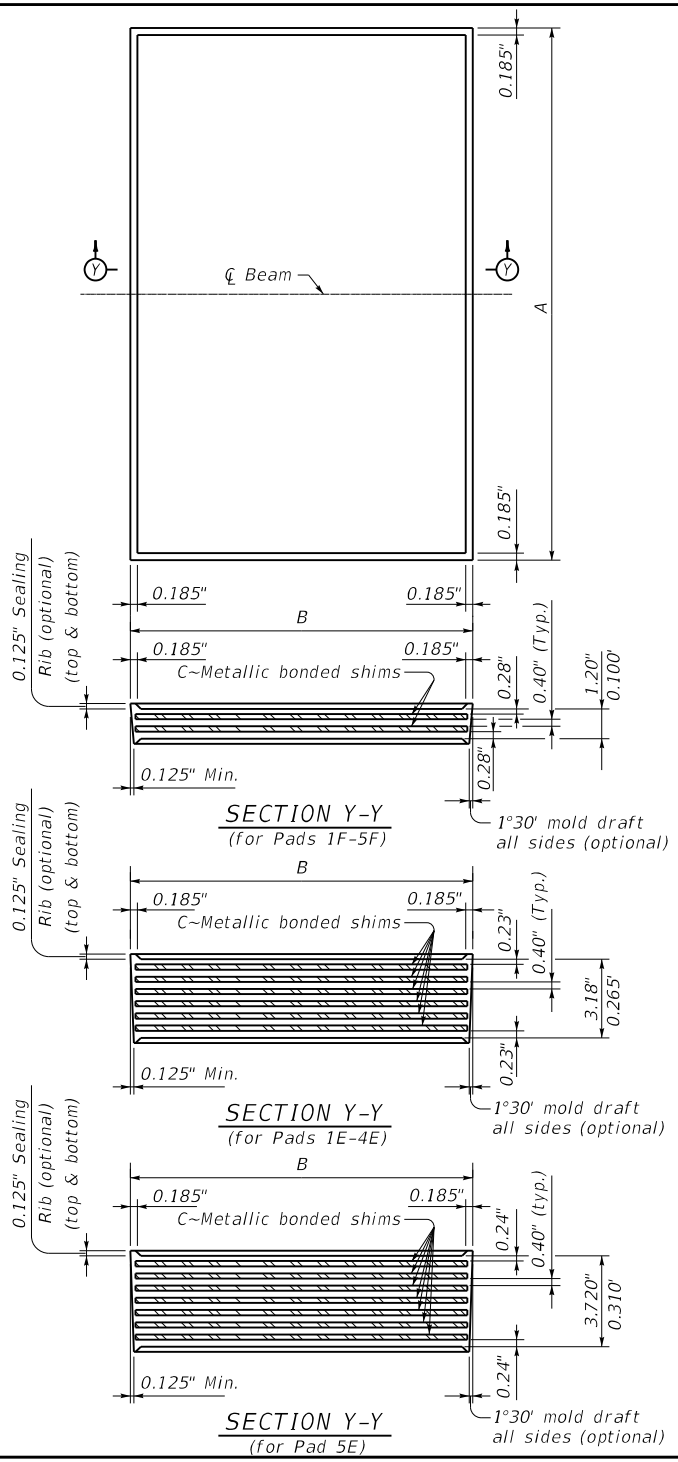


DIMENSIONS FOR I-BEAM PADS

PAD	A	B	C	*MAXIMUM REACTION	MAXIMUM MOVEMENT (One Direction)
1F	14"	10"	2~0.12" x 13.630" x 9.630"	121k	0.5"
2F	16"	10"	2~0.12" x 15.630" x 9.630"	146k	0.5"
3F	20"	10"	2~0.12" x 19.630" x 9.630"	197k	0.5"
4F	24"	10"	2~0.12" x 23.630" x 9.630"	251k	0.5"
5F	24"	11"	2~0.12" x 23.630" x 10.630"	265k	0.5"

* Use actual reactions to determine anchorage requirements for pads.

DIMENSIONS FOR I-BEAM PADS

PAD	A	B	C	*MAXIMUM REACTION	MAXIMUM MOVEMENT (One Direction)
1E	14"	10"	6~0.12" x 13.630" x 9.630"	121k	1.22"
2E	16"	10"	6~0.12" x 15.630" x 9.630"	146k	1.22"
3E	20"	10"	6~0.12" x 19.630" x 9.630"	197k	1.22"
4E	24"	10"	6~0.12" x 23.630" x 9.630"	251k	1.22"
5E	24"	11"	7~0.12" x 23.630" x 10.630"	265k	1.44"

* 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.

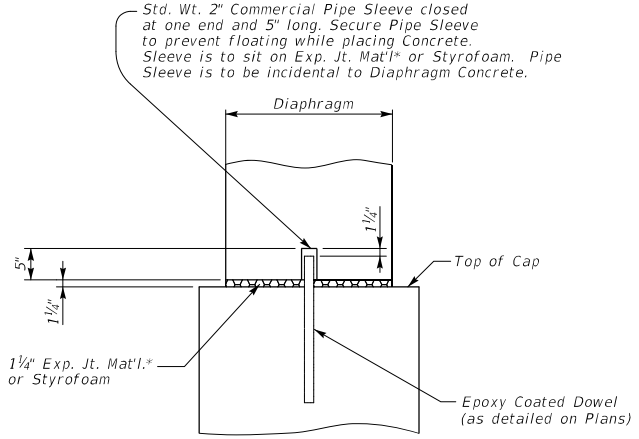
KENTUCKY
DEPARTMENT OF HIGHWAYS

ELASTOMERIC BEARING PADS FOR PRESTRESSED BEAMS

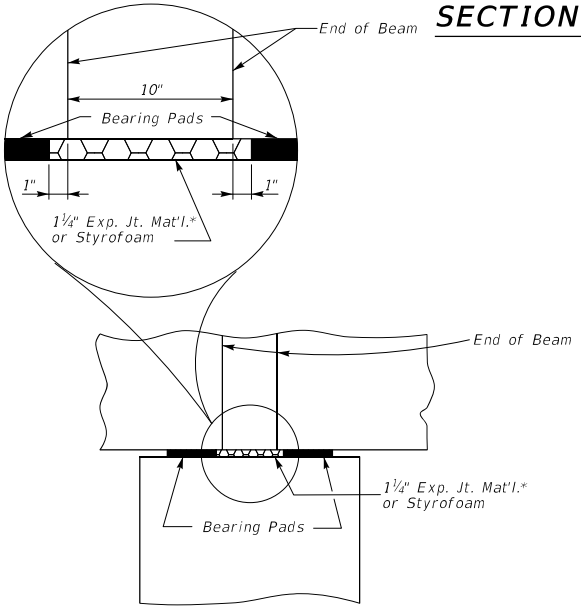
STANDARD DRAWING NO. BBP-001-12

SUBMITTED — DIRECTOR DIVISION OF STRUCTURAL DESIGN — DATE 02-26-20

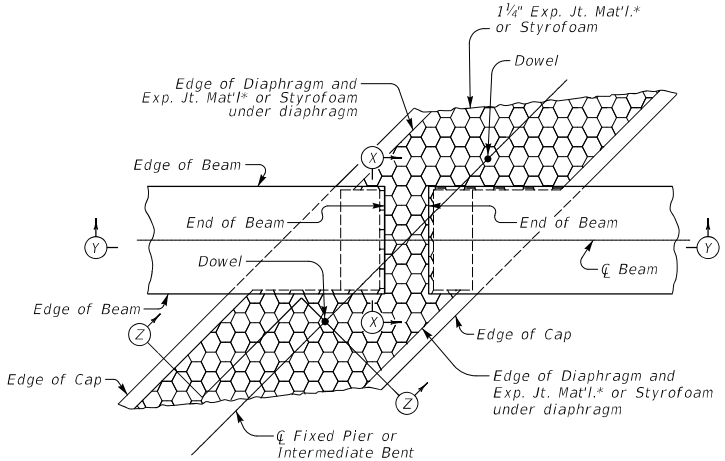
APPROVED — STATE HIGHWAY ENGINEER — DATE 02-26-20



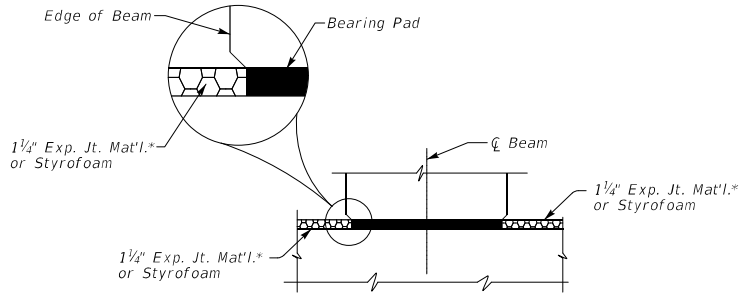
SECTION Z-Z



SECTION Y-Y



PLAN



SECTION X-X

*Expansion Joint Material:
AASHTO M153
Type-I Sponge Rubber

REVISION DATE: 08/11/2025
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — DATE: 08-11-2025

APPROVED — STATE HIGHWAY ENGINEER — DATE: 08-11-2025

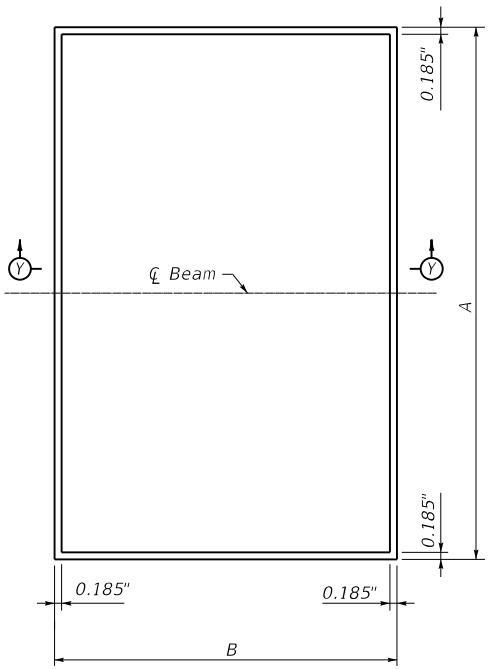
BEARING DEVICES

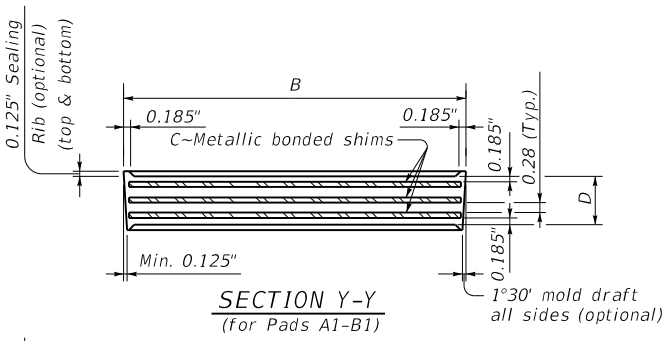
COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

BEARING DETAILS

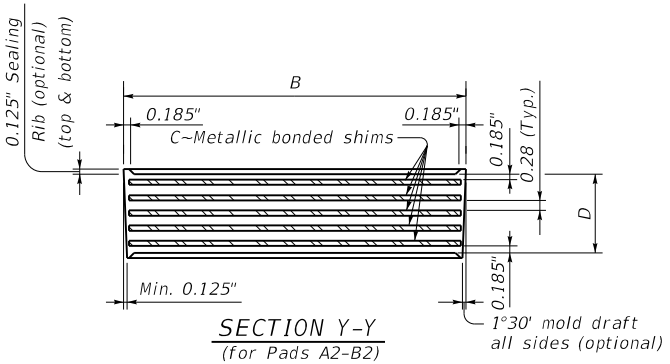
STANDARD DRAWING NUMBER
BBP-002-01

OpenRoads Designer v23.00.01.11





SECTION Y-Y
(for Pads A1-B1)



SECTION Y-Y
(for Pads A2-B2)

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 _____ 02-26-20
DIRECTOR DIVISION OF STRUCTURAL DESIGN — DATE

APPROVED _____ 02-26-20
STATE HIGHWAY ENGINEER — DATE

PRECAST PRESTRESSED BOX BEAMS

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:
Δd (in.): Sum of the downwards deflections caused by the design 5" deck, railing, and future wearing surface. (Positive Downwards)
Δc (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 ½" 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 ¾".

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 5½" 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	½"x 7"	ASTM A36 or A572	A123
Tubing	8x4x0.1875	ASTM A500 or A501	A123
Bolts	⅝"	ASTM A307	A153
Nuts	for ⅝"	ASTM A563, Grade A or better	A153
Washers	for ⅝"	ASTM A563, Grade A or better	A153
Stud	1¼"	ASTM A108 (1045 C.D. Bar)	B633, Type II, Class 25
Ferrule	2½"x 5"	ASTM A108 (11L17 Steel)	B633, Type II, Class 25
Wire	⅜"	ASTM A510 (1018 Steel)	B633, Type II, Class 25
Nut	for 1¼" Bolt	ASTM A108 (12L14 Steel)	B633, Type II, Class 25
Nut	for 1¼" Stud	ASTM A325M	B633, Type II, Class 25
Washers	for 1¼" 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

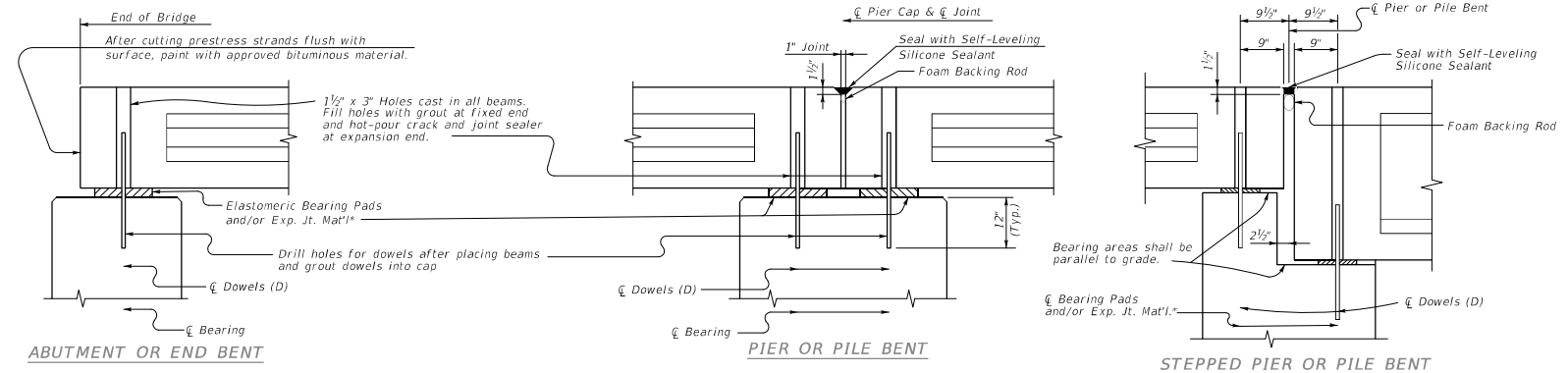
KENTUCKY
DEPARTMENT OF HIGHWAYS

BOX BEAM
GENERAL NOTES
AND REFERENCES

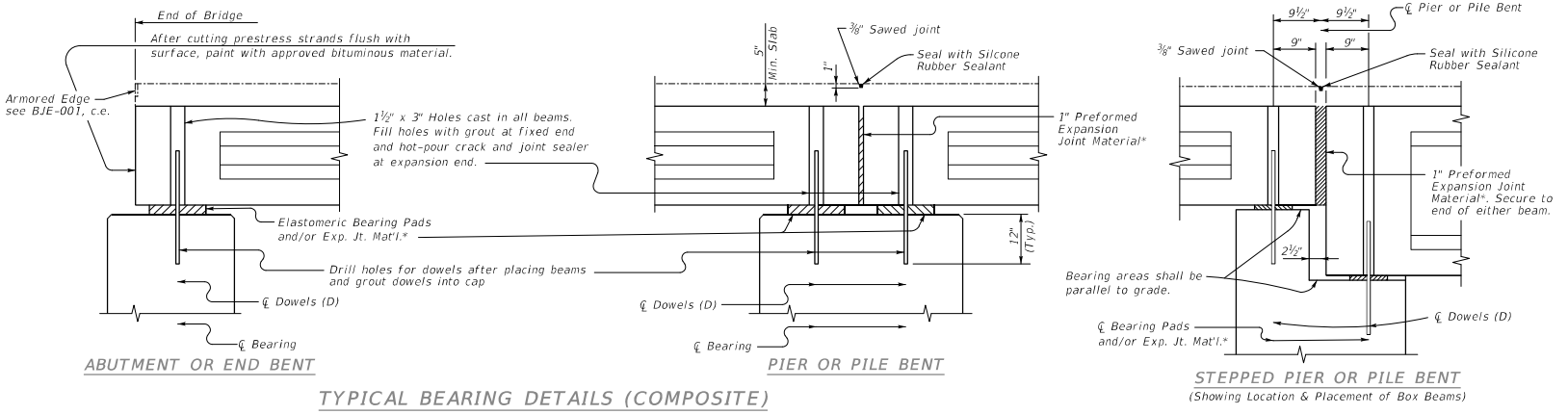
STANDARD DRAWING NO. BDP-001-06

SUBMITTED _____ 02-26-20
DIRECTOR DIVISION OF STRUCTURAL DESIGN — DATE

APPROVED _____ 02-26-20
STATE HIGHWAY ENGINEER — DATE



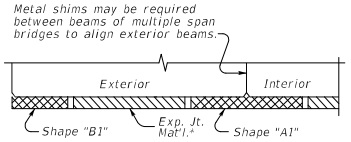
TYPICAL BEARING DETAILS (NON-COMPOSITE)



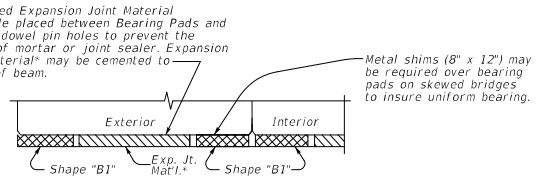
TYPICAL BEARING DETAILS (COMPOSITE)

*Expansion Joint Material:
AASHTO M153
Type-I Sponge Rubber

** Preformed Neoprene Rubber Sheet:
50 Durometer
AASHTO M251, Grade 3

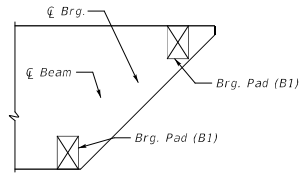


For Elastomeric Bearing Pad Details of Shapes A1 & B1, see Std. Dwg. BBP-003, c.e.



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

Use ½" x 1'-6" preformed neoprene rubber sheet** for beam types B12-B21 & CB12-CB21 for bearing.



PAD PLACEMENT FOR SKEWS

Pads "B1" are to always be placed perpendicular to ℄ beam with center of pad over ℄ bearing.

GENERAL NOTES

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

REVISION DATE: 08/11/2025
REVISION NUMBER: 0

Michael Cupp — 08-11-2025
SUBMITTED — DIVISION DIRECTOR — DATE

Jason Ballinger — 08-11-2025
APPROVED — STATE HIGHWAY ENGINEER — DATE

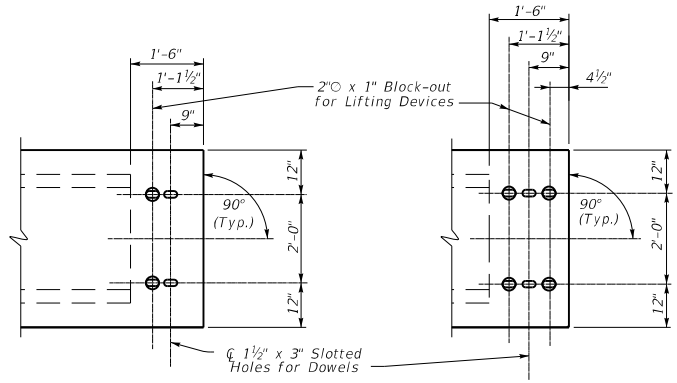
DECK UNITS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

BOX BEAM BEARING DETAILS

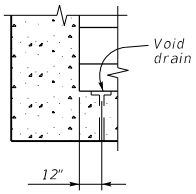
STANDARD DRAWING NUMBER
BDP-002-01

OpenRoads Designer v23.00.01.11



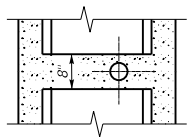
NOTE: Void omitted on 12" beams.

TYPICAL STRAIGHT END



VOID DRAIN DETAIL

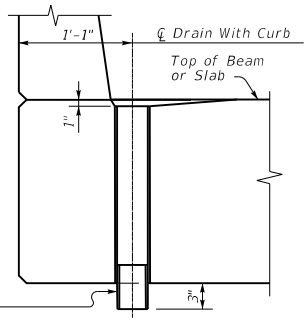
Locate two drains at each end of each void. Provide 1"○ drains of a type approved by the Division of Materials.



SECTION THRU BEAM

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

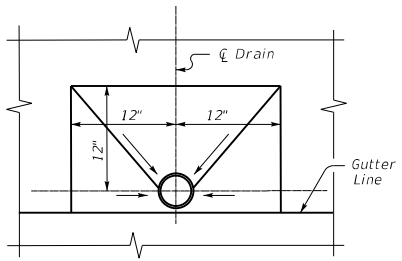
Provide drains on both sides of bridge with normal crown and on low side only for superelevated bridges. Space drains at maximum 12'-6" on centers with a minimum of one placed each gutter line per span. Omit drains when span crosses over a highway or railroad. Include the cost of pipe and fittings in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



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

SECTION THRU DRAIN EXTERIOR BOX BEAM

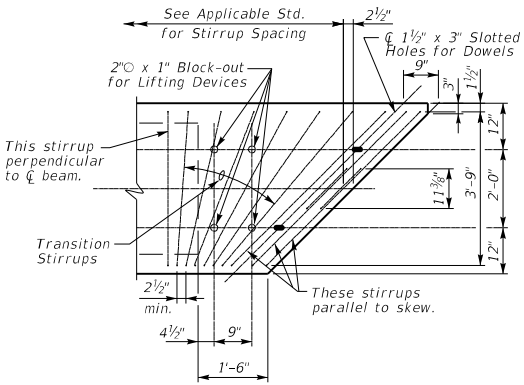
(Showing coupling in barrier)



TOP VIEW OF DRAIN

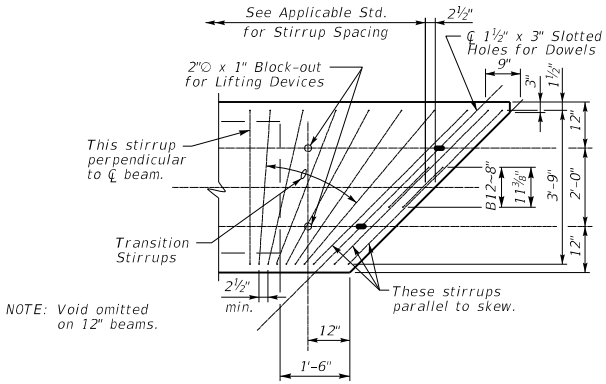
DRAIN DETAILS

(For Spans With Curbs)



TYPICAL SKEWED END FOR BEAMS OVER 50 FEET

(Right Skew Shown, Left Opposite Hand)

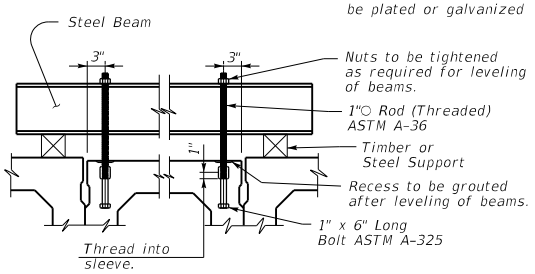


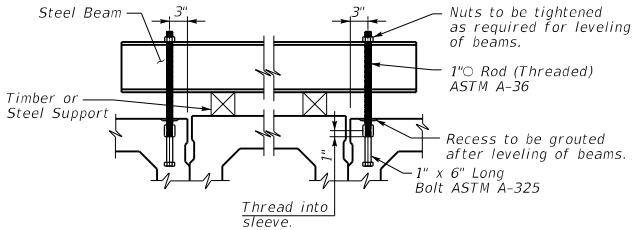
NOTE: Void omitted on 12" beams.

TYPICAL SKEWED END FOR BEAMS 50 FEET OR LESS

(Right Skew Shown, Left Opposite Hand)

NOTE: Inserts are to be plated or galvanized

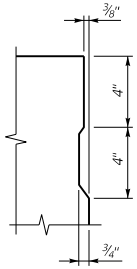




LEVELING DEVICE DETAILS

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.



SHEAR KEY DETAIL

KENTUCKY
DEPARTMENT OF HIGHWAYS

BOX BEAM MISCELLANEOUS DETAILS

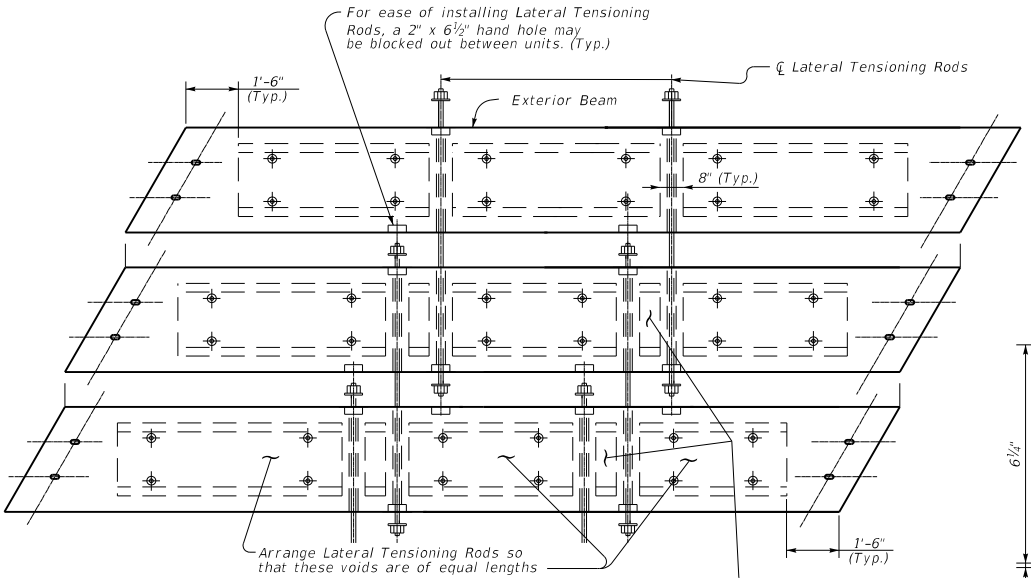
STANDARD DRAWING NO. BDP-003-03

SUBMITTED _____ DIRECTOR DIVISION OF STRUCTURAL DESIGN — DATE 02-26-20

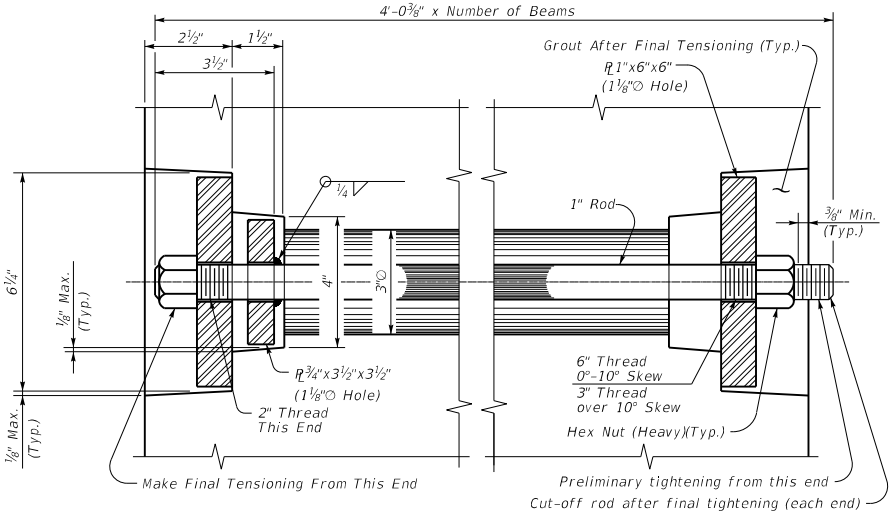
APPROVED _____ STATE HIGHWAY ENGINEER — DATE 02-26-20

GENERAL NOTES

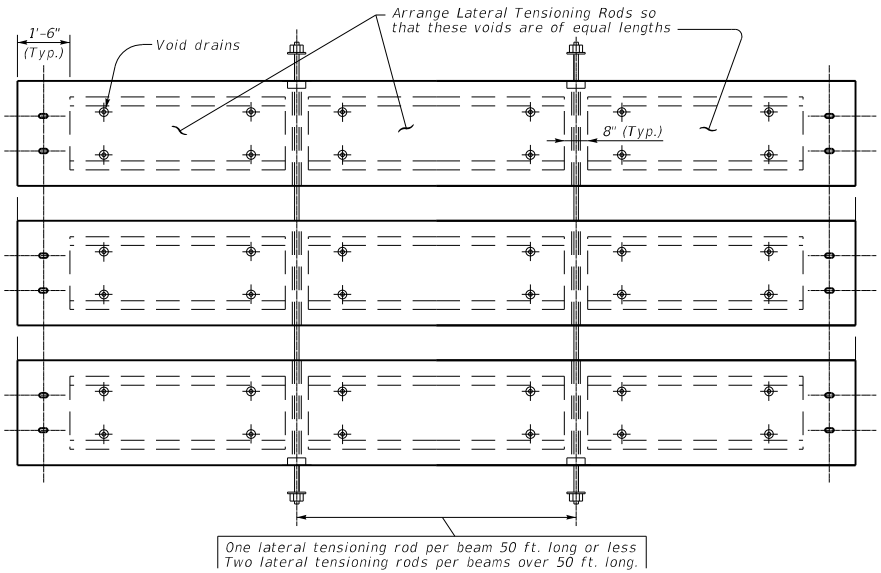
LATERAL TENSIONING RODS: After the deck units are in place, apply a preliminary tension to the lateral tensioning rods. Perform final tensioning that yields 20,000 psi as developed by a torque of 200 ft./lbs. Provide lateral tensioning rods and plates conforming to ASTM A36 with heavy hex nuts conforming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

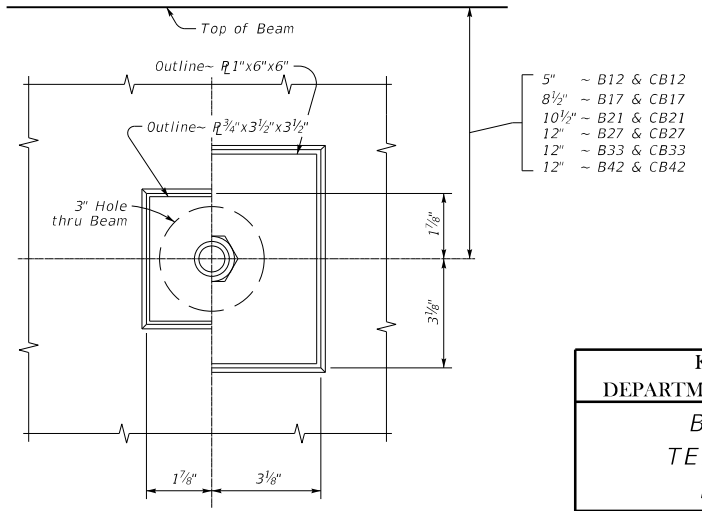


SECTION THRU LATERAL TENSIONING ROD



SECTIONAL PLAN SHOWING LATERAL TENSIONING METHOD FOR STRAIGHT SPANS

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



SECTIONAL END PLAN

(Lateral Tension Rod Details)

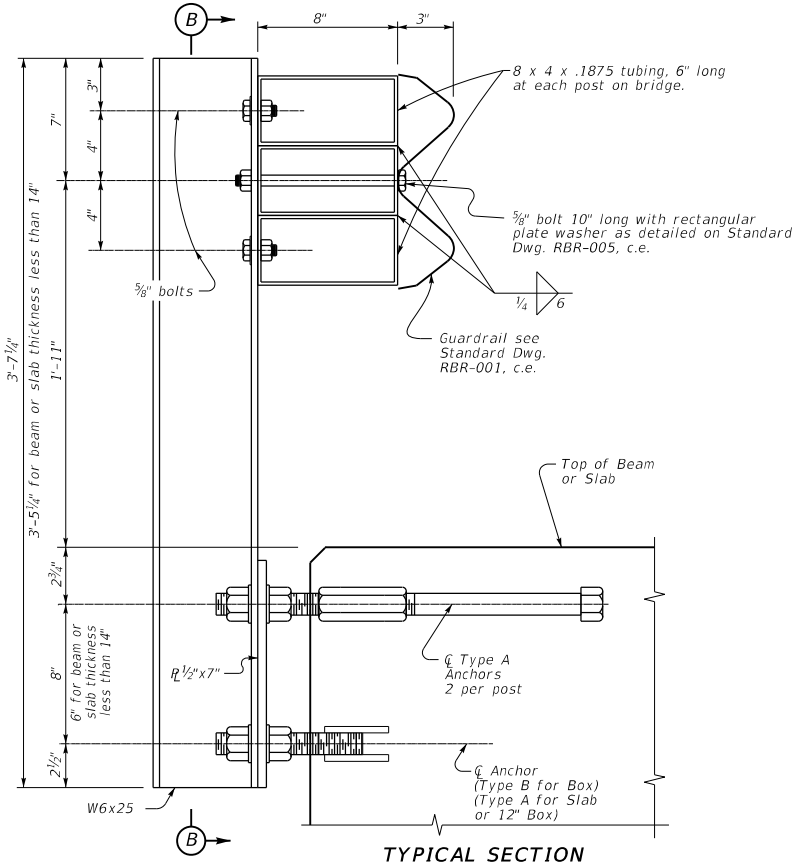
KENTUCKY
DEPARTMENT OF HIGHWAYS

BOX BEAM TENSION ROD DETAILS

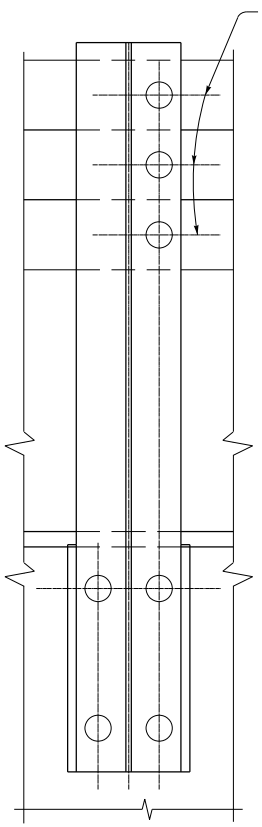
STANDARD DRAWING NO. BDP-004-04

SUBMITTED _____ DIRECTOR DIVISION OF STRUCTURAL DESIGN — 02-26-20 DATE

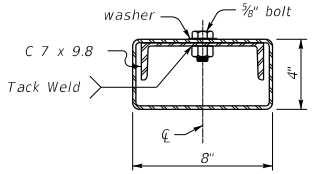
APPROVED _____ STATE HIGHWAY ENGINEER — 02-26-20 DATE



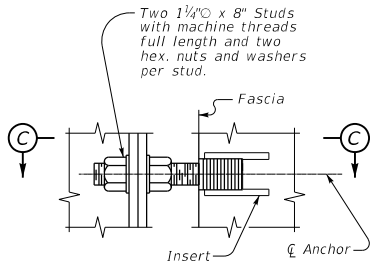
TYPICAL SECTION

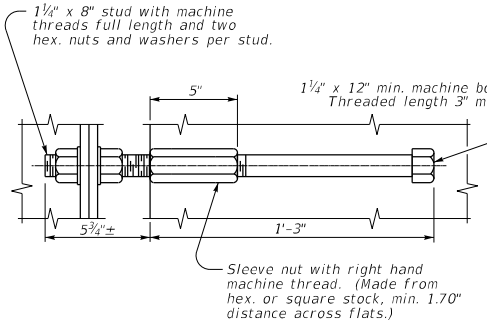


SECTION B-B

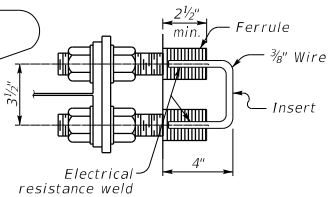


SECTION A-A



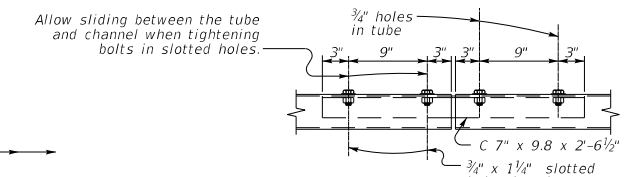


TYPE A ANCHOR DETAIL

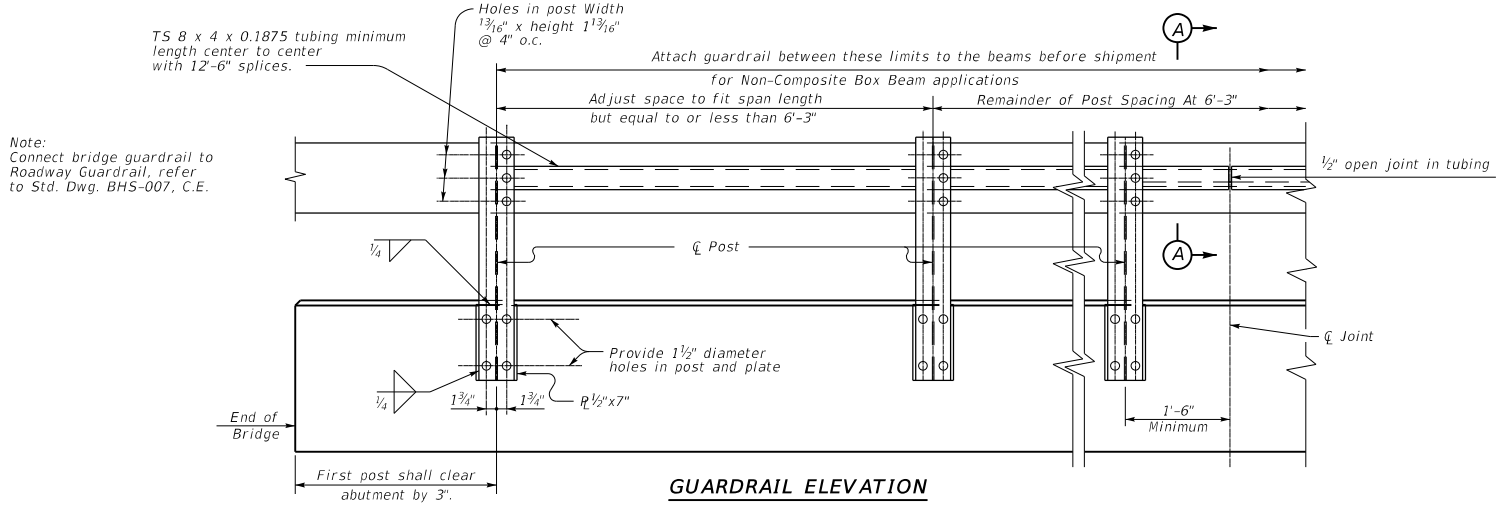


SECTION C-C

TYPE B ANCHOR DETAIL



OPEN JOINT



GUARDRAIL ELEVATION

Post Spacing

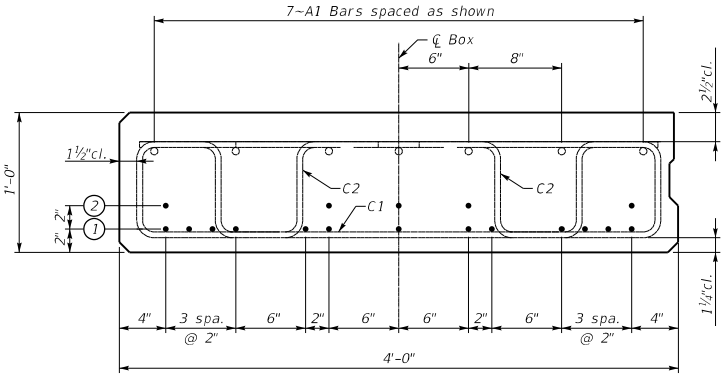
KENTUCKY
DEPARTMENT OF HIGHWAYS

RAILING SYSTEM TYPE II

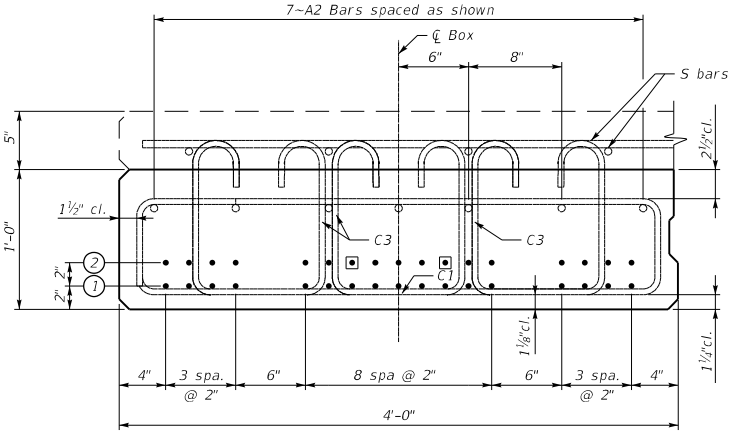
STANDARD DRAWING NO. BDP-005-06

SUBMITTED _____ DIRECTOR DIVISION OF STRUCTURAL DESIGN — 02-26-20 DATE

APPROVED _____ STATE HIGHWAY ENGINEER — 02-26-20 DATE

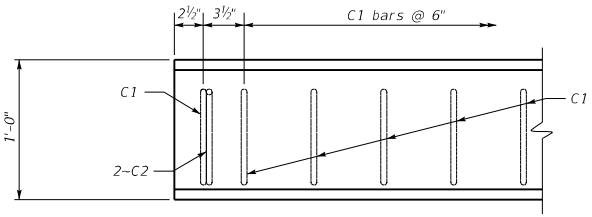


B12 BEAM



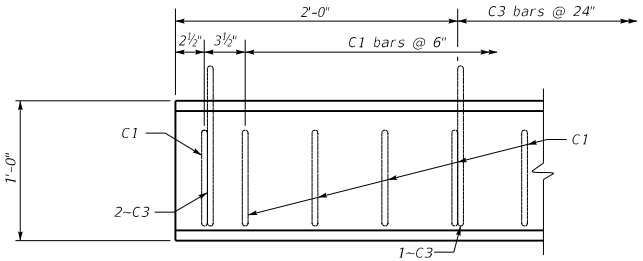
CB12 BEAM

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



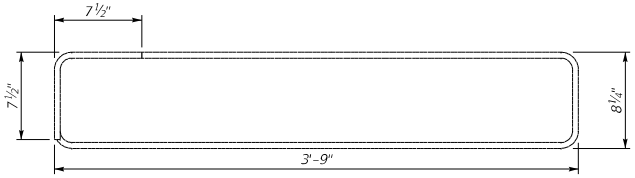
B12 ELEVATION OF O° SKEW

(Refer to BDP-003,c.e. for skewed details)



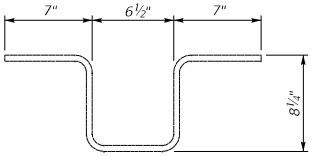
CB12 ELEVATION OF O° SKEW

(Refer to BDP-003,c.e. for skewed details)



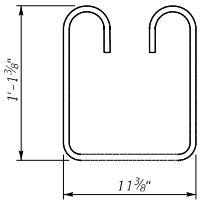
C1(e) Bar

#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 Row ①	Row ②	Concrete Strength 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		
	26	13	5		
CB12	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.)	Δc (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		
	26	53	2		8.4	0.7	33.8	43.4		
CB12	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"

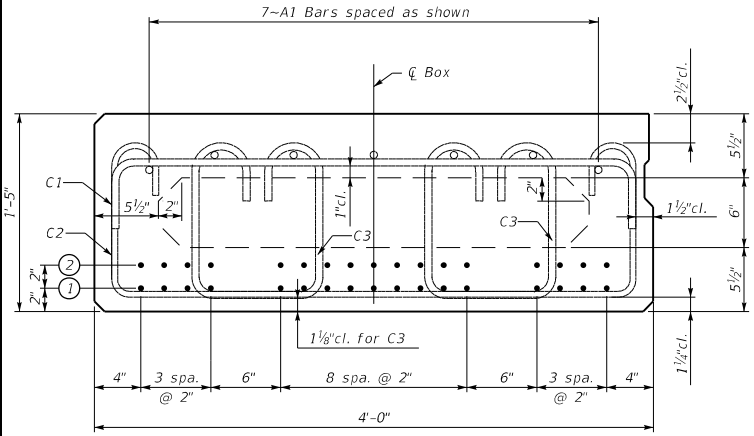
KENTUCKY
DEPARTMENT OF HIGHWAYS

BOX BEAM
B12 & CB12
DETAILS

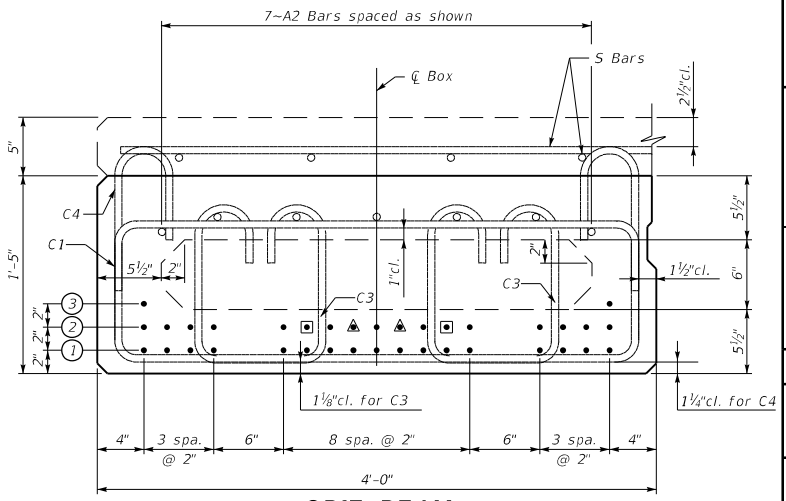
STANDARD DRAWING NO. BDP-006-05

SUBMITTED _____ 02-26-20
DIRECTOR DIVISION OF STRUCTURAL DESIGN — DATE

APPROVED _____ 02-26-20
STATE HIGHWAY ENGINEER — DATE

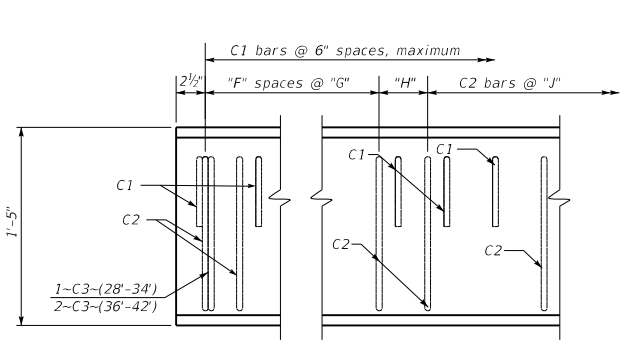


B17 BEAM

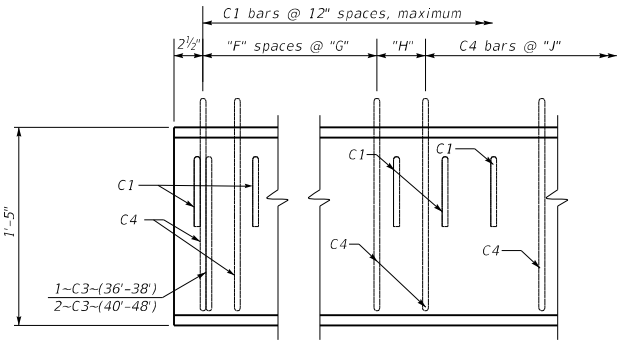


CB17 BEAM

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



B17 ELEVATION OF O° SKEW
(Refer to BDP-003,c.e. for skewed details)



CB17 ELEVATION OF O° SKEW
(Refer to BDP-003,c.e. for skewed details)

TABLE OF STRAND DATA

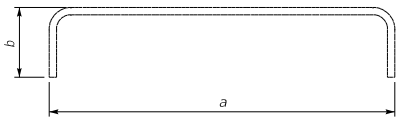
Beam Type	Beam Length (feet)	Number of Strands Required Row ①	Row ②	Row ③	Conc. Strength F'CI (psi)	F'C (psi)
B17	28	12				
	30	13				
	32	14				
	34	15				
	36	16				
	38	17	1			
	40	17	3			
	42	17	5			
CB17	36	14				
	38	15				
	40	16				
	42	17	1			
	44	17	2			
	46	17	9		6000	7000
	48	17	17	2	7000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

TABLE OF DIMENSION DATA

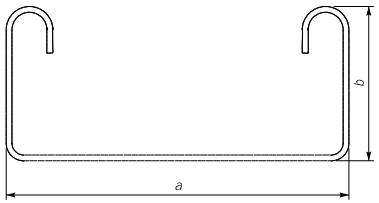
Beam Type	Beam Length (feet)	"F"	"G"	"H"	"J"				
B17	28	4	9"	8½"	11"				
	30	4	9"	9½"	11"				
	32	4	9"	10½"	11"				
	34	5	8"	7½"	11"				
	36	6	8"	6"	11"				
	38	7	7"	6½"	10"				
	40	7	7"	8½"	10"				
	42	7	7"	5½"	10"				
CB17	36	6	8"	11½"	14"				
	38	6	8"	9½"	14"				
	40	6	8"	7½"	14"				
	42	7	7"	8½"	12"				
	44	8	7"	7½"	12"				
	46	8	7"	7½"	12"				
	48	10	6"	9½"	12"				

TABLE OF BAR QUANTITIES — DESIGN DATA

Beam Type	Beam Length (feet)	C1	C2	C3	C4	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		
	40	81	53	4		13.4	1.1	42.1	53.4		
	42	85	56	4		14.1	1.2	43.0	54.5		
CB17	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



C1(e) Bar



C2(e)-C4(e) Bars

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'-1¼"	
C3(e)	#5	11⅜"	1'-1⅜"	
C4(e)	#4	3'-9"	1'-6¼"	

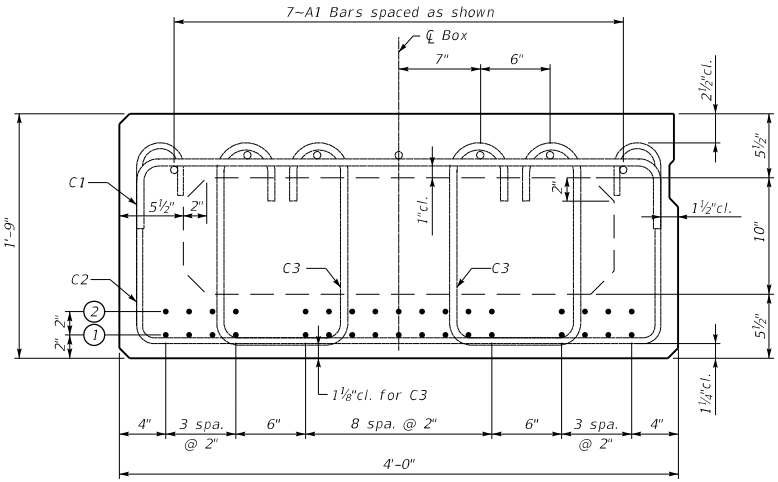
KENTUCKY
DEPARTMENT OF HIGHWAYS

BOX BEAM
B17 & CB17
DETAILS

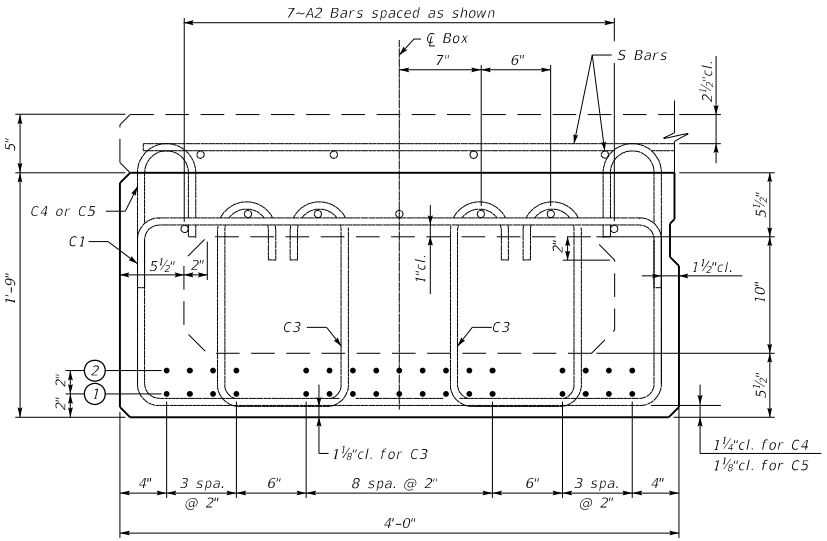
STANDARD DRAWING NO. BDP-007-05

SUBMITTED _____ 02-26-20
DIRECTOR DIVISION OF STRUCTURAL DESIGN — DATE

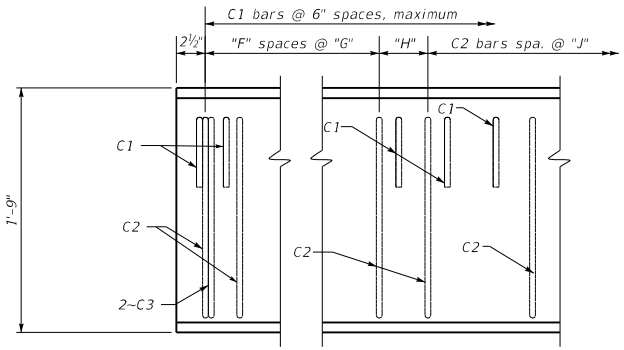
APPROVED _____ 02-26-20
STATE HIGHWAY ENGINEER — DATE



B21 BEAM

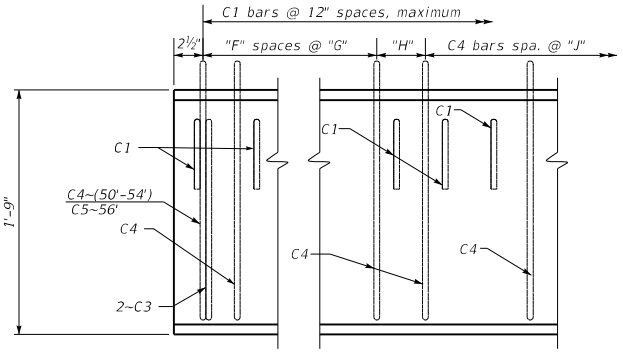


CB21 BEAM



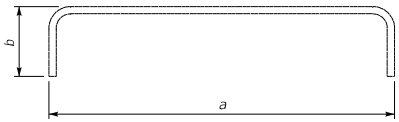
B21 ELEVATION OF O° SKEW

(Refer to BDP-003,c.e. for skewed details)

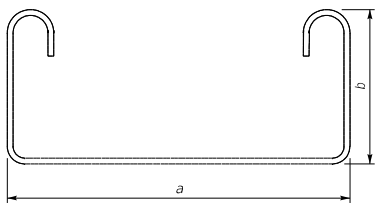


CB21 ELEVATION OF O° SKEW

(Refer to BDP-003,c.e. 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"	12½"	14"		
	46	6	9"	11½"	13"		
	48	7	9"	8"	13"		
	50	7	9"	7"	13"		
CB21	50	7	9"	10½"	16"		
	52	7	9"	14½"	16"		
	54	7	9"	10½"	16"		
	56	9	8"	13½"	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
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'-5¼"	
C3(e)	#5	11⅜"	1'-5⅜"	
C4(e)	#4	3'-9"	1'-10¼"	
C5(e)	#5	3'-9"	1'-10⅜"	

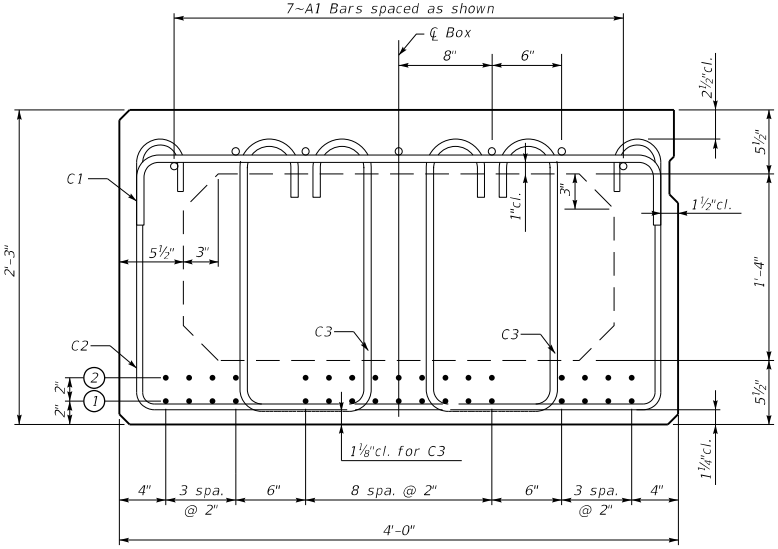
KENTUCKY
DEPARTMENT OF HIGHWAYS

BOX BEAM
B21 & CB21
DETAILS

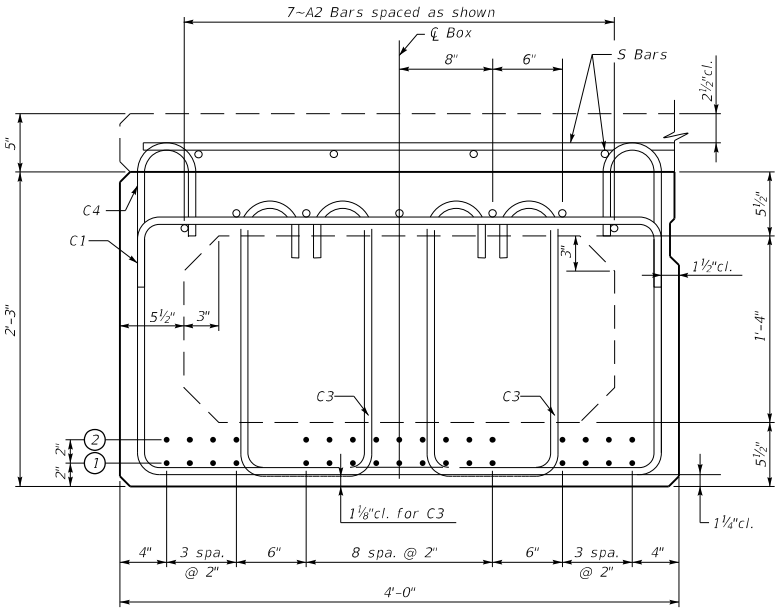
STANDARD DRAWING NO. BDP-008-04

SUBMITTED — DIRECTOR DIVISION OF STRUCTURAL DESIGN — 02-26-20 DATE

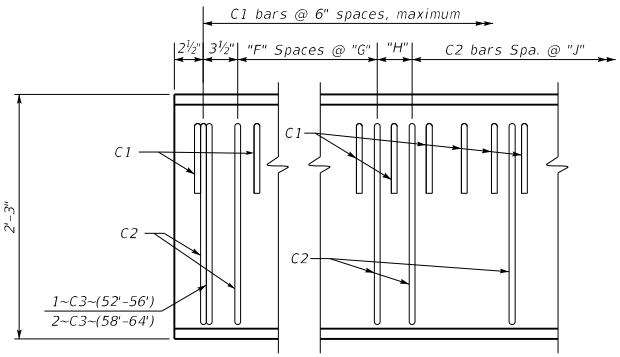
APPROVED — STATE HIGHWAY ENGINEER — 02-26-20 DATE



B27 BEAM

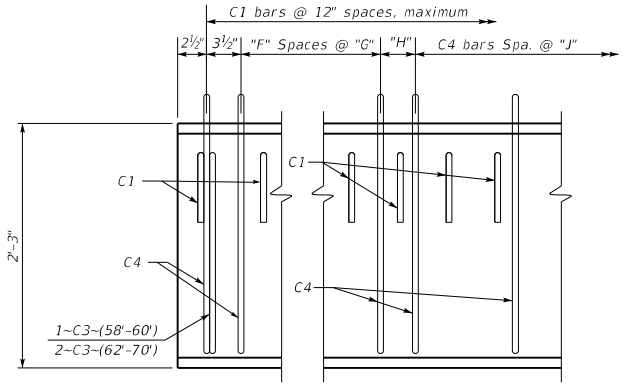


CB27 BEAM



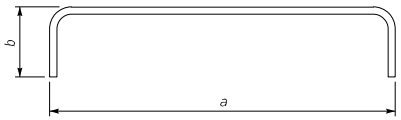
B27 ELEVATION OF O° SKEW

(Refer to BDP-003,c.e. for skewed details)

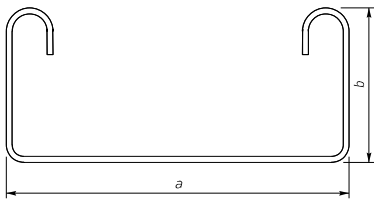


CB27 ELEVATION OF O° SKEW

(Refer to BDP-003,c.e. 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
	64	17	9
CB27	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"	13½"	17"		
	64	6	12"	8½"	17"		
CB27	58	6	12"	18"	21"		
	60	6	12"	19½"	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 kips	DW kips	LL kips	LL+I kips	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		
	64	129	52	4		25.3	1.8	51.0	63.6		
CB27	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'-11¼"	
C3(e)	#5	11⅜"	1'-11⅜"	
C4(e)	#4	3'-9"	2'-4¼"	

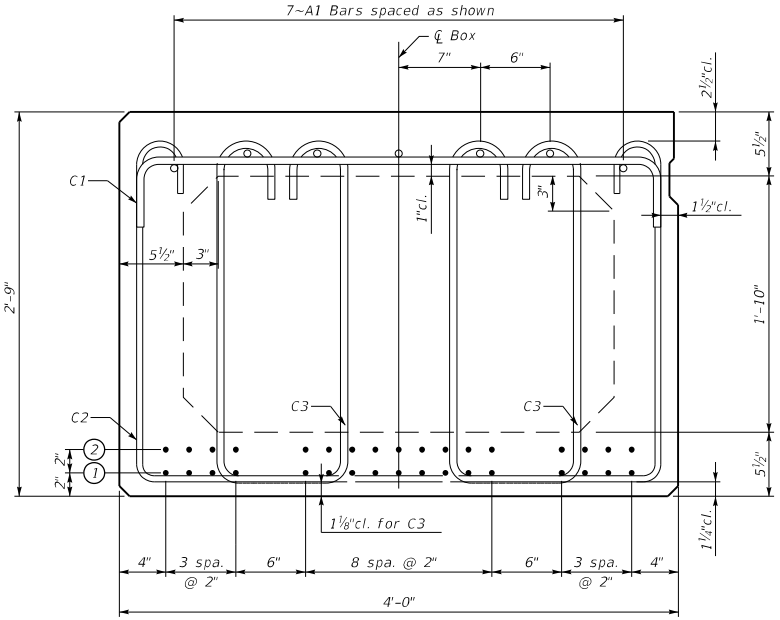
KENTUCKY
DEPARTMENT OF HIGHWAYS

BOX BEAM
B27 & CB27
DETAILS

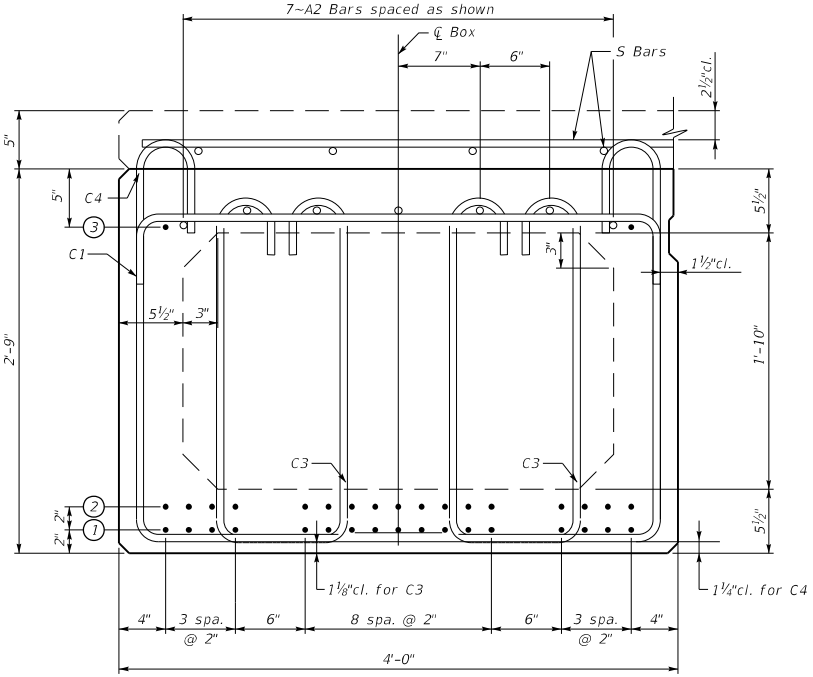
STANDARD DRAWING NO. BDP-009-04

SUBMITTED _____ DIRECTOR DIVISION OF STRUCTURAL DESIGN — DATE 02-26-20

APPROVED _____ STATE HIGHWAY ENGINEER — DATE 02-26-20



B33 BEAM



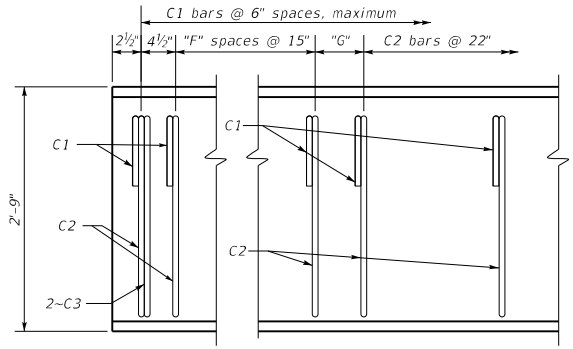
CB33 BEAM

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	
	78	17	12	
CB33	72	17	7	
	74	17	9	
	76	17	10	
	78	17	11	
	80	17	13	
	82	17	14	2
	84	17	15	2

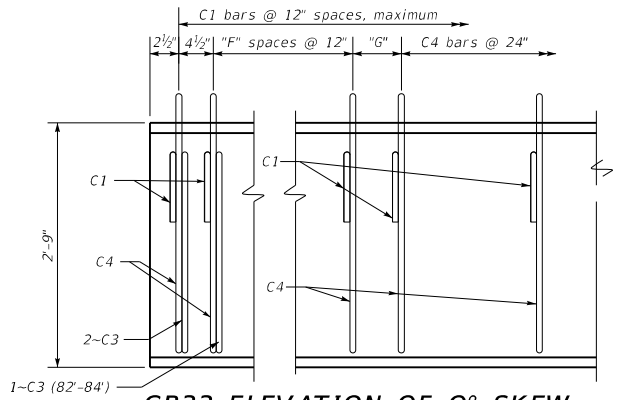
TABLE OF DIMENSION DATA

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"
	78	6	19"
CB33	72	7	17"
	74	7	17"
	76	8	17"
	78	8	17"
	80	8	17"
	82	8	17"
	84	8	17"



B33 ELEVATION OF O° SKEW

(Refer to BDP-003,c.e. for skewed details)



CB33 ELEVATION OF O° SKEW

(Refer to BDP-003,c.e. for skewed details)

BAR QUANTITIES TABLE — DESIGN DATA

Beam Type	Beam Length (feet)	C1	C2	C3	C4	DC kips	DW kips	LL kips	LL+I kips	Δd (in.)	Δc (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		
	78	157	49	4		33.6	2.2	55.0	68.0		
CB33	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

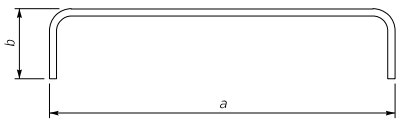
Straight Reinforcement

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

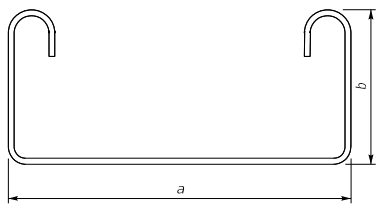
NOTE: A1 and A2 bars are to be lapped 2'-2" when necessary.

Bent Reinforcement

Mark	Size	a	b
C1(e)	#5	3'-9"	6"
C2(e)	#4	3'-9"	2'-5¼"
C3(e)	#5	11⅜"	2'-5⅜"
C4(e)	#4	3'-9"	2'-10¼"



C1(e) Bar



C2(e)-C4(e) Bars

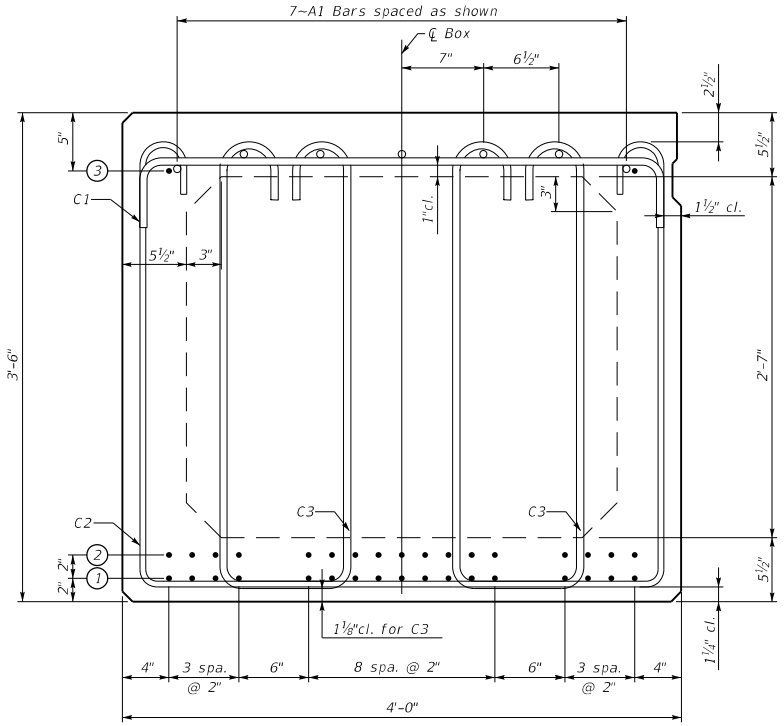
KENTUCKY
DEPARTMENT OF HIGHWAYS

BOX BEAM
B33 & CB33
DETAILS

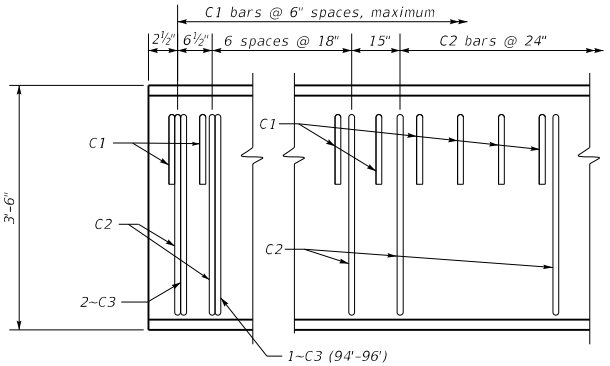
STANDARD DRAWING NO. BDP-010-04

SUBMITTED — DIRECTOR DIVISION OF STRUCTURAL DESIGN — DATE 02-26-20

APPROVED — STATE HIGHWAY ENGINEER — DATE 02-26-20



B42 BEAM



B42 ELEVATION OF O° SKEW

(Refer to BDP-003,c.e. for skewed details)

TABLE OF STRAND DATA

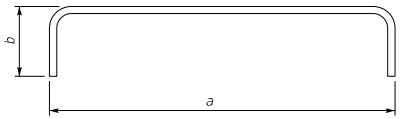
Beam Type	Beam Length (feet)	Number of Strands Required Row ①	Row ②	Row ③
B42	80	17	6	
	82	17	7	
	84	17	8	
	86	17	10	
	88	17	11	
	90	17	12	
	92	17	13	
	94	17	14	2
	96	17	15	2

BAR QUANTITIES TABLE

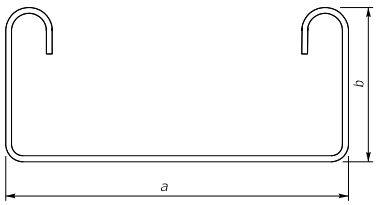
Beam Type	Beam Length (feet)	C1	C2	C3			
B42	80	161	46	4			
	82	165	47	4			
	84	169	48	4			
	86	173	49	4			
	88	177	50	4			
	90	181	51	4			
	92	185	52	4			
	94	189	53	6			
	96	193	54	6			

DESIGN DATA

Beam Type	Beam Length (feet)	DC kips	DW kips	LL kips	LL+I kips		
B42	80	38.5	2.3	55.5	68.6		
	82	39.5	2.3	56.1	69.2		
	84	40.4	2.4	56.6	69.8		
	86	41.4	2.4	57.1	70.3		
	88	42.4	2.5	57.6	70.9		
	90	43.3	2.6	58.1	71.4		
	92	44.3	2.6	58.6	72.0		
	94	45.3	2.7	59.1	72.5		
	96	46.2	2.7	59.6	73.0		



C1(e) Bar



C2(e)-C3(e) Bars

Bent Reinforcement

Mark	Size	a	b	
C1(e)	#5	3'-9"	6"	
C2(e)	#4	3'-9"	3'-2¼"	
C3(e)	#5	11⅜"	3'-2⅜"	

Straight Reinforcement

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

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

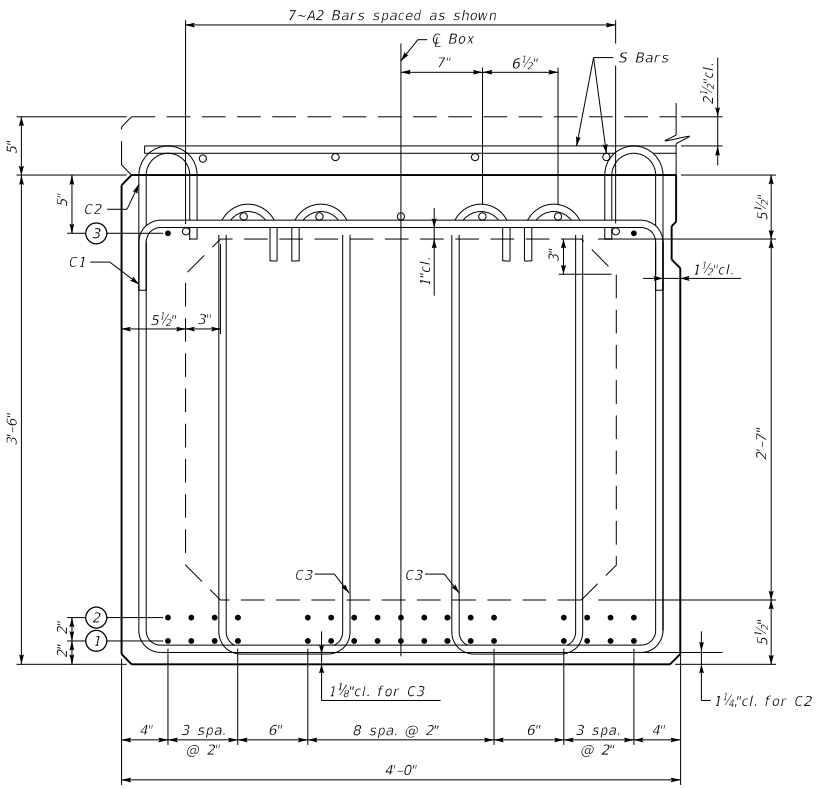
KENTUCKY
DEPARTMENT OF HIGHWAYS

BOX BEAM
B42
DETAILS

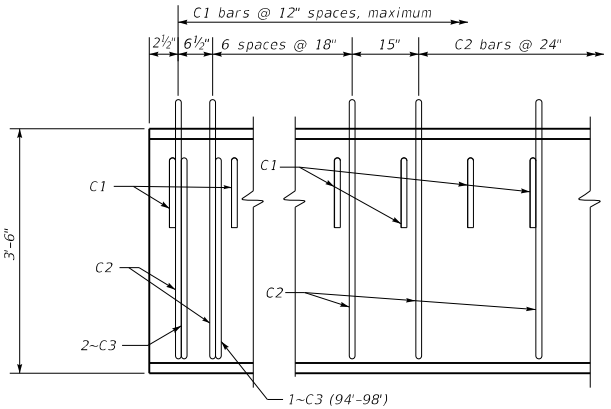
STANDARD DRAWING NO. BDP-011-04

SUBMITTED _____ 02-26-20
DIRECTOR DIVISION OF STRUCTURAL DESIGN — DATE

APPROVED _____ 02-26-20
STATE HIGHWAY ENGINEER — DATE



CB42 BEAM



CB42 ELEVATION OF O° SKEW

(Refer to BDP-003,c.e. for skewed details)

TABLE OF STRAND DATA

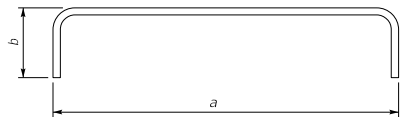
Beam Type	Beam Length (feet)	Number of Strands Required Row ①	Row ②	Row ③
CB42	86	17	9	
	88	17	10	
	90	17	12	
	92	17	13	
	94	17	14	2
	96	17	15	2
	98	17	16	2

BAR QUANTITIES TABLE

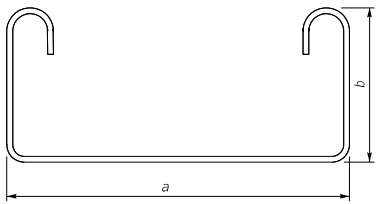
Beam Type	Beam Length (feet)	C1	C2	C3			
CB42	86	87	49	4			
	88	89	50	4			
	90	91	51	4			
	92	93	52	4			
	94	95	53	6			
	96	97	54	6			
	98	99	55	6			

DESIGN DATA

Beam Type	Beam Length (feet)	DC kips	DW kips	LL kips	LL+I kips	Δd (in.)	Δc (in.)
CB42	86	52.1	2.4	57.1	70.3	0.4	1.0
	88	53.3	2.5	57.6	70.9	0.5	1.1
	90	54.6	2.6	58.1	71.4	0.5	1.2
	92	55.8	2.6	58.6	72.0	0.5	1.3
	94	57.0	2.7	59.1	72.5	0.6	1.2
	96	58.2	2.7	59.6	73.0	0.6	1.3
	98	59.4	2.8	60.1	73.5	0.7	1.3



C1(e) Bar



C2(e)-C3(e) Bars

Bent Reinforcement

Mark	Size	a	b	
C1(e)	#5	3'-9"	6"	
C2(e)	#4	3'-9"	3'-7¼"	
C3(e)	#5	11⅜"	3'-2⅜"	

Straight Reinforcement

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

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

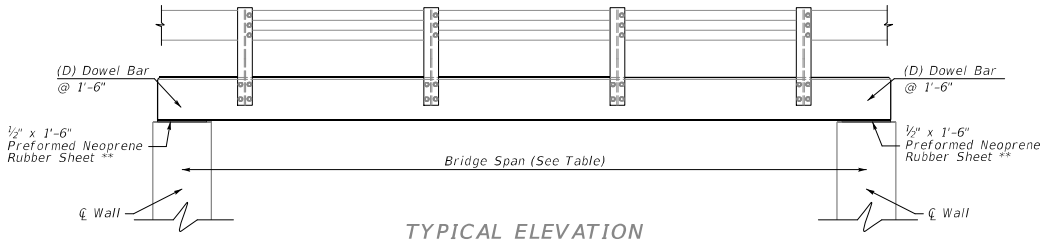
KENTUCKY
DEPARTMENT OF HIGHWAYS

BOX BEAM
CB42
DETAILS

STANDARD DRAWING NO. BDP-012-04

SUBMITTED _____ 02-26-20
DIRECTOR DIVISION OF STRUCTURAL DESIGN — DATE

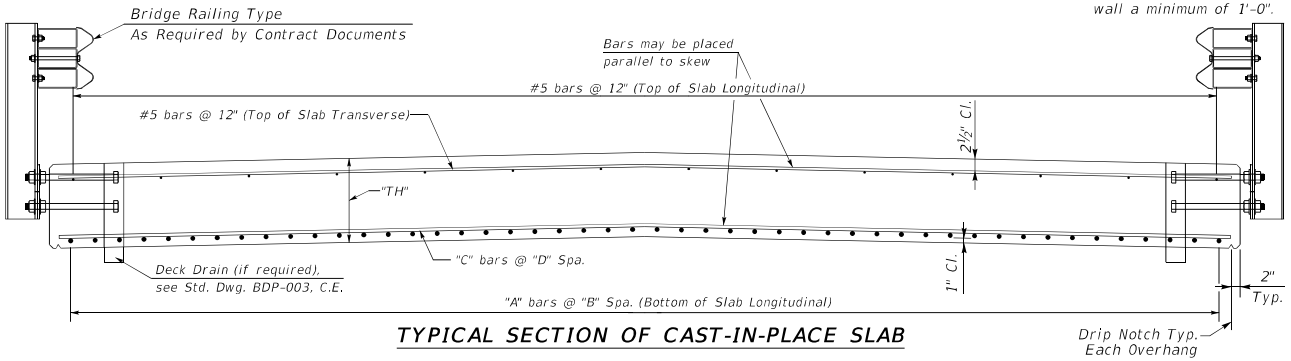
APPROVED _____ 02-26-20
STATE HIGHWAY ENGINEER — DATE



TYPICAL ELEVATION

SLAB BRIDGE SPAN DATA

BRIDGE SPAN (Max. Span)	SLAB THICK.	REINFORCEMENT				DEFLECTION IN INCHES	UNFACTORED BEAM END REACTION (PER UNSKEWED FT. OF BRIDGE WIDTH)		
	"TH"	"A"	"B"	"C"	"D"	SLAB + BARRIER DL DEFL.	DC (kips)	DW (kips)	LL+I (kips)
12'	1'-2"	#8	5"	#6	9"	0.01	1.78	0.10	9.75
14'	1'-4"	#9	5"	#6	8"	0.02	2.24	0.12	9.49
16'	1'-4"	#9	5"	#6	8"	0.03	2.53	0.13	9.25
18'	1'-4"	#9	5"	#6	9"	0.05	2.82	0.14	9.02
20'	1'-5"	#9	5"	#6	9"	0.06	3.24	0.16	8.99
22'	1'-5"	#10	5"	#6	8"	0.08	3.54	0.17	8.99
24'	1'-5"	#10	5"	#6	8"	0.12	3.84	0.19	8.98
26'	1'-6"	#10	5"	#6	8"	0.15	4.32	0.20	9.07
28'	1'-7"	#10	5"	#6	9"	0.17	4.81	0.22	11.76
30'	1'-7"	#11	5"	#6	7"	0.23	5.14	0.23	11.98
32'	1'-7"	#11	5"	#6	7"	0.29	5.47	0.25	12.16
34'	1'-8"	#11	5"	#6	8"	0.33	6.01	0.26	12.31
36'	1'-9"	#11	5"	#6	8"	0.37	6.59	0.28	12.43
38'	1'-10"	#11	5"	#6	8"	0.42	7.19	0.29	12.53
40'	2'-0"	#11	5"	#6	8"	0.42	8.07	0.31	12.61



TYPICAL SECTION OF CAST-IN-PLACE SLAB

General Notes

SLAB OPTION: *The superstructure option shown on this Standard Drawing may be used in lieu of composite or non-composite adjacent box beams. Notify the Director of the Division of Structural Design when this option is used. Slabs are designed for a minimum out to out width of 12'.*

CLASS "AA" REINFORCED CONCRETE: *All falsework is to remain in place until the Class "AA" Concrete compressive strength is 4000 PSI. Class "AA" Concrete is to be used throughout the superstructure.*

ELEVATIONS: *Determine final elevations using the elevations, slopes, and grades shown on the detailed plans.*

STEEL REINFORCEMENT: *Ensure steel reinforcement is ASTM A 615 Grade 60 and epoxy coated. "A" bars to be hooked on each end.*

SURFACE FINISH: *The top of the slab surface may be finished with a floated surface finish in accordance with Section 601.03.18 and textured in accordance with Section 609.03.10.*

FWS: *Slabs are designed for 15 psf future wearing surface.*

FORMWORK: *All formwork shall be designed by a Professional Engineer licensed to practice in Kentucky. The Engineer shall be responsible for accounting for all deflections of the slab after formwork is removed and deflections in formwork to ensure proper grade is maintained across the bridge. Submit formwork design and calculated deflections to the Divsion of Construction for approval prior to beginning work.*

BOTTOM OF SLAB: *Bottom of Slab may be poured flat instead of sloped as shown. See structure plans and elevations.*

DOWEL BAR (D): *Dowel bar shall be an epoxy coated #8 bar, 2'-0" in length. Dowel bar may be deformed or smooth. Dowel bar shall be embedded into wall a minimum of 1'-0".*

*** Preformed Neoprene Rubber Sheet:*
50 Durometer
AASHTO M251, Grade 3

REVISION DATE: 08/11/2025
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — DATE: 08-11-2025
APPROVED — STATE HIGHWAY ENGINEER — DATE: 08-11-2025

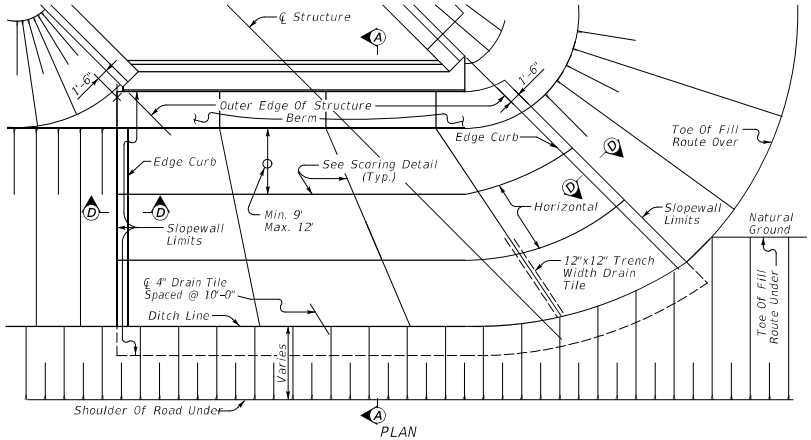
DECK UNITS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

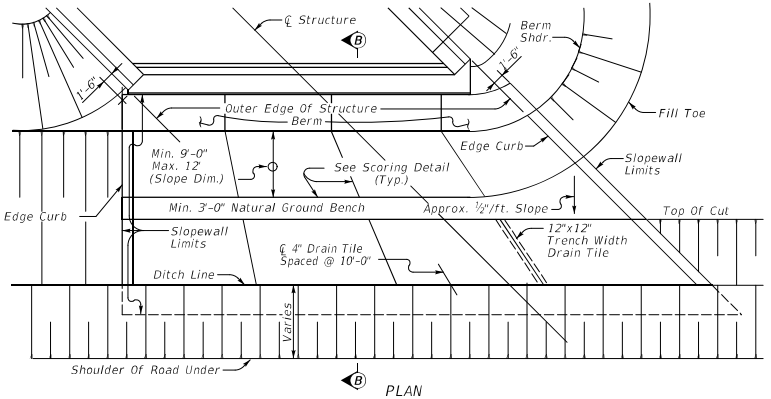
SLAB BRIDGE FOR 12" & 17" BEAMS

STANDARD DRAWING NUMBER
BDP-013-01

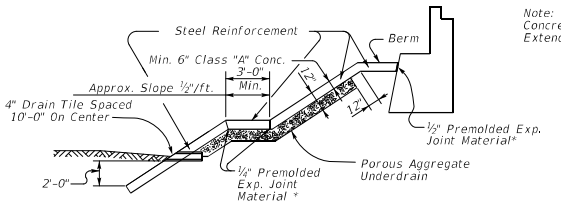
OpenRoads Designer v23.00.01.11



ROUTE UNDER ON FILL WITH ROUTE OVER ON FILL
ROUTE UNDER AT GRADE WITH ROUTE OVER ON FILL

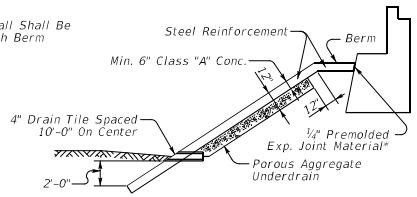


ROUTE UNDER IN EARTH CUT
ROUTE OVER ON FILL

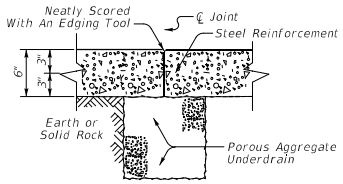


SECTION B-B

Note:
Concrete Slopewall Shall Be Extended Through Berm

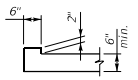


SECTION A-A



CONSTRUCTION JOINT DETAIL

CONSTRUCTION JOINTS REQUIRED AT 21'-0" CENTERS ALONG SLOPEWALL
CONSTRUCTION JOINTS PERMISSIVE AT SCORING DETAILS



SECTION D-D

Edge Curb

GENERAL NOTES

SPECIFICATIONS: *Slopewall is to be constructed according to details shown and to Section 703 of the Kentucky Department of Highways Standard Specifications for Road and Bridge Construction.*

INCIDENTALS: *Include the cost of steel reinforcement, drain tile, preformed expansion joint material*, aggregate, excavation, and all labor and materials required to complete the work in accordance with the plans and Specifications in the price for 6" Concrete Slopewall.*

SKEW: *A 45° Skew is detailed on this sheet. Details for other skews are similar.*

ROCK EXCAVATION: *Excavate the rock to plan depth and slope as near as possible to reduce the quantity of Concrete, Class "A" required to maintain a minimum slopewall thickness. Include the cost of additional concrete required to fill voids in the rock and maintain the slopewall thickness in the bid for 6" Concrete Slopewall.*

SLOPEWALL REINFORCEMENT: *Use No. 4 bars at 18" centers in each direction or an equivalent area of welded deformed steel fabric to reinforce the slopewall.*

**Expansion Joint Material:*
AASHTO M153
Type-I Sponge Rubber

REVISION DATE: 08/11/2025
REVISION NUMBER: 0

SUBMITTED Michael Cupp 08-11-2025
DIVISION DIRECTOR DATE

APPROVED Jason Ballinger 08-11-2025
STATE HIGHWAY ENGINEER DATE

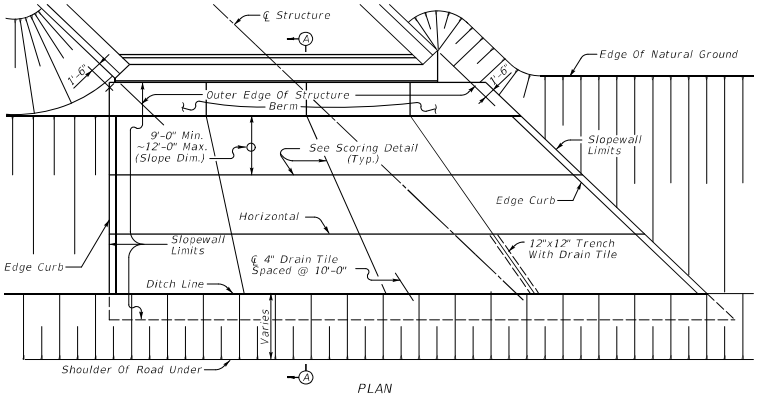
GENERAL

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

CONCRETE SLOPEWALLS FOR GRADE SEPARATION BRIDGES

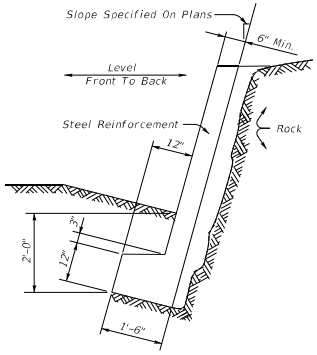
STANDARD DRAWING NUMBER
BGX-004-01

OpenRoads Designer v23.00.01.11

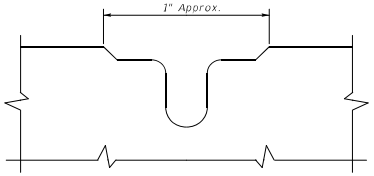


PLAN

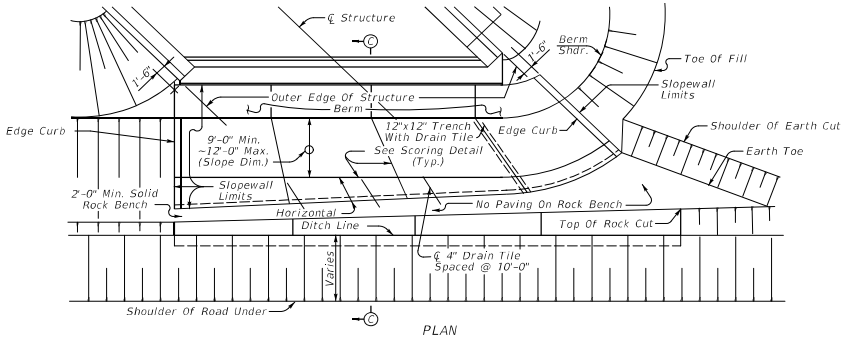
ROUTE UNDER IN FULL EARTH CUT



STEEP SLOPE SECTION
6" CONCRETE SLOPEWALL

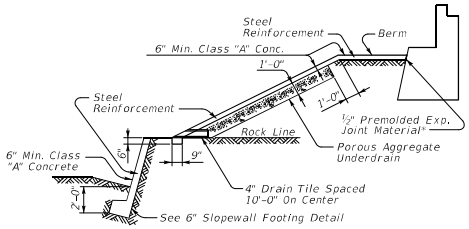


SCORING DETAIL
(Score With Approved Grooving Tool)



PLAN

ROUTE UNDER IN ROCK CUT AND EARTH CUT
ROUTE OVER ON FILL



SECTION C-C

*Expansion Joint Material:
AASHTO M153
Type-I Sponge Rubber

REVISION DATE: 08/11/2025
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — DATE 08-11-2025

APPROVED — STATE HIGHWAY ENGINEER — DATE 08-11-2025

GENERAL

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

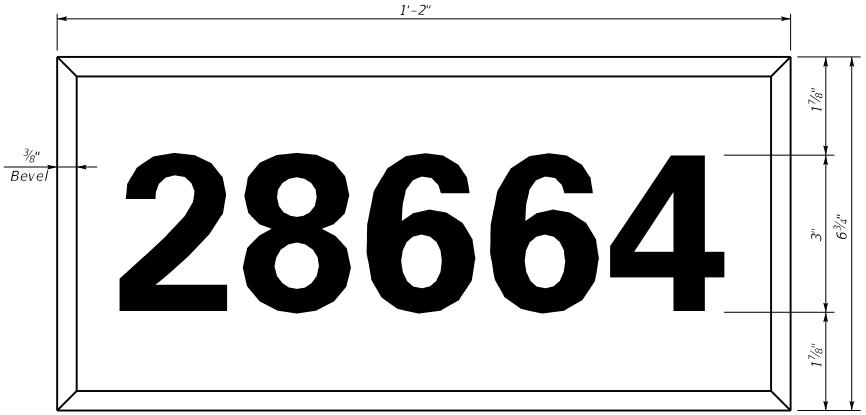
CONCRETE SLOPEWALLS FOR GRADE SEPARATION BRIDGES

STANDARD DRAWING NUMBER
BGX-005-01

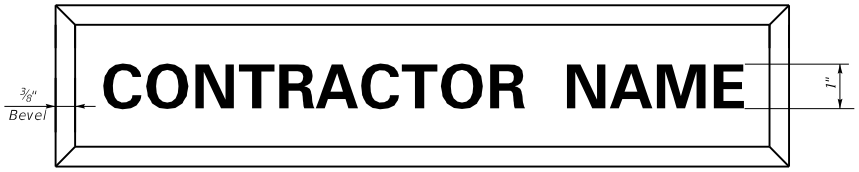
OpenRoads Designer v23.00.01.11

STENCIL FOR YEAR AND DESIGN LOADING

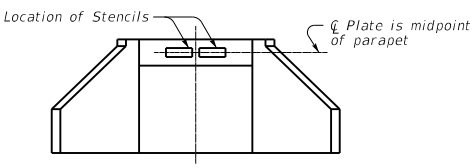
When year only is used place year in center of plate



STENCIL FOR DRAWING NUMBER

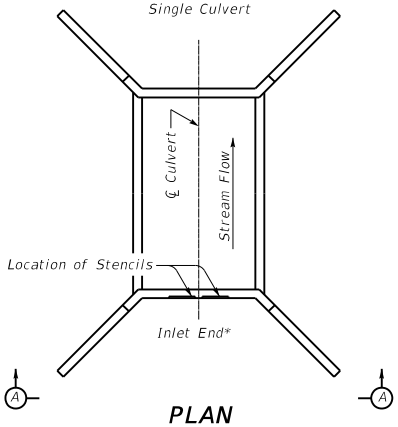


CONTRACTOR STENCIL



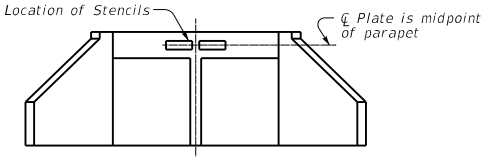
ELEVATION A-A

Single Culvert



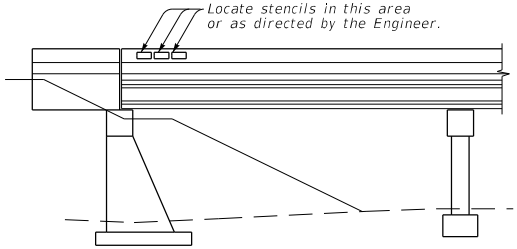
PLAN

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

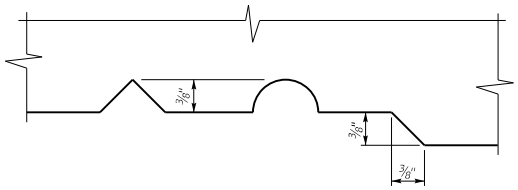


ELEVATION A-A

Multiple span Culvert



LOCATION OF STENCILS ON BRIDGES



TYPE OF LETTERS

* Use the outlet end for outlet only extensions

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.*

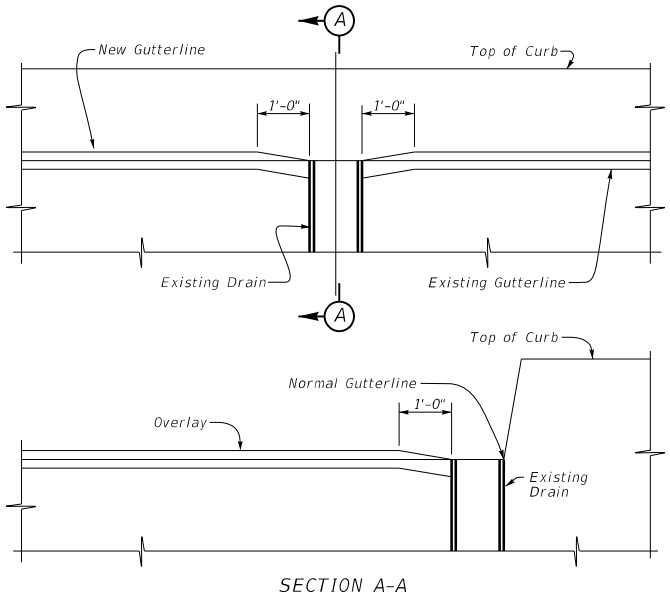
KENTUCKY
DEPARTMENT OF HIGHWAYS

STENCILS FOR STRUCTURE

STANDARD DRAWING NO. BGX-006-10

SUBMITTED Brian Clark 02-26-20
DIRECTOR DIVISION OF STRUCTURAL DESIGN DATE

APPROVED [signature] 02-26-20
STATE HIGHWAY ENGINEER DATE



SECTION A-A

FIGURE NO. 1

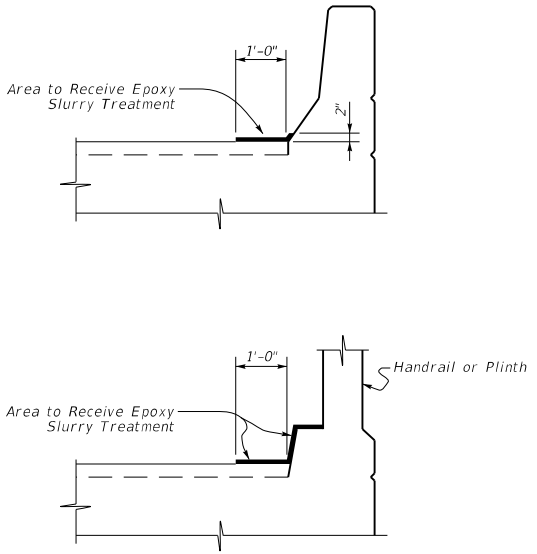


FIGURE NO. 2

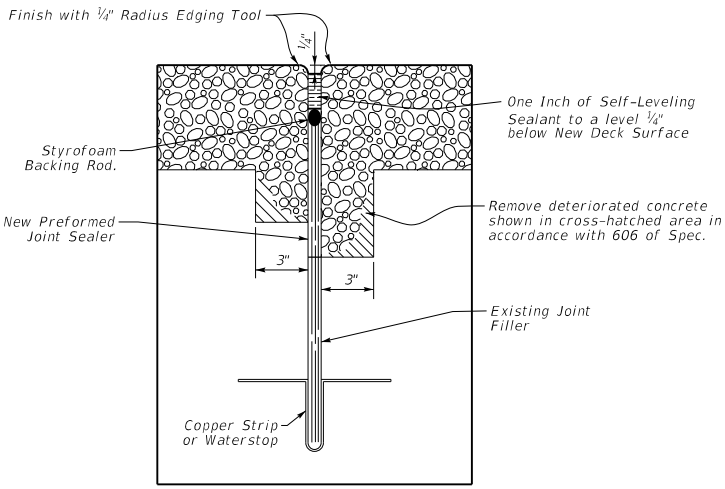
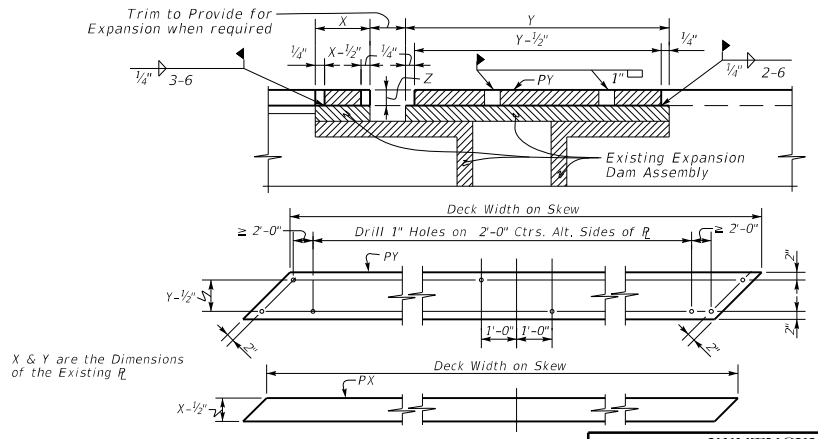


FIGURE NO. 3

TYPICAL EXPANSION DAM TREATMENT



Structural Steel weights given are approximate and the Contractor is responsible for all measurements.

Determine dimension Z for thickness of the built-up plates as the minimum specified thickness of overlay minus ¼".

Steel is to be furnished in 3-foot minumum lengths welded together as directed by the Engineer.

FIGURE NO. 4

KENTUCKY
DEPARTMENT OF HIGHWAYS

BRIDGE RESTORATION AND WATERPROOFING WITH CONCRETE OVERLAYS

STANDARD DRAWING NO. BGX-009-04

SUBMITTED _____ 02-26-20
DIRECTOR DIVISION OF STRUCTURAL DESIGN — DATE

APPROVED _____ 02-26-20
STATE HIGHWAY ENGINEER — DATE

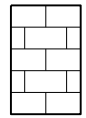
Description of Soil Compactness or Consistency

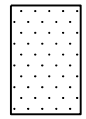
SOIL TYPE	COMPACTNESS OR CONSISTENCY	RANGE OF PENETRATION RESISTANCE	RANGE OF UNCONFINED COMPRESSIVE STRENGTH
Coarse grained soils (More than half of material is larger than No. 200 sieve size.)	Very loose Loose Medium compact Compact Very compact	Less than 4 blows per ft. 4 to 10 10 to 30 30 to 50 Greater than 50	Not applicable
Fine grained soils (More than half of material is smaller than No. 200 sieve size.)	Very soft Soft Medium stiff Stiff Very stiff Hard	Not applicable	Less than 0.25 tsf 0.25 to 0.50 0.50 to 1.0 1.0 to 2.0 2.0 to 4.0 Greater than 4.0

Unified Soil Classifications

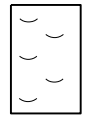
MAJOR DIVISION		SYMBOL	NAME
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	GW	Well-graded gravels or gravel-sand mixtures, little or no fines.
		GP	Poorly graded gravels or gravel-sand mixtures, little or no fines.
		GM	Silty gravels, gravel-sand-silt mixtures.
		GC	Clayey gravels, gravel-sand-clay mixtures.
	SAND AND SANDY SOILS	SW	Well graded sands or gravelly sands, little or no fines.
		SP	Poorly graded sands or gravelly sands, little or no fines.
		SM	Silty sands, sand-silt mixtures.
		SC	Clayey sands, sand-clay mixtures.
FINE GRAINED SOILS	SILTS AND CLAYS LL IS LESS THAN 50	ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.
		CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays silty clays, lean clays.
	SILTS AND CLAYS LL IS GREATER THAN 50	MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.
		CH	Inorganic clays of high plasticity, fat clays.
UNCLASSIFIED MATERIAL		NONE	Non-classified material (i.e. overburden, pavement, slag, etc.) include visual desc.

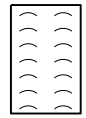
AI	Activity Index
LI	Liquidity Index
N	Penetration Resistance
S+C(%)	Material finer than No. 200 sieve
○	Rockline Soundings
⊕	Disturbed Sample Boring
◎	Undisturbed Sample Boring
◎	Undisturbed Sample Boring & Rock Core
⊙	Rock Core
⌖	Slope Inclinometer Installation
	typical applications: ⌖ ⊕ ◎ ◎ ⌖
▱	Approximate Footing Elevation
OW	
▽	7-Day (or greater) Water Table & Date
□	Thin-walled Tube Sample
<	Standard Penetration Test Sample
UU (psi)	Unconsolidated, Undrained Triaxial Test
Qu (psi)	Unconfined Compressive Strength
w (%)	Moisture Content
RQD (%)	Rock Quality Designation
SDI (JS)	Slake Durability Index (Jar Slake Test)
Rec. (%)	Core Recovery
Ø	Angle of Internal Friction
Ø̄	Effective Angle of Internal Friction
c (psi)	Cohesion
c̄ (psi)	Effective Cohesion
γ	Total Unit Weight
RDZ	Rock Disintegration Zone
OB	Overburden Bench
IB	Intermediate Bench
R	Refusal
NR	Refusal Not Encountered
VS (psi)	Field Vane Shear Strength

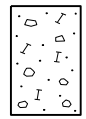

LIMESTONE

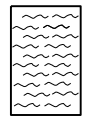

SANDSTONE

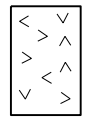
COAL

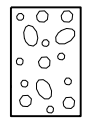

NONDURABLE SHALE (SDI < 90)


DURABLE SHALE (SDI ≥ 90)


TALUS OR MINE WASTE OR FILL MATERIAL


ROADWAY FILL-GRANULAR EMBANKMENT


STRUCTURE GRANULAR BACKFILL


SLOPE PROTECTION

Relation of RQD and in situ Rock Quality

RDQ (%)	Rock Quality
90 - 100	Excellent
75 - 90	Good
50 - 75	Fair
25 - 50	Poor
0 - 25	Very Poor

KENTUCKY DEPARTMENT OF HIGHWAYS

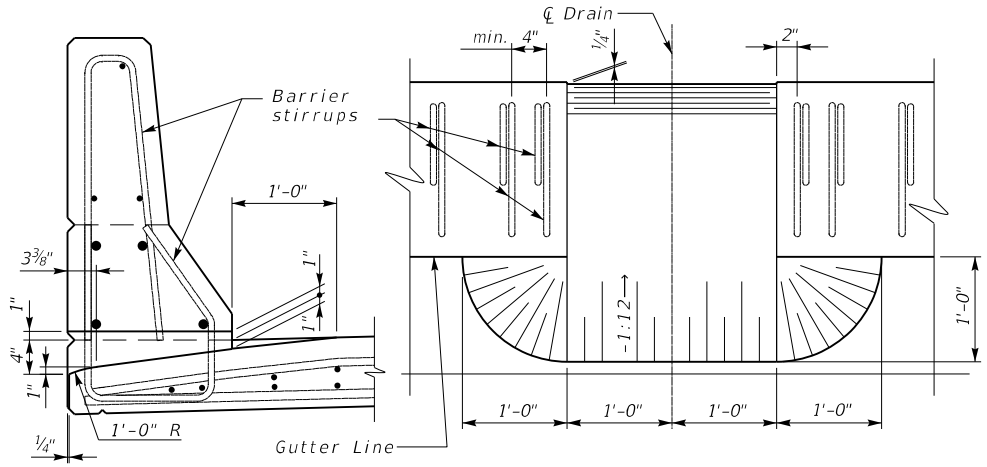
GEOTECHNICAL LEGEND

STANDARD DRAWING NO. BGX-012-02

SUBMITTED DIRECTOR DIVISION OF STRUCTURAL DESIGN 02-26-20 DATE

APPROVED STATE HIGHWAY ENGINEER 02-26-20 DATE

NOTE: Reposition barrier stirrups in manner shown as to not interfere with drain opening.



