

**GEOTECHNICAL INVESTIGATION FOR PROPOSED
65 MW NLC SOLAR PV PROJECT AT CUDDALORE,
TAMIL NADU**

CLIENT

**M/s. BHARAT HEAVY ELECTRICALS LIMITED,
HYDERABAD**

TITLE

DRAFT REPORT

REPORT NO: SI/CHN/16/1334/40 MW/01

AUGUST 2016



GEO FOUNDATIONS & STRUCTURES PVT LTD

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SOIL INVESTIGATION REPORT

1.0 INTRODUCTION

- 1.1 The work of sub- soil Investigation for the for proposed 65 MW Solar Power Plant structures at NLC, Neyveli was entrusted to M/s. Geo Foundations and Structures (P) Ltd., Adyar, Chennai – 600 020, by M/s. BHEL PE & SD, Hyderabad. The entire project site is split in to two sites namely Site 1- 40 MW and Site 2 – 25 MW. **This report deals with details of twenty two bore holes of Site 1- 40 MW only.**
- 1.2 The soil Investigation and laboratory studies were carried out during **July** and **August 2016**. This report summarizes the results of the soil investigation, and presents recommendation for suitable type of foundation.

2.0 OBJECTIVE OF INVESTIGATION

- 2.1 The objective of soil investigation is to determine the nature and characteristics of sub-soil below the ground level for the proposed structures. The study includes identification of suitable type of foundation for the proposed structures and assessment of safe bearing capacity.

3.0 SCOPE OF WORK

The scope of work at this site comprises of the following:

- 3.1 Mobilization of boring rig with all necessary equipments and personnel.
- 3.2 Boring of **twenty two** bore holes of 150 mm diameter with Calyx drilling equipments through sand, silt, clay & rock etc up to hard strata.
- 3.3 Conducting Standard Penetration Tests in the bore holes and collecting the representative soil samples including packing and transportation to laboratory.
- 3.4 To conduct the following laboratory tests on soil samples:
 - (a) Sieve analysis
 - (b) Index properties:

- (i) Liquid limit
 - (ii) Plastic limit
 - (c) Dry & wet density
 - (d) Water content
 - (e) Specific gravity
 - (f) Direct shear test
 - (g) UCS
- 3.5 Recording ground water level.
- 3.6 Conducting Forty CBR Tests.
- 3.7 Conducting Forty Electrical Resistivity tests.
- 3.8 Conducting one Trial Pit.
- 3.9 Preparation and sub submitting detailed report with field and laboratory results and recommendations for foundations.

4.0 FIELD INVESTIGATIONS-GEO-TECHNICAL STUDIES

- 4.1 Boring rig with all requisite equipments and accessories were mobilized at the worksite. A team of technical personnel with skilled labours was also deputed.
- 4.2 **Twenty two** bore holes of 150 mm diameter were bored to a maximum depth up to **7.50 m** below the existing ground level. The bore holes were made as per relevant Indian Standard IS: 1892.
- 4.3 Representative soil samples were collected at every change of strata of about 0.5 m depth interval up to 7.50 m from the existing ground level up to the termination depth. The samples so collected were sealed and numbered with full particulars for identification and sent to the laboratory for conducting the required tests.

4.4 Standard Penetration tests were conducted in the bore holes at 0.5 m depth intervals up to 5 m from the existing ground level up to the termination depth, as per the relevant Indian Standard, IS: 2131. In this test, a standard split spoon sampler is driven into the ground at the required depth by means of standard hammer of 63.5 kgs weight, falling from a height of 75 cm. Number of blows for the first 15 cm is not taken into consideration because of possible disturbances or presence of settled, suspended matters at the bottom of the bore- holes. The total number of blows for the next 30 cm depth of penetration is considered as SPT 'N' value as shown in Figure nos. 1 to 22.

5.0 LABORATORY INVESTIGATION

The following laboratory tests were conducted on the selected soil samples collected from the test bore holes:

- (a) Sieve analysis
- (b) Index properties:
 - (i) Liquid limit
 - (ii) Plastic limit
- (c) Dry & wet density
- (d) Water content
- (e) Specific gravity
- (f) Free swell index

All the above laboratory tests were carried out as per relevant Indian Standards.

All the soil samples were identified and classified as per relevant Indian Standard, IS: 1498. The results are shown in Tables Nos. 1 to 22.

6.0 SOIL PROFILE

Soil profile of the bore holes are as given below:

In bore hole BH 1, loose clayey sand occurs from ground level up to 1.5 m, followed by dense to very dense clayey sand up to **5.5 m**, at which depth the borehole was terminated.

In bore hole BH 2, loose clayey sand occurs from ground level up to 1.5 m, followed by hard sandy clay of medium plasticity up to **4.5 m**, followed by very dense clayey sand, at which depth the borehole was terminated.

In bore hole BH 3, loose clayey sand occurs from ground level up to 1.5 m, followed by dense clayey sand up to 2.5 m, hard sandy clay of medium plasticity up to 4.5 m, followed by very dense clayey sand, at which depth the borehole was terminated.

In bore hole BH 4, stiff sandy clay of medium plasticity occurs from ground level up to 1.5 m, followed by hard sandy clay of medium plasticity up to **5.5 m**, at which depth the borehole was terminated.

In bore hole BH 5, medium dense clayey sand occurs from ground level up to 2.5 m, followed by hard sandy clay of medium plasticity up to **5.5 m**, at which depth the borehole was terminated.

In bore hole BH 6, medium stiff to hard sandy clay of medium plasticity occurs from ground level up to 1.5 m, followed by very stiff to hard sandy clay of medium plasticity up to 3.5 m, very dense clayey sand with gravel up to 4.5 m, followed by very dense clayey sand up to **5.5 m**, at which depth the borehole was terminated.

In bore hole BH 7, loose clayey sand occurs from ground level up to 1.5 m, followed by stiff sandy clay of medium plasticity up to 2.5 m, very dense clayey sand with gravel up to 3.5 m, very dense clayey sand up to **5 m**, followed by hard sandy clay of medium plasticity, at which depth the borehole was terminated.

In bore hole BH 8, loose clayey sand occurs from ground level up to 1.5 m, followed by very stiff sandy clay of medium plasticity up to 2.5 m, very dense clayey sand up to **4.5 m**,

followed by hard sandy clay of medium plasticity, at which depth the borehole was terminated.

In bore hole BH 9, medium stiff sandy clay of low plasticity occurs from ground level up to 1.5 m, followed by very stiff sandy clay of medium plasticity up to 2.5 m, followed by hard sandy clay of medium plasticity up to **5.5 m**, at which depth the bore hole was terminated.

In bore hole BH 10, loose clayey sand of medium plasticity occurs from ground level up to 4 m, followed by hard sandy clay of low to medium plasticity up to **5.5 m**, at which depth the borehole was terminated.

In bore hole BH 11, loose to medium dense clayey sand occurs from ground level up to 2.5 m, followed by very dense clayey sand with gravel up to 3.5 m, hard sandy clay of low plasticity occurs up to **5.5 m**, followed by very dense clayey sand, at which depth the borehole was terminated.

In bore hole BH 12, Loose dense clayey sand occurs from ground level up to 1.5 m, followed by very stiff sandy clay of medium plasticity up to 2.5 m, hard sandy clay of medium plasticity up to 4.5 m, very dense silty sand up to **5.5 m**, followed by hard sandy clay of medium plasticity, at which depth the borehole was terminated.

In bore hole BH 13, medium stiff sandy clay of medium plasticity occurs from ground level up to 1.5 m, followed by hard sandy clay of low to medium plasticity up to **4.5 m**, at which depth the borehole was terminated.

In bore hole BH 14, loose clayey sand occurs from ground level up to 1.5 m, followed by medium dense clayey sand up to 2.5 m, very dense clayey sand up to **5.5 m**, at which depth the borehole was terminated.

In bore hole BH 15, loose clayey sand occurs from ground level up to 1.5 m followed by very stiff sandy clay of low plasticity up to 2.5 m, hard sandy clay of low plasticity up to 4.5

m, followed by very dense clayey sand up to **5.5 m**, at which depth the borehole was terminated.

In bore hole BH 16, medium dense clayey sand occurs from ground level up to 1.5 m, followed by very dense clayey sand up to 3.5 m, very dense, clayey sand with gravel of up to 4.5 m, followed by very dense clayey sand up to **5.5 m**, at which depth the borehole was terminated.

In bore hole BH 17, loose to medium dense clayey sand occurs from ground level up to 3 m, followed by very dense clayey sand up to **5 m**, at which depth the borehole was terminated.

In bore hole BH 18, medium sandy clay of low plasticity occurs from ground level up to 1.5 m, followed by hard sandy clay of low plasticity up to 3.5 m, very dense clayey sand occurs up to **5 m**, followed by very dense silty sand, at which depth the borehole was terminated.

In bore hole BH 19, medium clayey sand of occurs from ground level up to 1.5 m, followed by very dense clayey sand up to **5.5 m**, at which depth the borehole was terminated.

In bore hole BH 20, loose to medium dense clayey sand occurs from ground level up to 4 m, followed by very dense clayey sand up to **6.5 m**, at which depth the borehole was terminated.

In bore hole BH 21, loose to medium clayey sand of occurs from ground level up to 3.5 m, followed by very dense clayey sand of up to **7.5 m**, followed by very dense clayey sand, at which depth the borehole was terminated.

In bore hole BH 22, loose to medium dense clayey sand occurs from ground level up to 2.5 m, followed by very dense clayey sand up to **5.5 m**, at which depth the borehole was terminated.

7.0 GROUND WATER LEVEL

Ground water level was met at a depth ranging from **2.2 m** to **3.5 m**, with in the bore holes during the continuous boring from **23.07.2016** to **02.08.2016**.

8.0 DESIGN PARAMETERS

Shear Parameters as presented in table-23 below were retrieved from UDS samples collected from Bore holes and CBR locations.

TABLE 23

Bore holes	Depth from EGL	Type of sub Soil stratum	Test type	Shear Parameters	
				C (kg/cm²)	φ in degree
BH – 3	1.0	Clayey SAND	DS	-	29
BH – 4	1.0	Sandy CLAY	TA	0.55	8
BH – 6	1.0	Sandy CLAY	TA	0.63	11
BH – 8	1.0	Sandy CLAY	TA	0.60	8
BH -10	1.0	Clayey SAND	DS	-	28
BH – 11	1.0	Clayey SAND	DS	-	29
BH – 14	1.0	Clayey SAND	DS	-	28
BH – 16	1.0	Clayey SAND	DS	-	31

CBR	Depth from EGL (m)	Type of sub Soil stratum	Test type	Shear Parameters	
				C (kg/cm ²)	φ in degree
CBR-1	0.5	Clayey SAND	DS	-	31
CBR-2	0.5	Clayey SAND	DS	-	30
CBR-3	0.5	Clayey SAND	DS	-	28
CBR-4	0.5	Sandy CLAY	TA	0.63	8
CBR-5	0.5	Sandy CLAY	TA	0.60	8
CBR-6	0.5	Clayey SAND	DS	-	28
CBR-7	0.5	Clayey SAND	DS	-	27
CBR-8	0.5	Sandy CLAY	TA	0.45	8
CBR-9	0.5	Clayey SAND	DS	-	28
CBR-10	0.5	Clayey SAND	DS	-	29
CBR-11	0.5	Sandy CLAY	TA	0.41	8
CBR-12	0.5	Clayey SAND	DS	-	30
CBR-13	0.5	Sandy CLAY	TA	0.40	9
CBR-15	0.5	Clayey SAND	DS	-	27
CBR-17	0.5	Clayey SAND	DS	-	28
CBR-18	0.5	Clayey SAND	DS	-	29
CBR-21	0.5	Sandy CLAY	TA	0.55	8
CBR-22	0.5	Sandy CLAY	TA	0.60	6
CBR-23	0.5	Sandy CLAY	TA	0.60	5

9.0 DISCUSSION AND RECOMMENDATIONS ON RESULTS AND TYPE OF FOUNDATIONS:

On the basis of subsoil conditions discussed in Sl. No. 6, Pile foundations may be considered.

