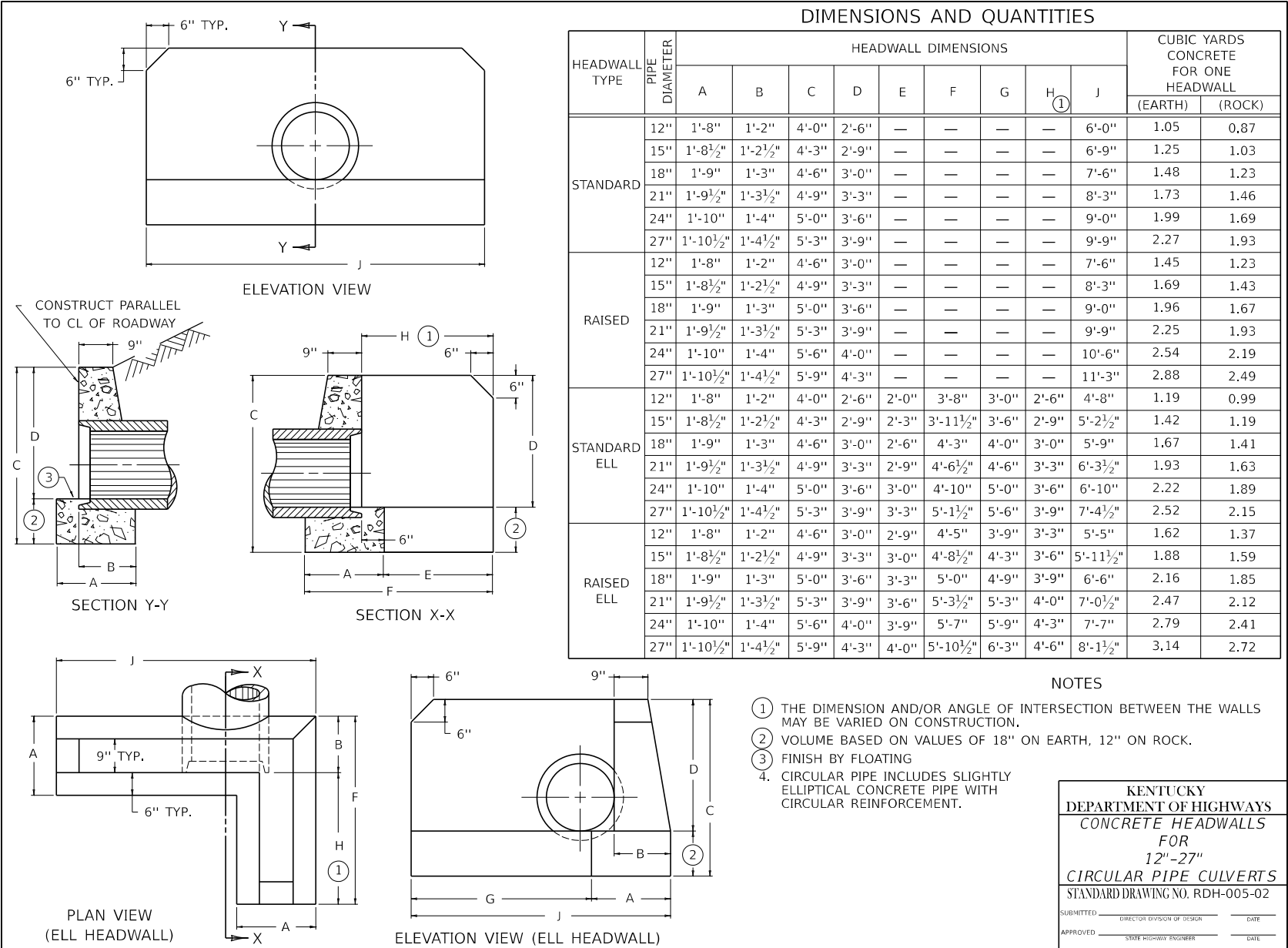


DRAWING SCALE: 1"=1'



CONSTRUCT PARALLEL
TO CL OF ROADWAY

ELEVATION VIEW

SECTION Y-Y

SECTION X-X

PLAN VIEW
(ELL HEADWALL)

ELEVATION VIEW (ELL HEADWALL)

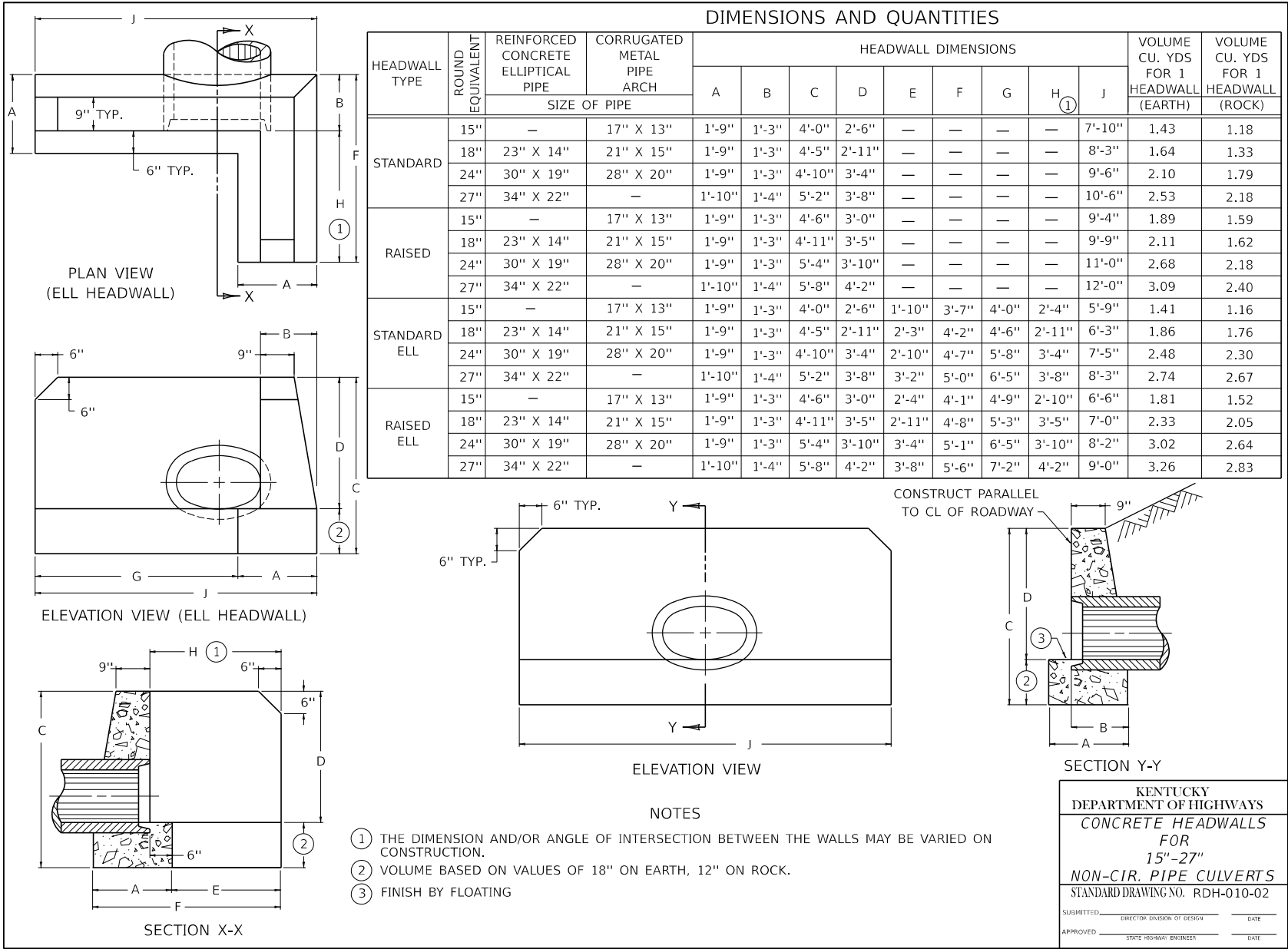
- ① THE DIMENSION AND/OR ANGLE OF INTERSECTION BETWEEN THE WALLS MAY BE VARIED ON CONSTRUCTION.
- ② VOLUME BASED ON VALUES OF 18" ON EARTH, 12" ON ROCK.
- ③ FINISH BY FLOATING
4. CIRCULAR PIPE INCLUDES SLIGHTLY ELLIPTICAL CONCRETE PIPE WITH CIRCULAR REINFORCEMENT.

KENTUCKY
DEPARTMENT OF HIGHWAYS
CONCRETE HEADWALLS
FOR
12"-27"
CIRCULAR PIPE CULVERTS
STANDARD DRAWING NO. RDH-005-02

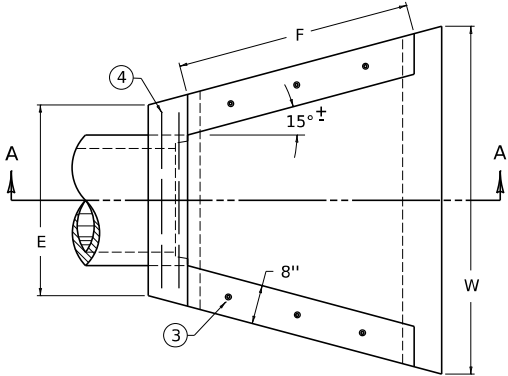
SUBMITTED _____ DIRECTOR DIVISION OF DESIGN _____ DATE _____

APPROVED _____ STATE HIGHWAY ENGINEER _____ DATE _____

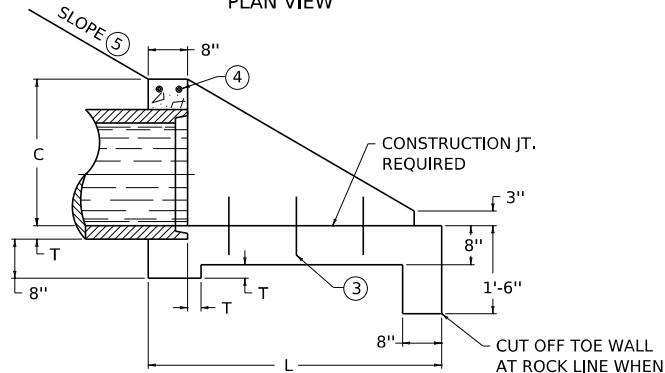
DRAWING SCALE: 1"=1'



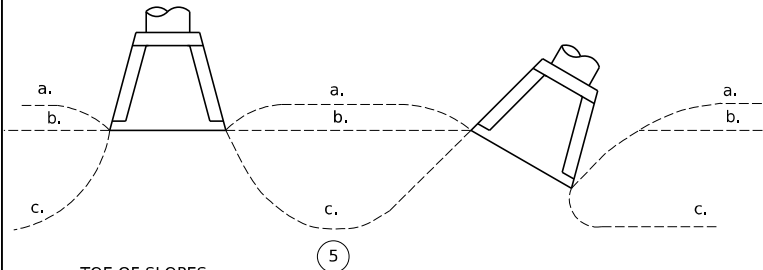
DRAWING SCALE:
1" : 1'



PLAN VIEW



SECTION A-A

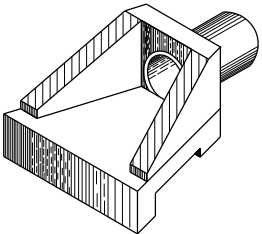


TOE OF SLOPES:
a. STEEPER THAN 2:1
b. 2:1
c. FLATTER THAN 2:1

PIPE DIA. OR EQUIV. DIA.	SHAPE ⑨	DIMENSIONS						CLASS A CONC	REINF STEEL
		C	E	F	L	W	T	C. Y.	LBS.
12"	○	1'-9"	2'-6"	2'-3"	3'-6"	4'-0"	2"	0.58	7
15"	○	2'-0"	2'-9"	2'-9"	4'-0"	4'-9"	2 1/4"	0.75	
	◐	1'-9"	3'-0"	2'-6"	3'-6"	4'-9"	2 1/4"	0.68	8
	◑	2'-3"	3'-0"	3'-6"	4'-6"	5'-3"	2 1/2"	0.93	
18"	○	2'-0"	3'-6"	3'-0"	4'-0"	5'-6"	2 3/4"	0.89	
	◐	2'-6"	3'-3"	4'-0"	5'-0"	6'-0"	2 3/4"	1.14	
21"	○	2'-3"	3'-0"	3'-6"	4'-6"	6'-0"	3"	1.07	9
	◐	2'-9"	3'-6"	4'-6"	5'-6"	6'-6"	3"	1.35	8
24"	○	2'-6"	4'-0"	4'-0"	5'-0"	6'-9"	3 1/4"	1.30	9
	◐	3'-0"	3'-9"	5'-0"	6'-0"	7'-0"	3 1/4"	1.57	
27"	○	2'-9"	4'-6"	4'-3"	5'-3"	7'-3"	3 1/2"	1.51	10

NOTES

1. DIMENSIONS AND QUANTITIES ARE BASED ON CONCRETE PIPE AND WILL VARY INSIGNIFICANTLY FOR CORRUGATED METAL PIPE.
2. REINFORCING STEEL : MINIMUM GRADE 40, BARS EVENLY SPACED.
- ③ 6 - NO. 4 x 1'-0" DOWEL BARS.
- ④ 2 - NO. 4 x (E DIMENSION MINUS 4").
- ⑤ SLOPES SHALL BE WARPED TO FIT HEADWALL WHEN PIPE IS SKEWED AND/OR NORMAL SLOPE VARIES FROM 2:1.
6. VOLUME DISPLACED BY PIPE COMPUTED USING INSIDE DIAMETER OF PIPE.
7. WING ANGLES AND/OR DIMENSIONS MAY BE ALTERED DURING CONSTRUCTION TO ACCOMMODATE FLOW OF WATER.
8. APRON BETWEEN WINGS SHALL BE SLOPED IN DIRECTION OF FLOW EQUAL TO SLOPE OF PIPE. FRONT FACE OF HEADWALL SHALL REMAIN VERTICAL.
- ⑨ HEADWALLS ARE FOR CIRCULAR, ARCH, AND HORIZONTAL ELLIPTICAL 12"- 27" EQUIVALENT PIPE SIZES. SEE CURRENT STD. DWG. RDI-016, FOR NON-CIRCULAR PIPE EQUIVALENT SIZES.



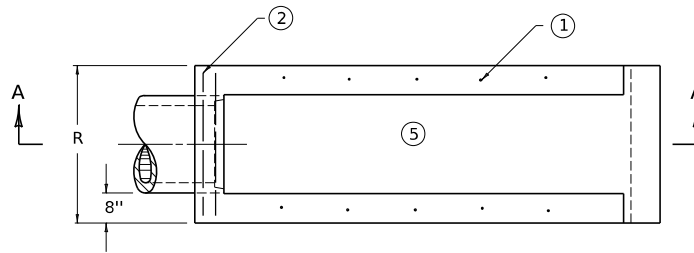
ISOMETRIC VIEW

KENTUCKY
DEPARTMENT OF HIGHWAYS

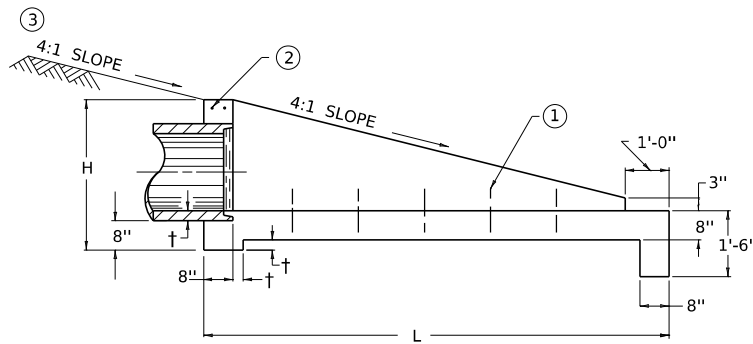
SLOPED & FLARED
HEADWALLS FOR
12" TO 27" PIPE

STANDARD DRAWING NO. RDH-020-03

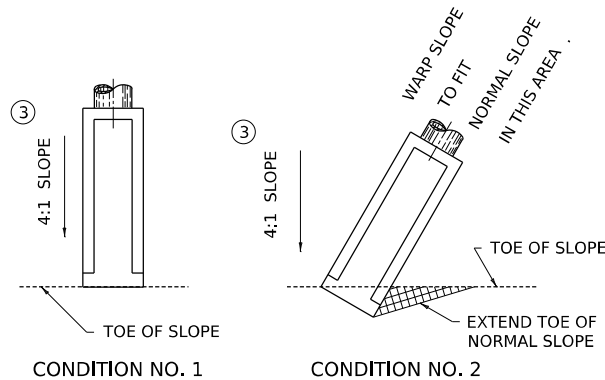
SUBMITTED DIRECTOR DIVISION OF DESIGN DATE
APPROVED STATE HIGHWAY ENGINEER DATE



PLAN VIEW



SECTION A-A

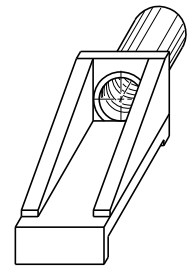


PLAN VIEW OF STRUCTURE LOCATIONS

- NOTES -

REINFORCING STEEL : MINIMUM GRADE 40, EVENLY SPACED .

- ① 12 - NO. 4 X 1'-0" DOWEL BARS .
- ② 2 - NO. 4 X (R DIMENSION MINUS 4") .
- ③ SLOPES SHALL BE WARPED TO FIT HEADWALL WHEN PIPE IS SKEWED AND/OR NORMAL SLOPE VARIES FROM 4 : 1 .
- ④ SEE CURRENT STD. DWG. RDI-016 FOR NON-CIRCULAR PIPE EQUIVALENT SIZES .
- ⑤ APRON BETWEEN WINGS SHALL BE SLOPED IN DIRECTION OF FLOW EQUAL TO SLOPE OF PIPE . FRONT FACE OF HEADWALL SHALL REMAIN VERTICAL .
- ⑥ DIMENSIONS AND QUANTITIES ARE BASED ON CONCRETE PIPE AND WILL VARY SLIGHTLY FOR METAL PIPE .



OBLIQUE VIEW

PIPE		DIMENSIONS ⑥				CLASS "A" CONC.	REINF. STEEL
DIA. OR EQUIV. DIA.	SHAPE ④	H	R	L	†	CU. YD.	LBS.
12"	○	2'-6"	2'-8"	7'-4"	2"	0.93	1 1
15"	○	2'-10"	3'-0"	8'-5"	2 1/4"	1.20	1 2
	○	2'-6"	3'-3"	7'-1"		1.02	
18"	○	3'-1"	3'-3"	9'-6"	2 1/2"	1.50	
	○	2'-9"	3'-7"	8'-0"		1.29	
	○	2'-10"	3'-9"	8'-3"	2 3/4"	1.38	1 3
21"	○	3'-5"	3'-7"	10'-7"		1.84	1 2

KENTUCKY
DEPARTMENT OF HIGHWAYS

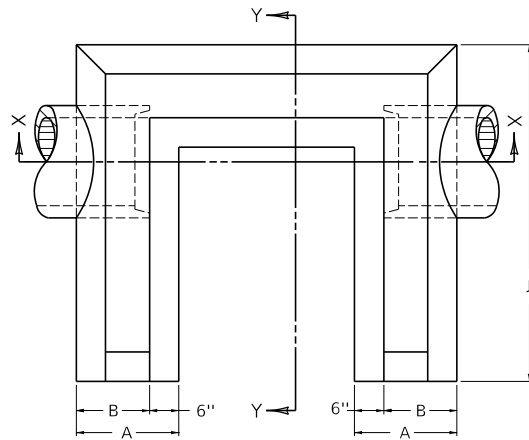
*SLOPED & PARALLEL
HEADWALLS
12" TO 21" PIPE*

STANDARD DRAWING NO. RDH-030-03

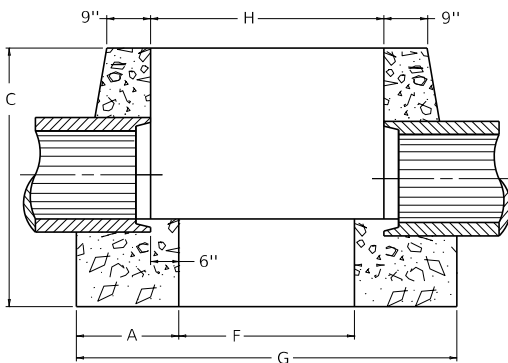
SUBMITTED: _____ DIRECTOR DIVISION OF DESIGN _____ DATE: _____

APPROVED: _____ STATE HIGHWAY ENGINEER _____ DATE: _____

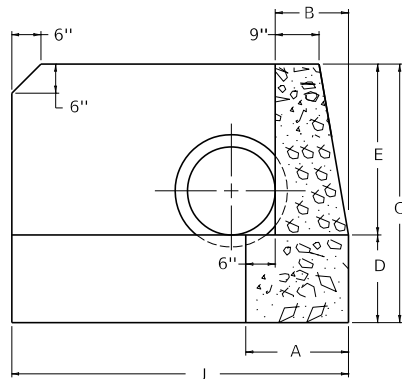
DRAWING SCALE: 1"=1'



PLAN VIEW



SECTION X-X



SECTION Y-Y

DIMENSIONS AND QUANTITIES

PIPE DIAMETER	HEADWALL DIMENSIONS									CU. YD. CONC. FOR 1 HEADWALL
	A	B	C	D	E	F	G	H	J	
12"	1'-8"	1'-2"	4'-0"	1'-6"	2'-6"	2'-6"	5'-10"	3'-6"	4'-8"	2.07
15"	1'-8"	1'-2"	4'-3"	1'-6"	2'-9"	2'-9"	6'-2"	3'-9"	5'-2"	2.42
18"	1'-9"	1'-3"	4'-6"	1'-6"	3'-0"	3'-0"	6'-6"	4'-0"	5'-9"	2.86
24"	1'-10"	1'-4"	5'-0"	1'-6"	3'-6"	3'-6"	7'-2"	4'-6"	6'-10"	3.75
30"	1'-11"	1'-5"	5'-6"	1'-6"	4'-0"	3'-9"	7'-7"	4'-9"	7'-11"	4.78
36"	2'-0"	1'-6"	6'-6"	2'-0"	4'-6"	4'-0"	8'-0"	5'-0"	9'-0"	6.72

NOTES

1. VOLUME DISPLACED BY BARREL OF PIPE HAS BEEN COMPUTED USING INSIDE DIAMETER OF PIPE.

KENTUCKY
DEPARTMENT OF HIGHWAYS

U-TYPE
HEADWALLS

STANDARD DRAWING NO. RDH-050-02

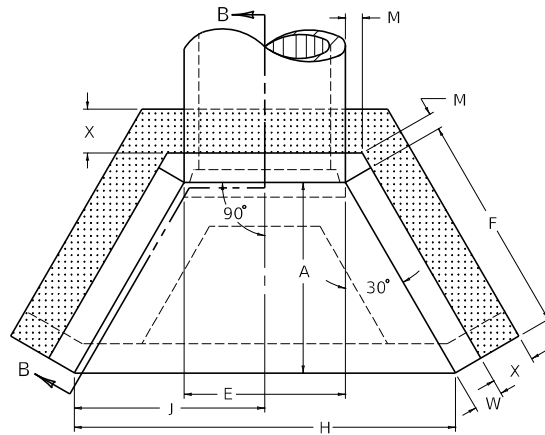
SUBMITTED: _____
APPROVED: _____

DIRECTOR DIVISION OF DESIGN

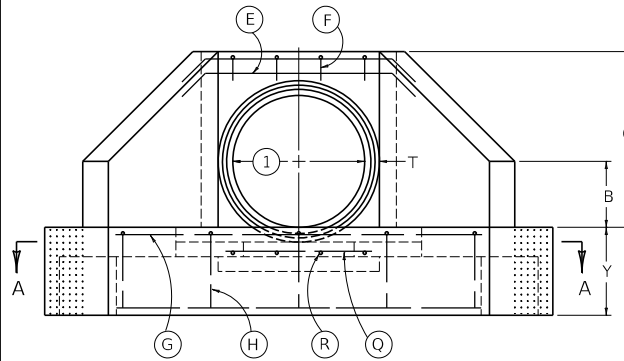
STATE HIGHWAY ENGINEER

DATE

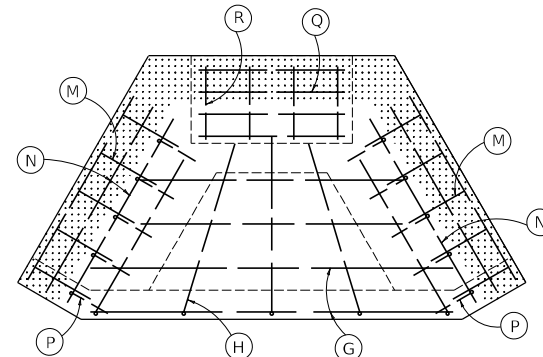
DATE



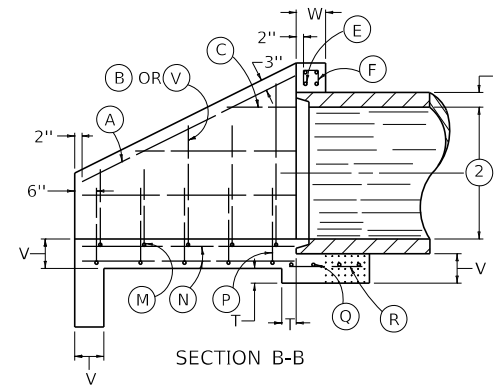
PLAN VIEW



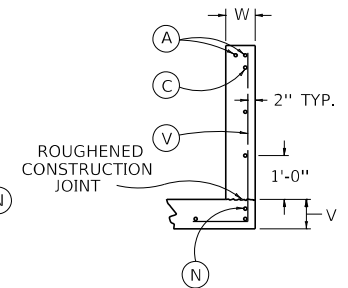
FRONT ELEVATION



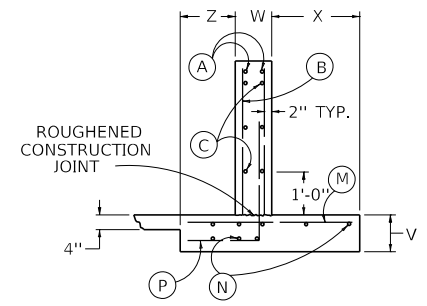
SECTION A-A



SECTION B-B



WING SECTION
30" TO 60" CIRCULAR PIPE
30" TO 72" NON-CIRCULAR PIPE



WING SECTION
66" TO 108" CIRCULAR PIPE

1. DIAMETER OF CIRCULAR PIPE OR SPAN OF NON-CIRCULAR PIPE
2. DIAMETER OF CIRCULAR PIPE OR RISE OF NON-CIRCULAR PIPE
3. [Pattern] APPLIES TO 66" DIAMETER AND GREATER. (CIRCULAR PIPE)
4. SEE CURRENT STANDARD DRAWINGS RDH-200 AND 300 SERIES FOR DIMENSIONS, QUANTITIES, AND BILL OF REINFORCEMENT.
5. DIMENSIONS FROM FACE OF CONCRETE TO STEEL SHALL BE 2" CLEAR DISTANCE.
6. ENCIRCLED LETTERS, (), INDICATE STEEL BAR LOCATIONS
7. BARS (B), (C), (G), (P), (M), (V) ARE SPACED 1'-0" O.C. ALL OTHER BARS SHALL BE EVENLY SPACED.
8. BARS (B) AND (V) ARE PLACED IN ORDER OF INCREASING LENGTHS, BEGINNING AT THE END OF EACH WING.
9. BARS (C) ARE PLACED IN ORDER OF INCREASING LENGTHS, BEGINNING AT THE TOP OF EACH WING.
10. HEADWALLS LOCATED AT EDGE OF SHOULDER SHALL BE PARALLEL TO CENTERLINE OF THE ROAD.
11. APRON BETWEEN WINGS SHALL BE SLOPED IN DIRECTION OF FLOW EQUAL TO SLOPE OF PIPE. FRONT FACE OF HEADWALL AND ENDS OF WINGS SHALL REMAIN VERTICAL.

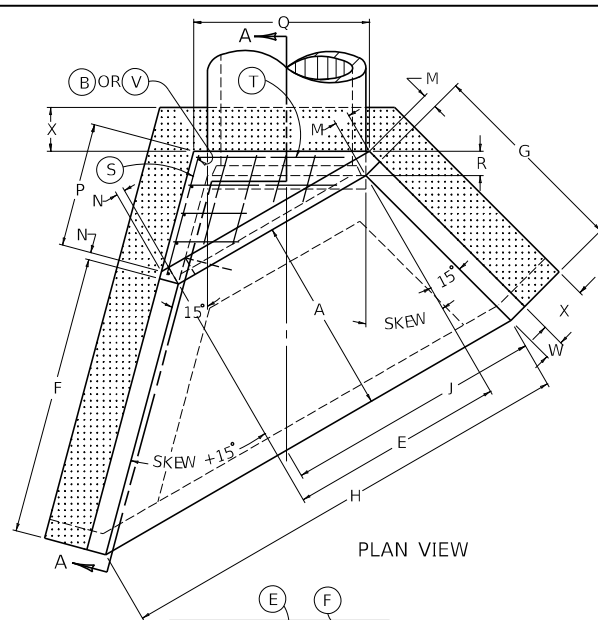
(LAYOUT AND STEEL PATTERN)

KENTUCKY
DEPARTMENT OF HIGHWAYS

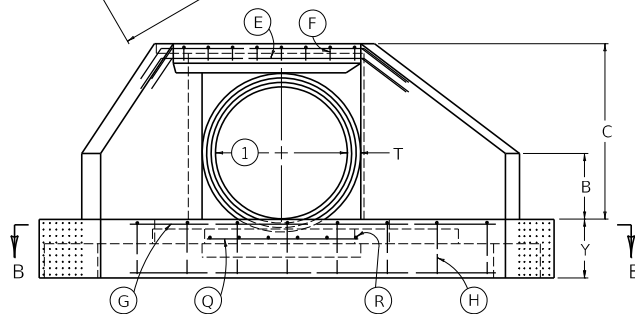
PIPE CULVERT
HEADWALLS
0° SKEW

STANDARD DRAWING NO. RDH-110-02

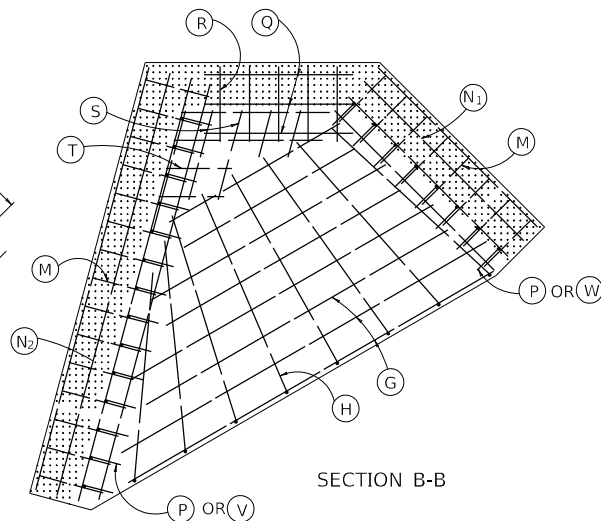
SUBMITTED _____ DIRECTOR DIVISION OF DESIGN _____ DATE _____
APPROVED _____ STATE HIGHWAY ENGINEER _____ DATE _____



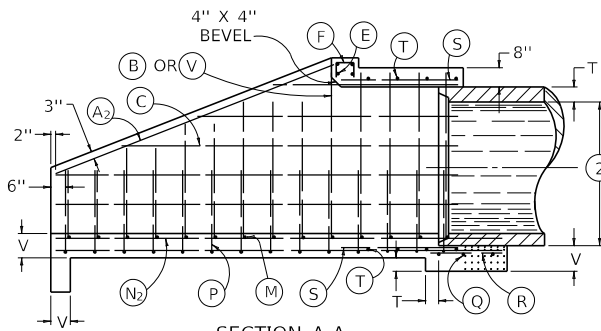
PLAN VIEW



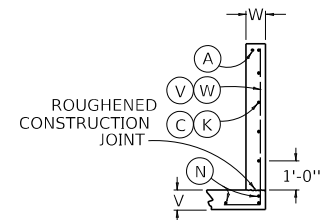
FRONT ELEVATION



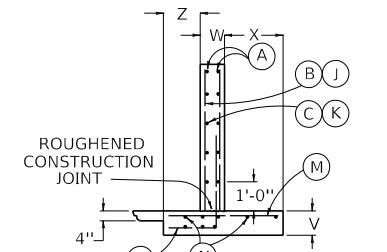
SECTION B-B



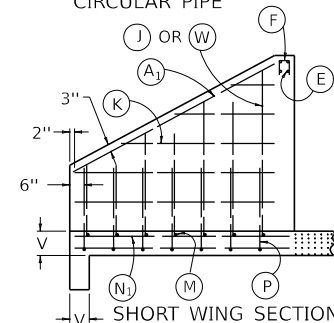
SECTION A-A



WING SECTION
30" TO 60" CIRCULAR PIPE
30" TO 72" NON-CIRCULAR PIPE



WING SECTION
66" TO 108"
CIRCULAR PIPE



(LAYOUT AND STEEL PATTERN)

KENTUCKY
DEPARTMENT OF HIGHWAYS

PIPE CULVERT
HEADWALLS
15° - 30° & 45° SKEW

STANDARD DRAWING NO. RDH-120-02

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN _____ DATE _____
APPROVED _____ STATE HIGHWAY ENGINEER _____ DATE _____

- ① DIAMETER OF CIRCULAR PIPE OR SPAN OF NON-CIRCULAR PIPE
- ② DIAMETER OF CIRCULAR PIPE OR RISE OF NON-CIRCULAR PIPE
3. [HATCH] APPLIES TO 66" DIAMETER AND GREATER. (CIRCULAR PIPE)
4. SEE CURRENT STANDARD DRAWINGS RDH-200 AND 300 SERIES FOR DIMENSIONS, QUANTITIES, AND BILL OF REINFORCEMENT.
5. DIMENSIONS FROM FACE OF CONCRETE TO STEEL SHALL BE 2" CLEAR DISTANCE.
6. ENCIRCLED LETTERS, ○, INDICATE STEEL BAR LOCATIONS
7. BARS (B), (C), (G), (P), (M), (V) ARE SPACED 1'-0" O.C. ALL OTHER BARS SHALL BE EVENLY SPACED.
8. BARS (B) AND (V) ARE PLACED IN ORDER OF INCREASING LENGTHS, BEGINNING AT THE END OF EACH WING.
9. BARS (C) ARE PLACED IN ORDER OF INCREASING LENGTHS, BEGINNING AT THE TOP OF EACH WING.
10. HEADWALLS LOCATED AT EDGE OF SHOULDER SHALL BE PARALLEL TO CENTERLINE OF THE ROAD.
11. APRON BETWEEN WINGS SHALL BE SLOPED IN DIRECTION OF FLOW EQUAL TO SLOPE OF PIPE. FRONT FACE OF HEADWALL AND ENDS OF WINGS SHALL REMAIN VERTICAL.

DIMENSION	DIAMETER OF PIPE														DIMENSION
	30"	36"	42"	48"	54"	60"	66"	72"	78"	84"	90"	96"	102"	108"	
A	3'-9"	4'-4"	4'-11"	5'-6"	6'-1"	6'-8"	7'-5"	8'-0"	8'-7"	9'-2"	9'-9"	10'-4"	10'-11"	11'-6"	A
B	1'-3"	1'-6"	1'-9"	2'-0"	2'-3"	2'-6"	2'-9"	3'-0"	3'-3"	3'-6"	3'-9"	4'-0"	4'-3"	4'-6"	B
C	3'-6"	4'-0"	4'-7"	5'-1"	5'-8"	6'-2"	7'-0"	7'-5"	8'-0"	8'-6"	9'-1"	9'-7"	10'-2"	10'-8"	C
E	3'-1"	3'-8"	4'-3"	4'-10"	5'-5"	6'-0"	6'-7"	7'-2"	7'-9"	8'-4"	8'-11"	9'-6"	10'-1"	10'-8"	E
F	4'-4"	5'-0"	5'-8"	6'-4"	7'-0"	7'-8"	8'-7"	9'-3"	9'-11"	10'-7"	11'-3"	11'-11"	12'-7"	13'-3"	F
H	7'-6"	8'-8"	10'-0"	11'-2"	12'-6"	13'-8"	15'-2"	16'-6"	17'-8"	19'-0"	20'-2"	21'-6"	22'-8"	24'-0"	H
J	3'-9"	4'-4"	5'-0"	5'-7"	6'-3"	6'-10"	7'-7"	8'-3"	8'-10"	9'-6"	10'-1"	10'-9"	11'-4"	12'-0"	J
M	0'-5"						0'-6"								M
T	0'-3.5"	0'-4.0"	0'-4.5"	0'-5.0"	0'-5.5"	0'-6.0"	0'-6.5"	0'-7.0"	0'-7.5"	0'-8.0"	0'-8.5"	0'-9.0"	0'-9.5"	0'-10.0"	T
V	0'-8"						1'-0"								V
W	0'-8"						0'-10"								W
X	----						2'-0"				2'-6"				X
Y	2'-0"						2'-6"				3'-0"				Y
Z	----						1'-3"				1'-9"				Z
CU.YDS.CONC. 2 HEADWALLS	3.36	4.30	5.35	6.53	7.82	9.22	18.76	20.95	23.25	25.67	31.48	34.31	37.25	40.32	CU.YDS.CONC. 2 HEADWALLS
LBS.STEEL 2 HEADWALLS	281	363	430	496	583	687	1320	1571	1815	2043	2451	2753	3050	3379	LBS.STEEL 2 HEADWALLS

DIMENSIONS AND QUANTITIES ARE BASED ON CONCRETE PIPE AND WILL VARY SLIGHTLY FOR CORRUGATED METAL PIPE.

USE WITH CUR. STD. DWG.RDH-110

KENTUCKY
DEPARTMENT OF HIGHWAYS

DIMENSIONS & QUANTITIES
30" - 108" HEADWALLS
CIRCULAR PIPE
0° SKEW

STANDARD DRAWING NO. RDH-210-03

SUBMITTED _____

DIRECTOR DIVISION OF DESIGN _____

DATE _____

APPROVED _____

STATE HIGHWAY ENGINEER _____

DATE _____

DIMENSION	DIAMETER OF PIPE														DIMENSION
	30"	36"	42"	48"	54"	60"	66"	72"	78"	84"	90"	96"	102"	108"	
A	4'-5"	5'-0"	5'-7"	6'-2"	6'-9"	7'-4"	7'-9"	8'-4"	8'-11"	9'-6"	10'-1"	10'-8"	11'-3"	11'-10"	A
B	1'-3"	1'-6"	1'-9"	2'-0"	2'-3"	2'-6"	2'-9"	3'-0"	3'-3"	3'-6"	3'-9"	4'-0"	4'-3"	4'-6"	B
C	3'-10"	4'-4"	4'-11"	5'-5"	6'-0"	6'-6"	7'-1"	7'-7"	8'-2"	8'-8"	9'-3"	9'-9"	10'-4"	10'-10"	C
E	3'-5"	4'-1"	4'-9"	5'-5"	6'-0"	6'-8"	7'-4"	8'-0"	8'-8"	9'-4"	9'-11"	10'-7"	11'-3"	11'-11"	E
F	5'-1"	5'-9"	6'-5"	7'-1"	7'-10"	8'-6"	8'-11"	9'-7"	10'-4"	11'-0"	11'-8"	12'-4"	13'-0"	13'-8"	F
G	4'-7"	5'-2"	5'-9"	6'-5"	7'-0"	7'-7"	8'-0"	8'-8"	9'-3"	9'-10"	10'-5"	11'-1"	11'-8"	12'-3"	G
H	7'-2"	8'-4"	9'-6"	10'-7"	11'-9"	12'-11"	13'-11"	15'-0"	16'-2"	17'-4"	18'-6"	19'-7"	20'-9"	21'-11"	H
J	4'-0"	4'-7"	5'-2"	5'-10"	6'-5"	7'-0"	7'-7"	8'-2"	8'-9"	9'-5"	10'-0"	10'-8"	11'-3"	11'-10"	J
M	0'-6"						0'-8"								M
N	0'-5"						0'-6"								N
P	1'-2"	1'-4"	1'-6"	1'-8"	1'-10"	2'-0"	2'-3"	2'-5"	2'-7"	2'-9"	3'-0"	3'-2"	3'-4"	3'-6"	P
Q	3'-11"	4'-6"	5'-1"	5'-8"	6'-3"	6'-10"	7'-7"	8'-2"	8'-9"	9'-4"	9'-11"	10'-6"	11'-1"	11'-8"	Q
R	0'-9"						1'-0"								R
T	0'-3.5"	0'-4.0"	0'-4.5"	0'-5.0"	0'-5.5"	0'-6.0"	0'-6.5"	0'-7.0"	0'-7.5"	0'-8.0"	0'-8.5"	0'-9.0"	0'-9.5"	0'-10.0"	T
V	0'-8"						1'-0"								V
W	0'-8"						0'-10"								W
X	----						2'-0"				2'-6"				X
Y	2'-0"						2'-6"				3'-0"				Y
Z	----						1'-3"				1'-9"				Z
CU.YDS.CONC. 2 HEADWALLS	3.76	4.89	6.15	7.55	9.07	10.73	21.24	23.75	26.39	29.16	35.43	38.66	42.03	45.54	CU.YDS.CONC. 2 HEADWALLS
LBS.STEEL 2 HEADWALLS	399	470	555	644	753	862	1689	1912	2148	2390	2937	3238	3582	3852	LBS.STEEL 2 HEADWALLS
DIMENSIONS AND QUANTITIES ARE BASED ON CONCRETE PIPE AND WILL VARY SLIGHTLY FOR CORRUGATED METAL PIPE.										USE WITH CUR. STD. DWG.RDH-120					
										KENTUCKY DEPARTMENT OF HIGHWAYS					
										DIMENSIONS & QUANTITIES 30"-108" HEADWALLS CIRCULAR PIPE 15° SKEW					
										STANDARD DRAWING NO. RDH-212-02					
										SUBMITTED _____ DIRECTOR, DIVISION OF DESIGN _____ DATE _____ APPROVED _____ STATE HIGHWAY ENGINEER _____ DATE _____					

DIMENSION	DIAMETER OF PIPE														DIMENSION
	30"	36"	42"	48"	54"	60"	66"	72"	78"	84"	90"	96"	102"	108"	
A	4'-5"	5'-0"	5'-7"	6'-2"	6'-9"	7'-4"	7'-9"	8'-4"	8'-11"	9'-6"	10'-1"	10'-8"	11'-3"	11'-10"	A
B	1'-3"	1'-6"	1'-9"	2'-0"	2'-3"	2'-6"	2'-9"	3'-0"	3'-3"	3'-6"	3'-9"	4'-0"	4'-3"	4'-6"	B
C	3'-10"	4'-4"	4'-11"	5'-5"	6'-0"	6'-6"	7'-1"	7'-7"	8'-2"	8'-8"	9'-3"	9'-9"	10'-4"	10'-10"	C
E	4'-3"	5'-0"	5'-10"	6'-7"	7'-5"	8'-2"	9'-0"	9'-9"	10'-7"	11'-5"	12'-2"	13'-0"	13'-9"	14'-7"	E
F	6'-3"	7'-1"	7'-11"	8'-9"	9'-7"	10'-4"	11'-0"	11'-9"	12'-7"	13'-5"	14'-3"	15'-1"	15'-11"	16'-9"	F
G	4'-7"	5'-2"	5'-9"	6'-5"	7'-0"	7'-7"	8'-0"	8'-8"	9'-3"	9'-10"	10'-5"	11'-1"	11'-8"	12'-3"	G
H	9'-10"	11'-4"	12'-11"	14'-5"	15'-11"	17'-6"	18'-10"	20'-4"	21'-11"	23'-5"	25'-0"	26'-6"	28'-0"	29'-7"	H
J	5'-6"	6'-4"	7'-2"	8'-0"	8'-10"	9'-8"	10'-4"	11'-2"	12'-0"	12'-10"	13'-8"	14'-6"	15'-4"	16'-2"	J
M	0'-6"						0'-8"								M
N	0'-3"						0'-4"								N
P	2'-7"	3'-0"	3'-5"	3'-10"	4'-3"	4'-8"	5'-2"	5'-7"	6'-0"	6'-5"	6'-10"	7'-3"	7'-8"	8'-1"	P
Q	3'-8"	4'-3"	4'-10"	5'-5"	6'-0"	6'-7"	7'-4"	7'-11"	8'-6"	9'-1"	9'-8"	10'-3"	10'-10"	11'-5"	Q
R	0'-10"						1'-0"								R
T	0'-3.5"	0'-4.0"	0'-4.5"	0'-5.0"	0'-5.5"	0'-6.0"	0'-6.5"	0'-7.0"	0'-7.5"	0'-8.0"	0'-8.5"	0'-9.0"	0'-9.5"	0'-10.0"	T
V	0'-8"						1'-0"								V
W	0'-8"						0'-10"								W
X	----						2'-0"				2'-6"				X
Y	2'-0"						2'-6"				3'-0"				Y
Z	----						1'-3"				1'-9"				Z
CU.YDS,CONC. 2 HEADWALLS	4.96	6.45	8.12	9.97	12.01	14.22	26.64	29.92	33.37	37.01	44.75	48.98	53.39	58.00	CU.YDS,CONC. 2 HEADWALLS
LBS,STEEL 2 HEADWALLS	474	579	683	795	947	1112	2134	2440	2761	3113	3697	4170	4568	4948	LBS,STEEL 2 HEADWALLS
DIMENSIONS AND QUANTITIES ARE BASED ON CONCRETE PIPE AND WILL VARY SLIGHTLY FOR CORRUGATED METAL PIPE.										USE WITH CUR. STD. DWG. RDH-120					
										KENTUCKY DEPARTMENT OF HIGHWAYS					
										DIMENSIONS & QUANTITIES 30" - 108" HEADWALLS CIRCULAR PIPE 30° SKEW					
										STANDARD DRAWING NO. RDH-214-03					
										SUBMITTED _____ DIRECTOR DIVISION OF DESIGN _____ DATE _____					
										APPROVED _____ STATE HIGHWAY ENGINEER _____ DATE _____					

DIMENSION	DIAMETER OF PIPE														DIMENSION
	30"	36"	42"	48"	54"	60"	66"	72"	78"	84"	90"	96"	102"	108"	
A	4'-5"	5'-0"	5'-7"	6'-2"	6'-9"	7'-4"	7'-9"	8'-4"	8'-11"	9'-6"	10'-1"	10'-8"	11'-3"	11'-10"	A
B	1'-3"	1'-6"	1'-9"	2'-0"	2'-3"	2'-6"	2'-9"	3'-0"	3'-3"	3'-6"	3'-9"	4'-0"	4'-3"	4'-6"	B
C	3'-10"	4'-4"	4'-11"	5'-5"	6'-0"	6'-6"	7'-1"	7'-7"	8'-2"	8'-8"	9'-3"	9'-9"	10'-4"	10'-10"	C
E	5'-11"	7'-1"	8'-3"	9'-4"	10'-6"	11'-7"	12'-9"	13'-10"	15'-0"	16'-1"	17'-3"	18'-4"	19'-6"	20'-7"	E
F	8'-10"	10'-0"	11'-2"	12'-4"	13'-6"	14'-8"	15'-6"	16'-8"	17'-10"	19'-0"	20'-2"	21'-4"	22'-6"	23'-8"	F
G	4'-7"	5'-2"	5'-9"	6'-5"	7'-0"	7'-7"	8'-0"	8'-8"	9'-3"	9'-10"	10'-5"	11'-1"	11'-8"	12'-3"	G
H	14'-9"	17'-1"	19'-5"	21'-8"	24'-0"	26'-3"	28'-3"	30'-6"	32'-10"	35'-1"	37'-5"	39'-8"	42'-0"	44'-3"	H
J	7'-9"	8'-11"	10'-1"	11'-3"	12'-5"	13'-6"	14'-6"	15'-8"	16'-9"	17'-11"	19'-1"	20'-3"	21'-5"	22'-7"	J
M	0'-6"						0'-8"								M
N	0'-2"						0'-3"								N
P	4'-10"	5'-8"	6'-6"	7'-4"	8'-2"	9'-0"	9'-11"	10'-9"	11'-7"	12'-5"	13'-3"	14'-1"	14'-11"	15'-9"	P
Q	3'-5"	4'-0"	4'-7"	5'-2"	5'-9"	6'-4"	7'-0"	7'-7"	8'-2"	8'-9"	9'-4"	9'-11"	10'-6"	11'-1"	Q
R	0'-10"						1'-0"								R
T	0'-3.5"	0'-4.0"	0'-4.5"	0'-5.0"	0'-5.5"	0'-6.0"	0'-6.5"	0'-7.0"	0'-7.5"	0'-8.0"	0'-8.5"	0'-9.0"	0'-9.5"	0'-10.0"	T
V	0'-8"						1'-0"								V
W	0'-8"						0'-10"								W
X	----						2'-0"				2'-6"				X
Y	2'-0"						2'-6"				3'-0"				Y
Z	----						1'-3"				1'-9"				Z
CU,YDS,CONC. 2 HEADWALLS	7.19	9.36	11.80	14.52	17.50	20.75	36.82	41.52	46.50	51.74	62.30	68.38	74.74	81.38	CU,YDS,CONC. 2 HEADWALLS
LBS,STEEL 2 HEADWALLS	639	768	965	1132	1353	1525	3046	3545	3963	4447	5261	5910	6537	7150	LBS,STEEL 2 HEADWALLS
DIMENSIONS AND QUANTITIES ARE BASED ON CONCRETE PIPE AND WILL VARY SLIGHTLY FOR CORRUGATED METAL PIPE.															USE WITH CUR. STD. DWG. RDH-120
															KENTUCKY DEPARTMENT OF HIGHWAYS
															DIMENSIONS & QUANTITIES 30"-108" H-WALLS CIRCULAR PIPE 45° SKEW
															STANDARD DRAWING NO. RDH-216-02
															SUBMITTED _____ DIRECTOR DIVISION OF DESIGN _____ DATE _____
															APPROVED _____ STATE HIGHWAY ENGINEER _____ DATE _____

DIMENSION	NON-CIRCULAR PIPE : EQUIVALENT ROUND SIZES								DIMENSION
	30"	36"	42"	48"	54"	60"	66"	72"	
A	3'-4"	3'-10"	4'-4"	4'-9"	5'-3"	5'-9"	6'-3"	6'-9"	A
B	1'-0"	1'-3"	1'-5"	1'-7"	1'-10"	2'-0"	2'-3"	2'-5"	B
C	3'-0"	3'-6"	3'-11"	4'-4"	4'-9"	5'-3"	5'-8"	6'-2"	C
E	3'-10"	4'-6"	5'-3"	5'-11"	6'-8"	7'-5"	8'-1"	8'-10"	E
F	3'-10"	4'-5"	5'-0"	5'-6"	6'-1"	6'-8"	7'-3"	7'-10"	F
G	3'-10"	4'-5"	5'-0"	5'-6"	6'-1"	6'-8"	7'-3"	7'-10"	G
H	7'-8"	9'-0"	10'-4"	11'-4"	12'-8"	14'-0"	15'-4"	16'-8"	H
J	3'-10"	4'-6"	5'-2"	5'-8"	6'-4"	7'-0"	7'-8"	8'-4"	J
M	0'-5"								M
N	0'-5"								N
T	0'-3.75"	0'-4.5"	0'-5.0"	0'-5.5"	0'-6.0"	0'-6.5"	0'-7.0"	0'-7.5"	T
V	0'-8"								V
W	0'-8"								W
Y	2'-0"								Y
CU.YDS,CONC. 2 HEADWALLS	3.07	3.94	4.86	5.76	6.89	8.16	9.47	10.95	CU.YDS,CONC. 2 HEADWALLS
LBS,STEEL 2 HEADWALLS	274	314	393	440	521	610	681	801	LBS,STEEL 2 HEADWALLS

DIMENSIONS AND QUANTITIES ARE BASED ON CONCRETE PIPE AND WILL VARY SLIGHTLY FOR CORRUGATED METAL PIPE.

USE WITH CUR. STD. DWG. RDH-110

KENTUCKY DEPARTMENT OF HIGHWAYS	
DIMENSIONS & QUANTITIES 30"-72" HEADWALLS NON-CIRCULAR PIPE 0° SKEW	
STANDARD DRAWING NO. RDH-220-02	
SUBMITTED _____ DIRECTOR DIVISION OF DESIGN	DATE _____
APPROVED _____ STATE HIGHWAY ENGINEER	DATE _____

DIMENSION	NON-CIRCULAR PIPE : EQUIVALENT ROUND SIZES								DIMENSION
	30"	36"	42"	48"	54"	60"	66"	72"	
A	4'-0"	4'-6"	5'-0"	5'-5"	5'-11"	6'-5"	6'-11"	7'-5"	A
B	1'-0"	1'-3"	1'-5"	1'-7"	1'-10"	2'-0"	2'-3"	2'-5"	B
C	3'-4"	3'-10"	4'-3"	4'-8"	5'-1"	5'-7"	6'-0"	6'-6"	C
E	4'-3"	5'-0"	5'-10"	6'-7"	7'-5"	8'-3"	9'-0"	9'-10"	E
F	4'-7"	5'-2"	5'-9"	6'-3"	6'-10"	7'-5"	8'-0"	8'-7"	F
G	4'-1"	4'-8"	5'-2"	5'-7"	6'-2"	6'-8"	7'-2"	7'-8"	G
H	7'-7"	8'-10"	10'-1"	11'-2"	12'-5"	13'-8"	14'-10"	16'-1"	H
J	4'-1"	4'-9"	5'-5"	6'-0"	6'-7"	7'-3"	7'-11"	8'-7"	J
M	0'-6"								M
N	0'-5"								N
P	1'-4"	1'-7"	1'-10"	2'-0"	2'-3"	2'-5"	2'-8"	2'-11"	P
Q	4'-7"	5'-4"	6'-1"	6'-9"	7'-6"	8'-3"	8'-11"	9'-8"	Q
R	0'-9"								R
T	0'-3.75"	0'-4.5"	0'-5.0"	0'-5.5"	0'-6.0"	0'-6.5"	0'-7.0"	0'-7.5"	T
V	0'-8"								V
W	0'-8"								W
Y	2'-0"								Y
CU.YDS,CONC. 2 HEADWALLS	4.10	5.22	6.42	7.60	9.08	10.68	12.35	14.20	CU.YDS,CONC. 2 HEADWALLS
LBS,STEEL 2 HEADWALLS	372	463	536	642	735	847	964	1113	LBS,STEEL 2 HEADWALLS

DIMENSIONS AND QUANTITIES ARE BASED ON CONCRETE PIPE AND WILL VARY SLIGHTLY FOR CORRUGATED METAL PIPE.

