

**GEOTECHNICAL INVESTIGATION REPORT
PROPOSED HIGH-RISE DEVELOPMENT
AT MAHIM (W) MUMBAI**

**Submitted to,
SHREE NIDHI CONCEPT PVT. LTD.**

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FINAL GEOTECHNICAL INVESTIGATION REPORT
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AT MAHIM (W) MUMBAI
FOR SHREE NIDHI CONCEPT PVT. LTD.

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1.0 INTRODUCTION

Shree Nidhi Concept Pvt. Ltd. plans a High-Rise SRA development in Mahim (W), Mumbai. The proposed buildings will consist of 2-Basement + G + 36 upper floors. The work of geotechnical investigation was awarded to Shree Samarth Krupa (SSK) Geotechnics. The field work and laboratory tests for the geotechnical investigation were completed by SSK in July 2017. This final report prepared by Geocon International Pvt Ltd presents results of the geotechnical investigation along with foundation recommendations for the proposed buildings.

2.0 EXPLORATION PROGRAM

2.1 Exploration Scope

Eight boreholes (BH-1 to BH-8) were completed as illustrated on the Borehole Location Plan in the Annexure.



2.2 Subsurface Conditions

Subsurface profile at this site consists of fill overlying marine sand underlain by completely weathered rock and then breccia bedrock. Encountered soil/rock layers are described below;

LAYER I: FILL

Fill was encountered at the ground surface in the boreholes. Layers of black clay or boulders were also encountered within this layer in few boreholes. The lower boundary of this layer was encountered at depths of 2.5m to 4.0m below ground surface in the boreholes.

LAYER II: MARINE SAND

Marine sand consisting mostly of yellowish brown sand was encountered at depths of 2.5m to 4.0m in the boreholes. Based on Standard Penetration Tests (SPT) conducted within this layer, relative density of the cohesionless soils (sand) varied between loose to very dense. The lower boundary of this layer was encountered at depths of 6.5m to 9.5m below ground surface.

LAYER III: COMPLETELY WEATHERED BEDROCK

Completely weathered bedrock was encountered at depths of 6.5m to 9.5m below ground surface. 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 typically less than 35%. The lower boundary of this layer was encountered at depths of 7.0m to 13.0m below ground surface.

LAYER IV: HARD BRECCIA BEDROCK

Yellowish/Brownish hard breccia bedrock was encountered at depths of 7.0m to 13.0m below ground surface. The bedrock was moderately weathered to sound. Core Recoveries varied from 35% to 93%, while Rock Quality Designation (RQD) ranged from nil to 93%. Compressive strength of rock samples ranged from 550 t/m² to 1880 t/m². The boreholes were terminated in this layer at a depth of 25.0m below ground surface.

2.3 Ground water Levels

Groundwater accumulation in boreholes was monitored during and after completion of drilling activities. Groundwater was observed at depths of 2.2m and 5.2m below ground surface. Seasonal and annual fluctuations in ground water levels can be expected.

3.0 FOUNDATION RECOMMENDATIONS

Proposed building with double basement should be supported on shallow foundations on weathered rock or hard rock. Depths to bedrock and shallow Foundations Recommendations are given in Table A below.

**TABLE A
DEPTHS TO BEDROCK**

Borehole Number	Depths To Completely Weathered Rock	Depth To Hard Rock	Net Allowable Bearing Capacity
BH-1	8.5m	9.0m	80 t/m ² For Solid Raft on CWR OR 150 t/m ² Spread on Hard Rock
BH-2	7.2m	8.0m	
BH-3	6.5m	7.0m	
BH-4	7.2m	10.0m	
BH-5	7.5m	10.0m	
BH-6	7.5m	12.0m	
BH-7	9.5m	12.0m	
BH-8	7.5m	10.0m	

Maximum settlement of spread and raft foundations installed as described above will be less than 12mm and 30mm. A modulus of subgrade reaction of 12500 t/m³ and 2600 t/m³ can be utilized for design of spread and raft foundations, respectively.

Footing load tests should be conducted at founding level to verify above recommendations.

If above recommended bearing capacity is not adequate, then bored piles as described in next section of this report can be utilized for support of building.

