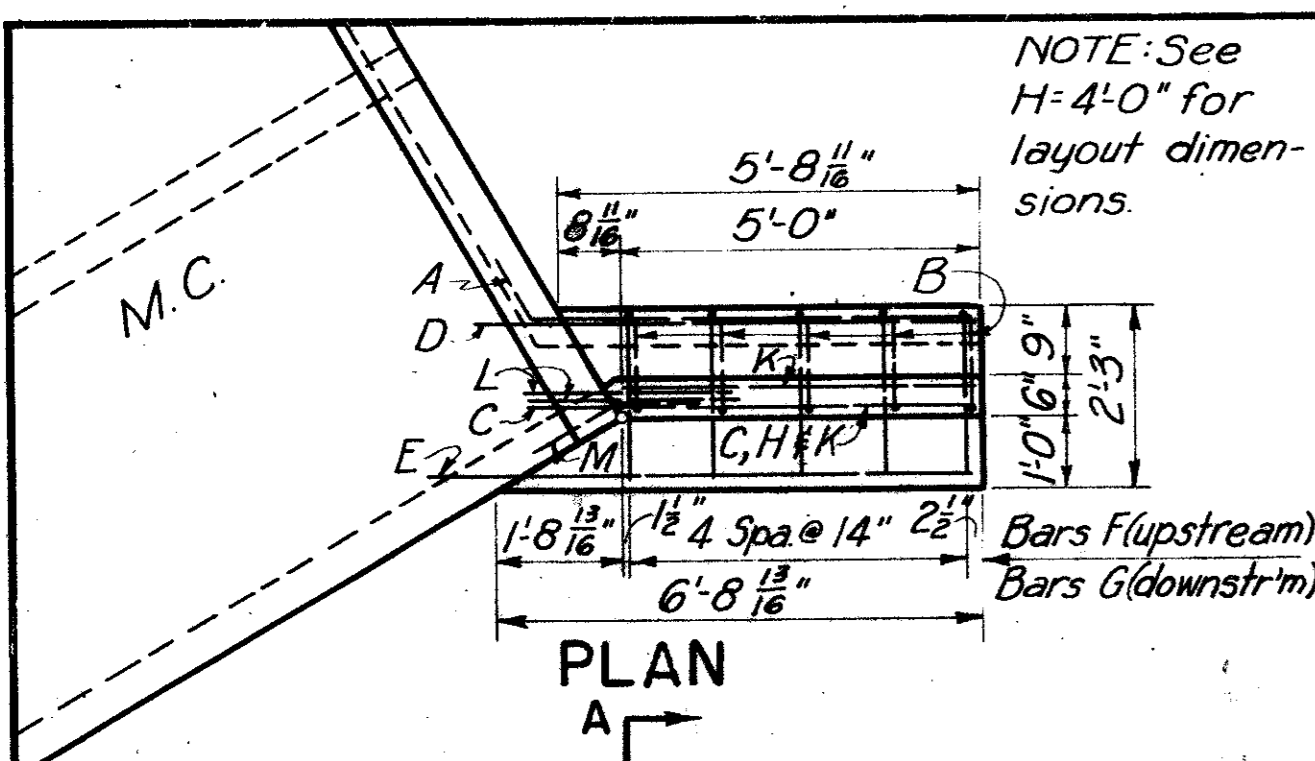


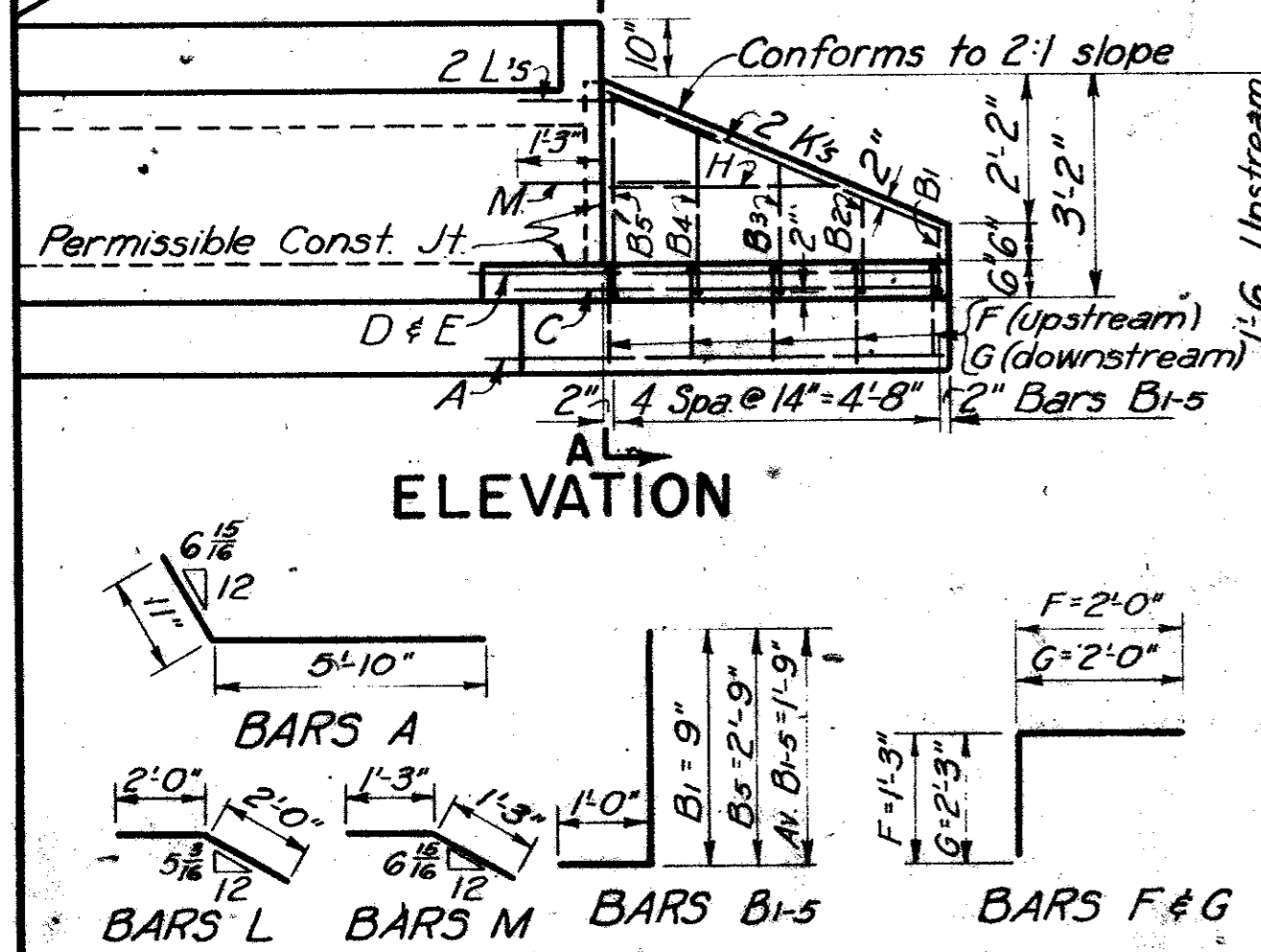
DATE: _____ BY: _____
 SURVEYED, PLOTTED, CHECKED, NO. _____
 NOTE BOOK GRADES CHECKED, RT. OF WAY CHECKED, NO. _____
 PLAN

