Bethlehem Steel H Piles

Handbook 2196 was printed about 1965

Photos that are not noted in the text have been omitted.

This has been done to reduce .pdf file size.

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Section 11

ACCESSORIES

Pile caps

Many engineers specify steel plates over the piles, to distribute the load from the top of H-piles into the concrete caps, footings, or foundations. Table 11A gives the size of plates required to develop the designated loads for the various sizes of piles.

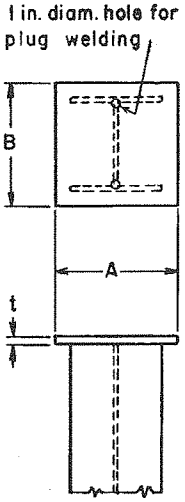


TABLE 11A—PILE CAPS

Load in Tons	*BP 8x36*				*BP 10x42 BP 10x57*				*BP 12x53 BP 12x74*				*BP 14x73 BP 14x89 BP 14x102 BP 14x117*			
	A	*B*	*t*	*Wt, lb*	*A*	*B*	*t*	*Wt, lb*	*A*	*B*	*t*	*Wt, lb*	*A*	*B*	*t*	*Wt, lb*
20	8	8	5/8	11												
25	8	9	5/8	13												
30	9	9	5/8	14												
35	10	10	5/8	18	10	10	5/8	18								
40	10	11	5/8	19	10	11	5/8	19	12	12	5/8	26				
45	11	11	3/4	26	11	11	5/8	21	12	12	5/8	26				
50	12	12	7/8	36	12	12	5/8	26	12	12	5/8	26				
55	12	13	7/8	39	12	13	5/8	28	12	13	5/8	28				
60	13	13	1	48	13	13	3/4	36	13	13	5/8	30				
65	13	14	1	52	13	14	3/4	39	13	14	5/8	32	14	14	3/4	42
70					14	14	7/8	49	14	14	3/4	42	14	14	3/4	42
75					14	15	7/8	52	14	15	3/4	45	14	15	3/4	45
80					15	15	1	64	15	15	7/8	56	15	15	7/8	56
85					15	16	1	68	15	16	7/8	59	15	16	7/8	59
90					15	16	1	68	15	16	7/8	59	15	16	7/8	59
95					16	16	1 1/4	90	16	16	1	72	16	16	7/8	63
100					16	17	1 1/4	97	16	17	1	77	16	17	7/8	68
110									17	18	1 1/8	98	17	18	7/8	76
120									18	18	1 1/4	115	18	18	1	92
130									19	19	1 3/8	140	19	19	1 1/8	115
140													19	20	1 1/8	121
150													20	20	1 1/4	142
160													21	21	1 3/8	172
170													21	22	1 3/8	180
180													22	22	1 1/2	205
190													22	23	1 1/2	215
200													23	24	1 3/8	254

These caps are based on an allowable bearing value of concrete not exceeding 750 psi.

Transmittal of load to H-piles without steel pile caps

An adequately designed reinforced concrete pile cap does not require steel plates to transmit the load to the H-piles. Research by the State of Ohio Department of Highways in 1947 demonstrated this with a very comprehensive series of tests, the

