

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"	295k	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"	295k	1.44"

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

### GENERAL NOTES

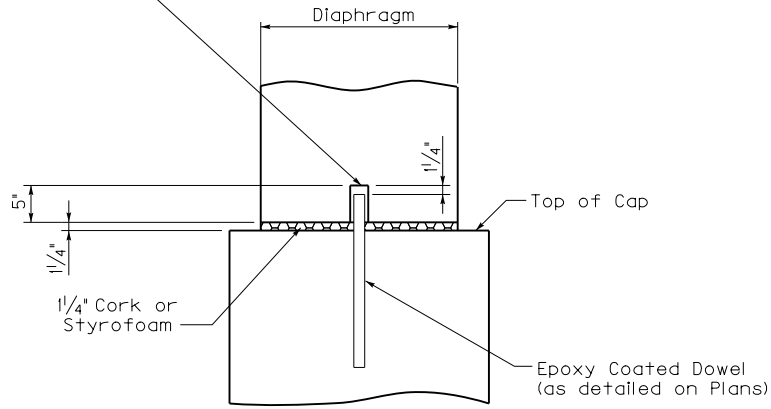
SPECIFICATIONS: Fabricate the Elastomeric Bearing Pads to the design and dimensions as shown on these drawings and to AASHTO LRFD Bridge Construction Specifications, Section 18.

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

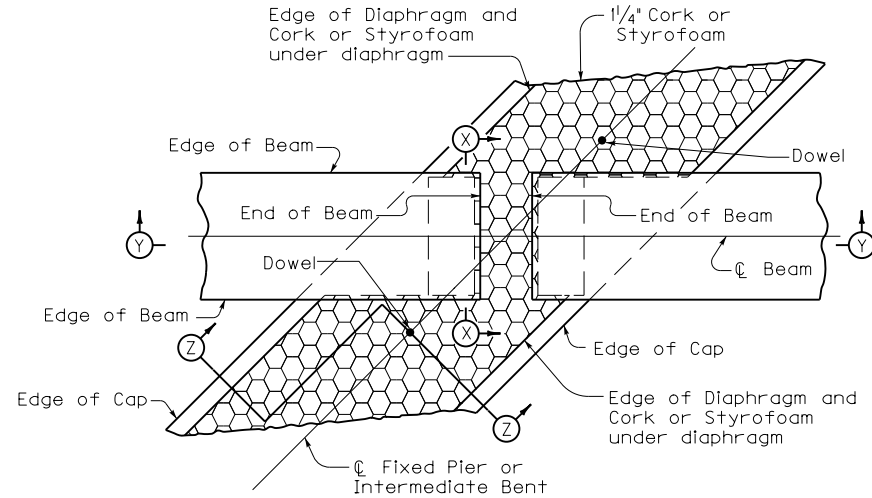
Include the price of bearing pads in the bid for the beams.

<b>KENTUCKY DEPARTMENT OF HIGHWAYS</b>		
<b>ELASTOMERIC BEARING PADS FOR PRESTRESSED BEAMS</b>		
STANDARD DRAWING NO. BBP-001-12		
SUBMITTED	<i>Mark Nite</i>	12-01-11
DIRECTOR, DIVISION OF STRUCTURAL DESIGN		DATE
APPROVED	<i>[Signature]</i>	12-01-11
STATE HIGHWAY ENGINEER		DATE

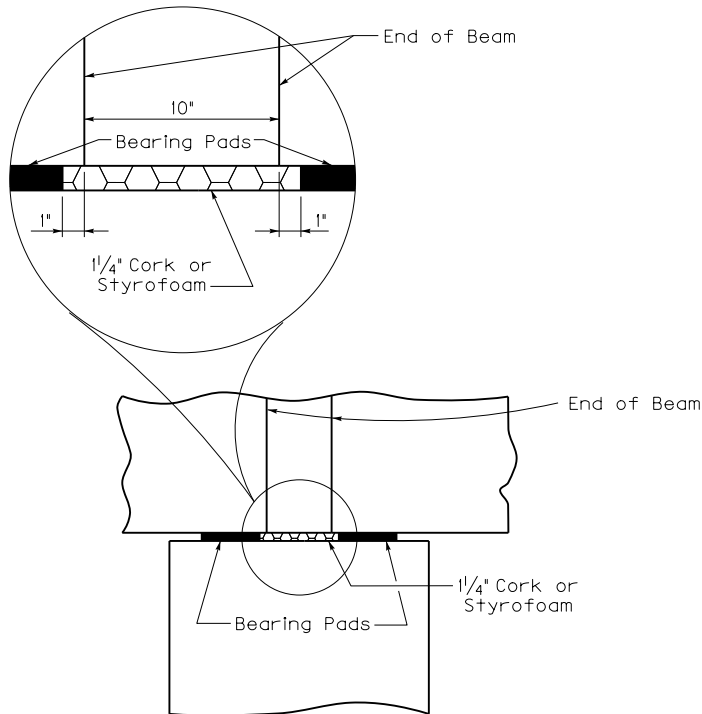
Std. Wt. 2" Commercial Pipe Sleeve closed at one end and 5" long. Secure Pipe Sleeve to prevent floating while placing Concrete. Sleeve is to sit on Cork or Styrofoam. Pipe Sleeve is to be incidental to Diaphragm Concrete.



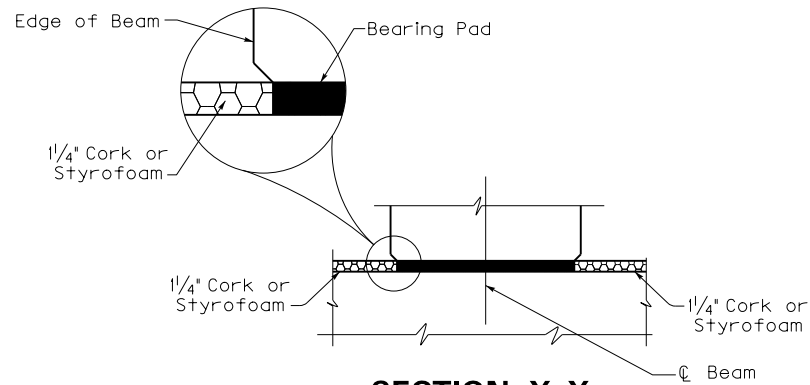
**SECTION Z-Z**



**PLAN**



**SECTION Y-Y**



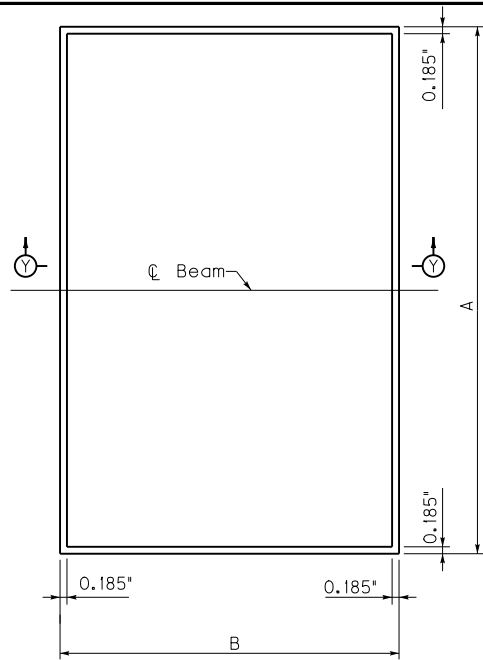
**SECTION X-X**

**KENTUCKY  
DEPARTMENT OF HIGHWAYS**

**BEARING DETAILS**

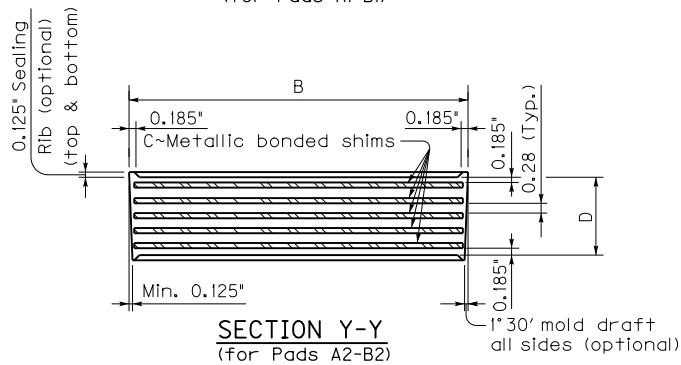
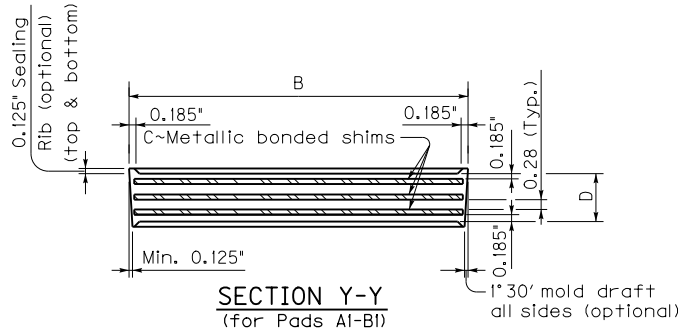
STANDARD DRAWING NO. BBP-002-04

SUBMITTED	<i>[Signature]</i> DIRECTOR, DIVISION OF BRIDGE DESIGN	12-01-99 DATE
APPROVED	<i>[Signature]</i> STATE HIGHWAY ENGINEER	12-01-99 DATE



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.

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

$\Delta_d$  (In.): Sum of the downwards deflections caused by the design 5' deck, railing, and future wearing surface. (Positive Downwards)

$\Delta_c$  (In.): Upwards midspan camber of the beam caused by prestressing minus the downward deflection of the beam due to self weight. (Positive Upwards)

**MATERIAL DESIGN SPECIFICATIONS:**

for Steel Reinforcement	FY = 60000 PSI
for Prestressed Girder Concrete	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 5500 PSI as shown by standard cylinders made and cured identically with the girders; attain 7000 PSI at or prior to 28 days. Apply an initial prestress force of 33817 lbs. per low relaxation strand. Beams with honeycomb of such extent as to affect the strength of resistance to deterioration will not be accepted. The allowance of .0005L (length) is made for shortening of beams due to shrinkage and elastic change. Furnish shop plans showing a detensioning plan by numbering, in sequence, the strand pattern.

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

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

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

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

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

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

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

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

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

### STANDARD DRAWINGS

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

### SPECIAL NOTES

for Corrosion Inhibitors

**KENTUCKY  
DEPARTMENT OF HIGHWAYS**

**BOX BEAM  
GENERAL NOTES  
& REFERENCES**

<b>STANDARD DRAWING NO. BDP-001-05</b>	
SUBMITTED	12-01-15
<i>Mark White</i> DIRECTOR, DIVISION OF STRUCTURAL DESIGN	
APPROVED	12-01-15
<i>[Signature]</i> STATE HIGHWAY ENGINEER	

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

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

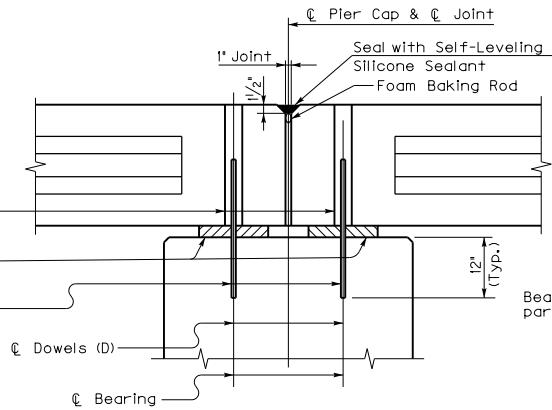
Elastomeric Bearing Pads and/or Cork.

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

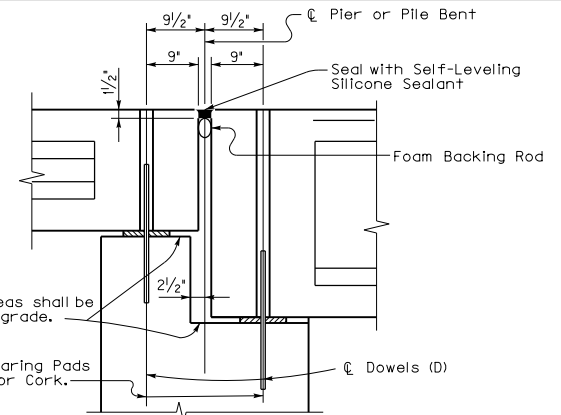
⌀ Dowels (D)

⌀ Bearing

**ABUTMENT OR END BENT**



**PIER OR PILE BENT**



**STEPPED PIER OR PILE BENT**

(Showing Location & Placement of Box Beams)

**TYPICAL BEARING DETAILS (NON-COMPOSITE)**

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

Armored Edge see BJE-001

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

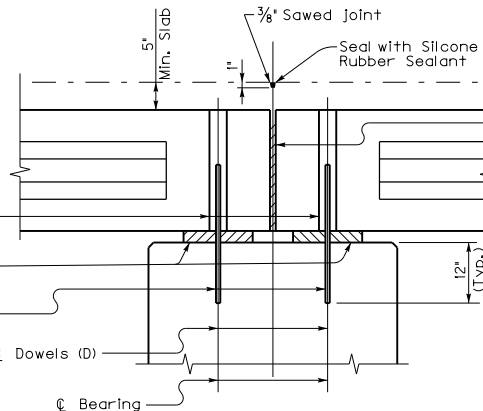
Elastomeric Bearing Pads and/or Cork.

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

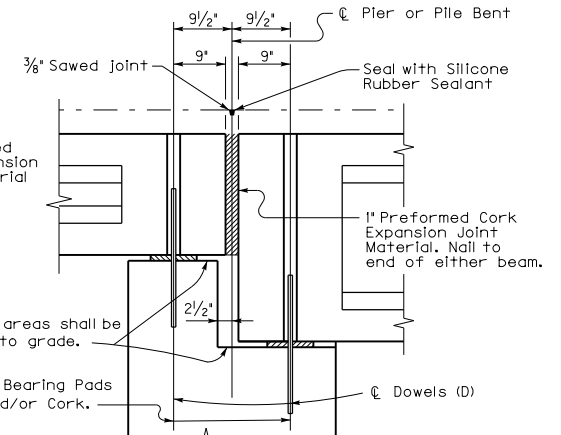
⌀ Dowels (D)

⌀ Bearing

**ABUTMENT OR END BENT**



**PIER OR PILE BENT**



**STEPPED PIER OR PILE BENT**

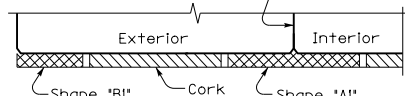
(Showing Location & Placement of Box Beams)

**TYPICAL BEARING DETAILS (COMPOSITE)**

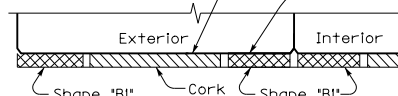
Metal shims may be required between beams of multiple span bridges to align exterior beams.

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

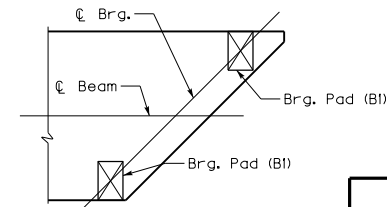
Metal shims (8" x 12") may be required over bearing pads or cork on skewed bridges to insure uniform bearing.



(0° Skew)



(Skewed Spans)



**PAD PLACEMENT FOR SKEWS**

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

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

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

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

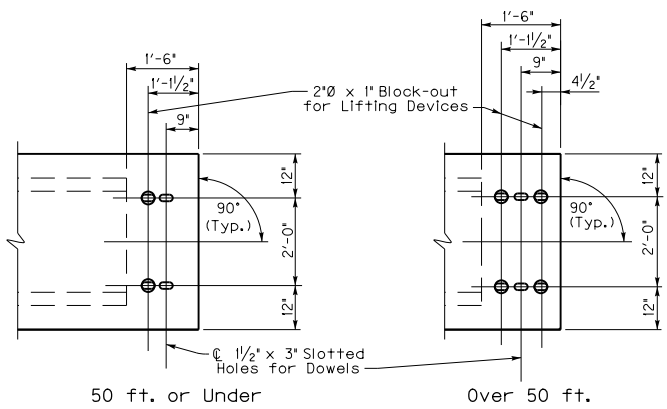
**GENERAL NOTES**

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

**KENTUCKY DEPARTMENT OF HIGHWAYS**  
**BOX BEAM BEARING DETAILS**

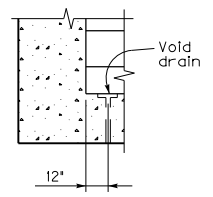
STANDARD DRAWING NO. BDP-002-03

SUBMITTED: *[Signature]* 12-02-02  
DIRECTOR, DIVISION OF BRIDGE DESIGN DATE  
APPROVED: *[Signature]* 12-02-02  
STATE HIGHWAY ENGINEER DATE



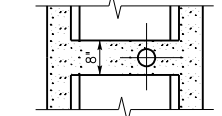
NOTE: Void omitted on 12" beams.

**TYPICAL STRAIGHT END**



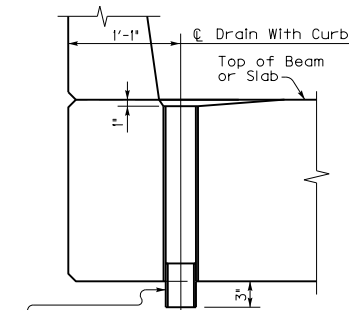
**VOID DRAIN DETAIL**

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



**SECTION THRU BEAM**

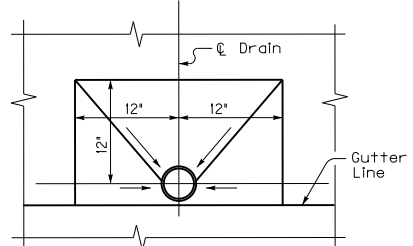
Diaphragms may be omitted if void is cut to allow drain to be encased with a minimum 2" of concrete.



**SECTION THRU DRAIN EXTERIOR BOX BEAM**  
(Showing coupling in barrier)

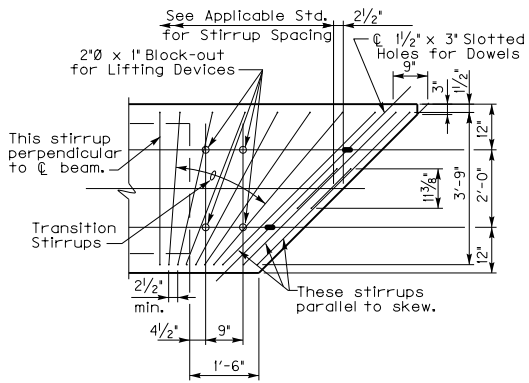
NPS Designation 4 Standard coupling and nipple in accordance with ASTM A53. Nipple to be installed in field.

