GEOTECHNICAL INVESTIGATION REPORT
PROPOSED HIGH RISE BUILDINGS "FENELIA & EUCALYPITA"
AT ACME OZONE, THANE (W)

Submitted to,
ACME HOUSING INDIA PVT. LTD.

Submitted By,
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1.0 INTRODUCTION

Acme Housing India Pvt. Ltd. plans construction of High Rise buildings (Fenelia& Eucalypita) in Thane (W). The proposed buildings will consist of Double Basement + 3 Podiums + Stilt + Ground + 36 Upper Floors. The work of geotechnical investigation was awarded to Shree Samarth Krupa Geotechnics. The field work for the geotechnical investigation was completed by Shree Samarth Krupa Geotechnics in June 2019. This report prepared by Geocon International Pvt. Ltd. presents results of the geotechnical investigation along with foundation recommendations for proposed building.

2.0 EXPLORATION PROGRAM

2.1 Exploration Scope

Nine boreholes (NBH-1 to NBH-9) were completed for the project as illustrated on the Borehole Location Plan in the Annexure. Borehole termination depths are summarized in Table A below.

TABLE A
BOREHOLE TERMINATION DEPTHS

Borehole Number	Borehole Location	Ground Reduced Levels	Borehole Termination Depths
NBH-01	Fenelia Building	+97.90m	28.0m
NBH-02		+100.52m	28.0m
NBH-03		+99.54m	28.0m
NBH-06		+100.94m	20.0m
NBH-03	Eucalypita Building	+99.54m	28.0m
NBH-04		+103.07m	28.0m
NBH-05	NTA	+99.34m	26.0m
NBH-07		+103.18m	19.0m
NBH-08		+103.16m	22.0m
NBH-09		+104.02m	20.0m

NTA – Non Tower Area

2.2 Subsurface Conditions

Subsurface profile at this site generally consists of residual soils overlying completely weathered rock underlain by basalt bedrock. Encountered soil/rock layers are described below;

LAYER I: RESIDUAL SOILS

Residual soils, consisting mostly of brownish / yellowish clay and sand were encountered at ground surface in the boreholes. Based on Standard Penetration Tests (SPT) conducted within this layer, consistency of cohesive soils (clay) was medium stiff to stiff and the relative

density of cohesion less soils (sand) was loose to medium dense. The lower boundary of this layer was encountered at depths of 1.5m to 7.0m below ground.

LAYER II: COMPLETELY WEATHERED ROCK

Completely weathered rock was encountered at depths of 2.0m to 7.0m below ground surface in few boreholes. This layer is formed by the complete in-place disintegration of parent bedrock material, but still partially retains the original rock mass structure. SPT tests conducted in this layer encountered refusals. Core recoveries were less than 35%. The lower boundary of this layer was encountered at depths of 5.0m to 15.0m below ground surface.

LAYER III: HARD BASALT BEDROCK

Grey basalt bedrock was encountered at depths of 1.5m to 15.0m below ground surface in the boreholes. The bedrock was moderately weathered to sound, generally improving with depth. Core Recoveries in the bedrock layer varied between 37% and 99%, and Rock Quality Designations (RQDs) varied between Nil and 97%. The boreholes were terminated in this layer at depths of 19.0m to 28.0m below ground surface.

2.3 Ground Water Table

Groundwater accumulation in boreholes was monitored during and after completion of drilling activities. Groundwater was observed in boreholes at depths of 1.0m to 8.0m below ground level. Seasonal and annual fluctuations in ground water levels can be expected.

3.0 FOUNDATION RECOMMENDATIONS

Hard rock is encountered at depths of typically 1.5m to 10.0m below ground. Spread foundations for proposed buildings with double basement can be supported on this hard bedrock or PCC extended to hard rock. Foundation recommendations are summarized in Table B given below.

TABLE B
FOUNDATION RECOMMENDATIONS

Borehole Number	Borehole Location	Ground Reduced Levels	Depths To CWR	Depths To Hard Rock	Net Allowable Bearing Capacity
NBH-01	Fenelia Building	+97.90m	3.0m (RL +94.90m)	3.0m (RL +94.90m)	300 t/m^2 on HR
NBH-02		+100.52m	2.0m (RL +98.52m)	2.0m (RL +98.52m)	
NBH-03		+99.54m	4.0m (RL +95.54m)	5.0m (RL +94.54m)	
NBH-06		+100.94m	1.5m (RL +99.44m)	1.5m (RL +99.44m)	
NBH-03	Eucalypita Building	+99.54m	4.0m (RL +95.54m)	5.0m (RL +94.54m)	
NBH-04		+103.07m	2.0m (RL +101.7m)	6.0m (RL +97.70m)	
NBH-05		+99.34m	5.0m (RL +94.34m)	15.0m (RL +84.34m)	
NBH-07	NTA	+103.18m	7.0m (RL +96.18m)	10.0m (RL +93.18m)	50 t/m^2 on CWR
NBH-08		+103.16m	7.0m (RL +96.16m)	13.0m (RL +90.16m)	OR
NBH-09		+104.02m	6.0m (RL +98.02m)	14.0m (RL +90.02m)	100 t/m^2 on HR

NTA – Non Tower Area
CWR – Completely Weathered Rock
HR – Hard Rock

As seen from above table, over-excavation and replacement with PCC will be required beneath foundations near NBH-05. Maximum settlement of foundations will be less than 12mm. Modulus of subgrade reaction can be obtained by dividing above recommended bearing capacities with its corresponding settlement (0.012m).

3.1 Basement Consideration

Excavation sides should be sloped at a maximum slope of 1:1 (horizontal: vertical) or flatter within the top 4.0m and 1:2 (horizontal: vertical) upto hard rock and near vertical below this depth. If adequate space is not available for this side sloping then excavation shoring with micro piles should be provided.

Basement floors and walls should be adequately water-proofed. Adequate uplift resistance in the form of dead weight or rock anchors should be provided. An allowable grout/rock bond stress of 40 t/m^2 can be utilized for design of rock anchors. Maximum groundwater table for uplift design should be taken at RL +100.50m.

3.2 Lateral Earth Pressures

Basement walls and pile shoring walls, if any, will be subjected to lateral earth pressures. Lateral earth pressure parameters for design of basement walls and pile shoring walls are given in Table B below. Hydrostatic pressures and surcharge pressures, if any, should also be considered.

TABLE B
LATERAL EARTH PRESSURE PARAMETERS
FOR DESIGN OF PILE SHORING WALLS AND BASEMENT WALLS

Depth	Soil Type	Unit weight	Active earth pressure coefficient	Passive earth pressure coefficient	Cohesion
0.0m – 7.0m	Residual soil	1.8 t/m^3	0.5	2	0 t/m^2
7.0m – 15.0m	CWR	2.1 t/m^3	0.17	7.5	0 t/m^2
Below 15.0m	Hard Basalt Bedrock	2.4 t/m^3	1	1	130 t/m^2

CWR: Completely Weathered Rock

3.3 Foundation Protection

Results of chemical analysis on soil and groundwater samples enclosed in the Annexure, indicate that the site falls under Class 1 for sulphate concentrations and chloride concentrations (As per IS456 and as per CIRIA Sp. Publication No. 31). A 'Moderate' Exposure Condition was assigned to this site. Therefore following precautions are recommended to protect subsurface concrete and reinforcement.

Type of Cement:	OPC or PPC
Minimum Grade of Reinforced Concrete:	M25
Minimum Cement Content for Spread Foundation:	300 kg/m^3
Maximum Water Cement Ratio:	0.50
Minimum Cover to Reinforcement:	50mm

4.0 FIELD EXPLORATION PROCEDURES

The sub-surface investigation was completed generally as per IS: 1892-1979. The field investigation was carried out using rotary rigs (Calyx, 8 HP, Engine). Casing was used to support sides of borehole until sufficiently stiff strata was encountered. Standard Penetration Tests (i.e. SPT) were carried out at every 1.5m vertical interval up to bedrock, in accordance with IS 2131-1981. Using this procedure, a 5 cm outside diameter split-barrel sampler is driven into the soil by 63.5 kg. weight falling through 75 cm height. After an initial set of 15cm, the number of blows required to drive the sampler an additional 30 cm, is known as the “penetration resistance” or “N value”.

After SPT refusal was obtained, NX sized rock coring was done in maximum of 1.5m runs, using diamond bit and double tube core barrel. Percent Rock Core Recovery and percent Rock Quality Designation (%RQD) were determined. % RQD = 100 x Sum of length of rock pieces in cms, each having lengths greater than 10cms/Total length of core run in cms.

Sincerely,

GEOCON INTERNATIONAL PVT. LTD.

_____

Jaydeep Wagh
B.E., M.S., P.E. (Geotechnical)

REFERENCES

1) Foundation Analysis and Design, J.E. Bowles, McGraw Hill Publication, 5th Edition, 1996.

2) Canadian Foundation Engineering Manual.

3) Soil Mechanics in Engineering Practice, 2nd Edition, Terzaghi K. and Peck R. B., John Willey and Sons, 1967.

4) Foundation Design Manual, N. V. Nayak, 5th Edition, 1996.

5) IS:6403-1981, Code of Practice for Design and Construction of Shallow Foundations on Soils.

6) IS 12070: 1987, Code of Practice for Design and Construction of Shallow Foundations on Rocks

SAMPLE CALCULATION OF ALLOWABLE BEARING CAPACITY FOR FOUNDATIONS ON COMPLETELY WEATHERED ROCK (For Non Tower Area)

_____ GL +0.0m

Layer I, Residual Soils

_____-2.0m to 7.0m

Layer II, Completely Weathered Rock

_____ -1.5m to -15.0m

Layer III, Hard Basalt Bedrock

(Assuming completely weathered rock to be a very dense granular soil.)

Net Ultimate Bearing Capacity = $q_u = cNc\ s_c + q\ (N_q - 1)\ s_q + 0.5\ B\ \gamma N\gamma\ s_\gamma$ (Refn. 5, Table 4-1)

Where,

q = Overburden Pressure (i.e. submerged unit weight x depth of foundation)
c = Cohesion
B = Minimum Width of foundation = 1m
γ' = submerged unit weight of soil = 0.80
N_c, N_q, N_γ = Terzaghi's Bearing capacity factors
Sc, sq, s_γ = Shape factors = Conservatively assumed as 1, 1, and 0.6
D = Depth of Footing = 2.0m

Minimum SPT N value obtained in boreholes = 50
Corresponding friction angle = 42^o (Reference No. 5)
Corresponding Nc=75, Nq=92, N_γ=174 (Reference 5, IS:6403-1981);

Substituting these values in the above equation;
q ultimate =q_u =[0x75x1]+[2.0x0.8x(92-1)x1]+[0.5x1x0.8x174x0.6]= 0+145+42 = 187 t/m^2
q safe = q_u/F.S. = 187/3 = 62.33 t/m^2

Restricted to 50 t/m^2 to limit settlements as shown below.

