



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 ₃ gms/cm ³	Moisture Content, %	Dry Density, g/cm ³	Type of test	Shear Strength Parameters		
From	To						Gravel (%)	Sand (%)	Silt (%)	Clay (%)											Confining Pressure ₃ kg/cm ²	C _v kg/cm ²	Degree ϕ
17.50	17.95	SPT-11	42	24	Dense to very dense grey fine sand (SP-SM)		0	91	9	0													
19.00	19.30	DS-4			- dense, 17.5 to 20.5 m																		
19.50	19.95	SPT-12	46	25																			
20.50	20.95	SPT-13	52	26	- very dense, 20.5 to 26.5 m																		
22.00	22.30	DS-5																					
22.50	22.95	SPT-14	57	27																			
23.50	23.95	SPT-15	60	28																			
25.00	25.30	DS-6																					
25.50	25.95	SPT-16	62	28		26.50																	
26.50	26.95	SPT-17	69	30	Very dense grey silty fine sand (SM)		6	78	16	0													
28.00	28.30	DS-7			- with gravel, 26.5 to 28.0 m																		
28.50	28.95	SPT-18	75	31																			
29.50	29.95	SPT-19	55	25																			
31.00	31.30	DS-8																					
31.50	31.95	SPT-20	56	24																			
32.50	32.95	SPT-21	62	26																			
34.00	34.30	DS-9																					
35.00	35.45	SPT-22	68	27		35.45																	

* Outside NABL scope.

DS: Direct shear test- Consolidated Drained

UUT: Unconsolidated undrained triaxial shear test



BOREHOLE NO: 33

PAGE 1 OF 3

BOREHOLE NO : BH-33			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.060 m							
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 7.45							
CHAINAGE :			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 35.45 m							
COORDINATES : 837 E, 143 N			CASING DEPTH : 35.00 m			LOGGED BY : Mr. Gaurav							
DATE OF START : 29-Nov-2019			DATE OF FINISH : 30-Nov-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 (%) ■				
1		CL	Very stiff brown clayey silt, low plastic (CL)		DS-1	0.00 - 0.50			20				
2					SPT-1	1.00 - 1.45			19				
3					UDS-1	2.00 - 2.30							
3			3.00	190.06									
4		SM	Medium dense to dense grey silty fine sand (SM)		SPT-2	3.00 - 3.45		18					
5					UDS-2	4.00 - 4.30							
6													
7				- medium dense, 3.0 to 5.0 m									
8													
9				- dense, 5.0 to 11.5 m									
10													
11													
12													
13													
14													
15													
16													
			- medium dense, 11.5 to 20.5 m		SPT-6	11.50 - 11.95		28					
					DS-3	13.00 - 13.30							
					SPT-7	14.50 - 14.95		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: 33

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BOREHOLE NO : BH-33			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.060 m																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
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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 ▲																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
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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: 33

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BOREHOLE NO : BH-33			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.060 m					
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 7.45					
CHAINAGE :			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 35.45 m					
COORDINATES : 837 E, 143 N			CASING DEPTH : 35.00 m			LOGGED BY : Mr. Gaurav					
DATE OF START : 29-Nov-2019			DATE OF FINISH : 30-Nov-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	
		SP-SM	32.50		160.56						
33		SM	Very dense grey silty fine sand (SM)		SPT-13	32.50 - 32.95		50			
- with gravels, 32.5 to 34.0 m				DS-10	34.00 - 34.30						
35		CL	35.00	158.06	SPT-14	35.00 - 35.45		62			
			Termination at 35.45 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.:-33

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, %	Shrinkage Limit, %	Specific Gravity	Free Swell Index, %	Bulk Density, gms/cm ³	Moisture Content, %	Dry Density, g/cm ³	Shear Strength Parameters			
						Gravel (%)	Sand (%)	Silt (%)	Clay (%)									Type of test	Confining Pressure, kg/cm ²	kg/cm ²	φ Degree
0.00	0.50	DS-1		Very stiff brown clayey silt, low plastic (CL)						31.7	14.4	17.3		0							
1.00	1.45	SPT-1	19																		
2.00	2.30	UDS-1			3.00					32.0	16.5	15.5			1.87	12.8	1.66	UU	1.2,3	0.6	4.7
3.00	3.45	SPT-2	18	Medium dense to dense grey silty fine sand (SM)																	
4.00	4.30	UDS-2		- medium dense, 3.0 to 5.0 m																	
5.00	5.45	SPT-3	31	32 - dense, 5.0 to 11.5 m		0	74	25	1				2.66		1.90	13.2	1.68	DS	0.5,1,1.5	0.0	32.5
6.00	6.30	UDS-3													1.95	14.8	1.70				
7.00	7.45	SPT-4	33																		
8.00	8.30	UDS-4																			
9.00	9.45	SPT-5	36																		
10.00	10.30	DS-2																			
11.50	11.95	SPT-6	28	19 - medium dense, 11.5 to 20.5 m		0	87	13	0												
13.00	13.30	DS-3																			
14.50	14.95	SPT-7	18												1.98	15.9	1.71				
16.00	16.30	DS-4																			
17.50	17.95	SPT-8	25																		
19.00	19.30	DS-5			20.50																
20.50	20.95	SPT-9	34	34 Hard brown sandy silt, low plastic (CL)	22.00					28.3	15.7	12.6									

* Outside NABL scope.

DS: Direct shear test- Consolidated Drained

UUT: Unconsolidated undrained triaxial shear test



SUMMARY OF LABORATORY TEST RESULTS

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* Outside NABL scope.

DS: Direct shear test- Consolidated Drained

UUT: Unconsolidated undrained triaxial shear test



BOREHOLE NO: 34

PAGE 1 OF 3

BOREHOLE NO : BH-34			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.210 m									
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 6.30									
CHAINAGE :			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 40.45 m									
COORDINATES : 795 E, 143 N			CASING DEPTH : 38.00 m			LOGGED BY : Mr. Gaurav									
DATE OF START : 04-Dec-2019			DATE OF FINISH : 06-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	Stiff to very stiff brown clayey silt, low plastic (CL)	DS-1	0.00 - 0.50										
			- very stiff, 0.0 to 3.0 m	SPT-1	1.00 - 1.45		18								
2															
3			- stiff, 3.0 to 5.0 m	SPT-2	3.00 - 3.45		8								
4			- with traces of gravel, 3.0 to 4.0 m	UDS-2	4.00 - 4.30										
5			5.00	188.21											
6		SM	Medium dense grey silty fine sand (SM)	SPT-3	5.00 - 5.45		17								
7				UDS-3	6.00 - 6.30										
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)

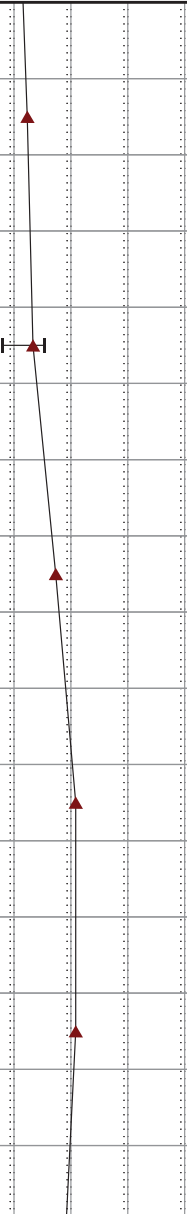
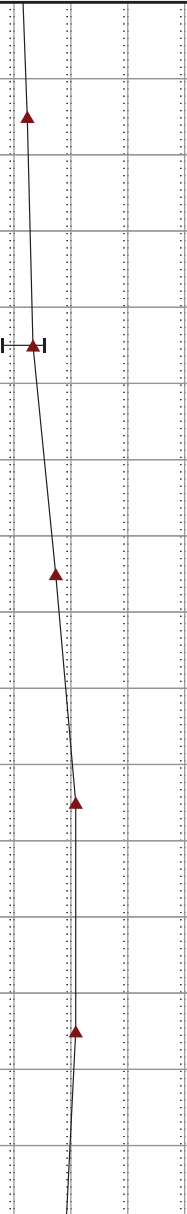
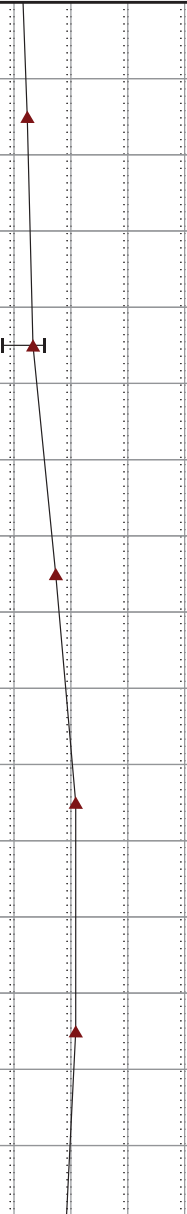
UNDISTURBED
SAMPLE (UDS)

(Continued Next Page)



BOREHOLE NO: 34

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BOREHOLE NO : BH-34			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.210 m							
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 6.30							
CHAINAGE :			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 40.45 m							
COORDINATES : 795 E, 143 N			CASING DEPTH : 38.00 m			LOGGED BY : Mr. Gaurav							
DATE OF START : 04-Dec-2019			DATE OF FINISH : 06-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	20.50	172.71	DS-4	16.00 - 16.30							
SPT-8					17.50 - 17.95		26						
DS-5					19.00 - 19.30								
21		CL	22.00	171.21	SPT-9	20.50 - 20.95							
23		SP-SM	- with traces of gravel, 26.5 to 28.0 m	DS-6	22.00 - 22.30								
24				SPT-10	23.50 - 23.95					36			
25				DS-7	25.00 - 25.30								
26													
27				SPT-11	26.50 - 26.95					43			
28				DS-8	28.00 - 28.30								
29													
30				SPT-12	29.50 - 29.95					43			
31													
32					DS-9	31.00 - 31.30							

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: 34

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BOREHOLE NO : BH-34			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.210 m						
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 6.30						
CHAINAGE :			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 40.45 m						
COORDINATES : 795 E, 143 N			CASING DEPTH : 38.00 m			LOGGED BY : Mr. Gaurav						
DATE OF START : 04-Dec-2019			DATE OF FINISH : 06-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-13	32.50 - 32.95		39			
34						DS-10	34.00 - 34.30					
35												
36		CL	35.50		157.71	SPT-14	35.50 - 35.95		50			
37												
38		SM		Very dense grey silty fine sand (SM)		DS-11	37.00 - 37.30					
39					- with traces of gravel, 38.5 to 40.0 m		SPT-15	38.50 - 38.95		58		
40								SPT-16	40.00 - 40.45		68	
			40.45	Termination at 40.45 meters Depth.	152.76							

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

Ground Water
Table

DISTURBED SAMPLE
(DS)

Standard Penetration
Test (SPT)

UNDISTURBED
SAMPLE (UDS)



Borehole No.:-34

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, %	Shrinkage Limit, %	Specific Gravity	Free Swell Index, %	Bulk Density, gms/cm ³	Moisture Content, %	Dry Density, g/cm ³	Shear Strength Parameters			
						Gravel (%)	Sand (%)	Silt (%)	Clay (%)									Type of test	Confining Pressure, kg/cm ²	kg/cm ²	φ Degree
0.00	0.50 DS-1			Stiff to very stiff brown clayey silt, low plastic (CL)																	
1.00	1.45 SPT-1	18	18	18 - very stiff, 0.0 to 3.0 m																	
2.00	2.30 UDS-1																				
3.00	3.45 SPT-2	8	8	8 - stiff, 3.0 to 5.0 m		1	14	78	7	31.0	15.0	16.0		0	1.76	14.5	1.54	UU	1.2,3	0.5	5.5
4.00	4.30 UDS-2			- with traces of gravel, 3.0 to 4.0 m	5.00					30.0	15.5	14.5			1.80	15.6	1.56				
5.00	5.45 SPT-3	17	18	Medium dense grey silty fine sand (SM)																	
6.00	6.30 UDS-3														1.84	16.7	1.58				
7.00	7.45 SPT-4	20	17																		
8.00	8.30 UDS-4																				
9.00	9.45 SPT-5	17	15																		
10.00	10.30 DS-2																				
11.50	11.95 SPT-6	20	16																		
13.00	13.30 DS-3																				
14.50	14.95 SPT-7	23	17			0	84	16	0												
16.00	16.30 DS-4																				
17.50	17.95 SPT-8	26	18																		
19.00	19.30 DS-5				20.50																
20.50	20.95 SPT-9	28	28	Very stiff brown clayey silt, low plastic (CL)	22.00					30.5	15.8	14.7									

* Outside NABL scope.

DS: Direct shear test- Consolidated Drained

UUT: Unconsolidated undrained triaxial shear test



Borehole No.:-34

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/cm³	Moisture Content, %	Dry Density, g/cm³	Shear Strength Parameters			
							Gravel (%)	Sand (%)	Silt (%)	Clay (%)										Type of test	Confining Pressure, kg/cm²	kg/cm²	φ Degree
22.00	22.30	DS-6			Dense grey fine sand (SP-SM)																		
23.50	23.95	SPT-10	36	20																			
25.00	25.30	DS-7													2.64								
26.50	26.95	SPT-11	43	22	- with traces of gravel, 26.5 to 28.0 m		2	87	11	0													
28.00	28.30	DS-8																					
29.50	29.95	SPT-12	43	21																			
31.00	31.30	DS-9																					
32.50	32.95	SPT-13	39	19																			
34.00	34.30	DS-10				35.50																	
35.50	35.95	SPT-14	50	50	Hard brown clayey silt, low plastic (CL)	37.00					27.5	16.0	11.5										
37.00	37.30	DS-11			Very dense grey silty fine sand (SM)																		
38.50	38.95	SPT-15	58	23	- with traces of gravel, 38.5 to 40.0 m		1	69	28	2													
40.00	40.45	SPT-16	68	26		40.45																	

* Outside NABL scope.

DS: Direct shear test- Consolidated Drained

UUT: Unconsolidated undrained triaxial shear test



BOREHOLE NO: 35

PAGE 1 OF 3

BOREHOLE NO : BH-35			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.350 m						
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 6.25						
CHAINAGE :			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 40.45 m						
COORDINATES : 760 E, 143 N			CASING DEPTH : 40.00 m			LOGGED BY : Mr. Gaurav						
DATE OF START : 04-Dec-2019			DATE OF FINISH : 06-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 (%) ■												
1		CL	Very stiff brown clayey silt, low plastic (CL)	DS-1	0.00 - 0.50							
				SPT-1	1.00 - 1.45		19					
2				- with traces of gravel, 1.0 to 2.0 m								
				UDS-1	2.00 - 2.30							
3			3.00	190.35								
		SM	Medium dense brown silty fine sand (SM)	SPT-2	3.00 - 3.45		22					
4				UDS-2	4.00 - 4.30							
5												
				SPT-3	5.00 - 5.45		17					
6					UDS-3	6.00 - 6.30						
7												
				SPT-4	7.00 - 7.45		21					
8					UDS-4	8.00 - 8.30						
9												
				SPT-5	9.00 - 9.45		19					
10					UDS-5	10.00 - 10.30						
11												
				SPT-6	11.50 - 11.95		22					
13					DS-2	13.00 - 13.30						
15						SPT-7	14.50 - 14.95		24			

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: 35

PAGE 2 OF 3

BOREHOLE NO : BH-35			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.350 m									
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 6.25									
CHAINAGE :			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 40.45 m									
COORDINATES : 760 E, 143 N			CASING DEPTH : 40.00 m			LOGGED BY : Mr. Gaurav									
DATE OF START : 04-Dec-2019			DATE OF FINISH : 06-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	16.00	Medium dense grey silty fine sand (SM)	169.85	DS-3	16.00 - 16.30		26						
SPT-8						17.50 - 17.95									
DS-4						19.00 - 19.30									
SPT-9						20.50 - 20.95									
DS-5						22.00 - 22.30									
23.50						169.85									
24				CL	23.50	Hard brown clayey silt, low plastic (CL)	168.35	SPT-10	23.50 - 23.95			31			
DS-6								25.00 - 25.30							
25								25.00	Medium to dense grey fine sand (SP)		168.35		DS-6	25.00 - 25.30	
													SPT-11	26.50 - 26.95	
													DS-7	28.00 - 28.30	
29								SP	29.50		- medium dense, 25.0 to 29.5 m		18	SPT-12	29.50 - 29.95
DS-8	31.00 - 31.30														
30	- dense, 29.5 to 35.5	37													
31			- with traces of gravel, 29.5 to 31.0 m												
32															

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

Ground Water
Table

DISTURBED SAMPLE
(DS)

Standard Penetration
Test (SPT)

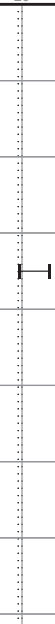
UNDISTURBED
SAMPLE (UDS)

(Continued Next Page)



BOREHOLE NO: 35

PAGE 3 OF 3

BOREHOLE NO : BH-35			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.350 m							
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 6.25							
CHAINAGE :			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 40.45 m							
COORDINATES : 760 E, 143 N			CASING DEPTH : 40.00 m			LOGGED BY : Mr. Gaurav							
DATE OF START : 04-Dec-2019			DATE OF FINISH : 06-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				SPT-13	32.50 - 32.95		43				
34						DS-9	34.00 - 34.30						
35													
36		CL	35.50	157.85	SPT-14	35.50 - 35.95		50					
37													
38		SM		Very dense grey silty fine sand (SM)		DS-10	37.00 - 37.30						
39													
40						SPT-15	38.50 - 38.95		57				
			40.45	152.90	SPT-16	40.00 - 40.45		77					
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.:-35

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/cm³	Moisture Content, %	Dry Density, g/cm³	Shear Strength Parameters			
							Gravel (%)	Sand (%)	Silt (%)	Clay (%)										Type of test	Confining Pressure, kg/cm²	kg/cm²	φ Degree
0.00	0.50	DS-1			Very stiff brown clayey silt, low plastic (CL)					31.9	13.7	18.2											
1.00	1.45	SPT-1	19	19	- with traces of gravel, 1.0 to 2.0 m		4	13	79	4					0								
2.00	2.30	UDS-1				3.00										1.75	12.5	1.56	UU	1.2,3	0.6	5.1	
3.00	3.45	SPT-2	22	26	Medium dense brown silty fine sand (SM)																		
4.00	4.30	UDS-2														1.79	13.7	1.57	DS	0.5,1,1.5	0.0	31.3	
5.00	5.45	SPT-3	17	18										2.63									
6.00	6.30	UDS-3														1.82	14.5	1.59					
7.00	7.45	SPT-4	21	18																			
8.00	8.30	UDS-4																1.60					
9.00	9.45	SPT-5	19	16			0	75	25	0													
10.00	10.30	UDS-5																1.62					
11.50	11.95	SPT-6	22	17																			
13.00	13.30	DS-2																					
14.50	14.95	SPT-7	24	17																			
16.00	16.30	DS-3																					
17.50	17.95	SPT-8	26	18																			
19.00	19.30	DS-4																					
20.50	20.95	SPT-9	26	17																			

* Outside NABL scope.