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



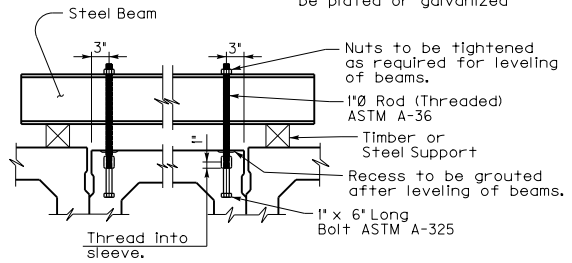
**TOP VIEW OF DRAIN**

**DRAIN DETAILS**  
(For Spans With Curbs)



**TYPICAL SKEWED END FOR BEAMS OVER 50 FEET**

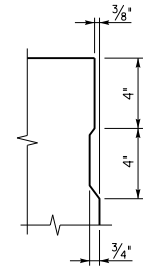
(Right Skew Shown, Left Opposite Hand)



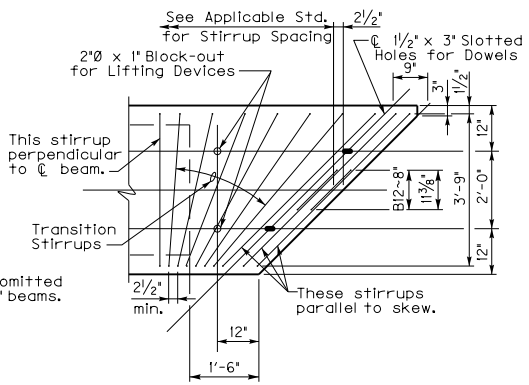
**LEVELING DEVICE DETAILS**

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.



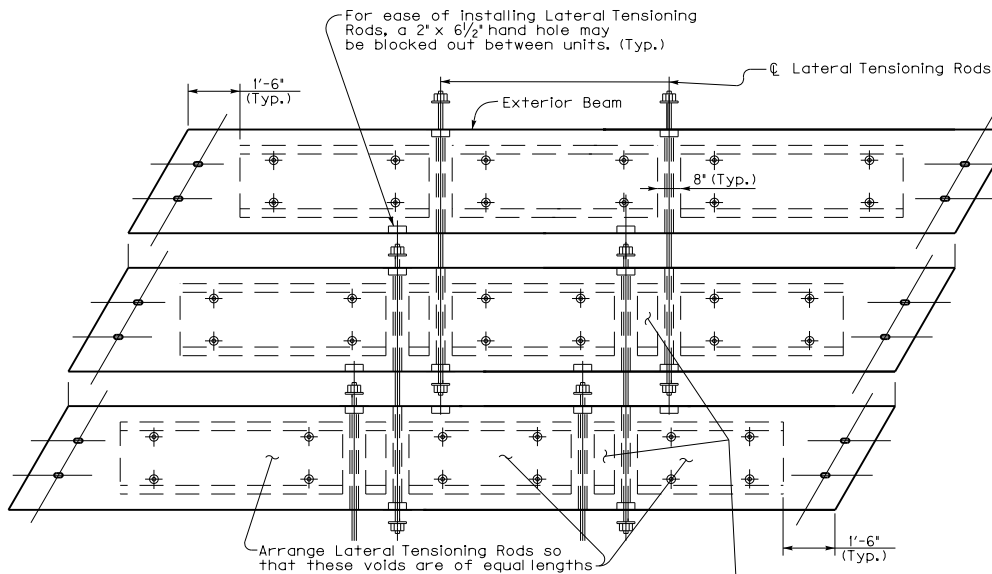
**SHEAR KEY DETAIL**



**TYPICAL SKEWED END FOR BEAMS 50 FEET OR LESS**

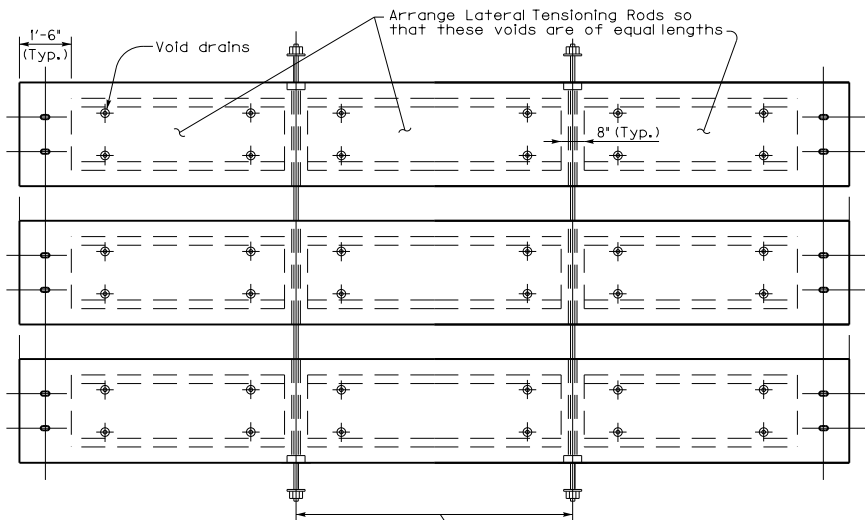
(Right Skew Shown, Left Opposite Hand)

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



**SECTIONAL PLAN SHOWING LATERAL TENSIONING METHOD FOR SKEWED SPANS**

Omit these voids when skew is 15° or less. (typ.)  
When void is 2'-0" long or less void may be omitted on any skew.



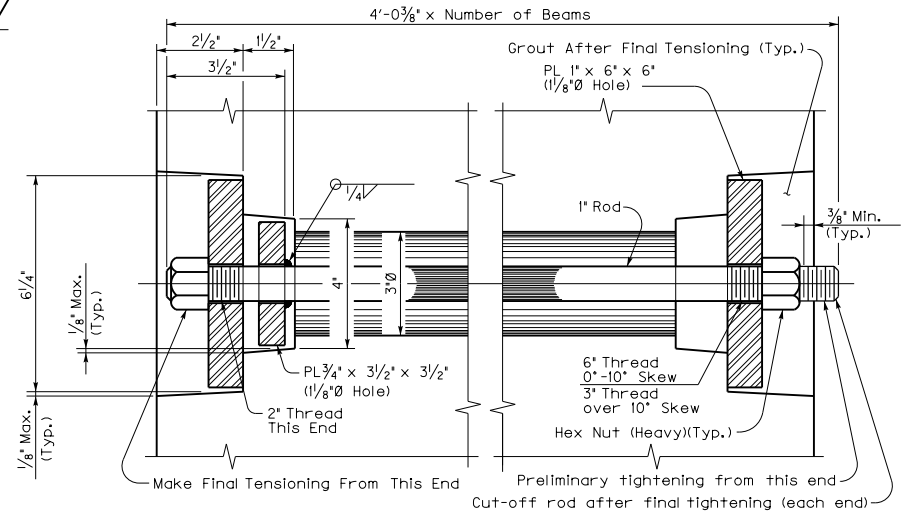
**SECTIONAL PLAN SHOWING LATERAL TENSIONING METHOD FOR STRAIGHT SPANS**

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

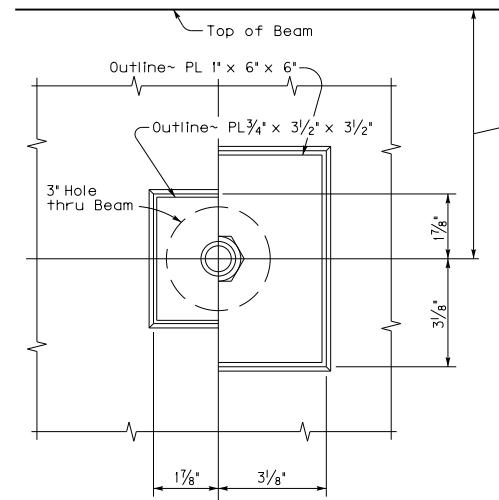
One lateral tensioning rod per beam 50 ft. long or less  
Two lateral tensioning rods per beams over 50 ft. long.

**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.



**SECTION THRU LATERAL TENSIONING ROD**

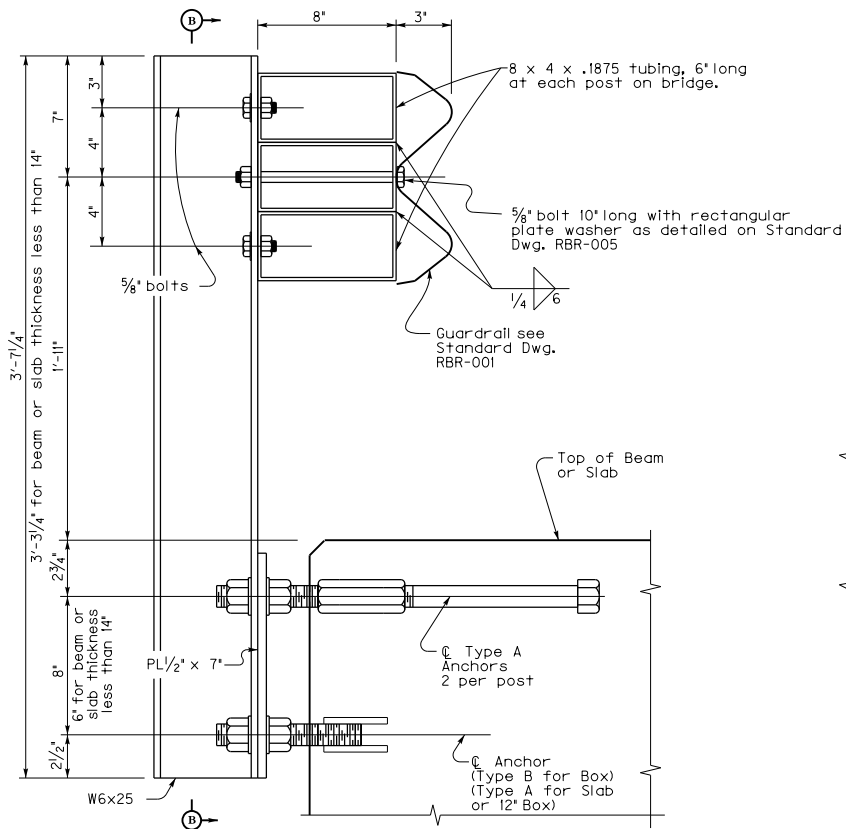


**SECTIONAL END PLAN**

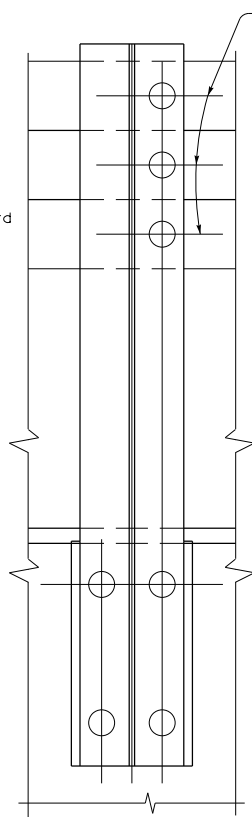
(Lateral Tension Rod Details)

- 6" ~ B12 & CB12
- 8 1/2" ~ B17 & CB17
- 10 1/2" ~ B21 & CB21
- 12" ~ B27 & CB27
- 12" ~ B33 & CB33
- 12" ~ B42 & CB42

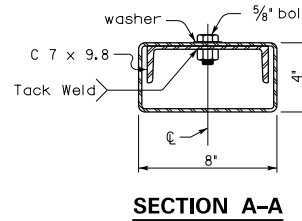
<b>KENTUCKY DEPARTMENT OF HIGHWAYS</b>	
<b>BOX BEAM TENSION ROD DETAILS</b>	
STANDARD DRAWING NO. BDP-004-03	
SUBMITTED	12-02-02
<small>DIRECTOR, DIVISION OF BRIDGE DESIGN</small>	
APPROVED	12-02-02
<small>STATE HIGHWAY ENGINEER</small>	



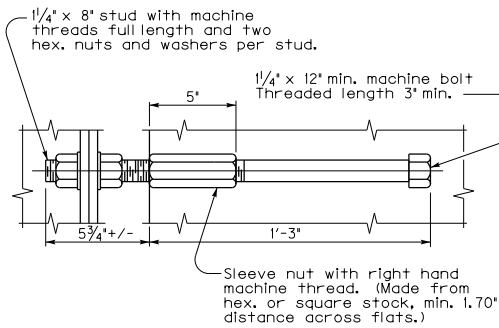
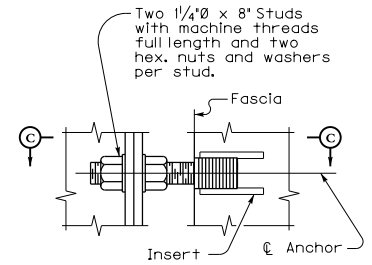
**TYPICAL SECTION**



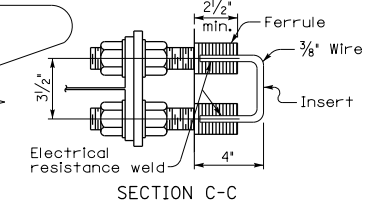
**SECTION B-B**



**SECTION A-A**



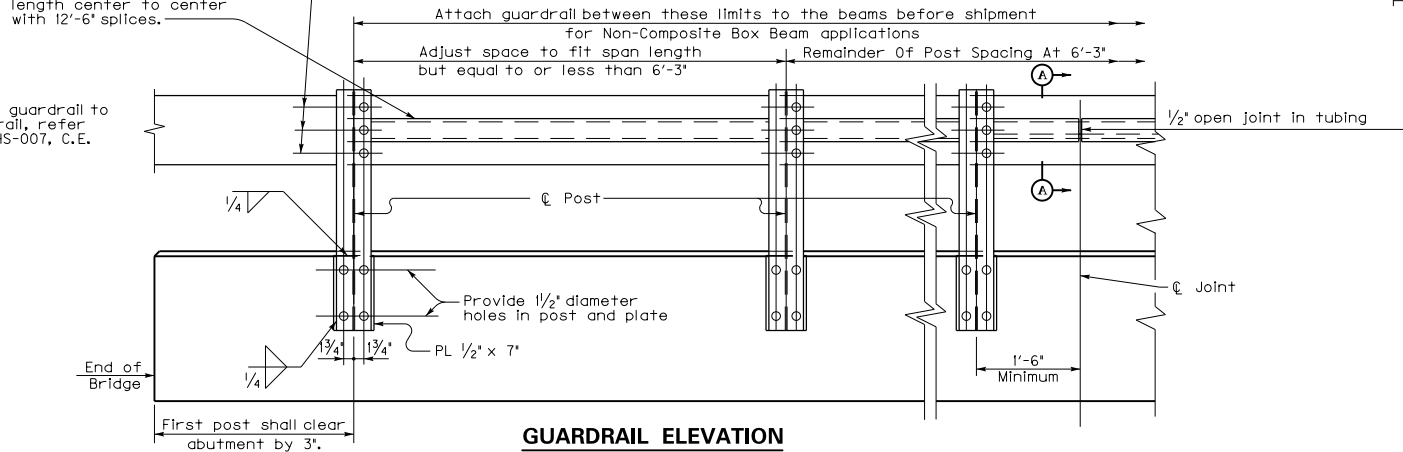
**TYPE A ANCHOR DETAIL**



**TYPE B ANCHOR DETAIL**

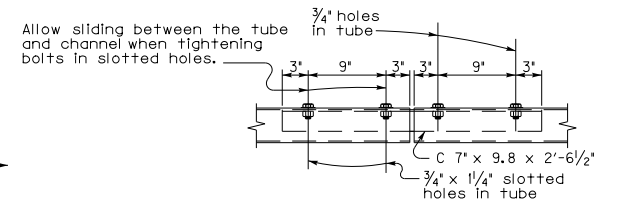
TS 8 x 4 x 0.1875 tubing minimum length center to center with 12'-6" splices.

Holes in post Width 1 1/8" x height 1 1/8" @ 4' o.c.



**GUARDRAIL ELEVATION**

Post Spacing



**OPEN JOINT**

Notes:  
Connect bridge guardrail to Roadway Guardrail, refer to Std. Dwg. BHS-007, C.E.

**KENTUCKY**  
**DEPARTMENT OF HIGHWAYS**

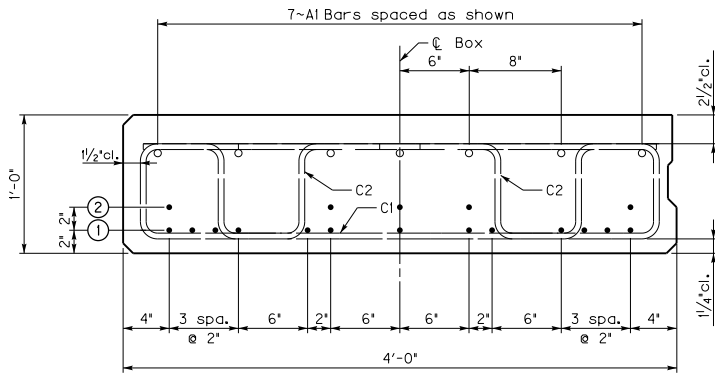
**RAILING**  
**SYSTEM**  
**TYPE II**

STANDARD DRAWING NO. BDP-005-05

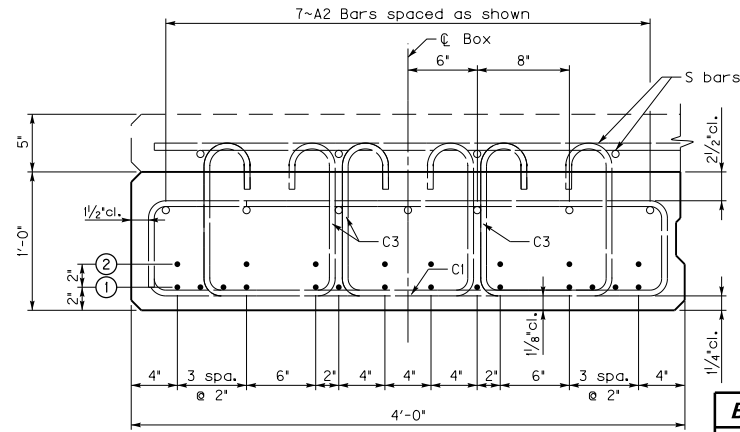
SUBMITTED *Mark Wite* DATE 12-01-15  
DIRECTOR, DIVISION OF STRUCTURAL DESIGN

APPROVED *John* DATE 12-01-15  
STATE HIGHWAY ENGINEER

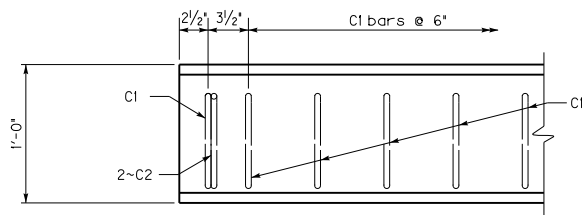




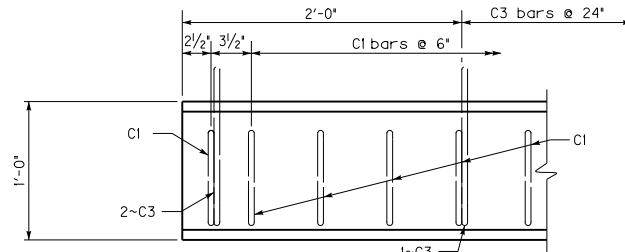
**B12 BEAM**



**CB12 BEAM**



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



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

**TABLE OF STRAND DATA**

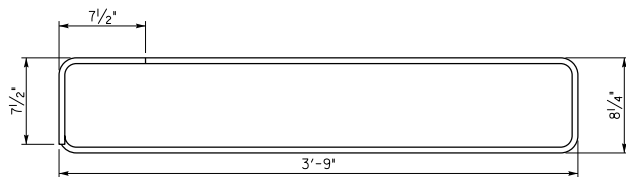
Beam Type	Beam Length (feet)	Number of Strands Required	
		Row ①	Row ②
B12	12	9	1
	14	10	1
	16	11	1
	18	12	1
	20	12	1
	22	12	2
24	13	2	
26	13	4	
CB12	12	7	
	14	8	
	16	8	
	18	9	
	20	10	
	22	10	
	24	10	
	26	12	
	28	13	
	30	13	2
32	14	2	
34	14	8	

