	12"	1.82	337
25-30	18"	10	5"	A	1	16-11	12-6 3/4	2-2	1-1 1/4	13-8	19"	10	5"	B	1	17-11	13-6 3/4	2-2	1-1 1/4	14-8	12"	5	9"	C	Str	8-8	12"	5	12"	12"	2.11	427
30-35	20"	11	5"	A	1	17-3	12-5 1/4	2-5	1-2 3/4	13-8	21"	11	5"	B	1	18-3	13-5 1/4	2-5	1-2 3/4	14-8	12"	5	8"	C	Str	9-0	12"	5	12"	12"	2.29	523
35-40	23"	11	5"	A	1	17-9	12-11 1/4	2-5	1-2 3/4	14-2	24"	11	5"	B	1	18-9	13-11 1/4	2-5	1-2 3/4	15-2	15"	5	8"	C	Str	9-6	15"	5	12"	12"	2.74	537

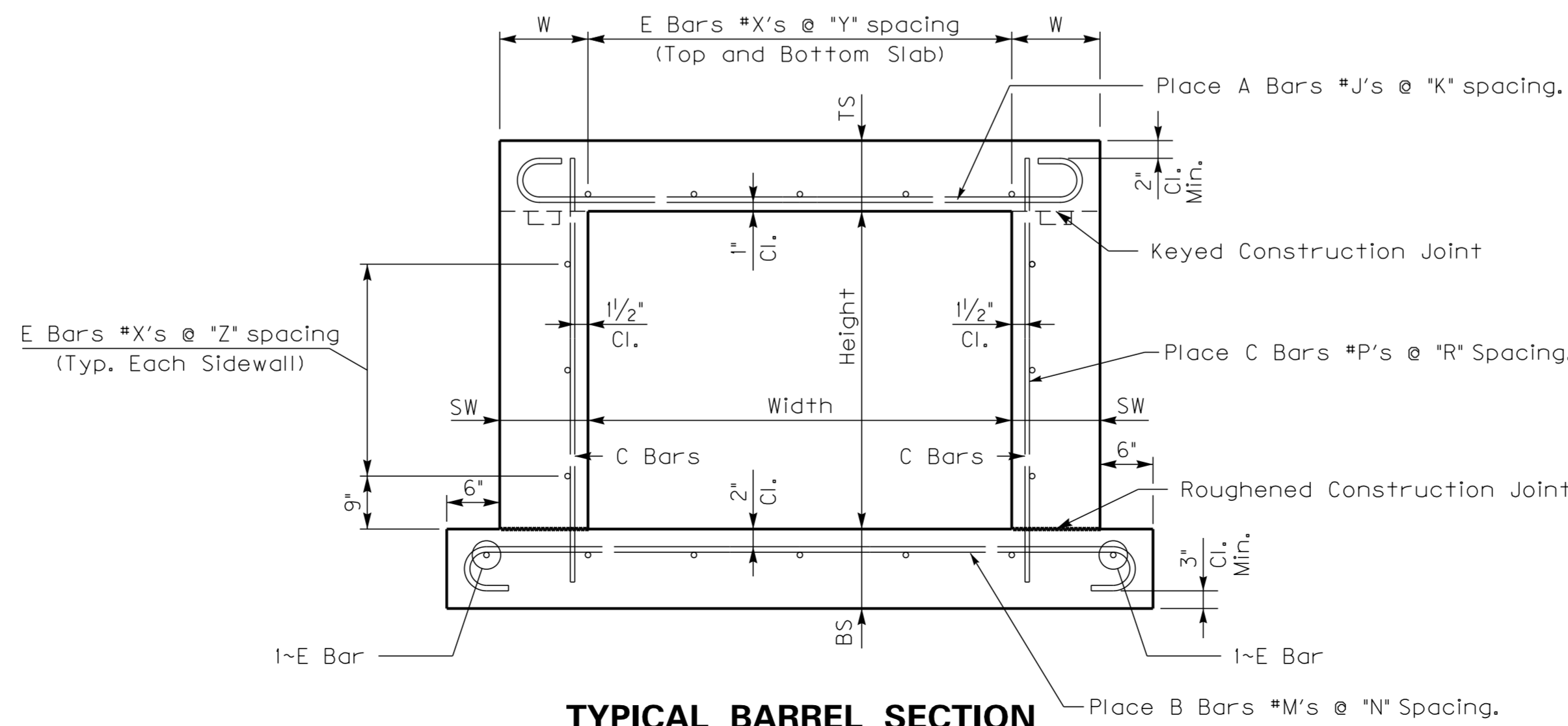
12'-0" Width x 8'-0" Height

Fill Height (Ft.)	Top Slab										Bottom Slab										Sidewall					Mark "E" Distribution				Quantities		
	TS	J	K	Mark	Type	Length	A	B	C	D	BS	M	N	Mark	Type	Length	A	B	C	D	SW	P	R	Mark	Type	Length	W	X	Y	Z	Concrete CY/LF	Steel LBS/LF
0-2	11"	7	5"	A	1	15-1	12-9	1-2	0-7	13-4	12"	7	5"	B	1	16-1	13-9	1-2	0-7	14-4	10"	5	12"	C	Str	9-6	12"	5	10"	12"	1.51	223
2.01-5	11"	7	5"	A	1	15-1	12-9	1-2	0-7	13-4	12"	7	5"	B	1	16-1	13-9	1-2	0-7	14-4	10"	5	12"	C	Str	9-6	10"	5	12"	12"	1.51	219
5-10	11"	8	5"	A	1	15-2	12-8	1-3	0-8	13-4	12"	8	5"	B	1	16-2	13-8	1-3	0-8	14-4	10"	5	10"	C	Str	9-6	10"	5	12"	12"	1.51	271
10-15	11"	8	5"	A	1	15-2	12-8	1-3	0-8	13-4	12"	8	5"	B	1	16-2	13-8	1-3	0-8	14-4	10"	5	9"	C	Str	9-6	10"	5	12"	12"	1.51	274
15-20	14"	8	5"	A	1	15-2	12-8	1-3	0-8	13-4	15"	8	5"	B	1	16-2	13-8	1-3	0-8	14-4	10"	5	7"	C	Str	10-0	10"	5	12"	12"	1.77	283
20-25	17"	8	5"	A	1	15-2	12-8	1-3	0-8	13-4	18"	8	5"	B	1	16-2	13-8	1-3	0-8	14-4	10"	5	6"	C	Str	10-6	10"	5	12"	12"	2.03	291
25-30	18"	11	5"	A	1	17-3	12-5 1/4	2-5	1-2 3/4	13-8	19"	11	5"	B	1	18-3	13-5 1/4	2-5	1-2 3/4	14-8	12"	5	7"	C	Str	10-8	12"	5	12"	12"	2.25	537
30-35	20"	11	5"	A	1	17-3	12-5 1/4	2-5	1-2 3/4	13-8	21"	11	5"	B	1	18-3	13-5 1/4	2-5	1-2 3/4	14-8	12"	5	5"	C	Str	11-0	12"	5	12"	12"	2.43	554
35-40	23"	11	5"	A	1	17-9	12-11 1/4	2-5	1-2 3/4	14-2	24"	11	5"	B	1	18-9	13-11 1/4	2-5	1-2 3/4	15-2	15"	5	6"	C	Str	11-6	15"	5	12"	12"	2.92	560

