

EPC PACKAGE FOR LARA SUPER THERMAL POWER PROJECT, STAGE-II (2x800 MW)
Amendment No. 01A to Technical Specifications Section-VI of Bidding Document No.: CS-9587-001R-2

S. No.	SPECIFICATION REFERENCE				Instead of	Read as
	Section / Part	Sub-Section	Clause No.	Page No.		
1.	VI/A	I-B	6.03.00	2 OF 22	Coal Quality The primary fuel for the main steam generator shall be coal. The coal quality parameters are indicated in Annexure-IV-2 are to be considered for steam generator design. Annexure-IV-2	Coal Quality The primary fuel for the main steam generator shall be coal. The coal quality parameters are indicated in Annexure-IV-2R are to be considered for steam generator design.

Doc. No.: CS-9587-001R-2-TECH AMDT- 01A	LARA SUPER THERMAL POWER PROJECT STAGE-II (2X800 MW)	Amendment No. 01A to Technical Specifications Section-VI
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LARA II 2 x800 MW Domestic Coal Characteristics						
S.No.	Characteristics	Range of coal supplies 95%			Range of coal supplies 5%	
	(as received basis)	Column - 1	Column - 2	Column - 3	Column - 1	Column - 2
1.0	PROXIMATE ANALYSIS	Design	Worst	Best	Worst	Best
1.1	Total Moisture (%)	16	17	13	17.5	13
1.2	Ash (%)	40	43	33.5	44	31
1.3	Volatile Matter (%)	21	19	23	19	23
1.4	Fixed Carbon (%)	23	21	30.5	19.5	33
1.5	Total (%)	100.00	100.00	100.00	100.00	100.00
2.0	ULTIMATE ANALYSIS					
2.1	Carbon (%)	34.7	30.4	42.85	29.1	43.03
2.2	Hydrogen (%)	2.8	2.3	1.7	2.3	3.58
2.3	Sulphur (%)	0.4	0.5	0.35	0.5	0.35
2.4	Nitrogen(%)	1	0.9	1.23	0.84	1.37
2.5	Oxygen(%) (By difference)	5.1	5.9	7.37	5.76	7.17
2.8	Total Moisture (%)	16	17	13	17.5	13
2.9	Ash (%)	40	43	33.5	44	31.5
	Total	100	100	100	100	100
2.10	GCV (Kcal/Kg)	3550	3000	3750	2900	4100
2.11	Hard Groove Index	50.00	48.00	65.00	45.00	70.00
2.12	YGP	75.00	80.00	70.00	85.00	65.00
3.0	ASH ANALYSIS					
3.1	Silica (%)	58.59	56.81	60.20	56.29	60.42
3.2	Alumina(%)	26.77	27.42	26.10	27.52	25.90
3.3	Iron Oxide (%)	8.80	9.80	7.80	10.10	7.60
3.4	Titania	1.66	1.78	1.56	1.86	1.52
3.5	Phosphoric Anhydride (%)	0.19	0.10	0.24	0.08	0.32
3.6	Lime (%)	1.38	1.48	1.32	1.52	1.28
3.7	Magnesia (%)	1.00	1.13	0.97	1.17	0.92
3.8	Sulphuric Anhydride (%)	0.05	0.04	0.10	0.04	0.15
3.9	Sodium Oxide (%)	0.10	0.08	0.15	0.08	0.17
3.10	Balance Alkalies (by difference)	1.46	1.36	1.56	1.34	1.72
	Total	100.00	100.00	100.00	100.00	100.00
4.0	ASH FUSION RANGE					
	REDUCING ATMOSPHERE					
4.1	Initial Deformation Temp.(oC)	1150.00	1100.00	1200.00	1100.00	1200.00
4.2	Hemispherical Temp. (oC)	1300.00	1250.00	1350.00	1250.00	1350.00
4.3	Fusion Temperature (oC)	1400.00	1400.00	1400.00	1400.00	1400.00

Surface Elevation : RL 208.237 m
Ground Water Depth : 23.82 m
Termination Depth : 35 m (RL 173.237 m)
Ground Water Level : RL 184.417 m

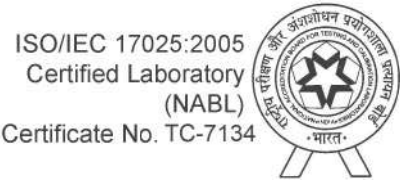
Boring Method : Rotary Drilling
Casing Depth : 11.0 m
Boring Start : 12-Dec-18
Boring Finish : 15-Dec-18

Rock Profile (BH-104)

SPT N- Value (N _t) ⁽¹⁾	Depth (m)	Drill Run (m)	Sample No.	Serial No. of Cores	Casing Lowered (Size)	Symbol	ROCK DESCRIPTION	Depth of Strata, (m)	Percent Recovery (%) ⁽¹⁾	Rock Quality Designation (RQD, %) ⁽¹⁾	Rock Mass Rating (RMR) ⁽¹⁾	Penetration Rate (minutes/cm)	Size of Hole: NX			Porosity (%)	Water Absorption (%)	Point Load Index (kg/cm ²)	Unconfined Compressive Strength (kg/cm ²)	Modulus of Elasticity (kg/cm ²)																																																					
													Return Water		Bits Used						Density (g/cc)	Specific Gravity																																																			
													Colour	Loss																																																											
	20.50	21.50	RK5	22-28		Weak, grey GRANITE, very intensely fractured, highly weathered			36	10			↕	↕	↕																																																										
	21.00												↕	↕	↕																																																										
	21.50												↕	↕	↕																																																										
	22.00	23.00	RK6	29-36											41						16			Light Brown	100%	32 CT Diamond Impregnated Bit																																															
	22.50																															↕	↕	↕																																							
	23.00																															↕	↕	↕																																							
	23.50	24.50	RK7	37-44																														43	18	18																																					
	24.00																																													↕	↕	↕																									
	24.50																																													↕	↕	↕																									
	25.00	26.00	RK8	45-53																																												59	23																								
	25.50																																																											↕	↕	↕											
	26.00																																																											↕	↕	↕											
	26.50	27.00	RK9	54-61																																																										63	24										
	27.00																																																																								

* Equivalent Unconfined Compressive Strength based on Point Load Strength Index

Rock Profile (BH-104)



Location : TAC
UTM Coordinates : 752848 E, 2407736 N
Survey Coordinates : 2138S, 1129W

Surface Elevation : RL 208.237 m
Ground Water Depth : 23.82 m
Termination Depth : 35 m (RL 173.237 m)
Ground Water Level : RL 184.417 m
Boring Method : Rotary Drilling
Casing Depth : 11.0 m
Boring Start : 12-Dec-18
Boring Finish : 15-Dec-18

SPT N- Value (N _t) ⁽¹⁾	Depth (m)	Drill Run (m)	Sample No.	Serial No. of Cores	Casing Lowered (Size)	Symbol	ROCK DESCRIPTION	Depth of Strata, (m)	Percent Recovery (%) ⁽¹⁾	Rock Quality Designation (RQD, %) ⁽¹⁾	Rock Mass Rating (RMR) ⁽¹⁾	Penetration Rate (minutes/cm)	Size of Hole: NX				Density (g/cc)	Specific Gravity	Porosity (%)	Water Absorption (%)	Point Load Index (kg/cm ²)	Unconfined Compressive Strength (kg/cm ²)	Modulus of Elasticity (kg/cm ²)									
													Return Water		Bits Used																	
													Colour	Loss																		
	27.00	27.50	RK10	62-72			Moderately strong to weak, grey GRANITE, very intensely fractured, highly weathered		70	26	18		↕	↕	↕																	
	27.50																															
	28.00																- weak, 14.0 to 30.5 m						↕	↕	↕							
	28.50																						↕	↕	↕							
	29.00	29.00	RK11	73-83					64	24			↕	↕	↕																	
	29.50																															
	30.00																					↕	↕	↕								
	30.50	30.50														- moderately strong, 30.5 to 35.0 m						↕	↕	↕								
	31.00	32.00	RK12	84-94					74	30			↕	↕	↕																	
	31.50																															
	32.00																						↕	↕	↕							
	32.50																						↕	↕	↕							
	33.00	33.50	RK13	95-103					78	32			↕	↕	↕																	
	33.50																						↕	↕	↕							

⁽¹⁾Outside NABL scope.

* Equivalent Unconfined Compressive Strength based on Point Load Strength Index

Rock Profile (BH-104)

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Location : TAC

UTM Coordinates : 752848 E, 2407736 N

Survey Coordinates : 2138S, 1129W

Surface Elevation : RL 208.237 m

Ground Water Depth : 23.82 m

Termination Depth : 35 m (RL 173.237 m)

Ground Water Level : RL 184.417 m

Boring Method : Rotary Drilling

Casing Depth : 11.0 m

Boring Start : 12-Dec-18

Boring Finish : 15-Dec-18

SPT N- Value (N _t) ⁽¹⁾	Depth (m)				Drill Run (m)	Sample No.	Serial No. of Cores	Casing Lowered (Size)	Symbol	ROCK DESCRIPTION	Depth of Strata, (m)	Percent Recovery (%) ⁽¹⁾	Rock Quality Designation (RQD, %) ⁽¹⁾	Rock Mass Rating (RMR) ⁽¹⁾	Penetration Rate (minutes/cm)	Size of Hole: NX				Density (g/cc)	Specific Gravity	Porosity (%)	Water Absorption (%)	Point Load Index (kg/cm ²)	Unconfined Compressive Strength (kg/cm ²)	Modulus of Elasticity (kg/cm ²)	
	Return		Water																								
	Colour	Loss	Bits Used																								
	33.50	34.00	34.50	35.00	35.00	RK14	104-111			Moderately strong, grey GRANITE, very intensely fractured, highly weathered	35.00	79	36	22		Light Brown	100%	3/2 C.I Diamond									

⁽¹⁾Outside NABL scope.

* Equivalent Unconfined Compressive Strength based on Point Load Strength Index

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Soil Profile (BH-105)

Location : Space for Lime & Gypsum Handling Area Surface Elevation : RL 207.587 m Boring Method : Shell & Auger
UTM Coordinates : 752953 E, 2407738 N Ground Water Depth : 20.60 m Casing Depth : 9.5 m
Survey Coordinates : 2128S, 1022W Termination Depth : 25 m (RL 182.587 m) Boring Start : 18-Dec-18
Ground Water Level : RL 186.987 m Boring Finish : 20-Dec-18

Depth, m		Sample No.	SPT ⁽¹⁾		Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Grain Size Analysis				Atterberg Limits		Shrinkage Limit, (%)	Density and Moisture			Specific Gravity	Shear Tests				Free Swell Index, (%)
From	To		Field Value, N _r	Corrected Value, N _r ^{''}				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)		Plasticity Index (%)	Bulk Density (gms/cm ³)	Dry Density (gms/cm ³)		Moisture Content (%)	Type of Test	Confining Pressures, (kg/cm ²)	Cohesion Intercept, 'c' (kg/cm ²)	
0.00	0.50	DS1				Dense brown gravelly sand (SP-SM-GP)	20	75	5	0	52.1	20.3	31.8										
1.00	1.30	UDS1																					
2.50	2.95	SPT1	32	40																			
4.00	4.45	SPT2	39	39		Hard brown silty clay with gravel, high plastic (CH)																	
5.50	5.95	SPT3	45	45																			
7.00	7.45	SPT4	52	52																			
8.50	8.95	SPT5	54	54																			
10.00	10.45	SPT6	77	77																			
10.50	10.90	SPT7	102/25cm				12.00																
12.40	12.44	SPT8	Ref*/4cm			Refusal met on Rock. Core drilling through rock adopted. Refer to next page for details.																	

⁽¹⁾ SPT is outside NABL scope.

Rock Profile (BH-105)

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Location : Space for Lime & Gypsum
Handling Area
UTM Coordinates : 752953 E, 2407738 N
Survey Coordinates : 2128S, 1022W

Surface Elevation : RL 207.587 m

Boring Method : Rotary Drilling

Ground Water Depth : 20.60 m

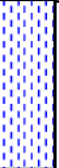
Casing Depth : 9.5 m

Termination Depth : 25 m (RL 182.587 m)

Boring Start : 18-Dec-18

Ground Water Level : RL 186.987 m

Boring Finish : 20-Dec-18

SPT N- Value (N _t) ⁽¹⁾	Depth (m)	Drill Run (m)	Sample No.	Serial No. of Cores	Casing Lowered (Size)	Symbol	ROCK DESCRIPTION	Depth of Strata, (m)	Percent Recovery (%) ⁽¹⁾	Rock Quality Designation (RQD, %) ⁽¹⁾	Rock Mass Rating (RMR) ₍₁₎	Penetration Rate (minutes/cm)	Size of Hole: NX					Density (g/cc)	Specific Gravity	Porosity (%)	Water Absorption (%)	Point Load Index (kg/cm ²)	Unconfined Compressive Strength (kg/cm ²)	Modulus of Elasticity (kg/cm ²)																
													Return Water		Bits Used	Diameter (mm)	Length (m)																							
													Colour	Loss																										
	12.50	12.50	RK1	1-6			Weak, grey GRANITE, very intensely fractured, highly weathered		28	11			Light Brown	100%	32 CT Diamond Impregnated Bit																									
	13.00																																							
	13.50																																							
	14.00	14.00																																						
	14.50		RK2	7-12					36	0																														
	15.00																																							
	15.50	15.50																																						
	16.00		RK3	13-19																																				
	16.50																																							
	17.00	17.00																																						
	17.50		RK4	20-26					39	18																														
	18.00																																							
	18.50	18.50																																						
19.00																																								

⁽¹⁾Outside NABL scope.

* Equivalent Unconfined Compressive Strength based on Point Load Strength Index

Rock Profile (BH-105)

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Location : Space for Lime & Gypsum
Handling Area
UTM Coordinates : 752953 E, 2407738 N
Survey Coordinates : 2128S, 1022W

Surface Elevation : RL 207.587 m

Ground Water Depth : 20.60 m

Termination Depth : 25 m (RL 182.587 m)

Ground Water Level : RL 186.987 m

Boring Method : Rotary Drilling

Casing Depth : 9.5 m

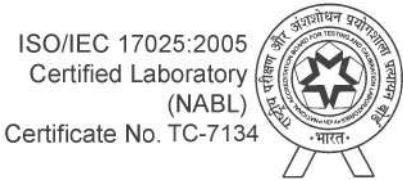
Boring Start : 18-Dec-18

Boring Finish : 20-Dec-18

SPT N- Value (N _t) ⁽¹⁾	Depth (m)	Drill Run (m)	Sample No.	Serial No. of Cores	Casing Lowered (Size)	Symbol	ROCK DESCRIPTION	Depth of Strata, (m)	Percent Recovery (%) ⁽¹⁾	Rock Quality Designation (RQD, %) ⁽¹⁾	Rock Mass Rating (RMR) ⁽¹⁾	Penetration Rate (minutes/cm)	Size of Hole: NX				Density (g/cc)	Specific Gravity	Porosity (%)	Water Absorption (%)	Point Load Index (kg/cm ²)	Unconfined Compressive Strength (kg/cm ²)	Modulus of Elasticity (kg/cm ²)																
													Return Water		Bits Used																								
													Colour	Loss																									
	19.00	20.00	RK5	27-34		Moderately strong to weak, grey GRANITE very intensely fractured, highly weathered - weak, 12.5 to 21.5 m - moderately strong, 21.5 to 25.0 m		45	21	18		Light Brown	100%	32 CT Diamond Impregnated Bit																									
	19.50																																						
	20.00																																						
	20.50	21.50	RK6	35-43						41														20															
	21.00																																						
	21.50																																						
	22.00	23.00	RK7	44-62						46														25															
	22.50																																						
	23.00																																						
	23.50	24.50	RK8	63-70						58														28	22														
	24.00																																						
	24.50																																						
	25.00	25.00	RK9	71-74																					69	33													
- - -							- - - - -	25.00	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -															

⁽¹⁾Outside NABL scope.

* Equivalent Unconfined Compressive Strength based on Point Load Strength Index



Soil Profile (BH-106)

Location : Space for Lime & Gypsum Handling Area Surface Elevation : RL 208.287 m Boring Method : Shell & Auger
UTM Coordinates : 752964 E, 2407858 N Ground Water Depth : 21.09 m Casing Depth : 7.0 m
Survey Coordinates : 2009S, 1025W Termination Depth : 25 m (RL 183.287 m) Boring Start : 10-Dec-18
Ground Water Level : RL 187.197 m Boring Finish : 13-Dec-18

Depth, m		Sample No.	SPT ⁽¹⁾		Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Grain Size Analysis				Atterberg Limits			Shrinkage Limit, (%)	Density and Moisture			Specific Gravity	Shear Tests				Free Swell Index, (%)
From	To		Field Value, N _r	Corrected Value, N"				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Plasticity Index (%)		Bulk Density (gms/cm ³)	Dry Density (gms/cm ³)	Moisture Content (%)		Type of Test	Confining Pressures, (kg/cm ²)	Cohesion Intercept, 'c' (kg/cm ²)	Angle of Internal Friction, ϕ (degrees)	
0.00	0.50	DS1				Hard brown silty clay, high plastic (CH)																		
1.00	1.45	SPT1	33	33		- with traces of gravel, 1.0 to 2.5 m		2	5	57	36													
2.50	2.72	UDS1											1.87	1.69	10.8									
4.00	4.45	SPT2	53	53																				
5.50	5.95	SPT3	72	72																				
7.00	7.20	SPT4	73/5cm				7.50					52.7	19.7	33.0										
7.50	7.52	SPT5	Ref*/2cm			Refusal met on Rock. Core drilling through rock adopted. Refer to next page for details.																		

⁽¹⁾ SPT is outside NABL scope.

Rock Profile (BH-106)

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Location : Space for Lime & Gypsum
Handling Area
UTM Coordinates : 752964 E, 2407858 N
Survey Coordinates : 2009S, 1025W

Surface Elevation : RL 208.287 m

Ground Water Depth : 21.09 m

Termination Depth : 25 m (RL 183.287 m)

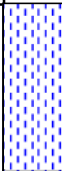
Ground Water Level : RL 187.197 m

Boring Method : Rotary Drilling

Casing Depth : 7.0 m

Boring Start : 10-Dec-18

Boring Finish : 13-Dec-18

SPT N- Value (N _t) ⁽¹⁾	Depth (m)	Drill Run (m)	Sample No.	Serial No. of Cores	Casing Lowered (Size)	Symbol	ROCK DESCRIPTION	Depth of Strata, (m)	Percent Recovery (%) ⁽¹⁾	Rock Quality Designation (RQD, %) ⁽¹⁾	Rock Mass Rating (RMR) ⁽¹⁾	Penetration Rate (minutes/cm)	Size of Hole: NX					Porosity (%)	Water Absorption (%)	Point Load Index (kg/cm ²)	Unconfined Compressive Strength (kg/cm ²)	Modulus of Elasticity (kg/cm ²)																								
													Return Water		Bits Used	Density (g/cc)	Specific Gravity																													
													Colour	Loss																																
Ref*/ 2cm	7.50	7.50	SPT5	1-6		Weak, grey GRANITE, very intensely fractured, highly weathered			46	18			↕	↕	↕																															
	8.00	7.52											RK1	7-13	48									21	Light Brown	100%	32 CT Diamond Impregnated Bit																			
	8.50																																													
	9.00	9.00	RK2	14-19					33	12			18																																	
	9.50																										RK3	20-27	35	0																
	10.00																																													
	10.50	10.50	RK4																																											
	11.00																												RK4																	
	11.50																																													
	12.00	12.00																																												
	12.50																																													
	13.00																																													
	13.50	13.50																																												
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⁽¹⁾Outside NABL scope.

* Equivalent Unconfined Compressive Strength based on Point Load Strength Index

Rock Profile (BH-106)

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Location : Space for Lime & Gypsum
Handling Area
UTM Coordinates : 752964 E, 2407858 N
Survey Coordinates : 2009S, 1025W

Surface Elevation : RL 208.287 m

Boring Method : Rotary Drilling

Ground Water Depth : 21.09 m

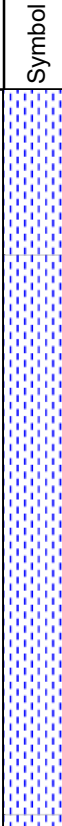
Casing Depth : 7.0 m

Termination Depth : 25 m (RL 183.287 m)

Boring Start : 10-Dec-18

Ground Water Level : RL 187.197 m

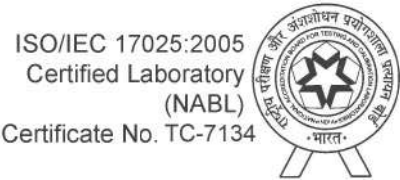
Boring Finish : 13-Dec-18

SPT N- Value (N _t) ⁽¹⁾	Depth (m)	Drill Run (m)	Sample No.	Serial No. of Cores	Casing Lowered (Size)	Symbol	ROCK DESCRIPTION	Depth of Strata, (m)	Percent Recovery (%) ⁽¹⁾	Rock Quality Designation (RQD, %) ⁽¹⁾	Rock Mass Rating (RMR) ⁽¹⁾	Penetration Rate (minutes/cm)	Size of Hole: NX					Porosity (%)	Water Absorption (%)	Point Load Index (kg/cm ²)	Unconfined Compressive Strength (kg/cm ²)	Modulus of Elasticity (kg/cm ²)
													Return Water		Bits Used	Density (g/cc)	Specific Gravity					
													Colour	Loss								
	14.00	15.00	RK5	28-36		Moderately strong to weak, grey GRANITE, very intensely fractured, highly weathered - weak, 7.5 to 19.5 m 																

⁽¹⁾Outside NABL scope.

* Equivalent Unconfined Compressive Strength based on Point Load Strength Index

Rock Profile (BH-106)



Location : Space for Lime & Gypsum
Handling Area
UTM Coordinates : 752964 E, 2407858 N
Survey Coordinates : 2009S, 1025W

Surface Elevation : RL 208.287 m

Boring Method : Rotary Drilling

Ground Water Depth : 21.09 m

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Boring Start : 10-Dec-18

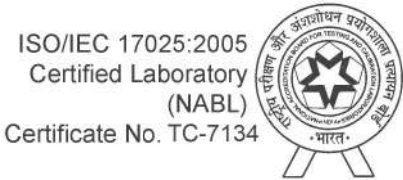
Ground Water Level : RL 187.197 m

Boring Finish : 13-Dec-18

SPT N- Value (N _t) ⁽¹⁾	Depth (m)	Drill Run (m)	Sample No.	Serial No. of Cores	Casing Lowered (Size)	Symbol	ROCK DESCRIPTION	Depth of Strata, (m)	Percent Recovery (%) ⁽¹⁾	Rock Quality Designation (RQD, %) ⁽¹⁾	Rock Mass Rating (RMR) ⁽¹⁾	Penetration Rate (minutes/cm)	Size of Hole: NX			Density (g/cc)	Specific Gravity	Porosity (%)	Water Absorption (%)	Point Load Index (kg/cm ²)	Unconfined Compressive Strength (kg/cm ²)	Modulus of Elasticity (kg/cm ²)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
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	20.50	21.00	RK10	75-82			Moderately strong, grey GRANITE, very intensely fractured, highly weathered		74	34			→	Light Brown	↕	100%	↕	32 CT Diamond Impregnated Bit	→																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				

⁽¹⁾Outside NABL scope.

* Equivalent Unconfined Compressive Strength based on Point Load Strength Index



Soil Profile (BH-107)

Location : ACW Surface Elevation : RL 209.887 m Boring Method : Shell & Auger
UTM Coordinates : 752434 E, 2408117 N Ground Water Depth : 21.15 m Casing Depth : 5.5 m
Survey Coordinates : 1805S, 1590W Termination Depth : 25 m (RL 184.887 m) Boring Start : 05-Dec-18
Ground Water Level : RL 188.737 m Boring Finish : 07-Dec-18

Depth, m		Sample No.	SPT ⁽¹⁾		Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Grain Size Analysis				Atterberg Limits			Shrinkage Limit, (%)	Density and Moisture			Specific Gravity	Shear Tests				Free Swell Index, (%)
From	To		Field Value, N _r	Corrected Value, N _r				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Plasticity Index (%)		Bulk Density (gms/cm ³)	Dry Density (gms/cm ³)	Moisture Content (%)		Type of Test	Confining Pressures, (kg/cm ²)	Cohesion Intercept, 'c' (kg/cm ²)	Angle of Internal Friction, ϕ (degrees)	
0.00	0.50	DS1	53	53		Hard brown silty clay with gravel, high plastic (CH)	5.00	10	31	26	33	62.9	25.4	37.5										
1.00	1.45	SPT1																						
2.50	2.95	SPT2																						
4.00	4.45	SPT3																						
5.00	5.08	SPT4				Refusal met on Rock. Core drilling through rock adopted. Refer to next page for details.																		

⁽¹⁾ SPT is outside NABL scope.

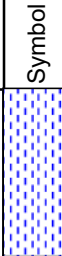
Rock Profile (BH-107)

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Location : ACW
UTM Coordinates : 752434 E, 2408117 N
Survey Coordinates : 1805S, 1590W

Surface Elevation : RL 209.887 m
Ground Water Depth : 21.15 m
Termination Depth : 25 m (RL 184.887 m)
Ground Water Level : RL 188.737 m
Boring Method : Rotary Drilling
Casing Depth : 5.5 m
Boring Start : 05-Dec-18
Boring Finish : 07-Dec-18

SPT N- Value (N _t) ⁽¹⁾	Depth (m)	Drill Run (m)	Sample No.	Serial No. of Cores	Casing Lowered (Size)	Symbol	ROCK DESCRIPTION	Depth of Strata, (m)	Percent Recovery (%) ⁽¹⁾	Rock Quality Designation (RQD, %) ⁽¹⁾	Rock Mass Rating (RMR) ⁽¹⁾	Penetration Rate (minutes/cm)	Size of Hole: NX					Porosity (%)	Water Absorption (%)	Point Load Index (kg/cm ²)	Unconfined Compressive Strength (kg/cm ²)	Modulus of Elasticity (kg/cm ²)			
													Return Water		Bits Used	Density (g/cc)	Specific Gravity								
													Colour	Loss											
Ref*/8cm	5.00	5.00	SPT4	1-7		Weak, grey GRANITE, very intensely fractured, highly weathered			22	0	18		Light Brown	100%	32 CT Diamond Impregnated Bit										
	5.50	5.08																							RK1
	6.00																								
	6.50	6.50	RK2	8-13																					
	7.00																								
	7.50																								
	8.00	8.00	RK3	14-21																					
	8.50																								
	9.00																								
	9.50	9.50	RK4	22-30																					
	10.00																								
	10.50																								
	11.00	11.00																							
	11.50																								

⁽¹⁾Outside NABL scope.

* Equivalent Unconfined Compressive Strength based on Point Load Strength Index

Surface Elevation : RL 209.887 m
Ground Water Depth : 21.15 m
Termination Depth : 25 m (RL 184.887 m)
Ground Water Level : RL 188.737 m

Boring Method : Rotary Drilling
Casing Depth : 5.5 m
Boring Start : 05-Dec-18
Boring Finish : 07-Dec-18

Size of Hole: NX

[illegible]

⁽¹⁾Outside NABL scope.

* Equivalent Unconfined Compressive Strength based on Point Load Strength Index

Rock Profile (BH-107)

Location : ACW

Surface Elevation : RL 209.887 m

Boring Method : Rotary Drilling

UTM Coordinates : 752434 E, 2408117 N

Ground Water Depth : 21.15 m

Casing Depth : 5.5 m

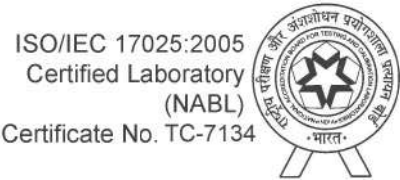
Survey Coordinates : 1805S, 1590W

Termination Depth : 25 m (RL 184.887 m)

Boring Start : 05-Dec-18

Ground Water Level : RL 188.737 m

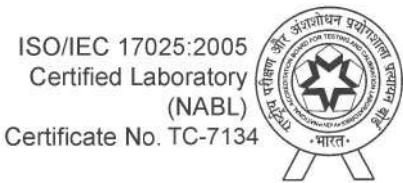
Boring Finish : 07-Dec-18



SPT N- Value (N _t) ⁽¹⁾	Depth (m)	Drill Run (m)	Sample No.	Serial No. of Cores	Casing Lowered (Size)	Symbol	ROCK DESCRIPTION	Depth of Strata, (m)	Percent Recovery (%) ⁽¹⁾	Rock Quality Designation (RQD, %) ⁽¹⁾	Rock Mass Rating (RMR) ⁽¹⁾	Penetration Rate (minutes/cm)	Size of Hole: NX					Porosity (%)	Water Absorption (%)	Point Load Index (kg/cm ²)	Unconfined Compressive Strength (kg/cm ²)	Modulus of Elasticity (kg/cm ²)																						
													Return Water		Bits Used	Density (g/cc)	Specific Gravity																											
													Colour	Loss																														
	18.00	18.50	RK10	82-94			Moderately strong to weak, grey GRANITE, very intensely fractured, highly weathered	25.00	42	22	18		—————>	—————>	—————>																													
	18.50						—————>						—————>	—————>																														
	19.00						20.00						RK11	95-104	- weak, 5.0 to 20.0 m							47	32		Light Brown	100%	32 CT Diamond Impregnated Bit																	
	19.50																																											
	20.00	21.50	RK12	105-116			- moderately strong, 20.0 to 25.0 m		52	38	22																																	
	20.50						—————>																						—————>	—————>														
	21.00						23.00																						RK13	117-124	58	34												
	21.50																																											
	22.00	24.00	RK14	125-138									70	42																														
	22.50																																	—————>	—————>	—————>								
	23.00																																	—————>	—————>	—————>								
	23.50																																	—————>	—————>	—————>								
	24.00	25.00																						—————>	—————>	—————>																		

⁽¹⁾Outside NABL scope.

* Equivalent Unconfined Compressive Strength based on Point Load Strength Index



Soil Profile (BH-108)

Location : ACW Surface Elevation : RL 209.987 m Boring Method : Shell & Auger
UTM Coordinates : 752517 E, 2408166 N Ground Water Depth : 21.29 m Casing Depth : 5.0 m
Survey Coordinates : 1748S, 1513W Termination Depth : 25 m (RL 184.987 m) Boring Start : 04-Dec-18
Ground Water Level : RL 188.697 m Boring Finish : 06-Dec-18

Depth, m		Sample No.	SPT ⁽¹⁾		Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Grain Size Analysis				Atterberg Limits			Shrinkage Limit, (%)	Density and Moisture			Specific Gravity	Shear Tests				Free Swell Index, (%)
From	To		Field Value, Nr	Corrected Value, N"				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Plasticity Index (%)		Bulk Density (gms/cm ³)	Dry Density (gms/cm ³)	Moisture Content (%)		Type of Test	Confining Pressures, (kg/cm ²)	Cohesion Intercept, 'c' (kg/cm ²)	Angle of Internal Friction, ϕ (degrees)	
0.00	0.50	DS1				Very dense brown silty sand with traces of gravel (SM)																		
1.00	1.45	SPT1	55	86				3	73	24	0													
2.50	2.95	SPT2	80	101			4.00																	
4.00	4.08	SPT3	102/8cm			Refusal met on Rock. Core drilling through rock adopted. Refer to next page for details.																		

⁽¹⁾ SPT is outside NABL scope.

Rock Profile (BH-108)

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Location : ACW

UTM Coordinates : 752517 E, 2408166 N

Survey Coordinates : 1748S, 1513W

Surface Elevation : RL 209.987 m

Ground Water Depth : 21.29 m

Termination Depth : 25 m (RL 184.987 m)

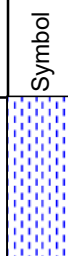
Ground Water Level : RL 188.697 m

Boring Method : Rotary Drilling

Casing Depth : 5.0 m

Boring Start : 04-Dec-18

Boring Finish : 06-Dec-18

SPT N- Value (N _t) ⁽¹⁾	Depth (m)	Drill Run (m)	Sample No.	Serial No. of Cores	Casing Lowered (Size)	Symbol	ROCK DESCRIPTION	Depth of Strata, (m)	Percent Recovery (%) ⁽¹⁾	Rock Quality Designation (RQD, %) ⁽¹⁾	Rock Mass Rating (RMR) ⁽¹⁾	Penetration Rate (minutes/cm)	Size of Hole: NX					Density (g/cc)	Specific Gravity	Porosity (%)	Water Absorption (%)	Point Load Index (kg/cm ²)	Unconfined Compressive Strength (kg/cm ²)	Modulus of Elasticity (kg/cm ²)								
													Return		Water	Bits Used																
													Colour		Loss																	
Ref*/8cm	4.00	4.00	SPT3	1-5			Weak, grey GRANITE, very intensely fractured, highly weathered		22	0	18		Light Brown	100%	32 CT Diamond Impregnated Bit																	
	4.50	4.08																									RK1					
	5.00																															
	5.50	5.50	RK2	6-12					25	0																						
	6.00																														7.00	
	6.50																															
	7.00	7.00	RK3	13-19					23	0																						
	7.50																															8.50
	8.00																															
	8.50	8.50	RK4	20-28					28	0																						
	9.00																															10.00
	9.50																															
	10.00	10.00																														
	10.50																															

⁽¹⁾Outside NABL scope.

* Equivalent Unconfined Compressive Strength based on Point Load Strength Index

Rock Profile (BH-108)

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Certificate No. TC-7134



Location : ACW
UTM Coordinates : 752517 E, 2408166 N
Survey Coordinates : 1748S, 1513W

Surface Elevation : RL 209.987 m
Ground Water Depth : 21.29 m
Termination Depth : 25 m (RL 184.987 m)
Ground Water Level : RL 188.697 m
Boring Method : Rotary Drilling
Casing Depth : 5.0 m
Boring Start : 04-Dec-18
Boring Finish : 06-Dec-18

SPT N- Value (N _t) ⁽¹⁾	Depth (m)	Drill Run (m)	Sample No.	Serial No. of Cores	Casing Lowered (Size)	Symbol	ROCK DESCRIPTION	Depth of Strata, (m)	Percent Recovery (%) ⁽¹⁾	Rock Quality Designation (RQD, %) ⁽¹⁾	Rock Mass Rating (RMR) ⁽¹⁾	Penetration Rate (minutes/cm)	Size of Hole: NX					Porosity (%)	Water Absorption (%)	Point Load Index (kg/cm ²)	Unconfined Compressive Strength (kg/cm ²)	Modulus of Elasticity (kg/cm ²)																																																																		
													Return Water		Bits Used	Density (g/cc)	Specific Gravity																																																																							
													Colour	Loss																																																																										
	10.50	11.50	RK5	29-38		Weak, grey GRANITE, very intensely fractured, highly weathered		31	13	18		Light Brown	100%	32 CT Diamond Impregnated Bit																																																																										
	11.00																																																																																							
	11.50																																																																																							
	12.00	13.00	RK6	39-48																					42	22	16																																																													
	12.50																																																																																							
	13.00																																																																																							
	13.50	14.50	RK7	49-58																																					45	16																																														
	14.00																																																																																							
	14.50																																																																																							
	15.00	16.00	RK8	59-66																																																				42	19																															
	15.50																																																																																							
	16.00																																																																																							
	16.50		RK9	67-69																																																																																				
	17.00																																																																																							

⁽¹⁾Outside NABL scope.

* Equivalent Unconfined Compressive Strength based on Point Load Strength Index

Rock Profile (BH-108)

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Location : ACW
UTM Coordinates : 752517 E, 2408166 N
Survey Coordinates : 1748S, 1513W

Surface Elevation : RL 209.987 m
Ground Water Depth : 21.29 m
Termination Depth : 25 m (RL 184.987 m)
Ground Water Level : RL 188.697 m

Boring Method : Rotary Drilling
Casing Depth : 5.0 m
Boring Start : 04-Dec-18
Boring Finish : 06-Dec-18

SPT N- Value (N _t) ⁽¹⁾	Depth (m)	Drill Run (m)	Sample No.	Serial No. of Cores	Casing Lowered (Size)	Symbol	ROCK DESCRIPTION	Depth of Strata, (m)	Percent Recovery (%) ⁽¹⁾	Rock Quality Designation (RQD, %) ⁽¹⁾	Rock Mass Rating (RMR) ⁽¹⁾	Penetration Rate (minutes/cm)	Size of Hole: NX					Porosity (%)	Water Absorption (%)	Point Load Index (kg/cm ²)	Unconfined Compressive Strength (kg/cm ²)	Modulus of Elasticity (kg/cm ²)		
													Return Water		Bits Used	Density (g/cc)	Specific Gravity							
													Colour	Loss										
	17.00	17.50	RK10	70-79			Moderately strong to weak, grey GRANITE, very intensely fractured, highly weathered - weak, 4.0 to 17.5 m - moderately strong, 17.5 to 25.0 m		57	28			↓	↑	32 CT Diamond Impregnated Bit									
	17.50												↑	↓										
	18.00												↑	↓										
	18.50	19.00	RK11	80-91					62	32	22		Light Brown	100%										
	19.00												↑	↓										
	19.50												↑	↓										
	20.00	20.50	RK12	92-102					56	27			↓	↑										
	20.50												↓	↑										
	21.00												↓	↑										
	21.50	22.00	RK13	103-112					67	29			↓	↑										
	22.00												↓	↑										
	22.50												↓	↑										
	23.00	23.50												↓										↑
	23.50													↓										↑

⁽¹⁾Outside NABL scope.

