



# ARKITECHNO CONSULTANTS (INDIA) PVT LTD

N 3/91, IRC Village, Bhubaneswar

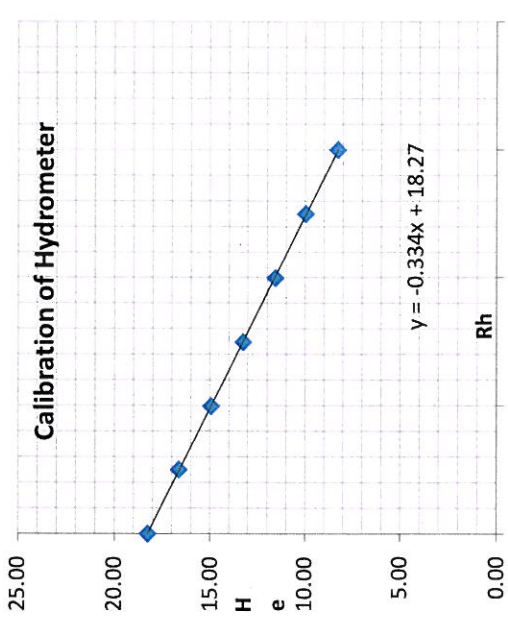
## GRAIN SIZE ANALYSIS OF SOIL - HYDROMETER METHOD

Client : DFCC  
 Project Name : G.I For 3 Nos. Important Bridges  
 Type of Sample : SPT  
 Location : BH-4(Markanda River- Ambala)  
 Sampled by : T.K.Das  
 Depth : 18.0m  
 Date of Testing : 06.10.12  
 Tested by : D.Mohanty

CALIBRATION OF HYDROMETER	
(Rh)	He (cm)
30	0.7
25	2.4
20	4.0
15	5.7
10	7.4
5	9.1
0	10.7
-5	12.4

Percentage of 75 micron passing (from sieve analysis) 93.63  
 Mass of dry soil passing 2mm sieve taken (gm) 50  
 Mass of dry soil retained on 75micron sieve (gm) 3.2  
 Mass of dry soil passing 75 micron Wh (gm) 46.8  
 Specific gravity of soil grains, Gs 2.65  
 Top Meniscus reading on hydrometer stem 2.0  
 Bottom meniscus reading on hydrometer stem 2.5  
 Meniscus correction, Cm = + [ (VII) - (VI) ] 0.5  
 Hydrometer No 1  
 Volume of Hydrometer V (cm<sup>3</sup>) 50  
 Height of bulb (h) in cm 16.5  
 Sedimentation Jar No 1  
 Cross sectional area of jar (A) in cm<sup>2</sup> 35.714

Rh = hydrometer Reading  
 H = height corresponding to Rh  
 He = Effective height = H + 0.5\*(h - V/A)



Time	Elapsed Time (min)	Hydrometer Reading (Rh)	Temperature (o C)	Composite Correction +/- C	Effective depth h (cm)	Rc1 = Rh + Cm	Sqrt (h/f)	Viscosity (gm/cm <sup>2</sup> )	Factor M	Particle 'C' (cm) (8) x (10)	Rc2 = Rh + C (3) + (5)	Factor N	% Finer w.r.t Wd F (12) x (13)	% Finer w.r.t total mass (14) x (11)/100
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
10.30	0.5	28.63	29	-2.0	8.71	29.13	0.539	0.000008341	0.012314796	0.00663461	26.63	3.431	91.36	85.54
	1	28.50	29	-2.0	8.75	29.00	0.382	0.000008341	0.012314796	0.00470306	26.50	3.431	90.91	85.12
	2	28.50	29	-2.0	8.75	29.00	0.270	0.000008341	0.012314796	0.00332556	26.50	3.431	90.91	85.12
	4	28.00	29	-2.0	8.92	28.50	0.193	0.000008341	0.012314796	0.00237386	26.00	3.431	89.20	83.52
	8	28.00	29	-2.0	8.92	28.50	0.136	0.000008341	0.012314796	0.00167857	26.00	3.431	89.20	83.52
	15	27.50	29	-2.0	9.09	28.00	0.100	0.000008341	0.012314796	0.00123728	25.50	3.431	87.48	81.91
	30	27.50	29	-2.0	9.09	28.00	0.071	0.000008341	0.012314796	0.00087489	25.50	3.431	87.48	81.91
	60	27.00	29	-2.0	9.25	27.50	0.051	0.000008341	0.012314796	0.00062430	25.00	3.431	85.77	80.30
	120	27.00	29	-2.0	9.25	27.50	0.036	0.000008341	0.012314796	0.00044145	25.00	3.431	85.77	80.30
	240	26.50	29	-2.0	9.42	27.00	0.026	0.000008341	0.012314796	0.00031495	24.50	3.431	84.05	78.70
	480	26.50	32	-2.0	9.42	27.00	0.018	0.000007821	0.011924722	0.00021565	24.50	3.431	84.05	78.70
	1440	26.35	32	-2.0	9.47	26.85	0.010	0.000007821	0.011924722	0.000124834	24.35	3.431	83.54	78.22

Lab Manager

Checked By

3779



# ARKITECHNO CONSULTANTS (INDIA) PVT LTD

N 3/91, IRC Village, Bhubaneswar

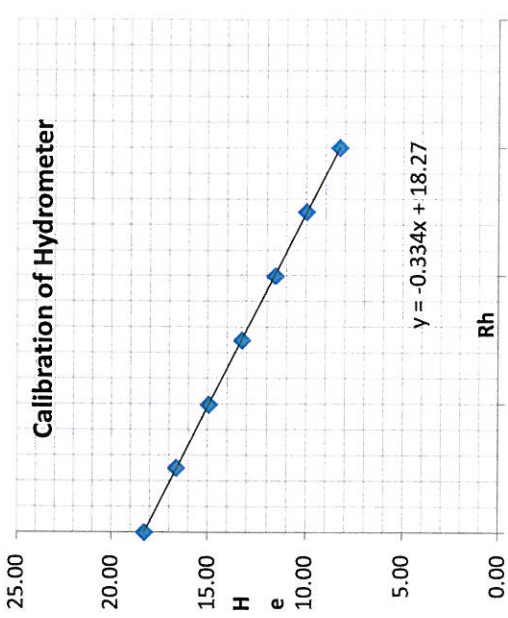
## GRAIN SIZE ANALYSIS OF SOIL - HYDROMETER METHOD

Client : DFCC  
 Project Name : G.I For 3 Nos. Important Bridges  
 Type of Sample : UDS  
 Location : BH-4(Markanda River- Ambala)  
 Sampled by : T.K.Das  
 Depth : 19.5m  
 Date of Testing : 06.10.12  
 Tested by : D.Mohanty

CALIBRATION OF HYDROMETER	
(Rh)	H (cm)
30	0.7
25	2.4
20	4.0
15	5.7
10	7.4
5	9.1
0	10.7
-5	12.4

Percentage of 75 micron passing (from sieve analysis) 98.37  
 Mass of dry soil passing 2mm sieve taken (gm) 50  
 Mass of dry soil retained on 75micron sieve (gm) 0.8  
 Mass of dry soil passing 75 micron Wh (gm) 49.2  
 Specific gravity of soil grains, Gs 2.67  
 Top Meniscus reading on hydrometer stem 2.0  
 Bottom meniscus reading on hydrometer stem 2.5  
 Meniscus correction, Cm = + [ (VI) - (VII) ] 0.5  
 Hydrometer No 1  
 Volume of Hydrometer V (cm<sup>3</sup>) 50  
 Height of bulb (h) in cm 16.5  
 Sedimentation Jar No 1  
 Cross sectional area of jar (A) in cm<sup>2</sup> 35.714

Rh = hydrometer Reading  
 H = height corresponding to Rh  
 He = Effective height = H + 0.5\*(h - V/A)



Time	Elapsed Time (min)	Hydrometer Reading (Rh)	Temperature (o C)	Composite Correction +/- C	Effective depth h (cm)	Rc1 = Rh + Cm	Sqrt (h/f)	Viscosity (gm/cm <sup>2</sup> )	Factor M	Particle 'C' (cm) (8) x (10)	Rc2 = Rh + C (3) + (5)	Factor N	% Finner w.r.t Wd F (12) x (13)	% Finner w.r.t total mass (14) x (11)/100
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
10.30	0.5	29.71	29	-2.0	8.35	30.21	0.527	0.000008341	0.012240833	0.00645672	27.71	3.251	90.07	88.61
	1	29.50	29	-2.0	8.42	30.00	0.375	0.000008341	0.012240833	0.00458473	27.50	3.251	89.39	87.93
	2	29.50	29	-2.0	8.42	30.00	0.265	0.000008341	0.012240833	0.00324190	27.50	3.251	89.39	87.93
	4	29.00	29	-2.0	8.58	29.50	0.189	0.000008341	0.012240833	0.00231500	27.00	3.251	87.77	86.34
	8	29.00	29	-2.0	8.58	29.50	0.134	0.000008341	0.012240833	0.00163695	27.00	3.251	87.77	86.34
	15	28.50	29	-2.0	8.75	29.00	0.099	0.000008341	0.012240833	0.00120703	26.50	3.251	86.14	84.74
	30	28.50	29	-2.0	8.75	29.00	0.070	0.000008341	0.012240833	0.00085350	26.50	3.251	86.14	84.74
	60	28.00	29	-2.0	8.92	28.50	0.050	0.000008341	0.012240833	0.00060925	26.00	3.251	84.52	83.14
	120	28.00	29	-2.0	8.92	28.50	0.035	0.000008341	0.012240833	0.00043080	26.00	3.251	84.52	83.14
	240	27.50	29	-2.0	9.09	28.00	0.025	0.000008341	0.012240833	0.00030746	25.50	3.251	82.89	81.54
	480	27.50	32	-2.0	9.09	28.00	0.018	0.000007821	0.011853101	0.00021052	25.50	3.251	82.89	81.54
	1440	27.05	32	-2.0	9.23	27.55	0.010	0.000007821	0.011853101	0.000122539	25.05	3.251	81.44	80.11

Lab Manager

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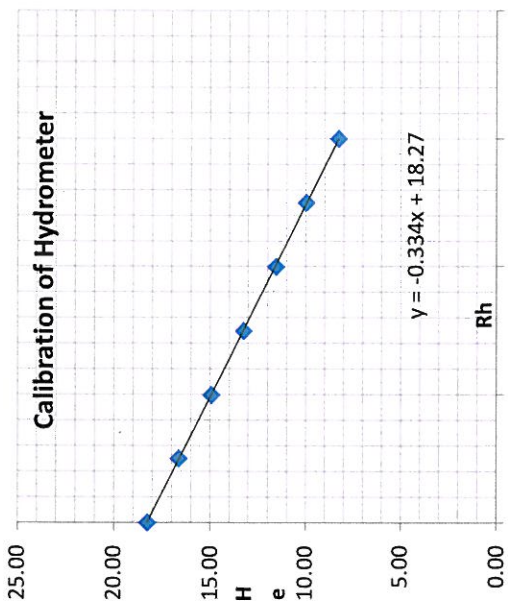
## GRAIN SIZE ANALYSIS OF SOIL - HYDROMETER METHOD

Client : DFCC  
 Project Name : G.I For 3 Nos. Important Bridges  
 Type of Sample : SPT  
 Location : BH-4(Markanda River- Ambala)  
 Sampled by : T.K.Das  
 Depth : 25.5m  
 Date of Testing : 06.10.12  
 Tested by : D.Mohanty

CALIBRATION OF HYDROMETER	
(Rh)	H (cm)
30	0.7
25	2.4
20	4.0
15	5.7
10	7.4
5	9.1
0	10.7
-5	12.4

Percentage of 75 micron passing (from sieve analysis) 95.23  
 Mass of dry soil passing 2mm sieve taken (gm) 50  
 Mass of dry soil retained on 75micron sieve (gm) 2.4  
 Mass of dry soil passing 75 micron Wh (gm) 47.6  
 Specific gravity of soil grains, Gs 2.68  
 Top Meniscus reading on hydrometer stem 2.0  
 Bottom meniscus reading on hydrometer stem 2.5  
 Meniscus correction, Cm = + [ (VI) - (VI) ] 0.5  
 Hydrometer No 1  
 Volume of Hydrometer V (cm<sup>3</sup>) 50  
 Height of bulb (h) in cm 16.5  
 Sedimentation Jar No 1  
 Cross sectional area of jar (A) in cm<sup>2</sup> 35.714

Rh = hydrometer Reading  
 H = height corresponding to Rh  
 He = Effective height = H + 0.5\*(h - V/A)



Time	Elapsed Time (min)	Hydrometer Reading (Rh)	Temperature (o C)	Composite Correction +/- C	Effective depth h (cm)	Rc1 = Rh + Cm	Sqrt (h/t)	Viscosity (gm/cm <sup>2</sup> )	Factor M	Particle 'C' (cm) (8) x (10)	Rc2 = Rh + C (3) + (5)	Factor N	% Finer w.r.t Wd F (12) x (13)	% Finer w.r.t total mass (14) x (11)/100
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
10.30	0.5	28.56	29	-2.0	8.73	29.06	0.539	0.000008341	0.012204347	0.00658393	26.56	3.350	88.98	84.74
	1	28.50	29	-2.0	8.75	29.00	0.382	0.000008341	0.012204347	0.00466088	26.50	3.350	88.78	84.55
	2	28.50	29	-2.0	8.75	29.00	0.270	0.000008341	0.012204347	0.00329574	26.50	3.350	88.78	84.55
	4	28.00	29	-2.0	8.92	28.50	0.193	0.000008341	0.012204347	0.00235257	26.00	3.350	87.11	82.95
	8	28.00	29	-2.0	8.92	28.50	0.136	0.000008341	0.012204347	0.00166352	26.00	3.350	87.11	82.95
	15	27.50	29	-2.0	9.09	28.00	0.100	0.000008341	0.012204347	0.00122618	25.50	3.350	85.43	81.36
	30	27.50	29	-2.0	9.09	28.00	0.071	0.000008341	0.012204347	0.00086704	25.50	3.350	85.43	81.36
	60	27.00	29	-2.0	9.25	27.50	0.051	0.000008341	0.012204347	0.00061870	25.00	3.350	83.76	79.76
	120	27.00	29	-2.0	9.25	27.50	0.036	0.000008341	0.012204347	0.00043749	25.00	3.350	83.76	79.76
	240	26.50	29	-2.0	9.42	27.00	0.026	0.000008341	0.012204347	0.00031213	24.50	3.350	82.08	78.17
	480	26.50	32	-2.0	9.42	27.00	0.018	0.000007821	0.011817771	0.00021372	24.50	3.350	82.08	78.17
	1440	26.48	32	-2.0	9.42	26.98	0.010	0.000007821	0.011817771	0.000123429	24.48	3.350	82.02	78.11

Lab Manager

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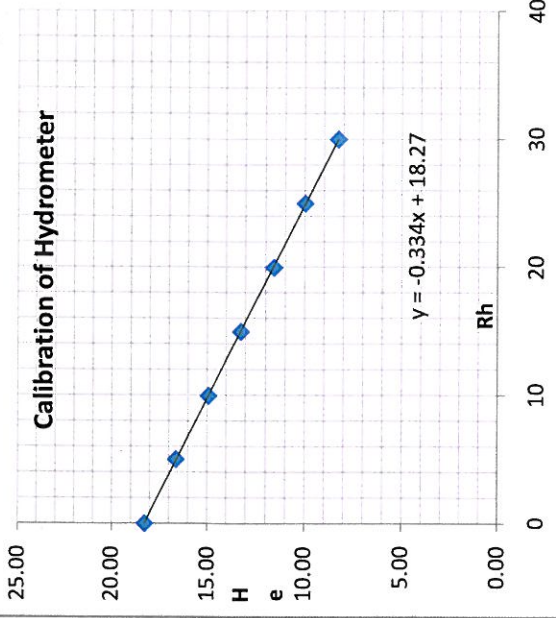
### GRAIN SIZE ANALYSIS OF SOIL - HYDROMETER METHOD

Client : DFCC  
 Project Name : G.I For 3 Nos. Important Bridges  
 Type of Sample : UDS  
 Location : BH-4(Markanda River- Ambala)  
 Sampled by : T.K.Das  
 Depth : 28.5m  
 Date of Testing : 06.10.12  
 Tested by : D.Mohanty

CALIBRATION OF HYDROMETER	
(Rh)	He (cm)
30	0.7
25	2.4
20	4.0
15	5.7
10	7.4
5	9.1
0	10.7
-5	12.4

Percentage of 75 micron passing (from sieve analysis) 97.82  
 Mass of dry soil passing 2mm sieve taken (gm) 50  
 Mass of dry soil retained on 75micron sieve (gm) 1.1  
 Mass of dry soil passing 75 micron Wh (gm) 48.9  
 Specific gravity of soil grains, Gs 2.67  
 Top Meniscus reading on hydrometer stem 2.0  
 Bottom meniscus reading on hydrometer stem 2.5  
 Meniscus correction, Cm = + [ (VII) - (VI) ] 0.5  
 Hydrometer No 1  
 Volume of Hydrometer V (cm<sup>3</sup>) 50  
 Height of bulb (h) in cm 16.5  
 Sedimentation Jar No 1  
 Cross sectional area of jar (A) in cm<sup>2</sup> 35.714

Rh = hydrometer Reading  
 H = height corresponding to Rh  
 He = Effective height = H + 0.5\*(h - V/A)



Elapsed Time (min)	Hydrometer Reading (Rh)	Temperature (o C)	Composite Correction +/- C	Effective depth h (cm)	Rc1 = Rh + Cm	Sqrt (h/f)	Viscosity (gm/cm <sup>2</sup> )	Factor M	Particle 'C' (cm) (8) x (10)	Rc2 = Rh + C (3) + (5)	Factor N	% Finner w.r.t Wd F (12) x (13)	% Finner w.r.t total mass (14) x (11)/100
2	3	4	5	6	7	8	9	10	11	12	13	14	15
16.30	29.62	29	-2.0	8.38	30.12	0.528	0.000008341	0.012240833	0.00646834	27.62	3.269	90.29	88.32
1	29.50	29	-2.0	8.42	30.00	0.375	0.000008341	0.012240833	0.00458473	27.50	3.269	89.89	87.93
2	29.50	29	-2.0	8.42	30.00	0.265	0.000008341	0.012240833	0.00324190	27.50	3.269	89.89	87.93
4	29.00	29	-2.0	8.58	29.50	0.189	0.000008341	0.012240833	0.00231500	27.00	3.269	88.26	86.34
8	29.00	29	-2.0	8.58	29.50	0.134	0.000008341	0.012240833	0.00163695	27.00	3.269	88.26	86.34
15	29.00	29	-2.0	8.58	29.50	0.098	0.000008341	0.012240833	0.00119546	27.00	3.269	88.26	86.34
30	28.50	29	-2.0	8.75	29.00	0.070	0.000008341	0.012240833	0.00085350	26.50	3.269	86.62	84.74
60	28.50	29	-2.0	8.75	29.00	0.049	0.000008341	0.012240833	0.00060352	26.50	3.269	86.62	84.74
120	28.50	29	-2.0	8.75	29.00	0.035	0.000008341	0.012240833	0.00042675	26.50	3.269	86.62	84.74
240	28.00	29	-2.0	8.92	28.50	0.025	0.000008341	0.012240833	0.00030462	26.00	3.269	84.99	83.14
480	28.00	32	-2.0	8.92	28.50	0.018	0.000007821	0.011853101	0.00020858	26.00	3.269	84.99	83.14
1440	27.51	32	-2.0	9.08	28.01	0.010	0.000007821	0.011853101	0.000121523	25.51	3.269	83.39	81.57



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N 3/91, IRC Village, Bhubaneswar

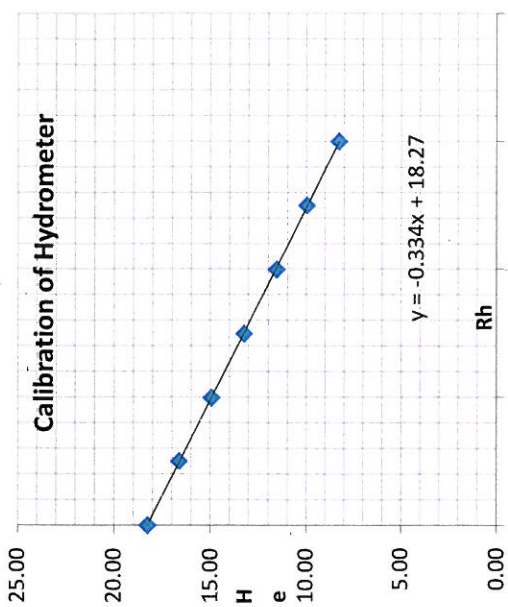
## GRAIN SIZE ANALYSIS OF SOIL - HYDROMETER METHOD

Client : DFCC  
 Project Name : G.I For 3 Nos. Important Bridges  
 Type of Sample : UDS  
 Location : BH-4(Markanda River- Ambala)  
 Sampled by : T.K.Das  
 Depth : 31.5m  
 Date of Testing : 06.10.12  
 Tested by : D.Mohanty

CALIBRATION OF HYDROMETER	
(Rh)	He (cm)
30	0.7
25	2.4
20	4.0
15	5.7
10	7.4
5	9.1
0	10.7
-5	12.4
-10	14.1
-15	15.8
-20	17.5
-25	19.2
-30	20.9

(I) Percentage of 75 micron passing (from sieve analysis) 98.41  
 (II) Mass of dry soil passing 2mm sieve taken (gm) 50  
 (III) Mass of dry soil retained on 75micron sieve (gm) 0.8  
 (IV) Mass of dry soil passing 75 micron W/h (gm) 49.2  
 (V) Specific gravity of soil grains, Gs 2.67  
 (VI) Top Meniscus reading on hydrometer stem 2.0  
 (VII) Bottom meniscus reading on hydrometer stem 2.5  
 (VIII) Meniscus correction, Cm = + [(VII) - (VI)] 0.5  
 Hydrometer No 1  
 Volume of Hydrometer V (cm3) 50  
 Height of bulb (h) in cm 16.5  
 Sedimentation Jar No 1  
 Cross sectional area of jar (A) in cm2 35.714

Rh = hydrometer Reading  
 H = height corresponding to Rh  
 He = Effective height = H + 0.5\*(h - V/A)



Elapsed Time (min)	Hydrometer Reading (Rh)	Temperature (o C)	Composite Correction +/- C	Effective depth h (cm)	Rc1 = Rh + Cm	Sqrt (h/t)	Viscosity (gm/cm2)	Factor M	Particle 'C' (cm) (8) x (10)	Rc2 = Rh + C (3) + (5)	Factor N	% Finer w.r.t Wd F (12) x (13)	% Finer w.r.t total mass (14) x (1)/100
1	3	4	5	6	7	8	9	10	11	12	13	14	15
10.30	29.73	29	-2.0	8.34	30.23	0.527	0.000008341	0.012240833	0.00645413	27.73	3.249	90.10	88.67
1	29.50	29	-2.0	8.42	30.00	0.375	0.000008341	0.012240833	0.00458473	27.50	3.249	89.35	87.93
2	29.50	29	-2.0	8.42	30.00	0.265	0.000008341	0.012240833	0.00324190	27.50	3.249	89.35	87.93
4	29.00	29	-2.0	8.58	29.50	0.189	0.000008341	0.012240833	0.00231500	27.00	3.249	87.73	86.34
8	29.00	29	-2.0	8.58	29.50	0.134	0.000008341	0.012240833	0.00163695	27.00	3.249	87.73	86.34
15	28.50	29	-2.0	8.75	29.00	0.099	0.000008341	0.012240833	0.00120703	26.50	3.249	86.11	84.74
30	28.50	29	-2.0	8.75	29.00	0.070	0.000008341	0.012240833	0.00085350	26.50	3.249	86.11	84.74
60	28.00	29	-2.0	8.92	28.50	0.050	0.000008341	0.012240833	0.00060925	26.00	3.249	84.48	83.14
120	28.00	29	-2.0	8.92	28.50	0.035	0.000008341	0.012240833	0.00043080	26.00	3.249	84.48	83.14
240	27.50	29	-2.0	9.09	28.00	0.025	0.000008341	0.012240833	0.00030746	25.50	3.249	82.86	81.54
480	27.50	32	-2.0	9.09	28.00	0.018	0.000007821	0.011853101	0.00021052	25.50	3.249	82.86	81.54
1440	27.36	32	-2.0	9.13	27.86	0.010	0.000007821	0.011853101	0.000121858	25.36	3.249	82.40	81.09

Lab Manager

Checked By



# ARKI TECHNO CONSULTANTS (INDIA) PVT LTD

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N 3/91, IRC Village, Bhubaneswar

