Arki Techno Consultants (India) Pvt.Ltd

ARKITECHNO

N 3/91, IRC Village, Bhubaneswar

DETERMINATION OF SPECIFIC GRAVITY BY DENSITY BOTTLE METHOD AS PER IS : 2386 (Part -2)

Client	:	DFCC			
Project Name	:	G.I For 3 Nos. Important Bridges			
Type of Sample	:	SPT	Date Of Testing	:	17.09.12
Location	:	BH-3(Tangri River-Ambala)	Sampled by	:	T.K.Das
Depth	:	30.0m	Tested by	:	D.Mohanty

Sl. No.	Observations	1	Remarks
1	Weight of density bottle W1 in gm	31.52	
2	Weight of bottle with dry soil in W2 gm	36.61	
3	Weight of bottle with soil and water W3 in gm	136.94	
4	Weight of bottle full of water W4 in gm	133.75	
5	Weight of dry soil (W2-W1)in gm	5.09	
6	Weight of equal volume of water(W2 - W1) - (W3 - W4) in gm	1.90	
7	Specific Gravity G = (5) / (6)	2.68	

Lab Manager

Checked By

4542

Arki Techno Consultants (India) Pvt.Ltd

ARKITECHNO

N 3/91, IRC Village, Bhubaneswar

DETERMINATION OF SPECIFIC GRAVITY BY DENSITY BOTTLE METHOD AS PER IS : 2386 (Part -2)

Client	:	DFCC			
Project Name	:	G.I For 3 Nos. *Important Bridges*			
Type of Sample	:	UDS	Date Of Testing	:	17.09.12
Location	:	BH-3(Tangri River-Ambala)	Sampled by	:	T.K.Das
Depth	:	31.0m	Tested by	:	D.Mohanty

Sl. No.	Observations	1	Remarks
1	Weight of density bottle W1 in gm	31.52	
2	Weight of bottle with dry soil in W2 gm	37.39	
3	Weight of bottle with soil and water W3 in gm	137.76	
4	Weight of bottle full of water W4 in gm	134.07	
5	Weight of dry soil (W2-W1)in gm	5.87	
6	Weight of equal volume of water(W2 - W1) - (W3 - W4) in gm	2.18	
7	Specific Gravity G = (5) / (6)	2.69	

Lab Manager

Checked By

4543

Arki Techno Consultants (India) Pvt.Ltd

ARKITECHNO CONSULTANTS (INDIA) PVT. LTD.

N 3/91, IRC Village, Bhubaneswar

DETERMINATION OF SPECIFIC GRAVITY BY DENSITY BOTTLE METHOD AS PER IS : 2386 (Part -2)

Client	:	DFCC			
Project Name	:	G.I For 3 Nos. Important Bridges			
Type of Sample	:	SPT	Date Of Testing	:	17.09.12
Location	:	BH-3(Tangri River-Ambala)	Sampled by	:	T.K.Das
Depth	:	45.0m	Tested by	:	D.Mohanty

Sl. No.	Observations	1	Remarks
1	Weight of density bottle W1 in gm	31.52	
2	Weight of bottle with dry soil in W2 gm	36.22	
3	Weight of bottle with soil and water W3 in gm	136.91	
4	Weight of bottle full of water W4 in gm	133.96	
5	Weight of dry soil (W2-W1)in gm	4.70	
6	Weight of equal volume of water(W2 - W1) - (W3 - W4) in gm	1.75	
7	Specific Gravity G = (5) / (6)	2.69	

Lab Manager

Checked By

4544

Arki Techno Consultants (India) Pvt.Ltd

ARKITECHNO CONSULTANTS (INDIA) PVT. LTD.

N 3/91, IRC Village, Bhubaneswar

DETERMINATION OF SPECIFIC GRAVITY BY DENSITY BOTTLE METHOD AS PER IS : 2386 (Part -2)

Client	:	DFCC			
Project Name	:	G.I For 3 Nos. Important Bridges			
Type of Sample	:	SPT	Date Of Testing	:	17.09.12
Location	:	BH-3(Tangri River-Ambala)	Sampled by	:	T.K.Das
Depth	:	50.0m	Tested by	:	D.Mohanty

Sl. No.	Observations	1	Remarks
1	Weight of density bottle W1 in gm	31.52	
2	Weight of bottle with dry soil in W2 gm	37.46	
3	Weight of bottle with soil and water W3 in gm	137.92	
4	Weight of bottle full of water W4 in gm	134.20	
5	Weight of dry soil (W2-W1)in gm	5.94	
6	Weight of equal volume of water(W2 - W1) - (W3 - W4) in gm	2.22	
7	Specific Gravity G = (5) / (6)	2.68	

Lab Manager

Checked By

4545

ARKI TECHNO CONSULTANTS (I) PVT. LTD.

N 3/91, IRC Village, Bhubaneswar

DETERMINATION OF BULK DENSITY & MOISTURE CONTENT OF SOIL SAMPLE

Client : DFCC

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

Location : BH-3(Tangri River-Ambala)

Sl No.	BH No.	Depth in m	Type of Sample	Date of Testing	Weight of Container in gm	Diameter of Sample in cm	Length of Sample in cm	Volume of Sample in cc	Weight of Container + Wet Soil in gm	Weight of Container + Dry soil in gm	Weight of Dry soil in gm	Weight of water in gm	Moisture Content in %	Bulk Density in gm/cc	Dry Density in gm/cc
1	BH-3(Tangri River-Ambala)	1.5	SPT	17.09.12	60.45	3.8	7	79.39	216.05	199.83	139.38	16.22	11.64	1.96	1.76
2		6.0	SPT	17.09.12	61.52	3.8	7	79.39	222.68	201.83	140.31	20.85	14.86	2.03	1.77
3		7.0	UDS	17.09.12	62.33	3.8	7	79.39	221.90	201.96	139.63	19.94	14.28	2.01	1.76
4		10.0	UDS	17.09.12	61.41	3.8	7	79.39	224.95	202.00	140.59	22.96	16.33	2.06	1.77
5		12.0	SPT	17.09.12	61.28	3.8	7	79.39	219.27	198.09	136.81	21.18	15.48	1.99	1.72
6		16.0	UDS	17.09.12	63.11	3.8	7	79.39	222.68	200.19	137.08	22.49	16.41	2.01	1.73
7		19.0	UDS	17.09.12	65.34	3.8	7	79.39	236.82	210.27	144.93	26.55	18.32	2.16	1.83
8		21.0	SPT	17.09.12	60.55	3.8	7	79.39	230.44	205.10	144.55	25.34	17.53	2.14	1.82
9		22.0	UDS	17.09.12	62.38	3.8	7	79.39	235.45	208.14	145.76	27.31	18.74	2.18	1.84
10		25.0	UDS	17.09.12	64.75	3.8	7	79.39	240.20	212.61	147.86	27.59	18.66	2.21	1.86
11		27.0	SPT	17.09.12	61.04	3.8	7	79.39	234.90	206.28	145.24	28.63	19.71	2.19	1.83
12		28.0	UDS	17.09.12	60.79	3.8	7	79.39	233.86	206.87	146.08	26.99	18.48	2.18	1.84
13		30.0	SPT	17.09.12	62.81	3.8	7	79.39	240.64	212.59	149.78	28.05	18.73	2.24	1.89
14		31.0	UDS	17.09.12	64.11	3.8	7	79.39	237.97	212.07	147.96	25.91	17.51	2.19	1.86
15		45.0	SPT	17.09.12	63.54	3.8	7	79.39	240.58	214.96	151.42	25.62	16.92	2.23	1.91
16		50.0	SPT	17.09.12	62.5	3.8	7	79.39	217.74	194.61	132.11	23.13	17.51	1.96	1.66

Arki Techno Consultants (India) Pvt. Ltd

ARKITECHNO CONSULTANTS (INDIA) PVT. LTD.

N 3/91, IRC Village, Bhubaneswar

GRAIN SIZE ANALYSIS OF SOIL AS PER IS 2720 (P- 4)

Client	:	DFCC			
Project Name	:	G.I.For 3 Nos. Important Bridges			
Type of Sample	:	UDS	Date of Testing	:	13.09.12
Location	:	BH-4(Tangri River-Ambala)	Sampled by	:	T. K. Das
Depth	:	0.5m	Tested by	:	D.Mohanty

Weight of oven dried sample before washing (gm) :- 100.00

Weight of oven dried sample after washing (gm) :- 6.86

Sieve Size mm	Individual Weight Retained in gm.	Individual Wt. Retained In %	Cummulative Wt Retained In %	Cummulative Wt Passing In %
75	0	0.00	0.00	100.00
50	0	0.00	0.00	100.00
37.5	0	0.00	0.00	100.00
19	0	0.00	0.00	100.00
4.75	0.00	0.00	0.00	100.00
2.00	3.24	3.24	3.24	96.76
0.425	2.73	2.73	5.97	94.03
0.075	0.90	0.90	6.87	93.13
Total	100.00			

Gravel Content (%)= **0.00**

Sand Content (%) = 6.87 **Silt and clay %** 93.13

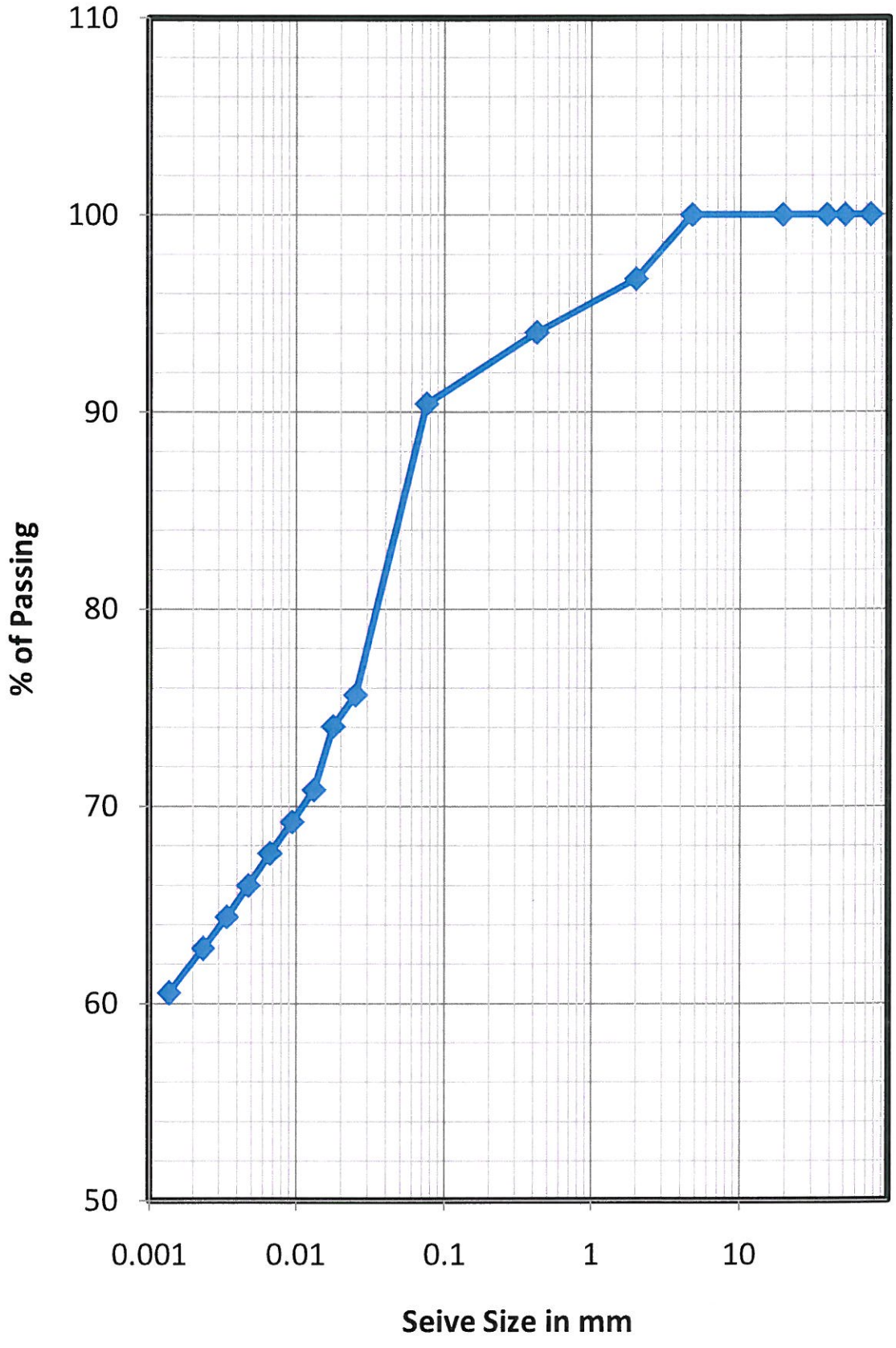
Remarks :-

Lab Manager

Checked By

4547

Grain Size Distribution Curve
BH-4, D-0.5m



4543

Arki Techno Consultants (India) Pvt. Ltd

ARKITECHNO CONSULTANTS (INDIA) PVT. LTD.

N 3/91, IRC Village, Bhubaneswar

GRAIN SIZE ANALYSIS OF SOIL AS PER IS 2720 (P- 4)

Client	:	DFCC			
Project Name	:	G.I.For 3 Nos. Important Bridges			
Type of Sample	:	SPT	Date of Testing	:	13.09.12
Location	:	BH-4(Tangri River-Ambala)	Sampled by	:	T. K. Das
Depth	:	1.5m	Tested by	:	D.Mohanty

Weight of oven dried sample before washing (gm) :- 100.00

Weight of oven dried sample after washing (gm) :- 12.37

Sieve Size mm	Individual Weight Retained in gm.	Individual Wt. Retained In %	Cummulative Wt Retained In %	Cummulative Wt Passing In %
75	0	0.00	0.00	100.00
50	0	0.00	0.00	100.00
37.5	0	0.00	0.00	100.00
19	0	0.00	0.00	100.00
4.75	0.00	0.00	0.00	100.00
2.00	6.01	6.01	6.01	93.99
0.425	5.21	5.21	11.22	88.78
0.075	1.15	1.15	12.37	87.63
Total	100.00			

Gravel Content (%)= **0.00**

Sand Content (%) = 12.37 **Silt and clay %** 87.63

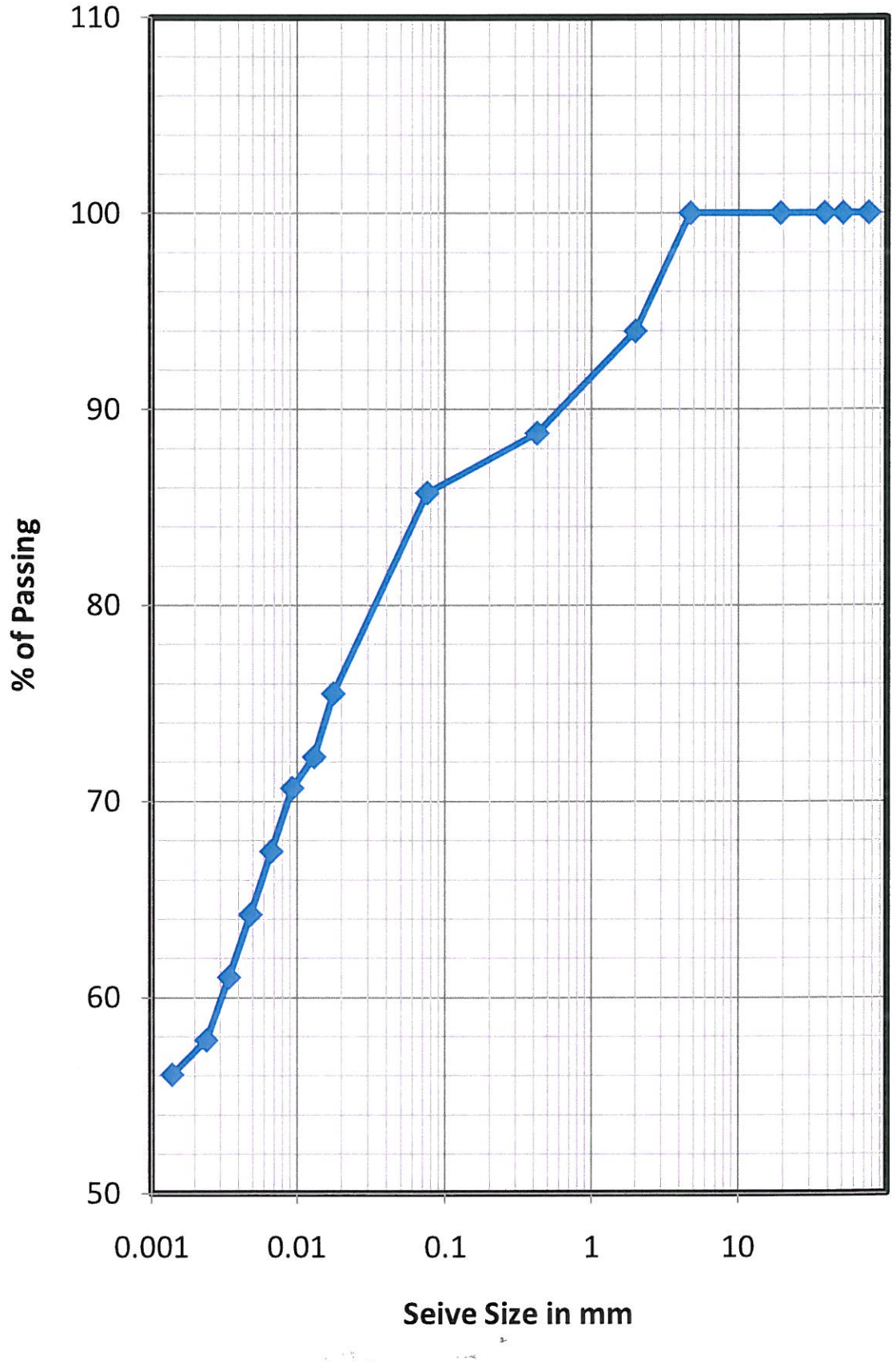
Remarks :-

Lab Manager

Checked By

4549

Grain Size Distribution Curve
BH-4, D-1.5m



4530

Arki Techno Consultants (India) Pvt. Ltd

ARKITECHNO CONSULTANTS (INDIA) PVT. LTD.

N 3/91, IRC Village, Bhubaneswar

GRAIN SIZE ANALYSIS OF SOIL AS PER IS 2720 (P- 4)

Client	:	DFCC			
Project Name	:	G.I.For 3 Nos. Important Bridges			
Type of Sample	:	SPT	Date of Testing	:	13.09.12
Location	:	BH-4(Tangri River-Ambala)	Sampled by	:	T. K. Das
Depth	:	3.0m	Tested by	:	D.Mohanty

Weight of oven dried sample before washing (gm) :- 100.00

Weight of oven dried sample after washing (gm) :- 63.40

Sieve Size mm	Individual Weight Retained in gm.	Individual Wt. Retained In %	Cummulative Wt Retained In %	Cummulative Wt Passing In %
75	0	0.00	0.00	100.00
50	0	0.00	0.00	100.00
37.5	0	0.00	0.00	100.00
19	0	0.00	0.00	100.00
4.75	0.00	0.00	0.00	100.00
2.00	30.74	30.74	30.74	69.26
0.425	24.37	24.37	55.11	44.89
0.075	8.29	8.29	63.40	36.60
Total	100.00			

Gravel Content (%)= **0.00**

Sand Content (%) = 63.40 **Silt and clay %** 36.60

Remarks :-

Lab Manager

Checked By

4551

Arki Techno Consultants (India) Pvt. Ltd

ARKITECHNO

N 3/91, IRC Village, Bhubaneswar

GRAIN SIZE ANALYSIS OF SOIL AS PER IS 2720 (P- 4)

Client	:	DFCC			
Project Name	:	G.I.For 3 Nos. Important Bridges			
Type of Sample	:	SPT	Date of Testing	:	13.09.12
Location	:	BH-4(Tangri River-Ambala)	Sampled by	:	T. K. Das
Depth	:	4.5m	Tested by	:	D.Mohanty

Weight of oven dried sample before washing (gm) :- 100.00

Weight of oven dried sample after washing (gm) :- 65.51

Sieve Size mm	Individual Weight Retained in gm.	Individual Wt. Retained In %	Cummulative Wt Retained In %	Cummulative Wt Passing In %
75	0	0.00	0.00	100.00
50	0	0.00	0.00	100.00
37.5	0	0.00	0.00	100.00
19	0	0.00	0.00	100.00
4.75	0.00	0.00	0.00	100.00
2.00	31.41	31.41	31.41	68.59
0.425	23.87	23.87	55.28	44.72
0.075	10.23	10.23	65.51	34.49
Total	100.00			

Gravel Content (%)= **0.00**

Sand Content (%) = 65.51 **Silt and clay %** 34.49

Remarks :-

Lab Manager Checked By

4532

Arki Techno Consultants (India) Pvt. Ltd

ARKITECHNO CONSULTANTS (INDIA) PVT. LTD.

N 3/91, IRC Village, Bhubaneswar

GRAIN SIZE ANALYSIS OF SOIL AS PER IS 2720 (P- 4)

Client	:	DFCC			
Project Name	:	G.I.For 3 Nos. Important Bridges			
Type of Sample	:	SPT	Date of Testing	:	13.09.12
Location	:	BH-4(Tangri River-Ambala)	Sampled by	:	T. K. Das
Depth	:	9.0m	Tested by	:	D.Mohanty

Weight of oven dried sample before washing (gm) :- 100.00

Weight of oven dried sample after washing (gm) :- 56.14

Sieve Size mm	Individual Weight Retained in gm.	Individual Wt. Retained In %	Cummulative Wt Retained In %	Cummulative Wt Passing In %
75	0	0.00	0.00	100.00
50	0	0.00	0.00	100.00
37.5	0	0.00	0.00	100.00
19	0	0.00	0.00	100.00
4.75	0.00	0.00	0.00	100.00
2.00	27.31	27.31	27.31	72.69
0.425	20.60	20.60	47.91	52.09
0.075	8.23	8.23	56.14	43.86
Total	100.00			

Gravel Content (%)= **0.00**

Sand Content (%) = 56.14 **Silt and clay %** 43.86

Remarks :-

Lab Manager

Checked By

4553

Arki Techno Consultants (India) Pvt. Ltd

ARKITECHNO CONSULTANTS (INDIA) PVT. LTD.