DS: Direct shear test- Consolidated Drained

UU: Unconsolidated undrained triaxial shear test



Borehole No.:-35

SUMMARY OF LABORATORY TEST RESULTS

Depth, m	Sample Type	Field Value N ^o *	Corrected Value N ^o *	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			
						Gravel (%)	Sand (%)	Silt (%)	Clay (%)										Type of test	Confining Pressure, kg/cm ²	kg/cm ²	Degree ϕ
22.00	22.30 DS-5			Medium dense grey silty fine sand (SM)	23.50																	
23.50	23.95 SPT-10	31	31	Hard brown clayey silt, low plastic (CL)	25.00					30.5	17.3	13.2										
25.00	25.30 DS-6			Medium to dense grey fine sand (SP)																		
26.50	26.95 SPT-11	18	12	- medium dense, 25.0 to 29.5 m																		
28.00	28.30 DS-7																					
29.50	29.95 SPT-12	37	19	- dense, 29.5 to 35.5		1	95	4	0													
31.00	31.30 DS-8			- with traces of gravel, 29.5 to 31.0 m																		
32.50	32.95 SPT-13	43	20																			
34.00	34.30 DS-9				35.50																	
35.50	35.95 SPT-14	50	50	Hard brown clayey silt, low plastic (CL)	37.00					29.6	19.2	10.4										
37.00	37.30 DS-10			Very dense grey silty fine sand (SM)																		
38.50	38.95 SPT-15	57	23																			
40.00	40.45 SPT-16	77	28		40.45																	

* Outside NABL scope.

DS: Direct shear test- Consolidated Drained

UUT: Unconsolidated undrained triaxial shear test



BOREHOLE NO: 36

PAGE 1 OF 3

BOREHOLE NO : BH-36			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 192.280 m						
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 6.05						
CHAINAGE :			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 40.3 m						
COORDINATES : 760 E, 119 N			CASING DEPTH : 35.00 m			LOGGED BY : Mr. Gaurav						
DATE OF START : 06-Dec-2019			DATE OF FINISH : 07-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 (%) ■												
1		CL	Very stiff brown clayey silt, low plastic (CL)	5.00	187.28	DS-1	0.00 - 0.50					
SPT-1						1.00 - 1.45		24				
UDS-1						2.00 - 2.30						
SPT-2						3.00 - 3.45		15				
UDS-2						4.00 - 4.30						
5		SM	Medium dense brown silty fine sand (SM)		SPT-3	5.00 - 5.45		21				
UDS-3					6.00 - 6.30							
SPT-4					7.00 - 7.45		27					
UDS-4					8.00 - 8.30							
SPT-5					9.00 - 9.45		20					
DS-2					10.00 - 10.30							
SPT-6					10.50 - 10.95		20					
SPT-7					11.50 - 11.95		22					
DS-3					13.00 - 13.30							
SPT-8					13.50 - 13.95		24					
SPT-9					14.50 - 14.95		26					

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

Ground Water
Table

DISTURBED SAMPLE
(DS)

Standard Penetration
Test (SPT)

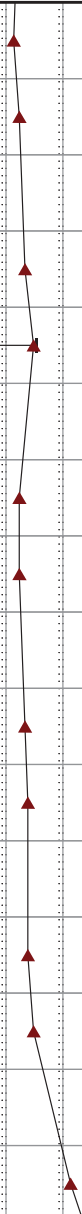
UNDISTURBED
SAMPLE (UDS)

(Continued Next Page)



BOREHOLE NO: 36

PAGE 2 OF 3

BOREHOLE NO : BH-36			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 192.280 m							
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 6.05							
CHAINAGE :			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 40.3 m							
COORDINATES : 760 E, 119 N			CASING DEPTH : 35.00 m			LOGGED BY : Mr. Gaurav							
DATE OF START : 06-Dec-2019			DATE OF FINISH : 07-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	Medium dense brown silty fine sand (SM)		DS-4	16.00 - 16.30							
				SPT-10	16.50 - 16.95		24						
18					SPT-11	17.50 - 17.95		26					
19													
20					DS-5	19.00 - 19.30							
				SPT-12	19.50 - 19.95		28						
21		CL	Brown clayey silt, low plastic (CL)	20.50	171.78								
				SPT-13	20.50 - 20.95		31						
22		SP-SM	Medium dense to very dense grey fine sand - SP-SM, 21.0 to 34.5 m - medium dense, 21.0 to 29.5 m - dense, 29.5 to 32.5 m		DS-6	21.00 - 21.30							
23					SPT-14	22.50 - 22.95		26					
24					SPT-15	23.50 - 23.95		26					
25													
				DS-7	25.00 - 25.30								
26					SPT-16	25.50 - 25.95		28					
27					SPT-17	26.50 - 26.95		29					
28													
				DS-8	28.00 - 28.30								
29					SPT-18	28.50 - 28.95		29					
30					SPT-19	29.50 - 29.95		31					
31													
				DS-9	31.00 - 31.30								
32					SPT-20	31.50 - 31.95		44					

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)

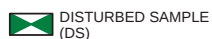


BOREHOLE NO: 36

PAGE 3 OF 3

BOREHOLE NO : BH-36			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 192.280 m													
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 6.05													
CHAINAGE :			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 40.3 m													
COORDINATES : 760 E, 119 N			CASING DEPTH : 35.00 m			LOGGED BY : Mr. Gaurav													
DATE OF START : 06-Dec-2019			DATE OF FINISH : 07-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, 32.5 to 37.5 m		SPT-21	32.50 - 32.95		53										
34																			
			34.50		157.78	DS-10	34.00 - 34.30												
35		SP		- SP, 34.5 to 35.5 m 34.5 to 35.5 m - with traces of gravel, Very dense to dense grey fine sand (SP) - very dense, 35.0 to 37.5 m - dense, 37.5 to 40.3 m		SPT-22	34.50 - 34.95		55										
36																			
37																			
38											DS-11	37.00 - 37.30							
											SPT-24	37.50 - 37.95		42					
39						SPT-25	38.50 - 38.95		44										
40			40.30		151.98	DS-12	40.00 - 40.30												
Termination at 40.30 meters Depth.																			

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





CENGRS

Borehole No.:-36

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			
						Gravel (%)	Sand (%)	Silt (%)	Clay (%)										Type of test	Confining Pressure, kg/cm ²	kg/cm ²	φ Degree
0.00	0.50	DS-1		Very stiff brown clayey silt, low plastic (CL)						26.9	13.8	13.1										
1.00	1.45	SPT-1	24																			
2.00	2.30	UDS-1								28.5	14.0	14.5				1.80	12.6	1.60				
3.00	3.45	SPT-2	15																			
4.00	4.30	UDS-2			5.00	0	9	85	6							1.82	13.8	1.60	UU	1.2,3	0.7	5.1
5.00	5.45	SPT-3	21	Medium dense brown silty fine sand (SM)						29.0	15.0	14.0										
6.00	6.30	UDS-3														1.85	14.3	1.62				
7.00	7.45	SPT-4	27																			
8.00	8.30	UDS-4																				
9.00	9.45	SPT-5	20																			
10.00	10.30	DS-2																				
10.50	10.95	SPT-6	20																			
11.50	11.95	SPT-7	22			0	76	20	4													
13.00	13.30	DS-3																				
13.50	13.95	SPT-8	24																			
14.50	14.95	SPT-9	26													1.89	15.6	1.63				
16.00	16.30	DS-4																				
16.50	16.95	SPT-10	24																			

SOIL PROFILE 219134 GINT.GPJ 05/08/2019.GDT 12/30/19

* Outside NABL scope.

DS: Direct shear test- Consolidated Drained

UUT: Unconsolidated undrained triaxial shear test



Borehole No.:-36

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/cm³	Moisture Content, %	Dry Density, g/cm³	Shear Strength Parameters			
							Gravel (%)	Sand (%)	Silt (%)	Clay (%)										Type of test	Confining Pressure, kg/cm²	kg/cm²	φ Degree
17.50	17.95	SPT-11	26	18	Medium dense brown silty fine sand (SM)																		
19.00	19.30	DS-5																					
19.50	19.95	SPT-12	28	18		20.50																	
20.50	20.95	SPT-13	31	31	Hard brown clayey silt, low plastic (CL)	21.00				30.5	17.0	13.6											
21.00	21.30	DS-6			Medium dense to very dense grey fine sand																		
22.50	22.95	SPT-14	26	17	- SP-SM, 21.0 to 34.5 m																		
23.50	23.95	SPT-15	26	17	- medium dense, 21.0 to 29.5 m									2.64									
25.00	25.30	DS-7																					
25.50	25.95	SPT-16	28	17																			
26.50	26.95	SPT-17	29	17			0	93	7	0													
28.00	28.30	DS-8																					
28.50	28.95	SPT-18	29	17																			
29.50	29.95	SPT-19	31	17	- dense, 29.5 to 32.5 m																		
31.00	31.30	DS-9																					
31.50	31.95	SPT-20	44	21																			
32.50	32.95	SPT-21	53	24	- very dense, 32.5 to 37.5 m																		
34.00	34.30	DS-10																					
34.50	34.95	SPT-22	55	24	- SP, 34.5 to 35.5 m - with traces of gravel, 34.5 to 35.5 m		2	94	4	0													

* Outside NABL scope.

DS: Direct shear test- Consolidated Drained

UUT: Unconsolidated undrained triaxial shear test



Borehole No.:-36

SUMMARY OF LABORATORY TEST RESULTS

[illegible]

* Outside NABL scope.

DS: Direct shear test- Consolidated Drained

UUT: Unconsolidated undrained triaxial shear test

Project No. 219134D

Plate 244 of 661



BOREHOLE NO: 37

PAGE 1 OF 3

BOREHOLE NO : BH-37			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.330 m						
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 7.12						
CHAINAGE :			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 35.45 m						
COORDINATES : 730 E, 98 N			CASING DEPTH : 35.00 m			LOGGED BY : Mr. Gaurav						
DATE OF START : 07-Dec-2019			DATE OF FINISH : 09-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		25					
2				UDS-1	2.00 - 2.30							
3				SPT-2	3.00 - 3.45		17					
4				UDS-2	4.00 - 4.30							
5			5.00	188.33								
6		SM	Medium dense to dense grey silty fine sand (SM)		SPT-3	5.00 - 5.45		15				
7			- medium dense, 5.0 to 7.0 m		UDS-3	6.00 - 6.30						
8			- dense, 7.0 to 11.5 m		SPT-4	7.00 - 7.45		34				
9				UDS-4	8.00 - 8.30							
10				SPT-5	9.00 - 9.45		36					
11				DS-2	10.00 - 10.30							
12			- medium dense, 11.5 to 14.5 m		SPT-6	10.50 - 10.95		38				
13				SPT-7	11.50 - 11.95		24					
14				DS-3	13.00 - 13.30							
15			- dense, 14.5 to 17.5 m		SPT-8	13.50 - 13.95		29				
16					SPT-9	14.50 - 14.95		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: 37

PAGE 2 OF 3

BOREHOLE NO : BH-37			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.330 m									
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 7.12									
CHAINAGE :			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 35.45 m									
COORDINATES : 730 E, 98 N			CASING DEPTH : 35.00 m			LOGGED BY : Mr. Gaurav									
DATE OF START : 07-Dec-2019			DATE OF FINISH : 09-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				DS-4	16.00 - 16.30								
						SPT-10	16.50 - 16.95		35						
18		SP-SM	17.50	175.83											
						SPT-11	17.50 - 17.95		40						
19															
								DS-5	19.00 - 19.30						
20															
								SPT-12	19.50 - 19.95		43				
21															
								SPT-13	20.50 - 20.95		29				
22															
								DS-6	22.00 - 22.30						
23															
								SPT-14	22.50 - 22.95		34				
24															
								SPT-15	23.50 - 23.95		41				
25															
								DS-7	25.00 - 25.30						
26															
								SPT-16	25.50 - 25.95		26				
27															
								SPT-17	26.50 - 26.95		52				
28															
						DS-8	28.00 - 28.30								
29															
						SPT-18	28.50 - 28.95		57						
30															
						SPT-19	29.50 - 29.95		61						
31															
						DS-9	31.00 - 31.30								
32															
						SPT-20	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: 37

PAGE 3 OF 3

BOREHOLE NO : BH-37			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.330 m						
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 7.12						
CHAINAGE :			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 35.45 m						
COORDINATES : 730 E, 98 N			CASING DEPTH : 35.00 m			LOGGED BY : Mr. Gaurav						
DATE OF START : 07-Dec-2019			DATE OF FINISH : 09-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		
		SP-SM	32.50		160.83							
33		SP	- SP, 32.5 to 35.45 m		SPT-21	32.50 - 32.95		70				
34												
35												
			35.45		157.88	SPT-22	35.00 - 35.45		65			
Termination at 35.45 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.:-37

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			
							Gravel (%)	Sand (%)	Silt (%)	Clay (%)										Type of test	Confining Pressure, kg/cm ²	kg/cm ²	φ Degree
0.00	0.50	DS-1			Very stiff brown clayey silt, low plastic (CL)					30.0	16.4	13.6											
1.00	1.45	SPT-1	25	25																			
2.00	2.30	UDS-1								29.5	17.0	12.5				1.79	12.8	1.59					
3.00	3.45	SPT-2	17	17																			
4.00	4.30	UDS-2			Medium dense to dense grey silty fine sand (SM)	5.00				30.2	17.2	13.0				1.82	13.2	1.61	UU	1.2,3	0.7	5.8	
5.00	5.45	SPT-3	15	16																			
6.00	6.30	UDS-3			- medium dense, 5.0 to 7.0 m											1.85	13.8	1.63					
7.00	7.45	SPT-4	34	23	- dense, 7.0 to 11.5 m																		
8.00	8.30	UDS-4																					
9.00	9.45	SPT-5	36	24			0	54	44	2				2.67					1.90	15.7	1.64		
10.00	10.30	DS-2																					
10.50	10.95	SPT-6	38	24																			
11.50	11.95	SPT-7	24	18	- medium dense, 11.5 to 14.5 m																		
13.00	13.30	DS-3																					
13.50	13.95	SPT-8	29	19																			
14.50	14.95	SPT-9	32	20	- dense, 14.5 to 17.5 m																		
16.00	16.30	DS-4																					
16.50	16.95	SPT-10	35	21		17.50																	

* Outside NABL scope.

