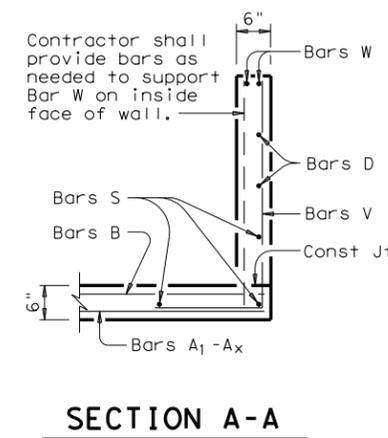
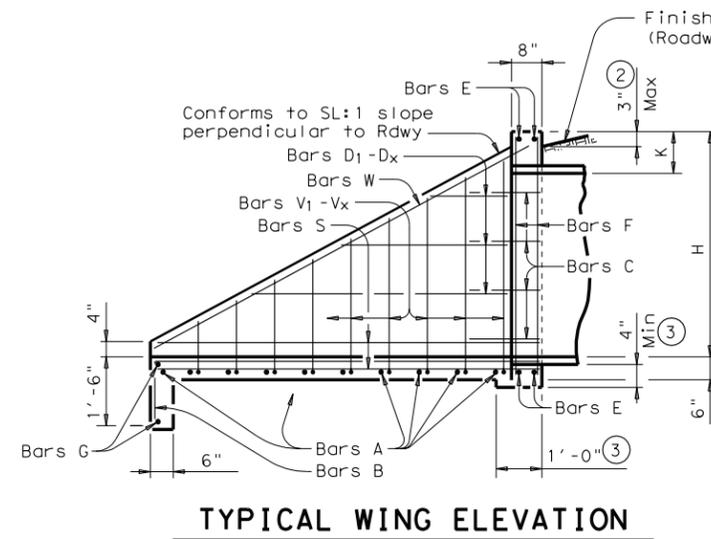
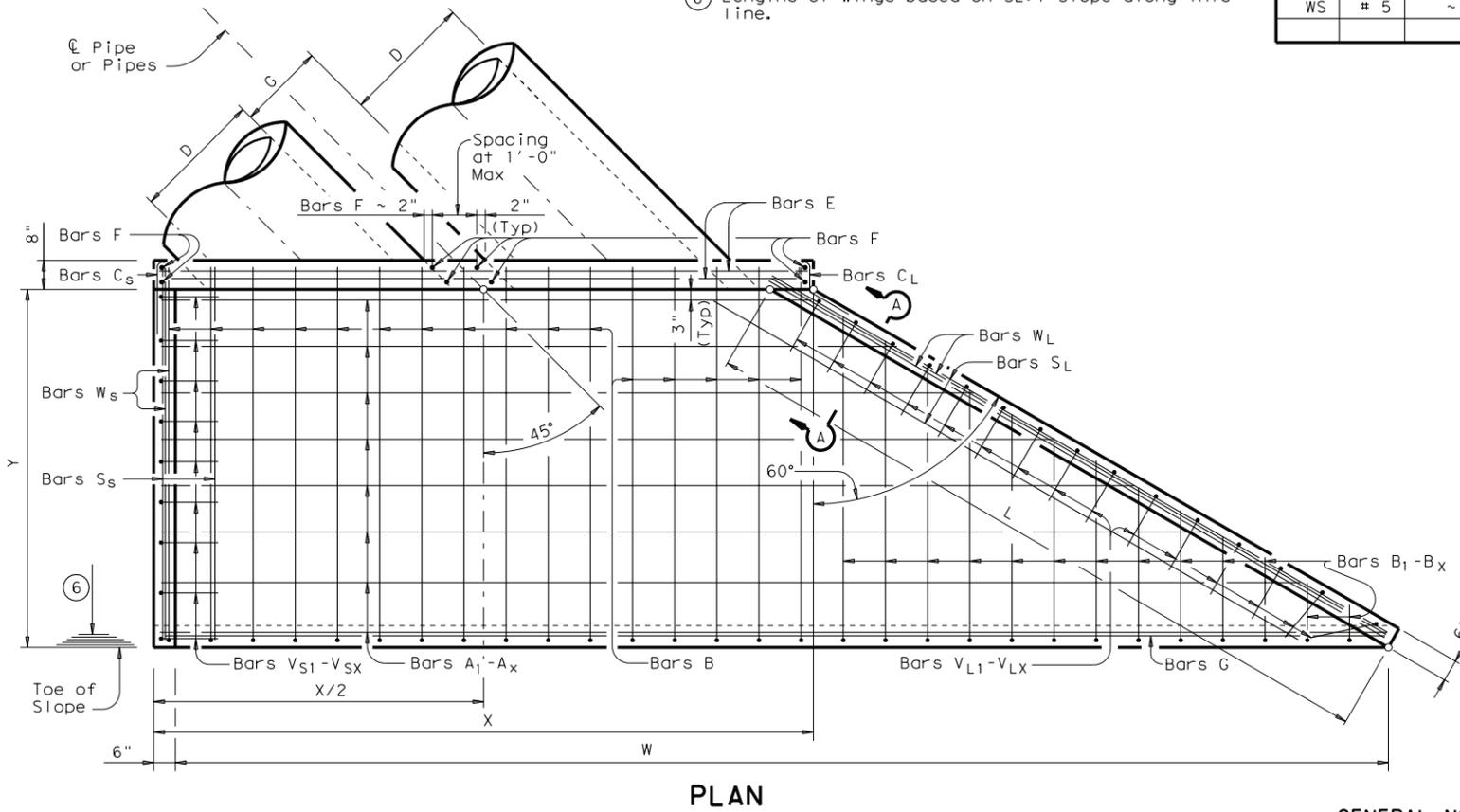