N 3/91, IRC Village, Bhubaneswar

GRAIN SIZE ANALYSIS OF SOIL AS PER IS 2720 (P- 4)

Client	:	DFCC			
Project Name	:	G.I.For 3 Nos. Important Bridges			
Type of Sample	:	UDS	Date of Testing	:	13.09.12
Location	:	BH-4(Tangri River-Ambala)	Sampled by	:	T. K. Das
Depth	:	14.5m	Tested by	:	D.Mohanty

Weight of oven dried sample before washing (gm) :- 100.00

Weight of oven dried sample after washing (gm) :- 5.71

Sieve Size mm	Individual Weight Retained in gm.	Individual Wt. Retained In %	Cummulative Wt Retained In %	Cummulative Wt Passing In %
75	0	0.00	0.00	100.00
50	0	0.00	0.00	100.00
37.5	0	0.00	0.00	100.00
19	0	0.00	0.00	100.00
4.75	0.00	0.00	0.00	100.00
2.00	3.13	3.13	3.13	96.87
0.425	2.24	2.24	5.37	94.63
0.075	0.35	0.35	5.72	94.28
Total	100.00			

Gravel Content (%)= **0.00**

Sand Content (%) = 5.72 **Silt and clay %** 94.28

Remarks :-

Lab Manager Checked By

4551

Arki Techno Consultants (India) Pvt. Ltd

ARKITECHNO

N 3/91, IRC Village, Bhubaneswar

GRAIN SIZE ANALYSIS OF SOIL AS PER IS 2720 (P- 4)

Client	:	DFCC			
Project Name	:	G.I.For 3 Nos. Important Bridges			
Type of Sample	:	SPT	Date of Testing	:	13.09.12
Location	:	BH-4(Tangri River-Ambala)	Sampled by	:	T. K. Das
Depth	:	15.0m	Tested by	:	D.Mohanty

Weight of oven dried sample before washing (gm) :- 100.00

Weight of oven dried sample after washing (gm) :- 6.48

Sieve Size mm	Individual Weight Retained in gm.	Individual Wt. Retained In %	Cummulative Wt Retained In %	Cummulative Wt Passing In %
75	0	0.00	0.00	100.00
50	0	0.00	0.00	100.00
37.5	0	0.00	0.00	100.00
19	0	0.00	0.00	100.00
4.75	0.00	0.00	0.00	100.00
2.00	3.37	3.37	3.37	96.63
0.425	2.59	2.59	5.96	94.04
0.075	0.53	0.53	6.49	93.51
Total	100.00			

Gravel Content (%)= **0.00**

Sand Content (%) = 6.49 **Silt and clay %** 93.51

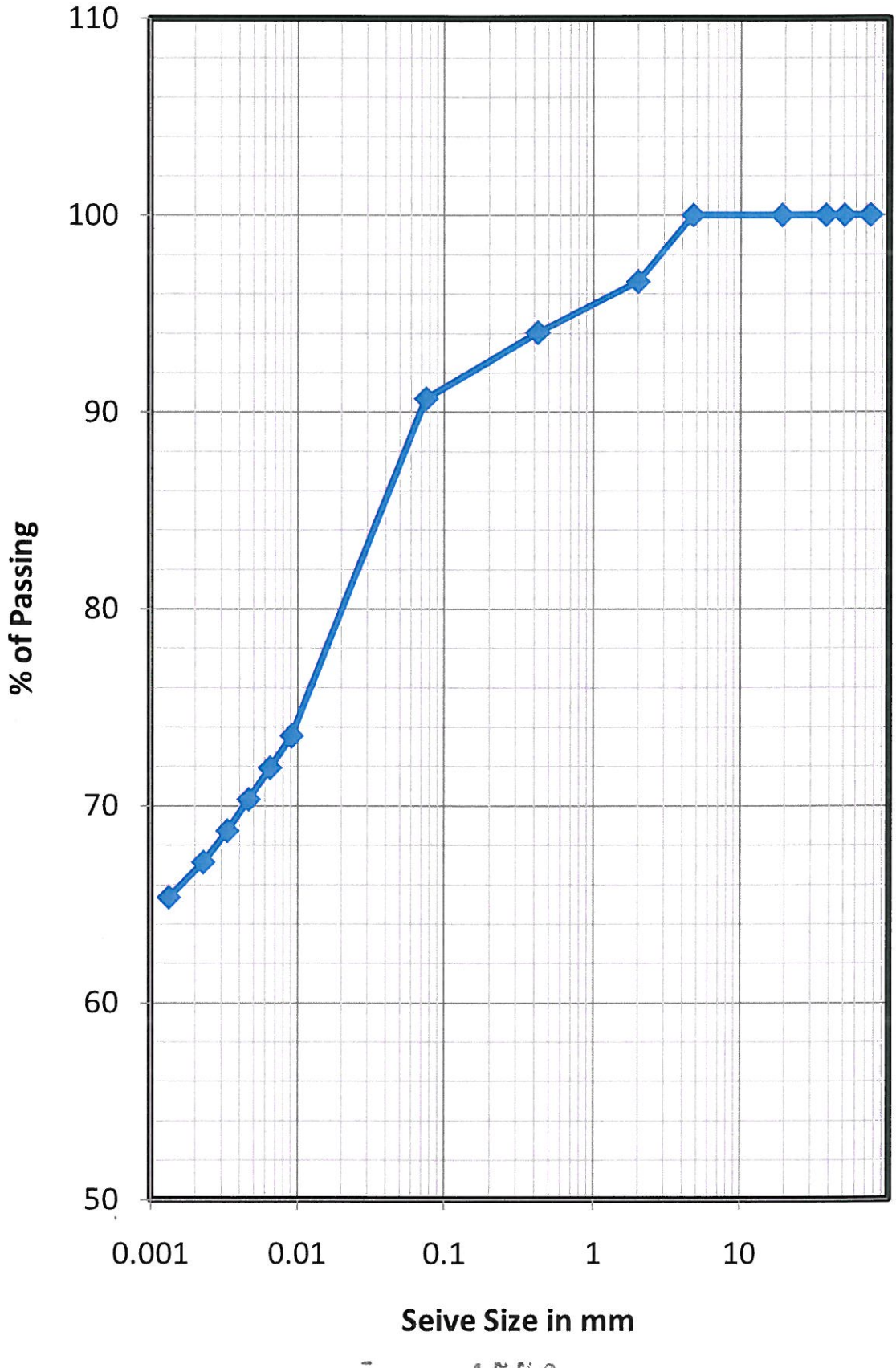
Remarks :-

Lab Manager

4555

Checked By

Grain Size Distribution Curve
BH-4, D-15.0m



4556

Arki Techno Consultants (India) Pvt. Ltd

ARKITECHNO CONSULTANTS (INDIA) PVT. LTD.

N 3/91, IRC Village, Bhubaneswar

GRAIN SIZE ANALYSIS OF SOIL AS PER IS 2720 (P- 4)

Client	:	DFCC			
Project Name	:	G.I.For 3 Nos. Important Bridges			
Type of Sample	:	UDS	Date of Testing	:	13.09.12
Location	:	BH-4(Tangri River-Ambala)	Sampled by	:	T. K. Das
Depth	:	17.5m	Tested by	:	D.Mohanty

Weight of oven dried sample before washing (gm) :- 100.00

Weight of oven dried sample after washing (gm) :- 5.93

Sieve Size mm	Individual Weight Retained in gm.	Individual Wt. Retained In %	Cummulative Wt Retained In %	Cummulative Wt Passing In %
75	0	0.00	0.00	100.00
50	0	0.00	0.00	100.00
37.5	0	0.00	0.00	100.00
19	0	0.00	0.00	100.00
4.75	0.00	0.00	0.00	100.00
2.00	3.01	3.01	3.01	96.99
0.425	2.45	2.45	5.46	94.54
0.075	0.47	0.47	5.93	94.07
Total	100.00			

Gravel Content (%)= **0.00**

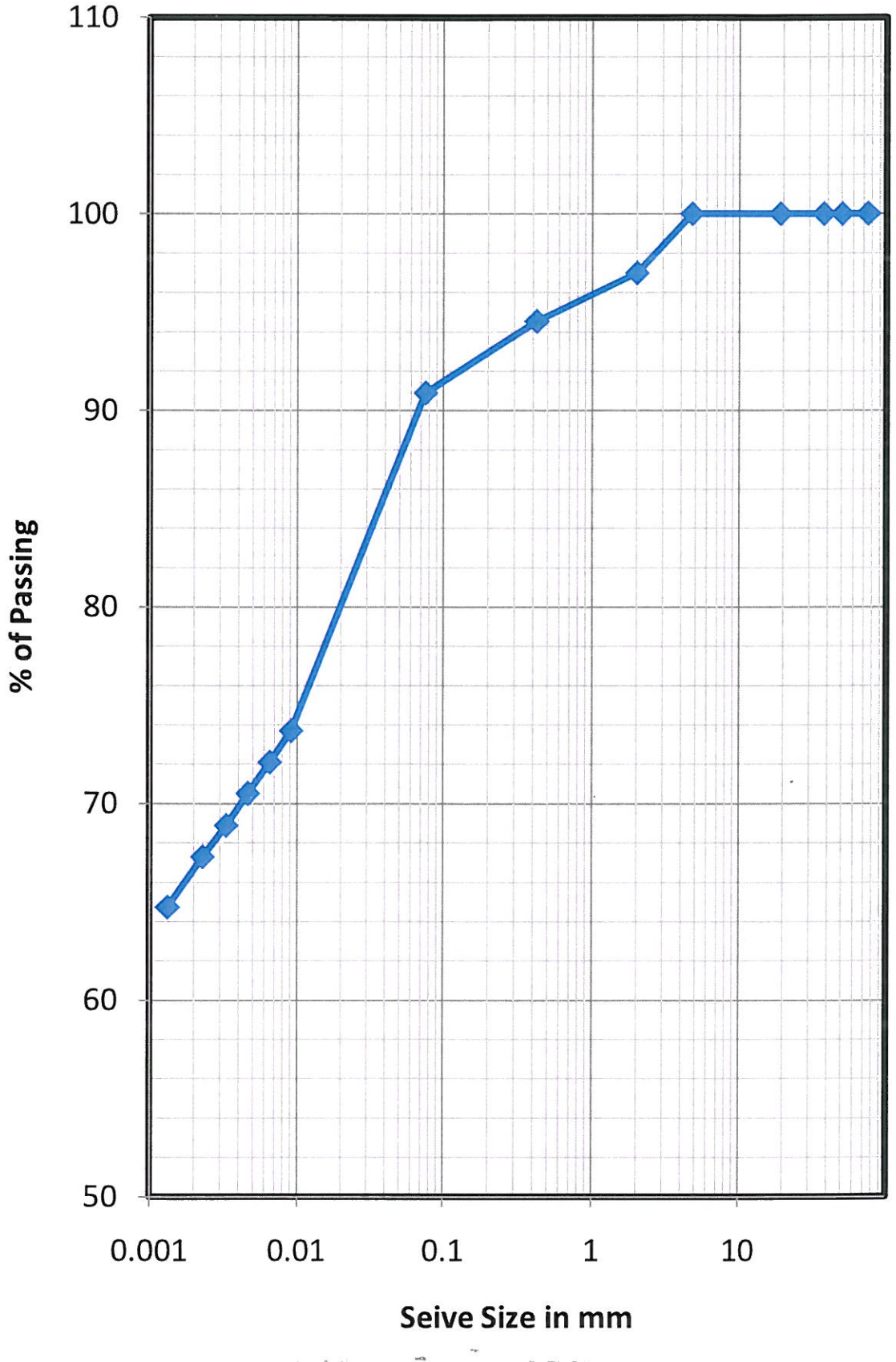
Sand Content (%) = 5.93 **Silt and clay %** 94.07

Remarks :-

Lab Manager Checked By

4557

Grain Size Distribution Curve
BH-4, D-17.5m



4558

Arki Techno Consultants (India) Pvt. Ltd

ARKITECHNO

N 3/91, IRC Village, Bhubaneswar

GRAIN SIZE ANALYSIS OF SOIL AS PER IS 2720 (P- 4)

Client	:	DFCC			
Project Name	:	G.I.For 3 Nos. Important Bridges			
Type of Sample	:	SPT	Date of Testing	:	13.09.12
Location	:	BH-4(Tangri River-Ambala)	Sampled by	:	T. K. Das
Depth	:	19.0m	Tested by	:	D.Mohanty

Weight of oven dried sample before washing (gm) :- 100.00

Weight of oven dried sample after washing (gm) :- 66.51

Sieve Size mm	Individual Weight Retained in gm.	Individual Wt. Retained In %	Cummulative Wt Retained In %	Cummulative Wt Passing In %
75	0	0.00	0.00	100.00
50	0	0.00	0.00	100.00
37.5	0	0.00	0.00	100.00
19	0	0.00	0.00	100.00
4.75	0.00	0.00	0.00	100.00
2.00	30.73	30.73	30.73	69.27
0.425	25.92	25.92	56.65	43.35
0.075	9.86	9.86	66.51	33.49
Total	100.00			

Gravel Content (%)= **0.00**

Sand Content (%) = 66.51 **Silt and clay %** 33.49

Remarks :-

Lab Manager Checked By

4559

Arki Techno Consultants (India) Pvt. Ltd

ARKITECHNO CONSULTANTS (INDIA) PVT. LTD.

N 3/91, IRC Village, Bhubaneswar

GRAIN SIZE ANALYSIS OF SOIL AS PER IS 2720 (P- 4)

Client	:	DFCC			
Project Name	:	G.I.For 3 Nos. Important Bridges			
Type of Sample	:	SPT	Date of Testing	:	13.09.12
Location	:	BH-4(Tangri River-Ambala)	Sampled by	:	T. K. Das
Depth	:	21.0m	Tested by	:	D.Mohanty

Weight of oven dried sample before washing (gm) :- 100.00

Weight of oven dried sample after washing (gm) :- 65.77

Sieve Size mm	Individual Weight Retained in gm.	Individual Wt. Retained In %	Cummulative Wt Retained In %	Cummulative Wt Passing In %
75	0	0.00	0.00	100.00
50	0	0.00	0.00	100.00
37.5	0	0.00	0.00	100.00
19	0	0.00	0.00	100.00
4.75	0.00	0.00	0.00	100.00
2.00	29.89	29.89	29.89	70.11
0.425	26.37	26.37	56.26	43.74
0.075	9.52	9.52	65.78	34.22
Total	100.00			

Gravel Content (%)= **0.00**

Sand Content (%) = 65.78 **Silt and clay %** 34.22

Remarks :-

Lab Manager

4560

Checked By

Arki Techno Consultants (India) Pvt. Ltd

ARKITECHNO CONSULTANTS (INDIA) PVT. LTD.

N 3/91, IRC Village, Bhubaneswar

GRAIN SIZE ANALYSIS OF SOIL AS PER IS 2720 (P- 4)

Client	:	DFCC			
Project Name	:	G.I.For 3 Nos. Important Bridges			
Type of Sample	:	SPT	Date of Testing	:	13.09.12
Location	:	BH-4(Tangri River-Ambala)	Sampled by	:	T. K. Das
Depth	:	24.0m	Tested by	:	D.Mohanty

Weight of oven dried sample before washing (gm) :- 100.00

Weight of oven dried sample after washing (gm) :- 25.30

Sieve Size mm	Individual Weight Retained in gm.	Individual Wt. Retained In %	Cummulative Wt Retained In %	Cummulative Wt Passing In %
75	0	0.00	0.00	100.00
50	0	0.00	0.00	100.00
37.5	0	0.00	0.00	100.00
19	0	0.00	0.00	100.00
4.75	0.00	0.00	0.00	100.00
2.00	12.89	12.89	12.89	87.11
0.425	10.04	10.04	22.93	77.07
0.075	2.37	2.37	25.30	74.70
Total	100.00			

Gravel Content (%)= **0.00**

Sand Content (%) = 25.30 **Silt and clay %** 74.70

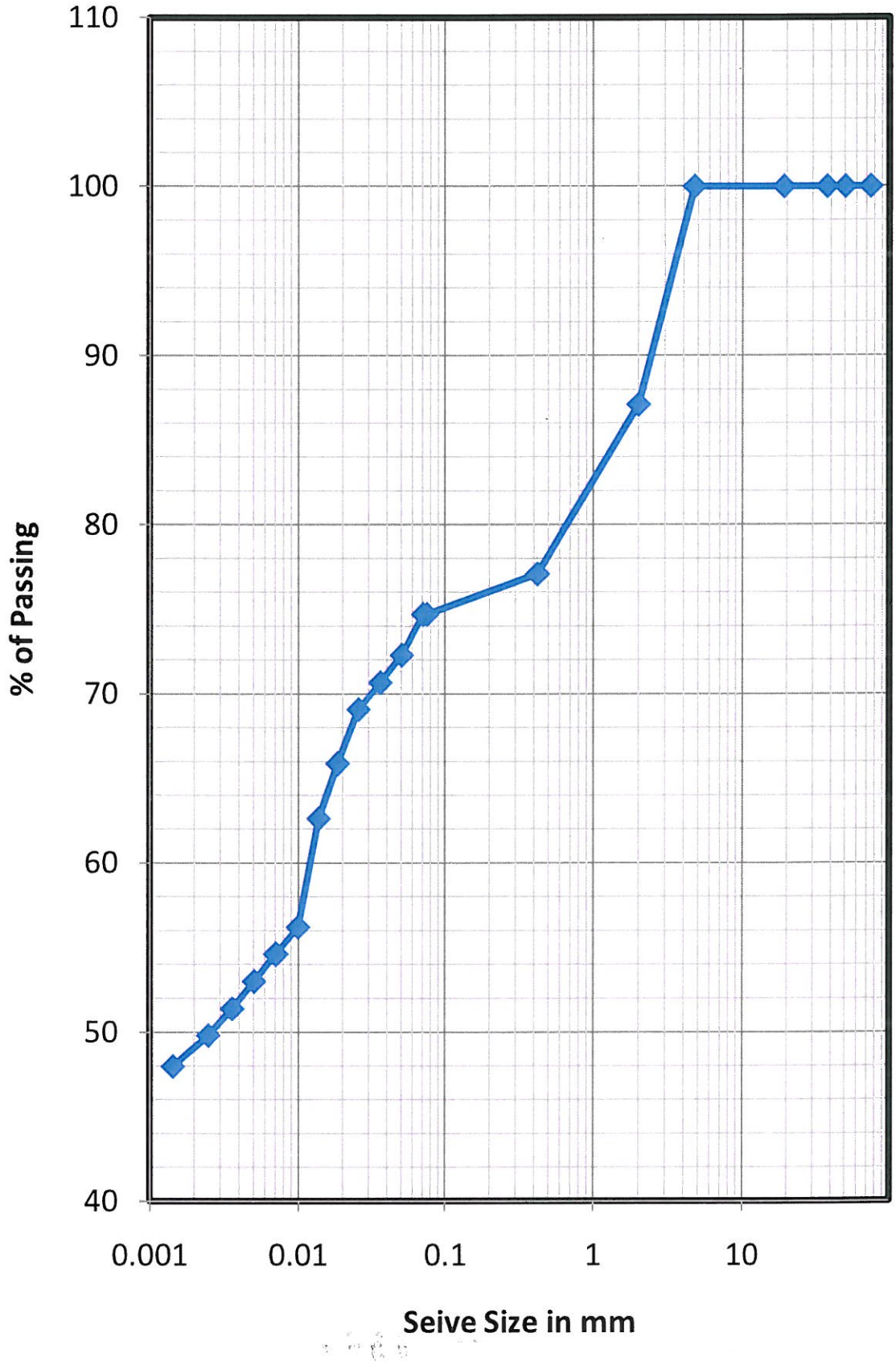
Remarks :-

Lab Manager

Checked By

4561

Grain Size Distribution Curve
BH-4, D-24.0m



4502

Arki Techno Consultants (India) Pvt. Ltd

ARKITECHNO CONSULTANTS (INDIA) PVT. LTD.

N 3/91, IRC Village, Bhubaneswar

GRAIN SIZE ANALYSIS OF SOIL AS PER IS 2720 (P- 4)

Client	:	DFCC			
Project Name	:	G.I.For 3 Nos. Important Bridges			
Type of Sample	:	UDS	Date of Testing	:	13.09.12
Location	:	BH-4(Tangri River-Ambala)	Sampled by	:	T. K. Das
Depth	:	29.0m	Tested by	:	D.Mohanty

Weight of oven dried sample before washing (gm) :- 100.00

Weight of oven dried sample after washing (gm) :- 0.76

Sieve Size mm	Individual Weight Retained in gm.	Individual Wt. Retained In %	Cummulative Wt Retained In %	Cummulative Wt Passing In %
75	0	0.00	0.00	100.00
50	0	0.00	0.00	100.00
37.5	0	0.00	0.00	100.00
19	0	0.00	0.00	100.00
4.75	0.00	0.00	0.00	100.00
2.00	0.37	0.37	0.37	99.63
0.425	0.32	0.32	0.69	99.31
0.075	0.07	0.07	0.76	99.24
Total	100.00			

Gravel Content (%)= **0.00**

Sand Content (%) = 0.76 **Silt and clay %** 99.24

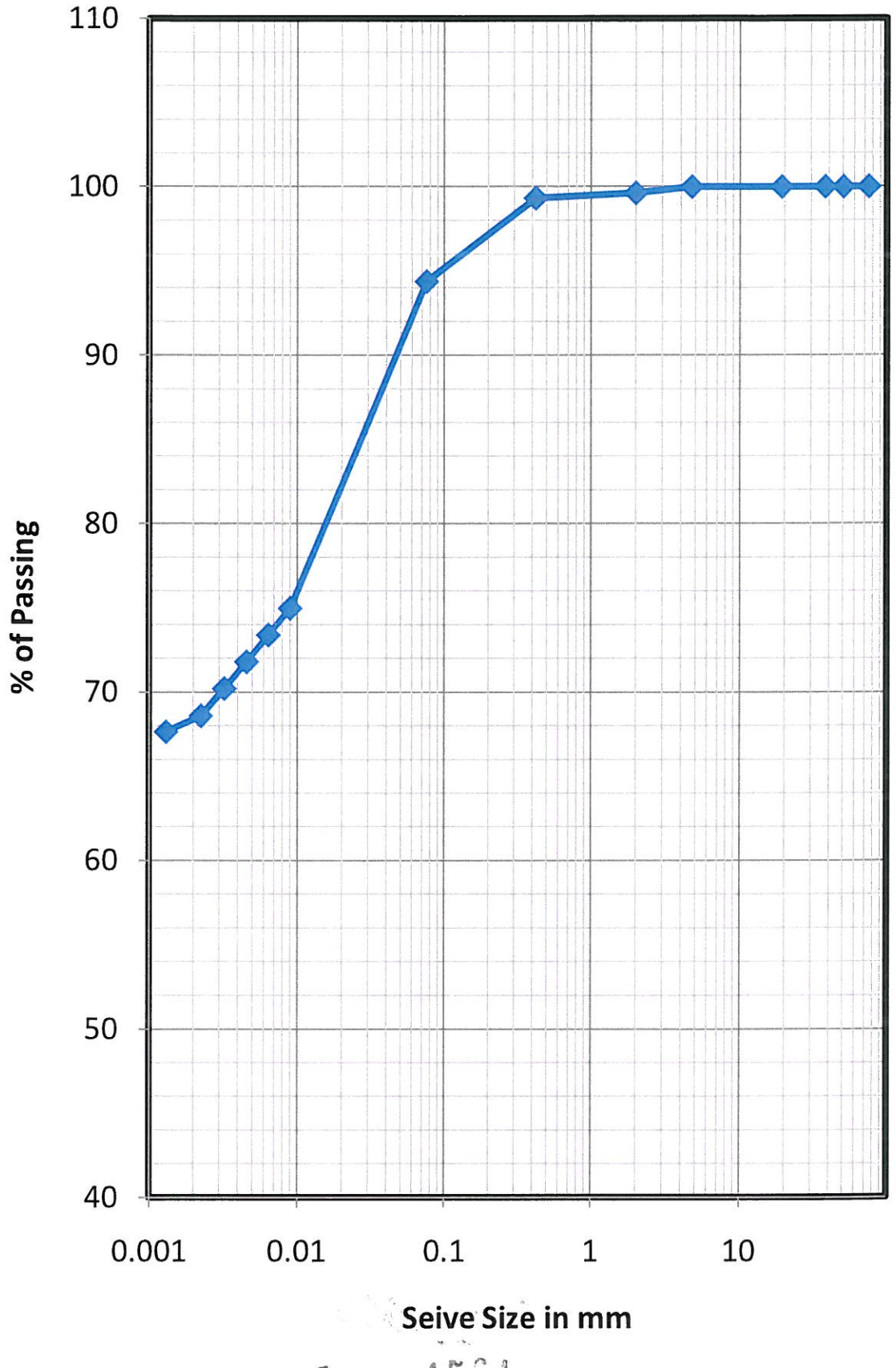
Remarks :-

Lab Manager

4563

Checked By

Grain Size Distribution Curve
BH-4, D-29.0m



4561

Arki Techno Consultants (India) Pvt. Ltd

ARKITECHNO CONSULTANTS (INDIA) PVT. LTD.