* Equivalent Unconfined Compressive Strength based on Point Load Strength Index

Rock Profile (BH-108)

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Location : ACW

UTM Coordinates : 752517 E, 2408166 N

Survey Coordinates : 1748S, 1513W

Surface Elevation : RL 209.987 m

Ground Water Depth : 21.29 m

Termination Depth : 25 m (RL 184.987 m)

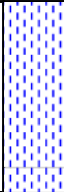
Ground Water Level : RL 188.697 m

Boring Method : Rotary Drilling

Casing Depth : 5.0 m

Boring Start : 04-Dec-18

Boring Finish : 06-Dec-18

	SPT N- Value (N _t) ⁽¹⁾	Depth (m)	Drill Run (m)	Sample No.	Serial No. of Cores	Casing Lowered (Size)	Symbol	ROCK DESCRIPTION	Depth of Strata, (m)	Percent Recovery (%) ⁽¹⁾	Rock Quality Designation (RQD, %) ⁽¹⁾	Rock Mass Rating (RMR) ⁽¹⁾	Penetration Rate (minutes/cm)	Size of Hole: NX					Porosity (%)	Water Absorption (%)	Point Load Index (kg/cm ²)	Unconfined Compressive Strength (kg/cm ²)	Modulus of Elasticity (kg/cm ²)		
	Return Water													Bits Used	Density (g/cc)	Specific Gravity									
	Colour																Loss								
		23.50	25.00	RK14	113-122			Moderately strong, grey GRANITE, very intensely fractured, highly weathered	25.00	72	38	22		Light	→	→	→								
	24.00													Brown	100%	3/2 C 1									
	24.50															Diamond									
	25.00	25.00																							

⁽¹⁾Outside NABL scope.

* Equivalent Unconfined Compressive Strength based on Point Load Strength Index

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Location : RWPH for Stage-I
UTM Coordinates : 752757 E, 2408137 N
Survey Coordinates : 1750S, 1264W

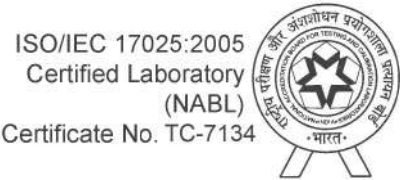
Soil Profile (BH-109)

Surface Elevation : RL 206.000 m
Ground Water Depth : 22.06 m
Termination Depth : 30 m (RL 176 m)
Ground Water Level : RL 183.94 m
Boring Method : Shell & Auger
Casing Depth : 11.0 m
Boring Start : 14-Dec-18
Boring Finish : 15-Dec-18

Depth, m		Sample No.	SPT ⁽¹⁾		Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Grain Size Analysis				Atterberg Limits			Shrinkage Limit, (%)	Density and Moisture			Specific Gravity	Shear Tests				Free Swell Index, (%)
From	To		Field Value, N _r	Corrected Value, N _r ¹				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Plasticity Index (%)		Bulk Density (gms/cm ³)	Dry Density (gms/cm ³)	Moisture Content (%)		Type of Test	Confining Pressures, (kg/cm ²)	Cohesion Intercept, 'c' (kg/cm ²)	Angle of Internal Friction, ϕ (degrees)	
0.00	0.50	DS1				Hard brown silty clay with gravel, high plastic (CH)																		
1.00	1.45	SPT1	51	51																				
2.50	2.95	SPT2	58	58																				
4.00	4.45	SPT3	66	66																				
5.50	5.95	SPT4	78	78																				
7.00	7.45	SPT5	87	87																				
8.50	8.95	SPT6	90	90																				
10.00	10.45	SPT7	95	95																				
11.50	11.95	SPT8	107	107			11.50																	
13.50	13.57	SPT9	Ref*/7cm			Refusal met on Rock. Core drilling through rock adopted. Refer to next page for details.																		

⁽¹⁾ SPT is outside NABL scope.

Rock Profile (BH-109)



Location : RWPH for Stage-I
UTM Coordinates : 752757 E, 2408137 N
Survey Coordinates : 1750S, 1264W

Surface Elevation : RL 206.000 m
Ground Water Depth : 22.06 m
Termination Depth : 30 m (RL 176 m)
Ground Water Level : RL 183.94 m

Boring Method : Rotary Drilling
Casing Depth : 11.0 m
Boring Start : 14-Dec-18
Boring Finish : 15-Dec-18

SPT N- Value (N _t) ⁽¹⁾	Depth (m)	Drill Run (m)	Sample No.	Serial No. of Cores	Casing Lowered (Size)	Symbol	ROCK DESCRIPTION	Depth of Strata, (m)	Percent Recovery (%) ⁽¹⁾	Rock Quality Designation (RQD, %) ⁽¹⁾	Rock Mass Rating (RMR) ⁽¹⁾	Penetration Rate (minutes/cm)	Size of Hole: NX					Porosity (%)	Water Absorption (%)	Point Load Index (kg/cm ²)	Unconfined Compressive Strength (kg/cm ²)	Modulus of Elasticity (kg/cm ²)
													Return Water		Bits Used	Density (g/cc)	Specific Gravity					
													Colour	Loss								
Ref*/ 7cm	13.50	13.50	SPT9	1-6		Weak, grey GRANITE, very intensely fractured, highly weathered		23	0		18	Light Brown	100%	32 CT Diamond Impregnated Bit								
	14.00	13.57																				
	14.50																					
	15.00	15.00	RK2	7-13				26	0													
	15.50																					
	16.00																					
	16.50	16.50	RK3	14-20				38	0	18												
	17.00																					
	17.50																					
	18.00	18.00	RK4	21-27				43	18													
	18.50																					
	19.00																					
	19.50	19.50																				
	20.00																					

⁽¹⁾Outside NABL scope.

* Equivalent Unconfined Compressive Strength based on Point Load Strength Index

Rock Profile (BH-109)

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Location : RWPH for Stage-I
UTM Coordinates : 752757 E, 2408137 N
Survey Coordinates : 1750S, 1264W

Surface Elevation : RL 206.000 m
Ground Water Depth : 22.06 m
Termination Depth : 30 m (RL 176 m)
Ground Water Level : RL 183.94 m

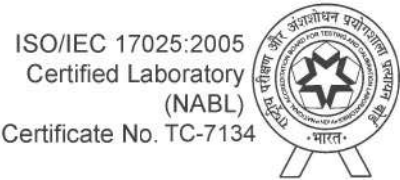
Boring Method : Rotary Drilling
Casing Depth : 11.0 m
Boring Start : 14-Dec-18
Boring Finish : 15-Dec-18

SPT N- Value (N _t) ⁽¹⁾	Depth (m)	Drill Run (m)	Sample No.	Serial No. of Cores	Casing Lowered (Size)	Symbol	ROCK DESCRIPTION	Depth of Strata, (m)	Percent Recovery (%) ⁽¹⁾	Rock Quality Designation (RQD, %) ⁽¹⁾	Rock Mass Rating (RMR) ⁽¹⁾	Penetration Rate (minutes/cm)	Size of Hole: NX					Porosity (%)	Water Absorption (%)	Point Load Index (kg/cm ²)	Unconfined Compressive Strength (kg/cm ²)	Modulus of Elasticity (kg/cm ²)							
													Return Water		Bits Used	Density (g/cc)	Specific Gravity												
													Colour	Loss															
	20.00	21.00	RK5	28-37			Moderately strong to weak, grey GRANITE, very intensely fractured, highly weathered - weak, 13.5 to 21.0 m - moderately strong, 21.0 to 25.0 m		54	21			↑	Light Brown	↓	100%	↓	32 CT Diamond Impregnated Bit	↓										
	20.50																												
	21.00																												
	21.50	22.50	RK6	38-46							58		28																
	22.00																												
	22.50																												
	23.00	24.00	RK7	47-57							46		36	22															
	23.50																												
	24.00																												
	24.50	25.50	RK8	58-66							61		29																
	25.00																												
	25.50																												
	26.00	26.50	RK9	67-78										63	35														
	26.50																												

⁽¹⁾Outside NABL scope.

* Equivalent Unconfined Compressive Strength based on Point Load Strength Index

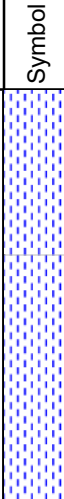
Rock Profile (BH-109)



Location : RWPH for Stage-I
UTM Coordinates : 752757 E, 2408137 N
Survey Coordinates : 1750S, 1264W

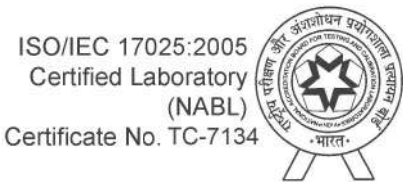
Surface Elevation : RL 206.000 m
Ground Water Depth : 22.06 m
Termination Depth : 30 m (RL 176 m)
Ground Water Level : RL 183.94 m

Boring Method : Rotary Drilling
Casing Depth : 11.0 m
Boring Start : 14-Dec-18
Boring Finish : 15-Dec-18

SPT N- Value (N _t) ⁽¹⁾	Depth (m)	Drill Run (m)	Sample No.	Serial No. of Cores	Casing Lowered (Size)	Symbol	ROCK DESCRIPTION	Depth of Strata, (m)	Percent Recovery (%) ⁽¹⁾	Rock Quality Designation (RQD, %) ⁽¹⁾	Rock Mass Rating (RMR) ⁽¹⁾	Penetration Rate (minutes/cm)	Size of Hole: NX					Porosity (%)	Water Absorption (%)	Point Load Index (kg/cm ²)	Unconfined Compressive Strength (kg/cm ²)	Modulus of Elasticity (kg/cm ²)												
													Return Water		Bits Used	Density (g/cc)	Specific Gravity																	
													Colour	Loss																				
	26.50	27.00	RK10	79-89			Moderately strong, grey GRANITE, very intensely fractured, highly weathered	30.00	66	39	22		Light Brown	100%	3/2 C 1 Diamond Impregnated Bit	/																		
	27.00																																	
	27.50																																	
	28.00																																	
	28.50	28.50	RK11	90-113																														
	29.00																																	
	29.50																																	
	30.00																																	

⁽¹⁾Outside NABL scope.

* Equivalent Unconfined Compressive Strength based on Point Load Strength Index



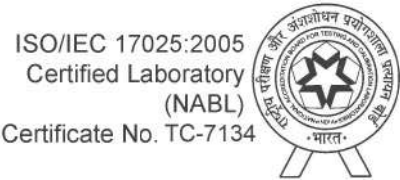
Soil Profile (BH-110)

Location : Lagoon-2 Surface Elevation : RL 204.087 m Boring Method : Shell & Auger
UTM Coordinates : 752646 E, 2408266 N Ground Water Depth : 19.32 m Casing Depth : 7.3 m
Survey Coordinates : 1636S, 1392W Termination Depth : 25 m (RL 179.087 m) Boring Start : 08-Dec-18
Ground Water Level : RL 184.767 m Boring Finish : 09-Dec-18

Depth, m		Sample No.	SPT ⁽¹⁾		Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Grain Size Analysis				Atterberg Limits			Shrinkage Limit, (%)	Density and Moisture			Specific Gravity	Shear Tests				Free Swell Index, (%)
From	To		Field Value, N _r	Corrected Value, N"				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Plasticity Index (%)		Bulk Density (gms/cm ³)	Dry Density (gms/cm ³)	Moisture Content (%)		Type of Test	Confining Pressures, (kg/cm ²)	Cohesion Intercept, 'c' (kg/cm ²)	Angle of Internal Friction, ϕ (degrees)	
0.00	0.50	DS1	58	91		Very dense brown fine sand with gravel (SP-SM)	4.00	8	88	4	0													
1.00	1.45	SPT1																						
2.50	2.95	SPT2																						
4.00	4.45	SPT3	69	69		Hard brown silty clay with traces of gravel, high plastic (CH)	7.00	1	0	35	64	85.6	25.4	60.1										
5.50	5.95	SPT4																						
5.50	7.00	DS2																						
7.00	7.05	SPT5	Ref*/5cm			Refusal met on Rock. Core drilling through rock adopted. Refer to next page for details.																		

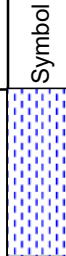
⁽¹⁾ SPT is outside NABL scope.

Rock Profile (BH-110)



Location : Lagoon-2
UTM Coordinates : 752646 E, 2408266 N
Survey Coordinates : 1636S, 1392W

Surface Elevation : RL 204.087 m
Ground Water Depth : 19.32 m
Termination Depth : 25 m (RL 179.087 m)
Ground Water Level : RL 184.767 m
Boring Method : Rotary Drilling
Casing Depth : 7.3 m
Boring Start : 08-Dec-18
Boring Finish : 09-Dec-18

SPT N- Value (N _t) ⁽¹⁾	Depth (m)	Drill Run (m)	Sample No.	Serial No. of Cores	Casing Lowered (Size)	Symbol	ROCK DESCRIPTION	Depth of Strata, (m)	Percent Recovery (%) ⁽¹⁾	Rock Quality Designation (RQD, %) ⁽¹⁾	Rock Mass Rating (RMR) ⁽¹⁾	Penetration Rate (minutes/cm)	Size of Hole: NX					Porosity (%)	Water Absorption (%)	Point Load Index (kg/cm ²)	Unconfined Compressive Strength (kg/cm ²)	Modulus of Elasticity (kg/cm ²)				
													Return Water		Bits Used	Density (g/cc)	Specific Gravity									
													Colour	Loss												
Ref*/ 5cm	7.00	7.00	SPT5	1-3			Weak, grey GRANITE, very intensely fractured, highly weathered		18	0			↕	↕	↕											
	7.50	7.05											RK1													
	8.00																									
Ref*/ 3cm	8.50	8.50	SPT6	4-9					19	0			Light Brown	100%	32 CT Diamond Impregnated Bit											
	9.00	8.53																							RK2	
	9.50																									
Ref*/ 2cm	10.00	10.00	SPT7	10-15					21	0	18				↕	↕	↕									
	10.50	10.02																								RK3
	11.00																									
	11.50	11.50	RK4	16-22					37	18				↕	↕	↕										
	12.00																									
	12.50																									
	13.00	13.00																								
13.50																										

⁽¹⁾Outside NABL scope.

* Equivalent Unconfined Compressive Strength based on Point Load Strength Index

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Location : Lagoon-2
UTM Coordinates : 752646 E, 2408266 N
Survey Coordinates : 1636S, 1392W

Rock Profile (BH-110)

Surface Elevation : RL 204.087 m
Ground Water Depth : 19.32 m
Termination Depth : 25 m (RL 179.087 m)
Ground Water Level : RL 184.767 m
Boring Method : Rotary Drilling
Casing Depth : 7.3 m
Boring Start : 08-Dec-18
Boring Finish : 09-Dec-18

SPT N- Value (N _t) ⁽¹⁾	Depth (m)	Drill Run (m)	Sample No.	Serial No. of Cores	Casing Lowered (Size)	Symbol	ROCK DESCRIPTION	Depth of Strata, (m)	Percent Recovery (%) ⁽¹⁾	Rock Quality Designation (RQD, %) ⁽¹⁾	Rock Mass Rating (RMR) ⁽¹⁾	Penetration Rate (minutes/cm)	Size of Hole: NX					Density (g/cc)	Specific Gravity	Porosity (%)	Water Absorption (%)	Point Load Index (kg/cm ²)	Unconfined Compressive Strength (kg/cm ²)	Modulus of Elasticity (kg/cm ²)																																																																										
													Return Water		Bits Used																																																																																			
													Colour	Loss																																																																																				
	13.50	14.50	RK5	23-30		Weak, grey GRANITE, very intensely fractured, highly weathered			34	18			↕	↕	↕ 32 CT Diamond Impregnated Bit ↕																																																																																			
	14.00												↕	↕																																																																																				
	14.50																																																																																																	
	15.00	16.00	RK6	31-40																						37	20			Light Brown	↕ 100% ↕																																																																			
	15.50																																																																																																	
	16.00																																																																																																	
	16.50	17.50	RK7	41-53																																									46	24	18																																																			
	17.00																																																																																																	
	17.50																																																																																																	
	18.00	19.00	RK8	54-64																																																											37	26																																		
	18.50																																																																																																	
	19.00																																																																																																	
	19.50	20.00	RK9	65-82																																																																														48	23															
	20.00																																																																																																	

⁽¹⁾Outside NABL scope.

* Equivalent Unconfined Compressive Strength based on Point Load Strength Index

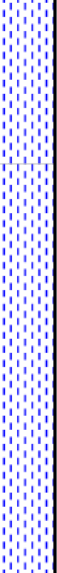
Rock Profile (BH-110)

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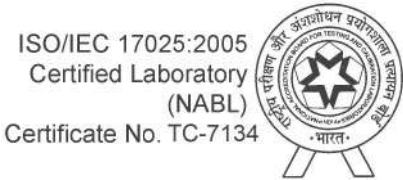
Location : Lagoon-2
UTM Coordinates : 752646 E, 2408266 N
Survey Coordinates : 1636S, 1392W

Surface Elevation : RL 204.087 m
Ground Water Depth : 19.32 m
Termination Depth : 25 m (RL 179.087 m)
Ground Water Level : RL 184.767 m
Boring Method : Rotary Drilling
Casing Depth : 7.3 m
Boring Start : 08-Dec-18
Boring Finish : 09-Dec-18

SPT N- Value (N _f) ⁽¹⁾	Depth (m)	Drill Run (m)	Sample No.	Serial No. of Cores	Casing Lowered (Size)	Symbol	ROCK DESCRIPTION	Depth of Strata, (m)	Percent Recovery (%) ⁽¹⁾	Rock Quality Designation (RQD, %) ⁽¹⁾	Rock Mass Rating (RMR) ⁽¹⁾	Penetration Rate (minutes/cm)	Size of Hole: NX			Density (g/cc)	Specific Gravity	Porosity (%)	Water Absorption (%)	Point Load Index (kg/cm ²)	Unconfined Compressive Strength (kg/cm ²)	Modulus of Elasticity (kg/cm ²)		
													Return Water		Bits Used									
													Colour	Loss										
	20.00	20.50	RK10	83-97			Moderately strong, grey GRANITE, very intensely fractured, highly weathered	25.00	56	28			↕	↕	↕									
	20.50												↕	↕	↕									
	21.00												Light Brown	100%	32 CT Diamond Impregnated Bit									
	21.50																							
	22.00	22.00	RK11	98-116						58	31	22			↕	↕	↕							
	22.50															100%	32 CT Diamond Impregnated Bit							
	23.00																							
	23.50	23.50													RK12	117-136								
	24.00			100%	32 CT Diamond Impregnated Bit																			
	24.50																							
	25.00	25.00																	↕	↕	↕			

⁽¹⁾Outside NABL scope.

* Equivalent Unconfined Compressive Strength based on Point Load Strength Index



Soil Profile (BH-4)

Location : Space for Future Provision
Survey Coordinates : 2509S, 1423W

Surface Elevation : RL 210.008 m
Ground Water Depth : 21.75 m
Termination Depth : 35 m (RL 175 m)
Ground Water Level : RL 188.3 m

Boring Method : Shell & Auger
Casing Depth : 31.0 m
Boring Start : 04-Jul-18
Boring Finish : 07-Jul-18

Depth, m		Sample No.	SPT ⁽¹⁾		Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Grain Size Analysis				Atterberg Limits			Shrinkage Limit, (%)	Density and Moisture			Specific Gravity	Shear Tests				Free Swell Index, (%)
From	To		Field Value, N _r	Corrected Value, N"				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Plasticity Index (%)		Bulk Density (gms/cm ³)	Dry Density (gms/cm ³)	Moisture Content (%)		Type of Test	Confining Pressures, (kg/cm ²)	Cohesion Intercept, 'c' (kg/cm ²)	Angle of Internal Friction, φ (degrees)	
0.00	0.50	DS1				Hard brown sandy silt intermixed with gravels, low plastic (CL-GP)																		
1.50	1.95	SPT1	83	119			2.00	35	33	13	19													
2.25	2.55	UDS1				Hard brown clayey silt, low expansive, medium plastic (CI)						43.6	21.3	22.4	19	1.80	1.57	15.0						
3.00	3.45	SPT2	41	41		- with traces of gravel, 3.0 to 4.5 m	4.50	1	2	54	43													
4.50	4.95	SPT3	41	41		Hard brown silty clay with traces of gravel, high plastic (CH)													2.67			1.1		
5.25	5.55	UDS2														1.85	1.58	17.2		UC				
6.00	6.45	SPT4	60	60								50.3	22.8	27.4										
7.50	7.95	SPT5	71	71				4	6	34	56													
8.25	8.55	DS2																						
9.00	9.10	SPT6	Ref*/10cm	-																				
10.50	10.67	SPT7	101/2cm	-																				
11.25	11.55	DS3					12.00																	

⁽¹⁾ SPT is outside NABL scope.

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Soil Profile (BH-4)

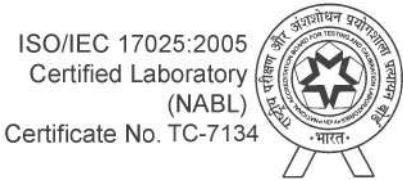
Location : Space for Future Provision
Survey Coordinates : 2509S, 1423W

Surface Elevation : RL 210.008 m
Ground Water Depth : 21.75 m
Termination Depth : 35 m (RL 175 m)
Ground Water Level : RL 188.3 m

Boring Method : Shell & Auger
Casing Depth : 31.0 m
Boring Start : 04-Jul-18
Boring Finish : 07-Jul-18

Depth, m		Sample No.	SPT ⁽¹⁾		Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Grain Size Analysis				Atterberg Limits			Shrinkage Limit, (%)	Density and Moisture			Specific Gravity	Shear Tests				Free Swell Index, (%)
From	To		Field Value, N _f	Corrected Value, N _c				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Plasticity Index (%)		Bulk Density (gms/cm ³)	Dry Density (gms/cm ³)	Moisture Content (%)		Type of Test	Confining Pressures, (kg/cm ²)	Cohesion Intercept, 'c' (kg/cm ²)	Angle of Internal Friction, φ (degrees)	
12.00	12.29	SPT8	107/14cm	-	Hard brown clayey silt, medium plastic (CI) - with traces of gravel, 12.0 to 13.5 m	21.00	1	6	65	28									UU	1 ,2, 3	3.0	8.3		
13.50	13.75	SPT9	100/10cm	-							35.6	22.0	13.6											
14.25	14.50	UDS3																						
15.00	15.22	SPT10	102/7cm	-																				
17.25	17.40	DS4																						
18.00	18.45	SPT11	66	66																				
20.25	20.55	UDS4																						
21.00	21.45	SPT12	57	57			Hard brown clayey silt with gravel, low plastic (CL)		17	12	51	20												
23.25	23.55	UDS5											2.00	1.65	21.2									
24.00	24.45	SPT13	31	31							31.3	19.5	11.8											
26.25	26.55	DS5																						
27.00	27.45	SPT14	36	36																				
							29.00																	

⁽¹⁾ SPT is outside NABL scope.



Soil Profile (BH-4)

Location : Space for Future Provision
Survey Coordinates : 2509S, 1423W

Surface Elevation : RL 210.008 m
Ground Water Depth : 21.75 m
Termination Depth : 35 m (RL 175 m)
Ground Water Level : RL 188.3 m

Boring Method : Shell & Auger
Casing Depth : 31.0 m
Boring Start : 04-Jul-18
Boring Finish : 07-Jul-18

Depth, m		Sample No.	SPT ⁽¹⁾		Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Grain Size Analysis				Atterberg Limits			Shrinkage Limit, (%)	Density and Moisture			Specific Gravity	Shear Tests				
From	To		Field Value, N _r	Corrected Value, N"				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Plasticity Index (%)		Bulk Density (gms/cm ³)	Dry Density (gms/cm ³)	Moisture Content (%)		Type of Test	Confining Pressures, (kg/cm ²)	Cohesion Intercept, 'c' (kg/cm ²)	Angle of Internal Friction, ϕ (degrees)	Free Swell Index, (%)
29.25	29.55	DS6				Hard brown clayey silt with traces of gravel, medium plastic (CI)																		
30.00	30.45	SPT15	48	48			31.00	1	7	50	42													
31.00	31.05	SPT16	Ref*/5cm	-		Refusal met on Rock. Core drilling through rock adopted. Refer to next page for details.																		

⁽¹⁾ SPT is outside NABL scope.

Rock Profile (BH-4)

Location : Space for Future Provision Surface Elevation : RL 210.008 m Boring Method : Rotary Drilling
Survey Coordinates : 2509S, 1423W Ground Water Depth 21.75 m Casing Depth : 31.0 m
Termination Depth : 35 m (RL 175 m) Boring Start : 04-Jul-18
Ground Water Level : RL 188.3 m Boring Finish : 07-Jul-18

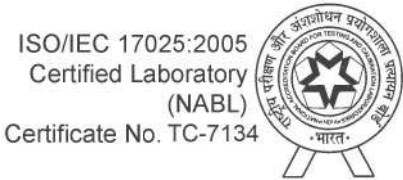
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SPT N- Value (N _t) ⁽¹⁾	Depth (m)	Drill Run (m)	Sample No.	Serial No. of Cores	Casing Lowered (Size)	Symbol	ROCK DESCRIPTION	Depth of Strata, (m)	Percent Recovery (%) ⁽¹⁾	Rock Quality Designation (RQD, %) ⁽¹⁾	Rock Mass Rating (RMR) ⁽¹⁾	Penetration Rate (minutes/cm)	Size of Hole: NX			Density (g/cc)	Specific Gravity	Porosity (%)	Water Absorption (%)	Point Load Index (kg/cm ²)	Unconfined Compressive Strength (kg/cm ²)	
													Return Water		Bits Used							
													Colour	Loss								
Ref*/5cm	31.00	31.00	SPT16	1			Weak, grey GRANITE, very intensely fractured, highly weathered		17	0	18		Light Brown	100%	32 CT Diamond Impregnated Bit	2.20	2.67	0.176	0.31	52	1137*	
	31.50	31.05																				
	32.00																					
	32.50	32.50	RK2	2-5																		
	33.00																					
	33.50																					
	34.00	34.00	RK3	6-8																		
	34.50																					
	35.00	35.00																				
								35.00														

⁽¹⁾Outside NABL scope.

* Equivalent Unconfined Compressive Strength based on Point Load Strength Index



Soil Profile (BH-5)

Location : Space for Future Provision
Survey Coordinates : 2576S, 1396W

Surface Elevation : RL 210.482 m
Ground Water Depth : 22.56 m
Termination Depth : 35 m (RL 175.5 m)
Ground Water Level : RL 187.9 m

Boring Method : Shell & Auger
Casing Depth : 27.0 m
Boring Start : 12-Jul-18
Boring Finish : 18-Jul-18

Depth, m		Sample No.	SPT ⁽¹⁾		Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Grain Size Analysis				Atterberg Limits			Shrinkage Limit, (%)	Density and Moisture			Specific Gravity	Shear Tests				Free Swell Index, (%)
From	To		Field Value, N _f	Corrected Value, N _c				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Plasticity Index (%)		Bulk Density (gms/cm ³)	Dry Density (gms/cm ³)	Moisture Content (%)		Type of Test	Confining Pressures, (kg/cm ²)	Cohesion Intercept, 'c' (kg/cm ²)	Angle of Internal Friction, ϕ (degrees)	
0.00	0.50	DS1				Dense to very dense brown clayey sand with gravel (SC)																		
0.50	0.95	SPT1	45	80		- dense, 0.0 to 1.5 m		14	52	26	8													
1.50	1.95	SPT2	57	81		- very dense, 1.5 to 2.0 m	2.00																	0
2.25	2.55	UDS1				Hard brown clayey silt with traces of gravel, low expansive, medium plastic (CI)						48.0	22.0	25.9	16	1.78	1.55	14.8						17
3.00	3.45	SPT3	80	80			4.50												2.66					
4.50	4.95	SPT4	59	59		Hard brown silty clay with traces of gravel, low expansive, high plastic (CH)		2	14	45	39													
5.25	5.55	UDS2														1.84	1.58	16.8		UC		2.0		
6.00	6.45	SPT5	68	68								60.5	23.2	37.4										
7.50	7.95	SPT6	75	75																				
8.25	8.55	UDS3														1.90	1.62	17.2						
9.00	9.45	SPT7	79	79																				
10.50	10.88	SPT8	103/23cm	-																				

⁽¹⁾ SPT is outside NABL scope.

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Soil Profile (BH-5)

Location : Space for Future Provision
Survey Coordinates : 2576S, 1396W

Surface Elevation : RL 210.482 m
Ground Water Depth : 22.56 m
Termination Depth : 35 m (RL 175.5 m)
Ground Water Level : RL 187.9 m

Boring Method : Shell & Auger
Casing Depth : 27.0 m
Boring Start : 12-Jul-18
Boring Finish : 18-Jul-18

Depth, m		Sample No.	SPT ⁽¹⁾		Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Grain Size Analysis				Atterberg Limits			Shrinkage Limit, (%)	Density and Moisture			Specific Gravity	Shear Tests				Free Swell Index, (%)
From	To		Field Value, N _f	Corrected Value, N _c				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Plasticity Index (%)		Bulk Density (gms/cm ³)	Dry Density (gms/cm ³)	Moisture Content (%)		Type of Test	Confining Pressures, (kg/cm ²)	Cohesion Intercept, 'c' (kg/cm ²)	Angle of Internal Friction, φ (degrees)	
11.25	11.55	UDS4	102/25cm	-		Hard brown silty clay high plastic (CH)	12.00	14	16	48	22								UU	1 ,2, 3	1.7	5.2		
12.00	12.40	SPT9		-		Hard brown clayey silt with gravel, low plastic (CL)																		
13.50	13.95	SPT10		97																				
14.25	14.55	UDS5																						
15.00	15.22	SPT11		102/7cm	-																			
17.25	17.55	DS2																						
18.00	18.37	SPT12		102/22cm	-																			
20.25	20.55	DS3																						
21.00	21.35	SPT13		103/20cm	-																			
23.25	23.55	DS4																						
24.00	24.45	SPT14	64	64																				
26.25	26.55	DS5				27.00																		

⁽¹⁾ SPT is outside NABL scope.

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Soil Profile (BH-5)

Location : Space for Future Provision
Survey Coordinates : 2576S, 1396W

Surface Elevation : RL 210.482 m

Ground Water Depth : 22.56 m

Termination Depth : 35 m (RL 175.5 m)

Ground Water Level : RL 187.9 m

Boring Method : Shell & Auger

Casing Depth : 27.0 m

Boring Start : 12-Jul-18

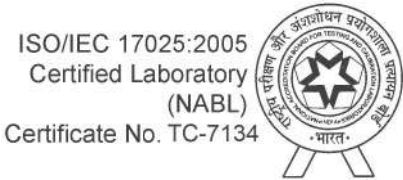
Boring Finish : 18-Jul-18

Depth, m		Sample No.	SPT ⁽¹⁾		Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Grain Size Analysis				Atterberg Limits			Shrinkage Limit, (%)	Density and Moisture			Specific Gravity	Shear Tests				Free Swell Index, (%)
From	To		Field Value, N _f	Corrected Value, N _c				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Plasticity Index (%)		Bulk Density (gms/cm ³)	Dry Density (gms/cm ³)	Moisture Content (%)		Type of Test	Confining Pressures, (kg/cm ²)	Cohesion Intercept, 'c' (kg/cm ²)	Angle of Internal Friction, ϕ (degrees)	
27.00	27.32	SPT15	102/17cm	-		Refusal met on Rock. Core drilling through rock adopted. Refer to next page for details.																		

⁽¹⁾ SPT is outside NABL scope.

Rock Profile (BH-5)

Location : Space for Future Provision Surface Elevation : RL 210.482 m Boring Method : Rotary Drilling
Survey Coordinates : 2576S, 1396W Ground Water Depth 22.56 m Casing Depth : 27.0 m
Termination Depth : 35 m (RL 175.5 m) Boring Start : 12-Jul-18
Ground Water Level : RL 187.9 m Boring Finish : 18-Jul-18



SPT N- Value (N _p) ⁽¹⁾	Depth (m)	Drill Run (m)	Sample No.	Serial No. of Cores	Casing Lowered (Size)	Symbol	ROCK DESCRIPTION	Depth of Strata, (m)	Percent Recovery (%) ⁽¹⁾	Rock Quality Designation (RQD, %) ⁽¹⁾	Rock Mass Rating (RMR) ⁽¹⁾	Penetration Rate (minutes/cm)	Size of Hole: NX			Porosity (%)	Water Absorption (%)	Point Load Index (kg/cm ²)	Unconfined Compressive Strength (kg/cm ²)																									
													Return Water		Bits Used					Density (g/cc)	Specific Gravity																							
													Colour	Loss																														
102/17cm	27.00	27.00	SPT15	1-6			Very weak to weak, grey GRANITE, disintegrated to very intensely fractured, highly to completely weathered		21	0	18		↕	↕	↕	2.12	2.67	0.206	1.95	37	811*																							
	27.50	27.32	RK1				- weak, very intensely fractured, highly weathered, 27.0 to 30.0 m						↕	↕	↕																													
	28.00																																											
	28.50	28.50																																										
	29.00		RK2	7-13					23	0			Light Brown	100%	32 CT Diamond Impregnated Bit	2.12	2.67	0.206	1.95	37	811*																							
	29.50																																											
	30.00	30.00																																										
	30.50		WS1	-			- very weak, disintegrated, completely weathered, 30.0 to 33.5 m		0	0																																		
	31.00																																											
	31.50	31.50	SPT16																																									
Ref*/5cm	32.00	31.55		-					0	0	15																																	
	32.50		WS2																																									
	33.00	33.00	SPT17																																									
Ref*/7cm	33.50	33.07																				↕	↕	↕																				

⁽¹⁾Outside NABL scope.

* Equivalent Unconfined Compressive Strength based on Point Load Strength Index

Rock Profile (BH-5)

Location : Space for Future Provision Surface Elevation : RL 210.482 m Boring Method : Rotary Drilling
Survey Coordinates : 2576S, 1396W Ground Water Depth 22.56 m Casing Depth : 27.0 m
Termination Depth : 35 m (RL 175.5 m) Boring Start : 12-Jul-18
Ground Water Level : RL 187.9 m Boring Finish : 18-Jul-18

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SPT N- Value (N _t) ⁽¹⁾	Depth (m)	Drill Run (m)	Sample No.	Serial No. of Cores	Casing Lowered (Size)	Symbol	ROCK DESCRIPTION	Depth of Strata, (m)	Percent Recovery (%) ⁽¹⁾	Rock Quality Designation (RQD, %) ⁽¹⁾	Rock Mass Rating (RMR) ⁽¹⁾	Penetration Rate (minutes/cm)	Size of Hole: NX			Bits Used	Density (g/cc)	Specific Gravity	Porosity (%)	Water Absorption (%)	Point Load Index (kg/cm ²)	Unconfined Compressive Strength (kg/cm ²)
	Return Water												Colour	Loss								
	33.50	34.00	RK3	14-17			Weak, grey GRANITE, very intensely fractured, highly weathered,	35.00	21	0	18		Light Brown	100%	32 CT Diamond	2.19	2.70	0.2	1.1	16	358*	
	34.00																					
	34.50	RK4	18-21																			
	35.00	35.00																				

⁽¹⁾Outside NABL scope.

* Equivalent Unconfined Compressive Strength based on Point Load Strength Index

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Soil Profile (BH-7)

Location : Space for Future Provision
Survey Coordinates : 2468S, 1375W

Surface Elevation : RL 210.612 m

Ground Water Depth : 22.05 m

Termination Depth : 35 m (RL 175.6 m)

Ground Water Level : RL 188.6 m

Boring Method : Shell & Auger

Casing Depth : 17.0 m

Boring Start : 20-Jun-18

Boring Finish : 02-Jul-18

Depth, m		Sample No.	SPT ⁽¹⁾		Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Grain Size Analysis				Atterberg Limits			Shrinkage Limit, (%)	Density and Moisture			Specific Gravity	Shear Tests				Free Swell Index, (%)
From	To		Field Value, N _f	Corrected Value, N _c				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Plasticity Index (%)		Bulk Density (gms/cm ³)	Dry Density (gms/cm ³)	Moisture Content (%)		Type of Test	Confining Pressures, (kg/cm ²)	Cohesion Intercept, 'c' (kg/cm ²)	Angle of Internal Friction, ϕ (degrees)	
0.00	0.50	DS1				Very dense brown clayey sand with gravel (SC)		12	47	31	10													
1.50	1.75	SPT1	100/10cm	-			3.00												2.67					
3.00	3.45	SPT2	41	41		Refusal met on Rock. Core drilling through rock adopted. Refer to next page for details.																		7

⁽¹⁾ SPT is outside NABL scope.