12'-0" Width x 10'-0" Height

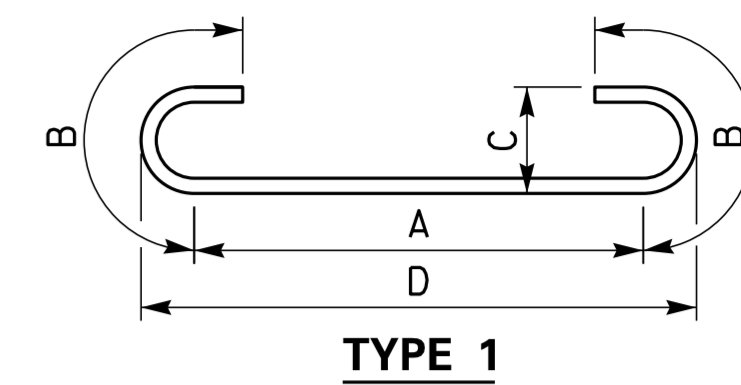
Fill Height (Ft.)	Top Slab										Bottom Slab										Sidewall					Mark "E" Distribution				Quantities		
	TS	J	K	Mark	Type	Length	A	B	C	D	BS	M	N	Mark	Type	Length	A	B	C	D	SW	P	R	Mark	Type	Length	W	X	Y	Z	Concrete CY/LF	Steel LBS/LF
0-2	11"	7	5"	A	1	15-1	12-9	1-2	0-7	13-4	12"	7	5"	B	1	16-1	13-9	1-2	0-7	14-4	10"	5	11"	C	Str	11-6	12"	5	10"	12"	1.63	234
2.01-5	11"	7	5"	A	1	15-1	12-9	1-2	0-7	13-4	12"	7	5"	B	1	16-1	13-9	1-2	0-7	14-4	10"	5	9"	C	Str	11-6	10"	5	12"	12"	1.63	236
5-10	11"	8	5"	A	1	15-2	12-8	1-3	0-8	13-4	12"	8	5"	B	1	16-2	13-8	1-3	0-8	14-4	10"	5	7"	C	Str	11-6	10"	5	12"	12"	1.63	293
10-15	12"	8	5"	A	1	15-2	12-8	1-3	0-8	13-4	13"	8	5"	B	1	16-2	13-8	1-3	0-8	14-4	10"	5	6"	C	Str	11-8	10"	5	12"	12"	1.72	300
15-20	15"	8	5"	A	1	15-6	13-0	1-3	0-8	13-8	16"	8	5"	B	1	16-6	14-0	1-3	0-8	14-8	12"	6	8"	C	Str	12-2	12"	5	12"	12"	2.13	311
20-25	17"	10	7"	A	1	16-11	12-6 3/4	2-2	1-1 1/4	13-8	18"	10	7"	B	1	17-11	13-6 3/4	2-2	1-1 1/4	14-8	12"	6	7"	C	Str	12-6	12"	5	12"	12"	2.31	372
25-30	18"	11	5"	A	1	17-9	12-11 1/4	2-5	1-2 3/4	14-2	19"	11	5"	B	1	18-9	13-11 1/4	2-5	1-2 3/4	15-2	15"	6	8"	C	Str	12-8	15"	5	12"	12"	2.65	573
30-35	21"	11	5"	A	1	17-9	12-11 1/4	2-5	1-2 3/4	14-2	22"	11	5"	B	1	18-9	13-11 1/4	2-5	1-2 3/4	15-2	15"	6	7"	C	Str	13-2	15"	5	12"	12"	2.92	584
35-40	24"	11	5"	A	1	18-3	13-5 1/4	2-5	1-2 3/4	14-8	25"	11	5"	B	1	19-3	14-5 1/4	2-5	1-2 3/4	15-8	18"	6	7"	C	Str	13-8	18"	5	12"	12"	3.46	599

NOTE:
Bar Dimensions are per bar.

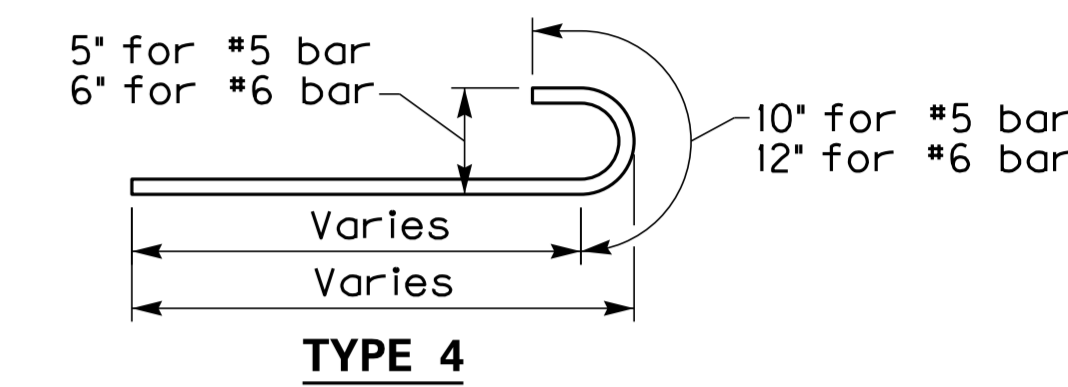


TYPICAL BARREL SECTION

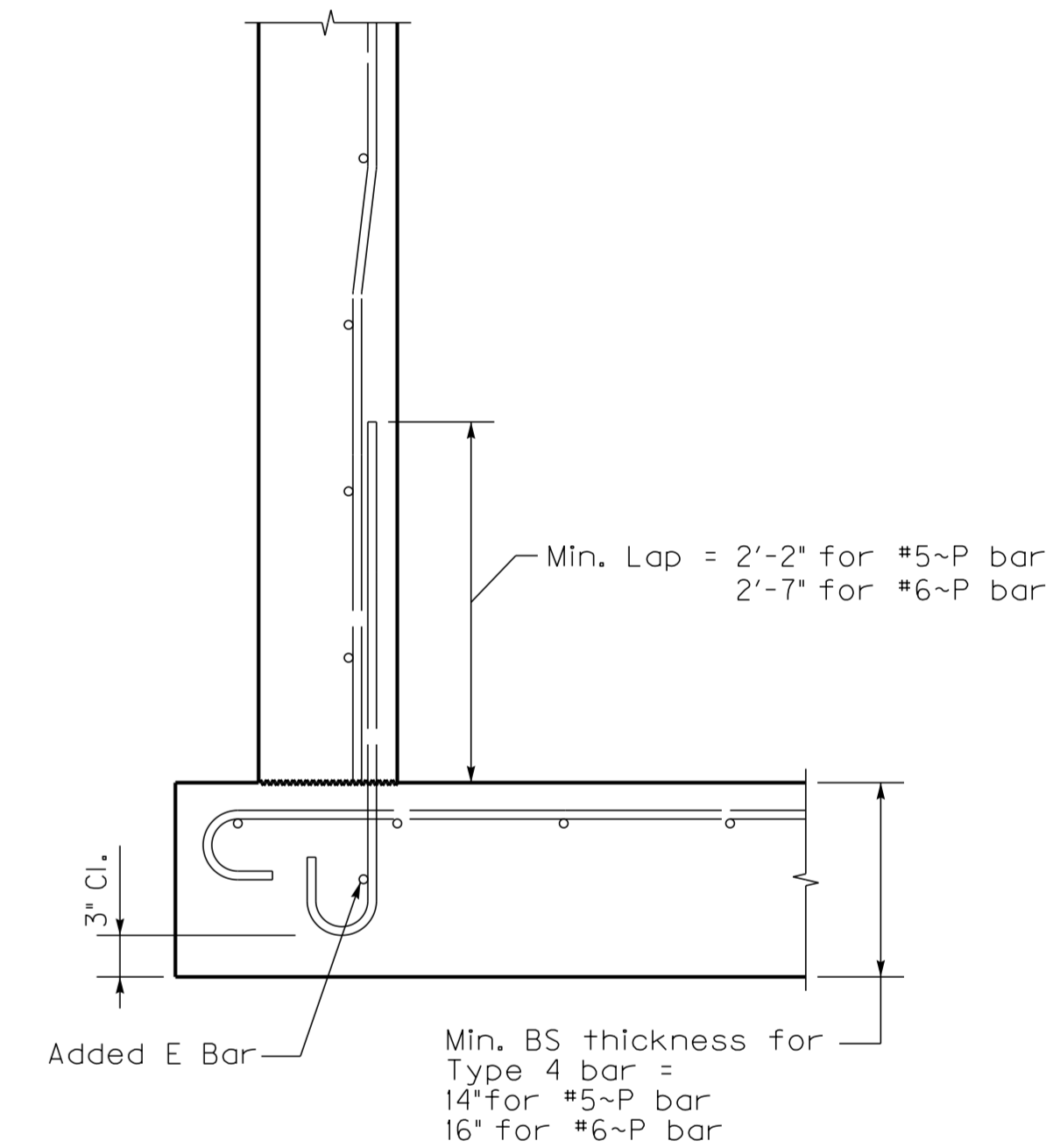
NOTE:
A & B bars may need to be rotated to maintain shown clearances.