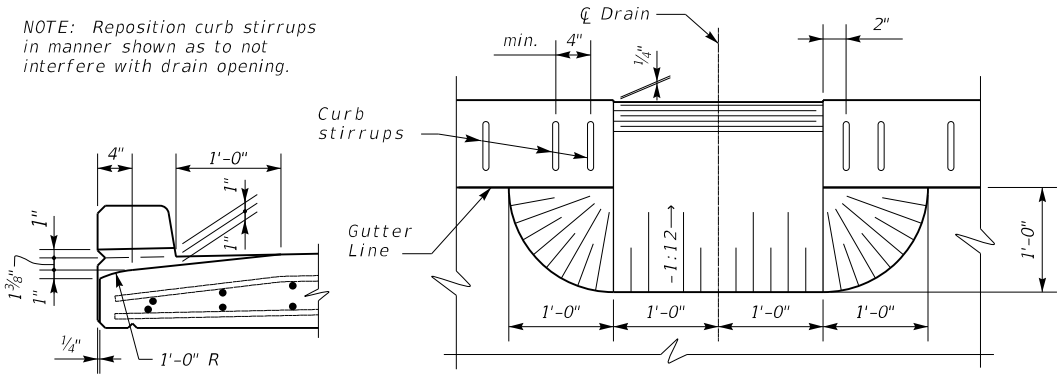
SECTION THROUGH DRAIN

PLAN OF DRAIN (Barrier not in place)

NOTE: Field bend top transverse slab reinforcement in the area of the drain to maintain 2½" of concrete cover through the drain. Bend reinforcement approximately 1'-0" from the gutter line. Transverse slab reinforcement adjacent to the opening is not to be bent. Longitudinal reinforcement is not to be tied to the transverse reinforcement adjacent to the drain for a distance sufficient to allow the reinforcement to sag under the bent reinforcement in the drain area.

THROUGH BARRIER DRAIN DETAILS

NOTE: Reposition curb stirrups in manner shown as to not interfere with drain opening.

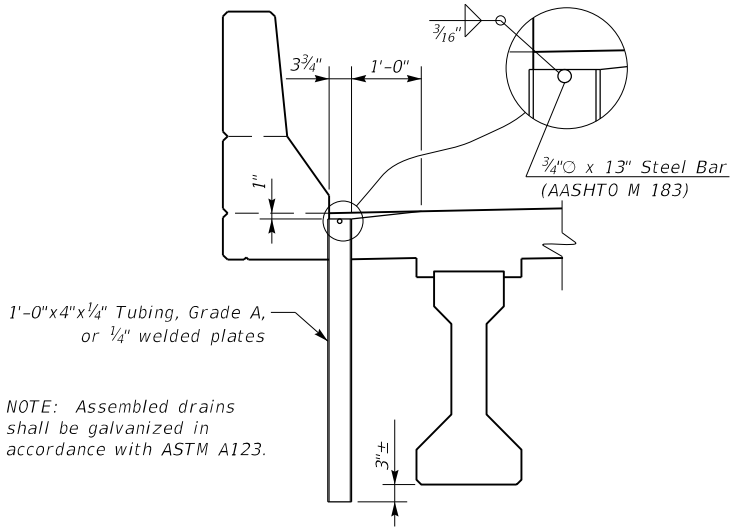


SECTION THROUGH DRAIN

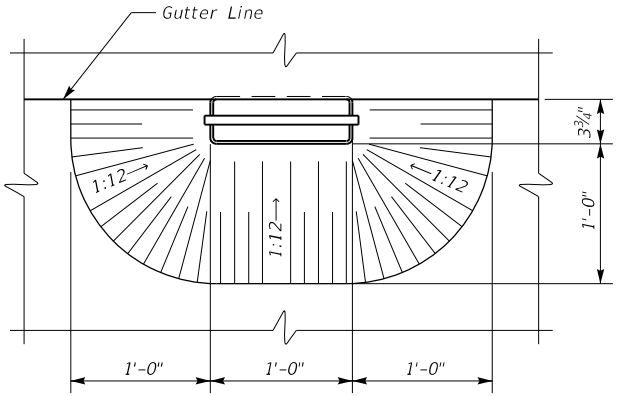
PLAN OF DRAIN (Curb not in place)

NOTE: Field bend top transverse slab reinforcement in the area of the drain to maintain 2½" of concrete cover through the drain. Bend reinforcement approximately 1'-0" from the gutter line. Transverse slab reinforcement adjacent to the opening is not to be bent. Longitudinal reinforcement is not to be tied to the transverse reinforcement adjacent to the drain for a distance sufficient to allow the reinforcement to sag under the bent reinforcement in the drain area.

THROUGH CURB DRAIN DETAILS



SECTION THROUGH DRAIN



PLAN OF DRAIN

THROUGH DECK DRAIN DETAILS

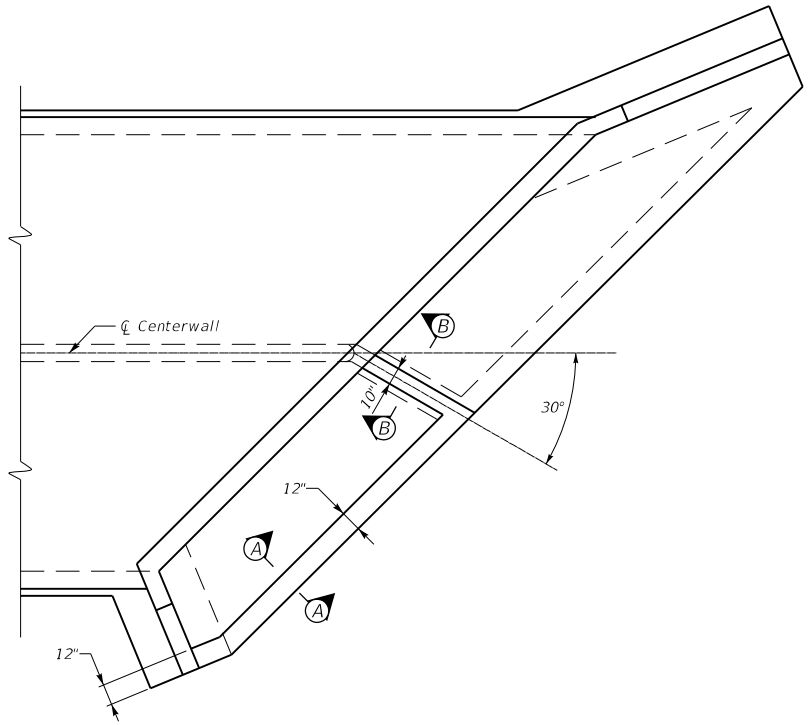
KENTUCKY
DEPARTMENT OF HIGHWAYS

BRIDGE DRAINS

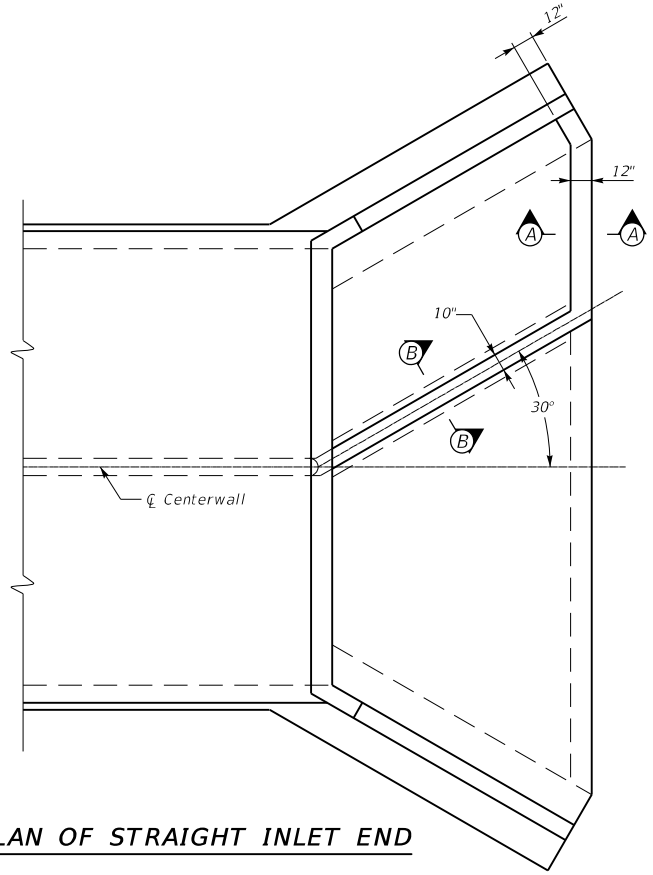
STANDARD DRAWING NO. BGX-015-04

SUBMITTED _____ 02-26-20
DIRECTOR DIVISION OF STRUCTURAL DESIGN — DATE

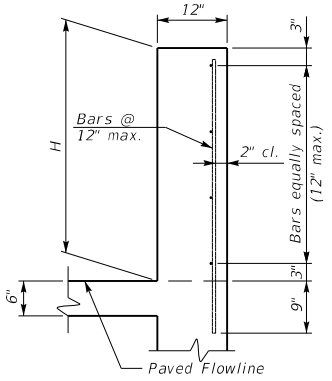
APPROVED _____ 02-26-20
STATE HIGHWAY ENGINEER — DATE



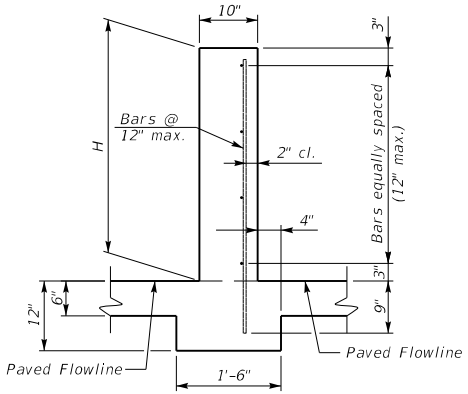
PLAN OF SKEWED INLET END



PLAN OF STRAIGHT INLET END



SECTION A-A



SECTION B-B

General Notes

LOW FLOW DIVERSION CURB: *Include all materials and labor required to construct the Low Flow Diversion Curb in the bid for Low Flow Diversion Curb.*

DIMENSION "H": *This dimension is the lesser of the wing tip elevation, one-half the barrel height opening, or as designated on the plans.*

METHOD OF MEASUREMENT: *The limits of the Low Flow Diversion Curb is the entire wall that is above the paved flowline, extending from the centerwall to the wing face as detailed on the Plan views, and the 6" x 1'-6" footing as shown in Section B-B.*

STEEL REINFORCEMENT: *All steel reinforcement is #4 bars in accordance with ASTM A 615, Grade 60.*

CONCRETE: *Class "A" Concrete is to be used.*

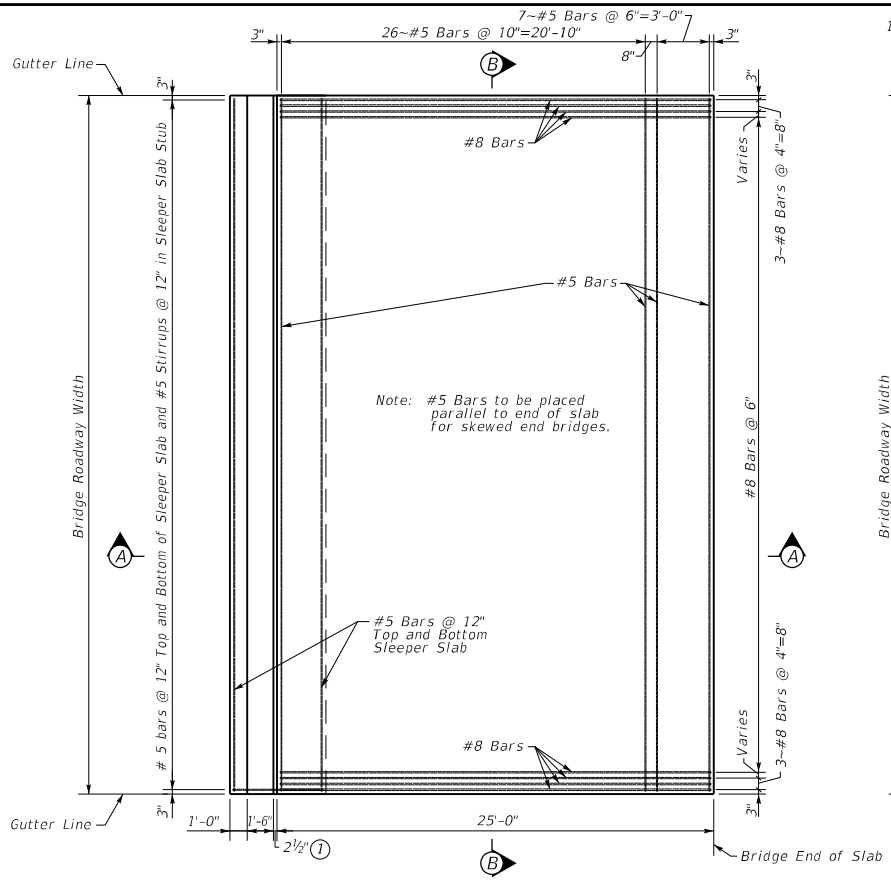
KENTUCKY
DEPARTMENT OF HIGHWAYS

LOW FLOW DIVERSION CURB

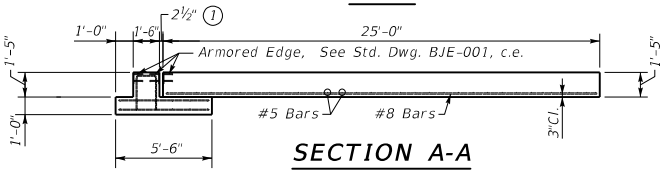
STANDARD DRAWING NO. BGX-016-01

SUBMITTED _____ 02-26-20
DIRECTOR DIVISION OF STRUCTURAL DESIGN — DATE

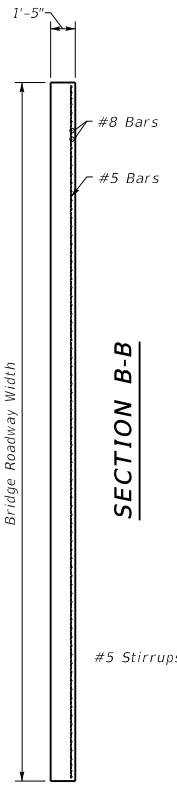
APPROVED _____ 02-26-20
STATE HIGHWAY ENGINEER — DATE



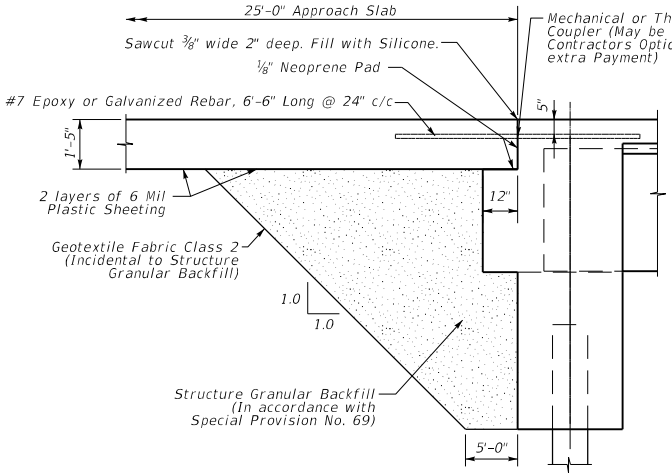
PLAN



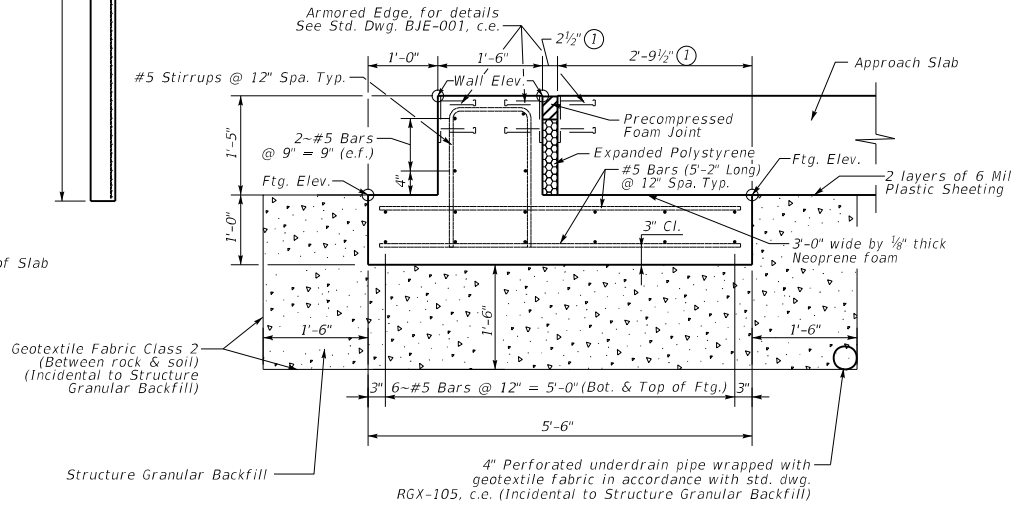
SECTION A-A



SECTION B-B



TYPICAL SECTION @ BRIDGE END



TYPICAL SECTION @ SLEEPER SLAB END

GENERAL NOTES

CROWN AND ELEVATIONS: *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. Elevations shall be given in the plans for top of footing and top of wall as shown on the sleeper slab typical section. Grade elevations shall also be given along the approach slab to ensure it is built to proper grade. These elevations shall be provided at each gutter line and at the crown (if applicable) and at maximum spacings of 8'-0" along the approach slab. Approach slabs and sleeper slabs added to existing bridges will require the contractor to provide field surveys to obtain existing elevations. The contractor shall calculate all elevations noted above and submit to the Engineer for review. All costs to field survey and calculate elevations are incidental to unit price bid for Approach Slab.*

CONCRETE: *Concrete shall be Class "AA".*

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

PAYMENT: *Include the cost of Class "AA" Concrete, epoxy-coated or galvanized steel reinforcement, precompressed foam joint seal, expanded polystyrene, plastic sheeting, and all labor and materials required to construct the approach slab in the bid item for Approach Slab. Payment for armored edges and structural granular backfill shall be made separately.*

(1) *The joint opening width shall be 2.5 in for expansion lengths of 150 feet or less, regardless of the joint setting temperature. For expansion lengths greater than 150 feet, the joint opening width shall be constructed based on the actual ambient temperature at the time of construction, with the manufacturer's joint setting table. The expansion length must be shown in the plans.*

The precompressed foam joint shall be able to accomodate both the minimum and the maximum joint opening widths as shown below:

Concrete Bridge Expansion length less than 347 feet and Steel Bridge Expansion Length less than 275 feet.
W(min) = 1.0 inch
W(max) = 4.0 inches

This standard is not applicable for concrete bridge expansion lengths greater than 347 feet or Steel bridge expansion lengths must be done and placed within the plans using a joint capable of greater movements greater than 275 feet. For bridges exceeding these limits a special design must be done and placed within the plans using a joint capable of greater movements.

KENTUCKY
DEPARTMENT OF HIGHWAYS

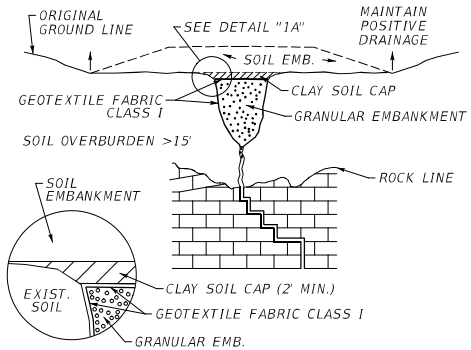
APPROACH SLAB

STANDARD DRAWING NO. BGX-017-03

SUBMITTED — DIRECTOR DIVISION OF STRUCTURAL DESIGN — 02-26-20 DATE

APPROVED — STATE HIGHWAY ENGINEER — 02-26-20 DATE

CONDITION NO. 1: SOIL EMBANKMENT OVER DEEP OVERBURDEN WITH OPEN SINKHOLES

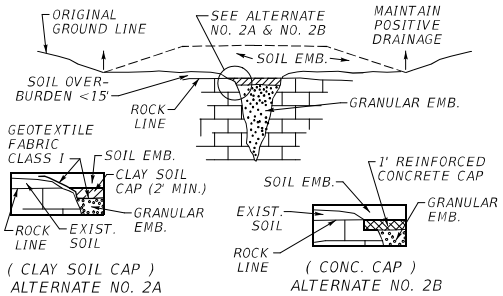


DETAIL "1A"

PROCEDURE:

a. REMOVE DEBRIS. DO NOT EXCAVATE SOIL OVERBURDEN.
b. LINE OPENING WITH GEOTEXTILE FABRIC CLASS I.
c. REFILL WITH GRANULAR EMBANKMENT.
d. PLACE GEOTEXTILE FABRIC CLASS I ON TOP OF GRANULAR EMBANKMENT.
e. REFILL WITH (2' MINIMUM) CLAY SOIL CAP.

CONDITION NO. 2: SOIL EMBANKMENT OVER SHALLOW OVERBURDEN WITH SINKHOLE OPENING IN ROCK



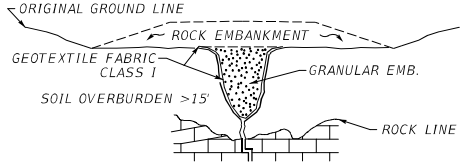
PROCEDURE FOR ALTERNATE NO. 2A

a. REMOVE DEBRIS AND SOIL OVERBURDEN.
b. REFILL OPENING WITH GRANULAR EMBANKMENT TO 2' MIN. BELOW ROCK LINE.
c. PLACE GEOTEXTILE FABRIC CLASS I ON TOP OF GRANULAR EMB. OVERLAPPING ORIGINAL GROUND LINE.
d. REFILL WITH (2' MIN.) CLAY SOIL CAP.

PROCEDURE FOR ALTERNATE NO. 2B

a. REMOVE DEBRIS AND SOIL OVERBURDEN.
b. REFILL OPENING WITH GRANULAR EMBANKMENT TO 1' MIN. BELOW ROCK LINE.
c. CONSTRUCT 1' REINFORCED CONCRETE CAP. CAP SHOULD BE INTERLOCKED WITH ROCK FOR SUPPORT.

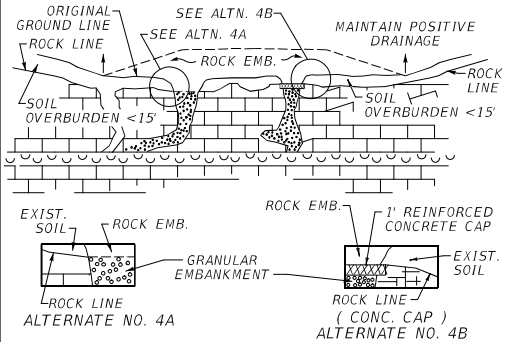
CONDITION NO.3: ROCK EMBANKMENT OVER DEEP OVERBURDEN WITH OPEN SINKHOLES



PROCEDURE:

a. REMOVE DEBRIS. DO NOT EXCAVATE SOIL OVERBURDEN.
b. LINE OPENING WITH GEOTEXTILE FABRIC CLASS I.
c. REFILL OPENING WITH GRANULAR EMBANKMENT TO TOP OF DEPRESSION.

CONDITION NO. 4: ROCK EMBANKMENT OVER SHALLOW OVERBURDEN WITH SINKHOLE OPENINGS IN ROCK



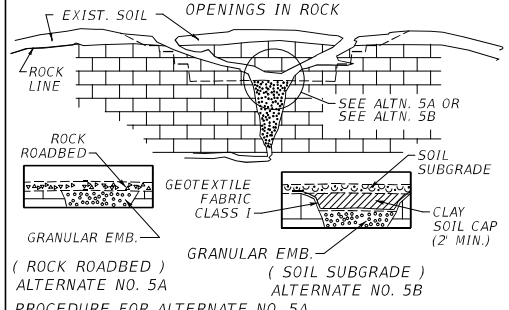
PROCEDURE FOR ALTERNATE NO. 4A

a. REMOVE DEBRIS AND SOIL OVERBURDEN.
b. REFILL OPENING TO ROCK LINE WITH GRANULAR EMBANKMENT.

PROCEDURE FOR ALTERNATE NO. 4B

a. REMOVE DEBRIS AND SOIL OVERBURDEN.
b. REFILL OPENING WITH GRANULAR EMBANKMENT TO 1' MIN. BELOW ROCK LINE.
c. CONST. 1' REINFORCED CONC. CAP. CAP SHOULD BE INTERLOCKED WITH ROCK FOR SUPPORT.

CONDITION NO. 5: CUT SECTIONS WITH SINKHOLE OPENINGS IN ROCK



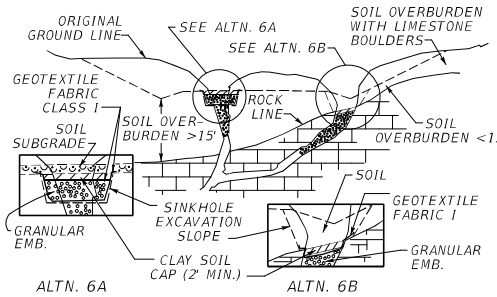
PROCEDURE FOR ALTERNATE NO. 5A

a. REFILL OPENING WITH GRANULAR EMBANKMENT. IF CONCRETE CAP IS USED IT SHALL BE INTERLOCKED WITH THE BEDROCK FOR SUPPORT AS DETAILED IN CONDITION NO. 2 ALTERNATE NO. 2B.

PROCEDURE FOR ALTERNATE NO. 5B

a. REFILL OPENING WITH GRANULAR EMBANKMENT. TO 2' MINIMUM BELOW SOIL SUBGRADE.
b. PLACE GEOTEXTILE FABRIC CLASS I OVER GRANULAR EMBANKMENT.
c. REFILL WITH (2' MIN.) CLAY SOIL CAP. IF CONCRETE CAP IS USED THE FABRIC SHALL BE OMITTED AND CAP SHALL BE INTERLOCKED WITH THE BEDROCK FOR SUPPORT AS DETAILED IN COND. NO. 2 ALTERNATE NO. 2B.

CONDITION NO. 6: CUT SECTIONS WITH SINKHOLE OPENINGS IN SOIL



ALTERNATE NO. 6A SOIL OVERBURDEN GREATER THAN 15'

a. REMOVE DEBRIS. DO NOT EXCAVATE SOIL OVERBURDEN.
b. LINE OPENING WITH GEOTEXTILE FABRIC CLASS I.
c. REFILL WITH GRANULAR EMBANKMENT.
d. PLACE GEOTEXTILE FABRIC CLASS I OVER GRANULAR EMBANKMENT OVERLAPPING ORIG. GROUND LINE.
e. REFILL WITH (2' MIN.) CLAY SOIL CAP. IF ROCK SUBGRADE IS USED OMIT SOIL CAP AND FABRIC UNDER-LYING SOIL CAP.

ALTERNATE NO. 6B SOIL OVERBURDEN LESS THAN 15'

a. REMOVE DEBRIS AND SOIL OVERBURDEN.
b. REFILL OPENING WITH GRANULAR EMBANKMENT TO 2' MIN. BELOW ROCK LINE.
c. PLACE GEOTEXTILE FABRIC CLASS I OVER GRANULAR EMBANKMENT OVERLAPPING ORIG. GROUND LINE.
d. REFILL WITH (2' MIN.) CLAY SOIL CAP. IF CONCRETE CAP IS USED THE FABRIC SHALL BE OMITTED AND CAP SHALL BE INTERLOCKED WITH THE BEDROCK FOR SUPPORT AS DETAILED IN COND. NO. 2 ALTERNATE NO. 2B.

THE CONCRETE CAP SHALL BE CLASS "B" CONC. AND CONTAIN NO. 8 REINFORCING BARS PLACED AT 12" CTRS. IN BOTH DIRECTIONS AND LOCATED 3" FROM THE BOTTOM SURFACE OF THE CAP.

REVISION DATE: 08/11/2025
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — DATE 08-11-2025
APPROVED — STATE HIGHWAY ENGINEER — DATE 08-11-2025

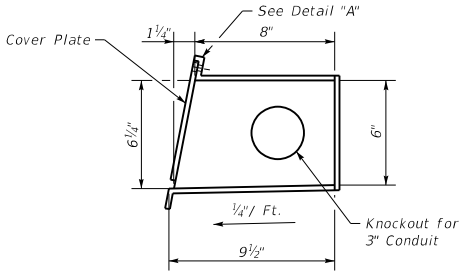
GENERAL

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

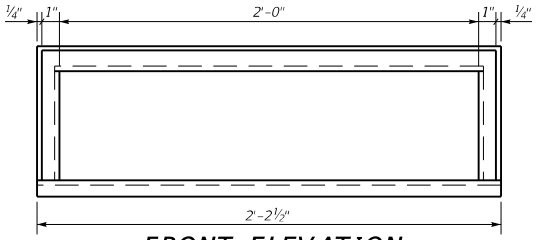
TREATMENT OF OPEN SINKHOLES

STANDARD DRAWING NUMBER
BGX-018-01

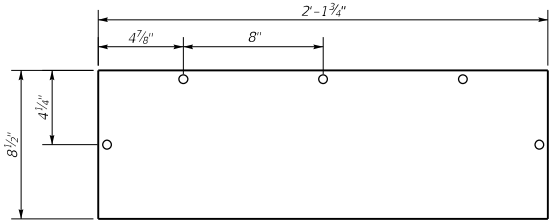
OpenRoads Designer v23.00.01.11



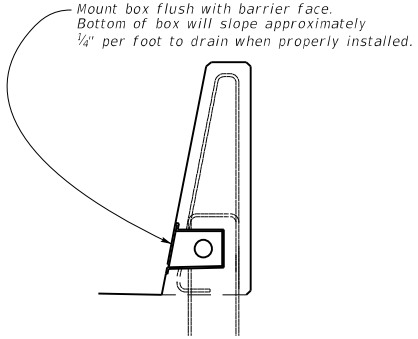
SIDE ELEVATION



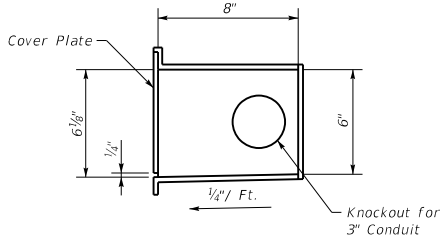
FRONT ELEVATION



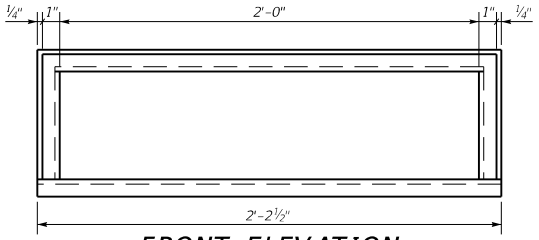
COVER PLATE



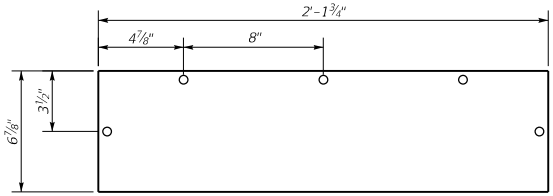
TYPICAL INSTALLATION IN SINGLE SLOPE BARRIER



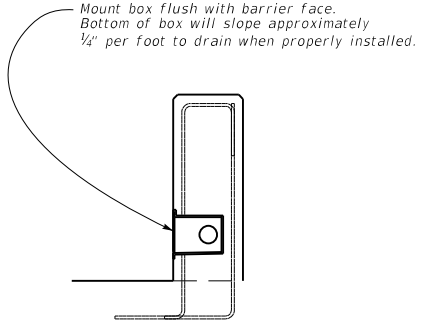
SIDE ELEVATION



FRONT ELEVATION



COVER PLATE



TYPICAL INSTALLATION IN VERTICAL BARRIER

General Notes

Construct junction boxes from ¼" A36 steel plate and the junction box cover from ⅛" A36 plate. Hot dip galvanize box and cover after fabrication and in accordance with ASTM A123 and the Standard Specifications. Cover plate shall include (5) Stainless Steel screw taps with wing nuts and a Rubber Gasket for all sides where screws are installed.

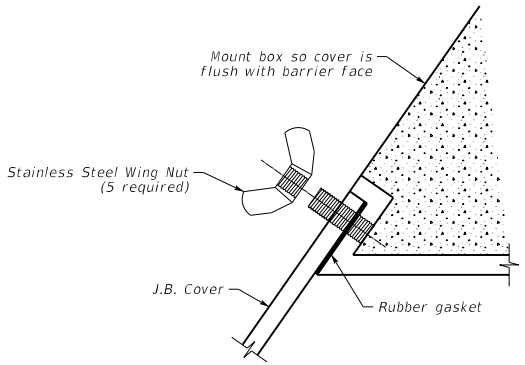
Fittings shall be UL listed and CSA-certified concrete tight on the outside of the Junction Box conduit connection. Use a sealing lock nut and a rigid PVC conduit bushing on the inside for all conduit penetrations.

Liberally coat the threads of the cover fasteners with anti-seize compound during construction and before final closure.

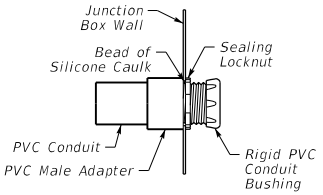
Protect cover of J.B. from damage/disfigurement from masonry coating application and other sources by taping or wrapping during construction. Remove protection prior to final electrical inspection and repair any damage or disfigurement to the satisfaction of the Engineer and at no cost to the Department.

When properly installed, box cover will be flush with barrier face and box bottom will slope to drain approximate ¼" / ft. in all cases.

The price bid for Junction Box - 24" shall include all costs to furnish and install the junction box in accordance with these plans and the Specifications.



DETAIL "A"



BUSHING DETAIL AT J.B. CONDUIT ENTRY

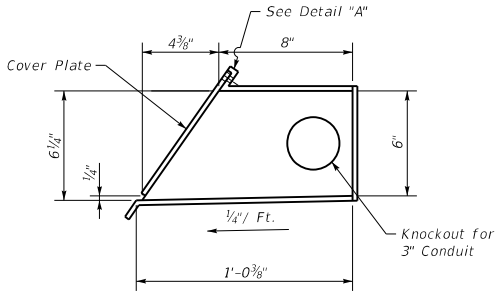
KENTUCKY
DEPARTMENT OF HIGHWAYS

24 INCH JUNCTION BOX
SINGLE SLOPE AND
VERTICAL BARRIER

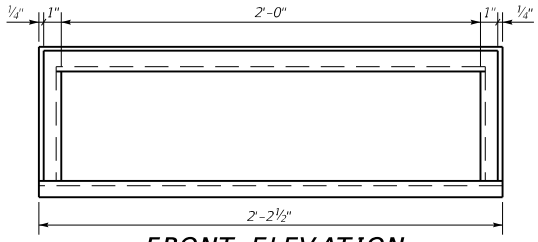
STANDARD DRAWING NO. BGX-019

SUBMITTED _____ 02-26-20
DIRECTOR DIVISION OF STRUCTURAL DESIGN — DATE

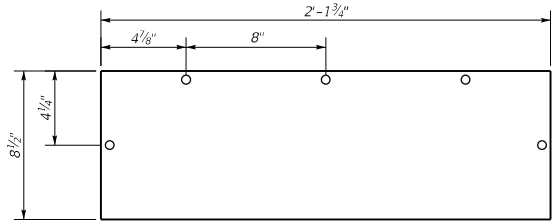
APPROVED _____ 02-26-20
STATE HIGHWAY ENGINEER — DATE



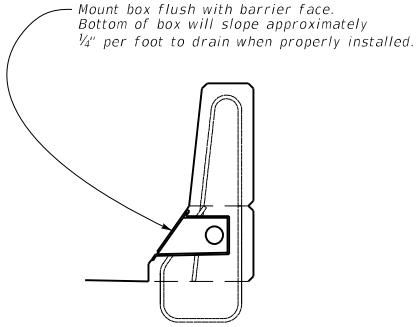
SIDE ELEVATION



FRONT ELEVATION



COVER PLATE



TYPICAL INSTALLATION IN TYPE 3 BARRIER

General Notes

Construct junction boxes from ¼" A36 steel plate and the junction box cover from ⅛" A36 plate. Hot dip galvanize box and cover after fabrication and in accordance with ASTM A123 and the Standard Specifications. Cover plate shall include (5) Stainless Steel screw taps with wing nuts and a Rubber Gasket for all sides where screws are installed.

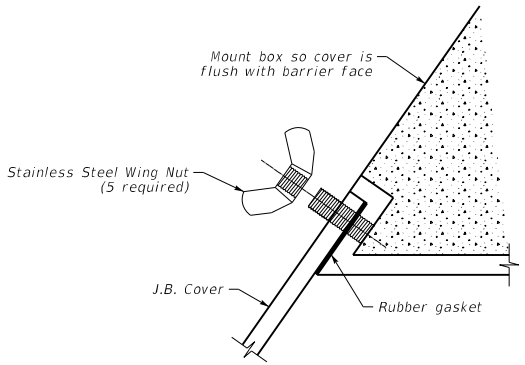
Fittings shall be UL listed and CSA-certified concrete tight on the outside of the Junction Box conduit connection. Use a sealing lock nut and a rigid PVC conduit bushing on the inside for all conduit penetrations.

Liberally coat the threads of the cover fasteners with anti-seize compound during construction and before final closure.

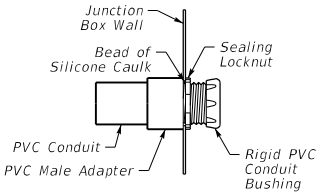
Protect cover of J.B. from damage/disfigurement from masonry coating application and other sources by taping or wrapping during construction. Remove protection prior to final electrical inspection and repair any damage or disfigurement to the satisfaction of the Engineer and at no cost to the Department.

When properly installed, box cover will be flush with barrier face and box bottom will slope to drain approximate ¼" / ft. in all cases.

The price bid for Junction Box – 24" shall include all costs to furnish and install the junction box in accordance with these plans and the Specifications.



DETAIL "A"



BUSHING DETAIL AT J.B. CONDUIT ENTRY

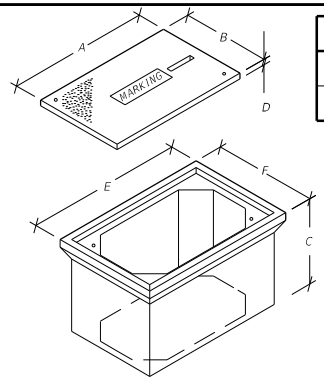
KENTUCKY
DEPARTMENT OF HIGHWAYS

24 INCH JUNCTION BOX TYPE 3 BARRIER

STANDARD DRAWING NO. BGX-020

SUBMITTED _____ 02-26-20
DIRECTOR DIVISION OF STRUCTURAL DESIGN — DATE

APPROVED _____ 02-26-20
STATE HIGHWAY ENGINEER — DATE

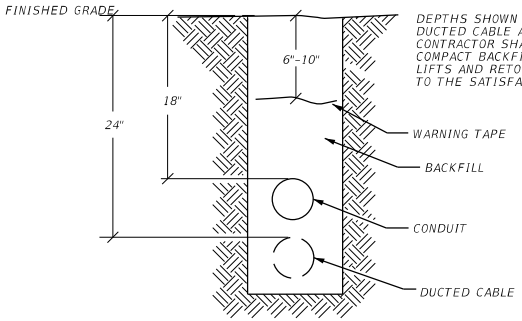


JUNCTION BOX DIMENSIONS (NOMINAL)					
A	B	C	D	E	F
23"	14"	27"	2"	25"	15"

Junction Box shall meet or exceed ANSI/SCTE 77-2002, Tier 15 and shall be installed flush with the finished grade as shown.

Junction box for traffic signal installations shall be marked "Traffic". Junction box for lighting installations shall be marked "Lighting". Covers shall be attached with a minimum of two $\frac{3}{8}$" Stainless Steel hex bolts.

Where required, Junction box shall be oriented such that the dimensions comply with the national electric code.



DEPTHS SHOWN FOR CONDUIT AND DUCTED CABLE ARE MINIMUMS. CONTRACTOR SHALL PLACE AND COMPACT BACKFILL IN 9" MAXIMUM LIFTS AND RETORE DISTURBED AREA TO THE SATISFACTION OF THE ENGINEER.

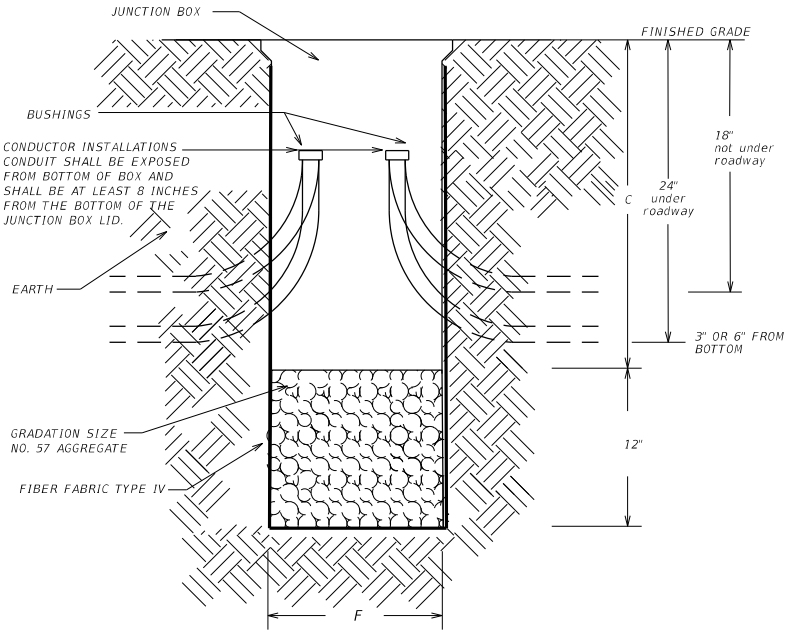
CONDUIT, DUCTED CABLE AND WARNING TAPE TRENCH

GENERAL NOTES

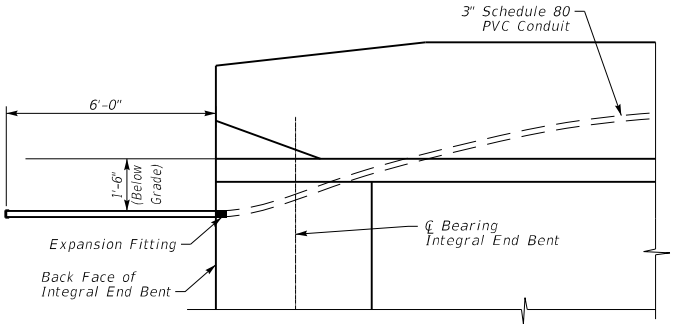
The bid for junction boxes shall include furnishing and installing specified junction box in accordance with the specifications. Junction box, Type A, shall include #57 aggregate as shown on this sheet, backfilling and restoration of disturbed areas to the satisfaction of the resident engineer, and concrete (if required).

Provide and install conduit caps and sleeve type expansion devices capable of sustaining + 1", 2" total movement at each integral end bent. All conduit shall have copper grounding bushings installed. The cost of the caps, expansion devices, and copper grounding bushings is incidental to the 3" conduit.

The 3" conduit in each barrier is to be schedule 80 PVC and is a separate pay item.

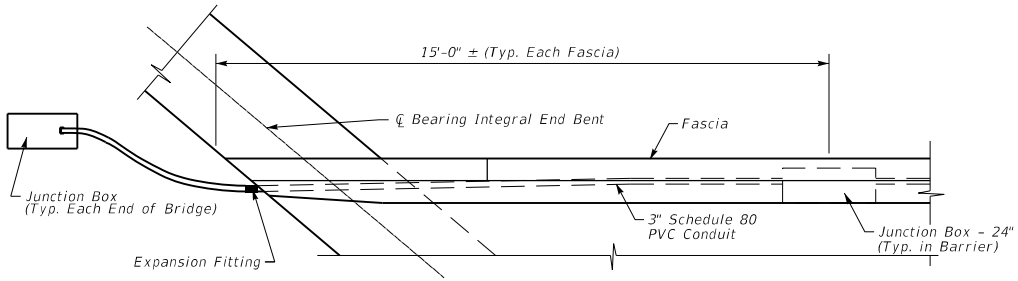


JUNCTION BOX INSTALLATION

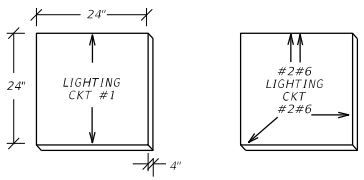


ELEVATION - EXPANSION AND CONDUIT DETAILS

BEFORE THE INSTALLATION OF THE #57 AGGREGATE AND JUNCTION BOX, THE CONTRACTOR SHALL INSTALL GEOTEXTILE FILTER FABRIC TYPE IV IN THE HOLE. THE FABRIC SHALL EXTEND TO JUST BELOW THE LIP OF THE JUNCTION BOX AND SHALL BE CONTINUOUSLY ADHERED TO THE EXTERIOR OF THE BOX WITH ADHESIVE. ANY LOCATIONS WHERE CONDUITS ENTER THE BOX, THE FABRIC SHALL BE "X CUT" ONLY AS MUCH AS NECESSARY TO ALLOW PASSAGE OF EACH INDIVIDUAL CONDUIT THROUGH THE FABRIC. THE FABRIC SHALL BE INCIDENTAL TO BID ITEMS 4811, 20391NS835, OR 20392NS835.



PLAN - EXPANSION AND CONDUIT DETAILS



CONCRETE CABLE MARKERS

KENTUCKY DEPARTMENT OF HIGHWAYS

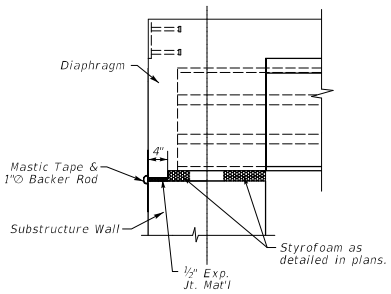
JUNCTION BOX TYPE - A

STANDARD DRAWING NO. BGX-021

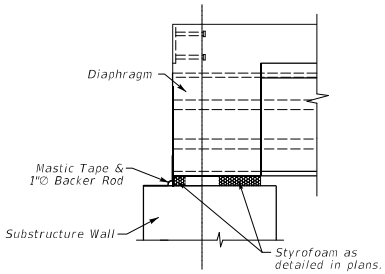
SUBMITTED _____ DIRECTOR DIVISION OF STRUCTURAL DESIGN — 02-26-20 DATE

APPROVED _____ STATE HIGHWAY ENGINEER — 02-26-20 DATE

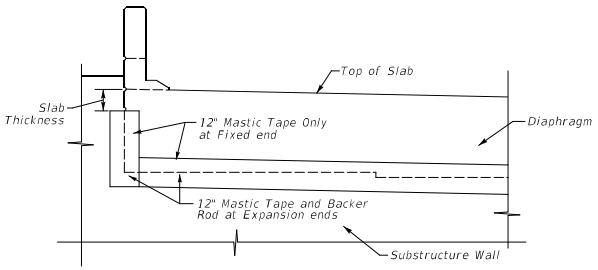
*Expansion Joint Material:
AASHTO M153
Type-I Sponge Rubber



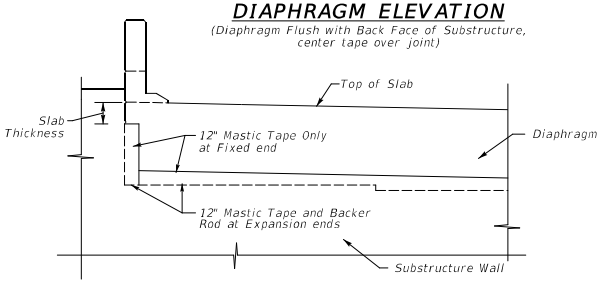
EXPANSION END
(Flush Diaphragm and Substructure)



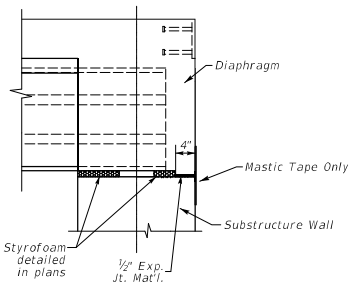
EXPANSION END
(Offset Diaphragm and Substructure)



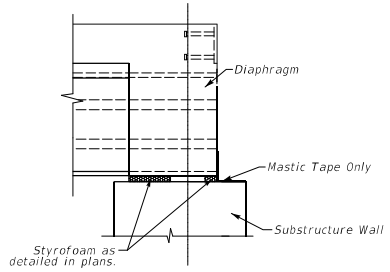
DIAPHRAGM ELEVATION
(Diaphragm Flush with Back Face of Substructure, center tape over joint)



DIAPHRAGM ELEVATION
(Offset Diaphragm and Substructure)



FIXED END
(Flush Diaphragm and Substructure)

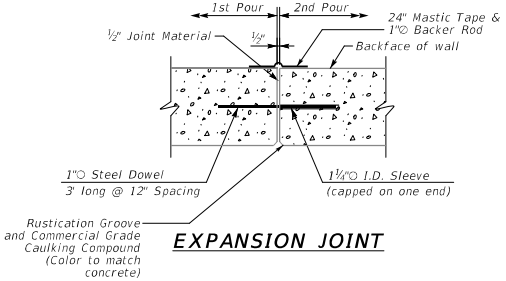


FIXED END
(Offset Diaphragm and Substructure)

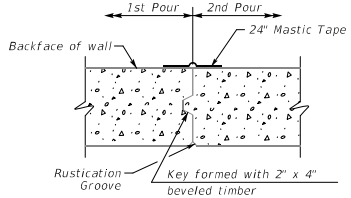
MASTIC TAPE APPLICATION AT BRIDGE ENDS

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.

Note: Center Mastic Tape over joint.



EXPANSION JOINT



CONTRACTION JOINT

NOTE:
Maintain 2 inch clearance from ends of Longitudinal reinforcement to edge of expansion joint.

MASTIC TAPE APPLICATION AT RETAINING WALLS

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 mfgr., 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 mfgrs. recommendations with the overlap running downhill.

All preformed expansion joint material, caulking, mastic tape, pipe sleeve and equipment and labor necessary to complete the joints are incidental to the square foot bid for Retaining Walls.

REVISION DATE: 08/11/2025
REVISION NUMBER: 0

SUBMITTED Michael Crupper DIVISION DIRECTOR 08-11-2025 DATE

APPROVED Jason Ballinger STATE HIGHWAY ENGINEER 08-11-2025 DATE

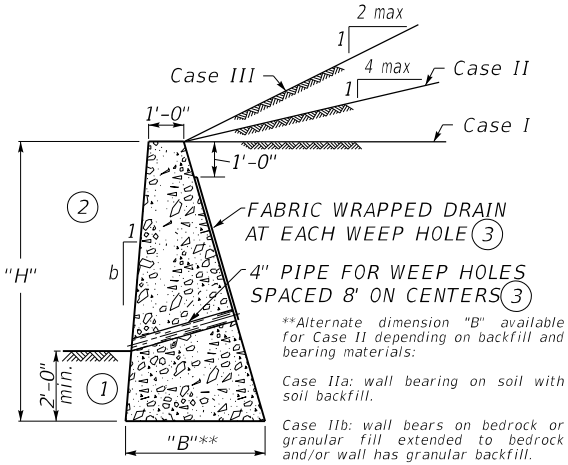
GENERAL

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

JOINT WATERPROOFING

STANDARD DRAWING NUMBER
BGX-022-01

OpenRoads Designer v23.00.01.11

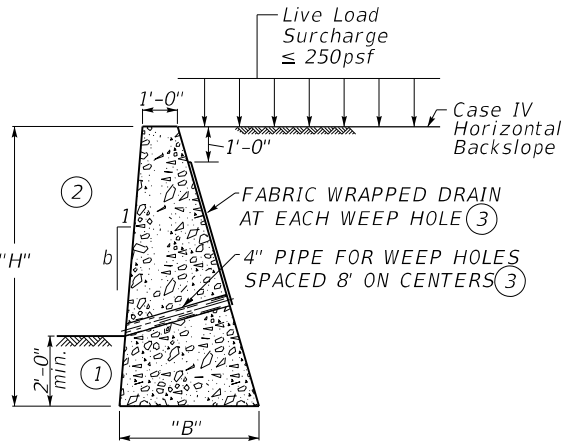


**Alternate dimension "B" available for Case II depending on backfill and bearing materials:

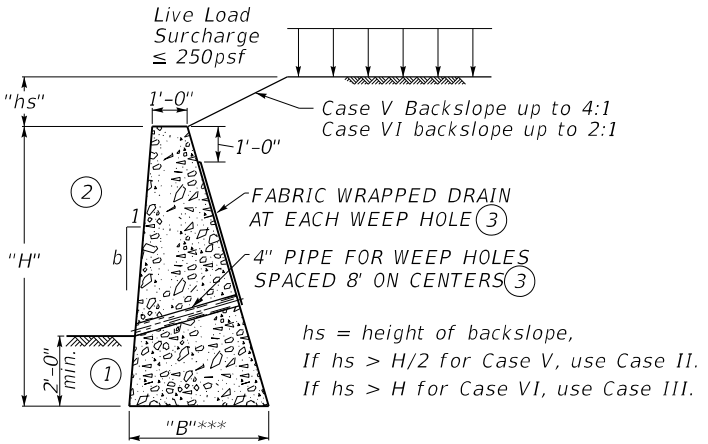
Case IIa: wall bearing on soil with soil backfill.

Case IIb: wall bears on bedrock or granular fill extended to bedrock and/or wall has granular backfill.

CASES I, II, AND III

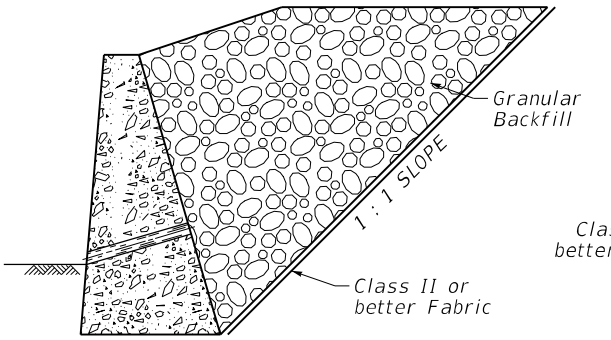


CASE IV



hs = height of backslope,
If hs > H/2 for Case V, use Case II.
If hs > H for Case VI, use Case III.

CASES V AND VI



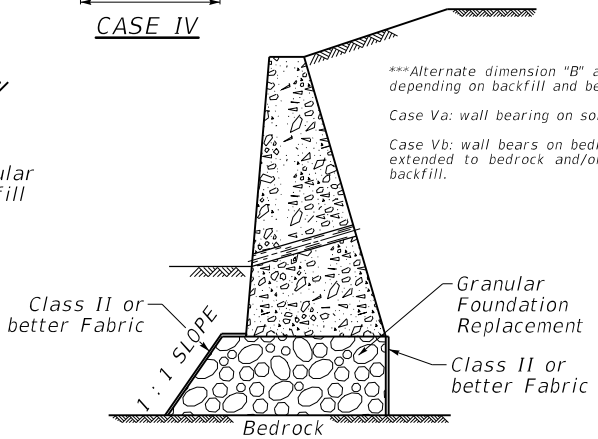
GRANULAR BACKFILL

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

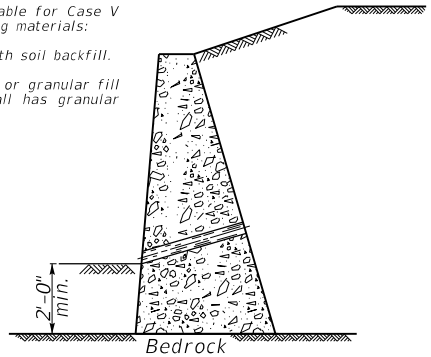
***Alternate dimension "B" available for Case V depending on backfill and bearing materials:

Case Va: wall bearing on soil with soil backfill.

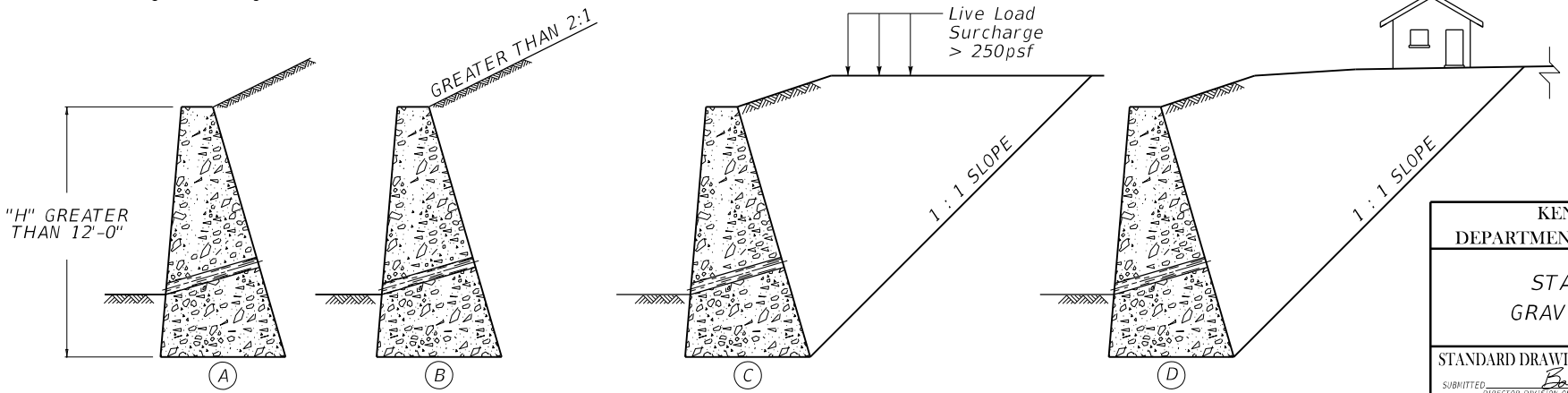
Case Vb: wall bears on bedrock or granular fill extended to bedrock and/or wall has granular backfill.



GRANULAR FOUNDATION REPLACEMENT



BEARING ON BEDROCK



SPECIAL DESIGNS REQUIRED

KENTUCKY
DEPARTMENT OF HIGHWAYS

STANDARD GRAVITY WALL

STANDARD DRAWING NO. BGX-023

SUBMITTED _____ 02-26-20
DIRECTOR DIVISION OF STRUCTURAL DESIGN — DATE

APPROVED _____ 02-26-20
STATE HIGHWAY ENGINEER — DATE

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 level (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:

(A) Wall height is greater than 12'–0".

(B) Backfill slopes are steeper than 2H:1V.

(C) 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.

(D) 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, 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 nonerodible, 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.

Construct standard gravity retaining walls according to Section 613 of the Standard Specifications, current edition, with the exceptions that the wall shall be constructed according to this Standard Drawing and that the wall's base width shall exceed ½ vertical height when required by plan notes or this Standard Drawing. Gravity walls meeting the criteria for Standard Gravity Wall defined herein may still require a Geotechnical Investigation. Conditions warranting a site investigation and geotechnical exploration shall be as defined in this Standard Drawing and KYTC Geotechnical Policy Manual Section 400, current edition.

	Required base width, B(ft)								
H(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	12:1 Batter
6.0	3.00	3.00	3.00	3.00	4.50	4.75	4.75	5.00	6:1 Batter
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*	12:1 Batter
10.0	5.00	5.25	5.00*	5.00*	6.75	7.00	7.00	7.50*	6:1 Batter
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*	

* 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 or required. The wall design shall be in accordance with the AASHTO Standard Specifications for Highway Bridges, current edition.

Soil Backfill	$c' = 0$ psf, $\Phi' = 28°$, $\gamma = 120$ pcf
Foundation	$c = 1200$ psf, $\Phi' = 0$, $\gamma = 120$ pcf
Granular backfill or foundation replacement	$c' = 0$, $\Phi' = 38°$, $\gamma = 115$ 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

STANDARD DRAWING NO. BGX-024

SUBMITTED _____ 02-26-20
DIRECTOR DIVISION OF STRUCTURAL DESIGN — DATE

APPROVED _____ 02-26-20
STATE HIGHWAY ENGINEER — DATE

GENERAL NOTES

SPECIFICATIONS: *Unless otherwise noted, vinyl coat all materials used in the fabrication of the pedestrian cage, stair and ramp fence and handrail in accordance with AASHTO Standard Specification M 181, current edition.*

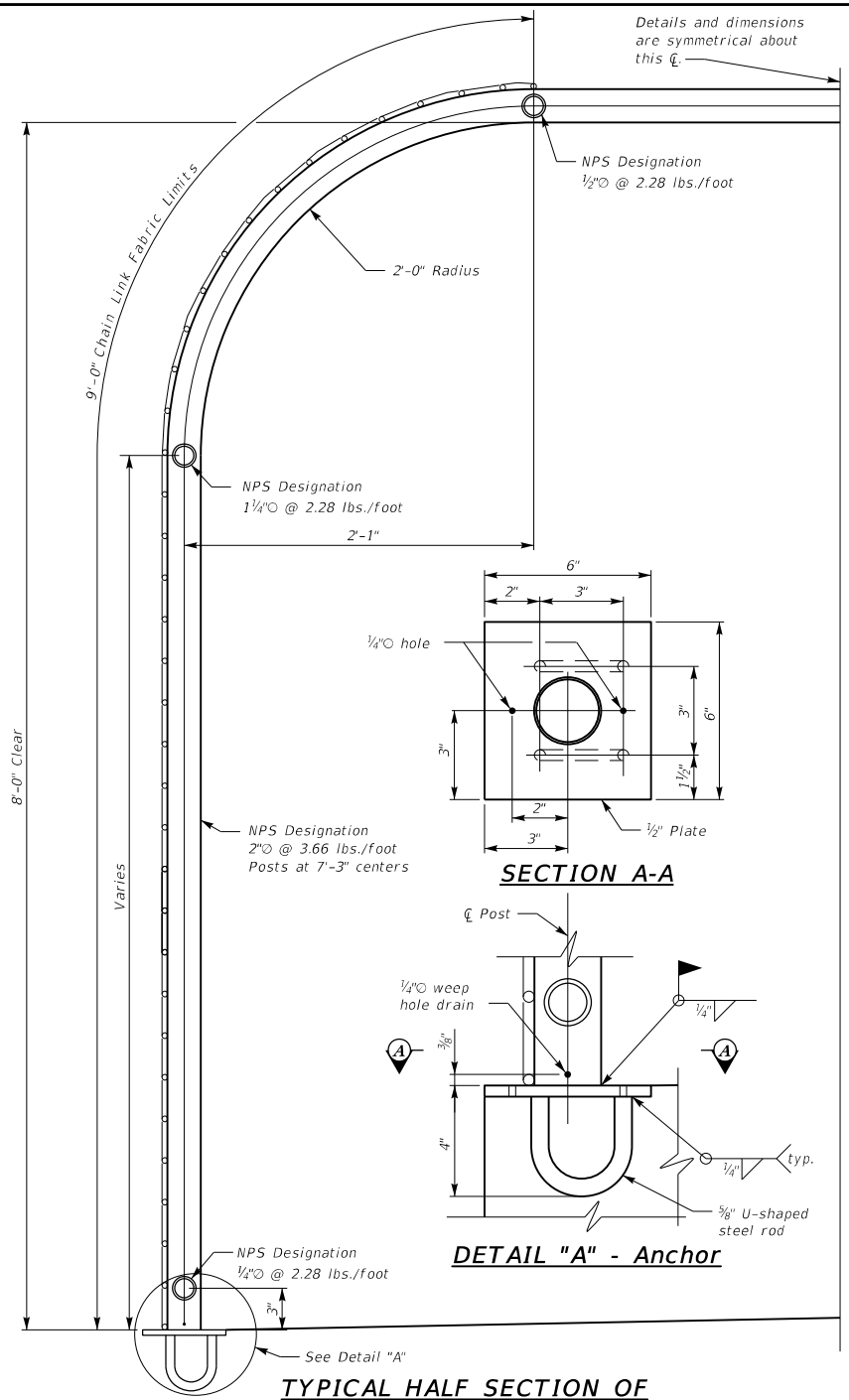
POST: *Ensure fence posts are NPS Designation 2"○ @ 3.66 lbs/ft., Grade 1.*

RAILS AND HANDRAIL: *Ensure rails are NPS Designation 1¼"○ @ 2.28 lbs/ft., Grade 1.*

CHAIN LINK FABRIC: *Use Polyvinyl Chloride (PVC) coated steel fence Type IV for this project with the color of coating to be Dark Green with the size of fence being in accordance with Section 817 of the Specifications. Tie the fabric to the posts and rails at 2 ft. centers (maximum).*

ANCHOR PLATES: *Place plates prior to pouring the concrete. Drilling of concrete to place anchor plates is not an option. Ensure anchor plates, handrail plates, and U-shaped rods conform to AASHTO M183 or SAE specification M 1020 and galvanized in accordance with ASTM A153. Apply a vinyl finish coat on all exposed surfaces of the anchor plates after the posts are in place.*

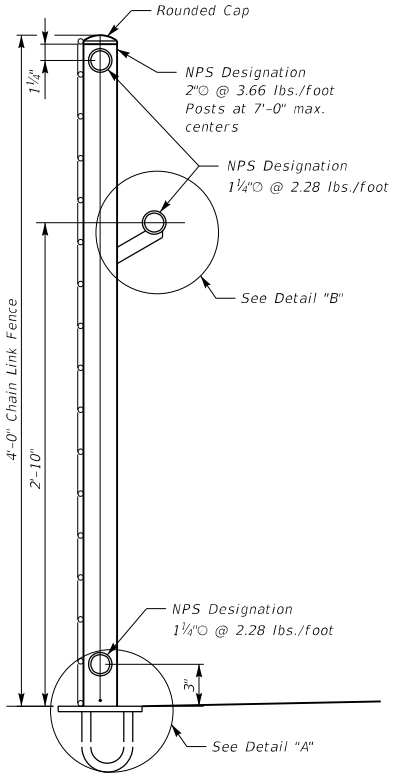
DAMAGE COATING: *After the installation of the chain link fabric, clean any damaged areas of any of the fence components by washing with mineral spirit solvent sufficient to remove any contaminants. After cleaning, apply a vinyl washing primer to the surfaces with dry film thickness of 0.3 mil to 0.5 mil before the final vinyl finish coat is applied.*



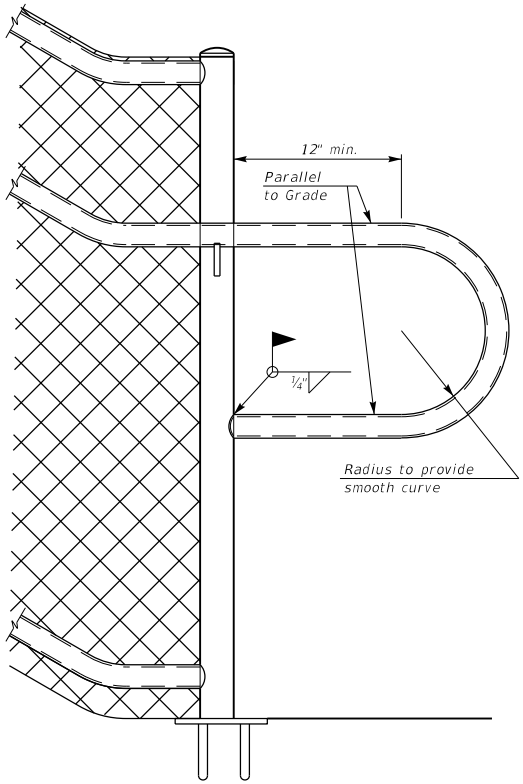
TYPICAL HALF SECTION OF PEDESTRIAN CAGE FOR OVERPASSES

SECTION A-A

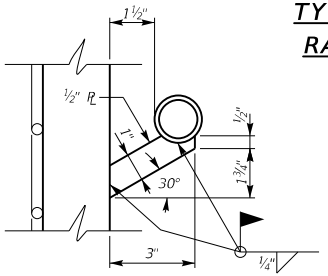
DETAIL "A" - Anchor



TYPICAL SECTION THROUGH RAMP OR STAIRS



TYPICAL ENDPOST RAIL TREATMENT



DETAIL "B" - Handrail

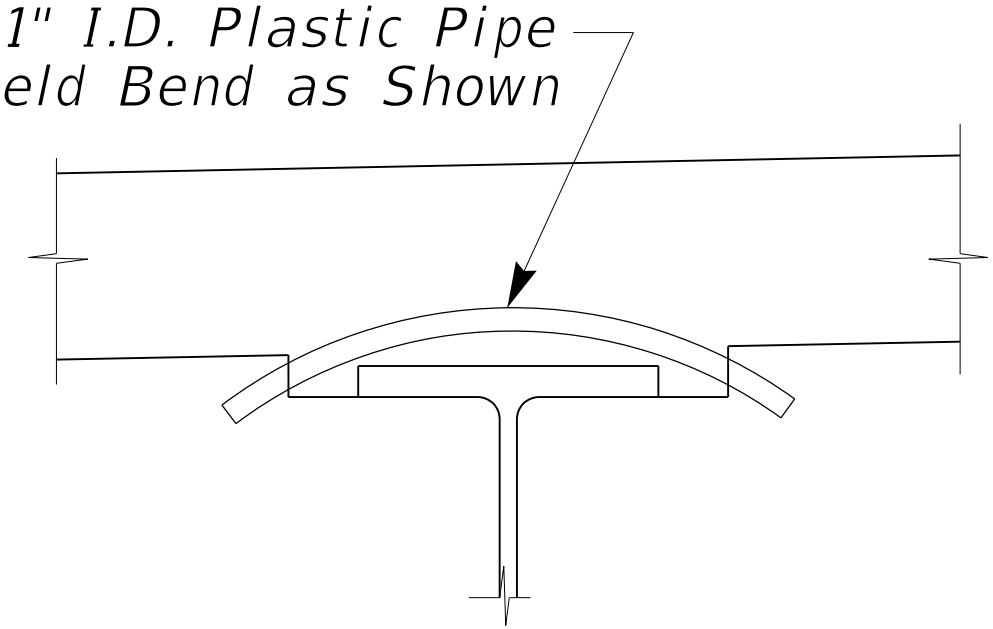
KENTUCKY DEPARTMENT OF HIGHWAYS

CHAINLINK FENCE

STANDARD DRAWING NO. BGX-025

SUBMITTED — DIRECTOR DIVISION OF STRUCTURAL DESIGN — DATE 02-26-20

APPROVED — STATE HIGHWAY ENGINEER — DATE 02-26-20



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

KENTUCKY
DEPARTMENT OF HIGHWAYS

AIR VENT
DETAILS

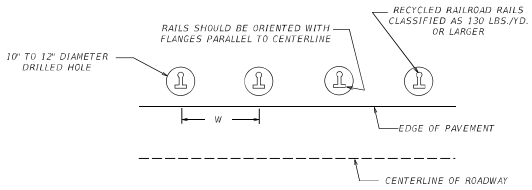
STANDARD DRAWING NO. BGX-026

SUBMITTED _____ 02-26-20
DIRECTOR DIVISION OF STRUCTURAL DESIGN DATE

APPROVED _____ 02-26-20
STATE HIGHWAY ENGINEER DATE

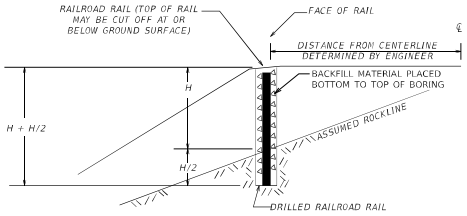
TYPICAL SPACING DETAIL - SINGLE ROW

(NO SCALE)



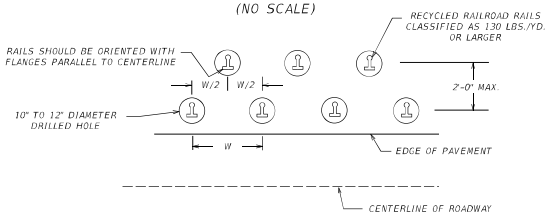
TYPICAL CROSS SECTION DETAIL - SINGLE ROW

(NO SCALE)



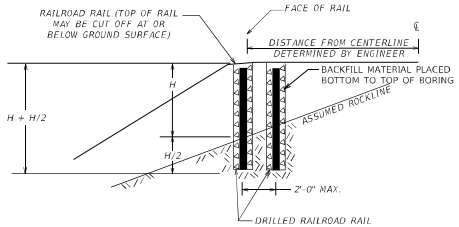
TYPICAL SPACING DETAIL - DOUBLE ROW

(NO SCALE)



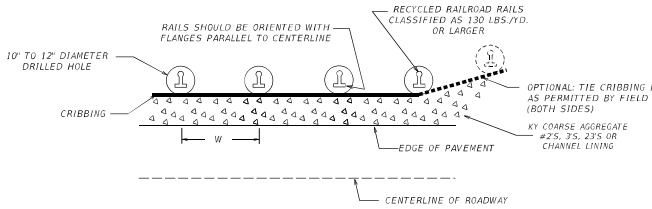
TYPICAL CROSS SECTION DETAIL - DOUBLE ROW

(NO SCALE)



TYPICAL SPACING DETAIL - SINGLE ROW W/ CRIBBING

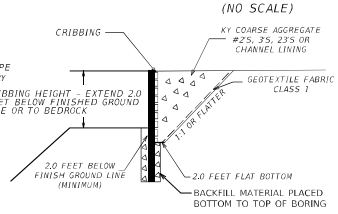
(NO SCALE)



TYPICAL CROSS SECTION WITH BACKFILL

(USE WITH SINGLE OR DOUBLE ROW)

(NO SCALE)



DEPTH TO ROCKLINE (H)	RAIL SPACING (W)	
	SINGLE ROW	DOUBLE ROW
<8 FT	4 FT	NA
8 - 12 FT	3 FT	NA
12 - 15 FT	2-3 FT*	3 FT
15 - 21 FT	NA	2-3 FT*
>21 FT	SPECIAL DESIGN REQUIREMENTS	

* 2 FEET SPACING PREFERRED - CAN EXTEND UP TO 3 FEET PROVIDED DEEPER RAILS (UP TO 40 FIET LONG) ARE USED

GEOTECHNICAL NOTES

(1) H IS THE HEIGHT OF MATERIAL FROM ROCKLINE TO ROADWAY GRADE

(2) MINIMUM EMBEDMENT INTO BEDROCK IS H/2 OR 1/3 OF TOTAL LENGTH OF THE INSTALLED RAIL. THESE LENGTHS MAY BE EXCEEDED AT THE FIELD ENGINEER'S DISCRETION DUE TO FIELD OR MATERIAL CONSIDERATIONS BUT SHALL NOT BE REDUCED.

(3) BACKFILL IS TO BE PEAGRAVEL, NO. 8 OR 9 CRUSHED STONE, CONCRETE, FLOWABLE FILL, OR GROUT. BACKFILL OF BORINGS SHALL NOT BE OMITTED BY CONTRACTOR/ ENGINEER AND SHALL NOT BE SOIL CUTTINGS FROM THE BORING.

(4) BACKFILL SHALL BE PLACED FROM THE BOTTOM TO THE TOP OF THE BORING

(5) BACKFILL (GRAVEL OR CRUSHED STONE) IS TO BE SHOVELED INTO BORE HOLE TO THE TOP OF THE BORING TO PREVENT VOIDS

(6) RAIL IS TO BE INSTALLED PERPENDICULAR TO THE ROADWAY WITH WIDE FLANGE FACING ROADWAY

(7) SPACING BETWEEN ROWS IS TO BE 2.0 FEET

(8) CRIBBING SHALL BE MINIMUM 2.0 FEET BELOW FINISHED GROUND LINE OR TO BEDROCK BASED ON LOCAL CONDITIONS

(9) BACKFILL BEHIND THE WALL IS TO BE 2'S, 23'S, 3'S, OR CHANNEL LINING

(10) ALL RAILS SHALL BE MINIMUM OF 130 LB/YD UNIT WEIGHT

(11) CRIBBING SHALL CONSIST OF USED W BEAM GUARDRAIL SECTIONS, CONCRETE PANELS, OR OTHER MATERIALS SPECIFIED BY THE ENGINEER

(12) RAILS 40.0 FEET IN LENGTH MAY BE REQUIRED WHEN LOCAL CONDITIONS WARRANT SUCH AS WHEN SPACING BETWEEN RAILS HAS TO BE WIDENED MORE THAN RECOMMENDED OR WHEN LOCALIZED, SMALL SECTIONS OF THE REPAIR EXCEED 21.0 FEET DEPTH TO BEDROCK.

(13) OPTIONAL: TIE CRIBBING INTO EMBANKMENT SLOPE OR HILLSIDE AS PERMITTED BY FIELD GEOMETRY (BOTH SIDES)

REVISION DATE: 08/11/2025
REVISION NUMBER: 0

SUBMITTED: Michael Crapp 08-11-2025
DIVISION DIRECTOR DATE

APPROVED: Jason Ballinger 08-11-2025
STATE HIGHWAY ENGINEER DATE

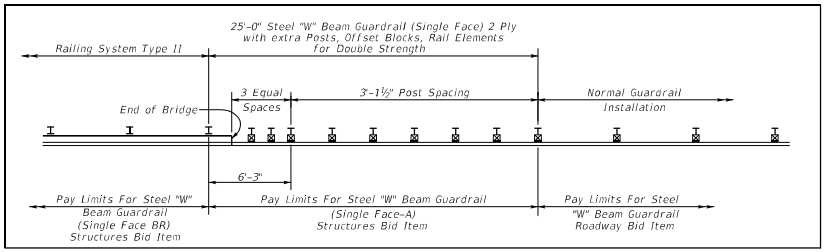
GENERAL

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

STANDARD RAIL AND CRIBBING INSTALL

STANDARD DRAWING NUMBER
BGX-027

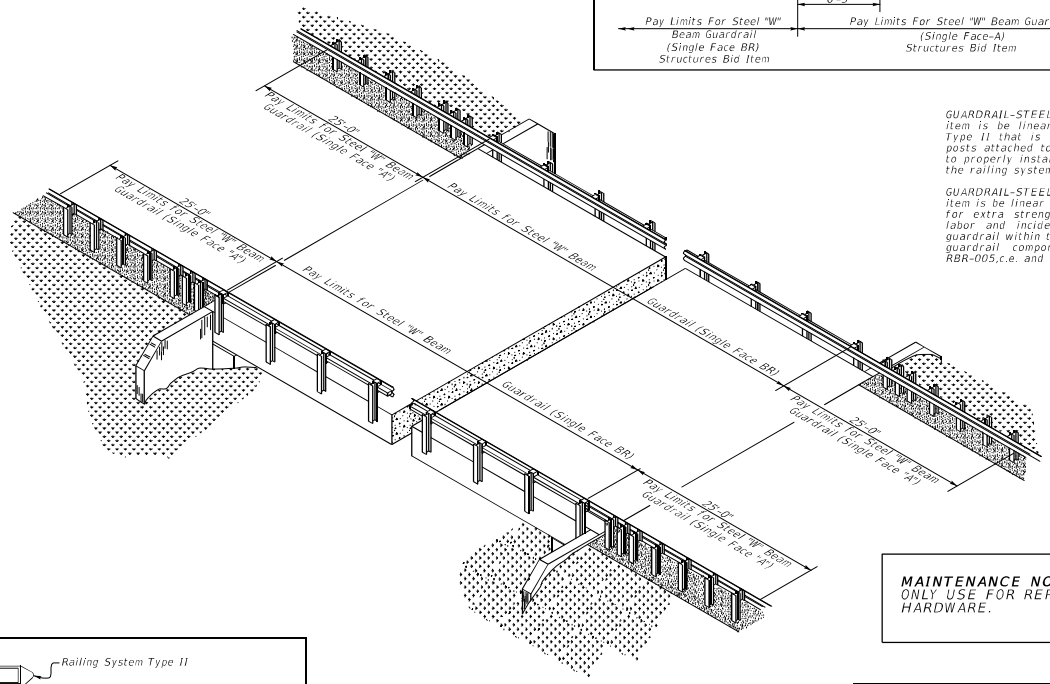
OpenRoads Designer v23.00.01.11



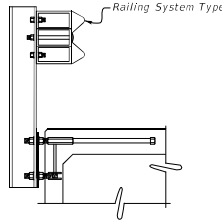
BID ITEM NOTES

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.

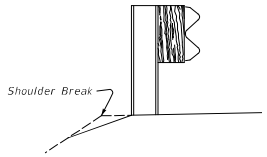
GUARDRAIL-STEEL W BEAM (SINGLE FACE A): The bid unit for this item is be linear feet. This item includes the W-Beam guardrail (2 ply for extra strength), guardrail posts, offset blocks, hardware, and labor and incidentals necessary to properly install the approach guardrail within the 25'-0" limits at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



MAINTENANCE NOTES: NOT FOR NEW CONSTRUCTION. ONLY USE FOR REPAIRING OR RESTORING EXISTING HARDWARE.



BRIDGE GUARDRAIL INSTALLATION



ROADWAY SHOULDER
G.R. INSTALLATION

REVISION DATE: 08/11/2025
REVISION NUMBER: 0

SUBMITTED Michael Cupp 08-11-2025
DIVISION DIRECTOR DATE

APPROVED Jason Ballinger 08-11-2025
STATE HIGHWAY ENGINEER DATE

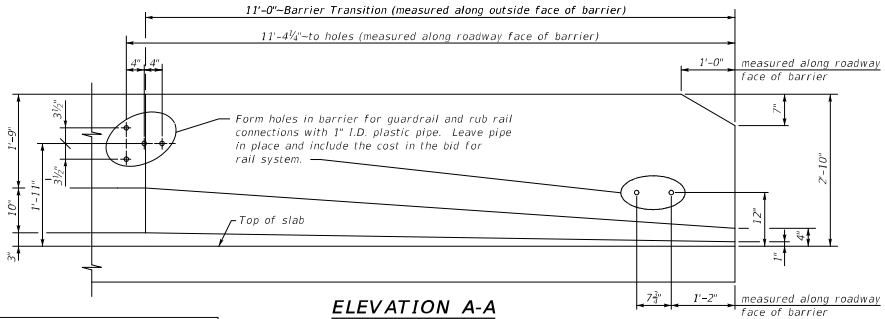
HANDRAIL

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

RAILING SYSTEM TYPE II GUARDRAIL SYSTEM

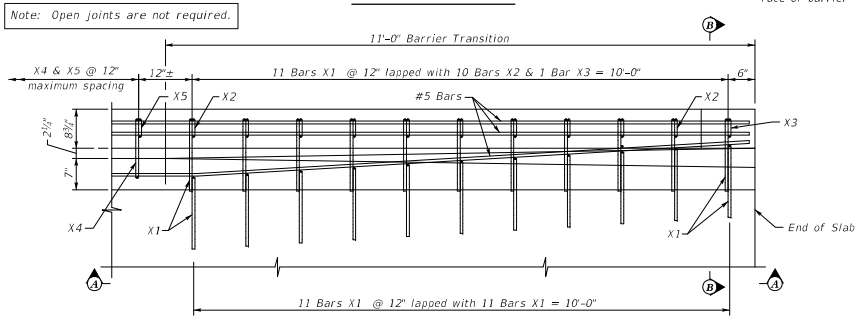
STANDARD DRAWING NUMBER
BHS-007-08

OpenRoads Designer v23.00.01.11

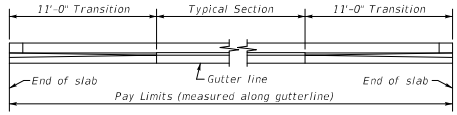


ELEVATION A-A

Note: Open joints are not required.

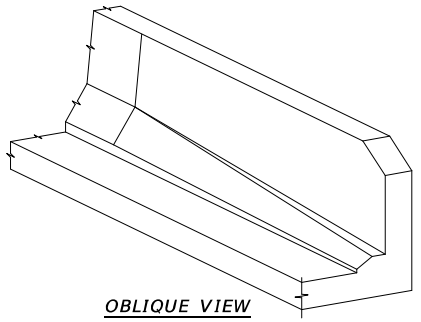


PLAN OF BARRIER TRANSITION

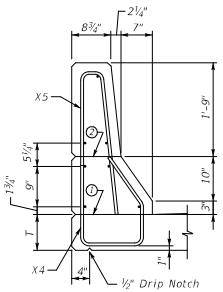


PLAN OF BARRIER

Note: X1 & X3 Bars at end of slab may be adjusted to maintain 2" minimum clearance on curved and skewed end bridges.



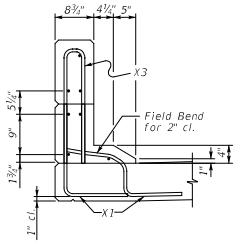
OBLIQUE VIEW



TYPICAL BARRIER SECTION

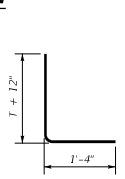
① Mandatory roughened construction joint. Concrete above this joint is to be placed after slab has been properly cured and included in the bid for Rail System, Type 3.

② Permissible construction joint. "V-Groove" rustication joint is required if construction joint is used. ¼" Open Joints are not required.



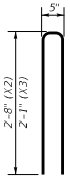
SECTION B-B

"V-Groove" Rustication



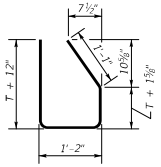
X1(e) Bars

#5 Bar



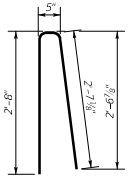
X2(e) & X3(e) Bars

#5 Bar



X4(e) Bars

#5 Bar



X5(e) Bars

#5 Bar

General Notes

CONCRETE: Use Class "AA" Concrete throughout.

OPTIONAL WELDED WIRE REINFORCEMENT: At the contractor's option, deformed welded wire reinforcement (WWR) in accordance with ASTM A497 and epoxy coated in accordance with ASTM A884 may be used in place of stirrup bars X2, X3, and X5 as well as the straight or longitudinal reinforcement attached to these stirrups. Use size D31 wire for both stirrups and straight reinforcement. Locate and space the wire reinforcement the same as the conventional reinforcement except lower the top straight bar at least 2½" away from the bend in the stirrup. Use a minimum 2'-8" lap for the straight reinforcement between sheets of WWR.

MEASUREMENT: The linear foot bid for the barrier is measured along the roadway gutterline. Include all reinforcement shown and all concrete above the top of slab in the bid item for Rail Sytem Type 3.

REINFORCEMENT: All reinforcement shown on this sheet is to be epoxy coated. Use stirrup bend diameters for all bent bars. Straight reinforcement is to be Size #5 and lapped 2'-2" when necessary.

MAINTENANCE NOTES: NOT FOR NEW CONSTRUCTION. ONLY USE FOR REPAIRING OR RESTORING CONCRETE BARRIER WALL. USE 4000 PSI CLASS "AA" CONCRETE FOR REPAIRS TO EXISTING JERSEY SHAPES.

REVISION DATE: 08/11/2025
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — DATE 08-11-2025

APPROVED — STATE HIGHWAY ENGINEER — DATE 08-11-2025

HANDRAIL

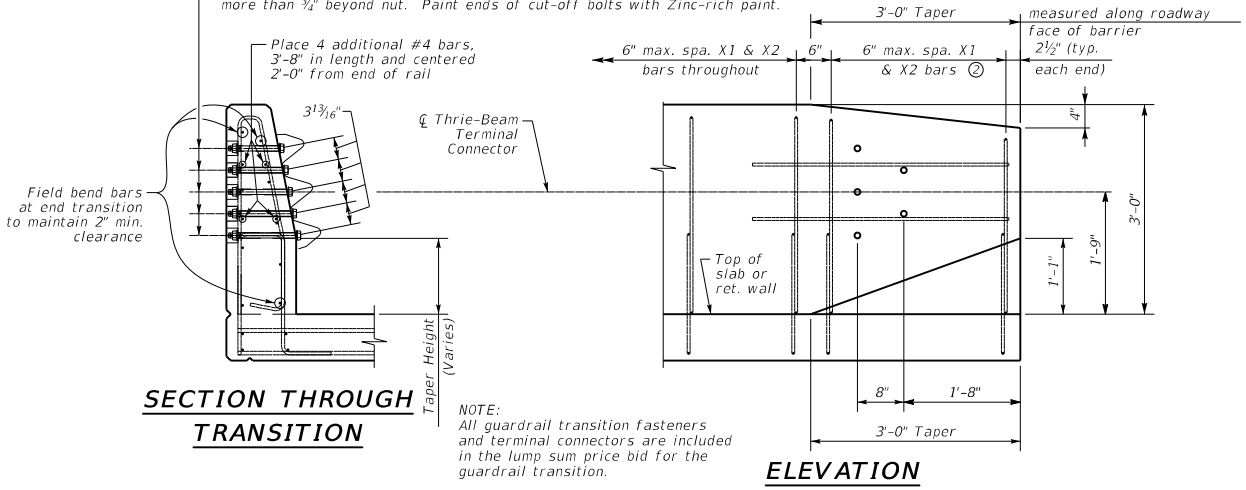
COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

RAIL SYSTEM TYPE 3

STANDARD DRAWING NUMBER
BHS-008-03

OpenRoads Designer v23.00.01.11

5 ~ 1" Dia holes and 2½" Dia x 2" deep recesses. Form or core holes and recesses. Percussion drilling is not permitted. Adjust placement of reinforcing steel as necessary to avoid bolt holes and recesses. Bolt recesses are only required when pedestrian sidewalks are adjacent to back of rail. Tighten the 5 Terminal Connection Bolts in a well distributed pattern so to prevent damage or distortion of the Thrie-Beam Connection and the guardrail Transition. Cut bolts off after installation so as to extend no more than ¾" beyond nut. Paint ends of cut-off bolts with Zinc-rich paint.



SECTION THROUGH TRANSITION

ELEVATION

NOTE:
All guardrail transition fasteners and terminal connectors are included in the lump sum price bid for the guardrail transition.

General Notes

This rail system has been structurally evaluated to be equivalent or greater in strength to other single slope railings which have been crash tested to MASH TL-4 Criteria. This rail system can be used for speeds of 50 mph or greater when a TL-3 rated transition is used. When a TL-2 transition is used, this railing can only be used for 45 mph or less.

CONCRETE: Use Class "AA" Concrete throughout.

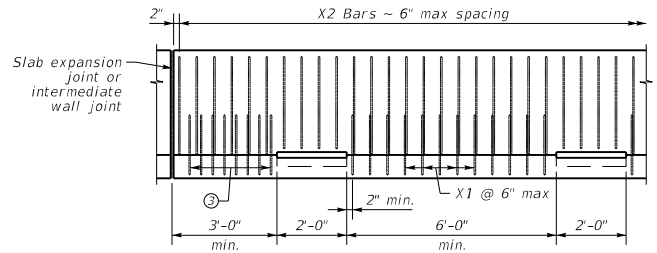
SHOP DRAWINGS: Are not required for this rail.

OPTIONAL WELDED WIRE REINFORCEMENT: At the contractor's option, deformed welded wire reinforcement (WWR) in accordance with ASTM A1064 and epoxy coated in accordance with ASTM A884 may be used in place of stirrup bars X1, X2, and X3 as well as the straight or longitudinal reinforcement attached to these stirrups. Use size D20 wire for both stirrups and straight reinforcement. Locate and space the wire reinforcement the same as the conventional reinforcement. Use a minimum 1'-11" lap for the straight reinforcement between sheets of WWR.

MEASUREMENT: The linear foot bid for the barrier is measured along the roadway gutter line. Include all reinforcement shown and all concrete above the top of slab in the bid item for Rail System, 36 Inch Single Slope.

REINFORCEMENT: All reinforcement shown on this sheet is to be epoxy coated Grade 60. Use stirrup bend diameters for all bent bars. Straight reinforcement is to be Size #4 and lapped 1'-11" when necessary.

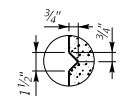
Average weight of rail is 412 lb/ft.



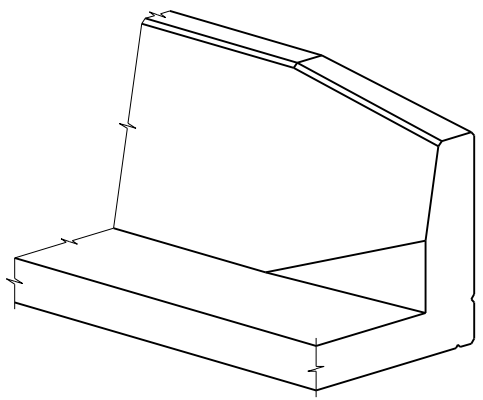
OPTIONAL SIDE SLOT DRAIN DETAIL

Note: Open joints are not required.

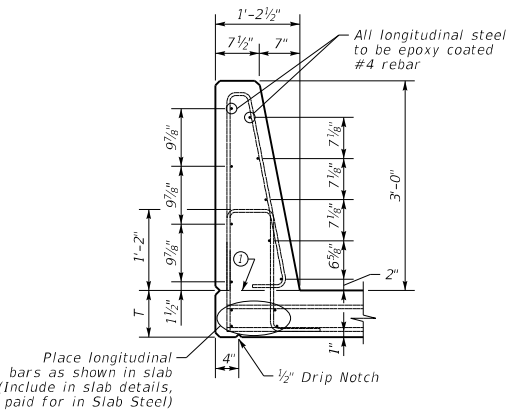
③ Space X1 @ 4" max. when end region of barrier is less than 6'-0" from joint to side slot. Space X1 @ 6" max. when end region is greater than 6'-0" from joint to edge of side slot.



"V-Groove" Rustication

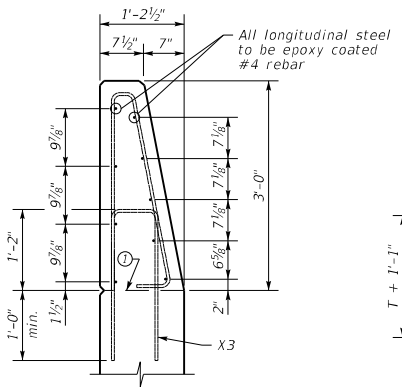


OBLIQUE VIEW

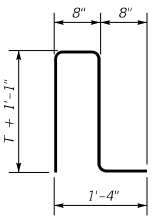


TYPICAL 36" BARRIER SECTION

① Mandatory roughened construction joint. Concrete above this joint is to be placed after slab has been properly cured and included in the bid for Rail System, 36 Inch Single Slope.

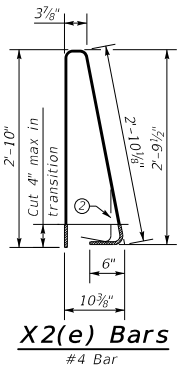


TYPICAL 36" BARRIER SECTION ON RETAINING WALL



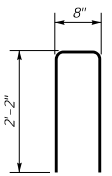
X1(e) Bars

#4 Bar



X2(e) Bars

#4 Bar



X3(e) Bars

#4 Bar

② Bend and field cut X2 bar as necessary to maintain 2" min. clearance to sides of taper and 2" to top of barrier.

KENTUCKY DEPARTMENT OF HIGHWAYS

RAILING SYSTEM
36 INCH
SINGLE SLOPE

STANDARD DRAWING NO. BHS-009

SUBMITTED _____ 02-26-20
DIRECTOR DIVISION OF STRUCTURAL DESIGN — DATE

APPROVED _____ 02-26-20
STATE HIGHWAY ENGINEER — DATE

General Notes

This rail system has been structurally evaluated to be equivalent or greater in strength to other single slope railings which have been crash tested to MASH TL-4 Criteria. This rail system can be used for speeds of 50 mph or greater when a TL-3 rated transition is used. When a TL-2 transition is used, this railing can only be used for 45 mph or less.

CONCRETE: Use Class "AA" Concrete throughout.

SHOP DRAWINGS: Are not required for this rail.

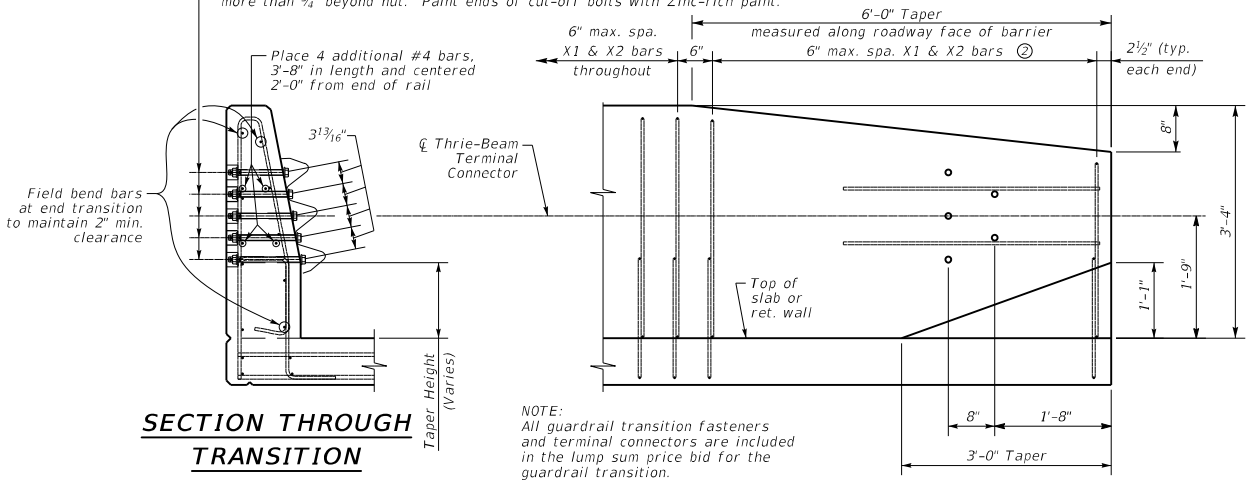
OPTIONAL WELDED WIRE REINFORCEMENT: At the contractor's option, deformed welded wire reinforcement (WWR) in accordance with ASTM A1064 and epoxy coated in accordance with ASTM A884 may be used in place of stirrup bars X1, X2, and X3 as well as the straight or longitudinal reinforcement attached to these stirrups. Use size D20 wire for both stirrups and straight reinforcement. Locate and space the wire reinforcement the same as the conventional reinforcement. Use a minimum 1'-11" lap for the straight reinforcement between sheets of WWR.

MEASUREMENT: The linear foot bid for the barrier is measured along the roadway gutter line. Include all reinforcement shown and all concrete above the top of slab in the bid item for Rail System, 40 Inch Single Slope.

REINFORCEMENT: All reinforcement shown on this sheet is to be epoxy coated Grade 60. Use stirrup bend diameters for all bent bars. Straight reinforcement is to be Size #4 and lapped 1'-11" when necessary.

Average weight of rail is 474 lb/ft.

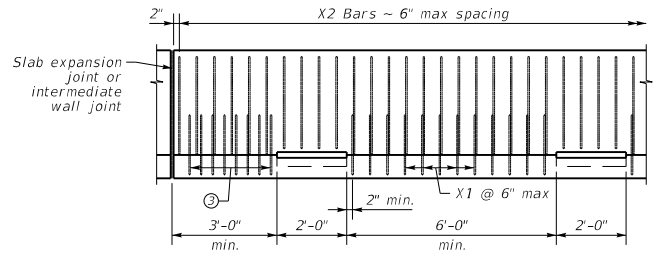
5 ~ 1" Dia holes and 2½" Dia x 2" deep recesses. Form or core holes and recesses. Percussion drilling is not permitted. Adjust placement of reinforcing steel as necessary to avoid bolt holes and recesses. Bolt recesses are only required when pedestrian sidewalks are adjacent to back of rail. Tighten the 5 Terminal Connection Bolts in a well distributed pattern so to prevent damage or distortion of the Thrie-Beam Connection and the guardrail Transition. Cut bolts off after installation so as to extend no more than ¾" beyond nut. Paint ends of cut-off bolts with Zinc-rich paint.



SECTION THROUGH TRANSITION

ELEVATION

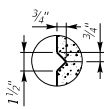
NOTE:
All guardrail transition fasteners and terminal connectors are included in the lump sum price bid for the guardrail transition.



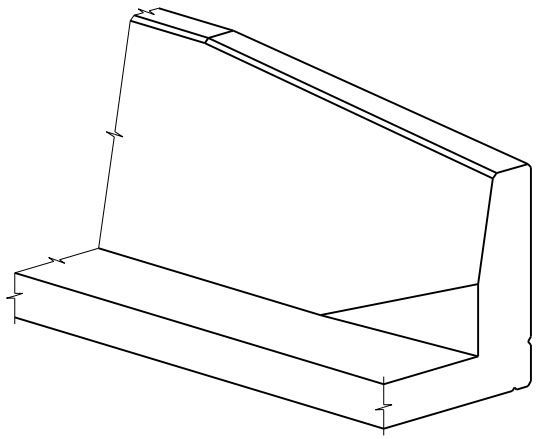
OPTIONAL SIDE SLOT DRAIN DETAIL

③ Space X1 @ 4" max. when end region of barrier is less than 6'-0" from joint to side slot. Space X1 @ 6" max. when end region is greater than 6'-0" from joint to edge of side slot.

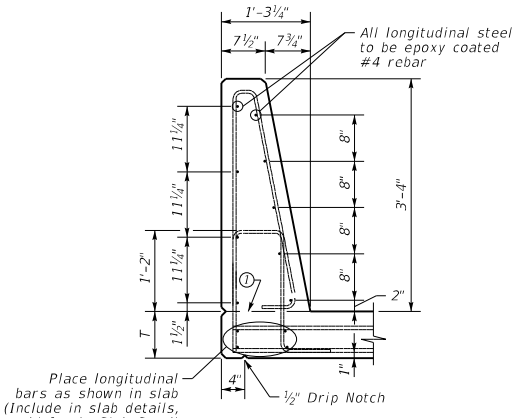
Note: Open joints are not required.



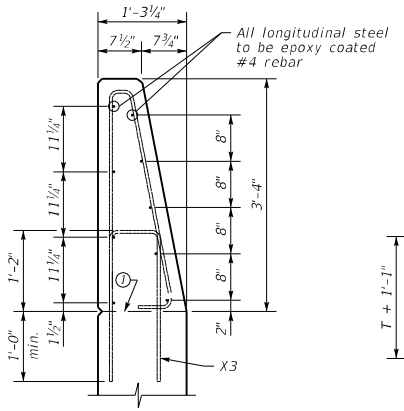
"V-Groove" Rustication



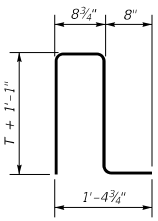
OBLIQUE VIEW



TYPICAL 40" BARRIER SECTION

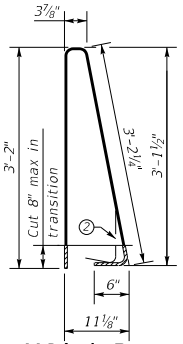


TYPICAL 40" BARRIER SECTION ON RETAINING WALL



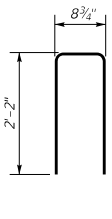
X1(e) Bars

#4 Bar



X2(e) Bars

#4 Bar



X3(e) Bars

#4 Bar

① Mandatory roughened construction joint. Concrete above this joint is to be placed after slab has been properly cured and included in the bid or Rail System, 40 Inch Single Slope.

② Bend and field cut X2 bar as necessary to maintain 2" min. clearance to sides of taper and 2" to top of barrier.

KENTUCKY DEPARTMENT OF HIGHWAYS

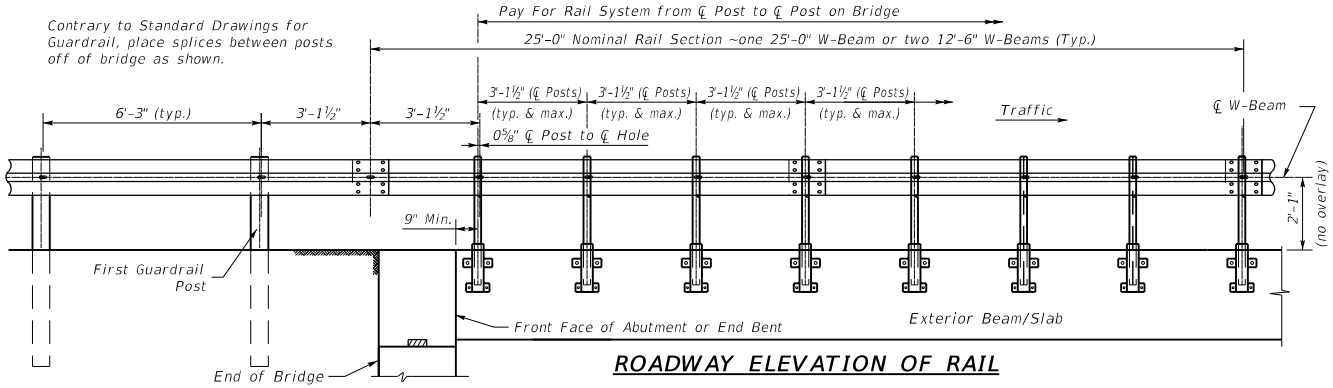
RAILING SYSTEM
40 INCH
SINGLE SLOPE

STANDARD DRAWING NO. BHS-010

SUBMITTED _____ 02-26-20
DIRECTOR DIVISION OF STRUCTURAL DESIGN — DATE

APPROVED _____ 02-26-20
STATE HIGHWAY ENGINEER — DATE

Contrary to Standard Drawings for Guardrail, place splices between posts off of bridge as shown.



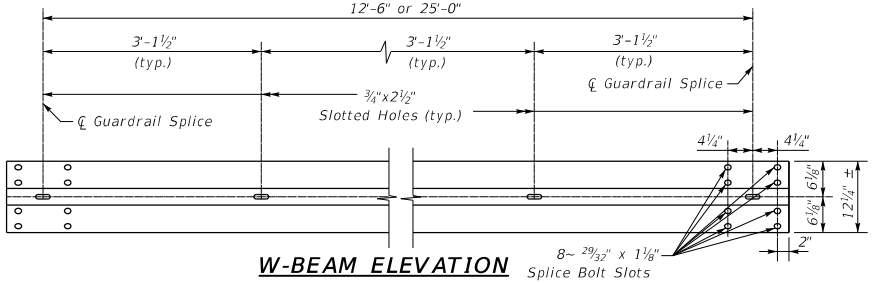
ROADWAY ELEVATION OF RAIL

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.

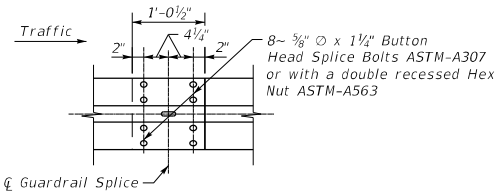
CONSTRUCTION NOTES:
Face of rail post must be plumb unless otherwise approved by the Engineer. Post must be perpendicular to adjacent roadway grade. Fully anchored guardrail must be attached to each end of rail. Typical guardrail construction as indicated above and not bridge rail transition or bridge 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. Threaded rod may be cast in the beam/slab or may be drilled and epoxy grouted. Epoxy grout must conform to Section 826 and must have a minimum bond strength of 1,305 psi. Follow all manufacturers recommendations for installation.

MATERIAL NOTES:
All components must be supplied galvanized including fasteners, anchor rods, threaded rods, etc. Galvanize all steel components after fabrication in accordance with ASTM A123. W-beam must meet the requirements of Std. Dwg. RBR-001, c.e. 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'-1½".

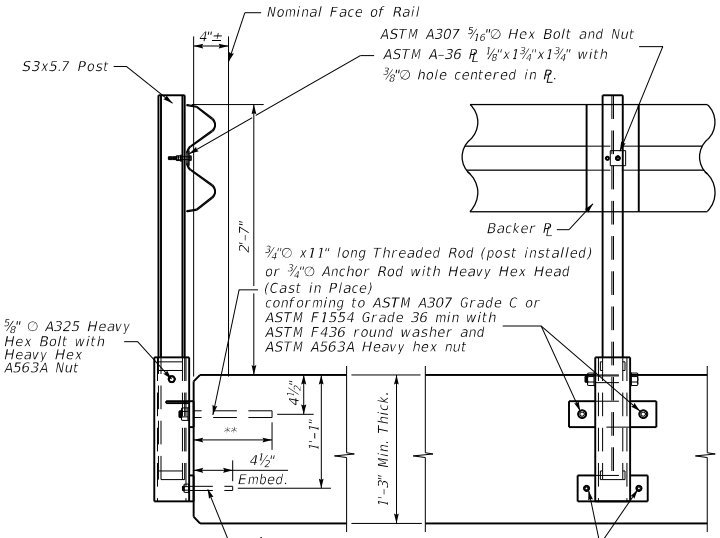
GENERAL NOTES:
This railing has been successfully evaluated by full scale crash test to meet MASH TL-3 criteria. This railing can be used for speeds 45 mph and greater.
This rail is designed to deflect approximately 4'-0" – 4'-6" as it contains and redirects the errant vehicle. This rail may not be installed 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 mounting bracket unit are not permitted. Replace all impact-damaged posts with a new post. If mounting bracket is visibly damaged, replace the bracket with a new one as well.
Average weight of railing with no overlay: 19 plf total.