DS: Direct shear test- Consolidated Drained

UUT: Unconsolidated undrained triaxial shear test



Borehole No.:-37

SUMMARY OF LABORATORY TEST RESULTS

Depth, m	Sample Type	Field Value N ^o *	Corrected Value N ^o *	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			
						Gravel (%)	Sand (%)	Silt (%)	Clay (%)										Type of test	Confining Pressure, kg/cm ²	kg/cm ²	Degree ϕ
17.50	17.95 SPT-11	40	23	Medium dense to very dense grey fine sand with traces of gravel		4	91	5	0													
19.00	19.30 DS-5			- SP-SM, 17.5 to 32.5 m																		
19.50	19.95 SPT-12	43	23	- dense, 17.5 to 20.5 m																		
20.50	20.95 SPT-13	29	18	- medium dense, 20.5 to 22.5 m																		
22.00	22.30 DS-6																					
22.50	22.95 SPT-14	34	19	- dense, 22.5 to 25.5 m																		
23.50	23.95 SPT-15	41	22																			
25.00	25.30 DS-7																					
25.50	25.95 SPT-16	26	16	- medium dense, 25.5 to 26.5 m																		
26.50	26.95 SPT-17	52	25	- very dense, 26.5 to 35.45 m		1	90	9	0													
28.00	28.30 DS-8																					
28.50	28.95 SPT-18	57	26																			
29.50	29.95 SPT-19	61	27																			
31.00	31.30 DS-9																					
31.50	31.95 SPT-20	69	28																			
32.50	32.95 SPT-21	70	28	- SP, 32.5 to 35.45 m		1	96	3	0													
34.00	34.30 DS-10																					
35.00	35.45 SPT-22	65	26		35.45																	

* Outside NABL scope.

DS: Direct shear test- Consolidated Drained

UUT: Unconsolidated undrained triaxial shear test



BOREHOLE NO: 38

PAGE 1 OF 3

BOREHOLE NO : BH-38			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.200 m											
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 6.10											
CHAINAGE :			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 40.3 m											
COORDINATES : 795 E, 119 N			CASING DEPTH : 35.00 m			LOGGED BY : Mr. Gaurav											
DATE OF START : 06-Dec-2019			DATE OF FINISH : 07-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 ▲			PL (%) MC (%) LL (%)			FINES CONTENT (%) ■		
									20 40 60 80			20 40 60 80			20 40 60 80		
1		CL	Stiff brown clayey silt, low plastic (CL)	DS-1	0.00 - 0.50				▲								
2			- with traces of gravel, 1.0 to 2.0 m	SPT-1	1.00 - 1.45		12		▲								
3				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		11		▲								
7				UDS-3	6.00 - 6.30				■								
8		SP	Medium dense grey fine sand with traces of gravel (SP)	SPT-4	7.00 - 7.45		18		▲								
9				UDS-4	8.00 - 8.30				■								
10				SPT-5	9.00 - 9.45		17		▲								
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		25		▲								
16				SPT-9	14.50 - 14.95		24		▲								

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: 38

PAGE 2 OF 3

BOREHOLE NO : BH-38			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.200 m							
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 6.10							
CHAINAGE :			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 40.3 m							
COORDINATES : 795 E, 119 N			CASING DEPTH : 35.00 m			LOGGED BY : Mr. Gaurav							
DATE OF START : 06-Dec-2019			DATE OF FINISH : 07-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	16.00 - 17.50	Medium dense to dense grey fine sand (SP)	172.70	DS-4	16.00 - 16.30						
SPT-10						16.50 - 16.95		28					
SPT-11						17.50 - 17.95		28					
DS-5						19.00 - 19.30							
SPT-12						19.50 - 19.95		31					
21		CL	20.50 - 22.00	Hard brown clayey silt, low plastic (CL)	171.20	SPT-13	20.50 - 20.95		62				
22													
23		SP-SM	22.00 - 32.50	Medium dense to very dense grey fine sand (SP-SM) - medium dense, 22.0 to 32.5 m		DS-6	22.00 - 22.30						
24						SPT-14	22.50 - 22.95		27				
25						SPT-15	23.50 - 23.95		27				
26						DS-7	25.00 - 25.30						
27						SPT-16	25.50 - 25.95		26				
28						SPT-17	26.50 - 26.95		27				
29						DS-8	28.00 - 28.30						
30						SPT-18	28.50 - 28.95		29				
31						SPT-19	29.50 - 29.95		30				
32						DS-9	31.00 - 31.30						
						SPT-20	31.50 - 31.95		27				

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: 38

PAGE 3 OF 3

BOREHOLE NO : BH-38			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.200 m							
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 6.10							
CHAINAGE :			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 40.3 m							
COORDINATES : 795 E, 119 N			CASING DEPTH : 35.00 m			LOGGED BY : Mr. Gaurav							
DATE OF START : 06-Dec-2019			DATE OF FINISH : 07-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, 32.5 to 35.5 m		SPT-21	32.50 - 32.95		54					
34													
35													
36													
37													
38													
39													
40													
40.30			152.90	DS-12	40.00 - 40.30								
Termination at 40.30 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.:-38

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/cm³	Moisture Content, %	Dry Density, g/cm³	Shear Strength Parameters			
							Gravel (%)	Sand (%)	Silt (%)	Clay (%)										Type of test	Confining Pressure, kg/cm²	kg/cm²	φ Degree
0.00	0.50	DS-1			Stiff brown clayey silt, low plastic (CL)					22.7	14.7	7.9											
1.00	1.45	SPT-1	12	12	- with traces of gravel, 1.0 to 2.0 m		1	34	63	2					0								
2.00	2.30	UDS-1															1.74	12.5	1.55	UU	1.2,3	0.5	5.1
3.00	3.45	SPT-2	12	12																			
4.00	4.30	UDS-2															1.77	13.7	1.56				
5.00	5.45	SPT-3	11	11																			
6.00	6.30	UDS-3				7.00											1.82	14.9	1.58				
7.00	7.45	SPT-4	18	16	Medium dense grey fine sand with traces of gravel (SP)		3	95	2	0													
8.00	8.30	UDS-4															1.85	15.8	1.60	DS	0.5,1,1.5	0.0	31.7
9.00	9.45	SPT-5	17	15																			
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	25	18																			
14.50	14.95	SPT-9	24	17			1	99	0	0													
16.00	16.30	DS-4																					
16.50	16.95	SPT-10	28	19																			

* Outside NABL scope.

DS: Direct shear test- Consolidated Drained

UUT: Unconsolidated undrained triaxial shear test



Borehole No.:-38

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			
From	To						Gravel (%)	Sand (%)	Silt (%)	Clay (%)										Type of test	Confining Pressure, kg/cm ²	kg/cm ²	Degree ϕ
17.50	17.95	SPT-11	28	18	Medium dense to dense grey fine sand (SP)																		
19.00	19.30	DS-5			- medium dense, 17.5 to 19.5 m																		
19.50	19.95	SPT-12	31	19	- dense, 19.5 to 20.5 m	20.50																	
20.50	20.95	SPT-13	62	62	Hard brown clayey silt, low plastic (CL)	22.00					34.3	18.6	15.7										
22.00	22.30	DS-6			Medium dense to very dense grey fine sand (SP-SM)																		
22.50	22.95	SPT-14	27	17	- medium dense, 22.0 to 32.5 m																		
23.50	23.95	SPT-15	27	17																			
25.00	25.30	DS-7																					
25.50	25.95	SPT-16	26	16																			
26.50	26.95	SPT-17	27	17																			
28.00	28.30	DS-8																					
28.50	28.95	SPT-18	29	17																			
29.50	29.95	SPT-19	30	17																			
31.00	31.30	DS-9																					
31.50	31.95	SPT-20	27	16																			
32.50	32.95	SPT-21	54	24	- very dense, 32.5 to 35.5 m		0	91	9	0													
34.00	34.30	DS-10																					
34.50	34.95	SPT-22	58	25																			

* Outside NABL scope.

DS: Direct shear test- Consolidated Drained

UUT: Unconsolidated undrained triaxial shear test



SUMMARY OF LABORATORY TEST RESULTS

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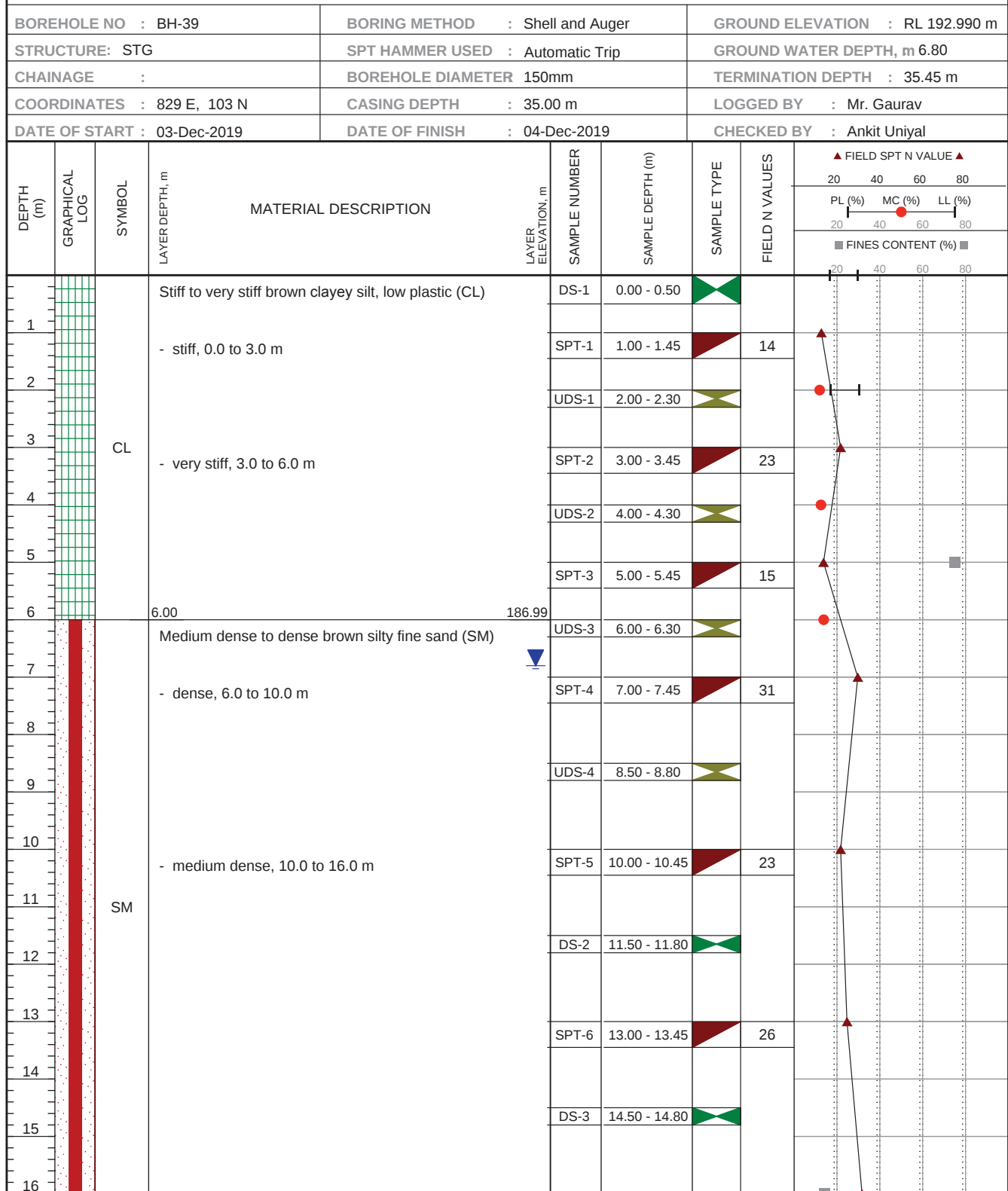
DS: Direct shear test- Consolidated Drained

UUUT: Unconsolidated undrained triaxial shear test



BOREHOLE NO: 39

PAGE 1 OF 3



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

Ground Water
Table

DISTURBED SAMPLE
(DS)

Standard Penetration
Test (SPT)

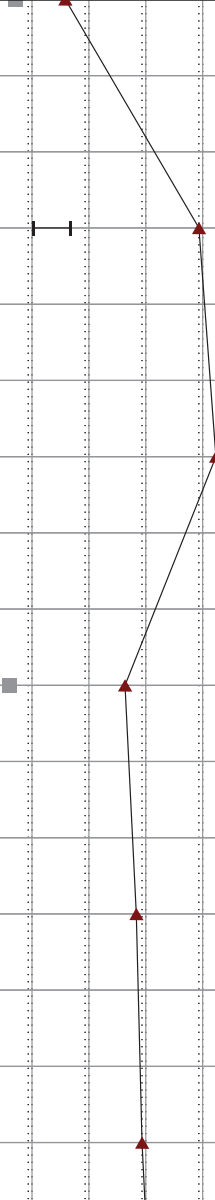
UNDISTURBED
SAMPLE (UDS)

(Continued Next Page)



BOREHOLE NO: 39

PAGE 2 OF 3

BOREHOLE NO : BH-39			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 192.990 m							
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 6.80							
CHAINAGE :			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 35.45 m							
COORDINATES : 829 E, 103 N			CASING DEPTH : 35.00 m			LOGGED BY : Mr. Gaurav							
DATE OF START : 03-Dec-2019			DATE OF FINISH : 04-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, 16.0 to 19.0 m		SPT-7	16.00 - 16.45		33					
18			- with traces of gravel, 16.0 to 17.5 m		DS-4	17.50 - 17.80							
19			19.00	173.99									
20		CL	Hard brown clayey silt, low plastic (CL)		SPT-8	19.00 - 19.45		80					
21			20.50	172.49									
22		SP-SM	Very dense grey fine sand (SP-SM)		DS-5	20.50 - 20.80							
23				SPT-9	22.00 - 22.45		86						
24			Very dense grey fine sand (SP-SM)		DS-6	23.50 - 23.80							
25				SPT-10	25.00 - 25.45		54						
26													
27				DS-7	26.50 - 26.80								
28				SPT-11	28.00 - 28.45		58						
29													
30				DS-8	29.50 - 29.80								
31				SPT-12	31.00 - 31.45		60						
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: 39

PAGE 3 OF 3

BOREHOLE NO : BH-39			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 192.990 m								
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 6.80								
CHAINAGE :			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 35.45 m								
COORDINATES : 829 E, 103 N			CASING DEPTH : 35.00 m			LOGGED BY : Mr. Gaurav								
DATE OF START : 03-Dec-2019			DATE OF FINISH : 04-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				DS-9	32.50 - 32.80							
34														
35							SPT-13	34.00 - 34.45		64				
							SPT-14	35.00 - 35.45		66				
			35.45	157.54		Termination at 35.45 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.:-39

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			
							Gravel (%)	Sand (%)	Silt (%)	Clay (%)										Type of test	Confining Pressure, kg/cm ²	kg/cm ²	φ Degree
0.00	0.50	DS-1			Stiff to very stiff brown clayey silt, low plastic (CL)					29.6	16.5	13.0											
1.00	1.45	SPT-1	14	14	- stiff, 0.0 to 3.0 m											0							
2.00	2.30	UDS-1															1.78	11.9	1.59	UU	1.2,3	0.6	5.8
3.00	3.45	SPT-2	23	23	- very stiff, 3.0 to 6.0 m																		
4.00	4.30	UDS-2															1.76	12.5	1.56				
5.00	5.45	SPT-3	15	15		6.00	0	25	73	2				2.65									
6.00	6.30	UDS-3			Medium dense to dense brown silty fine sand (SM)												1.80	13.8	1.58				
7.00	7.45	SPT-4	31	22	- dense, 6.0 to 10.0 m																		
8.50	8.80	UDS-4																					
10.00	10.45	SPT-5	23	18	- medium dense, 10.0 to 16.0 m																		
11.50	11.80	DS-2																					
13.00	13.45	SPT-6	26	18																			
14.50	14.80	DS-3																					
16.00	16.45	SPT-7	33	21	- dense, 16.0 to 19.0 m		2	84	14	0													
17.50	17.80	DS-4			- with traces of gravel, 16.0 to 17.5 m 80	19.00																	
19.00	19.45	SPT-8	80		Hard brown clayey silt, low plastic (CL)	20.50					33.6	20.4	13.2										
20.50	20.80	DS-5			Very dense grey fine sand (SP-SM)																		
22.00	22.45	SPT-9	86	38																			

* Outside NABL scope.

DS: Direct shear test- Consolidated Drained

UU: Unconsolidated undrained triaxial shear test



CENGRS

Borehole No.:-39

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			
							Gravel (%)	Sand (%)	Silt (%)	Clay (%)										Type of test	Confining Pressure, kg/cm ²	kg/cm ²	φ Degree
23.50	23.80	DS-6			Very dense grey fine sand (SP-SM)																		
25.00	25.45	SPT-10	54	26			0	88	12	0													
26.50	26.80	DS-7																					
28.00	28.45	SPT-11	58	26																			
29.50	29.80	DS-8																					
31.00	31.45	SPT-12	60	26																			
32.50	32.80	DS-9																					
34.00	34.45	SPT-13	64	26																			
35.00	35.45	SPT-14	66	27		35.45	0	94	6	0													
						</																	

* Outside NABL scope.