**BAR QUANTITIES DESIGN DATA**

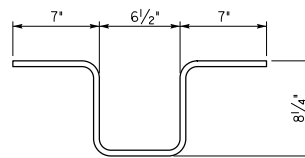
Beam Type	Beam Length (feet)	C1	C2	C3	DC (Klps)	DW (Klps)	LL (Klps)	LL+I (Klps)	Δd (In.)	ΔG (In.)
B12	12	25	2		3.9	0.4	27.8	36.3		
	14	29	2		4.6	0.4	29.1	37.8		
	16	33	2		5.2	0.5	30.1	39.1		
	18	37	2		5.8	0.5	31.0	40.1		
	20	41	2		6.5	0.6	31.8	41.0		
	22	45	2		7.1	0.6	32.5	41.9		
24	49	2		7.8	0.7	33.2	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	0.6
32	65		19	14.3	0.9	37.7	48.1	0.2	0.7	
34	69		20	15.2	1.0	38.9	49.6	0.3	1.0	

**Straight Reinforcement**

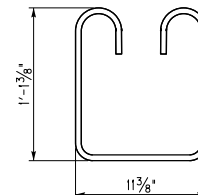
MARK	SIZE	LENGTH
A1(E)	#5	Beam Length Minus 3'
A2(E)	#4	Beam Length Minus 3'
D(E)	#8	2'-0"



**C1(e) Bar**  
#4 Stirrup



**C2(e) Bar**  
#4 Stirrup

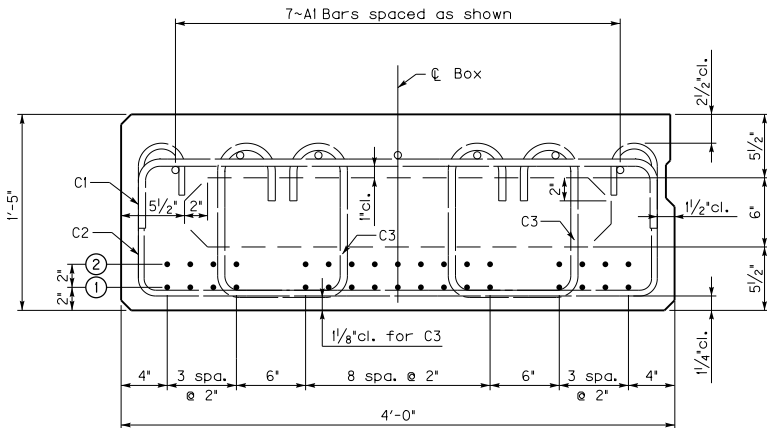


**C3(e) Bar**  
#5 Stirrup

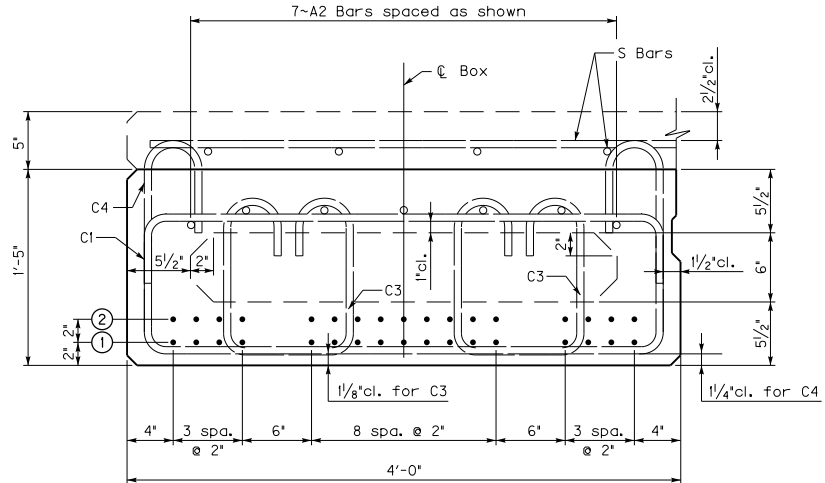
**KENTUCKY DEPARTMENT OF HIGHWAYS**  
**BOX BEAM**  
**B12 & CB12**  
**DETAILS**

STANDARD DRAWING NO. BDP-006-04

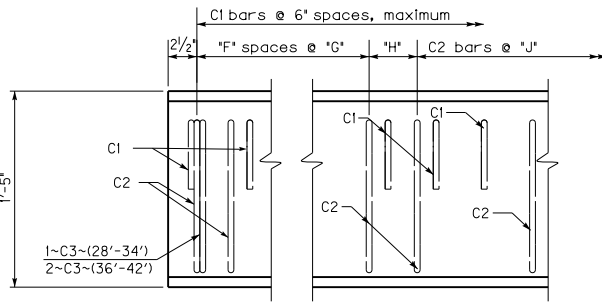
SUBMITTED *Mark Wite* 12-01-11  
 DIRECTOR OF STRUCTURAL DESIGN DATE  
 APPROVED *[Signature]* 12-01-11  
 STATE HIGHWAY ENGINEER DATE



**B17 BEAM**

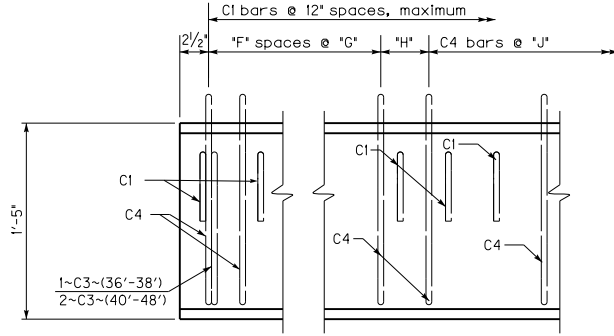


**CB17 BEAM**



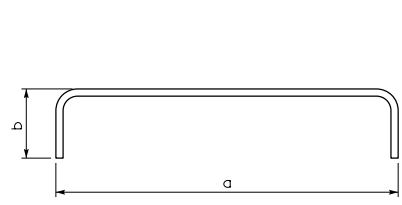
**B17 ELEVATION OF 0° SKEW**

(Refer to BDP-003, for skewed details)

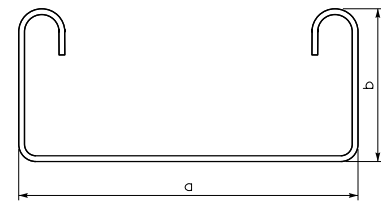


**CB17 ELEVATION OF 0° SKEW**

(Refer to BDP-003, for skewed details)



**C1(e) Bar**



**C2(e)-C4(e) Bars**

**TABLE OF STRAND DATA**

Beam Type	Beam Length (feet)	Number of Strands Required	
		Row ①	Row ②
B17	28	12	
	30	13	
	32	14	
	34	15	
	36	16	
	38	17	1
CB17	40	17	3
	42	17	5
	36	14	
	38	15	
	40	16	
	42	17	1
	44	17	2
	46	17	5
	48	17	7

**TABLE OF DIMENSION DATA**

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

**TABLE OF BAR QUANTITIES DESIGN DATA**

Beam Type	Beam Length (feet)	C1	C2	C3	C4	DC (klps)	DW (klps)	LL (klps)	LL+I (klps)	Δd (in.)	Δc (in.)
B17	28	57	33	2		9.4	0.8	35.1	44.9		
	30	61	35	2		10.1	0.9	36.4	46.4		
	32	65	37	2		10.7	0.9	37.7	48.1		
	34	69	41	2		11.4	1.0	38.9	49.6		
	36	73	44	4		12.1	1.0	40.0	50.9		
	38	77	51	4		12.7	1.1	41.1	52.2		
CB17	40	81	53	4		13.4	1.1	42.1	53.4		
	42	85	56	4		14.1	1.2	43.0	54.5		
	36	37		2	37	16.6	1.0	40.0	50.9	0.2	0.6
	38	39		2	39	17.5	1.1	41.1	52.2	0.2	0.7
	40	41		4	41	18.4	1.1	42.1	53.4	0.2	0.8
	42	43		4	49	19.3	1.2	43.0	54.5	0.3	0.9
	44	45		4	52	20.2	1.3	43.9	55.5	0.3	1.0
	46	47		4	54	21.1	1.3	44.7	56.5	0.3	1.2
	48	49		4	56	22.0	1.4	45.5	57.4	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'-1 1/4"
C3(e)	#5	11 3/8"	1'-1 3/8"
C4(e)	#4	3'-9"	1'-6 1/4"

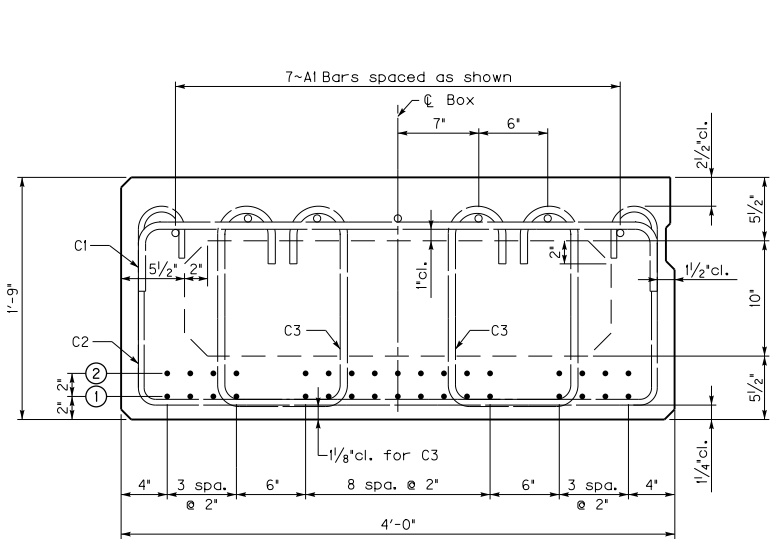
**KENTUCKY  
DEPARTMENT OF HIGHWAYS**

**BOX BEAM  
B17 & CB17  
DETAILS**

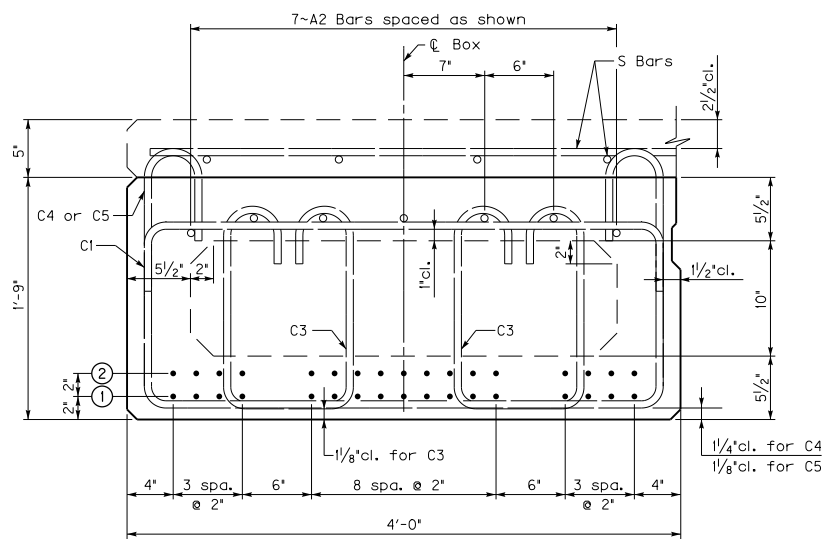
STANDARD DRAWING NO. BDP-007-04

SUBMITTED *Mad. Wt.* 12-01-11  
DIRECTOR DIVISION OF STRUCTURAL DESIGN DATE

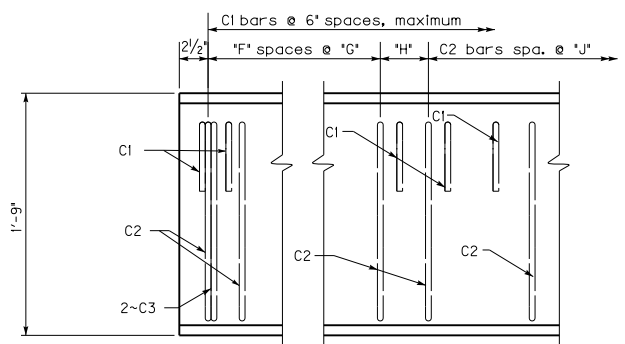
APPROVED *[Signature]* 12-01-11  
STATE HIGHWAY ENGINEER DATE



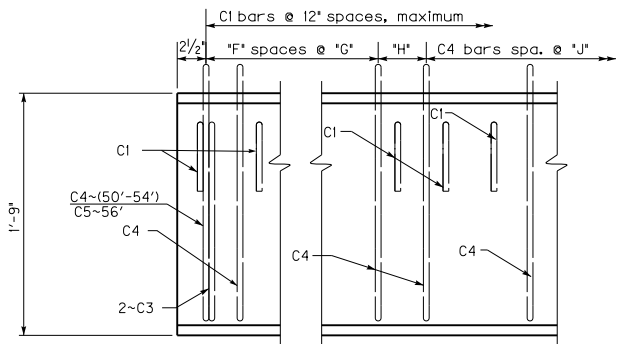
**B21 BEAM**



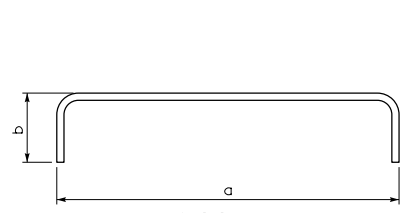
**CB21 BEAM**



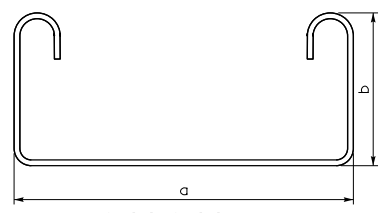
**B21 ELEVATION OF 0° SKEW**  
(Refer to BDP-003, for skewed details)



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



**C1(e) Bar**



**C2(e)-C5(e) Bars**

**TABLE OF STRAND DATA**

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

**TABLE OF DIMENSION DATA**

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

**TABLE OF BAR QUANTITIES**

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

**DESIGN DATA**

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

**Straight Reinforcement**

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

**Bent Reinforcement**

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

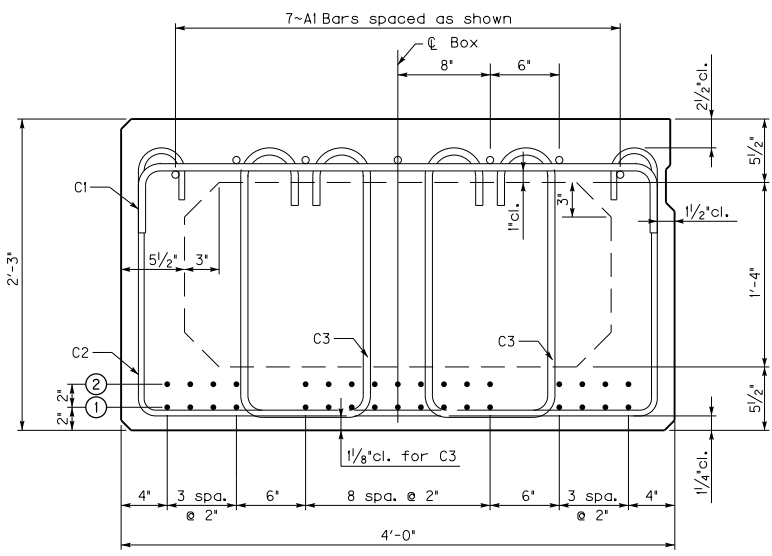
**KENTUCKY DEPARTMENT OF HIGHWAYS**

**BOX BEAM B21 & CB21 DETAILS**

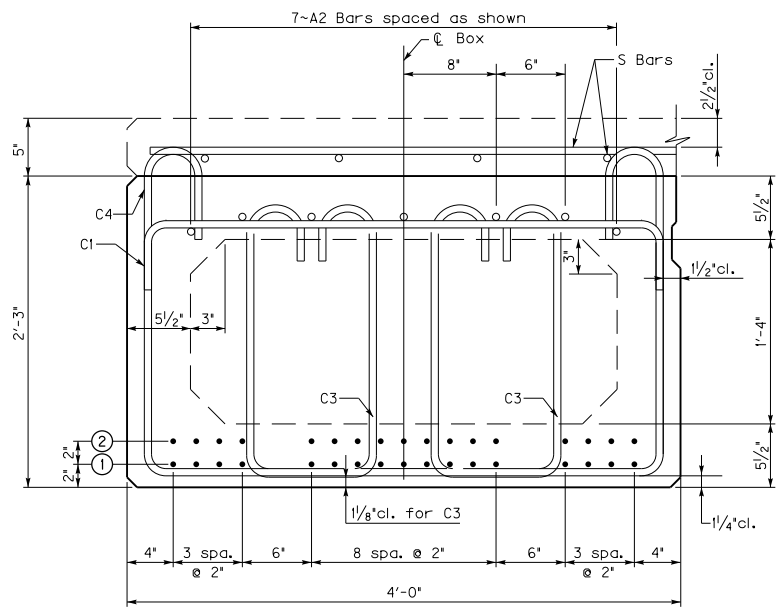
STANDARD DRAWING NO. BDP-008-04

SUBMITTED *Mad Ant* 12-01-11  
 DIRECTOR OFFICE OF STRUCTURAL DESIGN DATE

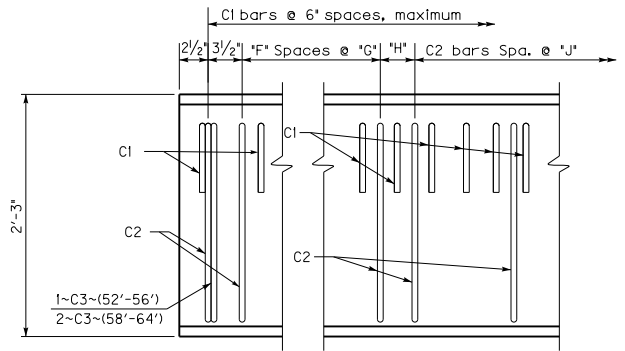
APPROVED *[Signature]* 12-01-11  
 STATE HIGHWAY ENGINEER DATE



**B27 BEAM**

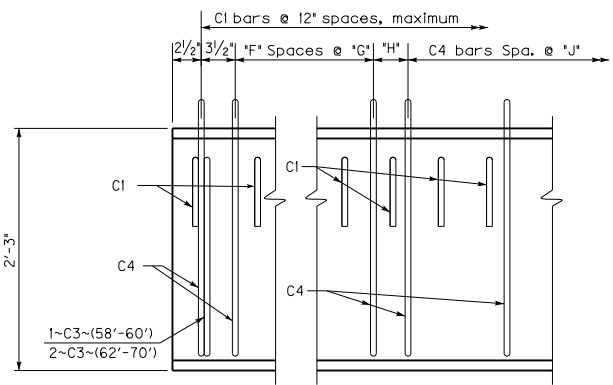


**CB27 BEAM**



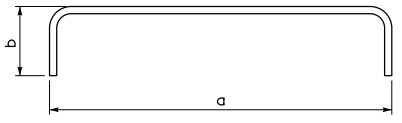
**B27 ELEVATION OF 0° SKEW**

(Refer to BDP-003, for skewed details)

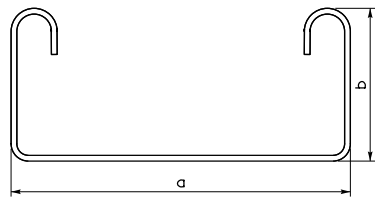


**CB27 ELEVATION OF 0° SKEW**

(Refer to BDP-003, for skewed details)