3.1 Bored Piles For Building Without Basement:

Proposed building can be supported on bored piles socketed in weathered bedrock encountered at depths of 6.5m to 9.5m below ground surface. Pile rock socketing will start from a depth of 9.5m below ground.

Capacities of representative pile sizes are given in Table B below.

TABLE B
Safe Vertical Downward & Lateral Capacity of Piles

Pile Diameter (mm)	Pile Rock Socketing length below 9.5m depth	Safe Vertical Downward Capacity (tons)	Safe Lateral Capacity (tons)	Safe Uplift Capacity (tons)
600	6D	165	7.5	40
700		250	8.5	75
800		355	10	115
1000		600	12.5	210
600	8D	205	7.5	70
700		305	8.5	110
800		420	10	160
1000		705	12.5	285

Maximum total settlement of piles installed as described above will be less than 12mm.

Depth of fixity for lateral loads will be 8.6D below pile cap.

3.2 Basement Construction

Excavation sides should be sloped at a maximum slope of 1:1 (horizontal:vertical) or flatter. If adequate space is not available for this side sloping, then excavation side shoring with bored 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 30 t/m^2 can be utilized for design of rock anchors. Maximum groundwater table for uplift design can be taken at 1.0m below ground surface.

3.3 Lateral Earth Pressures

Basement walls and pile shoring walls, if any, will be subjected to lateral earth pressures. A soil submerged unit weight (γ_{sub}) and coefficient of active lateral earth pressure (K_a) of 0.8 t/m³ and 0.5, respectively, should be utilized for design of basement walls installed without adjacent pile shoring walls. Lateral earth pressure parameters for design of pile shoring walls are given in Table C below. Hydrostatic pressures and surcharge pressures, if any, should also be considered.

**TABLE C
LATERAL EARTH PRESSURE PARAMETERS
FOR DESIGN OF PILE SHORING WALLS**

Depth	Soil Type	Unit weight	Active earth pressure coefficient	Passive earth pressure coefficient	Cohesion
0.0m- 2.5m	FILL	1.8 t/m ³	0.33	3.0	0 t/m ²
2.5m- 4.0m	Residual Soil (Sand)	1.8 t/m ³	0.33	3.0	0 t/m ²
4.0m- 6.0m	Residual Soil (Sand)	1.8 t/m ³	0.29	3.5	0 t/m ²
6.0m- 11.0m	CWR	2.1 t/m ³	0.22	4.59	0 t/m ²
Below 11.0m	Hard Breccia Bedrock	2.4 t/m ³	1	1	66 t/m ²

CWR = Completely Weathered Rock

3.4 Foundation Protection

Results of chemical analysis on groundwater samples enclosed in the Annexure, indicate that the site falls under Class 1 for sulphate concentrations (Ref. 1, Table 4, clause 8.2.24 & 9.1.2, pg. 19) and chloride concentrations (Ref. 1, Table 7, clause 8.2.5.2, pg. 21). A 'Severe' (Ref. 1, Table 3, clause 8.2.2.1 & 3.5.3.2, pg. 18) Exposure Condition was assigned to this site. Therefore only following normal precautions are recommended to protect subsurface concrete and reinforcement (Ref. 1, Table 5, clause 6.1.2, 8.2.4.1 & 9.1.2, pg. 20)

Type of Cement:	OPC or PPC
Minimum Grade of Reinforced Concrete:	M30
Minimum Cement Content for Spread Footing:	320 kg/m ³
Minimum Cement Content for Piles:	400 kg/m ³
Maximum Water Cement Ratio:	0.5
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 a rotary machine. Casing was used to support sides of borehole until sufficiently stiff strata was encountered. Standard Penetration Tests (i.e. SPT) were carried out in soil in accordance with IS 2131-1981. Using this procedure, a 2" 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".

When SPT refusal was obtained in hard strata, rock coring was done using diamond bit and double tube core barrel to obtain rock samples. Percent Rock Core Recovery and Rock Quality Designation (%RQD) were determined. $\% RQD = 100 \times \text{Sum of length of rock pieces in cm, each having lengths greater than 10cm} / \text{Total length of core run}$.