CALCULATION OF SETTLEMENTS OF FOUNDATIONS (3m x 3m) EXERTING PRESSURE OF 50 t/m^2:

From Reference No. 1:

$$\text{Settlement} = S = q_0 B' \frac{1-«^2}{E_s} m I_s I_f$$

Where,
q_0 = Footing Pressure = 50 t/m^2
B' = B/2 (Where B is the width of pressure distribution
μ = Poisson's ratio = 0.3
E = Modulus of Elasticity
I_s = Influence Factor (Obtained from Table 5-2, Reference No. 1)
I_f = Depth Factor (Obtained from Figure 5-7, Reference No. 1)
m = 4 for center of footing

Very conservatively assuming completely weathered rock to be over-consolidated sand:
E value for over-consolidated sand = 105(N)+4000 (Reference No. 1)
Therefore, for a SPT N value of 50, E=9250 t/m^2

L' = 3/2 =1.5, B' = 3/2 = 1.5, H=6m, and D=2.0m
Therefore, M=L/B=1; and N=H/B'=4, and D/B=0.67
Corresponding, I_s = 0.43, Conservative I_f = 1 (From Table 5-2, Reference 1)

Settlement of Layer = $S_1 = 50x1.5x\frac{1-0.3^2}{9250}x4x0.51x1$ = 0.012m = 12mm

SAMPLE CALCULATION OF ALLOWABLE BEARING CAPACITY FOR FOUNDATIONS ON HARD BEDROCK (For Tower Area)

_____ GL +0.0m
Layer I, Residual Soils
_____-2.0m to 7.0m
Layer II, Completely Weathered Rock
_____ -1.5m to -15.0m
Layer III, Hard Basalt Bedrock

Allowable bearing capacity = (Nj) x Qu (Ref. 6, Clause 6.2, pg. 7)

Where,
Nj = Joint condition factor = 0.1 to 0.4 (Ref. 6, Table 4, clause 6.2, pg. 9)
Assumed as 0.1 for hard rock

Qu = Rock Compressive strength = minimum of 3270 t/m^2 (Annexure, Laboratory Test Result)

Therefore, Allowable Bearing Capacity = 0.1 x 3270 = 327 t/m^2

Restricted to 300 t/m^2

B) CALCULATION OF SETTLEMENTS OF SPREAD foundations (3m x 3m) EXERTING PRESSURE OF 300 t/m^2:

$$\text{Settlement} = S = q_0 B' \frac{1 - «^2}{E_s} m I_s I_f$$

Where,
q_0 = Footing Pressure = 300 t/m^2
B' = B/2 (Where B is the width of pressure distribution
μ = Poisson's ratio = 0.25
E = Modulus of Elasticity
I_s = Influence Factor (Obtained from Table 5-2, Reference No. 1)
I_f = Depth Factor (Obtained from Figure 5-7, Reference No. 1)
m = 4 for center of footing

E value for Basalt bedrock = 17,00,000 t/m^2 (Reference No. 1)
Using 1/10th of this value, E = 1,70,000 t/m^2

L' =3/2 =1.5, B' = 3/2 = 1.5, H=15m, and D=8m
Therefore, M=L/B=1; and N=H/B'=10 and D/B=2.67
Corresponding, I_s = 0.53, Conservative I_f = 1.0 (From Table 5-2, Reference 1)

Settlement of Layer = $S_1 = 300x1.5x\frac{1-0.25^2}{1{,}70{,}000}x4x0.53x1.0$ = 0.005m = 5mm


NBH-1
NBH-2
NBH-3
NBH-4
NBH-5
NBH-6
NBH-7
NBH-8
Wide Road
Compound Wall
Amenity Open
99.34
98.54
100.54
103.07
103.18
106.16
Trial
ZWCAD
www.ZWSOFT.COM

CLIENT	: ACME HOUSING INDIA PVT. LTD.	BOREHOLE NO. :NBH-01	
PROJECT	: PROPOSED HIGH RISE BUILDINGS FENELIA & EUCALYPITA AT ACME OZONE, THANE (W)	SHEET NO. : 1 of 3	
LOCATION	: --		
CO-ORDINATES	: --	DATE	: 09/06/2019 TO 20/06/2019
GROUND R. L.	: 97.9m	METHOD	: ROTARY DRILLING
GROUND W. T.	: 3.00m	CASING	: 4.00m

DEPTH (m.)	DIA. OF BORE HOLE	LOG.	STRATA DESCRIPTION	DEPTH (m)	DRILLING TIME (Min)	TYPE OF SAMPLE	BLOWS/15cm 15	15	15	15	SPT N	C R %	RQD %
1.00	100 mm		Brownish Sand & Gravel with Boulders	1.50									
2.00													
3.00	NX		Brownish Weathered Rock	3.00									
				3.60		SPT 1	06	09	11	16	20		
4.00				4.50									
5.00			Grayish BASALT	5.00								72	72
6.00				6.00								66	58
7.00				7.00								63	63
8.00				8.00								90	90
9.00				9.00								98	92
10.00				10.00								96	96

SPT N =STANDARD PENETRATION TEST VALUE RQD = ROCK QUALITY DESIGNATION UDS = UNDISTURBED SOIL SAMPLE
CR = CORE RECOVERY DS = DISTURBED SOIL SAMPLE VST = VANE SHEAR TEST W/L = Water Loss

REMARKS : CONTINUE ON NEXT PAGE.

M/S. SHREE SAMARTH KRUPA GEOTECHNICS

CLIENT	: **ACME HOUSING INDIA PVT. LTD.**	BOREHOLE NO. :NBH-01
PROJECT	: **PROPOSED HIGH RISE BUILDINGS FENELIA & EUCALYPITA AT ACME OZONE, THANE (W)**	SHEET NO. : 2 of 3

DEPTH (m.)	DIA. OF BORE HOLE	LOG.	STRATA DESCRIPTION	DEPTH (m)	DRILLING TIME (Min)	BLOWS/15cm TYPE	15	15	15	15	SPT N	C R %	RQD %
				10.00									
11.00	NX			11.00								73	73
12.00			Grayish BASALT	12.00								94	94
13.00				13.00								96	88
14.00				14.00								91	91
15.00				15.00								79	70
16.00				16.00								99	82
			Grayish to Reddish BASALT										
17.00				17.00								70	70
18.00				18.00								86	86
19.00				19.00								87	87
20.00				20.00								76	71
21.00				21.00								82	82

SPT N =STANDARD PENETRATION TEST VALUE RQD = ROCK QUALITY DESIGNATION UDS = UNDISTURBED SOIL SAMPLE
CR = CORE RECOVERY DS = DISTURBED SOIL SAMPLE VST = VANE SHEAR TEST W/L = Water Loss

REMARKS : CONTINUE ON NEXT PAGE.

M/S. SHREE SAMARTH KRUPA GEOTECHNICS

CLIENT	: **ACME HOUSING INDIA PVT. LTD.**	BOREHOLE NO. :NBH-0
PROJECT	: **PROPOSED HIGH RISE BUILDINGS FENELIA & EUCALYPITA AT ACME OZONE, THANE (W)**	SHEET NO. : 3 of 3

DEPTH (m.)	DIA. OF BORE HOLE	LOG.	STRATA DESCRIPTION	DEPTH (m)	DRILLING TIME (Min)	BLOWS/15cm TYPE	15	15	15	15	SPT N	C R %	RQD %
				21.00									
22.00	NX			22.00								77	41
23.00			Grayish BASALT	23.00								80	80
24.00				24.00								76	76
			Grayish to Reddish BASALT										
25.00				25.00								83	78
26.00				26.00								80	61
27.00			Grayish BASALT	27.00								79	68
28.00				28.00								97	97
29.00													
30.00													
31.00													
32.00													

SPT N =STANDARD PENETRATION TEST VALUE | RQD = ROCK QUALITY DESIGNATION | UDS = UNDISTURBED SOIL SAMPLE

CR = CORE RECOVERY | DS = DISTURBED SOIL SAMPLE | VST = VANE SHEAR TEST | W/L = Water Loss

REMARKS : BOREHOLE IS TERMINATED AT 28.00 MTR BELOW EGL.

M/S. SHREE SAMARTH KRUPA GEOTECHNICS

CLIENT	: ACME HOUSING INDIA PVT. LTD.		BOREHOLE NO. :NBH-02 SHEET NO. : 1 of 3
PROJECT	: PROPOSED HIGH RISE BUILDINGS FENELIA & EUCALYPITA AT ACME OZONE, THANE (W)		
LOCATION	: --		
CO-ORDINATES	: --	DATE	: 12/06/2019 TO 24/06/2019
GROUND R. L.	: 100.52m	METHOD	: ROTARY DRILLING
GROUND W. T.	: 2.00m	CASING	: 1.50m

DEPTH (m.)	DIA. OF BORE HOLE	LOG.	STRATA DESCRIPTION	DEPTH (m)	DRILLING TIME (Min)	TYPE OF SAMPLE	BLOWS/15cm 15	15	15	15	SPT N	C R %	RQD %
1.00	100 mm		Brownish Sand & Gravel with Boulders	1.00									
2.00			Boulders	2.00									
	NX			2.06		SPT 1	52	--	--	--	R		
3.00				3.00								46	31
4.00				4.00								75	40
5.00				5.00								74	74
6.00			Grayish BASALT	6.00								54	27
7.00				7.00								57	57
8.00				8.00								65	31
9.00				9.00								84	77
10.00				10.00								68	68

SPT N =STANDARD PENETRATION TEST VALUE RQD = ROCK QUALITY DESIGNATION UDS = UNDISTURBED SOIL SAMPLE
CR = CORE RECOVERY DS = DISTURBED SOIL SAMPLE VST = VANE SHEAR TEST W/L = Water Loss

REMARKS : CONTINUE ON NEXT PAGE.

