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FINAL REPORT PART II 375 MW ACME PLANT AREA

NCD/G/RPPL/4536A(1)/2023

22 June 2023

Renew Power Pvt Ltd.,

Sub : G(D) 4536A Conducting Geotechnical Investigation for the Proposed 375 MW ACME at Village Rampuriya, Tehsil Sahgada, District Jaisalmer, Rajasthan

INTRODUCTION

ReNew Power Pvt Ltd are in the process of constructing 375MW ACME solar power project at Village Rampuraiya, Tehsil Sahgada, District Jaisalmer, Rajasthan.

A detailed geotechnical investigation report for the Switch yard area had already been submitted as Part - I, for the above mentioned power project

The stipulated scope of work for plant area consisted of conducting boreholes down to a maximum depth of 5m below the existing ground level or minimum 3m below the existing ground level if refusal/rock strata is encountered before 3m depth, at twenty three locations, conducting two field california bearing ratio test and conducting two laboratory california bearing ratio test inclusive of modified proctor density test on one bulk soil sample collected from site

This **report** (Part II) is based on the geotechnical investigations results for a part of the investigations i.e. along with the results and analysis of the investigations and the recommendations thereof.

BOREHOLE INVESTIGATION :

All the twenty three boreholes had been progressed down to the stipulated depths as mentioned above. The refusal depth, termination depths and coordinates of the boreholes are as follows :

BHNo.	Refusal depth (m) below EGL	Termination Depth (m) below EGL	Boreholes Coordinates (m)	
			X	Y
1A	1.5	3	758273.706	2935611.031
2A	1	3	758188.317	2935362.354
3A	2	3	758309.863	2935120.955
4A	1.0	3	758186.676	2934908.205

BHNo.	Refusal depth (m) below EGL	Termination Depth (m) below EGL	Boreholes Coordinates (m)	
			X	Y
5	1.5	3	758020.151	2934786.337
6	1.0	3	758327.076	2934659.946
7	1.5	3	758148/.419	2934474.849
8	1	3	758584.931	2934274.685
9	1.5	3	758084.193	2934240.603
10	2	3	757356.897	2934376.383
11	1.5	3	757633.811	2934193.66
12	1	3	757881.331	2934043.837
13	1.5	3	758718.944	2933373.059
14	0.7	3	758934.356	2933062.284
15	1.5	3	759156.136	2932929.177
16	2	3	759485.454	2932844.715
17	1.5	3	759276.592	2932684.777
18	1	3	759595.455	2932600.562
19	1.5	3	759876.025	2932782.527
20	2	3	760212.033	2932880.35
21	4	4	760473.583	2933014.434
28	1.5	3	758957.098	2933424.437
29	1.5	3	759015.991	2933354.605

The results of the boreholes investigations indicate that the subsoil strata generally consists of silty sandy soils with significant percentages of gravel, pebble and conglomerate down to the depth of refusal strata below which substrata consists of highly weathered conglomerate/ sandstone down to the maximum depth investigated i.e. 4m below the existing ground level. The grain size distributions of the soil samples in the twenty three boreholes have been presented in the form of grain size analysis curves in figs.

Ground water table had not been encountered in any of the boreholes down to the maximum depth investigated i.e. 4m below the existing ground level.

The standard penetration test values (N-values) vary between 26 and 58. The observed N-values indicate that the subsoil is in a medium dense to dense state down to the depths of refusal strata.

The subsoil strata is ***predominantly non-plastic*** down to the depth of refusal strata.

The proposed structures are supporting structures for Solar Panels. Considering this, medium heavy loads can be anticipated on the foundations. Based on the above results and the probable loads on the foundations, the following recommendations are being made.

RECOMMENDATION :

Considering the above, the proposed structures can be supported *over Short bored piles*.

PILE CAPACITIES

The parameters considered for the analysis of the pile capacities are given below :

<i>Sl.No.</i>	<i>Parameter</i>	<i>Vaslue</i>
1	<i>Effective length(m)</i>	1.2 to 1.6
2	<i>Cohesion (kg/cm²)</i>	<i>0.05</i>
3	<i>Angle of shearing resistance</i>	<i>32</i>
4	<i>Density (g/cm³)</i>	<i>1.8</i>
5	<i>SPT Value at pile tip</i>	<i>25</i>
6	<i>Factor of safety for pile vertical capacity</i>	<i>2.5</i>

The following pile capacity can be considered for 300mm diameter and various effective lengths of piles.

Pile Dia (mm)	Pile Effective Length (m)	Pile vertical Load Capacity (tons)	Safe Uplift Capacity of Pile (tons)	Safe Lateral Load capacity (tons)
300	1.2	10	0.9	0.4
	1.3	10	1	0.5
	1.4	10	1.1	0.6
	1.5	10	1.2	0.7
	1.6	10	1.3	0.8

Note : Factor of safety for determination of uplift capacity has been considered as 2 whereas factory of safety for determination of lateral capacity has been considered as 3.

The self weight of the pile has been added for the evaluation for the pile uplift capacities.

FIELD CALIFORNIA BEARING RATIO TESTS:

Two field california bearing ratio test (CBR) had been conducted at site. The results of the field CBR along with the coordinates of the test locations are as follows :

FCBR No	CBR (%) Value for Plunger Penetration		FCBR Test Coordinate (m)	
	2.5mm	5mm	X	Y
1	4.0	3.6	758333.61	2934405.83
2	1.6	1.9	759484.541	2932873.117

LABORATORY CALIFORNIA BEARING RATION TESTS

Two laboratory CBR tests had been conducted on soil samples collected from the specified locations at the site. Modified proctor density tests have been conducted for the preparation fo CBR samples.

The results of the **modified proctor density** test are as follows :

Modified Proctor Density Test	Maximum Dry Density (MDD) g/cm ³	Optimum Moisture Content(OMC) (%)
1	2.25	5.7
2	2.18	7.1

The results of the **Laboratory CBR** tests remoulded to the above mentioned modified proctor density are given below :

LCBR No	CBR (%) Value for Plunger Penetration	
	2.5mm	5mm
1	31.4	40.0
2	34.3	49.5

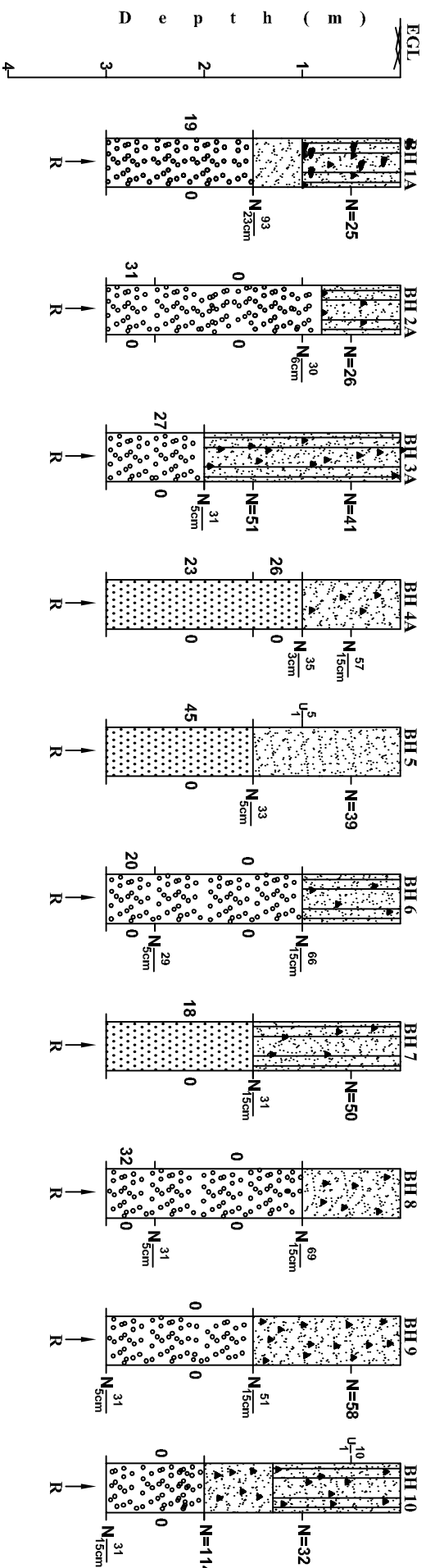
We hope you find this in order.

Thanking you,
Yours sincerely,

Y.S. Rana
Executive Consultant

encls :

1. Compile Soil / Rock Profile
2. Soil Profile Tables
3. Grain Size Analysis Curves
4. Field California Bearing Ratio Plot
5. Modified Proctor Density Plot
6. Laboratory California Bearing Ratio Plot

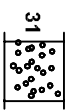


LEGEND

 Yellowish brown gravelly silty sand / sand with traces of silt

 Whitish/ pinkish grey Conglomerate

 Reddish/ whitish grey Sandstone

 Core recovery(%)

 RQD(%)

R - Refusal strata

 Observed 'N' Values

 31 blows for 5cm. penetration

Ground water table had not been encountered.

COMPILED SOIL/ ROCK PROFILE



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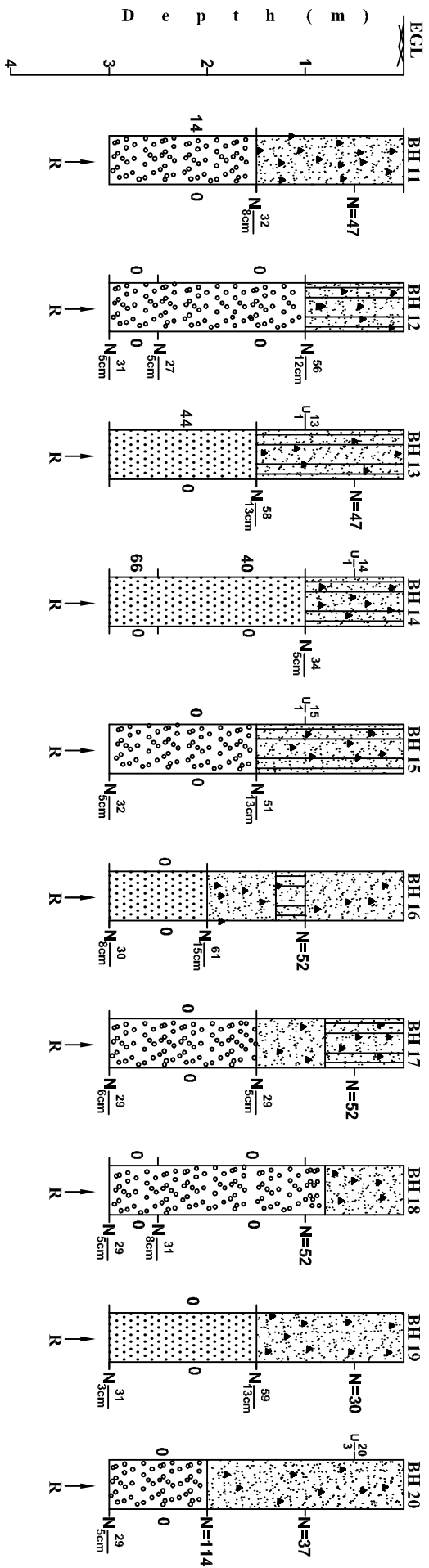
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GEOTECHNICAL INVESTIGATION REPORT FOR THE PROPOSED
375MW ACME SOLAR POWER PROJECT AT RAJASTHAN

