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TABLE OF VARIABLE DIMENSIONS AND QUANTITIES FOR ONE HEADWALL (5)

Slope	Dia of Pipe (D)	Values for One Pipe					Values to be Added for Each Add'l Pipe			
		W	X	Y	L	Reinf (Lbs)	Conc (CY) (1)	X and W	Reinf (Lbs)	Conc (CY) (1)
2:1	12"	3'-3 1/2"	2'-8 3/4"	2'-10"	3'-3 1/4"	85	0.5	1'-9 3/4"	20	0.2
	15"	3'-10 1/2"	3'-0 1/4"	3'-4"	3'-10 1/4"	97	0.6	2'-3"	25	0.3
	18"	4'-5 1/2"	3'-4"	3'-10"	4'-5"	119	0.8	2'-9 1/4"	32	0.4
	21"	5'-0 3/4"	3'-7 1/2"	4'-4"	5'-0"	134	0.9	3'-2 1/4"	43	0.5
	24"	5'-9 1/4"	4'-0 3/4"	4'-10"	5'-7"	154	1.1	3'-8 1/2"	51	0.6
	27"	6'-4 1/2"	4'-4 1/2"	5'-4"	6'-2"	164	1.3	4'-0 3/4"	57	0.7
	30"	6'-11 1/2"	4'-8"	5'-10"	6'-8 3/4"	187	1.5	4'-5 3/4"	67	0.8
	33"	7'-6 1/2"	4'-11 3/4"	6'-4"	7'-3 3/4"	205	1.7	4'-10"	73	0.9
	36"	8'-1 3/4"	5'-3 1/4"	6'-10"	7'-10 3/4"	231	1.9	5'-3 1/4"	82	1.1
	42"	9'-3 3/4"	5'-10 1/2"	7'-10"	9'-0 1/2"	271	2.4	6'-0 1/2"	100	1.4
	48"	10'-9 1/2"	6'-5 3/4"	9'-4"	10'-9 1/4"	325	3.2	6'-9 3/4"	121	1.8
	54"	11'-11 3/4"	7'-1"	10'-4"	11'-11 1/4"	384	3.8	7'-9 1/4"	154	2.2
60"	13'-1 3/4"	7'-8 1/4"	11'-4"	13'-1"	431	4.5	8'-6 1/2"	178	2.6	
66"	14'-4"	8'-3 1/2"	12'-4"	14'-3"	489	5.3	9'-0 3/4"	198	3.0	
72"	15'-6 1/4"	8'-10 3/4"	13'-4"	15'-4 3/4"	537	6.1	9'-8"	220	3.3	
3:1	12"	4'-1 1/4"	2'-8 3/4"	4'-3"	4'-11"	108	0.7	1'-9 3/4"	23	0.2
	15"	4'-10"	3'-0 1/4"	5'-0"	5'-9 1/4"	127	0.9	2'-3"	29	0.3
	18"	5'-7"	3'-4"	5'-9"	6'-7 3/4"	156	1.1	2'-9 1/4"	37	0.5
	21"	6'-3 3/4"	3'-7 1/2"	6'-6"	7'-6"	177	1.3	3'-2 1/4"	49	0.6
	24"	7'-2"	4'-0 3/4"	7'-3"	8'-4 1/2"	204	1.6	3'-8 1/2"	59	0.7
	27"	7'-11"	4'-4 1/2"	8'-0"	9'-2 3/4"	225	1.9	4'-0 3/4"	68	0.9
	30"	8'-7 3/4"	4'-8"	8'-9"	10'-1 1/4"	260	2.2	4'-5 3/4"	79	1.0
	33"	9'-4 1/2"	4'-11 3/4"	9'-6"	10'-11 3/4"	282	2.5	4'-10"	86	1.2
	36"	10'-1 1/4"	5'-3 1/4"	10'-3"	11'-10"	313	2.9	5'-3 1/4"	97	1.4
	42"	11'-7"	5'-10 1/2"	11'-9"	13'-6 3/4"	379	3.7	6'-0 1/2"	122	1.8
	48"	13'-5 3/4"	6'-5 3/4"	14'-0"	16'-2"	465	4.9	6'-9 3/4"	152	2.4
	54"	14'-11 1/2"	7'-1"	15'-6"	17'-10 3/4"	544	5.9	7'-9 1/4"	190	3.0
