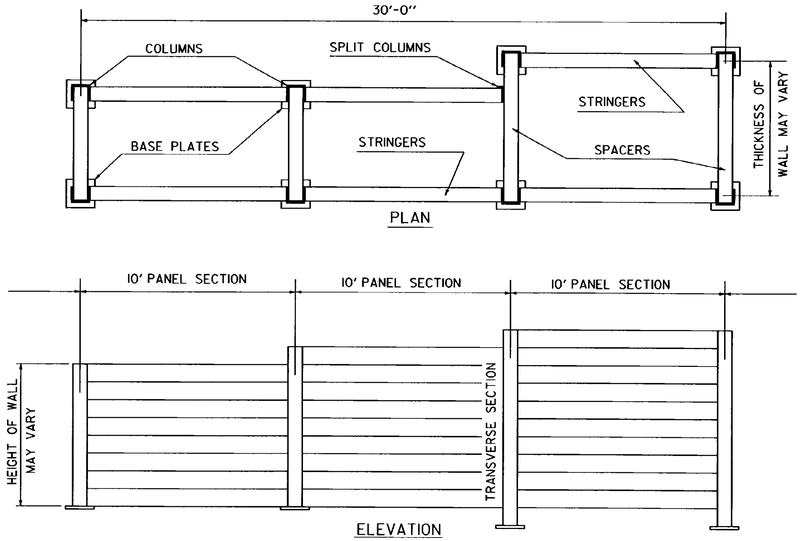


PLAN AND ELEVATION OF TYPICAL WALL

UNITS REQUIRED FOR PANEL SECTIONS

WALL HEIGHT FEET	WALL HEIGHT FEET-IN.	STRINGER 9'-6" GAGE 16	14	12	10	STRINGER STIFFENER 9'-6"
4.00	4'-0"	4				1
5.33	5'-4"	6				1
6.67	6'-8"	8				1
8.00	8'-0"	10				1
9.33	9'-4"	12				1
10.67	10'-8"	14				1
12.00	12'-0"	14	2			1
13.33	13'-4"	14	4			1
14.67	14'-8"	14	6			1
16.00	16'-0"	14	8			1
17.33	17'-4"	14	8	2		1
18.67	18'-8"	14	8	4		1
20.00	20'-0"	14	8	6		1
21.33	21'-4"	14	8	8		1
22.67	22'-8"	14	8	10		1
24.00	24'-0"	14	8	12		1
25.33	25'-4"	14	8	14		1
26.67	26'-8"	14	8	14	2	1
28.00	28'-0"	14	8	14	4	1
29.33	29'-4"	14	8	14	6	1
30.67	30'-8"	14	8	14	8	1

NOTE :
THIS TABLE APPLIES ONLY TO STANDARD PANEL SECTIONS AND INCLUDES UNITS FOR BOTH FRONT AND REAR OF A 10 FOOT ELEMENT OF WALL.

UNITS REQUIRED FOR SHORT PANEL SECTIONS

WALL HEIGHT FEET	SHORT STRINGERS IN FRONT OF WALL: 16 GAGE STD 9.5'	16 GAGE SHORT 9.0'	14 GAGE STD 9.5'	14 GAGE SHORT 9.0'	12 GAGE STD 9.5'	12 GAGE SHORT 9.0'	10 GAGE STD 9.5'	10 GAGE SHORT 9.0'	SHORT STRINGER STIFFENER	SHORT STRINGERS IN REAR OF WALL: 16 GAGE STD 9.5'	16 GAGE SHORT 9.0'	14 GAGE STD 9.5'	14 GAGE SHORT 9.0'	12 GAGE STD 9.5'	12 GAGE SHORT 9.0'	10 GAGE STD 9.5'	10 GAGE SHORT 9.0'	STANDARD STRINGER STIFFENER
4.00	1	3							1	3	1							1
5.33	2	4							1	4	2							1
6.67	3	5							1	5	3							1
8.00	4	6							1	6	4							1
9.33	5	7							1	7	5							1
10.67	6	8							1	8	6							1
12.00	6	8	1	1					1	8	6	1	1					1
13.33	6	8	2	2					1	8	6	2	2					1
14.67	6	8	3	3					1	8	6	3	3					1
16.00	6	8	4	4					1	8	6	4	4					1
17.33	6	8	4	4	1	1			1	8	6	4	4	1	1			1
18.67	6	8	4	4	2	2			1	8	6	4	4	2	2			1
20.00	6	8	4	4	3	3			1	8	6	4	4	3	3			1
21.33	6	8	4	4	4	4			1	8	6	4	4	4	4			1
22.67	6	8	4	4	5	5			1	8	6	4	4	5	5			1
24.00	6	8	4	4	6	6			1	8	6	4	4	6	6			1
25.33	6	8	4	4	7	7			1	8	6	4	4	7	7			1
26.67	6	8	4	4	7	7	1	1	1	8	6	4	4	7	7	1	1	1
28.00	6	8	4	4	7	7	2	2	1	8	6	4	4	7	7	2	2	1
29.33	6	8	4	4	7	7	3	3	1	8	6	4	4	7	7	3	3	1
30.67	6	8	4	4	7	7	4	4	1	8	6	4	4	7	7	4	4	1