Rock Profile (BH-7)

Location : Space for Future Provision Surface Elevation : RL 210.612 m Boring Method : Rotary Drilling
Survey Coordinates : 2468S, 1375W Ground Water Depth 22.05 m Casing Depth : 17.0 m
Termination Depth : 35 m (RL 175.6 m) Boring Start : 20-Jun-18
Ground Water Level : RL 188.6 m Boring Finish : 02-Jul-18

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SPT N- Value (N_t) ⁽¹⁾	Depth (m)	Drill Run (m)	Sample No.	Serial No. of Cores	Casing Lowered (Size)	Symbol	ROCK DESCRIPTION	Depth of Strata, (m)	Percent Recovery (%) ⁽¹⁾	Rock Quality Designation (RQD, %) ⁽¹⁾	Rock Mass Rating (RMR) ⁽¹⁾	Penetration Rate (minutes/cm)	Size of Hole: NX			Density (g/cc)	Specific Gravity	Porosity (%)	Water Absorption (%)	Point Load Index (kg/cm ²)	Unconfined Compressive Strength (kg/cm ²)
													Return Water		Bits Used						
													Colour	Loss							
41	3.00	3.00	SPT2	1/3		Very weak, Brown GRANITE, disintegrated to intensely fractured, completely weathered		7	0				↑	↑	↑						
	3.50	3.45	RK1																		
	4.00																				
100/9cm	4.50	4.50	SPT3	2/7		- intensely fractured, 3.0 to 6.0 m		6	0		15			Light Brown	100%	32 CT Diamond Impregnated Bit					
	5.00	4.74																			
	5.50		RK2																		
102/15cm	6.00	6.00	SPT4	-		- disintegrated, 6.0 to 9.5 m		0	0					↓	↓	↓					
	6.50	6.30																			
	7.00		WS1																		
100/13cm	7.50	7.50	SPT5	-				0	0												
	8.00	7.78																			
	8.50		WS2																		
103/15cm	9.00	9.00	SPT6																		
	9.50	9.30																			

⁽¹⁾Outside NABL scope.

* Equivalent Unconfined Compressive Strength based on Point Load Strength Index

Rock Profile (BH-7)

Location : Space for Future Provision Surface Elevation : RL 210.612 m Boring Method : Rotary Drilling
Survey Coordinates : 2468S, 1375W Ground Water Depth 22.05 m Casing Depth : 17.0 m
Termination Depth : 35 m (RL 175.6 m) Boring Start : 20-Jun-18
Ground Water Level : RL 188.6 m Boring Finish : 02-Jul-18

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SPT N- Value (N _f) ⁽¹⁾	Depth (m)	Drill Run (m)	Sample No.	Serial No. of Cores	Casing Lowered (Size)	Symbol	ROCK DESCRIPTION	Depth of Strata, (m)	Percent Recovery (%) ⁽¹⁾	Rock Quality Designation (RQD, %) ⁽¹⁾	Rock Mass Rating (RMR) ⁽¹⁾	Penetration Rate (minutes/cm)	Size of Hole: NX			Density (g/cc)	Specific Gravity	Porosity (%)	Water Absorption (%)	Point Load Index (kg/cm ²)	Unconfined Compressive Strength (kg/cm ²)
													Return Water		Bits Used						
													Colour	Loss							
100/14cm 																					

⁽¹⁾Outside NABL scope.

* Equivalent Unconfined Compressive Strength based on Point Load Strength Index

Rock Profile (BH-7)

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Location : Space for Future Provision

Survey Coordinates : 2468S, 1375W

Surface Elevation : RL 210.612 m

Ground Water Depth 22.05 m

Termination Depth : 35 m (RL 175.6 m)

Ground Water Level : RL 188.6 m

Boring Method : Rotary Drilling

Casing Depth : 17.0 m

Boring Start : 20-Jun-18

Boring Finish : 02-Jul-18

SPT N- Value (N _t) ⁽¹⁾	Depth (m)	Drill Run (m)	Sample No.	Serial No. of Cores	Casing Lowered (Size)	Symbol	ROCK DESCRIPTION	Depth of Strata, (m)	Percent Recovery (%) ⁽¹⁾	Rock Quality Designation (RQD, %) ⁽¹⁾	Rock Mass Rating (RMR) ⁽¹⁾	Penetration Rate (minutes/cm)	Size of Hole: NX			Density (g/cc)	Specific Gravity	Porosity (%)	Water Absorption (%)	Point Load Index (kg/cm ²)	Unconfined Compressive Strength (kg/cm ²)
													Return	Water							
Ref*/7 cm	16.00	16.50 16.57	SPT11 RK4	-			Very weak, Brown GRANITE, disintegrated to intensely fractured, completely weathered - intensely fractured, 16.0 to 19.5 m		7	0	15		Colour ↑	Loss ↑	Bits Used ↑						
	16.50																				
	17.00																				
	17.50																				
Ref*/5 cm	18.00	18.00 18.05	SPT12 RK5	5/7					7	0			Light Brown ↑	100% ↑	32 CT Diamond Impregnated Bit ↑						
	18.50																				
	19.00																				
Ref*/8 cm	19.50	19.50 19.58	SPT13 WS7	-			- disintegrated, 19.5 to 22.5 m		0	0			↑	↑	↑						
	20.00																				
	20.50																				
Ref*/6 cm	21.00	21.00 21.06	SPT14 WS8	-					0	0			↓	↓	↓						
	21.50																				
	22.00																				
	22.50																				

⁽¹⁾Outside NABL scope.

* Equivalent Unconfined Compressive Strength based on Point Load Strength Index

Rock Profile (BH-7)

Location : Space for Future Provision Surface Elevation : RL 210.612 m Boring Method : Rotary Drilling
Survey Coordinates : 2468S, 1375W Ground Water Depth 22.05 m Casing Depth : 17.0 m
Termination Depth : 35 m (RL 175.6 m) Boring Start : 20-Jun-18
Ground Water Level : RL 188.6 m Boring Finish : 02-Jul-18

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SPT N- Value (N _t) ⁽¹⁾	Depth (m)	Drill Run (m)	Sample No.	Serial No. of Cores	Casing Lowered (Size)	Symbol	ROCK DESCRIPTION	Depth of Strata, (m)	Percent Recovery (%) ⁽¹⁾	Rock Quality Designation (RQD, %) ⁽¹⁾	Rock Mass Rating (RMR) ⁽¹⁾	Penetration Rate (minutes/cm)	Size of Hole: NX			Density (g/cc)	Specific Gravity	Porosity (%)	Water Absorption (%)	Point Load Index (kg/cm ²)	Unconfined Compressive Strength (kg/cm ²)
													Return Water		Bits Used						
													Colour	Loss							
100/5cm	22.50	22.50	SPT15	-			Very weak, Brown GRANITE, disintegrated to intensely fractured, completely weathered		0	0			↑	↑	↑						
	23.00	22.70	WS9																		
	23.50																				
Ref*/15cm	24.00	24.00	SPT16	6-8			- disintegrated, 22.5 to 24.0 m		11	0	15		Light Brown	100%	32 CT Diamond Impregnated Bit						
	24.50	24.15																			
	25.00		RK6																		
Ref*/5cm	25.50	25.50	SPT17	9-11			- intensely fractured, 24.0 to 27.0 m		13	0			↓	↓	↓						
	26.00	25.55																			
	26.50		RK7																		
Ref*/2cm	27.00	27.00	SPT18	-			- disintegrated, 27.0 to 29.0 m		0	0											
	27.50	27.02																			
	28.00		WS10																		
Ref*/7cm	28.50	28.50	SPT19																		
	29.00	28.57																			

⁽¹⁾Outside NABL scope.

* Equivalent Unconfined Compressive Strength based on Point Load Strength Index

Rock Profile (BH-7)

Location : Space for Future Provision Surface Elevation : RL 210.612 m Boring Method : Rotary Drilling
Survey Coordinates : 2468S, 1375W Ground Water Depth 22.05 m Casing Depth : 17.0 m
Termination Depth : 35 m (RL 175.6 m) Boring Start : 20-Jun-18
Ground Water Level : RL 188.6 m Boring Finish : 02-Jul-18

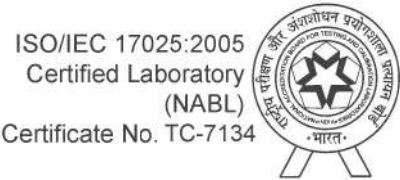
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SPT N- Value (N _f) ⁽¹⁾	Depth (m)	Drill Run (m)	Sample No.	Serial No. of Cores	Casing Lowered (Size)	Symbol	ROCK DESCRIPTION	Depth of Strata, (m)	Percent Recovery (%) ⁽¹⁾	Rock Quality Designation (RQD, %) ⁽¹⁾	Rock Mass Rating (RMR) ⁽¹⁾	Penetration Rate (minutes/cm)	Size of Hole: NX					Porosity (%)	Water Absorption (%)	Point Load Index (kg/cm ²)	Unconfined Compressive Strength (kg/cm ²)
													Return Water		Bits Used	Density (g/cc)	Specific Gravity				
	29.00	30.00 30.09	WS11	-		Very weak, Brown GRANITE, disintegrated to intensely fractured, completely weathered - disintegrated, 29.0 to 31.5 m		0	0	15		Light Brown	100%	32 CT Diamond Impregnated Bit							
Ref*/9 cm	29.50																				
	30.00		SPT20																		
	30.50																				
	31.00	WS12	-	0		0															
Ref*/8 cm	31.50	31.50 31.58	SPT21	12/5		- intensely fractured, 31.5 to 33.0 m		11	0												
	32.00		RK8																		
	32.50																				
	33.00		SPT22																		
Ref*/2cm	33.50	33.00 33.02	WS13	-		- disintegrated, 33.0 to 35.0 m		0	0												
	34.00																				
	34.50																				
	35.00															SPT23					
Ref*/14cm	35.14	35.14				35.14															

⁽¹⁾Outside NABL scope.

* Equivalent Unconfined Compressive Strength based on Point Load Strength Index



Soil Profile (BH-8)

Location : Space for Future Provision
Survey Coordinates : 2393S, 1403W

Surface Elevation : RL 209.924 m

Ground Water Depth : 21.60 m

Termination Depth : 35 m (RL 174.9 m)

Ground Water Level : RL 188.3 m

Boring Method : Shell & Auger

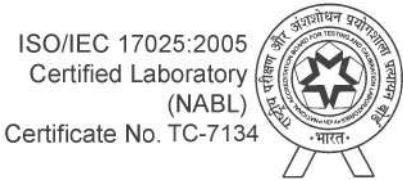
Casing Depth : 20.0 m

Boring Start : 25-Jun-18

Boring Finish : 05-Jul-18

Depth, m		Sample No.	SPT ⁽¹⁾		Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Grain Size Analysis				Atterberg Limits			Shrinkage Limit, (%)	Density and Moisture			Specific Gravity	Shear Tests				
From	To		Field Value, N _f	Corrected Value, N"				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Plasticity Index (%)		Bulk Density (gms/cm ³)	Dry Density (gms/cm ³)	Moisture Content (%)		Type of Test	Confining Pressures, (kg/cm ²)	Cohesion Intercept, 'c' (kg/cm ²)	Angle of Internal Friction, ϕ (degrees)	Free Swell Index, (%)
0.00	0.50	DS1				Very dense brown clayey sand with gravel (SC)																		
1.50	1.95	SPT1	94	134			2.00	21	50	15	14													18
2.25	2.55	UDS1				Hard brown silty clay, low expansive, high plastic (CH)						53.7	23.7	30.0	20	1.78	1.54	15.4						
3.00	3.45	SPT2	46	46																				
4.50	4.95	SPT3	40	40		- with traces of gravel, 4.5 to 5.0 m		3	10	38	49													15
5.25	5.55	UDS2														1.85	1.58	17.3		UC		1.3		
6.00	6.45	SPT4	84	84			7.50												2.68					
7.50	7.95	SPT5	71	71		Hard brown clayey silt, medium plastic (CI)						48.8	20.1	28.7										
8.25	8.55	UDS3																						
9.00	9.45	SPT6	89	89																				
10.50	10.95	SPT7	46	46																				
11.25	11.55	UDS4																						

⁽¹⁾ SPT is outside NABL scope.



Soil Profile (BH-8)

Location : Space for Future Provision
Survey Coordinates : 2393S, 1403W

Surface Elevation : RL 209.924 m

Ground Water Depth : 21.60 m

Termination Depth : 35 m (RL 174.9 m)

Ground Water Level : RL 188.3 m

Boring Method : Shell & Auger

Casing Depth : 20.0 m

Boring Start : 25-Jun-18

Boring Finish : 05-Jul-18

Depth, m		Sample No.	SPT ⁽¹⁾		Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Grain Size Analysis				Atterberg Limits			Shrinkage Limit, (%)	Density and Moisture			Specific Gravity	Shear Tests				Free Swell Index, (%)
From	To		Field Value, N _f	Corrected Value, N _c				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Plasticity Index (%)		Bulk Density (gms/cm ³)	Dry Density (gms/cm ³)	Moisture Content (%)		Type of Test	Confining Pressures, (kg/cm ²)	Cohesion Intercept, 'c' (kg/cm ²)	Angle of Internal Friction, ϕ (degrees)	
12.00	12.45	SPT8	43	43		Hard brown clayey silt, medium plastic (CI)	18.00	3	17	45	35					1.96	1.65	18.8		UU	1, 2, 3	1.1	4.2	
13.50	13.95	SPT9	52	52																				
14.25	14.55	UDS5																						
15.00	15.45	SPT10	48	48																				
17.25	18.00	DS2																						
18.00	18.10	SPT11	Ref*/10cm	-		Refusal met on Rock. Core drilling through rock adopted. Refer to next page for details.																		

⁽¹⁾ SPT is outside NABL scope.

Rock Profile (BH-8)

Location : Space for Future Provision Surface Elevation : RL 209.924 m Boring Method : Rotary Drilling
Survey Coordinates : 2393S, 1403W Ground Water Depth 21.60 m Casing Depth : 20.0 m
Termination Depth : 35 m (RL 174.9 m) Boring Start : 25-Jun-18
Ground Water Level : RL 188.3 m Boring Finish : 05-Jul-18

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SPT N- Value (N _t) ⁽¹⁾	Depth (m)	Drill Run (m)	Sample No.	Serial No. of Cores	Casing Lowered (Size)	Symbol	ROCK DESCRIPTION	Depth of Strata, (m)	Percent Recovery (%) ⁽¹⁾	Rock Quality Designation (RQD, %) ⁽¹⁾	Rock Mass Rating (RMR) ⁽¹⁾	Penetration Rate (minutes/cm)	Size of Hole: NX			Density (g/cc)	Specific Gravity	Porosity (%)	Water Absorption (%)	Point Load Index (kg/cm ²)	Unconfined Compressive Strength (kg/cm ²)
													Return Water		Bits Used						
													Colour	Loss							
100/10cm	18.00	18.00	SPT11	1/5			Very weak, grey GRANITE,disintegrated, to intensely fractured, completely weathered		5	0			↑	↑	↑						
	18.50	18.10	RK1																		
	19.00																				
Ref*/6cm	19.50	19.50	SPT12	-			- intensely fractured, 18.0 to 19.5 m		0	0	15		Light Brown	Partial	32 CT Diamond Impregnated Bit						
	20.00	19.56	WS1																		
	20.50																				
Ref*/7cm	21.00	21.00	SPT13	-			- disintegrated, 19.5 to 24.5 m		0	0			↓	↓	↓						
	21.50	21.07	WS2																		
	22.00																				
Ref*/13cm	22.50	22.50	SPT14	-					0	0											
	23.00	22.63	WS3																		
	23.50																				
Ref*/10cm	24.00	24.00	SPT15																		
	24.50	24.10																			

⁽¹⁾Outside NABL scope.

* Equivalent Unconfined Compressive Strength based on Point Load Strength Index

Rock Profile (BH-8)

Location : Space for Future Provision Surface Elevation : RL 209.924 m Boring Method : Rotary Drilling
Survey Coordinates : 2393S, 1403W Ground Water Depth 21.60 m Casing Depth : 20.0 m
Termination Depth : 35 m (RL 174.9 m) Boring Start : 25-Jun-18
Ground Water Level : RL 188.3 m Boring Finish : 05-Jul-18

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SPT N- Value (N _t) ⁽¹⁾	Depth (m)	Drill Run (m)	Sample No.	Serial No. of Cores	Casing Lowered (Size)	Symbol	ROCK DESCRIPTION	Depth of Strata, (m)	Percent Recovery (%) ⁽¹⁾	Rock Quality Designation (RQD, %) ⁽¹⁾	Rock Mass Rating (RMR) ⁽¹⁾	Penetration Rate (minutes/cm)	Size of Hole: NX			Density (g/cc)	Specific Gravity	Porosity (%)	Water Absorption (%)	Point Load Index (kg/cm ²)	Unconfined Compressive Strength (kg/cm ²)	
													Return Water		Bits Used							
													Colour	Loss								
Ref*/10cm	24.50	25.50 25.60	WS4	-		Very weak, grey GRANITE,disintegrated, to intensely fractured, completely weathered		0	0				Light Brown	100%	32 CT Diamond Impregnated Bit							
	25.00																					
25.50	SPT16		-																			- disintegrated, 24.5 to 27.0 m
26.00																						
26.50	WS5																					
27.00	SPT17																					
Ref*/7cm	27.00	27.00 27.07	RK2	2/3			- intensely fractured, 27.0 to 28.5 m		5	0	15											
	27.50																					
28.00																						
28.50	SPT18																					
Ref*/5cm	28.50	28.50 28.55	WS6	-			- disintegrated, 28.5 to 31.0 m		0	0												
	29.00																					
29.50																						
30.00	SPT19																					
Ref*/4cm	30.00	30.00 30.04																				
	30.50																					
31.00	WS7				-																	

⁽¹⁾Outside NABL scope.

* Equivalent Unconfined Compressive Strength based on Point Load Strength Index

Rock Profile (BH-8)

Location : Space for Future Provision Surface Elevation : RL 209.924 m Boring Method : Rotary Drilling
Survey Coordinates : 2393S, 1403W Ground Water Depth 21.60 m Casing Depth : 20.0 m
Termination Depth : 35 m (RL 174.9 m) Boring Start : 25-Jun-18
Ground Water Level : RL 188.3 m Boring Finish : 05-Jul-18

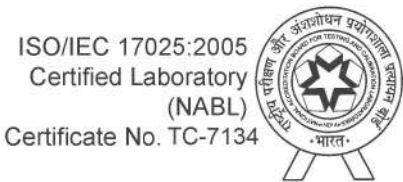
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SPT N- Value (N _f) ⁽¹⁾	Depth (m)	Drill Run (m)	Sample No.	Serial No. of Cores	Casing Lowered (Size)	Symbol	ROCK DESCRIPTION	Depth of Strata, (m)	Percent Recovery (%) ⁽¹⁾	Rock Quality Designation (RQD, %) ⁽¹⁾	Rock Mass Rating (RMR) ⁽¹⁾	Penetration Rate (minutes/cm)	Size of Hole: NX									
													Return Water		Bits Used	Density (g/cc)	Specific Gravity	Porosity (%)	Water Absorption (%)	Point Load Index (kg/cm ²)	Unconfined Compressive Strength (kg/cm ²)	
													Colour	Loss								
Ref*/ 6cm	31.00	31.50 31.56	SPT20	3-7			Very weak, grey GRANITE,disintegrated, completely weathered		39	7	15		Light Brown	100%	32 CT Diamond Impregnated Bit	2.54	2.70	0.126	1.41	63	1374*	
	31.50																					
	32.00																					
	32.50	33.00	RK3	8-12		Weak, grey GRANITE, intensely to to imoderately fractured, highly weathered	48	0	24	2.65	2.82	0.060				2.31	-	373				
	33.00																					
	33.50																					
	34.00	34.00	RK4	13-15		- moderately fractured, 31.5 to 33.0	45	27		35.00												
	34.50																					
	35.00																					

⁽¹⁾Outside NABL scope.

* Equivalent Unconfined Compressive Strength based on Point Load Strength Index



Soil Profile (BH-16)

Location : Space for Future Provision
Survey Coordinates : 2358S, 1245W

Surface Elevation : RL 211.666 m

Ground Water Depth : 21.95 m

Termination Depth : 35 m (RL 176.7 m)

Ground Water Level : RL 189.7 m

Boring Method : Shell & Auger

Casing Depth : 29.0 m

Boring Start : 23-Jul-18

Boring Finish : 03-Aug-18

Depth, m		Sample No.	SPT ⁽¹⁾		Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Grain Size Analysis				Atterberg Limits			Shrinkage Limit, (%)	Density and Moisture			Specific Gravity	Shear Tests				Free Swell Index, (%)
From	To		Field Value, N _f	Corrected Value, N _c				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Plasticity Index (%)		Bulk Density (gms/cm ³)	Dry Density (gms/cm ³)	Moisture Content (%)		Type of Test	Confining Pressures, (kg/cm ²)	Cohesion Intercept, 'c' (kg/cm ²)	Angle of Internal Friction, φ (degrees)	
0.50	0.50	DS1				Medium dense brown silty sand with gravel (SM)																		
1.00	1.30	UDS1					2.50	14	70	16	0								2.67					0
2.50	2.95	SPT1	24	24		Very stiff to hard brown clayey silt, low expansive, medium plastic (CI)																		14
4.00	4.30	UDS2				- very stiff, 2.5 to 5.5 m						38.0	20.2	17.9	20	1.79	1.56	15.1		UC		0.9		
5.50	5.95	SPT2	45	45		- hard, 5.5 to 17.5 m																		
7.00	7.30	UDS3																						
8.50	8.95	SPT3	48	48																				
10.00	10.30	UDS4														1.92	1.63	17.9						
11.50	11.95	SPT4	86	86								37.0	21.1	15.9										
13.00	13.45	SPT5	76	76																				
14.50	14.95	SPT6	102	102																				
16.00	16.45	SPT7	92	92				12	19	63	6													

⁽¹⁾ SPT is outside NABL scope.

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Soil Profile (BH-16)

Location : Space for Future Provision
Survey Coordinates : 2358S, 1245W

Surface Elevation : RL 211.666 m
Ground Water Depth : 21.95 m
Termination Depth : 35 m (RL 176.7 m)
Ground Water Level : RL 189.7 m

Boring Method : Shell & Auger
Casing Depth : 29.0 m
Boring Start : 23-Jul-18
Boring Finish : 03-Aug-18

Depth, m		Sample No.	SPT ⁽¹⁾		Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Grain Size Analysis				Atterberg Limits			Shrinkage Limit, (%)	Density and Moisture			Specific Gravity	Shear Tests					Free Swell Index, (%)
From	To		Field Value, N _f	Corrected Value, N _c				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Plasticity Index (%)		Bulk Density (gms/cm ³)	Dry Density (gms/cm ³)	Moisture Content (%)		Type of Test	Confining Pressures, (kg/cm ²)	Cohesion Intercept, 'c' (kg/cm ²)	Angle of Internal Friction, ϕ (degrees)		
17.50	17.95	SPT8	66	66		Hard brown clayey silt, medium plastic (CI)		19	32	36	13	43.8	23.5	20.3											
19.00	19.45	SPT9	64	64																					
20.50	20.85	SPT10	100/20cm	-																					
22.00	22.27	SPT11	102/12cm	-																					
23.50	23.69	SPT12	103/4cm	-			25.00																		
25.00	25.19	SPT13	102/4cm	-		Disintegrated ROCK																			
26.50	26.70	SPT14	104/5cm	-																					
28.00	28.09	SPT15	Ref*/9cm	-		Refusal met on Rock. Core drilling through rock adopted. Refer to next page for details.																			

⁽¹⁾ SPT is outside NABL scope.

Rock Profile (BH-16)

Location : Space for Future Provision

Surface Elevation : RL 211.666 m

Boring Method : Rotary Drilling

Survey Coordinates : 2358S, 1245W

Ground Water Depth 21.95 m

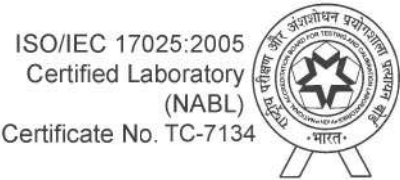
Casing Depth : 29.0 m

Termination Depth : 35 m (RL 176.7 m)

Boring Start : 23-Jul-18

Ground Water Level : RL 189.7 m

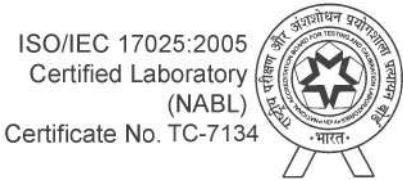
Boring Finish : 03-Aug-18



SPT N- Value (N _f) ⁽¹⁾	Depth (m)	Drill Run (m)	Sample No.	Serial No. of Cores	Casing Lowered (Size)	Symbol	ROCK DESCRIPTION	Depth of Strata, (m)	Percent Recovery (%) ⁽¹⁾	Rock Quality Designation (RQD, %) ⁽¹⁾	Rock Mass Rating (RMR) ⁽¹⁾	Penetration Rate (minutes/cm)	Size of Hole: NX					Porosity (%)	Water Absorption (%)	Point Load Index (kg/cm ²)	Unconfined Compressive Strength (kg/cm ²)	
													Return Water		Bits Used	Density (g/cc)	Specific Gravity					
													Colour	Loss								
Ref*/9cm	28.00	28.00	SPT15	1-5			Very weak to weak, grey GRANITE, disintegrated to very intensely fractured, completely weathered		20	0			↑	↑	↑							
	28.50	28.09																				RK1
	29.00																					
Ref*/6cm	29.50	29.50	SPT16	6			- weak, intensely fractured, 28.0 to 29.5 m		6	0			Light Brown	100%	32 CT Diamond Impregnated Bit	2.45	2.64	0.071	2.06	18	398*	
	30.00	29.56																				RK2
	30.50																					
Ref*/8cm	31.00	31.00	SPT17	7-11			- very weak, disintegrated, 29.5 to 31.0 m		20	0	18		↓	↓	↓	2.27	2.65	0.143	1.36	-	-	
	31.50	31.08																				RK3
	32.00																					
Ref*/5cm	32.50	32.50	SPT18	12-15			- weak, intensely fractured, 31.0 to 35.0 m		21	0						2.27	2.65	0.143	1.36	-	-	
	33.00	32.55																				RK4
	33.50																					
		34.00	34.00	RK5	16-20					25	0											
	35.00	35.00						35.00														

⁽¹⁾Outside NABL scope.

* Equivalent Unconfined Compressive Strength based on Point Load Strength Index



Soil Profile (BH-19)

Location : Space for Future Provision
Survey Coordinates : 2534S, 1337W

Surface Elevation : RL 212.528 m

Ground Water Depth : 21.95 m

Termination Depth : 35.11 m (RL 177.4 m)

Ground Water Level : RL 190.6 m

Boring Method : Shell & Auger

Casing Depth : 19.3 m

Boring Start : 21-Jul-18

Boring Finish : 29-Jul-18

Depth, m		Sample No.	SPT ⁽¹⁾		Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Grain Size Analysis				Atterberg Limits			Shrinkage Limit, (%)	Density and Moisture			Specific Gravity	Shear Tests				Free Swell Index, (%)
From	To		Field Value, N _r	Corrected Value, N"				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Plasticity Index (%)		Bulk Density (gms/cm ³)	Dry Density (gms/cm ³)	Moisture Content (%)		Type of Test	Confining Pressures, (kg/cm ²)	Cohesion Intercept, 'c' (kg/cm ²)	Angle of Internal Friction, φ (degrees)	
0.00	0.50	DS1				Medium dense brown silty fine sand intermixed with gravels (SM-GP)	1.00	39	45	16	0													
1.00	1.30	UDS1				Very stiff brown clayey silt, low expansive, medium plastic (CI)						38.0	19.1	19.0	17	1.72	1.52	13.5						
2.50	2.95	SPT1	17	17		- intermixed with gravels, 2.5 to 4.0 m		37	19	20	24								2.67					17
4.00	4.30	UDS2					5.50									1.80	1.56	15.2		UC		0.6		
5.50	5.95	SPT2	46	46		Hard brown clayey silt, low expansive, low plastic (CL)						30.4	18.2	12.2										15
7.00	7.30	UDS3																						
8.50	8.95	SPT3	65	65		- with traces of gravel, 8.5 to 10.0 m																		
10.00	10.45	SPT4	66	66																				
11.50	11.95	SPT5	77	77																				
13.00	13.45	SPT6	85	85		- with gravel, 13.0 to 17.5 m																		
14.50	14.95	SPT7	84	84								34.1	20.7	13.4										
16.00	16.45	SPT8	102	102				17	11	53	19													

⁽¹⁾ SPT is outside NABL scope.

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Soil Profile (BH-19)

Location : Space for Future Provision

Surface Elevation : RL 212.528 m

Boring Method : Shell & Auger

Survey Coordinates : 2534S, 1337W

Ground Water Depth : 21.95 m

Casing Depth : 19.3 m

Termination Depth : 35.11 m (RL 177.4 m)

Boring Start : 21-Jul-18

Ground Water Level : RL 190.6 m

Boring Finish : 29-Jul-18

Depth, m		Sample No.	SPT ⁽¹⁾		Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Grain Size Analysis				Atterberg Limits		Shrinkage Limit, (%)	Density and Moisture			Specific Gravity	Shear Tests				Free Swell Index, (%)
From	To		Field Value, N _f	Corrected Value, N _c				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)		Plasticity Index (%)	Bulk Density (gms/cm ³)	Dry Density (gms/cm ³)		Moisture Content (%)	Type of Test	Confining Pressures, (kg/cm ²)	Cohesion Intercept, 'c' (kg/cm ²)	
17.50	17.95	SPT9	84	84		Hard brown clayey silt, low plastic (CL)	18.00																
18.00	18.21	SPT10	103/6cm	-		Refusal met on Rock. Core drilling through rock adopted. Refer to next page for details.																	

⁽¹⁾ SPT is outside NABL scope.

Rock Profile (BH-19)

Location : Space for Future Provision Surface Elevation : RL 212.528 m Boring Method : Rotary Drilling
Survey Coordinates : 2534S, 1337W Ground Water Depth 21.95 m Casing Depth : 19.3 m
Termination Depth : 35.11 m (RL 177.4 m) Boring Start : 21-Jul-18
Ground Water Level : RL 190.6 m Boring Finish : 29-Jul-18

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SPT N- Value (N _f) ⁽¹⁾	Depth (m)	Drill Run (m)	Sample No.	Serial No. of Cores	Casing Lowered (Size)	Symbol	ROCK DESCRIPTION	Depth of Strata, (m)	Percent Recovery (%) ⁽¹⁾	Rock Quality Designation (RQD, %) ⁽¹⁾	Rock Mass Rating (RMR) ⁽¹⁾	Penetration Rate (minutes/cm)	Size of Hole: NX																		
													Return Water		Bits Used	Density (g/cc)	Specific Gravity	Porosity (%)	Water Absorption (%)	Point Load Index (kg/cm ²)	Unconfined Compressive Strength (kg/cm ²)										
													Colour	Loss																	
103/6cm	18.00	18.00	SPT10	1-4			Weak, grey GRANITE, very intensely fractured, completely weathered		13	0	18		↑	↑	32 CT Diamond Impregnated Bit																
	18.50	18.21	RK1																												
	19.00																														
Ref*/6cm	19.50	19.50	SPT11	5-10					15	0																					
	20.00	19.56																													
	20.50		RK2																												
Ref*/8cm	21.00	21.00	SPT12	11-16					14	0																					
	21.50	21.08																													
	22.00		RK3																												
Ref*/5cm	22.50	22.50	SPT13	17-22					17	0																					
	23.00	22.55																													
	23.50		RK4																												
Ref*/8cm	24.00	24.00	SPT14						24.50													↓	↓								
	24.50	24.08																													

⁽¹⁾Outside NABL scope.

* Equivalent Unconfined Compressive Strength based on Point Load Strength Index

Rock Profile (BH-19)

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Location : Space for Future Provision

Survey Coordinates : 2534S, 1337W

Surface Elevation : RL 212.528 m

Ground Water Depth 21.95 m

Termination Depth : 35.11 m (RL 177.4 m)

Ground Water Level : RL 190.6 m

Boring Method : Rotary Drilling

Casing Depth : 19.3 m

Boring Start : 21-Jul-18

Boring Finish : 29-Jul-18

SPT N- Value (N _f) ⁽¹⁾	Depth (m)	Drill Run (m)	Sample No.	Serial No. of Cores	Casing Lowered (Size)	Symbol	ROCK DESCRIPTION	Depth of Strata, (m)	Percent Recovery (%) ⁽¹⁾	Rock Quality Designation (RQD, %) ⁽¹⁾	Rock Mass Rating (RMR) ⁽¹⁾	Penetration Rate (minutes/cm)	Size of Hole: NX			Density (g/cc)	Specific Gravity	Porosity (%)	Water Absorption (%)	Point Load Index (kg/cm ²)	Unconfined Compressive Strength (kg/cm ²)											
													Return Water		Bits Used																	
													Colour	Loss																		
Ref*/ 7cm	24.50	25.50 25.57	RK5	23-25		Very weak to weak, grey GRANITE, disintegrated to very intensely fractured, completely weathered		9	0	18		Light Black	Partial	32 CT Diamond Impregnated Bit																		
	25.00																															
	26.00																															
	26.50																															
Ref*/ 6cm	27.00	27.00 27.06	SPT16	26-28					- weak, very intensely fractured, 24.5 to 30.0 m				12	0	18		Light Black	Partial	32 CT Diamond Impregnated Bit													
	27.50																															
	28.00																															
	28.50																															
Ref*/ 7cm	29.00	28.50 28.57	RK7	29-32										-very weak, disintegrated, 30.0 to 31.0 m				10	0	15		Light Black	Partial	32 CT Diamond Impregnated Bit								
	29.50																															
	30.00																															
	30.50																															
Ref*/ 4cm	31.00	30.00 30.04	SPT18	33-37						0	0							15				Light Black	Partial	32 CT Diamond Impregnated Bit								
	31.00																															
WS1	-																															

⁽¹⁾Outside NABL scope.

* Equivalent Unconfined Compressive Strength based on Point Load Strength Index

Rock Profile (BH-19)

Location : Space for Future Provision

Surface Elevation : RL 212.528 m

Boring Method : Rotary Drilling

Survey Coordinates : 2534S, 1337W

Ground Water Depth 21.95 m

Casing Depth : 19.3 m

Termination Depth : 35.11 m (RL 177.4 m)

Boring Start : 21-Jul-18

Ground Water Level : RL 190.6 m

Boring Finish : 29-Jul-18

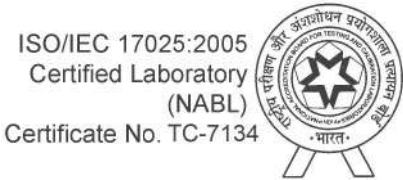
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SPT N- Value (N _f) ⁽¹⁾	Depth (m)	Drill Run (m)	Sample No.	Serial No. of Cores	Casing Lowered (Size)	Symbol	ROCK DESCRIPTION	Depth of Strata, (m)	Percent Recovery (%) ⁽¹⁾	Rock Quality Designation (RQD, %) ⁽¹⁾	Rock Mass Rating (RMR) ⁽¹⁾	Penetration Rate (minutes/cm)	Size of Hole: NX																		
													Return Water																		
													Colour	Loss	Bits Used	Density (g/cc)	Specific Gravity	Porosity (%)	Water Absorption (%)	Point Load Index (kg/cm ²)	Unconfined Compressive Strength (kg/cm ²)										
Ref*/ 13cm	31.00	31.50 31.63	SPT19	-			Very weak, grey GRANITE, disintegrated completely weathered		0	0	15		Light Black	Partial	32 CT Diamond Impregnated Bit																
	31.50																														
	32.00																														
	32.50																														
	33.00																														
Ref*/ 13cm	33.50	33.00	WS2																												
	33.50		WS3																												
Ref*/ 13cm	34.00	34.00	SPT20										0	0																	
	34.50	34.13	WS4										0	0																	
Ref*/ 11cm	35.00	35.00	SPT21																												
		35.11						35.11																							

⁽¹⁾Outside NABL scope.

* Equivalent Unconfined Compressive Strength based on Point Load Strength Index



Soil Profile (BH-23)

Location : Space for Future Provision
Survey Coordinates : 2524S, 1183W

Surface Elevation : RL 213.193 m

Ground Water Depth : 22.80 m

Termination Depth : 30.35 m (RL 182.8 m)

Ground Water Level : RL 190.4 m

Boring Method : Shell & Auger

Casing Depth : 23.6 m

Boring Start : 26-Jul-18

Boring Finish : 27-Jul-18

Depth, m		Sample No.	SPT ⁽¹⁾		Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Grain Size Analysis				Atterberg Limits			Shrinkage Limit, (%)	Density and Moisture			Specific Gravity	Shear Tests				
From	To		Field Value, N _r	Corrected Value, N"				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Plasticity Index (%)		Bulk Density (gms/cm ³)	Dry Density (gms/cm ³)	Moisture Content (%)		Type of Test	Confining Pressures, (kg/cm ²)	Cohesion Intercept, 'c' (kg/cm ²)	Angle of Internal Friction, φ (degrees)	Free Swell Index, (%)
0.00	0.50	DS1				Stiff brown sandy silt with gravel, low expansive, low plastic (CL)		7	40	41	12													
1.00	1.45	SPT1	14	14																				9
2.50	2.80	UDS1					4.00									1.76	1.53	15.0	2.68	UC		0.9		25
4.00	4.45	SPT2	66	66		Hard brown clayey silt, low plastic (CL)						29.5	17.2	12.3	16									
5.50	5.95	SPT3	40	40																				
7.00	7.45	SPT4	47	47								28.9	17.7	11.3										
8.50	8.80	UDS2																						
10.00	10.45	SPT5	36	36		- with traces of gravel, 10.0 to 13.0 m																		
11.50	11.80	UDS3														1.95	1.65	18.1		UU	1, 2, 3	1.0	5.2	
13.00	13.45	SPT6	84	84								30.5	19.0	11.5										
14.50	14.95	SPT7	93	93																				
16.00	16.45	SPT8	103	103		- with gravel, 16.0 to 17.5 m																		

⁽¹⁾ SPT is outside NABL scope.