M/S. SHREE SAMARTH KRUPA GEOTECHNICS

CLIENT	: ACME HOUSING INDIA PVT. LTD.	BOREHOLE NO. :NBH-02
PROJECT	: PROPOSED HIGH RISE BUILDINGS FENELIA & EUCALYPITA AT ACME OZONE, THANE (W)	SHEET NO. : 2 of 3

DEPTH (m.)	DIA. OF BORE HOLE	LOG.	STRATA DESCRIPTION	DEPTH (m)	DRILLING TIME (Min)	BLOWS/15cm TYPE	15	15	15	15	SPT N	C R %	RQD %
				10.00								78	70
11.00	NX			11.00									
												74	74
12.00			Grayish BASALT	12.00									
												87	87
13.00				13.00									
												91	84
14.00				14.00									
												70	70
15.00				15.00									
												82	82
16.00				16.00									
												93	93
17.00				17.00									
												94	51
18.00				18.00									
												87	87
19.00				19.00									
												90	90
20.00				20.00									
												84	84
21.00				21.00									

SPT N =STANDARD PENETRATION TEST VALUE RQD = ROCK QUALITY DESIGNATION UDS = UNDISTURBED SOIL SAMPLE
CR = CORE RECOVERY DS = DISTURBED SOIL SAMPLE VST = VANE SHEAR TEST W/L = Water Loss

REMARKS : CONTINUE ON NEXT PAGE.

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CLIENT	: ACME HOUSING INDIA PVT. LTD.	BOREHOLE NO. :NBH-02
PROJECT	: PROPOSED HIGH RISE BUILDINGS FENELIA & EUCALYPITA AT ACME OZONE, THANE (W)	SHEET NO. : 3 of 3

DEPTH (m.)	DIA. OF BORE HOLE	LOG.	STRATA DESCRIPTION	DEPTH (m)	DRILLING TIME (Min)	BLOWS/15cm TYPE	15	15	15	15	SPT N	C R %	RQD %
22.00	NX		Grayish to Reddish BASALT	21.00								93	80
23.00				22.00								88	88
24.00			Grayish BASALT	23.00								76	76
25.00				24.00								82	82
26.00				25.00								88	80
27.00				26.00								86	71
28.00				27.00								88	88
29.00				28.00									
30.00													
31.00													
32.00													

SPT N =STANDARD PENETRATION TEST VALUE RQD = ROCK QUALITY DESIGNATION UDS = UNDISTURBED SOIL SAMPLE
CR = CORE RECOVERY DS = DISTURBED SOIL SAMPLE VST = VANE SHEAR TEST W/L = Water Loss

REMARKS : BOREHOLE IS TERMINATED AT 28.00 MTR BELOW EGL.

M/S. SHREE SAMARTH KRUPA GEOTECHNICS

CLIENT	: ACME HOUSING INDIA PVT. LTD.		BOREHOLE NO. :NBH-03 SHEET NO. : 1 of 3
PROJECT	: PROPOSED HIGH RISE BUILDINGS FENELIA & EUCALYPITA AT ACME OZONE, THANE (W)		
LOCATION	: --		
CO-ORDINATES	: --	DATE	: 12/06/2019 TO 24/06/2019
GROUND R. L.	: 99.54m	METHOD	: ROTARY DRILLING
GROUND W. T.	: 2.00m	CASING	: 1.50m

DEPTH (m.)	DIA. OF BORE HOLE	LOG.	STRATA DESCRIPTION	DEPTH (m)	DRILLING TIME (Min)	TYPE OF SAMPLE	BLOWS/15cm				SPT N	C R %	RQD %
							15	15	15	15			
1.00	100 mm		Brownish Sand & Gravel with Boulders	1.00									
				1.50									
2.00			Brownish Clay	1.95		SPT 1	02	02	04	--	06		
3.00	NX		Brownish Clay with Gravels	3.00									
				3.45		SPT 2	03	05	06	--	11		
4.00				4.00									
5.00			Brownish Weathered BASALT	5.00									
6.00			Gray to Reddish BASALT	6.00								12	NIL
7.00				7.00								55	14
8.00				8.00								59	48
9.00				9.00								76	67
10.00			Grayish BASALT	10.00								71	52

SPT N =STANDARD PENETRATION TEST VALUE RQD = ROCK QUALITY DESIGNATION UDS = UNDISTURBED SOIL SAMPLE
CR = CORE RECOVERY DS = DISTURBED SOIL SAMPLE VST = VANE SHEAR TEST W/L = Water Loss

REMARKS : CONTINUE ON NEXT PAGE.

M/S. SHREE SAMARTH KRUPA GEOTECHNICS

CLIENT	: ACME HOUSING INDIA PVT. LTD.	BOREHOLE NO. :NBH-03
PROJECT	: PROPOSED HIGH RISE BUILDINGS FENELIA & EUCALYPITA AT ACME OZONE, THANE (W)	SHEET NO. : 2 of 3

DEPTH (m.)	DIA. OF BORE HOLE	LOG.	STRATA DESCRIPTION	DEPTH (m)	DRILLING TIME (Min)	BLOWS/15cm TYPE	15	15	15	15	SPT N	C R %	RQD %
				10.00								83	83
11.00	NX			11.00									
												73	65
12.00			Grayish BASALT	12.00									
												71	71
13.00				13.00									
												81	70
14.00				14.00									
												83	83
15.00				15.00									
												91	82
16.00				16.00									
												89	53
17.00				17.00									
												82	82
18.00				18.00									
												80	80
19.00				19.00									
												87	87
20.00				20.00									
												86	86
21.00				21.00									

SPT N =STANDARD PENETRATION TEST VALUE RQD = ROCK QUALITY DESIGNATION UDS = UNDISTURBED SOIL SAMPLE
CR = CORE RECOVERY DS = DISTURBED SOIL SAMPLE VST = VANE SHEAR TEST W/L = Water Loss

REMARKS : CONTINUE ON NEXT PAGE.

M/S. SHREE SAMARTH KRUPA GEOTECHNICS

CLIENT	: **ACME HOUSING INDIA PVT. LTD.**	BOREHOLE NO. :NBH-03
PROJECT	: **PROPOSED HIGH RISE BUILDINGS FENELIA & EUCALYPITA AT ACME OZONE, THANE (W)**	SHEET NO. : 3 of 3

DEPTH (m.)	DIA. OF BORE HOLE	LOG.	STRATA DESCRIPTION	DEPTH (m)	DRILLING TIME (Min)	BLOWS/15cm TYPE	15	15	15	15	SPT N	C R %	RQD %
22.00	NX		Grayish BASALT	21.00								85	68
23.00				22.00								88	79
24.00				23.00								82	82
25.00				24.00								82	82
26.00				25.00								81	81
27.00				26.00								89	60
28.00				27.00								86	74
29.00				28.00									
30.00													
31.00													
32.00													

SPT N =STANDARD PENETRATION TEST VALUE RQD = ROCK QUALITY DESIGNATION UDS = UNDISTURBED SOIL SAMPLE

CR = CORE RECOVERY DS = DISTURBED SOIL SAMPLE VST = VANE SHEAR TEST W/L = Water Loss

REMARKS : BOREHOLE IS TERMINATED AT 28.00 MTR BELOW EGL.

M/S. SHREE SAMARTH KRUPA GEOTECHNICS

CLIENT	: ACME HOUSING INDIA PVT. LTD.	BOREHOLE NO. :NBH-04	
PROJECT	: PROPOSED HIGH RISE BUILDINGS FENELIA & EUCALYPITA AT ACME OZONE, THANE (W)	SHEET NO.	: 1 of 3
LOCATION	: --		
CO-ORDINATES	: --	DATE	: 20/06/2019 TO 01/07/2019
GROUND R. L.	: 103.07m	METHOD	: ROTARY DRILLING
GROUND W. T.	: 4.50m	CASING	: 3.00m

DEPTH (m.)	DIA. OF BORE HOLE	LOG.	STRATA DESCRIPTION	DEPTH (m)	DRILLING TIME (Min)	TYPE OF SAMPLE	BLOWS/15cm 15	15	15	15	SPT N	C R %	RQD %
1.00	100 mm		Brownish Sand & Gravel with Boulders	1.00									
2.00			Boulders	2.00									
	NX			2.50									
				2.60		SPT 1	52	--	--	--	R		
3.00				3.00								11	NIL
4.00			Brownish Weathered Rock	4.00								19	NIL
5.00				5.00								16	NIL
6.00				6.00								33	33
7.00				7.00								53	33
8.00			Grayish BASALT	8.00								52	31
9.00				9.00								69	60
10.00				10.00								71	69

SPT N =STANDARD PENETRATION TEST VALUE RQD = ROCK QUALITY DESIGNATION UDS = UNDISTURBED SOIL SAMPLE
CR = CORE RECOVERY DS = DISTURBED SOIL SAMPLE VST = VANE SHEAR TEST W/L = Water Loss

REMARKS : CONTINUE ON NEXT PAGE.

M/S. SHREE SAMARTH KRUPA GEOTECHNICS

CLIENT	: ACME HOUSING INDIA PVT. LTD.	BOREHOLE NO. :NBH-04
PROJECT	: PROPOSED HIGH RISE BUILDINGS FENELIA & EUCALYPITA AT ACME OZONE, THANE (W)	SHEET NO. : 2 of 3

DEPTH (m.)	DIA. OF BORE HOLE	LOG.	STRATA DESCRIPTION	DEPTH (m)	DRILLING TIME (Min)	BLOWS/15cm TYPE	15	15	15	15	SPT N	C R %	RQD %
				10.00									
11.00	NX			11.00								73	73
12.00			Grayish BASALT	12.00								85	77
13.00				13.00								91	91
14.00				14.00								87	87
15.00			Red to Grayish BASALT	15.00								90	90
16.00				16.00								79	58
17.00			Grayish BASALT	17.00								81	81
18.00				18.00								92	83
19.00			Gray to Reddish BASALT	19.00								94	75
20.00				20.00								90	80
21.00				21.00								93	85

SPT N =STANDARD PENETRATION TEST VALUE RQD = ROCK QUALITY DESIGNATION UDS = UNDISTURBED SOIL SAMPLE
CR = CORE RECOVERY DS = DISTURBED SOIL SAMPLE VST = VANE SHEAR TEST W/L = Water Loss

REMARKS : CONTINUE ON NEXT PAGE.

M/S. SHREE SAMARTH KRUPA GEOTECHNICS

CLIENT	: **ACME HOUSING INDIA PVT. LTD.**	BOREHOLE NO. :NBH-04
PROJECT	: **PROPOSED HIGH RISE BUILDINGS FENELIA & EUCALYPITA AT ACME OZONE, THANE (W)**	SHEET NO. : 3 of 3

DEPTH (m.)	DIA. OF BORE HOLE	LOG.	STRATA DESCRIPTION	DEPTH (m)	DRILLING TIME (Min)	BLOWS/15cm TYPE	15	15	15	15	SPT N	C R %	RQD %
22.00	NX		Grayish BASALT	21.00								95	95
23.00				22.00								93	86
24.00				23.00								86	86
25.00				24.00								82	82
26.00				25.00								88	88
27.00				26.00								79	79
28.00				27.00								82	82
29.00				28.00									
30.00													
31.00													
32.00													

SPT N =STANDARD PENETRATION TEST VALUE RQD = ROCK QUALITY DESIGNATION UDS = UNDISTURBED SOIL SAMPLE

CR = CORE RECOVERY DS = DISTURBED SOIL SAMPLE VST = VANE SHEAR TEST W/L = Water Loss

REMARKS : BOREHOLE IS TERMINATED AT 28.00 MTR BELOW EGL.