W-BEAM ELEVATION



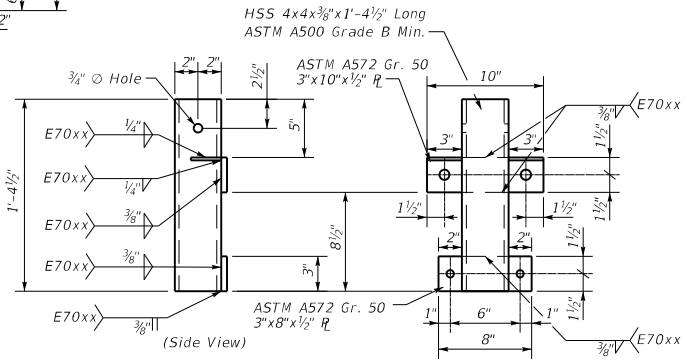
W-BEAM SPLICE ELEVATION

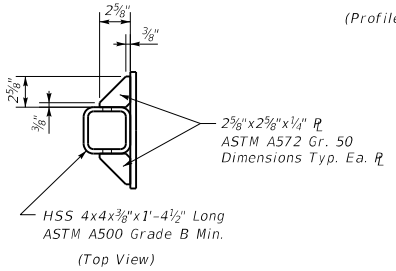


BACK VIEW

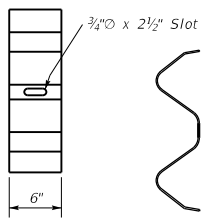
** Use 9" Min. Embed for Threaded Rod post installed
Use 12" Min. Embed for Headed Anchors Cast in Place

X-SECTION VIEW



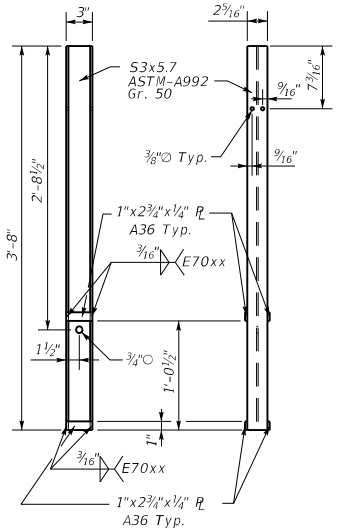


MOUNTING BRACKET



ELEVATION (Backer Plate)

SIDE VIEW (Backer Plate)



POST ELEVATION

Note: Fabricator may elect to provide a ¾"∅ ASTM A563A heavy hex sleeve nut with a minimum length of 2¼" and minimum 1¼" across the flats along with threaded rod and the Anchor Rod. Maintain 12" minimum embedment with the ¾" Anchor Rod behind the sleeve nut. The fabricator may elect to provide a ½" ferrule insert for the bottom anchors with a minimum length of 2¾" and a safe working load of 2000 lbs in tension and shear along with the threaded rod. Alternatively, the bottom anchors may also be supplied with a ½"∅ ASTM A563A heavy hex sleeve nut with a minimum length of 1½" and a minimum of ⅞" across the flats. Maintain 4½" embedment behind the sleeve nut. All costs for sleeve nuts, threaded rods, anchor rods, etc. are incidental to the price bid for the Railing System Side Mounted MGS.

KENTUCKY DEPARTMENT OF HIGHWAYS

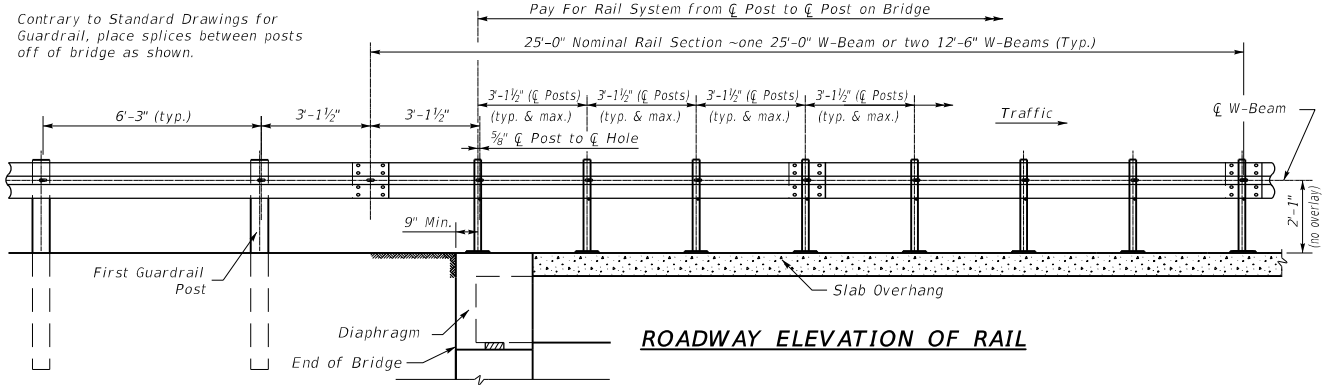
RAILING SYSTEM SIDE MOUNTED MGS DETAILS

STANDARD DRAWING NO. BHS-011

SUBMITTED _____ DIRECTOR DIVISION OF STRUCTURAL DESIGN — 02-26-20 DATE

APPROVED _____ STATE HIGHWAY ENGINEER — 02-26-20 DATE

Contrary to Standard Drawings for Guardrail, place splices between posts off of bridge as shown.



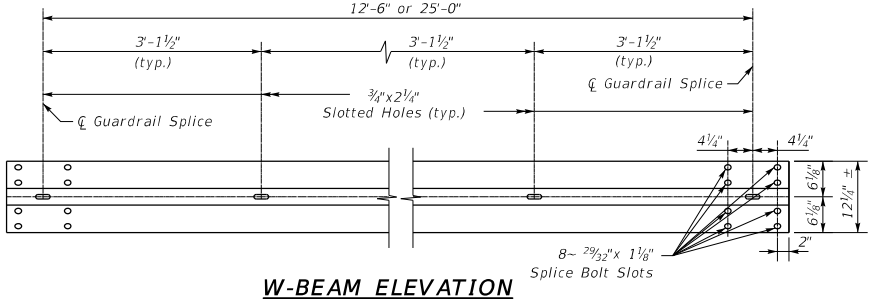
ROADWAY ELEVATION OF RAIL

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.

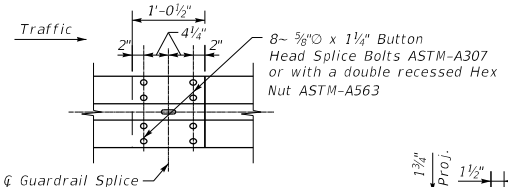
CONSTRUCTION NOTES:
Face of rail post must be plumb unless otherwise approved by the Engineer. Post must be perpendicular to adjacent roadway grade. Use epoxy mortar with Type III binder conforming to Section 826 and ASTM C881 under post base plates if gaps larger than 1/16" exist. Fully anchored guardrail 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 ⅝"∅ ASTM-A325 or A449 bolts with one hardened washer and one regular lock washer placed under each heavey hex nut. Nuts must conform to A563 requirements. W-beam must meet the requirements of Std. Dwg. RBR-001, c.e. 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'-1½".

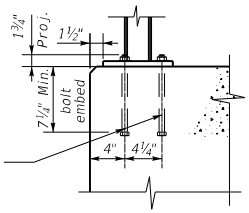
GENERAL NOTES:
This railing has been successfully evaluated by full scale crash test to meet MASH TL-3 criteria. This railing can be used for speeds 50 mph and greater.
This rail is designed to deflect approximately 4'-0" - 4'-6" as it contains and redirects the errant vehicle. This rail may not be installed 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.



W-BEAM ELEVATION



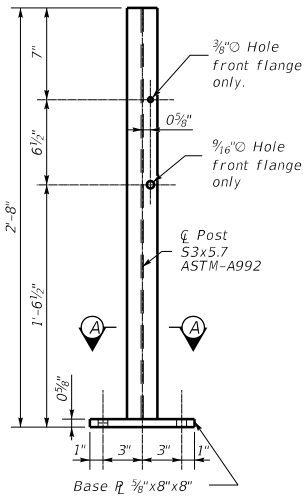
W-BEAM SPLICE ELEVATION



℄ ⅝"∅ 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

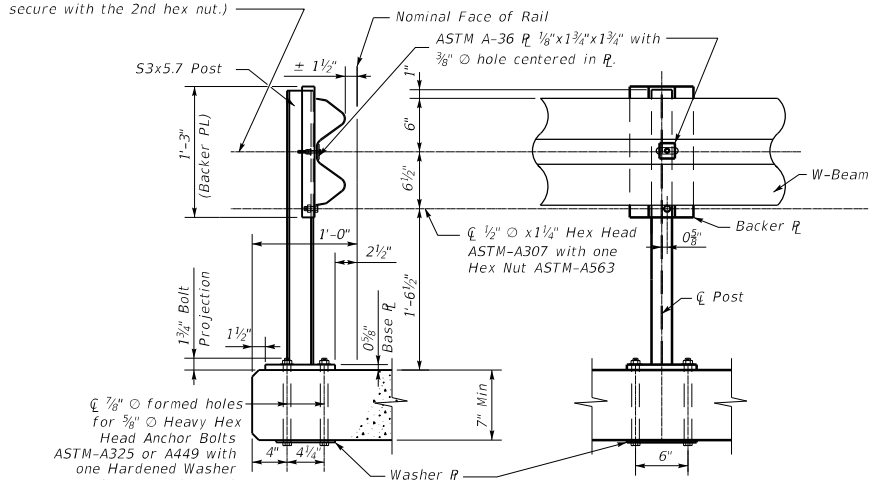
ALTERNATE ANCHORAGE

(For Concrete >11" Thick)



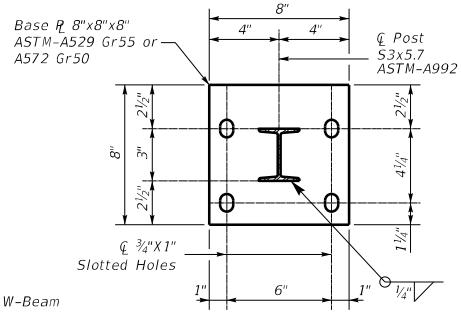
POST ELEVATION

℄ ⅝"x2½" Hex Head Bolt ASTM-A307 with one Regular Washer and one Regular Lock Washer placed under two Hex Nuts. (Tighten the first hex nut by hand until the top and bot. edges of the W-beam engage the backer plate snug against the post. Then tighten hex nut one revolution with wrench and secure with the 2nd hex nut.)

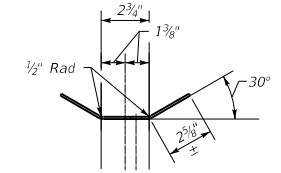


X-SECTION VIEW

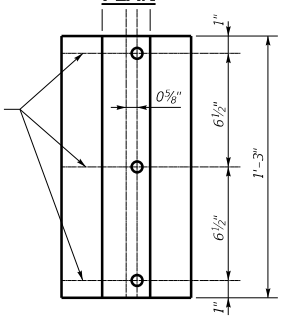
TRAFFIC VIEW



SECTION A-A

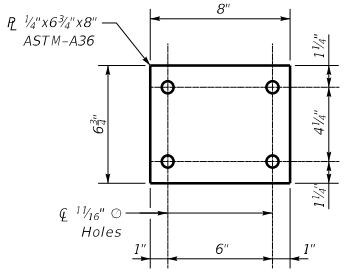


PLAN



ELEVATION

(Bent Plate)
Backer PL ⅛"x8"x1'-3"
ASTM-A1011 CS or SS Gr 33, or A1008 CS or SS Gr 33
(11 Gage acceptable)



WASHER PLATE

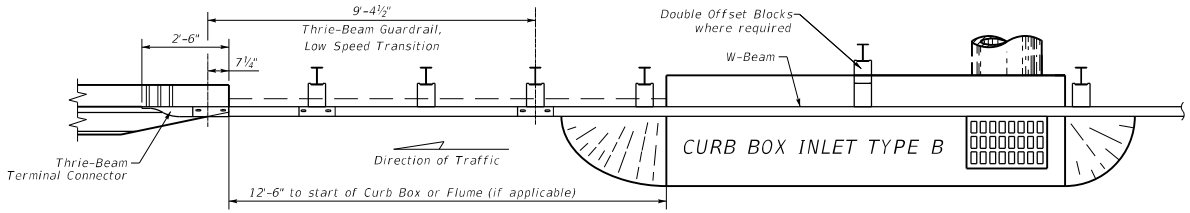
KENTUCKY
DEPARTMENT OF HIGHWAYS

RAILING SYSTEM TYPE T631 DETAILS

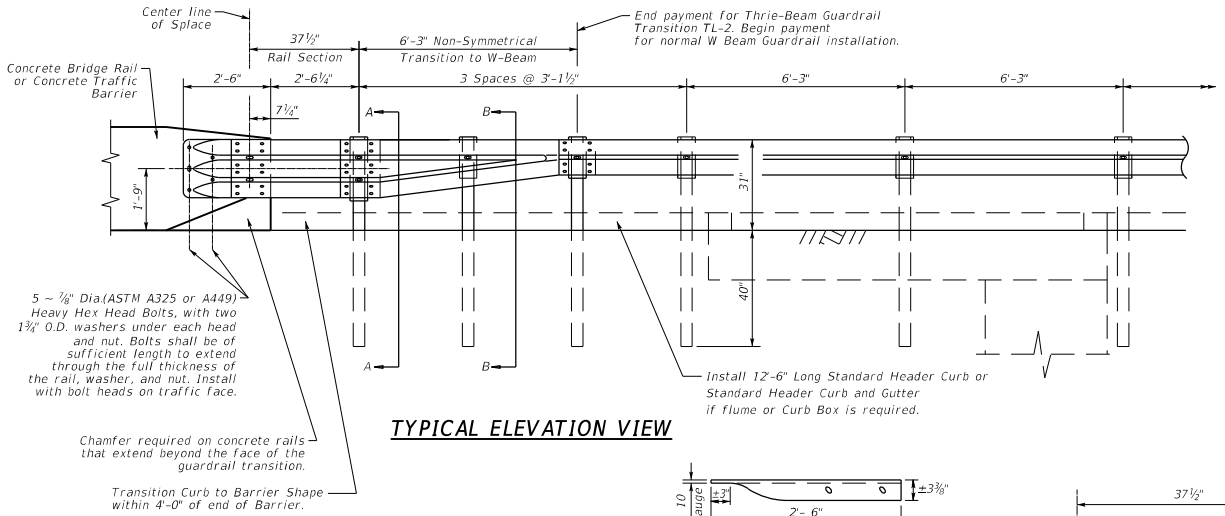
STANDARD DRAWING NO. BHS-012

SUBMITTED _____ 02-26-20
DIRECTOR DIVISION OF STRUCTURAL DESIGN — DATE

APPROVED _____ 02-26-20
STATE HIGHWAY ENGINEER — DATE



TYPICAL PLAN VIEW



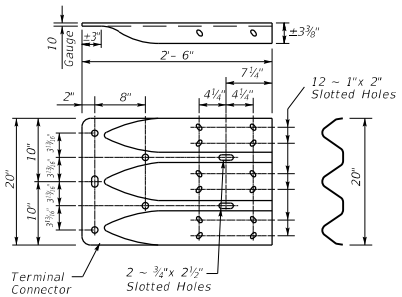
TYPICAL ELEVATION VIEW

TERMINAL CONNECTION NOTE

To ensure a stable connection. (12) Rectangular Washers (See Std. Dwg. RBR-005, c.e.) are required under the recessed nuts at the Terminal Connection splice.

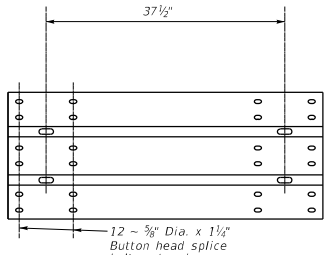
GENERAL NOTES

1. Use steel posts unless otherwise indicated in the plans. The exact position of transitions shall be as shown in the plans or as directed by the Engineer.
2. Rail element shall meet the requirements of AASHTO M180 except as modified in the plans.
3. Button head "post" bolts (ASTM A307) shall be of sufficient length to extend through the full thickness of the nut and Type A 1¾" O.D. washer and not more than 1" beyond it. Button head "splice" bolts (ASTM A307) are ⅝" x 1¼" with ⅜" double recessed nuts (ASTM A563).
4. Bolts, nuts, and washers shall be galvanized in accordance with AASHTO M232, Hardware shall be incidental to Thrie-Beam Guardrail Transition TL-2.
5. If solid rock is encountered. See the standard specifications for the proper installation guidance.
6. Posts shall not be set in concrete, of any depth.
7. This railing has been successfully evaluated by full scale crash test to meet MASH TL-2 criteria. This railing transition is to be used when speeds are 45 mph or less.
8. Install 12'-6" of Standard Header Curb or Standard Header Curb and Gutter if a Curb Box Inlet Type B or Flume is required at end of bridge. See Std. Dwg. RPM-100, c.e. for curb details. All costs to install the curb shall be incidental to the lump sum price bid for Thrie-Beam Guardrail Transition, TL-2. No curb is required if a flume or Curb box is not installed at the end of the bridge.
9. Method of measurement and basis of payment.
   A. Thrie-Beam Guardrail Transition, TL-2 shall be paid at the contract unit price Each and includes the Thrie-beam terminal connection, Thrie-beam element, non symmetrical transition, curb or curb and gutter, posts, hardware and all other incidentals necessary to complete the installation. This transition must tie into W Beam Guardrail, which is not included in this transition bid item.
   B. Plastic pipe and cost of forming holes shall be included in the cost for the bridge railing.

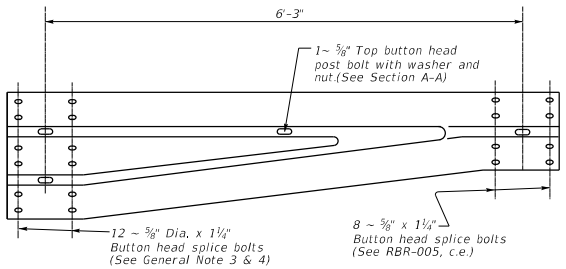


THRIE-BEAM TERMINAL CONNECTION

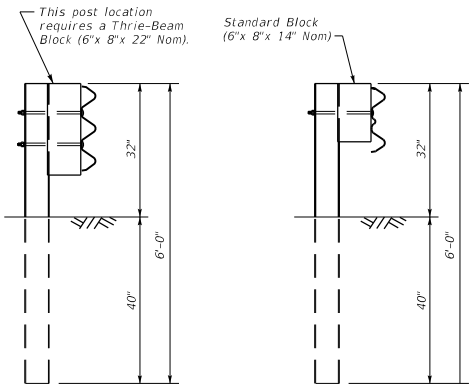
(See Terminal Connection Note)



THRIE-BEAM (3'-1½") (10 GA.) ELEMENT SECTION

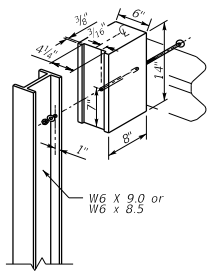


TRANSITION SECTION NON-SYMMETRICAL(10 GA.)



SECTION A-A

SECTION B-B



STEEL POST & BLOCK

(Showing Standard Block, see Thrie-Beam Guardrail Transition, TL-3 for Thrie-Beam Block & Post dimensions)

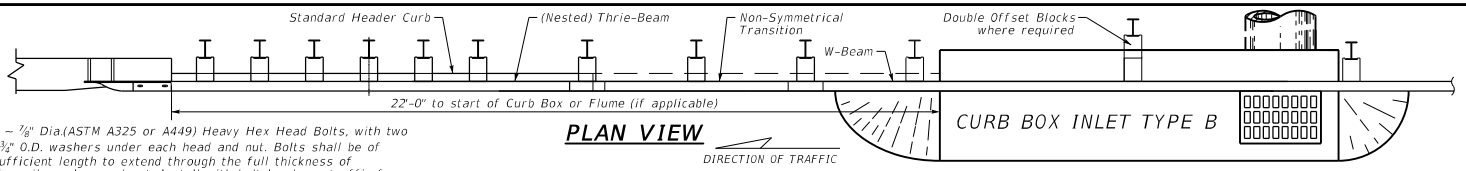
KENTUCKY
DEPARTMENT OF HIGHWAYS

THRIE-BEAM GUARDRAIL TRANSITION (TL-2)

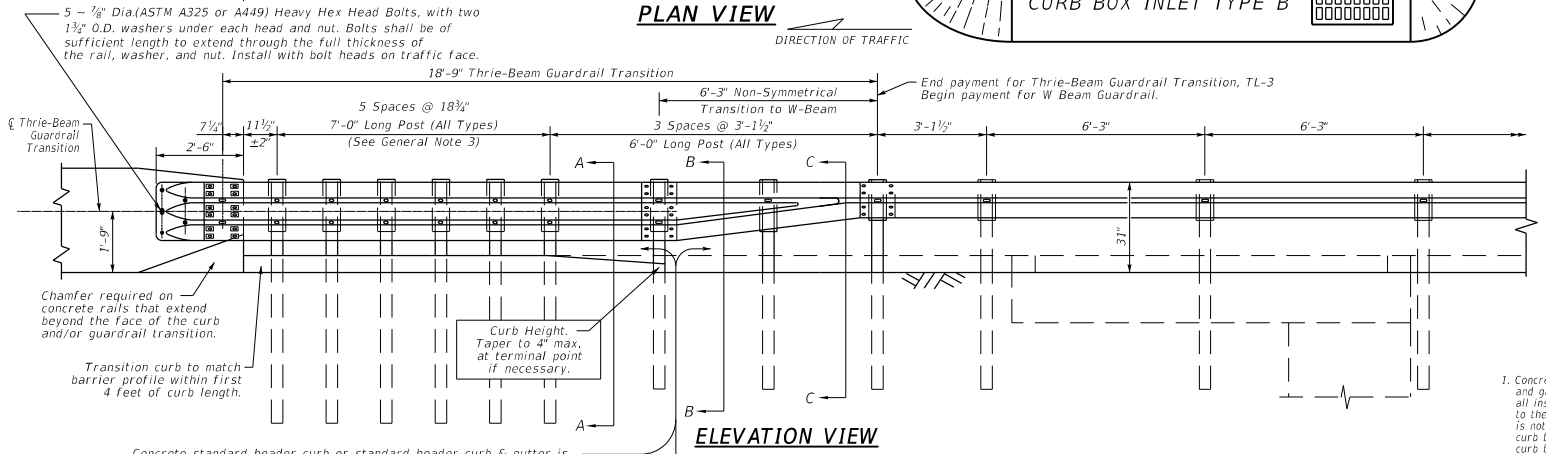
STANDARD DRAWING NO. BHS-013

SUBMITTED _____ 02-26-20
DIRECTOR DIVISION OF STRUCTURAL DESIGN — DATE

APPROVED _____ 02-26-20
STATE HIGHWAY ENGINEER — DATE



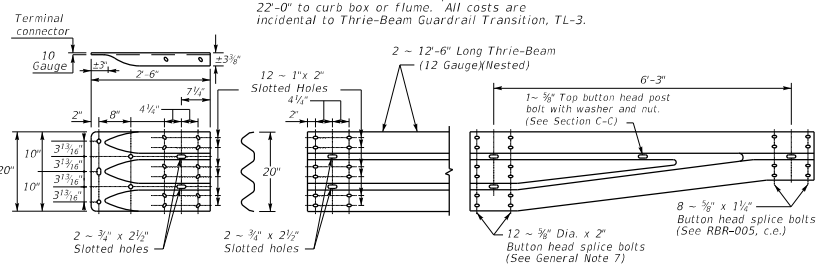
PLAN VIEW



ELEVATION VIEW

Concrete standard header curb or standard header curb & gutter is incidental to "Thrie-Beam Guardrail Transition, TL-3". If no additional curb is indicated beyond the transition, then any curb height greater than 4" will be tapered down beginning at the last 7 ft. post to a maximum height of 4" at the first 6 ft post.

If curb box or a flume is required, extend curb 22'-0" to curb box or flume. All costs are incidental to Thrie-Beam Guardrail Transition, TL-3.

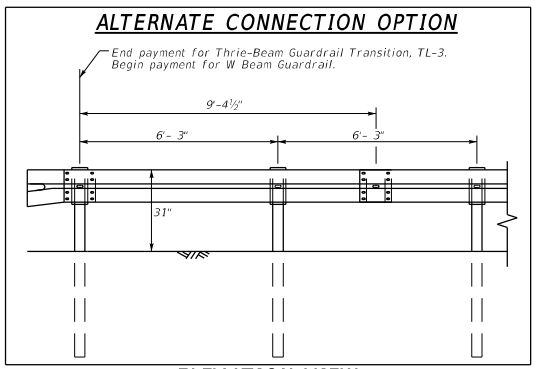


THRIE-BEAM TERMINAL CONNECTION

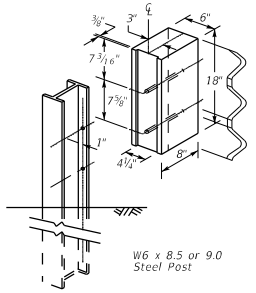
(See General Notes 6 & 7 for required hardware)

NON-SYMMETRICAL TRANSITION TO W-BEAM (10 Gauge)

ALTERNATE CONNECTION OPTION



ELEVATION VIEW



STEEL POST & BLOCK

(Showing Thrie-Beam Block)

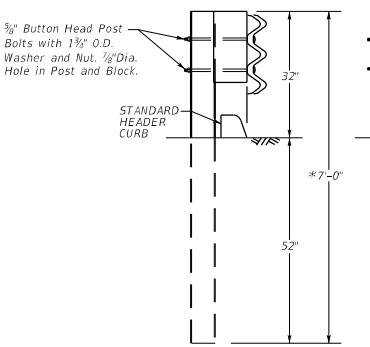
GENERAL NOTES

1. Concrete curb shall be standard header curb or standard header curb and gutter as shown on Std. Dwg. RPM-100, c.e. and is required on all installations. At a minimum, concrete curb shall be continuous to the seventh post (first 6'-0" long post). Where a curb box or flume is not required, end curb at first 6'-0" long post as detailed. Where a curb box or flume is required extend the curb 22'-0" minimum to the curb box or flume. All costs are incidental to the lump sum price bid for Thrie-Beam Guardrail Transition, TL-3.
2. Use steel posts as shown unless indicated otherwise in the plans.
3. The post length shall be marked on all 7'- 0" long posts by the Manufacturer. The mark shall be located within the top 1 ft. region of the post, at least 3/8" in height, and visible after installation. Steel posts shall be marked with a stencil before galvanizing.
4. Rail element shall meet the requirements of AASHTO M180 except as modified on the plans. The thrie-beam terminal connector and the thrie-beam transition to w-beam shall be of the same material, but shall not be less than 10 gauge.

   Contractor shall verify that the locations of bolt holes match those in the thrie-beam terminal connector prior to ordering materials.
5. Unless otherwise shown in the plans, transitions shall be placed with the block face in front of or directly above the curb face.
6. Galvanized washers used with the 5/8" dia. post bolts shall be 1 3/4" O.D. washers. The (12) rectangular plate washers are required at the terminal connector splice.
7. Button head "post" bolts (ASTM A307) shall be of sufficient length to extend through the full thickness of the nut (ASTM A563) and washer and not more than 1" beyond it. Button head "splice" bolts (ASTM A307) 5/8" dia.x 2" (at triple rail splices) with 5/8" double recessed nuts.
8. Bolts, nuts, and washers shall be galvanized in accordance with AASHTO M232. Hardware shall be incidental to the bid item.
9. If solid rock is encountered, see the standard specifications for the proper installation guidance.
10. Posts shall not be set in concrete.
11. This railing has been successfully evaluated by full scale crash test to meet MASH TL-3 criteria. This railing transition is to be used when speeds are over 45 mph.
12. Method of measurement and basis of payment.

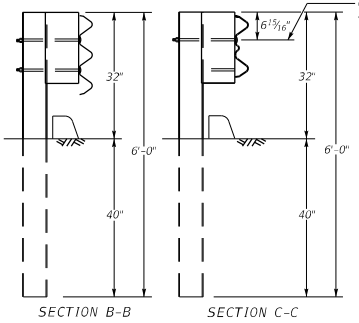
A. Thrie-Beam Guardrail Transition, TL-3 shall be paid at the contract unit price Each and includes the Thrie-beam terminal connection, nested Thrie-Beam elements, non symmetrical transition, posts, concrete standard header curb or standard header curb and gutter, hardware and all other incidentals necessary to complete the installation. This transition must tie into W Beam Guardrail, which is not included in this transition bid item.

B. Plastic pipe and cost of forming holes shall be included in the cost for the bridge railing.

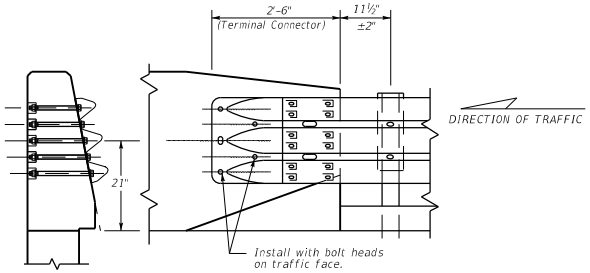


SECTION A-A

* Note: (All post types) (See General Note 3)



TRANSITION SECTIONS



CONNECTION TO CONCRETE BRIDGE RAIL AND TRAFFIC BARRIERS

(12) Galvanized rectangular washers (See Std. Dwg. RBR-005, c.e.) are required under the recessed nut at the terminal connector splice to nested thrie-beam. (See General Notes 6 & 7).

KENTUCKY DEPARTMENT OF HIGHWAYS

THRIE-BEAM GUARDRAIL TRANSITION (TL-3)

STANDARD DRAWING NO. BHS-014

SUBMITTED _____ DIRECTOR DIVISION OF STRUCTURAL DESIGN — 02-26-20 DATE

APPROVED _____ STATE HIGHWAY ENGINEER — 02-26-20 DATE

General Notes

PIPE RAILING & POSTS: *Structural Tube, Pipe and Bar shall be in accordance with ASTM B221 or ASTM B429, Alloy 6061-T6. For curved longitudinal alignments the top and bottom rails and handrails shall be shop bent to match the alignment radius.*

BASE PLATES: *Base Plates shall be in accordance with ASTM B209, Alloy 6061-T6.*

COATINGS: *The aluminum railing shall be mill finish unless otherwise noted in the Contract Documents. All nuts, anchor bolts, and washers shall be hot-dip galvanized in accordance with AASHTO M232.*

ANCHOR BOLTS: *Anchor bolts shall be in accordance with ASTM F1554 Grade 36. Headless anchor bolts for Adhesive Anchors shall be threaded full length. Cutting of reinforcing steel is permitted for drilled hole installation. All anchor bolts shall have single self-locking hex nuts. Tack welding of the nut to the anchor bolt may be used in lieu of self-locking nuts. All nuts shall be in accordance with ASTM A563 or ASTM A194. Flat Washers shall be in accordance with ASTM F436. After the nuts have been snug tightened, the anchor bolt threads shall be distorted to prevent removal of the nuts. Distorted threads and tack welds shall be coated with a zinc rich paint. Mechanical anchors may be allowed. Submit calculations by a professional engineer and manufacture data for proposed mechanical anchor to the engineer for approval along with the shop drawings.*

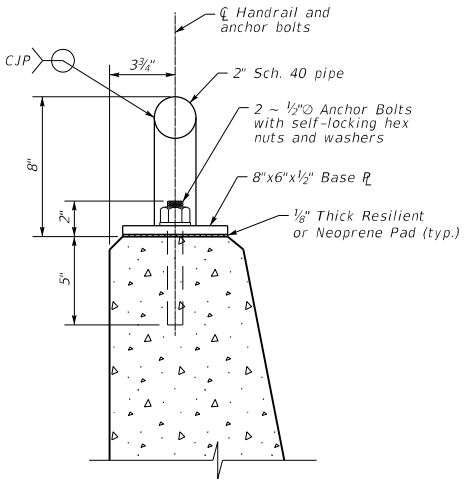
RESILIENT AND NEOPRENE PADS: *Resilient and Neoprene pads shall be in accordance with Specification Section 932, except that testing of the finished pads shall not be required. Neoprene pads shall be durometer hardness 60 or 70.*

JOINTS: *All fixed joints are to be welded all around and ground smooth. Expansion Joints shall be spaced at a maximum of 20'-0". Field splices similar to the expansion joint detail may be approved by the Engineer to facilitate shipping and handling, but rails must be continuous across a minimum of two posts.*

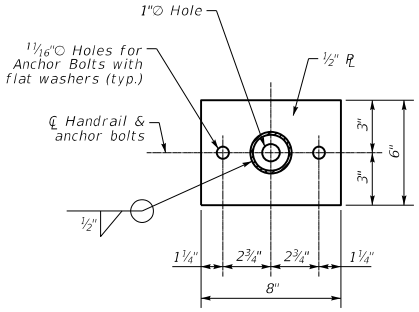
WELDING: *All welding shall be in accordance with the American Welding Society Structural Welding Code (Aluminum) ANSI/AWS D1.2 (current edition). Filler metal shall be either ER5183, ER5356 orER5556. Nondestructive testing of welds is not required.*

SHOP DRAWINGS: *Details addressing project specific geometry (line & grade) showing post and expansion joint locations must be submitted by the Contractor for the Engineer's approval prior to fabrication of the railing. Shop drawings shall be in accordance with the Specifications.*

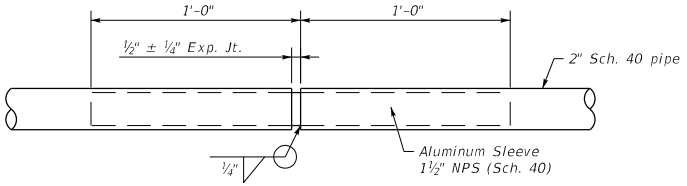
PAYMENT: *Aluminum handrail shall be paid for under the contract unit price for Aluminum Handrail, LF. Payment for the handrail will be plan quantity measured as the length along the center line of the top rail, and includes rails, posts, rail splice assembly, base plates, anchor bolts, nuts, washers, resilient or neoprene pads and all incidental materials and labor required to complete installation of the handrail.*



TYPICAL SECTION



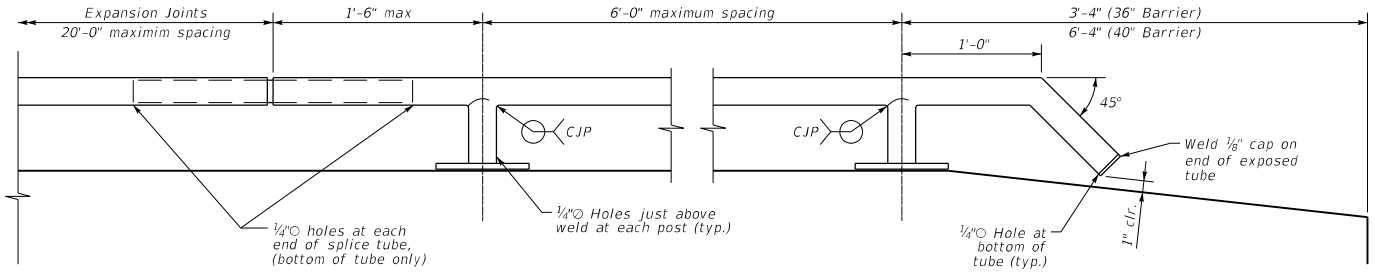
BASE PLATE DETAIL



EXPANSION JOINT

**Note: Expansion Joints shall be placed at bridge expansion joint locations and shall match Bridge Expansion Joint Size. This handrail shall not be used where bridge expansion and contraction will leave less than 6 inch overlap in handrail joint.*

RAILING MEMBER DIMENSIONS TABLE			
MEMBER	DESIGNATION	OUTSIDE DIMENSION	WALL THICKNESS
Posts and Rails	2" NPS (Sch. 40)	2.375"	0.154"
Rail Joint/Splice Sleeves	1½" NPS (Sch. 40)	1.900"	0.145"



ELEVATION

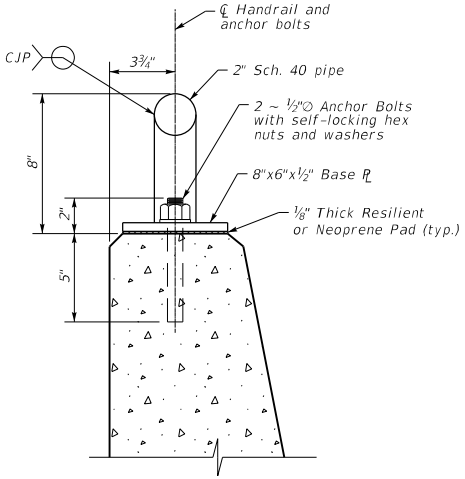
KENTUCKY
DEPARTMENT OF HIGHWAYS

ALUMINUM
HANDRAIL

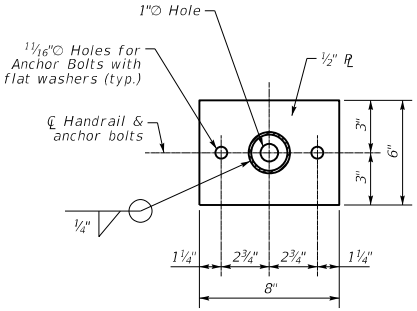
STANDARD DRAWING NO. BHS-015

SUBMITTED _____ 02-26-20
DIRECTOR DIVISION OF STRUCTURAL DESIGN — DATE

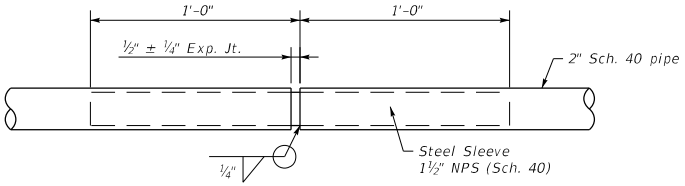
APPROVED _____ 02-26-20
STATE HIGHWAY ENGINEER — DATE



TYPICAL SECTION

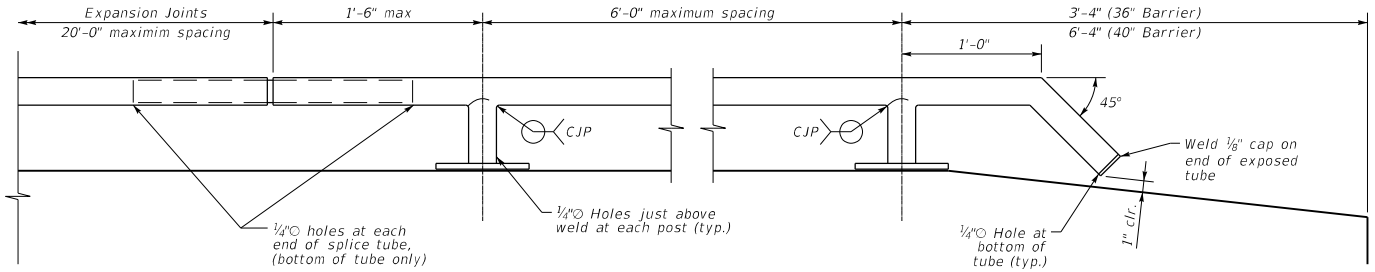


BASE PLATE DETAIL



EXPANSION JOINT

*Note: Expansion Joints shall be placed at bridge expansion joint locations and shall match Bridge Expansion Joint Size. This handrail shall not be used where bridge expansion and contraction will leave less than 6 inch overlap in handrail joint.



ELEVATION

General Notes

PIPE RAILING & POSTS: *Pipe Rails and Posts shall be in accordance with ASTM A53 Grade B for standard weight pipe and ASTM A500 Grade B, C or D or ASTM A501 for structural tube. For curved longitudinal alignments the top and bottom rails and handrails shall be shop bent to match the alignment radius.*

BASE PLATES: *Base Plates shall be in accordance with ASTM A36 or ASTM A709 Grade 36.*

COATINGS: *The railing shall be hot-dip galvanized after fabrication in accordance with AASHTO M111. All nuts, anchor bolts, and washers shall be hot-dip galvanized in accordance with AASHTO M232.*

ANCHOR BOLTS: *Anchor bolts shall be in accordance with ASTM F1554 Grade 36. Headless anchor bolts for Adhesive Anchors shall be threaded full length. Cutting of reinforcing steel is permitted for drilled hole installation. All anchor bolts shall have single self-locking hex nuts. Tack welding of the nut to the anchor bolt may be used in lieu of self-locking nuts. All nuts shall be in accordance with ASTM A563 or ASTM A194. Flat Washers shall be in accordance with ASTM F436. After the nuts have been snug tightened, the anchor bolt threads shall be distorted to prevent removal of the nuts. Distorted threads and tack welds shall be coated with a zinc rich paint. Mechanical anchors may be allowed. Submit calculations by a professional engineer and manufacture data for proposed mechanical anchor to the engineer for approval along with the shop drawings.*

RESILIENT AND NEOPRENE PADS: *Resilient and Neoprene pads shall be in accordance with Specification Section 932, except that testing of the finished pads shall not be required. Neoprene pads shall be durometer hardness 60 or 70.*

JOINTS: *All fixed joints are to be welded all around and plug welds ground smooth. Remove burs and weld splatter, additionally remove any sharp edges on rails to prevent injury. Expansion Joints shall be spaced at a maximum of 20'-0". Field splices similar to the expansion joint detail may be approved by the Engineer to facilitate shipping and handling, but rails must be continuous across a minimum of two posts.*

WELDING: *All welding shall be in accordance with the American Welding Society Structural Welding Code (Steel) ANSI/AWS D1.1 (current edition). Weld metal shall be E60XX or E70XX. Nondestructive testing of welds is not required.*

SHOP DRAWINGS: *Details addressing project specific geometry (line & grade) showing post and expansion joint locations must be submitted by the Contractor for the Engineer's approval prior to fabrication of the railing. Shop drawings shall be in accordance with the Specifications.*

PAYMENT: *Steel handrail shall be paid for under the contract unit price for Steel Handrail, LF. Payment for the handrail will be plan quantity measured as the length along the center line of the top rail, and includes rails, posts, rail splice assembly, base plates, anchor bolts, nuts, washers, resilient or neoprene pads and all incidental materials and labor required to complete installation of the handrail.*

RAILING MEMBER DIMENSIONS TABLE			
MEMBER	DESIGNATION	OUTSIDE DIMENSION	WALL THICKNESS
Posts and Rails	2" NPS (Sch. 40)	2.375"	0.154"
Rail Joint/Splice Sleeves	1½" NPS (Sch. 40)	1.900"	0.145"

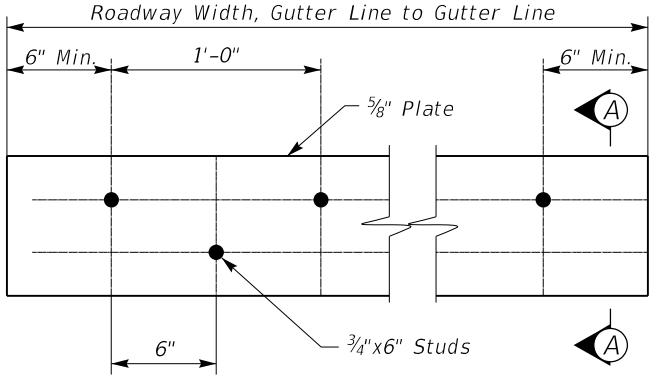
KENTUCKY
DEPARTMENT OF HIGHWAYS

STEEL HANDRAIL

STANDARD DRAWING NO. BHS-016

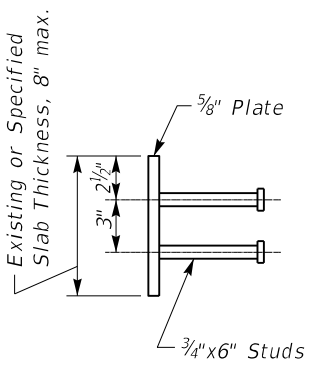
SUBMITTED _____ 02-26-20
DIRECTOR DIVISION OF STRUCTURAL DESIGN — DATE

APPROVED _____ 02-26-20
STATE HIGHWAY ENGINEER — DATE

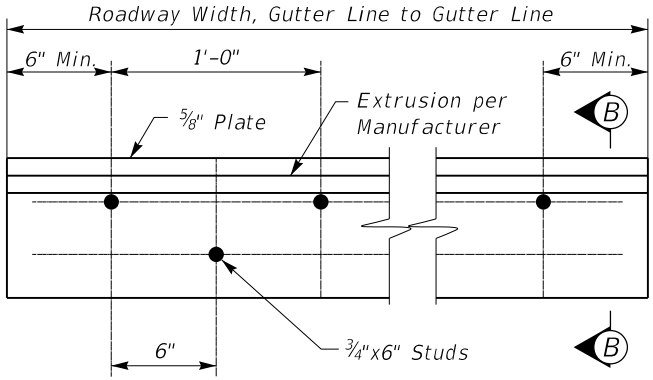


ARMORED EDGE

(For 1"–3" Expansion Dams and Bridge End)

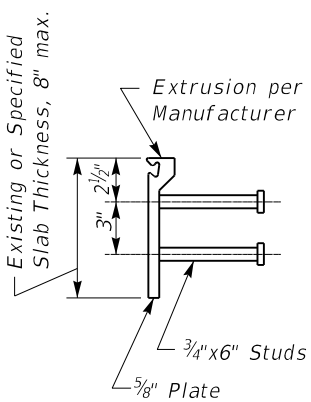


SECTION A-A

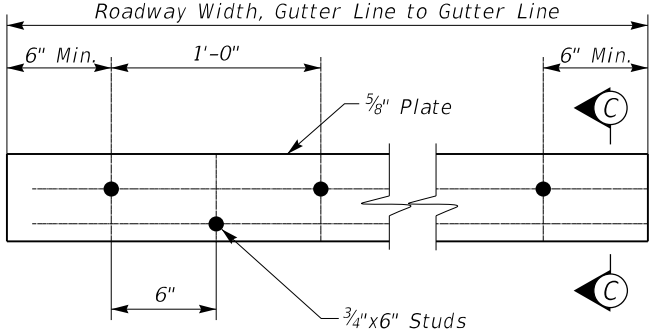


ARMORED EDGE

(For 4" & 5" Expansion Dams)

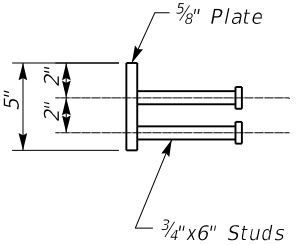


SECTION B-B



ARMORED EDGE

(For 5" Composite Box Beam Slab Ends)



SECTION C-C

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.*

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

MATERIALS:

A. *Structural Steel. Use new, commercial grade steel suitable for welding. The Engineer will base acceptance on visual inspection.*

B. *Stud Anchors. The armored edge stud anchors are 3/4" embedded stud shear connectors conforming to ASTM A108, Grade 1015.*

LOCATION: *Locate armored edges and/or expansion dams in accordance with detail plans, proposals and applicable Standard Drawings.*

PAINT: *Clean and paint all structural steel in accordance with the with the requirement of Section 607, except that surfaces to come in contact wiht concrete are not to be painted and no field coating will be required.*

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

PLACEMENT: *Fabricate and place new armored edges to match original or new grade.*

STAGE CONSTRUCTION: *If installation of armored edges in two or more stages is necessary. Join the armored edges at or near the centerline of the roadway or lane line, field weld and grind smooth.*

BASIS OF PAYMENT:

A. *ARMORED EDGE AT END OF BRIDGE: Payment at the contract unit price bid for Amored Edge for Concrete shall be full compensation for furnishing and installing the armored edge as specified. Measurement shall be in linear feet from gutter line to gutter line with concrete barrier or curb type railing or existing parapet applications and from fascia to fascia of slab for metal or guardrail type railing systems and no curb.*

B. *ARMORED EDGE AT EXPANSION JOINTS: Payment for armored edge at expansion joints shall be included in the unit price bid for the specified application and joint size.*

KENTUCKY
DEPARTMENT OF HIGHWAYS

ARMORED EDGES

STANDARD DRAWING NO. *BJE-001-14*

SUBMITTED _____ 02-26-20
DIRECTOR DIVISION OF STRUCTURAL DESIGN — DATE

APPROVED _____ 02-26-20
STATE HIGHWAY ENGINEER — DATE

General Notes

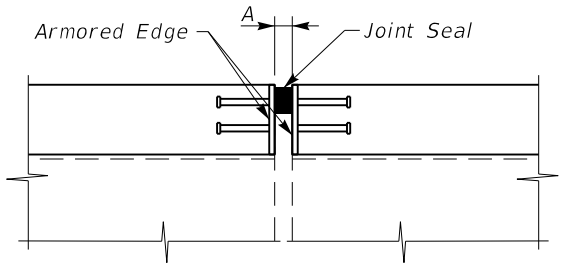
SPECIFICATIONS: *All references to the Specifications are to the current edition of the Kentucky Department of Highways Standard Specifications for Road and Bridge Construction. All references to the AASHTO Specifications are to the current edition of the AASHTO LRFD Bridge Design Specifications.*

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

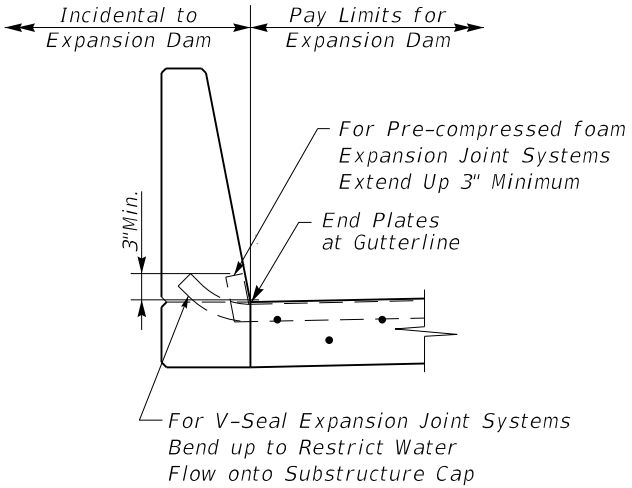
SHOP DRAWINGS: *Contrary to the Specifications, no shop plans are required.*

BASIS OF PAYMENT: *Payment at the contract unit price bid for Expansion Joint (specified size) shall be full compensation for finishing and installing expansion joint as specified. Measurement shall be in lineal feet from gutter line to gutter line.*

Note: For Details of Armored Edge
See STD DWG BJE-001 (C.E.)



SECTION THROUGH JOINT



SECTION THROUGH BARRIER

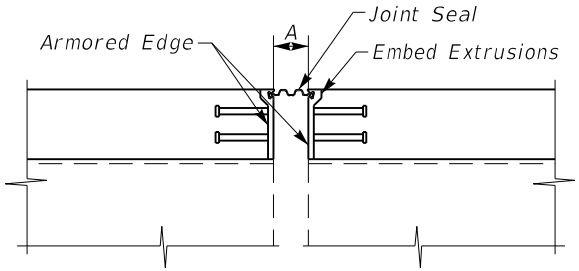
EXPANSION JOINT 1"-3"

Joint Data
Dim. A Maximum Opening
1"
1½"
2"
2½"
3"
4"
5"

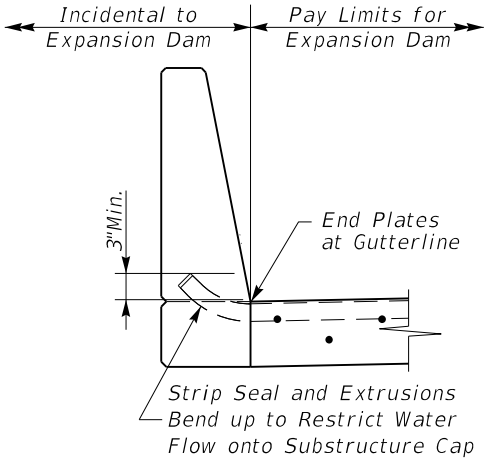
The joint seal supplied must accommodate the required movement shown. Set Dimension A with temperature change increment and as required by the manufacturer to obtain the required movement.

Temperature Change Increment per 10°F			
Concrete		Steel	
Expansion Length (ft)	Increment (in)	Expansion Length (ft)	Increment (in)
0 - 80	1/32	0 - 60	1/32
81 - 140	1/16	61 - 100	1/16
141 - 200	1/8	101 - 140	3/32
201 - 260	5/32	141 - 180	1/8
261 - 320	7/32	181 - 220	5/32
321 - 380	1/4	221 - 260	3/16
381 - 440	5/16	261 - 300	7/32
		301 - 340	1/4

Note: For Details of Armored Edge
See STD DWG BJE-001 (C.E.)



SECTION THROUGH JOINT



SECTION THROUGH BARRIER

EXPANSION JOINT 4" & 5"

KENTUCKY
DEPARTMENT OF HIGHWAYS

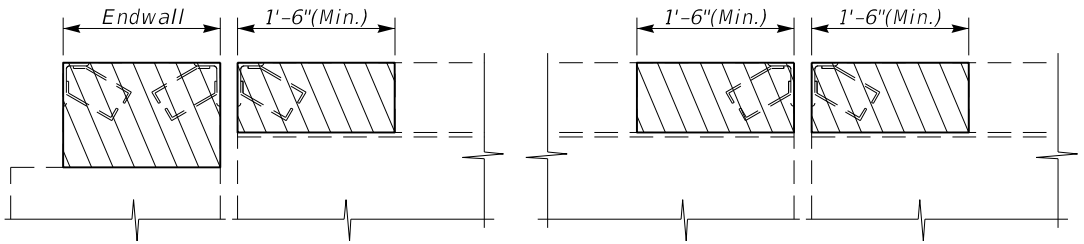
EXPANSION JOINTS

STANDARD DRAWING NO. BJE-002

SUBMITTED _____ 02-26-20
DIRECTOR DIVISION OF STRUCTURAL DESIGN — DATE

APPROVED _____ 02-26-20
STATE HIGHWAY ENGINEER — DATE

Note: Remove X-Hatched Areas of Concrete & Expansion Device.

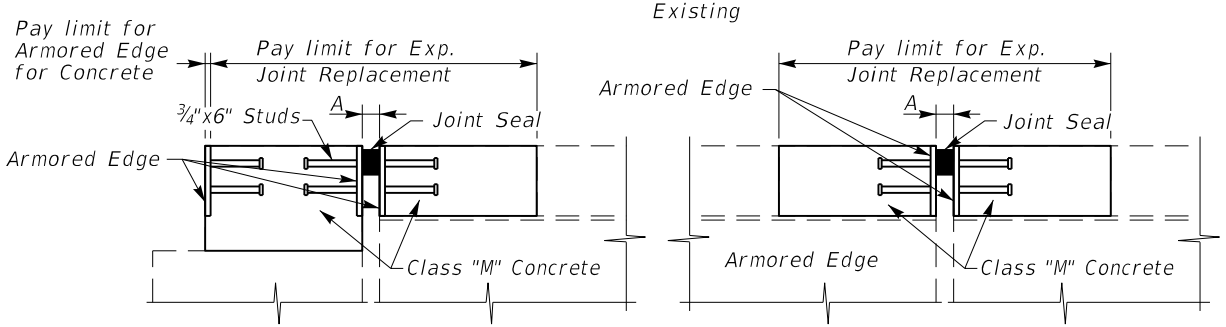


@ End Bents or Abutments @ Piers or Bents

SECTION THROUGH JOINT

Existing

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 Maximum Opening	
1"	
1½"	
2"	
2½"	
3"	



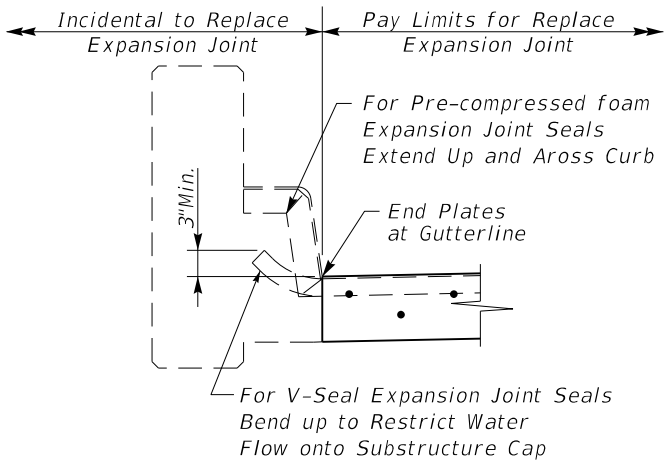
@ End Bents or Abutments @ Piers or Bents

SECTION THROUGH JOINT

Proposed

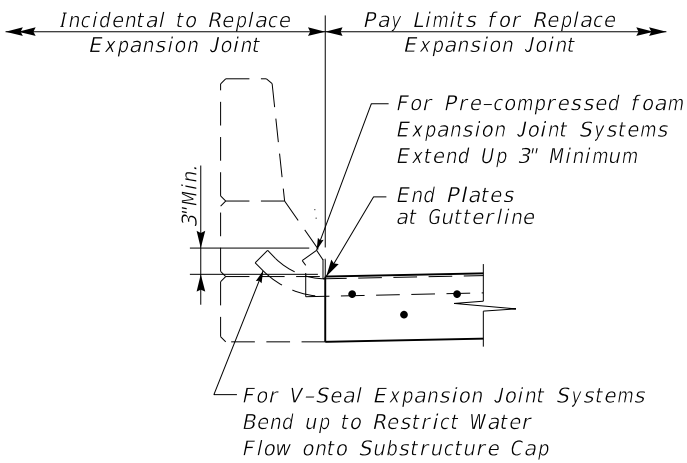
Temperature Change Increment per 10°F			
Concrete		Steel	
Expansion Length (ft)	Increment (in)	Expansion Length (ft)	Increment (in)
0 - 80	1/32	0 - 60	1/32
81 - 140	1/16	61 - 100	1/16
141 - 200	1/8	101 - 140	3/32
201 - 260	5/32	141 - 180	1/8
261 - 320	7/32	181 - 220	5/32
321 - 380	1/4	221 - 260	3/16
381 - 440	5/16	261 - 300	7/32
		301 - 340	1/4

Note: For Details of Armored Edge See STD DWG BJE-001 (C.E.)



SECTION THROUGH PAPAPET

(Typ. for Plinth Walls)



SECTION THROUGH PARAPET

(Typ. for Barrier Walls)

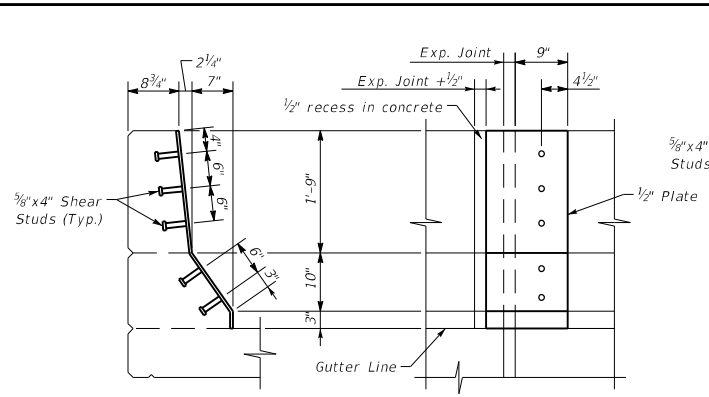
KENTUCKY
DEPARTMENT OF HIGHWAYS

EXPANSION JOINT REPLACEMENT 1"-3"

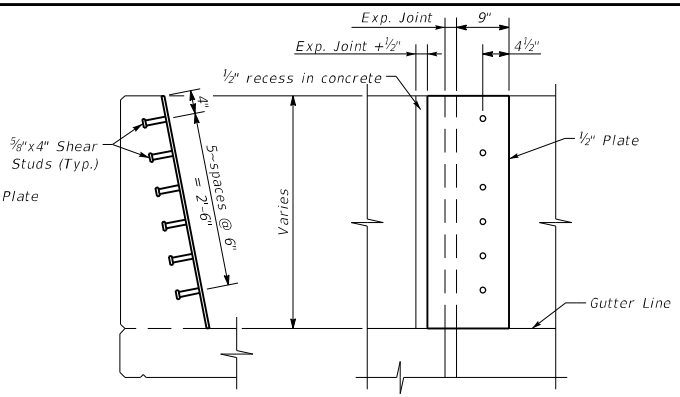
STANDARD DRAWING NO. BJE-003

SUBMITTED _____ 02-26-20
DIRECTOR DIVISION OF STRUCTURAL DESIGN DATE

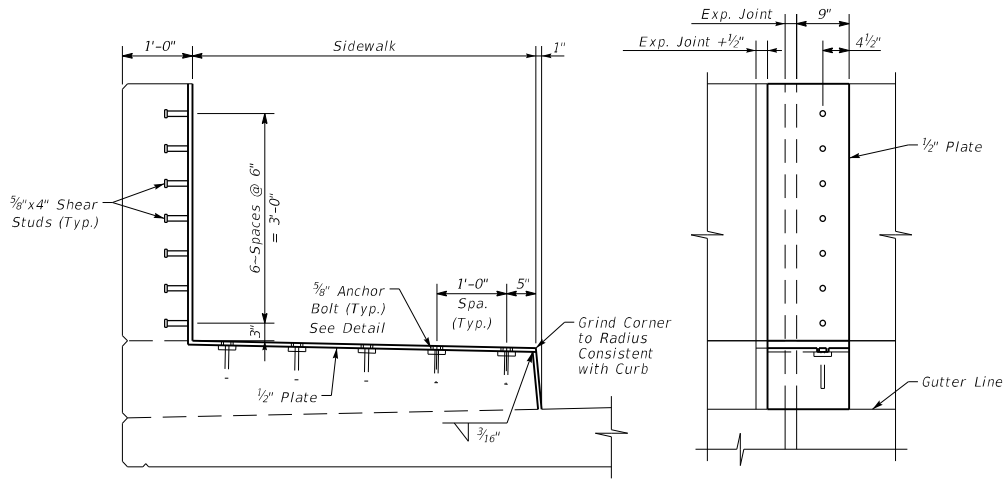
APPROVED _____ 02-26-20
STATE HIGHWAY ENGINEER DATE



TYPE 3 SLIDE PLATE



SINGLE SLOPE SLIDE PLATE



SIDEWALK SLIDE PLATE

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 Standard Specifications for Highway Bridges.*

MATERIAL SPECIFICATIONS: *Steel material shall be new, M270 GR50 steel suitable for welding. Shop drawings will be required for the assembly. Anchor studconnectors shall conform to ASTM A108, Grade 1015. Acceptance will be based onvisual inspection by the Engineer. Joint sealing material, only, is in accordance with Section 807 of the Specifications. Ensure stud shear connectors conform toASTM A108, Grade 1015. All structural steel shall be galvanized in accordance with ASTM A123.*

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

BASIS OF PAYMENT: *The cost of furnishing and placing the Expansion Joint and all plates, hardware and materials as shown in these assembly details shall beincluded in the contract unit price per linear foot, measured along centerline of joint between the ends of the trough. Joint assembly shall conform to theroadway grade and cross slope or 2% with parabolic crown.*

ANCHOR BOLT DETAIL

KENTUCKY
DEPARTMENT OF HIGHWAYS

EXPANSION JOINT COVER PLATE DETAILS

STANDARD DRAWING NO. BJE-004

SUBMITTED _____ 02-26-20
DIRECTOR DIVISION OF STRUCTURAL DESIGN — DATE

APPROVED _____ 02-26-20
STATE HIGHWAY ENGINEER — DATE

General Notes ~ Expansion Joint Replacement

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.

MATERIALS.

A. Class "M" Concrete. Use either "M1" or "M2". See Section 601.
B. Steel Reinforcement. Use Grade 60. See Section 602.
C. Epoxy Bond Coat. See Section 511.
D. Joint Seal System. Use a joint seal system for the specified width in accordance with section 807.

EQUIPMENT.

A. See Section 606.

CONSTRUCTION.

A. Remove Existing Materials. Remove existing Expansion Dam, Bridge End, Remove debris and/or expansion joint filler as directed by the Engineer. Clean and leave all existing steel reinforcement encountered in place. Damaged steel reinforcement will be repaired as directed by the Engineer at no additional cost to the Department. Dispose of all removed material entirely away from the job site.

B. Place New Concrete and Armored Edges. After all specified existing materials have been removed, place new armored edges to match the grade of the proposed overlay or to match the original grade. Place the new Class "M" concrete to the scarified grade and finish to receive the new overlay or place the new Class "M" concrete to the original grade and finish with broom strokes drawn transversely from curb to curb. All new structural steel shall be cleaned and painted in accordance with requirements of Section 607.03.23, except that surfaces to come in contact with concrete are not to be painted and no field coating will be required. Blast clean all areas of existing concrete and structural steel to come in contact with new concrete until free of all laitance and deleterious substances immediately prior to the placement of the Class "M" Concrete. The surface areas of existing concrete to come in contact with the new Class "M" Concrete are to be coated with an epoxy bond coat immediately prior to placing new concrete in accordance with Section 511. The interfaces of the new and old concrete shall be as nearly vertical and horizontal as possible.

C. Additional Epoxy Coated Steel Reinforcement. Furnish for replacement, as directed by the Engineer, 200 linear feet of #4 steel reinforcing bars in 20' lengths. Place these bars in areas deemed by the Engineer to require additional reinforcement. Field cutting and bending is permitted. Do not place any additional steel reinforcement above the height of the top row of studs on the armored edges. Ensure that all exposed steel reinforcement is tied in accordance with Section 602. prior to pouring the new Class "M" Concrete. Deliver unused bars as directed by the Engineer.

D. Stage Construction. Installation of concrete and armored edges in two (or more if specified) stages is necessary. Join the armored edges at or near the centerline of the roadway or lane line, field weld and grind smooth.

E. Pre-Compressed Foam Expansion Joint Systems. System shall be supplied in pre-compressed sticks for easy installation. System shall be installed in accordance with manufacture's recommendations concerning approved adhesives, welds between sticks, appurtenances, and adhesion to concrete or armored edges and section 609.

CONSTRUCTION. (Continued)

F. Preformed Neoprene Strip Seals and V Seals. Place the seals in one continuous, unbroken length. Place neoprene strip seals as recommended by the manufacturer and in accordance with Section 609.

G. Approach Pavement Repair. If no bridge overlay approach is specified the Contractor shall repair any and all damage to the approach pavement due to this construction. A new asphalt surface wedge up to three feet long and the width of the bridge deck shall be placed and compacted to the satisfaction of the Engineer prior to allowing traffic back onto the structure after each section of the joint is replaced. No additional payment will be allowed for this work, as it will be considered incidental to the pay item "Armored Edge for Concrete".

H. Verifying Field Conditions. The Contractor shall field verify all dimensions before ordering any material. New material that is unsuitable due to variation in existing structure shall be replaced at the Contractors expense.

I. Damage to the Structure. The Contractor shall bear all responsibility and expense for any and all damage to the structure during the repair work even to removal and replacement of a fallen span, should the fallen span result from the Contractor's actions.

J. Shop Plans. Shop plans will not be required. The Contractor is responsible for obtaining field measurements and supplying properly sized materials to complete the work.

MEASUREMENT.

A. Expansion Joint Replace - 1", ½", 2", 2½", 3", 4" & 5" The Department will measure the quantity in linear feet from gutter line to gutter line along the centerline of the joint.
B. Armored Edge for Concrete. The Department will measure the quantity in linear feet from gutter line to gutter line along the centerline of the joint.
C. Steel Reinforcement. The Department will measure the quantity in LBS.

PAYMENT:

A. Expansion Joint Replace - 1", 1½", 2" 2 ½", 3", 4" & 5". Payment at the contract unit price per linear foot shall be full compensation for removing specified existing materials, furnishing and installing the new armored edges, concrete, seal, and all incidental items necessary to complete the work within the specified pay limits.

B. Armored Edge for Concrete. Payment at the contract unit price per linear foot shall be full compensation for furnishing and installing new armored edges at each end of bridge.

C. Steel Reinforcement. See Section 602.

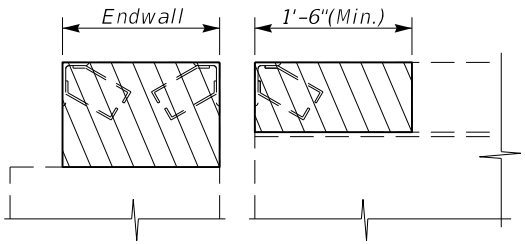
KENTUCKY
DEPARTMENT OF HIGHWAYS

EXPANSION JOINT
REPLACEMENT
GENERAL NOTES

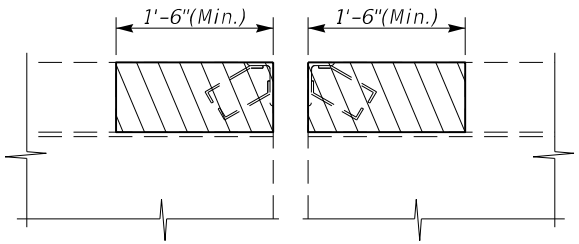
STANDARD DRAWING NO. BJE-005

SUBMITTED — DIRECTOR DIVISION OF STRUCTURAL DESIGN — DATE 02-26-20

APPROVED — STATE HIGHWAY ENGINEER — DATE 02-26-20



@ End Bents or Abutments



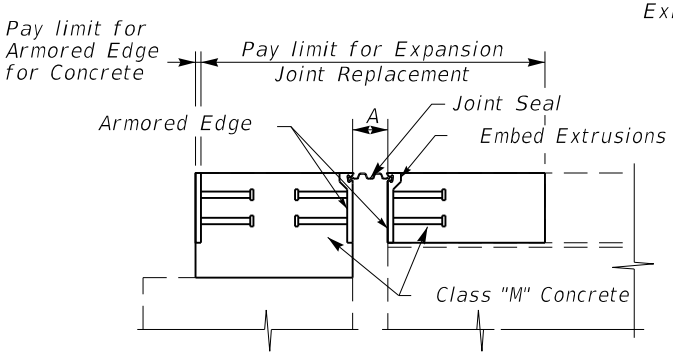
@ Piers or Bents

Note: Remove X-Hatched Areas of Concrete & Expansion Device.

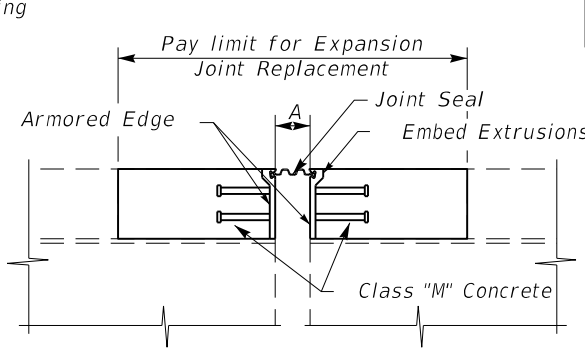
SECTION THROUGH JOINT

Existing

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 Maximum Opening	
4"	
5"	



@ End Bents or Abutments



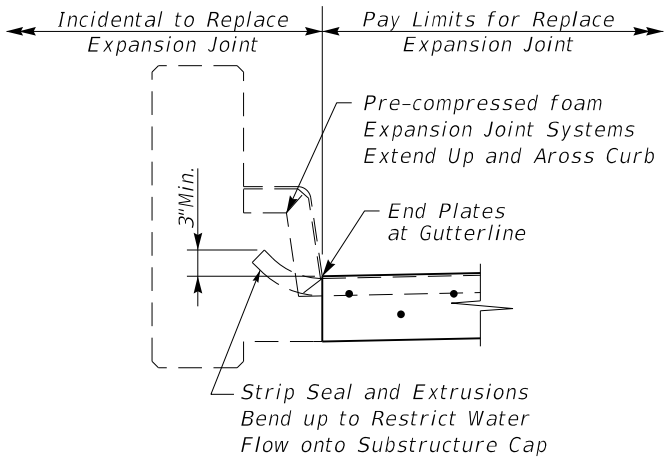
@ Piers or Bents

Temperature Change Increment per 10°F			
Concrete		Steel	
Expansion Length (ft)	Increment (in)	Expansion Length (ft)	Increment (in)
0 - 80	1/32	0 - 60	1/32
81 - 140	1/16	61 - 100	1/16
141 - 200	1/8	101 - 140	3/32
201 - 260	5/32	141 - 180	1/8
261 - 320	7/32	181 - 220	5/32
321 - 380	1/4	221 - 260	3/16
381 - 440	5/16	261 - 300	7/32
		301 - 340	1/4

SECTION THROUGH JOINT

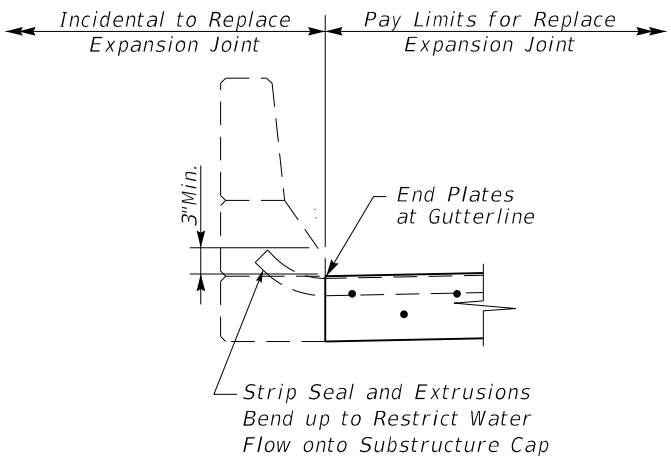
Proposed

Note: For Details of Armored Edge See STD DWG BJE-001 (C.E.)



SECTION THROUGH PAPAPET

(Typ. for Plinth Walls)



SECTION THROUGH PARAPET

(Typ. for Barrier Walls)

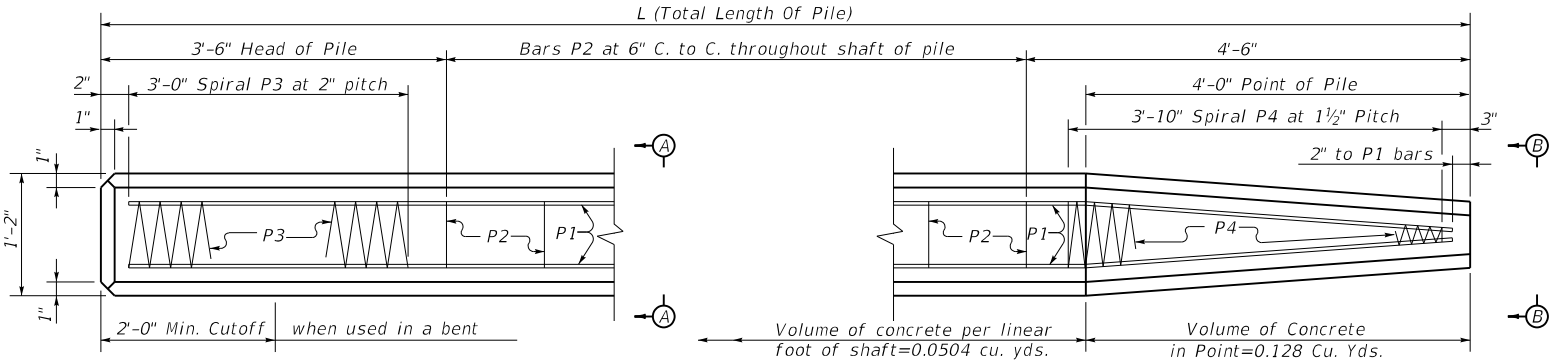
KENTUCKY
DEPARTMENT OF HIGHWAYS

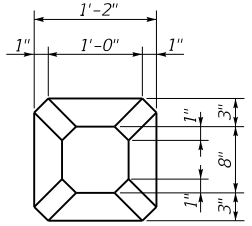
EXPANSION JOINT
REPLACEMENT
4" & 5"

STANDARD DRAWING NO. BJE-006

SUBMITTED _____ 02-26-20
DIRECTOR DIVISION OF STRUCTURAL DESIGN — DATE

APPROVED _____ 02-26-20
STATE HIGHWAY ENGINEER — DATE



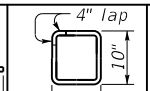


VIEW B-B

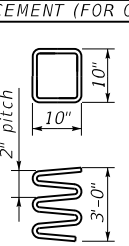
TABLE OF DIMENSIONS AND QUANTITIES (FOR ONE PILE ONLY)

BILL AND TYPES OF REINFORCEMENT (FOR ONE PILE ONLY)

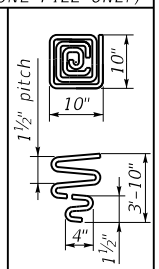
Bars P1
4~#8



Bars P2
#3~3'-8" long



Bars P3
* ¼" ∅ Spiral



Bars P4
* ¼" ∅ Spiral

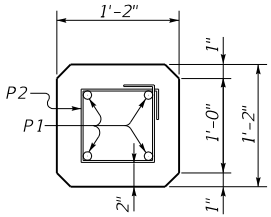
L Ft.	Estimated Concrete Class "D" Cu. Yd.	Length Ft.	Length In.	A Ft.	A In.	Number
16	0.73	15	8	11	8	17
18	0.83	17	8	13	8	21
20	0.93	19	8	15	8	25
22	1.04	21	8	17	8	29
24	1.14	23	8	19	8	33
26	1.24	25	8	21	8	37
28	1.34	27	8	23	8	41
30	1.44	29	8	25	8	45
32	1.54	31	8	27	8	49
34	1.64	33	8	29	8	53
36	1.74	35	8	31	8	57
38	1.84	37	8	33	8	61
40	1.94	39	8	35	8	65
42	2.04	41	8	37	8	69
44	2.14	43	8	39	8	73
46	2.24	45	8	41	8	77
48	2.34	47	8	43	8	81
50	2.44	49	8	45	8	85
52	2.54	51	8	47	8	89
54	2.64	53	8	49	8	93
56	2.74	55	8	51	8	97
58	2.84	57	8	53	8	101
60	2.94	59	8	55	8	105

* ¼" Plain Round Bars may be used in place of Deformed Bars

One in Head of Each Pile

One in Point of Each Pile

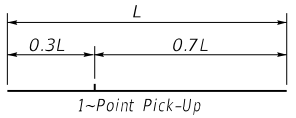
Pile lengths beyond those shown in table will have their concrete quantities adjusted to the length required.



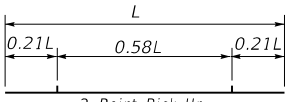
SECTION A-A

Table Showing Max. Length of Concrete Piles for Various Methods of Handing.

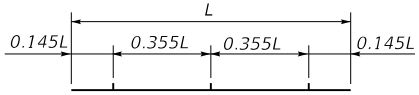
Pick-up Method	Max. Length for 4~#8	Max. Length for 4~#9
1~Point	41 ft.	43 ft.
2~Point	58 ft.	61 ft.
3~Point	87 ft.	92 ft.



1~Point Pick-Up



2~Point Pick-Up



3~Point Pick-Up

All lifting to be at pick-up points. Clearly mark all pick-up points.

GENERAL NOTES

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

CONCRETE: Use class "D" concrete throughout the piles.

REINFORCEMENT: Include the cost of reinforcement in the price bid per linear foot of piles. Concrete piles must not be damaged below cut-off elevation. Concrete and spiral bars above cut-off elevation are to be removed. Bars P1 and P2 are to remain and project into structure above. Field bend these bars if necessary to maintain clearance shown on Bridge details.

PILING: Minimum penetration of all piles is 20 feet unless solid rock is encountered.

TEST PILES: Drive test piles where designated on Bridge Plans to determine the length required. Locate all test piles so they will act as a part of the piling system.

PILE CUT-OFF: No payment will be made for pile cut-off.

SPIRAL REINFORCEMENT: May be plain or deformed and have a minimum yield strength of 40,000 psi and a minimum tensile strength of 70,000 psi.

KENTUCKY
DEPARTMENT OF HIGHWAYS

14" REINFORCED CONCRETE PILE

STANDARD DRAWING NO. BPC-002-08

SUBMITTED _____ DIRECTOR DIVISION OF STRUCTURAL DESIGN — DATE 02-26-20

APPROVED _____ STATE HIGHWAY ENGINEER — DATE 02-26-20

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.

CONCRETE: Use class "D" modified concrete in piles. Cylinder strength shall be 4000 psi at the time of release of the prestress strands and 5000 psi minimum at 28 days.

PRESTRESS STRANDS: Ensure prestressing reinforcement to be ½" inch nominal diameter uncoated seven-wire low lax strand conforming to the requirements of grade 270, AASHTO M203, current edition.

DESIGN STRESSES: Initial strand tension=30,982 pounds. f's=270,000 psi. (strands) f's=20,000 psi (mild reinforcement) f'c=5,000 psi. f'c at transfer=4000 psi. Spiral reinforcement wire W3.5 conforming to ASTM A82.

DRIVING PILES: Protect piles heads from direct hammer impact by using approved cushion blocks.

EDGES: Chamfer all edges one inch or rounded to approximately one inch radius.

BUILD-UP AND SPLICES: Build-ups and splices may be used, as detailed, if authorized by the Engineer.

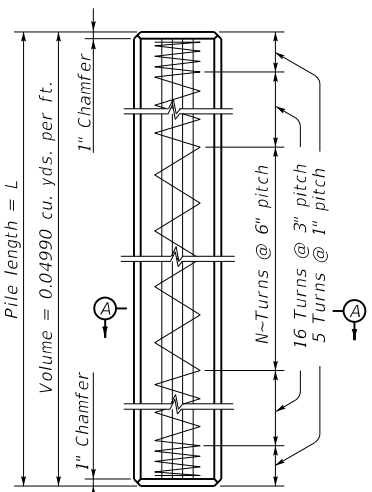
FORMS: For forming the exterior of piles, the use of steel forms on concrete casting beds is required unless otherwise approved by the Engineer. Ensure concrete finish conforms to Subsection 601.03.18, Part A of the Specifications.

PAYMENT: Payment is to be made on the basis of the unit price bid per linear foot of piling. See Section 604.04 of the Specifications.

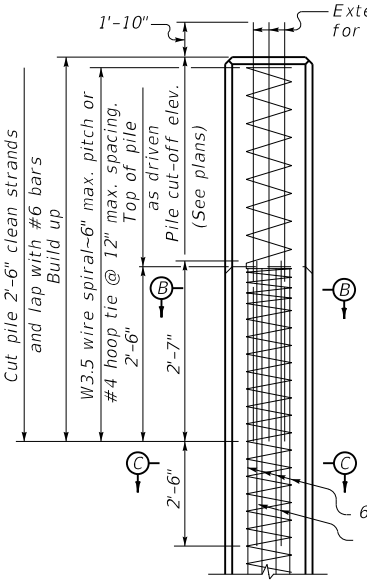
PILE TIP: Use pile tips when specified in the bridge plans and the pile is used as a point bearing pile. Include the cost of pile tip in the unit price bid per linear foot of piling.

Pick-up Method	Maximum Length
1~Point	54 ft.
2~Point	77 ft.
3~Point	111 ft.
4~Point	151 ft.

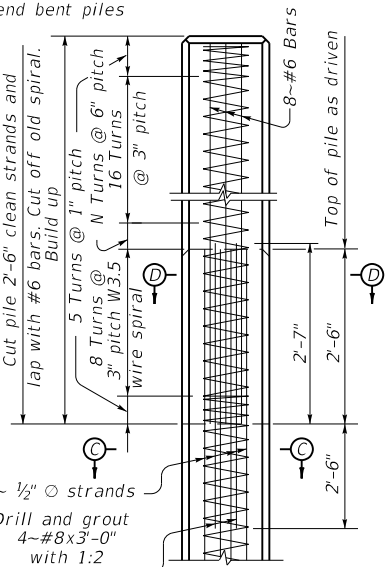
All lifting to be at pick-up points. Clearly mark all pick-up points.



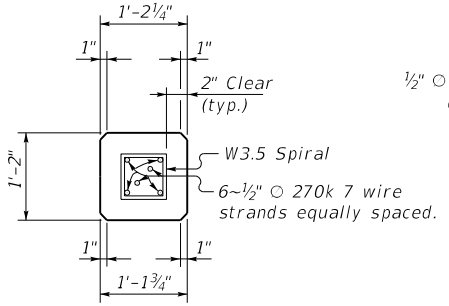
ELEVATION



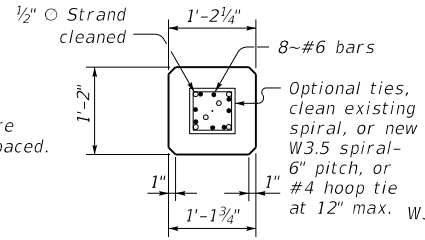
BUILD UP WITHOUT DRIVING



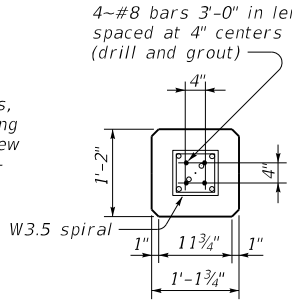
BUILD UP WITH DRIVING



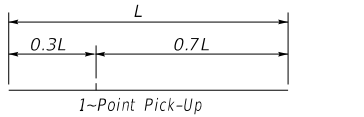
SECTION A-A



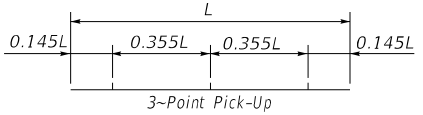
SECTION B-B



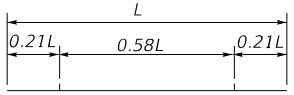
SECTION C-C



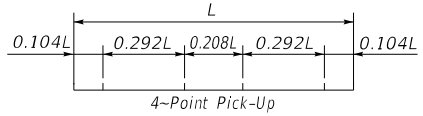
1~Point Pick-Up



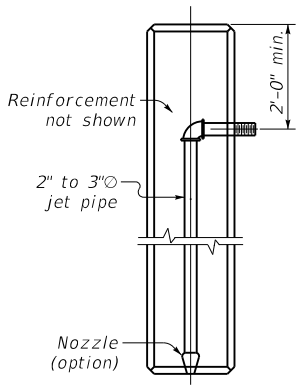
3~Point Pick-Up



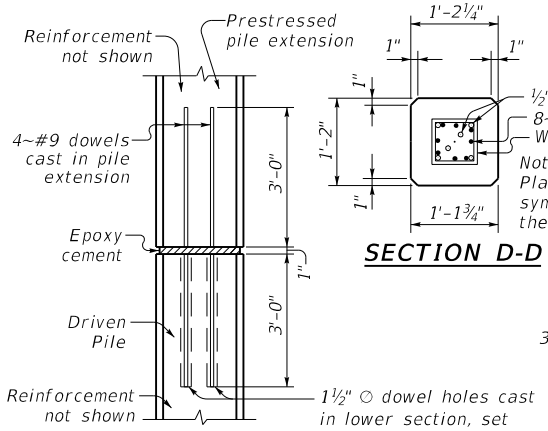
2~Point Pick-Up



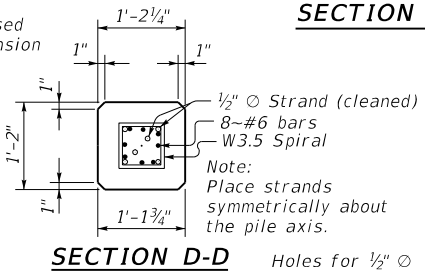
4~Point Pick-Up



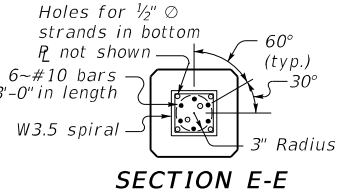
JET PIPE



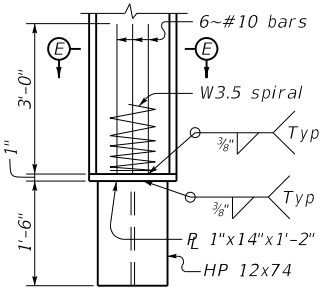
DOWELED SPLICE



SECTION D-D



SECTION E-E



PILE TIP

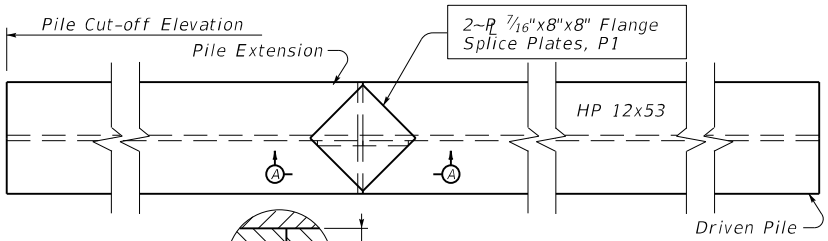
KENTUCKY DEPARTMENT OF HIGHWAYS

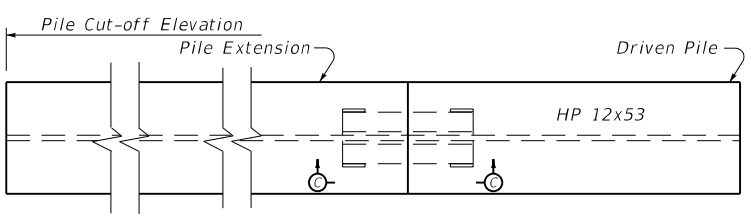
14" PRECAST PRESTRESSED CONCRETE PILE

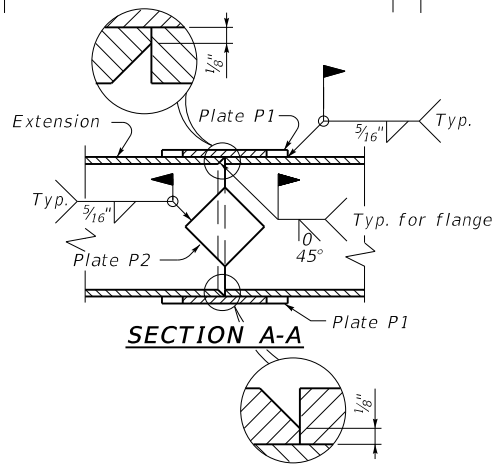
STANDARD DRAWING NO. BPC-011-07

SUBMITTED _____ DIRECTOR DIVISION OF STRUCTURAL DESIGN — 02-26-20 DATE

APPROVED _____ STATE HIGHWAY ENGINEER — 02-26-20 DATE

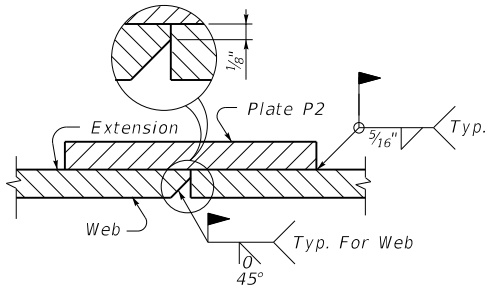




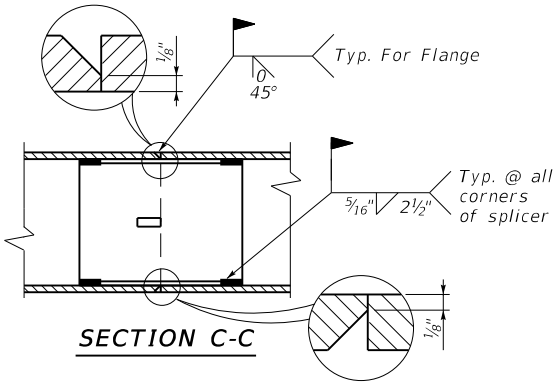


SECTION A-A

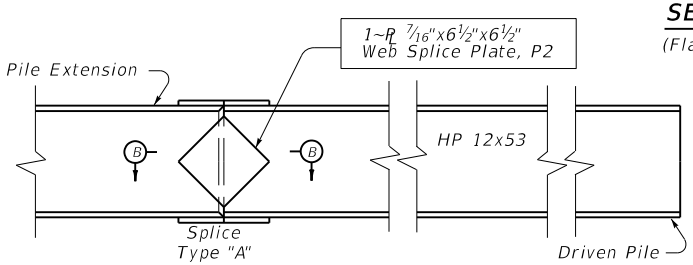
NOTE:
Bevel flanges and web of pile extension on 1:1 bevel as shown and employ conventional butt weld.

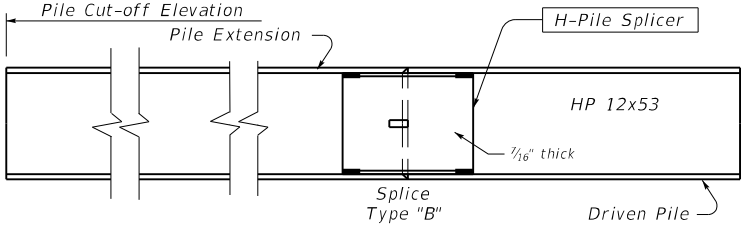


SECTION B-B
(Flange Not Shown)



SECTION C-C





GENERAL NOTES

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.*

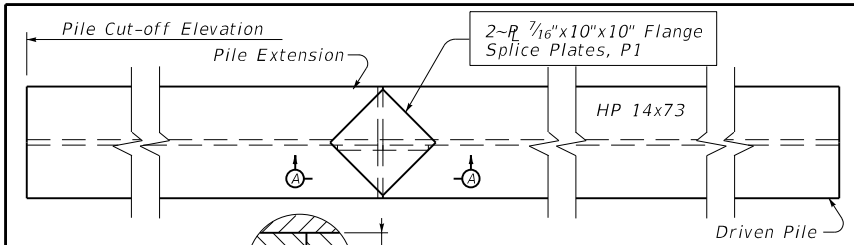
KENTUCKY
DEPARTMENT OF HIGHWAYS

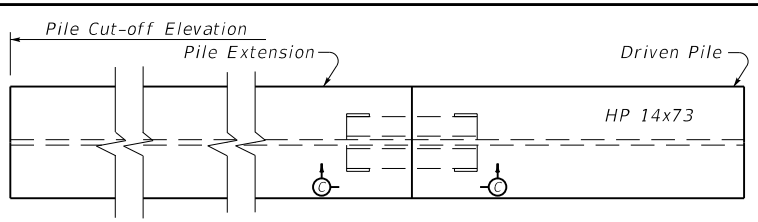
HP12x53
Steel Pile

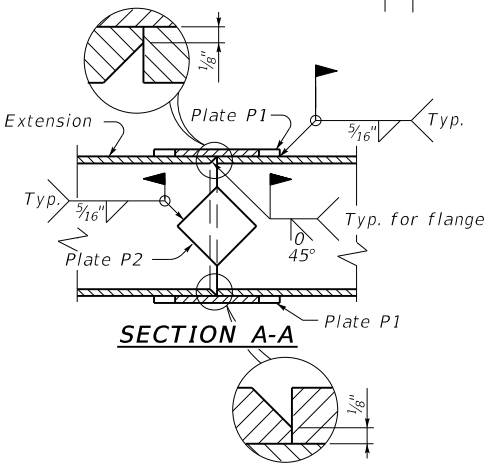
STANDARD DRAWING NO. *BPS-003-09*

SUBMITTED _____ 02-26-20
DIRECTOR DIVISION OF STRUCTURAL DESIGN — DATE

APPROVED _____ 02-26-20
STATE HIGHWAY ENGINEER — DATE

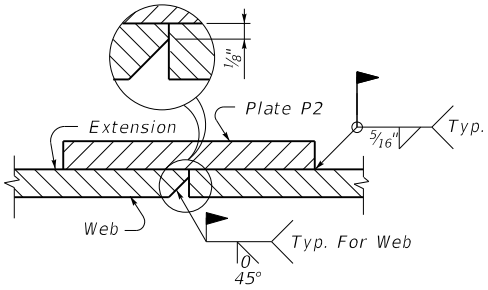




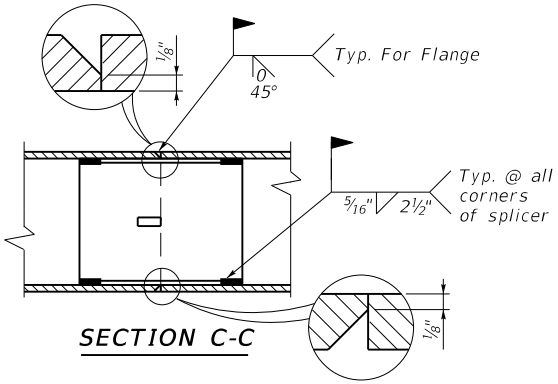


SECTION A-A

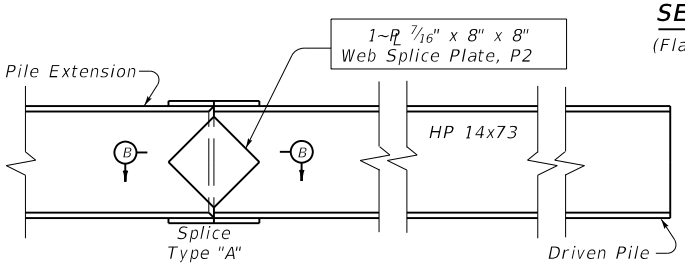
NOTE:
Bevel flanges and web of pile extension on 1:1 bevel as shown and employ conventional butt weld.

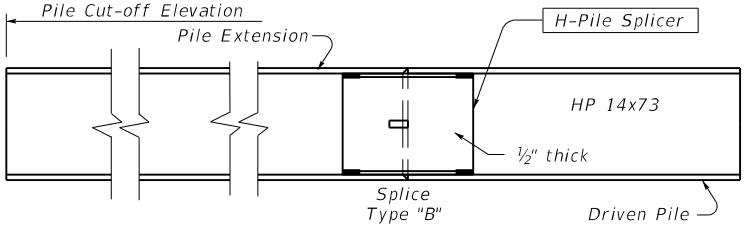


SECTION B-B
(Flange Not Shown)



SECTION C-C





GENERAL NOTES

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 HP14x73 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.*

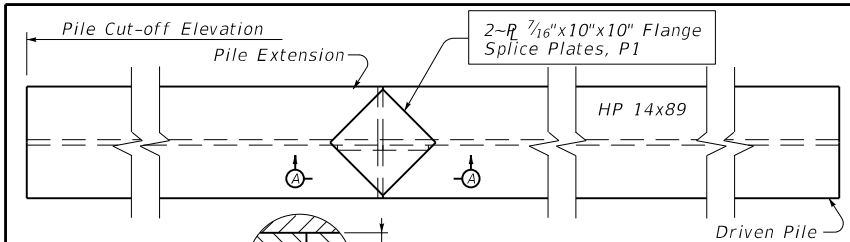
KENTUCKY
DEPARTMENT OF HIGHWAYS

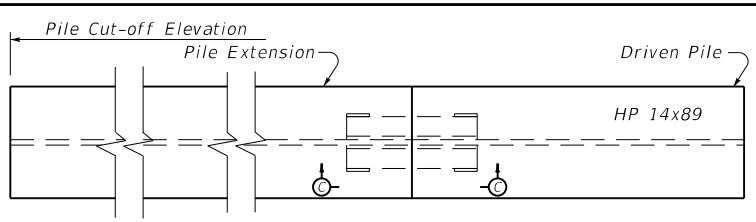
HP14x73
Steel Pile

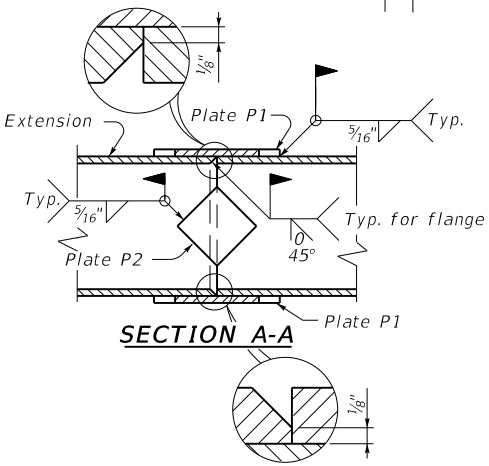
STANDARD DRAWING NO. *BPS-009-08*

SUBMITTED _____ 02-26-20
DIRECTOR DIVISION OF STRUCTURAL DESIGN — DATE

APPROVED _____ 02-26-20
STATE HIGHWAY ENGINEER — DATE

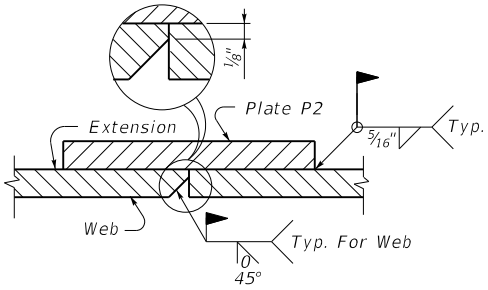




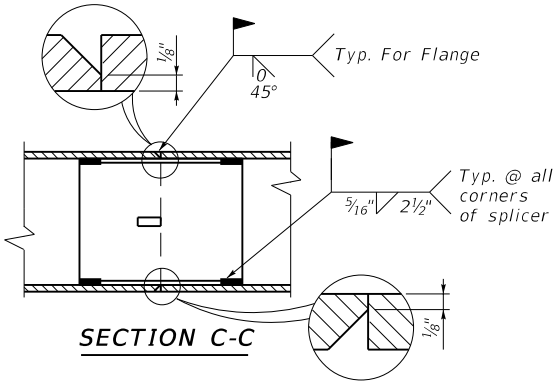


SECTION A-A

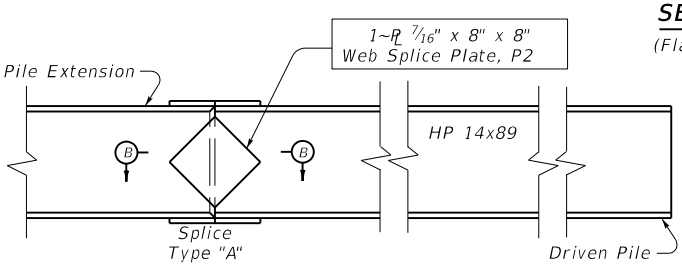
NOTE:
Bevel flanges and web of pile extension on 1:1 bevel as shown and employ conventional butt weld.

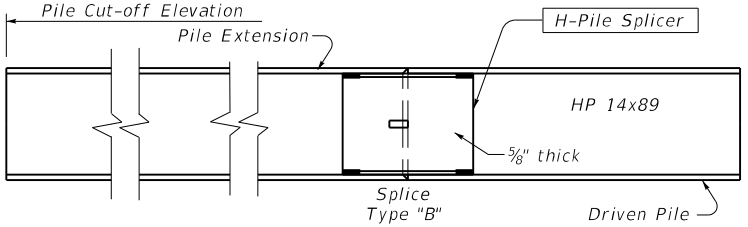


SECTION B-B
(Flange Not Shown)



SECTION C-C





GENERAL NOTES

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 HP14x89 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.*

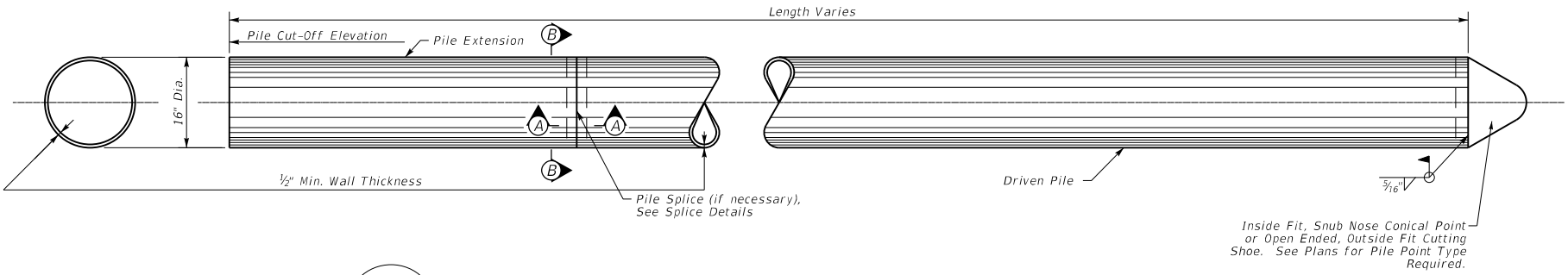
KENTUCKY
DEPARTMENT OF HIGHWAYS

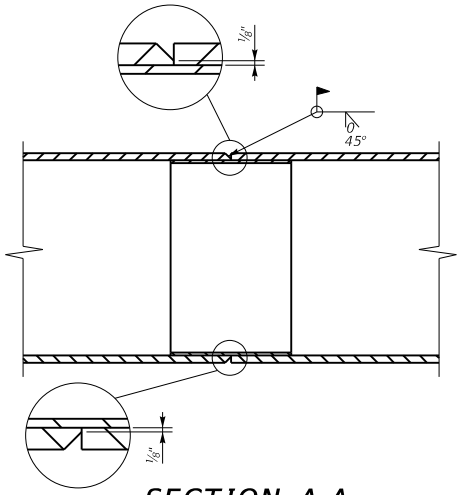
HP14x89
Steel Pile

STANDARD DRAWING NO. *BPS-011-04*

SUBMITTED _____ 02-26-20
DIRECTOR DIVISION OF STRUCTURAL DESIGN — DATE

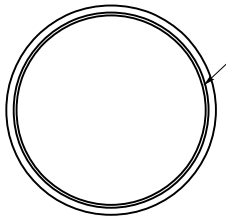
APPROVED _____ 02-26-20
STATE HIGHWAY ENGINEER — DATE





SECTION A-A

Note: Bevel pile extension on 1:1 bevel as shown and employ conventional butt weld.



Back-up ring or sleeve must be a tight enough fit to ensure the pile extension does not move relative to the driven pile. The ring or sleeve may be tack-welded to the driven pile.