DATE: _____ BY: _____
 SURVEYED, PLOTTED, CHECKED, NO. _____
 NOTE BOOK GRADES CHECKED, E. M. S. NOTED, STRUCTURE INDICATED, NO. _____
 PROFILE



NOTE: See H=4'-0" for layout dimensions.

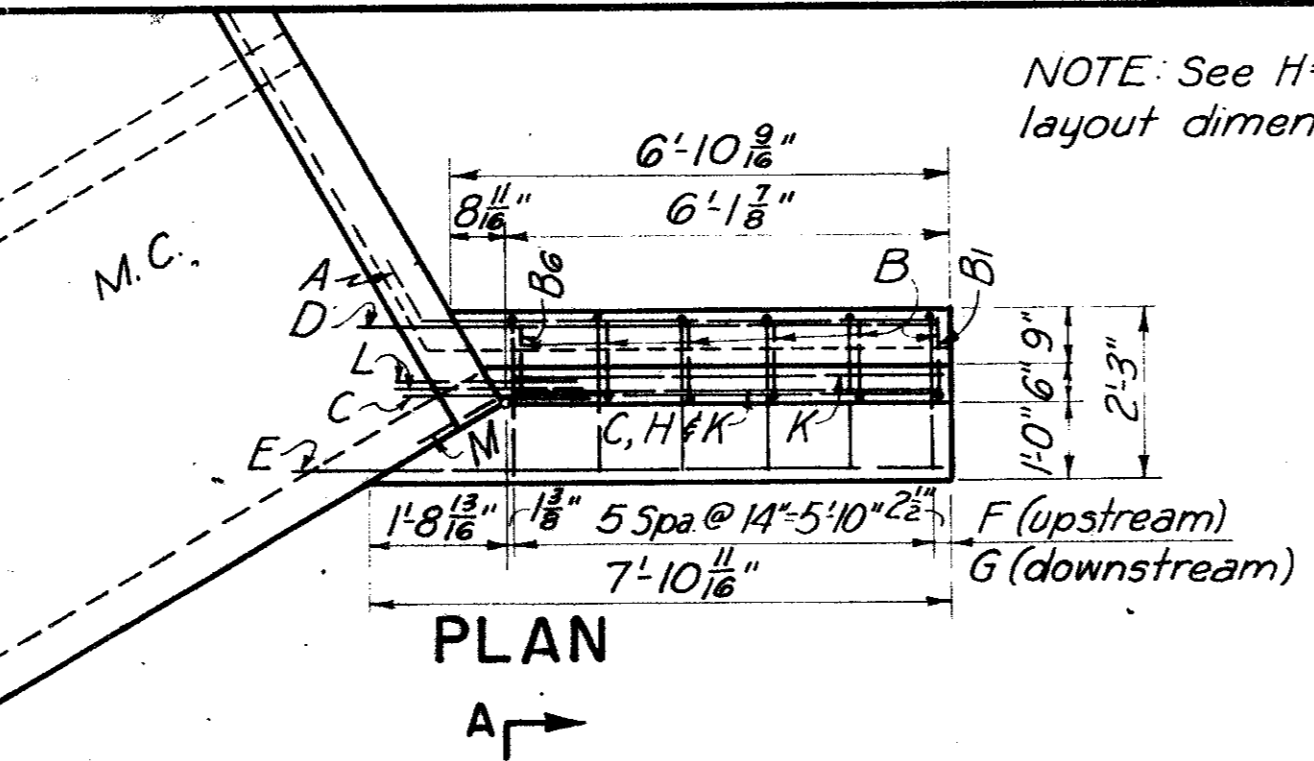
BAR NO.	SIZE	SPA	LGTH	WT.	
A	4	#4	6'-9"	18	
B	20	#4	14"	289	
C	4	#4	6'-3"	17	
D	4	#4	6'-9"	18	
E	4	#4	7'-5"	20	
F	10	#4	14"	3'-3"	22
G	10	#4	14"	4'-3"	28
H	4	#4	3'-1"	8	
K	8	#4	5'-2"	28	
L	8	#5	4'-0"	33	
M	4	#4	2'-6"	7	
TOTAL FOR 4 WINGS 236					