PILE FOUNDATIONS:

- Bored cast in situ concrete pile foundations of 2 m length from existing ground level are recommended.
- The recommended safe load carrying capacity of bored cast in situ concrete piles as per IS 2911 (Part 1/Sec2) for 30 cm pile diameter is presented in Table 23.

TABLE 24

Approximate Length of Pile from G.L (m)	Dia (cm)	Recommended Safe Vertical Capacity (T)	Lateral Capacity (T)	Up lift capacity (T)
2 m	30	3.5	1.0	1.5

- 10.0** The results and recommendations given in this report are based on the results of the soil investigation carried out. If, in actual execution, any variation is found, the consultants may also be referred to.

For GEO FOUNDATIONS & STRUCTURES PVT. LTD.

A. Suresh Kumar, M.Tech (Geo technical), **M.B.A** (T.M)


D.G.M. (Geo Technical)



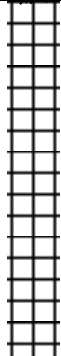
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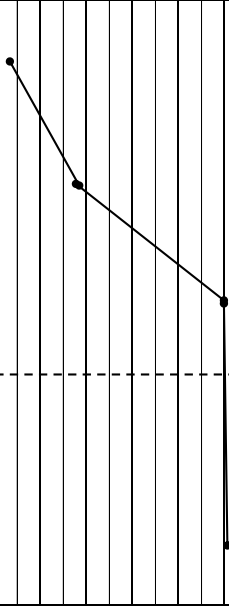

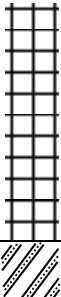
Dr. K. Muthukrishnaiah BE (Hons), M.Tech., Ph.D.,
(Professor & Head, Ocean Engineering Dept. IIT Madras)(Rtd),
(Chief Consultant)


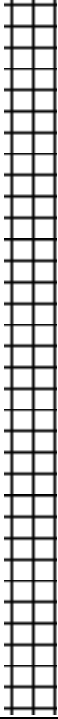
APPENDIX I



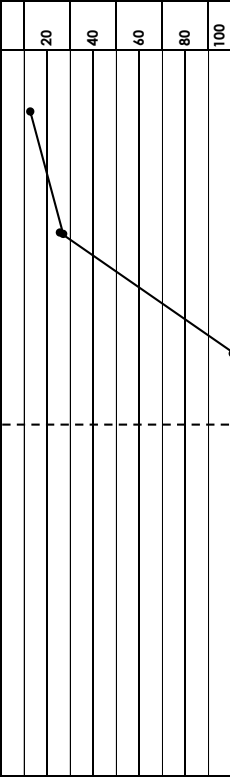

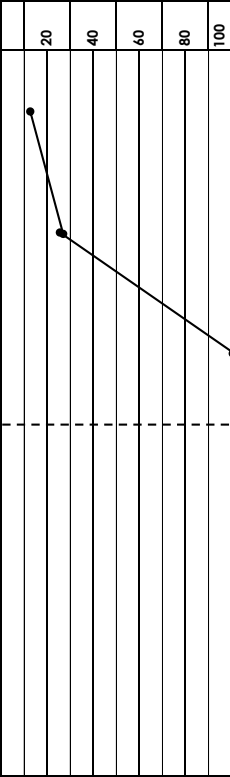

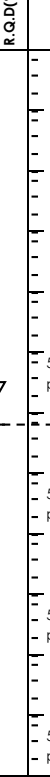
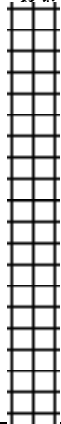
BORELOGS


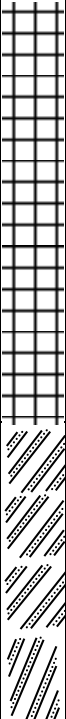
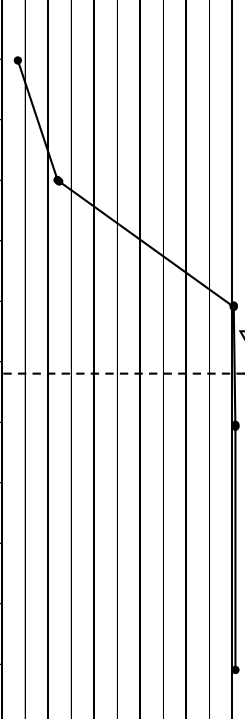
Project : Soil Investigation for 65 MW NLC Solar PV Project at Cuddalore, Tamil Nadu																					
 <p>GEO FOUNDATIONS & STRUCTURES PVT. LTD</p>				Bore Hole No : BH-1 Location : 40 MW, NLC Co-ordinates : N 12869, E 4308 Type of Boring : Calyx Ground Water Level : 3.00 m from G.L on 01.08.2016 Termination Depth : 5.50 m						Drillhole Record -BH-1 Fig No. 1											
				Start Date : 31.07.2016 End Date : 31.07.2016																	
SOIL DESCRIPTION	COLOUR	STRUCTURE	GROUND LEVEL (m)	LEGEND	TEST NO	SAMPLE TYPE	DEPTH (m)	TEST DEPTH(m)	PENETRATION VALUES			SPT 'N' Blows/300mm	SPT 'N' PROFILE					REMARKS			
									15cm	30cm	45cm		20	40	60	80	100		C.R (%)	R.Q.D (%)	
Clayey SAND (SC-CL)	Red	Loose, Granular	1.50		SPT-1	SS	0.50	0.50-0.95	3	4	5	9	20	40	60	80	100				
Clayey SAND (SC-CI)	Red	Dense, Granular	2.50		SPT-2	SS	1.50	1.50-1.95	11	16	21	37									
					SPT-3	SS	2.50	2.50-2.95	18	31	45	76									
Clayey SAND (SC-CL)	Red	Very Dense, Granular	3.50		SPT-4	SS	3.50	3.50-3.90	24	41	>50	>100									
					SPT-5	SS	4.50	4.50-4.76	31	>50	-	>100									
					SPT-6	SS	5.50	5.50-5.75	35	>50	-	>100									
G.W.L: 3.00 m from G.L on 01.08.2016				No of SPT: 06 Nos		REMARKS															







Project : Soil Investigation for 65 MW NLC Solar PV Project at Cuddalore, Tamil Nadu																					
 <p>GEO FOUNDATIONS & STRUCTURES PVT. LTD</p>				Bore Hole No : BH-2 Location : 40 MW, NLC Co-ordinates : N 13156, E 4520 Type of Boring : Calyx Ground Water Level : 3.40 m from G.L on 27.07.2016 Termination Depth : 4.50 m						Drillhole Record -BH-2 Fig No. 2											
										Start Date : 26.07.2016 End Date : 26.07.2016											
SOIL DESCRIPTION	COLOUR	STRUCTURE	GROUND LEVEL (m)	LEGEND	TEST NO	SAMPLE TYPE	DEPTH (m)	PENETRATION VALUES			SPT 'N' Blows/300mm	SPT 'N' PROFILE					REMARKS				
								15cm	30cm	45cm		20	40	60	80	100		C.R (%)	R.Q.D (%)		
Clayey SAND (SC-CI)	Red	Loose, Granular	1.50		SPT-1	SS	0.50	0.50-0.95	4	4	5	9									
					SPT-2	SS	1.50	1.50-1.95	14	26	38	64									
Sandy CLAY (CI-SC)	Red	Hard, Layered	4.50		SPT-3	SS	2.50	2.50-2.85	30	48	>50	>100							50/05 cm penetration		
					SPT-4	SS	3.50	3.50-3.73	44	>50	-	>100									50/08 cm penetration
					SPT-5	SS	4.50	4.50-4.63	>50	-	-	>100									
G.W.L: 3.40 m from G.L on 27.07.2016			No of SPT: 05 Nos			REMARKS															





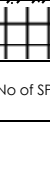
Project : Soil Investigation for 65 MW NLC Solar PV Project at Cuddalore, Tamil Nadu																				
 <p>GEO FOUNDATIONS & STRUCTURES PVT. LTD</p>				Bore Hole No : BH-3 Location : 40 MW, NLC Co-ordinates : N 12181 E 4520 Type of Boring : Calyx Ground Water Level : 3.10 m from G.L on 27.07.2016 Termination Depth : 4.50 m						Drillhole Record -BH-3 Fig No. 3 Start Date : 25.07.2016 End Date : 26.07.2016										
				SOIL DESCRIPTION	COLOUR	STRUCTURE	GROUND LEVEL (m)	LEGEND	TEST NO	SAMPLE TYPE	DEPTH (m)	TEST DEPTH(m)	PENETRATION VALUES			SPT 'N' PROFILE	C.R (%)	R.Q.D (%)	REMARKS	
									15cm	30cm	45cm	SPT 'N' Blows/300mm	20	40	60	80	100			
Clayey SAND (SC-CL)	Red	Loose, Granular	1.50		SPT-1	SS	0.50	0.50-0.95	3	4	5	9								
		Dense, Granular	2.50		SPT-2	SS	1.50	1.50-1.95	11	18	21	39								
Sandy CLAY (CI-SC)	Red	Hard, Layered	4.50		SPT-3	SS	2.50	2.50-2.92	21	45	>50	>100							50/12 cm penetration	
					SPT-4	SS	3.50	3.50-3.61	>50	-	-	>100							50/11 cm penetration	
					SPT-5	SS	4.50	4.50-4.59	>50	-	-	>100							50/09 cm penetration	
Reddish, Very Dense, Clayey SAND (SC-CL)																				
G.W.L: 3.10 m from G.L on 27.07.2016				No of SPT: 05 Nos			REMARKS													


