

[illegible]

Reinforcement Details

The diagrams illustrate the following reinforcement details:

- TYPE 4:** A straight beam with a single longitudinal bar. Dimensions include A (total length), D (effective length), C (hook length), and B (hook angle).
- TYPE 10:** A U-shaped beam with two longitudinal bars. Dimensions include $B = 2'-5"$ (total length), A (hook length), $1'-7"$ (hook angle), and $1'-3"$ (hook length).
- TYPE 31:** A U-shaped beam with two longitudinal bars. Dimensions include $R = 1\frac{1}{2}"$ (hook radius), $1'-4"$ (hook angle), $1'-8"$ (hook length), and $3"$ (hook length).
- TYPE 14:** A U-shaped beam with two longitudinal bars. Dimensions include $A = 3'-2"$ (total length), $6"$ (hook length), $B = 3'-2"$ (hook length), and $1'$ (hook angle).

		QUANTITIES												
 TYPE 2 (For Stepped Cap) $A = Ht. \text{ diff. } -2^{\circ} C.$ $+2 \cdot 0^{\circ} emb.$ $B = 1^{\circ} - 2\frac{1}{2}''$		DIMENSIONS TABLE												
		H	A	B	C	D	H	CONCRETE CLASS "A"	STEEL REINFORCEMENT EPOXY COATED	STEEL REINFORCEMENT				
		ft.	in.	ft.	in.	ft.	in.	ft.	in.	ft.	in.	YDS. (1)	LBS.	LBS.
10-11		2	6	3	0	14	3	5	6	10-11	55.9	1107	6060	
12-13		2	6	3	0	14	3	5	6	12-13	59.2	1107	6555	
14-15		2	6	3	0	14	3	5	6	14-15	62.5	1107	7051	
16-17		2	6	3	0	14	3	5	6	16-17	65.7	1107	7546	
18-19		2	6	3	0	14	3	5	6	18-19	69	1107	8041	
20-21		2	6	3	0	14	3	5	6	20-21	72.3	1107	8536	
22-23		2	6	3	0	14	3	5	6	22-23	75.5	1107	9031	
24-25		2	6	3	0	14	3	5	6	24-25	78.8	1107	9527	

Diagram illustrating the geometry of a bridge pier and abutment. The diagram shows a rectangular structure with dimensions and angles defined. The total width is 14'-3" on both sides of the centerline. The width of the pier is 3'-0" (typ.). The width of the abutment is 9'-0" (typ.). The height of the structure is 3'-6". The angle of the skew is 15° (Lt. Skew shown: Rt. Skew opp. hand). The angle of the pier is 90° (typ.). The angle of the abutment is 15° (typ.). The diagram also shows the centerline of the bridge (C Bridge) and the centerline of the pier and abutment (C Pier & C Brg.). The diagram is labeled "Note: All dimensions are in feet and inches." and "Note: All dimensions are in feet and inches.".

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

PLAN OF CAP

Reinforcement & dimensions shown are symmetrical about vertical ϕ of Pier

3'-6" (min.)

3'-0" (typ.)

H-A (3'-6")

"B"

"A"

P11 @ 12"

P11 stirrups

2" Cl.

P9

P10

P9

P6

P5

P8

Bars P5 & P6 @ 12"

P6

P5

P3

P1

P2

P4

3" Cl.

(alternate 90° & 135° bar ends)

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

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

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

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

Figure 10 is a detailed cross-section diagram of a 12" x 20" reinforced concrete beam. The diagram illustrates the placement and spacing of reinforcement bars (P1 through P8) and the required clearances and lap lengths. Key dimensions and labels include:

- Overall Dimensions:** The beam has an overall width of $"D"$ and an overall height of $"D"$. The top and bottom reinforcement bars are labeled $P1\ B\&F\ \&P3\ T\&F$ and $P2\ B\&F\ \&T\&F$ respectively.
- Internal Dimensions:** The distance between the centerlines of the top and bottom reinforcement bars is $11'-3"$. The distance from the centerline of the top reinforcement bars to the centerline of the bottom reinforcement bars is $"B"$.
- Reinforcement Bars:**
 - $P4\ \&P8$ are located at each end of the beam.
 - $P4\ \&P8\ E.F.$ indicates the end of the reinforcement bars.
 - $P6\ E.F.$ indicates the end of the reinforcement bars.
 - $P5$ is located at the bottom of the beam.
 - $P7\ (2'-0" \text{ spa.})$ indicates the spacing of the reinforcement bars.
- Clearances and Lap Lengths:**
 - $2"$ clear cover to $P7$.
 - $P7$ hooks over $P6$.
 - $P4\ \&P8$ inside $P5\ \&P6$.
 - $2\frac{1}{2}"$ clear cover to $P6$.
 - $3\frac{1}{8}"$ clear cover to $P4\ \&P8$.
 - $2'-6"$ (Min. Lap) indicates the minimum lap length for the reinforcement bars.
- Other Labels:**
 - $12" \text{ Rad. (typ.)}$ indicates the typical radius of the reinforcement bars.
 - $2'-0"$ indicates the spacing of the reinforcement bars.

ADDITIONAL BARS FOR STEPPED PIER CAP

- 2-P9(e)s
(18" to 28" ht. diff.)
- 2-P10(e)s
(over 28" ht. diff.)
- 4-P10(e)s
of P12(e)=# of P11(e)

APPROVED [Signature] 02-26-20
STATE REGISTERED ENGINEER DATE