ESTIMATED QUANT. - 4 WINGS

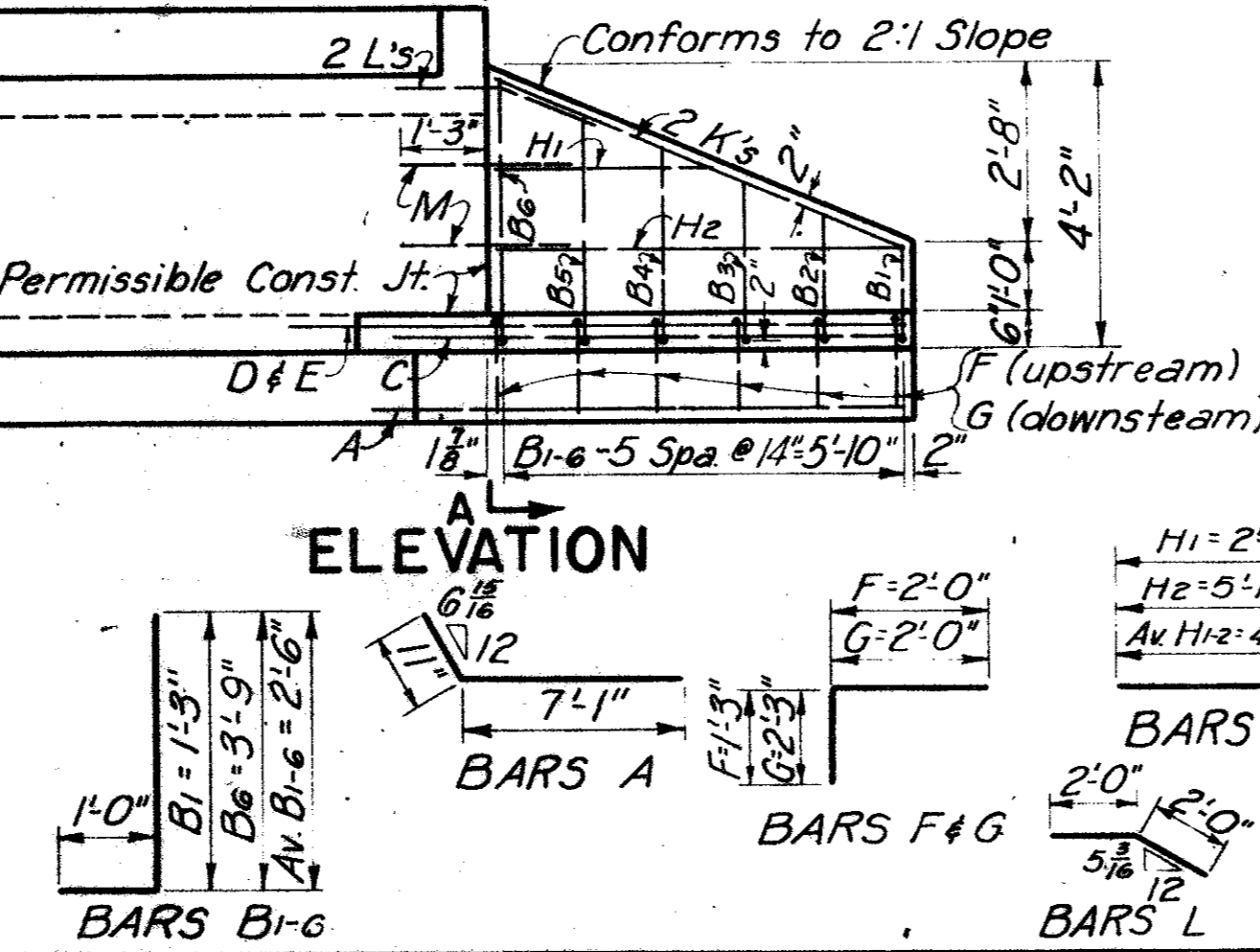
ITEM	UNIT	QUANT.
CONCRETE	C.Y.	2.16
REINF. STEEL	LB.	236

WINGWALLS FOR M.C.'s H=2'-0"



NOTE: See H=4'-0" for layout dimensions.

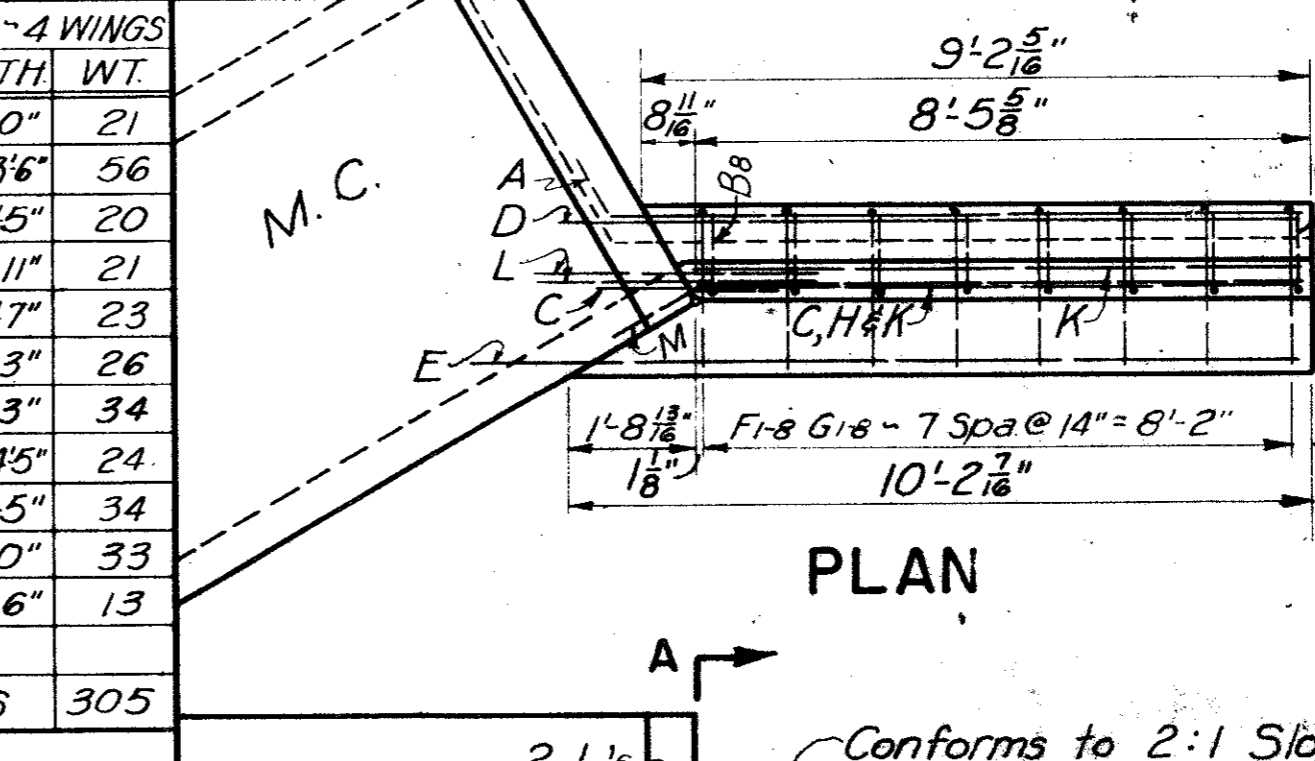
BAR NO.	SIZE	SPA	LGTH	WT.	
A	4	#4	8'-0"	21	
B	24	#4	14"	Av 3'6"	56
C	4	#4	7'-5"	20	
D	4	#4	7'-11"	21	
E	4	#4	8'-7"	23	
F	12	#4	14"	3'-3"	26
G	12	#4	14"	4'-3"	34
H	8	#4	15"	Av 4'5"	24
K	8	#4	6'-5"	34	
L	8	#5	4'-0"	33	
M	8	#4	15"	2'-6"	13
TOTAL FOR 4 WINGS 305					