N 3/91, IRC Village, Bhubaneswar

GRAIN SIZE ANALYSIS OF SOIL AS PER IS 2720 (P- 4)

Client	:	DFCC			
Project Name	:	G.I.For 3 Nos. Important Bridges			
Type of Sample	:	SPT	Date of Testing	:	13.09.12
Location	:	BH-4(Tangri River-Ambala)	Sampled by	:	T. K. Das
Depth	:	30.0m	Tested by	:	D.Mohanty

Weight of oven dried sample before washing (gm) :- 100.00

Weight of oven dried sample after washing (gm) :- 0.38

Sieve Size mm	Individual Weight Retained in gm.	Individual Wt. Retained In %	Cummulative Wt Retained In %	Cummulative Wt Passing In %
75	0	0.00	0.00	100.00
50	0	0.00	0.00	100.00
37.5	0	0.00	0.00	100.00
19	0	0.00	0.00	100.00
4.75	0.00	0.00	0.00	100.00
2.00	0.20	0.20	0.20	99.80
0.425	0.14	0.14	0.34	99.66
0.075	0.05	0.05	0.39	99.61
Total	100.00			

Gravel Content (%)= **0.00**

Sand Content (%) = 0.39 **Silt and clay %** 99.61

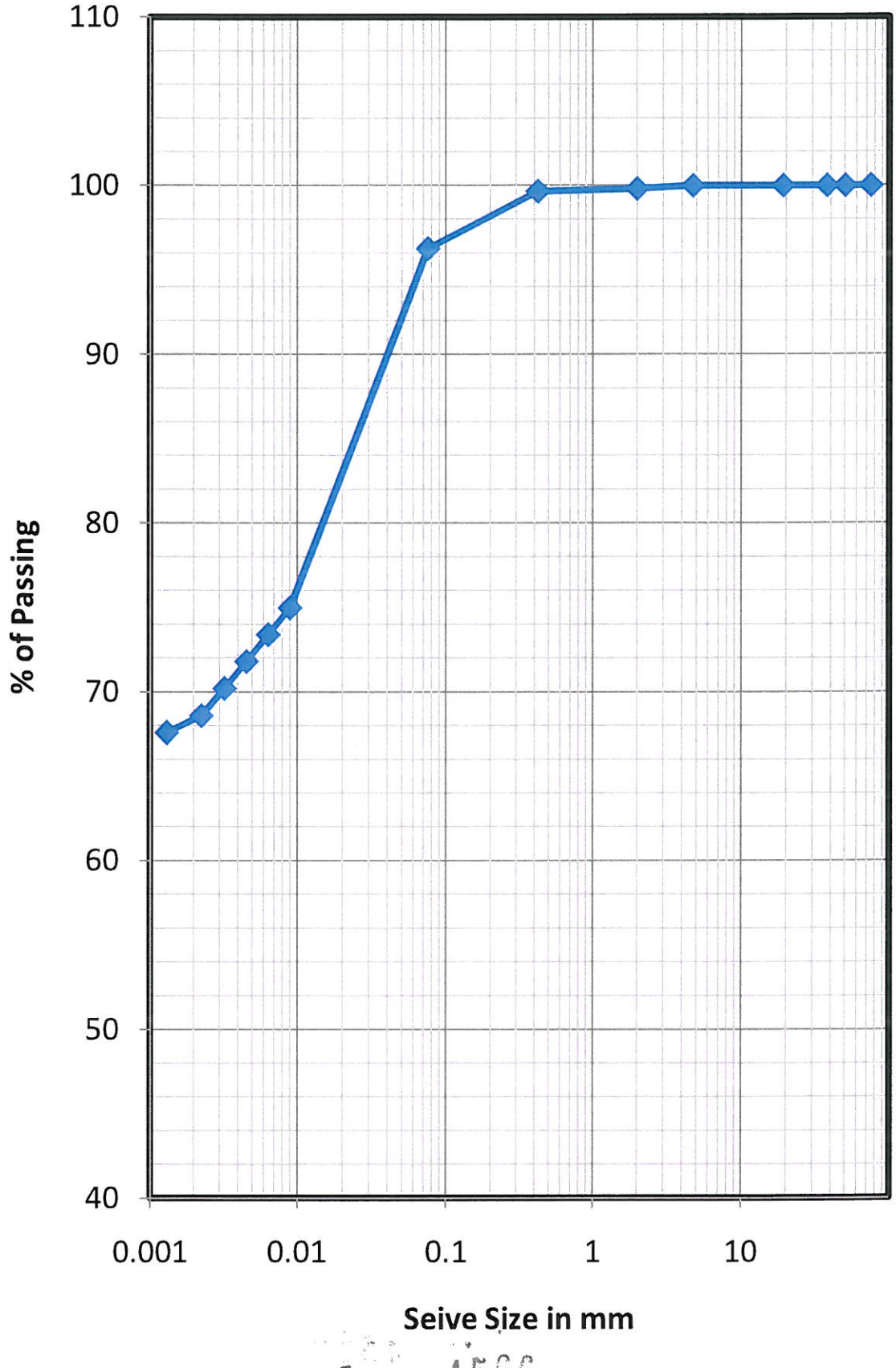
Remarks :-

Lab Manager

4565

Checked By

Grain Size Distribution Curve
BH-4, D-30.0m



4566

Arki Techno Consultants (India) Pvt. Ltd

ARKITECHNO CONSULTANTS (INDIA) PVT. LTD.

N 3/91, IRC Village, Bhubaneswar

GRAIN SIZE ANALYSIS OF SOIL AS PER IS 2720 (P- 4)

Client	:	DFCC			
Project Name	:	G.I.For 3 Nos. Important Bridges			
Type of Sample	:	UDS	Date of Testing	:	13.09.12
Location	:	BH-4(Tangri River-Ambala)	Sampled by	:	T. K. Das
Depth	:	32.0m	Tested by	:	D.Mohanty

Weight of oven dried sample before washing (gm) :- 100.00

Weight of oven dried sample after washing (gm) :- 0.43

Sieve Size mm	Individual Weight Retained in gm.	Individual Wt. Retained In %	Cummulative Wt Retained In %	Cummulative Wt Passing In %
75	0	0.00	0.00	100.00
50	0	0.00	0.00	100.00
37.5	0	0.00	0.00	100.00
19	0	0.00	0.00	100.00
4.75	0.00	0.00	0.00	100.00
2.00	0.21	0.21	0.21	99.79
0.425	0.17	0.17	0.38	99.62
0.075	0.06	0.06	0.44	99.56
Total	100.00			

Gravel Content (%)= **0.00**

Sand Content (%) = 0.44 **Silt and clay %** 99.56

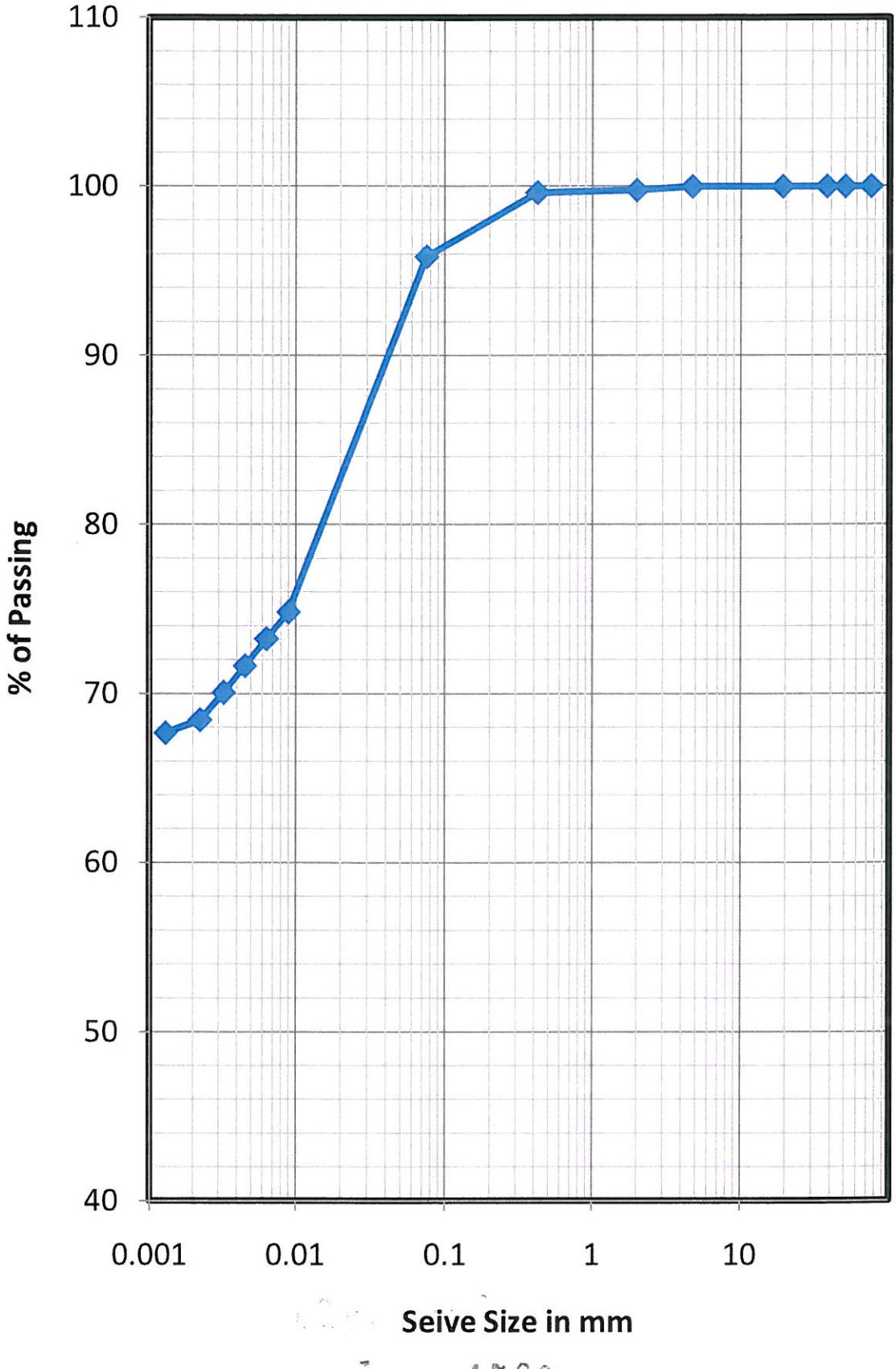
Remarks :-

Lab Manager

4567

Checked By

Grain Size Distribution Curve
BH-4, D-32.0m



4563

Arki Techno Consultants (India) Pvt. Ltd

ARKITECHNO CONSULTANTS (INDIA) PVT. LTD.

N 3/91, IRC Village, Bhubaneswar

GRAIN SIZE ANALYSIS OF SOIL AS PER IS 2720 (P- 4)

Client	:	DFCC			
Project Name	:	G.I.For 3 Nos. Important Bridges			
Type of Sample	:	SPT	Date of Testing	:	13.09.12
Location	:	BH-4(Tangri River-Ambala)	Sampled by	:	T. K. Das
Depth	:	34.0m	Tested by	:	D.Mohanty

Weight of oven dried sample before washing (gm) :- 100.00

Weight of oven dried sample after washing (gm) :- 70.14

Sieve Size mm	Individual Weight Retained in gm.	Individual Wt. Retained In %	Cummulative Wt Retained In %	Cummulative Wt Passing In %
75	0	0.00	0.00	100.00
50	0	0.00	0.00	100.00
37.5	0	0.00	0.00	100.00
19	0	0.00	0.00	100.00
4.75	0.00	0.00	0.00	100.00
2.00	32.67	32.67	32.67	67.33
0.425	27.09	27.09	59.76	40.24
0.075	10.38	10.38	70.14	29.86
Total	100.00			

Gravel Content (%)= **0.00**

Sand Content (%) = 70.14 **Silt and clay %** 29.86

Remarks :-

Lab Manager

4569

Checked By

Arki Techno Consultants (India) Pvt. Ltd

ARKITECHNO

N 3/91, IRC Village, Bhubaneswar

GRAIN SIZE ANALYSIS OF SOIL AS PER IS 2720 (P- 4)

Client	:	DFCC			
Project Name	:	G.I.For 3 Nos. Important Bridges			
Type of Sample	:	SPT	Date of Testing	:	13.09.12
Location	:	BH-4(Tangri River-Ambala)	Sampled by	:	T. K. Das
Depth	:	39.0m	Tested by	:	D.Mohanty

Weight of oven dried sample before washing (gm) :- 100.00

Weight of oven dried sample after washing (gm) :- 0.37

Sieve Size mm	Individual Weight Retained in gm.	Individual Wt. Retained In %	Cummulative Wt Retained In %	Cummulative Wt Passing In %
75	0	0.00	0.00	100.00
50	0	0.00	0.00	100.00
37.5	0	0.00	0.00	100.00
19	0	0.00	0.00	100.00
4.75	0.00	0.00	0.00	100.00
2.00	0.16	0.16	0.16	99.84
0.425	0.11	0.11	0.27	99.73
0.075	0.10	0.10	0.37	99.63
Total	100.00			

Gravel Content (%)= **0.00**

Sand Content (%) = 0.37 **Silt and clay %** 99.63

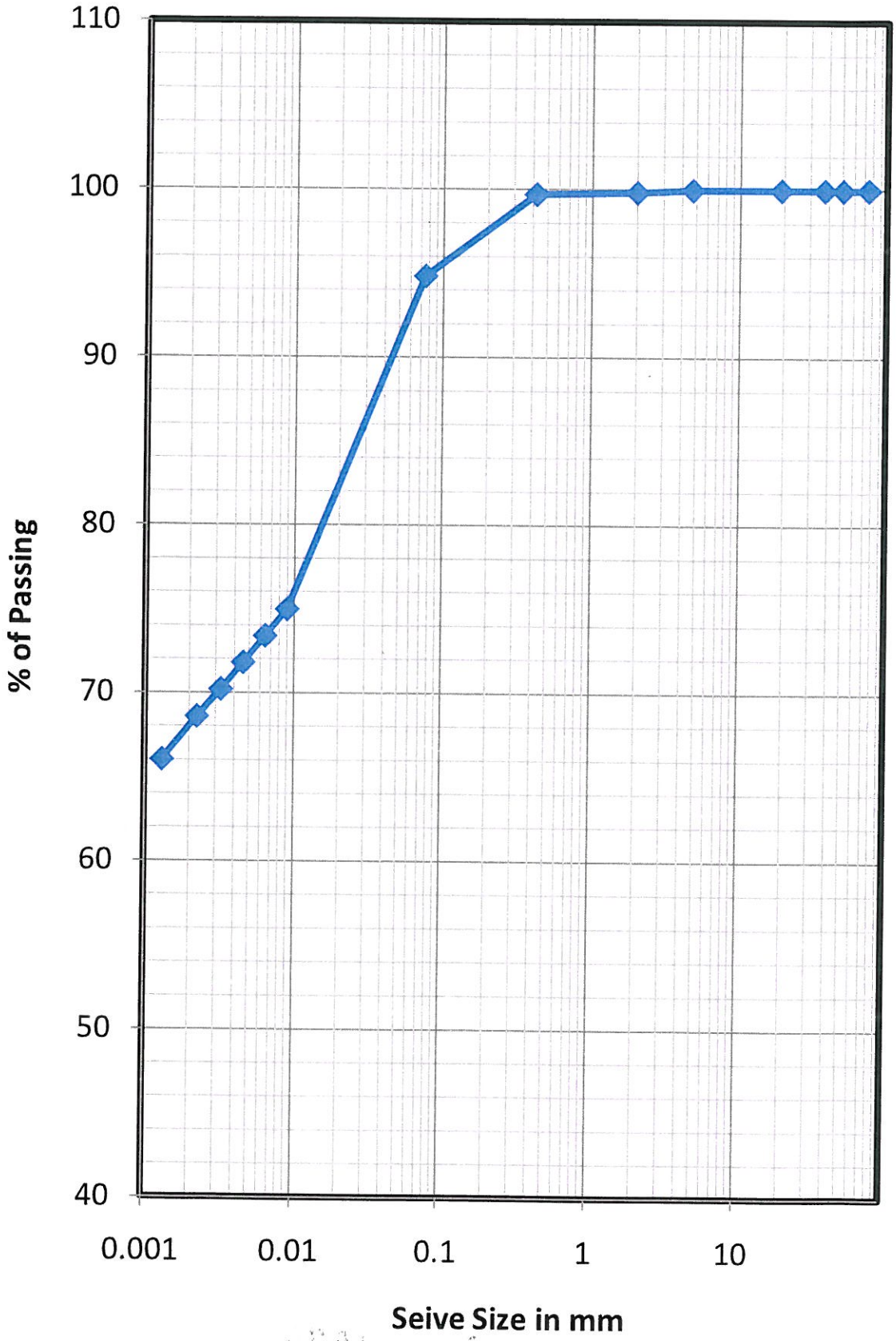
Remarks :-

Lab Manager

4579

Checked By

Grain Size Distribution Curve
BH-4, D-39.0m



4571

Arki Techno Consultants (India) Pvt. Ltd

ARKITECHNO

N 3/91, IRC Village, Bhubaneswar

GRAIN SIZE ANALYSIS OF SOIL AS PER IS 2720 (P- 4)

Client	:	DFCC			
Project Name	:	G.I.For 3 Nos. Important Bridges			
Type of Sample	:	SPT	Date of Testing	:	13.09.12
Location	:	BH-4(Tangri River-Ambala)	Sampled by	:	T. K. Das
Depth	:	42.0m	Tested by	:	D.Mohanty

Weight of oven dried sample before washing (gm) :- 100.00

Weight of oven dried sample after washing (gm) :- 0.74

Sieve Size mm	Individual Weight Retained in gm.	Individual Wt. Retained In %	Cummulative Wt Retained In %	Cummulative Wt Passing In %
75	0	0.00	0.00	100.00
50	0	0.00	0.00	100.00
37.5	0	0.00	0.00	100.00
19	0	0.00	0.00	100.00
4.75	0.00	0.00	0.00	100.00
2.00	0.36	0.36	0.36	99.64
0.425	0.29	0.29	0.65	99.35
0.075	0.09	0.09	0.74	99.26
Total	100.00			

Gravel Content (%)= **0.00**

Sand Content (%) = 0.74 **Silt and clay %** 99.26

Remarks :-

Lab Manager Checked By

4572

Arki Techno Consultants (India) Pvt. Ltd

ARKITECHNO CONSULTANTS (INDIA) PVT. LTD.

N 3/91, IRC Village, Bhubaneswar

GRAIN SIZE ANALYSIS OF SOIL AS PER IS 2720 (P- 4)

Client	:	DFCC			
Project Name	:	G.I.For 3 Nos. Important Bridges			
Type of Sample	:	SPT	Date of Testing	:	13.09.12
Location	:	BH-4(Tangri River-Ambala)	Sampled by	:	T. K. Das
Depth	:	45.0m	Tested by	:	D.Mohanty

Weight of oven dried sample before washing (gm) :- 100.00

Weight of oven dried sample after washing (gm) :- 2.24

Sieve Size mm	Individual Weight Retained in gm.	Individual Wt. Retained In %	Cummulative Wt Retained In %	Cummulative Wt Passing In %
75	0	0.00	0.00	100.00
50	0	0.00	0.00	100.00
37.5	0	0.00	0.00	100.00
19	0	0.00	0.00	100.00
4.75	0.00	0.00	0.00	100.00
2.00	1.17	1.17	1.17	98.83
0.425	0.86	0.86	2.03	97.97
0.075	0.21	0.21	2.24	97.76
Total	100.00			

Gravel Content (%)= **0.00**

Sand Content (%) = 2.24 **Silt and clay %** 97.76

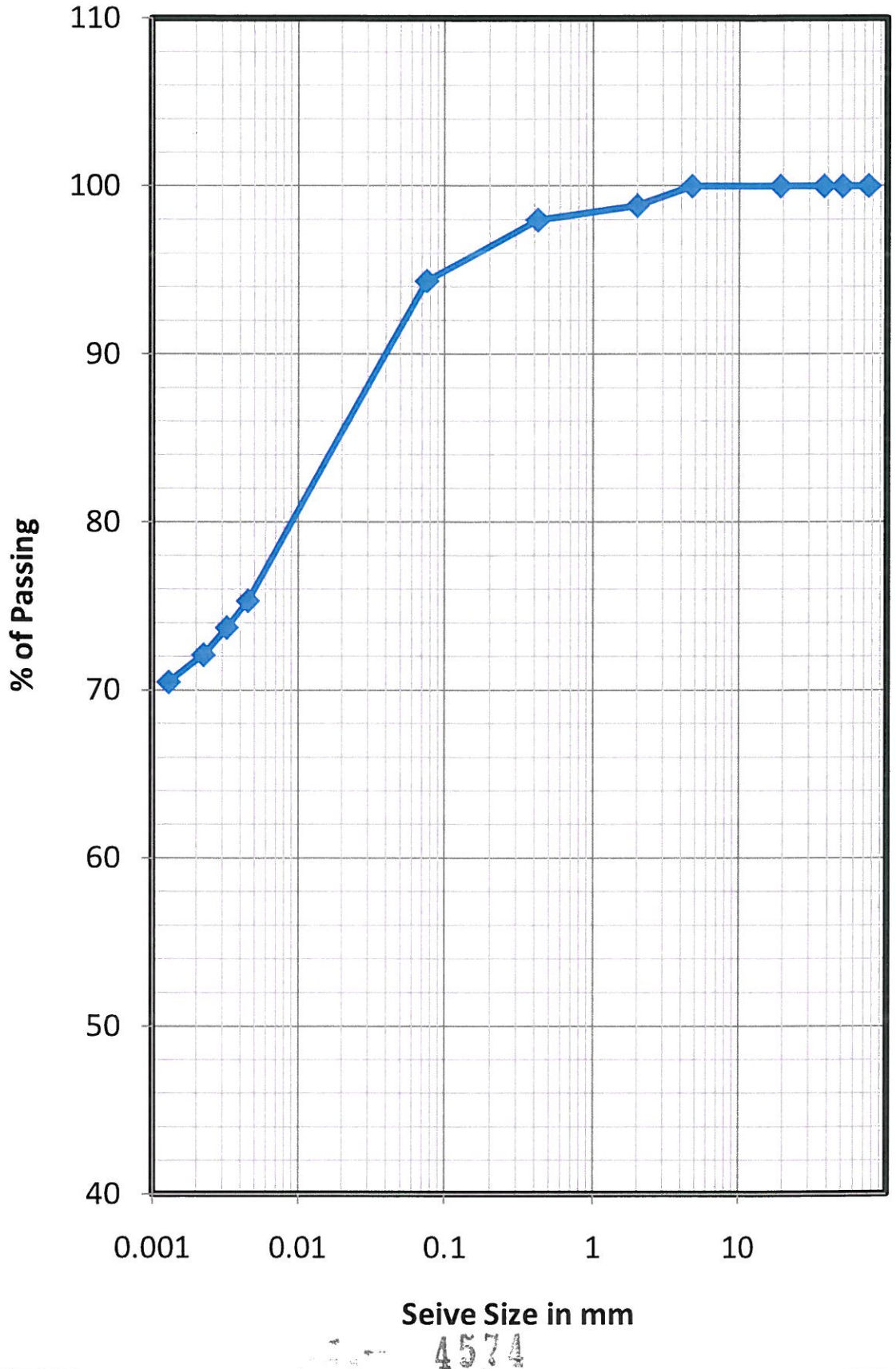
Remarks :-

Lab Manager

4573

Checked By

Grain Size Distribution Curve
BH-4, D-45.0m



4574

Arki Techno Consultants (India) Pvt. Ltd

ARKITECHNO

N 3/91, IRC Village, Bhubaneswar

GRAIN SIZE ANALYSIS OF SOIL AS PER IS 2720 (P- 4)