**C1(e) Bar**



**C2(e)-C4(e) Bars**

**TABLE OF STRAND DATA**

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

**TABLE OF DIMENSION DATA**

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

**BAR QUANTITIES TABLE DESIGN DATA**

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

**Straight Reinforcement**

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

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

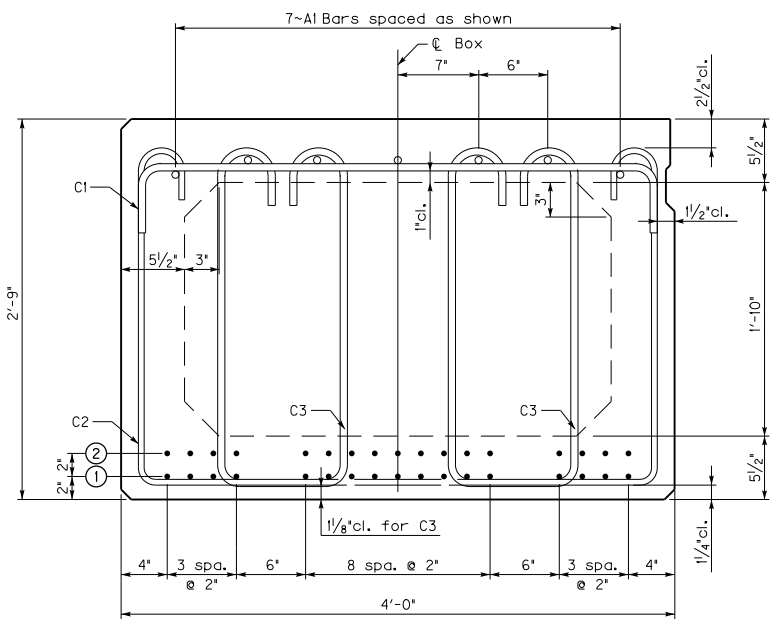
**Bent Reinforcement**

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

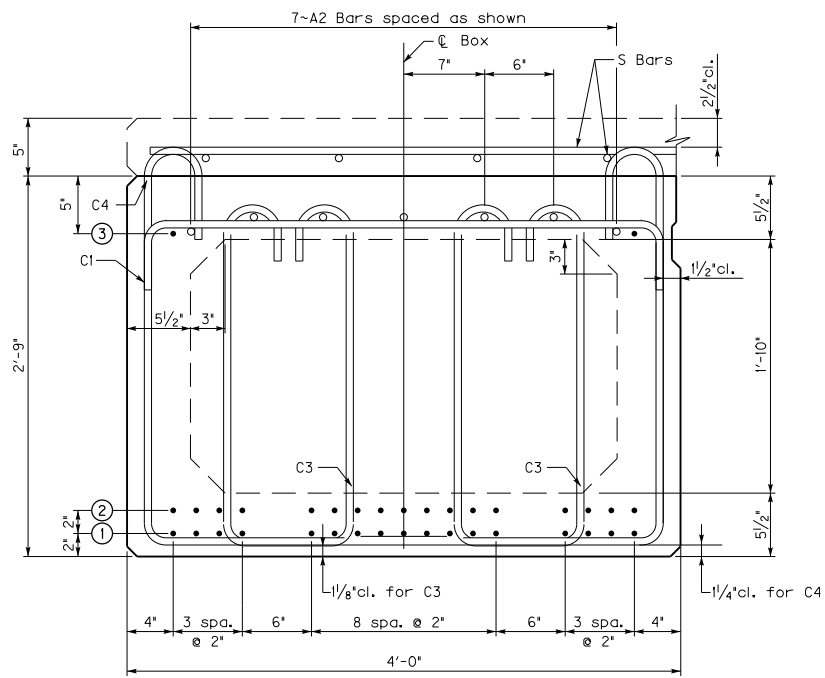
**KENTUCKY DEPARTMENT OF HIGHWAYS**

**BOX BEAM B27 & CB27 DETAILS**

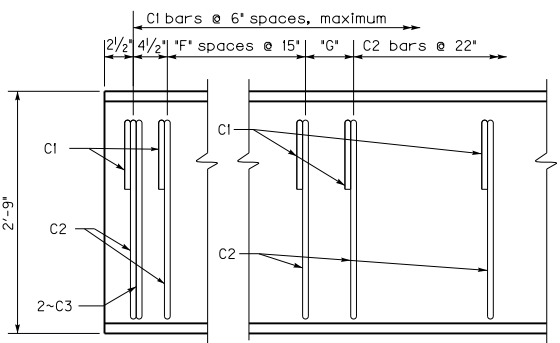
STANDARD DRAWING NO. BDP-009-04  
 SUBMITTED *Mad. Art* 12-01-11  
 DIRECTOR DIVISION OF STRUCTURAL DESIGN DATE  
 APPROVED *[Signature]* 12-01-11  
 STATE HIGHWAY ENGINEER DATE



**B33 BEAM**

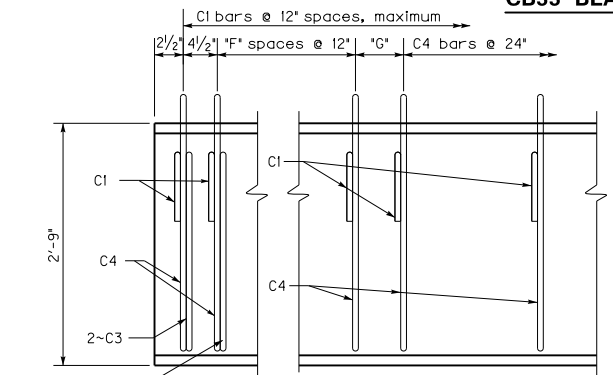


**CB33 BEAM**



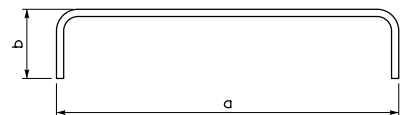
**B33 ELEVATION OF 0° SKEW**

(Refer to BDP-003, for skewed details)



**CB33 ELEVATION OF 0° SKEW**

(Refer to BDP-003, for skewed details)



**C1(e) Bar**



**C2(e)-C4(e) Bars**

**TABLE OF STRAND DATA**

Beam Type	Beam Length (feet)	Number of Strands Required		
		Row ①	Row ②	Row ③
B33	66	17	5	
	68	17	6	
	70	17	7	
	72	17	8	
	74	17	10	
	76	17	11	
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"			

**BAR QUANTITIES TABLE**

Beam Type	Beam Length (feet)	DESIGN DATA				DC k/ips	DW k/ips	LL k/ips	LL+I k/ips	Δd (in.)	Δe (in.)
		C1	C2	C3	C4						
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'-5 1/4"
C3(e)	#5	11 3/8"	2'-5 3/8"
C4(e)	#4	3'-9"	2'-10 1/4"

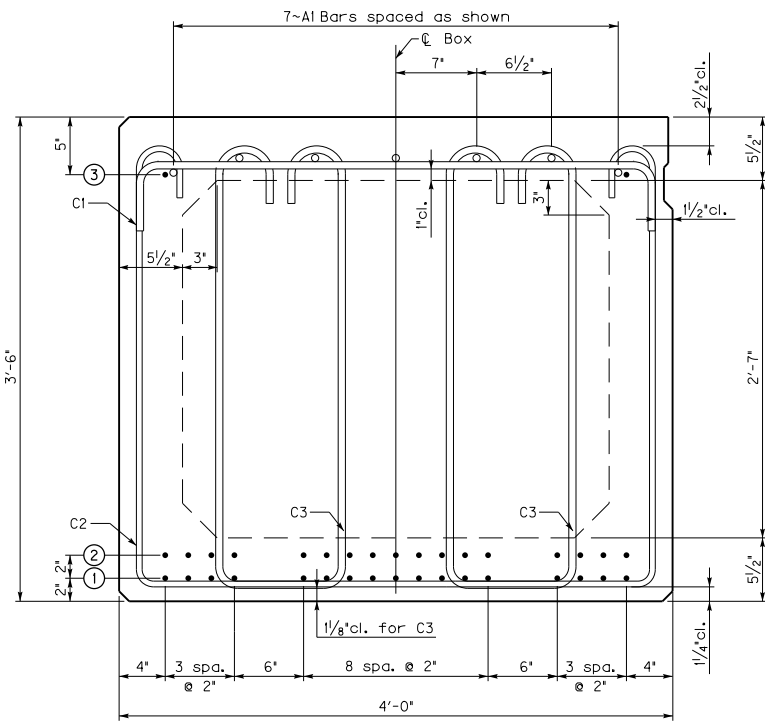
**KENTUCKY DEPARTMENT OF HIGHWAYS**

**BOX BEAM B33 & CB33 DETAILS**

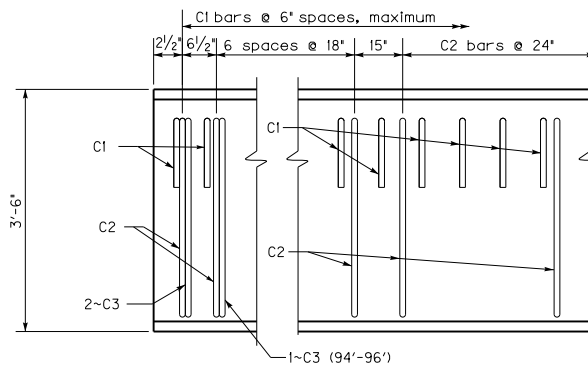
STANDARD DRAWING NO. BDP-010-04

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

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



**B42 BEAM**



**B42 ELEVATION OF 0° SKEW**

(Refer to BDP-003, for skewed details)

**TABLE OF STRAND DATA**

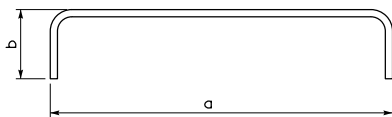
Beam Type	Beam Length (feet)	Number of Strands Required		
		Row ①	Row ②	Row ③
B42	80	17	6	
	82	17	7	
	84	17	8	
	86	17	10	
	88	17	11	
	90	17	12	
	92	17	13	
	94	17	14	2
96	17	15	2	

**BAR QUANTITIES TABLE**

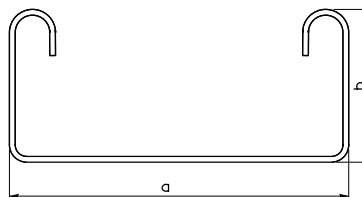
Beam Type	Beam Length (feet)	C1	C2	C3			
B42	80	161	46	4			
	82	165	47	4			
	84	169	48	4			
	86	173	49	4			
	88	177	50	4			
	90	181	51	4			
	92	185	52	4			
	94	189	53	6			
96	193	54	6				

**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'-2 1/4"	
C3(e)	#5	11 3/8"	3'-2 3/8"	

**Straight Reinforcement**

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

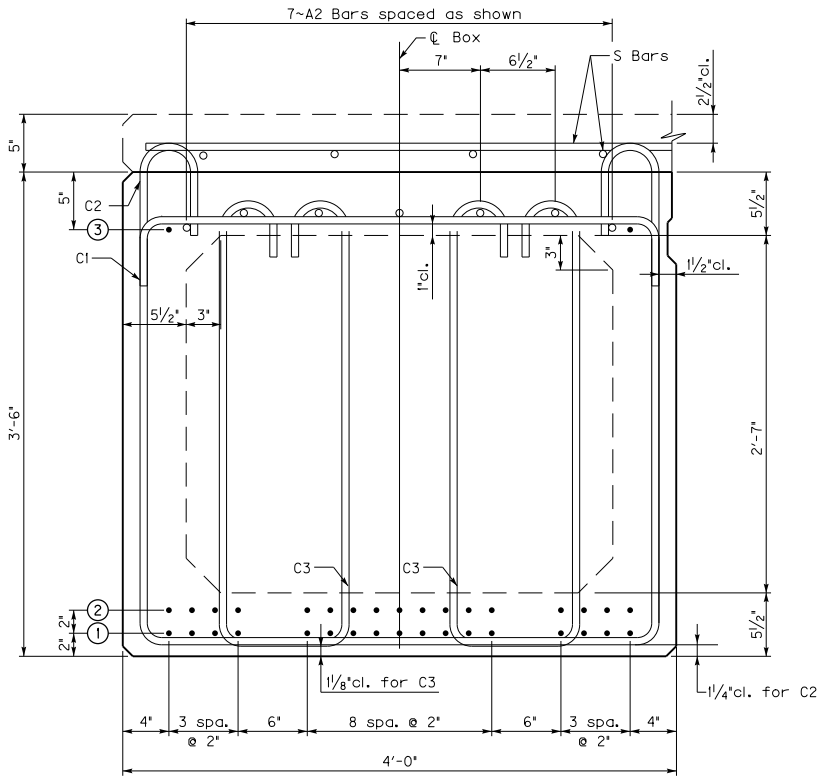
NOTE: A1 bars are to be lapped 2'-2" when necessary.

**KENTUCKY DEPARTMENT OF HIGHWAYS**

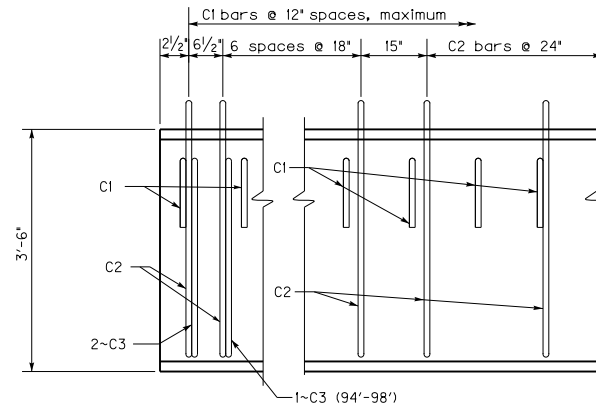
**BOX BEAM B42 DETAILS**

STANDARD DRAWING NO. BDP-011-04

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



**CB42 BEAM**



**CB42 ELEVATION OF 0° SKEW**  
(Refer to BDP-003, for skewed details)

**TABLE OF STRAND DATA**

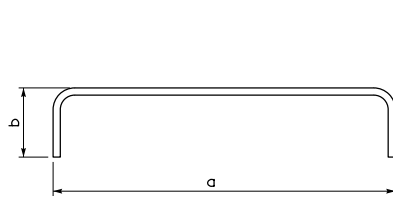
Beam Type	Beam Length (feet)	Number of Strands Required		
		Row ①	Row ②	Row ③
CB42	86	17	9	
	88	17	10	
	90	17	12	
	92	17	13	
	94	17	14	2
	96	17	15	2
98	17	16	2	

**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'-7 1/4"
C3(e)	#5	11 3/8"	3'-2 3/8"

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

## General Notes

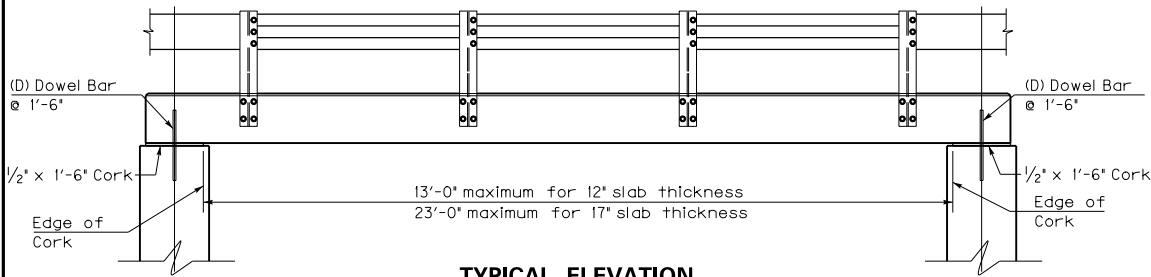
**SLAB OPTION:** The superstructure option shown on this Standard Drawing may be used in lieu of composite or non-composite adjacent box beams. Notify the Director of the Division of Structural Design when this option is used.

**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.

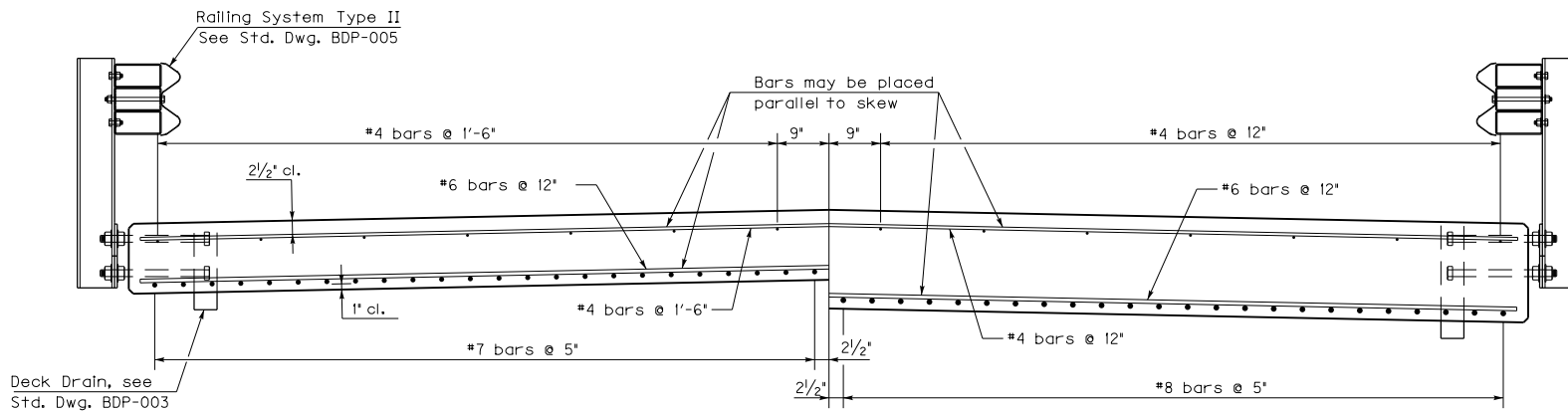
**ELEVATIONS:** Determine final elevations using the elevations, slopes, and grades shown on the detailed plans.