ESTIMATED QUANT. - 4 WINGS

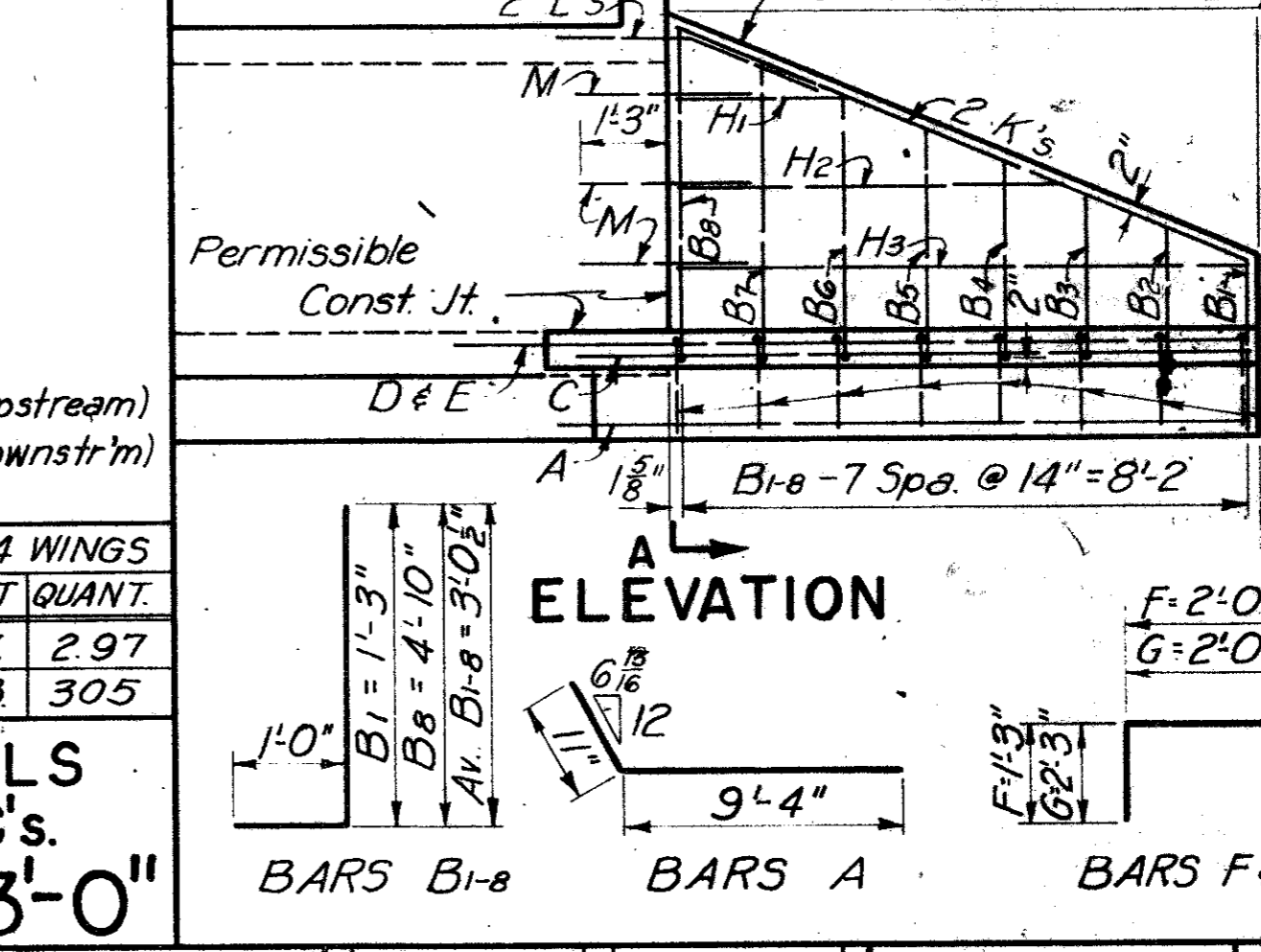
ITEM	UNIT	QUANT.
CONCRETE	C.Y.	2.97
REINF. STEEL	LB.	305

WINGWALLS FOR M.C.'s H=3'-0"



NOTE: See H=4'-0" for layout dimensions.

BAR NO.	SIZE	SPA	LGTH	WT.	
A	4	#4	10'-3"	27	
B	32	#4	14"	Av 4'0"	86
C	4	#4	9'-3"	26	
D	4	#4	10'-2"	27	
E	4	#5	11'-5"	48	
F	16	#4	14"	3'-3"	35
G	16	#4	14"	4'-3"	45
H	12	#4	15"	Av 5'4"	43
K	8	#5	9'-0"	75	
L	8	#5	4'-0"	33	
M	12	#4	15"	2'-6"	20
TOTAL FOR 4 WINGS 465					



