7′-0″ X 5′-1″

MARK	SIZE	NO ①	LGTH FT	LGTH IN	K FT	K IN
A1	5	2	7	9		
A2	5	2	8	6		
C1	4	1	5	0		
C2	4	1	7	1		
C3	4	1	9	2		
C4	4	2	10	6		
E1	5	2	11	6	8	6
E2	5	2	11	10	8	10
F	4	9	1	3	0	6
G1	4	1	7	7		
G2	4	2	9	1		
G3	4	2	10	6		
G4	4	3	12	0		
H	4	7	8	9	7	1
K1	4	1	2	0		
K2	4	1	3	11		
K3	4	1	5	9		
K4	4	2	6	10		
N1	4	3	6	10		
N2	4	3	10	3		
Q	4	2	7	0		
R	4	8	0	7		
S1	5	2	1	1		
S2	5	2	1	4		
S3	5	2	1	8		
S4	5	2	2	0		
S5	5	2	2	4		
S6	5	2	2	8		
T1	5	2	2	1		
T2	5	2	5	3		
T3	5	2	7	11		
V1	5	2	4	4	3	1
V2	5	2	5	3	4	0
V3	5	2	6	3	5	0
V4	5	2	7	2	5	11
V5	5	3	7	6	6	3
W1	5	2	4	4	3	1
W2	5	2	5	5	4	2
W3	5	2	6	6	5	3
W4	5	1	7	6	6	3

8′-2″ X 5′-9″

MARK	SIZE	NO ①	LGTH FT	LGTH IN	K FT	K IN
A1	5	2	8	6		
A2	5	2	9	4		
C1	4	1	4	9		
C2	4	1	6	10		
C3	4	1	9	0		
C4	4	1	11	1		
C5	4	2	11	7		
E1	5	2	12	9	9	9
E2	5	2	13	2	10	2
F	4	10	1	3	0	6
G1	4	2	9	5		
G2	4	2	11	0		
G3	4	2	12	6		
G4	4	3	14	0		
H	4	8	9	5	7	9
K1	4	1	1	4		
K2	4	1	3	3		
K3	4	1	5	2		
K4	4	1	7	1		
K5	4	2	7	6		
N1	4	3	7	6		
N2	4	3	11	5		
Q	4	2	8	2		
R	4	9	0	7		
S1	5	2	1	1		
S2	5	2	1	5		
S3	5	2	1	9		
S4	5	2	2	0		
S5	5	2	2	4		
S6	5	2	2	8		
S7	5	2	3	0		
T1	5	2	3	3		
T2	5	2	6	6		
T3	5	2	9	1		
V1	5	2	4	8	3	5
V2	5	2	5	7	4	4
V3	5	2	6	7	5	4
V4	5	2	7	6	6	3
V5	5	4	8	2	6	11
W1	5	2	4	8	3	5
W2	5	2	5	9	4	6
W3	5	2	6	9	5	6
W4	5	2	7	10	6	7

9′-6″ X 6′-5″

MARK	SIZE	NO ①	LGTH FT	LGTH IN	K FT	K IN
A1	5	2	9	1		
A2	5	2	9	11		
B1	5	4	3	3		
B2	5	4	4	3		
B3	5	4	5	2		
B4	5	4	6	2		
B5	5	10	7	1		
C1	4	2	4	4		
C2	4	2	6	6		
C3	4	2	8	6		
C4	4	2	10	8		
C5	4	6	12	6		
E1	5	2	16	2	11	2
E2	5	2	16	10	11	10
F	4	12	1	5	0	6
G1	4	2	11	5		
G2	4	2	12	11		
G3	4	2	14	6		
G4	4	3	16	0		
H	4	9	10	7	8	5
J1	5	4	3	3		
J2	5	4	4	4		
J3	5	4	5	5		
J4	5	4	6	6		
K1	4	2	2	7		
K2	4	2	4	6		
K3	4	2	6	4		
K4	4	6	8	0		
M1	4	1	2	4		
M2	4	20	3	9		
N1	4	7	8	0		
N2	4	5	11	9		
N3	4	2	12	8		
P	5	21	5	5	3	8
Q	5	4	9	6		
R	5	10	2	10		
S1	5	2	1	2		
S2	5	2	1	5		
S3	5	2	1	9		
S4	5	2	2	1		
S5	5	2	2	4		
S6	5	2	2	8		
S7	5	2	3	0		
S8	5	2	3	3		
S9	5	2	3	5		
T1	5	2	1	11		
T2	5	2	5	2		
T3	5	2	8	9		
T4	5	2	10	7		

