

NOTE: The following information is to only be used for initial abutment design sizing and planning study assumptions. Final design of abutments shall be based on current Bridge Design Specifications.

Figure 6A.B.1 High Cantilever Abutment on Spread Footing Details



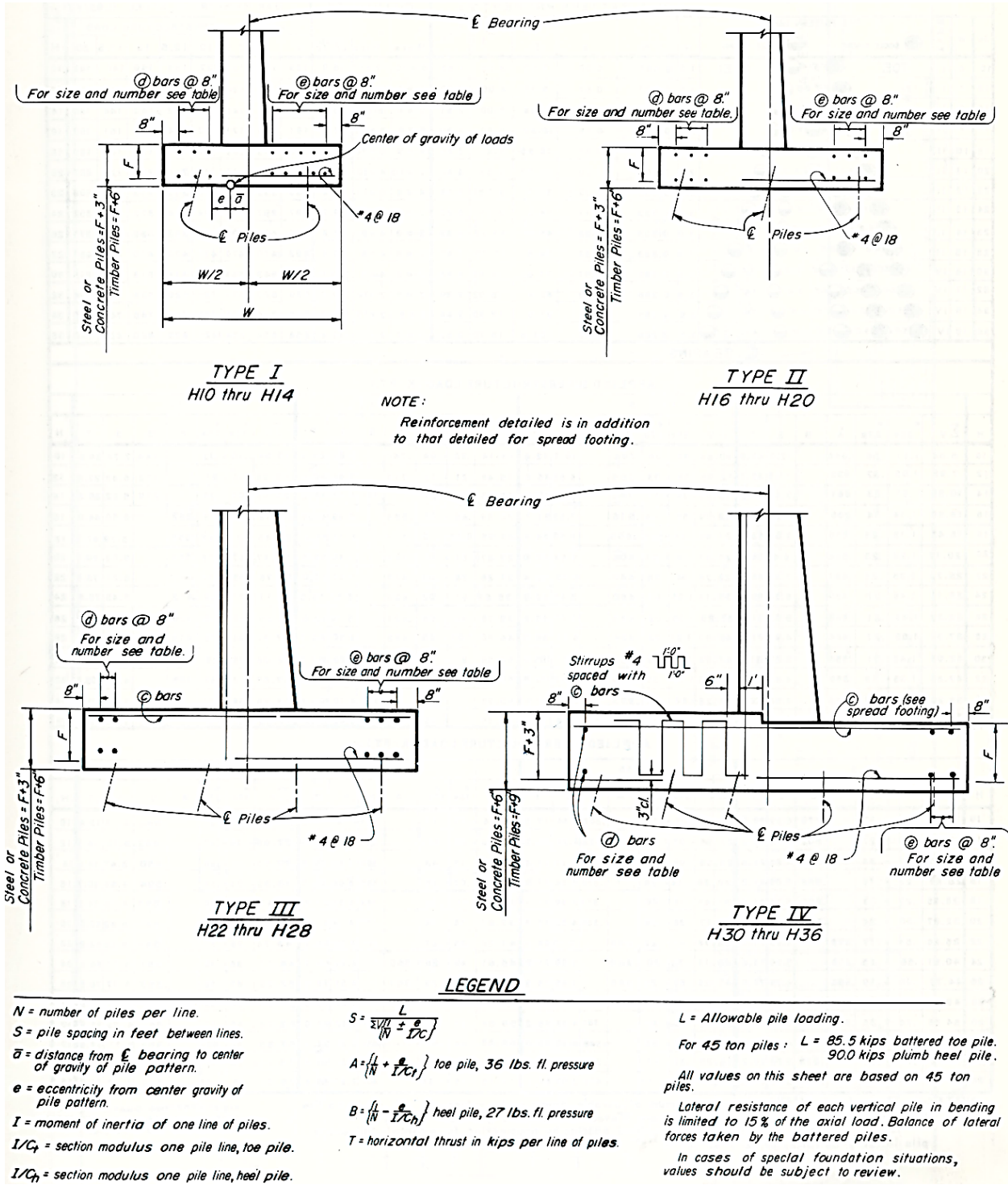
										APPLIED SUPERSTRUCTURE LOAD IN KIPS PER FT.																		
H	W	F	ΣM @ CL	ΣV with 0 Supstr	Shaft @ top of ftg.		0				5				7.5				10									
					Mom.	As	toe Pr.	toe Mom.	heel Mom.	heel As	toe Pr.	toe Mom.	heel Mom.	heel As	toe Pr.	toe Mom.	heel Mom.	heel As	toe Pr.	toe Mom.	heel Mom.	heel As						
																							a bars	b bars	c bars	c bars	c bars	c bars
10	6	1.5	-9.40	5.42	9.60	0.42 #8@18		2.47	-2.62	+4.37	0.19 #5@18		3.31	-3.89	+1.21	0.05 #4@18		3.72	-4.52	-1.84	0.08 #4@18		4.14	-5.17	-3.44	0.15 #5@18		10
12	7	1.5	-13.7	7.72	15.55	0.64 #9@18		2.78	-4.88	+7.58	0.33 #7@18		3.50	-6.70	+3.99	0.17 #5@18		3.85	-7.59	+2.22	0.10 #4@18		4.21	-8.50	-2.01	0.09 #4@18		12
14	8	1.5	-19.0	10.25	23.50	0.91 #11@18		3.06	-8.33	+11.35	0.49 #8@18		3.69	-10.70	+7.33	0.32 #7@18		4.00	-11.89	+5.37	0.23 #6@18		4.31	-13.06	+3.33	0.14 #5@18		14
16	9	1.5	-25.4	13.05	33.80	1.24 #11@15		3.33	-12.66	+16.03	0.70 #9@15		3.89	-15.60	+11.57	0.50 #8@15		4.16	-17.04	+9.39	0.41 #7@15		4.44	-18.51	+7.05	0.31 #6@15		16
18	10	1.5	-32.9	16.08	46.65	1.62 #11@11½		3.59	-18.19	+21.73	0.94 #9@11½		4.08	-21.72	+16.84	0.73 #8@11½		4.34	-23.50	+14.41	0.63 #7@11½		4.59	-25.30	+11.94	0.52 #7@11½		18