USE WITH CUR. STD. DWG. RDH-120

KENTUCKY DEPARTMENT OF HIGHWAYS	
DIMENSIONS & QUANTITIES 30" - 72" HEADWALLS NON-CIRCULAR PIPE 15° SKEW	
STANDARD DRAWING NO. RDH-222-02	
SUBMITTED _____ DIRECTOR DIVISION OF DESIGN	_____ DATE
APPROVED _____ STATE HIGHWAY ENGINEER	_____ DATE

DIMENSION	NON-CIRCULAR PIPE : EQUIVALENT ROUND SIZES								DIMENSION
	30"	36"	42"	48"	54"	60"	66"	72"	
A	4'-0"	4'-6"	5'-0"	5'-5"	5'-11"	6'-5"	6'-11"	7'-5"	A
B	1'-0"	1'-3"	1'-5"	1'-7"	1'-10"	2'-0"	2'-3"	2'-5"	B
C	3'-4"	3'-10"	4'-3"	4'-8"	5'-1"	5'-7"	6'-0"	6'-6"	C
E	5'-2"	6'-2"	7'-2"	8'-1"	9'-1"	10'-2"	11'-1"	12'-1"	E
F	5'-7"	6'-4"	7'-1"	7'-8"	8'-4"	9'-1"	9'-9"	10'-6"	F
G	4'-1"	4'-8"	5'-2"	5'-7"	6'-2"	6'-8"	7'-2"	7'-8"	G
H	10'-2"	11'-10"	13'-6"	14'-11"	16'-7"	18'-3"	19'-10"	21'-6"	H
J	5'-6"	6'-5"	7'-3"	8'-0"	8'-10"	9'-8"	10'-6"	11'-4"	J
M	0'-6"								M
N	0'-3"								N
P	3'-1"	3'-7"	4'-1"	4'-7"	5'-1"	5'-8"	6'-1"	6'-8"	P
Q	4'-4"	5'-1"	5'-10"	6'-6"	7'-3"	8'-0"	8'-8"	9'-5"	Q
R	0'-10"								R
T	0'-3.75"	0'-4.5"	0'-5.0"	0'-5.5"	0'-6.0"	0'-6.5"	0'-7.0"	0'-7.5"	T
V	0'-8"								V
W	0'-8"								W
Y	2'-0"								Y
CU.YDS.CONC. 2 HEADWALLS	5.27	6.81	8.46	10.04	12.07	14.28	16.58	19.08	CU.YDS.CONC. 2 HEADWALLS
LBS.STEEL 2 HEADWALLS	482	597	712	846	966	1146	1282	1467	LBS.STEEL 2 HEADWALLS

DIMENSIONS AND QUANTITIES ARE BASED ON CONCRETE PIPE AND WILL VARY SLIGHTLY FOR CORRUGATED METAL PIPE.

USE WITH CUR. STD. DWG.RDH-120

KENTUCKY DEPARTMENT OF HIGHWAYS	
DIMENSIONS & QUANTITIES 30" - 72" HEADWALLS NON-CIRCULAR PIPE 30° SKEW	
STANDARD DRAWING NO. RDH-224-02	
SUBMITTED _____ DIRECTOR DIVISION OF DESIGN	DATE _____
APPROVED _____ STATE HIGHWAY ENGINEER	DATE _____

DIMENSION	NON-CIRCULAR PIPE : EQUIVALENT ROUND SIZES								DIMENSION
	30"	36"	42"	48"	54"	60"	66"	72"	
A	4'-0"	4'-6"	5'-0"	5'-5"	5'-11"	6'-5"	6'-11"	7'-5"	A
B	1'-0"	1'-3"	1'-5"	1'-7"	1'-10"	2'-0"	2'-3"	2'-5"	B
C	3'-4"	3'-10"	4'-3"	4'-8"	5'-1"	5'-7"	6'-0"	6'-6"	C
E	7'-4"	8'-8"	10'-2"	11'-5"	12'-11"	14'-4"	15'-7"	17'-1"	E
F	7'-11"	9'-0"	10'-0"	10'-10"	11'-10"	12'-10"	13'-10"	14'-10"	F
G	4'-1"	4'-8"	5'-2"	5'-7"	6'-2"	6'-8"	7'-2"	7'-8"	G
H	15'-3"	17'-8"	20'-2"	22'-3"	24'-9"	27'-2"	29'-5"	31'-11"	H
J	7'-8"	8'-11"	10'-1"	11'-1"	12'-3"	13'-5"	14'-6"	15'-8"	J
M	0'-6"								M
N	0'-2"								N
P	5'-10"	6'-10"	7'-11"	8'-10"	9'-11"	11'-0"	11'-11"	13'-0"	P
Q	4'-2"	4'-10"	5'-7"	6'-3"	7'-0"	7'-9"	8'-5"	9'-2"	Q
R	0'-10"								R
T	0'-3.75"	0'-4.5"	0'-5.0"	0'-5.5"	0'-6.0"	0'-6.5"	0'-7.0"	0'-7.5"	T
V	0'-8"								V
W	0'-8"								W
Y	2'-0"								Y
CU.YDS,CONC. 2 HEADWALLS	7.64	9.81	12.36	14.68	17.83	21.04	24.48	28.29	CU.YDS,CONC. 2 HEADWALLS
LBS,STEEL 2 HEADWALLS	679	861	1015	1233	1428	1696	1885	2163	LBS,STEEL 2 HEADWALLS

DIMENSIONS AND QUANTITIES ARE BASED ON CONCRETE PIPE AND WILL VARY SLIGHTLY FOR CORRUGATED METAL PIPE.

USE WITH CUR. STD. DWG. RDH-120

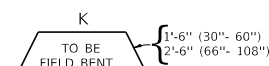
KENTUCKY DEPARTMENT OF HIGHWAYS		
DIMENSIONS & QUANTITIES 30" - 72" HEADWALLS NON-CIRCULAR PIPE 45° SKEW		
STANDARD DRAWING NO. RDH-226-02		
SUBMITTED	DIRECTOR DIVISION OF DESIGN	DATE
APPROVED	STATE HIGHWAY ENGINEER	DATE

MARK K	SIZE	NO		LGTH		K		MARK K	SIZE	NO		LGTH		K	
		①		FT	IN	FT	IN			①		FT	IN	FT	IN
96"								102" (CONTINUED)							
A	5	4	13	0				G ₃	4	3	19	2			
B ₁	5	8	4	1				G ₄	4	3	21	7			
B ₂	5	8	5	0				H	4	11	13	3	10	7	
B ₃	5	8	5	11				M	4	26	4	9			
B ₄	5	8	6	10				N	4	16	12	5			
B ₅	5	8	7	10				P	7	26	7	0	4	9	
B ₆	5	8	8	9				Q	5	4	9	9			
C ₁	4	4	3	0				R	5	10	3	4			
C ₂	4	4	5	2											
C ₃	4	4	7	3											
C ₄	4	4	9	5				108"							
C ₅	4	4	11	7				A	5	4	14	6			
C ₆	4	12	11	9				B ₁	5	8	4	7			
E ₁	5	2	14	9	9	9		B ₂	5	8	5	6			
E ₂	5	2	15	3	10	3		B ₃	5	8	6	5			
F	4	10	1	9	0	6		B ₄	5	8	7	4			
G ₁	4	3	10	9				B ₅	5	8	8	3			
G ₂	4	3	14	3				B ₆	5	8	9	3			
G ₃	4	3	17	9				B ₇	5	8	10	2			
G ₄	4	3	20	0				C ₁	4	4	3	3			
H	4	10	12	8	10	0		C ₂	4	4	5	5			
M	4	24	4	9				C ₃	4	4	7	7			
N	4	16	11	9				C ₄	4	4	9	8			
P	6	24	6	9	4	6		C ₅	4	4	11	10			
Q	5	4	9	2				C ₆	4	16	13	1			
R	5	10	3	3				E ₁	5	2	15	10	10	10	
								E ₂	5	2	16	5	11	5	
								F	4	11	1	9	0	6	
102"								G ₁	4	1	9	10			
A	5	4	13	9				G ₂	4	3	13	4			
B ₁	5	8	4	4				G ₃	4	3	16	10			
B ₂	5	8	5	3				G ₄	4	3	20	3			
B ₃	5	8	6	2				G ₅	4	3	22	7			
B ₄	5	8	7	2				H	4	11	13	10	11	2	
B ₅	5	8	8	1				M	4	28	4	9			
B ₆	5	8	9	0				N	4	16	13	1			
B ₇	5	4	9	11				P	7	28	7	3	5	0	
C ₁	4	4	2	0				Q	5	4	10	4			
C ₂	4	4	4	2				R	5	11	3	4			
C ₃	4	4	6	4											
C ₄	4	4	8	6											
C ₅	4	4	10	7											
C ₆	4	16	12	5											
E ₁	5	2	15	4	10	4									
E ₂	5	2	15	10	10	10									
F	4	10	1	9	0	6									
G ₁	4	3	12	1											
G ₂	4	3	15	8											

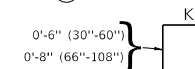
NOTES

- ① NUMBER OF BARS IN ONE HEADWALL.
- 2 DIMENSIONS ARE 0. TO 0. OF BARS.
- 3 ALL BARS ARE STRAIGHT EXCEPT THOSE SHOWN BELOW.

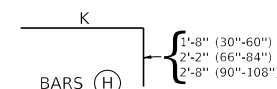
BENT BAR SHAPES



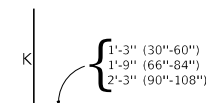
BARS (E)



BARS (F)



BARS (H)



BARS (P) AND (V)

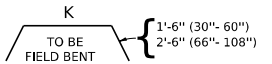
(USE WITH CURRENT RDH-110)

KENTUCKY DEPARTMENT OF HIGHWAYS	
BILL OF REINFORCEMENT 96" TO 108" DIAMETER CIRCULAR PIPE HEADWALLS 0° SKEW	
STANDARD DRAWING NO. RDH-312-04	
SUBMITTED _____	DIRECTOR DIVISION OF DESIGN _____
APPROVED _____	STATE HIGHWAY ENGINEER _____
DATE _____	DATE _____

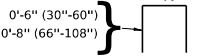
M A R K	S I Z E	NO	LGTH	K		M A R K	S I Z E	NO	LGTH	K		M A R K	S I Z E	NO	LGTH	K		M A R K	S I Z E	NO	LGTH	K		M A R K	S I Z E	NO	LGTH	K						
	①	FT	IN	FT	IN		①	FT	IN	FT	IN		①	FT	IN	FT	IN		①	FT	IN	FT	IN		①	FT	IN	FT	IN					
30"					36" (CONTINUED)					48"					54" (CONTINUED)					60" (CONTINUED)					72"									
A1	5	2	5	0		R	4	4	0	10		A1	5	2	7	0		K2	4	1	3	4		V3	5	2	6	3	5	0				
A2	5	2	5	6		T	5	4	2	10		A2	5	2	7	9		K4	4	2	6	10		V5	5	3	7	9	6	6				
C1	4	1	2	7		V1	5	2	3	4	2	1	C1	4	1	4	5		N1	4	3	6	10		V6	5	2	4	4	3	1			
C2	4	1	4	8		V2	5	2	4	3	3	0	C2	4	1	6	6		N2	4	3	7	7		V6	5	2	5	5	4	2			
C3	4	1	6	3		V3	5	2	5	3	4	0	C3	4	1	8	8		Q	4	2	5	1		V6	5	2	6	5	5	2			
E1	5	2	6	9	3	9	V4	5	3	5	7	4	4	C4	4	1	8	10		R	4	6	0	11		V6	5	2	7	6	6	3		
E2	5	2	7	0	4	0	V6	5	2	3	4	2	1	E1	5	2	8	9	5	9	S1	5	4	1	4									
F	4	4	1	3	0	4	V6	5	2	4	5	3	2	E2	5	2	9	0	6	0	S2	5	4	1	9									
G1	4	1	3	7		V6	5	1	5	6	4	3	F	4	6	1	3	0	4	T	5	4	4	0										
G2	4	3	4	5									G1	4	2	5	5			V1	5	2	4	0	2	9	66"							
G3	4	3	6	2									G2	4	3	7	11			V2	5	2	5	0	3	9								
H	4	4	6	7	4	11							G3	4	3	9	8			V3	5	2	6	0	4	9	A1	5	2	8	11			
K1	4	1	1	1		42"					K1	4	1	2	4				V4	5	2	6	11	5	8	A2	5	2	9	9				
K2	4	1	2	11		A1	5	2	6	4			K2	4	1	4	1			V5	5	2	7	2	5	11	B1	5	4	2	10			
K3	4	1	4	5		A2	5	2	7	0			K3	4	1	6	0			V6	5	2	4	0	2	9	B2	5	4	3	9			
N1	4	3	4	4		A2	5	2	7	0			K4	4	1	6	0			V6	5	2	5	1	3	10	B3	5	4	4	9			
N2	4	3	4	11		C1	4	1	3	2			K4	4	1	6	2			V6	5	2	6	2	4	11	B4	5	4	5	8			
Q	4	2	2	9		C2	4	1	5	2			N1	4	3	6	3			V6	5	1	7	2	5	11	B5	5	6	6	7			
R	4	3	0	9		C3	4	1	7	3			N2	4	3	7	0									C1	4	2	4	5				
S	5	6	1	0		C4	4	1	8	0			Q	4	2	4	6									C2	4	2	6	5				
T	5	4	2	9		E1	5	2	8	1	5	1	R	4	5	0	10									C3	4	2	8	6				
V1	5	2	3	1	1	10	E2	5	2	8	4	5	4	S1	5	4	1	2			60"					C4	4	2	10	7				
V2	5	2	4	0	2	9	F	4	5	1	3	0	4	S2	5	4	1	9								C5	4	4	11	4				
V3	5	3	5	1	3	10	G1	4	2	5	0			T	5	4	3	1			A1	5	2	8	4		E1	5	2	12	8	7	8	
V6	5	2	3	1	1	10	G2	4	2	6	9			V1	5	2	3	10	2	7	A2	5	2	9	2		E2	5	2	13	1	8	1	
V6	5	2	4	2	2	11	G3	4	3	8	5			V2	5	2	4	9	3	6	C1	4	1	5	1		F	4	8	1	9	0	6	
V6	5	1	5	4	4	1	H	4	5	7	9	6	1	V3	5	2	5	9	4	6	C2	4	1	7	2		G1	4	1	6	3			
						K1	4	1	1	3				V4	5	3	6	8	5	5	C3	4	1	9	3		G2	4	3	8	7			
						K2	4	1	3	1				V6	5	2	3	10	2	7	C4	4	2	10	6		G3	4	3	11	2			
						K3	4	1	4	11				V6	5	2	4	11	3	8	E1	5	2	10	0	7	0	G4	4	3	12	10		
						K4	4	1	5	7				V6	5	2	5	11	4	8	E2	5	2	10	3	7	3	H	4	7	10	7	8	5
						N1	4	3	5	8											F	4	7	1	3	0	4	J1	5	4	2	10		
A1	5	2	5	8		N2	4	3	6	2										G1	4	3	7	7		J2	5	4	3	11				
A2	5	2	6	3		Q	4	2	3	11										G2	4	3	10	2		J3	5	4	5	0				
C1	4	1	3	11		R	4	4	0	10			54"					G3	4	3	11	10			H	4	6	9	6	7	10			
C2	4	1	5	11		S	5	6	1	1			A1	5	2	7	9			K1	4	1	2	6		K2	4	2	3	7				
C3	4	1	7	2		T	5	4	3	0			A2	5	2	8	5			K2	4	1	4	5		K3	4	2	5	5				
E1	5	2	7	5	4	5	V1	5	2	3	7	2	4	C1	4	1	3	9			K3	4	1	6	3		K4	4	2	7	4			
E2	5	2	7	8	4	8	V2	5	2	4	6	3	3	C2	4	1	5	10			K4	4	2	7	5		K5	4	4	7	10			
F	4	5	1	3	0	4	V3	5	2	5	6	4	3	C3	4	1	7	11			N1	4	3	7	5		M	4	19	7	9			
G1	4	1	4	0		V4	5	3	6	1	4	10	C4	4	2	9	8			N2	4	3	8	3		N1	4	7	7	10				
G2	4	2	5	7		V6	5	2	3	7	2	4	E1	5	2	9	4	6	4	Q	4	2	5	8		N2	4	7	11	4				
G3	4	3	7	3		V6	5	2	4	8	3	5	E2	5	2	9	7	6	7	R	4	6	0	11		P	5	19	5	0	3	3		
H	4	4	7	2	5	6	V6	5	2	5	9	4	6	F	4	7	1	3	0	4	S1	5	6	1	3		Q	5	3	6	10			
K1	4	1	2	1										G1	4	3	6	5			S2	5	4	2	3		R	5	7	2	9			
K2	4	1	3	11										G2	4	3	8	0			T1	5	2	1	6		S1	5	8	1	3			
K3	4	1	5	0										G3	4	3	10	9			T2	5	4	4	3		S2	5	4	2	3			
N1	4	3	5	0										H	4	6	8	11	7	3	V1	5	2	4	3	3	0	T1	5	2	1	6		
N2	4	3	5	7										K1	4	1	1	5			V2	5	2	5	3	4	0	T2	5	4	5	9		
Q	4	2	3	4																														

- NOTES**
- NUMBER OF BARS IN ONE HEADWALL.
 - DIMENSIONS ARE 0. TO 0. OF BARS.
 - ALL BARS ARE STRAIGHT EXCEPT THOSE SHOWN BELOW.

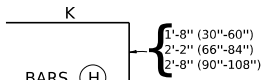
BENT BAR SHAPES



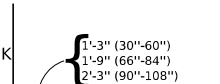
BARS (E)



BARS (F)



BARS (H)



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

(USE WITH CURRENT RDH-120)

KENTUCKY
DEPARTMENT OF HIGHWAYS
BILL OF REINFORCEMENT
30" TO 72" DIAMETER
CIRCULAR PIPE HEADWALLS
15° SKEW

STANDARD DRAWING NO. RDH-320-04

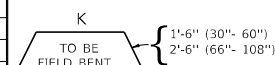
SUBMITTED _____ DIRECTOR DIVISION OF DESIGN _____ DATE _____
APPROVED _____ STATE HIGHWAY ENGINEER _____ DATE _____

NOTES		
①	NUMBER OF BARS IN ONE HEADWALL.	
2	DIMENSIONS ARE 0. TO 0. OF BARS.	
3	ALL BARS ARE STRAIGHT EXCEPT THOSE SHOWN BELOW.	
BENT BAR SHAPES		
 K TO BE FIELD BENT BARS (E)		
 0'-6" (30"-60") 0'-8" (66"-108") BARS (F)		
 K BARS (H)		
 K BARS (P) AND (V)		
(USE WITH CURRENT RDH-120)		
KENTUCKY DEPARTMENT OF HIGHWAYS <i>BILL OF REINFORCEMENT</i> <i>78" TO 108" DIAMETER</i> <i>CIRCULAR PIPE HEADWALLS</i> <i>15° SKEW</i>		
STANDARD DRAWING NO. RDH-322-04		
SUBMITTED _____	DIRECTOR DIVISION OF DESIGN _____	DATE _____
APPROVED _____	STATE HIGHWAY ENGINEER _____	DATE _____

MARK	SIZE	NO	LGTH	K		MARK	SIZE	NO	LGTH	K		MARK	SIZE	NO	LGTH	K		MARK	SIZE	NO	LGTH	K		MARK	SIZE	NO	LGTH	K		MARK	SIZE	NO	LGTH	K							
		①	FT	IN	FT	IN			①	FT	IN	FT	IN			①	FT	IN	FT	IN			①	FT	IN	FT	IN			①	FT	IN	FT	IN			①	FT	IN	FT	IN
30"						36" (CONTINUED)						42" (CONTINUED)						54" (CONTINUED)						60" (CONTINUED)						66" (CONTINUED)											
A1	5	2	5	0			N1	4	3	5	0			W6	5	2	4	7	3	4	6	E1	5	2	10	9	7	9	N1	4	3	7	5			K4	4	2	7	1	
A2	5	2	6	9			N2	4	3	6	10			W6	5	2	5	9	4	6		E2	5	2	10	11	7	11	N2	4	3	10	2			K5	4	4	7	10	
C1	4	1	4	1			R	4	2	0	10										F	4	8	1	3	0	4	Q	4	2	5	8			M	4	24	3	9		
C2	4	1	6	7			S1	5	4	1	3										G1	4	3	7	11			R	4	6	0	11			N1	4	7	7	10		
C3	4	1	8	9			S2	5	4	2	3										G2	4	3	11	7			S1	5	6	1	5			N2	4	7	16	1		
E1	5	2	7	7	4	7	T1	5	2	1	6			48"								G3	4	3	14	5			S2	5	6	3	8			P	5	24	5	0	3
E2	5	2	7	9	4	9	T2	5	4	3	3			A1	5	2	7	0			K1	4	1	1	6			T1	5	4	2	10			Q	5	3	6	3		
F	4	5	1	3	0	4	V1	5	2	3	3	2	0	A2	5	2	9	2			K2	4	1	3	5			V1	5	2	4	3	3	0	S1	5	4	1	3		
G1	4	1	3	6			V2	5	2	4	1	2	10	C1	4	1	7	0			K3	4	1	3	5			V2	5	2	5	0	3	9	S2	5	4	2	8		
G2	4	2	5	9			V3	5	2	4	10	3	7	C2	4	1	9	7			K4	4	2	6	10			V3	5	2	5	10	4	7	S3	5	4	4	2		
G3	4	3	8	4			V4	5	5	5	7	4	4	C3	4	1	12	1			N1	4	3	6	10			V4	5	2	6	7	5	4	T1	5	4	3	3		
H	4	5	6	4	4	8	W6	5	2	3	4	2	1	C4	4	1	12	5			N2	4	3	9	4			V5	5	2	7	4	6	1	T2	5	4	5	3		
K1	4	1	1	1			W6	5	2	4	5	3	2	E1	5	2	9	11	6	11	Q	4	2	5	1			V6	5	5	7	9	6	6							
K2	4	1	2	11			W6	5	1	5	6	4	3	E2	5	2	10	1	7	1	R	4	6	0	11			W6	5	2	4	4	3	1							
K3	4	1	4	4										F	4	7	1	3	0	4	S1	5	6	1	6			W6	5	2	5	4	4	1							
N1	4	3	4	5										G1	4	2	6	7			S2	5	4	3	2			W6	5	2	6	5	5	1							
N2	4	3	6	0										G2	4	2	10	2			T1	5	4	2	3			W6	5	2	7	5	6	2							
Q	4	2	2	9			42"								G3	4	3	12	11			T2	5	4	4	6															
R	4	3	0	9										H	4	7	8	4	6	8	V1	5	2	4	0	2	9														
S1	5	2	1	3			A1	5	2	6	4			K1	4	1	2	4			V2	5	2	4	9	3	6														
S2	5	4	2	3			A2	5	2	8	3			K2	4	1	4	2			V3	5	2	5	7	4	4	66"													
T1	5	2	1	3			C1	4	1	5	3			K3	4	1	6	0			V4	5	2	6	4	5	1	66"													
T2	5	4	2	3			C2	4	1	7	10			K4	4	1	6	3			V5	5	2	7	1	5	10	A1	5	2	8	11									
V1	5	2	3	0	1	9	C3	4	1	10	4			N1	4	3	6	2			V6	5	4	7	2	5	11	A2	5	2	11	6									
V2	5	2	3	10	2	7	C4	4	1	11	2			N2	4	3	8	6			W6	5	2	3	1	2	10	B1	5	4	2	9									
V3	5	2	4	8	3	5	E1	5	2	9	2	6	2	Q	4	2	4	6			W6	5	2	4	2	3	11	B2	5	4	3	6									
V4	5	3	4	10	3	10	E2	5	2	9	4	6	4	R	4	5	0	10			W6	5	2	6	3	5	0	B3	5	4	4	4									
W6	5	2	3	1	1	10	F	4	6	1	3	0	4	S1	5	4	1	6			W6	5	1	7	4	6	1	B4	5	4	5	1									
W6	5	2	4	3	3	0	G1	4	1	5	11			S2	5	4	2	9									B5	5	4	5	11										
W6	5	1	5	4	4	1	G2	4	3	8	8			T1	5	2	2	0									B6	5	12	6	6										
							G3	4	3	11	4			T2	5	4	3	9									C1	4	2	7	7										
							H	4	7	7	9	6	1	V1	5	2	3	9	2	6	60"														C2	4	2	10	1		
							K1	4	1	1	3			V2	5	2	4	6	3	3	60"														C3	4	2	12	8		
							K2	4	1	3	1			V3	5	2	5	4	4	1	A1	5	2	8	5			C4	4	2	15	1									
							K3	4	1	4	11			V4	5	2	6	1	4	10	A2	5	2	10	11			C5	4	4	16	1									
A1	5	2	5	8			K4	4	1	5	7			V5	5	5	6	8	5	5	C1	4	1	8	2			E1	5	2	14	4	9	4							
A2	5	2	7	5			N1	4	3	6	0			W6	5	2	3	10	2	7	C2	4	1	10	9			E2	5	2	14	8	9	8							
C1	4	1	6	2			N2	4	3	7	9			W6	5	2	4	11	3	8	C3	4	1	13	5			F	4	10	1	9	0	6							
C2	4	1	8	9			Q	4	2	3	11			W6	5	2	6	0	4	9	C4	4	2	14	11			G1	4	1	9	0									
C3	4	1	10	0			R	4	4	0	10										E1	5	2	11	6	8	6	G2	4	3	11	0									
E1	5	2	8	4	5	4	S1	5	2	1	3										E2	5	2	11	8	8	8	G3	4	3	14	10									
E2	5	2	8	6	5	6	S2	5	2	2	4										F	4	9	1	3	0	4	G4	4	3	17	3									
F	4	6	1	3	0	4	T1	5	2	2	0			54"								G1	4	3	9	4			H	4	9	10	6	8	4						
G1	4	1	4	8			T2	5	4	3	6										G2	4	3	13	3			J1	5	4	2	9									
G2	4	2	7	3			V1	5	2	3	6	2	3	A1	5	2	7	8			G3	4	3	16	0			J2	5	4	3	10									
G3	4	3	9	10			V2	5	2	4	4	3	1	A2	5	2	10	0			H	4	9	9	8	8	0	J3	5	4	4	11									
H	4	6	7	2	5	6	V3	5	2	5	1	3	10	C1	4	1	6	4			K1	4	1	2	6			J4	5	4	6	0									
K1	4	1	2	2			V4	5	2	5	10	4	7	C2	4	1	8	11			K2	4	1	4	5			K1	4	2	1	7									
K2	4	1	4	0			V5	5	4	6	0	4	9	C3	4	1	11	6			K3	4	1	6	3			K2	4	2	3	5									
K3	4	1	5	0			W6	5	2	3	7	2	4	C4	4	2	13	9			K4	4	2	7	5			K3	4	2	5	4									

- NOTES**
- NUMBER OF BARS IN ONE HEADWALL.
 - DIMENSIONS ARE 0. TO 0. OF BARS.
 - ALL BARS ARE STRAIGHT EXCEPT THOSE SHOWN BELOW.

BENT BAR SHAPES



NOTES

- ① NUMBER OF BARS IN ONE HEADWALL.
- 2 DIMENSIONS ARE 0. TO 0. OF BARS.
- 3 ALL BARS ARE STRAIGHT EXCEPT THOSE SHOWN BELOW.

BENT BAR SHAPES



TO BE FIELD BENT

1'-6" (30"-60")
2'-6" (66"-108")

0'-6" (30"-60")
0'-8" (66"-108")

BARS (E)



1'-8" (30"-60")
2'-2" (66"-84")
2'-8" (90"-108")

BARS (F)



1'-3" (30"-60")
1'-9" (66"-84")
2'-3" (90"-108")

BARS (H)



1'-3" (30"-60")
1'-9" (66"-84")
2'-3" (90"-108")

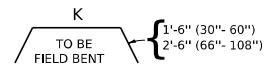
BARS (P) AND (V)

MARK	SIZE	NO ①	LGTH		K		MARK	SIZE	NO ①	LGTH		K		MARK	SIZE	NO ①	LGTH		K	
			FT	IN	FT	IN				FT	IN	FT	IN				FT	IN		
102"							102" (CONTINUED)							108" (CONTINUED)						
A1	5	2	12	11			T3	5	4	8	9			S2	5	4	2	0		
A2	5	2	16	10										S3	5	4	5	0		
B1	5	4	4	3										S4	5	4	6	3		
B2	5	4	5	0			108"							S5	5	2	7	0		
B3	5	4	5	9										T1	5	2	2	3		
B4	5	4	6	6										A1	5	2	13	6		
B5	5	4	7	4			A2	5	2	17	8			T3	5	4	6	9		
B6	5	4	8	1			B1	5	4	4	6			T4	5	4	9	9		
B7	5	4	8	10			B2	5	4	5	3									
B8	5	4	9	7			B3	5	4	6	0									
B9	5	16	9	9			B4	5	4	6	9									
C1	4	2	10	10			B5	5	4	7	6									
C2	4	2	13	5			B6	5	4	8	3									
C3	4	2	15	11			B7	5	4	9	0									
C4	4	2	18	7			B8	5	4	9	9									
C5	4	2	21	3			B9	5	18	10	4									
C6	4	8	23	5			C1	4	2	9	10									
E1	5	2	19	1	14	1	C2	4	2	12	6									
E2	5	2	19	5	14	5	C3	4	2	15	2									
F	4	15	1	9	0	6	C4	4	2	17	9									
G1	4	1	12	8			C5	4	2	20	6									
G2	4	3	16	5			C6	4	2	23	1									
G3	4	3	20	3			C7	4	8	24	9									
G4	4	3	24	0			E1	5	2	19	11	14	11							
G5	4	3	26	7			E2	5	2	20	3	15	3							
H	4	14	14	6	11	10	F	4	15	1	9	0	6							
J1	5	4	4	4			G1	4	1	15	5									
J2	5	4	5	4			G2	4	3	18	0									
J3	5	4	6	5			G3	4	3	21	10									
J4	5	4	7	5			G4	4	3	25	7									
J5	5	4	8	6			G5	4	3	28	3									
J6	5	4	9	6			H	4	15	15	2	12	6							
K1	4	2	2	2			J1	5	4	4	6									
K2	4	2	4	1			J2	5	4	5	7									
K3	4	2	6	0			J3	5	4	6	7									
K4	4	2	8	0			J4	5	4	7	7									
K5	4	2	9	11			J5	5	4	8	8									
K6	4	8	11	5			J6	5	4	9	9									
M	4	36	4	9			K1	4	2	3	2									
N1	4	8	11	5			K2	4	2	5	1									
N2	4	8	23	7			K3	4	2	7	0									
P	7	36	7	0	4	9	K4	4	2	8	11									
Q	5	4	9	9			K5	4	2	10	9									
R	5	10	3	5			K6	4	8	12	0									
S1	5	4	2	3			M	4	37	4	9									
S2	5	4	3	6			N1	4	8	11	11									
S3	5	4	5	3			N2	4	8	24	9									
S4	5	4	6	6			P	7	37	7	3	5	0							
T1	5	4	3	3			Q	5	4	10	4									
T2	5	4	6	3			R	5	10	3	5									

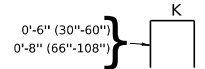
NOTES

- ① NUMBER OF BARS IN ONE HEADWALL.
- DIMENSIONS ARE 0. TO 0. OF BARS.
- ALL BARS ARE STRAIGHT EXCEPT THOSE SHOWN BELOW.

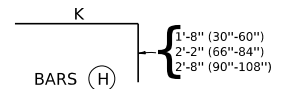
BENT BAR SHAPES



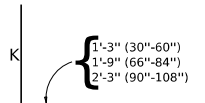
BARS (E)



BARS (F)



BARS (H)



BARS (P) AND (V)

(USE WITH CURRENT RDH-120)

KENTUCKY DEPARTMENT OF HIGHWAYS	
BILL OF REINFORCEMENT 102" TO 108" DIAMETER CIRCULAR PIPE HEADWALLS 30° SKEW	
STANDARD DRAWING NO. RDH-334-04	
SUBMITTED _____ DIRECTOR DIVISION OF DESIGN	DATE _____
APPROVED _____ STATE HIGHWAY ENGINEER	DATE _____

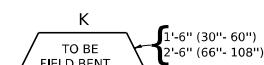
M A R K	S I Z E	N O	L G T H	K		M A R K	S I Z E	N O	L G T H	K		M A R K	S I Z E	N O	L G T H	K		M A R K	S I Z E	N O	L G T H	K		M A R K	S I Z E	N O	L G T H	K												
		①	FT	IN	FT	IN		①	FT	IN	FT	IN		①	FT	IN	FT	IN		①	FT	IN	FT	IN		①	FT	IN	FT	IN										
30"						36" (CONTINUED)						42" (CONTINUED)						54"						60" (CONTINUED)						66" (CONTINUED)										
							K3	4	1	4	11			V2	5	2	4	0	2	9					E1	5	2	14	10	11	10	C3	4	2	20	6				
A1	5	2	5	0			N1	4	3	5	0			V3	5	2	4	7	3	4					E2	5	2	15	1	12	1	C4	4	2	24	1				
A2	5	2	8	11			N2	4	3	9	10			V4	5	2	5	2	3	11					F	4	12	1	3	0	4	C5	4	4	25	3				
C1	4	1	7	1			Q	4	2	3	4			V5	5	2	5	9	4	6					G1	4	3	13	0			E1	5	2	18	0	13			
C2	4	1	10	6			R	4	4	0	10			V6	5	8	6	3	5	0					G2	4	3	19	0			E2	5	2	18	5	13			
C3	4	1	13	7			S1	5	2	2	3			W1	5	2	3	6	2	3					G3	4	3	23	10			F	4	13	1	9	0			
E1	5	2	9	4	6	4	S2	5	4	4	3			W2	5	2	4	8	3	5					H	4	13	9	5	7	9	G1	4	1	11	8				
E2	5	2	9	6	6	6	T1	5	4	1	6			W3	5	2	5	9	4	6					K1	4	1	2	7			G2	4	3	15	6				
F	4	7	1	3	0	4	T2	5	4	3	0														E2	5	2	14	0	11	0	K2	4	1	4	5				
G1	4	1	6	5			V1	5	2	3	3	2	0												F	4	11	1	3	0	4	K3	4	1	6	4				
G2	4	2	8	5			V2	5	2	3	9	2	6												G1	4	3	11	7			K4	4	2	7	5				
G3	4	3	12	5			V3	5	2	4	4	3	1	48"						G2	4	3	16	11			G2	4	3	16	11			N1	4	3	7	5		
H	4	7	6	7	4	11	V4	5	2	4	11	3	8							G3	4	3	21	7			N2	4	3	14	6			J1	5	2	2	10		
K1	4	1	1	0			V5	5	2	5	6	4	3	A1	5	2	7	1							H	4	11	8	11	7	3	Q	4	2	5	8				
K2	4	1	2	10			V6	5	6	5	7	4	4	A2	5	2	12	6							K1	4	1	1	5			R	4	6	0	11				
K3	4	1	4	5			W1	5	2	3	3	2	0	C1	4	1	11	10							K2	4	1	3	3			S1	5	4	1	9				
N1	4	3	4	5			W2	5	2	4	5	3	2	C2	4	1	15	4							K3	4	1	5	2			S2	5	4	4	6				
N2	4	3	8	8			W3	5	1	5	7	4	4	C3	4	1	18	11							K4	4	2	6	10			S3	5	4	7	9				
Q	4	2	2	9										C4	4	1	19	6						N1	4	3	6	10			T1	5	4	1	6					
R	4	3	0	9										E1	5	2	12	7	9	7				N2	4	3	13	4			T2	5	4	2	6					
S1	5	2	1	6										E2	5	2	12	10	9	10				Q	4	2	5	1			T3	5	4	4	0					
S2	5	4	3	6			42"						F	4	10	1	3	0	4					R	4	6	0	11			T4	5	4	5	6					
T1	5	2	1	6									G1	4	2	10	0							S1	5	2	1	9			V1	5	2	4	3	3	0			
T2	5	4	2	9			A1	5	2	6	5			G2	4	3	14	6						S2	5	4	3	6			V2	5	2	4	9	3	6			
V1	5	2	3	0	1	9	A2	5	2	11	5			G3	4	3	19	4						S3	5	4	6	6			V3	5	2	5	4	4	1			
V2	5	2	3	7	2	4	C1	4	1	9	2			H	4	11	8	3	6	7				T1	5	2	1	3			V4	5	2	5	10	4	7			
V3	5	2	4	1	2	10	C2	4	1	12	8			K1	4	1	2	4						T2	5	4	2	6			V5	5	2	6	5	5	2			
V4	5	2	4	9	3	6	C3	4	1	16	3			K2	4	1	4	2						T3	5	4	3	3			V6	5	2	6	11	5	8			
V5	5	6	5	0	3	9	C4	4	1	17	6			K3	4	1	6	1						T4	5	4	4	9			V7	5	2	7	6	6	3			
W1	5	2	3	1	1	10	E1	5	2	11	6	8	6	K4	4	1	6	3						V1	5	2	3	11	2	8	V8	5	10	7	9	6	6			
W2	5	2	4	3	3	0	E2	5	2	11	9	8	9	N1	4	3	6	2						V2	5	2	4	6	3	3	W1	5	2	4	4	3	1			
W3	5	1	5	3	4	0	F	4	9	1	3	0	4	N2	4	3	12	2						V3	5	2	5	1	3	10	W2	5	2	5	5	4	2			
							G1	4	1	8	3			Q	4	2	4	6						V4	5	2	5	7	4	4	W3	5	2	6	6	5	3			
							G2	4	3	12	5			R	4	5	0	10						V5	5	2	6	1	4	10	W4	5	1	7	7	6	4			
							G3	4	3	16	11			S1	5	4	2	9						V6	5	2	6	8	5	5										
							H	4	9	7	8	6	0	S2	5	4	5	6						V7	5	10	7	3	6	0										
							K1	4	1	1	3			T1	5	4	1	6						W1	5	2	4	0	2	9										
							K2	4	1	3	1			T2	5	4	2	9						W2	5	2	5	1	3	10	66"									
A1	5	2	5	8			K3	4	1	5	0			T3	5	4	4	3						W3	5	2	6	2	4	11										
A2	5	2	10	2			K4	4	1	5	7			V1	5	2	3	8	2	5				W4	5	1	8	2	6	11	A1	5	2	8	11					
C1	4	1	9	8			N1	4	3	5	7			V2	5	2	4	3	3	0											A2	5	2	15	11					
C2	4	1	13	2			N2	4	3	11	0			V3	5	2	4	10	3	7										B1	5	4	2	9						
C3	4	1	15	6			Q	4	2	3	11			V4	5	2	5	5	4	2									B2	5	4	3	4							
E1	5	2	10	4	7	4	R	4	4	0	10			V5	5	2	5	11	4	8								B3	5	4	3	10								
E2	5	2	10	7	7	7	S1	5	2	1	9			V6	5	2	6	6	5	3								B4	5	4	4	5								
F	4	8	1	3	0	4	S2	5	2	3	3			V7	5	8	6	8	5	5								B5	5	4	5	0								
G1	4	1	8	8			S3	5	4	5	3			W1	5	2	3	10	2	7								B6	5	4	5	6								
G2	4	2	10	8			T1	5	4	1	3			W2	5	2	4	11	3	8								B7	5	4	6	1								
G3	4	3	14	9			T2	5	4	2	3			W3	5	2	6	0	4																					

MARK	SIZE	NO	LGTH		K	MARK	SIZE	NO	LGTH		K	MARK	SIZE	NO	LGTH		K	
			①						FT	IN					FT	IN		①
102"						102" (CONTINUED)						108" (CONTINUED)						
A1	5	2	12	9		S5	5	4	13	6		K4	4	2	8	11		
A2	5	2	23	4		T1	5	4	2	9		K5	4	2	10	9		
B1	5	4	4	3		T2	5	4	4	3		K6	4	8	12	0		
B2	5	4	4	9		T3	5	4	5	3		M	4	51	4	9		
B3	5	4	5	4		T4	5	4	6	6		N1	4	8	16	0		
B4	5	4	5	10		T5	5	4	8	6		N2	4	8	44	0		
B5	5	4	6	4		T6	5	4	9	6		P	7	51	7	3	5	0
B6	5	4	6	11								Q	5	4	10	4		
B7	5	4	7	5								R	5	10	3	5		
B8	5	4	8	0		108"						S1	5	4	3	5		
B9	5	4	8	6								S2	5	4	6	0		
B10	5	4	9	0								S3	5	4	8	6		
B11	5	34	9	7		A1	5	2	13	7		S4	5	4	11	6		
C1	4	2	19	0		A2	5	2	24	3		S5	5	4	13	6		
C2	4	2	22	9		B1	5	4	4	5		T1	5	4	2	3		
C3	4	2	26	5		B2	5	4	5	0		T2	5	4	3	6		
C4	4	2	30	0		B3	5	4	5	5		T3	5	4	5	0		
C5	4	2	34	0		B4	5	4	6	0		T4	5	4	6	3		
C6	4	8	37	3		B5	5	4	6	6		T5	5	4	7	9		
E1	5	2	24	9	19	9	B6	5	4	7	1	T6	5	4	9	3		
E2	5	2	25	2	20	2	B7	5	4	7	7	T7	5	4	10	3		
F	4	20	1	9	0	6	B8	5	4	8	2							
G1	4	1	20	6			B9	5	4	8	8							
G2	4	3	24	0			B10	5	4	9	3							
G3	4	3	29	0			B11	5	4	9	9							
G4	4	3	35	0			B12	5	34	10	3							
G5	4	3	39	6			C1	4	2	18	2							
H	4	21	14	5	11	9	C2	4	2	22	1							
J1	5	4	4	3			C3	4	2	25	5							
J2	5	4	5	4			C4	4	2	29	3							
J3	5	4	6	4			C5	4	2	33	0							
J4	5	4	7	5			C6	4	2	36	7							
J5	5	4	8	5			C7	4	8	39	2							
J6	5	4	9	5			E1	5	2	25	7	20	7					
K1	4	2	2	0			E2	5	2	26	2	21	2					
K2	4	2	4	0			F	4	21	1	9	0	6					
K3	4	2	6	0			G1	4	1	19	9							
K4	4	2	8	0			G2	4	3	25	8							
K5	4	2	10	0			G3	4	3	31	10							
K6	4	8	11	6			G4	4	3	37	9							
M	4	49	4	9			G5	4	3	41	9							
N1	4	8	11	6			H	4	21	15	1	12	5					
N2	4	8	37	3			J1	5	4	4	6							
P	7	49	7	0	4	9	J2	5	4	5	7							
Q	5	4	9	9			J3	5	4	6	7							
R	5	10	3	5			J4	5	4	7	6							
S1	5	4	2	6			J5	5	4	8	7							
S2	5	4	5	3			J6	5	4	9	7							
S3	5	4	8	6			K1	4	2	2	11							
S4	5	4	10	6			K2	4	2	4	11							
							K3	4	2	6	10							

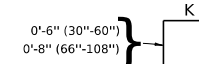
NOTES

- ① NUMBER OF BARS IN ONE HEADWALL.
- DIMENSIONS ARE 0. TO 0. OF BARS.
- ALL BARS ARE STRAIGHT EXCEPT THOSE SHOWN BELOW.

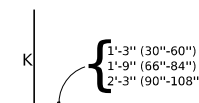
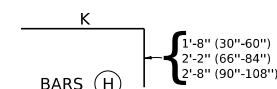
BENT BAR SHAPES



BARS (E)



BARS (F)



(USE WITH CURRENT RDH-120)

KENTUCKY DEPARTMENT OF HIGHWAYS	
BILL OF REINFORCEMENT 102" TO 108" DIAMETER CIRCULAR PIPE HEADWALLS 45° SKEW	
STANDARD DRAWING NO. RDH-344-04	
SUBMITTED _____	DIRECTOR DIVISION OF DESIGN _____ DATE _____
APPROVED _____	STATE HIGHWAY ENGINEER _____ DATE _____

MARK	SIZE	NO		LGTH		K		MARK	SIZE	NO		LGTH		K		MARK	SIZE	NO		LGTH		K									
		①		FT	IN	FT	IN			①		FT	IN	FT	IN			①		FT	IN	FT	IN								
30"								42" (CONTINUED)								60"								72"							
A	5	4	4	1				Q	4	2	4	11				A	5	4	7	2				A	5	4	8	6			
C ₁	4	2	1	5				V ₁	5	4	3	3	2	0	C ₁	4	2	2	2				C ₁	4	2	2	0				
C ₂	4	2	3	5				V ₂	5	4	4	3	3	0	C ₂	4	2	4	3				C ₂	4	2	4	1				
E ₁	5	2	7	0	4	0		V ₃	5	2	5	3	4	0	C ₃	4	2	6	4				C ₃	4	2	6	3				
E ₂	5	2	7	5	4	5									C ₄	4	2	6	6				C ₄	4	4	7	7				
F	4	4	1	3	0	4									E ₁	5	2	10	7	7	7		E ₁	5	2	12	0	9	0		
G ₁	4	2	4	0											E ₂	5	2	11	0	8	0		E ₂	5	2	12	5	9	5		
G ₂	4	3	6	4				48"								F	4	8	1	3	0	4		F	4	9	1	3	0	4	
H	4	4	4	10	3	2		A	5	4	5	11				G ₁	4	2	8	1				G ₁	4	1	8	4			
N	4	6	3	8				C ₁	4	2	2	4				G ₂	4	2	10	4				G ₂	4	2	10	8			
Q	4	2	3	5				C ₂	4	2	4	4				G ₃	4	3	12	8				G ₃	4	2	13	0			
R	4	4	0	8				C ₃	4	2	5	4				H	4	7	7	4	5	8		G ₄	4	3	14	10			
V ₁	5	4	2	10	1	7		E ₁	5	2	9	1	6	1	N	4	6	6	6			H	4	9	8	3	6	7			
V ₂	5	4	3	11	2	8		E ₂	5	2	9	6	6	6	Q	4	2	7	1			N	4	6	7	7					
								F	4	7	1	3	0	4	R	4	7	0	10			Q	4	3	8	6					
								G ₁	4	1	5	4			V ₁	5	4	3	10	2	7		R	4	9	1	0				
36"								G ₂	4	2	7	8			V ₂	5	4	4	10	3	7		V ₁	5	4	4	3	3	0		
A	5	4	4	9				G ₃	4	3	9	11			V ₃	5	4	5	9	4	6		V ₂	5	4	5	2	3	11		
C ₁	4	2	2	7				H	4	6	6	3	4	7	V ₄	5	2	6	9	5	6		V ₃	5	4	6	2	4	11		
C ₂	4	2	4	3				N	4	6	5	4											V ₄	5	4	7	1	5	10		

MARK SIZE	NO	LGTH		K		MARK SIZE	NO	LGTH		K		MARK SIZE	NO	LGTH		K		MARK SIZE	NO	LGTH		K		MARK SIZE	NO	LGTH		K		MARK SIZE	NO	LGTH		K					
		①	FT					IN	FT					IN	①					FT	IN					FT	IN					①	FT			IN	FT	IN	①
30"						36" (CONTINUED)						48"						54" (CONTINUED)						60" (CONTINUED)						66" (CONTINUED)									
A1	5	2	4	6		V1	5	2	3	3	1	10	A1	5	2	6	2		K2	4	1	3	7		T1	5	2	2	9		W6	5	2	6	2	4	11		
A2	5	2	5	0		V2	5	2	4	1	2	10	A2	5	2	6	9		K3	4	1	5	6		T2	5	4	6	3		W6	5	1	7	3	6	0		
C1	4	1	3	10		V3	5	3	5	1	3	10	C1	4	1	3	2		K4	4	1	6	0		V1	5	2	3	9	2	6								
C2	4	1	5	9		W6	5	2	3	1	1	10	C2	4	1	5	2		N1	4	3	6	0		V2	5	2	4	9	3	6								
E1	5	2	7	6	4	6	W6	5	2	4	3	3	0	C3	4	1	7	3		N2	4	3	9	1		V3	5	2	5	9	4	6							
E2	5	2	7	11	4	11	W6	5	1	5	4	4	1	C4	4	1	8	4		Q	4	2	6	4		V4	5	2	6	8	5	5	72"						
F	4	5	1	3	0	4							E1	5	2	9	10	6	10	S1	5	4	1	2		W6	5	2	3	10	2	7	A1	5	2	8	6		
G1	4	2	4	11									E2	5	2	10	3	7	3	S2	5	4	1	9		W6	5	2	4	11	3	8	A2	5	2	9	7		
G2	4	3	6	7									F	4	7	1	3	0	4	S3	5	4	2	4		W6	5	2	6	0	4	9	C1	4	1	3	10		
H	4	4	6	2	4	6	42"						G1	4	2	6	9			T1	5	2	2	1		W6	5	1	7	1	5	10	C2	4	1	6	0		
K1	4	1	2	0									G2	4	2	8	6			T2	5	4	5	6															
K2	4	1	3	9		A1	5	2	5	8			G3	4	3	10	2			V1	5	2	3	8	2	5													
N1	4	3	3	11		A2	5	2	6	2			H	4	6	7	8	6	0	V2	5	2	4	8	3	5													
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Q	4	2	3	5		C2	4	1	6	3			K2	4	1	4	5			V4	5	3	6	4	5	1													
R	4	4	0	10		C3	4	1	7	8			K3	4	1	5	5			W6	5	2	3	8	2	5		A1	5	2	7	8							
S1	5	2	1	1		E1	5	2	9	1	6	1	N1	4	3	5	5			W6	5	2	4	9	3	6		A2	5	2	8	8							
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V1	5	2	2	10	1	7	G1	4	1	5	8		R	4	6	1	0										C3	4	1	8	10								
V2	5	2	3	10	2	7	G2	4	2	7	4		S1	5	2	1	1										C4	4	2	10	9								
V3	5	2	4	7	3	4	G3	4	3	9	0		S2	5	4	1	6		60"						E1	5	2	12	3	9	3								
W6	5	2	2	11	1	8	H	4	5	7	3	5	7	S3	5	4	2	2									E2	5	2	12	8	9	8						
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							K2	4	1	3	9		V1	5	2	3	5	2	2	A2	5	2	8	0				G1	4	1	8	10							
							K3	4	1	5	0		V2	5	2	4	5	3	2	C1	4	1	3	6				G2	4	2	10	6							
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							N2	4	3	7	8		V4	5	3	5	11	4	8	C3	4	1	7	6				G4	4	3	13	10							
							Q	4	2	4	11		W6	5	2	3	6	2	3	C4	4	1	9	6				H	4	8	9	2	7	6					
A1	5	2	5	2			R	4	5	0	11		W6	5	2	4	7	3	4	C5	4	1	9	11				K1	4	1	1	7							
A2	5	2	5	10			S1	5	4	1	4		W6	5	2	5	8	4	5	E1	5	2	11	5	8	5		K2	4	1	3	5							
C1	4	1	3	2			S2	5	4	1	11									E2	5	2	11	11	8	11		K3	4	1	5	4							
C2	4	1	5	2			T	5	4	3	11									F	4	9	1	3	0	4		K4	4	2	7	0							
C3	4	1	6	10			V1	5	2	3	3	2	0							G1	4	1	7	7				N1	4	3	7	0							
E1	5	2	8	2	5	3	V2	5	2	4	3	3	0	54"						G2	4	2	9	4				N2	4	3	10	9							
E2	5	2	8	8	5	8	V3	5	2	5	3	4	0	A1	5	2	6	9			G3	4	2	10	11				Q	4	3	7	9						
F	4	6	1	3	0	4	V4	5	2	5	6	4	3	A2	5	2	7	4			G4	4	3	12	8				R	4	8	1	1						
G1	4	1	4	6			W6	5	2	3	3	2	0	A2	5	2	7	4			H	4	7	8	7	6	11		S1	5	2	1	1						
G2	4	2	6	1			W6	5	2	4	4	3	1	C1	4	1	4	4			K1	4	1	2	7				S2	5	4	1	7						
G3	4	3	7	9			W6	5	1	5	6	4	3	C2	4	1	6	5			K2	4	1	4	5				S3	5	4	2	2						
H	4	4	6	9	5	1							C3	4	1	8	6			K3	4	1	6	4				S4	5	4	2	9							
K1	4	1	1	2									C4	4	1	9	1			K4	4	1	6	6				T1	5	2	3	6							
K2	4	1	2	11									E1	5	2	10	8	7	8	N1	4	3	6	6				T2	5	4	6	10							
K3	4	1	4	6									E2	5	2	11	1	8	1	N2	4	3	9	11				V1	5	2	4	1	2	10					
N1	4	3	4	6									F	4	8	1	3	0	4	Q	4	2	7	1				V2	5	2	5	0	3	9					
N2	4	3	6	10									G1	4	2	8	0			R	4	7	1	0				V3	5	2	6	0	4	9					
Q	4	2	4	2									G2	4	2	9	9			S1	5	2	1	0				V4	5	2	6	11	5	8					
R	4	5	0	11									G3	4	3	11	5			S2	5	4	1	3				V5	5	3	7	3	6	0					
S1	5	4	1	1									H	4	7	8	2	6	6	S3	5	4		11				W6	5	2	4	1	2	10					
S2	5	4	1	8									K1	4	1	1	8			S4	5	4	2	6				W6	5	2	5	2	3	11					

NOTES

- NUMBER OF BARS IN ONE HEADWALL. DIMENSIONS ARE 0. TO 0. OF BARS.
- ALL BARS ARE STRAIGHT EXCEPT THOSE SHOWN BELOW.