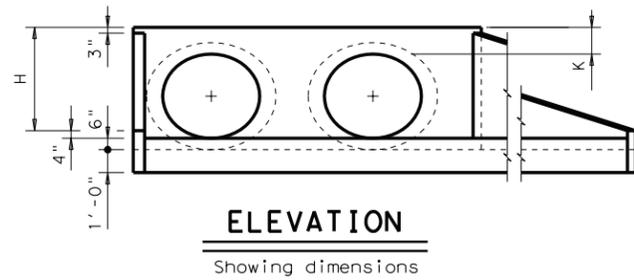
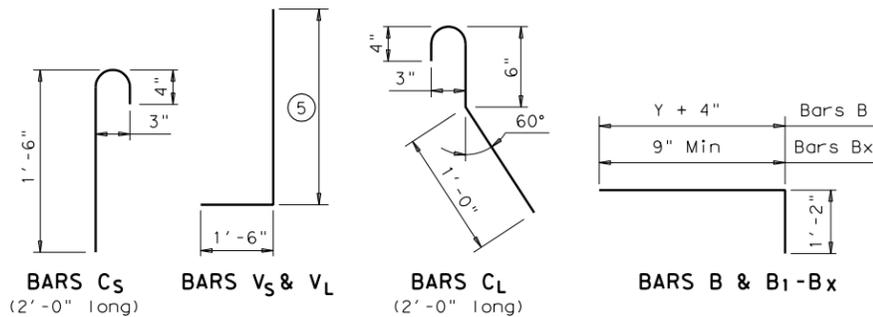