Client	:	DFCC			
Project Name	:	G.I.For 3 Nos. Important Bridges			
Type of Sample	:	SPT	Date of Testing	:	13.09.12
Location	:	BH-4(Tangri River-Ambala)	Sampled by	:	T. K. Das
Depth	:	48.0m	Tested by	:	D.Mohanty

Weight of oven dried sample before washing (gm) :- 100.00

Weight of oven dried sample after washing (gm) :- 1.13

Sieve Size mm	Individual Weight Retained in gm.	Individual Wt. Retained In %	Cummulative Wt Retained In %	Cummulative Wt Passing In %
75	0	0.00	0.00	100.00
50	0	0.00	0.00	100.00
37.5	0	0.00	0.00	100.00
19	0	0.00	0.00	100.00
4.75	0.00	0.00	0.00	100.00
2.00	0.56	0.56	0.56	99.44
0.425	0.45	0.45	1.01	98.99
0.075	0.12	0.12	1.13	98.87
Total	100.00			

Gravel Content (%)= **0.00**

Sand Content (%) = 1.13 **Silt and clay %** 98.87

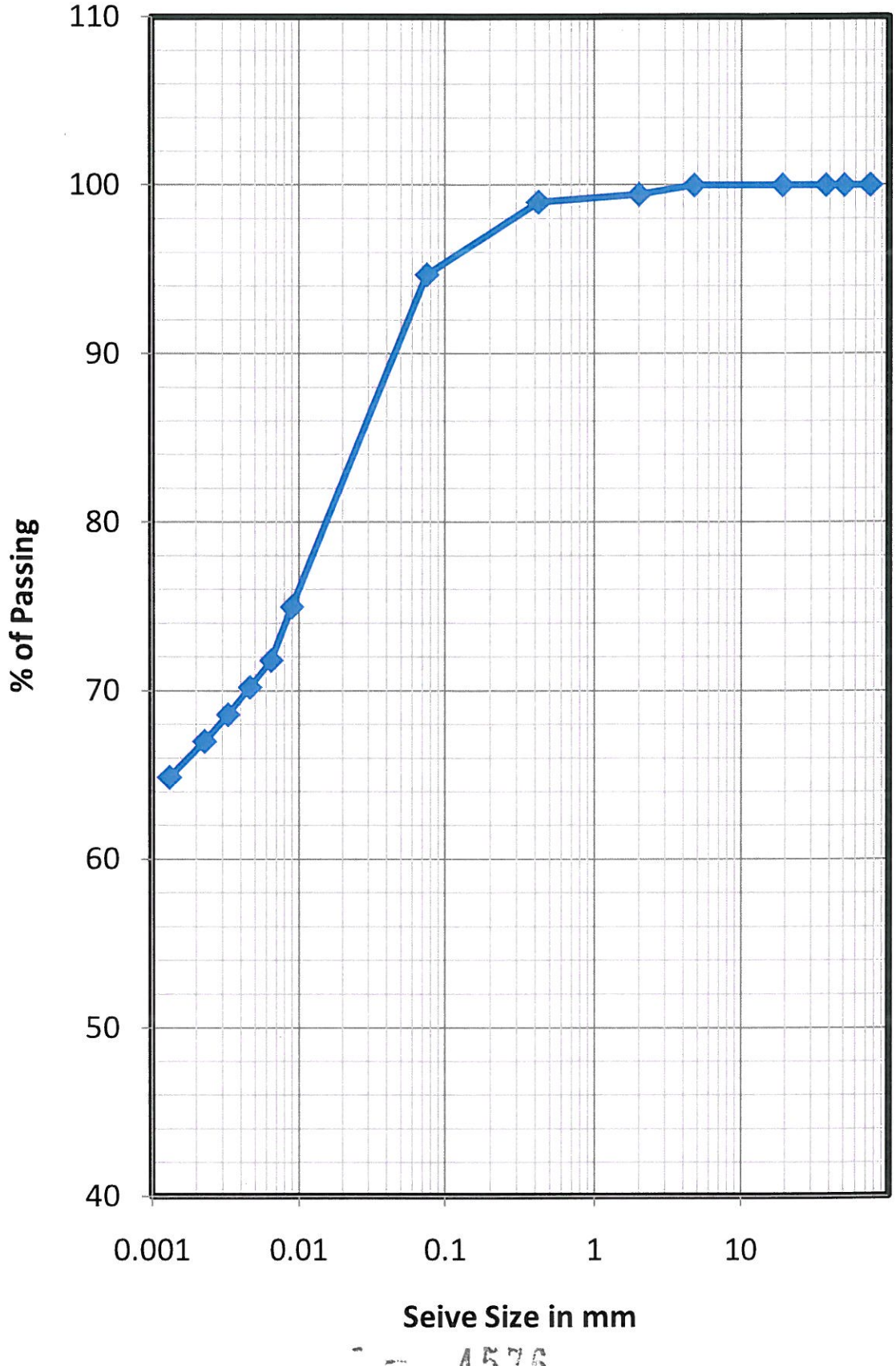
Remarks :-

Lab Manager

Checked By

4575

Grain Size Distribution Curve
BH-4, D-48.0m



4576

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 : UDS

Location : BH-4(Tangri River-Ambala)

Sampled by : T.K.Das

Depth : 0.5m

Date of Testing : 14.09.12

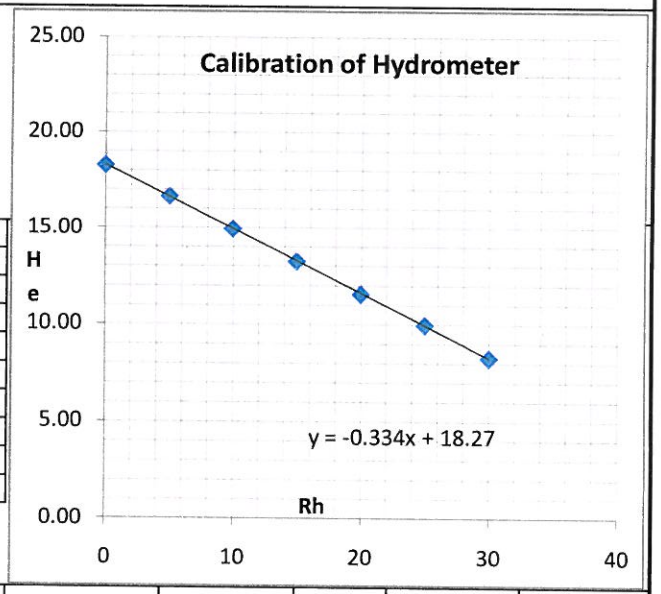
Tested by : D.Mohanty

(I)	Percentage of 75 micron passing (from sieve analysis)		93.13
(II)	Mass of dry soil passing 2mm sieve taken (gm)		50
(III)	Mass of dry soil retained on 75micron sieve (gm)		3.4
(IV)	Mass of dry soil passing 75 micron Wh (gm)		46.6
(V)	Specific gravity of soil grains, Gs		2.64
(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	
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)

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



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 (I)/100
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
10.30	0.5	27.31	29	-2.0	9.15	27.81	0.552	0.000008341	0.012352284	0.00682120	25.31	3.457	87.50	81.49
	1	26.50	29	-2.0	9.42	27.00	0.396	0.000008341	0.012352284	0.00489411	24.50	3.457	84.70	78.88
	2	26.00	29	-2.0	9.59	26.50	0.283	0.000008341	0.012352284	0.00349121	24.00	3.457	82.97	77.27
	4	25.50	29	-2.0	9.75	26.00	0.202	0.000008341	0.012352284	0.00249007	23.50	3.457	81.24	75.66
	8	25.00	29	-2.0	9.92	25.50	0.144	0.000008341	0.012352284	0.00177575	23.00	3.457	79.51	74.05
	15	24.00	29	-2.0	10.25	24.50	0.107	0.000008341	0.012352284	0.00131848	22.00	3.457	76.05	70.83
	30	23.50	29	-2.0	10.42	24.00	0.076	0.000008341	0.012352284	0.00093987	21.50	3.457	74.33	69.22
	60	23.00	29	-2.0	10.59	23.50	0.054	0.000008341	0.012352284	0.00066989	21.00	3.457	72.60	67.61
	120	22.50	29	-2.0	10.76	23.00	0.039	0.000008341	0.012352284	0.00047740	20.50	3.457	70.87	66.00
	240	22.00	29	-2.0	10.92	22.50	0.028	0.000008341	0.012352284	0.00034019	20.00	3.457	69.14	64.39
	480	21.50	32	-2.0	11.09	22.00	0.020	0.000007821	0.011961022	0.00023470	19.50	3.457	67.41	62.78
	1440	20.80	32	-2.0	11.32	21.30	0.011	0.000007821	0.011961022	0.000136925	18.80	3.457	65.00	60.53

Lab Manager

Checked By

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(Tangri River-Ambala)

Sampled by : T.K.Das

Depth : 1.5m

Date of Testing : 14.09.12

Tested by : D.Mohanty

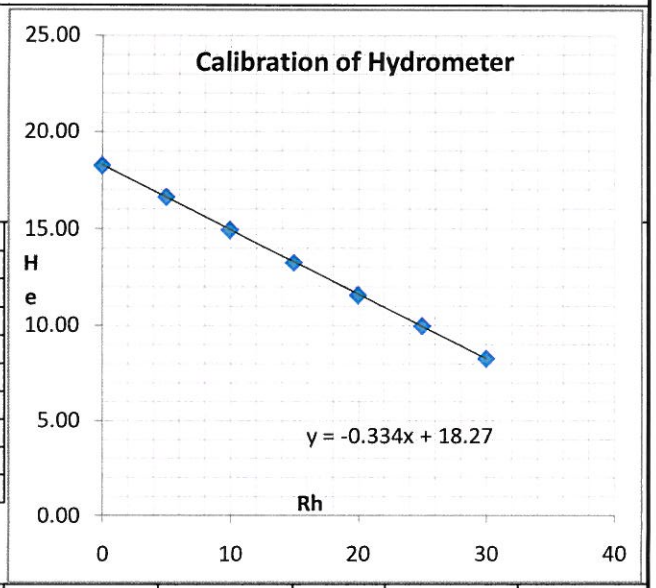
(I)	Percentage of 75 micron passing (from sieve analysis)		87.46
(II)	Mass of dry soil passing 2mm sieve taken (gm)		50
(III)	Mass of dry soil retained on 75micron sieve (gm)		6.3
(IV)	Mass of dry soil passing 75 micron Wh (gm)		43.7
(V)	Specific gravity of soil grains, Gs		2.65
(VI)	Top Meniscus reading on hydrometer stem		2.0
(VII)	Bottom meniscus reading on hydrometer stem		2.5
(VIII)	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	
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)

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



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 (I)/100
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
10.30	0.5	29.23	29	-2.0	8.51	29.73	0.533	0.000008341	0.012314796	0.00655806	27.23	3.673	100.00	87.46
	1	28.50	29	-2.0	8.75	29.00	0.382	0.000008341	0.012314796	0.00470306	26.50	3.673	97.33	85.12
	2	27.50	29	-2.0	9.09	28.00	0.275	0.000008341	0.012314796	0.00338843	25.50	3.673	93.65	81.91
	4	26.50	29	-2.0	9.42	27.00	0.198	0.000008341	0.012314796	0.00243963	24.50	3.673	89.98	78.70
	8	25.50	29	-2.0	9.75	26.00	0.143	0.000008341	0.012314796	0.00175540	23.50	3.673	86.31	75.48
	15	24.50	29	-2.0	10.09	25.00	0.106	0.000008341	0.012314796	0.00130373	22.50	3.673	82.64	72.27
	30	24.00	29	-2.0	10.25	24.50	0.075	0.000008341	0.012314796	0.00092947	22.00	3.673	80.80	70.67
	60	23.00	29	-2.0	10.59	23.50	0.054	0.000008341	0.012314796	0.00066786	21.00	3.673	77.13	67.45
	120	22.00	29	-2.0	10.92	22.50	0.039	0.000008341	0.012314796	0.00047964	20.00	3.673	73.45	64.24
	240	21.00	29	-2.0	11.26	21.50	0.028	0.000008341	0.012314796	0.00034430	19.00	3.673	69.78	61.03
	480	20.00	32	-2.0	11.59	20.50	0.020	0.000007821	0.011924722	0.00023922	18.00	3.673	66.11	57.82
	1440	19.46	32	-2.0	11.77	19.96	0.012	0.000007821	0.011924722	0.000139191	17.46	3.673	64.11	56.07

Lab Manager

Checked By

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(Tangri River-Ambala)

Sampled by : T.K.Das

Depth : 15.0m

Date of Testing : 14.09.12

Tested by : D.Mohanty

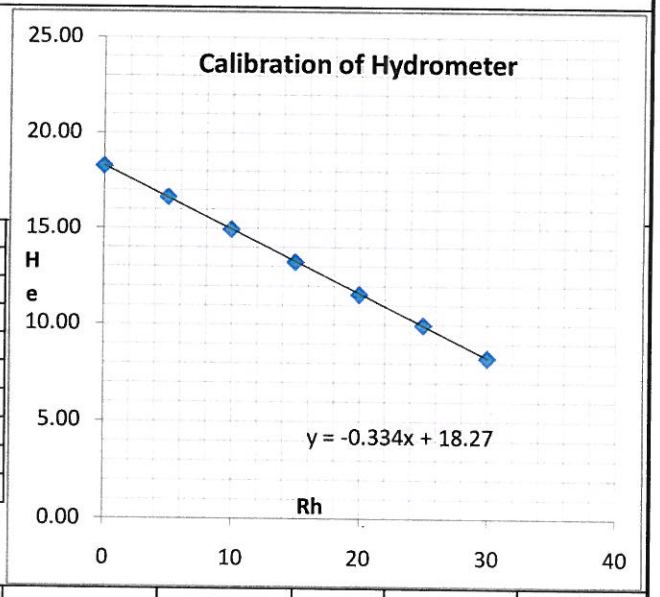
(I)	Percentage of 75 micron passing (from sieve analysis)		93.51
(II)	Mass of dry soil passing 2mm sieve taken (gm)		50
(III)	Mass of dry soil retained on 75micron sieve (gm)		3.2
(IV)	Mass of dry soil passing 75 micron Wh (gm)		46.8
(V)	Specific gravity of soil grains, Gs		2.67
(VI)	Top Meniscus reading 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	
b	Sedimentation Jar No	1	
	Cross sectional area of jar (A) in cm2	35.714	

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/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 (I)/100
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
10.30	0.5	28.67	29	-2.0	8.69	29.17	0.538	0.000008341	0.012240833	0.00658970	26.67	3.420	91.20	85.28
	1	28.00	29	-2.0	8.92	28.50	0.386	0.000008341	0.012240833	0.00471921	26.00	3.420	88.91	83.14
	2	27.50	29	-2.0	9.09	28.00	0.275	0.000008341	0.012240833	0.00336808	25.50	3.420	87.20	81.54
	4	27.00	29	-2.0	9.25	27.50	0.196	0.000008341	0.012240833	0.00240338	25.00	3.420	85.49	79.94
	8	26.50	29	-2.0	9.42	27.00	0.140	0.000008341	0.012240833	0.00171472	24.50	3.420	83.78	78.34
	15	26.00	29	-2.0	9.59	26.50	0.103	0.000008341	0.012240833	0.00126331	24.00	3.420	82.07	76.74
	30	25.00	29	-2.0	9.92	25.50	0.074	0.000008341	0.012240833	0.00090872	23.00	3.420	78.65	73.54
	60	24.50	29	-2.0	10.09	25.00	0.053	0.000008341	0.012240833	0.00064795	22.50	3.420	76.94	71.95
	120	24.00	29	-2.0	10.25	24.50	0.038	0.000008341	0.012240833	0.00046195	22.00	3.420	75.23	70.35
	240	23.50	29	-2.0	10.42	24.00	0.027	0.000008341	0.012240833	0.00032929	21.50	3.420	73.52	68.75
	480	23.00	32	-2.0	10.59	23.50	0.019	0.000007821	0.011853101	0.00022727	21.00	3.420	71.81	67.15
	1440	22.44	32	-2.0	10.78	22.94	0.011	0.000007821	0.011853101	0.000132374	20.44	3.420	69.89	65.35

Lab Manager

Checked By

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 : UDS

Location : BH-4(Tangri River-Ambala)

Sampled by : T.K.Das

Depth : 17.5m

Date of Testing : 14.09.12

Tested by : D.Mohanty

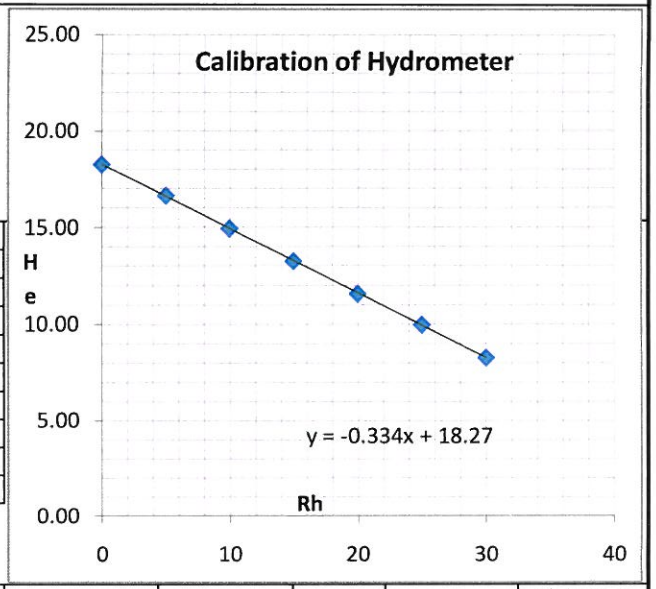
(I)	Percentage of 75 micron passing (from sieve analysis)		94.07
(II)	Mass of dry soil passing 2mm sieve taken (gm)		50
(III)	Mass of dry soil retained on 75micron sieve (gm)		3.0
(IV)	Mass of dry soil passing 75 micron Wh (gm)		47.0
(V)	Specific gravity of soil grains, Gs		2.66
(VI)	Top Meniscus reading 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	
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)

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



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 (I)/100
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
10.30	0.5	29.37	29	-2.0	8.46	29.87	0.531	0.000008341	0.012277647	0.00652004	27.37	3.407	93.25	87.72
	1	28.50	29	-2.0	8.75	29.00	0.382	0.000008341	0.012277647	0.00468887	26.50	3.407	90.28	84.93
	2	28.00	29	-2.0	8.92	28.50	0.273	0.000008341	0.012277647	0.00334702	26.00	3.407	88.58	83.33
	4	27.50	29	-2.0	9.09	28.00	0.195	0.000008341	0.012277647	0.00238876	25.50	3.407	86.87	81.72
	8	27.00	29	-2.0	9.25	27.50	0.139	0.000008341	0.012277647	0.00170456	25.00	3.407	85.17	80.12
	15	26.00	29	-2.0	9.59	26.50	0.103	0.000008341	0.012277647	0.00126711	24.00	3.407	81.76	76.92
	30	25.00	29	-2.0	9.92	25.50	0.074	0.000008341	0.012277647	0.00091145	23.00	3.407	78.36	73.71
	60	24.50	29	-2.0	10.09	25.00	0.053	0.000008341	0.012277647	0.00064990	22.50	3.407	76.65	72.11
	120	24.00	29	-2.0	10.25	24.50	0.038	0.000008341	0.012277647	0.00046334	22.00	3.407	74.95	70.51
	240	23.50	29	-2.0	10.42	24.00	0.027	0.000008341	0.012277647	0.00033028	21.50	3.407	73.25	68.90
	480	23.00	32	-2.0	10.59	23.50	0.019	0.000007821	0.011888750	0.00022795	21.00	3.407	71.54	67.30
	1440	22.20	32	-2.0	10.85	22.70	0.011	0.000007821	0.011888750	0.000133258	20.20	3.407	68.82	64.74

Lab Manager

Checked By

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(Tangri River-Ambala)

Sampled by : T.K.Das

Depth : 24.0m

Date of Testing : 14.09.12

Tested by : D.Mohanty

(I)	Percentage of 75 micron passing (from sieve analysis)		74.70
(II)	Mass of dry soil passing 2mm sieve taken (gm)		50
(III)	Mass of dry soil retained on 75micron sieve (gm)		12.7
(IV)	Mass of dry soil passing 75 micron Wh (gm)		37.4
(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)	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	
b	Sedimentation Jar No	1	
	Cross sectional area of jar (A) in cm2	35.714	

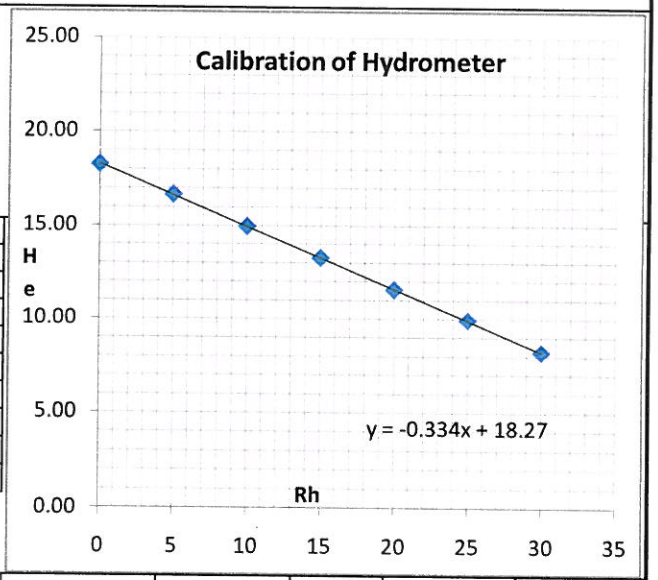
CALIBRATION OF HYDROMETER

(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/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 (I)/100
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
10.30	0.5	25.26	29	-2.0	9.83	25.76	0.573	0.000008341	0.012314796	0.00705091	23.26	4.300	100.00	74.70
	1	24.50	29	-2.0	10.09	25.00	0.410	0.000008341	0.012314796	0.00504932	22.50	4.300	96.75	72.27
	2	24.00	29	-2.0	10.25	24.50	0.292	0.000008341	0.012314796	0.00359984	22.00	4.300	94.60	70.67
	4	23.50	29	-2.0	10.42	24.00	0.208	0.000008341	0.012314796	0.00256612	21.50	4.300	92.45	69.06
	8	22.50	29	-2.0	10.76	23.00	0.150	0.000008341	0.012314796	0.00184337	20.50	4.300	88.15	65.85
	15	21.50	29	-2.0	11.09	22.00	0.111	0.000008341	0.012314796	0.00136695	19.50	4.300	83.85	62.64
	30	19.50	29	-2.0	11.76	20.00	0.081	0.000008341	0.012314796	0.00099527	17.50	4.300	75.25	56.21
	60	19.00	29	-2.0	11.92	19.50	0.058	0.000008341	0.012314796	0.00070874	17.00	4.300	73.10	54.61
	120	18.50	29	-2.0	12.09	19.00	0.041	0.000008341	0.012314796	0.00050465	16.50	4.300	70.95	53.00
	240	18.00	29	-2.0	12.26	18.50	0.029	0.000008341	0.012314796	0.00035930	16.00	4.300	68.80	51.39
	480	17.50	32	-2.0	12.43	18.00	0.021	0.000007821	0.011924722	0.00024769	15.50	4.300	66.65	49.79
	1440	16.93	32	-2.0	12.62	17.43	0.012	0.000007821	0.011924722	0.000144097	14.93	4.300	64.19	47.95