**STEEL REINFORCEMENT:** Ensure steel reinforcement is ASTM A 615 Grade 60 and epoxy coated.

**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.



**TYPICAL ELEVATION**



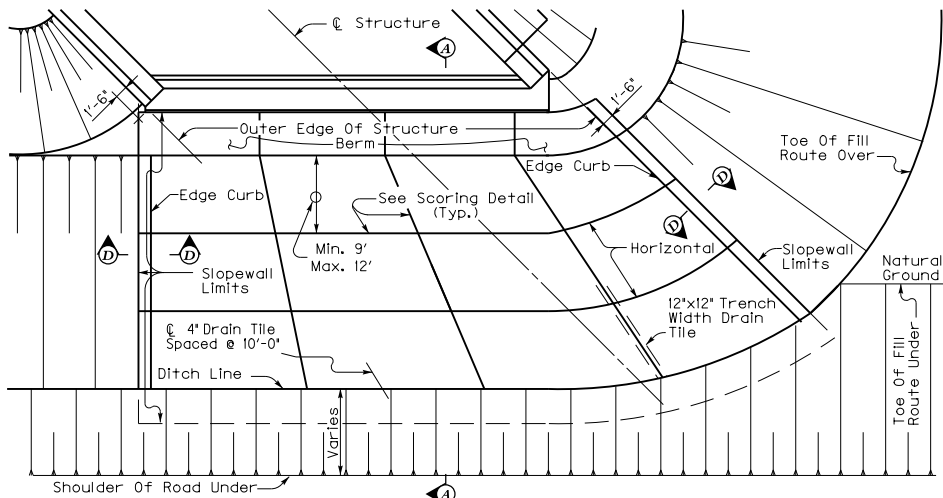
**Half-Section showing 12" Slab**

**Half-Section showing 17" Slab**

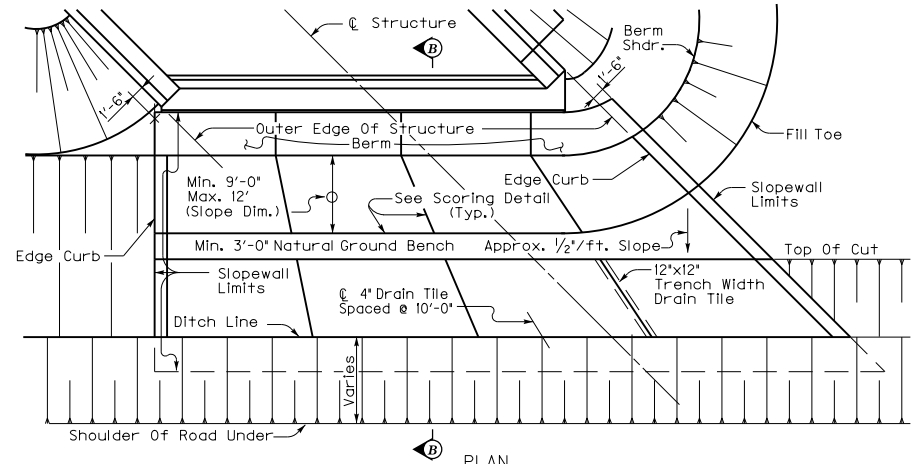
**TYPICAL SECTION OF CAST-IN-PLACE SLAB**

<b>KENTUCKY DEPARTMENT OF HIGHWAYS</b>	
<b>SLAB BRIDGE FOR 12" &amp; 17" BEAMS</b>	
STANDARD DRAWING NO. BDP-013-03	
SUBMITTED <i>Mad. Nite</i>	DATE 12-01-15
<small>DIRECTOR, DIVISION OF STRUCTURAL DESIGN</small>	<small>DATE</small>
APPROVED <i>[Signature]</i>	DATE 12-01-15
<small>STATE HIGHWAY ENGINEER</small>	<small>DATE</small>

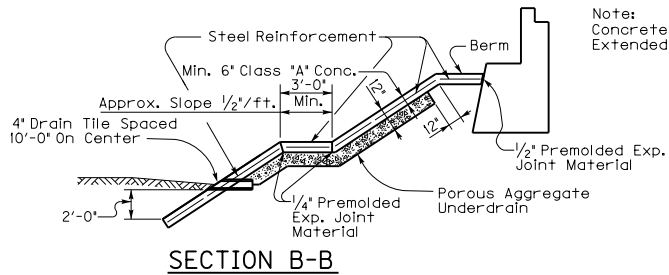




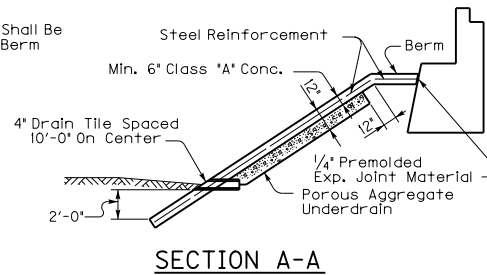
ROUTE UNDER ON FILL WITH ROUTE OVER ON FILL  
ROUTE UNDER AT GRADE WITH ROUTE OVER ON FILL



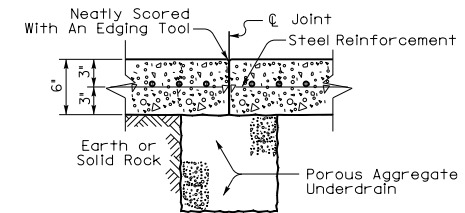
ROUTE UNDER IN EARTH CUT  
ROUTE OVER ON FILL



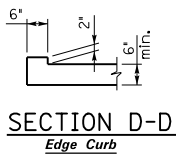
SECTION B-B



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:** Sloped wall 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 Sloped wall.

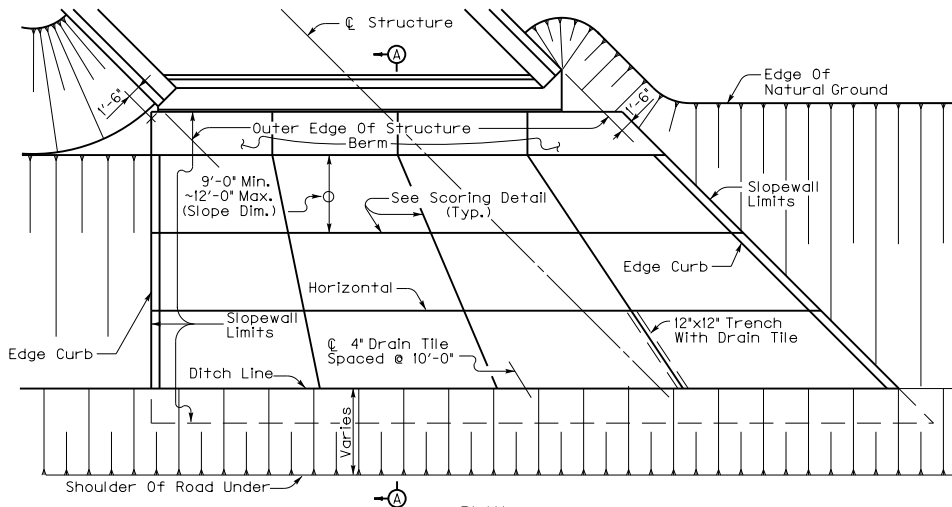
**ROCK EXCAVATION:** Excavate the rock to plan depth and slope as near as possible to reduce the quantity of Concrete, Class 'A' required to maintain a minimum sloped wall thickness. Include the cost of additional concrete required to fill voids in the rock and maintain the sloped wall thickness in the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

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

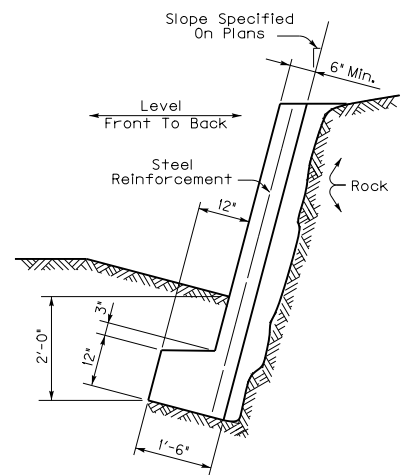
**SKEW:** A 45° Skew is detailed on this sheet. Details for other skews are similar.

Work This Drawing With Drawing No. **BGX-005**

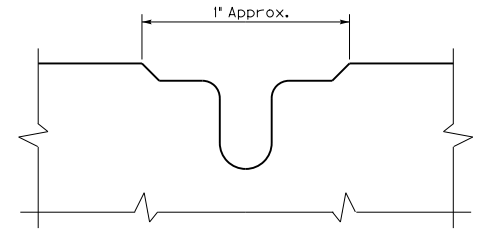
<b>KENTUCKY DEPARTMENT OF HIGHWAYS</b>	
<b>CONCRETE SLOPEWALLS FOR GRADE SEPARATION BRIDGES</b>	
STANDARD DRAWING NO. BGX-004-09	
SUBMITTED <i>[Signature]</i>	12-01-99 DATE
APPROVED <i>[Signature]</i> DIRECTOR, DIVISION OF BRIDGE DESIGN	12-01-99 DATE
<i>[Signature]</i> STATE HIGHWAY ENGINEER	



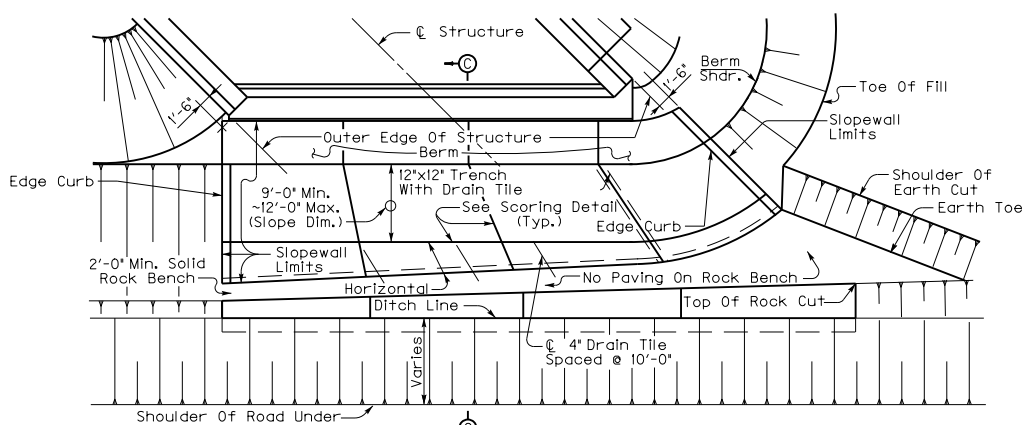
PLAN  
ROUTE UNDER IN FULL EARTH CUT



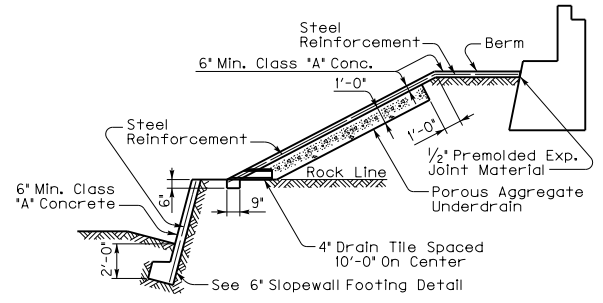
STEEP SLOPE SECTION  
6" CONCRETE SLOPEWALL



SCORING DETAIL  
(Score With Approved Grooving Tool)



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



SECTION C-C

Work This Drawing With Drawing No. BGX-004

<b>KENTUCKY</b>		
<b>DEPARTMENT OF HIGHWAYS</b>		
<b>CONCRETE SLOPEWALLS</b>		
<b>FOR GRADE</b>		
<b>SEPARATION BRIDGES</b>		
STANDARD DRAWING NO. BGX-005-09		
SUBMITTED	<i>[Signature]</i> DIRECTOR, DIVISION OF BRIDGE DESIGN	12-01-99 DATE
APPROVED	<i>[Signature]</i> STATE HIGHWAY ENGINEER	12-01-99 DATE



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



STENCIL FOR DRAWING NUMBER

GENERAL NOTES

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

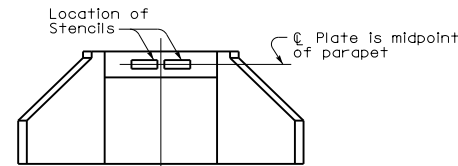
YEAR AND DESIGN LOADING STENCIL: Show the year that the contract is executed and the design load as shown on the contract plans. The design load is required on all structures classified as bridges by Subsection 101.03 of the Specifications and on other structures as referenced on plans.

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

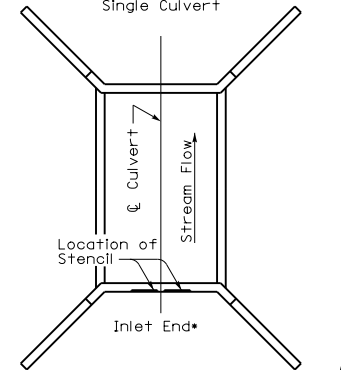
CONTRACTOR STENCIL: Place on all bridges, the name of the prime contractor and subcontractor(s), when applicable, in proximity to other stencils required.



CONTRACTOR STENCIL

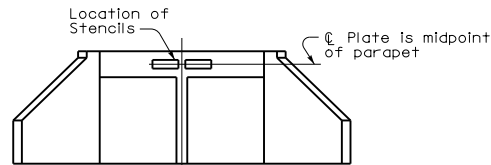


ELEVATION A-A  
Single Culvert

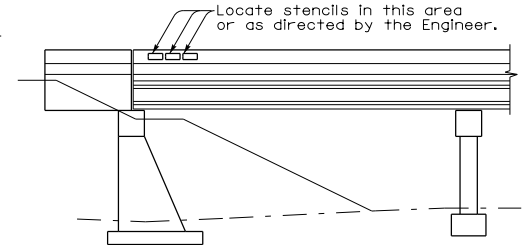


PLAN

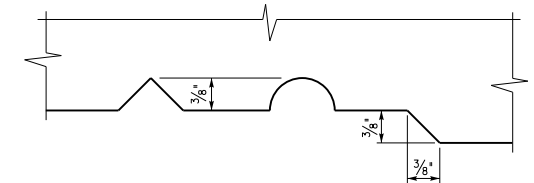
Location of Stencils on all Culverts (Single or Multiple) and Arches



ELEVATION A-A  
Multiple span Culvert



LOCATION OF STENCILS  
ON BRIDGES



TYPE OF LETTERS

\* Use the outlet end for outlet only extensions

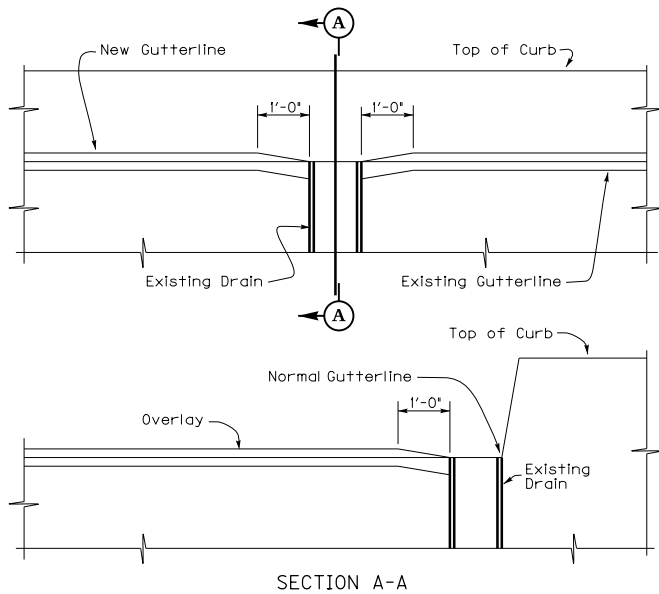
KENTUCKY  
DEPARTMENT OF HIGHWAYS

STENCILS  
FOR STRUCTURES

STANDARD DRAWING NO. BGX-006-10

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

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



SECTION A-A

FIGURE NO. 1

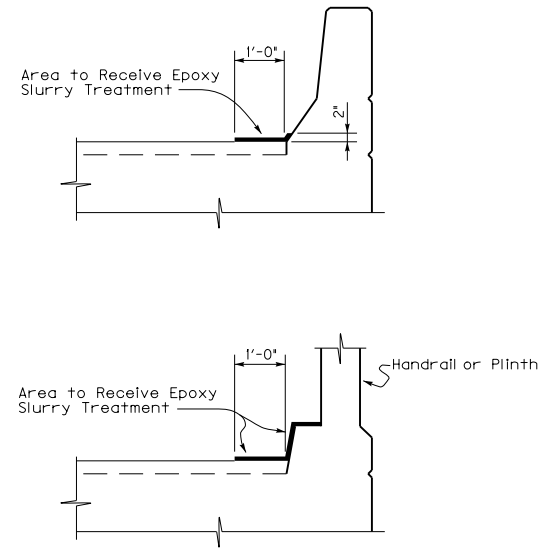


FIGURE NO. 2

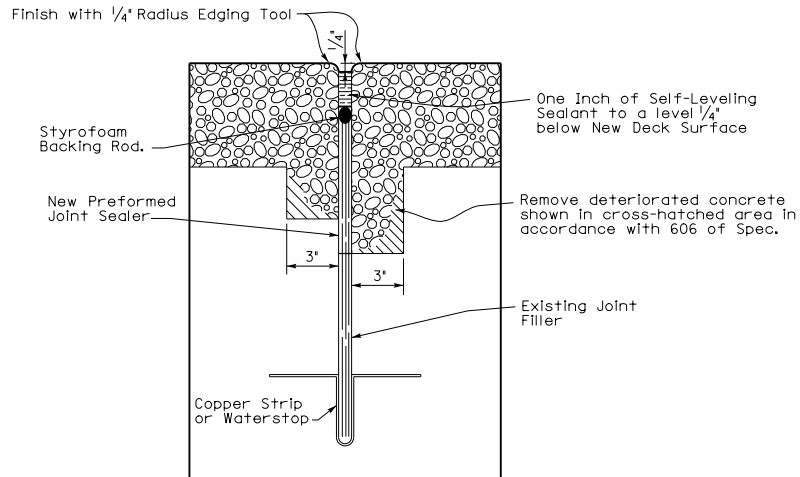
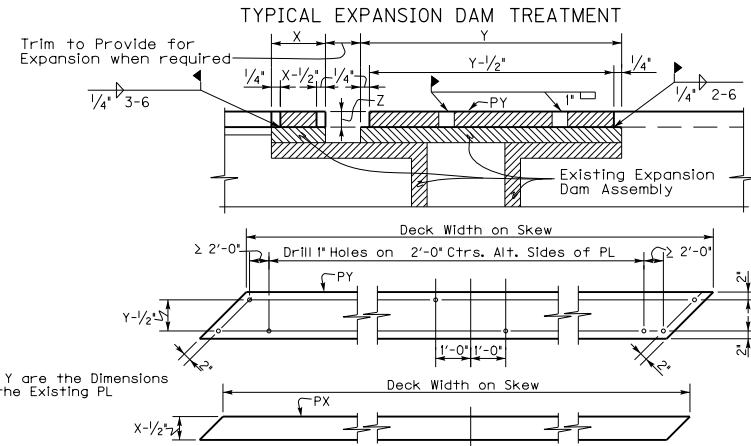


FIGURE NO. 3



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 1/4".

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

FIGURE NO. 4

<b>KENTUCKY DEPARTMENT OF HIGHWAYS</b>	
<b>BRIDGE RESTORATION AND WATERPROOFING WITH CONCRETE OVERLAYS</b>	
STANDARD DRAWING NO. BGX-009-04	
SUBMITTED <i>SE</i>	12-01-99
<small>DIRECTOR DIVISION OF BRIDGE DESIGN</small>	
APPROVED <i>[Signature]</i>	12-01-99
<small>STATE HIGHWAY ENGINEER</small>	
	DATE

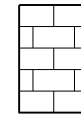
### Description of Soil Compactness or Consistency

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

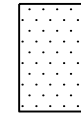
### Unified Soil Classifications

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 description.	

