



Borehole No.:-18

SUMMARY OF LABORATORY TEST RESULTS

Depth, m		Sample Type	Field Value N**	Corrected Value N**	SOIL DESCRIPTION	Strata Break	Grain Size Analysis				Liquid Limit, %	Plastic Limit, %	Plasticity Index, %	Shrinkage Limit, %	Specific Gravity	Free Swell Index, %	Bulk Density ₃ gms/cm ³	Moisture Content, %	Dry Density, g/cm ³	Shear Strength Parameters				
From	To						Gravel (%)	Sand (%)	Silt (%)	Clay (%)										Type of test	Confining Pressure kg/cm ²	C _u kg/cm ²	Degree ϕ	
0.00	0.50	DS-1			Very stiff brown clayey silt, low plastic (CL)																			
1.00	1.45	SPT-1	19	19								31.1	18.3	12.7	11.0		10.0							
2.00	2.30	UDS-1																1.72	14.3	1.50				
3.00	3.45	SPT-2	13	16		4.00																		
4.00	4.30	UDS-2			Medium dense to dense grey silty fine sand (SM)													1.84	18.1	1.56				
5.00	5.45	SPT-3	15	16		16 - medium dense, 4.0 to 13.5 m		0	82	18	0													
6.00	6.30	UDS-3																						
7.00	7.45	SPT-4	17	16	Medium dense to dense grey fine sand with traces of gravels (SP-SM)	8.00												1.94	25.8	1.54				
8.00	8.30	DS-2																						
8.50	8.95	SPT-5	18	16		16 - medium dense, 8.0 to 14.5 m																		
9.00	9.45	SPT-6	22	18																				
10.00	10.30	DS-3																						
10.50	10.95	SPT-7	23	18																				
11.50	11.95	SPT-8	27	19																				
13.00	13.30	DS-4																						
13.50	13.95	SPT-9	30	20	- dense, 13.5 to 16.5 m																			
14.50	14.95	SPT-10	33	21	- dense, 14.5 to 20.5 m																			
16.00	16.30	DS-5																						

* Outside NABL scope.

DS: Direct shear test- Consolidated Drained

UUT: Unconsolidated undrained triaxial shear test



Borehole No.:-18

SUMMARY OF LABORATORY TEST RESULTS

Depth, m		Sample Type	Field Value N*	Corrected Value N**	SOIL DESCRIPTION	Strata Break	Grain Size Analysis				Liquid Limit, %	Plastic Limit, %	Plasticity Index, %	Shrinkage Limit, %	Specific Gravity	Free Swell Index, %	Bulk Density, gms/cm ³	Moisture Content, %	Dry Density, g/cm ³	Shear Strength Parameters			Degree ϕ
From	To						Gravel (%)	Sand (%)	Silt (%)	Clay (%)										Type of test	Confining Pressure, kg/cm ²	kg/cm ²	
16.50	16.95	SPT-11	38	23	Dense grey fine sand (SP-SM)		3	91	6	0													
17.50	17.95	SPT-12	41	23																			
19.00	19.30	DS-6																					
19.50	19.95	SPT-13	46	25		20.50																	
20.50	20.95	SPT-14	49	49	Hard brown clayey silt, low plastic (CL)	22.00					34.0	18.8	15.2										
22.00	22.30	DS-7			Very dense grey fine sand (SP)																		
22.50	22.95	SPT-15	53	26																			
23.50	23.95	SPT-16	56	27																			
25.00	25.30	DS-8																					
25.50	25.95	SPT-17	58	27																			
26.50	26.95	SPT-18	61	28																			
28.00	28.30	DS-9																					
28.50	28.95	SPT-19	65	28																			
29.50	29.95	SPT-20	68	29																			
31.00	31.30	DS-10																					
31.50	31.95	SPT-21	71	29	- with gravel, 31.5 to 32.5 m		6	90	4	0													
32.50	32.95	SPT-22	73	30																			
34.00	34.30	DS-11																					

* Outside NABL scope.

DS: Direct shear test- Consolidated Drained

UUT: Unconsolidated undrained triaxial shear test



CENGRS

Borehole No.:-18

SUMMARY OF LABORATORY TEST RESULTS

Depth, m		Sample Type	Field Value N*	Corrected Value N**	SOIL DESCRIPTION	Strata Break	Grain Size Analysis				Liquid Limit, %	Plastic Limit, %	Plasticity Index, %	Shrinkage Limit, %	Specific Gravity	Free Swell Index, %	Bulk Density ₃ gms/cm ³	Moisture Content, %	Dry Density, g/cm ³	Shear Strength Parameters			Degree ϕ
From	To						Gravel (%)	Sand (%)	Silt (%)	Clay (%)										Type of test	Confining Pressure kg/cm ²	c_u kg/cm ²	
34.50	34.95	SPT-23	77	30	Very dense grey fine sand (SP)	35.50																	
35.50	35.95	SPT-24	80	80	Hard brown clayey silt, low plastic (CL)	37.00					33.7	20.5	13.2										
37.00	37.30	DS-12			Very dense grey fine sand (SP-SM)																		
37.50	37.95	SPT-25	82	30																			
38.50	38.95	SPT-26	86	31																			
40.00	40.30	DS-13																					
40.50	40.95	SPT-27	91	32																			
41.50	41.95	SPT-28	94	32																			
43.00	43.30	DS-14																					
43.50	43.95	SPT-29	96	32			0	90	10	0													
44.50	44.95	SPT-30	99	32																			
46.00	46.30	DS-15																					
46.50	46.95	SPT-31	99	32																			
47.50	47.93	SPT-32	100/28cm																				
49.00	49.30	DS-16																					
49.50	49.92	SPT-33	100/27cm																				
50.50	50.90	SPT-34	100/25cm																				
52.00	52.30	DS-17																					

* Outside NABL scope.

DS: Direct shear test- Consolidated Drained

UUT: Unconsolidated undrained triaxial shear test



Borehole No.:-18

[illegible]

* Outside NABL scope.

DS: Direct shear test- Consolidated Drained

UUT: Unconsolidated undrained triaxial shear test



BOREHOLE NO: 19

PAGE 1 OF 3

BOREHOLE NO : BH-19			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.190 m							
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m6.70							
CHAINAGE : -			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 45.4 m							
COORDINATES : 800 E, 170 N			CASING DEPTH : 45.00 m			LOGGED BY : Mr. Gaurav							
DATE OF START : 10-Dec-2019			DATE OF FINISH : 11-Dec-2019			CHECKED BY : Ankit Uniyal							
DEPTH (m)	GRAPHICAL LOG	SYMBOL	LAYER DEPTH, m	MATERIAL DESCRIPTION	LAYER ELEVATION, m	SAMPLE NUMBER	SAMPLE DEPTH (m)	SAMPLE TYPE	FIELD N VALUES	▲ FIELD SPT N VALUE ▲			
										20	40	60	80
										PL (%)	MC (%)	LL (%)	
20406080 20406080 ■ FINES CONTENT (%) ■ 20406080													
1		CL	2.00	Very stiff brown clayey silt, low plastic (CL)	191.19	DS-1	0.00 - 0.50						
2						SPT-1	1.00 - 1.45		25				
3		SM	191.19	Medium dense to dense grey silty fine sand with traces of gravel (SM)	191.19	UDS-1	2.00 - 2.30						
4													
5						- medium dense, 2.0 to 11.5 m	SPT-2	3.00 - 3.45		12			
6							UDS-2	4.00 - 4.30					
7							SPT-3	5.00 - 5.45		14			
8							UDS-3	6.00 - 6.30					
9							SPT-4	7.00 - 7.45		17			
10							UDS-4	8.00 - 8.30					
11							SPT-5	9.00 - 9.45		19			
12							DS-2	10.00 - 10.30					
13							SPT-6	10.50 - 10.95		25			
14							SPT-7	11.50 - 11.95		32			
15							DS-3	13.00 - 13.30					
16							SPT-8	13.50 - 13.95		37			
17							SPT-9	14.50 - 14.95		21			

PL - PLASTIC LIMIT
LL - LIQUID LIMIT
MC - MOISTURE CONTENT

Ground Water
Table

DISTURBED SAMPLE
(DS)

Standard Penetration
Test (SPT)

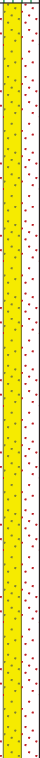
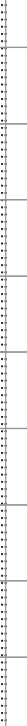
UNDISTURBED
SAMPLE (UDS)

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BOREHOLE NO: 19

PAGE 2 OF 3

BOREHOLE NO : BH-19			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.190 m							
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 6.70							
CHAINAGE : -			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 45.4 m							
COORDINATES : 800 E, 170 N			CASING DEPTH : 45.00 m			LOGGED BY : Mr. Gaurav							
DATE OF START : 10-Dec-2019			DATE OF FINISH : 11-Dec-2019			CHECKED BY : Ankit Uniyal							
DEPTH (m)	GRAPHICAL LOG	SYMBOL	LAYER DEPTH, m	MATERIAL DESCRIPTION	LAYER ELEVATION, m	SAMPLE NUMBER	SAMPLE DEPTH (m)	SAMPLE TYPE	FIELD N VALUES	FIELD SPT N VALUE ▲			
										20 40 60 80			
										PL (%) MC (%) LL (%) 20 40 60 80			
■ FINES CONTENT (%) ■													
17		SM	Dense grey silty fine sand (SM)	- dense, 19.5 to 20.5 m	172.69	DS-4	16.00 - 16.30						
SPT-10						16.50 - 16.95		24					
SPT-11						17.50 - 17.95		30					
DS-5						19.00 - 19.30							
20						SPT-12	19.50 - 19.95		35				
21	CL	Very stiff brown clayey silt, low plastic (CL)	171.19	SPT-13	20.50 - 20.95		25						
22													
23		SP-SM	Dense to very dense grey fine sand (SP-SM) - dense, 22.0 to 26.5 m - very dense, 26.5 to 45.45 m		171.19	DS-6	22.00 - 22.30						
SPT-14						22.50 - 22.95		39					
SPT-15						23.50 - 23.95		42					
DS-7						25.00 - 25.30							
SPT-16						25.50 - 25.95		49					
SPT-17						26.50 - 26.95		56					
DS-8						28.00 - 28.30							
SPT-18						28.50 - 28.95		66					
SPT-19						29.50 - 29.95		68					
DS-9						31.00 - 31.30							
SPT-20						31.50 - 31.95		72					

PL - PLASTIC LIMIT
LL - LIQUID LIMIT
MC - MOISTURE CONTENT

Ground Water
Table

DISTURBED SAMPLE
(DS)

Standard Penetration
Test (SPT)

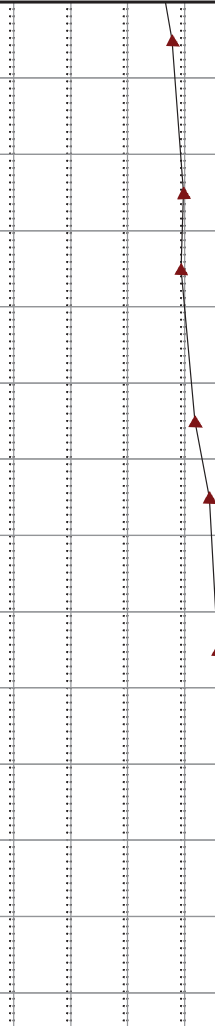
UNDISTURBED
SAMPLE (UDS)

(Continued Next Page)



BOREHOLE NO: 19

PAGE 3 OF 3

BOREHOLE NO : BH-19				BORING METHOD : Shell and Auger				GROUND ELEVATION : RL 193.190 m					
STRUCTURE: STG				SPT HAMMER USED : Automatic Trip				GROUND WATER DEPTH, m6.70					
CHAINAGE : -				BOREHOLE DIAMETER 150mm				TERMINATION DEPTH : 45.4 m					
COORDINATES : 800 E, 170 N				CASING DEPTH : 45.00 m				LOGGED BY : Mr. Gaurav					
DATE OF START : 10-Dec-2019				DATE OF FINISH : 11-Dec-2019				CHECKED BY : Ankit Uniyal					
DEPTH (m)	GRAPHICAL LOG	SYMBOL	LAYER DEPTH, m	MATERIAL DESCRIPTION	LAYER ELEVATION, m	SAMPLE NUMBER	SAMPLE DEPTH (m)	SAMPLE TYPE	FIELD N VALUES	▲ FIELD SPT N VALUE ▲			
										20 40 60 80			
										PL (%) MC (%) LL (%)			
										20 40 60 80			
■ FINES CONTENT (%) ■													
20 40 60 80													
33		SP-SM	Very dense grey fine sand (SP-SM)	147.79	SPT-21	32.50 - 32.95		77					
34					DS-10	34.00 - 34.30							
35					SPT-22	34.50 - 34.95		81					
36					SPT-23	35.50 - 35.95		80					
37					DS-11	37.00 - 37.30							
38					SPT-24	37.50 - 37.95		85					
39					SPT-25	38.50 - 38.95		90					
40					DS-12	40.00 - 40.30							
41					SPT-26	40.50 - 40.95		93					
42					SPT-27	41.50 - 41.95		98					
43					DS-13	42.00 - 42.30							
43					SPT-28	42.50 - 42.95		99					
44					SPT-29	43.50 - 43.92		102/ 27cm					
45													
						45.40	Termination at 45.40 meters Depth.	147.79		SPT-30	45.00 - 45.40		103/ 25cm

PL - PLASTIC LIMIT
LL - LIQUID LIMIT
MC - MOISTURE CONTENT

Ground Water
Table

DISTURBED SAMPLE
(DS)

Standard Penetration
Test (SPT)

UNDISTURBED
SAMPLE (UDS)



Borehole No.:-19

SUMMARY OF LABORATORY TEST RESULTS

Depth, m		Sample Type	Field Value N*	Corrected Value N**	SOIL DESCRIPTION	Strata Break	Grain Size Analysis				Liquid Limit, %	Plastic Limit, %	Plasticity Index, %	Shrinkage Limit, %	Specific Gravity	Free Swell Index, %	Bulk Density ₃ gms/cm ³	Moisture Content, %	Dry Density ₃ g/cm ³	Shear Strength Parameters			
From	To						Gravel (%)	Sand (%)	Silt (%)	Clay (%)										Type of test	Confining Pressure ₃ kg/cm ²	C _u kg/cm ²	Degree ϕ
0.00	0.50	DS-1			Very stiff brown clayey silt, low plastic (CL)																		
1.00	1.45	SPT-1	25	25		2.00					33.6	22.0	11.7	10.0									
2.00	2.30	UDS-1			Medium dense to dense grey silty fine sand with traces of gravel (SM)		0	70	28	2						1.75	13.5	1.54					
3.00	3.45	SPT-2	12	14	14 - medium dense, 2.0 to 11.5 m																		
4.00	4.30	UDS-2															1.78	14.7	1.55				
5.00	5.45	SPT-3	14	15																			
6.00	6.30	UDS-3															1.81	15.3	1.57				
7.00	7.45	SPT-4	17	16																			
8.00	8.30	UDS-4															1.84	15.9	1.59				
9.00	9.45	SPT-5	19	16																			
10.00	10.30	DS-2																					
10.50	10.95	SPT-6	25	19																			
11.50	11.95	SPT-7	32	21	21 - dense, 11.5 to 14.5 m																		
13.00	13.30	DS-3																					
13.50	13.95	SPT-8	37	23	23 - with gravel, 13.5 to 14.5 m		12	59	27	2													
14.50	14.95	SPT-9	21	16	16 - medium dense, 14.5 to 19.5 m																		
16.00	16.30	DS-4																					
16.50	16.95	SPT-10	24	17																			

* Outside NABL scope.

DS: Direct shear test- Consolidated Drained

UUT: Unconsolidated undrained triaxial shear test



Borehole No.:-19

SUMMARY OF LABORATORY TEST RESULTS

Depth, m		Sample Type	Field Value N*	Corrected Value N**	SOIL DESCRIPTION	Strata Break	Grain Size Analysis				Liquid Limit, %	Plastic Limit, %	Plasticity Index, %	Shrinkage Limit, %	Specific Gravity	Free Swell Index, %	Bulk Density ₃ gms/cm ³	Moisture Content, %	Dry Density ₃ g/cm ³	Type of test	Confining Pressure ₃ kg/cm ²	C _u kg/cm ²	Degree ϕ
From	To						Gravel (%)	Sand (%)	Silt (%)	Clay (%)													
17.50	17.95	SPT-11	30	19	Dense grey silty fine sand (SM)																		
19.00	19.30	DS-5																					
19.50	19.95	SPT-12	35	21	- dense, 19.5 to 20.5 m	20.50																	
20.50	20.95	SPT-13	25	25	Very stiff brown clayey silt, low plastic (CL)	22.00					26.6	16.5	10.1										
22.00	22.30	DS-6			Dense to very dense grey fine sand (SP-SM)																		
22.50	22.95	SPT-14	39	21	- dense, 22.0 to 26.5 m		3	90	7	0													
23.50	23.95	SPT-15	42	22																			
25.00	25.30	DS-7																					
25.50	25.95	SPT-16	49	24																			
26.50	26.95	SPT-17	56	26	- very dense, 26.5 to 45.45 m																		
28.00	28.30	DS-8																					
28.50	28.95	SPT-18	66	29																			
29.50	29.95	SPT-19	68	29																			
31.00	31.30	DS-9																					
31.50	31.95	SPT-20	72	29			0	95	5	0													
32.50	32.95	SPT-21	77	31																			
34.00	34.30	DS-10																					
34.50	34.95	SPT-22	81	31																			

* Outside NABL scope.

DS: Direct shear test- Consolidated Drained

UUT: Unconsolidated undrained triaxial shear test



SUMMARY OF LABORATORY TEST RESULTS

[illegible]

UUT: Unconsolidated undrained triaxial shear test



BOREHOLE NO: 20

PAGE 1 OF 3

BOREHOLE NO : BH-20			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.070 m					
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 6.80					
CHAINAGE :			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 45.45 m					
COORDINATES : 815 E, 185 N			CASING DEPTH : 45.00 m			LOGGED BY : Mr. Gaurav					
DATE OF START : 11-Dec-2019			DATE OF FINISH : 14-Dec-2019			CHECKED BY : Ankit Uniyal					
DEPTH (m)	GRAPHICAL LOG	SYMBOL	MATERIAL DESCRIPTION	LAYER ELEVATION, m	SAMPLE NUMBER	SAMPLE DEPTH (m)	SAMPLE TYPE	FIELD N VALUES	FIELD SPT N VALUE ▲		
									20 40 60 80		
									PL (%)	MC (%)	LL (%)
20 40 60 80 ■ FINES CONTENT (%) ■ 20 40 60 80											
1		CL	Very stiff brown clayey silt, low plastic (CL)		DS-1	0.00 - 0.50					
					SPT-1	1.00 - 1.45		23			
2						UDS-1	2.00 - 2.30				
3			3.00	190.07							
4		SM	Medium dense to dense grey silty fine sand (SM) - medium dense, 3.0 to 14.5 m <								

PL - PLASTIC LIMIT
LL - LIQUID LIMIT
MC - MOISTURE CONTENT

Ground Water
Table

DISTURBED SAMPLE
(DS)

Standard Penetration
Test (SPT)

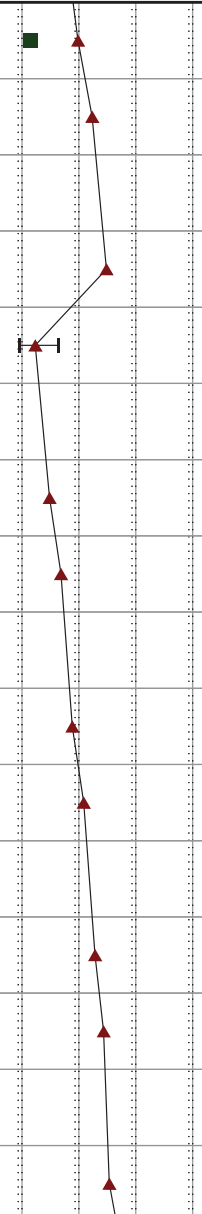
UNDISTURBED
SAMPLE (UDS)

(Continued Next Page)



BOREHOLE NO: 20

PAGE 2 OF 3

BOREHOLE NO : BH-20			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.070 m						
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 6.80						
CHAINAGE :			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 45.45 m						
COORDINATES : 815 E, 185 N			CASING DEPTH : 45.00 m			LOGGED BY : Mr. Gaurav						
DATE OF START : 11-Dec-2019			DATE OF FINISH : 14-Dec-2019			CHECKED BY : Ankit Uniyal						
DEPTH (m)	GRAPHICAL LOG	SYMBOL	LAYER DEPTH, m	MATERIAL DESCRIPTION	LAYER ELEVATION, m	SAMPLE NUMBER	SAMPLE DEPTH (m)	SAMPLE TYPE	FIELD N VALUES	▲ FIELD SPT N VALUE ▲		
										20 40 60 80		
										PL (%) MC (%) LL (%)		
										20 40 60 80		
■ FINES CONTENT (%) ■												
20 40 60 80												
17		SM	Dense to very dense grey silty fine sand (SM) - dense, 17.5 to 19.0 m - very dense, 190 to 20.5 m			DS-4	16.00 - 16.30					
SPT-10						16.50 - 16.95		41				
SPT-11						17.50 - 17.95		46				
DS-5						19.00 - 19.30						
20		CL	Very stiff brown clayey silt, low plastic (CL)			SPT-12	19.50 - 19.95		51			
20.50												
SPT-13						20.50 - 20.95		26				
22		SP-SM	Medium dense to very dense grey fine sand (SP-SM) - dense, 22.0 to 29.5 m			DS-6	22.00 - 22.30					
22.00												
SPT-14						22.50 - 22.95		31				
SPT-15						23.50 - 23.95		35				
DS-7						25.00 - 25.30						
SPT-16						25.50 - 25.95		39				
SPT-17						26.50 - 26.95		43				
DS-8						28.00 - 28.30						
29						SPT-18	28.50 - 28.95		47			
SPT-19						29.50 - 29.95		50				
30			- very dense, 29.5 to 35.5 m			DS-9	31.00 - 31.30					
SPT-20						31.50 - 31.95		52				

PL - PLASTIC LIMIT
LL - LIQUID LIMIT
MC - MOISTURE CONTENT

Ground Water
Table

DISTURBED SAMPLE
(DS)

Standard Penetration
Test (SPT)

UNDISTURBED
SAMPLE (UDS)

(Continued Next Page)



BOREHOLE NO: 20

PAGE 3 OF 3

BOREHOLE NO : BH-20			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.070 m						
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 6.80						
CHAINAGE :			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 45.45 m						
COORDINATES : 815 E, 185 N			CASING DEPTH : 45.00 m			LOGGED BY : Mr. Gaurav						
DATE OF START : 11-Dec-2019			DATE OF FINISH : 14-Dec-2019			CHECKED BY : Ankit Uniyal						
DEPTH (m)	GRAPHICAL LOG	SYMBOL	LAYER DEPTH, m	MATERIAL DESCRIPTION	LAYER ELEVATION, m	SAMPLE NUMBER	SAMPLE DEPTH (m)	SAMPLE TYPE	FIELD N VALUES	▲ FIELD SPT N VALUE ▲		
										20 40 60 80		
										PL (%) MC (%) LL (%)		
										■ FINES CONTENT (%) ■		
										20 40 60 80		
33		SP-SM				SPT-21	32.50 - 32.95		57			
34						DS-10	34.00 - 34.30					
35						SPT-22	34.50 - 34.95		64			
36		SM	35.50	Very dense grey silty fine sand with traces of gravels (SM)	157.57	SPT-23	35.50 - 35.95		80			
37						DS-11	37.00 - 37.30					
38						SPT-24	37.50 - 37.95		83			
39						SPT-25	38.50 - 38.95		86			
40						DS-12	40.00 - 40.30					
41						SPT-26	40.50 - 40.95		89			
42						SPT-27	41.50 - 41.95		94			
43						DS-13	43.00 - 43.30					
44						SPT-28	43.50 - 43.95		98			
45					45.45		147.62	SPT-29	45.00 - 45.45		100	
				Termination at 45.45 meters Depth.								

PL - PLASTIC LIMIT
LL - LIQUID LIMIT
MC - MOISTURE CONTENT

Ground Water
Table

DISTURBED SAMPLE
(DS)

Standard Penetration
Test (SPT)

UNDISTURBED
SAMPLE (UDS)



Borehole No.:-20

SUMMARY OF LABORATORY TEST RESULTS

Depth, m	To From	Sample Type	Field Value N*	Corrected Value N**	SOIL DESCRIPTION	Strata Break	Grain Size Analysis				Liquid Limit, %	Plastic Limit, %	Plasticity Index, %	Shrinkage Limit, %	Specific Gravity	Free Swell Index, %	Bulk Density ₃ gms/cm ³	Moisture Content, %	Dry Density, g/cm ³	Shear Strength Parameters			Degree ϕ
							Gravel (%)	Sand (%)	Silt (%)	Clay (%)										Type of test	Confining Pressure kg/cm ²	c_u kg/cm ²	
0.00	0.50	DS-1			Very stiff brown clayey silt, low plastic (CL)																		
1.00	1.45	SPT-1	23	23							32.8	19.0	13.8	16.0									
2.00	2.30	UDS-1				3.00											1.72	7.0	1.61	DS	0.5,1,1.5	0.0	31.6
3.00	3.45	SPT-2	10	12	Medium dense to dense grey silty fine sand (SM)																		
4.00	4.30	UDS-2			- medium dense, 3.0 to 14.5 m												1.76	13.0	1.56				
5.00	5.45	SPT-3	20	21			0	80	20	0													
6.00	6.30	UDS-3															1.84	15.9	1.59				
7.00	7.45	SPT-4	26	20											2.65								
8.00	8.30	UDS-4																					
9.00	9.45	SPT-5	20	17																			
10.00	10.30	DS-2																					
10.50	10.95	SPT-6	25	19																			
11.50	11.95	SPT-7	27	19																			
13.00	13.30	DS-3																					
13.50	13.95	SPT-8	29	20																			
14.50	14.95	SPT-9	34	21	- dense, 14.5 to 20.5 m																		
16.00	16.30	DS-4																					
16.50	16.95	SPT-10	41	24			5	72	23	0													

* Outside NABL scope.