M/S. SHREE SAMARTH KRUPA GEOTECHNICS

CLIENT	: ACME HOUSING INDIA PVT. LTD.	BOREHOLE NO. :NBH-05	
PROJECT	: PROPOSED HIGH RISE BUILDINGS FENELIA & EUCALYPITA AT ACME OZONE, THANE (W)	SHEET NO.	: 1 of 3
LOCATION	: --		
CO-ORDINATES	: --	DATE	: 12/07/2019 TO 18/07/2019
GROUND R. L.	: 99.34m	METHOD	: ROTARY DRILLING
GROUND W. T.	: 8.00m	CASING	: 5.00m

DEPTH (m.)	DIA. OF BORE HOLE	LOG.	STRATA DESCRIPTION	DEPTH (m)	DRILLING TIME (Min)	TYPE OF SAMPLE	BLOWS/15cm 15	15	15	15	SPT N	C R %	RQD %
1.00	100 mm		Brownish Sand & Gravel with Boulders	1.00		DS 1							
2.00				2.00									
	NX			2.45		SPT 1	03	04	05	--	09		
3.00			Brownish Clay with Gravel	3.50									
				3.95		SPT 2	03	05	06	--	11		
4.00													
5.00				5.00									
				5.45		SPT 3	05	07	09	--	16		
6.00				6.00								18	NIL
7.00			Brownish Weathered Rock (Fractured)	7.00								15	NIL
8.00				8.00								16	NIL
9.00				9.00								21	NIL
10.00				10.00								23	NIL

SPT N =STANDARD PENETRATION TEST VALUE | RQD = ROCK QUALITY DESIGNATION | UDS = UNDISTURBED SOIL SAMPLE

CR = CORE RECOVERY | DS = DISTURBED SOIL SAMPLE | VST = VANE SHEAR TEST | W/L = Water Loss

REMARKS : CONTINUE ON NEXT PAGE.

M/S. SHREE SAMARTH KRUPA GEOTECHNICS

CLIENT	: **ACME HOUSING INDIA PVT. LTD.**	BOREHOLE NO. :NBH-05
PROJECT	: **PROPOSED HIGH RISE BUILDINGS FENELIA & EUCALYPITA AT ACME OZONE, THANE (W)**	SHEET NO. : 2 of 3

DEPTH (m.)	DIA. OF BORE HOLE	LOG.	STRATA DESCRIPTION	DEPTH (m)	DRILLING TIME (Min)	BLOWS/15cm TYPE	15	15	15	15	SPT N	C R %	RQD %
				10.00									
11.00	NX			11.00								24	NIL
12.00			Brownish Weathered Rock (Fractured)	12.00								27	NIL
13.00				13.00								29	NIL
14.00				14.00								26	NIL
15.00				15.00								31	20
16.00				16.00								38	NIL
17.00			Brownish Weathered Grayish BASALT (Fractured)	17.00								45	NIL
18.00				18.00								50	20
19.00			Grayish BASALT	19.00								75	67
20.00				20.00								77	77
21.00				21.00								75	75

SPT N =STANDARD PENETRATION TEST VALUE RQD = ROCK QUALITY DESIGNATION UDS = UNDISTURBED SOIL SAMPLE
CR = CORE RECOVERY DS = DISTURBED SOIL SAMPLE VST = VANE SHEAR TEST W/L = Water Loss

REMARKS : CONTINUE ON NEXT PAGE.

M/S. SHREE SAMARTH KRUPA GEOTECHNICS

CLIENT	: ACME HOUSING INDIA PVT. LTD.	BOREHOLE NO. :NBH-05
PROJECT	: PROPOSED HIGH RISE BUILDINGS FENELIA & EUCALYPITA AT ACME OZONE, THANE (W)	SHEET NO. : 3 of 3

DEPTH (m.)	DIA. OF BORE HOLE	LOG.	STRATA DESCRIPTION	DEPTH (m)	DRILLING TIME (Min)	BLOWS/15cm TYPE	15	15	15	15	SPT N	C R %	RQD %
22.00	NX		Grayish BASALT	21.00								82	82
23.00				22.00								74	74
24.00				23.00								78	78
25.00				24.00								81	77
26.00				25.00								87	87
27.00				26.00									
28.00													
29.00													
30.00													
31.00													
32.00													

SPT N =STANDARD PENETRATION TEST VALUE RQD = ROCK QUALITY DESIGNATION UDS = UNDISTURBED SOIL SAMPLE

CR = CORE RECOVERY DS = DISTURBED SOIL SAMPLE VST = VANE SHEAR TEST W/L = Water Loss

REMARKS : BOREHOLE IS TERMINATED AT 26.00 MTR BELOW EGL.

M/S. SHREE SAMARTH KRUPA GEOTECHNICS

CLIENT	: ACME HOUSING INDIA PVT. LTD.		BOREHOLE NO. :NBH-06 SHEET NO. : 1 of 2
PROJECT	: PROPOSED HIGH RISE BUILDINGS FENELIA & EUCALYPITA AT ACME OZONE, THANE (W)		
LOCATION	: --		
CO-ORDINATES	: --	DATE	: 12/06/2019 TO 20/06/2019
GROUND R. L.	: 100.94m	METHOD	: ROTARY DRILLING
GROUND W. T.	: 1.00m	CASING	: 2.00m

DEPTH (m.)	DIA. OF BORE HOLE	LOG.	STRATA DESCRIPTION	DEPTH (m)	DRILLING TIME (Min)	TYPE OF SAMPLE	BLOWS/15cm 15	15	15	15	SPT N	C R %	RQD %
1.00	100 mm		Brownish Sand & Gravel with Boulders	1.50									
2.00				2.00									
3.00	NX			3.00								49	NIL
4.00				4.00								66	66
5.00				5.00								72	72
6.00			Grayish BASALT	6.00								80	50
7.00				7.00								83	60
8.00				8.00								87	85
9.00				9.00								92	92
10.00				10.00								79	79

SPT N =STANDARD PENETRATION TEST VALUE RQD = ROCK QUALITY DESIGNATION UDS = UNDISTURBED SOIL SAMPLE
CR = CORE RECOVERY DS = DISTURBED SOIL SAMPLE VST = VANE SHEAR TEST W/L = Water Loss

REMARKS : CONTINUE ON NEXT PAGE.

M/S. SHREE SAMARTH KRUPA GEOTECHNICS

CLIENT	: ACME HOUSING INDIA PVT. LTD.	BOREHOLE NO. :NBH-06
PROJECT	: PROPOSED HIGH RISE BUILDINGS FENELIA & EUCALYPITA AT ACME OZONE, THANE (W)	SHEET NO. : 2 of 2

DEPTH (m.)	DIA. OF BORE HOLE	LOG.	STRATA DESCRIPTION	DEPTH (m)	DRILLING TIME (Min)	BLOWS/15cm TYPE	15	15	15	15	SPT N	C R %	RQD %
				10.00									
11.00	NX			11.00								83	68
12.00			Grayish BASALT	12.00								85	85
13.00				13.00								94	86
14.00				14.00								96	96
15.00				15.00								86	63
16.00				16.00								86	79
17.00				17.00								84	68
18.00				18.00								87	65
19.00				19.00								89	89
20.00				20.00								84	84
21.00													

SPT N =STANDARD PENETRATION TEST VALUE RQD = ROCK QUALITY DESIGNATION UDS = UNDISTURBED SOIL SAMPLE
CR = CORE RECOVERY DS = DISTURBED SOIL SAMPLE VST = VANE SHEAR TEST W/L = Water Loss

REMARKS : BOREHOLE IS TERMINATED AT 20.00 MTR BELOW EGL.

M/S. SHREE SAMARTH KRUPA GEOTECHNICS

CLIENT	: ACME HOUSING INDIA PVT. LTD.		BOREHOLE NO. :NBH-07 SHEET NO. : 1 of 2
PROJECT	: PROPOSED HIGH RISE BUILDINGS FENELIA & EUCALYPITA AT ACME OZONE, THANE (W)		
LOCATION	: --		
CO-ORDINATES	: --	DATE	: 08/07/2019 TO 12/07/2019
GROUND R. L.	: 103.18m	METHOD	: ROTARY DRILLING
GROUND W. T.	: 6.00m	CASING	: 4.00m

DEPTH (m.)	DIA. OF BORE HOLE	LOG.	STRATA DESCRIPTION	DEPTH (m)	DRILLING TIME (Min)	TYPE OF SAMPLE	BLOWS/15cm 15	15	15	15	SPT N	C R %	RQD %
1.00	100 mm		Brownish Sand & Gravel with Boulders	1.00									
2.00	NX		Brownish Clay with Gravel	2.50									
3.00				2.95		SPT 1	03	04	05	--	09		
4.00				4.00									
5.00			Brownish Weathered Rock	4.45		SPT 2	05	05	07	--	12		
6.00				5.50									
7.00				5.95		SPT 3	06	08	11	--	19		
8.00				7.00								08	NIL
9.00				8.00								12	NIL
10.00			Grayish BASALT	9.00								79	79
				10.00									

SPT N =STANDARD PENETRATION TEST VALUE RQD = ROCK QUALITY DESIGNATION UDS = UNDISTURBED SOIL SAMPLE
CR = CORE RECOVERY DS = DISTURBED SOIL SAMPLE VST = VANE SHEAR TEST W/L = Water Loss

REMARKS : CONTINUE ON NEXT PAGE.

M/S. SHREE SAMARTH KRUPA GEOTECHNICS

CLIENT	: **ACME HOUSING INDIA PVT. LTD.**
PROJECT	: **PROPOSED HIGH RISE BUILDINGS FENELIA & EUCALYPITA AT ACME OZONE, THANE (W)**

BOREHOLE NO. :NBH-07
SHEET NO. : 2 of 2

DEPTH (m.)	DIA. OF BORE HOLE	LOG.	STRATA DESCRIPTION	DEPTH (m)	DRILLING TIME (Min)	BLOWS/15cm TYPE	15	15	15	15	SPT N	C R %	RQD %
				10.00									
												85	85
11.00	NX			11.00									
												83	73
12.00			Grayish BASALT	12.00									
												80	69
13.00				13.00									
												82	82
14.00				14.00									
												85	80
15.00				15.00									
												90	66
16.00				16.00									
												96	94
17.00				17.00									
												91	82
18.00				18.00									
												84	84
19.00				19.00									
20.00													
21.00													

SPT N =STANDARD PENETRATION TEST VALUE RQD = ROCK QUALITY DESIGNATION UDS = UNDISTURBED SOIL SAMPLE
CR = CORE RECOVERY DS = DISTURBED SOIL SAMPLE VST = VANE SHEAR TEST W/L = Water Loss

REMARKS : BOREHOLE IS TERMINATED AT 19.00 MTR BELOW EGL.