SECTION B-B

GENERAL NOTES

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

PIPE PILE MATERIAL: *The steel for the pipe piling shall conform to the requirements of ASTM A252, Grade 3 (minimum yield strength of 45 ksi), for welded or seamless steel pipe piles.*

PIPE FILL: *The pipe piles shall be filled with sand or gravel to the bottom of cap or footing elevation unless the plans specify the pipes to be filled with concrete. If the plans specify that the pipes shall be filled with concrete, fill pipes with Class A concrete at the same time the footing or pile cap is poured. The cost of this material and labor is incidental to the price per linear foot pipe pile 16".*

PAINT: *No paint shall be required on the steel pile shell.*

PILE POINTS: *Inside Fit, Snub Nose Conical Points and Open Ended, Outside Fit Cutting Shoes, with a minimum thickness of 1", shall conform to ASTM A148 or AASHTO M103 Grade 65/35 minimum. Pile points shall be attached using a minimum 5/16" fillet weld around the circumference.*

SPLICES: *Splices shall be welded as detailed on this sheet, employing the use of a back-up ring or sleeve to align the pile sections. When splicing is necessary, use a length that will reasonably assure that capacity will be attained without additional splicing.*

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 the plans and specifications will be made at the contract price per linear foot.*

PIPE PILE THICKNESS: *Contractor shall select wall thickness sufficient to withstand driving without injury and resist harmful distortion and/or buckling due to soil pressures after driving. Selected wall thickness shall not be less than that indicated above.*

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

KENTUCKY
DEPARTMENT OF HIGHWAYS

PIPE PILE
16 INCH

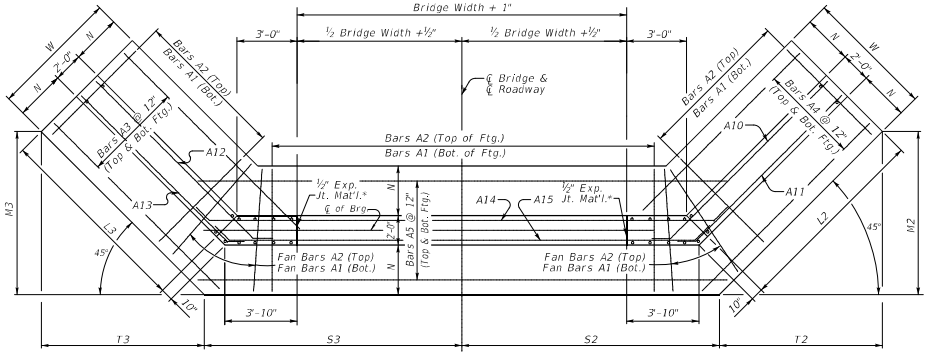
STANDARD DRAWING NO. BPS-012

SUBMITTED _____ 02-26-20
DIRECTOR DIVISION OF STRUCTURAL DESIGN — DATE

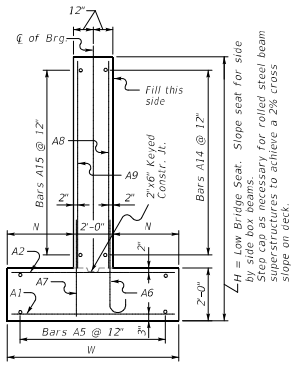
APPROVED _____ 02-26-20
STATE HIGHWAY ENGINEER — DATE

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

ABUTMENT SKEW CORRECTION FACTOR (SCF) = 1.000

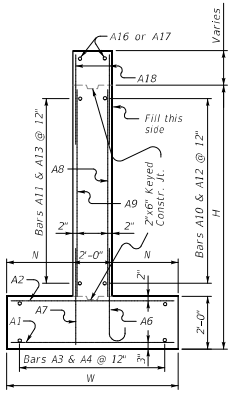


PLAN



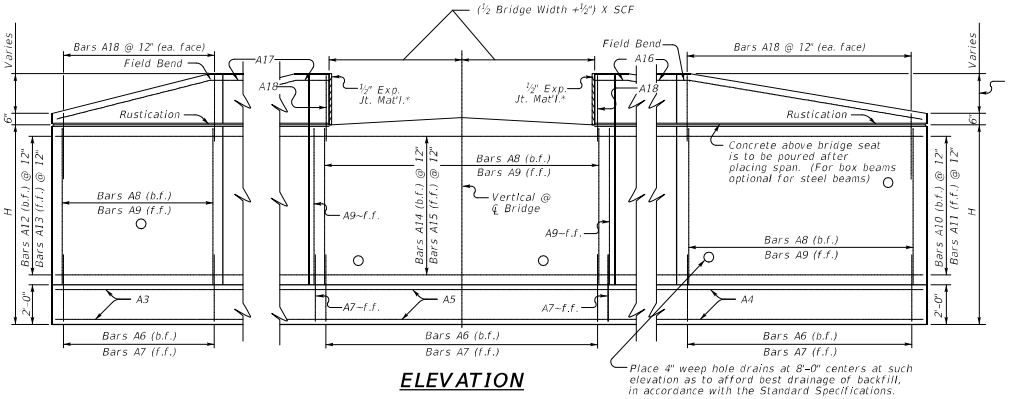
WALL SECTION

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

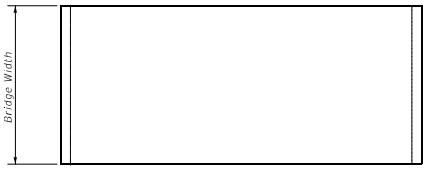


WING SECTION

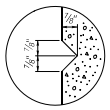
Note: Trim A16 & A17 bars if necessary



ELEVATION



PLAN OF SUPERSTRUCTURE SLAB



RUSTICATION GROOVE

*Expansion Joint Material:
AASHTO M153
Type-I Sponge Rubber

REVISION DATE: 08/11/2025
REVISION NUMBER: 0

SUBMITTED Michael Cupp 08-11-2025
DIVISION DIRECTOR DATE

APPROVED Jason Ballinger 08-11-2025
STATE HIGHWAY ENGINEER DATE

BRIDGE STANDARDS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

0° SKEW SUPPORT VARIABLE WIDTH ABUTMENT 50% SKEWED WINGS

STANDARD DRAWING NUMBER
BSA-001-01

OpenRoads Designer v23.00.01.11

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

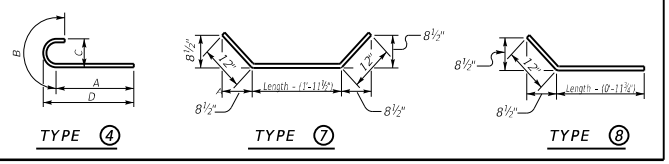
Bill of Reinforcement

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	
H	No.	Size	Length ft.	Length in.	No.	Size	Length ft.	Length in.	Spacing	No.	Length ft.	Length in.	No.	Length ft.	Length in.	+Lb	No.	Size	Length ft.	Length in.	Spacing	A in.	B ft.	B in.	C ft.	C in.	D ft.	D in.	No.	Size	Length ft.	Length in.	Spacing	No.	Size	Length ft.	Length in.	No.	Size	Length ft.	Length in.	Spacing	No.	Length ft.	Length in.	No.	Length ft.	Length in.	+Lb	Length ft.	Length in.	No.	Length ft.	Length in.	No.	Length ft.	Length in.	No.	Length ft.	Length in.	No.	Length ft.	Length in.	No.	Length ft.	Length in.
15–16	60+Nb=	10	11	8	12	60+Nb=	7	11	8	12	24	24	0	24	24	0	24	12	4	+Lb=			49+Nb=	9	9	11	12	8	⅛	1	10	0	11¾	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	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	10½	1	2	0	7	6	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	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	8½	0	10	0	5	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	8½	0	10	0	5	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 Length ft.	W Length in.	N Length ft.	N Length in.	M2 Length ft.	M2 Length in.	M3 Length ft.	M3 Length in.	T2 Length ft.	T2 Length in.	T3 Length ft.	T3 Length in.	L2 Length ft.	L3 Length ft.	S2 Length ft.	S2 Length in.	S2 + Lb/2 =	S2 Length ft.	S2 Length in.	S3 Length ft.	S3 Length in.	S3 + Lb/2 =	S3 Length ft.	S3 Length in.
15–16	12	0	5	0	16	10¾	16	10¾	16	10¾	16	10¾	21	21	5	11¼	+0.5Lb=			5	11¼	+0.5Lb=		
13–14	11	0	4	6	14	7⅝	14	7⅝	14	7⅝	14	7⅝	18	18	5	8¾	+0.5Lb=			5	8¾	+0.5Lb=		
11–12	10	0	4	0	13	⅞	13	⅞	13	⅞	13	⅞	16	16	5	6⅜	+0.5Lb=			5	6⅜	+0.5Lb=		
9–10	9	0	3	6	11	6⅛	11	6⅛	11	6⅛	11	6⅛	14	14	5	3⅞	+0.5Lb=			5	3⅞	+0.5Lb=		
7–8	7	6	2	9	8	5½	8	5½	8	5½	8	5½	10	10	5	⅛	+0.5Lb=			5	⅛	+0.5Lb=		
5–6	6	6	2	3	6	10⅝	6	10⅝	6	10⅝	6	10⅝	8	8	4	9⅜	+0.5Lb=			4	9⅜	+0.5Lb=		

Reinforcement Details



*Concrete quantities computed using 21" beam depth on ½" pad & Variable Bridge Width

Quantities

H	Concrete* C.Y.	Reinforcement 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)

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

KENTUCKY
DEPARTMENT OF HIGHWAYS

0° SKEW VARIABLE WIDTH ABUTMENT 50% SKEWED WINGS

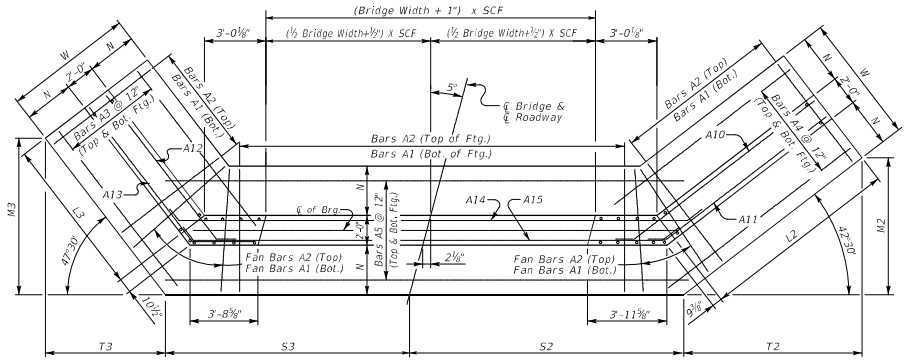
STANDARD DRAWING NO. *BSA-002*

SUBMITTED _____ DIRECTOR DIVISION OF STRUCTURAL DESIGN — DATE 02-26-20

APPROVED _____ STATE HIGHWAY ENGINEER — DATE 02-26-20

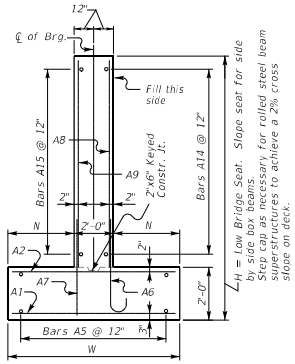
5° SKEW VARIABLE BRIDGE WIDTH 2:1 FILL SLOPES
WINGS SKEWED 50% FROM ROADWAY TO BREASTWALL

ABUTMENT SKEW CORRECTION FCTOR (SCF) = 1.004

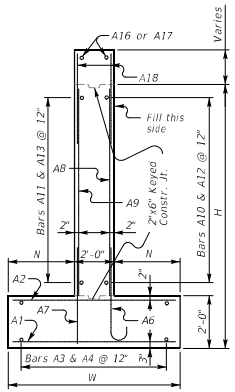


(Left Skew as shown; right skew opp. hand)

PLAN

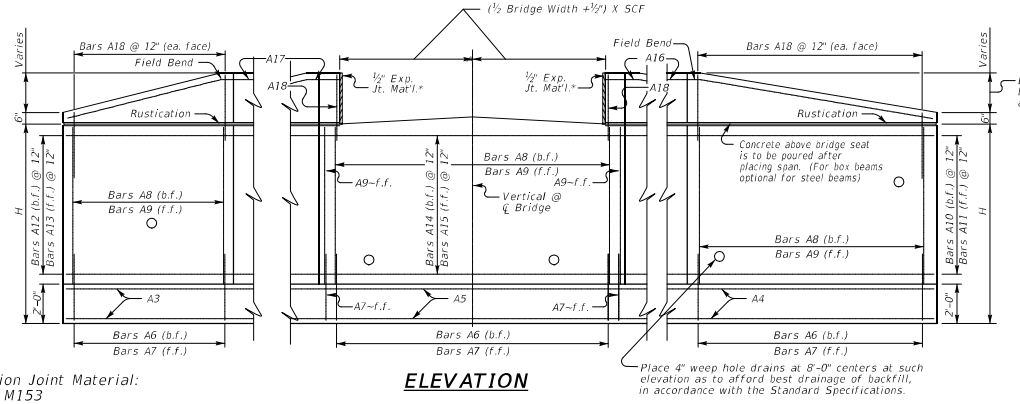


WALL SECTION



WING SECTION

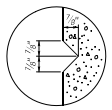
Note: Trim A16 & A17 bars if necessary



ELEVATION

*Expansion Joint Material:
AASHTO M153
Type-I Sponge Rubber

PLAN OF SUPERSTRUCTURE SLAB



RUSTICATION GROOVE

REVISION DATE: 08/11/2025
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — DATE 08-11-2025

APPROVED — STATE HIGHWAY ENGINEER — DATE 08-11-2025

BRIDGE STANDARDS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

5° SKEW SUPPORT VARIABLE WIDTH ABUTMENT 50% SKEWED WINGS

STANDARD DRAWING NUMBER
BSA-003-01

OpenRoads Designer v23.00.01.11

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

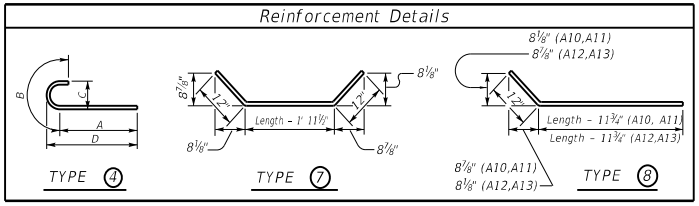
Bill of Reinforcement

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	
H	No.	Size	Length ft.	Length in.	No.	Size	Length ft.	Length in.	Spacing	No.	Length ft.	Length in.	No.	Length ft.	Length in.	= +Lb=	No.	Length ft.	Length in.	No.	Size	Length ft.	Length in.	Spacing	A in.	B ft.	B in.	C ft.	C in.	D in.	No.	Size	Length ft.	Length in.	Spacing	No.	Size	Length ft.	Length in.	Spacing	No.	Length ft.	Length in.	No.	Length ft.	Length in.	= +Lb=	No.	Length ft.	Length in.	No.	Length ft.	Length in.	= +Lb=	No.	Length ft.	Length in.	No.	Length ft.	Length in.
15–16	60+Nb=	10	11	8	60+Nb=	7	11	8	12	24	23	1	24	24	10	24	12	4	+Lb=			49+Nb=	9	9	11	12	8	⅛	1	10	0	11¾	8	6	52+Nb=	5	4	11	12	49+Nb=	6	12	10	12	52+Nb=	12	10	12	14	25	1	14	23	7	14	22	11	14	21	8	14	12	5	+Lb=			14	9	6	+Lb=			2	26	8	2	24	6	104	5	9
13–14	53+Nb=	9	10	8	12	53+Nb=	7	10	8	12	22	19	11	22	21	8	22	11	11	+Lb=			43+Nb=	8	8	3	12	6	11	1	3	0	8	7	3	46+Nb=	5	4	11	12	43+Nb=	6	10	10	12	46+Nb=	10	10	12	12	22	1	12	20	7	12	19	11	12	18	8	12	12	6	+Lb=			12	9	6	+Lb=			2	23	8	2	21	6	92	5	9
11–12	48+Nb=	8	9	8	12	48+Nb=	6	9	8	12	20	17	8	20	18	5	20	11	6	+Lb=			38+Nb=	7	7	1	12	5	10½	1	2	0	7	6	2	41+Nb=	5	4	11	12	38+Nb=	5	8	10	12	41+Nb=	8	10	12	10	19	1	10	17	7	10	17	11	10	16	8	10	12	6	+Lb=			10	9	6	+Lb=			2	20	8	2	19	6	82	5	9
9–10	43+Nb=	7	8	8	12	43+Nb=	5	8	8	12	18	15	6	18	16	3	18	11	1	+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	17	1	8	15	7	8	15	11	8	14	8	8	12	6	+Lb=			8	9	6	+Lb=			2	18	8	2	17	6	74	5	9
7–8	34+Nb=	6	7	2	12	34+Nb=	5	7	2	12	16	10	11	16	11	8	16	10	0	+Lb=			26+Nb=	5	5	7	12	4	8½	0	10	0	5	4	11	29+Nb=	5	4	11	12	26+Nb=	5	4	10	12	29+Nb=	4	10	12	6	13	2	6	11	7	6	12	0	6	10	8	6	12	6	+Lb=			6	9	6	+Lb=			2	14	8	2	13	6	58	5	9
5–6	29+Nb=	5	6	2	12	29+Nb=	5	6	2	12	14	8	8	14	9	6	14	9	7	+Lb=			22+Nb=	5	5	7	12	4	8½	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	2	4	9	7	4	10	0	4	8	8	4	12	6	+Lb=			4	9	6	+Lb=			2	12	8	2	11	6	50	5	9

Table of Dimensions

H	W Length ft.	W Length in.	N Length ft.	N Length in.	M2 Length ft.	M2 Length in.	M3 Length ft.	M3 Length in.	T2 Length ft.	T2 Length in.	T3 Length ft.	T3 Length in.	L2 Length ft.	L3 Length ft.	S2 Length ft.	S2 Length in.	S2 + Lb/2 = Length ft.	S2 + Lb/2 = Length in.	S3 Length ft.	S3 Length in.	S3 + Lb/2 = Length ft.	S3 + Lb/2 = Length in.
15–16	12	0	5	0	16	8⅜	17	¼	18	2¾	15	7⅛	22	20	6	4⅝	+0.5Lb=		5	6¼	+0.5Lb=	
13–14	11	0	4	6	14	6½	14	7¾	15	10½	13	5	19	17	6	1¾	+0.5Lb=		5	4⅛	+0.5Lb=	
11–12	10	0	4	0	12	4⅞	13	⅛	13	6¼	11	11	16	15	5	11	+0.5Lb=		5	2	+0.5Lb=	
9–10	9	0	3	6	10	10⅞	11	4⅜	11	10¾	10	5	14	13	5	8⅛	+0.5Lb=		4	11⅞	+0.5Lb=	
7–8	7	6	2	9	8	0	8	2⅛	8	8⅞	7	5⅞	10	9	5	3¾	+0.5Lb=		4	8¾	+0.5Lb=	
5–6	6	6	2	3	6	6¼	6	6½	7	1⅜	5	11⅛	8	7	5	⅞	+0.5Lb=		4	6⅜	+0.5Lb=	

Reinforcement Details



*Concrete quantities computed using 21" beam depth on ½" pad & Variable Bridge Width

Quantities

H	Concrete* C.Y.	Reinforcement LBS.
5	18.92+(0.71xLb) =	1785+(52.8xLb) =
6	20.61+(0.78xLb) =	1785+(52.8xLb) =
7	28.09+(0.93xLb) =	2590+(68.7xLb) =
8	30.07+(1.01xLb) =	2590+(68.7xLb) =
9	45.33+(1.19xLb) =	4204+(91xLb) =
10	47.9+(1.27xLb) =	4204+(91xLb) =
11	59.09+(1.41xLb) =	5983+(120.4xLb) =
12	61.96+(1.49xLb) =	5983+(120.4xLb) =
13	76.36+(1.64xLb) =	8660+(161xLb) =
14	79.6+(1.71xLb) =	8660+(161xLb) =
15	97.81+(1.86xLb) =	11856+(198.6xLb) =
16	101.5+(1.93xLb) =	11856+(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.

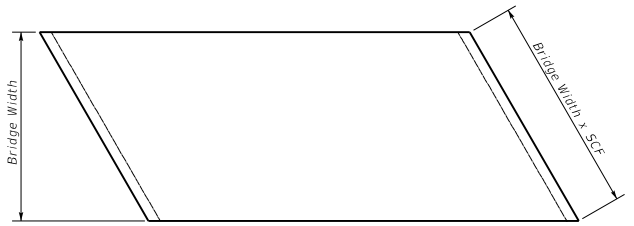
FOUNDATION PRESSURE: Construct abutment footings on solid rock bearing material that can support a pressure of 8000 psf service or 10,800 psf strength factored as recommended by a geotechnical engineer.

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



PLAN OF SUPERSTRUCTURE SLAB

KENTUCKY
DEPARTMENT OF HIGHWAYS

5° SKEW VARIABLE
WIDTH ABUTMENT
50% SKEWED WINGS

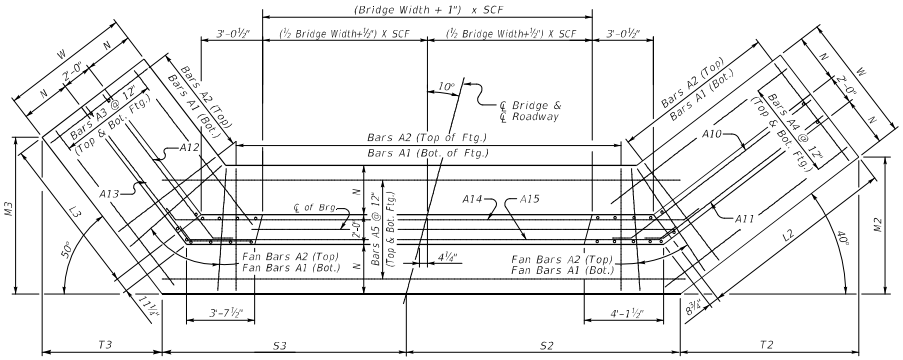
STANDARD DRAWING NO. BSA-004

SUBMITTED _____ DIRECTOR DIVISION OF STRUCTURAL DESIGN — DATE 02-26-20

APPROVED _____ STATE HIGHWAY ENGINEER — DATE 02-26-20

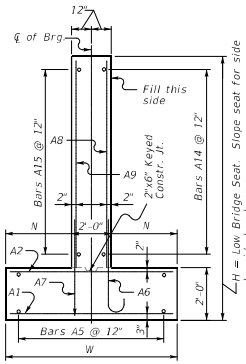
10° SKEW VARIABLE BRIDGE WIDTH 2:1 FILL SLOPES WINGS SKEWED 50% FROM ROADWAY TO BREASTWALL

ABUTMENT SKEW CORRECTION FACTOR (SCF) = 1.015



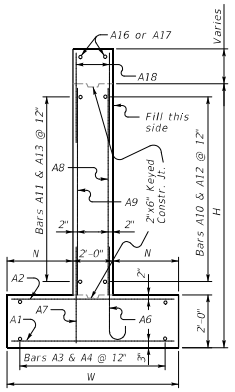
(Left Skew as shown; right skew opp. hand)

PLAN



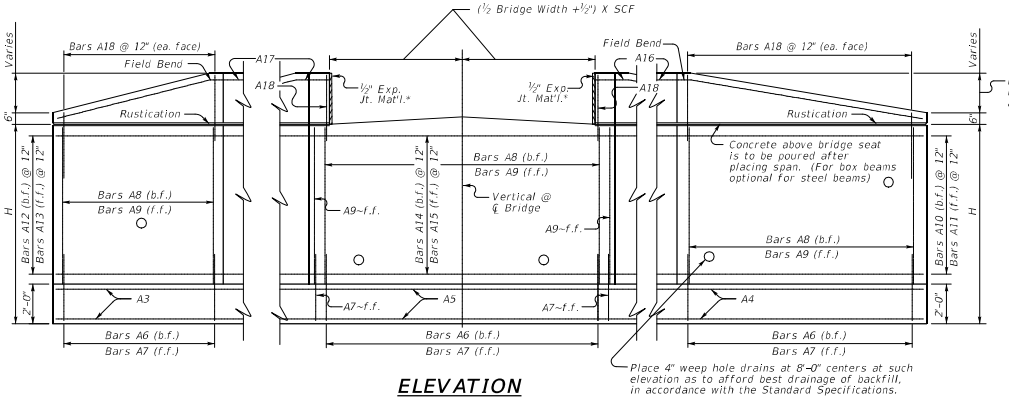
H = Low Bridge Seat. Slope seat for side by side box beams. Step cap as necessary for rolled steel beam superstructures to achieve a 2% cross slope on deck.

WALL SECTION



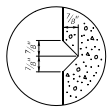
WING SECTION

Note: Trim A16 & A17 bars if necessary



ELEVATION

PLAN OF SUPERSTRUCTURE SLAB



RUSTICATION GROOVE

*Expansion Joint Material:
AASHTO M153
Type-I Sponge Rubber

REVISION DATE: 08/11/2025
REVISION NUMBER: 0

SUBMITTED: Michael Cooper 08-11-2025
APPROVED: Jason Ballinger 08-11-2025

BRIDGE STANDARDS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

10° SKEW SUPPORT VARIABLE WIDTH ABUTMENT 50% SKEWED WINGS

STANDARD DRAWING NUMBER
BSA-005-01

OpenRoads Designer v23.00.01.11

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

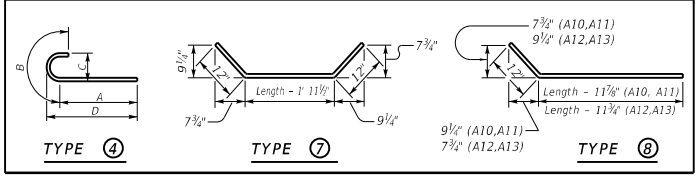
Bill of Reinforcement

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	
H	No.	Size	Length ft.	Length in.	Spacing	No.	Size	Length ft.	Length in.	Spacing	No.	No.	No.	Length ft.	Length in.	= +Lb=	No.	Size	Length ft.	Length in.	Spacing	A in.	B ft.	B in.	C ft.	C in.	D ft.	D in.	No.	Size	Length ft.	Length in.	Spacing	No.	Size	Length ft.	Length in.	Spacing	No.	Length ft.	Length in.	No.	Size	Length ft.	Length in.	Spacing	No.	Length ft.	Length in.	No.	Length ft.	Length in.	= +Lb=	No.	Length ft.	Length in.	= +Lb=	No.	Length ft.	Length in.	No.	Length ft.	Length in.	No.	Length ft.	Length in.
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	⅛	1	10	0	11¾	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=			2	27	9	2	23	6	104	5	9
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=			2	24	9	2	21	6	94	5	9
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	10½	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=			2	21	9	2	18	6	82	5	9
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=			2	18	9	2	16	6	72	5	9
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	8½	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=			2	15	9	2	13	6	60	5	9
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	8½	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=			2	12	9	2	11	6	50	5	9

Table of Dimensions

H	W Length ft.	W Length in.	N Length ft.	N Length in.	M2 Length ft.	M2 Length in.	M3 Length ft.	M3 Length in.	T2 Length ft.	T2 Length in.	T3 Length ft.	T3 Length in.	L2 Length ft.	L3 Length ft.	S2 Length ft.	S2 Length in.	S2 + Lb/2 =	S3 Length ft.	S3 Length in.	S3 + Lb/2 =
15–16	12	0	5	0	16	5	17	⅜	19	6⅞	14	3¾	23	19	6	10½	+0.5Lb=	5	1⅜	+0.5Lb=
13–14	11	0	4	6	14	4½	15	4⅛	17	1⅜	12	10½	20	17	6	7¼	+0.5Lb=	4	11⅞	+0.5Lb=
11–12	10	0	4	0	12	4	12	10⅜	14	8⅜	10	9⅜	17	14	6	4	+0.5Lb=	4	10	+0.5Lb=
9–10	9	0	3	6	10	3⅜	11	1⅞	12	3⅛	9	4⅜	14	12	6	¾	+0.5Lb=	4	8¼	+0.5Lb=
7–8	7	6	2	9	8	2⅛	8	7⅛	9	9	7	2½	11	9	5	7⅞	+0.5Lb=	4	5⅝	+0.5Lb=
5–6	6	6	2	3	6	1⅜	6	10⅜	7	3¾	5	9¼	8	7	5	4⅜	+0.5Lb=	4	3⅛	+0.5Lb=

Reinforcement Details



*Concrete quantities computed using 21" beam depth on ½" pad & Variable Bridge Width

Quantities

H	Concrete* C.Y.	Reinforcement 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

KENTUCKY
DEPARTMENT OF HIGHWAYS

10° SKEW VARIABLE WIDTH ABUTMENT 50% SKEWED WINGS

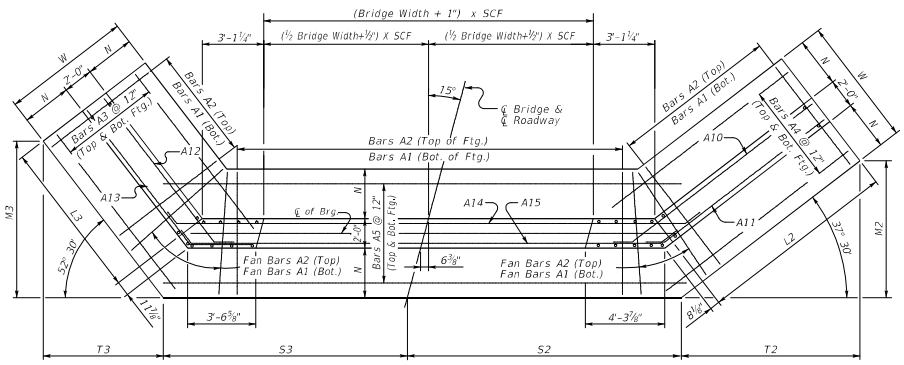
STANDARD DRAWING NO. *BSA-006*

SUBMITTED _____ 02-26-20
DIRECTOR DIVISION OF STRUCTURAL DESIGN — DATE

APPROVED _____ 02-26-20
STATE HIGHWAY ENGINEER — DATE

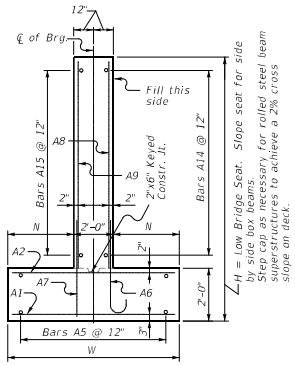
15° SKEW VARIABLE BRIDGE WIDTH 2:1 FILL SLOPES
WINGS SKEWED 50% FROM ROADWAY TO BREASTWALL

ABUTMENT SKEW CORRECTION FACTOR (SCF) = 1.035

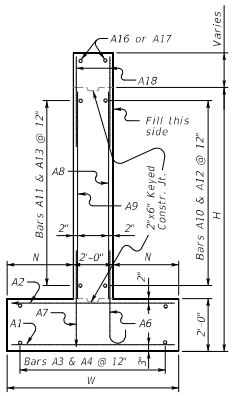


(Left Skew as shown; right skew opp. hand)

PLAN

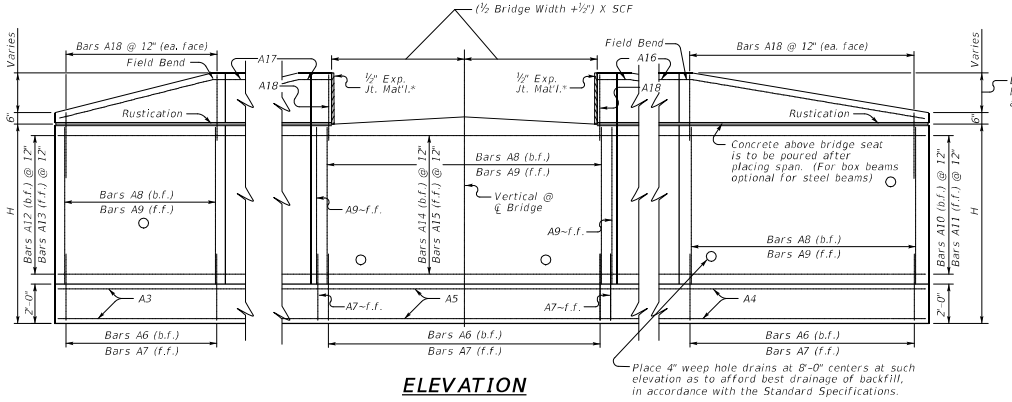


WALL SECTION



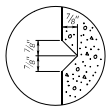
WING SECTION

Note: Trim A16 & A17 bars if necessary



ELEVATION

PLAN OF SUPERSTRUCTURE SLAB



RUSTICATION GROOVE

*Expansion Joint Material:
AASHTO M153
Type-I Sponge Rubber

REVISION DATE: 08/11/2025
REVISION NUMBER: 0

SUBMITTED Michael Cupp 08-11-2025 DATE
DIVISION DIRECTOR

APPROVED Jason Ballenger 08-11-2025 DATE
STATE HIGHWAY ENGINEER

BRIDGE STANDARDS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

15° SKEW SUPPORT VARIABLE WIDTH ABUTMENT 50% SKEWED WINGS

STANDARD DRAWING NUMBER
BSA-007-01

OpenRoads Designer v23.00.01.11

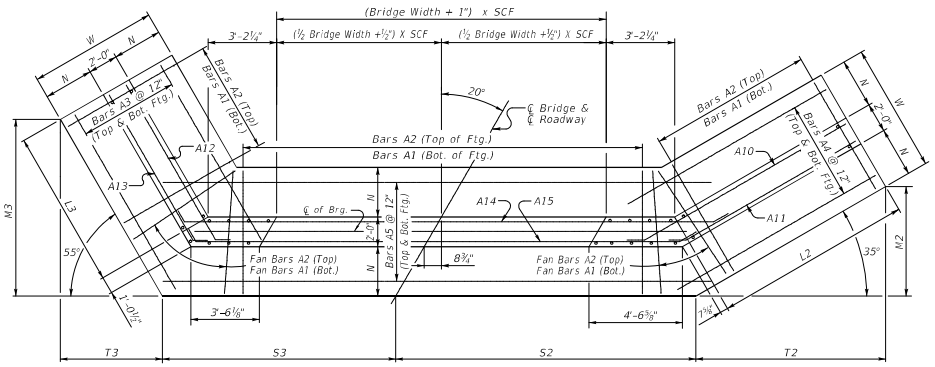
15° SKEW VARIABLE BRIDGE WIDTH 2:1 FILL SLOPES
WINGS SKEWED 50% FROM ROADWAY TO BREASTWALL

Bill of Reinforcement

| MARK | A1 | | | | | A2 | | | | | A3 | A4 | A5 | | | | | A6 | | | | | | | | | | | | | | | | A7 | | | | | A8 | | | | | A9 | | | | | A10 | A11 | A12 | A13 | A14 | | | | | A15 | | | | | A16 | A17 | A18 | | |
|---|---|---

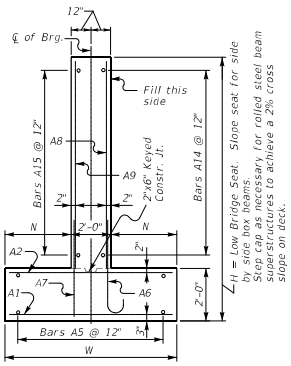
20° SKEW VARIABLE BRIDGE WIDTH 2:1 FILL SLOPES WINGS SKEWED 50% FROM ROADWAY TO BREASTWALL

ABUTMENT SKEW CORRECTION FACTOR (SCF) = 1.064

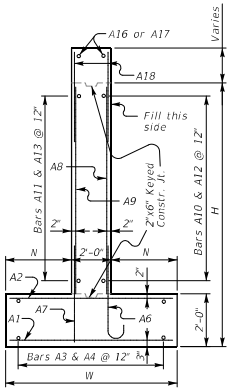


(Left Skew as shown; right skew opp. hand)

PLAN

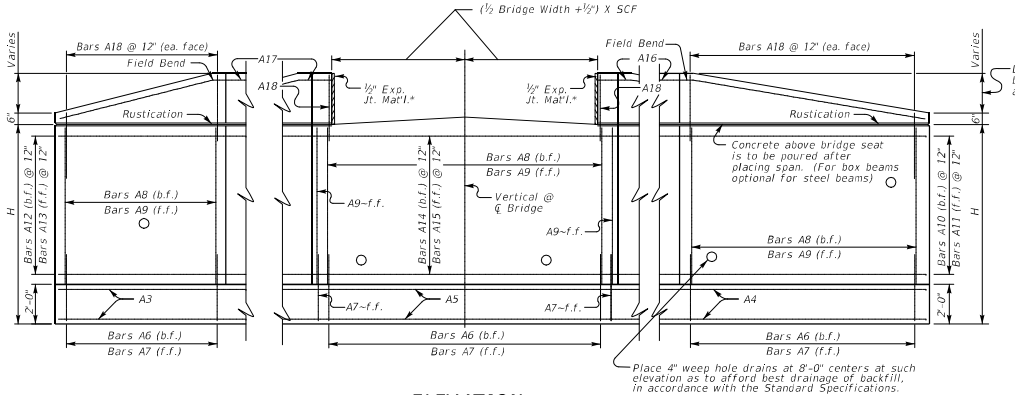


WALL SECTION

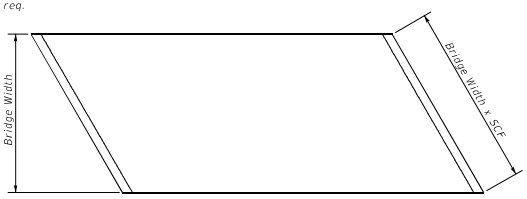


WING SECTION

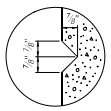
NOTE: Trim A16 & A17 bars if necessary



ELEVATION



PLAN OF SUPERSTRUCTURE SLAB



RUSTICATION GROOVE

*Expansion Joint Material:
AASHTO M153
Type-I Sponge Rubber

REVISION DATE: 08/11/2025
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — DATE 08-11-2025
APPROVED — STATE HIGHWAY ENGINEER — DATE 08-11-2025

BRIDGE STANDARDS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

20° SKEW SUPPORT VARIABLE WIDTH ABUTMENT 50% SKEWED WINGS

STANDARD DRAWING NUMBER
BSA-009-01

OpenRoads Designer v23.00.01.11

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

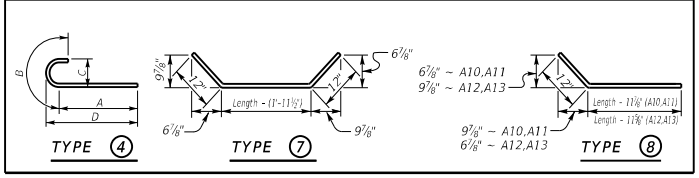
Bill of Reinforcement

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	
H	No.	Size	Length ft.	Length in.	Spacing	No.	Size	Length ft.	Length in.	Spacing	No.	No.	No.	Length ft.	Length in.	= +Lb	Length ft.	Length in.	No.	Size	Length ft.	Length in.	Spacing	A ft.	A in.	B ft.	B in.	C ft.	C in.	D ft.	D in.	No.	Size	Length ft.	Length in.	Spacing	No.	Size	Length ft.	Length in.	Spacing	No.	Length ft.	Length in.	No.	Length ft.	Length in.	No.	Length ft.	Length in.	= +Lb	Length ft.	Length in.	No.	Length ft.	Length in.	= +Lb	Length ft.	Length in.	No.	Length ft.	No.	Length ft.	No.	Length ft.
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	⅛	1	10	0	11¾	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	10½	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	8½	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	8½	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 Length ft.	W Length in.	N Length ft.	N Length in.	M2 Length ft.	M2 Length in.	M3 Length ft.	M3 Length in.	T2 Length ft.	T2 Length in.	T3 Length ft.	T3 Length in.	L2 Length ft.	L3 Length ft.	S2 Length ft.	S2 Length in.	S2 + Lb/2 =	S3 Length ft.	S3 Length in.	S3 + Lb/2 =
15-16	12	0	5	0	16	2⅛	17	8¾	23	1¼	12	5	26	18	7	11⅞	+0.5Lb=	4	4	+0.5Lb=
13-14	11	0	4	6	13	9½	15	⅜	19	8⅜	10	6½	22	15	7	7⅜	+0.5Lb=	4	3	+0.5Lb=
11-12	10	0	4	0	11	11¾	13	2½	17	1⅜	9	3	19	13	7	3¾	+0.5Lb=	4	2⅛	+0.5Lb=
9-10	9	0	3	6	10	2⅛	11	4¼	14	6⅜	7	11⅜	16	11	6	11⅜	+0.5Lb=	4	1⅛	+0.5Lb=
7-8	7	6	2	9	7	8⅛	8	7	11	⅝	6	⅛	12	8	6	5½	+0.5Lb=	3	11¾	+0.5Lb=
5-6	6	6	2	3	5	11⅛	6	8¾	8	5⅝	4	8½	9	6	6	1½	+0.5Lb=	3	10⅞	+0.5Lb=

Reinforcement Details



*Concrete quantities computed using 21" beam depth on ½" pad & Variable Bridge Width

Quantities

H	Concrete* C.Y.	Reinforcement 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

PLAN OF SUPERSTRUCTURE SLAB

KENTUCKY
DEPARTMENT OF HIGHWAYS

20° SKEW VARIABLE WIDTH ABUTMENT 50% SKEWED WINGS

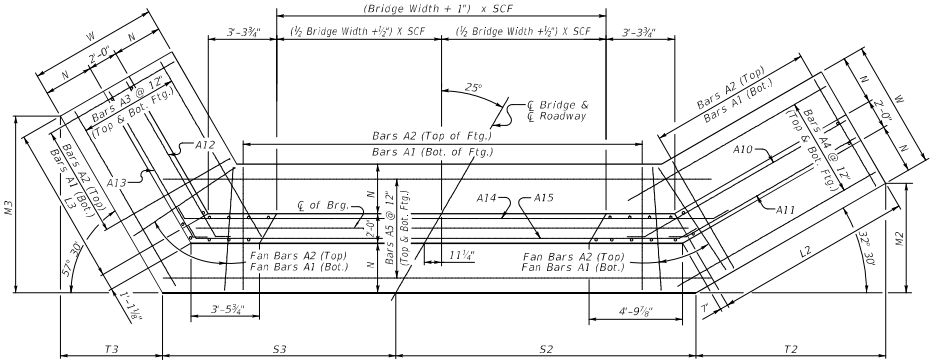
STANDARD DRAWING NO. *BSA-010*

SUBMITTED _____ DIRECTOR DIVISION OF STRUCTURAL DESIGN — DATE 02-26-20

APPROVED _____ STATE HIGHWAY ENGINEER — DATE 02-26-20

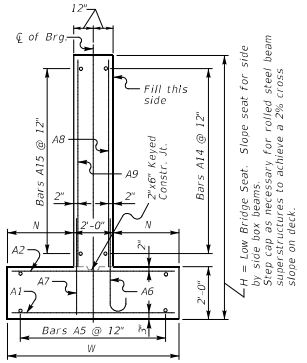
25° SKEW VARIABLE BRIDGE WIDTH 2:1 FILL SLOPES
WINGS SKEWED 50% FROM ROADWAY TO BREASTWALL

ABUTMENT SKEW CORRECTION FACTOR (SCF) = 1.103

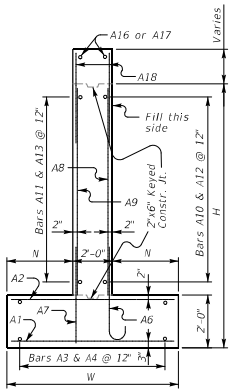


(Left Skew as shown; right skew opp. hand)

PLAN

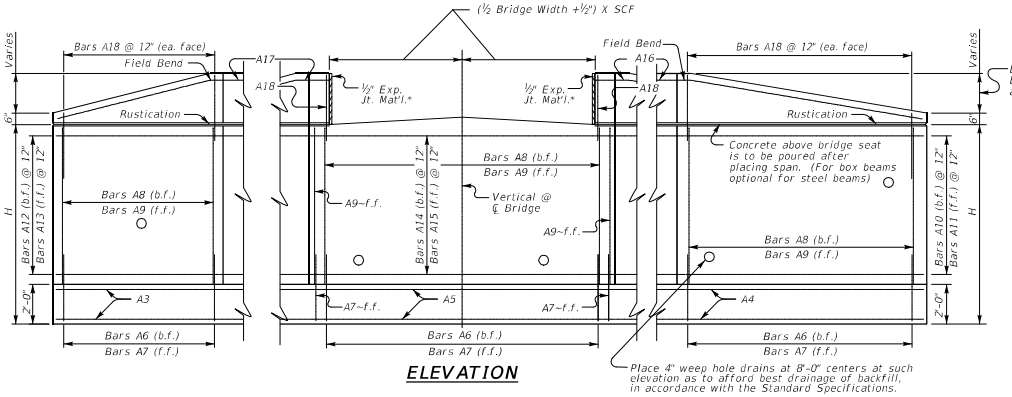


WALL SECTION

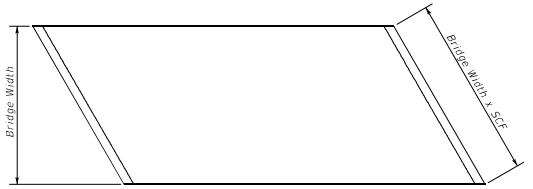


WING SECTION

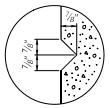
NOTE: Trim A16 & A17 bars if necessary



ELEVATION



PLAN OF SUPERSTRUCTURE SLAB



RUSTICATION GROOVE

*Expansion Joint Material:
AASHTO M153
Type-I Sponge Rubber

REVISION DATE: 08/11/2025
REVISION NUMBER: 0

SUBMITTED: Michael Cupp 08-11-2025
DIVISION DIRECTOR DATE

APPROVED: James Ballinger 08-11-2025
STATE HIGHWAY ENGINEER DATE

BRIDGE STANDARDS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

25° SKEW SUPPORT VARIABLE WIDTH ABUTMENT 50% SKEWED WINGS

STANDARD DRAWING NUMBER
BSA-011-01

OpenRoads Designer v23.00.01.11

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

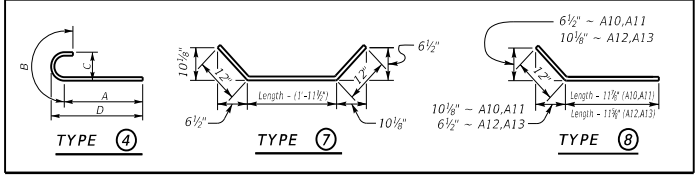
Bill of Reinforcement

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 ft.	Length in.	No.	Size	Length ft.	Length in.	Spacing	No.	Length ft.	Length in.	No.	Length ft.	Length in.	= +Lb	No.	Length ft.	Length in.	Spacing	A ft.	A in.	B ft.	B in.	C ft.	C in.	D ft.	D in.	No.	Size	Length ft.	Length in.	Spacing	No.	Size	Length ft.	Length in.	Spacing	No.	Length ft.	Length in.	No.	Length ft.	Length in.	No.	Length ft.	Length in.	= +Lb	No.	Length ft.	Length in.	= +Lb	No.	Length ft.	Length in.	No.	Length ft.	Length in.
15–16	64+Nb=	10	11	8	64+Nb=	7	11	8	12	24	20	9	24	29	4	24	12	10	+Lb=			51+Nb=	9	9	11	12	8	⅛	1	10	0	11¾	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	111	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	101	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	10½	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	89	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	77	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	8½	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	65	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	8½	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	53	5	9

Table of Dimensions

H	W Length ft.	W Length in.	N Length ft.	N Length in.	M2 Length ft.	M2 Length in.	M3 Length ft.	M3 Length in.	T2 Length ft.	T2 Length in.	T3 Length ft.	T3 Length in.	L2 Length ft.	L3 Length ft.	S2 Length ft.	S2 Length in.	S2 + Lb/2 = Length ft.	S2 + Lb/2 = Length in.	S3 Length ft.	S3 Length in.	S3 + Lb/2 = Length ft.	S3 + Lb/2 = Length in.
15–16	12	0	5	0	15	7¼	17	6⅞	24	5⅞	11	2⅜	27	17	8	7⅞	+0.5Lb=		3	11⅛	+0.5Lb=	
13–14	11	0	4	6	13	11	15	7⅞	21	10⅛	9	11¾	24	15	8	3⅜	+0.5Lb=		3	10¾	+0.5Lb=	
11–12	10	0	4	0	11	8½	13	8⅞	18	4⅛	8	9	20	13	7	10⅞	+0.5Lb=		3	10¼	+0.5Lb=	
9–10	9	0	3	6	10	0	10	11¾	15	8¼	6	11⅞	17	10	7	6¼	+0.5Lb=		3	9¾	+0.5Lb=	
7–8	7	6	2	9	7	8¾	8	11⅜	12	1⅜	5	8⅜	13	8	6	11½	+0.5Lb=		3	9	+0.5Lb=	
5–6	6	6	2	3	5	6	7	⅜	8	7⅝	4	5¾	9	6	6	6⅞	+0.5Lb=		3	8½	+0.5Lb=	

Reinforcement Details



*Concrete quantities computed using 21" beam depth on ½" 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

KENTUCKY
DEPARTMENT OF HIGHWAYS

25° SKEW VARIABLE WIDTH ABUTMENT 50% SKEWED WINGS

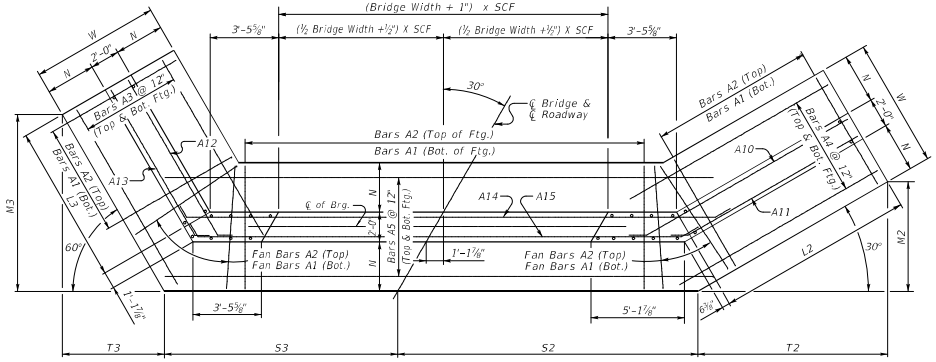
STANDARD DRAWING NO. *BSA-012*

SUBMITTED _____ DIRECTOR DIVISION OF STRUCTURAL DESIGN — DATE 02-26-20

APPROVED _____ STATE HIGHWAY ENGINEER — DATE 02-26-20

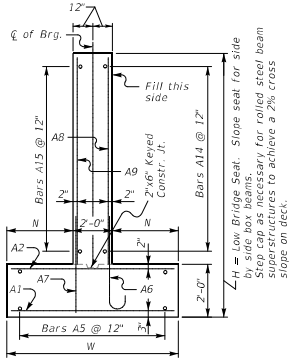
30° SKEW VARIABLE BRIDGE WIDTH 2:1 FILL SLOPES
WINGS SKEWED 50% FROM ROADWAY TO BREASTWALL

ABUTMENT SKEW CORRECTION FACTOR (SCF) = 1.155

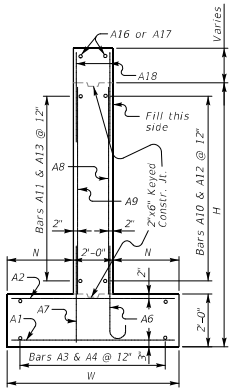


(Left Skew as shown; right skew opp. hand)

PLAN

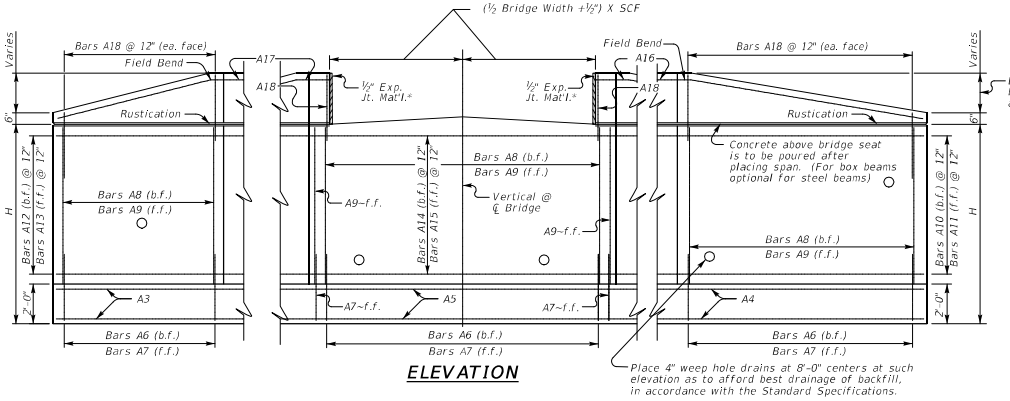


WALL SECTION

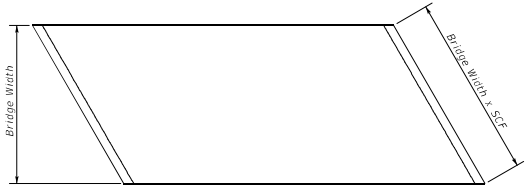


WING SECTION

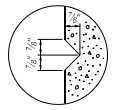
NOTE: Trim A16 & A17 bars if necessary



ELEVATION



PLAN OF SUPERSTRUCTURE SLAB



RUSTICATION GROOVE

*Expansion Joint Material:
AASHTO M153
Type-I Sponge Rubber

REVISION DATE: 08/11/2025
REVISION NUMBER: 0

SUBMITTED: Michael Cupp 08-11-2025
DIVISION DIRECTOR — DATE

APPROVED: Jason Ballinger 08-11-2025
STATE HIGHWAY ENGINEER — DATE

BRIDGE STANDARDS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

30° SKEW SUPPORT VARIABLE WIDTH ABUTMENT 50% SKEWED WINGS

STANDARD DRAWING NUMBER
BSA-013-01

OpenRoads Designer v23.00.01.11

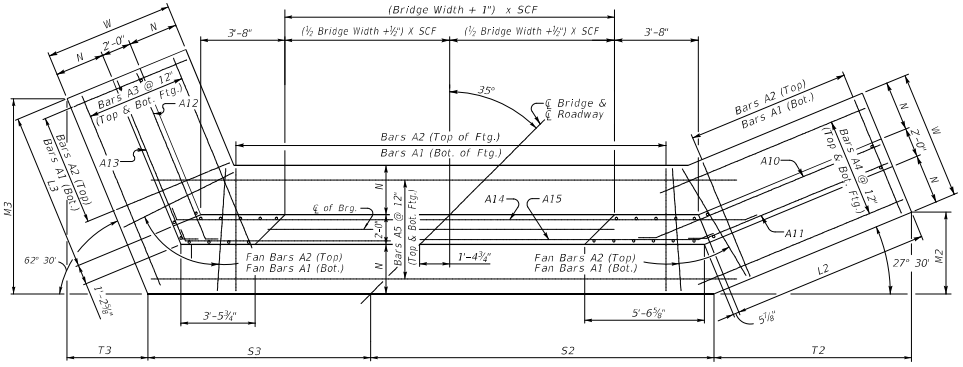
30° SKEW VARIABLE BRIDGE WIDTH 2:1 FILL SLOPES
WINGS SKEWED 50% FROM ROADWAY TO BREASTWALL

Bill of Reinforcement

| MARK | A1 | | | | | A2 | | | | | A3 | A4 | A5 | | | | A6 | | | | | | | | | | | | A7 | | | | | A8 | | | | | A9 | | | | | A10 | A11 | A12 | A13 | A14 | | | | | A15 | | | | A16 | A17 | A18 | | |
|---|---|---

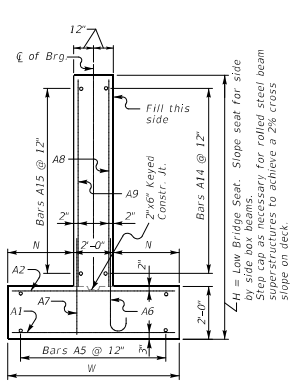
35° SKEW VARIABLE BRIDGE WIDTH 2:1 FILL SLOPES WINGS SKEWED 50% FROM ROADWAY TO BREASTWALL

ABUTMENT SKEW CORRECTION FACTOR (SCF) = 1.221

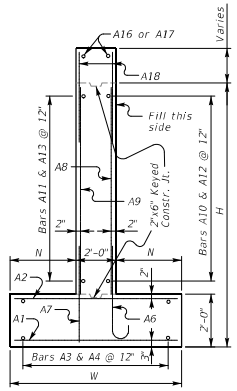


(Left Skew as shown; right skew opp. hand)

PLAN

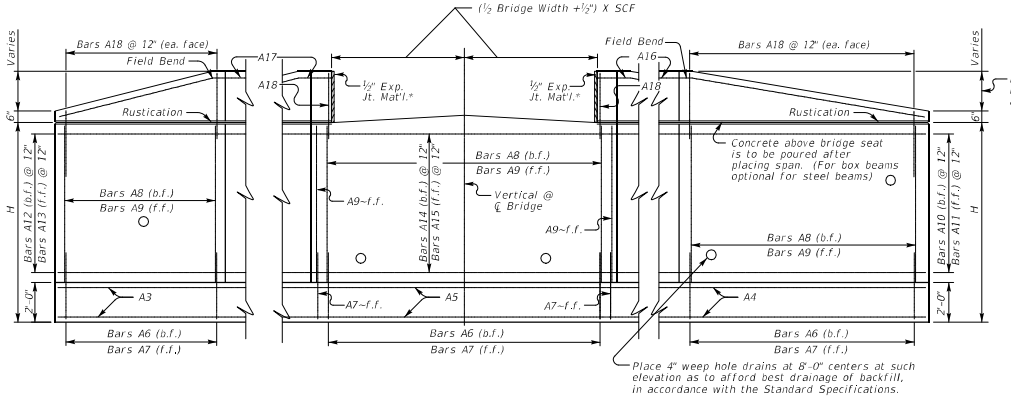


WALL SECTION

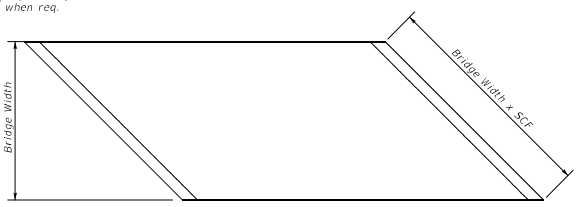


WING SECTION

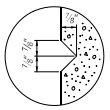
NOTE: Trim A16 & A17 bars if necessary



ELEVATION



PLAN OF SUPERSTRUCTURE SLAB



RUSTICATION GROOVE

*Expansion Joint Material:
AASHTO M153
Type-I Sponge Rubber

REVISION DATE: 08/11/2025
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — DATE: 08-11-2025
APPROVED — STATE HIGHWAY ENGINEER — DATE: 08-11-2025

BRIDGE STANDARDS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

35° SKEW SUPPORT VARIABLE WIDTH ABUTMENT 50% SKEWED WINGS

STANDARD DRAWING NUMBER
BSA-015-01

OpenRoads Designer v23.00.01.11

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

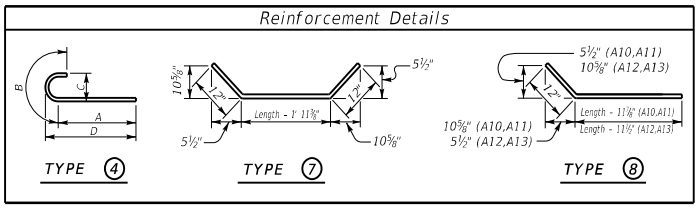
Bill of Reinforcement

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	
H	No.	Size	Length ft.	Length in.	No.	Size	Length ft.	Length in.	Spacing	No	Length ft.	Length in.	No.	Length ft.	Length in.	ll +Lb=	No.	Length ft.	Length in.	Spacing	A ft.	A in.	B ft.	B in.	C ft.	C in.	D ft.	D in.	No.	Size	Length ft.	Length in.	Spacing	No.	Size	Length ft.	Length in.	Spacing	No.	Length ft.	Length in.	No.	Length ft.	Length in.	No.	Length ft.	Length in.	ll +Lb=	No.	Length ft.	Length in.	No.	Length ft.	Length in.	No.	Length ft.	Length in.
15–16	68+Nb=	10	11	8	68+Nb=	7	11	8	12	24	20	2	24	34	1	24	13	6	+Lb=			56+Nb=	9	9	11	12	8	⅛	1	10	0	11¾	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	10½	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	8½	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	8½	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 Length ft.	W Length in.	N Length ft.	N Length in.	M2 Length ft.	M2 Length in.	M3 Length ft.	M3 Length in.	T2 Length ft.	T2 Length in.	T3 Length ft.	T3 Length in.	L2 Length ft.	L3 Length ft.	S2 Length ft.	S2 Length in.	S2 + Lb/2 = Length ft.	S2 + Lb/2 = Length in.	S3 Length ft.	S3 Length in.	S3 + Lb/2 = Length ft.	S3 + Lb/2 = Length in.
15–16	12	0	5	0	15	6¾	17	11½	29	10⅞	9	4¼	32	16	10	3⅜	+0.5Lb=		3	¾	+0.5Lb=	
13–14	11	0	4	6	13	8	15	11	26	3	8	3⅜	28	14	9	10¼	+0.5Lb=		3	1¼	+0.5Lb=	
11–12	10	0	4	0	11	3⅜	13	10½	21	8½	7	2⅝	23	12	9	4⅝	+0.5Lb=		3	1⅞	+0.5Lb=	
9–10	9	0	3	6	9	10¼	11	10	18	11⅛	6	1⅞	20	10	8	10⅞	+0.5Lb=		3	2⅜	+0.5Lb=	
7–8	7	6	2	9	7	5½	9	7⅞	14	4	5	¼	15	8	8	2⅜	+0.5Lb=		3	3¼	+0.5Lb=	
5–6	6	6	2	3	5	6¾	7	7⅜	10	8⅛	3	11½	11	6	7	8¾	+0.5Lb=		3	3¾	+0.5Lb=	

Reinforcement Details



*Concrete quantities computed using 21" beam depth on ½" pad & Variable Bridge Width

Quantities

H	Concrete* C.Y.	Reinforcement 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)

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.*

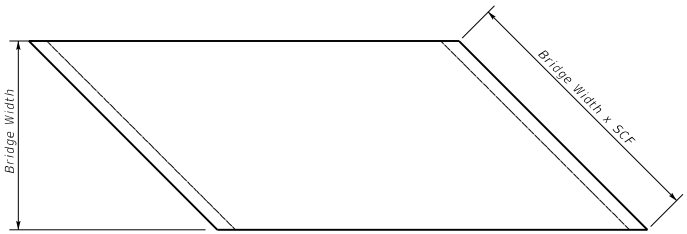
FOUNDATION PRESSURE: *Construct abutment footings on solid rock bearing material that can support a pressure of 8000 psf service or 10,800 psf strength factored as recommended by a geotechnical engineer.*

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

KENTUCKY
DEPARTMENT OF HIGHWAYS

35° SKEW VARIABLE WIDTH ABUTMENT 50% SKEWED WINGS

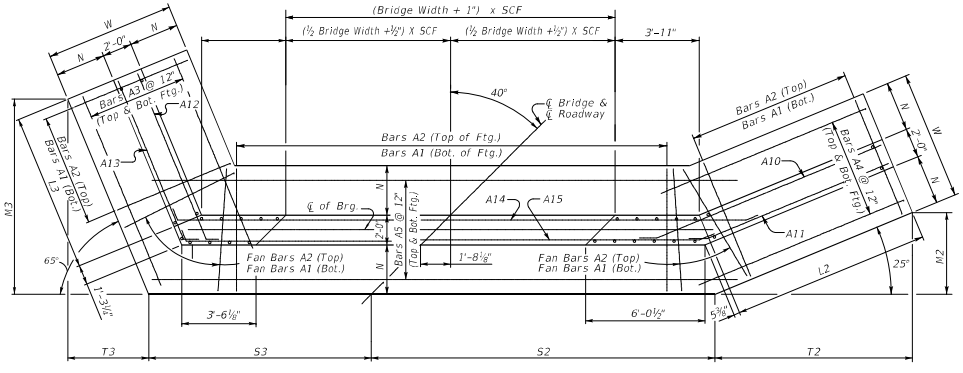
STANDARD DRAWING NO. *BSA-016*

SUBMITTED _____ DIRECTOR DIVISION OF STRUCTURAL DESIGN — DATE 02-26-20

APPROVED _____ STATE HIGHWAY ENGINEER — DATE 02-26-20

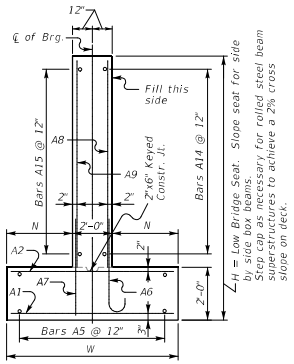
40° SKEW VARIABLE BRIDGE WIDTH 2:1 FILL SLOPES
WINGS SKEWED 50% FROM ROADWAY TO BREASTWALL

ABUTMENT SKEW CORRECTION FACTOR (SCF) = 1.305

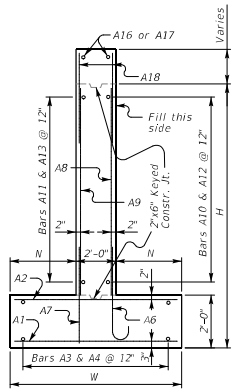


(Left Skew as shown; right skew opp. hand)

PLAN

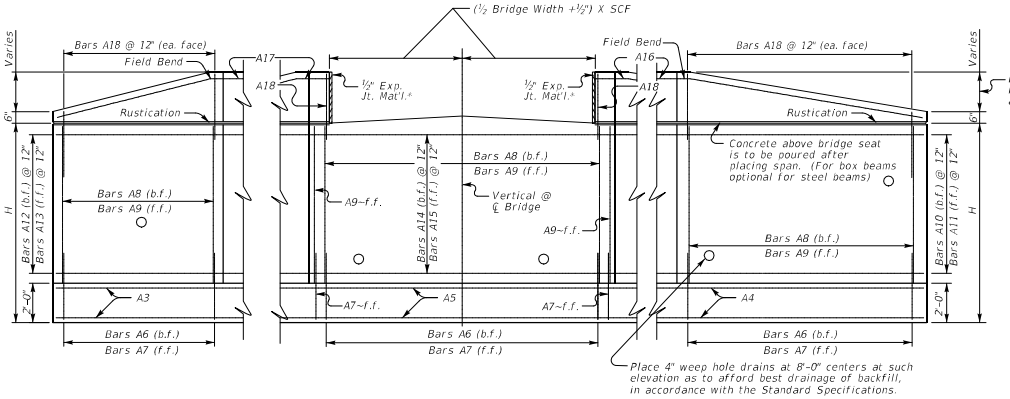


WALL SECTION



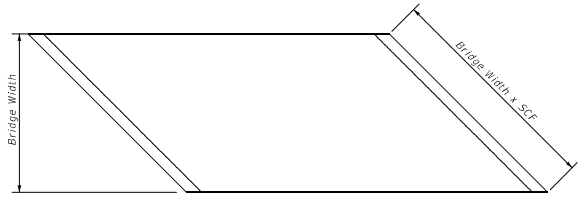
WING SECTION

NOTE: Trim A16 & A17 bars if necessary

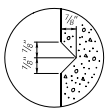


ELEVATION

*Expansion Joint Material:
AASHTO M153
Type-I Sponge Rubber



PLAN OF SUPERSTRUCTURE SLAB



RUSTICATION GROOVE

REVISION DATE: 08/11/2025
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — DATE: 08-11-2025
APPROVED — STATE HIGHWAY ENGINEER — DATE: 08-11-2025

BRIDGE STANDARDS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

40° SKEW SUPPORT VARIABLE WIDTH ABUTMENT 50% SKEWED WINGS

STANDARD DRAWING NUMBER
BSA-017-01

OpenRoads Designer v23.00.01.11

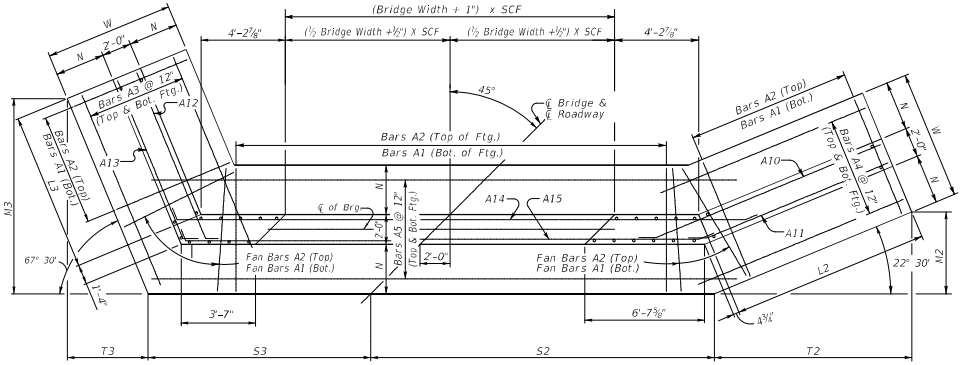
40° SKEW VARIABLE BRIDGE WIDTH 2:1 FILL SLOPES
WINGS SKEWED 50% FROM ROADWAY TO BREASTWALL

Bill of Reinforcement

| MARK | A1 | | | | | A2 | | | | | A3 | A4 | A5 | | | | A6 | | | | | | | | | | | | | | | | A7 | | | | | A8 | | | | | A9 | | | | | A10 | A11 | A12 | A13 | A14 | | | | | A15 | | | | | A16 | A17 | A18 | | |
|---|---|---

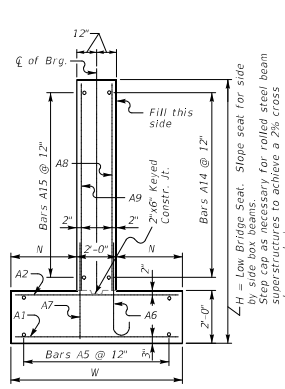
45° SKEW VARIABLE BRIDGE WIDTH 2:1 FILL SLOPES
WINGS SKEWED 50% FROM ROADWAY TO BREASTWALL

ABUTMENT SKEW CORRECTION FACTOR (SCF) = 1.414

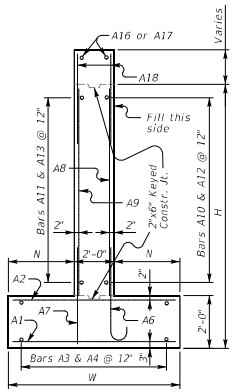


(Left Skew as shown; right skew opp. hand)

PLAN

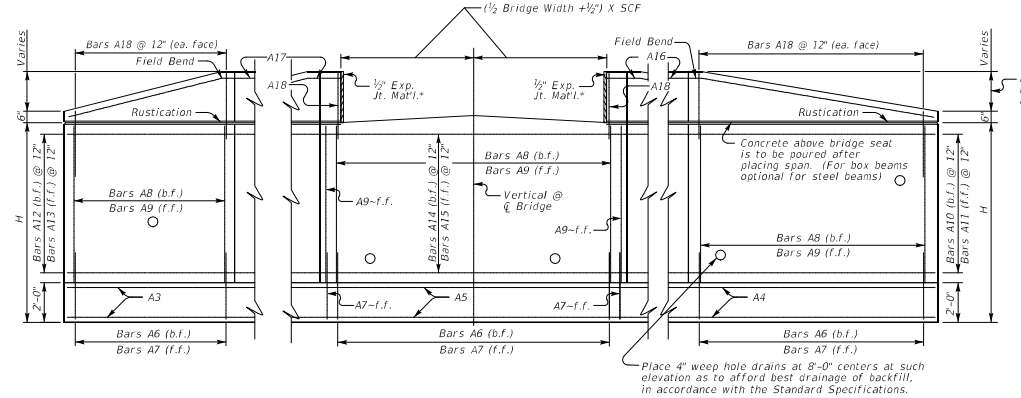


WALL SECTION



WING SECTION

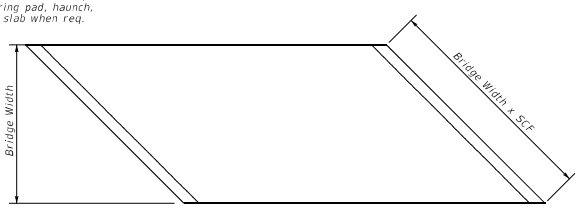
NOTE: Trim A16 & A17 bars if necessary



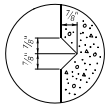
ELEVATION

*Expansion Joint Material:
AASHTO M153
Type-I Sponge Rubber

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



PLAN OF SUPERSTRUCTURE SLAB



RUSTICATION GROOVE

REVISION DATE: 08/11/2025
REVISION NUMBER: 0

SUBMITTED: Michael Cupp 08-11-2025
DIVISION DIRECTOR DATE

APPROVED: Jason Ballinger 08-11-2025
STATE HIGHWAY ENGINEER DATE

BRIDGE STANDARDS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

45° SKEW SUPPORT VARIABLE WIDTH ABUTMENT 50% SKEWED WINGS

STANDARD DRAWING NUMBER
BSA-019-01

OpenRoads Designer v23.00.01.11

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

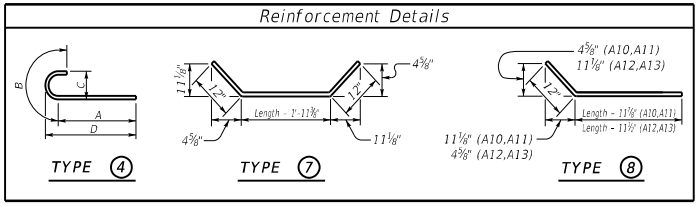
Bill of Reinforcement

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		
H	No.	Size	Length ft.	Length in.	Spacing	No.	Size	Length ft.	Length in.	Spacing	No.	Length ft.	Length in.	No.	Length ft.	Length in.	≈ +Lb=	No.	Size	Length ft.	Length in.	Spacing	A ft.	A in.	B ft.	B in.	C ft.	C in.	D ft.	D in.	No.	Size	Length ft.	Length in.	Spacing	No.	Size	Length ft.	Length in.	Spacing	No.	Length ft.	Length in.	No.	No.	No.	No.	No.	Length ft.	Length in.	≈ +Lb=	Length ft.	Length in.	No.	Length ft.	Length in.	≈ +Lb=	Length ft.	Length in.	No.	Length ft.	Length in.	No.	Length ft.	Length in.
15–16	75+Nb=	10	11	8	12	75+Nb=	7	11	8	12	24	20	6	24	38	11	24	11	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	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	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	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	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	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 Length ft.	W Length in.	N Length ft.	N Length in.	M2 Length ft.	M2 Length in.	M3 Length ft.	M3 Length in.	T2 Length ft.	T2 Length in.	T3 Length ft.	T3 Length in.	L2 Length ft.	L3 Length ft.	S2 Length ft.	S2 Length in.	S2 + Lb/2 =	S3 Length ft.	S3 Length in.	S3 + Lb/2 =	S3 Length ft.	S3 Length 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 3/8	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 1/8	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 1/8	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 3/8	8	2	12	9 1/2	3	4 3/8	13	6	9	4 3/4	+0.5Lb=	2	10 3/4	+0.5Lb=		

Reinforcement Details



*Concrete quantities computed using 21" beam depth on ½" 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.*

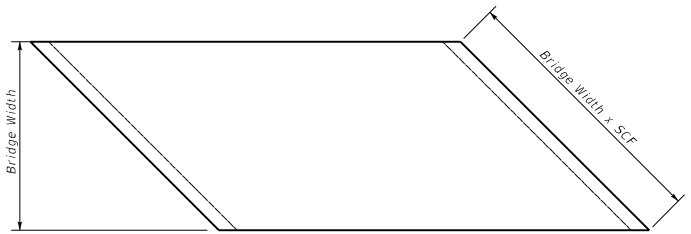
FOUNDATION PRESSURE: *Construct abutment footings on solid rock bearing material that can support a pressure of 8000 psf service or 10,800 psf strength factored as recommended by a geotechnical engineer.*

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



PLAN OF SUPERSTRUCTURE SLAB

KENTUCKY
DEPARTMENT OF HIGHWAYS

45° SKEW SUPPORT
VARIABLE WIDTH ABUTMENT
50% SKEWED WINGS

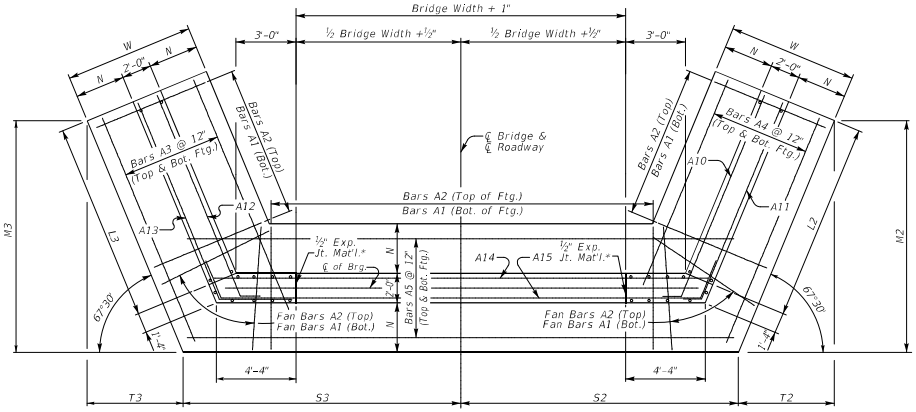
STANDARD DRAWING NO. *BSA-020*

SUBMITTED _____ DIRECTOR DIVISION OF STRUCTURAL DESIGN — DATE 02-26-20

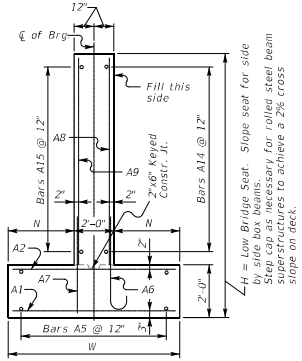
APPROVED _____ STATE HIGHWAY ENGINEER — DATE 02-26-20

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

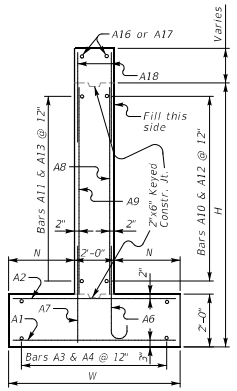
ABUTMENT SKEW CORRECTION FACTOR (SCF) = 1.000



PLAN

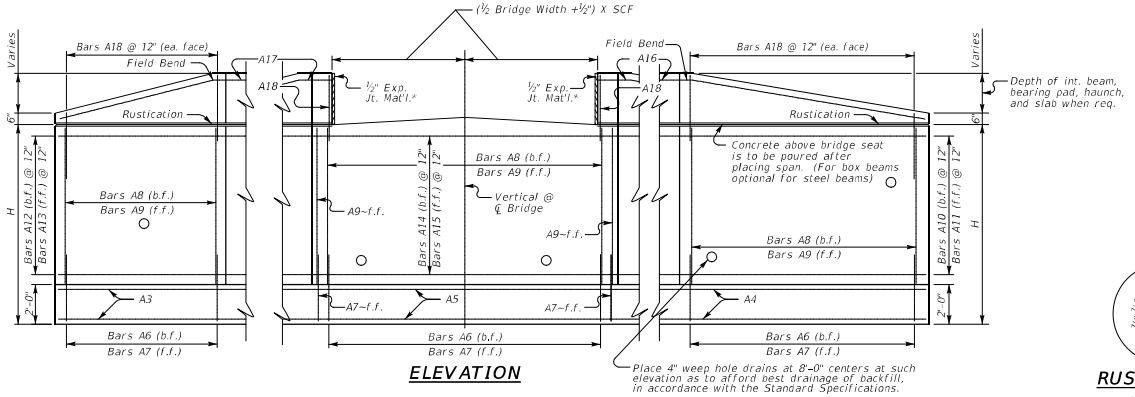


WALL SECTION



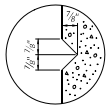
WING SECTION

Note: Trim A16 & A17 bars if necessary



ELEVATION

PLAN OF SUPERSTRUCTURE SLAB



RUSTICATION GROOVE

*Expansion Joint Material:
AASHTO M153
Type-I Sponge Rubber

REVISION DATE: 08/11/2025
REVISION NUMBER: 0

SUBMITTED Michael Crupper 08-11-2025 DATE
DIVISION DIRECTOR

APPROVED Jason Ballinger 08-11-2025 DATE
STATE HIGHWAY ENGINEER

BRIDGE STANDARDS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

0° SKEW SUPPORT VARIABLE WIDTH ABUTMENT 25% SKEWED WINGS

STANDARD DRAWING NUMBER
BSA-021-01

OpenRoads Designer v23.00.01.11

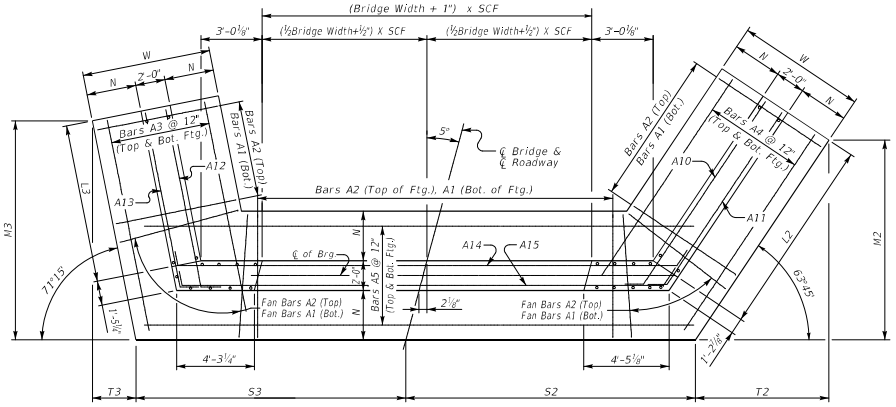
0° SKEW VARIABLE BRIDGE WIDTH 2:1 FILL SLOPES
22.5° SKEW FROM ROADWAY ON WINGS

Bill of Reinforcement

| MARK | A1 | | | | | A2 | | | | | A3 | A4 | A5 | | | | | A6 | | | | |

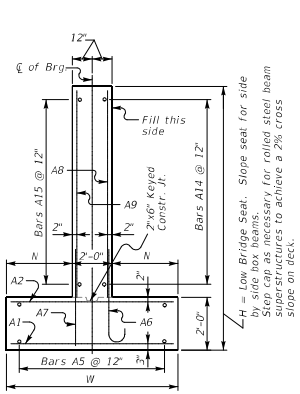
5° SKEW VARIABLE BRIDGE WIDTH 2:1 FILL SLOPES
WINGS SKEWED 25% FROM ROADWAY TO BREASTWALL

ABUTMENT SKEW CORRECTION FACTOR (SCF) = 1.004



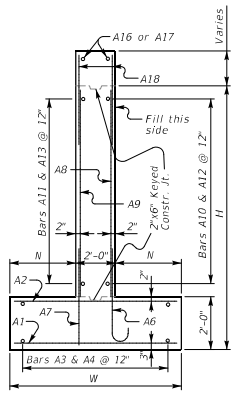
(Left Skew as shown; right skew opp. hand)

PLAN



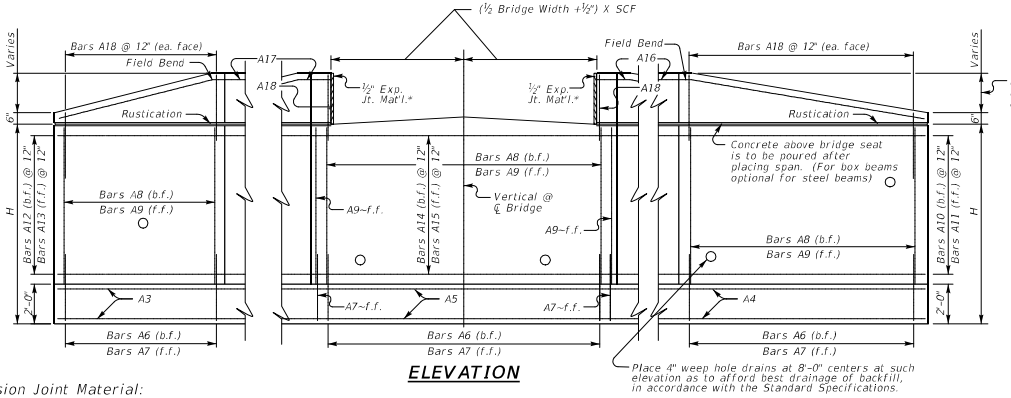
H = Low Bridge Seat. Slope seat for side by side box beams. Step cap as necessary for rolled steel beam superstructures to achieve a 2% cross slope on deck.

WALL SECTION



WING SECTION

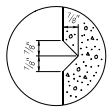
NOTE: Trim A16 & A17 bars if necessary



ELEVATION

*Expansion Joint Material:
AASHTO M153
Type-I Sponge Rubber

PLAN OF SUPERSTRUCTURE SLAB



RUSTICATION GROOVE

REVISION DATE: 08/11/2025
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — DATE: 08-11-2025

APPROVED — STATE HIGHWAY ENGINEER — DATE: 08-11-2025

BRIDGE STANDARDS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

5° SKEW SUPPORT VARIABLE WIDTH ABUTMENT 25% SKEWED WINGS

STANDARD DRAWING NUMBER
BSA-023-01

OpenRoads Designer v23.00.01.11

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

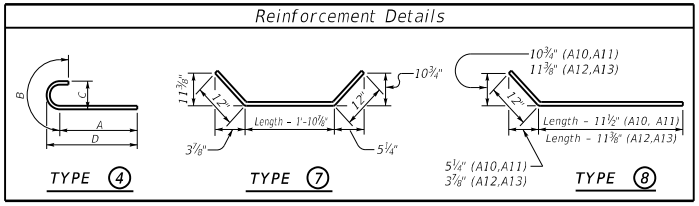
Bill of Reinforcement

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	
H	No.	Size	Length ft.	Length in.	Spacing	No.	Size	Length ft.	Length in.	Spacing	No.	No.	No.	Length ft.	Length in.	= +Lb	No.	Size	Length ft.	Length in.	Spacing	A ft.	A in.	B ft.	B in.	C ft.	C in.	D ft.	D in.	No.	Size	Length ft.	Length in.	Spacing	No.	Size	Length ft.	Length in.	Spacing	No.	Size	Length ft.	Length in.	Spacing	No.	No.	No.	No.	No.	Length ft.	Length in.	Spacing	No.	Length ft.	Length in.	No.	Length ft.	Length in.	= +Lb	Length ft.	Length in.	No.	Length ft.	Length in.	No.	Length ft.	Length in.	No.	Length ft.	Length in.
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 Length ft.	W Length in.	N Length ft.	N Length in.	M2 Length ft.	M2 Length in.	M3 Length ft.	M3 Length in.	T2 Length ft.	T2 Length in.	T3 Length ft.	T3 Length in.	L2 Length ft.	L3 Length ft.	S2 Length ft.	S2 Length in.	S2 + Lb/2 =	S2 Length ft.	S2 Length in.	S3 Length ft.	S3 Length in.	S3 + Lb/2 =	S3 Length ft.	S3 Length 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 3/8	7	7 1/4	20	19	7	8	+0.5Lb=			7	1 3/4	+0.5Lb=		
11-12	10	0	4	0	17	8 7/8	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 3/8	8	8	6	7/8	+0.5Lb=			5	8 3/4	+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	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.

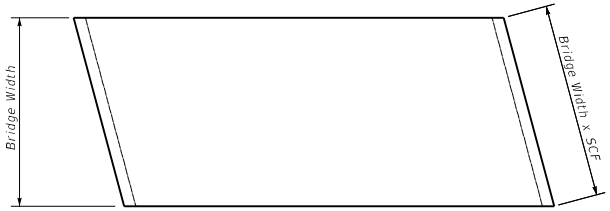
FOUNDATION PRESSURE: Construct abutment footings on solid rock bearing material that can support a pressure of 8000 psf service or 10,800 psf strength factored as recommended by a geotechnical engineer.

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



PLAN OF SUPERSTRUCTURE SLAB

KENTUCKY
DEPARTMENT OF HIGHWAYS

5° SKEW VARIABLE
WIDTH ABUTMENT
25% SKEWED WINGS

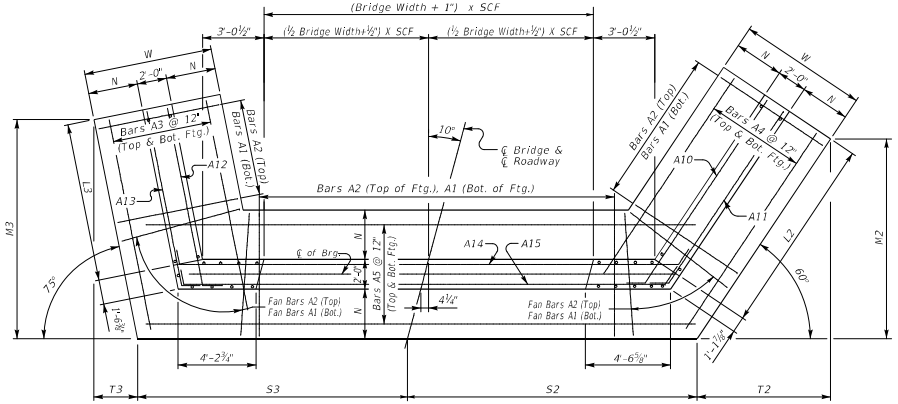
STANDARD DRAWING NO. BSA-024

SUBMITTED _____ DIRECTOR DIVISION OF STRUCTURAL DESIGN 02-26-20 DATE

APPROVED _____ STATE HIGHWAY ENGINEER 02-26-20 DATE

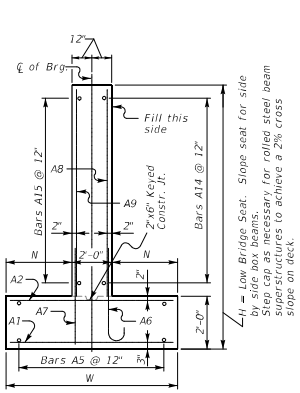
10° SKEW VARIABLE BRIDGE WIDTH 2:1 FILL SLOPES
WINGS SKEWED 25% FROM ROADWAY TO BREASTWALL

ABUTMENT SKEW CORRECTION FACTOR (SCF) = 1.015

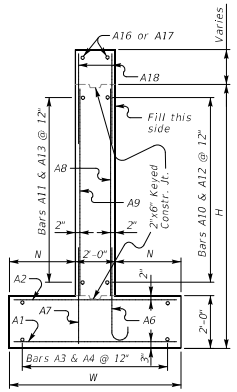


(Left Skew as shown; right skew opp. hand)

PLAN

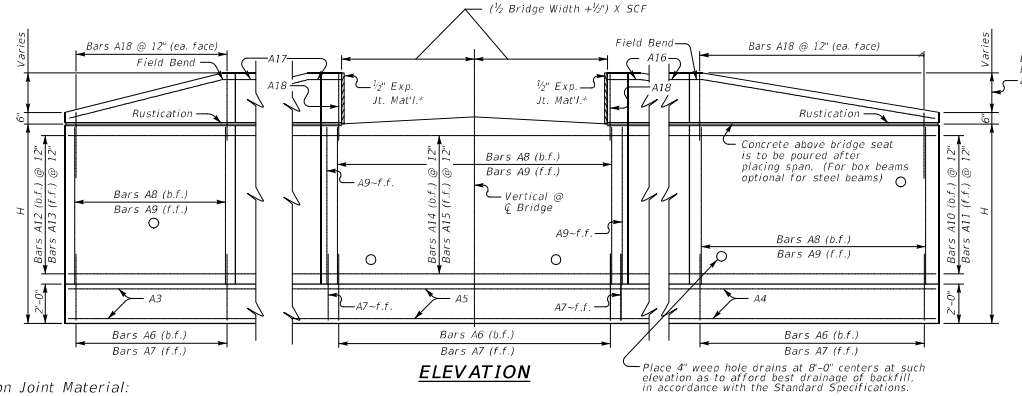


WALL SECTION

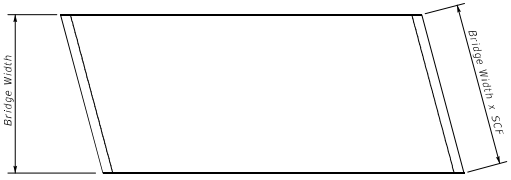


WING SECTION

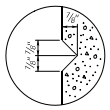
NOTE: Trim A16 & A17 bars if necessary



ELEVATION



PLAN OF SUPERSTRUCTURE SLAB



RUSTICATION GROOVE

*Expansion Joint Material:
AASHTO M153
Type-I Sponge Rubber

REVISION DATE: 08/11/2025
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — DATE: 08-11-2025
APPROVED — STATE HIGHWAY ENGINEER — DATE: 08-11-2025

BRIDGE STANDARDS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

10° SKEW SUPPORT VARIABLE WIDTH ABUTMENT 25% SKEWED WINGS

STANDARD DRAWING NUMBER
BSA-025-01

OpenRoads Designer v23.00.01.11

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

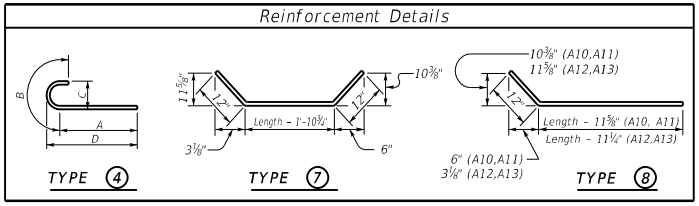
Bill of Reinforcement

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		
H	No.	Size	Length ft.	Length in.	Spacing	No.	Size	Length ft.	Length in.	Spacing	No	Length ft.	Length in.	No.	Length ft.	Length in.	= +Lb=	No.	Size	Length ft.	Length in.	Spacing	No.	A ft.	A in.	B ft.	B in.	C ft.	C in.	D ft.	D in.	No.	Size	Length ft.	Length in.	Spacing	No.	Size	Length ft.	Length in.	Spacing	No.	Size	Length ft.	Length in.	Spacing	No.	Length ft.	Length in.	No.	Length ft.	Length in.	No.	Length ft.	Length in.	= +Lb=	No.	Length ft.	Length in.	= +Lb=	No.	Length ft.	Length in.	No	Length ft.	Length in.	No	Length ft.	Length in.
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 Length ft.	W Length in.	N Length ft.	N Length in.	M2 Length ft.	M2 Length in.	M3 Length ft.	M3 Length in.	T2 Length ft.	T2 Length in.	T3 Length ft.	T3 Length in.	L2 Length ft.	L3 Length ft.	S2 Length ft.	S2 Length in.	+ Lb/2 =	S3 Length ft.	S3 Length in.	+ Lb/2 =
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 5/8	+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 1/8	+0.5Lb=	6	11 1/8	+0.5Lb=
11–12	10	0	4	0	17	8 7/8	18	11 1/4	10	2 3/4	5	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 1/8	12	2 3/8	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=

Reinforcement Details



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

Quantities

H	Concrete* C.Y.	Reinforcement 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.*

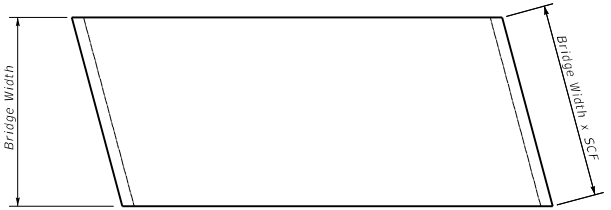
FOUNDATION PRESSURE: *Construct abutment footings on solid rock bearing material that can support a pressure of 8000 psf service or 10,800 psf strength factored as recommended by a geotechnical engineer.*

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



PLAN OF SUPERSTRUCTURE SLAB

KENTUCKY
DEPARTMENT OF HIGHWAYS

10° SKEW VARIABLE WIDTH ABUTMENT 25% SKEWED WINGS

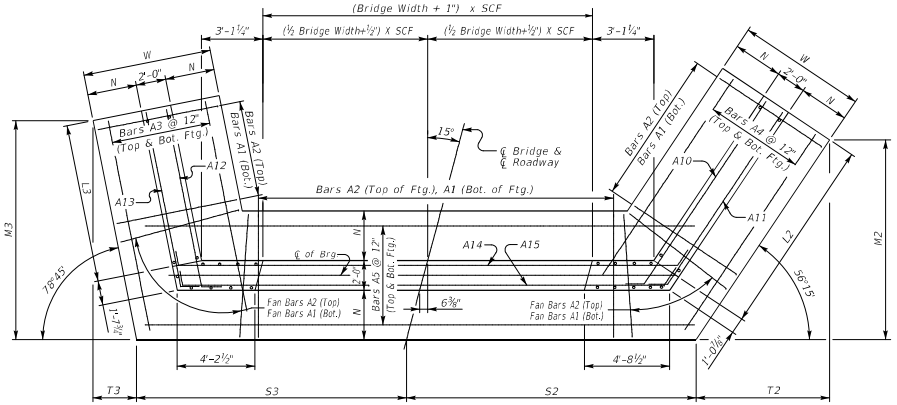
STANDARD DRAWING NO. *BSA-026*

SUBMITTED _____ DIRECTOR DIVISION OF STRUCTURAL DESIGN — DATE 02-26-20

APPROVED _____ STATE HIGHWAY ENGINEER — DATE 02-26-20

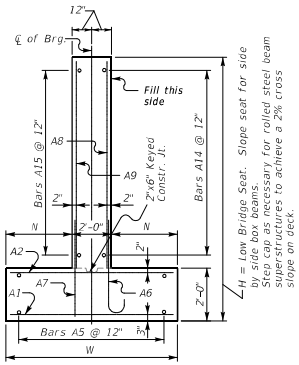
15° SKEW VARIABLE BRIDGE WIDTH 2:1 FILL SLOPES
WINGS SKEWED 25% FROM ROADWAY TO BREASTWALL

ABUTMENT SKEW CORRECTION FACTOR (SCF) = 1.035

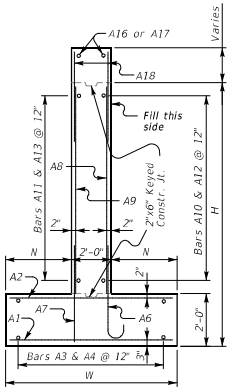


(Left Skew as shown;right skew opp. hand)

PLAN

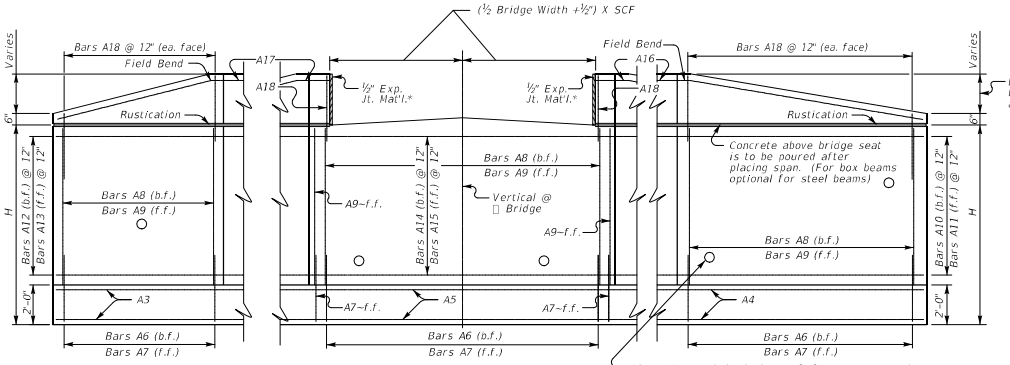


WALL SECTION



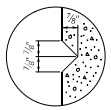
WING SECTION

NOTE: Trim A16 & A17 bars if necessary



ELEVATION

PLAN OF SUPERSTRUCTURE SLAB



RUSTICATION GROOVE

*Expansion Joint Material:
AASHTO M153
Type-I Sponge Rubber

REVISION DATE: 08/11/2025
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — DATE: 08-11-2025
APPROVED — STATE HIGHWAY ENGINEER — DATE: 08-11-2025

BRIDGE STANDARDS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

15° SKEW SUPPORT VARIABLE WIDTH ABUTMENT 25% SKEWED WINGS

STANDARD DRAWING NUMBER
BSA-027-01

OpenRoads Designer v23.00.01.11

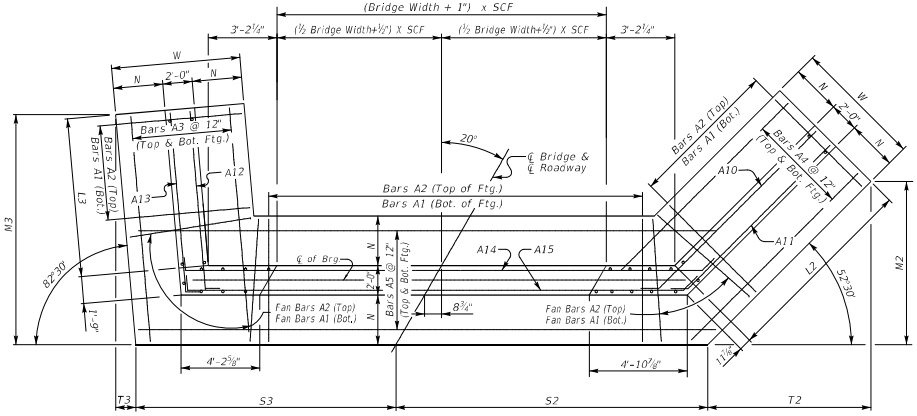
15° SKEW VARIABLE BRIDGE WIDTH 2:1 FILL SLOPES
WINGS SKEWED 25% FROM ROADWAY TO BREASTWALL

Bill of Reinforcement

| MARK | A1 | | | | | A2 | | | | | A3 | A4 | A5 | | | | A6 | | | | | | | | | | | | | | | | A7 | | | | | A8 | | | | | A9 | | | | | A10 | A11 | A12 | A13 | A14 | | | | | A15 | | | | | A16 | A17 | A18 | | |
|---|---|---

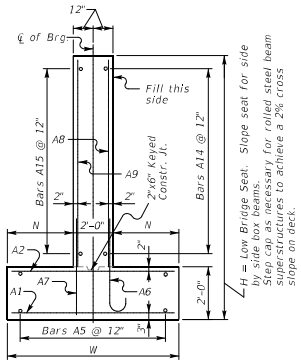
20° SKEW VARIABLE BRIDGE WIDTH 2:1 FILL SLOPES
WINGS SKEWED 25% FROM ROADWAY TO BREASTWALL

ABUTMENT SKEW CORRECTION FACTOR (SCF) = 1.064

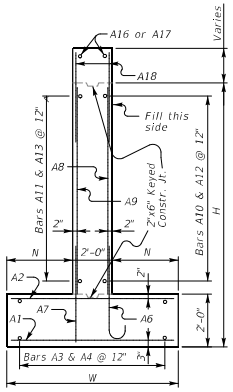


(Left Skew as shown; right skew opp. hand)

PLAN

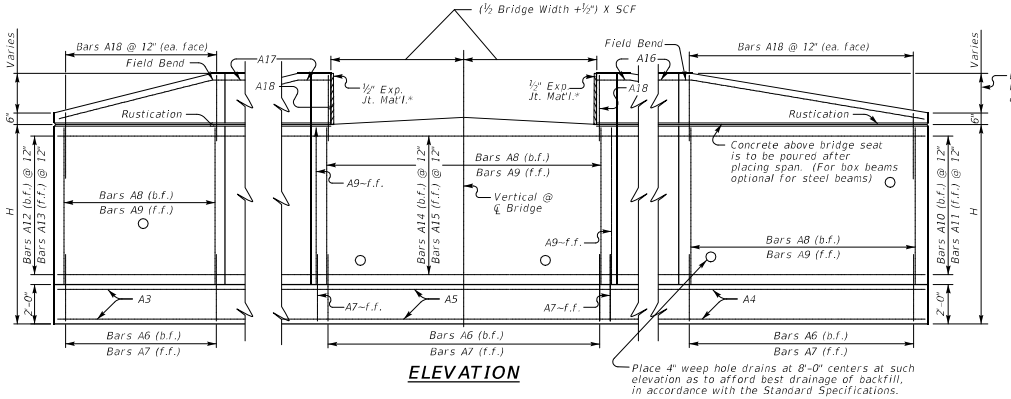


WALL SECTION

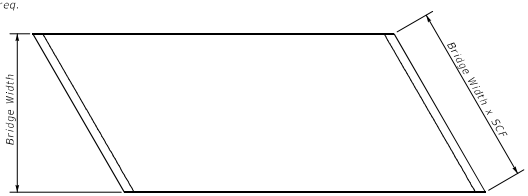


WING SECTION

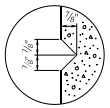
NOTE: Trim A16 & A17 bars if necessary



ELEVATION



PLAN OF SUPERSTRUCTURE SLAB



RUSTICATION GROOVE

*Expansion Joint Material:
AASHTO M153
Type-I Sponge Rubber

REVISION DATE: 08/11/2025
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — DATE: 08-11-2025
APPROVED — STAFF HIGHWAY ENGINEER — DATE: 08-11-2025

BRIDGE STANDARDS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

20° SKEW SUPPORT VARIABLE WIDTH ABUTMENT 25% SKEWED WINGS

STANDARD DRAWING NUMBER
BSA-029-01

OpenRoads Designer v23.00.01.11

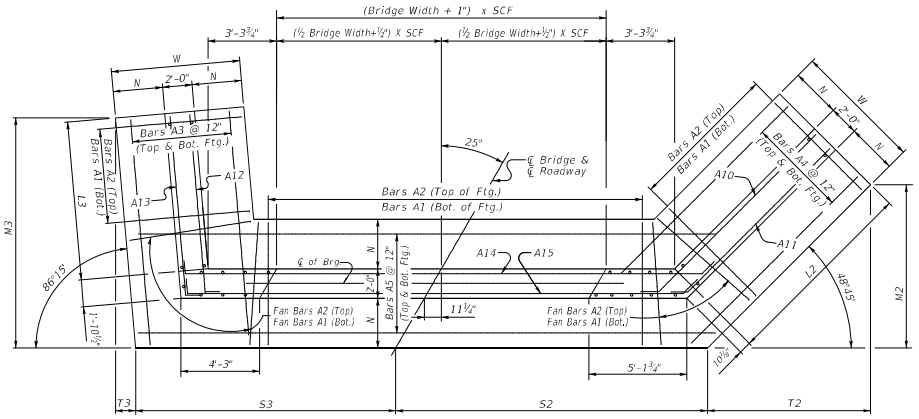
20° SKEW VARIABLE BRIDGE WIDTH 2:1 FILL SLOPES WINGS SKEWED 25% FROM ROADWAY TO BREASTWALL

Bill of Reinforcement

| MARK | A1 | | | | | A2 | | | | | A3 | A4 | A5 | | | | A6 | | | | | | | | | | | | A7 | | | | | A8 | | | | | A9 | | | | | A10 | A11 | A12 | A13 | A14 | | | | A15 | | | | A16 | A17 | A18 | | |
|---|---|---

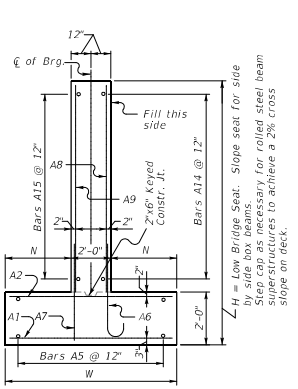
25° SKEW VARIABLE BRIDGE WIDTH 2:1 FILL SLOPES WINGS SKEWED 25% FROM ROADWAY TO BREASTWALL

ABUTMENT SKEW CORRECTION FACTOR (SCF) = 1.103

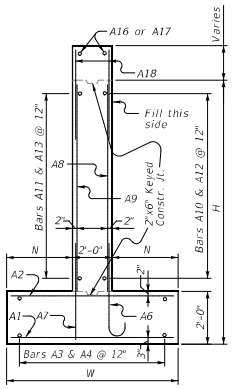


(Left Skew as shown; right skew opp. hand)

PLAN

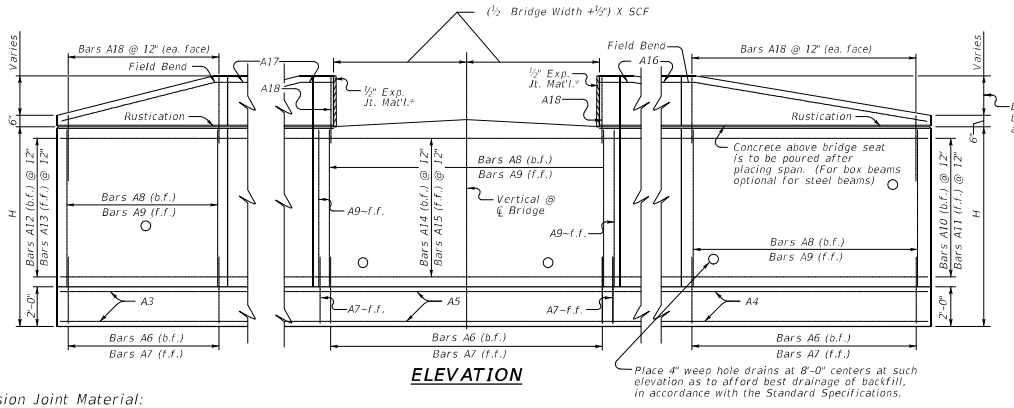


WALL SECTION

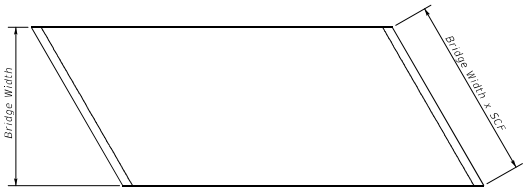


WING SECTION

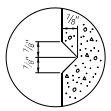
NOTE: Trim A16 & A17 bars if necessary



ELEVATION



PLAN OF SUPERSTRUCTURE SLAB



RUSTICATION GROOVE

*Expansion Joint Material:
AASHTO M153
Type-I Sponge Rubber

REVISION DATE: 08/11/2025
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — DATE: 08-11-2025
APPROVED — STATE HIGHWAY ENGINEER — DATE: 08-11-2025

BRIDGE STANDARDS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

25° SKEW SUPPORT VARIABLE WIDTH ABUTMENT 25% SKEWED WINGS

STANDARD DRAWING NUMBER
BSA-031-01

OpenRoads Designer v23.00.01.11

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

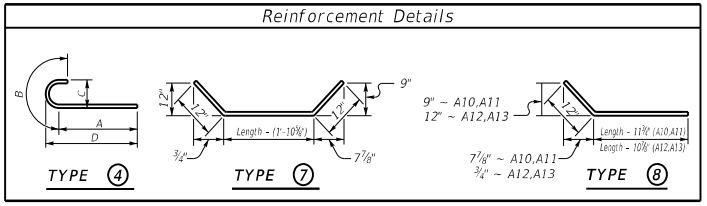
Bill of Reinforcement

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 ft.	Length in.	Spacing	No.	Size	Length ft.	Length in.	Spacing	No.	No.	No.	Length ft.	Length in.	= +Lb	No.	Size	Length ft.	Length in.	Spacing	A ft.	A in.	B ft.	B in.	C ft.	C in.	D ft.	D in.	No.	Size	Length ft.	Length in.	Spacing	No.	Size	Length ft.	Length in.	Spacing	No.	Length ft.	Length in.	No.	Length ft.	Length in.	No.	Length ft.	Length in.	No.	Length ft.	Length in.	= +Lb	No.	Length ft.	Length in.	= +Lb	Length ft.	Length in.	No.	Length ft.	No.	Length ft.	No.	Length ft.	
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	⅛	1	10	0	11¾	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	7	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	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	10½	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	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	8½	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	8½	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 Length ft.	W Length in.	N Length ft.	N Length in.	M2 Length ft.	M2 Length in.	M3 Length ft.	M3 Length in.	T2 Length ft.	T2 Length in.	T3 Length ft.	T3 Length in.	L2 Length ft.	L3 Length ft.	S2 Length ft.	S2 Length in.	S2 + Lb/2 = Length ft.	S2 + Lb/2 = Length in.	S3 Length ft.	S3 Length in.	S3 + Lb/2 = Length ft.	S3 + Lb/2 = Length in.
15–16	12	0	5	0	23	5¼	25	6	20	6⅝	1	8	28	19	9	9½	+0.5Lb=		6	7¾	+0.5Lb=	
13–14	11	0	4	6	21	⅛	22	½	18	5½	1	5⅜	25	16	9	4	+0.5Lb=		6	5	+0.5Lb=	
11–12	10	0	4	0	17	10	19	6⅞	15	7⅞	1	3⅜	21	14	8	10½	+0.5Lb=		6	2⅛	+0.5Lb=	
9–10	9	0	3	6	15	4⅞	16	1⅜	13	6⅛	1	⅝	18	11	8	5	+0.5Lb=		5	11⅜	+0.5Lb=	
7–8	7	6	2	9	12	1¾	13	5	10	7¾	0	10½	14	9	7	8⅜	+0.5Lb=		5	7⅛	+0.5Lb=	
5–6	6	6	2	3	9	8⅝	9	11½	8	6½	0	7⅞	11	6	7	3⅛	+0.5Lb=		5	4¼	+0.5Lb=	

Reinforcement Details



*Concrete quantities computed using 21" beam depth on ½" pad & Variable Bridge Width

Quantities

H	Concrete* C.Y.	Reinforcement 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.*

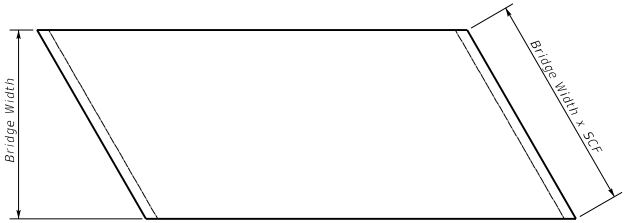
WING LENGTHS: *Calculated assuming 21" superstructure depth and stream bank elevation at top of footing.*

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

KENTUCKY
DEPARTMENT OF HIGHWAYS

25° SKEW VARIABLE WIDTH ABUTMENT 25% SKEWED WINGS

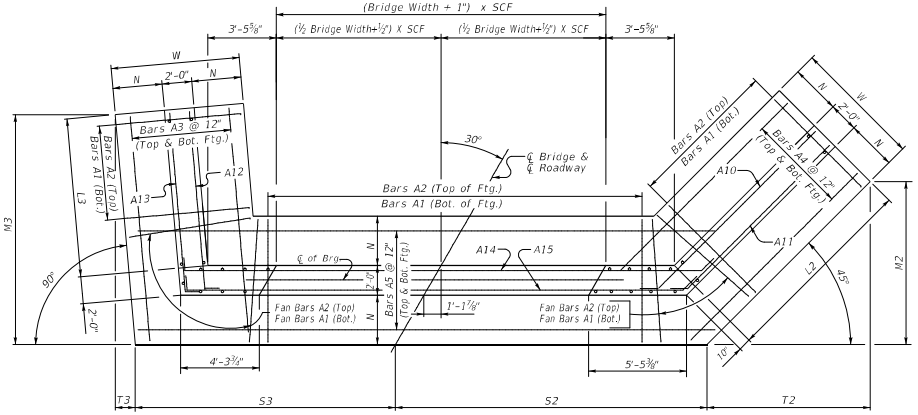
STANDARD DRAWING NO. *BSA-032*

SUBMITTED _____ DIRECTOR DIVISION OF STRUCTURAL DESIGN — DATE 02-26-20

APPROVED _____ STATE HIGHWAY ENGINEER — DATE 02-26-20

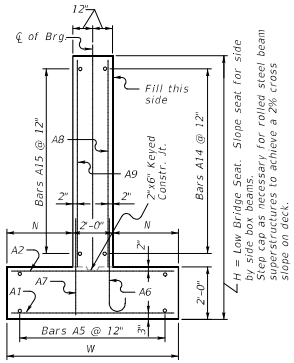
30° SKEW VARIABLE BRIDGE WIDTH 2:1 FILL SLOPES WINGS SKEWED 25% FROM ROADWAY TO BREASTWALL

ABUTMENT SKEW CORRECTION FACTOR (SCF) = 1.155



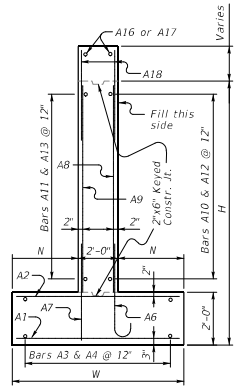
(Left Skew as shown; right skew opp. hand)

PLAN



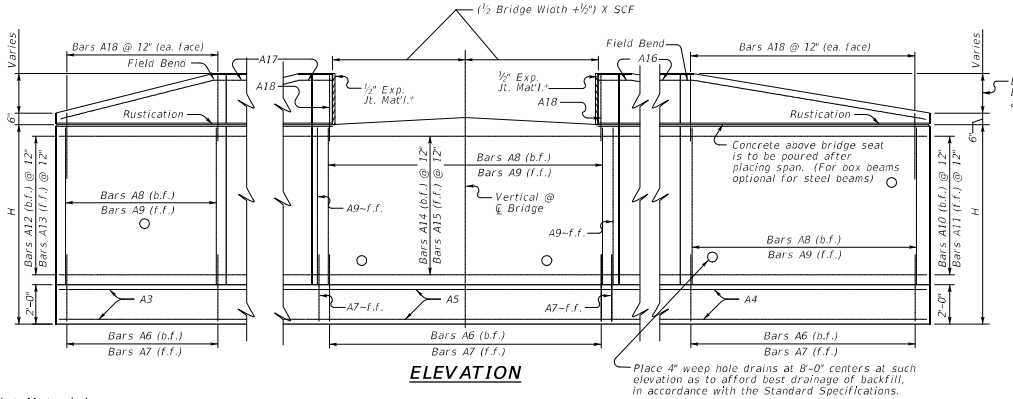
H = Low Bridge Seat. Slope seat for side by side box beams. Step cap as necessary for rolled steel beam superstructures to achieve a 2% cross slope on deck.