DS: Direct shear test- Consolidated Drained

UUT: Unconsolidated undrained triaxial shear test



BOREHOLE NO: 40

PAGE 1 OF 3

BOREHOLE NO : BH-40			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.090 m						
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 6.80						
CHAINAGE :			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 35.25 m						
COORDINATES : 835 E, 125 N			CASING DEPTH : 35.00 m			LOGGED BY : Mr. Gaurav						
DATE OF START : 01-Dec-2019			DATE OF FINISH : 02-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)	187.09	DS-1	0.00 - 0.50						
2				SPT-1	1.00 - 1.45		26		26			
3				UDS-1	2.00 - 2.30				45			
4				SPT-2	3.00 - 3.45		22		22			
5				UDS-2	4.00 - 4.30				45			
6			6.00				SPT-3	5.00 - 5.45		21		
7		SM	Medium dense to very dense grey silty fine sand with traces of gravel (SM)	187.09	UDS-3	6.00 - 6.30						
8					- medium dense, 6.0 to 13.0 m	SPT-4	7.00 - 7.45		26			
9						DS-2	8.50 - 8.80					
10						SPT-5	10.00 - 10.45		28			
11												
12						DS-3	11.50 - 11.80			45		
13						SPT-6	13.00 - 13.45		31			
14					- dense, 13.0 to 22.0 m							
15					DS-4	14.50 - 14.80						
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: 40

PAGE 2 OF 3

BOREHOLE NO : BH-40			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.090 m								
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 6.80								
CHAINAGE :			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 35.25 m								
COORDINATES : 835 E, 125 N			CASING DEPTH : 35.00 m			LOGGED BY : Mr. Gaurav								
DATE OF START : 01-Dec-2019			DATE OF FINISH : 02-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				SPT-7	16.00 - 16.45		35					
18						DS-5	17.50 - 17.80							
19						SPT-8	19.00 - 19.45		42					
20														
21						UDS-4	20.50 - 20.80							
22				- very dense, 22.0 to 23.5 m		SPT-9	22.00 - 22.45		72					
23														
24			23.50		169.59	DS-6	23.50 - 23.80							
25				Very dense grey fine sand (SP)		SPT-10	25.00 - 25.45		74					
26														
27						DS-7	26.50 - 26.80							
28		SP				SPT-11	28.00 - 28.45		78					
29														
30						DS-8	29.50 - 29.80							
31														
32				- with traces of gravel, 31.0 to 32.5 m		SPT-12	31.00 - 31.45		84					

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: 40

PAGE 3 OF 3

BOREHOLE NO : BH-40			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.090 m											
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 6.80											
CHAINAGE :			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 35.25 m											
COORDINATES : 835 E, 125 N			CASING DEPTH : 35.00 m			LOGGED BY : Mr. Gaurav											
DATE OF START : 01-Dec-2019			DATE OF FINISH : 02-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				DS-9	32.50 - 32.80										
34																	
35																	
			35.25	157.84		SPT-14	35.00 - 35.25		102/10cm								
			Termination at 35.25 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.:-40

SUMMARY OF LABORATORY TEST RESULTS

Depth, m	Sample Type	Field Value N ^o *	Corrected Value N ^o *	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			
						Gravel (%)	Sand (%)	Silt (%)	Clay (%)										Type of test	Confining Pressure, kg/cm ²	kg/cm ²	φ Degree
0.00	0.50	DS-1		Very stiff brown clayey silt, low plastic (CL)																		
1.00	1.45	SPT-1	26							30.5	19.7	10.8										
2.00	2.30	UDS-1														1.75	12.4	1.56				
3.00	3.45	SPT-2	22							33.5	21.6	11.9										
4.00	4.30	UDS-2				0	26	72	2							1.78	13.1	1.57	UU	1.2,3	0.8	3.5
5.00	5.45	SPT-3	21		6.00					33.2	20.9	12.3										
6.00	6.30	UDS-3		Medium dense to very dense grey silty fine sand with traces of gravel (SM)												1.80	13.9	1.58				
7.00	7.45	SPT-4	26	20 - medium dense, 6.0 to 13.0 m																		
8.50	8.80	DS-2																				
10.00	10.45	SPT-5	28																			
11.50	11.80	DS-3				1	85	14	0													
13.00	13.45	SPT-6	31	20 - dense, 13.0 to 22.0 m																		
14.50	14.80	DS-4																				
16.00	16.45	SPT-7	35																			
17.50	17.80	DS-5																				
19.00	19.45	SPT-8	42																			
20.50	20.80	UDS-4				2	85	13	0							1.90	14.7	1.66				
22.00	22.45	SPT-9	72	33 - very dense, 22.0 to 23.5 m	23.50																	

* Outside NABL scope.

DS: Direct shear test- Consolidated Drained

UUT: Unconsolidated undrained triaxial shear test



CENGRS

Borehole No.:-40

SUMMARY OF LABORATORY TEST RESULTS

[illegible]

* Outside NABL scope.

DS: Direct shear test- Consolidated Drained

UUT: Unconsolidated undrained triaxial shear test



BOREHOLE NO: 41

PAGE 1 OF 3

BOREHOLE NO : BH-41			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.070 m									
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 6.30									
CHAINAGE :			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 35.45 m									
COORDINATES : 869 E, 67 N			CASING DEPTH : 35.00 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 (%) ■															
1		CI	4.00	Very stiff brown clayey silt, medium plastic (CI)	189.07	DS-1	0.00 - 0.50		29						
						SPT-1	1.00 - 1.45								
2							UDS-1	2.00 - 2.30							
3							SPT-2	3.00 - 3.45							
4		CL	6.00	Stiff brown clayey silt (CL)	187.07	UDS-2	4.00 - 4.30		15						
5							SPT-3	5.00 - 5.45							
6							UDS-3	6.00 - 6.30							
							SPT-4	7.00 - 7.45							
7		SM		Medium dense to dense grey silty fine sand (SM)											
8							- medium dense, 6.0 to 14.5 m					SPT-5	8.50 - 8.95		
9								UDS-4				8.00 - 8.30		21	
10								SPT-6				9.00 - 9.45		23	
11								DS-2				10.00 - 10.30			
12								SPT-7				10.50 - 10.95		27	
13								SPT-8				11.50 - 11.95		28	
14								DS-3				13.00 - 13.30			
15								SPT-9				13.50 - 13.95		30	
16								SPT-10				14.50 - 14.95		33	
				- dense, 13.5 to 20.0 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: 41

PAGE 2 OF 3

BOREHOLE NO : BH-41				BORING METHOD : Shell and Auger				GROUND ELEVATION : RL 193.070 m					
STRUCTURE: STG				SPT HAMMER USED : Automatic Trip				GROUND WATER DEPTH, m 6.30					
CHAINAGE :				BOREHOLE DIAMETER 150mm				TERMINATION DEPTH : 35.45 m					
COORDINATES : 869 E, 67 N				CASING DEPTH : 35.00 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	17.00 - 20.00	Dense grey silty fine sand (SM)	173.07	DS-4	16.00 - 16.30						
SPT-11						16.50 - 16.95		35					
18		SM	17.00 - 20.00	Dense grey silty fine sand (SM)	173.07	SPT-12	17.50 - 17.95		37				
19		SM	17.00 - 20.00	Dense grey silty fine sand (SM)	173.07	DS-5	19.00 - 19.30						
20		CL	20.00 - 22.00	Very stiff brown clayey silt, low plastic (CL)	171.07	SPT-13	19.50 - 19.95		41				
21		CL	20.00 - 22.00	Very stiff brown clayey silt, low plastic (CL)	171.07	SPT-14	20.50 - 20.95		29				
22		SP-SM	22.00 - 35.45	Dense to very dense grey fine sand (SP-SM) - dense, 22.0 to 25.5 m	171.07	DS-6	22.00 - 22.30						
23		SP-SM	22.00 - 35.45	Dense to very dense grey fine sand (SP-SM) - dense, 22.0 to 25.5 m	171.07	SPT-15	22.50 - 22.95		42				
24		SP-SM	22.00 - 35.45	Dense to very dense grey fine sand (SP-SM) - dense, 22.0 to 25.5 m	171.07	SPT-16	23.50 - 23.95		48				
25		SP-SM	22.00 - 35.45	Dense to very dense grey fine sand (SP-SM) - dense, 22.0 to 25.5 m	171.07	DS-7	25.00 - 25.30						
26		SP-SM	22.00 - 35.45	Dense to very dense grey fine sand (SP-SM) - very dense, 25.5 to 35.45 m	171.07	SPT-17	25.50 - 25.95		50				
27		SP-SM	22.00 - 35.45	Dense to very dense grey fine sand (SP-SM) - very dense, 25.5 to 35.45 m	171.07	SPT-18	26.50 - 26.95		53				
28		SP-SM	22.00 - 35.45	Dense to very dense grey fine sand (SP-SM) - very dense, 25.5 to 35.45 m	171.07	DS-8	28.00 - 28.30						
29		SP-SM	22.00 - 35.45	Dense to very dense grey fine sand (SP-SM) - very dense, 25.5 to 35.45 m	171.07	SPT-19	28.50 - 28.95		57				
30		SP-SM	22.00 - 35.45	Dense to very dense grey fine sand (SP-SM) - very dense, 25.5 to 35.45 m	171.07	SPT-20	29.50 - 29.95		63				
31		SP-SM	22.00 - 35.45	Dense to very dense grey fine sand (SP-SM) - very dense, 25.5 to 35.45 m	171.07	DS-9	31.00 - 31.30						
32		SP-SM	22.00 - 35.45	Dense to very dense grey fine sand (SP-SM) - very dense, 25.5 to 35.45 m	171.07	SPT-21	31.50 - 31.95		68				

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: 41

PAGE 3 OF 3

BOREHOLE NO : BH-41			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.070 m					
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 6.30					
CHAINAGE :			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 35.45 m					
COORDINATES : 869 E, 67 N			CASING DEPTH : 35.00 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	35.45	Very dense grey fine sand (SP-SM)	157.62	SPT-22	32.50 - 32.95		71		
34											
35											
				Termination at 35.45 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.:-41

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	kg/cm ²		
0.00	0.50	DS-1			Very stiff brown clayey silt, medium plastic (CI)																			
1.00	1.45	SPT-1	29	29							36.8	20.4	16.4											
2.00	2.30	UDS-1															1.78	13.5	1.57					
3.00	3.45	SPT-2	14	14		4.00					37.9	14.6	23.4								UU	1.2,3	0.8	5.1
4.00	4.30	UDS-2			Stiff brown clayey silt (CL)												1.77	14.8	1.54					
5.00	5.45	SPT-3	15	16		6.00	0	43	54	3														
6.00	6.30	UDS-3			Medium dense to dense grey silty fine sand (SM)												1.80	15.4	1.56					
7.00	7.45	SPT-4	18	16		16 - medium dense, 6.0 to 14.5 m																		
8.00	8.30	UDS-4																						
8.50	8.95	SPT-5	21	17			2	77	21	0														
9.00	9.45	SPT-6	23	18																				
10.00	10.30	DS-2																						
10.50	10.95	SPT-7	27	20																				
11.50	11.95	SPT-8	28	20																				
13.00	13.30	DS-3			13.5 - dense, 13.5 to 20.0 m																			
13.50	13.95	SPT-9	30	20																				
14.50	14.95	SPT-10	33	21																				
16.00	16.30	DS-4																						

* Outside NABL scope.

DS: Direct shear test- Consolidated Drained

UUT: Unconsolidated undrained triaxial shear test



Borehole No.:-41

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	C _u kg/cm ²	
16.50	16.95	SPT-11	35	21	Dense grey silty fine sand (SM)																		
17.50	17.95	SPT-12	37	22																			
19.00	19.30	DS-5																					
19.50	19.95	SPT-13	41	23		20.50	0	83	17	0													
20.50	20.95	SPT-14	29	29	Very stiff brown clayey silt, low plastic (CL)	22.00					25.6	17.3	8.3										
22.00	22.30	DS-6			Dense to very dense grey fine sand (SP-SM)																		
22.50	22.95	SPT-15	42	22	- dense, 22.0 to 25.5 m																		
23.50	23.95	SPT-16	48	24																			
25.00	25.30	DS-7																					
25.50	25.95	SPT-17	50	24	- very dense, 25.5 to 35.45 m																		
26.50	26.95	SPT-18	53	25																			
28.00	28.30	DS-8																					
28.50	28.95	SPT-19	57	26																			
29.50	29.95	SPT-20	63	27			4	87	9	0													
31.00	31.30	DS-9																					
31.50	31.95	SPT-21	68	28																			
32.50	32.95	SPT-22	71	29																			
34.00	34.30	DS-10																					

* Outside NABL scope.

DS: Direct shear test- Consolidated Drained

UUT: Unconsolidated undrained triaxial shear test



SUMMARY OF LABORATORY TEST RESULTS

[illegible]

* Outside NABL scope.

DS: Direct shear test- Consolidated Drained

UUT: Unconsolidated undrained triaxial shear test



BOREHOLE NO: 42

PAGE 1 OF 3

BOREHOLE NO : BH-42			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.040 m							
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 6.80							
CHAINAGE : -			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 40.45 m							
COORDINATES : 899 E, 119 N			CASING DEPTH : 40.00 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	3.00	Stiff brown clayey silt, low plastic (CL)	190.04	DS-1	0.00 - 0.50		11				
SPT-1						1.00 - 1.45							
UDS-1						2.00 - 2.30							
3		SM	3.00	Medium dense to dense grey silty fine sand (SM) - medium dense, 3.0 to 14.5 m	190.04	SPT-2	3.00 - 3.45		21				
4						UDS-2	4.00 - 4.30						
5						SPT-3	5.00 - 5.45					28	
6						UDS-3	6.00 - 6.30						
7							SPT-4	7.00 - 7.45					15
8							DS-2	8.00 - 8.30					
9						SPT-5	8.50 - 8.95					17	
10						SPT-6	9.00 - 9.45						20
11						DS-3	10.00 - 10.30						
12						SPT-7	10.50 - 10.95					24	
13						SPT-8	11.50 - 11.95						22
14						DS-4	13.00 - 13.30						
15						SPT-9	13.50 - 13.95					25	
16						SPT-10	14.50 - 14.95						31

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: 42

PAGE 2 OF 3

BOREHOLE NO : BH-42			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.040 m						
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 6.80						
CHAINAGE : -			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 40.45 m						
COORDINATES : 899 E, 119 N			CASING DEPTH : 40.00 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												
17		SM	20.50	Dense grey silty fine sand (SM)	172.54	DS-5	16.00 - 16.30					
SPT-11						16.50 - 16.95		39				
SPT-12						17.50 - 17.95		49				
DS-6						19.00 - 19.30						
SPT-13						19.50 - 19.95		41				
SPT-14						20.50 - 20.95		50				
21		CI	22.00	Hard brown clayey silt, medium plastic (CI)	171.04							
22												
23		SP-SM	- with gravel, 28.5 to 29.5 m	Very dense grey fine sand (SP-SM)		DS-7	22.00 - 22.30					
24						SPT-15	22.50 - 22.95		59			
25						SPT-16	23.50 - 23.95		51			
26						DS-8	25.00 - 25.30					
27						SPT-17	25.50 - 25.95		53			
28						SPT-18	26.50 - 26.95		65			
29						DS-9	28.00 - 28.30					
30						SPT-19	28.50 - 28.95		49			
31						SPT-20	29.50 - 29.95		52			
32						DS-10	31.00 - 31.30					
						SPT-21	31.50 - 31.95		55			

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: 42

PAGE 3 OF 3

BOREHOLE NO : BH-42			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.040 m						
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 6.80						
CHAINAGE : -			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 40.45 m						
COORDINATES : 899 E, 119 N			CASING DEPTH : 40.00 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	Very dense grey fine sand (SP-SM) - with traces of gravel, 34.5 to 35.5 m	152.59	SPT-22	32.50 - 32.95		58	 ▲ FIELD SPT N VALUE ▲ PL (%) MC (%) LL (%) 20 40 60 80 ■ FINES CONTENT (%) ■			
DS-11					34.00 - 34.30							
SPT-23					34.50 - 34.95		61					
SPT-24					35.50 - 35.95		65					
DS-12					37.00 - 37.30							
SPT-25					37.50 - 37.95		68					
SPT-26					38.50 - 38.95		72					
SPT-27					40.00 - 40.45		77					
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.:-42