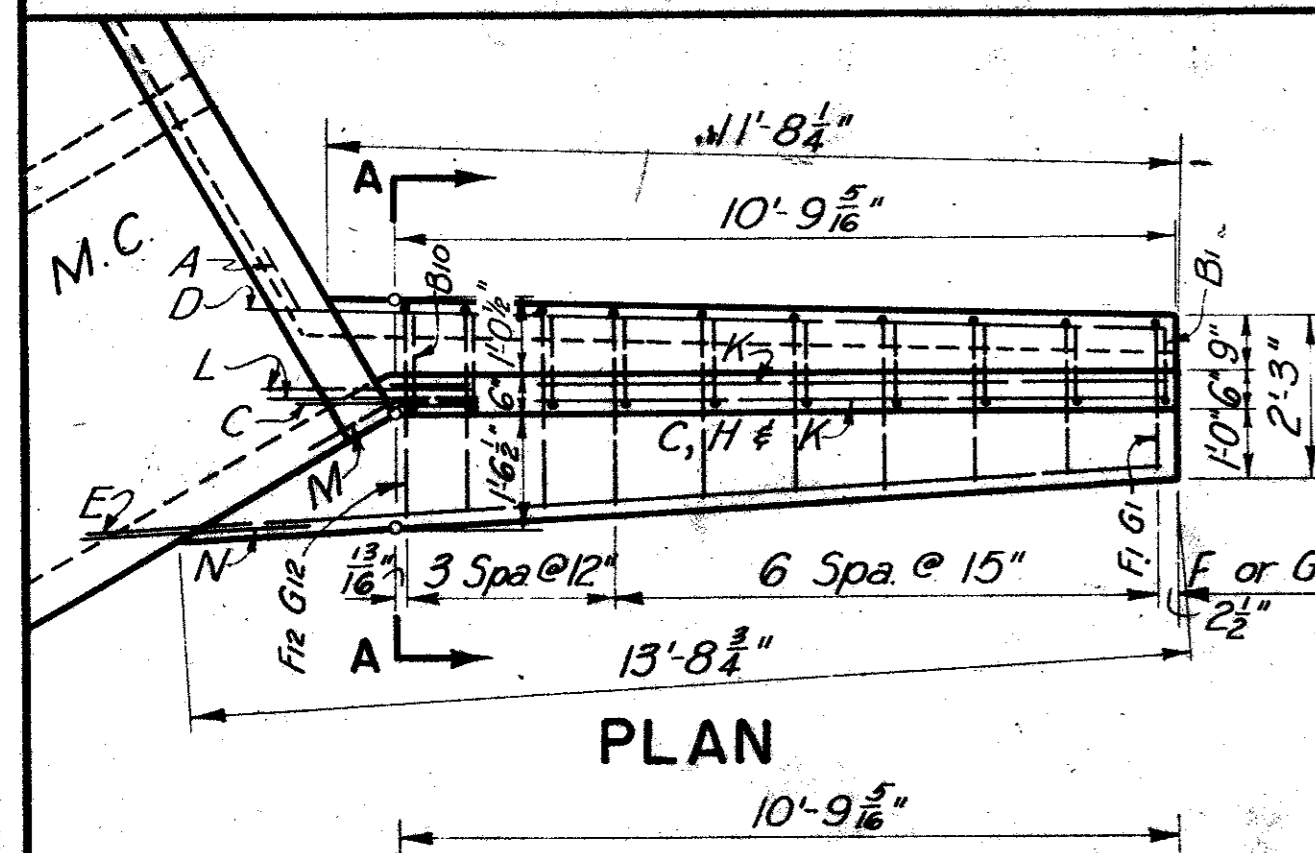
ESTIMATED QUANT. - 4 WINGS

ITEM	UNIT	QUANT.
CONCRETE	C.Y.	4.34
REINF. STEEL	LB.	465

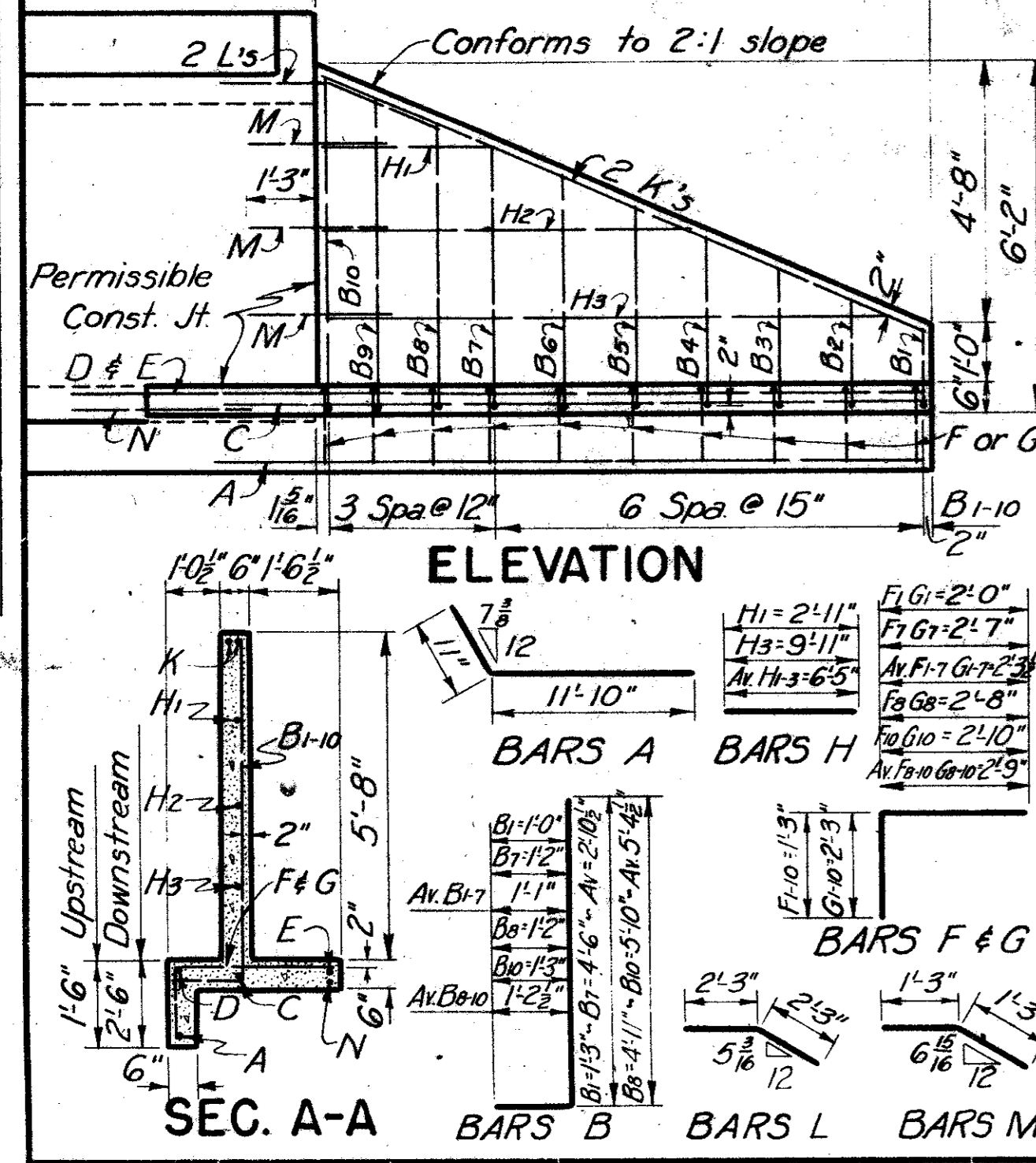
WINGWALLS FOR M.C.'s H=4'-0"

LAYOUT DIMENSIONS H=2'-0" TO H=4'-0" INCL.