TYPE 1



TYPE 4



OPTIONAL HOOK DETAIL

NOTE:
The contractor will not be paid additionally if optional hook detail is used.

DATE 11/2017
DRAWN E. Downey
CHECKED J. Van Zee
RECOMMENDED
APPROVED F.H.W.A.
REVISED BY

KENTUCKY
DEPARTMENT OF HIGHWAYS

**STANDARD CULVERT
12'-0" WIDTH**

STANDARD DRAWING NO. B--005-01

SUBMITTED 11-01-17
DIRECTOR DIVISION OF STRUCTURAL DESIGN DATE
APPROVED 11-01-17
STATE HIGHWAY ENGINEER DATE

14'-0" Width x 4'-0" Height

Fill Height (Ft.)	Top Slab										Bottom Slab										Sidewall					Mark "E" Distribution				Quantities		
	TS	J	K	Mark	Type	Length	A	B	C	D	BS	M	N	Mark	Type	Length	A	B	C	D	SW	P	R	Mark	Type	Length	W	X	Y	Z	Concrete CY/LF	Steel LBS/LF
0-2	12"	7	5"	A	1	17-1	14-9	1-2	0-7	15-4	13"	7	5"	B	1	18-1	15-9	1-2	0-7	16-4	10"	5	12"	C	Str	5-8	13"	5	9"	12"	1.50	235
2.01-5	12"	8	6"	A	1	17-2	14-8	1-3	0-8	15-4	13"	8	6"	B	1	18-2	15-8	1-3	0-8	16-4	10"	5	12"	C	Str	5-8	10"	5	12"	12"	1.50	243
5-10	12"	8	5"	A	1	17-2	14-8	1-3	0-8	15-4	13"	8	5"	B	1	18-2	15-8	1-3	0-8	16-4	10"	5	12"	C	Str	5-8	10"	5	12"	12"	1.50	281
10-15	13"	8	5"	A	1	17-2	14-8	1-3	0-8	15-4	14"	8	5"	B	1	18-2	15-8	1-3	0-8	16-4	10"	5	12"	C	Str	5-10	10"	5	12"	12"	1.60	281
15-20	15"	9	5"	A	1	18-2	14-4 1/4	1-11	0-11 3/4	15-4	16"	9	5"	B	1	19-2	15-4 1/4	1-11	0-11 3/4	16-4	10"	5	12"	C	Str	6-2	10"	5	12"	12"	1.80	360
20-25	17"	10	5"	A	1	18-7	14-2 3/4	2-2	1-1 1/4	15-4	18"	10	5"	B	1	19-7	15-2 3/4	2-2	1-1 1/4	16-4	10"	5	12"	C	Str	6-6	10"	5	12"	12"	2.00	451
25-30	19"	11	5"	A	1	19-3	14-5 1/4	2-5	1-2 3/4	15-8	20"	11	5"	B	1	20-3	15-5 1/4	2-5	1-2 3/4	16-8	12"	5	12"	C	Str	6-10	12"	5	12"	12"	2.29	560
30-35	23"	11	5"	A	1	19-9	14-11 1/4	2-5	1-2 3/4	16-2	24"	11	5"	B	1	20-9	15-11 1/4	2-5	1-2 3/4	17-2	15"	5	12"	C	Str	7-6	15"	5	12"	12"	2.84	574
35-40	26"	11	5"	A	1	20-3	15-5 1/4	2-5	1-2 3/4	16-8	27"	11	5"	B	1	21-3	16-5 1/4	2-5	1-2 3/4	17-8	18"	5	12"	C	Str	8-0	18"	5	12"	12"	3.31	588

14'-0" Width x 6'-0" Height

Fill Height (Ft.)	Top Slab										Bottom Slab										Sidewall					Mark "E" Distribution				Quantities		
	TS	J	K	Mark	Type	Length	A	B	C	D	BS	M	N	Mark	Type	Length	A	B	C	D	SW	P	R	Mark	Type	Length	W	X	Y	Z	Concrete CY/LF	Steel LBS/LF
0-2	12"	7	5"	A	1	17-1	14-9	1-2	0-7	15-4	13"	7	5"	B	1	18-1	15-9	1-2	0-7	16-4	10"	5	12"	C	Str	7-8	13"	5	9"	12"	1.62	243
2.01-5	12"	8	6"	A	1	17-2	14-8	1-3	0-8	15-4	13"	8	6"	B	1	18-2	15-8	1-3	0-8	16-4	10"	5	12"	C	Str	7-8	10"	5	12"	12"	1.62	251
5-10	12"	8	5"	A	1	17-2	14-8	1-3	0-8	15-4	13"	8	5"	B	1	18-2	15-8	1-3	0-8	16-4	10"	5	12"	C	Str	7-8	10"	5	12"	12"	1.62	289
10-15	13"	8	5"	A	1	17-2	14-8	1-3	0-8	15-4	14"	8	5"	B	1	18-2	15-8	1-3	0-8	16-4	10"	5	12"	C	Str	7-10	10"	5	12"	12"	1.72	289
15-20	15"	9	5"	A	1	18-2	14-4 1/4	1-11	0-11 3/4	15-4	16"	9	5"	B	1	19-2	15-4 1/4	1-11	0-11 3/4	16-4	10"	5	10"	C	Str	8-2	10"	5	12"	12"	1.92	372
20-25	18"	10	5"	A	1	18-11	14-6 3/4	2-2	1-1 1/4	15-8	19"	10	5"	B	1	19-11	15-6 3/4	2-2	1-1 1/4	16-8	12"	5	10"	C	Str	8-8	12"	5	12"	12"	2.33	470
25-30	20"	11	5"	A	1	19-3	14-5 1/4	2-5	1-2 3/4	15-8	21"	11	5"	B	1	20-3	15-5 1/4	2-5	1-2 3/4	16-8	12"	5	8"	C	Str	9-0	12"	5	12"	12"	2.54	578
30-35	23"	11	5"	A	1	19-9	14-11 1/4	2-5	1-2 3/4	16-2	24"	11	5"	B	1	20-9	15-11 1/4	2-5	1-2 3/4	17-2	15"	5	9"	C	Str	9-6	15"	5	12"	12"	3.03	589
35-40	27"	11	5"	A	1	20-3	15-5 1/4	2-5	1-2 3/4	16-8	28"	11	5"	B	1	21-3	16-5 1/4	2-5	1-2 3/4	17-8	18"	5	10"	C	Str	10-2	18"	5	12"	12"	3.64	601