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)										25											
1.00	1.45	SPT-1	11	11								33.0	19.7	13.3		16										
2.00	2.30	UDS-1			Medium dense to dense grey silty fine sand (SM) - medium dense, 3.0 to 14.5 m	3.00	0	45	50	5							1.74	11.9	1.55							
3.00	3.45	SPT-2	21	25																						
4.00	4.30	UDS-2																1.77	12.7	1.57						
5.00	5.45	SPT-3	28	29																						
6.00	6.30	UDS-3															1.80	13.8	1.58							
7.00	7.45	SPT-4	15	14																						
8.00	8.30	DS-2																								
8.50	8.95	SPT-5	17	15																						
9.00	9.45	SPT-6	20	17																						
10.00	10.30	DS-3																								
10.50	10.95	SPT-7	24	18			0	86	14	0																
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	31	20		- 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.:-42

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	39	23	Dense grey silty fine sand (SM)																		
17.50	17.95	SPT-12	49	26																			
19.00	19.30	DS-6																					
19.50	19.95	SPT-13	41	23		20.50																	
20.50	20.95	SPT-14	50	50	Hard brown clayey silt, medium plastic (CI)	22.00					40.6	17.4	23.2										
22.00	22.30	DS-7			Very dense grey fine sand (SP-SM)																		
22.50	22.95	SPT-15	59	28																			
23.50	23.95	SPT-16	51	25																			
25.00	25.30	DS-8																					
25.50	25.95	SPT-17	53	25																			
26.50	26.95	SPT-18	65	29																			
28.00	28.30	DS-9																					
28.50	28.95	SPT-19	49	23	- with gravel, 28.5 to 29.5 m		7	87	6	0													
29.50	29.95	SPT-20	52	24																			
31.00	31.30	DS-10																					
31.50	31.95	SPT-21	55	24																			
32.50	32.95	SPT-22	58	25																			
34.00	34.30	DS-11																					

* 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

Plate 277 of 661



BOREHOLE NO: 43

PAGE 1 OF 3

BOREHOLE NO : BH-43			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.160 m									
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m6.85									
CHAINAGE : -			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 40.45 m									
COORDINATES : 928 E, 119 N			CASING DEPTH : 40.00 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															
1		CL	2.00	Hard brown clayey silt, low plastic (CL)	191.16	DS-1	0.00 - 0.50								
						SPT-1	1.00 - 1.45		31						
2															
3		SM	Medium dense to very dense grey silty fine sand (SM) - medium dense, 2.0 to 13.5 m	UDS-1	2.00 - 2.30		15		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												DS-2	8.00 - 8.30		
10												SPT-5	8.50 - 8.95		20
11												SPT-6	9.00 - 9.45		23
12												DS-3	10.00 - 10.30		
13												SPT-7	10.50 - 10.95		25
14												SPT-8	11.50 - 11.95		25
15												DS-4	13.00 - 13.30		
16		SPT-9	13.50 - 13.95		31										
		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)

(Continued Next Page)



BOREHOLE NO: 43

PAGE 2 OF 3

BOREHOLE NO : BH-43			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.160 m						
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 6.85						
CHAINAGE : -			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 40.45 m						
COORDINATES : 928 E, 119 N			CASING DEPTH : 40.00 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	Dense to very dense grey silty fine sand (SM) - dense, 16.5 to 22.5 m - very dense, 22.5 to 40.45 m		DS-5	16.00 - 16.30						
				SPT-11	16.50 - 16.95		33					
18					SPT-12	17.50 - 17.95		40				
19					DS-6	19.00 - 19.30						
20					SPT-13	19.50 - 19.95		49				
21					SPT-14	20.50 - 20.95		34				
22					DS-7	22.00 - 22.30						
23					SPT-15	22.50 - 22.95		53				
24					SPT-16	23.50 - 23.95		59				
25					DS-8	25.00 - 25.30						
26					SPT-17	25.50 - 25.95		63				
27					SPT-18	26.50 - 26.95		65				
28					DS-9	28.00 - 28.30						
29					SPT-19	28.50 - 28.95		71				
30					SPT-20	29.50 - 29.95		67				
31					DS-10	31.00 - 31.30						
32					SPT-21	31.50 - 31.95		73				

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: 43

PAGE 3 OF 3

BOREHOLE NO : BH-43			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.160 m							
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m6.85							
CHAINAGE : -			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 40.45 m							
COORDINATES : 928 E, 119 N			CASING DEPTH : 40.00 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		SM	Very dense grey silty fine sand (SM)	152.71	SPT-22	32.50 - 32.95		77					
34													
35					DS-11	34.00 - 34.30							
36					SPT-23	34.50 - 34.95		83					
37													
38					SPT-24	35.50 - 35.95		46					
39													
40					DS-12	37.00 - 37.30							
					SPT-25	37.50 - 37.95		92					
					SPT-26	38.50 - 38.95		85					
		40.45	Termination at 40.45 meters Depth.		SPT-27	40.00 - 40.45		99					

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

Ground Water
Table

DISTURBED SAMPLE
(DS)

Standard Penetration
Test (SPT)

UNDISTURBED
SAMPLE (UDS)



Borehole No.:-43

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	
0.00	0.50	DS-1			Hard brown clayey silt, low plastic (CL)											17							
1.00	1.45	SPT-1	31	31		2.00					30.2	15.3	15.0	12									
2.00	2.30	UDS-1			Medium dense to very dense grey silty fine sand (SM)												1.75	12.7	1.55				
3.00	3.45	SPT-2	15	18	- medium dense, 2.0 to 13.5 m																		
4.00	4.30	UDS-2						0	65	33	2						1.79	13.8	1.57				
5.00	5.45	SPT-3	16	17																			
6.00	6.30	UDS-3															1.84	15.6	1.59				
7.00	7.45	SPT-4	15	14																			
8.00	8.30	DS-2																					
8.50	8.95	SPT-5	20	17																			
9.00	9.45	SPT-6	23	18																			
10.00	10.30	DS-3																					
10.50	10.95	SPT-7	25	18																			
11.50	11.95	SPT-8	25	18			0	68	31	1													
13.00	13.30	DS-4																					
13.50	13.95	SPT-9	31	20	- dense, 13.5 to 14.5 m																		
14.50	14.95	SPT-10	27	18	- medium 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.:-43

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	
16.50	16.95	SPT-11	33	20	Dense to very dense grey silty fine sand (SM)																		
17.50	17.95	SPT-12	40	23	- dense, 16.5 to 22.5 m																		
19.00	19.30	DS-6																					
19.50	19.95	SPT-13	49	26																			
20.50	20.95	SPT-14	34	20																			
22.00	22.30	DS-7																					
22.50	22.95	SPT-15	53	26	- very dense, 22.5 to 40.45 m																		
23.50	23.95	SPT-16	59	28																			
25.00	25.30	DS-8																					
25.50	25.95	SPT-17	63	29																			
26.50	26.95	SPT-18	65	29																			
28.00	28.30	DS-9																					
28.50	28.95	SPT-19	71	30																			
29.50	29.95	SPT-20	67	29			0	87	13	0													
31.00	31.30	DS-10																					
31.50	31.95	SPT-21	73	30																			
32.50	32.95	SPT-22	77	31																			
34.00	34.30	DS-11																					

* 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: 44

PAGE 1 OF 3

BOREHOLE NO : BH-44			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.150 m						
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 7.14						
CHAINAGE : -			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 35.45 m						
COORDINATES : 987 E, 102 N			CASING DEPTH : 34.50 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	Hard brown clayey silt, low plastic (CL)	190.15	DS-1	0.00 - 0.50			36			
2			- with gravel, 2.0 to 3.0 m		SPT-1	1.00 - 1.45						
3					UDS-1	2.00 - 2.30						
4		SM	Medium dense grey silty fine sand (SM)	177.15	SPT-2	3.00 - 3.45		20	23			
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			- with traces of gravel, 9.0 to 10.0 m		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 - 13.45						
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: 44

PAGE 2 OF 3

BOREHOLE NO : BH-44			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.150 m									
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 7.14									
CHAINAGE : -			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 35.45 m									
COORDINATES : 987 E, 102 N			CASING DEPTH : 34.50 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 (%) ■					
17		SP-SM	Dense grey fine sand (SP-SM)		DS-5	16.00 - 16.30				■	20 40 60 80				
			Dense to very dense grey fine sand (SP-SM)		SPT-11	16.50 - 16.95		31		▲	20 40 60 80				
- with traces of gravel, 16.0 to 17.5 m											▲	20 40 60 80			
			SPT-12	17.50 - 17.95		34			▲	20 40 60 80					
18												20 40 60 80			
			DS-6	19.00 - 19.30								20 40 60 80			
19													20 40 60 80		
			SPT-13	19.50 - 19.95		34				▲	20 40 60 80				
20													20 40 60 80		
			SPT-14	20.50 - 20.95		40				▲	20 40 60 80				
21													20 40 60 80		
													20 40 60 80		
22								DS-7	22.00 - 22.30				20 40 60 80		
			SPT-15	22.50 - 22.95		47				▲	20 40 60 80				
23													20 40 60 80		
			SPT-16	23.50 - 23.95		51				▲	20 40 60 80				
24			- very dense, 23.5 to 35.45 m										20 40 60 80		
				DS-8	25.00 - 25.30								20 40 60 80		
SPT-17				25.50 - 25.95		56				▲	20 40 60 80				
25													20 40 60 80		
				SPT-18	26.50 - 26.95		61				▲	20 40 60 80			
26												20 40 60 80			
	DS-9	28.00 - 28.30										20 40 60 80			
27	- with traces of gravel, 26.5 to 28.0 m	SPT-19		28.50 - 28.95		67						20 40 60 80			
		SPT-20		29.50 - 29.95		64						20 40 60 80			
28												20 40 60 80			
		DS-10	31.00 - 31.30									20 40 60 80			
29												20 40 60 80			
	SPT-21	31.50 - 31.95		64							20 40 60 80				
30											20 40 60 80				
31											20 40 60 80				
32											20 40 60 80				

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: 44

PAGE 3 OF 3

BOREHOLE NO : BH-44			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.150 m				
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 7.14				
CHAINAGE : -			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 35.45 m				
COORDINATES : 987 E, 102 N			CASING DEPTH : 34.50 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	35.45	Very dense grey fine sand (SP-SM)	157.70	SPT-22	32.50 - 32.95		69	
34						DS-11	34.00 - 34.30			
35										
						SPT-23	35.00 - 35.45		75	
						Termination at 35.45 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.:-44

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)							14													
1.00	1.45	SPT-1	36	36		- with gravel, 2.0 to 3.0 m					28.9	16.1	12.8			20									
2.00	2.30	UDS-1					3.00	11	14	67	8						1.74	13.1	1.54						
3.00	3.45	SPT-2	20	24	Medium dense grey silty fine sand (SM)									2.62											
4.00	4.30	UDS-2															1.79	14.5	1.56	DS	0.5,1,1.5	0.0	30.6		
5.00	5.45	SPT-3	17	18																					
6.00	6.30	UDS-3															1.84	15.7	1.59						
7.00	7.45	SPT-4	20	17																					
8.00	8.30	DS-2																							
8.50	8.95	SPT-5	23	18																					
9.00	9.45	SPT-6	19	16	- with traces of gravel, 9.0 to 10.0 m		1	70	28	1															
10.00	10.30	DS-3																							
10.50	10.95	SPT-7	20	16																					
11.50	11.95	SPT-8	23	17																					
13.00	13.45	DS-4																							
13.50	13.95	SPT-9	25	18																					
14.50	14.95	SPT-10	23	17		16.00																			
16.00	16.30	DS-5			Dense grey fine sand (SP-SM)		1	90	9	0															

* Outside NABL scope.

DS: Direct shear test- Consolidated Drained

UUT: Unconsolidated undrained triaxial shear test



Borehole No.:-44

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	31	20	Dense to very dense grey fine sand (SP-SM)																		
17.50	17.95	SPT-12	34	20	- with traces of gravel, 16.0 to 17.5 m																		
19.00	19.30	DS-6																					
19.50	19.95	SPT-13	34	20																			
20.50	20.95	SPT-14	40	22																			
22.00	22.30	DS-7																					
22.50	22.95	SPT-15	47	24																			
23.50	23.95	SPT-16	51	25	- very dense, 23.5 to 35.45 m																		
25.00	25.30	DS-8																					
25.50	25.95	SPT-17	56	26																			
26.50	26.95	SPT-18	61	27	- with traces of gravel, 26.5 to 28.0 m		3	92	5	0													
28.00	28.30	DS-9																					
28.50	28.95	SPT-19	67	29																			
29.50	29.95	SPT-20	64	27																			
31.00	31.30	DS-10																					
31.50	31.95	SPT-21	64	27																			
32.50	32.95	SPT-22	69	28																			
34.00	34.30	DS-11																					

* Outside NABL scope.

DS: Direct shear test- Consolidated Drained

UUT: Unconsolidated undrained triaxial shear test



Borehole No.:-44

SUMMARY OF LABORATORY TEST RESULTS

[illegible]

* Outside NABL scope.

DS: Direct shear test- Consolidated Drained

UU: Unconsolidated undrained triaxial shear test



BOREHOLE NO: 45

PAGE 1 OF 3

BOREHOLE NO : BH-45			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 192.190 m															
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 6.40															
CHAINAGE : -			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 35.45 m															
COORDINATES : 618 E, 553 N			CASING DEPTH : 35.00 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)	190.19	DS-1	0.00 - 0.50														
						SPT-1	1.00 - 1.45		32												
2		SM	10.00	Medium dense grey silty fine sand (SM)	182.19	UDS-1	2.00 - 2.30														
3																					
4							SPT-2	3.00 - 3.45		12											
5							UDS-2	4.00 - 4.30													
6																					
7							SPT-3	5.00 - 5.45		14											
8							UDS-3	6.00 - 6.30													
9																					
10											SPT-4	7.00 - 7.45		18							
11											UDS-4	8.00 - 8.30									
12		SP-SM		Medium dense to very dense grey fiine sand (SP-SM) - medium dense, 10.0 to 13.5 m		DS-2	10.00 - 10.30														
13							SPT-6	10.50 - 10.95		25											
14																					
15							SPT-7	11.50 - 11.95		29											
16																					
17							DS-3	13.00 - 13.30													
18						SPT-8	13.50 - 13.95		33												
19																					
20						SPT-9	14.50 - 14.95		37												
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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: 45

PAGE 2 OF 3

BOREHOLE NO : BH-45	BORING METHOD : Shell and Auger	GROUND ELEVATION : RL 192.190 m
STRUCTURE: STG	SPT HAMMER USED : Automatic Trip	GROUND WATER DEPTH, m 6.40
CHAINAGE : -	BOREHOLE DIAMETER 150mm	TERMINATION DEPTH : 35.45 m
COORDINATES : 618 E, 553 N	CASING DEPTH : 35.00 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 ▲	PL (%)	MC (%)	LL (%)	FINES CONTENT (%) ■
17				- with traces of gravel, 16.5 to 17.5 m		DS-4	16.00 - 16.30	UNDISTURBED SAMPLE (UDS)						
18				Dense to very dense grey fine sand (SP-SM)		SPT-10	16.50 - 16.95	DISTURBED SAMPLE (DS)	40					
19						SPT-11	17.50 - 17.95	DISTURBED SAMPLE (DS)	43					
20				- dense, 17.5 to 22.5 m		DS-5	19.00 - 19.30	UNDISTURBED SAMPLE (UDS)						
21						SPT-12	19.50 - 19.95	DISTURBED SAMPLE (DS)	46					
22						SPT-13	20.50 - 20.95	DISTURBED SAMPLE (DS)	48					
23				- very dense, 22.5 to 35.45 m		DS-6	22.00 - 22.30	UNDISTURBED SAMPLE (UDS)						
24						SPT-14	22.50 - 22.95	DISTURBED SAMPLE (DS)	50					
25						SPT-15	23.50 - 23.95	DISTURBED SAMPLE (DS)	53					
26						DS-7	25.00 - 25.30	UNDISTURBED SAMPLE (UDS)						
27						SPT-16	25.50 - 25.95	DISTURBED SAMPLE (DS)	53					
28						SPT-17	26.50 - 26.95	DISTURBED SAMPLE (DS)	60					
29						DS-8	28.00 - 28.30	UNDISTURBED SAMPLE (UDS)						
30						SPT-18	28.50 - 28.95	DISTURBED SAMPLE (DS)	67					
31						SPT-19	29.50 - 29.95	DISTURBED SAMPLE (DS)	65					
32						DS-9	31.00 - 31.30	UNDISTURBED SAMPLE (UDS)						
						SPT-20	31.50 - 31.95	DISTURBED SAMPLE (DS)	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: 45

PAGE 3 OF 3

BOREHOLE NO : BH-45			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 192.190 m						
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 6.40						
CHAINAGE : -			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 35.45 m						
COORDINATES : 618 E, 553 N			CASING DEPTH : 35.00 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	35.45	Very dense grey fine sand (SP-SM)	156.74	SPT-21	32.50 - 32.95		80			
DS-10						34.00 - 34.30						
SPT-22						34.50 - 34.95		65				
SPT-23						35.00 - 35.45		78				
Termination at 35.45 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.:-45

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	
0.00	0.50	DS-1			Hard brown clayey silt, low plastic (CL)																		
1.00	1.45	SPT-1	32	32		2.00					28.2	19.1	9.1										
2.00	2.30	UDS-1			Medium dense grey silty fine sand (SM)												1.75	13.5	1.54				
3.00	3.45	SPT-2	12	14																			
4.00	4.30	UDS-2															1.85	18.6	1.56				
5.00	5.45	SPT-3	14	15			0	84	16	0													
6.00	6.30	UDS-3															1.89	20.5	1.57				
7.00	7.45	SPT-4	18	16																			
8.00	8.30	UDS-4																					
9.00	9.45	SPT-5	22	18		10.00	0	52	47	1													
10.00	10.30	DS-2			Medium dense to very dense grey fine sand (SP-SM)																		
10.50	10.95	SPT-6	25	19	- medium dense, 10.0 to 13.5 m																		
11.50	11.95	SPT-7	29	20																			
13.00	13.30	DS-3																					
13.50	13.95	SPT-8	33	21	- dense, 13.5 to 22.5 m																		
14.50	14.95	SPT-9	37	23																			
16.00	16.30	DS-4																					
16.50	16.95	SPT-10	40	23	- with traces of gravel, 16.5 to 17.5 m		1	93	6	0													

* Outside NABL scope.