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Soil Profile (BH-23)

Location : Space for Future Provision
Survey Coordinates : 2524S, 1183W

Surface Elevation : RL 213.193 m

Ground Water Depth : 22.80 m

Termination Depth : 30.35 m (RL 182.8 m)

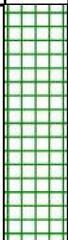
Ground Water Level : RL 190.4 m

Boring Method : Shell & Auger

Casing Depth : 23.6 m

Boring Start : 26-Jul-18

Boring Finish : 27-Jul-18

Depth, m		Sample No.	SPT ⁽¹⁾		Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Grain Size Analysis				Atterberg Limits			Shrinkage Limit, (%)	Density and Moisture			Specific Gravity	Shear Tests					Free Swell Index, (%)									
From	To		Field Value, N _f	Corrected Value, N"				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Plasticity Index (%)		Bulk Density (gms/cm ³)	Dry Density (gms/cm ³)	Moisture Content (%)		Type of Test	Confining Pressures, (kg/cm ²)	Cohesion Intercept, 'c' (kg/cm ²)	Angle of Internal Friction, φ (degrees)											
17.50	17.87	SPT9	101/22cm	-		Hard brown clayey silt with traces of gravel, low plastic (CL)	23.50	2	5	67	26	32.0	20.0	12.0																				
19.00	19.36	SPT10	101/21cm	-								31.8	20.7	11.1																				
20.50	20.90	SPT11	101/25cm	-																														
22.00	22.26	SPT12	101/11cm	-																														
23.50	23.87	SPT13	101/22cm	-		Hard black Peat with gravel, medium plastic (OI)		6	27	51	16	41.6	18.7	22.9																				
25.00	25.22	SPT14	103/7cm	-																														
26.50	26.70	SPT15	102/5cm	-																														
28.00	28.34	SPT16	102/19cm	-				11	19	52	18																							
29.50	29.83	SPT17	103/18cm	-																														
30.00	30.35	SPT18	100/20cm	-																														

⁽¹⁾ SPT is outside NABL scope.

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Soil Profile (BH-24)

Location : Space for Future Provision
Survey Coordinates : 2370S, 1183W

Surface Elevation : RL 211.958 m

Ground Water Depth : 21.10 m

Termination Depth : 30.39 m (RL 181.6 m)

Ground Water Level : RL 190.9 m

Boring Method : Shell & Auger

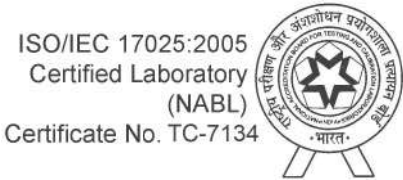
Casing Depth : 24.2 m

Boring Start : 25-Jul-18

Boring Finish : 26-Jul-18

Depth, m		Sample No.	SPT ⁽¹⁾		Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Grain Size Analysis				Atterberg Limits			Shrinkage Limit, (%)	Density and Moisture			Specific Gravity	Shear Tests				Free Swell Index, (%)
From	To		Field Value, N _r	Corrected Value, N"				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Plasticity Index (%)		Bulk Density (gms/cm ³)	Dry Density (gms/cm ³)	Moisture Content (%)		Type of Test	Confining Pressures, (kg/cm ²)	Cohesion Intercept, 'c' (kg/cm ²)	Angle of Internal Friction, φ (degrees)	
0.00	0.50	DS1				Very stiff brown sandy silt with gravel, low plastic (CL)		3	43	44	10													
1.00	1.30	UDS1					2.50									1.71	1.51	13.6		UC		0.7		
2.50	2.95	SPT1	20	20		Very stiff to hard brown clayey silt, medium plastic (CI)						38.7	20.2	18.6	16									23
4.00	4.30	UDS2				- very stiff, 2.5 to 5.5 m										1.78	1.54	15.3						21
5.50	5.95	SPT2	38	38		- hard, 5.5 to 17.5 m		0	5	61	34								2.66					
7.00	7.30	UDS3					8.50																	
8.50	8.95	SPT3	35	35		Hard brown sandy silt, low plastic (CL)						32.4	20.2	12.3										
10.00	10.30	UDS4					11.50																	
11.50	11.95	SPT4	77	77		Hard brown clayey silt, medium plastic (CI)		11	17	50	22													
13.00	13.45	SPT5	58	58		- with gravel, 11.5 to 13.0 m						35.6	19.6	15.9										
14.50	14.95	SPT6	73	73																				
16.00	16.45	SPT7	79	79																				

⁽¹⁾ SPT is outside NABL scope.



Soil Profile (BH-24)

Location : Space for Future Provision
Survey Coordinates : 2370S, 1183W

Surface Elevation : RL 211.958 m

Ground Water Depth : 21.10 m

Termination Depth : 30.39 m (RL 181.6 m)

Ground Water Level : RL 190.9 m

Boring Method : Shell & Auger

Casing Depth : 24.2 m

Boring Start : 25-Jul-18

Boring Finish : 26-Jul-18

Depth, m		Sample No.	SPT ⁽¹⁾		Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Grain Size Analysis				Atterberg Limits			Shrinkage Limit, (%)	Density and Moisture			Specific Gravity	Shear Tests				
From	To		Field Value, N _f	Corrected Value, N _c				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Plasticity Index (%)		Bulk Density (gms/cm ³)	Dry Density (gms/cm ³)	Moisture Content (%)		Type of Test	Confining Pressures, (kg/cm ²)	Cohesion Intercept, 'c' (kg/cm ²)	Angle of Internal Friction, ϕ (degrees)	Free Swell Index, (%)
17.50	17.95	SPT8	76	76		Hard brown clayey silt, medium plastic (CI)	22.00	4	7	54	35	35.8	21.6	14.2						UU	1, 2, 3	1.6	3.8	
19.00	19.45	SPT9	52	52																				
20.50	20.95	SPT10	62	62																				
22.00	22.45	SPT11	21	21		Very stiff to hard brown clayey silt, low plastic (CL)						34.8	25.2	9.6							1, 2, 3	1.6	3.8	
23.50	23.80	UDS5				- very stiff, 22.0 to 25.0 m																		
25.00	25.45	SPT12	51	51		- hard, 25.0 to 30.39 m																		
26.50	26.95	SPT13	84	84								31.3	21.3	10.0										
28.00	28.33	SPT14	100/18cm	-		- with gravel, 28.0 to 29.5 m																		
29.50	29.69	SPT15	102/4cm	-			30.39	12	36	39	13													
30.00	30.39	SPT16	101/24cm	-																				

⁽¹⁾ SPT is outside NABL scope.

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Soil Profile (BH-25)

Location : Space for Future Provision
Survey Coordinates : 2328S, 1145W

Surface Elevation : RL 211.408 m

Ground Water Depth : 22.23 m

Termination Depth : 35.09 m (RL 176.3 m)

Ground Water Level : RL 189.2 m

Boring Method : Shell & Auger

Casing Depth : 28.0 m

Boring Start : 26-Jul-18

Boring Finish : 08-Aug-18

Depth, m		Sample No.	SPT ⁽¹⁾		Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Grain Size Analysis				Atterberg Limits			Shrinkage Limit, (%)	Density and Moisture			Specific Gravity	Shear Tests				Free Swell Index, (%)
From	To		Field Value, N _f	Corrected Value, N _c				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Plasticity Index (%)		Bulk Density (gms/cm ³)	Dry Density (gms/cm ³)	Moisture Content (%)		Type of Test	Confining Pressures, (kg/cm ²)	Cohesion Intercept, 'c' (kg/cm ²)	Angle of Internal Friction, ϕ (degrees)	
0.00	0.50	DS1				Medium dense silty fine sand intermixed with gravels (SM-GP)																		
1.00	1.45	SPT1	25	39			2.50	36	44	20	0													9
2.50	2.80	UDS1				Hard brown clayey silt with gravel, low plastic (CL)						34.0	18.4	15.6	16	1.78	1.55	15.0						
4.00	4.45	SPT2	37	37				10	8	46	36								2.66					7
5.50	5.80	UDS2														1.86	1.60	16.0		UC		0.6		
7.00	7.45	SPT3	56	56								33.8	20.6	13.2										
8.50	8.95	SPT4	74	74																				
10.00	10.45	SPT5	80	80																				
11.50	11.83	SPT6	101/18cm	-																				
13.00	13.34	SPT7	101/19cm	-																				
14.50	14.70	SPT8	102/5cm	-		- intermixed with gravel, 14.5 to 16.0 m		35	3	28	34													
16.00	16.28	SPT9	100/13cm	-			17.50																	

⁽¹⁾ SPT is outside NABL scope.

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Soil Profile (BH-25)

Location : Space for Future Provision
Survey Coordinates : 2328S, 1145W

Surface Elevation : RL 211.408 m

Ground Water Depth : 22.23 m

Termination Depth : 35.09 m (RL 176.3 m)

Ground Water Level : RL 189.2 m

Boring Method : Shell & Auger

Casing Depth : 28.0 m

Boring Start : 26-Jul-18

Boring Finish : 08-Aug-18

Depth, m		Sample No.	SPT ⁽¹⁾		Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Grain Size Analysis				Atterberg Limits		Shrinkage Limit, (%)	Density and Moisture			Specific Gravity	Shear Tests					Free Swell Index, (%)
From	To		Field Value, N _f	Corrected Value, N _c				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)		Plasticity Index (%)	Bulk Density (gms/cm ³)	Dry Density (gms/cm ³)		Moisture Content (%)	Type of Test	Confining Pressures, (kg/cm ²)	Cohesion Intercept, 'c' (kg/cm ²)	Angle of Internal Friction, ϕ (degrees)	
17.50	17.74	SPT10	103/9cm	-		Hard brown sandy silt, low plastic (CL)	19.00																	
19.00	19.20	SPT11	102/5cm	-		Refusal met on Rock. Core drilling through rock adopted. Refer to next page for details.																		

⁽¹⁾ SPT is outside NABL scope.

Rock Profile (BH-25)

Location : Space for Future Provision Surface Elevation : RL 211.408 m Boring Method : Rotary Drilling
Survey Coordinates : 2328S, 1145W Ground Water Depth 22.23 m Casing Depth : 28.0 m
Termination Depth : 35.09 m (RL 176.3 m) Boring Start : 26-Jul-18
Ground Water Level : RL 189.2 m Boring Finish : 08-Aug-18

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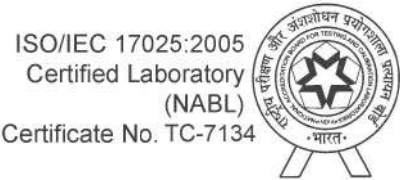
SPT N- Value (N _t) ⁽¹⁾	Depth (m)	Drill Run (m)	Sample No.	Serial No. of Cores	Casing Lowered (Size)	Symbol	ROCK DESCRIPTION	Depth of Strata, (m)	Percent Recovery (%) ⁽¹⁾	Rock Quality Designation (RQD, %) ⁽¹⁾	Rock Mass Rating (RMR) ⁽¹⁾	Penetration Rate (minutes/cm)	Size of Hole: NX			Density (g/cc)	Specific Gravity	Porosity (%)	Water Absorption (%)	Point Load Index (kg/cm ²)	Unconfined Compressive Strength (kg/cm ²)
													Return Water	Colour	Loss	Bits Used					
102/5cm	19.00	19.00	SPT11	1-3			Very weak, grey GRANITE, disintegrated very intensely fractured, highly to completely weathered		8	0				Light Brown	100%	32 CT Diamond Impregnated Bit					
	19.50	19.20	RK1																		
	20.00						- very intensely fractured, highly weathered , 19.0 to 20.5 m														
Ref*/9cm	20.50	20.50	SPT12	-			- disintegrated, completely weathered, 20.5 to 23.5 m		0	0	15										
	21.00	20.59	WS1																		
	21.50																				
Ref*/12cm	22.00	22.00	SPT13	-					0	0											
	22.50	22.12	WS2																		
	23.00																				
Ref*/7cm	23.50	23.50	SPT14	4-5			- very intensely fractured, highly weathered , 23.5 to 25.5 m		6	0											
	24.00	23.57																			
	24.50		RK2																		
Ref*/8cm	25.00	25.00	SPT15																		
	25.50	25.08																			

⁽¹⁾Outside NABL scope.

* Equivalent Unconfined Compressive Strength based on Point Load Strength Index

Rock Profile (BH-25)

Location : Space for Future Provision Surface Elevation : RL 211.408 m Boring Method : Rotary Drilling
Survey Coordinates : 2328S, 1145W Ground Water Depth 22.23 m Casing Depth : 28.0 m
Termination Depth : 35.09 m (RL 176.3 m) Boring Start : 26-Jul-18
Ground Water Level : RL 189.2 m Boring Finish : 08-Aug-18



SPT N- Value (N _f) ⁽¹⁾	Depth (m)	Drill Run (m)	Sample No.	Serial No. of Cores	Casing Lowered (Size)	Symbol	ROCK DESCRIPTION	Depth of Strata, (m)	Percent Recovery (%) ⁽¹⁾	Rock Quality Designation (RQD, %) ⁽¹⁾	Rock Mass Rating (RMR) ⁽¹⁾	Penetration Rate (minutes/cm)	Size of Hole: NX			Porosity (%)	Water Absorption (%)	Point Load Index (kg/cm ²)	Unconfined Compressive Strength (kg/cm ²)								
													Return Water		Bits Used					Density (g/cc)	Specific Gravity						
	Colour	Loss																									
Ref*/ 7cm	25.50	26.50	RK3	6-12		Very weak to weak, grey GRANITE, disintegrated to very intensely fractured, highly to completely weathered - weak, very intensely fractured, highly weathered , 25.5 to 26.5 m - very weak, disintegrated, completely weathered, 26.5 to 28.0 m - weak, very intensely fractured, highly weathered , 28.0 to 31.0 m - very weak, disintegrated, ompletely weathered, 31.0 to 32.0 m		22	0	18		Light Brown				2.45	-	-	1.81	64	1399*						
	26.00																					2.38	-	-	1.85	7	155*
	26.50																										
	27.00	28.07	WS3	-				0	0	15						2.33	-	-	2.46	4	78*						
	27.50																										
	28.00																										
	28.50	29.50	RK4	13-19				22	0	18						32 CT Diamond Impregnated Bit	2.45	-	-	1.81	64	1399*					
	29.00																										
	29.50																										
	30.00	31.00	RK5	20-22				21	0	15						32 CT Diamond Impregnated Bit	2.45	-	-	1.81	64	1399*					
	30.50																										
	31.00																										
	31.50		WS4	-				0	0	15						32 CT Diamond Impregnated Bit	2.45	-	-	1.81	64	1399*					
	32.00																										

⁽¹⁾Outside NABL scope.

* Equivalent Unconfined Compressive Strength based on Point Load Strength Index

Rock Profile (BH-25)

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Location : Space for Future Provision

Survey Coordinates : 2328S, 1145W

Surface Elevation : RL 211.408 m

Ground Water Depth 22.23 m

Termination Depth : 35.09 m (RL 176.3 m)

Ground Water Level : RL 189.2 m

Boring Method : Rotary Drilling

Casing Depth : 28.0 m

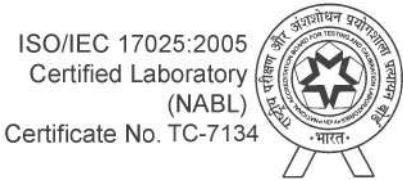
Boring Start : 26-Jul-18

Boring Finish : 08-Aug-18

SPT N- Value (N _t) ⁽¹⁾	Depth (m)	Drill Run (m)	Sample No.	Serial No. of Cores	Casing Lowered (Size)	Symbol	ROCK DESCRIPTION	Depth of Strata, (m)	Percent Recovery (%) ⁽¹⁾	Rock Quality Designation (RQD, %) ⁽¹⁾	Rock Mass Rating (RMR) ⁽¹⁾	Penetration Rate (minutes/cm)	Size of Hole: NX			Density (g/cc)	Specific Gravity	Porosity (%)	Water Absorption (%)	Point Load Index (kg/cm ²)	Unconfined Compressive Strength (kg/cm ²)	
													Return Water		Bits Used							
													Colour	Loss								
Ref*/ 8cm	32.00	32.50 32.58	SPT17 RK6	23-24			Very weak, grey GRANITE, disintegrated very intenselt fractured, highly to completely weathered - very intensely fractured, highly weathered , 32.0 to 34.0 m		10	0	15		Light Brown	100%	32 CT Diamond Impregnated Bit							
	32.50																					
	33.00																					
	33.50																					
Ref*/ 10cm	34.00	34.00	SPT18				- disintegrated, completely weathered, 34.0 to 35.0 m		0	0												
	34.50	34.10																				
Ref*/ 9cm	35.00	35.00	WS5 SPT19	-				35.09														
		35.09																				

⁽¹⁾Outside NABL scope.

* Equivalent Unconfined Compressive Strength based on Point Load Strength Index



Soil Profile (BH-26)

Location : Space for Future Provision
Survey Coordinates : 2396S, 1035W

Surface Elevation : RL 210.768 m

Ground Water Depth : 22.15 m

Termination Depth : 35.26 m (RL 175.5 m)

Ground Water Level : RL 188.6 m

Boring Method : Shell & Auger

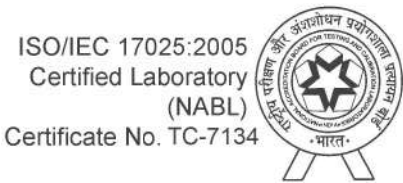
Casing Depth : 27.4 m

Boring Start : 28-Jul-18

Boring Finish : 02-Aug-18

Depth, m		Sample No.	SPT ⁽¹⁾		Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Grain Size Analysis				Atterberg Limits			Shrinkage Limit, (%)	Density and Moisture			Specific Gravity	Shear Tests					Free Swell Index, (%)														
From	To		Field Value, N _f	Corrected Value, N"				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Plasticity Index (%)		Bulk Density (gms/cm ³)	Dry Density (gms/cm ³)	Moisture Content (%)		Type of Test	Confining Pressures, (kg/cm ²)	Cohesion Intercept, 'c' (kg/cm ²)	Angle of Internal Friction, φ (degrees)																
0.00	0.50	DS1	20	20		Very stiff brown sandy silt with gravel, low plastic (CL)	2.50	4	28	51	17			23.0	18	1.72	1.51	13.6	2.67	UC	1.0		23																
1.00	1.30	UDS1																																					
2.50	2.95	SPT1																						Very stiff brown clayey silt with gravel, medium plastic (CI)	5.50	94	2	4	0		23.9	23.0	1.79	1.56	15.1				
4.00	4.30	UDS2																																					
5.50	5.68	SPT2	100/3cm	-		Very dense brown gravels (GP)	7.00	7	13	62	18		32.3	21.2	11.1																								
7.00	7.45	SPT3	62	62		Hard brown sandy silt with gravel, low plastic (CL)																																	
8.50	8.95	SPT4	81	81			11.50																45	11	31	13		31.5	21.1	10.4									
10.00	10.45	SPT5	88	88																																			
11.50	11.86	SPT6	101/21cm	-		Hard brown sandy clay intermixed with gravels, low plastic (SC-GP)																																	
13.00	13.28	SPT7	101/13cm	-																																			
14.50	14.80	SPT8	103/15cm	-																																			
16.00	16.24	SPT9	102/9cm	-																																			

⁽¹⁾ SPT is outside NABL scope.



Soil Profile (BH-26)

Location : Space for Future Provision
Survey Coordinates : 2396S, 1035W

Surface Elevation : RL 210.768 m

Ground Water Depth : 22.15 m

Termination Depth : 35.26 m (RL 175.5 m)

Ground Water Level : RL 188.6 m

Boring Method : Shell & Auger

Casing Depth : 27.4 m

Boring Start : 28-Jul-18

Boring Finish : 02-Aug-18

Depth, m		Sample No.	SPT ⁽¹⁾		Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Grain Size Analysis				Atterberg Limits			Shrinkage Limit, (%)	Density and Moisture			Specific Gravity	Shear Tests				
From	To		Field Value, N _f	Corrected Value, N _c				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Plasticity Index (%)		Bulk Density (gms/cm ³)	Dry Density (gms/cm ³)	Moisture Content (%)		Type of Test	Confining Pressures, (kg/cm ²)	Cohesion Intercept, 'c' (kg/cm ²)	Angle of Internal Friction, ϕ (degrees)	Free Swell Index, (%)
17.50	17.79	SPT10	100/14cm	-		Hard brown sandy clay intermixed with gravels, low plastic (SC-GP)						31.8	21.0	10.9										
19.00	19.34	SPT11	101/19cm	-																				
20.50	20.70	SPT12	100/5cm	-																				
22.00	22.26	SPT13	103/11cm	-																				
23.50	23.74	SPT14	102/9cm	-																				
25.00	25.27	SPT15	100/12cm	-																				
26.50	26.83	SPT16	103/18cm	-																				
28.00	28.36	SPT17	102/21cm	-																				
29.50	29.83	SPT18	101/18cm	-																				
31.00	31.36	SPT19	101/21cm	-																				
32.50	32.82	SPT20	101/17cm	-																				
34.00	34.34	SPT21	102/19cm	-																				

⁽¹⁾ SPT is outside NABL scope.

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Soil Profile (BH-26)

Location : Space for Future Provision

Surface Elevation : RL 210.768 m

Boring Method : Shell & Auger

Survey Coordinates : 2396S, 1035W

Ground Water Depth : 22.15 m

Casing Depth : 27.4 m

Termination Depth : 35.26 m (RL 175.5 m)

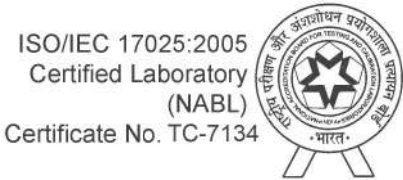
Boring Start : 28-Jul-18

Ground Water Level : RL 188.6 m

Boring Finish : 02-Aug-18

Depth, m		Sample No.	SPT ⁽¹⁾		Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Grain Size Analysis				Atterberg Limits		Shrinkage Limit, (%)	Density and Moisture			Specific Gravity	Shear Tests					Free Swell Index, (%)
From	To		Field Value, N _f	Corrected Value, N"				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)		Plasticity Index (%)	Bulk Density (gms/cm ³)	Dry Density (gms/cm ³)		Moisture Content (%)	Type of Test	Confining Pressures, (kg/cm ²)	Cohesion Intercept, 'c' (kg/cm ²)	Angle of Internal Friction, ϕ (degrees)	
35.00	35.26	SPT22	102/11cm	-		Hard brown sandy clay intermixed with gravels, low plastic (SC-GP)	35.26																	

⁽¹⁾ SPT is outside NABL scope.



Soil Profile (BH-27)

Location : Space for Future Provision
Survey Coordinates : 2471S, 1136W

Surface Elevation : RL 213.129 m

Ground Water Depth : 22.49 m

Termination Depth : 35.22 m (RL 177.9 m)

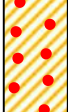
Ground Water Level : RL 190.6 m

Boring Method : Shell & Auger

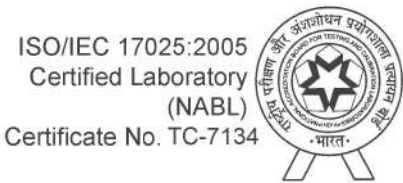
Casing Depth : 26.3 m

Boring Start : 31-Jul-18

Boring Finish : 07-Aug-18

Depth, m		Sample No.	SPT ⁽¹⁾		Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Grain Size Analysis				Atterberg Limits			Shrinkage Limit, (%)	Density and Moisture			Specific Gravity	Shear Tests				Free Swell Index, (%)							
From	To		Field Value, N _f	Corrected Value, N _c				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Plasticity Index (%)		Bulk Density (gms/cm ³)	Dry Density (gms/cm ³)	Moisture Content (%)		Type of Test	Confining Pressures, (kg/cm ²)	Cohesion Intercept, 'c' (kg/cm ²)	Angle of Internal Friction, φ (degrees)								
0.00	0.50	DS1				Medium dense brown gravels intermixed with clayey sand (GP-SC)		51	21	11	17				19				UC		0.7		7								
1.00	1.45	SPT1	25	39		Very stiff to hard brown clayey silt, medium plastic (CI)	2.50																								
2.50	2.80	UDS1				- very stiff, 2.5 to 7.0 m										37.8	21.3	16.5								1.79	1.55	15.2			
4.00	4.45	SPT2	20	20		- hard, 7.0 to 17.5 m																									
5.50	5.80	UDS2				-intermixed with gravel, 8.5 to 10.0 m		47	19	24	10					2.68															
7.00	7.45	SPT3	90	90											36.5		14.5	21.9			1.84	1.59		15.8							
8.50	8.95	SPT4	89	89																											
10.00	10.45	SPT5	104	104																											
11.50	11.95	SPT6	102	102																											
13.00	13.40	SPT7	102/25cm	-			14.50																								
14.50	14.87	SPT8	101/22cm	-		Hard brown sandy silt, low plastic (CL)						28.1	17.5	10.6																	
16.00	16.27	SPT9	103/12cm	-																											

⁽¹⁾ SPT is outside NABL scope.



Soil Profile (BH-27)

Location : Space for Future Provision
Survey Coordinates : 2471S, 1136W

Surface Elevation : RL 213.129 m
Ground Water Depth : 22.49 m
Termination Depth : 35.22 m (RL 177.9 m)
Ground Water Level : RL 190.6 m

Boring Method : Shell & Auger
Casing Depth : 26.3 m
Boring Start : 31-Jul-18
Boring Finish : 07-Aug-18

Depth, m		Sample No.	SPT ⁽¹⁾		Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Grain Size Analysis				Atterberg Limits			Shrinkage Limit, (%)	Density and Moisture			Specific Gravity	Shear Tests				
From	To		Field Value, N _f	Corrected Value, N _c				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Plasticity Index (%)		Bulk Density (gms/cm ³)	Dry Density (gms/cm ³)	Moisture Content (%)		Type of Test	Confining Pressures, (kg/cm ²)	Cohesion Intercept, 'c' (kg/cm ²)	Angle of Internal Friction, ϕ (degrees)	Free Swell Index, (%)
17.50	17.75	SPT10	100/10cm	-		Hard brown sandy silt with gravel, low plastic (CL)		11	27	54	8													
19.00	19.25	SPT11	104/10cm	-								31.3	22.1	9.2										
20.50	20.86	SPT12	102/21cm	-																				
22.00	22.33	SPT13	100/18cm	-																				
23.50	23.85	SPT14	101/20cm	-																				
25.00	25.36	SPT15	101/21cm	-								28.5	18.4	10.1										
26.50	26.95	SPT16	42	42																				
28.00	28.40	SPT17	105/25cm	-		- intermixed with gravels, 32.5 to 34.0 m		18	29	43	10													
29.50	29.84	SPT18	102/19cm	-																				
31.00	31.27	SPT19	101/12cm	-																				
32.50	32.83	SPT20	100/18cm	-																				
34.00	34.27	SPT21	102/12cm	-																				

⁽¹⁾ SPT is outside NABL scope.

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Soil Profile (BH-27)

Location : Space for Future Provision

Surface Elevation : RL 213.129 m

Boring Method : Shell & Auger

Survey Coordinates : 2471S, 1136W

Ground Water Depth : 22.49 m

Casing Depth : 26.3 m

Termination Depth : 35.22 m (RL 177.9 m)

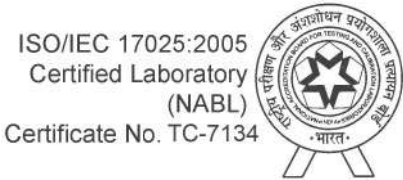
Boring Start : 31-Jul-18

Ground Water Level : RL 190.6 m

Boring Finish : 07-Aug-18

Depth, m		Sample No.	SPT ⁽¹⁾		Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Grain Size Analysis				Atterberg Limits			Shrinkage Limit, (%)	Density and Moisture			Specific Gravity	Shear Tests					Free Swell Index, (%)
From	To		Field Value, N _f	Corrected Value, N"				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Plasticity Index (%)		Bulk Density (gms/cm ³)	Dry Density (gms/cm ³)	Moisture Content (%)		Type of Test	Confining Pressures, (kg/cm ²)	Cohesion Intercept, 'c' (kg/cm ²)	Angle of Internal Friction, ϕ (degrees)		
35.00	35.22	SPT22	103/7cm	-		Hard brown sandy silt, low plastic (CL)	35.22																		

⁽¹⁾ SPT is outside NABL scope.



Soil Profile (BH-28)

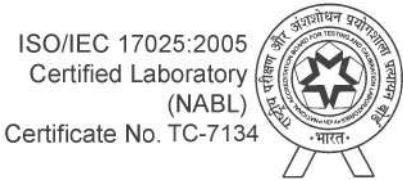
Location : Space for Future Provision
Survey Coordinates : 2516S, 1104W

Surface Elevation : RL 211.848 m
Ground Water Depth : 21.95 m
Termination Depth : 35 m (RL 176.8 m)
Ground Water Level : RL 189.9 m

Boring Method : Shell & Auger
Casing Depth : 27.4 m
Boring Start : 28-Jul-18
Boring Finish : 31-Jul-18

Depth, m		Sample No.	SPT ⁽¹⁾		Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Grain Size Analysis				Atterberg Limits			Shrinkage Limit, (%)	Density and Moisture			Specific Gravity	Shear Tests				
From	To		Field Value, N _f	Corrected Value, N _c				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Plasticity Index (%)		Bulk Density (gms/cm ³)	Dry Density (gms/cm ³)	Moisture Content (%)		Type of Test	Confining Pressures, (kg/cm ²)	Cohesion Intercept, 'c' (kg/cm ²)	Angle of Internal Friction, φ (degrees)	Free Swell Index, (%)
0.00	0.50	DS1				Medium dense brown gravels intermixed with clayey sand (GP-SC)	2.50	54	16	19	11					1.70	1.50	13.7						
1.00	1.30	UDS1				Very stiff to hard brown clayey silt, low expansive, low plastic (CL)						34.5	21.0	13.5	17									
2.50	2.95	SPT1	22	22		- very stiff, 2.5 to 5.5 m										1.81	1.57	15.3		UC		0.9		21
4.00	4.30	UDS2				- hard, 5.5 to 17.5 m													2.67					
5.50	5.95	SPT2	60	60																				
7.00	7.45	SPT3	27	27								32.6	22.5	10.1										
8.50	8.95	SPT4	77	77																				
10.00	10.40	SPT5	101/25cm	-																				
11.50	11.95	SPT6	90	90																				
13.00	13.42	SPT7	100/27cm	-																				
14.50	14.95	SPT8	51	-		- with gravel, 14.5 to 16.0 m		20	10	51	19													
16.00	16.27	SPT9	100/12cm	-			17.50					30.9	19.7	11.2										

⁽¹⁾ SPT is outside NABL scope.



Soil Profile (BH-28)

Location : Space for Future Provision
Survey Coordinates : 2516S, 1104W

Surface Elevation : RL 211.848 m
Ground Water Depth : 21.95 m
Termination Depth : 35 m (RL 176.8 m)
Ground Water Level : RL 189.9 m

Boring Method : Shell & Auger
Casing Depth : 27.4 m
Boring Start : 28-Jul-18
Boring Finish : 31-Jul-18

Depth, m		Sample No.	SPT ⁽¹⁾		Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Grain Size Analysis				Atterberg Limits			Shrinkage Limit, (%)	Density and Moisture			Specific Gravity	Shear Tests				Free Swell Index, (%)
From	To		Field Value, N _f	Corrected Value, N _c				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Plasticity Index (%)		Bulk Density (gms/cm ³)	Dry Density (gms/cm ³)	Moisture Content (%)		Type of Test	Confining Pressures, (kg/cm ²)	Cohesion Intercept, 'c' (kg/cm ²)	Angle of Internal Friction, ϕ (degrees)	
17.50	17.87	SPT10	105/22cm	-		Hard brown clayey silt with gravel, medium plastic (CI)	25.00	9	21	55	15	38.9	17.0	21.9										
19.00	19.40	SPT11	104/25cm	-																				
20.50	20.95	SPT12	56	56																				
22.00	22.45	SPT13	60	60																				
23.50	23.95	SPT14	94	94																				
25.00	25.36	SPT15	101/21cm	-		Hard brown clayey silt, low plastic (CL) - with traces of gravel, 28.0 to 29.5 m - with gravel, 32.5 to 34.0 m		14	22	44	20	30.0	21.2	8.8										
26.50	26.76	SPT16	102/11cm	-																				
28.00	28.42	SPT17	101/27cm	-																				
29.50	29.95	SPT18	92	92																				
31.00	31.34	SPT19	101/19cm	-																				
32.50	32.95	SPT20	77	77																				
34.00	34.45	SPT21	78	78																				

⁽¹⁾ SPT is outside NABL scope.

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Soil Profile (BH-28)

Location : Space for Future Provision

Surface Elevation : RL 211.848 m

Boring Method : Shell & Auger

Survey Coordinates : 2516S, 1104W

Ground Water Depth : 21.95 m

Casing Depth : 27.4 m

Termination Depth : 35 m (RL 176.8 m)

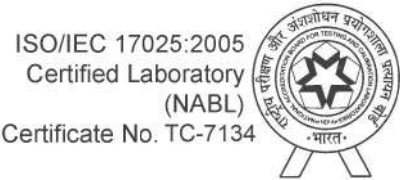
Boring Start : 28-Jul-18

Ground Water Level : RL 189.9 m

Boring Finish : 31-Jul-18

Depth, m		Sample No.	SPT ⁽¹⁾		Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Grain Size Analysis				Atterberg Limits		Shrinkage Limit, (%)	Density and Moisture			Specific Gravity	Shear Tests				Free Swell Index, (%)
From	To		Field Value, N _f	Corrected Value, N"				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)		Plasticity Index (%)	Bulk Density (gms/cm ³)	Dry Density (gms/cm ³)		Moisture Content (%)	Type of Test	Confining Pressures, (kg/cm ²)	Cohesion Intercept, 'c' (kg/cm ²)	
35.00	35.45	SPT22	88	88		Hard brown sandy silt, low plastic (CL)	35.45																

⁽¹⁾ SPT is outside NABL scope.



Soil Profile (BH-30)

Location : Space for Future Provision
Survey Coordinates : 2311S, 1033W

Surface Elevation : RL 211.737 m

Ground Water Depth : 22.10 m

Termination Depth : 30.09 m (RL 181.6 m)

Ground Water Level : RL 189.6 m

Boring Method : Shell & Auger

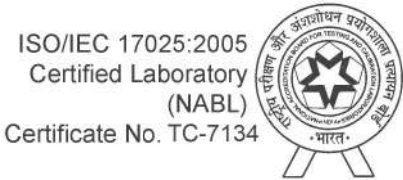
Casing Depth : 24.0 m

Boring Start : 03-Aug-18

Boring Finish : 05-Aug-18

Depth, m		Sample No.	SPT ⁽¹⁾		Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Grain Size Analysis				Atterberg Limits			Shrinkage Limit, (%)	Density and Moisture			Specific Gravity	Shear Tests				Free Swell Index, (%)
From	To		Field Value, N _r	Corrected Value, N"				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Plasticity Index (%)		Bulk Density (gms/cm ³)	Dry Density (gms/cm ³)	Moisture Content (%)		Type of Test	Confining Pressures, (kg/cm ²)	Cohesion Intercept, 'c' (kg/cm ²)	Angle of Internal Friction, φ (degrees)	
0.00	0.50	DS1				Medium dense brown gravels with silty fine sand (GP-SM)																		
1.00	1.45	SPT1	24	37			2.50	60	22	18	0													
2.50	2.80	UDS1				Very stiff to hard brown clayey silt, medium plastic (CI)						39.3	23.0	16.3	17	1.76	1.53	14.9		UC		0.9		
4.00	4.45	SPT2	27	27		- with traces of gravel, 4.0 to 5.5 m																		7
5.50	5.80	UDS2				- very stiff, 4.0 to 7.0 m										1.85	1.59	16.2						
7.00	7.45	SPT3	67	67		- hard, 7.0 to 17.5 m													2.68					7
8.50	8.95	SPT4	78	78																				
10.00	10.45	SPT5	78	78																				
11.50	11.95	SPT6	91	91																				
13.00	13.45	SPT7	98	98		- with gravel, 13.0 to 14.5 m	14.50	6	9	59	26													
14.50	14.84	SPT8	103/19cm	-		Hard brown sandy silt, low plastic (CL)						30.8	18.8	12.1										
16.00	16.36	SPT9	102/21cm	-			17.50																	

⁽¹⁾ SPT is outside NABL scope.



Soil Profile (BH-30)

Location : Space for Future Provision
Survey Coordinates : 2311S, 1033W

Surface Elevation : RL 211.737 m

Ground Water Depth : 22.10 m

Termination Depth : 30.09 m (RL 181.6 m)

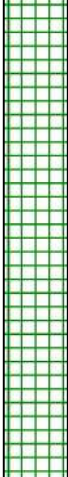
Ground Water Level : RL 189.6 m

Boring Method : Shell & Auger

Casing Depth : 24.0 m

Boring Start : 03-Aug-18

Boring Finish : 05-Aug-18

Depth, m		Sample No.	SPT ⁽¹⁾		Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Grain Size Analysis				Atterberg Limits			Shrinkage Limit, (%)	Density and Moisture			Specific Gravity	Shear Tests					Free Swell Index, (%)
From	To		Field Value, N _f	Corrected Value, N"				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Plasticity Index (%)		Bulk Density (gms/cm ³)	Dry Density (gms/cm ³)	Moisture Content (%)		Type of Test	Confining Pressures, (kg/cm ²)	Cohesion Intercept, 'c' (kg/cm ²)	Angle of Internal Friction, ϕ (degrees)		
17.50	17.75	SPT10	101/10cm	-		Hard brown clayey silt, low plastic (CL)		30	13	41	16	33.9	20.8	13.1											
19.00	19.34	SPT11	101/19cm	-		- intermixed with gravels, 17.5 to 19.0 m																			
20.50	20.86	SPT12	101/21cm	-		- with gravel, 22.0 to 29.5 m																			
22.00	22.39	SPT13	102/24cm	-																					
23.50	23.86	SPT14	100/21cm	-		32.7						19.5	13.2												
25.00	25.37	SPT15	100/22cm	-																					
26.50	26.84	SPT16	101/19cm	-			Disintegrated ROCK	29.50																	
28.00	28.22	SPT17	101/7cm	-																					
29.50	29.76	SPT18	101/11cm	-																					
30.00	30.09	SPT19	Ref*/9cm	-		30.09																			

⁽¹⁾ SPT is outside NABL scope.