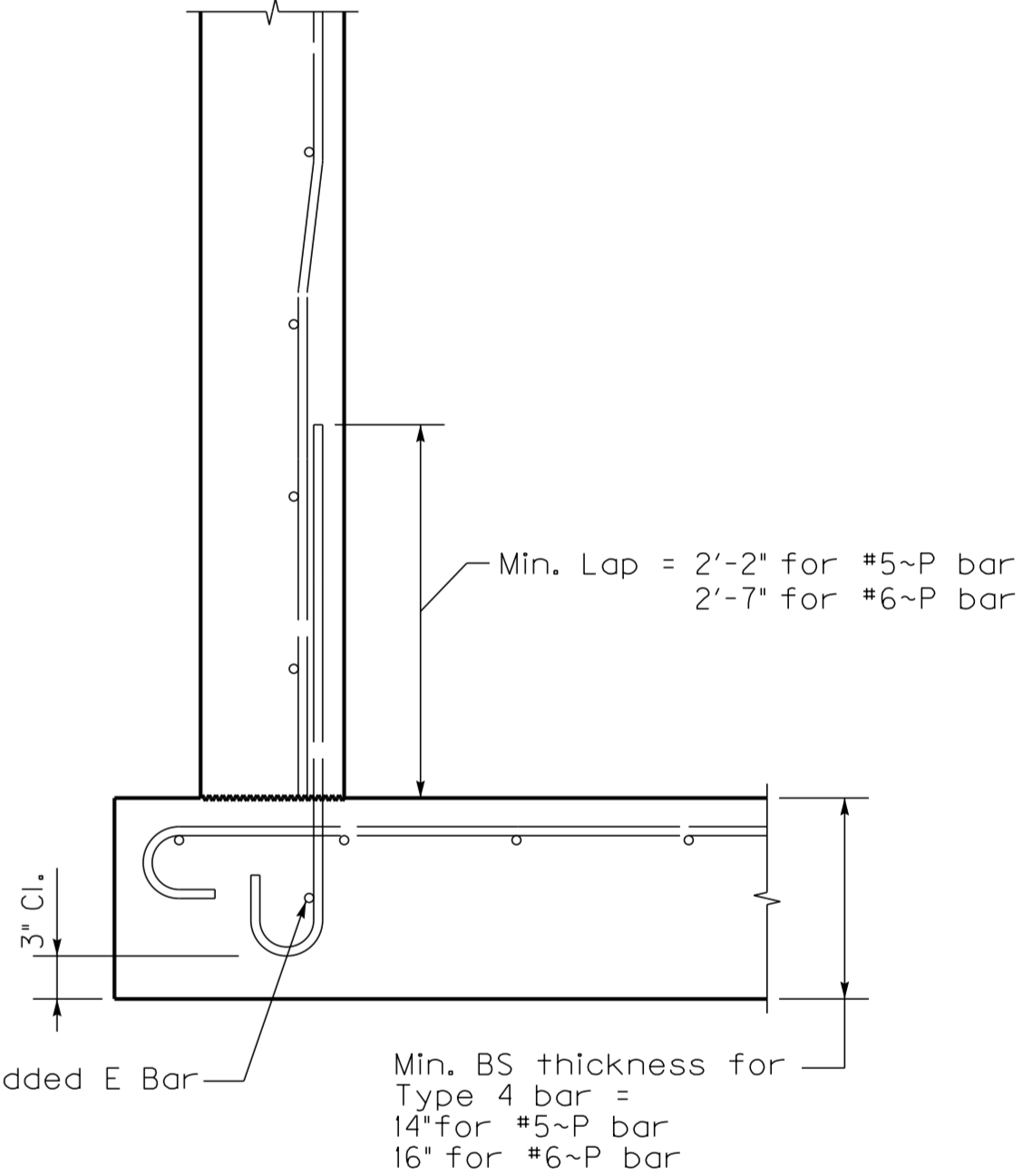
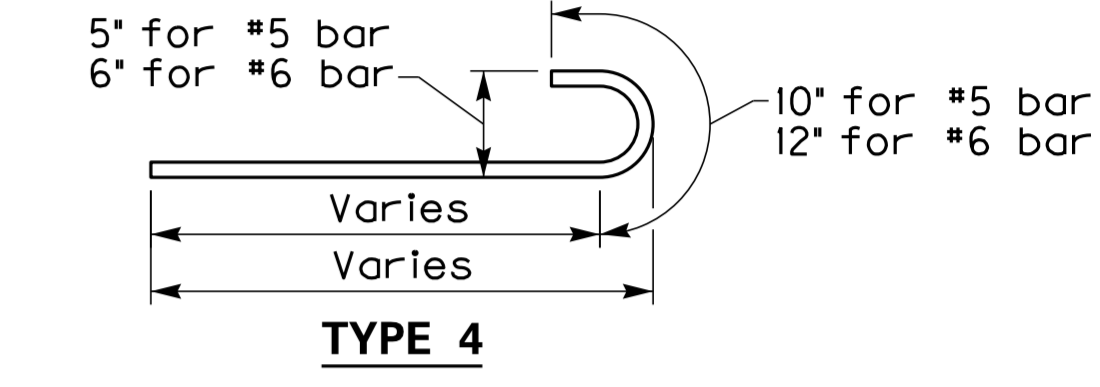
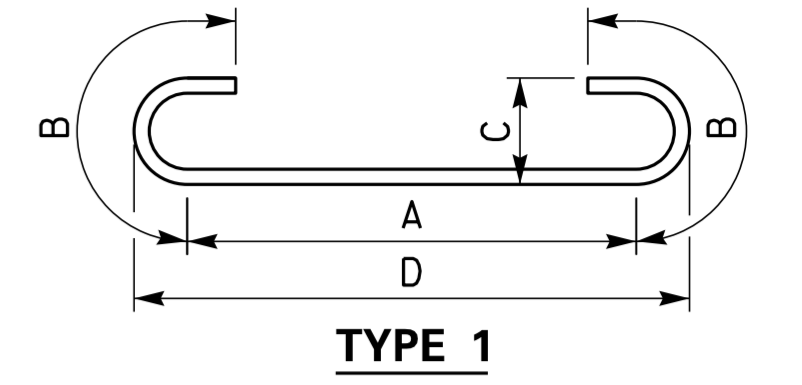
14'-0" Width x 8'-0" Height

Fill Height (Ft.)	Top Slab										Bottom Slab										Sidewall					Mark "E" Distribution				Quantities		
	TS	J	K	Mark	Type	Length	A	B	C	D	BS	M	N	Mark	Type	Length	A	B	C	D	SW	P	R	Mark	Type	Length	W	X	Y	Z	Concrete CY/LF	Steel LBS/LF
0-2	12"	8	6"	A	1	17-2	14-8	1-3	0-8	15-4	13"	8	6"	B	1	18-2	15-8	1-3	0-8	16-4	10"	5	12"	C	Str	9-8	13"	5	9"	12"	1.75	268
2.01-5	12"	8	6"	A	1	17-2	14-8	1-3	0-8	15-4	13"	8	6"	B	1	18-2	15-8	1-3	0-8	16-4	10"	5	12"	C	Str	9-8	10"	5	12"	12"	1.75	260
5-10	12"	8	5"	A	1	17-2	14-8	1-3	0-8	15-4	13"	8	5"	B	1	18-2	15-8	1-3	0-8	16-4	10"	5	10"	C	Str	9-8	10"	5	12"	12"	1.75	301
10-15	13"	8	5"	A	1	17-2	14-8	1-3	0-8	15-4	14"	8	5"	B	1	18-2	15-8	1-3	0-8	16-4	10"	5	8"	C	Str	9-10	10"	5	12"	12"	1.85	308
15-20	16"	8	5"	A	1	17-2	14-8	1-3	0-8	15-4	17"	8	5"	B	1	18-2	15-8	1-3	0-8	16-4	10"	5	7"	C	Str	10-4	10"	5	12"	12"	2.15	314
20-25	18"	10	5"	A	1	18-11	14-6 3/4	2-2	1-1 1/4	15-8	19"	10	5"	B	1	19-11	15-6 3/4	2-2	1-1 1/4	16-8	12"	5	7"	C	Str	10-8	12"	5	12"	12"	2.48	491
25-30	20"	11	5"	A	1	19-3	14-5 1/4	2-5	1-2 3/4	15-8	21"	11	5"	B	1	20-3	15-5 1/4	2-5	1-2 3/4	16-8	12"	5	6"	C	Str	11-0	12"	5	12"	12"	2.69	600
30-35	24"	11	5"	A	1	20-3	15-5 1/4	2-5	1-2 3/4	16-8	25"	11	5"	B	1	21-3	16-5 1/4	2-5	1-2 3/4	17-8	18"	6	9"	C	Str	11-8	18"	5	12"	12"	3.54	627
35-40	28"	11	5"	A	1	20-3	15-5 1/4	2-5	1-2 3/4	16-8	29"	11	5"	B	1	21-3	16-5 1/4	2-5	1-2 3/4	17-8	18"	6	8"	C	Str	12-4	18"	5	12"	12"	3.97	635