DS: Direct shear test- Consolidated Drained

UUT: Unconsolidated undrained triaxial shear test



Borehole No.:-45

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	43	24	Dense to very dense grey fine sand (SP-SM)																		
19.00	19.30	DS-5			- dense, 17.5 to 22.5 m																		
19.50	19.95	SPT-12	46	25																			
20.50	20.95	SPT-13	48	25																			
22.00	22.30	DS-6																					
22.50	22.95	SPT-14	50	25	- very dense, 22.5 to 35.45 m																		
23.50	23.95	SPT-15	53	26																			
25.00	25.30	DS-7																					
25.50	25.95	SPT-16	53	25																			
26.50	26.95	SPT-17	60	27			0	93	7	0													
28.00	28.30	DS-8																					
28.50	28.95	SPT-18	67	29																			
29.50	29.95	SPT-19	65	28																			
31.00	31.30	DS-9																					
31.50	31.95	SPT-20	72	30																			
32.50	32.95	SPT-21	80	32																			
34.00	34.30	DS-10																					
34.50	34.95	SPT-22	65	26																			

* 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: 46

PAGE 1 OF 3

BOREHOLE NO : BH-46			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.090 m					
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 6.20					
CHAINAGE :			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 45.36 m					
COORDINATES : 883 E, 254 N			CASING DEPTH : 44.72 m			LOGGED BY : Mr. Gaurav					
DATE OF START : 17-Dec-2019			DATE OF FINISH : 18-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		CI	Very stiff brown clayey silt, medium plastic (CI)	190.09	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 to dense grey silty fine sand (SM) - medium dense, 3.0 to 16.5 m		SPT-2	3.00 - 3.45		23			
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					DS-2	8.00 - 8.30					
10					SPT-5	9.00 - 9.45		18			
11					DS-3	10.00 - 10.30					
12					SPT-6	10.50 - 10.95		18			
13					SPT-7	11.50 - 11.95		20			
14					DS-4	13.00 - 13.30					
15					SPT-8	13.50 - 13.95		25			
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: 46

PAGE 2 OF 3

BOREHOLE NO : BH-46			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.090 m							
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 6.20							
CHAINAGE :			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 45.36 m							
COORDINATES : 883 E, 254 N			CASING DEPTH : 44.72 m			LOGGED BY : Mr. Gaurav							
DATE OF START : 17-Dec-2019			DATE OF FINISH : 18-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, 16.5 to 20.5 m		DS-5	16.00 - 16.30							
			SPT-10	16.50 - 16.95		34							
18			Dense grey silty fine sand (SM)		SPT-11	17.50 - 17.95		30					
19													
20													
20.50													
21		CL	Hard brown clayey silt, low plastic (CL)	172.59	SPT-13	20.50 - 20.95		34					
22													
22		SP-SM	Dense to very dense grey fine sand (SP-SM)	171.09	DS-7	22.00 - 22.30							
23			- dense, 22.0 to 25.5 m		SPT-14	22.50 - 22.95		41					
24					SPT-15	23.50 - 23.95		46					
25													
26			- very dense, 25.5 to 34.5 m		DS-8	25.00 - 25.30							
27					SPT-16	25.50 - 25.95		62					
28					SPT-17	26.50 - 26.95		53					
29													
30					DS-9	28.00 - 28.30							
31					SPT-18	28.50 - 28.95		59					
32					SPT-19	29.50 - 29.95		66					
					DS-10	31.00 - 31.30							
					SPT-20	31.50 - 31.95		55					

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: 46

PAGE 3 OF 3

BOREHOLE NO : BH-46		BORING METHOD : Shell and Auger		GROUND ELEVATION : RL 193.090 m										
STRUCTURE: STG		SPT HAMMER USED : Automatic Trip		GROUND WATER DEPTH, m 6.20										
CHAINAGE :		BOREHOLE DIAMETER 150mm		TERMINATION DEPTH : 45.36 m										
COORDINATES : 883 E, 254 N		CASING DEPTH : 44.72 m		LOGGED BY : Mr. Gaurav										
DATE OF START : 17-Dec-2019		DATE OF FINISH : 18-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 (%) ■
33		SP-SM					SPT-21	32.50 - 32.95	64					
34			34.50		158.59	DS-11	34.00 - 34.30							
35		CI		Hard brown clayey silt, medium plastic (CI)		SPT-22	34.50 - 34.95	77						
36						SPT-23	35.50 - 35.95	35						
37			37.00	Very dense grey fine sand with traces of gravel, (SP-SM)	156.09	DS-12	37.00 - 37.30							
38						SPT-24	37.50 - 37.95	82						
39						SPT-25	38.50 - 38.95	95						
40						DS-13	40.00 - 40.30							
41		SP-SM				SPT-26	40.50 - 40.91	101/26cm						
42						SPT-27	41.50 - 41.88	101/23cm						
43						DS-14	43.00 - 43.30							
44						SPT-28	43.50 - 43.90	101/25cm						
45			45.36	Termination at 45.36 meters Depth.	147.73	SPT-29	45.00 - 45.36	101/21cm						

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

Ground Water
Table

DISTURBED SAMPLE
(DS)

Standard Penetration
Test (SPT)

UNDISTURBED
SAMPLE (UDS)



Borehole No.:-46

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 ₁ 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, medium plastic (CI)																		
1.00	1.45	SPT-1	19	19		2.00					38.7	23.2	15.5										
2.00	2.30	UDS-1			Medium dense to dense grey silty fine sand (SM)																		
3.00	3.45	SPT-2	23	28	- medium dense, 2.0 to 16.5 m		0	64	34	2							1.73	12.4	1.54	DS	0.5,1,1.5	0.0	29.9
4.00	4.30	UDS-2																					
5.00	5.45	SPT-3	17	18											2.64		1.77	13.9	1.55	DS	0.5,1,1.5	0.0	31.0
6.00	6.30	UDS-3															1.80	14.7	1.57				
7.00	7.45	SPT-4	14	13																			
8.00	8.30	DS-2																					
9.00	9.45	SPT-5	18	16																			
10.00	10.30	DS-3																					
10.50	10.95	SPT-6	18	16																			
11.50	11.95	SPT-7	20	16																			
13.00	13.30	DS-4																					
13.50	13.95	SPT-8	25	18																			
14.50	14.95	SPT-9	28	19																			
16.00	16.30	DS-5																					
16.50	16.95	SPT-10	34	21	- dense, 16.5 to 20.5 m		0	83	17	0													

* Outside NABL scope.

DS: Direct shear test- Consolidated Drained

UUT: Unconsolidated undrained triaxial shear test



Borehole No.:-46

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	c_u kg/cm ²	
17.50	17.95	SPT-11	30	19	Dense grey silty fine sand (SM)																		
19.00	19.30	DS-6																					
19.50	19.95	SPT-12	39	22		20.50																	
20.50	20.95	SPT-13	34	34	Hard brown clayey silt, low plastic (CL)	22.00					29.0	16.9	12.1										
22.00	22.30	DS-7			Dense to very dense grey fine sand (SP-SM)																		
22.50	22.95	SPT-14	41	22	- dense, 22.0 to 25.5 m																		
23.50	23.95	SPT-15	46	24																			
25.00	25.30	DS-8																					
25.50	25.95	SPT-16	62	29	- very dense, 25.5 to 34.5 m																		
26.50	26.95	SPT-17	53	25																			
28.00	28.30	DS-9																					
28.50	28.95	SPT-18	59	27																			
29.50	29.95	SPT-19	66	28																			
31.00	31.30	DS-10																					
31.50	31.95	SPT-20	55	24	- with traces of gravel, 31.5 to 32.5 m		3	92	5	0													
32.50	32.95	SPT-21	64	27																			
34.00	34.30	DS-11																					
34.50	34.95	SPT-22	77	30		34.50																	

* Outside NABL scope.

DS: Direct shear test- Consolidated Drained

UUT: Unconsolidated undrained triaxial shear test



Borehole No.:-46

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 _v kg/cm ²		
35.50	35.95	SPT-23	35	35	Hard brown clayey silt, medium plastic (CI) Very dense grey fine sand with traces of gravel, (SP-SM)	37.00				39.1	22.0	17.1												
37.00	37.30	DS-12																						
37.50	37.95	SPT-24	82	30																				
38.50	38.95	SPT-25	95	34						2	93	5	0											
40.00	40.30	DS-13																						
40.50	40.91	SPT-26	101/26cm																					
41.50	41.88	SPT-27	101/23cm																					
43.00	43.30	DS-14																						
43.50	43.90	SPT-28	101/25cm			45.36																		
45.00	45.36	SPT-29	101/21cm																					

* Outside NABL scope.

DS: Direct shear test- Consolidated Drained

UUT: Unconsolidated undrained triaxial shear test



BOREHOLE NO: 47

PAGE 1 OF 3

BOREHOLE NO : BH-47			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.050 m							
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 6.95							
CHAINAGE :			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 45.43 m							
COORDINATES : 883 E, 231 N			CASING DEPTH : 45.00 m			LOGGED BY : Mr. Gaurav							
DATE OF START : 17-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 (%)	
</													

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: 47

PAGE 2 OF 3

BOREHOLE NO : BH-47			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.050 m						
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 6.95						
CHAINAGE :			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 45.43 m						
COORDINATES : 883 E, 231 N			CASING DEPTH : 45.00 m			LOGGED BY : Mr. Gaurav						
DATE OF START : 17-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 (%) ■												
17		SP-SM	17.50	Dense grey fine sand (SP)	175.55	DS-5	16.00 - 16.30					
SPT-11						16.50 - 16.95		35				
18		SP	20.50	- with traces of gravel, 17.5 to 19.5 m	172.55	SPT-12	17.50 - 17.95		38			
19		SP	20.50	- with traces of gravel, 17.5 to 19.5 m	172.55	DS-6	19.00 - 19.30					
20		SP	20.50	- with traces of gravel, 17.5 to 19.5 m	172.55	SPT-13	19.50 - 19.95		40			
21		CL	22.50	Very stiff brown clayey silt, low plastic (CL)	170.55	SPT-14	20.50 - 20.95		26			
22		CL	22.50	Very stiff brown clayey silt, low plastic (CL)	170.55	DS-7	22.00 - 22.30					
23		SP-SM	22.50	Dense to very dense grey fine sand (SP-SM)	170.55	SPT-15	22.50 - 22.95		43			
24		SP-SM	22.50	- dense, 22.5 to 26.5 m	170.55	SPT-16	23.50 - 23.95		46			
25		SP-SM	22.50	- dense, 22.5 to 26.5 m	170.55	DS-8	25.00 - 25.30					
26		SP-SM	22.50	- dense, 22.5 to 26.5 m	170.55	SPT-17	25.50 - 25.95		49			
27		SP-SM	22.50	- very dense, 26.5 to 34.5 m	170.55	SPT-18	26.50 - 26.95		52			
28		SP-SM	22.50	- very dense, 26.5 to 34.5 m	170.55	DS-9	28.00 - 28.30					
29		SP-SM	22.50	- very dense, 26.5 to 34.5 m	170.55	SPT-19	28.50 - 28.95		56			
30		SP-SM	22.50	- very dense, 26.5 to 34.5 m	170.55	SPT-20	29.50 - 29.95		58			
31		SP-SM	22.50	- very dense, 26.5 to 34.5 m	170.55	DS-10	31.00 - 31.30					
32		SP-SM	22.50	- very dense, 26.5 to 34.5 m	170.55	SPT-21	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: 47

PAGE 3 OF 3

BOREHOLE NO : BH-47			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.050 m								
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 6.95								
CHAINAGE :			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 45.43 m								
COORDINATES : 883 E, 231 N			CASING DEPTH : 45.00 m			LOGGED BY : Mr. Gaurav								
DATE OF START : 17-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-22	32.50 - 32.95		64					
34														
34.50			34.50		158.55	DS-11	34.00 - 34.30							
35		CL		Hard brown clayey silt, low plastic (CL)		SPT-23	34.50 - 34.95		38					
35.50														
36		SM		Very dense grey silty fine sand (SM)		SPT-24	35.50 - 35.95		66					
37														
37											DS-12	37.00 - 37.30		
38											SPT-25	37.50 - 37.95		84
39											SPT-26	38.50 - 38.95		90
40														
40											DS-13	40.00 - 40.30		
41											SPT-27	40.50 - 40.95		94
42											SPT-28	41.50 - 41.95		98
43														
43											DS-14	43.00 - 43.30		
44											SPT-29	43.50 - 43.95		97
45											SPT-30	44.50 - 44.95		100
45.43								45.43			147.62	SPT-31	45.00 - 45.43	
Termination at 45.43 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.:-47

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			Stiff to hard brown clayey silt, low plastic (CL)																		
1.00	1.45	SPT-1	35	35		- hard, 0.0 to 3.0 m					34.1	20.9	13.2										
2.00	2.30	UDS-1			- stiff, 3.0 to 4.0 m												1.76	13.5	1.55	DS	0.5,1,1.5	0.0	30.2
3.00	3.45	SPT-2	15	15		4.00	0	36	60	4													
4.00	4.30	UDS-2			Medium dense to dense grey fine sand												1.79	14.9	1.56				
5.00	5.45	SPT-3	13	13		- SP-SM, 4.00 to 17.5 m									2.65								
6.00	6.30	UDS-3			- medium dense, 4.0 to 14.5 m												1.82	15.7	1.57				
7.00	7.45	SPT-4	13	12																			
8.00	8.30	DS-2																					
8.50	8.95	SPT-5	16	15																			
9.00	9.45	SPT-6	18	16																			
10.00	10.30	DS-3																					
10.50	10.95	SPT-7	22	17	- with traces of gravel, 10.5 to 11.5 m		2	86	12	0													
11.50	11.95	SPT-8	25	18																			
13.00	13.30	DS-4																					
13.50	13.95	SPT-9	27	19																			
14.50	14.95	SPT-10	32	20	- dense, 14.5 to 20.5 m																		
16.00	16.30	DS-5				17.50																	

* Outside NABL scope.

DS: Direct shear test- Consolidated Drained

UUT: Unconsolidated undrained triaxial shear test



Borehole No.:-47

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	C _u kg/cm ²	
16.50	16.95	SPT-11	35	21	Dense grey fine sand (SP)																		
17.50	17.95	SPT-12	38	22			3	93	4	0													
19.00	19.30	DS-6			- with traces of gravel, 17.5 to 19.5 m																		
19.50	19.95	SPT-13	40	22		20.50																	
20.50	20.95	SPT-14	26	26	Very stiff brown clayey silt, low plastic (CL)						29.6	19.9	9.7										
22.00	22.30	DS-7				22.50					30.2	19.8	10.4										
22.50	22.95	SPT-15	43	23	Dense to very dense grey fine sand (SP-SM)																		
23.50	23.95	SPT-16	46	23	- dense, 22.5 to 26.5 m																		
25.00	25.30	DS-8																					
25.50	25.95	SPT-17	49	24																			
26.50	26.95	SPT-18	52	25	- very dense, 26.5 to 34.5 m																		
28.00	28.30	DS-9																					
28.50	28.95	SPT-19	56	25																			
29.50	29.95	SPT-20	58	26			0	92	8	0													
31.00	31.30	DS-10																					
31.50	31.95	SPT-21	60	26																			
32.50	32.95	SPT-22	64	27																			
34.00	34.30	DS-11				34.50																	

* Outside NABL scope.