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Soil Profile (BH-32)

Location : Space for Future Provision
Survey Coordinates : 2429S, 1035W

Termination Depth : 35.06 m (RL 176 m)
Ground Water Depth : 21.50 m
Surface Elevation : RL 211.05 m
Ground Water Level : RL 189.6 m

Boring Method : Shell & Auger
Casing Depth : 29.0 m
Boring Start : 11-Aug-18
Boring Finish : 23-Aug-18

Depth, m		Sample No.	SPT ⁽¹⁾		Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Grain Size Analysis				Atterberg Limits			Shrinkage Limit, (%)	Density and Moisture			Specific Gravity	Shear Tests				
From	To		Field Value, N _r	Corrected Value, N"				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Plasticity Index (%)		Bulk Density (gms/cm ³)	Dry Density (gms/cm ³)	Moisture Content (%)		Type of Test	Confining Pressures, (kg/cm ²)	Cohesion Intercept, 'c' (kg/cm ²)	Angle of Internal Friction, φ (degrees)	Free Swell Index, (%)
0.00	0.50	DS1				Hard brown sandy silt intermixed with gravels, low plastic (CL)		32	28	24	16													
1.00	1.45	SPT1	33	33																				
2.50	2.80	UDS1					4.00									1.82	1.65	10.1		UC		1.7		8
4.00	4.45	SPT2	40	40		Hard brown clayey silt, low plastic (CL)																		
5.50	5.80	UDS2				- with traces of gravel, 4.0 to 5.5 m										1.85	1.65	12.0						
7.00	7.45	SPT3	71	71								31.4	9.1	22.3					2.68					
8.50	8.95	SPT4	81	81																				
10.00	10.45	SPT5	99	99				9	26	52	13													
11.50	11.95	SPT6	89	89																				
13.00	13.45	SPT7	95	95																				
14.50	14.95	SPT8	101	101																				
16.00	16.33	SPT9	101/18cm	-		- intermixed with gravel, 16.0 to 17.5 m	17.50																	

⁽¹⁾ SPT is outside NABL scope.

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Soil Profile (BH-32)

Location : Space for Future Provision
Survey Coordinates : 2429S, 1035W

Termination Depth : 35.06 m (RL 176 m)
Ground Water Depth : 21.50 m
Surface Elevation : RL 211.05 m
Ground Water Level : RL 189.6 m

Boring Method : Shell & Auger
Casing Depth : 29.0 m
Boring Start : 11-Aug-18
Boring Finish : 23-Aug-18

Depth, m		Sample No.	SPT ⁽¹⁾		Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Grain Size Analysis				Atterberg Limits			Shrinkage Limit, (%)	Density and Moisture			Specific Gravity	Shear Tests				
From	To		Field Value, N _r	Corrected Value, N"				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Plasticity Index (%)		Bulk Density (gms/cm ³)	Dry Density (gms/cm ³)	Moisture Content (%)		Type of Test	Confining Pressures, (kg/cm ²)	Cohesion Intercept, 'c' (kg/cm ²)	Angle of Internal Friction, ϕ (degrees)	Free Swell Index, (%)
17.50	17.85	SPT10	100/20cm	-		Hard brown clayey silt with gravel, low plastic (CI)																		
19.00	19.34	SPT11	101/19cm	-																				
20.50	20.75	SPT12	102/10cm	-				12	14	64	10													
22.00	22.27	SPT13	103/12cm	-								34.3	21.1	13.2					2.68					
23.50	23.64	SPT14	Ref*/14cm	-			25.00																	
25.00	25.08	SPT15	Ref*/8cm	-		Disintegrated Rock	25.08																	
						Refusal met on Rock. Core drilling through rock adopted. Refer to next page for details.																		

⁽¹⁾ SPT is outside NABL scope.

Rock Profile (BH-32)

Location : Space for Future Provision Surface Elevation : RL 211.053 m Boring Method : Rotary Drilling
Survey Coordinates : 2429S, 1035W Ground Water Depth 21.50 m Casing Depth : 29.0 m
Termination Depth : 35.06 m (RL 176 m) Boring Start : 11-Aug-18
Ground Water Level : RL 189.6 m Boring Finish : 23-Aug-18

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SPT N- Value (N _f) ⁽¹⁾	Depth (m)	Drill Run (m)	Sample No.	Serial No. of Cores	Casing Lowered (Size)	Symbol	ROCK DESCRIPTION	Depth of Strata, (m)	Percent Recovery (%) ⁽¹⁾	Rock Quality Designation (RQD, %) ⁽¹⁾	Rock Mass Rating (RMR) ⁽¹⁾	Penetration Rate (minutes/cm)	Size of Hole: NX			Density (g/cc)	Specific Gravity	Porosity (%)	Water Absorption (%)	Point Load Index (kg/cm ²)	Unconfined Compressive Strength (kg/cm ²)											
													Return	Water																		
Ref*/ 3cm	25.50	25.50	RK1	1-5		Very weak to weak, brown GRANITE, disintegrated to very intensely fractured, highly to completely weathered - very weak, very intensely fractured, highly weathered , 25.5 to 27.0 m - weak, very intensely fractured, highly weathered , 27.0 to 28.5 m - very weak, disintegrated, completely weathered, 28.5 to 32.0 m		13	0	18		Colour	Loss	Bits Used																		
	26.00																															
	26.50																															
	27.00	27.00	RK2	6-9																												
	27.50	27.03																														
28.00																																
28.50	28.50	WS1	-																													
29.00																																
29.50																																
Ref*/ 7cm	30.00	30.00	SPT17	-				0	0	15		Light Brown	Partial	32 CT Diamond Impregnated Bit																		
	30.50	30.07																														
	31.00																															
Ref*/ 2cm	31.50	31.50	SPT18																													
	32.00	31.52																														

⁽¹⁾Outside NABL scope.

* Equivalent Unconfined Compressive Strength based on Point Load Strength Index

Rock Profile (BH-32)

Location : Space for Future Provision Surface Elevation : RL 211.053 m Boring Method : Rotary Drilling
Survey Coordinates : 2429S, 1035W Ground Water Depth 21.50 m Casing Depth : 29.0 m
Termination Depth : 35.06 m (RL 176 m) Boring Start : 11-Aug-18
Ground Water Level : RL 189.6 m Boring Finish : 23-Aug-18

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SPT N- Value (N _f) ⁽¹⁾	Depth (m)	Drill Run (m)	Sample No.	Serial No. of Cores	Casing Lowered (Size)	Symbol	ROCK DESCRIPTION	Depth of Strata, (m)	Percent Recovery (%) ⁽¹⁾	Rock Quality Designation (RQD, %) ⁽¹⁾	Rock Mass Rating (RMR) ⁽¹⁾	Penetration Rate (minutes/cm)	Size of Hole: NX			Density (g/cc)	Specific Gravity	Porosity (%)	Water Absorption (%)	Point Load Index (kg/cm ²)	Unconfined Compressive Strength (kg/cm ²)	
													Return Water		Bits Used							
													Colour	Loss								
Ref*/ 6cm	32.00	33.00 33.06	WS3	-			Very weak, brown GRANITE, disintegrate to very intensely fractured, highly to completely weathered - very weak, disintegrated, completely weathered, 32.0 to 33.0 m		0	0	15		Light Brown	Partial	32 CT Diamond Impregnated Bit							
	32.50																					
	33.00																					
	33.50																					
Ref*/ 7cm	34.00	34.00 34.07	SPT19	10-13				- weak, very intensely fractured, highly weathered , 33.0 to 35.0 m		15	0											
	34.50																					
Ref*/ 6cm	35.00	35.00 35.06	SPT20	14-18						17	0	18										
								35.00														

⁽¹⁾Outside NABL scope.

* Equivalent Unconfined Compressive Strength based on Point Load Strength Index

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Soil Profile (BH-33)

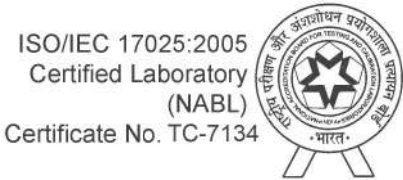
Location : Space for Future Provision
Survey Coordinates : 2455S, 1032W

Termination Depth : 35 m (RL 176.3 m)
Ground Water Depth : 21.60 m
Surface Elevation : RL 211.31 m
Ground Water Level : RL 189.7 m

Boring Method : Shell & Auger
Casing Depth : 25.5 m
Boring Start : 06-Aug-18
Boring Finish : 28-Aug-18

Depth, m		Sample No.	SPT ⁽¹⁾		Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Grain Size Analysis				Atterberg Limits			Shrinkage Limit, (%)	Density and Moisture			Specific Gravity	Shear Tests				Free Swell Index, (%)
From	To		Field Value, N _r	Corrected Value, N"				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Plasticity Index (%)		Bulk Density (gms/cm ³)	Dry Density (gms/cm ³)	Moisture Content (%)		Type of Test	Confining Pressures, (kg/cm ²)	Cohesion Intercept, 'c' (kg/cm ²)	Angle of Internal Friction, φ (degrees)	
0.00	0.50	DS1				Hard brown sandy silt with gravel, low plastic (CL)		8	26	50	16													
1.00	2.50	UDS1					2.50									1.75	1.60	9.5						
2.50	2.95	SPT1	46	46		Hard brown clayey silt, medium plastic (CI)						42.9	21.8	21.2	14									
4.00	4.30	UDS2														1.81	1.61	12.5		UU	1,2,3	2.1	6.1	
5.50	5.95	SPT2	54	54		- with gravel, 5.5 to 7.0 m		5	19	52	24								2.67					
7.00	7.45	SPT3	84	84																				
8.50	8.95	SPT4	90	90																				
10.00	10.45	SPT5	100	100		- intermixed with gravel, 10.0 to 11.5 m																		
11.50	11.90	SPT6	103/25cm	-								37.6	20.4	17.2										
13.00	13.45	SPT7	101	101																				
14.50	14.95	SPT8	101	101		- with taces of gravel, 14.5 to 16.0 m		4	7	68	21													
16.00	16.36	SPT9	101/21cm	-								35.2												

⁽¹⁾ SPT is outside NABL scope.



Soil Profile (BH-33)

Location : Space for Future Provision
Survey Coordinates : 2455S, 1032W

Termination Depth : 35 m (RL 176.3 m)
Ground Water Depth : 21.60 m
Surface Elevation : RL 211.31 m
Ground Water Level : RL 189.7 m

Boring Method : Shell & Auger
Casing Depth : 25.5 m
Boring Start : 06-Aug-18
Boring Finish : 28-Aug-18

Depth, m		Sample No.	SPT ⁽¹⁾		Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Grain Size Analysis				Atterberg Limits			Shrinkage Limit, (%)	Density and Moisture			Specific Gravity	Shear Tests				Free Swell Index, (%)															
From	To		Field Value, N _f	Corrected Value, N _c				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Plasticity Index (%)		Bulk Density (gms/cm ³)	Dry Density (gms/cm ³)	Moisture Content (%)		Type of Test	Confining Pressures, (kg/cm ²)	Cohesion Intercept, 'c' (kg/cm ²)	Angle of Internal Friction, ϕ (degrees)																
17.50	17.95	SPT10	80	80		Hard brown clayey silt with traces of gravel, medium plastic (CI)	20.50	2	5	69	24	28.6	16.4	12.2				2.67																					
19.00	19.45	SPT11	89	89																																			
20.50	20.95	SPT12	33	33		Hard brown sandy silt with gravel, low plastic (CL)	25.00																																
22.00	22.45	SPT13	60	60																																			
23.50	23.81	SPT14	101/16cm	-																																			
25.00	25.09	SPT15	Ref*/9cm	-		Refusal met on Rock. Core drilling through rock adopted. Refer to next page for details.																																	

⁽¹⁾ SPT is outside NABL scope.

Rock Profile (BH-33)

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Location : Space for Future Provision Surface Elevation : RL 211.314 m Boring Method : Rotary Drilling
Survey Coordinates : 2455S, 1032W Ground Water Depth 21.60 m Casing Depth : 25.5 m
Termination Depth : 35 m (RL 176.3 m) Boring Start : 06-Aug-18
Ground Water Level : RL 189.7 m Boring Finish : 28-Aug-18

SPT N- Value (N _t) ⁽¹⁾	Depth (m)	Drill Run (m)	Sample No.	Serial No. of Cores	Casing Lowered (Size)	Symbol	ROCK DESCRIPTION	Depth of Strata, (m)	Percent Recovery (%) ⁽¹⁾	Rock Quality Designation (RQD, %) ⁽¹⁾	Rock Mass Rating (RMR) ⁽¹⁾	Penetration Rate (minutes/cm)	Size of Hole: NX					Porosity (%)	Water Absorption (%)	Point Load Index (kg/cm ²)	Unconfined Compressive Strength (kg/cm ²)
													Return Water		Bits Used	Density (g/cc)	Specific Gravity				
													Colour	Loss							
Ref*/9cm	25.00	25.00	SPT15	1-3			Weak, brown GRANITE, very intensely fractured, highly weathered		11	0	18		Light Brown	100%	32 CT Diamond Impregnated Bit						
	25.50	25.09	RK1																		
	26.00																				
Ref*/4cm	26.50	26.50	SPT16	4-7					14	0											
	27.00	26.54	RK2																		
	27.50																				
Ref*/3cm	28.00	28.00	SPT17	8-11					17	0											
	28.50	28.03	RK3																		
	29.00																				
Ref*/3cm	29.50	29.50	SPT18	12-14					13	0											
	30.00	29.53	RK4																		
	30.50																				
Ref*/6cm	31.00	31.00	SPT19																		
	31.50	31.06																			

⁽¹⁾Outside NABL scope.

* Equivalent Unconfined Compressive Strength based on Point Load Strength Index

Rock Profile (BH-33)

Location : Space for Future Provision Surface Elevation : RL 211.314 m Boring Method : Rotary Drilling
Survey Coordinates : 2455S, 1032W Ground Water Depth 21.60 m Casing Depth : 25.5 m
Termination Depth : 35 m (RL 176.3 m) Boring Start : 06-Aug-18
Ground Water Level : RL 189.7 m Boring Finish : 28-Aug-18

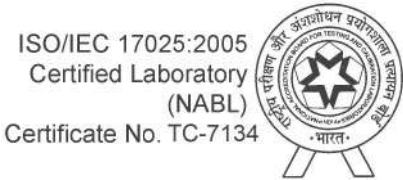
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SPT N- Value (N _f) ⁽¹⁾	Depth (m)	Drill Run (m)	Sample No.	Serial No. of Cores	Casing Lowered (Size)	Symbol	ROCK DESCRIPTION	Depth of Strata, (m)	Percent Recovery (%) ⁽¹⁾	Rock Quality Designation (RQD, %) ⁽¹⁾	Rock Mass Rating (RMR) ⁽¹⁾	Penetration Rate (minutes/cm)	Size of Hole: NX			Density (g/cc)	Specific Gravity	Porosity (%)	Water Absorption (%)	Point Load Index (kg/cm ²)	Unconfined Compressive Strength (kg/cm ²)
													Return Water		Bits Used						
													Colour	Loss							
Ref*/ 12cm	31.50	32.50 32.62	WS1	-			Very weak to weak, brown GRANITE, disintegrated to very intensely fractured, highly to completely weathered		0	0	15		Light Brown	100%	32 CT Diamond Impregnated Bit						
	32.00																				
	32.50		WS2	-																	
	33.00																				
Ref*/ 9cm	33.50	34.00 34.09	SPT21				- very weak, disintegrated, completely weathered, 31.5 to 34.0 m		0	0	18										
	34.00																				
	34.50		RK5	15-18																	
	35.00																				
								35.00													

⁽¹⁾Outside NABL scope.

* Equivalent Unconfined Compressive Strength based on Point Load Strength Index



Soil Profile (BH-34)

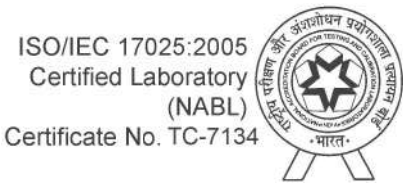
Location : Space for Future Provision
Survey Coordinates : 2442S, 1004W

Termination Depth : 35 m (RL 175 m)
Ground Water Depth : 21.03 m
Surface Elevation : RL 209.95 m
Ground Water Level : RL 188.9 m

Boring Method : Shell & Auger
Casing Depth : 25.5 m
Boring Start : 10-Aug-18
Boring Finish : 01-Sep-18

Depth, m		Sample No.	SPT ⁽¹⁾		Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Grain Size Analysis				Atterberg Limits			Shrinkage Limit, (%)	Density and Moisture			Specific Gravity	Shear Tests				
From	To		Field Value, N _f	Corrected Value, N _c				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Plasticity Index (%)		Bulk Density (gms/cm ³)	Dry Density (gms/cm ³)	Moisture Content (%)		Type of Test	Confining Pressures, (kg/cm ²)	Cohesion Intercept, 'c' (kg/cm ²)	Angle of Internal Friction, φ (degrees)	Free Swell Index, (%)
0.00	0.50	DS1				Medium dense brown gravel intermixed with silty fine sand (GP-SM)		66	17	17	0													
1.00	1.30	UDS1					2.50									1.79	1.60	11.8						
2.50	2.95	SPT1	34	34		Hard brown sandy silt intermixed with gravels, low plastic (CL-GP)		24	22	29	25													
4.00	4.30	UDS2														1.85	1.64	12.8		UU	1,2, 3	1.7	11.1	
5.50	5.95	SPT2	54	54								34.1	23.8	10.3					2.68					
7.00	7.45	SPT3	68	68																				
8.50	8.95	SPT4	74	74			10.00																	
10.00	10.45	SPT5	85	85		Hard brown clayey silt intermixed with gravels, medium plastic (CI)																		
11.50	11.90	SPT6	102/25cm	-				29	27	32	12													
13.00	13.36	SPT7	102/21cm	-								40.1	17.3	22.8										
14.50	14.89	SPT8	104/24cm	-																				
16.00	16.39	SPT9	102/24cm	-			17.50	28	28	44														

⁽¹⁾ SPT is outside NABL scope.

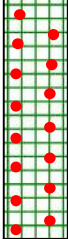


Soil Profile (BH-34)

Location : Space for Future Provision
Survey Coordinates : 2442S, 1004W

Termination Depth : 35 m (RL 175 m)
Ground Water Depth : 21.03 m
Surface Elevation : RL 209.95 m
Ground Water Level : RL 188.9 m

Boring Method : Shell & Auger
Casing Depth : 25.5 m
Boring Start : 10-Aug-18
Boring Finish : 01-Sep-18

Depth, m		Sample No.	SPT ⁽¹⁾		Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Grain Size Analysis				Atterberg Limits			Shrinkage Limit, (%)	Density and Moisture			Specific Gravity	Shear Tests					Free Swell Index, (%)
From	To		Field Value, N _f	Corrected Value, N _c				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Plasticity Index (%)		Bulk Density (gms/cm ³)	Dry Density (gms/cm ³)	Moisture Content (%)		Type of Test	Confining Pressures, (kg/cm ²)	Cohesion Intercept, 'c' (kg/cm ²)	Angle of Internal Friction, ϕ (degrees)		
17.50	17.83	SPT10	101/18cm	-		Hard brown sandy silt intermixed with gravels, low plastic (CL-GP)	23.50	42	35	23	31.2	20.4	10.7				2.68								
19.00	19.20	SPT11	102/5cm	-																					
20.50	20.70	SPT12	100/5cm	-																					
22.00	22.40	SPT13	113/25cm	-																					
23.50	23.59	SPT14	Ref*/9cm	-		Refusal met on Rock. Core drilling through rock adopted. Refer to next page for details.																			

⁽¹⁾ SPT is outside NABL scope.

Rock Profile (BH-34)

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Location : Space for Future Provision Surface Elevation : RL 209.950 m Boring Method : Rotary Drilling
Survey Coordinates : 2442S, 1004W Ground Water Depth 21.03 m Casing Depth : 25.5 m
Termination Depth : 35 m (RL 175 m) Boring Start : 10-Aug-18
Ground Water Level : RL 188.9 m Boring Finish : 01-Sep-18

SPT N- Value (N _t) ⁽¹⁾	Depth (m)	Drill Run (m)	Sample No.	Serial No. of Cores	Casing Lowered (Size)	Symbol	ROCK DESCRIPTION	Depth of Strata, (m)	Percent Recovery (%) ⁽¹⁾	Rock Quality Designation (RQD, %) ⁽¹⁾	Rock Mass Rating (RMR) ⁽¹⁾	Penetration Rate (minutes/cm)	Size of Hole: NX					Porosity (%)	Water Absorption (%)	Point Load Index (kg/cm ²)	Unconfined Compressive Strength (kg/cm ²)					
													Return Water		Bits Used	Density (g/cc)	Specific Gravity									
													Colour	Loss												
Ref*/ 9cm	23.50	23.50	SPT14	1-4			Weak, grey GRANITE, very intensely Fractured, highly weathered		16	0	18		↑	↑	↑											
	24.00	23.59	RK1																							
	24.50																									
Ref*/ 6cm	25.00	25.00	SPT15	5-8										17	0				32 CT Diamond Impregnated Bit	2.65	-	-	3.06	25	551*	
	25.50	25.06	RK2																							
	26.00																									
Ref*/ 5cm	26.50	26.50	SPT16	9-12										12	0											
	27.00	26.55	RK3																							
	27.50																									
Ref*/ 8cm	28.00	28.00	SPT17	13-16										21	0				↓	↓	↓					
	28.50	28.08	RK4																							
	29.00																									
	29.50	29.50																								
	30.00																									

⁽¹⁾Outside NABL scope.

* Equivalent Unconfined Compressive Strength based on Point Load Strength Index

Rock Profile (BH-34)

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Location : Space for Future Provision

Survey Coordinates : 2442S, 1004W

Surface Elevation : RL 209.950 m

Ground Water Depth 21.03 m

Termination Depth : 35 m (RL 175 m)

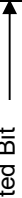
Ground Water Level : RL 188.9 m

Boring Method : Rotary Drilling

Casing Depth : 25.5 m

Boring Start : 10-Aug-18

Boring Finish : 01-Sep-18

SPT N- Value (N _t) ⁽¹⁾	Depth (m)	Drill Run (m)	Sample No.	Serial No. of Cores	Casing Lowered (Size)	Symbol	ROCK DESCRIPTION	Depth of Strata, (m)	Percent Recovery (%) ⁽¹⁾	Rock Quality Designation (RQD, %) ⁽¹⁾	Rock Mass Rating (RMR) ⁽¹⁾	Penetration Rate (minutes/cm)	Size of Hole: NX			Density (g/cc)	Specific Gravity	Porosity (%)	Water Absorption (%)	Point Load Index (kg/cm ²)	Unconfined Compressive Strength (kg/cm ²)									
													Return Water		Bits Used															
Ref*/6cm	30.00	31.00	RK5	17-22		Weak, grey GRANITE, very intensely Fractured, highly weathered			22	0	18		Light Brown				100%		32 CT Diamond Impregnated Bit											
	30.50																													
	31.00																													
	31.50																													
	32.00																													
	32.50	32.56	SPT18	23-27					19	0					17									0	2.44	-	-	0.71	28	622*
	33.00																													
	33.50																													
	34.00	34.06	SPT19	28-35					25	0					2.43									-	-	1.78	21	473*		
	34.50																													
35.00																														
								35.00																						

⁽¹⁾Outside NABL scope.

* Equivalent Unconfined Compressive Strength based on Point Load Strength Index

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Soil Profile (BH-35)

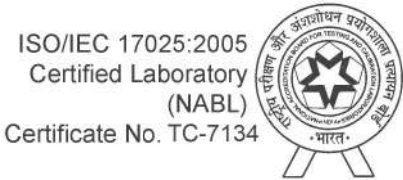
Location : Space for Future Provision
Survey Coordinates : 2494S, 1041W

Termination Depth : 35 m (RL 176.3 m)
Ground Water Depth : 21.60 m
Surface Elevation : RL 211.31 m
Ground Water Level : RL 189.7 m

Boring Method : Shell & Auger
Casing Depth : 28.0 m
Boring Start : 07-Aug-18
Boring Finish : 21-Aug-18

Depth, m		Sample No.	SPT ⁽¹⁾		Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Grain Size Analysis				Atterberg Limits			Shrinkage Limit, (%)	Density and Moisture			Specific Gravity	Shear Tests				Free Swell Index, (%)
From	To		Field Value, N _f	Corrected Value, N _c				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Plasticity Index (%)		Bulk Density (gms/cm ³)	Dry Density (gms/cm ³)	Moisture Content (%)		Type of Test	Confining Pressures, (kg/cm ²)	Cohesion Intercept, 'c' (kg/cm ²)	Angle of Internal Friction, ϕ (degrees)	
0.00	0.50	DS1				Hard brown sandy silt intermixed with gravel, low plastic (CL-GP)		44	27	16	13													
1.00	1.45	SPT1	29	29			2.50																	
2.50	2.80	UDS1				Hard brown clayey silt, medium plastic (CI)										1.89	1.67	12.9		UC		1.0		
4.00	4.45	SPT2	48	48		- with gravel, 4.0 to 5.5 m		5	14	81														
5.50	5.80	UDS2														1.94	1.71	13.1		UU	1,2,3	2.1	7.8	
7.00	7.45	SPT3	62	62															2.67					
8.50	8.95	SPT4	88	88																				
10.00	10.45	SPT5	98	98		- with gravel, 10.0 to 11.5 m																		
11.50	11.90	SPT6	101/25cm	-								34.2	23.8	10.4										
13.00	13.36	SPT7	101/21cm	-																				
14.50	14.89	SPT8	102/24cm	-																				
16.00	16.33	SPT9	101/18cm	-		- intermixed with gravels, 16.0 to 17.5 m	17.50	31	18	27	24													

⁽¹⁾ SPT is outside NABL scope.

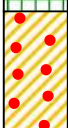


Soil Profile (BH-35)

Location : Space for Future Provision
Survey Coordinates : 2494S, 1041W

Termination Depth : 35 m (RL 176.3 m)
Ground Water Depth : 21.60 m
Surface Elevation : RL 211.31 m
Ground Water Level : RL 189.7 m

Boring Method : Shell & Auger
Casing Depth : 28.0 m
Boring Start : 07-Aug-18
Boring Finish : 21-Aug-18

Depth, m		Sample No.	SPT ⁽¹⁾		Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Grain Size Analysis				Atterberg Limits			Shrinkage Limit, (%)	Density and Moisture			Specific Gravity	Shear Tests					Free Swell Index, (%)
From	To		Field Value, N _f	Corrected Value, N"				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Plasticity Index (%)		Bulk Density (gms/cm ³)	Dry Density (gms/cm ³)	Moisture Content (%)		Type of Test	Confining Pressures, (kg/cm ²)	Cohesion Intercept, 'c' (kg/cm ²)	Angle of Internal Friction, ϕ (degrees)		
17.50	17.78	SPT10	100/13cm	-		Hard brown clayey silt, low plastic (CL)	26.50	8	21	49	22	28.1	19.7	8.3				2.69							
19.00	19.24	SPT11	103/9cm	-																					
20.50	20.75	SPT12	100/10cm	-																					
22.00	22.36	SPT13	101/21cm	-																					
23.50	23.82	SPT14	100/17cm	-																					
25.00	25.33	SPT15	101/18cm	-		Very dense brown gravels intermixed with clayey sand (GP-SC)	29.50	55	22	23															
26.50	26.74	SPT16	102/9cm	-																					
28.00	28.13	SPT17	Ref*/13cm	-																					
29.50	29.58	SPT18	Ref*/8cm	-		Refusal met on Rock. Core drilling through rock adopted. Refer to next page for details.																			

⁽¹⁾ SPT is outside NABL scope.

Rock Profile (BH-35)

Location : Space for Future Provision Surface Elevation : RL 211.305 m Boring Method : Rotary Drilling
Survey Coordinates : 2494S, 1041W Ground Water Depth 21.60 m Casing Depth : 28.0 m
Termination Depth : 35 m (RL 176.3 m) Boring Start : 07-Aug-18
Ground Water Level : RL 189.7 m Boring Finish : 21-Aug-18

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SPT N- Value (N _t) ⁽¹⁾	Depth (m)	Drill Run (m)	Sample No.	Serial No. of Cores	Casing Lowered (Size)	Symbol	ROCK DESCRIPTION	Depth of Strata, (m)	Percent Recovery (%) ⁽¹⁾	Rock Quality Designation (RQD, %) ⁽¹⁾	Rock Mass Rating (RMR) ⁽¹⁾	Penetration Rate (minutes/cm)	Size of Hole: NX			Density (g/cc)	Specific Gravity	Porosity (%)	Water Absorption (%)	Point Load Index (kg/cm ²)	Unconfined Compressive Strength (kg/cm ²)
													Return Water	Colour	Loss	Bits Used					
Ref*/8cm	29.50	29.50	SPT18	1-4			Weak, brown GRANITE, very intensely Fractured, highly weathered		21	0	18			Light Brown	Partial	32 CT Diamond Impregnated Bit					
	30.00	29.58																			
	30.50		RK1																		
	31.00	31.00																			
	31.50		RK2	5-8					16	0											
	32.00																				
Ref*/8cm	32.50	32.50	SPT19	9-12					15	0											
	33.00	32.58																			
	33.50		RK3																		
Ref*/6cm	34.00	34.00	SPT20	13-15				35.00	22	0											
	34.50	34.56																			
	35.00	35.00	RK4																		

⁽¹⁾Outside NABL scope.

* Equivalent Unconfined Compressive Strength based on Point Load Strength Index

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Soil Profile (BH-36)

Location : Space for Future Provision
Survey Coordinates : 2582S, 1021W

Surface Elevation : RL 210.518 m

Ground Water Depth : 21.95 m

Termination Depth : 35.26 m (RL 175.3 m)

Ground Water Level : RL 188.6 m

Boring Method : Shell & Auger

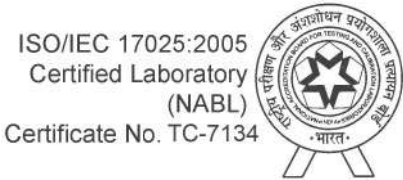
Casing Depth : 27.4 m

Boring Start : 06-Aug-18

Boring Finish : 10-Aug-18

Depth, m		Sample No.	SPT ⁽¹⁾		Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Grain Size Analysis				Atterberg Limits			Shrinkage Limit, (%)	Density and Moisture			Specific Gravity	Shear Tests				Free Swell Index, (%)
From	To		Field Value, N _r	Corrected Value, N"				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Plasticity Index (%)		Bulk Density (gms/cm ³)	Dry Density (gms/cm ³)	Moisture Content (%)		Type of Test	Confining Pressures, (kg/cm ²)	Cohesion Intercept, 'c' (kg/cm ²)	Angle of Internal Friction, ϕ (degrees)	
0.00	0.50	DS1				Very stiff brown clayey silt, low expansive, low plastic (CL)		1	6	58	35													
1.00	1.30	UDS1														1.80	1.62	11.1						
2.50	2.95	SPT1	25	25								32.4	20.5	11.8	13									
4.00	4.30	UDS2														1.89	1.69	12.1		UU	1, 2, 3	2.2	4.5	
5.50	5.95	SPT2	49	49				0	6	68	26								2.69					
7.00	7.45	SPT3	53	53								31.9	19.6	12.3										
8.50	8.95	SPT4	63	63																				
10.00	10.45	SPT5	48	48																				
11.50	11.95	SPT6	48	48																				
13.00	13.45	SPT7	52	52								32.7	21.1	11.6										
14.50	14.95	SPT8	52	52																				
16.00	16.45	SPT9	50	50			17.50																	

⁽¹⁾ SPT is outside NABL scope.



Soil Profile (BH-36)

Location : Space for Future Provision
Survey Coordinates : 2582S, 1021W

Surface Elevation : RL 210.518 m

Ground Water Depth : 21.95 m

Termination Depth : 35.26 m (RL 175.3 m)

Ground Water Level : RL 188.6 m

Boring Method : Shell & Auger

Casing Depth : 27.4 m

Boring Start : 06-Aug-18

Boring Finish : 10-Aug-18

Depth, m		Sample No.	SPT ⁽¹⁾		Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Grain Size Analysis				Atterberg Limits			Shrinkage Limit, (%)	Density and Moisture			Specific Gravity	Shear Tests					Free Swell Index, (%)
From	To		Field Value, N _f	Corrected Value, N _c				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Plasticity Index (%)		Bulk Density (gms/cm ³)	Dry Density (gms/cm ³)	Moisture Content (%)		Type of Test	Confining Pressures, (kg/cm ²)	Cohesion Intercept, 'c' (kg/cm ²)	Angle of Internal Friction, ϕ (degrees)		
17.50	17.95	SPT10	61	61		Hard brown sandy silt, low plastic (CL) - intermixed with gravel, 28.0 to 29.5 m		13	25	46	16	30.1	20.9	9.2				2.71							
19.50	19.95	SPT11	53	53																					
20.50	20.95	SPT12	59	59																					
22.00	22.45	SPT13	65	65																					
23.50	23.83	SPT14	101/18cm	-																					
25.00	25.37	SPT15	101/22cm	-																					
26.50	26.73	SPT16	101/8cm	-																					
28.00	28.22	SPT17	101/7cm	-																					
29.50	29.86	SPT18	101/21cm	-																					
31.00	31.34	SPT19	102/19cm	-																					
32.50	32.70	SPT20	101/5cm	-																					
34.00	34.30	SPT21	103/15c	-																					

⁽¹⁾ SPT is outside NABL scope.

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Soil Profile (BH-36)

Location : Space for Future Provision
Survey Coordinates : 2582S, 1021W

Surface Elevation : RL 210.518 m

Ground Water Depth : 21.95 m

Termination Depth : 35.26 m (RL 175.3 m)

Ground Water Level : RL 188.6 m

Boring Method : Shell & Auger

Casing Depth : 27.4 m

Boring Start : 06-Aug-18

Boring Finish : 10-Aug-18

Depth, m		Sample No.	SPT ⁽¹⁾		Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Grain Size Analysis				Atterberg Limits		Shrinkage Limit, (%)	Density and Moisture			Specific Gravity	Shear Tests					Free Swell Index, (%)
From	To		Field Value, N _f	Corrected Value, N _c				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)		Plasticity Index (%)	Bulk Density (gms/cm ³)	Dry Density (gms/cm ³)		Moisture Content (%)	Type of Test	Confining Pressures, (kg/cm ²)	Cohesion Intercept, 'c' (kg/cm ²)	Angle of Internal Friction, φ (degrees)	
35.00	35.26	SPT22	101/11cm	-		Hard brown sandy silt, low plastic (CL)	35.26					28.8	5.8	23.0										

⁽¹⁾ SPT is outside NABL scope.

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Soil Profile (BH-37)

Location : Space for Future Provision
Survey Coordinates : 2591S, 960W

Surface Elevation : RL 209.582 m

Ground Water Depth : 21.02 m

Termination Depth : 35.3 m (RL 174.3 m)

Ground Water Level : RL 188.6 m

Boring Method : Shell & Auger

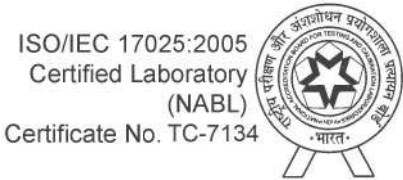
Casing Depth : 15.8 m

Boring Start : 13-Aug-18

Boring Finish : 17-Aug-18

Depth, m		Sample No.	SPT ⁽¹⁾		Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Grain Size Analysis				Atterberg Limits			Shrinkage Limit, (%)	Density and Moisture			Specific Gravity	Shear Tests				Free Swell Index, (%)
From	To		Field Value, N _r	Corrected Value, N"				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Plasticity Index (%)		Bulk Density (gms/cm ³)	Dry Density (gms/cm ³)	Moisture Content (%)		Type of Test	Confining Pressures, (kg/cm ²)	Cohesion Intercept, 'c' (kg/cm ²)	Angle of Internal Friction, ϕ (degrees)	
0.00	0.50	DS1				Hard brown sandy silt with gravel , low expansive, low plastic (CL)		5	26	56	13													
1.00	1.30	UDS1					2.50									1.57	1.44	9.2						
2.50	2.95	SPT1	33	33																				
4.00	4.30	UDS2														1.85	1.67	11.1		UU	1 ,2, 3	2.7	6.2	
5.50	5.95	SPT2	41	41															2.70					
7.00	7.30	UDS3																						
8.50	8.95	SPT3	49	49								31.1	11.7	19.4										
10.00	10.45	SPT4	54	54																				
11.50	11.95	SPT5	59	59				15	23	49	13													
13.00	13.45	SPT6	62	62								31.0	6.9	24.2										
14.50	14.95	SPT7	61	61																				
16.00	16.45	SPT8	57	57																				

⁽¹⁾ SPT is outside NABL scope.