BENT BAR SHAPES

(E) TO BE FIELD BENT

(F) 0'-6"

(H) 1'-8"

(V) AND (W) 1'-3"

(USE WITH CURRENT RDH-120)

**KENTUCKY
DEPARTMENT OF HIGHWAYS**

**BILL OF REINFORCEMENT
30" TO 72" DIAMETER
NON-CIRCULAR PIPE HEADWALLS
15° SKEW**

STANDARD DRAWING NO. RDH-360-04

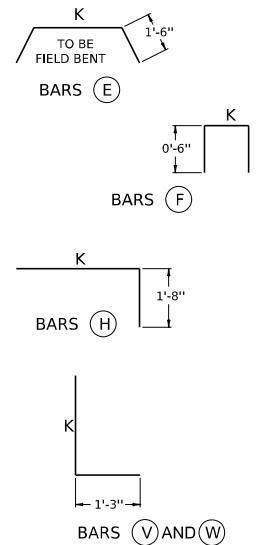
SUBMITTED _____ DIRECTOR DIVISION OF DESIGN _____ DATE _____

APPROVED _____ STATE HIGHWAY ENGINEER _____ DATE _____

MARK SIZE	NO ①	LGTH		K		MARK SIZE	NO ①	LGTH		K		MARK SIZE	NO ①	LGTH		K		MARK SIZE	NO ①	LGTH		K		MARK SIZE	NO ①	LGTH		K						
		FT	IN	FT	IN			FT	IN	FT	IN			FT	IN	FT	IN			FT	IN	FT	IN											
30"						36" (CONTINUED)						48"						54" (CONTINUED)						60" (CONTINUED)										
A1	5	2	4	6		S2	5	4	3	0		A1	5	2	6	2		H	4	8	8	1	6	5	R	4	2	7	1					
A2	5	2	5	10		T1	5	4	1	4		A2	5	2	8	1		K1	4	1	1	8		S1	5	4	1	2						
C1	4	1	5	11		T2	5	4	4	2		C1	4	1	5	11		K2	4	1	3	7		S2	5	4	2	6						
C2	4	1	8	4		V1	5	2	3	0	1	9	C2	4	1	8	4		K3	4	1	5	6		S3	5	4	3	11					
E1	5	2	8	4	5	4	V2	5	2	3	10	2	7	C3	4	1	10	10		K4	4	1	6	0	S4	5	4	5	5					
E2	5	2	8	9	5	9	V3	5	2	4	7	3	4	C4	4	1	12	2		N1	4	3	6	0	T1	5	4	1	6					
F	4	6	1	3	0	4	V4	5	4	5	0	3	9	E1	5	2	11	4	8	4	N2	4	3	13	3	T2	5	4	4	3				
G1	4	2	6	2			W1	5	2	3	1	1	10	E2	5	2	11	9	8	9	Q	4	2	6	4	T3	5	4	7	2				
G2	4	3	8	8			W2	5	2	4	3	3	0	F	4	9	1	3	0	4	R	4	7	1	0	V1	5	2	3	10	2			
H	4	5	6	2	4	6	W3	5	1	5	4	4	1	G1	4	2	8	4		S1	5	2	1	1	V2	5	2	4	7	3				
K1	4	1	2	0									G2	4	2	10	11			S2	5	4	1	9	V3	5	2	5	5	4				
K2	4	1	3	9									G3	4	3	13	6			S3	5	4	3	3	V4	5	2	6	2	4				
N1	4	3	3	11									H	4	8	7	7	5	11	S4	5	4	4	9	V5	5	7	6	11	5				
N2	4	3	8	7			42"						K1	4	1	2	7			T1	5	2	1	10	W1	5	2	3	10	2				
Q	4	2	3	5			A1	5	2	5	8			K2	4	1	4	5			T2	5	4	3	3	W2	5	2	4	11	3			
R	4	4	0	10			A2	5	2	7	5			K3	4	1	5	5			T3	5	4	6	3	W3	5	2	6	0	4			
S1	5	4	1	5			C1	4	1	6	10			N1	4	3	5	5			V1	5	2	3	8	2	5	W4	5	1	7	1	5	
S2	5	4	2	9			C2	4	1	9	4			N2	4	3	12	2			V2	5	2	4	4	3	1							
T1	5	2	1	2			C3	4	1	9	4			Q	4	2	5	7			V3	5	2	5	1	3	10							
T2	5	4	3	9			C4	4	1	11	1			R	4	6	1	0			V4	5	2	5	11	4	8							
V1	5	2	2	10	1	7	E1	5	2	10	4	7	4	S1	5	4	1	5			V5	5	6	6	3	5	0							
V2	5	2	3	8	2	5	E2	5	2	10	9	7	9	S2	5	4	2	10			W1	5	2	3	8	2	5							
V3	5	2	4	6	3	3	F	4	8	1	3	0	4	S3	5	4	4	3			W2	5	2	4	9	3	6							
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W1	5	2	2	11	1	8	G2	4	2	9	6			T2	5	4	2	9																
W2	5	2	4	0	2	9	G3	4	3	12	0			T3	5	4	5	10																
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							K1	4	1	1	11			V2	5	2	4	2	2	11	60"													
							K2	4	1	3	9			V3	5	2	5	0	3	9														
36"							K3	4	1	5	0			V4	5	2	5	9	4	6	A1	5	2	7	4									
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A1	5	2	5	2			N2	4	3	11	1			W1	5	2	3	6	2	3	C1	4	1	6	10									
A2	5	2	6	9			Q	4	2	4	11			W2	5	2	4	7	3	4	C2	4	1	9	4									
C1	4	1	5	3			R	4	5	0	11			W3	5	2	5	8	4	5	C3	4	1	11	10									
C2	4	1	7	8			S1	5	4	1	0										C4	4	1	14	4									
C3	4	1	9	10			S2	5	4	2	5										C5	4	1	14	6									
E1	5	2	9	4	6	4	S3	5	4	3	9			E1	5	2	13	4	10	4														
E2	5	2	9	8	6	8	T1	5	4	2	2			E2	5	2	13	9	10	9														
F	4	7	1	3	0	4	T2	5	4	5	0			F	4	11	1	3	0	4														
G1	4	1	6	7			V1	5	2	3	3	2	0	A1	5	2	6	9			G1	4	1	9	3									
G2	4	2	7	10			V2	5	2	4	0	2	9	A2	5	2	8	10			G2	4	2	11	9									
G3	4	3	10	0			V3	5	2	4	10	3	7	C1	4	1	7	6			G3	4	2	14	3									
H	4	6	6	8	5	0	V4	5	5	5	7	4	4	C2	4	1	10	0			G4	4	3	16	10									
K1	4	1	1	2			W1	5	2	3	3	2	0	C3	4	1	12	7			H	4	9	8	7	6	11							
K2	4	1	2	11			W2	5	2	4	4	3	1	C4	4	1	13	3			K1	4	1	2	7									
K3	4	1	4	6			W3	5	1	5	6	4	3	E1	5	2	12	3	9	3	K2	4	1	4	5									
N1	4	3	4	6										E2	5	2	12	7	9	7	K3	4	1	6	4									
N2	4	3	9	10										F	4	10	1	3	0	4	K4	4	1	6	6									
Q	4	2	4	2										G1	4	2	10	0			N1	4	3	6	6									
R	4	5	0	11										G2	4	2	12	7			N2	4	3	14	6									

- NOTES**
- ① NUMBER OF BARS IN ONE HEADWALL.
 - DIMENSIONS ARE 0. TO 0. OF BARS.
 - ALL BARS ARE STRAIGHT EXCEPT THOSE SHOWN BELOW.

BENT BAR SHAPES



(USE WITH CURRENT RDH-120)

KENTUCKY
DEPARTMENT OF HIGHWAYS

BILL OF REINFORCEMENT
30" TO 60" DIAMETER
NON-CIRCULAR PIPE HEADWALLS
30° SKEW

STANDARD DRAWING NO. RDH-370-05

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN _____ DATE _____

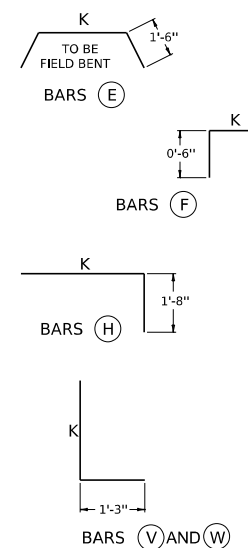
APPROVED _____ STATE HIGHWAY ENGINEER _____ DATE _____

[illegible]

NOTES

- ① NUMBER OF BARS IN ONE HEADWALL.
- 2 DIMENSIONS ARE 0. TO 0. OF BARS.
- 3 ALL BARS ARE STRAIGHT EXCEPT THOSE SHOWN BELOW.

BENT BAR SHAPES



(USE WITH CURRENT RDH-120)

**KENTUCKY
DEPARTMENT OF HIGHWAYS**

*BILL OF REINFORCEMENT
66" TO 72" DIAMETER
NON-CIRCULAR PIPE HEADWALLS
30° SKEW*

STANDARD DRAWING NO. RDH-372-04

SUBMITTED _____ DATE _____
DIRECTOR DIVISION OF DESIGN

APPROVED _____ DATE _____
STATE HIGHWAY ENGINEER

NOTES

- ① NUMBER OF BARS IN ONE HEADWALL.
- 2 DIMENSIONS ARE 0. TO 0. OF BARS.
- 3 ALL BARS ARE STRAIGHT EXCEPT THOSE SHOWN BELOW.

BENT BAR SHAPES

BARS (E)

BARS (F)

BARS (H)

BARS (V) AND (W)

(USE WITH CURRENT RDH-120)

KENTUCKY
DEPARTMENT OF HIGHWAYS

BILL OF REINFORCEMENT
66" TO 72" DIAMETER
NON-CIRCULAR PIPE HEADWALLS
45° SKEW

STANDARD DRAWING NO. RDH-382-04

SUBMITTED _____

APPROVED _____

DIRECTOR SECTION OF DESIGN

STATE HIGHWAY ENGINEER

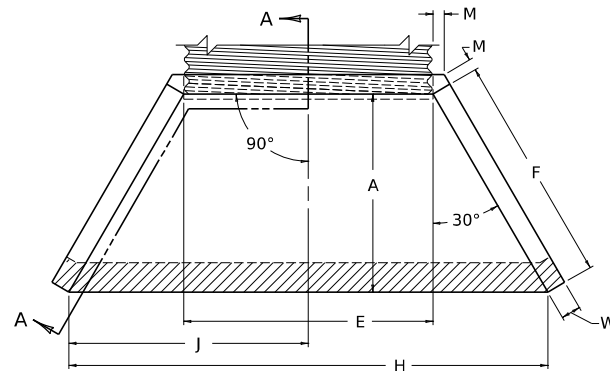
DATE _____

DATE _____

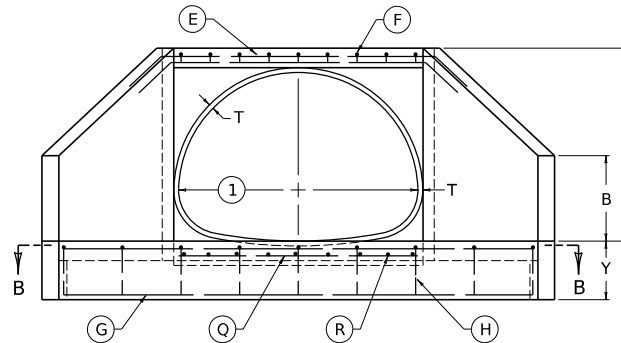
- ① NUMBER OF BARS IN ONE HEADWALL.
- 2 DIMENSIONS ARE 0. TO 0. OF BARS.
- 3 ALL BARS ARE STRAIGHT EXCEPT THOSE SHOWN BELOW.

KENTUCKY DEPARTMENT OF HIGHWAYS		
BILL OF REINFORCEMENT 66" TO 72" DIAMETER NON-CIRCULAR PIPE HEADWALLS 45° SKEW		
STANDARD DRAWING NO. RDH-382-04		
SUBMITTED _____	DIRECTOR, DEPARTMENT OF DESIGN _____	DATE _____
APPROVED _____	STATE HIGHWAY ENGINEER _____	DATE _____

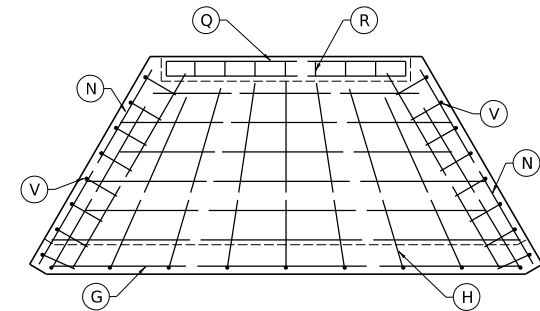
DRAWING SCALE:
1/2" = 1'



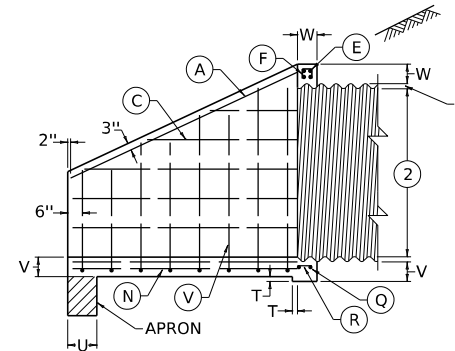
PLAN VIEW



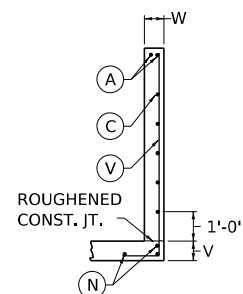
FRONT ELEVATION



SECTION B-B



SECTION A-A



WING SECTION

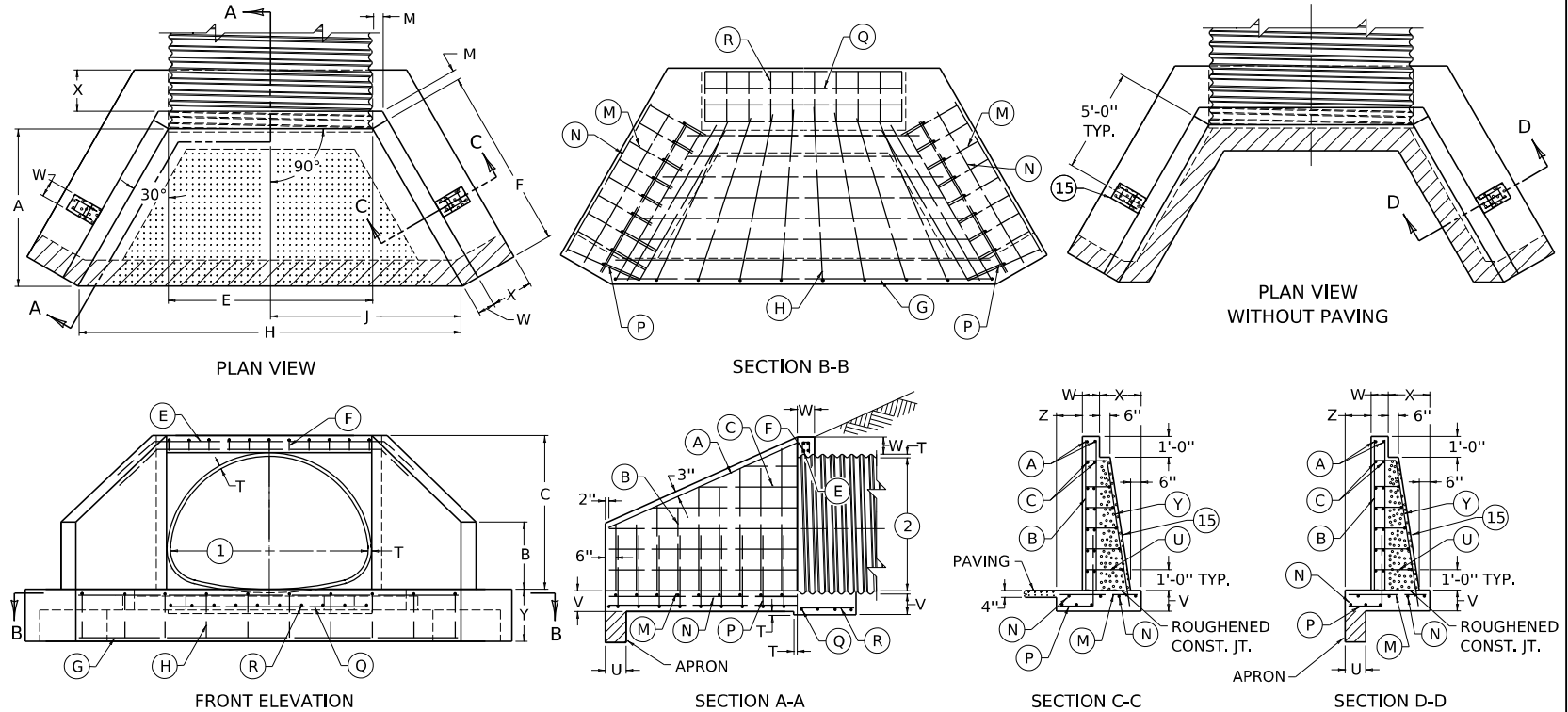
NOTES

1. SPAN OF STRUCTURAL PLATE STEEL PIPE ARCH
2. RISE OF STRUCTURAL PLATE STEEL PIPE ARCH
3. FOR DIMENSIONS, QUANTITIES, AND BILL OF REINFORCEMENT SEE CUR. STD. DWGS. RDH-420 THRU RDH-465.
4. DIMENSIONS FROM FACE OF CONCRETE TO STEEL SHALL BE 2" CLEAR DISTANCE.
5. ENCIRCLED LETTERS, ○, INDICATE STEEL BAR LOCATIONS.
6. BARS ○, ○, AND ○ ARE SPACED 1'-0" O.C. ALL OTHER BARS SHALL BE EVENLY SPACED.
7. BARS ○ ARE PLACED IN ORDER OF INCREASING LENGTHS, BEGINNING AT THE END OF EACH WING.
8. BARS ○ ARE PLACED IN ORDER OF INCREASING LENGTHS, BEGINNING AT THE TOP OF EACH WING.
9. HEADWALLS LOCATED AT SHOULDER EDGE SHALL BE PARALLEL TO CENTERLINE OF ROAD.
10. LIMITS OF APRON.
11. PAVING SHALL BE REQUIRED AND SHALL BE SLOPED IN DIRECTION OF FLOW EQUAL TO SLOPE OF PIPE. FRONT FACE OF HEADWALL AND ENDS OF WINGS SHALL REMAIN VERTICAL.

(LAYOUT AND STEEL PATTERN)

KENTUCKY DEPARTMENT OF HIGHWAYS	
STEEL PIPE ARCH HEADWALLS - 0° SKEW (PIPE RISE LESS THAN 6'-0")	
STANDARD DRAWING NO. RDH-400-02	
SUBMITTED	DIRECTOR DIVISION OF DESIGN DATE
APPROVED	STATE HIGHWAY ENGINEER DATE

DRAWING SCALE:
3/4" = 1'



NOTES

- ① SPAN OF STRUCTURAL PLATE STEEL PIPE ARCH.
- ② RISE OF STRUCTURAL PLATE STEEL PIPE ARCH.
3. FOR DIMENSIONS, QUANTITIES, AND BILL OF REINFORCEMENT SEE CUR. STD. DWGS. RDH-420 THRU RDH-465.
4. DIMENSIONS FROM FACE OF CONCRETE TO STEEL SHALL BE 2" CLEAR DISTANCE.
5. ENCIRCLED LETTERS, ○, INDICATE STEEL BAR LOCATIONS.
6. BARS (B), (C), (G), (M), (P) AND (U) ARE SPACED 1'-0" O.C. ALL OTHER BARS SHALL BE EVENLY SPACED.
7. BARS (B), (C) AND (U) ARE PLACED IN ORDER OF INCREASING LENGTH, BEGINNING AT THE END OF WING, TOP OF WING AND TOP OF COUNTERFORT RESPECTIVELY.
8. HEADWALLS LOCATED AT SHOULDER EDGE SHALL BE PARALLEL TO CENTERLINE OF ROAD.
9. LIMITS OF APRON.
10. LIMITS OF PAVING.
11. LIMITS OF COUNTERFORTS.
12. THESE HEADWALLS ARE DESIGNED BOTH WITH AND WITHOUT PAVING BETWEEN THE WINGS. (SEE PLANS)
13. WHEN PAVING IS REQUIRED; PAVING SHALL BE SLOPED IN DIRECTION OF FLOW EQUAL TO SLOPE OF PIPE. FRONT FACE OF HEADWALL AND ENDS OF WINGS SHALL REMAIN VERTICAL.
14. WHEN PAVING IS NOT REQUIRED BARS (H) AND (G) SHALL BE ELIMINATED.
- ⑮ A COUNTERFORT SHALL BE REQUIRED ON A WING WALL WHEN THE PIPE RISE IS 8'-0" OR GREATER AND THE WING WALL IS 15'-0" OR LONGER.

(LAYOUT AND STEEL PATTERN)

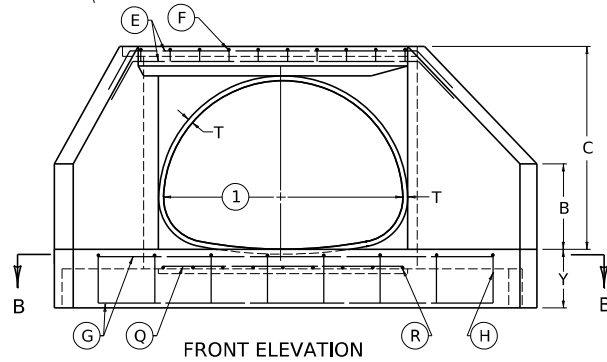
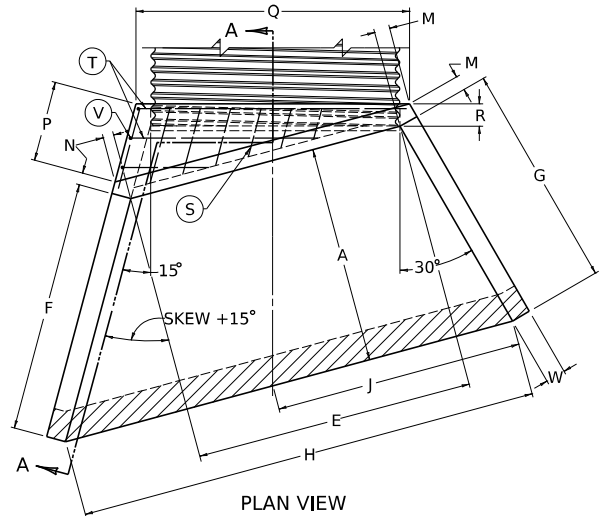
KENTUCKY
DEPARTMENT OF HIGHWAYS

STEEL PIPE ARCH
HEADWALLS - 0° SKEW
(PIPE RISE 6'-0" OR GREATER)

STANDARD DRAWING NO. RDH-405-02

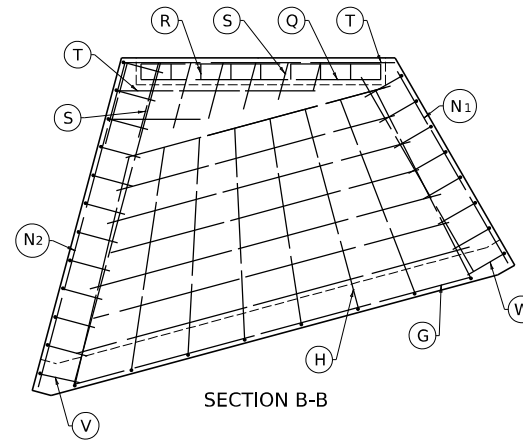
SUBMITTED: _____ DIRECTOR DIVISION OF DESIGN _____ DATE: _____
APPROVED: _____ DATE: _____

DRAWING SCALE: 1/2" = 1'

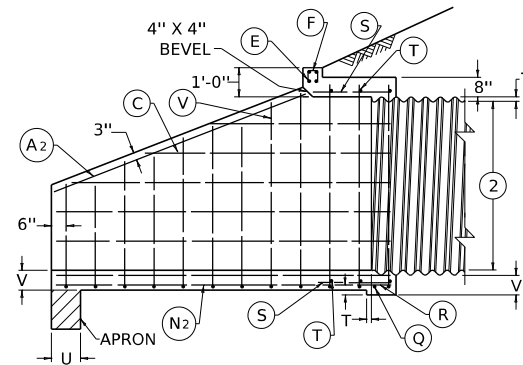


~ NOTES ~

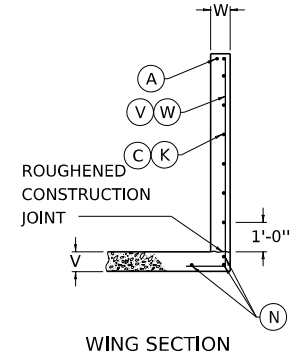
- ① SPAN OF STRUCTURAL PLATE STEEL PIPE ARCH.
- ② RISE OF STRUCTURAL PLATE STEEL PIPE ARCH.
3. FOR DIMENSIONS, QUANTITIES, AND BILL OF INCREASING LENGTHS, BEGINNING AT THE END OF EACH WING.
4. DIMENSIONS FROM CONCRETE TO STEEL SHALL BE 2" CLEAR DISTANCE.
5. ENCIRCLED LETTERS (), INDICATE STEEL BAR LOCATIONS.
6. BARS (C), (G), (K), (V), (W) ARE SPACED 1'-0" O.C. ALL OTHER BARS SHALL BE EVENLY SPACED.
7. BARS (V) AND (W) ARE PLACED IN ORDER OF INCREASING LENGTHS, BEGINNING AT THE END OF EACH WING.
8. BARS (C) AND (K) ARE PLACED IN ORDER OF INCREASING LENGTHS, BEGINNING AT THE TOP OF EACH WING.
9. HEADWALLS LOCATED AT EDGE OF SHOULDERS SHALL BE PARALLEL TO CENTERLINE OF THE ROAD.
10.  LIMITS OF APRON.
11. PAVING SHALL BE REQUIRED AND SHALL BE SLOPED IN DIRECTION OF FLOW EQUAL TO SLOPE OF PIPE. FRONT FACE OF HEADWALL AND ENDS OF WINGS SHALL REMAIN VERTICAL.



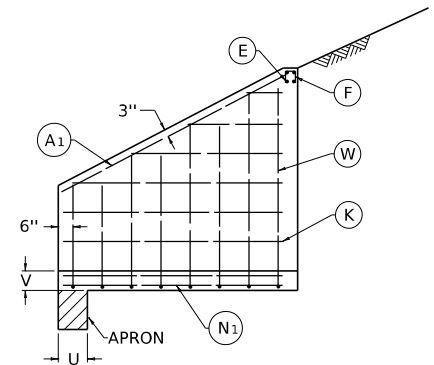
SECTION B-B



SECTION A-A



WING SECTION



SHORT WING SECTION

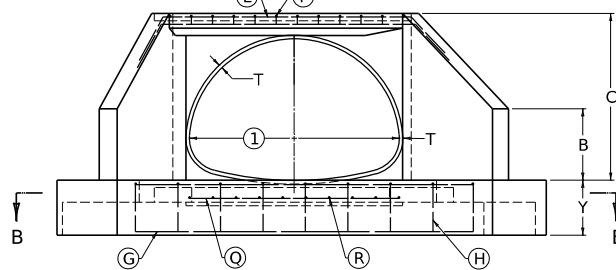
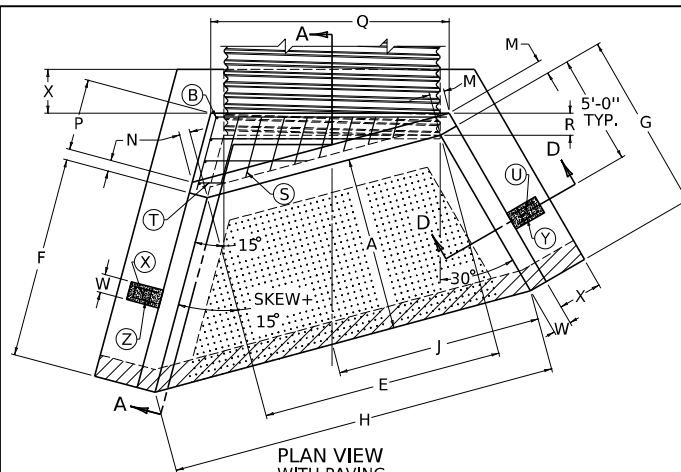
(LAYOUT AND STEEL PATTERN)

KENTUCKY
DEPARTMENT OF HIGHWAYS

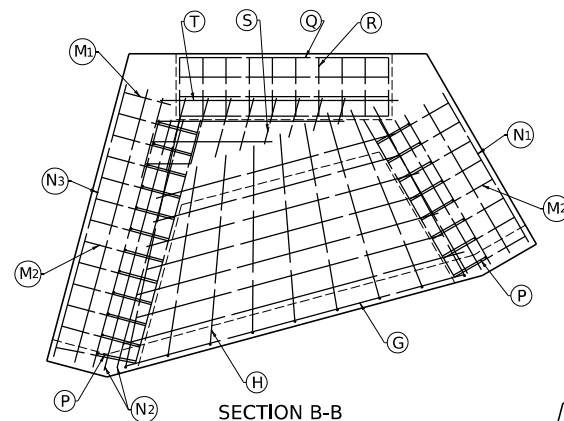
STEEL PIPE ARCH
H-WALLS-15° -30° & 45° SK
(PIPE RISE LESS THAN 6'-0")

STANDARD DRAWING NO. RDH-410-02

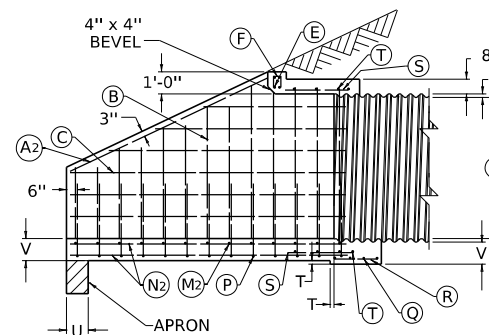
SUBMITTED	DIRECTOR DIVISION OF DESIGN	DATE
APPROVED	STATE HIGHWAY ENGINEER	DATE



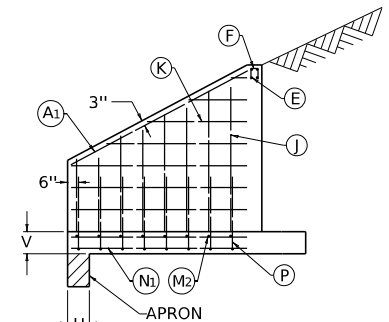
FRONT ELEVATION



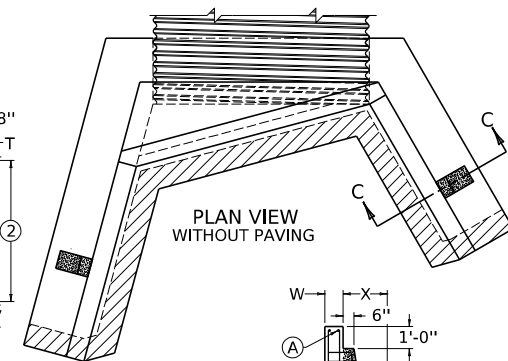
SECTION B-B



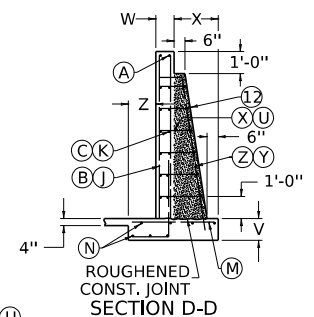
SECTION A-A



SHORT WING SECTION



PLAN VIEW WITHOUT PAVING



(LAYOUT AND STEEL PATTERN)

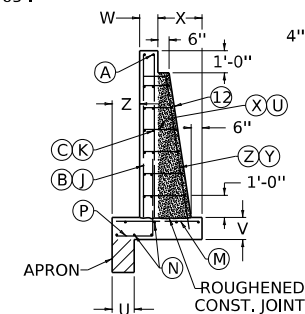
KENTUCKY
DEPARTMENT OF HIGHWAYS

STEEL PIPE ARCH
H-WALLS-15°, 30° & 45° SK
(PIPE RISE 6'-0" OR GREATER)

STANDARD DRAWING NO. RDH-415-02

SUBMITTED: DIRECTOR DIVISION OF DESIGN DATE
APPROVED: STATE HIGHWAY ENGINEER DATE

- ① SPAN OF STRUCTURAL PLATE STEEL PIPE ARCH. ② RISE OF STRUCTURAL PLATE STEEL PIPE ARCH.
3. FOR DIMENSIONS, QUANTITIES, AND BILL OF REINFORCEMENT SEE CURRENT STANDARD DRAWINGS RDH-420 THRU RDH-465 .
4. DIMENSIONS FROM FACE OF CONCRETE TO STEEL SHALL BE 2" CLEAR DISTANCE.
5. ENCIRCLED LETTERS, $\bigcirc$, INDICATE STEEL BAR LOCATIONS.
6. BARS $\bigcirc$, $\bigcirc$, $\bigcirc$, $\bigcirc$, $\bigcirc$, $\bigcirc$, $\bigcirc$, $\bigcirc$ ARE SPACED 1'-0" O. C. ALL OTHER BARS SHALL BE EVENLY SPACED.
7. BARS $\bigcirc$ AND $\bigcirc$, $\bigcirc$ AND $\bigcirc$, $\bigcirc$ AND $\bigcirc$ ARE PLACED IN ORDER OF INCREASING LENGTH BEGINNING AT THE END OF WING, TOP OF WING AND TOP OF COUNTERFORT RESPECTIVELY.
8. HEADWALLS LOCATED AT EDGE OF SHOULDER SHALL BE PARALLEL TO CENTERLINE OF THE ROAD.
9. //// LIMITS OF APRON, |||| LIMITS OF PAVING, |||| LIMITS OF COUNTERFORTS
10. THESE HEADWALLS ARE DESIGNED BOTH WITH AND WITHOUT PAVING BETWEEN THE WINGS.(SEE PLANS)
11. WHEN PAVING IS REQUIRED IT SHALL BE SLOPED IN DIRECTION OF FLOW EQUAL TO SLOPE OF BOX. FRONT FACE OF HEADWALL AND ENDS OF WINGS SHALL REMAIN VERTICAL.
- ⑫ A COUNTERFORT SHALL BE REQUIRED ON A WING WALL WHEN THE BOX RISE IS 8'-0" OR GREATER AND THE WING WALL IS 15'-0" OR LONGER.
13. WHEN PAVING IS NOT REQUIRED $\bigcirc$ AND $\bigcirc$ BARS SHALL BE ELIMINATED.



SECTION C-C

DIMENSION	0° SKEW						15° SKEW						DIMENSION
	7'-0" X 5'-1"	8'-2" X 5'-9"	9'-6" X 6'-5"	11'-5" X 7'-3"	12'-10" X 8'-4"	15'-4" X 9'-3"	7'-0" X 5'-1"	8'-2" X 5'-9"	9'-6" X 6'-5"	11'-5" X 7'-3"	12'-10" X 8'-4"	15'-4" X 9'-3"	
A	6'-1"	6'-9"	7'-7"	8'-5"	9'-6"	10'-5"	6'-9"	7'-5"	7'-11"	8'-9"	9'-10"	10'-9"	A
B	2'-7"	2'-11"	3'-3"	3'-8"	4'-2"	4'-8"	2'-7"	2'-11"	3'-3"	3'-8"	4'-2"	4'-8"	B
C	5'-11"	6'-7"	7'-5"	8'-3"	9'-4"	10'-3"	6'-3"	6'-11"	7'-7"	8'-5"	9'-6"	10'-5"	C
E	7'-4"	8'-6"	9'-10"	11'-9"	13'-2"	15'-8"	8'-2"	9'-6"	11'-0"	13'-1"	14'-8"	17'-6"	E
F	7'-0"	7'-10"	8'-9"	9'-9"	11'-0"	12'-0"	7'-10"	8'-7"	9'-2"	10'-1"	11'-4"	12'-5"	F
G	-----						7'-0"	7'-8"	8'-2"	9'-1"	10'-2"	11'-2"	G
H	14'-4"	16'-4"	18'-7"	21'-6"	24'-2"	27'-8"	13'-11"	15'-9"	17'-8"	20'-6"	23'-0"	26'-7"	H
J	7'-2"	8'-2"	9'-4"	10'-9"	12'-1"	13'-10"	7'-5"	8'-4"	9'-4"	10'-9"	12'-1"	13'-10"	J
M	0'-5"		0'-6"				0'-6"		0'-8"				M
N	-----						0'-5"		0'-6"				N
P	-----						2'-5"	2'-9"	3'-3"	3'-10"	4'-3"	5'-0"	P
Q	-----						8'-2"	9'-4"	10'-10"	12'-9"	14'-2"	16'-8"	Q
R	-----						0'-9"		1'-0"				R
T	0'-2"						0'-2"						T
U	1'-0"						1'-0"						U
V	0'-8"		1'-0"				0'-8"		1'-0"				V
W	0'-8"		0'-10"				0'-8"		0'-10"				W
X	----		2'-0"		2'-6"		----		2'-0"		2'-6"		X
Y	2'-0"		2'-6"		3'-0"		2'-0"		2'-6"		3'-0"		Y
Z	----		1'-3"		1'-9"		----		1'-3"		1'-9"		Z

KENTUCKY
DEPARTMENT OF HIGHWAYS

DIMENSIONS
STEEL PIPE ARCHES
0° SKEW & 15° SKEW

STANDARD DRAWING NO. RDH-420-02

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN _____ DATE _____

APPROVED _____ STATE HIGHWAY ENGINEER _____ DATE _____

DIMENSION	30° SKEW						45° SKEW						DIMENSION
	7'-0" X 5'-1"	8'-2" X 5'-9"	9'-6" X 6'-5"	11'-5" X 7'-3"	12'-10" X 8'-4"	15'-4" X 9'-3"	7'-0" X 5'-1"	8'-2" X 5'-9"	9'-6" X 6'-5"	11'-5" X 7'-3"	12'-10" X 8'-4"	15'-4" X 9'-3"	
A	6'-9"	7'-5"	7'-11"	8'-9"	9'-10"	10'-9"	6'-9"	7'-5"	7'-11"	8'-9"	9'-10"	10'-9"	A
B	2'-7"	2'-11"	3'-3"	3'-8"	4'-2"	4'-8"	2'-7"	2'-11"	3'-3"	3'-8"	4'-2"	4'-8"	B
C	6'-3"	6'-11"	7'-7"	8'-5"	9'-6"	10'-5"	6'-3"	6'-11"	7'-7"	8'-5"	9'-6"	10'-5"	C
E	10'-0"	11'-7"	13'-5"	16'-1"	18'-0"	21'-5"	14'-2"	16'-5"	19'-0"	22'-8"	25'-5"	30'-3"	E
F	9'-7"	10'-6"	11'-2"	12'-4"	13'-11"	15'-2"	13'-6"	14'-10"	15'-10"	17'-6"	19'-8"	21'-6"	F
G	6'-9"	7'-5"	7'-11"	8'-9"	9'-10"	10'-9"	7'-0"	7'-8"	8'-2"	9'-1"	10'-2"	11'-2"	G
H	16'-9"	19'-0"	21'-4"	24'-10"	27'-10"	32'-2"	24'-1"	27'-3"	30'-7"	35'-6"	39'-10"	46'-0"	H
J	8'-2"	9'-2"	10'-3"	11'-10"	13'-3"	15'-3"	10'-2"	11'-5"	12'-9"	14'-9"	16'-6"	18'-11"	J
M	0'-8"		0'-10"				0'-10"		1'-1"				M
N	0'-3"		0'-4"				0'-2"		0'-3"				N
P	5'-8"	6'-6"	7'-7"	8'-11"	9'-11"	11'-8"	11'-2"	12'-9"	14'-10"	17'-7"	19'-7"	23'-1"	P
Q	8'-0"	9'-2"	10'-8"	12'-7"	14'-0"	16'-6"	7'-11"	9'-1"	10'-6"	12'-5"	13'-10"	16'-4"	Q
R	0'-11"		1'-2"				1'-1"		1'-4"				R
T	0'-2"						0'-2"						T
U	1'-0"						1'-0"						U
V	0'-8"		1'-0"				0'-8"		1'-0"				V
W	0'-8"		0'-10"				0'-8"		0'-10"				W
X	----		2'-0"		2'-6"		----		2'-0"		2'-6"		X
Y	2'-0"		2'-6"		3'-0"		2'-0"		2'-6"		3'-0"		Y
Z	----		1'-3"		1'-9"		----		1'-3"		1'-9"		Z

KENTUCKY
DEPARTMENT OF HIGHWAYS

DIMENSIONS
STEEL PIPE ARCHES
30° SKEW & 45° SKEW

STANDARD DRAWING NO. RDH-425-02

SUBMITTED _____
DIRECTOR DIVISION OF DESIGN DATE _____

APPROVED _____
STATE HIGHWAY ENGINEER DATE _____

BOX SIZE ①	CONCRETE 2 HEADWALLS					REINFORCEMENT 2 HEADWALLS	
	②	③	④	⑤	⑥	⑦	⑧
0° SKEW							
7'-0" x 5'-1"	9.48	1.50	——	——	——	581	——
8'-2" x 5'-9"	11.50	1.69	——	——	——	693	——
9'-6" x 6'-5"	21.81	2.64	2.63	3.45	19.99	1709	306
11'-5" x 7'-3"	26.11	2.96	3.45	3.88	23.59	2155	372
12'-10" x 8'-4"	34.41	4.48	3.95	5.81	31.78	2903	496
15'-4" x 9'-3"	40.69	5.01	5.13	6.49	37.04	3389	583
15° SKEW							
7'-0" x 5'-1"	12.02	1.46	——	——	——	892	——
8'-2" x 5'-9"	14.63	1.65	——	——	——	1076	——
9'-6" x 6'-5"	26.27	2.55	2.71	3.54	24.55	2147	295
11'-5" x 7'-3"	32.00	2.86	3.56	3.98	29.56	2747	399
12'-10" x 8'-4"	41.67	4.34	4.07	5.95	39.21	3678	488
15'-4" x 9'-3"	50.31	4.86	5.31	6.66	46.80	4452	621

BOX SIZE ①	CONCRETE 2 HEADWALLS					REINFORCEMENT 2 HEADWALLS	
	②	③	④	⑤	⑥	⑦	⑧
30° SKEW							
7'-0" x 5'-1"	15.78	1.75	——	——	——	1197	——
8'-2" x 5'-9"	19.36	1.97	——	——	——	1440	——
9'-6" x 6'-5"	34.24	2.96	3.35	4.00	31.94	2875	366
11'-5" x 7'-3"	42.39	3.34	4.39	4.52	39.18	3758	478
12'-10" x 8'-4"	54.95	5.05	5.04	6.74	51.60	4962	575
15'-4" x 9'-3"	68.08	5.69	6.56	7.58	63.40	6145	762
45° SKEW							
7'-0" x 5'-1"	23.33	2.46	——	——	——	1782	——
8'-2" x 5'-9"	28.88	2.78	——	——	——	2208	——
9'-6" x 6'-5"	49.84	3.98	4.89	5.14	46.11	4287	540
11'-5" x 7'-3"	62.51	4.53	6.39	5.84	57.43	5551	668
12'-10" x 8'-4"	81.38	6.82	7.38	8.63	75.81	7467	831
15'-4" x 9'-3"	101.25	7.74	9.55	9.76	93.71	9276	1040

- ① STRUCTURAL PLATE STEEL PIPE ARCHES EQUALS THE INTERIOR SPAN (S) BY THE INTERIOR RISE (R) IN FEET AND INCHES.
- ② CU. YDS. OF CONCRETE IN TWO HEADWALLS WITH PAVING.
- ③ CU. YDS. OF CONCRETE IN TWO APRONS (HEADWALLS WITH PAVING).
- ④ CU. YDS. OF CONCRETE IN TWO PAVED AREAS OF THE HEADWALLS.
- ⑤ CU. YDS. OF CONCRETE IN TWO APRONS (HEADWALLS WITHOUT PAVING).
- ⑥ CU. YDS. OF CONCRETE IN TWO HEADWALLS WITHOUT PAVING.
- ⑦ POUNDS OF REINFORCING STEEL IN TWO HEADWALLS WITH PAVING.
- ⑧ POUNDS OF REINFORCING STEEL TO DEDUCT WHEN PAVING FOR TWO HEADWALLS IS ELIMINATED.

KENTUCKY
DEPARTMENT OF HIGHWAYS

QUANTITIES FOR
STEEL PIPE ARCHES
0°-15°-30° & 45° SKEW

STANDARD DRAWING NO. RDH-430-02

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN _____ DATE _____

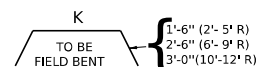
APPROVED _____ STATE HIGHWAY ENGINEER _____ DATE _____

M A R K	S I Z E	NO	LGTH	K		M A R K	S I Z E	NO	LGTH	K		M A R K	S I Z E	NO	LGTH	K		M A R K	S I Z E	NO	LGTH	K									
	①	FT	IN	FT	IN		①	FT	IN	FT	IN		①	FT	IN	FT	IN		①	FT	IN	FT	IN								
7'-0" x 5'-1"						9'-6" x 6'-5"						11'-5" x 7'-3" (CONT'D)						15'-4" x 9'-3" (CONT'D)													
A	5	4	7	8		A	5	4	9	7		P	6	20	5	10	4	1	C6	4	16	11	10								
C1	4	2	1	6		B1	5	8	3	3		Q	5	4	11	5		E1	5	2	20	11	15	11							
C2	4	2	3	7		B2	5	8	4	3		R	5	12	2	8		E2	5	2	21	5	16	5							
C3	4	2	5	8		B3	5	8	5	2								F	4	17	1	5	0	6							
C4	4	4	6	10		B4	5	8	6	2								G1	4	1	15	2									
E1	5	2	10	7	7	7	B5	5	4	7	1	12'-10" x 8'-4"						G2	4	2	17	4									
E2	5	2	10	11	7	11	C1	4	4	2	6							G3	4	2	19	6									
F	4	8	0	11	0	4	C2	4	4	4	7							G4	4	2	21	8									
G1	4	2	9	5			C3	4	4	6	8							G5	4	2	23	10									
G2	4	2	11	8			C4	4	12	8	7	B1	5	8	4	3			G6	4	3	26	0								
G3	4	3	14	0		E1	5	2	15	1	10	1	B2	5	8	5	2		H	4	14	12	9	10	1						
H	4	8	7	5	5	9	E2	5	2	15	8	10	8	B3	5	8	6	1	M	4	24	4	9								
N	4	6	6	10			F	4	11	1	5	0	6	B4	5	8	7	0	N	4	16	11	10								
Q	4	2	7	0			G1	4	2	11	3			B5	5	8	8	0	P	7	24	7	4	5	1						
R	4	8	0	6			G2	4	2	13	6			B6	5	4	8	11	Q	5	4	15	4								
V1	5	4	4	4	3	1	G3	4	2	15	9			C1	4	4	2	5	R	5	16	3	2								
V2	5	4	5	4	4	1	G4	4	3	18	0			C2	4	4	4	6													
V3	5	4	6	3	5	0	H	4	10	9	5	7	3	C3	4	4	6	8													
V4	5	2	7	3	6	0	M	4	18	3	9			C4	4	4	8	10													
							N	4	14	8	7			E1	5	2	18	4	13	4											
							P	5	18	5	5	3	8	E2	5	2	18	11	13	11											
							Q	5	4	9	6			F	4	14	1	5	0	6											
							R	5	10	2	8			G1	4	2	14	8													
8'-2" x 5'-9"														G2	4	2	17	0													
																		G3	4	2	19	4									
																			G4	4	2	21	8								
																			G5	4	3	24	0								
																			H	4	13	11	10	9	2						
A	5	4	8	6										M	4	22	4	9													
C1	4	2	2	11		11'-5" x 7'-3"																									
C2	4	2	5	0								B1	5	8	3	8				N	4	16	10	10							
C3	4	2	7	2								B2	5	8	4	8				P	7	22	6	11	4	8					
C4	4	4	7	8								B3	5	8	5	7				Q	5	4	12	10							
E1	5	2	11	8	8							8	B4	5	8	6	6			R	5	14	3	2							
E2	5	2	12	1	9	1	B5	5	8	7	6																				
F	4	9	0	11	0	4	C1	4	4	2	3																				
G1	4	1	9	1			C2	4	4	4	4																				
G2	4	2	11	4			B5	5	8	7	6																				
G3	4	2	13	8			C1	4	4	2	3																				
G4	4	3	16	0			C2	4	4	4	4																				
H	4	9	8	1	6	5	C3	4	4	6	5			15'-4" x 9'-3"																	
N	4	6	7	8			C4	4	4	8	6									A	5	4	13	1							
Q	4	2	8	2			C5	4	12	9	7									B1	5	8	4	8							
R	4	9	0	6			E1	5	2	17	0	12	0							B2	5	8	5	7							
V1	5	4	4	8	3	5	E2	5	2	17	6	12	6	B3	5	8	6	7													
V2	5	4	5	7	4	4	F	4	13	1	5	0	6	B4	5	8	7	6													
V3	5	4	6	7	5	4	G1	4	1	11	4			B5	5	8	8	5													
V4	5	4	7	6	6	3	G2	4	2	13	6			B6	5	8	9	4													
							G3	4	2	15	8			C1	4	4	2	3													
							G4	4	2	17	10			C2	4	4	4	5													
							G5	4	3	20	0			C3	4	4	6	6													
							H	4	11	10	3	8	1	C4	4	4	8	8													
							M	4	20	3	9			C5	4	4	10	10													
							N	4	14	9	7																				

NOTES

- ① NUMBER OF BARS IN ONE HEADWALL.
- 2 DIMENSIONS ARE 0. TO 0. 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



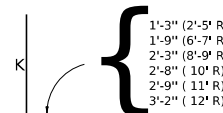
BARS (E)



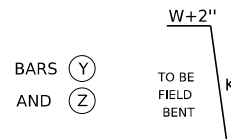
BARS (F), (U) AND (X)



BARS (H)



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



BARS (Y)

AND (Z)

TO BE FIELD BENT

KENTUCKY DEPARTMENT OF HIGHWAYS	
BILL OF REINFORCEMENT 7'-0" x 5'-1" - 15'-4" x 9'-3" STEEL PIPE ARCHES 0° SKEW	
STANDARD DRAWING NO. RDH-435-04	
SUBMITTED _____	DIRECTOR DIVISION OF DESIGN _____ DATE _____
APPROVED _____	STATE HIGHWAY ENGINEER _____ DATE _____

MARK	SIZE	NO		LGTH		K		MARK	SIZE	NO		LGTH		K	
		①		FT	IN	FT	IN			①		FT	IN	FT	IN
15'-4" X 9'-3"								15'-4" X 9'-3" (CONT'D)							
A ₁	5	2	12	4				S ₆	5	2	2	7			
A ₂	5	2	13	6				S ₇	5	2	2	11			
B ₁	5	4	4	8				S ₈	5	2	3	3			
B ₂	5	4	5	7				S ₉	5	2	3	6			
B ₃	5	4	6	7				S ₁₀	5	2	3	10			
B ₄	5	4	7	6				S ₁₁	5	2	4	1			
B ₅	5	4	7	6				S ₁₂	5	2	4	5			
B ₅	5	4	8	5				S ₁₃	5	2	4	8			
B ₆	5	4	9	4				S ₁₄	5	2	5	0			
B ₇	5	12	9	11				S ₁₅	5	2	5	2			
C ₁	4	2	8	0				T ₁	5	2	4	4			
C ₂	4	2	10	1				T ₂	5	2	7	8			
C ₃	4	2	12	3				T ₃	5	2	11	0			
C ₄	4	2	14	4				T ₄	5	2	14	5			
C ₅	4	2	16	6				T ₅	5	2	16	5			
C ₆	4	8	17	6											
E ₁	5	2	22	9	17	9									
E ₂	5	2	23	4	18	4									
F	4	19	1	5	0	6									
G ₁	4	1	17	8											
G ₂	4	2	19	4											
G ₃	4	2	21	0											
G ₄	4	2	22	8											
G ₅	4	2	24	4											
G ₆	4	3	26	0											
H	4	14	13	11	11	3									
J ₁	5	4	4	8											
J ₂	5	4	5	9											
J ₃	5	4	6	9											
J ₄	5	4	7	10											
J ₅	5	4	8	10											
J ₆	5	2	9	11											
K ₁	4	2	2	5											
K ₂	4	2	4	4											
K ₃	4	2	6	3											
K ₄	4	2	8	2											
K ₅	4	2	10	1											
K ₆	4	8	10	11											
M ₁	4	1	2	11											
M ₂	4	28	4	9											
N ₁	4	8	11	0											
N ₂	4	5	16	1											
N ₃	4	3	17	9											
P	7	29	7	5	5	2									
Q	5	4	15	4											
R	5	16	3	4											
S ₁	5	2	1	1											
S ₂	5	2	1	5											
S ₃	5	2	1	9											
S ₄	5	2	2	0											
S ₅	5	2	2	4											