14'-0" Width x 10'-0" Height

Fill Height (Ft.)	Top Slab										Bottom Slab										Sidewall					Mark "E" Distribution				Quantities		
	TS	J	K	Mark	Type	Length	A	B	C	D	BS	M	N	Mark	Type	Length	A	B	C	D	SW	P	R	Mark	Type	Length	W	X	Y	Z	Concrete CY/LF	Steel LBS/LF
0-2	12"	8	6"	A	1	17-2	14-8	1-3	0-8	15-4	13"	8	6"	B	1	18-2	15-8	1-3	0-8	16-4	10"	5	11"	C	Str	11-8	13"	5	9"	12"	1.87	279
2.01-5	12"	8	6"	A	1	17-2	14-8	1-3	0-8	15-4	13"	8	6"	B	1	18-2	15-8	1-3	0-8	16-4	10"	5	9"	C	Str	11-8	10"	5	12"	12"	1.87	276
5-10	12"	8	5"	A	1	17-2	14-8	1-3	0-8	15-4	13"	8	5"	B	1	18-2	15-8	1-3	0-8	16-4	10"	5	7"	C	Str	11-8	10"	5	12"	12"	1.87	323
10-15	13"	8	5"	A	1	17-2	14-8	1-3	0-8	15-4	14"	8	5"	B	1	18-2	15-8	1-3	0-8	16-4	10"	5	6"	C	Str	11-10	10"	5	12"	12"	1.97	331
15-20	16"	9	5"	A	1	18-6	14-8 1/4	1-11	0-11 3/4	15-8	17"	9	5"	B	1	19-6	15-8 1/4	1-11	0-11 3/4	16-8	12"	6	8"	C	Str	12-4	12"	5	12"	12"	2.43	421
20-25	18"	10	5"	A	1	19-9	14-11 1/4	2-5	1-2 3/4	16-2	19"	11	5"	B	1	20-9	15-11 1/4	2-5	1-2 3/4	17-2	15"	5	6"	C	Str	12-8	15"	5	12"	12"	2.87	624
25-30	21"	11	5"	A	1	19-9	14-11 1/4	2-5	1-2 3/4	16-2	22"	11	5"	B	1	20-9	15-11 1/4	2-5	1-2 3/4	17-2	15"	5	5"	C	Str	13-2	15"	5	12"	12"	3.19	637
30-35	25"	11	5"	A	1	20-3	15-5 1/4	2-5	1-2 3/4	16-8	26"	11	5"	B	1	21-3	16-5 1/4	2-5	1-2 3/4	17-8	18"	6	8"	C	Str	13-10	18"	5	12"	12"	3.87	646
35-40	28"	11	5"	A	1	20-3	15-5 1/4	2-5	1-2 3/4	16-8	29"	11	5"	B	1	21-3	16-5 1/4	2-5	1-2 3/4	17-8	18"	6	7"	C	Str	14-4	18"	5	12"	12"	4.20	658

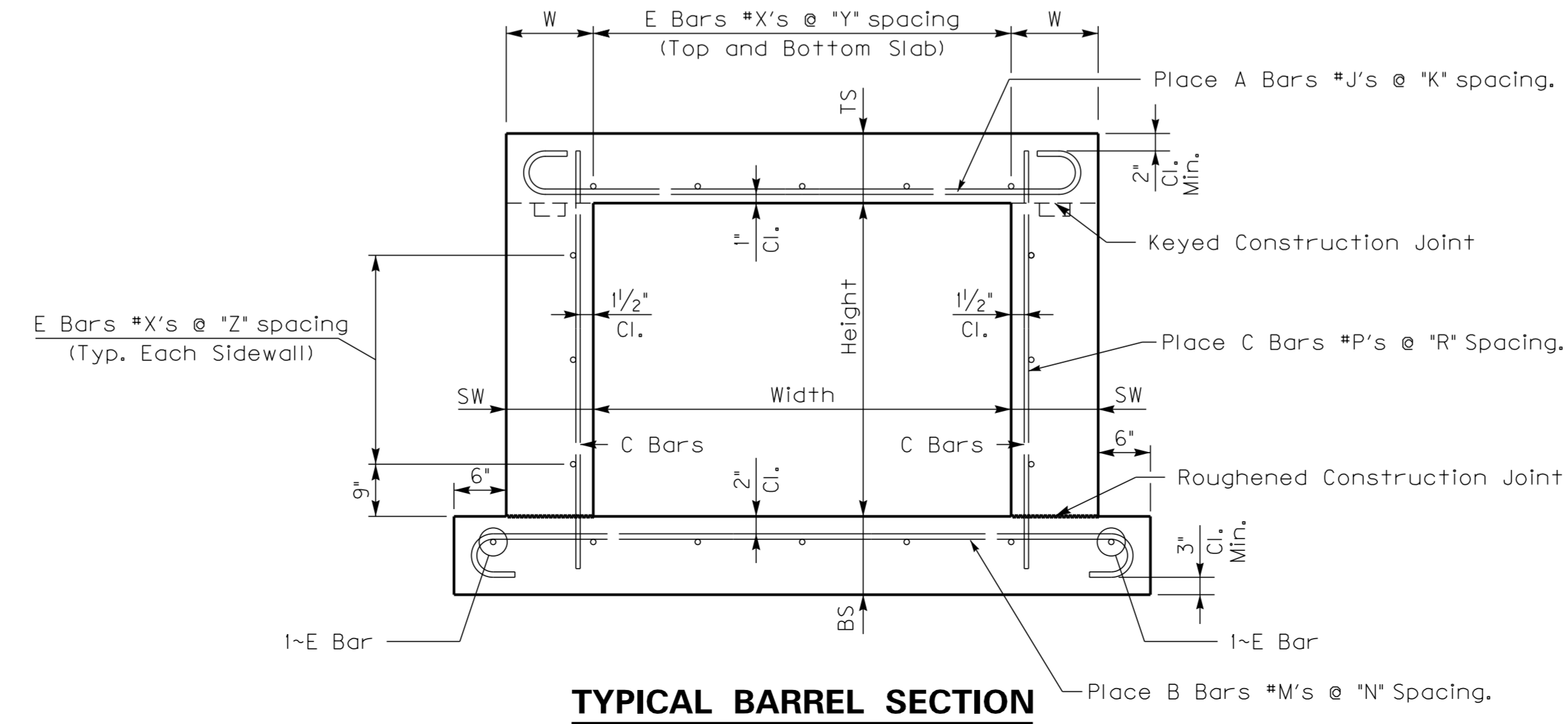
NOTE:
A & B bars may need to be rotated to maintain shown clearances.



OPTIONAL HOOK DETAIL

NOTE:
The contractor will not be paid additionally if optional hook detail is used.

NOTE:
Bar Dimensions are per bar.



DATE 11/2017
11/2017
DRAWN E. Downey
CHECKED J. Van Zee
RECOMMENDED
APPROVED F.H.W.A.
REVISED BY

KENTUCKY DEPARTMENT OF HIGHWAYS	
STANDARD CULVERT 14'-0" WIDTH	
STANDARD DRAWING NO. B--006-01	
SUBMITTED	11-01-17
DIRECTOR DIVISION OF STRUCTURAL DESIGN	
APPROVED	11-01-17
STATE HIGHWAY ENGINEER	

16'-0" Width x 4'-0" Height

Table with 24 columns: Fill Height (Ft.), Top Slab (TS, J, K, Mark, Type, Length, A, B, C, D), Bottom Slab (BS, M, N, Mark, Type, Length, A, B, C, D), Sidewall (SW, P, R, Mark, Type, Length), Mark 'E' Distribution (W, X, Y, Z), and Quantities (Concrete CY/LF, Steel LBS/LF).

16'-0" Width x 6'-0" Height

Table with 24 columns: Fill Height (Ft.), Top Slab (TS, J, K, Mark, Type, Length, A, B, C, D), Bottom Slab (BS, M, N, Mark, Type, Length, A, B, C, D), Sidewall (SW, P, R, Mark, Type, Length), Mark 'E' Distribution (W, X, Y, Z), and Quantities (Concrete CY/LF, Steel LBS/LF).