DS: Direct shear test- Consolidated Drained

UUT: Unconsolidated undrained triaxial shear test



Borehole No.:-47

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
						Gravel (%)	Sand (%)	Silt (%)	Clay (%)										Type of test	Confining Pressure ₃ kg/cm ²	C _u kg/cm ²	
34.50	34.95 SPT-23	38	38	Hard brown clayey silt, low plastic (CL)	35.50	0	31	64	5	27.5	16.8	10.8										
35.50	35.95 SPT-24	66	26	Very dense grey silty fine sand (SM)																		
37.00	37.30 DS-12																					
37.50	37.95 SPT-25	84	31																			
38.50	38.95 SPT-26	90	32																			
40.00	40.30 DS-13																					
40.50	40.95 SPT-27	94	32																			
41.50	41.95 SPT-28	98	33																			
43.00	43.30 DS-14																					
43.50	43.95 SPT-29	97	32																			
44.50	44.95 SPT-30	100	32																			
45.00	45.43 SPT-31	100/29cm			45.43																	

* Outside NABL scope.

DS: Direct shear test- Consolidated Drained

UUT: Unconsolidated undrained triaxial shear test



BOREHOLE NO: 48

PAGE 1 OF 3

BOREHOLE NO : BH-48			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.210 m							
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m6.25							
CHAINAGE : -			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 35.45 m							
COORDINATES : 749 E, 294 N			CASING DEPTH : 35.00 m			LOGGED BY : Mr. Gaurav							
DATE OF START : 17-Dec-2019			DATE OF FINISH : 18-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)	191.21	DS-1	0.00 - 0.50		18				
SPT-1						1.00 - 1.45							
2													
3		SM	Medium dense grey silty fine sand (SM)	- with traces of gravel, 5.0 to 6.0 m		UDS-1	2.00 - 2.30		14				
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: 48

PAGE 2 OF 3

BOREHOLE NO : BH-48			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.210 m							
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 6.25							
CHAINAGE : -			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 35.45 m							
COORDINATES : 749 E, 294 N			CASING DEPTH : 35.00 m			LOGGED BY : Mr. Gaurav							
DATE OF START : 17-Dec-2019			DATE OF FINISH : 18-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	- with gravel, 16.5 to 17.5 m		DS-5	16.00 - 16.30							
			SPT-10	16.50 - 16.95			25						
18			Dense grey silty fine sand (SM)		SPT-11	17.50 - 17.95			31				
19					DS-6	19.00 - 19.30							
20					SPT-12	19.50 - 19.95			39				
20.50													
21		CL	Hard brown clayey silt, low plastic (CL)		SPT-13	20.50 - 20.95			34				
22													
22			22.00		171.21								
23		SP-SM	Dense to very dense grey fine sand (SP-SM)		DS-7	22.00 - 22.30							
			- dense, 22.0 to 25.5 m		SPT-14	22.50 - 22.95			46				
24					SPT-15	23.50 - 23.95			47				
25					DS-8	25.00 - 25.30							
26			- very dense, 25.5 to 35.45 m		SPT-16	25.50 - 25.95			50				
27			- with traces of gravel, 25.5 to 26.5 m		SPT-17	26.50 - 26.95			53				
28					DS-9	28.00 - 28.30							
29					SPT-18	28.50 - 28.95			59				
30					SPT-19	29.50 - 29.95			69				
31					DS-10	31.00 - 31.30							
32					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: 48

PAGE 3 OF 3

BOREHOLE NO : BH-48			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.210 m					
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 6.25					
CHAINAGE : -			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 35.45 m					
COORDINATES : 749 E, 294 N			CASING DEPTH : 35.00 m			LOGGED BY : Mr. Gaurav					
DATE OF START : 17-Dec-2019			DATE OF FINISH : 18-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	35.45	Termination at 35.45 meters Depth.	157.76	SPT-21	32.50 - 32.95		67		
34						DS-11	34.00 - 34.30				
35											
						SPT-22	35.00 - 35.45		78		

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

Ground Water Table

DISTURBED SAMPLE (DS)

Standard Penetration Test (SPT)

UNDISTURBED SAMPLE (UDS)



Borehole No.:-48

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 ₃ kg/cm ²	C _u kg/cm ²	
0.00	0.50	DS-1			Very stiff brown clayey silt, low plastic (CL)	2.00																	
1.00	1.45	SPT-1	18	18							30.8	17.5	13.3										
2.00	2.30	UDS-1			Medium dense grey silty fine sand (SM)												1.74	13.2	1.54				
3.00	3.45	SPT-2	14	17																			
4.00	4.30	UDS-2															1.79	14.8	1.56				
5.00	5.45	SPT-3	16	17	17 - with traces of gravel, 5.0 to 6.0 m	1	55	42	2														
6.00	6.30	UDS-3																	1.83	15.9	1.58	DS	0.5,1,1.5
7.00	7.45	SPT-4	13	13																		31.5	
8.00	8.30	DS-2																					
9.00	9.45	SPT-5	17	15																			
10.00	10.30	DS-3																					
10.50	10.95	SPT-6	18	16																			
11.50	11.95	SPT-7	21	17																			
13.00	13.30	DS-4																					
13.50	13.95	SPT-8	19	15																			
14.50	14.95	SPT-9	25	18										2.63									
16.00	16.30	DS-5																					
16.50	16.95	SPT-10	25	17	17 - with gravel, 16.5 to 17.5 m	10	77	13	0														

* Outside NABL scope.

DS: Direct shear test- Consolidated Drained

UUT: Unconsolidated undrained triaxial shear test



Borehole No.:-48

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
17.50	17.95	SPT-11	31	20	Dense grey silty fine sand (SM) 19.00																		
19.30	DS-6																						
19.50	19.95	SPT-12	39	22		20.50																	
20.50	20.95	SPT-13	34	34	Hard brown clayey silt, low plastic (CL)	22.00					34.1	15.3	18.8										
22.00	22.30	DS-7			Dense to very dense grey fine sand (SP-SM)																		
22.50	22.95	SPT-14	46	24	- dense, 22.0 to 25.5 m																		
23.50	23.95	SPT-15	47	24																			
25.00	25.30	DS-8																					
25.50	25.95	SPT-16	50	24	- very dense, 25.5 to 35.45 m		2	87	11	0													
26.50	26.95	SPT-17	53	25	- with traces of gravel, 25.5 to 26.5 m																		
28.00	28.30	DS-9																					
28.50	28.95	SPT-18	59	27																			
29.50	29.95	SPT-19	69	29																			
31.00	31.30	DS-10																					
31.50	31.95	SPT-20	72	30																			
32.50	32.95	SPT-21	67	28																			
34.00	34.30	DS-11																					
35.00	35.45	SPT-22	78	30		35.45	0	92	8	0													

* Outside NABL scope.

DS: Direct shear test- Consolidated Drained

UUT: Unconsolidated undrained triaxial shear test



BOREHOLE NO: 49

PAGE 1 OF 3

BOREHOLE NO : BH-49			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.210 m						
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m6.66						
CHAINAGE : -			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 35.45 m						
COORDINATES : 733 E, 260 N			CASING DEPTH : 34.80 m			LOGGED BY : Mr. Gaurav						
DATE OF START : 15-Dec-2019			DATE OF FINISH : 17-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	Stiff brown clayey silt, low plastic (CL)	191.21	DS-1	0.00 - 0.50		10			
SPT-1						1.00 - 1.45						
2												
3		SM	10.50	Medium dense grey silty fine sand (SM)	182.71	UDS-1	2.00 - 2.30		17			
4						SPT-2	3.00 - 3.45					
5						UDS-2	4.00 - 4.30					
6						SPT-3	5.00 - 5.45					
7						DS-2	6.00 - 6.30					
8						SPT-4	7.00 - 7.45					
9						DS-3	8.00 - 8.30					
10						SPT-5	9.00 - 9.45					
11						DS-4	10.00 - 10.30					
12							SP-SM					Medium dense to dense grey fine sand (SP-SM)
13												
14	SPT-7	11.50 - 11.95										
15	DS-5	13.00 - 13.30										
16	SPT-8	13.50 - 13.95										
						SPT-9	14.50 - 14.95		23			
									29			

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: 49

PAGE 2 OF 3

BOREHOLE NO : BH-49			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.210 m							
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 6.66							
CHAINAGE : -			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 35.45 m							
COORDINATES : 733 E, 260 N			CASING DEPTH : 34.80 m			LOGGED BY : Mr. Gaurav							
DATE OF START : 15-Dec-2019			DATE OF FINISH : 17-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-SM	- dense, 16.5 to 20.5 m		DS-6	16.00 - 16.30							
			SPT-10	16.50 - 16.95		31							
18			Dense grey fine sand (SP-SM)		SPT-11	17.50 - 17.95		37					
19													
20			- with gravel, 19.5 to 20.5 m		SPT-12	19.50 - 19.95		33					
20.50													
21		CL	Very stiff brown clayey silt, low plastic (CL)	172.71	SPT-13	20.50 - 20.95		29					
22			22.00	171.21									
23		SM	Dense to very dense grey silty fine sand (SM)		DS-8	22.00 - 22.30							
			- dense, 22.0 to 26.5 m		SPT-14	22.50 - 22.95		39					
24					SPT-15	23.50 - 23.95		45					
25													
					DS-9	25.00 - 25.30							
26					SPT-16	25.50 - 25.95		46					
27			- very dense, 26.5 to 31.5 m		SPT-17	26.50 - 26.95		51					
28													
					DS-10	28.00 - 28.30							
29					SPT-18	28.50 - 28.95		60					
30			- with traces of gravel, 29.5 to 31.5 m		SPT-19	29.50 - 29.95		66					
31													
			DS-11	31.00 - 31.30									
32	SP-SM		Very dense grey fine sand (SP-SM)	161.71	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: 49

PAGE 3 OF 3

BOREHOLE NO : BH-49			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.210 m					
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 6.66					
CHAINAGE : -			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 35.45 m					
COORDINATES : 733 E, 260 N			CASING DEPTH : 34.80 m			LOGGED BY : Mr. Gaurav					
DATE OF START : 15-Dec-2019			DATE OF FINISH : 17-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		76		
34						DS-12	34.00 - 34.30				
35			35.00		158.21						
		CL	35.45	Hard brown sandy silt, low plastic (CL)	157.76	SPT-22	35.00 - 35.45		50		
Termination at 35.45 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.:-49

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			Stiff brown clayey silt, low plastic (CL)																		
1.00	1.45	SPT-1	10	10		2.00					26.6	18.5	8.1										
2.00	2.30	UDS-1			Medium dense grey silty fine sand (SM)											1.87	6.9	1.75					
3.00	3.45	SPT-2	17	20																			
4.00	4.30	UDS-2															1.76	12.8	1.56				
5.00	5.45	SPT-3	17	18																			
6.00	6.30	DS-2																					
7.00	7.45	SPT-4	19	17																			
8.00	8.30	DS-3																					
9.00	9.45	SPT-5	25	19			0	73	26	1													
10.00	10.30	DS-4				10.50																	
10.50	10.95	SPT-6	19	16	Medium dense to dense grey fine sand (SP-SM)																		
11.50	11.95	SPT-7	20	16		- medium dense, 10.5 to 16.5 m																	
13.00	13.30	DS-5																					
13.50	13.95	SPT-8	23	17																			
14.50	14.95	SPT-9	29	19																			
16.00	16.30	DS-6																					
16.50	16.95	SPT-10	31	20	- dense, 16.5 to 20.5 m																		

* Outside NABL scope.

DS: Direct shear test- Consolidated Drained

UUT: Unconsolidated undrained triaxial shear test



Borehole No.:-49

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
17.50	17.95	SPT-11	37	22	Dense grey fine sand (SP-SM)																		
19.00	19.30	DS-7																					
19.50	19.95	SPT-12	33	20	- with gravel, 19.5 to 20.5 m	20.50	7	82	11	0													
20.50	20.95	SPT-13	29	29	Very stiff brown clayey silt, low plastic (CL)	22.00					26.0	16.9	9.1										
22.00	22.30	DS-8			Dense to very dense grey silty fine sand (SM)																		
22.50	22.95	SPT-14	39	21	- dense, 22.0 to 26.5 m																		
23.50	23.95	SPT-15	45	23																			
25.00	25.30	DS-9																					
25.50	25.95	SPT-16	46	23																			
26.50	26.95	SPT-17	51	24	- very dense, 26.5 to 31.5 m																		
28.00	28.30	DS-10																					
28.50	28.95	SPT-18	60	27																			
29.50	29.95	SPT-19	66	28	- with traces of gravel, 29.5 to 31.5 m		1	82	17	0													
31.00	31.30	DS-11				31.50																	
31.50	31.95	SPT-20	72	29	Very dense grey fine sand (SP-SM) 32.50																		
32.95	SPT-21	76	30																				
34.00	34.30	DS-12					35.00	0	93	7	0												
35.00	35.45	SPT-22	50	50	Hard brown clayey silt, low plastic (CL)		35.45				30.1	17.6	12.4										

* Outside NABL scope.

DS: Direct shear test- Consolidated Drained

UUT: Unconsolidated undrained triaxial shear test



BOREHOLE NO: 50

PAGE 1 OF 3

BOREHOLE NO : BH-50			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.280 m					
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 6.90					
CHAINAGE :			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 45.45 m					
COORDINATES : 720 E, 192 N			CASING DEPTH : 44.95 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)	191.28	DS-1	0.00 - 0.50		21			
2					SPT-1	1.00 - 1.45					
3		SM	Medium dense to dense grey silty fine sand (SM) - medium dense, 2.0 to 13.5 m - dense, 13.5 to 14.5 m - medium dense, 14.5 to 17.5 m		UDS-1	2.00 - 2.30		24			
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: 50

PAGE 2 OF 3

BOREHOLE NO : BH-50			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.280 m						
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 6.90						
CHAINAGE :			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 45.45 m						
COORDINATES : 720 E, 192 N			CASING DEPTH : 44.95 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 (%)

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: 50

PAGE 3 OF 3

BOREHOLE NO : BH-50			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.280 m				
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 6.90				
CHAINAGE :			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 45.45 m				
COORDINATES : 720 E, 192 N			CASING DEPTH : 44.95 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
33		SP-SM	33.00 - 37.00	Very dense grey fine sand (SP-SM)	156.28	SPT-21	32.50 - 32.95		61	
34										
35						DS-10	34.00 - 34.30			
35						SPT-22	34.50 - 34.95		59	
36						SPT-23	35.50 - 35.95		51	
37										
38		SM	37.00 - 45.45	Very dense grey silty fine sand (SM) - with traces of gravel, 37.0 to 38.5 m	147.83	DS-11	37.00 - 37.30			
38						SPT-24	37.50 - 37.95		81	
39						SPT-25	38.50 - 38.95		84	
40										
41						DS-12	40.00 - 40.30			
41						SPT-26	40.50 - 40.95		89	
42						SPT-27	41.50 - 41.95		84	
43										
44						DS-13	43.00 - 43.30			
44						SPT-28	43.50 - 43.95		99	
45										
			45.45	Termination at 45.45 meters Depth.		SPT-29	45.00 - 45.45		103	

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

Ground Water
Table

DISTURBED SAMPLE
(DS)

Standard Penetration
Test (SPT)

UNDISTURBED
SAMPLE (UDS)



Borehole No.:-50

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)	2.00																	
1.00	1.45	SPT-1	21	21								32.8	20.5	12.3									
2.00	2.30	UDS-1			Medium dense to dense grey silty fine sand (SM)		0	54	44	2						1.72	13.8	1.51					
3.00	3.45	SPT-2	24	29	- medium dense, 2.0 to 13.5 m													1.80	18.2	1.52			
4.00	4.30	UDS-2																					
5.00	5.45	SPT-3	19	20																			
6.00	6.30	UDS-3																					
7.00	7.45	SPT-4	21	17														1.90	25.0	1.52			
8.00	8.30	UDS-4																1.94	26.1	1.54			
9.00	9.45	SPT-5	23	18																			
10.00	10.30	DS-2																					
10.50	10.95	SPT-6	26	19																			
11.50	11.95	SPT-7	29	20																			
13.00	13.30	DS-3																					
13.50	13.95	SPT-8	31	20	- dense, 13.5 to 14.5 m		2	71	26	1													
14.50	14.95	SPT-9	26	18																			
16.00	16.30	DS-4																					
16.50	16.95	SPT-10	28	18																			

* Outside NABL scope.