ITEM	UNIT	QUANT.
CONCRETE	C.Y.	4.34
REINF. STEEL	LB.	465



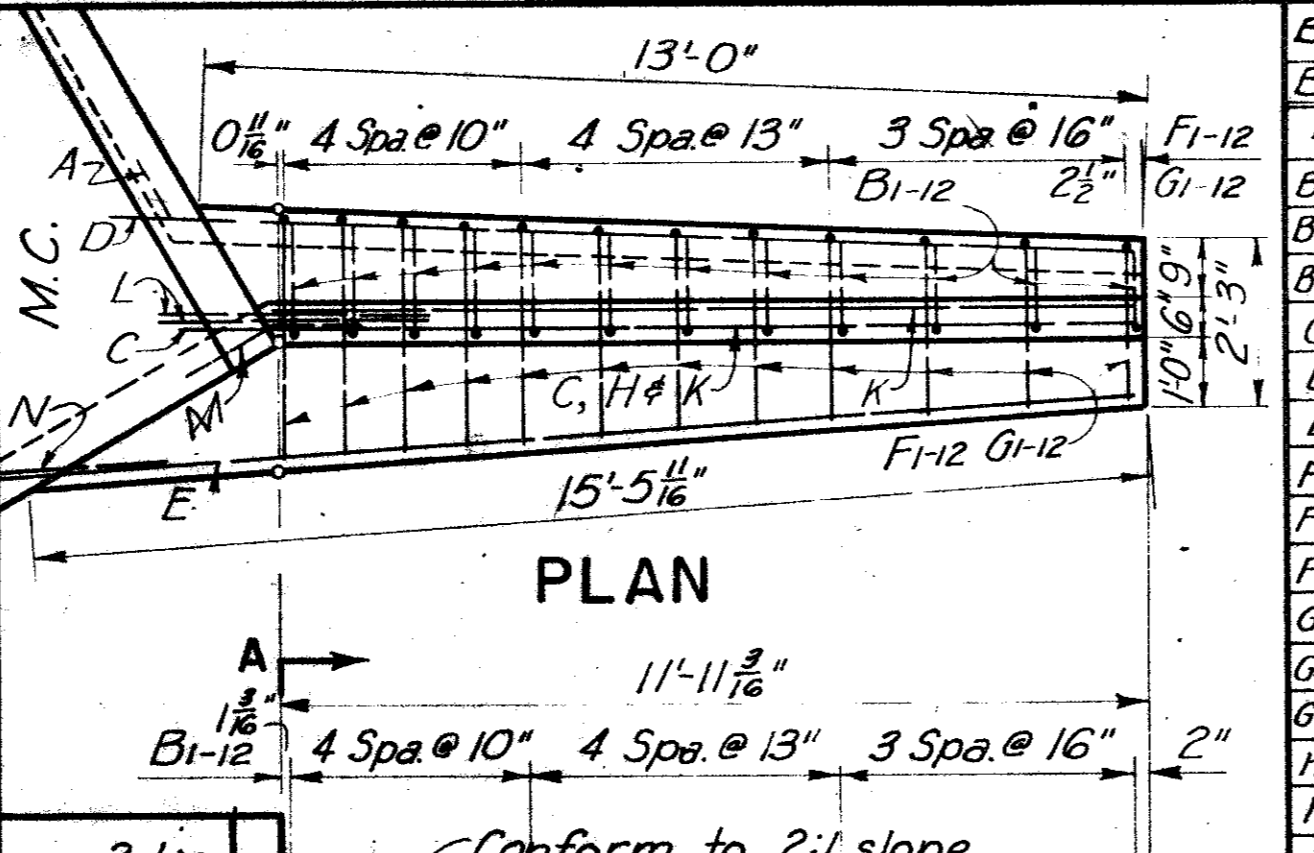
BAR NO.	SIZE	SPA	LGTH	WT.	
A	4	#4	12'-9"	34	
B	28	#4	15"	Av 3'11"	73
C	4	#4	12'-0"	32	
D	4	#4	12'-9"	34	
E	4	#5	14'-0"	62	
F	14	#4	15"	Av 3'6"	33
G	14	#4	15"	Av 4'6"	42
H	6	#4	12"	Av 4'0"	16
I	14	#4	15"	Av 4'6"	42
J	6	#4	12"	Av 5'0"	20
K	12	#4	18"	Av 6'5"	51
L	8	#5	11'-6"	36	
M	8	#6	4'-6"	54	
N	4	#5	3'-2"	13	
TOTAL FOR 4 WINGS 633					