Job No: G(0) 4536A

Sheet No: 2a



For Legend Refer Sheet 2a

COMPILED SOIL/ ROCK PROFILE

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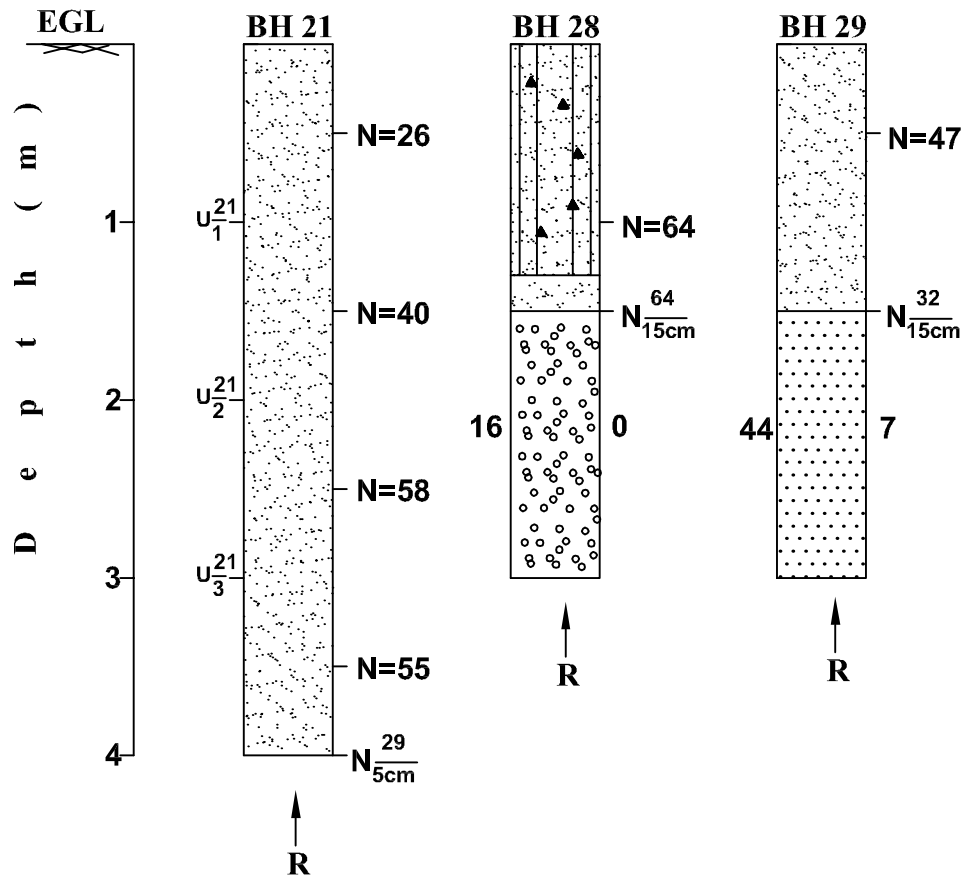
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Job No: G(0) 4536A

GEOTECHNICAL INVESTIGATION REPORT FOR THE PROPOSED
375MW ACME SOLAR POWER PROJECT AT RAJASTHAN

Sheet No: 2a



For Legend Refer Sheet 2a

COMPILED SOIL/ ROCK PROFILE



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Job No: G(D) 4536A

Sheet No: 2a

SOIL PROFILE			Project : Proposed Project 375MW ACME Village Rampuriya, Tehsil Sahgada, Dist Jaisalmer, Rajasthan										
			B.H. Location :			Water Table : N.E.			Term. Depth : 3m			B.H. No.: 1A	
N - Value	Depth (m)	Soil Description	Grain Size Analysis				Atterberg Limits		In-situ properties		Triaxial Test		
			Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Density (g/cm ³)	Water Cont (%)	Type	c (kg/cm ²)	φ (°)
55	0.0												
	0.5	Yellowish brown gravelly silty sand	35	40	25	0	Non	Plastic					
	1.0	Yellowish brown sand with silt	0	87	13	0	Non	Plastic					
	1.5	Refusal strata in the form of Conglomerate	23	21	42	14	33	21					
93	23cm												

ROCK PROFILE		Project : Proposed Project 375MW ACME Village Rampuriya, Tehsil Sahgada, Dist Jaisalmer, Rajasthan										Location :					
		B.H. Size : Nx				Water Table (m): N.E.			Term. Depth (m): 3			B.H. No. : 1A					
Depth (m)	Strata Description	No. of Core Pieces of Size (cm)			Core Recovery (%)					RQD (%)	Run Time (min)	Unit Weight (g/cm³)	Porosity (%)	Water Absorption (%)	Unconfined Compressive Strength (kg/cm²)	Point Load Strength (kg/cm²)	Remarks
		<10	10-25	25-75	>75	20	40	60	80	100							
1.5	-																
	Brownish red Conglomerate	9	0	0						19	0	60					
3.0	-																

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SOIL PROFILE			Project : Proposed Project 375MW ACME Village Rampuriya, Tehsil Sahgada, Dist Jaisalmer, Rajasthan									
			B.H. Location :			Water Table : N.E.		Term. Depth : 3m			B.H. No.: 2A	
N - Value	Depth (m)	Soil Description	Grain Size Analysis				Atterberg		In-situ		Triaxial Test	
			Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Density (g/cm ³)	Water Cont (%)	Type	ϕ (°) c (kg/cm ²)
26	0.0	Yellowish brown gravelly silty sand Change of the strata Refusal strata in the form of Conglomerate	52	41	7	0	Non	Plastic				
	0.5											
	0.8											
30 6cm	1.0											

ROCK PROFILE		Project : Proposed Project 375MW ACME Village Rampuriya, Tehsil Sahgada, Dist Jaisalmer, Rajasthan										Location :					
		B.H. Size : Nx				Water Table (m): N.E.			Term. Depth (m): 3			B.H. No. : 2A					
Depth (m)	Strata Description	No. of Core Pieces of Size (cm)			Core Recovery (%)					RQD (%)	Run Time (min)	Unit Weight (g/cm ³)	Porosity (%)	Water Absorption (%)	Unconfined Compressive Strength (kg/cm ²)	Point Load Strength (kg/cm ²)	Remarks
		<10	10-25	25-75	>75	20	40	60	80	100							
1.0	-																
	Yellowish pinkish grey Conglomerate	0	0	0							0	0	55				
2.5	-																
	Yellowish pinkish grey Conglomerate	9	0	0							31	0	25				
3.0	-																

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SOIL PROFILE			Project : Proposed Project 375MW ACME Village Rampuriya, Tehsil Sahgada, Dist Jaisalmer, Rajasthan										
			B.H. Location :			Water Table : N.E.			Term. Depth : 3m			B.H. No.: 3A	
N - Value	Depth (m)	Soil Description	Grain Size Analysis				Atterberg		In-situ		Triaxial Test		
			Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Density (g/cm³)	Water Cont (%)	Type	c (kg/cm²)	φ (°)
41	0.0	Yellowish brown silty sand with gravel	3	74	23	0	Non	Plastic					
	0.5												
	1.0												
51	1.5	Gravelly silty sand	39	34	27	0	Non	Plastic					
31 5cm	2.0	Refusal strata in the form of Conglomerate											

ROCK PROFILE		Project : Proposed Project 375MW ACME Village Rampuriya, Tehsil Sahgada, Dist Jaisalmer, Rajasthan										Location :					
		B.H. Size : Nx				Water Table (m): N.E.				Term. Depth (m): 3			B.H. No. : 3A				
Depth (m)	Strata Description	No. of Core Pieces of Size (cm)			Core Recovery (%)				RQD (%)	Run Time (min)	Unit Weight (g/cm ³)	Porosity (%)	Water Absorption (%)	Unconfined Compressive Strength (kg/cm ²)	Point Load Strength (kg/cm ²)	Remarks	
		<10	10-25	25-75	>75	20	40	60									80
2.0	-	Whitish/ pinkish brownish grey Conglomerate	9	0	0						27	0	27				
3.0	-																

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SOIL PROFILE			Project : Proposed Project 375MW ACME Village Rampuriya, Tehsil Sahgada, Dist Jaisalmer, Rajasthan										
			B.H. Location :		Water Table : N.E.			Term. Depth : 3m			B.H. No.: 4A		
N - Value	Depth (m)	Soil Description	Grain Size Analysis				Atterberg		In-situ		Triaxial Test		
			Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Density (g/cm³)	Water Cont (%)	Type	c (kg/cm²)	φ (°)
57 ----- 15cm	0.0	Yellowish brown gravelly sand with silt	60	29	11	0	Non	Plastic					
	0.5												
35 ----- 3cm	1.0	Refusal strata in the form of Sandstone											

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ROCK PROFILE		Project : Proposed Project 375MW ACME Village Rampuriya, Tehsil Sahgada, Dist Jaisalmer, Rajasthan										Location :					
		B.H. Size : Nx				Water Table (m): N.E.			Term. Depth (m): 3m			B.H. No. : 4A					
Depth (m)	Strata Description	No. of Core Pieces of Size (cm)				Core Recovery (%)			RQD (%)	Run Time (min)	Unit Weight (g/cm ³)	Porosity (%)	Water Absorption (%)	Unconfined Compressive Strength (kg/cm ²)	Point Load Strength (kg/cm ²)	Remarks	
		<10	10-25	25-75	>75	20	40	60									80
1.0	-																Highly weathered
	Pinkish whitish grey Sandstone	4	0	0						26	0	25					
1.5	-																
	Brownish red Sandstone	14	0	0						23	0	70					
3.0	-																

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SOIL PROFILE			Project : Proposed Project 375MW ACME Village Rampuriya, Tehsil Sahgada, Dist Jaisalmer, Rajasthan									
			B.H. Location :			Water Table : N.E.		Term. Depth : 3m		B.H. No.: 5		
N - Value	Depth (m)	Soil Description	Grain Size Analysis				Atterberg		In-situ		Triaxial Test	
			Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Density (g/cm ³)	Water Cont (%)	Type	φ (°) c (kg/cm ²)
39	0.0	Yellowish brown sand with silt	0	57	10	0	Non	Plastic	1.82	3.5		
	0.5											
	1.0											
33 5cm	1.5	Refusal strata in the form of Sandstone										

ROCK PROFILE			Project : Proposed Project 375MW ACME Village Rampuriya, Tehsil Sahgada, Dist Jaisalmer, Rajasthan									Location :					
			B.H. Size : Nx				Water Table (m): N.E.				Term. Depth (m): 3m			B.H. No. : 5			
Depth (m)	Strata Description	No. of Core Pieces of Size (cm)			Core Recovery (%)				RQD (%)	Run Time (min)	Unit Weight (g/cm³)	Porosity (%)	Water Absorption (%)	Unconfined Compressive Strength (kg/cm²)	Point Load Strength (kg/cm²)	Remarks	
		<10	10-25	25-75	>75	20	40	60	80	100							
1.5	-	23	0	0						45	0	70					Highly weathered
3.0	-																

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SOIL PROFILE			Project : Proposed Project 375MW ACME Village Rampuriya, Tehsil Sahgada, Dist Jaisalmer, Rajasthan									
			B.H. Location :			Water Table : N.E.		Term. Depth : 3m		B.H. No.: 6		
N - Value	Depth (m)	Soil Description	Grain Size Analysis				Atterberg		In-situ		Triaxial Test	
			Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Density (g/cm ³)	Water Cont (%)	Type	ϕ (°)
66 15cm	0.0											
	0.5	Yellowish brown silty sand with gravel					1.70	6.4				
	1.0	Refusal strata in the form of Conglomerate										

ROCK PROFILE		Project : Proposed Project 375MW ACME Village Rampuriya, Tehsil Sahgada, Dist Jaisalmer, Rajasthan											Location :					
		B.H. Size : Nx				Water Table (m): N.E.				Term. Depth (m): 3m			B.H. No. : 6					
Depth (m)	Strata Description	No. of Core Pieces of Size (cm)			Core Recovery (%)					RQD (%)	Run Time (min)	Unit Weight (g/cm³)	Porosity (%)	Water Absorption (%)	Unconfined Compressive Strength (kg/cm²)	Point Load Strength (kg/cm²)	Remarks	
		<10	10-25	25-75	>75	20	40	60	80									100
1.0	-																	N=29/5cm at 2.5m depth
	Whitish pinkish grey Conglomerate	0	0	0						0	0	24						
2.5	-																	
	Whitish pinkish grey Conglomerate	4	0	0						20	0	14						
3.0	-																	

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SOIL PROFILE			Project : Proposed Project 375MW ACME Village Rampuriya, Tehsil Sahgada, Dist Jaisalmer, Rajasthan									
			B.H. Location :			Water Table : N.E.		Term. Depth : 3m		B.H. No.: 7		
N - Value	Depth (m)	Soil Description	Grain Size Analysis				Atterberg		In-situ		Triaxial Test	
			Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Density (g/cm ³)	Water Cont (%)	Type	ϕ (°) c (kg/cm ²)
50	0.0	Yellowish brown gravelly silty sand	35	39	26	0	Non Tube	Plastic bent				
	0.5											
	1.0											
	1.5	Refusal strata in the form of Sandstone										
31 5cm												