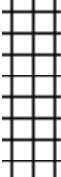
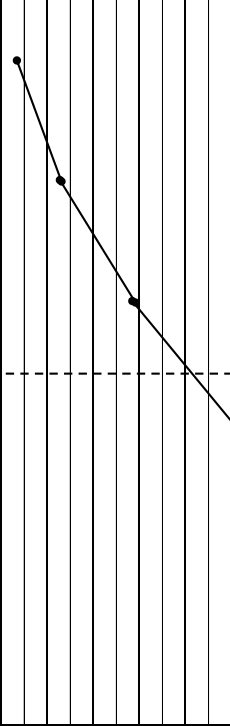
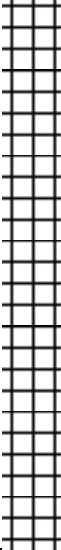
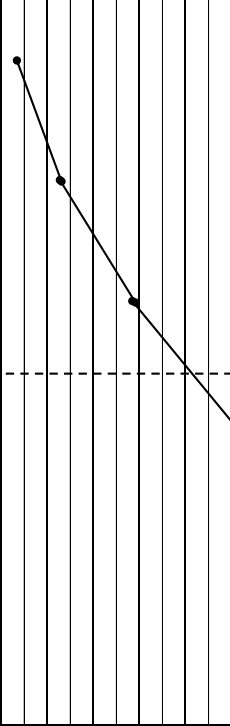
Project : Soil Investigation for 65 MW NLC Solar PV Project at Cuddalore, Tamil Nadu																				
 <p>GEO FOUNDATIONS & STRUCTURES PVT. LTD</p>				Bore Hole No : BH-4 Location : 40 MW, NLC Co-ordinates : N 12619 E 4579 Type of Boring : Calyx Ground Water Level : 3.00 m from G.L on 01.08.2016 Termination Depth : 5.50 m						Drillhole Record -BH-4 Fig No. 4										
										Start Date : 31.07.2016 End Date : 31.07.2016										
SOIL DESCRIPTION	COLOUR	STRUCTURE	GROUND LEVEL (m)	LEGEND	TEST NO	SAMPLE TYPE	DEPTH (m)	PENETRATION VALUES			SPT 'N' Blows/300mm	SPT 'N' PROFILE					REMARKS			
								15cm	30cm	45cm		20	40	60	80	100		C.R (%)	R.Q.D (%)	
Sandy CLAY (Cl-SC)	Red	Stiff, Layered	1.50		SPT-1	SS	0.50	0.50-0.95	3	5	6	11	20	40	60	80	100			
		SPT-2			SS	1.50	1.50-1.95	7	17	21	28									
		SPT-3			SS	2.50	2.50-2.95	22	36	43	79									
	SPT-4	SS	3.50		3.50-3.76	29	>50	-	>100										50/11 cm penetration	
	SPT-5	SS	4.50		4.50-4.75	42	>50	-	>100										50/10 cm penetration	
	SPT-6	SS	5.50		5.50-5.62	>50	-	-	>100										50/12 cm penetration	
G.W.L: 3.00 m from G.L on 01.08.2016			No of SPT: 06 Nos			REMARKS														



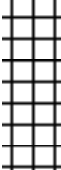
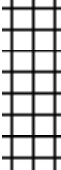
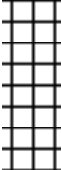
Project : Soil Investigation for 65 MW NLC Solar PV Project at Cuddalore, Tamil Nadu																				
 <p>GEO FOUNDATIONS & STRUCTURES PVT. LTD</p>				Bore Hole No : BH-5 Location : 40 MW, NLC Co-ordinates : N 12604 E 4744 Type of Boring : Calyx Ground Water Level : 3.10 m from G.L on 31.07.2016 Termination Depth : 5.50 m						Drillhole Record -BH-5 Fig No. 5 Start Date : 30.07.2016 End Date : 30.07.2016										
				SOIL DESCRIPTION	COLOUR	STRUCTURE	GROUND LEVEL (m)	LEGEND	TEST NO	SAMPLE TYPE	DEPTH (m)	TEST DEPTH(m)	PENETRATION VALUES			SPT 'N' PROFILE	C.R (%)	R.Q.D(%)	REMARKS	
									15cm	30cm	45cm	SPT 'N' Blows/300mm	20	40	60	80	100			
Clayey SAND (SC-CL)	Red	Medium Dense, Granular	2.50		SPT-1	SS	0.50	0.50-0.95	4	5	7	12								
					SPT-2	SS	1.50	1.50-1.95	6	11	16	27								
					SPT-3	SS	2.50	2.50-2.89	40	47	>50	>100								50/09 cm penetration
Sandy CLAY (CI-SC)	Red	Hard, Layered	5.50		SPT-4	SS	3.50	3.50-3.64	>50	-	-	>100								50/14 cm penetration
					SPT-5	SS	4.50	4.50-4.63	>50	-	-	>100								50/13 cm penetration
					SPT-6	SS	5.50	5.50-5.78	47	>50	-	>100								50/13 cm penetration
G.W.L: 3.10 m from G.L on 31.07.2016				No of SPT: 06 Nos				REMARKS												



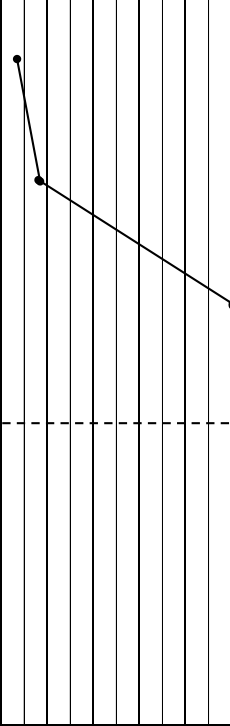
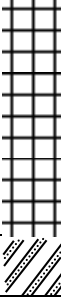
Project : Soil Investigation for 65 MW NLC Solar PV Project at Cuddalore, Tamil Nadu																				
 <p>GEO FOUNDATIONS & STRUCTURES PVT. LTD</p>				Bore Hole No : BH-6 Location : 40 MW, NLC Co-ordinates : N 12703 E 4732 Type of Boring : Calyx Ground Water Level : 2.90 m from G.L on 31.07.2016 Termination Depth : 5.50 m					Drillhole Record -BH-6 Fig No. 6 Start Date : 30.07.2016 End Date : 30.07.2016											
				SOIL DESCRIPTION	COLOUR	STRUCTURE	GROUND LEVEL (m)	LEGEND	TEST NO	SAMPLE TYPE	DEPTH (m)	TEST DEPTH(m)	PENETRATION VALUES			SPT 'N' PROFILE	C.R (%)	R.Q.D(%)	REMARKS	
									15cm	30cm	45cm	SPT 'N' Blows/300mm	20	40	60	80	100			
Sandy CLAY (CI-SC)	Red	Medium Stiff, Layered	1.50		SPT-1	SS	0.50	0.50-0.95	3	4	5	9								
		Very Stiff, Layered	2.50		SPT-2	SS	1.50	1.50-1.95	5	8	13	21								
	Hard, Layered	3.50	SPT-3		SS	2.50	2.50-2.94	16	42	>50	>100	50/14 cm penetration								
Clayey SAND with gravel (SC-CI-G)	Red	Very Dense, Granular	4.50		SPT-4	SS	3.50	3.50-3.78	39	>50	-	>100								50/13 cm penetration
			4.50		SPT-5	SS	4.50	4.50-4.76	41	>50	-	>100								50/11 cm penetration
Clayey SAND (SC-CI)	Red	Very Dense, Granular	5.50		SPT-6	SS	5.50	5.50-5.79	38	>50	-	>100								50/14 cm penetration
G.W.L: 2.90 m from G.L on 31.07.2016				No of SPT: 06 Nos			REMARKS													


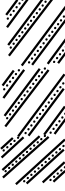
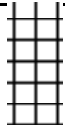



Project : Soil Investigation for 65 MW NLC Solar PV Project at Cuddalore, Tamil Nadu																			
 <p>GEO FOUNDATIONS & STRUCTURES PVT. LTD</p>				Bore Hole No : BH-7 Location : 40 MW, NLC Co-ordinates : N 13156 E 4770 Type of Boring : Calyx Ground Water Level : 2.75 m from G.L on 27.06.2016 Termination Depth : 5.00 m						Drillhole Record -BH-7 Fig No. 7									
										Start Date : 26.07.2016 End Date : 26.07.2016									
SOIL DESCRIPTION	COLOUR	STRUCTURE	GROUND LEVEL (m)	LEGEND	TEST NO	SAMPLE TYPE	DEPTH (m)	TEST DEPTH(m)	PENETRATION VALUES			SPT 'N' Blows/300mm	SPT 'N' PROFILE					REMARKS	
									15cm	30cm	45cm		20	40	60	80	100		C.R (%)
Clayey SAND (SC-CL)	Red	Loose, Granular	1.50		SPT-1	SS	0.50	0.50-0.95	3	4	4	8							
Sandy CLAY (CI-SC)	Red	Stiff, Layered	2.50		SPT-2	SS	1.50	1.50-1.95	4	4	5	9							
Clayey SAND with Gravel (SC-CL-G)	Red	Very Dense, Granular	3.50		SPT-3	SS	2.50	2.50-2.87	25	48	>50	>100							G.W.L 50/07 cm penetration
Clayey SAND (SC-CL)	Red	Very Dense, Granular	5.00		SPT-4	SS	3.50	3.50-3.76	32	>50	-	>100							50/11 cm penetration
Reddish, Hard, Sandy Clay (CI-SC)					SPT-5	SS	5.00	5.00-5.13	>50	-	-	>100							50/13 cm penetration
G.W.L: 2.75 m from G.L on 27.07.2016			No of SPT: 05 Nos			REMARKS													


Project : Soil Investigation for 65 MW NLC Solar PV Project at Cuddalore, Tamil Nadu																					
 <p>GEO FOUNDATIONS & STRUCTURES PVT. LTD</p>				Bore Hole No : BH-8 Location : 40 MW, NLC Co-ordinates : N 12981 E 4770 Type of Boring : Calyx Ground Water Level : 2.90 m from G.L on 26.07.2016 Termination Depth : 4.50 m					Drillhole Record -BH-8 Fig No. 8 Start Date : 25.07.2016 End Date : 25.07.2016												
				SOIL DESCRIPTION	COLOUR	STRUCTURE	GROUND LEVEL (m)	LEGEND	TEST NO	SAMPLE TYPE	DEPTH (m)	TEST DEPTH(m)	PENETRATION VALUES			SPT 'N' PROFILE	REMARKS				
									15cm	30cm	45cm	SPT 'N' Blows/300mm	20	40	60	80	100	C.R (%)	R.Q.D.(%)		
Clayey SAND (SC-CL)	Red	Loose, Granular	1.50		SPT-1	SS	0.50	0.50-0.95	3	4	4	8	●								
Sandy CLAY (CI-SC)	Red	Very Stiff, Layered	2.50		SPT-2	SS	1.50	1.50-1.95	9	11	11	22	●								
Clayey SAND (SC-CL)	Red	Very Dense, Layered	4.50		SPT-3	SS	2.50	2.50-2.86	28	48	>50	>100	●							50/06 cm penetration	
					SPT-4	SS	3.50	3.50-3.70	48	>50	-	>100									
Reddish, Hard, Sandy CLAY (CI-SC)					SPT-5	SS	4.50	4.50-4.69	49	>50	-	>100	●								50/05 cm penetration
G.W.L: 2.90 m from G.L on 26.07.2016				No of SPT: 05 Nos			REMARKS														


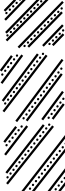


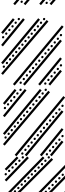
Project : Soil Investigation for 65 MW NLC Solar PV Project at Cuddalore, Tamil Nadu																
 <p>GEO FOUNDATIONS & STRUCTURES PVT. LTD</p>				Bore Hole No : BH-9 Location : 40 MW, NLC Co-ordinates : N 12692 E 4964 Type of Boring : Calyx Ground Water Level : 3.10 m from G.L on 30.07.2016 Termination Depth : 5.50 m						Drillhole Record -BH-9 Fig No. 9						
										Start Date : 29.07.2016 End Date : 29.07.2016						
SOIL DESCRIPTION	COLOUR	STRUCTURE	GROUND LEVEL (m)	LEGEND	TEST NO	SAMPLE TYPE	DEPTH (m)	PENETRATION VALUES			SPT 'N' PROFILE	SPT 'N' Blows/300mm	C.R (%)	R.Q.D (%)	REMARKS	
								15cm	30cm	45cm						
Sandy CLAY (CL-SC)	Red	Medium Stiff, Layered	1.50		SPT-1	SS	0.50	0.50-0.95	3	4	5	9				
					SPT-2	SS	1.50	1.50-1.95	5	12	17	29				
Sandy CLAY (CI-SC)	Red	Very Stiff, Layered	2.50		SPT-3	SS	2.50	2.50-2.95	12	27	31	58				
					SPT-4	SS	3.50	3.50-3.79	41	>50	-	>100				
		SPT-5	SS		4.50	4.50-4.71	37	>50	-	>100						
		SPT-6	SS		5.50	5.50-5.71	47	>50	-	>100						
G.W.L: 3.10 m from G.L on 30.07.2016			No of SPT: 06 Nos			REMARKS										