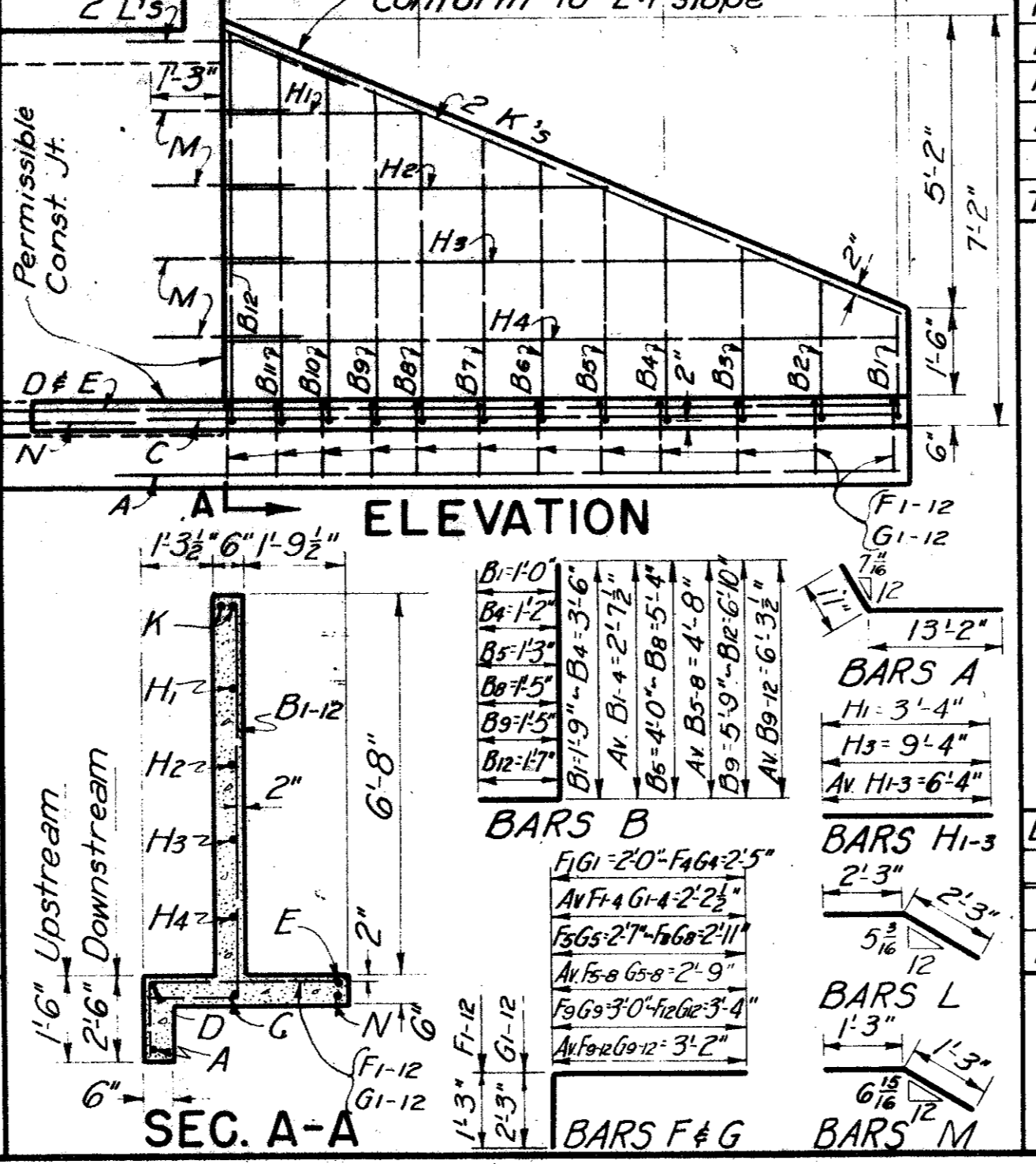
ESTIMATED QUANT. - 4 WINGS

ITEM	UNIT	QUANT.
CONCRETE	C.Y.	6.34
REINF. STEEL	LB.	633

WINGWALLS FOR M.C.'s H=5'-0"



BAR NO.	SIZE	SPA	LGTH	WT.	
A	4	#4	14'-1"	38	
B	16	#4	16"	Av 3'8"	39
C	16	#4	13"	Av 6'0"	64
D	16	#4	10"	Av 7'9"	83
E	4	#4	13'-2"	35	
F	4	#4	14'-0"	37	
G	8	#4	16"	Av 3'5"	18
H	8	#4	13"	Av 4'0"	21
I	8	#4	10"	Av 4'5"	24
J	8	#4	16"	Av 4'5"	24
K	8	#4	13"	Av 5'0"	27
L	8	#4	10"	Av 5'5"	29
M	16	#4	16"	Av 4'5"	24
N	4	#5	3'-2"	13	
TOTAL FOR 4 WINGS 791					



ESTIMATED QUANT. - 4 WINGS

ITEM	UNIT	QUANT.
CONCRETE	C.Y.	7.95
REINF. STEEL	LB.	791

WINGWALLS FOR M.C.'s H=6'-0"

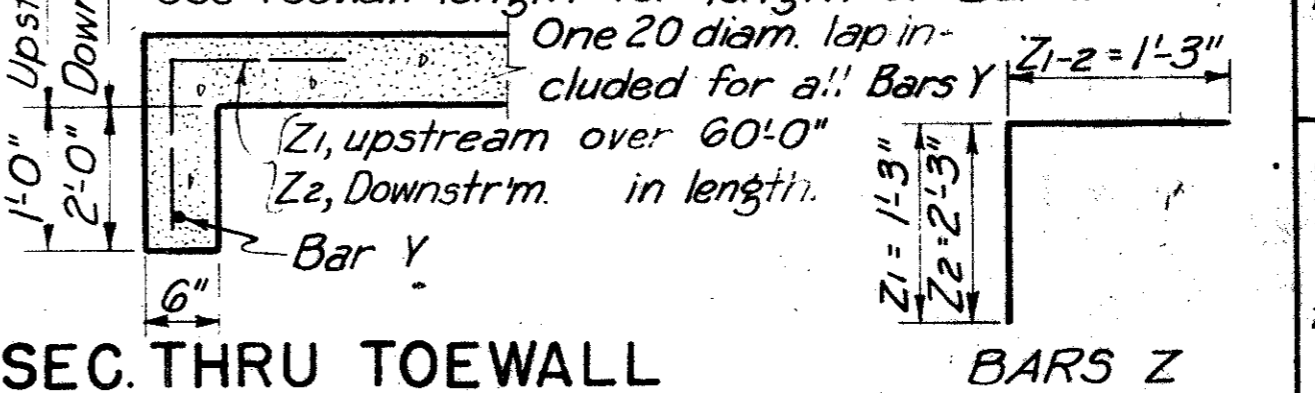
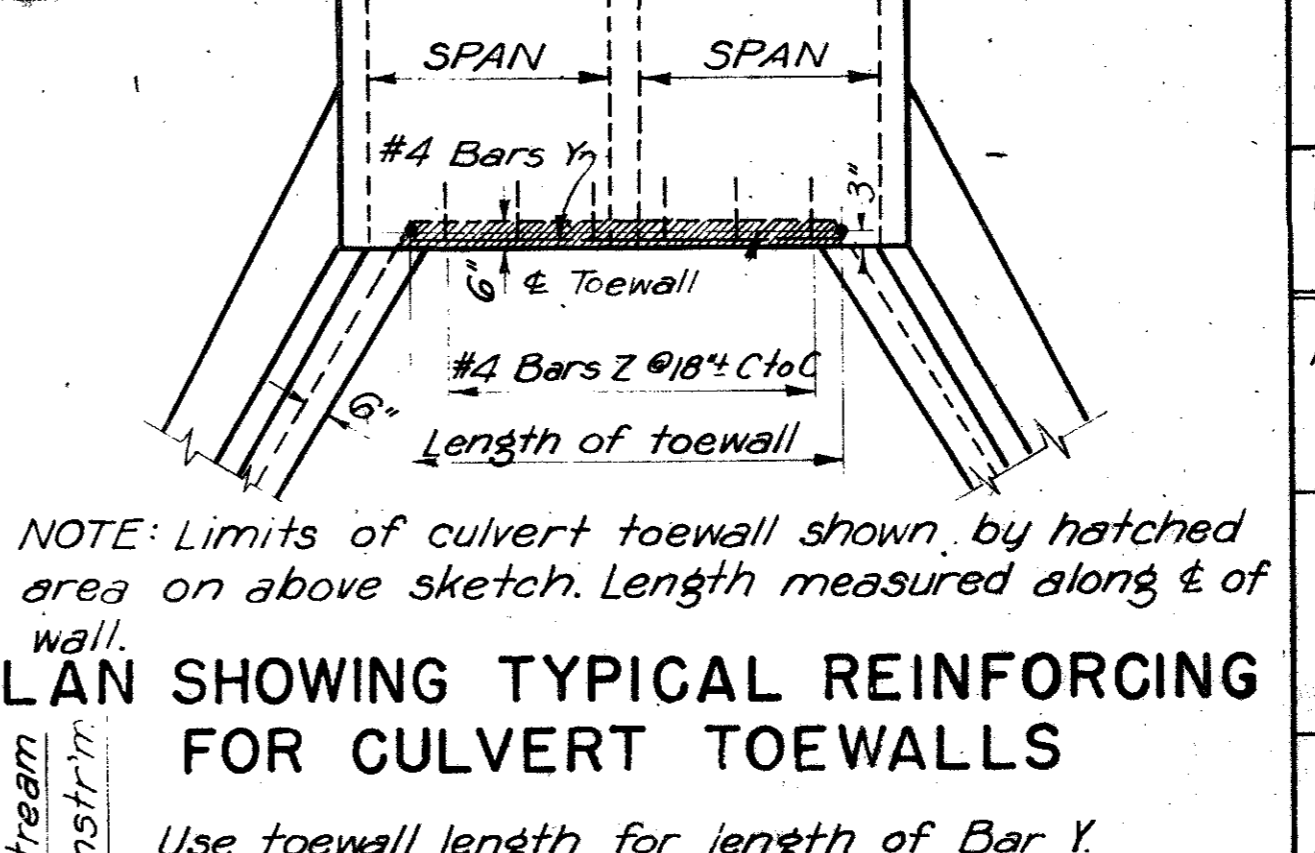