DS: Direct shear test- Consolidated Drained

UUT: Unconsolidated undrained triaxial shear test



Borehole No.:-20

SUMMARY OF LABORATORY TEST RESULTS

Depth, m		Sample Type	Field Value N*	Corrected Value N**	SOIL DESCRIPTION	Strata Break	Grain Size Analysis				Liquid Limit, %	Plastic Limit, %	Plasticity Index, %	Shrinkage Limit, %	Specific Gravity	Free Swell Index, %	Bulk Density ₃ g/cm ³	Moisture Content, %	Dry Density ₃ g/cm ³	Shear Strength Parameters			Degree ϕ
From	To						Gravel (%)	Sand (%)	Silt (%)	Clay (%)										Type of test	Confining Pressure ₃ kg/cm ²	c_u kg/cm ²	
17.50	17.95	SPT-11	46	25	Dense to very dense grey silty fine sand (SM)																		
19.00	19.30	DS-5			- dense, 17.5 to 19.0 m																		
19.50	19.95	SPT-12	51	26	- very dense, 190 to 20.5 m	20.50																	
20.50	20.95	SPT-13	26	26	Very stiff brown clayey silt, low plastic (CL)	22.00																	
22.00	22.30	DS-6			Medium dense to very dense grey fine sand (SP-SM)																		
22.50	22.95	SPT-14	31	18	- dense, 22.0 to 29.5 m																		
23.50	23.95	SPT-15	35	20																			
25.00	25.30	DS-7																					
25.50	25.95	SPT-16	39	21																			
26.50	26.95	SPT-17	43	22																			
28.00	28.30	DS-8																					
28.50	28.95	SPT-18	47	22																			
29.50	29.95	SPT-19	50	23	- very dense, 29.5 to 35.5 m																		
31.00	31.30	DS-9																					
31.50	31.95	SPT-20	52	23																			
32.50	32.95	SPT-21	57	25																			
34.00	34.30	DS-10																					
34.50	34.95	SPT-22	64	26		35.50																	

* Outside NABL scope.

DS: Direct shear test- Consolidated Drained

UUT: Unconsolidated undrained triaxial shear test



Borehole No.:-20

SUMMARY OF LABORATORY TEST RESULTS

Depth, m		Sample Type	Field N**	Corrected Value N**	SOIL DESCRIPTION	Strata Break	Grain Size Analysis				Liquid Limit, %	Plastic Limit, %	Plasticity Index, %	Shrinkage Limit, %	Specific Gravity	Free Swell Index, %	Bulk Density ₃ gms/cm ³	Moisture Content, %	Dry Density ₃ g/cm ³	Shear Strength Parameters						
From	To						Gravel (%)	Sand (%)	Silt (%)	Clay (%)										Type of test	Confining Pressure ₂ kg/cm ²	C ₂ kg/cm ²	Degree ϕ			
35.50	35.95	SPT-23	80	30	Very dense grey silty fine sand with traces of gravels (SM)																					
37.00	37.30	DS-11																								
37.50	37.95	SPT-24	83	31					1	68	29	2														
38.50	38.95	SPT-25	86	31																						
40.00	40.30	DS-12																								
40.50	40.95	SPT-26	89	31																						
41.50	41.95	SPT-27	94	32																						
43.00	43.30	DS-13																								
43.50	43.95	SPT-28	98	32				45.45																		
45.00	45.45	SPT-29	100	32																						

* Outside NABL scope.

DS: Direct shear test- Consolidated Drained

UUT: Unconsolidated undrained triaxial shear test



BOREHOLE NO: 21

PAGE 1 OF 3

BOREHOLE NO : BH-21			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.400 m									
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 6.35									
CHAINAGE :			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 45.45 m									
COORDINATES : 841 E, 170 N			CASING DEPTH : 45.00 m			LOGGED BY : Mr. Gaurav									
DATE OF START : 14-Dec-2019			DATE OF FINISH : 15-Dec-2019			CHECKED BY : Ankit Uniyal									
DEPTH (m)	GRAPHICAL LOG	SYMBOL	LAYER DEPTH, m	MATERIAL DESCRIPTION	LAYER ELEVATION, m	SAMPLE NUMBER	SAMPLE DEPTH (m)	SAMPLE TYPE	FIELD N VALUES	▲ FIELD SPT N VALUE ▲					
										20	40	60	80		
										PL (%) MC (%) LL (%)					
									20	40	60	80			
									■ FINES CONTENT (%) ■			20	40	60	80
1		CL	3.00	Very stiff brown clayey silt, low plastic (CL)	190.40	DS-1	0.00 - 0.50								
						SPT-1	1.00 - 1.45		22						
2							UDS-1	2.00 - 2.30							
3		SM	3.00	Medium desne to dense grey silty fine sand (SM) - medium dense, 3.0 to 14.5 m	190.40	SPT-2	3.00 - 3.45		16						
4							UDS-2	4.00 - 4.30							
5							SPT-3	5.00 - 5.45							14
6							DS-2	6.00 - 6.30							
7							SPT-4	7.00 - 7.45							17
8							DS-3	8.00 - 8.30							
9							SPT-5	9.00 - 9.45							19
10							DS-4	10.00 - 10.30							
11							SPT-6	10.50 - 10.95							21
12							SPT-7	11.50 - 11.95							24
13							DS-5	13.00 - 13.30							
14							SPT-8	13.50 - 13.95							28
15							SPT-9	14.50 - 14.95							34
16															
				- dense, 14.5 to 20.5 m											

PL - PLASTIC LIMIT
LL - LIQUID LIMIT
MC - MOISTURE CONTENT

Ground Water Table

DISTURBED SAMPLE (DS)

Standard Penetration Test (SPT)

UNDISTURBED SAMPLE (UDS)

(Continued Next Page)



BOREHOLE NO: 21

PAGE 2 OF 3

BOREHOLE NO : BH-21			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.400 m					
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 6.35					
CHAINAGE :			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 45.45 m					
COORDINATES : 841 E, 170 N			CASING DEPTH : 45.00 m			LOGGED BY : Mr. Gaurav					
DATE OF START : 14-Dec-2019			DATE OF FINISH : 15-Dec-2019			CHECKED BY : Ankit Uniyal					
DEPTH (m)	GRAPHICAL LOG	SYMBOL	LAYER DEPTH, m	MATERIAL DESCRIPTION	LAYER ELEVATION, m	SAMPLE NUMBER	SAMPLE DEPTH (m)	SAMPLE TYPE	FIELD N VALUES	▲ FIELD SPT N VALUE ▲ 20 40 60 80 PL (%) MC (%) LL (%) 20 40 60 80 ■ FINES CONTENT (%) ■ 20 40 60 80	
17		SM	Dense grey silty fine sand (SM)	- with traces of gravel, 17.5 to 19.0 m	172.90	DS-6	16.00 - 16.30				
						SPT-10	16.50 - 16.95		31		
18							SPT-11	17.50 - 17.95			40
19											
20							SPT-12	19.50 - 19.95			37
21											
22		CL	Very stiff to hard brown clayey silt, low plsatic (CL)	- very stiff, 20.5 to 22.5 m	169.90	SPT-13	20.50 - 20.95		24		
23											
						DS-8	22.00 - 22.30				
24		SP-SM	Dense to very dense grey fine sand with traces of gravel, (SP-SM)	- dense, 23.5 to 28.5 m		SPT-14	22.50 - 22.95		44		
25											
26							SPT-15	23.50 - 23.95		49	
27											
28							DS-9	25.00 - 25.30			
29							SPT-16	25.50 - 25.95		39	
30											
31							SPT-17	26.50 - 26.95		48	
32											
							DS-10	28.00 - 28.30			
		SPT-18	28.50 - 28.95		52						
		SPT-19	29.50 - 29.95		60						
		DS-11	31.00 - 31.30								
		SPT-20	31.50 - 31.95		71						

PL - PLASTIC LIMIT
LL - LIQUID LIMIT
MC - MOISTURE CONTENT

Ground Water
Table

DISTURBED SAMPLE
(DS)

Standard Penetration
Test (SPT)

UNDISTURBED
SAMPLE (UDS)

(Continued Next Page)



BOREHOLE NO: 21

PAGE 3 OF 3

BOREHOLE NO : BH-21			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.400 m						
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 6.35						
CHAINAGE :			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 45.45 m						
COORDINATES : 841 E, 170 N			CASING DEPTH : 45.00 m			LOGGED BY : Mr. Gaurav						
DATE OF START : 14-Dec-2019			DATE OF FINISH : 15-Dec-2019			CHECKED BY : Ankit Uniyal						
DEPTH (m)	GRAPHICAL LOG	SYMBOL	LAYER DEPTH, m	MATERIAL DESCRIPTION	LAYER ELEVATION, m	SAMPLE NUMBER	SAMPLE DEPTH (m)	SAMPLE TYPE	FIELD N VALUES	▲ FIELD SPT N VALUE ▲		
										20 40 60 80		
										PL (%) MC (%) LL (%) 20 40 60 80		
										■ FINES CONTENT (%) ■		
										20 40 60 80		
33		SP-SM	- dense, 32.5 to 35.5 m	Very dense grey fine sand (SP-SM)	155.90	SPT-21	32.50 - 32.95		31			
34						DS-12	34.00 - 34.30					
35						SPT-22	34.50 - 34.95		50			
36						SPT-23	35.50 - 35.95		55			
37						DS-13	37.00 - 37.30					
38		SM	- with gravel, 37.5 to 38.5 m	Very dense grey silty fine sand (SM)	147.95	SPT-24	37.50 - 37.95		73			
39						SPT-25	38.50 - 38.95		70			
40						DS-14	40.00 - 40.30					
41						SPT-26	40.50 - 40.95		85			
42						SPT-27	41.50 - 41.95		89			
43						DS-15	43.00 - 43.30					
44						SPT-28	43.50 - 43.95		82			
45						SPT-29	45.00 - 45.45		89			
			Termination at 45.45 meters Depth.									

PL - PLASTIC LIMIT
LL - LIQUID LIMIT
MC - MOISTURE CONTENT

Ground Water
Table

DISTURBED SAMPLE
(DS)

Standard Penetration
Test (SPT)

UNDISTURBED
SAMPLE (UDS)



Borehole No.:-21
SUMMARY OF LABORATORY TEST RESULTS

Depth, m		Sample Type	Field Value N**	Corrected Value N**	SOIL DESCRIPTION	Strata Break	Grain Size Analysis				Liquid Limit, %	Plastic Limit, %	Plasticity Index, %	Shrinkage Limit, %	Specific Gravity	Free Swell Index, %	Bulk Density ₃ gms/cm ³	Moisture Content, %	Dry Density ₃ g/cm ³	Shear Strength Parameters			Degree ϕ	
From	To						Gravel (%)	Sand (%)	Silt (%)	Clay (%)										Type of test	Confining Pressure kg/cm ²	C _u kg/cm ²		
0.00	0.50	DS-1			Very stiff brown clayey silt, low plastic (CL)																			
1.00	1.45	SPT-1	22	22							32.3	14.8	17.4	17.0										
2.00	2.30	UDS-1				3.00											1.75	8.5	1.61					
3.00	3.45	SPT-2	16	19	Medium desne to dense grey silty fine sand (SM)										2.66									
4.00	4.30	UDS-2			- medium dense, 3.0 to 14.5 m												1.80	16.3	1.55					
5.00	5.45	SPT-3	14	15			0	57	42	1														
6.00	6.30	DS-2															1.88	20.6	1.56					
7.00	7.45	SPT-4	17	16																				
8.00	8.30	DS-3																						
9.00	9.45	SPT-5	19	16																				
10.00	10.30	DS-4																						
10.50	10.95	SPT-6	21	17																				
11.50	11.95	SPT-7	24	18																				
13.00	13.30	DS-5																						
13.50	13.95	SPT-8	28	19																				
14.50	14.95	SPT-9	34	21	- dense, 14.5 to 20.5 m																			
16.00	16.30	DS-6																						
16.50	16.95	SPT-10	31	20																				

* Outside NABL scope.

DS: Direct shear test- Consolidated Drained

UUT: Unconsolidated undrained triaxial shear test



Borehole No.:-21

SUMMARY OF LABORATORY TEST RESULTS

Depth, m		Sample Type	Field Value N*	Corrected Value N**	SOIL DESCRIPTION	Strata Break	Grain Size Analysis				Liquid Limit, %	Plastic Limit, %	Plasticity Index, %	Shrinkage Limit, %	Specific Gravity	Free Swell Index, %	Bulk Density, g/cm ³	Moisture Content, %	Dry Density, g/cm ³	Type of test	Confining Pressure, kg/cm ²	C _u , kg/cm ²	Degree ϕ
From	To						Gravel (%)	Sand (%)	Silt (%)	Clay (%)													
17.50	17.95	SPT-11	40	23	Dense grey silty fine sand (SM)		1	79	20	0													
19.00	19.30	DS-7			- with traces of gravel, 17.5 to 19.0 m																		
19.50	19.95	SPT-12	37	21		20.50																	
20.50	20.95	SPT-13	24	24	Very stiff to hard brown clayey silt, low plastic (CL)						27.0	13.6	13.4										
22.00	22.30	DS-8			- very stiff, 20.5 to 22.5 m						28.1	19.9	8.2										
22.50	22.95	SPT-14	44	44	- hard, 22.5 to 23.5 m	23.50					31.6	19.4	12.2										
23.50	23.95	SPT-15	49	25	Dense to very dense grey fine sand with traces of gravel, (SP-SM)																		
25.00	25.30	DS-9			- dense, 23.5 to 28.5 m																		
25.50	25.95	SPT-16	39	21																			
26.50	26.95	SPT-17	48	23																			
28.00	28.30	DS-10																					
28.50	28.95	SPT-18	52	24	- very dense, 28.5 to 32.5 m																		
29.50	29.95	SPT-19	60	26			0	90	10	0													
31.00	31.30	DS-11																					
31.50	31.95	SPT-20	71	29																			
32.50	32.95	SPT-21	31	17	- dense, 32.5 to 35.5 m																		
34.00	34.30	DS-12																					
34.50	34.95	SPT-22	50	22																			

* Outside NABL scope.

DS: Direct shear test- Consolidated Drained

UUT: Unconsolidated undrained triaxial shear test



CENGRS

Borehole No.:-21

SUMMARY OF LABORATORY TEST RESULTS

Depth, m		Sample Type	Field Value N*	Corrected Value N**	SOIL DESCRIPTION	Strata Break	Grain Size Analysis				Liquid Limit, %	Plastic Limit, %	Plasticity Index, %	Shrinkage Limit, %	Specific Gravity	Free Swell Index, %	Bulk Density ₃ gms/cm ³	Moisture Content, %	Dry Density, g/cm ³	Shear Strength Parameters					
From	To						Gravel (%)	Sand (%)	Silt (%)	Clay (%)										Type of test	Confining Pressure kg/cm ²	c _v kg/cm ²	Degree ϕ		
35.50	35.95	SPT-23	55	23	Very dense grey fine sand (SP-SM)	37.50																			
37.00	37.30	DS-13																							
37.50	37.95	SPT-24	73	28			Very dense grey silty fine sand (SM)	13	67	19	1														
38.50	38.95	SPT-25	70	27	- with gravel, 37.5 to 38.5 m																				
40.00	40.30	DS-14																							
40.50	40.95	SPT-26	85	30																					
41.50	41.95	SPT-27	89	31																					
43.00	43.30	DS-15																							
43.50	43.95	SPT-28	82	28																					
45.00	45.45	SPT-29	89	30		45.45																			

* Outside NABL scope.

DS: Direct shear test- Consolidated Drained

UUT: Unconsolidated undrained triaxial shear test



BOREHOLE NO: 22

PAGE 1 OF 3

BOREHOLE NO : BH-22			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.060 m							
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 7.10							
CHAINAGE :			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 45.4 m							
COORDINATES : 880 E, 170 N			CASING DEPTH : 45.00 m			LOGGED BY : Mr. Gaurav							
DATE OF START : 18-Dec-2019			DATE OF FINISH : 19-Dec-2019			CHECKED BY : Ankit Uniyal							
DEPTH (m)	GRAPHICAL LOG	SYMBOL	MATERIAL DESCRIPTION	LAYER ELEVATION, m	SAMPLE NUMBER	SAMPLE DEPTH (m)	SAMPLE TYPE	FIELD N VALUES	FIELD SPT N VALUE ▲				
									20 40 60 80				
									PL (%)	MC (%)	LL (%)		
									20	40	60	80	
									■ FINES CONTENT (%) ■				
									20	40	60	80	
1		CL	Very stiff brown clayey silt, low plastic (CL)	190.06	DS-1	0.00 - 0.50		19					
2					SPT-1	1.00 - 1.45							
3					UDS-1	2.00 - 2.30							
4		SM	Medium dense grey silty fine sand with traces of gravel, (SM)	190.06	SPT-2	3.00 - 3.45		17					
5					UDS-2	4.00 - 4.30							
6					SPT-3	5.00 - 5.45							17
7					UDS-3	6.00 - 6.30							
8					SPT-4	7.00 - 7.45							14
9					UDS-4	8.00 - 8.30							
10					SPT-5	9.00 - 9.45							19
11					DS-2	10.00 - 10.30							
12					SPT-6	10.50 - 10.95							23
13					DS-3	13.00 - 13.30							
14					SPT-7	13.50 - 13.95							28
15					SPT-8	14.50 - 14.95							
16													

PL - PLASTIC LIMIT
LL - LIQUID LIMIT
MC - MOISTURE CONTENT

Ground Water
Table

DISTURBED SAMPLE
(DS)

Standard Penetration
Test (SPT)

UNDISTURBED
SAMPLE (UDS)

(Continued Next Page)



BOREHOLE NO: 22

PAGE 2 OF 3

BOREHOLE NO : BH-22			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.060 m						
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 7.10						
CHAINAGE :			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 45.4 m						
COORDINATES : 880 E, 170 N			CASING DEPTH : 45.00 m			LOGGED BY : Mr. Gaurav						
DATE OF START : 18-Dec-2019			DATE OF FINISH : 19-Dec-2019			CHECKED BY : Ankit Uniyal						
DEPTH (m)	GRAPHICAL LOG	SYMBOL	LAYER DEPTH, m	MATERIAL DESCRIPTION	LAYER ELEVATION, m	SAMPLE NUMBER	SAMPLE DEPTH (m)	SAMPLE TYPE	FIELD N VALUES	▲ FIELD SPT N VALUE ▲		
										20 40 60 80		
										PL (%)	MC (%)	LL (%)
20 40 60 80 PL (%) MC (%) LL (%) 20 40 60 80 ■ FINES CONTENT (%) ■												
		SM	16.50		176.56	DS-4	16.00 - 16.30					
17		SP-SM	16.50 - 35.50	Dense grey fine sand (SP-SM)		SPT-9	16.50 - 16.95		35			
18				- dense, 16.5 to 28.5 m		SPT-10	17.50 - 17.95		38			
19				Dense to medium dense grey fine sand (SP-SM)		DS-5	19.00 - 19.30					
20					- dense, 19.0 to 20.5 m		SPT-11	19.50 - 19.95		40		
21					- medium dense, 20.5 to 22.5		SPT-12	20.50 - 20.95		29		
22				- dense, 22.5 to 28.5 m		DS-6	22.00 - 22.30					
23						SPT-13	22.50 - 22.95		42			
24						SPT-14	23.50 - 23.95		45			
25					DS-7	25.00 - 25.30						
26					SPT-15	25.50 - 25.95		47				
27					SPT-16	26.50 - 26.95		50				
28				- very dense, 28.5 to 35.5 m		DS-8	28.00 - 28.30					
29						SPT-17	28.50 - 28.95		54			
30						SPT-18	29.50 - 29.95		56			
31						DS-9	31.00 - 31.30					
32						SPT-19	31.50 - 31.95		60			

PL - PLASTIC LIMIT
LL - LIQUID LIMIT
MC - MOISTURE CONTENT

Ground Water
Table

DISTURBED SAMPLE
(DS)

Standard Penetration
Test (SPT)

UNDISTURBED
SAMPLE (UDS)

(Continued Next Page)



BOREHOLE NO: 22

PAGE 3 OF 3

BOREHOLE NO : BH-22			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.060 m							
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 7.10							
CHAINAGE :			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 45.4 m							
COORDINATES : 880 E, 170 N			CASING DEPTH : 45.00 m			LOGGED BY : Mr. Gaurav							
DATE OF START : 18-Dec-2019			DATE OF FINISH : 19-Dec-2019			CHECKED BY : Ankit Uniyal							
DEPTH (m)	GRAPHICAL LOG	SYMBOL	LAYER DEPTH, m	MATERIAL DESCRIPTION	LAYER ELEVATION, m	SAMPLE NUMBER	SAMPLE DEPTH (m)	SAMPLE TYPE	FIELD N VALUES	FIELD SPT N VALUE ▲			
										20 40 60 80			
										PL (%) MC (%) LL (%)			
										20 40 60 80			
										■ FINES CONTENT (%) ■			
										20 40 60 80			
33		SP-SM				SPT-20	32.50 - 32.95		63				
34													
35													
36		SM	35.50	Very dense grey silty fine sand with traces of gravels (SM)	157.56	SPT-22	35.50 - 35.95		69				
37													
38													
39													
40													
41													
42													
43													
44													
45													
				</									

PL - PLASTIC LIMIT
LL - LIQUID LIMIT
MC - MOISTURE CONTENT

Ground Water
Table

DISTURBED SAMPLE
(DS)

Standard Penetration
Test (SPT)

UNDISTURBED
SAMPLE (UDS)



Borehole No.:-22

SUMMARY OF LABORATORY TEST RESULTS

Depth, m		Sample Type	Field Value N*	Corrected Value N**	SOIL DESCRIPTION	Strata Break	Grain Size Analysis				Liquid Limit, %	Plastic Limit, %	Plasticity Index, %	Shrinkage Limit, %	Specific Gravity	Free Swell Index, %	Bulk Density ₃ gms/cm ³	Moisture Content, %	Dry Density, g/cm ³	Shear Strength Parameters			Degree ϕ	
From	To						Gravel (%)	Sand (%)	Silt (%)	Clay (%)										Type of test	Confining Pressure kg/cm ²	C _v kg/cm ²		
0.00	0.50	DS-1			Very stiff brown clayey silt, low plastic (CL)																			
1.00	1.45	SPT-1	19	19							30.5	22.0	8.5											
2.00	2.30	UDS-1				3.00											1.90	9.0	1.74					
3.00	3.45	SPT-2	17	20	Medium dense grey silty fine sand with traces of gravel, (SM)																			
4.00	4.30	UDS-2																						
5.00	5.45	SPT-3	17	18			2	78	20	0														
6.00	6.30	UDS-3													2.68		1.98	18.0	1.68					
7.00	7.45	SPT-4	14	13																				
8.00	8.30	UDS-4																						
9.00	9.45	SPT-5	19	16																				
10.00	10.30	DS-2																						
10.50	10.95	SPT-6	23	18																				
13.00	13.30	DS-3																						
13.50	13.95	SPT-7	28	19																				
14.50	14.95	SPT-8	30	20																				
16.00	16.30	DS-4				16.50																		
16.50	16.95	SPT-9	35	21	Dense grey fine sand (SP-SM)		7	85	8	0														
17.50	17.95	SPT-10	38	22	- dense, 16.5 to 28.5 m																			

* Outside NABL scope.

DS: Direct shear test- Consolidated Drained

UUT: Unconsolidated undrained triaxial shear test



Borehole No.:-22

SUMMARY OF LABORATORY TEST RESULTS

Depth, m		Sample Type	Field Value N**	Corrected Value N**	SOIL DESCRIPTION	Strata Break	Grain Size Analysis				Liquid Limit, %	Plastic Limit, %	Plasticity Index, %	Shrinkage Limit, %	Specific Gravity	Free Swell Index, %	Bulk Density ₃ gms/cm ³	Moisture Content, %	Dry Density, g/cm ³	Type of test	Shear Strength Parameters			Degree ϕ
From	To						Gravel (%)	Sand (%)	Silt (%)	Clay (%)											Confining Pressure ₃ kg/cm ²	C _u kg/cm ²	σ_c kg/cm ²	
19.00	19.30	DS-5			Dense to medium dense grey fine sand (SP-SM)																			
19.50	19.95	SPT-11	40	22	- dense, 19.0 to 20.5 m																			
20.50	20.95	SPT-12	29	18	- medium dense, 20.5 to 22.5																			
22.00	22.30	DS-6																						
22.50	22.95	SPT-13	42	22	- dense, 22.5 to 28.5 m																			
23.50	23.95	SPT-14	45	23																				
25.00	25.30	DS-7																						
25.50	25.95	SPT-15	47	23																				
26.50	26.95	SPT-16	50	24																				
28.00	28.30	DS-8																						
28.50	28.95	SPT-17	54	25	- very dense, 28.5 to 35.5 m																			
29.50	29.95	SPT-18	56	25																				
31.00	31.30	DS-9																						
31.50	31.95	SPT-19	60	26																				
32.50	32.95	SPT-20	63	26																				
34.00	34.30	DS-10																						
34.50	34.95	SPT-21	66	27		35.50																		
35.50	35.95	SPT-22	69	27	Very dense grey silty fine sand with traces of gravels (SM)		2	84	14	0														

* Outside NABL scope.

DS: Direct shear test- Consolidated Drained

UUT: Unconsolidated undrained triaxial shear test



Borehole No.:-22

SUMMARY OF LABORATORY TEST RESULTS

Depth, m		Sample Type	Field Value N*	Corrected Value N**	SOIL DESCRIPTION	Strata Break	Grain Size Analysis				Liquid Limit, %	Plastic Limit, %	Plasticity Index, %	Shrinkage Limit, %	Specific Gravity	Free Swell Index, %	Bulk Density, gms/cm ³	Moisture Content, %	Dry Density, g/cm ³	Shear Strength Parameters			Degree ϕ
From	To						Gravel (%)	Sand (%)	Silt (%)	Clay (%)										Type of test	Confining Pressure, kg/cm ²	kg/cm ²	
37.00	37.30	DS-11			Very dense grey silty fine sand (SM)																		
37.50	37.95	SPT-23	72	27																			
38.50	38.95	SPT-24	74	27																			
40.00	40.30	DS-12																					
40.50	40.95	SPT-25	77	28																			
41.50	41.95	SPT-26	79	28																			
43.00	43.30	DS-13																					
43.50	43.95	SPT-27	104	34																			
44.50	44.92	SPT-28	100/27cm																				
45.00	45.40	SPT-29	100/25cm			45.40																	

* Outside NABL scope.

