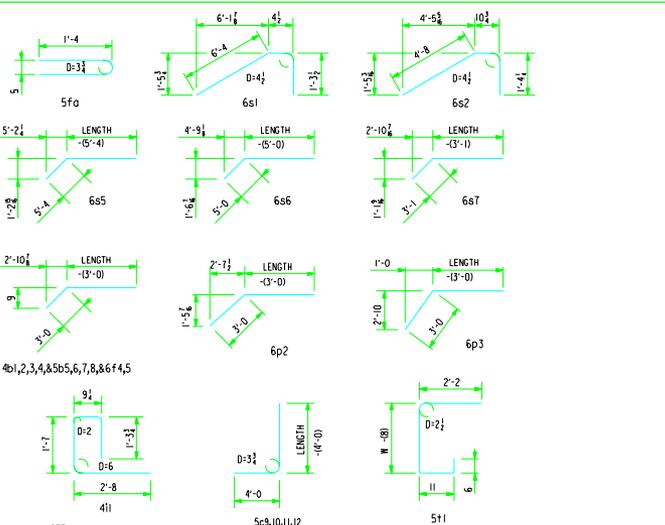


BILL OF REINFORCING FOR ONE HEADWALL 30° SKEW CULVERT 30" X CULVERT HEIGHT

LOCATION	SHAPE	BAR	12' X 12'	12' X 10'	12' X 8'	12' X 6'	10' X 12'	10' X 10'	10' X 8'	10' X 6'	8' X 10'	8' X 8'	8' X 6'	BAR
			NO. LENGTH WT.	NO. LENGTH WT.	NO. LENGTH WT.	NO. LENGTH WT.	NO. LENGTH WT.	NO. LENGTH WT.	NO. LENGTH WT.	NO. LENGTH WT.	NO. LENGTH WT.	NO. LENGTH WT.	NO. LENGTH WT.	
FENCE ANCHOR (GALV.)		5f0	2 3'-1 6	2 3'-1 6	2 3'-1 6	2 3'-1 6	2 3'-1 6	2 3'-1 6	2 3'-1 6	2 3'-1 6	2 3'-1 6	2 3'-1 6	2 3'-1 6	6 5f0
WINGWALL, B.F.H. L		4b1	1 54'-3 37	1 45'-11 32	1 37'-7 25	1 29'-3 20	1 54'-3 37	1 45'-11 32	1 37'-7 25	1 29'-3 20	1 45'-11 32	1 37'-7 25	1 29'-3 20	20 4b1
WINGWALL, B.F.H. L		4b2	1 41'-3 29	1 35'-1 23	1 28'-10 19	1 22'-7 15	1 41'-3 29	1 35'-1 23	1 28'-10 19	1 22'-7 15	1 35'-1 23	1 28'-10 19	1 22'-7 15	15 4b2
WINGWALL, B.F.H. L		4b3	10 VAR TO 52'-4	8 VAR TO 44'-0	6 VAR TO 35'-7	4 VAR TO 27'-4	10 VAR TO 52'-4	8 VAR TO 44'-0	6 VAR TO 35'-7	4 VAR TO 27'-4	10 VAR TO 52'-4	8 VAR TO 44'-0	6 VAR TO 35'-7	4 VAR TO 27'-4
WINGWALL, B.F.H. S		4b4	10 VAR TO 39'-10	8 VAR TO 33'-8	6 VAR TO 27'-4	4 VAR TO 21'-2	10 VAR TO 39'-10	8 VAR TO 33'-8	6 VAR TO 27'-4	4 VAR TO 21'-2	10 VAR TO 39'-10	8 VAR TO 33'-8	6 VAR TO 27'-4	4 VAR TO 21'-2
WINGWALL, F.F.H. L		5b5	1 54'-3 37	1 45'-11 32	1 37'-7 25	1 29'-3 20	1 54'-3 37	1 45'-11 32	1 37'-7 25	1 29'-3 20	1 45'-11 32	1 37'-7 25	1 29'-3 20	31 5b5
WINGWALL, F.F.H. S		5b6	1 41'-3 29	1 35'-1 23	1 28'-10 19	1 22'-7 15	1 41'-3 29	1 35'-1 23	1 28'-10 19	1 22'-7 15	1 35'-1 23	1 28'-10 19	1 22'-7 15	24 5b6
WINGWALL, F.F.H. L		5b7	10 VAR TO 37'-10	8 VAR TO 31'-8	6 VAR TO 25-4	4 VAR TO 19'-2	10 VAR TO 37'-10	8 VAR TO 31'-8	6 VAR TO 25-4	4 VAR TO 19'-2	10 VAR TO 37'-10	8 VAR TO 31'-8	6 VAR TO 25-4	4 VAR TO 19'-2
WINGWALL, F.F.H. S		5b8	10 VAR TO 39'-10	8 VAR TO 33'-8	6 VAR TO 27'-4	4 VAR TO 21'-2	10 VAR TO 39'-10	8 VAR TO 33'-8	6 VAR TO 27'-4	4 VAR TO 21'-2	10 VAR TO 39'-10	8 VAR TO 33'-8	6 VAR TO 27'-4	4 VAR TO 21'-2
CENTER WALL, BOTH F.H.		5b9	21 VAR TO 54'-4	17 VAR TO 46'-0	13 VAR TO 37-6	9 VAR TO 29-2	21 VAR TO 54'-4	17 VAR TO 46'-0	13 VAR TO 37-6	9 VAR TO 29-2	21 VAR TO 54'-4	17 VAR TO 46'-0	13 VAR TO 37-6	9 VAR TO 29-2