ROCK PROFILE			Project : Proposed Project 375MW ACME Village Rampuriya, Tehsil Sahgada, Dist Jaisalmer, Rajasthan										Location :				
			B.H. Size : Nx				Water Table (m): N.E.				Term. Depth (m): 3m			B.H. No. : 7			
Depth (m)	Strata Description	No. of Core Pieces of Size (cm)			Core Recovery (%)				RQD (%)	Run Time (min)	Unit Weight (g/cm³)	Porosity (%)	Water Absorption (%)	Unconfined Compressive Strength (kg/cm²)	Point Load Strength (kg/cm²)	Remarks	
		<10	10-25	25-75	>75	20	40	60									80
1.5	-	17	0	0						18	0	40					Highly weathered
3.0	-																

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SOIL PROFILE			Project : Proposed Project 375MW ACME Village Rampuriya, Tehsil Sahgada, Dist Jaisalmer, Rajasthan									
			B.H. Location :			Water Table : N.E.		Term. Depth : 3m		B.H. No.: 8		
N - Value	Depth (m)	Soil Description	Grain Size Analysis				Atterberg		In-situ		Triaxial Test	
			Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Density (g/cm ³)	Water Cont (%)	Type	ϕ (°) c (kg/cm ²)
69 15cm	0.0											
	0.5	Yell. brown gravelly sand with traces of silt	36	60	4	0	Low	Plastic				
	0.8	Change of the strata										
	1.0	Refusal strata in the form of Conglomerate										

ROCK PROFILE		Project : Proposed Project 375MW ACME Village Rampuriya, Tehsil Sahgada, Dist Jaisalmer, Rajasthan										Location :						
		B.H. Size : Nx				Water Table (m): N.E.				Term. Depth (m): 3m			B.H. No. : 8					
Depth (m)	Strata Description	No. of Core Pieces of Size (cm)			Core Recovery (%)					RQD (%)	Run Time (min)	Unit Weight (g/cm ³)	Porosity (%)	Water Absorption (%)	Unconfined Compressive Strength (kg/cm ²)	Point Load Strength (kg/cm ²)	Remarks	
		<10	10-25	25-75	>75	20	40	60	80									100
1.0	-																	N=31/5cm at 2.5m depth
	Yellowish pinkish grey Conglomerate	0	0	0						0	0	28						
2.5	-																	
	Yellowish pinkish grey Conglomerate	3	0	0						32	0	20						
3.0	-																	

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SOIL PROFILE			Project : Proposed Project 375MW ACME Village Rampuriya, Tehsil Sahgada, Dist Jaisalmer, Rajasthan									
			B.H. Location :			Water Table : N.E.		Term. Depth : 3m		B.H. No.: 9		
N - Value	Depth (m)	Soil Description	Grain Size Analysis				Atterberg		In-situ		Triaxial Test	
			Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Density (g/cm ³)	Water Cont (%)	Type	ϕ (°)
58	0.0											
	0.5	Yellowish brown gravelly sand with silt	34	48	18	0	Non	Plastic				
	0.8	Change of the strata										
	1.0	Yellowish brown sand with traces of silt	0	95	5	0	Non	Plastic				
	1.3	Change of the strata										
51 15cm	1.5	Refusal strata in the form of Conglomerate										

ROCK PROFILE		Project : Proposed Project 375MW ACME Village Rampuriya, Tehsil Sahgada, Dist Jaisalmer, Rajasthan										Location :						
		B.H. Size : Nx				Water Table (m): N.E.				Term. Depth (m): 3m			B.H. No. : 9					
Depth (m)	Strata Description	No. of Core Pieces of Size (cm)			Core Recovery (%)					RQD (%)	Run Time (min)	Unit Weight (g/cm³)	Porosity (%)	Water Absorption (%)	Unconfined Compressive Strength (kg/cm²)	Point Load Strength (kg/cm²)	Remarks	
		<10	10-25	25-75	>75	20	40	60	80									100
1.5	-	0	0	0						0	0	25						N=31/5cm at 3m depth
3.0	-																	

G(D)4536A

SOIL PROFILE			Project : Proposed Project 375MW ACME Village Rampuriya, Tehsil Sahgada, Dist Jaisalmer, Rajasthan									
			B.H. Location :			Water Table : N.E.		Term. Depth : 3m		B.H. No.: 10		
N - Value	Depth (m)	Soil Description	Grain Size Analysis				Atterberg		In-situ		Triaxial Test	
			Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Density (g/cm ³)	Water Cont (%)	Type	ϕ (°)
32	0.0											
	0.5								4.5	1.69		
	1.0	Yellowish brown gravelly silty sand	42	42	16	0	Non	Plastic				
	1.3	Change of the strata										
114	1.5	Yell. brown gravelly sand with traces of silt	55	36	9	0	Non	Plastic				
	2.0	Refusal strata in the form of Conglomerate										

ROCK PROFILE		Project : Proposed Project 375MW ACME Village Rampuriya, Tehsil Sahgada, Dist Jaisalmer, Rajasthan										Location :					
		B.H. Size : Nx				Water Table (m): N.E.				Term. Depth (m): 3m			B.H. No. : 10				
Depth (m)	Strata Description	No. of Core Pieces of Size (cm)			Core Recovery (%)				RQD (%)	Run Time (min)	Unit Weight (g/cm³)	Porosity (%)	Water Absorption (%)	Unconfined Compressive Strength (kg/cm²)	Point Load Strength (kg/cm²)	Remarks	
		<10	10-25	25-75	>75	20	40	60									80
2.0	-	0	0	0						0	0	18					N=31/5cm at 3m depth
3.0	-																

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SOIL PROFILE			Project : Proposed Project 375MW ACME Village Rampuriya, Tehsil Sahgada, Dist Jaisalmer, Rajasthan										
			B.H. Location :		Water Table : N.E.		Term. Depth : 3m		B.H. No.: 11				
N - Value	Depth (m)	Soil Description	Grain Size Analysis				Atterberg		In-situ		Triaxial Test		
			Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Density (g/cm³)	Water Cont (%)	Type	c (kg/cm²)	φ (°)
47 <													

ROCK PROFILE			Project : Proposed Project 375MW ACME Village Rampuriya, Tehsil Sahgada, Dist Jaisalmer, Rajasthan										Location :					
			B.H. Size : Nx				Water Table (m): N.E.				Term. Depth (m): 3m			B.H. No. : 11				
Depth (m)	Strata Description			No. of Core Pieces of Size (cm)			Core Recovery (%)			RQD (%)	Run Time (min)	Unit Weight (g/cm³)	Porosity (%)	Water Absorption (%)	Unconfined Compressive Strength (kg/cm²)	Point Load Strength (kg/cm²)	Remarks	
				<10	10-25	25-75	>75	20	40									60
1.5	- Whitish yellowish brownish grey Conglomerate			7	0	0						11	0	30				
3.0																		

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SOIL PROFILE			Project : Proposed Project 375MW ACME Village Rampuriya, Tehsil Sahgada, Dist Jaisalmer, Rajasthan										
			B.H. Location :		Water Table : N.E.		Term. Depth : 3m		B.H. No.: 12				
N - Value	Depth (m)	Soil Description	Grain Size Analysis				Atterberg		In-situ		Triaxial Test		
			Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Density (g/cm³)	Water Cont (%)	Type	c (kg/cm²)	φ (°)
56 12cm	0.0	Yellowish brown gravelly silty sand Refusal strata in the form of Conglomerate					1.63	4.9					

ROCK PROFILE				Project : Proposed Project 375MW ACME Village Rampuriya, Tehsil Sahgada, Dist Jaisalmer, Rajasthan										Location :								
				B.H. Size : Nx				Water Table (m): N.E.					Term. Depth (m): 3m			B.H. No. : 12						
Depth (m)	Strata Description				No. of Core Pieces of Size (cm)			Core Recovery (%)					RQD (%)	Run Time (min)	Unit Weight (g/cm ³)	Porosity (%)	Water Absorption (%)	Unconfined Compressive Strength (kg/cm ²)	Point Load Strength (kg/cm ²)	Remarks		
					<10	10-25	25-75	>75	20	40	60	80									100	
1.0	- Whitish yellowish brownish grey conglomerate - Whitish yellowish brownish grey Conglomerate -				0	0	0						0	0	25					N=27/5cm at 2.5m depth		
2.5					0	0	0							0	0	10						N=31/5cm at 3m depth
3.0																						

SOIL PROFILE			Project : Proposed Project 375MW ACME Village Rampuriya, Tehsil Sahgada, Dist Jaisalmer, Rajasthan									
			B.H. Location :			Water Table : N.E.		Term. Depth : 3			B.H. No.: 13	
N - Value	Depth (m)	Soil Description	Grain Size Analysis				Atterberg		In-situ		Triaxial Test	
			Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Density (g/cm ³)	Water Cont (%)	Type	ϕ (°) c (kg/cm ²)
37	0.0	Yellowish brown silty sand with gravel	9	61	30	0	Low	Plastic	1.84	13.7		
	0.5											
	1.0											
	1.5	Refusal strata in the form of Sandstone										
58 13cm												

ROCK PROFILE		Project : Proposed Project 375MW ACME Village Rampuriya, Tehsil Sahgada, Dist Jaisalmer, Rajasthan										Location :				
		B.H. Size : Nx				Water Table (m): N.E.			Term. Depth (m): 3m			B.H. No. : 13				
Depth (m)	Strata Description	No. of Core Pieces of Size (cm)			Core Recovery (%)			RQD (%)	Run Time (min)	Unit Weight (g/cm³)	Porosity (%)	Water Absorption (%)	Unconfined Compressive Strength (kg/cm²)	Point Load Strength (kg/cm²)	Remarks	
		<10	10-25	25-75	>75	20	40									60
1.5	-	12	0	0						44	0	80				Highly weathered
3.0	-															

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SOIL PROFILE			Project : Proposed Project 375MW ACME Village Rampuriya, Tehsil Sahgada, Dist Jaisalmer, Rajasthan									
			B.H. Location :			Water Table : N.E.		Term. Depth : 3m			B.H. No.: 14	
N - Value	Depth (m)	Soil Description	Grain Size Analysis				Atterberg		In-situ		Triaxial Test	
			Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Density (g/cm ³)	Water Cont (%)	Type	ϕ (°) c (kg/cm ²)
34 5cm	0.0											
	0.5	Yellowish brown gravelly silty sand	35	50	15	0	Non	Plastic	1.71	9.2		
	1.0	Refusal strata in the form of Sandstone										

ROCK PROFILE		Project : Proposed Project 375MW ACME Village Rampuriya, Tehsil Sahgada, Dist Jaisalmer, Rajasthan										Location :					
		B.H. Size : Nx				Water Table (m): N.E.				Term. Depth (m): 3m			B.H. No. : 14				
Depth (m)	Strata Description	No. of Core Pieces of Size (cm)			Core Recovery (%)					RQD (%)	Run Time (min)	Unit Weight (g/cm ³)	Porosity (%)	Water Absorption (%)	Unconfined Compressive Strength (kg/cm ²)	Point Load Strength (kg/cm ²)	Remarks
		<10	10-25	25-75	>75	20	40	60	80	100							
1.0	- Pinkish whitish grey Sandstone	18	0	0							40	0	60				
2.5	- Pinkish whitish grey Sandstone	8	0	0							66	0	25				
3.0	-																

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SOIL PROFILE			Project : Proposed Project 375MW ACME Village Rampuriya, Tehsil Sahgada, Dist Jaisalmer, Rajasthan									
			B.H. Location :			Water Table : N.E.		Term. Depth : 3m		B.H. No.: 15		
N - Value	Depth (m)	Soil Description	Grain Size Analysis				Atterberg		In-situ		Triaxial Test	
			Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Density (g/cm ³)	Water Cont (%)	Type	ϕ (°) c (kg/cm ²)
52	0.0	Yellowish brown silty sand with gravel	8	69	23	0	Non	Plastic	1.75	6.4		
	0.5											
	1.0	Refusal strata in the form of Conglomerate										
51 13cm	1.5											