60"	16'-5"	7'-8 1/4"	17'-0"	19'-7 1/2"	616	7.0	8'-6 1/2"	224	3.5	
66"	17'-10 3/4"	8'-3 1/2"	18'-6"	21'-4 1/4"	701	8.1	9'-0 3/4"	248	4.0	
72"	19'-4 1/4"	8'-10 3/4"	20'-0"	23'-1 1/4"	786	9.4	9'-8"	281	4.6	
4:1	12"	4'-11"	2'-8 3/4"	5'-8"	6'-6 1/2"	136	0.9	1'-9 3/4"	26	0.3
	15"	5'-9 1/2"	3'-0 1/4"	6'-8"	7'-8 1/2"	162	1.2	2'-3"	33	0.4
	18"	6'-8 1/4"	3'-4"	7'-8"	8'-10 1/4"	198	1.5	2'-9 1/4"	43	0.6
	21"	7'-6 3/4"	3'-7 1/2"	8'-8"	10'-0"	232	1.8	3'-2 1/4"	57	0.7
	24"	8'-6 3/4"	4'-0 3/4"	9'-8"	11'-2"	264	2.2	3'-8 1/2"	68	0.9
	27"	9'-5 1/4"	4'-4 1/2"	10'-8"	12'-3 3/4"	292	2.6	4'-0 3/4"	79	1.1
	30"	10'-4"	4'-8"	11'-8"	13'-5 3/4"	333	3.0	4'-5 3/4"	91	1.3
	33"	11'-2 1/2"	4'-11 3/4"	12'-8"	14'-7 1/2"	368	3.5	4'-10"	104	1.5
	36"	12'-1"	5'-3 1/4"	13'-8"	15'-9 1/4"	411	4.0	5'-3 1/4"	115	1.7
	42"	13'-10"	5'-10 1/2"	15'-8"	18'-1"	495	5.1	6'-0 1/2"	144	2.2
	48"	16'-2 1/4"	6'-5 3/4"	18'-8"	21'-6 3/4"	612	6.8	6'-9 3/4"	183	3.0
	54"	17'-11 1/4"	7'-1"	20'-8"	23'-10 1/4"	729	8.2	7'-9 1/4"	231	3.7
60"	19'-8 1/4"	7'-8 1/4"	22'-8"	26'-2"	824	9.8	8'-6 1/2"	270	4.4	
66"	21'-5 1/2"	8'-3 1/2"	24'-8"	28'-5 3/4"	947	11.4	9'-0 3/4"	305	5.0	
72"	23'-2 1/2"	8'-10 3/4"	26'-8"	30'-9 1/2"	1,060	13.2	9'-8"	342	5.7	
6:1	12"	6'-6 3/4"	2'-8 3/4"	8'-6"	9'-9 3/4"	192	1.4	1'-9 3/4"	30	0.4
	15"	7'-8 3/4"	3'-0 1/4"	10'-0"	11'-6 1/2"	230	1.9	2'-3"	40	0.5
	18"	8'-10 3/4"	3'-4"	11'-6"	13'-3 1/4"	281	2.4	2'-9 1/4"	51	0.7
	21"	10'-0 3/4"	3'-7 1/2"	13'-0"	15'-0 1/4"	334	2.9	3'-2 1/4"	69	1.0
	24"	11'-4 1/4"	4'-0 3/4"	14'-6"	16'-9"	377	3.5	3'-8 1/2"	83	1.3
	27"	12'-6 1/4"	4'-4 1/2"	16'-0"	18'-5 3/4"	428	4.2	4'-0 3/4"	98	1.5
	30"	13'-8 1/4"	4'-8"	17'-6"	20'-2 1/2"	488	4.9	4'-5 3/4"	113	1.8
	33"	14'-10 1/4"	4'-11 3/4"	19'-0"	21'-11 1/4"	551	5.7	4'-10"	130	2.0
	36"	16'-0 1/4"	5'-3 1/4"	20'-6"	23'-8"	606	6.5	5'-3 1/4"	145	2.4
	42"	18'-4 1/2"	5'-10 1/2"	23'-6"	27'-1 1/2"	740	8.4	6'-0 1/2"	184	3.1
	48"	21'-6 3/4"	6'-5 3/4"	28'-0"	32'-4"	946	11.4	6'-9 3/4"	240	4.1
	54"	23'-10 3/4"	7'-1"	31'-0"	35'-9 1/2"	1,124	13.8	7'-9 1/4"	303	5.2
60"	26'-2 3/4"	7'-8 1/4"	34'-0"	39'-3"	1,278	16.4	8'-6 1/2"	358	6.2	