TABLE OF VARIABLE DIMENSIONS AND QUANTITIES FOR ONE HEADWALL (4)

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)	X and W	Reinf (Lbs)	Conc (CY)
2:1	12"	7'-7 3/4"	4'-3"	2'-10"	5'-8"	115	0.9	2'-5 3/4"	26	0.3
	15"	8'-10 1/2"	4'-7 1/4"	3'-4"	6'-8"	131	1.1	3'-0 3/4"	32	0.4
	18"	10'-1 1/4"	4'-11 1/2"	3'-10"	7'-8"	163	1.3	3'-9 1/4"	48	0.5
	21"	11'-3 3/4"	5'-3 3/4"	4'-4"	8'-8"	181	1.6	4'-4 1/4"	54	0.6
	24"	12'-6 1/2"	5'-8"	4'-10"	9'-8"	208	1.8	5'-0 3/4"	67	0.8
	27"	13'-9"	6'-0 1/4"	5'-4"	10'-8"	225	2.1	5'-6 1/2"	73	0.9
	30"	14'-11 3/4"	6'-4 1/2"	5'-10"	11'-8"	259	2.5	6'-1 1/2"	86	1.1
	33"	16'-3"	6'-9 1/2"	6'-4"	12'-8"	284	2.8	6'-7 1/4"	92	1.2
	36"	17'-6 1/4"	7'-2 1/4"	6'-10"	13'-8"	316	3.2	7'-2 1/4"	107	1.4
	42"	20'-1"	8'-0 1/4"	7'-10"	15'-8"	383	4.0	8'-3"	138	1.8
	48"	23'-6"	8'-10 1/4"	9'-4"	18'-8"	468	5.4	9'-3 3/4"	167	2.4
	54"	26'-0 3/4"	9'-8"	10'-4"	20'-8"	549	6.4	10'-7 1/4"	198	3.0
60"	28'-7 1/2"	10'-6"	11'-4"	22'-8"	620	7.5	11'-8"	243	3.6	
66"	31'-2 1/4"	11'-3 3/4"	12'-4"	24'-8"	710	8.8	12'-4 1/2"	269	4.0	
72"	33'-8 3/4"	12'-1 3/4"	13'-4"	26'-8"	789	10.1	13'-2 1/2"	303	4.6	
3:1	12"	10'-1 1/4"	4'-3"	4'-3"	8'-6"	154	1.3	2'-5 3/4"	28	0.3
	15"	11'-9 1/4"	4'-7 1/4"	5'-0"	10'-0"	184	1.6	3'-0 3/4"	37	0.5
	18"	13'-5"	4'-11 1/2"	5'-9"	11'-6"	225	2.0	3'-9 1/4"	55	0.6
	21"	15'-0 3/4"	5'-3 3/4"	6'-6"	13'-0"	254	2.4	4'-4 1/4"	62	0.8
	24"	16'-8 3/4"	5'-8"	7'-3"	14'-6"	291	2.8	5'-0 3/4"	77	1.0
	27"	18'-4 1/2"	6'-0 1/4"	8'-0"	16'-0"	329	3.3	5'-6 1/2"	88	1.2
	30"	20'-0 1/4"	6'-4 1/2"	8'-9"	17'-6"	377	3.9	6'-1 1/2"	103	1.4
	33"	21'-8 3/4"	6'-9 1/2"	9'-6"	19'-0"	413	4.4	6'-7 1/4"	111	1.6
	36"	23'-5 1/2"	7'-2 1/4"	10'-3"	20'-6"	462	5.1	7'-2 1/4"	126	1.9
	42"	26'-10 1/2"	8'-0 1/4"	11'-9"	23'-6"	571	6.4	8'-3"	168	2.4
	48"	31'-7 1/4"	8'-10 1/4"	14'-0"	28'-0"	712	8.7	9'-3 3/4"	210	3.2
	54"	35'-0 1/4"	9'-8"	15'-6"	31'-0"	830	10.5	10'-7 1/4"	249	4.0
60"	38'-5 1/4"	10'-6"	17'-0"	34'-0"	954	12.4	11'-8"	306	4.8	
66"	41'-10 1/4"	11'-3 3/4"	18'-6"	37'-0"	1092	14.5	12'-4 1/2"	338	5.5	
4:1	12"	12'-6 3/4"	4'-3"	5'-8"	11'-4"	203	1.7	2'-5 3/4"	32	0.4
	15"	14'-7 3/4"	4'-7 1/4"	6'-8"	13'-4"	242	2.2	3'-0 3/4"	43	0.6
	18"	16'-8 3/4"	4'-11 1/2"	7'-8"	15'-4"	296	2.8	3'-9 1/4"	61	0.8
	21"	18'-9 3/4"	5'-3 3/4"	8'-8"	17'-4"	343	3.4	4'-4 1/4"	73	1.0
	24"	20'-10 3/4"	5'-8"	9'-8"	19'-4"	394	4.0	5'-0 3/4"	90	1.3
	27"	23'-0"	6'-0 1/4"	10'-8"	21'-4"	445	4.8	5'-6 1/2"	103	1.5
	30"	25'-1"	6'-4 1/2"	11'-8"	23'-4"	510	5.5	6'-1 1/2"	120	1.8
	33"	27'-2 3/4"	6'-9 1/2"	12'-8"	25'-4"	572	6.4	6'-7 1/4"	134	2.0
	36"	29'-4 1/2"	7'-2 1/4"	13'-8"	27'-4"	631	7.3	7'-2 1/4"	152	2.4
	42"	33'-8"	8'-0 1/4"	15'-8"	31'-4"	781	9.4	8'-3"	198	3.0
	48"	39'-8"	8'-10 1/4"	18'-8"	37'-4"	991	12.8	9'-3 3/4"	255	4.0
	54"	45'-8"	9'-8"	21'-8"	43'-4"	1210	15.5	10'-7 1/4"	312	5.0
6:1	12"	17'-5 3/4"	4'-3"	8'-6"	17'-0"	295	2.9	2'-5 3/4"	38	0.5
	15"	20'-5"	4'-7 1/4"	10'-0"	20'-0"	367	3.7	3'-0 3/4"	51	0.8
	18"	23'-4 1/2"	4'-11 1/2"	11'-6"	23'-0"	445	4.7	3'-9 1/4"	73	1.0
	21"	26'-4"	5'-3 3/4"	13'-0"	26'-0"	531	5.8	4'-4 1/4"	89	1.3
	24"	29'-3 1/4"	5'-8"	14'-6"	29'-0"	605	7.0	5'-0 3/4"	110	1.7
	27"	32'-2 3/4"	6'-0 1/4"	16'-0"	32'-0"	702	8.3	5'-6 1/2"	129	2.0
	30"	35'-2 1/4"	6'-4 1/2"	17'-6"	35'-0"	801	9.7	6'-1 1/2"	150	2.4
	33"	38'-2 1/4"	6'-9 1/2"	19'-0"	38'-0"	913	11.3	6'-7 1/4"	170	2.8