DS: Direct shear test- Consolidated Drained

UUT: Unconsolidated undrained triaxial shear test



BOREHOLE NO: 23

PAGE 1 OF 3

BOREHOLE NO : BH-23			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.010 m								
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 6.95								
CHAINAGE : -			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 45.4 m								
COORDINATES : 920 E, 170 N			CASING DEPTH : 45.00 m			LOGGED BY : Mr. Gaurav								
DATE OF START : 20-Dec-2019			DATE OF FINISH : 21-Dec-2019			CHECKED BY : Ankit Uniyal								
DEPTH (m)	GRAPHICAL LOG	SYMBOL	LAYER DEPTH, m	MATERIAL DESCRIPTION	LAYER ELEVATION, m	SAMPLE NUMBER	SAMPLE DEPTH (m)	SAMPLE TYPE	FIELD N VALUES	▲ FIELD SPT N VALUE ▲				
										20 40 60 80				
										PL (%)	MC (%)	LL (%)		
20 40 60 80 ■ FINES CONTENT (%) ■ 20 40 60 80														
1		CL	2.00	Very stiff brown clayey silt with gravels, low plastic (CL)	191.01	DS-1	0.00 - 0.50		21					
2						SPT-1	1.00 - 1.45							
3		SP-SM	Medium dense to dense grey fine sand (SP-SM) - medium dense, 2.0 to 14.5 m	UDS-1	2.00 - 2.30		13		16					
4												SPT-2	3.00 - 3.45	
5												UDS-2	4.00 - 4.30	
6												SPT-3	5.00 - 5.45	
7												UDS-3	6.00 - 6.30	
8												SPT-4	7.00 - 7.45	
9												UDS-4	8.00 - 8.30	
10												SPT-5	9.00 - 9.45	
11												DS-2	10.00 - 10.30	
12												SPT-6	10.50 - 10.95	
13												SPT-7	11.50 - 11.95	
14												DS-3	13.00 - 13.30	
15												SPT-8	13.50 - 13.95	
16												SPT-9	14.50 - 14.95	

PL - PLASTIC LIMIT
LL - LIQUID LIMIT
MC - MOISTURE CONTENT

Ground Water
Table

DISTURBED SAMPLE
(DS)

Standard Penetration
Test (SPT)

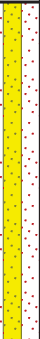
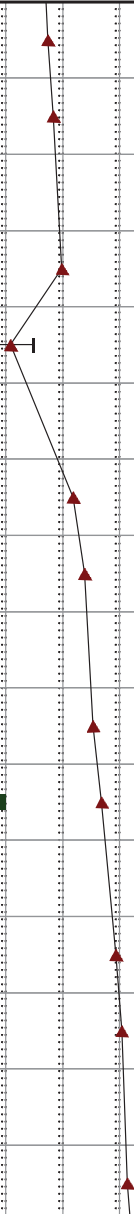
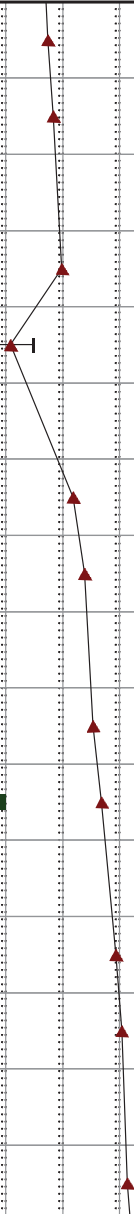
UNDISTURBED
SAMPLE (UDS)

(Continued Next Page)



BOREHOLE NO: 23

PAGE 2 OF 3

BOREHOLE NO : BH-23			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.010 m								
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 6.95								
CHAINAGE : -			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 45.4 m								
COORDINATES : 920 E, 170 N			CASING DEPTH : 45.00 m			LOGGED BY : Mr. Gaurav								
DATE OF START : 20-Dec-2019			DATE OF FINISH : 21-Dec-2019			CHECKED BY : Ankit Uniyal								
DEPTH (m)	GRAPHICAL LOG	SYMBOL	LAYER DEPTH, m	MATERIAL DESCRIPTION	LAYER ELEVATION, m	SAMPLE NUMBER	SAMPLE DEPTH (m)	SAMPLE TYPE	FIELD N VALUES	▲ FIELD SPT N VALUE ▲				
										20 40 60 80				
										PL (%) MC (%) LL (%)				
										20 40 60 80				
										■ FINES CONTENT (%) ■				
										20 40 60 80				
17		SP-SM	16.00 - 17.50	Dense grey fine sand (SP-SM)	172.51	DS-4	16.00 - 16.30		36					
SPT-10						16.50 - 16.95								
SPT-11						17.50 - 17.95								
DS-5						19.00 - 19.30								
SPT-12						19.50 - 19.95								
SPT-13						20.50 - 20.95								
21		CL	172.51 - 22.00	Very stiff brown clayey silt, low plastic (CL)	171.01				23					
22														
23		SM	22.00 - 45.40	Dense to very dense grey silty fine sand (SM) - dense, 22.0 to 25.5 m - very dense, 25.5 to 45.4 m	171.01	DS-6	22.00 - 22.30		45					
SPT-14						22.50 - 22.95								
SPT-15						23.50 - 23.95								
DS-7						25.00 - 25.30								
SPT-16						25.50 - 25.95								
SPT-17						26.50 - 26.95								
DS-8						28.00 - 28.30								
SPT-18						28.50 - 28.95								
SPT-19						29.50 - 29.95								
DS-9						31.00 - 31.30								
SPT-20						31.50 - 31.95								

PL - PLASTIC LIMIT
LL - LIQUID LIMIT
MC - MOISTURE CONTENT

Ground Water
Table

DISTURBED SAMPLE
(DS)

Standard Penetration
Test (SPT)

UNDISTURBED
SAMPLE (UDS)

(Continued Next Page)



BOREHOLE NO: 23

PAGE 3 OF 3

BOREHOLE NO : BH-23			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.010 m						
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 6.95						
CHAINAGE : -			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 45.4 m						
COORDINATES : 920 E, 170 N			CASING DEPTH : 45.00 m			LOGGED BY : Mr. Gaurav						
DATE OF START : 20-Dec-2019			DATE OF FINISH : 21-Dec-2019			CHECKED BY : Ankit Uniyal						
DEPTH (m)	GRAPHICAL LOG	SYMBOL	LAYER DEPTH, m	MATERIAL DESCRIPTION	LAYER ELEVATION, m	SAMPLE NUMBER	SAMPLE DEPTH (m)	SAMPLE TYPE	FIELD N VALUES	▲ FIELD SPT N VALUE ▲		
										20 40 60 80		
										PL (%) MC (%) LL (%)		
										20 40 60 80		
■ FINES CONTENT (%) ■												
20 40 60 80												
33		SM	Very dense grey silty fine sand (SM)	147.61	SPT-21	32.50 - 32.95		66				
34					DS-10	34.00 - 34.30						
35					SPT-22	34.50 - 34.95		71				
36					SPT-23	35.50 - 35.95		75				
37					DS-11	37.00 - 37.30						
38					SPT-24	37.50 - 37.95		80				
39					SPT-25	38.50 - 38.95		85				
40					DS-12	40.00 - 40.30						
41					SPT-26	40.50 - 40.95		93				
42					SPT-27	41.50 - 41.95		96				
43					DS-13	43.00 - 43.30						
44					SPT-28	43.50 - 43.92		100/27cm				
45												

PL - PLASTIC LIMIT
LL - LIQUID LIMIT
MC - MOISTURE CONTENT

Ground Water
Table

DISTURBED SAMPLE
(DS)

Standard Penetration
Test (SPT)

UNDISTURBED
SAMPLE (UDS)



Borehole No.:-23

SUMMARY OF LABORATORY TEST RESULTS

Depth, m		Sample Type	Field Value N*	Corrected Value N**	SOIL DESCRIPTION	Strata Break	Grain Size Analysis				Liquid Limit, %	Plastic Limit, %	Plasticity Index, %	Shrinkage Limit, %	Specific Gravity	Free Swell Index, %	Bulk Density ₃ gms/cm ³	Moisture Content, %	Dry Density ₃ g/cm ³	Shear Strength Parameters			
From	To						Gravel (%)	Sand (%)	Silt (%)	Clay (%)										Type of test	Confining Pressure ₃ kg/cm ²	C _u kg/cm ²	Degree ϕ
0.00	0.50	DS-1			Very stiff brown clayey silt with gravels, low plastic (CL)																		
1.00	1.45	SPT-1	21	21			2.00	11	25	55	9												
2.00	2.30	UDS-1			Medium dense to dense grey fine sand (SP-SM)												1.73	11.5	1.55	DS	0.5,1,1.5	0.0	29.9
3.00	3.45	SPT-2	13	16		- medium dense, 2.0 to 14.5 m																	
4.00	4.30	UDS-2															1.76	12.6	1.56				
5.00	5.45	SPT-3	16	17											2.66								
6.00	6.30	UDS-3															1.79	13.5	1.58				
7.00	7.45	SPT-4	18	16																			
8.00	8.30	UDS-4																					
9.00	9.45	SPT-5	21	17																			
10.00	10.30	DS-2																					
10.50	10.95	SPT-6	24	18																			
11.50	11.95	SPT-7	27	19						0	89	11	0										
13.00	13.30	DS-3																					
13.50	13.95	SPT-8	30	20																			
14.50	14.95	SPT-9	34	21	- dense, 14.5 to 20.5 m																		
16.00	16.30	DS-4																					
16.50	16.95	SPT-10	36	22																			

* Outside NABL scope.

DS: Direct shear test- Consolidated Drained

UUT: Unconsolidated undrained triaxial shear test



Borehole No.:-23

SUMMARY OF LABORATORY TEST RESULTS

Depth, m		Sample Type	Field Value N*	Corrected Value N**	SOIL DESCRIPTION	Strata Break	Grain Size Analysis				Liquid Limit, %	Plastic Limit, %	Plasticity Index, %	Shrinkage Limit, %	Specific Gravity	Free Swell Index, %	Bulk Density ₃ gms/cm ³	Moisture Content, %	Dry Density ₃ g/cm ³	Shear Strength Parameters		
From	To						Gravel (%)	Sand (%)	Silt (%)	Clay (%)										Type of test	Confining Pressure ₃ kg/cm ²	C _u kg/cm ²
17.50	17.95	SPT-11	38	22	Dense grey fine sand (SP-SM)																	
19.00	19.30	DS-5																				
19.50	19.95	SPT-12	41	23		20.50																
20.50	20.95	SPT-13	23	23	Very stiff brown clayey silt, low plastic (CL)	22.00					29.6	14.8	14.8									
22.00	22.30	DS-6			Dense to very dense grey silty fine sand (SM)																	
22.50	22.95	SPT-14	45	23	- dense, 22.0 to 25.5 m																	
23.50	23.95	SPT-15	49	24																		
25.00	25.30	DS-7																				
25.50	25.95	SPT-16	52	25	- very dense, 25.5 to 45.4 m																	
26.50	26.95	SPT-17	55	26			3	80	17	0												
28.00	28.30	DS-8																				
28.50	28.95	SPT-18	60	27																		
29.50	29.95	SPT-19	62	27																		
31.00	31.30	DS-9																				
31.50	31.95	SPT-20	64	27																		
32.50	32.95	SPT-21	66	27			0	80	20	0												
34.00	34.30	DS-10																				
34.50	34.95	SPT-22	71	28																		

* Outside NABL scope.

DS: Direct shear test- Consolidated Drained

UUT: Unconsolidated undrained triaxial shear test



SUMMARY OF LABORATORY TEST RESULTS

[illegible]

UUT: Unconsolidated undrained triaxial shear test



BOREHOLE NO: 24

PAGE 1 OF 4

BOREHOLE NO : BH-24			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.020 m			
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 7.00			
CHAINAGE : -			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 55.4 m			
COORDINATES : 926 E, 185 N			CASING DEPTH : 55.00 m			LOGGED BY : Mr. Gaurav			
DATE OF START : 23-Dec-2019			DATE OF FINISH : 24-Dec-2019			CHECKED BY : Ankit Uniyal			
DEPTH (m)	GRAPHICAL LOG	SYMBOL	MATERIAL DESCRIPTION	LAYER ELEVATION, m	SAMPLE NUMBER	SAMPLE DEPTH (m)	SAMPLE TYPE	FIELD N VALUES	▲ FIELD SPT N VALUE ▲
									20 40 60 80
									PL (%) MC (%) LL (%)
									20 40 60 80
									■ FINES CONTENT (%) ■
									20 40 60 80
1		CL	Hard brown clayey silt, low plastic (CL)	191.02	DS-1	0.00 - 0.50			
2					SPT-1	1.00 - 1.45		37	
3		SM	Medium dense to dense grey silty fine sand (SM) - medium dense, 2.0 to 16.5 m		UDS-1	2.00 - 2.30			
4					SPT-2	3.00 - 3.45		10	
5					UDS-2	4.00 - 4.30			
6					SPT-3	5.00 - 5.45		12	
7					UDS-3	6.00 - 6.30			
8					SPT-4	7.00 - 7.45		14	
9					DS-2	8.00 - 8.30			
10					SPT-5	8.50 - 8.95		17	
11					SPT-6	9.00 - 9.45		19	
12					DS-3	10.00 - 10.30			
13					SPT-7	10.50 - 10.95		20	
14					SPT-8	11.50 - 11.95		22	
15					DS-4	13.00 - 13.30			
16					SPT-9	13.50 - 13.95		25	
			- with traces of gravel, 14.5 to 16.0 m		SPT-10	14.50 - 14.95		27	

PL - PLASTIC LIMIT
LL - LIQUID LIMIT
MC - MOISTURE CONTENT

Ground Water
Table

DISTURBED SAMPLE
(DS)

Standard Penetration
Test (SPT)

UNDISTURBED
SAMPLE (UDS)

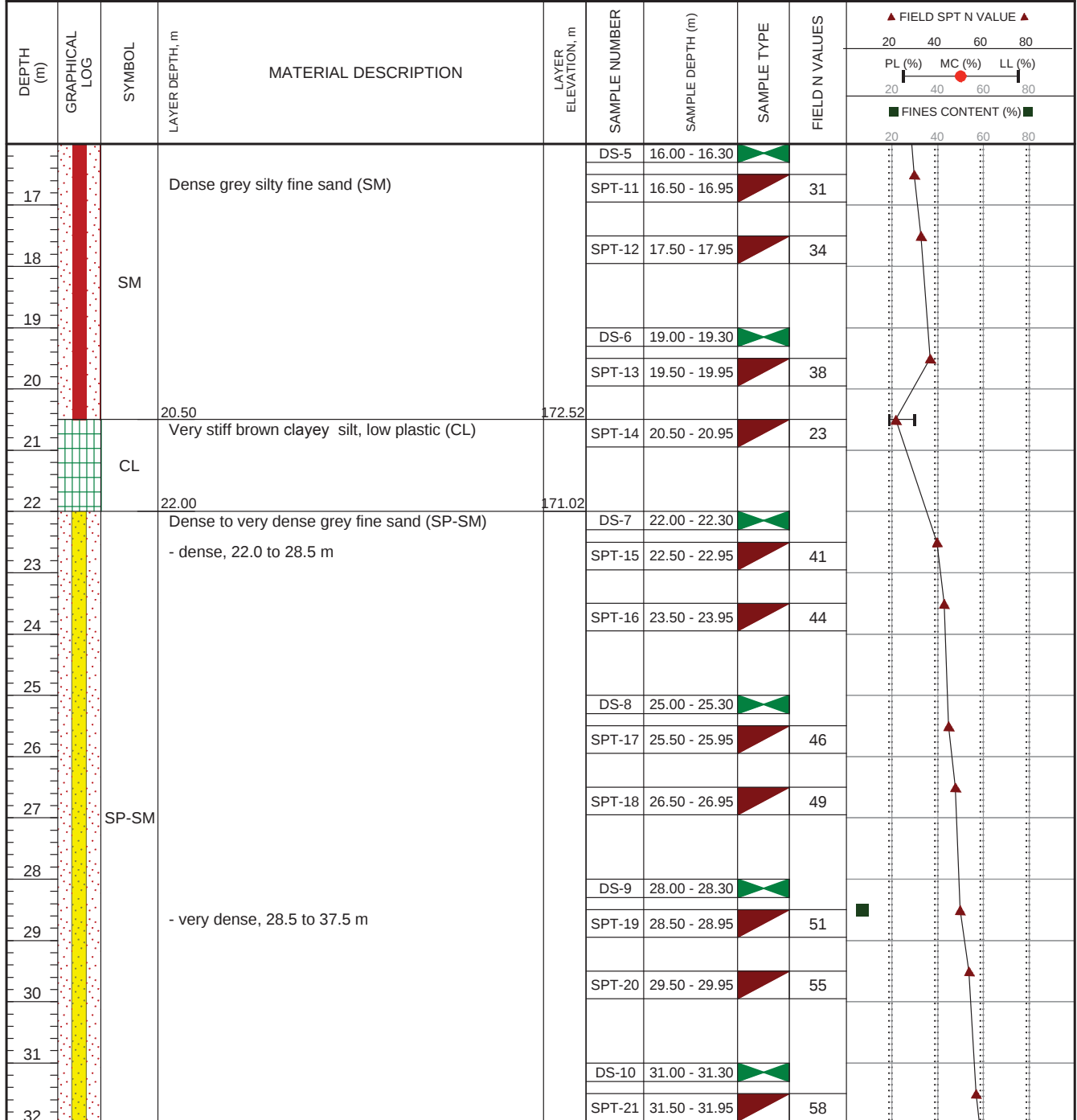
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BOREHOLE NO: 24

PAGE 2 OF 4

BOREHOLE NO : BH-24	BORING METHOD : Shell and Auger	GROUND ELEVATION : RL 193.020 m
STRUCTURE: STG	SPT HAMMER USED : Automatic Trip	GROUND WATER DEPTH, m 7.00
CHAINAGE : -	BOREHOLE DIAMETER 150mm	TERMINATION DEPTH : 55.4 m
COORDINATES : 926 E, 185 N	CASING DEPTH : 55.00 m	LOGGED BY : Mr. Gaurav
DATE OF START : 23-Dec-2019	DATE OF FINISH : 24-Dec-2019	CHECKED BY : Ankit Uniyal



PL - PLASTIC LIMIT
LL - LIQUID LIMIT
MC - MOISTURE CONTENT

Ground Water
Table

DISTURBED SAMPLE
(DS)

Standard Penetration
Test (SPT)

UNDISTURBED
SAMPLE (UDS)

(Continued Next Page)



BOREHOLE NO: 24

PAGE 3 OF 4

BOREHOLE NO : BH-24			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.020 m							
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 7.00							
CHAINAGE : -			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 55.4 m							
COORDINATES : 926 E, 185 N			CASING DEPTH : 55.00 m			LOGGED BY : Mr. Gaurav							
DATE OF START : 23-Dec-2019			DATE OF FINISH : 24-Dec-2019			CHECKED BY : Ankit Uniyal							
DEPTH (m)	GRAPHICAL LOG	SYMBOL	LAYER DEPTH, m	MATERIAL DESCRIPTION	LAYER ELEVATION, m	SAMPLE NUMBER	SAMPLE DEPTH (m)	SAMPLE TYPE	FIELD N VALUES	FIELD SPT N VALUE ▲			
										20 40 60 80			
										PL (%) MC (%) LL (%) 20 40 60 80			
										■ FINES CONTENT (%) ■ 20 40 60 80			
33		SP-SM	37.50	Very dense grey fine sand (SP-SM)	155.52	SPT-22	32.50 - 32.95		61				
34													
						DS-11	34.00 - 34.30						
35						SPT-23	34.50 - 34.95		64				
36						SPT-24	35.50 - 35.95		67				
37													
						DS-12	37.00 - 37.30						
38		SM	37.50	Very dense grey silty fine sand (SM)	155.52	SPT-25	37.50 - 37.95		71				
39						SPT-26	38.50 - 38.95		73				
40													
						DS-13	40.00 - 40.30						
41						SPT-27	40.50 - 40.95		76				
42						SPT-28	41.50 - 41.95		81				
43													
						DS-14	43.00 - 43.30						
44	SPT-29	43.50 - 43.95		85									
45	SPT-30	44.50 - 44.95		91									
46													
	DS-15	46.00 - 46.30											
47	SPT-31	46.50 - 46.95		98									
48													
		</											

PL - PLASTIC LIMIT
LL - LIQUID LIMIT
MC - MOISTURE CONTENT

Ground Water
Table

DISTURBED SAMPLE
(DS)

Standard Penetration
Test (SPT)

UNDISTURBED
SAMPLE (UDS)

(Continued Next Page)



BOREHOLE NO: 24

PAGE 4 OF 4

BOREHOLE NO : BH-24			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.020 m						
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 7.00						
CHAINAGE : -			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 55.4 m						
COORDINATES : 926 E, 185 N			CASING DEPTH : 55.00 m			LOGGED BY : Mr. Gaurav						
DATE OF START : 23-Dec-2019			DATE OF FINISH : 24-Dec-2019			CHECKED BY : Ankit Uniyal						
DEPTH (m)	GRAPHICAL LOG	SYMBOL	LAYER DEPTH, m	MATERIAL DESCRIPTION	LAYER ELEVATION, m	SAMPLE NUMBER	SAMPLE DEPTH (m)	SAMPLE TYPE	FIELD N VALUES	▲ FIELD SPT N VALUE ▲		
										20 40 60 80		
										PL (%) MC (%) LL (%) 20 40 60 80		
■ FINES CONTENT (%) ■												
20 40 60 80												
49		SM							29cm			
			DS-16	49.00 - 49.30								
50			SPT-33	49.50 - 49.93		100/28cm						
51			SPT-34	50.50 - 50.91		100/26cm						
52			52.00		141.02							
		CI	Hard brown clayey silt, medium plastic (CI)				DS-17	52.00 - 52.30				
53			Hard brown clayey silt, medium plastic (CI)				SPT-35	52.50 - 52.90		100/25cm		
54			SPT-36	53.50 - 53.91		100/26cm						
55			55.40		137.62	SPT-37	55.00 - 55.40		100/25cm			
			Termination at 55.40 meters Depth.									

PL - PLASTIC LIMIT
LL - LIQUID LIMIT
MC - MOISTURE CONTENT

Ground Water
Table

DISTURBED SAMPLE
(DS)

Standard Penetration
Test (SPT)

UNDISTURBED
SAMPLE (UDS)



Borehole No.:-24

SUMMARY OF LABORATORY TEST RESULTS

Depth, m		Sample Type	Field Value N*	Corrected Value N**	SOIL DESCRIPTION	Strata Break	Grain Size Analysis				Liquid Limit, %	Plastic Limit, %	Plasticity Index, %	Shrinkage Limit, %	Specific Gravity	Free Swell Index, %	Bulk Density ₃ gms/cm ³	Moisture Content, %	Dry Density ₃ g/cm ³	Shear Strength Parameters			
From	To						Gravel (%)	Sand (%)	Silt (%)	Clay (%)										Type of test	Confining Pressure kg/cm ²	C _u kg/cm ²	Degree ϕ
0.00	0.50	DS-1			Hard brown clayey silt, low plastic (CL)										26								
1.00	1.45	SPT-1	37	37			2.00				34.0	17.5	16.6	17									
2.00	2.30	UDS-1			Medium dense to dense grey silty fine sand (SM)											1.76	12.5	1.56					
3.00	3.45	SPT-2	10	12		- medium dense, 2.0 to 16.5 m																	
4.00	4.30	UDS-2					0	84	16	0						1.79	13.8	1.57					
5.00	5.45	SPT-3	12	12																			
6.00	6.30	UDS-3															1.82	14.6	1.59				
7.00	7.45	SPT-4	14	13																			
8.00	8.30	DS-2																					
8.50	8.95	SPT-5	17	15																			
9.00	9.45	SPT-6	19	16																			
10.00	10.30	DS-3																					
10.50	10.95	SPT-7	20	16																			
11.50	11.95	SPT-8	22	17																			
13.00	13.30	DS-4																					
13.50	13.95	SPT-9	25	18																			
14.50	14.95	SPT-10	27	18	- with traces of gravel, 14.5 to 16.0 m		2	85	13	0													
16.00	16.30	DS-5																					

* Outside NABL scope.

DS: Direct shear test- Consolidated Drained

UUT: Unconsolidated undrained triaxial shear test



Borehole No.:-24

SUMMARY OF LABORATORY TEST RESULTS

Depth, m		Sample Type	Field Value N*	Corrected Value N**	SOIL DESCRIPTION	Strata Break	Grain Size Analysis				Liquid Limit, %	Plastic Limit, %	Plasticity Index, %	Shrinkage Limit, %	Specific Gravity	Free Swell Index, %	Bulk Density ₃ g/cm ³	Moisture Content, %	Dry Density ₃ g/cm ³	Shear Strength Parameters	Type of test	Confining Pressure ₃ kg/cm ²	C _u kg/cm ²	Degree ϕ
From	To						Gravel (%)	Sand (%)	Silt (%)	Clay (%)														
16.50	16.95	SPT-11	31	20	Dense grey silty fine sand (SM)																			
17.50	17.95	SPT-12	34	21																				
19.00	19.30	DS-6																						
19.50	19.95	SPT-13	38	22		20.50										16								
20.50	20.95	SPT-14	23	23	Very stiff brown clayey silt, low plastic	22.00					29.7	18.7	10.9	9										
22.00	22.30	DS-7			Dense to very dense grey fine sand (SP-SM)																			
22.50	22.95	SPT-15	41	22	- dense, 22.0 to 28.5 m																			
23.50	23.95	SPT-16	44	23																				
25.00	25.30	DS-8																						
25.50	25.95	SPT-17	46	23																				
26.50	26.95	SPT-18	49	24																				
28.00	28.30	DS-9																						
28.50	28.95	SPT-19	51	24	- very dense, 28.5 to 37.5 m		0	93	7	0														
29.50	29.95	SPT-20	55	25																				
31.00	31.30	DS-10																						
31.50	31.95	SPT-21	58	25																				
32.50	32.95	SPT-22	61	26																				
34.00	34.30	DS-11																						

* Outside NABL scope.

DS: Direct shear test- Consolidated Drained

UUT: Unconsolidated undrained triaxial shear test



Borehole No.:-24

SUMMARY OF LABORATORY TEST RESULTS

Depth, m		Sample Type	Field Value N*	Corrected Value N**	SOIL DESCRIPTION	Strata Break	Grain Size Analysis				Liquid Limit, %	Plastic Limit, %	Plasticity Index, %	Shrinkage Limit, %	Specific Gravity	Free Swell Index, %	Bulk Density ₃ gms/cm ³	Moisture Content, %	Dry Density ₃ g/cm ³	Shear Strength Parameters			Degree ϕ
From	To						Gravel (%)	Sand (%)	Silt (%)	Clay (%)										Type of test	Confining Pressure ₃ kg/cm ²	C _u kg/cm ²	
34.50	34.95	SPT-23	64	26	Very dense grey fine sand (SP-SM)																		
35.50	35.95	SPT-24	67	27																			
37.00	37.30	DS-12				37.50																	
37.50	37.95	SPT-25	71	27	Very dense grey silty fine sand (SM)		1	85	14	0													
38.50	38.95	SPT-26	73	27																			
40.00	40.30	DS-13																					
40.50	40.95	SPT-27	76	28																			
41.50	41.95	SPT-28	81	29																			
43.00	43.30	DS-14																					
43.50	43.95	SPT-29	85	29																			
44.50	44.95	SPT-30	91	30																			
46.00	46.30	DS-15																					
46.50	46.95	SPT-31	98	31																			
47.50	47.94	SPT-32	100/ 29cm																				
49.00	49.30	DS-16																					
49.50	49.93	SPT-33	100/ 28cm																				
50.50	50.91	SPT-34	100/ 26cm			52.00																	
52.00	52.30	DS-17			Hard brown clayey silt, medium plastic (CI)																		

* Outside NABL scope.