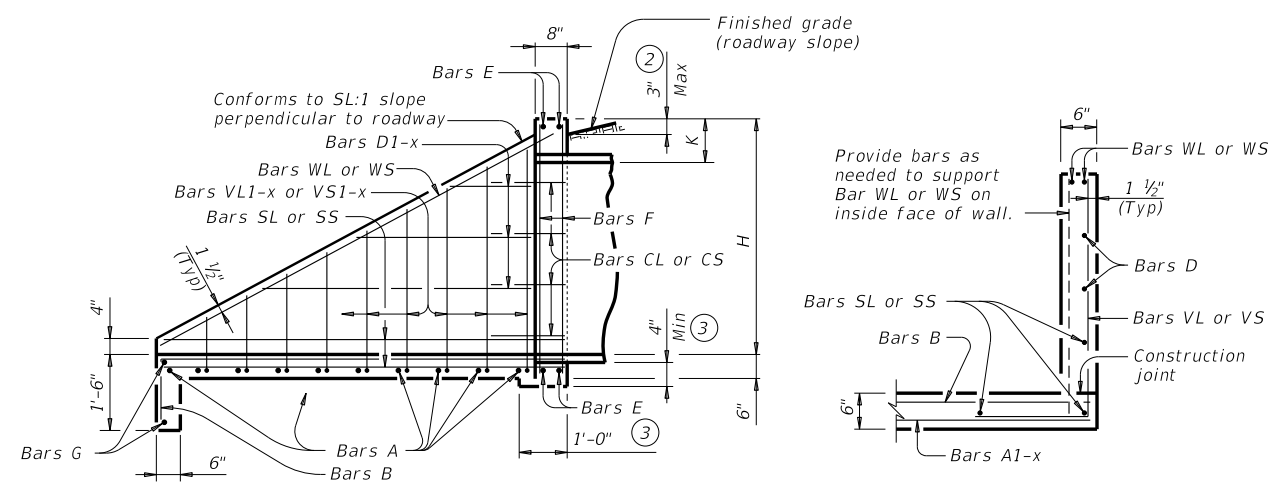
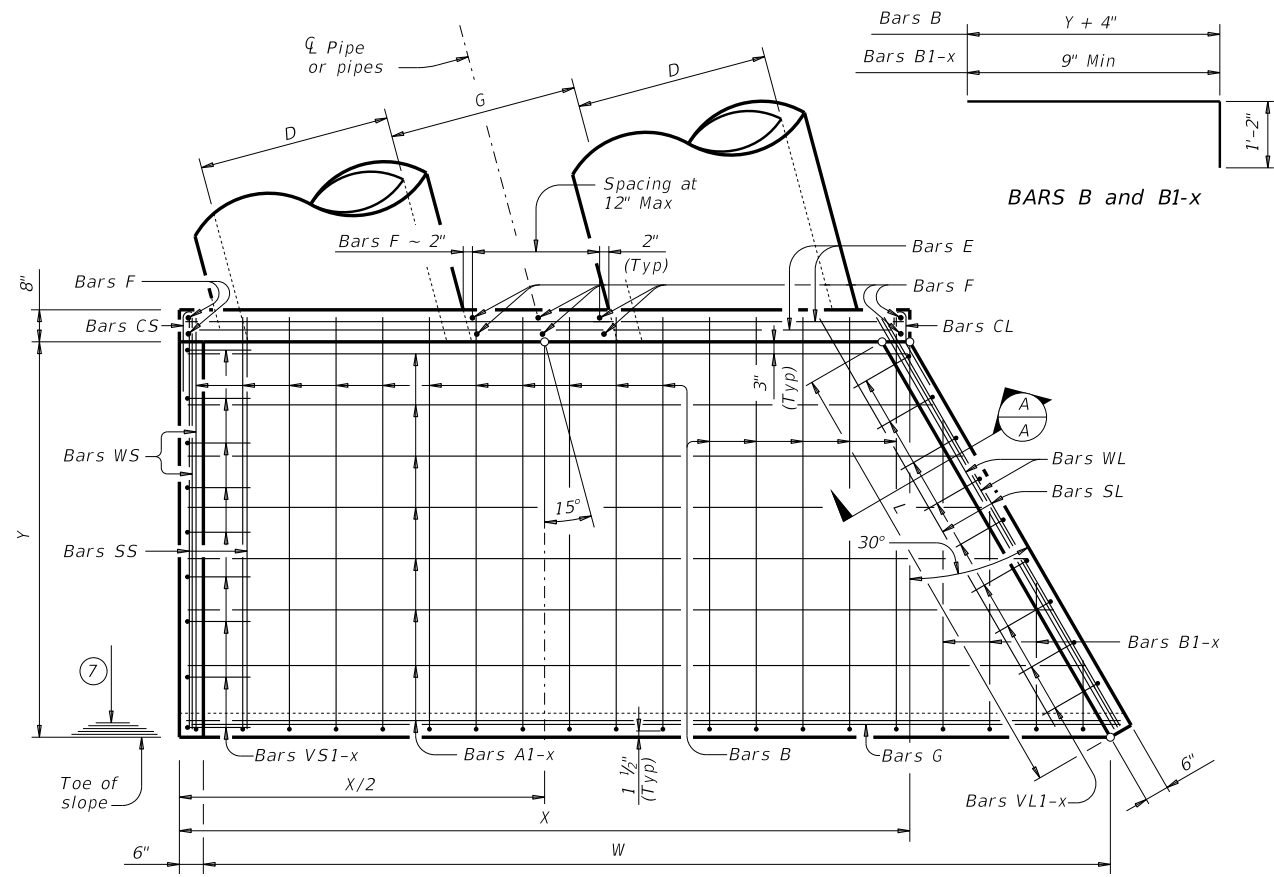
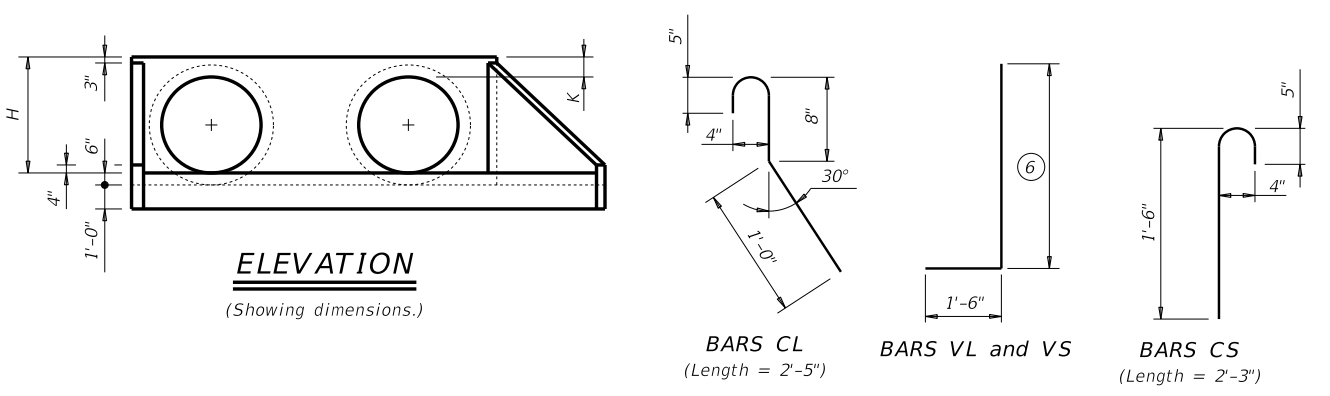