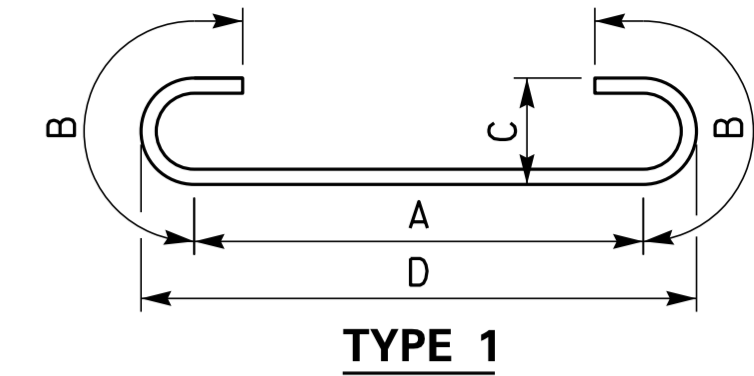
16'-0" Width x 8'-0" Height

Table with 24 columns: Fill Height (Ft.), Top Slab (TS, J, K, Mark, Type, Length, A, B, C, D), Bottom Slab (BS, M, N, Mark, Type, Length, A, B, C, D), Sidewall (SW, P, R, Mark, Type, Length), Mark 'E' Distribution (W, X, Y, Z), and Quantities (Concrete CY/LF, Steel LBS/LF).

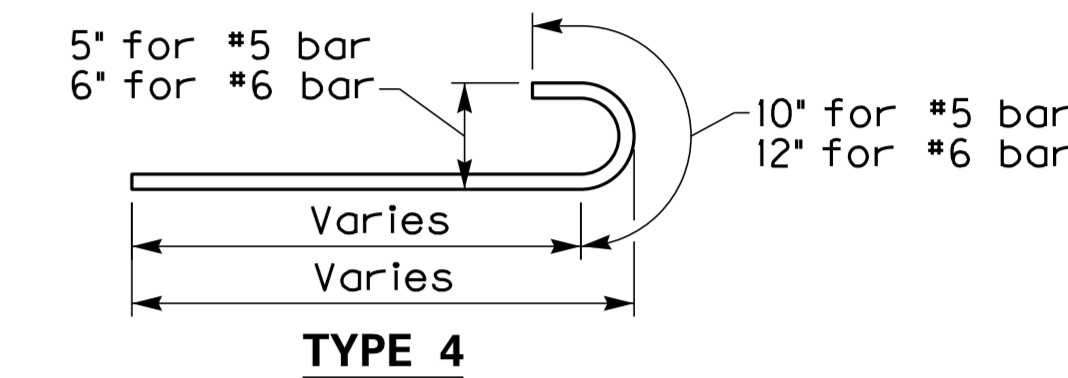
16'-0" Width x 10'-0" Height

Table with 24 columns: Fill Height (Ft.), Top Slab (TS, J, K, Mark, Type, Length, A, B, C, D), Bottom Slab (BS, M, N, Mark, Type, Length, A, B, C, D), Sidewall (SW, P, R, Mark, Type, Length), Mark 'E' Distribution (W, X, Y, Z), and Quantities (Concrete CY/LF, Steel LBS/LF).

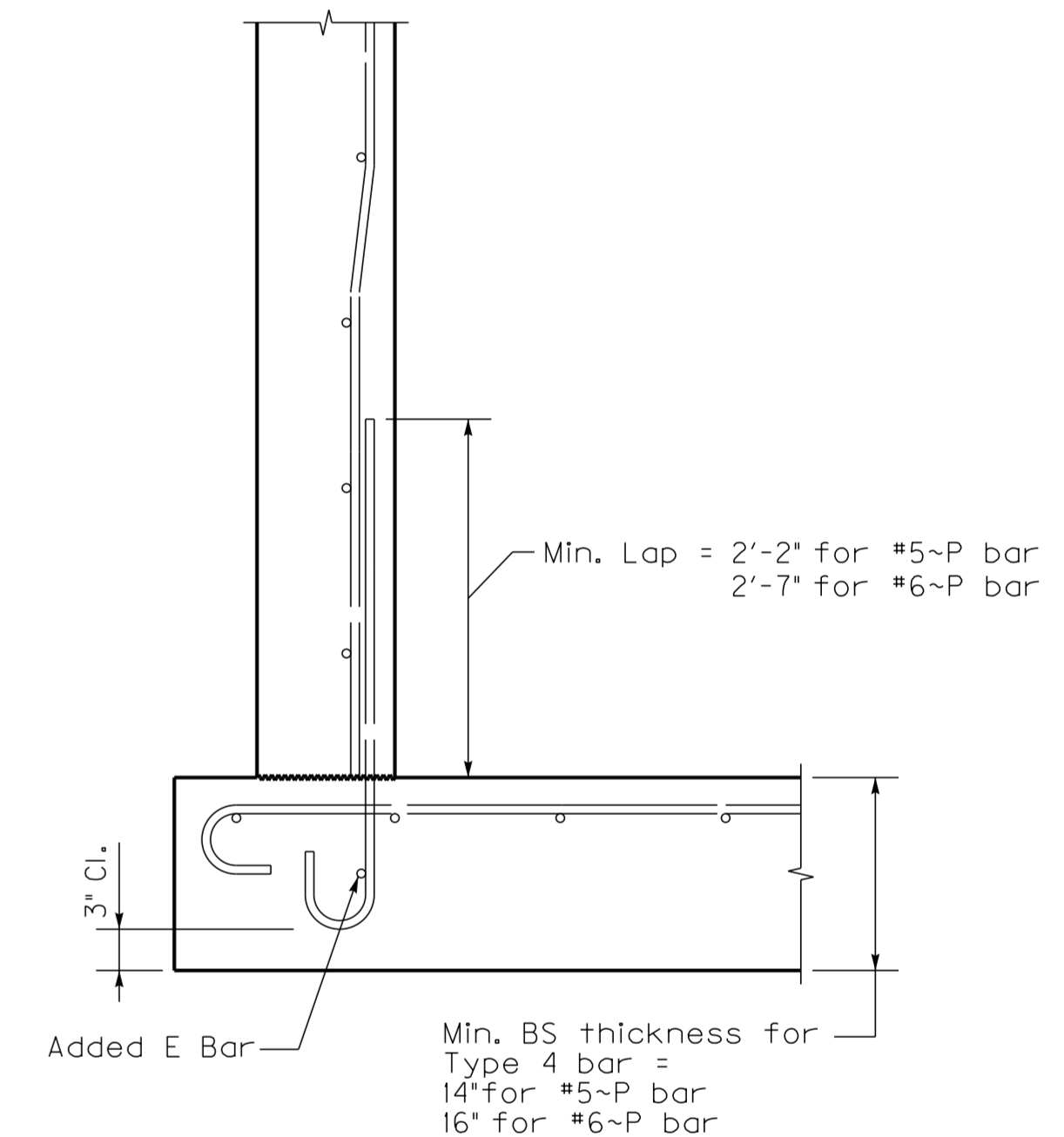
NOTE: A & B bars may need to be rotated to maintain shown clearances.