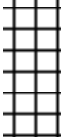
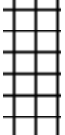

Project : Soil Investigation for 65 MW NLC Solar PV Project at Cuddalore, Tamil Nadu																			
 <p>GEO FOUNDATIONS & STRUCTURES PVT. LTD</p>				Bore Hole No : BH-10 Location : 40 MW, NLC Co-ordinates : N 12695 E 4327 Type of Boring : Calyx Ground Water Level : 2.90 m from G.L on 01.08.2016 Termination Depth : 5.50 m						Drillhole Record -BH-10 Fig No. 10									
				Start Date : 31.07.2016 End Date : 31.07.2016															
SOIL DESCRIPTION	COLOUR	STRUCTURE	GROUND LEVEL (m)	LEGEND	TEST NO	SAMPLE TYPE	DEPTH (m)	PENETRATION VALUES			SPT 'N' Blows/300mm	SPT 'N' PROFILE					REMARKS		
								15cm	30cm	45cm		20	40	60	80	100		C.R (%)	R.Q.D (%)
Clayey SAND (SC-CI)	Red	Loose, Granular	1.50		SPT-1	SS	0.50	0.50-0.95	3	4	5	9							
Sandy CLAY (CI-SC)	Red	Hard, Layered	3.50		SPT-2	SS	1.50	1.50-1.95	13	21	33	54							
					SPT-3	SS	2.50	2.50-2.95	18	29	44	73							
Sandy CLAY (CL-SC)	Red	Hard, Layered	5.50		SPT-4	SS	3.50	3.50-3.78	28	>50	-	>100							50/13 cm penetration
					SPT-5	SS	4.50	4.50-4.79	39	>50	-	>100							
Reddish, Hard, Sandy CLAY (CI-SC)					SPT-6	SS	5.50	5.50-5.74	44	>50	-	>100							50/09 cm penetration
G.W.L: 2.90 m from G.L on 01.08.2016			No of SPT: 06 Nos			REMARKS													



Project : Soil Investigation for 65 MW NLC Solar PV Project at Cuddalore, Tamil Nadu																		
 <p>GEO FOUNDATIONS & STRUCTURES PVT. LTD</p>				Bore Hole No : BH-11 Location : 40 MW, NLC Co-ordinates : N 12880 E 4895 Type of Boring : Calyx Ground Water Level : 3.50 m from G.L on 29.07.2016 Termination Depth : 5.50 m						Drillhole Record -BH-11 Fig No. 11								
				Start Date : 28.07.2016 End Date : 28.07.2016														
SOIL DESCRIPTION	COLOUR	STRUCTURE	GROUND LEVEL (m)	LEGEND	TEST NO	SAMPLE TYPE	DEPTH (m)	TEST DEPTH(m)	PENETRATION VALUES			SPT 'N' PROFILE	SPT 'N' Blows/300mm	C.R. (%)	R.Q.D.(%)	REMARKS		
									15cm	30cm	45cm							
Clayey SAND (SC-CL)	Red	Loose, Granular	1.50		SPT-1	SS	0.50	0.50-0.95	2	4	5	9						
		Medium Dense, Granular	2.50		SPT-2	SS	1.50	1.50-1.95	5	6	8	14						
Clayey SAND with Gravel (SC-CL-G)	Red	Very dense, Granular	3.50		SPT-3	SS	2.50	2.50-2.93	35	42	>50	>100					50/13 cm penetration	
					SPT-4	SS	3.50	3.50-3.76	35	>50	-	>100					50/11 cm penetration	
Sandy CLAY (CL-SC)	Red	Hard, Layered	5.50			SPT-5	SS	4.50	4.50-4.64	>50	-	-					>100	50/14 cm penetration
						SPT-6	SS	5.50	5.50-5.64	>50	-	-					>100	50/14 cm penetration
Reddish, Very Dense, Clayey SAND (SC-CL)																		
G.W.L: 3.50 m from G.L on 29.07.2016			No of SPT: 06 Nos			REMARKS												


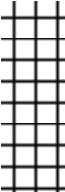
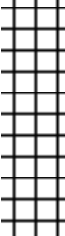


Project : Soil Investigation for 65 MW NLC Solar PV Project at Cuddalore, Tamil Nadu																					
 <p>GEO FOUNDATIONS & STRUCTURES PVT. LTD</p>				Bore Hole No : BH-12 Location : 40 MW NLC Co-ordinates : N 13156 E 5020 Type of Boring : Calyx Ground Water Level : 3.00 m from G.L on 28.07.2016 Termination Depth : 5.50 m					Drillhole Record -BH-12 Fig No. 12				Start Date : 27.07.2016 End Date : 27.07.2016								
				SOIL DESCRIPTION	COLOUR	STRUCTURE	GROUND LEVEL (m)	LEGEND	TEST NO	SAMPLE TYPE	DEPTH (m)	TEST DEPTH(m)	PENETRATION VALUES			SPT 'N' PROFILE	C.R (%)	R.Q.D (%)	REMARKS		
									15cm	30cm	45cm	SPT 'N' Blows/300mm	20	40	60	80	100				
Clayey SAND (SC-CL)	Red	Loose, Granular	1.50		SPT-1	SS	0.50	0.50-0.95	3	4	4	8	20								
Sandy CLAY (CI-SC)	Red	Very Stiff, Layered	2.50		SPT-2	SS	1.50	1.50-1.95	6	8	11	19	40								
		Hard, Layered	2.50		SPT-3	SS	2.50	2.50-2.95	9	25	47	72	60								
			4.50		SPT-4	SS	3.50	3.50-3.78	41	>50	-	>100	80								
Silty SAND (SM)	Red	Very Dense, Granular	5.50		SPT-5	SS	4.50	4.50-4.79	42	>50	-	>100	100								
Reddish, Hard, Sandy CLAY (CI-SC)					SPT-6	SS	5.50	5.50-5.79	42	>50	-	>100									
G.W.L: 3.00 m from G.L on 28.07.2016			No of SPT: 06 Nos			REMARKS															



Project : Soil Investigation for 65 MW NLC Solar PV Project at Cuddalore, Tamil Nadu																						
 <p>GEO FOUNDATIONS & STRUCTURES PVT. LTD</p>		Bore Hole No : BH-13 Location : 40 MW NLC Co-ordinates : N 12981 E 5020 Type of Boring : Calyx Ground Water Level : 2.20 m from G.L on 25.07.2016 Termination Depth : 4.50 m						Drillhole Record -BH-13 Fig No. 13														
		Start Date : 24.07.2016 End Date : 24.07.2016																				
SOIL DESCRIPTION	COLOUR	STRUCTURE	GROUND LEVEL (m)	LEGEND	TEST NO	SAMPLE TYPE	DEPTH (m)	TEST DEPTH(m)	PENETRATION VALUES			SPT 'N' Blows/300mm	SPT 'N' PROFILE					C.R. (%)	R.Q.D.(%)	REMARKS		
									15cm	30cm	45cm		20	40	60	80	100					
Sandy CLAY (CI-SC)	Red	Medium Stiff, Layered	1.50		SPT-1	SS	0.50	0.50-0.95	3	3	4	7										
Sandy CLAY (CL-SC)			2.50		SPT-2	SS	1.50	1.50-1.95	9	15	21	36										
Sandy CLAY (CI-SC)	Red	Hard, Layered	3.50		SPT-3	SS	2.50	2.50-2.86	30	48	>50	>100										G.W.L 50/06 cm penetration
Sandy CLAY (CL-SC)			4.50		SPT-4	SS	3.50	3.50-3.71	48	>50	-	>100										50/06 cm penetration
					SPT-5	SS	4.50	4.50-4.64	>50	-	-	>100										50/14 cm penetration
G.W.L: 2.20 m from G.L on 25.07.2016			No of SPT: 05 Nos			REMARKS																



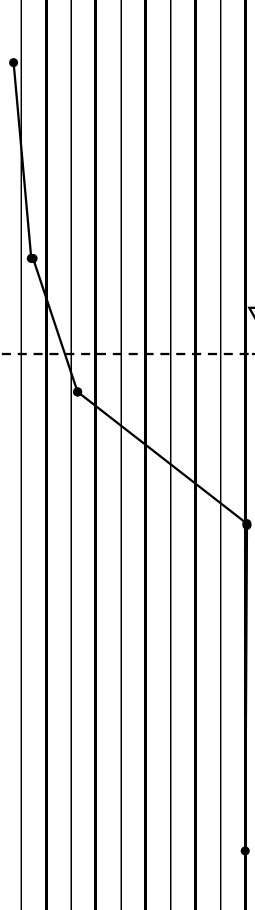
Project : Soil Investigation for 65 MW NLC Solar PV Project at Cuddalore, Tamil Nadu																						
 <p>GEO FOUNDATIONS & STRUCTURES PVT. LTD</p>				Bore Hole No : BH-14 Location : 40 MW NLC Co-ordinates : N 12806 E 5020 Type of Boring : Calyx Ground Water Level : 2.90 m from G.L on 30.07.2016 Termination Depth : 5.50 m					Drillhole Record -BH-14 Fig No. 14				Start Date : 29.07.2016 End Date : 29.07.2016									
				SOIL DESCRIPTION	COLOUR	STRUCTURE	GROUND LEVEL (m)	LEGEND	TEST NO	SAMPLE TYPE	DEPTH (m)	TEST DEPTH(m)	PENETRATION VALUES			SPT 'N' PROFILE	C.R. (%)	R.Q.D.(%)	REMARKS			
									15cm	30cm	45cm	SPT 'N' Blows/300mm	20	40	60	80	100					
Clayey SAND (SC-CL)	Red	Loose, Granular	1.50		SPT-1	SS	0.50	0.50-0.95	2	3	3	6										
Clayey SAND (SC-CI)	Red	Medium Dense, Granular	2.50		SPT-2	SS	1.50	1.50-1.95	5	7	10	17										
		Very Dense, Granular	4.50		SPT-3	SS	2.50	2.50-2.95	11	20	34	54										
Clayey SAND (SC-CL)	Red	Very Dense, Granular	5.50		SPT-4	SS	3.50	3.50-3.78	31	>50	-	>100										G.W.L. 50/13 cm penetration
					SPT-5	SS	4.50	4.50-4.71	42	>50	-	>100										
Reddish, Very Dense, Clayey SAND (SC-CI)					SPT-6	SS	5.50	5.50-5.64	>50	-	-	>100										50/14 cm penetration
G.W.L.: 2.90 m from G.L on 30.07.2016				No of SPT: 06 Nos			REMARKS															