## GRAIN SIZE ANALYSIS OF SOIL - HYDROMETER METHOD

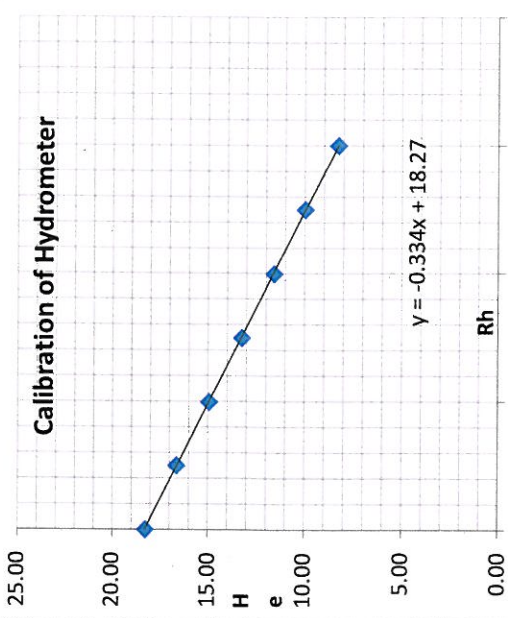
Client : DFCC  
 Project Name : G.I For 3 Nos. Important Bridges  
 Type of Sample : SPT  
 Location : BH-4(Markanda River- Ambala)  
 Sampled by : T.K.Das  
 Depth : 33.0m  
 Date of Testing : 06.10.12  
 Tested by : D.Mohanty

CALIBRATION OF HYDROMETER	
(Rh)	H (cm)
30	0.7
25	2.4
20	4.0
15	5.7
10	7.4
5	9.1
0	10.7
-5	12.4

Percentage of 75 micron passing (from sieve analysis) 98.11  
 Mass of dry soil passing 2mm sieve taken (gm) 50  
 Mass of dry soil retained on 75micron sieve (gm) 0.9  
 Mass of dry soil passing 75 micron Wh (gm) 49.1  
 Specific gravity of soil grains, Gs 2.66  
 Top Meniscus reading on hydrometer stem 2.0  
 Bottom meniscus reading on hydrometer stem 2.5  
 Meniscus correction, Cm = + [(VII) - (VI)] 0.5  
 Hydrometer No 1  
 Volume of Hydrometer V (cm3) 50  
 Height of bulb (h) in cm 16.5  
 Sedimentation Jar No 1  
 Cross sectional area of jar (A) in cm2 35.714

Rh = hydrometer Reading to Rh  
 H = height corresponding to Rh  
 He = Effective height = H + 0.5\*(h - V/A)

Time	Elapsed Time (min)	Hydrometer Reading (Rh)	Temperature (o C)	Composite Correction +/- C	Effective depth h (cm)	Rc1 = Rh + Cm	Sqrt (h/t)	Viscosity (gm/cm2)	Factor M	Particle 'C' (cm) (8) x (10)	Rc2 = Rh + C (3) + (5)	Factor N	% Finer w.r.t Wd F (12) x (13)	% Finer w.r.t total mass (14) x (1)/100
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
10:30	0.5	29.57	29	-2.0	8.39	30.07	0.529	0.000008341	0.012277647	0.00649425	27.57	3.267	90.06	88.36
	1	29.50	29	-2.0	8.42	30.00	0.375	0.000008341	0.012277647	0.00459852	27.50	3.267	89.83	88.13
	2	29.50	29	-2.0	8.42	30.00	0.265	0.000008341	0.012277647	0.00325165	27.50	3.267	89.83	88.13
	4	29.00	29	-2.0	8.58	29.50	0.189	0.000008341	0.012277647	0.00232196	27.00	3.267	88.20	86.53
	8	29.00	29	-2.0	8.58	29.50	0.134	0.000008341	0.012277647	0.00164187	27.00	3.267	88.20	86.53
	15	28.50	29	-2.0	8.75	29.00	0.099	0.000008341	0.012277647	0.00121066	26.50	3.267	86.56	84.93
	30	28.50	29	-2.0	8.75	29.00	0.070	0.000008341	0.012277647	0.00085607	26.50	3.267	86.56	84.93
	60	28.00	29	-2.0	8.92	28.50	0.050	0.000008341	0.012277647	0.00061108	26.00	3.267	84.93	83.33
	120	28.00	29	-2.0	8.92	28.50	0.035	0.000008341	0.012277647	0.00043210	26.00	3.267	84.93	83.33
	240	27.50	29	-2.0	9.09	28.00	0.025	0.000008341	0.012277647	0.00030839	25.50	3.267	83.30	81.72
	480	27.50	32	-2.0	9.09	28.00	0.018	0.000007821	0.011888750	0.00021116	25.50	3.267	83.30	81.72
	1440	27.45	32	-2.0	9.10	27.95	0.010	0.000007821	0.011888750	0.000122018	25.45	3.267	83.14	81.57



Lab Manager

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# ARKI TECHNO CONSULTANTS (INDIA) PVT LTD

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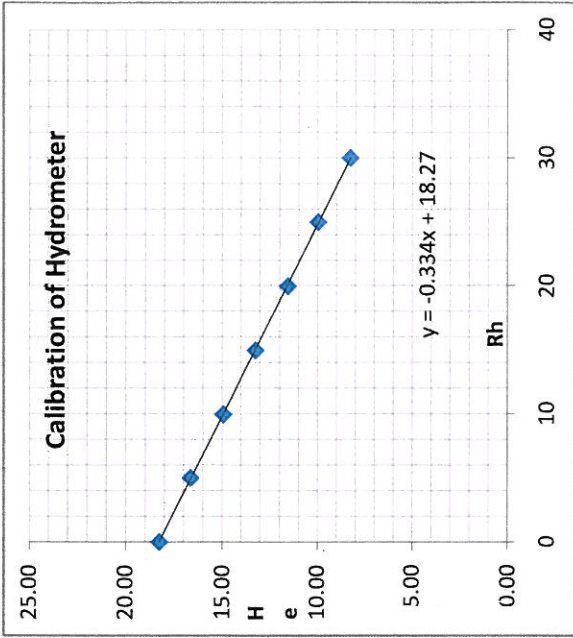
## GRAIN SIZE ANALYSIS OF SOIL - HYDROMETER METHOD

Client : DFCC  
 Project Name : G.I For 3 Nos. Important Bridges  
 Type of Sample : UDS  
 Location : BH-4(Markanda River- Ambala)  
 Sampled by : T.K.Das  
 Depth : 34.5m  
 Date of Testing : 06.10.12  
 Tested by : D.Mohanty

CALIBRATION OF HYDROMETER	
(Rh)	He (cm)
30	0.7
25	2.4
20	4.0
15	5.7
10	7.4
5	9.1
0	10.7
-5	12.4

(I) Percentage of 75 micron passing (from sieve analysis) 91.13  
 (II) Mass of dry soil passing 2mm sieve taken (gm) 50  
 (III) Mass of dry soil retained on 75micron sieve (gm) 4.4  
 (IV) Mass of dry soil passing 75 micron Wh (gm) 45.6  
 (V) Specific gravity of soil grains, Gs 2.67  
 (VI) Top Meniscus reading on hydrometer stem 2.0  
 (VII) Bottom meniscus reading on hydrometer stem 2.5  
 (VIII) Meniscuss correction, Cm = + [(VII) - (VI)] 0.5  
 a Hydrometer No 1  
 Volume of Hydrometer V (cm3) 50  
 Height of bulb (h) in cm 16.5  
 Sedimentation Jar No 1  
 Cross sectional area of jar (A) in cm2 35.714

Elapsed Time (min)	Hydrometer Reading (Rh)	Temperature (o C)	Composite Correction +/- C	Effective depth h (cm)	Rc1 = Rh + Cm	Sqrt (h/t)	Viscosity (gm/cm2)	Factor M	Particle 'C' (cm) (8) x (10)	Rc2 = Rh + C (3) + (5)	Factor N	% Finner w.r.t Wd F (12) x (13)	% Finner w.r.t total mass (14) x (1)/100
1	3	4	5	6	7	8	9	10	11	12	13	14	15
10.30	28.91	29	-2.0	8.61	29.41	0.536	0.00008341	0.012240833	0.00655925	26.91	3.509	94.42	86.05
1	28.50	29	-2.0	8.75	29.00	0.382	0.00008341	0.012240833	0.00467481	26.50	3.509	92.98	84.74
2	28.50	29	-2.0	8.75	29.00	0.270	0.00008341	0.012240833	0.00330559	26.50	3.509	92.98	84.74
4	28.00	29	-2.0	8.92	28.50	0.193	0.00008341	0.012240833	0.00235960	26.00	3.509	91.23	83.14
8	28.00	29	-2.0	8.92	28.50	0.136	0.00008341	0.012240833	0.00166849	26.00	3.509	91.23	83.14
15	28.00	29	-2.0	8.92	28.50	0.100	0.00008341	0.012240833	0.00121849	26.00	3.509	91.23	83.14
30	27.50	29	-2.0	9.09	28.00	0.071	0.00008341	0.012240833	0.00086964	25.50	3.509	89.48	81.54
60	27.50	29	-2.0	9.09	28.00	0.050	0.00008341	0.012240833	0.00061493	25.50	3.509	89.48	81.54
120	27.50	29	-2.0	9.09	28.00	0.036	0.00008341	0.012240833	0.00043482	25.50	3.509	89.48	81.54
240	27.00	29	-2.0	9.25	27.50	0.025	0.00008341	0.012240833	0.00031028	25.00	3.509	87.72	79.94
480	27.00	32	-2.0	9.25	27.50	0.018	0.000007821	0.011853101	0.00021245	25.00	3.509	87.72	79.94
1440	26.77	32	-2.0	9.33	27.27	0.010	0.000007821	0.011853101	0.000123155	24.77	3.509	86.93	79.22



Lab Manager

Checked By: c

3785



# ARKI TECHNO CONSULTANTS (INDIA) PVT LTD

N 3/91, IRC Village, Bhubaneswar

## GRAIN SIZE ANALYSIS OF SOIL - HYDROMETER METHOD

Client : DFCC  
 Project Name : G.I For 3 Nos. Important Bridges  
 Type of Sample : SPT  
 Location : BH-4(Markanda River- Ambala)  
 Sampled by : T.K.Das  
 Depth : 37.5m  
 Date of Testing : 06.10.12  
 Tested by : D.Mohanty

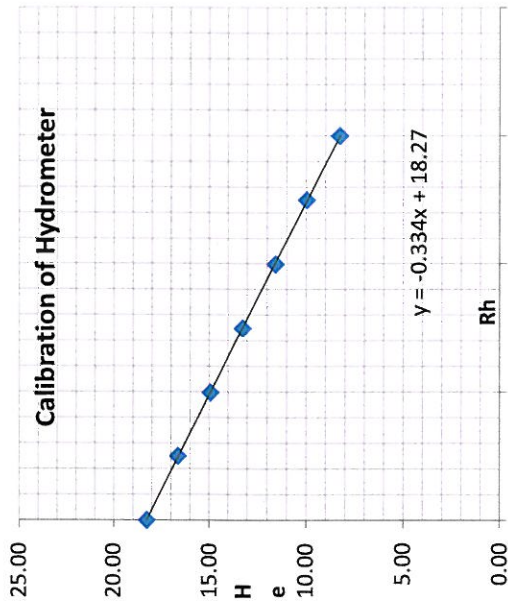
CALIBRATION OF HYDROMETER	
(Rh)	He (cm)
30	0.7
25	2.4
20	4.0
15	5.7
10	7.4
5	9.1
0	10.7
-5	12.4

Rh = hydrometer Reading

H = height corresponding to Rh

He = Effective height = H + 0.5\*(h - V/A)

Time	Elapsed Time (min)	Hydrometer Reading (Rh)	Temperature (o C)	Composite Correction +/- C	Effective depth h (cm)	Rc1 = Rh + Cm	Sqrt (h/t)	Viscosity (gm/cm <sup>2</sup> )	Factor M	Particle 'C' (cm) (8) x (10)	Rc2 = Rh + C (3) + (5)	Factor N	% Finner w.r.t Wd F (12) x (13)	% Finner w.r.t total mass (14) x (1)/100
10.30	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	0.5	29.35	29	-2.0	8.47	29.85	0.531	0.000008341	0.012277647	0.00652262	27.35	3.236	88.50	87.65
	1	29.00	29	-2.0	8.58	29.50	0.378	0.000008341	0.012277647	0.00464392	27.00	3.236	87.37	86.53
	2	28.50	29	-2.0	8.75	29.00	0.270	0.000008341	0.012277647	0.00331553	26.50	3.236	85.75	84.93
	4	28.00	29	-2.0	8.92	28.50	0.193	0.000008341	0.012277647	0.00236670	26.00	3.236	84.13	83.33
	8	27.50	29	-2.0	9.09	28.00	0.138	0.000008341	0.012277647	0.00168911	25.50	3.236	82.52	81.72
	15	27.00	29	-2.0	9.25	27.50	0.101	0.000008341	0.012277647	0.00124483	25.00	3.236	80.90	80.12
	30	26.00	29	-2.0	9.59	26.50	0.073	0.000008341	0.012277647	0.00089598	24.00	3.236	77.66	76.92
	60	25.50	29	-2.0	9.75	26.00	0.052	0.000008341	0.012277647	0.00063905	23.50	3.236	76.04	75.31
	120	25.00	29	-2.0	9.92	25.50	0.037	0.000008341	0.012277647	0.00045573	23.00	3.236	74.43	73.71
	240	24.50	29	-2.0	10.09	25.00	0.026	0.000008341	0.012277647	0.00032495	22.50	3.236	72.81	72.11
	480	24.00	32	-2.0	10.25	24.50	0.019	0.000007821	0.011888750	0.00022433	22.00	3.236	71.19	70.51
	1440	23.66	32	-2.0	10.37	24.16	0.011	0.000007821	0.011888750	0.000130223	21.66	3.236	70.10	69.43



Lab Manager

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# ARKI TECHNO CONSULTANTS (INDIA) PVT LTD

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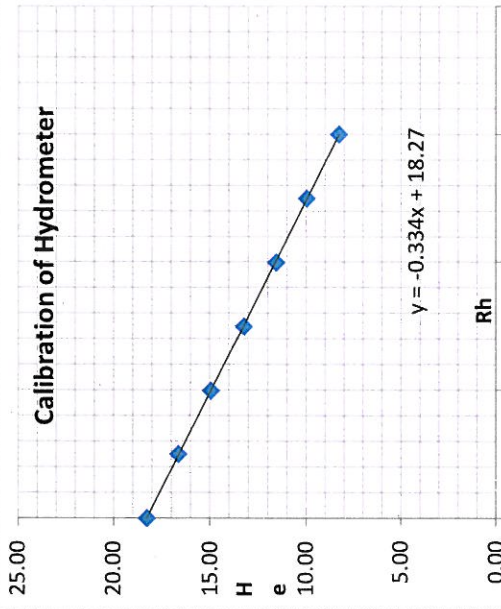
## GRAIN SIZE ANALYSIS OF SOIL - HYDROMETER METHOD

Client : DFCC  
 Project Name : G.I For 3 Nos. Important Bridges  
 Type of Sample : SPT  
 Location : BH-4(Markanda River- Ambala)  
 Sampled by : T.K.Das  
 Depth : 40.5m  
 Date of Testing : 06.10.12  
 Tested by : D.Mohanty

CALIBRATION OF HYDROMETER	
(Rh)	He (cm)
30	8.25
25	9.95
20	11.55
15	13.25
10	14.95
5	16.65
0	18.25
-5	19.95

(I) Percentage of 75 micron passing (from sieve analysis) 98.03  
 (II) Mass of dry soil passing 2mm sieve taken (gm) 50  
 (III) Mass of dry soil retained on 75micron sieve (gm) 1.0  
 (IV) Mass of dry soil passing 75 micron Wh (gm) 49.0  
 (V) Specific gravity of soil grains, Gs 2.65  
 (VI) Top Meniscus reading on hydrometer stem 2.0  
 (VII) Bottom meniscus reading on hydrometer stem 2.5  
 (VIII) Meniscus correction, Cm = + [(VII) - (VI)] 0.5  
 a Hydrometer No 1  
 Volume of Hydrometer V (cm3) 50  
 Height of bulb (h) in cm 16.5  
 b' Sedimentation Jar No 1  
 Cross sectional area of jar (A) in cm2 35.714

Rh = hydrometer Reading  
 H = height corresponding to Rh  
 He = Effective height = H + 0.5\*(h - V/A)



Elapsed Time (min)	Hydrometer Reading (Rh)	Temperature (o C)	Composite Correction +/- C	Effective depth h (cm)	Rc1 = Rh + Cm	Sqrt (h/t)	Viscosity (gm/cm2)	Factor M	Particle 'C' (cm) (8) x (10)	Rc2 = Rh + C (3) + (5)	Factor N	% Finner w.r.t Wd F (12) x (13)	% Finner w.r.t total mass (14) x (1)/100
1	3	4	5	6	7	8	9	10	11	12	13	14	15
10.30	29.28	29	-2.0	8.49	29.78	0.532	0.000008341	0.012314796	0.00655138	27.28	3.277	89.39	87.63
1	29.00	29	-2.0	8.58	29.50	0.378	0.000008341	0.012314796	0.00465797	27.00	3.277	88.47	86.73
2	28.50	29	-2.0	8.75	29.00	0.270	0.000008341	0.012314796	0.00332556	26.50	3.277	86.83	85.12
4	28.00	29	-2.0	8.92	28.50	0.193	0.000008341	0.012314796	0.00237386	26.00	3.277	85.19	83.52
8	27.50	29	-2.0	9.09	28.00	0.138	0.000008341	0.012314796	0.00169422	25.50	3.277	83.56	81.91
15	27.00	29	-2.0	9.25	27.50	0.101	0.000008341	0.012314796	0.00124860	25.00	3.277	81.92	80.30
30	26.50	29	-2.0	9.42	27.00	0.072	0.000008341	0.012314796	0.00089083	24.50	3.277	80.28	78.70
60	26.00	29	-2.0	9.59	26.50	0.052	0.000008341	0.012314796	0.00063547	24.00	3.277	78.64	77.09
120	25.50	29	-2.0	9.75	26.00	0.037	0.000008341	0.012314796	0.00045324	23.50	3.277	77.00	75.48
240	25.00	29	-2.0	9.92	25.50	0.026	0.000008341	0.012314796	0.00032322	23.00	3.277	75.36	73.88
480	24.50	32	-2.0	10.09	25.00	0.019	0.000007821	0.011924722	0.00022317	22.50	3.277	73.73	72.27
1440	23.93	32	-2.0	10.28	24.43	0.011	0.000007821	0.011924722	0.000130051	21.93	3.277	71.87	70.45

Lab Manager

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# ARKI TECHNO CONSULTANTS (INDIA) PVT LTD

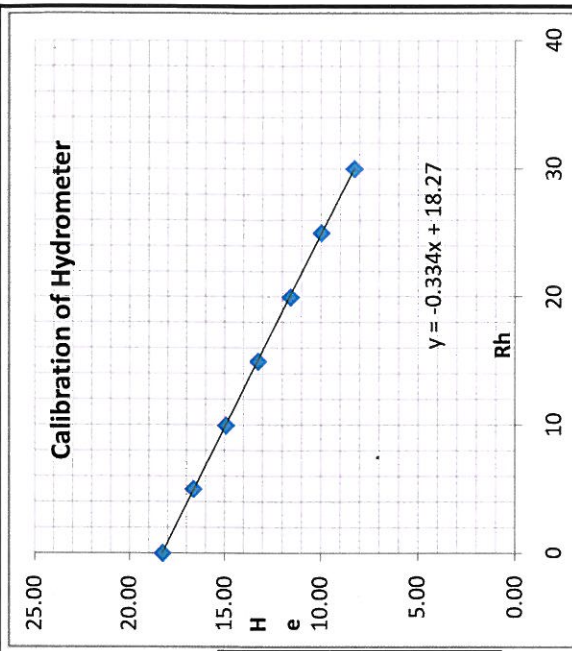
N 3/91, IRC Village, Bhubaneswar

## GRAIN SIZE ANALYSIS OF SOIL - HYDROMETER METHOD

Client : DFCC  
 Project Name : G.I For 3 Nos. Important Bridges  
 Type of Sample : SPT  
 Location : BH-4(Markanda River- Ambala)  
 Sampled by : T.K.Das  
 Depth : 42.0m  
 Date of Testing : 06.10.12  
 Tested by : D.Mohanty

CALIBRATION OF HYDROMETER		
(Rh)	H (cm)	He (cm)
30	0.7	8.25
25	2.4	9.95
20	4.0	11.55
15	5.7	13.25
10	7.4	14.95
5	9.1	16.65
0	10.7	18.25
-5	12.4	19.95

Rh = hydrometer Reading  
 H = height corresponding to Rh  
 He = Effective height = H + 0.5\*(h - V/A)



Time	Elapsed Time (min)	Hydrometer Reading (Rh)	Temperature (o C)	Composite Correction +/- C	Effective depth h (cm)	Rc1 = Rh + Cm	Sqrt (h/t)	Viscosity (gm/cm <sup>2</sup> )	Factor M	Particle 'C' (cm) (8) x (10)	Rc2 = Rh + C (3) + (5)	Factor N	% Finner w.r.t Wd F (12) x (13)	% Finner w.r.t total mass (14) x (1)/100
3	2	3	4	5	6	7	8	9	10	11	12	13	14	15
10:30	0.5	28.91	29	-2.0	8.61	29.41	0.536	0.000008341	0.012277647	0.00657898	26.91	3.261	87.76	86.24
	1	28.50	29	-2.0	8.75	29.00	0.382	0.000008341	0.012277647	0.00468887	26.50	3.261	86.42	84.93
	2	28.00	29	-2.0	8.92	28.50	0.273	0.000008341	0.012277647	0.00334702	26.00	3.261	84.79	83.33
	4	27.50	29	-2.0	9.09	28.00	0.195	0.000008341	0.012277647	0.00238876	25.50	3.261	83.16	81.72
	8	27.00	29	-2.0	9.25	27.50	0.139	0.000008341	0.012277647	0.00170456	25.00	3.261	81.53	80.12
	15	26.50	29	-2.0	9.42	27.00	0.102	0.000008341	0.012277647	0.00125602	24.50	3.261	79.90	78.52
	30	26.00	29	-2.0	9.59	26.50	0.073	0.000008341	0.012277647	0.00089598	24.00	3.261	78.27	76.92
	60	25.50	29	-2.0	9.75	26.00	0.052	0.000008341	0.012277647	0.00063905	23.50	3.261	76.64	75.31
	120	25.00	29	-2.0	9.92	25.50	0.037	0.000008341	0.012277647	0.00045573	23.00	3.261	75.01	73.71
	240	24.50	29	-2.0	10.09	25.00	0.026	0.000008341	0.012277647	0.00032495	22.50	3.261	73.38	72.11
	480	24.00	32	-2.0	10.25	24.50	0.019	0.000007821	0.011888750	0.00022433	22.00	3.261	71.75	70.51
	1440	23.48	32	-2.0	10.43	23.98	0.011	0.000007821	0.011888750	0.000130602	21.48	3.261	70.06	68.85



# ARKI TECHNO CONSULTANTS (INDIA) PVT LTD

N 3/91, IRC Village, Bhubaneswar

## GRAIN SIZE ANALYSIS OF SOIL - HYDROMETER METHOD

Client : DFCC  
 Project Name : G.I For 3 Nos. Important Bridges  
 Type of Sample : SPT  
 Location : BH-4(Markanda River- Ambala)  
 Sampled by : T.K.Das  
 Depth : 45.0m  
 Date of Testing : 06.10.12  
 Tested by : D.Mohanty

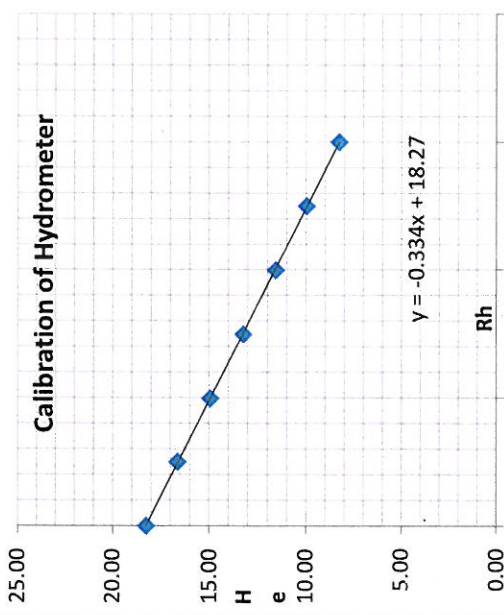
CALIBRATION OF HYDROMETER			
(Rh)	H (cm)	He (cm)	
30	0.7	8.25	
25	2.4	9.95	
20	4.0	11.55	
15	5.7	13.25	
10	7.4	14.95	
5	9.1	16.65	
0	10.7	18.25	
-5	12.4	19.95	