WALL SECTION

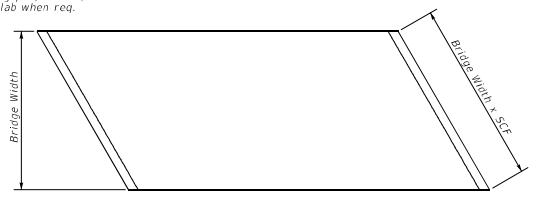


WING SECTION

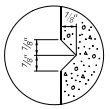
NOTE: Trim A16 & A17 bars if necessary



ELEVATION



PLAN OF SUPERSTRUCTURE SLAB



RUSTICATION GROOVE

*Expansion Joint Material:
AASHTO M153
Type-I Sponge Rubber

REVISION DATE: 08/11/2025
REVISION NUMBER: 0

SUBMITTED: Michael Cupp 08-11-2025
DIVISION DIRECTOR DATE

APPROVED: James Ballinger 08-11-2025
STATE HIGHWAY ENGINEER DATE

BRIDGE STANDARDS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

30° SKEW SUPPORT VARIABLE WIDTH ABUTMENT 25% SKEWED WINGS

STANDARD DRAWING NUMBER
BSA-033-01

OpenRoads Designer v23.00.01.11

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

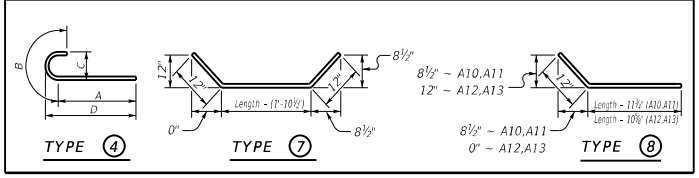
Bill of Reinforcement

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		
H	No.	Size	Length ft.	Length in.	Spacing	No.	Size	Length ft.	Length in.	Spacing	No.	No.	No.	Length ft.	Length in.	= +Lb	No.	Size	Length ft.	Length in.	Spacing	A ft.	A in.	B ft.	B in.	C ft.	C in.	D ft.	D in.	No.	Size	Length ft.	Length in.	Spacing	No.	Size	Length ft.	Length in.	Spacing	No.	Size	Length ft.	Length in.	Spacing	No.	Length ft.	Length in.	No.	Length ft.	Length in.	No.	Length ft.	Length in.	= +Lb	Length ft.	Length in.	No.	Length ft.	Length in.	No.	Length ft.	Length in.	No.	Length ft.	Length in.
15-16	77+Nb=	10	11	8	12	77+Nb=	7	11	8	12	24	24	24	25	8	+Lb=	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	22	2	22	+Lb=	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	20	24	7	+Lb=	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	18	21	4	+Lb=	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	16	15	9	+Lb=	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	+Lb=	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 Length ft.	W Length in.	N Length ft.	N Length in.	M2 Length ft.	M2 Length in.	M3 Length ft.	M3 Length in.	T2 Length ft.	T2 Length in.	T3 Length ft.	T3 Length in.	L2 Length ft.	L3 Length ft.	S2 Length ft.	S2 Length in.	+ Lb/2 =	S2 Length ft.	S2 Length in.	S3 Length ft.	S3 Length in.	+ Lb/2 =	S3 Length ft.	S3 Length in.
15-16	12	0	5	0	23	3 1/8	26	0	23	3 1/8	0	0	30	19	10	5 1/2	+0.5Lb=			6	5 5/8	+0.5Lb=		
13-14	11	0	4	6	20	3 1/2	22	6	20	3 1/2	0	0	26	16	9	11 1/2	+0.5Lb=			6	3 1/8	+0.5Lb=		
11-12	10	0	4	0	17	3 3/4	20	0	17	3 3/4	0	0	22	14	9	5 1/2	+0.5Lb=			6	5/8	+0.5Lb=		
9-10	9	0	3	6	15	1/2	16	6	15	1/2	0	0	19	11	8	11 3/8	+0.5Lb=			5	10	+0.5Lb=		
7-8	7	6	2	9	11	3 1/2	13	9	11	3 1/2	0	0	14	9	8	2 3/8	+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=		

Reinforcement Details



*Concrete quantities computed using 21" beam depth on ½" pad & Variable Bridge Width

Quantities

H	Concrete* C.Y.	Reinforcement 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.

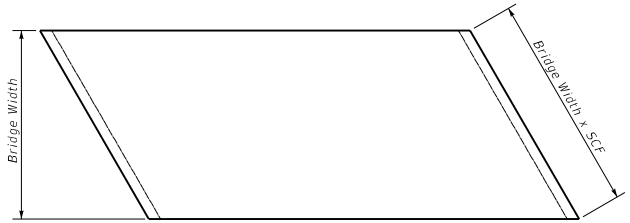
FOUNDATION PRESSURE: Construct abutment footings on solid rock bearing material that can support a pressure of 8000 psf service or 10,800 psf strength factored as recommended by a geotechnical engineer.

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



PLAN OF SUPERSTRUCTURE SLAB

KENTUCKY
DEPARTMENT OF HIGHWAYS

30° SKEW VARIABLE WIDTH ABUTMENT 25% SKEWED WINGS

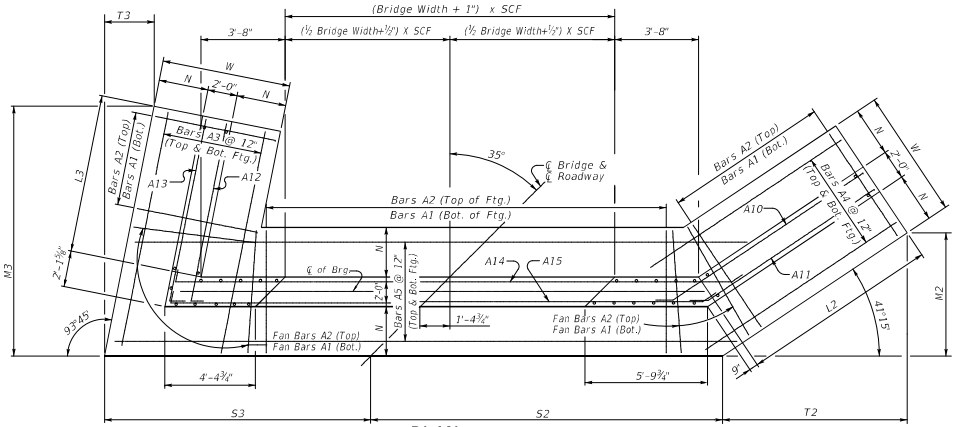
STANDARD DRAWING NO. BSA-034

SUBMITTED _____ DIRECTOR DIVISION OF STRUCTURAL DESIGN — DATE 02-26-20

APPROVED _____ STATE HIGHWAY ENGINEER — DATE 02-26-20

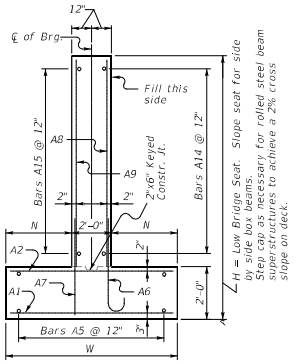
35° SKEW VARIABLE BRIDGE WIDTH 2:1 FILL SLOPES WINGS SKEWED 25% FROM ROADWAY TO BREASTWALL

ABUTMENT SKEW CORRECTION FACTOR (SCF) = 1.221

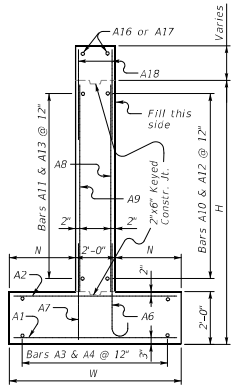


PLAN

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

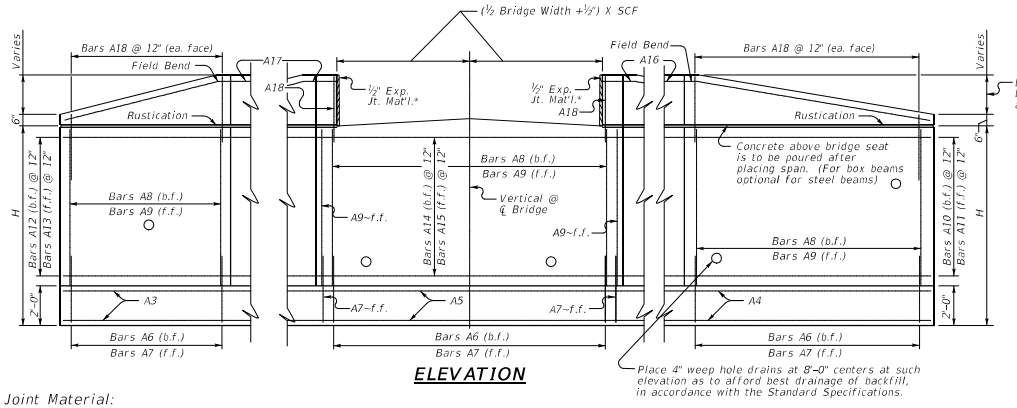


WALL SECTION

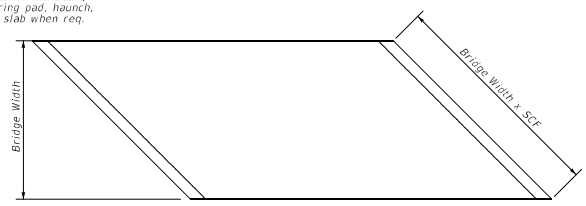


WING SECTION

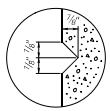
NOTE: Trim A16 & A17 bars if necessary
Trim A3 bars as necessary



ELEVATION



PLAN OF SUPERSTRUCTURE SLAB



RUSTICATION GROOVE

*Expansion Joint Material:
AASHTO M153
Type-I Sponge Rubber

REVISION DATE: 08/11/2025
REVISION NUMBER: 0

SUBMITTED: Michael Cooper 08-11-2025
DIVISION DIRECTOR DATE

APPROVED: Jason Ballinger 08-11-2025
STATE HIGHWAY ENGINEER DATE

BRIDGE STANDARDS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

35° SKEW SUPPORT VARIABLE WIDTH ABUTMENT 25% SKEWED WINGS

STANDARD DRAWING NUMBER
BSA-035-01

OpenRoads Designer v23.00.01.11

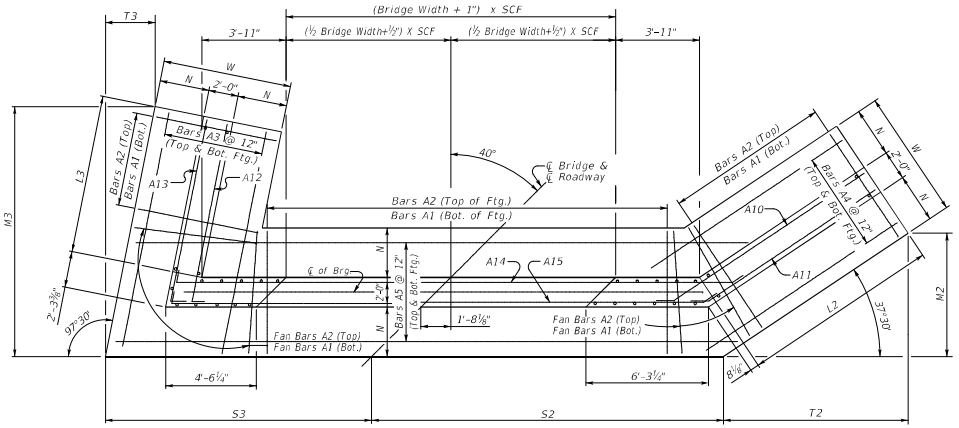
35° SKEW VARIABLE BRIDGE WIDTH 2:1 FILL SLOPES WINGS SKEWED 25% FROM ROADWAY TO BREASTWALL

Bill of Reinforcement

| MARK | A1 | | | | | A2 | | | | | A3 | A4 | A5 | | | | | A6 | | | | | | | | | | | | A7 | | | | | A8 | | | | | A9 | | | | | A10 | A11 | A12 | A13 | A14 | | | | | A15 | | | | | A16 | A17 | A18 | | |
|---|---|---

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

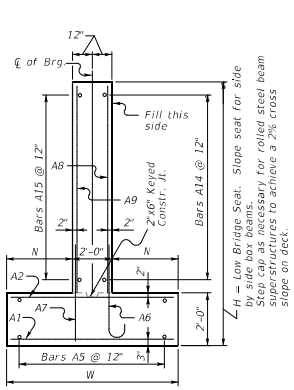
ABUTMENT SKEW CORRECTION FACTOR (SCF) = 1.305



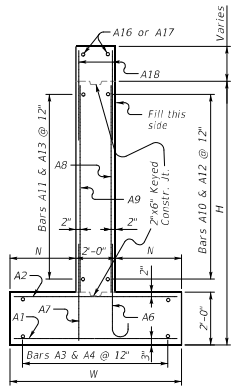
(Left Skew as shown; right skew opp. hand)

PLAN

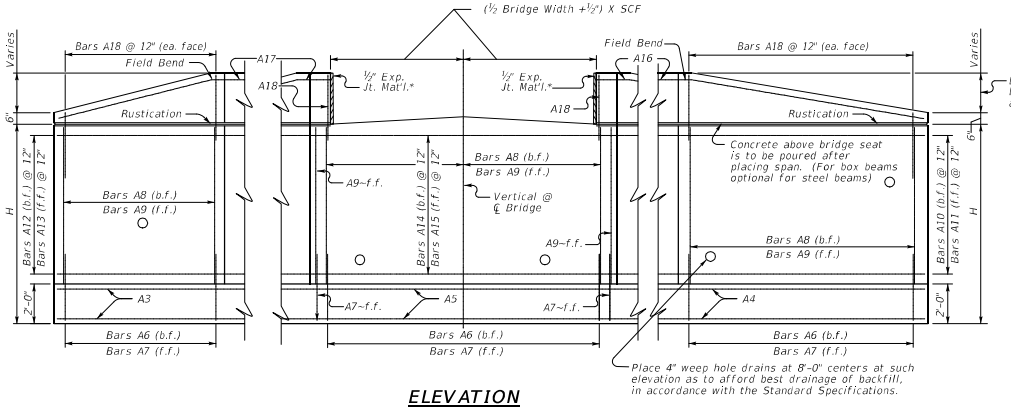
NOTE: Trim A16 & A17 bars if necessary
Trim A3 bars as necessary



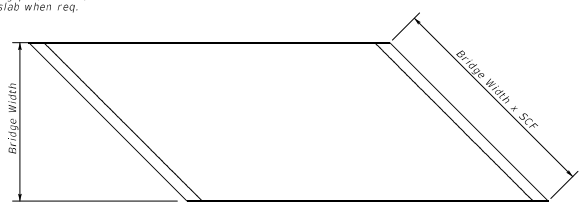
WALL SECTION



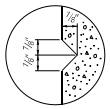
WING SECTION



ELEVATION



PLAN OF SUPERSTRUCTURE SLAB



RUSTICATION GROOVE

*Expansion Joint Material:
AASHTO M153
Type-I Sponge Rubber

REVISION DATE: 08/11/2025
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — DATE 08-11-2025

APPROVED — STATE HIGHWAY ENGINEER — DATE 08-11-2025

BRIDGE STANDARDS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

40° SKEW SUPPORT VARIABLE WIDTH ABUTMENT 25% SKEWED WINGS

STANDARD DRAWING NUMBER
BSA-037-01

OpenRoads Designer v23.00.01.11

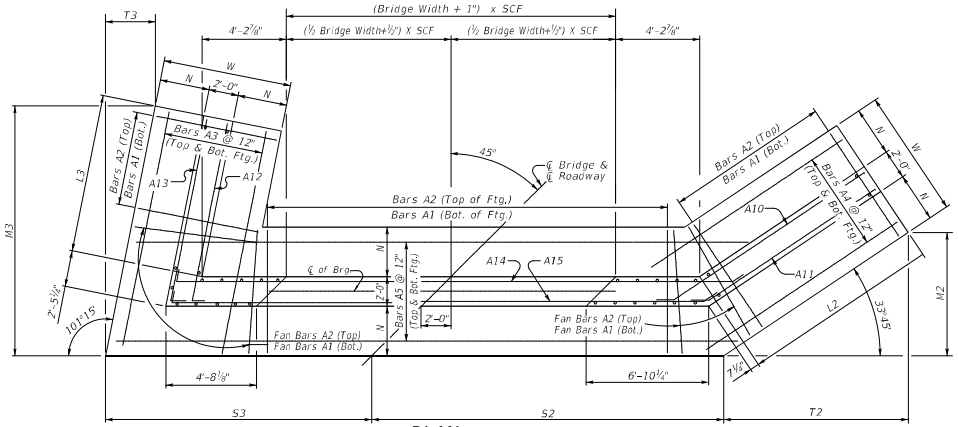
40° SKEW VARIABLE BRIDGE WIDTH 2:1 FILL SLOPES
WINGS SKEWED 25% FROM ROADWAY TO BREASTWALL

Bill of Reinforcement

| MARK | A1 | | | | | A2 | | | | | A3 | A4 | A5 | | | | | A6 | | | | |

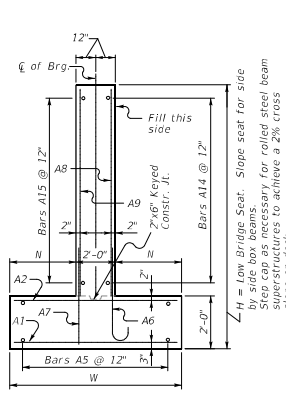
45° SKEW VARIABLE BRIDGE WIDTH 2:1 FILL SLOPES WINGS SKEWED 25% FROM ROADWAY TO BREASTWALL

ABUTMENT SKEW CORRECTION FACTOR (SCF) = 1.414

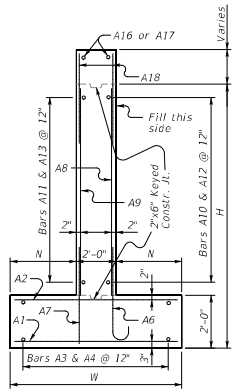


(Left Skew as shown; right skew opp. hand)

PLAN

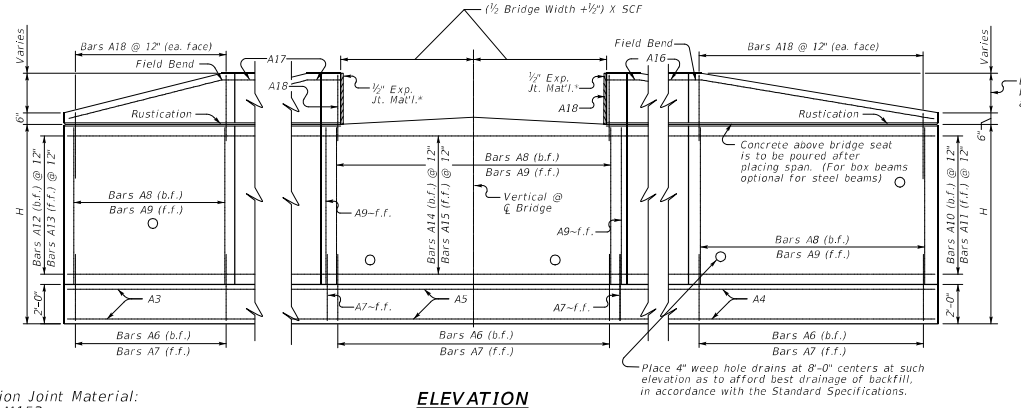


WALL SECTION



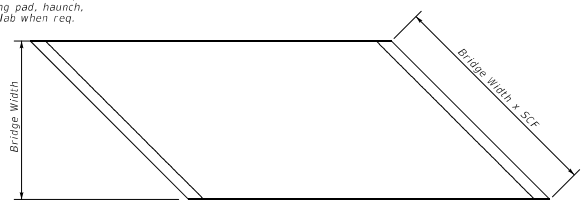
WING SECTION

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

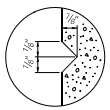


ELEVATION

*Expansion Joint Material:
AASHTO M153
Type-I Sponge Rubber



PLAN OF SUPERSTRUCTURE SLAB



RUSTICATION GROOVE

REVISION DATE: 08/11/2025
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — DATE: 08-11-2025
APPROVED — STATE HIGHWAY ENGINEER — DATE: 08-11-2025

BRIDGE STANDARDS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

45° SKEW SUPPORT VARIABLE WIDTH ABUTMENT 25% SKEWED WINGS

STANDARD DRAWING NUMBER
BSA-039-01

OpenRoads Designer v23.00.01.11

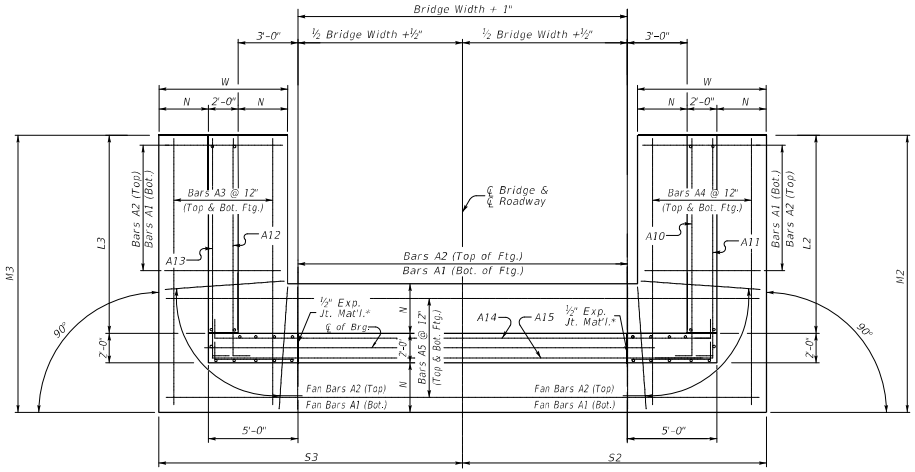
45° SKEW VARIABLE BRIDGE WIDTH 2:1 FILL SLOPES
WINGS SKEWED 25% FROM ROADWAY TO BREASTWALL

Bill of Reinforcement

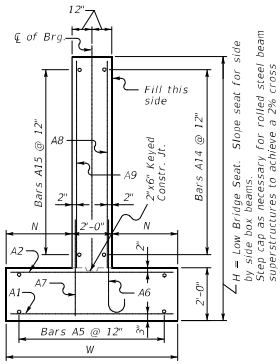
| MARK | A1 | | | | | A2 | | | | | A3 | A4 | A5 | | | | A6 | | | | | | | | | | | | | | A7 | | | | | A8 | | | | | A9 | | | | | A10 | A11 | A12 | A13 | A14 | | | | A15 | | | | A16 | A17 | A18 | | |
|---|---|---

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

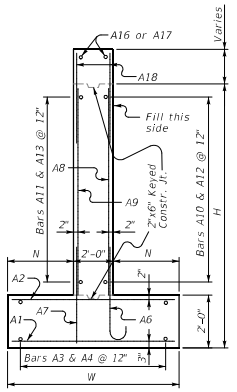
ABUTMENT SKEW CORRECTION FACTOR (SCF) = 1.000



PLAN

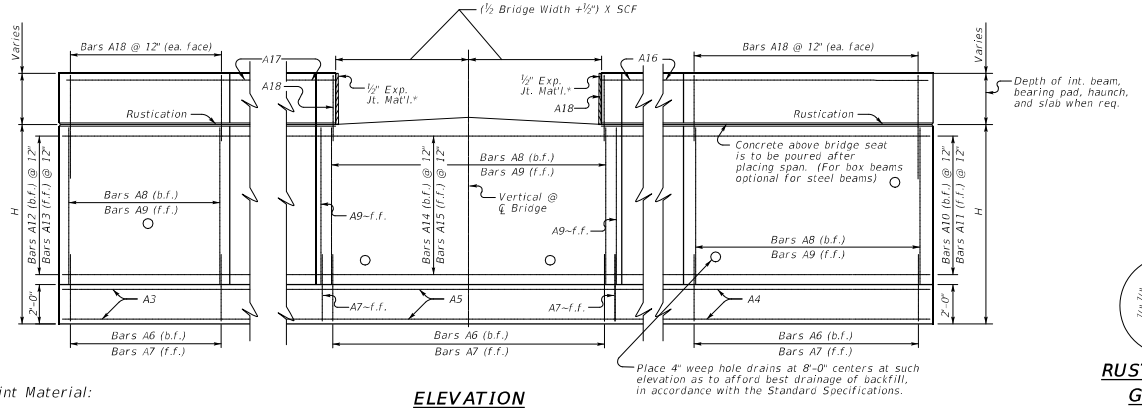


WALL SECTION



WING SECTION

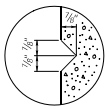
NOTE: Trim A16 & A17 bars if necessary



ELEVATION

*Expansion Joint Material:
AASHTO M153
Type-I Sponge Rubber

PLAN OF SUPERSTRUCTURE SLAB



RUSTICATION GROOVE

REVISION DATE: 08/11/2025
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — DATE: 08-11-2025

APPROVED — STATE HIGHWAY ENGINEER — DATE: 08-11-2025

BRIDGE STANDARDS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

0° SKEW SUPPORT VARIABLE WIDTH ABUTMENT PARALLEL WINGS

STANDARD DRAWING NUMBER
BSA-041-01

OpenRoads Designer v23.00.01.11

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

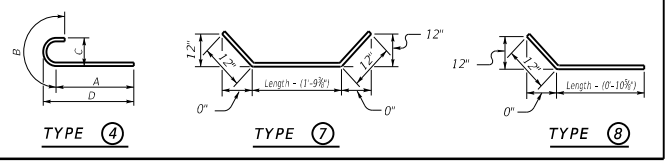
Bill of Reinforcement

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		
H	No.	Size	Length ft.	Length in.	Spacing	No.	Size	Length ft.	Length in.	Spacing	No.	No.	No.	Length ft.	Length in.	= +Lb	No.	Size	Length ft.	Length in.	Spacing	A in.	B ft.	B in.	C ft.	C in.	D ft.	D in.	No.	Size	Length ft.	Length in.	Spacing	No.	Size	Length ft.	Length in.	Spacing	No.	Length ft.	Length in.	No.	No.	No.	No.	No.	Length ft.	Length in.	= +Lb	No.	Length ft.	Length in.	= +Lb	No.	No.	Length ft.	Length in.	No.	Length ft.	Length in.
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=			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	23	8	10	11	5	+Lb=			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	6	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 Length ft.	W Length in.	N Length ft.	N Length in.	M2 Length ft.	M2 Length in.	M3 Length ft.	M3 Length in.	T2 Length ft.	T2 Length in.	T3 Length ft.	T3 Length in.	L2 Length ft.	L3 Length ft.	S2 Length ft.	S2 Length in.	S2 + Lb/2 =	S2 Length ft.	S2 Length in.	S3 Length ft.	S3 Length in.	S3 + Lb/2 =	S3 Length ft.	S3 Length in.
15–16	12	0	5	0	35	0	35	0	0	0	0	0	0	28	28	10	½	+0.5Lb=			10	½	+0.5Lb=		
13–14	11	0	4	6	31	6	31	6	0	0	0	0	0	25	25	9	6½	+0.5Lb=			9	6½	+0.5Lb=		
11–12	10	0	4	0	27	0	27	0	0	0	0	0	0	21	21	9	½	+0.5Lb=			9	½	+0.5Lb=		
9–10	9	0	3	6	22	6	22	6	0	0	0	0	0	17	17	8	6½	+0.5Lb=			8	6½	+0.5Lb=		
7–8	7	6	2	9	16	9	16	9	0	0	0	0	0	12	12	7	9½	+0.5Lb=			7	9½	+0.5Lb=		
5–6	6	6	2	3	13	3	13	3	0	0	0	0	0	9	9	7	3½	+0.5Lb=			7	3½	+0.5Lb=		

Reinforcement Details



*Concrete quantities computed using 21" beam depth on ½" pad & Variable Bridge Width

Quantities

H	Concrete* C.Y.	Reinforcement 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

KENTUCKY
DEPARTMENT OF HIGHWAYS

0° SKEW VARIABLE
WIDTH ABUTMENT
PARALLEL WINGS

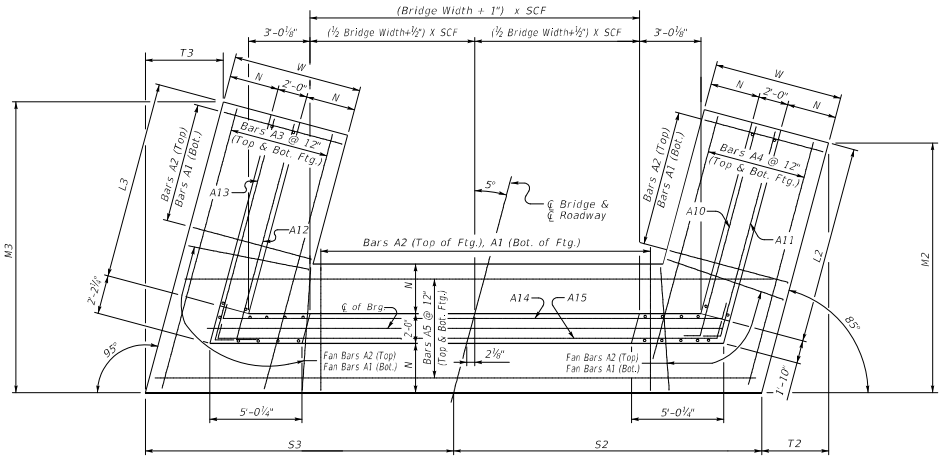
STANDARD DRAWING NO. BSA-042

SUBMITTED _____ 02-26-20
DIRECTOR DIVISION OF STRUCTURAL DESIGN — DATE

APPROVED _____ 02-26-20
STATE HIGHWAY ENGINEER — DATE

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

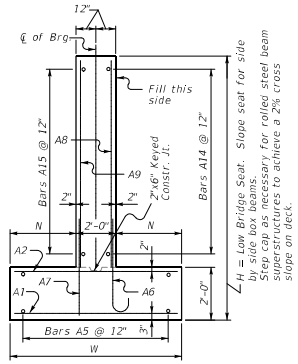
ABUTMENT SKEW CORRECTION FACTOR (SCF) = 1.004



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

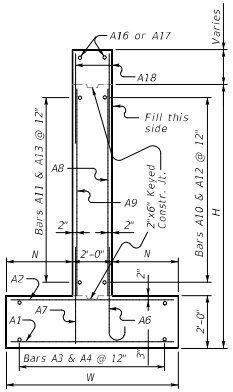
PLAN

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

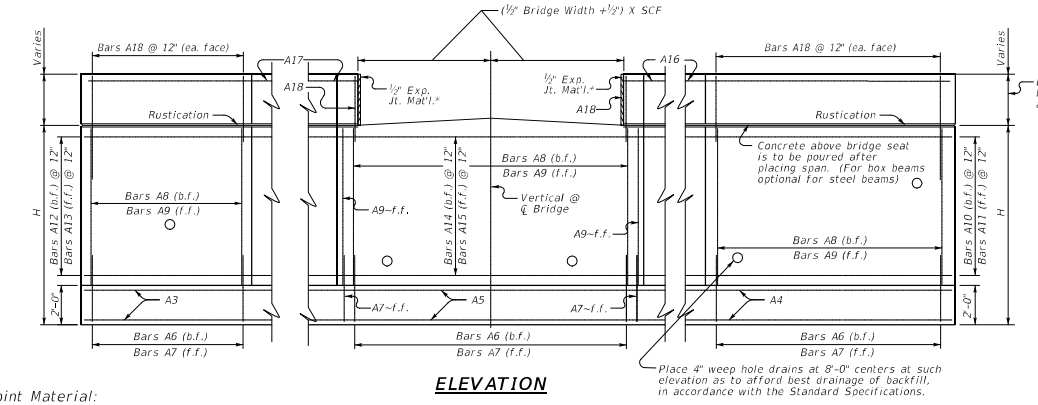


H = Low Bridge Seat. Slope seat for side by side box beams. Slope seat for rolled steel beam superstructures to achieve a 2% cross slope on deck.

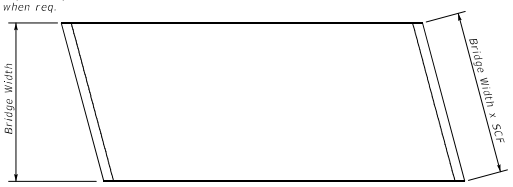
WALL SECTION



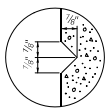
WING SECTION



ELEVATION



PLAN OF SUPERSTRUCTURE SLAB



RUSTICATION GROOVE

*Expansion Joint Material:
AASHTO M153
Type-I Sponge Rubber

REVISION DATE: 08/11/2025
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — DATE: 08-11-2025
APPROVED — STATE HIGHWAY ENGINEER — DATE: 08-11-2025

BRIDGE STANDARDS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

5° SKEW SUPPORT VARIABLE WIDTH ABUTMENT PARALLEL WINGS

STANDARD DRAWING NUMBER
BSA-043-01

OpenRoads Designer v23.00.01.11

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

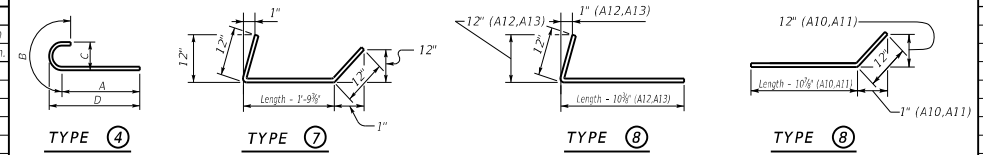
Bill of Reinforcement

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	
H	No.	Size	Length ft.	Length in.	No.	Size	Length ft.	Length in.	Spacing	No.	Length ft.	Length in.	No.	Length ft.	Length in.	= +Lb	No.	Length ft.	Length in.	Spacing	A in.	B ft.	B in.	C ft.	C in.	D ft.	D in.	No.	Size	Length ft.	Length in.	Spacing	No.	Size	Length ft.	Length in.	Spacing	No.	Length ft.	Length in.	No.	Length ft.	Length in.	No.	Length ft.	Length in.	= +Lb	No.	Length ft.	Length in.	No.	Length ft.	Length in.	No.	Length ft.	Length in.
15-16	93+Nb=	10	11	8	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	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	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	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	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	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	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	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 Length ft.	W Length in.	N Length ft.	N Length in.	M2 Length ft.	M2 Length in.	M3 Length ft.	M3 Length in.	T2 Length ft.	T2 Length in.	T3 Length ft.	T3 Length in.	L2 Length ft.	L3 Length ft.	S2 Length ft.	S2 Length in.	S2 + Lb/2 =	S3 Length ft.	S3 Length in.	S3 + Lb/2 =
15-16	12	0	5	0	35	3 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 3/8	2	8 3/8	2	9 3/8	25	25	9	6 3/8	+0.5Lb=	9	6 3/8	+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 3/8	+0.5Lb=	8	6 3/8	+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 1/8	+0.5Lb=	7	9 1/8	+0.5Lb=
5-6	6	6	2	3	12	10 1/8	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.*

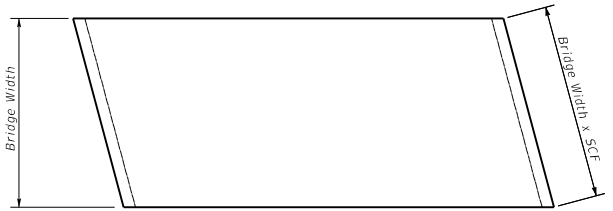
WING LENGTHS: *Calculated assuming 21" superstructure depth and stream bank elevation at top of footing.*

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

KENTUCKY
DEPARTMENT OF HIGHWAYS

5° SKEW VARIABLE
WIDTH ABUTMENT
PARALLEL WINGS

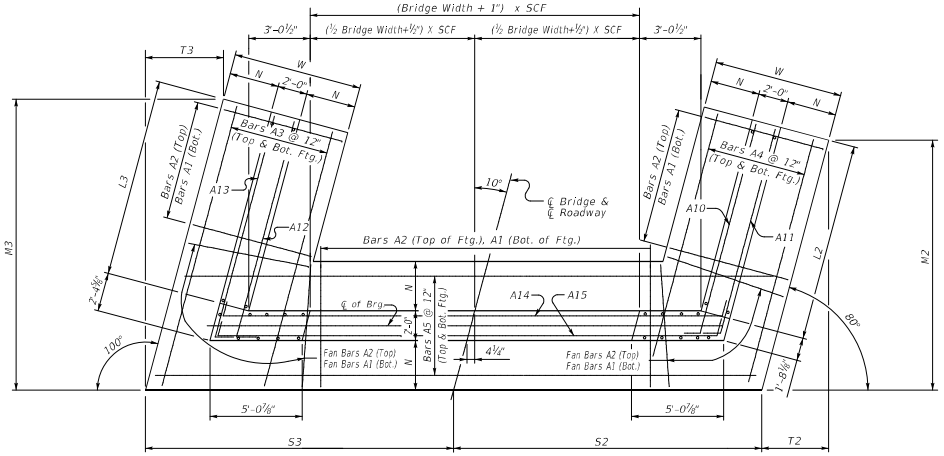
STANDARD DRAWING NO. BSA-044

SUBMITTED _____ DIRECTOR DIVISION OF STRUCTURAL DESIGN — 02-26-20 DATE

APPROVED _____ STATE HIGHWAY ENGINEER — 02-26-20 DATE

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

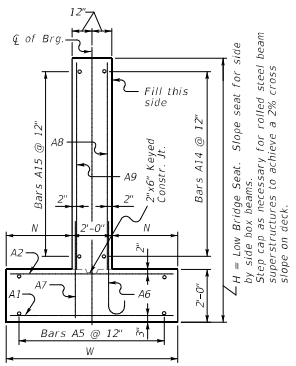
ABUTMENT SKEW CORRECTION FACTOR (SCF) = 1.015



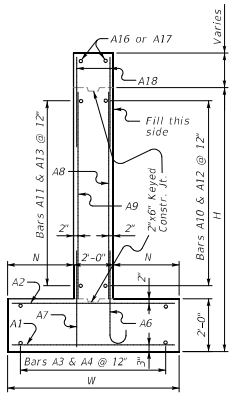
(Left Skew as shown;right skew opp. hand)

PLAN

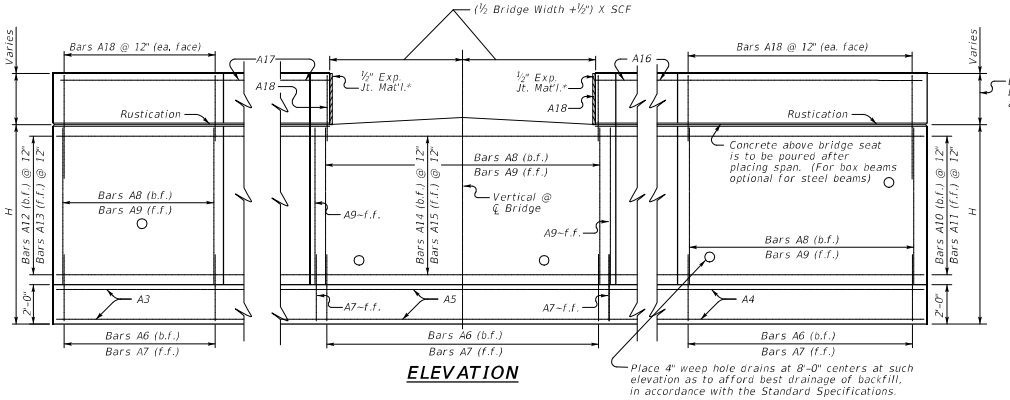
Note: Trim A16 & A17 bars if necessary
Trim A3 bars as necessary



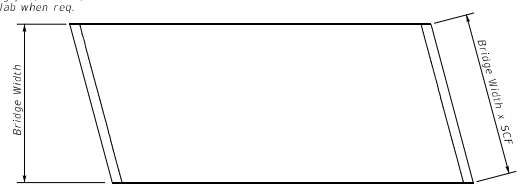
WALL SECTION



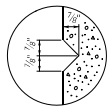
WING SECTION



ELEVATION



PLAN OF SUPERSTRUCTURE SLAB



RUSTICATION GROOVE

*Expansion Joint Material:
AASHTO M153
Type-I Sponge Rubber

REVISION DATE: 08/11/2025
REVISION NUMBER: 0

SUBMITTED Michael Cooper 08-11-2025
DIVISION DIRECTOR DATE

APPROVED Jason Ballinger 08-11-2025
STATE HIGHWAY ENGINEER DATE

BRIDGE STANDARDS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

10° SKEW SUPPORT VARIABLE WIDTH ABUTMENT PARALLEL WINGS

STANDARD DRAWING NUMBER
BSA-045-01

OpenRoads Designer v23.00.01.11

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

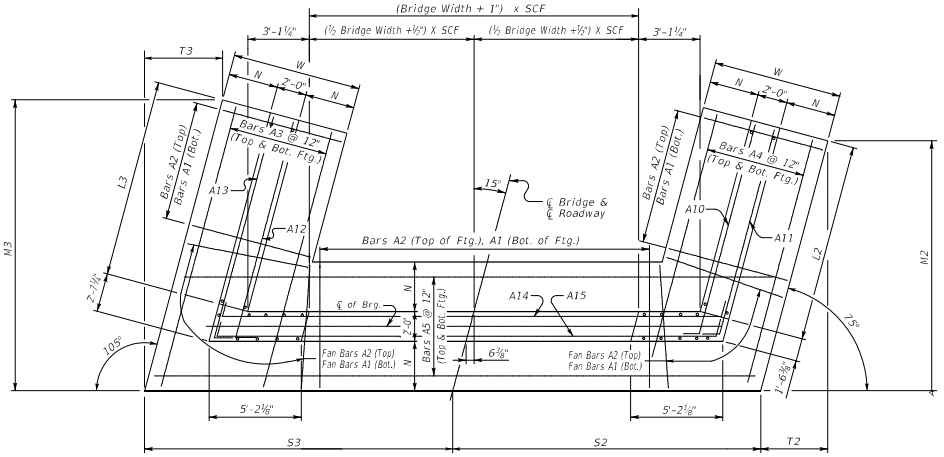
Bill of Reinforcement

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 | A1 No. | A1 Size | A1 Length ft. | A1 Length in. | A1 Spacing | A2 No. | A2 Size | A2 Length ft. | A2 Length in. | A2 Spacing | A3 No. | A3 Length ft. | A3 Length in. | A4 No. | A4 Length ft. | A4 Length in. | A5 No. | A5 Length ft. | A5 Length in. | A5 = | A5 +Lb | A5 Length ft. | A5 Length in. | A6 No. | A6 Size | A6 Length ft. | A6 Length in. | A6 Spacing | A6 A ft. | A6 A in. | A6 B ft. | A6 B in. | A6 C ft. | A6 C in. | A6 D ft. | A6 D in. | A7 No. | A7 Size | A7 Length ft. | A7 Length in. | A7 Spacing | A8 No. | A8 Size | A8 Length ft. | A8 Length in. | A8 Spacing | A9 No. | A9 Length ft. | A9 Length in. | A9 Spacing | A10 No. | A10 Length ft. | A10 Length in. | A10 Spacing | A11 No. | A11 Length ft. | A11 Length in. | A11 Spacing | A12 No. | A12 Length ft. | A12 Length in. | A12 Spacing | A13 No. | A13 Length ft. | A13 Length in. | A13 Spacing | A14 No. | A14 Length ft. | A14 Length in. | A14 Spacing | A14 = | A14 +Lb | A14 Length ft. | A14 Length in. | A15 No. | A15 Length ft. | A15 Length in. | A15 = | A15 +Lb | A15 Length ft. | A15 Length in. | A16 No. | A16 Length ft. | A16 Length in. | A17 No. | A17 Length ft. | A17 Length in. | A18 No. | A18 Length ft. | A18 Length in. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---

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

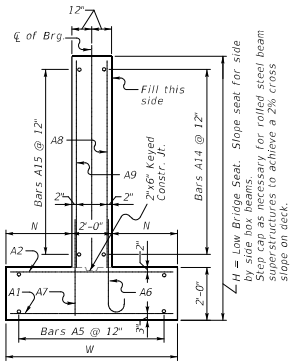
ABUTMENT SKEW CORRECTION FACTOR (SCF) = 1.035



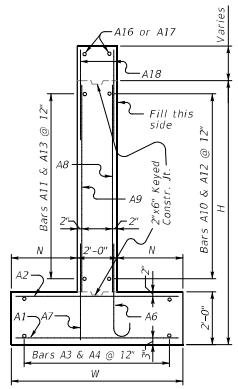
(Left Skew as shown; right skew opp. hand)

PLAN

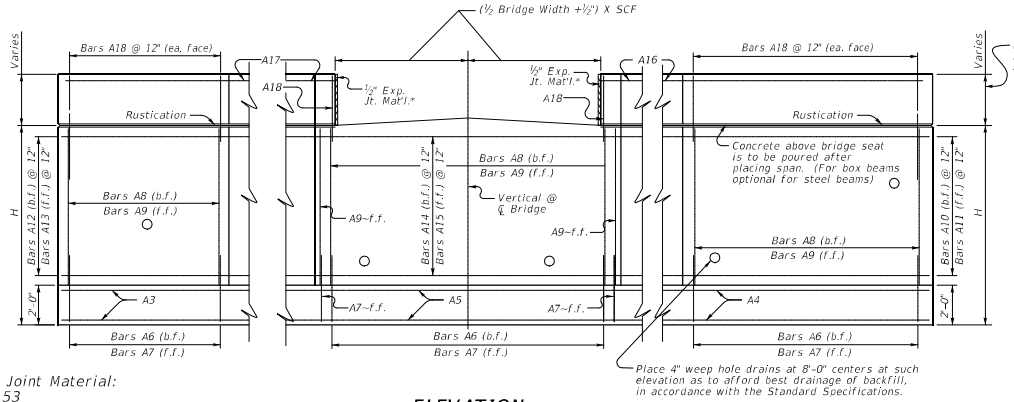
NOTE: Trim A16 & A17 bars if necessary
Trim A3 bars as necessary



WALL SECTION



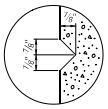
WING SECTION



*Expansion Joint Material:
AASHTO M153
Type-I Sponge Rubber

ELEVATION

PLAN OF SUPERSTRUCTURE SLAB



RUSTICATION GROOVE

REVISION DATE: 08/11/2025
REVISION NUMBER: 0

SUBMITTED: Michael Cupp 08-11-2025
DIVISION DIRECTOR — DATE

APPROVED: Jason Ballinger 08-11-2025
STATE HIGHWAY ENGINEER — DATE

BRIDGE STANDARDS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

15° SKEW SUPPORT VARIABLE WIDTH ABUTMENT PARALLEL WINGS

STANDARD DRAWING NUMBER
BSA-047-01

OpenRoads Designer v23.00.01.11

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

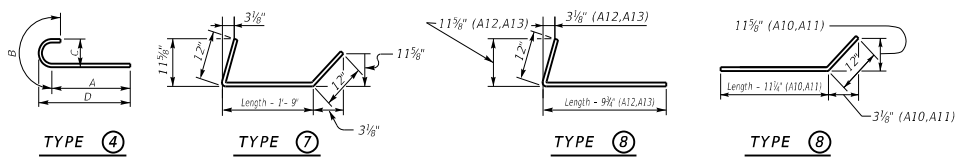
Bill of Reinforcement

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	
H	No.	Size	Length ft.	Length in.	Spacing	No.	Size	Length ft.	Length in.	Spacing	No.	Length ft.	No.	Length ft.	Length in.	=	+Lb	Length ft.	Length in.	No.	Size	Length ft.	Length in.	Spacing	A ft.	A in.	B ft.	B in.	C ft.	C in.	D ft.	D in.	No.	Size	Length ft.	Length in.	Spacing	No.	Size	Length ft.	Length in.	Spacing	No.	Length ft.	Length in.	No.	Length ft.	Length in.	No.	Length ft.	Length in.	No.	Length ft.	Length in.	=	+Lb	No.	Length ft.	Length in.	=	+Lb	No.	Length ft.	Length in.	No.	Length ft.	Length in.	No.	Length ft.	Length in.
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	1	0	0	6	5	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 Length ft.	W Length in.	N Length ft.	N Length in.	M2 Length ft.	M2 Length in.	M3 Length ft.	M3 Length in.	T2 Length ft.	T2 Length in.	T3 Length ft.	T3 Length in.	L2 Length ft.	L3 Length ft.	S2 Length ft.	S2 Length in.	+ Lb/2 =	S3 Length ft.	S3 Length in.	+ Lb/2 =
15–16	12	0	5	0	34	2	37	9 1/2	9	1 7/8	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 1/4	+0.5Lb=	9	10 1/4	+0.5Lb=
11–12	10	0	4	0	25	8 3/8	28	9 3/8	6	10 5/8	7	8 3/8	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	1/8	18	6 3/8	4	3 3/4	4	11 3/8	13	13	8	3/8	+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* C.Y.	Reinforcement 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.

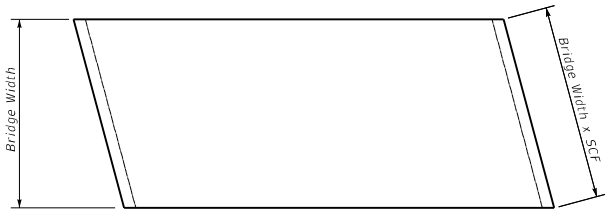
FOUNDATION PRESSURE: Construct abutment footings on solid rock bearing material that can support a pressure of 8000 psf service or 10,800 psf strength factored as recommended by a geotechnical engineer.

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

KENTUCKY
DEPARTMENT OF HIGHWAYS

15° SKEW VARIABLE WIDTH ABUTMENT PARALLEL WINGS

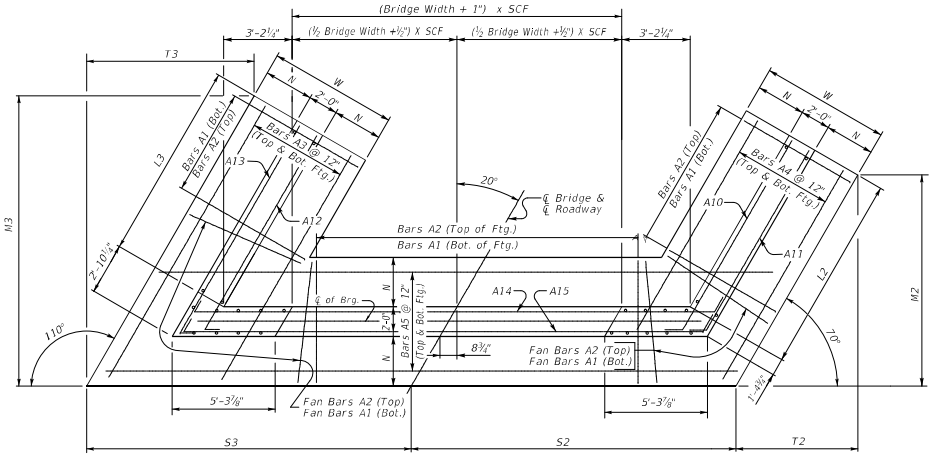
STANDARD DRAWING NO. BSA-048

SUBMITTED _____ DIRECTOR DIVISION OF STRUCTURAL DESIGN — DATE 02-26-20

APPROVED _____ STATE HIGHWAY ENGINEER — DATE 02-26-20

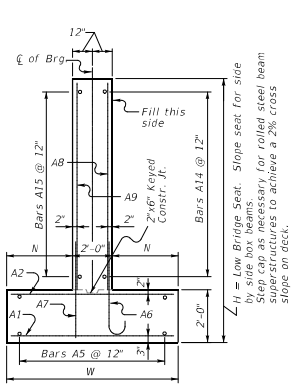
20° SKEW VARIABLE BRIDGE WIDTH 2:1 FILL SLOPES WINGS PARALLEL TO ROADWAY

ABUTMENT SKEW CORRECTION FACTOR (SCF) = 1.064

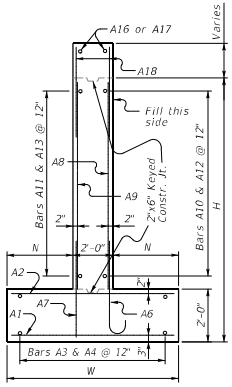


(Left Skew as shown,right skew opp. hand)

PLAN

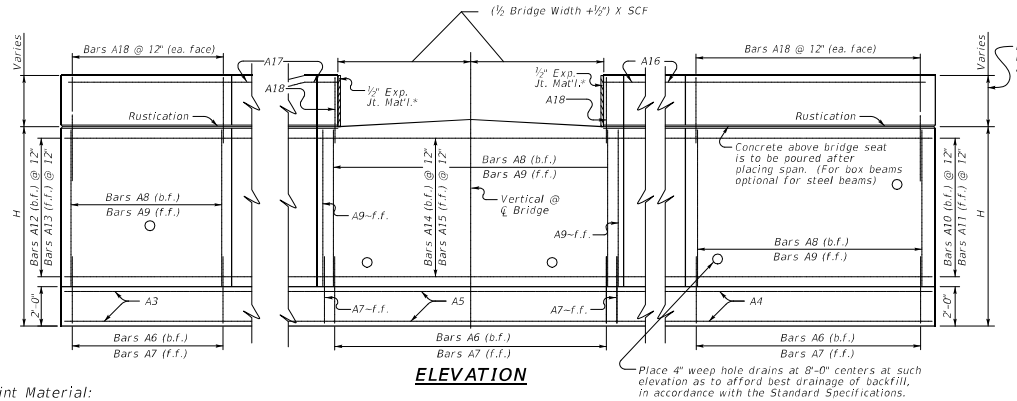


WALL SECTION

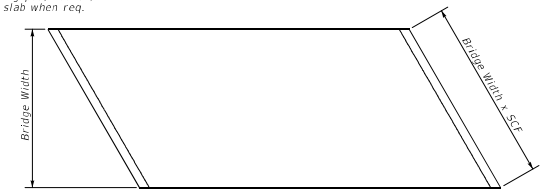


WING SECTION

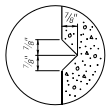
NOTE: Trim A16 & A17 bars if necessary
Trim A3 bars as necessary



ELEVATION



PLAN OF SUPERSTRUCTURE SLAB



RUSTICATION GROOVE

*Expansion Joint Material:
AASHTO M153
Type-I Sponge Rubber

REVISION DATE: 08/11/2025
REVISION NUMBER: 0

SUBMITTED: Michael Cupp 08-11-2025
DIVISION DIRECTOR DATE

APPROVED: Jason Ballinger 08-11-2025
STATE HIGHWAY ENGINEER DATE

BRIDGE STANDARDS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

20° SKEW SUPPORT VARIABLE WIDTH ABUTMENT PARALLEL WINGS

STANDARD DRAWING NUMBER
BSA-049-01

OpenRoads Designer v23.00.01.11

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

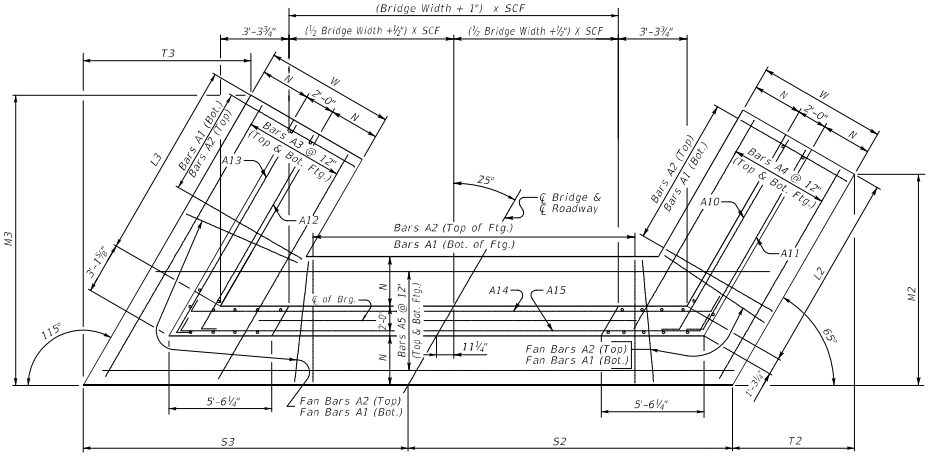
Bill of Reinforcement

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

| H | A1 No. | A1 Size | A1 Length ft. | A1 Length in. | A1 Spacing | A2 No. | A2 Size | A2 Length ft. | A2 Length in. | A2 Spacing | A3 No. | A3 Length ft. | A3 Length in. | A4 No. | A4 Length ft. | A4 Length in. | A5 No. | A5 Length ft. | A5 Length in. | A5 = +Lb= | A6 No. | A6 Size | A6 Length ft. | A6 Length in. | A6 Spacing | A6 A ft. | A6 A in. | A6 B ft. | A6 B in. | A6 C ft. | A6 C in. | A6 D ft. | A6 D in. | A7 No. | A7 Size | A7 Length ft. | A7 Length in. | A7 Spacing | A8 No. | A8 Size | A8 Length ft. | A8 Length in. | A8 Spacing | A9 No. | A9 Length ft. | A9 Length in. | A9 Spacing | A10 No. | A10 Length ft. | A10 Length in. | A11 No. | A11 Length ft. | A11 Length in. | A12 No. | A12 Length ft. | A12 Length in. | A13 No. | A13 Length ft. | A13 Length in. | A14 No. | A14 Length ft. | A14 Length in. | A14 = +Lb= | A14 Length ft. | A14 Length in. | A15 No. | A15 Length ft. | A15 Length in. | A15 = +Lb= | A15 Length ft. | A15 Length in. | A16 No. | A16 Length ft. | A16 Length in. | A17 No. | A17 Length ft. | A17 Length in. | A18 No. | A18 Length ft. | A18 Length in. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---

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

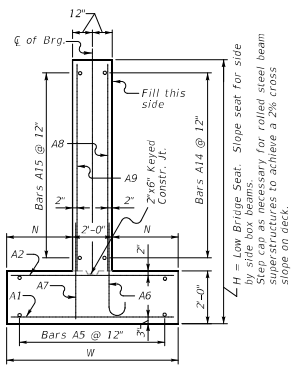
ABUTMENT SKEW CORRECTION FACTOR (SCF) = 1.103



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

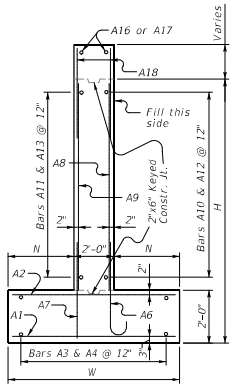
PLAN

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

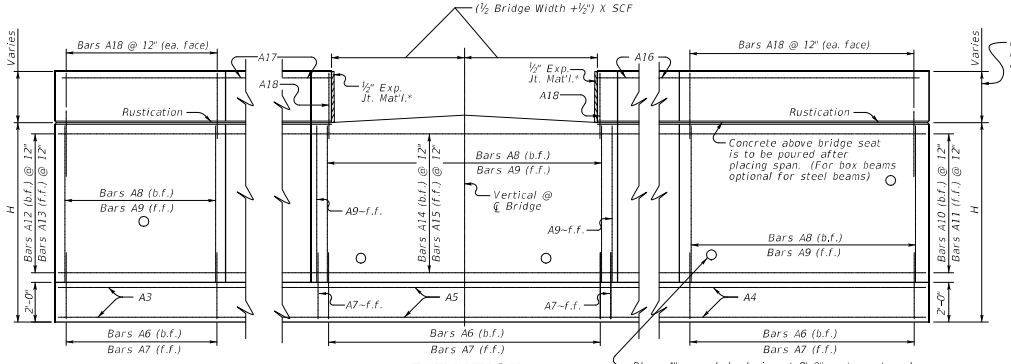


H = Low Bridge Seat. Slope seat for side by side box beams. Step can as necessary for rolled steel beam superstructures to achieve a 2% cross slope on deck.

WALL SECTION



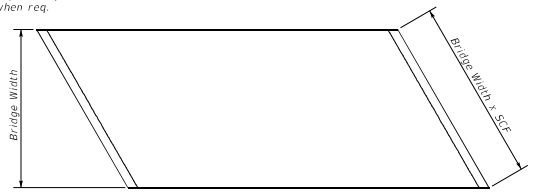
WING SECTION



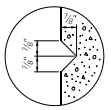
ELEVATION

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.

*Expansion Joint Material:
AASHTO M153
Type-I Sponge Rubber



PLAN OF SUPERSTRUCTURE SLAB



RUSTICATION GROOVE

REVISION DATE: 08/11/2025
REVISION NUMBER: 0

SUBMITTED: Michael Cupp 08-11-2025
DIVISION DIRECTOR — DATE

APPROVED: Jason Ballinger 08-11-2025
STATE HIGHWAY ENGINEER — DATE

BRIDGE STANDARDS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

25° SKEW SUPPORT VARIABLE WIDTH ABUTMENT PARALLEL WINGS

STANDARD DRAWING NUMBER
BSA-051-01

OpenRoads Designer v23.00.01.11

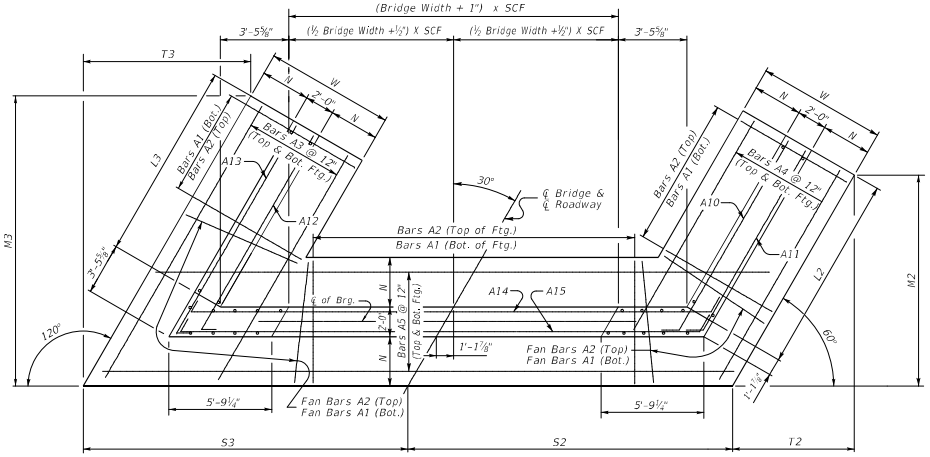
25° SKEW VARIABLE BRIDGE WIDTH 2:1 FILL SLOPES WINGS PARALLEL TO ROADWAY

Bill of Reinforcement

| MARK | A1 | | | | | A2 | | | | | A3 | A4 | A5 | | | | A6 | | | | | | | | | | | | A7 | | | | | A8 | | | | | A9 | | | | | A10 | A11 | A12 | A13 | A14 | | | | | A15 | | | | | A16 | A17 | A18 | | |
|---|---|---

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

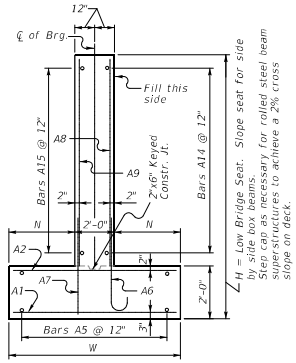
ABUTMENT SKEW CORRECTION FACTOR (SCF) = 1.155



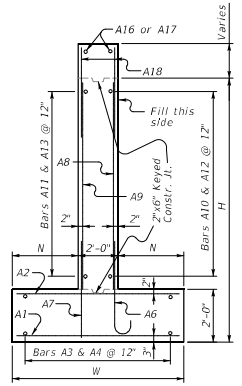
(Left Skew as shown; right skew opp. hand)

PLAN

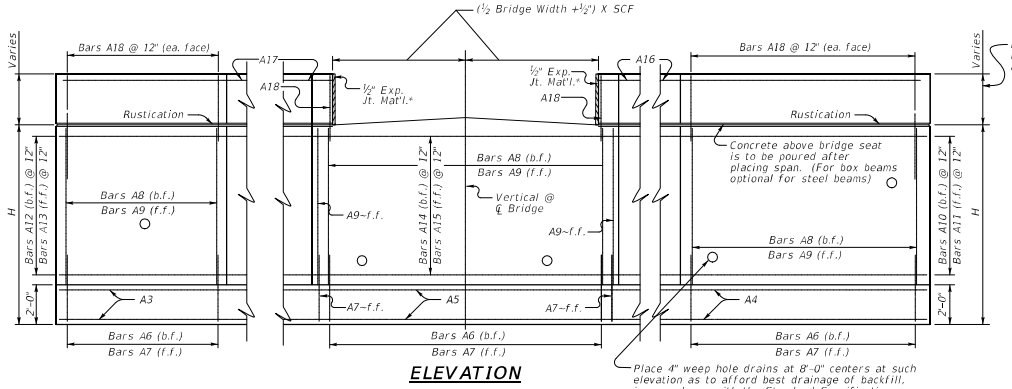
NOTE: Trim A16 & A17 bars if necessary
Trim A3 bars as necessary



WALL SECTION

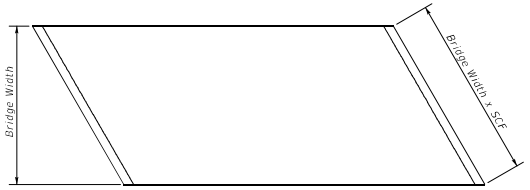


WING SECTION

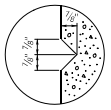


ELEVATION

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.



PLAN OF SUPERSTRUCTURE SLAB



RUSTICATION GROOVE

*Expansion Joint Material:
AASHTO M153
Type-I Sponge Rubber

REVISION DATE: 08/11/2025
REVISION NUMBER: 0

SUBMITTED: Michael Cupp 08-11-2025
DIVISION DIRECTOR DATE

APPROVED: Jason Ballinger 08-11-2025
STATE HIGHWAY ENGINEER DATE

BRIDGE STANDARDS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

30° SKEW SUPPORT VARIABLE WIDTH ABUTMENT PARALLEL WINGS

STANDARD DRAWING NUMBER
BSA-053-01

OpenRoads Designer v23.00.01.11

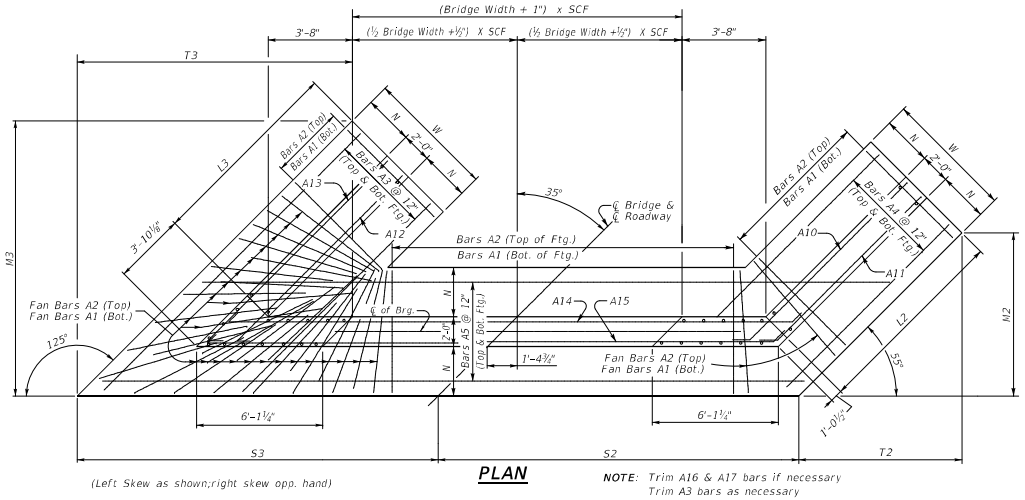
30° SKEW VARIABLE BRIDGE WIDTH 2:1 FILL SLOPES WINGS PARALLEL TO ROADWAY

Bill of Reinforcement

| MARK | A1 | | | | | A2 | | | | | A3 | A4 | A5 | | | | | A6 | | | | | | | | | | | | A7 | | | | | A8 | | | | | A9 | | | | | A10 | A11 | A12 | A13 | A14 | | | | | A15 | | | | | A16 | A17 | A18 | | |
|---|---|---

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

ABUTMENT SKEW CORRECTION FACTOR (SCF) = 1.221

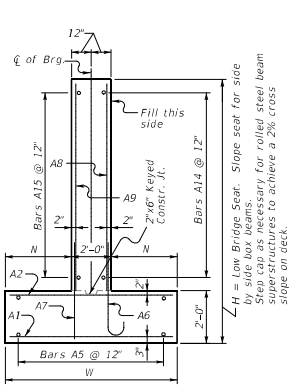


PLAN

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

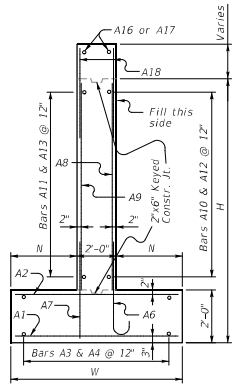
NOTE: Trim A16 & A17 bars if necessary
Trim A3 bars as necessary

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)

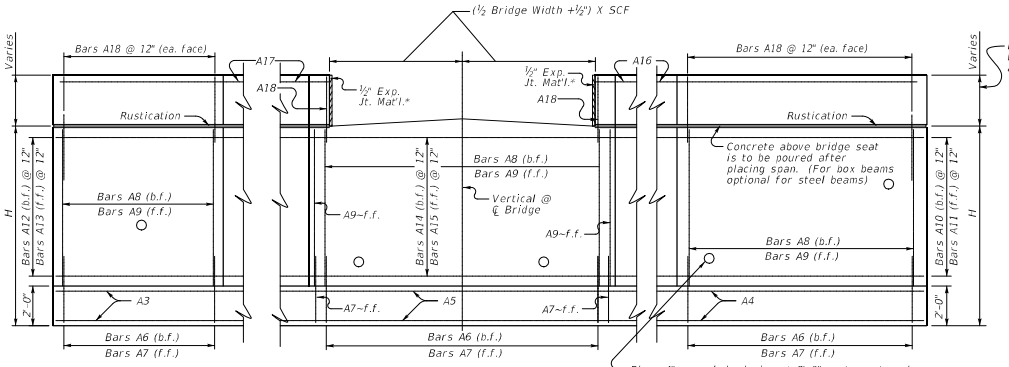


H = Low Bridge Seat. Slope seat for side by side box beams. Step cap as necessary for rolled steel beam superstructures to achieve a 2% cross slope on deck.

WALL SECTION

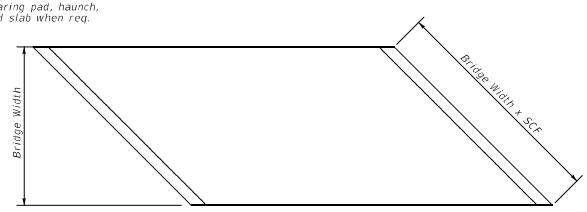


WING SECTION

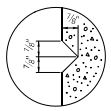


ELEVATION

*Expansion Joint Material:
AASHTO M153
Type-I Sponge Rubber



PLAN OF SUPERSTRUCTURE SLAB



RUSTICATION GROOVE

REVISION DATE: 08/11/2025
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — DATE: 08-11-2025

APPROVED — STATE HIGHWAY ENGINEER — DATE: 08-11-2025

BRIDGE STANDARDS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

35° SKEW SUPPORT VARIABLE WIDTH ABUTMENT PARALLEL WINGS

STANDARD DRAWING NUMBER
BSA-055-01

OpenRoads Designer v23.00.01.11

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

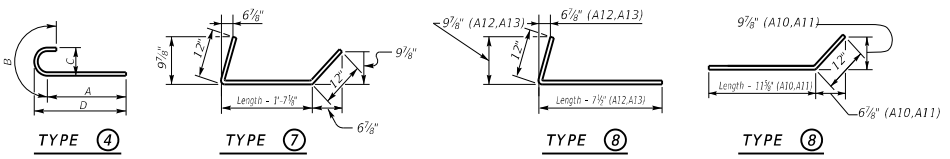
Bill of Reinforcement

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	
H	No.	Size	Length ft.	Length in.	Spacing	No.	Size	Length ft.	Length in.	Spacing	No.	No.	No.	Length ft.	Length in.	= or +	Lb	No.	Size	Length ft.	Length in.	Spacing	A ft.	A in.	B ft.	B in.	C ft.	C in.	D ft.	D in.	No.	Size	Length ft.	Length in.	Spacing	No.	Size	Length ft.	Length in.	Spacing	No.	Size	Length ft.	Length in.	Spacing	No.	No.	No.	No.	No.	Length ft.	Length in.	Spacing	No.	No.	Length ft.	Length in.	= or +	Lb	No.	Length ft.	No.	Length ft.	No.	Length ft.
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	1⅛	1	10	0	11¾	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	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	10½	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	8½	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	8½	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 Length ft.	W Length in.	N Length ft.	N Length in.	M2 Length ft.	M2 Length in.	M3 Length ft.	M3 Length in.	T2 Length ft.	T2 Length in.	T3 Length ft.	T3 Length in.	L2 Length ft.	L3 Length ft.	S2 Length ft.	S2 Length in.	S2 + Lb/2 =	S3 Length ft.	S3 Length in.	S3 + Lb/2 =
15–16	12	0	5	0	32	5¾	40	6	22	8⅞	28	4⅜	36	36	12	3⅛	+0.5Lb=	12	3⅛	+0.5Lb=
13–14	11	0	4	6	28	2	35	7½	19	8⅜	24	11⅜	31	31	11	7¾	+0.5Lb=	11	7¾	+0.5Lb=
11–12	10	0	4	0	23	10¼	30	8⅞	16	8½	21	6¼	26	26	11	½	+0.5Lb=	11	½	+0.5Lb=
9–10	9	0	3	6	19	6⅝	25	10¼	13	8¼	18	1¼	21	21	10	5⅛	+0.5Lb=	10	5⅛	+0.5Lb=
7–8	7	6	2	9	15	11⅜	21	4¾	11	2	14	11⅞	17	17	9	6⅛	+0.5Lb=	9	6⅛	+0.5Lb=
5–6	6	6	2	3	11	7¾	16	6¼	8	1⅞	11	6¾	12	12	8	10⅞	+0.5Lb=	8	10⅞	+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) =

*Concrete quantities computed using 21" beam depth on ½" 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.*

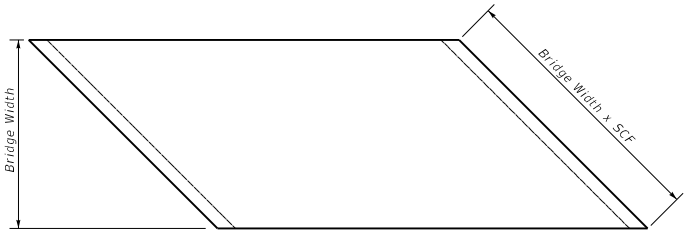
FOUNDATION PRESSURE: *Construct abutment footings on solid rock bearing material that can support a pressure of 8000 psf service or 10,800 psf strength factored as recommended by a geotechnical engineer.*

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

KENTUCKY
DEPARTMENT OF HIGHWAYS

35° SKEW VARIABLE WIDTH ABUTMENT PARALLEL WINGS

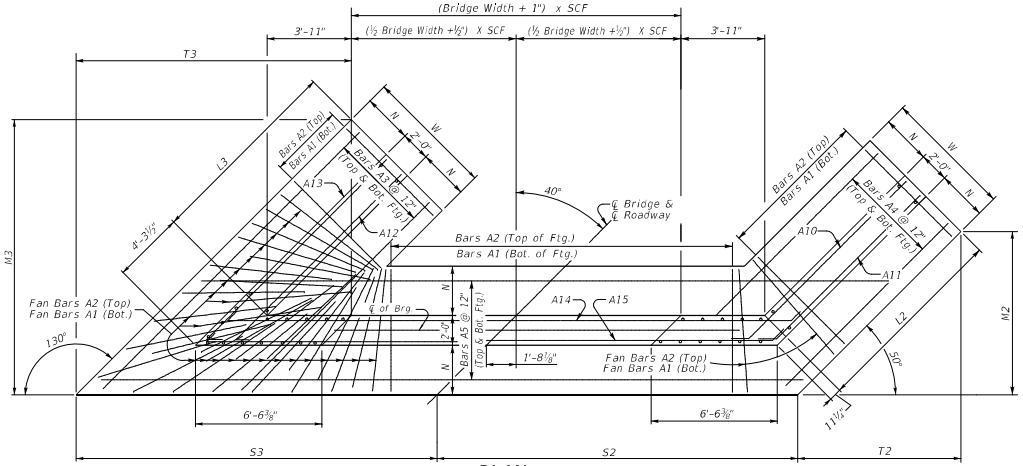
STANDARD DRAWING NO. *BSA-056*

SUBMITTED _____ 02-26-20
DIRECTOR DIVISION OF STRUCTURAL DESIGN — DATE

APPROVED _____ 02-26-20
STATE HIGHWAY ENGINEER — DATE

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

ABUTMENT SKEW CORRECTION FACTOR (SCF) = 1.305

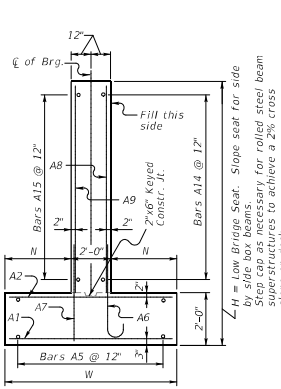


PLAN

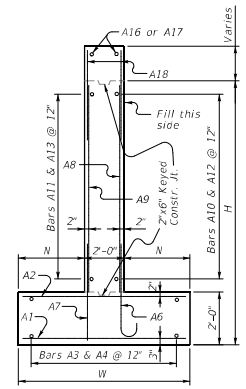
(Left Skew as shown; right skew opp. hand)

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

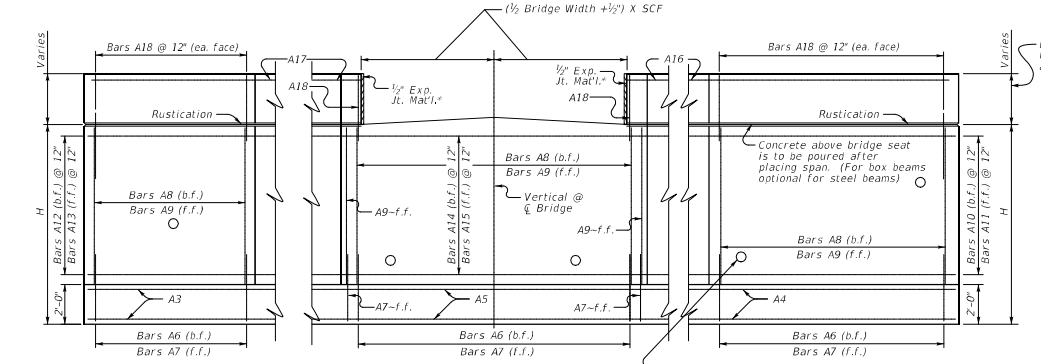
For fanning A1 & A2 bars with an acute angle, space @ 12" at face of toe, then as you get closer to the corner start pulling every other bar back toward the heel. (Similar to as shown)



WALL SECTION

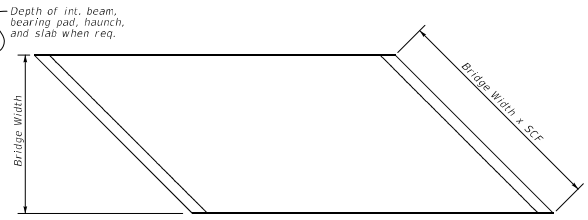


WING SECTION

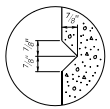


ELEVATION

*Expansion Joint Material:
AASHTO M153
Type-I Sponge Rubber



PLAN OF SUPERSTRUCTURE SLAB



RUSTICATION GROOVE

REVISION DATE: 08/11/2025
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — DATE: 08-11-2025
APPROVED — STATE HIGHWAY ENGINEER — DATE: 08-11-2025

BRIDGE STANDARDS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

40° SKEW SUPPORT VARIABLE WIDTH ABUTMENT PARALLEL WINGS

STANDARD DRAWING NUMBER
BSA-057-01

OpenRoads Designer v23.00.01.11

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

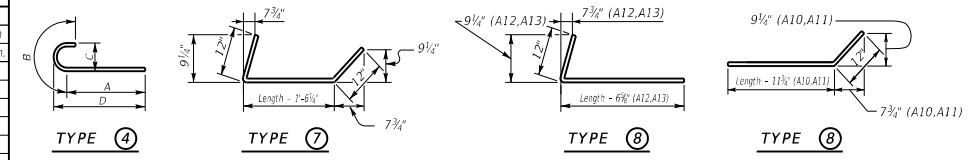
Bill of Reinforcement

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	
H	No.	Size	Length ft.	Length in.	Spacing	No.	Size	Length ft.	Length in.	Spacing	No.	No.	No.	Length ft.	Length in.	= +Lb	No.	Size	Length ft.	Length in.	Spacing	A ft.	A in.	B ft.	B in.	C ft.	C in.	D ft.	D in.	No.	Size	Length ft.	Length in.	Spacing	No.	Size	Length ft.	Length in.	Spacing	No.	Length ft.	Length in.	No.	No.	No.	No.	No.	Length ft.	Length in.	= +Lb	Length ft.	Length in.	No.	Length ft.	Length in.	No.	Length ft.	Length in.	No.	Length ft.	Length in.
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	⅛	1	10	0	11¾	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	10½	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	8½	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	8½	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 Length ft.	W Length in.	N Length ft.	N Length in.	M2 Length ft.	M2 Length in.	M3 Length ft.	M3 Length in.	T2 Length ft.	T2 Length in.	T3 Length ft.	T3 Length in.	L2 Length ft.	L3 Length ft.	S2 Length ft.	S2 Length in.	S2 + Lb/2 =	S3 Length ft.	S3 Length in.	S3 + Lb/2 =
15–16	12	0	5	0	31	7⅜	40	7¼	26	6¼	34	⅞	38	38	13	1¼	+0.5Lb=	13	1¼	+0.5Lb=
13–14	11	0	4	6	27	7¼	35	11½	23	1⅞	30	2⅛	33	33	12	5½	+0.5Lb=	12	5½	+0.5Lb=
11–12	10	0	4	0	23	7⅛	31	3⅝	19	9½	26	3¼	28	28	11	9⅝	+0.5Lb=	11	9⅝	+0.5Lb=
9–10	9	0	3	6	19	7	26	7⅞	16	5¼	22	4⅜	23	23	11	1⅜	+0.5Lb=	11	1¾	+0.5Lb=
7–8	7	6	2	9	15	5⅞	21	7⅛	12	11⅞	18	1⅜	18	18	10	2	+0.5Lb=	10	2	+0.5Lb=
5–6	6	6	2	3	11	5¾	16	11¼	9	7½	14	2⅝	13	13	9	6¼	+0.5Lb=	9	6¼	+0.5Lb=

Reinforcement Details



Quantities

H	Concrete* C.Y.	Reinforcement 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 ½" 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.

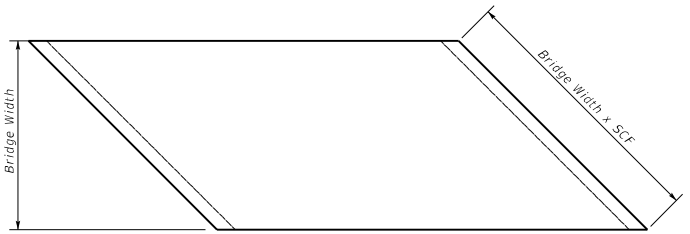
FOOTING ELEVATION: Construct bottom of footing below the anticipated scour elevation. (This typically entails embedding the footings 1'-0" to 2'-0" into rock and pouring concrete directly against cut rock faces. as recommended by geotechnical engineer.)

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

KENTUCKY
DEPARTMENT OF HIGHWAYS

40° SKEW VARIABLE WIDTH ABUTMENT PARALLEL WINGS

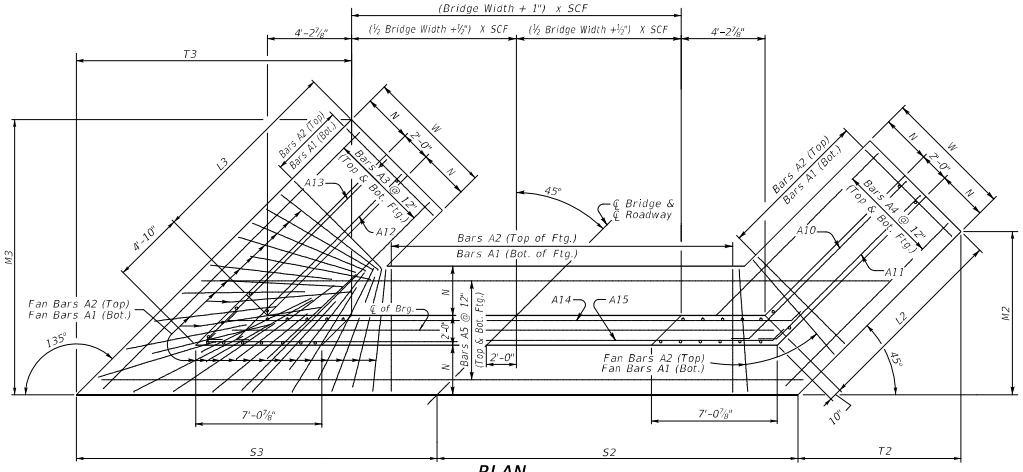
STANDARD DRAWING NO. BSA-058

SUBMITTED _____ DIRECTOR DIVISION OF STRUCTURAL DESIGN — DATE 02-26-20

APPROVED _____ STATE HIGHWAY ENGINEER — DATE 02-26-20

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

ABUTMENT SKEW CORRECTION FACTOR (SCF) = 1.414

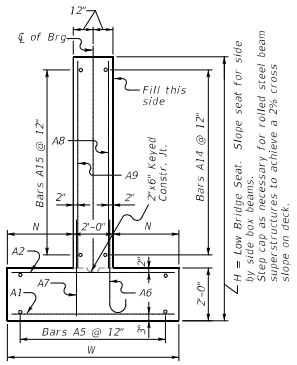


(Left Skew as shown; right skew opp. hand)

PLAN

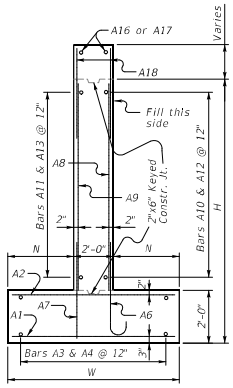
NOTE: Trim A16 & A17 bars if necessary
Trim A3 bars as necessary

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)

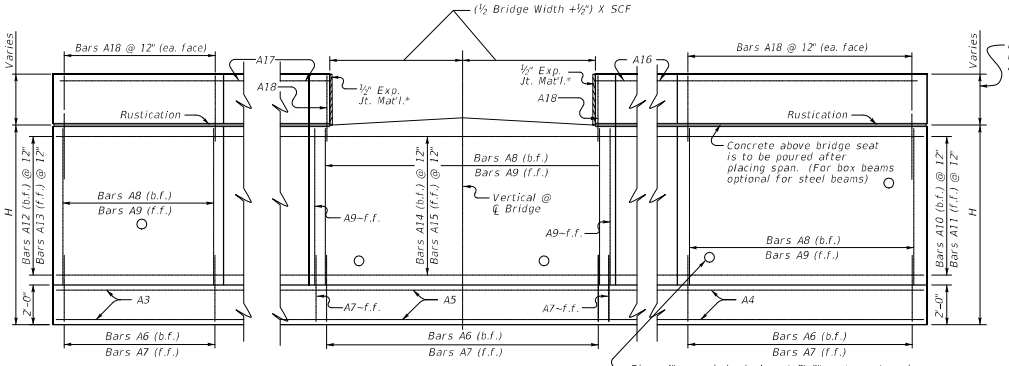


H = Low Bridge Seat. Slope seat for side by side box beams. Step cap as necessary for rolled steel beam superstructures to achieve a 2% cross slope on deck.

WALL SECTION

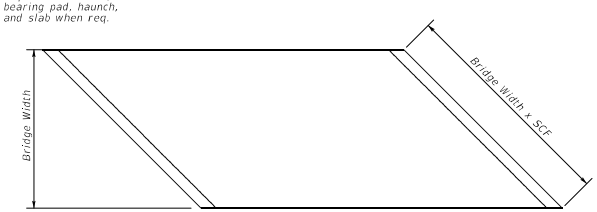


WING SECTION

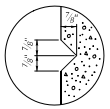


ELEVATION

*Expansion Joint Material:
AASHTO M153
Type-I Sponge Rubber



PLAN OF SUPERSTRUCTURE SLAB



RUSTICATION GROOVE

REVISION DATE: 08/11/2025
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — DATE: 08-11-2025
APPROVED — STATE HIGHWAY ENGINEER — DATE: 08-11-2025

BRIDGE STANDARDS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

45° SKEW SUPPORT VARIABLE WIDTH ABUTMENT PARALLEL WINGS

STANDARD DRAWING NUMBER
BSA-059-01

OpenRoads Designer v23.00.01.11

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

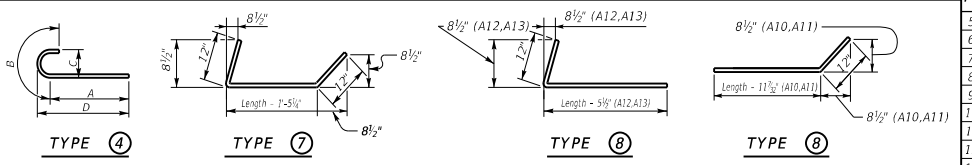
Bill of Reinforcement

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	
H	No.	Size	Length ft.	Length in.	Spacing	No.	Size	Length ft.	Length in.	Spacing	No.	Length ft.	No.	Length ft.	No.	Length ft.	= +Lb=	Length ft.	No.	Size	Length ft.	Length in.	Spacing	A ft.	A in.	B ft.	B in.	C ft.	C in.	D ft.	D in.	No.	Size	Length ft.	Length in.	Spacing	No.	Size	Length ft.	Length in.	Spacing	No.	Size	Length ft.	Length in.	Spacing	No.	Length ft.	Length in.	No.	Length ft.	Length in.	No.	Length ft.	Length in.	No.	Length ft.	Length in.	No.	Length ft.	Length in.	= +Lb=	Length ft.	Length in.	No.	Length ft.	No.	Length ft.	No.	Length ft.	Length in.
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	⅛	1	10	0	11¾	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	10½	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	8½	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	8½	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 Length ft.	W Length in.	N Length ft.	N Length in.	M2 Length ft.	M2 Length in.	M3 Length ft.	M3 Length in.	T2 Length ft.	T2 Length in.	T3 Length ft.	T3 Length in.	L2 Length ft.	L3 Length ft.	S2 Length ft.	S2 Length in.	S2 + Lb/2 =	S3 Length ft.	S3 Length in.	S3 + Lb/2 =
15–16	12	0	5	0	31	½	40	11¼	31	½	40	11¼	41	41	14	2⅜	+0.5Lb=	14	2⅜	+0.5Lb=
13–14	11	0	4	6	27	4⅜	36	6⅜	27	4⅜	36	6⅜	36	36	13	5⅛	+0.5Lb=	13	5⅛	+0.5Lb=
11–12	10	0	4	0	22	11⅝	31	5½	22	11⅝	31	5½	30	30	12	9½	+0.5Lb=	12	9½	+0.5Lb=
9–10	9	0	3	6	19	3½	27	¾	19	3½	27	¾	25	25	12	1	+0.5Lb=	12	1	+0.5Lb=
7–8	7	6	2	9	14	9⅞	21	6½	14	9⅞	21	6½	19	19	11	¼	+0.5Lb=	11	¼	+0.5Lb=
5–6	6	6	2	3	11	1¾	17	1⅞	11	1¾	17	1⅞	14	14	10	3¾	+0.5Lb=	10	3¾	+0.5Lb=

Reinforcement Details



Quantities

H	Concrete* C.Y.	Reinforcement 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) =

*Concrete quantities computed using 21" beam depth on ½" pad & Variable Bridge Width

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.*

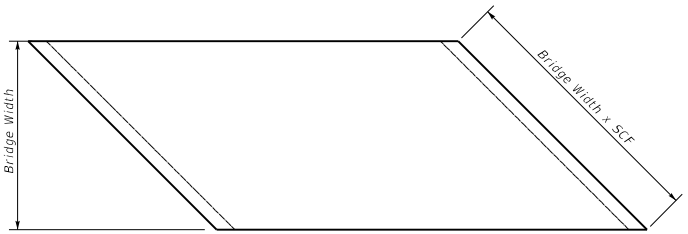
FOUNDATION PRESSURE: *Construct abutment footings on solid rock bearing material that can support a pressure of 8000 psf service or 10,800 psf strength factored as recommended by a geotechnical engineer.*

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



PLAN OF SUPERSTRUCTURE SLAB

KENTUCKY
DEPARTMENT OF HIGHWAYS

45° SKEW VARIABLE WIDTH ABUTMENT PARALLEL WINGS

STANDARD DRAWING NO. BSA-060

SUBMITTED _____ DIRECTOR DIVISION OF STRUCTURAL DESIGN — DATE 02-26-20

APPROVED _____ STATE HIGHWAY ENGINEER — DATE 02-26-20

0° SKEW 16'-0" – 17'-6" BRIDGE WIDTH 2:1 FILL SLOPES

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	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11	A12	A13	A14	A15	A16	A17	A18
15'-16"	68 10 11 8	12 68	7 11 8	12 24 24	0 24 24	0 24 29 10	66 9 9	11 12 8	1 10 0	11⅜ 8	6 69	5 4 11	12 66	6 12 10	12 69	12 10 12	14 24	0 14 22
14'-14"	64 9 10 8	12 64	7 10 8	12 22 20	9 22 20	9 22 29 5	60 8 8	3 12 6	1 1 3	0 8 7	3 63	5 4 11	12 60	6 10 10	12 63	10 10 12	12 21	0 12 19
13'-13"	61 8 9 8	12 61	6 9 8	12 20 18	7 20 18	7 20 29 0	56 7 7	1 12 5	10½ 1	2 0 7	6 2 59	5 4 11	12 56	5 8 10	12 59	8 10 12	10 19	0 10 17
12'-12"	57 7 8 8	12 57	5 8 8	12 18 16	4 18 16	4 18 28 7	52 6 6	1 12 5	1 1 0	0 6 5	4 55	5 4 11	12 52	5 6 10	12 55	6 10 12	8 17	0 8 15
11'-11"	53 7 7 8	12 53	5 7 8	12 16 14	3 16 14	3 16 27 6	48 6 5	1 12 5	9½ 1	1 0 6	4 51	5 4 11	12 48	5 4 10	12 51	4 10 12	7 16	0 7 14
10'-10"	49 6 6 8	12 49	4 6 8	12 14 12	2 14 12	2 14 27 5	44 5 5	1 12 4	8½ 0	10 0 5	4 47	5 4 11	12 44	5 4 10	12 47	4 10 12	6 13	0 6 11
9'-9"	45 6 5 8	12 45	4 5 8	12 12 10	2 12 10	2 12 27 4	40 5 5	1 12 4	8½ 0	10 0 5	4 43	5 4 11	12 40	5 2 10	12 43	2 10 12	4 11	0 4 9
8'-8"	41 5 5 8	12 41	4 4 8	12 10 8	2 10 8	2 10 27 3	36 4 4	1 12 4	7½ 0	9 0 5	4 39	5 4 11	12 36	5 2 10	12 39	2 9 12	4 9	0 4 7
7'-7"	37 5 4 8	12 37	3 4 8	12 8 6	2 8 6	2 8 27 2	32 4 3	1 12 4	7½ 0	8 0 4	4 35	5 4 11	12 32	5 2 10	12 35	2 8 12	4 7	0 4 7
6'-6"	33 4 4 8	12 33	3 3 8	12 6 4	2 6 4	2 6 27 2	28 3 3	1 12 4	6½ 0	7 0 4	4 31	5 4 11	12 28	5 2 10	12 31	2 7 12	4 6	0 4 6
5'-6"	29 4 3 8	12 29	3 3 8	12 6 4	2 6 4	2 6 27 2	24 3 3	1 12 4	6½ 0	7 0 4	4 27	5 4 11	12 24	5 2 10	12 27	2 6 12	4 6	0 4 6

Reinforcement Details

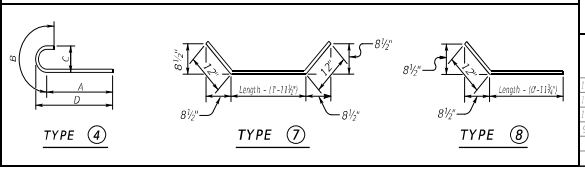
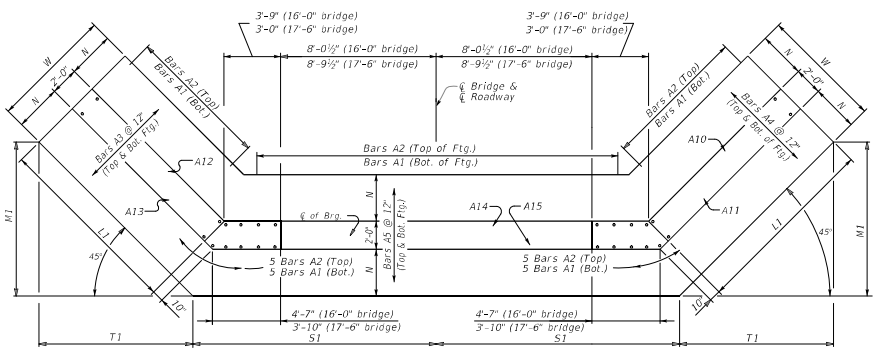


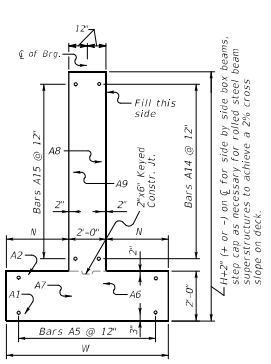
Table of Dimensions

H	W Length	N1 Length	M1 Length	S1 Ft.	S1 In.	T1 Length Ft.	T1 Length In.	L1 Length
15'-16"	12 0	5 0	16 10½	14	8½	16	10½	21
13'-14"	11 0	4 6	14 7⅝	14	5½	14	7⅝	18
11'-12"	10 0	4 0	13 ¾	14	3½	13	¾	16
9'-10"	9 0	3 6	11 6½	14	⅞	11	6½	14
7'-8"	7 6	2 9	9 5½	13	9½	8	5½	10
5'-6"	6 6	2 3	6 10⅝	13	6½	6	10⅝	8

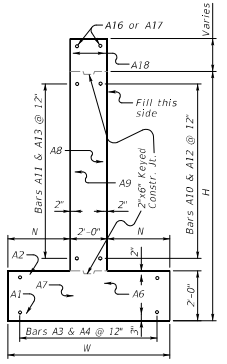
4 foot min. shoulder



PLAN



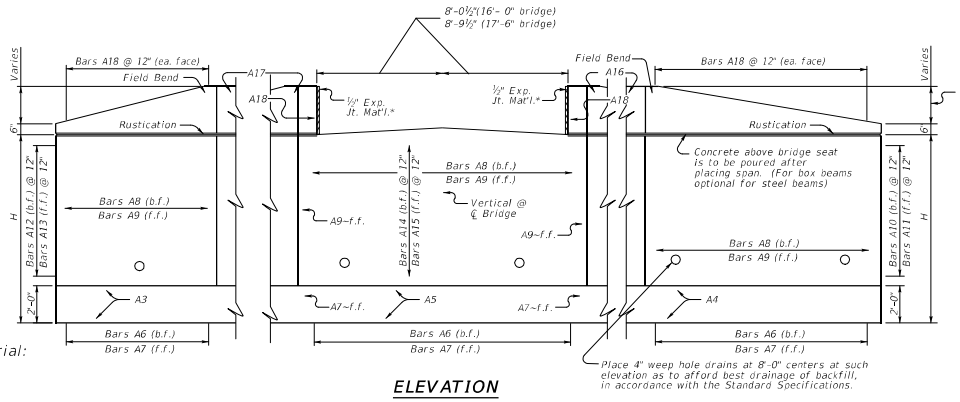
WALL SECTION



WING SECTION

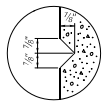
Quantities		
H	Concrete* C.Y.	Reinforcement LBS.
5	32.3	2801
6	35.3	2801
7	45.5	3843
8	48.9	3843
9	67.6	5792
10	71.5	5792
11	85.4	8010
12	89.7	8010
13	105.1	11097
14	109.6	11097
15	130.4	14634
16	135.4	14634

*Concrete quantities computed using 21" beam depth on ½" pad & 16'-0" Bridge Width



ELEVATION

*Expansion Joint Material:
AASHTO M153
Type-I Sponge Rubber



RUSTICATION GROOVE

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 17'-6" rolled steel beam bridge width.

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

NOTE: Trim A16 & A17 bars if necessary

REVISION DATE: 08/11/2025
REVISION NUMBER: 0

SUBMITTED: Michael Cupp 08-11-2025
DIVISION DIRECTOR — DATE

APPROVED: James Ballinger 08-11-2025
STATE HIGHWAY ENGINEER — DATE

BRIDGE STANDARDS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

0° SKEW 16'-0"-17'6" BRIDGE WIDTH 2:1 FILL SLOPES 4'-0" MIN. SHOULDER

STANDARD DRAWING NUMBER
BSA-101-01

OpenRoads Designer v23.00.01.11

0° SKEW 24'-0" - 25'-6" BRIDGE WIDTH 2:1 FILL SLOPES

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. Shape	No. Size Length Ft. In. Shape	No. Size Length Ft. In. Shape	No. Size Length Ft. In. Shape	No. Size Length Ft. In. Shape	No. Size Length Ft. In. Shape A B C D	No. Size Length Ft. In. Shape	No. Size Length Ft. In. Shape	No. Size Length Ft. In. Shape	No. Size Length Ft. In. Shape	No. Size Length Ft. In. Shape	No. Size Length Ft. In. Shape	No. Size Length Ft. In. Shape	No. Size Length Ft. In. Shape	No. Size Length Ft. In. Shape	No. Size Length Ft. In. Shape	No. Size Length Ft. In. Shape	No. Size Length Ft. In. Shape
15-16	76 10 11 8	12 76 7 11 8	12 24 24 0	24 24 0	24 37 10	74 9 9 11 12 8	6 7 10 0	11⅜ 8 6	77 5 4 11 12	74 6 12 10 12	77 12 10 12 12	24 0 14 24 0	14 27 7	14 37 11	14 25 0	2 26 4	2 26 4	108 5 9
13-14	72 9 10 8	12 72 7 10 8	12 22 20 9	22 20 9	22 37 5	68 8 8 3 12 6	11 7 3 0	8 7 3	71 5 4 11 12	68 6 10 10 12	71 10 10 12 12	21 0 12 19 7	12 21 0	12 19 7	12 37 11	12 25 0	2 23 4	2 23 4	96 5 9
11-12	69 8 9 8	12 69 6 9 8	12 20 18 7	20 18 7	20 37 0	64 7 7 1 12 5	10½ 7 2 0	7 6 2	67 5 4 11 12	64 5 8 10 12	67 8 10 12 10	19 0 10 17 7	10 19 0	10 17 7	10 37 11	10 25 0	2 21 4	2 21 4	88 5 9
9-10	65 7 8 8	12 65 5 8 8	12 18 16 4	18 16 4	18 36 7	60 6 6 1 12 5	1 7 0 0	6 5 4	63 5 4 11 12	60 5 6 10 12	63 6 10 12 8	17 0 8 15 7	8 17 0	8 15 7	8 38 0	8 35 0	2 19 4	2 19 4	80 5 9
7-8	58 6 7 2	12 58 5 7 2	12 16 14 9	16 14 9	16 35 6	52 5 5 7 12 4	8½ 6 0 0	5 4	55 5 4 11 12	52 5 4 10 12	55 4 10 12 6	13 0 6 11 7	6 13 0	6 11 7	6 38 0	6 35 0	2 15 4	2 15 4	64 5 9
5-6	56 5 6 2	12 56 5 6 2	12 14 12 9	14 12 9	14 35 1	48 5 5 7 12 4	8½ 6 0 0	5 4	51 5 4 11 12	48 5 2 10 12	51 2 10 12 4	11 0 4 9 7	4 11 0	4 9 7	4 38 0	4 35 0	2 13 4	2 13 4	56 5 9

Reinforcement Details

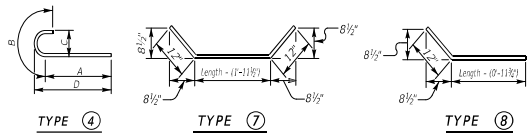
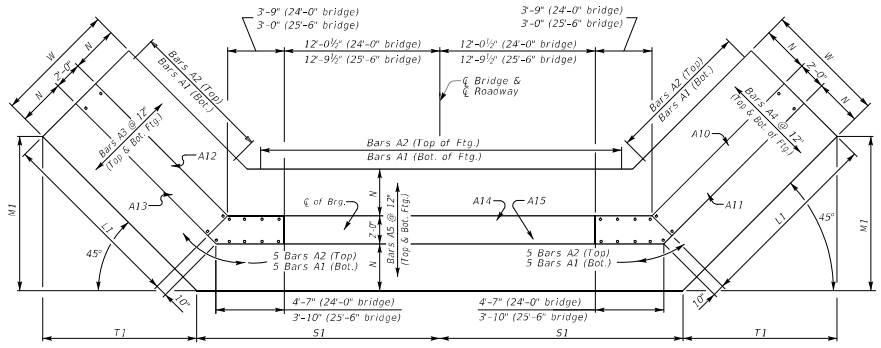


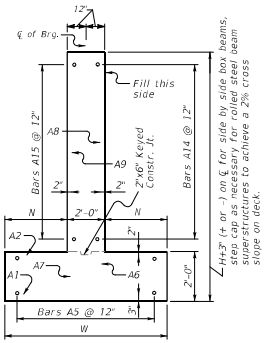
Table of Dimensions

H	W Length Ft. In.	N Length Ft. In.	W1 Length Ft. In.	S1 Length Ft. In.	T1 Length Ft. In.	L1 Length Ft.
15-16	12 0	5 0	16 10½	18 8½	16 10½	21
13-14	11 0	4 6	14 7⅝	18 5½	14 7⅝	18
11-12	10 0	4 0	13 3⅞	18 3⅝	13 3⅞	16
9-10	9 0	3 6	11 6⅝	18 ⅞	11 6⅝	14
7-8	7 6	2 9	9 8	5½	8 5½	10
5-6	6 6	2 3	6 10½	17 6⅝	6 10½	8

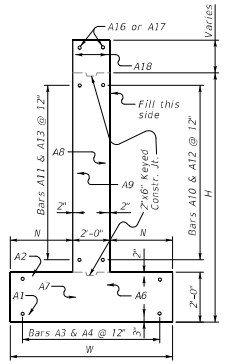
4 foot min. shoulder



PLAN



WALL SECTION



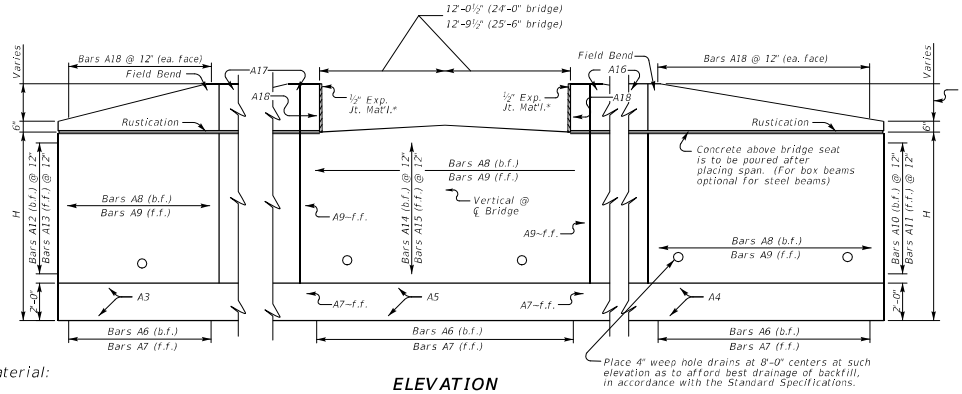
WING SECTION

Quantities

H	Concrete* C.Y.	Reinforcement LBS.
5	38	3223
6	41.7	3223
7	53.1	4392
8	57	4392
9	77.2	6520
10	81.7	6520
11	96.8	8974
12	101.7	8974
13	118.2	12385
14	123.4	12385
15	145.4	16223
16	150.9	16223

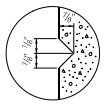
*Concrete quantities computed using 21" beam depth on ½" pad & 24'-0" Bridge Width

NOTE: Trim A16 & A17 bars if necessary



ELEVATION

*Expansion Joint Material:
AASHTO M153
Type-I Sponge Rubber



RUSTICATION GROOVE

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 25'-6" rolled steel beam bridge width.