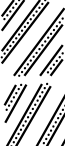

Project : Soil Investigation for 65 MW NLC Solar PV Project at Cuddalore, Tamil Nadu																						
 <p>GEO FOUNDATIONS & STRUCTURES PVT. LTD</p>				Bore Hole No : BH-15 Location : 40 MW NLC Co-ordinates : N 13087 E 5123 Type of Boring : Calyx Ground Water Level : 2.90 m from G.L on 29.07.2016 Termination Depth : 5.50 m					Drillhole Record -BH-15 Fig No. 15				Start Date : 28.07.2016 End Date : 28.07.2016									
				SOIL DESCRIPTION	COLOUR	STRUCTURE	GROUND LEVEL (m)	LEGEND	TEST NO	SAMPLE TYPE	DEPTH (m)	TEST DEPTH(m)	PENETRATION VALUES			SPT 'N' PROFILE	C.R (%)	R.Q.D (%)	REMARKS			
									15cm	30cm	45cm	SPT 'N' Blows/300mm	20	40	60	80	100					
Clayey SAND (SC-CL)	Red	Loose, Granular	1.50		SPT-1	SS	0.50	0.50-0.95	3	4	4	8										
Sandy CLAY (CL-SC)	Red	Very Stiff, Layered	2.50		SPT-2	SS	1.50	1.50-1.95	8	13	17	30										
		Hard, Layered	2.50		SPT-3	SS	2.50	2.50-2.95	18	29	41	70										
			4.50		SPT-4	SS	3.50	3.50-3.85	28	46	>50	>100										
Clayey SAND (SC-CL)	Red	Very Dense, Layered	5.50		SPT-5	SS	4.50	4.50-4.78	33	>50	-	>100										50/13 cm penetration
					SPT-6	SS	5.50	5.50-5.79	36	>50	-	>100										
G.W.L: 2.90 m from G.L on 29.07.2016				No of SPT: 06 Nos			REMARKS															



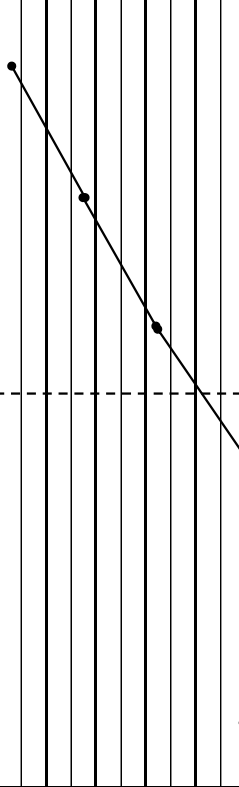
Project : Soil Investigation for 65 MW NLC Solar PV Project at Cuddalore, Tamil Nadu																						
 <p>GEO FOUNDATIONS & STRUCTURES PVT. LTD</p>				Bore Hole No : BH-17 Location : 40 MW NLC Co-ordinates : N 12981 E 5270 Type of Boring : Calyx Ground Water Level : 2.40 m from G.L on 25.07.2016 Termination Depth : 5.00 m					Drillhole Record -BH-17 Fig No. 17				Start Date : 24.07.2016 End Date : 24.07.2016									
				SOIL DESCRIPTION	COLOUR	STRUCTURE	GROUND LEVEL (m)	LEGEND	TEST NO	SAMPLE TYPE	DEPTH (m)	TEST DEPTH(m)	PENETRATION VALUES			SPT 'N' PROFILE	C.R. (%)	R.Q.D.(%)	REMARKS			
Clayey SAND (SC-CI)	Red	Loose, Granular	2.00		SPT-1	SS	0.50	0.50-0.95	15cm	30cm	45cm	SPT 'N' Blows/300mm	20	40	60	80	100					
		Medium Dense, Granular	3.00		SPT-2	SS	2.00	2.00-2.45	7	9	14	23									G.W.L	
	Very Dense, Granular	SPT-3	SS		3.00	3.00-3.35	20	47	>50	>100												50/05 cm penetration
		SPT-4	SS		4.00	4.00-4.35	33	49	>50	>100												50/05 cm penetration
		SPT-5	SS		5.00	5.00-5.21	46	>50	-	>100												50/06 cm penetration
G.W.L: 2.40 m from G.L on 25.07.2016			No of SPT: 05 Nos			REMARKS																

Project : Soil Investigation for 65 MW NLC Solar PV Project at Cuddalore, Tamil Nadu																					
 <p>GEO FOUNDATIONS & STRUCTURES PVT. LTD</p>			Bore Hole No : BH-18 Location : 40 MW, NLC Co-ordinates : N 13156 E 5270 Type of Boring : Calyx Ground Water Level : 3.25 m from G.L on 28.07.2016 Termination Depth : 5.00 m						Drillhole Record -BH-18 Fig No. 18												
									Start Date : 27.07.2016 End Date : 27.07.2016												
SOIL DESCRIPTION	COLOUR	STRUCTURE	GROUND LEVEL (m)	LEGEND	TEST NO	SAMPLE TYPE	DEPTH (m)	TEST DEPTH(m)	PENETRATION VALUES			SPT 'N' Blows/300mm	SPT 'N' PROFILE					C.R. (%)	R.Q.D.(%)	REMARKS	
									15cm	30cm	45cm		20	40	60	80	100				
Sandy CLAY (CL-SC)	Red	Medium Stiff, Layered	1.50		SPT-1	SS	0.50	0.50-0.95	2	3	4	7									
		Hard, Layered	3.50		SPT-2	SS	1.50	1.50-1.95	8	15	22	37									
					SPT-3	SS	2.50	2.50-2.77	35	>50	-	>100									
Clayey SAND (SC-CL)	Red	Very Dense, Granular	5.00		SPT-4	SS	3.50	3.50-3.64	>50	-	-	>100									50/14 cm penetration
					SPT-5	SS	5.00	5.00-5.14	>50	-	-	>100									
Reddish, Very Dense, Silty SAND (SM)					SPT-5	SS	5.00	5.00-5.14	>50	-	-	>100									50/14 cm penetration
G.W.L: 3.25 m from G.L on 28.07.2016			No of SPT: 05 Nos			REMARKS															

Project : Soil Investigation for 65 MW NLC Solar PV Project at Cuddalore, Tamil Nadu																				
 <p>GEO FOUNDATIONS & STRUCTURES PVT. LTD</p>				Bore Hole No : BH-19 Location : 40 MW NLC Co-ordinates : N 12728 E 5265 Type of Boring : Calyx Ground Water Level : 3.10 m from G.L on 02.08.2016 Termination Depth : 5.50 m					Drillhole Record -BH-19 Fig No. 19				Start Date : 01.08.2016 End Date : 01.08.2016							
				SOIL DESCRIPTION	COLOUR	STRUCTURE	GROUND LEVEL (m)	LEGEND	TEST NO	SAMPLE TYPE	DEPTH (m)	TEST DEPTH(m)	PENETRATION VALUES			SPT 'N' PROFILE	C.R (%)	R.Q.D (%)	REMARKS	
Clayey SAND (SC-CL)	Red	Medium Dense, Granular	1.50		SPT-1	SS	0.50	0.50-0.95	15cm	30cm	45cm	SPT 'N' Blows/300mm	20	40	60	80	100			
	Very Dense, Granular					SPT-2	SS	1.50	1.50-1.95											
						SPT-3	SS	2.50	2.50-2.95											
						SPT-4	SS	3.50	3.50-3.92											
						SPT-5	SS	4.50	4.50-4.77											
			SPT-6	SS	5.50	5.50-5.75														
G.W.L: 3.10 m from G.L on 02.08.2016			No of SPT: 06 Nos			REMARKS														

Project : Soil Investigation for 65 MW NLC Solar PV Project at Cuddalore, Tamil Nadu																					
 <p>GEO FOUNDATIONS & STRUCTURES PVT. LTD</p>				Bore Hole No : BH-20 Location : 40 MW NLC Co-ordinates : N 13156 E 5420 Type of Boring : Calyx Ground Water Level : 2.60 m from G.L on 24.07.2016 Termination Depth : 6.50 m					Drillhole Record - BH-20 Fig No. 20				Start Date : 23.07.2016 End Date : 23.07.2016								
				SOIL DESCRIPTION	COLOUR	STRUCTURE	GROUND LEVEL (m)	LEGEND	TEST NO	SAMPLE TYPE	DEPTH (m)	TEST DEPTH(m)	PENETRATION VALUES			SPT 'N' PROFILE	C.R (%)	R.Q.D (%)	REMARKS		
									15cm	30cm	45cm	SPT 'N' Blows/300mm	20	40	60	80	100				
Clayey SAND (SC-CL)	Red	Loose, Granular	2.00		SPT-1	SS	0.50	0.50-0.95	3	4	4	8									
		Medium Dense, Granular			SPT-2	SS	2.00	2.00-2.45	5	7	7	14									
		4.00	SPT-3		SS	3.00	3.00-3.45	8	14	19	33										
			SPT-4		SS	4.00	4.00-4.43	36	41	>50	>100										
			SPT-5		SS	5.00	5.00-5.36	36	47	>50	>100										
			SPT-6		SS	6.50	6.50-6.84	37	48	>50	>100										
G.W.L: 2.60 m from G.L on 24.07.2016			No of SPT: 06 Nos			REMARKS															

Project : Soil Investigation for 65 MW NLC Solar PV Project at Cuddalore, Tamil Nadu																					
 <p>GEO FOUNDATIONS & STRUCTURES PVT. LTD</p>				Bore Hole No : BH-21 Location : 40 MW NLC Co-ordinates : N 12981.8 E 5420.4 Type of Boring : Calyx Ground Water Level : 2.45 m from G.L on 24.07.2016 Termination Depth : 7.50 m					Drillhole Record -BH-21 Fig No. 21				Start Date : 23.07.2016 End Date : 23.07.2016								
				SOIL DESCRIPTION	COLOUR	STRUCTURE	GROUND LEVEL (m)	LEGEND	TEST NO	SAMPLE TYPE	DEPTH (m)	TEST DEPTH(m)	PENETRATION VALUES			SPT 'N' PROFILE	C.R. (%)	R.Q.D.(%)	REMARKS		
									15cm	30cm	45cm	SPT 'N' Blows/300mm	20	40	60	80	100				
Clayey SAND (SC-CL)	Red	Loose, Granular	2.00		SPT-1	SS	0.50	0.50-0.95	4	4	5	9	●								
		Medium Dense, Granular	3.50		SPT-2	SS	2.00	2.00-2.45	6	10	15	25	●								
	Very Dense, Granular	SPT-3	SS	3.50	3.50-3.95	26	32	41	73	●											
		SPT-4	SS	4.50	4.50-4.95	17	37	49	86	●											
		SPT-5	SS	6.00	6.00-6.45	11	22	36	58	●											
		SPT-6	SS	7.50	7.50-7.85	32	49	>50	>100	●											
Reddish, Very Dense, Clayey SAND (SC-CI)																					
G.W.L: 2.45 m from G.L on 24.07.2016			No of SPT: 06 Nos			REMARKS															

Project : Soil Investigation for 65 MW NLC Solar PV Project at Cuddalore, Tamil Nadu																				
 <p>GEO FOUNDATIONS & STRUCTURES PVT. LTD</p>				Bore Hole No : BH-22 Location : 40 MW NLC Co-ordinates : Type of Boring : Calyx Ground Water Level : 3.00 m from G.L on 03.08.2016 Termination Depth : 5.50 m					Drillhole Record -BH-22 Fig No. 22											
									Start Date : 02.08.2016 End Date : 02.08.2016											
SOIL DESCRIPTION	COLOUR	STRUCTURE	GROUND LEVEL (m)	LEGEND	TEST NO	SAMPLE TYPE	DEPTH (m)	TEST DEPTH(m)	PENETRATION VALUES			SPT 'N' Blows/300mm	SPT 'N' PROFILE					C.R (%)	R.Q.D (%)	REMARKS
									15cm	30cm	45cm		20	40	60	80	100			
Clayey SAND (SC-CL)	Red	Loose, Granular	1.50		SPT-1	SS	0.50	0.50-0.95	4	4	5	9								
		Medium Dense, Granular	2.50		SPT-2	SS	1.50	1.50-1.95	9	14	19	33								
	Very Dense, Granular	SPT-3	SS		2.50	2.50-2.95	17	26	39	65										
		SPT-4	SS		3.50	3.50-3.77	29	>50	-	>100	50/12 cm penetration									
		SPT-5	SS		4.50	4.50-4.78	41	>50	-	>100	50/13 cm penetration									
		SPT-6	SS		5.50	5.50-5.64	>50	-	-	>100	50/14 cm penetration									
G.W.L: 3.00 m from G.L on 03.08.2016			No of SPT: 06 Nos			REMARKS														