Soil Profile (BH-37)

Location : Space for Future Provision
Survey Coordinates : 2591S, 960W

Surface Elevation : RL 209.582 m

Ground Water Depth : 21.02 m

Termination Depth : 35.3 m (RL 174.3 m)

Ground Water Level : RL 188.6 m

Boring Method : Shell & Auger

Casing Depth : 15.8 m

Boring Start : 13-Aug-18

Boring Finish : 17-Aug-18

Depth, m		Sample No.	SPT ⁽¹⁾		Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Grain Size Analysis				Atterberg Limits			Shrinkage Limit, (%)	Density and Moisture			Specific Gravity	Shear Tests					Free Swell Index, (%)	
From	To		Field Value, N _f	Corrected Value, N _c				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Plasticity Index (%)		Bulk Density (gms/cm ³)	Dry Density (gms/cm ³)	Moisture Content (%)		Type of Test	Confining Pressures, (kg/cm ²)	Cohesion Intercept, 'c' (kg/cm ²)	Angle of Internal Friction, ϕ (degrees)			
17.50	17.95	SPT9	67	67		Hard brown sandy silt with gravel , low plastic (CL)						33.0	22.3	10.6					2.70							
19.00	19.39	SPT10	103/24cm	-																						
20.50	20.90	SPT11	101/25cm	-																						
22.00	22.37	SPT12	103/22cm	-																						
23.50	23.84	SPT13	102/19cm	-																						
25.00	25.31	SPT14	101/16cm	-																						
26.50	26.83	SPT15	102/18cm	-																						
28.00	28.29	SPT16	102/14cm	-				13	25	50	12															
29.50	29.84	SPT17	101/19cm	-								29.2	20.6	8.5												
31.00	31.34	SPT18	101/19cm	-																						
32.50	32.79	SPT19	102/14cm	-																						
34.00	34.28	SPT20	101/13cm	-				17	25	44	14															

⁽¹⁾ SPT is outside NABL scope.

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Soil Profile (BH-37)

Location : Space for Future Provision

Surface Elevation : RL 209.582 m

Boring Method : Shell & Auger

Survey Coordinates : 2591S, 960W

Ground Water Depth : 21.02 m

Casing Depth : 15.8 m

Termination Depth : 35.3 m (RL 174.3 m)

Boring Start : 13-Aug-18

Ground Water Level : RL 188.6 m

Boring Finish : 17-Aug-18

Depth, m		Sample No.	SPT ⁽¹⁾		Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Grain Size Analysis				Atterberg Limits			Shrinkage Limit, (%)	Density and Moisture			Specific Gravity	Shear Tests					Free Swell Index, (%)
From	To		Field Value, N _f	Corrected Value, N"				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Plasticity Index (%)		Bulk Density (gms/cm ³)	Dry Density (gms/cm ³)	Moisture Content (%)		Type of Test	Confining Pressures, (kg/cm ²)	Cohesion Intercept, 'c' (kg/cm ²)	Angle of Internal Friction, ϕ (degrees)		
35.00	35.30	SPT21	102/15cm	-		Hard brown sandy silt with gravel , low plastic (CL)	35.30																		

⁽¹⁾ SPT is outside NABL scope.

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Soil Profile (BH-38)

Location : Space for Future Provision
Survey Coordinates : 2545S, 980W

Surface Elevation : RL 209.596 m

Ground Water Depth : 21.07 m

Termination Depth : 35.34 m (RL 174.3 m)

Ground Water Level : RL 188.5 m

Boring Method : Shell & Auger

Casing Depth : 27.0 m

Boring Start : 10-Aug-18

Boring Finish : 12-Aug-18

Depth, m		Sample No.	SPT ⁽¹⁾		Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Grain Size Analysis				Atterberg Limits			Shrinkage Limit, (%)	Density and Moisture			Specific Gravity	Shear Tests				Free Swell Index, (%)
From	To		Field Value, N _r	Corrected Value, N"				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Plasticity Index (%)		Bulk Density (gms/cm ³)	Dry Density (gms/cm ³)	Moisture Content (%)		Type of Test	Confining Pressures, (kg/cm ²)	Cohesion Intercept, 'c' (kg/cm ²)	Angle of Internal Friction, ϕ (degrees)	
0.00	0.50	DS1				Stiff to hard brown sandy silt, low plastic (CL)																		
1.00	1.45	SPT1	9	9		- stiff, 0.0 to 4.0 m						31.6	21.4	10.2	13									8
2.50	2.80	UDS1														1.79	1.58	13.2		UU	1, 2, 3	1.1	5.0	
4.00	4.45	SPT2	32	32		- hard, 4.0 to 8.5 m		12	18	52	18								2.68					
5.50	5.80	UDS2				- with gravel, 4.0 to 5.5 m										1.82	1.58	15.5						
7.00	7.45	SPT3	72	72			8.50																	
8.50	8.95	SPT4	75	75		Hard brown clayey silt, medium plastic (CI)																		
10.00	10.39	SPT5	102/24cm					20	23	44	13													
11.50	11.95	SPT6	72	72								36.1	11.2	24.9										
13.00	13.45	SPT7	64	64																				
14.50	14.95	SPT8	98	98																				
16.00	16.35	SPT9	101/20cm	-			17.50																	

⁽¹⁾ SPT is outside NABL scope.

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Soil Profile (BH-38)

Location : Space for Future Provision
Survey Coordinates : 2545S, 980W

Surface Elevation : RL 209.596 m

Ground Water Depth : 21.07 m

Termination Depth : 35.34 m (RL 174.3 m)

Ground Water Level : RL 188.5 m

Boring Method : Shell & Auger

Casing Depth : 27.0 m

Boring Start : 10-Aug-18

Boring Finish : 12-Aug-18

Depth, m		Sample No.	SPT ⁽¹⁾		Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Grain Size Analysis				Atterberg Limits			Shrinkage Limit, (%)	Density and Moisture			Specific Gravity	Shear Tests				
From	To		Field Value, N _f	Corrected Value, N _c				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Plasticity Index (%)		Bulk Density (gms/cm ³)	Dry Density (gms/cm ³)	Moisture Content (%)		Type of Test	Confining Pressures, (kg/cm ²)	Cohesion Intercept, 'c' (kg/cm ²)	Angle of Internal Friction, ϕ (degrees)	Free Swell Index, (%)
17.50	17.87	SPT10	102/22cm	-		Hard brown sandy silt intermixed with gravel, low plastic (CL)													2.52					
19.00	19.38	SPT11	102/23cm	-				34	23	36	7													
20.50	20.86	SPT12	104/21cm	-								32.1	8.7	23.4										
22.00	22.37	SPT13	103/22cm	-																				
23.50	23.76	SPT14	101/11cm	-																				
25.00	25.45	SPT15	50	50																				
26.50	26.90	SPT16	105/25cm	-																				
28.00	28.45	SPT17	65	65																				
29.50	29.78	SPT18	101/13cm	-																				
31.00	31.37	SPT19	101/22cm	-																				
32.50	32.90	SPT20	102/25cm	-																				
34.00	34.38	SPT21	101/23cm	-			35.00																	

⁽¹⁾ SPT is outside NABL scope.

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Soil Profile (BH-38)

Location : Space for Future Provision

Surface Elevation : RL 209.596 m

Boring Method : Shell & Auger

Survey Coordinates : 2545S, 980W

Ground Water Depth : 21.07 m

Casing Depth : 27.0 m

Termination Depth : 35.34 m (RL 174.3 m)

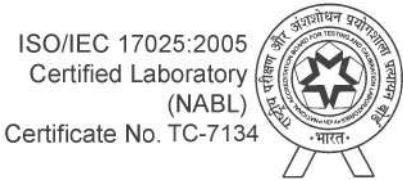
Boring Start : 10-Aug-18

Ground Water Level : RL 188.5 m

Boring Finish : 12-Aug-18

Depth, m		Sample No.	SPT ⁽¹⁾		Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Grain Size Analysis				Atterberg Limits			Shrinkage Limit, (%)	Density and Moisture			Specific Gravity	Shear Tests				
From	To		Field Value, N _f	Corrected Value, N"				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Plasticity Index (%)		Bulk Density (gms/cm ³)	Dry Density (gms/cm ³)	Moisture Content (%)		Type of Test	Confining Pressures, (kg/cm ²)	Cohesion Intercept, 'c' (kg/cm ²)	Angle of Internal Friction, ϕ (degrees)	Free Swell Index, (%)
35.00	35.34	SPT22	103/19cm	-		Very dense brown gravels intermixed with clayey sand (GP-SC)	35.34	51	23	26														

⁽¹⁾ SPT is outside NABL scope.



Soil Profile (BH-39)

Location : Space for Future Provision
Survey Coordinates : 2495S, 950W

Surface Elevation : RL 211.017 m

Ground Water Depth : 20.15 m

Termination Depth : 15.45 m (RL 195.6 m)

Ground Water Level : RL 188.6 m

Boring Method : Shell & Auger

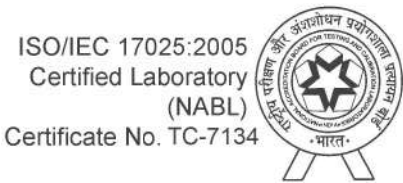
Casing Depth : 28.0 m

Boring Start : 16-Aug-18

Boring Finish : 05-Sep-18

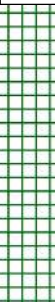
Depth, m		Sample No.	SPT ⁽¹⁾		Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Grain Size Analysis				Atterberg Limits			Shrinkage Limit, (%)	Density and Moisture			Specific Gravity	Shear Tests				Free Swell Index, (%)
From	To		Field Value, N _r	Corrected Value, N"				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Plasticity Index (%)		Bulk Density (gms/cm ³)	Dry Density (gms/cm ³)	Moisture Content (%)		Type of Test	Confining Pressures, (kg/cm ²)	Cohesion Intercept, 'c' (kg/cm ²)	Angle of Internal Friction, ϕ (degrees)	
0.00	0.50	DS1				Hard brown sandy silt, low expansive, low plastic (CL)		0	8	74	18													
1.00	1.30	UDS1					2.50									1.69	1.54	9.5						
2.50	2.95	SPT1	31	31		Hard brown clayey silt with gravel, low expansive, medium plastic (CI)									15									
4.00	4.30	UDS2														1.78	1.61	10.2		UU	1, 2, 3	1.7	7.3	
5.50	5.95	SPT2	56	56				5	12	70	13								2.70					
7.00	7.45	SPT3	76	76								38.9	23.3	15.6										
8.50	7.87	SPT4	101/22cm	-			10.00																	
10.00	10.39	SPT5	102/24cm	-		Hard brown sandy silt with gravel, low plastic (CL)		23	27	43	7													
11.50	11.69	SPT6	103/4cm	-			13.00																	
13.00	13.30	SPT7	101/15cm	-		Very dense brown gravels intermixed with fine to coarse sand (GP-SP)		52	44	4	0													
14.50	14.92	SPT8	101/27cm	-			16.00																	
16.00	16.38	SPT9	101/23cm	-		Hard brown sandy silt with gravel, low plastic (CL)		17	31	45	7													

⁽¹⁾ SPT is outside NABL scope.



Soil Profile (BH-39)

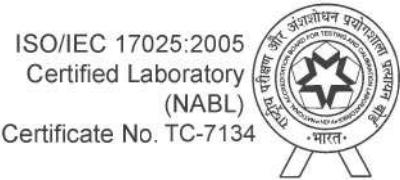
Location : Space for Future Provision Surface Elevation : RL 211.017 m Boring Method : Shell & Auger
Survey Coordinates : 2495S, 950W Ground Water Depth : 20.15 m Casing Depth : 28.0 m
Termination Depth : 15.45 m (RL 195.6 m) Boring Start : 16-Aug-18
Ground Water Level : RL 188.6 m Boring Finish : 05-Sep-18

Depth, m		Sample No.	SPT ⁽¹⁾		Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Grain Size Analysis				Atterberg Limits			Shrinkage Limit, (%)	Density and Moisture			Specific Gravity	Shear Tests				Free Swell Index, (%)
From	To		Field Value, N _f	Corrected Value, N _c				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Plasticity Index (%)		Bulk Density (gms/cm ³)	Dry Density (gms/cm ³)	Moisture Content (%)		Type of Test	Confining Pressures, (kg/cm ²)	Cohesion Intercept, 'c' (kg/cm ²)	Angle of Internal Friction, ϕ (degrees)	
17.50	17.88	SPT10	102/23cm	-		Hard brown sandy silt with gravel, low plastic (CL)	25.00	14	37	43	6	30.1	20.4	9.8				2.66						
19.00	19.42	SPT11	103/27cm	-																				
20.50	20.95	SPT12	74	74																				
22.00	22.32	SPT13	101/17cm	-																				
23.50	23.78	SPT14	101/13cm	-		Refusal met on Rock. Core drilling through rock adopted. Refer to next page for details.																		
25.00	25.26	SPT15	102/11cm	-																				

⁽¹⁾ SPT is outside NABL scope.

Rock Profile (BH-39)

Location : Space for Future Provision Surface Elevation : RL 208.738 m Boring Method : Rotary Drilling
Survey Coordinates : 2495S, 950W Ground Water Depth 20.15 m Casing Depth : 28.0 m
Termination Depth : 15.45 m (RL 195.6 m) Boring Start : 16-Aug-18
Ground Water Level : RL 188.6 m Boring Finish : 05-Sep-18

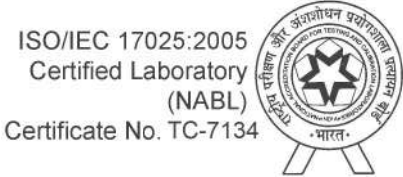


SPT N- Value (N _f) ⁽¹⁾	Depth (m)	Drill Run (m)	Sample No.	Serial No. of Cores	Casing Lowered (Size)	Symbol	ROCK DESCRIPTION	Depth of Strata, (m)	Percent Recovery (%) ⁽¹⁾	Rock Quality Designation (RQD, %) ⁽¹⁾	Rock Mass Rating (RMR) ⁽¹⁾	Penetration Rate (minutes/cm)	Size of Hole: NX					Porosity (%)	Water Absorption (%)	Point Load Index (kg/cm ²)	Unconfined Compressive Strength (kg/cm ²)				
													Return Water		Bits Used	Density (g/cc)	Specific Gravity								
													Colour	Loss											
102/11cm	25.00	25.00	SPT15	RK1	1-5		Very weak to weak, grey GRANITE, disintegrated to very intensely fractured, completely to highly weathered		21	0	18		Colour	Light Brown	Loss	Partial	Bits Used	32 CT Diamond Impregnated Bit							
	25.50	25.26																							
	26.00																								
	26.50	26.50																							
Ref*/8cm	27.00		WS1	-				- weak, very intensely fractured, highly weathered, 25.0 to 26.5 m		0	0														
		27.50																							
		28.00																							28.00
		28.50																							28.04
Ref*/8cm	29.00		WS2	-						0	0	15													
		29.50																							29.50
		30.00																							
		30.50																							
Ref*/8cm	31.00	31.00	SPT17	WS3	-					0	0														
		31.50																							31.04
Ref*/8cm	31.00	31.00	SPT18																						
		31.50																						31.04	

⁽¹⁾Outside NABL scope.

* Equivalent Unconfined Compressive Strength based on Point Load Strength Index

Rock Profile (BH-39)



Location : Space for Future Provision
Survey Coordinates : 2495S, 950W

Surface Elevation : RL 208.738 m
Ground Water Depth 20.15 m
Termination Depth : 15.45 m (RL 195.6 m)
Ground Water Level : RL 188.6 m

Boring Method : Rotary Drilling
Casing Depth : 28.0 m
Boring Start : 16-Aug-18
Boring Finish : 05-Sep-18

SPT N- Value (N _f) ⁽¹⁾	Depth (m)	Drill Run (m)	Sample No.	Serial No. of Cores	Casing Lowered (Size)	Symbol	ROCK DESCRIPTION	Depth of Strata, (m)	Percent Recovery (%) ⁽¹⁾	Rock Quality Designation (RQD, %) ⁽¹⁾	Rock Mass Rating (RMR) ⁽¹⁾	Penetration Rate (minutes/cm)	Size of Hole: NX					Porosity (%)	Water Absorption (%)	Point Load Index (kg/cm ²)	Unconfined Compressive Strength (kg/cm ²)																	
													Return Water		Bits Used	Density (g/cc)	Specific Gravity																					
													Colour	Loss																								
Ref*/ 8cm	31.50	32.50 32.53	WS4	-			Very weak to weak, grey GRANITE, disintegrated to very intensely fractured, completely to highly weathered		0	0			Light Brown	Partial	32 CT Diamond Impregnated Bit																							
	32.00																																					
	33.00		WS5	-																			- very weak, disintegrated, completely weathered, 26.5 to 34.0m	0	0	15												
	33.50																																					
Ref*/ 8cm	34.00	34.00 34.05	SPT20			- weak, very intensely fractured, highly weathered, 34.0 to 35.0 m	24	0																														
	34.50																																					
	35.00		RK2	6-9																																		
																								35.00														

⁽¹⁾Outside NABL scope.

* Equivalent Unconfined Compressive Strength based on Point Load Strength Index

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Soil Profile (BH-40)

Location : Space for Future Provision
Survey Coordinates : 2386S, 953W

Surface Elevation : RL 211.017 m

Ground Water Depth : 21.07 m

Termination Depth : 15.45 m (RL 195.6 m)

Ground Water Level : RL 188.7 m

Boring Method : Shell & Auger

Casing Depth : 28.0 m

Boring Start : 30-Jul-18

Boring Finish : 02-Sep-18

Depth, m		Sample No.	SPT ⁽¹⁾		Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Grain Size Analysis				Atterberg Limits			Shrinkage Limit, (%)	Density and Moisture			Specific Gravity	Shear Tests				Free Swell Index, (%)
From	To		Field Value, N _r	Corrected Value, N"				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Plasticity Index (%)		Bulk Density (gms/cm ³)	Dry Density (gms/cm ³)	Moisture Content (%)		Type of Test	Confining Pressures, (kg/cm ²)	Cohesion Intercept, 'c' (kg/cm ²)	Angle of Internal Friction, ϕ (degrees)	
0.00	0.50	DS1				Hard brown sandy silt with traces of gravel, low plastic (CL)	1.00	3	27	49	21	26.7	15.4	11.2	15									
1.00	1.45	SPT1	37	58		Very dense brown silty fine sand intermixed with gravels (SM-GP)	2.50	43	40	17	0													9
2.50	2.80	UDS1				Hard brown clayey silt with gravel, low plastic (CL)										1.79	1.56	14.8	2.67	UC		1.0		
4.00	4.45	SPT2	43	43												1.86	1.61	15.8						
5.50	5.80	UDS2														1.89	1.61	17.6		UU	1, 2, 3	1.2	7.7	
7.00	7.45	SPT3	40	40																				
8.50	8.80	UDS3																						
10.00	10.45	SPT4	69	69				4	6	66	24													
11.50	11.95	SPT5	53	53								30.3	20.1	10.2										
13.00	13.45	SPT6	77	77			14.50																	
14.50	14.78	SPT7	100/13cm			Refusal met on Rock. Core drilling through rock adopted. Refer to next page for details.																		

⁽¹⁾ SPT is outside NABL scope.

Rock Profile (BH-40)

Location : Space for Future Provision Surface Elevation : RL 209.751 m Boring Method : Rotary Drilling
Survey Coordinates : 2386S, 953W Ground Water Depth 21.07 m Casing Depth : 28.0 m
Termination Depth : 15.45 m (RL 195.6 m) Boring Start : 30-Jul-18
Ground Water Level : RL 188.7 m Boring Finish : 02-Sep-18

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SPT N- Value (N _t) ⁽¹⁾	Depth (m)	Drill Run (m)	Sample No.	Serial No. of Cores	Casing Lowered (Size)	Symbol	ROCK DESCRIPTION	Depth of Strata, (m)	Percent Recovery (%) ⁽¹⁾	Rock Quality Designation (RQD, %) ⁽¹⁾	Rock Mass Rating (RMR) ⁽¹⁾	Penetration Rate (minutes/cm)	Size of Hole: NX			Density (g/cc)	Specific Gravity	Porosity (%)	Water Absorption (%)	Point Load Index (kg/cm ²)	Unconfined Compressive Strength (kg/cm ²)								
													Return Water		Bits Used														
													Colour	Loss															
100/13cm	14.50	14.50	SPT7	1-5			Very weak, grey GRANITE, disintegrated, completely weathered		13	0	15		↑	↑	↑														
	15.00	14.78	RK-1																										
	15.50																												
Ref*/7cm	16.00	16.00	SPT8	6-9																									
	16.50	16.07																											
	17.00		RK-2																										
Ref*/4cm	17.50	17.50	SPT9	WS-1																									
	18.00	17.54																											
	18.50																												
Ref*/6cm	19.00	19.00	SPT10	WS-2																									
	19.50	19.06																											
	20.00																												
Ref*/5cm	20.50	20.50	SPT11																										
	21.00	20.55																											

⁽¹⁾Outside NABL scope.

* Equivalent Unconfined Compressive Strength based on Point Load Strength Index

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Boring Finish : 02-Sep-18

SPT N- Value (N_t) ⁽¹⁾	Depth (m)	Drill Run (m)	Sample No.	Serial No. of Cores	Casing Lowered (Size)	Symbol	ROCK DESCRIPTION	Depth of Strata, (m)	Percent Recovery (%) ⁽¹⁾	Rock Quality Designation (RQD, %) ⁽¹⁾	Rock Mass Rating (RMR) ⁽¹⁾	Penetration Rate (minutes/cm)	Size of Hole: NX												
													Return Water												
													Colour	Loss	Bits Used	Density (g/cc)	Specific Gravity	Porosity (%)	Water Absorption (%)	Point Load Index (kg/cm ²)	Unconfined Compressive Strength (kg/cm ²)				
Ref*/ 4cm	21.00	22.00 22.04	SPT12	WS-3		Very weak, grey GRANITE, disintegrated, completely weathered			0	0	15		↑	↑	↑										
	21.50																								
22.00	WS-4		SPT13	WS5					SPT16	WS6			SPT17	WS7	0							0	Light Brown	100%	32 CT Diamond Impregnated Bit
22.50																									
23.00		23.50	23.56	24.00					24.50	25.00			25.07	26.50	26.58							27.00	27.50		

* Equivalent Unconfined Compressive Strength based on Point Load Strength Index

Rock Profile (BH-40)

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Location : Space for Future Provision

Survey Coordinates : 2386S, 953W

Surface Elevation : RL 209.751 m

Ground Water Depth 21.07 m

Termination Depth : 15.45 m (RL 195.6 m)

Ground Water Level : RL 188.7 m

Boring Method : Rotary Drilling

Casing Depth : 28.0 m

Boring Start : 30-Jul-18

Boring Finish : 02-Sep-18

SPT N- Value (N _t) ⁽¹⁾	Depth (m)	Drill Run (m)	Sample No.	Serial No. of Cores	Casing Lowered (Size)	Symbol	ROCK DESCRIPTION	Depth of Strata, (m)	Percent Recovery (%) ⁽¹⁾	Rock Quality Designation (RQD, %) ⁽¹⁾	Rock Mass Rating (RMR) ⁽¹⁾	Penetration Rate (minutes/cm)	Size of Hole: NX			Density (g/cc)	Specific Gravity	Porosity (%)	Water Absorption (%)	Point Load Index (kg/cm ²)	Unconfined Compressive Strength (kg/cm ²)
													Return Water		Bits Used						
													Colour	Loss							
Ref*/ 6cm	27.50	28.00 28.06	SPT18	WS8			Very weak, grey GRANITE, disintegrated, completely weathered		0	0			↕	↕	↕						
	28.00																				
	28.50																				
	29.00																				
Ref*/ 7cm	29.50	29.50 29.57	SPT19	WS9					0	0	15		↕	↕	↕						
	30.00																				
	30.50																				
Ref*/ 7cm	31.00	31.00 31.07	SPT20	WS10					0	0			↕	↕	↕						
	31.50																				
	32.00																				
Ref*/ 6cm	32.50	32.50 32.56	SPT21	WS11					0	0			↕	↕	↕						
	33.00																				
	33.50																				
	34.00																				

⁽¹⁾Outside NABL scope.

* Equivalent Unconfined Compressive Strength based on Point Load Strength Index

Rock Profile (BH-40)

Location : Space for Future Provision Surface Elevation : RL 209.751 m Boring Method : Rotary Drilling
Survey Coordinates : 2386S, 953W Ground Water Depth 21.07 m Casing Depth : 28.0 m
Termination Depth : 15.45 m (RL 195.6 m) Boring Start : 30-Jul-18
Ground Water Level : RL 188.7 m Boring Finish : 02-Sep-18

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SPT N- Value (N _t) ⁽¹⁾	Depth (m)	Drill Run (m)	Sample No.	Serial No. of Cores	Casing Lowered (Size)	Symbol	ROCK DESCRIPTION	Depth of Strata, (m)	Percent Recovery (%) ⁽¹⁾	Rock Quality Designation (RQD, %) ⁽¹⁾	Rock Mass Rating (RMR) ⁽¹⁾	Penetration Rate (minutes/cm)	Size of Hole: NX			Density (g/cc)	Specific Gravity	Porosity (%)	Water Absorption (%)	Point Load Index (kg/cm ²)	Unconfined Compressive Strength (kg/cm ²)
													Return Water		Bits Used						
													Colour	Loss							
Ref*/ 8cm	34.00	34.00	SPT22	WS12			Very weak, grey GRANITE, disintegrated, completely weathered		0	0	15		Light Brown	100%	32 C 1 Diamond Impregnated Bit						
	34.50	34.08																			
Ref*/ 6cm	35.00	35.00	SPT23																		
		35.06																			

⁽¹⁾Outside NABL scope.

* Equivalent Unconfined Compressive Strength based on Point Load Strength Index

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Soil Profile (BH-41)

Location : Space for Future Provision
Survey Coordinates : 2328S, 953W

Surface Elevation : RL 211.017 m

Ground Water Depth : 22.03 m

Termination Depth : 15.45 m (RL 195.6 m)

Ground Water Level : RL 188.5 m

Boring Method : Shell & Auger

Casing Depth : 9.3 m

Boring Start : 05-Aug-18

Boring Finish : 20-Aug-18

Depth, m		Sample No.	SPT ⁽¹⁾		Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Grain Size Analysis				Atterberg Limits			Shrinkage Limit, (%)	Density and Moisture			Specific Gravity	Shear Tests				Free Swell Index, (%)
From	To		Field Value, N _r	Corrected Value, N"				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Plasticity Index (%)		Bulk Density (gms/cm ³)	Dry Density (gms/cm ³)	Moisture Content (%)		Type of Test	Confining Pressures, (kg/cm ²)	Cohesion Intercept, 'c' (kg/cm ²)	Angle of Internal Friction, ϕ (degrees)	
0.00	0.50	DS1				Hard brown sandy silt, low plastic (CL)	0.50	0	33	52	15													
1.00	1.45	SPT1	32	32		Hard brown clayey silt with traces of gravel, medium plastic (CI)						37.1	12.8	24.3	11									8
2.50	2.80	UDS1														1.79	1.61	11.5						
4.00	4.45	SPT2	34	34				2	2	59	37								2.68					
5.50	5.80	UDS2					5.50									1.85	1.62	14.1		UU	1, 2, 3	1.9	4.5	
7.00	7.45	SPT3	49	49		Hard brown sandy silt with gravel, low plastic (CL)						28.4	14.4	14.0										
8.50	8.80	UDS3					10.00																	
10.00	10.45	SPT4	52	52		Hard brown clayey silt with traces of gravel, medium plastic (CI)		4	3	68	25													
11.50	11.95	SPT5	54	54								35.3	6.6	28.8										
13.00	13.45	SPT6	61	61																				
14.50	14.95	SPT7	80	80																				
16.00	16.33	SPT8	101/18cm	-																				

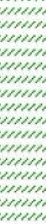
⁽¹⁾ SPT is outside NABL scope.

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Soil Profile (BH-41)

Location : Space for Future Provision Surface Elevation : RL 211.017 m Boring Method : Shell & Auger
Survey Coordinates : 2328S, 953W Ground Water Depth : 22.03 m Casing Depth : 9.3 m
Termination Depth : 15.45 m (RL 195.6 m) Boring Start : 05-Aug-18
Ground Water Level : RL 188.5 m Boring Finish : 20-Aug-18

Depth, m		Sample No.	SPT ⁽¹⁾		Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Grain Size Analysis				Atterberg Limits			Shrinkage Limit, (%)	Density and Moisture			Specific Gravity	Shear Tests				Free Swell Index, (%)
From	To		Field Value, N _f	Corrected Value, N _c				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Plasticity Index (%)		Bulk Density (gms/cm ³)	Dry Density (gms/cm ³)	Moisture Content (%)		Type of Test	Confining Pressures, (kg/cm ²)	Cohesion Intercept, 'c' (kg/cm ²)	Angle of Internal Friction, ϕ (degrees)	
17.50	17.80	SPT9	102/15cm	-		Hard brown clayey silt, medium plastic (CI)	23.50	0	11	58	31	38.3	22.9	15.4				2.69						
19.00	19.24	SPT10	100/9cm	-																				
20.50	20.95	SPT11	56	56																				
22.00	22.45	SPT12	60	60																				
23.50	23.95	SPT13	75	75		Hard black Peat with gravel, medium plastic (OI)		9	10	56	25	36.9	22.0	14.9										
25.00	25.45	SPT14	84	84																				
26.50	26.95	SPT15	77	77																				
28.00	28.45	SPT16	79	79																				
29.50	29.95	SPT17	81	81																				
31.00	31.45	SPT18	84	84																				
32.50	32.95	SPT19	82	82																				
34.00	34.45	SPT20	77	77																				

⁽¹⁾ SPT is outside NABL scope.

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Soil Profile (BH-41)

Location : Space for Future Provision
Survey Coordinates : 2328S, 953W

Surface Elevation : RL 211.017 m

Boring Method : Shell & Auger

Ground Water Depth : 22.03 m

Casing Depth : 9.3 m

Termination Depth : 15.45 m (RL 195.6 m)

Boring Start : 05-Aug-18

Ground Water Level : RL 188.5 m

Boring Finish : 20-Aug-18

Depth, m		Sample No.	SPT ⁽¹⁾		Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Grain Size Analysis				Atterberg Limits			Shrinkage Limit, (%)	Density and Moisture			Specific Gravity	Shear Tests				Free Swell Index, (%)
From	To		Field Value, Nr	Corrected Value, N"				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Plasticity Index (%)		Bulk Density (gms/cm ³)	Dry Density (gms/cm ³)	Moisture Content (%)		Type of Test	Confining Pressures, (kg/cm ²)	Cohesion Intercept, 'c' (kg/cm ²)	Angle of Internal Friction, ϕ (degrees)	
35.00	35.45	SPT21	86	86		Hard black Peat, medium plastic (OI)	35.45																	

⁽¹⁾ SPT is outside NABL scope.

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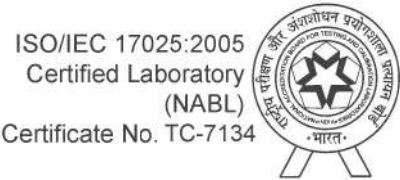


Soil Profile (BH-42)

Location : Space for Future Provision Surface Elevation : RL 211.017 m Boring Method : Shell & Auger
Survey Coordinates : 2318S, 900W Ground Water Depth : 22.08 m Casing Depth : 29.0 m
Termination Depth : 15.45 m (RL 195.6 m) Boring Start : 03-Aug-18
Ground Water Level : RL 188.1 m Boring Finish : 04-Aug-18

Depth, m		Sample No.	SPT ⁽¹⁾		Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Grain Size Analysis				Atterberg Limits			Shrinkage Limit, (%)	Density and Moisture			Specific Gravity	Shear Tests				Free Swell Index, (%)
From	To		Field Value, N _r	Corrected Value, N"				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Plasticity Index (%)		Bulk Density (gms/cm ³)	Dry Density (gms/cm ³)	Moisture Content (%)		Type of Test	Confining Pressures, (kg/cm ²)	Cohesion Intercept, 'c' (kg/cm ²)	Angle of Internal Friction, φ (degrees)	
0.00	0.50	DS1				Medium dense brown sandy silt, low expansive, low plastic (CL)	1.00																	
1.00	1.45	SPT1	12	12		Stiff to hard brown clayey silt, low expansive, medium plastic (CI)																		8
2.50	2.80	UDS1				- stiff, 1.0 to 2.5 m						38.4	18.7	19.8	17	1.78	1.55	14.9						
4.00	4.45	SPT2	36	36		- hard, 4.0 to 7.0 m													2.68					20
5.50	5.80	UDS2										39.5				1.84	1.58	16.8		UC		1.3		
7.00	7.45	SPT3	72	72				11	15	59	15													
8.50	8.89	SPT4	105/24cm	-																				
10.00	10.45	SPT5	58	58																				
11.50	11.95	SPT6	35	35								33.7	20.0	13.7										
13.00	13.45	SPT7	93	93																				
14.50	14.95	SPT8	74	74																				
16.00	16.45	SPT9	91	91			17.50																	

⁽¹⁾ SPT is outside NABL scope.



Soil Profile (BH-42)

Location : Space for Future Provision
Survey Coordinates : 2318S, 900W

Surface Elevation : RL 211.017 m

Ground Water Depth : 22.08 m

Termination Depth : 15.45 m (RL 195.6 m)

Ground Water Level : RL 188.1 m

Boring Method : Shell & Auger

Casing Depth : 29.0 m

Boring Start : 03-Aug-18

Boring Finish : 04-Aug-18

Depth, m		Sample No.	SPT ⁽¹⁾		Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Grain Size Analysis				Atterberg Limits			Shrinkage Limit, (%)	Density and Moisture			Specific Gravity	Shear Tests				Free Swell Index, (%)
From	To		Field Value, N _f	Corrected Value, N"				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Plasticity Index (%)		Bulk Density (gms/cm ³)	Dry Density (gms/cm ³)	Moisture Content (%)		Type of Test	Confining Pressures, (kg/cm ²)	Cohesion Intercept, 'c' (kg/cm ²)	Angle of Internal Friction, φ (degrees)	
17.50	17.85	SPT10	100/20cm	-		Hard brown clayey silt, low plastic (CL) - with traces of gravel, 19.0 to 20.5 m - with gravel, 25.0 to 35.0 m																		
19.00	19.45	SPT11	64	64																				
20.50	20.90	SPT12	101/25cm	-							30.4	18.8	11.6											
22.00	22.39	SPT13	102/24cm	-															UU	1 ,2, 3	2.3	7.8		
23.50	23.87	SPT14	103/22cm	-																				
25.00	25.34	SPT15	103/19cm	-																				
26.50	26.86	SPT16	101/21cm	-																				
28.00	28.45	SPT17	75	75																				
29.50	29.85	SPT18	101/20cm	-					8	12	69	11												
31.00	31.36	SPT19	101/21cm	-									28.8	18.4	10.4									
32.50	32.86	SPT20	102/21cm	-																				
34.00	34.37	SPT21	100/22cm	-					11	12	60	17												

⁽¹⁾ SPT is outside NABL scope.

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Soil Profile (BH-42)

Location : Space for Future Provision
Survey Coordinates : 2318S, 900W

Surface Elevation : RL 211.017 m

Boring Method : Shell & Auger

Ground Water Depth : 22.08 m

Casing Depth : 29.0 m

Termination Depth : 15.45 m (RL 195.6 m)

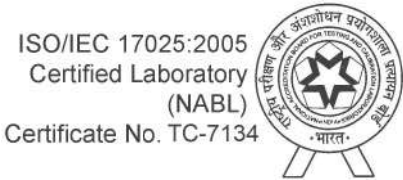
Boring Start : 03-Aug-18

Ground Water Level : RL 188.1 m

Boring Finish : 04-Aug-18

Depth, m		Sample No.	SPT ⁽¹⁾		Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Grain Size Analysis				Atterberg Limits			Shrinkage Limit, (%)	Density and Moisture			Specific Gravity	Shear Tests				Free Swell Index, (%)
From	To		Field Value, Nr	Corrected Value, N"				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Plasticity Index (%)		Bulk Density (gms/cm ³)	Dry Density (gms/cm ³)	Moisture Content (%)		Type of Test	Confining Pressures, (kg/cm ²)	Cohesion Intercept, 'c' (kg/cm ²)	Angle of Internal Friction, ϕ (degrees)	
35.00	35.33	SPT22	100/18cm	-		Hard brown clayey silt with gravel, low plastic (CL)	35.33																	

⁽¹⁾ SPT is outside NABL scope.