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

REVISION DATE: 08/11/2025
REVISION NUMBER: 0

SUBMITTED: Michael Cupp 08-11-2025
DIVISION DIRECTOR DATE

APPROVED: Jason Ballinger 08-11-2025
STATE HIGHWAY ENGINEER DATE

BRIDGE STANDARDS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

0° SKEW 24'-0" - 25'-6" BRIDGE WIDTH ABUTMENT 2:1 FILL SLOPES, 4'-0" MIN. SHOULDER

STANDARD DRAWING NUMBER
BSA-102-01

OpenRoads Designer v23.00.01.11

0° SKEW 32'-0" - 33'-6" BRIDGE WIDTH 2:1 FILL SLOPES

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 | A1 Wt. | A1 Str. | A1 Length ft | A1 Length in | A2 Wt. | A2 Str. | A2 Length ft | A2 Length in | A3 Wt. | A3 Str. | A3 Length ft | A3 Length in | A4 Wt. | A4 Str. | A4 Length ft | A4 Length in | A5 Wt. | A5 Str. | A5 Length ft | A5 Length in | A6 Wt. | A6 Str. | A6 Length ft | A6 Length in | A6 A | A6 B | A6 C | A6 D | A7 Wt. | A7 Str. | A7 Length ft | A7 Length in | A8 Wt. | A8 Str. | A8 Length ft | A8 Length in | A9 Wt. | A9 Str. | A9 Length ft | A9 Length in | A10 Wt. | A10 Str. | A10 Length ft | A10 Length in | A11 Wt. | A11 Str. | A11 Length ft | A11 Length in | A12 Wt. | A12 Str. | A12 Length ft | A12 Length in | A13 Wt. | A13 Str. | A13 Length ft | A13 Length in | A14 Wt. | A14 Str. | A14 Length ft | A14 Length in | A15 Wt. | A15 Str. | A15 Length ft | A15 Length in | A16 Wt. | A16 Str. | A16 Length ft | A16 Length in | A17 Wt. | A17 Str. | A17 Length ft | A17 Length in | A18 Wt. | A18 Str. | A18 Length ft | A18 Length in |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---

15° SKEW 16'-0" - 17'-6" BRIDGE WIDTH 2:1 FILL SLOPES

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. Str. Length Skew	No. Str. Length Skew	No. Str. Length Skew	No. Str. Length Skew	No. Str. Length Skew	No. Str. Length A B C D Skew	No. Str. Length Skew	No. Str. Length Skew	No. Str. Length Skew	No. Str. Length Skew	No. Str. Length Skew	No. Str. Length Skew	No. Str. Length Skew	No. Str. Length Skew	No. Str. Length Skew	No. Str. Length Skew	No. Str. Length Skew	No. Str. Length Skew
15'-16'	70 10 11 8 12	70 7 11 8 12	24 21 5	24 26 7	24 30 7	67 9 9 11 12 8	5/8 1 10 0 11 3/8 8 6	70 5 4 11 12	67 6 12 10 12	70 12 10 12 12	24 27 4 14	25 6 14 20 10	14 19 9	14 30 10 14	27 10 2	29 8 2	23 3 1	10 5 9
13'-14'	65 9 10 8 12	65 7 10 8 12	22 19 2	27 23 5	22 30 7	62 8 8 3 12	6 11 1 3 0 8 7 3	65 5 4 11 12	62 6 10 10 12	65 10 10 12 12	24 4 12 22 6	12 18 10 12	17 9	12 30 11 12	27 10 2	26 8 2	21 3 1	00 5 9
11'-12'	62 8 9 8 12	62 6 9 8 12	20 16 1	20 20 3	20 29 9	57 7 7 1 12	5 10½ 1 2 0 7 6 2	60 5 4 11 12	57 5 8 10 12	60 8 10 12 10	21 4 10	19 6 10 16	10 10	15 9	10 30 11	10 27 10	2 23 8	2 19 3	90 5 9
9'-10'	56 7 8 8 12	56 5 8 8 12	18 17 1	18 29 4	51 6 6 1 12	5 1 1 0 0 6 5 4	54 5 4 11 12	51 5 6 10 12	54 6 10 12 8	18 4 8 16 6	8 13 10 8	12 9	8 30 11	8 27 10	2 20 8	2 16 3	78 5 9	
7'-8'	52 6 7 2 12	52 5 7 2 12	16 12 6	16 28 4	45 5 5 7 12	4 8½ 0 10 0	5 4 11	48 5 4 11 12	45 5 4 10 12	48 4 10 12 6	14 4 6 12 6	6 11 10 6	10 9	6 30 11	6 27 10	2 16 8	2 14 3	66 5 9
5'-6'	48 5 6 2 12	48 5 6 2 12	14 10 4	14 27 11	41 5 5 7 12	4 8½ 0 10 0	5 4 11	44 5 4 11 12	41 5 2 10 12	44 2 10 12 4	12 4 4 10 6	4 9 10 4	8 9	4 30 11	4 27 10	2 14 8	2 12 3	58 5 9

Reinforcement Details

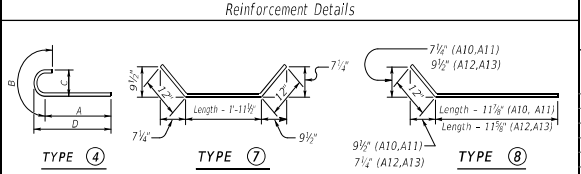


Table of Dimensions

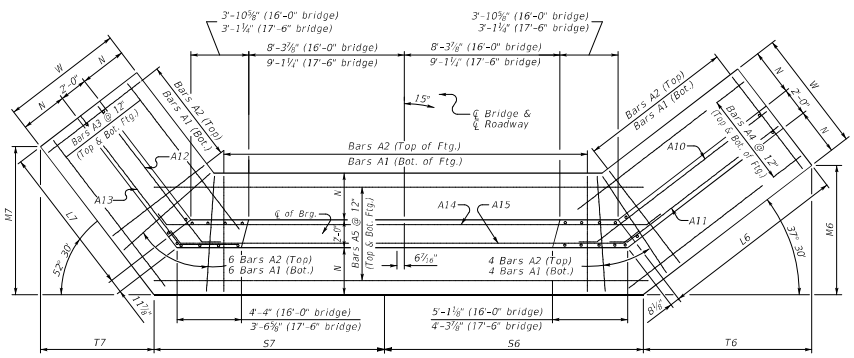
H	W	N	M6	M7	S6	S7	T6	T7	L6	L7
	Length Ft. In.	Length Ft. In.	Length Ft. In.	Length Ft. In.	Length Ft. In.	Length Ft. In.	Length Ft. In.	Length Ft. In.	Length Ft.	Length Ft.
15'-16'	12 0	5 0	16 ⅜	17 ¼	16 5½	13 9⅜	20 11¼	13 ¾	24	18
13'-14'	11 0	4 6	14 1⅞	15 2⅛	16 1⅞	13 8	18 4⅛	11 8⅛	21	16
11'-12'	10 0	4 0	12 2⅜	13 5⅛	15 10¼	13 6⅛	15 10½	10 3⅛	18	14
9'-10'	9 0	3 6	10 3⅛	10 8½	15 6⅜	13 5⅛	13 4⅝	8 4⅛	15	11
7'-8'	7 6	2 9	7 8⅛	9 0	15 1⅛	13 3⅛	10 ⅝	6 10¼	11	9
5'-6'	6 6	2 3	6 4¼	7 2⅛	14 9½	13 2	8 3⅛	5 6⅛	9	7

REVISION DATE: 08/11/2025
REVISION NUMBER: 0

SUBMITTED: Michael Cooper, DIVISION DIRECTOR — DATE: 08-11-2025
APPROVED: Jason Ballinger, STATE HIGHWAY ENGINEER — DATE: 08-11-2025

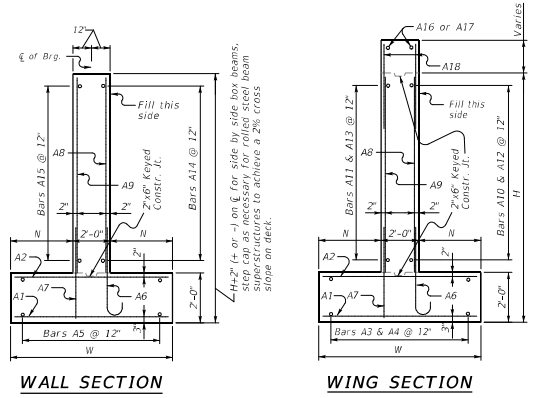
BRIDGE STANDARDS

4 foot min. shoulder



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

PLAN

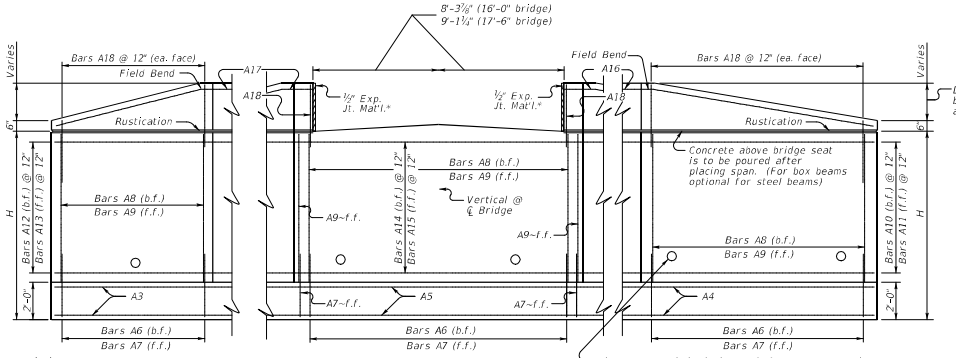


WALL SECTION **WING SECTION**

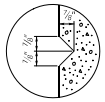
NOTE: Trim A16 & A17 bars if necessary

Quantities		
H	Concrete* C.Y.	Reinforcement Lbs.
5	32.9	2852
6	36	2852
7	46.4	3942
8	49.8	3942
9	66	5682
10	69.9	5682
11	86.7	8139
12	91	8139
13	108.2	11385
14	112.9	11385
15	132	14911
16	137.1	14911

*Concrete quantities computed using 21" beam depth on ½" pad & 16'-0" Bridge Width.



ELEVATION



RUSTICATION GROOVE

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 17'-6" rolled steel beam bridge width.

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

*Expansion Joint Material:
AASHTO M153
Type-I Sponge Rubber

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

15° SKEW 16'-0" - 17'-6" BRIDGE WIDTH ABUTMENT 2:1 FILL SLOPES, 4'-0" MIN. SHOULDER

STANDARD DRAWING NUMBER
BSA-104-01

OpenRoads Designer v23.00.01.11

15° SKEW 24'-0" - 25'-6" BRIDGE WIDTH 2:1 FILL SLOPES

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	No. Size	No. Size	No. Size	No. Size	No. Size Length A B C D	No. Size	No. Size	No. Size Length	No. Size Length	No. Size Length	No. Size Length	No. Size Length	No. Size Length	No. Size Length	No. Size Length	No. Size Length	No. Size Length
5'-10"	78 10	11 8	12 78	7 11	8 12	24 21	5 24	26 7	24 38	10 75	9 9	11 12	8 ⅛	1 10	0 11⅜	8 6	79	5 4
6'-1"	73 9	10 8	12 73	7 10	8 12	22 19	2 22	23 5	22 38	5 70	8 8	3 12	6 11	1 3	0 8	7 3	74	5 4
7'-1"	70 8	9 8	12 70	6 9	8 12	20 16	11 20	20 3	20 38	0 65	7 7	1 12	5 10½	1 2	0 7	6 2	69	5 4
8'-1"	64 7	8 8	12 64	5 8	8 12	18 13	8 18	17 1	18 37	7 59	6 6	1 12	5 1	1 1	0 0	6 5	63	5 4
9'-1"	60 6	7 7	12 60	5 7	7 12	16 11	2 16	16 6	16 36	7 53	5 5	7 12	4 8½	0 10	0 5	5 4	57	5 4
10'-1"	56 5	6 6	12 56	5 6	6 12	14 8	11 14	10 4	14 36	2 49	5 5	7 12	4 8½	0 10	0 5	5 4	53	5 4

Reinforcement Details

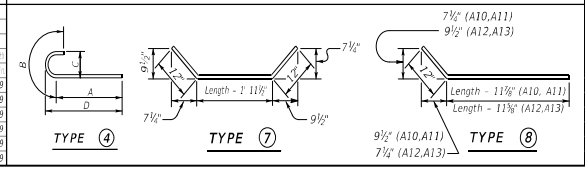
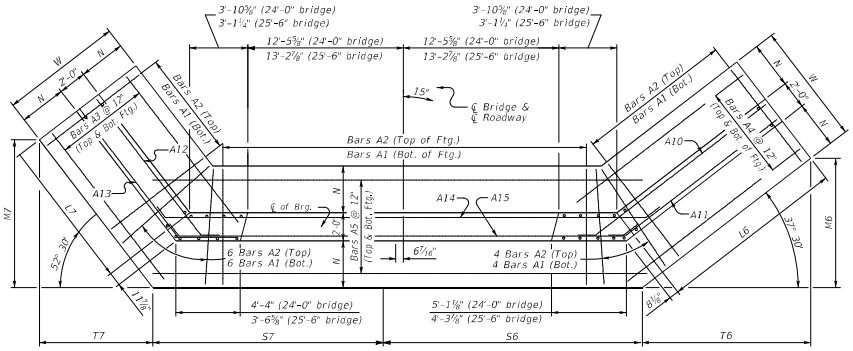


Table of Dimensions

H	W	N1	N6	M7	S6	S7	T6	T7	L6	L7
	Ft. In.	Ft. In.	Ft. In.	Ft. In.	Ft. In.	Ft. In.	Ft. In.	Ft. In.	Ft.	Ft.
5'-10"	12 0	5 0	10 6⅝	5 11	8 ⅛	7 11	8 ⅛	7 11	24	18
6'-1"	11 0	4 6	10 1½	5 2⅝	8 3½	7 10	8 3½	7 10	21	16
7'-1"	10 0	4 0	9 12	5 2⅜	8 3	7 9½	8 3	7 9½	18	14
8'-1"	9 0	3 6	9 10½	5 2⅛	8 2½	7 9	8 2½	7 9	15	11
9'-1"	8 0	3 0	9 8½	5 1⅞	8 2	7 8½	8 2	7 8½	13	9
10'-1"	7 0	2 6	9 6½	5 1⅝	8 1½	7 8	8 1½	7 8	11	9
11'-1"	6 0	2 0	9 4½	5 1⅜	8 1	7 7½	8 1	7 7½	9	7

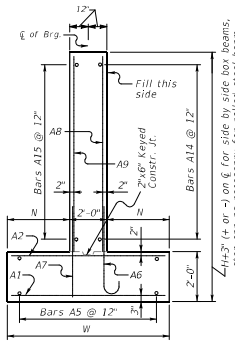
4 foot min. shoulder



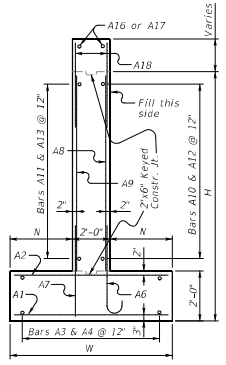
(Left Skew as shown; right skew opp. hand)

PLAN

NOTE: Trim A16 & A17 bars if necessary



WALL SECTION

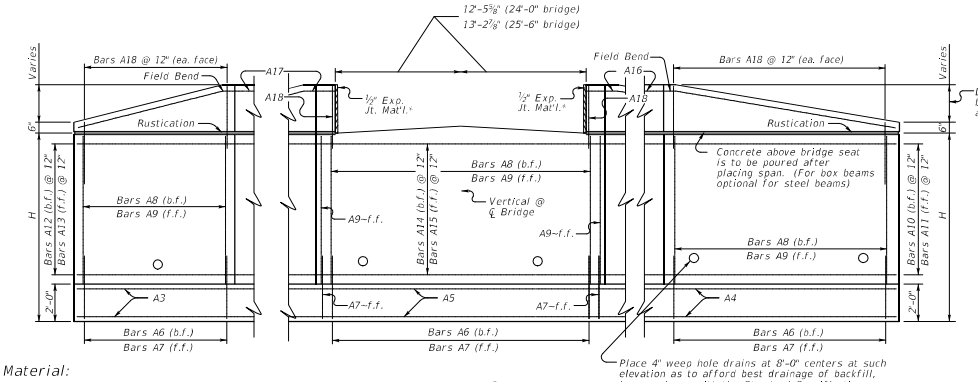


WING SECTION

Quantities

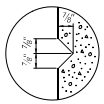
H	Concrete* C.Y.	Reinforcement LBS.
5'	38.9	3289
6'	42.6	3289
7'	54.2	4510
8'	58.2	4510
9'	76	6431
10'	80.5	6431
11'	98.5	9127
12'	103.4	9127
13'	121.9	12701
14'	127.1	12701
15'	147.5	16534
16'	153.1	16534

*Concrete quantities computed using 21" beam depth on ½" pad & 24'-0" Bridge Width



ELEVATION

*Expansion Joint Material:
AASHTO M153
Type-I Sponge Rubber



RUSTICATION GROOVE

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 25'-6" rolled steel beam bridge width.

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

REVISION DATE: 08/11/2025
REVISION NUMBER: 0

SUBMITTED: Michael Cupp 08-11-2025
DIVISION DIRECTOR DATE

APPROVED: James Ballinger 08-11-2025
STAFF HIGHWAY ENGINEER DATE

BRIDGE STANDARDS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

15° SKEW 24'-0" - 25'-6" BRIDGE WIDTH ABUTMENT 2:1 FILL SLOPES, 4'-0" MIN. SHOULDER

STANDARD DRAWING NUMBER
BSA-105-01

OpenRoads Designer v23.00.01.11

15° SKEW 32'-0" - 33'-6" BRIDGE WIDTH 2:1 FILL SLOPES

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	No. Size Length ft in	No. Size Length ft in	No. Size Length ft in	No. Size Length ft in	No. Size Length ft in A B C D	No. Size Length ft in	No. Size Length ft in	No. Size Length ft in	No. Size Length ft in	No. Size Length ft in	No. Size Length ft in	No. Size Length ft in	No. Size Length ft in	No. Size Length ft in	No. Size Length ft in	No. Size Length ft in	No. Size Length ft in
5-16	86 10 11 8	12 86	7 11 8	12 24 21	5 24 26	7 24 47 1 83	9 9 11 12 8	⅞ 1 10 0 11⅜ 8	6 87	5 4 11 12 83	6 12 10 12 87	12 10 12 14 27	4 14 25 6	14 20 10 14 19	9 14 47 5	14 44 5	2 29 8	2 23 3 110 5
13-14	82 9 10 8	12 82	7 10 8	12 22 19	2 22 23	5 22 46 8 78 8 8	3 12 6 11 1	3 0 8 7 3	82 5	4 11 12 78	6 10 10 12 82	10 10 12 12 24	4 12 22 6	12 18 10 12 17	9 12 47 5	12 44 5	2 26 8	2 21 3 100 5
11-12	78 8 9 8	12 78	6 9 8	12 20 16	11 20 20	3 20 46 3 73	7 7 1 12 5	10½ 1 2 0 7	6 2 77	5 4 11 12 73	5 8 10 12 77	8 10 12 10 21	4 10 19 6	10 16 10 10 15	9 10 47 6	10 44 5	2 23 8	2 19 3 90 5
9-10	73 7 8 8	12 73	5 8 8	12 18 13	8 18 17	1 18 45 10 67	6 6 1 12 5	1 1 1 0 0 6	5 4 71 5	4 11 12 67	5 6 10 12 71	6 10 12 8 18	4 8 16 6	8 13 10 8 12	9 8 47 6	8 44 5	2 20 8	2 16 3 78 5
7-8	68 6 7 2	12 68	5 7 2	12 16 11	2 16 12	6 16 44 10 61	5 5 7 12 4	8½ 0 10 0 5	4 11 65 5	4 11 12 61	5 4 10 12 65	4 10 12 6 14	4 6 12 6	6 11 10 6 10	9 6 47 6	6 44 5	2 16 8	2 14 3 66 5
5-6	65 5 6 2	12 65	5 6 2	12 14 8	11 14 10	4 14 44 5 57	5 5 7 12 4	8½ 0 10 0 5	4 11 61 5	4 11 12 57	5 2 10 12 61	2 10 12 4 12	4 4 10 6	4 9 10 4 8	9 6 47 6	4 44 5	2 14 8	2 12 3 58 5

Reinforcement Details

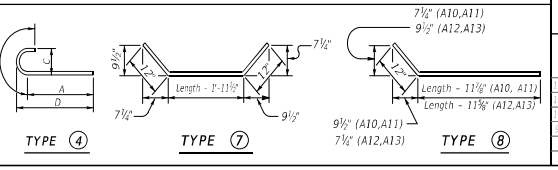
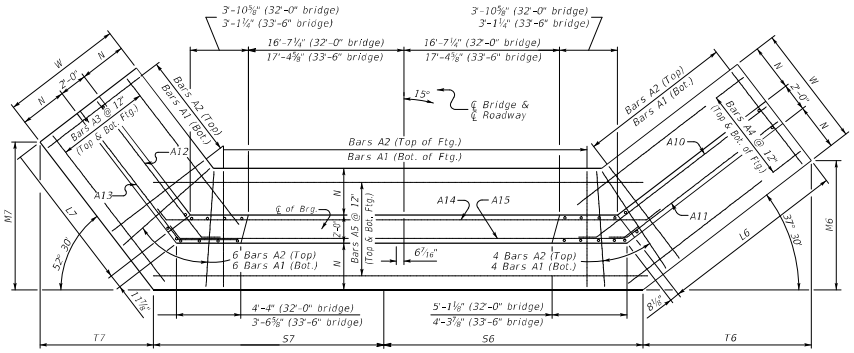


Table of Dimensions

H	W Length	N Length	W6 Length	N7 Length	S6 Length	S7 Length	T6 Length	T7 Length	L6 Length	L7 Length
	ft in	ft in	ft in	ft in	ft in	ft in	ft in	ft in	ft	ft
5-16	12 0	5 0	16 ⅜	17 ¼	24 8⅝	22 ⅜	20 1⅛	13 ⅜	24	18
13-14	11 0	4 6	14 1½	15 2⅞	24 5⅝	21 11½	18 4⅛	11 8½	21	16
11-12	10 0	4 0	12 2⅝	13 5½	24 1⅜	21 0⅛	15 10½	10 3⅝	18	14
9-10	9 0	3 6	10 3¼	10 10⅝	23 10	21 8½	13 4⅝	8 4⅝	15	11
7-8	7 6	2 9	7 8¼	9 0	23 4½	21 6½	10 ⅛	6 10¼	11	9
5-6	6 6	2 3	6 4⅛	7 2⅝	23 ⅞	21 5⅜	8 3⅜	5 6½	9	7

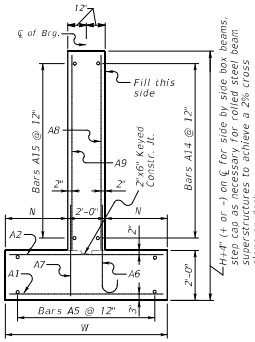
4 foot min. shoulder



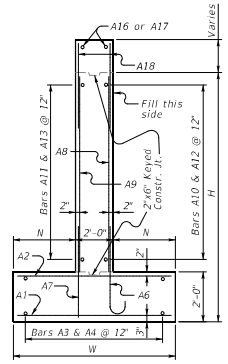
(Left Skew as shown; right skew opp. hand)

PLAN

NOTE: Trim A16 & A17 bars if necessary



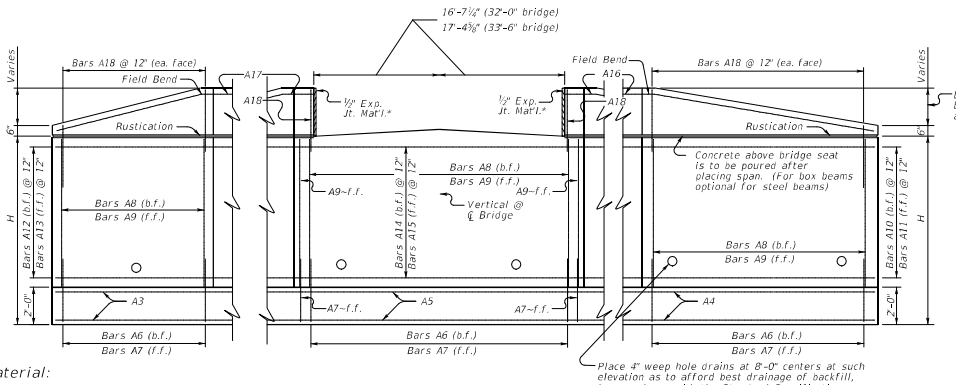
WALL SECTION



WING SECTION

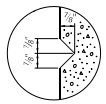
Quantities		
H	Concrete* C.Y.	Reinforcement* LBS.
5	44.9	3731
6	49.2	3731
7	62	5067
8	66.6	5067
9	86	7196
10	91.1	7196
11	110.3	10103
12	115.8	10103
13	135.5	14061
14	141.4	14061
15	163	18138
16	169.3	18138

*Concrete quantities computed using 21" beam depth on ½" pad & 32'-0" Bridge Width



*Expansion Joint Material:
AASHTO M153
Type-I Sponge Rubber

ELEVATION



RUSTICATION GROOVE

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 33'-6" rolled steel beam bridge width.

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

REVISION DATE: 08/11/2025
REVISION NUMBER: 0

SUBMITTED Michael Cupp 08-11-2025 DIVISION DIRECTOR DATE

APPROVED Jason Ballinger 08-11-2025 STATE HIGHWAY ENGINEER DATE

BRIDGE STANDARDS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

15° SKEW 32'-0" - 33'-6" BRIDGE WIDTH ABUTMENT 2:1 FILL SLOPES, 4'-0" MIN. SHOULDER

STANDARD DRAWING NUMBER
BSA-106-01

OpenRoads Designer v23.00.01.11

30° SKEW 16'-0" - 17'-6" BRIDGE WIDTH 2:1 FILL SLOPES

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. Size	No. Size Length Ft. In. Size	No. Size Length Ft. In. Size	No. Size Length Ft. In. Size	No. Size Length Ft. In. Size	No. Size Length Ft. In. Size A B C D	No. Size Length Ft. In. Size	No. Size Length Ft. In. Size	No. Size Length Ft. In. Size	No. Size Length Ft. In. Size	No. Size Length Ft. In. Size	No. Size Length Ft. In. Size	No. Size Length Ft. In. Size	No. Size Length Ft. In. Size	No. Size Length Ft. In. Size	No. Size Length Ft. In. Size	No. Size Length Ft. In. Size	No. Size Length Ft. In. Size
15-16	77 10 11 8 12	77 7 11 8 12	24 20 11	24 31 2	24 33 4	74 9 9 11 12 8 ½ 1 0 10 0 11⅞ 8 6	77 5 4 11 12	74 6 12 10 12	77 12 10 12	14 32 10 14 30	4 14 19 8	14 18 11 14 34	1 14 30 8	2 35 6	2 22 5	12 11 5	5 9	
13-14	70 9 10 8 12	70 7 10 8 12	22 17 8	22 27 1	22 32 11	67 8 8 3 12 6 11 1 3 0 8 7 3	70 5 4 11 12	67 6 10 10 12	70 10 10 12	12 28 10 12 26	4 12 16 8	12 15 11 12 34	1 12 30 8	2 31 6	2 19 5	10 7 5	5 9	
11-12	64 8 9 8 12	64 6 9 8 12	20 15 5	20 22 11	20 32 6	61 7 7 1 12 5 10½ 1 2 0 7 6	64 5 4 11 12	61 5 8 10 12	64 8 10 12	10 24 10 10 22	4 10 14 8	10 13 11 10 34	1 10 30 8	2 27 6	2 17 5	9 5 5	5 9	
9-10	61 7 8 8 12	61 5 8 8 12	18 13 2	18 19 10	18 32 1	56 6 6 1 12 5 1 1 1 0 0 6 5 4	59 5 4 11 12	56 5 6 10 12	59 6 10 12	8 20 10 8 19	4 8 12 8	8 11 11 8 34	1 8 30 8	2 24 6	2 15 5	8 5 5	5 9	
7-8	55 6 7 2 12	55 5 7 2 12	16 10 6	16 14 2	16 31 1	49 5 5 7 12 4 8½ 0 10 0 5 4	52 5 4 11 12	49 5 4 10 12	52 4 10 12	6 16 11 6 14	4 6 10 8	6 9 11 6 34	2 6 30 8	2 19 6	2 13 5	7 1 5	5 9	
5-6	51 5 6 2 12	51 5 6 2 12	14 8 3	14 11 0	14 30 8	44 5 5 7 12 4 8½ 0 10 0 5 4	47 5 4 11 12	44 5 2 10 12	47 2 10 12	4 13 11 4 11	4 4 8 8	4 7 11 4 34	2 4 30 8	2 16 6	2 11 5	6 1 5	5 9	

Reinforcement Details

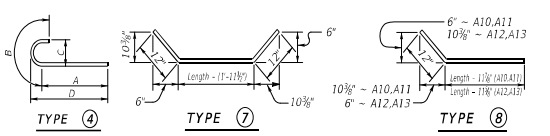


Table of Dimensions

H	W Length	N Length	M2 Length	M3 Length	S2 Length	S3 Length	T2 Length	T3 Length	L2 Length	L3 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	15 5½	18 2⅝	19 6⅝	13 7⅜	26 8⅝	10 6½	29	17
13-14	11 0	4 6	13 4½	15 4½	19 1⅜	13 7⅜	23 1⅞	8 10½	25	14
11-12	10 0	4 0	11 3⅜	13 4⅜	18 8½	13 7⅜	19 7	7 8⅛	21	12
9-10	9 0	3 6	9 8¼	11 4⅛	18 3⅝	13 7⅜	16 10⅜	6 7	18	10
7-8	7 6	3 0	7 1⅛	9 3⅝	17 7⅝	13 7⅜	13 4⅝	5 4½	16	8
5-6	6 6	2 6	5 6⅛	7 3⅛	17 2½	13 7⅜	10 9	4 2½	10	6

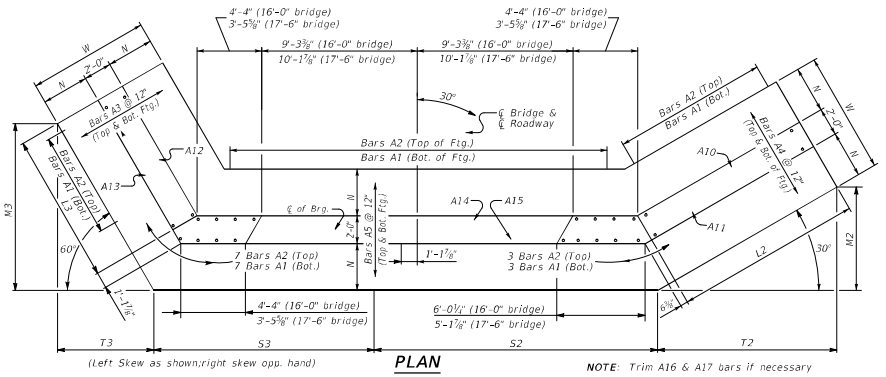
REVISION DATE: 08/11/2025
REVISION NUMBER: 0

SUBMITTED: Michael Cupp 08-11-2025
DIVISION DIRECTOR — DATE

APPROVED: Jason Ballinger 08-11-2025
STATE HIGHWAY ENGINEER — DATE

BRIDGE STANDARDS

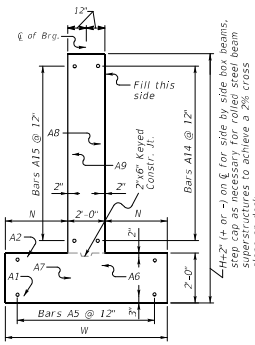
4 foot min. shoulder



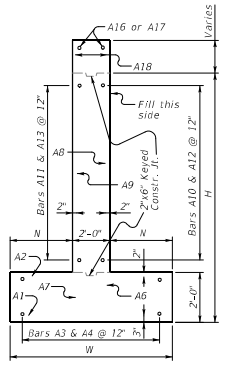
(Left Skew as shown; right skew opp. hand)

PLAN

NOTE: Trim A16 & A17 bars if necessary



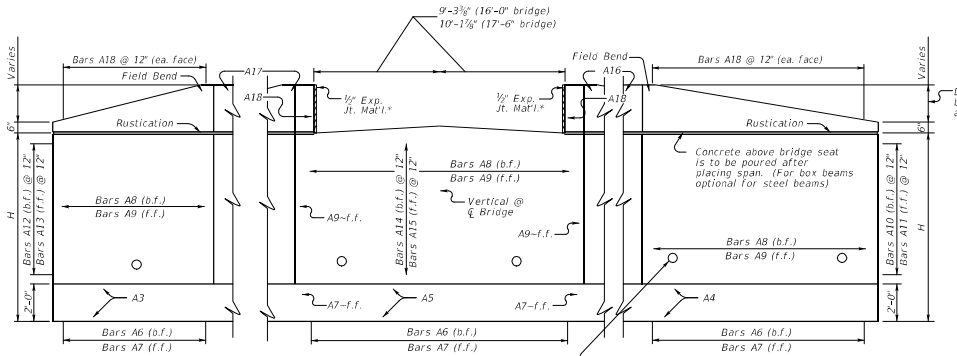
WALL SECTION



WING SECTION

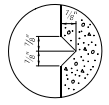
Quantities		
H	Concrete*	Reinforcement
	C.Y.	LBS.
5	35.1	3029
6	38.4	3029
7	50.2	4232
8	53.9	4232
9	72.1	6186
10	76.4	6186
11	92.3	8576
12	96.9	8576
13	116.5	12240
14	121.5	12240
15	145.3	16380
16	150.8	16380

*Concrete quantities computed using 21" beam depth on ℄ pad & 16'-0" Bridge Width.



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

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 17'-6" rolled steel beam bridge width.

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

*Expansion Joint Material:
AASHTO M153
Type-I Sponge Rubber

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

30° SKEW 16'-0" - 17'-6" BRIDGE WIDTH ABUTMENT 2:1 FILL SLOPES, 4'-0" MIN. SHOULDER

STANDARD DRAWING NUMBER
BSA-107-01

OpenRoads Designer v23.00.01.11

30° SKEW 24'-0" - 25'-6" BRIDGE WIDTH 2:1 FILL SLOPES

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. Length	No. Length	No. Length	No. Length	No. Length	No. Length A B C D	No. Length	No. Length	No. Length	No. Length	No. Length	No. Length	No. Length	No. Length	No. Length	No. Length	No. Length	No. Length
5-16	86 10 11 8	12 86	7 11 8	12 24	20 11	24 31	2 24	42 7	83 9	9 11	12 8	⅝ 1	0 10	0 11⅜	8 6	86 5	4 11	12 83
2-14	79 9	10 8	12 79	7 10	8 12	22 17	8 23	27 1	22 42	2 76	8 8	3 12	6 11	1 3	0 8	7 1	79 5	4 11
1-13	74 8	9 8	12 74	6 9	8 12	20 15	5 20	22 11	20 41	8 70	7 7	1 12	5 10½	1 2	0 7	6 2	73 5	4 11
0-12	70 7	8 8	12 70	5 8	8 12	18 13	2 18	19 10	18 41	3 65	6 6	1 12	5 1	1 1	0 0	6 5	4 68	5 4
1-11	65 6	7 2	12 65	5 7	2 12	16 10	6 16	14 2	16 40	4 58	5 5	7 12	4 8½	0 10	0 5	4 12	61 5	4 11
5-16	60 5	6 2	12 60	5 6	2 12	14 8	3 14	11 0	14 39	11 53	5 5	7 12	4 8½	0 10	0 5	4 11	56 5	4 11

Reinforcement Details

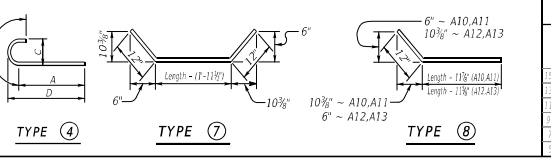
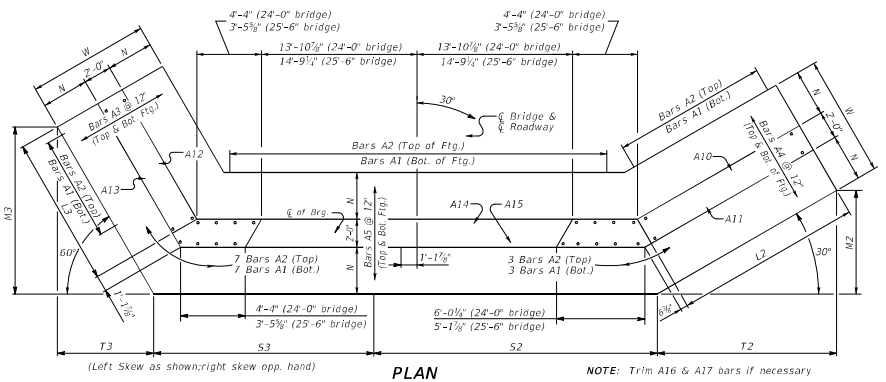


Table of Dimensions

H	W Length	N Length	M2 Length	M3 Length	S2 Length	S3 Length	T2 Length	T3 Length	L2 Length	L3 Length
	ft in	ft in	ft in	ft in	ft in	ft in	ft in	ft in	ft in	ft
5-16	12 0	5 0	15 5½	18 2⅝	24 1⅞	18 2⅝	26 8⅝	10 6½	29	17
2-14	11 0	4 6	13 4½	15 4½	23 8⅝	18 2⅝	23 1⅞	8 10½	25	14
1-13	10 0	4 0	11 3⅝	13 4½	23 3⅝	18 2⅝	19 7	7 8⅞	21	12
0-12	9 0	3 6	9 8⅝	11 4⅛	22 0⅝	18 2⅝	16 10⅛	6 7	18	10
1-11	7 6	2 9	7 1⅝	9 3⅛	22 3	18 2⅝	12 4⅜	5 4⅝	13	8
5-16	6 6	2 3	5 6⅝	7 3⅛	21 9⅛	18 2⅝	9 1⅞	4 2⅛	10	6

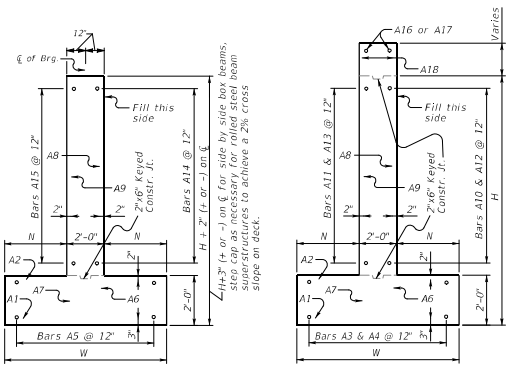
4 foot min. shoulder



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

PLAN

NOTE: Trim A16 & A17 bars if necessary

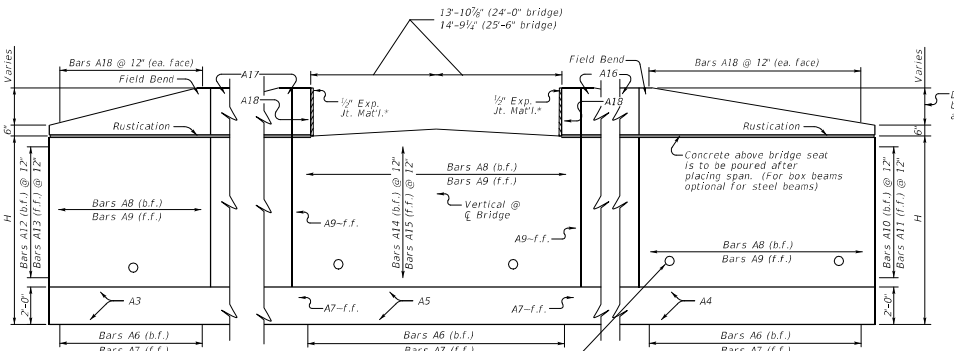


WALL SECTION

WING SECTION

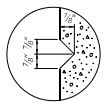
Quantities		
H	Concrete*	Reinforcement
	C.Y.	LBS.
5	41.7	3510
6	45.7	3510
7	58.9	4875
8	63.3	4875
9	83.2	7013
10	88.1	7013
11	103.5	9709
12	110.8	9709
13	131.7	13702
14	137.4	13702
15	162.5	18180
16	168.7	18180

*Concrete quantities computed using 21" beam depth on ½" pad & 24'-0" Bridge Width



ELEVATION

*Expansion Joint Material:
AASHTO M153
Type-I Sponge Rubber



RUSTICATION GROOVE

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 25'-6" rolled steel beam bridge width.

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

REVISION DATE: 08/11/2025
REVISION NUMBER: 0

SUBMITTED: Michael Cupp 08-11-2025
DIVISION DIRECTOR — DATE

APPROVED: Jason Ballinger 08-11-2025
STATE HIGHWAY ENGINEER — DATE

BRIDGE STANDARDS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

30° SKEW 24'-0" - 25'-6" BRIDGE WIDTH ABUTMENT 2:1 FILL SLOPES, 4'-0" MIN. SHOULDER

STANDARD DRAWING NUMBER
BSA-108-01

OpenRoads Designer v23.00.01.11

30° SKEW 32'-0" - 33'-6" BRIDGE WIDTH 2:1 FILL SLOPES

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
H	No. Size Length ft in	No. Size Length ft in	No. Size Length ft in	No. Size Length ft in	No. Size Length ft in	No. Size Length ft in A ft in B ft in C ft in D ft in	No. Size Length ft in	No. Size Length ft in	No. Size Length ft in	No. Size Length ft in	No. Size Length ft in	No. Size Length ft in	No. Size Length ft in	No. Size Length ft in	No. Size Length ft in	No. Size Length ft in	No. Size Length ft in	No. Size Length ft in
15-16	95 10 11 8	12 95	7 11 8	12 24 20	11 24 31	2 24 51	9 92	9 9 11	12 8 ½	1 10 0	11⅞ 8	6 96	5 4 11	12 92	6 12 10	12 96	12 10 12	14 32
13-14	88 9 10 8	12 88	7 10 8	12 22 17	9 23 27	1 22 51	4 85	8 8 3	12 6 11	1 3 0	8 7 3	6 89	5 4 11	12 85	6 10 10	12 89	10 10 12	12 28
11-12	83 8 9 8	12 83	6 9 8	12 20 15	5 20 22	11 20 50	11 79	7 7 1	12 5 10½	1 2 0	7 6 2	6 83	5 4 11	12 79	5 8 10	12 83	8 10 12	10 24
9-10	79 7 8 8	12 79	5 8 8	12 18 13	2 18 19	10 18 50	6 74	6 6 1	12 5 1	1 1 0	0 6 5	4 78	5 4 11	12 74	5 6 10	12 78	6 10 12	8 21
7-8	74 6 7 2	12 74	5 7 2	12 16 10	6 16 14	2 16 49	7 67	5 5 7	12 4 8½	0 10 0	5 4	11 71	5 4 11	12 67	5 4 10	12 71	4 10 12	6 16
5-6	69 5 6 2	12 69	5 6 2	12 14 8	3 14 11	0 14 49	2 62	5 5 7	12 4 8½	0 10 0	5 4	11 66	5 4 11	12 62	5 2 10	12 66	2 10 12	4 13

MARK	A10	A11	A12	A13	A14	A15	A16	A17	A18
TYPE	8	8	8	8	7	7	Str.	Str.	Str.
SIZE	#5	#5	#5	#5	#5	#5	#5	#5	#5
H	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	15 5½	18 2⅜	28 9½	22 10½	26 8½	10 6½	29 17
13-14	11 0	4 6	13 4½	15 4½	28 4⅛	22 10½	23 1⅞	8 10½	25 14
11-12	10 0	4 0	11 3⅝	13 4½	27 11¼	22 10½	19 7	7 8⅛	21 12
9-10	9 0	3 6	9 8⅝	11 4⅜	27 6	22 10½	16 10⅛	6 7	18 10
7-8	7 6	2 9	7 1⅝	9 3⅜	26 10⅞	22 10½	12 4⅝	5 4½	13 8
5-6	6 6	2 3	5 6¼	7 3⅛	26 5⅜	22 10½	9 7⅞	4 2½	10 6

Reinforcement Details

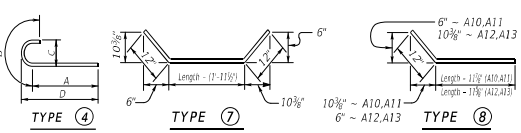
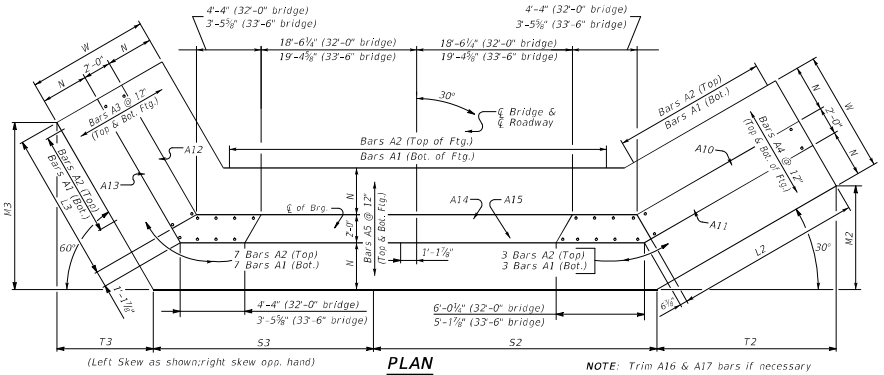


Table of Dimensions

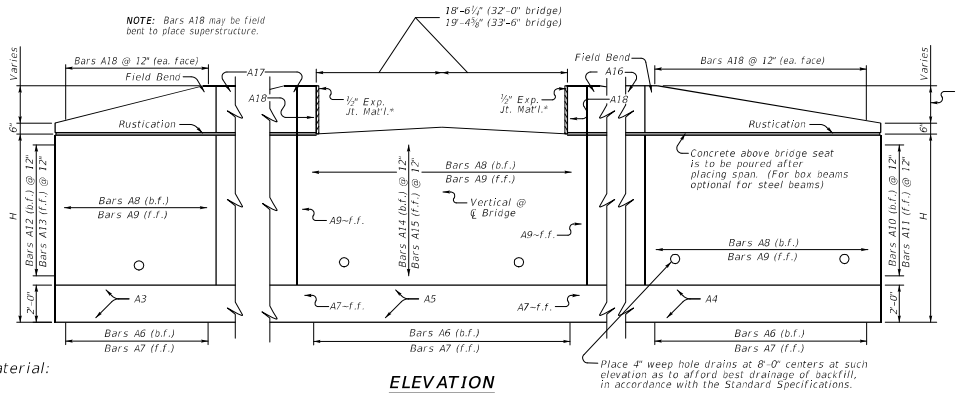
H	W Length ft in	N Length ft in	M2 Length ft in	M3 Length ft in	S2 Length ft in	S3 Length ft in	T2 Length ft in	T3 Length ft in	L2 Length ft
15-16	12 0	5 0	15 5½	18 2⅜	22 10½	26 8½	10 6½	29	17
13-14	11 0	4 6	13 4½	15 4½	28 4⅛	22 10½	23 1⅞	8 10½	25 14
11-12	10 0	4 0	11 3⅝	13 4½	27 11¼	22 10½	19 7	7 8⅛	21 12
9-10	9 0	3 6	9 8⅝	11 4⅜	27 6	22 10½	16 10⅛	6 7	18 10
7-8	7 6	2 9	7 1⅝	9 3⅜	26 10⅞	22 10½	12 4⅝	5 4½	13 8
5-6	6 6	2 3	5 6¼	7 3⅛	26 5⅜	22 10½	9 7⅞	4 2½	10 6

4 foot min. shoulder



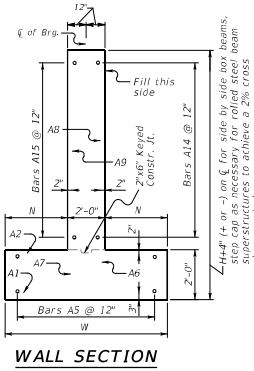
(Left Skew as shown; right skew opp. hand)

PLAN

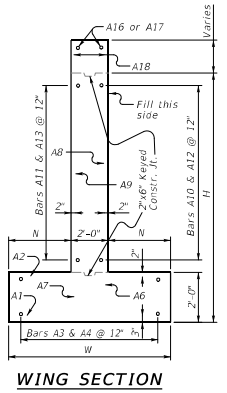


ELEVATION

*Expansion Joint Material:
AASHTO M153
Type-I Sponge Rubber



WALL SECTION



WING SECTION

Quantities		
H	Concrete*	Reinforcing
	C.Y.	Lbs.
5	48.4	3999
6	53.1	3999
7	67.6	5511
8	72.7	5511
9	94.4	7853
10	100	7853
11	118.7	10818
12	124.6	10818
13	146.9	15177
14	153.3	15177
15	179.8	19998
16	186.7	19998

*Concrete quantities computed using 21" beam depth on ½" pad & 32'-0" 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 33'-6" rolled steel beam bridge width.*

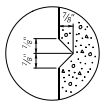
FOUNDATION PRESSURE: *Construct abutment footings on solid rock bearing material that can support a pressure of 8000 psf service or 10,800 psf strength factored as recommended by a geotechnical engineer.*

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



RUSTICATION GROOVE

REVISION DATE: 08/11/2025
REVISION NUMBER: 0

SUBMITTED: Mark Cox 08-11-2025 DATE
DIVISION DIRECTOR

APPROVED: Jason Ballinger 08-11-2025 DATE
STATE HIGHWAY ENGINEER

BRIDGE STANDARDS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

30° SKEW 32'-0" - 33'-6" BRIDGE WIDTH ABUTMENT 2:1 FILL SLOPES, 4'-0" MIN. SHOULDER

STANDARD DRAWING NUMBER
BSA-109-01

OpenRoads Designer v23.00.01.11

45° SKEW 16'-0" – 17'-6" BRIDGE WIDTH 2:1 FILL SLOPES

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
H	No. Size Length ft in	No. Size Length ft in	No. Size Length ft in	No. Size Length ft in	No. Size Length ft in	No. Size A ft in B ft in C ft in D ft in	No. Size Length ft in	No. Size Length ft in	No. Size Length ft in	No. Size Length ft in	No. Size Length ft in	No. Size Length ft in	No. Size Length ft in	No. Size Length ft in	No. Size Length ft in	No. Size Length ft in	No. Size Length ft in	No. Size Length ft in
15–16	90 10 11 8 12	90 7 11 8 12	24 20 6	24 38 11	24 39 5	87 9 9 11 12 8 ⅝ 7 10 0 11⅜ 8 6	90 5 4 11 12	87 6 12 10 12	90 12 10 12 14	41 8 14 38 2	14 18 6	14 18 1	14 40 11	14 36 10 2	45 0 2	21 11 14	0 5 9
13–14	84 9 10 8 12	84 7 10 8 12	22 18 2	22 34 10	22 39 0	81 8 8 3 12 6 11 7 3 0 8 7 3	84 5 4 11 12	81 6 10 10 12	84 10 10 12 12	37 9 12 34 2	12 16 6	12 16 1	12 43 0	12 38 10 2	41 0 2	19 11 12	8 5 9
11–12	78 8 9 8 12	78 6 9 8 12	20 15 10	20 29 9	20 38 7	74 7 7 1 12 5 10½ 7 2 0 7 6 2	77 5 4 11 12	74 5 8 10 12	77 8 10 12 10	32 9 10 29 2	10 14 6	10 14 1	10 41 0	10 36 10 2	36 0 2	17 11 11	4 5 9
9–10	72 7 8 8 12	72 5 8 8 12	18 13 6	18 24 8	18 38 2	67 6 6 1 12 5 1 7 0 0 6 5 4	70 5 4 11 12	67 5 6 10 12	70 6 10 12 8	27 9 8 24 2	8 12 6	8 12 1	8 41 1	8 36 10 2	31 0 2	15 11 10	0 5 9
7–8	66 6 7 2 12	66 5 7 2 12	16 10 11	16 18 11	16 37 4	60 5 5 7 12 4 8⅝ 0 10 0 5 4	63 5 4 11 12	60 5 4 10 12	63 4 10 12 6	22 10 6 19 2	6 10 6	6 10 1	6 41 1	6 36 10 2	26 0 2	13 11 8	6 5 9
5–6	60 5 6 2 12	60 5 6 2 12	14 8 7	14 13 9	14 36 10	53 5 5 7 12 4 8½ 0 10 0 5 4	56 5 4 11 12	53 5 2 10 12	56 2 10 12 4	17 10 4 14 2	4 8 6	4 8 1	4 41 1	4 36 10 2	21 0 2	11 11 7	2 5 9

Reinforcement Details

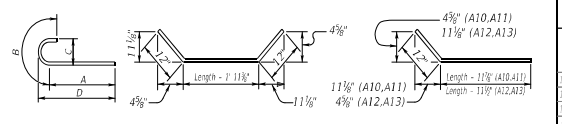
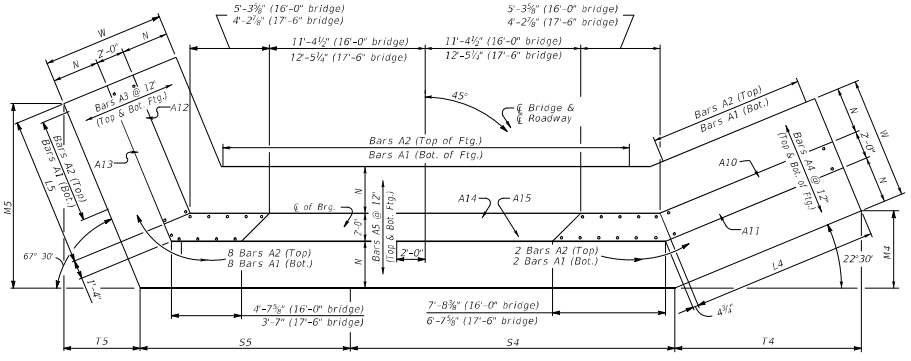


Table of Dimensions

H	W	N	M4	M5	S4	S5	T4	T5	L4	L5
	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	Length ft
15–16	12 0	5 0	14 8⅝	19 1¾	25 ⅝	14 4½	35 5⅝	7 11	37	16
13–14	11 0	4 6	13 1½	16 11⅜	24 5⅛	14 6⅝	33 8⅜	7 ⅛	33	14
11–12	10 0	4 0	11 2	14 9½	23 0½	14 8⅝	26 11⅝	6 1½	28	12
9–10	9 0	3 6	9 2⅝	12 7⅞	23 3¼	14 10⅝	22 3⅜	5 2⅛	23	10
7–8	7 6	3 0	7 3	10 3⅞	22 4½	15 1¼	17 6	4 3⅜	18	8
5–6	6 6	2 6	5 3	8 2	21 6⅛	15 3⅝	12 9½	3 4⅝	13	6

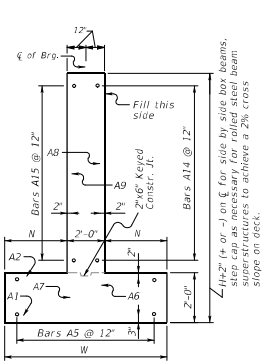
4 foot min. shoulder



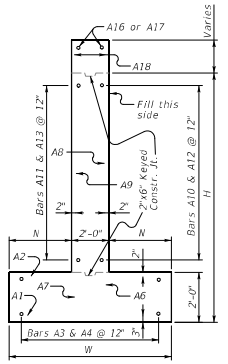
(Left Skew as shown; right skew opp. hand)

PLAN

NOTE: Trim A16 & A17 bars if necessary



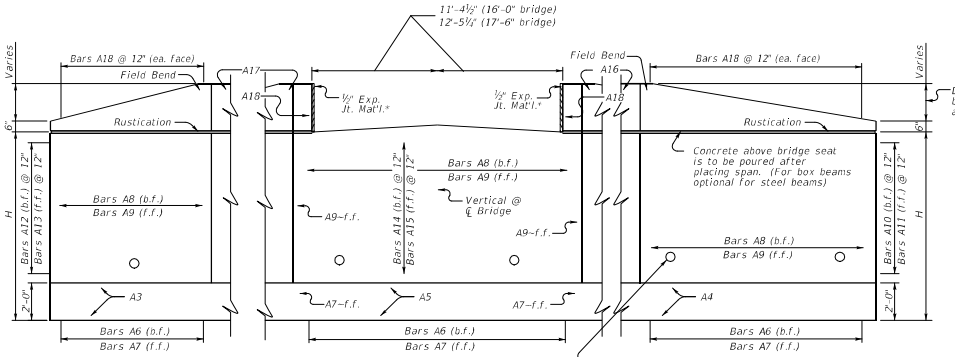
WALL SECTION



WING SECTION

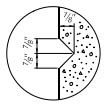
Quantities		
H	Concrete*	Reinforcement
	C.Y.	LBS.
5	42.2	3593
6	46.2	3593
7	61.4	5111
8	65.9	5111
9	86.2	7315
10	91.3	7315
11	111.9	10341
12	117.5	10341
13	140.7	14673
14	146.8	14673
15	170.7	19131
16	177.2	19131

*Concrete quantities computed using 21" beam depth on 12" pad & 16'-0" Bridge Width.



ELEVATION

*Expansion Joint Material:
AASHTO M153
Type-I Sponge Rubber



RUSTICATION GROOVE

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 17'-6" rolled steel beam bridge width.

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

REVISION DATE: 08/11/2025
REVISION NUMBER: 0

SUBMITTED Michael Cupp DIVISION DIRECTOR 08-11-2025 DATE

APPROVED Jason Ballinger STATE HIGHWAY ENGINEER 08-11-2025 DATE

BRIDGE STANDARDS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

45° SKEW 16'-0" - 17'-6" BRIDGE WIDTH ABUTMENT 2:1 FILL SLOPES, 4'-0" MIN. SHOULDER

STANDARD DRAWING NUMBER
BSA-110-01

OpenRoads Designer v23.00.01.11

45° SKEW 24'-0" - 25'-6" BRIDGE WIDTH 2:1 FILL SLOPES

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	A1 No.	A1 Length	A2 No.	A2 Length	A3 No.	A3 Length	A4 No.	A4 Length	A5 No.	A5 Length	A6 No.	A6 Length	A6 A	A6 B	A6 C	A6 D	A7 No.	A7 Length	A8 No.	A8 Length	A9 No.	A9 Length	A10 No.	A10 Length	A11 No.	A11 Length	A12 No.	A12 Length	A13 No.	A13 Length	A14 No.	A14 Length	A15 No.	A15 Length	A16 No.	A16 Length	A17 No.	A17 Length	A18 No.	A18 Length
5-16	101	10 11 8	12	101	7	11 8	12	24 20 6	24	38 11	24	50	9	98	9	9	11	12	8	⅛	1	10 0	11⅞	8	6	102	5	4	11	12	98	6	12	10	12	102	12	10	12	14	41	8	14	38	2	14	18	6	14	18	1	14	52	3	14	48	1	2	45	0	2	21	11	140	5	9
5-14	95	9 10	8	12	95	7	10	8	12	22	18	2	22	34	10	22	50	4	92	8	8	3	12	6	11	1	3	0	8	7	3	96	5	4	11	12	92	6	10	10	12	96	10	10	12	12	37	9	12	34	2	12	16	6	12	16	1	12	52	4	12	48	1	2	41	0	2	19	11	128	5	9
1-12	90	8 9	8	12	90	6	9	8	12	20	15	10	20	29	8	20	49	11	85	7	7	1	12	5	10½	1	2	0	7	6	2	89	5	4	11	12	85	5	8	10	12	89	8	10	12	10	32	9	10	29	2	10	14	6	10	14	1	10	52	4	10	48	1	2	36	0	2	17	11	114	5	9
9-10	83	7 8	8	12	83	5	8	8	12	18	13	6	18	24	8	18	49	6	78	6	6	1	12	5	1	1	1	0	6	5	4	82	5	4	11	12	78	5	6	10	12	82	6	10	12	8	27	9	8	24	2	8	12	6	8	12	1	8	52	4	8	48	1	2	31	0	2	15	11	100	5	9
7-8	78	6 7	2	12	78	5	7	2	12	16	10	11	16	18	11	16	48	7	71	5	5	7	12	4	8½	0	10	0	5	4	17	75	5	4	11	12	71	5	4	10	12	75	4	10	12	6	22	10	6	19	2	6	10	6	6	10	1	6	52	5	6	48	1	2	26	0	2	13	11	86	5	9
5-6	71	5 6	2	12	71	5	6	2	12	14	8	7	14	13	9	14	48	2	64	5	5	7	12	4	8½	0	10	0	5	4	17	68	5	4	11	12	64	5	2	10	12	68	2	10	12	4	17	10	4	14	2	4	8	6	4	8	1	4	52	5	4	48	1	2	21	0	2	11	11	72	5	9

Reinforcement Details

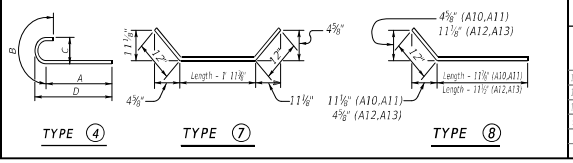
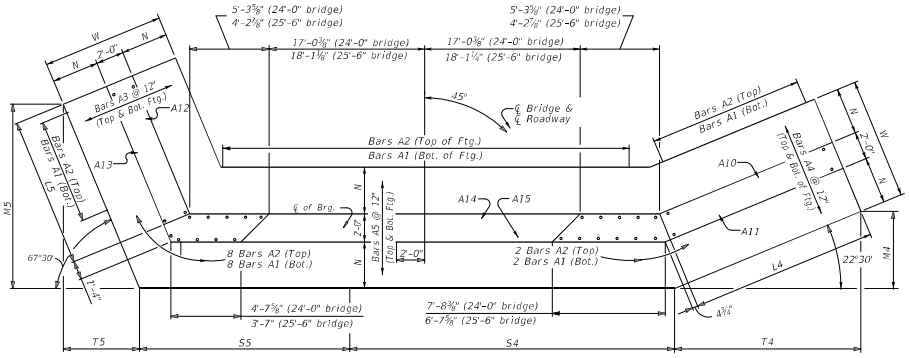


Table of Dimensions

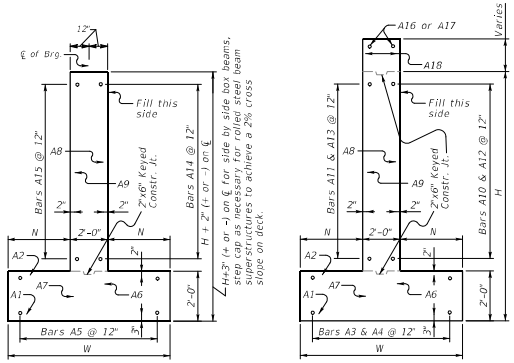
H	W Length	N Length	W4 Length	W5 Length	S4 Length	S5 Length	T4 Length	T5 Length	L4 Length	L5 Length
	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft.	ft.
5-16	12 0	5 0	14 8⅝	19 1¼	30 8⅝	20 ¼	35 5⅝	7 11	37	16
5-14	11 0	4 6	13 1½	16 11⅝	30 1½	20 2½	33 8½	7 ¼	33	14
1-12	10 0	4 0	11 2	14 9½	29 6½	20 4¼	28 11⅝	6 1½	28	12
9-10	9 0	3 6	9 2⅝	12 7⅞	28 11½	20 6½	22 3⅝	5 2⅞	23	10
7-8	7 6	2 9	7 3	10 3⅞	28 ⅜	20 9½	17 6	4 3⅞	18	8
5-6	6 6	2 3	5 3⅝	8 2	27 5⅛	20 11⅛	13 9½	3 4⅞	13	6

4 foot min. shoulder



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

PLAN



WALL SECTION

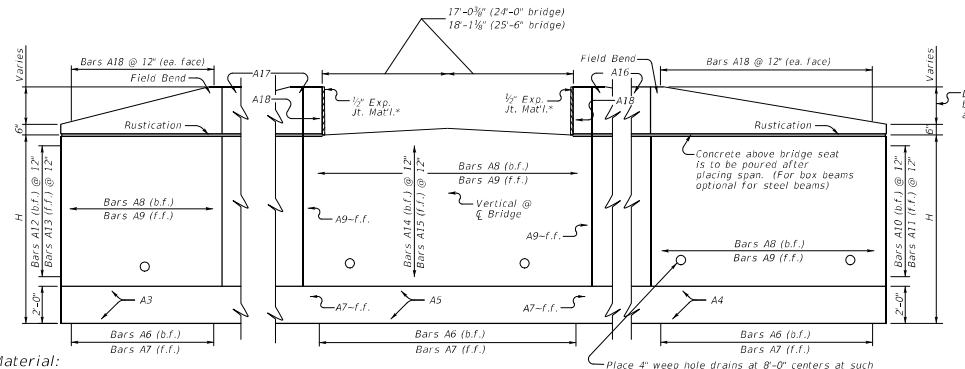
WING SECTION

NOTE: Trim A16 & A17 bars if necessary

Quantities

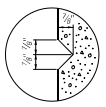
H	Concrete* C.Y.	Reinforcement LBS.
5	50.3	4189
6	55.2	4189
7	72	5902
8	77.4	5902
9	99.8	8339
10	105.7	8339
11	128	11734
12	134.4	11734
13	159.4	16476
14	166.3	16476
15	191.8	21351
16	199.2	21351

*Concrete quantities computed using 21" beam depth on ½" pad & 24'-0" Bridge Width



ELEVATION

*Expansion Joint Material:
AASHTO M153
Type-1 Sponge Rubber



RUSTICATION GROOVE

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 25'-6" rolled steel beam bridge width.*

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

REVISION DATE: 08/11/2025
REVISION NUMBER: 0

SUBMITTED: Mitchell Cooper 08-11-2025
DIVISION DIRECTOR — DATE

APPROVED: Jason Ballinger 08-11-2025
STATE HIGHWAY ENGINEER — DATE

BRIDGE STANDARDS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

45° SKEW 24'-0" - 25'-6" BRIDGE WIDTH ABUTMENT 2:1 FILL SLOPES, 4'-0" MIN. SHOULDER

STANDARD DRAWING NUMBER
BSA-111-01

OpenRoads Designer v23.00.01.11

45° SKEW 32'-0" - 33'-6" BRIDGE WIDTH 2:1 FILL SLOPES

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 | A1 No. | A1 Size | A1 Length ft | A1 Length in | A1 Length Str. | A2 No. | A2 Size | A2 Length ft | A2 Length in | A2 Length Str. | A3 No. | A3 Size | A3 Length ft | A3 Length in | A4 No. | A4 Size | A4 Length ft | A4 Length in | A5* No. | A5* Size | A5* Length ft | A5* Length in | A6 No. | A6 Size | A6 A ft | A6 A in | A6 B ft | A6 B in | A6 C ft | A6 C in | A6 D ft | A6 D in | A7 No. | A7 Size | A7 Length ft | A7 Length in | A8 No. | A8 Size | A8 Length ft | A8 Length in | A9 No. | A9 Size | A9 Length ft | A9 Length in | A10 No. | A10 Size | A10 Length ft | A10 Length in | A11 No. | A11 Size | A11 Length ft | A11 Length in | A12 No. | A12 Size | A12 Length ft | A12 Length in | A13 No. | A13 Size | A13 Length ft | A13 Length in | A14* No. | A14* Size | A14* Length ft | A14* Length in | A15 No. | A15 Size | A15 Length ft | A15 Length in | A16 No. | A16 Size | A16 Length ft | A16 Length in | A17 No. | A17 Size | A17 Length ft | A17 Length in | A18 No. | A18 Size | A18 Length ft | A18 Length in |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---

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 Specification, 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	A.S.T.M	AASHTO
High Strength Low Alloy 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 1½", frequency of testing shall be (P).

HIGH STRENGTH BOLT CONNECTIONS: Unless otherwise specified on the plans, all bolted connnections shall be ASTM F3125 Grade A325 ¾" diameter high strength bolts, nuts, and washers. Open holes shall be 13/16" 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 ¾".

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.

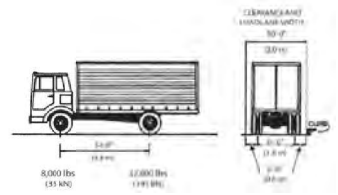
CORROSION PROTECTION: These beams and all steel components are to be hot dip galvanized. If hot dip galvanizing is cost prohibitive then all steel components must be painted. Unpainted weathering steel is not recommended within 10 feet of moving water. Additionally these beams do not meet fatigue design 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		
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.

KENTUCKY
DEPARTMENT OF HIGHWAYS

H20 STEEL BEAM STANDARDS

STANDARD DRAWING NO. BSB-001

SUBMITTED _____ 02-26-20
DIRECTOR DIVISION OF STRUCTURAL DESIGN — DATE

APPROVED _____ 02-26-20
STATE HIGHWAY ENGINEER — DATE

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 Specification, 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	A.S.T.M	AASHTO
High Strength Low Alloy 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 1½", frequency of testing shall be (P).

HIGH STRENGTH BOLT CONNECTIONS: Unless otherwise specified on the plans, all bolted connnections shall be ASTM F3125 Grade A325 ¾" diameter high strength bolts, nuts, and washers. Open holes shall be 13/16" 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 ¾".

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.

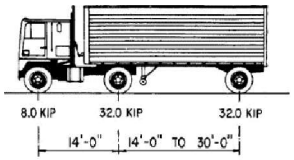
TABLE OF BEAM SIZES AND DESIGN DATA (4 FT. MAX. BEAM SPACING)

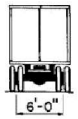
BEAM SPAN	ROLLED BEAM		DEFLECTION IN INCHES		UNFACTORED BEAM END REACTION		
	BEAM MEMBER	BEAM DEPTH (IN.)	STEEL ONLY	TOTAL DL	DC (kips)	DW (kips)	LL+I (kips)
15' Max.	W18x50	18.0	0.00	0.03	5.54	0.45	46.82
	W16x50	16.3	0.00	0.03	5.54		
	W14x53	13.9	0.01	0.06	5.56		
	W12x58	12.2	0.01	0.06	5.60		
	W10x77	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		
	W24x162	25.0	0.17	0.80	20.35		
55' Max.	W36x160	36.0	0.13	0.62	22.27	1.65	72.83
	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		
	W24x192	25.5	0.24	0.99	23.17		
60' Max.	W36x194	36.5	0.18	0.73	25.3	1.80	75.05
	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 TRUCK





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).

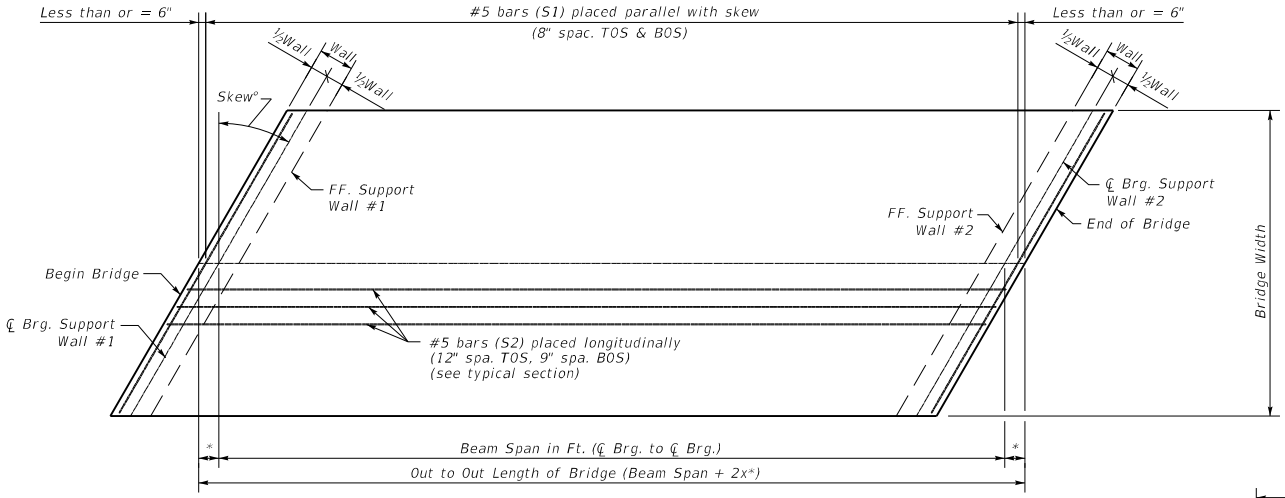
KENTUCKY
DEPARTMENT OF HIGHWAYS

KYHL-93 STEEL
BEAM
STANDARDS

STANDARD DRAWING NO. BSB-002

SUBMITTED _____ 02-26-20
DIRECTOR DIVISION OF STRUCTURAL DESIGN — DATE

APPROVED _____ 02-26-20
STATE HIGHWAY ENGINEER — DATE



PLAN OF SLAB

NOTE: All reinforcing steel shall be epoxy coated.

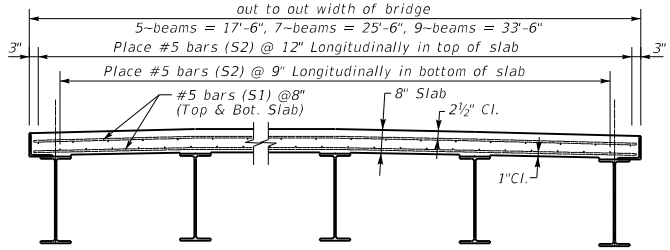
#5 Skewed Transverse Bar (S1) Length

0° Skew –> Bridge Width – 4"
15° Skew –> ((Bridge Width – 4"))x 1.035)
30° Skew –> ((Bridge Width – 4") x 1.155) – 3/16"
45° Skew –> ((Bridge Width – 4") x 1.414) – 3/8"

* *0° skew, ½Wall*
15° skew, ½Wall x 1.035
30° skew, ½Wall x 1.155
45° skew, ½Wall x 1.414

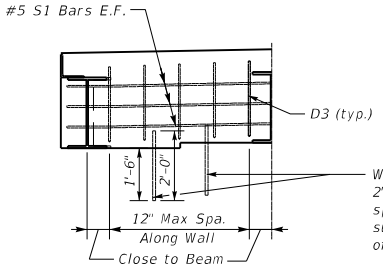
NOTES: 1.) Diaphragm stirrups are to project into the slab regardless of slab forming method.

2.) Place stirrup bars parallel to face of beams.



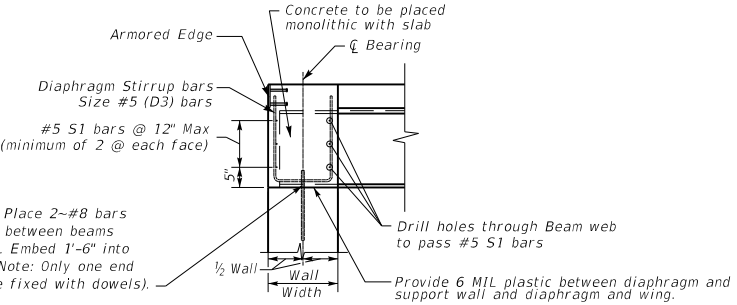
TYPICAL SECTION

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.



When required Place 2~#8 bars 2'-0" Long (D4) between beams spaced equally. Embed 1'-6" into support wall. (Note: Only one end of bridge to be fixed with dowels).

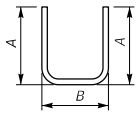
DIAPHRAGM



DIAPHRAGM X-SECTION

(Perpendicular to Diaphragm)

NOTE: End Diaphragms are required on both Grid Deck and Slabs.



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

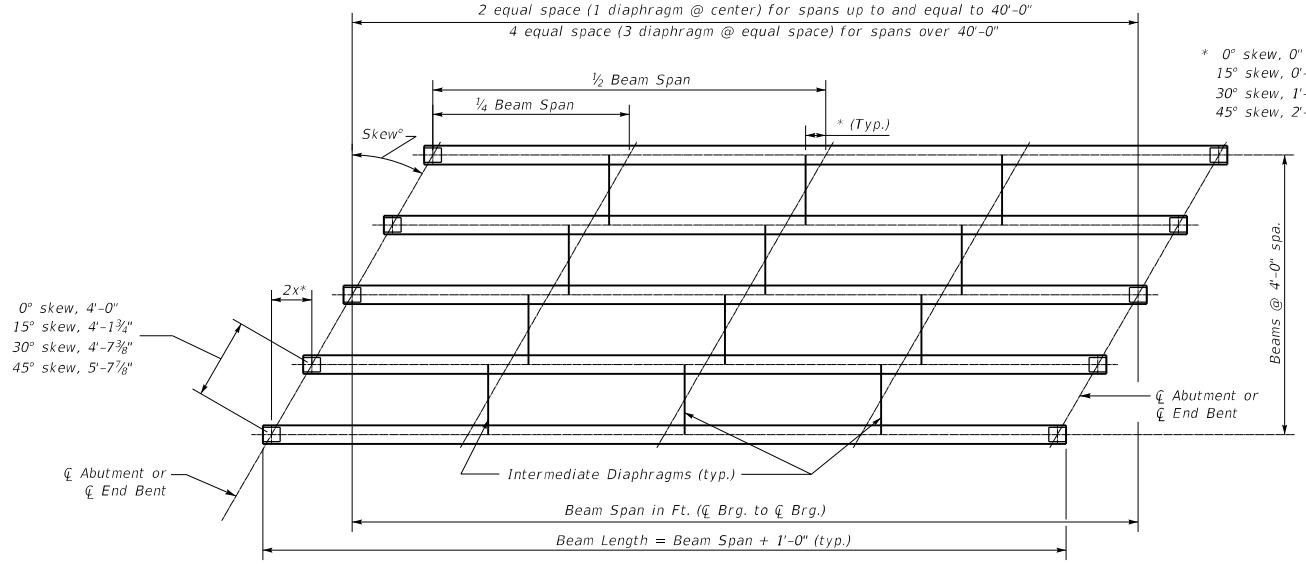
KENTUCKY
DEPARTMENT OF HIGHWAYS

SLAB AND END DIAPHRAGM DETAILS

STANDARD DRAWING NO. BSB-003

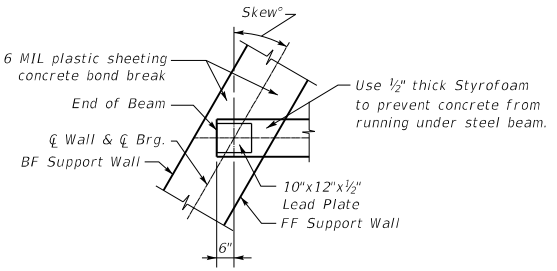
SUBMITTED _____ 02-26-20
DIRECTOR DIVISION OF STRUCTURAL DESIGN — DATE

APPROVED _____ 02-26-20
STATE HIGHWAY ENGINEER — DATE



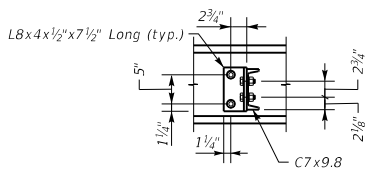
FRAMING PLAN

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

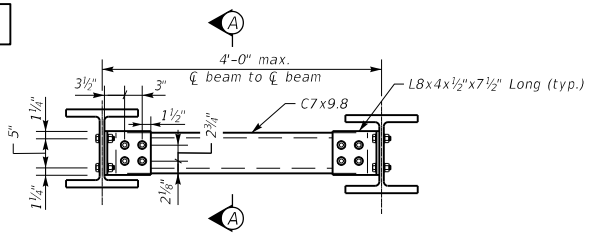


END OF BEAM DETAIL @ SUPPORTS

NOTE: Use ¾" ○ Bolts with 13/16" ○ Holes Throughout.

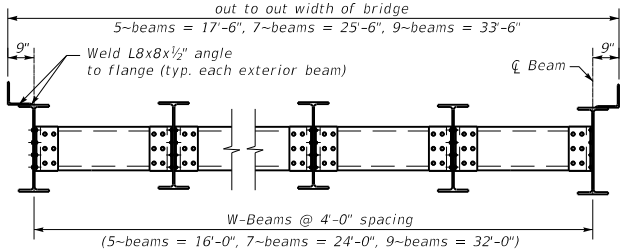


SECTION A-A



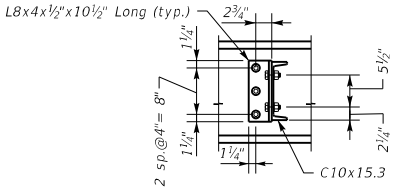
INTERMEDIATE DIAPHRAGM

(for up to 14" beam depth)

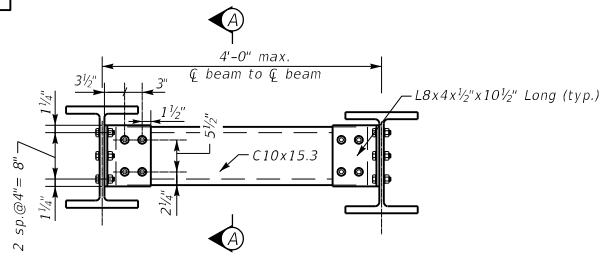


FRAMING TYPICAL

NOTE: Use ¾" ○ Bolts with 13/16" ○ Holes Throughout.



SECTION A-A



INTERMEDIATE DIAPHRAGM

(for up to 20" beam depth)

KENTUCKY
DEPARTMENT OF HIGHWAYS

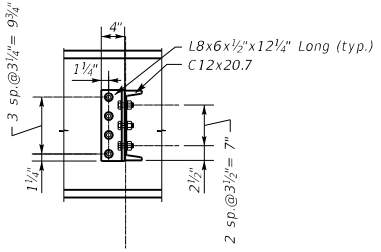
ROLLED STEEL DIAPHRAGM DETAILS

STANDARD DRAWING NO. BSB-004

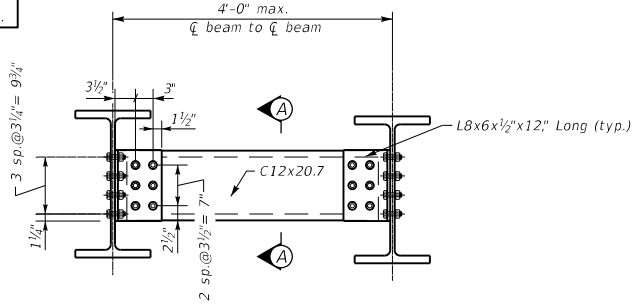
SUBMITTED _____ 02-26-20
DIRECTOR DIVISION OF STRUCTURAL DESIGN — DATE

APPROVED _____ 02-26-20
STATE HIGHWAY ENGINEER — DATE

NOTE: Use ¾" ∅ Bolts with 13/16" ∅ Holes Throughout.



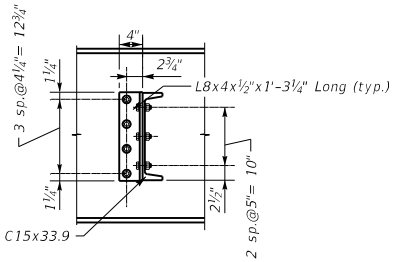
SECTION A-A



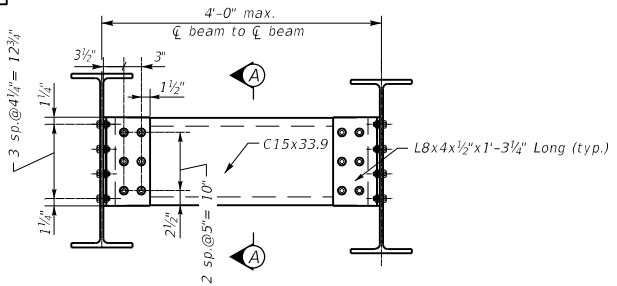
INTERMEDIATE DIAPHRAGM

(for up to 24" beam depth)

NOTE: Use ¾" ∅ Bolts with 13/16" ∅ Holes Throughout.



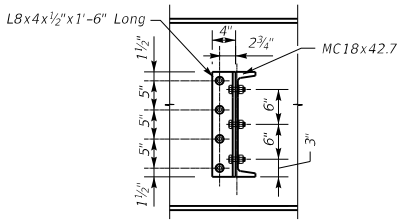
SECTION A-A



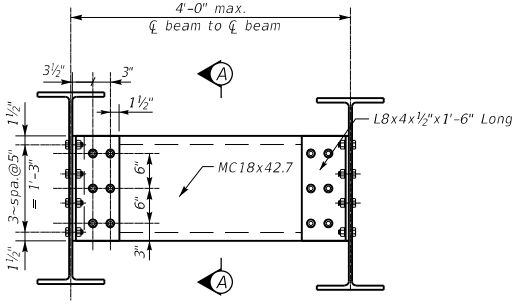
INTERMEDIATE DIAPHRAGM

(for up to 30" beam depth)

NOTE: Use ¾" ∅ Bolts with 13/16" ∅ Holes Throughout.



SECTION A-A



INTERMEDIATE DIAPHRAGM

(for up to 36" beam depth)

KENTUCKY
DEPARTMENT OF HIGHWAYS

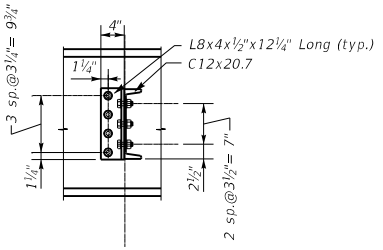
ROLLED STEEL DIAPHRAGM DETAILS

STANDARD DRAWING NO. BSB-005

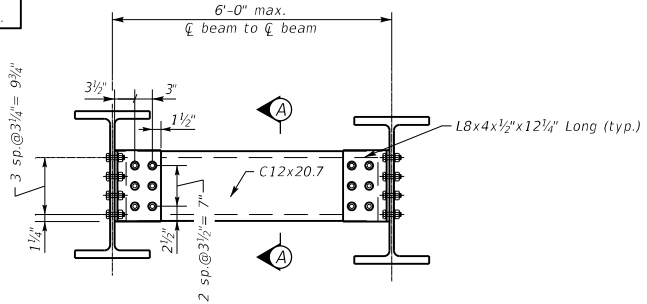
SUBMITTED _____ 02-26-20
DIRECTOR DIVISION OF STRUCTURAL DESIGN — DATE

APPROVED _____ 02-26-20
STATE HIGHWAY ENGINEER — DATE

NOTE: Use ¾" ∅ Bolts with 13/16" ∅ Holes Throughout.



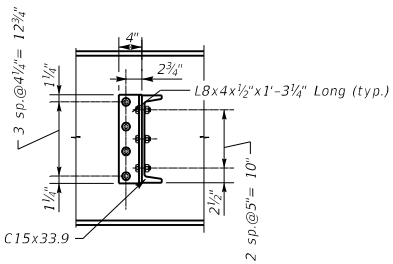
SECTION A-A



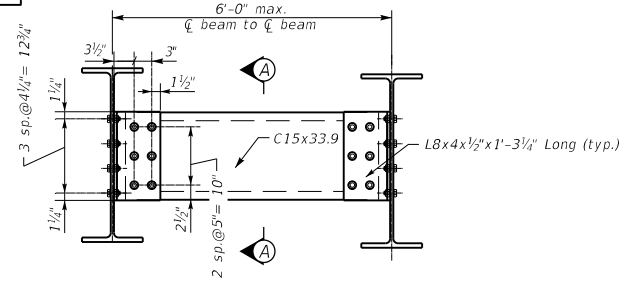
INTERMEDIATE DIAPHRAGM

(for up to 24" beam depth)

NOTE: Use ¾" ∅ Bolts with 13/16" ∅ Holes Throughout.



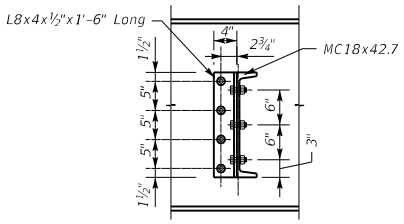
SECTION A-A



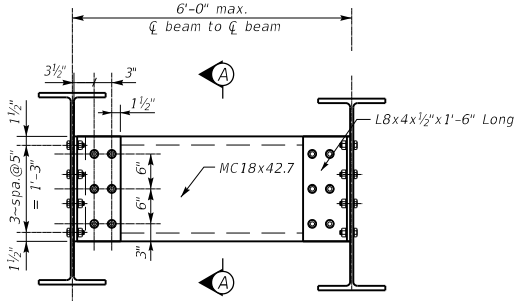
INTERMEDIATE DIAPHRAGM

(for up to 30" beam depth)

NOTE: Use ¾" ∅ Bolts with 13/16" ∅ Holes Throughout.



SECTION A-A



INTERMEDIATE DIAPHRAGM

(for up to 36" beam depth)

KENTUCKY
DEPARTMENT OF HIGHWAYS

COMPOSITE STEEL BEAM SUPERSTRUCTURES DIAPHRAGMS CONTINUED

STANDARD DRAWING NO. BSB-006

SUBMITTED _____ 02-26-20
DIRECTOR DIVISION OF STRUCTURAL DESIGN — DATE

APPROVED _____ 02-26-20
STATE HIGHWAY ENGINEER — DATE

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	FY	= 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 1

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 1½" frequency of testing shall be (P).

HIGH STRENGTH BOLT CONNECTIONS: Unless otherwise specified on the plans, all bolted connnections shall be ASTM F3125 Grade A325 ¾" diameter high strength bolts, nuts, and washers. Open holes shall be 13/16" 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 ¾".

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.

KENTUCKY
DEPARTMENT OF HIGHWAYS

COMPOSITE STEEL BEAM SUPERSTRUCTURES
GENERAL NOTES

STANDARD DRAWING NO. BSB-101

SUBMITTED _____ 02-26-20
DIRECTOR DIVISION OF STRUCTURAL DESIGN — DATE

APPROVED _____ 02-26-20
STATE HIGHWAY ENGINEER — DATE

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. @ 5¼"	5¾" Spa.	300	11.85	0.90	72.65		.877
	W16x77	16.5	0.00	0.09	3	5 Spa. @ 5¾"	6" Spa.	Inf.	12.10		71.61		.865
	W14x82	14.3	0.00	0.11	3	14 Spa. @ 5¼"	6" Spa.	450	12.14		72.36		.874
	W12x106	12.9	0.00	0.11	3	14 Spa. @ 5¼"	6" Spa.	400	12.40		71.78		.867
25' Max.	W24x62	23.7	0.02	0.17	2	23 Spa. @ 5¼"	6" Spa.	400	14.75	1.13	74.47		.860
	W21x62	21.0	0.03	0.21	2	23 Spa. @ 5¼"	6" Spa.	350	14.75		75.31		.870
	W18x71	18.5	0.03	0.24	2	23 Spa. @ 5¼"	6" Spa.	290	14.86		75.67		.874
	W16x77	16.5	0.04	0.25	3	11 Spa. @ 5½"	6" Spa.	Inf.	14.96		76.05		.878
	W14x82	14.3	0.05	0.31	3	23 Spa. @ 5¼"	6" Spa.	425	15.01		76.89		.888
	W12x106	12.9	0.05	0.31	3	23 Spa. @ 5¼"	6" Spa.	385	15.33		76.25		.880
30' Max.	W24x76	23.9	0.04	0.28	2	28 Spa. @ 5¼"	6" Spa.	415	17.78	1.35	80.90		.856
	W21x83	21.4	0.05	0.32	2	28 Spa. @ 5¼"	6" Spa.	350	17.89		81.41		.862
	W18x86	18.4	0.06	0.39	3	7 Spa. @ 5¾"	6" Spa.	Inf.	17.94		82.40		.872
	W16x100	17.0	0.06	0.40	3	14 Spa. @ 5½"	6" Spa.	Inf.	18.18		82.26		.871
	W14x120	14.5	0.08	0.45	3	28 Spa. @ 5¼"	6" Spa.	440	18.48		82.48		.873
	W12x120	13.1	0.10	0.57	3	28 Spa. @ 5¼"	6" Spa.	375	18.48		83.41		.883
35' Max.	W27x84	26.7	0.06	0.39	3	6 Spa. @ 7¾"	8" Spa.	Inf.	20.79	1.58	86.49		.850
	W24x94	24.3	0.06	0.41	2	24 Spa. @ 5¼"	6" Spa.	420	20.97		86.69		.852
	W21x101	21.4	0.07	0.47	3	7 Spa. @ 6½"	7" Spa.	Inf.	21.10		87.33		.858
	W18x119	19.0	0.09	0.52	3	7 Spa. @ 6"	6½" Spa.	Inf.	21.43		87.50		.860
	W14x132	14.7	0.14	0.76	3	24 Spa. @ 5¼"	6" Spa.	425	21.66		89.15		.876
	W12x152	13.7	0.17	0.82	3	24 Spa. @ 5⅜"	6" Spa.	375	22.03		89.00		.874
40' Max.	W30x99	29.7	0.07	0.48	3	12 Spa. @ 8"	9" Spa.	Inf.	23.97	1.80	90.47		.840
	W27x102	27.1	0.08	0.53	3	20 Spa. @ 7½"	9" Spa.	Inf.	24.03		91.07		.845
	W24x117	24.3	0.09	0.56	3	14 Spa. @ 7"	8" Spa.	Inf.	24.35		91.22		.846
	W21x122	21.7	0.12	0.67	3	16 Spa. @ 6"	7" Spa.	Inf.	24.45		92.04	0.65	.854
	W18x130	19.3	0.15	0.81	3	9 Spa. @ 5½"	6" Spa.	Inf.	24.62		92.79		.861
	W14x176	15.2	0.21	0.98	3	19 Spa. @ 5¼"	6" Spa.	425	25.58		93.11		.864
	W12x190	14.4	0.25	1.12	3	19 Spa. @ 5¼"	6" Spa.	375	25.86		93.25		.865
45' Max.	W33x118	32.9	0.09	0.54	3	12 Spa. @ 9"	10" Spa.	Inf.	27.33	2.03	93.45		.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. @ 7½"	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. @ 6½"	7" Spa.	Inf.	28.00		95.83		.849
	W18x158	19.7	0.22	1.08	3	10 Spa. @ 5½"	6" Spa.	Inf.	28.25		96.54		.855
50' Max.	W33x130	33.1	0.13	0.74	3	23 Spa. @ 8"	10" Spa.	Inf.	30.60	2.25	97.11		.828
	W30x132	30.3	0.15	0.86	3	24 Spa. @ 7½"	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. @ 6½"	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. @ 5¼"	7" Spa.	Inf.	32.19		99.51		.848
55' Max.	W36x135	35.6	0.17	0.93	3	16 Spa. @ 8¼"	10" Spa.	Inf.	33.73	2.48	100.10		.825
	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. @ 7¼"	9" Spa.	Inf.	34.09		100.97		.832
	W27x178	27.8	0.23	1.10	3	19 Spa. @ 7"	8" Spa.	Inf.	34.96		100.75		.830
	W24x192	25.5	0.27	1.25	3	31 Spa. @ 6½"	8" Spa.	Inf.	35.33		101.20		.834
	W21x223	23.4	0.33	1.35	3	33 Spa. @ 6"	8" Spa.	Inf.	36.21		101.10		.833
	W18x258	21.5	0.40	1.51	3	35 Spa. @ 5¾"	7" Spa.	Inf.	37.22		101.21		.834
60' Max.	W36x150	35.9	0.22	1.17	3	27 Spa. @ 8¼"	10" Spa.	Inf.	37.20	2.70	102.92		.823
	W33x169	33.8	0.24	1.16	3	18 Spa. @ 8"	9" Spa.	Inf.	37.76		102.82		.822
	W30x173	30.4	0.27	1.32	3	30 Spa. @ 7¼"	9" Spa.	Inf.	37.91		103.60		.828
	W27x194	28.1	0.31	1.42	3	21 Spa. @ 7"	8" Spa.	Inf.	38.56		103.72		.829
	W24x229	26.0	0.37	1.51	3	34 Spa. @ 6½"	8" Spa.	Inf.	39.61		103.58		.828

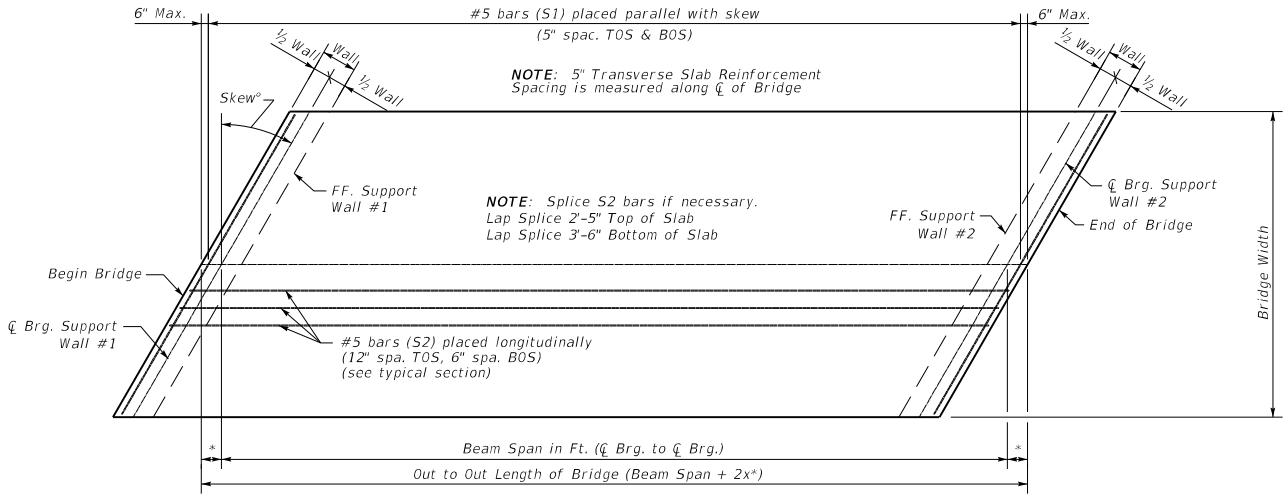
KENTUCKY
DEPARTMENT OF HIGHWAYS

COMPOSITE STEEL BEAM SUPERSTRUCTURES
BEAM TABLES

STANDARD DRAWING NO. BSB-102

SUBMITTED _____ 02-26-20
DIRECTOR DIVISION OF STRUCTURAL DESIGN — DATE

APPROVED _____ 02-26-20
STATE HIGHWAY ENGINEER — DATE



PLAN OF SLAB

NOTE: All reinforcing steel shall be epoxy coated.

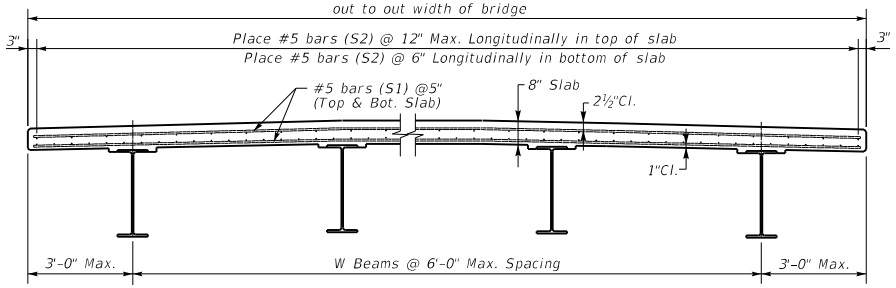
#5 Skewed Transverse Bar (S1) Length = $\frac{\text{Bridge Width} - 4"}{SF}$

* = $\frac{\text{½ Wall}}{SF}$

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

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.

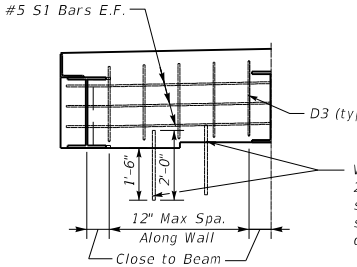
Estimate of Steel Quantities = (Bridge Length-4in)*(Bridge Width-4in) * $\frac{(3.129 \text{ lb/sq. ft.} + 5.006 \text{ lb/sq. ft.})}{SF}$



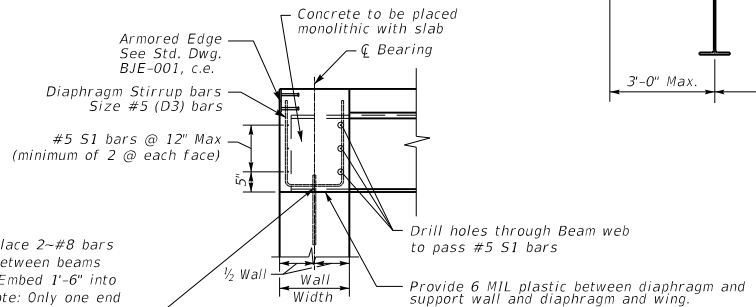
TYPICAL SECTION

NOTES: 1.) Diaphragm stirrups are to project into the slab regardless of slab forming method.

2.) Place stirrup bars parallel to face of beams.



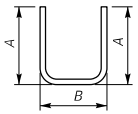
DIAPHRAGM



DIAPHRAGM X-SECTION

(Perpendicular to Diaphragm)

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



D3 BARS

Dim. "A" = Beam Depth + 4"

Dim. "B" = $\frac{\text{(Wall Width - 4")}}{SF}$

KENTUCKY
DEPARTMENT OF HIGHWAYS

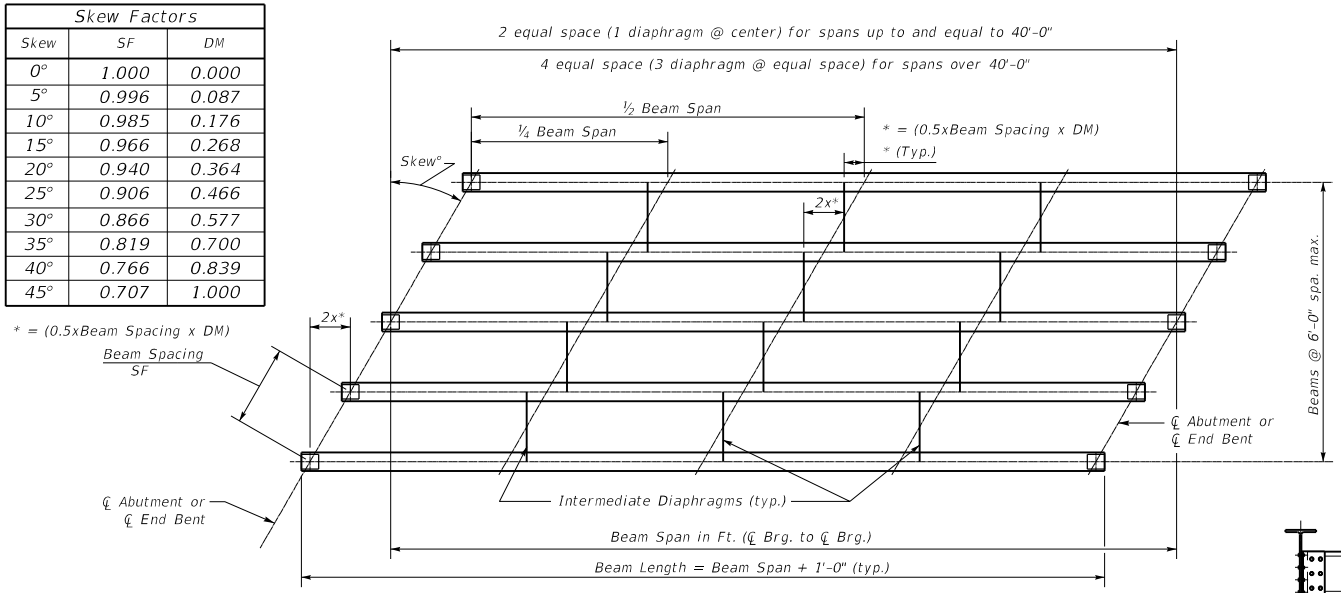
COMPOSITE STEEL BEAM SUPERSTRUCTURES SLAB DETAILS

STANDARD DRAWING NO. BSB-103

SUBMITTED _____ 02-26-20
DIRECTOR DIVISION OF STRUCTURAL DESIGN — DATE

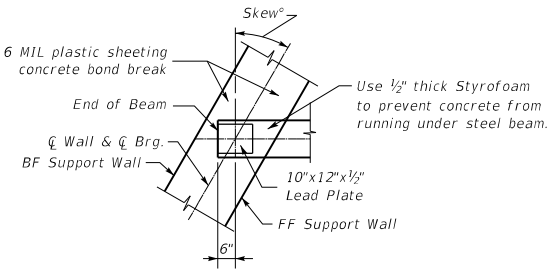
APPROVED _____ 02-26-20
STATE HIGHWAY ENGINEER — DATE

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

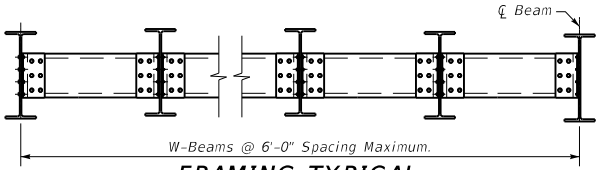


FRAMING PLAN

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

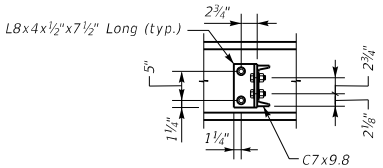


END OF BEAM DETAIL @ SUPPORTS

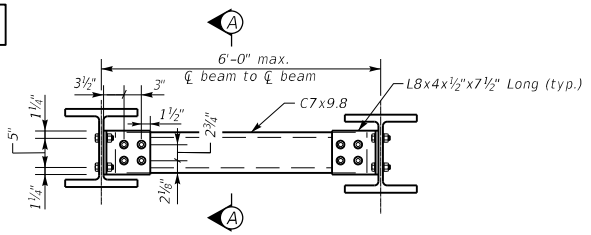


FRAMING TYPICAL

NOTE: Use ¾" ∅ Bolts with 13/16" ∅ Holes Throughout.

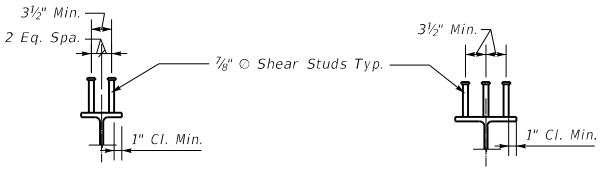


SECTION A-A



INTERMEDIATE DIAPHRAGM

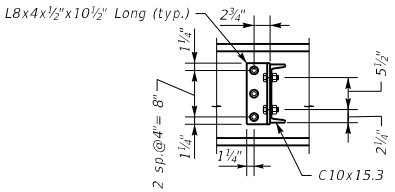
(for up to 14" beam depth)



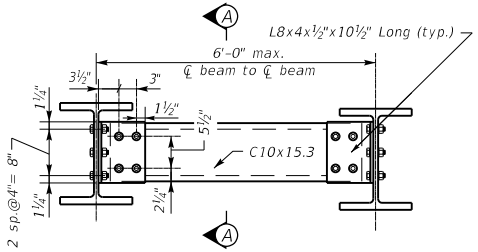
BEAM SECTION - 2 SHEAR STUDS PER ROW

BEAM SECTION - 3 SHEAR STUDS PER ROW

NOTE: Use ¾" ∅ Bolts with 13/16" ∅ Holes Throughout.

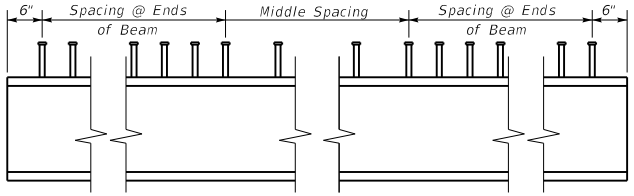


SECTION A-A



INTERMEDIATE DIAPHRAGM

(for up to 20" beam depth)



SHEAR CONNECTOR LAYOUT

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

KENTUCKY
DEPARTMENT OF HIGHWAYS

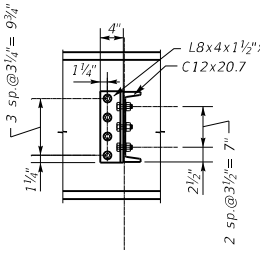
COMPOSITE STEEL BEAM
SUPERSTRUCTURES
FRAMING PLAN/DIAPHRAGMS

STANDARD DRAWING NO. BSB-104

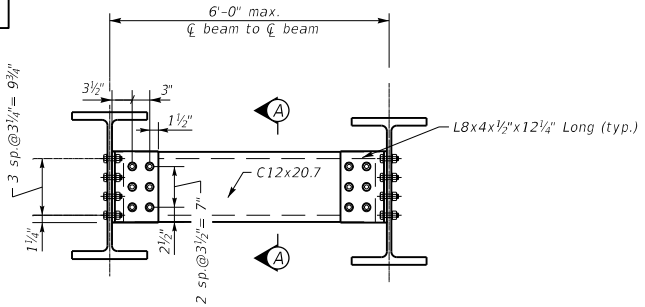
SUBMITTED _____ 02-26-20
DIRECTOR DIVISION OF STRUCTURAL DESIGN — DATE

APPROVED _____ 02-26-20
STATE HIGHWAY ENGINEER — DATE

NOTE: Use ¾" ∅ Bolts with 13/16" ∅ Holes Throughout.



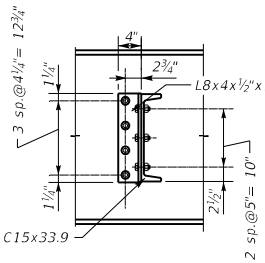
SECTION A-A



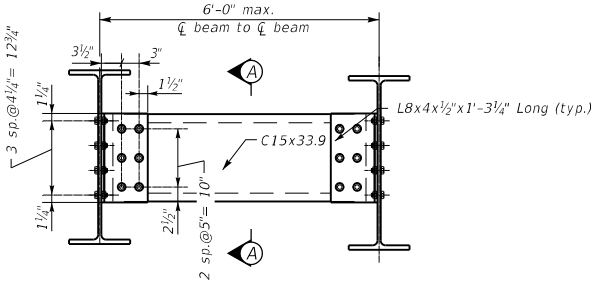
INTERMEDIATE DIAPHRAGM

(for up to 24" beam depth)

NOTE: Use ¾" ∅ Bolts with 13/16" ∅ Holes Throughout.