WINGWALL, F.F.V. L		4c1	5 VAR TO 14'-10	4 VAR TO 12'-11	3 VAR TO 10'-10	2 VAR TO 8'-10	5 VAR TO 14'-10	4 VAR TO 12'-11	3 VAR TO 10'-10	2 VAR TO 8'-10	5 VAR TO 14'-10	4 VAR TO 12'-11	3 VAR TO 10'-10	2 VAR TO 8'-10
WINGWALL, F.F.V. S		4c2	38 VAR TO 14'-9	24 VAR TO 12'-10	18 VAR TO 10'-11	12 VAR TO 8'-10	38 VAR TO 14'-9	24 VAR TO 12'-10	18 VAR TO 10'-11	12 VAR TO 8'-10	38 VAR TO 14'-9	24 VAR TO 12'-10	18 VAR TO 10'-11	12 VAR TO 8'-10
WINGWALL, F.F.V. L		4c3	2 13'-9 18	2 11'-9 16	1 9'-9 7	1 7'-9 5	2 13'-9 18	2 11'-9 16	1 9'-9 7	1 7'-9 5	2 13'-9 18	2 11'-9 16	1 9'-9 7	1 7'-9 5
WINGWALL, F.F.V. S		4c4	2 13'-9 18	2 11'-9 16	1 9'-9 7	1 7'-9 5	2 13'-9 18	2 11'-9 16	1 9'-9 7	1 7'-9 5	2 13'-9 18	2 11'-9 16	1 9'-9 7	1 7'-9 5
CENTER WALL, BOTH F.V.		4c5	54 VAR TO 12'-5	45 VAR TO 10'-5	36 VAR TO 8'-5	27 VAR TO 6'-6	54 VAR TO 12'-5	45 VAR TO 10'-5	36 VAR TO 8'-5	27 VAR TO 6'-6	54 VAR TO 12'-5	45 VAR TO 10'-5	36 VAR TO 8'-5	27 VAR TO 6'-6
CENTER WALL, BOTH F.V.		4c6	2 12'-7 17	2 10'-7 14	2 8'-7 11	2 6'-7 9	2 12'-7 17	2 10'-7 14	2 8'-7 11	2 6'-7 9	2 12'-7 17	2 10'-7 14	2 8'-7 11	2 6'-7 9
WINGWALL, B.F.V. L		5c7	11 VAR TO 5'-2	10 VAR TO 4'-6	9 VAR TO 4'-0	8 VAR TO 3'-4	11 VAR TO 5'-2	10 VAR TO 4'-6	9 VAR TO 4'-0	8 VAR TO 3'-4	11 VAR TO 5'-2	10 VAR TO 4'-6	9 VAR TO 4'-0	8 VAR TO 3'-4
WINGWALL, B.F.V. S		5c8	5 VAR TO 4'-2	4 VAR TO 3'-6	3 VAR TO 3'-0	2 VAR TO 2'-4	5 VAR TO 4'-2	4 VAR TO 3'-6	3 VAR TO 3'-0	2 VAR TO 2'-4	5 VAR TO 4'-2	4 VAR TO 3'-6	3 VAR TO 3'-0	2 VAR TO 2'-4
WINGWALL, B.F.V. L		5c9	40 VAR TO 9'-6	32 VAR TO 7'-6	24 VAR TO 5'-6	16 VAR TO 3'-6	40 VAR TO 9'-6	32 VAR TO 7'-6	24 VAR TO 5'-6	16 VAR TO 3'-6	40 VAR TO 9'-6	32 VAR TO 7'-6	24 VAR TO 5'-6	16 VAR TO 3'-6
WINGWALL, B.F.V. S		5c10	33 VAR TO 8'-6	27 VAR TO 6'-6	21 VAR TO 4'-6	15 VAR TO 2'-6	33 VAR TO 8'-6	27 VAR TO 6'-6	21 VAR TO 4'-6	15 VAR TO 2'-6	33 VAR TO 8'-6	27 VAR TO 6'-6	21 VAR TO 4'-6	15 VAR TO 2'-6
WINGWALL, B.F.V. L		5c11	30 VAR TO 10'-6	24 VAR TO 8'-6	18 VAR TO 6'-6	12 VAR TO 4'-6	30 VAR TO 10'-6	24 VAR TO 8'-6	18 VAR TO 6'-6	12 VAR TO 4'-6	30 VAR TO 10'-6	24 VAR TO 8'-6	18 VAR TO 6'-6	12 VAR TO 4'-6
WINGWALL, B.F.V. S		5c12	21 VAR TO 10'-6	15 VAR TO 8'-6	9 VAR TO 6'-6	3 VAR TO 4'-6	21 VAR TO 10'-6	15 VAR TO 8'-6	9 VAR TO 6'-6	3 VAR TO 4'-6	21 VAR TO 10'-6	15 VAR TO 8'-6	9 VAR TO 6'-6	3 VAR TO 4'-6