M/S. SHREE SAMARTH KRUPA GEOTECHNICS

CLIENT	: ACME HOUSING INDIA PVT. LTD.	BOREHOLE NO. :NBH-08	
PROJECT	: PROPOSED HIGH RISE BUILDINGS FENELIA & EUCALYPITA AT ACME OZONE, THANE (W)	SHEET NO. : 1 of 3	
LOCATION	: --		
CO-ORDINATES	: --	DATE	: 12/07/2019 TO 18/07/2019
GROUND R. L.	: 103.16m	METHOD	: ROTARY DRILLING
GROUND W. T.	: 8.00m	CASING	: 5.00m

DEPTH (m.)	DIA. OF BORE HOLE	LOG.	STRATA DESCRIPTION	DEPTH (m)	DRILLING TIME (Min)	TYPE OF SAMPLE	BLOWS/15cm 15	15	15	15	SPT N	C R %	RQD %
1.00	100 mm		Brownish Sand & Gravel with Boulders	1.50		DS 1							
2.00	NX		Brownish Clay with Gravel										
3.00				3.00									
				3.45		SPT 1	03	04	04	--	08		
4.00				4.50									
				4.95		SPT 2	05	07	08	--	15		
5.00													
6.00				6.00									
				6.45		SPT 3	08	11	15	--	26		
7.00			Brownish Clay with Weathered Rock	7.00									
8.00				8.00								16	NIL
9.00			Brownish Weathered Rock (Fractured)	9.00								19	NIL
10.00				10.00								18	NIL

SPT N =STANDARD PENETRATION TEST VALUE RQD = ROCK QUALITY DESIGNATION UDS = UNDISTURBED SOIL SAMPLE
CR = CORE RECOVERY DS = DISTURBED SOIL SAMPLE VST = VANE SHEAR TEST W/L = Water Loss

REMARKS : CONTINUE ON NEXT PAGE.

M/S. SHREE SAMARTH KRUPA GEOTECHNICS

CLIENT	: ACME HOUSING INDIA PVT. LTD.	BOREHOLE NO. :NBH-08
PROJECT	: PROPOSED HIGH RISE BUILDINGS FENELIA & EUCALYPITA AT ACME OZONE, THANE (W)	SHEET NO. : 2 of 3

DEPTH (m.)	DIA. OF BORE HOLE	LOG.	STRATA DESCRIPTION	DEPTH (m)	DRILLING TIME (Min)	BLOWS/15cm TYPE	15	15	15	15	SPT N	C R %	RQD %
11.00	NX		Brownish Weathered Rock	10.00 11.00								14	NIL
12.00				12.00								23	NIL
13.00				13.00								33	12
14.00				14.00								39	15
15.00				15.00								82	82
16.00			Grayish BASALT (Fractured)	16.00								85	61
17.00				17.00								82	67
18.00				18.00								82	82
19.00				19.00								79	68
20.00				20.00								93	93
21.00				21.00								92	82

SPT N =STANDARD PENETRATION TEST VALUE RQD = ROCK QUALITY DESIGNATION UDS = UNDISTURBED SOIL SAMPLE
CR = CORE RECOVERY DS = DISTURBED SOIL SAMPLE VST = VANE SHEAR TEST W/L = Water Loss

REMARKS : CONTINUE ON NEXT PAGE.

M/S. SHREE SAMARTH KRUPA GEOTECHNICS

CLIENT	: **ACME HOUSING INDIA PVT. LTD.**	BOREHOLE NO. :NBH-08
PROJECT	: **PROPOSED HIGH RISE BUILDINGS FENELIA & EUCALYPITA AT ACME OZONE, THANE (W)**	SHEET NO. : 3 of 3

DEPTH (m.)	DIA. OF BORE HOLE	LOG.	STRATA DESCRIPTION	DEPTH (m)	DRILLING TIME (Min)	BLOWS/15cm TYPE	15	15	15	15	SPT N	C R %	RQD %
22.00	NX		Grayish BASALT	21.00 22.00								90	85
23.00													
24.00													
25.00													
26.00													
27.00													
28.00													
29.00													
30.00													
31.00													
32.00													

SPT N =STANDARD PENETRATION TEST VALUE RQD = ROCK QUALITY DESIGNATION UDS = UNDISTURBED SOIL SAMPLE
CR = CORE RECOVERY DS = DISTURBED SOIL SAMPLE VST = VANE SHEAR TEST W/L = Water Loss

REMARKS : BOREHOLE IS TERMINATED AT 22.00 MTR BELOW EGL.

M/S. SHREE SAMARTH KRUPA GEOTECHNICS

CLIENT	: ACME HOUSING INDIA PVT. LTD.	BOREHOLE NO.	:NBH-09
PROJECT	: PROPOSED HIGH RISE BUILDINGS FENELIA & EUCALYPITA AT ACME OZONE, THANE (W)	SHEET NO.	: 1 of 2
LOCATION	: --		
CO-ORDINATES	: --	DATE	: 07/07/2019 TO 12/07/2019
GROUND R. L.	: 104.02m	METHOD	: ROTARY DRILLING
GROUND W. T.	: 8.00m	CASING	: 5.00m

DEPTH (m.)	DIA. OF BORE HOLE	LOG.	STRATA DESCRIPTION	DEPTH (m)	DRILLING TIME (Min)	TYPE OF SAMPLE	BLOWS/15cm 15	15	15	15	SPT N	C R %	RQD %
1.00	100 mm		Brownish Sand & Gravel with Boulders	1.00									
2.00				2.00									
	NX			2.45		SPT 1	03	03	04	--	07		
3.00			Brownish Clay with Gravel	3.50									
				3.95		SPT 2	03	04	06	--	10		
4.00													
5.00				5.00									
				5.45		SPT 3	05	07	08	--	15		
6.00				6.00									
7.00				7.00									
8.00			Brownish Weathered Rock (Fractured)	8.00									
9.00				9.00								19	NIL
10.00				10.00								22	NIL

SPT N =STANDARD PENETRATION TEST VALUE RQD = ROCK QUALITY DESIGNATION UDS = UNDISTURBED SOIL SAMPLE
CR = CORE RECOVERY DS = DISTURBED SOIL SAMPLE VST = VANE SHEAR TEST W/L = Water Loss

REMARKS : CONTINUE ON NEXT PAGE.

M/S. SHREE SAMARTH KRUPA GEOTECHNICS

CLIENT	: ACME HOUSING INDIA PVT. LTD.	BOREHOLE NO. :NBH-09
PROJECT	: PROPOSED HIGH RISE BUILDINGS FENELIA & EUCALYPITA AT ACME OZONE, THANE (W)	SHEET NO. : 2 of 2

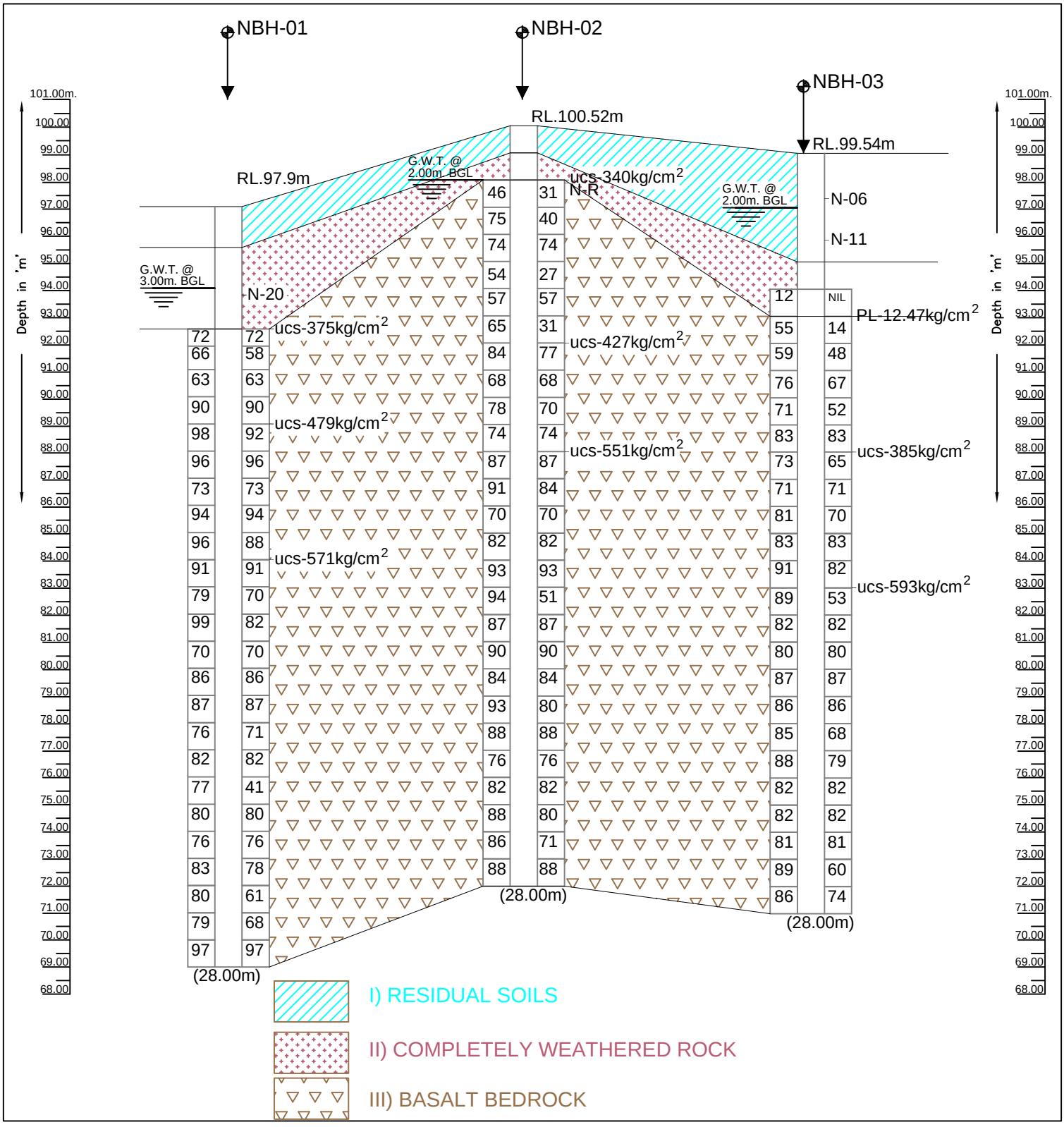
DEPTH (m.)	DIA. OF BORE HOLE	LOG.	STRATA DESCRIPTION	DEPTH (m)	DRILLING TIME (Min)	BLOWS/15cm TYPE	15	15	15	15	SPT N	C R %	RQD %
11.00	NX		Brownish Weathered Rock (Fractured)	10.00 11.00								15	NIL
12.00				12.00								41	NIL
13.00				13.00								27	NIL
14.00			Brown to Grayish BRECCIA (Fractured)	14.00								33	NIL
15.00				15.00								37	NIL
16.00				16.00								51	NIL
17.00				17.00								37	NIL
18.00				18.00								57	11
19.00			Brown to Grayish BASALT (Fractured)	19.00								68	12
20.00			Grayish BASALT (Fractured)	20.00								70	34
21.00													