NOTES

- ① NUMBER OF BARS IN ONE HEADWALL.
- 2 DIMENSIONS ARE 0. TO 0. OF BARS.
- 3 ALL BARS ARE STRAIGHT EXCEPT THOSE SHOWN BELOW.
- 4 R = BOX OR PIPE RISE
- 5 W = WING WALL WIDTH

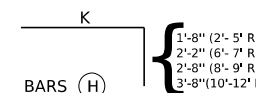
BENT BAR SHAPES



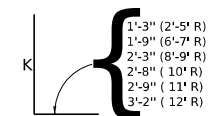
BARS (E)



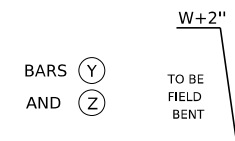
BARS (F), (U) AND (X)



BARS (H)



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



BARS (Y) AND (Z)

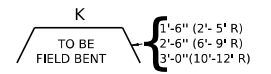
KENTUCKY DEPARTMENT OF HIGHWAYS	
BILL OF REINFORCEMENT	
15'-4" x 9'-3"	
STEEL PIPE ARCHES	
15° SKEW	
STANDARD DRAWING NO. RDH-445-03	
SUBMITTED _____	DIRECTOR DIVISION OF DESIGN _____ DATE _____
APPROVED _____	STATE HIGHWAY ENGINEER _____ DATE _____

MARK K	SIZE E	NO ①	LGTH		K		MARK K	SIZE E	NO ①	LGTH		K	
			FT	IN	FT	IN				FT	IN		
15'-4" X 9'-3"							15'-4" X 9'-3" (CONT'D)						
A ₁	5	2	12	0			S ₆	5	2	5	0		
A ₂	5	2	16	1			S ₇	5	2	5	8		
B ₁	5	4	4	7			S ₈	5	2	6	5		
B ₂	5	4	5	5			S ₉	5	2	7	2		
B ₃	5	4	6	2			S ₁₀	5	2	7	10		
B ₄	5	4	6	11			S ₁₁	5	2	8	7		
B ₅	5	4	7	8			S ₁₂	5	2	9	3		
B ₆	5	4	8	5			S ₁₃	5	2	10	0		
B ₇	5	4	9	2			S ₁₄	5	2	10	8		
B ₈	5	26	9	11			S ₁₅	5	2	11	4		
C ₁	4	2	15	1			S ₁₆	5	2	11	9		
C ₂	4	2	17	8			T ₁	5	2	1	7		
C ₃	4	2	19	4			T ₂	5	2	3	0		
C ₄	4	2	23	0			T ₃	5	2	4	4		
C ₅	4	2	25	7			T ₄	5	2	5	10		
C ₆	4	8	26	11			T ₅	5	2	7	2		
E ₁	5	2	26	8	21	8	T ₆	5	2	8	6		
E ₂	5	2	27	3	22	3	T ₇	5	2	10	0		
F	4	22	1	5	0	6	T ₈	5	2	11	5		
G ₁	4	1	22	0			T ₉	5	2	12	10		
G ₂	4	2	24	0			T ₁₀	5	2	14	3		
G ₃	4	2	26	0			T ₁₁	5	2	15	7		
G ₄	4	2	28	0			T ₁₂	5	2	16	3		
G ₅	4	2	30	0			X ₁	4	1	2	7	1	1
G ₆	4	3	32	0			X ₂	4	1	2	11	1	3
H	4	17	13	11	11	3	X ₃	4	1	3	5	1	6
J ₁	5	4	4	8			X ₄	4	1	3	9	1	8
J ₂	5	4	5	9			X ₅	4	1	4	1	1	10
J ₃	5	4	6	10			X ₆	4	1	4	7	2	1
J ₄	5	4	7	11			X ₇	4	1	4	11	2	3
J ₅	5	4	9	0			Z	4	2	9	4	8	4
J ₆	5	2	10	1									
K ₁	4	2	2	3									
K ₂	4	2	4	2									
K ₃	4	2	6	0									
K ₄	4	2	7	10									
K ₅	4	2	9	8									
K ₆	4	8	10	7									
M ₁	4	1	2	11									
M ₂	4	37	4	9									
N ₁	4	8	10	7									
N ₂	4	5	24	8									
N ₃	4	3	27	0									
P	7	38	7	4	5	1							
Q	5	4	15	4									
R	5	16	3	6									
S ₁	5	2	1	5									
S ₂	5	2	2	2									
S ₃	5	2	2	10									
S ₄	5	2	3	7									

NOTES

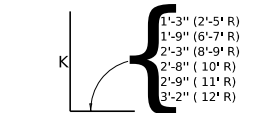
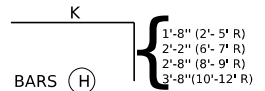
- ① NUMBER OF BARS IN ONE HEADWALL.
- 2 DIMENSIONS ARE 0. TO 0. OF BARS.
- 3 ALL BARS ARE STRAIGHT EXCEPT THOSE SHOWN BELOW.
- 4 R = BOX OR PIPE RISE
- 5 W = WING WALL WIDTH

BENT BAR SHAPES

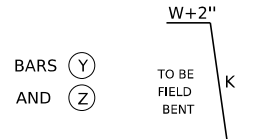


BARS (E)

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



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

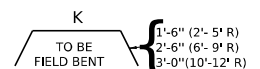


KENTUCKY DEPARTMENT OF HIGHWAYS	
BILL OF REINFORCEMENT 15'-4" x 9'-3" STEEL PIPE ARCHES 30° SKEW	
STANDARD DRAWING NO. RDH-455-03	
SUBMITTED _____	DATE _____
APPROVED _____	DATE _____

M A R K	S I Z E	NO	LGTH	K	M A R K	S I Z E	NO	LGTH	K	M A R K	S I Z E	NO	LGTH	K	M A R K	S I Z E	NO	LGTH	K						
	①	FT	IN	FT	IN		①	FT	IN	FT	IN		①	FT	IN	FT	IN		①	FT	IN	FT	IN		
12'-10" X 8'-4"					12'-10" X 8'-4" (CONT'D)					15'-4" X 9'-3" (CONT'D)					15'-4" X 9'-3" (CONT'D)										
A1	5	2	11	4		S6	5	2	8	9		B10	5	4	9	5		S14	5	2	20	10			
A2	5	2	20	2		S7	5	2	10	2		B11	5	50	9	11		S15	5	2	22	3			
B1	5	4	4	1		S8	5	2	11	8		C1	4	2	27	7		S16	5	2	23	0			
B2	5	4	4	8		S9	5	2	13	1		C2	4	2	31	4		T1	5	2	1	2			
B3	5	4	5	2		S10	5	2	14	5		C3	4	2	35	1		T2	5	2	1	11			
B4	5	4	5	9		S11	5	2	15	10		C4	4	2	38	9		T3	5	2	2	7			
B5	5	4	6	3		S12	5	2	7	2		C5	4	2	42	6		T4	5	2	3	4			
B6	5	4	6	10		S13	5	2	18	8		C6	4	8	44	5		T5	5	2	4	0			
B7	5	4	7	4		S14	5	2	19	6		E1	5	2	35	7	30	7	T6	5	2	4	8		
B8	5	4	7	11		T1	5	2	1	6		E2	5	2	36	2	31	2	T7	5	2	5	5		
B9	5	4	8	5		T2	5	2	2	2		F	4	31	1	5	0	6	T8	5	2	6	1		
B10	5	42	9	0		T3	5	2	2	11		G1	4	1	30	0		T9	5	2	6	10			
C1	4	2	20	10		T4	5	2	3	7		G2	4	2	32	10		T10	5	2	7	7			
C2	4	2	24	7		T5	5	2	4	4		G3	4	2	35	8		T11	5	2	8	3			
C3	4	2	28	2		T6	5	2	5	0		G4	4	2	38	5		T12	5	2	8	11			
C4	4	2	31	10		T7	5	2	5	9		G5	4	2	41	3		T13	5	2	9	8			
C5	4	2	35	6		T8	5	2	6	5		G6	4	3	44	0		T14	5	2	10	4			
C6	4	8	39	1		T9	5	2	7	2		H	4	23	13	11	11	3	T15	5	2	11	1		
E1	5	2	30	9	25	9	T10	5	2	7	10		J1	5	4	4	8		T16	5	2	11	9		
E2	5	2	31	4	26	4	T11	5	2	8	7		J2	5	4	5	9		T17	5	2	12	5		
F	4	27	1	5	0	6	T12	5	2	9	3		J3	5	4	6	9		T18	5	2	13	2		
G1	4	2	26	9		T13	5	2	10	0		J4	5	4	7	10		T19	5	2	13	11			
G2	4	2	29	7		T14	5	2	10	8		J5	5	4	8	10		T20	5	2	14	7			
G3	4	2	32	5		T15	5	2	11	4		J6	5	2	9	11		T21	5	2	15	3			
G4	4	2	35	2		T16	5	2	12	1		K1	4	2	2	4		T22	5	2	16	0			
G5	4	3	38	0		T17	5	2	12	9		K2	4	2	4	3		T23	5	2	16	2			
H	4	20	13	0	10	4	T18	5	2	13	6		K3	4	2	6	2		X1	4	1	2	3	1	2
J1	5	4	4	3		T19	5	2	13	7		K4	4	2	8	1		X2	4	1	2	7	1	4	
J2	5	4	5	3		X1	4	1	2	5	1	3	K5	4	2	10	0		X3	4	1	2	11	1	6
J3	5	4	6	4		X2	4	1	2	9	1	5	K6	4	8	11	0		X4	4	1	3	5	1	9
J4	5	4	7	4		X3	4	1	3	3	1	8	M1	4	1	2	10		X5	4	1	3	10	1	11
J5	5	4	8	5		X4	4	1	3	7	1	10	M2	4	55	4	9		X6	4	1	4	2	2	1
K1	4	2	2	6		X5	4	1	4	1	2	1	N1	4	8	11	0		X7	4	1	4	5	2	3
K2	4	2	4	5		X6	4	1	4	5	2	3	N2	4	5	40	10		Z	4	2	9	11	8	11
K3	4	2	6	4		Z	4	2	9	0	8	0	N3	4	3	44	8								
K4	4	2	8	3									P	7	56	7	5	5	2						
K5	4	8	10	0									Q	5	4	15	4								
M1	4	1	2	11									R	5	16	3	8								
M2	4	48	4	9		15'-4" X 9'-3"							S1	5	2	2	4								
N1	4	8	10	0		A1	5	2	12	5			S2	5	2	3	9								
N2	4	5	35	5		A2	5	2	22	0			S3	5	2	5	3								
N3	4	3	39	4		B1	5	4	4	7			S4	5	2	6	8								
P	7	49	6	11	4	8	B2	5	4	5	1		S5	5	2	8	1								
Q	5	4	12	10		B3	5	4	5	8			S6	5	2	9	6								
R	5	14	3	8		B4	5	4	6	2			S7	5	2	10	11								
S1	5	2	1	8		B5	5	4	6	9			S8	5	2	12	3								
S2	5	2	3	1		B6	5	4	7	3			S9	5	2	13	9								
S3	5	2	4	7		B7	5	4	7	10			S10	5	2	15	2								
S4	5	2	6	0		B8	5	4	8	4			S11	5	2	16	7								
S5	5	2	7	4		B9	5	4	8	10			S12	5	2	18	0								
													S13	5	2	19	5								

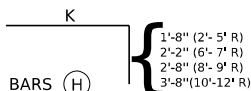
- NOTES**
- ① NUMBER OF BARS IN ONE HEADWALL.
 - 2 DIMENSIONS ARE 0. TO 0. OF BARS.
 - 3 ALL BARS ARE STRAIGHT EXCEPT THOSE SHOWN BELOW.
 - 4 R = BOX OR PIPE RISE
 - 5 W = WING WALL WIDTH

BENT BAR SHAPES

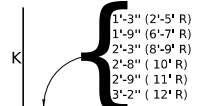


BARS (E)

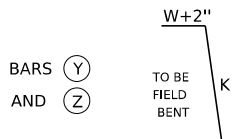
BARS (F), (U) AND (X)



BARS (H)



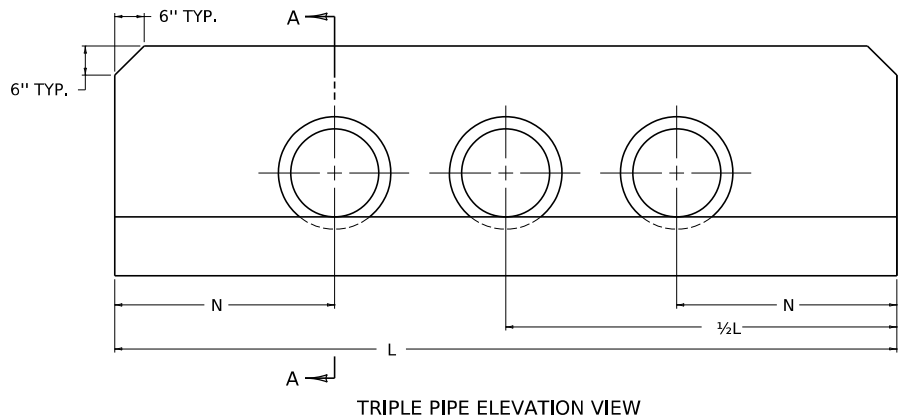
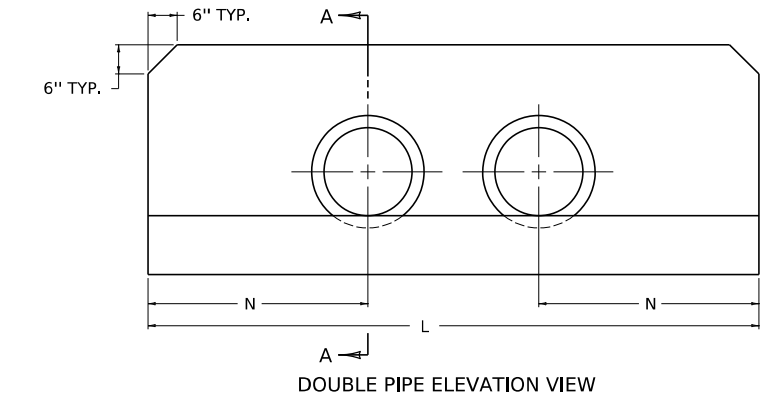
BARS (P), (V) AND (W)



BARS (Y) AND (Z)

KENTUCKY DEPARTMENT OF HIGHWAYS BILL OF REINFORCEMENT 12'-10" x 8'-4" - 15'-4" x 9'-3" STEEL PIPE ARCHES 45° SKEW STANDARD DRAWING NO. RDH-465-03	
SUBMITTED	DIRECTOR DIVISION OF DESIGN
APPROVED	STATE HIGHWAY ENGINEER
	DATE

DRAWING SCALE: 1"=1'

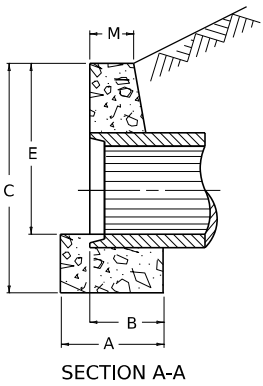


DIMENSIONS AND QUANTITIES

HEADWALL TYPE	PIPE DIAMETER	HEADWALL DIMENSIONS							VOLUME CU. YD. FOR 2 HEADWALL
		A	B	C	E	L	M	N	
STANDARD DOUBLE	18"	1'-9"	1'-3"	4'-6"	3'-0"	10'-5"	10¾"	3'-9"	4.18
	24"	1'-10"	1'-4"	5'-0"	3'-6"	12'-6"	10¾"	4'-6"	5.65
STANDARD TRIPLE	18"	1'-9"	1'-3"	4'-6"	3'-0"	13'-4"	10¾"	3'-9"	4.87
	24"	1'-10"	1'-4"	5'-0"	3'-6"	16'-0"	10¾"	4'-6"	6.68
RAISED DOUBLE	18"	1'-9"	1'-3"	5'-0"	3'-6"	11'-11"	10¾"	4'-6"	5.25
	24"	1'-10"	1'-4"	5'-6"	4'-0"	14'-2"	10¾"	5'-3"	7.43
RAISED TRIPLE	18"	1'-9"	1'-3"	5'-0"	4'-0"	14'-10"	10¾"	4'-6"	6.76
	24"	1'-10"	1'-4"	5'-6"	4'-6"	17'-6"	10¾"	5'-3"	8.83

NOTES

1. VOLUME DISPLACED BY BARREL OF PIPE HAS BEEN COMPUTED USING INSIDE DIAMETER OF PIPE. NO DEDUCTION HAS BEEN MADE FOR BEVELED EDGES.
2. WHEN HEADWALLS ARE LOCATED AT THE EDGE OF THE SHOULDER, THE TOP OF THE HEADWALLS SHALL BE PARALLEL TO THE EDGE OF SHOULDER.
3. WHEN A RAISED HEADWALL IS USED ON THE OUTLET END OF THE PIPE, THE TOPS OF BOTH WALLS SHALL BE AT THE SAME ELEVATION.



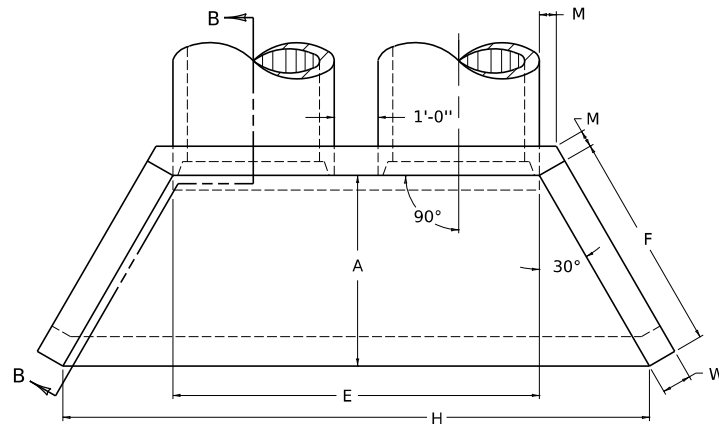
KENTUCKY
DEPARTMENT OF HIGHWAYS

18"-24" DOUBLE AND
TRIPLE PIPE CULVERT
HEADWALLS AT 0° SKEW

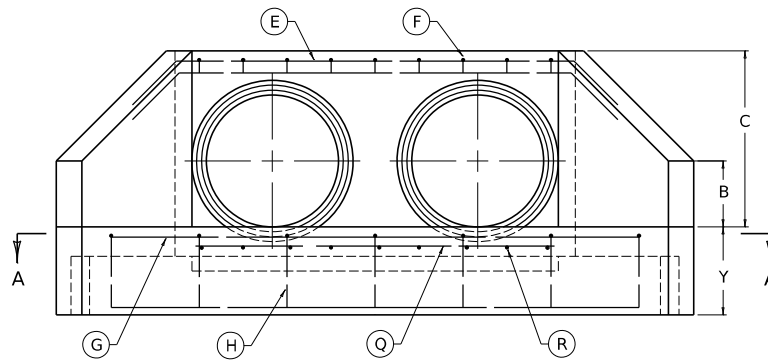
STANDARD DRAWING NO. RDH-500-03

SUBMITTED: _____ DIRECTOR DIVISION OF DESIGN _____ DATE: _____

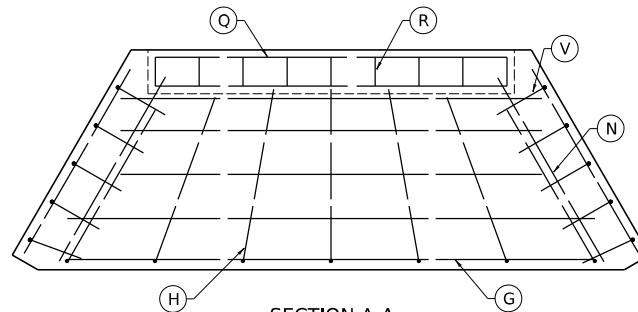
APPROVED: _____ STATE HIGHWAY ENGINEER _____ DATE: _____



PLAN VIEW



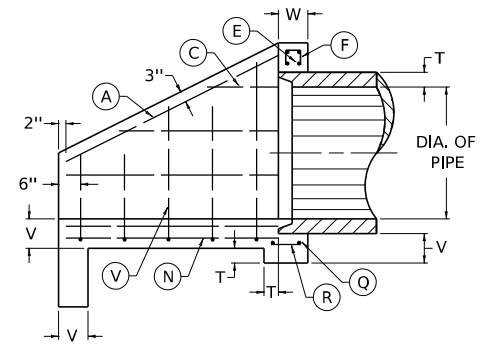
FRONT ELEVATION



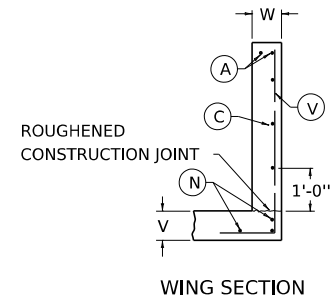
SECTION A-A

~ NOTES ~

1. SEE CURRENT STANDARD DRAWING RDH-522 AND 524 FOR DIMENSIONS, QUANTITIES AND BILL OF REINFORCEMENT.
2. ENCIRCLED LETTERS, $\bigcirc$, INDICATE STEEL BAR LOCATIONS.
3. BARS $\bigcirc$, $\bigcirc$, $\bigcirc$, ARE SPACED 1'-0" O.C. ALL OTHER BARS SHALL BE EVENLY SPACED.
4. BARS $\bigcirc$ ARE PLACED IN ORDER OF INCREASING LENGTHS, BEGINNING AT THE END OF EACH WING.
5. BARS $\bigcirc$ ARE PLACED IN ORDER OF INCREASING LENGTHS, BEGINNING AT THE TOP OF EACH WING.
6. HEADWALLS LOCATED AT EDGE OF SHOULDER SHALL BE PARALLEL TO CENTERLINE OF THE ROAD.
7. APRON BETWEEN WINGS SHALL BE SLOPED IN DIRECTION OF FLOW EQUAL TO SLOPE OF PIPE. FRONT FACE OF HEADWALL AND ENDS OF WINGS SHALL REMAIN VERTICAL.
8. DIMENSIONS FROM FACE OF CONCRETE TO STEEL SHALL BE 2" CLEAR DISTANCE.

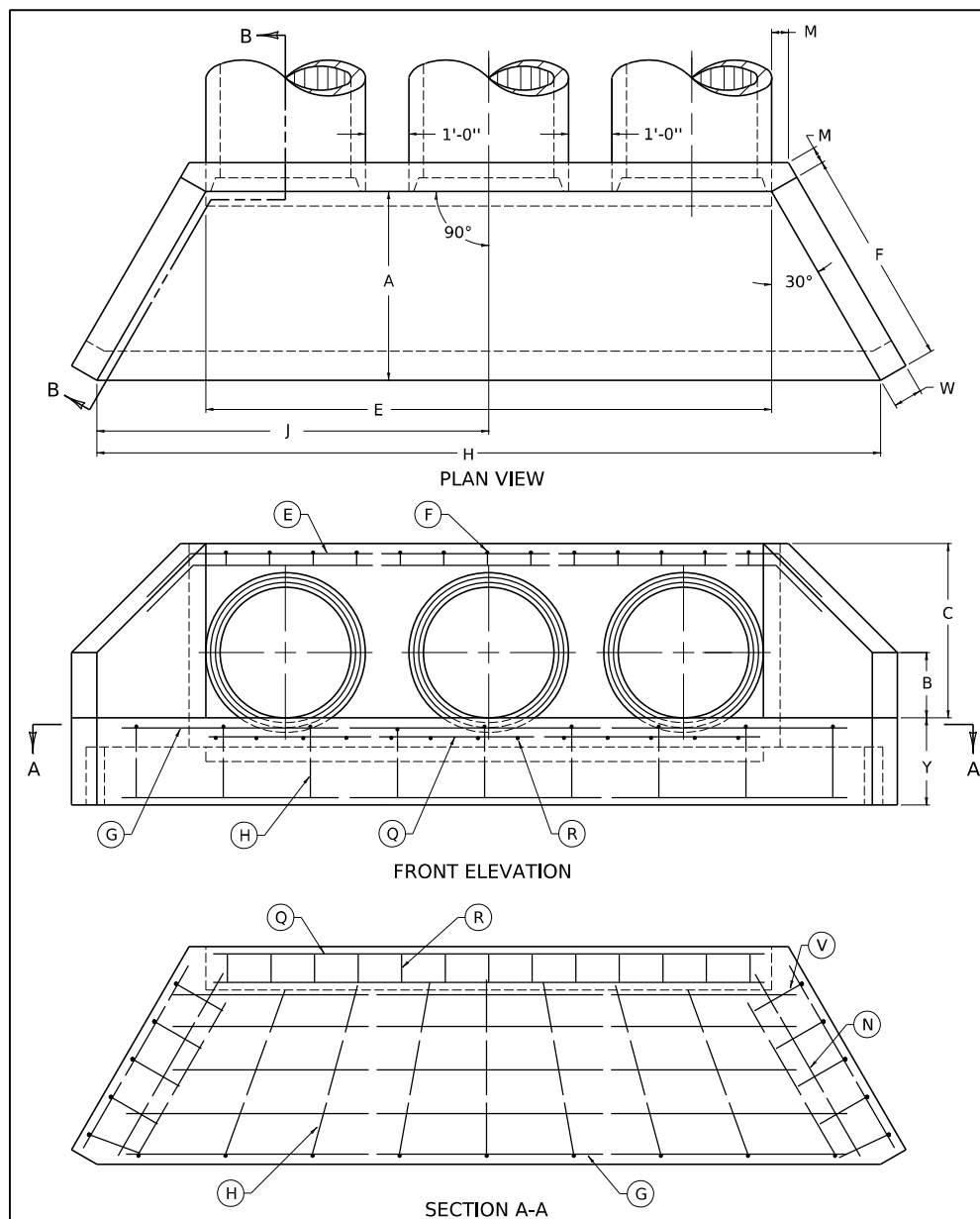


SECTION B-B



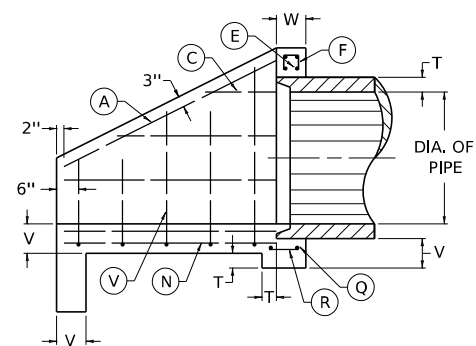
WING SECTION

KENTUCKY DEPARTMENT OF HIGHWAYS		
DOUBLE PIPE CULVERT HEADWALLS 0° SKEW		
STANDARD DRAWING NO. RDH-510-04		
SUBMITTED	DIRECTOR DIVISION OF DESIGN	DATE
APPROVED	STATE HIGHWAY ENGINEER	DATE

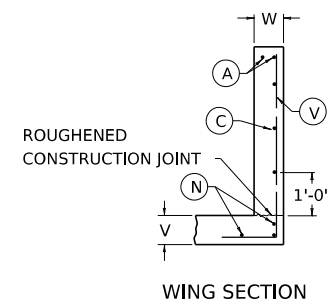


~ NOTES ~

1. SEE CURRENT STANDARD DRAWING RDH-522 AND 524 FOR DIMENSIONS, QUANTITIES AND BILL OF REINFORCEMENT.
2. ENCIRCLED LETTERS, $\bigcirc$, INDICATE STEEL BAR LOCATIONS.
3. BARS $\bigcirc$, $\bigcirc$, $\bigcirc$ ARE SPACED $1'-0"$ O.C. ALL OTHER BARS SHALL BE EVENLY SPACED.
4. BARS $\bigcirc$ ARE PLACED IN ORDER OF INCREASING LENGTHS, BEGINNING AT THE END OF EACH WING.
5. BARS $\bigcirc$ ARE PLACED IN ORDER OF INCREASING LENGTHS, BEGINNING AT THE TOP OF EACH WING.
6. HEADWALLS LOCATED AT EDGE OF SHOULDER SHALL BE PARALLEL TO CENTERLINE OF THE ROAD.
7. APRON BETWEEN WINGS SHALL BE SLOPED IN DIRECTION OF FLOW EQUAL TO SLOPE OF PIPE. FRONT FACE OF HEADWALL AND ENDS OF WINGS SHALL REMAIN VERTICAL.
8. DIMENSIONS FROM FACE OF CONCRETE TO STEEL SHALL BE $2"$ CLEAR DISTANCE.



SECTION B-B



KENTUCKY DEPARTMENT OF HIGHWAYS		
TRIPLE PIPE CULVERT HEADWALLS 0° SKEW		
STANDARD DRAWING NO. RDH-520-05		
SUBMITTED	DIRECTOR DIVISION OF DESIGN	DATE
APPROVED	STATE HIGHWAY ENGINEER	DATE

DIMENSIONS FOR MULTIPLE PIPE HEADWALLS - 0° SKEW									
DIMENSION	DOUBLE				TRIPLE				DIMENSION
	30"	36"	42"	48"	30"	36"	42"	48"	
A	3'-9"	4'-4"	4'-11"	5'-6"	3'-9"	4'-4"	4'-11"	5'-6"	A
B	1'-3"	1'-6"	1'-9"	2'-0"	1'-3"	1'-6"	1'-9"	2'-0"	B
C	3'-6"	4'-0"	4'-7"	5'-1"	3'-6"	4'-0"	4'-7"	5'-1"	C
E	7'-2"	8'-4"	9'-6"	10'-8"	11'-3"	13'-0"	14'-9"	16'-6"	E
F	4'-4"	5'-0"	5'-8"	6'-4"	4'-4"	5'-0"	5'-8"	6'-4"	F
H	11'-6"	13'-4"	15'-2"	17'-0"	15'-6"	18'-0"	20'-6"	22'-10"	H
J	--	--	--	--	7'-9"	9'-0"	10'-3"	11'-5"	J
M	0'-5"				0'-5"				M
T	0'-3.5"	0'-4"	0'-4.5"	0'-5"	0'-3.5"	0'-4"	0'-4.5"	0'-5"	T
V	0'-8"				0'-8"				V
W	0'-8"				0'-8"				W
Y	2'-0"				2'-0"				Y
CLASS "A" CONC. CU. YDS. 2 HEADWALLS	4.91	6.22	7.75	9.38	6.49	8.20	10.19	12.30	CLASS "A" CONC. CU. YDS. 2 HEADWALLS
LBS. STEEL 2 HEADWALLS	379	480	561	660	475	594	702	797	LBS. STEEL 2 HEADWALLS

DIMENSIONS AND QUANTITIES ARE BASED ON CONCRETE PIPE AND WILL VARY SLIGHTLY FOR CORRUGATED METAL PIPE.

USE WITH CURRENT STD. DWG.
 RDH-510 OR RDH-520

KENTUCKY
 DEPARTMENT OF HIGHWAYS
 DIMENSIONS & QUANTITIES
 30"-48" DOUBLE &
 TRIPLE-HEADWALLS
 CIRCULAR PIPE 0° SKEW
 STANDARD DRAWING NO. RDH-522-02

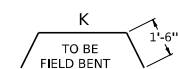
SUBMITTED _____ DIRECTOR DIVISION OF DESIGN _____ DATE _____
 APPROVED _____ STATE HIGHWAY ENGINEER _____ DATE _____

[illegible]

NOTES

- ① NUMBER OF BARS IN ONE HEADWALL.
- 2 DIMENSIONS ARE 0. TO 0. OF BARS.
- 3 ALL BARS ARE STRAIGHT EXCEPT THOSE SHOWN BELOW.

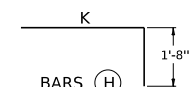
BENT BAR SHAPES



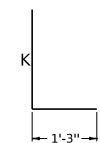
BARS (E)



BARS (F)



BARS (H)



BARS (V)

(USE WITH CURRENT STD. DWG.
NO.RDH-510 OR RDH-520)

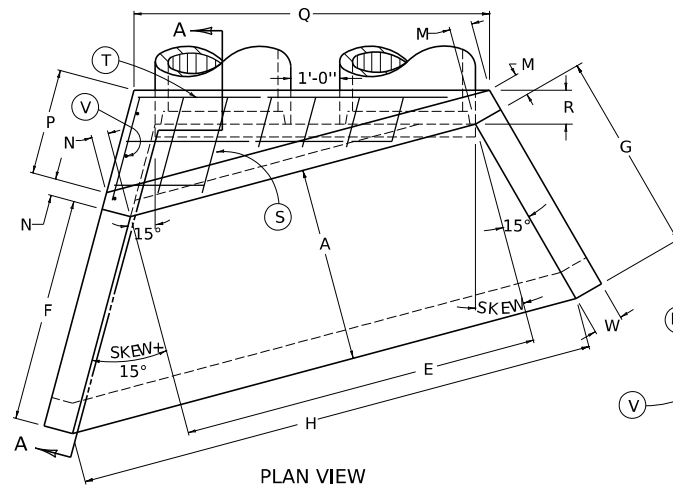
KENTUCKY DEPARTMENT OF HIGHWAYS

BILL OF REINFORCEMENT
30" TO 48" DOUBLE & TRIPLE
CIRCULAR PIPE HEADWALLS
0° SKEW

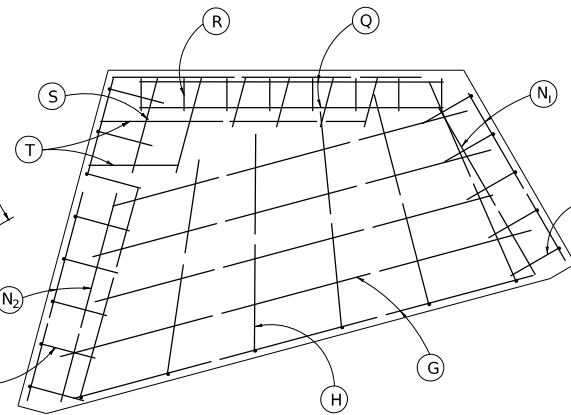
STANDARD DRAWING NO. RDH-524-03

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN _____ DATE _____

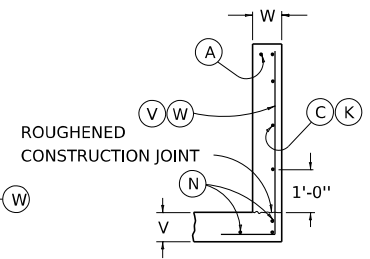
APPROVED _____ STATE HIGHWAY ENGINEER _____ DATE _____



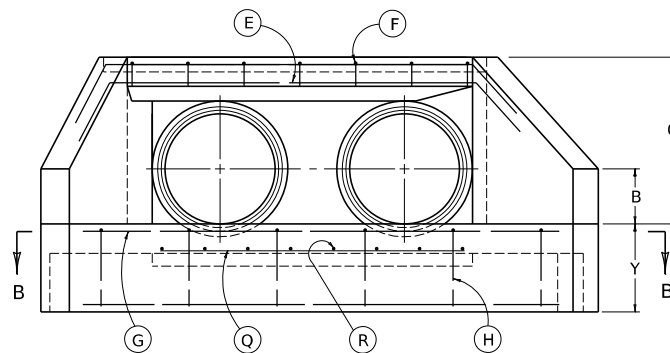
PLAN VIEW



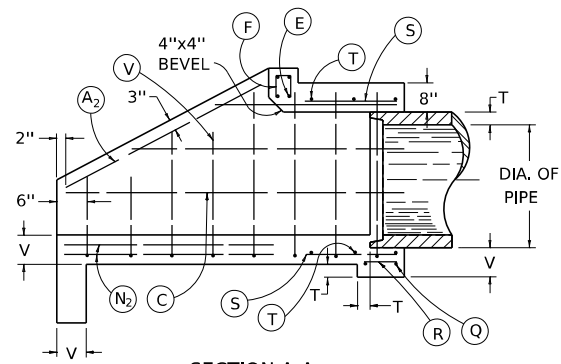
SECTION B-B



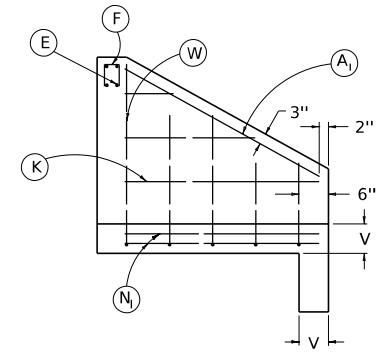
WING SECTION



FRONT ELEVATION



SECTION A-A



SHORT WING SECTION

~ NOTES ~

1. SEE CURRENT STANDARD DRAWINGS RDH-532, 534 AND 536 FOR DIMENSIONS, QUANTITIES AND BILL OF REINFORCEMENT.
2. DIMENSIONS FROM FACE OF CONCRETE TO STEEL SHALL BE 2" CLEAR DISTANCE.
3. ENCIRCLED LETTERS, ○, INDICATE STEEL BAR LOCATIONS.
4. BARS ○, ○, ○ ARE SPACED 1'-0" O.C. ALL OTHER BARS SHALL BE EVENLY SPACED.
5. BARS ○ AND ○ ARE PLACED IN ORDER OF INCREASING LENGTHS, BEGINNING AT THE END OF EACH WING.
6. BARS ○ AND ○ ARE PLACED IN ORDER OF INCREASING LENGTHS, BEGINNING AT THE TOP OF EACH WING.
7. HEADWALLS LOCATED AT EDGE OF SHOULDER SHALL BE PARALLEL TO CENTERLINE OF THE ROAD.
8. APRON BETWEEN WINGS SHALL BE SLOPED IN DIRECTION OF FLOW EQUAL TO SLOPE OF PIPE, FRONT FACE OF HEADWALL AND ENDS OF WINGS SHALL REMAIN VERTICAL.

(LAYOUT AND STEEL PATTERN)

KENTUCKY
DEPARTMENT OF HIGHWAYS

DOUBLE PIPE
CULVERT HEADWALLS
15° -30° & 45° SKEW

STANDARD DRAWING NO. RDH-530-04

SUBMITTED: DIRECTOR DIVISION OF DESIGN DATE
APPROVED: STATE HIGHWAY ENGINEER DATE

DIMENSION	DIAMETER OF PIPE												DIMENSION
	15° SKEW				30° SKEW				45° SKEW				
	30"	36"	42"	48"	30"	36"	42"	48"	30"	36"	42"	48"	
A	4'-5"	5'-0"	5'-7"	6'-2"	4'-5"	5'-0"	5'-7"	6'-2"	4'-5"	5'-0"	5'-7"	6'-2"	A
B	1'-3"	1'-6"	1'-9"	2'-0"	1'-3"	1'-6"	1'-9"	2'-0"	1'-3"	1'-6"	1'-9"	2'-0"	B
C	3'-10"	4'-4"	4'-11"	5'-5"	3'-10"	4'-4"	4'-11"	5'-5"	3'-10"	4'-4"	4'-11"	5'-5"	C
E	8'-0"	9'-4"	10'-7"	11'-11"	9'-9"	11'-5"	13'-0"	14'-7"	13'-10"	16'-1"	18'-4"	20'-7"	E
F	5'-1"	5'-9"	6'-5"	7'-1"	6'-3"	7'-1"	7'-11"	8'-9"	8'-10"	10'-0"	11'-2"	12'-4"	F
G	4'-7"	5'-2"	5'-9"	6'-5"	4'-7"	5'-2"	5'-9"	6'-5"	4'-7"	5'-2"	5'-9"	6'-5"	G
H	11'-9"	13'-6"	15'-4"	17'-1"	15'-5"	17'-9"	20'-1"	22'-5"	22'-8"	26'-1"	29'-6"	32'-11"	H
M	0'-6"				0'-6"				0'-6"				M
N	0'-6"				0'-6"				0'-6"				N
P	2'-5"	2'-9"	3'-1"	3'-6"	5'-7"	6'-5"	7'-3"	8'-1"	10'-11"	12'-6"	14'-2"	15'-10"	P
Q	8'-1"	9'-3"	10'-5"	11'-7"	7'-11"	9'-1"	10'-3"	11'-5"	7'-8"	8'-10"	10'-0"	11'-2"	Q
R	0'-9"				0'-10"				0'-10"				R
T	0'-3.5"	0'-4.0"	0'-4.5"	0'-5.0"	0'-3.5"	0'-4.0"	0'-4.5"	0'-5.0"	0'-3.5"	0'-4.0"	0'-4.5"	0'-5.0"	T
V	0'-8"				0'-8"				0'-8"				V
W	0'-8"				0'-8"				0'-8"				W
Y	2'-0"				2'-0"				2'-0"				Y
CU.YDS,CONC. 2 HEADWALLS	7.16	9.06	11.20	13.54	9.80	12.62	15.75	19.12	14.82	19.12	24.02	29.29	CU.YDS,CONC. 2 HEADWALLS
LBS,STEEL 2 HEADWALLS	607	727	871	1021	841	1001	1205	1426	1239	1529	1876	2252	LBS,STEEL 2 HEADWALLS

DIMENSIONS AND QUANTITIES ARE BASED ON CONCRETE PIPE AND WILL VARY SLIGHTLY FOR CORRUGATED METAL PIPE.

USE WITH CUR. STD. DWG.RDH-530

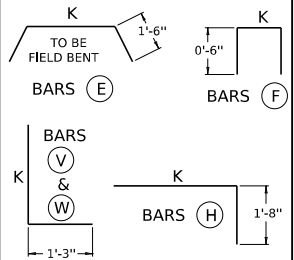
KENTUCKY DEPARTMENT OF HIGHWAYS
<i>DIMENSTONS & QUANTITIES 30"-48" DOUBLE H-WALLS CIRCULAR PIPE 15°-30°-45° SKEW</i>
STANDARD DRAWING NO. RDH-532-04
SUBMITTED _____ DIRECTOR DIVISION OF DESIGN _____ DATE _____
APPROVED _____ STATE HIGHWAY ENGINEER _____ DATE _____

MARK SIZE	NO	LGTH	K		MARK SIZE	NO	LGTH	K		MARK SIZE	NO	LGTH	K		MARK SIZE	NO	LGTH	K		MARK SIZE	NO	LGTH	K		MARK SIZE	NO	LGTH	K																																																	
①	FT	IN	FT	IN	①	FT	IN	FT	IN	①	FT	IN	FT	IN	①	FT	IN	FT	IN	①	FT	IN	FT	IN	①	FT	IN	FT	IN																																																
30" 15° SKEW					36" (CONT'D)					42" (CONT'D)					30" 30° SKEW					36" (CONT'D)					42" (CONT'D)					48" (CONT'D)																																															
					K ₂	4	1	3	11						V ₃	5	2	5	6	4	3						F	4	12	1	3	0	4						N ₁	4	3	5	7						S ₆	5	4	6	4																								
					K ₃	4	1	5	0						V ₄	5	4	6	2	4	11						G ₁	4	1	12	0						N ₂	4	3	7	9						S ₇	5	4	7	6																										
					N ₁	4	3	5	0						W ₁	5	2	3	7	2	4						G ₂	4	2	13	9						Q	4	2	9	2						T ₁	5	2	1	3																										
A ₁	5	2	5	0						N ₂	4	3	5	7						W ₂	5	2	4	8	3	5						G ₃	4	3	16	3						R	4	10	0	10						T ₂	5	2	3	1																					
A ₂	5	2	5	6						Q	4	2	8	0						W ₃	5	2	5	9	4	6						H	4	9	7	2	5	6						S ₁	5	4	1	3						T ₃	5	2	4	3																			
C ₁	4	1	3	11						R	4	9	0	10											C ₁	4	1	2	2						S ₂	5	4	2	6						T ₄	5	2	5	3																												
C ₂	4	1	5	11						S ₁	5	8	1	2											C ₂	4	1	9	8						S ₃	5	4	3	6						T ₅	5	2	7	3																												
C ₃	4	1	7	6						S ₂	5	8	2	3											C ₃	4	1	11	9						K ₃	4	1	5	0						S ₄	5	4	5	6						T ₆	5	2	8	3																		
E ₁	5	2	11	4	8	4						T ₁	5	2	3	3											E ₁	5	2	13	1	10	1						N ₁	4	3	5	0						S ₅	5	4	6	6						T ₇	5	4	10	3														
E ₂	5	2	11	7	8	7						T ₂	5	4	7	2											E ₂	5	2	13	3	10	3						N ₂	4	3	6	10						T ₁	5	2	1	3						V ₁	5	2	3	9	2	6												
F	4	9	1	3	0	4						V ₁	5	2	3	4	2	1						A ₁	5	2	7	0						F	4	11	1	3	0	4						Q	4	2	8	0						T ₂	5	4	3	3						V ₂	5	2	4	6	3	3					
G ₁	4	1	8	4						V ₂	5	2	4	4	3	1						A ₂	5	2	7	9						G ₁	4	1	10	4						R	4	9	0	10						T ₃	5	2	5	3						V ₃	5	2	5	4	4	1									
G ₂	4	2	9	2						V ₃	5	2	5	3	4	0						C ₁	4	1	6	4						G ₂	4	2	11	7						S ₁	5	4	1	2						T ₄	5	2	7	3						V ₄	5	2	6	1	4	10									
G ₃	4	3	10	10						V ₄	5	3	5	7	4	4						C ₂	4	1	8	5						G ₃	4	3	14	2						S ₂	5	2	2	4						T ₅	5	4	9	3						V ₅	5	9	6	8	5	5									
H	4	6	6	7	4	11						W ₁	5	2	3	4	2	1						C ₃	4	1	10	6						H	4	8	6	7	4	11						S ₃	5	4	3	4						V ₁	5	2	3	6	2	3															
K ₁	4	1	1	1						W ₂	5	2	4	5	3	2						C ₄	4	1	10	8						K ₁	4	1	1	2						S ₄	5	2	4	4						V ₂	5	2	4	4	3	1																			
K ₂	4	1	2	11						W ₃	5	1	5	6	4	3						E ₁	5	2	15	3	12	3						K ₂	4	1	2	11						S ₅	5	6	5	4						V ₃	5	2	5	1	3	10																	
K ₃	4	1	4	5											E ₂	5	2	15	6	12	6						K ₃	4	1	4	4						T ₁	5	2	2	3						V ₄	5	2	5	11	4	8																								
N ₁	4	3	4	5											F	4	13	1	3	0	4						N ₁	4	3	4	5						T ₂	5	2	3	3						V ₅	5	7	6	2	4	11																								
N ₂	4	3	4	11											G ₁	4	2	11	11						N ₂	4	3	6	1						T ₃	5	2	5	2						W ₁	5	2	3	7	2	4																										
Q	4	2	6	10											G ₂	4	3	14	6						Q	4	2	6	10						R	4	8	0	9						T ₄	5	2	6	3						W ₂	5	2	4	8	3	5																
R	4	8	0	9											G ₃	4	3	16	4						H	4	8	0	9						S ₁	5	4	8	2						W ₃	5	2	5	9	4	6																										
S ₁	5	8	1	2						A ₁	5	2	6	3						H	4	9	8	4	6	8						S ₂	5	2	2	4						V ₂	5	2	4	1	2	10																													
S ₂	5	6	2	3						A ₂	5	2	7	0						K ₁	4	1	2	4						S ₃	5	4	3	3						V ₃	5	2	4	10	3	7																															
T ₁	5	2	2	0						C ₁	4	1	4	9						K ₂	4	1	4	2						S ₄	5	4	3	3						V ₄	5	2	4	10	3	7																															
T ₂	5	2	6	0						C ₂	4	1	6	10						K ₃	4	1	6	1						S ₅	5	2	4	4						W ₁	5	2	4	10	3	7																															
T ₃	5	2	7	0						C ₃	4	1	8	10						K ₄	4	1	6	3						T ₁	5	2	1	2						W ₂	5	2	3	4	2	1																															
V ₁	5	2	3	1	1	10						C ₄	4	1	9	7						N ₁	4	3	6	3						T ₂	5	2	1	2						W ₃	5	2	4	5	3	2																													
V ₂	5	2	4	1	2	10						E ₁	5	2	13	11	10	11						N ₂	4	3	6	11						T ₃	5	2	2	3						W ₄	5	1	5	6	4	3																											
V ₃	5	4	5	1	3	10						E ₂	5	2	14	2	11	2						Q	4	2	10	4						T ₄	5	2	4	1																																							
W ₁	5	2	3	1	1	10						F	4	11	1	3	0	4						R	4	11	0	10						T ₅	5	2	5	3																																							
W ₂	5	2	4	2	2	11						G ₁	4	2	11	0						S ₁	5	8	1	2						V ₁	5	2	3	0	1	9																																							
W ₃	5	1	5	4	4	1						G ₂	4	2	12	9						S ₂	5	6	2	4						V ₂	5	2	3	10	2	7																																							
										G ₃	4	3	14	5						S ₃	5	6	3	3						V ₃	5	2	3	10	2	7																																									
										H	4	8	7	9	6	1						T ₁	5	2	2	3						V ₄	5	6	5	1	3	10																																							
										K ₁	4	1	1	3						T ₂	5	2	5	3						V ₅	5	2	4	3	3	0																																									
										K ₂	4	1	3	1						T ₃	5	4	9	3						W ₁	5	2	3	1	1	10																																									
										K ₃	4	1	4	11						V ₁	5	2	3	10	2	7						W ₂	5	2	4	3	3	0																																							
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C ₃	4	1	8	6						R	4	10	0	10						W ₂	5	2	4	11	3	8																																																			
E ₁	5	2	12	8	9	8						S ₁	5	8	1	3						W ₃	5	2	5	11	4	8																																																	
E ₂	5	2	12	11	9	11						S ₂	5	6	2	3																																																													
F	4	10	1	3	0	4</																																																																							

NOTES

- ① NUMBER OF BARS IN ONE HEADWALL.
- DIMENSIONS ARE 0. TO 0. OF BARS.
- ALL BARS ARE STRAIGHT EXCEPT THOSE SHOWN BELOW.

BENT BAR SHAPES



(USE WITH CURRENT RDH-530)

KENTUCKY
DEPARTMENT OF HIGHWAYS
BILL OF REINFORCEMENT
30" TO 48" DOUBLE
CIRCULAR PIPE HEADWALLS
15° - 30° SKEW

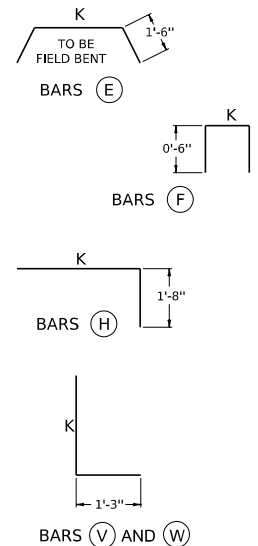
STANDARD DRAWING NO. RDH-534-03

SUBMITTED: DIRECTOR, DIVISION OF DESIGN DATE: _____
APPROVED: STATE HIGHWAY ENGINEER DATE: _____

MARK SIZE	NO ①	LGTH		K		MARK SIZE	NO ①	LGTH		K		MARK SIZE	NO ①	LGTH		K		MARK SIZE	NO ①	LGTH		K		MARK SIZE	NO ①	LGTH		K		MARK SIZE	NO ①	LGTH		K	
		FT	IN	FT	IN			FT	IN	FT	IN			FT	IN	FT	IN			FT	IN	FT	IN			FT	IN	FT	IN			FT	IN	FT	IN
30" 45° SKEW						36"						42"						48"						48" (CONT'D)											
						A1	5	2	5	8			A1	5	2	6	5			A1	5	2	7	1			W6	5	2	4	11	3			
						A2	5	2	10	2			A2	5	2	11	5			A2	5	2	12	6											
						C1	4	1	16	8			C1	4	1	16	9			C1	4	1	20	4											
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						C3	4	1	22	3			C3	4	1	23	9			C3	4	1	27	6											
						E1	5	2	19	5	16	5	E1	5	2	21	8	18	8	E1	5	2	23	11	20	11									
						E2	5	2	19	7	16	7	E2	5	2	21	10	18	10	E2	5	2	24	1	21	1									
						F	4	17	1	3	0	4	F	4	19	1	3	0	4	F	4	21	1	3	0	4									
						G1	4	2	20	0			G1	4	2	19	4			G1	4	2	21	0											
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						H	4	13	7	2	5	6	G3	4	3	27	3			G3	4	3	30	10											
						K1	4	1	2	0			H	4	14	7	9	6	1	H	4	16	8	4	6	8									
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						S2	5	2	3	3			R	4	10	0	10			R	4	11	0	10											
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						S7	5	2	9	6			S5	5	2	7	6			S5	5	2	7	9											
						S8	5	4	11	8			S6	5	2	8	6			S6	5	2	8	9											
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						V1	5	2	3	2	1	11	T6	5	4	6	0			T5	5	2	4	6											
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													V5	5	2	5	9	4	6	V2	5	2	4	3	3	0									
													V6	5	15	6	1	4	10	V3	5	2	4	10	3	7									
													W6	5	2	3	7	2	4	V4	5	2	5	5	4	2									
													W6	5	2	4	8	3	5	V5	5	2	5	11	4	8									
													W6	5	2	5	9	4	6	V6	5	2	6	6	5	3									
													V7	5	16	6	8	5	5																
													W6	5	2	3	10	2	7																

- NOTES**
- ① NUMBER OF BARS IN ONE HEADWALL.
 - 2 DIMENSIONS ARE 0. TO 0. OF BARS.
 - 3 ALL BARS ARE STRAIGHT EXCEPT THOSE SHOWN BELOW.