- 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
- ∅ Angle of Internal Friction
- ∅ 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



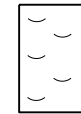
LIMESTONE



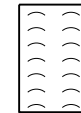
SANDSTONE



COAL



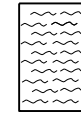
NONDURABLE SHALE (SDI < 90)



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

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

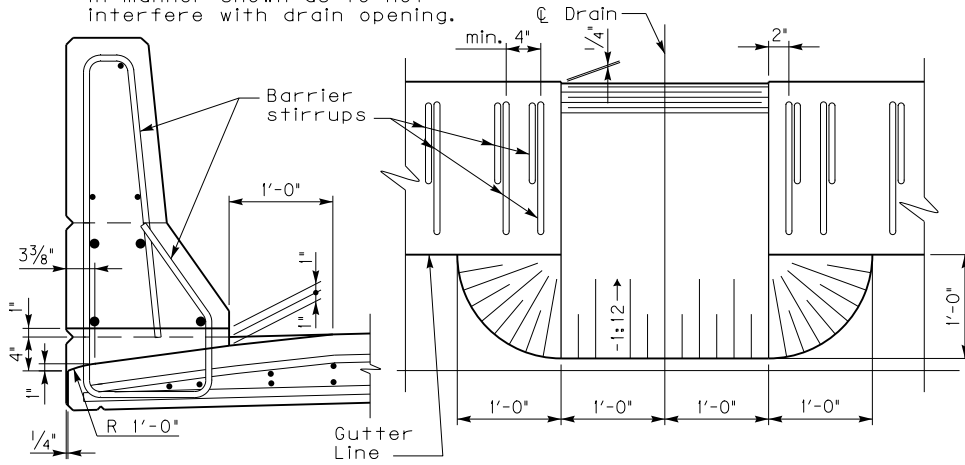
KENTUCKY DEPARTMENT OF HIGHWAYS

GEOTECHNICAL LEGEND

STANDARD DRAWING NO. BGX-012-02

SUBMITTED: *[Signature]* 12-01-99  
 DIRECTOR, DIVISION OF BRIDGE DESIGN DATE  
 APPROVED: *[Signature]* 12-01-99  
 STATE HIGHWAY ENGINEER DATE

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

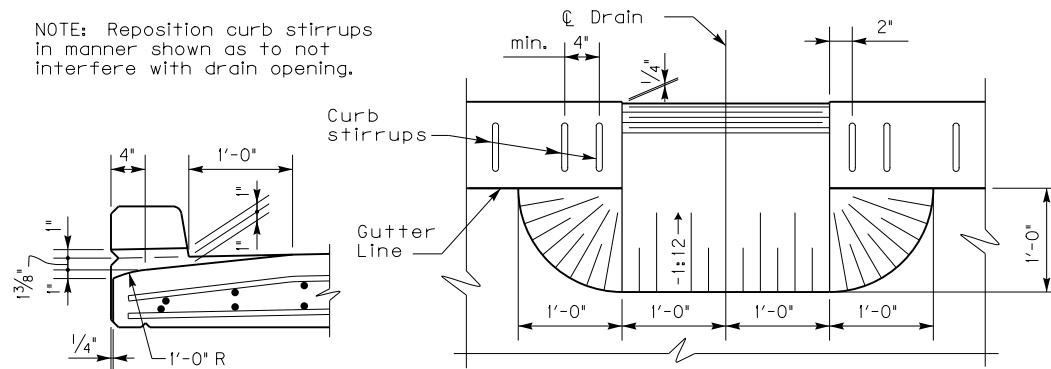


**SECTION THROUGH DRAIN**      **PLAN OF DRAIN (Barrier not in place)**

NOTE: Field bend top transverse slab reinforcement in the area of the drain to maintain  $2\frac{1}{2}$ " 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**

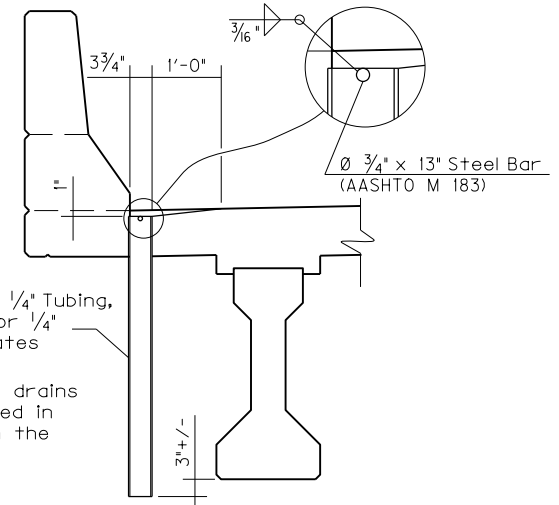
NOTE: Reposition curb stirrups in manner shown as to not interfere with drain opening.



**SECTION THROUGH DRAIN**      **PLAN OF DRAIN (Curb not in place)**

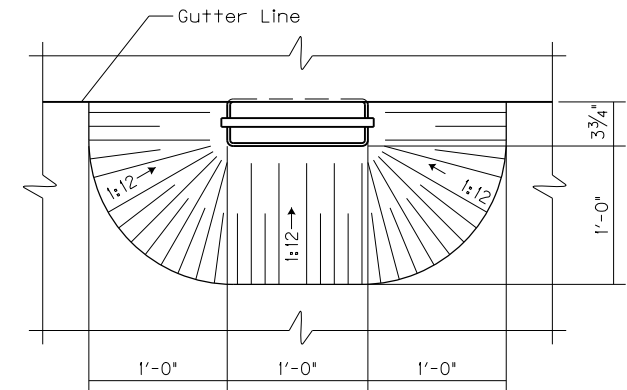
NOTE: Field bend top transverse slab reinforcement in the area of the drain to maintain  $2\frac{1}{2}$ " of concrete cover through the drain. Bend reinforcement approximately 1'-0" from the gutter line. Transverse slab reinforcement adjacent to the opening is not to be bent. Longitudinal reinforcement 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**



NOTE: Assembled drains shall be galvanized in accordance with the Specifications.

**SECTION THROUGH DRAIN**



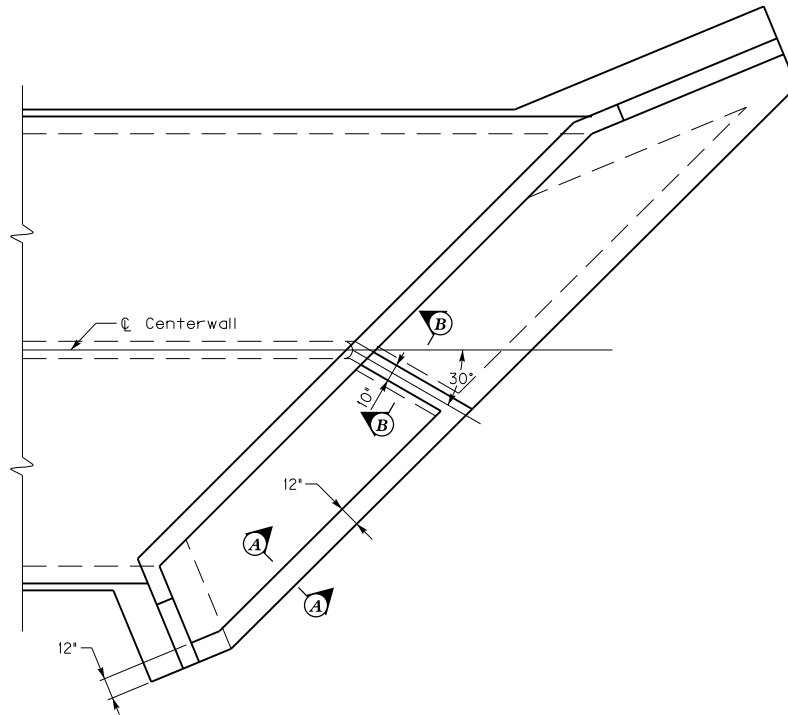
**PLAN OF DRAIN**  
**THROUGH DECK DRAIN DETAILS**

KENTUCKY  
DEPARTMENT OF HIGHWAYS

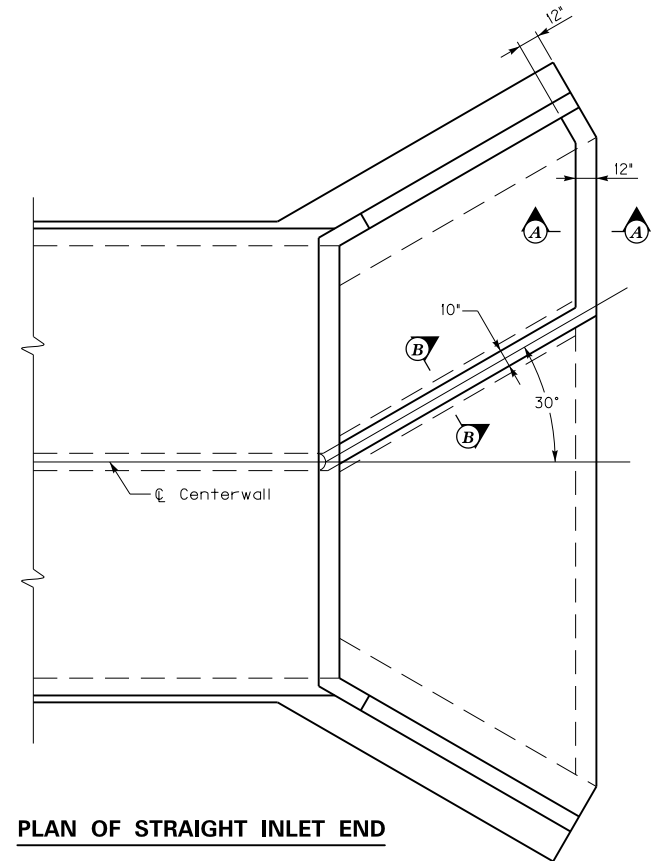
BRIDGE DRAINS

STANDARD DRAWING NO. BGX-015-03

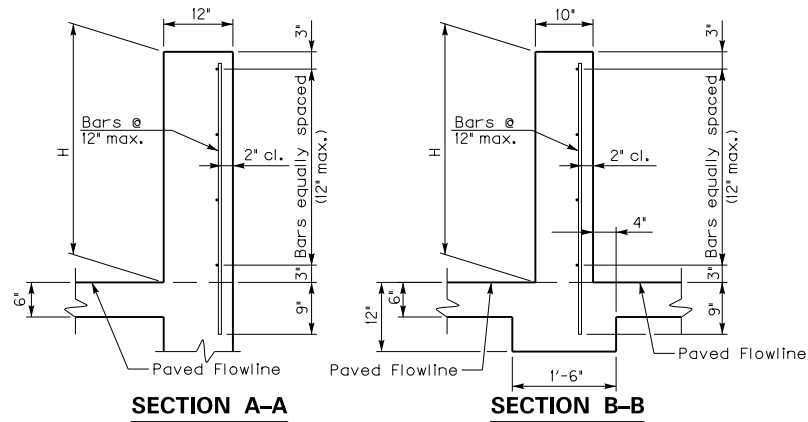
SUBMITTED	<i>[Signature]</i> DIRECTOR, DIVISION OF BRIDGE DESIGN	12-01-99 DATE
APPROVED	<i>[Signature]</i> STATE HIGHWAY ENGINEER	12-01-99 DATE



**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.

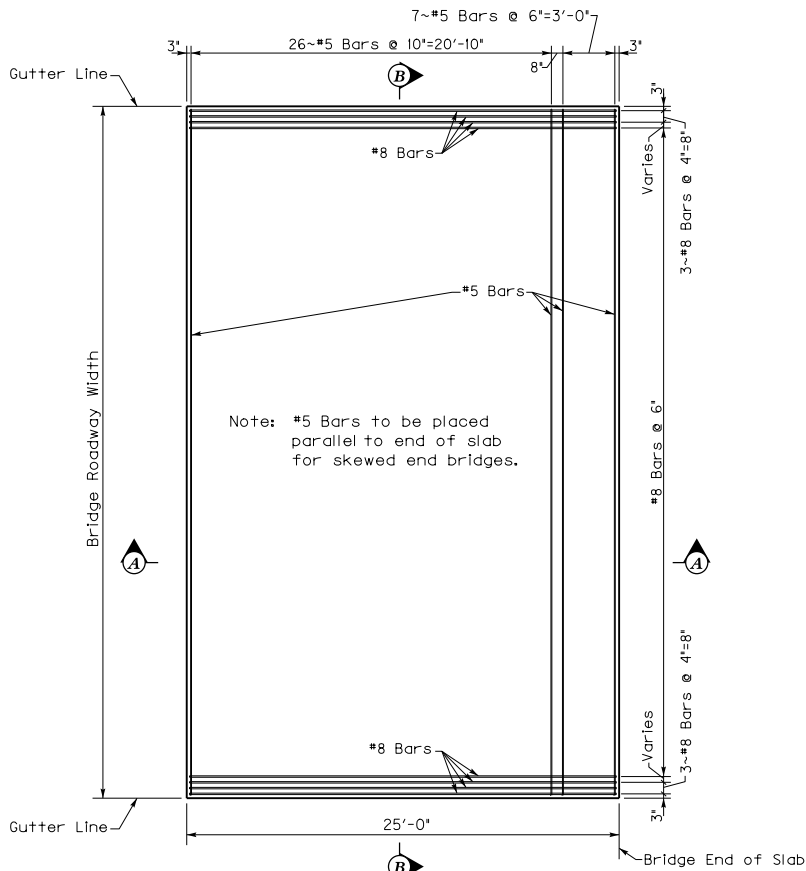
**DIMENSION 'H':** This dimension is the lesser of the wing tip elevation, one-half the barrel height opening, or as designated on the plans.

**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.

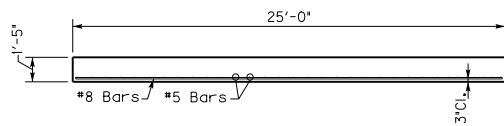
**STEEL REINFORCEMENT:** All steel reinforcement is #4 bars in accordance with ASTM A 615, Grade 60.

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

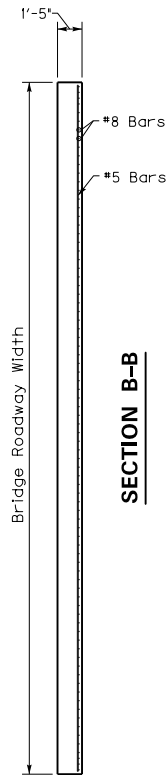
<b>KENTUCKY DEPARTMENT OF HIGHWAYS</b>		
<b>LOW FLOW DIVERSION CURB</b>		
STANDARD DRAWING NO. BGX-016-01		
SUBMITTED	<i>[Signature]</i> DIRECTOR, DIVISION OF BRIDGE DESIGN	12-01-99 DATE
APPROVED	<i>[Signature]</i> STATE HIGHWAY ENGINEER	12-01-99 DATE



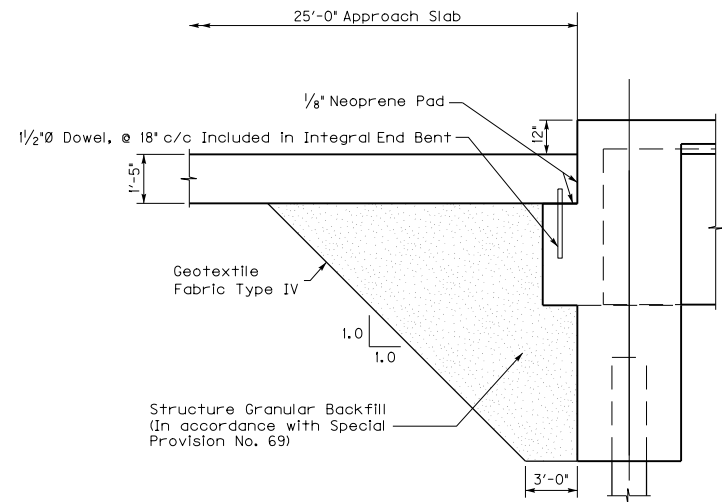
**PLAN**



**SECTION A-A**



**SECTION B-B**



**TYPICAL SECTION BRIDGE END**

**GENERAL NOTES**

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

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

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

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

**KENTUCKY  
DEPARTMENT OF HIGHWAYS**

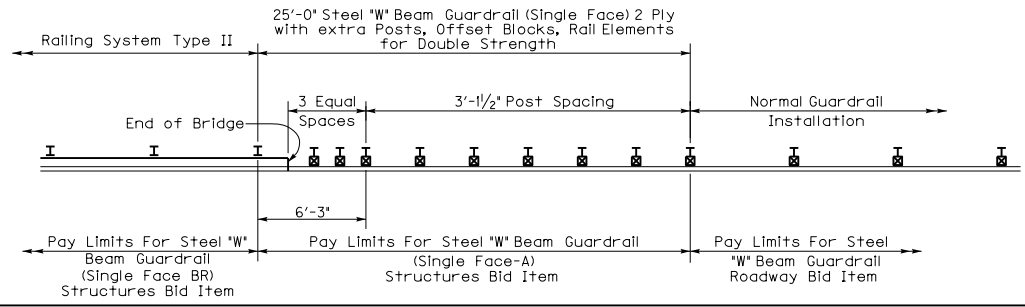
**APPROACH SLAB**

**STANDARD DRAWING NO. BGX-017-02**

SUBMITTED *Mark White* 12-01-15  
DIRECTOR, DIVISION OF STRUCTURAL DESIGN DATE

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

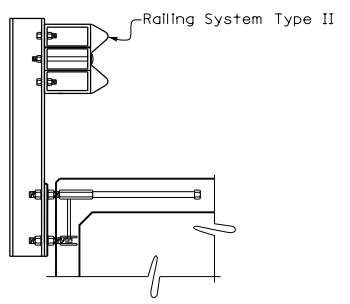
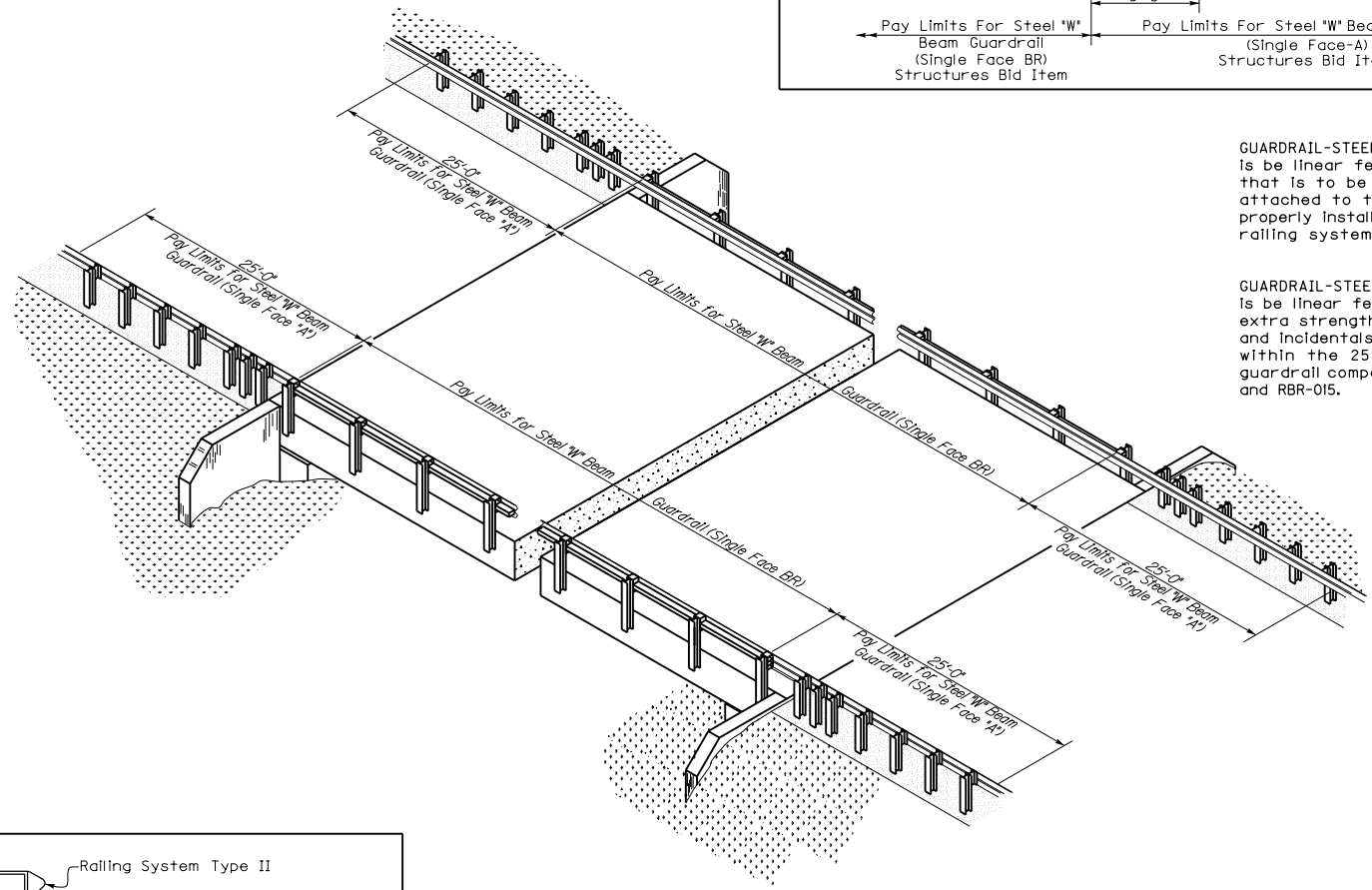