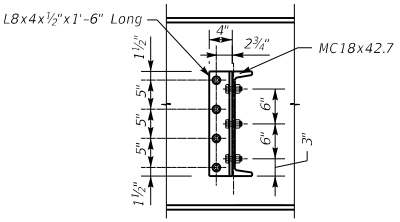
SECTION A-A



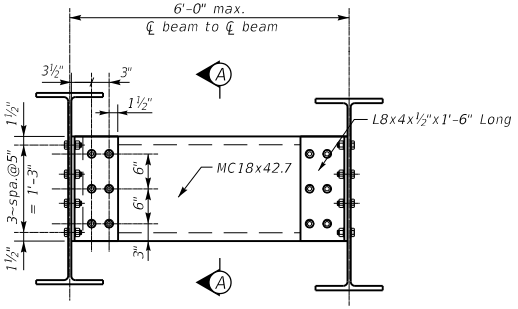
INTERMEDIATE DIAPHRAGM

(for up to 30" beam depth)

NOTE: Use ¾" ∅ Bolts with 13/16" ∅ Holes Throughout.



SECTION A-A



INTERMEDIATE DIAPHRAGM

(for up to 36" beam depth)

KENTUCKY
DEPARTMENT OF HIGHWAYS

COMPOSITE STEEL BEAM SUPERSTRUCTURES DIAPHRAGMS CONTINUED

STANDARD DRAWING NO. BSB-105

SUBMITTED _____ 02-26-20
DIRECTOR DIVISION OF STRUCTURAL DESIGN — DATE

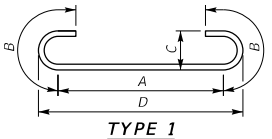
APPROVED _____ 02-26-20
STATE HIGHWAY ENGINEER — DATE

4'-0" Width x 4'-0" Height

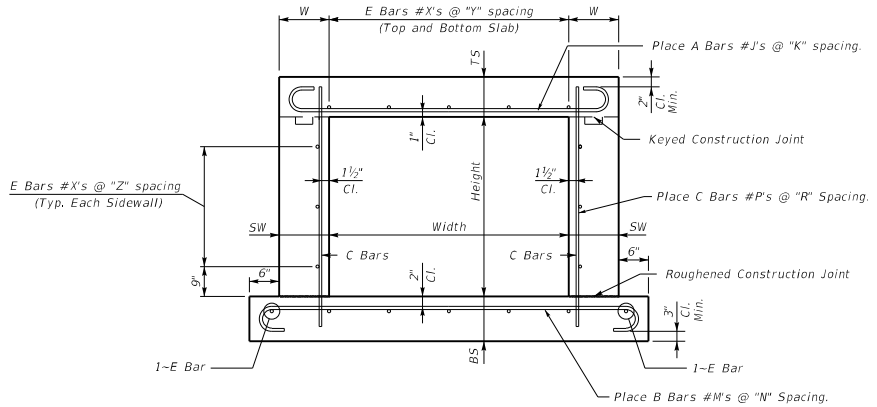
Fill Height (Ft.)	Top Slab										Bottom Slab										Sidewall						Mark "E" Distribution				Quantities	
	TS	J	K	Mark	Type	Length	A	B	C	D	BS	M	N	Mark	Type	Length	A	B	C	D	SW	P	R	Mark	Type	Length	W	X	Y	Z	Concrete CY/LF	Steel LBS/LF
0-2	8"	5	6"	A	1	6- 7	4- 11	0- 10	0- 5	5- 4	9"	5	6"	B	1	7- 7	5- 11	0- 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:
Bar Dimensions are per bar.

NOTE:
A & B bars may need to be rotated to maintain shown clearances.



TYPE 1



TYPICAL BARREL SECTION

KENTUCKY
DEPARTMENT OF HIGHWAYS

STANDARD CULVERT
4' - 0" WIDTH

STANDARD DRAWING NO. BSC-001

SUBMITTED _____ 02-26-20
DIRECTOR DIVISION OF STRUCTURAL DESIGN — DATE

APPROVED _____ 02-26-20
STATE HIGHWAY ENGINEER — 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

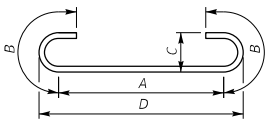
6'-0" Width x 6'-0" Height

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

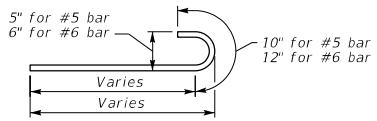
6'-0" Width x 8'-0" Height

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:
A & B bars may need to be rotated to maintain shown clearances.

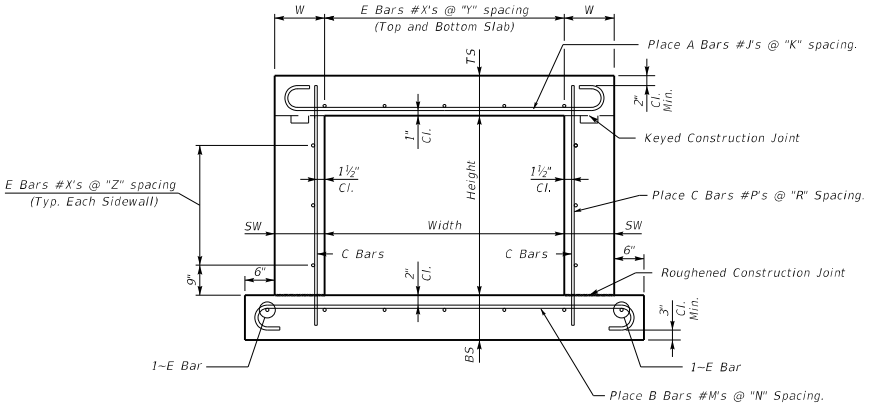


TYPE 1

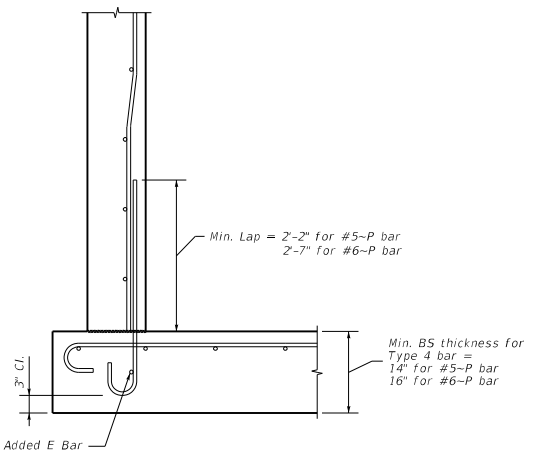


TYPE 4

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.

KENTUCKY
DEPARTMENT OF HIGHWAYS

STANDARD CULVERT
6' - 0" WIDTH

STANDARD DRAWING NO. BSC-002

SUBMITTED _____ 02-26-20
DIRECTOR DIVISION OF STRUCTURAL DESIGN — DATE

APPROVED _____ 02-26-20
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- 4¼	1-11	0-11¾	9- 4	17"	9	5"	B	1	13- 2	9- 4¼	1-11	0-11¾	10- 4	10"	5	11"	C	Str	6- 4	10"	5	12"	12"	1.29	251

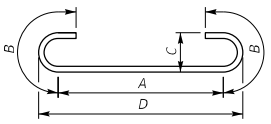
8'-0" Width x 6'-0" Height

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- 4¼	1-11	0-11¾	9- 4	16"	9	5"	B	1	13- 2	9- 4¼	1-11	0-11¾	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- 2¾	2- 2	1- 1¼	9- 4	18"	10	7"	B	1	13- 7	9- 2¾	2- 2	1- 1¼	10- 4	10"	5	7"	C	Str	8- 6	10"	5	12"	12"	1.48	258

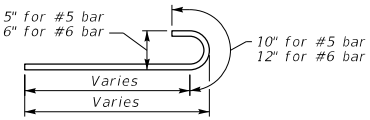
8'-0" Width x 8'-0" Height

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- 4¼	1-11	0-11¾	9- 4	16"	9	5"	B	1	13- 2	9- 4¼	1-11	0-11¾	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- 4¼	1-11	0-11¾	9- 4	18"	9	5"	B	1	13- 2	9- 4¼	1-11	0-11¾	10- 4	10"	6	5"	C	Str	10- 6	10"	5	12"	12"	1.60	321

NOTE:
A & B bars may need to be rotated to maintain shown clearances.

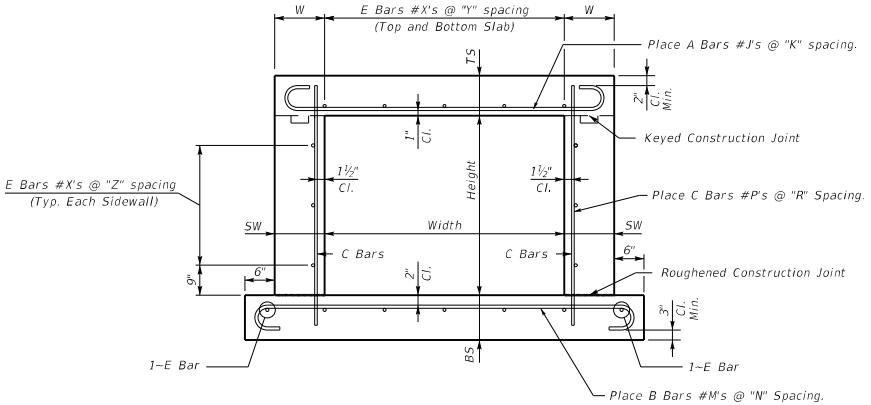


TYPE 1

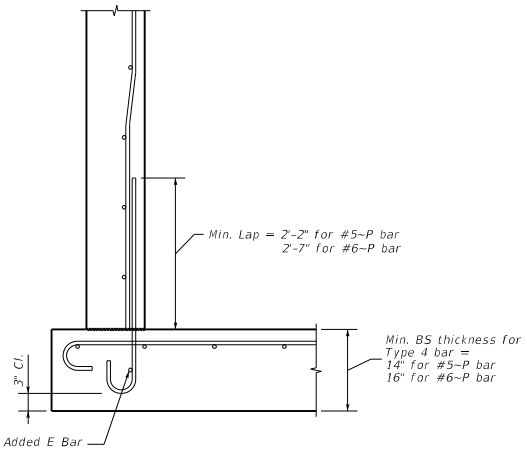


TYPE 4

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.

KENTUCKY
DEPARTMENT OF HIGHWAYS

STANDARD CULVERT
8' - 0" WIDTH

STANDARD DRAWING NO. BSC-003

SUBMITTED _____ 02-26-20
DIRECTOR DIVISION OF STRUCTURAL DESIGN — DATE

APPROVED _____ 02-26-20
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- 4¼	1-11	0-11¾	11- 4	17"	9	6"	B	1	15- 2	11- 4¼	1-11	0-11¾	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- 2¾	2- 2	1- 1¼	11- 4	18"	10	5"	B	1	15- 7	11- 2¾	2- 2	1- 1¼	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- 5¼	2- 5	1- 2¾	11- 8	19"	11	5"	B	1	16- 3	11- 5¼	2- 5	1- 2¾	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- 4¼	1-11	0-11¾	11- 4	17"	9	5"	B	1	15- 2	11- 4¼	1-11	0-11¾	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- 2¾	2- 2	1- 1¼	11- 4	18"	10	5"	B	1	15- 7	11- 2¾	2- 2	1- 1¼	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- 5¾	2- 5	1- 2¾	11- 8	20"	11	5"	B	1	16- 3	11- 5¼	2- 5	1- 2¾	12- 8	12"	5	8"	C	Str	8-10	12"	5	12"	12"	1.96	467

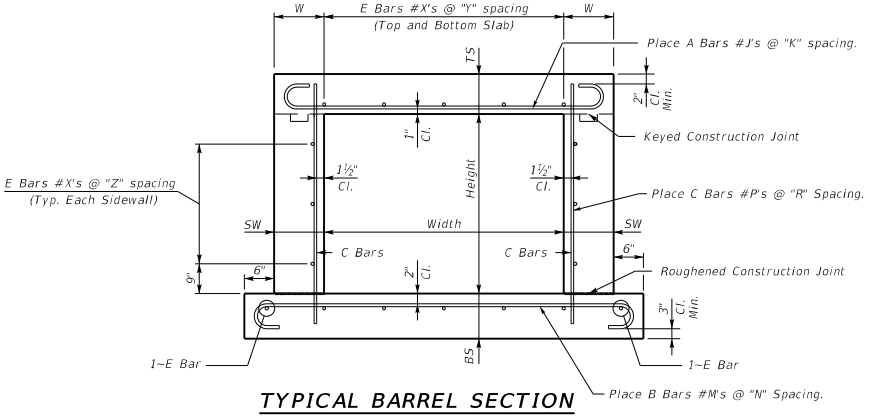
10'-0" Width x 8'-0" Height

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- 4¼	1-11	0-11¾	11- 4	17"	9	5"	B	1	15- 2	11- 4¼	1-11	0-11¾	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- 6¾	2- 2	1- 1¼	11- 8	19"	10	5"	B	1	15-11	11- 6¾	2- 2	1- 1¼	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- 5¼	2- 5	1- 2¾	11- 8	20"	11	5"	B	1	16- 3	11- 5¼	2- 5	1- 2¾	12- 8	12"	5	5"	C	Str	10-10	12"	5	12"	12"	2.10	498

10'-0" Width x 10'-0" Height

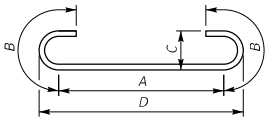
Fill Height (Ft.)	Top Slab										Bottom Slab										Sidewall						Mark "E" Distribution				Quantities	
	TS	J	K	Mark	Type	Length	A	B	C	D	BS	M	N	Mark	Type	Length	A	B	C	D	SW	P	R	Mark	Type	Length	W	X	Y	Z	Concrete CY/LF	Steel LBS/LF
0-2	10"	7	6"	A	1	13- 1	10- 9	1- 2	0- 7	11- 4	11"	7	6"	B	1	14- 1	11- 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- 6¾	2- 2	1- 1¼	11- 8	18"	10	7"	B	1	15-11	11- 6¾	2- 2	1- 1¼	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- 0¾	2- 2	1- 1¼	12- 2	19"	10	5"	B	1	16- 5	12- 0¾	2- 2	1- 1¼	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	10-11¼	2- 5	1- 2¾	12- 2	21"	11	5"	B	1	16- 9	11-11¼	2- 5	1- 2¾	13- 2	15"	6	6"	C	Str	13- 0	15"	5	12"	12"	2.58	539

NOTE:
Bar Dimensions are per bar.

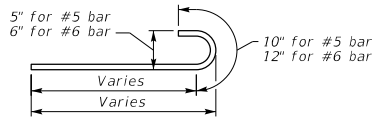


TYPICAL BARREL SECTION

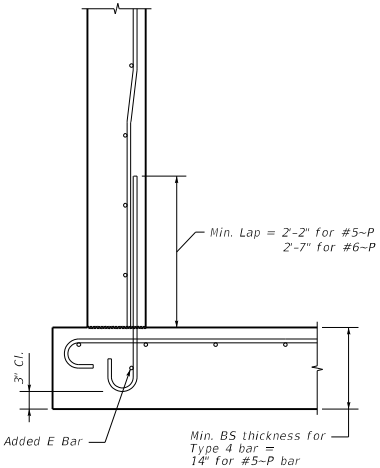
NOTE:
A & B bars may need to be rotated to maintain shown clearances.



TYPE 1



TYPE 4



OPTIONAL HOOK DETAIL

NOTE:
The contractor will not be paid additionally if optional hook detail is used.

KENTUCKY
DEPARTMENT OF HIGHWAYS

STANDARD CULVERT
10' - 0" WIDTH

STANDARD DRAWING NO. BSC-004

SUBMITTED _____ 02-26-20
DIRECTOR DIVISION OF STRUCTURAL DESIGN — DATE

APPROVED _____ 02-26-20
STATE HIGHWAY ENGINEER — DATE

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- 4¼	1-11	0-11¾	13- 4	17"	9	6"	B	1	17- 2	13- 4¼	1-11	0-11¾	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- 2¾	2- 2	1- 1¼	13- 4	18"	10	5"	B	1	17- 7	13- 2¾	2- 2	1- 1¼	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- 5¼	2- 5	1- 2¾	13- 8	20"	11	5"	B	1	18- 3	13- 5¼	2- 5	1- 2¾	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	12-11¼	2- 5	1- 2¾	14- 2	23"	11	5"	B	1	18- 9	13-11¼	2- 5	1- 2¾	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- 4¼	1-11	0-11¾	13- 4	17"	9	5"	B	1	17- 2	13- 4¼	1-11	0-11¾	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- 6¾	2- 2	1- 1¼	13- 8	19"	10	5"	B	1	17-11	13- 6¾	2- 2	1- 1¼	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- 5¼	2- 5	1- 2¾	13- 8	21"	11	5"	B	1	18- 3	13- 5¼	2- 5	1- 2¾	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	12-11¼	2- 5	1- 2¾	14- 2	24"	11	5"	B	1	18- 9	13-11¼	2- 5	1- 2¾	15- 2	15"	5	8"	C	Str	9- 6	15"	5	12"	12"	2.74	537

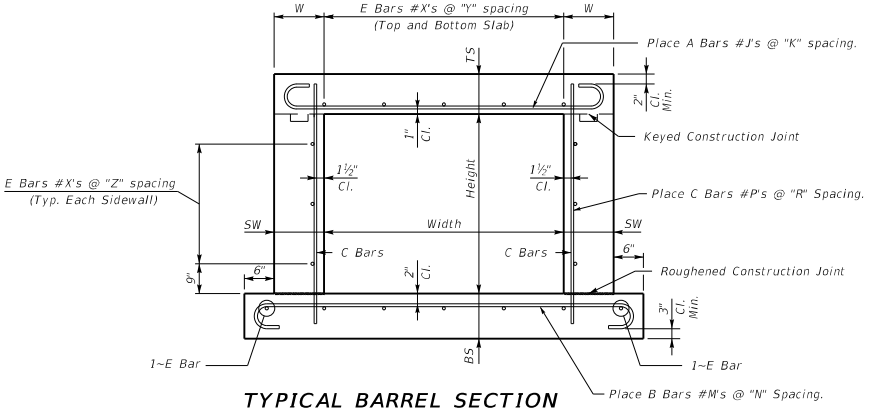
12'-0" Width x 8'-0" Height

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- 5¼	2- 5	1- 2¾	13- 8	19"	11	5"	B	1	18- 3	13- 5¼	2- 5	1- 2¾	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- 5¼	2- 5	1- 2¾	13- 8	21"	11	5"	B	1	18- 3	13- 5¼	2- 5	1- 2¾	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	12-11¼	2- 5	1- 2¾	14- 2	24"	11	5"	B	1	18- 9	13-11¼	2- 5	1- 2¾	15- 2	15"	5	6"	C	Str	11- 6	15"	5	12"	12"	2.92	560

12'-0" Width x 10'-0" Height

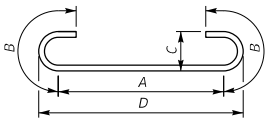
Fill Height (Ft.)	Top Slab										Bottom Slab										Sidewall						Mark "E" Distribution				Quantities	
	TS	J	K	Mark	Type	Length	A	B	C	D	BS	M	N	Mark	Type	Length	A	B	C	D	SW	P	R	Mark	Type	Length	W	X	Y	Z	Concrete CY/LF	Steel LBS/LF
0-2	11"	7	5"	A	1	15- 1	12- 9	1- 2	0- 7	13- 4	12"	7	5"	B	1	16- 1	13- 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- 6¾	2- 2	1- 1¼	13- 8	18"	10	7"	B	1	17-11	13- 6¾	2- 2	1- 1¼	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	12-11¼	2- 5	1- 2¾	14- 2	19"	11	5"	B	1	18- 9	13-11¼	2- 5	1- 2¾	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	12-11¼	2- 5	1- 2¾	14- 2	22"	11	5"	B	1	18- 9	13-11¼	2- 5	1- 2¾	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- 5¼	2- 5	1- 2¾	14- 8	25"	11	5"	B	1	19- 3	14- 5¼	2- 5	1- 2¾	15- 8	18"	6	7"	C	Str	13- 8	18"	5	12"	12"	3.46	599

NOTE:
Bar Dimensions are per bar.

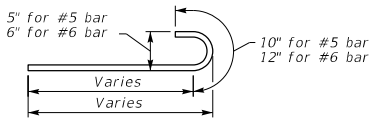


TYPICAL BARREL SECTION

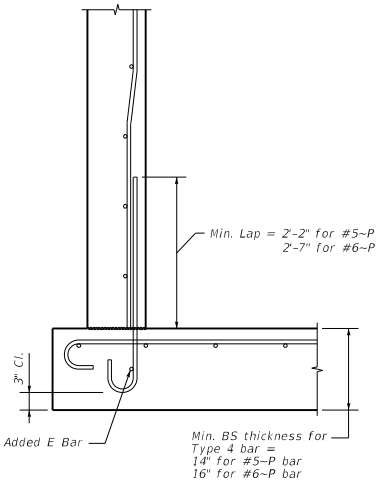
NOTE:
A & B bars may need to be rotated to maintain shown clearances.



TYPE 1



TYPE 4



OPTIONAL HOOK DETAIL

NOTE:
The contractor will not be paid additionally if optional hook detail is used.

KENTUCKY
DEPARTMENT OF HIGHWAYS

STANDARD CULVERT
12' - 0" WIDTH

STANDARD DRAWING NO. BSC-005

SUBMITTED — DIRECTOR DIVISION OF STRUCTURAL DESIGN — DATE 02-26-20

APPROVED — STATE HIGHWAY ENGINEER — DATE 02-26-20

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- 4¼	1-11	0-11¾	15- 4	16"	9	5"	B	1	19- 2	15- 4¼	1-11	0-11¾	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- 2¾	2- 2	1- 1¼	15- 4	18"	10	5"	B	1	19- 7	15- 2⅜	2- 2	1- 1¼	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- 5¼	2- 5	1- 2¾	15- 8	20"	11	5"	B	1	20- 3	15- 5¼	2- 5	1- 2¾	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	14-11¼	2- 5	1- 2¾	16- 2	24"	11	5"	B	1	20- 9	15-11¼	2- 5	1- 2¾	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- 5¼	2- 5	1- 2¾	16- 8	27"	11	5"	B	1	21- 3	16- 5¼	2- 5	1- 2¾	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- 4¼	1-11	0-11¾	15- 4	16"	9	5"	B	1	19- 2	15- 4¼	1-11	0-11¾	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- 6¾	2- 2	1- 1¼	15- 8	19"	10	5"	B	1	19-11	15- 6¾	2- 2	1- 1¼	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- 5¼	2- 5	1- 2¾	15- 8	21"	11	5"	B	1	20- 3	15- 5¼	2- 5	1- 2¾	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	14-11¼	2- 5	1- 2¾	16- 2	24"	11	5"	B	1	20- 9	15-11¼	2- 5	1- 2¾	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- 5¼	2- 5	1- 2¾	16- 8	28"	11	5"	B	1	21- 3	16- 5¼	2- 5	1- 2¾	17- 8	18"	5	10"	C	Str	10- 2	18"	5	12"	12"	3.64	601

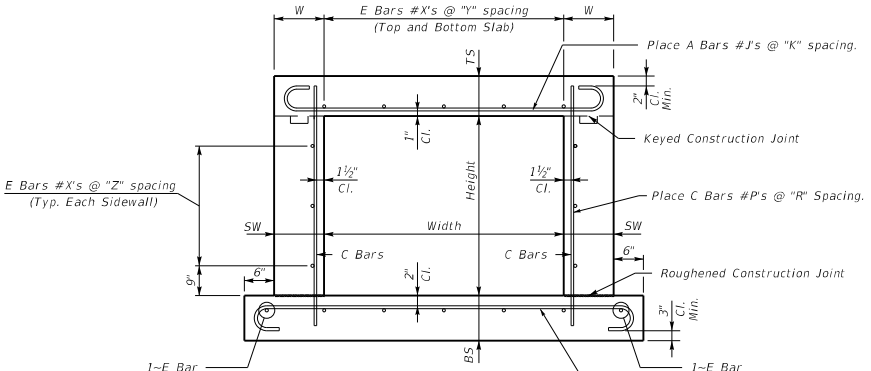
14'-0" Width x 8'-0" Height

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- 6¾	2- 2	1- 1¼	15- 8	19"	10	5"	B	1	19-11	15- 6¾	2- 2	1- 1¼	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- 5¼	2- 5	1- 2¾	15- 8	21"	11	5"	B	1	20- 3	15- 5¼	2- 5	1- 2¾	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- 5¼	2- 5	1- 2¾	16- 8	25"	11	5"	B	1	21- 3	16- 5¼	2- 5	1- 2¾	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- 5¼	2- 5	1- 2¾	16- 8	29"	11	5"	B	1	21- 3	16- 5¼	2- 5	1- 2¾	17- 8	18"	6	8"	C	Str	12- 4	18"	5	12"	12"	3.97	635

14'-0" Width x 10'-0" Height

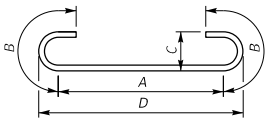
Fill Height (Ft.)	Top Slab										Bottom Slab										Sidewall						Mark "E" Distribution				Quantities	
	TS	J	K	Mark	Type	Length	A	B	C	D	BS	M	N	Mark	Type	Length	A	B	C	D	SW	P	R	Mark	Type	Length	W	X	Y	Z	Concrete CY/LF	Steel LBS/LF
0-2	12"	8	6"	A	1	17- 2	14- 8	1- 3	0- 8	15- 4	13"	8	6"	B	1	18- 2	15- 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- 8¼	1-11	0-11¾	15- 8	17"	9	5"	B	1	19- 6	15- 8¼	1-11	0-11¾	16- 8	12"	6	8"	C	Str	12- 4	12"	5	12"	12"	2.43	421
20-25	18"	11	5"	A	1	19- 9	14-11¼	2- 5	1- 2¾	16- 2	19"	11	5"	B	1	20- 9	15-11¼	2- 5	1- 2¾	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	14-11¼	2- 5	1- 2¾	16- 2	22"	11	5"	B	1	20- 9	15-11¼	2- 5	1- 2¾	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- 5¼	2- 5	1- 2¾	16- 8	26"	11	5"	B	1	21- 3	16- 5¼	2- 5	1- 2¾	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- 5¼	2- 5	1- 2¾	16- 8	29"	11	5"	B	1	21- 3	16- 5¼	2- 5	1- 2¾	17- 8	18"	6	7"	C	Str	14- 4	18"	5	12"	12"	4.20	658

NOTE:
Bar Dimensions are per bar.

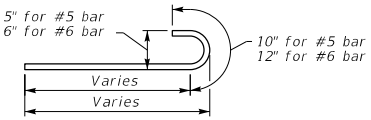


TYPICAL BARREL SECTION

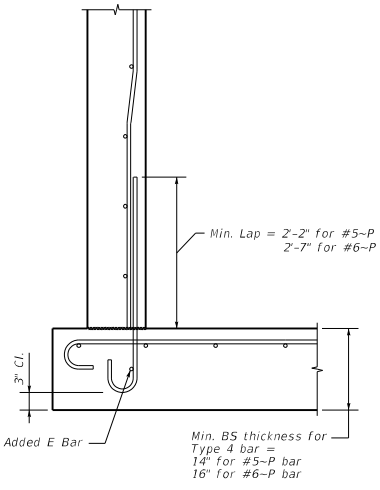
NOTE:
A & B bars may need to be rotated to maintain shown clearances.



TYPE 1



TYPE 4



OPTIONAL HOOK DETAIL

NOTE:
The contractor will not be paid additionally if optional hook detail is used.

KENTUCKY
DEPARTMENT OF HIGHWAYS

STANDARD CULVERT
14' - 0" WIDTH

STANDARD DRAWING NO. BSC-006

SUBMITTED — DIRECTOR DIVISION OF STRUCTURAL DESIGN — 02-26-20 DATE

APPROVED — STATE HIGHWAY ENGINEER — 02-26-20 DATE

16'-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	13"	8	5"	A	1	19- 2	16- 8	1- 3	0- 8	17- 4	14"	8	5"	B	1	20- 2	17- 8	1- 3	0- 8	18- 4	10"	5	12"	C	Str	5-10	11½"	5	9"	12"	1.77	321
2.01-5	13"	8	5"	A	1	19- 2	16- 8	1- 3	0- 8	17- 4	14"	8	5"	B	1	20- 2	17- 8	1- 3	0- 8	18- 4	10"	5	12"	C	Str	5-10	10"	5	12"	12"	1.77	311
5-10	14"	8	5"	A	1	19- 2	16- 8	1- 3	0- 8	17- 4	15"	8	5"	B	1	20- 2	17- 8	1- 3	0- 8	18- 4	10"	5	12"	C	Str	6- 0	10"	5	12"	12"	1.88	311
10-15	15"	9	5"	A	1	20- 2	16- 4¼	1-11	0-11¾	17- 4	16"	9	5"	B	1	21- 2	17- 4¼	1-11	0-11¾	18- 4	10"	5	12"	C	Str	6- 2	10"	5	12"	12"	1.99	397
15-20	17"	9	5"	A	1	20- 2	16- 4¼	1-11	0-11¾	17- 4	18"	9	5"	B	1	21- 2	17- 4¼	1-11	0-11¾	18- 4	10"	5	12"	C	Str	6- 6	10"	5	12"	12"	2.22	397
20-25	19"	11	5"	A	1	21- 3	16- 5¼	2- 5	1- 2¾	17- 8	20"	11	5"	B	1	22- 3	17- 5¼	2- 5	1- 2¾	18- 8	12"	5	12"	C	Str	6-10	12"	5	12"	12"	2.53	615
25-30	23"	11	5"	A	1	21- 9	16-11¼	2- 5	1- 2¾	18- 2	24"	11	5"	B	1	22- 9	17-11¼	2- 5	1- 2¾	19- 2	15"	5	12"	C	Str	7- 6	15"	5	12"	12"	3.13	630
30-35	26"	11	5"	A	1	22- 3	17- 5¼	2- 5	1- 2¾	18- 8	27"	11	5"	B	1	23- 3	18- 5¼	2- 5	1- 2¾	19- 8	18"	5	12"	C	Str	8- 0	18"	5	12"	12"	3.64	643
35-40	30"	11	5"	A	1	22- 3	17- 5¼	2- 5	1- 2¾	18- 8	31"	11	5"	B	1	23- 3	18- 5¼	2- 5	1- 2¾	19- 8	18"	5	12"	C	Str	8- 8	18"	5	12"	12"	4.12	645

16'-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	13"	8	5"	A	1	19- 2	16- 8	1- 3	0- 8	17- 4	14"	8	5"	B	1	20- 2	17- 8	1- 3	0- 8	18- 4	10"	5	12"	C	Str	7-10	11½"	5	9"	12"	1.89	330
2.01-5	13"	8	5"	A	1	19- 2	16- 8	1- 3	0- 8	17- 4	14"	8	5"	B	1	20- 2	17- 8	1- 3	0- 8	18- 4	10"	5	12"	C	Str	7-10	10"	5	12"	12"	1.89	319
5-10	14"	8	5"	A	1	19- 2	16- 8	1- 3	0- 8	17- 4	15"	8	5"	B	1	20- 2	17- 8	1- 3	0- 8	18- 4	10"	5	12"	C	Str	8- 0	10"	5	12"	12"	2.00	320
10-15	15"	9	5"	A	1	20- 2	16- 4¼	1-11	0-11¾	17- 4	16"	9	5"	B	1	21- 2	17- 4¼	1-11	0-11¾	18- 4	10"	5	12"	C	Str	8- 2	10"	5	12"	12"	2.12	405
15-20	17"	9	5"	A	1	20- 2	16- 4¼	1-11	0-11¾	17- 4	18"	9	5"	B	1	21- 2	17- 4¼	1-11	0-11¾	18- 4	10"	5	10"	C	Str	8- 6	10"	5	12"	12"	2.34	409
20-25	19"	11	5"	A	1	21- 3	16- 5¼	2- 5	1- 2¾	17- 8	20"	11	5"	B	1	22- 3	17- 5¼	2- 5	1- 2¾	18- 8	12"	5	10"	C	Str	8-10	12"	5	12"	12"	2.68	627
25-30	23"	11	5"	A	1	21- 9	16-11¼	2- 5	1- 2¾	18- 2	24"	11	5"	B	1	22- 9	17-11¼	2- 5	1- 2¾	19- 2	15"	5	11"	C	Str	9- 6	15"	5	12"	12"	3.32	640
30-35	27"	11	5"	A	1	22- 3	17- 5¼	2- 5	1- 2¾	18- 8	28"	11	5"	B	1	23- 3	18- 5¼	2- 5	1- 2¾	19- 8	18"	5	11"	C	Str	10- 2	18"	5	12"	12"	3.98	654
35-40	31"	11	5"	A	1	22- 3	17- 5¼	2- 5	1- 2¾	18- 8	32"	11	5"	B	1	23- 3	18- 5¼	2- 5	1- 2¾	19- 8	18"	5	9"	C	Str	10-10	18"	5	12"	12"	4.46	661

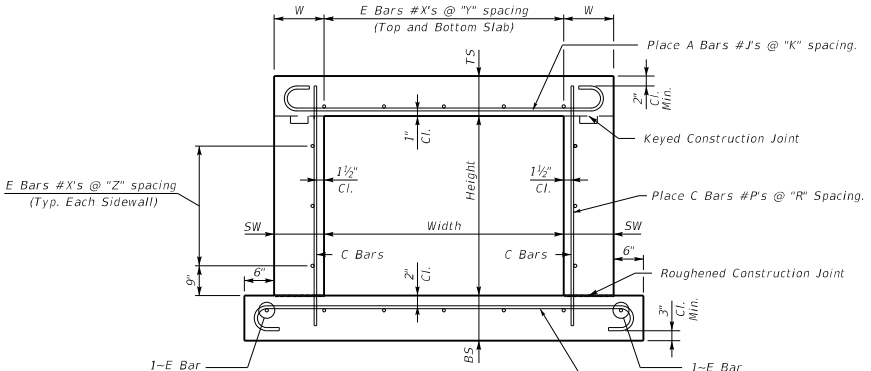
16'-0" Width x 8'-0" Height

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	13"	8	5"	A	1	19- 2	16- 8	1- 3	0- 8	17- 4	14"	8	5"	B	1	20- 2	17- 8	1- 3	0- 8	18- 4	10"	5	12"	C	Str	9-10	11½"	5	9"	12"	2.01	338
2.01-5	13"	8	5"	A	1	19- 2	16- 8	1- 3	0- 8	17- 4	14"	8	5"	B	1	20- 2	17- 8	1- 3	0- 8	18- 4	10"	5	12"	C	Str	9-10	10"	5	12"	12"	2.01	328
5-10	14"	8	5"	A	1	19- 2	16- 8	1- 3	0- 8	17- 4	15"	8	5"	B	1	20- 2	17- 8	1- 3	0- 8	18- 4	10"	5	10"	C	Str	10- 0	10"	5	12"	12"	2.13	332
10-15	15"	9	5"	A	1	20- 2	16- 4¼	1-11	0-11¾	17- 4	16"	9	5"	B	1	21- 2	17- 4¼	1-11	0-11¾	18- 4	10"	5	8"	C	Str	10- 2	10"	5	12"	12"	2.24	424
15-20	17"	10	5"	A	1	20- 7	16- 2¾	2- 2	1- 1¼	17- 4	18"	10	5"	B	1	21- 7	17- 2¾	2- 2	1- 1¼	18- 4	10"	5	7"	C	Str	10- 6	10"	5	12"	12"	2.46	529
20-25	20"	11	5"	A	1	21- 3	16- 5¼	2- 5	1- 2¾	17- 8	21"	11	5"	B	1	22- 3	17- 5¼	2- 5	1- 2¾	18- 8	12"	5	7"	C	Str	11- 0	12"	5	12"	12"	2.94	649
25-30	24"	11	5"	A	1	22- 3	17- 5¼	2- 5	1- 2¾	18- 8	25"	11	5"	B	1	23- 3	18- 5¼	2- 5	1- 2¾	19- 8	18"	5	8"	C	Str	11- 8	18"	5	12"	12"	3.84	672
30-35	28"	11	5"	A	1	22- 3	17- 5¼	2- 5	1- 2¾	18- 8	29"	11	5"	B	1	23- 3	18- 5¼	2- 5	1- 2¾	19- 8	18"	6	9"	C	Str	12- 4	18"	5	12"	12"	4.33	684
35-40	31"	11	5"	A	1	22- 3	17- 5¼	2- 5	1- 2¾	18- 8	32"	11	5"	B	1	23- 3	18- 5¼	2- 5	1- 2¾	19- 8	18"	6	8"	C	Str	12-10	18"	5	12"	12"	4.69	693

16'-0" Width x 10'-0" Height

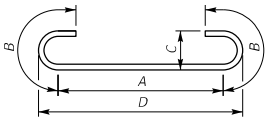
Fill Height (Ft.)	Top Slab										Bottom Slab										Sidewall						Mark "E" Distribution				Quantities	
	TS	J	K	Mark	Type	Length	A	B	C	D	BS	M	N	Mark	Type	Length	A	B	C	D	SW	P	R	Mark	Type	Length	W	X	Y	Z	Concrete CY/LF	Steel LBS/LF
0-2	13"	8	5"	A	1	19- 2	16- 8	1- 3	0- 8	17- 4	14"	8	5"	B	1	20- 2	17- 8	1- 3	0- 8	18- 4	10"	5	11"	C	Str	11-10	11½"	5	9"	12"	2.14	349
2.01-5	13"	8	5"	A	1	19- 2	16- 8	1- 3	0- 8	17- 4	14"	8	5"	B	1	20- 2	17- 8	1- 3	0- 8	18- 4	10"	5	9"	C	Str	11-10	10"	5	12"	12"	2.14	344
5-10	14"	8	5"	A	1	19- 2	16- 8	1- 3	0- 8	17- 4	15"	8	5"	B	1	20- 2	17- 8	1- 3	0- 8	18- 4	10"	5	7"	C	Str	12- 0	10"	5	12"	12"	2.25	354
10-15	16"	9	5"	A	1	20- 2	16- 4¼	1-11	0-11¾	17- 4	17"	9	5"	B	1	21- 2	17- 4¼	1-11	0-11¾	18- 4	10"	5	6"	C	Str	12- 4	10"	5	12"	12"	2.47	448
15-20	17"	10	5"	A	1	20-11	16- 6¾	2- 2	1- 1¼	17- 8	18"	10	5"	B	1	21-11	17- 6¾	2- 2	1- 1¼	18- 8	12"	5	6"	C	Str	12- 6	12"	5	12"	12"	2.75	554
20-25	20"	11	5"	A	1	21- 3	16- 5¼	2- 5	1- 2¾	17- 8	21"	11	5"	B	1	22- 3	17- 5¼	2- 5	1- 2¾	18- 8	12"	5	5"	C	Str	13- 0	12"	5	12"	12"	3.09	679
25-30	25"	11	5"	A	1	22- 3	17- 5¼	2- 5	1- 2¾	18- 8	26"	11	5"	B	1	23- 3	18- 5¼	2- 5	1- 2¾	19- 8	18"	5	5"	C	Str	13-10	18"	5	12"	12"	4.19	709
30-35	28"	11	5"	A	1	22- 3	17- 5¼	2- 5	1- 2¾	18- 8	29"	11	5"	B	1	23- 3	18- 5¼	2- 5	1- 2¾	19- 8	18"	6	8"	C	Str	14- 4	18"	5	12"	12"	4.55	704
35-40	32"	11	5"	A	1	22- 3	17- 5¼	2- 5	1- 2¾	18- 8	33"	11	5"	B	1	23- 3	18- 5¼	2- 5	1- 2¾	19- 8	18"	6	7"	C	Str	15- 0	18"	5	12"	12"	5.03	716

NOTE:
Bar Dimensions are per bar.

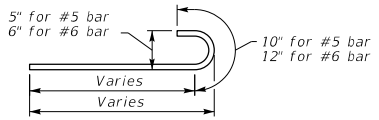


TYPICAL BARREL SECTION

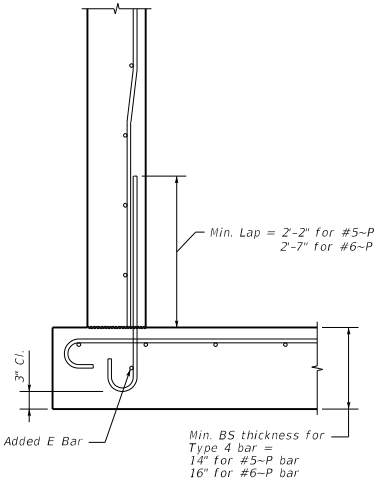
NOTE:
A & B bars may need to be rotated to maintain shown clearances.



TYPE 1



TYPE 4



OPTIONAL HOOK DETAIL

NOTE:
The contractor will not be paid additionally if optional hook detail is used.

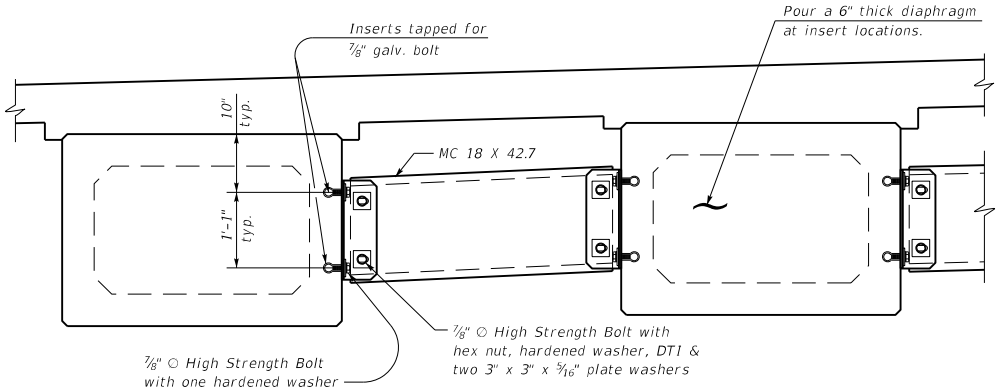
KENTUCKY
DEPARTMENT OF HIGHWAYS

STANDARD CULVERT
16' - 0" WIDTH

STANDARD DRAWING NO. BSC-007

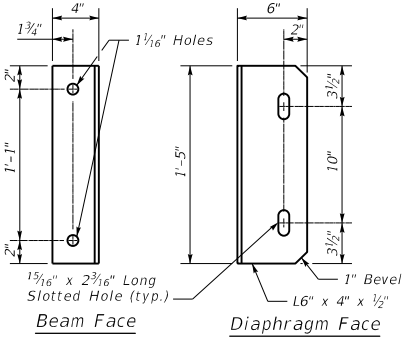
SUBMITTED — DIRECTOR DIVISION OF STRUCTURAL DESIGN — 02-26-20 DATE

APPROVED — STATE HIGHWAY ENGINEER — 02-26-20 DATE

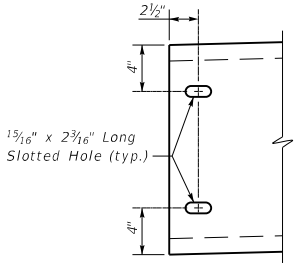


INTERMEDIATE DIAPHRAGM

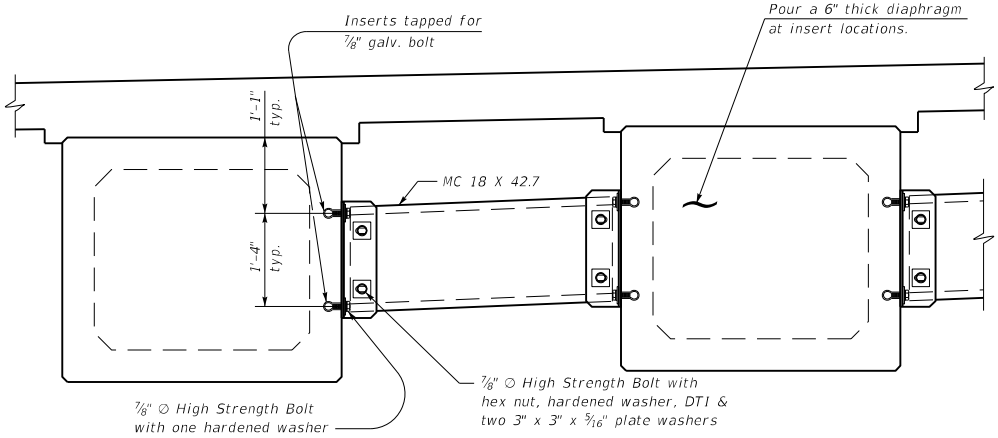
~Typical for SB-33 Beams~



CLIP ANGLE

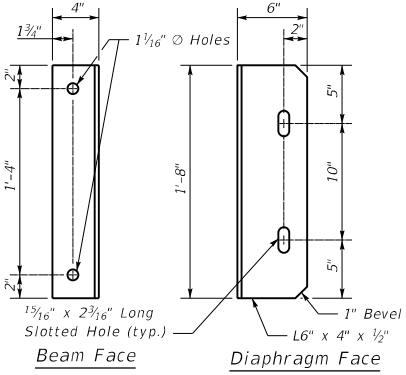


CHANNEL END

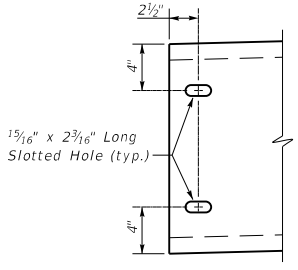


INTERMEDIATE DIAPHRAGM

~Typical for SB-42 Beams~



CLIP ANGLE



CHANNEL END

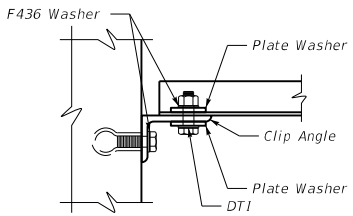
Diaphragm Notes

CONNECTIONS: *Ensure all bolted connections are ASTM A325, 7/8 inch diameter high strength bolts, nuts, and washers, mechanically zinc coated in accordance with AASHTO M298, for Class 50. Install all high strength bolted field connections using "direct tension indicators" (DTI's) in accordance with the Standard Specificationsand ASTM F959. Ensure all DTI's are mechanically zinc coated. Show installation details of the DTI's on the shop plans. Place DTI's under the bolt head.*

STRUCTURAL STEEL: *Ensure plates, angles, and channels conform to ASTM A36 or A572 and galvanized after fabrication.*

SHOP DRAWINGS: *Show the location of all inserts and holes on the precast beam shop drawings. Submit shop drawings for the steel diaphragms to the Division of Structural Design for approval.*

DIAPHRAGMS: *Erect the diaphragms the same day that the precast beams are placed on the substructure. Include the cost of all materials and labor required to fabricate and erect the diaphragms in the bid for Precast Beams.*



CONNECTION DETAILS

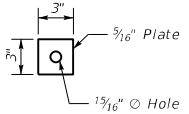


PLATE WASHER

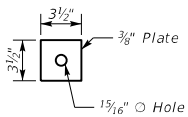
KENTUCKY
DEPARTMENT OF HIGHWAYS

BOX BEAM DIAPHRAGMS

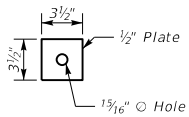
STANDARD DRAWING NO. BSD-001

SUBMITTED _____ 02-26-20
DIRECTOR DIVISION OF STRUCTURAL DESIGN — DATE

APPROVED _____ 02-26-20
STATE HIGHWAY ENGINEER — DATE



BACKING PLATE



FILLER PLATE

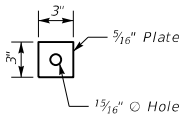
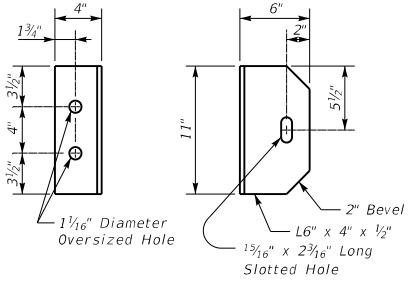


PLATE WASHER



CLIP ANGLE - L1

CROSS FRAME NOTES

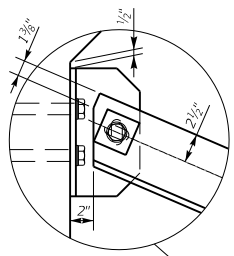
CONNECTIONS: Ensure all bolted connections are ASTM A325, ⅞ inch diameter high strength bolts, nuts, and washers, mechanically zinc coated in accordance with AASHTO M298, for Class 50. Install all high strength bolted field connections using "direct tension indicators" (DTI's) in accordance with the Standard Specifications and ASTM F959. Ensure all DTI's are mechanically zinc coated. Show installation details of the DTI's on the shop plans. Place DTI's under the bolt head. ASTM A449 bolts may be used in lieu of A325 for the bolts carried through the girder webs only.

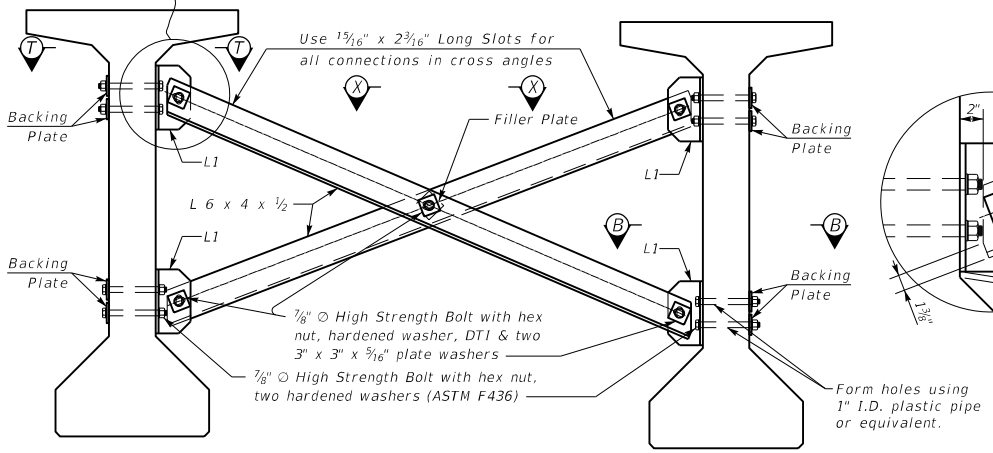
STRUCTURAL STEEL: Ensure plates and angles conform to ASTM A36 or A572 and galvanized after fabrication.

SHOP DRAWINGS: Show the location of all inserts and holes on the precast beam shop drawings. Submit shop drawings for the steel diaphragms to the Division of Structural Design for approval.

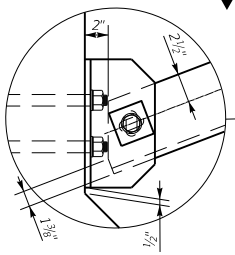
DIAPHRAGMS: Erect the diaphragms the same day that the precast beams are placed on the substructure. Include the cost of all materials and labor required to fabricate and erect the diaphragms in the bid for Precast Beams.

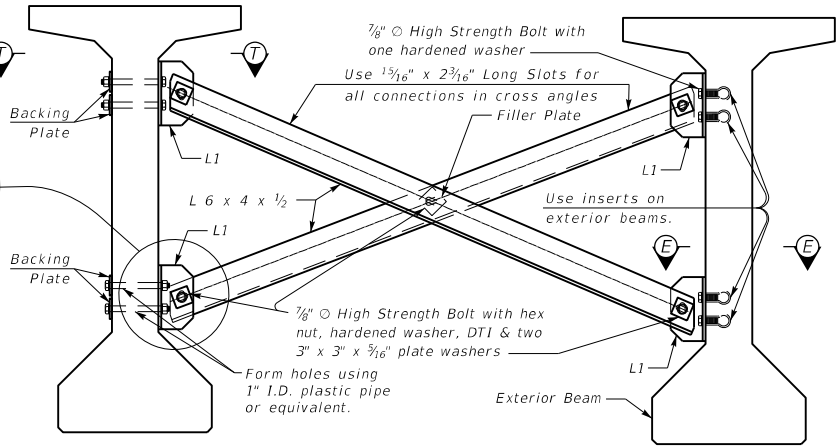
BEAMS: This crossframe is to be used on PPC I-Beams with heights of 60 inches or greater such as Type 5-8 and HN60 to HN84.



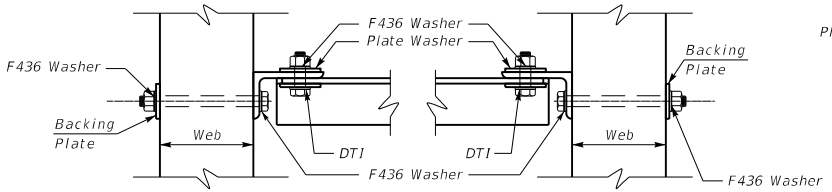


INTERMEDIATE DIAPHRAGM DETAILS BETWEEN INTERIOR BEAMS

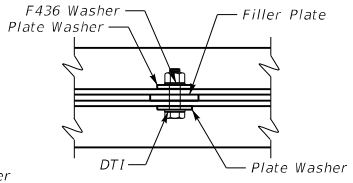




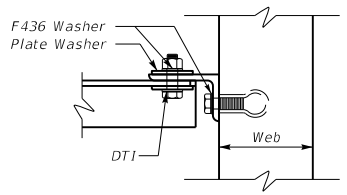
INTERMEDIATE DIAPHRAGM DETAILS BETWEEN OUTMOST BEAMS



SECTION T-T SECTION B-B



SECTION X-X



SECTION E-E

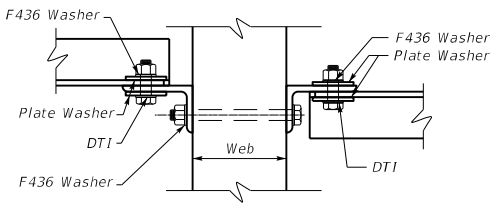
KENTUCKY
DEPARTMENT OF HIGHWAYS

PPC I-BEAM
SKEWED STEEL
CROSS FRAME DETAILS

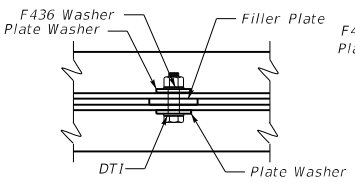
STANDARD DRAWING NO. BSD-002

SUBMITTED _____ 02-26-20
DIRECTOR DIVISION OF STRUCTURAL DESIGN — DATE

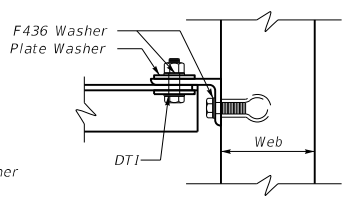
APPROVED _____ 02-26-20
STATE HIGHWAY ENGINEER — DATE



SECTION T-T



SECTION X-X



SECTION E-E

CROSS FRAME NOTES

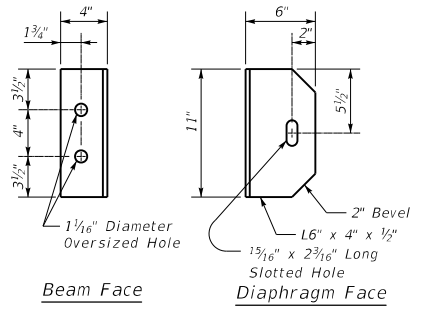
CONNECTIONS: *Ensure all bolted connections are ASTM A325, 7/8 inch diameter high strength bolts, nuts, and washers, mechanically zinc coated in accordance with AASHTO M298, for Class 50. Install all high strength bolted field connections using "direct tension indicators" (DTI's) in accordance with the Standard Specifications and ASTM F959. Ensure all DTI's are mechanically zinc coated. Show installation details of the DTI's on the shop plans. Place DTI's under the bolt head. ASTM A449 bolts may be used in lieu of A325 for the bolts carried through the girder webs only.*

STRUCTURAL STEEL: *Ensure plates and angles conform to ASTM A36 or A572 and galvanized after fabrication.*

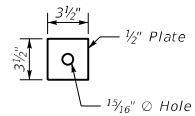
SHOP DRAWINGS: *Show the location of all inserts and holes on the precast beam shop drawings. Submit shop drawings for the steel diaphragms to the Division of Structural Design for approval.*

DIAPHRAGMS: *Erect the diaphragms the same day that the precast beams are placed on the substructure. Include the cost of all materials and labor required to fabricate and erect the diaphragms in the bid for Precast Beams.*

BEAMS: *This crossframe is to be used on PPC I-Beams with heights of 60 inches or greater such as Type 5-8 and HN60 to HN84.*



CLIP ANGLE - L1



FILLER PLATE

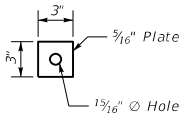
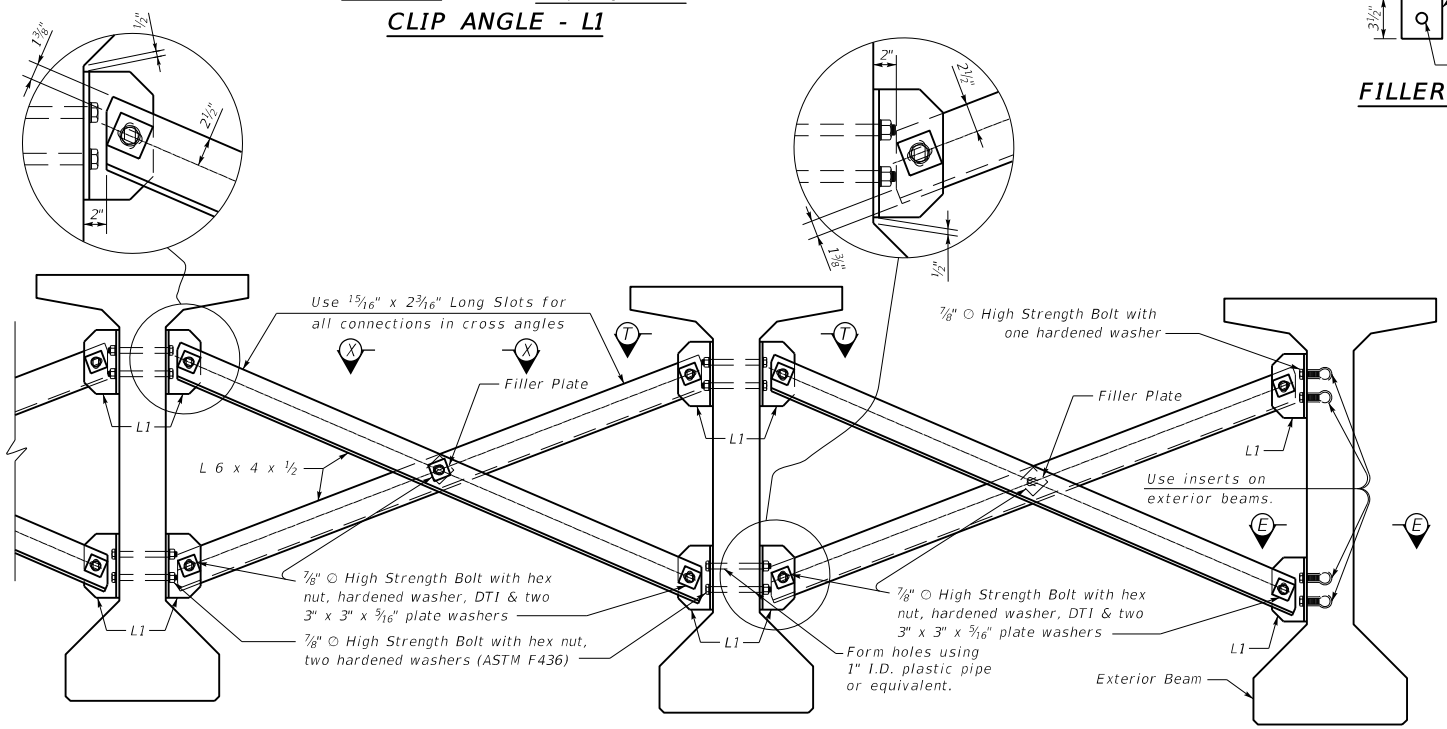


PLATE WASHER



INTERMEDIATE DIAPHRAGM DETAILS

KENTUCKY
DEPARTMENT OF HIGHWAYS

PPC I-BEAM
0° SKEW STEEL
CROSS FRAME DETAILS

STANDARD DRAWING NO. BSD-003

SUBMITTED _____ 02-26-20
DIRECTOR DIVISION OF STRUCTURAL DESIGN — DATE

APPROVED _____ 02-26-20
STATE HIGHWAY ENGINEER — DATE

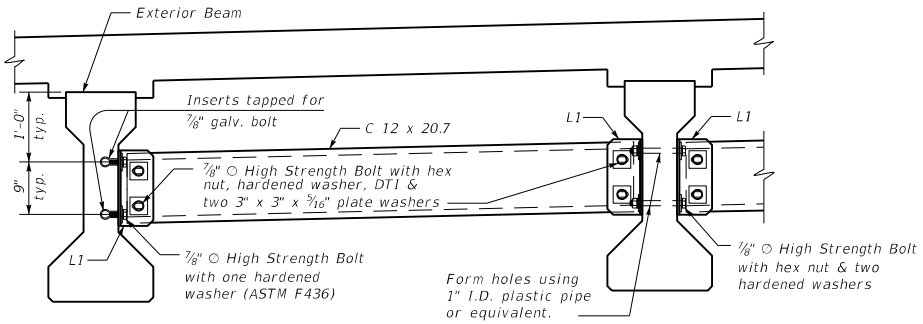
DIAPHRAGM NOTES

CONNECTIONS: Ensure all bolted connections are ASTM A325, 7/8 inch diameter high strength bolts, nuts, and washers, mechanically zinc coated in accordance with AASHTO M298, for Class 50. Install all high strength bolted field connections using "direct tension indicators" (DTI's) in accordance with the Standard Specifications and ASTM F959. Ensure all DTI's are mechanically zinc coated. Show installation details of the DTI's on the shop plans. Place DTI's under the bolt head. ASTM A449 bolts may be used in lieu of A325 for the bolts carried through the girder webs only.

STRUCTURAL STEEL: Ensure plates, angles, and channels conform to ASTM A36 or A572 and galvanized after fabrication.

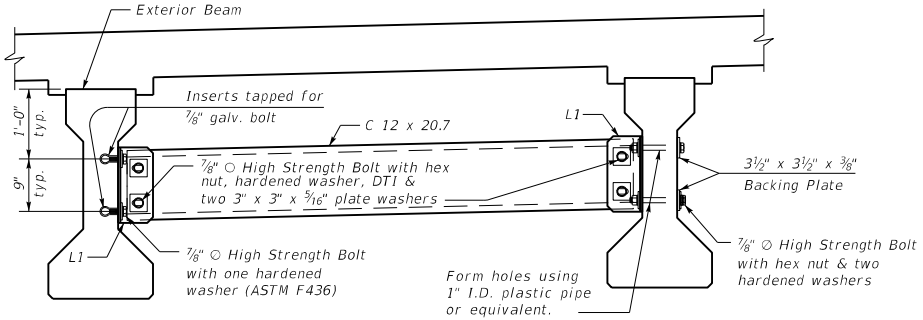
SHOP DRAWINGS: Show the location of all inserts and holes on the precast beam shop drawings. Submit shop drawings for the steel diaphragms to the Division of Structural Design for approval.

DIAPHRAGMS: Erect the diaphragms the same day that the precast beams are placed on the substructure. Include the cost of all materials and labor required to fabricate and erect the diaphragms in the bid for Precast Beams.



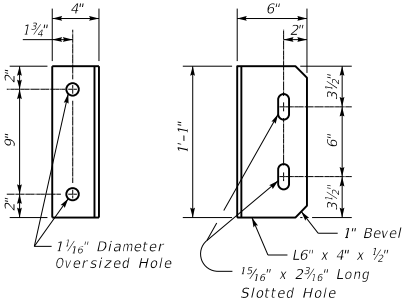
INTERMEDIATE DIAPHRAGM

~Typical for 0° Skew PCI, Type 2 Beams~

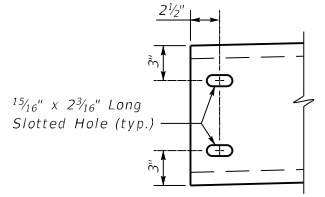


INTERMEDIATE DIAPHRAGM

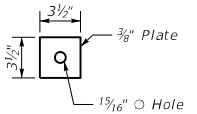
~Typical for Skewed PCI, Type 2 Beams~



CLIP ANGLE - L1



CHANNEL END



BACKING PLATE

Skewed Spans, Only

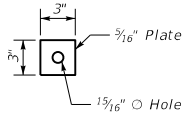
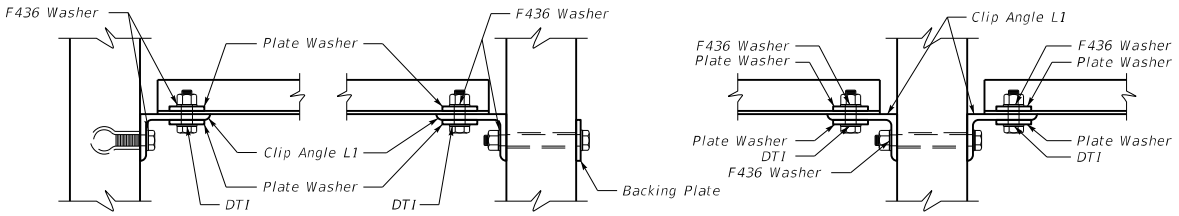


PLATE WASHER



CONNECTION DETAILS

KENTUCKY
DEPARTMENT OF HIGHWAYS

PPC I-BEAM
TYPE 2
DIAPHRAGM DETAILS

STANDARD DRAWING NO. BSD-004

SUBMITTED _____ 02-26-20
DIRECTOR DIVISION OF STRUCTURAL DESIGN — DATE

APPROVED _____ 02-26-20
STATE HIGHWAY ENGINEER — DATE

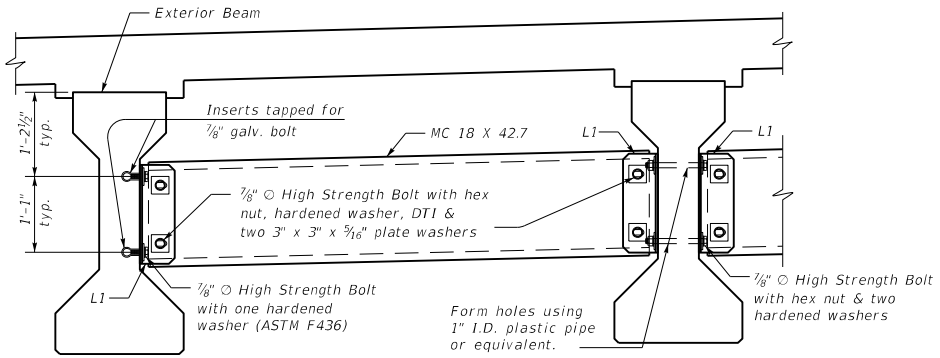
DIAPHRAGM NOTES

CONNECTIONS: Ensure all bolted connections are ASTM A325, 7/8 inch diameter high strength bolts, nuts, and washers, mechanically zinc coated in accordance with AASHTO M298, for Class 50. Install all high strength bolted field connections using "direct tension indicators" (DTI's) in accordance with the Standard Specifications and ASTM F959. Ensure all DTI's are mechanically zinc coated. Show installation details of the DTI's on the shop plans. Place DTI's under the bolt head. ASTM A449 bolts may be used in lieu of A325 for the bolts carried through the girder webs only.

STRUCTURAL STEEL: Ensure plates, angles, and channels conform to ASTM A36 or A572 and galvanized after fabrication.

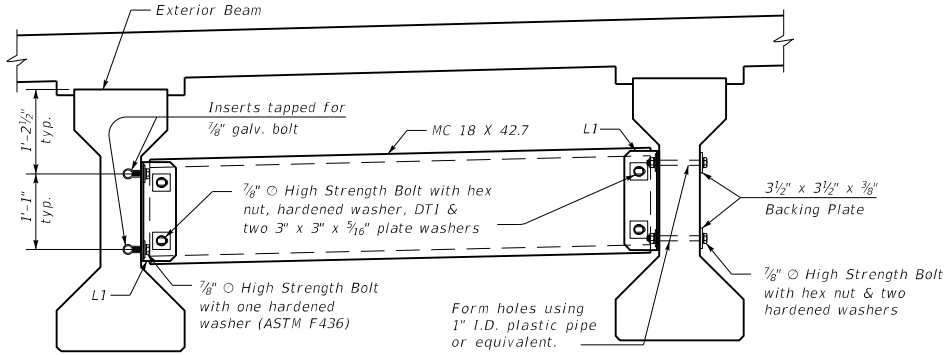
SHOP DRAWINGS: Show the location of all inserts and holes on the precast beam shop drawings. Submit shop drawings for the steel diaphragms to the Division of Structural Design for approval.

DIAPHRAGMS: Erect the diaphragms the same day that the precast beams are placed on the substructure. Include the cost of all materials and labor required to fabricate and erect the diaphragms in the bid for Precast Beams.



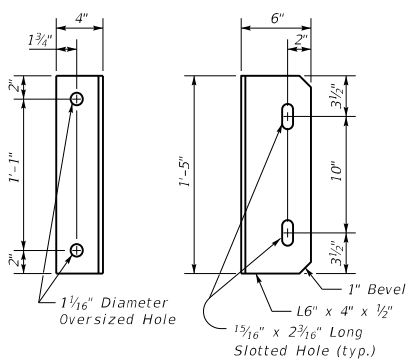
INTERMEDIATE DIAPHRAGM

~Typical for 0° Skew PCI, Type 3 Beams~

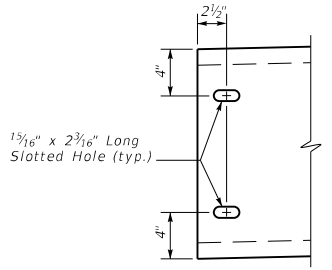


INTERMEDIATE DIAPHRAGM

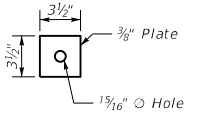
~Typical for Skewed PCI, Type 3 Beams~



CLIP ANGLE - L1



CHANNEL END



BACKING PLATE

Skewed Spans, Only

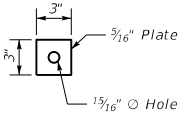
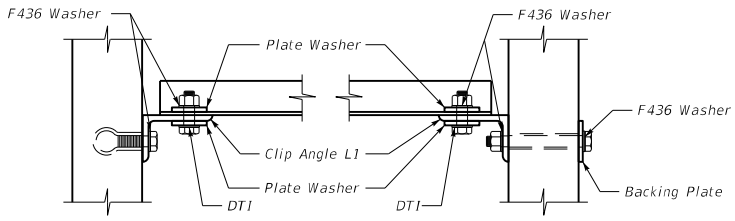
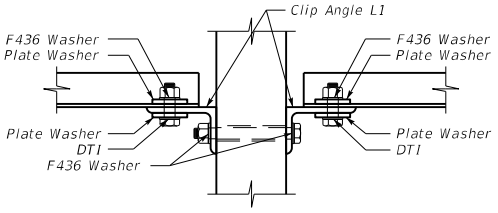


PLATE WASHER





CONNECTION DETAILS

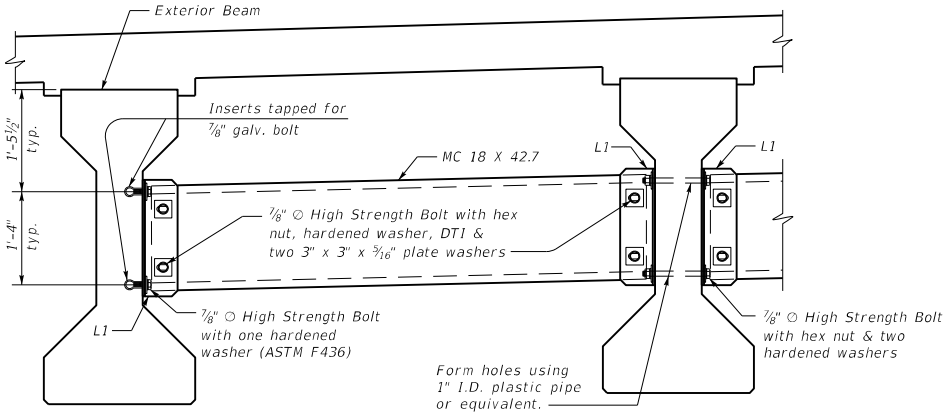
KENTUCKY
DEPARTMENT OF HIGHWAYS

PPC I-BEAM
TYPE 3
DIAPHRAGM DETAILS

STANDARD DRAWING NO. BSD-005

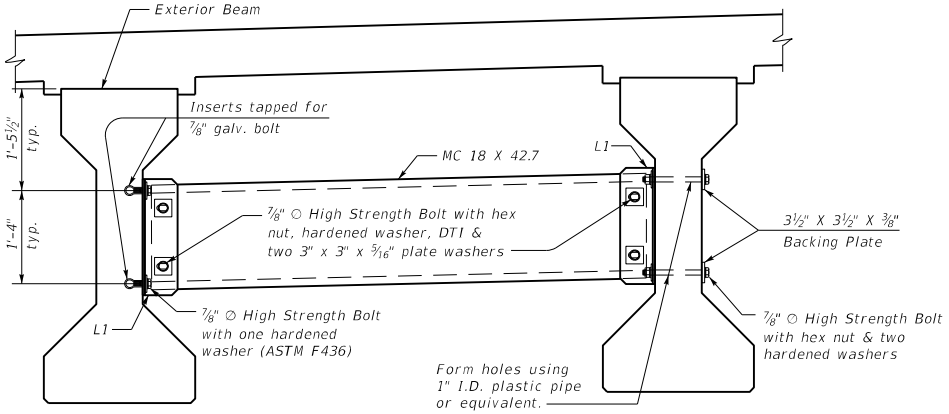
SUBMITTED _____ 02-26-20
DIRECTOR DIVISION OF STRUCTURAL DESIGN — DATE

APPROVED _____ 02-26-20
STATE HIGHWAY ENGINEER — DATE



INTERMEDIATE DIAPHRAGM

~Typical for 0° Skew PCI, Type 4 Beams~



INTERMEDIATE DIAPHRAGM

~Typical for Skewed PCI, Type 4 Beams~

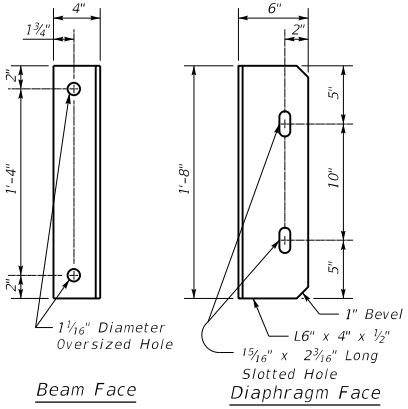
DIAPHRAGM NOTES

CONNECTIONS: Ensure all bolted connections are ASTM A325, 7/8 inch diameter high strength bolts, nuts, and washers, mechanically zinc coated in accordance with AASHTO M298, for Class 50. Install all high strength bolted field connections using "direct tension indicators" (DTI's) in accordance with the Standard Specifications and ASTM F959. Ensure all DTI's are mechanically zinc coated. Show installation details of the DTI's on the shop plans. Place DTI's under the bolt head. ASTM A449 bolts may be used in lieu of A325 for the bolts carried through the girder webs only.

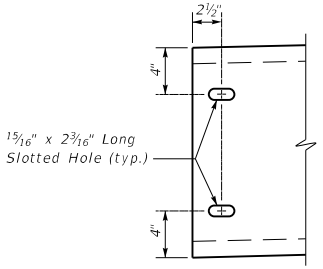
STRUCTURAL STEEL: Ensure plates, angles, and channels conform to ASTM A36 or A572 and galvanized after fabrication.

SHOP DRAWINGS: Show the location of all inserts and holes on the precast beam shop drawings. Submit shop drawings for the steel diaphragms to the Division of Structural Design for approval.

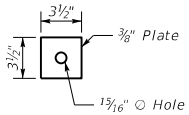
DIAPHRAGMS: Erect the diaphragms the same day that the precast beams are placed on the substructure. Include the cost of all materials and labor required to fabricate and erect the diaphragms in the bid for Precast Beams.



CLIP ANGLE - L1



CHANNEL END



BACKING PLATE

Skewed Spans, Only

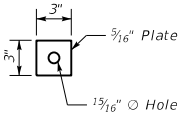
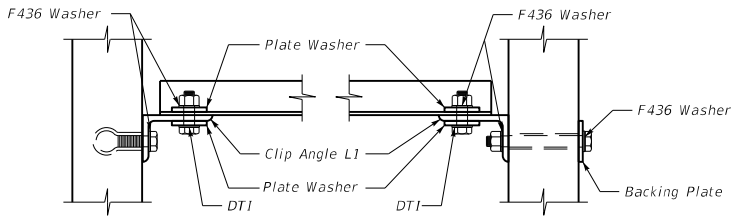
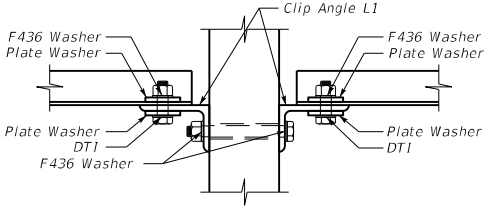


PLATE WASHER





CONNECTION DETAILS

KENTUCKY
DEPARTMENT OF HIGHWAYS

PRESTRESSED PREFORMED CONCRETE I-BEAM TYPE 4 DIAPHRAGM DETAILS

STANDARD DRAWING NO. BSD-006

SUBMITTED _____ 02-26-20
DIRECTOR DIVISION OF STRUCTURAL DESIGN — DATE

APPROVED _____ 02-26-20
STATE HIGHWAY ENGINEER — DATE

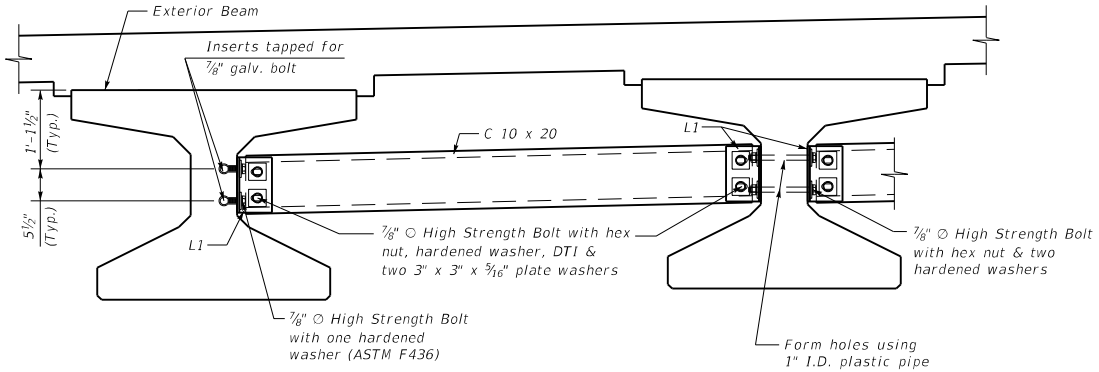
DIAPHRAGM NOTES

CONNECTIONS: Ensure all bolted connections are ASTM A325, 7/8 inch diameter high strength bolts, nuts, and washers, mechanically zinc coated in accordance with AASHTO M298, for Class 50. Install all high strength bolted field connections using "direct tension indicators" (DTI's) in accordance with the Standard Specifications and ASTM F959. Ensure all DTI's are mechanically zinc coated. Show installation details of the DTI's on the shop plans. Place DTI's under the bolt head. ASTM A449 bolts may be used in lieu of A325 for the bolts carried through the girder webs only.

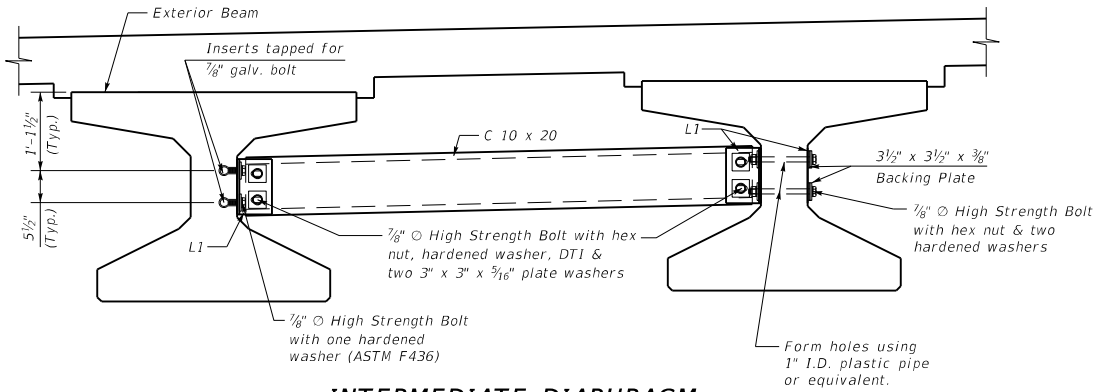
STRUCTURAL STEEL: Ensure plates, angles, and channels conform to ASTM A36 or A572 and galvanized after fabrication.

SHOP DRAWINGS: Show the location of all inserts and holes on the precast beam shop drawings. Submit shop drawings for the steel diaphragms to the Division of Structural Design for approval.

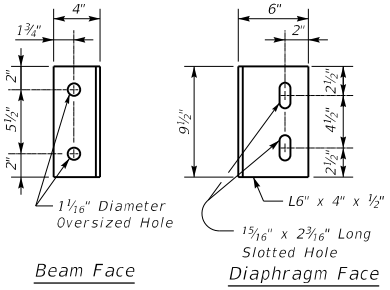
DIAPHRAGMS: Erect the diaphragms the same day that the precast beams are placed on the substructure. Include the cost of all materials and labor required to fabricate and erect the diaphragms in the bid for Precast Beams.



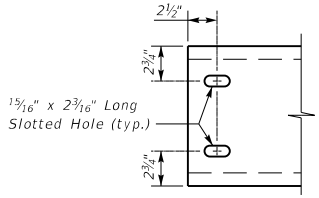
INTERMEDIATE DIAPHRAGM
~Typical for 0° Skew~



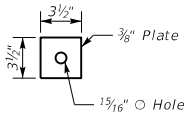
INTERMEDIATE DIAPHRAGM
~Typical for Skewed~



CLIP ANGLE - L1



CHANNEL END



BACKING PLATE
Skewed Spans, Only

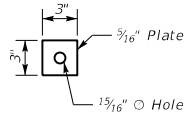
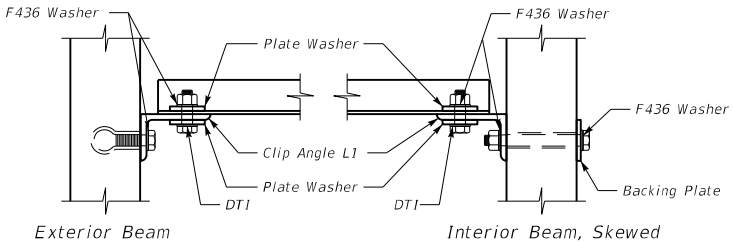


PLATE WASHER



CONNECTION DETAILS

KENTUCKY
DEPARTMENT OF HIGHWAYS

PPC I-BEAM HN36
DIAPHRAGM DETAILS

STANDARD DRAWING NO. BSD-007

SUBMITTED _____ 02-26-20
DIRECTOR DIVISION OF STRUCTURAL DESIGN — DATE

APPROVED _____ 02-26-20
STATE HIGHWAY ENGINEER — DATE

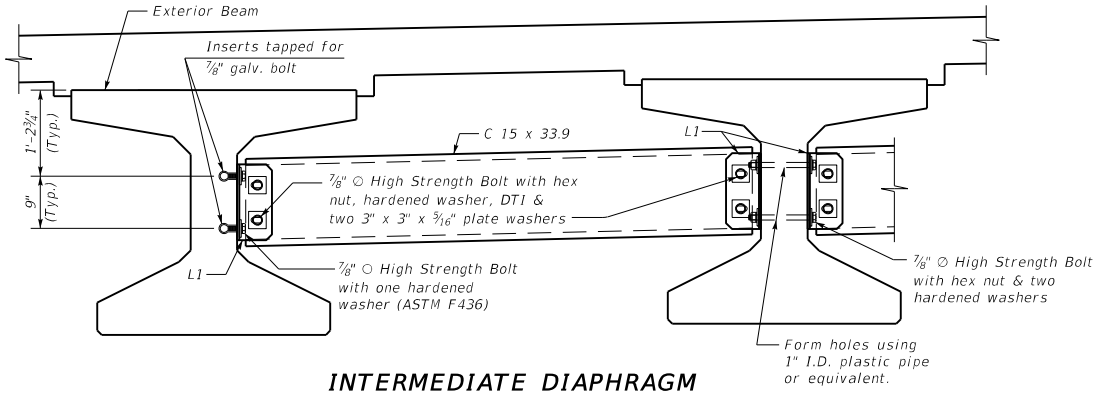
DIAPHRAGM NOTES

CONNECTIONS: Ensure all bolted connections are ASTM A325, 7/8 inch diameter high strength bolts, nuts, and washers, mechanically zinc coated in accordance with AASHTO M298, for Class 50. Install all high strength bolted field connections using "direct tension indicators" (DTI's) in accordance with the Standard Specifications and ASTM F959. Ensure all DTI's are mechanically zinc coated. Show installation details of the DTI's on the shop plans. Place DTI's under the bolt head. ASTM A449 bolts may be used in lieu of A325 for the bolts carried through the girder webs only.

STRUCTURAL STEEL: Ensure plates, angles, and channels conform to ASTM A36 or A572 and galvanized after fabrication.

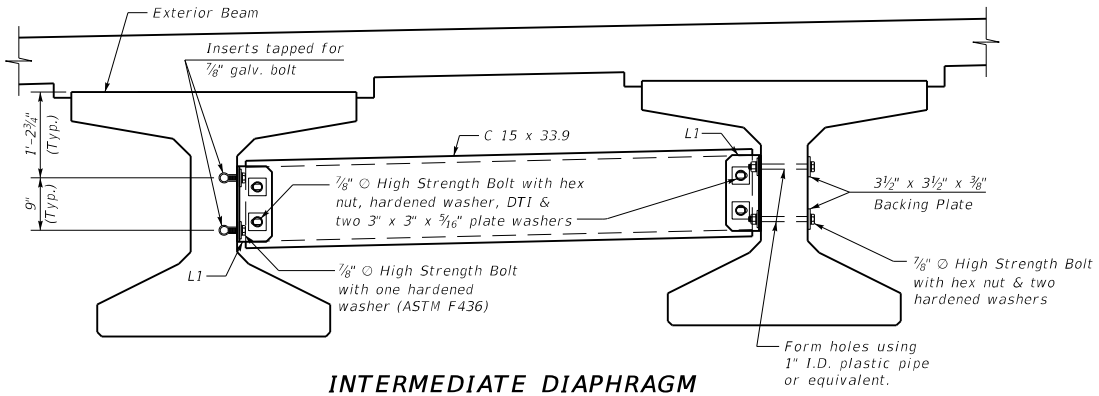
SHOP DRAWINGS: Show the location of all inserts and holes on the precast beam shop drawings. Submit shop drawings for the steel diaphragms to the Division of Structural Design for approval.

DIAPHRAGMS: Erect the diaphragms the same day that the precast beams are placed on the substructure. Include the cost of all materials and labor required to fabricate and erect the diaphragms in the bid for Precast Beams.



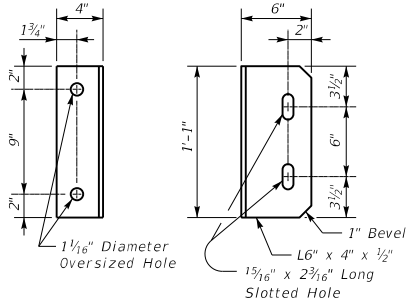
INTERMEDIATE DIAPHRAGM

~Typical for 0° Skew~

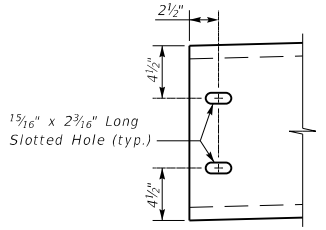


INTERMEDIATE DIAPHRAGM

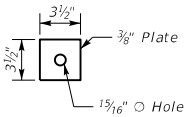
~Typical for Skewed~



CLIP ANGLE - L1



CHANNEL END



BACKING PLATE

Skewed Spans, Only

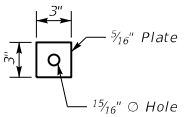
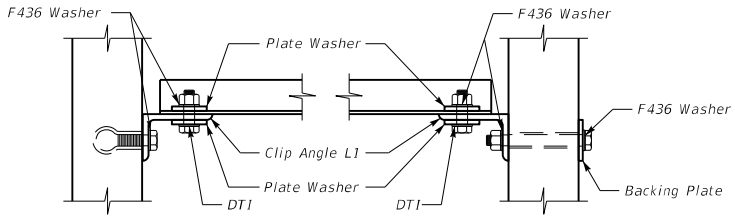
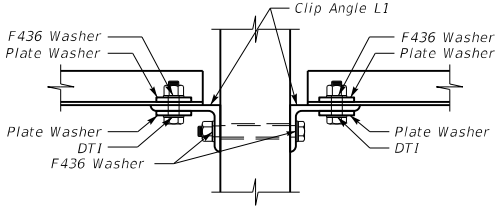


PLATE WASHER





CONNECTION DETAILS

KENTUCKY
DEPARTMENT OF HIGHWAYS

PPC I-BEAM HN42
DIAPHRAGM DETAILS

STANDARD DRAWING NO. BSD-008

SUBMITTED _____ 02-26-20
DIRECTOR DIVISION OF STRUCTURAL DESIGN — DATE

APPROVED _____ 02-26-20
STATE HIGHWAY ENGINEER — DATE

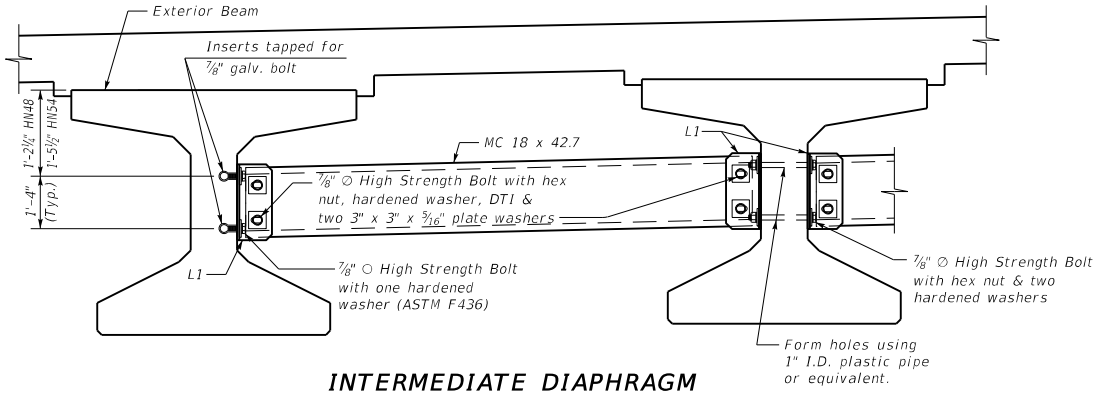
DIAPHRAGM NOTES

CONNECTIONS: Ensure all bolted connections are ASTM A325, 7/8 inch diameter high strength bolts, nuts, and washers, mechanically zinc coated in accordance with AASHTO M298, for Class 50. Install all high strength bolted field connections using "direct tension indicators" (DTI's) in accordance with the Standard Specifications and ASTM F959. Ensure all DTI's are mechanically zinc coated. Show installation details of the DTI's on the shop plans. Place DTI's under the bolt head. ASTM A449 bolts may be used in lieu of A325 for the bolts carried through the girder webs only.

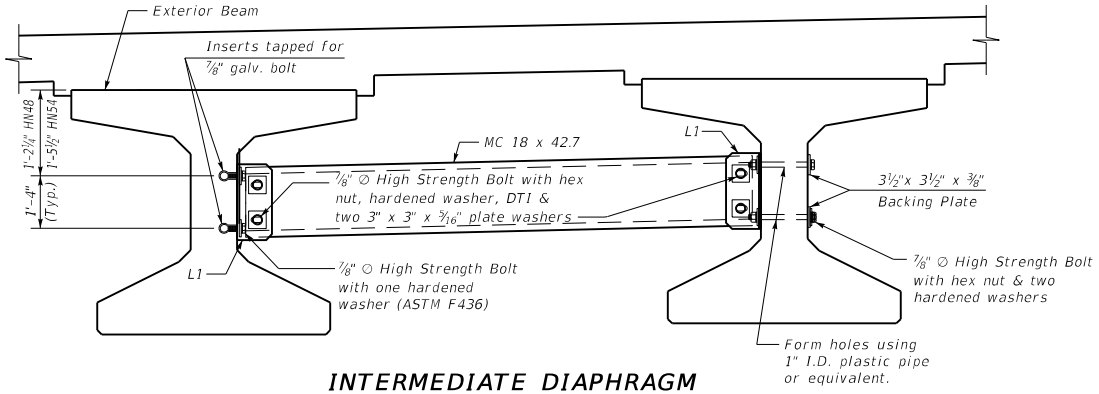
STRUCTURAL STEEL: Ensure plates, angles, and channels conform to ASTM A36 or A572 and galvanized after fabrication.

SHOP DRAWINGS: Show the location of all inserts and holes on the precast beam shop drawings. Submit shop drawings for the steel diaphragms to the Division of Structural Design for approval.

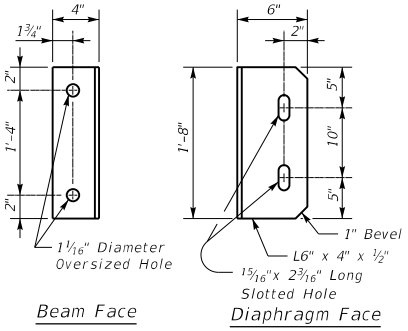
DIAPHRAGMS: Erect the diaphragms the same day that the precast beams are placed on the substructure. Include the cost of all materials and labor required to fabricate and erect the diaphragms in the bid for Precast Beams.



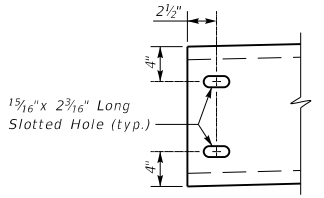
INTERMEDIATE DIAPHRAGM
~Typical for 0° Skew~



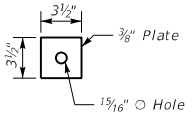
INTERMEDIATE DIAPHRAGM
~Typical for Skewed~



CLIP ANGLE - L1



CHANNEL END



BACKING PLATE
Skewed Spans, Only

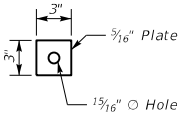
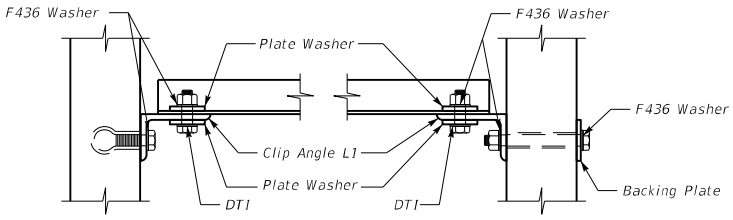
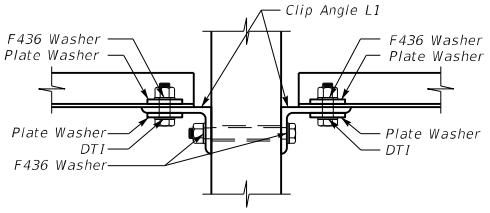


PLATE WASHER





CONNECTION DETAILS

KENTUCKY
DEPARTMENT OF HIGHWAYS

PPC I-BEAM
HN48 AND HN54
DIAPHRAGM DETAILS

STANDARD DRAWING NO. BSD-009

SUBMITTED _____ 02-26-20
DIRECTOR DIVISION OF STRUCTURAL DESIGN — DATE

APPROVED _____ 02-26-20
STATE HIGHWAY ENGINEER — DATE

CAP BILL OF REINFORCEMENT

SUPERSTRUCTURE HEIGHT SDH = Beam+Pad Height +(haunch+slab) [if applicable]		16'-0" BRIDGE WIDTH					24'-0" BRIDGE WIDTH					32'-0" BRIDGE WIDTH				
		MARK	TYPE	NO.	SIZE	LENGTH	MARK	TYPE	NO.	SIZE	LENGTH	MARK	TYPE	NO.	SIZE	LENGTH
H1	12" ≤SDH≤27"	A1e	14s	22	5	11'-0	A1e	14s	29	5	11'-0	A1e	14s	36	5	11'-0
		A2e	Str.	9	8	22'-9	A2e	Str.	9	8	30'-9	A2e	Str.	9	8	38'-9
		A3e	Str.	4	5	22'-9	A3e	Str.	4	5	30'-9	A3e	Str.	4	5	38'-9
H2	27" <SDH≤35"	A1e	14s	24	5	11'-0	A1e	14s	30	5	11'-0	A1e	14s	38	5	11'-0
		A2e	Str.	9	8	25'-5	A2e	Str.	9	8	33'-5	A2e	Str.	9	8	41'-5
		A3e	Str.	4	5	25'-5	A3e	Str.	4	5	33'-5	A3e	Str.	4	5	41'-5
H3	35" <SDH≤50"	A1e	14s	29	5	11'-0	A1e	14s	36	5	11'-0	A1e	14s	43	5	11'-0
		A2e	Str.	9	8	30'-5	A2e	Str.	9	8	38'-5	A2e	Str.	9	8	46'-5
		A3e	Str.	4	5	30'-5	A3e	Str.	4	5	38'-5	A3e	Str.	4	5	46'-5

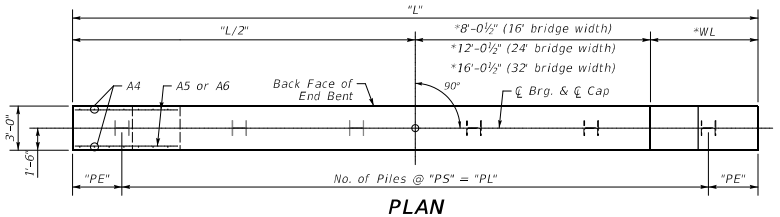
WING BILL OF REINFORCEMENT

MARK	TYPE	NO.	SIZE	LENGTH
A4e	Str.	12	5	4'-0
A5e	Str.	8	5	3'-2
A6e	Str.	4	6	3'-2
A4e	Str.	20	5	4'-8
A5e	Str.	12	5	4'-6
A6e	Str.	4	6	4'-6
A4e	Str.	28	5	5'-11
A5e	Str.	16	5	7'-0
A6e	Str.	4	6	7'-5

BRIDGE WIDTH	PILE LOAD		PILES				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'-6½"	8'-0"	16'-0"	3½"	4	9"	2'-3"	7	6'-0"	3	2'-0"	2	23'-1"	3'-6"	3'-6"	0	0	9.8	991
	H2	87	4	2'-4½"	7'-0"	21'-0"	2½"	3	7"	1'-2"	6	5'-0"	5	4'-0"	3	25'-9"	4'-10"	4'-10"	0	0	12.2	1175
	H3	107	4	3'-4½"	8'-0"	24'-0"	4½"	4	8"	2'-0"	7	6'-0"	7	6'-0"	4	30'-9"	7'-4"	3'-3"	4'-1"	2'-1"	16.8	1527
24	H1	97	4	3'-6½"	8'-0"	24'-0"	3½"	4	9"	2'-3"	7	6'-0"	3	2'-0"	2	31'-1"	3'-6"	3'-6"	0	0	12.4	1297
	H2	99	5	2'-10½"	7'-0"	28'-0"	2½"	3	10"	1'-8"	6	5'-0"	5	4'-0"	3	33'-9"	4'-10"	4'-10"	0	0	14.8	1469
	H3	122	5	3'-4½"	8'-0"	32'-0"	4½"	4	8"	2'-0"	7	6'-0"	7	6'-0"	4	38'-9"	7'-4"	3'-3"	4'-1"	2'-1"	19.4	1833
32	H1	103	5	3'-6½"	8'-0"	32'-0"	3½"	4	9"	2'-3"	7	6'-0"	3	2'-0"	2	39'-1"	3'-6"	3'-6"	0	0	15.1	1604
	H2	109	6	3'-4½"	7'-0"	35'-0"	4½"	4	8"	2'-0"	6	5'-0"	5	4'-0"	3	41'-9"	4'-10"	4'-10"	0	0	17.5	1787
	H3	133	6	3'-4½"	8'-0"	40'-0"	4½"	4	8"	2'-0"	7	6'-0"	7	6'-0"	4	46'-9"	7'-4"	3'-3"	4'-1"	2'-1"	22.1	2139

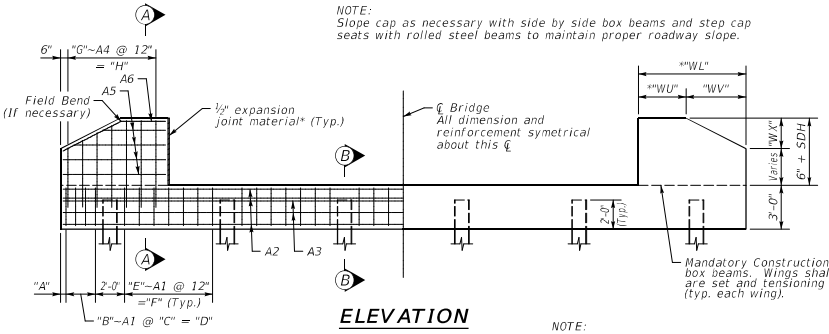
NOTES:
1) Conform to KYTC, Standard Specifications, Current Edition.
2) Concrete to be Class "A", 3500 psi.
3) Rebar to be epoxy coated A615, Grade 60.
4) Maintain 2" clear cover to reinforcement unless otherwise noted.
5) End Bents are designed for the maximum span of the following steel and concrete 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 ½" 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.

*Adjust 9" as necessary for rolled beam superstructure



PLAN

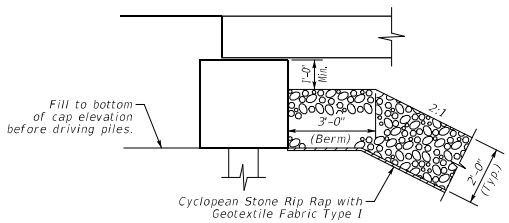
NOTE:
Slope cap as necessary with side by side box beams and step cap seats with rolled steel beams to maintain proper roadway slope.



ELEVATION

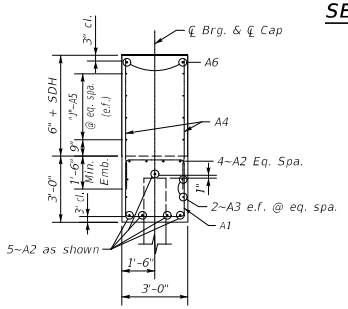
NOTE:
Trim A4-A6 bars as necessary.

Mandatory Construction joint for side by side box beams. Wings shall be poured after beams are set and tensioning rods are tightened (typ. each wing).

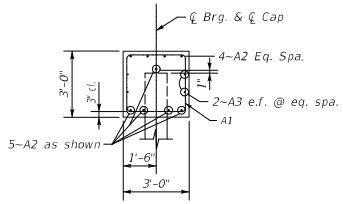


SECTION THRU END BENT

(Showing berm and fill slope)



SECTION A-A



SECTION B-B

A1 Bar

~Size #5~

*Expansion Joint Material:
AASHTO M153
Type-I Sponge Rubber

REVISION DATE: 08/11/2025
REVISION NUMBER: 0

SUBMITTED: Michael Cupp, DIVISION DIRECTOR, DATE 08-11-2025

APPROVED: James Ballinger, STATE HIGHWAY ENGINEER, DATE 08-11-2025

BRIDGE STANDARDS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

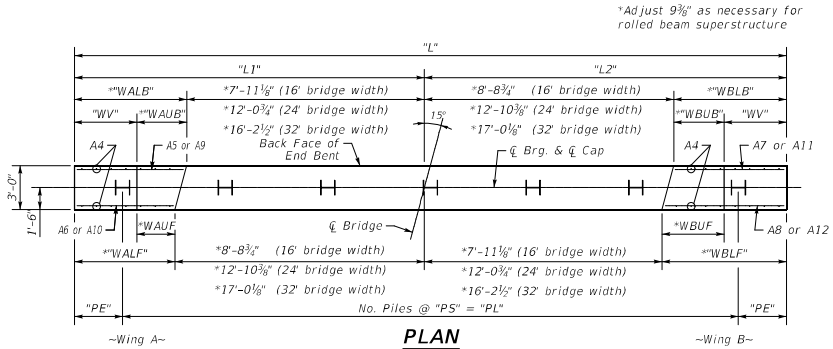
PILE END BENT 0° SKEW

STANDARD DRAWING NUMBER
BSE-001-01

OpenRoads Designer v23.00.01.11

SUPERSTRUCTURE HEIGHT SDH=Beam Height +pad height +(haunch+slab) [if applicable]		CAP BILL OF REINFORCEMENT																WING BILL OF REINFORCEMENT													
		16'-0" BRIDGE WIDTH					24'-0" BRIDGE WIDTH					32'-0" BRIDGE WIDTH																			
		MARK	TYPE	NO.	SIZE	LENGTH	MARK	TYPE	NO.	SIZE	LENGTH	MARK	TYPE	NO.	SIZE	LENGTH	MARK	TYPE	NO.	SIZE	LENGTH	MARK	TYPE	NO.	SIZE	LENGTH	MARK	TYPE	NO.	SIZE	LENGTH
H1	12" ≤SDH≤27"	A1e	14s	22	5	11'-0	A1e	14s	29	5	11'-0	A1e	14s	36	5	11'-0	A4e	Str.	14	5	4'-0	A7e	Str.	2	5	3'-4	A10e	Str.	1	6	2'-6
		A2e	Str.	9	8	23'-7	A2e	Str.	9	8	31'-11	A2e	Str.	9	8	40'-2	A5e	Str.	2	5	3'-2	A8e	Str.	1	6	3'-2	A11e	Str.	1	6	3'-4
		A3e	Str.	4	5	23'-7	A3e	Str.	4	5	31'-11	A3e	Str.	4	5	40'-2	A6e	Str.	2	5	2'-6	A9e	Str.	1	6	3'-2	A12e	Str.	1	6	4'-1
H2	27" <SDH≤35"	A1e	14s	24	5	11'-0	A1e	14s	34	5	11'-0	A1e	14s	41	5	11'-0	A4e	Str.	20	5	4'-8	A7e	Str.	3	5	4'-8	A10e	Str.	1	6	3'-11
		A2e	Str.	9	8	26'-4	A2e	Str.	9	8	34'-8	A2e	Str.	9	8	42'-11	A5e	Str.	3	5	4'-7	A8e	Str.	3	5	5'-4	A11e	Str.	1	6	4'-8
		A3e	Str.	4	5	26'-4	A3e	Str.	4	5	34'-8	A3e	Str.	4	5	42'-11	A6e	Str.	3	5	3'-11	A9e	Str.	1	6	4'-7	A12e	Str.	1	6	5'-4
H3	35" <SDH≤50"	A1e	14s	29	5	11'-0	A1e	14s	36	5	11'-0	A1e	14s	44	5	11'-0	A4e	Str.	30	5	5'-11	A7e	Str.	4	5	7'-4	A10e	Str.	1	6	7'-0
		A2e	Str.	9	8	31'-7	A2e	Str.	9	8	39'-11	A2e	Str.	9	8	48'-2	A5e	Str.	4	5	7'-2	A8e	Str.	4	5	8'-0	A11e	Str.	1	6	7'-10
		A3e	Str.	4	5	31'-7	A3e	Str.	4	5	39'-11	A3e	Str.	4	5	48'-2	A6e	Str.	4	5	6'-6	A9e	Str.	1	6	7'-8	A12e	Str.	1	6	8'-6

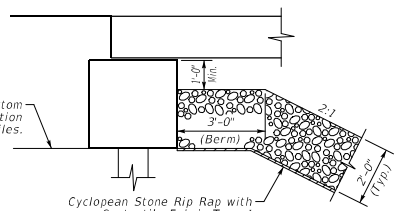
BRIDGE WIDTH	PILE LOAD		PILES				DIMENSIONS										WING A																WING B										QUANTITIES	
							Geometry			Reinforcement							Back Face						Front Face										Back Face						Front Face					
	SIZE	TONS	NO.	PE	PS	PL	L	L1	L2	A	B	C	D	E	F	G	H	WALB	WAUB	WV	WX	J	K	WALF	WAUF	WV	WX	J	K	WBLB	WBUB	WV	WX	J	K	WBLF	WBUF	WV	WX	J	K	CONC. (C.Y.)	STEEL (LBS.)
16	H1	95	3	3'-11⅞"	8'-0"	16'-0"	23'-11¾"	11'-6⅛"	12'-4⅛"	2⅞"	4	11"	2'-9"	7	12"	6'-0"	2	3'-7⅛"	0	0	0	3	2'-0"	2'-10½"	0	0	0	3	2'-0"	3'-8½"	0	0	0	4	3'-0"	4'-5⅞"	0	0	0	4	3'-0"	10.2	1024
	H2	87	4	2'-10⅜"	7'-0"	21'-0"	26'-8¾"	12'-11⅜"	13'-8⅛"	4⅜"	3	9"	1'-6"	6	12"	5'-0"	3	5'-0⅛"	0	0	0	4	3'-0"	4'-3⅛"	0	0	0	4	3'-0"	5'-0⅛"	0	0	0	5	4'-0"	5'-9⅞"	0	0	0	5	4'-0"	12.6	1203
	H3	108	4	3'-11⅞"	8'-0"	24'-0"	31'-1¾"	15'-6⅞"	16'-4⅛"	2⅞"	4	11"	2'-9"	7	12"	6'-0"	4	7'-7⅛"	3'-4⅞"	4'-3"	2'-1"	7	6'-0"	6'-10½"	2'-7⅛"	4'-3"	2'-1"	7	6'-0"	7'-8½"	3'-5⅛"	4'-3"	2'-1"	8	7'-0"	8'-5⅞"	4'-2⅛"	4'-3"	2'-1"	8	7'-0"	17.5	1578
24	H1	99	4	4'-1⅝"	8'-0"	24'-0"	32'-3½"	15'-8⅝"	16'-6⅜"	4⅝"	4	11"	2'-9"	7	12"	6'-0"	2	3'-7⅛"	0	0	0	3	2'-0"	2'-10½"	0	0	0	3	2'-0"	3'-8½"	0	0	0	4	3'-0"	4'-5⅞"	0	0	0	4	3'-0"	12.9	1340
	H2	98	5	2'-6⅛"	7'-6"	30'-0"	35'-0½"	17'-1⅝"	17'-10⅝"	4⅛"	3	7"	1'-2"	7	11"	5'-6"	3	5'-0⅛"	0	0	0	5	4'-0"	4'-3½"	0	0	0	4	3'-0"	5'-0½"	0	0	0	5	4'-0"	5'-9⅜"	0	0	0	5	4'-0"	15.4	1553
	H3	123	5	4'-1⅝"	8'-0"	32'-0"	40'-3½"	19'-8⅝"	20'-6⅜"	4⅝"	4	11"	2'-9"	7	12"	6'-0"	4	7'-7⅛"	3'-4⅞"	4'-3"	2'-1"	7	6'-0"	6'-10½"	2'-7½"	4'-3"	2'-1"	7	6'-0"	7'-8½"	3'-5⅛"	4'-3"	2'-1"	8	7'-0"	8'-5⅞"	4'-2⅛"	4'-3"	2'-1"	8	7'-0"	20.2	1887
32	H1	87	6	2'-9½"	7'-0"	35'-0"	40'-6½"	19'-10¼"	20'-8¼"	3½"	3	9"	1'-6"	6	12"	5'-0"	2	3'-7⅛"	0	0	0	3	2'-0"	2'-10½"	0	0	0	3	2'-0"	3'-8½"	0	0	0	4	3'-0"	4'-5⅞"	0	0	0	4	3'-0"	15.7	1653
	H2	108	6	2'-10¾"	7'-6"	37'-6"	43'-3½"	21'-3¼"	22'-0¼"	2¾"	3	10"	1'-8"	7	11"	5'-6"	3	5'-0⅛"	0	0	0	5	4'-0"	4'-3⅛"	0	0	0	4	3'-0"	5'-0½"	0	0	0	5	4'-0"	5'-9⅛"	0	0	0	5	4'-0"	18.2	1866
	H3	115	7	3'-3⅞"	7'-0"	42'-0"	48'-6½"	23'-10¼"	24'-8¼"	3½"	4	8"	2'-0"	6	12"	5'-0"	4	7'-7⅛"	3'-4⅞"	4'-3"	2'-1"	7	6'-0"	6'-10½"	2'-7½"	4'-3"	2'-1"	7	6'-0"	7'-8½"	3'-5⅛"	4'-3"	2'-1"	8	7'-0"	8'-5⅞"	4'-2⅛"	4'-3"	2'-1"	8	7'-0"	23.0	2219



PLAN

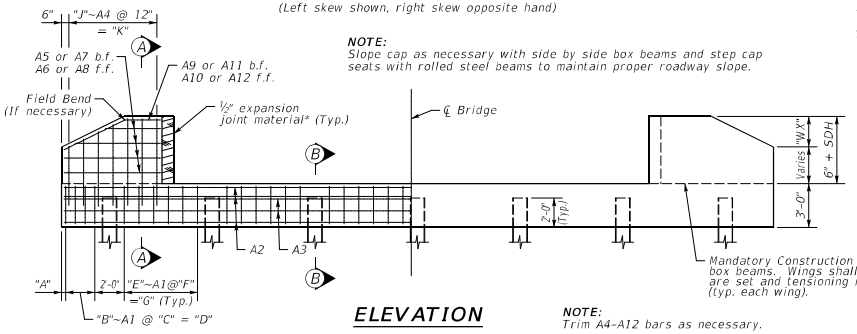
(Left skew shown, right skew opposite hand)

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. Fill to bottom of cap elevation before driving piles.
   H3 - CB33, B42, CB42 or rolled steel beams up to 36" nominal depth.
6) Piles may be HP12x53 or 16" Steel Pipes with ½" 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.