Rh = hydrometer Reading

H = height corresponding to Rh

He = Effective height = H + 0.5\*(h - V/A)

Time (min)	Hydrometer Reading (Rh)	Temperature (o C)	Composite Correction +/- C	Effective depth h (cm)	Rc1 = Rh + Cm	Sqrt (h/t)	Viscosity (gm/cm <sup>2</sup> )	Factor M	Particle 'C' (cm) (8) x (10)	Rc2 = Rh + C (3) + (5)	Factor N	% Finner w.r.t Wd F (12) x (13)	% Finner w.r.t total mass (14) x (1)/100
10.30	27.99	29	-2.0	8.92	28.49	0.545	0.000008341	0.012352284	0.00673659	25.99	3.848	100.00	83.66
1	27.50	29	-2.0	9.09	28.00	0.389	0.000008341	0.012352284	0.00480656	25.50	3.848	98.13	82.10
2	26.50	29	-2.0	9.42	27.00	0.280	0.000008341	0.012352284	0.00346066	24.50	3.848	94.28	78.88
4	25.50	29	-2.0	9.75	26.00	0.202	0.000008341	0.012352284	0.00249007	23.50	3.848	90.44	75.66
8	24.50	29	-2.0	10.09	25.00	0.145	0.000008341	0.012352284	0.00179064	22.50	3.848	86.59	72.44
15	23.00	29	-2.0	10.59	23.50	0.108	0.000008341	0.012352284	0.00133978	21.00	3.848	80.81	67.61
30	21.50	29	-2.0	11.09	22.00	0.078	0.000008341	0.012352284	0.00096952	19.50	3.848	75.04	62.78
60	19.50	29	-2.0	11.76	20.00	0.057	0.000008341	0.012352284	0.00070590	17.50	3.848	67.35	56.34
120	18.50	29	-2.0	12.09	19.00	0.041	0.000008341	0.012352284	0.00050619	16.50	3.848	63.50	53.12
240	17.50	29	-2.0	12.43	18.00	0.029	0.000008341	0.012352284	0.00036284	15.50	3.848	59.65	49.90
480	16.50	32	-2.0	12.76	17.00	0.021	0.000007821	0.011961022	0.00025176	14.50	3.848	55.80	46.68
1440	16.05	32	-2.0	12.91	16.55	0.012	0.000007821	0.011961022	0.000146196	14.05	3.848	54.09	45.25



Lab Manager

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# ARKITECHNO CONSULTANTS (INDIA) PVT LTD

N 3/91, IRC Village, Bhubaneswar

## GRAIN SIZE ANALYSIS OF SOIL - HYDROMETER METHOD

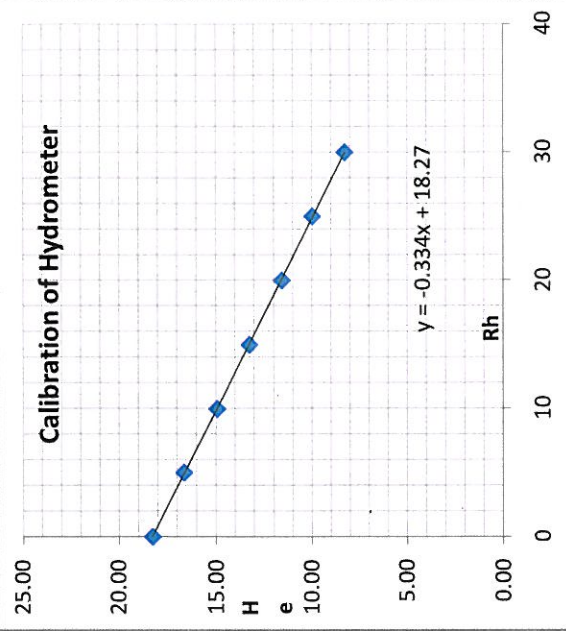
Client : DFCC  
 Project Name : G.I For 3 Nos. Important Bridges  
 Type of Sample : SPT  
 Location : BH-4(Markanda River- Ambala)  
 Sampled by : T.K.Das

Depth : 48.0m  
 Date of Testing : 06.10.12  
 Tested by : D.Mohanty

CALIBRATION OF HYDROMETER	
(Rh)	He (cm)
30	0.7
25	2.4
20	4.0
15	5.7
10	7.4
5	9.1
0	10.7
-5	12.4

(I) Percentage of 75 micron passing (from sieve analysis) 84.06  
 (II) Mass of dry soil passing 2mm sieve taken (gm) 50  
 (III) Mass of dry soil retained on 75micron sieve (gm) 8.0  
 (IV) Mass of dry soil passing 75 micron Wh (gm) 42.0  
 (V) Specific gravity of soil grains, Gs 2.67  
 (VI) Top Meniscus reading on hydrometer stem 2.0  
 (VII) Bottom meniscus reading on hydrometer stem 2.5  
 (VIII) Meniscus correction, Cm = + [ (VII) - (VI) ] 0.5  
 a Hydrometer No 1  
 Volume of Hydrometer V (cm3) 50  
 Height of bulb (h) in cm 16.5  
 Sedimentation Jar No 1  
 Cross sectional area of jar (A) in cm2 35.714

Rh = hydrometer Reading  
 H = height corresponding to Rh  
 He = Effective height = H + 0.5\*(h - V/A)



Time	Elapsed Time (min)	Hydrometer Reading (Rh)	Temperature (o C)	Composite Correction +/- C	Effective depth h (cm)	Rc1 = Rh + Cm	Sqrt (h/t)	Viscosity (gm/cm2)	Factor M	Particle 'C' (cm) (8) x (10)	Rc2 = Rh + C (3) + (5)	Factor N	% Finner w.r.t Wd F (12) x (13)	% Finner w.r.t total mass (14) x (1)/100
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
10.30	0.5	28.29	29	-2.0	8.82	28.79	0.542	0.000008341	0.012240833	0.00663782	26.29	3.804	100.00	84.06
	1	28.00	29	-2.0	8.92	28.50	0.386	0.000008341	0.012240833	0.00471921	26.00	3.804	98.90	83.14
	2	27.50	29	-2.0	9.09	28.00	0.275	0.000008341	0.012240833	0.00336808	25.50	3.804	97.00	81.54
	4	26.50	29	-2.0	9.42	27.00	0.198	0.000008341	0.012240833	0.00242498	24.50	3.804	93.20	78.34
	8	25.50	29	-2.0	9.75	26.00	0.143	0.000008341	0.012240833	0.00174486	23.50	3.804	89.39	75.14
	15	24.50	29	-2.0	10.09	25.00	0.106	0.000008341	0.012240833	0.00129590	22.50	3.804	85.59	71.95
	30	23.00	29	-2.0	10.59	23.50	0.077	0.000008341	0.012240833	0.00093882	21.00	3.804	79.88	67.15
	60	19.50	29	-2.0	11.76	20.00	0.057	0.000008341	0.012240833	0.00069953	17.50	3.804	66.57	55.96
	120	18.50	29	-2.0	12.09	19.00	0.041	0.000008341	0.012240833	0.00050162	16.50	3.804	62.77	52.76
	240	17.50	29	-2.0	12.43	18.00	0.029	0.000008341	0.012240833	0.00035957	15.50	3.804	58.96	49.56
	480	17.00	32	-2.0	12.59	17.50	0.021	0.000007821	0.011853101	0.00024785	15.00	3.804	57.06	47.96
	1440	16.86	32	-2.0	12.64	17.36	0.012	0.000007821	0.011853101	0.000143358	14.86	3.804	56.53	47.52

Lab Manager

Checked By



# ARKECHNO CONSULTANTS (INDIA) PVT LTD

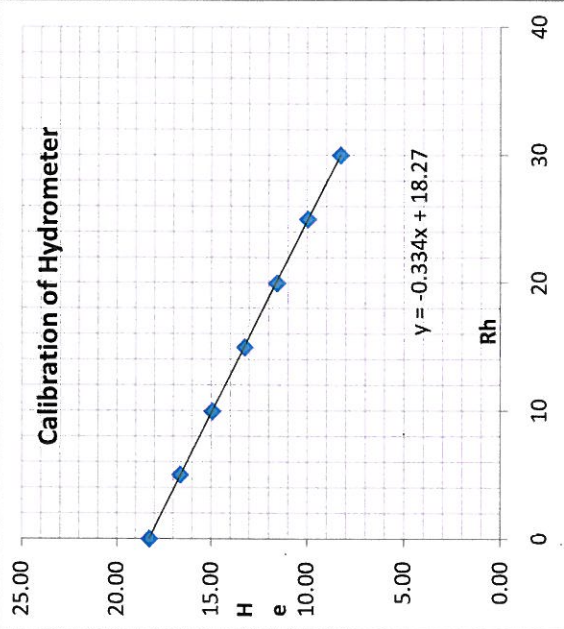
N 3/91, IRC Village, Bhubaneswar

## GRAIN SIZE ANALYSIS OF SOIL - HYDROMETER METHOD

Client : DFCC  
 Project Name : G.I For 3 Nos. Important Bridges  
 Type of Sample : SPT  
 Location : BH-4(Markanda River- Ambala)  
 Sampled by : T.K.Das  
 Depth : 50.0m  
 Date of Testing : 06.10.12  
 Tested by : D.Mohanty

CALIBRATION OF HYDROMETER	
(Rh)	He (cm)
30	0.7
25	8.25
20	2.4
15	4.0
10	5.7
5	7.4
0	9.1
-5	10.7
	12.4
	19.95

Rh = hydrometer Reading  
 H = height corresponding to Rh  
 He = Effective height = H + 0.5\*(h - V/A)



Elapsed Time (min)	Hydrometer Reading (Rh)	Temperature (o C)	Composite Correction +/- C	Effective depth h (cm)	Rc1 = Rh + Cm	Sqrt (h/t)	Viscosity (gm/cm <sup>2</sup> )	Factor M	Particle 'C' (cm) (8) x (10)	Rc2 = Rh + C (3) + (5)	Factor N	% Finner w.r.t Wd F (12) x (13)	% Finner w.r.t total mass (14) x (11)/100
2	3	4	5	6	7	8	9	10	11	12	13	14	15
10.30	27.74	29	-2.0	9.00	28.24	0.548	0.000008341	0.012352284	0.00676745	25.74	3.885	100.00	82.87
1	26.50	29	-2.0	9.42	27.00	0.396	0.000008341	0.012352284	0.00489411	24.50	3.885	95.18	78.88
2	25.50	29	-2.0	9.75	26.00	0.285	0.000008341	0.012352284	0.00352148	23.50	3.885	91.30	75.66
4	24.50	29	-2.0	10.09	25.00	0.205	0.000008341	0.012352284	0.00253234	22.50	3.885	87.41	72.44
8	23.50	29	-2.0	10.42	24.00	0.147	0.000008341	0.012352284	0.00182004	21.50	3.885	83.53	69.22
15	22.50	29	-2.0	10.76	23.00	0.109	0.000008341	0.012352284	0.00135030	20.50	3.885	79.64	66.00
30	21.00	29	-2.0	11.26	21.50	0.079	0.000008341	0.012352284	0.00097679	19.00	3.885	73.82	61.17
60	19.50	29	-2.0	11.76	20.00	0.057	0.000008341	0.012352284	0.00070590	17.50	3.885	67.99	56.34
120	18.50	29	-2.0	12.09	19.00	0.041	0.000008341	0.012352284	0.00050619	16.50	3.885	64.10	53.12
240	17.50	29	-2.0	12.43	18.00	0.029	0.000008341	0.012352284	0.00036284	15.50	3.885	60.22	49.90
480	16.50	32	-2.0	12.76	17.00	0.021	0.000007821	0.011961022	0.00025176	14.50	3.885	56.33	46.68
1440	15.85	32	-2.0	12.98	16.35	0.012	0.000007821	0.011961022	0.000146577	13.85	3.885	53.82	44.60

Lab Manager

Checked By



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# Arki Techno Consultants (India) Pvt.Ltd

N 3/91, IRC Village, Bhubaneswar

## DETERMINATION OF LIQUID LIMIT AND PLASTIC LIMIT

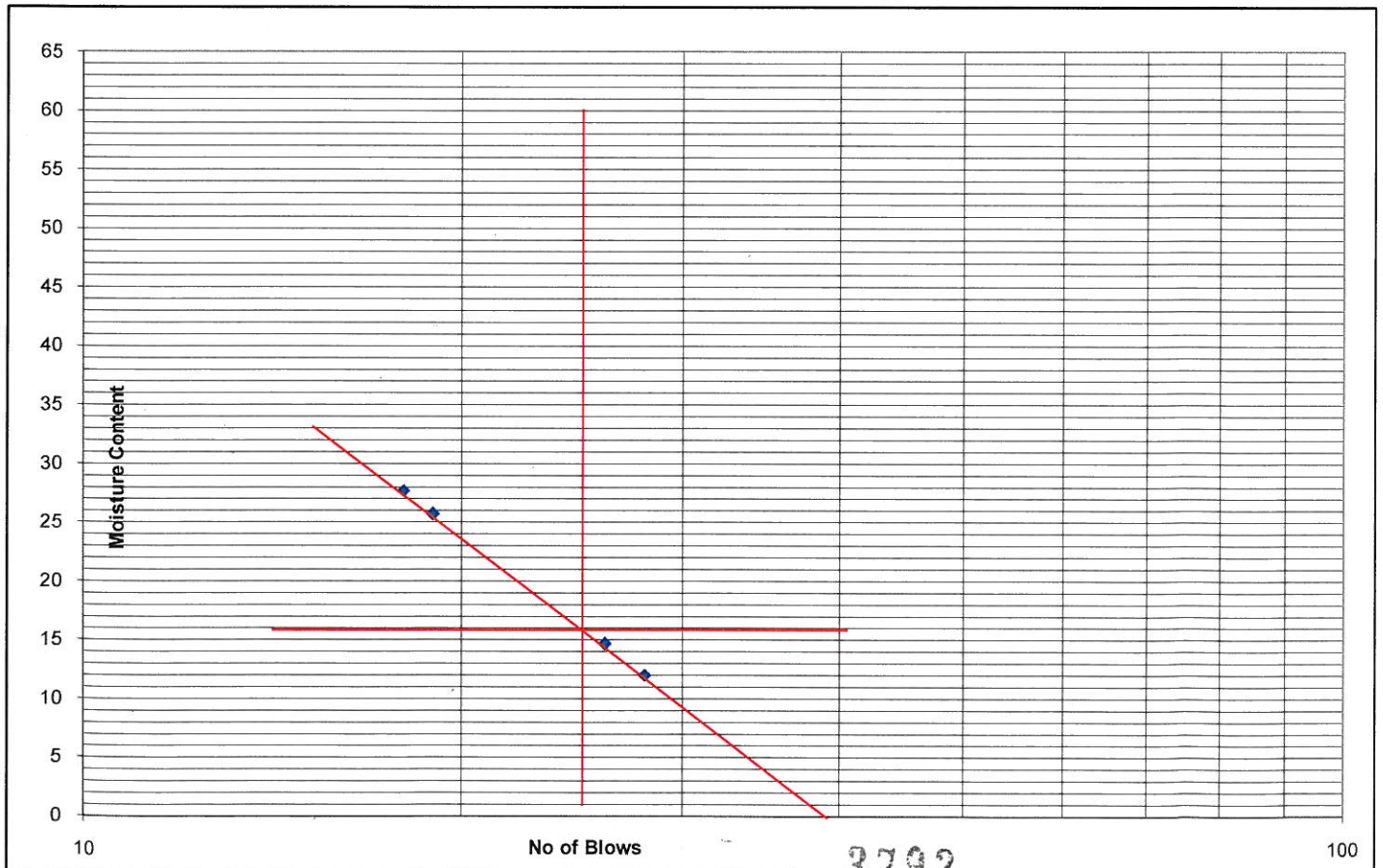
IS : 2720 (Part -5)

Client : DFCC  
 Project Name : G.I For 3 Nos. Important Bridges  
 Type of Sample : SPT  
 Date Of Testing : 09.10.12  
 Location : BH-4(Markanda River-Ambala)  
 Sampled by : T.K.Das  
 Depth : 1.5m  
 Tested by : D.Mohanty

Number of Blows	28	26	19	18	Plastic Limit
Container No.	C19	C20	C21	C22	NP
Container Weight (gm) (W1)	30.48	35.24	37.88	34.61	
Container + Wt. of wet soil (gm) (W2)	83.63	96.03	97.95	102.77	
Wt of Container + Wt. of oven dry soil (gm) (W3)	77.93	88.25	85.65	87.98	
Wt. Of water (gm) (W2-W1)-(W3-W1)	5.70	7.78	12.30	14.79	
Wt. of oven dry soil (gm) (W3-W1)	47.45	53.01	47.77	53.37	
Moisture Content (%)= $(W2-W1)-(W3-W1)]/(W3-W1) \times 100$	12.01	14.67	25.74	27.71	

### Result Summary

Liquid Limit (WL)	16	%
Plastic Limit (Wp)	-	%
Plasticity Index (Ip)	-	%



3792

### DETERMINATION OF LIQUID LIMIT AND PLASTIC LIMIT

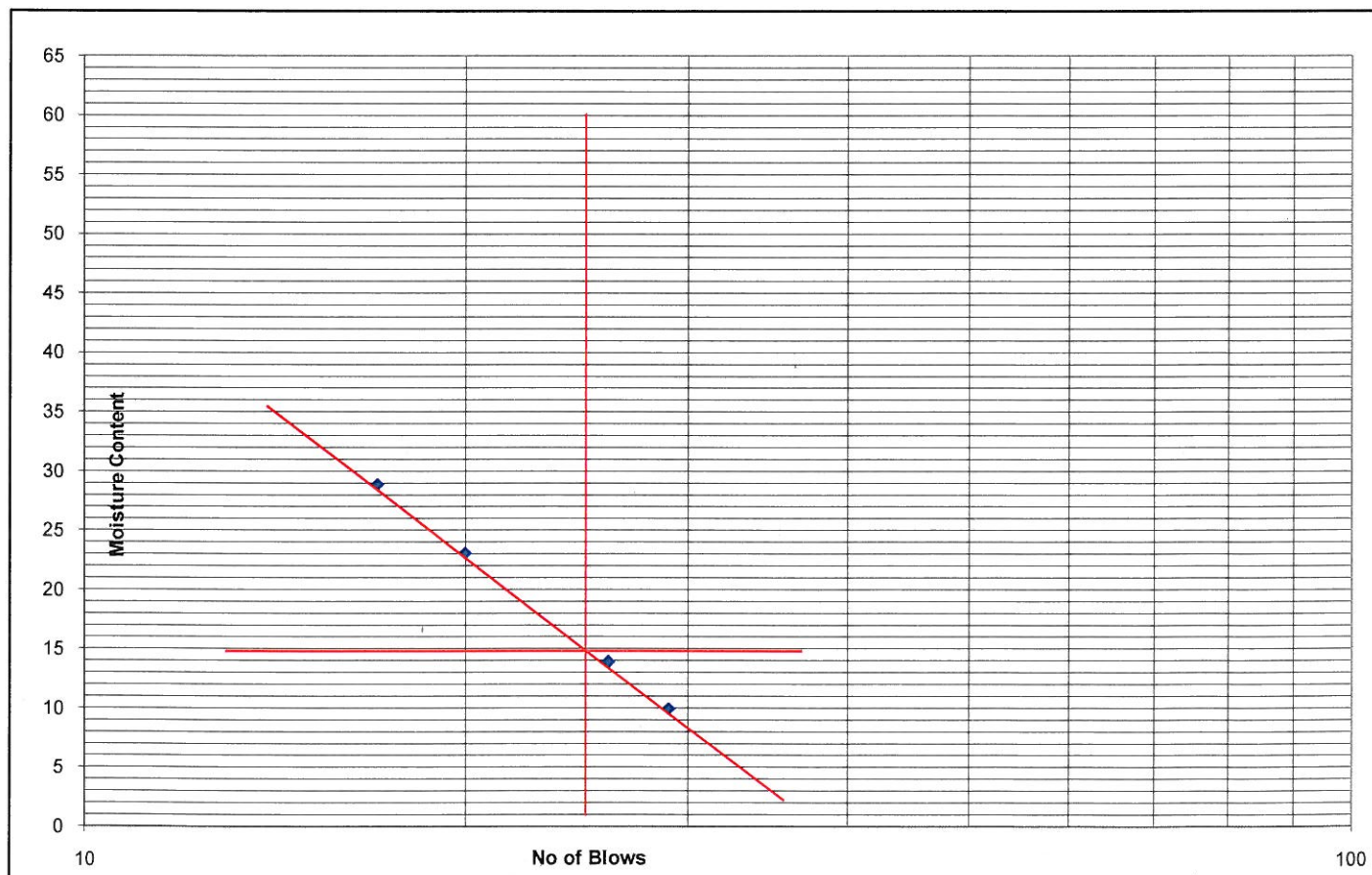
IS : 2720 (Part -5)

Client	: DFCC				
Project Name	: G.I For 3 Nos. Important Bridges			Date Of Testing	: 09.10.12
Type of Sample	: SPT			Sampled by	: T.K.Das
Location	: BH-4(Markanda River-Ambala)			Tested by	: D.Mohanty
Depth	: 3.0m				

Number of Blows	29	26	20	17	Plastic Limit
Container No.	C7	C8	C9	C10	NP
Container Weight (gm) (W1)	32.58	37.21	33.14	35.42	
Container + Wt. of wet soil (gm) (W2)	82.15	95.73	98.33	103.16	
Wt of Container + Wt. of oven dry soil (gm) (W3)	77.67	88.59	86.11	87.98	
Wt. Of water (gm) (W2-W1)-(W3-W1)	4.48	7.14	12.22	15.17	
Wt. of oven dry soil (gm) (W3-W1)	45.09	51.38	52.97	52.56	
Moisture Content (%)= [(W2-W1)-(W3-W1)]/(W3-W1) X 100	<b>9.94</b>	<b>13.89</b>	<b>23.07</b>	<b>28.87</b>	

#### Result Summary

Liquid Limit (WL)	15	%
Plastic Limit (Wp)	—	%
Plasticity Index (Ip)	—	%



- 3763

### DETERMINATION OF LIQUID LIMIT AND PLASTIC LIMIT

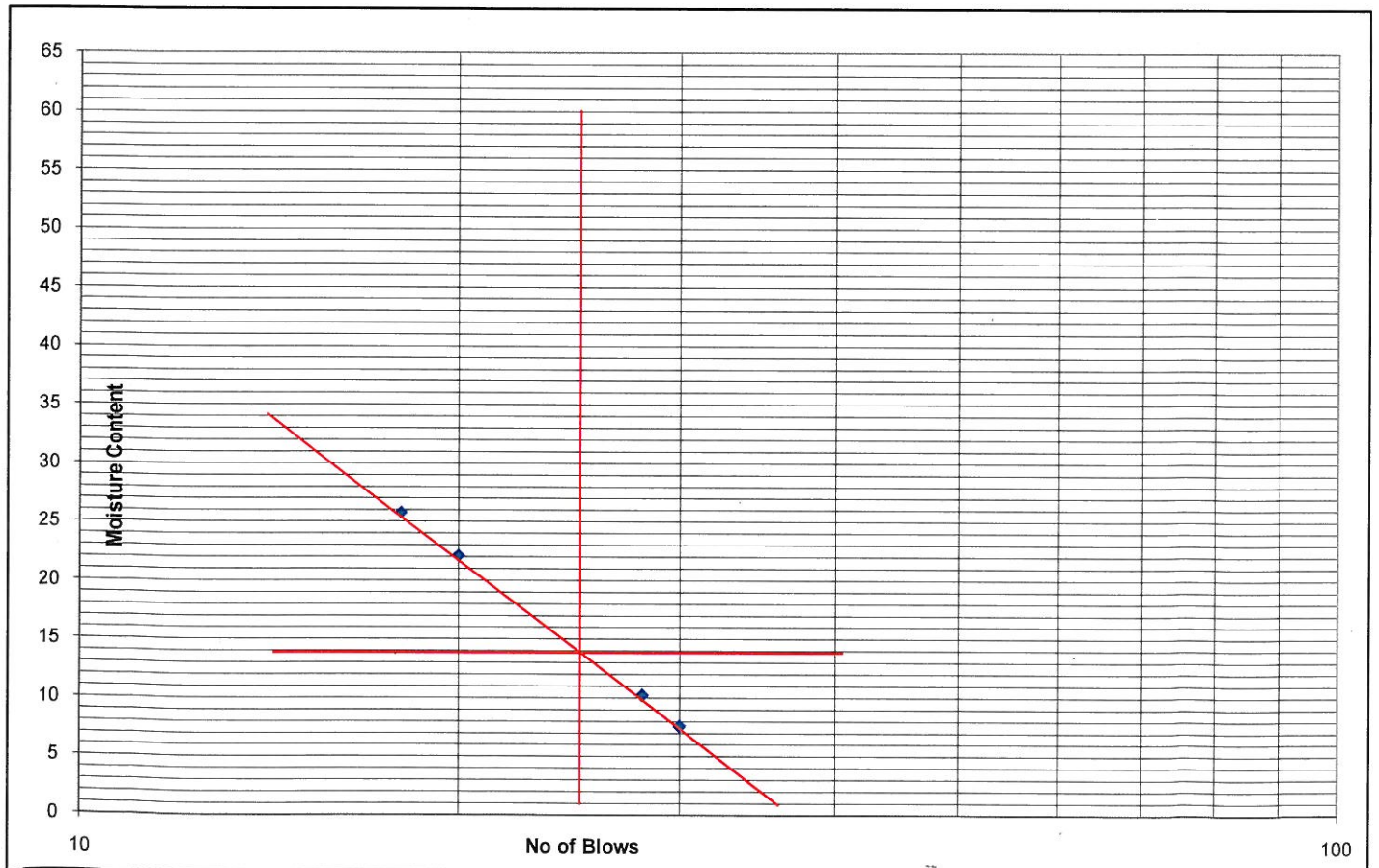
IS : 2720 (Part -5)