TABLE OF REINFORCING STEEL (5)

Bar	Size	Spa	No.
A	#4	1'-0"	~
B	#3	1'-6"	~
CL & CS	#4	1'-0"	~
D	#3	1'-0"	~
E	#5	~	4
F	#5	~	~
G	#3	~	2
SL & SS	#4	~	6
VL & VS	#4	1'-0"	~
WL & WS	#5	~	4

TABLE OF CONSTANT DIMENSIONS

Dia of Pipe (D)	G	K (4)	H
12"	0'-9"	1'-0"	2'-0"
15"	0'-11"	1'-0"	2'-3"
18"	1'-0"	1'-0"	2'-6"
21"	1'-4"	1'-0"	2'-9"
24"	1'-7"	1'-0"	3'-0"
27"	1'-8"	1'-0"	3'-3"
30"	1'-10"	1'-0"	3'-6"
33"	1'-11"	1'-0"	3'-9"
36"	2'-1"	1'-0"	4'-0"
42"	2'-4"	1'-0"	4'-6"
48"	2'-7"	1'-3"	5'-3"
54"	3'-0"	1'-3"	5'-9"
60"	3'-3"	1'-3"	6'-3"
66"	3'-3"	1'-3"	6'-9"
72"	3'-4"	1'-3"	7'-3"

- Quantities shown are for concrete pipe and will increase slightly for metal pipe installations.
- For vehicle safety, construct curbs no more than 3" above finished grade. Reduce curb heights, if necessary, to meet these requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.
- Provide a 1'-0" footing as shown where required to maintain 4" minimum cover for pipes.
- Dimensions shown are usual and maximum.
- Quantities shown are for one structure end only (one headwall).
- Min Length = $6" + 3" \times \left(\frac{12 \times H - 7}{12 \times L} \right)$
Max Length = $12 \times H - 3" \times \left(\frac{12 \times H - 7}{12 \times L} \right) - 1"$
- Lengths of wings based on SL:1 slope along this line.

MATERIAL NOTES:
Provide Grade 60 reinforcing steel.
Provide Class C concrete (f'c = 3,600 psi).

GENERAL NOTES:
Designed according to AASHTO LRFD Bridge Design Specifications.
Do not mount bridge rails of any type directly to these culvert headwalls.
This standard may not be used for wall heights, H, exceeding the values shown.

Cover dimensions are clear dimensions, unless noted otherwise. Reinforcing dimensions are out-to-out of bars.

Texas Department of Transportation Bridge Division Standard

CONCRETE HEADWALLS WITH FLARED WINGS FOR 15° SKEW PIPE CULVERTS

CH-FW-15

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REVISIONS				
	DIST	COUNTY		SHEET NO.