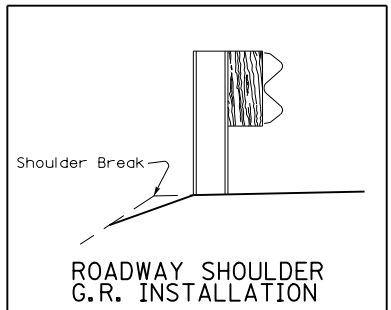
**BID ITEM NOTES**

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

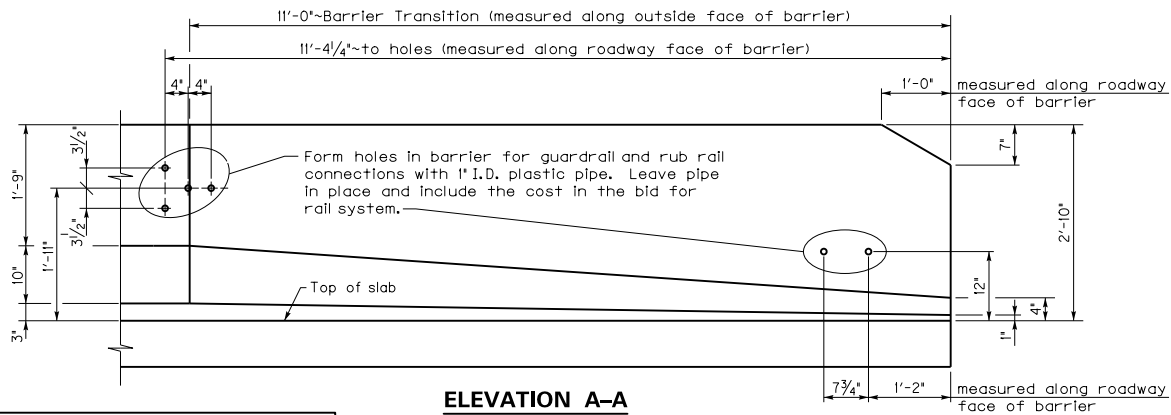
GUARDRAIL-STEEL W BEAM (SINGLE FACE A): The bid unit for this item is be linear feet. This item includes the W-Beam guardrail (2 ply for extra strength), guardrail posts, offset blocks, hardware, and labor and incidentals necessary to properly install the approach guardrail within the 25'-0" limits at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



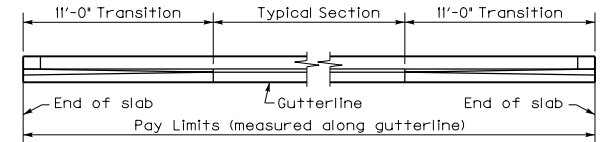
BRIDGE GUARDRAIL INSTALLATION



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



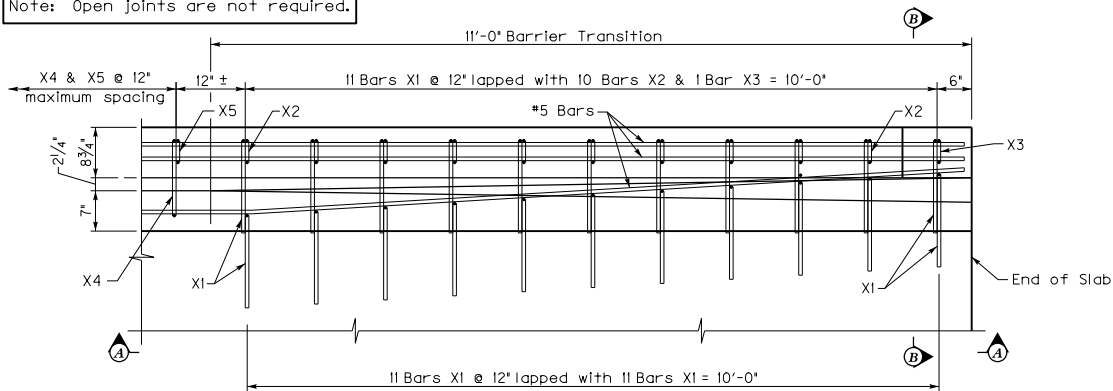
**ELEVATION A-A**



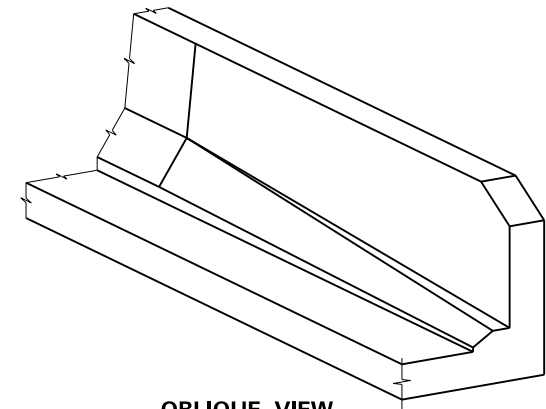
**PLAN OF BARRIER**

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

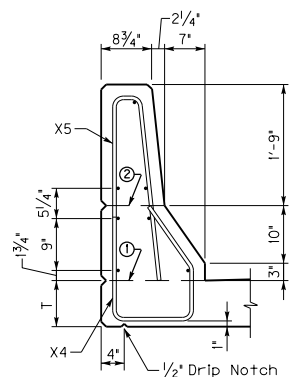
Note: Open joints are not required.



**PLAN OF BARRIER TRANSITION**



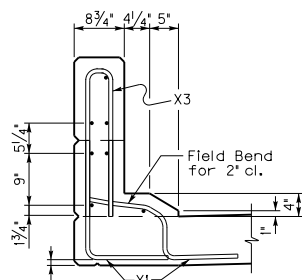
**OBLIQUE VIEW**



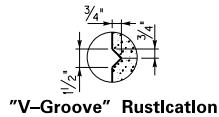
**TYPICAL BARRIER SECTION**

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.

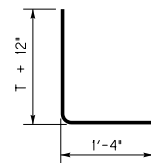
② Permissible construction joint. "V-Groove" rustication joint is required if construction joint is used. 1/4" open joints are not required.



**SECTION B-B**

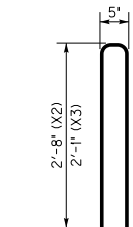


**"V-Groove" Rustication**



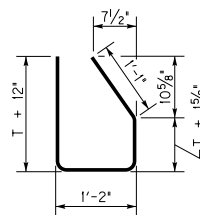
**X1(e) Bars**

#5 Bar



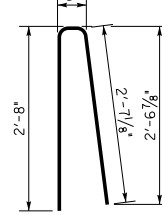
**X2(e) & X3(e) Bars**

#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 2 1/2' 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 System 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.

**KENTUCKY  
DEPARTMENT OF HIGHWAYS**

**RAIL SYSTEM TYPE 3**

STANDARD DRAWING NO. BHS-008-02

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

# General Notes

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

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

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

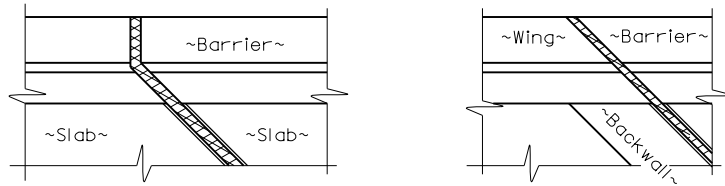
**MATERIAL SPECIFICATIONS:** Ensure steel material is new, commercial grade steel suitable for welding. Acceptance will be based on visual inspection by the Engineer. Joint sealing material, only, is in accordance with Section 807 of the Specifications. Ensure stud shear connectors conform to ASTM A108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

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

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

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

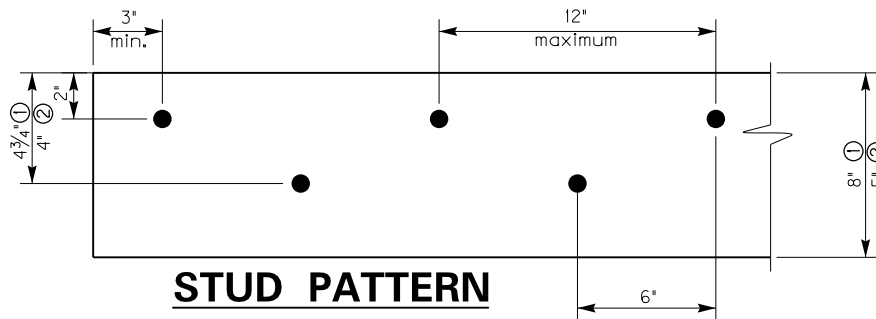
**BASIS OF PAYMENT:** The accepted quantities of Neoprene Expansion Dam which includes the armored edges & preformed compression joint seal will be paid for at the contract unit price per linear foot for each size, measured along centerline of joint between the vertical faces of the barriers. When only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



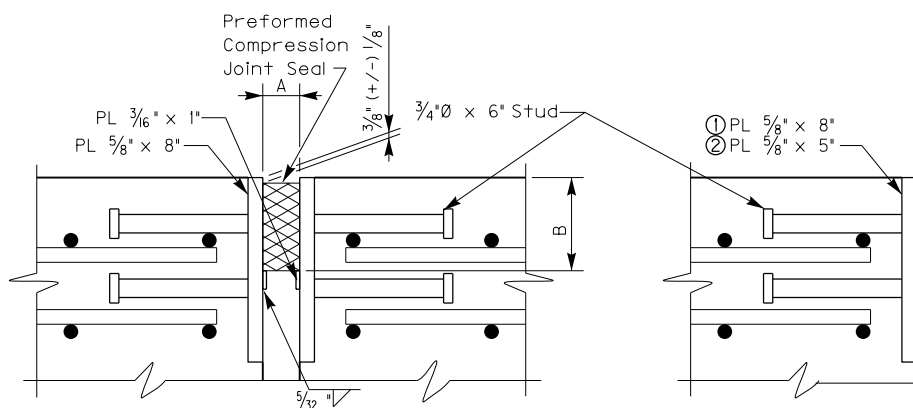
@ Piers or Bents      @ Backwall Substructures

## TYPICAL BARRIER-JOINT TREATMENTS

*Details are for skewed joints*



### STUD PATTERN



### SECTION THROUGH JOINT

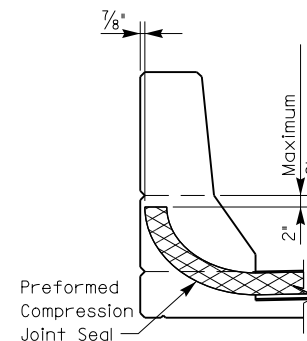
"A" - Minimum Joint opening @ 60°F  
 "B" - Manufacturer's compressed seal height 1/4".

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

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

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

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



### SECTION THROUGH ARMORED EDGE

### SECTION THROUGH BARRIER

**KENTUCKY  
DEPARTMENT OF HIGHWAYS**

**NEOPRENE EXPANSION  
DAMS AND  
ARMORED EDGES**

STANDARD DRAWING NO. BJE-001-13

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

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

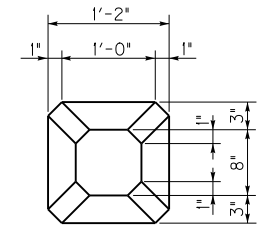
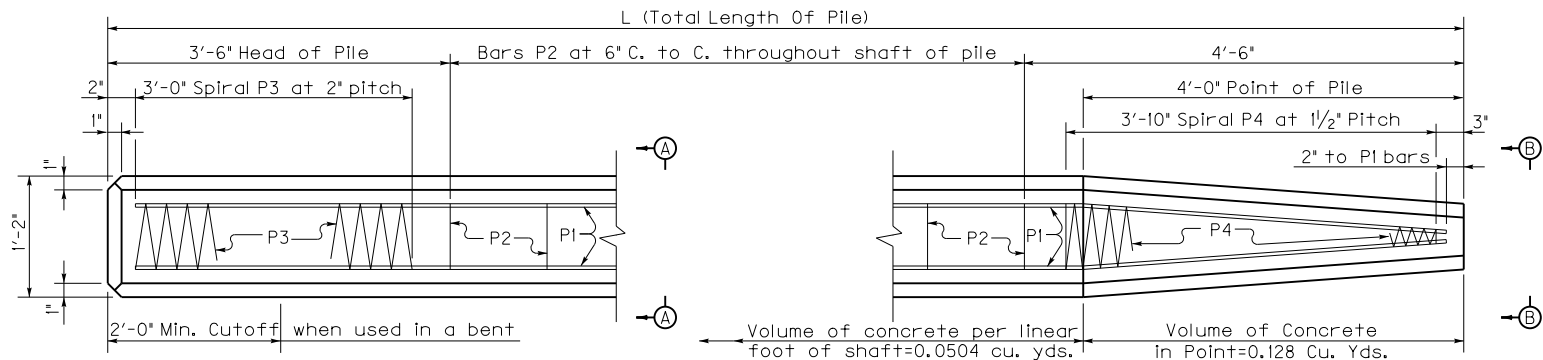
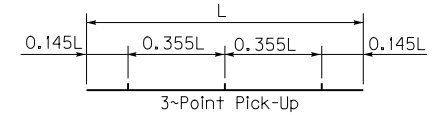
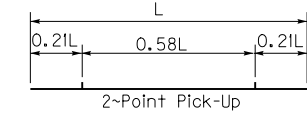
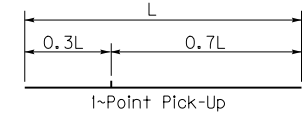


TABLE OF DIMENSIONS AND QUANTITIES (FOR ONE PILE ONLY)

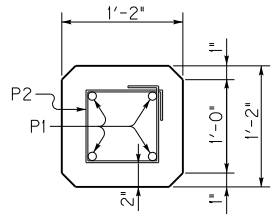
L	ESTIMATED CONCRETE CLASS 'D'	BILL AND TYPES OF REINFORCEMENT (FOR ONE PILE ONLY)				
		Bars P1 4~#8		Bars P2 #3-3'-8" long		Number
Ft.	Cu. Yd.	Length Ft.	A In.	Ft.	In.	
16	0.73	15	8	11	8	17
18	0.83	17	8	13	8	21
20	0.93	19	8	15	8	25
22	1.04	21	8	17	8	29
24	1.14	23	8	19	8	33
26	1.24	25	8	21	8	37
28	1.34	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

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

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.



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.

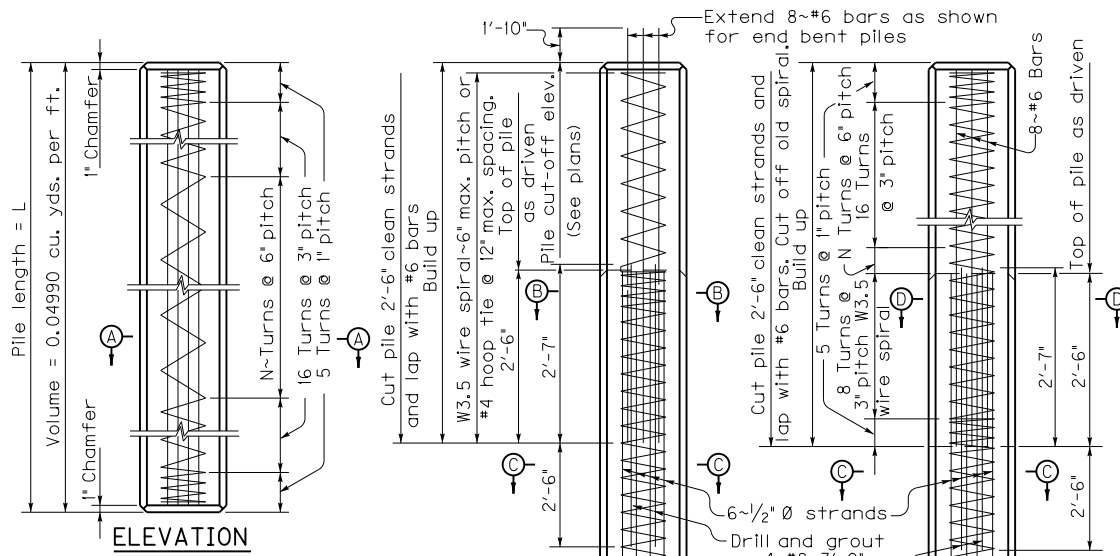
Pile lengths beyond those shown in table will have their concrete quantities adjusted to the length required.

**KENTUCKY  
DEPARTMENT OF HIGHWAYS**

**14" REINFORCED  
CONCRETE PILE**

STANDARD DRAWING NO. BPC-002-08

SUBMITTED	<i>[Signature]</i>	12-01-99
DIRECTOR, DIVISION OF BRIDGE DESIGN		DATE
APPROVED	<i>[Signature]</i>	12-01-99
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.