DS: Direct shear test- Consolidated Drained

UUT: Unconsolidated undrained triaxial shear test



Borehole No.: -24

SUMMARY OF LABORATORY TEST RESULTS

[illegible]

* Outside NABL scope.

DS: Direct shear test- Consolidated Drained

UU: Unconsolidated undrained triaxial shear test



BOREHOLE NO: 1

PAGE 1 OF 3

BOREHOLE NO : BH-1			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.430 m							
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 7.15							
CHAINAGE : -			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 45.39 m							
COORDINATES : 721 E, 212 N			CASING DEPTH : 45.00 m			LOGGED BY : Mr. Gaurav							
DATE OF START : 18-Dec-2019			DATE OF FINISH : 19-Dec-2019			CHECKED BY : Ankit Uniyal							
DEPTH (m)	GRAPHICAL LOG	SYMBOL	LAYER DEPTH, m	MATERIAL DESCRIPTION	LAYER ELEVATION, m	SAMPLE NUMBER	SAMPLE DEPTH (m)	SAMPLE TYPE	FIELD N VALUES	FIELD SPT N VALUE ▲			
										20	40	60	80
										PL (%) MC (%) LL (%)			
									20 40 60 80				
									20 40 60 80				
									■ FINES CONTENT (%) ■				
									20 40 60 80				
1		CL	2.00	Very stiff brown clayey silt, low plastic (CL)	191.43	DS-1	0.00 - 0.50						
2						SPT-1	1.00 - 1.45					18	
3		SM	Medium dense to dense grey silty fine sand with traces of gravel (SM) - medium dense, 2.0 to 13.5 m			UDS-1	2.00 - 2.30						
4						SPT-2	3.00 - 3.45					14	
5						UDS-2	4.00 - 4.30						
6						SPT-3	5.00 - 5.45						
7						UDS-3	6.00 - 6.30						
8						SPT-4	7.00 - 7.45						
9						DS-2	8.00 - 8.30						
10						SPT-5	9.00 - 9.45						
11						DS-3	10.00 - 10.30						
12						SPT-6	10.50 - 10.95						
13						SPT-7	11.50 - 11.95					25	
14						DS-4	13.00 - 13.30						
15						SPT-8	13.50 - 13.95						
16						SPT-9	14.50 - 14.95					30	

PL - PLASTIC LIMIT
LL - LIQUID LIMIT
MC - MOISTURE CONTENT

Ground Water
Table

DISTURBED SAMPLE
(DS)

Standard Penetration
Test (SPT)

UNDISTURBED
SAMPLE (UDS)

(Continued Next Page)



BOREHOLE NO: 1

PAGE 2 OF 3

BOREHOLE NO : BH-1			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.430 m						
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 7.15						
CHAINAGE : -			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 45.39 m						
COORDINATES : 721 E, 212 N			CASING DEPTH : 45.00 m			LOGGED BY : Mr. Gaurav						
DATE OF START : 18-Dec-2019			DATE OF FINISH : 19-Dec-2019			CHECKED BY : Ankit Uniyal						
DEPTH (m)	GRAPHICAL LOG	SYMBOL	LAYER DEPTH, m	MATERIAL DESCRIPTION	LAYER ELEVATION, m	SAMPLE NUMBER	SAMPLE DEPTH (m)	SAMPLE TYPE	FIELD N VALUES	FIELD SPT N VALUE ▲		
										20 40 60 80		
										PL (%)	MC (%)	LL (%)
20 40 60 80 ■ FINES CONTENT (%) ■ 20 40 60 80												
17		SM	Dense grey silty fine sand (SM)	169.93	DS-5	16.00 - 16.30						
					SPT-10	16.50 - 16.95		34				
18												
					SPT-11	17.50 - 17.95		40				
19												
					DS-6	19.00 - 19.30						
20												
					SPT-12	19.50 - 19.95		37				
21												
					SPT-13	20.50 - 20.95		42				
22												
	DS-7	22.00 - 22.30										
23												
	SPT-14	22.50 - 22.95		38								
24		CL	Very stiff brown clayey silt, low plastic (CL)	168.43	SPT-15	23.50 - 23.95		23				
25												
26		SP-SM	Dense to very dense grey fine sand (SP-SM)	168.43	DS-8	25.00 - 25.30						
					SPT-16	25.50 - 25.95		41				
27			- dense, 25.0 to 26.5 m									
					SPT-17	26.50 - 26.95		51				
28			- very dense, 26.5 to 28.5 m									
					DS-9	28.00 - 28.30						
29												
			SPT-18		28.50 - 28.95		40					
30			- dense, 28.5 to 29.5 m									
					SPT-19	29.50 - 29.95		59				
31	- very dense, 29.5 to 35.5 m											
		DS-10	31.00 - 31.30									
32												

PL - PLASTIC LIMIT
LL - LIQUID LIMIT
MC - MOISTURE CONTENT

Ground Water
Table

DISTURBED SAMPLE
(DS)

Standard Penetration
Test (SPT)

UNDISTURBED
SAMPLE (UDS)

(Continued Next Page)



BOREHOLE NO: 1

PAGE 3 OF 3

BOREHOLE NO : BH-1			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.430 m							
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 7.15							
CHAINAGE : -			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 45.39 m							
COORDINATES : 721 E, 212 N			CASING DEPTH : 45.00 m			LOGGED BY : Mr. Gaurav							
DATE OF START : 18-Dec-2019			DATE OF FINISH : 19-Dec-2019			CHECKED BY : Ankit Uniyal							
DEPTH (m)	GRAPHICAL LOG	SYMBOL	LAYER DEPTH, m	MATERIAL DESCRIPTION	LAYER ELEVATION, m	SAMPLE NUMBER	SAMPLE DEPTH (m)	SAMPLE TYPE	FIELD N VALUES	FIELD SPT N VALUE ▲			
										20 40 60 80			
										PL (%) MC (%) LL (%) 20 40 60 80			
■ FINES CONTENT (%) ■													
20 40 60 80													
33		SP-SM				SPT-21	32.50 - 32.95		83				
34													
35		CL	35.50	Hard brown clayey silt, low plastic (CL)	157.93	DS-11	34.00 - 34.30						
36													
37		SP-SM		Very dense grey fine sand (SP-SM)		SPT-22	34.50 - 34.95		87				
38													
39													
40													
41													
42													
43						DS-12	37.00 - 37.30						
44													
45						SPT-23	35.50 - 35.95		39				
46													
47						SPT-24	37.50 - 37.95		96				
48													
49						SPT-25	38.50 - 38.92		101/27cm				
50													
51						DS-13	40.00 - 40.30						
52													
53						SPT-26	40.50 - 40.95		86				
54													
55						SPT-27	41.50 - 41.89		101/24cm				
56													
57						DS-14	43.00 - 43.30						
58													
59						SPT-28	43.50 - 43.92		101/27cm				
60													
61													
62													
63						SPT-29	45.00 - 45.39		101/24cm				
64													
				Termination at 45.39 meters Depth.									

PL - PLASTIC LIMIT
LL - LIQUID LIMIT
MC - MOISTURE CONTENT

Ground Water
Table

DISTURBED SAMPLE
(DS)

Standard Penetration
Test (SPT)

UNDISTURBED
SAMPLE (UDS)



BOREHOLE NO: 7

PAGE 1 OF 3

BOREHOLE NO : BH-7				BORING METHOD : Shell and Auger				GROUND ELEVATION : RL 193.160 m																
STRUCTURE: STG				SPT HAMMER USED : Automatic Trip				GROUND WATER DEPTH, m 7.13																
CHAINAGE : -				BOREHOLE DIAMETER 150mm				TERMINATION DEPTH : 45.4 m																
COORDINATES : 1001 E, 212 N				CASING DEPTH : 45.00 m				LOGGED BY : Mr. Gaurav																
DATE OF START : 20-Dec-2019				DATE OF FINISH : 21-Dec-2019				CHECKED BY : Ankit Uniyal																
DEPTH (m)	GRAPHICAL LOG	SYMBOL	LAYER DEPTH, m	MATERIAL DESCRIPTION	LAYER ELEVATION, m	SAMPLE NUMBER	SAMPLE DEPTH (m)	SAMPLE TYPE	FIELD N VALUES	▲ FIELD SPT N VALUE ▲														
										20 40 60 80														
										PL (%) MC (%) LL (%) 20 40 60 80														
											■ FINES CONTENT (%) ■													
											20 40 60 80													
1		CL	2.00	Hard brown clayey silt, low plastic (CL)	191.16	DS-1	0.00 - 0.50																	
2						SPT-1	1.00 - 1.45		64															
3		SM	Medium dense to dense grey silty fine sand with traces of gravel (SM) Medium dense, 2.0 to 13.5 m			UDS-1	2.00 - 2.30																	
4																								
5						SPT-2	3.00 - 3.45		14															
6																								
7						UDS-2	4.00 - 4.30																	
8																								
9						SPT-3	5.00 - 5.45		20															
10																								
11						UDS-3	6.00 - 6.30																	
12																								
13						SPT-4	7.00 - 7.45		17															
14																								
15						DS-2	8.00 - 8.30																	
16																								
17	SPT-5	8.50 - 8.95		20																				
18																								
19	SPT-6	9.00 - 9.45		21																				
20																								
21	DS-3	10.00 - 10.30																						
22																								
23	SPT-7	10.50 - 10.95		22																				
24																								
25	SPT-8	11.50 - 11.95		25																				
26																								
27	DS-4	13.00 - 13.30																						
28																								
29	SPT-9	13.50 - 13.95		35																				
30																								
31																								
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PL - PLASTIC LIMIT
LL - LIQUID LIMIT
MC - MOISTURE CONTENT

Ground Water
Table

DISTURBED SAMPLE
(DS)

Standard Penetration
Test (SPT)

UNDISTURBED
SAMPLE (UDS)

(Continued Next Page)



BOREHOLE NO: 7

PAGE 2 OF 3

BOREHOLE NO : BH-7			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.160 m							
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 7.13							
CHAINAGE : -			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 45.4 m							
COORDINATES : 1001 E, 212 N			CASING DEPTH : 45.00 m			LOGGED BY : Mr. Gaurav							
DATE OF START : 20-Dec-2019			DATE OF FINISH : 21-Dec-2019			CHECKED BY : Ankit Uniyal							
DEPTH (m)	GRAPHICAL LOG	SYMBOL	LAYER DEPTH, m	MATERIAL DESCRIPTION	LAYER ELEVATION, m	SAMPLE NUMBER	SAMPLE DEPTH (m)	SAMPLE TYPE	FIELD N VALUES	▲ FIELD SPT N VALUE ▲			
										20	40	60	80
										PL (%) MC (%) LL (%)			
20 40 60 80													
■ FINES CONTENT (%) ■													
20 40 60 80													
17		SM	19.00	Dense grey silty fine sand (SM)	174.16	DS-5	16.00 - 16.30						
SPT-11						16.50 - 16.95		33					
18						SPT-12	17.50 - 17.95		39				
19													
20		SP-SM		Very dense grey fine sand (SP-SM)		DS-6	19.00 - 19.30						
						SPT-13	19.50 - 19.95		96				
21						SPT-14	20.50 - 20.85		102/ 20cm				
22													
						DS-7	22.00 - 22.30						
23						SPT-15	22.50 - 22.95		54				
24						SPT-16	23.50 - 23.95		59				
25													
						DS-8	25.00 - 25.30						
26						SPT-17	25.50 - 25.95		55				
27						SPT-18	26.50 - 26.95		65				
28													
	DS-9	28.00 - 28.30											
29	SPT-19	28.50 - 28.95		80									
30	SPT-20	29.50 - 29.95		66									
31													
	DS-10	31.00 - 31.30											
32	SPT-21	31.50 - 31.95		77									

PL - PLASTIC LIMIT
LL - LIQUID LIMIT
MC - MOISTURE CONTENT

Ground Water
Table

DISTURBED SAMPLE
(DS)

Standard Penetration
Test (SPT)

UNDISTURBED
SAMPLE (UDS)

(Continued Next Page)



BOREHOLE NO: 7

PAGE 3 OF 3

BOREHOLE NO : BH-7			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.160 m							
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 7.13							
CHAINAGE : -			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 45.4 m							
COORDINATES : 1001 E, 212 N			CASING DEPTH : 45.00 m			LOGGED BY : Mr. Gaurav							
DATE OF START : 20-Dec-2019			DATE OF FINISH : 21-Dec-2019			CHECKED BY : Ankit Uniyal							
DEPTH (m)	GRAPHICAL LOG	SYMBOL	LAYER DEPTH, m	MATERIAL DESCRIPTION	LAYER ELEVATION, m	SAMPLE NUMBER	SAMPLE DEPTH (m)	SAMPLE TYPE	FIELD N VALUES	FIELD SPT N VALUE ▲			
										20	40	60	80
										PL (%) MC (%) LL (%)			
20406080 20406080 ■ FINES CONTENT (%) ■ 20406080													
33		SP-SM	35.50	Very dense grey fine sand (SP-SM)	157.66	SPT-22	32.50 - 32.95		83				
34													
35													
36		SM	45.40	Termination at 45.40 meters Depth.	147.76	SPT-24	35.50 - 35.95		88				
37													
38													
39													
40													
41													
42													
43													
44													
45													

PL - PLASTIC LIMIT
LL - LIQUID LIMIT
MC - MOISTURE CONTENT

Ground Water
Table

DISTURBED SAMPLE
(DS)

Standard Penetration
Test (SPT)

UNDISTURBED
SAMPLE (UDS)



BOREHOLE NO: 9

PAGE 1 OF 4

BOREHOLE NO : BH-9			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.040 m						
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m6.90						
CHAINAGE : -			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 50.42 m						
COORDINATES : 930 E, 200 N			CASING DEPTH : 50.00 m			LOGGED BY : Mr. Gaurav						
DATE OF START : 21-Dec-2019			DATE OF FINISH : 23-Dec-2019			CHECKED BY : Ankit Uniyal						
DEPTH (m)	GRAPHICAL LOG	SYMBOL	LAYER DEPTH, m	MATERIAL DESCRIPTION	LAYER ELEVATION, m	SAMPLE NUMBER	SAMPLE DEPTH (m)	SAMPLE TYPE	FIELD N VALUES	▲ FIELD SPT N VALUE ▲		
										20 40 60 80		
										PL (%)	MC (%)	LL (%)
20 40 60 80 ■ FINES CONTENT (%) ■												
1		CL	2.00	Very stiff brown clayey silt, low plastic (CL)	191.04	DS-1	0.00 - 0.50		25			
2						SPT-1	1.00 - 1.45					
3		SM		Medium dense grey silty fine sand (SM)		UDS-1	2.00 - 2.30					
4						SPT-2	3.00 - 3.45					
5						UDS-2	4.00 - 4.30					
6						SPT-3	5.00 - 5.45					
7						UDS-3	6.00 - 6.30					
8						SPT-4	7.00 - 7.45					
9						DS-2	8.00 - 8.30					
10						SPT-5	8.50 - 8.95					
11						SPT-6	9.00 - 9.45					
12						DS-3	10.00 - 10.30					
13						SPT-7	10.50 - 10.95					
14						SPT-8	11.50 - 11.95					
15						DS-4	13.00 - 13.30					
16						SPT-9	13.50 - 13.95					
	SPT-10	14.50 - 14.95										

PL - PLASTIC LIMIT
LL - LIQUID LIMIT
MC - MOISTURE CONTENT

Ground Water
Table

DISTURBED SAMPLE
(DS)

Standard Penetration
Test (SPT)

UNDISTURBED
SAMPLE (UDS)

(Continued Next Page)



BOREHOLE NO: 9

PAGE 2 OF 4

BOREHOLE NO : BH-9			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.040 m						
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 6.90						
CHAINAGE : -			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 50.42 m						
COORDINATES : 930 E, 200 N			CASING DEPTH : 50.00 m			LOGGED BY : Mr. Gaurav						
DATE OF START : 21-Dec-2019			DATE OF FINISH : 23-Dec-2019			CHECKED BY : Ankit Uniyal						
DEPTH (m)	GRAPHICAL LOG	SYMBOL	LAYER DEPTH, m	MATERIAL DESCRIPTION	LAYER ELEVATION, m	SAMPLE NUMBER	SAMPLE DEPTH (m)	SAMPLE TYPE	FIELD N VALUES	▲ FIELD SPT N VALUE ▲		
										20 40 60 80		
										PL (%) MC (%) LL (%) 20 40 60 80		
■ FINES CONTENT (%) ■												
20 40 60 80												
17		SM	16.50	Medium dense to dense grey silty fine sand (SM)	166.54	DS-5	16.00 - 16.30					
SPT-11				16.50 - 16.95			29					
SPT-12				17.50 - 17.95			32					
DS-6				19.00 - 19.30								
SPT-13				19.50 - 19.95			33					
SPT-14				20.50 - 20.95			35					
DS-7				22.00 - 22.30								
SPT-15				22.50 - 22.95			39					
SPT-16				23.50 - 23.95			42					
DS-8				25.00 - 25.30								
SPT-17				25.50 - 25.95			44					
SPT-18				26.50 - 26.95			48					
DS-9				28.00 - 28.30								
SPT-19				28.50 - 28.95			52					
SPT-20				29.50 - 29.95			54					
DS-10				31.00 - 31.30								
SPT-21	31.50 - 31.95		58									

PL - PLASTIC LIMIT
LL - LIQUID LIMIT
MC - MOISTURE CONTENT

Ground Water
Table

DISTURBED SAMPLE
(DS)

Standard Penetration
Test (SPT)

UNDISTURBED
SAMPLE (UDS)

(Continued Next Page)



BOREHOLE NO: 9

PAGE 3 OF 4

BOREHOLE NO : BH-9			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.040 m							
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 6.90							
CHAINAGE : -			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 50.42 m							
COORDINATES : 930 E, 200 N			CASING DEPTH : 50.00 m			LOGGED BY : Mr. Gaurav							
DATE OF START : 21-Dec-2019			DATE OF FINISH : 23-Dec-2019			CHECKED BY : Ankit Uniyal							
DEPTH (m)	GRAPHICAL LOG	SYMBOL	LAYER DEPTH, m	MATERIAL DESCRIPTION	LAYER ELEVATION, m	SAMPLE NUMBER	SAMPLE DEPTH (m)	SAMPLE TYPE	FIELD N VALUES	FIELD SPT N VALUE ▲			
										20 40 60 80			
										PL (%)	MC (%)	LL (%)	
										20	40	60	80
										■ FINES CONTENT (%) ■			
										20	40	60	80
33		SP-SM	Very dense grey fine sand - SP-SM, 34.5 to 46.5 m - with traces of gravel, 35.5 to 37.0 m			SPT-22	32.50 - 32.95		61				
34						DS-11	34.00 - 34.30						
35						SPT-23	34.50 - 34.95		65				
36						SPT-24	35.50 - 35.95		67				
37						DS-12	37.00 - 37.30						
38						SPT-25	37.50 - 37.95		71				
39						SPT-26	38.50 - 38.95		73				
40						DS-13	40.00 - 40.30						
41						SPT-27	40.50 - 40.95		75				
42						SPT-28	41.50 - 41.95		80				
43						DS-14	43.00 - 43.30						
44						SPT-29	43.50 - 43.95		86				
45						SPT-30	44.50 - 44.95		89				
46						DS-15	46.00 - 46.30						
47		SP	- SP, 46.5 to 50.0 m			SPT-31	46.50 - 46.95		92				
48						SPT-32	47.50 - 47.95		94				

PL - PLASTIC LIMIT
LL - LIQUID LIMIT
MC - MOISTURE CONTENT

Ground Water
Table

DISTURBED SAMPLE
(DS)

Standard Penetration
Test (SPT)

UNDISTURBED
SAMPLE (UDS)

(Continued Next Page)



BOREHOLE NO: 9

PAGE 4 OF 4

BOREHOLE NO : BH-9			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.040 m								
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 6.90								
CHAINAGE : -			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 50.42 m								
COORDINATES : 930 E, 200 N			CASING DEPTH : 50.00 m			LOGGED BY : Mr. Gaurav								
DATE OF START : 21-Dec-2019			DATE OF FINISH : 23-Dec-2019			CHECKED BY : Ankit Uniyal								
DEPTH (m)	GRAPHICAL LOG	SYMBOL	LAYER DEPTH, m	MATERIAL DESCRIPTION	LAYER ELEVATION, m	SAMPLE NUMBER	SAMPLE DEPTH (m)	SAMPLE TYPE	FIELD N VALUES	▲ FIELD SPT N VALUE ▲				
										20 40 60 80				
										PL (%) MC (%) LL (%)				
										20	40	60	80	
49		SP												
50			50.00		143.04									
		CL	50.42	Brown clayey silt, low plastic (CL)	142.62	SPT-33	50.00 - 50.42		100/ 27cm					
Termination at 50.42 meters Depth.														

PL - PLASTIC LIMIT
LL - LIQUID LIMIT
MC - MOISTURE CONTENT

Ground Water Table

DISTURBED SAMPLE (DS)

Standard Penetration Test (SPT)

UNDISTURBED SAMPLE (UDS)



BOREHOLE NO: 19

PAGE 1 OF 3

BOREHOLE NO : BH-19			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.190 m							
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 6.70							
CHAINAGE : -			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 45.4 m							
COORDINATES : 800 E, 170 N			CASING DEPTH : 45.00 m			LOGGED BY : Mr. Gaurav							
DATE OF START : 10-Dec-2019			DATE OF FINISH : 11-Dec-2019			CHECKED BY : Ankit Uniyal							
DEPTH (m)	GRAPHICAL LOG	SYMBOL	LAYER DEPTH, m	MATERIAL DESCRIPTION	LAYER ELEVATION, m	SAMPLE NUMBER	SAMPLE DEPTH (m)	SAMPLE TYPE	FIELD N VALUES	▲ FIELD SPT N VALUE ▲			
										20	40	60	80
										PL (%)	MC (%)	LL (%)	
20 40 60 80													
■ FINES CONTENT (%) ■													
20 40 60 80													
1		CL	2.00	Very stiff brown clayey silt, low plastic (CL)	191.19	DS-1	0.00 - 0.50						
2						SPT-1	1.00 - 1.45		25				
3		SM	191.19	Medium dense to dense grey silty fine sand with traces of gravel (SM) - medium dense, 2.0 to 11.5 m		UDS-1	2.00 - 2.30						
4						SPT-2	3.00 - 3.45		12				
5						UDS-2	4.00 - 4.30						
6						SPT-3	5.00 - 5.45		14				
7						UDS-3	6.00 - 6.30						
8						SPT-4	7.00 - 7.45		17				
9						UDS-4	8.00 - 8.30						
10						SPT-5	9.00 - 9.45		19				
11						DS-2	10.00 - 10.30						
12						SPT-6	10.50 - 10.95		25				
13						SPT-7	11.50 - 11.95		32				
14						DS-3	13.00 - 13.30						
15						SPT-8	13.50 - 13.95		37				
16						SPT-9	14.50 - 14.95		21				

PL - PLASTIC LIMIT
LL - LIQUID LIMIT
MC - MOISTURE CONTENT

Ground Water
Table

DISTURBED SAMPLE
(DS)

Standard Penetration
Test (SPT)

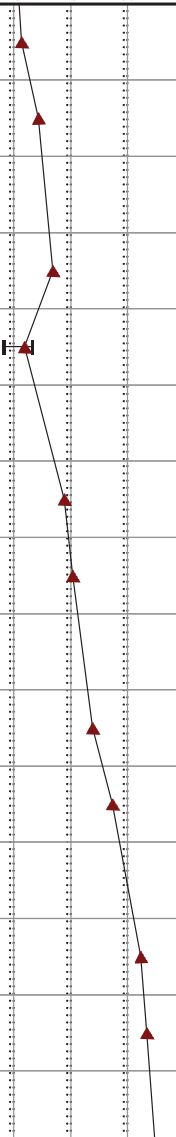
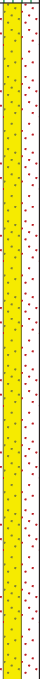
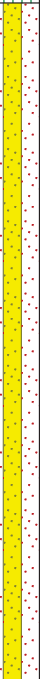
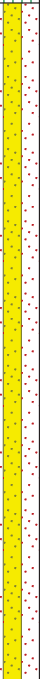
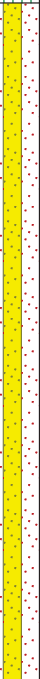
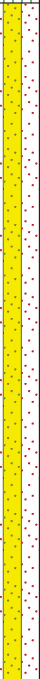
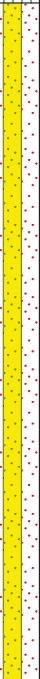
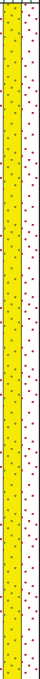
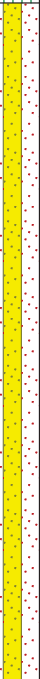
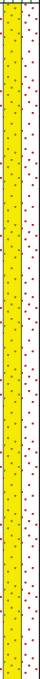
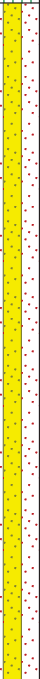
UNDISTURBED
SAMPLE (UDS)

(Continued Next Page)