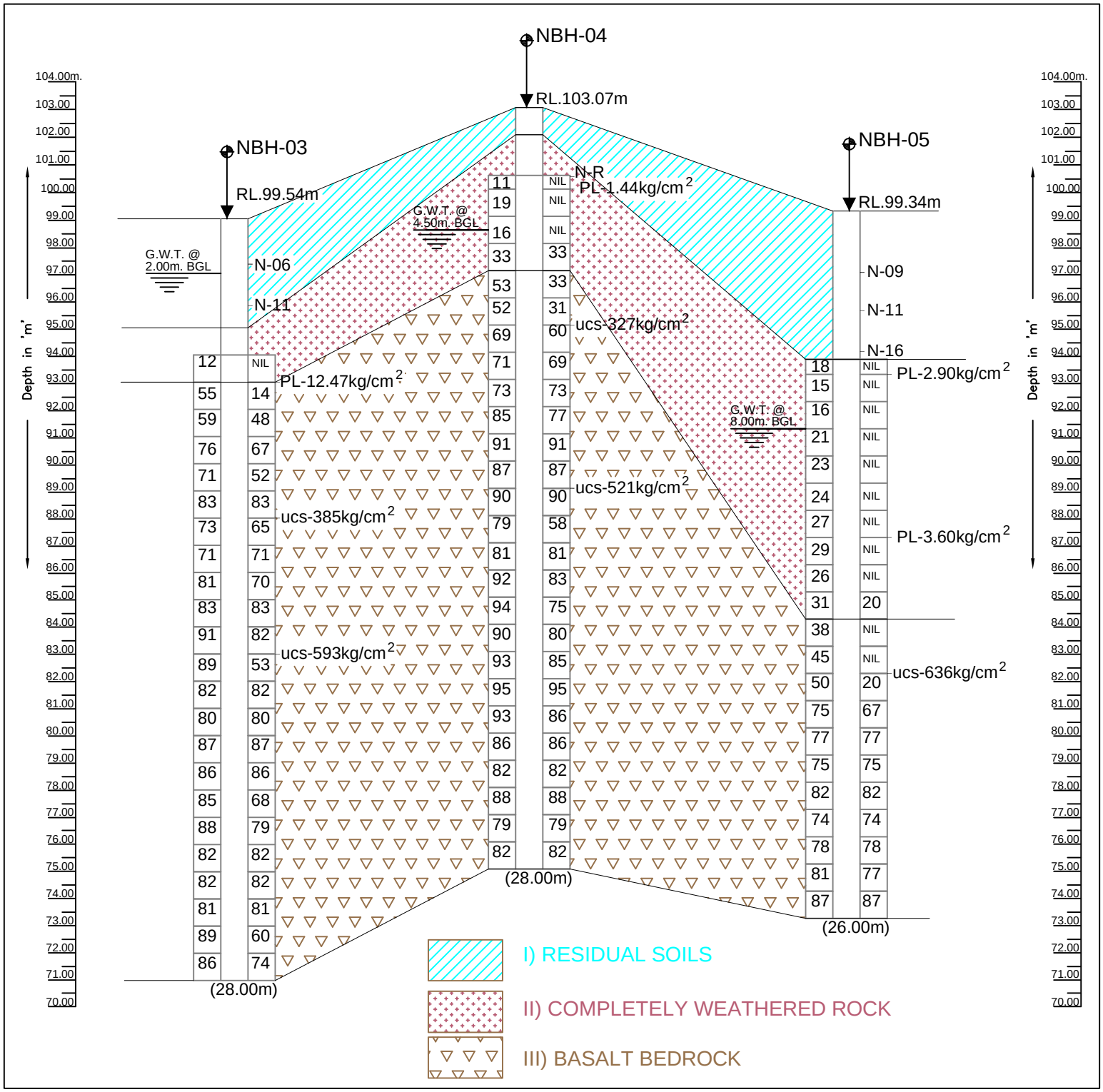
SPT N =STANDARD PENETRATION TEST VALUE RQD = ROCK QUALITY DESIGNATION UDS = UNDISTURBED SOIL SAMPLE

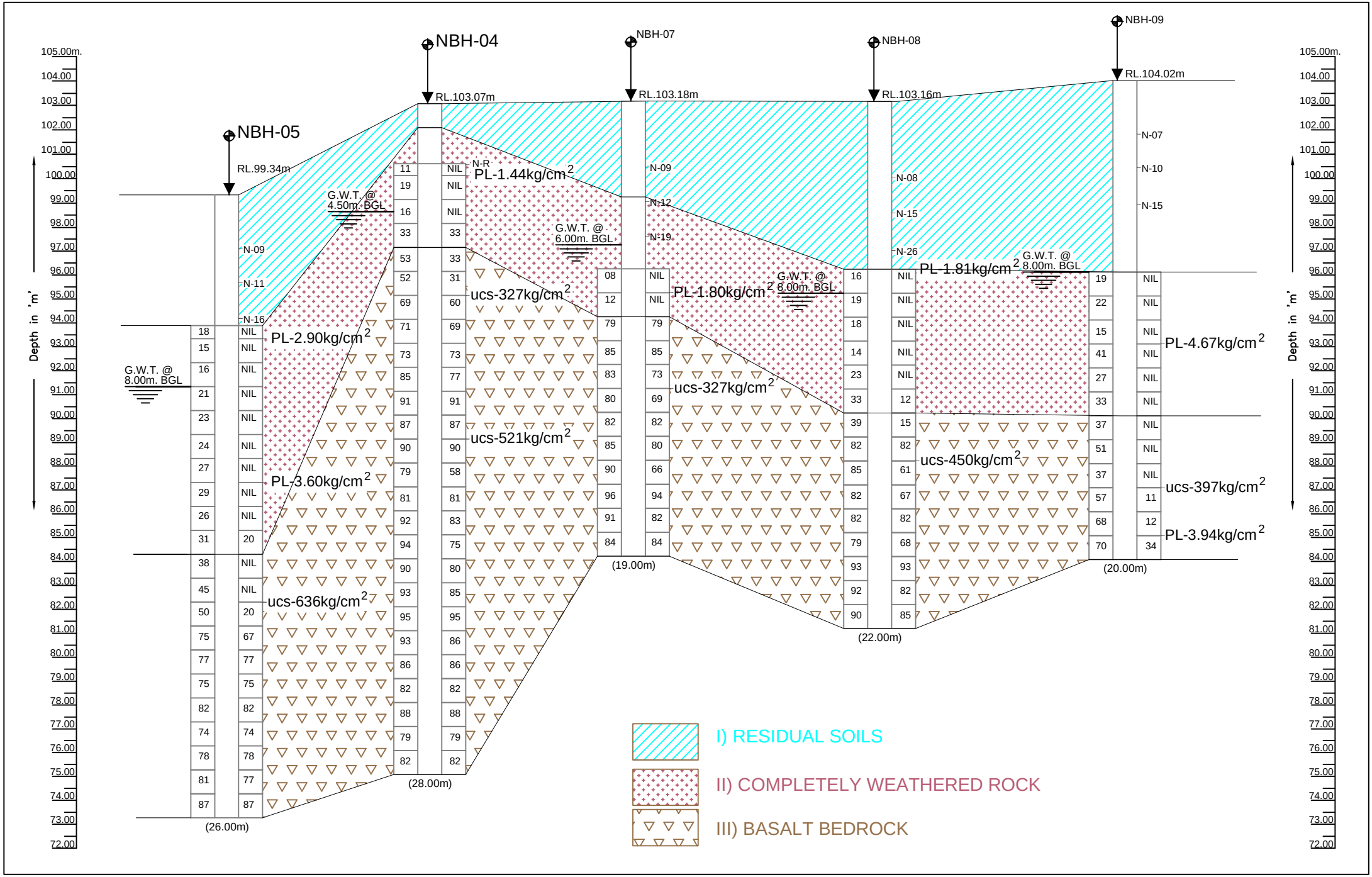
CR = CORE RECOVERY DS = DISTURBED SOIL SAMPLE VST = VANE SHEAR TEST W/L = Water Loss