Client	: DFCC		Date Of Testing	: 09.10.12
Project Name	: G.I For 3 Nos. Important Bridges		Sampled by	: T.K.Das
Type of Sample	: SPT		Tested by	: D.Mohanty
Location	: BH-4(Markanda River-Ambala)			
Depth	: 4.5m			

Number of Blows	30	28	20	18	Plastic Limit
Container No.	C13	C14	C9	C16	NP
Container Weight (gm) (W1)	39.64	36.34	33.14	32.28	
Container + Wt. of wet soil (gm) (W2)	80.75	94.17	97.53	101.51	
Wt of Container + Wt. of oven dry soil (gm) (W3)	77.84	88.80	85.88	87.31	
Wt. Of water (gm) (W2-W1)-(W3-W1)	2.91	5.37	11.66	14.20	
Wt. of oven dry soil (gm) (W3-W1)	38.21	52.46	52.74	55.03	
Moisture Content (%)= (W2-W1)-(W3-W1)]/(W3-W1) X 100	<b>7.61</b>	<b>10.23</b>	<b>22.10</b>	<b>25.81</b>	

#### Result Summary

Liquid Limit (WL)	14	%
Plastic Limit (Wp)	-	%
Plasticity Index (Ip)	-	%



3794



### DETERMINATION OF LIQUID LIMIT AND PLASTIC LIMIT

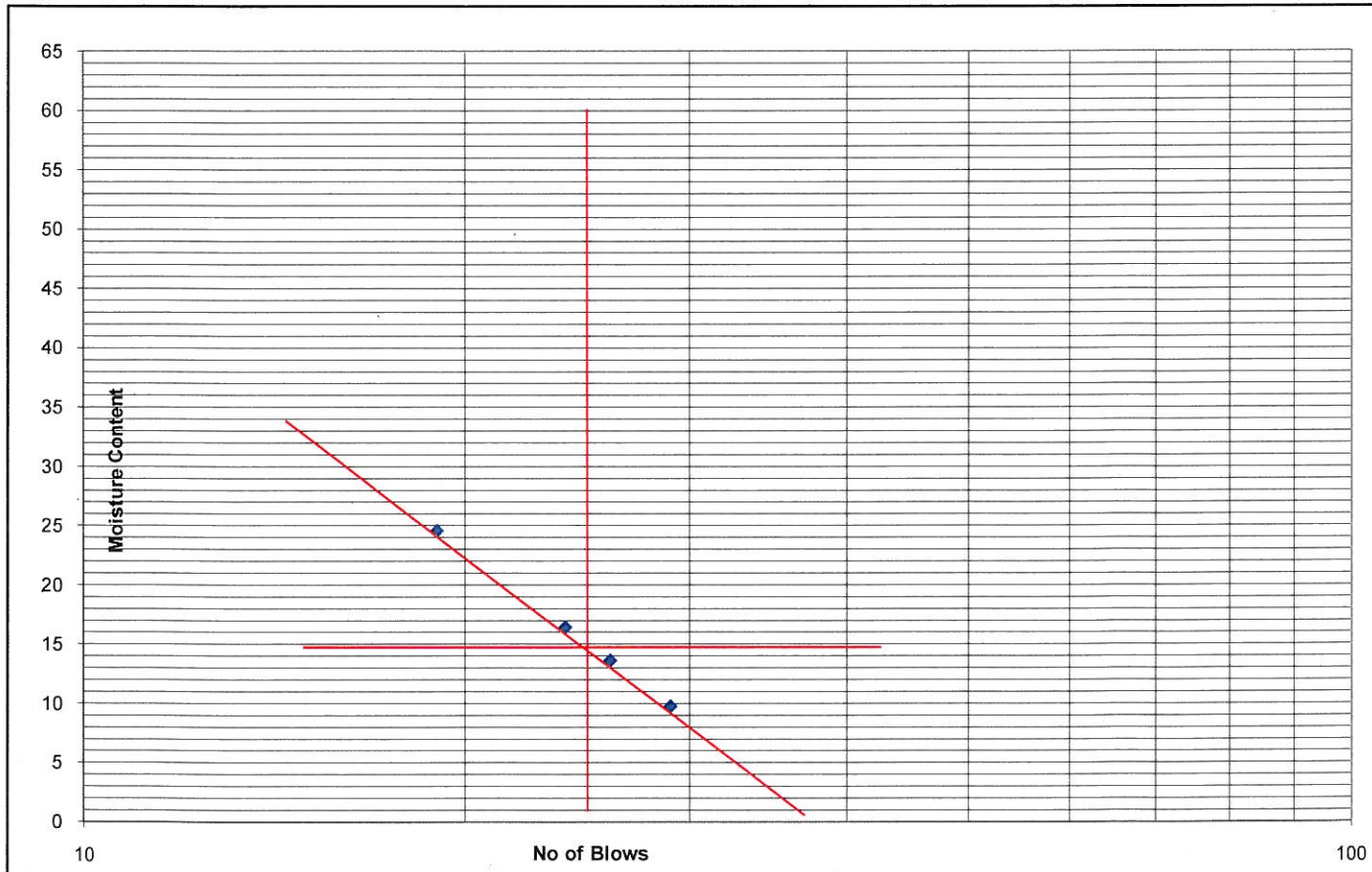
IS : 2720 (Part -5)

Client	: DFCC		
Project Name	: G.I For 3 Nos. Important Bridges	Date Of Testing	: 09.10.12
Type of Sample	: SPT	Sampled by	: T.K.Das
Location	: BH-4(Markanda River-Ambala)	Tested by	: D.Mohanty
Depth	: 6.0m		

Number of Blows	29	26	24	19	Plastic Limit
Container No.	C37.	C38	C39	C40	NP
Container Weight (gm) (W1)	38.52	37.22	39.43	30.5	
Container + Wt. of wet soil (gm) (W2)	81.14	96.34	93.40	102.19	
Wt of Container + Wt. of oven dry soil (gm) (W3)	77.35	89.25	85.79	88.05	
Wt. Of water (gm) (W2-W1)-(W3-W1)	3.79	7.08	7.62	14.14	
Wt. of oven dry soil (gm) (W3-W1)	38.83	52.03	46.36	57.55	
Moisture Content (%)= [(W2-W1)-(W3-W1)]/(W3-W1) X 100	<b>9.76</b>	<b>13.61</b>	<b>16.43</b>	<b>24.58</b>	

#### Result Summary

Liquid Limit (WL)	15	%
Plastic Limit (Wp)	-	%
Plasticity Index (Ip)	-	%



3795



## DETERMINATION OF LIQUID LIMIT AND PLASTIC LIMIT

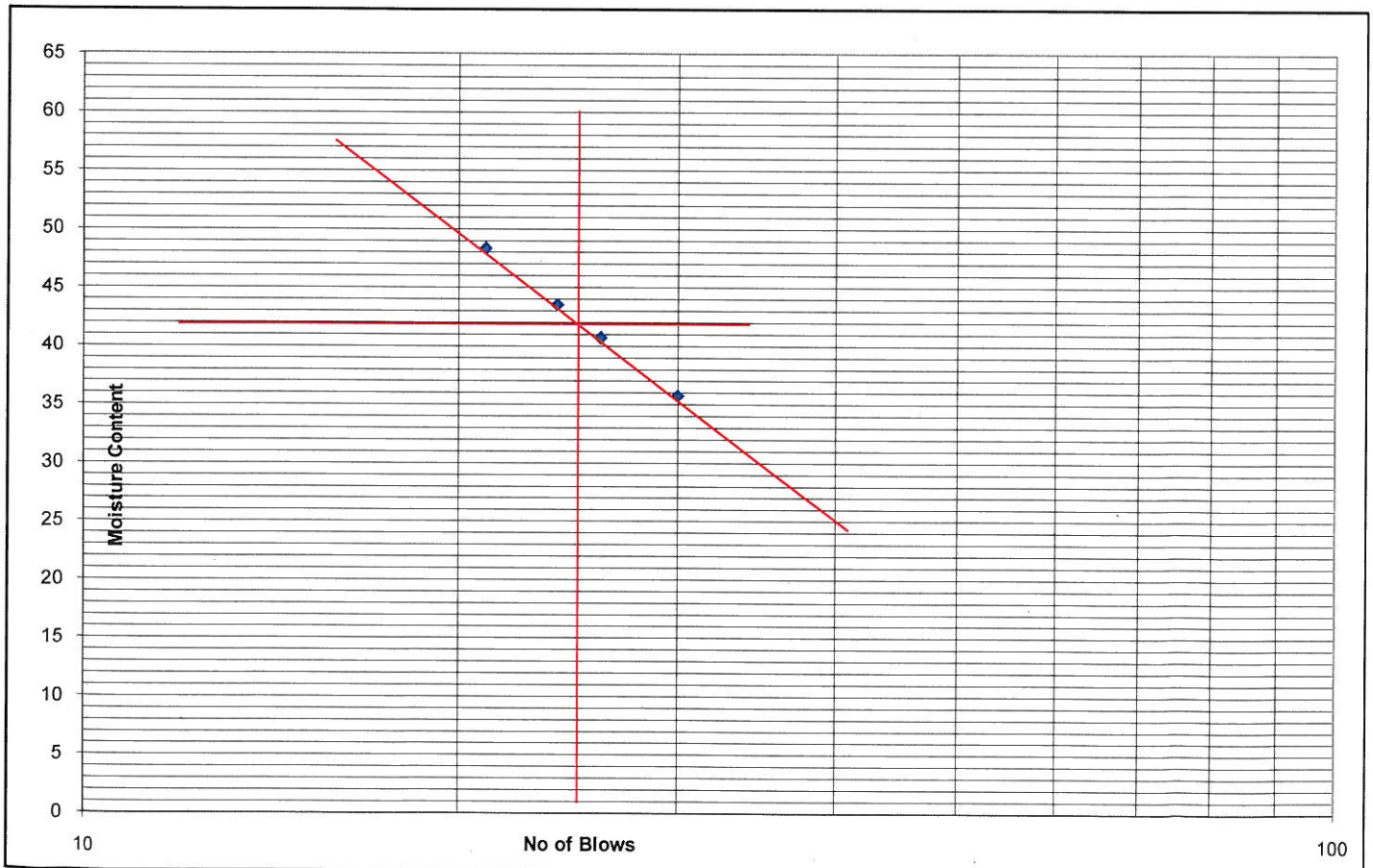
IS : 2720 (Part -5)

Client : DFCC  
 Project Name : G.I For 3 Nos. Important Bridges  
 Type of Sample : UDS  
 Location : BH-4(Markanda River-Ambala)  
 Depth : 7.5m  
 Date Of Testing : 09.10.12  
 Sampled by : T.K.Das  
 Tested by : D.Mohanty

Number of Blows	30	26	24	21	Plastic Limit	
Container No.	C25	C26	C27	C28	C29	C30
Container Weight (gm) (W1)	35.83	33.36	31.2	39.42	34.86	30.76
Container + Wt. of wet soil (gm) (W2)	92.37	112.08	109.77	110.77	92.26	92.56
Wt of Container + Wt. of oven dry soil (gm) (W3)	77.48	89.31	85.94	87.53	82.45	82.11
Wt. Of water (gm) (W2-W1)-(W3-W1)	14.89	22.77	23.82	23.24	9.82	10.45
Wt. of oven dry soil (gm) (W3-W1)	41.65	55.95	54.74	48.11	47.59	51.35
Moisture Content (%)= (W2-W1)-(W3-W1)]/(W3-W1) X 100	<b>35.76</b>	<b>40.69</b>	<b>43.52</b>	<b>48.31</b>	<b>20.63</b>	<b>20.36</b>

### Result Summary

Liquid Limit (WL)	42	%
Plastic Limit (Wp)	20	%
Plasticity Index (Ip)	22	%



3796

### DETERMINATION OF LIQUID LIMIT AND PLASTIC LIMIT

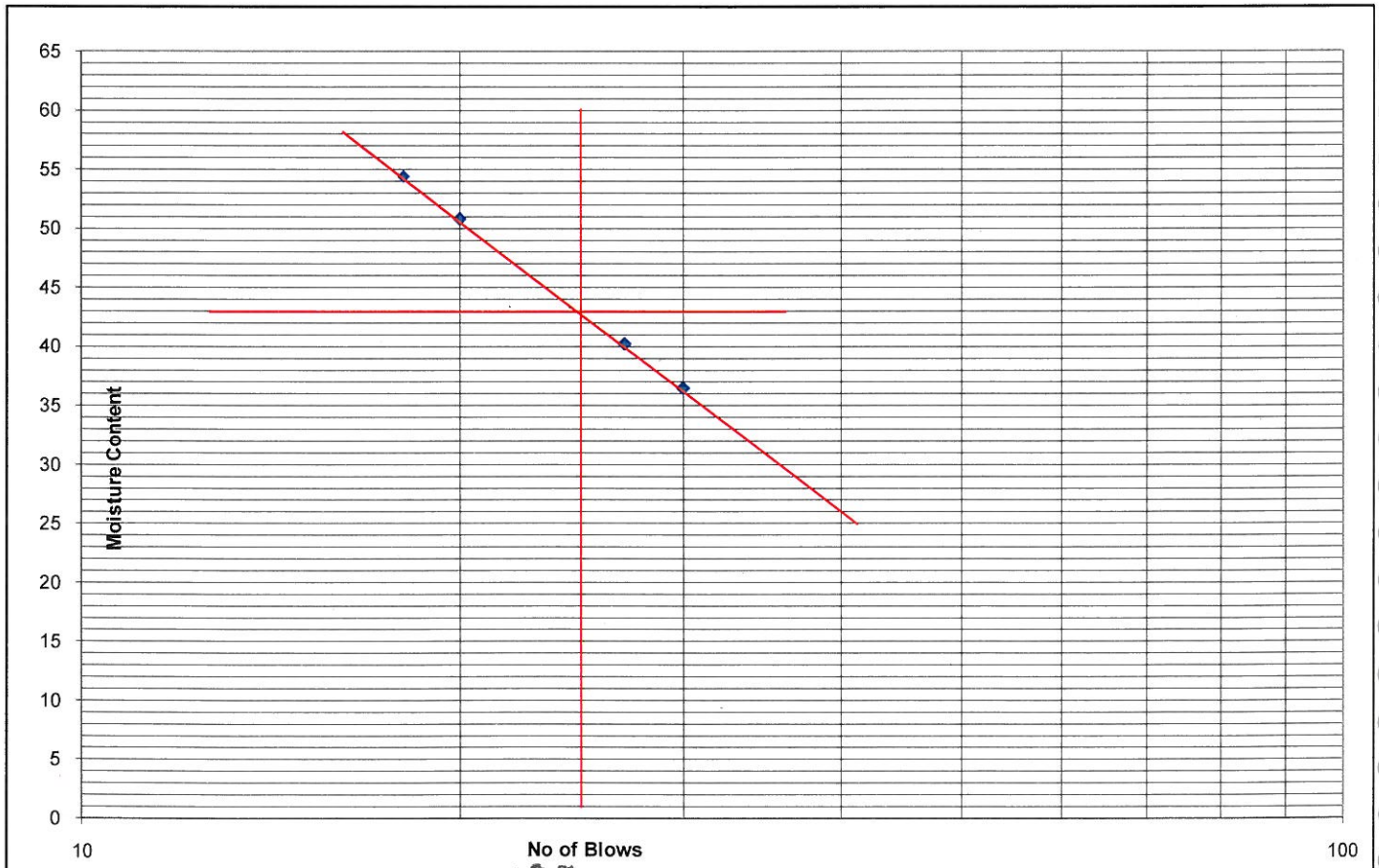
IS : 2720 (Part -5)

Client	: DFCC		Date Of Testing	: 09.10.12
Project Name	: G.I For 3 Nos. Important Bridges		Sampled by	: T.K.Das
Type of Sample	: UDS		Tested by	: D.Mohanty
Location	: BH-4(Markanda River-Ambala)			
Depth	: 10.5m			

Number of Blows	30	27	20	18	Plastic Limit	
	C1	C2	C3	C4	C5	C6
Container No.	C1	C2	C3	C4	C5	C6
Container Weight (gm) (W1)	33.6	34.2	36.7	32.65	31.26	30.12
Container + Wt. of wet soil (gm) (W2)	93.80	111.72	110.80	117.60	93.17	92.65
Wt of Container + Wt. of oven dry soil (gm) (W3)	77.71	89.48	85.84	87.66	82.49	81.90
Wt. Of water (gm) (W2-W1)-(W3-W1)	16.08	22.24	24.96	29.93	10.68	10.75
Wt. of oven dry soil (gm) (W3-W1)	44.11	55.28	49.14	55.01	51.23	51.78
Moisture Content (%)= [(W2-W1)-(W3-W1)]/(W3-W1) X 100	<b>36.46</b>	<b>40.23</b>	<b>50.79</b>	<b>54.41</b>	<b>20.84</b>	<b>20.76</b>

#### Result Summary

Liquid Limit (WL)	43	%
Plastic Limit (Wp)	21	%
Plasticity Index (Ip)	22	%



3797



## DETERMINATION OF LIQUID LIMIT AND PLASTIC LIMIT

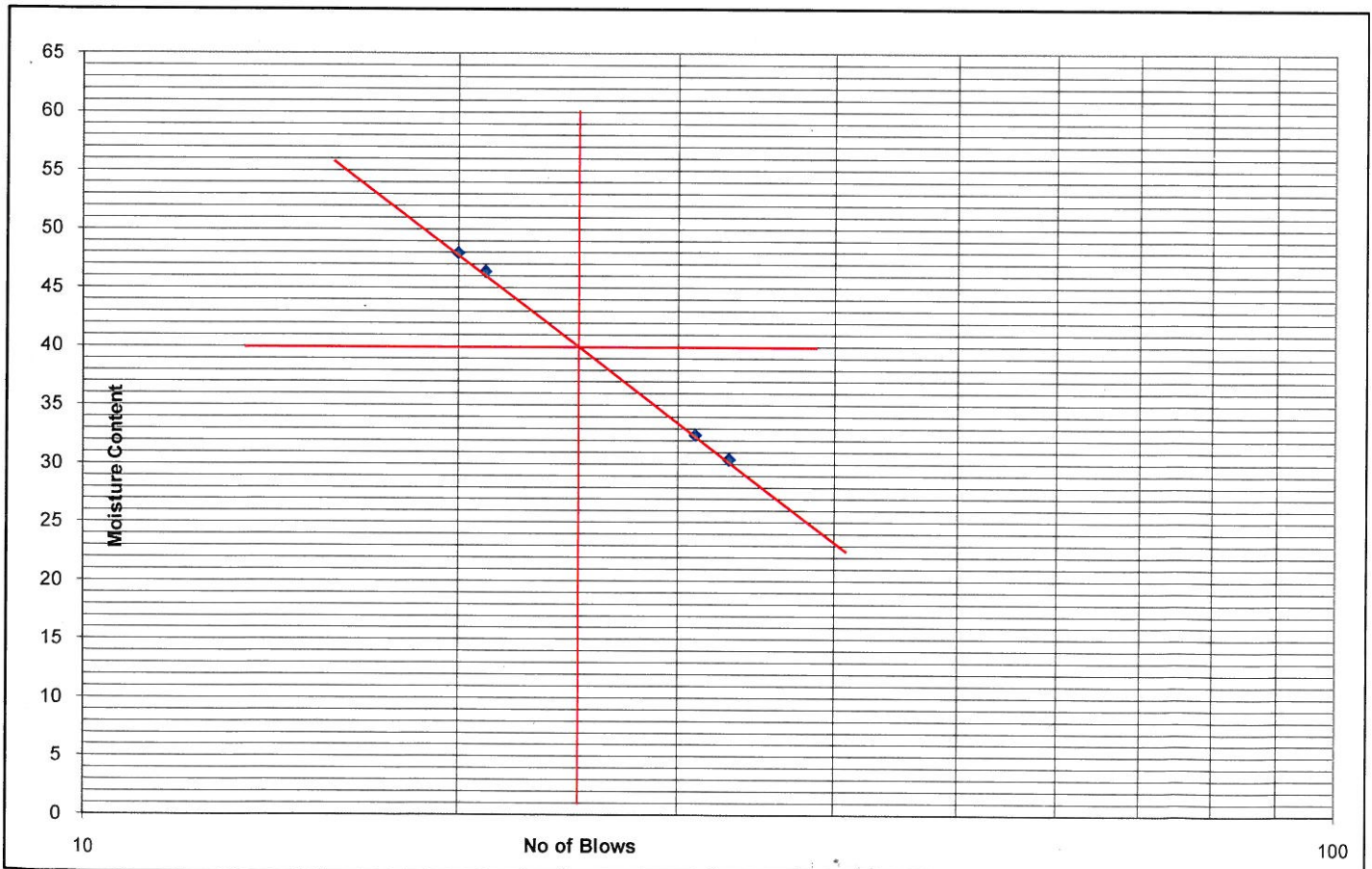
IS : 2720 (Part -5)

Client : DFCC  
 Project Name : G.I For 3 Nos. Important Bridges  
 Type of Sample : SPT  
 Location : BH-4(Markanda River-Ambala)  
 Depth : 12.0m  
 Date Of Testing : 09.10.12  
 Sampled by : T.K.Das  
 Tested by : D.Mohanty

Number of Blows	33	31	21	20	Plastic Limit	
Container No.	A13	A14	A15	A16	A17	A18
Container Weight (gm) (W1)	30.74	36.34	35.26	32.28	30.76	32.29
Container + Wt. of wet soil (gm) (W2)	92.47	106.36	109.38	113.80	93.18	90.07
Wt of Container + Wt. of oven dry soil (gm) (W3)	78.08	89.19	85.90	87.38	82.63	80.99
Wt. Of water (gm) (W2-W1)-(W3-W1)	14.39	17.17	23.47	26.42	10.56	9.08
Wt. of oven dry soil (gm) (W3-W1)	47.34	52.85	50.64	55.10	51.87	48.70
Moisture Content (%)= $\frac{(W2-W1)-(W3-W1)}{(W3-W1)} \times 100$	<b>30.39</b>	<b>32.48</b>	<b>46.35</b>	<b>47.96</b>	<b>20.35</b>	<b>18.64</b>