Lab Manager

Checked By

ARKI TECHNO CONSULTANTS (INDIA) PVT LTD

ARKITECHNO

N 3/91, IRC Village, Bhubaneswar

GRAIN SIZE ANALYSIS OF SOIL - HYDROMETER METHOD

Client : DFCC

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

Depth : 29.0m

Type of Sample : UDS

Date of Testing : 14.09.12

Location : BH-4(Tangri River-Ambala)

Tested by : D.Mohanty

Sampled by : T.K.Das

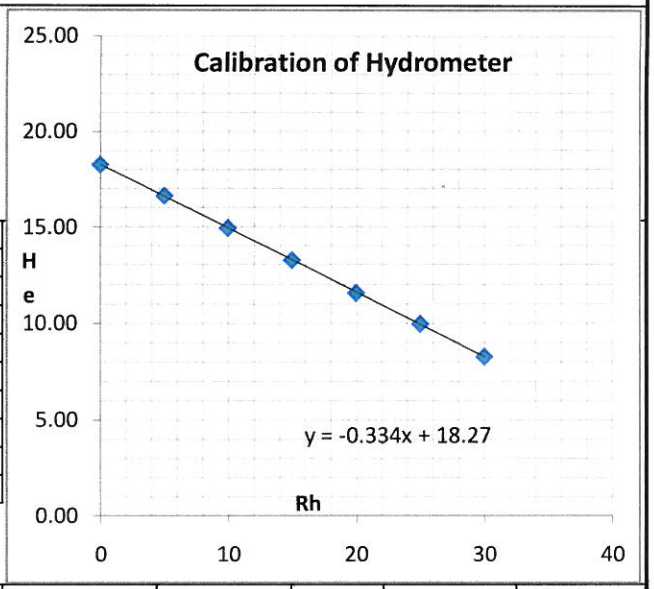
(I)	Percentage of 75 micron passing (from sieve analysis)		99.24
(II)	Mass of dry soil passing 2mm sieve taken (gm)		50
(III)	Mass of dry soil retained on 75micron sieve (gm)		0.4
(IV)	Mass of dry soil passing 75 micron Wh (gm)		49.6
(V)	Specific gravity of soil grains, Gs		2.68
(VI)	Top Meniscus reading 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	
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)

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



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 (I)/100
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
10.30	0.5	29.94	29	-2.0	8.27	30.44	0.525	0.000008341	0.012204347	0.00640778	27.94	3.215	89.82	89.14
	1	29.50	29	-2.0	8.42	30.00	0.375	0.000008341	0.012204347	0.00457107	27.50	3.215	88.41	87.74
	2	29.00	29	-2.0	8.58	29.50	0.267	0.000008341	0.012204347	0.00326414	27.00	3.215	86.80	86.14
	4	28.50	29	-2.0	8.75	29.00	0.191	0.000008341	0.012204347	0.00233044	26.50	3.215	85.20	84.55
	8	27.50	29	-2.0	9.09	28.00	0.138	0.000008341	0.012204347	0.00167902	25.50	3.215	81.98	81.36
	15	26.50	29	-2.0	9.42	27.00	0.102	0.000008341	0.012204347	0.00124852	24.50	3.215	78.77	78.17
	30	25.50	29	-2.0	9.75	26.00	0.074	0.000008341	0.012204347	0.00089835	23.50	3.215	75.55	74.98
	60	25.00	29	-2.0	9.92	25.50	0.052	0.000008341	0.012204347	0.00064065	23.00	3.215	73.94	73.38
	120	24.50	29	-2.0	10.09	25.00	0.037	0.000008341	0.012204347	0.00045680	22.50	3.215	72.34	71.79
	240	24.00	29	-2.0	10.25	24.50	0.027	0.000008341	0.012204347	0.00032567	22.00	3.215	70.73	70.19
	480	23.50	32	-2.0	10.42	24.00	0.019	0.000007821	0.011817771	0.00022480	21.50	3.215	69.12	68.60
	1440	23.20	32	-2.0	10.52	23.70	0.011	0.000007821	0.011817771	0.000130415	21.20	3.215	68.15	67.63

Lab Manager

Checked By

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(Tangri River-Ambala)

Sampled by : T.K.Das

Depth : 30.0m

Date of Testing : 14.09.12

Tested by : D.Mohanty

(I)	Percentage of 75 micron passing (from sieve analysis)		99.61
(II)	Mass of dry soil passing 2mm sieve taken (gm)		50
(III)	Mass of dry soil retained on 75micron sieve (gm)		0.2
(IV)	Mass of dry soil passing 75 micron Wh (gm)		49.8
(V)	Specific gravity of soil grains, Gs		2.68
(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	
b	Sedimentation Jar No	1	
	Cross sectional area of jar (A) in cm2	35.714	

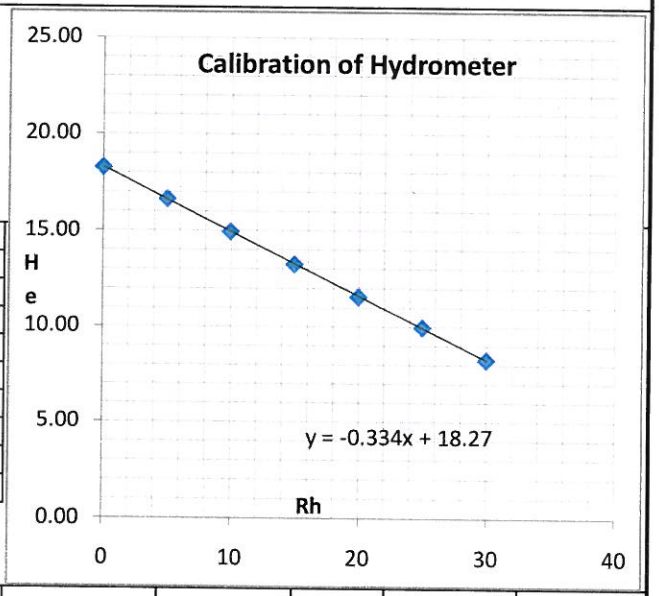
Rh = hydrometer Reading

H = height corresponding to Rh

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

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



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 (I)/100
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
10.30	0.5	29.97	29	-2.0	8.26	30.47	0.525	0.000008341	0.012204347	0.00640390	27.97	3.203	89.59	89.24
	1	29.50	29	-2.0	8.42	30.00	0.375	0.000008341	0.012204347	0.00457107	27.50	3.203	88.08	87.74
	2	29.00	29	-2.0	8.58	29.50	0.267	0.000008341	0.012204347	0.00326414	27.00	3.203	86.48	86.14
	4	28.50	29	-2.0	8.75	29.00	0.191	0.000008341	0.012204347	0.00233044	26.50	3.203	84.88	84.55
	8	27.50	29	-2.0	9.09	28.00	0.138	0.000008341	0.012204347	0.00167902	25.50	3.203	81.68	81.36
	15	26.50	29	-2.0	9.42	27.00	0.102	0.000008341	0.012204347	0.00124852	24.50	3.203	78.47	78.17
	30	25.50	29	-2.0	9.75	26.00	0.074	0.000008341	0.012204347	0.00089835	23.50	3.203	75.27	74.98
	60	25.00	29	-2.0	9.92	25.50	0.052	0.000008341	0.012204347	0.00064065	23.00	3.203	73.67	73.38
	120	24.50	29	-2.0	10.09	25.00	0.037	0.000008341	0.012204347	0.00045680	22.50	3.203	72.07	71.79
	240	24.00	29	-2.0	10.25	24.50	0.027	0.000008341	0.012204347	0.00032567	22.00	3.203	70.47	70.19
	480	23.50	32	-2.0	10.42	24.00	0.019	0.000007821	0.011817771	0.00022480	21.50	3.203	68.86	68.60
	1440	23.18	32	-2.0	10.53	23.68	0.011	0.000007821	0.011817771	0.000130461	21.18	3.203	67.82	67.56

Lab Manager

Checked By

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 : UDS

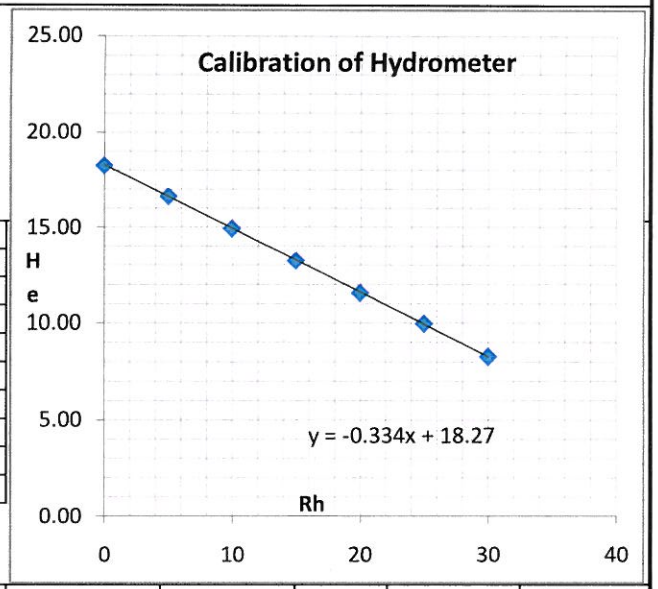
Location : BH-4(Tangri River-Ambala)

Sampled by : T.K.Das

Depth : 32.0m

Date of Testing : 14.09.12

Tested by : D.Mohanty



(I)	Percentage of 75 micron passing (from sieve analysis)		99.56
(II)	Mass of dry soil passing 2mm sieve taken (gm)		50
(III)	Mass of dry soil retained on 75micron sieve (gm)		0.2
(IV)	Mass of dry soil passing 75 micron Wh (gm)		49.8
(V)	Specific gravity of soil grains, Gs		2.69
(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	
b	Sedimentation Jar No	1	
	Cross sectional area of jar (A) in cm2	35.714	

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/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 (I)/100
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
10.30	0.5	29.86	29	-2.0	8.30	30.36	0.526	0.000008341	0.012168186	0.00639911	27.86	3.198	89.08	88.69
	1	29.50	29	-2.0	8.42	30.00	0.375	0.000008341	0.012168186	0.00455752	27.50	3.198	87.93	87.54
	2	29.00	29	-2.0	8.58	29.50	0.267	0.000008341	0.012168186	0.00325447	27.00	3.198	86.33	85.95
	4	28.50	29	-2.0	8.75	29.00	0.191	0.000008341	0.012168186	0.00232353	26.50	3.198	84.73	84.36
	8	27.50	29	-2.0	9.09	28.00	0.138	0.000008341	0.012168186	0.00167405	25.50	3.198	81.54	81.18
	15	26.50	29	-2.0	9.42	27.00	0.102	0.000008341	0.012168186	0.00124482	24.50	3.198	78.34	77.99
	30	25.50	29	-2.0	9.75	26.00	0.074	0.000008341	0.012168186	0.00089569	23.50	3.198	75.14	74.81
	60	25.00	29	-2.0	9.92	25.50	0.052	0.000008341	0.012168186	0.00063875	23.00	3.198	73.54	73.22
	120	24.50	29	-2.0	10.09	25.00	0.037	0.000008341	0.012168186	0.00045545	22.50	3.198	71.94	71.63
	240	24.00	29	-2.0	10.25	24.50	0.027	0.000008341	0.012168186	0.00032471	22.00	3.198	70.35	70.04
	480	23.50	32	-2.0	10.42	24.00	0.019	0.000007821	0.011782756	0.00022413	21.50	3.198	68.75	68.44
	1440	23.26	32	-2.0	10.50	23.76	0.011	0.000007821	0.011782756	0.000129906	21.26	3.198	67.97	67.67

Lab Manager

Checked By

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(Tangri River-Ambala)

Sampled by : T.K.Das

Depth : 39.0m

Date of Testing : 14.09.12

Tested by : D.Mohanty

(I)	Percentage of 75 micron passing (from sieve analysis)		99.63
(II)	Mass of dry soil passing 2mm sieve taken (gm)		50
(III)	Mass of dry soil retained on 75micron sieve (gm)		0.2
(IV)	Mass of dry soil passing 75 micron Wh (gm)		49.8
(V)	Specific gravity of soil grains, Gs		2.68
(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	
b	Sedimentation Jar No	1	
	Cross sectional area of jar (A) in cm2	35.714	

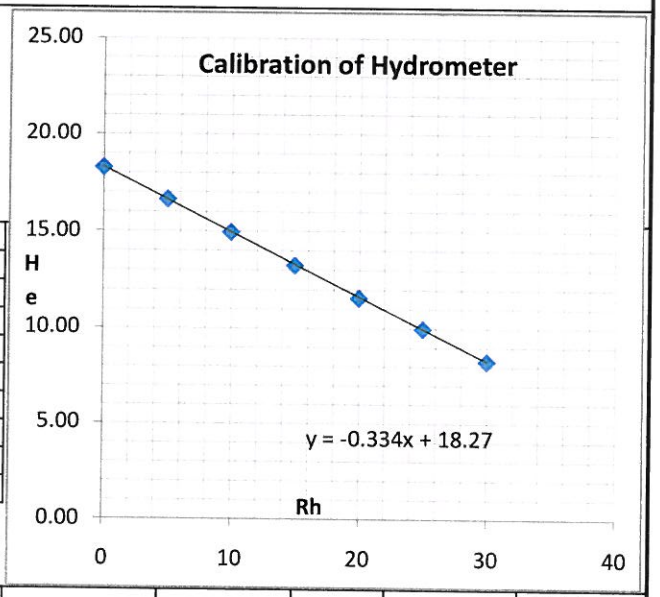
Rh = hydrometer Reading

H = height corresponding to Rh

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

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



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 (I)/100
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
10.30	0.5	29.98	29	-2.0	8.26	30.48	0.525	0.000008341	0.012204347	0.00640260	27.98	3.202	89.60	89.27
	1	29.50	29	-2.0	8.42	30.00	0.375	0.000008341	0.012204347	0.00457107	27.50	3.202	88.06	87.74
	2	29.00	29	-2.0	8.58	29.50	0.267	0.000008341	0.012204347	0.00326414	27.00	3.202	86.46	86.14
	4	28.50	29	-2.0	8.75	29.00	0.191	0.000008341	0.012204347	0.00233044	26.50	3.202	84.86	84.55
	8	27.50	29	-2.0	9.09	28.00	0.138	0.000008341	0.012204347	0.00167902	25.50	3.202	81.66	81.36
	15	26.50	29	-2.0	9.42	27.00	0.102	0.000008341	0.012204347	0.00124852	24.50	3.202	78.46	78.17
	30	25.50	29	-2.0	9.75	26.00	0.074	0.000008341	0.012204347	0.00089835	23.50	3.202	75.25	74.98
	60	25.00	29	-2.0	9.92	25.50	0.052	0.000008341	0.012204347	0.00064065	23.00	3.202	73.65	73.38
	120	24.50	29	-2.0	10.09	25.00	0.037	0.000008341	0.012204347	0.00045680	22.50	3.202	72.05	71.79
	240	24.00	29	-2.0	10.25	24.50	0.027	0.000008341	0.012204347	0.00032567	22.00	3.202	70.45	70.19
	480	23.50	32	-2.0	10.42	24.00	0.019	0.000007821	0.011817771	0.00022480	21.50	3.202	68.85	68.60
	1440	22.70	32	-2.0	10.69	23.20	0.011	0.000007821	0.011817771	0.000131449	20.70	3.202	66.28	66.03

Lab Manager

Checked By

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

Depth : 45.0m

Type of Sample : SPT

Date of Testing : 14.09.12

Location : BH-4(Tangri River-Ambala)

Tested by : D.Mohanty

Sampled by : T.K.Das

(I)	Percentage of 75 micron passing (from sieve analysis)		97.76
(II)	Mass of dry soil passing 2mm sieve taken (gm)		50
(III)	Mass of dry soil retained on 75micron sieve (gm)		1.1
(IV)	Mass of dry soil passing 75 micron Wh (gm)		48.9
(V)	Specific gravity of soil grains, Gs		2.66
(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	
b	Sedimentation Jar No	1	
	Cross sectional area of jar (A) in cm2	35.714	

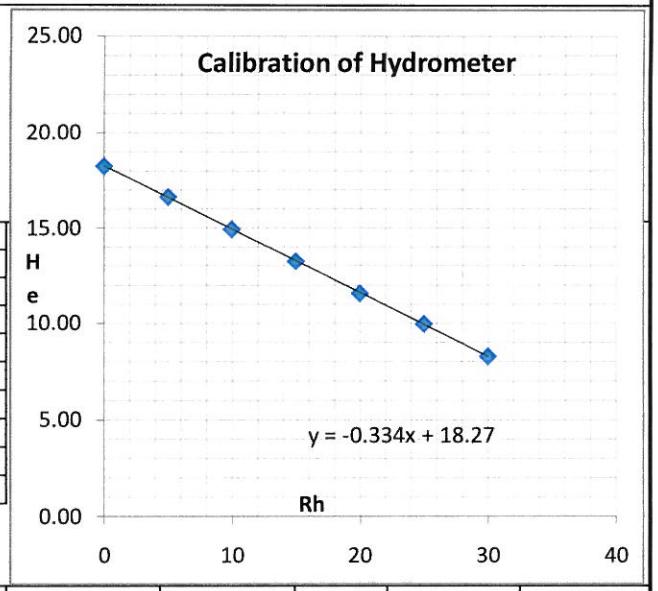
CALIBRATION OF HYDROMETER

(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/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 (I)/100
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
10.30	0.5	29.73	29	-2.0	8.34	30.23	0.527	0.000008341	0.012277647	0.00647355	27.73	3.278	90.91	88.87
	1	29.50	29	-2.0	8.42	30.00	0.375	0.000008341	0.012277647	0.00459852	27.50	3.278	90.15	88.13
	2	29.00	29	-2.0	8.58	29.50	0.267	0.000008341	0.012277647	0.00328374	27.00	3.278	88.51	86.53
	4	28.50	29	-2.0	8.75	29.00	0.191	0.000008341	0.012277647	0.00234444	26.50	3.278	86.87	84.93
	8	28.00	29	-2.0	8.92	28.50	0.136	0.000008341	0.012277647	0.00167351	26.00	3.278	85.23	83.33
	15	27.50	29	-2.0	9.09	28.00	0.100	0.000008341	0.012277647	0.00123355	25.50	3.278	83.60	81.72
	30	26.50	29	-2.0	9.42	27.00	0.072	0.000008341	0.012277647	0.00088814	24.50	3.278	80.32	78.52
	60	26.00	29	-2.0	9.59	26.50	0.052	0.000008341	0.012277647	0.00063355	24.00	3.278	78.68	76.92
	120	25.50	29	-2.0	9.75	26.00	0.037	0.000008341	0.012277647	0.00045187	23.50	3.278	77.04	75.31
	240	25.00	29	-2.0	9.92	25.50	0.026	0.000008341	0.012277647	0.00032225	23.00	3.278	75.40	73.71
	480	24.50	32	-2.0	10.09	25.00	0.019	0.000007821	0.011888750	0.00022250	22.50	3.278	73.76	72.11
	1440	23.99	32	-2.0	10.26	24.49	0.011	0.000007821	0.011888750	0.000129534	21.99	3.278	72.09	70.48

Lab Manager

Checked By

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(Tangri River-Ambala)

Sampled by : T.K.Das

Depth : 48.0m

Date of Testing : 14.09.12

Tested by : D.Mohanty

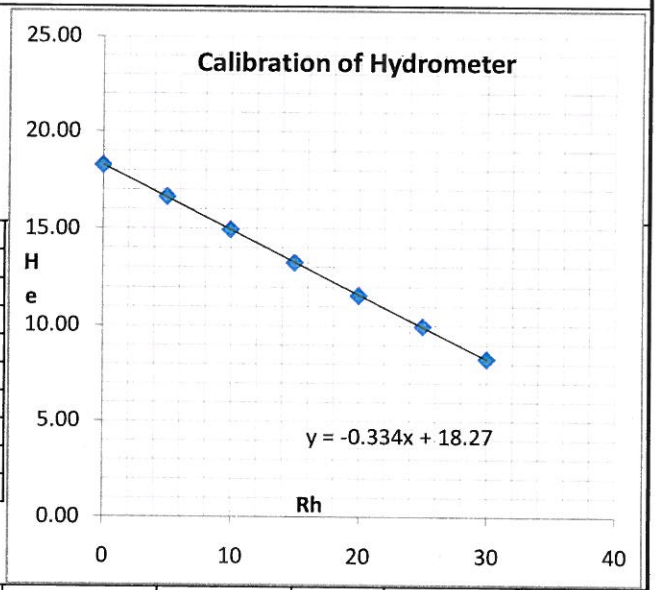
(I)	Percentage of 75 micron passing (from sieve analysis)		98.87
(II)	Mass of dry soil passing 2mm sieve taken (gm)		50
(III)	Mass of dry soil retained on 75micron sieve (gm)		0.6
(IV)	Mass of dry soil passing 75 micron Wh (gm)		49.4
(V)	Specific gravity of soil grains, Gs		2.68
(VI)	Top Meniscus reading 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	
b	Sedimentation Jar No	1	
	Cross sectional area of jar (A) in cm2	35.714	

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/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 (I)/100
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
10.30	0.5	29.31	29	-2.0	8.48	29.81	0.532	0.000008341	0.012204347	0.00648879	27.31	3.227	88.13	87.13
	1	29.00	29	-2.0	8.58	29.50	0.378	0.000008341	0.012204347	0.00461619	27.00	3.227	87.13	86.14
	2	28.50	29	-2.0	8.75	29.00	0.270	0.000008341	0.012204347	0.00329574	26.50	3.227	85.51	84.55
	4	28.00	29	-2.0	8.92	28.50	0.193	0.000008341	0.012204347	0.00235257	26.00	3.227	83.90	82.95
	8	27.50	29	-2.0	9.09	28.00	0.138	0.000008341	0.012204347	0.00167902	25.50	3.227	82.29	81.36
	15	26.50	29	-2.0	9.42	27.00	0.102	0.000008341	0.012204347	0.00124852	24.50	3.227	79.06	78.17
	30	25.50	29	-2.0	9.75	26.00	0.074	0.000008341	0.012204347	0.00089835	23.50	3.227	75.83	74.98
	60	24.50	29	-2.0	10.09	25.00	0.053	0.000008341	0.012204347	0.00064602	22.50	3.227	72.61	71.79
	120	24.00	29	-2.0	10.25	24.50	0.038	0.000008341	0.012204347	0.00046057	22.00	3.227	70.99	70.19
	240	23.50	29	-2.0	10.42	24.00	0.027	0.000008341	0.012204347	0.00032831	21.50	3.227	69.38	68.60
	480	23.00	32	-2.0	10.59	23.50	0.019	0.000007821	0.011817771	0.00022659	21.00	3.227	67.77	67.00
	1440	22.33	32	-2.0	10.81	22.83	0.011	0.000007821	0.011817771	0.000132200	20.33	3.227	65.60	64.86