APPENDIX II

**LABORATORY TEST
RESULTS**

TEST RESULTS			Project :Soil Investigation works for the proposed 65 MW NLC Solar Power Project at Cuddalore, Tamil Nadu					Boring Start: 31.07.2016		Termination Depth		Table No.							
								Boring End : 31.07.2016		5.50 M		1							
								Location		G.W.T		Bore-Hole No.							
								40 MW		3.00 m		1							
N VALUE	DEPTH (m)	SAMPLE	SOIL DESCRIPTION	IS. CLASSIFICATION	GRAIN SIZE ANALYSIS			ATTERBERG LIMITS			SHINKAGE LIMIT (%)	DRY DENSITY, gm/cc	WET DENSITY, gm/cc	WATER CONTENT, %	SPECIFIC GRAVITY	FREE SWELL INDEX, %	SHEAR PARAMETERS		
					GRAVEL, %	SAND, %	SILT & CLAY, %	LIQUID LIMIT,%	PLASTIC LIMIT,%	PLASTICITY INDEX							TEST METHOD	C in Kg/cm ²	φ in degrees
9	0.50	SPT-1	Clayey SAND	SC -CL	0	66	34	31	12	19	10			8	2.50				
37	1.50	SPT-2	Clayey SAND	SC- CI	0	58	42	35	14	21	11			9					
76	2.50	SPT-3	Clayey SAND	SC - CI	0	56	44	36	13	23	13			17	2.55				
>100	3.50	SPT-4	Clayey SAND	SC - CL	0	67	33	32	12	20	12			13					
>100	4.50	SPT-5	Clayey SAND	SC -CL	0	55	45	33	11	22	14			10					
>100	5.50	SPT-6	Clayey SAND	SC - CL	0	60	40	31	10	21	11			11	2.57				

TEST RESULTS			Project :Soil Investigation works for the proposed 65 MW NLC Solar Power Project at Cuddalore, Tamil Nadu					Boring Start: 26.07.2016		Termination Depth		Table No.							
								Boring End : 26.07.2016		4.50 M		2							
			Location					G.W.T		Bore-Hole No.									
			40 MW					3.40 m		2									
N VALUE	DEPTH (m)	SAMPLE	SOIL DESCRIPTION	IS. CLASSIFICATION	GRAIN SIZE ANALYSIS			ATTERBERG LIMITS			SHINKAGE LIMIT (%)	DRY DENSITY, gm/cc	WET DENSITY, gm/cc	WATER CONTENT, %	SPECIFIC GRAVITY	FREE SWELL INDEX. %	SHEAR PARAMETERS		
					GRAVEL, %	SAND, %	SILT & CLAY, %	LIQUID LIMIT.%	PLASTIC LIMIT,%	PLASTICITY INDEX							TEST METHOD	C in Kg/cm ²	φ in degrees
9	0.50	SPT-1	Clayey SAND	SC- CI	0	60	40	36	13	23	11			7	2.56				
64	1.50	SPT-2	Sandy CLAY	CI - SC	0	48	52	34	15	19	13			12					
>100	2.50	SPT-3	Sandy CLAY	CI - SC	0	44	56	35	12	23	11			13					
>100	3.50	SPT-4	Sandy CLAY											13					
>100	4.50	SPT-5	Sandy CLAY	CL-SC	0	41	59	33	14	19	12			15	2.60				

TEST RESULTS			Project :Soil Investigation works for the proposed 65 MW NLC Solar Power Project at Cuddalore, Tamil Nadu					Boring Start: 25.07.2016 Boring End : 26.07.2016		Termination Depth 4.50 M		Table No. 3							
								Location 40 MW		G.W.T 3.10 m		Bore-Hole No. 3							
N VALUE	DEPTH (m)	SAMPLE	SOIL DESCRIPTION	IS. CLASSIFICATION	GRAIN SIZE ANALYSIS			ATTERBERG LIMITS			SHINKAGE LIMIT (%)	DRY DENSITY, gm/cc	WET DENSITY, gm/cc	WATER CONTENT, %	SPECIFIC GRAVITY	FREE SWELL INDEX. %	SHEAR PARAMETERS		
					GRAVEL, %	SAND, %	SILT & CLAY, %	LIQUID LIMIT.%	PLASTIC LIMIT,%	PLASTICITY INDEX							TEST METHOD	C in Kg/cm ²	φ in degrees
9	0.50	SPT-1	Clayey SAND	SC- CL	0	54	46	34	16	18	11				2.60				
39	1.50	SPT-2	Clayey SAND	SC- CL															
>100	2.50	SPT-3	Sandy CLAY	CI - SC	0	40	60	37	14	23	14								
>100	3.50	SPT-4	Sandy CLAY	CI - SC															
>100	4.50	SPT-5	Clayey SAND	SC- CL	0	51	49	33	13	20	13				2.52				

TEST RESULTS			Project :Soil Investigation works for the proposed 65 MW NLC Solar Power Project at Cuddalore, Tamil Nadu					Boring Start: 31.07.2016		Termination Depth		Table No.							
								Boring End : 31.07.2016		5.50 M		4							
								Location		G.W.T		Bore-Hole No.							
								40 MW		3.00 m		4							
N VALUE	DEPTH (m)	SAMPLE	SOIL DESCRIPTION	IS. CLASSIFICATION	GRAIN SIZE ANALYSIS			ATTERBERG LIMITS			SHINKAGE LIMIT (%)	DRY DENSITY, gm/cc	WET DENSITY, gm/cc	WATER CONTENT, %	SPECIFIC GRAVITY	FREE SWELL INDEX, %	SHEAR PARAMETERS		
					GRAVEL, %	SAND, %	SILT & CLAY, %	LIQUID LIMIT,%	PLASTIC LIMIT,%	PLASTICITY INDEX							TEST METHOD	C in Kg/cm ²	φ in degrees
11	0.50	SPT-1	Sandy CLAY	CI - SC	0	43	57	36	12	24				7					
38	1.50	SPT-2	Sandy CLAY	CI - SC	0	36	64	37	14	23				12					
79	2.50	SPT-3	Sandy CLAY	CI - SC										13					
>100	3.50	SPT-4	Sandy CLAY	CI - SC	0	37	63	37	12	25	12			12					
>100	4.50	SPT-5	Sandy CLAY	CI - SC										12					
>100	5.50	SPT-6	Sandy CLAY	CI - SC	15	35	50	35	13	22	10			13					

TEST RESULTS			Project :Soil Investigation works for the proposed 65 MW NLC Solar Power Project at Cuddalore, Tamil Nadu					Boring Start: 30.07.2016		Termination Depth		Table No.							
								Boring End : 30.07.2016		5.50 M		5							
								Location		G.W.T		Bore-Hole No.							
								40 MW		3.10 m		5							
N VALUE	DEPTH (m)	SAMPLE	SOIL DESCRIPTION	IS. CLASSIFICATION	GRAIN SIZE ANALYSIS			ATTERBERG LIMITS			SHINKAGE LIMIT (%)	DRY DENSITY, gm/cc	WET DENSITY, gm/cc	WATER CONTENT, %	SPECIFIC GRAVITY	FREE SWELL INDEX, %	SHEAR PARAMETERS		
					GRAVEL, %	SAND, %	SILT & CLAY, %	LIQUID LIMIT,%	PLASTIC LIMIT,%	PLASTICITY INDEX							TEST METHOD	C in Kg/cm ²	φ in degrees
12	0.50	SPT-1	Clayey SAND	SC- CL	0	62	38	33	13	20	11			14	2.60				
27	1.50	SPT-2	Clayey SAND	SC- CL															
>100	2.50	SPT-3	Sandy CLAY	CI - SC	0	45	55	35	12	23	14			13					
>100	3.50	SPT-4	Sandy CLAY	CI - SC															
>100	4.50	SPT-5	Sandy CLAY	CI - SC															
>100	5.50	SPT-6	Sandy CLAY	CI - SC	0	34	66	37	14	23				11					

TEST RESULTS			Project :Soil Investigation works for the proposed 65 MW NLC Solar Power Project at Cuddalore, Tamil Nadu					Boring Start: 30.07.2016 Boring End : 30.07.2016		Termination Depth 5.50 M		Table No. 6							
								Location 40 MW		G.W.T 2.90 m		Bore-Hole No. 6							
N VALUE	DEPTH (m)	SAMPLE	SOIL DESCRIPTION	IS. CLASSIFICATION	GRAIN SIZE ANALYSIS			ATTERBERG LIMITS			SHINKAGE LIMIT (%)	DRY DENSITY, gm/cc	WET DENSITY, gm/cc	WATER CONTENT, %	SPECIFIC GRAVITY	FREE SWELL INDEX, %	SHEAR PARAMETERS		
					GRAVEL, %	SAND, %	SILT & CLAY, %	LIQUID LIMIT,%	PLASTIC LIMIT,%	PLASTICITY INDEX							TEST METHOD	C in Kg/cm ²	Φ in degrees
9	0.50	SPT-1	Sandy CLAY	CI - SC	0	46	54	33	12	21	14			10					
21	1.50	SPT-2	Sandy CLAY	CI - SC	0	38	62	37	12	25	14			14	2.50				
>100	2.50	SPT-3	Sandy CLAY	CI - SC										13					
>100	3.50	SPT-4	Clayey SAND With Gravel	SC- CI -G	31	36	33	35	14	21	11			9	2.55				
>100	4.50	SPT-5	Clayey SAND	SC- CI															
>100	5.50	SPT-6	Clayey SAND	SC- CI															

TEST RESULTS			Project :Soil Investigation works for the proposed 65 MW NLC Solar Power Project at Cuddalore, Tamil Nadu					Boring Start: 26.07.2016		Termination Depth		Table No.							
								Boring End : 26.07.2016		5.00 M		7							
								Location		G.W.T		Bore-Hole No.							
								40 MW		2.75 m		7							
N VALUE	DEPTH (m)	SAMPLE	SOIL DESCRIPTION	IS. CLASSIFICATION	GRAIN SIZE ANALYSIS			ATTERBERG LIMITS			SHINKAGE LIMIT (%)	DRY DENSITY, gm/cc	WET DENSITY, gm/cc	WATER CONTENT, %	SPECIFIC GRAVITY	FREE SWELL INDEX, %	SHEAR PARAMETERS		
					GRAVEL, %	SAND, %	SILT & CLAY, %	LIQUID LIMIT,%	PLASTIC LIMIT,%	PLASTICITY INDEX							TEST METHOD	C in Kg/cm ²	φ in degrees
8	0.50	SPT-1	Clayey SAND	SC- CL	0	54	46	32	13	19	12			13	2.60				
9	1.50	SPT-2	Sandy CLAY	CL-SC	0	48	52	36	11	25	14			12					
>100	2.50	SPT-3	Clayey SAND with Gravel	SC- CL -G	23	31	46	31	12	19	13			10	2.55				
>100	3.50	SPT-4	Clayey SAND	SC- C															
>100	5.00	SPT-5	Sandy CLAY	CI - SC	1	39	60	37	14	23	15			14					