### Result Summary

Liquid Limit (WL)	40	%
Plastic Limit (Wp)	19	%
Plasticity Index (Ip)	21	%



3700

### DETERMINATION OF LIQUID LIMIT AND PLASTIC LIMIT

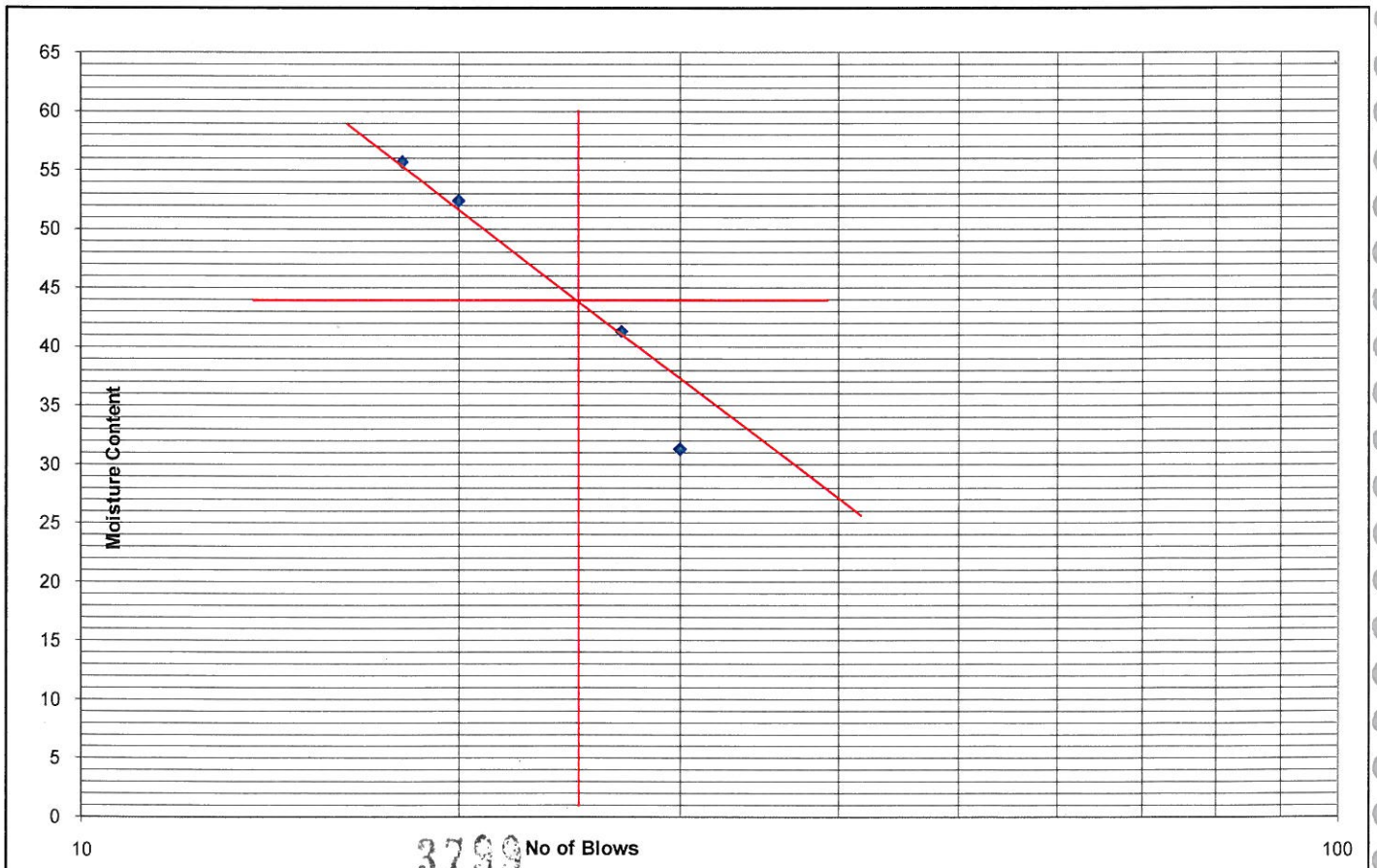
IS : 2720 (Part -5)

Client	: DFCC		Date Of Testing	: 09.10.12
Project Name	: G.I For 3 Nos. Important Bridges		Sampled by	: T.K.Das
Type of Sample	: UDS		Tested by	: D.Mohanty
Location	: BH-4(Markanda River-Ambala)			
Depth	: 13.5m			

Number of Blows	30	27	20	18	Plastic Limit	
	A1	A2	A3	A4	A5	A6
Container No.						
Container Weight (gm) (W1)	30.58	33.64	36.7	32.65	34.87	31.29
Container + Wt. of wet soil (gm) (W2)	94.57	110.41	111.93	118.31	93.02	91.52
Wt of Container + Wt. of oven dry soil (gm) (W3)	79.33	87.97	86.08	87.68	82.68	80.98
Wt. Of water (gm) (W2-W1)-(W3-W1)	15.25	22.44	25.86	30.62	10.34	10.54
Wt. of oven dry soil (gm) (W3-W1)	48.75	54.33	49.38	55.03	47.81	49.69
Moisture Content (%)= [(W2-W1)-(W3-W1)]/(W3-W1) X 100	<b>31.28</b>	<b>41.30</b>	<b>52.37</b>	<b>55.64</b>	<b>21.63</b>	<b>21.20</b>

#### Result Summary

Liquid Limit (WL)	44	%
Plastic Limit (Wp)	21	%
Plasticity Index (Ip)	23	%





# Arki Techno Consultants (India) Pvt.Ltd

N 3/91, IRC Village, Bhubaneswar

## DETERMINATION OF LIQUID LIMIT AND PLASTIC LIMIT

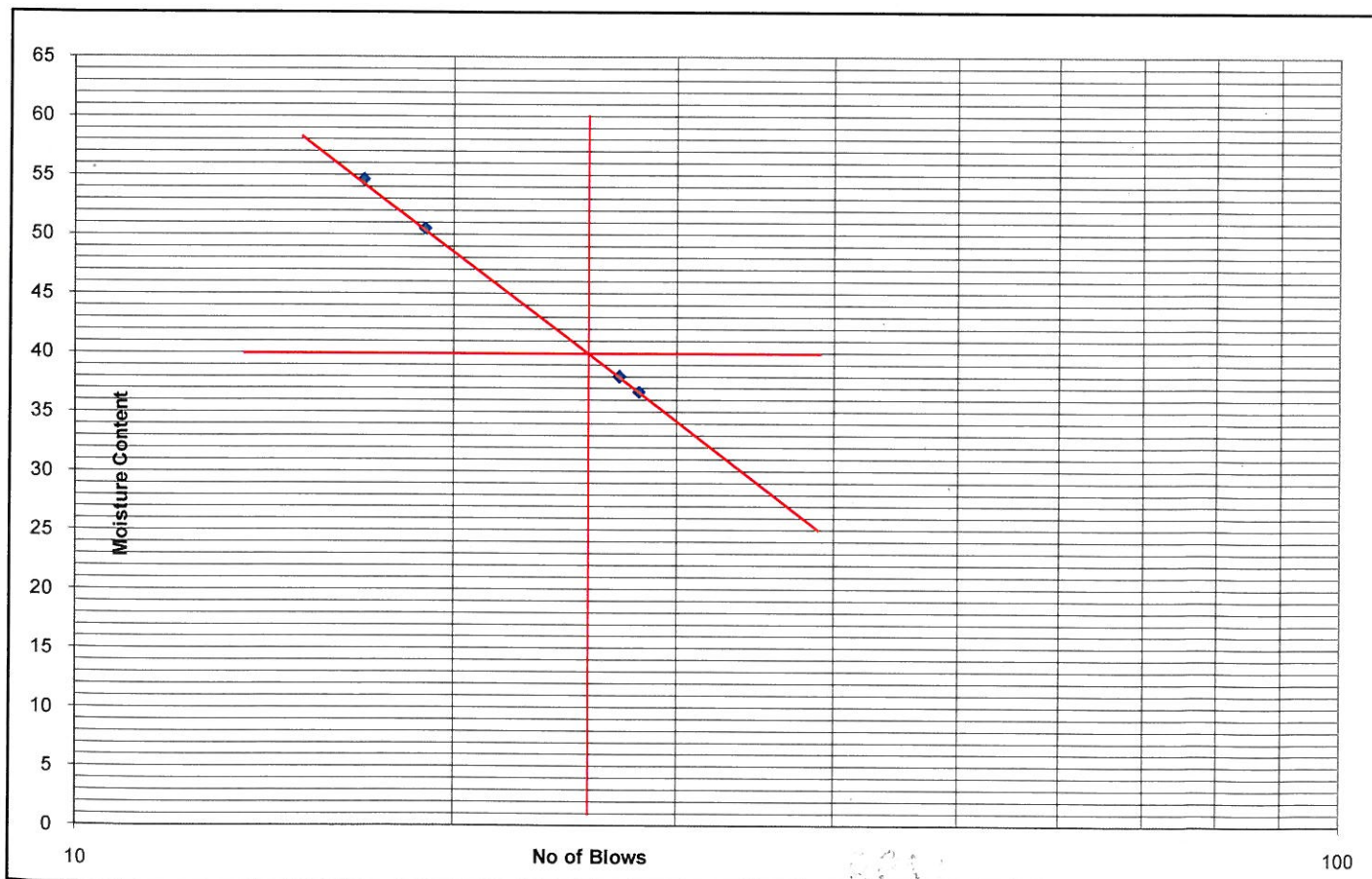
IS : 2720 (Part -5)

Client : DFCC  
 Project Name : G.I For 3 Nos. Important Bridges  
 Type of Sample : UDS  
 Location : BH-4(Markanda River-Ambala)  
 Depth : 16.5m  
 Date Of Testing : 09.10.12  
 Sampled by : T.K.Das  
 Tested by : D.Mohanty

Number of Blows	28	27	19	17	Plastic Limit	
	Container No.	A19	A20	A21	A22	C11
Container Weight (gm) (W1)	30.48	36.37	35.44	34.61	31.85	36.97
Container + Wt. of wet soil (gm) (W2)	94.31	108.86	111.16	116.95	91.78	89.02
Wt of Container + Wt. of oven dry soil (gm) (W3)	77.17	88.90	85.76	87.87	81.63	80.38
Wt. Of water (gm) (W2-W1)-(W3-W1)	17.14	19.97	25.41	29.08	10.15	8.64
Wt. of oven dry soil (gm) (W3-W1)	46.69	52.53	50.32	53.26	49.78	43.41
Moisture Content (%)= (W2-W1)-(W3-W1)]/(W3-W1) X 100	36.71	38.01	50.49	54.61	20.38	19.89

### Result Summary

Liquid Limit (WL)	40	%
Plastic Limit (Wp)	20	%
Plasticity Index (Ip)	20	%



3800

### DETERMINATION OF LIQUID LIMIT AND PLASTIC LIMIT

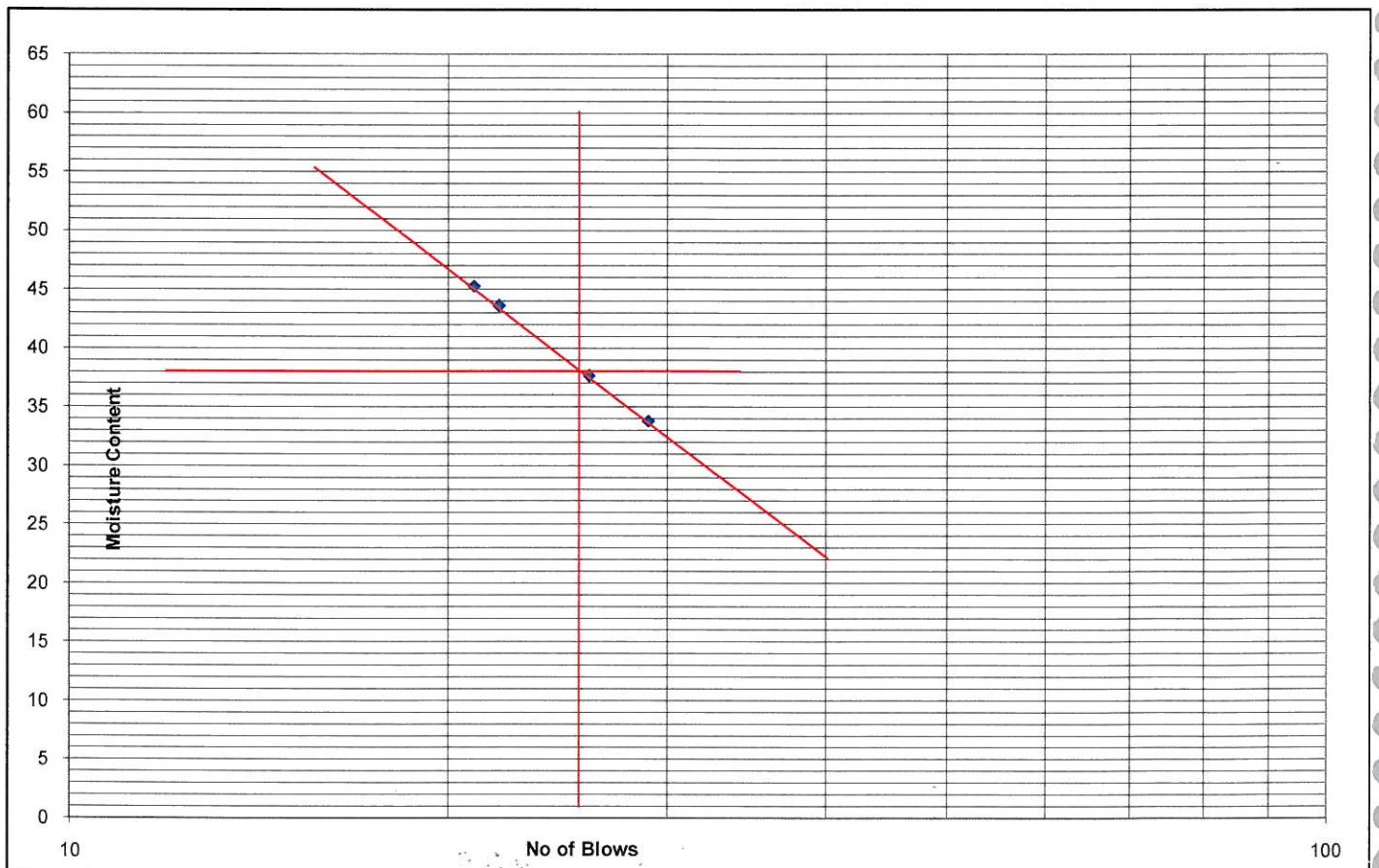
IS : 2720 (Part -5)

Client	: DFCC		Date Of Testing	: 09.10.12
Project Name	: G.I For 3 Nos. Important Bridges		Sampled by	: T.K.Das
Type of Sample	: SPT		Tested by	: D.Mohanty
Location	: BH-4(Markanda River-Ambala)			
Depth	: 18.0m			

Number of Blows	29	26	22	21	Plastic Limit	
	A7	A8	A9	A10	A11	A12
Container No.	A7	A8	A9	A10	A11	A12
Container Weight (gm) (W1)	36.24	35.69	32.84	33.18	31.85	34.26
Container + Wt. of wet soil (gm) (W2)	91.55	109.18	109.20	111.82	98.75	97.97
Wt of Container + Wt. of oven dry soil (gm) (W3)	77.58	89.08	86.01	87.32	88.10	87.86
Wt. Of water (gm) (W2-W1)-(W3-W1)	13.97	20.10	23.19	24.51	10.64	10.11
Wt. of oven dry soil (gm) (W3-W1)	41.34	53.39	53.17	54.14	56.25	53.60
Moisture Content (%)= [(W2-W1)-(W3-W1)]/(W3-W1) X 100	<b>33.79</b>	<b>37.64</b>	<b>43.61</b>	<b>45.27</b>	<b>18.92</b>	<b>18.87</b>

#### Result Summary

Liquid Limit (WL)	38	%
Plastic Limit (Wp)	19	%
Plasticity Index (Ip)	19	%



3801



### DETERMINATION OF LIQUID LIMIT AND PLASTIC LIMIT

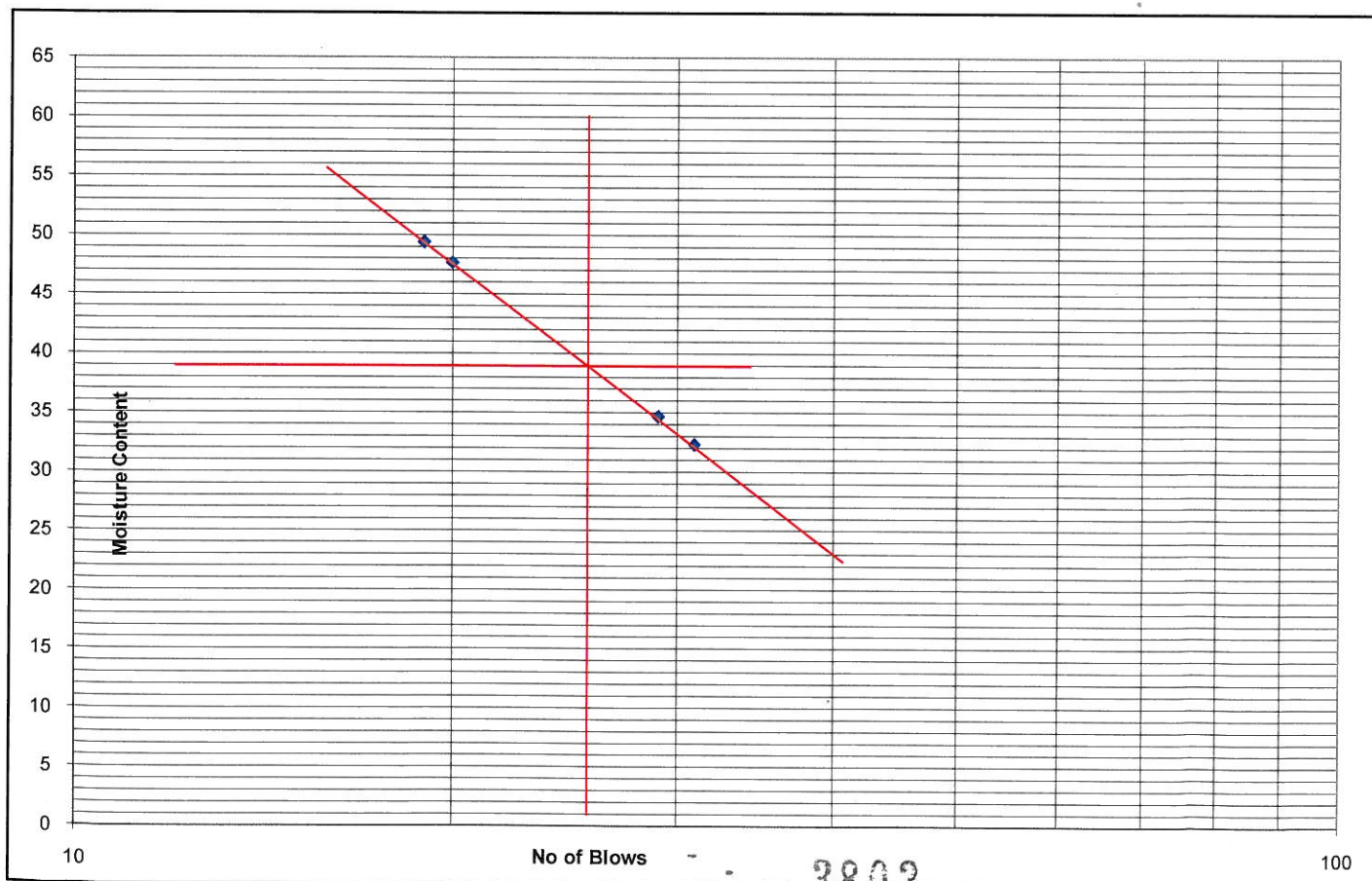
IS : 2720 (Part -5)

Client : DFCC  
 Project Name : G.I For 3 Nos. Important Bridges  
 Type of Sample : UDS  
 Location : BH-4(Markanda River-Ambala)  
 Depth : 19.5m  
 Date Of Testing : 09.10.12  
 Sampled by : T.K.Das  
 Tested by : D.Mohanty

Number of Blows	31	29	20	19	Plastic Limit	
Container No.	A25	A26	A27	A28	A29	A30
Container Weight (gm) (W1)	35.83	33.36	31.2	39.42	34.86	30.76
Container + Wt. of wet soil (gm) (W2)	91.50	108.43	111.99	110.82	98.22	98.71
Wt of Container + Wt. of oven dry soil (gm) (W3)	77.91	89.10	85.92	87.22	87.95	88.51
Wt. Of water (gm) (W2-W1)-(W3-W1)	13.59	19.33	26.07	23.60	10.27	10.19
Wt. of oven dry soil (gm) (W3-W1)	42.08	55.74	54.72	47.80	53.09	57.75
Moisture Content (%)= $\frac{(W2-W1)-(W3-W1)}{(W3-W1)} \times 100$	<b>32.29</b>	<b>34.68</b>	<b>47.64</b>	<b>49.37</b>	<b>19.34</b>	<b>17.65</b>

#### Result Summary

Liquid Limit (WL)	39	%
Plastic Limit (Wp)	18	%
Plasticity Index (Ip)	21	%



3802



### DETERMINATION OF LIQUID LIMIT AND PLASTIC LIMIT

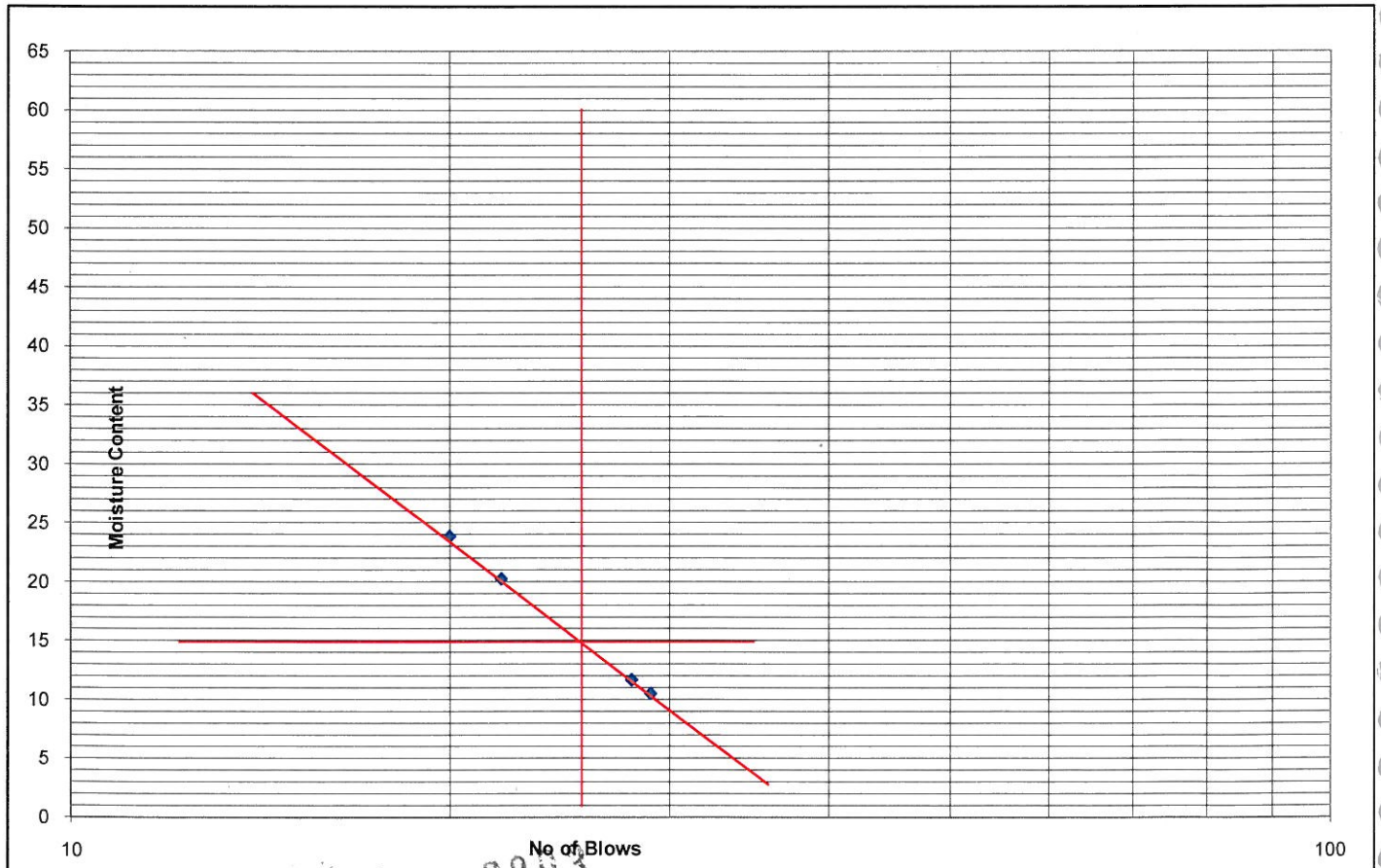
IS : 2720 (Part -5)

Client	: DFCC		Date Of Testing	: 10.10.12
Project Name	: G.I For 3 Nos. Important Bridges		Sampled by	: T.K.Das
Type of Sample	: SPT		Tested by	: D.Mohanty
Location	: BH-4(Markanda River-Ambala)			
Depth	: 22.5m			