Lab Manager

Checked By

Arki Techno Consultants (India) Pvt.Ltd

ARKITECHNO

N 3/91, IRC Village, Bhubaneswar

DETERMINATION OF LIQUID LIMIT AND PLASTIC LIMIT

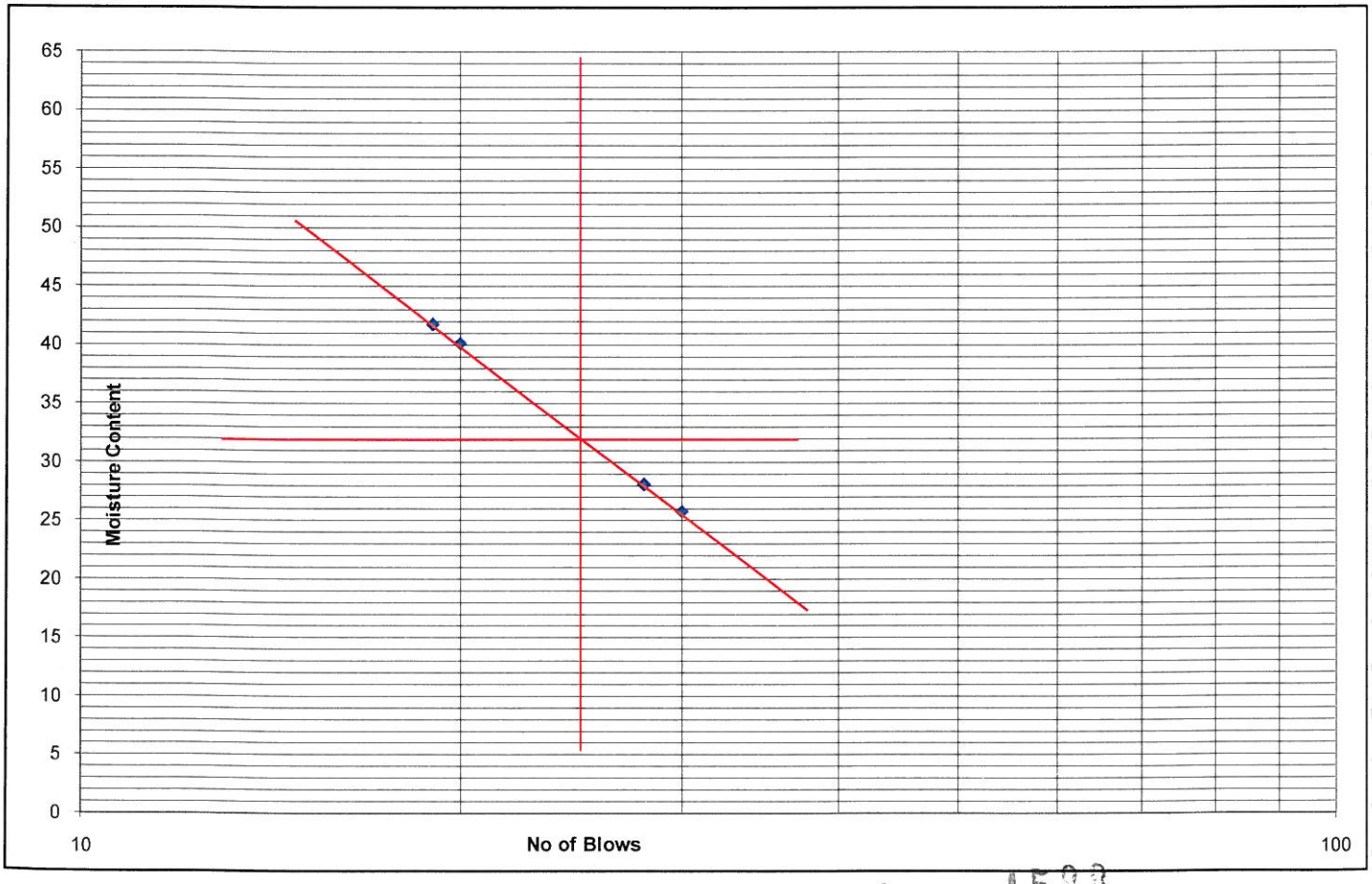
IS : 2720 (Part -5)

Client	:	DFCC			
Project Name	:	G.I.For 3 Nos. Important Bridges			
Type of Sample	:	UDS	Date Of Testing	:	14.09.12
Location	:	BH-4(Tangri River-Ambala)	Sampled by	:	T.K.Das
Depth	:	0.5m	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)	89.04	104.18	107.68	109.46	97.04	98.95
Wt of Container + Wt. of oven dry soil (gm) (W3)	77.84	88.66	86.12	87.62	87.58	89.38
Wt. Of water (gm) (W2-W1)-(W3-W1)	11.21	15.52	21.56	21.84	9.46	9.57
Wt. of oven dry soil (gm) (W3-W1)	43.44	55.20	53.71	52.31	57.02	57.89
Moisture Content (%)= [(W2-W1)-(W3-W1)]/(W3-W1) X 100	**25.80**	**28.11**	**40.13**	**41.76**	**16.59**	**16.53**

Result Summary

Liquid Limit (WL)	32	%
Plastic Limit (Wp)	17	%
Plasticity Index (Ip)	15	%



4503

Arki Techno Consultants (India) Pvt.Ltd

ARKITECHNO

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

Location : BH-4(Tangri River-Ambala)

Depth : 1.5m

Date Of Testing : 14.09.12

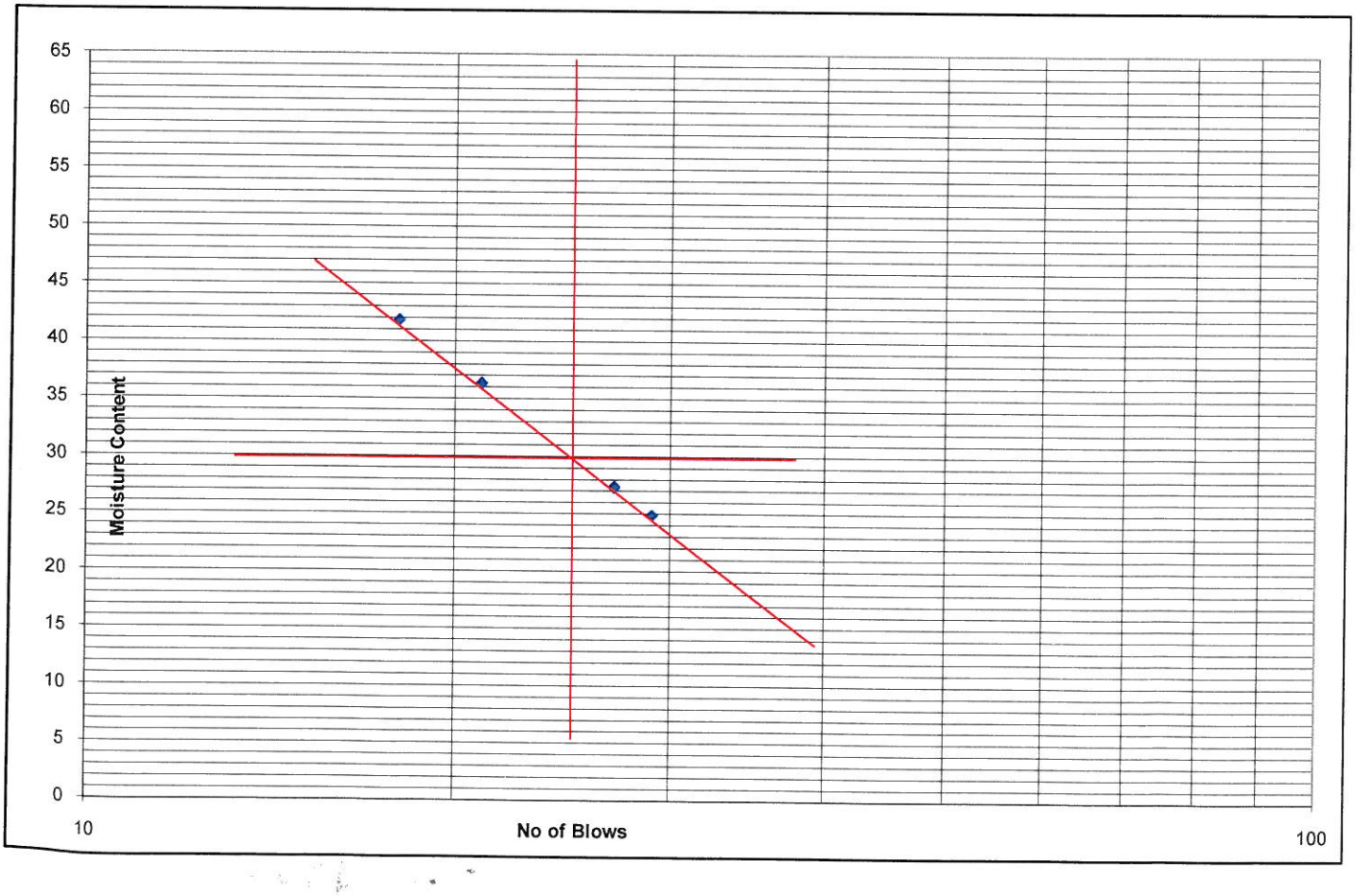
Sampled by : T.K.Das

Tested by : D.Mohanty

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)	87.91	103.91	106.48	111.82	96.75	98.14
Wt of Container + Wt. of oven dry soil (gm) (W3)	77.67	88.51	86.39	87.83	87.80	89.57
Wt. Of water (gm) (W2-W1)-(W3-W1)	10.24	15.40	20.09	23.98	8.95	8.57
Wt. of oven dry soil (gm) (W3-W1)	41.10	56.25	55.35	57.33	52.83	54.02
Moisture Content (%)= [(W2-W1)-(W3-W1)]/(W3-W1) X 100	**24.91**	**27.37**	**36.30**	**41.83**	**16.94**	**15.86**

Result Summary

Liquid Limit (WL)	30	%
Plastic Limit (Wp)	16	%
Plasticity Index (Ip)	14	%



4583

Arki Techno Consultants (India) Pvt.Ltd

ARKITECHNO

N 3/91, IRC Village, Bhubaneswar

DETERMINATION OF LIQUID LIMIT AND PLASTIC LIMIT

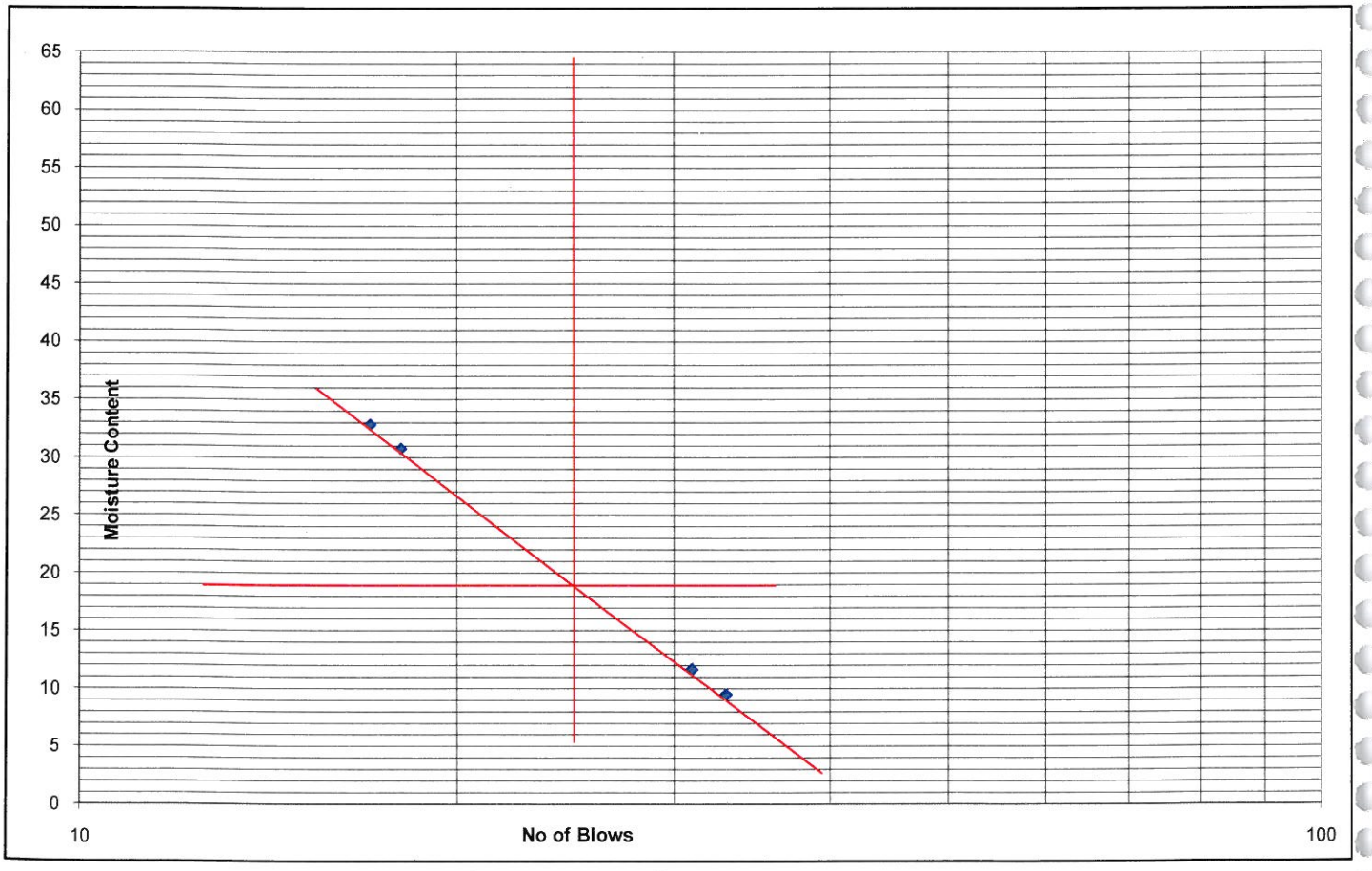
IS : 2720 (Part -5)

Client	:	DFCC			
Project Name	:	G.I.For 3 Nos. Important Bridges			
Type of Sample	:	SPT	Date Of Testing	:	14.09.12
Location	:	BH-4(Tangri River-Ambala)	Sampled by	:	T.K.Das
Depth	:	3.0m	Tested by	:	D.Mohanty

Number of Blows	33	31	18	17	Plastic Limit	
Container No.	D19	D20	D21	D22	NP	
Container Weight (gm) (W1)	35.26	31.48	30.11	32.39		
Container + Wt. of wet soil (gm) (W2)	81.65	95.14	103.07	105.12		
Wt of Container + Wt. of oven dry soil (gm) (W3)	77.61	88.48	85.89	87.14		
Wt. Of water (gm) (W2-W1)-(W3-W1)	4.03	6.65	17.18	17.98		
Wt. of oven dry soil (gm) (W3-W1)	42.35	57.00	55.78	54.75		
Moisture Content (%)= [(W2-W1)-(W3-W1)]/(W3-W1) X 100	**9.52**	**11.67**	**30.79**	**32.84**		

Result Summary

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



4590

Arki Techno Consultants (India) Pvt.Ltd

ARKITECHNO

N 3/91, IRC Village, Bhubaneswar

DETERMINATION OF LIQUID LIMIT AND PLASTIC LIMIT

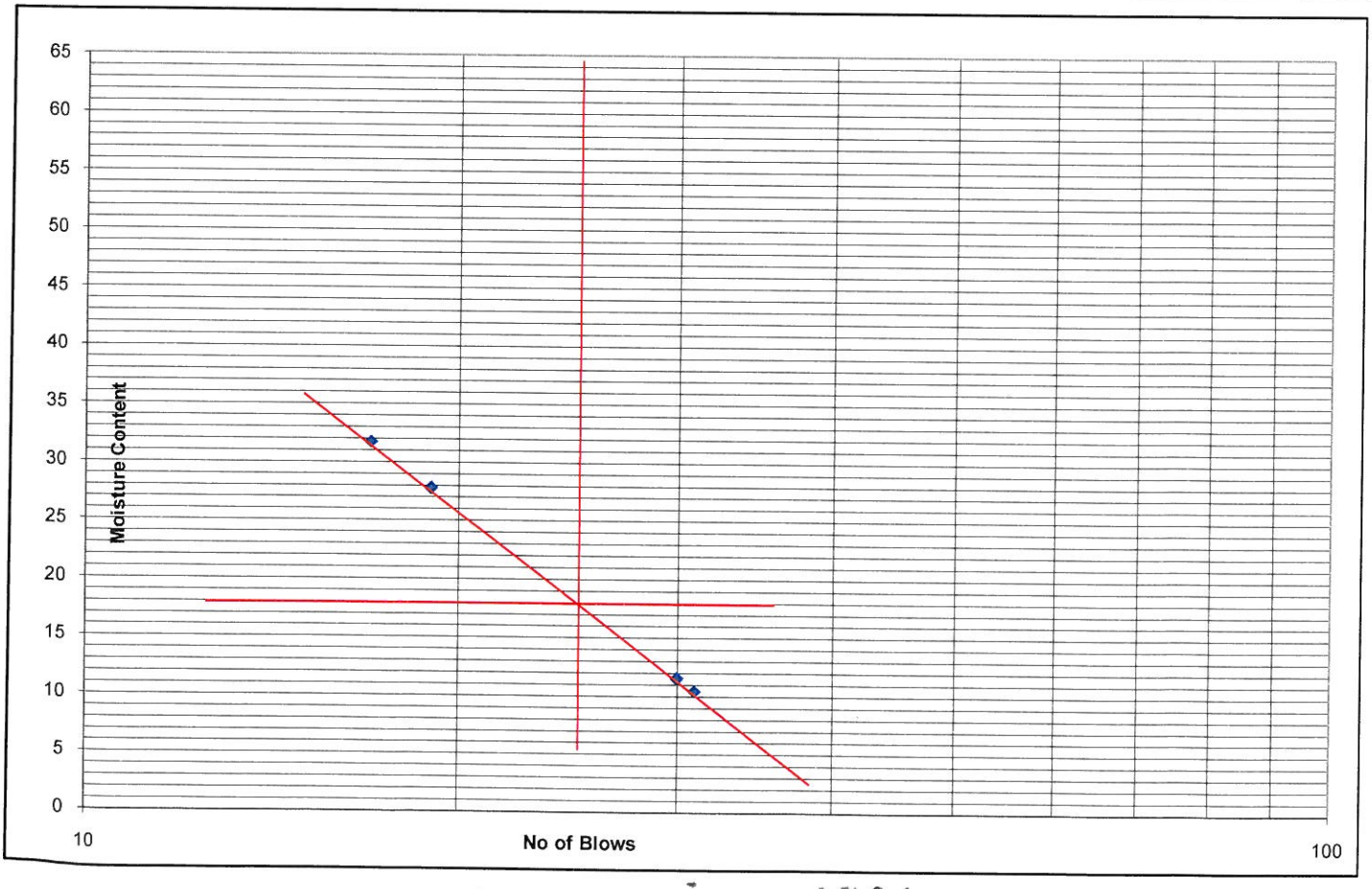
IS : 2720 (Part -5)

Client	:	DFCC			
Project Name	:	G.I.For 3 Nos. Important Bridges			
Type of Sample	:	SPT	Date Of Testing	:	14.09.12
Location	:	BH-4(Tangri River-Ambala)	Sampled by	:	T.K.Das
Depth	:	4.5m	Tested by	:	D.Mohanty

Number of Blows	31	30	19	17	Plastic Limit	
Container No.	D1	D2	D3	D4	NP	
Container Weight (gm) (W1)	32.58	33.69	31.24	30.58		
Container + Wt. of wet soil (gm) (W2)	82.40	94.70	101.04	105.25		
Wt of Container + Wt. of oven dry soil (gm) (W3)	77.68	88.38	85.86	87.26		
Wt. Of water (gm) (W2-W1)-(W3-W1)	4.73	6.32	15.18	17.99		
Wt. of oven dry soil (gm) (W3-W1)	45.10	54.69	54.62	56.68		
Moisture Content (%)= [(W2-W1)-(W3-W1)]/(W3-W1) X 100	**10.48**	**11.56**	**27.79**	**31.74**		

Result Summary

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



4591

Arki Techno Consultants (India) Pvt.Ltd

ARKITECHNO

N 3/91, IRC Village, Bhubaneswar

DETERMINATION OF LIQUID LIMIT AND PLASTIC LIMIT

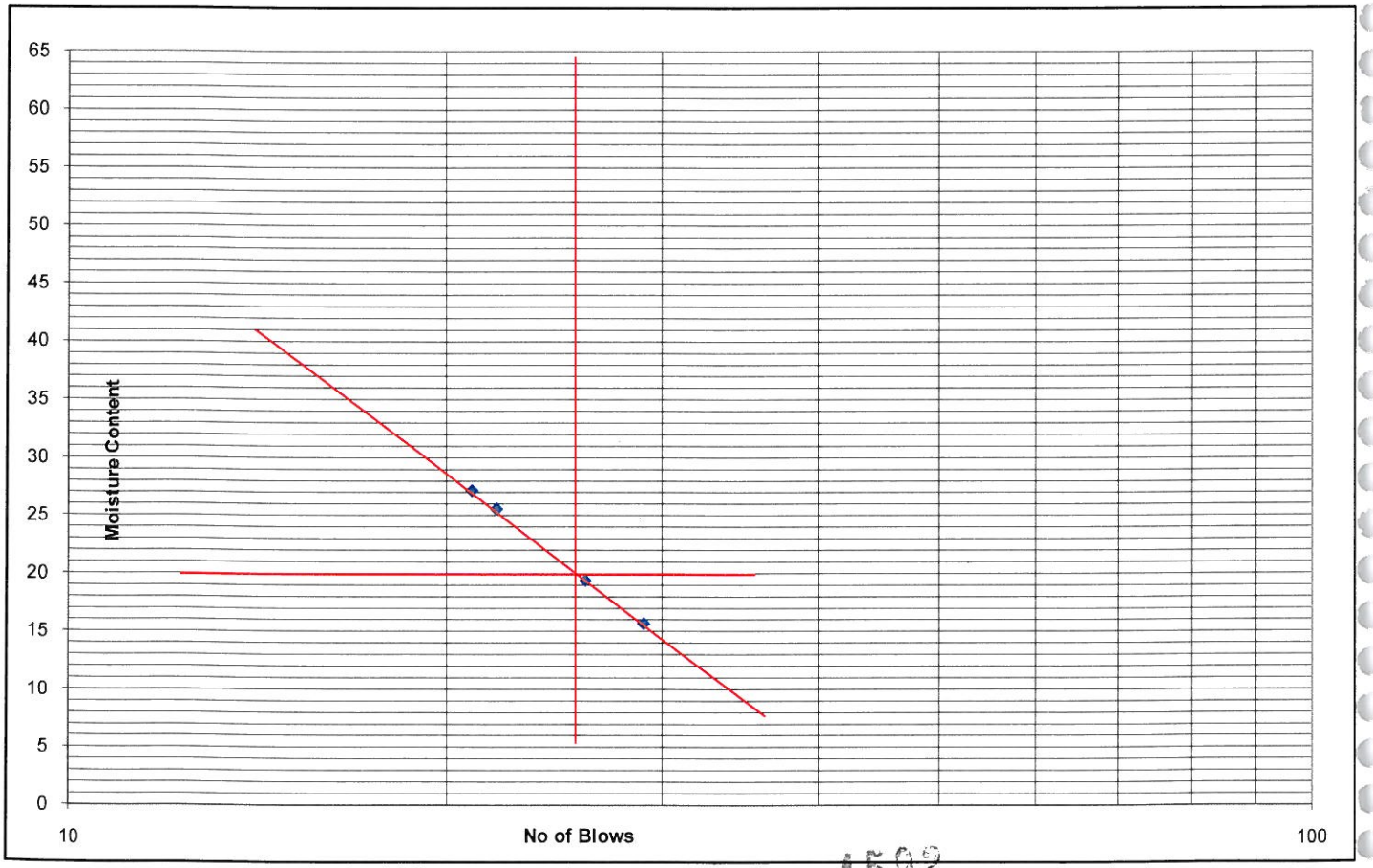
IS : 2720 (Part -5)

