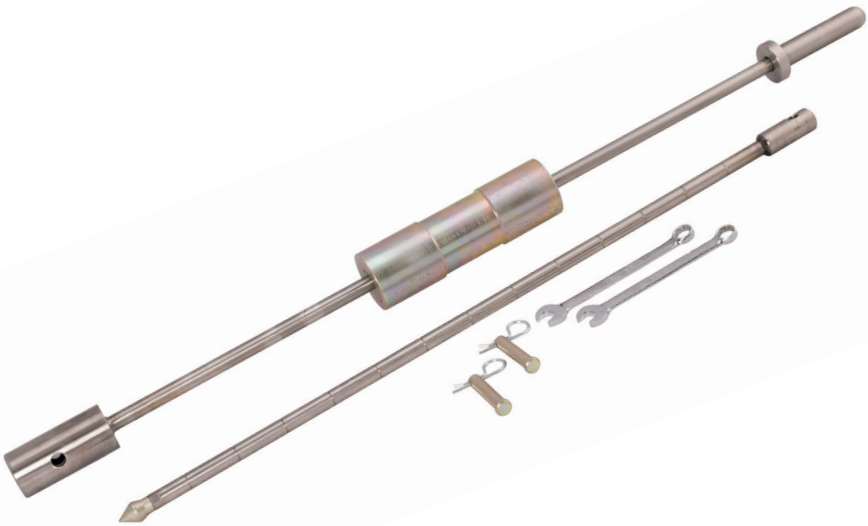

Humboldt Single-Mass Foundation DCP

Humboldt Single-Mass, Foundation Dynamic Cone Penetrometer

The H-4220F Single-Mass (10.1 lbs.), Foundation DCP is used to estimate the shear strength of weak soil with a CBR less than 20 and psf less than 4000. It can be used to assess the in-place strength of undisturbed soil and/or compacted materials. It can also be used to estimate the CBR (California Bearing Ratio), shear strength and thickness of the material. The H-4220F is ideal for horizontal construction applications, such as shallow foundations and pavement shoulders. Typically it is used to assess material properties to a depth of 36" (914 mm) below the surface. Also, with the use of 24" extensions this depth can be increased to 6 ft (2m).

The H-4220F comes with a 37.75" drive rod that is marked in 2" increments; a single-mass, 10.1 lb (4.5kg), sliding hammer and a reusable, hardened point. The drive rod and hammer are connected with a quick-connect pin. The Hammer drop is 22.6" (575mm) with a tolerance of 0.039" (1.0mm) The hardened point has a 60° angle with a tolerance of 1°. The tip base diameter is 0.790" (20mm) with a tolerance of 0.010" (0.25mm).

To use, the operator drives the tip of the DCP into the soil by lifting the sliding hammers to the height of the handle and then releasing it. The operator will then keep track of how many blows it takes to drive the rod into the ground for a given depth (i.e. 2", 4" or 6". The number of blows are then recorded and this number is compared to the charts in this manual to determine an estimate of CBR or PSF.

The Single Mass DCP can be used to estimate the strength characteristics of fine and grained soils, granular construction materials and weak stabilized or modified materials. It should not be used in highly stabilized or cemented materials or for granular materials containing aggregates greater than 2" (50 mm).

Equipment Check

Before beginning a test, check to ensure the Drive Rod is straight by rolling the rod on a flat surface. NOTE: The Drive Rod may bend if driven beyond refusal

The Hardened Point must be checked to ensure the 3mm flat is discernible. The flat area will become rounded after about 250 tests and the hardened point should be replaced. Rarely, if ever, does the Hardened Point wear to the extent that the diameter fails to meet specification

Testing Sequence

Hold the DCP device in a vertical position. Raise the Hammer until it touches, but does not impact, the handle. Allow the Hammer to fall freely and impact the anvil coupler assembly. Count the number of blows for corresponding penetration for each 2" increment on the drive rod. Use Table 1 for the correlation, the blow count, and the bearing capacity in PSF (pounds per square foot).

Hammer 10.1 lbs. Blows/2"	CBR			PSF		
	Soil Type					
	Other	CL	CH	Other	CL	CH
1	2	0	3	760	260	1240
2	4	1	7	1270	660	1960
3	6	3	10	1720	1130	2560
4	8	5	14	2130	1660	3100
5	10	8	17	2520	2230	3600
6	12	12	21	2880	2840	4060
7	15	15	24	3240	3240	4500
8	17	17	27	3570	3570	4920
9	19	19	31	3900	3900	5320
10	22	22	34	4220	4220	5700
11	24	24	38	4530	4530	6070
12	27	27	41	4830	4830	6430
13	29	29	45	5130	5130	6790
14	32	32	48	5420	5420	7130
15	34	34	51	5700	5700	7460
16	37	37	55	5980	5980	7790
17	39	39	58	6260	6260	8110
18	42	42	62	6530	6530	8420
19	45	45	65	6800	6800	8730
20	47	47	69	7060	7060	9030
21	50	50	72	7320	7320	9330
22	53	53	75	7580	7580	9620
23	55	55	79	7840	7840	9910
24	58	58	82	8090	8090	10200
25	61	61	86	8340	8340	10480
26	63	63	89	8580	8580	10750
27	66	66	92	8830	8830	11020
28	69	69	96	9070	9070	11290
29	72	72	99	9310	9310	11560
30	74	74	100	9550	9550	11820
31	77	77		9780	9780	
32	80	80		10020	10020	
33	83	83		10250	10250	
34	86	86		10480	10480	
35	89	89		10710	10710	
36	91	91		10930	10930	
37	94	94		11160	11160	
38	97	97		11380	11380	
39	100	100		11600	11600	
40	100	100		11820	11820	

The presence of aggregates > 2" or rock strata will either stop further penetration or deflect the drive rod. If, after 3 blows, the device has not advanced more than 0.08" (2 mm) or the handle has deflected more than 3" (75 mm) from the vertical position, stop the test and move the device to another test location. Continuing to drop the hammer will damage the instrument. The new test location should be a minimum of 12" (300 mm) from the prior location to minimize test error caused by disturbance of the material.

Following completion of the test, extract the device by driving the hammer upward against the handle. Use a smooth upward movement and do not throw the hammer against the handle.

- DO NOT drop the hammer after refusal.
- DO NOT throw the hammer upwards.
- DO NOT rock the DCP side to side or forward and back in an attempt to loosen it from the ground.

Warranty

Humboldt Mfg. Co. warrants its products to be free from defects in material or workmanship. The exclusive remedy for this warranty is Humboldt Mfg. Co., factory replacement of any part or parts of such product, for the warranty of this product please refer to Humboldt Mfg. Co. catalog on Terms and Conditions of Sale. The purchaser is responsible for the transportation charges. Humboldt Mfg. Co. shall not be responsible under this warranty if the goods have been improperly maintained, installed, operated or the goods have been altered or modified so as to adversely affect the operation, use performance or durability or so as to change their intended use. The Humboldt Mfg. Co. liability under the warranty contained in this clause is limited to the repair or replacement of defective goods and making good, defective workmanship.

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