TEST RESULTS			Project :Soil Investigation works for the proposed 65 MW NLC Solar Power Project at Cuddalore, Tamil Nadu							Boring Start: 25.07.2016		Termination Depth		Table No.					
										Boring End : 25.07.2016		4.50 M		8					
			Location							G.W.T		Bore-Hole No.							
			40 MW							2.90 m		8							
N VALUE	DEPTH (m)	SAMPLE	SOIL DESCRIPTION	IS. CLASSIFICATION	GRAIN SIZE ANALYSIS			ATTERBERG LIMITS			SHINKAGE LIMIT (%)	DRY DENSITY, gm/cc	WET DENSITY, gm/cc	WATER CONTENT, %	SPECIFIC GRAVITY	FREE SWELL INDEX. %	SHEAR PARAMETERS		
					GRAVEL, %	SAND, %	SILT & CLAY, %	LIQUID LIMIT.%	PLASTIC LIMIT,%	PLASTICITY INDEX							TEST METHOD	C in Kg/cm ²	φ in degrees
8	0.50	SPT-1	Clayey SAND	SC- CL	0	53	47	31	16	15									
22	1.50	SPT-2	Sandy CLAY	CI - SC	0	33	67	36	13	23	14			12	2.50				
>100	2.50	SPT-3	Clayey SAND	SC- CL	0	51	49	33	16	17				13					
>100	3.50	SPT-4	Clayey SAND	SC- CL	5	49	46	31	12	19				12	2.60				
>100	4.50	SPT-5	Sandy CLAY																

TEST RESULTS			Project :Soil Investigation works for the proposed 65 MW NLC Solar Power Project at Cuddalore, Tamil Nadu					Boring Start: 29.07.2016		Termination Depth		Table No.							
								Boring End : 29.07.2016		5.50 m		9							
								Location		G.W.T		Bore-Hole No.							
								40 MW		3.10 m		9							
N VALUE	DEPTH (m)	SAMPLE	SOIL DESCRIPTION	IS. CLASSIFICATION	GRAIN SIZE ANALYSIS			ATTERBERG LIMITS			SHINKAGE LIMIT (%)	DRY DENSITY, gm/cc	WET DENSITY, gm/cc	WATER CONTENT, %	SPECIFIC GRAVITY	FREE SWELL INDEX, %	SHEAR PARAMETERS		
					GRAVEL, %	SAND, %	SILT & CLAY, %	LIQUID LIMIT,%	PLASTIC LIMIT,%	PLASTICITY INDEX							TEST METHOD	C in Kg/cm ²	φ in degrees
9	0.50	SPT-1	Sandy CLAY	CL - SC	0	49	51	33	13	20	10			7					
29	1.50	SPT-2	Sandy CLAY	CI - SC	0	43	57	38	12	26	11			12	2.60				
58	2.50	SPT-3	Sandy CLAY	CI - SC															
>100	3.50	SPT-4	Sandy CLAY	CI - SC	2	45	53	35	14	21	12			11					
>100	4.50	SPT-5	Sandy CLAY	CI - SC															
>100	5.50	SPT-6	Sandy CLAY	CI - SC															

TEST RESULTS			Project :Soil Investigation works for the proposed 65 MW NLC Solar Power Project at Cuddalore, Tamil Nadu						Boring Start: 31.07.2016		Termination Depth		Table No.							
									Boring End : 31.07.2016		5.50 m		10							
									Location		G.W.T		Bore-Hole No.							
									40 MW		2.90 m		10							
N VALUE	DEPTH (m)	SAMPLE	SOIL DESCRIPTION	IS. CLASSIFICATION	GRAIN SIZE ANALYSIS			ATTERBERG LIMITS			SHINKAGE LIMIT (%)	DRY DENSITY, gm/cc	WET DENSITY, gm/cc	WATER CONTENT, %	SPECIFIC GRAVITY	FREE SWELL INDEX, %	SHEAR PARAMETERS			
					GRAVEL, %	SAND, %	SILT & CLAY, %	LIQUID LIMIT,%	PLASTIC LIMIT,%	PLASTICITY INDEX							TEST METHOD	C in Kg/cm ²	φ in degrees	
9	0.50	SPT-1	Clayey SAND	SC- CI	0	55	45	35	12	23				12						
54	1.50	SPT-2	Sandy CLAY	CI - SC	0	33	67	38	13	25	13			12	2.55					
73	2.50	SPT-3	Sandy CLAY	CI - SC																
>100	3.50	SPT-4	Sandy CLAY	CL - SC	0	46	54	32	12	20	12									
>100	4.50	SPT-5	Sandy CLAY	CL - SC																
>100	5.50	SPT-6	Sandy CLAY	CI - SC	0	31	69	39	12	27	12			13	2.60					

TEST RESULTS			Project :Soil Investigation works for the proposed 65 MW NLC Solar Power Project at Cuddalore, Tamil Nadu					Boring Start: 28.07.2016		Termination Depth		Table No.							
								Boring End : 28.07.2016		5.50 m		11							
								Location		G.W.T		Bore-Hole No.							
								40 MW		3.50 m		11							
N VALUE	DEPTH (m)	SAMPLE	SOIL DESCRIPTION	IS. CLASSIFICATION	GRAIN SIZE ANALYSIS			ATTERBERG LIMITS			SHINKAGE LIMIT (%)	DRY DENSITY, gm/cc	WET DENSITY, gm/cc	WATER CONTENT, %	SPECIFIC GRAVITY	FREE SWELL INDEX, %	SHEAR PARAMETERS		
					GRAVEL, %	SAND, %	SILT & CLAY, %	LIQUID LIMIT,%	PLASTIC LIMIT,%	PLASTICITY INDEX							TEST METHOD	C in Kg/cm ²	Φ in degrees
9	0.50	SPT-1	Clayey SAND	SC- CL	0	54	46	33	11	22	12			11	2.50				
14	1.50	SPT-2	Clayey SAND	SC- CL															
>100	2.50	SPT-3	Clayey SAND With Gravel	SC - CI - G	22	37	41	36	13	23	14			13					
>100	3.50	SPT-4	Sandy CLAY	CL - SC	4	43	53	32	15	17	12								
>100	4.50	SPT-5	Sandy CLAY	CL - SC															
>100	5.50	SPT-6	Clayey SAND	SC- CL	2	53	45	33	13	20	11			15	2.55				

TEST RESULTS			Project :Soil Investigation works for the proposed 65 MW NLC Solar Power Project at Cuddalore, Tamil Nadu					Boring Start: 27.07.2016		Termination Depth		Table No.							
								Boring End : 27.07.2016		5.50 m		12							
								Location		G.W.T		Bore-Hole No.							
								40 MW		3.00 m		12							
N VALUE	DEPTH (m)	SAMPLE	SOIL DESCRIPTION	IS. CLASSIFICATION	GRAIN SIZE ANALYSIS			ATTERBERG LIMITS			SHINKAGE LIMIT (%)	DRY DENSITY, gm/cc	WET DENSITY, gm/cc	WATER CONTENT, %	SPECIFIC GRAVITY	FREE SWELL INDEX, %	SHEAR PARAMETERS		
					GRAVEL, %	SAND, %	SILT & CLAY, %	LIQUID LIMIT,%	PLASTIC LIMIT,%	PLASTICITY INDEX							TEST METHOD	C in Kg/cm ²	φ in degrees
8	0.50	SPT-1	Clayey SAND	SC- CL	0	61	39	31	13	18	11			10	2.60				
19	1.50	SPT-2	Sandy CLAY	CI - SC	5	41	54	36	12	24	14			12					
72	2.50	SPT-3	Sandy CLAY	CI - SC	2	33	65	35	15	35									
>100	3.50	SPT-4	Sandy CLAY	CI - SC															
>100	4.50	SPT-5	Silty SAND	SM	2	50	48	Non-Plastic						12					
>100	5.50	SPT-6	Sandy CLAY	CI - SC															

TEST RESULTS			Project :Soil Investigation works for the proposed 65 MW NLC Solar Power Project at Cuddalore, Tamil Nadu					Boring Start: 24.07.2016		Termination Depth		Table No.						
								Boring End : 24.07.2016		4.50 m		13						
								Location		G.W.T		Bore-Hole No.						
								40 MW		2.20 m		13						
N VALUE	DEPTH (m)	SAMPLE	SOIL DESCRIPTION	IS. CLASSIFICATION	GRAIN SIZE ANALYSIS			ATTERBERG LIMITS				SHEAR PARAMETERS						
					GRAVEL, %	SAND, %	SILT & CLAY, %	LIQUID LIMIT,%	PLASTIC LIMIT,%	PLASTICITY INDEX	SHINKAGE LIMIT (%)	DRY DENSITY, gm/cc	WET DENSITY, gm/cc	WATER CONTENT, %	SPECIFIC GRAVITY	FREE SWELL INDEX, %	TEST METHOD	C in Kg/cm ²
7	0.50	SPT-1	Sandy CLAY	CI - SC	0	34	66	37	14	23					2.60			
36	1.50	SPT-2	Sandy CLAY	CL - SC	0	46	54	31	15	16	11							
>100	2.50	SPT-3	Sandy CLAY	CI - SC	0	38	62	36	13	23	14				2.55			
>100	3.50	SPT-4	Sandy CLAY	CL - SC	0	46	54	33	12	21	12							
>100	4.50	SPT-5	Sandy CLAY	CL - SC														

TEST RESULTS			Project :Soil Investigation works for the proposed 65 MW NLC Solar Power Project at Cuddalore, Tamil Nadu					Boring Start: 29.07.2016		Termination Depth		Table No.							
								Boring End : 29.07.2016		5.50 m		14							
								Location		G.W.T		Bore-Hole No.							
								40 MW		2.90 m		14							
N VALUE	DEPTH (m)	SAMPLE	SOIL DESCRIPTION	IS. CLASSIFICATION	GRAIN SIZE ANALYSIS			ATTERBERG LIMITS			SHINKAGE LIMIT (%)	DRY DENSITY, gm/cc	WET DENSITY, gm/cc	WATER CONTENT, %	SPECIFIC GRAVITY	FREE SWELL INDEX, %	SHEAR PARAMETERS		
					GRAVEL, %	SAND, %	SILT & CLAY, %	LIQUID LIMIT,%	PLASTIC LIMIT,%	PLASTICITY INDEX							TEST METHOD	C in Kg/cm ²	φ in degrees
6	0.50	SPT-1	Clayey SAND	SC - CL	0	56	44	33	12	21					2.60				
17	1.50	SPT-2	Clayey SAND	SC - CI	9	51	40	38	11	27	13				2.50				
54	2.50	SPT-3	Clayey SAND	SC - CI															
>100	3.50	SPT-4	Clayey SAND	SC - CI	4	58	38	37	10	27	11								
>100	4.50	SPT-5	Clayey SAND	SC - CL	0	70	30	33	14	19	13								
>100	5.50	SPT-6	Clayey SAND	SC - CI															