BENT BAR SHAPES



(USE WITH CURRENT RDH-530)

KENTUCKY
DEPARTMENT OF HIGHWAYS

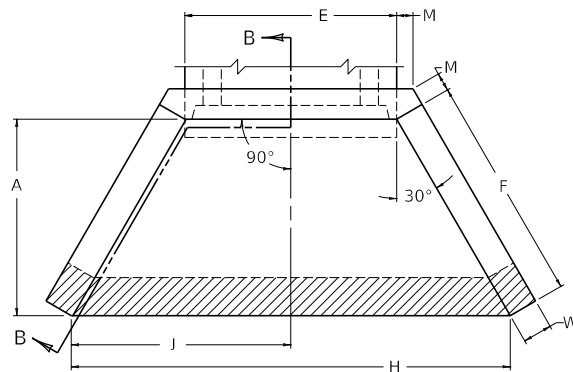
BILL OF REINFORCEMENT
30" TO 48" DOUBLE
CIRCULAR PIPE HEADWALLS
45° SKEW

STANDARD DRAWING NO. RDH-536-03

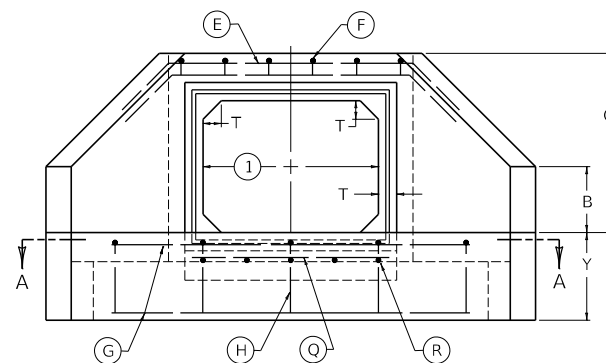
SUBMITTED _____ DIRECTOR DIVISION OF DESIGN _____ DATE _____

APPROVED _____ STATE HIGHWAY ENGINEER _____ DATE _____

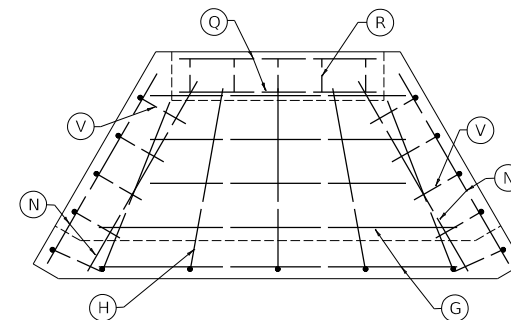
DRAWING SCALE:
 $\frac{3}{4}" : 1'$



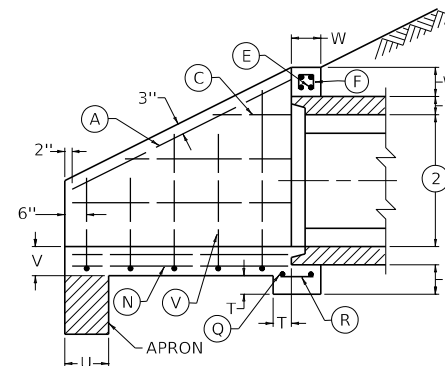
PLAN VIEW



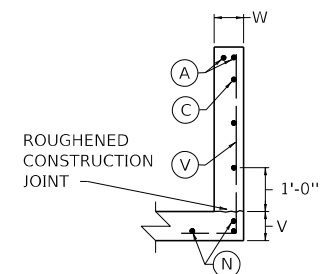
FRONT ELEVATION



SECTION A-A



SECTION B-B



WING SECTION

NOTES

1. SPAN OF BOX CULVERT
2. RISE OF BOX CULVERT
3. FOR DIMENSIONS, QUANTITIES, AND BILL OF REINFORCEMENT SEE CUR. STD. DWGS. RDH-1100, RDH-1200 AND RDH-1300 SERIES.
4. DIMENSIONS FROM FACE OF CONCRETE TO STEEL SHALL BE 2" CLEAR DISTANCE.
5. ENCIRCLED LETTERS, ○, INDICATE STEEL BAR LOCATIONS.
6. BARS ○, ○, AND ○ ARE SPACED 1'-0" O.C. ALL OTHER BARS SHALL BE EVENLY SPACED.
7. BARS ○ ARE PLACED IN ORDER OF INCREASING LENGTHS, BEGINNING AT THE END OF EACH WING.
8. BARS ○ ARE PLACED IN ORDER OF INCREASING LENGTHS, BEGINNING AT THE TOP OF EACH WING.
9. HEADWALLS LOCATED AT SHOULDER EDGE SHALL BE PARALLEL TO CENTERLINE OF ROAD.
10. LIMITS OF APRON.
11. PAVING SHALL BE REQUIRED AND SHALL BE SLOPED IN DIRECTION OF FLOW EQUAL TO SLOPE OF BOX. FRONT FACE OF HEADWALL AND ENDS OF WINGS SHALL REMAIN VERTICAL.

(LAYOUT AND STEEL PATTERN)

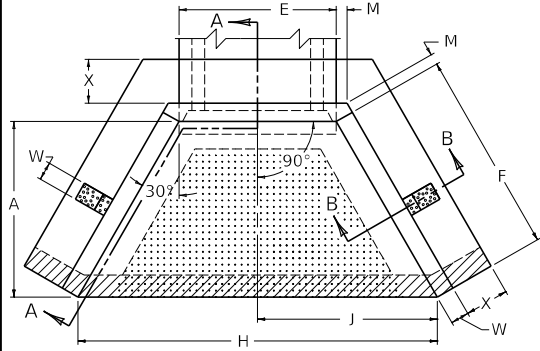
KENTUCKY
 DEPARTMENT OF HIGHWAYS

PRECAST BOX CULVERT
 HEADWALLS - 0° SKEW
 (BOX RISE LESS THAN 6'-0")

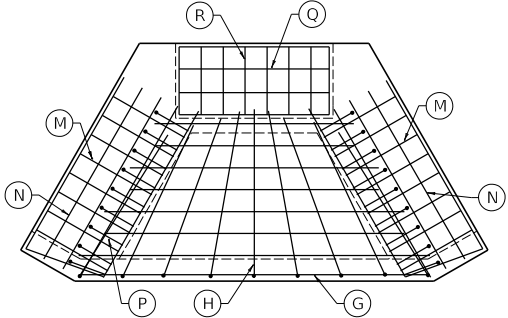
STANDARD DRAWING NO. RDH-1000-02

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN _____ DATE _____
 APPROVED _____ STATE HIGHWAY ENGINEER _____ DATE _____

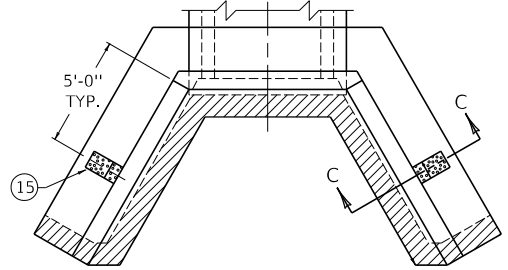
DRAWING SCALE:
3/4" = 1'



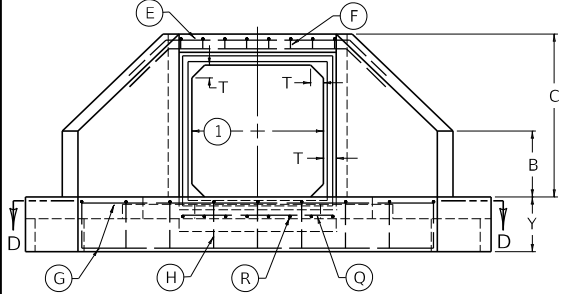
PLAN VIEW



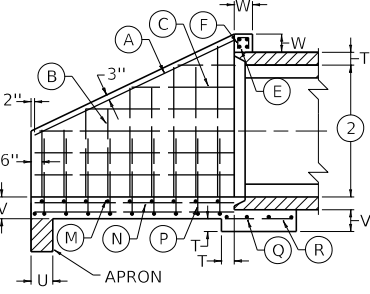
SECTION D-D



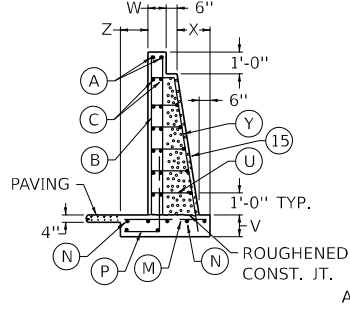
PLAN VIEW
WITHOUT PAVING



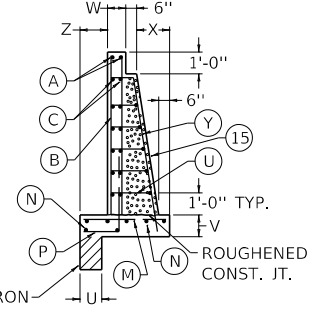
FRONT ELEVATION



SECTION A-A



SECTION B-B



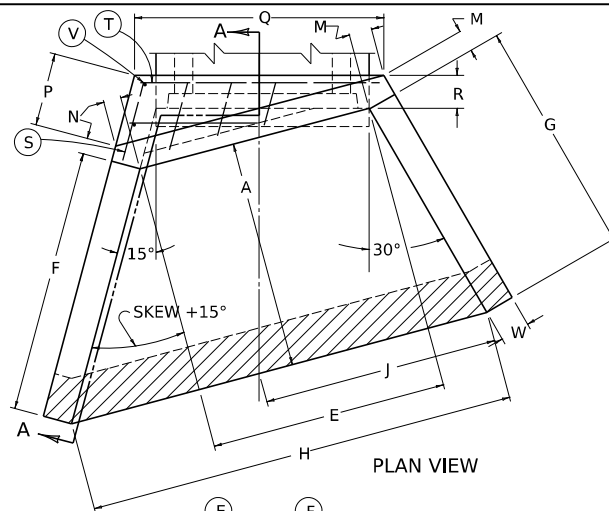
SECTION C-C

NOTES

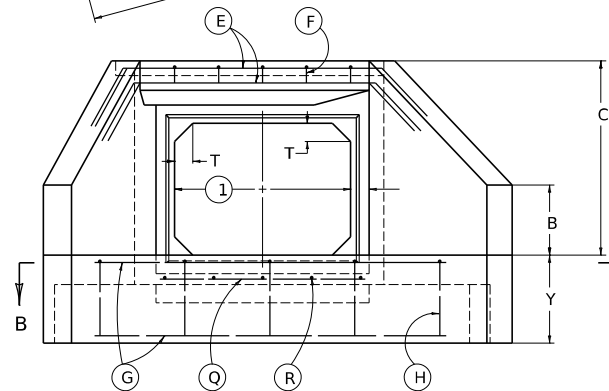
1. SPAN OF BOX CULVERT
2. RISE OF BOX CULVERT
3. FOR DIMENSIONS, QUANTITIES, AND BILL OF REINFORCEMENT SEE CUR. STD. DWGS. RDH-1100, RDH-1200 AND RDH-1300 SERIES.
4. DIMENSIONS FROM FACE OF CONCRETE TO STEEL SHALL BE 2" CLEAR DISTANCE.
5. ENCIRCLED LETTERS, ○, INDICATE STEEL BAR LOCATIONS.
6. BARS ○, ○, ○, ○, ○, ○ AND ○ ARE SPACED 1'-0" O.C. ALL OTHER BARS SHALL BE EVENLY SPACED.
7. BARS ○, ○ AND ○ ARE PLACED IN ORDER OF INCREASING LENGTH, BEGINNING AT THE END OF WING, TOP OF WING AND TOP OF COUNTERFORT RESPECTIVELY.
8. HEADWALLS LOCATED AT SHOULDER EDGE SHALL BE PARALLEL TO CENTERLINE OF ROAD.
9. LIMITS OF APRON.
10. LIMITS OF PAVING.
11. LIMITS OF COUNTERFORTS.
12. THESE HEADWALLS ARE DESIGNED BOTH WITH AND WITHOUT PAVING BETWEEN THE WINGS. (SEE PLANS)
13. WHEN PAVING IS REQUIRED; PAVING SHALL BE SLOPED IN DIRECTION OF FLOW EQUAL TO SLOPE OF BOX. FRONT FACE OF HEADWALL AND ENDS OF WINGS SHALL REMAIN VERTICAL.
14. WHEN PAVING IS NOT REQUIRED BARS ○ AND ○ SHALL BE ELIMINATED.
15. A COUNTERFORT SHALL BE REQUIRED ON A WING WALL WHEN THE BOX RISE IS 8'-0" OR GREATER AND THE WING WALL IS 15'-0" OR LONGER.

(LAYOUT AND STEEL PATTERN)

KENTUCKY DEPARTMENT OF HIGHWAYS	
PRECAST BOX CULVERT HEADWALLS - 0° SKEW (BOX RISE 6'-0" OR GREATER)	
STANDARD DRAWING NO. RDH-1005-02	
SUBMITTED _____	DIRECTOR DIVISION OF DESIGN _____
APPROVED _____	DATE _____



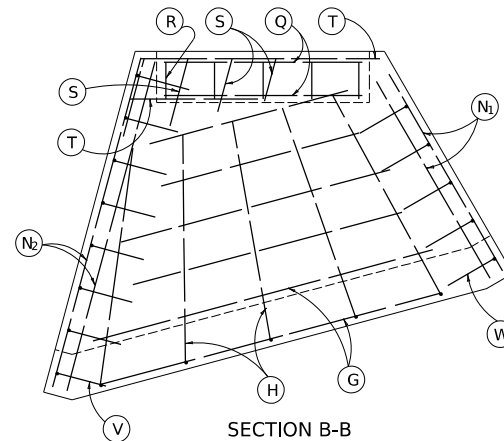
PLAN VIEW



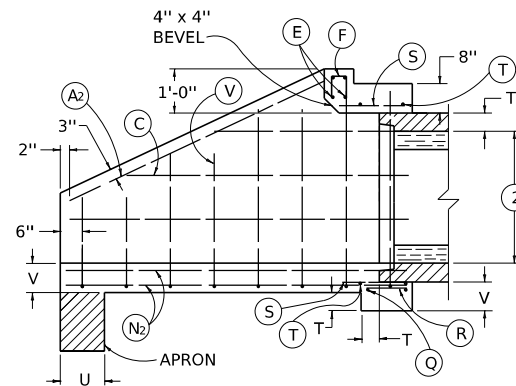
FRONT ELEVATION

~ NOTES ~

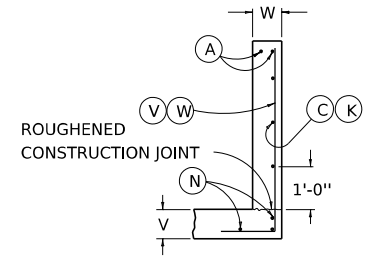
- ① SPAN OF BOX CULVERT.
- ② RISE OF BOX CULVERT.
3. FOR DIMENSIONS, QUANTITIES, AND BILL OF REINFORCEMENT SEE CURRENT STANDARD DRAWINGS RDH-1100, RDH-1200 AND RDH-1300 SERIES.
4. DIMENSIONS FROM CONCRETE TO STEEL SHALL BE 2" CLEAR DISTANCE.
5. ENCIRCLED LETTERS , $\bigcirc$, INDICATE STEEL BAR LOCATIONS.
6. BARS $\bigcirc$ C, $\bigcirc$ G, $\bigcirc$ K, $\bigcirc$ V, $\bigcirc$ W ARE SPACED 1'-0" O.C. ALL OTHER BARS SHALL BE EVENLY SPACED.
7. BARS $\bigcirc$ V AND W ARE PLACED IN ORDER OF INCREASING LENGTHS, BEGINNING AT THE END OF EACH WING.
8. BARS $\bigcirc$ C AND K ARE PLACED IN ORDER OF INCREASING LENGTHS, BEGINNING AT THE TOP OF EACH WING.
9. HEADWALLS LOCATED AT EDGE OF SHOULDERS SHALL BE PARALLEL TO CENTERLINE OF THE ROAD.
10. LIMITS OF APRON.
11. PAVING SHALL BE REQUIRED AND SHALL BE SLOPED IN DIRECTION OF FLOW EQUAL TO SLOPE OF BOX. FRONT FACE OF HEADWALL AND ENDS OF WINGS SHALL REMAIN VERTICAL.



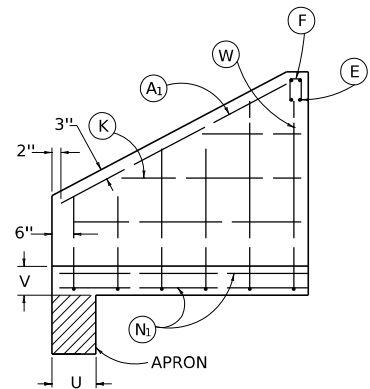
SECTION B-B



SECTION A-A



WING SECTION



SHORT WING SECTION

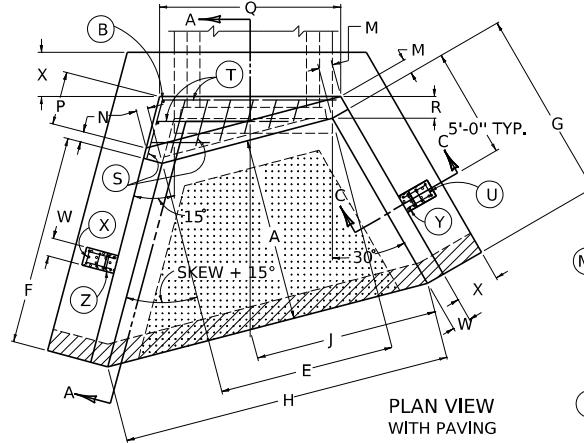
(LAYOUT AND STEEL PATTERN)

KENTUCKY
DEPARTMENT OF HIGHWAYS

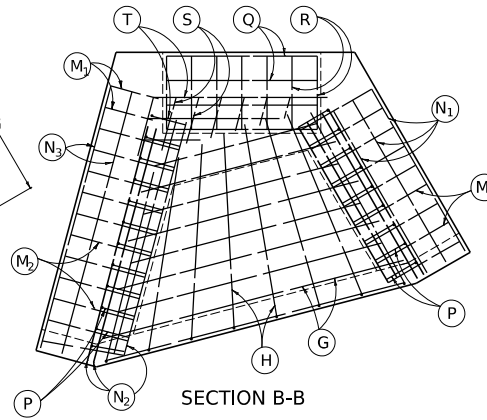
PRECAST BOX CULVERT
H-WALLS-15° -30° & 45° SK
(BOX RISE LESS THAN 6'-0")

STANDARD DRAWING NO. RDH-1010-02

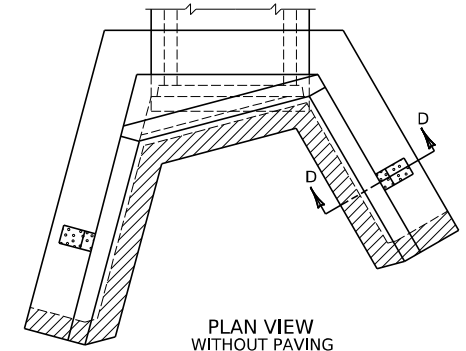
SUBMITTED	DIRECTOR DIVISION OF DESIGN	DATE
APPROVED	STATE HIGHWAY ENGINEER	DATE



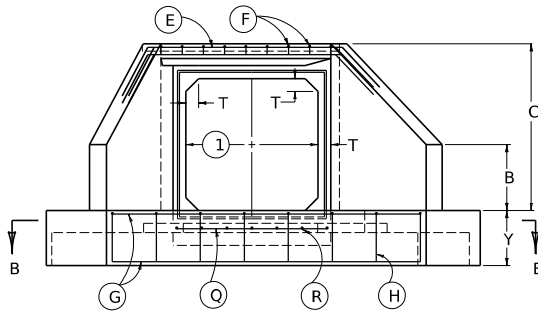
PLAN VIEW
WITH PAVING



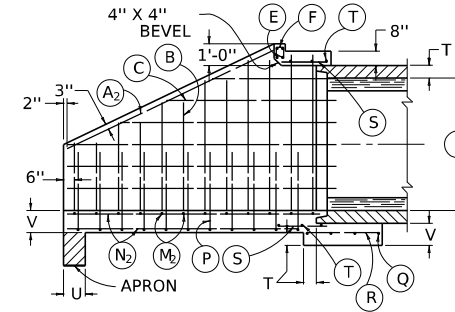
SECTION B-B



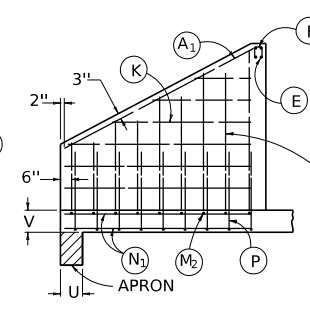
PLAN VIEW
WITHOUT PAVING



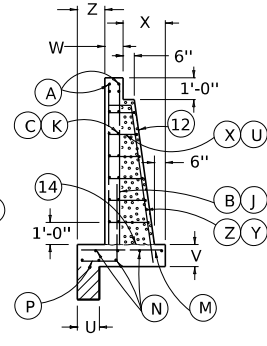
FRONT ELEVATION



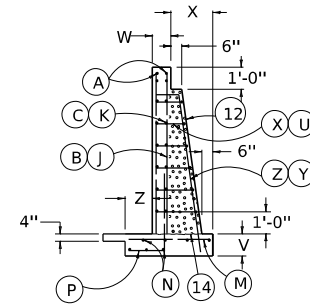
SECTION A-A



SHORT WING SECTION



SECTION D-D



SECTION C-C

- ① SPAN OF BOX CULVERT.
- ② RISE OF BOX CULVERT.
3. FOR DIMENSIONS, QUANTITIES, AND BILL OF REINFORCEMENT SEE CURRENT STANDARD DRAWINGS RDH-1100, RDH-1200 AND RDH-1300 SERIES.
4. DIMENSIONS FROM FACE OF CONCRETE TO STEEL SHALL BE 2" CLEAR DISTANCE.
5. ENCIRCLED LETTERS, ○, INDICATE STEEL BAR LOCATIONS.
6. BARS (B), (C), (G), (J), (K), (M), (P), (X), (U) ARE SPACED 1'-0" O. C. ALL OTHER BARS SHALL BE EVENLY SPACED.
7. BARS (B) AND (J), (C) AND (K), (U) AND (X) ARE PLACED IN ORDER OF INCREASING LENGTH BEGINNING AT THE END OF WING, TOP OF WING AND TOP OF COUNTERFORT RESPECTIVELY.
8. HEADWALLS LOCATED AT EDGE OF SHOULDER SHALL BE PARALLEL TO CENTERLINE OF THE ROAD.
9. LIMITS OF APRON, [HATCHED] LIMITS OF PAVING, [HATCHED] LIMITS OF COUNTERFORTS
10. THESE HEADWALLS ARE DESIGNED BOTH WITH AND WITHOUT PAVING BETWEEN THE WINGS. (SEE PLANS)
11. WHEN PAVING IS REQUIRED IT SHALL BE SLOPED IN DIRECTION OF FLOW EQUAL TO SLOPE OF BOX. FRONT FACE OF HEADWALL AND ENDS OF WINGS SHALL REMAIN VERTICAL.
- ⑫ A COUNTERFORT SHALL BE REQUIRED ON A WING WALL WHEN THE BOX RISE IS 8'-0" OR GREATER AND THE WING WALL IS 15'-0" OR LONGER.
13. WHEN PAVING IS NOT REQUIRED (H) AND (G) BARS SHALL BE ELIMINATED.
14. ROUGHENED CONSTRUCTION JOINT

KENTUCKY DEPARTMENT OF HIGHWAYS		
PRECAST BOX CULVERT H-WALLS-15°-30° & 45° SK (BOX RISE 6'-0" OR GREATER)		
STANDARD DRAWING NO. RDH-1015-02		
SUBMITTED	DIRECTOR DIVISION OF DESIGN	DATE
APPROVED	STATE HIGHWAY ENGINEER	DATE

DIMENSION	PRECAST BOX CULVERT												DIMENSION
	3'x2'	3'x3'	4'x2'	4'x3'	4'x4'	5'x3'	5'x4'	5'x5'	6'x3'	6'x4'	6'x5'	6'x6'	
A	3'-4"	4'-4"	3'-6"	4'-6"	5'-6"	4'-8"	5'-8"	6'-8"	4'-10"	5'-10"	6'-10"	8'-0"	A
B	1'-0"	1'-6"	1'-0"	1'-6"	2'-0"	1'-6"	2'-0"	2'-6"	1'-6"	2'-0"	2'-6"	3'-0"	B
C	3'-0"	4'-0"	3'-1"	4'-1"	5'-1"	4'-2"	5'-2"	6'-2"	4'-3"	5'-3"	6'-3"	7'-5"	C
E	3'-8"		4'-10"			6'-0"			7'-2"				E
F	3'-10"	5'-0"	4'-0"	5'-2"	6'-4"	5'-5"	6'-7"	7'-8"	5'-7"	6'-9"	7'-11"	9'-3"	F
H	7'-6"	8'-8"	8'-10"	10'-0"	11'-2"	11'-5"	12'-7"	13'-8"	12'-9"	13'-11"	15'-1"	16'-5"	H
J	3'-9"	4'-4"	4'-5"	5'-0"	5'-7"	5'-8"	6'-3"	6'-10"	6'-4"	6'-11"	7'-6"	8'-2"	J
M	0'-5"											0'-6"	M
T	0'-4"		0'-5"			0'-6"			0'-7"				T
U	1'-0"												U
V	0'-8"											1'-0"	V
W	0'-8"											0'-10"	W
X	----											2'-0"	X
Y	2'-0"											2'-6"	Y
Z	----											1'-3"	Z

KENTUCKY

DEPARTMENT OF HIGHWAYS

DIMENSIONS

3'x2' - 6'x6' HEADWALLS

PRECAST BOX CULVERT

0° SKEW

STANDARD DRAWING NO. RDH-1100-02

SUBMITTED

DIRECTOR DIVISION OF DESIGN

DATE

APPROVED

STATE HIGHWAY ENGINEER

DATE

DIMENSION	PRECAST BOX CULVERT											DIMENSION
	10'x5'	10'x6'	10'x7'	10'x8'	10'x9'	10'x10'	11'x4'	11'x6'	11'x8'	11'x10'	11'x11'	
A	7'-4"	8'-6"	9'-6"	10'-6"	11'-6"	12'-8"	6'-6"	8'-8"	10'-8"	12'-10"	13'-11"	A
B	2'-6"	3'-0"	3'-6"	4'-0"	4'-6"	5'-0"	2'-0"	3'-0"	4'-0"	5'-0"	5'-6"	B
C	6'-6"	7'-8"	8'-8"	9'-8"	10'-8"	11'-10"	5'-7"	7'-9"	9'-9"	11'-11"	13'-0"	C
E	11'-8"						12'-10"					E
F	8'-6"	9'-10"	11'-0"	12'-1"	13'-3"	14'-8"	7'-6"	10'-0"	12'-4"	14'-10"	16'-1"	F
H	20'-2"	21'-6"	22'-8"	23'-9"	24'-11"	26'-4"	20'-4"	22'-10"	25'-2"	27'-8"	28'-11"	H
J	10'-1"	10'-9"	11'-4"	11'-11"	12'-6"	13'-2"	10'-2"	11'-5"	12'-7"	13'-10"	14'-5"	J
M	0'-5"	0'-6"				0'-7"	0'-5"	0'-6"		0'-7"	0'-8"	M
T	0'-10"						0'-11"					T
U	1'-0"											U
V	0'-8"	1'-0"				1'-1"	0'-8"	1'-0"		1'-1"	1'-2"	V
W	0'-8"	0'-10"				1'-0"	0'-8"	0'-10"		1'-0"	1'-1"	W
X	----	2'-0"		2'-6"		3'-0"	----	2'-0"	2'-6"	3'-0"	3'-3"	X
Y	2'-0"	2'-6"		3'-0"		4'-0"	2'-0"	2'-6"	3'-0"	4'-0"		Y
Z	----	1'-3"		1'-9"		2'-0"	----	1'-3"	1'-9"	2'-0"		Z

KENTUCKY DEPARTMENT OF HIGHWAYS		
DIMENSIONS 10'x5' - 11'x11' HEADWALLS PRECAST BOX CULVERT 0° SKEW		
STANDARD DRAWING NO. RDH-1110-02		
SUBMITTED _____	DIRECTOR DIVISION OF DESIGN _____	DATE _____
APPROVED _____	STATE HIGHWAY ENGINEER _____	DATE _____

DIMENSION	PRECAST BOX CULVERT					DIMENSION
	12'x4'	12'x6'	12'x8'	12'x10'	12'x12'	
A	6'-8"	8'-10"	10'-10"	13'-0"	15'-3"	A
B	2'-0"	3'-0"	4'-0"	5'-0"	6'-0"	B
C	5'-8"	7'-10"	9'-10"	12'-0"	14'-3"	C
E	14'-0"					E
F	7'-8"	10'-2"	12'-6"	15'-0"	17'-7"	F
H	21'-8"	24'-2"	26'-6"	29'-0"	31'-7"	H
J	10'-10"	12'-1"	13'-3"	14'-6"	15'-10"	J
M	0'-5"	0'-6"		0'-7"	0'-9"	M
T	1'-0"					T
U	1'-0"					U
V	0'-8"	1'-0"		1'-1"	1'-4"	V
W	0'-8"	0'-10"		1'-0"	1'-3"	W
X	----	2'-0"	2'-6"	3'-0"	3'-6"	X
Y	2'-0"	2'-6"	3'-0"	4'-0"		Y
Z	----	1'-3"	1'-9"	2'-0"	2'-3"	Z

KENTUCKY
DEPARTMENT OF HIGHWAYS

DIMENSIONS

12'x4' - 12'x12' HEADWALLS

PRECAST BOX CULVERT

0° SKEW

STANDARD DRAWING NO. RDH-1115-02

SUBMITTED _____

DIRECTOR DIVISION OF DESIGN _____

DATE _____

APPROVED _____

STATE HIGHWAY ENGINEER _____

DATE _____

DIMENSION	PRECAST BOX CULVERT												DIMENSION
	3'x2'	3'x3'	4'x2'	4'x3'	4'x4'	5'x3'	5'x4'	5'x5'	6'x3'	6'x4'	6'x5'	6'x6'	
A	4'-0"	5'-0"	4'-2"	5'-2"	6'-2"	5'-4"	6'-4"	7'-4"	5'-6"	6'-6"	7'-6"	8'-4"	A
B	1'-0"	1'-6"	1'-0"	1'-6"	2'-0"	1'-6"	2'-0"	2'-6"	1'-6"	2'-0"	2'-6"	3'-0"	B
C	3'-4"	4'-4"	3'-5"	4'-5"	5'-5"	4'-6"	5'-6"	6'-6"	4'-7"	5'-7"	6'-7"	7'-7"	C
E	4'-1"		5'-5"			6'-8"			8'-0"				E
F	4'-7"	5'-9"	4'-10"	6'-0"	7'-1"	6'-2"	7'-4"	8'-6"	6'-4"	7'-6"	8'-8"	9'-7"	F
G	4'-2"	5'-2"	4'-4"	5'-4"	6'-5"	5'-6"	6'-7"	7'-7"	5'-8"	6'-9"	7'-9"	8'-8"	G
H	7'-6"	8'-4"	8'-11"	9'-9"	10'-7"	11'-2"	12'-1"	12'-11"	12'-8"	13'-6"	14'-4"	15'-0"	H
J	4'-0"	4'-7"	4'-9"	5'-3"	5'-10"	6'-0"	6'-6"	7'-0"	6'-8"	7'-2"	7'-9"	8'-2"	J
M	0'-6"											0'-8"	M
N	0'-5"											0'-6"	N
P	1'-4"		1'-8"			2'-0"			2'-5"				P
Q	4'-6"		5'-8"			6'-10"			8'-0"			8'-2"	Q
R	0'-9"											1'-0"	R
T	0'-4"		0'-5"			0'-6"			0'-7"				T
U	1'-0"												U
V	0'-8"											1'-0"	V
W	0'-8"											0'-10"	W
X	----											2'-0"	X
Y	2'-0"											2'-6"	Y
Z	----											1'-3"	Z

KENTUCKY
DEPARTMENT OF HIGHWAYS

DIMENSIONS

3'x2' - 6'x6' HEADWALLS

PRECAST BOX CULVERT

15° SKEW

STANDARD DRAWING NO. RDH-1120-02

SUBMITTED _____

DIRECTOR DIVISION OF DESIGN _____

DATE _____

APPROVED _____

STATE HIGHWAY ENGINEER _____

DATE _____

DIMENSION	PRECAST BOX CULVERT											DIMENSION
	10'x5'	10'x6'	10'x7'	10'x8'	10'x9'	10'x10'	11'x4'	11'x6'	11'x8'	11'x10'	11'x11'	
A	8'-0"	8'-10"	9'-10"	10'-10"	11'-10"	12'-8"	7'-2"	9'-0"	11'-0"	12'-10"	13'-9"	A
B	2'-6"	3'-0"	3'-6"	4'-0"	4'-6"	5'-0"	2'-0"	3'-0"	4'-0"	5'-0"	5'-6"	B
C	6'-10"	7'-10"	8'-10"	9'-10"	10'-10"	11'-10"	5'-11"	7'-11"	9'-11"	11'-11"	12'-11"	C
E	13'-0"						14'-4"					E
F	9'-3"	10'-2"	11'-4"	12'-6"	13'-8"	14'-8"	8'-3"	10'-5"	12'-8"	14'-10"	15'-11"	F
G	8'-3"	9'-2"	10'-2"	11'-3"	12'-3"	13'-1"	7'-5"	9'-4"	11'-5"	13'-3"	14'-3"	G
H	19'-9"	20'-6"	21'-4"	22'-2"	23'-0"	23'-9"	20'-4"	21'-11"	23'-7"	25'-2"	25'-11"	H
J	10'-4"	10'-9"	11'-4"	11'-10"	12'-5"	12'-10"	10'-6"	11'-6"	12'-6"	13'-6"	14'-0"	J
M	0'-6"	0'-8"				0'-9"	0'-6"	0'-8"		0'-9"	0'-10"	M
N	0'-5"	0'-6"				0'-7"	0'-5"	0'-6"		0'-7"	0'-8"	N
P	3'-9"					3'-10"	4'-1"	4'-2"			4'-3"	P
Q	12'-6"	12'-8"				12'-10"	13'-8"	13'-10"		14'-0"	14'-2"	Q
R	0'-9"	1'-0"				1'-2"	0'-9"	1'-0"		1'-2"	1'-3"	R
T	0'-10"						0'-11"					T
U	1'-0"											U
V	0'-8"	1'-0"				1'-1"	0'-8"	1'-0"		1'-1"	1'-2"	V
W	0'-8"	0'-10"				1'-0"	0'-8"	0'-10"		1'-0"	1'-1"	W
X	----	2'-0"		2'-6"		3'-0"	----	2'-0"	2'-6"	3'-0"	3'-3"	X
Y	2'-0"	2'-6"		3'-0"		4'-0"	2'-0"	2'-6"	3'-0"	4'-0"		Y
Z	----	1'-3"		1'-9"		2'-0"	----	1'-3"	1'-9"	2'-0"		Z

KENTUCKY DEPARTMENT OF HIGHWAYS		
DIMENSIONS		
10'x5' - 11'x11' HEADWALLS		
PRECAST BOX CULVERT		
15° SKEW		
STANDARD DRAWING NO. RDH-1130-02		
SUBMITTED _____	DIRECTOR DIVISION OF DESIGN _____	DATE _____
APPROVED _____	STATE HIGHWAY ENGINEER _____	DATE _____

DIMENSION	PRECAST BOX CULVERT					DIMENSION
	12'x4'	12'x6'	12'x8'	12'x10'	12'x12'	
A	7'-4"	9'-2"	11'-2"	13'-0"	14'-9"	A
B	2'-0"	3'-0"	4'-0"	5'-0"	6'-0"	B
C	6'-0"	8'-0"	10'-0"	12'-0"	14'-0"	C
E	15'-7"					E
F	8'-6"	10'-7"	12'-11"	15'-0"	17'-0"	F
G	7'-7"	9'-6"	11'-7"	13'-6"	15'-3"	G
H	21'-10"	23'-4"	25'-1"	26'-7"	28'-1"	H
J	11'-2"	12'-2"	13'-3"	14'-3"	15'-2"	J
M	0'-6"	0'-8"		0'-9"	1'-0"	M
N	0'-5"	0'-6"		0'-7"	0'-9"	N
P	4'-5"	4'-6"		4'-7"	4'-8"	P
Q	14'-10"	15'-0"		15'-2"	15'-6"	Q
R	0'-9"	1'-0"		1'-2"	1'-5"	R
T	1'-0"					T
U	1'-0"					U
V	0'-8"	1'-0"		1'-1"	1'-4"	V
W	0'-8"	0'-10"		1'-0"	1'-3"	W
X	----	2'-0"	2'-6"	3'-0"	3'-6"	X
Y	2'-0"	2'-6"	3'-0"	4'-0"		Y
Z	----	1'-3"	1'-9"	2'-0"	2'-3"	Z

KENTUCKY DEPARTMENT OF HIGHWAYS	
<i>DIMENSIONS</i> 12'x4' - 12'x12' HEADWALLS PRECAST BOX CULVERT 15° SKEW	
STANDARD DRAWING NO. RDH-1135-02	
SUBMITTED _____	DATE _____
APPROVED _____	DATE _____

DIMENSION	PRECAST BOX CULVERT												DIMENSION
	3'x2'	3'x3'	4'x2'	4'x3'	4'x4'	5'x3'	5'x4'	5'x5'	6'x3'	6'x4'	6'x5'	6'x6'	
A	4'-0"	5'-0"	4'-2"	5'-2"	6'-2"	5'-4"	6'-4"	7'-4"	5'-6"	6'-6"	7'-6"	8'-4"	A
B	1'-0"	1'-6"	1'-0"	1'-6"	2'-0"	1'-6"	2'-0"	2'-6"	1'-6"	2'-0"	2'-6"	3'-0"	B
C	3'-4"	4'-4"	3'-5"	4'-5"	5'-5"	4'-6"	5'-6"	6'-6"	4'-7"	5'-7"	6'-7"	7'-7"	C
E	5'-0"		6'-7"			8'-2"			9'-9"				E
F	5'-8"	7'-1"	5'-11"	7'-4"	8'-9"	7'-7"	8'-11"	10'-4"	7'-9"	9'-2"	10'-7"	11'-9"	F
G	4'-0"	5'-0"	4'-2"	5'-2"	6'-2"	5'-4"	6'-4"	7'-4"	5'-6"	6'-6"	7'-6"	8'-4"	G
H	9'-0"	10'-0"	10'-9"	11'-9"	12'-9"	13'-6"	14'-6"	15'-6"	15'-3"	16'-3"	17'-3"	18'-1"	H
J	4'-5"	5'-0"	5'-2"	5'-9"	6'-4"	6'-7"	7'-1"	7'-8"	7'-4"	7'-11"	8'-6"	8'-11"	J
M	0'-8"											0'-10"	M
N	0'-3"											0'-4"	N
P	3'-1"		3'-11"			4'-9"			5'-7"			5'-8"	P
Q	4'-4"		5'-6"			6'-8"			7'-10"			8'-0"	Q
R	0'-11"											1'-2"	R
T	0'-4"		0'-5"			0'-6"			0'-7"				T
U	1'-0"												U
V	0'-8"											1'-0"	V
W	0'-8"											0'-10"	W
X	----											2'-0"	X
Y	2'-0"											2'-6"	Y
Z	----											1'-3"	Z

KENTUCKY
DEPARTMENT OF HIGHWAYS

DIMENSIONS
3'x2' - 6'x6' HEADWALLS
PRECAST BOX CULVERT
30° SKEW

STANDARD DRAWING NO. RDH-1140-02

SUBMITTED _____

DIRECTOR DIVISION OF DESIGN _____

DATE _____

APPROVED _____

STATE HIGHWAY ENGINEER _____

DATE _____

DIMENSION	PRECAST BOX CULVERT											DIMENSION
	10'x5'	10'x6'	10'x7'	10'x8'	10'x9'	10'x10'	11'x4'	11'x6'	11'x8'	11'x10'	11'x11'	
A	8'-0"	8'-10"	9'-10"	10'-10"	11'-10"	12'-8"	7'-2"	9'-0"	11'-0"	12'-10"	13'-9"	A
B	2'-6"	3'-0"	3'-6"	4'-0"	4'-6"	5'-0"	2'-0"	3'-0"	4'-0"	5'-0"	5'-6"	B
C	6'-10"	7'-10"	8'-10"	9'-10"	10'-10"	11'-10"	5'-11"	7'-11"	9'-11"	11'-11"	12'-11"	C
E	15'-11"						17'-6"					E
F	11'-4"	12'-6"	13'-11"	15'-4"	16'-9"	17'-11"	10'-2"	12'-9"	15'-7"	18'-2"	19'-5"	F
G	8'-0"	8'-10"	9'-10"	10'-10"	11'-10"	12'-8"	7'-2"	9'-0"	11'-0"	12'-10"	13'-9"	G
H	23'-11"	24'-9"	25'-9"	26'-9"	27'-9"	28'-7"	24'-8"	26'-6"	28'-6"	30'-4"	31'-3"	H
J	11'-4"	11'-10"	12'-5"	13'-0"	13'-7"	14'-1"	11'-7"	12'-7"	13'-9"	14'-10"	15'-4"	J
M	0'-8"	0'-10"				1'-0"	0'-8"	0'-10"		1'-0"	1'-1"	M
N	0'-3"	0'-4"				0'-5"	0'-3"	0'-4"		0'-5"		N
P	8'-9"	8'-10"				9'-0"	9'-7"	9'-8"		9'-10"		P
Q	12'-4"	12'-6"				12'-8"	13'-6"	13'-8"		13'-10"	13'-11"	Q
R	0'-11"	1'-2"				1'-4"	0'-11"	1'-2"		1'-4"	1'-6"	R
T	0'-10"						0'-11"					T
U	1'-0"											U
V	0'-8"	1'-0"				1'-1"	0'-8"	1'-0"		1'-1"	1'-2"	V
W	0'-8"	0'-10"				1'-0"	0'-8"	0'-10"		1'-0"	1'-1"	W
X	----	2'-0"		2'-6"		3'-0"	----	2'-0"	2'-6"	3'-0"	3'-3"	X
Y	2'-0"	2'-6"		3'-0"		4'-0"	2'-0"	2'-6"	3'-0"	4'-0"		Y
Z	----	1'-3"		1'-9"		2'-0"	----	1'-3"	1'-9"	2'-0"		Z

KENTUCKY
DEPARTMENT OF HIGHWAYS

DIMENSIONS
10'x5' - 11'x11' HEADWALLS
PRECAST BOX CULVERT
30° SKEW

STANDARD DRAWING NO. RDH-1150-02

SUBMITTED _____

DIRECTOR, DIVISION OF DESIGN _____

DATE _____

APPROVED _____

STATE HIGHWAY ENGINEER _____

DATE _____

DIMENSION	PRECAST BOX CULVERT					DIMENSION
	12'x4'	12'x6'	12'x8'	12'x10'	12'x12'	
A	7'-4"	9'-2"	11'-2"	13'-0"	14'-9"	A
B	2'-0"	3'-0"	4'-0"	5'-0"	6'-0"	B
C	6'-0"	8'-0"	10'-0"	12'-0"	14'-0"	C
E	19'-1"					E
F	10'-4"	13'-0"	15'-10"	18'-5"	20'-10"	F
G	7'-4"	9'-2"	11'-2"	13'-0"	14'-9"	G
H	26'-5"	28'-3"	30'-3"	32'-1"	33'-10"	H
J	12'-4"	13'-5"	14'-6"	15'-7"	16'-7"	J
M	0'-8"	0'-10"		1'-0"	1'-3"	M
N	0'-3"	0'-4"		0'-5"	0'-6"	N
P	10'-5"	10'-6"		10'-8"	10'-10"	P
Q	14'-8"	14'-10"		15'-0"	15'-4"	Q
R	0'-11"	1'-2"		1'-4"	1'-8"	R
T	1'-0"					T
U	1'-0"					U
V	0'-8"	1'-0"		1'-1"	1'-4"	V
W	0'-8"	0'-10"		1'-0"	1'-3"	W
X	----	2'-0"	2'-6"	3'-0"	3'-6"	X
Y	2'-0"	2'-6"	3'-0"	4'-0"		Y
Z	----	1'-3"	1'-9"	2'-0"	2'-3"	Z

KENTUCKY
DEPARTMENT OF HIGHWAYS

DIMENSIONS
12'x4' - 12'x12' HEADWALLS
PRECAST BOX CULVERT
30° SKEW

STANDARD DRAWING NO. RDH-1155-02

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN _____ DATE _____
APPROVED _____ STATE HIGHWAY ENGINEER _____ DATE _____

DIMENSION	PRECAST BOX CULVERT												DIMENSION
	3'x2'	3'x3'	4'x2'	4'x3'	4'x4'	5'x3'	5'x4'	5'x5'	6'x3'	6'x4'	6'x5'	6'x6'	
A	4'-0"	5'-0"	4'-2"	5'-2"	6'-2"	5'-4"	6'-4"	7'-4"	5'-6"	6'-6"	7'-6"	8'-4"	A
B	1'-0"	1'-6"	1'-0"	1'-6"	2'-0"	1'-6"	2'-0"	2'-6"	1'-6"	2'-0"	2'-6"	3'-0"	B
C	3'-4"	4'-4"	3'-5"	4'-5"	5'-5"	4'-6"	5'-6"	6'-6"	4'-7"	5'-7"	6'-7"	7'-7"	C
E	7'-1"		9'-4"			11'-7"			13'-10"				E
F	8'-0"	10'-0"	8'-4"	10'-4"	12'-4"	10'-8"	12'-8"	14'-8"	11'-0"	13'-0"	15'-0"	16'-8"	F
G	4'-2"	5'-2"	4'-4"	5'-4"	6'-5"	5'-6"	6'-7"	7'-7"	5'-8"	6'-9"	7'-9"	8'-8"	G
H	12'-11"	14'-5"	15'-5"	16'-11"	18'-4"	19'-5"	20'-10"	22'-4"	21'-11"	23'-4"	24'-10"	26'-1"	H
J	5'-6"	6'-3"	6'-6"	7'-2"	7'-11"	8'-2"	8'-11"	9'-7"	9'-1"	9'-10"	10'-7"	11'-2"	J
M	0'-10"											1'-1"	M
N	0'-2"											0'-3"	N
P	5'-11"		7'-7"			9'-3"			10'-11"		11'-1"		P
Q	4'-3"		5'-5"			6'-7"			7'-9"		7'-10"		Q
R	1'-1"											1'-4"	R
T	0'-4"		0'-5"			0'-6"			0'-7"				T
U	1'-0"												U
V	0'-8"											1'-0"	V
W	0'-8"											0'-10"	W
X	----											2'-0"	X
Y	2'-0"											2'-6"	Y
Z	----											1'-3"	Z

KENTUCKY
DEPARTMENT OF HIGHWAYS

DIMENSIONS

3'x2' - 6'x6' HEADWALLS

PRECAST BOX CULVERT

45° SKEW

STANDARD DRAWING NO. RDH-1160-02

SUBMITTED _____

DIRECTOR DIVISION OF DESIGN _____

DATE _____

APPROVED _____

STATE HIGHWAY ENGINEER _____

DATE _____

DIMENSION	PRECAST BOX CULVERT														DIMENSION											
	7'x4'	7'x5'	7'x6'	7'x7'	8'x4'	8'x5'	8'x6'	8'x7'	8'x8'	9'x5'	9'x6'	9'x7'	9'x8'	9'x9'												
A	6'-8"	7'-8"	8'-6"	9'-6"	6'-8"	7'-8"	8'-6"	9'-6"	10'-6"	7'-10"	8'-8"	9'-8"	10'-8"	11'-8"	A											
B	2'-0"	2'-6"	3'-0"	3'-6"	2'-0"	2'-6"	3'-0"	3'-6"	4'-0"	2'-6"	3'-0"	3'-6"	4'-0"	4'-6"	B											
C	5'-8"	6'-8"	7'-8"	8'-8"	5'-8"	6'-8"	7'-8"	8'-8"	9'-8"	6'-9"	7'-9"	8'-9"	9'-9"	10'-9"	C											
E	16'-1"				18'-0"					20'-3"					E											
F	13'-4"	15'-4"	17'-0"	19'-0"	13'-4"	15'-4"	17'-0"	19'-0"	21'-0"	15'-8"	17'-4"	19'-4"	21'-4"	23'-4"	F											
G	6'-11"	7'-11"	8'-10"	9'-10"	6'-11"	7'-11"	8'-10"	9'-10"	10'-10"	8'-1"	9'-0"	10'-0"	11'-1"	12'-1"	G											
H	25'-10"	27'-4"	28'-7"	30'-0"	27'-9"	29'-3"	30'-6"	31'-11"	33'-5"	31'-9"	33'-0"	34'-5"	35'-11"	37'-4"	H											
J	10'-9"	11'-6"	12'-1"	12'-10"	11'-6"	12'-3"	12'-10"	13'-7"	14'-3"	13'-2"	13'-9"	14'-6"	15'-3"	16'-0"	J											
M	0'-10"		1'-1"		0'-10"		1'-1"			0'-10"	1'-1"				M											
N	0'-2"		0'-3"		0'-2"		0'-3"			0'-2"	0'-3"				N											
P	12'-7"		12'-9"		14'-0"		14'-2"			15'-7"	15'-10"				P											
Q	8'-11"		9'-0"		9'-11"		10'-0"			11'-1"	11'-2"				Q											
R	1'-1"		1'-4"		1'-1"		1'-4"			1'-1"	1'-4"				R											
T	0'-8"									0'-9"					T											
U	1'-0"														U											
V	0'-8"		1'-0"		0'-8"		1'-0"			0'-8"	1'-0"				V											
W	0'-8"		0'-10"		0'-8"		0'-10"			0'-8"	0'-10"				W											
X	----		2'-0"		----		2'-0"		2'-6"	----	2'-0"		2'-6"		X											
Y	2'-0"		2'-6"		2'-0"		2'-6"		3'-0"	2'-0"	2'-6"		3'-0"		Y											
Z	----		1'-3"		----		1'-3"		1'-9"	----	1'-3"		1'-9"		Z											

DIMENSION	PRECAST BOX CULVERT											DIMENSION
	10'x5'	10'x6'	10'x7'	10'x8'	10'x9'	10'x10'	11'x4'	11'x6'	11'x8'	11'x10'	11'x11'	
A	8'-0"	8'-10"	9'-10"	10'-10"	11'-10"	12'-8"	7'-2"	9'-0"	11'-0"	12'-10"	13'-9"	A
B	2'-6"	3'-0"	3'-6"	4'-0"	4'-6"	5'-0"	2'-0"	3'-0"	4'-0"	5'-0"	5'-6"	B
C	6'-10"	7'-10"	8'-10"	9'-10"	10'-10"	11'-10"	5'-11"	7'-11"	9'-11"	11'-11"	12'-11"	C
E	22'-6"						24'-10"					E
F	16'-0"	17'-8"	19'-8"	21'-8"	23'-8"	25'-4"	14'-4"	18'-0"	22'-0"	25'-8"	27'-6"	F
G	8'-3"	9'-2"	10'-2"	11'-3"	12'-3"	13'-1"	7'-5"	9'-4"	11'-5"	13'-3"	14'-3"	G
H	34'-3"	35'-6"	36'-11"	38'-5"	39'-10"	41'-1"	35'-3"	38'-0"	40'-11"	43'-7"	44'-11"	H
J	14'-1"	14'-9"	15'-5"	16'-2"	16'-11"	17'-6"	14'-4"	15'-8"	17'-2"	18'-6"	19'-2"	J
M	0'-10"	1'-1"				1'-4"	0'-10"	1'-1"		1'-4"	1'-5"	M
N	0'-2"	0'-3"					0'-2"	0'-3"				N
P	17'-3"	17'-5"				17'-8"	18'-11"	19'-1"		19'-4"	19'-5"	P
Q	12'-3"	12'-4"				12'-6"	13'-5"	13'-6"		13'-8"	13'-9"	Q
R	1'-1"	1'-4"				1'-8"	1'-1"	1'-4"		1'-8"	1'-9"	R
T	0'-10"						0'-11"					T
U	1'-0"											U
V	0'-8"	1'-0"				1'-1"	0'-8"	1'-0"		1'-1"	1'-2"	V
W	0'-8"	0'-10"				1'-0"	0'-8"	0'-10"		1'-0"	1'-1"	W
X	----	2'-0"		2'-6"		3'-0"	----	2'-0"	2'-6"	3'-0"	3'-3"	X
Y	2'-0"	2'-6"		3'-0"		4'-0"	2'-0"	2'-6"	3'-0"	4'-0"		Y
Z	----	1'-3"		1'-9"		2'-0"	----	1'-3"	1'-9"	2'-0"		Z

KENTUCKY DEPARTMENT OF HIGHWAYS	
<i>DIMENSIONS</i> 10'x5' - 11'x11' HEADWALLS PRECAST BOX CULVERT 45° SKEW	
STANDARD DRAWING NO. RDH-1170-02	
SUBMITTED _____	DATE _____
APPROVED _____	DATE _____
STATE HIGHWAY ENGINEER	

DIMENSION	PRECAST BOX CULVERT					DIMENSION
	12'x4'	12'x6'	12'x8'	12'x10'	12'x12'	
A	7'-4"	9'-2"	11'-2"	13'-0"	14'-9"	A
B	2'-0"	3'-0"	4'-0"	5'-0"	6'-0"	B
C	6'-0"	8'-0"	10'-0"	12'-0"	14'-0"	C
E	27'-1"					E
F	14'-8"	18'-4"	22'-4"	26'-0"	29'-6"	F
G	7'-7"	9'-6"	11'-7"	13'-6"	15'-3"	G
H	37'-9"	40'-6"	43'-5"	46'-1"	48'-8"	H
J	15'-3"	16'-7"	18'-1"	19'-5"	20'-8"	J
M	0'-10"	1'-1"		1'-4"	1'-8"	M
N	0'-2"	0'-3"			0'-4"	N
P	20'-7"	20'-9"		20'-11"	21'-3"	P
Q	14'-7"	14'-8"		14'-10"	15'-0"	Q
R	1'-1"	1'-4"		1'-8"	2'-0"	R
T	1'-0"					T
U	1'-0"					U
V	0'-8"	1'-0"		1'-1"	1'-4"	V
W	0'-8"	0'-10"		1'-0"	1'-3"	W
X	----	2'-0"	2'-6"	3'-0"	3'-6"	X
Y	2'-0"	2'-6"	3'-0"	4'-0"		Y
Z	----	1'-3"	1'-9"	2'-0"	2'-3"	Z

KENTUCKY
DEPARTMENT OF HIGHWAYS

DIMENSIONS
12'x4' - 12'x12' HEADWALLS
PRECAST BOX CULVERT
45° SKEW

STANDARD DRAWING NO. RDH-1175-02

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN _____ DATE _____
APPROVED _____ STATE HIGHWAY ENGINEER _____ DATE _____

BOX SIZE ①	CONCRETE 2 HEADWALLS					REINFORCEMENT 2 HEADWALLS	
	②	③	④	⑤	⑥	⑦	⑧
3 X 2	3.17	0.82	—	—	—	271	—
3 X 3	4.39	0.94	—	—	—	365	—
4 X 2	3.74	0.96	—	—	—	311	—
4 X 3	5.06	1.07	—	—	—	389	—
4 X 4	6.60	1.18	—	—	—	497	—
5 X 3	5.76	1.20	—	—	—	430	—
5 X 4	7.39	1.32	—	—	—	576	—
5 X 5	9.24	1.43	—	—	—	681	—
6 X 3	6.51	1.34	—	—	—	483	—
6 X 4	8.22	1.45	—	—	—	603	—
6 X 5	10.16	1.57	—	—	—	738	—
6 X 6	19.81	2.39	2.24	3.26	18.43	1619	273
7 X 4	9.10	1.59	—	—	—	652	—
7 X 5	11.13	1.70	—	—	—	796	—
7 X 6	21.08	2.54	2.56	3.43	19.40	1678	292
7 X 7	24.13	2.67	3.00	3.69	22.15	2092	353
8 X 4	9.59	1.68	—	—	—	693	—
8 X 5	11.67	1.80	—	—	—	805	—
8 X 6	21.80	2.65	2.78	3.54	19.90	1736	325
8 X 7	24.88	2.78	3.25	3.80	22.64	2117	350
8 X 8	31.42	4.03	3.34	5.47	29.52	2749	427

BOX SIZE ①	CONCRETE 2 HEADWALLS					REINFORCEMENT 2 HEADWALLS	
	②	③	④	⑤	⑥	⑦	⑧
9 X 5	12.70	1.93	—	—	—	877	—
9 X 6	23.13	2.81	3.12	3.71	20.91	1791	327
9 X 7	26.26	2.93	3.62	3.97	23.68	2204	397
9 X 8	33.01	4.23	3.73	5.70	30.75	2846	479
9 X 9	36.81	4.40	4.25	6.04	34.20	3431	509
10 X 5	13.79	2.07	—	—	—	971	—
10 X 6	24.50	2.96	3.47	3.89	21.96	1972	376
10 X 7	27.69	3.09	4.00	4.14	24.75	2419	444
10 X 8	34.64	4.43	4.12	5.93	32.01	3081	482
10 X 9	38.50	4.60	4.68	6.27	35.49	3539	565
10 X 10	53.89	7.29	5.40	9.95	51.16	4748	674
11 X 4	12.60	2.09	—	—	—	870	—
11 X 6	25.92	3.11	3.83	4.06	23.04	2049	413
11 X 8	36.32	4.63	4.53	6.16	33.32	3180	534
11 X 10	56.04	7.59	5.89	10.29	52.85	4801	677
11 X 11	69.84	7.77	6.93	10.66	65.81	5688	778
12 X 4	13.72	2.22	—	—	—	903	—
12 X 6	27.39	3.26	4.19	4.23	24.17	2134	457
12 X 8	38.05	4.84	4.94	6.39	34.66	3424	587
12 X 10	60.16	7.88	6.38	10.62	56.52	5075	740
12 X 12	92.85	8.01	8.83	10.98	86.98	6916	929

- ① PRECAST CONCRETE BOX CULVERT SECTIONS EQUALS THE INTERIOR SPAN (S) BY THE INTERIOR RISE (R) IN FEET.
 ② CU. YDS. OF CONCRETE IN TWO HEADWALLS WITH PAVING.
 ③ CU. YDS. OF CONCRETE IN TWO APRONS (HEADWALLS WITH PAVING).
 ④ CU. YDS. OF CONCRETE IN TWO PAVED AREAS OF THE HEADWALLS.
 ⑤ CU. YDS. OF CONCRETE IN TWO APRONS (HEADWALLS WITHOUT PAVING).
 ⑥ CU. YDS. OF CONCRETE IN TWO HEADWALLS WITHOUT PAVING.
 ⑦ POUNDS OF REINFORCING STEEL IN TWO HEADWALLS WITH PAVING.
 ⑧ POUNDS OF REINFORCING STEEL TO DEDUCT WHEN PAVING FOR TWO HEADWALLS IS ELIMINATED.