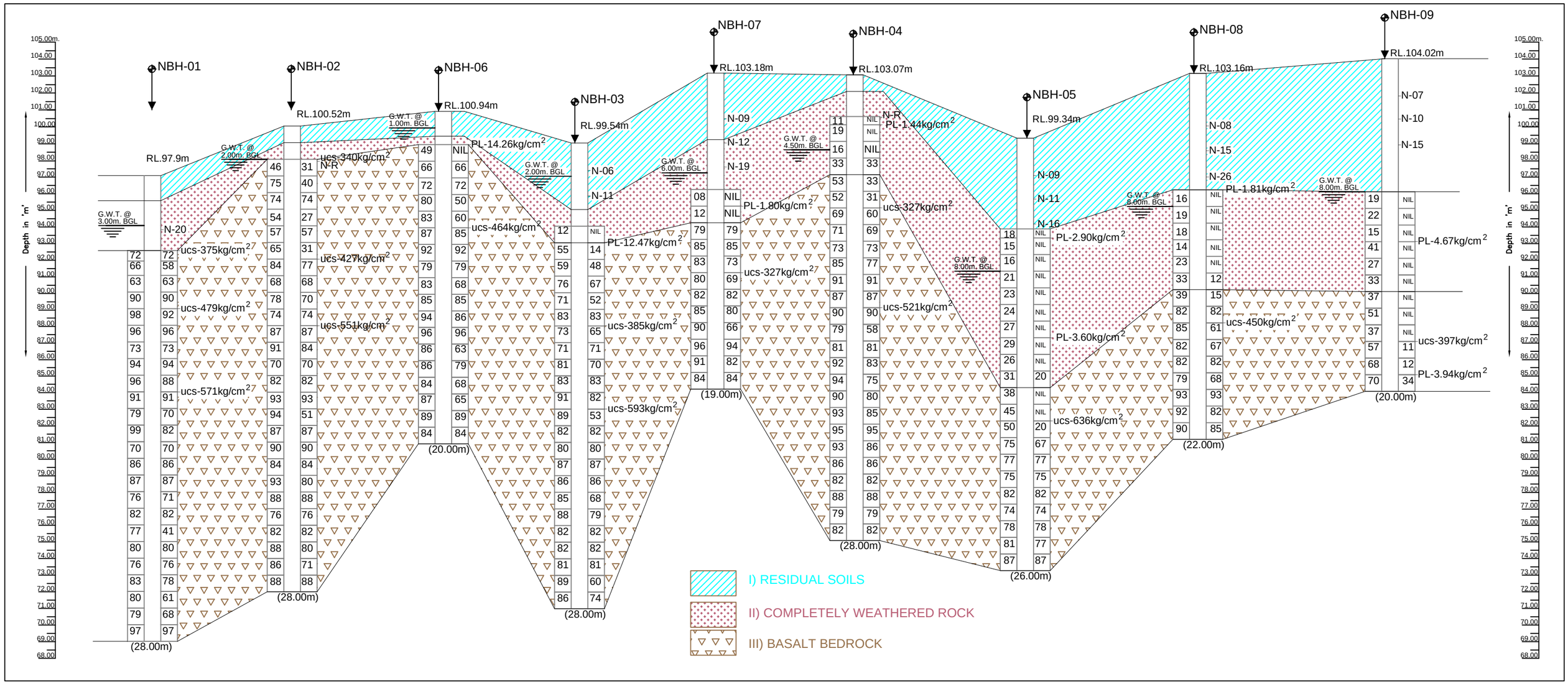
REMARKS : BOREHOLE IS TERMINATED AT 20.00 MTR BELOW EGL.

M/S. SHREE SAMARTH KRUPA GEOTECHNICS


NBH-01
NBH-02
NBH-03
RL.100.52m
RL.97.9m
RL.99.54m
G.W.T. @ 2.00m. BGL
G.W.T. @ 3.00m. BGL
G.W.T. @ 2.00m. BGL
N-20
N-R
N-06
N-11
ucs-375kg/cm2
ucs-340kg/cm2
ucs-427kg/cm2
ucs-479kg/cm2
ucs-551kg/cm2
ucs-385kg/cm2
ucs-571kg/cm2
ucs-593kg/cm2
PL-12.47kg/cm2
NIL
(28.00m)
(28.00m)
(28.00m)
Depth in 'm'
Depth in 'm'
I) RESIDUAL SOILS
II) COMPLETELY WEATHERED ROCK
III) BASALT BEDROCK


NBH-04
RL.103.07m
NBH-03
RL.99.54m
NBH-05
RL.99.34m
G.W.T. @ 2.00m. BGL
G.W.T. @ 4.50m. BGL
G.W.T. @ 8.00m. BGL
N-06
N-11
N-R
PL-1.44kg/cm2
N-09
N-11
N-16
PL-2.90kg/cm2
PL-12.47kg/cm2
ucs-327kg/cm2
ucs-521kg/cm2
ucs-385kg/cm2
PL-3.60kg/cm2
ucs-593kg/cm2
ucs-636kg/cm2
(28.00m)
(28.00m)
(26.00m)
Depth in 'm'
I) RESIDUAL SOILS
II) COMPLETELY WEATHERED ROCK
III) BASALT BEDROCK


NBH-04
NBH-07
NBH-08
NBH-09
NBH-05
RL.103.07m
RL.103.18m
RL.103.16m
RL.104.02m
RL.99.34m
G.W.T. @ 4.50m. BGL
G.W.T. @ 6.00m. BGL
G.W.T. @ 8.00m. BGL
G.W.T. @ 8.00m. BGL
G.W.T. @ 8.00m. BGL
PL-2.90kg/cm2
PL-3.60kg/cm2
PL-1.44kg/cm2
PL-1.80kg/cm2
PL-1.81kg/cm2
PL-4.67kg/cm2
PL-3.94kg/cm2
ucs-636kg/cm2
ucs-327kg/cm2
ucs-521kg/cm2
ucs-327kg/cm2
ucs-450kg/cm2
ucs-397kg/cm2
(26.00m)
(28.00m)
(19.00m)
(22.00m)
(20.00m)
Depth in 'm'
I) RESIDUAL SOILS
II) COMPLETELY WEATHERED ROCK
III) BASALT BEDROCK


NBH-01
NBH-02
NBH-06
NBH-03
NBH-07
NBH-04
NBH-05
NBH-08
NBH-09
RL.97.9m
RL.100.52m
RL.100.94m
RL.99.54m
RL.103.18m
RL.103.07m
RL.99.34m
RL.103.16m
RL.104.02m
G.W.T. @ 3.00m. BGL
G.W.T. @ 2.00m. BGL
G.W.T. @ 1.00m. BGL
G.W.T. @ 2.00m. BGL
G.W.T. @ 6.00m. BGL
G.W.T. @ 4.50m. BGL
G.W.T. @ 8.00m. BGL
G.W.T. @ 8.00m. BGL
G.W.T. @ 8.00m. BGL
N-20
ucs-375kg/cm2
ucs-479kg/cm2
ucs-571kg/cm2
ucs-340kg/cm2
N-R
ucs-427kg/cm2
ucs-551kg/cm2
PL-14.26kg/cm2
ucs-464kg/cm2
N-06
N-11
PL-12.47kg/cm2
ucs-385kg/cm2
ucs-593kg/cm2
N-09
N-12
N-19
PL-1.80kg/cm2
ucs-327kg/cm2
N-R
PL-1.44kg/cm2
ucs-327kg/cm2
ucs-521kg/cm2
PL-3.60kg/cm2
ucs-636kg/cm2
N-09
N-11
N-16
PL-2.90kg/cm2
N-08
N-15
N-26
PL-1.81kg/cm2
ucs-450kg/cm2
N-07
N-10
N-15
PL-4.67kg/cm2
ucs-397kg/cm2
PL-3.94kg/cm2
(28.00m)
(28.00m)
(20.00m)
(28.00m)
(19.00m)
(28.00m)
(26.00m)
(22.00m)
(20.00m)
Depth in 'm'
I) RESIDUAL SOILS
II) COMPLETELY WEATHERED ROCK
III) BASALT BEDROCK

SOIL TEST DATA SHEET As per IS 2720 Part 3, 4, 5, 40

PROJECT: PROPOSED HIGH RISE BUILDINGS "FENELIA & EUCALYPITA" AT ACME OZONE, THANE (W)

CLIENT: ACME HOUSING INDIA PVT. LTD.

DATE: 25.07.2019

Bore Hole No.	Depth in m.	Sample Type UD / D	Density gm/ cm^3		Natural Moisture Content, w %	Soil Classification (I.S)	Mechanical Analysis				Consistancy Limits				Shear Strength Test			Unconfined Compression Test Kg/cm^2	free swell index	Verical Consolidation		Specific Gravity	Remarks
			Wet Density	Dry Density			Gravel %	Sand %	Silt %	Clay %	Liquid %	Plastic %	Plasticity Index, I_p %	Shrinkage Limit %	Shrinkage Ratio	Cohesion C_u kg/cm^2	Degree f			Comp. Index C_{cv} (Lab)	Initial Void Ratio		
BH-01	3.00-3.60	SPT	-----	-----	-----	CH	2	15	83	----->	65	29	36		-----	-----	-----	-----	-----	-----	-----	-----	
BH-03	3.00-3.45	SPT	-----	-----	-----	CH	5	19	76	----->	57	25	32		-----	-----	-----	-----	-----	-----	-----	-----	
BH-05	3.50-3.95	SPT	-----	-----	-----	CH	0	20	80	----->	60	27	33		-----	-----	-----	-----	-----	-----	-----	-----	
BH-07	4.00-4.45	SPT	-----	-----	-----	CH	3	20	77	----->	58	26	32		-----	-----	-----	-----	-----	-----	-----	-----	
BH-09	3.50-3.95	SPT	-----	-----	-----	CH	9	22	69	----->	55	22	33		-----	-----	-----	-----	-----	-----	-----	-----	

CHEM : Chemical Analysis
COMP : Compaction Test
DS : Direct Shear
K : Permeability Test
FSI : Free Swell Test

Tuu : Triaxial Test (Unconsolidated Undrained)
Tcu : Triaxial Test (Consolidated Undrained)
Tcd : Triaxial Test (Consolidated Drained)
NP : Non Plastic
SL : Shrikage Limit Test

SP : Swelling Pressure or Swelling Potential Test
SPT : Standard Penetration Test Sample
UDS : Undisturbed Soil Sample
VL : Laboratory Vane Shear Test
UC : Unconfined Compression Test