ROCK PROFILE		Project : Proposed Project 375MW ACME Village Rampuriya, Tehsil Sahgada, Dist Jaisalmer, Rajasthan										Location :					
		B.H. Size : Nx				Water Table (m): N.E.				Term. Depth (m): 3m			B.H. No. : 15				
Depth (m)	Strata Description	No. of Core Pieces of Size (cm)			Core Recovery (%)				RQD (%)	Run Time (min)	Unit Weight (g/cm ³)	Porosity (%)	Water Absorption (%)	Unconfined Compressive Strength (kg/cm ²)	Point Load Strength (kg/cm ²)	Remarks	
		<10	10-25	25-75	>75	20	40	60									80
1.5	-	0	0	0						0	0	32					N=32/5cm
3.0	-																at 3m depth

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SOIL PROFILE			Project : Proposed Project 375MW ACME Village Rampuriya, Tehsil Sahgada, Dist Jaisalmer, Rajasthan										
			B.H. Location :			Water Table : N.E.		Term. Depth : 3m			B.H. No.: 16		
N - Value	Depth (m)	Soil Description	Grain Size Analysis				Atterberg		In-situ		Triaxial Test		
			Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Density (g/cm ³)	Water Cont (%)	Type	c (kg/cm ²)	φ (°)
52	0.0												
	0.5	Yellowish brown gravelly sand with silt	40	45	15	0	Non	Plastic					
	1.0	Yellowish brown gravelly silty sand	46	33	21	0	Non	Plastic					
	1.3	Change of the strata											
	1.5	Yell. brown sand with traces of silt and gravel	7	89	4	0	Non	Plastic					
61 ----- 15cm	2.0	Refusal strata in the form of Sandstone											

ROCK PROFILE		Project : Proposed Project 375MW ACME Village Rampuriya, Tehsil Sahgada, Dist Jaisalmer, Rajasthan										Location :					
		B.H. Size : Nx				Water Table (m): N.E.				Term. Depth (m): 3m			B.H. No. : 16				
Depth (m)	Strata Description	No. of Core Pieces of Size (cm)			Core Recovery (%)				RQD (%)	Run Time (min)	Unit Weight (g/cm³)	Porosity (%)	Water Absorption (%)	Unconfined Compressive Strength (kg/cm²)	Point Load Strength (kg/cm²)	Remarks	
		<10	10-25	25-75	>75	20	40	60									80
2.0	-	0	0	0						0	0	20					N=30/8cm at 3m depth
3.0	-																

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SOIL PROFILE			Project : Proposed Project 375MW ACME Village Rampuriya, Tehsil Sahgada, Dist Jaisalmer, Rajasthan									
			B.H. Location :			Water Table : N.E.		Term. Depth : 3m		B.H. No.: 17		
N - Value	Depth (m)	Soil Description	Grain Size Analysis				Atterberg		In-situ		Triaxial Test	
			Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Density (g/cm ³)	Water Cont (%)	Type	ϕ (°)
47	0.0											
	0.5	Yellowish brown gravelly silty sand	30	49	21	0	Non	Plastic				
	0.8	Change of the strata										
	1.0	Yell. brown sand with traces of silt and gravel	10	81	9	0	Non	Plastic				
	1.5	Refusal strata in the form of Conglomerate										
29 5cm												

ROCK PROFILE			Project : Proposed Project 375MW ACME Village Rampuriya, Tehsil Sahgada, Dist Jaisalmer, Rajasthan										Location :				
			B.H. Size : Nx				Water Table (m): N.E.				Term. Depth (m): 3m			B.H. No. : 17			
Depth (m)	Strata Description	No. of Core Pieces of Size (cm)			Core Recovery (%)				RQD (%)	Run Time (min)	Unit Weight (g/cm ³)	Porosity (%)	Water Absorption (%)	Unconfined Compressive Strength (kg/cm ²)	Point Load Strength (kg/cm ²)	Remarks	
		<10	10-25	25-75	>75	20	40	60									80
1.5	-	Whitish pinkish grey Conglomerate	0	0	0						0	0	20				N=29/6cm at 3m depth
3.0	-																

SOIL PROFILE			Project : Proposed Project 375MW ACME Village Rampuriya, Tehsil Sahgada, Dist Jaisalmer, Rajasthan									
			B.H. Location :			Water Table : N.E.		Term. Depth : 3m		B.H. No.: 18		
N - Value	Depth (m)	Soil Description	Grain Size Analysis				Atterberg		In-situ		Triaxial Test	
			Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Density (g/cm ³)	Water Cont (%)	Type	ϕ (°)
102	0.0											
	0.5	Yell. brown gravelly sand with traces of silt	67	29	4	0	Non	Plastic				
	0.8	Change of the strata										
	1.0	Refusal strata in the form of Conglomerate										

ROCK PROFILE		Project : Proposed Project 375MW ACME Village Rampuriya, Tehsil Sahgada, Dist Jaisalmer, Rajasthan										Location :						
		B.H. Size : Nx				Water Table (m): N.E.				Term. Depth (m): 3m			B.H. No. : 18					
Depth (m)	Strata Description	No. of Core Pieces of Size (cm)			Core Recovery (%)					RQD (%)	Run Time (min)	Unit Weight (g/cm ³)	Porosity (%)	Water Absorption (%)	Unconfined Compressive Strength (kg/cm ²)	Point Load Strength (kg/cm ²)	Remarks	
		<10	10-25	25-75	>75	20	40	60	80									100
1.0	-																	N=31/8cm at 2.5m depth N=29/5cm at 3m depth
2.5	-																	
3.0	-																	

SOIL PROFILE			Project : Proposed Project 375MW ACME Village Rampuriya, Tehsil Sahgada, Dist Jaisalmer, Rajasthan										
			B.H. Location :		Water Table : N.E.		Term. Depth : 3m		B.H. No.: 19				
N - Value	Depth (m)	Soil Description	Grain Size Analysis				Atterberg		In-situ		Triaxial Test		
			Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Density (g/cm³)	Water Cont (%)	Type	c (kg/cm²)	φ (°)
30 													

ROCK PROFILE			Project : Proposed Project 375MW ACME Village Rampuriya, Tehsil Sahgada, Dist Jaisalmer, Rajasthan										Location :				
			B.H. Size : Nx				Water Table (m): N.E.				Term. Depth (m): 3m			B.H. No. : 19			
Depth (m)	Strata Description			No. of Core Pieces of Size (cm)		Core Recovery (%)				RQD (%)	Run Time (min)	Unit Weight (g/cm³)	Porosity (%)	Water Absorption (%)	Unconfined Compressive Strength (kg/cm²)	Point Load Strength (kg/cm²)	Remarks
				<10	10-25	25-75	>75	20	40								
1.5	-	Greyish white Sandstone			0	0	0				0	25					N=31/3cm at 3m depth
3.0	-				0												

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SOIL PROFILE			Project : Proposed Project 375MW ACME Village Rampuriya, Tehsil Sahgada, Dist Jaisalmer, Rajasthan										
			B.H. Location :		Water Table : N.E.		Term. Depth : 3m		B.H. No.: 20				
N - Value	Depth (m)	Soil Description	Grain Size Analysis				Atterberg		In-situ		Triaxial Test		
			Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Density (g/cm ³)	Water Cont (%)	Type	c (kg/cm ²)	φ (°)
37	0.0	Yellowish gravelly sand with silt	33	47	20	0	Non	Plastic	1.60	2.4			
	0.5												
	1.0												
	1.3												
114	1.5	Yellowish brown sand with traces of silt	0	91	9	0	Non	Plastic					
	1.8	Change of the strata											
	2.0	Refusal strata in the form of Conglomerate											

ROCK PROFILE		Project : Proposed Project 375MW ACME Village Rampuriya, Tehsil Sahgada, Dist Jaisalmer, Rajasthan										Location :					
		B.H. Size : Nx				Water Table (m): N.E.				Term. Depth (m): 3m			B.H. No. : 20				
Depth (m)	Strata Description	No. of Core Pieces of Size (cm)			Core Recovery (%)					RQD (%)	Run Time (min)	Unit Weight (g/cm³)	Porosity (%)	Water Absorption (%)	Unconfined Compressive Strength (kg/cm²)	Point Load Strength (kg/cm²)	Remarks
		<10	10-25	25-75	>75	20	40	60	80	100							
2.0	-	0	0	0						0	0	35					N=29/5cm at 3m depth
3.0	-																

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SOIL PROFILE			Project : Proposed Project 375MW ACME Village Rampuriya, Tehsil Sahgada, Dist Jaisalmer, Rajasthan										
			B.H. Location :			Water Table : N.E.		Term. Depth : 4m			B.H. No.: 21		
N - Value	Depth (m)	Soil Description	Grain Size Analysis				Atterberg		In-situ		Triaxial Test		
			Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Density (g/cm ³)	Water Cont (%)	Type	c (kg/cm ²)	φ (°)
26	0.0	Yellowish brown sand with traces of silt	0	91	9	0	Non	Plastic	1.82	17.8			
	0.5												
	1.0												
40	1.5	Yellowish brown sand with traces of silt	0	95	2	0	Non	Plastic	1.90	19.9			
	2.0												
58	2.5	Yellowish brown sand with traces of silt	0	98	2	0	Non	Plastic	1.92	18.6			
	3.0												
55	3.5	Yellowish brown sand with traces of silt	0	98	2	0	Non	Plastic					
34 5cm	4.0	Conglomerate											

ROCK PROFILE		Project : Proposed Project 375MW ACME Village Rampuriya, Tehsil Sahgada, Dist Jaisalmer, Rajasthan										Location :					
		B.H. Size : Nx				Water Table (m): N.E.			Term. Depth (m): 3m			B.H. No. : 28					
Depth (m)	Strata Description	No. of Core Pieces of Size (cm)			Core Recovery (%)				RQD (%)	Run Time (min)	Unit Weight (g/cm³)	Porosity (%)	Water Absorption (%)	Unconfined Compressive Strength (kg/cm²)	Point Load Strength (kg/cm²)	Remarks	
		<10	10-25	25-75	>75	20	40	60									80
1.5	-	14	0	0						16	0	27					
3.0	-																