Client	:	DFCC			
Project Name	:	G.I.For 3 Nos. Important Bridges			
Type of Sample	:	SPT	Date Of Testing	:	14.09.12
Location	:	BH-4(Tangri River-Ambala)	Sampled by	:	T.K.Das
Depth	:	9.0m	Tested by	:	D.Mohanty

Number of Blows	29	26	22	21	Plastic Limit	
Container No.	D7	D8	D9	D10	NP	
Container Weight (gm) (W1)	35.82	31.27	34.13	32.45		
Container + Wt. of wet soil (gm) (W2)	84.06	99.24	99.66	104.02		
Wt of Container + Wt. of oven dry soil (gm) (W3)	77.51	88.19	86.32	88.72		
Wt. Of water (gm) (W2-W1)-(W3-W1)	6.55	11.05	13.34	15.30		
Wt. of oven dry soil (gm) (W3-W1)	41.69	56.92	52.19	56.27		
Moisture Content (%)= [(W2-W1)-(W3-W1)]/(W3-W1) X 100	**15.72**	**19.42**	**25.56**	**27.19**		

Result Summary

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



4592

Arki Techno Consultants (India) Pvt.Ltd

ARKITECHNO

N 3/91, IRC Village, Bhubaneswar

DETERMINATION OF LIQUID LIMIT AND PLASTIC LIMIT

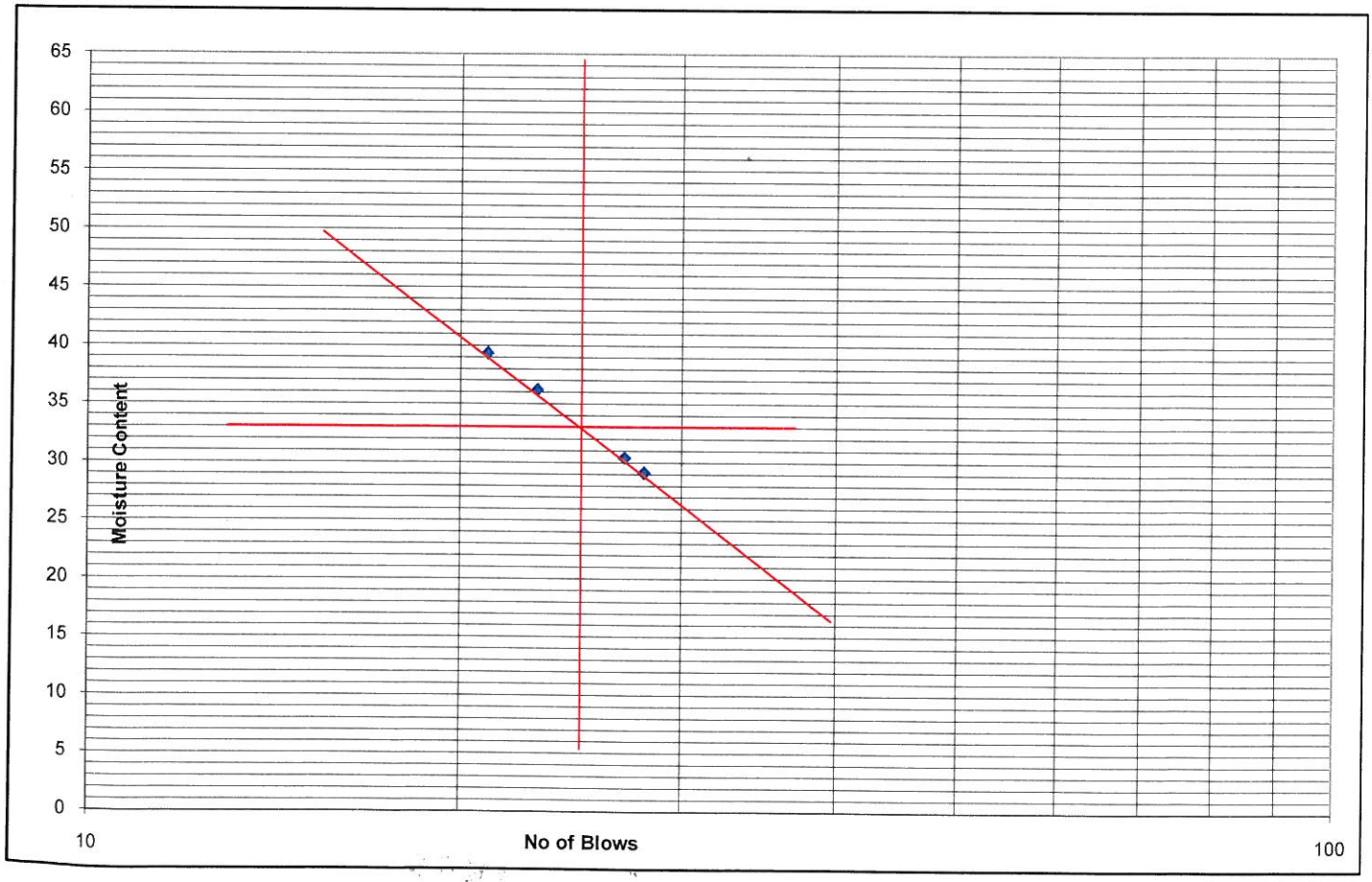
IS : 2720 (Part -5)

Client	:	DFCC			
Project Name	:	G.I.For 3 Nos. Important Bridges			
Type of Sample	:	UDS	Date Of Testing	:	14.09.12
Location	:	BH-4(Tangri River-Ambala)	Sampled by	:	T.K.Das
Depth	:	17.5m	Tested by	:	D.Mohanty

Number of Blows	28	27	23	21	Plastic Limit	
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)	90.36	104.65	105.63	112.11	96.91	97.77
Wt of Container + Wt. of oven dry soil (gm) (W3)	77.55	88.21	86.14	90.25	87.42	87.87
Wt. Of water (gm) (W2-W1)-(W3-W1)	12.80	16.44	19.49	21.86	9.49	9.90
Wt. of oven dry soil (gm) (W3-W1)	43.97	54.03	53.85	55.61	50.58	57.00
Moisture Content (%)= (W2-W1)-(W3-W1)]/(W3-W1) X 100	**29.11**	**30.42**	**36.20**	**39.31**	**18.76**	**17.37**

Result Summary

Liquid Limit (WL)	33	%
Plastic Limit (Wp)	18	%
Plasticity Index (Ip)	15	%



4593

Arki Techno Consultants (India) Pvt.Ltd

ARKITECHNO

N 3/91, IRC Village, Bhubaneswar

DETERMINATION OF LIQUID LIMIT AND PLASTIC LIMIT

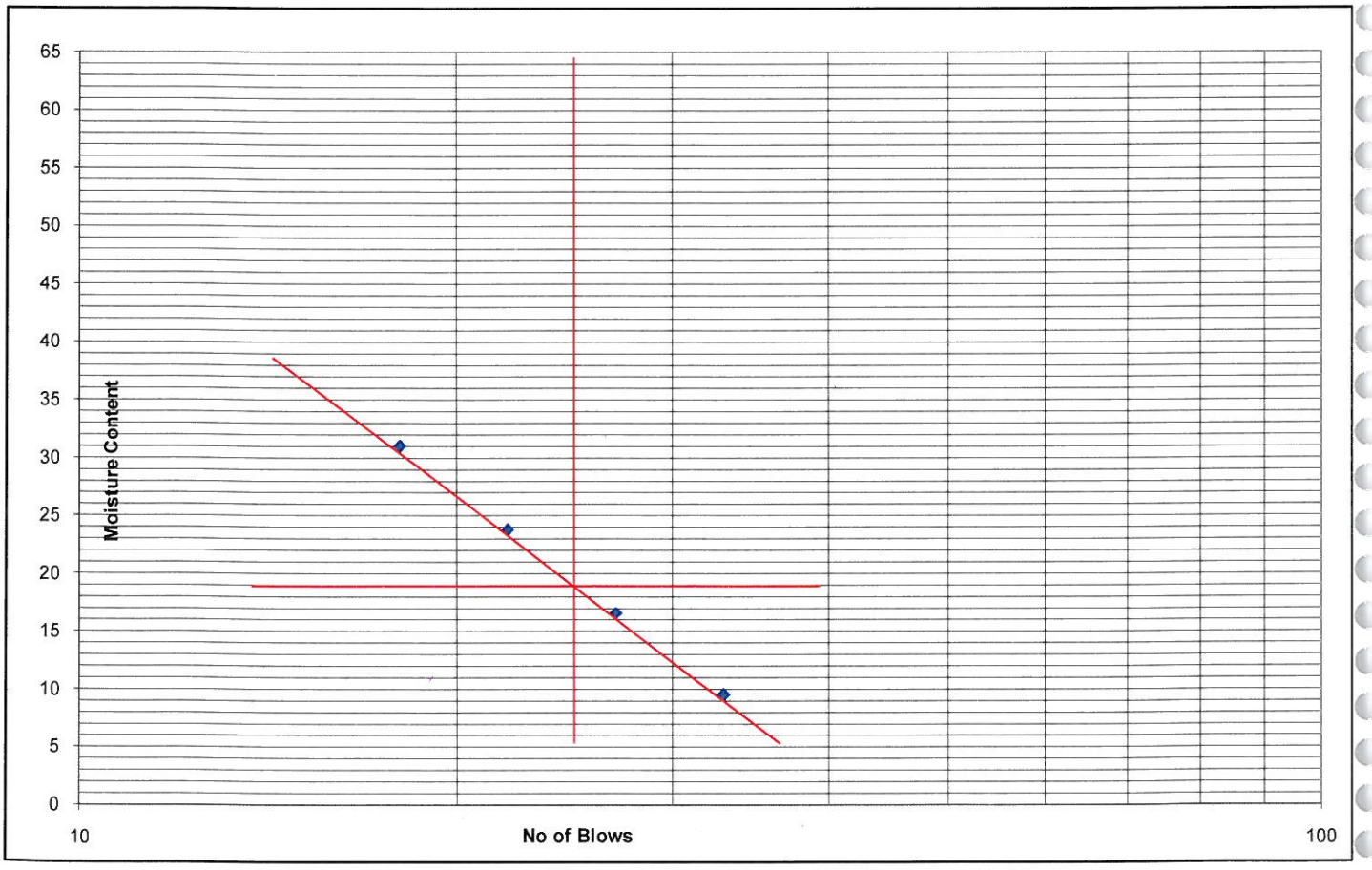
IS : 2720 (Part -5)

Client	:	DFCC			
Project Name	:	G.I.For 3 Nos. Important Bridges			
Type of Sample	:	SPT	Date Of Testing	:	14.09.12
Location	:	BH-4(Tangri River-Ambala)	Sampled by	:	T.K.Das
Depth	:	19.0m	Tested by	:	D.Mohanty

Number of Blows	33	27	22	18	Plastic Limit	
Container No.	D23	D24	D5	D6	NP	
Container Weight (gm) (W1)	33.72	34.86	34.68	35.29		
Container + Wt. of wet soil (gm) (W2)	81.96	97.49	98.58	104.71		
Wt of Container + Wt. of oven dry soil (gm) (W3)	77.76	88.57	86.31	88.28		
Wt. Of water (gm) (W2-W1)-(W3-W1)	4.21	8.92	12.27	16.44		
Wt. of oven dry soil (gm) (W3-W1)	44.04	53.71	51.63	52.99		
Moisture Content (%)= [(W2-W1)-(W3-W1)]/(W3-W1) X 100	**9.55**	**16.61**	**23.76**	**31.02**		

Result Summary

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



4591

Arki Techno Consultants (India) Pvt.Ltd

ARKITECHNO

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

Location : BH-4(Tangri River-Ambala)

Depth : 24.0m

Date Of Testing : 14.09.12

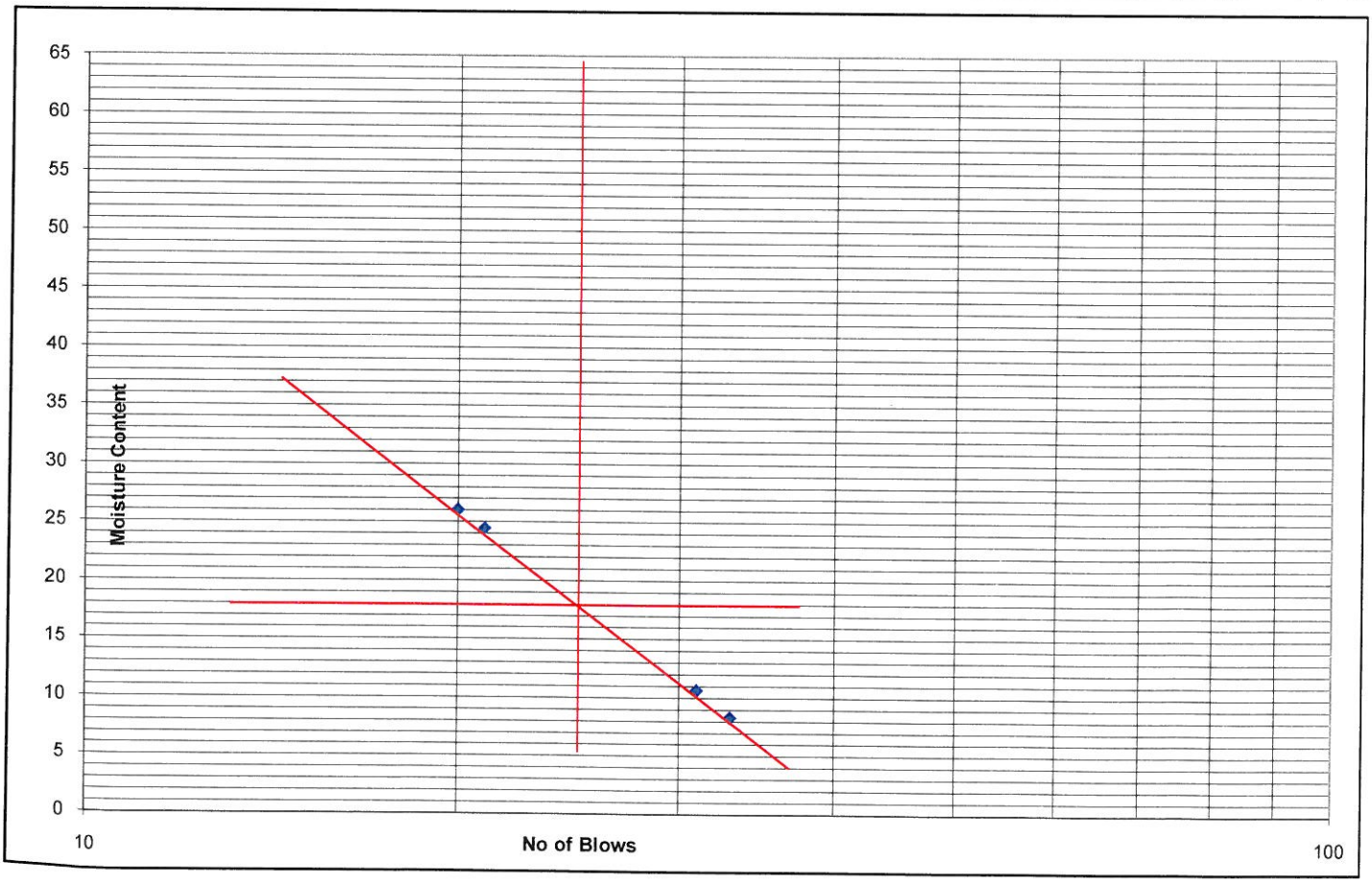
Sampled by : T.K.Das

Tested by : D.Mohanty

Number of Blows	33	31	21	20	Plastic Limit	
Container No.	B13	B14	B15	B16	NP	
Container Weight (gm) (W1)	34.46	33.59	32.1	31.29		
Container + Wt. of wet soil (gm) (W2)	81.91	94.28	100.02	103.15		
Wt of Container + Wt. of oven dry soil (gm) (W3)	78.26	88.43	86.66	88.31		
Wt. Of water (gm) (W2-W1)-(W3-W1)	3.65	5.85	13.36	14.85		
Wt. of oven dry soil (gm) (W3-W1)	43.80	54.84	54.56	57.02		
Moisture Content (%)= (W2-W1)-(W3-W1)]/(W3-W1) X 100	**8.33**	**10.67**	**24.48**	**26.04**		

Result Summary

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



4595

Arki Techno Consultants (India) Pvt.Ltd

ARKITECHNO

N 3/91, IRC Village, Bhubaneswar

DETERMINATION OF LIQUID LIMIT AND PLASTIC LIMIT

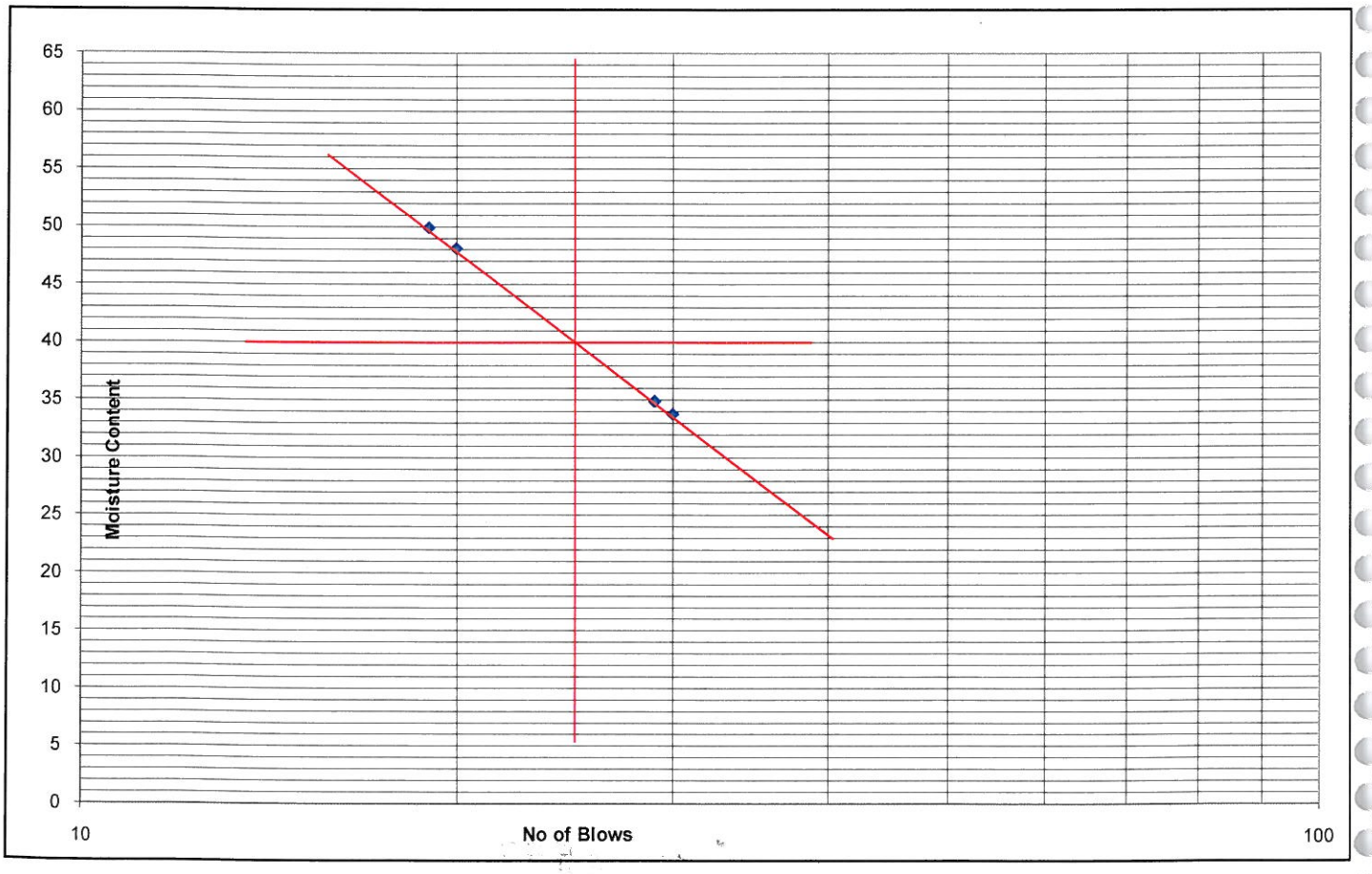
IS : 2720 (Part -5)

Client	:	DFCC			
Project Name	:	G.I.For 3 Nos. Important Bridges			
Type of Sample	:	UDS	Date Of Testing	:	14.09.12
Location	:	BH-4(Tangri River-Ambala)	Sampled by	:	T.K.Das
Depth	:	29.0m	Tested by	:	D.Mohanty

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)	92.18	107.47	113.15	112.64	98.79	99.22
Wt of Container + Wt. of oven dry soil (gm) (W3)	77.80	88.30	86.53	88.26	87.84	88.63
Wt. Of water (gm) (W2-W1)-(W3-W1)	14.39	19.17	26.63	24.38	10.95	10.59
Wt. of oven dry soil (gm) (W3-W1)	42.58	54.94	55.33	48.84	52.98	57.87
Moisture Content (%)= [(W2-W1)-(W3-W1)]/(W3-W1) X 100	**33.79**	**34.89**	**48.13**	**49.91**	**20.67**	**18.30**