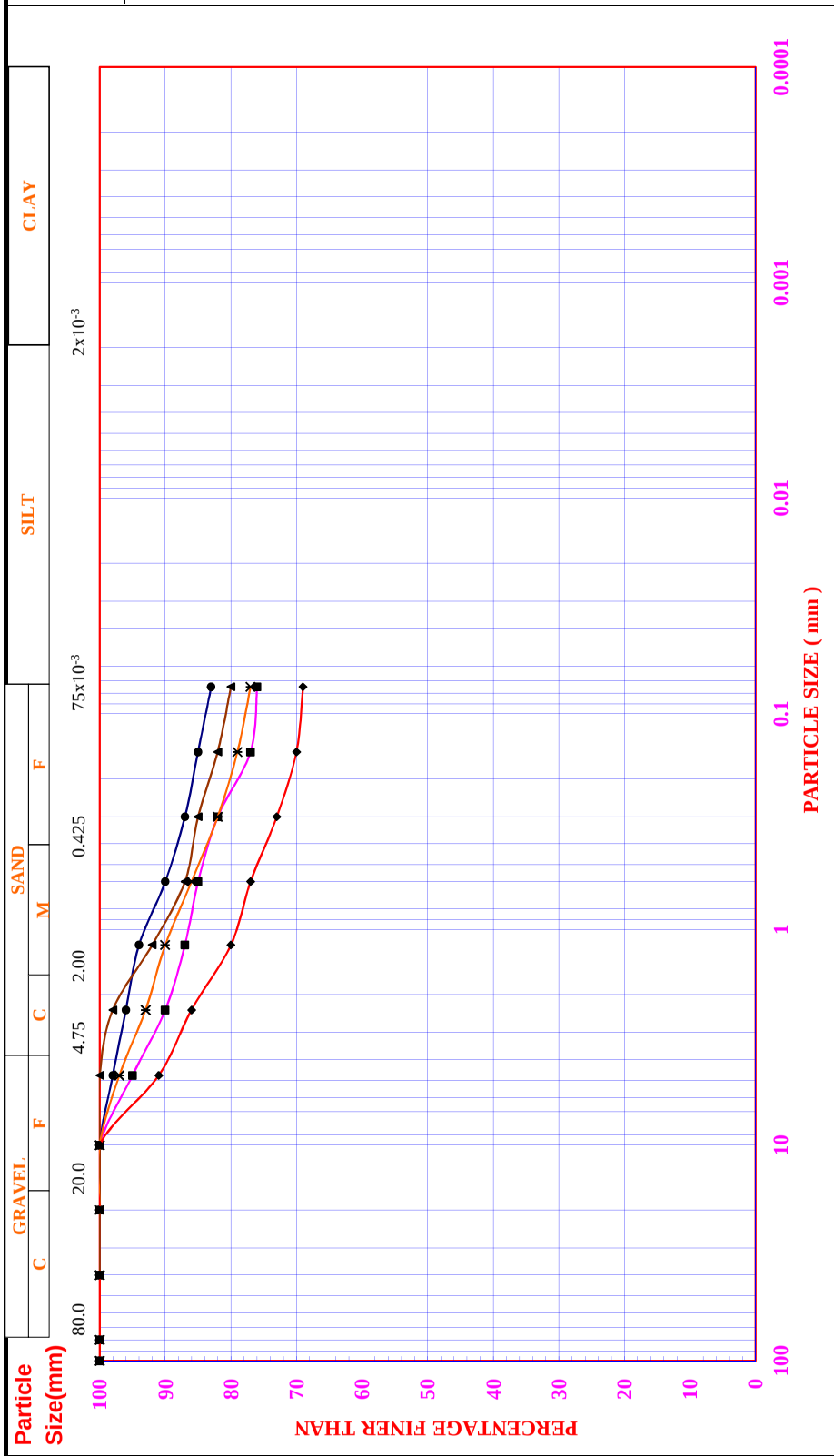
ϕ : Angle of Internal Friction
Cc : Undrained Cohesion
ϕ' : Effective Angle of Internal Friction
Cc' : Effective Cohesion
-----> : Combined Silt + Clay

GEOCON INTERNATIONAL PVT. LTD ISO 9001:2015

Job. No. : **L-19/412**

GRAIN SIZE DISTRIBUTION ANALYSIS

PROJECT:	PROPOSED HIGH RISE BUILDINGS “FENELIA & EUCALYPITA” AT ACME OZONE, THANE (W)
CLIENT:	ACME HOUSING INDIA PVT. LTD.



Symbol	Bore Hole No.	Depth in m.	Classification (IS)	Gravel %	Sand %	Silt %	Clay %	D_{10} mm	D_{30} mm	D_{60} mm	Coeff. of Uniformity, $C_u = D_{60} / D_{10}$	Coeff. Of Curvature C_c $D_{30}^2/(D_{60}*D_{10})$	Liquid Limit, W_l	Plastic Limit, W_p	Plasticity Index, I_p	Remarks
●	BH-01	3.00-3.60	CH	2	15	83	---->	----	----	----	----	----	65	29	36	SPT
■	BH-03	3.00-3.45	CH	5	19	76	---->	----	----	----	----	----	57	25	32	SPT
◄	BH-05	3.50-3.95	CH	0	20	80	---->	----	----	----	----	----	60	27	33	SPT
✳	BH-07	4.00-4.45	CH	3	20	77	---->	----	----	----	----	----	58	26	32	SPT
◆	BH-09	3.50-3.95	CH	9	22	69	---->	----	----	----	----	----	55	22	33	SPT

GEOCON INTERNATIONAL PVT. LTD. MUMBAI

ISO 9001:2015

Job No. : L-19/412

TEST RESULTS OF ROCK CORES As per IS 9143, 8764, 13030

CLIENT: ACME HOUSING INDIA PVT. LTD.

PROJECT: PROPOSED HIGH RISE BUILDINGS "FENELIA & EUCALYPITA" AT ACME OZONE, THANE (W)

Date : 24.07.2019

Sr. No.	Bore Hole No.	Core No.	Depth, m	Diameter, cm	Height, cm	H : D (1:H/D)	Correction Factor	Condition of Test	Failure Load	Uniaxial Compressive Strength	Modulus of Elasticity	Point Load Index (Dimetrical)	Point Load Index (Axial)	Brazilian Test	Porosity	Water Absorption	Dry Density	Specific Gravity	Remark
				cm	cm				kN	kg/cm2	kg/cm2	kg/cm2		N/mm2	%	%	gm/cm3		
1	BH-01	1	4.50-5.00	5.40	10.94	2.03	1.00	Soaked	84.0	375	--	---	---	---	1.60	0.60	2.67		
2	BH-01	15	8.00-9.00	5.42	11.05	2.04	1.00	Soaked	108.0	479	--	--	---	---	1.18	0.43	2.71		
3	BH-01	22	13.00-14.00	5.43	11.10	2.04	1.00	Soaked	129.0	571	---	---	---	---	0.78	0.28	2.75		
4	BH-02	4	2.00-3.00	5.40	11.00	2.04	1.00	Soaked	76.0	340	--	--	---	---	-1.59	-0.60	2.66		
5	BH-02	29	8.00-9.00	5.44	11.14	2.05	1.01	Soaked	96.8	427	---	---	---	---	1.93	0.72	2.70		
6	BH-02	45	12.00-13.00	5.42	11.12	2.05	1.01	Soaked	124.0	551	--	--	---	---	0.78	0.29	2.73		
7	BH-03	5	6.00-7.00	5.40	8.05	1.49	0.95	Soaked	3.5	--	--	12.47	---	---	1.63	0.63	2.60		
8	BH-03	30	11.00-12.00	5.40	11.06	2.05	1.01	Soaked	86.0	385	--	--	---	---	2.37	0.88	2.68		
9	BH-03	44	16.00-17.00	5.43	11.15	2.05	1.01	Soaked	134.0	593	--	--	---	---	1.55	0.56	2.75		
10	BH-04	4	3.00-4.00	5.36	8.00	1.49	0.95	Soaked	0.4	--	--	1.44	---	---	4.99	2.49	2.01		
11	BH-04	25	8.00-9.00	5.40	11.03	2.04	1.00	Soaked	73.0	327	--	--	---	---	1.98	0.74	2.69		
12	BH-04	40	14.00-15.00	5.43	11.14	2.05	1.01	Soaked	117.6	521	--	--	---	---	1.16	0.42	2.74		

GEOCON INTERNATIONAL PVT. LTD. MUMBAI ISO 9001:2015

Job. No. : L-19/412

Checked by: KOMAL

TEST RESULTS OF ROCK CORES As per IS 9143, 8764, 13030

CLIENT: ACME HOUSING INDIA PVT. LTD.

PROJECT: PROPOSED HIGH RISE BUILDINGS "FENELIA & EUCALYPITA" AT ACME OZONE, THANE (W)

Date : 24.07.2019

Sr. No.	Bore Hole No.	Core No.	Depth, m	Diameter, cm	Height, cm	H : D (1:H/D)	Correction Factor	Condition of Test	Failure Load	Uniaxial Compressive Strength	Modulus of Elasticity	Point Load Index (Dimetrical)	Point Load Index (Axial)	Brazilian Test	Porosity	Water Absorption	Dry Density	Specific Gravity	Remark
				cm	cm				kN	kg/cm2	kg/cm2	kg/cm2		N/mm2	%	%	gm/cm3		
13	BH-05	2	6.00-7.00	5.34	7.90	1.48	0.94	Soaked	0.8	---	--	2.90	---	---	5.09	2.50	2.03		
14	BH-05	18	12.00-13.00	5.36	8.05	1.50	0.95	Soaked	1.0	---	--	3.60	---	---	4.40	2.13	2.07		
15	BH-05	40	17.00-18.00	5.40	11.09	2.05	1.01	Soaked	142.0	636	---	---	---	---	0.39	0.14	2.76		
16	BH-06	5	2.00-3.00	5.40	8.10	1.50	0.95	Soaked	4.0	---	--	14.26	---	---	6.47	2.45	2.64		
17	BH-06	25	7.00-8.00	5.42	11.07	2.04	1.00	Soaked	104.6	464	---	---	---	---	0.78	0.29	2.72		
18	BH-07	1	8.00-9.00	5.36	8.08	1.51	0.95	Soaked	0.5	---	--	1.80	---	---	4.94	2.36	2.09		
19	BH-07	11	12.00-13.00	5.41	11.14	2.06	1.01	Soaked	126.7	566	--	---	---	---	0.98	0.36	2.73		
20	BH-08	1	7.00-8.00	5.35	8.02	1.50	0.95	Soaked	0.5	---	--	1.81	---	---	5.55	2.76	2.01		
21	BH-08	10	15.00-16.00	5.42	11.00	2.03	1.00	Soaked	101.4	450	--	--	---	---	1.58	0.59	2.69		
22	BH-09	6	11.00-12.00	5.37	7.94	1.48	0.94	Soaked	1.3	--	--	4.67	---	---	4.45	2.09	2.12		
23	BH-09	27	17.00-18.00	5.40	11.12	2.06	1.01	Soaked	88.6	397	--	--	---	---	2.36	0.88	2.67		
24	BH-09	40	19.00-20.00	5.38	8.10	1.51	0.95	Soaked	1.1	---	--	3.94	---	---	2.72	1.30	2.10		

GEOCON INTERNATIONAL PVT. LTD. MUMBAI ISO 9001:2015

Job. No. : L-19/412

Checked by: KOMAL

CHEMICAL TEST RESULT OF GROUND WATER SAMPLES.

As per IS 3025 Part 11, 24, 32

Date: 24.07.2019

CLIENT: **ACME HOUSING INDIA PVT. LTD.**

PROJECT: **PROPOSED HIGH RISE BUILDINGS "FENELIA & EUCALYPITA" AT ACME OZONE, THANE (W)**

SR NO.	BH NO.	DEPTH IN METERS	TYPE OF SAMPLE	pH ELECTROMETERICALLY	SULPHATE AS SO_3 ppm	CHLORIDE AS Cl ppm	REMARKS
				* Limit between 6.3 to 8.5	* Limit <400ppm Maximum	* Limit <2000ppm Maximum	
1	BH-01	--	Water	7.42	46.00	124.00	
2	BH-02	--	Water	7.48	57.00	148.00	
3	BH-03	--	Water	7.44	52.00	136.00	
4	BH-04	--	Water	7.50	64.00	162.00	

GEOCON INTERNATIONAL PVT. LTD. MUMBAI ISO 9001:2015

Job. No. : **L-19/412**

Checked By **KOMAL**