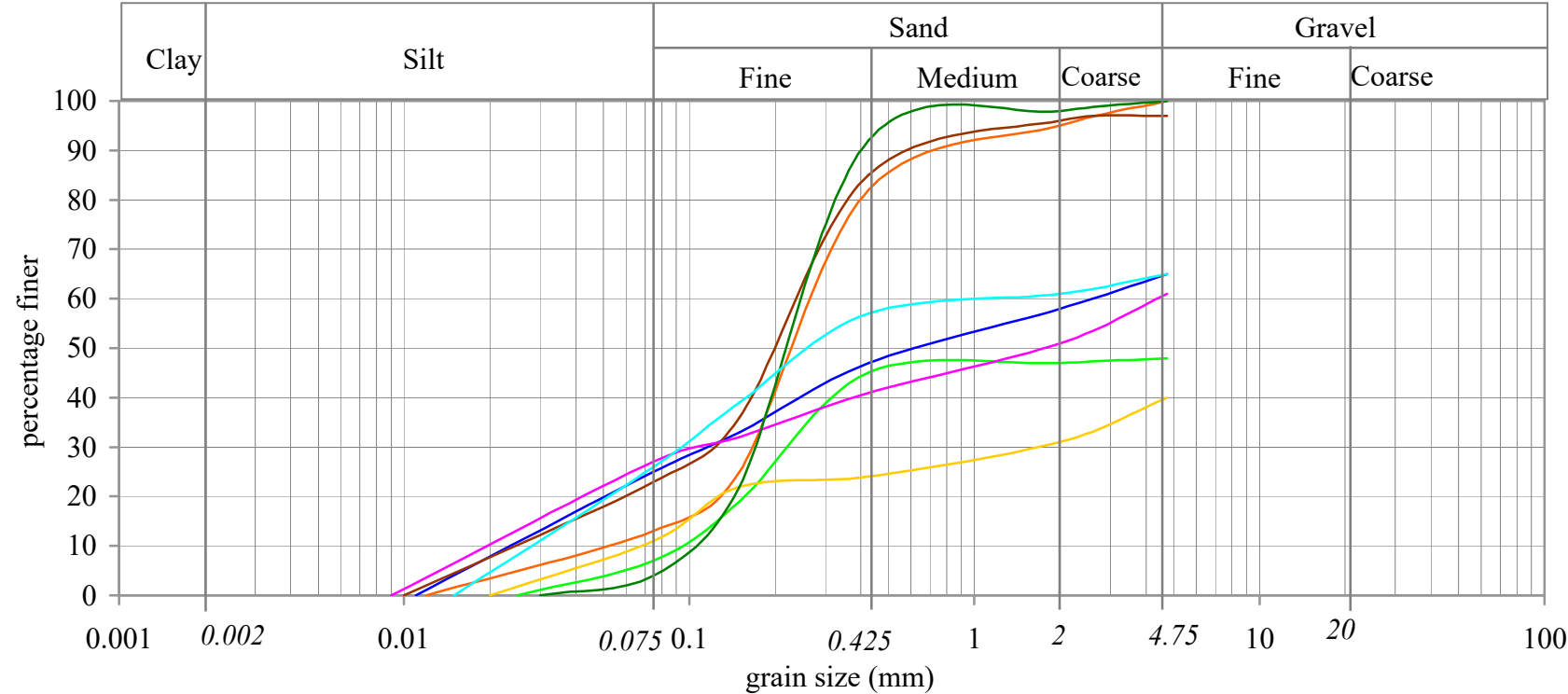
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SOIL PROFILE			Project : Proposed Project 375MW ACME Village Rampuriya, Tehsil Sahgada, Dist Jaisalmer, Rajasthan										
			B.H. Location :		Water Table : N.E.		Term. Depth : 3m		B.H. No.: 29				
N - Value	Depth (m)	Soil Description	Grain Size Analysis				Atterberg		In-situ		Triaxial Test		
			Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Density (g/cm³)	Water Cont (%)	Type	c (kg/cm²)	φ (°)
47 <													

ROCK PROFILE			Project : Proposed Project 375MW ACME Village Rampuriya, Tehsil Sahgada, Dist Jaisalmer, Rajasthan										Location :					
			B.H. Size : Nx				Water Table (m): N.E.				Term. Depth (m): 3m			B.H. No. : 29				
Depth (m)	Strata Description	No. of Core Pieces of Size (cm)			Core Recovery (%)					RQD (%)	Run Time (min)	Unit Weight (g/cm³)	Porosity (%)	Water Absorption (%)	Unconfined Compressive Strength (kg/cm²)	Point Load Strength (kg/cm²)	Remarks	
		<10	10-25	25-75	>75	20	40	60	80									100
1.5	-	Reddish/ whitish grey Sandstone	16	1	0					44	7	45						
3.0	-																	

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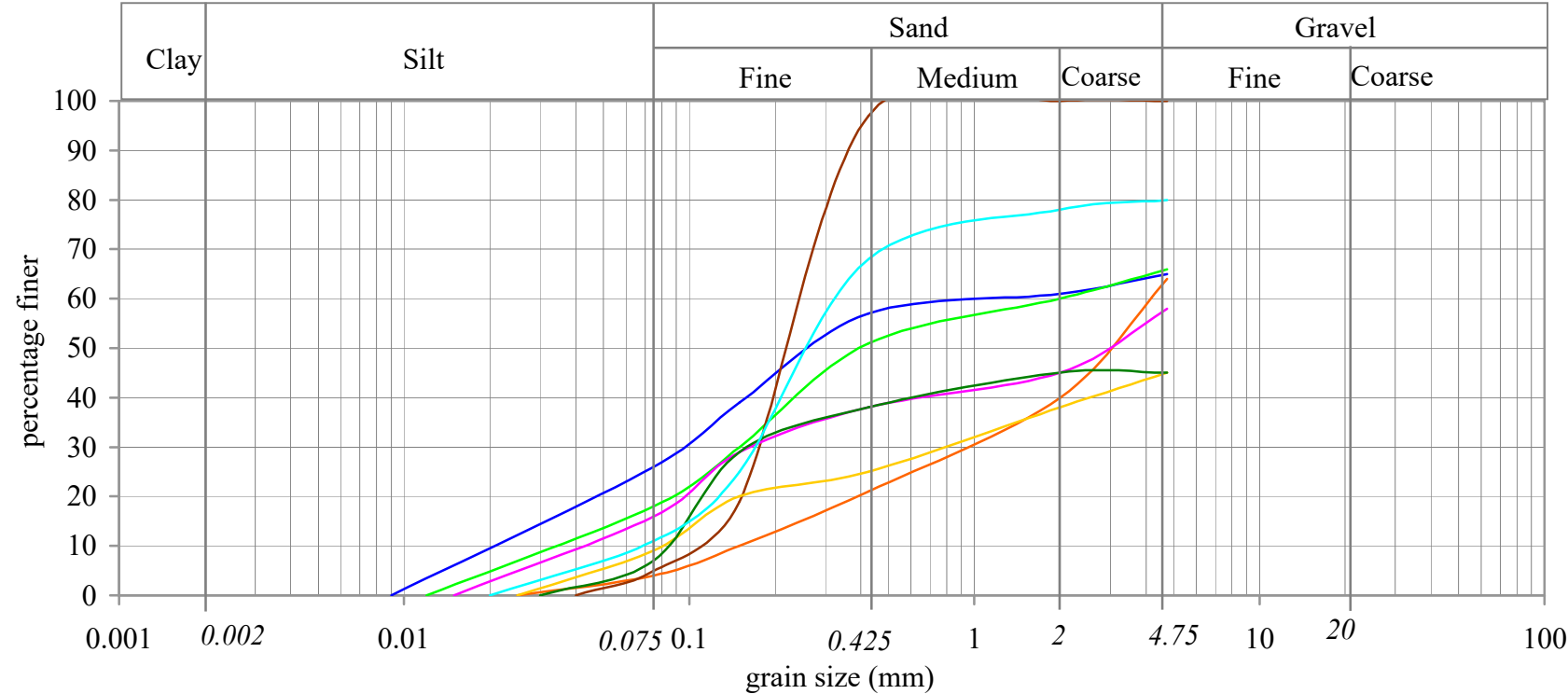
Grain Size Analysis Curves (refer paragraph no. 7.3.1)



Line Style	Bore hole	Depth (m)	Description	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	d ₆₀	d ₁₀	C _u
	1	0.5	Gravelly silty sand	35	40	25	0	2.5	0.025	100.0
	1	1	Sand with silt	0	87	13	0	0.26	0.051	5.1
	2	0.5	Gravelly silty sand	52	41	7	0	-	0.095	-
	3	0.5	Silty sand with gravel	3	74	23	0	0.25	0.25	1.0
	3	1.5	Gravelly silty sand	39	34	27	0	4.5	0.019	236.8
	4	0.5	Gravelly sand with silt	60	29	11	0	-	0.07	-
	5	0.5	Sand with silt	0	96	4	0	0.25	0.11	2.3

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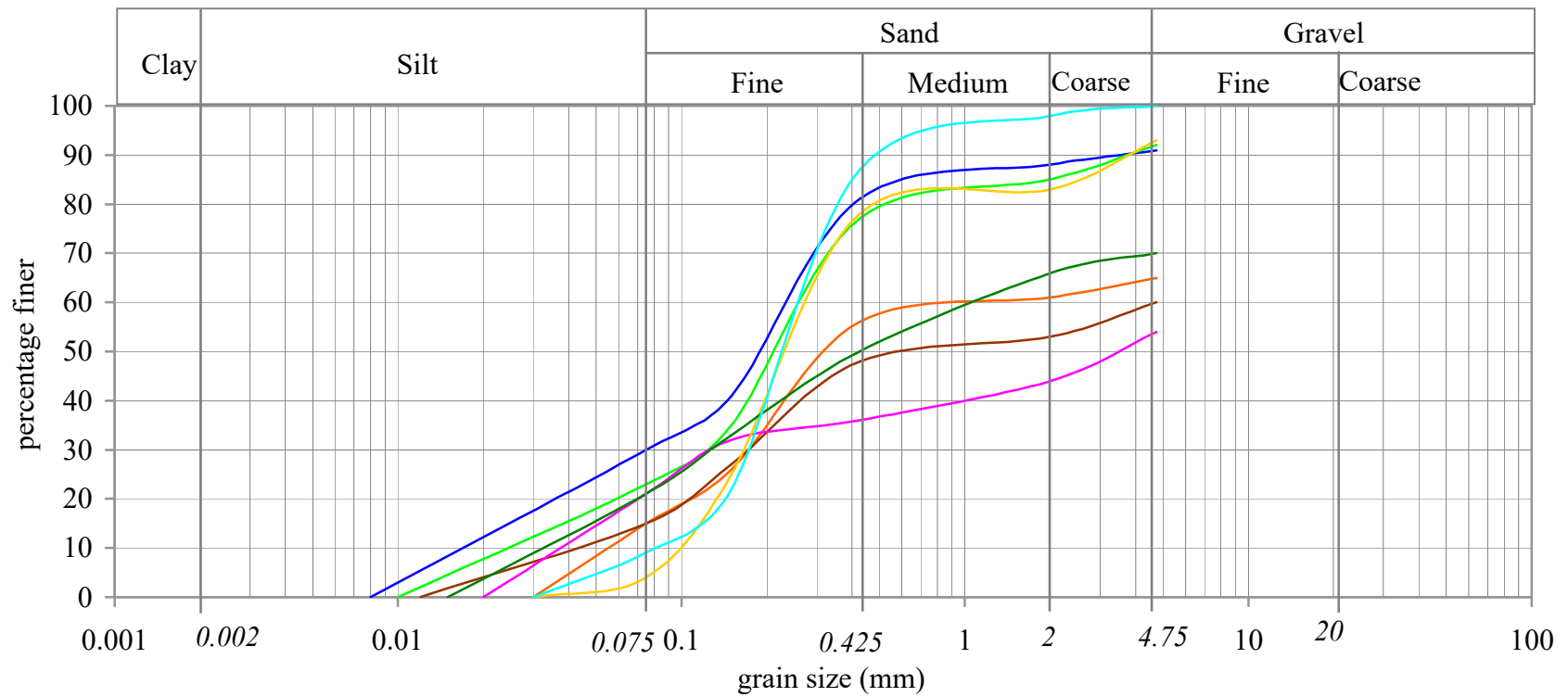
Grain Size Analysis Curves (refer paragraph no. 7.3.1)



Line Style	Bore hole	Depth (m)	Description	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	d ₆₀	d ₁₀	C _u
	7	0.5	Gravelly silty sand	35	39	26	0	1.1	0.021	52.4
	8	0.5	Gravelly sand with traces of silt	36	60	4	0	4	0.15	26.7
	9	0.5	Gravelly sand with silt	34	48	18	0	1.9	0.032	59.4
	9	1	Sand with traces of silt	0	95	5	0	0.25	0.11	2.3
	10	1	Gravelly silty sand	42	42	16	0	-	0.041	-
	10	1.5	Gravelly sand with traces of silt	55	36	9	0	-	-	-
	11	0.5	Gravelly sand with traces of silt	55	38	7	0	-	-	-
	11	1	Gravelly sand with silt	20	69	11	0	0.31	0.021	14.8