BOREHOLE NO: 19

PAGE 2 OF 3

BOREHOLE NO : BH-19			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.190 m							
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 6.70							
CHAINAGE : -			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 45.4 m							
COORDINATES : 800 E, 170 N			CASING DEPTH : 45.00 m			LOGGED BY : Mr. Gaurav							
DATE OF START : 10-Dec-2019			DATE OF FINISH : 11-Dec-2019			CHECKED BY : Ankit Uniyal							
DEPTH (m)	GRAPHICAL LOG	SYMBOL	LAYER DEPTH, m	MATERIAL DESCRIPTION	LAYER ELEVATION, m	SAMPLE NUMBER	SAMPLE DEPTH (m)	SAMPLE TYPE	FIELD N VALUES	FIELD SPT N VALUE ▲			
										20 40 60 80			
										PL (%) MC (%) LL (%) 20 40 60 80			
■ FINES CONTENT (%) ■													
17		SM	17.00 - 17.50 Dense grey silty fine sand (SM)	172.69	DS-4	16.00 - 16.30			24				
SPT-10					16.50 - 16.95								
SPT-11					17.50 - 17.95			30					
18		SM	17.50 - 19.50 - dense, 19.5 to 20.5 m	172.69									
DS-5					19.00 - 19.30								
19		SM	19.50 - 20.50 - dense, 19.5 to 20.5 m	172.69									
SPT-12					19.50 - 19.95			35					
20		SM	20.50 - 21.00 Very stiff brown clayey silt, low plastic (CL)	172.69									
SPT-13					20.50 - 20.95			25					
21		CL	21.00 - 22.00 Very stiff brown clayey silt, low plastic (CL)	171.19									
22		CL	22.00 - 22.50 Dense to very dense grey fine sand (SP-SM)	171.19									
DS-6					22.00 - 22.30								
23		SP-SM	22.50 - 23.50 - dense, 22.0 to 26.5 m	171.19									
SPT-14					22.50 - 22.95			39					
24		SP-SM	23.50 - 24.50 - dense, 22.0 to 26.5 m	171.19									
SPT-15					23.50 - 23.95			42					
25		SP-SM	24.50 - 25.50 - dense, 22.0 to 26.5 m	171.19									
DS-7					25.00 - 25.30								
26		SP-SM	25.50 - 26.50 - dense, 22.0 to 26.5 m	171.19									
SPT-16					25.50 - 25.95			49					
27		SP-SM	26.50 - 27.50 - very dense, 26.5 to 45.45 m	171.19									
SPT-17					26.50 - 26.95			56					
28		SP-SM	27.50 - 28.50 - very dense, 26.5 to 45.45 m	171.19									
DS-8					28.00 - 28.30								
29		SP-SM	28.50 - 29.50 - very dense, 26.5 to 45.45 m	171.19									
SPT-18					28.50 - 28.95			66					
30		SP-SM	29.50 - 30.50 - very dense, 26.5 to 45.45 m	171.19									
SPT-19					29.50 - 29.95			68					
31		SP-SM	30.50 - 31.50 - very dense, 26.5 to 45.45 m	171.19									
DS-9					31.00 - 31.30								
32		SP-SM	31.50 - 32.50 - very dense, 26.5 to 45.45 m	171.19									
SPT-20					31.50 - 31.95			72					

PL - PLASTIC LIMIT
LL - LIQUID LIMIT
MC - MOISTURE CONTENT

Ground Water
Table

DISTURBED SAMPLE
(DS)

Standard Penetration
Test (SPT)

UNDISTURBED
SAMPLE (UDS)

(Continued Next Page)



BOREHOLE NO: 19

PAGE 3 OF 3

BOREHOLE NO : BH-19				BORING METHOD : Shell and Auger				GROUND ELEVATION : RL 193.190 m							
STRUCTURE: STG				SPT HAMMER USED : Automatic Trip				GROUND WATER DEPTH, m 6.70							
CHAINAGE : -				BOREHOLE DIAMETER 150mm				TERMINATION DEPTH : 45.4 m							
COORDINATES : 800 E, 170 N				CASING DEPTH : 45.00 m				LOGGED BY : Mr. Gaurav							
DATE OF START : 10-Dec-2019				DATE OF FINISH : 11-Dec-2019				CHECKED BY : Ankit Uniyal							
DEPTH (m)	GRAPHICAL LOG	SYMBOL	LAYER DEPTH, m	MATERIAL DESCRIPTION	LAYER ELEVATION, m	SAMPLE NUMBER	SAMPLE DEPTH (m)	SAMPLE TYPE	FIELD N VALUES	▲ FIELD SPT N VALUE ▲					
										20 40 60 80					
										PL (%) MC (%) LL (%)					
										20 40 60 80					
										■ FINES CONTENT (%) ■					
										20 40 60 80					
33		SP-SM	45.40	Very dense grey fine sand (SP-SM)	147.79	SPT-21	32.50 - 32.95		77						
34						DS-10	34.00 - 34.30								
35						SPT-22	34.50 - 34.95		81						
36						SPT-23	35.50 - 35.95		80						
37						DS-11	37.00 - 37.30								
38						SPT-24	37.50 - 37.95		85						
39						SPT-25	38.50 - 38.95		90						
40						DS-12	40.00 - 40.30								
41						SPT-26	40.50 - 40.95		93						
42						SPT-27	41.50 - 41.95		98						
43						DS-13	42.00 - 42.30								
43						SPT-28	42.50 - 42.95		99						
44						SPT-29	43.50 - 43.92		102/ 27cm						
45															
								45.40	Termination at 45.40 meters Depth.			SPT-30	45.00 - 45.40		103/ 25cm

PL - PLASTIC LIMIT
LL - LIQUID LIMIT
MC - MOISTURE CONTENT

Ground Water
Table

DISTURBED SAMPLE
(DS)

Standard Penetration
Test (SPT)

UNDISTURBED
SAMPLE (UDS)



BOREHOLE NO: 23

PAGE 1 OF 3

BOREHOLE NO : BH-23			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.010 m																																													
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 6.95																																													
CHAINAGE : -			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 45.4 m																																													
COORDINATES : 920 E, 170 N			CASING DEPTH : 45.00 m			LOGGED BY : Mr. Gaurav																																													
DATE OF START : 20-Dec-2019			DATE OF FINISH : 21-Dec-2019			CHECKED BY : Ankit Uniyal																																													
DEPTH (m)	GRAPHICAL LOG	SYMBOL	LAYER DEPTH, m	MATERIAL DESCRIPTION	LAYER ELEVATION, m	SAMPLE NUMBER	SAMPLE DEPTH (m)	SAMPLE TYPE	FIELD N VALUES	FIELD SPT N VALUE ▲																																									
										20	40	60	80																																						
										PL (%) MC (%) LL (%)																																									
									20 40 60 80																																										
									20 40 60 80																																										
									■ FINES CONTENT (%) ■																																										
									20 40 60 80																																										
1		CL	2.00	Very stiff brown clayey silt with gravels, low plastic (CL)	191.01	DS-1	0.00 - 0.50																																												
2						SPT-1	1.00 - 1.45					21																																							
3		SP-SM	2.00	Medium dense to dense grey fine sand (SP-SM) - medium dense, 2.0 to 14.5 m	191.01	UDS-1	2.00 - 2.30																																												
4						SPT-2	3.00 - 3.45					13																																							
5						UDS-2	4.00 - 4.30																																												
6						SPT-3	5.00 - 5.45											16																																	
7						UDS-3	6.00 - 6.30																																												
8						SPT-4	7.00 - 7.45																	18																											
9						UDS-4	8.00 - 8.30																																												
10						SPT-5	9.00 - 9.45																							21																					
11						DS-2	10.00 - 10.30																																												
12						SPT-6	10.50 - 10.95																													24															
13						SPT-7	11.50 - 11.95																													27															
14						DS-3	13.00 - 13.30																																												
15						SPT-8	13.50 - 13.95																																						30						
16						SPT-9	14.50 - 14.95																																						34						

PL - PLASTIC LIMIT
LL - LIQUID LIMIT
MC - MOISTURE CONTENT

Ground Water
Table

DISTURBED SAMPLE
(DS)

Standard Penetration
Test (SPT)

UNDISTURBED
SAMPLE (UDS)

(Continued Next Page)



BOREHOLE NO: 23

PAGE 2 OF 3

BOREHOLE NO : BH-23			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.010 m									
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 6.95									
CHAINAGE : -			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 45.4 m									
COORDINATES : 920 E, 170 N			CASING DEPTH : 45.00 m			LOGGED BY : Mr. Gaurav									
DATE OF START : 20-Dec-2019			DATE OF FINISH : 21-Dec-2019			CHECKED BY : Ankit Uniyal									
DEPTH (m)	GRAPHICAL LOG	SYMBOL	LAYER DEPTH, m	MATERIAL DESCRIPTION	LAYER ELEVATION, m	SAMPLE NUMBER	SAMPLE DEPTH (m)	SAMPLE TYPE	FIELD N VALUES	▲ FIELD SPT N VALUE ▲					
										20	40	60	80		
										PL (%) MC (%) LL (%)					
									20	40	60	80			
									■ FINES CONTENT (%) ■			20	40	60	80
17		SP-SM	16.50 - 17.50	Dense grey fine sand (SP-SM)	172.51	DS-4	16.00 - 16.30								
SPT-10						16.50 - 16.95		36							
SPT-11						17.50 - 17.95		38							
18															
19						DS-5	19.00 - 19.30								
20						SPT-12	19.50 - 19.95		41						
20.50															
21		CL	17.01 - 22.00	Very stiff brown clayey silt, low plastic (CL)	171.01	SPT-13	20.50 - 20.95		23						
22															
22						DS-6	22.00 - 22.30								
23				Dense to very dense grey silty fine sand (SM)		SPT-14	22.50 - 22.95		45						
				- dense, 22.0 to 25.5 m											
24						SPT-15	23.50 - 23.95		49						
25						DS-7	25.00 - 25.30								
26				- very dense, 25.5 to 45.4 m		SPT-16	25.50 - 25.95		52						
27		SM	25.50 - 45.40			SPT-17	26.50 - 26.95		55						
28															
29						DS-8	28.00 - 28.30								
						SPT-18	28.50 - 28.95		60						
30							SPT-19	29.50 - 29.95			62				
31						DS-9	31.00 - 31.30								
32						SPT-20	31.50 - 31.95		64						

PL - PLASTIC LIMIT
LL - LIQUID LIMIT
MC - MOISTURE CONTENT

Ground Water
Table

DISTURBED SAMPLE
(DS)

Standard Penetration
Test (SPT)

UNDISTURBED
SAMPLE (UDS)

(Continued Next Page)



BOREHOLE NO: 23

PAGE 3 OF 3

BOREHOLE NO : BH-23				BORING METHOD : Shell and Auger				GROUND ELEVATION : RL 193.010 m					
STRUCTURE: STG				SPT HAMMER USED : Automatic Trip				GROUND WATER DEPTH, m 6.95					
CHAINAGE : -				BOREHOLE DIAMETER 150mm				TERMINATION DEPTH : 45.4 m					
COORDINATES : 920 E, 170 N				CASING DEPTH : 45.00 m				LOGGED BY : Mr. Gaurav					
DATE OF START : 20-Dec-2019				DATE OF FINISH : 21-Dec-2019				CHECKED BY : Ankit Uniyal					
DEPTH (m)	GRAPHICAL LOG	SYMBOL	LAYER DEPTH, m	MATERIAL DESCRIPTION	LAYER ELEVATION, m	SAMPLE NUMBER	SAMPLE DEPTH (m)	SAMPLE TYPE	FIELD N VALUES	▲ FIELD SPT N VALUE ▲			
										20 40 60 80			
										PL (%) MC (%) LL (%)			
20 40 60 80 ■ FINES CONTENT (%) ■ 20 40 60 80													
33		SM	Very dense grey silty fine sand (SM)	147.61	SPT-21	32.50 - 32.95		66					
34													
35					DS-10	34.00 - 34.30		71					
36					SPT-22	34.50 - 34.95		75					
37													
38					SPT-23	35.50 - 35.95		80					
39													
40					DS-11	37.00 - 37.30		85					
41					SPT-24	37.50 - 37.95		93					
42													
43					SPT-25	38.50 - 38.95		96					
44													
45					DS-12	40.00 - 40.30		100/27cm					
					SPT-26	40.50 - 40.95							
					SPT-27	41.50 - 41.95							
					DS-13	43.00 - 43.30							
					SPT-28	43.50 - 43.92							
	SPT-29	45.00 - 45.40		100/25cm									
			Termination at 45.40 meters Depth.										

PL - PLASTIC LIMIT
LL - LIQUID LIMIT
MC - MOISTURE CONTENT

Ground Water
Table

DISTURBED SAMPLE
(DS)

Standard Penetration
Test (SPT)

UNDISTURBED
SAMPLE (UDS)



BOREHOLE NO: 24

PAGE 1 OF 4

BOREHOLE NO : BH-24			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.020 m						
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 7.00						
CHAINAGE : -			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 55.4 m						
COORDINATES : 926 E, 185 N			CASING DEPTH : 55.00 m			LOGGED BY : Mr. Gaurav						
DATE OF START : 23-Dec-2019			DATE OF FINISH : 24-Dec-2019			CHECKED BY : Ankit Uniyal						
DEPTH (m)	GRAPHICAL LOG	SYMBOL	LAYER DEPTH, m	MATERIAL DESCRIPTION	LAYER ELEVATION, m	SAMPLE NUMBER	SAMPLE DEPTH (m)	SAMPLE TYPE	FIELD N VALUES	▲ FIELD SPT N VALUE ▲ 20 40 60 80 PL (%) MC (%) LL (%) 20 40 60 80 ■ FINES CONTENT (%) ■ 20 40 60 80		
1		CL	2.00	Hard brown clayey silt, low plastic (CL)	191.02	DS-1	0.00 - 0.50		37			
2						SPT-1	1.00 - 1.45					
3		SM	Medium dense to dense grey silty fine sand (SM) - medium dense, 2.0 to 16.5 m	- medium dense, 2.0 to 16.5 m		UDS-1	2.00 - 2.30		10			
4						SPT-2	3.00 - 3.45					
5						UDS-2	4.00 - 4.30					
6						SPT-3	5.00 - 5.45					
7						UDS-3	6.00 - 6.30					
8						SPT-4	7.00 - 7.45					
9						DS-2	8.00 - 8.30					
10						SPT-5	8.50 - 8.95					
11						SPT-6	9.00 - 9.45					
12						DS-3	10.00 - 10.30					
13						SPT-7	10.50 - 10.95					
14						SPT-8	11.50 - 11.95					
15						DS-4	13.00 - 13.30					
16						SPT-9	13.50 - 13.95					
17		SM	- with traces of gravel, 14.5 to 16.0 m	- with traces of gravel, 14.5 to 16.0 m		SPT-10	14.50 - 14.95		27			
18												

PL - PLASTIC LIMIT
LL - LIQUID LIMIT
MC - MOISTURE CONTENT

Ground Water
Table

DISTURBED SAMPLE
(DS)

Standard Penetration
Test (SPT)

UNDISTURBED
SAMPLE (UDS)

(Continued Next Page)



BOREHOLE NO: 24

PAGE 2 OF 4

BOREHOLE NO : BH-24			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.020 m							
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 7.00							
CHAINAGE : -			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 55.4 m							
COORDINATES : 926 E, 185 N			CASING DEPTH : 55.00 m			LOGGED BY : Mr. Gaurav							
DATE OF START : 23-Dec-2019			DATE OF FINISH : 24-Dec-2019			CHECKED BY : Ankit Uniyal							
DEPTH (m)	GRAPHICAL LOG	SYMBOL	LAYER DEPTH, m	MATERIAL DESCRIPTION	LAYER ELEVATION, m	SAMPLE NUMBER	SAMPLE DEPTH (m)	SAMPLE TYPE	FIELD N VALUES	▲ FIELD SPT N VALUE ▲			
										20	40	60	80
										PL (%) MC (%) LL (%)			
									20 40 60 80				
									20 40 60 80				
									■ FINES CONTENT (%) ■				
									20 40 60 80				
17		SM		Dense grey silty fine sand (SM)		DS-5	16.00 - 16.30						
				SPT-11		16.50 - 16.95		31					
18						SPT-12	17.50 - 17.95				34		
19													
20		CL		Very stiff brown clayey silt, low plastic (CL)	172.52	DS-6	19.00 - 19.30						
						SPT-13	19.50 - 19.95				38		
21						SPT-14	20.50 - 20.95		23				
22					171.02								
23		SP-SM		Dense to very dense grey fine sand (SP-SM)		DS-7	22.00 - 22.30						
						SPT-15	22.50 - 22.95				41		
24						SPT-16	23.50 - 23.95				44		
25													
						DS-8	25.00 - 25.30						
26						SPT-17	25.50 - 25.95				46		
27						SPT-18	26.50 - 26.95				49		
28													
						DS-9	28.00 - 28.30						
29						SPT-19	28.50 - 28.95				51		
30						SPT-20	29.50 - 29.95				55		
31													
		DS-10	31.00 - 31.30										
32		SPT-21	31.50 - 31.95		58								

PL - PLASTIC LIMIT
LL - LIQUID LIMIT
MC - MOISTURE CONTENT

Ground Water
Table

DISTURBED SAMPLE
(DS)

Standard Penetration
Test (SPT)

UNDISTURBED
SAMPLE (UDS)

(Continued Next Page)



BOREHOLE NO: 24

PAGE 3 OF 4

BOREHOLE NO : BH-24			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.020 m						
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 7.00						
CHAINAGE : -			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 55.4 m						
COORDINATES : 926 E, 185 N			CASING DEPTH : 55.00 m			LOGGED BY : Mr. Gaurav						
DATE OF START : 23-Dec-2019			DATE OF FINISH : 24-Dec-2019			CHECKED BY : Ankit Uniyal						
DEPTH (m)	GRAPHICAL LOG	SYMBOL	LAYER DEPTH, m	MATERIAL DESCRIPTION	LAYER ELEVATION, m	SAMPLE NUMBER	SAMPLE DEPTH (m)	SAMPLE TYPE	FIELD N VALUES	FIELD SPT N VALUE ▲		
										20 40 60 80		
										PL (%) MC (%) LL (%) 20 40 60 80		
										■ FINES CONTENT (%) ■ 20 40 60 80		
33		SP-SM	37.50	Very dense grey fine sand (SP-SM)	155.52	SPT-22	32.50 - 32.95		61			
34												
35						DS-11	34.00 - 34.30					
35						SPT-23	34.50 - 34.95		64			
36						SPT-24	35.50 - 35.95		67			
37												
38		SM	37.50	Very dense grey silty fine sand (SM)	155.52	DS-12	37.00 - 37.30					
38						SPT-25	37.50 - 37.95		71			
39						SPT-26	38.50 - 38.95		73			
40												
41						DS-13	40.00 - 40.30					
41						SPT-27	40.50 - 40.95		76			
42						SPT-28	41.50 - 41.95		81			
43												
44						DS-14	43.00 - 43.30					
44						SPT-29	43.50 - 43.95		85			
45						SPT-30	44.50 - 44.95		91			
46												
47	DS-15	46.00 - 46.30										
47	SPT-31	46.50 - 46.95		98								
48												
						SPT-32	47.50 - 47.94		100/			

PL - PLASTIC LIMIT
LL - LIQUID LIMIT
MC - MOISTURE CONTENT

Ground Water
Table

DISTURBED SAMPLE
(DS)

Standard Penetration
Test (SPT)

UNDISTURBED
SAMPLE (UDS)

(Continued Next Page)



BOREHOLE NO: 24

PAGE 4 OF 4

BOREHOLE NO : BH-24			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.020 m							
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 7.00							
CHAINAGE : -			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 55.4 m							
COORDINATES : 926 E, 185 N			CASING DEPTH : 55.00 m			LOGGED BY : Mr. Gaurav							
DATE OF START : 23-Dec-2019			DATE OF FINISH : 24-Dec-2019			CHECKED BY : Ankit Uniyal							
DEPTH (m)	GRAPHICAL LOG	SYMBOL	LAYER DEPTH, m	MATERIAL DESCRIPTION	LAYER ELEVATION, m	SAMPLE NUMBER	SAMPLE DEPTH (m)	SAMPLE TYPE	FIELD N VALUES	▲ FIELD SPT N VALUE ▲			
										20 40 60 80			
										PL (%) MC (%) LL (%)			
										20	40	60	80
										■ FINES CONTENT (%) ■			
										20	40	60	80
49		SM							29cm				
			DS-16	49.00 - 49.30									
50			SPT-33	49.50 - 49.93		100/28cm							
51			SPT-34	50.50 - 50.91		100/26cm							
52		CI	52.00	Hard brown clayey silt, medium plastic (CI)	141.02	DS-17	52.00 - 52.30						
53			SPT-35	52.50 - 52.90		100/25cm							
54			SPT-36	53.50 - 53.91		100/26cm							
55													
			55.40	Termination at 55.40 meters Depth.	137.62	SPT-37	55.00 - 55.40		100/25cm				

PL - PLASTIC LIMIT
LL - LIQUID LIMIT
MC - MOISTURE CONTENT

Ground Water
Table

DISTURBED SAMPLE
(DS)

Standard Penetration
Test (SPT)

UNDISTURBED
SAMPLE (UDS)



BOREHOLE NO: 25

PAGE 1 OF 4

BOREHOLE NO : BH-25			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.060 m						
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 7.08						
CHAINAGE : -			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 50.4 m						
COORDINATES : 957 E, 185 N			CASING DEPTH : 50.00 m			LOGGED BY : Mr. Gaurav						
DATE OF START : 22-Dec-2019			DATE OF FINISH : 24-Dec-2019			CHECKED BY : Ankit Uniyal						
DEPTH (m)	GRAPHICAL LOG	SYMBOL	LAYER DEPTH, m	MATERIAL DESCRIPTION	LAYER ELEVATION, m	SAMPLE NUMBER	SAMPLE DEPTH (m)	SAMPLE TYPE	FIELD N VALUES	▲ FIELD SPT N VALUE ▲		
										20 40 60 80		
										PL (%) MC (%) LL (%)		
										20 40 60 80		
										■ FINES CONTENT (%) ■		
										20 40 60 80		
1		CL	3.00	Stiff brown clayey silt, low plastic (CL)	190.06	DS-1	0.00 - 0.50		13			
SPT-1						1.00 - 1.45						
UDS-1						2.00 - 2.30						
3		SM	190.06	Medium dense to ddense grey silty fine sand (SM) - medium dense, 3.0 to 14.5 m		SPT-2	3.00 - 3.45		12			
UDS-2						4.00 - 4.30						
SPT-3						5.00 - 5.45						
6						UDS-3	6.00 - 6.30		14			
SPT-4						7.00 - 7.45						
DS-2						8.00 - 8.30						
9						SPT-5	8.50 - 8.95		18			
SPT-6						9.00 - 9.45						
DS-3						10.00 - 10.30						
11						SPT-7	10.50 - 10.95		23			
SPT-8						11.50 - 11.95						
DS-4						13.00 - 13.30						
14						SPT-9	13.50 - 13.95		28			
SPT-10						14.50 - 14.95						
15												
16												

PL - PLASTIC LIMIT
LL - LIQUID LIMIT
MC - MOISTURE CONTENT

Ground Water
Table

DISTURBED SAMPLE
(DS)

Standard Penetration
Test (SPT)

UNDISTURBED
SAMPLE (UDS)

(Continued Next Page)



BOREHOLE NO: 25

PAGE 2 OF 4

BOREHOLE NO : BH-25			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.060 m							
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 7.08							
CHAINAGE : -			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 50.4 m							
COORDINATES : 957 E, 185 N			CASING DEPTH : 50.00 m			LOGGED BY : Mr. Gaurav							
DATE OF START : 22-Dec-2019			DATE OF FINISH : 24-Dec-2019			CHECKED BY : Ankit Uniyal							
DEPTH (m)	GRAPHICAL LOG	SYMBOL	LAYER DEPTH, m	MATERIAL DESCRIPTION	LAYER ELEVATION, m	SAMPLE NUMBER	SAMPLE DEPTH (m)	SAMPLE TYPE	FIELD N VALUES	▲ FIELD SPT N VALUE ▲			
										20	40	60	80
										PL (%) MC (%) LL (%)			
									20 40 60 80				
									■ FINES CONTENT (%) ■				
									20 40 60 80				
17		SM		Dense grey silty fine sand (SM)		DS-5	16.00 - 16.30						
				SPT-11	16.50 - 16.95		33						
18				SPT-12	17.50 - 17.95		36						
19		SP-SM	19.50		173.56	DS-6	19.00 - 19.30						
20				SPT-13	19.50 - 19.95		38						
21				SPT-14	20.50 - 20.95		41						
22		SP-SM		- dense, 19.5 to 25.5 m		DS-7	22.00 - 22.30						
23				SPT-15	22.50 - 22.95		46						
24				SPT-16	23.50 - 23.95		48						
25		SP-SM		- very dense, 25.5 to 40.0 m		DS-8	25.00 - 25.30						
26				SPT-17	25.50 - 25.95		52						
27				SPT-18	26.50 - 26.95		54						
28		SP-SM		- very dense, 25.5 to 40.0 m		DS-9	28.00 - 28.30						
29				SPT-19	28.50 - 28.95		57						
30				SPT-20	29.50 - 29.95		60						
31		SP-SM		- very dense, 25.5 to 40.0 m		DS-10	31.00 - 31.30						
32				SPT-21	31.50 - 31.95		62						

PL - PLASTIC LIMIT
LL - LIQUID LIMIT
MC - MOISTURE CONTENT

Ground Water
Table

DISTURBED SAMPLE
(DS)

Standard Penetration
Test (SPT)

UNDISTURBED
SAMPLE (UDS)

(Continued Next Page)



BOREHOLE NO: 25

PAGE 3 OF 4

BOREHOLE NO : BH-25			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.060 m									
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 7.08									
CHAINAGE : -			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 50.4 m									
COORDINATES : 957 E, 185 N			CASING DEPTH : 50.00 m			LOGGED BY : Mr. Gaurav									
DATE OF START : 22-Dec-2019			DATE OF FINISH : 24-Dec-2019			CHECKED BY : Ankit Uniyal									
DEPTH (m)	GRAPHICAL LOG	SYMBOL	LAYER DEPTH, m	MATERIAL DESCRIPTION	LAYER ELEVATION, m	SAMPLE NUMBER	SAMPLE DEPTH (m)	SAMPLE TYPE	FIELD N VALUES	FIELD SPT N VALUE ▲					
										20 40 60 80					
										PL (%)	MC (%)	LL (%)			
20 40 60 80 ■ FINES CONTENT (%) ■ 20 40 60 80															
33		SP-SM	40.00	Very dense grey fine sand (SP-SM)	153.06	SPT-22	32.50 - 32.95		65						
34						DS-11	34.00 - 34.30								
35						SPT-23	34.50 - 34.95		69						
36						SPT-24	35.50 - 35.95		73						
37						DS-12	37.00 - 37.30								
38						SPT-25	37.50 - 37.95		77						
39						SPT-26	38.50 - 38.95		79						
40															
41							SM	40.00	Very dense grey silty fine sand (SM)		153.06	DS-13	40.00 - 40.30		
42												SPT-27	40.50 - 40.95		80
43	SPT-28	41.50 - 41.95		83											
44	DS-14	43.00 - 43.30													
45	SPT-29	43.50 - 43.95		88											
46	SPT-30	44.50 - 44.95		94											
47	DS-15	46.00 - 46.30													
48	SPT-31	46.50 - 46.95		99											
						SPT-32	47.50 - 47.93		100/						

PL - PLASTIC LIMIT
LL - LIQUID LIMIT
MC - MOISTURE CONTENT

Ground Water
Table

DISTURBED SAMPLE
(DS)

Standard Penetration
Test (SPT)

UNDISTURBED
SAMPLE (UDS)

(Continued Next Page)



BOREHOLE NO: 25

PAGE 4 OF 4

BOREHOLE NO : BH-25			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.060 m							
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 7.08							
CHAINAGE : -			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 50.4 m							
COORDINATES : 957 E, 185 N			CASING DEPTH : 50.00 m			LOGGED BY : Mr. Gaurav							
DATE OF START : 22-Dec-2019			DATE OF FINISH : 24-Dec-2019			CHECKED BY : Ankit Uniyal							
DEPTH (m)	GRAPHICAL LOG	SYMBOL	LAYER DEPTH, m	MATERIAL DESCRIPTION	LAYER ELEVATION, m	SAMPLE NUMBER	SAMPLE DEPTH (m)	SAMPLE TYPE	FIELD N VALUES	▲ FIELD SPT N VALUE ▲			
										20 40 60 80			
										PL (%) MC (%) LL (%)			
										20 40 60 80			
										■ FINES CONTENT (%) ■			
										20 40 60 80			
49		SM	50.40	Termination at 50.40 meters Depth.	142.66				28cm				
DS-16						49.00 - 49.30							
50						SPT-33	50.00 - 50.40		100/25cm				

PL - PLASTIC LIMIT
LL - LIQUID LIMIT
MC - MOISTURE CONTENT

Ground Water
Table

DISTURBED SAMPLE
(DS)

Standard Penetration
Test (SPT)

UNDISTURBED
SAMPLE (UDS)



Borehole No.:-25

SUMMARY OF LABORATORY TEST RESULTS

Depth, m		Sample Type	Field Value N*	Corrected Value N**	SOIL DESCRIPTION	Strata Break	Grain Size Analysis				Liquid Limit, %	Plastic Limit, %	Plasticity Index, %	Shrinkage Limit, %	Specific Gravity	Free Swell Index, %	Bulk Density ₃ gms/cm ³	Moisture Content, %	Dry Density ₃ g/cm ³	Shear Strength Parameters			
From	To						Gravel (%)	Sand (%)	Silt (%)	Clay (%)										Type of test	Confining Pressure ₃ kg/cm ²	C _u kg/cm ²	Degree ϕ
0.00	0.50	DS-1			Stiff brown clayey silt, low plastic (CL)										15								
1.00	1.45	SPT-1	13	13							27.2	16.9	10.3	9									
2.00	2.30	UDS-1			Medium dense to ddense grey silty fine sand (SM) - medium dense, 3.0 to 14.5 m	3.00	4	39	56	1							1.73	12.9	1.53				
3.00	3.45	SPT-2	12	14																			
4.00	4.30	UDS-2															1.75	13.5	1.54				
5.00	5.45	SPT-3	14	15																			
6.00	6.30	UDS-3																					
7.00	7.45	SPT-4	15	14			0	87	13	0							1.79	14.7	1.56				
8.00	8.30	DS-2																					
8.50	8.95	SPT-5	18	16																			
9.00	9.45	SPT-6	20	17																			
10.00	10.30	DS-3																					
10.50	10.95	SPT-7	23	18																			
11.50	11.95	SPT-8	26	19																			
13.00	13.30	DS-4																					
13.50	13.95	SPT-9	28	19																			
14.50	14.95	SPT-10	32	20	- dense, 14.5 to 19.5 m																		
16.00	16.30	DS-5																					

* Outside NABL scope.