TYPE 1



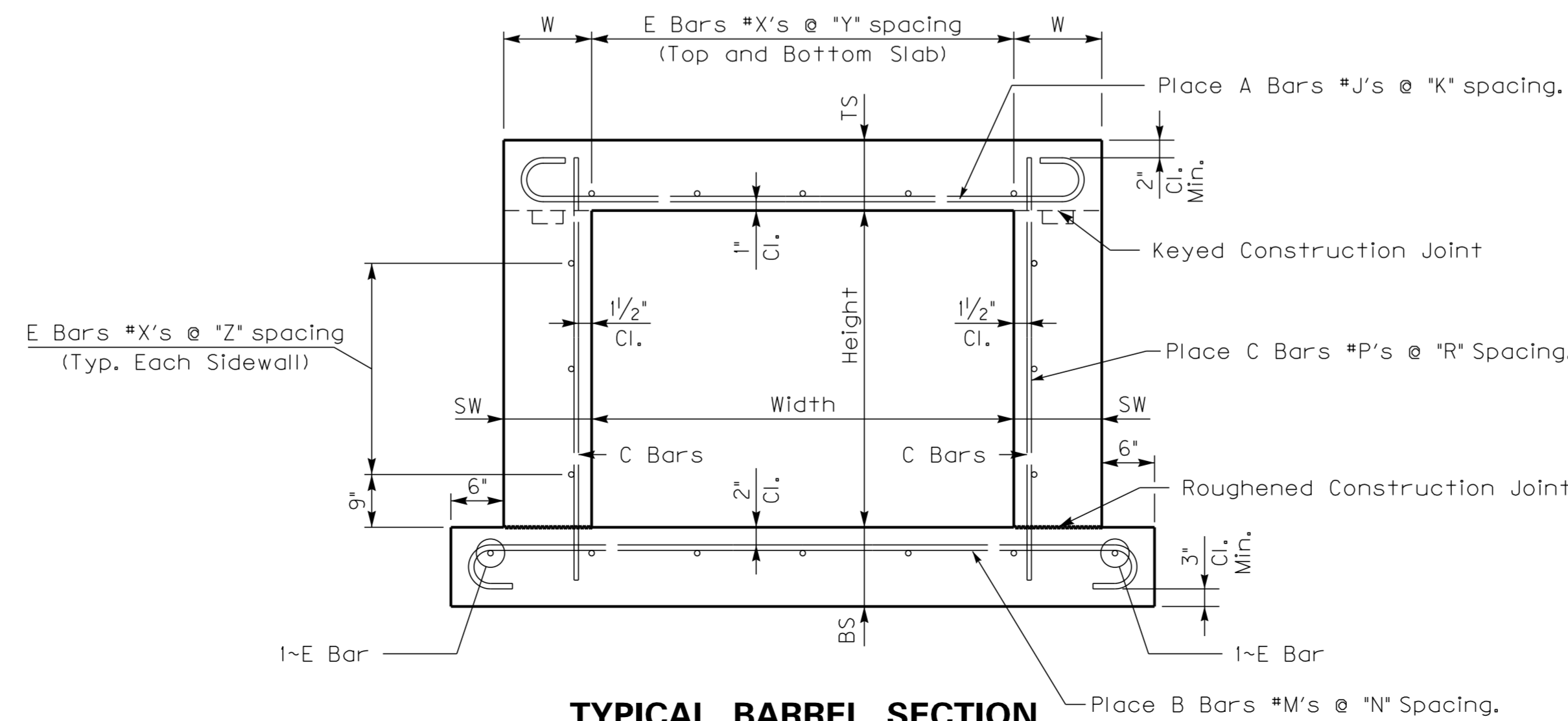
TYPE 4



OPTIONAL HOOK DETAIL

NOTE: The contractor will not be paid additionally if optional hook detail is used.

NOTE: Bar Dimensions are per bar.



TYPICAL BARREL SECTION

DATE 11/2017
DRAWN E. Downey
CHECKED J. Van Zee
RECOMMENDED
APPROVED F.H.W.A.
REVISED BY

KENTUCKY DEPARTMENT OF HIGHWAYS

STANDARD CULVERT 16'-0" WIDTH

STANDARD DRAWING NO. B--007-01

SUBMITTED 11-01-17
APPROVED STATE HIGHWAY ENGINEER DATE 11-01-17

SPECIAL NOTE FOR CONCRETE SEALING

These Notes or designated portions thereof, apply where so indicated on the plans, proposals or bidding instruction.

- I. DESCRIPTION.** Perform all work in accordance with the Department's 2019 Standard Specifications, and applicable Supplemental Specifications, the attached sketches, and these Notes. Section references are to the Standard Specifications.

This work consists of: (1) Furnish all labor, materials, tools, and equipment; (2) Clean the bridge deck; (3) Seal the bridge deck; (4) Maintain & control traffic; and, (5) Any other work specified as part of this contract.

II. MATERIALS.

- A. Sealer.** Use one of the following:

Product	Supplier
Protectosil BHN	Evonik Industries
Protectosil 300S	Evonik Industries
TK-590-40 Tri-Silane 40%	TK Products
SW-244-100	Chemical Products Industries, Inc.
TK-590-1 MS Tri-Silane	TK Products
MasterProtect H1000	BASF
Aquanil Plus 40	ChemMasters
SIL-ACT ATS-100	Advanced Chemical Technologies
Certivex Penseal BTS 100%	Vexcon
Pentreat 244-40	W.R. Meadows
Aquanil Plus 40A	ChemMasters

- B. Coverage Rate:** Follow all manufacturers recommendations for coverage rates except the application rate must not exceed the square footage coverage rate per gallon of sealer as given in the chart below. If the manufacturer recommends a coverage rate greater than given in the table below, apply sealer at the rate given in the table below for the chosen sealers silane percentage.

% Silane	Coverage rate (ft ² /gallon)
100	300
40	125
20	60

III. CONSTRUCTION.

- A. Cleaning the Deck.** Dry clean the deck to remove all loose debris. Remove all visible hydrocarbons from the surface with detergent approved by the manufacturer of the deck sealant. Pressure wash all surfaces to be sealed at 2000 to 3000 psi. Install pressure gauges at each wand to verify pressure. Use 30° fan tip or as recommended by the manufacturer of the deck sealant. Hold pressure washing wand a minimum of 45° from the deck with a maximum stand-off distance of 12 inches.
- B. Sealing the Deck.** Allow new concrete to cure a minimum 28 days prior to application of sealer. Monitor weather conditions prior to sealer application. Refer to manufacturer's recommendations for proper ambient conditions. Do not apply sealer if precipitation is anticipated within the time stated by the manufacturer. Allow the deck to dry 24 hours (after washing or rain event) before sealer application. The deck can be reopened to traffic while drying. Sealer must be applied within 48 hours of washing or the deck must be rewashed. Divide the deck into predefined areas of specific square footage to aid in determining usage. Comply with manufacturer's usage recommendation. Using a low pressure pump, apply sealer and spread evenly with broom or squeegee; do not allow pooling to remain. When each predefined area is complete, measure the amount of sealer used to verify proper usage. After sealing, follow manufacturer's recommended cure time before opening to traffic. On vertical surfaces, apply the sealer in a flooding application from the bottom up, so the material runs down 6 to 8 inches below the spray pattern.
- C. Inspection:** Monitor all aspects of the project to assure compliance to this specification. Observe and document general conditions during the entirety of the project. Verify that each phase of work has been satisfactorily completed prior to beginning the next phase. Phases are described as follows:
1. Dry cleaning to remove loose debris, verify and document:
 - a. All debris has been removed and disposed of properly.
 2. Removal of hydrocarbons, verify and document:
 - a. The manufacturer's recommended detergent is used for removal.

- b. Hydrocarbons have been satisfactorily removed.
- 3. Pressure washing, verify and document:
 - a. Washing pressure at the wand.
 - b. Tip size used.
 - c. Wash angle and stand-off distance.
 - d. The deck is satisfactorily cleaned.
- 4. Sealer application, verify and document:
 - a. Proper cure time for new concrete.
 - b. Deck surface is dry.
 - 1. Document time since washed.
 - 2. Was deck opened to traffic after washing?
 - c. Ambient conditions.
 - 1. Document ambient temperature, surface temperature, relative humidity, and dew point.
 - d. Application and distribution method.
 - e. Coverage to be complete and even.
 - f. Material is not allowed to remain pooled.
 - g. Monitor material usage.
 - h. No traffic until proper cure time is allowed.

IV. MEASUREMENT

- A. Concrete Sealing.** The Department will measure the quantity per square feet of each area sealed.

V. PAYMENT

- A. Concrete Sealing.** Payment at the contract unit price per square feet is full compensation for the following: (1) Furnish all labor, materials, tools, and equipment; (2) Clean the bridge deck; (3) Seal the bridge deck; (4) Maintain & control traffic; and, (5) Any other work specified as part of this contract.