20	11	1.75	-44.3	19.76	62.40	2.06 #11@9		3.99	-26.60	+29.46	1.08 #9@9		4.44	-30.66	+24.15	0.88 #8@9		4.67	-32.75	+21.50	0.79 #7@9		4.90	-34.83	+18.88	0.69 #7@9		20
22	12	1.75	-55.8	23.33	81.30	2.56 #11@7		4.27	-35.42	+37.70	1.38 #9@7		4.68	-40.14	+31.93	1.17 #11@14		4.90	-42.56	+28.97	1.06 #11@14		5.10	-44.84	+26.21	0.96 #10@14		22
24	13	2.00	-71.7	27.62	103.7	3.13 #11@5½		4.67	-47.39	+48.85	1.54 #11@11½		5.06	-52.73	+42.62	1.35 #11@11½		5.25	-55.31	+39.60	1.25 #10@11½		5.44	-57.95	+36.52	1.15 #10@11½		24
26	14	2.00	-86.2	31.77	129.8	3.38 #11@7	#9@14	4.90	-60.51	+53.7	1.74 #9@7		5.26	-66.44	+49.0	1.64 #9@7		5.44	-69.37	+45.8	1.53 #9@7		5.61	-72.28	+42.0	1.40 #9@7		26
28	15	2.25	-107.2	36.74	159.3	3.93 #11@7	#8@7	5.32	-77.10	+67.2	1.96 #10@7		5.65	-83.62	+61.0	1.77 #9@7		5.82	-86.88	+59.2	1.73 #9@7		5.98	-90.09	+56.5	1.65 #9@7		28
30	16	2.25	-126.1	41.48	194.4	3.89 #11@7	#8@7	5.55	-94.25	+70.1	2.19 #10@7		5.86	-101.39	+64.3	1.86 #10@7		6.01	-104.91	+61.7	1.80 #10@7		6.17	-108.69	+59.7	1.74 #10@7		30
32	17	2.50	-152.5	47.21	233.5	4.40 #11@7	#9@7	5.94	-116.15	+83.3	2.16 #10@7		6.23	-123.80	+77.4	2.00 #10@7		6.38	-127.73	+74.3	1.93 #10@7		6.52	-131.63	+71.4	1.85 #10@7		32
34	18	2.50	-176.5	52.58	277.4	4.97 #11@7	#11@7	6.19	-139.21	+96.5	2.50 #11@7		6.47	-147.62	+89.6	2.32 #11@7		6.61	-151.82	+87.2	2.25 #11@7		6.75	-156.02	+84.1	2.17 #10@7		34
36	19	2.75	-209.1	58.94	326.6	5.55 #11@6½	#11@6½	6.55	-166.91	+111.6	2.60 #11@6½		6.82	-175.92	+105.1	2.43 #11@6½		6.95	-180.35	+103.5	2.36 #11@6½		7.09	-184.94	+101.2	2.28 #10@6½		36