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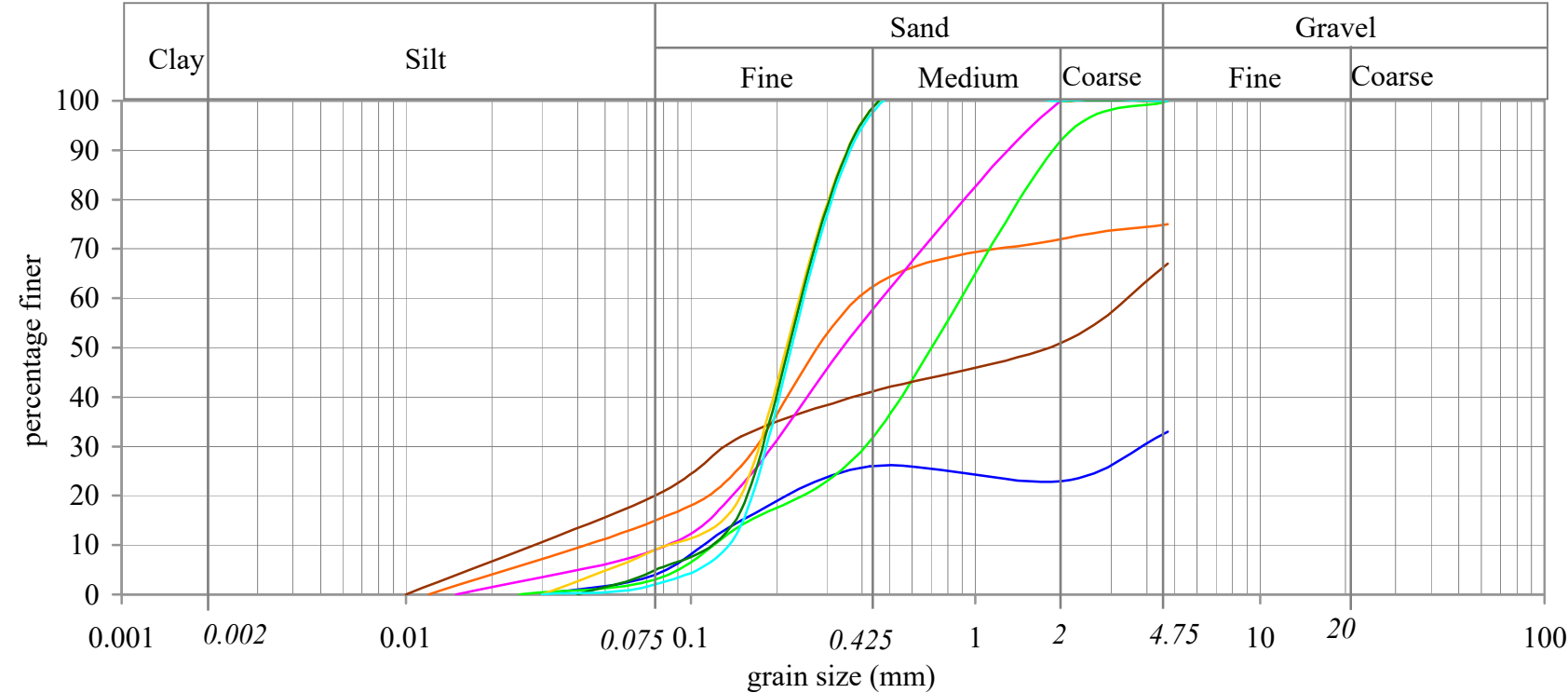
Grain Size Analysis Curves (refer paragraph no. 7.3.1)



Line Style	Bore hole	Depth (m)	Description	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	d ₆₀	d ₁₀	C _u
—	13	0.5	Silty sand with gravel	9	61	30	0	0.23	0.017	13.5
—	14	0.5	Gravelly silty sand	35	50	15	0	1	0.045	22.2
—	15	0.5	Silty sand with gravel	8	69	23	0	0.25	0.025	10.0
—	16	0.5	Gravelly sand with silt	40	45	15	0	4.75	0.041	115.9
—	16	1	Gravelly silty sand	46	33	21	0	-	0.038	-
—	16	1.5	Sand with traces of silt and gravel	7	89	4	0	0.27	0.11	2.5
—	17	0.5	Gravelly silty sand	30	49	21	0	1.2	0.032	37.5
—	17	1	Sand with traces of silt and gravel	0	91	9	0	0.27	0.024	11.3

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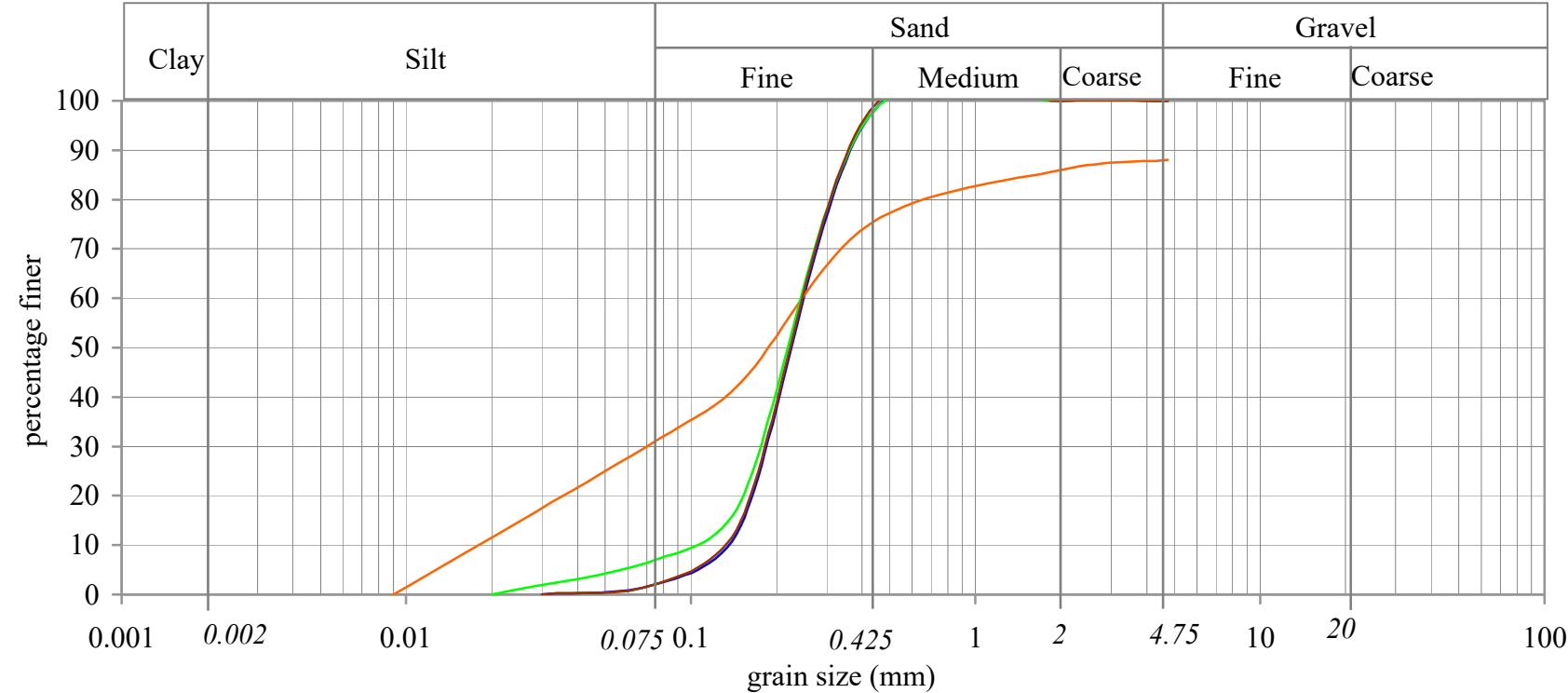
Grain Size Analysis Curves (refer paragraph no. 7.3.1)



Line Style	Bore hole	Depth (m)	Description	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	d ₆₀	d ₁₀	C _u
	18	0.5	Gravelly sand with traces of silt	67	29	4	0	-	0.12	-
	19	0.5	Gravelly sand with silt	25	60	15	0	0.038	0.041	0.9
	19	1	Sand with traces of silt and gravel	0	97	3	0	0.9	0.13	6.9
	20	1	Gravelly sand with silt	33	47	20	0	3.2	0.028	114.3
	20	1.5	Sand with traces of silt	0	91	9	0	0.45	0.081	5.6
	21	0.5	Sand with traces of silt	0	91	9	0	0.25	0.081	3.1
	21	1.5	Sand with traces of silt	0	95	5	0	0.25	0.13	1.9
	21	2.5	Sand with traces of silt	0	98	2	0	0.25	0.14	1.8

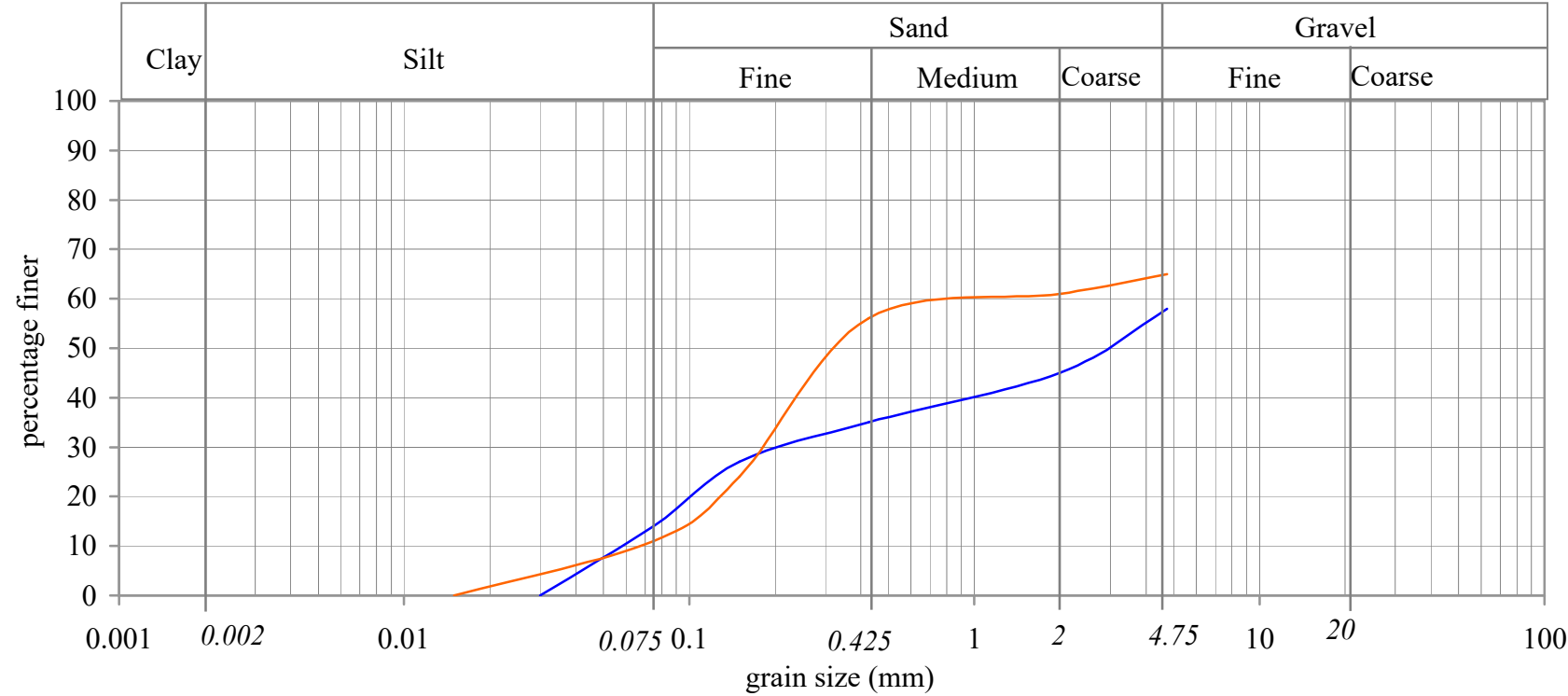
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Grain Size Analysis Curves (refer paragraph no. 7.3.1)