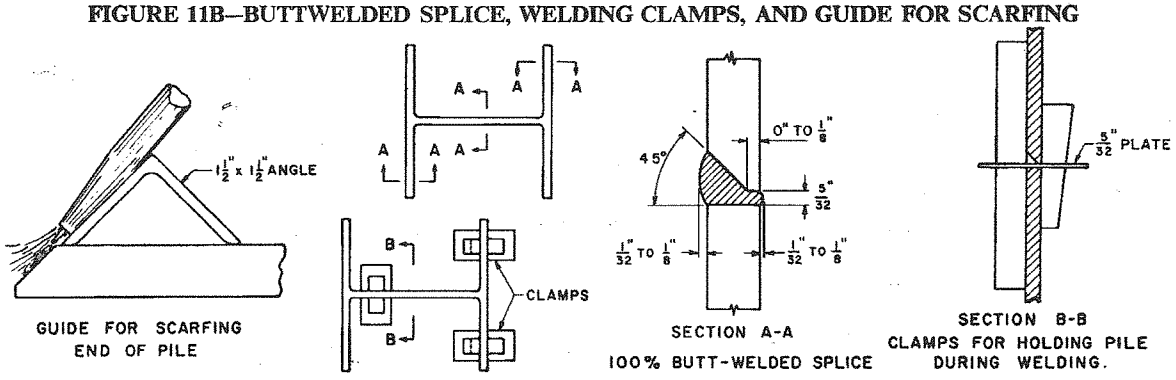
results of which were published in their Research Report No. 1, *Investigation of the Strength of the Connection Between a Concrete Cap and the Embedded End of a Steel H-pile.* The following is quoted from their conclusions: ". . . the evidence is believed conclusive that where the top of a steel H-pile is embedded in a concrete cap or footing, if the pile itself is of adequate section and the concrete member is of adequate size and arrangement and properly reinforced for the pile reactions, there need be no concern regarding the strength of the connection for compressive force, and it is unnecessary to provide a bearing plate or other auxiliary device at the top of the pile."

Splices

H-pile splices should be designed to develop the full strength of the pile both in bearing and bending. This can be done most economically with buttwelded splices. Some engineers prefer plate splices, with the strength developed by welding between the edges of the plates and the H-pile; others go to the extreme of using plates and buttwelding combined, but this seems a needless expense. A 100 per cent buttwelded splice is recommended. It is customary to order piles that are to be spliced, cut to mill tolerances. Milled ends are unnecessary. Field scarfing preparatory to butt-welding is done by torch-cutting.

The buttwelded splice shown in Figure 11B was first shown in our H-pile catalog published in 1948. Since then it has been used extensively with uniformly successful results. For example, 70,000 tons of H-piles 140 feet long were driven at Bethlehem's Sparrows Point plant in 1955-56 using this splice. All piles were driven successfully, without a single splice failure.

FIGURE 11B—BUTTWELDED SPLICE, WELDING CLAMPS, AND GUIDE FOR SCARFING



Splicing is often performed before the piles are placed in the leads to be driven, in order not to delay operation of the pile-driving equipment. One of the important advantages of H-piles is that they can be handled without damage in very long lengths—sometimes in excess of 200 feet. Figure 11C shows a buttweld splice being completed on a pile lying horizontally on skids. This method requires that the pile be turned over several times during the welding operation. Where a large number of piles must be spliced, the roller jigs shown in Figure 11D are an advantage, since the piles can be rotated easily to permit downhand welding.

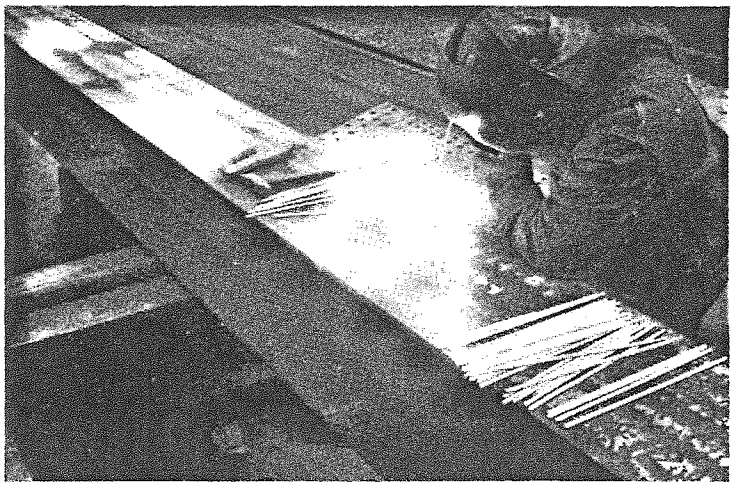


FIGURE 11C—The buttweld splice, easily made with downhand welding procedures, is entirely suitable for most driving conditions.