WINGWALL, B.F.V. S		5c12	2 17'-9 31	2 15'-9 33	1 13'-9 14	1 11'-9 12	2 17'-9 31	2 15'-9 33	1 13'-9 14	1 11'-9 12	2 17'-9 31	2 15'-9 33	1 13'-9 14	1 11'-9 12
APRON, LONGIT, BOT, L		4d1	17 31'-3 355	17 26'-8 303	17 22'-1 251	17 17'-5 198	15 31'-3 355	15 26'-8 303	15 22'-1 251	15 17'-5 198	13 31'-3 355	13 26'-8 303	13 22'-1 251	12 4d1
APRON, LONGIT, BOT, S		4d2	3 48'-0 100	3 39'-7 79	3 32'-4 63	3 23'-1 31	3 48'-0 100	3 39'-7 79	3 32'-4 63	3 23'-1 31	3 39'-7 79	3 32'-4 63	3 23'-1 31	4 4d2
APRON, LONGIT, BOT, S		4d3	3 36'-9 74	3 30'-8 61	3 24'-5 49	3 18'-4 37	3 36'-9 74	3 30'-8 61	3 24'-5 49	3 18'-4 37	3 36'-9 74	3 30'-8 61	3 24'-5 49	3 18'-4 37
APRON, LONGIT, TOP		6f1	24 31'-3 1127	24 26'-8 961	24 22'-1 786	24 17'-5 628	20 26'-8 801	20 22'-1 663	20 17'-5 523	16 26'-8 641	16 22'-1 531	16 17'-5 419	16 17'-5 419	6f1
APRON, LONGIT, TOP		6f2	11 VAR TO 5'-4	9 VAR TO 4'-6	7 VAR TO 3'-8	5 VAR TO 3'-0	11 VAR TO 5'-4	9 VAR TO 4'-6	7 VAR TO 3'-8	5 VAR TO 3'-0	11 VAR TO 5'-4	9 VAR TO 4'-6	7 VAR TO 3'-8	5 VAR TO 3'-0
APRON, LONGIT, TOP		6f3	8 VAR TO 7'-0	7 VAR TO 6'-4	6 VAR TO 5'-8	5 VAR TO 5'-2	8 VAR TO 7'-0	7 VAR TO 6'-4	6 VAR TO 5'-8	5 VAR TO 5'-2	8 VAR TO 7'-0	7 VAR TO 6'-4	6 VAR TO 5'-8	5 VAR TO 5'-2
APRON, LONGIT, TOP		6f4	1 54'-3 37	1 45'-11 32	1 37'-7 25	1 29'-3 20	1 54'-3 37	1 45'-11 32	1 37'-7 25	1 29'-3 20	1 45'-11 32	1 37'-7 25	1 29'-3 20	4 6f4
APRON, LONGIT, TOP		6f5	1 41'-3 29	1 35'-1 23	1 28'-10 19	1 22'-7 15	1 41'-3 29	1 35'-1 23	1 28'-10 19	1 22'-7 15	1 35'-1 23	1 28'-10 19	1 22'-7 15	4 6f5
PARAPET, VERTICAL		4l1	51 6'-4 216	49 6'-4 207	49 6'-4 207	49 6'-4 207	49 6'-4 216	47 6'-4 201	45 6'-4 193	41 6'-4 173	41 6'-4 173	41 6'-4 173	41 6'-4 173	41 6f1
PARAPET, HORIZONTAL		7j1	4 42'-8 236	4 29'-0 237	4 28'-11 237	4 28'-11 237	4 42'-8 236	4 29'-0 237	4 28'-11 237	4 28'-11 237	4 28'-11 237	4 28'-11 237	4 28'-11 237	4 7j1
APRON, TRANS, TOP		6m1	12 VAR TO 31'-2	10 VAR TO 28'-10	8 VAR TO 25-4	6 VAR TO 22-0	12 VAR TO 31'-2	10 VAR TO 28'-10	8 VAR TO 25-4	6 VAR TO 22-0	12 VAR TO 31'-2	10 VAR TO 28'-10	8 VAR TO 25-4	6 VAR TO 22-0
APRON, TRANS, TOP		6m2	18 VAR TO 37'-8	15 VAR TO 33-0	12 VAR TO 28'-10	9 VAR TO 24'-10	18 VAR TO 37'-8	15 VAR TO 33-0	12 VAR TO 28'-10	9 VAR TO 24'-10	18 VAR TO 37'-8	15 VAR TO 33-0	12 VAR TO 28'-10	9 VAR TO 24'-10