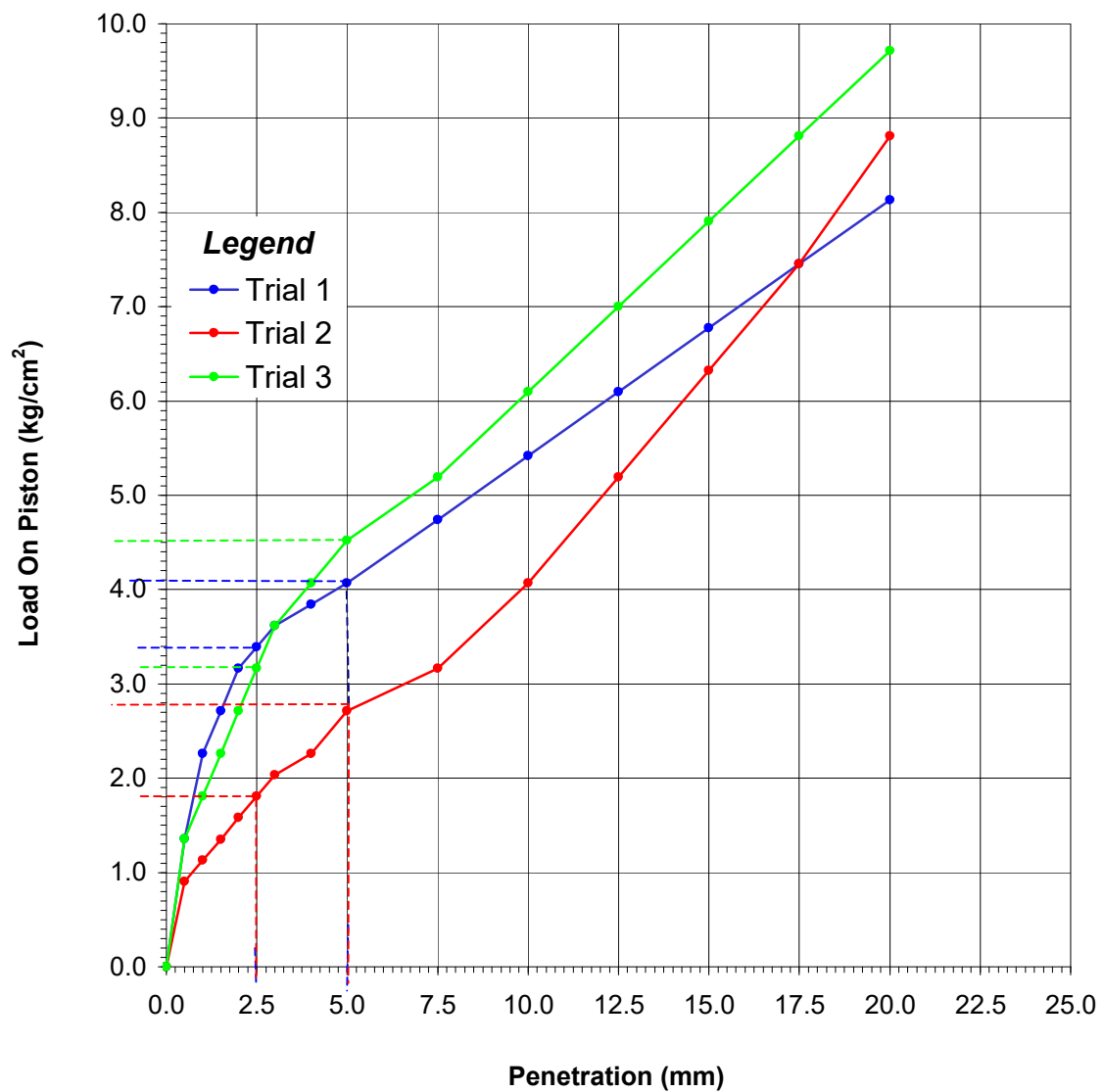


Line Style	Bore hole	Depth (m)	Description	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	d ₆₀	d ₁₀	C _u
	21	3.5	Sand with traces of silt	0	98	2	0	0.25	0.15	1.7
	28	1	Silty sand with gravel	12	57	31	0	0.25	0.019	13.2
	29	0.5	Sand with traces of silt	0	93	7	0	0.25	0.11	2.3
	29	1	Sand with traces of silt	0	98	2	0	0.25	0.14	1.8

Grain Size Analysis Curves (refer paragraph no. 7.3.1)



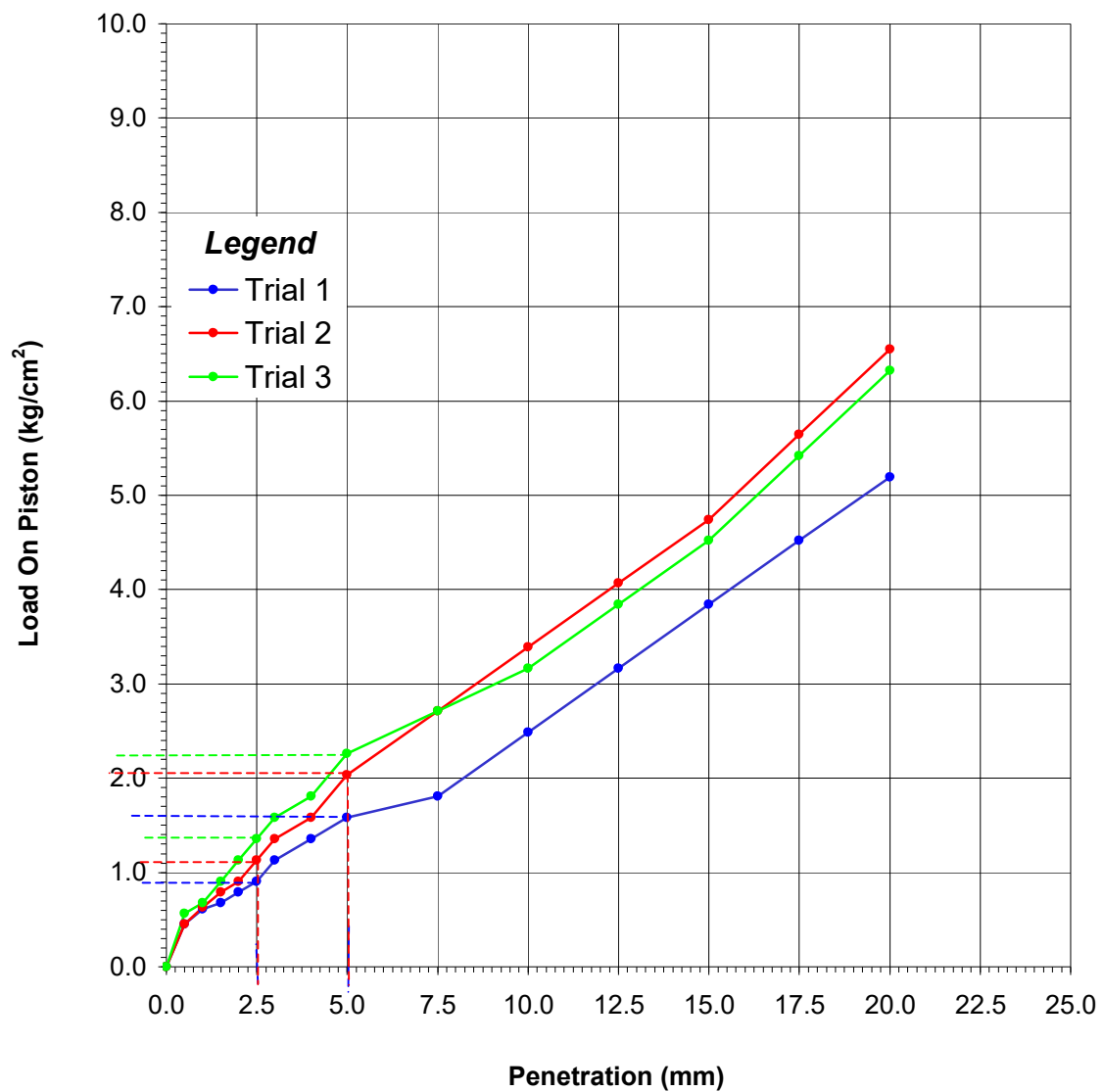
Line Style	Bore hole	Depth (m)	Description	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	d ₆₀	d ₁₀	C _u
	CBR1		Gravelly sand with silt	42	44	14	0	1	0.048	20.8
	CBR2		Gravelly sand with silt	35	54	11	0	0.7	0.068	10.3



PENETRATION	2.5 mm	5.0 mm
CBR VALUE		
Trial 1	4.9	3.9
Trial 2	2.6	2.7
Trial 3	4.6	4.2
<i>Average</i>	<i>4.0</i>	<i>3.6</i>

FIELD CBR TEST- 1
(Refer paragraph no. 7.16.1)

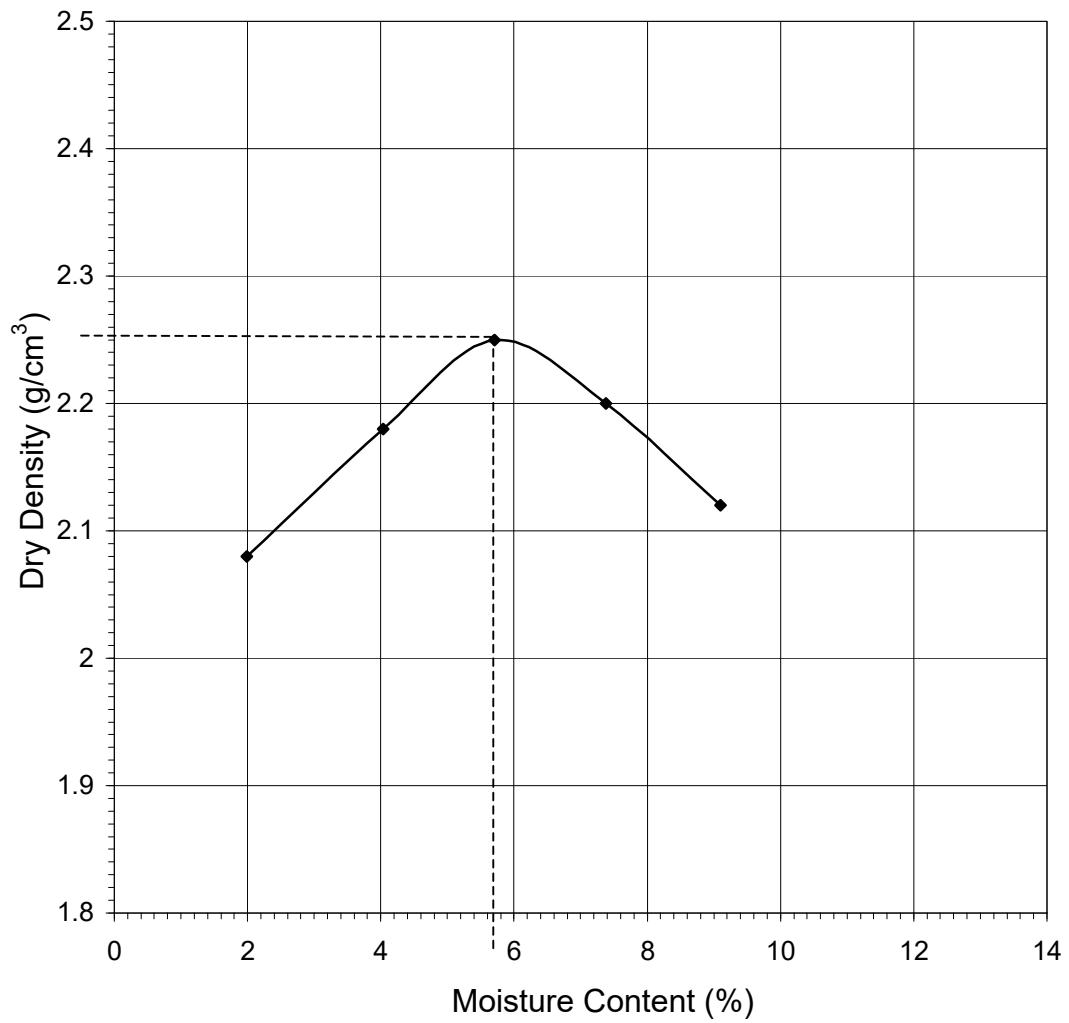
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PENETRATION	2.5 mm	5.0 mm
CBR VALUE		
Trial 1	1.3	1.5
Trial 2	1.6	2.0
Trial 3	2.0	2.1
<i>Average</i>	<i>1.6</i>	<i>1.9</i>