										APPLIED SUPERSTRUCTURE LOAD IN KIPS PER FT.																QUANTITIES									
H	W	F	12.5				15				17.5				20				Conc. cf/ft	Bar Reinforcing Steel (lbs./ft.)															
			toe Pr.	toe Mom.	heel Mom.	heel As	toe Pr.	toe Mom.	heel Mom.	heel As	toe Pr.	toe Mom.	heel Mom.	heel As	toe Pr.	toe Mom.	heel Mom.	heel As		Applied Superstructure Load															
																				0	5	7.5	10	12.5	15	17.5	20								
10	4.56	-5.80	-4.99	0.22 #6@18	4.97	-6.45	-6.61	0.31 #7@18	5.39	-7.09	-8.17	0.38 #7@18	5.81	-7.73	-9.74	0.45 #8@18	24.5	57	55	57	58	59	61	61	63	10									
12	4.57	-9.41	-3.74	0.15 #5@18	4.93	-10.31	-5.55	0.26 #6@18	5.28	-11.21	-7.32	0.34 #7@18	5.64	-12.12	-9.13	0.42 #8@18	29.1	74	69	68	70	71	72	74	76	12									
14	4.62	-14.23	-1.98	0.09 #4@18	4.94	-15.44	-4.05	0.19 #5@18	5.25	-16.60	-6.01	0.28 #6@18	5.56	-17.78	-8.01	0.37 #7@18	33.8	102	99	96	93	94	95	96	98	14									
16	4.72	-20.00	+4.92	0.22 #5@15	5.00	-21.47	+2.68	0.12 #4@15	5.27	-22.90	-3.98	0.17 #5@15	5.55	-24.40	-6.25	0.29 #6@15	38.9	129	124	119	115	112	109	113	115	16									
18	4.84	-27.06	+9.52	0.41 #6@11½	5.09	-28.84	+7.10	0.31 #5@11½	5.34	-30.24	+4.63	0.20 #4@11½	5.59	-32.37	-3.80	0.18 #4@11½	43.8	172	164	158	158	152	147	143	145	18									
20	5.13	-36.78	+16.25	0.59 #6@9	5.36	-38.89	+13.06	0.48 #6@9	5.59	-40.98	+10.92	0.40 #5@9	5.81	-42.97	+8.29	0.30 #5@9	51.7	231	220	211	211	203	203	196	196	20									
22	5.31	-47.11	+22.87	0.83 #9@14	5.52	-49.53	+20.49	0.75 #9@14	5.72	-51.89	+17.62	0.64 #8@14	5.94	-54.27	+14.69	0.54 #8@14	57.4	307	291	291	281	271	271	264	264	22									
24	5.64	-60.67	+33.31	1.05 #10@11½	5.83	-63.21	+30.19	0.95 #9@11½	6.02	-65.94	+27.21	0.86 #9@11½	6.21	-68.65	+24.13	0.76 #8@11½	66.5	366	366	353	353	353	341	341	331	24									
26	5.80	-75.32	+40.3	1.35 #11@14	5.98	-78.30	+36.9	1.23 #11@14	6.16	-81.29	+33.6	1.17 #11@14	6.34	-84.23	+31.4	1.05 #10@14	77.8	400	400	400	400	382	382	382	371	26									
28	6.14	-93.30	+53.1	1.55 #9@7	6.32	-96.66	+50.2	1.47 #9@7	6.48	-99.85	+46.8	1.37 #11@14	6.64	-103.14	+43.9	1.28 #11@14	90.8	492	470	470	470	470	470	451	451	28									
30	6.33	-112.04	+56.0	1.63 #9@7	6.49	-115.69	+52.8	1.54 #9@7	6.65	-119.29	+49.9	1.43 #9@7	6.80	-122.80	+46.9	1.36 #9@7	103.6	543	543	543	543	518	518	518	518	30									
32	6.67	-135.31	+68.3	1.76 #10@7	6.82	-139.31	+65.4	1.69 #9@7	6.97	-143.23	+62.2	1.60 #9@7	7.11	-147.00	+59.3	1.52 #9@7	117.3	620	620	620	620	620	594	594	594	32									
34	6.89	-160.12	+80.4	2.08 #10@7	7.03	-163.83	+77.1	2.00 #10@7	7.16	-168.32	+74.0	1.91 #10@7	7.30	-172.53	+70.8	1.83 #10@7	126.7	776	776	776	745	745	745	745	745	34									
36	7.22	-189.28	+99.1	2.30 #10@6½	7.35	-193.74	+96.2	2.24 #10@6½	7.48	-198.21	+88.6	2.18 #10@6½	7.61	-202.63	+85.1	2.00 #10@6½	141.4	854	854	854	820	820	820	820	820	36									

NOTE: For walls with seats less than 7'-0", the concrete quantity shall be increased by 2% per foot of variation.