Soil Profile (BH-43)

Location : Space for Future Provision
Survey Coordinates : 2377S, 902W

Surface Elevation : RL 211.017 m

Ground Water Depth : 22.05 m

Termination Depth : 15.45 m (RL 195.6 m)

Ground Water Level : RL 187.4 m

Boring Method : Shell & Auger

Casing Depth : 26.6 m

Boring Start : 31-Jul-18

Boring Finish : 02-Aug-18

Depth, m		Sample No.	SPT ⁽¹⁾		Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Grain Size Analysis				Atterberg Limits			Shrinkage Limit, (%)	Density and Moisture			Specific Gravity	Shear Tests				Free Swell Index, (%)
From	To		Field Value, N _r	Corrected Value, N _r				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Plasticity Index (%)		Bulk Density (gms/cm ³)	Dry Density (gms/cm ³)	Moisture Content (%)		Type of Test	Confining Pressures, (kg/cm ²)	Cohesion Intercept, 'c' (kg/cm ²)	Angle of Internal Friction, ϕ (degrees)	
0.00	0.50	DS1				Hard brown Sandy silt, low plastic (CL)	1.00	0	27	65	8													0
1.00	1.45	SPT1	34	53		Dense brown gravels intermixed with fine sand (GP-SP-SM)	2.50	71	23	6	0													
2.50	2.80	UDS1				Hard brown clayey silt, medium plastic (CI)										1.77	1.54	14.7		UC		1.1		
4.00	4.45	SPT2	40	40								39.1	21.0	18.1	19									13
5.50	5.80	UDS2					7.00									1.86	1.59	16.7						
7.00	7.45	SPT3	84	84		Hard brown clayey silt, low plastic (CL)						31.5	19.5	12.0					2.66					
8.50	8.95	SPT4	64	64																				
10.00	10.45	SPT5	68	68		- with traces of gravel, 10.0 to 11.5 m		2	7	61	30													
11.50	11.95	SPT6	69	69																				
13.00	13.45	SPT7	74	74		- with gravel, 13.0 to 17.5 m																		
14.50	14.90	SPT8	100/25cm	-																				
16.00	16.38	SPT9	104/23cm	-			17.50																	

⁽¹⁾ SPT is outside NABL scope.

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Soil Profile (BH-43)

Location : Space for Future Provision
Survey Coordinates : 2377S, 902W

Surface Elevation : RL 211.017 m

Ground Water Depth : 22.05 m

Termination Depth : 15.45 m (RL 195.6 m)

Ground Water Level : RL 187.4 m

Boring Method : Shell & Auger

Casing Depth : 26.6 m

Boring Start : 31-Jul-18

Boring Finish : 02-Aug-18

Depth, m		Sample No.	SPT ⁽¹⁾		Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Grain Size Analysis				Atterberg Limits			Shrinkage Limit, (%)	Density and Moisture			Specific Gravity	Shear Tests				Free Swell Index, (%)
From	To		Field Value, N _r	Corrected Value, N"				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Plasticity Index (%)		Bulk Density (gms/cm ³)	Dry Density (gms/cm ³)	Moisture Content (%)		Type of Test	Confining Pressures, (kg/cm ²)	Cohesion Intercept, 'c' (kg/cm ²)	Angle of Internal Friction, ϕ (degrees)	
17.50	17.95	SPT10	55	55		Hard brown clayey silt, medium plastic (CI)		5	9	66	20													
19.00	19.34	SPT11	101/19cm	-		- with gravel, 17.5 to 25.0 m						35.1	22.0	13.2										
20.50	20.87	SPT12	105/22cm	-																				
22.00	22.33	SPT13	101/18cm	-																				
23.50	23.80	SPT14	100/15cm	-				8	12	68	12													
25.00	25.35	SPT15	105/20cm	-								43.9	24.1	19.8						UU	1, 2, 3	2.5	8.0	
26.50	26.77	SPT16	102/22cm	-																				
28.00	28.26	SPT17	101/11cm	-		- with traces of gravel, 28.0 to 29.5 m		4	19	62	15													
29.50	29.61	SPT18	Ref*/11cm	-			31.00																	
31.00	31.35	SPT19	101/20cm	-		Disintegrated ROCK																		
32.50	32.87	SPT20	101/22cm	-																				
34.00	34.34	SPT21	101/19cm	-																				

⁽¹⁾ SPT is outside NABL scope.

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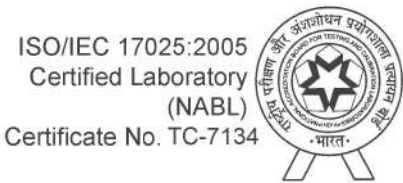


Soil Profile (BH-43)

Location : Space for Future Provision Surface Elevation : RL 211.017 m Boring Method : Shell & Auger
Survey Coordinates : 2377S, 902W Ground Water Depth : 22.05 m Casing Depth : 26.6 m
Termination Depth : 15.45 m (RL 195.6 m) Boring Start : 31-Jul-18
Ground Water Level : RL 187.4 m Boring Finish : 02-Aug-18

Depth, m		Sample No.	SPT ⁽¹⁾		Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Grain Size Analysis				Atterberg Limits			Shrinkage Limit, (%)	Density and Moisture			Specific Gravity	Shear Tests				Free Swell Index, (%)
From	To		Field Value, N _r	Corrected Value, N _c				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Plasticity Index (%)		Bulk Density (gms/cm ³)	Dry Density (gms/cm ³)	Moisture Content (%)		Type of Test	Confining Pressures, (kg/cm ²)	Cohesion Intercept, 'c' (kg/cm ²)	Angle of Internal Friction, ϕ (degrees)	
35.00	35.40	SPT22	102/25cm	-		Disintegrated ROCK	35.40																	

⁽¹⁾ SPT is outside NABL scope.



Soil Profile (BH-44)

Location : Space for Future Provision
Survey Coordinates : 2493S, 889W

Surface Elevation : RL 211.017 m

Boring Method : Shell & Auger

Ground Water Depth : 20.12 m

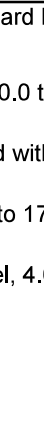
Casing Depth : 24.0 m

Termination Depth : 15.45 m (RL 195.6 m)

Boring Start : 18-Aug-18

Ground Water Level : RL 187.7 m

Boring Finish : 04-Sep-18

Depth, m		Sample No.	SPT ⁽¹⁾		Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Grain Size Analysis				Atterberg Limits			Shrinkage Limit, (%)	Density and Moisture			Specific Gravity	Shear Tests				Free Swell Index, (%)
From	To		Field Value, N _r	Corrected Value, N"				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Plasticity Index (%)		Bulk Density (gms/cm ³)	Dry Density (gms/cm ³)	Moisture Content (%)		Type of Test	Confining Pressures, (kg/cm ²)	Cohesion Intercept, 'c' (kg/cm ²)	Angle of Internal Friction, ϕ (degrees)	
0.00	0.50	DS1				Very stiff to hard brown sandy silt, low plastic (CL)																		
1.00	1.45	SPT1	18	18		- very stiff, 0.0 to 4.0 m																		
2.50	2.80	UDS1				- intermixed with gravels, 1.0 to 2.5 m										1.72	1.51	13.3						
4.00	4.45	SPT2	36	36		- hard, 4.0 to 17.5 m		11	26	48	15													
5.50	5.80	UDS2				- with gravel, 4.0 to 5.5 m										1.82	1.60	13.6						
7.00	7.45	SPT3	51	51								33.5	20.3	13.2										
8.50	8.95	SPT4	58	58				10.00											2.69					
10.00	10.45	SPT5	51	51		Hard brown clayey silt with gravel, medium plastic (CI)		9	10	64	17													
11.50	11.95	SPT6	60	60								40.7	17.8	22.9										
13.00	13.45	SPT7	69	69																				
14.50	14.95	SPT8	81	81				16.00																
16.00	16.32	SPT9	101/17cm	-			Very dense brown gravels intermixed with silty fine sand (GP-SM)	17.50	58	25	17	0												

⁽¹⁾ SPT is outside NABL scope.

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Soil Profile (BH-44)

Location : Space for Future Provision Surface Elevation : RL 211.017 m Boring Method : Shell & Auger
Survey Coordinates : 2493S, 889W Ground Water Depth : 20.12 m Casing Depth : 24.0 m
Termination Depth : 15.45 m (RL 195.6 m) Boring Start : 18-Aug-18
Ground Water Level : RL 187.7 m Boring Finish : 04-Sep-18

Depth, m		Sample No.	SPT ⁽¹⁾		Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Grain Size Analysis				Atterberg Limits			Shrinkage Limit, (%)	Density and Moisture			Specific Gravity	Shear Tests				Free Swell Index, (%)
From	To		Field Value, Nr	Corrected Value, N"				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Plasticity Index (%)		Bulk Density (gms/cm ³)	Dry Density (gms/cm ³)	Moisture Content (%)		Type of Test	Confining Pressures, (kg/cm ²)	Cohesion Intercept, 'c' (kg/cm ²)	Angle of Internal Friction, ϕ (degrees)	
17.50	17.79	SPT10	102/14cm	-		Hard brown sandy silt, low plastic (CL)	22.50					33.0	20.0	13.0										
19.00	19.34	SPT11	101/19cm	-																				
20.50	20.85	SPT12	101/20cm	-		Refusal met on Rock. Core drilling through rock adopted. Refer to next page for details.																		

⁽¹⁾ SPT is outside NABL scope.

Rock Profile (BH-44)

Location : Space for Future Provision Surface Elevation : RL 207.860 m Boring Method : Rotary Drilling
Survey Coordinates : 2493S, 889W Ground Water Depth 20.12 m Casing Depth : 24.0 m
Termination Depth : 15.45 m (RL 195.6 m) Boring Start : 18-Aug-18
Ground Water Level : RL 187.7 m Boring Finish : 04-Sep-18

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SPT N- Value (N _f) ⁽¹⁾	Depth (m)	Drill Run (m)	Sample No.	Serial No. of Cores	Casing Lowered (Size)	Symbol	ROCK DESCRIPTION	Depth of Strata, (m)	Percent Recovery (%) ⁽¹⁾	Rock Quality Designation (RQD, %) ⁽¹⁾	Rock Mass Rating (RMR) ⁽¹⁾	Penetration Rate (minutes/cm)	Size of Hole: NX					Porosity (%)	Water Absorption (%)	Point Load Index (kg/cm ²)	Unconfined Compressive Strength (kg/cm ²)						
													Return Water		Bits Used	Density (g/cc)	Specific Gravity										
													Colour	Loss													
Ref*/ 4cm	22.00	22.00	RK1	1-6			Very weak to weak, grey GRANITE, disintegrated to very intensely fractured, completely to highly weathered - weak, very intensely fractured, highly weathered, 22.0 to 23.5 m - very weak, disintegrated, completely weathered, 23.5 to 28.5 m		18	0	18		↑	↑	↑												
	22.50	23.50 23.54											SPT13	-							18	0	18		Light Brown	Partial	32 CT Diamond Impregnated Bit
	23.00																										
23.50	WS1		-		0	0		15.0																			
24.00		SPT14											-		0	0	15.0										
24.50																											
25.00	WS2		-		0	0		15.0																			
25.50		SPT15											-		0	0	15.0										
26.00																											
26.50	WS3		-		0	0		15.0																			
27.00		SPT16											-		0	0	15.0										
27.50																											
28.00	28.00 28.07		28.50	28.00 28.07																							
28.50																											

⁽¹⁾Outside NABL scope.

* Equivalent Unconfined Compressive Strength based on Point Load Strength Index

Rock Profile (BH-44)

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Location : Space for Future Provision

Survey Coordinates : 2493S, 889W

Surface Elevation : RL 207.860 m

Ground Water Depth 20.12 m

Termination Depth : 15.45 m (RL 195.6 m)

Ground Water Level : RL 187.7 m

Boring Method : Rotary Drilling

Casing Depth : 24.0 m

Boring Start : 18-Aug-18

Boring Finish : 04-Sep-18

SPT N- Value (N _t) ⁽¹⁾	Depth (m)	Drill Run (m)	Sample No.	Serial No. of Cores	Casing Lowered (Size)	Symbol	ROCK DESCRIPTION	Depth of Strata, (m)	Percent Recovery (%) ⁽¹⁾	Rock Quality Designation (RQD, %) ⁽¹⁾	Rock Mass Rating (RMR) ⁽¹⁾	Penetration Rate (minutes/cm)	Size of Hole: NX			Density (g/cc)	Specific Gravity	Porosity (%)	Water Absorption (%)	Point Load Index (kg/cm ²)	Unconfined Compressive Strength (kg/cm ²)
	28.50	29.00	RK2	7-10				30.00	21	0	18		Return Water		Bits Used						
													Colour	Loss							
	29.00	29.00											Light Brown	Partial	IMP Bit						
	29.50		RK3	11-17					23	0											
	30.00	30.00																			

⁽¹⁾Outside NABL scope.

* Equivalent Unconfined Compressive Strength based on Point Load Strength Index

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Soil Profile (BH-45)

Location : Space for Future Provision
Survey Coordinates : 2574S, 900W

Surface Elevation : RL 211.017 m

Ground Water Depth : 20.16 m

Termination Depth : 15.45 m (RL 195.6 m)

Ground Water Level : RL 188.3 m

Boring Method : Shell & Auger

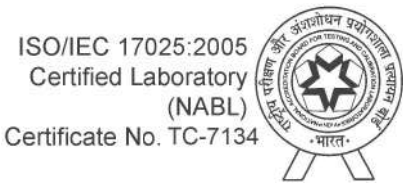
Casing Depth : 29.0 m

Boring Start : 17-Aug-18

Boring Finish : 20-Aug-18

Depth, m		Sample No.	SPT ⁽¹⁾		Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Grain Size Analysis				Atterberg Limits			Shrinkage Limit, (%)	Density and Moisture			Specific Gravity	Shear Tests				Free Swell Index, (%)
From	To		Field Value, N _r	Corrected Value, N"				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Plasticity Index (%)		Bulk Density (gms/cm ³)	Dry Density (gms/cm ³)	Moisture Content (%)		Type of Test	Confining Pressures, (kg/cm ²)	Cohesion Intercept, 'c' (kg/cm ²)	Angle of Internal Friction, ϕ (degrees)	
0.00	0.50	DS1				Very stiff to hard brown clayey silt with gravel, low expansive, medium plastic (CI)																		
1.00	1.30	UDS1														1.79	1.63	10.1						
2.50	2.95	SPT1	20	20								40.8	12.2	28.6	11									
4.00	4.30	UDS2														1.92	1.73	11.0		UU	1, 2, 3	2.5	7.9	
5.50	5.95	SPT2	53	53		- hard, 5.5 to 11.5 m																		
7.00	7.45	SPT3	62	62								35.6	19.2	16.4					2.70					
8.50	8.95	SPT4	67	67				6	18	60	16													
10.00	10.44	SPT5	101/28cm	-			11.50																	
11.50	11.87	SPT6	101/22cm	-		Hard brown sandy silt with gravel, low plastic (CL)																		
13.00	13.45	SPT7	101	101																				
14.50	14.92	SPT8	102/27cm	-																				
16.00	16.40	SPT9	101/25cm	-				8	13	67	12													
												32.5	21.9	10.6										

⁽¹⁾ SPT is outside NABL scope.



Soil Profile (BH-45)

Location : Space for Future Provision Surface Elevation : RL 211.017 m Boring Method : Shell & Auger
Survey Coordinates : 2574S, 900W Ground Water Depth : 20.16 m Casing Depth : 29.0 m
Termination Depth : 15.45 m (RL 195.6 m) Boring Start : 17-Aug-18
Ground Water Level : RL 188.3 m Boring Finish : 20-Aug-18

Depth, m		Sample No.	SPT ⁽¹⁾		Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Grain Size Analysis				Atterberg Limits			Shrinkage Limit, (%)	Density and Moisture			Specific Gravity	Shear Tests				Free Swell Index, (%)
From	To		Field Value, N _r	Corrected Value, N"				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Plasticity Index (%)		Bulk Density (gms/cm ³)	Dry Density (gms/cm ³)	Moisture Content (%)		Type of Test	Confining Pressures, (kg/cm ²)	Cohesion Intercept, 'c' (kg/cm ²)	Angle of Internal Friction, φ (degrees)	
17.50	17.88	SPT10	102/23cm	-		Hard brown sandy silt with gravel, low plastic (CL)																		
19.00	19.37	SPT11	101/22cm	-			8	11	68	13														
20.50	20.79	SPT12	101/14cm	-							29.9	12.5	17.4											
22.00	22.31	SPT13	102/16cm	-																				
23.50	23.87	SPT14	102/22cm	-																				
25.00	25.31	SPT15	101/16cm	-			3	15	70	12														
26.50	26.83	SPT16	102/18cm	-							31.4	21.0	10.4					2.70						
28.00	28.39	SPT17	102/14cm	-																				
29.50	29.89	SPT18	101/14cm	-																				
31.00	31.41	SPT19	102/26cm	-			6	26	56	12														
32.50	32.78	SPT20	102/18cm	-							30.0	15.1	14.9											
34.00	34.38	SPT21	101/23cm	-																				

⁽¹⁾ SPT is outside NABL scope.

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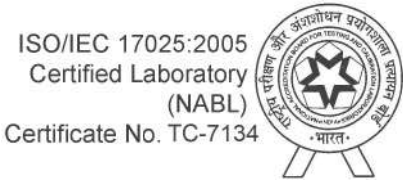


Soil Profile (BH-45)

Location : Space for Future Provision Surface Elevation : RL 211.017 m Boring Method : Shell & Auger
Survey Coordinates : 2574S, 900W Ground Water Depth : 20.16 m Casing Depth : 29.0 m
Termination Depth : 15.45 m (RL 195.6 m) Boring Start : 17-Aug-18
Ground Water Level : RL 188.3 m Boring Finish : 20-Aug-18

Depth, m		Sample No.	SPT ⁽¹⁾		Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Grain Size Analysis				Atterberg Limits			Shrinkage Limit, (%)	Density and Moisture			Specific Gravity	Shear Tests				Free Swell Index, (%)
From	To		Field Value, N _r	Corrected Value, N _r ¹				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Plasticity Index (%)		Bulk Density (gms/cm ³)	Dry Density (gms/cm ³)	Moisture Content (%)		Type of Test	Confining Pressures, (kg/cm ²)	Cohesion Intercept, 'c' (kg/cm ²)	Angle of Internal Friction, ϕ (degrees)	
35.00	35.36	SPT22	102/21cm	-		Hard brown sandy silt with gravel, low plastic (CL)	35.36	10	16	61	13													

⁽¹⁾ SPT is outside NABL scope.



Soil Profile (BH-46)

Location : Space for Future Provision
Survey Coordinates : 2198S, 1429W

Surface Elevation : RL 211.017 m

Ground Water Depth : 20.10 m

Termination Depth : 15.45 m (RL 195.6 m)

Ground Water Level : RL 187.7 m

Boring Method : Shell & Auger

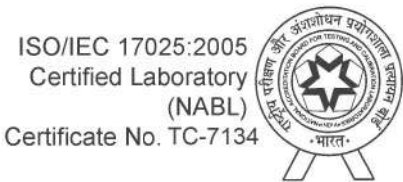
Casing Depth : 19.7 m

Boring Start : 29-Jul-18

Boring Finish : 30-Jul-18

Depth, m		Sample No.	SPT ⁽¹⁾		Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Grain Size Analysis				Atterberg Limits			Shrinkage Limit, (%)	Density and Moisture			Specific Gravity	Shear Tests				Free Swell Index, (%)
From	To		Field Value, N _r	Corrected Value, N"				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Plasticity Index (%)		Bulk Density (gms/cm ³)	Dry Density (gms/cm ³)	Moisture Content (%)		Type of Test	Confining Pressures, (kg/cm ²)	Cohesion Intercept, 'c' (kg/cm ²)	Angle of Internal Friction, ϕ (degrees)	
0.00	0.50	DS1				Very dense brown silty fine sand with gravel (SM)	1.00	20	70	10	0													
1.00	1.30	UDS1				Hard brown sandy silt intermixed with gravels, low plastic (CL-GP)										1.71	1.50	14.0		UC		0.9		
2.50	2.95	SPT1	54	54			4.00	38	30	12	20													
4.00	4.45	SPT2	60	60		Hard brown silty clay, high plastic (CH)		0	12	46	42								2.68					
5.50	5.95	SPT3	42	42								51.9	25.6	26.3	19									
7.00	7.30	UDS2														1.88	1.60	17.2						
8.50	8.95	SPT4	64	64			10.00																	
10.00	10.45	SPT5	70	70		Hard brown clayey silt, medium plastic (CI)						35.6	22.9	12.7										
11.50	11.95	SPT6	50	50			13.00																	
13.00	13.45	SPT7	65	65		Hard brown silty clay, high plastic (CH)		0	7	36	57													
14.50	14.95	SPT8	91	91								51.3	19.7	31.6										
16.00	16.45	SPT9	67	67																UU	1 ,2, 3	1.0	8.1	

⁽¹⁾ SPT is outside NABL scope.



Soil Profile (BH-46)

Location : Space for Future Provision
Survey Coordinates : 2198S, 1429W

Surface Elevation : RL 211.017 m

Boring Method : Shell & Auger

Ground Water Depth : 20.10 m

Casing Depth : 19.7 m

Termination Depth : 15.45 m (RL 195.6 m)

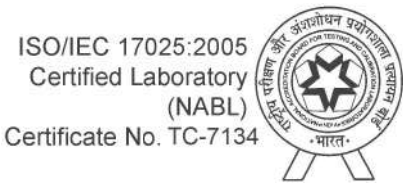
Boring Start : 29-Jul-18

Ground Water Level : RL 187.7 m

Boring Finish : 30-Jul-18

Depth, m		Sample No.	SPT ⁽¹⁾		Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Grain Size Analysis				Atterberg Limits			Shrinkage Limit, (%)	Density and Moisture			Specific Gravity	Shear Tests				Free Swell Index, (%)
From	To		Field Value, N _r	Corrected Value, N"				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Plasticity Index (%)		Bulk Density (gms/cm ³)	Dry Density (gms/cm ³)	Moisture Content (%)		Type of Test	Confining Pressures, (kg/cm ²)	Cohesion Intercept, 'c' (kg/cm ²)	Angle of Internal Friction, ϕ (degrees)	
17.50	17.95	SPT10	86	86		Hard brown silty clay, high plastic (CH)	19.00	73	15	12	0	39.6	19.0	20.5										
19.00	19.25	SPT11	100/10cm	-		Hard brown clayey silt, medium plastic (CI)	20.50																	
20.50	20.84	SPT12	102/19cm	-		Very dense brown gravels intermixed with silty fine sand (GP-SM)	22.00																	
22.00	22.21	SPT13	103/6cm	-		Hard brown silty clay, high plastic (CH)	23.50																	
23.50	23.69	SPT14	102/14cm	-		Very dense brown gravels intermixed with silty fine sand (GP-SM)																		
25.00	25.24	SPT15	101/9cm	-			25.24																	

⁽¹⁾ SPT is outside NABL scope.



Soil Profile (BH-48)

Location : Space for Future Provision
Survey Coordinates : 2213S, 1187W

Surface Elevation : RL 211.017 m

Ground Water Depth : 21.05 m

Termination Depth : 15.45 m (RL 195.6 m)

Ground Water Level : RL 188.1 m

Boring Method : Shell & Auger

Casing Depth : 19.0 m

Boring Start : 26-Jul-18

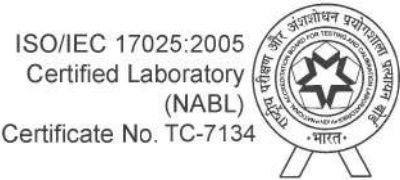
Boring Finish : 17-Aug-18

Depth, m		Sample No.	SPT ⁽¹⁾		Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Grain Size Analysis				Atterberg Limits			Shrinkage Limit, (%)	Density and Moisture			Specific Gravity	Shear Tests				Free Swell Index, (%)
From	To		Field Value, N _r	Corrected Value, N"				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Plasticity Index (%)		Bulk Density (gms/cm ³)	Dry Density (gms/cm ³)	Moisture Content (%)		Type of Test	Confining Pressures, (kg/cm ²)	Cohesion Intercept, 'c' (kg/cm ²)	Angle of Internal Friction, ϕ (degrees)	
0.00	0.50	DS1				Dense brown silty fine sand (SM)		5	65	24	6													
1.00	1.30	UDS1				- with gravels, 0.0 to 1.0 m	2.50																	
2.50	2.95	SPT1	31	31		Hard brown silty clay with gravel, low expansive, high plastic (CH)						55.5	26.0	29.6	20									
4.00	4.30	UDS2																						
5.50	5.95	SPT2	36	36			7.00	4	7	21	68													
7.00	7.30	DS2				Hard brown clayey silt, medium plastic (CI)	8.50					43.0	21.3	21.8										
8.50	8.95	SPT3	52	52		Hard brown silty clay, high plastic (CH)		0	6	34	60													
10.00	10.45	SPT4	60	60			11.50					63.1	30.1	33.0										
11.50	11.59	SPT5	Ref*/ 9 cm	-		Refusal met on Rock. Core drilling through rock adopted. Refer to next page for details.																		

⁽¹⁾ SPT is outside NABL scope.

Rock Profile (BH-48)

Location : Space for Future Provision Surface Elevation : RL 209.124 m Boring Method : Rotary Drilling
Survey Coordinates : 2213S, 1187W Ground Water Depth 21.05 m Casing Depth : 19.0 m
Termination Depth : 15.45 m (RL 195.6 m) Boring Start : 26-Jul-18
Ground Water Level : RL 188.1 m Boring Finish : 17-Aug-18



SPT N- Value (N _f) ⁽¹⁾	Depth (m)	Drill Run (m)	Sample No.	Serial No. of Cores	Casing Lowered (Size)	Symbol	ROCK DESCRIPTION	Depth of Strata, (m)	Percent Recovery (%) ⁽¹⁾	Rock Quality Designation (RQD, %) ⁽¹⁾	Rock Mass Rating (RMR) ⁽¹⁾	Penetration Rate (minutes/cm)	Size of Hole: NX					Porosity (%)	Water Absorption (%)	Point Load Index (kg/cm ²)	Unconfined Compressive Strength (kg/cm ²)
													Return Water		Bits Used	Density (g/cc)	Specific Gravity				
													Colour	Loss							
Ref*/ 9cm	11.50	11.50	SPT5	1-4			Weak, grey GRANITE, very intensely fractured, highly to moderately weathered		17	0			↑	↑	↑						
	12.00	11.59	RK1																		
	12.50																				
Ref*/ 6cm	13.00	13.00	SPT6	5-9					16	0	18		Light Brown	Partial	32 CT Diamond Impregnated Bit						
	13.50	13.06	RK2																		
	14.00																				
Ref*/ 5cm	14.50	14.50	SPT7	10-15					23	0			↓	↓	↓	2.44	2.79	0.126	1.39	-	288
	15.00	14.55	RK3																		
	15.50																				
	16.00	16.00	RK4	16-17			- moderately weathered, 16.0 to 18.0 m		22	18	20										
	16.50																				
	17.00																				
17.50	17.50																				
18.00																					

⁽¹⁾Outside NABL scope.

* Equivalent Unconfined Compressive Strength based on Point Load Strength Index

Rock Profile (BH-48)

Location : Space for Future Provision

Surface Elevation : RL 209.124 m

Boring Method : Rotary Drilling

Survey Coordinates : 2213S, 1187W

Ground Water Depth 21.05 m

Casing Depth : 19.0 m

Termination Depth : 15.45 m (RL 195.6 m)

Boring Start : 26-Jul-18

Ground Water Level : RL 188.1 m

Boring Finish : 17-Aug-18

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SPT N- Value (N _f) ⁽¹⁾	Depth (m)	Drill Run (m)	Sample No.	Serial No. of Cores	Casing Lowered (Size)	Symbol	ROCK DESCRIPTION	Depth of Strata, (m)	Percent Recovery (%) ⁽¹⁾	Rock Quality Designation (RQD, %) ⁽¹⁾	Rock Mass Rating (RMR) ⁽¹⁾	Penetration Rate (minutes/cm)	Size of Hole: NX																
													Return Water		Bits Used	Density (g/cc)	Specific Gravity	Porosity (%)	Water Absorption (%)	Point Load Index (kg/cm ²)	Unconfined Compressive Strength (kg/cm ²)								
													Colour	Loss															
Ref*/ 6cm	18.00	19.00	RK5	18-21		Very weak to weak, grey GRANITE, disintegrated to very intensely fractured, completely to moderately weathered - weak, very intensely fractured, moderately weathered, 18.0 to 19.0 m - weak, very intensely fractured, highly weathered, 19.0 to 20.5 m - very weak, disintegrated, completely weathered, 20.5 to 25.0 m		23	9	20		Light Brown				2.51	2.81	0.107	1.06	-	364								
	18.50																												
	19.00																												
	19.50																												
	20.00																												
	20.50	20.50	RK6	22-25					16	0						18													
	20.56																												
	21.00		SPT8																										
	21.50		WS1	-					0	0																			
	Ref*/ 11cm	22.00	22.00	SPT9															15			32 CT Diamond Impregnated Bit							
22.50		22.11																											
23.00			WS2	-					0	0																			
Ref*/ 10cm	23.50	23.50	SPT10																										
Ref*/ 13cm	25.00	23.60																											
		25.00	WS3	-												0	0												
		25.13	SPT11																										

⁽¹⁾Outside NABL scope.

* Equivalent Unconfined Compressive Strength based on Point Load Strength Index

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Soil Profile (BH-49)

Location : Space for Future Provision
Survey Coordinates : 2208S, 1078W

Surface Elevation : RL 211.017 m

Ground Water Depth : 22.05 m

Termination Depth : 15.45 m (RL 195.6 m)

Ground Water Level : RL 188 m

Boring Method : Shell & Auger

Casing Depth : 24.0 m

Boring Start : 02-Aug-18

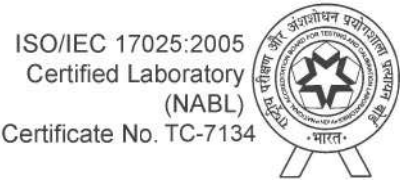
Boring Finish : 18-Aug-18

Depth, m		Sample No.	SPT ⁽¹⁾		Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Grain Size Analysis				Atterberg Limits			Shrinkage Limit, (%)	Density and Moisture			Specific Gravity	Shear Tests				Free Swell Index, (%)
From	To		Field Value, N _r	Corrected Value, N _r ¹				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Plasticity Index (%)		Bulk Density (gms/cm ³)	Dry Density (gms/cm ³)	Moisture Content (%)		Type of Test	Confining Pressures, (kg/cm ²)	Cohesion Intercept, 'c' (kg/cm ²)	Angle of Internal Friction, ϕ (degrees)	
0.00	0.50	DS1				Hard brown sandy silt with gravel, low plastic (CL)		20	49	24	7													
1.00	1.30	UDS1					2.50																	
2.50	2.95	SPT1	39	39		Hard brown silty clay, low expansive, high plastic (CH)						56.0	26.6	29.5	19									
4.00	4.30	UDS2																						
5.50	5.95	SPT2	51	51																				
7.00	7.45	SPT3	59	59								54.9	28.4	26.5										
8.50	8.95	SPT4	60	60				0	2	45	53													
10.00	10.40	SPT5	102/25cm	-			10.50																	
						Refusal met on Rock. Core drilling through rock adopted. Refer to next page for details.																		

⁽¹⁾ SPT is outside NABL scope.

Rock Profile (BH-49)

Location : Space for Future Provision Surface Elevation : RL 210.036 m Boring Method : Rotary Drilling
Survey Coordinates : 2208S, 1078W Ground Water Depth 22.05 m Casing Depth : 24.0 m
Termination Depth : 15.45 m (RL 195.6 m) Boring Start : 02-Aug-18
Ground Water Level : RL 188 m Boring Finish : 18-Aug-18



SPT N- Value (N _f) ⁽¹⁾	Depth (m)	Drill Run (m)	Sample No.	Serial No. of Cores	Casing Lowered (Size)	Symbol	ROCK DESCRIPTION	Depth of Strata, (m)	Percent Recovery (%) ⁽¹⁾	Rock Quality Designation (RQD, %) ⁽¹⁾	Rock Mass Rating (RMR) ⁽¹⁾	Penetration Rate (minutes/cm)	Size of Hole: NX					Porosity (%)	Water Absorption (%)	Point Load Index (kg/cm ²)	Unconfined Compressive Strength (kg/cm ²)										
													Return Water		Bits Used	Density (g/cc)	Specific Gravity														
													Colour	Loss																	
Ref*/ 5cm	10.50	10.50	RK1	1-6			Very weak to weak, grey GRANITE, disintegrated to very intensely fracture completely to highly weathered - weak, very intensely fractured, highly weathered, 10.5 to 15.0 m		18	0	18		↑	↑	↑	2.68	-	-	0.66	70	1532*										
	11.00												↑	↑	↑																
	11.50												↑	↑	↑																
	12.00	12.00	RK2	7-12					24	0	18		↑	↑	↑	2.69	-	-	0.27	104	2299*										
	12.50	12.05											32 CT Diamond Impregnated Bit										↑	↑	↑						
13.00		↑																					↑	↑							
13.50	13.50	RK3	13-16						22	0	15		↑	↑	↑	2.59	-	-	0.11	78	1708*										
14.00													↑	↑	↑																
14.50													↑	↑	↑																
15.00	15.00	WS1	-						0	0	15		↑	↑	↑	2.59	-	-	0.11	78	1708*										
15.50													↑	↑	↑																
16.00													↑	↑	↑																
Ref*/ 13cm	16.50	16.50	SPT7								15		↑	↑	↑	2.59	-	-	0.11	78	1708*										
	17.00	16.63											↑	↑	↑																

⁽¹⁾Outside NABL scope.

* Equivalent Unconfined Compressive Strength based on Point Load Strength Index

Rock Profile (BH-49)

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Location : Space for Future Provision
Survey Coordinates : 2208S, 1078W

Surface Elevation : RL 210.036 m
Ground Water Depth 22.05 m
Termination Depth : 15.45 m (RL 195.6 m)
Ground Water Level : RL 188 m

Boring Method : Rotary Drilling
Casing Depth : 24.0 m
Boring Start : 02-Aug-18
Boring Finish : 18-Aug-18

SPT N- Value (N _f) ⁽¹⁾	Depth (m)	Drill Run (m)	Sample No.	Serial No. of Cores	Casing Lowered (Size)	Symbol	ROCK DESCRIPTION	Depth of Strata, (m)	Percent Recovery (%) ⁽¹⁾	Rock Quality Designation (RQD, %) ⁽¹⁾	Rock Mass Rating (RMR) ⁽¹⁾	Penetration Rate (minutes/cm)	Size of Hole: NX					Porosity (%)	Water Absorption (%)	Point Load Index (kg/cm ²)	Unconfined Compressive Strength (kg/cm ²)									
													Return Water		Bits Used	Density (g/cc)	Specific Gravity													
													Colour	Loss																
Ref*/ 11cm	17.00	18.00 18.11	WS2	-		Very weak, grey GRANITE, disintegrated, completely weathered		0	0	15		Light Brown	↑	↑	↑															
	17.50																													
	18.00		SPT8																											
	18.50																													
Ref*/ 10cm	19.00	19.50 19.60	WS3	-																0	0									
	19.50		SPT9																											
	20.00																													
	20.50		WS4	-																0	0	15								
Ref*/ 13cm	21.00	21.00 21.13	SPT10																											
	21.50																													
	22.00		WS5	-																0	0									
	22.50		SPT11																											
Ref*/ 14cm	23.00	22.50 22.64																												
	23.50		WS6	-				0	0																					

⁽¹⁾Outside NABL scope.

* Equivalent Unconfined Compressive Strength based on Point Load Strength Index

Rock Profile (BH-49)

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Location : Space for Future Provision

Survey Coordinates : 2208S, 1078W

Surface Elevation : RL 210.036 m

Ground Water Depth 22.05 m

Termination Depth : 15.45 m (RL 195.6 m)

Ground Water Level : RL 188 m

Boring Method : Rotary Drilling

Casing Depth : 24.0 m

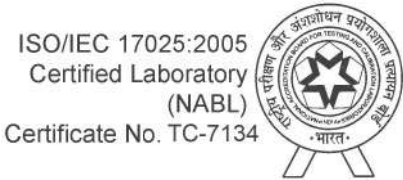
Boring Start : 02-Aug-18

Boring Finish : 18-Aug-18

SPT N- Value (N _f) ⁽¹⁾	Depth (m)	Drill Run (m)	Sample No.	Serial No. of Cores	Casing Lowered (Size)	Symbol	ROCK DESCRIPTION	Depth of Strata, (m)	Percent Recovery (%) ⁽¹⁾	Rock Quality Designation (RQD, %) ⁽¹⁾	Rock Mass Rating (RMR) ⁽¹⁾	Penetration Rate (minutes/cm)	Size of Hole: NX					Porosity (%)	Water Absorption (%)	Point Load Index (kg/cm ²)	Unconfined Compressive Strength (kg/cm ²)
													Return Water		Bits Used	Density (g/cc)	Specific Gravity				
													Colour	Loss							
Ref*/ 13cm	23.50	24.00 24.13	SPT12 WS7	-			Very weak, grey GRANITE, disintegrated, completely weathered		0	0	15		Light Brown	Partial	32 CT Diamond Impregnated Bit						
	24.00																				
	24.50																				
	25.00																				
Ref*/ 9cm	25.50	25.50 25.59	SPT13 WS8	-					0	0											
	26.00																				
	26.50																				
Ref*/ 12cm	27.00	27.00 27.12	SPT14 WS9	-					0	0											
	27.50																				
	28.00																				
Ref*/ 11cm	28.50	28.50 28.61	SPT15 WS10	-					0	0											
	29.00																				
Ref*/ 10cm	30.00	30.00 30.10	SPT16					30.10													

⁽¹⁾Outside NABL scope.