KENTUCKY DEPARTMENT OF HIGHWAYS	
QUANTITIES 3' x 2' - 12' x 12' H-WALLS PRECAST BOX CULVERTS 0° SKEW	
STANDARD DRAWING NO. RDH-1200-02	
SUBMITTED _____	DIRECTOR DIVISION OF DESIGN _____ DATE _____
APPROVED _____	STATE HIGHWAY ENGINEER _____ DATE _____

BOX SIZE ①	CONCRETE 2 HEADWALLS					REINFORCEMENT 2 HEADWALLS	
	②	③	④	⑤	⑥	⑦	⑧
3 x 2	4.15	0.83	—	—	—	371	—
3 x 3	5.44	0.91	—	—	—	475	—
4 x 2	5.05	0.97	—	—	—	448	—
4 x 3	6.44	1.06	—	—	—	534	—
4 x 4	8.04	1.14	—	—	—	661	—
5 x 3	7.53	1.20	—	—	—	637	—
5 x 4	9.23	1.28	—	—	—	769	—
5 x 5	11.15	1.37	—	—	—	887	—
6 x 3	8.70	1.34	—	—	—	719	—
6 x 4	10.51	1.42	—	—	—	830	—
6 x 5	12.53	1.51	—	—	—	982	—
6 x 6	22.48	2.26	2.21	3.31	21.33	1967	270
7 x 4	11.88	1.57	—	—	—	933	—
7 x 5	14.00	1.65	—	—	—	1057	—
7 x 6	24.40	2.42	2.57	3.50	22.91	2129	310
7 x 7	27.46	2.51	2.96	3.74	25.73	2433	336
8 x 4	12.82	1.68	—	—	—	1053	—
8 x 5	15.01	1.76	—	—	—	1139	—
8 x 6	25.71	2.54	2.82	3.62	23.97	2201	315
8 x 7	28.82	2.63	3.24	3.87	26.81	2549	382
8 x 8	35.47	3.79	3.28	5.53	33.93	3239	418

BOX SIZE ①	CONCRETE 2 HEADWALLS					REINFORCEMENT 2 HEADWALLS	
	②	③	④	⑤	⑥	⑦	⑧
9 X 5	16.63	1.90	—	—	—	1266	—
9 X 6	27.77	2.70	3.19	3.81	25.68	2381	357
9 X 7	30.96	2.79	3.65	4.05	28.57	2694	385
9 X 8	37.85	4.00	3.70	5.78	35.93	3394	469
9 X 9	41.66	4.12	4.17	6.10	39.46	4022	498
10 X 5	18.35	2.05	—	—	—	1328	—
10 X 6	29.93	2.86	3.58	3.99	27.49	2541	401
10 X 7	33.20	2.95	4.07	4.24	30.42	2996	434
10 X 8	40.34	4.21	4.14	6.02	38.01	3818	520
10 X 9	44.22	4.34	4.64	6.35	41.59	4257	554
10 X 10	59.12	6.77	4.96	9.87	57.26	5286	602
11 X 4	17.65	2.10	—	—	—	1308	—
11 X 6	32.19	3.02	3.97	4.18	29.38	2692	403
11 X 8	42.92	4.43	4.58	6.27	40.18	3926	526
11 X 10	62.30	7.08	5.47	10.23	59.98	5480	670
11 X 11	74.61	7.18	6.12	10.49	71.81	6336	702
12 X 4	19.47	2.25	—	—	—	1468	—
12 X 6	34.56	3.18	4.38	4.36	31.36	2921	468
12 X 8	45.61	4.64	5.04	6.52	42.45	4246	598
12 X 10	66.55	7.39	5.98	10.59	63.76	5915	730
12 X 12	99.18	7.34	7.20	10.67	95.30	7588	876

- ① PRECAST CONCRETE BOX CULVERT SECTIONS EQUALS THE INTERIOR SPAN (S) BY THE INTERIOR RISE (R) IN FEET.
 ② CU. YDS. OF CONCRETE IN TWO HEADWALLS WITH PAVING.
 ③ CU. YDS. OF CONCRETE IN TWO APRONS (HEADWALLS WITH PAVING).
 ④ CU. YDS. OF CONCRETE IN TWO PAVED AREAS OF THE HEADWALLS.
 ⑤ CU. YDS. OF CONCRETE IN TWO APRONS (HEADWALLS WITHOUT PAVING).
 ⑥ CU. YDS. OF CONCRETE IN TWO HEADWALLS WITHOUT PAVING.
 ⑦ POUNDS OF REINFORCING STEEL IN TWO HEADWALLS WITH PAVING.
 ⑧ POUNDS OF REINFORCING STEEL TO DEDUCT WHEN PAVING FOR TWO HEADWALLS IS ELIMINATED.

KENTUCKY DEPARTMENT OF HIGHWAYS	
QUANTITIES 3' x 2' - 12' x 12' H-WALLS PRECAST BOX CULVERTS 15° SKEW	
STANDARD DRAWING NO. RDH-1205-02	
SUBMITTED _____	DIRECTOR DIVISION OF DESIGN _____ DATE _____
APPROVED _____	STATE HIGHWAY ENGINEER _____ DATE _____

BOX SIZE ①	CONCRETE 2 HEADWALLS					REINFORCEMENT 2 HEADWALLS	
	②	③	④	⑤	⑥	⑦	⑧
3 x 2	5.29	0.98	—	—	—	467	—
3 x 3	6.83	1.08	—	—	—	595	—
4 x 2	6.60	1.15	—	—	—	581	—
4 x 3	8.29	1.25	—	—	—	682	—
4 x 4	10.21	1.35	—	—	—	835	—
5 x 3	9.90	1.43	—	—	—	821	—
5 x 4	11.96	1.53	—	—	—	982	—
5 x 5	14.25	1.62	—	—	—	1116	—
6 x 3	11.65	1.60	—	—	—	955	—
6 x 4	13.86	1.70	—	—	—	1123	—
6 x 5	16.30	1.80	—	—	—	1279	—
6 x 6	28.16	2.60	2.74	3.71	26.53	2526	344
7 x 4	15.92	1.87	—	—	—	1253	—
7 x 5	18.50	1.97	—	—	—	1436	—
7 x 6	31.04	2.79	3.18	3.93	29.01	2765	351
7 x 7	34.68	2.90	3.66	4.20	32.32	3163	421
8 x 4	17.44	2.01	—	—	—	1388	—
8 x 5	20.13	2.11	—	—	—	1574	—
8 x 6	33.19	2.94	3.49	4.08	30.84	2933	391
8 x 7	36.90	3.06	4.00	4.35	34.20	3378	464
8 x 8	44.65	4.37	4.08	6.20	42.41	4170	508

BOX SIZE ①	CONCRETE 2 HEADWALLS					REINFORCEMENT 2 HEADWALLS	
	②	③	④	⑤	⑥	⑦	⑧
9 X 5	22.59	2.28	—	—	—	1754	—
9 X 6	36.36	3.14	3.94	4.31	33.58	3214	435
9 X 7	40.19	3.25	4.50	4.57	37.01	3594	472
9 X 8	48.79	4.63	4.60	6.50	46.06	4453	549
9 X 9	53.38	4.78	5.17	6.86	50.28	5254	601
10 X 5	25.21	2.45	—	—	—	1904	—
10 X 6	39.70	3.34	4.41	4.53	36.48	3470	479
10 X 7	43.64	3.45	5.01	4.80	39.98	4035	520
10 X 8	52.57	4.89	5.13	6.80	49.35	5002	613
10 X 9	57.28	5.04	5.74	7.15	53.65	5595	657
10 X 10	75.63	7.82	6.15	11.08	72.74	7001	770
11 X 4	24.86	2.53	—	—	—	1911	—
11 X 6	43.21	3.53	4.89	4.75	39.53	3741	523
11 X 8	56.54	5.15	5.67	7.09	52.80	5316	666
11 X 10	80.45	8.20	6.77	11.51	76.99	7270	832
11 X 11	94.18	8.30	7.57	11.78	90.10	8203	881
12 X 4	27.66	2.70	—	—	—	2133	—
12 X 6	46.90	3.73	5.39	4.97	42.76	4020	568
12 X 8	60.68	5.41	6.23	7.39	56.42	5712	720
12 X 10	85.47	8.58	7.41	11.94	81.42	7651	895
12 X 12	123.25	8.49	8.92	11.98	117.82	9593	998

- ① PRECAST CONCRETE BOX CULVERT SECTIONS EQUALS THE INTERIOR SPAN (S) BY THE INTERIOR RISE (R) IN FEET.
 ② CU. YDS. OF CONCRETE IN TWO HEADWALLS WITH PAVING.
 ③ CU. YDS. OF CONCRETE IN TWO APRONS (HEADWALLS WITH PAVING).
 ④ CU. YDS. OF CONCRETE IN TWO PAVED AREAS OF THE HEADWALLS.
 ⑤ CU. YDS. OF CONCRETE IN TWO APRONS (HEADWALLS WITHOUT PAVING).
 ⑥ CU. YDS. OF CONCRETE IN TWO HEADWALLS WITHOUT PAVING.
 ⑦ POUNDS OF REINFORCING STEEL IN TWO HEADWALLS WITH PAVING.
 ⑧ POUNDS OF REINFORCING STEEL TO DEDUCT WHEN PAVING FOR TWO HEADWALLS IS ELIMINATED.

KENTUCKY DEPARTMENT OF HIGHWAYS	
QUANTITIES 3' x 2' - 12' x 12' H-WALLS PRECAST BOX CULVERTS 30° SKEW	
STANDARD DRAWING NO. RDH-1210-02	
SUBMITTED _____	DIRECTOR DIVISION OF DESIGN _____ DATE _____
APPROVED _____	STATE HIGHWAY ENGINEER _____ DATE _____

BOX SIZE ①	CONCRETE 2 HEADWALLS					REINFORCEMENT 2 HEADWALLS	
	②	③	④	⑤	⑥	⑦	⑧
3 x 2	7.66	1.37	—	—	—	682	—
3 x 3	9.79	1.51	—	—	—	836	—
4 x 2	9.76	1.61	—	—	—	855	—
4 x 3	12.12	1.76	—	—	—	1023	—
4 x 4	14.78	1.90	—	—	—	1213	—
5 x 3	14.71	2.00	—	—	—	1244	—
5 x 4	17.59	2.15	—	—	—	1443	—
5 x 5	20.78	2.29	—	—	—	1672	—
6 x 3	17.55	2.25	—	—	—	1458	—
6 x 4	20.67	2.39	—	—	—	1672	—
6 x 5	24.08	2.54	—	—	—	1903	—
6 x 6	39.83	3.47	4.05	4.71	37.03	3606	453
7 x 4	24.01	2.64	—	—	—	1808	—
7 x 5	27.65	2.79	—	—	—	2153	—
7 x 6	44.50	3.75	4.67	5.02	41.10	4010	536
7 x 7	49.45	3.91	5.37	5.36	45.52	4518	580
8 x 4	26.61	2.83	—	—	—	2122	—
8 x 5	30.41	2.98	—	—	—	2373	—
8 x 6	48.14	3.97	5.11	5.23	44.30	4305	577
8 x 7	53.23	4.13	5.86	5.57	48.81	4833	627
8 x 8	64.11	5.87	6.04	7.83	60.03	5959	729

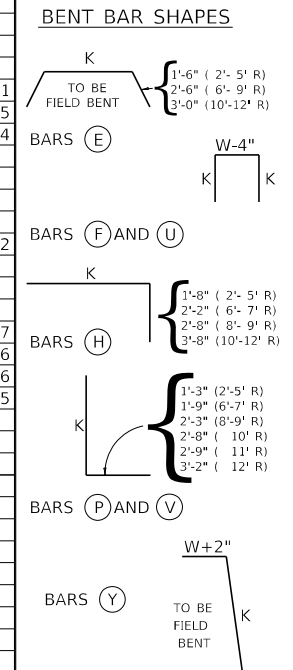
BOX SIZE ①	CONCRETE 2 HEADWALLS					REINFORCEMENT 2 HEADWALLS	
	②	③	④	⑤	⑥	⑦	⑧
9 X 5	34.44	3.22	—	—	—	2652	—
9 X 6	53.33	4.24	5.75	5.54	48.87	4710	623
9 X 7	58.61	4.41	6.56	5.88	53.51	5291	717
9 X 8	69.97	6.24	6.77	8.24	65.20	6440	784
9 X 9	76.20	6.46	7.62	8.69	70.82	7566	887
10 X 5	38.73	3.47	—	—	—	2996	—
10 X 6	58.82	4.52	6.42	5.85	53.72	5143	670
10 X 7	64.29	4.68	7.29	6.18	58.49	5991	769
10 X 8	76.14	6.61	7.53	8.65	70.65	7345	885
10 X 9	82.56	6.83	8.43	9.10	76.40	8098	948
10 X 10	107.47	10.51	9.07	13.96	101.86	9907	1087
11 X 4	38.80	3.57	—	—	—	2550	—
11 X 6	64.61	4.80	7.11	6.15	58.85	5587	716
11 X 8	82.61	6.98	8.30	9.06	76.38	7869	942
11 X 10	115.31	11.05	9.96	14.56	108.87	10514	1153
11 X 11	134.04	11.15	11.13	14.87	126.62	11723	1277
12 X 4	43.41	3.82	—	—	—	3397	—
12 X 6	70.70	5.08	7.81	6.46	64.28	6159	840
12 X 8	89.38	7.35	9.10	9.47	82.40	8518	1036
12 X 10	123.48	11.59	10.86	15.16	116.18	11234	1220
12 X 12	177.08	11.40	13.12	15.07	167.63	13937	1478

- ① PRECAST CONCRETE BOX CULVERT SECTIONS EQUALS THE INTERIOR SPAN (S) BY THE INTERIOR RISE (R) IN FEET.
 ② CU. YDS. OF CONCRETE IN TWO HEADWALLS WITH PAVING.
 ③ CU. YDS. OF CONCRETE IN TWO APRONS (HEADWALLS WITH PAVING).
 ④ CU. YDS. OF CONCRETE IN TWO PAVED AREAS OF THE HEADWALLS.
 ⑤ CU. YDS. OF CONCRETE IN TWO APRONS (HEADWALLS WITHOUT PAVING).
 ⑥ CU. YDS. OF CONCRETE IN TWO HEADWALLS WITHOUT PAVING.
 ⑦ POUNDS OF REINFORCING STEEL IN TWO HEADWALLS WITH PAVING.
 ⑧ POUNDS OF REINFORCING STEEL TO DEDUCT WHEN PAVING FOR TWO HEADWALLS IS ELIMINATED.

KENTUCKY DEPARTMENT OF HIGHWAYS	
QUANTITIES 3' x 2' - 12' x 12' H-WALLS PRECAST BOX CULVERTS 45° SKEW	
STANDARD DRAWING NO. RDH-1215-02	
SUBMITTED _____	DIRECTOR DIVISION OF DESIGN _____ DATE _____
APPROVED _____	STATE HIGHWAY ENGINEER _____ DATE _____

M A R K	S I Z E	N O	L G T H	K		M A R K	S I Z E	N O	L G T H	K		M A R K	S I Z E	N O	L G T H	K		M A R K	S I Z E	N O	L G T H	K		M A R K	S I Z E	N O	L G T H	K		M A R K	S I Z E	N O	L G T H	K				
	①	FT	IN	FT	IN		①	FT	IN	FT	IN		①	FT	IN	FT	IN		①	FT	IN	FT	IN		①	FT	IN	FT	IN		①	FT	IN	FT	IN			
9' X 8'						9' X 9' (CONTINUED)						10' X 6' (CONTINUED)						10' X 8'						10' X 9' (CONTINUED)						10' X 10' (CONTINUED)								
A	5	4	13	0		G1	4	2	10	6		C2	4	4	3	2		A	5	4	13	3		E1	5	2	16	11	11	11	Q	5	6	11	4			
B1	5	8	4	0		G2	4	2	12	10		C3	4	4	5	4		B1	5	8	4	1		F	4	12	1	5	0	6								
B2	5	8	5	0		G3	4	2	15	1		C4	4	4	7	4		B2	5	8	5	0		G1	4	2	12	6										
B3	5	8	5	11		G4	4	2	17	5		C5	4	4	9	6		B3	5	8	5	11		G2	4	2	14	10										
B4	5	8	6	10		G5	4	2	19	9		C6	4	8	9	8		B4	5	8	6	10		G3	4	2	17	1		11' X 4'								
B5	5	8	7	10		G6	4	3	22	0		E1	5	2	16	11	11	11	B5	5	8	7	9		G4	4	2	19	5									
B6	5	8	8	9		H	4	12	13	8	11	0	E2	5	2	17	5	12	5	B6	5	4	8	9		G5	4	2	21	9		A	5	4	8	2		
C1	4	4	2	11		M	4	26	4	9		F	4	12	1	5	0	6	B7	5	4	9	2		G6	4	3	24	0		C1	4	2	3	0			
C2	4	4	5	2		N	4	16	12	11		G1	4	1	11	5			C1	4	4	1	1		H	4	13	13	10	11	2	C2	4	2	5	1		
C3	4	4	7	3		P	7	26	7	3	5	0	G2	4	2	14	0		C2	4	4	3	2		M	4	26	4	9		C3	4	2	7	2			
C4	4	4	9	5		Q	5	5	10	2		G3	4	2	16	3			C3	4	4	5	4		N	4	16	13	1		C4	4	2	7	4			
C5	4	4	11	6		R	5	11	3	9		G4	4	2	17	11			C4	4	4	7	6		P	7	26	7	3	5	0	E1	5	2	16	1	13	
C6	4	12	11	9								H	4	11	10	4	8	2	C5	4	4	9	7		Q	5	5	11	4		E2	5	2	16	5	13		
E1	5	2	15	9	10	9						M	4	20	3	9		C6	4	4	11	9		R	5	12	3	10		F	4	13	0	11	0			
E2	5	2	16	3	11	3	10' X 5'					N	4	14	9	8		C7	4	12	11	11									G1	4	1	13	1			
F	4	11	1	5	0	6						P	5	20	5	3	3	6	E1	5	2	16	11	11	11									G2	4	2	15	5
G1	4	1	10	6		A	5	4	9	3		Q	5	4	11	4			E2	5	2	17	5	12	5								G3	4	2	17	9	
G2	4	2	12	10		C1	4	2	2	10		R	5	12	3	4		F	4	12	1	5	0	6	10' X 10'					G4	4	3	20	0				
G3	4	2	15	1		C2	4	2	4	11								G1	4	1	10	6								H	4	11	7	10	6			
G4	4	2	17	5		C3	4	2	7	1								G2	4	2	12	10		A	5	4	16	0		N	4	6	7	4				
G5	4	2	19	9		C4	4	4	8	4								G3	4	2	15	1		B1	5	8	5	0		Q	4	2	12	6				
G6	4	3	22	0		E1	5	2	14	11	11	11	10' X 7'					G4	4	2	17	5		B2	5	8	6	0		R	4	13	1	3				
H	4	12	12	8	10	0	E2	5	2	15	3	12	3	A	5	4	12	0		G5	4	2	19	9		B3	5	8	6	11		V1	5	4	3	10	2	
M	4	24	4	9		F	4	12	0	11	0	4	B1	5	8	3	7		H	4	12	12	10	10	2	B4	5	8	7	10		V2	5	4	4	9	3	
N	4	16	11	9		G1	4	2	13	0		B2	5	8	4	6			M	4	24	4	9		B5	5	8	8	10		V3	5	4	5	9	4		
P	6	24	6	9	4	6	G2	4	2	15	3		B3	5	8	5	5		N	4	16	11	11		B6	5	8	9	9		V4	5	4	6	8	5		
Q	5	5	10	2		G3	4	2	17	7		B4	5	8	6	5		P	7	24	6	9	4	6	B7	5	8	10	8									
R	5	11	3	9		G4	4	3	19	11		B5	5	8	7	4		Q	5	5	11	4		B8	5	4	11	7										
						H	4	11	8	8	7	0	B6	5	4	8	3		R	5	12	3	10		C1	4	4	1	5									
						N	4	6	8	4		C1	4	4	1	0								C2	4	4	3	7										
						Q	4	2	11	4		C2	4	4	3	2								C3	4	4	5	9										
9' X 9'						R	4	12	1	2		C3	4	4	5	3		10' X 9'									C4	4	4	7	10							
						V1	5	4	4	3	3	0	C4	4	4	7	5										C5	4	4	10	0			C6	4	4	12	2
A	5	4	14	3		V2	5	4	5	3	4	0	C5	4	4	9	7	10' X 6'						A	5	4	14	6		E1	5	2	17	11	11	11		
B1	5	8	4	7		V3	5	4	6	2	4	11	C6	4	12	10	10											B1	5	8	4	6		E2	5	2	18	8
B2	5	8	5	6		V4	5	4	7	2	5	11	E1	5	2	16	11	11	11				B2	5	8	5	6		F	4	12	1	11	0	8			
B3	5	8	6	5		V5	5	2	8	0	6	9	E2	5	2	17	5	12	5				B3	5	8	6	5		G1	4	1	12	2					
B4	5	8	7	4									F	4	12	1	5	0	6				B4	5	8	7	4		G2	4	2	14	5					
B5	5	8	8	3									G1	4	2	12	9					B5	5	8	8	3		G3	4	2	16	9						
B6	5	8	9	2									G2	4	2	15	1					B6	5	8	9	2		G4	4	2	19	1						
B7	5	4	10	2									G3	4	2	17	5					B7	5	4	10	2		G5	4	2	21	4						
C1	4	4	3	0									G4	4	2	19	9					C1	4	4	1	1		G6	4	2	23	8						
C2	4	4	5	2		A	5	4	10	8			H	4	12	11	4	9	2			C2	4	4	3	2		G7	4	3	26	0						
C3	4	4	7	4		B1	5	8	3	1			G5	4	3	22	0					C3	4	4	5	4		H	4	14	16	0	12	4				
C4	4	4	9	6		B2	5	8	4	0			M	4	22	3	9					C4	4	4	7	6		M	4	30	5	8						
C5	4	4	11	8		B3	5	8	5	0			N	4	14	10	10					C5	4	4	9	8		N	4	18	14	6						
C6	4	16	12	11		B4	5	8	5	11			P	6	22	5	9	4	0			C6	4	4	11	10		P	8	30	8	2						
E1	5	2	15	9	10	9	B5	5	4	6	11		Q	5	4	11	4					C7	4	16	13	1												
E2	5	2	16	3	11	3	B6	5	4	7	4		R	5	12	3	4																					
F	4	11	1	5	0	6	C1	4	4	1	0																											

- NOTES**
- NUMBER OF BARS IN ONE HEADWALL.
 - DIMENSIONS ARE 0. TO 0. OF BARS.
 - ALL BARS ARE STRAIGHT EXCEPT THOSE SHOWN BELOW.
 - R = BOX OR PIPE RISE
 - W = WING WALL WIDTH



KENTUCKY
DEPARTMENT OF HIGHWAYS

BILL OF REINFORCEMENT
9' X 8' - 11' X 4' HEADWALLS
PRECAST BOX CULVERTS
0° SKEW

STANDARD DRAWING NO. RDH-1304-03

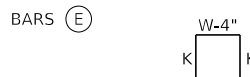
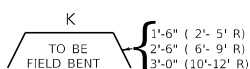
SUBMITTED _____ DIRECTOR DIVISION OF DESIGN _____ DATE _____

APPROVED _____ STATE HIGHWAY ENGINEER _____ DATE _____

MARK	SIZE	NO	LGTH	K		MARK	SIZE	NO	LGTH	K		MARK	SIZE	NO	LGTH	K		MARK	SIZE	NO	LGTH	K		MARK	SIZE	NO	LGTH	K		MARK	SIZE	NO	LGTH	K								
		①	FT	IN	FT	IN			①	FT	IN	FT	IN			①	FT	IN	FT	IN			①	FT	IN	FT	IN			①	FT	IN	FT	IN			①	FT	IN	FT	IN	
11' X 6'						11' X 8' (CONTINUED)						11' X 11'						12' X 4'						12' X 6' (CONTINUED)						12' X 10' (CONTINUED)												
A	5	4	10	11			G1	4	1	12	6			A	5	4	17	6			A	5	4	8	4			Q	5	20	5	3	3	6	B8	5	4	11	6			
B1	5	8	3	1			G2	4	2	14	9			B1	5	8	5	6			C1	4	2	1	1			Q	5	4	13	8			C1	4	4	1	8			
B2	5	8	4	0			G3	4	2	17	1			B2	5	8	6	6			C2	4	2	3	2									C2	4	4	3	10				
B3	5	8	4	11			G4	4	2	19	5			B3	5	8	7	5			C3	4	2	5	2									C3	4	4	6	0				
B4	5	8	5	11			G5	4	2	21	8			B4	5	8	8	4			C4	4	2	7	3									C4	4	4	8	1				
B5	5	4	6	10			G6	4	3	24	0			B5	5	8	8	4			C5	4	2	7	3									C5	4	4	10	3				
B6	5	4	7	4			H	4	13	13	0	10	4	B5	5	8	9	3			C6	4	2	7	6		12' X 8'						C6	4	4	12	5					
C1	4	4	1	3			M	4	24	4	9			B6	5	8	10	3			C7	4	2	17	3	14	3								C7	4	4	14	6			
C2	4	4	3	4			N	4	16	12	2			B7	5	8	11	2			E2	5	2	17	7	14	7	A	5	4	13	7			C8	4	16	14	10			
C3	4	4	5	5			P	7	24	6	9	4	6	B8	5	8	12	1			F	4	14	0	11	0	4	B1	5	8	4	0			E1	5	2	20	3	14		
C4	4	4	7	6			Q	5	5	12	6			C1	4	4	1	9			G1	4	3	15	8			B2	5	8	5	0			E2	5	2	20	11	14	1	
C5	4	4	9	8			R	5	13	3	11			C2	4	4	3	10			G2	4	2	17	11			B3	5	8	5	11			F	4	14	1	11	0		
C6	4	8	9	10										C3	4	4	6	0			G3	4	3	20	0			B4	5	8	6	10			G1	4	1	14	2			
E1	5	2	18	1	13	1								C4	4	4	8	1			H	4	11	8	0	6	4	B5	5	8	7	9			G2	4	2	16	6			
E2	5	2	18	7	13	7	11' X 10'						C5	4	4	10	3			N	4	6	7	6			B6	5	8	8	8			G3	4	2	18	9				
F	4	13	1	5	0	6								C6	4	4	12	4			Q	4	2	13	8			B7	5	4	9	7			G4	4	2	21	1			
G1	4	1	12	9										C7	4	4	14	6			R	4	14	1	4			C1	4	4	1	4			G5	4	2	23	5			
G2	4	2	15	1			A	5	4	16	2			C8	4	20	15	11			V1	5	4	3	10	2	7	C2	4	4	3	6			G6	4	2	25	8			
G3	4	2	17	5			B1	5	8	5	0			E1	5	2	19	1	13	1	V2	5	4	4	9	3	6	C3	4	4	5	8			G7	4	3	28	0			
G4	4	2	19	8			B2	5	8	6	0			E2	5	2	19	10	13	10	V3	5	4	5	8	4	5	C4	4	4	7	9			H	4	15	16	4	12		
G5	4	3	22	0			B3	5	8	6	11			F	4	13	2	2	0	9	V4	5	2	6	8	5	5	C5	4	4	9	11			M	4	30	5	8			
H	4	12	10	6	8	4	B4	5	8	7	10			G1	4	2	14	3			V5	5	2	7	2	5	11	C6	4	4	12	0			N	4	18	14	10			
M	4	20	3	9			B5	5	8	8	9			G2	4	2	16	6									C7	4	12	12	4			P	8	30	8	2	5			
N	4	14	9	10			B6	5	8	9	9			G3	4	2	18	10									E1	5	2	19	3	14	3	Q	5	6	13	8				
P	5	20	5	3	3	6	B7	5	8	10	8			G4	4	2	21	1									E2	5	2	19	9	14	9	R	5	14	4	8				
Q	5	4	12	6			B8	5	4	11	7			G5	4	2	23	5									F	4	14	1	5	0	6	U1	4	2	3	1	1			
R	5	13	3	5			C1	4	4	1	6			G6	4	2	25	9			12' X 6'						G1	4	1	14	8			U2	4	2	3	7	1			
							C2	4	4	3	8			G7	4	3	28	0			A	5	4	11	1			G2	4	2	16	10			U3	4	2	4	1	1		
							C3	4	4	5	10			H	4	15	17	3	13	7	B1	5	8	3	1			G3	4	2	19	2			U4	4	2	4	7	2		
							C4	4	4	8	0			M	4	32	6	0			B2	5	8	4	0			G4	4	2	21	5			U5	4	2	5	1	2		
							C5	4	4	10	2			N	4	20	15	11			B3	5	8	4	11			G5	4	2	23	8			U6	4	2	5	5	2		
11' X 8'						C6	4	4	12	3			P	8	32	8	9	6	0		B4	5	8	5	11			G6	4	3	26	0			U7	4	2	5	11	2		
A	5	4	13	6			C7	4	4	14	4			Q	5	6	12	6			B5	5	4	6	10			H	4	14	13	2	10	6	U8	4	2	6	5	2	1	
B1	5	8	4	0			C8	4	16	14	8			R	5	13	4	11			B6	5	4	7	4			M	4	26	4	9			Y	4	4	10	10	9		
B2	5	8	4	0			E1	5	2	19	1	13	1	U1	4	2	3	6	1	5	C1	4	4	1	5			N	4	16	12	4										
B3	5	8	5	10			E2	5	2	19	10	13	10	U2	4	2	4	0	1	8	C2	4	4	3	6			P	7	26	6	9	4	6								
B4	5	8	6	10			F	4	13	1	11	0	8	U3	4	2	4	4	1	10	C3	4	4	5	8			Q	5	5	13	8										
B5	5	8	7	9			G1	4	1	12	1			U4	4	2	4	10	2	1	C4	4	4	7	8																	
B6	5	8	7	9			G2	4	2	14	5			U5	4	2	5	4	2	4	C5	4	4	9	8																	
B7	5	4	8	8			G3	4	2	16	9			U6	4	2	5	10	2	7	C6	4	8	10	0																	
C1	4	4	9	2			G4	4	2	19	1			U7	4	2	6	4	2	10	E1	5	2	19	3	14	3															
C2	4	4	1	3			G5	4	2	21	4			U8	4	2	6	8	3	0	E2	5	2	19	9	14	9		12' X 10'													
C3	4	4	3	5			G6	4	2	23	8			U9	4	2	7	2	3	3	F	4	14	1	5	0	6															
C4	4	4	5	6			G7	4	3	26	0			Y	4	4	12	0	10	9	G1	4	1	14	10			A	5	4	16	6										
C5	4	4	7	8			H	4	14	16	2	12	6								G2	4	2	17	1			B1	5	8	5	0										
C6	4	4	9	9			M	4	30	5	8										G3	4	2	19	5			B2	5	8	6	0										
C7	4	12	12	2			N	4	18	14	8										G4	4	2	21	9			B3	5	8	6	11										
E1	5	2	18	1	13	1	P	8	30	8	2	5	6								G5	4	3	24	0			B4	5	8	7	10										
E2	5	2	18	7	13	7	Q	5	6	12	6										H	4	13	10	8	8	6	B5	5	8	8	9										
F	4	13	1	5	0	6	R	5	13	4	7										M	4	20	3	9			B6	5	8	9	8										
																					N	4	14	10	0			B7	5	8	10	7										

- NOTES**
- NUMBER OF BARS IN ONE HEADWALL.
 - DIMENSIONS ARE 0. TO 0. OF BARS.
 - ALL BARS ARE STRAIGHT EXCEPT THOSE SHOWN BELOW.
 - R = BOX OR PIPE RISE
 - W = WING WALL WIDTH

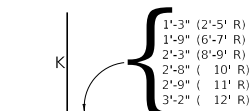
BENT BAR SHAPES



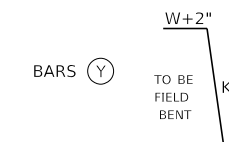
BARS (E) AND (U)



BARS (H)



BARS (P) AND (V)



BARS (Y)

**KENTUCKY
DEPARTMENT OF HIGHWAYS**

BILL OF REINFORCEMENT
11' X 6' - 12' X 10' HEADWALLS
PRECAST BOX CULVERTS
0° SKEW

STANDARD DRAWING NO. RDH-1306-03

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN _____ DATE _____
APPROVED _____ STATE HIGHWAY ENGINEER _____ DATE _____

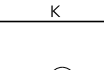
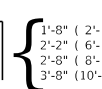
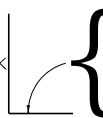
[illegible]

BENT BAR SHAPES



KENTUCKY DEPARTMENT OF HIGHWAYS	
<i>BILL OF REINFORCEMENT 12' X 12' HEADWALLS PRECAST BOX CULVERTS 0° SKEW</i>	
STANDARD DRAWING NO. RDH-1308-03	
SUBMITTED _____	DATE _____
APPROVED _____ STATE HIGHWAY ENGINEER	_____ DATE

MARK	SIZE	NO	LGTH	K		MARK	SIZE	NO	LGTH	K		MARK	SIZE	NO	LGTH	K		MARK	SIZE	NO	LGTH	K		MARK	SIZE	NO	LGTH	K													
SIZE	①	FT	IN	FT	IN	SIZE	①	FT	IN	FT	IN	SIZE	①	FT	IN	FT	IN	SIZE	①	FT	IN	FT	IN	SIZE	①	FT	IN	FT	IN												
3' X 2'					3' X 3' (CONTINUED)							4' X 3'					4' X 4' (CONTINUED)					5' X 3' (CONTINUED)					5' X 4' (CONTINUED)														
A1	5	2	4	7		S1	5	2	1	0		A1	5	2	5	11		K1	4	6	8	2	6	6	S5	5	2	2	2		W6	5	2	4	11	3					
A2	5	2	5	0		S2	5	4	1	2		A2	5	2	6	6		K2	4	1	4	2			T1	5	2	4	2		W6	5	2	5	11	4					
C1	4	1	3	10		T1	5	2	1	7		A2	5	2	6	6		K2	4	1	4	2			T2	5	2	6	7		W6	5	1	7	0	5					
C2	4	1	5	10		T2	5	2	4	3		C1	4	1	4	5		K3	4	1	6	0			V1	5	2	3	4	2	1										
E1	5	2	7	4	4	V1	5	2	3	4	2	1	C2	4	1	6	5		K4	4	1	6	3		V2	5	2	4	3	3	0										
E2	5	2	7	10	4	10	V2	5	2	4	3	3	0	C3	4	1	7	9		N1	4	3	6	3		V3	5	2	5	3	4	0									
F	4	5	1	3	0	6	V3	5	3	5	3	4	0	E1	5	2	8	8	5	8	N2	4	3	8	10		V4	5	3	5	9	4	6	5' X 5'							
G1	4	1	3	2		W6	5	2	3	4	2	1	E2	5	2	9	1	6	1	Q	4	2	4	6		W6	5	2	3	4	2	1									
G2	4	2	4	7		W6	5	2	4	5	3	2	F	4	6	1	3	0	6	R	4	5	0	10		W6	5	2	4	5	3	2	A1	5	2	9	2				
G3	4	3	6	0									G1	4	2	4	8			S1	5	2	1	0		W6	5	2	5	6	4	3	A2	5	2	8	5				
H	4	4	6	0	4	4							G2	4	2	6	4			S2	5	2	1	3									C1	4	1	2	11				
K1	4	1	2	0									G3	4	3	8	0			S3	5	2	1	7									C2	4	1	5	0				
K2	4	1	3	9		4' X 2'					H	4	5	7	2	5	6			T1	5	2	2	11		5' X 4'					C3	4	1	7	1						
N1	4	3	4	0							K1	4	1	2	3		K2	4	1	4	1			T2	5						2	5	5								C4
N2	4	3	6	0		A1	5	2	4	9		K3	4	1	5	2			V1	5	2	3	9	2	6	A1	5	2	7	3			E1	5	2	9	11	6	11		
Q	4	2	3	4		A2	5	2	5	2		N1	4	3	5	2			V2	5	2	4	9	3	6	A2	5	2	7	11			E2	5	2	10	5	7	5		
R	4	4	0	9		C1	4	1	4	4		N2	4	3	7	9			V3	5	2	5	9	4	9	C1	4	1	2	11			F	4	8	1	3	0	6		
S1	5	2	1	0		C2	4	1	6	4		Q	4	2	4	6			V4	5	3	6	8	5	5	C2	4	1	5	0			G1	4	2	7	0				
S2	5	4	1	2		E1	5	2	8	8	5	8	R	4	5	0	10			W6	5	2	3	10	2	7	C3	4	1	7	1			G2	4	2	8	7			
T1	5	2	1	7		E2	5	2	9	1	6	1	S1	5	2	1	0			W6	5	2	4	11	3	8	C4	4	1	9	2			G3	4	2	10	4			
T2	5	2	4	3		F	4	6	1	3	0	6	S2	5	2	1	3			W6	5	2	6	0	4	9	C5	4	1	9	5			G4	4	3	12	0			
V1	5	2	2	10	1	7	G1	4	1	4	7		S3	5	2	1	7									E1	5	2	9	11	6	11	H	4	7	9	4	7	8		
V2	5	2	3	10	2	7	G2	4	2	6	4		S4	5	2	1	10									E2	5	2	10	5	7	5	K1	4	1	2	6				
V3	5	2	4	7	3	4	G3	4	3	8	0		T1	5	2	2	11									F	4	8	1	3	0	6	K2	4	1	4	5				
W6	5	2	2	10	1	7	H	4	5	6	2	4	6	T2	5	2	5	5		5' X 3'					G1	4	1	6	8							K3	4	1	6	3	
W6	5	2	3	11	2	8	K1	4	1	2	2		V1	5	2	3	3	2	0						A1	5	2	6	1			G2	4	2	8	4			K4	4	2
							K2	4	1	4	0		V2	5	2	4	3	3	0	A2	5	2	6	8			G3	4	2	10	0			N1	4	3	7	5			
							N1	4	3	4	2		V3	5	2	5	3	4	0	C1	4	1	2	11			G4	4	3	11	9			N2	4	3	10	7			
							N2	4	3	6	6		V4	5	2	5	8	4	5	C2	4	1	2	11			H	4	7	8	4	6	8	Q	4	2	5	8			
3' X 3'																																									
A1	5	2	5	9			S1	5	2	1	0		W6	5	2	3	4	2	1	C3	4	1	7	0			K2	4	1	2	6			S1	5	2	1	0			
A2	5	2	6	3			S2	5	2	1	3									E1	5	2	9	11	6	11	K4	4	1	6	5			S2	5	2	1	3			
C1	4	1	3	11			S3	5	2	1	7									E2	5	2	10	5	7	5	N1	4	3	6	5			S3	5	2	1	7			
C2	4	1	5	11			S4	5	2	1	10									F	4	8	1	3	0	6	N2	4	3	9	5			S4	5	2	2	2			
C3	4	1	7	2			T1	5	2	2	11									G1	4	2	6	8			Q	4	2	5	8			T1	5	2	3	11			
E1	5	2	7	4	4	4	T2	5	2	5	5		4' X 4'					G2	4	2	8	5				R	4	6	0	11			T2	5	2	6	7				
E2	5	2	7	9	4	9	V1	5	2	2	10	1						7	A1	5	2	7	1			G3	4	3	10	0			S1	5	2	1	0			V1	5
F	4	5	1	3	0	6	V2	5	2	3	10	2	7	A2	5	2	7	9			H	4	6	7	4	5	8	S2	5	2	1	3			V2	5	2	5	3	4	
G1	4	2	4	7			V3	5	3	4	8	3	5	C1	4	1	4	6			K1	4	1	2	5			S3	5	2	1	7			V3	5	2	6	2	4	11
G2	4	2	6	4			W6	5	2	2	10	1	7	C2	4	1	6	7			K2	4	1	4	3			S4	5	2	1	11			V4	5	2	7	1	5	10
G3	4	3	8	0			W6	5	2	3	11	2	8	C3	4	1	8	8			K3	4	1	5	4			S5	5	2	2	2			V5	5	3	7	9	6	6
H	4	5	7	0	5	4								C4	4	1	8	10			N1	4	3	5	4			T1	5	2	3	11			W6	5	2	4	3	3	
K1	4	1	2	0			E1	5	2	8	8	5	8	N2	4	3	8	3			Q	4	2	5	8			T2	5	2	6	7			W6	5	2	5	4	4	
K2	4	1	3	11			E2	5	2	9	1	6	1	Q	4	2	5	8			R	4	6	0	11			V1	5	2	3	9	2	6	W6	5	2	6	5	5	
K3	4	1	5	0			F	4	6	1	3	0	6	S1	5	2	1	0			S1	5	2	1	0			V2	5	2	4	9	3	6	W6	5	2	7	6	6	
N1	4	3	5	0			G1	4	1	5	0			R	4	6	0	11			S2	5	2	1	3			V3	5	2	5	8	4	5							
N2	4	3	7	2			G2	4	2	6	8			S2	5	2	1	3			S3	5	2	1	7			V4	5	1	6	8	5	5							
Q	4	2	3	4			G3	4	2	8	4			S3	5	2	1	7			S4	5	2	1	11			V5	5	3	6	9	5	6							
R	4	4	0	9			G4	4	3	10	0			S4	5	2	1	11			W6	5	2	3	10	2	7														

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100	NOTES ① NUMBER OF BARS IN ONE HEADWALL. 2 DIMENSIONS ARE 0. TO 0. 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  TO BE FIELD BENT 1'-6" (2'-5' R) 2'-6" (6'-9' R) 3'-0" (10'-12' R) BARS (E)  BARS (F), (U) AND (X)  BARS (H)  BARS (P), (V) AND (W)  BARS (Y) AND (Z)  TO BE FIELD BENT 
	KENTUCKY DEPARTMENT OF HIGHWAYS BILL OF REINFORCEMENT 6' X 3' - 7' X 5' HEADWALLS PRECAST BOX CULVERTS 15° SKEW STANDARD DRAWING NO. RDH-1312-03 SUBMITTED _____ APPROVED _____ DIRECTOR DIVISION OF DESIGN STATE HIGHWAY ENGINEER DATE _____ DATE _____

MARK	SIZE	NO		LGTH		K		MARK	SIZE	NO		LGTH		K		MARK	SIZE	NO		LGTH		K		MARK	SIZE	NO		LGTH		K		MARK	SIZE	NO		LGTH		K									
		①	②	FT	IN					FT	IN	FT	IN					FT	IN	FT	IN					FT	IN	FT	IN					FT	IN	FT	IN										
7' X 6'								7' X 6' (CONTINUED)								7' X 7' (CONTINUED)								8' X 4' (CONTINUED)								8' X 5' (CONTINUED)								8' X 6' (CONTINUED)							
A1	5	2	9	9				T2	5	2	7	1				S4	5	2	1	11				V5	5	6	6	11	5	8		W6	5	2	6	5	5	2	S4	5	2	1	11				
A2	5	2	10	8				T3	5	2	9	1				S5	5	2	2	2				W5	5	2	3	9	2	6		W6	5	2	7	5	6	2	S5	5	2	2	3				
B1	5	4	3	1											S6	5	2	2	6				W6	5	2	4	10	3	7								S6	5	2	2	6						
B2	5	4	4	0											S7	5	2	2	10				W6	5	2	5	11	4	8								S7	5	2	2	10						
B3	5	4	4	11											S8	5	2	3	1				W6	5	1	6	11	5	8								S8	5	2	3	1						
B4	5	4	5	11				7' X 7'								T1	5	2	3	6				8' X 6'															S9	5	2	3	5				
B5	5	4	6	10				A1	5	2	10	11				T2	5	2	7	1																	T1	5	2	1	3						
B6	5	6	7	2				A2	5	2	12	0				T3	5	2	9	1																T2	5	2	4	9							
C1	4	2	4	1				B1	5	4	3	6												8' X 5'								A2	5	2	10	8				T3	5	2	8	1			
C2	4	2	6	2				B2	5	4	4	6												A1	5	2	8	9								B1	5	4	3	0							
C3	4	2	8	4				B3	5	4	5	5											A2	5	2	9	7							B2	5	4	4	0									
C4	4	2	10	5				B4	5	4	6	5				8' X 4'											C1	4	1	4	3							B3	5	4	4	11					
C5	4	2	12	6				B5	5	4	7	4				A1	5	2	7	7																B4	5	4	5	11							
C6	4	4	12	9				B6	5	8	8	2				A2	5	2	8	4															B5	5	4	6	10								
E1	5	2	14	6	9	6		C1	4	2	4	1				C1	4	1	4	2															C2	4	2	4	4								
E2	5	2	15	2	10	2		C2	4	2	6	2				C2	4	1	6	4															C3	4	2	6	5								
F	4	10	1	5	0	6		C3	4	2	8	4				C3	4	1	8	5															C4	4	2	8	6								
G1	4	1	9	0				C4	4	2	10	5				C4	4	1	10	7															C5	4	2	10	8								
G2	4	2	10	9				C5	4	2	12	7				C5	4	1	10	9																C6	4	2	12	8							
G3	4	2	12	6				C6	4	6	13	11				E1	5	2	13	8	10	8													C6	4	4	13	0								
G4	4	2	14	2				E1	5	2	14	6	9	6		E2	5	2	14	1	11	1													E1	5	2	15	8	10	8						
G5	4	3	16	0				E2	5	2	15	2	10	2		F	4	11	1	3	0	6													E2	5	2	16	3	11	3						
H	4	9	11	2	9	0		F	4	10	1	5	0	6		G1	4	1	10	9															F	4	11	1	5	0	6						
J1	5	4	3	1				G1	4	2	9	3				G2	4	2	12	6															G1	4	1	9	10								
J2	5	4	4	2				G2	4	2	10	11				G3	4	2	14	2															G2	4	2	11	4								
J3	5	4	5	2				G3	4	2	12	8				G4	4	3	16	0															G3	4	2	12	11								
J4	5	4	6	3				G4	4	2	14	4				H	4	9	8	8	7	0													G4	4	2	14	6								
J5	5	2	7	4				G5	4	3	16	0				K1	4	1	2	9																G5	4	3	16	0							
K1	4	2	2	10				H	4	9	12	2	10	0		K2	4	1	4	8															H	4	9	11	2	9	0						
K2	4	2	4	9				J1	5	4	3	7				K3	4	1	6	6																J1	5	4	3	1							
K3	4	2	6	7				J2	5	4	4	7				K4	4	1	6	9																J2	5	4	4	1							
K4	4	2	8	6				J3	5	4	5	8				N1	4	3	6	9																J3	5	4	5	2							
K5	4	4	8	8				J4	5	4	6	8				N2	4	3	10	9																J4	5	4	6	3							
M1	4	1	2	5				J5	5	4	7	9				Q	4	2	9	0																J5	5	2	7	3							
M2	4	21	3	9				K1	4	2	2	9				R	4	10	1	1																K1	4	2	2	9							
N1	4	7	8	8				K2	4	2	4	8				S1	5	2	1	1																K2	4	2	4	7							
N2	4	5	11	7				K3	4	2	6	7				S2	5	2	1	4																K3	4	2	6	6							
N3	4	2	12	11				K4	4	2	8	6				S3	5	2	1	8																K4	4	2	8	5							
P	5	22	5	3	3	6		K5	4	6	9	8				S4	5	2	2	0																K5	4	4	8	8							
Q	5	4	8	0				M1	4	1	2	6				S5	5	2	2	3																M1	4	2	2	3							
R	5	9	3	4				M2	4	23	3	9				S6	5	2	2	7																M2	4	21	3	9							
S1	5	2	1	0				N1	4	7	9	8				S7	5	2	2	10																N1	4	7	8	8							
S2	5	2	1	4				N2	4	5	12	9				S8	5	2	3	2																N2	4	5	11	11							
S3	5	2	1	7				N3	4	2	14	1				T1	5	2	4	0																	N3	4	2	13	3						
S4	5	2	1	11				P	5	24	5	9	4	0		T2	5	2	7	4																P	5	22	5	3	3	6					
S5	5	2	2	2				Q	5	4	8	0				T3	5	2	9	11																Q	5	4	9	0							
S6	5	2	2	6				R	5	9	3	4				V1	5	2	3	10	2	7														R	5	10	3	4							
S7	5	2	2	10				S1	5	2	1	0				V2	5	2	4	9	3	6														S1	5	2	1	1							
S8	5	2	3	1				S2	5	2	1	4				V3	5	2	5	8	4	5														S2	5	2	1	4							
T1	5	2	3	6				S3	5	2	1	7				V4	5	2	6	8	5	5														S3	5	2	1	7							
																V																															

NOTES

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- DIMENSIONS ARE 0. TO 0. OF BARS.
- ALL BARS ARE STRAIGHT EXCEPT THOSE SHOWN BELOW.
- R = BOX OR PIPE RISE
- W = WING WALL WIDTH