APRON, TRANS, TOP		6m3	10 VAR TO 18'-8	8 VAR TO 16'-8	6 VAR TO 14'-8	4 VAR TO 12'-8	10 VAR TO 18'-8	8 VAR TO 16'-8	6 VAR TO 14'-8	4 VAR TO 12'-8	10 VAR TO 18'-8	8 VAR TO 16'-8	6 VAR TO 14'-8	4 VAR TO 12'-8
APRON, TRANS, TOP		6m4	6 18'-2 164	6 16'-10 152	6 15'-8 142	6 14'-6 130	6 18'-2 164	6 16'-10 152	6 15'-8 142	6 14'-6 130	6 18'-2 164	6 16'-10 152	6 15'-8 142	6 14'-6 130
APRON, TRANS, BOT, L		6n5	24 VAR TO 11'-2	20 VAR TO 9'-6	16 VAR TO 8'-0	12 VAR TO 6'-4	24 VAR TO 11'-2	20 VAR TO 9'-6	16 VAR TO 8'-0	12 VAR TO 6'-4	24 VAR TO 11'-2	20 VAR TO 9'-6	16 VAR TO 8'-0	12 VAR TO 6'-4
CURTAIN, HORIZONTAL		6p1	4 29'-4 176	4 29'-1 175	4 29'-1 175	4 24'-8 148	4 29'-4 176	4 29'-1 175	4 29'-1 175	4 24'-8 148	4 29'-4 176	4 29'-1 175	4 29'-1 175	4 4p1
CURTAIN, HORIZONTAL		6p2	4 28'-0 168	4 24'-0 144	4 20'-0 120	4 16'-0 96	4 28'-0 168	4 24'-0 144	4 20'-0 120	4 16'-0 96	4 28'-0 168	4 24'-0 144	4 20'-0 120	4 16'-0 96
CURTAIN, HORIZONTAL		6p3	4 16'-0 96	4 13'-11 84	4 11'-10 71	4 9'-8 58	4 16'-0 96	4 13'-11 84	4 11'-10 71	4 9'-8 58	4 16'-0 96	4 13'-11 84	4 11'-10 71	4 9'-8 58
WING SLOPE, BOTH F. L		6s1	2 8'-0 24	2 8'-0 24	2 8'-0 24	2 8'-0 24	2 8'-0 24	2 8'-0 24	2 8'-0 24	2 8'-0 24	2 8'-0 24	2 8'-0 24	2 8'-0 24	2 8s1
WING SLOPE, BOTH F. S		6s2	2 6'-11 21	2 6'-11 21	2 6'-11 21	2 6'-11 21	2 6'-11 21	2 6'-11 21	2 6'-11 21	2 6'-11 21	2 6'-11 21	2 6'-11 21	2 6'-11 21	2 6s2
WING SLOPE, BOTH F. L		6s3	2 49'-4 154	2 40'-9 128	2 32'-2 97	2 23'-7 71	2 49'-4 154	2 40'-9 128	2 32'-2 97	2 23'-7 71	2 49'-4 154	2 40'-9 128	2 32'-2 97	2 23'-7 71
WING SLOPE, BOTH F. S		6s4	2 38'-6 116	2 31'-11 96	2 25-4 76	2 18'-10 57	2 38'-6 116	2 31'-11 96	2 25-4 76	2 18'-10 57	2 38'-6 116	2 31'-11 96	2 25-4 76	2 18'-10 57
WING SLOPE, F.F. L		6s5	1 54'-3 37	1 46'-0 32	1 37'-5 25	1 28'-10 19	1 54'-3 37	1 46'-0 32	1 37'-5 25	1 28'-10 19	1 54'-3 37	1 46'-0 32	1 37'-5 25	1 28'-10 19
WING SLOPE, F.F. S		6s6	1 42'-8 27	1 36'-4 24	1 29'-1 17	1 22'-7 15	1 42'-8 27	1 36'-4 24	1 29'-1 17	1 22'-7 15	1 42'-8 27	1 36'-4 24	1 29'-1 17	1 22'-7 15
CURTAIN, WALL, BOTH F.H.		6s7	2 32'-11 95	2 27'-11 84	2 22'-11 69	2 17'-11 54	2 32'-11 95	2 27'-11 84	2 22'-11 69	2 17'-11 54	2 32'-11 95	2 27'-11 84	2 22'-11 69	2 17'-11 54
CURTAIN, WALL, VERT.		6s8	49 7'-1 405	43 7'-5 333	38 6'-11 274	34 6'-5 228	49 7'-1 405	43 7'-5 333	38 6'-11 274	34 6'-5 228	49 7'-1 405	43 7'-5 333	38 6'-11 274	34 6'-5 228