Number of Blows	29	28	22	20	Plastic Limit
Container No.	A37	A38	A39	A40	NP
Container Weight (gm) (W1)	30.18	33.67	35.48	31.39	
Container + Wt. of wet soil (gm) (W2)	82.74	95.76	96.71	100.64	
Wt of Container + Wt. of oven dry soil (gm) (W3)	77.75	89.26	86.41	87.31	
Wt. Of water (gm) (W2-W1)-(W3-W1)	4.99	6.49	10.30	13.33	
Wt. of oven dry soil (gm) (W3-W1)	47.57	55.59	50.93	55.92	
Moisture Content (%)= [(W2-W1)-(W3-W1)]/(W3-W1) X 100	<b>10.49</b>	<b>11.68</b>	<b>20.23</b>	<b>23.84</b>	

#### Result Summary

Liquid Limit (WL)	15	%
Plastic Limit (Wp)	-	%
Plasticity Index (Ip)	-	%





## DETERMINATION OF LIQUID LIMIT AND PLASTIC LIMIT

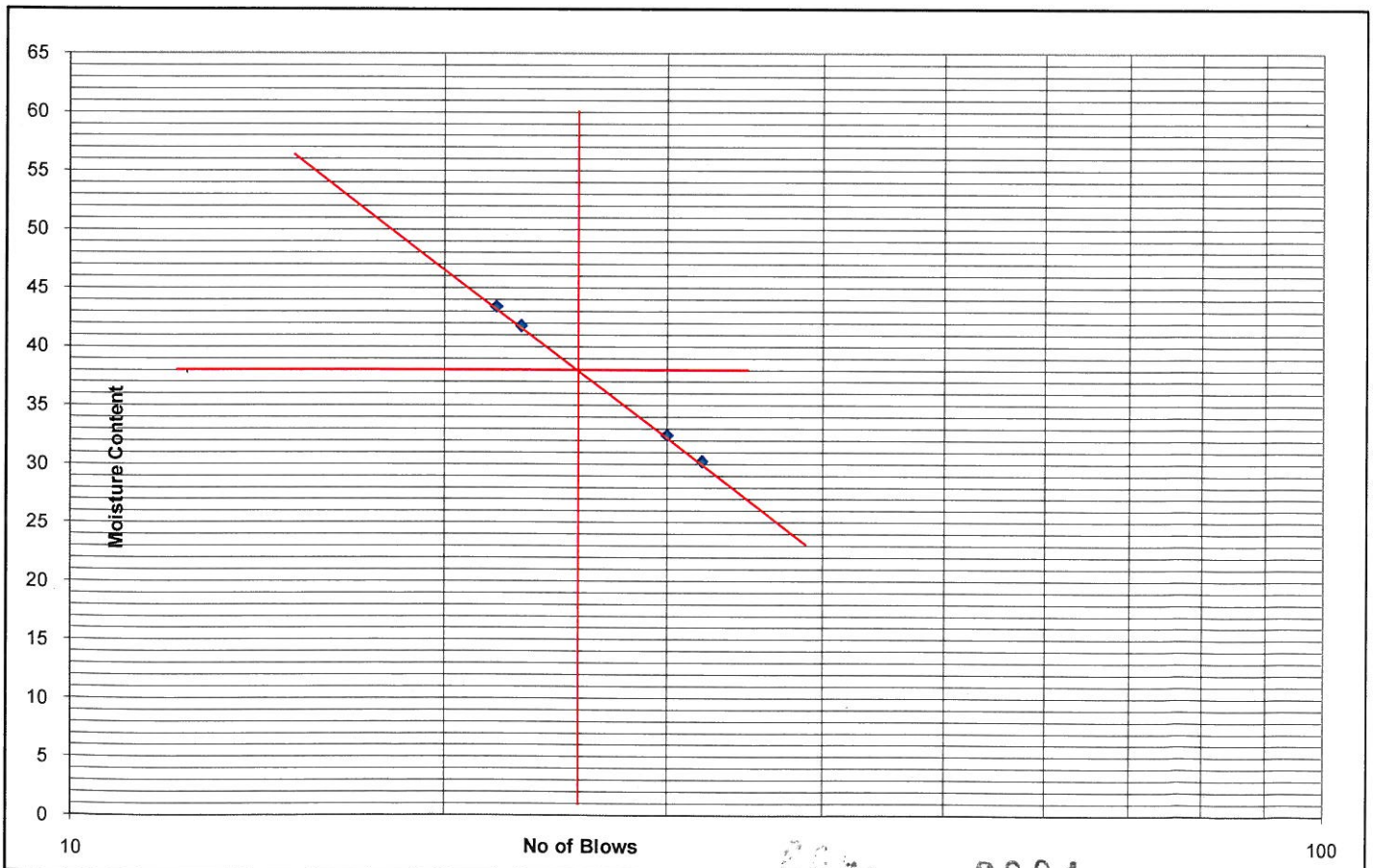
IS : 2720 (Part -5)

Client	: DFCC	Date Of Testing	: 10.10.12
Project Name	: G.I For 3 Nos. Important Bridges	Sampled by	: T.K.Das
Type of Sample	: SPT	Tested by	: D.Mohanty
Location	: BH-4(Markanda River-Ambala)		
Depth	: 25.5m		

Number of Blows	32	30	23	22	Plastic Limit	
Container No.	A31	A32	A33	A34	A35	A36
Container Weight (gm) (W1)	35.64	34.29	32.47	31.56	30.22	33.47
Container + Wt. of wet soil (gm) (W2)	90.55	107.50	108.59	111.57	99.44	99.20
Wt of Container + Wt. of oven dry soil (gm) (W3)	77.80	89.55	86.17	87.35	88.43	89.15
Wt. Of water (gm) (W2-W1)-(W3-W1)	12.75	17.95	22.42	24.22	11.01	10.05
Wt. of oven dry soil (gm) (W3-W1)	42.16	55.26	53.70	55.79	58.21	55.68
Moisture Content (%)= $\frac{(W2-W1)-(W3-W1)}{(W3-W1)} \times 100$	<b>30.24</b>	<b>32.48</b>	<b>41.75</b>	<b>43.42</b>	<b>18.92</b>	<b>18.05</b>

### Result Summary

Liquid Limit (WL)	38	%
Plastic Limit (Wp)	18	%
Plasticity Index (Ip)	20	%



3804

### DETERMINATION OF LIQUID LIMIT AND PLASTIC LIMIT

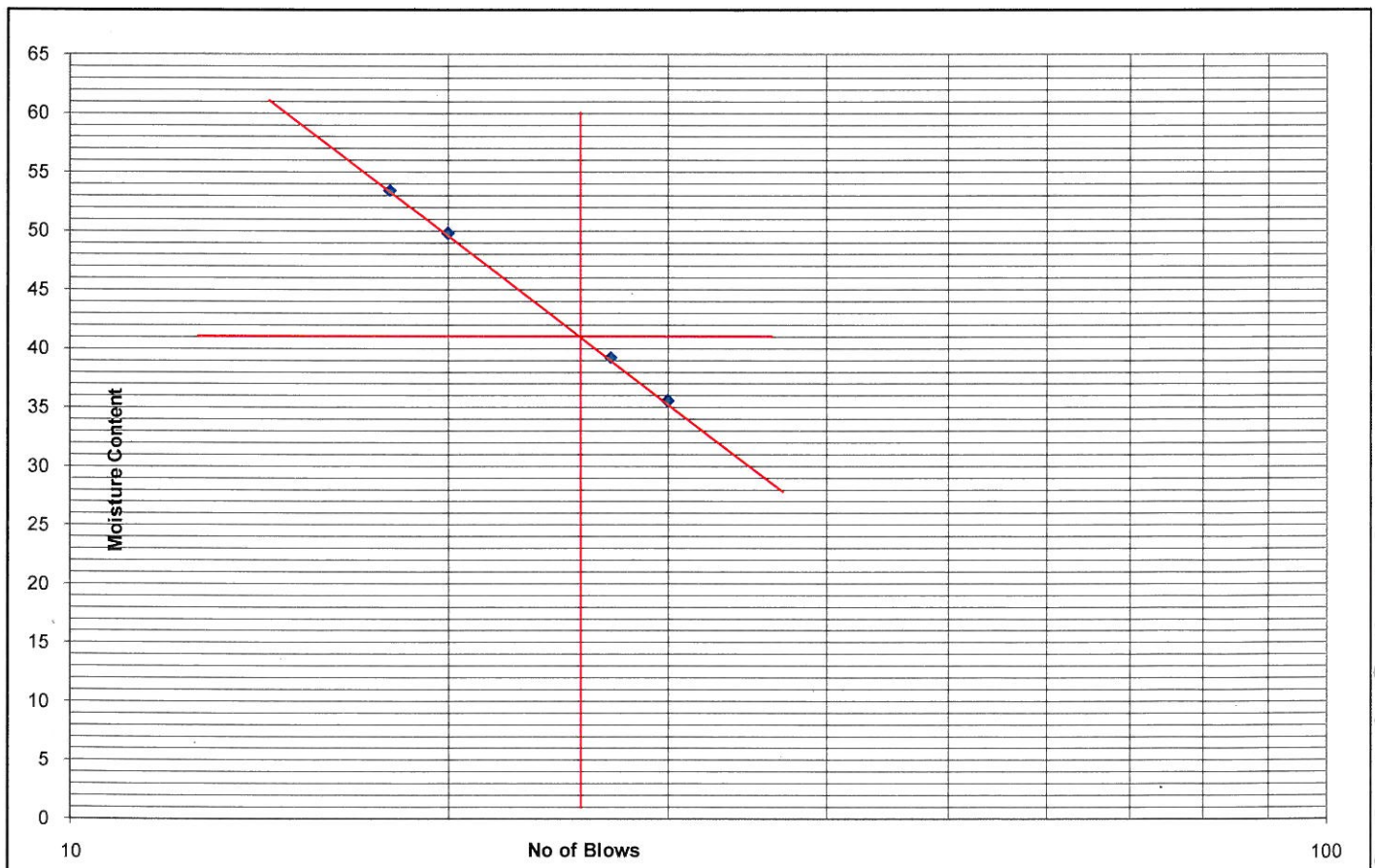
IS : 2720 (Part -5)

Client	: DFCC		Date Of Testing	: 10.10.12
Project Name	: G.I For 3 Nos. Important Bridges		Sampled by	: T.K.Das
Type of Sample	: UDS		Tested by	: D.Mohanty
Location	: BH-4(Markanda River-Ambala)			
Depth	: 28.5m			

Number of Blows	30	27	20	18	Plastic Limit	
Container No.	A23	A24	C23	C24	C17	C18
Container Weight (gm) (W1)	35.8	32.51	32.47	31.56	30.76	32.24
Container + Wt. of wet soil (gm) (W2)	92.68	112.68	112.94	117.93	92.42	90.55
Wt of Container + Wt. of oven dry soil (gm) (W3)	77.76	90.09	86.19	87.86	82.09	80.86
Wt. Of water (gm) (W2-W1)-(W3-W1)	14.92	22.59	26.75	30.07	10.33	9.69
Wt. of oven dry soil (gm) (W3-W1)	41.96	57.58	53.72	56.30	51.33	48.62
Moisture Content (%)= [(W2-W1)-(W3-W1)]/(W3-W1) X 100	<b>35.55</b>	<b>39.24</b>	<b>49.79</b>	<b>53.41</b>	<b>20.13</b>	<b>19.94</b>

#### Result Summary

Liquid Limit (WL)	41	%
Plastic Limit (Wp)	20	%
Plasticity Index (Ip)	21	%



3805

## DETERMINATION OF LIQUID LIMIT AND PLASTIC LIMIT

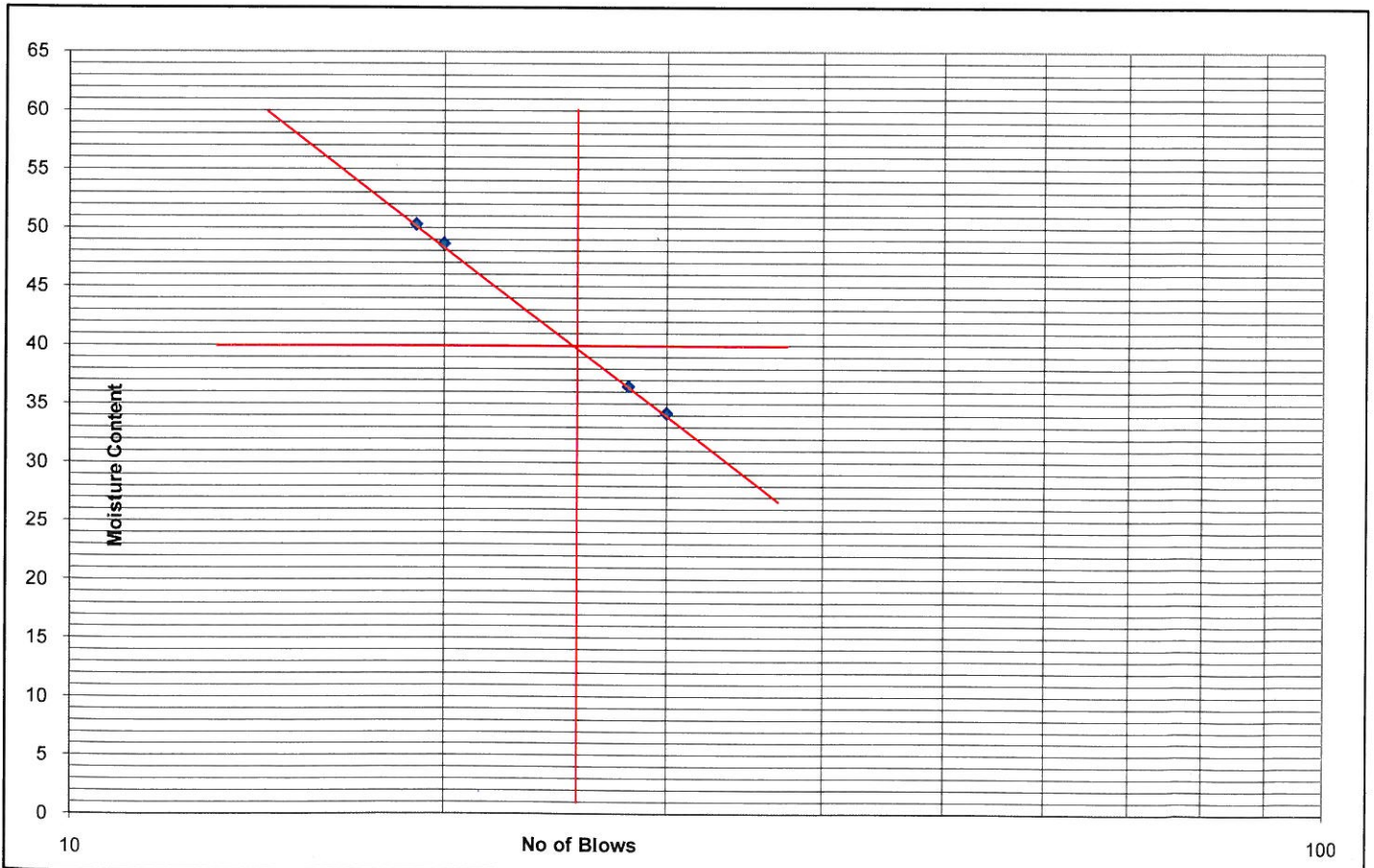
IS : 2720 (Part -5)

Client : DFCC  
 Project Name : G.I For 3 Nos. Important Bridges  
 Type of Sample : UDS  
 Location : BH-4(Markanda River-Ambala)  
 Depth : 31.5m  
 Date Of Testing : 10.10.12  
 Sampled by : T.K.Das  
 Tested by : D.Mohanty

Number of Blows	30	28	20	19	Plastic Limit	
Container No.	D13	D14	D15	D16	D17	D18
Container Weight (gm) (W1)	34.4	33.46	32.41	35.31	30.56	31.49
Container + Wt. of wet soil (gm) (W2)	92.62	110.88	112.34	114.41	92.38	90.66
Wt of Container + Wt. of oven dry soil (gm) (W3)	77.79	90.18	86.19	87.95	81.97	80.84
Wt. Of water (gm) (W2-W1)-(W3-W1)	14.83	20.70	26.15	26.46	10.42	9.83
Wt. of oven dry soil (gm) (W3-W1)	43.39	56.72	53.78	52.64	51.41	49.35
Moisture Content (%)= (W2-W1)-(W3-W1)]/(W3-W1) X 100	<b>34.18</b>	<b>36.49</b>	<b>48.62</b>	<b>50.26</b>	<b>20.26</b>	<b>19.92</b>

### Result Summary

Liquid Limit (WL)	40	%
Plastic Limit (Wp)	20	%
Plasticity Index (Ip)	20	%



3806

### DETERMINATION OF LIQUID LIMIT AND PLASTIC LIMIT

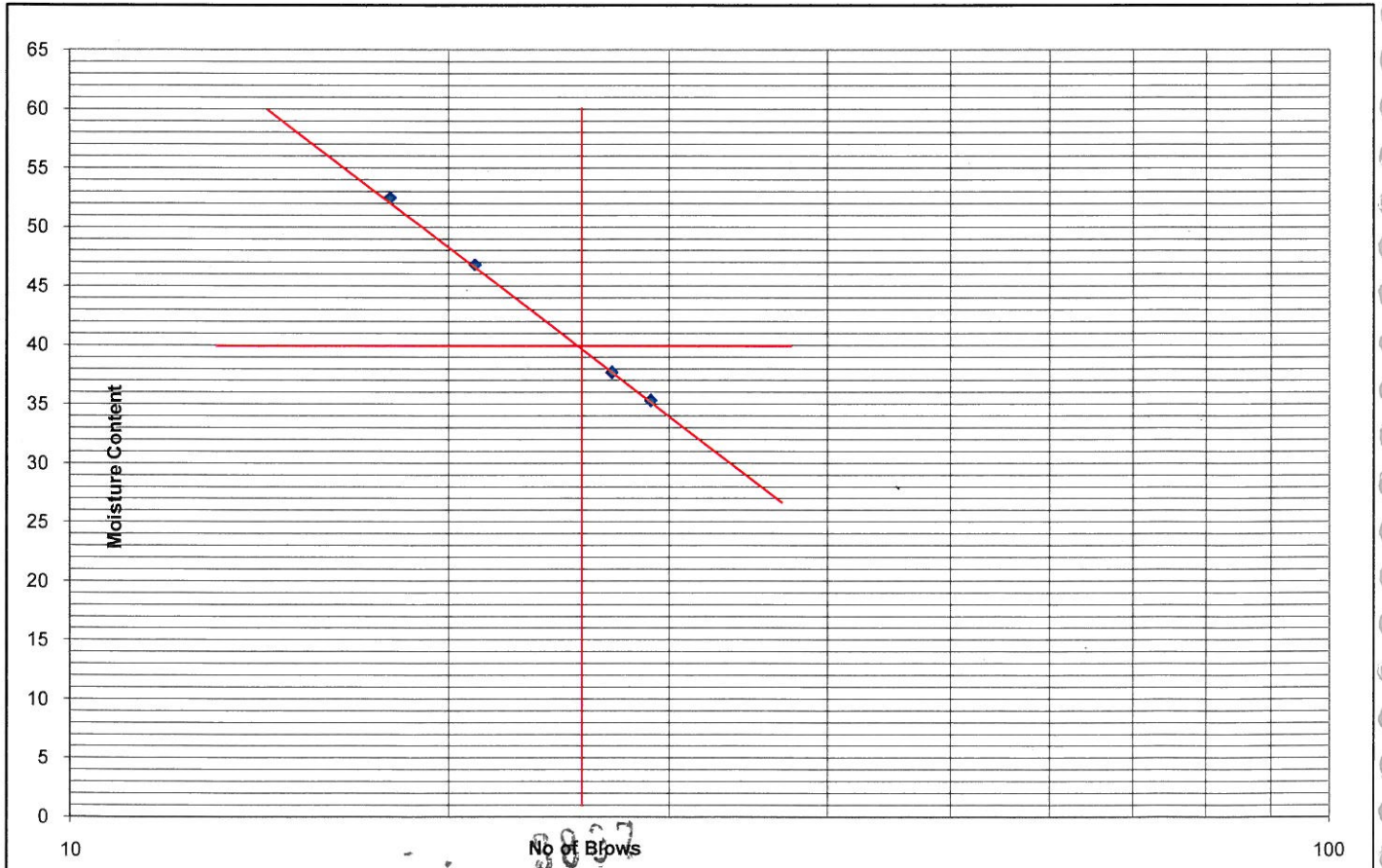
IS : 2720 (Part -5)

Client	: DFCC		Date Of Testing	: 10.10.12
Project Name	: G.I For 3 Nos. Important Bridges		Sampled by	: T.K.Das
Type of Sample	: SPT		Tested by	: D.Mohanty
Location	: BH-4(Markanda River-Ambala)			
Depth	: 33.0m			

Number of Blows	29	27	21	18	Plastic Limit	
Container No.	D37	D38	D39	D40	D41	D42
Container Weight (gm) (W1)	36.57	32.26	31.04	30.5	34.97	35.55
Container + Wt. of wet soil (gm) (W2)	92.47	111.74	112.11	118.10	91.95	89.75
Wt of Container + Wt. of oven dry soil (gm) (W3)	77.88	89.98	86.26	87.95	82.40	81.17
Wt. Of water (gm) (W2-W1)-(W3-W1)	14.59	21.76	25.85	30.14	9.55	8.57
Wt. of oven dry soil (gm) (W3-W1)	41.31	57.72	55.22	57.45	47.43	45.62
Moisture Content (%)= [(W2-W1)-(W3-W1)]/(W3-W1) X 100	<b>35.31</b>	<b>37.69</b>	<b>46.81</b>	<b>52.46</b>	<b>20.14</b>	<b>18.79</b>

#### Result Summary

Liquid Limit (WL)	40	%
Plastic Limit (Wp)	19	%
Plasticity Index (Ip)	21	%





# Arki Techno Consultants (India) Pvt.Ltd

N 3/91, IRC Village, Bhubaneswar

## DETERMINATION OF LIQUID LIMIT AND PLASTIC LIMIT

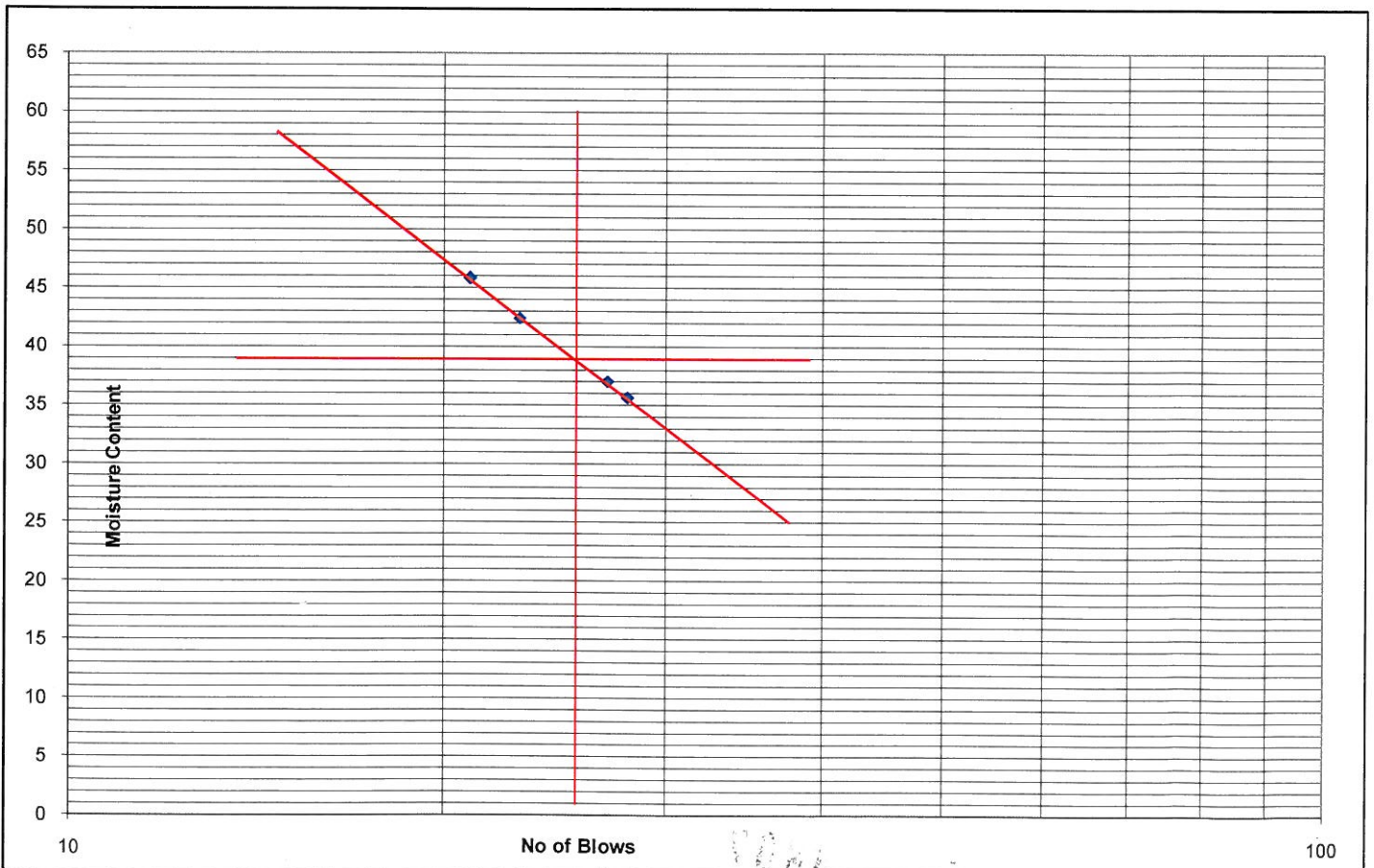
IS : 2720 (Part -5)