SECTION THRU END BENT

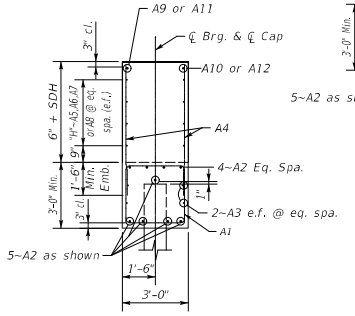
(Showing berm and fill slope)



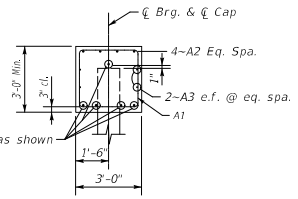
ELEVATION

NOTE:
Trim A4~A12 bars as necessary.

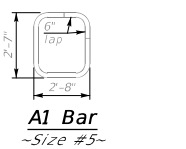
*Expansion Joint Material:
AASHTO M153
Type-I Sponge Rubber



SECTION A-A



SECTION B-B



A1 Bar

~Size #5~

REVISION DATE: 08/11/2025
REVISION NUMBER: 0

SUBMITTED Michael Cupp DIVISION DIRECTOR 08-11-2025 DATE

APPROVED Jason Ballenger STATE HIGHWAY ENGINEER 08-11-2025 DATE

BRIDGE STANDARDS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

PILE END BENT 15° SKEW

STAMDARD DRAWING NUMBER
BSE-002-01

OpenRoads Designer v23.00.01.11

SUPERSTRUCTURE HEIGHT SDH=Beam Height +pad height +(haunch+slab) [if applicable]		CAP BILL OF REINFORCEMENT																	WING BILL OF REINFORCEMENT												
		16'-0" BRIDGE WIDTH					24'-0" BRIDGE WIDTH					32'-0" BRIDGE WIDTH																		
		MARK	TYPE	NO.	SIZE	LENGTH	MARK	TYPE	NO.	SIZE	LENGTH	MARK	TYPE	NO.	SIZE	LENGTH	MARK	TYPE	NO.	SIZE	LENGTH	MARK	TYPE	NO.	SIZE	LENGTH	MARK	TYPE	NO.	SIZE	LENGTH
H1	12" ≤SDH≤27"	A1e	14s	24	5	11- 0	A1e	14s	34	5	11- 0	A1e	14s	41	5	11- 0	A4e	Str.	15	5	4- 0	A7e	Str.	2	5	3- 9	A10e	Str.	1	6	2- 0
		A2e	Str.	9	8	26- 3	A2e	Str.	9	8	35- 6	A2e	Str.	9	8	44- 9	A5e	Str.	2	5	3- 6	A8e	Str.	2	5	5- 3	A11e	Str.	1	6	3- 9
		A3e	Str.	4	5	26- 3	A3e	Str.	4	5	35- 6	A3e	Str.	4	5	44- 9	A6e	Str.	2	5	2- 0	A9e	Str.	1	6	3- 6	A12e	Str.	1	6	5- 3
H2	27" <SDH≤35"	A1e	14s	27	5	11- 0	A1e	14s	36	5	11- 0	A1e	14s	43	5	11- 0	A4e	Str.	22	5	4- 8	A7e	Str.	3	5	5- 4	A10e	Str.	1	6	3- 7
		A2e	Str.	9	8	29- 5	A2e	Str.	9	8	38- 8	A2e	Str.	9	8	47-11	A5e	Str.	3	5	5- 1	A8e	Str.	3	5	6-10	A11e	Str.	1	6	5- 4
		A3e	Str.	4	5	29- 5	A3e	Str.	4	5	38- 8	A3e	Str.	4	5	47-11	A6e	Str.	3	5	3- 7	A9e	Str.	1	6	5- 1	A12e	Str.	1	6	6-10
H3	35" <SDH≤50"	A1e	14s	34	5	11- 0	A1e	14s	41	5	11- 0	A1e	14s	48	5	11- 0	A4e	Str.	33	5	5-11	A7e	Str.	4	5	8- 3	A10e	Str.	1	6	6-11
		A2e	Str.	9	8	35- 3	A2e	Str.	9	8	44- 6	A2e	Str.	9	8	53- 9	A5e	Str.	4	5	8- 0	A8e	Str.	4	5	9- 9	A11e	Str.	1	6	8- 9
		A3e	Str.	4	5	35- 3	A3e	Str.	4	5	44- 6	A3e	Str.	4	5	53- 9	A6e	Str.	4	5	6- 6	A9e	Str.	1	6	8- 5	A12e	Str.	1	6	10- 2

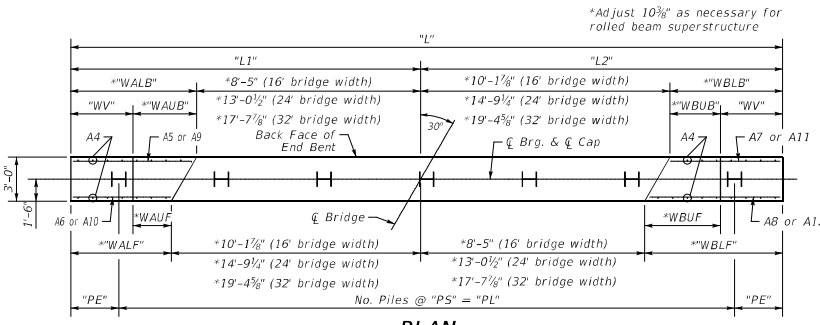
BRIDGE WIDTH	PILE LOAD		PILES				DIMENSIONS									WING A											WING B									QUANTITIES	
							Geometry			Reinforcement						Back Face					Front Face						Back Face					Front Face						
	SIZE	TONS	NO.	PE	PS	PL	L	L1	L2	A	B	C	D	E	F	G	H	WALB	WAUB	WV	WX	J	K	WALF	WAUF	WV	WX	J	K	WBLB	WBUB	WV	WX	J	K	WBLF	WBUF	WV	WX	J	K	CONC. (C.Y.)	STEEL (LBS.)
16	H1	73	4	2'-9⅛"	7'-0"	21'-0"	26'-7⅛"	12'-5½"	14'-2⅜"	3⅞"	3	9"	1'-6"	6	12°	5'-0"	2	4'-0⅜"	0	0	0	4	3'-0"	2'-3⅝"	0	0	0	2	1'-0"	4'-0⅜"	0	0	0	4	3'-0"	5'-9⅛"	0	0	0	5	4'-0"	11.3	1132
	H2	87	4	2'-10⅛"	8'-0"	24'-0"	29'-9⅛"	14'-0½"	15'-9⅜"	2⅛"	3	10"	1'-8"	7	12°	6'-0"	3	5'-7⅜"	0	0	0	5	4'-0"	3'-10⅝"	0	0	0	4	3'-0"	5'-7⅜"	0	0	0	6	5'-0"	7'-4⅝"	0	0	0	7	6'-0"	14.1	1345
	H3	88	5	2'-9⅛"	7'-6"	30'-0"	35'-7⅛"	16'-11½"	18'-8⅜"	3⅛"	3	9"	1'-6"	7	11°	5'-6"	4	8'-6⅜"	3'-9⅜"	4'-9"	2'-1"	8	7'-0"	6'-9⅝"	2'-0⅝"	4'-9"	2'-1"	7	6'-0"	8'-6⅜"	3'-9⅝"	4'-9"	2'-1"	8	7'-0"	10'-3⅜"	5'-6⅞"	4'-9"	2'-1"	10	9'-0"	19.5	1777
24	H1	80	5	2'-11⅜"	7'-6"	30'-0"	35'-10⅞"	17'-0⅞"	18'-9⅛"	3⅜"	3	10"	1'-8"	7	11°	5'-6"	2	4'-0⅜"	0	0	0	4	3'-0"	2'-3⅝"	0	0	0	2	1'-0"	4'-0⅜"	0	0	0	4	3'-0"	5'-9⅛"	0	0	0	5	4'-0"	14.4	1508
	H2	99	5	3'-6⅜"	8'-0"	32'-0"	39'-0¾"	18'-7⅞"	20'-4⅛"	3⅜"	4	9"	2'-3"	7	12°	6'-0"	3	5'-7⅜"	0	0	0	5	4'-0"	3'-10⅝"	0	0	0	4	3'-0"	5'-7⅜"	0	0	0	6	5'-0"	7'-4⅝"	0	0	0	7	6'-0"	17.2	1709
	H3	103	6	3'-5⅜"	8'-0"	40'-0"	44'-10⅛"	21'-6⅛"	23'-3⅛"	3⅜"	3	7"	1'-2"	7	12°	6'-0"	4	8'-6⅜"	3'-9⅜"	4'-9"	2'-1"	8	7'-0"	6'-9⅝"	2'-0⅝"	4'-9"	2'-1"	7	6'-0"	8'-6⅜"	3'-9⅝"	4'-9"	2'-1"	8	7'-0"	10'-3⅜"	5'-6⅞"	4'-9"	2'-1"	10	9'-0"	22.6	2119
32	H1	88	6	2'-6⅞"	8'-0"	40'-0"	45'-1½"	21'-8½"	23'-5¼"	2¾"	3	8"	1'-4"	7	12°	6'-0"	2	4'-0⅜"	0	0	0	4	3'-0"	2'-3⅝"	0	0	0	2	1'-0"	4'-0⅜"	0	0	0	4	3'-0"	5'-9⅛"	0	0	0	5	4'-0"	17.4	1850
	H2	109	6	4'-1⅞"	8'-0"	40'-0"	48'-3½"	23'-3¼"	25'-0¼"	4⅝"	4	11"	2'-9"	7	12°	6'-0"	3	5'-7⅜"	0	0	0	5	4'-0"	3'-10⅝"	0	0	0	4	3'-0"	5'-7⅜"	0	0	0	6	5'-0"	7'-4⅝"	0	0	0	7	6'-0"	20.3	2051
	H3	116	7	3'-3⅞"	8'-0"	48'-0"	54'-1½"	26'-2¼"	27'-11½"	2⅞"	3	11"	1'-10"	7	12°	6'-0"	4	8'-6⅜"	3'-9⅜"	4'-9"	2'-1"	8	7'-0"	6'-9⅝"	2'-0⅝"	4'-9"	2'-1"	7	6'-0"	8'-6⅜"	3'-9⅝"	4'-9"	2'-1"	8	7'-0"	10'-3⅜"	5'-6⅞"	4'-9"	2'-1"	10	9'-0"	25.6	2460

REVISION DATE: 08/11/2025
REVISION NUMBER: 0

SUBMITTED: Michael Cupp, DIVISION DIRECTOR, DATE: 08-11-2025

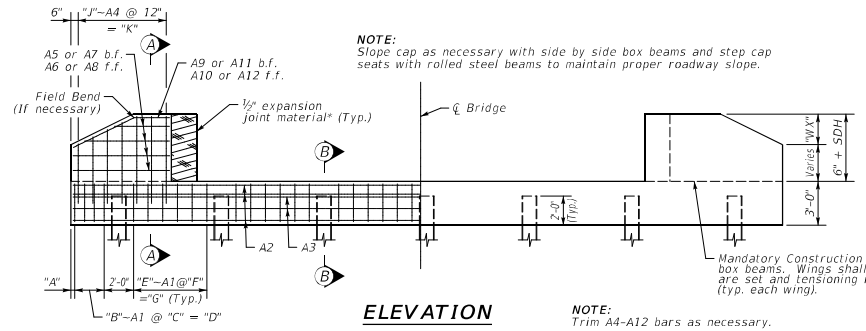
APPROVED: James Ballinger, STATE HIGHWAY ENGINEER, DATE: 08-11-2025

BRIDGE STANDARDS



PLAN

(Left skew shown, right skew opposite hand)



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

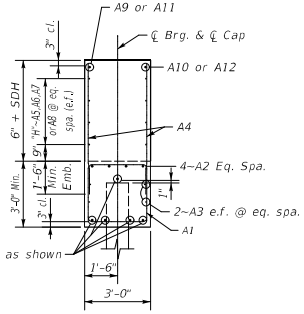
Mandatory Construction joint for side by side box beams. Wings shall be poured after beams are set and tensioning rods are tightened (typ. each wing).

ELEVATION

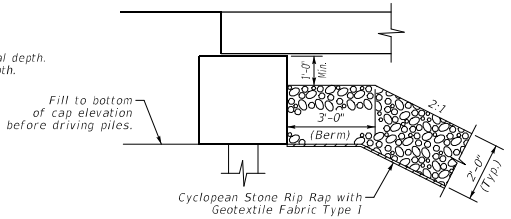
NOTE:
Trim A4-A12 bars as necessary.

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 ½" 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.

*Expansion Joint Material:
AASHTO M153
Type-I Sponge Rubber

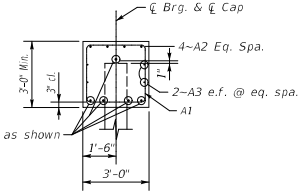


SECTION A-A

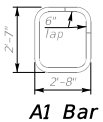


SECTION THRU END BENT

(Showing berm and fill slope)



SECTION B-B



A1 Bar

~Size #5~

COMMONWEALTH OF KENTUCKY DEPARTMENT OF HIGHWAYS	PILE END BENT 30° SKEW	STANDARD DRAWING NUMBER BSE-003-01

OpenRoads Designer v23.00.01.11

SUPERSTRUCTURE HEIGHT SDH=Beam Height +pad height +(haunch+slab) [if applicable]		CAP BILL OF REINFORCEMENT																	WING BILL OF REINFORCEMENT												
		16'-0" BRIDGE WIDTH					24'-0" BRIDGE WIDTH					32'-0" BRIDGE WIDTH																		
		MARK	TYPE	NO.	SIZE	LENGTH	MARK	TYPE	NO.	SIZE	LENGTH	MARK	TYPE	NO.	SIZE	LENGTH	MARK	TYPE	NO.	SIZE	LENGTH	MARK	TYPE	NO.	SIZE	LENGTH	MARK	TYPE	NO.	SIZE	LENGTH
H1	12" ≤SDH≤27"	A1e	14s	30	5	11- 0	A1e	14s	43	5	11- 0	A1e	14s	50	5	11- 0	A4e	Str.	20	5	4- 0	A7e	Str.	2	5	4-10	A10e	Str.	1	6	1-10
		A2e	Str.	9	8	32- 5	A2e	Str.	9	8	43- 8	A2e	Str.	9	8	55- 0	A5e	Str.	2	5	4- 4	A8e	Str.	2	5	7- 4	A11e	Str.	1	6	4-10
		A3e	Str.	4	5	32- 5	A3e	Str.	4	5	43- 8	A3e	Str.	4	5	55- 0	A6e	Str.	2	5	1-10	A9e	Str.	1	6	4- 4	A12e	Str.	1	6	7- 4
H2	27" <SDH≤35"	A1e	14s	34	5	11- 0	A1e	14s	43	5	11- 0	A1e	14s	57	5	11- 0	A4e	Str.	26	5	4- 8	A7e	Str.	3	5	6- 8	A10e	Str.	1	6	3- 8
		A2e	Str.	9	8	36- 1	A2e	Str.	9	8	47- 4	A2e	Str.	9	8	58- 8	A5e	Str.	3	5	6- 2	A8e	Str.	3	5	9- 2	A11e	Str.	1	6	6- 8
		A3e	Str.	4	5	36- 1	A3e	Str.	4	5	47- 4	A3e	Str.	4	5	58- 8	A6e	Str.	3	5	3- 8	A9e	Str.	1	6	6- 2	A12e	Str.	1	6	9- 2
H3	35" <SDH≤50"	A1e	14s	41	5	11- 0	A1e	14s	50	5	11- 0	A1e	14s	62	5	11- 0	A4e	Str.	40	5	5-11	A7e	Str.	4	5	10- 2	A10e	Str.	1	6	7- 5
		A2e	Str.	9	8	43- 3	A2e	Str.	9	8	54- 6	A2e	Str.	18	8	35- 8	A5e	Str.	4	5	9- 9	A8e	Str.	4	5	12- 9	A11e	Str.	1	6	10- 6
		A3e	Str.	4	5	43- 3	A3e	Str.	4	5	54- 6	A3e	Str.	8	5	34- 3	A6e	Str.	4	5	7- 2	A9e	Str.	1	6	10- 0	A12e	Str.	1	6	13- 0

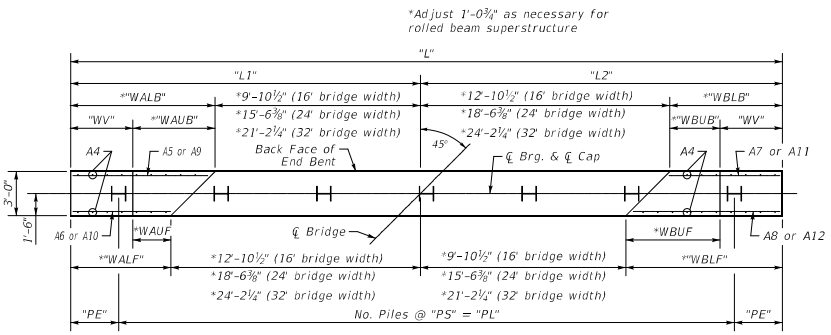
BRIDGE WIDTH	PILE LOAD		PILES				DIMENSIONS								WING A												WING B								QUANTITIES	
							Geometry			Reinforcement						Back Face					Front Face						Back Face					Front Face					
	SIZE	TONS	NO.	PE	PS	PL	L	L1	L2	A	B	C	D	E	F	G	H	WALB	WAUB	WV	WX	J	K	WALF	WAUF	WV	WX	J	K	WBLB	WBUB	WV	WX	J	K	WBLF	WBUF	WV	WX	J	K	CONC. (C.Y.)	STEEL (LBS.)
16	H1	60	5	2'-4½"	7'-0"	28'-0"	32'-9"	14'-10½"	17'-10½"	4½"	3	6"	1'-0"	6	12°	5'-0"	2	5'-0"	0	0	0	5	4'-0"	2'-0"	0	0	0	2	1'-0"	5'-0"	0	0	0	5	4'-0"	8'-0"	0	0	0	8	7'-0"	13.9	1410
	H2	71	5	3'-2½"	7'-6"	30'-0"	36'-5"	16'-8½"	19'-8½"	4½"	3	11"	1'-10"	7	11°	5'-6"	3	6'-10"	0	0	0	6	5'-0"	3'-10"	0	0	0	4	3'-0"	6'-10"	0	0	0	7	6'-0"	9'-10"	0	0	0	9	8'-0"	17.2	1655
	H3	76	6	3'-0½"	7'-6"	37'-6"	43'-7"	20'-3½"	23'-3½"	4½"	3	10"	1'-8"	7	11°	5'-6"	4	10'-5"	4'-8"	5'-9"	2'-0"	10	9'-0"	7'-5"	1'-8"	5'-9"	2'-0"	10	9'-0"	10'-5"	4'-8"	5'-9"	2'-0"	10	9'-0"	13'-5"	7'-8"	5'-9"	2'-0"	13	12'-0"	23.9	2167
24	H1	69	6	3'-3⅜"	7'-6"	37'-6"	44'-0¾"	20'-6⅜"	23'-6⅜"	3⅜"	4	8"	2'-0"	7	11°	5'-6"	2	5'-0"	0	0	0	5	4'-0"	2'-0"	0	0	0	2	1'-0"	5'-0"	0	0	0	5	4'-0"	8'-0"	0	0	0	8	7'-0"	17.1	1877
	H2	85	6	3'-10⅜"	8'-0"	40'-0"	47'-8¾"	22'-4⅜"	25'-4⅜"	4⅜"	4	10"	2'-6"	7	12°	6'-0"	3	6'-10"	0	0	0	6	5'-0"	3'-10"	0	0	0	4	3'-0"	6'-10"	0	0	0	7	6'-0"	9'-10"	0	0	0	9	8'-0"	21.0	2076
	H3	91	7	3'-5⅜"	8'-0"	48'-0"	54'-10¾"	25'-11⅜"	28'-11⅜"	5⅜"	4	8"	2'-0"	7	12°	6'-0"	4	10'-5"	4'-8"	5'-9"	2'-0"	10	9'-0"	7'-5"	1'-8"	5'-9"	2'-0"	10	9'-0"	10'-5"	4'-8"	5'-9"	2'-0"	10	9'-0"	13'-5"	7'-8"	5'-9"	2'-0"	13	12'-0"	27.6	2588
32	H1	79	7	3'-8¼"	8'-0"	48'-0"	55'-4½"	26'-3¼"	29'-2¼"	5¼"	4	9"	2'-3"	7	12°	6'-0"	2	5'-0"	0	0	0	5	4'-0"	2'-0"	0	0	0	2	1'-0"	5'-0"	0	0	0	5	4'-0"	8'-0"	0	0	0	8	7'-0"	21.4	2277
	H2	84	8	3'-3¼"	7'-6"	52'-6"	59'-0½"	28'-0¼"	31'-0¼"	3¼"	4	8"	2'-0"	7	11°	5'-6"	3	6'-10"	0	0	0	6	5'-0"	3'-10"	0	0	0	4	3'-0"	6'-10"	0	0	0	7	6'-0"	9'-10"	0	0	0	9	8'-0"	24.7	2557
	H3	93	9	3'-1¼"	7'-6"	60'-0"	66'-2½"	31'-1¼"	34'-7¼"	3¼"	3	11"	1'-10"	7	11°	5'-6"	4	10'-5"	4'-8"	5'-9"	2'-0"	10	9'-0"	7'-5"	1'-8"	5'-9"	2'-0"	10	9'-0"	10'-5"	4'-8"	5'-9"	2'-0"	10	9'-0"	13'-5"	7'-8"	5'-9"	2'-0"	13	12'-0"	31.4	3190

REVISION DATE: 08/11/2025
REVISION NUMBER: 0

SUBMITTED: Michael Cupp, DIVISION DIRECTOR, DATE: 08-11-2025

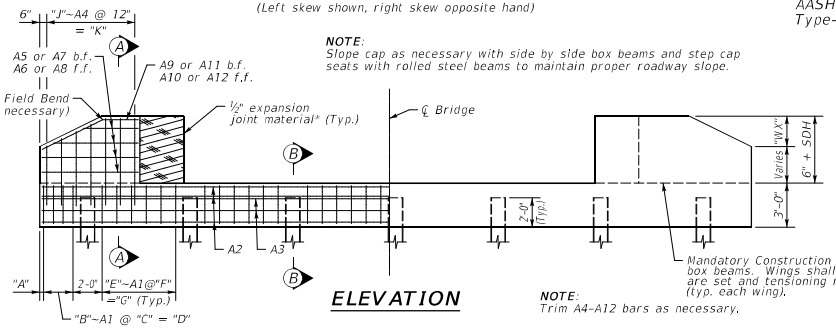
APPROVED: James Ballinger, STATE HIGHWAY ENGINEER, DATE: 08-11-2025

BRIDGE STANDARDS



PLAN

(Left skew shown, right skew opposite hand)



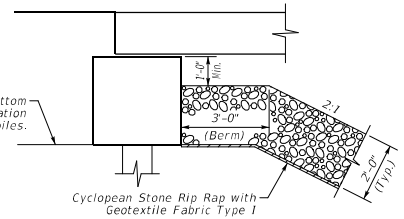
ELEVATION

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

*Expansion Joint Material:
AASHTO M153
Type-I Sponge Rubber

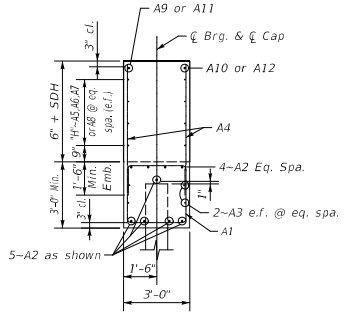
NOTE:
Trim A4-A12 bars as necessary.

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 ½" 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.



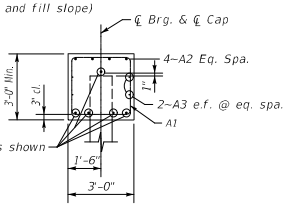
SECTION THRU END BENT

(Showing berm and fill slope)

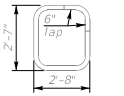


SECTION A-A

NOTE:
A2 bars (#8), 5'-6" min. lap if required
A3 bars (#5), 2'-8" min. lap if required



SECTION B-B



A1 Bar

~Size #5~

COMMONWEALTH OF KENTUCKY DEPARTMENT OF HIGHWAYS	PILE END BENT 45° SKEW	STANDARD DRAWING NUMBER BSE-004-01

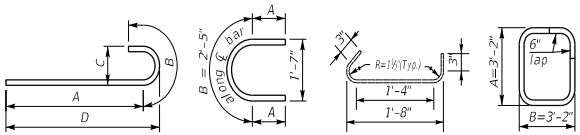
OpenRoads Designer v23.00.01.11

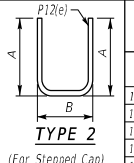
0° SKEW 16'-0" – 17'-6" BRIDGE WIDTH (No Seismic Load)

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.	Type 14	
SIZE																													#4				#8	#5	#5	
H	No.	Size	Length Ft.	Length In.	No.	Size	Length Ft.	Length In.	No.	Size	Length Ft.	Length In.	No.	Size	Length Ft.	Length In.	Spacing	A Ft.	A In.	B Ft.	B In.	C Ft.	C In.	D Ft.	D In.	No.	Size	Length Ft.	Length In.	Spacing	A Ft.	A In.	No.	Length In.	No.	Length In.	No.	Length Ft.	Length In.
10'-11"	30	8	12	8	26	5	19	8	30	5	12	8	42	8	8	10	8	7	5	1	5	0	8	7	9	10	5	7	5	12	2	6	35	2	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	30	5	12	8	42	8	8	10	8	7	5	1	5	0	8	7	9	14	5	7	5	12	2	6	49	2	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	30	5	12	8	42	8	8	10	8	7	5	1	5	0	8	7	9	18	5	7	5	12	2	6	63	2	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	30	5	12	8	42	8	8	10	8	7	5	1	5	0	8	7	9	22	5	7	5	12	2	6	77	2	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	30	5	12	8	42	8	8	10	8	7	5	1	5	0	8	7	9	26	5	7	5	12	2	6	91	2	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	30	5	12	8	42	8	8	10	8	7	5	1	5	0	8	7	9	30	5	7	5	12	2	6	105	2	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	30	5	12	8	42	8	8	10	8	7	5	1	5	0	8	7	9	34	5	7	5	12	2	6	119	2	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	30	5	12	8	42	8	8	10	8	7	5	1	5	0	8	7	9	38	5	7	5	12	2	6	133	2	5	42	8	22	0	8	8	18	8	4	18	8	19	13	2

Reinforcement Details





DIMENSIONS TABLE

H	A Ft.	A In.	B Ft.	B In.	C Ft.	C In.	D Ft.	D In.
10'-11"	2	6	2	6	10	0	5	6
12'-13"	2	6	2	6	10	0	5	6
14'-15"	2	6	2	6	10	0	5	6
16'-17"	2	6	2	6	10	0	5	6
18'-19"	2	6	2	6	10	0	5	6
20'-21"	2	6	2	6	10	0	5	6
22'-23"	2	6	2	6	10	0	5	6
24'-25"	2	6	2	6	10	0	5	6

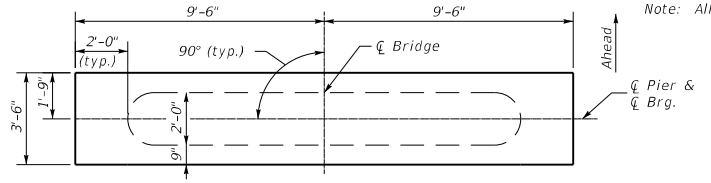
QUANTITIES

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

Note: All bars in cap shall be epoxy coated.

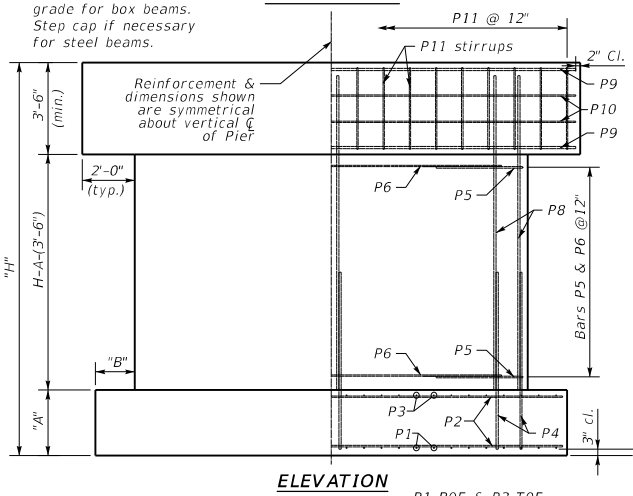
Note: All concrete shall be Class "A"

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

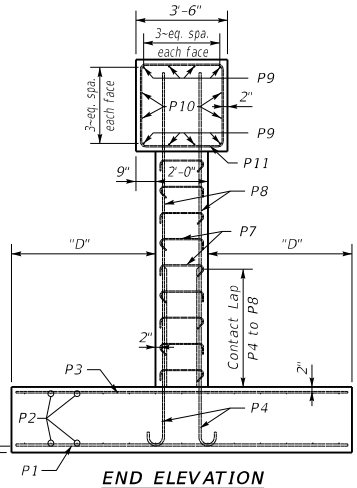


PLAN OF CAP

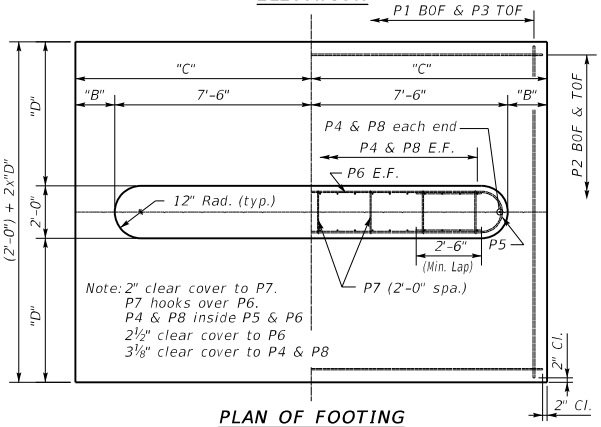
Note: Grade cap to roadway grade for box beams. Step cap if necessary for steel beams.



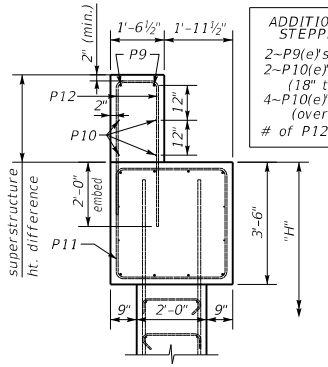
ELEVATION



END ELEVATION

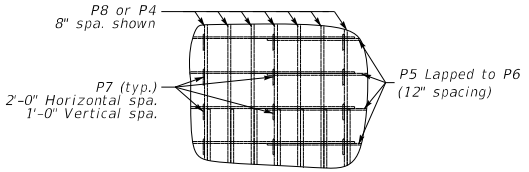


PLAN OF FOOTING



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)



P7 BAR PLACEMENT
(alternate 90° & 135° bar ends)

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

KENTUCKY
DEPARTMENT OF HIGHWAYS

Standard Pier
0° Skew
16'-0"-17'-6" Bridge Width

STANDARD DRAWING NO. BSP-001

SUBMITTED _____ 02-26-20
DIRECTOR DIVISION OF STRUCTURAL DESIGN — DATE

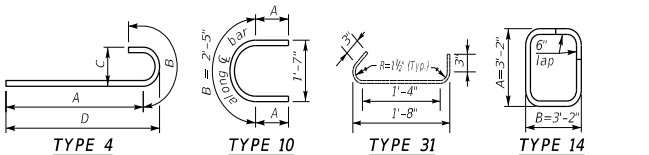
APPROVED _____ 02-26-20
STATE HIGHWAY ENGINEER — DATE

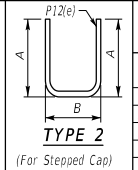
0° SKEW 24'-0" – 25'-6" BRIDGE WIDTH (No Seismic Load)

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.	Type 14	
SIZE																															#4				#8	#5	#5	
H	No.	Size	Length ft.	Length in.	No.	Size	Length ft.	Length in.	No.	Size	Length ft.	Length in.	No.	Size	Length ft.	Length in.	Spacing	A ft.	A in.	B ft.	B in.	C ft.	C in.	D ft.	D in.	No.	Size	Length ft.	Length in.	Spacing	A in.	No.	Size	Length ft.	Length in.	No.	Length ft.	Length in.	No.	Length ft.	Length in.
10'-11"	40	8	12	8	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	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	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	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	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	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	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	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



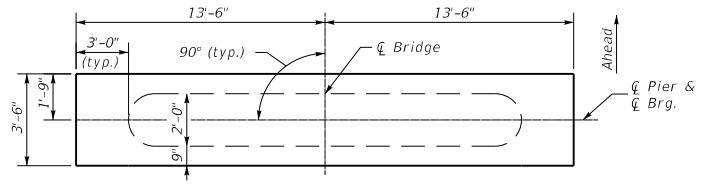


H	DIMENSIONS TABLE A		B		C		D		H	QUANTITIES CONCRETE CLASS "A"	STEEL REINFORCEMENT EPOXY COATED	STEEL REINFORCEMENT
	ft	in	ft	in	ft	in	ft	in		CU. YDS. (1)	LBS.	LBS.
10'-11"	2	6	2	9	13	3	5	6	10'-11"	52.2	1055	5973
12'-13"	2	6	2	9	13	3	5	6	12'-13"	55.3	1055	6438
14'-15"	2	6	2	9	13	3	5	6	14'-15"	58.3	1055	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

Note: All bars in cap shall be epoxy coated.

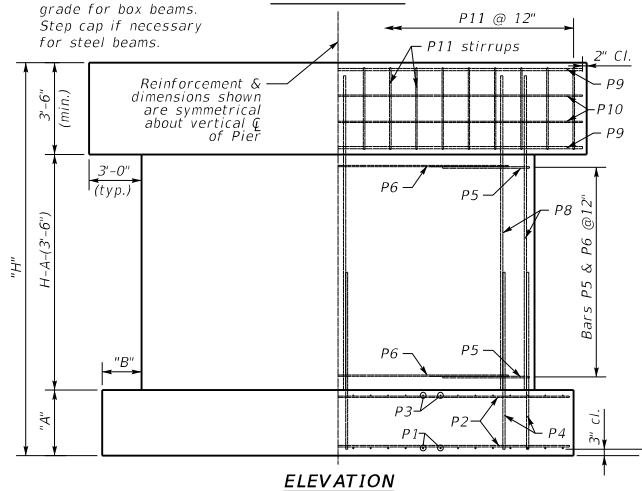
Note: All concrete shall be Class "A"

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

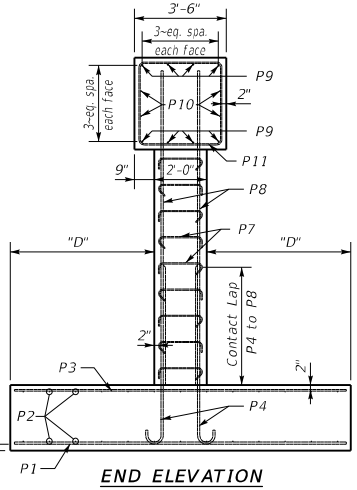


PLAN OF CAP

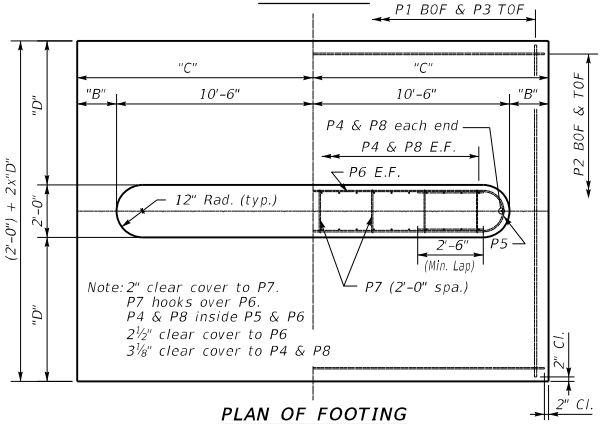
Note: Grade cap to roadway grade for box beams. Step cap if necessary for steel beams.



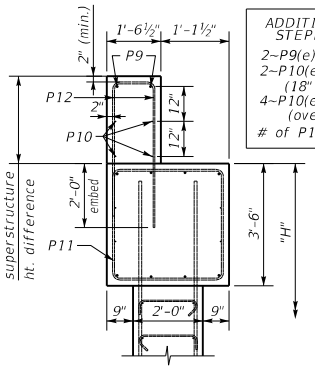
ELEVATION



END ELEVATION



PLAN OF FOOTING

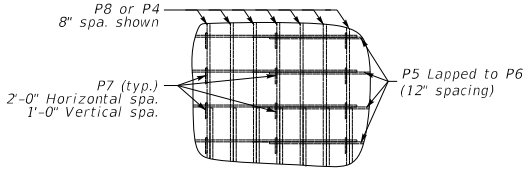


STEPPED CAP

(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)



P7 BAR PLACEMENT

(alternate 90° & 135° bar ends)

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

KENTUCKY
DEPARTMENT OF HIGHWAYS

Standard Pier
0° Skew
24'-0"-25'-6" Bridge Width

STANDARD DRAWING NO. *BSP-002*

SUBMITTED _____ 02-26-20
DIRECTOR DIVISION OF STRUCTURAL DESIGN — DATE

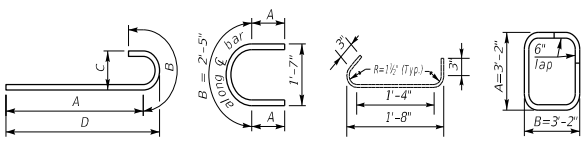
APPROVED _____ 02-26-20
STATE HIGHWAY ENGINEER — DATE

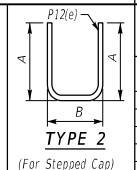
0° SKEW 32'-0" – 33'-6" BRIDGE WIDTH (No Seismic Load)

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.		Type 14	
SIZE																															#4						#8		#5		#5	
H	No.	Size	Length Ft.	Length In.	No.	Size	Length Ft.	Length In.	No.	Size	Length Ft.	Length In.	No.	Size	Length Ft.	Length In.	Spacing	A Ft.	A In.	B Ft.	B In.	C Ft.	C In.	D Ft.	D In.	No.	Size	Length Ft.	Length In.	Spacing	A Ft.	A In.	No.	Size	Length Ft.	Length In.	No.	Size	Length Ft.	Length In.	No.	Length In.	No.	Length Ft.	Length In.
10-11	52	8	12	8	26	6	34	2	12	52	5	12	8	8	84	8	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	8	0	8	34	8	4	34	8	35	13	2
12-13	52	8	12	8	26	6	34	2	12	52	5	12	8	8	84	8	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	34	8	4	34	8	35	13	2
14-15	52	8	12	8	26	6	34	2	12	52	5	12	8	8	84	8	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	34	8	4	34	8	35	13	2
16-17	52	8	12	8	26	6	34	2	12	52	5	12	8	8	84	8	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	34	8	4	34	8	35	13	2
18-19	52	8	12	8	26	6	34	2	12	52	5	12	8	8	84	8	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	34	8	4	34	8	35	13	2
20-21	52	8	12	8	26	6	34	2	12	52	5	12	8	8	84	8	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	34	8	4	34	8	35	13	2
22-23	52	8	12	8	26	6	34	2	12	52	5	12	8	8	84	8	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	34	8	4	34	8	35	13	2
24-25	52	8	12	8	26	6	34	2	12	52	5	12	8	8	84	8	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	34	8	4	34	8	35	13	2

Reinforcement Details





DIMENSIONS TABLE

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

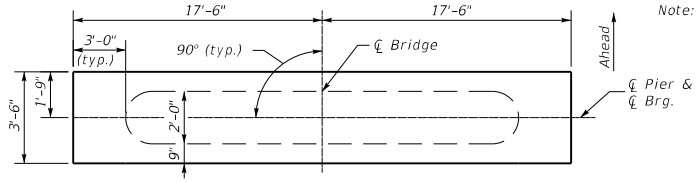
QUANTITIES

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

Note: All bars in cap shall be epoxy coated.

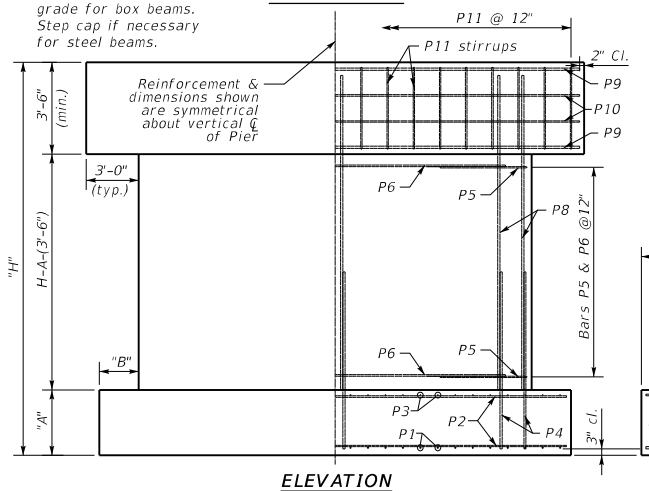
Note: All concrete shall be Class "A"

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

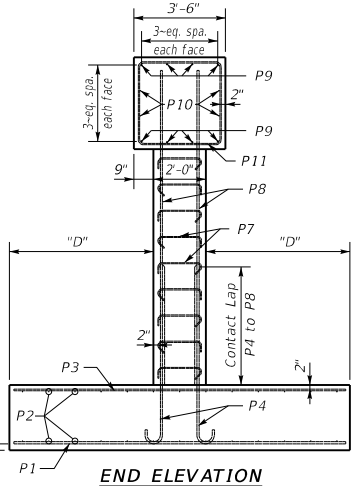


PLAN OF CAP

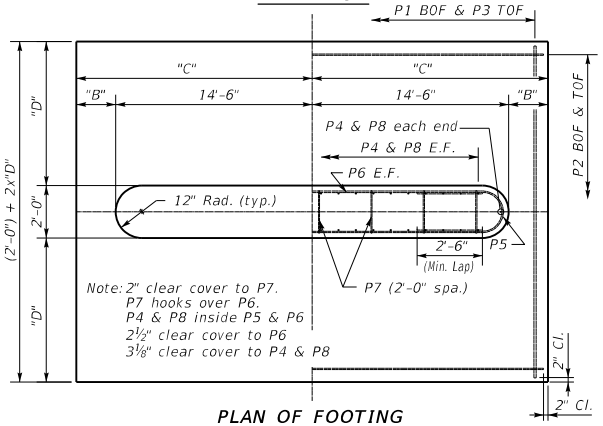
Note: Grade cap to roadway grade for box beams. Step cap if necessary for steel beams.



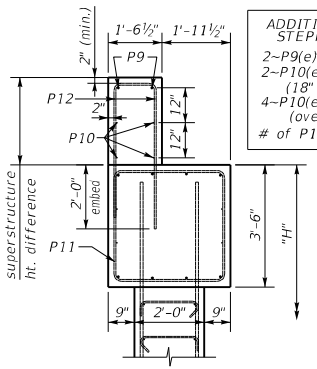
ELEVATION



END ELEVATION

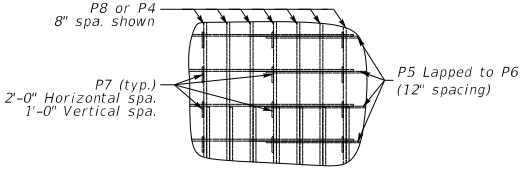


PLAN OF FOOTING



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)



P7 BAR PLACEMENT
(alternate 90° & 135° bar ends)

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

KENTUCKY
DEPARTMENT OF HIGHWAYS

Standard Pier
0° Skew
32'-0"-33'-6" Bridge Width

STANDARD DRAWING NO. *BSP-003*

SUBMITTED _____ 02-26-20
DIRECTOR DIVISION OF STRUCTURAL DESIGN — DATE

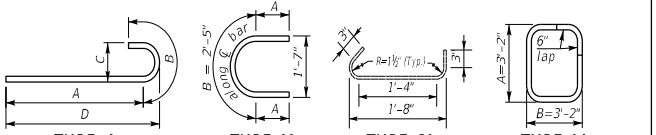
APPROVED _____ 02-26-20
STATE HIGHWAY ENGINEER — DATE

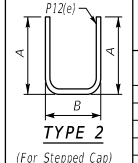
15° SKEW 16'-0" – 17'-6" BRIDGE WIDTH (No Seismic Load)

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.				Type 14			
SIZE																																#4								#8				#5				#5			
H	No.	Size	Length Ft.	Length In.	No.	Size	Length Ft.	Length In.	No.	Size	Length Ft.	Length In.	No.	Size	Length Ft.	Length In.	A In.	B Ft.	B In.	C Ft.	C In.	D Ft.	D In.	No.	Size	Length Ft.	Length In.	A In.	No.	Size	Length Ft.	Length In.	No.	Size	Length Ft.	Length In.	No.	Size	Length Ft.	Length In.	No.	Size	Length Ft.	Length In.	No.	Size	Length Ft.	Length In.	No.	Size	Length Ft.	Length In.
10'-11"	29	8	12	2	8	26	5	19	2	12	29	5	12	2	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	42	8	8	0	8	8	20	2	4	20	2	20	13	2
12'-13"	29	8	12	2	8	26	5	19	2	12	29	5	12	2	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	42	8	10	0	8	8	20	2	4	20	2	20	13	2
14'-15"	29	8	12	2	8	26	5	19	2	12	29	5	12	2	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	42	8	12	0	8	8	20	2	4	20	2	20	13	2
16'-17"	29	8	12	2	8	26	5	19	2	12	29	5	12	2	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	42	8	14	0	8	8	20	2	4	20	2	20	13	2
18'-19"	29	8	12	2	8	26	5	19	2	12	29	5	12	2	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	42	8	16	0	8	8	20	2	4	20	2	20	13	2
20'-21"	29	8	12	2	8	26	5	19	2	12	29	5	12	2	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	42	8	18	0	8	8	20	2	4	20	2	20	13	2
22'-23"	29	8	12	2	8	26	5	19	2	12	29	5	12	2	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	42	8	20	0	8	8	20	2	4	20	2	20	13	2
24'-25"	29	8	12	2	8	26	5	19	2	12	29	5	12	2	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	42	8	22	0	8	8	20	2	4	20	2	20	13	2

Reinforcement Details





DIMENSIONS TABLE

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

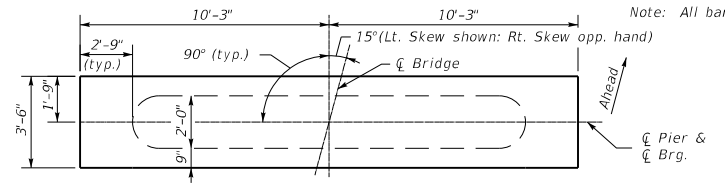
QUANTITIES

H	CONCRETE CLASS "A" CU. YDS. (1)	STEEL REINFORCEMENT EPOXY COATED LBS.	STEEL REINFORCEMENT LBS.
10'-11"	37.5	792	3998
12'-13"	39.7	792	4331
14'-15"	41.8	792	4665
16'-17"	44	792	4998
18'-19"	46.2	792	5331
20'-21"	48.3	792	5664
22'-23"	50.5	792	5997
24'-25"	52.6	792	6330

Note: All bars in cap shall be epoxy coated.

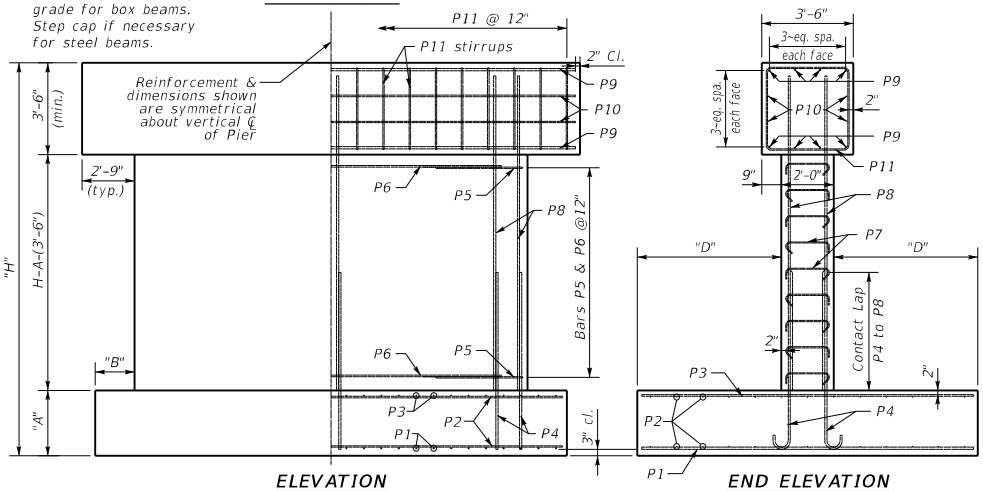
Note: All concrete shall be Class "A"

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



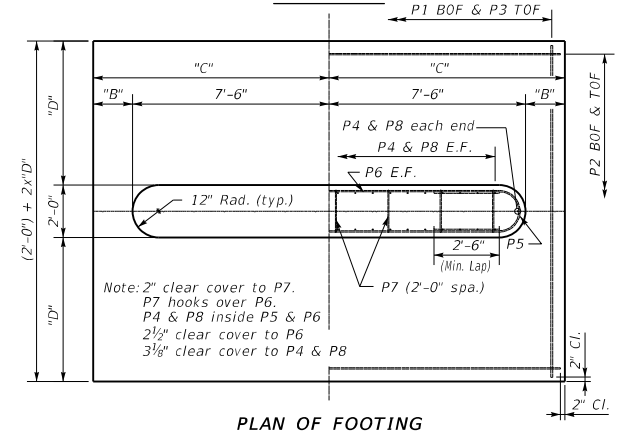
PLAN OF CAP

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

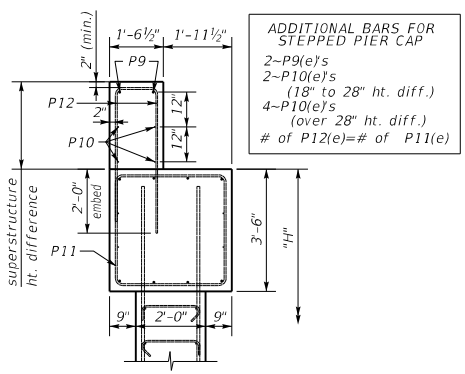


ELEVATION

END ELEVATION

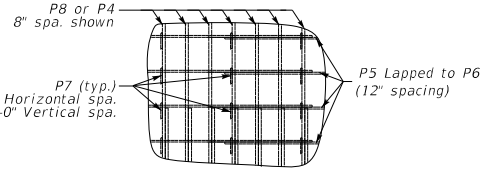


PLAN OF FOOTING



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)



P7 BAR PLACEMENT
(alternate 90° & 135° bar ends)

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

KENTUCKY
DEPARTMENT OF HIGHWAYS

Standard Pier
15° Skew
16'-0"-17'-6" Bridge Width

STANDARD DRAWING NO. *BSP-004*

SUBMITTED _____ 02-26-20
DIRECTOR DIVISION OF STRUCTURAL DESIGN — DATE

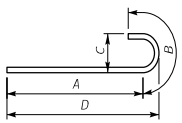
APPROVED _____ 02-26-20
STATE HIGHWAY ENGINEER — DATE

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

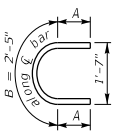
Bill of Reinforcement

MARK	P1				P2				P3				P4								P5								P6				P7	P8			P9(e)	P10(e)	P11(e)	
TYPE	Str.				Str.				Str.				Type 4								Type 10								Str.				Type 31	Str.			Str.	Str.	Type 14	
SIZE																																#4				#8	#5	#5	
H	No.	Size	Length Ft.	Length In.	No.	Size	Length Ft.	Length In.	No.	Size	Length Ft.	Length In.	No.	Size	Length Ft.	Length In.	A Ft.	A In.	B Ft.	B In.	C Ft.	C In.	D Ft.	D In.	No.	Size	Length Ft.	Length In.	A In.	No.	Size	Length Ft.	Length In.	No.	Size	Length Ft.	Length In.	No.	Length Ft.	Length In.	No.	Length Ft.	Length In.
10-11	43	8	12	8	26	5	28	2	12	43	5	12	8	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	8	28	2	4	28	2	28	13	2
12-13	43	8	12	8	26	5	28	2	12	43	5	12	8	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	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	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
18-19	43	8	12	8	26	5	28	2	12	43	5	12	8	8	64	8	8	10	8	7	5	1	5	0	8	7	9	26	5	7	5	12	2	6	26	5	20	6	12	143	2	5	64	8	16	0	8	8	28	2	4	28	2	28	13	2
20-21	43	8	12	8	26	5	28	2	12	43	5	12	8	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	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	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

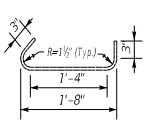
Reinforcement Details



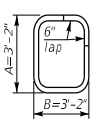
TYPE 4



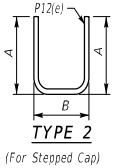
TYPE 10
(#5 bar)



TYPE 31
(#4 bar)



TYPE 14
(#5 bar)



TYPE 2
(For Stepped Cap)
A=Ht. diff.–2" Cl. +2'-0"emb.
B=1'-2½"

DIMENSIONS TABLE

H	A ft.	A in.	B ft.	B in.	C ft.	C in.	D ft.	D 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

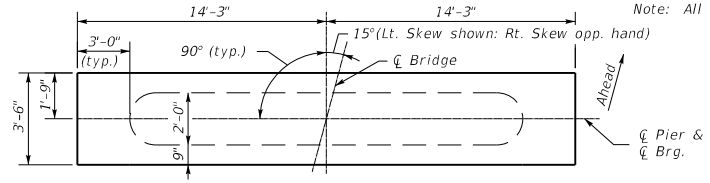
QUANTITIES

H	CONCRETE CLASS "A" CU. YDS. (1)	STEEL REINFORCEMENT EPOXY COATED LBS.	STEEL REINFORCEMENT 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.

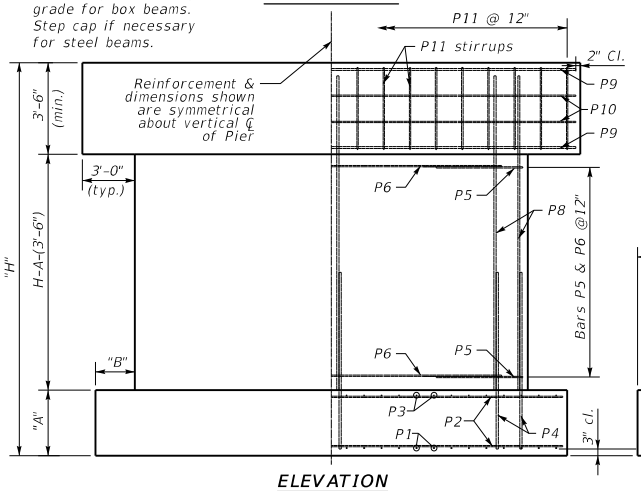
Note: All concrete shall be Class "A"

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

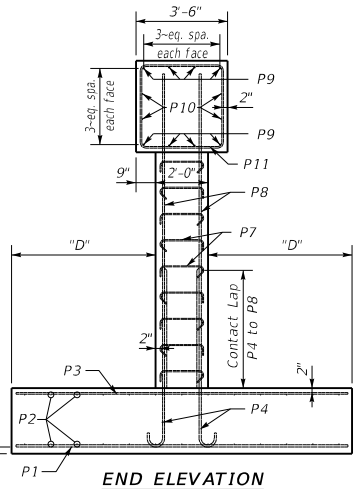


PLAN OF CAP

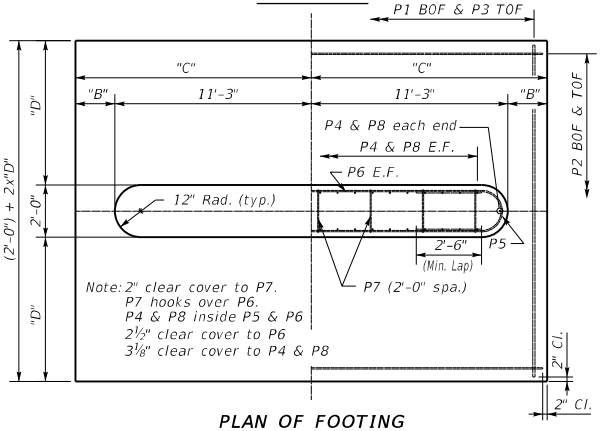
Note: Grade cap to roadway grade for box beams. Step cap if necessary for steel beams.



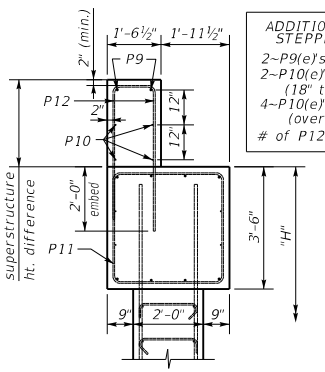
ELEVATION



END ELEVATION

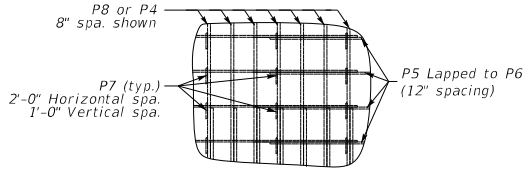


PLAN OF FOOTING



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)



P7 BAR PLACEMENT
(alternate 90° & 135° bar ends)

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

KENTUCKY
DEPARTMENT OF HIGHWAYS

Standard Pier
15° Skew
24'-0"–25'-6" Bridge Width

STANDARD DRAWING NO. *BSP-005*

SUBMITTED _____ 02-26-20
DIRECTOR DIVISION OF STRUCTURAL DESIGN — DATE

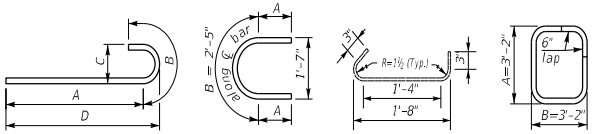
APPROVED _____ 02-26-20
STATE HIGHWAY ENGINEER — DATE

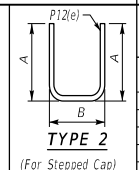
15° SKEW 32'-0" – 33'-6" BRIDGE WIDTH (No Seismic Load)

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.				Str.				Type 14			
SIZE																															#4								#8				#5				#5			
H	No.	Size	Length Ft.	Length In.	No.	Size	Length Ft.	Length In.	No.	Size	Length Ft.	Length In.	No.	Size	Length Ft.	Length In.	Spacing	A Ft.	A In.	B Ft.	B In.	C Ft.	C In.	D Ft.	D In.	No.	Size	Length Ft.	Length In.	Spacing	A Ft.	A In.	No.	Size	Length Ft.	Length In.	No.	Size	Length Ft.	Length In.	No.	Size	Length Ft.	Length In.	No.	Size	Length Ft.	Length In.	No.	Size	Length Ft.	Length In.
10-11	55	8	12	8	8	26	6	36	2	12	55	5	12	8	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	8	8	26	6	36	2	12	55	5	12	8	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	8	8	26	6	36	2	12	55	5	12	8	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	8	8	26	6	36	2	12	55	5	12	8	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	8	8	26	6	36	2	12	55	5	12	8	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	8	8	26	6	36	2	12	55	5	12	8	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	8	8	26	6	36	2	12	55	5	12	8	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	8	8	26	6	36	2	12	55	5	12	8	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





H	A Ft.	A In.	B Ft.	B In.	C Ft.	C In.	D Ft.	D 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

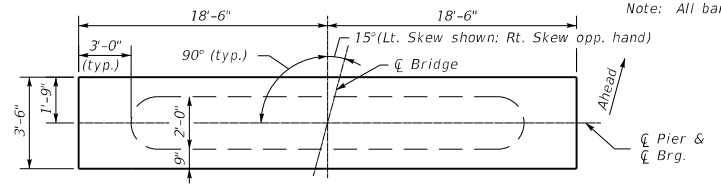
QUANTITIES

H	CONCRETE CLASS "A" CU. YDS. (1)	STEEL REINFORCEMENT EPOXY COATED LBS.	STEEL REINFORCEMENT 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.

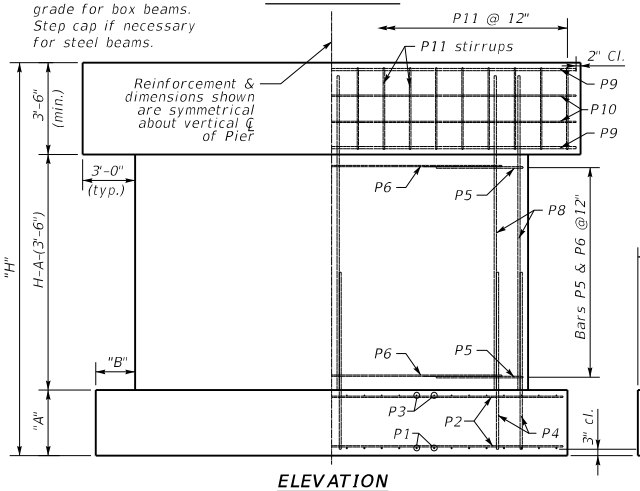
Note: All concrete shall be Class "A"

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

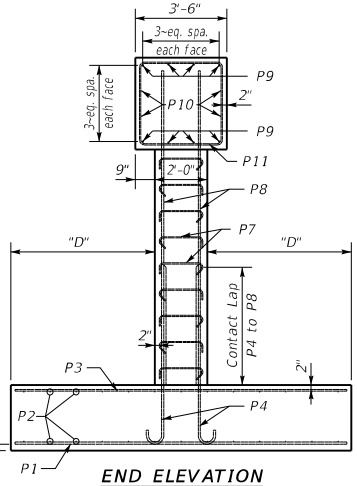


PLAN OF CAP

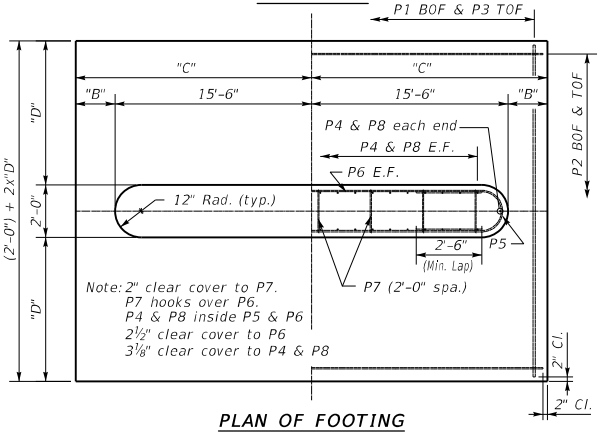
Note: Grade cap to roadway grade for box beams. Step cap if necessary for steel beams.



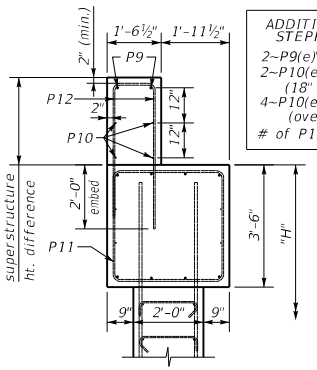
ELEVATION



END ELEVATION

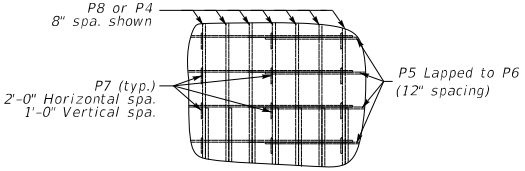


PLAN OF FOOTING



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)



P7 BAR PLACEMENT
(alternate 90° & 135° bar ends)

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

KENTUCKY
DEPARTMENT OF HIGHWAYS

Standard Pier
15° Skew
32'-0"–33'-6" Bridge Width

STANDARD DRAWING NO. *BSP-006*

SUBMITTED _____ 02-26-20
DIRECTOR DIVISION OF STRUCTURAL DESIGN — DATE

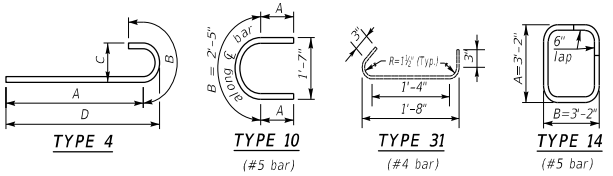
APPROVED _____ 02-26-20
STATE HIGHWAY ENGINEER — DATE

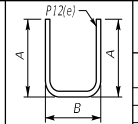
30° SKEW 16'-0" – 17'-6" BRIDGE WIDTH (No Seismic Load)

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.		Type 14	
SIZE																															#4						#8		#5		#5	
H	No.	Size	Length Ft.	Length In.	No.	Size	Length Ft.	Length In.	No.	Size	Length Ft.	Length In.	No.	Size	Length Ft.	Length In.	Spacing	A Ft.	A In.	B Ft.	B In.	C Ft.	C In.	D Ft.	D In.	No.	Size	Length Ft.	Length In.	Spacing	A Ft.	A In.	No.	Size	Length Ft.	Length In.	No.	Size	Length Ft.	Length In.	No.	Length Ft.	Length In.
10'-11"	32	8	12	2	8	26	5	21	2	12	32	5	12	2	8	48	8	8	10	8	7	5	1	5	0	8	7	9	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	8	10	8	7	5	1	5	0	8	7	9	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	8	10	8	7	5	1	5	0	8	7	9	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	8	10	8	7	5	1	5	0	8	7	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	8	10	8	7	5	1	5	0	8	7	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	8	10	8	7	5	1	5	0	8	7	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	8	10	8	7	5	1	5	0	8	7	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	8	10	8	7	5	1	5	0	8	7	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





TYPE 2

(For Stepped Cap)
A=Ht. diff.-2" Cl. +2'-0"emb.
B=1'-2½"

DIMENSIONS TABLE

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

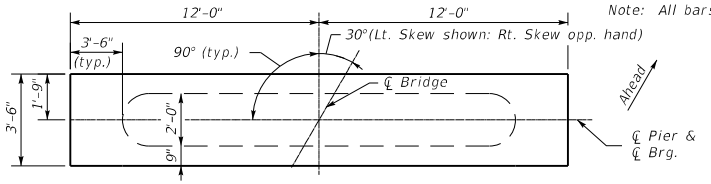
QUANTITIES

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

Note: All bars in cap shall be epoxy coated.

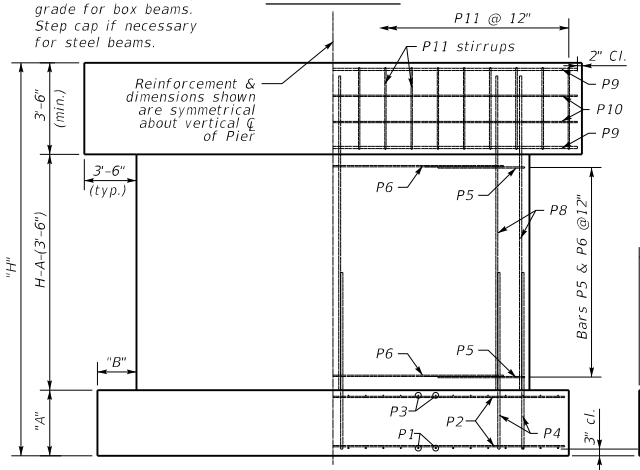
Note: All concrete shall be Class "A"

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

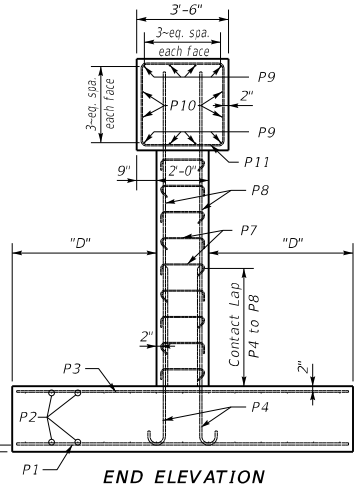


PLAN OF CAP

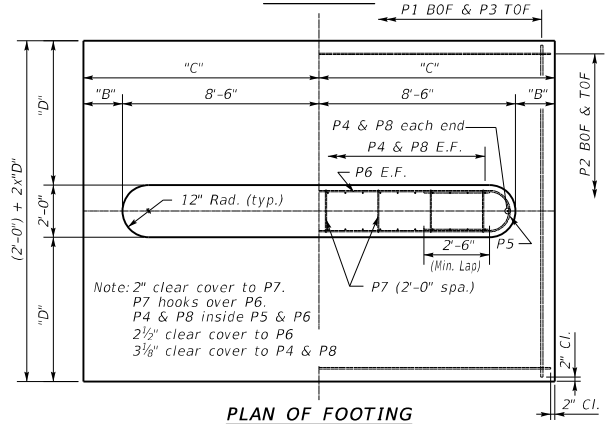
Note: Grade cap to roadway grade for box beams. Step cap if necessary for steel beams.



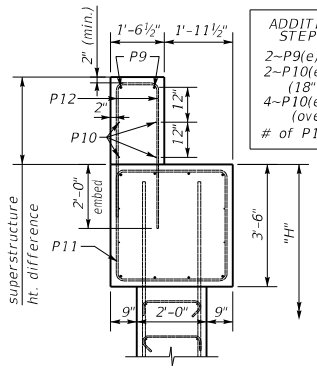
ELEVATION



END ELEVATION



PLAN OF FOOTING

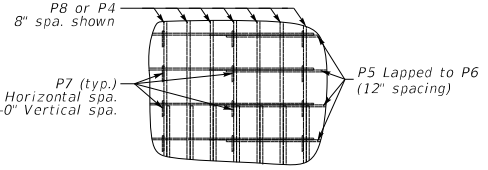


STEPPED CAP

(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)



P7 BAR PLACEMENT

(alternate 90° & 135° bar ends)

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

KENTUCKY DEPARTMENT OF HIGHWAYS

Standard Pier
30° Skew
16'-0"-17'-6" Bridge Width

STANDARD DRAWING NO. BSP-007

SUBMITTED _____ 02-26-20
DIRECTOR DIVISION OF STRUCTURAL DESIGN — DATE

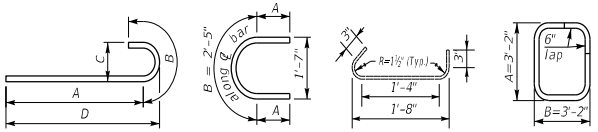
APPROVED _____ 02-26-20
STATE HIGHWAY ENGINEER — DATE

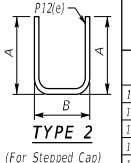
30° SKEW 24'-0" – 25'-6" BRIDGE WIDTH (No Seismic Load)

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.		Type 14	
SIZE																																	#4						#8		#5		#5	
H	No.	Size	Length Ft.	Length In.	No.	Size	Length Ft.	Length In.	No.	Size	Length Ft.	Length In.	No.	Size	Length Ft.	Length In.	Spacing	A Ft.	A In.	B Ft.	B In.	C Ft.	C In.	D Ft.	D In.	No.	Size	Length Ft.	Length In.	Spacing	A Ft.	A In.	No.	Size	Length Ft.	Length In.	No.	Size	Length Ft.	Length In.	No.	Length Ft.	Length In.	No.	Length Ft.	Length In.
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	10	5	7	5	12	2	6	10	5	24	0	12	65	2	5	76	8	8	0	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	14	5	7	5	12	2	6	14	5	24	0	12	91	2	5	76	8	10	0	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	18	5	7	5	12	2	6	18	5	24	0	12	117	2	5	76	8	12	0	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	22	5	7	5	12	2	6	22	5	24	0	12	143	2	5	76	8	14	0	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	26	5	7	5	12	2	6	26	5	24	0	12	169	2	5	76	8	16	0	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	30	5	7	5	12	2	6	30	5	24	0	12	195	2	5	76	8	18	0	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	34	5	7	5	12	2	6	34	5	24	0	12	221	2	5	76	8	20	0	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	38	5	7	5	12	2	6	38	5	24	0	12	247	2	5	76	8	22	0	8	4	32	8	33	13	2

Reinforcement Details





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

DIMENSIONS TABLE

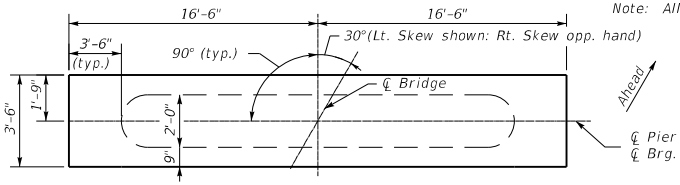
QUANTITIES

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

Note: All bars in cap shall be epoxy coated.

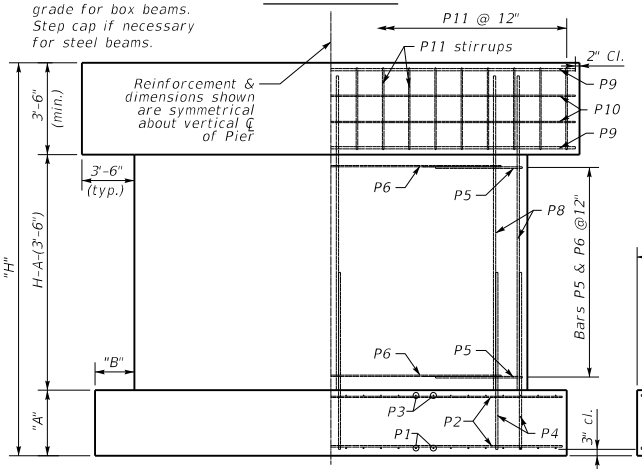
Note: All concrete shall be Class "A"

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

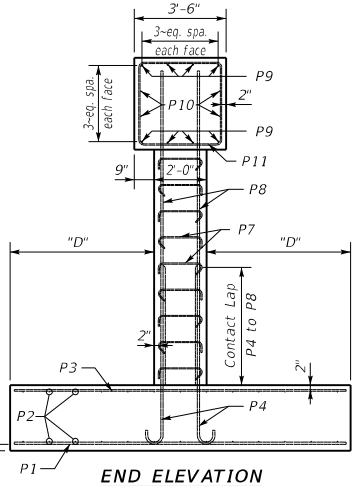


PLAN OF CAP

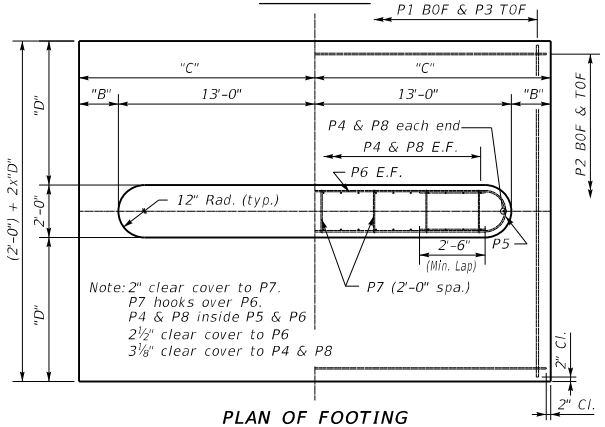
Note: Grade cap to roadway grade for box beams. Step cap if necessary for steel beams.



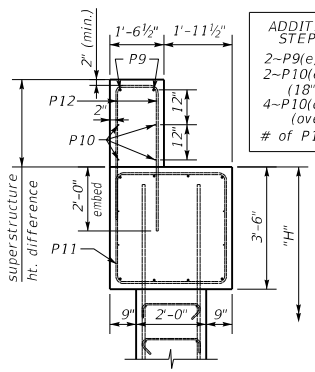
ELEVATION



END ELEVATION

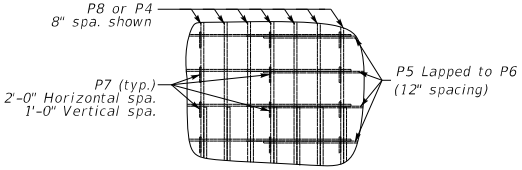


PLAN OF FOOTING



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)



P7 BAR PLACEMENT
(alternate 90° & 135° bar ends)

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

KENTUCKY
DEPARTMENT OF HIGHWAYS

Standard Pier
30° Skew
24'-0"-25'-6" Bridge Width

STANDARD DRAWING NO. *BSP-008*

SUBMITTED _____ DIRECTOR DIVISION OF STRUCTURAL DESIGN — 02-26-20 DATE

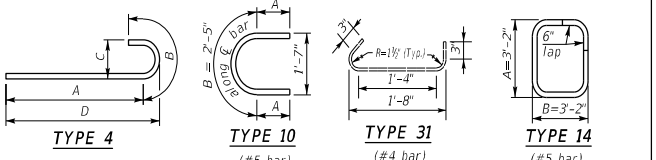
APPROVED _____ STATE HIGHWAY ENGINEER — 02-26-20 DATE

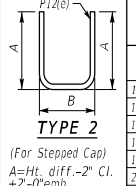
30° SKEW 32'-0" – 33'-6" BRIDGE WIDTH (No Seismic Load)

Bill of Reinforcement

MARK	P1				P2				P3				P4								P5								P6				P7	P8			P9(e)		P10(e)		P11(e)	
TYPE	Str.				Str.				Str.				Type 4								Type 10								Str.				Type 31	Str.			Str.		Str.		Type 14	
SIZE																																	#4				#8		#5		#5	
H	No.	Size	Length ft.	Length in.	Spacing	No.	Size	Length ft.	Length in.	Spacing	No.	Size	Length ft.	Length in.	Spacing	A ft.	A in.	B ft.	B in.	C ft.	C in.	D ft.	D in.	No.	Size	Length ft.	Length in.	Spacing	A in.	No.	Size	Length ft.	Length in.	No.	Size	Length ft.	Length in.	No.	Length ft.	Length in.	No.	Length ft.	Length in.	No.	Length ft.	Length in.
10'-11"	61	8	12	8	8	26	6	40	2	12	61	5	12	8	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	42	2	4	42	2	42	13	2
12'-13"	61	8	12	8	8	26	6	40	2	12	61	5	12	8	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	42	2	4	42	2	42	13	2
14'-15"	61	8	12	8	8	26	6	40	2	12	61	5	12	8	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	42	2	4	42	2	42	13	2
16'-17"	61	8	12	8	8	26	6	40	2	12	61	5	12	8	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	42	2	4	42	2	42	13	2
18'-19"	61	8	12	8	8	26	6	40	2	12	61	5	12	8	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	42	2	4	42	2	42	13	2
20'-21"	61	8	12	8	8	26	6	40	2	12	61	5	12	8	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	42	2	4	42	2	42	13	2
22'-23"	61	8	12	8	8	26	6	40	2	12	61	5	12	8	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	42	2	4	42	2	42	13	2
24'-25"	61	8	12	8	8	26	6	40	2	12	61	5	12	8	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	42	2	4	42	2	42	13	2

Reinforcement Details





DIMENSIONS TABLE

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

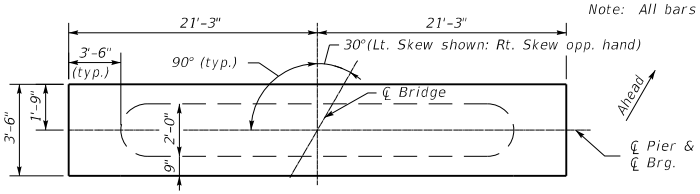
QUANTITIES

H	CONCRETE CLASS "A"	STEEL REINFORCEMENT EPOXY COATED	STEEL REINFORCEMENT
	CU. YDS. (1)	LBS.	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.

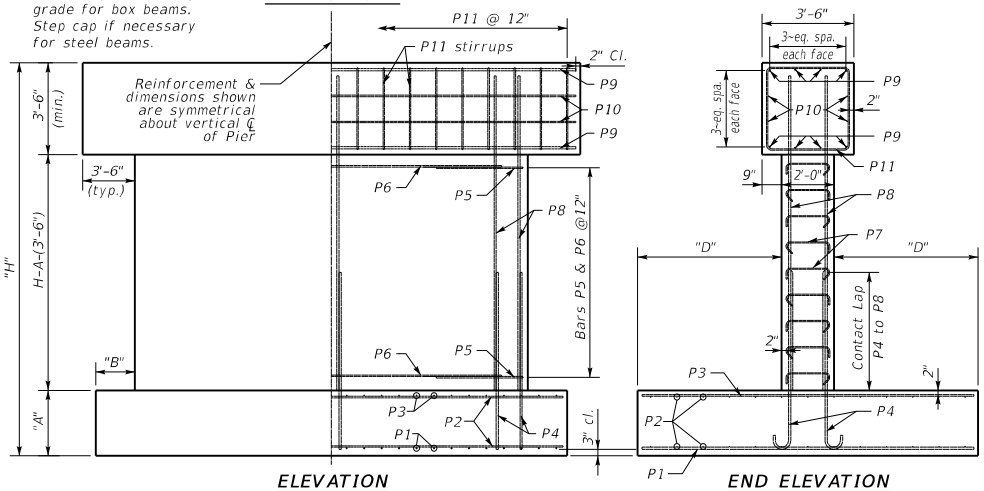
Note: All concrete shall be Class "A"

(1) Quantity is based on taller height. Reduce by 2.6 cubic yd. for shorter height.



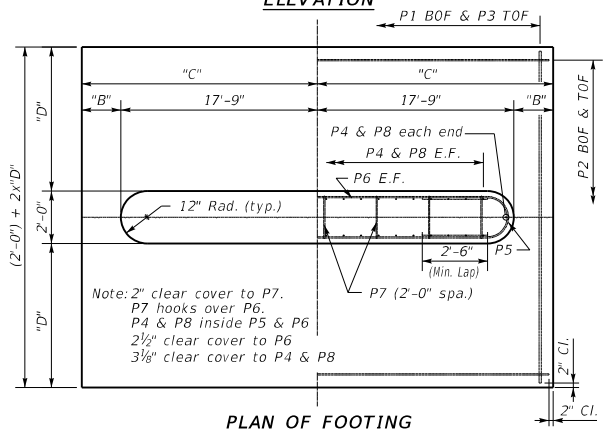
PLAN OF CAP

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

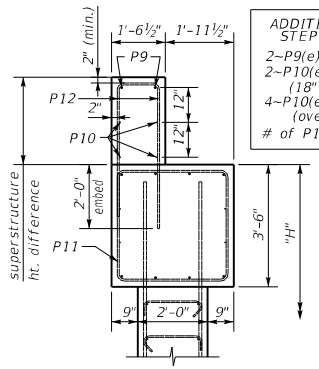


ELEVATION

END ELEVATION

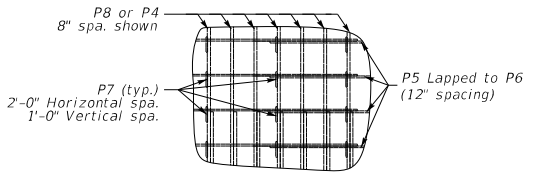


PLAN OF FOOTING



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)



P7 BAR PLACEMENT
(alternate 90° & 135° bar ends)

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

KENTUCKY
DEPARTMENT OF HIGHWAYS

Standard Pier
30° Skew
32'-0"–33'-6" Bridge Width

STANDARD DRAWING NO. *BSP-009*

SUBMITTED _____ 02-26-20
DIRECTOR DIVISION OF STRUCTURAL DESIGN — DATE

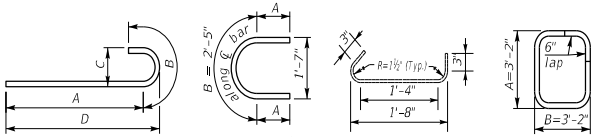
APPROVED _____ 02-26-20
STATE HIGHWAY ENGINEER — DATE

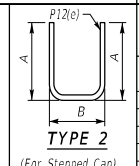
45° SKEW 16'-0" – 17'-6" BRIDGE WIDTH (No Seismic Load)

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.		Type 14	
SIZE																															#4						#8		#5		#5	
H	No.	Size	Length Ft.	Length In.	No.	Size	Length Ft.	Length In.	No.	Size	Length Ft.	Length In.	No.	Size	Length Ft.	Length In.	A In.	B Ft.	B In.	C In.	D Ft.	D In.	No.	Size	Length Ft.	Length In.	No.	Size	Length Ft.	Length In.	No.	Size	Length Ft.	Length In.	No.	Size	Length Ft.	Length In.	No.	Length Ft.	Length In.	No.	Length Ft.	Length In.
10'-11'	40	7	10	8	22	6	26	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	29	2	4	29	2	29	13	2
12'-13'	40	7	10	8	22	6	26	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	29	2	4	29	2	29	13	2
14'-15'	40	7	10	8	22	6	26	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	29	2	4	29	2	29	13	2
16'-17'	40	7	10	8	22	6	26	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	29	2	4	29	2	29	13	2
18'-19'	40	7	10	8	22	6	26	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	29	2	4	29	2	29	13	2
20'-21'	40	7	10	8	22	6	26	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	29	2	4	29	2	29	13	2
22'-23'	40	7	10	8	22	6	26	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	29	2	4	29	2	29	13	2
24'-25'	40	7	10	8	22	6	26	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	29	2	4	29	2	29	13	2

Reinforcement Details





DIMENSIONS TABLE

H	A Ft.	A In.	B Ft.	B In.	C Ft.	C In.	D Ft.	D In.
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

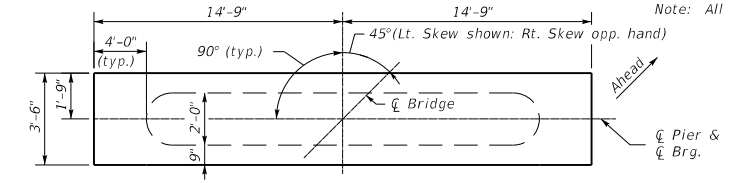
QUANTITIES

H	CONCRETE CLASS "A" CU. YDS. (1)	STEEL REINFORCEMENT EPOXY COATED LBS.	STEEL REINFORCEMENT LBS.
10'-11'	49.1	1146	5362
12'-13'	52.2	1146	5839
14'-15'	55.3	1146	6317
16'-17'	58.5	1146	6794
18'-19'	61.6	1146	7271
20'-21'	64.7	1146	7748
22'-23'	67.8	1146	8225
24'-25'	70.9	1146	8692

Note: All bars in cap shall be epoxy coated.

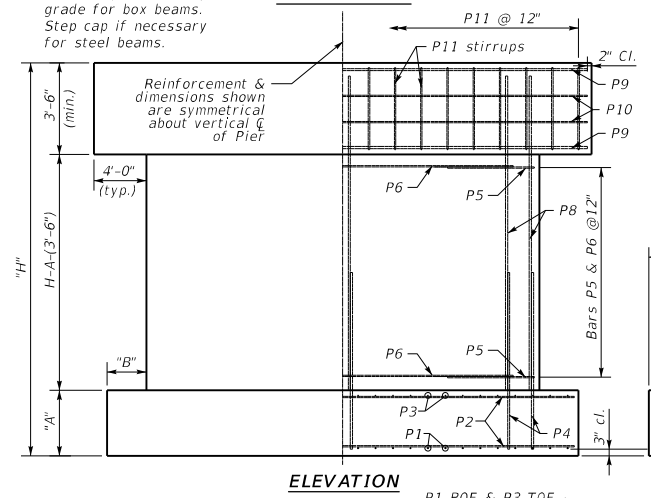
Note: All concrete shall be Class "A"

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

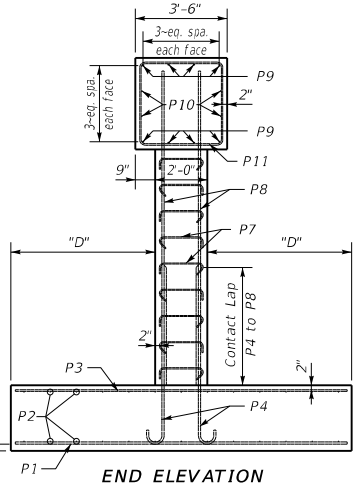


PLAN OF CAP

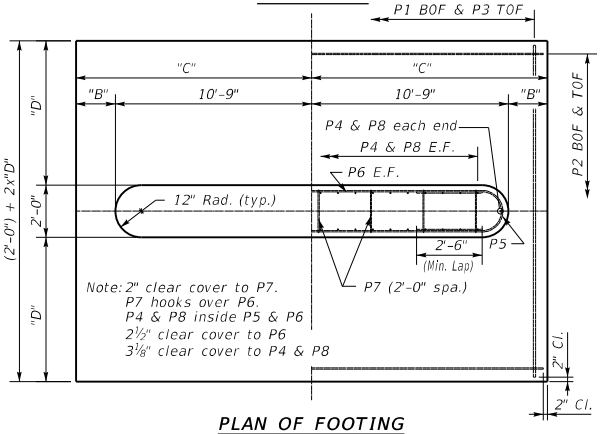
Note: Grade cap to roadway grade for box beams. Step cap if necessary for steel beams.



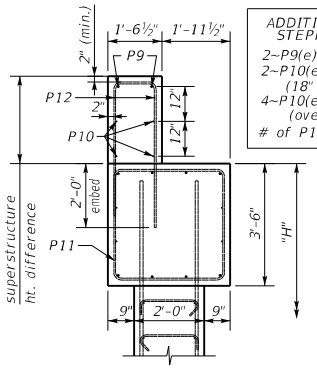
ELEVATION



END ELEVATION

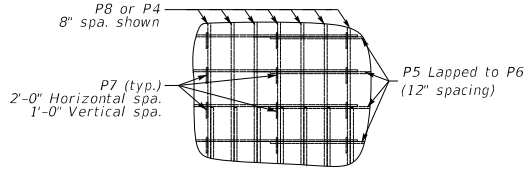


PLAN OF FOOTING



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)



P7 BAR PLACEMENT
(alternate 90° & 135° bar ends)

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

KENTUCKY
DEPARTMENT OF HIGHWAYS

Standard Pier
45° Skew
16'-0"-17'-6" Bridge Width

STANDARD DRAWING NO. *BSP-010*

SUBMITTED _____ DIRECTOR DIVISION OF STRUCTURAL DESIGN — 02-26-20 DATE

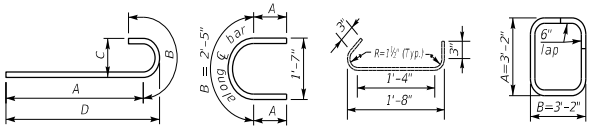
APPROVED _____ STATE HIGHWAY ENGINEER — 02-26-20 DATE

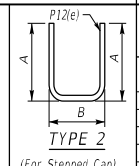
45° SKEW 24'-0" – 25'-6" BRIDGE WIDTH (No Seismic Load)

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.		Type 14	
SIZE																																	#4				#8		#5		#5	
H	No.	Size	Length ft.	Length in.	No.	Size	Length ft.	Length in.	No.	Size	Length ft.	Length in.	No.	Size	Length ft.	Length in.	Stirrup	A ft.	A in.	B ft.	B in.	C ft.	C in.	D ft.	D in.	No.	Size	Length ft.	Length in.	Stirrup	A in.	No.	Size	Length ft.	Length in.	No.	Length ft.	Length in.	No.	Length ft.	Length in.	No.	Length ft.	Length in.
10-11	56	7	12	2	8	26	6	37	2	12	56	5	12	2	8	94	8	8	10	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	40	2	4	40	2	40	13	2
12-13	56	7	12	2	8	26	6	37	2	12	56	5	12	2	8	94	8	8	10	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	40	2	4	40	2	40	13	2
14-15	56	7	12	2	8	26	6	37	2	12	56	5	12	2	8	94	8	8	10	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	40	2	4	40	2	40	13	2
16-17	56	7	12	2	8	26	6	37	2	12	56	5	12	2	8	94	8	8	10	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	40	2	4	40	2	40	13	2
18-19	56	7	12	2	8	26	6	37	2	12	56	5	12	2	8	94	8	8	10	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	40	2	4	40	2	40	13	2
20-21	56	7	12	2	8	26	6	37	2	12	56	5	12	2	8	94	8	8	10	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	40	2	4	40	2	40	13	2
22-23	56	7	12	2	8	26	6	37	2	12	56	5	12	2	8	94	8	8	10	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	40	2	4	40	2	40	13	2
24-25	56	7	12	2	8	26	6	37	2	12	56	5	12	2	8	94	8	8	10	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	40	2	4	40	2	40	13	2

Reinforcement Details





DIMENSIONS TABLE

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

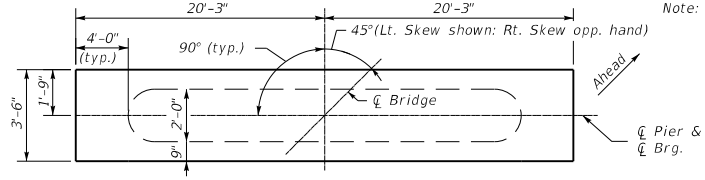
QUANTITIES

H	CONCRETE CLASS "A" CU. YDS. (1)	STEEL REINFORCEMENT EPOXY COATED LBS.	STEEL REINFORCEMENT LBS.
10-11	74.4	1580	8329
12-13	79.2	1580	9049
14-15	83.9	1580	9757
16-17	88.7	1580	10471
18-19	93.4	1580	11184
20-21	98.2	1580	11898
22-23	102.9	1580	12612
24-25	107.7	1580	13326

Note: All bars in cap shall be epoxy coated.

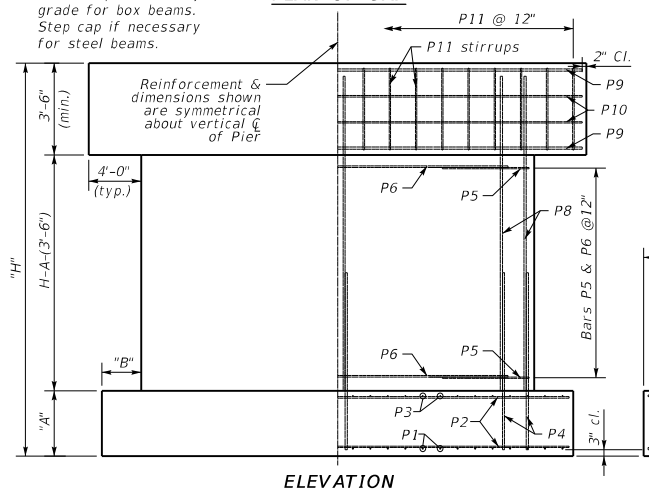
Note: All concrete shall be Class "A"

(1) Quantity is based on taller height. Reduce by 2.3 cubic yd. for shorter height.

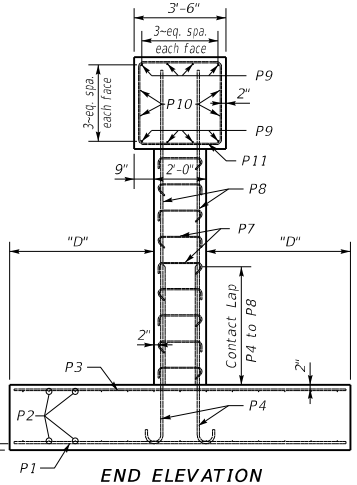


PLAN OF CAP

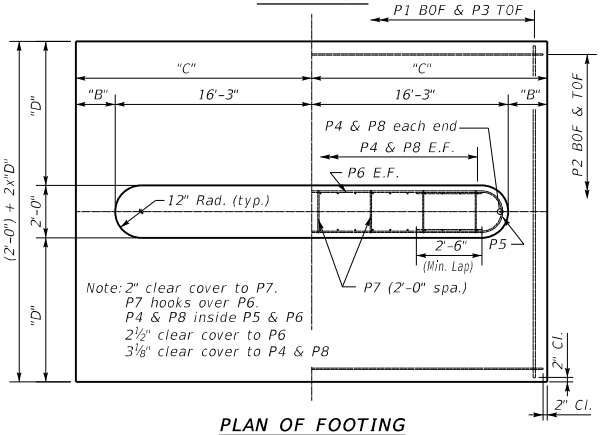
Note: Grade cap to roadway grade for box beams. Step cap if necessary for steel beams.



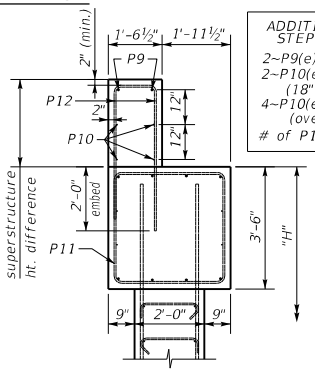
ELEVATION



END ELEVATION

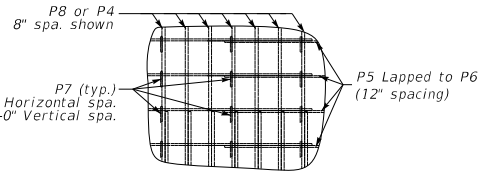


PLAN OF FOOTING



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)



P7 BAR PLACEMENT
(alternate 90° & 135° bar ends)

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

KENTUCKY
DEPARTMENT OF HIGHWAYS

Standard Pier
45° Skew
24'-0"-25'-6" Bridge Width

STANDARD DRAWING NO. BSP-011

SUBMITTED _____ DIRECTOR DIVISION OF STRUCTURAL DESIGN 02-26-20 DATE

APPROVED _____ STATE HIGHWAY ENGINEER 02-26-20 DATE

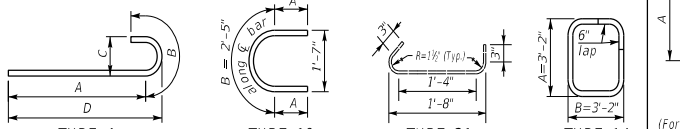
45° SKEW 32'-0" – 33'-6" BRIDGE WIDTH (No Seismic Load)

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.	Type 14
SIZE							#4		#8	#5	#5

H	P1 No.	P1 Size	P1 Length Ft.	P1 Length In.	P1 Spacing	P2 No.	P2 Size	P2 Length Ft.	P2 Length In.	P2 Spacing	P3 No.	P3 Size	P3 Length Ft.	P3 Length In.	P3 Spacing	P4 No.	P4 Size	P4 Length Ft.	P4 Length In.	P4 Spacing	P4 A In.	P4 B Ft.	P4 B In.	P4 C Ft.	P4 C In.	P4 D Ft.	P4 D In.	P5 No.	P5 Size	P5 Length Ft.	P5 Length In.	P5 Spacing	P5 A In.	P6 No.	P6 Size	P6 Length Ft.	P6 Length In.	P7 No.	P7 Size	P7 Length Ft.	P7 Length In.	P8 No.	P8 Size	P8 Length Ft.	P8 Length In.	P8 Spacing	P9(e) No.	P9(e) Length Ft.	P9(e) Length In.	P10(e) No.	P10(e) Length Ft.	P10(e) Length In.	P11(e) Length Ft.	P11(e) Length In.
10-11	72	7	12	8	8	26	5	4	7	8	12	72	5	12	8	8	126	8	8	10	8	7	5	1	5	0	8	7	9	10	5	7	5	12	2	6	10	5	41	0	12	105	2	5	126	8	8	0	8	8	51	2	4	51	2	51	13	2
12-13	72	7	12	8	8	26	5	4	7	8	12	72	5	12	8	8	126	8	8	10	8	7	5	1	5	0	8	7	9	14	5	7	5	12	2	6	14	5	41	0	12	147	2	5	126	8	10	0	8	8	51	2	4	51	2	51	13	2
14-15	72	7	12	8	8	26	5	4	7	8	12	72	5	12	8	8	126	8	8	10	8	7	5	1	5	0	8	7	9	18	5	7	5	12	2	6	18	5	41	0	12	189	2	5	126	8	12	0	8	8	51	2	4	51	2	51	13	2
16-17	72	7	12	8	8	26	5	4	7	8	12	72	5	12	8	8	126	8	8	10	8	7	5	1	5	0	8	7	9	22	5	7	5	12	2	6	22	5	41	0	12	231	2	5	126	8	14	0	8	8	51	2	4	51	2	51	13	2
18-19	72	7	12	8	8	26	5	4	7	8	12	72	5	12	8	8	126	8	8	10	8	7	5	1	5	0	8	7	9	26	5	7	5	12	2	6	26	5	41	0	12	273	2	5	126	8	16	0	8	8	51	2	4	51	2	51	13	2
20-21	72	7	12	8	8	26	5	4	7	8	12	72	5	12	8	8	126	8	8	10	8	7	5	1	5	0	8	7	9	30	5	7	5	12	2	6	30	5	41	0	12	315	2	5	126	8	18	0	8	8	51	2	4	51	2	51	13	2
22-23	72	7	12	8	8	26	5	4	7	8	12	72	5	12	8	8	126	8	8	10	8	7	5	1	5	0	8	7	9	34	5	7	5	12	2	6	34	5	41	0	12	357	2	5	126	8	20	0	8	8	51	2	4	51	2	51	13	2
24-25	72	7	12	8	8	26	5	4	7	8	12	72	5	12	8	8	126	8	8	10	8	7	5	1	5	0	8	7	9	38	5	7	5	12	2	6	38	5	41	0	12	399	2	5	126	8	22	0	8	8	51	2	4	51	2	51	13	2

Reinforcement Details



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

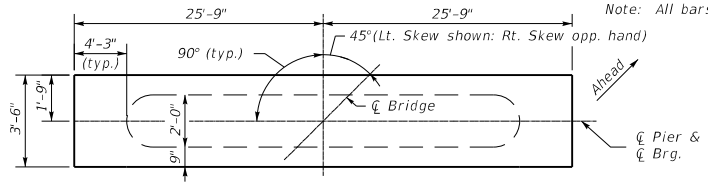
QUANTITIES

H	CONCRETE CLASS "A" CU. YDS. (1)	STEEL REINFORCEMENT EPOXY COATED LBS.	STEEL REINFORCEMENT LBS.
10-11	98.1	2013	10477
12-13	104.4	2013	11422
14-15	110.7	2013	12367
16-17	117	2013	13313
18-19	123.4	2013	14278
20-21	129.7	2013	15204
22-23	136	2013	16149
24-25	142.3	2013	17094

Note: All bars in cap shall be epoxy coated.

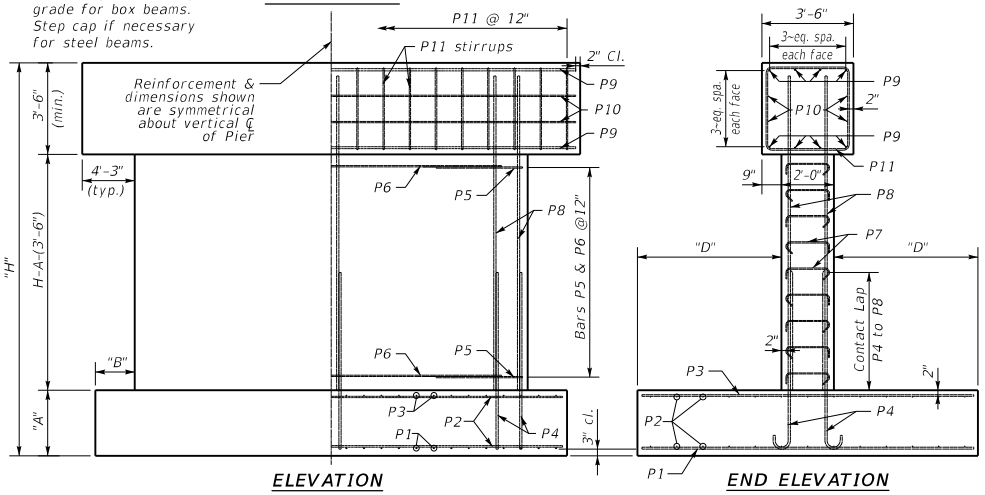
Note: All concrete shall be Class "A"

(1) Quantity is based on taller height. Reduce by 3.1 cubic yd. for shorter height.



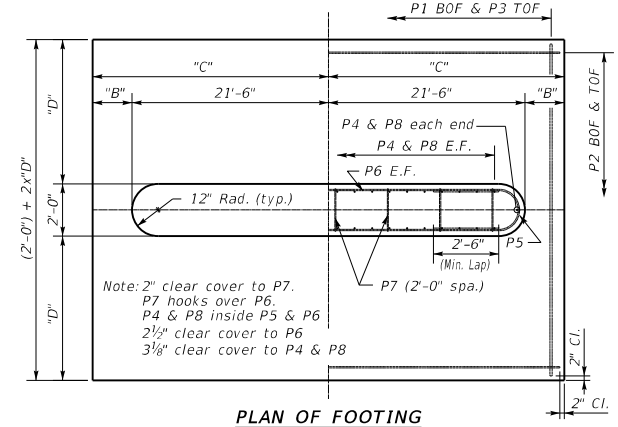
PLAN OF CAP

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

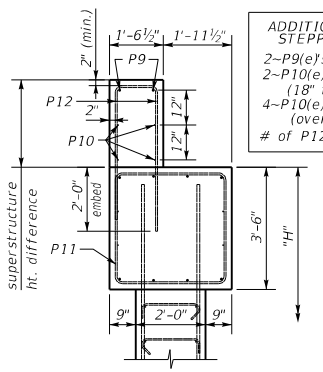


ELEVATION

END ELEVATION

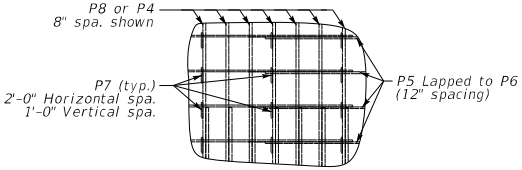


PLAN OF FOOTING



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)



P7 BAR PLACEMENT
(alternate 90° & 135° bar ends)

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

KENTUCKY
DEPARTMENT OF HIGHWAYS

Standard Pier
45° Skew
32'-0"-33'-6" Bridge Width

STANDARD DRAWING NO. BSP-012

SUBMITTED _____ 02-26-20
DIRECTOR DIVISION OF STRUCTURAL DESIGN — DATE

APPROVED _____ 02-26-20
STATE HIGHWAY ENGINEER — DATE