BENT BAR DETAILS



NOTE: ALL DIMENSIONS ARE OUT TO OUT.
D = PIN DIAMETER.

NOTE: INCLUDE TOP OF WINGWALL QUANTITIES.
WEIGHT OF BARS OVER 40'-0 LONG INCLUDE AN ALLOWANCE OF 2'-0 FOR LAP.

SUBSCRIPT 1 DENOTES LONG WING.
SUBSCRIPT 2 DENOTES SHORT WING.

NOTES:
1. SEE DRAWING THREE-DIGIT-87 FOR GENERAL INFORMATION, SPECIFICATIONS, AND DESIGN STRESSES.

HEADWALL NOTES:
THIS HEADWALL IS BASED ON A 3:1 SLOPE NORMAL TO CENTERLINE OF ROADWAY.
THE SIDES OF THE FOOTING ARE TO BE FORMED TO INSURE CORRECT LINE AND GRADE.
ALL EXPOSED CORNERS OF 90° OR SHARPER ARE TO BE FILLETED WITH A 1" DRESSED AND BEVELLED STRIP.
ALL REINFORCING IS TO BE SECURELY WOUND IN PLACE BEFORE THE CONCRETE IS POURED. ALL SLAB AND FLOOR REINFORCING STEEL IS TO BE SUPPORTED BY BAR CHAIRS AT INTERVALS OF NOT MORE THAN 3'-0 IN EITHER DIRECTION AS OUTLINED IN THE STANDARD SPECIFICATIONS.
THE LENGTH COLUMN REFLECTS TOTAL NUMBER OF FEET NECESSARY TO MEET THESE REQUIREMENTS.

CONCRETE QUANTITIES ARE ESTIMATED FROM BACK OF PARAPET.
HORIZONTAL TAILS OF BARS "a" & "b" ESTIMATED TO EXTEND 2'-0 BEYOND BACK OF PARAPET (UNTIL END OF BARREL). LONGITUDINAL BARS "c", "d", "e", "f", "g", "h", "i", "j", "k", "l", "m", "n", "o", "p", "q", "r", "s", "t", "u", "v", "w", "x", "y", "z", "aa", "ab", "ac", "ad", "ae", "af", "ag", "ah", "ai", "aj", "ak", "al", "am", "an", "ao", "ap", "aq", "ar", "as", "at", "au", "av", "aw", "ax", "ay", "az", "ba", "bb", "bc", "bd", "be", "bf", "bg", "bh", "bi", "bj", "bk", "bl", "bm", "bn", "bo", "bp", "bq", "br", "bs", "bt", "bu", "bv", "bw", "bx", "by", "bz", "ca", "cb", "cc", "cd", "ce", "cf", "cg", "ch", "ci", "cj", "ck", "cl", "cm", "cn", "co", "cp", "cq", "cr", "cs", "ct", "cu", "cv", "cw", "cx", "cy", "cz", "da", "db", "dc", "dd",