Client : DFCC  
 Project Name : G.I For 3 Nos. Important Bridges  
 Type of Sample : UDS  
 Location : BH-4(Markanda River-Ambala)  
 Depth : 34.5m  
 Date Of Testing : 10.10.12  
 Sampled by : T.K.Das  
 Tested by : D.Mohanty

Number of Blows	28	27	23	21	Plastic Limit	
	D25	D26	D27	D28	D29	D30
Container No.	D25	D26	D27	D28	D29	D30
Container Weight (gm) (W1)	33.58	34.18	32.29	34.64	36.84	30.87
Container + Wt. of wet soil (gm) (W2)	93.94	110.27	109.51	112.64	91.61	90.65
Wt of Container + Wt. of oven dry soil (gm) (W3)	78.08	89.71	86.51	88.13	82.31	81.31
Wt. Of water (gm) (W2-W1)-(W3-W1)	15.86	20.56	23.00	24.51	9.30	9.34
Wt. of oven dry soil (gm) (W3-W1)	44.50	55.53	54.22	53.49	45.47	50.44
Moisture Content (%)= (W2-W1)-(W3-W1)]/(W3-W1) X 100	<b>35.64</b>	<b>37.02</b>	<b>42.42</b>	<b>45.81</b>	<b>20.46</b>	<b>18.51</b>

### Result Summary

Liquid Limit (WL)	39	%
Plastic Limit (Wp)	19	%
Plasticity Index (Ip)	20	%



3808

### DETERMINATION OF LIQUID LIMIT AND PLASTIC LIMIT

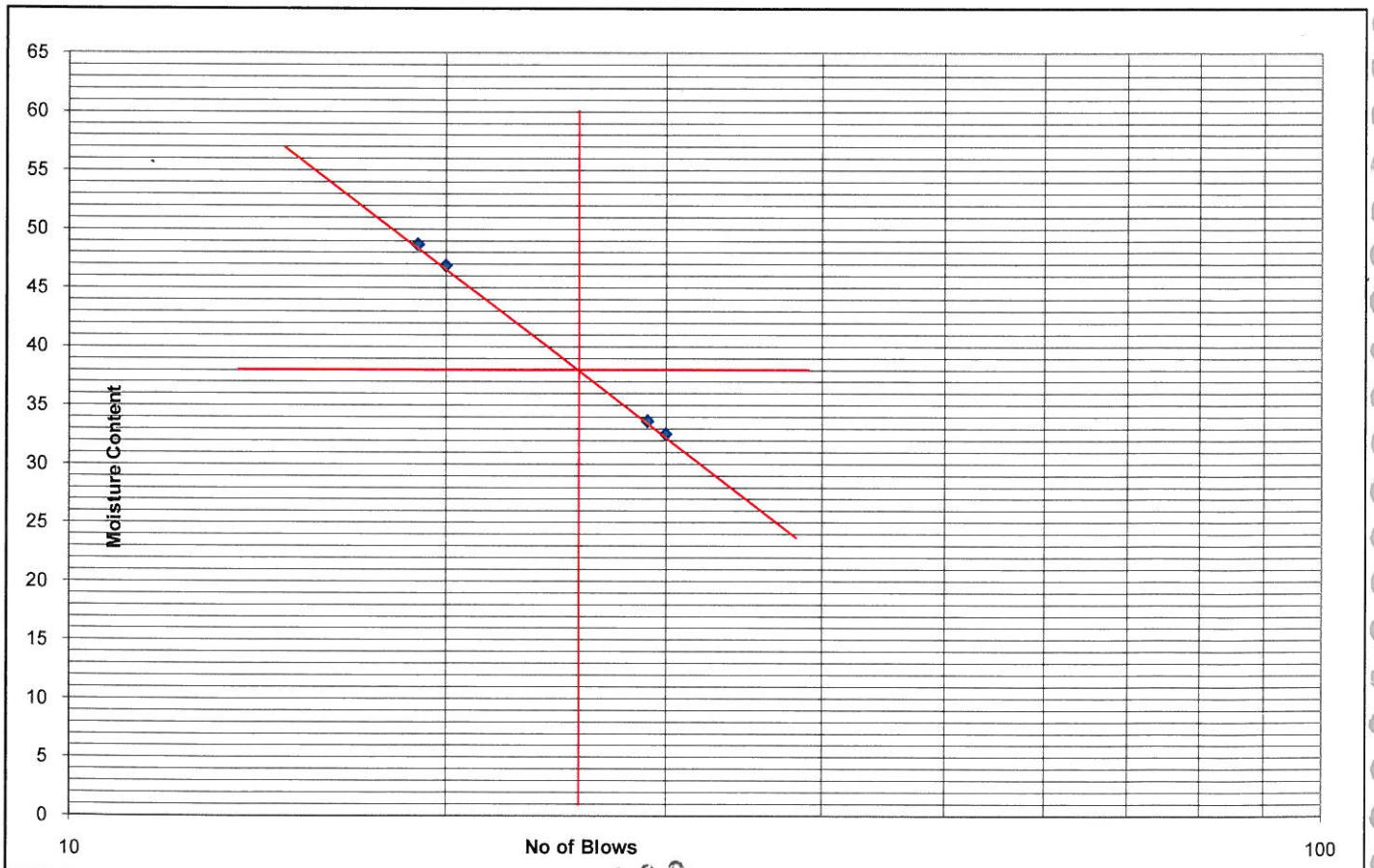
IS : 2720 (Part -5)

Client	: DFCC		Date Of Testing	: 10.10.12
Project Name	: G.I For 3 Nos. Important Bridges		Sampled by	: T.K.Das
Type of Sample	: SPT		Tested by	: D.Mohanty
Location	: BH-4(Markanda River-Ambala)			
Depth	: 37.5m			

Number of Blows	30	29	20	19	Plastic Limit		
	Container No.	B25	B26	B27	B28	B29	B30
Container Weight (gm) (W1)	35.22	33.36	31.2	39.42	34.86	30.76	
Container + Wt. of wet soil (gm) (W2)	91.91	108.82	112.56	111.72	91.16	90.53	
Wt of Container + Wt. of oven dry soil (gm) (W3)	77.99	89.81	86.60	88.05	82.58	81.47	
Wt. Of water (gm) (W2-W1)-(W3-W1)	13.92	19.01	25.96	23.68	8.58	9.06	
Wt. of oven dry soil (gm) (W3-W1)	42.77	56.45	55.40	48.63	47.72	50.71	
Moisture Content (%)= [(W2-W1)-(W3-W1)]/(W3-W1) X 100	<b>32.55</b>	<b>33.67</b>	<b>46.87</b>	<b>48.69</b>	<b>17.97</b>	<b>17.86</b>	

#### Result Summary

Liquid Limit (WL)	38	%
Plastic Limit (Wp)	18	%
Plasticity Index (Ip)	20	%



3809



## DETERMINATION OF LIQUID LIMIT AND PLASTIC LIMIT

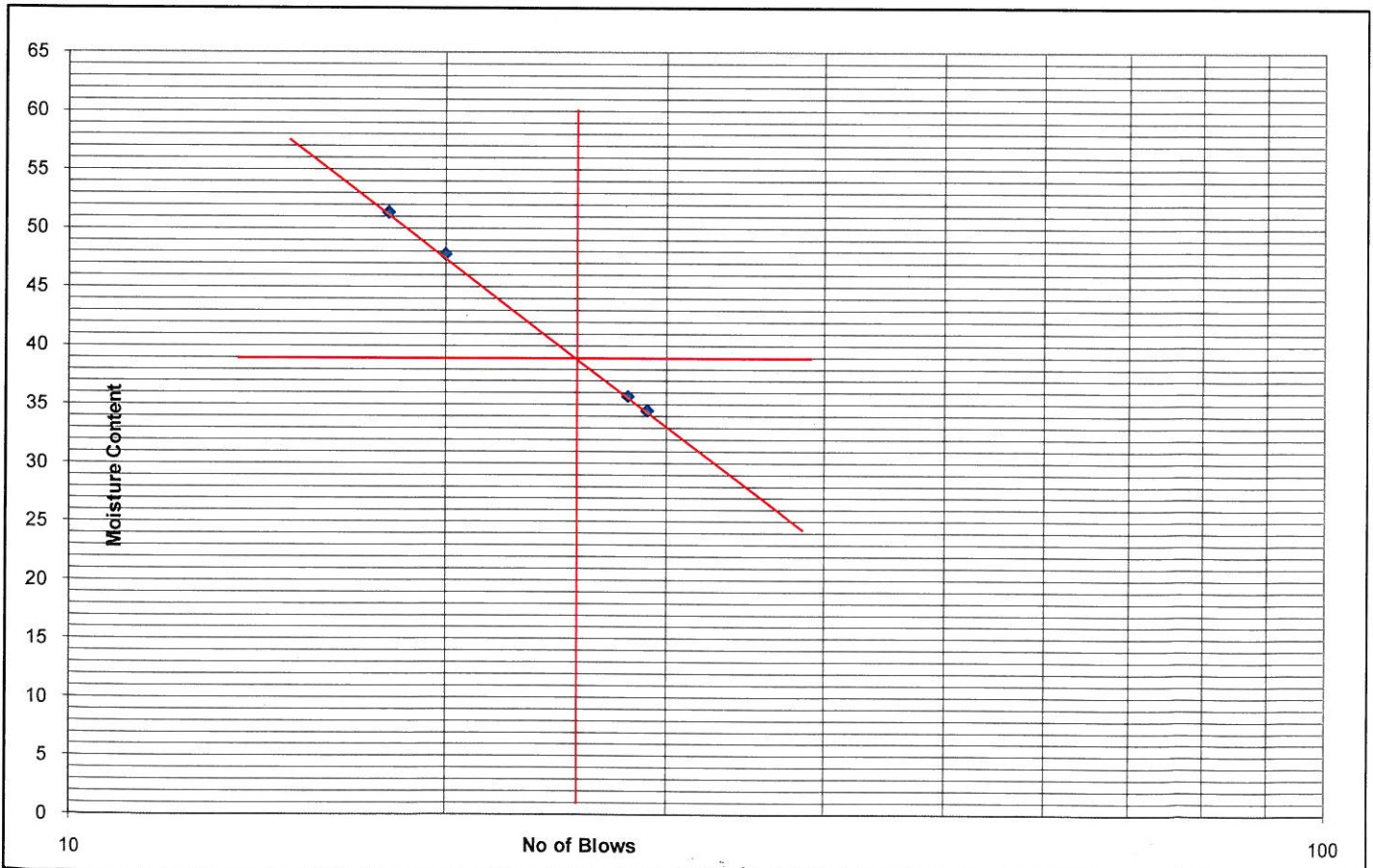
IS : 2720 (Part -5)

Client	: DFCC	Date Of Testing	: 10.10.12
Project Name	: G.I For 3 Nos. Important Bridges	Sampled by	: T.K.Das
Type of Sample	: SPT	Tested by	: D.Mohanty
Location	: BH-4(Markanda River-Ambala)		
Depth	: 40.5m		

Number of Blows	29	28	20	18	Plastic Limit	
Container No.	B1	B2	B3	B4	B5	B6
Container Weight (gm) (W1)	34.29	33.64	36.7	32.65	31.26	30.57
Container + Wt. of wet soil (gm) (W2)	92.99	109.78	110.46	116.51	92.65	91.12
Wt of Container + Wt. of oven dry soil (gm) (W3)	77.94	89.75	86.61	88.07	82.53	81.47
Wt. Of water (gm) (W2-W1)-(W3-W1)	15.04	20.03	23.85	28.44	10.12	9.66
Wt. of oven dry soil (gm) (W3-W1)	43.65	56.11	49.91	55.42	51.27	50.90
Moisture Content (%)= $(W2-W1)-(W3-W1)/(W3-W1) \times 100$	<b>34.46</b>	<b>35.69</b>	<b>47.79</b>	<b>51.32</b>	<b>19.73</b>	<b>18.98</b>

### Result Summary

Liquid Limit (WL)	39	%
Plastic Limit (Wp)	19	%
Plasticity Index (Ip)	20	%



3810



### DETERMINATION OF LIQUID LIMIT AND PLASTIC LIMIT

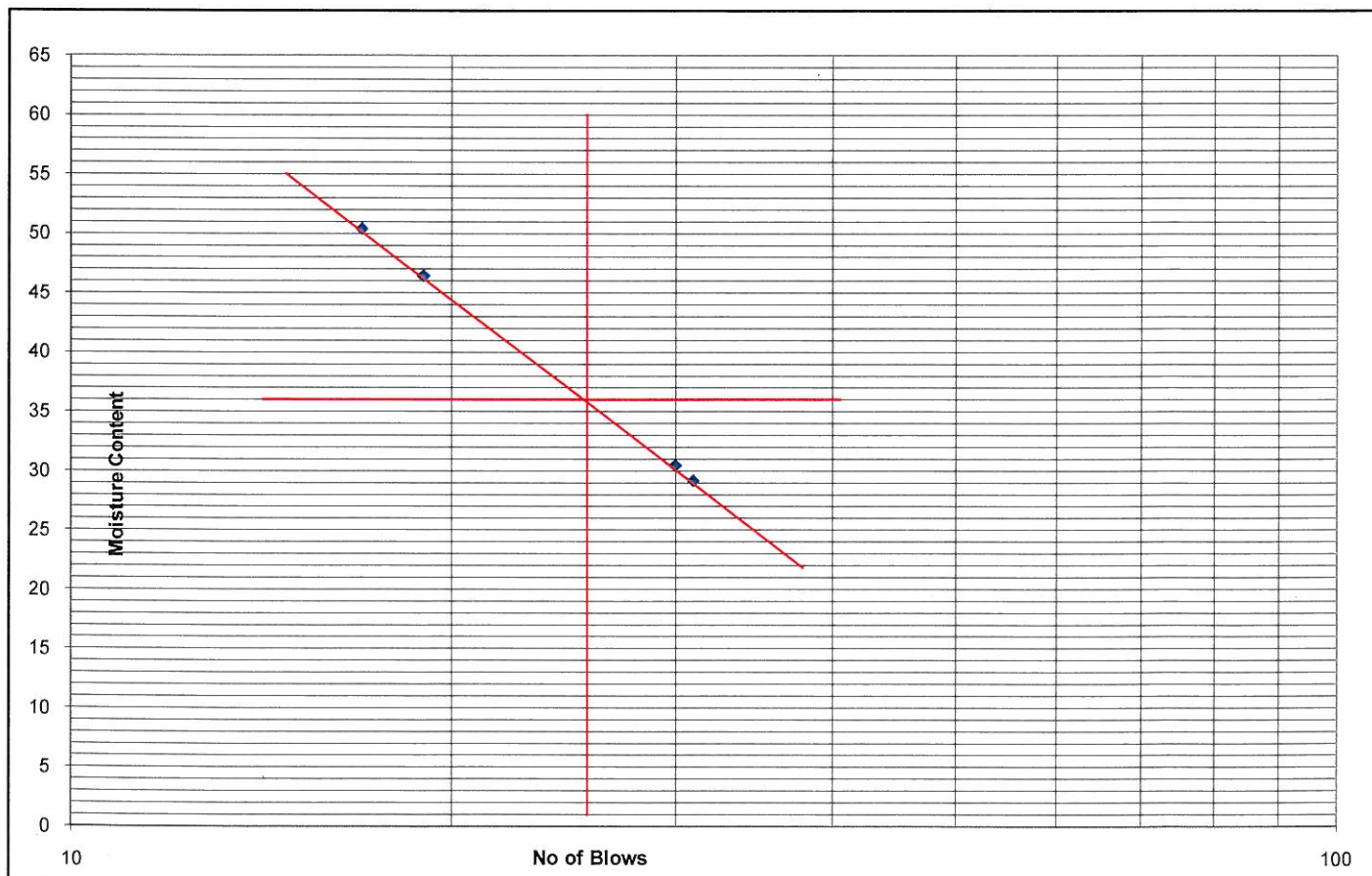
IS : 2720 (Part -5)

Client	: DFCC		Date Of Testing	: 10.10.12
Project Name	: G.I For 3 Nos. Important Bridges		Sampled by	: T.K.Das
Type of Sample	: SPT		Tested by	: D.Mohanty
Location	: BH-4(Markanda River-Ambala)			
Depth	: 42.0m			

Number of Blows	31	30	19	17	Plastic Limit	
Container No.	B7	B8	B9	B10	B11	B12
Container Weight (gm) (W1)	36.85	32.71	31.43	34.52	35.81	33.24
Container + Wt. of wet soil (gm) (W2)	90.11	107.13	112.37	114.96	90.63	89.58
Wt of Container + Wt. of oven dry soil (gm) (W3)	78.08	89.75	86.70	88.01	82.48	81.50
Wt. Of water (gm) (W2-W1)-(W3-W1)	12.04	17.38	25.66	26.95	8.14	8.07
Wt. of oven dry soil (gm) (W3-W1)	41.23	57.04	55.27	53.49	46.67	48.26
Moisture Content (%)= [(W2-W1)-(W3-W1)]/(W3-W1) X 100	<b>29.20</b>	<b>30.47</b>	<b>46.43</b>	<b>50.39</b>	<b>17.45</b>	<b>16.73</b>

#### Result Summary

Liquid Limit (WL)	36	%
Plastic Limit (Wp)	17	%
Plasticity Index (Ip)	19	%



3811



## DETERMINATION OF LIQUID LIMIT AND PLASTIC LIMIT

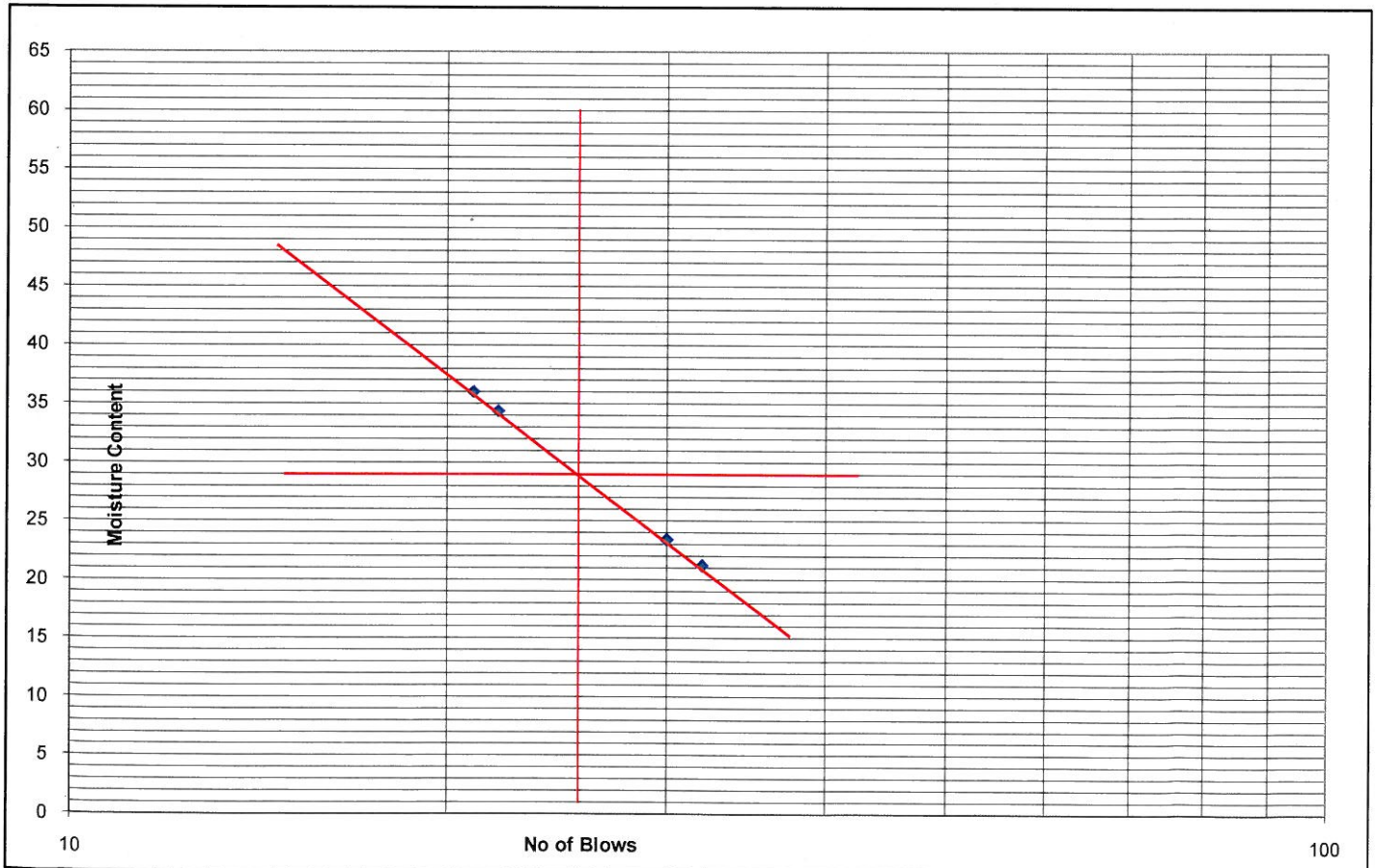
IS : 2720 (Part -5)

Client	: DFCC	Date Of Testing	: 10.10.12
Project Name	: G.I For 3 Nos. Important Bridges	Sampled by	: T.K.Das
Type of Sample	: SPT	Tested by	: D.Mohanty
Location	: BH-4(Markanda River-Ambala)		
Depth	: 45.0m		

Number of Blows	32	30	22	21	Plastic Limit	
Container No.	B37	B38	B39	B40	B41	B42
Container Weight (gm) (W1)	33.26	32.74	31.98	30.5	34.67	35.55
Container + Wt. of wet soil (gm) (W2)	88.01	103.23	105.62	108.96	91.48	90.12
Wt of Container + Wt. of oven dry soil (gm) (W3)	78.44	89.86	86.78	88.18	82.55	81.67
Wt. Of water (gm) (W2-W1)-(W3-W1)	9.57	13.37	18.84	20.77	8.93	8.45
Wt. of oven dry soil (gm) (W3-W1)	45.18	57.12	54.80	57.68	47.88	46.12
Moisture Content (%)= $\frac{(W2-W1)-(W3-W1)}{(W3-W1)} \times 100$	21.19	23.41	34.38	36.01	18.64	18.33