**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 1/2 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.

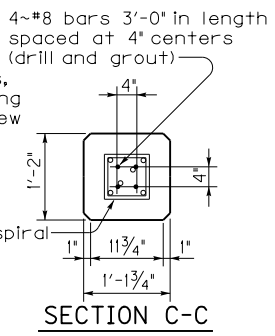
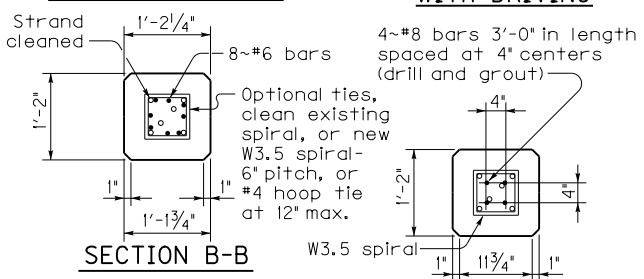
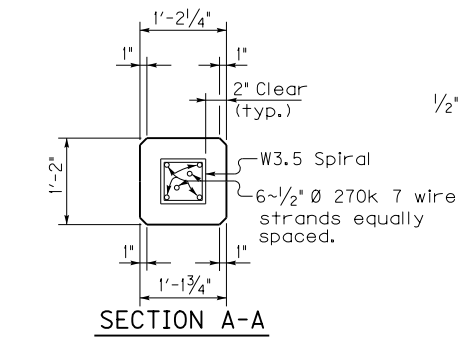
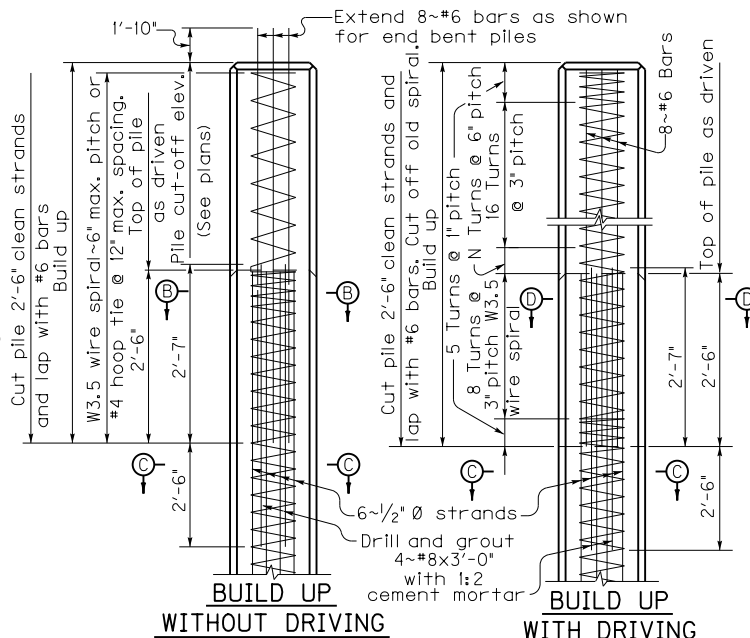
**EDGES:** Chamfer all edges one inch or rounded to approximately one inch radius.

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

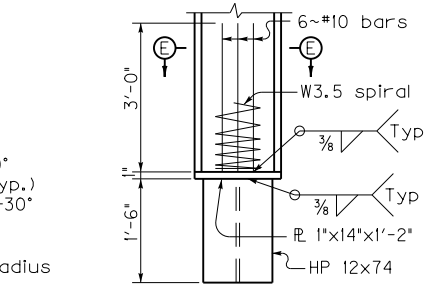
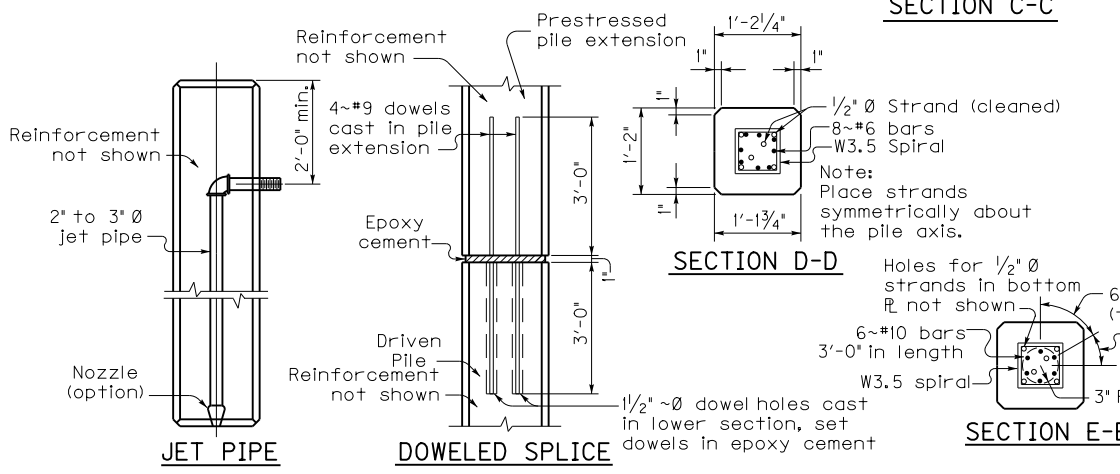
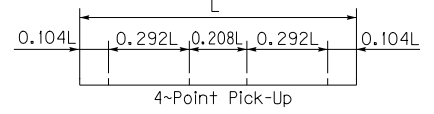
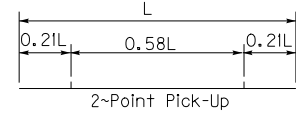
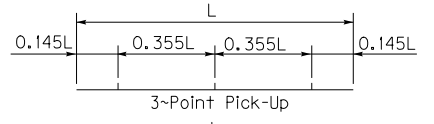
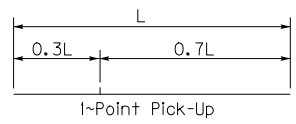
**FORMS:** For forming the exterior of piles, the use of steel forms on concrete casting beds is required unless otherwise approved by the Engineer. Ensure concrete finish conforms to Subsection 60L.03.18, Part A of the Specifications.

**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.



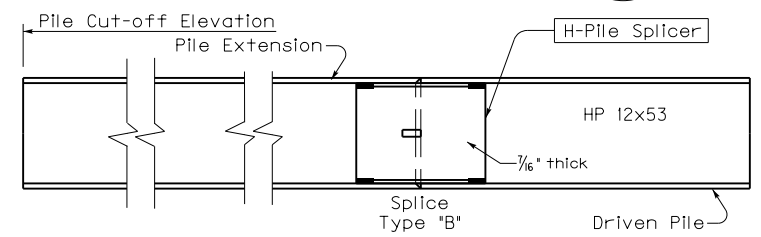
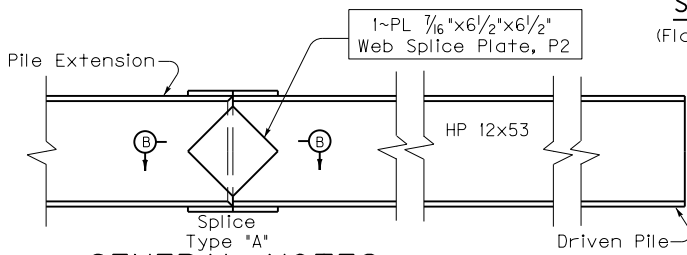
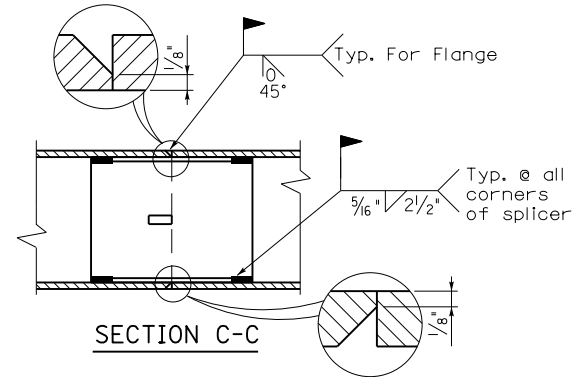
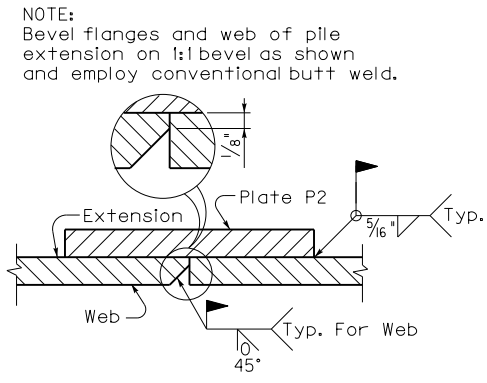
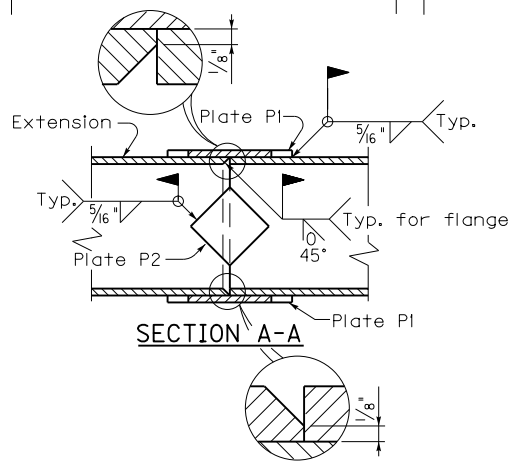
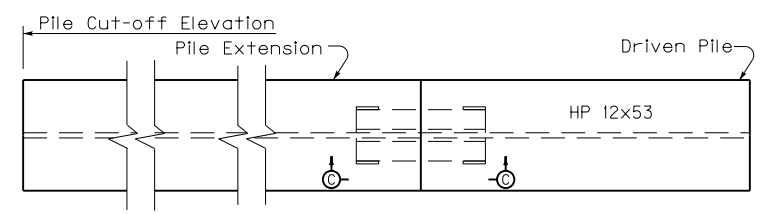
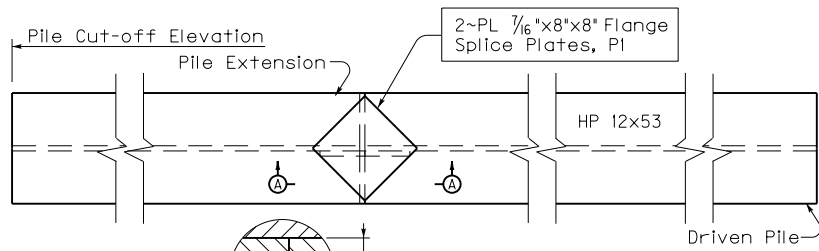
All lifting to be at pick-up points. Clearly mark all pick-up points.

**KENTUCKY DEPARTMENT OF HIGHWAYS**

**14" PRECAST PRESTRESSED CONCRETE PILE**

STANDARD DRAWING NO. BPC-011-07

SUBMITTED	<i>[Signature]</i>	12-01-99
DIRECTOR, DIVISION OF BRIDGE DESIGN		DATE
APPROVED	<i>[Signature]</i>	12-01-99
STATE HIGHWAY ENGINEER		DATE



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

**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.

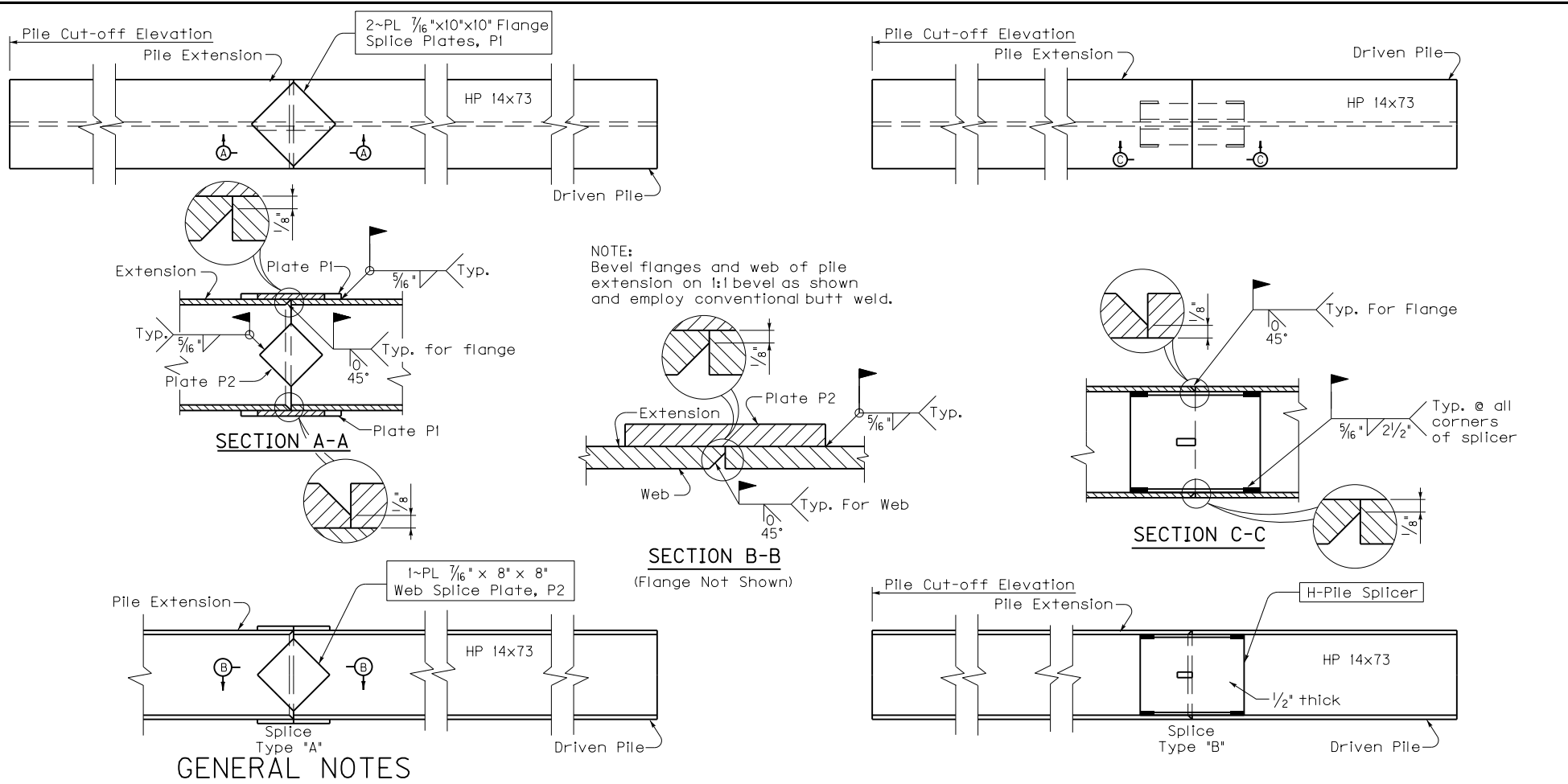
**FIELD WELDS:** Ensure field welding material and workmanship for all piling conforms to the current Joint Specifications ANSI/AASHTO/AWS D1.5 Bridge Welding Code. Splice piles as indicated above only when driven below cut-off elevation.

**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.

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



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

**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.

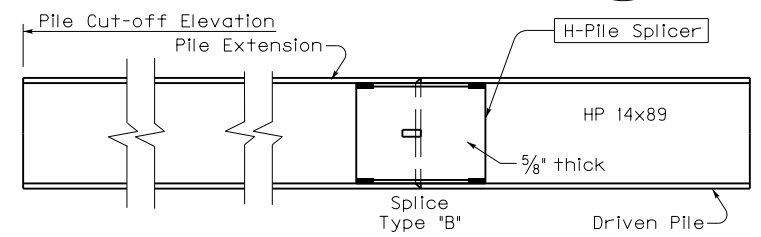
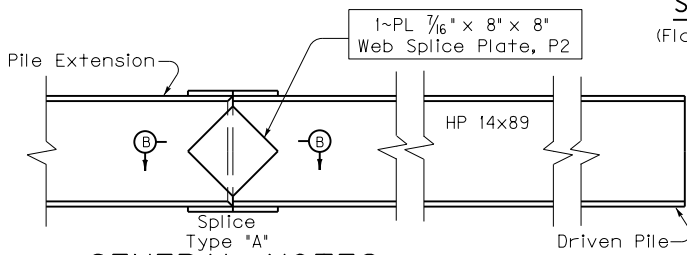
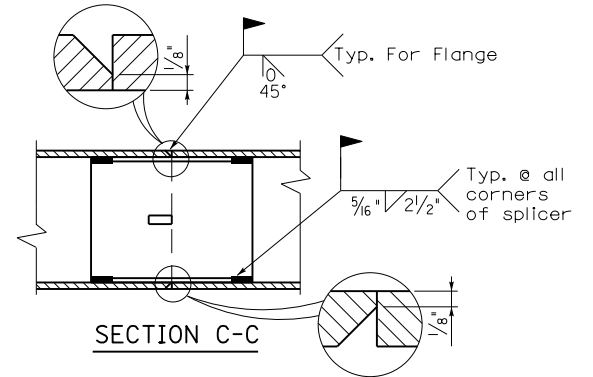
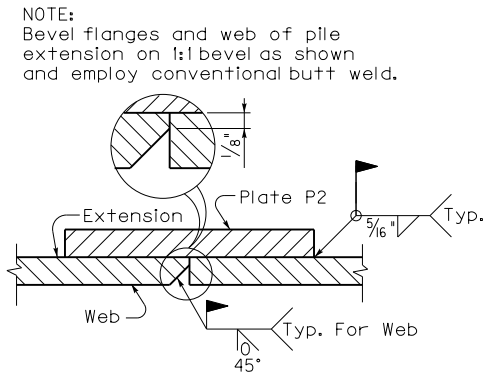
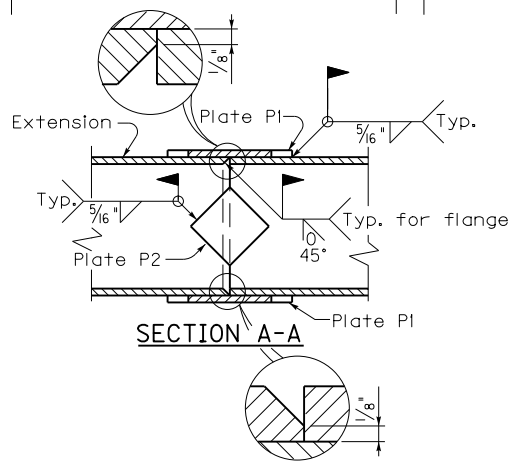
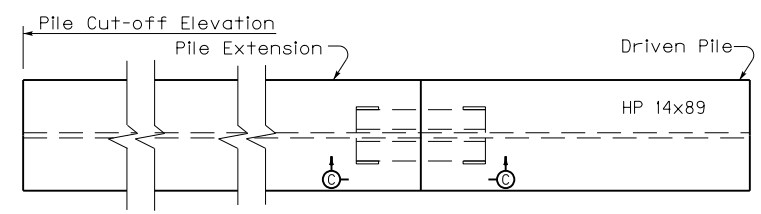
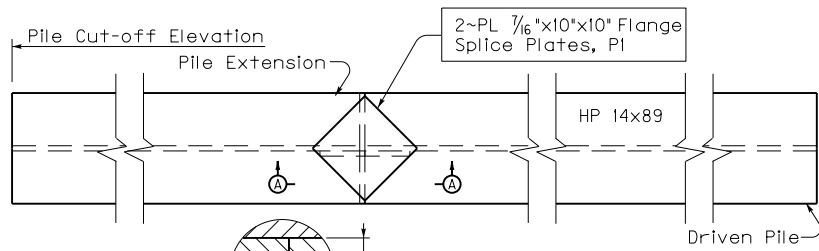
**FIELD WELDS:** Ensure field welding material and workmanship for all piling conforms to the current Joint Specifications ANSI/AASHTO/AWS D1.5 Bridge Welding Code. Splice piles as indicated above only when driven below cut-off elevation.

**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.

<b>KENTUCKY DEPARTMENT OF HIGHWAYS</b>	
<b>HP14x73 STEEL PILE</b>	
STANDARD DRAWING NO. BPS-009-08	
SUBMITTED <i>Mark Wite</i>	12-01-11
<small>DIRECTOR DIVISION OF STRUCTURAL DESIGN</small>	
APPROVED <i>[Signature]</i>	12-01-11
<small>STATE HIGHWAY ENGINEER</small>	



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

**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.

<b>KENTUCKY DEPARTMENT OF HIGHWAYS</b>	
<b>HP14x89 STEEL PILE</b>	
STANDARD DRAWING NO. BPS-011-04	
SUBMITTED <i>Mark Rite</i>	12-01-11
<small>DIRECTOR DIVISION OF STRUCTURAL DESIGN</small>	
APPROVED <i>[Signature]</i>	12-01-11
<small>STATE HIGHWAY ENGINEER</small>	