* Equivalent Unconfined Compressive Strength based on Point Load Strength Index



Soil Profile (BH-50)

Location : Space for Future Provision Surface Elevation : RL 211.017 m Boring Method : Shell & Auger
Survey Coordinates : 2208S, 946W Ground Water Depth : 21.80 m Casing Depth : 18.5 m
Termination Depth : 15.45 m (RL 195.6 m) Boring Start : 03-Aug-18
Ground Water Level : RL 189.5 m Boring Finish : 03-Aug-18

Depth, m		Sample No.	SPT ⁽¹⁾		Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Grain Size Analysis				Atterberg Limits			Shrinkage Limit, (%)	Density and Moisture			Specific Gravity	Shear Tests				Free Swell Index, (%)				
From	To		Field Value, N _r	Corrected Value, N _r ¹				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Plasticity Index (%)		Bulk Density (gms/cm ³)	Dry Density (gms/cm ³)	Moisture Content (%)		Type of Test	Confining Pressures, (kg/cm ²)	Cohesion Intercept, 'c' (kg/cm ²)	Angle of Internal Friction, φ (degrees)					
0.00	1.00	DS1	48	75		Very dense brown silty fine sand intermixed with gravels (SM-GP)	2.50	38	48	14	0					1.77	1.54	14.7	2.68	UC	1.3		9					
1.00	1.45	SPT1																										
2.50	2.80	UDS1			Very stiff to hard brown clayey silt, medium plastic (CI)		4	18	78	41.0	20.9	20.1	23		1.86	1.60	16.6	2.68						UC	1.3		25	
4.00	4.45	SPT2		15	15																							- very stiff, 4.0 to 10.0 m
5.50	5.80	UDS2																										
7.00	7.45	SPT3		28	28																							
8.50	8.80	UDS3																										
10.00	10.45	SPT4		61	61																							- hard, 10.0 to 17.5 m
11.50	11.95	SPT5		63	63																							- low plastic, 11.5 to 23.5m
13.00	13.45	SPT6		91	91																							
14.50	14.89	SPT7		102/24cm	-																							
16.00	16.45	SPT8		84	84																							

⁽¹⁾ SPT is outside NABL scope.

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Soil Profile (BH-50)

Location : Space for Future Provision
Survey Coordinates : 2208S, 946W

Surface Elevation : RL 211.017 m

Boring Method : Shell & Auger

Ground Water Depth : 21.80 m

Casing Depth : 18.5 m

Termination Depth : 15.45 m (RL 195.6 m)

Boring Start : 03-Aug-18

Ground Water Level : RL 189.5 m

Boring Finish : 03-Aug-18

Depth, m		Sample No.	SPT ⁽¹⁾		Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Grain Size Analysis				Atterberg Limits			Shrinkage Limit, (%)	Density and Moisture			Specific Gravity	Shear Tests				Free Swell Index, (%)
From	To		Field Value, N _r	Corrected Value, N _r				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Plasticity Index (%)		Bulk Density (gms/cm ³)	Dry Density (gms/cm ³)	Moisture Content (%)		Type of Test	Confining Pressures, (kg/cm ²)	Cohesion Intercept, 'c' (kg/cm ²)	Angle of Internal Friction, ϕ (degrees)	
17.50	17.95	SPT9	92	92		Hard brown clayey silt, low plastic (CL)		2	7	62	29													
19.00	19.45	SPT10	66	66								30.6	19.4	11.2										
20.50	20.95	SPT11	56	56																				
22.00	22.45	SPT12	61	61			23.50	4	18	56	22													
23.50	23.95	SPT13	79	79		Hard black Peat with traces of gravel, medium plastic (OI)																		
25.00	25.39	SPT14	101/24cm	-			25.39	1	7	66	26													

⁽¹⁾ SPT is outside NABL scope.

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Soil Profile (BH-51)

Location : Space for Future Provision
Survey Coordinates : 2208S, 878W

Surface Elevation : RL 211.017 m

Ground Water Depth : 22.02 m

Termination Depth : 15.45 m (RL 195.6 m)

Ground Water Level : RL 189.5 m

Boring Method : Shell & Auger

Casing Depth : 19.5 m

Boring Start : 04-Aug-18

Boring Finish : 05-Aug-18

Depth, m		Sample No.	SPT ⁽¹⁾		Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Grain Size Analysis				Atterberg Limits			Shrinkage Limit, (%)	Density and Moisture			Specific Gravity	Shear Tests				Free Swell Index, (%)
From	To		Field Value, N _r	Corrected Value, N"				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Plasticity Index (%)		Bulk Density (gms/cm ³)	Dry Density (gms/cm ³)	Moisture Content (%)		Type of Test	Confining Pressures, (kg/cm ²)	Cohesion Intercept, 'c' (kg/cm ²)	Angle of Internal Friction, φ (degrees)	
0.00	0.50	DS1				Very stiff brown sandy silt intermixed with gravels, low plastic (CL)		33	48	19	0													
1.00	1.30	UDS1					2.50									1.72	1.51	13.6						
2.50	2.95	SPT1	18	18		Very stiff to hard brown silty clay, low expansive, high plastic (CH)																		13
4.00	4.30	UDS2				- very stiff, 2.5 to 5.5 m										1.81	1.57	15.3		UC		0.8		
5.50	5.95	SPT2	56	56		- hard, 5.5 to 10.0 m						57.6	28.1	29.5	21									13
7.00	7.45	SPT3	65	65																				
8.50	8.95	SPT4	52	52			10.00	11	7	46	36								2.66					
10.00	10.45	SPT5	66	66		Hard brown clayey silt with traces of gravel, medium plastic (CI)						42.1	23.8	18.4										
11.50	11.95	SPT6	84	84																				
13.00	13.40	SPT7	101/25cm	-				4	10	57	29													
14.50	14.95	SPT8	61	61								34.6	19.8	14.9										
16.00	16.45	SPT9	56	56																				

⁽¹⁾ SPT is outside NABL scope.

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Soil Profile (BH-51)

Location : Space for Future Provision
Survey Coordinates : 2208S, 878W

Surface Elevation : RL 211.017 m

Boring Method : Shell & Auger

Ground Water Depth : 22.02 m

Casing Depth : 19.5 m

Termination Depth : 15.45 m (RL 195.6 m)

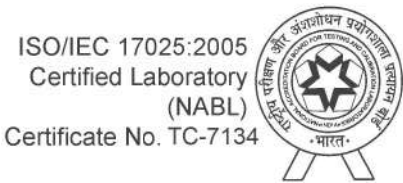
Boring Start : 04-Aug-18

Ground Water Level : RL 189.5 m

Boring Finish : 05-Aug-18

Depth, m		Sample No.	SPT ⁽¹⁾		Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Grain Size Analysis				Atterberg Limits			Shrinkage Limit, (%)	Density and Moisture			Specific Gravity	Shear Tests				Free Swell Index, (%)
From	To		Field Value, N _r	Corrected Value, N"				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Plasticity Index (%)		Bulk Density (gms/cm ³)	Dry Density (gms/cm ³)	Moisture Content (%)		Type of Test	Confining Pressures, (kg/cm ²)	Cohesion Intercept, 'c' (kg/cm ²)	Angle of Internal Friction, ϕ (degrees)	
17.50	17.95	SPT10	75	75		Hard brown clayey silt, medium plastic (CI)														UU	1, 2, 3	1.2	2.0	
19.00	19.45	SPT11	52	52								30.1	19.2	10.9										
20.50	20.95	SPT12	69	69																				
22.00	22.45	SPT13	63	63		- with gravel, 22.0 to 23.5 m		9	14	59	18													
23.50	23.95	SPT14	76	76								32.5	19.9	12.6										
25.00	25.45	SPT15	63	63			25.45																	

⁽¹⁾ SPT is outside NABL scope.



Soil Profile (BH-55)

Location : Space for Future Provision
Survey Coordinates : 1871S, 897W

Surface Elevation : RL 211.017 m

Ground Water Depth : Not met

Termination Depth : 15.45 m (RL 195.6 m)

Boring Method : Shell & Auger

Casing Depth : 6.0 m

Boring Start : 21-Aug-18

Boring Finish : 23-Sep-18

Depth, m		Sample No.	SPT ⁽¹⁾		Symbol	SOIL DESCRIPTION	Depth of Strata, (m)	Grain Size Analysis				Atterberg Limits			Shrinkage Limit, (%)	Density and Moisture			Specific Gravity	Shear Tests				Free Swell Index, (%)
From	To		Field Value, N _r	Corrected Value, N _r ¹				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid (%)	Plastic (%)	Plasticity Index (%)		Bulk Density (gms/cm ³)	Dry Density (gms/cm ³)	Moisture Content (%)		Type of Test	Confining Pressures, (kg/cm ²)	Cohesion Intercept, 'c' (kg/cm ²)	Angle of Internal Friction, ϕ (degrees)	
0.00	0.50	DS1	102/25cm			Hard brown sandy silt with gravel, low plastic (CL)	1.00	3	36	52	9								2.74					
1.00	1.40	SPT1				Very dense brown clayey sand with gravel, low plastic (SC)		17	53	13	17													
2.50	2.87	SPT2																						
4.00	4.36	SPT3										46.5	22.7	23.8										
5.00	5.28	SPT4				Refusal met on Rock. Core drilling through rock adopted. Refer to next page for details.																		

⁽¹⁾ SPT is outside NABL scope.

Rock Profile (BH-55)

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Location : Space for Future Provision Surface Elevation : RL 210.580 m Boring Method : Rotary Drilling
Survey Coordinates : 1871S, 897W Ground Water Depth Not met Casing Depth : 6.0 m
Termination Depth : 15.45 m (RL 195.6 m) Boring Start : 21-Aug-18
Boring Finish : 23-Sep-18

SPT N- Value (N _f) ⁽¹⁾	Depth (m)	Drill Run (m)	Sample No.	Serial No. of Cores	Casing Lowered (Size)	Symbol	ROCK DESCRIPTION	Depth of Strata, (m)	Percent Recovery (%) ⁽¹⁾	Rock Quality Designation (RQD, %) ⁽¹⁾	Rock Mass Rating (RMR) ⁽¹⁾	Penetration Rate (minutes/cm)	Size of Hole: NX					Porosity (%)	Water Absorption (%)	Point Load Index (kg/cm ²)	Unconfined Compressive Strength (kg/cm ²)												
													Return Water		Bits Used	Density (g/cc)	Specific Gravity																
													Colour	Loss																			
102/13cm	5.00	5.00	SPT4	1-6		Weak, grey GRANITE, very intensely fractured, highly weathered		23	0		18		Light Brown	Patial	32 CT Diamond Impregnated Bit																		
	5.50	5.28	RK1																														
	6.00																																
	6.50	6.50																															
7.00		RK2	7-11																														
7.50																																	
8.00	8.00																																
8.50		RK3	12-16																														
9.00																																	
Ref*/3cm	9.50	9.50	SPT5	17-20																													
	10.00	9.53																															
	10.50		RK4																														
	11.00	11.00	SPT6																														
Ref*/4cm	11.50	11.04																															
																									↓	↓	↓	2.75	-	-	0.13	100.0	2201*
																												2.60	-	-	0.55	125.0	2750*

⁽¹⁾Outside NABL scope.

* Equivalent Unconfined Compressive Strength based on Point Load Strength Index

Rock Profile (BH-55)

Location : Space for Future Provision Surface Elevation : RL 210.580 m Boring Method : Rotary Drilling
Survey Coordinates : 1871S, 897W Ground Water Depth Not met Casing Depth : 6.0 m
Termination Depth : 15.45 m (RL 195.6 m) Boring Start : 21-Aug-18
Boring Finish : 23-Sep-18

ISO/IEC 17025:2005
Certified Laboratory
(NABL)
Certificate No. TC-7134



SPT N- Value (N_f) ⁽¹⁾	Depth (m)	Drill Run (m)	Sample No.	Serial No. of Cores	Casing Lowered (Size)	Symbol	ROCK DESCRIPTION	Depth of Strata, (m)	Percent Recovery (%) ⁽¹⁾	Rock Quality Designation (RQD, %) ⁽¹⁾	Rock Mass Rating (RMR) ⁽¹⁾	Penetration Rate (minutes/cm)	Size of Hole: NX			Density (g/cc)	Specific Gravity	Porosity (%)	Water Absorption (%)	Point Load Index (kg/cm ²)	Unconfined Compressive Strength (kg/cm ²)
													Return	Water	Bits Used						
Ref*/ 5cm	11.50	12.50	RK5	21-24			Weak, grey GRANITE, very intensely fractured, highly weathered		17	0			Light Brown	Patial	32 CT Diamond Impregnated Bit						
	12.00																				
	12.50																				
	13.00																				
Ref*/ 3cm	13.50	14.00	RK6	25-29					16	0			Light Brown	Patial	32 CT Diamond Impregnated Bit						
	14.00																				
	14.50																				
	15.00																				
Ref*/ 4cm	15.50	15.54	RK7	30-33					12	0	18		Light Brown	Patial	32 CT Diamond Impregnated Bit						
	16.00																				
	16.50																				
	17.00																				
Ref*/ 5cm	17.50	17.05	RK8	34-39					14	0			Light Brown	Patial	32 CT Diamond Impregnated Bit						
	17.00																				
	17.50																				
	18.00																				
Ref*/ 5cm	17.00	17.05	RK9	40-44					16	0			Light Brown	Patial	32 CT Diamond Impregnated Bit						
	17.50																				
	18.00																				
	18.00																				

⁽¹⁾Outside NABL scope.

* Equivalent Unconfined Compressive Strength based on Point Load Strength Index

Rock Profile (BH-55)

Location : Space for Future Provision Surface Elevation : RL 210.580 m Boring Method : Rotary Drilling
Survey Coordinates : 1871S, 897W Ground Water Depth Not met Casing Depth : 6.0 m
Termination Depth : 15.45 m (RL 195.6 m) Boring Start : 21-Aug-18
Boring Finish : 23-Sep-18

ISO/IEC 17025:2005
Certified Laboratory
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SPT N- Value (N _f) ⁽¹⁾	Depth (m)	Drill Run (m)	Sample No.	Serial No. of Cores	Casing Lowered (Size)	Symbol	ROCK DESCRIPTION	Depth of Strata, (m)	Percent Recovery (%) ⁽¹⁾	Rock Quality Designation (RQD, %) ⁽¹⁾	Rock Mass Rating (RMR) ⁽¹⁾	Penetration Rate (minutes/cm)	Size of Hole: NX			Density (g/cc)	Specific Gravity	Porosity (%)	Water Absorption (%)	Point Load Index (kg/cm ²)	Unconfined Compressive Strength (kg/cm ²)
													Return Water		Bits Used						
													Colour	Loss							
Ref*/ 5cm	18.00	18.50 18.55	SPT 11 RK10	45-49			Weak, grey GRANITE, very intensely fractured, highly weathered		19	0	18		Light Brown	Patial	IMP Bit	2.72	2.8	0.0	0.43	71.0	1558*
	18.50																				
	19.00																				
	19.50																				
Ref*/ 6cm	20.00	20.00	SPT 12					20.06					↓	↓	↓						
		20.06																			

⁽¹⁾Outside NABL scope.

* Equivalent Unconfined Compressive Strength based on Point Load Strength Index



MEDINI GEO ENGINEERING SERVICES

SUB SURFACE EXPLORATION LOG

PROJECT : GEO-TECHNICAL INVESTIGATION FOR PLANT AREA OF LARA STPP STAGE-II, PUSSORE, RAIGHAR, CHHATTISGARH.

BORE HOLE NO :	1	TYPE OF STRUCTURE :	NTPC Stage -II	DATE COMMENCEI:	18 October 2022
COORDINATES N :	937 W	LOCATION :	NTPC Stage -II	DATE COMPLETED :	19 October 2022
E :	1349 S	CORE DIAMETER (mm) :	75	GEO-TECH ENGINE:	NEELAKANTAM
GROUND ELEVATION :	207.34 meter	WEIGHT OF HAMMER (Kg) :	63.5	WATER TABLE :	0.50 mts
TOTAL DEPTH (m) :	10.00 meter	DIST.FALLING HAMMER (cm) :	75	DRILLING MASTE:	MGES TEAM
		CASSING DIAMETER (MM) :	150	METHOD OF SAMP:	ROTARY DRILLING

SOIL PROFILE LOG

DATE	DEPTH (m)	Depth of Casing	G.W.L (m)	RECYCLING WATER	HATCHING	BORE PROFILE	SAMPLE DESCRIPTIONS	CORE RECOVERY %	RQD %	SPT TEST	TYPE OF SAMPLE	SPT BLOWS 15-30-45 cms	SPT 'N' VALUE	STANDARD PENETRATION TEST NUMBER OF BLOWS	REMARKS
	0.00													10 20 30 40 50	
18 October 2022	0.50														
	1.00														
	1.50														
	2.00						Medium to Fine Grained Silty Sand mixed with Trace of gravel			SPT	DS	16 21 24 45			
	2.50														
	3.00														
	3.50														
	4.00									SPT	DS	9 13 15 28			
	4.50														
	5.00														
	5.50														
	6.00														
	6.50						Brown Coloured Silty Clay with Gravel								
	7.00									SPT	DS	11 14 17 31			
	7.50														
	8.00														
	8.50														
	9.00														
	9.50														
	10.00									SPT	DS	15 18 21 39			

REMARK : **SPT**- STANDARD PENETRATION TEST **UDS**- UNDISTURBED SAMPLE **DS**- DISTURBED SAMPLE
RQD- ROCK QUALITY DESIGNTEGRATED **CR**- CORE RECOVERY **GWL**- GROUND WATER LEVEL
RUB- ROAD UNDER BRIDGE **ROB**- ROAD OVER BRIDGE



MEDINI GEO ENGINEERING SERVICES

SUB SURFACE EXPLORATION LOG

PROJECT : GEO-TECHNICAL INVESTIGATION FOR PLANT AREA OF LARA STPP STAGE-II,
PUSSORE, RAIGHAR, CHHATTISGARH.

BORE HOLE NO :	2	TYPE OF STRUCTURE :		DATE COMMENCEI:	22 October 2022
	BH : 2	LOCATION :	NTPC Stage -II	DATE COMPLETED :	24 October 2022
COORDINATES N :	1212 W	CORE DIAMETER (mm) :	75	GEO-TECH ENGINE:	NEELAKANTAM
E :	1351 S	WEIGHT OF HAMMER (Kg) :	63.5	WATER TABLE :	2.90 m
GROUND ELEVATION :	207.34 meter	DIST.FALLING HAMMER (cm) :	75	DRILLING MASTE:	MGES TEAM
TOTAL DEPTH (m) :	15.00 meter	CASSING DIAMETER (MM) :	150	METHOD OF SAMP:	ROTARY DRILLING

SOIL PROFILE LOG

DATE	DEPTH (m)	Depth of Casing	G.W.L (m)	RECYCLING WATER	HATCHING	BORE PROFILE	SAMPLE DESCRIPTIONS	CORE RECOVERY %	RQD %	SPT TEST	TYPE OF SAMPLE	SPT BLOWS 15-30-45 cms	SPT N VALUE	STANDARD PENETRATION TEST NUMBER OF BLOWS					REMARKS	
	0.00													10	20	30	40	50		
22 October 2022	0.50						Medium to Fine Grained Silty Sand mixed with Trace of gravel													
	1.00																			
	1.50									SPT		15	16	20	36					
	2.00																			
	2.50																			
	3.00						Brown Coloured Silty Clay with Gravel			SPT		20	22	25	47					
	3.50																			
	4.00																			
	4.50						Completely Weathered Rock or Residual Soil (SDR)			SPT		12	14	19	33					
	5.00																			
	5.50																			
	6.00									SPT		10	24	30	54					
	6.50																			
	7.00																			
	7.50									SPT		15	25	31	56					
	8.00																			
	8.50																			
	9.00									SPT		14	22	38	60					
9.80										DS										
24 October 2022	10.30						Completely to Moderately Weathered Rock													
	10.80							23.0	23.0											
	11.30																			
	11.80							28.0	28.0											
	12.30																			
	12.80							28.0	28.0											
	13.30																			
	13.80							25.0	25.0											
	14.30																			
	15.00							40.0	33.3											

REMARK : **SPT-** STANDARD PENETRATION TEST
RQD- ROCK QUALITY DESIGNTEGRATED
RUB- ROAD UNDER BRIDGE

UDS- UNDISTURBED SAMPLE
CR- CORE RECOVERY
ROB- ROAD OVER BRIDGE

DS - DISTURBED SAMPLE
GWL- GROUND WATER LEVEL



MEDINI GEO ENGINEERING SERVICES

SUB SURFACE EXPLORATION LOG

PROJECT : GEO-TECHNICAL INVESTIGATION FOR PLANT AREA OF LARA STPP STAGE-II,
PUSSORE, RAIGHAR, CHHATTISGARH.

BORE HOLE NO :	3	TYPE OF STRUCTURE :		DATE COMMENCEI:	05 November 2022
	BH : 3	LOCATION :	NTPC Stage -II	DATE COMPLETED :	06 November 2022
COORDINATES N :	1065 W	CORE DIAMETER (mm) :	75	GEO-TECH ENGINE:	NEELAKANTAM
E :	1354 S	WEIGHT OF HAMMER (Kg) :	63.5	WATER TABLE :	3.00 m
GROUND ELEVATION :	208.10 meter	DIST.FALLING HAMMER (cm) :	75	DRILLING MASTE:	MGES TEAM
TOTAL DEPTH (m) :	15.00 meter	CASSING DIAMETER (MM) :	150	METHOD OF SAMP:	ROTARY DRILLING

SOIL PROFILE LOG

DATE	DEPTH (m)	Depth of Casing	G.W.L (m)	RECYCLING WATER	HATCHING	BORE PROFILE	SAMPLE DESCRIPTIONS	CORE RECOVERY %	RQD %	SPT TEST	TYPE OF SAMPLE	SPT BLOWS 15-30-45 cms	SPT N VALUE	STANDARD PENETRATION TEST NUMBER OF BLOWS	REMARKS
	0.00													10 20 30 40 50	
05 November 2022	0.50														
	1.00														
	1.50									SPT		7 16 21 37			
	2.00						Medium to Fine Grained Silty Sand mixed with Trace of gravel								
	2.50									SPT		8 14 20 34			
	3.00														
	3.50									SPT		7 13 19 32			
	4.00														
	4.50									SPT		8 16 19 35			
	5.00						Brown Coloured Silty Clay with Gravel								
06 November 2022	5.50									SPT		8 17 18 35			
	6.00														
	6.50									SPT		11 16 20 36			
	7.00						Completely Weathered Rock or Residual Soil (SDR)								
	7.50									SPT					
	8.00														
	8.50														
	9.00														
	9.50														
	10.00						Boulders	30.0							
	10.50														
	11.00							21.0							
	11.50														
	12.00							23.0							
	12.50														
	13.00						Fractured Rock	28.0							
	13.50														
	14.00							30.0							
	14.50														
	15.00							24.0							

REMARK : **SPT-** STANDARD PENETRATION TEST
RQD- ROCK QUALITY DESIGNTEGRATED
RUB- ROAD UNDER BRIDGE

UDS- UNDISTURBED SAMPLE
CR- CORE RECOVERY
ROB- ROAD OVER BRIDGE

DS - DISTURBED SAMPLE
GWL- GROUND WATER LEVEL



MEDINI GEO ENGINEERING SERVICES

SUB SURFACE EXPLORATION LOG

PROJECT : GEO-TECHNICAL INVESTIGATION FOR PLANT AREA OF LARA STPP STAGE-II,
PUSSORE, RAIGHAR, CHHATTISGARH.

BORE HOLE NO :	4	TYPE OF STRUCTURE :		DATE COMMENCEI:	06 November 2022
	BH : 4	LOCATION :	NTPC Stage -II	DATE COMPLETED :	07 November 2022
COORDINATES N :	1231 W	CORE DIAMETER (mm) :	75	GEO-TECH ENGINE:	NEELAKANTAM
E :	1439 S	WEIGHT OF HAMMER (Kg) :	63.5	WATER TABLE :	3.40 m
GROUND ELEVATION :	208.21 meter	DIST.FALLING HAMMER (cm) :	75	DRILLING MASTE:	MGES TEAM
TOTAL DEPTH (m) :	15.00 meter	CASSING DIAMETER (MM) :	150	METHOD OF SAMP:	ROTARY DRILLING

SOIL PROFILE LOG

DATE	DEPTH (m)	Depth of Casing	G.W.L (m)	RECYCLING WATER	HATCHING	BORE PROFILE	SAMPLE DESCRIPTIONS	CORE RECOVERY %	RQD %	SPT TEST	TYPE OF SAMPLE	SPT BLOWS 15-30-45 cms	SPT N VALUE	STANDARD PENETRATION TEST NUMBER OF BLOWS	REMARKS
	0.00													10 20 30 40 50	
06 November 2022	0.50														
	1.00														
	1.50									SPT		12 15 17 32			
	2.00														
	2.50						Medium to Fine Grained Silty Sand mixed with Trace of gravel								
	3.00									SPT		10 16 19 35			
	3.50														
	4.00														
	4.50									SPT		14 19 20 39			
	5.00														
07 November 2022	5.50														
	6.00									SPT		13 18 22 40			
	6.50						Brown Coloured Silty Clay with Gravel								
	7.00														
	7.50									SPT		11 15 20 35			
	8.00														
	8.50														
	9.00									SPT		12 19 27 46			
	9.50														
	10.00						Boulders	30.0							
	10.50														
	11.00							28.0							
	11.50														
	12.00							26.0							
	12.50														
	13.00						Fractured Rock	31.0							
	13.50														
	14.00							21.0							
	14.50														
	15.00							34.0							

REMARK : **SPT-** STANDARD PENETRATION TEST
RQD- ROCK QUALITY DESIGNTEGRATED
RUB- ROAD UNDER BRIDGE

UDS- UNDISTURBED SAMPLE
CR- CORE RECOVERY
ROB- ROAD OVER BRIDGE

DS - DISTURBED SAMPLE
GWL- GROUND WATER LEVEL



MEDINI GEO ENGINEERING SERVICES

SUB SURFACE EXPLORATION LOG

PROJECT : GEO-TECHNICAL INVESTIGATION FOR PLANT AREA OF LARA STPP STAGE-II,
PUSSORE, RAIGHAR, CHHATTISGARH.

BORE HOLE NO :	5	TYPE OF STRUCTURE :	DATE COMMENCEI:	17 October 2022
	BH : 5	LOCATION :	DATE COMPLETED :	18 October 2022
COORDINATES N :	1086 W	CORE DIAMETER (mm) :	GEO-TECH ENGINE:	NEELAKANTAM
E :	1442 S	WEIGHT OF HAMMER (Kg) :	WATER TABLE :	3.50 m
GROUND ELEVATION :	208.02 meter	DIST.FALLING HAMMER (cm) :	DRILLING MASTE:	MGES TEAM
TOTAL DEPTH (m) :	15.00 meter	CASSING DIAMETER (MM) :	METHOD OF SAMP:	ROTARY DRILLING

SOIL PROFILE LOG

DATE	DEPTH (m)	Depth of Casing	G.W.L (m)	RECYCLING WATER	HATCHING	BORE PROFILE	SAMPLE DESCRIPTIONS	CORE RECOVERY %	RQD %	SPT TEST	TYPE OF SAMPLE	SPT BLOWS 15-30-45 cms	SPT 'N' VALUE	STANDARD PENETRATION TEST NUMBER OF BLOWS	REMARKS
	0.00													10 20 30 40 50	
17 October 2022	0.50														
	1.00														
	1.50									SPT		11 13 19 32			
	2.00						Medium to Fine Grained Silty Sand mixed with Trace of gravel								
	2.50														
	3.00									SPT		14 16 21 37			
	3.50														
	4.00														
	4.50									SPT		15 19 23 42			
	5.00														
18 October 2022	5.50														
	6.00									SPT		12 14 15 29			
	6.50														
	7.00														
	7.50						Brown Coloured Silty Clay with Gravel			SPT		13 16 17 33			
	8.00														
	8.50														
	9.00									SPT		9 13 17 30			
	9.50														
	10.00														
	10.50									SPT		50 Blows 4.5 Cms > 100			
	11.00							40.0							
	11.50														
	12.00							45.0							
	12.50						Completely to Moderately Weathered Rock								
	13.00							25.0							
	13.50														
	14.00							30.0							
	14.50														
	15.00							35.0							

REMARK : **SPT**- STANDARD PENETRATION TEST
RQD- ROCK QUALITY DESIGNTEGRATED
RUB- ROAD UNDER BRIDGE

UDS- UNDISTURBED SAMPLE
CR- CORE RECOVERY
ROB- ROAD OVER BRIDGE

DS- DISTURBED SAMPLE
GWL- GROUND WATER LEVEL



MEDINI GEO ENGINEERING SERVICES

SUB SURFACE EXPLORATION LOG

PROJECT : GEO-TECHNICAL INVESTIGATION FOR PLANT AREA OF LARA STPP STAGE-II, PUSSORE, RAIGHAR, CHHATTISGARH.

BORE HOLE NO :	6	TYPE OF STRUCTURE :	NTPC Stage -II	DATE COMMENCEI:	22 October 2022
	BH : 6	LOCATION :	NTPC Stage -II	DATE COMPLETED :	23 October 2022
COORDINATES N :	1203 W	CORE DIAMETER (mm) :	75	GEO-TECH ENGINE:	NEELAKANTAM
E :	1515 S	WEIGHT OF HAMMER (Kg) :	63.5	WATER TABLE :	2.00 m
GROUND ELEVATION :	208.11 meter	DIST.FALLING HAMMER (cm) :	75	DRILLING MASTE:	MGES TEAM
TOTAL DEPTH (m) :	10.00 meter	CASSING DIAMETER (MM) :	150	METHOD OF SAMP:	ROTARY DRILLING

SOIL PROFILE LOG

DATE	DEPTH (m)	Depth of Casing	G.W.L (m)	RECYCLING WATER	HATCHING	BORE PROFILE	SAMPLE DESCRIPTIONS	CORE RECOVERY %	RQD %	SPT TEST	TYPE OF SAMPLE	SPT BLOWS 15-30-45 cms	SPT 'N' VALUE	STANDARD PENETRATION TEST NUMBER OF BLOWS	REMARKS
	0.00													10 20 30 40 50	
22 October 2022	0.50														
	1.00														
	1.50						Medium to Fine Grained Silty Sand mixed with Trace of gravel			SPT		12 16 18 34			
	2.00														
	2.50														
	3.00									SPT		8 12 16 28			
	3.50														
	4.00														
	4.50									SPT		7 14 15 29			
	5.00														
	5.50														
	6.00									SPT		8 13 16 29			
	6.50						Brown Coloured Silty Clay								
	7.00														
	7.50									SPT		10 15 17 32			
	8.00														
	8.50														
	9.00									SPT		50 Blows 4 cms > 100			
	9.50														
	10.00						Completely Weathered Rock	25.0							

REMARK :	SPT- STANDARD PENETRATION TEST	UDS - UNDISTURBED SAMPLE	DS - DISTURBED SAMPLE
	RQD- ROCK QUALITY DESIGNTEGRATED	CR- CORE RECOVERY	GWL- GROUND WATER LEVEL
	RUB- ROAD UNDER BRIDGE	ROB- ROAD OVER BRIDGE	

PROJECT : GEO-TECHNICAL INVESTIGATION FOR PLANT AREA OF LARA STPP STAGE-II,
PUSSORE RAIGHAR, CHHATTISGARH.

BORE HOLE NO	:	7	TYPE OF STRUCTURE	:		DATE COMMENCEI	:	18 October 2022
	:	BH : 7	LOCATION	:	NTPC Stage-II	DATE COMPLETED	:	21 October 2022
COORDINATES	N	1066 W	CORE DIAMETER (mm)	:	75	GEO-TECH ENGINE	:	NEELAKANTAM
	E	1521 S	WEIGHT OF HAMMER (Kg)	:	63.5	WATER TABLE	:	2.80 m
GROUND ELEVATION	:	207.23 meter	DIST.FALLING HAMMER (cm)	:	75	DRILLING MASTER	:	MGES TEAM
TOTAL DEPTH (m)	:	10.00 meter	CASSING DIAMETER (MM)	:	150	METHOD OF SAMP	:	ROTARY DRILLING

SOIL PROFILE LOG

[illegible]

REMARK: **SPT-** STANDARD PENETRATION TEST
RQD- ROCK QUALITY DESIGNTEGRATED
RUB- ROAD UNDER BRIDGE

UDS - UNDISTURBED SAMPLE
CR- CORE RECOVERY
ROB- ROAD OVER BRIDGE

DS - DISTURBED SAMPLE
GWL- GROUND WATER LEVEL



MEDINI GEO ENGINEERING SERVICES

SUB SURFACE EXPLORATION LOG

PROJECT		: GEO-TECHNICAL INVESTIGATION FOR PLANT AREA OF LARA STPP STAGE-II, PUSSORE, RAIGHAR, CHHATTISGARH.			
BORE HOLE NO	:	8	TYPE OF STRUCTURE	:	DATE COMMENCEI : 18 October 2022
	:	BH : 8	LOCATION	:	DATE COMPLETED : 21 October 2022
COORDINATES	N	: 961 W	CORE DIAMETER (mm)	:	GEO-TECH ENGINE : NEELAKANTAM
	E	: 1510 S	WEIGHT OF HAMMER (Kg)	:	WATER TABLE : 4.30 m
GROUND ELEVATION		: 208.40 meter	DIST.FALLING HAMMER (cm)	:	DRILLING MASTE : MGES TEAM
TOTAL DEPTH (m)		: 15.00 meter	CASSING DIAMETER (MM)	:	METHOD OF SAMP : ROTARY DRILLING

SOIL PROFILE LOG

DATE	DEPTH (m)	Depth of Casing	G.W.L (m)	RECYCLING WATER	HATCHING	BORE PROFILE	SAMPLE DESCRIPTIONS	CORE RECOVERY %	RQD %	SPT TEST	TYPE OF SAMPLE	SPT BLOWS 15-30-45 cms	SPT 'N' VALUE	STANDARD PENETRATION TEST NUMBER OF BLOWS					REMARKS
														10	20	30	40	50	
18 October 2022	0.00																		
	0.50																		
	1.00																		
	1.50																		
	2.00									SPT		3	11	11	22				
	2.50																		
	3.00						Medium to Fine Grained Silty Sand mixed with Trace of gravel												
	3.50																		
	4.00									SPT		15	15	21	36				
	4.50																		
	5.00																		
	5.50																		
	6.00																		
	6.50																		
	7.00									SPT		12	16	19	35				
	7.50						Brown Coloured Silty Clay												
	8.00																		
	8.50																		
	9.00																		
	9.50																		
	10.00						Completely Weathered Rock or Residual Soil (SDR)			SPT		17	19	22	41				
	10.50																		
	11.00																		
	11.50																		
	12.00							43.0	28.7										
	12.50																		
	13.00																		
	13.50							61.0	40.4										
	14.00																		
	14.50																		
	15.00							38.0	25.3										

REMARK : SPT- STANDARD PENETRATION TEST UDS- UNDISTURBED SAMPLE DS - DISTURBED SAMPLE
RQD- ROCK QUALITY DESIGNTEGRATED CR- CORE RECOVERY GWL- GROUND WATER LEVEL
RUB- ROAD UNDER BRIDGE ROB- ROAD OVER BRIDGE



MEDINI GEO ENGINEERING SERVICES

SUB SURFACE EXPLORATION LOG

PROJECT : GEO-TECHNICAL INVESTIGATION FOR PLANT AREA OF LARA STPP STAGE-II,
PUSSORE, RAIGHAR, CHHATTISGARH.

BORE HOLE NO : 11	TYPE OF STRUCTURE :	DATE COMMENCEI: 07 October 2022
COORDINATES N : 1116W	LOCATION : NTPC Stage -II	DATE COMPLETED : 11 October 2022
E : 1641S	CORE DIAMETER (mm) : 75	GEO-TECH ENGINE: NEELAKANTAM
GROUND ELEVATION : 207.32 meter	WEIGHT OF HAMMER (Kg) : 63.5	WATER TABLE : NOT MET
TOTAL DEPTH (m) : 15.00 meter	DIST.FALLING HAMMER (cm) : 75	DRILLING MASTE: MGES TEAM
	CASSING DIAMETER (MM) : 150	METHOD OF SAMP: ROTARY DRILLING

SOIL PROFILE LOG

DATE	DEPTH (m)	Depth of Casing	G.W.L (m)	RECYCLING WATER	HATCHING	BORE PROFILE	SAMPLE DESCRIPTIONS	CORE RECOVERY %	RQD %	SPT TEST	TYPE OF SAMPLE	SPT BLOWS 15-30-45 cms	SPT 'N' VALUE	STANDARD PENETRATION TEST NUMBER OF BLOWS	REMARKS
	0.00													10 20 30 40 50	
07 October 2022	0.50						Medium to Fine Grained Silty Sand mixed with Trace of gravel								
	1.00									SPT		11 13 16 29			
	1.50										DS				
	2.00														
	2.50														
	3.00														
	3.50														
	4.00									SPT		14 16 17 33			
	4.50														
	5.00														
11 October 2022	5.50						Brown Coloured Silty Clay with Gravel								
	6.00														
	6.50														
	7.00									SPT		17 19 21 40			
	7.50														
	8.00														
	8.50														
	9.00														
	9.50														
	10.00									SPT		17 21 23 44			
	10.50						Completely to Moderately Weathered Rock								
	11.00														
	11.50														
	12.00									SPT					
	12.50										DS				
	13.00														
	13.50						Completely to Moderately Weathered Rock	30.7	6.66						
	14.00														
	14.50														
	15.00							34.0	21.3						

REMARK : SPT- STANDARD PENETRATION TEST
RQD- ROCK QUALITY DESIGNTEGRATED
RUB- ROAD UNDER BRIDGE

UDS- UNDISTURBED SAMPLE
CR- CORE RECOVERY
ROB- ROAD OVER BRIDGE

DS - DISTURBED SAMPLE
GWL- GROUND WATER LEVEL