Result Summary

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



4596

Arki Techno Consultants (India) Pvt.Ltd

ARKITECHNO

N 3/91, IRC Village, Bhubaneswar

DETERMINATION OF LIQUID LIMIT AND PLASTIC LIMIT

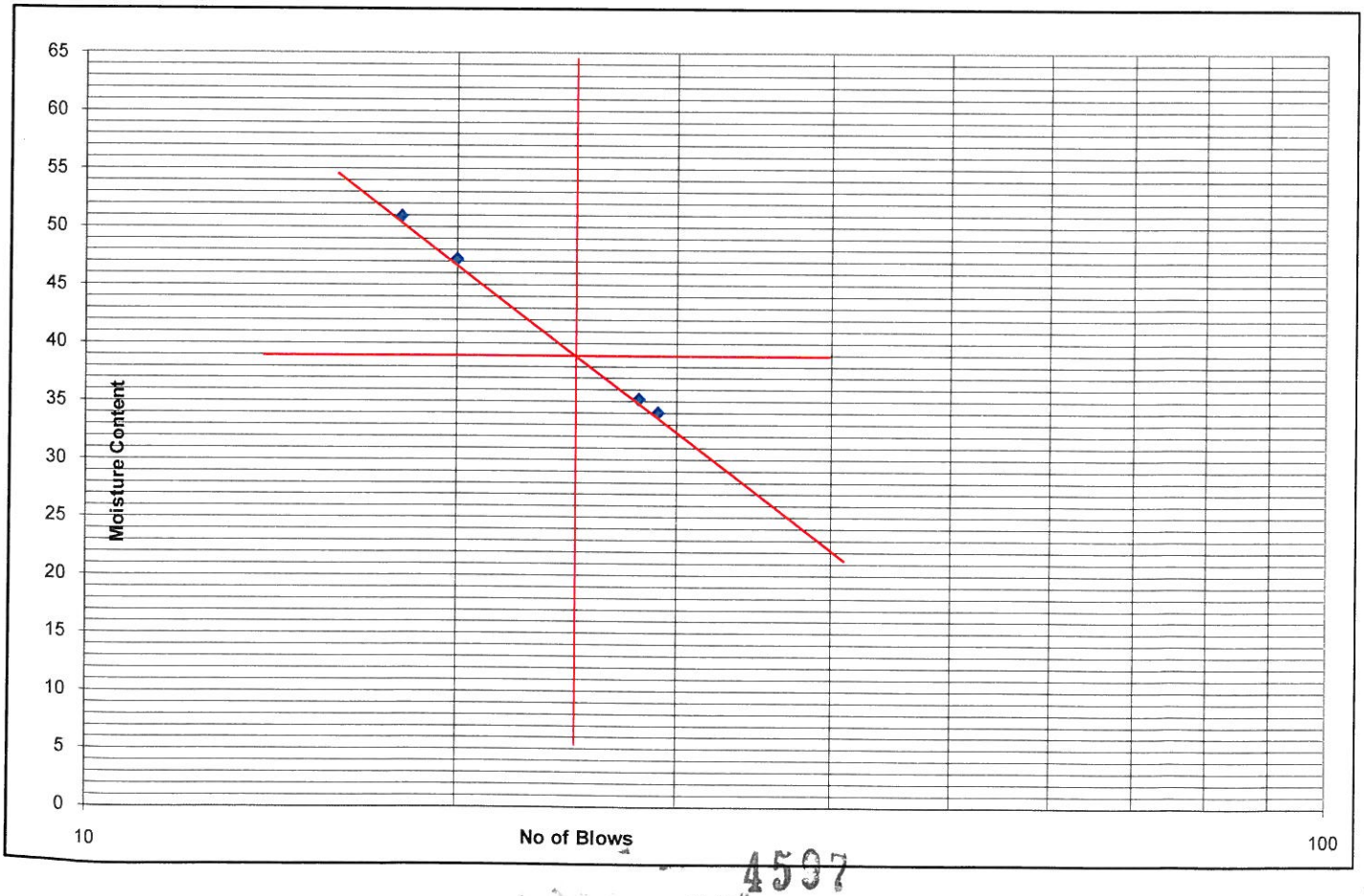
IS : 2720 (Part -5)

Client	:	DFCC			
Project Name	:	G.I.For 3 Nos. Important Bridges			
Type of Sample	:	UDS	Date Of Testing	:	14.09.12
Location	:	BH-4(Tangri River-Ambala)	Sampled by	:	T.K.Das
Depth	:	32.0m	Tested by	:	D.Mohanty

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	108.48	110.37	116.76	98.45	90.28
Wt of Container + Wt. of oven dry soil (gm) (W3)	78.09	88.99	86.75	88.39	87.74	80.95
Wt. Of water (gm) (W2-W1)-(W3-W1)	14.90	19.49	23.62	28.37	10.71	9.33
Wt. of oven dry soil (gm) (W3-W1)	43.80	55.35	50.05	55.74	56.48	50.38
Moisture Content (%)= [(W2-W1)-(W3-W1)]/(W3-W1) X 100	**34.02**	**35.21**	**47.20**	**50.89**	**18.97**	**18.53**

Result Summary

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



4597

Arki Techno Consultants (India) Pvt.Ltd

ARKITECHNO

N 3/91, IRC Village, Bhubaneswar

DETERMINATION OF LIQUID LIMIT AND PLASTIC LIMIT

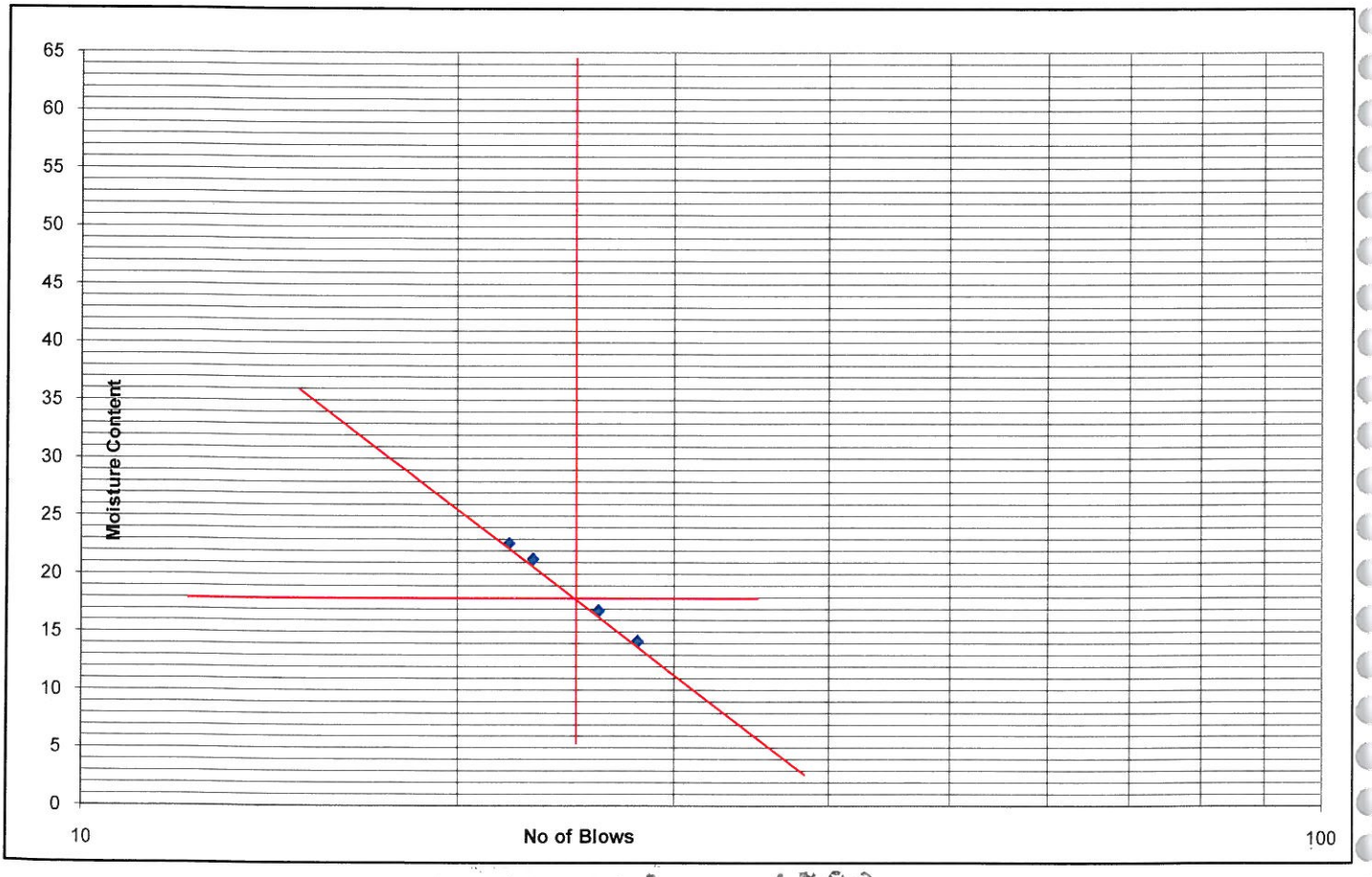
IS : 2720 (Part -5)

Client	:	DFCC			
Project Name	:	G.I.For 3 Nos. Important Bridges			
Type of Sample	:	SPT	Date Of Testing	:	14.09.12
Location	:	BH-4(Tangri River-Ambala)	Sampled by	:	T.K.Das
Depth	:	34.0m	Tested by	:	D.Mohanty

Number of Blows	28	26	23	22	Plastic Limit	
Container No.	B19	B20	B21	B22	NP	
Container Weight (gm) (W1)	31.66	35.46	33.74	34.61		
Container + Wt. of wet soil (gm) (W2)	84.57	98.15	96.50	101.65		
Wt of Container + Wt. of oven dry soil (gm) (W3)	77.99	89.12	85.49	89.26		
Wt. Of water (gm) (W2-W1)-(W3-W1)	6.58	9.04	11.01	12.40		
Wt. of oven dry soil (gm) (W3-W1)	46.33	53.66	51.75	54.65		
Moisture Content (%)= [(W2-W1)-(W3-W1)]/(W3-W1) X 100	**14.20**	**16.84**	**21.28**	**22.69**		

Result Summary

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



4598

Arki Techno Consultants (India) Pvt.Ltd

ARKITECHNO

N 3/91, IRC Village, Bhubaneswar

DETERMINATION OF LIQUID LIMIT AND PLASTIC LIMIT

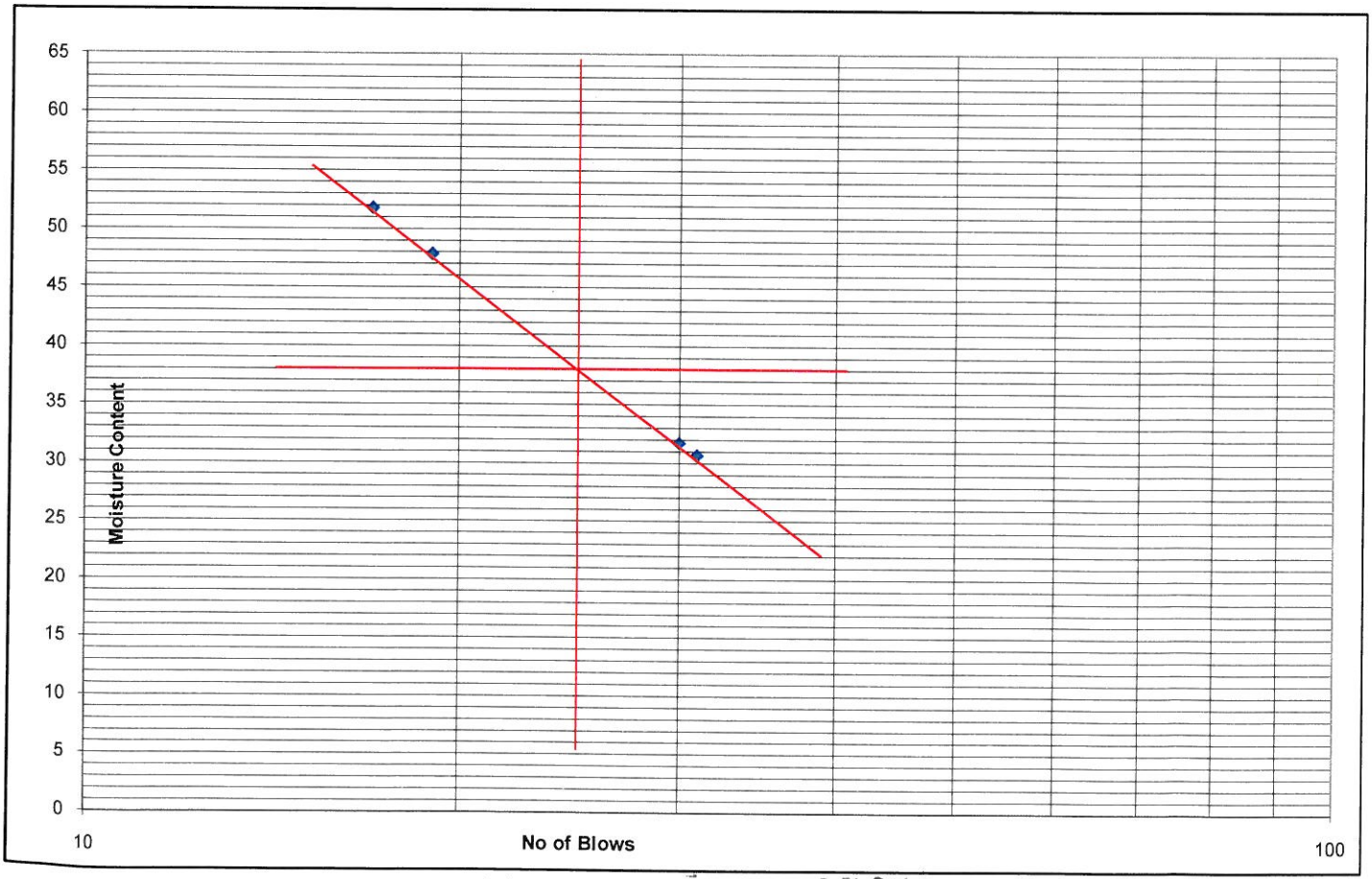
IS : 2720 (Part -5)

Client	:	DFCC			
Project Name	:	G.I.For 3 Nos. Important Bridges			
Type of Sample	:	SPT	Date Of Testing	:	14.09.12
Location	:	BH-4(Tangri River-Ambala)	Sampled by	:	T.K.Das
Depth	:	39.0m	Tested by	:	D.Mohanty

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)	90.61	106.56	111.18	116.88	97.33	90.47
Wt of Container + Wt. of oven dry soil (gm) (W3)	78.00	88.77	85.37	88.80	87.96	82.15
Wt. Of water (gm) (W2-W1)-(W3-W1)	12.61	17.79	25.80	28.08	9.36	8.32
Wt. of oven dry soil (gm) (W3-W1)	41.15	56.06	53.94	54.28	52.15	48.91
Moisture Content (%)= [(W2-W1)-(W3-W1)]/(W3-W1) X 100	**30.65**	**31.73**	**47.83**	**51.74**	**17.95**	**17.02**

Result Summary

Liquid Limit (WL)	38	%
Plastic Limit (Wp)	17	%
Plasticity Index (Ip)	21	%



4599

Arki Techno Consultants (India) Pvt.Ltd

ARKITECHNO

N 3/91, IRC Village, Bhubaneswar

DETERMINATION OF LIQUID LIMIT AND PLASTIC LIMIT

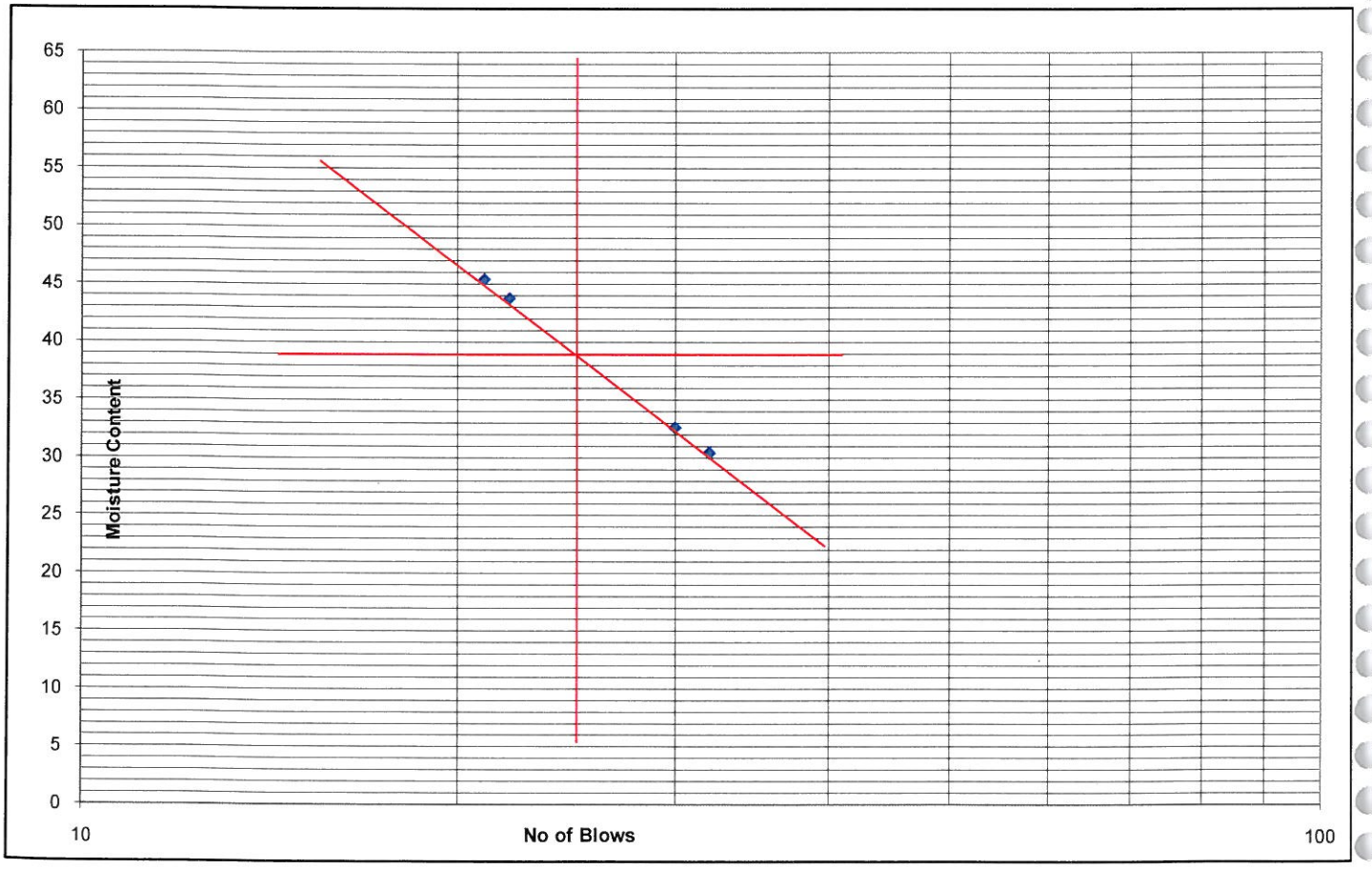
IS : 2720 (Part -5)

Client	:	DFCC			
Project Name	:	G.I.For 3 Nos. Important Bridges			
Type of Sample	:	SPT	Date Of Testing	:	14.09.12
Location	:	BH-4(Tangri River-Ambala)	Sampled by	:	T.K.Das
Depth	:	42.0m	Tested by	:	D.Mohanty

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)	92.06	107.13	109.07	115.18	98.61	90.21
Wt of Container + Wt. of oven dry soil (gm) (W3)	78.34	88.82	85.59	88.73	87.98	81.55
Wt. Of water (gm) (W2-W1)-(W3-W1)	13.72	18.30	23.48	26.45	10.63	8.66
Wt. of oven dry soil (gm) (W3-W1)	45.08	56.08	53.61	58.23	53.31	46.00
Moisture Content (%)= [(W2-W1)-(W3-W1)]/(W3-W1) X 100	**30.44**	**32.64**	**43.79**	**45.43**	**19.94**	**18.83**

Result Summary

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



4600

Arki Techno Consultants (India) Pvt.Ltd

ARKITECHNO

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

Location : BH-4(Tangri River-Ambala)

Depth : 45.0m

Date Of Testing : 14.09.12

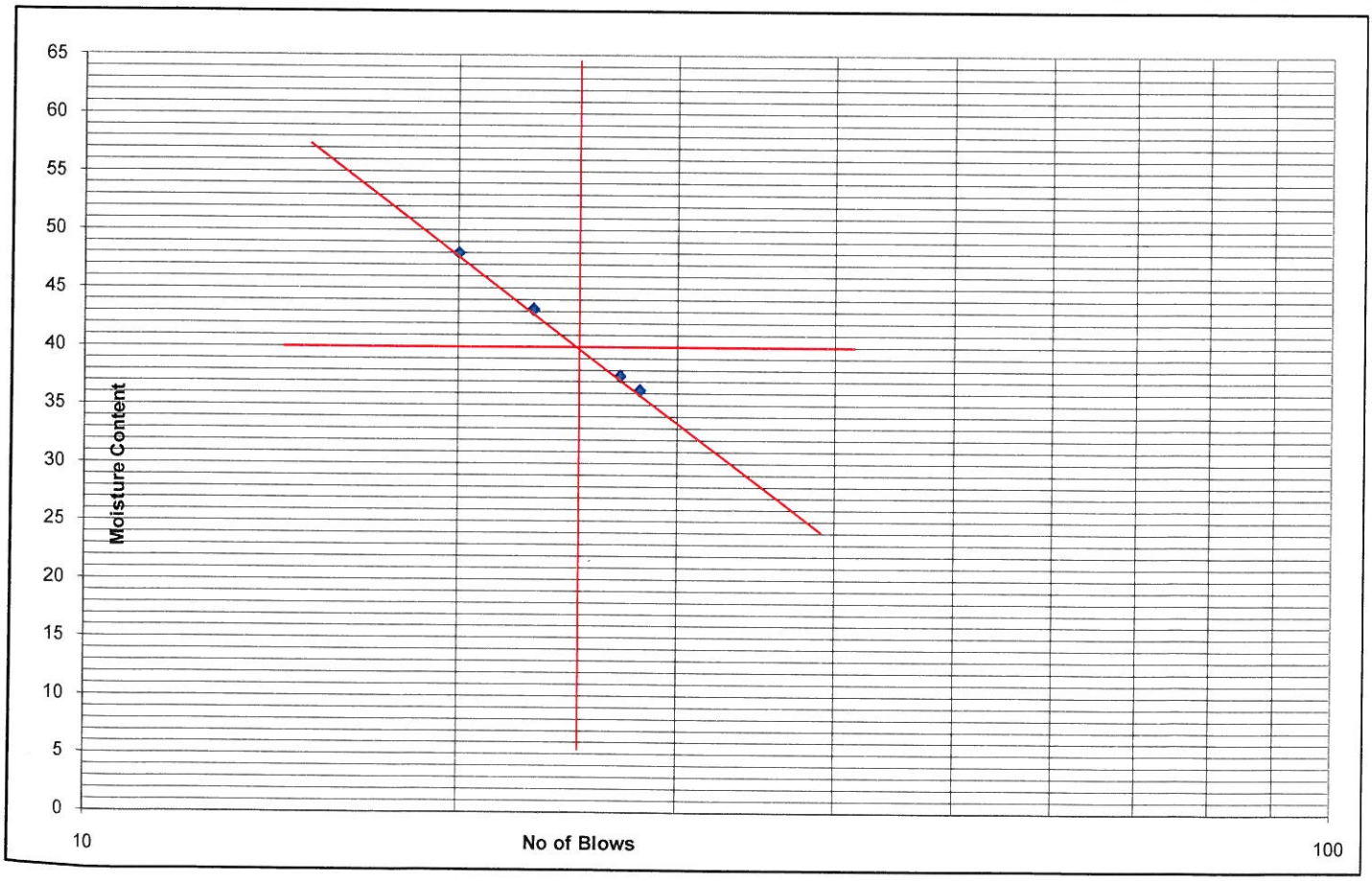
Sampled by : T.K.Das

Tested by : D.Mohanty

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)	95.66	109.07	108.14	116.38	97.80	91.42
Wt of Container + Wt. of oven dry soil (gm) (W3)	78.40	88.64	85.32	88.87	87.87	81.89
Wt. Of water (gm) (W2-W1)-(W3-W1)	17.26	20.43	22.82	27.51	9.93	9.53
Wt. of oven dry soil (gm) (W3-W1)	47.60	54.54	52.85	57.31	52.22	50.90
Moisture Content (%)= (W2-W1)-(W3-W1)]/(W3-W1) X 100	**36.26**	**37.46**	**43.18**	**48.01**	**19.02**	**18.73**

Result Summary

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



4601