DS: Direct shear test- Consolidated Drained

UUT: Unconsolidated undrained triaxial shear test



Borehole No.:-25

SUMMARY OF LABORATORY TEST RESULTS

Depth, m		Sample Type	Field Value N*	Corrected Value N**	SOIL DESCRIPTION	Strata Break	Grain Size Analysis				Liquid Limit, %	Plastic Limit, %	Plasticity Index, %	Shrinkage Limit, %	Specific Gravity	Free Swell Index, %	Bulk Density ₃ gms/cm ³	Moisture Content, %	Dry Density ₃ g/cm ³	Shear Strength Parameters				
From	To						Gravel (%)	Sand (%)	Silt (%)	Clay (%)										Type of test	Confining Pressure ₃ kg/cm ²	C _u kg/cm ²	Degree ϕ	
16.50	16.95	SPT-11	33	20	Dense grey silty fine sand (SM)																			
17.50	17.95	SPT-12	36	21																				
19.00	19.30	DS-6				19.50																		
19.50	19.95	SPT-13	38	22		Dense to very dense grey fine sand (SP-SM)		1	90	9	0													
20.50	20.95	SPT-14	41	22	- dense, 19.5 to 25.5 m																			
22.00	22.30	DS-7																						
22.50	22.95	SPT-15	46	24																				
23.50	23.95	SPT-16	48	24																				
25.00	25.30	DS-8																						
25.50	25.95	SPT-17	52	25	- very dense, 25.5 to 40.0 m																			
26.50	26.95	SPT-18	54	25																				
28.00	28.30	DS-9																						
28.50	28.95	SPT-19	57	26																				
29.50	29.95	SPT-20	60	26			2	86	12	0														
31.00	31.30	DS-10																						
31.50	31.95	SPT-21	62	26																				
32.50	32.95	SPT-22	65	27																				
34.00	34.30	DS-11																						

* Outside NABL scope.

DS: Direct shear test- Consolidated Drained

UUT: Unconsolidated undrained triaxial shear test



Borehole No.:-25

SUMMARY OF LABORATORY TEST RESULTS

Depth, m		Sample Type	Field Value N*	Corrected Value N**	SOIL DESCRIPTION	Strata Break	Grain Size Analysis				Liquid Limit, %	Plastic Limit, %	Plasticity Index, %	Shrinkage Limit, %	Specific Gravity	Free Swell Index, %	Bulk Density ₃ gms/cm ³	Moisture Content, %	Dry Density ₃ g/cm ³	Type of test	Confining Pressure ₃ kg/cm ²	C _u kg/cm ²	Degree ϕ
From	To						Gravel (%)	Sand (%)	Silt (%)	Clay (%)													
34.50	34.95	SPT-23	69	27	Very dense grey fine sand (SP-SM)																		
35.50	35.95	SPT-24	73	28																			
37.00	37.30	DS-12																					
37.50	37.95	SPT-25	77	29																			
38.50	38.95	SPT-26	79	29																			
40.00	40.30	DS-13				40.00																	
40.50	40.95	SPT-27	80	29	Very dense grey silty fine sand (SM)		0	79	21	0													
41.50	41.95	SPT-28	83	29																			
43.00	43.30	DS-14																					
43.50	43.95	SPT-29	88	30																			
44.50	44.95	SPT-30	94	31																			
46.00	46.30	DS-15																					
46.50	46.95	SPT-31	99	31																			
47.50	47.93	SPT-32	100/ 28cm																				
49.00	49.30	DS-16																					
50.00	50.40	SPT-33	100/ 25cm			50.40																	

* Outside NABL scope.

DS: Direct shear test- Consolidated Drained

UUT: Unconsolidated undrained triaxial shear test



BOREHOLE NO: 26

PAGE 1 OF 4

BOREHOLE NO : BH-26			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.193 m						
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 7.10						
CHAINAGE : -			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 50.41 m						
COORDINATES : 960 E, 170 N			CASING DEPTH : 50.00 m			LOGGED BY : Mr. Gaurav						
DATE OF START : 21-Dec-2019			DATE OF FINISH : 24-Dec-2019			CHECKED BY : Ankit Uniyal						
DEPTH (m)	GRAPHICAL LOG	SYMBOL	LAYER DEPTH, m	MATERIAL DESCRIPTION	LAYER ELEVATION, m	SAMPLE NUMBER	SAMPLE DEPTH (m)	SAMPLE TYPE	FIELD N VALUES	FIELD SPT N VALUE ▲		
										20 40 60 80		
										PL (%)	MC (%)	LL (%)
20 40 60 80 ■ FINES CONTENT (%) ■ 20 40 60 80												
1		CL		Very stiff brown clayey silt, low plastic (CL)		DS-1	0.00 - 0.50					
2							SPT-1	1.00 - 1.45		19		
2.00						191.19						
3		SM		Medium dense to very dense grey silty fine sand (SM)		UDS-1	2.00 - 2.30					
4							SPT-2	3.00 - 3.45		15		
5							UDS-2	4.00 - 4.30				
6							SPT-3	5.00 - 5.45		29		
7							UDS-3	6.00 - 6.30				
8							SPT-4	7.00 - 7.45		22		
9							DS-2	8.00 - 8.30				
10							SPT-5	8.50 - 8.95		25		
11							SPT-6	9.50 - 9.95		26		
12							DS-3	10.00 - 10.30				
13							SPT-7	10.50 - 10.95		29		
14							SPT-8	11.50 - 11.95		32		
15							DS-4	13.00 - 13.30				
16					SPT-9	13.50 - 13.95		34				
					SPT-10	14.50 - 14.95		38				

PL - PLASTIC LIMIT
LL - LIQUID LIMIT
MC - MOISTURE CONTENT

Ground Water
Table

DISTURBED SAMPLE
(DS)

Standard Penetration
Test (SPT)

UNDISTURBED
SAMPLE (UDS)

(Continued Next Page)



BOREHOLE NO: 26

PAGE 2 OF 4

BOREHOLE NO : BH-26			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.193 m							
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 7.10							
CHAINAGE : -			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 50.41 m							
COORDINATES : 960 E, 170 N			CASING DEPTH : 50.00 m			LOGGED BY : Mr. Gaurav							
DATE OF START : 21-Dec-2019			DATE OF FINISH : 24-Dec-2019			CHECKED BY : Ankit Uniyal							
DEPTH (m)	GRAPHICAL LOG	SYMBOL	LAYER DEPTH, m	MATERIAL DESCRIPTION	LAYER ELEVATION, m	SAMPLE NUMBER	SAMPLE DEPTH (m)	SAMPLE TYPE	FIELD N VALUES	FIELD SPT N VALUE ▲			
										20	40	60	80
										PL (%)	MC (%)	LL (%)	
										20	40	60	80
										■ FINES CONTENT (%) ■			
										20	40	60	80
17		SM	Dense to very dense grey silty fine sand (SM)		DS-5	16.00 - 16.30							
SPT-11					16.50 - 16.95		41						
18					- dense, 16.5 to 20.5 m	SPT-12	17.50 - 17.95			44			
19													
20						DS-6	19.00 - 19.30						
						SPT-13	19.50 - 19.95			48			
21					- medium dense, 20.5 to 22.5 m	SPT-14	20.50 - 20.95			26			
22													
23					- very dense, 22.5 to 50.41 m	DS-7	22.00 - 22.30						
						SPT-15	22.50 - 22.95			52			
24						SPT-16	23.50 - 23.95			54			
25													
26						DS-8	25.00 - 25.30						
						SPT-17	25.50 - 25.95			58			
27						SPT-18	26.50 - 26.95			60			
28													
29					- with traces of gravel, 28.5 to 31.0 m	DS-9	28.00 - 28.30						
						SPT-19	28.50 - 28.95			65			
30						SPT-20	29.50 - 29.95			67			
31													
32		DS-10	31.00 - 31.30										
		SPT-21	31.50 - 31.95		69								

PL - PLASTIC LIMIT
LL - LIQUID LIMIT
MC - MOISTURE CONTENT

Ground Water
Table

DISTURBED SAMPLE
(DS)

Standard Penetration
Test (SPT)

UNDISTURBED
SAMPLE (UDS)

(Continued Next Page)



BOREHOLE NO: 26

PAGE 3 OF 4

BOREHOLE NO : BH-26			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.193 m						
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 7.10						
CHAINAGE : -			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 50.41 m						
COORDINATES : 960 E, 170 N			CASING DEPTH : 50.00 m			LOGGED BY : Mr. Gaurav						
DATE OF START : 21-Dec-2019			DATE OF FINISH : 24-Dec-2019			CHECKED BY : Ankit Uniyal						
DEPTH (m)	GRAPHICAL LOG	SYMBOL	LAYER DEPTH, m	MATERIAL DESCRIPTION	LAYER ELEVATION, m	SAMPLE NUMBER	SAMPLE DEPTH (m)	SAMPLE TYPE	FIELD N VALUES	FIELD SPT N VALUE ▲		
										20 40 60 80		
										PL (%) MC (%) LL (%) 20 40 60 80		
										■ FINES CONTENT (%) ■		
										20 40 60 80		
33		SM	Very dense grey silty fine sand (SM) - with traces of gravel, 37.5 to 38.5 m			SPT-22	32.50 - 32.95		71			
34						DS-11	34.00 - 34.30					
35						SPT-23	34.50 - 34.95		76			
36						SPT-24	35.50 - 35.95		78			
37												
38						DS-12	37.00 - 37.30					
						SPT-25	37.50 - 37.95		82			
39						SPT-26	38.50 - 38.95		84			
40												
						DS-13	40.00 - 40.30					
41						SPT-27	40.50 - 40.95		87			
42						SPT-28	41.50 - 41.95		90			
43												
						DS-14	43.00 - 43.30					
44						SPT-29	43.50 - 43.95		93			
45						SPT-30	44.50 - 44.95		95			
46												
						DS-15	46.00 - 46.30					
47						SPT-31	46.50 - 46.95		98			
48			SPT-32	47.50 - 47.92		100/27cm						

PL - PLASTIC LIMIT
LL - LIQUID LIMIT
MC - MOISTURE CONTENT

Ground Water
Table

DISTURBED SAMPLE
(DS)

Standard Penetration
Test (SPT)

UNDISTURBED
SAMPLE (UDS)

(Continued Next Page)



BOREHOLE NO: 26

PAGE 4 OF 4

BOREHOLE NO : BH-26			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.193 m								
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 7.10								
CHAINAGE : -			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 50.41 m								
COORDINATES : 960 E, 170 N			CASING DEPTH : 50.00 m			LOGGED BY : Mr. Gaurav								
DATE OF START : 21-Dec-2019			DATE OF FINISH : 24-Dec-2019			CHECKED BY : Ankit Uniyal								
DEPTH (m)	GRAPHICAL LOG	SYMBOL	LAYER DEPTH, m	MATERIAL DESCRIPTION	LAYER ELEVATION, m	SAMPLE NUMBER	SAMPLE DEPTH (m)	SAMPLE TYPE	FIELD N VALUES	▲ FIELD SPT N VALUE ▲				
										20 40 60 80				
										PL (%) MC (%) LL (%)				
										20 40 60 80				
■ FINES CONTENT (%) ■														
20 40 60 80														
49		SM	50.41	Termination at 50.41 meters Depth.	142.78	DS-16	49.00 - 49.30		100/26cm					
50														
Termination at 50.41 meters Depth.														

PL - PLASTIC LIMIT
LL - LIQUID LIMIT
MC - MOISTURE CONTENT

Ground Water
Table

DISTURBED SAMPLE
(DS)

Standard Penetration
Test (SPT)

UNDISTURBED
SAMPLE (UDS)



Borehole No.:-26

SUMMARY OF LABORATORY TEST RESULTS

Depth, m		Sample Type	Field Value N*	Corrected Value N**	SOIL DESCRIPTION	Strata Break	Grain Size Analysis				Liquid Limit, %	Plastic Limit, %	Plasticity Index, %	Shrinkage Limit, %	Specific Gravity	Free Swell Index, %	Bulk Density ₃ gms/cm ³	Moisture Content, %	Dry Density ₃ g/cm ³	Shear Strength Parameters				
From	To						Gravel (%)	Sand (%)	Silt (%)	Clay (%)										Type of test	Confining Pressure kg/cm ²	C _u kg/cm ²	Degree ϕ	
0.00	0.50	DS-1			Very stiff brown clayey silt, low plastic (CL)	2.00																		
1.00	1.45	SPT-1	19	19																				
2.00	2.30	UDS-1			Medium dense to very dense grey silty fine sand (SM)												1.75	12.8	1.55					
3.00	3.45	SPT-2	15	18			0	52	45	3														
4.00	4.30	UDS-2															1.79	13.7	1.57					
5.00	5.45	SPT-3	29	30										2.66										
6.00	6.30	UDS-3															1.83	15.2	1.59					
7.00	7.45	SPT-4	22	18																				
8.00	8.30	DS-2																						
8.50	8.95	SPT-5	25	19																				
9.50	9.95	SPT-6	26	19																				
10.00	10.30	DS-3																						
10.50	10.95	SPT-7	29	20																				
11.50	11.95	SPT-8	32	21	- dense, 11.5 to 20.5 m																			
13.00	13.30	DS-4																						
13.50	13.95	SPT-9	34	21																				
14.50	14.95	SPT-10	38	23																				
16.00	16.30	DS-5																						

* Outside NABL scope.

DS: Direct shear test- Consolidated Drained

UUT: Unconsolidated undrained triaxial shear test



Borehole No.:-26

SUMMARY OF LABORATORY TEST RESULTS

Depth, m		Sample Type	Field Value N*	Corrected Value N**	SOIL DESCRIPTION	Strata Break	Grain Size Analysis				Liquid Limit, %	Plastic Limit, %	Plasticity Index, %	Shrinkage Limit, %	Specific Gravity	Free Swell Index, %	Bulk Density ₃ g/cm ³	Moisture Content, %	Dry Density ₃ g/cm ³	Type of test	Confining Pressure ₃ kg/cm ²	C _u kg/cm ²	Degree ϕ
From	To						Gravel (%)	Sand (%)	Silt (%)	Clay (%)													
16.50	16.95	SPT-11	41	23	Dense to very dense grey silty fine sand (SM)																		
17.50	17.95	SPT-12	44	24	- dense, 16.5 to 20.5 m		0	83	17	0													
19.00	19.30	DS-6																					
19.50	19.95	SPT-13	48	25																			
20.50	20.95	SPT-14	26	17	- medium dense, 20.5 to 22.5 m																		
22.00	22.30	DS-7																					
22.50	22.95	SPT-15	52	26	- very dense, 22.5 to 50.41 m																		
23.50	23.95	SPT-16	54	26																			
25.00	25.30	DS-8																					
25.50	25.95	SPT-17	58	27																			
26.50	26.95	SPT-18	60	27																			
28.00	28.30	DS-9																					
28.50	28.95	SPT-19	65	28	- with traces of gravel, 28.5 to 31.0 m		1	83	16	0													
29.50	29.95	SPT-20	67	28																			
31.00	31.30	DS-10																					
31.50	31.95	SPT-21	69	28																			
32.50	32.95	SPT-22	71	29																			
34.00	34.30	DS-11																					

* Outside NABL scope.

DS: Direct shear test- Consolidated Drained

UUT: Unconsolidated undrained triaxial shear test



Borehole No.:-26

SUMMARY OF LABORATORY TEST RESULTS

Depth, m		Sample Type	Field Value N*	Corrected Value N**	SOIL DESCRIPTION	Strata Break	Grain Size Analysis				Liquid Limit, %	Plastic Limit, %	Plasticity Index, %	Shrinkage Limit, %	Specific Gravity	Free Swell Index, %	Bulk Density ₃ gms/cm ³	Moisture Content, %	Dry Density ₃ g/cm ³	Shear Strength Parameters			
From	To						Gravel (%)	Sand (%)	Silt (%)	Clay (%)										Type of test	Confining Pressure ₃ kg/cm ²	C _u kg/cm ²	Degree ϕ
34.50	34.95	SPT-23	76	29	Very dense grey silty fine sand (SM)																		
35.50	35.95	SPT-24	78	30																			
37.00	37.30	DS-12																					
37.50	37.95	SPT-25	82	30																			
38.50	38.95	SPT-26	84	30			2	82	16	0													
40.00	40.30	DS-13																					
40.50	40.95	SPT-27	87	30																			
41.50	41.95	SPT-28	90	31																			
43.00	43.30	DS-14																					
43.50	43.95	SPT-29	93	31																			
44.50	44.95	SPT-30	95	31																			
46.00	46.30	DS-15																					
46.50	46.95	SPT-31	98	31																			
47.50	47.92	SPT-32	100/ 27cm																				
49.00	49.30	DS-16																					
50.00	50.41	SPT-33	100/ 26cm			50.41																	

* Outside NABL scope.

DS: Direct shear test- Consolidated Drained

UUT: Unconsolidated undrained triaxial shear test



BOREHOLE NO: 27

PAGE 1 OF 3

BOREHOLE NO : BH-27			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.070 m						
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 7.14						
CHAINAGE : -			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 45.44 m						
COORDINATES : 1001 E, 189 N			CASING DEPTH : 45.00 m			LOGGED BY : Mr. Gaurav						
DATE OF START : 21-Dec-2019			DATE OF FINISH : 22-Dec-2019			CHECKED BY : Ankit Uniyal						
DEPTH (m)	GRAPHICAL LOG	SYMBOL	LAYER DEPTH, m	MATERIAL DESCRIPTION	LAYER ELEVATION, m	SAMPLE NUMBER	SAMPLE DEPTH (m)	SAMPLE TYPE	FIELD N VALUES	▲ FIELD SPT N VALUE ▲		
										20 40 60 80		
										PL (%) MC (%) LL (%)		
										■ FINES CONTENT (%) ■		
										20 40 60 80		
1		CL	3.00	Hard brown clayey silt, low plastic (CL)	190.07	DS-1	0.00 - 0.50					
2						SPT-1	1.00 - 1.45		34			
3						UDS-1	2.00 - 2.30					
4		SM	3.00	Medium dense to very dense grey silty fine sand (SM)	190.07	SPT-2	3.00 - 3.45		12			
5						UDS-2	4.00 - 4.30					
6						SPT-3	5.00 - 5.45		16			
7						UDS-3	6.00 - 6.30					
8						SPT-4	7.00 - 7.45		18			
9						DS-2	8.00 - 8.30					
10						SPT-5	8.50 - 8.95		21			
11						SPT-6	9.00 - 9.45		26			
12						DS-3	10.00 - 10.30					
13						SPT-7	10.50 - 10.95		28			
14						SPT-8	11.50 - 11.95		30			
15						DS-4	13.00 - 13.30					
16						SPT-9	13.50 - 13.95		33			
				- dense, 13.5 to 23.5 m		SPT-10	14.50 - 14.95		36			

PL - PLASTIC LIMIT
LL - LIQUID LIMIT
MC - MOISTURE CONTENT

Ground Water
Table

DISTURBED SAMPLE
(DS)

Standard Penetration
Test (SPT)

UNDISTURBED
SAMPLE (UDS)

(Continued Next Page)



BOREHOLE NO: 27

PAGE 2 OF 3

BOREHOLE NO : BH-27				BORING METHOD : Shell and Auger				GROUND ELEVATION : RL 193.070 m					
STRUCTURE: STG				SPT HAMMER USED : Automatic Trip				GROUND WATER DEPTH, m 7.14					
CHAINAGE : -				BOREHOLE DIAMETER 150mm				TERMINATION DEPTH : 45.44 m					
COORDINATES : 1001 E, 189 N				CASING DEPTH : 45.00 m				LOGGED BY : Mr. Gaurav					
DATE OF START : 21-Dec-2019				DATE OF FINISH : 22-Dec-2019				CHECKED BY : Ankit Uniyal					
DEPTH (m)	GRAPHICAL LOG	SYMBOL	LAYER DEPTH, m	MATERIAL DESCRIPTION	LAYER ELEVATION, m	SAMPLE NUMBER	SAMPLE DEPTH (m)	SAMPLE TYPE	FIELD N VALUES	FIELD SPT N VALUE ▲			
										20 40 60 80			
										PL (%) MC (%) LL (%)			
										20 40 60 80			
										FINES CONTENT (%) ■			
										20 40 60 80			
17		SM	Dense to very dense grey silty fine sand (SM) - dense, 16.5 to 23.5 m - very dense, 23.5 to 45.44 m		DS-5	16.00 - 16.30			38				
				SPT-11	16.50 - 16.95								
18					SPT-12	17.50 - 17.95		40					
19					DS-6	19.00 - 19.30							
20					SPT-13	19.50 - 19.95		42					
21					SPT-14	20.50 - 20.95		45					
22					DS-7	22.00 - 22.30							
23					SPT-15	22.50 - 22.95		48					
24					SPT-16	23.50 - 23.95		50					
25					DS-8	25.00 - 25.30							
26					SPT-17	25.50 - 25.95		53					
27					SPT-18	26.50 - 26.95		55					
28					DS-9	28.00 - 28.30							
29					SPT-19	28.50 - 28.95		58					
30					SPT-20	29.50 - 29.95		61					
31					DS-10	31.00 - 31.30							
32					SPT-21	31.50 - 31.95		65					

PL - PLASTIC LIMIT
LL - LIQUID LIMIT
MC - MOISTURE CONTENT

Ground Water
Table

DISTURBED SAMPLE
(DS)

Standard Penetration
Test (SPT)

UNDISTURBED
SAMPLE (UDS)

(Continued Next Page)



BOREHOLE NO: 27

PAGE 3 OF 3

BOREHOLE NO : BH-27				BORING METHOD : Shell and Auger				GROUND ELEVATION : RL 193.070 m									
STRUCTURE: STG				SPT HAMMER USED : Automatic Trip				GROUND WATER DEPTH, m 7.14									
CHAINAGE : -				BOREHOLE DIAMETER 150mm				TERMINATION DEPTH : 45.44 m									
COORDINATES : 1001 E, 189 N				CASING DEPTH : 45.00 m				LOGGED BY : Mr. Gaurav									
DATE OF START : 21-Dec-2019				DATE OF FINISH : 22-Dec-2019				CHECKED BY : Ankit Uniyal									
DEPTH (m)	GRAPHICAL LOG	SYMBOL	LAYER DEPTH, m	MATERIAL DESCRIPTION	LAYER ELEVATION, m	SAMPLE NUMBER	SAMPLE DEPTH (m)	SAMPLE TYPE	FIELD N VALUES	▲ FIELD SPT N VALUE ▲							
										20 40 60 80							
										PL (%) MC (%) LL (%)							
										20 40 60 80							
										■ FINES CONTENT (%) ■							
										20 40 60 80							
33		SM	Very dense grey silty fine sand (SM)	- with traces of gravel, 37.5 to 38.5 m		SPT-22	32.50 - 32.95		70								
34						DS-11	34.00 - 34.30										
35						SPT-23	34.50 - 34.95		73								
36						SPT-24	35.50 - 35.95		76								
37						DS-12	37.00 - 37.30										
38						SPT-25	37.50 - 37.95		81								
39						SPT-26	38.50 - 38.95		85								
40						DS-13	40.00 - 40.30										
41						SPT-27	40.50 - 40.95		91								
42						SPT-28	41.50 - 41.95		96								
43						DS-14	43.00 - 43.30										
44						SPT-29	43.50 - 43.95		100								
45																	
						45.44		147.63	SPT-30		45.00 - 45.44		100/ 29cm				
						Termination at 45.44 meters Depth.											