DS: Direct shear test- Consolidated Drained

UUT: Unconsolidated undrained triaxial shear test



Borehole No.:-50

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	C _u kg/cm ²	
17.50	17.95	SPT-11	34	21	Dense grey silty fine sand (SM)																		
19.00	19.30	DS-5																					
19.50	19.95	SPT-12	36	21																			
20.50	20.95	SPT-13	24	16		20.50																	
22.00	22.30	DS-6			Very stiff brown clayey silt, low plastic (CL)																		
22.50	22.95	SPT-14	27	17	Medium dense to very dense grey fine sand (SP-SM)	22.50					30.2	20.7	9.5										
23.50	23.95	SPT-15	31	18	- medium dense, 22.5 to 25.0 m																		
25.00	25.30	DS-7			- dense, 25.0 to 31.5 m																		
25.50	25.95	SPT-16	36	20																			
26.50	26.95	SPT-17	38	20																			
28.00	28.30	DS-8																					
28.50	28.95	SPT-18	42	21																			
29.50	29.95	SPT-19	47	22			11	80	9	0													
31.00	31.30	DS-9																					
31.50	31.95	SPT-20	55	24	- very dense, 31.5 to 37.0 m																		
32.50	32.95	SPT-21	61	26																			
34.00	34.30	DS-10																					
34.50	34.95	SPT-22	59	25																			

* Outside NABL scope.

DS: Direct shear test- Consolidated Drained

UUT: Unconsolidated undrained triaxial shear test



Borehole No.:-50

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	Confining Pressure kg/cm ²	C _u kg/cm ²	Degree ϕ
From	To						Gravel (%)	Sand (%)	Silt (%)	Clay (%)													
35.50	35.95	SPT-23	51	22	Very dense grey fine sand (SP-SM)	37.00																	
37.00	37.30	DS-11			Very dense grey silty fine sand (SM)		1	53	39	7													
37.50	37.95	SPT-24	81	30	- with traces of gravel, 37.0 to 38.5 m																		
38.50	38.95	SPT-25	84	30																			
40.00	40.30	DS-12																					
40.50	40.95	SPT-26	89	31																			
41.50	41.95	SPT-27	84	29																			
43.00	43.30	DS-13																					
43.50	43.95	SPT-28	99	33																			
45.00	45.45	SPT-29	103	33		45.45																	

* Outside NABL scope.

DS: Direct shear test- Consolidated Drained

UUT: Unconsolidated undrained triaxial shear test



BOREHOLE NO: 51

PAGE 1 OF 3

BOREHOLE NO : BH-51			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 : 45.4 m							
COORDINATES : 873 E, 242 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 (%) ■													
1		CI	2.00	Very stiff brown clayey silt, medium plastic (CI)	191.08	DS-1	0.00 - 0.50		28				
2						SPT-1	1.00 - 1.45						
3		SM	Medium dense to very dense grey silty fine sand (SM) - medium dense, 2.0 to 14.5 m	191.08		UDS-1	2.00 - 2.30		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						
								- dense, 14.5 to 23.5 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: 51

PAGE 2 OF 3

BOREHOLE NO : BH-51			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 : 45.4 m						
COORDINATES : 873 E, 242 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			Dense to very dense grey silty fine sand (SM)			DS-4	16.00 - 16.30					
						SPT-10	16.50 - 16.95		35			
18						SPT-11	17.50 - 17.95		38			
19												
						DS-5	19.00 - 19.30					
20						SPT-12	19.50 - 19.95		42			
21						SPT-13	20.50 - 20.95		45			
22												
						DS-6	22.00 - 22.30					
23						SPT-14	22.50 - 22.95		47			
24		SM			- very dense, 23.5 to 45.40. m		SPT-15	23.50 - 23.95		51		
25												
						DS-7	25.00 - 25.30					
26					- with gravels, 23.5 to 45.40 m		SPT-16	25.50 - 25.95		54		
27							SPT-17	26.50 - 26.95		56		
28												
						DS-8	28.00 - 28.30					
29							SPT-18	28.50 - 28.95		59		
30						SPT-19	29.50 - 29.95		61			
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: 51

PAGE 3 OF 3

BOREHOLE NO : BH-51				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 : 45.4 m						
COORDINATES : 873 E, 242 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			Dense to very dense grey silty fine sand (SM) - dense, 35.5 to 37.5 m - very dense, 37.5 to 45.4 m			SPT-21	32.50 - 32.95		74					
34						DS-10	34.00 - 34.30							
35						SPT-22	34.50 - 34.95		75					
36						SPT-23	35.50 - 35.95		47					
37						DS-11	37.00 - 37.30							
38						SPT-24	37.50 - 37.95		78					
39		SM				SPT-25	38.50 - 38.95		87					
40						DS-12	40.00 - 40.30							
41						SPT-26	40.50 - 40.95		96					
42						SPT-27	41.50 - 41.95		98					
43						DS-13	43.00 - 43.30							
44						SPT-28	43.50 - 43.92		100/27cm					
45						SPT-29	44.50 - 44.93		100/28cm					
				45.40	Termination at 45.40 meters Depth.	147.68	SPT-30	45.00 - 45.40		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.:-51
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	C _u , kg/cm ²	Degree ϕ
From	To						Gravel (%)	Sand (%)	Silt (%)	Clay (%)													
0.00	0.50	DS-1			Very stiff brown clayey silt, medium plastic (CI)																		
1.00	1.45	SPT-1	28	28		2.00					35.1	24.2	10.9										
2.00	2.30	UDS-1			Medium dense to very dense grey silty fine sand (SM)					2					2.67		1.78	14.9	1.55				
3.00	3.45	SPT-2	16	19	- medium dense, 2.0 to 14.5 m			66	32														
4.00	4.30	UDS-2															1.82	16.5	1.56				
5.00	5.45	SPT-3	22	23																			
6.00	6.30	UDS-3															1.89	20.2	1.57	DS	0.5,1,1.5	0.0	31.4
7.00	7.45	SPT-4	28	21																			
8.00	8.30	UDS-4																					
9.00	9.45	SPT-5	21	17				81	19	0													
10.00	10.30	DS-2																					
10.50	10.95	SPT-6	24	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	- dense, 14.5 to 23.5 m																		
16.00	16.30	DS-4																					
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.:-51

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	38	22	Dense to very dense grey silty fine sand (SM)																		
19.00	19.30	DS-5			- dense, 17.5 to 23.5 m																		
19.50	19.95	SPT-12	42	23																			
20.50	20.95	SPT-13	45	24																			
22.00	22.30	DS-6																					
22.50	22.95	SPT-14	47	24																			
23.50	23.95	SPT-15	51	25	- very dense, 23.5 to 45.40. m		13	72	15	0													
25.00	25.30	DS-7			- with gravels, 23.5 to 45.40 m																		
25.50	25.95	SPT-16	54	26																			
26.50	26.95	SPT-17	56	26																			
28.00	28.30	DS-8																					
28.50	28.95	SPT-18	59	26																			
29.50	29.95	SPT-19	61	27																			
31.00	31.30	DS-9																					
31.50	31.95	SPT-20	64	27																			
32.50	32.95	SPT-21	74	30																			
34.00	34.30	DS-10																					
34.50	34.95	SPT-22	75	29			8	46	42	4													

* Outside NABL scope.

DS: Direct shear test- Consolidated Drained

UUT: Unconsolidated undrained triaxial shear test



Borehole No.:-51

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	Shear Strength Parameters			Degree ϕ
From	To						Gravel (%)	Sand (%)	Silt (%)	Clay (%)										Type of test	Confining Pressure, kg/cm ²	kg/cm ²	
35.50	35.95	SPT-23	47	21	Dense to very dense grey silty fine sand (SM)																		
37.00	37.30	DS-11			- dense, 35.5 to 37.5 m																		
37.50	37.95	SPT-24	78	29	- very dense, 37.5 to 45.4 m																		
38.50	38.95	SPT-25	87	31																			
40.00	40.30	DS-12																					
40.50	40.95	SPT-26	96	33																			
41.50	41.95	SPT-27	98	33																			
43.00	43.30	DS-13																					
43.50	43.92	SPT-28	100/27cm																				
44.50	44.93	SPT-29	100/28cm																				
45.00	45.40	SPT-30	100/25cm			45.40																	

* Outside NABL scope.

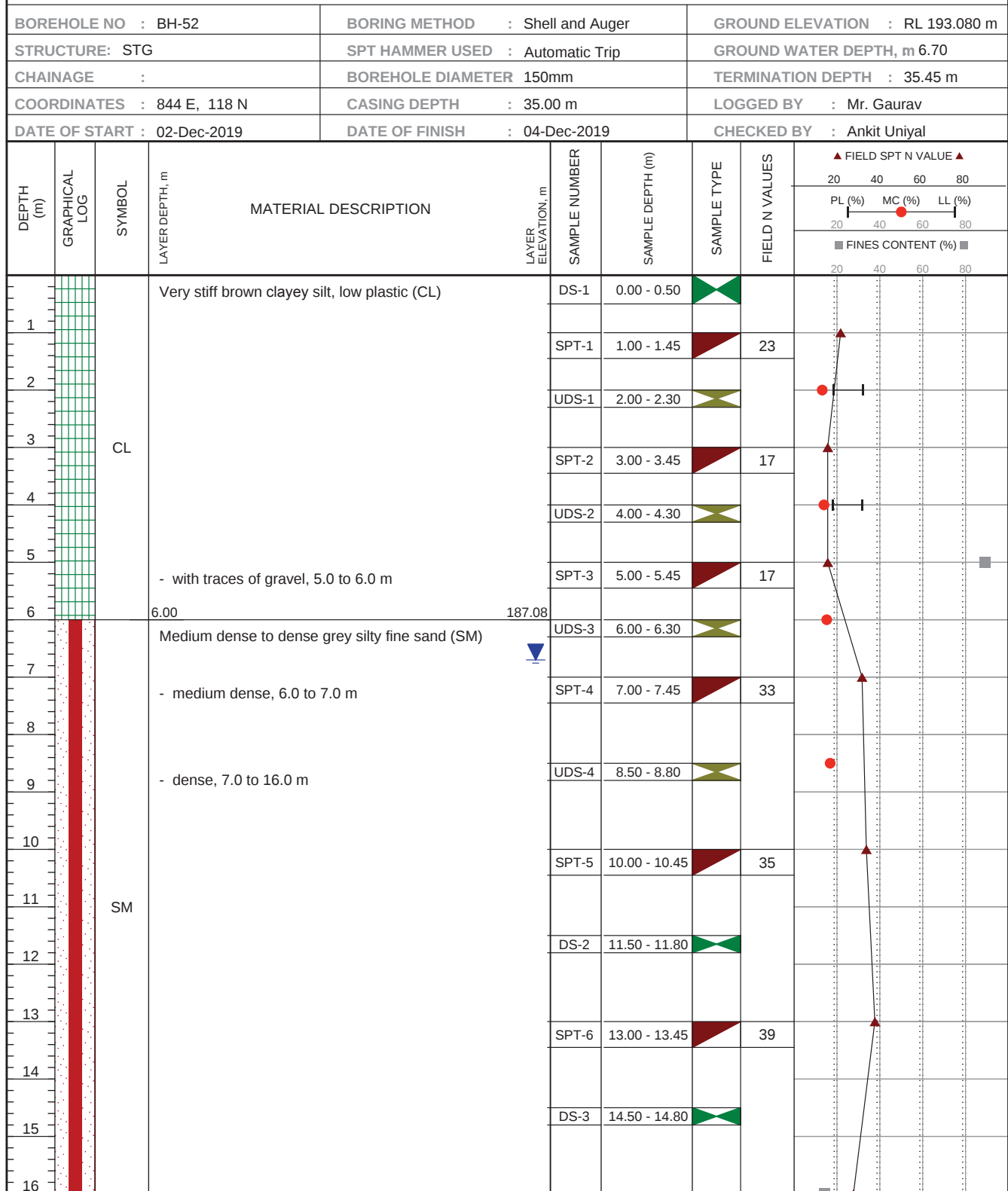
DS; Direct shear test- Consolidated Drained

UUT: Unconsolidated undrained triaxial shear test



BOREHOLE NO: 52

PAGE 1 OF 3



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

Ground Water
Table

DISTURBED SAMPLE
(DS)

Standard Penetration
Test (SPT)

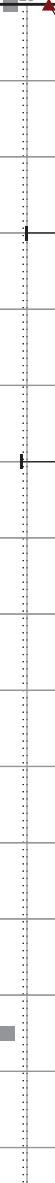
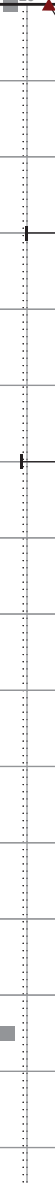
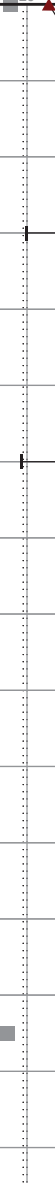
UNDISTURBED
SAMPLE (UDS)

(Continued Next Page)



BOREHOLE NO: 52

PAGE 2 OF 3

BOREHOLE NO : BH-52			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.080 m												
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 6.70												
CHAINAGE :			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 35.45 m												
COORDINATES : 844 E, 118 N			CASING DEPTH : 35.00 m			LOGGED BY : Mr. Gaurav												
DATE OF START : 02-Dec-2019			DATE OF FINISH : 04-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		SM	- medium dense, 16.0 to 19.0 m			SPT-7	16.00 - 16.45		29		20	40	60	80				
18						DS-4	17.50 - 17.80											
19																		
19.00			19.00		174.08													
20		CL	Hard brown clayey silt, low plastic (CL)			SPT-8	19.00 - 19.45		79		20	40	60	80				
21						DS-5	20.50 - 20.80											
22																		
23						SPT-9	22.00 - 22.45		81									
23.50			23.50		169.58													
24		SM	Very dense grey silty fine sand (SM)			DS-6	23.50 - 23.80				20	40	60	80				
25																		
26						SPT-10	25.00 - 25.45		52									
27						DS-7	26.50 - 26.80											
28																		
29						SPT-11	28.00 - 28.45		54									
30						DS-8	29.50 - 29.80											
31																		
32						SPT-12	31.00 - 31.45		63									

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

Ground Water
Table

DISTURBED SAMPLE
(DS)

Standard Penetration
Test (SPT)

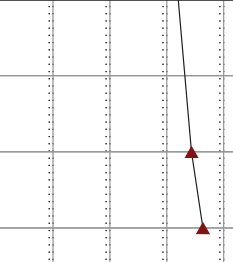
UNDISTURBED
SAMPLE (UDS)

(Continued Next Page)



BOREHOLE NO: 52

PAGE 3 OF 3

BOREHOLE NO : BH-52			BORING METHOD : Shell and Auger			GROUND ELEVATION : RL 193.080 m							
STRUCTURE: STG			SPT HAMMER USED : Automatic Trip			GROUND WATER DEPTH, m 6.70							
CHAINAGE :			BOREHOLE DIAMETER 150mm			TERMINATION DEPTH : 35.45 m							
COORDINATES : 844 E, 118 N			CASING DEPTH : 35.00 m			LOGGED BY : Mr. Gaurav							
DATE OF START : 02-Dec-2019			DATE OF FINISH : 04-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				DS-9	32.50 - 32.80						
34					SPT-13	34.00 - 34.45		70					
35													
			35.45	157.63	SPT-14	35.00 - 35.45		74					
				Termination at 35.45 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.:-52

SUMMARY OF LABORATORY TEST RESULTS

Depth, m	Sample Type	Field Value N ₆₀ *	Corrected Value N ₆₀ *	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			
						Gravel (%)	Sand (%)	Silt (%)	Clay (%)										Type of test	Confining Pressure, kg/cm ²	kg/cm ²	φ Degree
0.00	0.50	DS-1		Very stiff brown clayey silt, low plastic (CL)																		
1.00	1.45	SPT-1	23																			
2.00	2.30	UDS-1																				
3.00	3.45	SPT-2	17																			
4.00	4.30	UDS-2																				
5.00	5.45	SPT-3	17	17 - with traces of gravel, 5.0 to 6.0 m	6.00	2	9	86	3													
6.00	6.30	UDS-3		Medium dense to dense grey silty fine sand (SM)																		
7.00	7.45	SPT-4	33	23 - medium dense, 6.0 to 7.0 m																		
8.50	8.80	UDS-4		- dense, 7.0 to 16.0 m																		
10.00	10.45	SPT-5	35	23																		
11.50	11.80	DS-2																				
13.00	13.45	SPT-6	39	24																		
14.50	14.80	DS-3																				
16.00	16.45	SPT-7	29	19 - medium dense, 16.0 to 19.0 m																		
17.50	17.80	DS-4			19.00																	
19.00	19.45	SPT-8	79	79 Hard brown clayey silt, low plastic (CL)																		
20.50	20.80	DS-5																				
22.00	22.45	SPT-9	81	81	23.50																	

* Outside NABL scope.

DS: Direct shear test- Consolidated Drained

UUT: Unconsolidated undrained triaxial shear test



Borehole No.:-52

SUMMARY OF LABORATORY TEST RESULTS

[illegible]

* Outside NABL scope.

DS: Direct shear test- Consolidated Drained

UUT: Unconsolidated undrained triaxial shear test