BENT BAR SHAPES

M A R K	S I Z E	NO	LGTH	K		M A R K	S I Z E	NO	LGTH	K		M A R K	S I Z E	NO	LGTH	K		M A R K	S I Z E	NO	LGTH	K		M A R K	S I Z E	NO	LGTH	K												
		①	FT	IN	FT	IN		①	FT	IN	FT	IN		①	FT	IN	FT	IN		①	FT	IN	FT	IN		①	FT	IN	FT	IN										
8' X 7'						8' X 7' (CONTINUED)						8' X 8' (CONTINUED)						9' X 5' (CONTINUED)						9' X 6' (CONTINUED)						9' X 7' (CONTINUED)										
A1	5	2	10	11			T1	5	2	1	3			N3	4	3	15	6		S7	5	2	2	11		K3	4	2	4	9		G4	4	2	16	4				
A2	5	2	12	0			T2	5	2	4	9			P	6	27	6	9	4	6	S8	5	2	3	2		K4	4	2	6	8		G5	4	3	18	0			
B1	5	4	3	6			T3	5	2	8	1			Q	5	5	9	0			S9	5	2	3	5		K5	4	2	8	8		H	4	10	12	4	10		
B2	5	4	4	6			T4	5	2	10	1			R	5	10	3	10			T1	5	2	1	9		K6	4	4	8	9		J1	5	4	3	6			
B3	5	4	5	5									S1	5	2	1	1			T2	5	2	5	2		M1	4	1	2	5		J2	5	4	4	7				
B4	5	4	6	4									S2	5	2	1	4			T3	5	2	8	6		M2	4	22	3	9		J3	5	4	5	8				
B5	5	4	7	4									S3	5	2	1	7			T4	5	2	11	1		N1	4	7	8	10		J4	5	4	6	8				
B6	5	8	8	2			8' X 8'						S4	5	2	1	11			V1	5	2	4	4	3	1	N2	4	5	12	5		J5	5	4	7	9			
C1	4	2	4	4			A1	5	2	12	1			S5	5	2	2	3			V2	5	2	5	3	4	0	N3	4	2	13	9		K1	4	2	2	11		
C2	4	2	6	6			A2	5	2	13	2			S6	5	2	2	6			V3	5	2	6	2	4	11	P	5	23	5	3	3	6	K2	4	2	4	10	
C3	4	2	8	7			B1	5	4	4	0			S7	5	2	2	10			V4	5	2	7	1	5	10	Q	5	4	10	2		K3	4	2	6	9		
C4	4	2	10	8			B2	5	4	5	0			S8	5	2	3	1			V5	5	5	8	0	6	9	R	5	11	3	5		K4	4	2	8	8		
C5	4	2	12	10			B3	5	4	5	11			S9	5	2	3	5			W1	5	2	4	3	3	0	S1	5	2	1	1		K5	4	6	9	10		
C6	4	6	14	2			B4	5	4	6	10			T1	5	2	1	3			W2	5	2	5	4	4	1	S2	5	2	1	4		M1	4	1	2	5		
E1	5	2	15	8	10	8	B5	5	4	7	9			T2	5	2	4	9			W3	5	2	6	4	5	1	S3	5	2	1	8		M2	4	24	3	9		
E2	5	2	16	3	11	3	B6	5	4	8	8			T3	5	2	8	1			W4	5	2	7	5	6	2	S4	5	2	2	0		N1	4	7	9	10		
F	4	11	1	5	0	6	B7	5	8	9	2			T4	5	2	10	1									S5	5	2	2	3		N2	4	5	13	8			
G1	4	2	11	2			C1	4	2	4	4															S6	5	2	2	7		N3	4	2	14	11				
G2	4	2	12	11			C2	4	2	6	6															S7	5	2	2	11		P	5	25	5	9	4	0		
G3	4	2	14	7			C3	4	2	8	8			9' X 5'					9' X 6'									S8	5	2	3	2		Q	5	4	10	2		
G4	4	2	16	4			C4	4	2	10	9			A1	5	2	9	0			A2	5	2	10	10			S9	5	2	3	5		R	5	11	3	5		
G5	4	3	18	0			C5	4	2	12	11			A2	5	2	9	9			B1	5	4	3	0			S10	5	2	3	7		S1	5	2	1	1		
H	4	10	12	2	10	0	C6	4	2	15	0			A2	5	2	9	9			B2	5	4	4	0			T1	5	2	2	6		S2	5	2	1	4		
J1	5	4	3	7			C7	4	6	15	4			C1	4	1	4	8			B3	5	4	4	0			T2	5	2	5	11		S3	5	2	1	8		
J2	5	4	4	7			E1	5	2	15	8	10	8	C2	4	1	6	10			B4	5	4	4	11			T3	5	2	9	3		S4	5	2	2	0		
J3	5	4	5	8			E2	5	2	16	3	11	3	C3	4	1	9	0			B5	5	4	5	10			T4	5	2	11	3		S5	5	2	2	3		
J4	5	4	6	8			F	4	11	1	5	0	6	C4	4	1	11	1			B6	5	4	6	10								S6	5	2	2	7			
J5	5	4	7	9			G1	4	1	9	7			C5	4	2	12	5															S7	5	2	2	11			
K1	4	2	2	9			G2	4	2	12	3			E1	5	2	15	0	12	0	C1	4	2	4	11			9' X 7'					S8	5	2	3	5			
K2	4	2	4	8			G3	4	2	13	0			E2	5	2	15	5	12	5	C2	4	2	7	0			C3	4	2	9	2		S9	5	2	3	7		
K3	4	2	6	7			G4	4	2	14	8			F	4	13	1	5	0	6	C3	4	2	9	2			A1	5	2	11	2		T1	5	2	2	6		
K4	4	2	8	6			G5	4	2	16	4			G1	4	2	12	11			C4	4	2	11	3			A2	5	2	12	2		T2	5	2	5	11		
K5	4	6	9	8			G6	4	3	18	0			G2	4	2	14	8			C5	4	2	13	3			B1	5	4	3	6		T3	5	2	9	3		
M1	4	2	2	3			H	4	10	13	8	11	0	G3	4	2	16	3			C6	4	4	13	7			B2	5	4	4	5		T4	5	2	11	3		
M2	4	23	3	9			J1	5	4	4	1			G4	4	3	18	0			E1	5	2	17	0	12	0	B3	5	4	5	5								
N1	4	7	9	8			J2	5	4	5	1			H	4	10	9	10	8	2	E2	5	2	17	7	12	7	B4	5	4	6	4								
N2	4	5	13	0			J3	5	4	6	2			K1	4	1	2	11			F	4	13	1	5	0	6	B5	5	4	7	3								
N3	4	2	14	6			J4	5	4	7	2			K2	4	1	4	10			G1	4	1	11	6			B6	5	10	8	3								
P	5	24	5	9	4	0	J5	5	4	8	2			K3	4	1	6	9			G2	4	2	13	1			C1	4	2	4	11								
Q	5	4	9	0			J6	5	2	9	3			K4	4	2	7	11			G3	4	2	14	9			C2	4	2	7	0								
R	5	10	3	4			K1	4	2	2	9			N1	4	3	7	11			G4	4	2	16	4			C3	4	2	9	1								
S1	5	2	1	1			K2	4	2	4	8			N2	4	3	12	7			G5	4	3	18	0			C4	4	2	11	3								
S2	5	2	1	4			K3	4	2	6	7			Q	4	2	10	2			H	4	10	11	4	9	2	C5	4	2	13	4								
S3	5	2	1	7			K4	4	2	8	6			R	4	11	1	2			J1	5	4	3	1			C6	4	6	14	9								
S4	5	2	1	11			K5	4	2	10	5			S1	5	2	1	2			J2	5	4	4	1			E1	5	2	17	0	12	0						
S5	5	2	2	3			K6	4	6	10	8			S2	5	2	1	5			J3	5	4	5	2			E2	5	2	17	7	12	7						
S6	5	2	2	6			M1	4	1	2	9			S3	5	2	1	9			J4	5	4	6	3			F	4	13	1	5	0	6						
S7	5	2	2	10			M2	4	26	4	9			S4	5	2	2	0			J5	5	2	7	3			G1	4	2	11	3								
S8	5	2	3	1			N1	4	8	10	8			S5	5	2	2	4			K1	4	2	1	0			G2	4	2	13	0								
S9	5	2	3	5			N2	4	5	14	0			S6	5	2	2	7			K2	4	2	3	0			G3	4	2	14	8								

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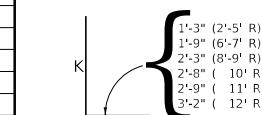
BENT BAR SHAPES



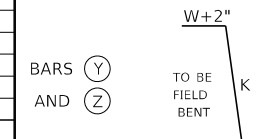
BARS (E), (F), (U) AND (X)



BARS (H)



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



BARS (Y) AND (Z)

MARK	SIZE	NO	LGTH	K		MARK	SIZE	NO	LGTH	K		MARK	SIZE	NO	LGTH	K		MARK	SIZE	NO	LGTH	K		MARK	SIZE	NO	LGTH	K										
SIZE	①	FT	IN	FT	IN	SIZE	①	FT	IN	FT	IN	SIZE	①	FT	IN	FT	IN	SIZE	①	FT	IN	FT	IN	SIZE	①	FT	IN	FT	IN									
9' X 8'					9' X 8' (CONTINUED)					9' X 9' (CONTINUED)					10' X 5' (CONTINUED)					10' X 6' (CONTINUED)					10' X 7' (CONTINUED)													
A1	5	2	12	3		S5	5	2	2	0		K4	4	2	8	9		Q	4	2	11	4		G5	4	3	20	0		C3	4	2	9	8				
A2	5	2	13	5		S6	5	2	2	7		K5	4	2	10	8		R	4	12	1	3		H	4	11	11	6	9	4	C4	4	2	11	10			
B1	5	4	4	0		S7	5	2	2	11		M1	4	1	2	9		S2	5	2	1	5		J2	5	4	4	1		C6	4	6	15	3				
B2	5	4	4	11		S8	5	2	3	2		M2	4	28	4	9		S3	5	2	1	9		J3	5	4	5	2		E1	5	2	18	3	13			
B3	5	4	5	10		S9	5	2	3	5		N1	4	8	11	11		S4	5	2	2	1		J4	5	4	6	3		E2	5	2	18	11	13			
B4	5	4	6	10		S10	5	2	3	7		N2	4	5	15	9		S5	5	2	2	4		J5	5	2	7	3		F	4	14	1	5	0			
B5	5	4	7	9		T1	5	2	2	6		N3	4	3	17	3		S6	5	2	2	8		K1	4	2	1	2		G1	4	2	13	6				
B6	5	4	8	8		T2	5	2	5	11		P	7	29	7	3	5	0	S7	5	2	2	11		K2	4	2	3	1		G2	4	2	15	2			
B7	5	8	9	3		T3	5	2	9	3		Q	5	5	10	2		S8	5	2	3	3		K3	4	2	4	11		G3	4	2	16	9				
C1	4	2	4	11		T4	5	2	11	3		R	5	11	3	11		S9	5	2	3	6		K4	4	2	6	10		G4	4	2	18	5				
C2	4	2	7	1								S1	5	2	1	1		S10	5	2	3	10		K5	4	2	8	9		G5	4	3	20	0				
C3	4	2	9	3								S2	5	2	1	4		T1	5	2	2	7		K6	4	4	9	0		H	4	11	12	6	10			
C4	4	2	11	5								S3	5	2	1	8		T2	5	2	6	1		M1	4	1	2	6		J1	5	4	3	7				
C5	4	2	13	6		9' X 9'						S4	5	2	2	0		T3	5	2	9	6		M2	4	22	3	9		J2	5	4	4	7				
C6	4	2	15	6		A1	5	2	13	5		S5	5	2	2	3		T4	5	2	12	3		N1	4	7	9	0		J3	5	4	5	8				
C7	4	6	15	10		A2	5	2	14	8		S6	5	2	2	7		V1	5	2	4	3	3	0	N2	4	5	13	0		J4	5	4	6	8			
E1	5	2	17	0	12	0	A2	5	2	14	8		S7	5	2	2	11		V2	5	2	5	3	4	0	N3	4	2	14	3		J5	5	4	7	9		
E2	5	2	17	7	12	7	B1	5	4	4	6		S8	5	2	3	2		V3	5	2	6	2	4	11	P	5	23	5	3	3	6	K1	4	2	3	1	
F	4	13	1	5	0	6	B2	5	4	5	5		S9	5	2	3	5		V4	5	2	7	1	5	10	Q	5	5	11	4		K2	4	2	5	0		
G1	4	1	11	9		B3	5	4	6	5		S10	5	2	3	7		V5	5	5	8	1	6	10	R	5	12	3	6		K3	4	2	6	11			
G2	4	2	13	5		B4	5	4	7	4		T1	5	2	2	6		W1	5	2	4	4	3	1	S1	5	2	1	2		K4	4	2	8	10			
G3	4	2	15	1		B5	5	4	8	3		T2	5	2	5	11		W2	5	2	5	4	4	1	S2	5	2	1	5		K5	4	6	10	0			
G4	4	2	16	8		B6	5	4	9	2		T3	5	2	9	3		W3	5	2	6	5	5	2	S3	5	2	1	9		M1	4	2	2	3			
G5	4	2	18	4		B7	5	10	10	3		T4	5	2	11	3		W4	5	2	7	5	6	2	S4	5	2	2	0		M2	4	24	3	9			
G6	4	3	20	0		C1	4	2	4	11								S5	5	2	2	2	3		S5	5	2	2	3		N1	4	7	10	0			
H	4	11	13	10	11	2	C2	4	2	7	1							S6	5	2	2	7		S6	5	2	2	7		N2	4	5	14	1				
J1	5	4	4	1		C3	4	2	9	3								S7	5	2	2	11		S7	5	2	2	11		N3	4	2	15	5				
J2	5	4	5	1		C4	4	2	11	5		10' X 5'								S8	5	2	3	2		S8	5	2	3	2		P	6	25	5	9	4	
J3	5	4	6	2		C5	4	2	13	6		10' X 5'								S9	5	2	3	6		S9	5	2	3	6		Q	5	5	11	4		
J4	5	4	7	2		C6	4	2	15	8		A1	5	2	9	2		A1	5	2	10	2		S10	5	2	3	9		R	5	12	3	6				
J5	5	4	8	2		C7	4	8	17	0		A2	5	2	10	0		A2	5	2	11	1		S11	5	2	4	0		S1	5	2	1	2				
J6	5	2	9	3		E1	5	2	17	0	12	0	C1	4	1	5	3		B1	5	4	3	0		T1	5	2	3	9		S2	5	2	1	5			
K1	4	2	1	0		E2	5	2	17	7	12	7	C2	4	1	7	5		B2	5	4	4	0		T2	5	2	7	0		S3	5	2	1	9			
K2	4	2	3	0		F	4	13	1	5	0	6	C3	4	1	9	7		B3	5	4	4	11		T3	5	2	10	6		S4	5	2	2	0			
K3	4	2	4	10		G1	4	2	11	7		C4	4	1	11	8		B4	5	4	5	10		T4	5	2	12	5		S5	5	2	2	3				
K4	4	2	6	10		G2	4	2	13	3		C5	4	2	13	0		B5	5	4	6	10								S6	5	2	2	7				
K5	4	2	8	9		G3	4	2	14	11		E1	5	2	16	3	13	3	B6	5	8	7	4							S7	5	2	2	11				
K6	4	2	10	8		G4	4	2	16	8		E2	5	2	16	8	13	8	C1	4	2	5	4							S8	5	2	3	2				
K7	4	6	10	10		G5	4	2	18	4		F	4	14	1	3	0	6	C2	4	2	7	6		10' X 7'					S9	5	2	3	6				
M1	4	1	3	0		G6	4	3	20	0		G1	4	2	12	11			C3	4	2	9	7		10' X 7'					S10	5	2	3	9				
M2	4	26	4	9		H	4	11	14	10	12	2	G2	4	2	14	7		C4	4	2	11	9		A1	5	2	11	3		S11	5	2	4	0			
N1	4	8	10	11		J1	5	4	4	6		G3	4	2	16	4			C5	4	2	13	9		A2	5	2	12	4		T1	5	2	3	9			
N2	4	5	14	6		J2	5	4	5	7		G4	4	3	18	0			C6	4	4	14	1		B1	5	4	3	6		T2	5	2	7	0			
N3	4	3	16	1		J3	5	4	6	7		H	4	10	10	0	8	4	E1	5	2	18	3	13	3	B2	5	4	4	6		T3	5	2	10	6		
P	6	27	6	9	4	6	J4	5	4	7	8		K1	4	1	3	1		E2	5	2	18	11	13	11	B3	5	4	5	5		T4	5	2	12	5		
Q	5	5	10	2		J5	5	4	8	8		K2	4	1	5	0			F	4	14	1	5	0	6	B4	5	4	6	4								
R	5	11	3	11		J6	5	4	9	9		K3	4	1	6	11			G1	4	1	13	4		B5	5	4	7	3									
S1	5	2	1	1		K1	4	2	3	0		K4	4	2	8	1			G2	4	2	15	0		B6	5	10	8	4									
S2	5	2	1	4		K2	4	2	4	11		N1	4	3	8	1			G3	4	2	16	8		C1	4	2	5	5									
S3	5	2	1	8		K3	4	2	6	10		N2	4	3	13	1			G4	4	2	18	4		C2	4	2	7	6									

NOTES

- NUMBER OF BARS IN ONE HEADWALL.
- DIMENSIONS ARE 0. TO 0. OF BARS.
- ALL BARS ARE STRAIGHT EXCEPT THOSE SHOWN BELOW.
- R = BOX OR PIPE RISE
- W = WING WALL WIDTH

BENT BAR SHAPES

TO BE FIELD BENT { 1'-6" (2'-5' R)
2'-6" (6'-9' R)
3'-0" (10'-12' R)

BARS (E)

W-4"

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

TO BE FIELD BENT { 1'-8" (2'-5' R)
2'-2" (6'-7' R)
2'-8" (8'-9' R)
3'-8" (10'-12' R)

BARS (H)

TO BE FIELD BENT { 1'-3" (2'-5' R)
1'-9" (6'-9' R)
2'-3" (8'-9' R)
2'-8" (10' R)
2'-9" (11' R)
3'-2" (12' R)

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

W+2"

TO BE FIELD BENT

BARS (Y) AND (Z)

KENTUCKY DEPARTMENT OF HIGHWAYS

BILL OF REINFORCEMENT

9' X 8' - 10' X 7' HEADWALLS

PRECAST BOX CULVERTS

15° SKEW

STANDARD DRAWING NO. RDH-1318-03

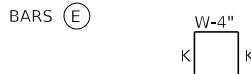
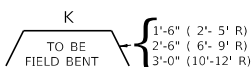
SUBMITTED _____ DIRECTOR DIVISION OF DESIGN _____ DATE _____

APPROVED _____ STATE HIGHWAY ENGINEER _____ DATE _____

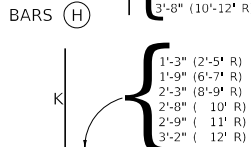
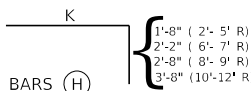
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	①	FT	IN	FT	IN		①	FT	IN	FT	IN		①	FT	IN	FT	IN		①	FT	IN	FT	IN										
10' x 8'						10' x 8' (CONTINUED)						10' x 9' (CONTINUED)						10' x 10' (CONTINUED)						11' x 4'									
A1	5	2	12	5		S4	5	2	2	0		K2	4	2	5	2		E1	5	2	19	3	13	3	A1	5	2	8	3				
A2	5	2	13	8		S5	5	2	2	3		K3	4	2	7	0		E2	5	2	20	1	14	1	A2	5	2	8	11				
B1	5	4	4	0		S7	5	2	2	11		K5	4	2	10	11		G1	4	1	11	10			C1	4	1	5	9				
B2	5	4	5	0		S8	5	2	3	2		K6	4	8	12	0		G2	4	2	13	6			C2	4	1	7	11				
B3	5	4	5	11		S9	5	2	3	6		M1	4	1	2	10		G3	4	2	15	3			C3	4	1	10	1				
B4	5	4	6	10		S10	5	2	3	9		M2	4	29	4	9		G4	4	2	16	11			C4	4	2	12	2				
B5	5	4	7	9		S11	5	2	4	0		N1	4	8	12	1		G5	4	2	18	7			E1	5	2	17	7	14	7		
B6	5	4	8	9		T1	5	2	3	9		N2	4	5	16	3		G6	4	2	20	3			E2	5	2	17	11	14	11		
B7	5	10	9	4		T2	5	2	7	0		N3	4	3	17	9		G7	4	3	22	0			F	4	15	1	3	0	6		
C1	4	2	5	6		T3	5	2	10	6		P	7	30	7	3	5	0	H	4	12	17	0	13	4	G1	4	1	14	11			
C2	4	2	7	7		T4	5	2	12	5		Q	5	5	11	4		J1	5	4	5	0			G2	4	2	16	7				
C3	4	2	9	9								R	5	12	4	0		J2	5	4	6	1			G3	4	2	18	3				
C4	4	2	11	11								S1	5	2	1	2		J3	5	4	7	1			G4	4	3	20	0				
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C6	4	2	16	1		10' x 9'						S3	5	2	1	9		J5	5	4	9	2			K1	4	1	1	4				
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G4	4	2	18	7			B5	5	4	8	3		S11	5	2	4	0		K6	4	2	10	10			R	4	13	1	4			
G5	4	2	20	3			B6	5	4	9	2		T1	5	2	3	9		K7	4	2	12	8			S1	5	2	1	0			
G6	4	3	22	0			B7	5	4	10	1		T2	5	2	7	0		K8	4	8	12	11			S2	5	2	1	3			
H	4	12	14	0	11	4	B8	5	8	10	4		T3	5	2	10	6		M1	4	1	3	6			S3	5	2	1	6			
J1	5	4	4	0			C1	4	2	5	6		T4	5	2	12	5		M2	4	31	5	8			S4	5	2	1	10			
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J3	5	4	6	1			C3	4	2	9	9								N2	4	6	17	2			S6	5	2	2	5			
J4	5	4	7	2			C4	4	2	12	0								N3	4	3	18	11			S7	5	2	2	8			
J5	5	4	8	2			C5	4	2	14	1		10' x 10'						P	8	32	8	2	5	6	S8	5	2	3	0			
J6	5	2	9	3			C6	4	2	16	3		A1	5	2	14	8		Q	5	6	11	4			S9	5	2	3	4			
K1	4	2	1	2			C7	4	8	17	7		A2	5	2	15	11		R	5	12	4	8			S10	5	2	3	7			
K2	4	2	3	1			E1	5	2	18	3	13	3	B1	5	4	5	0		S1	5	2	1	1			S11	5	2	3	11		
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K7	4	6	11	1			G3	4	2	16	11			B6	5	4	9	8		S6	5	2	2	7			T4	5	2	13	4		
M1	4	1	2	10			G4	4	2	18	7			B7	5	4	10	8		S7	5	2	2	10			V1	5	2	3	10	2	7
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N1	4	8	11	1			G6	4	3	22	0			C1	4	2	5	7		S9	5	2	3	5			V3	5	2	4	5	5	8
N2	4	5	15	1			H	4	12	15	0	12	4	C2	4	2	7	9		S10	5	2	3	9			V4	5	2	5	4	6	7
N3	4	3	16	7			J1	5	4	4	6			C3	4	2	9	11		S11	5	2	4	0			V5	5	5	7	2	5	11
P	7	28	6	9	4	6	J2	5	4	5	7			C4	4	2	12	1		S12	5	2	4	2			V6	5	2	3	10	2	7
Q	5	5	11	4			J3	5	4	6	7			C5	4	2	14	2		T1	5	2	4	2			V7	5	2	4	10	3	7
R	5	12	4	0			J4	5	4	7	8			C6	4	2	16	4		T2	5	2	7	8			V8	5	2	5	11	4	8
S1	5	2	1	2			J5	5	4	8	8			C7	4	2	18	5		T3	5	2	11	3			V9	5	1	6	9	5	9
S2	5	2	1	5			J6	5	4	9	9			C8	4	8	18	9		T4	5	2	12	6									
S3	5	2	1	9			K1	4	2	3	2																						

- NOTES**
- ① NUMBER OF BARS IN ONE HEADWALL.
 - 2 DIMENSIONS ARE 0. TO 0. OF BARS.
 - 3 ALL BARS ARE STRAIGHT EXCEPT THOSE SHOWN BELOW.
 - 4 R = BOX OR PIPE RISE
 - 5 W = WING WALL WIDTH

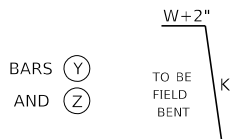
BENT BAR SHAPES



BARS (E), (U) AND (X)



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



BARS (Y) AND (Z)

KENTUCKY
DEPARTMENT OF HIGHWAYS

BILL OF REINFORCEMENT
10' X 8' - 11' X 4' HEADWALLS
PRECAST BOX CULVERTS
15° SKEW

STANDARD DRAWING NO. RDH-1320-03

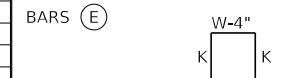
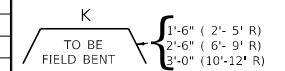
SUBMITTED _____ DIRECTOR, DIVISION OF DESIGN _____ DATE _____

APPROVED _____ STATE HIGHWAY ENGINEER _____ DATE _____

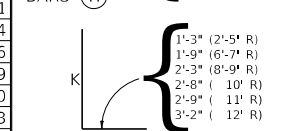
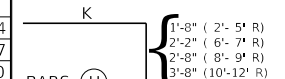
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①	FT	IN	FT	IN	①	FT	IN	FT	IN	①	FT	IN	FT	IN	①	FT	IN	FT	IN	①	FT	IN	FT	IN
11' X 6'				11' X 6' (CONTINUED)				11' X 8' (CONTINUED)				11' X 10' (CONTINUED)				11' X 11'				11' X 11' (CONTINUED)				
A1	5	2	10	4	S9	5	2	3	7	K7	4	6	11	2	G1	4	1	14	4	A1	5	2	15	10
A2	5	2	12	4	S10	5	2	3	10	M1	4	1	3	0	G2	4	2	16	0	A2	5	2	17	4
B1	5	4	3	0	S11	5	2	4	2	M2	4	27	4	9	G3	4	2	17	6	B1	5	4	5	6
B2	5	4	4	0	S12	5	2	4	5	N1	4	8	11	3	G4	4	2	19	2	B2	5	4	6	5
B3	5	4	4	11	T1	5	2	4	7	N2	4	5	15	7	G5	4	2	20	10	B3	5	4	7	5
B4	5	4	5	10	T2	5	2	8	2	N3	4	3	17	2	G6	4	2	22	5	B4	5	4	8	4
B5	5	4	6	10	T3	5	2	11	6	P	7	28	6	9	G7	4	3	24	0	B5	5	4	9	3
B6	5	10	7	5	T4	5	2	13	7	Q	5	5	12	6	H	4	13	17	2	B6	5	4	10	2
C1	4	2	6	0						R	5	13	4	1	J1	5	4	5	1	B7	5	4	11	2
C2	4	2	8	1						S1	5	2	1	2	J2	5	4	6	1	B8	5	4	12	1
C3	4	2	10	2						S2	5	2	1	6	J3	5	4	7	2	B9	5	10	12	5
C4	4	2	12	3	11' X 8'				S3	5	2	1	9	J4	5	4	8	2	C1	4	2	6	3	
C5	4	2	14	5	A1	5	2	12	7	S4	5	2	2	1	J5	5	4	9	2	C2	4	2	8	4
C6	4	4	14	8	A2	5	2	13	10	S5	5	2	2	4	J6	5	4	10	3	C3	4	2	10	6
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G3	4	2	16	8	B6	5	4	8	8	S11	5	2	4	2	K5	4	2	9	1	E1	5	2	20	7
G4	4	2	18	4	B7	5	10	9	5	S12	5	2	4	5	K6	4	2	11	0	E2	5	2	21	6
G5	4	3	20	0	C1	4	2	6	0	T1	5	2	4	7	K7	4	2	12	11	F	4	15	1	8
H	4	11	11	8	C2	4	2	8	1	T2	5	2	8	2	K8	4	8	13	1	G1	4	2	13	10
J1	5	4	3	1	C3	4	2	10	3	T3	5	2	11	6	M1	4	2	3	5	G2	4	2	15	7
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J3	5	4	5	2	C5	4	2	14	7						N1	4	9	13	1	G4	4	2	18	11
J4	5	4	6	3	C6	4	2	16	8						N2	4	6	17	8	G5	4	2	20	8
J5	5	2	7	3	C7	4	6	17	0						N3	4	3	19	5	G6	4	2	22	4
K1	4	2	1	4	E1	5	2	19	7	11' X 10'				P	8	32	8	2	5	G7	4	3	24	0
K2	4	2	3	3	E2	5	2	20	2	A1	5	2	14	9	Q	5	6	12	6	H	4	13	18	2
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M2	4	23	3	9	G5	4	2	20	4	B5	5	4	8	9	S5	5	2	2	7	J6	5	4	10	9
N1	4	7	9	2	G6	4	3	22	0	B6	5	4	9	8	S6	5	2	2	11	J7	5	4	11	10
N2	4	5	13	6	H	4	12	14	2	B7	5	4	10	7	S7	5	2	3	2	K1	4	2	3	4
N3	4	2	14	11	J1	5	4	4	0	B8	5	10	11	4	S8	5	2	3	6	K2	4	2	5	3
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Q	5	5	12	6	J3	5	4	6	1	C2	4	2	8	3	S10	5	2	4	1	K4	4	2	9	1
R	5	13	3	7	J4	5	4	7	2	C3	4	2	10	5	S11	5	2	4	5	K5	4	2	11	1
S1	5	2	1	2	J5	5	4	8	2	C4	4	2	12	6	S12	5	2	4	7	K6	4	2	13	0
S2	5	2	1	6	J6	5	2	9	3	C5	4	2	14	9	T1	5	2	2	4	K7	4	10	14	1
S3	5	2	1	9	K1	4	2	1	4	C6	4	2	16	10	T2	5	2	5	9	M1	4	1	3	9
S4	5	2	2	1	K2	4	2	3	3	C7	4	2	19	0	T3	5	2	9	1	M2	4	34	6	0
S5	5	2	2	4	K3	4	2	5	3	C8	4	8	19	3	T4	5	2	12	4	N1	4	10	14	1
S6	5	2	2	8	K4	4	2	7	1	E1	5	2	20	7	T5	5	2	13	9	N2	4	6	18	9
S7	5	2	3	0	K5	4	2	9	1	E2	5	2	21	5						N3	4	4	20	8
S8	5	2	3	3	K6	4	2	11	0	F	4	15	1	7						P	8	35	8	9

- NOTES**
- NUMBER OF BARS IN ONE HEADWALL.
 - DIMENSIONS ARE 0. TO 0. OF BARS.
 - ALL BARS ARE STRAIGHT EXCEPT THOSE SHOWN BELOW.
 - R = BOX OR PIPE RISE
 - W = WING WALL WIDTH

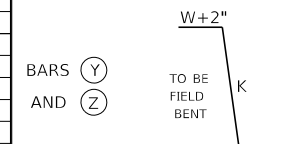
BENT BAR SHAPES



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



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



**KENTUCKY
DEPARTMENT OF HIGHWAYS**

BILL OF REINFORCEMENT

11' X 6' - 11' X 11' HEADWALLS

PRECAST BOX CULVERTS

15° SKEW

STANDARD DRAWING NO. RDH-1322-03

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN _____ DATE _____

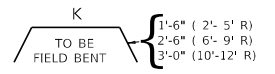
APPROVED _____ STATE HIGHWAY ENGINEER _____ DATE _____

MARK	SIZE	NO		LGTH		K		MARK	SIZE	NO		LGTH		K	
		①		FT	IN	FT	IN			①		FT	IN	FT	IN
12' X 12'								12' X 12' (CONTINUED)							
A1	5	2	17	0				M2	4	36	6	8			
A2	5	2	18	8				N2	4	7	20	2			
B1	5	4	6	0				N3	4	4	22	3			
B2	5	4	7	0				P	8	37	9	8	6	6	
B3	5	4	7	11				Q	5	7	13	8			
B4	5	4	8	10				R	5	14	5	7			
B5	5	4	9	9				S1	5	2	1	0			
B6	5	4	10	8				S2	5	2	1	4			
B7	5	4	11	7				S3	5	2	1	7			
B8	5	4	12	7				S4	5	2	1	11			
B9	5	12	13	6				S5	5	2	2	2			
C1	4	2	6	10				S6	5	2	2	6			
C2	4	2	9	0				S7	5	2	2	9			
C3	4	2	11	1				S8	5	2	3	1			
C4	4	2	13	3				S9	5	2	3	5			
C5	4	2	15	5				S10	5	2	3	8			
C6	4	2	17	6				S11	5	2	4	0			
C7	4	2	19	9				S12	5	2	4	3			
C8	4	2	21	9				S13	5	2	4	7			
C9	4	10	22	1				S14	5	2	4	10			
E1	5	2	21	10	15	10		S15	5	2	5	2			
E2	5	2	23	1	17	1		S16	5	2	5	6			
F	4	17	1	10	0	6		T1	5	2	4	5			
G1	4	1	16	2				T2	5	2	8	0			
G2	4	2	17	10				T3	5	2	11	5			
G3	4	2	19	7				T4	5	2	14	10			
G4	4	2	21	3				T5	5	2	15	3			
G5	4	2	23	0				U1	4	1	3	8	1	5	
G6	4	2	24	8				U2	4	1	4	2	1	8	
G7	4	2	26	5				U3	4	1	4	8	1	11	
G8	4	3	28	0				U4	4	1	5	2	2	2	
H	4	15	19	4	15	8		U5	4	1	5	8	2	5	
J1	5	4	6	1				U6	4	1	6	2	2	8	
J2	5	4	7	1				U7	4	1	6	8	2	11	
J3	5	4	8	2				U8	4	1	7	2	3	2	
J4	5	4	9	3				U9	4	1	7	8	3	5	
J5	5	4	10	3				U10	4	1	8	2	3	8	
J6	5	4	11	4				X1	4	1	4	0	1	7	
J7	5	4	12	4				X2	4	1	4	4	1	9	
J8	5	2	13	5				X3	4	1	4	10	2	0	
K1	4	2	1	6				X4	4	1	5	4	2	3	
K2	4	2	3	5				X5	4	1	5	10	2	6	
K3	4	2	5	4				X6	4	1	6	2	2	8	
K4	4	2	7	3				X7	4	1	6	8	2	11	
K5	4	2	9	2				X8	4	1	7	2	3	2	
K6	4	2	11	1				X9	4	1	7	8	3	5	
K7	4	2	13	0				X10	4	1	8	2	3	8	
K8	4	2	14	11				Y	4	2	13	1	11	8	
K9	4	10	15	1				Z	4	2	13	4	11	11	
M1	4	2	4	0											

NOTES

- ① NUMBER OF BARS IN ONE HEADWALL.
- 2 DIMENSIONS ARE 0. TO 0. OF BARS.
- 3 ALL BARS ARE STRAIGHT EXCEPT THOSE SHOWN BELOW.
- 4 R = BOX OR PIPE RISE
- 5 W = WING WALL WIDTH

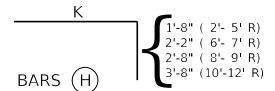
BENT BAR SHAPES



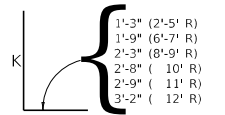
BARS (E)



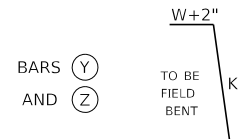
BARS (F), (U) AND (X)



BARS (H)



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



BARS (Y) AND (Z)

KENTUCKY DEPARTMENT OF HIGHWAYS	
BILL OF REINFORCEMENT 12' X 12' HEADWALLS PRECAST BOX CULVERTS 15° SKEW	
STANDARD DRAWING NO. RDH-1326-03	
SUBMITTED _____	DIRECTOR DIVISION OF DESIGN _____ DATE _____
APPROVED _____	STATE HIGHWAY ENGINEER _____ DATE _____

M A R K	S I Z E	N O	L G T H	K		M A R K	S I Z E	N O	L G T H	K		M A R K	S I Z E	N O	L G T H	K		M A R K	S I Z E	N O	L G T H	K		M A R K	S I Z E	N O	L G T H	K		M A R K	S I Z E	N O	L G T H	K							
		①	FT	IN	FT	IN		①	FT	IN	FT	IN			①	FT	IN	FT	IN			①	FT	IN	FT	IN			①	FT	IN	FT	IN			①	FT	IN	FT	IN	
3' X 2'						3' X 3' (CONTINUED)						4' X 2' (CONTINUED)						4' X 4'						5' X 3' (CONTINUED)						5' X 4' (CONTINUED)											
A1	5	2	4	5			N2	4	3	10	1		W	5	2	2	10	1	7		A1	5	2	6	10		E2	5	2	11	11	8	11	H	4	8	8	4	6		
A2	5	2	5	11			R	4	4	0	11										A2	5	2	9	2		G1	4	2	8	6			K2	4	1	4	2			
C1	4	1	5	11			S1	5	2	1	1										C1	4	1	7	2		G2	4	2	10	2			K3	4	1	6	0			
C2	4	1	8	4			S2	5	2	1	10										C2	4	1	9	9		G3	4	3	12	0			K4	4	1	6	2			
E1	5	2	8	3	5	3	S3	5	2	2	6		4' X 3'								C3	4	1	12	3		H	4	7	7	4	5	8	N1	4	3	6	2			
E2	5	2	8	8	5	8	S4	5	2	3	0										C4	4	1	12	7		K1	4	1	2	4			N2	4	3	13	7			
F	4	6	1	3	0	6	T1	5	2	1	9		A1	5	2	5	9				E1	5	2	9	10	6	10	K2	4	1	4	1			Q	4	2	5	8		
G1	4	2	6	3			T2	5	2	3	2		A2	5	2	7	9				E2	5	2	10	4	7	4	K3	4	1	5	2			R	4	6	1	1		
G2	4	2	8	0			T3	5	2	4	1		C1	4	1	7	1				F	4	7	1	3	0	6	N1	4	3	5	2			S1	5	2	1	4		
H	4	5	6	0	4	4	V1	5	2	3	3	2	0	C2	4	1	9	7			G1	4	2	8	3			N2	4	3	12	3			S2	5	2	2	1		
K1	4	1	1	11			V2	5	2	4	1	2	10	C3	4	1	11	2			G2	4	2	10	1			Q	4	2	5	8			S3	5	2	2	9		
K2	4	1	3	8			V3	5	2	4	10	3	7	E1	5	2	9	10	6	10	G3	4	3	12	0			R	4	6	1	1			S4	5	2	3	6		
N1	4	3	3	10			V4	5	4	5	7	4	4	E2	5	2	10	4	7	4	H	4	7	8	2	6	6	S1	5	2	1	4			S5	5	2	4	2		
N2	4	3	8	8			W	5	2	3	4	2	1	F	4	7	1	3	0	6	K1	4	1	2	3			S2	5	2	2	1			S6	5	2	4	8		
Q	4	2	3	4			W	5	2	4	6	3	3	G1	4	1	6	7			K2	4	1	4	1			S3	5	2	2	9			T1	5	2	1	3		
R	4	4	0	11			W	5	1	5	7	4	4	G2	4	2	8	4			K3	4	1	5	10			S4	5	2	3	6			T2	5	2	2	8		
S1	5	2	1	1										G3	4	3	10	0			K4	4	1	6	0			S5	5	2	4	2			T3	5	2	4	1		
S2	5	2	1	10										H	4	6	7	2	5	6	N1	4	3	6	0			S6	5	2	4	8			T4	5	2	5	6		
S3	5	2	2	6										K1	4	1	2	2			N2	4	3	12	7			T1	5	2	1	3			T5	5	2	6	5		
S4	5	2	3	0			4' X 2'							K2	4	1	4	0			Q	4	2	4	6			T2	5	2	2	8			V1	5	2	3	9	2	
T1	5	2	1	9			A1	5	2	4	8			K3	4	1	5	0			R	4	5	1	0			T3	5	2	4	1			V2	5	2	4	6	3	
T2	5	2	3	2			A2	5	2	6	3			N1	4	3	5	0			S1	5	2	1	2			T4	5	2	5	6			V3	5	2	5	4	4	
T3	5	2	4	1			A2	5	2	6	3			N2	4	3	11	2			S2	5	2	1	11			T5	5	2	6	5			V4	5	2	6	1	4	10
V1	5	2	2	9	1	6	C1	4	1	7	0			Q	4	2	4	6			S3	5	2	2	8			V1	5	2	3	3	2	0	V5	5	6	6	9	5	
V2	5	2	3	7	2	4	C2	4	1	9	6			R	4	5	1	0			S4	5	2	3	4			V2	5	2	4	0	2	9	W	5	2	3	10	2	
V3	5	2	4	5	3	2	E1	5	2	9	10	6	10	S1	5	2	1	2			S5	5	2	3	10			V3	5	2	4	10	3	7	W	5	2	4	11	3	
V4	5	3	4	7	3	4	E2	5	2	10	4	7	4	S2	5	2	1	11			T1	5	2	1	6			V4	5	2	5	7	4	4	W	5	2	6	0	4	
W	5	2	2	10	1	7	F	4	7	1	3	0	6	S3	5	2	2	8			T2	5	2	2	11			V5	5	4	5	9	4	6							
W	5	2	4	0	2	9	G1	4	2	8	2			S4	5	2	3	4			T3	5	2	4	4			W	5	2	3	4	2	1							
							G2	4	3	10	0			S5	5	2	3	10			T4	5	2	5	3			W	5	2	4	5	3	2							
							H	4	6	6	2	4	6	T1	5	2	1	6			V1	5	2	3	9	2	6	W	5	1	5	6	4	3							
							K1	4	1	2	1			T2	5	2	2	11			V2	5	2	4	6	3	3														
							K2	4	1	3	9			T3	5	2	4	4			V3	5	2	5	4	4	1														
							N1	4	3	4	0			T4	5	2	5	3			V4	5	2	6	1	4	10														
A1	5	2	5	7			N2	4	3	9	9			V1	5	2	3	3	2	0	V5	5	5	6	8	5	5	5' X 4'													
A2	5	2	7	5			Q	4	2	4	6			V2	5	2	4	1	2	10	W	5	2	3	10	2	7														
C1	4	1	6	1			R	4	5	1	0			V3	5	2	4	10	3	7	W	5	2	4	11	3	8	A1	5	2	7	1									
C2	4	1	8	10			S1	5	2	1	2			V4	5	5	5	8	4	5	W	5	2	6	1	4	10	A2	5	2	9	5									
C3	4	1	10	1			S2	5	2	1	11			W	5	2	3	4	2	1							C1	4	1	5	8										
E1	5	2	8	3	5	3	S3	5	2	2	8			W	5	2	4	5	3	2							C2	4	1	8	2										
E2	5	2	8	8	5	8	S4	5	2	3	4			W	5	1	5	7	4	4							C3	4	1	10	9										
F	4	6	1	3	0	6	S5	5	2	3	10																C4	4	1	13	3										
G1	4	1	5	10			T1	5	2	1	6																C5	4	1	13	7										
G2	4	2	7	10			T2	5	2	2	11										A1	5	2	5	11			E1	5	2	11	6	8	8	6						
G3	4	3	9	10			T3	5	2	4	4										A2	5	2	7	11			E2	5	2	11	11	8	11							
H	4	6	7	0	5	4	T4	5	2	5	3										C1	4	1	5	8			F	4	9	1	3	0	6							
K1	4	1	2	0			V1	5	2	2	9	1	6								C2	4	1	8	2			G1	4	1	8	2									
K2	4	1	3	9			V2	5	2	3	7	2	4								C3	4	1	10	8			G2	4	2	10	1									
K3	4	1	4	10			V3	5	2	4	5	3	2								C4	4	1	12	2			G3	4	2	12	1									
N1	4	3	4	10			V4	5	4	4	8	3	5								E1	5	2	11	6	8	6	G4	4	3	14	0									

NOTES

- NUMBER OF BARS IN ONE HEADWALL.
- DIMENSIONS ARE 0. TO 0. OF BARS.
- ALL BARS ARE STRAIGHT EXCEPT THOSE SHOWN BELOW.
- R = BOX OR PIPE RISE
- W = WING WALL WIDTH

BENT BAR SHAPES

TO BE FIELD BENT

BARS (E)

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

BARS (H)

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

BARS (Y) AND (Z)

TO BE FIELD BENT

KENTUCKY
DEPARTMENT OF HIGHWAYS

BILL OF REINFORCEMENT
3' X 2' - 5' X 4' HEADWALLS
PRECAST BOX CULVERTS
30° SKEW

STANDARD DRAWING NO. RDH-1328-03

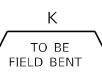
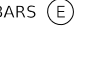
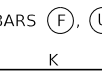
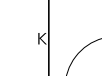
SUBMITTED _____ DIRECTOR DIVISION OF DESIGN _____ DATE _____

APPROVED _____ STATE HIGHWAY ENGINEER _____ DATE _____

M A R K	S I Z E	NO	LGTH	K		M A R K	S I Z E	NO	LGTH	K		M A R K	S I Z E	NO	LGTH	K		M A R K	S I Z E	NO	LGTH	K		M A R K	S I Z E	NO	LGTH	K														
		①	FT	IN	FT	IN		①	FT	IN	FT	IN		①	FT	IN	FT	IN		①	FT	IN	FT	IN		①	FT	IN	FT	IN												
5' X 5'						6' X 3'						6' X 4' (CONTINUED)						6' X 5' (CONTINUED)						6' X 6' (CONTINUED)						7' X 4'												
A1	5	2	8	1			A1	5	2	6	1			E1	5	2	13	1	10	1	F2	5	2	13	6	10	6	C1	4	2	6	9			A1	5	2	7	5			
A2	5	2	10	11			A2	5	2	8	2			E2	5	2	13	6	10	6	G1	4	2	10	4			C2	4	2	9	4			A2	5	2	9	11			
C1	4	1	5	8			C1	4	1	6	8			F	4	11	1	3	0	6	G2	4	2	12	3			C3	4	2	11	11			C1	4	1	7	8			
C2	4	1	8	2			C2	4	1	9	2			G1	4	1	10	0			G3	4	2	14	1			C4	4	2	14	7			C2	4	1	10	3			
C3	4	1	10	10			C3	4	1	11	9			G2	4	2	12	0			G4	4	3	16	0			C5	4	2	17	1			C3	4	1	12	10			
C4	4	1	13	5			C4	4	1	13	3			G3	4	2	14	0			H	4	9	9	6	7	10	C6	4	4	17	5			C4	4	1	15	4			
C5	4	2	15	0			E1	5	2	13	1	10	1	G4	4	3	16	0			K1	4	1	2	6			E1	5	2	15	1	10	1	C5	4	1	15	9			
E1	5	2	11	6	8	6	E2	5	2	13	6	10	6	H	4	9	8	6	6	10	K2	4	1	4	4			E2	5	2	15	9	10	9	E1	5	2	14	8	11	8	
E2	5	2	11	11	8	11	F	4	11	1	3	0	6	K1	4	1	2	6			K3	4	1	6	2			F	4	11	1	5	0	6	E2	5	2	15	0	12	0	
F	4	9	1	3	0	6	G1	4	2	10	4			K2	4	1	4	4			K4	4	2	7	4			G1	4	1	9	11			F	4	12	1	3	0	6	
G1	4	2	8	6			G2	4	2	12	2			K3	4	1	6	2			N1	4	3	7	4			G2	4	2	11	11			G1	4	1	10	7			
G2	4	2	10	4			G3	4	3	14	0			K4	4	1	6	4			N2	4	3	16	1			G3	4	2	13	11			G2	4	2	12	5			
G3	4	2	12	1			H	4	8	7	6	5	10	N1	4	3	6	4			Q	4	2	6	10			G4	4	2	15	11			G3	4	2	14	2			
G4	4	3	14	0			K1	4	1	2	6			N2	4	3	14	8			R	4	8	1	2			G5	4	3	18	0			G4	4	3	16	0			
H	4	8	9	4	7	8	K2	4	1	4	3			Q	4	2	6	10			S1	5	2	1	5			H	4	10	11	0	8	10	H	4	9	8	8	7	0	
K1	4	1	2	5			K3	4	1	5	4			R	4	8	1	2			S2	5	2	2	2			J1	5	4	3	1			K1	4	1	2	8			
K2	4	1	4	2			N1	4	3	5	4			S1	5	2	1	5			S3	5	2	2	10			J2	5	4	4	2			K2	4	1	4	6			
K3	4	1	6	1			N2	4	3	13	3			S2	5	2	2	2			S4	5	2	3	7			J3	5	4	5	3			K3	4	1	6	3			
K4	4	2	7	2			Q	4	2	6	10			S3	5	2	2	10			S5	5	2	4	3			J4	5	4	6	4			K4	4	1	6	6			
N1	4	3	7	2			R	4	8	1	2			S4	5	2	3	7			S6	5	2	5	0			K1	4	2	2	6			N1	4	3	6	6			
N2	4	3	15	0			S1	5	2	1	5			S5	5	2	4	3			S7	5	2	5	6			K2	4	2	4	3			N2	4	3	15	9			
Q	4	2	5	8			S2	5	2	2	2			S6	5	2	5	0			T1	5	2	1	0			K3	4	2	6	2			Q	4	2	8	0			
R	4	6	1	1			S3	5	2	2	10			S7	5	2	5	6			T2	5	2	2	5			K4	4	2	7	11			R	4	9	1	3			
S1	5	2	1	4			S4	5	2	3	7			T1	5	2	1	0			T3	5	2	3	10			K5	4	4	8	2			S1	5	2	1	7			
S2	5	2	2	1			S5	5	2	4	3			T2	5	2	2	5			T4	5	2	5	3			M1	4	25	3	9			S2	5	2	2	3			
S3	5	2	2	9			S6	5	2	5	0			T3	5	2	3	10			T5	5	2	6	8			M2	4	1	2	4			S3	5	2	3	0			
S4	5	2	3	6			S7	5	2	5	6			T4	5	2	5	3			T6	5	2	7	7			N1	4	7	8	2			S4	5	2	3	8			
S5	5	2	4	2			T1	5	2	1	0			T5	5	2	6	8			V1	5	2	4	3	3	0		N2	4	5	15	6			S5	5	2	4	5		
S6	5	2	4	8			T2	5	2	2	5			T6	5	2	7	7			V2	5	2	5	0	3	9		N3	4	2	17	7			S6	5	2	5	1		
T1	5	2	1	3			T3	5	2	3	10			V1	5	2	3	9	2	6	V3	5	2	5	9	4	6		P	5	26	5	3	3	6	S7	5	2	5	10		
T2	5	2	2	8			T4	5	2	5	3			V2	5	2	4	6	3	3	V4	5	2	6	6	5	3		Q	5	5	6	10			S8	5	2	6	4		
T3	5	2	4	1			T5	5	2	6	8			V3	5	2	5	3	4	0	V5	5	2	7	4	6	1		R	5	8	3	5			T1	5	2	2	2		
T4	5	2	5	6			T6	5	2	7	7			V4	5	2	6	1	4	10	V6	5	2	6	7	10	6	7	S1	5	2	1	1			T2	5	2	3	7		
T5	5	2	6	5			V1	5	2	3	3	2	0	V5	5	7	6	10	5	7	V7	5	2	4	3	3	0		S2	5	2	1	10			T3	5	2	5	1		
V1	5	2	4	3	3	0	V2	5	2	4	0	2	9	V7	5	2	3	9	2	6	V8	5	2	5	4	4	1		S3	5	2	2	6			T4	5	2	6	6		
V2	5	2	5	0	3	9	V3	5	2	4	10	3	7	V8	5	2	4	11	3	8	V8	5	2	6	5	5	2		S4	5	2	3	3			T5	5	2	7	10		
V3	5	2	5	9	4	6	V4	5	2	5	8	4	5	V8	5	2	6	0	4	9	V8	5	2	7	7	6	4		S5	5	2	4	0			T6	5	2	8	10		
V4	5	2	6	7	5	4	V5	5	5	5	10	4	7															S6	5	2	4	8			V1	5	2	3	9	2	6	
V5	5	2	7	4	6	1	V6	5	2	3	4	2	1															S7	5	2	5	4			V2	5	2	4	6	3	3	
V6	5	5	7	9	6	6	V7	5	2	4	5	3	2															S8	5	2	5	8			V3	5	2	5	3	4	0	
V7	5	2	4	4	3	1	V8	5	1	5	7	4	4	6' X 5'						6' X 6'						6' X 6'						7' X 4'										
V8	5	2	5	5	4	2							A1	5	2	8	4			A1	5	2	9	3			T1	5	2	1	6			V4	5	2	6	1	4	10		
V8	5	2	6	6	5	3	6' X 4'						A2	5	2	11	2			A2	5	2	12	5			T2	5	2	3	0			V5	5	2	6	10	5	7		
V8	5	1	7	7	6	4	A1	5	2	7	3			C1	4	1	6	8			B1	5	4	3	0			T3														

NOTES

- NUMBER OF BARS IN ONE HEADWALL.
- DIMENSIONS ARE 0. TO 0. OF BARS.
- ALL BARS ARE STRA

NOTES		
①	NUMBER OF BARS IN ONE HEADWALL.	
2	DIMENSIONS ARE 0. TO 0. 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' X 5' - 8' X 5' HEADWALLS
PRECAST BOX CULVERTS
30° SKEW

STANDARD DRAWING NO. RDH-1332-03

SUBMITTED _____	DIRECTOR DIVISION OF DESIGN _____	DATE _____
APPROVED _____	STATE HIGHWAY ENGINEER _____	DATE _____

NOTES

- ① NUMBER OF BARS IN ONE HEADWALL.
- 2 DIMENSIONS ARE 0. TO 0. OF BARS.
- 3 ALL BARS ARE STRAIGHT EXCEPT THOSE SHOWN BELOW.
- 4 R = BOX OR PIPE RISE
- 5 W = WING WALL WIDTH