PL - PLASTIC LIMIT
LL - LIQUID LIMIT
MC - MOISTURE CONTENT

Ground Water
Table

DISTURBED SAMPLE
(DS)

Standard Penetration
Test (SPT)

UNDISTURBED
SAMPLE (UDS)



Borehole No.:-27

SUMMARY OF LABORATORY TEST RESULTS

Depth, m		Sample Type	Field Value N*	Corrected Value N**	SOIL DESCRIPTION	Strata Break	Grain Size Analysis				Liquid Limit, %	Plastic Limit, %	Plasticity Index, %	Shrinkage Limit, %	Specific Gravity	Free Swell Index, %	Bulk Density ₃ gms/cm ³	Moisture Content, %	Dry Density ₃ g/cm ³	Shear Strength Parameters		
From	To						Gravel (%)	Sand (%)	Silt (%)	Clay (%)										Type of test	Confining Pressure ₃ kg/cm ²	C _u kg/cm ²
0.00	0.50	DS-1			Hard brown clayey silt, low plastic (CL)																	
1.00	1.45	SPT-1	34	34																		
2.00	2.30	UDS-1				3.00											1.75	13.1	1.55			
3.00	3.45	SPT-2	12	14	Medium dense to very dense grey silty fine sand (SM)		3	57	39	1												
4.00	4.30	UDS-2			- medium dense, 3.0 to 13.5 m												1.79	12.9	1.59			
5.00	5.45	SPT-3	16	17	- with traces of gravel, 3.0 to 5.0 m																	
6.00	6.30	UDS-3																				
7.00	7.45	SPT-4	18	16																		
8.00	8.30	DS-2																				
8.50	8.95	SPT-5	21	17																		
9.00	9.45	SPT-6	26	19																		
10.00	10.30	DS-3																				
10.50	10.95	SPT-7	28	20	- with traces of gravel, 10.5 to 11.5 m		1	56	42	1												
11.50	11.95	SPT-8	30	20																		
13.00	13.30	DS-4																				
13.50	13.95	SPT-9	33	21	- dense, 13.5 to 23.5 m																	
14.50	14.95	SPT-10	36	22																		
16.00	16.30	DS-5																				

* Outside NABL scope.

DS: Direct shear test- Consolidated Drained

UUT: Unconsolidated undrained triaxial shear test



Borehole No.:-27

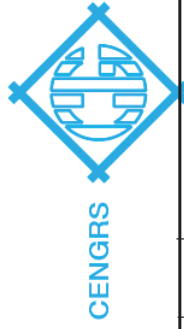
SUMMARY OF LABORATORY TEST RESULTS

Depth, m		Sample Type	Field Value N*	Corrected Value N**	SOIL DESCRIPTION	Strata Break	Grain Size Analysis				Liquid Limit, %	Plastic Limit, %	Plasticity Index, %	Shrinkage Limit, %	Specific Gravity	Free Swell Index, %	Bulk Density ₃ gms/cm ³	Moisture Content, %	Dry Density ₃ g/cm ³	Type of test	Confining Pressure ₃ kg/cm ²	C _u kg/cm ²	Degree ϕ
From	To						Gravel (%)	Sand (%)	Silt (%)	Clay (%)													
16.50	16.95	SPT-11	38	22	Dense to very dense grey silty fine sand (SM)																		
17.50	17.95	SPT-12	40	23	- dense, 16.5 to 23.5 m																		
19.00	19.30	DS-6																					
19.50	19.95	SPT-13	42	23																			
20.50	20.95	SPT-14	45	24																			
22.00	22.30	DS-7																					
22.50	22.95	SPT-15	48	24																			
23.50	23.95	SPT-16	50	25	- very dense, 23.5 to 45.44 m																		
25.00	25.30	DS-8																					
25.50	25.95	SPT-17	53	25																			
26.50	26.95	SPT-18	55	26			0	84	16	0													
28.00	28.30	DS-9																					
28.50	28.95	SPT-19	58	26																			
29.50	29.95	SPT-20	61	27																			
31.00	31.30	DS-10																					
31.50	31.95	SPT-21	65	27																			
32.50	32.95	SPT-22	70	28																			
34.00	34.30	DS-11																					

* Outside NABL scope.

DS: Direct shear test- Consolidated Drained

UUT: Unconsolidated undrained triaxial shear test



Borehole No.:-27

[illegible]

UUT: Unconsolidated undrained triaxial shear test



BOREHOLE NO: 28

PAGE 1 OF 3

BOREHOLE NO : BH-28			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.100 m								
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 7.15								
CHAINAGE : -			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 45.41 m								
COORDINATES : 1000 E, 170 N			CASING DEPTH : 45.00 m			LOGGED BY : Mr. Gaurav								
DATE OF START : 21-Dec-2019			DATE OF FINISH : 22-Dec-2019			CHECKED BY : Ankit Uniyal								
DEPTH (m)	GRAPHICAL LOG	SYMBOL	LAYER DEPTH, m	MATERIAL DESCRIPTION	LAYER ELEVATION, m	SAMPLE NUMBER	SAMPLE DEPTH (m)	SAMPLE TYPE	FIELD N VALUES	▲ FIELD SPT N VALUE ▲				
										20 40 60 80				
										PL (%)	MC (%)	LL (%)		
										20 40 60 80				
										■ FINES CONTENT (%) ■				
										20 40 60 80				
1		SM	Medium dense grey silty fine sand (SM)	186.10	DS-1	0.00 - 0.50								
SPT-1					1.00 - 1.45		22							
UDS-1					2.00 - 2.30									
SPT-2					3.00 - 3.45		14							
UDS-2					4.00 - 4.30									
SPT-3					5.00 - 5.45		16							
UDS-3					6.00 - 6.30									
7.00														
8						SP-SM	Medium dense to very dense grey fine sand (SP-SM) - medium dense, 7.0 to 11.5 m - dense, 11.5 to 22.5 m - with gravel, 11.5 to 13.0 m	186.10		SPT-4	7.00 - 7.45		20	
DS-2										8.00 - 8.30				
SPT-5	8.50 - 8.95		23											
SPT-6	9.00 - 9.45		26											
DS-3	10.00 - 10.30													
SPT-7	10.50 - 10.95		29											
SPT-8	11.50 - 11.95		32											
DS-4	13.00 - 13.30													
SPT-9	13.50 - 13.95		34											
SPT-10	14.50 - 14.95		37											

PL - PLASTIC LIMIT
LL - LIQUID LIMIT
MC - MOISTURE CONTENT

Ground Water
Table

DISTURBED SAMPLE
(DS)

Standard Penetration
Test (SPT)

UNDISTURBED
SAMPLE (UDS)

(Continued Next Page)



BOREHOLE NO: 28

PAGE 2 OF 3

BOREHOLE NO : BH-28			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.100 m							
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 7.15							
CHAINAGE : -			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 45.41 m							
COORDINATES : 1000 E, 170 N			CASING DEPTH : 45.00 m			LOGGED BY : Mr. Gaurav							
DATE OF START : 21-Dec-2019			DATE OF FINISH : 22-Dec-2019			CHECKED BY : Ankit Uniyal							
DEPTH (m)	GRAPHICAL LOG	SYMBOL	LAYER DEPTH, m	MATERIAL DESCRIPTION	LAYER ELEVATION, m	SAMPLE NUMBER	SAMPLE DEPTH (m)	SAMPLE TYPE	FIELD N VALUES	FIELD SPT N VALUE ▲			
										20 40 60 80			
										PL (%) MC (%) LL (%)			
20 40 60 80													
■ FINES CONTENT (%) ■													
20 40 60 80													
17		SP-SM	Dense to very dense grey fine sand (SP-SM) - dense, 16.5 to 22.5 m	167.60	DS-5	16.00 - 16.30							
SPT-11					16.50 - 16.95		39						
SPT-12					17.50 - 17.95		41						
DS-6					19.00 - 19.30								
SPT-13					19.50 - 19.95		43						
SPT-14					20.50 - 20.95		49						
22			- very dense, 22.5 to 25.5 m	167.60	DS-7	22.00 - 22.30							
SPT-15	22.50 - 22.95				52								
SPT-16	23.50 - 23.95				55								
DS-8	25.00 - 25.30												
25.50													
26		SM			Very dense grey silty fine sand (SM) - with gravel, 25.5 to 26.5 m	167.60	SPT-17	25.50 - 25.95		57			
SPT-18			26.50 - 26.95				61						
DS-9			28.00 - 28.30										
SPT-19			28.50 - 28.95				65						
SPT-20			29.50 - 29.95				67						
31			DS-10	31.00 - 31.30									
32			SPT-21	31.50 - 31.95		72							

PL - PLASTIC LIMIT
LL - LIQUID LIMIT
MC - MOISTURE CONTENT

Ground Water
Table

DISTURBED SAMPLE
(DS)

Standard Penetration
Test (SPT)

UNDISTURBED
SAMPLE (UDS)

(Continued Next Page)



BOREHOLE NO: 28

PAGE 3 OF 3

BOREHOLE NO : BH-28			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.100 m							
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 7.15							
CHAINAGE : -			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 45.41 m							
COORDINATES : 1000 E, 170 N			CASING DEPTH : 45.00 m			LOGGED BY : Mr. Gaurav							
DATE OF START : 21-Dec-2019			DATE OF FINISH : 22-Dec-2019			CHECKED BY : Ankit Uniyal							
DEPTH (m)	GRAPHICAL LOG	SYMBOL	LAYER DEPTH, m	MATERIAL DESCRIPTION	LAYER ELEVATION, m	SAMPLE NUMBER	SAMPLE DEPTH (m)	SAMPLE TYPE	FIELD N VALUES	▲ FIELD SPT N VALUE ▲			
										20 40 60 80			
										PL (%)	MC (%)	LL (%)	
										20	40	60	80
										■ FINES CONTENT (%) ■			
										20	40	60	80
33		SM	35.50	Very dense grey silty fine sand (SM)	157.60	SPT-22	32.50 - 32.95		75				
34						DS-11	34.00 - 34.30						
35						SPT-23	34.50 - 34.95		78				
36						SPT-24	35.50 - 35.95		81				
37		SP-SM	45.41	- with traces of gravel, 35.5 to 37.0 m	147.69	DS-12	37.00 - 37.30						
38						SPT-25	37.50 - 37.95		82				
39						SPT-26	38.50 - 38.95		84				
40						DS-13	40.00 - 40.30						
41													
42						SPT-27	41.50 - 41.95		88				
43						SPT-28	42.50 - 42.95		92				
44						DS-14	43.00 - 43.30						
45													
			45.41	Termination at 45.41 meters Depth.	147.69	SPT-30	45.00 - 45.41		100/26cm				

PL - PLASTIC LIMIT
LL - LIQUID LIMIT
MC - MOISTURE CONTENT

Ground Water
Table

DISTURBED SAMPLE
(DS)

Standard Penetration
Test (SPT)

UNDISTURBED
SAMPLE (UDS)



Borehole No.:-28

SUMMARY OF LABORATORY TEST RESULTS

Depth, m		Sample Type	Field Value N*	Corrected Value N**	SOIL DESCRIPTION	Strata Break	Grain Size Analysis				Liquid Limit, %	Plastic Limit, %	Plasticity Index, %	Shrinkage Limit, %	Specific Gravity	Free Swell Index, %	Bulk Density ₃ gms/cm ³	Moisture Content, %	Dry Density ₃ g/cm ³	Shear Strength Parameters			
From	To						Gravel (%)	Sand (%)	Silt (%)	Clay (%)										Type of test	Confining Pressure ₃ kg/cm ²	C _u kg/cm ²	Degree ϕ
0.00	0.50	DS-1			Medium dense grey silty fine sand (SM)																		
1.00	1.45	SPT-1	22	34																			
2.00	2.30	UDS-1					0	78	22	0							1.74	12.5	1.55				
3.00	3.45	SPT-2	14	17																			
4.00	4.30	UDS-2															1.79	13.9	1.57				
5.00	5.45	SPT-3	16	17																			
6.00	6.30	UDS-3			Medium dense to very dense grey fine sand (SP-SM)	7.00											1.82	15.1	1.58				
7.00	7.45	SPT-4	20	17																			
8.00	8.30	DS-2				- medium dense, 7.0 to 11.5 m									2.65								
8.50	8.95	SPT-5	23	18																			
9.00	9.45	SPT-6	26	19																			
10.00	10.30	DS-3																					
10.50	10.95	SPT-7	29	20																			
11.50	11.95	SPT-8	32	21	- dense, 11.5 to 22.5 m		8	80	12	0													
13.00	13.30	DS-4			- with gravel, 11.5 to 13.0 m																		
13.50	13.95	SPT-9	34	21																			
14.50	14.95	SPT-10	37	22																			
16.00	16.30	DS-5																					

* Outside NABL scope.

DS: Direct shear test- Consolidated Drained

UUT: Unconsolidated undrained triaxial shear test



Borehole No.:-28

SUMMARY OF LABORATORY TEST RESULTS

Depth, m		Sample Type	Field Value N*	Corrected Value N**	SOIL DESCRIPTION	Strata Break	Grain Size Analysis				Liquid Limit, %	Plastic Limit, %	Plasticity Index, %	Shrinkage Limit, %	Specific Gravity	Free Swell Index, %	Bulk Density ₃ gms/cm ³	Moisture Content, %	Dry Density ₃ g/cm ³	Type of test	Confining Pressure ₃ kg/cm ²	C _u kg/cm ²	Degree ϕ
From	To						Gravel (%)	Sand (%)	Silt (%)	Clay (%)													
16.50	16.95	SPT-11	39	23	Dense to very dense grey fine sand (SP-SM)																		
17.50	17.95	SPT-12	41	23	- dense, 16.5 to 22.5 m																		
19.00	19.30	DS-6																					
19.50	19.95	SPT-13	43	23																			
20.50	20.95	SPT-14	49	25																			
22.00	22.30	DS-7																					
22.50	22.95	SPT-15	52	26	- very dense, 22.5 to 25.5 m																		
23.50	23.95	SPT-16	55	26																			
25.00	25.30	DS-8				25.50																	
25.50	25.95	SPT-17	57	26	Very dense grey silty fine sand (SM)		6	79	15	0													
26.50	26.95	SPT-18	61	27	- with gravel, 25.5 to 26.5 m																		
28.00	28.30	DS-9																					
28.50	28.95	SPT-19	65	28																			
29.50	29.95	SPT-20	67	28																			
31.00	31.30	DS-10																					
31.50	31.95	SPT-21	72	29																			
32.50	32.95	SPT-22	75	30																			
34.00	34.30	DS-11																					

* Outside NABL scope.

DS: Direct shear test- Consolidated Drained

UUT: Unconsolidated undrained triaxial shear test



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[illegible]

UUT: Unconsolidated undrained triaxial shear test



BOREHOLE NO: 29

PAGE 1 OF 3

BOREHOLE NO : BH-29			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.110 m							
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 7.18							
CHAINAGE : -			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 35.45 m							
COORDINATES : 957 E, 135 N			CASING DEPTH : 34.20 m			LOGGED BY : Mr. Gaurav							
DATE OF START : 21-Dec-2019			DATE OF FINISH : 22-Dec-2019			CHECKED BY : Ankit Uniyal							
DEPTH (m)	GRAPHICAL LOG	SYMBOL	LAYER DEPTH, m	MATERIAL DESCRIPTION	LAYER ELEVATION, m	SAMPLE NUMBER	SAMPLE DEPTH (m)	SAMPLE TYPE	FIELD N VALUES	▲ FIELD SPT N VALUE ▲			
										20	40	60	80
										PL (%)	MC (%)	LL (%)	
										20	40	60	80
										■ FINES CONTENT (%) ■			
										20	40	60	80
1		CL	4.00	Very stiff brown clayey silt, low plastic (CL)	189.11	DS-1	0.00 - 0.50		24				
SPT-1						1.00 - 1.45							
UDS-1						2.00 - 2.30							
SPT-2						3.00 - 3.45							
4		SM	4.00	Medium dense to dense grey silty fine sand (SM) - medium dense, 4.0 to 14.5 m 									

PL - PLASTIC LIMIT
LL - LIQUID LIMIT
MC - MOISTURE CONTENT

Ground Water
Table

DISTURBED SAMPLE
(DS)

Standard Penetration
Test (SPT)

UNDISTURBED
SAMPLE (UDS)

(Continued Next Page)



BOREHOLE NO: 29

PAGE 2 OF 3

BOREHOLE NO : BH-29		BORING METHOD : Shell and Auger		GROUND ELEVATION : RL 193.110 m										
STRUCTURE: STG		SPT HAMMER USED : Automatic Trip		GROUND WATER DEPTH, m 7.18										
CHAINAGE : -		BOREHOLE DIAMETER 150mm		TERMINATION DEPTH : 35.45 m										
COORDINATES : 957 E, 135 N		CASING DEPTH : 34.20 m		LOGGED BY : Mr. Gaurav										
DATE OF START : 21-Dec-2019		DATE OF FINISH : 22-Dec-2019		CHECKED BY : Ankit Uniyal										
DEPTH (m)	GRAPHICAL LOG	SYMBOL	LAYER DEPTH, m	MATERIAL DESCRIPTION	LAYER ELEVATION, m	SAMPLE NUMBER	SAMPLE DEPTH (m)	SAMPLE TYPE	FIELD N VALUES	FIELD SPT N VALUE ▲	PL (%)	MC (%)	LL (%)	FINES CONTENT (%) ■
17				Medium dense to dense grey silty fine sand (SM)		DS-5	16.00 - 16.30	UNDISTURBED SAMPLE (UDS)						
18				- medium dense, 16.5 to 17.5 m		SPT-11	16.50 - 16.95	DISTURBED SAMPLE (DS)	27					
19				- dense, 17.5 to 20.5 m		SPT-12	17.50 - 17.95	DISTURBED SAMPLE (DS)	39					
20						DS-6	19.00 - 19.30	UNDISTURBED SAMPLE (UDS)						
21			20.50	Hard brown clayey silt, low plastic (CL)	172.61	SPT-13	19.50 - 19.95	DISTURBED SAMPLE (DS)	44					
22			22.00		171.11	SPT-14	20.50 - 20.95	DISTURBED SAMPLE (DS)	31					
23				Dense to very dense grey fine sand with traces of gravel (SP-SM)		DS-7	22.00 - 22.30	UNDISTURBED SAMPLE (UDS)						
24				- dense, 22.0 to 23.5 m		SPT-15	22.50 - 22.95	DISTURBED SAMPLE (DS)	47					
25				- very dense, 23.5 to 35.0 m		SPT-16	23.50 - 23.95	DISTURBED SAMPLE (DS)	59					
26						DS-8	25.00 - 25.30	UNDISTURBED SAMPLE (UDS)						
27						SPT-17	25.50 - 25.95	DISTURBED SAMPLE (DS)	62					
28						SPT-18	26.50 - 26.95	DISTURBED SAMPLE (DS)	71					
29				- with traces of gravel, 28.0 to 34.0 m		DS-9	28.00 - 28.30	UNDISTURBED SAMPLE (UDS)						
30						SPT-19	28.50 - 28.95	DISTURBED SAMPLE (DS)	75					
31						SPT-20	29.50 - 29.95	DISTURBED SAMPLE (DS)	78					
32						DS-10	31.00 - 31.30	UNDISTURBED SAMPLE (UDS)						
						SPT-21	31.50 - 31.95	DISTURBED SAMPLE (DS)	85					

PL - PLASTIC LIMIT
LL - LIQUID LIMIT
MC - MOISTURE CONTENT

Ground Water
Table

DISTURBED SAMPLE
(DS)

Standard Penetration
Test (SPT)

UNDISTURBED
SAMPLE (UDS)

(Continued Next Page)



BOREHOLE NO: 29

PAGE 3 OF 3

BOREHOLE NO : BH-29			BORING METHED : Shell and Auger			GROUND ELEVATION : RL 193.110 m							
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 7.18							
CHAINAGE : -			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 35.45 m							
COORDINATES : 957 E, 135 N			CASING DEPTH : 34.20 m			LOGGED BY : Mr. Gaurav							
DATE OF START : 21-Dec-2019			DATE OF FINISH : 22-Dec-2019			CHECKED BY : Ankit Uniyal							
DEPTH (m)	GRAPHICAL LOG	SYMBOL	LAYER DEPTH, m	MATERIAL DESCRIPTION	LAYER ELEVATION, m	SAMPLE NUMBER	SAMPLE DEPTH (m)	SAMPLE TYPE	FIELD N VALUES	▲ FIELD SPT N VALUE ▲			
										20	40	60	80
										PL (%)	MC (%)	LL (%)	
										20	40	60	80
										■ FINES CONTENT (%) ■			
										20	40	60	80
33		SP-SM				SPT-22	32.50 - 32.95		72				
34													
35													
		CL	35.00	Hard brown sandy silt, low plastic (CL)	158.11								
			35.45	Termination at 35.45 meters Depth.	157.66	SPT-23	35.00 - 35.45		50				

PL - PLASTIC LIMIT
LL - LIQUID LIMIT
MC - MOISTURE CONTENT

Ground Water Table

DISTURBED SAMPLE (DS)

Standard Penetration Test (SPT)

UNDISTURBED SAMPLE (UDS)



Borehole No.:-29

SUMMARY OF LABORATORY TEST RESULTS

Depth, m		Sample Type	Field Value N*	Corrected Value N**	SOIL DESCRIPTION	Strata Break	Grain Size Analysis				Liquid Limit, %	Plastic Limit, %	Plasticity Index, %	Shrinkage Limit, %	Specific Gravity	Free Swell Index, %	Bulk Density ₃ gms/cm ³	Moisture Content, %	Dry Density ₃ g/cm ³	Shear Strength Parameters			
From	To						Gravel (%)	Sand (%)	Silt (%)	Clay (%)										Type of test	Confining Pressure kg/cm ²	C _u kg/cm ²	Degree ϕ
0.00	0.50	DS-1			Very stiff brown clayey silt, low plastic (CL)																		
1.00	1.45	SPT-1	24	24							28.3	21.2	7.1										
2.00	2.30	UDS-1															1.74	12.8	1.54				
3.00	3.45	SPT-2	17	17		4.00	0	39	60	1					2.65								
4.00	4.30	UDS-2			Medium dense to dense grey silty fine sand (SM)												1.78	13.5	1.57				
5.00	5.45	SPT-3	15	16																			
6.00	6.30	UDS-3															1.83	14.9	1.59	DS	0.5,1,1.5	0.0	31.9
7.00	7.45	SPT-4	18	16																			
8.00	8.30	DS-2																					
8.50	8.95	SPT-5	21	17																			
9.00	9.45	SPT-6	24	18																			
10.00	10.30	DS-3																					
10.50	10.95	SPT-7	25	18																			
11.50	11.95	SPT-8	22	17																			
13.00	13.30	DS-4																					
13.50	13.95	SPT-9	25	18			0	79	21	0													
14.50	14.95	SPT-10	31	20	- dense, 14.5 to 16.5 m																		
16.00	16.30	DS-5																					

* Outside NABL scope.

DS: Direct shear test- Consolidated Drained

UUT: Unconsolidated undrained triaxial shear test



Borehole No.:-29

SUMMARY OF LABORATORY TEST RESULTS

Depth, m		Sample Type	Field Value N*	Corrected Value N*	SOIL DESCRIPTION	Strata Break	Grain Size Analysis				Liquid Limit, %	Plastic Limit, %	Plasticity Index, %	Shrinkage Limit, %	Specific Gravity	Free Swell Index, %	Bulk Density ₃ g/cm ³	Moisture Content, %	Dry Density ₃ g/cm ³	Shear Strength Parameters	Type of test	Confining Pressure ₃ kg/cm ²	C _u kg/cm ²	Degree ϕ
From	To						Gravel (%)	Sand (%)	Silt (%)	Clay (%)														
16.50	16.95	SPT-11	27	18	Medium dense to dense grey silty fine sand (SM)																			
17.50	17.95	SPT-12	39	22	- medium dense, 16.5 to 17.5 m 19.00																			
19.30	DS-6		-		- dense, 17.5 to 20.5 m																			
19.50	19.95	SPT-13	44	24		20.50																		
20.50	20.95	SPT-14	31	31	Hard brown clayey silt, low plastic (CL)	22.00					28.2	17.4	10.8	11										
22.00	22.30	DS-7			Dense to very dense grey fine sand with traces of gravel (SP-SM)																			
22.50	22.95	SPT-15	47	24	- dense, 22.0 to 23.5 m																			
23.50	23.95	SPT-16	59	28	- very dense, 23.5 to 35.0 m																			
25.00	25.30	DS-8																						
25.50	25.95	SPT-17	62	28																				
26.50	26.95	SPT-18	71	31																				
28.00	28.30	DS-9			- with traces of gravel, 28.0 to 34.0 m		1	92	7	0														
28.50	28.95	SPT-19	75	31																				
29.50	29.95	SPT-20	78	32																				
31.00	31.30	DS-10																						
31.50	31.95	SPT-21	85	33																				
32.50	32.95	SPT-22	72	29			2	88	10	0														
34.00	34.30	DS-11				35.00																		

* Outside NABL scope.

DS: Direct shear test- Consolidated Drained

UUT: Unconsolidated undrained triaxial shear test



Borehole No.:-29

SUMMARY OF LABORATORY TEST RESULTS

[illegible]

* Outside NABL scope.