NOTE:
THIS TABLE APPLIES ONLY TO SHORT PANEL SECTIONS FOR CURVED WALLS AND INCLUDES UNITS FOR BOTH FRONT AND REAR OF A 9.5 FOOT ELEMENT OF WALL.

UNITS REQUIRED FOR TRANSVERSE SECTIONS

DESIGN	WALL HEIGHT FEET	WALL HEIGHT FEET IN.	BEARING PLATES	FRONT COLUMN HEIGHT IN FEET: 1st LIFT	2nd LIFT	3rd LIFT	TOTAL HEIGHT	REAR COLUMN HEIGHT IN FEET: 1st LIFT	2nd LIFT	3rd LIFT	TOTAL HEIGHT	TOTAL COLUMN LENGTH IN FEET	COLUMN SPLICE	COLUMN CAP	SPACERS GAGE AND LENGTH: 16 / 5.2	16 / 7.4	14 / 9.6	12 / 11.8	12 / 14.0	BOTTOM SPACERS GAGE AND LENGTH: 16 / 5.2	16 / 7.4	14 / 9.6	12 / 11.8	12 / 14.0	WALL HEIGHT FEET	DESIGN
A	4.00	4'-0"	2	4.00			4.00	1.33			1.33	5.33		1	0					1					4.00	A
	5.33	5'-4"	2	5.33			5.33	2.67			2.67	8.00		1	1					1					5.33	
	6.67	6'-8"	2	6.67			6.67	4.00			4.00	10.67		1	2					1					6.67	
	8.00	8'-0"	2	8.00			8.00	5.33			5.33	13.33		1	3					1					8.00	
	9.33	9'-4"	2	9.33			9.33	6.67			6.67	16.00		1	4					1					9.33	
	10.67	10'-8"	2	10.67			10.67	8.00			8.00	18.67		1	5					1					10.67	
B	9.33	9'-4"	2	9.33			9.33	6.67			6.67	16.00		1		4					1				9.33	B
	10.67	10'-8"	2	10.67			10.67	8.00			8.00	18.67		1		5					1				10.67	
	12.00	12'-0"	2	12.00			12.00	9.33			9.33	21.33		1		6					1				12.00	
	13.33	13'-4"	2	8.00	5.33		13.33	10.67			10.67	24.00	1	1		7					1				13.33	
	14.67	14'-8"	2	8.00	6.67		14.67	12.00			12.00	26.67	1	1		8					1				14.67	
	16.00	16'-0"	2	8.00	8.00		16.00	8.00	5.33		13.33	29.33	2	1		9					1				16.00	
	17.33	17'-4"	2	12.00	5.33		17.33	8.00	6.67		14.67	32.00	2	1		10					1				17.33	
C	14.67	14'-8"	2	8.00	6.67		14.67	12.00			12.00	26.67	1	1			8					1			14.67	C
	16.00	16'-0"	2	8.00	8.00		16.00	8.00	5.33		13.33	29.33	2	1			9					1			16.00	
	17.33	17'-4"	2	12.00	5.33		17.33	8.00	6.67		14.67	32.00	2	1			10					1			17.33	
	18.67	18'-8"	2	12.00	6.67		18.67	8.00	8.00		16.00	34.67	2	1			11					1			18.67	
	20.00	20'-0"	2	12.00	8.00		20.00	12.00	5.33		17.33	37.33	2	1			12					1			20.00	
	21.33	21'-4"	2	12.00	9.33		21.33	12.00	6.67		18.67	40.00	2	1			13					1			21.33	
D	18.67	18'-8"	2	12.00	6.67		18.67	8.00	8.00		16.00	34.67	2	1				11					1		18.67	D
	20.00	20'-0"	2	12.00	8.00		20.00	12.00	5.33		17.33	37.33	2	1				12					1		20.00	
	21.33	21'-4"	2	12.00	9.33		21.33	12.00	6.67		18.67	40.00	2	1				13					1		21.33	
	22.67	22'-8"	2	12.00	10.67		22.67	12.00	8.00		20.00	42.67	2	1				14					1		22.67	
	24.00	24'-0"	2	12.00	12.00		24.00	12.00	9.33		21.33	45.33	2	1				15					1		24.00	
	25.33	25'-4"	2	12.00	8.00	5.33	25.33	12.00	10.67		22.67	48.00	3	1				16					1		25.33	
	26.67	26'-8"	2	12.00	8.00	6.67	26.67	12.00	12.00		24.00	50.67	3	1				17					1		26.67	
E	22.67	22'-8"	2	12.00	10.67		22.67	12.00	8.00		20.00	42.67	2	1					14					1	22.67	E
	24.00	24'-0"	2	12.00	12.00		24.00	12.00	9.33		21.33	45.33	2	1					15					1	24.00	
	25.33	25'-4"	2	12.00	8.00	5.33	25.33	12.00	10.67		22.67	48.00	3	1					16					1	25.33	
	26.67	26'-8"	2	12.00	8.00	6.67	26.67	12.00	12.00		24.00	50.67	3	1					17					1	26.67	
	28.00	28'-0"	2	12.00	8.00	8.00	28.00	12.00	8.00	5.33	25.33	53.33	4	1					18					1	28.00	
	29.33	29'-4"	2	12.00	12.00	5.33	29.33	12.00	8.00	6.67	26.67	56.00	4	1					19					1	29.33	
	30.67	30'-8"	2	12.00	12.00	6.67	30.67	12.00	8.00	8.00	28.00	58.67	4	1					20					1	30.67	