FIELD CBR TEST- 1
(Refer paragraph no. 7.16.1)

G(D)4536A

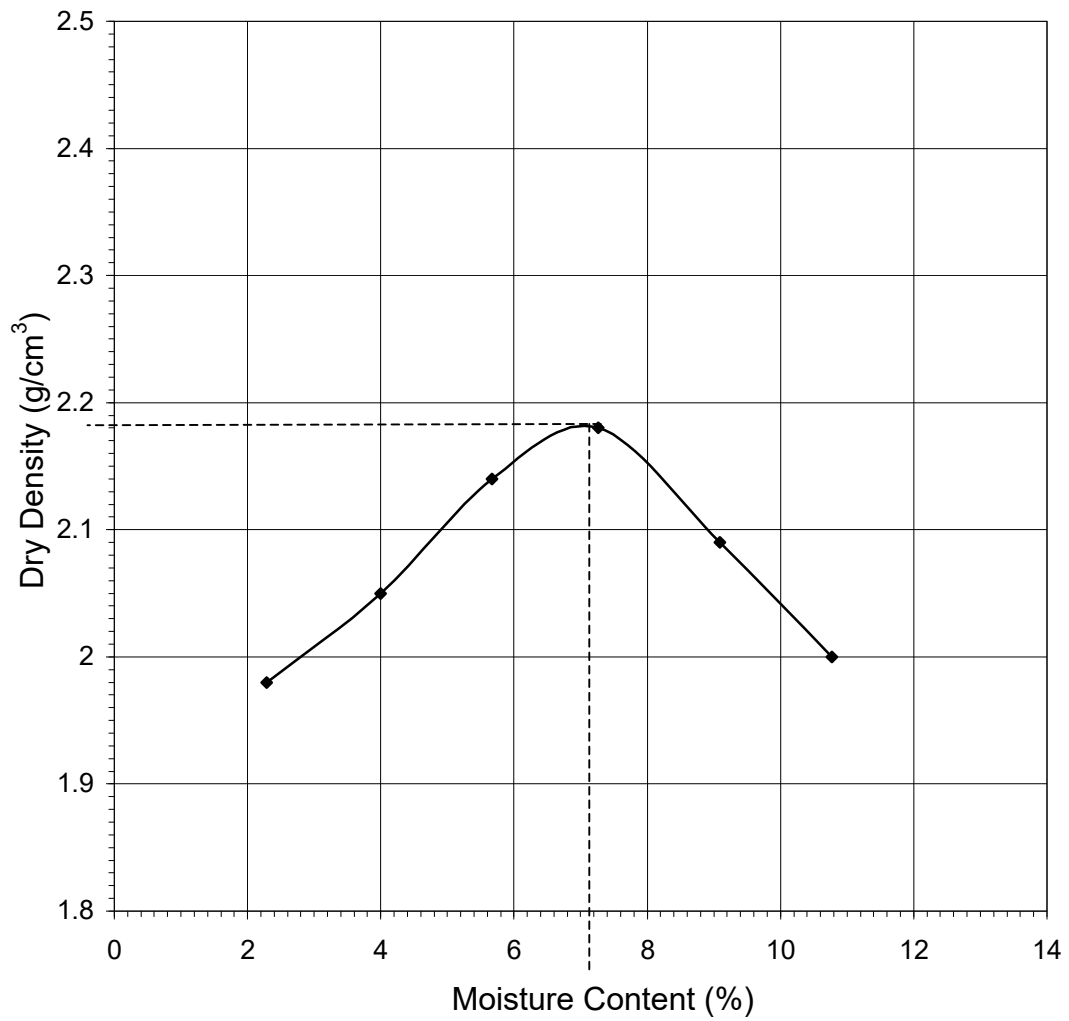


Maximum Dry Density = 2.25 g/cm³
Optimum Moisture Content = 5.7 %

Modified Proctor Density Test - 1

(Refer paragraph no. 7.10.1)

G(D)4536A

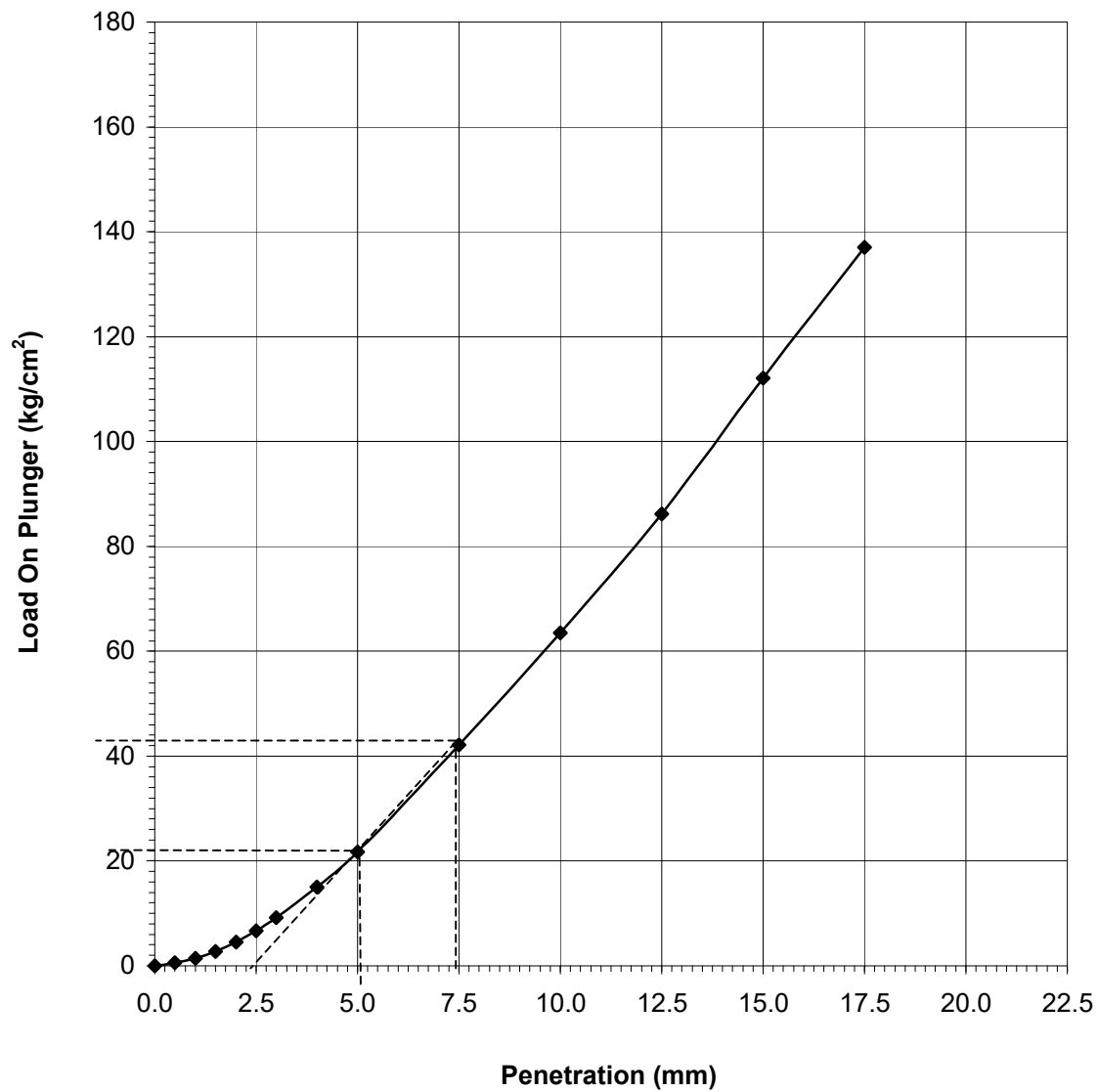


Maximum Dry Density = 2.18 g/cm³
Optimum Moisture Content = 7.1 %

Modified Proctor Density Test - 2

(Refer paragraph no. 7.10.1)

G(D) 4536A

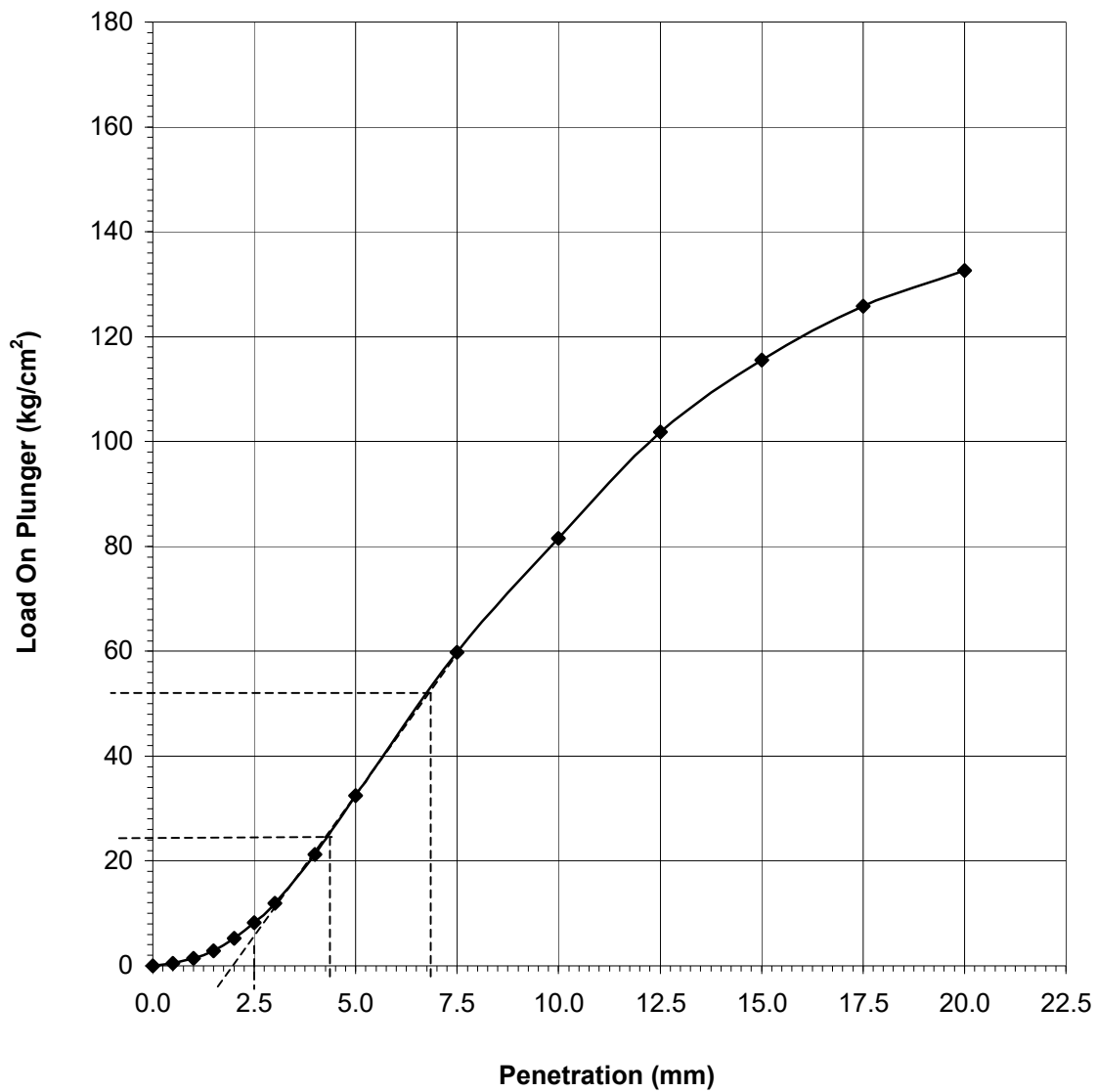


PENETRATION	2.5 mm	5.0 mm
CBR VALUE	31.4	40.0

Laboratory CBR Curve - 1

(Refer paragraph no. 7.11.1)

G(D) 4536A



PENETRATION	2.5 mm	5.0 mm
CBR VALUE	34.3	49.5

Laboratory CBR Curve - 2

(Refer paragraph no. 7.11.1)

G(D) 4536A