TABLE OF TOEWALL LENGTHS FOR M.C.'s

WING WALL	SPAN	LENGTH					
		2 SPANS	3 SPANS	4 SPANS	5 SPANS	6 SPANS	
H=2'-0"	5'-0"	9'-5 3/4"	14'-11 3/4"	20'-5 3/4"	25'-11 3/4"	31'-5 3/4"	
	6'-0"	9'-5 3/4"	14'-11 3/4"	20'-5 3/4"	25'-11 3/4"	31'-5 3/4"	
	7'-0"	11'-5 3/4"	17'-11 3/4"	24'-5 3/4"	30'-11 3/4"	37'-5 3/4"	
H=3'-0"	6'-0"	11'-5 3/4"	17'-11 3/4"	24'-5 3/4"	30'-11 3/4"	37'-5 3/4"	
	7'-0"	13'-5 3/4"	20'-11 3/4"	28'-5 3/4"	35'-11 3/4"	43'-5 3/4"	
	8'-0"	15'-5 3/4"	23'-11 3/4"	32'-5 3/4"	40'-11 3/4"	49'-5 3/4"	
H=4'-0"	7'-0"	13'-5 3/4"	20'-11 3/4"	28'-5 3/4"	35'-11 3/4"	43'-5 3/4"	
	8'-0"	15'-5 3/4"	23'-11 3/4"	32'-5 3/4"	40'-11 3/4"	49'-5 3/4"	
	9'-0"	17'-5 3/4"	26'-11 3/4"	36'-1 3/4"	45'-8 3/4"	55'-3 3/4"	
H=5'-0"	8'-0"	17'-5 3/4"	26'-11 3/4"	36'-1 3/4"	45'-8 3/4"	55'-3 3/4"	
	9'-0"	19'-5 3/4"	29'-11 3/4"	39'-5 3/4"	48'-8 3/4"	58'-8 3/4"	
	10'-0"	21'-5 3/4"	32'-11 3/4"	42'-5 3/4"	51'-8 3/4"	61'-8 3/4"	
H=6'-0"	9'-0"	19'-5 3/4"	29'-11 3/4"	39'-5 3/4"	48'-8 3/4"	58'-8 3/4"	
	10'-0"	21'-5 3/4"	32'-11 3/4"	42'-5 3/4"	51'-8 3/4"	61'-8 3/4"	
	11'-0"	23'-5 3/4"	35'-11 3/4"	45'-5 3/4"	54'-8 3/4"	64'-8 3/4"	

ESTIMATED QUANTITIES FOR TWO CULVERT TOEWALLS

WING WALL	SPAN LENGTH	2 SPANS		3 SPANS		4 SPANS		5 SPANS		6 SPANS	
		CONC. C.Y.	REINF. LB.	CONC. C.Y.	REINF. LB.	CONC. C.Y.	REINF. LB.	CONC. C.Y.	REINF. LB.	CONC. C.Y.	REINF. LB.
H=2'-0" TO H=4'-0" INCL.	5'-0"	0.53	41	0.83	64	1.14	83	1.44	105	1.75	130
	6'-0"	0.64	51	1.00	76	1.36	101	1.72	129	2.08	154
	7'-0"	0.75	58	1.17	88	1.58	118	2.00	148	2.42	178
H=5'-0"	8'-0"	0.86	63	1.33	100	1.80	135	2.28	160	2.75	202
	9'-0"	0.94	71	1.48	112	2.01	148	2.54	185	3.07	226
	10'-0"	1.02	76	1.61	119	2.20	161	2.78	203	3.37	248

GENERAL NOTES: -
 DESIGN: Wing Walls designed in accordance with Rankine's theory of retaining wall design. Elements of design are shown on sketch at right. All concrete shall be Class C. Chamfer all exposed corners 3/4" unless specified otherwise.
 All dimensions relating to reinforcing steel are to centers of bars.
 Toe walls for culvert and wing walls shall be omitted when structure is founded on solid rock.

TEXAS HIGHWAY DEPARTMENT
 FLARED WINGWALLS
 FOR MULTIPLE CULVERTS
 H=2'-0" TO 6'-0" INCL.
 MCW-FI

DATE: 1945
 ORIGINAL
 REV. 12-51: DOWN FOR H=5'-0"
 REV. JAN. 1959
 REV. NOV. 1964
 REV. NOV. 1967

DEPARTMENT OF PUBLIC WORKS
 COUNTY OF DALLAS, TEXAS