TEST RESULTS			Project :Soil Investigation works for the proposed 65 MW NLC Solar Power Project at Cuddalore, Tamil Nadu					Boring Start: 28.07.2016		Termination Depth		Table No.							
								Boring End : 28.07.2016		5.50 m		15							
								Location		G.W.T		Bore-Hole No.							
								40 MW		2.90 m		15							
N VALUE	DEPTH (m)	SAMPLE	SOIL DESCRIPTION	IS. CLASSIFICATION	GRAIN SIZE ANALYSIS			ATTERBERG LIMITS			SHINKAGE LIMIT (%)	DRY DENSITY, gm/cc	WET DENSITY, gm/cc	WATER CONTENT, %	SPECIFIC GRAVITY	FREE SWELL INDEX, %	SHEAR PARAMETERS		
					GRAVEL, %	SAND, %	SILT & CLAY, %	LIQUID LIMIT,%	PLASTIC LIMIT,%	PLASTICITY INDEX							TEST METHOD	C in Kg/cm ²	φ in degrees
8	0.50	SPT-1	Clayey SAND	SC - CL	0	58	42	31	14	17	12				2.60				
30	1.50	SPT-2	Sandy CLAY	CL - SC															
70	2.50	SPT-3	Sandy CLAY	CL - SC	1	46	53	34	14	20	11				2.50				
>100	3.50	SPT-4	Sandy CLAY	CL - SC															
>100	4.50	SPT-5	Clayey SAND	SC - CL	4	60	36	33	14	19	12								
>100	5.50	SPT-6	Clayey SAND	SC - CL	0	66	34	31	11	20									

TEST RESULTS			Project :Soil Investigation works for the proposed 65 MW NLC Solar Power Project at Cuddalore, Tamil Nadu							Boring Start: 01.08.2016		Termination Depth		Table No.					
										Boring End : 01.08.2016		5.50 m		16					
										Location		G.W.T		Bore-Hole No.					
										40 MW		2.90 m		16					
N VALUE	DEPTH (m)	SAMPLE	SOIL DESCRIPTION	IS. CLASSIFICATION	GRAIN SIZE ANALYSIS			ATTERBERG LIMITS			SHINKAGE LIMIT (%)	DRY DENSITY, gm/cc	WET DENSITY, gm/cc	WATER CONTENT, %	SPECIFIC GRAVITY	FREE SWELL INDEX, %	SHEAR PARAMETERS		
					GRAVEL, %	SAND, %	SILT & CLAY, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX							TEST METHOD	C in Kg/cm ²	φ in degrees
15	0.50	SPT-1	Clayey SAND	SC - CL	0	51	49	34	13	21									
53	1.50	SPT-2	Clayey SAND	SC - CL	0	58	42	34	13	21	11				2.60				
77	2.50	SPT-3	Clayey SAND	SC - CL															
>100	3.50	SPT-4	Clayey SAND With Gravel	SC - CL -G	12	70	18	34	11	23									
>100	4.50	SPT-5	Clayey SAND	SC - CL															
>100	5.50	SPT-6	Clayey SAND	SC - CL	6	77	33	32	10	22					2.55				

TEST RESULTS			Project :Soil Investigation works for the proposed 65 MW NLC Solar Power Project at Cuddalore, Tamil Nadu							Boring Start: 24.07.2016		Termination Depth		Table No.					
										Boring End : 24.07.2016		5.00 m		17					
										Location		G.W.T		Bore-Hole No.					
										40 MW		2.40 m		17					
N VALUE	DEPTH (m)	SAMPLE	SOIL DESCRIPTION	IS. CLASSIFICATION	GRAIN SIZE ANALYSIS			ATTERBERG LIMITS			SHINKAGE LIMIT (%)	DRY DENSITY, gm/cc	WET DENSITY, gm/cc	WATER CONTENT, %	SPECIFIC GRAVITY	FREE SWELL INDEX, %	SHEAR PARAMETERS		
					GRAVEL, %	SAND, %	SILT & CLAY, %	LIQUID LIMIT,%	PLASTIC LIMIT,%	PLASTICITY INDEX							TEST METHOD	C in Kg/cm ²	φ in degrees
8	0.50	SPT-1	Clayey SAND	SC - CI	0	60	40	35	10	25					2.55				
23	2.00	SPT-2	Clayey SAND	SC - CI	0	64	36	37	14	23	11								
>100	3.00	SPT-3	Clayey SAND	SC - CI	0	52	48	39	14	35					2.60				
>100	4.00	SPT-4	Clayey SAND	SC - CI	0	53	47	37	14	23	13								
>100	5.00	SPT-5	Clayey SAND	SC - CI															

TEST RESULTS			Project :Soil Investigation works for the proposed 65 MW NLC Solar Power Project at Cuddalore, Tamil Nadu						Boring Start: 27.07.2016		Termination Depth		Table No.						
									Boring End : 27.07.2016		5.00 m		18						
									Location		G.W.T		Bore-Hole No.						
									40 MW		3.25 m		18						
N VALUE	DEPTH (m)	SAMPLE	SOIL DESCRIPTION	IS. CLASSIFICATION	GRAIN SIZE ANALYSIS			ATTERBERG LIMITS			SHINKAGE LIMIT (%)	DRY DENSITY, gm/cc	WET DENSITY, gm/cc	WATER CONTENT, %	SPECIFIC GRAVITY	FREE SWELL INDEX, %	SHEAR PARAMETERS		
					GRAVEL, %	SAND, %	SILT & CLAY, %	LIQUID LIMIT,%	PLASTIC LIMIT,%	PLASTICITY INDEX							TEST METHOD	C in Kg/cm ²	φ in degrees
7	0.50	SPT-1	Sandy CLAY	CL - SC	0	42	58	34	14	20	13				2.62				
37	1.50	SPT-2	Sandy CLAY	CL - SC															
>100	2.50	SPT-3	Sandy CLAY	CI - SC	0	48	52	37	12	25									
>100	3.50	SPT-4	Clayey SAND	SC - CL	4	60	36	34	13	21									
>100	5.00	SPT-5	Silty SAND	SM	0	72	27												

TEST RESULTS			Project :Soil Investigation works for the proposed 65 MW NLC Solar Power Project at Cuddalore, Tamil Nadu						Boring Start: 01.08.2016		Termination Depth		Table No.						
									Boring End : 01.08.2016		5.50 m		19						
									Location		G.W.T		Bore-Hole No.						
									40 MW		3.10 m		19						
N VALUE	DEPTH (m)	SAMPLE	SOIL DESCRIPTION	IS. CLASSIFICATION	GRAIN SIZE ANALYSIS			ATTERBERG LIMITS			SHINKAGE LIMIT (%)	DRY DENSITY, gm/cc	WET DENSITY, gm/cc	WATER CONTENT, %	SPECIFIC GRAVITY	FREE SWELL INDEX, %	SHEAR PARAMETERS		
					GRAVEL, %	SAND, %	SILT & CLAY, %	LIQUID LIMIT,%	PLASTIC LIMIT,%	PLASTICITY INDEX							TEST METHOD	C in Kg/cm ²	φ in degrees
11	0.50	SPT-1	Clayey SAND	SC - CL	0	52	48	32	13	22	12				2.50				
51	1.50	SPT-2	Clayey SAND	SC - CL															
63	2.50	SPT-3	Clayey SAND	SC - CL	0	60	40	33	13	20	11				2.60				
>100	3.50	SPT-4	Clayey SAND	SC - CL	0	53	47	34	14	20									
>100	4.50	SPT-5	Clayey SAND	SC - CL															
>100	5.00	SPT-6	Clayey SAND	SC - CL	0	67	33	31	15	16									

TEST RESULTS			Project :Soil Investigation works for the proposed 65 MW NLC Solar Power Project at Cuddalore, Tamil Nadu						Boring Start: 23.07.2016		Termination Depth		Table No.						
									Boring End : 23.07.2016		6.50 m		20						
									Location		G.W.T		Bore-Hole No.						
									40 MW		2.60 m		20						
N VALUE	DEPTH (m)	SAMPLE	SOIL DESCRIPTION	IS. CLASSIFICATION	GRAIN SIZE ANALYSIS			ATTERBERG LIMITS			SHINKAGE LIMIT (%)	DRY DENSITY, gm/cc	WET DENSITY, gm/cc	WATER CONTENT, %	SPECIFIC GRAVITY	FREE SWELL INDEX, %	SHEAR PARAMETERS		
					GRAVEL, %	SAND, %	SILT & CLAY, %	LIQUID LIMIT,%	PLASTIC LIMIT,%	PLASTICITY INDEX							TEST METHOD	C in Kg/cm ²	φ in degrees
8	0.50	SPT-1	Clayey SAND	SC - CL	0	54	46	33	11	22									
14	2.00	SPT-2	Clayey SAND	SC - CL	0	52	48	33	10	23									
33	3.00	SPT-3	Clayey SAND	SC - CL															
>100	4.00	SPT-4	Clayey SAND	SC - CL	0	70	30												
>100	5.00	SPT-5	Clayey SAND	SC - CL	0	63	37	34	12	22									
>100	6.50	SPT-6	Clayey SAND	SC - CL	0	58	42	31	14	17									

TEST RESULTS			Project :Soil Investigation works for the proposed 65 MW NLC Solar Power Project at Cuddalore, Tamil Nadu					Boring Start: 23.07.2016		Termination Depth		Table No.							
								Boring End : 23.07.2016		7.50 m		21							
								Location		G.W.T		Bore-Hole No.							
								40 MW		2.45 m		21							
N VALUE	DEPTH (m)	SAMPLE	SOIL DESCRIPTION	IS. CLASSIFICATION	GRAIN SIZE ANALYSIS			ATTERBERG LIMITS			SHINKAGE LIMIT (%)	DRY DENSITY, gm/cc	WET DENSITY, gm/cc	WATER CONTENT, %	SPECIFIC GRAVITY	FREE SWELL INDEX, %	SHEAR PARAMETERS		
					GRAVEL, %	SAND, %	SILT & CLAY, %	LIQUID LIMIT,%	PLASTIC LIMIT,%	PLASTICITY INDEX							TEST METHOD	C in Kg/cm ²	φ in degrees
9	0.50	SPT-1	Clayey SAND	SC - CL	0	53	47	33	11	22	12				2.60				
25	2.00	SPT-2	Clayey SAND	SC - CL	0	54	46	31	11	20	11								
73	3.50	SPT-3	Clayey SAND	SC - CI	1	56	43	36	14	22									
86	4.50	SPT-4	Clayey SAND	SC - CL															
58	6.00	SPT-5	Clayey SAND	SC - CL															
>100	7.50	SPT-6	Clayey SAND	SC - CL	1	59	40	34	12	22					2.55				

TEST RESULTS			Project :Soil Investigation works for the proposed 65 MW NLC Solar Power Project at Cuddalore, Tamil Nadu					Boring Start: 02.08.2016		Termination Depth		Table No.							
								Boring End : 02.08.2016		5.50 m		22							
								Location		G.W.T		Bore-Hole No.							
								40 MW		3.00 m		22							
N VALUE	DEPTH (m)	SAMPLE	SOIL DESCRIPTION	IS. CLASSIFICATION	GRAIN SIZE ANALYSIS			ATTERBERG LIMITS			SHINKAGE LIMIT (%)	DRY DENSITY, gm/cc	WET DENSITY, gm/cc	WATER CONTENT, %	SPECIFIC GRAVITY	FREE SWELL INDEX, %	SHEAR PARAMETERS		
					GRAVEL, %	SAND, %	SILT & CLAY, %	LIQUID LIMIT,%	PLASTIC LIMIT,%	PLASTICITY INDEX							TEST METHOD	C in Kg/cm ²	φ in degrees
9	0.50	SPT-1	Clayey SAND	SC - CL	0	60	40	31	12	19	13				2.60				
33	1.50	SPT-2	Clayey SAND	SC - CL	0	66	34	33	14	19									
65	2.50	SPT-3	Clayey SAND	SC - CL															
>100	3.50	SPT-4	Clayey SAND	SC - CL	0	55	45	33	11	22									
>100	4.50	SPT-5	Clayey SAND	SC - CL															
>100	5.50	SPT-6	Clayey SAND	SC - CL	0	59	41	35	12	23									