BEARING PLATES 16" x 22"

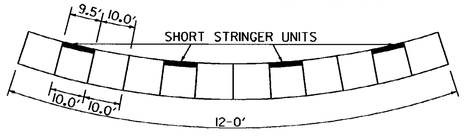
NOTE :
SPLIT COLUMNS ARE USED WHERE CHANGES IN THICKNESS OF WALL ARE MADE TO CONNECT REAR STRINGERS OF THINNER WALL TO TRANSVERSE SECTION OF THICKER WALL. THEY ARE THE SAME HEIGHT AS THE REAR COLUMNS FOR THE THINNER WALL.

CURVE DATA FOR BIN-TYPE RETAINING WALLS

DESIGN	WALL HEIGHT IN FEET	DEGREE OF CURVE 1 / RADIUS OF CURVE 5730	2 / 2865	3 / 1910	4 / 1432	5 / 1146	6 / 955	7 / 819	8 / 716	9 / 637	10 / 573	11 / 521	12 / 477	13 / 441	14 / 409	15 / 382	16 / 358	17 / 337	18 / 318	19 / 302	20 / 286	21 / 273	22 / 260	23 / 249	24 / 238	25 / 229	26 / 220	27 / 212	28 / 205	29 / 198	30 / 191	31 / 185	32 / 179	33 / 174	34 / 169	35 / 164
A	4.00	61	31	20	15	12	10	9	8	7	6	6	5	5	4	4	4	4	3	3	3	3	3	3	3	2	2	2	2	2	2	2	2	2	2	2
	5.33	61	31	20	15	12	10	9	8	7	6	6	5	5	4	4	4	4	3	3	3	3	3	3	3	2	2	2	2	2	2	2	2	2	2	2
	6.67	61	31	20	15	12	10	9	8	7	6	6	5	5	4	4	4	4	3	3	3	3	3	3	3	2	2	2								
	8.00	61	31	20	15	12	10	9	8	7	6	6	5	5	4	4	4	4	3	3	3	3	3													
	9.33	61	31	20	15	12	10	9	8	7	6	6	5	5	4	4	4	4	3	3	3															
	10.67	61	31	20	15	12	10	9	8	7	6	6	5	5	4	4	4	4																		
B	9.33	42	21	14	10	8	7	6	5	5	4	4	3	3	3	3	3	2	2	2																
	10.67	42	21	14	10	8	7	6	5	5	4	4	3	3	3	3	2	2																		
	12.00	42	21	14	10	8	7	6	5	5	4	4	3	3	3	3																				
	13.33	42	21	14	10	8	7	6	5	5	4	4	3	3																						
	14.67	42	21	14	10	8	7	6	5	5	4	4	3																							
	16.00	42	21	14	10	8	7	6	5	5	4	4																								
	17.33	42	21	14	10	8	7	6	5	5	4																									
C	14.67	32	16	10	8	6	5	5	4	4	3	3	3																							
	16.00	32	16	10	8	6	5	5	4	4	3	3																								
	17.33	32	16	10	8	6	5	5	4	4	3																									
	18.67	32	16	10	8	6	5	5	4	4																										
	20.00	32	16	10	8	6	5	5	4	4																										
	21.33	32	16	10	8	6	5	5	4																											