NOTE: The following information is to only be used for initial abutment design sizing and planning study assumptions. Final design of abutments shall be based on current Bridge Design Specifications.

Figure 6A.B.2 High Cantilever Abutment on Spread Footing Information



NOTE: The following information is to only be used for initial abutment design sizing and planning study assumptions. Final design of abutments shall be based on current Bridge Design Specifications.

Figure 6A.B.3 High Cantilever Abutment on Pile Footing Details



PILE LOADINGS FOR ABUTMENT PILE FOOTINGS																											
PILE PATTERN PROPERTIES														QUANTITIES				BAR REINFORCING STEEL (LBS/FT)									
H	W	L	PILE PATTERN LAYOUT		N	1/N	a	I	I/C _t	I/C _h	d	e	conc. cf/ft	APPLIED SUPERSTRUCTURE LOAD									H				
			TOE	HEEL										O	5	7.5	10	12.5	15	17.5	20						
10	6	1	TOE	HEEL	1.5	0.667	0.50	3.00	3.00	1.56	6-#10	10-#11	26.0	139	137	136	137	138	140	140	142	10					
12	7	1			1.5	0.667	0.67	5.33	4.00	2.00	6-#9	10-#11	30.8	140	135	134	133	134	135	137	139	12					
14	8	1			1.5	0.667	0.83	8.34	5.00	2.51	6-#8	6-#11	35.8	154	151	148	145	142	143	144	146	14					
16	9	II			2.0	0.500	0.75	12.37	5.50	3.30	6-#8	6-#11	41.1	181	176	171	167	164	161	161	163	16					
18	10	II			2.0	0.500	0.87	16.85	6.41	3.86	4-#9	6-#10	46.3	216	208	202	202	196	191	187	185	18					
20	11	II			2.0	0.500	1.00	22.00	7.33	4.40	2-#10	4-#10	54.5	262	251	242	242	234	234	227	227	20					
22	12	III			3.0	0.333	1.00	30.7	8.76	5.58	4-#8	6-#10	60.4	349	333	333	323	313	313	306	306	22					
24	13	III			3.0	0.333	1.11	38.0	9.78	6.22	2-#10	6-#8	69.7	397	397	384	384	384	372	372	362	24					
26	14	III			3.0	0.333	1.22	45.9	10.72	6.82	2-#9	4-#9	77.8	400	400	400	400	382	382	371	371	26					
28	15	III			3.0	0.333	1.33	54.6	11.70	7.45	2-#8	4-#8	90.8	492	470	470	470	470	470	451	451	28					
30	16	IV			3.5	0.286	1.57	71.6	14.52	8.88	2-#8	4-#8	103.6	543	543	543	543	518	518	518	518	30					
32	17	IV			3.5	0.286	1.86	82.4	16.02	9.30	2-#8	2-#10	117.3	620	620	620	620	620	594	594	594	32					
34	18	IV			3.5	0.286	2.21	91.6	17.30	9.44	2-#8	2-#10	126.7	776	776	776	745	745	745	745	745	34					
36	19	IV			3.5	0.286	2.57	101.6	18.70	9.62	2-#7	2-#10	141.4	854	854	854	820	820	820	820	820	36					

BEARING

APPLIED SUPERSTRUCTURE LOAD (K/FT.)

APPLIED SUPERSTRUCTURE LOAD (K/FT.)

APPLIED SUPERSTRUCTURE LOAD (K/FT.)

NOTES: The values of "S" given are maximum allowable. Where only values of "A" are listed the toe pile governs. When "B" values only are listed the heel pile governs. For other pile loadings obtain the required spacing by proportion, for example: allowable pile loading - 60 tons, multiply values of "S" in the table by 60/45.

BAR REINFORCING QUANTITIES ARE TOTAL QUANTITIES INCLUDING STEEL IN ABUTMENT AND FOOTING.

NOTE: The following information is to only be used for initial abutment design sizing and planning study assumptions. Final design of abutments shall be based on current Bridge Design Specifications.

Figure 6A.B.4 High Cantilever Abutment on Pile Footing Information