DS: Direct shear test- Consolidated Drained

UUUT: Unconsolidated undrained triaxial shear test



BOREHOLE NO: 30

PAGE 1 OF 3

BOREHOLE NO : BH-30			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.080 m						
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 7.05						
CHAINAGE :			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 40.45 m						
COORDINATES : 928 E, 143 N			CASING DEPTH : 40.00 m			LOGGED BY : Mr. Gaurav						
DATE OF START : 19-Dec-2019			DATE OF FINISH : 20-Dec-2019			CHECKED BY : Ankit Uniyal						
DEPTH (m)	GRAPHICAL LOG	SYMBOL	MATERIAL DESCRIPTION	LAYER ELEVATION, m	SAMPLE NUMBER	SAMPLE DEPTH (m)	SAMPLE TYPE	FIELD N VALUES	▲ FIELD SPT N VALUE ▲			
									20	40	60	80
									PL (%)	MC (%)	LL (%)	
20 40 60 80 ■ FINES CONTENT (%) ■ 20 40 60 80												
1		CL	Very stiff brown clayey silt, low plastic (CL)	190.08	DS-1	0.00 - 0.50						
					SPT-1	1.00 - 1.45		28				
2						UDS-1	2.00 - 2.30					
3		SM	Medium dense to dense grey silty fine sand (SM) - medium dense, 3.0 to 16.5 m	190.08								
4						SPT-2	3.00 - 3.45		14			
5						UDS-2	4.00 - 4.30					
6						SPT-3	5.00 - 5.45		16			
7						UDS-3	6.00 - 6.30					
8						SPT-4	7.00 - 7.45		13			
9						UDS-4	8.00 - 8.30					
10						SPT-5	9.00 - 9.45		16			
11						DS-2	10.00 - 10.30					
12						SPT-6	10.50 - 10.95		20			
13						SPT-7	11.50 - 11.95		22			
14						DS-3	13.00 - 13.30					
15						SPT-8	13.50 - 13.95		24			
16		SPT-9	14.50 - 14.95		28							

PL - PLASTIC LIMIT
LL - LIQUID LIMIT
MC - MOISTURE CONTENT

Ground Water
Table

DISTURBED SAMPLE
(DS)

Standard Penetration
Test (SPT)

UNDISTURBED
SAMPLE (UDS)

(Continued Next Page)



BOREHOLE NO: 30

PAGE 2 OF 3

BOREHOLE NO : BH-30			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.080 m							
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 7.05							
CHAINAGE :			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 40.45 m							
COORDINATES : 928 E, 143 N			CASING DEPTH : 40.00 m			LOGGED BY : Mr. Gaurav							
DATE OF START : 19-Dec-2019			DATE OF FINISH : 20-Dec-2019			CHECKED BY : Ankit Uniyal							
DEPTH (m)	GRAPHICAL LOG	SYMBOL	LAYER DEPTH, m	MATERIAL DESCRIPTION	LAYER ELEVATION, m	SAMPLE NUMBER	SAMPLE DEPTH (m)	SAMPLE TYPE	FIELD N VALUES	▲ FIELD SPT N VALUE ▲			
										20	40	60	80
										PL (%)	MC (%)	LL (%)	
</													

PL - PLASTIC LIMIT
LL - LIQUID LIMIT
MC - MOISTURE CONTENT

Ground Water
Table

DISTURBED SAMPLE
(DS)

Standard Penetration
Test (SPT)

UNDISTURBED
SAMPLE (UDS)

(Continued Next Page)



BOREHOLE NO: 30

PAGE 3 OF 3

BOREHOLE NO : BH-30			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.080 m												
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 7.05												
CHAINAGE :			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 40.45 m												
COORDINATES : 928 E, 143 N			CASING DEPTH : 40.00 m			LOGGED BY : Mr. Gaurav												
DATE OF START : 19-Dec-2019			DATE OF FINISH : 20-Dec-2019			CHECKED BY : Ankit Uniyal												
DEPTH (m)	GRAPHICAL LOG	SYMBOL	LAYER DEPTH, m	MATERIAL DESCRIPTION	LAYER ELEVATION, m	SAMPLE NUMBER	SAMPLE DEPTH (m)	SAMPLE TYPE	FIELD N VALUES	▲ FIELD SPT N VALUE ▲								
										20 40 60 80								
										PL (%) MC (%) LL (%)								
										20 40 60 80								
										■ FINES CONTENT (%) ■								
										20 40 60 80								
33		SP-SM	Very dense grey fine sand (SP-SM)	152.63	SPT-21	32.50 - 32.95		64										
34					DS-9	34.00 - 34.30												
35					SPT-22	34.50 - 34.95		70										
36					SPT-23	35.50 - 35.95		73										
37					DS-10	37.00 - 37.30												
38					SPT-24	37.50 - 37.95		77										
39					SPT-25	38.50 - 38.95		80										
40					SPT-26	40.00 - 40.45		85										
					Termination at 40.45 meters Depth.													

PL - PLASTIC LIMIT
LL - LIQUID LIMIT
MC - MOISTURE CONTENT

Ground Water
Table

DISTURBED SAMPLE
(DS)

Standard Penetration
Test (SPT)

UNDISTURBED
SAMPLE (UDS)



Borehole No.:-30

SUMMARY OF LABORATORY TEST RESULTS

Depth, m		Sample Type	Field Value N*	Corrected Value N**	SOIL DESCRIPTION	Strata Break	Grain Size Analysis				Liquid Limit, %	Plastic Limit, %	Plasticity Index, %	Shrinkage Limit, %	Specific Gravity	Free Swell Index, %	Bulk Density ₃ gms/cm ³	Moisture Content, %	Dry Density, g/cm ³	Shear Strength Parameters			Degree ϕ	
From	To						Gravel (%)	Sand (%)	Silt (%)	Clay (%)										Type of test	Confining Pressure kg/cm ²	c_u kg/cm ²		
0.00	0.50	DS-1			Very stiff brown clayey silt, low plastic (CL)																			
1.00	1.45	SPT-1	28	28							32.9	22.9	10.0	15.0										
2.00	2.30	UDS-1				3.00											1.78	15.6	1.54	DS	0.5,1,1.5	0.0	30.4	
3.00	3.45	SPT-2	14	17	Medium dense to dense grey silty fine sand (SM) - medium dense, 3.0 to 16.5 m																			
4.00	4.30	UDS-2															1.82	16.8	1.56					
5.00	5.45	SPT-3	16	17			0	83	17	0					2.67									
6.00	6.30	UDS-3														1.86	17.5	1.58						
7.00	7.45	SPT-4	13	12																				
8.00	8.30	UDS-4																						
9.00	9.45	SPT-5	16	14																				
10.00	10.30	DS-2																						
10.50	10.95	SPT-6	20	16																				
11.50	11.95	SPT-7	22	17																				
13.00	13.30	DS-3																						
13.50	13.95	SPT-8	24	17																				
14.50	14.95	SPT-9	28	19																				
16.00	16.30	DS-4																						
16.50	16.95	SPT-10	31	20	- dense, 16.5 to 17.5 m	17.50																		

* Outside NABL scope.

DS: Direct shear test- Consolidated Drained

UUT: Unconsolidated undrained triaxial shear test



Borehole No.:-30

SUMMARY OF LABORATORY TEST RESULTS

Depth, m		Sample Type	Field Value N*	Corrected Value N**	SOIL DESCRIPTION	Strata Break	Grain Size Analysis				Liquid Limit, %	Plastic Limit, %	Plasticity Index, %	Shrinkage Limit, %	Specific Gravity	Free Swell Index, %	Bulk Density, g/cm ³	Moisture Content, %	Dry Density, g/cm ³	Type of test	Confining Pressure, kg/cm ²	kg/cm ²	Degree ϕ
From	To						Gravel (%)	Sand (%)	Silt (%)	Clay (%)													
17.50	17.95	SPT-11	35	21	Dense grey fine sand (SP)		0	96	4	0													
19.00	19.30	DS-5																					
19.50	19.95	SPT-12	37	21		20.50																	
20.50	20.95	SPT-13	31	31	Hard brown clayey silt, low plastic (CL)	22.00					29.8	19.2	10.6										
22.00	22.30	DS-6			Dense to very dense grey fine sand with traces of gravel (SP-SM)																		
22.50	22.95	SPT-14	39	21	- dense, 22.0 to 26.5 m																		
23.50	23.95	SPT-15	42	22																			
25.00	25.30	UDS-5																					
25.50	25.95	SPT-16	47	23													1.95	20.1	1.62				
26.50	26.95	SPT-17	51	24	- very dense, 26.5 to 45.45 m																		
28.00	28.30	DS-7																					
28.50	28.95	SPT-18	54	25																			
29.50	29.95	SPT-19	57	25			1	92	7	0													
31.00	31.30	DS-8																					
31.50	31.95	SPT-20	61	26																			
32.50	32.95	SPT-21	64	27																			
34.00	34.30	DS-9																					
34.50	34.95	SPT-22	70	28																			

* Outside NABL scope.

DS: Direct shear test- Consolidated Drained

UUT: Unconsolidated undrained triaxial shear test

Borehole No.:-30

[illegible]

* Outside NABL scope.

DS: Direct shear test- Consolidated Drained

UUUT: Unconsolidated undrained triaxial shear test



BOREHOLE NO: 31

PAGE 1 OF 3

BOREHOLE NO : BH-31			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.040 m					
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 7.10					
CHAINAGE :			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 40.45 m					
COORDINATES : 899 E, 143 N			CASING DEPTH : 40.00 m			LOGGED BY : Mr. Gaurav					
DATE OF START : 11-Dec-2019			DATE OF FINISH : 12-Dec-2019			CHECKED BY : Ankit Uniyal					
DEPTH (m)	GRAPHICAL LOG	SYMBOL	LAYER DEPTH, m	MATERIAL DESCRIPTION	LAYER ELEVATION, m	SAMPLE NUMBER	SAMPLE DEPTH (m)	SAMPLE TYPE	FIELD N VALUES	▲ FIELD SPT N VALUE ▲ 20 40 60 80 PL (%) MC (%) LL (%) 20 40 60 80 ■ FINES CONTENT (%) ■	
1		CL	2.00	Hard brown clayey silt, low plastic (CL)	191.04	DS-1	0.00 - 0.50				
						SPT-1	1.00 - 1.45		43		
2		SM	16.00	Medium dense grey silty fine sand (SM)	177.04	UDS-1	2.00 - 2.30				
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											
13											
14											
15											
16											

PL - PLASTIC LIMIT
LL - LIQUID LIMIT
MC - MOISTURE CONTENT

Ground Water
Table

DISTURBED SAMPLE
(DS)

Standard Penetration
Test (SPT)

UNDISTURBED
SAMPLE (UDS)

(Continued Next Page)



BOREHOLE NO: 31

PAGE 2 OF 3

BOREHOLE NO : BH-31			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.040 m							
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 7.10							
CHAINAGE :			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 40.45 m							
COORDINATES : 899 E, 143 N			CASING DEPTH : 40.00 m			LOGGED BY : Mr. Gaurav							
DATE OF START : 11-Dec-2019			DATE OF FINISH : 12-Dec-2019			CHECKED BY : Ankit Uniyal							
DEPTH (m)	GRAPHICAL LOG	SYMBOL	LAYER DEPTH, m	MATERIAL DESCRIPTION	LAYER ELEVATION, m	SAMPLE NUMBER	SAMPLE DEPTH (m)	SAMPLE TYPE	FIELD N VALUES	FIELD SPT N VALUE ▲			
										20 40 60 80			
										PL (%) MC (%) LL (%) 20 40 60 80			
										■ FINES CONTENT (%) ■			
17		SP	Dense grey fine sand (SP)	172.54	DS-4	16.00 - 16.30			35				
					SPT-10	16.50 - 16.95							
18													
					SPT-11	17.50 - 17.95					44		
19													
					DS-5	19.00 - 19.30							
20		CI	Hard brown clayey silt, medium plastic (CI)	171.04	SPT-12	19.50 - 19.95			49				
20.50													
21		SM	Very dense grey silty fine sand (SM)	171.04	SPT-13	20.50 - 20.95			59				
22													
					DS-6	22.00 - 22.30							
23						SPT-14	22.50 - 22.95				66		
24						SPT-15	23.50 - 23.95				68		
25						DS-7	25.00 - 25.30						
26						SPT-16	25.50 - 25.95				69		
27						SPT-17	26.50 - 26.95				74		
28						DS-8	28.00 - 28.30						
29						SPT-18	28.50 - 28.95				76		
30		SPT-19	29.50 - 29.95			81							
31		DS-9	31.00 - 31.30										
32		SPT-20	31.50 - 31.95			83							

PL - PLASTIC LIMIT
LL - LIQUID LIMIT
MC - MOISTURE CONTENT

Ground Water
Table

DISTURBED SAMPLE
(DS)

Standard Penetration
Test (SPT)

UNDISTURBED
SAMPLE (UDS)

(Continued Next Page)



BOREHOLE NO: 31

PAGE 3 OF 3

BOREHOLE NO : BH-31			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.040 m								
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 7.10								
CHAINAGE :			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 40.45 m								
COORDINATES : 899 E, 143 N			CASING DEPTH : 40.00 m			LOGGED BY : Mr. Gaurav								
DATE OF START : 11-Dec-2019			DATE OF FINISH : 12-Dec-2019			CHECKED BY : Ankit Uniyal								
DEPTH (m)	GRAPHICAL LOG	SYMBOL	LAYER DEPTH, m	MATERIAL DESCRIPTION	LAYER ELEVATION, m	SAMPLE NUMBER	SAMPLE DEPTH (m)	SAMPLE TYPE	FIELD N VALUES	▲ FIELD SPT N VALUE ▲				
										20 40 60 80				
										PL (%) MC (%) LL (%)				
										20 40 60 80				
										■ FINES CONTENT (%) ■				
										20 40 60 80				
33		SM	40.45	Very dense grey silty fine sand (SM)	152.59	SPT-21	32.50 - 32.95		87					
34						DS-10	34.00 - 34.30							
35						SPT-22	34.50 - 34.95		79					
36						SPT-23	35.50 - 35.95		88					
37						DS-11	37.00 - 37.30							
38						SPT-24	37.50 - 37.95		89					
39						SPT-25	39.00 - 39.45		92					
40						SPT-26	40.00 - 40.45		96					
Termination at 40.45 meters Depth.														

PL - PLASTIC LIMIT
LL - LIQUID LIMIT
MC - MOISTURE CONTENT

Ground Water
Table

DISTURBED SAMPLE
(DS)

Standard Penetration
Test (SPT)

UNDISTURBED
SAMPLE (UDS)



Borehole No.:-31

SUMMARY OF LABORATORY TEST RESULTS

Depth, m		Sample Type	Field Value N*	Corrected Value N**	SOIL DESCRIPTION	Strata Break	Grain Size Analysis				Liquid Limit, %	Plastic Limit, %	Plasticity Index, %	Shrinkage Limit, %	Specific Gravity	Free Swell Index, %	Bulk Density ₃ gms/cm ³	Moisture Content, %	Dry Density, g/cm ³	Shear Strength Parameters			Degree ϕ	
From	To						Gravel (%)	Sand (%)	Silt (%)	Clay (%)										Type of test	Confining Pressure kg/cm ²	C _u kg/cm ²		
0.00	0.50	DS-1			Hard brown clayey silt, low plastic (CL)	2.00																		
1.00	1.45	SPT-1	43	43								30.1	23.1	7.0										
2.00	2.30	UDS-1			Medium dense grey silty fine sand (SM)												1.78	13.9	1.56					
3.00	3.45	SPT-2	24	29					0	77	23	0												
4.00	4.30	UDS-2															1.85	14.5	1.62					
5.00	5.45	SPT-3	19	20										2.67										
6.00	6.30	UDS-3																1.89	21.7	1.55				
7.00	7.45	SPT-4	22	18																				
8.00	8.30	UDS-4																						
9.00	9.45	SPT-5	18	16			0	78	22	0														
10.00	10.30	DS-2																						
10.50	10.95	SPT-6	23	18																				
11.50	11.95	SPT-7	27	19																				
13.00	13.30	DS-3																						
13.50	13.95	SPT-8	29	19																				
14.50	14.95	SPT-9	32	20		16.00																		
16.00	16.30	DS-4			Dense grey fine sand (SP)			0	96	4	0													
16.50	16.95	SPT-10	35	21																				

* Outside NABL scope.

DS: Direct shear test- Consolidated Drained

UUT: Unconsolidated undrained triaxial shear test



Borehole No.:-31

SUMMARY OF LABORATORY TEST RESULTS

Depth, m		Sample Type	Field Value N**	Corrected Value N**	SOIL DESCRIPTION	Strata Break	Grain Size Analysis				Liquid Limit, %	Plastic Limit, %	Plasticity Index, %	Shrinkage Limit, %	Specific Gravity	Free Swell Index, %	Bulk Density ₃ gms/cm ³	Moisture Content, %	Dry Density, g/cm ³	Shear Strength Parameters			Degree ϕ	
From	To						Gravel (%)	Sand (%)	Silt (%)	Clay (%)										Type of test	Confining Pressure kg/cm ²	C _u kg/cm ²		
17.50	17.95	SPT-11	44	24	Dense grey fine sand (SP)																			
19.00	19.30	DS-5																						
19.50	19.95	SPT-12	49	26		20.50																		
20.50	20.95	SPT-13	59	59	Hard brown clayey silt, medium plastic (CI)	22.00					38.7	20.4	18.2											
22.00	22.30	DS-6			Very dense grey silty fine sand (SM)																			
22.50	22.95	SPT-14	66	31																				
23.50	23.95	SPT-15	68	31																				
25.00	25.30	DS-7																						
25.50	25.95	SPT-16	69	30																				
26.50	26.95	SPT-17	74	32			0	78	22	0														
28.00	28.30	DS-8																						
28.50	28.95	SPT-18	76	32																				
29.50	29.95	SPT-19	81	33																				
31.00	31.30	DS-9																						
31.50	31.95	SPT-20	83	33																				
32.50	32.95	SPT-21	87	33																				
34.00	34.30	DS-10																						
34.50	34.95	SPT-22	79	30																				

* Outside NABL scope.

DS: Direct shear test- Consolidated Drained

UUT: Unconsolidated undrained triaxial shear test



Borehole No.:-31

[illegible]

* Outside NABL scope.

DS: Direct shear test- Consolidated Drained

UUT: Unconsolidated undrained triaxial shear test



BOREHOLE NO: 32

PAGE 1 OF 3

BOREHOLE NO : BH-32			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.050 m						
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 7.08						
CHAINAGE :			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 35.45 m						
COORDINATES : 868 E, 165 N			CASING DEPTH : 35.00 m			LOGGED BY : Mr. Gaurav						
DATE OF START : 09-Dec-2019			DATE OF FINISH : 10-Dec-2019			CHECKED BY : Ankit Uniyal						
DEPTH (m)	GRAPHICAL LOG	SYMBOL	LAYER DEPTH, m	MATERIAL DESCRIPTION	LAYER ELEVATION, m	SAMPLE NUMBER	SAMPLE DEPTH (m)	SAMPLE TYPE	FIELD N VALUES	▲ FIELD SPT N VALUE ▲		
										20 40 60 80		
										PL (%) MC (%) LL (%)		
										20 40 60 80		
■ FINES CONTENT (%) ■												
20 40 60 80												
1		CL	Very stiff brown clayey silt with traces of gravel, low plastic (CL)	187.05	DS-1	0.00 - 0.50		15				
SPT-1					1.00 - 1.45							
2					UDS-1	2.00 - 2.30						
3					SPT-2	3.00 - 3.45						
4					UDS-2	4.00 - 4.30						
5					SPT-3	5.00 - 5.45						
6		6.00										
7		SM	Medium dense to dense grey silty fine sand (SM) - medium dense, 6.0 to 13.5 m - dense, 13.5 to 17.5 m	187.05	UDS-3	6.00 - 6.30		14				
8					SPT-4	7.00 - 7.45						
9					UDS-4	8.00 - 8.30						
10					SPT-5	9.00 - 9.45						
11					UDS-5	10.00 - 10.30						
12					SPT-6	10.50 - 10.95						
13					SPT-7	11.50 - 11.95						
14					DS-2	13.00 - 13.30						
15					SPT-8	13.50 - 13.95						
16												
						SPT-9	14.50 - 14.95		34			

PL - PLASTIC LIMIT
LL - LIQUID LIMIT
MC - MOISTURE CONTENT

Ground Water
Table

DISTURBED SAMPLE
(DS)

Standard Penetration
Test (SPT)

UNDISTURBED
SAMPLE (UDS)

(Continued Next Page)



BOREHOLE NO: 32

PAGE 2 OF 3

BOREHOLE NO : BH-32			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.050 m						
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 7.08						
CHAINAGE :			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 35.45 m						
COORDINATES : 868 E, 165 N			CASING DEPTH : 35.00 m			LOGGED BY : Mr. Gaurav						
DATE OF START : 09-Dec-2019			DATE OF FINISH : 10-Dec-2019			CHECKED BY : Ankit Uniyal						
DEPTH (m)	GRAPHICAL LOG	SYMBOL	LAYER DEPTH, m	MATERIAL DESCRIPTION	LAYER ELEVATION, m	SAMPLE NUMBER	SAMPLE DEPTH (m)	SAMPLE TYPE	FIELD N VALUES	▲ FIELD SPT N VALUE ▲		
										20 40 60 80		
										PL (%) MC (%) LL (%)		
										20 40 60 80		
■ FINES CONTENT (%) ■												
20 40 60 80												
17		SM	17.50		175.55	DS-3	16.00 - 16.30					
						SPT-10	16.50 - 16.95		39			
18		SP-SM	17.50	Dense to very dense grey fine sand (SP-SM)	175.55	SPT-11	17.50 - 17.95		42			
19												
						- dense, 17.5 to 20.5 m		DS-4	19.00 - 19.30			
20								SPT-12	19.50 - 19.95			46
21						- very dense, 20.5 to 26.5 m		SPT-13	20.50 - 20.95			52
22												
								DS-5	22.00 - 22.30			
23								SPT-14	22.50 - 22.95			57
24								SPT-15	23.50 - 23.95			60
25												
					DS-6	25.00 - 25.30						
26			26.50		166.55	SPT-16	25.50 - 25.95		62			
27				Very dense grey silty fine sand (SM)		SPT-17	26.50 - 26.95		69			
28		SM		- with gravel, 26.5 to 28.0 m		DS-7	28.00 - 28.30					
29								SPT-18	28.50 - 28.95			75
30								SPT-19	29.50 - 29.95			55
31												
								DS-8	31.00 - 31.30			
32						SPT-20	31.50 - 31.95		56			

PL - PLASTIC LIMIT
LL - LIQUID LIMIT
MC - MOISTURE CONTENT

Ground Water
Table

DISTURBED SAMPLE
(DS)

Standard Penetration
Test (SPT)

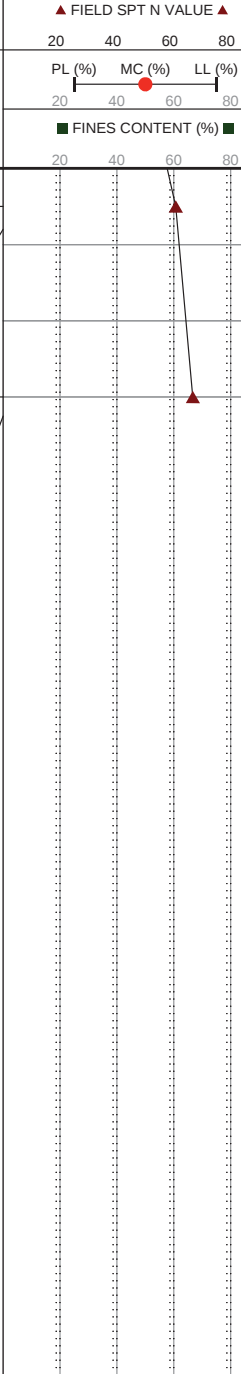
UNDISTURBED
SAMPLE (UDS)

(Continued Next Page)



BOREHOLE NO: 32

PAGE 3 OF 3

BOREHOLE NO : BH-32			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.050 m					
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 7.08					
CHAINAGE :			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 35.45 m					
COORDINATES : 868 E, 165 N			CASING DEPTH : 35.00 m			LOGGED BY : Mr. Gaurav					
DATE OF START : 09-Dec-2019			DATE OF FINISH : 10-Dec-2019			CHECKED BY : Ankit Uniyal					
DEPTH (m)	GRAPHICAL LOG	SYMBOL	LAYER DEPTH, m	MATERIAL DESCRIPTION	LAYER ELEVATION, m	SAMPLE NUMBER	SAMPLE DEPTH (m)	SAMPLE TYPE	FIELD N VALUES	▲ FIELD SPT N VALUE ▲	
										20 40 60 80	
										PL (%) MC (%) LL (%)	
										20 40 60 80	
										■ FINES CONTENT (%) ■	
										20 40 60 80	
33		SM				SPT-21	32.50 - 32.95		62		
34					DS-9	34.00 - 34.30					
35											
			35.45	Termination at 35.45 meters Depth.	157.60	SPT-22	35.00 - 35.45		68		

PL - PLASTIC LIMIT
LL - LIQUID LIMIT
MC - MOISTURE CONTENT

Ground Water
Table

DISTURBED SAMPLE
(DS)

Standard Penetration
Test (SPT)

UNDISTURBED
SAMPLE (UDS)



Borehole No.:-32

SUMMARY OF LABORATORY TEST RESULTS

Depth, m		Sample Type	Field Value N*	Corrected Value N**	SOIL DESCRIPTION	Strata Break	Grain Size Analysis				Liquid Limit, %	Plastic Limit, %	Plasticity Index, %	Shrinkage Limit, %	Specific Gravity	Free Swell Index, %	Bulk Density, gms/cm ³	Moisture Content, %	Dry Density, g/cm ³	Type of test	Confining Pressure, kg/cm ²	kg/cm ²	Degree ϕ
From	To						Gravel (%)	Sand (%)	Silt (%)	Clay (%)													
0.00	0.50	DS-1			Very stiff brown clayey silt with traces of gravel, low plastic (CL)						33.2	19.4	13.8										
1.00	1.45	SPT-1	15	15																			
2.00	2.30	UDS-1									30.7	27.2	3.6				1.72	12.5	1.53	UU	1,2,3	0.5	4.0
3.00	3.45	SPT-2	15	15							34.4	24.1	10.3										
4.00	4.30	UDS-2					1	11	83	5							1.75	13.9	1.54	UU	1,2,3	0.7	6.6
5.00	5.45	SPT-3	19	19		6.00					31.1	27.3	3.9										
6.00	6.30	UDS-3			Medium dense to dense grey silty fine sand (SM)												1.79	14.8	1.56				
7.00	7.45	SPT-4	14	13	- medium dense, 6.0 to 13.5 m																		
8.00	8.30	UDS-4																					
9.00	9.45	SPT-5	17	15			0	54	45	1													
10.00	10.30	UDS-5																					
10.50	10.95	SPT-6	23	18																			
11.50	11.95	SPT-7	29	20																			
13.00	13.30	DS-2																					
13.50	13.95	SPT-8	32	21	- dense, 13.5 to 17.5 m																		
14.50	14.95	SPT-9	34	21																			
16.00	16.30	DS-3																					
16.50	16.95	SPT-10	39	23		17.50																	

* Outside NABL scope.

DS: Direct shear test- Consolidated Drained

UUT: Unconsolidated undrained triaxial shear test