D	18.67	25	13	9	6	5	4	4	3	3																										
	20.00	25	13	9	6	5	4	4	3	3																										
	21.33	25	13	9	6	5	4	4	3																											
	22.67	25	13	9	6	5	4	4	3																											
	24.00	25	13	9	6	5	4	4																												
	25.33	25	13	9	6	5	4	4																												
	26.67	25	13	9	6	5	4																													
E	22.67	21	10	7	5	4	3	3	3																											
	24.00	21	10	7	5	4	3	3																												
	25.33	21	10	7	5	4	3	3																												
	26.67	21	10	7	5	4	3																													
	28.00	21	10	7	5	4	3																													
	29.33	21	10	7	5	4	3																													
	30.67	21	10	7	5	4																														

FIGURES IN TABLE INDICATE NUMBER OF BINS WHICH ONE SET OF SHORT STRINGERS MUST BE INCLUDED IN THE FRONT OR REAR OF ONE BIN TO PRODUCE CURVES. EXAMPLE : A WALL 10.67 FEET IN HEIGHT, DESIGN (B) MUST HAVE ONE SET OF SHORT STRINGER UNITS INCLUDED IN EVERY 3 BINS IN ORDER TO BUILD ON A 15 CURVE.

STRINGER UNITS ARE STANDARD EXCEPT AS NOTED BELOW
DIMENSIONS ARE TO COLUMN CENTERS



NOTE :
CURVATURE LIMITS ARE ESTABLISHED BY THE VARIATION IN CENTER TO CENTER SPACING BETWEEN THE TOP AND BOTTOM OF COLUMNS RESULTING FROM SLIGHT PLAY AT THE JOINTS. THE DIFFERENCE IN THE CHORD LENGTHS AT THE TOP AND BOTTOM OF EACH PANEL VARIES WITH THE BATTER IN THE WALL BECAUSE OF DIFFERENT RADII AT THE TOP AND BOTTOM OF THE WALL. DATA SET FORTH IN THIS TABLE APPLY ONLY TO WALLS ON BATTER OF 2 INCHES PER FOOT.

REVISIONS AND CORRECTIONS

DEC. 14, 1971 - ORIGINAL APPROVAL
JUNE 1, 1994 - REISSUED, WITHOUT CHANGE, UNDER NEW SIGNATURES.

APPROVED,

APPROVED FOR THIS PROJECT AND/OR DESIGN IMPLEMENTATION. FHWA FINAL APPROVAL PENDING.

Gordon S. MacArthur, P.E.
DIRECTOR OF ENGINEERING

Robert M. Murphy, P.E.
DESIGN ENGINEER

METAL BIN-TYPE RETAINING WALL

VERMONT AGENCY OF TRANSPORTATION

STANDARD
H-1b