**SPECIAL NOTE FOR BRIDGE DECK WATERPROOFING
MEMBRANE AND ASPHALT OVERLAY ON BRIDGES**

I. DESCRIPTION

Perform all work in accordance with the Department's 2012 Standard Specifications, applicable Special Provisions, and Standard Drawings, except as hereafter specified. Article references are to the Standard Specifications. Furnish all materials, labor, equipment, tools, and incidentals necessary to complete the One Step Bridge Deck Waterproofing Membrane.

II. MATERIALS

- A. Bridge Deck Waterproofing Membrane.** See Section 808.05.
- B. Surface Primer.** Use surface primer material recommended by the manufacturer.
- C. Asphalt Overlay.** Pave the bridge with the same type and thickness of asphalt that is being placed on the adjacent roadway.

III. CONSTRUCTION METHODS

- A. Surface Preparation.** Thoroughly clean the entire surface area of the bridge deck prior to paving. Clean by either air blasting or water blasting. If water blasting is used, thoroughly dry area prior to placing the primer and membrane.
- B. Prime Coating.** Apply material to the bridge deck according to the Manufacturer's recommendations.
- C. One Step Membrane.** Apply the membrane to the entire surface of the bridge deck. Overlap the membrane a minimum of 1 foot onto the adjacent roadway approaches. Extend the membrane up the face of the curbs a minimum of 1½ inches. Overlap membrane as necessary to achieve 100% coverage of the bridge deck. Install as recommended by the manufacturer, straight and wrinkle free, with no curled or uplifted edges.
- E. Pave Bridge with Asphalt Surface.** Pave the bridge with asphalt overlay immediately after the one step membrane is in place.

IV. METHOD OF MEASUREMENT

- A. One Step Membrane.** The Department will measure this item in square yards. The one step membrane area (A) will be calculated from the (L) length of the bridge plus 1 foot on each approach multiplied by the (W) width of the bridge curb to curb. $A = ((L+2) \times W)$

W)/9. This calculated area will be the area measured for payment; laps, cutoffs and waste will not be measured for payment.

V. METHOD OF PAYMENT

A. Waterproofing Membrane. Payment at the contract unit price per square yard shall be full compensation for all labor, equipment, materials and incidentals for surface preparation and furnishing and installing the surface primer and the one step membrane according to the Manufacturer's recommendations and these notes.

WATERPROOFING MEMBRANE
04/11/2019

SPECIAL NOTE FOR HOT-DIP GALVANIZING STEEL

These Notes or designated portions thereof, apply where so indicated on the plans, proposals or bidding instruction.

I. DESCRIPTION. This work shall consist of surface preparation and hot-dip galvanizing structural steel specified on the plans. An additional coating system as described in Section 607.03.23 of the Specifications is not required when this note is included in the contract.

II. MATERIALS.

- A. Steel.** Use steel specified in the plans; however, fabricator must confirm that the steel material has silicon content either below 0.4% or between 0.15% and 0.22% to ensure galvanizing will perform and bond as required. Steel material out of this range shall be rejected. This specification can only be utilized for rolled steel beam bridges (no plate girders) and associated hardware.
- B. Zinc.** In accordance with AASHTO M111.

III. HOT-DIP GALVANIZING.

A. Application.

Steel members, fabrications and assemblies shall be galvanized by the hot-dip process in the shop according to AASHTO M111 (*Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products*).

Bolts, nuts, washers and steel components shall be galvanized in the shop according to AASHTO M232 (*Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware*).

B. Safeguarding against embrittlement, distortion, and cracking

All steel shall be safeguarded against embrittlement according to ASTM A143 (*Standard Specification for Safeguarding against Embrittlement of Hot-Dip Galvanized Structural Steel Products and Procedure for Detecting Embrittlement*). Water quenching or chromate conversion coatings shall not be used on any steel work that is to be painted.

All galvanized steel work shall be handled in a manner to avoid mechanical damage and minimize distortion. Members shall be supported during galvanization to prevent permanent distortion. The contractor/fabricator/galvanizer must propose changes to the element prior to preparing shop drawings if necessary to minimize the chances of permanent distortion or cracking during hot-dip galvanizing. Pre-heating must be utilized if necessary to minimize the chance of permanent distortion or cracking.

The contractor is required to inspect each element for distortion following hot-dip galvanizing prior to dipping the next element. Consult the Engineer if distortion is detected before proceeding to the next element.

C. Fabrication

Hot-dip galvanizing shall be indicated on the shop drawings. The fabricator shall coordinate with the galvanizer to incorporate additional steel detail required to facilitate galvanizing of the steel. These additional details shall be indicated on the shop drawings.

To insure identification after galvanizing, piece marks shall be supplemented with metal tags for all items where fit-up requires matching specific pieces.

After fabrication (cutting, welding, drilling, etc.) is complete, all holes shall be deburred and all fins, scabs or other surface/edge anomalies shall be ground or repaired per ASTM A6. The items shall then be cleaned per Steel Structures Painting Council's Surface Preparation Specification SSPC-SP1 (Solvent Cleaning) and SSPC-SP6 (Commercial Blast Cleaning). All surfaces shall be inspected to verify no fins, scabs or other similar defects are present.

All welded attachments shall be connected prior to hot dip galvanization, including shear studs.

Beams shall be handled, stored and transported with their webs vertical and with proper cushioning to prevent damage to the member and coating. Members shall be supported during galvanizing to prevent permanent distortion.

D. Surface Preparation

The Contractor/Fabricator shall consult with the galvanizer to insure proper removal of grease, paint and other deleterious materials prior to galvanizing. The members shall be abrasive blasted/cleaned to SSPC SP6/NACE 3 to remove all mill scale.

E. Coating Requirements

Coating weight, surface finish, appearance and adhesion shall conform to requirements of ASTM A385 (*Standard Practice for Providing High-Quality Zinc Coatings (Hot-Dip)*) and AASHTO M111 or AASHTO M232, as appropriate.

F. Testing Requirements

Inspection and testing of hot-dip galvanized coatings shall follow the guidelines provided in the American Galvanizers Association publication "*Inspection of Products Hot-dip Galvanized after Fabrication*". Sampling, inspection, rejection and retesting for conformance with requirements shall be according to AASHTO M111 or AASHTO M232 as applicable, with the target coating thickness of 152 microns (6 mils). Coating thickness shall be measured according to AASHTO M111, for magnetic thickness gage measurement and AASHTO M232 as appropriate. The Cabinet may elect to conduct testing in addition to the Standards required testing.

All galvanized steel will be visually inspected for finish and appearance.

Bolts, nuts, washers, and steel components shall be packaged according to AASHTO M232. Identity of bolts, nuts and washers shall be maintained for lot-testing after galvanizing according to Article 505.04(f)(2) for high strength steel bolts.

G. Connection Treatment

After galvanizing and prior to shipping, contact surfaces for any bolted connections shall be roughened by hand wire brushing or according to SSPC-SP7 (Brush-Off Blast Cleaning). Power wire brushing is not allowed.

All bolt holes shall be reamed or drilled to their specified diameters after galvanizing. All bolts shall be installed after galvanizing.

H. Repair of Hot-dip Galvanized Coating

Surfaces with inadequate zinc thickness will be repaired using zinc based solder in accordance to ASTM A780 (*Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings*) Section 4.2.1 and AASHTO M111. Any fins or slivers present after galvanizing will be removed and repaired ASTM A780 (Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings) Section 4.2.1 and AASHTO M111.

Surfaces of galvanized steel that are damaged after the galvanizing operation shall be repaired according to ASTM A780. Damage that occurs in the shop shall be repaired in the shop. Damage that occurs during transport or in the field shall be repaired in the field. Any drips or runs in the galvanizing will be removed by grinding to match the surrounding surface.

All bolt holes shall be reamed or drilled to their specified diameters after galvanizing.

The Cabinet's Project Team must inspect and approve the galvanized steel prior to the subsequent Phase of Work.

V. PAYMENT

The cost of all surface preparation, galvanizing, and all other work described herein shall be the considered as included in the unit price bid for the applicable pay item to be hot-dip galvanized.

The Department will consider payment as full compensation for all work required by these notes and detail drawings.