### Result Summary

Liquid Limit (WL)	29	%
Plastic Limit (Wp)	18	%
Plasticity Index (Ip)	11	%



3812

### DETERMINATION OF LIQUID LIMIT AND PLASTIC LIMIT

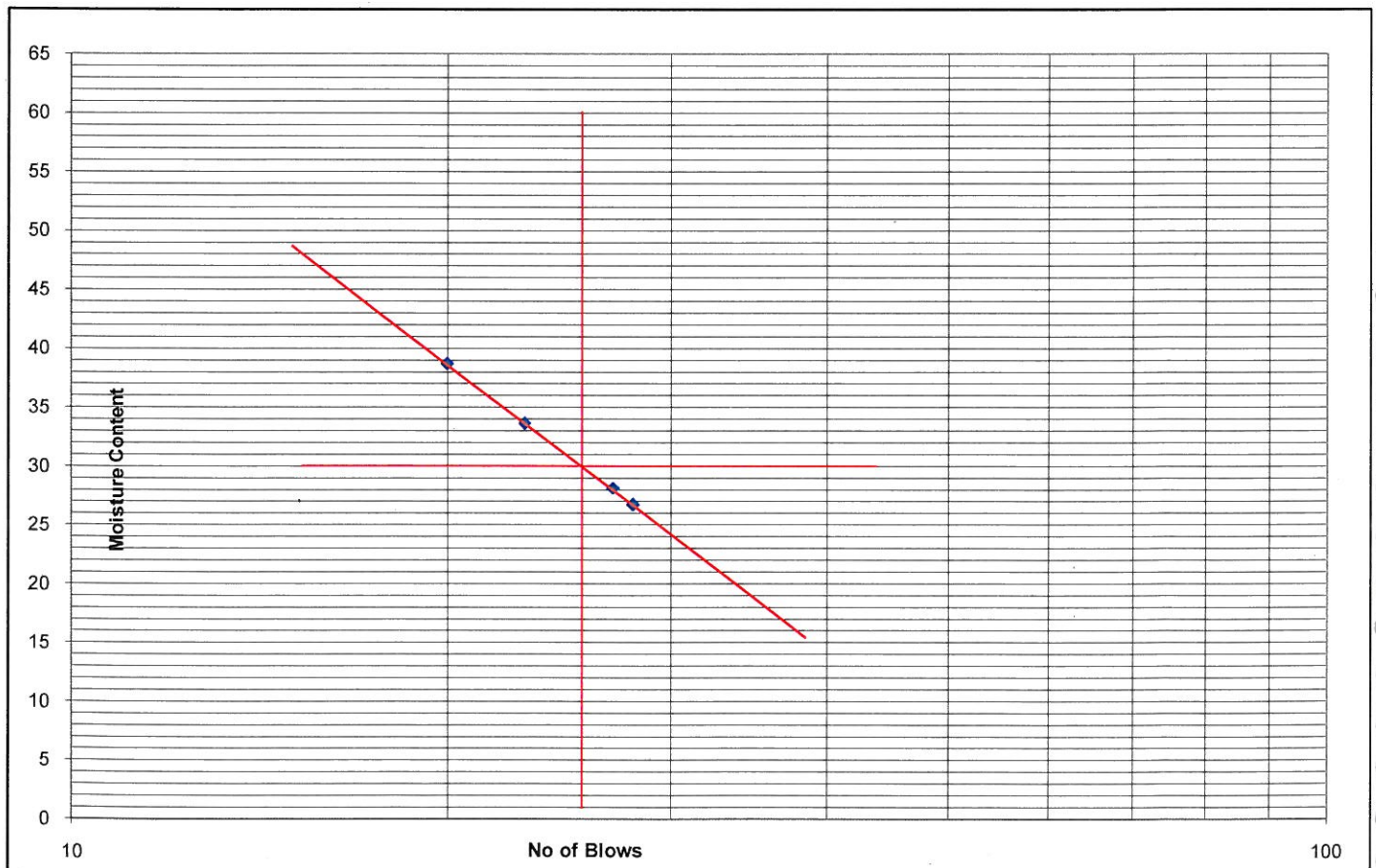
IS : 2720 (Part -5)

Client	: DFCC		Date Of Testing	: 10.10.12
Project Name	: G.I For 3 Nos. Important Bridges		Sampled by	: T.K.Das
Type of Sample	: SPT		Tested by	: D.Mohanty
Location	: BH-4(Markanda River-Ambala)			
Depth	: 48.0m			

Number of Blows	28	27	23	20	Plastic Limit	
Container No.	B31	B32	B33	B34	B35	B36
Container Weight (gm) (W1)	30.8	34.1	32.47	31.56	35.65	30.99
Container + Wt. of wet soil (gm) (W2)	91.48	105.70	105.20	109.84	91.78	90.95
Wt of Container + Wt. of oven dry soil (gm) (W3)	78.68	89.98	86.90	88.01	82.68	81.51
Wt. Of water (gm) (W2-W1)-(W3-W1)	12.80	15.72	18.30	21.83	9.10	9.44
Wt. of oven dry soil (gm) (W3-W1)	47.88	55.88	54.43	56.45	47.03	50.52
Moisture Content (%)= [(W2-W1)-(W3-W1)]/(W3-W1) X 100	<b>26.73</b>	<b>28.13</b>	<b>33.61</b>	<b>38.67</b>	<b>19.34</b>	<b>18.69</b>

#### Result Summary

Liquid Limit (WL)	30	%
Plastic Limit (Wp)	19	%
Plasticity Index (Ip)	11	%



3813



## DETERMINATION OF LIQUID LIMIT AND PLASTIC LIMIT

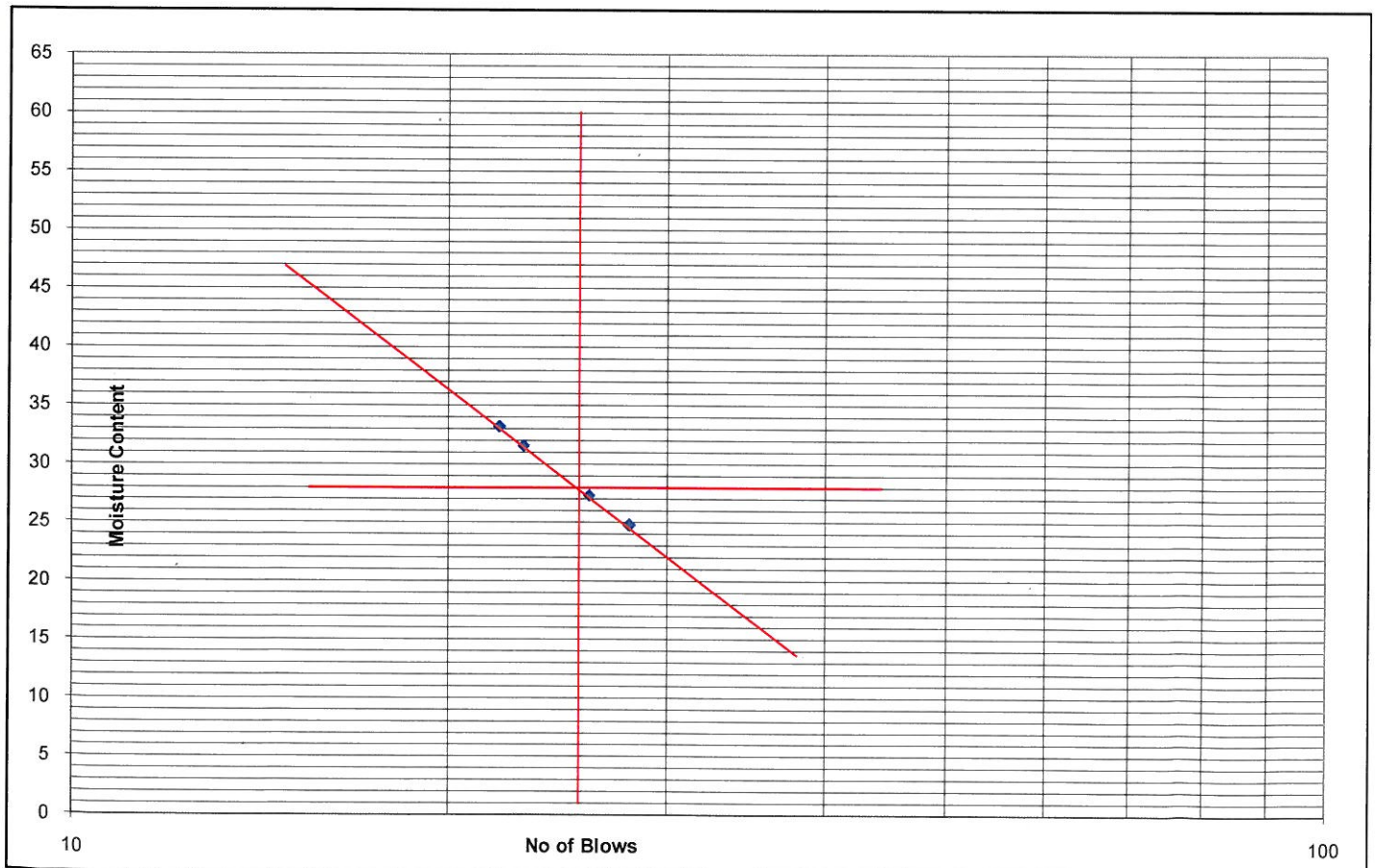
IS : 2720 (Part -5)

Client : DFCC  
 Project Name : G.I For 3 Nos. Important Bridges  
 Type of Sample : SPT  
 Location : BH-4(Markanda River-Ambala)  
 Depth : 50.0m  
 Date Of Testing : 10.10.12  
 Sampled by : T.K.Das  
 Tested by : D.Mohanty

Number of Blows	28	26	23	22	Plastic Limit	
Container No.	B19	B20	B21	B22	B23	B24
Container Weight (gm) (W1)	31.66	35.46	33.74	34.61	32.82	30.69
Container + Wt. of wet soil (gm) (W2)	90.58	105.07	103.69	105.92	91.83	90.05
Wt of Container + Wt. of oven dry soil (gm) (W3)	78.88	90.13	86.90	88.14	82.77	81.52
Wt. Of water (gm) (W2-W1)-(W3-W1)	11.71	14.95	16.78	17.78	9.06	8.54
Wt. of oven dry soil (gm) (W3-W1)	47.22	54.67	53.16	53.53	49.95	50.83
Moisture Content (%)= (W2-W1)-(W3-W1)]/(W3-W1) X 100	24.79	27.34	31.57	33.21	18.13	16.80

### Result Summary

Liquid Limit (WL)	28	%
Plastic Limit (Wp)	17	%
Plasticity Index (Ip)	11	%



2100  
3814



**Arki Techno Consultants (India) Pvt.Ltd**  
**N 3/91, IRC Village, Bhubaneswar**

**DIFFERENTIAL FREE SWELL INDEX OF SOIL (D.F.S.)**

**AS PER IS: 2720 (PART - 40)**

Client : DFCC  
Project Name : G.I For 3 Nos. Important Bridges Date Of Testing : 08.10.12  
Type of Sample : UDS Tested by : D.Mohanty  
Location : BH-4(Markanda River-Ambala) Sampled by : T.K.Das  
Depth : 7.5m Weight of Sample : 10gm

SAMPLE NO.	VOLUME IN Kerosin Oil $V_k$	VOLUME IN WATER $V_d$	SWELL ( $V_d - V_k$ )	SWELL INDEX = $\frac{(V_d - V_k)}{V_k} * 100$ (%)	AVERAGE SWELL %	SPECIFIC LIMIT
1	10	13.5	3.50	35	26	50%
2	10	12.5	2.50	25		
3	10	11.8	1.80	18		

Remarks:

Lab Manager

Checked By:

3815



# Arki Techno Consultants (India) Pvt.Ltd

N 3/91, IRC Village, Bhubaneswar

## DIFFERENTIAL FREE SWELL INDEX OF SOIL (D.F.S.)

AS PER IS: 2720 (PART - 40)

Client : DFCC

Project Name : G.I For 3 Nos. Important Bridges

Date Of Testing : 08.10.12

Type of Sample : UDS

Tested by : D.Mohanty

Location : BH-4(Markanda River-Ambala)

Sampled by : T.K.Das

Depth : 10.5m

Weight of Sample : 10gm

SAMPLE NO.	VOLUME IN Kerosin Oil V <sub>k</sub>	VOLUME IN WATER V <sub>d</sub>	SWELL (V <sub>d</sub> -V <sub>k</sub> )	SWELL INDEX = $\frac{(V_d - V_k)}{V_k} \times 100$ (%)	AVERAGE SWELL %	SPECIFIC LIMIT
1	10	14.0	4.00	40	27	50%
2	10	12.5	2.50	25		
3	10	11.5	1.50	15		

Remarks:

Lab Manager

Checked By:

3816



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# Arki Techno Consultants (India) Pvt.Ltd

N 3/91, IRC Village, Bhubaneswar

## DIFFERENTIAL FREE SWELL INDEX OF SOIL (D.F.S.)

AS PER IS: 2720 (PART - 40)

Client : DFCC  
 Project Name : G.I For 3 Nos. Important Bridges Date Of Testing : 08.10.12  
 Type of Sample : SPT Tested by : D.Mohanty  
 Location : BH-4(Markanda River-Ambala) Sampled by : T.K.Das  
 Depth : 12.0m Weight of Sample : 10gm

SAMPLE NO.	VOLUME IN KEROSIN OIL V <sub>k</sub>	VOLUME IN WATER V <sub>d</sub>	SWELL (V <sub>d</sub> -V <sub>k</sub> )	SWELL INDEX = $\frac{(V_d - V_k)}{V_k} \times 100$ (%)	AVERAGE SWELL %	SPECIFIC LIMIT
1	10	13.5	3.50	35	25	50%
2	10	12.5	2.50	25		
3	10	11.5	1.50	15		

Remarks:

Lab Manager

Checked By:

3817



**Arki Techno Consultants (India) Pvt.Ltd**  
N 3/91, IRC Village, Bhubaneswar

**DIFFERENTIAL FREE SWELL INDEX OF SOIL (D.F.S.)**

**AS PER IS: 2720 (PART - 40)**

Client : DFCC  
Project Name : G.I For 3 Nos. Important Bridges  
Type of Sample : UDS  
Location : BH-4(Markanda River-Ambala)  
Depth : 13.5m  
Date Of Testing : 08.10.12  
Tested by : D.Mohanty  
Sampled by : T.K.Das  
Weight of Sample : 10gm

SAMPLE NO.	VOLUME IN Kerosin Oil V <sub>k</sub>	VOLUME IN WATER V <sub>d</sub>	SWELL (V <sub>d</sub> -V <sub>k</sub> )	SWELL INDEX = (V <sub>d</sub> -V <sub>k</sub> ) / (V <sub>k</sub> )*100 (%)	AVERAGE SWELL %	SPECIFIC LIMIT
1	10	14.0	4.00	40	26	50%
2	10	12.3	2.30	23		
3	10	11.5	1.50	15		

Remarks:

Lab Manager

Checked By:

3818





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# Arki Techno Consultants (India) Pvt.Ltd

N 3/91, IRC Village, Bhubaneswar

## DIFFERENTIAL FREE SWELL INDEX OF SOIL (D.F.S.)

AS PER IS: 2720 (PART - 40)

Client : DFCC  
Project Name : G.I For 3 Nos. Important Bridges Date Of Testing : 08.10.12  
Type of Sample : UDS Tested by : D.Mohanty  
Location : BH-4(Markanda River-Ambala) Sampled by : T.K.Das  
Depth : 16.5m Weight of Sample : 10gm

SAMPLE NO.	VOLUME IN Kerosin Oil $V_k$	VOLUME IN WATER $V_d$	SWELL ( $V_d - V_k$ )	SWELL INDEX = $\frac{(V_d - V_k)}{V_k} * 100$ (%)	AVERAGE SWELL %	SPECIFIC LIMIT
1	10	13.0	3.00	30	25	50%
2	10	12.5	2.50	25		
3	10	12.0	2.00	20		

Remarks:

Lab Manager

Checked By:

3819



# Arki Techno Consultants (India) Pvt.Ltd

N 3/91, IRC Village, Bhubaneswar

## DIFFERENTIAL FREE SWELL INDEX OF SOIL (D.F.S.)

AS PER IS: 2720 (PART - 40)

Client : DFCC  
Project Name : G.I For 3 Nos. Important Bridges  
Type of Sample : SPT  
Location : BH-4(Markanda River-Ambala)  
Depth : 18.0m  
Date Of Testing : 08.10.12  
Tested by : D.Mohanty  
Sampled by : T.K.Das  
Weight of Sample : 10gm

SAMPLE NO.	VOLUME IN KEROSIN OIL $V_k$	VOLUME IN WATER $V_d$	SWELL ( $V_d - V_k$ )	SWELL INDEX = $\frac{(V_d - V_k)}{V_k} * 100$ (%)	AVERAGE SWELL %	SPECIFIC LIMIT
1	10	12.5	2.50	25	23	50%
2	10	12.4	2.40	24		
3	10	12.0	2.00	20		

Remarks:

Lab Manager

Checked By:

3820



# Arki Techno Consultants (India) Pvt.Ltd

N 3/91, IRC Village, Bhubaneswar

## DIFFERENTIAL FREE SWELL INDEX OF SOIL (D.F.S.)

AS PER IS: 2720 (PART - 40)

Client : DFCC  
Project Name : G.I For 3 Nos. Important Bridges  
Type of Sample : UDS  
Location : BH-4(Markanda River-Ambala)  
Depth : 19.5m  
Date Of Testing : 08.10.12  
Tested by : D.Mohanty  
Sampled by : T.K.Das  
Weight of Sample : 10gm

SAMPLE NO.	VOLUME IN Kerosin Oil $V_k$	VOLUME IN WATER $V_d$	SWELL ( $V_d - V_k$ )	SWELL INDEX = $\frac{(V_d - V_k)}{V_k} \times 100$ (%)	AVERAGE SWELL %	SPECIFIC LIMIT
1	10	12.7	2.70	27	24	50%
2	10	12.5	2.50	25		
3	10	12.0	2.00	20		

Remarks:

Lab Manager

Checked By:

3821



**Arki Techno Consultants (India) Pvt.Ltd**  
**N 3/91, IRC Village, Bhubaneswar**

**DIFFERENTIAL FREE SWELL INDEX OF SOIL (D.F.S.)**

**AS PER IS: 2720 (PART - 40)**

Client : DFCC  
Project Name : G.I For 3 Nos. Important Bridges Date Of Testing : 08.10.12  
Type of Sample : SPT Tested by : D.Mohanty  
Location : BH-4(Markanda River-Ambala) Sampled by : T.K.Das  
Depth : 25.5m Weight of Sample : 10gm

SAMPLE NO.	VOLUME IN Kerosin Oil V <sub>k</sub>	VOLUME IN WATER V <sub>d</sub>	SWELL (V <sub>d</sub> -V <sub>k</sub> )	SWELL INDEX = $\frac{(V_d - V_k)}{V_k} \times 100$ (%)	AVERAGE SWELL %	SPECIFIC LIMIT
1	10	12.5	2.50	25	22	50%
2	10	12.5	2.50	25		
3	10	11.5	1.50	15		

Remarks:

Lab Manager

Checked By:

3822

# Arki Techno Consultants (India) Pvt.Ltd

N 3/91, IRC Village, Bhubaneswar



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## DIFFERENTIAL FREE SWELL INDEX OF SOIL (D.F.S.)

AS PER IS: 2720 (PART - 40)

Client : DFCC

Project Name : G.I For 3 Nos. Important Bridges

Date Of Testing : 08.10.12

Type of Sample : UDS

Tested by : D.Mohanty

Location : BH-4(Markanda River-Ambala)

Sampled by : T.K.Das

Depth : 28.5m

Weight of Sample : 10gm

SAMPLE NO.	VOLUME IN Kerosin Oil $V_k$	VOLUME IN WATER $V_d$	SWELL ( $V_d - V_k$ )	SWELL INDEX = $\frac{(V_d - V_k)}{V_k} * 100$ (%)	AVERAGE SWELL %	SPECIFIC LIMIT
1	10	14.5	4.50	45	25	50%
2	10	12.0	2.00	20		
3	10	11.0	1.00	10		

Remarks:

Lab Manager

Checked By:

3823



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# Arki Techno Consultants (India) Pvt.Ltd

N 3/91, IRC Village, Bhubaneswar

## DIFFERENTIAL FREE SWELL INDEX OF SOIL (D.F.S.)

AS PER IS: 2720 (PART - 40)

Client : DFCC  
Project Name : G.I For 3 Nos. Important Bridges  
Type of Sample : UDS  
Location : BH-4(Markanda River-Ambala)  
Depth : 31.5m  
Date Of Testing : 08.10.12  
Tested by : D.Mohanty  
Sampled by : T.K.Das  
Weight of Sample : 10gm

SAMPLE NO.	VOLUME IN Kerosin Oil $V_k$	VOLUME IN WATER $V_d$	SWELL ( $V_d - V_k$ )	SWELL INDEX = $\frac{(V_d - V_k)}{V_k} * 100$ (%)	AVERAGE SWELL %	SPECIFIC LIMIT
1	10	13.5	3.50	35	26	50%
2	10	12.8	2.80	28		
3	10	11.5	1.50	15		

Remarks:

Lab Manager

Checked By:

3821



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# Arki Techno Consultants (India) Pvt.Ltd

N 3/91, IRC Village, Bhubaneswar

## DIFFERENTIAL FREE SWELL INDEX OF SOIL (D.F.S.)

AS PER IS: 2720 (PART - 40)

Client : DFCC

Project Name : G.I For 3 Nos. Important Bridges

Date Of Testing : 08.10.12

Type of Sample : SPT

Tested by : D.Mohanty

Location : BH-4(Markanda River-Ambala)

Sampled by : T.K.Das

Depth : 33.0m

Weight of Sample : 10gm

SAMPLE NO.	VOLUME IN KEROSENE OIL $V_k$	VOLUME IN WATER $V_d$	SWELL ( $V_d - V_k$ )	SWELL INDEX = $\frac{(V_d - V_k)}{V_k} \times 100$ (%)	AVERAGE SWELL %	SPECIFIC LIMIT
1	10	13.5	3.50	35	27	50%
2	10	13.0	3.00	30		
3	10	11.5	1.50	15		

Remarks:

Lab Manager

Checked By:

3823



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# Arki Techno Consultants (India) Pvt.Ltd

N 3/91, IRC Village, Bhubaneswar

## DIFFERENTIAL FREE SWELL INDEX OF SOIL (D.F.S.)

AS PER IS: 2720 (PART - 40)

Client : DFCC  
Project Name : G.I For 3 Nos. Important Bridges  
Type of Sample : UDS  
Location : BH-4(Markanda River-Ambala)  
Depth : 34.5m  
Date Of Testing : 08.10.12  
Tested by : D.Mohanty  
Sampled by : T.K.Das  
Weight of Sample : 10gm

SAMPLE NO.	VOLUME IN Kerosin Oil V <sub>k</sub>	VOLUME IN WATER V <sub>d</sub>	SWELL (V <sub>d</sub> -V <sub>k</sub> )	SWELL INDEX = $\frac{(V_d - V_k)}{V_k} \times 100$ (%)	AVERAGE SWELL %	SPECIFIC LIMIT
1	10	13.0	3.00	30	25	50%
2	10	12.5	2.50	25		
3	10	12.0	2.00	20		

Remarks:

Lab Manager

Checked By:

3826





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# Arki Techno Consultants (India) Pvt.Ltd

N 3/91, IRC Village, Bhubaneswar

## DIFFERENTIAL FREE SWELL INDEX OF SOIL (D.F.S.)

AS PER IS: 2720 (PART - 40)

Client : DFCC  
Project Name : G.I For 3 Nos. Important Bridges  
Type of Sample : UDS  
Location : BH-4(Markanda River-Ambala)  
Depth : 37.5m  
Date Of Testing : 08.10.12  
Tested by : D.Mohanty  
Sampled by : T.K.Das  
Weight of Sample : 10gm

SAMPLE NO.	VOLUME IN KEROSIN OIL $V_k$	VOLUME IN WATER $V_d$	SWELL ( $V_d - V_k$ )	SWELL INDEX = $\frac{(V_d - V_k)}{V_k} * 100$ (%)	AVERAGE SWELL %	SPECIFIC LIMIT
1	10	12.0	2.00	20	12	50%
2	10	11.0	1.00	10		
3	10	10.5	0.50	5		

Remarks:

Lab Manager

Checked By:

3827



ARKITECHNO  
CONSULTANTS (INDIA) PVT. LTD.

# Arki Techno Consultants (India) Pvt.Ltd

N 3/91, IRC Village, Bhubaneswar

## DIFFERENTIAL FREE SWELL INDEX OF SOIL (D.F.S.)

AS PER IS: 2720 (PART - 40)

Client : DFCC  
Project Name : G.I For 3 Nos. Important Bridges  
Type of Sample : SPT  
Location : BH-4(Markanda River-Ambala)  
Depth : 40.5m  
Date Of Testing : 08.10.12  
Tested by : D.Mohanty  
Sampled by : T.K.Das  
Weight of Sample : 10gm

SAMPLE NO.	VOLUME IN Kerosin Oil V <sub>k</sub>	VOLUME IN WATER V <sub>d</sub>	SWELL (V <sub>d</sub> -V <sub>k</sub> )	SWELL INDEX = $\frac{(V_d - V_k)}{V_k} \times 100$ (%)	AVERAGE SWELL %	SPECIFIC LIMIT
1	10	12.0	2.00	20	15	50%
2	10	11.5	1.50	15		
3	10	11.0	1.00	10		

Remarks:

Lab Manager

Checked By:

3828