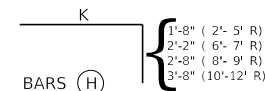
BENT BAR SHAPES



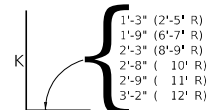
BARS (E)



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



BARS (H)



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



BARS (Y)
AND (Z)



KENTUCKY
DEPARTMENT OF HIGHWAYS
BILL OF REINFORCEMENT
8' X 6' - 9' X 5' HEADWALLS
PRECAST BOX CULVERTS
30° SKEW

STANDARD DRAWING NO. RDH-1334-03

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN _____ DATE _____
APPROVED _____ STATE HIGHWAY ENGINEER _____ DATE _____

MARK SIZE NO	LGTH FT	IN	K	MARK SIZE NO	LGTH FT	IN	K	MARK SIZE NO	LGTH FT	IN	K	MARK SIZE NO	LGTH FT	IN	K	MARK SIZE NO	LGTH FT	IN	K	MARK SIZE NO	LGTH FT	IN	K	MARK SIZE NO	LGTH FT	IN	K																		
①				①				①				①				①				①				①																					
9' X 6'				9' X 6' (CONTINUED)				9' X 7' (CONTINUED)				9' X 8' (CONTINUED)				9' X 8' (CONTINUED)				9' X 9' (CONTINUED)																									
A1	5	2	9	8				S9	5	2	7	0				M1	4	6	9	6				E2	5	2	20	2	15	2	X3	4	1	3	7	1	7	M2	4	35	4	9			
A2	5	2	12	11				S10	5	2	7	8				M2	4	31	3	9				G1	4	1	14	5			X5	4	1	4	5	2	0	N2	4	5	22	2			
B1	5	4	3	0				S11	5	2	8	0				N1	4	7	9	6				G2	4	2	16	4			X6	4	1	4	11	2	3	N3	4	3	24	8			
B2	5	4	3	9				T1	5	2	2	0				N2	4	5	19	10				G3	4	2	18	2			Z	4	2	8	8	7	8	P	7	37	7	3	5		
B3	5	4	4	6				T2	5	2	3	5				N3	4	2	21	10				G4	4	2	20	2																	
B4	5	4	5	4				T3	5	2	4	10				P	5	32	5	9	4	0		G5	4	2	22	1																	
B5	5	4	6	1				T4	5	2	6	3				Q	5	5	10	2				G6	4	3	24	0																	
B6	5	4	6	10				T5	5	2	7	8				R	5	11	3	7				H	4	13	13	2	11	2	9' X 9'														
B7	5	18	7	3				T6	5	2	9	1				S1	5	2	1	5				J1	5	4	4	0																	
C1	4	2	9	6				T7	5	2	10	6				S2	5	2	2	1				J2	5	4	5	1			A1	5	2	13	1										
C2	4	2	12	2				T8	5	2	11	2				S3	5	2	2	9				J3	5	4	6	2			A2	5	2	17	6										
C3	4	2	14	9												S4	5	2	3	6				J4	5	4	7	3			B1	5	4	4	6										
C4	4	2	17	3												S5	5	2	4	2				J5	5	4	8	4			B2	5	4	5	3										
C5	4	2	19	11												S6	5	2	4	11				J6	5	2	9	5			B3	5	4	6	0										
C6	4	4	20	3				9' X 7'								S7	5	2	5	7				K1	4	2	1	1			B4	5	4	6	9										
E1	5	2	19	7	14	7										S8	5	2	6	4				K2	4	2	2	11			B5	5	4	7	6										
E2	5	2	20	2	15	2		A1	5	2	10	10				S9	5	2	7	0				K3	4	2	4	9			B6	5	4	8	3										
F	4	15	1	5	0	6		A2	5	2	14	5				S10	5	2	7	8				K4	5	2	6	8			B7	5	4	9	0										
G1	4	1	14	3				B1	5	4	3	6				S11	5	2	8	0				K5	4	2	8	6			B8	5	4	9	9										
G2	4	2	16	3				B2	5	4	4	3				T1	5	2	2	0				K6	4	2	10	4			B9	5	18	10	3										
G3	4	2	18	2				B3	5	4	5	0				T2	5	2	3	5				K7	4	6	10	6			C1	4	2	9	8										
G4	4	2	20	1				B4	5	4	5	9				T3	5	2	4	10				M1	4	1	3	0			C2	4	2	12	3										
G5	4	3	22	0				B5	5	4	6	7				T4	5	2	6	3				M2	4	33	4	9			C3	4	2	15	0										
H	4	12	11	4	9	2		B6	5	4	7	4				T5	5	2	7	8				N1	4	8	10	6			C4	4	2	17	6										
J1	5	4	3	1				B7	5	4	8	1				T6	5	2	9	1				N2	4	5	20	10			C5	4	2	20	3										
J2	5	4	4	2				B8	5	16	8	3				T7	5	2	10	6				N3	4	3	23	3			C6	4	2	22	10										
J3	5	4	5	3				C1	4	2	9	8				T8	5	2	11	2				P	6	34	6	9	4	6	C7	4	8	24	6										
J4	5	4	6	4				C2	4	2	12	3												Q	5	5	10	2			E1	5	2	19	7	14	7								
J5	5	2	7	5				C3	4	2	14	11												R	5	11	4	1			E2	5	2	20	2	15	2								
K1	4	2	1	0				C4	4	2	17	5												S1	5	2	2	1			F	4	15	1	5	0	6								
K2	4	2	2	10				C5	4	2	20	1				9' X 8'								S2	5	2	2	1			G1	4	2	14	10										
K3	4	2	4	8				C6	4	6	21	8												S3	5	2	2	9			G2	4	2	16	8										
K4	4	2	6	6				E1	5	2	19	7	14	7		A1	5	2	12	0				S4	5	2	3	6			G3	4	2	18	6										
K5	4	2	8	3				E2	5	2	20	2	15	2		A2	5	2	16	0				S5	5	2	4	2			G4	4	2	20	3										
K6	4	4	8	6				F	4	15	1	5	0	6		B1	5	4	4	0				S6	5	2	4	11			G5	4	2	22	3										
M1	4	2	2	3				G1	4	2	14	8				B2	5	4	4	9				S7	5	2	5	7			G6	4	3	24	0										
M2	4	28	3	9				G2	4	2	16	6				B3	5	4	5	6				S8	5	2	6	4			H	4	13	14	10	12	2								
N1	4	7	8	6				G3	4	2	18	4				B4	5	4	6	3				S9	5	2	7	0			J1	5	4	4	7										
N2	4	5	18	6				G4	4	2	20	2				B5	5	4	7	0				S10	5	2	7	8			J2	5	4	5	7										
N3	4	2	20	5				G5	4	3	22	0				B6	5	4	7	9				S11	5	2	8	0			J3	5	4	6	8										
P	5	30	5	3	3	6		H	4	12	12	4	10	2		B7	5	4	8	6				T1	5	2	2	0			J4	5	4	7	9										
Q	5	5	10	2				J1	5	4	3	7				B8	5	18	9	3				T2	5	2	3	5			J5	5	4	8	10										
R	5	11	3	7				J2	5	4	4	7				C1	4	2	9	8				T3	5	2	4	10			J6	5	4	9	11										
S1	5	2	1	5				J3	5	4	5	9				C2	4	2	12	4				T4	5	2	6	3			K1	4	2	2	10										
S2	5	2	2	1				J4	5	4	6	10				C3	4	2	14	11				T5	5	2	7	8			K2	4	2	4	9										
S3	5	2	2	9				J5	5	4	7	10				C4	4	2	17	7				T6	5	2	9	1			K3	4	2	6	7										
S4	5	2	3	6				K1	4	2	2	10				C5	4	2	20	2				T7	5	2	10	6			K4	4	2	8	5										
S5	5	2	4	2				K2	4	2	4	8				C6	4	2	22	10				T8	5	2	11	2			K5	4	2	10	3										
S6	5	2	4	11				K3	4	2	6	6				C7	4	6	23	1				X1	4	1	2	9	1	2	K6	4	8	11	6										
S7	5	2	5	7				K4	4	2	8	5				E1	5	2	19	7	14	7		X2	4	1	3	1	1	4	M1	4	2	2	10										

NOTES

- NUMBER OF BARS IN ONE HEADWALL.
- DIMENSIONS ARE 0. TO 0. OF BARS.
- ALL BARS ARE STRAIGHT EXCEPT THOSE SHOWN BELOW.
- R = BOX OR PIPE RISE
- W = WING WALL WIDTH

BENT BAR SHAPES

TO BE FIELD BENT

W-4"

W+2"

TO BE FIELD BENT

KENTUCKY DEPARTMENT OF HIGHWAYS

BILL OF REINFORCEMENT

9' X 6' - 9' X 9' HEADWALLS

PRECAST BOX CULVERTS

30° SKEW

STANDARD DRAWING NO. RDH-1336-03

SUBMITTED _____ DIRECTOR, DIVISION OF DESIGN _____ DATE _____

APPROVED _____ STATE HIGHWAY ENGINEER _____ DATE _____

MARK	SIZE	NO	LGTH	K	MARK	SIZE	NO	LGTH	K	MARK	SIZE	NO	LGTH	K	MARK	SIZE	NO	LGTH	K	MARK	SIZE	NO	LGTH	K	MARK	SIZE	NO	LGTH	K	
	①	FT	IN	FT	IN		①	FT	IN	FT	IN		①	FT	IN	FT	IN		①	FT	IN	FT	IN		①	FT	IN	FT	IN	
10' X 5'					10' X 5' (CONTINUED)					10' X 6' (CONTINUED)					10' X 7' (CONTINUED)					10' X 8' (CONTINUED)					10' X 8' (CONTINUED)					
A1	5	2	8	10		W6	5	2	4	4	3	1	R	5	12	3	8		H	4	13	12	6	10	4	B5	5	4	7	0
A2	5	2	11	11		W6	5	2	5	5	4	2	S1	5	2	1	5		J1	5	4	3	7		B6	5	4	7	9	
C1	4	1	10	6		W6	5	2	6	6	5	3	S2	5	2	2	2		J2	5	4	4	8		B7	5	4	8	6	
C2	4	1	13	1		W6	5	2	7	7	6	4	S3	5	2	2	10		J3	5	4	5	9		B8	5	20	9	3	
C3	4	1	15	9									S4	5	2	3	7		J4	5	4	6	10		C1	4	2	10	8	
C4	4	1	18	5									S5	5	2	4	3		J5	5	4	7	11		C2	4	2	13	4	
C5	4	2	20	0									S6	5	2	5	0		K1	4	2	3	0		C3	4	2	15	11	
E1	5	2	19	2	16	2	10' X 6'						S7	5	2	5	8		K2	4	2	4	10		C4	4	2	18	7	
E2	5	2	19	8	16	8	A1	5	2	9	11		S9	5	2	7	1		K4	4	2	8	6		C6	4	2	23	9	
F	4	17	1	3	0	6	A2	5	2	13	2		S10	5	2	7	10		K5	4	6	9	8		C7	4	6	24	2	
G1	4	2	16	5			B1	5	4	3	0		S11	5	2	8	6		M1	4	1	2	4		E1	5	2	21	2	
G2	4	2	18	3			B2	5	4	3	9		S12	5	2	8	9		M2	4	32	3	9		E2	5	2	21	10	
G3	4	2	20	2			B3	5	4	4	7		T1	5	2	1	9		N1	4	7	9	8		F	4	17	1	5	
G4	4	3	22	0			B4	5	4	5	4		T2	5	2	3	2		N2	4	5	20	11		G1	4	1	16	3	
H	4	12	10	0	8	4	B5	5	4	6	1		T3	5	2	4	6		N3	4	2	22	11		G2	4	2	18	2	
K1	4	1	3	0			B6	5	4	6	10		T4	5	2	6	0		P	6	33	5	9	4	0	G3	4	2	20	1
K2	4	1	4	10			B7	5	20	7	4		T5	5	2	7	4		Q	5	5	11	4		G4	4	2	22	0	
K3	4	1	6	8			C1	4	2	10	8		T6	5	2	8	9		R	5	12	3	8		G5	4	2	24	0	
K4	4	2	7	10			C2	4	2	13	3		T7	5	2	10	2		S1	5	2	1	5		G6	4	3	26	0	
N1	4	3	7	10			C3	4	2	15	10		T8	5	2	11	7		S2	5	2	2	2		H	4	14	14	0	
N2	4	3	20	0			C4	4	2	18	5		T9	5	2	12	3		S3	5	2	2	10		J1	5	4	4	1	
Q	4	2	11	4			C5	4	2	21	0								S4	5	2	3	7		J2	5	4	5	2	
R	4	12	1	5			C6	4	4	21	4								S5	5	2	4	3		J3	5	4	6	3	
S1	5	2	1	2			E1	5	2	21	2	16	2						S6	5	2	5	0		J4	5	4	7	3	
S2	5	2	1	10			E2	5	2	21	10	16	10						S7	5	2	5	8		J5	5	4	8	4	
S3	5	2	2	7			F	4	17	1	5	0	6	10' X 7'					S8	5	2	6	5		J6	5	2	9	5	
S4	5	2	3	3			G1	4	1	16	3		A1	5	2	11	0		S9	5	2	7	1		K1	4	2	1	1	
S5	5	2	4	0			G2	4	2	18	2		A2	5	2	14	8		S10	5	2	7	10		K2	4	2	3	0	
S6	5	2	4	8			G3	4	2	20	1		B1	5	4	3	6		S11	5	2	8	6		K3	4	2	4	10	
S7	5	2	5	5			G4	4	2	22	1		B2	5	4	4	3		S12	5	2	8	9		K4	4	2	6	9	
S8	5	2	6	1			G5	4	3	24	0		B3	5	4	5	0		T1	5	2	1	9		K5	4	2	8	7	
S9	5	2	6	10			H	4	13	11	6	9	4	B4	5	4	5	9		T2	5	2	3	2		K6	4	2	10	6
S10	5	2	7	6			J1	5	4	3	1		B5	5	4	6	7		T3	5	2	4	6		K7	4	6	10	8	
S11	5	2	8	3			J2	5	4	4	2		B6	5	4	7	4		T4	5	2	6	0		M1	4	2	2	9	
S12	5	2	8	8			J3	5	4	5	3		B7	5	4	8	1		T5	5	2	7	4		M2	4	34	4	9	
T1	5	2	1	3			J4	5	4	6	4		B8	5	18	8	4		T6	5	2	8	9		N1	4	8	10	8	
T2	5	2	2	8			J5	5	2	7	5		C1	4	2	10	8		T7	5	2	10	2		N2	4	5	21	11	
T3	5	2	4	1			K1	4	2	1	1		C2	4	2	13	3		T8	5	2	11	7		N3	4	3	24	4	
T4	5	2	5	6			K2	4	2	2	11		C3	4	2	15	10		T9	5	2	12	3		P	7	35	6	9	
T5	5	2	6	11			K3	4	2	4	9		C4	4	2	18	6								Q	5	5	11	4	
T6	5	2	8	4			K4	4	2	6	7		C5	4	2	21	1								R	5	12	4	2	
T7	5	2	9	9			K5	4	2	8	5		C6	4	6	22	9								S1	5	2	1	5	
T8	5	2	11	2			K6	4	4	8	8		E1	5	2	21	2	16	2	10' X 8'					S2	5	2	2	2	
T9	5	2	12	1			M1	4	2	2	4		E2	5	2	21	10	16	10					S3	5	2	2	10		
V1	5	2	4	3	3	0	M2	4	29	3	9		F	4	17	1	5	0	6	A1	5	2	12	1		S4	5	2	3	7
V2	5	2	5	0	3	9	N1	4	7	8	8		G1	4	2	16	6		A2	5	2	16	2		S5	5	2	4	3	
V3	5	2	5	9	4	6	N2	4	5	19	5		G2	4	2	18	4		B1	5	4	4	0		S6	5	2	5	0	
V4	5	2	6	6	5	3	N3	4	2	21	6		G3	4	2	20	3		B2	5	4	4	9		S7	5	2	5	8	
V5	5	2	7	3	6	0	P	5	31	5	3	3	6	G4	4	2	22	2		B3	5	4	5	6		S8	5	2	6	5
V6	5	10	8	1	6	10	Q	5	5	11	4		G5	4	3	24	0		B4	5	4	6	3		S9	5	2	7	1	

NOTES

- NUMBER OF BARS IN ONE HEADWALL.
- DIMENSIONS ARE 0. TO 0. OF BARS.
- ALL BARS ARE STRAIGHT EXCEPT THOSE SHOWN BELOW.
- R = BOX OR PIPE RISE
- W = WING WALL WIDTH

BENT BAR SHAPES

TO BE FIELD BENT

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
10' X 5' - 10' X 8' HEADWALLS
PRECAST BOX CULVERTS
30° SKEW

STANDARD DRAWING NO. RDH-1338-03

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN _____ DATE _____

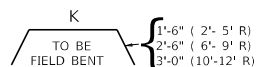
APPROVED _____ STATE HIGHWAY ENGINEER _____ DATE _____

NOTES		
①	NUMBER OF BARS IN ONE HEADWALL.	
2	DIMENSIONS ARE 0. TO 0. 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)		
TO BE FIELD BENT		

MARK	SIZE	NO	LGTH	K		MARK	SIZE	NO	LGTH	K		MARK	SIZE	NO	LGTH	K		MARK	SIZE	NO	LGTH	K												
MARK	SIZE	①	FT	IN	FT	IN	MARK	SIZE	①	FT	IN	FT	IN	MARK	SIZE	①	FT	IN	FT	IN	MARK	SIZE	①	FT	IN	FT	IN							
12' X 4'						12' X 4' (CONTINUED)						12' X 6' (CONTINUED)						12' X 8' (CONTINUED)						12' X 8' (CONTINUED)										
A1	5	2	8	2			V3	5	2	5	3	4	0	N2	4	5	21	7			C5	4	2	23	3		T3	5	2	4	1			
A2	5	2	10	11			V5	5	2	6	10	5	7	P	5	33	5	3	3	6	C6	4	2	26	0		T4	5	2	5	6			
C1	4	1	12	7			V6	5	11	7	3	6	0	Q	5	5	13	8			C7	4	6	26	3		T5	5	2	6	11			
C2	4	1	15	2			W	5	2	3	10	2	7	R	5	14	3	10			E1	5	2	24	5	19	5	T6	5	2	8	4		
C3	4	1	17	9			W	5	2	4	11	3	8	S1	5	2	1	0			E2	5	2	25	0	20	0	T7	5	2	9	9		
C4	4	1	20	5			W	5	2	6	0	4	9	S2	5	2	1	8			F	4	20	1	5	0	6	T8	5	2	11	1		
C5	4	1	20	8			W	5	1	7	1	5	10	S3	5	2	2	5			G1	4	1	20	0			T9	5	2	12	7		
E1	5	2	22	5	19	5								S4	5	2	3	1			G2	4	2	21	11			T10	5	2	14	0		
E2	5	2	22	9	19	9								S5	5	2	3	10			G3	4	2	23	11			T11	5	2	14	7		
F	4	20	1	3	0	6								S6	5	2	4	6			G4	4	2	25	11			X1	4	1	2	9	1	2
G1	4	2	20	0			12' X 6'						S7	5	2	5	3				G5	4	2	27	11			X2	4	1	3	3	1	5
G2	4	2	22	0			A1	5	2	10	3			S8	5	2	5	11			H	4	16	14	4	11	8	X3	4	1	3	7	1	7
G3	4	2	24	0			A2	5	2	13	8			S9	5	2	6	8			J1	5	4	4	1			X4	4	1	4	1	1	10
G4	4	3	26	0			B1	5	4	3	0			S10	5	2	7	4			J2	5	4	5	2			X5	4	1	4	5	2	0
H	4	14	9	4	7	8	B2	5	4	3	9			S11	5	2	8	0			J3	5	4	6	2			X6	4	1	4	11	2	3
K1	4	1	1	5			B3	5	4	3	9			S12	5	2	8	9			J4	5	4	7	3			Z	4	2	8	11	7	11
K2	4	1	3	3			B4	5	4	4	6			S13	5	2	9	5			J5	5	4	8	4									
K3	4	1	5	2			B5	5	4	5	4			S14	5	2	10	2			J6	5	2	9	5									
K4	4	1	7	0			B6	5	4	6	1			S15	5	2	10	5			K1	4	2	1	6									
K5	4	1	7	2			B7	5	4	6	10			T1	5	2	1	3			K2	4	2	3	3									
N1	4	3	7	2			B8	5	24	7	6			T2	5	2	2	8			K3	4	2	5	3									
N2	4	3	20	9			C1	4	2	12	10			T3	5	2	4	1			K4	4	2	7	2									
Q	4	2	13	8			C2	4	2	15	4			T4	5	2	5	6			K5	4	2	8	11									
R	4	14	1	7			C3	4	2	17	11			T5	5	2	6	11			K6	4	2	10	9									
S1	5	2	1	4			C4	4	2	20	6			T6	5	2	8	4			K7	4	6	11	0									
S2	5	2	2	1			C5	4	2	23	0			T7	5	2	9	9			M1	4	2	2	9									
S3	5	2	2	9			C6	4	4	23	6			T8	5	2	11	1			M2	4	36	4	9									
S4	5	2	3	6			E1	5	2	24	5	19	5	T9	5	2	12	7			N1	4	8	11	0									
S5	5	2	4	2			E2	5	2	25	0	20	0	T10	5	2	14	0			N2	4	5	24	0									
S6	5	2	4	10			F	4	20	1	5	0	6	T11	5	2	14	7			N3	4	3	26	7									
S7	5	2	5	7			G1	4	1	20	0									P	7	38	6	9	4	6								
S8	5	2	6	3			G2	4	2	22	0									Q	5	5	13	8										
S9	5	2	7	0			G3	4	2	23	11									R	5	14	4	4										
S10	5	2	7	8			G4	4	2	26	0			12' X 8'						S1	5	2	1	0										
S11	5	2	8	4			G5	4	3	28	0			A1	5	2	12	6			S2	5	2	1	8									
S12	5	2	9	0			H	4	15	11	10	9	8	A2	5	2	16	9			S3	5	2	2	5									
S13	5	2	9	8			J1	5	4	3	1			B1	5	4	4	0			S4	5	2	3	1									
S14	5	2	10	4			J2	5	4	4	2			B2	5	4	4	9			S5	5	2	3	10									
T1	5	2	2	2			J3	5	4	5	3			B3	5	4	4	9			S6	5	2	4	6									
T2	5	2	3	7			J4	5	4	6	4			B4	5	4	5	6			S7	5	2	5	3									
T3	5	2	5	0			J5	5	2	7	5			B5	5	4	6	3			S8	5	2	5	11									
T4	5	2	6	5			K1	4	2	1	6			B6	5	4	7	1			S9	5	2	6	8									
T5	5	2	7	10			K2	4	2	3	4			B7	5	4	7	10			S10	5	2	7	4									
T6	5	2	9	3			K3	4	2	5	2			B8	5	4	8	7			S11	5	2	8	0									
T7	5	2	10	8			K4	4	2	6	11			B9	5	4	9	4			S12	5	2	8	9									
T8	5	2	12	0			K5	4	2	8	10			C1	4	2	12	10			S13	5	2	9	5									
T9	5	2	13	6			K6	4	4	9	0			C2	4	2	15	4			S14	5	2	10	2									
T10	5	2	14	5			M1	4	2	2	3			C3	4	2	18	1			S15	5	2	10	5									
V1	5	2	3	9	2	6	M2	4	31	3	9			C4	4	2	18	1			T1	5	2	1	3									
V2	5	2	4	6	3	3	N1	4	7	9	0			C4	4	2	20	9			T2	5	2	2	8									

- NOTES**
- ① NUMBER OF BARS IN ONE HEADWALL.
 - 2 DIMENSIONS ARE 0. TO 0. OF BARS.
 - 3 ALL BARS ARE STRAIGHT EXCEPT THOSE SHOWN BELOW.
 - 4 R = BOX OR PIPE RISE
 - 5 W = WING WALL WIDTH

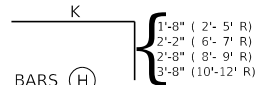
BENT BAR SHAPES



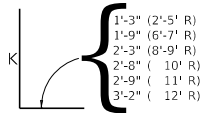
BARS (E)



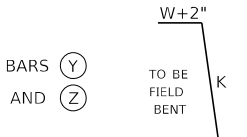
BARS (F), (U) AND (X)



BARS (H)



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



BARS (Y) AND (Z)

KENTUCKY DEPARTMENT OF HIGHWAYS <i>BILL OF REINFORCEMENT</i> 12' X 4' - 12' X 8' HEADWALLS PRECAST BOX CULVERTS 30° SKEW STANDARD DRAWING NO. RDH-1344-03		
SUBMITTED	DIRECTOR DIVISION OF DESIGN	DATE
APPROVED	STATE HIGHWAY ENGINEER	DATE

NOTES

- ① NUMBER OF BARS IN ONE HEADWALL.
- 2 DIMENSIONS ARE 0. TO 0. OF BARS.
- 3 ALL BARS ARE STRAIGHT EXCEPT THOSE SHOWN BELOW.
- 4 R = BOX OR PIPE RISE
- 5 W = WING WALL WIDTH

K
TO BE
FIELD BENT
BARS (E)
W-4"
K

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

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

W+2"

BARS (Y)

AND (Z)

TO BE FIELD BENT

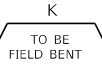
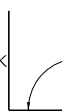
K

**KENTUCKY
DEPARTMENT OF HIGHWAYS**

*BILL OF REINFORCEMENT
12' X 10' - 12' X 12' HEADWALLS
PRECAST BOX CULVERTS
30° SKEW*

STANDARD DRAWING NO. RDH-1346-03

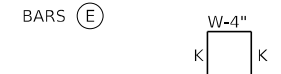
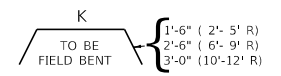
 DIRECTOR, DIVISION OF DESIGN

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NOTES ① NUMBER OF BARS IN ONE HEADWALL. 2 DIMENSIONS ARE 0. TO 0. 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)																																																																																																			

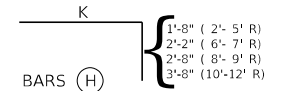
M A R K	S I Z E	NO	LGTH		K		M A R K	S I Z E	NO	LGTH		K		M A R K	S I Z E	NO	LGTH		K		M A R K	S I Z E	NO	LGTH		K		M A R K	S I Z E	NO	LGTH		K		
	①	FT	IN	FT	IN			①	FT	IN	FT	IN				①	FT	IN	FT	IN			①	FT	IN	FT	IN			①	FT	IN	FT	IN	
6' X 6'						6' X 6' (CONTINUED)						7' X 4' (CONTINUED)						7' X 5' (CONTINUED)						7' X 6' (CONTINUED)											
A1	5	2	9	7			S8	5	2	11	0			T3	5	2	2	7			S3	5	2	4	2			C5	4	2	29	2			
A2	5	2	17	1			T1	5	2	1	2			T4	5	2	3	4			S4	5	2	5	8			C6	4	4	29	7			
B1	5	4	2	11			T2	5	2	1	10			T5	5	2	4	0			S5	5	2	7	1			E1	5	2	21	4	16		
B2	5	4	3	6			T3	5	2	2	7			T6	5	2	4	9			S6	5	2	8	6			E2	5	2	22	1	17		
B3	5	4	4	1			T4	5	2	3	3			T7	5	2	5	5			S7	5	2	9	11			F	4	17	1	5	0		
B4	5	4	4	7			T5	5	2	4	0			T8	5	2	6	2			S8	5	2	11	4			G1	4	1	16	4			
B5	5	4	5	2			T6	5	2	4	8			T9	5	2	6	10			S9	5	2	12	2			G2	4	2	19	3			
B6	5	4	5	8			T7	5	2	5	4			T10	5	2	7	7			T1	5	2	1	2			G3	4	2	22	2			
B7	5	4	6	3			T8	5	2	6	1			T11	5	2	8	3			T2	5	2	1	11			G4	4	2	25	1			
B8	5	4	6	10			T9	5	2	6	10			T12	5	2	8	8			T3	5	2	2	7			G5	4	3	28	0			
B9	5	24	7	1			T10	5	2	7	6			V1	5	2	3	8	2	5	T4	5	2	3	4			H	4	15	11	2	9		
C1	4	2	12	8			T11	5	2	7	8			V2	5	2	4	3	3	0	T5	5	2	4	0			J1	5	4	3	1			
C2	4	2	16	4									V3	5	2	4	10	3	7	T6	5	2	4	9			J2	5	4	4	2				
C3	4	2	19	10									V4	5	2	5	4	4	1	T7	5	2	5	5			J3	5	4	5	2				
C4	4	2	23	6									V5	5	2	5	11	4	8	T8	5	2	6	2			J4	5	4	6	3				
C5	4	2	27	2			7' X 4'								V6	5	2	6	5	5	2	T9	5	2	6	10			J5	5	2	7	4		
C6	4	4	27	8									V7	5	14	6	11	5	8	T10	5	2	7	7			K1	4	2	2	9				
E1	5	2	19	1	14	1	A1	5	2	7	7			V8	5	2	3	10	2	7	T11	5	2	8	3			K2	4	2	4	8			
E2	5	2	19	10	14	10	A2	5	2	13	8			V9	5	2	4	11	3	8	T12	5	2	8	8			K3	4	2	6	7			
F	4	15	1	5	0	6	C1	4	1	14	4			V10	5	2	5	11	4	8	V1	5	2	4	2	2	11	K4	4	2	8	5			
G1	4	1	13	1			C2	4	1	18	0			V11	5	1	7	0	5	9	V2	5	2	4	8	3	5	K5	4	4	8	7			
G2	4	2	15	9			C3	4	1	21	8				V3	5	2	5	3	4	0	M1	4	2	5	3	4	0	M1	4	2	2	3		
G3	4	2	18	6			C4	4	1	25	4				V4	5	2	5	10	4	7	M2	4	37	3	9			M2	4	37	3	9		
G4	4	2	21	3			C5	4	1	25	9				V5	5	2	6	4	5	1	N1	4	7	8	8			N1	4	7	8	8		
G5	4	3	24	0			E1	5	2	19	4	16	4		V6	5	2	6	11	5	8	N2	4	5	26	7			N2	4	5	26	7		
H	4	13	11	0	8	10	E2	5	2	19	9	16	9		V7	5	2	7	5	6	2	N3	4	2	29	10			N3	4	2	29	10		
J1	5	4	3	1			F	4	17	1	3	0	6	A1	5	2	8	8			V8	5	14	7	10	6	7	P	5	39	5	3	3	6	
J2	5	4	4	1			G1	4	1	15	9			A2	5	2	15	8			V9	5	2	4	4	3	1	Q	5	5	8	0			
J3	5	4	5	2			G2	4	2	18	6			C1	4	1	14	5			V10	5	2	5	4	4	1	R	5	9	3	8			
J4	5	4	6	3			G3	4	2	21	3			C2	4	1	18	0			V11	5	2	6	5	5	2	S1	5	2	1	11			
J5	5	2	7	3			G4	4	3	24	0			C3	4	1	21	8			V12	5	2	7	5	6	2	S2	5	2	3	4			
K1	4	2	2	7			H	4	13	8	8	7	0	C4	4	1	25	5									S3	5	2	4	9				
K2	4	2	4	5			K1	4	1	2	9			C5	4	2	27	8									S4	5	2	6	2				
K3	4	2	6	5			K2	4	1	4	7			E1	5	2	19	4	16	4							S5	5	2	7	7				
K4	4	2	8	3			K3	4	1	6	6			E2	5	2	19	9	16	9	7' X 6'						S6	5	2	9	0				
K5	4	4	8	5			K4	4	1	6	9			F	4	17	1	3	0	6							S7	5	2	10	5				
M1	4	2	2	2			N1	4	3	6	9			G1	4	2	17	7			A1	5	2	9	9			S8	5	2	11	10			
M2	4	35	3	9			N2	4	3	25	9			G2	4	2	20	4			A2	5	2	17	5			S9	5	2	12	8			
N1	4	7	8	6			Q	4	2	8	0			G3	4	2	23	2			B1	5	4	2	11			T1	5	2	1	6			
N2	4	5	24	9			R	4	9	1	5			G4	4	3	26	0			B2	5	4	3	6			T2	5	2	2	4			
N3	4	2	27	10			S1	5	2	1	5			H	4	14	9	8	8	0	B3	5	4	4	0			T3	5	2	3	0			
P	5	37	5	3	3	6	S2	5	2	2	9			K1	4	1	2	10			B4	5	4	4	7			T4	5	2	3	9			
Q	5	5	6	10			S3	5	2	4	2			K2	4	1	4	8			B5	5	4	5	2			T5	5	2	4	5			
R	5	8	3	7			S4	5	2	5	8			K3	4	1	6	7			B6	5	4	5	8			T6	5	2	5	1			
S1	5	2	1	9			S5	5	2	7	1			K4	4	2	7	8			B7	5	4	6	3			T7	5	2	5	10			
S2	5	2	3	2			S6	5	2	8	6			N1	4	3	7	9			B8	5	4	6	9			T8	5	2	6	6			
S3	5	2	4	6			S7	5	2	9	11			N2	4	3	27	9			B9	5	28	7	2			T9	5	2	7	3			
S4	5	2	5	11			S8	5	2	11	4			Q	4	2	8	0			C1	4	2	14	5			T10	5	2	8	0			
S5	5	2	7	4			S9	5	2	12	2			R	4	9	1	5			C2	4	2	18	3			T11	5	2	8	8			
S6	5	2	8	9			T1	5	2	1	2			S1	5	2	1	5			C3	4	2	21	10			T12	5	2	8	10			

- NOTES**
- ① NUMBER OF BARS IN ONE HEADWALL.
 - 2 DIMENSIONS ARE 0. TO 0. OF BARS.
 - 3 ALL BARS ARE STRAIGHT EXCEPT THOSE SHOWN BELOW.
 - 4 R = BOX OR PIPE RISE
 - 5 W = WING WALL WIDTH

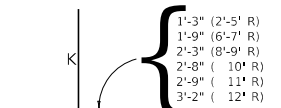
BENT BAR SHAPES



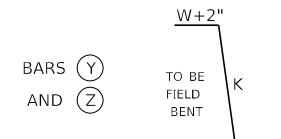
BARS (E), (U) AND (X)



BARS (H)



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



BARS (Y) AND (Z)

KENTUCKY DEPARTMENT OF HIGHWAYS	
<i>BILL OF REINFORCEMENT 6' X 6' - 7' X 6' HEADWALLS PRECAST BOX CULVERTS 45° SKEW</i>	
STANDARD DRAWING NO. RDH-1352-04	
SUBMITTED _____	DIRECTOR DIVISION OF DESIGN _____ DATE _____
APPROVED _____	STATE HIGHWAY ENGINEER _____ DATE _____

M A R K	S I Z E	NO	LGTH	K		M A R K	S I Z E	NO	LGTH	K		M A R K	S I Z E	NO	LGTH	K		M A R K	S I Z E	NO	LGTH	K		M A R K	S I Z E	NO	LGTH	K											
		①	FT	IN	FT	IN		①	FT	IN	FT	IN		①	FT	IN	FT	IN		①	FT	IN	FT	IN		①	FT	IN	FT	IN									
8' X 7'						8' X 7' (CONTINUED)						8' X 8' (CONTINUED)						8' X 8' (CONTINUED)						9' X 5' (CONTINUED)						9' X 6' (CONTINUED)									
A1	5	2	10	11			S6	5	2	9	0		G5	4	2	29	2		X5	4	1	4	1	1	10	T9	5	2	6	11		J2	5	4	4	2			
A2	5	2	19	6			S8	5	2	11	10		G6	4	3	32	0		X6	4	1	4	7	2	1	T10	5	2	7	8		J3	5	4	5	2			
B1	5	4	3	6			S9	5	2	13	3		H	4	17	13	8	11	0	X7	4	1	4	11	2	3	T11	5	2	8	4		J4	5	4	6	3		
B2	5	4	4	0			S10	5	2	14	1		J1	5	4	4	0		Z	4	2	9	2	8	2	T12	5	2	9	1		J5	5	2	7	4			
B3	5	4	4	7			T1	5	2	1	2		J2	5	4	5	1									T13	5	2	9	9		K1	4	2	3	0			
B4	5	4	5	1			T2	5	2	1	11		J3	5	4	6	2									T14	5	2	10	6		K2	4	2	4	10			
B5	5	4	5	8			T3	5	2	2	7		J4	5	4	7	2		9' X 5'						T15	5	2	10	10			K3	4	2	6	9			
B6	5	4	6	2			T4	5	2	3	4		J5	5	4	8	2								V1	5	2	4	2	2	11	K4	4	2	8	7			
B7	5	4	6	9			T5	5	2	4	0		K1	4	2	2	10		A1	5	2	9	0			V3	5	2	5	3	4	0	M1	4	1	2	4		
B8	5	4	7	3			T6	5	2	4	8		K2	4	2	4	10		A2	5	2	16	1			V4	5	2	5	10	4	7	M2	4	4	1	3	9	
B9	5	4	7	10			T7	5	2	5	5		K3	4	2	6	10		C1	4	1	17	7			V5	5	2	6	4	5	1	N1	4	7	8	10		
B10	5	30	8	2			T8	5	2	6	1		K4	4	2	8	9		C2	4	1	21	4			V6	5	2	6	11	5	8	N2	4	5	30	1		
C1	4	2	16	1			T9	5	2	6	10		K5	4	2	10	7		C3	4	1	25	0			V7	5	2	7	5	6	2	N3	4	2	33	2		
C2	4	2	19	9			T10	5	2	7	7		K6	4	6	10	9		C4	4	1	28	8			V8	5	17	7	11	6	8	P	5	42	5	3	3	6
C3	4	2	23	5			T11	5	2	8	3		M1	4	1	2	11		C5	4	2	31	2			W1	5	2	4	3	3	0	Q	5	5	10	2		
C4	4	2	27	1			T12	5	2	9	0		M2	4	45	4	9		E1	5	2	23	6	20	6	W2	5	2	5	4	4	1	R	5	11	3	9		
C5	4	2	30	8			T13	5	2	9	8		N1	4	8	10	8		E2	5	2	24	1	21	1	W3	5	2	6	5	5	2	S1	5	2	2	2		
C6	4	6	33	0			T14	5	2	9	10		N2	4	5	31	3		F	4	21	1	3	0	6	W4	5	2	7	5	6	2	S2	5	2	3	7		
E1	5	2	23	3	18	3						N3	4	3	35	2		G1	4	2	21	7									S3	5	2	5	0				
E2	5	2	24	0	19	0						P	6	46	6	9	4	6	G2	4	2	24	4									S4	5	2	6	5			
F	4	19	1	5	0	6						Q	5	5	9	0		G3	4	2	27	2										S5	5	2	7	10			
G1	4	2	18	10			8' X 8'					R	5	10	4	2		G4	4	3	30	0		9' X 6'					S6	5	2	9	3						
G2	4	2	21	9			A1	5	2	12	1		S1	5	2	1	11		H	4	16	9	10	8	2	9' X 6'					S7	5	2	10	8				
G3	4	2	24	6			A2	5	2	21	7		S2	5	2	3	4		K1	4	1	3	0		A1	5	2	10	0			S8	5	2	12	1			
G4	4	2	27	3			A1	5	2	12	1		S3	5	2	4	9		K2	4	1	4	11		A2	5	2	17	10			S9	5	2	13	6			
G5	4	3	30	0			B1	5	4	3	11		S4	5	2	6	2		K3	4	1	6	9		B1	5	4	2	11			S10	5	2	14	11			
H	4	16	12	2	10	0	B2	5	4	4	5		S5	5	2	7	7		K4	4	2	7	11		B2	5	4	3	6			S11	5	2	15	9			
J1	5	4	3	7			B3	5	4	5	0		S6	5	2	9	0		N1	4	3	7	11		B3	5	4	4	1			T1	5	2	1	8			
J2	5	4	4	8			B4	5	4	5	6		S7	5	2	10	5		N2	4	3	31	1		B4	5	4	4	8			T2	5	2	2	4			
J3	5	4	5	8			B5	5	4	6	1		S8	5	2	11	10		Q	4	2	10	2		B5	5	4	5	2			T3	5	2	3	0			
J4	5	4	6	9			B6	5	4	6	7		S9	5	2	13	3		R	4	11	1	6		B6	5	4	5	8			T4	5	2	3	9			
J5	5	4	7	9			B7	5	4	7	1		S10	5	2	14	1		S1	5	2	1	8		B7	5	4	6	3			T5	5	2	4	6			
K1	4	2	2	10			B8	5	4	7	8		T1	5	2	1	2		S2	5	2	3	1		B8	5	4	6	9			T6	5	2	5	2			
K2	4	2	4	8			B9	5	4	8	3		T2	5	2	1	11		S3	5	2	4	6		B9	5	34	7	3			T7	5	2	5	11			
K3	4	2	6	7			B10	5	4	8	9		T3	5	2	2	7		S4	5	2	5	11		C1	4	2	18	0			T8	5	2	6	7			
K4	4	2	8	6			B11	5	30	9	1		T4	5	2	3	4		S5	5	2	7	3		C2	4	2	21	9			T9	5	2	7	4			
K5	4	6	9	8			C1	4	2	15	11		T5	5	2	4	0		S6	5	2	8	9		C3	4	2	25	3			T10	5	2	8	0			
M1	4	1	2	5			C2	4	2	19	8		T6	5	2	4	8		S7	5	2	10	2		C4	4	2	28	11			T11	5	2	8	9			
M2	4	42	3	9			C3	4	2	23	4		T7	5	2	5	5		S8	5	2	11	7		C5	4	2	32	6			T12	5	2	9	5			
N1	4	7	9	8			C4	4	2	27	0		T8	5	2	6	1		S9	5	2	13	0		C6	4	4	33	0			T13	5	2	10	2			
N2	4	5	30	2			C5	4	2	30	9		T9	5	2	6	10		S10	5	2	14	4		E1	5	2	25	6	20	6	T14	5	2	10	10			
N3	4	2	33	3			C6	4	2	34	6		T10	5	2	7	7		S11	5	2	15	5		E2	5	2	26	3	21	3	T15	5	2	11	0			
P	5	43	5	9	4	0	C7	4	6	35	1		T11	5	2	8	3		T1	5	2	1	2		F	4	21	1	5	0	6								
Q	5	5	9	0			E1	5	2	23	3	18	3	T12	5	2	9	0		T2	5	2	2	0		G1	4	1	20	6									
R	5	10	3	8			E2	5	2	24	0	19	0	T13	5	2	9	8		T3	5	2	2	8		G2	4	2	23	4									
S1	5	2	1	11			F	4	19	1	5	0	6	T14	5	2	9	10		T4	5	2	3	4		G3	4	2	26	3									
S2	5	2	3	4			G1	4	1	18	0		X1	4	1	2	5	1	0	T5	5	2	4	1		G4	4	2	29	2									
S3	5	2	4	9			G2	4	2	20	9		X2	4	1	2	11	1	3	T6	5	2	4	10		G5	4	3	32	0									
S4	5	2	6	2			G3	4	2	23	7		X3	4	1	3	3	1	5	T7	5	2	5	6		H	4	17	11	4	9	2							
S5	5	2	7	7			G4	4	2	26	4		X4	4	1	3	9	1	8	T8	5	2	6	3		J1	5	4	3	1									

NOTES

- NUMBER OF BARS IN ONE HEADWALL.
- DIMENSIONS ARE 0. TO 0. OF BARS.
- ALL BARS ARE STRAIGHT EXCEPT THOSE SHOWN BELOW.
- R = BOX OR PIPE RISE
- W = WING WALL WIDTH

BENT BAR SHAPES

Diagram showing bent bar shapes with dimensions and bar labels:

- Diagram 1: Bent bar with dimensions 1'-6" (2'-5' R), 2'-6" (6'-9' R), 3'-0" (10'-12' R). Bar label: BARS (E).
- Diagram 2: Bent bar with dimensions 1'-8" (2'-5' R), 2'-2" (6'-7' R), 2'-8" (8'-9' R), 3'-8" (10'-12' R). Bar labels: BARS (F), (U) AND (X).
- Diagram 3: Bent bar with dimensions 1'-3" (2'-5' R), 1'-9" (6'-9' R), 2'-3" (8'-9' R), 2'-8" (10' R), 2'-9" (11' R), 3'-2" (12' R). Bar labels: BARS (P), (V) AND (W).
- Diagram 4: Bent bar with dimensions 1'-6" (2'-5' R), 2'-6" (6'-9' R), 3'-0" (10'-12' R). Bar labels: BARS (Y) AND (Z).

KENTUCKY DEPARTMENT OF HIGHWAYS

BILL OF REINFORCEMENT

8' X 7' - 9' X 6' HEADWALLS

PRECAST BOX CULVERTS

45° SKEW

STANDARD DRAWING NO. RDH-1356-03

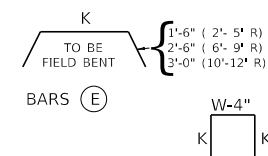
SUBMITTED _____ DIRECTOR DIVISION OF DESIGN _____ DATE _____

APPRO

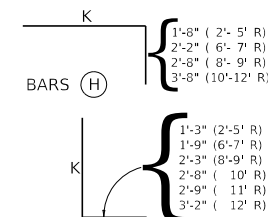
NOTES

- ① NUMBER OF BARS IN ONE HEADWALL.
- 2 DIMENSIONS ARE 0. TO 0. 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 (F), (U) AND (X)



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



KENTUCKY
DEPARTMENT OF HIGHWAYS

BILL OF REINFORCEMENT
9' X 7' - 9' X 9' HEADWALLS
PRECAST BOX CULVERTS
45° SKEW

STANDARD DRAWING NO. RDH-1358-03		
SUBMITTED _____	DIRECTOR DIVISION OF DESIGN	DATE _____
APPROVED _____	STATE HIGHWAY ENGINEER	DATE _____

NOTES

- ① NUMBER OF BARS IN ONE HEADWALL.
- 2 DIMENSIONS ARE 0. TO 0. OF BARS.
- 3 ALL BARS ARE STRAIGHT EXCEPT THOSE SHOWN BELOW.
- 4 R = BOX OR PIPE RISE
- 5 W = WING WALL WIDTH

K

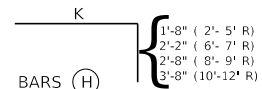
TO BE
FIELD BENT

- 1'-6" (2'- 5" R)
- 2'-6" (6'- 9" R)
- 3'-0" (10'-12" R)

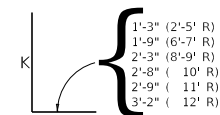
BARS (E)



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



BARS (H)



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



BARS (Y)
AND (Z)

KENTUCKY
DEPARTMENT OF HIGHWAYS

BILL OF REINFORCEMENT
10' X 5' - 10' X 7' HEADWALLS
PRECAST BOX CULVERTS
45° SKEW

STANDARD DRAWING NO. RDH-1360-03

SUBMITTED _____ DATE _____
DIRECTOR DIVISION OF DESIGN

APPROVED _____ DATE _____
STATE HIGHWAY ENGINEER

	<u>NOTES</u>
①	NUMBER OF BARS IN ONE HEADWALL.
2	DIMENSIONS ARE 0. TO 0. OF BARS.
3	ALL BARS ARE STRAIGHT EXCEPT THOSE SHOWN BELOW.
4	R = BOX OR PIPE RISE
5	W = WING WALL WIDTH
<u>BENT BAR SHAPES</u>	
	BARS (E)
	BARS (F), (U) AND (X)
	BARS (P), (V) AND (W)
	BARS (Y) AND (Z)
KENTUCKY DEPARTMENT OF HIGHWAYS BILL OF REINFORCEMENT 11' X 10' - 12' X 4' HEADWALLS PRECAST BOX CULVERTS 45° SKEW STANDARD DRAWING NO. RDH-1366-03	
SUBMITTED _____	DATE _____
APPROVED _____	DATE _____

MARK K	SIZE E	NO		LGTH		K		MARK K	SIZE E	NO		LGTH		K		MARK K	SIZE E	NO		LGTH		K	
		①		FT	IN	FT	IN			①		FT	IN	FT	IN			①		FT	IN	FT	IN
12' X 12'								12' X 12' (CONTINUED)								12' X 12' (CONTINUED)							
A ₁	5	2	17	0				K ₅	4	2	9	2					U ₄	4	1	5	2	2	2
A ₂	5	2	30	5				K ₆	4	2	11	1					U ₅	4	1	5	8	2	5
B ₁	5	4	5	11				K ₇	4	2	13	0					U ₆	4	1	6	2	2	8
B ₂	5	4	6	6				K ₈	4	2	15	0					U ₇	4	1	6	8	2	11
B ₃	5	4	7	0				K ₉	4	10	15	1					U ₈	4	1	7	2	3	2
B ₄	5	4	7	6				M ₁	4	3	4	0					U ₉	4	1	7	8	3	5
B ₅	5	4	7	6				M ₂	4	63	6	8					U ₁₀	4	1	8	2	3	8
B ₆	5	4	8	1				N ₁	4	11	15	1					X ₁	4	1	3	10	1	6
B ₆	5	4	8	7				N ₂	4	7	45	5					X ₂	4	1	4	2	1	8
B ₇	5	4	9	2				N ₃	4	4	50	9					X ₃	4	1	4	8	1	11
B ₈	5	4	9	8				P	8	66	9	8	6	6			X ₄	4	1	5	2	2	2
B ₉	5	4	10	3				Q	5	7	13	8					X ₅	4	1	5	6	2	4
B ₁₀	5	4	10	9				R	5	14	6	2					X ₆	4	1	6	0	2	7
B ₁₁	5	4	11	4				S ₁	5	2	2	9					X ₇	4	1	6	6	2	10
B ₁₂	5	4	11	10				S ₂	5	2	4	3					X ₈	4	1	6	10	3	0
B ₁₃	5	4	12	5				S ₃	5	2	5	7					X ₉	4	1	7	4	3	3
B ₁₄	5	4	12	11				S ₄	5	2	7	0					X ₁₀	4	1	7	8	3	5
B ₁₅	5	46	13	5				S ₅	5	2	8	5					X ₁₁	4	1	8	2	3	8
C ₁	4	2	24	2				S ₆	5	2	9	10					Y	4	2	13	1	11	8
C ₂	4	2	27	10				S ₇	5	2	11	3					Z	4	2	14	3	12	10
C ₃	4	2	31	8				S ₈	5	2	12	7											
C ₄	4	2	35	4				S ₉	5	2	14	1											
C ₅	4	2	38	10				S ₁₀	5	2	15	5											
C ₆	4	2	42	9				S ₁₁	5	2	16	11											
C ₇	4	2	46	5				S ₁₂	5	2	18	5											
C ₈	4	2	50	0				S ₁₃	5	2	19	9											
C ₉	4	10	50	8				S ₁₄	5	4	21	2											
E ₁	5	2	33	3	27	3		T ₁	5	2	1	1											
E ₂	5	2	34	8	28	8		T ₂	5	2	1	10											
F	4	28	1	10	0	6		T ₃	5	2	2	7											
G ₁	4	1	27	6				T ₄	5	2	3	3											
G ₂	4	2	30	4				T ₅	5	2	4	0											
G ₃	4	2	33	2				T ₆	5	2	4	8											
G ₄	4	2	36	3				T ₇	5	2	5	3											
G ₅	4	2	39	1				T ₈	5	2	6	0											
G ₆	4	2	42	0				T ₉	5	2	6	9											
G ₇	4	2	44	10				T ₁₀	5	2	7	5											
G ₈	4	3	48	0				T ₁₁	5	2	8	1											
H	4	25	19	4	15	8		T ₁₂	5	2	8	11											
J ₁	5	4	6	0				T ₁₃	5	2	9	7											
J ₂	5	4	7	1				T ₁₄	5	2	10	3											
J ₃	5	4	8	1				T ₁₅	5	2	11	0											
J ₄	5	4	9	2				T ₁₆	5	2	11	8											
J ₅	5	4	10	2				T ₁₇	5	2	12	5											
J ₆	5	4	11	3				T ₁₈	5	2	13	1											
J ₇	5	4	12	4				T ₁₉	5	2	13	10											
J ₈	5	2	13	4				T ₂₀	5	2	14	6											
K ₁	4	2	1	5				T ₂₁	5	4	14	10											
K ₂	4	2	3	4				U ₁	4	1	3	10	1	6									
K ₃	4	2	5	4				U ₂	4	1	4	2	1	8									
K ₄	4	2	7	3				U ₃	4	1	4	8	1	11									

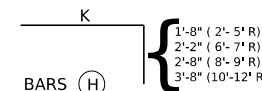
NOTES

- ① NUMBER OF BARS IN ONE HEADWALL.
- DIMENSIONS ARE 0. TO 0. OF BARS.
- ALL BARS ARE STRAIGHT EXCEPT THOSE SHOWN BELOW.
- R = BOX OR PIPE RISE
- W = WING WALL WIDTH

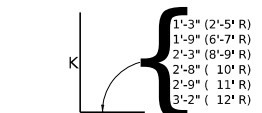
BENT BAR SHAPES



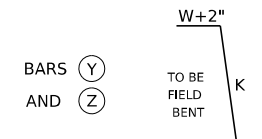
BARS (F), (U) AND (X)



BARS (H)



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



BARS (Y) AND (Z)

KENTUCKY DEPARTMENT OF HIGHWAYS	
BILL OF REINFORCEMENT 12' X 12' HEADWALLS PRECAST BOX CULVERTS 45° SKEW	
STANDARD DRAWING NO. RDH-1370-03	
SUBMITTED	DIRECTOR DIVISION OF DESIGN
APPROVED	STATE HIGHWAY ENGINEER
DATE	DATE