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LEVELS DISPLAYED	ACC:
1	



- Quantities shown are for concrete pipe and will increase slightly for metal pipe installations.
- For vehicle safety, curbs shall project no more than 3" above finished grade. Curb heights shall be reduced, 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" Min cover for pipes.
- 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.

TABLE OF REINFORCING STEEL (4)

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

TABLE OF CONSTANT DIMENSIONS

DIA OF PIPE, D	G	K	H
12"	9"	1'-0"	2'-0"
15"	11"	1'-0"	2'-3"
18"	1'-2"	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"

GENERAL NOTES:
 Designed according to AASHTO LRFD Specifications.
 Reinforcing steel shall be placed with the center of the outside layer of bars 2" from the surface of the concrete.
 All reinforcing steel shall be Grade 60.
 All concrete shall be Class "C" and shall have a minimum compressive strength of 3600 psi.
 No bridge rails of any type may be mounted directly to these culvert headwalls.

Texas Department of Transportation
 Bridge Division

CONCRETE HEADWALLS WITH FLARED WINGS FOR 45° SKEW PIPE CULVERTS

CH-FW-45

FILE: chfw45se.dgn	DN: TxDOT	CK: TxDOT	OW: TxDOT	CK: GAF
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REVISIONS				
COUNTY	CONTROL	SECT	JOB	HIGHWAY