11′-5″ X 7′-3″

MARK	SIZE	NO ①	LGTH FT	LGTH IN	K FT	K IN
A1	5	2	10	1		
A2	5	2	11	0		
B1	5	4	3	8		
B2	5	4	4	8		
B3	5	4	5	7		
B4	5	4	6	6		
B5	5	4	7	6		
B6	5	8	7	11		
C1	4	2	6	8		
C2	4	2	8	10		
C3	4	2	10	11		
C4	4	2	13	0		
C5	4	6	14	0		
E1	5	2	18	4	13	4
E2	5	2	19	0	14	0
F	4	14	1	5	0	6
G1	4	1	13	4		
G2	4	2	15	0		
G3	4	2	16	8		
G4	4	2	18	4		
G5	4	3	20	0		
H	4	11	11	5	9	3
J1	5	4	3	8		
J2	5	4	4	9		
J3	5	4	5	10		
J4	5	4	6	10		
J5	5	2	7	11		
K1	4	2	2	4		
K2	4	2	4	3		
K3	4	2	6	1		
K4	4	2	8	0		
K5	4	6	8	11		
M1	4	1	2	6		
M2	4	22	3	9		
N1	4	7	8	11		
N2	4	5	12	10		
N3	4	2	14	3		
P	6	23	5	11	4	2
Q	5	4	11	5		
R	5	12	2	10		
S1	5	2	1	2		
S2	5	2	1	5		
S3	5	2	1	9		
S4	5	2	2	1		
S5	5	2	2	4		
S6	5	2	2	8		
S7	5	2	2	11		
S8	5	2	3	3		
S9	5	2	3	7		
S10	5	2	3	10		

11′-5″ X 7′-3″ (CONT'D)

MARK	SIZE	NO ①	LGTH FT	LGTH IN	K FT	K IN
S11	5	2	4	0		
T1	5	2	3	11		
T2	5	2	7	3		
T3	5	2	10	7		
T4	5	2	12	6		

12′-10″ X 8′-4″

MARK	SIZE	NO ①	LGTH FT	LGTH IN	K FT	K IN
A1	5	2	11	3		
A2	5	2	12	4		
B1	5	4	4	2		
B2	5	4	5	2		
B3	5	4	6	1		
B4	5	4	7	0		
B5	5	4	8	0		
B6	5	4	8	11		
B7	5	8	9	0		
C1	4	2	5	2		
C2	4	2	7	4		
C3	4	2	9	6		
C4	4	2	11	7		
C5	4	2	13	8		
C6	4	8	15	9		
E1	5	2	19	11	14	11
E2	5	2	20	6	15	6
F	4	16	1	5	0	6
G1	4	2	15	6		
G2	4	2	17	1		
G3	4	2	18	9		
G4	4	2	20	4		
G5	4	3	22	0		
H	4	12	13	0	10	4
J1	5	4	4	3		
J2	5	4	5	3		
J3	5	4	6	4		
J4	5	4	7	5		
J5	5	4	8	5		
K1	4	2	2	6		
K2	4	2	4	5		
K3	4	2	6	4		
K4	4	2	8	3		
K5	4	8	10	0		
M1	4	1	2	11		
M2	4	25	4	9		
N1	4	8	10	0		
N2	4	5	14	5		
N3	4	3	15	11		
P	7	26	6	11	4	8
Q	5	4	12	10		

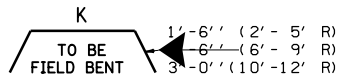
12′-10″ X 8′-4″ (CONT'D)

MARK	SIZE	NO ①	LGTH FT	LGTH IN	K FT	K IN
R	5	14	3	4		
S1	5	2	1	0		
S2	5	2	1	3		
S3	5	2	1	7		
S4	5	2	1	10		
S5	5	2	2	2		
S6	5	2	2	6		
S7	5	2	2	9		
S8	5	2	3	1		
S9	5	2	3	4		
S10	5	2	3	8		
S11	5	2	3	11		
S12	5	4	4	3		
T1	5	2	1	10		
T2	5	2	5	3		
T3	5	2	8	8		
T4	5	2	12	0		
T5	5	2	13	11		

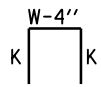
NOTES

1. NUMBER OF BARS IN ONE HEADWALL.
2. DIMENSIONS ARE O. TO O. OF BARS.
3. ALL BARS ARE STRAIGHT EXCEPT THOSE SHOWN BELOW.
4. R = BOX OR PIPE RISE
5. W = WING WALL WIDTH

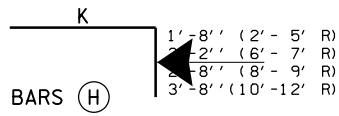
BENT BAR SHAPES



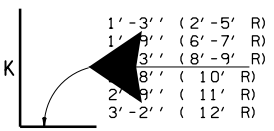
BARS (E)



BARS (F), (U) AND (X)



BARS (H)



BARS (P), (V) AND (W)

BARS (Y) AND (Z)

KENTUCKY
DEPARTMENT OF HIGHWAYS

BILL OF REINFORCEMENT
7′-0″ x 5′-1″ - 12′-10″ x 8′-4″
STEEL PIPE ARCHES
15° SKEW

STANDARD DRAWING NO. RDH-440-03

SUBMITTED John B Sachatello — DIRECTOR DIVISION OF DESIGN — 12-1-99 DATE

APPROVED J M Yowell — STATE HIGHWAY ENGINEER — 12-1-99 DATE