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) Geotechnical Engineering and Evaluation, R. F. Hunt.
- 4) Foundation Design Manual, N. V. Nayak, 5th Edition, 1996.
- 5) IS:12070-1987, Code of Practice for Design and Construction of Shallow Foundations on Rock.
- 6) Bored Piling in Mumbai Region, K. R. Datye, IGC 1990.
- 7) IS14593: Code of Practice for Design of Piles Founded on Rock.

**SAMPLE CALCULATION OF ALLOWABLE BEARING CAPACITY
FOR FOUNDATIONS INSTALLED ON HARD ROCK**

Layer I, Fill	GL +0.0m
Layer II, Marine Sand	-2.5m to -4.0m
Layer III, Completely Weathered Bedrock	-6.5m to -9.5m
Layer III, Hard BrecciaRock	-7.0m to -12.0m

Allowable bearing capacity = $(N_j) \times Q_u$ (Ref. 2, Clause 6.2, pg. 7)

Where,

N_j = Joint condition factor = 0.1 to 0.4 (Ref. 2, Table 4, clause 6.2, pg. 9)
Assumed as 0.3 for slightly weathered rock

Q_u = Rock Compressive strength = minimum of 550 t/m² (Annexure, Laboratory Test Result)

Therefore, Allowable Bearing Capacity = $(0.3) \times 550 = 165 \text{ t/m}^2$

Conservatively, Restricted to 150 t/m² as shown below.

CALCULATION OF SETTLEMENTS OF FOUNDATIONS (3M X 3M) EXERTING PRESSURE OF 150 T/M2:

$$\text{Settlement} = S = q_0 B' \frac{1 - \mu^2}{E_s} m I_s I_f \quad (\text{Ref. 3, 5.16a, pg. 306})$$

Where,

q_0 = Footing Pressure = 150 t/m²

B' = $B/2$ (Where B is the width of footing)

μ = Poisson's ratio

E = Modulus of Elasticity

I_s = Influence Factor

I_f = Depth Factor

From Reference No. 1:

E value for Breccia bedrock = 3,00,000 t/m² (Ref. 3, Table 4-11, pg. 278)

Using 1/10th of this value for weathered bedrock, $E = 30,000$ t/m²

$L' = 3/2 = 1.5$, $B' = 3/2 = 1.5$, $H = 6\text{m}$, and $D = 12.0\text{m}$

Therefore, $M = L/B = 1$; and $N = H/B' = 4$ and $D/B = 4.0$

Corresponding, $I_s = 0.43$ (Ref. 3, Table 5.2, pg. 304 & 305)

$I_f = 1.0$ (Ref.3, Fig. 5.7, pg. 303)

$$\text{Settlement of Layer} = S_1 = 150 \times 1.5 \times \frac{1 - 0.25^2}{30,000} \times 4 \times 0.43 \times 1.0$$

$$\text{Settlement of Layer} = S_1 = 0.0117\text{m} = 11.7\text{mm}$$

TOTAL SETTLEMENT = 12mm

**SAMPLE CALCULATION OF ALLOWABLE BEARING CAPACITY
FOR SOLID RAFT FOUNDATIONS INSTALLED ON COMPLETELY WEATHERED
ROCK**

Layer I, Fill	GL +0.0m
Layer II, Marine Sand	-2.5m to -4.0m
Layer III, Completely Weathered Bedrock	-6.5m to -9.5m
Layer III, Hard BrecciaRock	-7.0m to -12.0m

(Assuming Completely weathered Bedrock to be a very dense granular soil.)

Net Ultimate Bearing Capacity = $q_u = cN_c s_c + q (N_q - 1) s_q + 0.5 B \gamma N_\gamma s_\gamma$ (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 = 10m

γ' = submerged unit weight of soil = 0.80

N_c, N_q, N_γ = Terzaghi's Bearing capacity factors

S_c, s_q, s_γ = Shape factors = Conservatively assumed as 1, 1, and 0.6

D = Depth of Footing below basement = 1.0m

Minimum SPT N value obtained in boreholes = 50

Corresponding friction angle = 42° (Reference No. 5)

Corresponding $N_c=100, N_q=92, N_\gamma=174$ (Reference 5, IS:6403-1981);

Substituting these values in the above equation;

$$q_{\text{ultimate}} = q_u = [0 \times 100 \times 1] + [1.0 \times 0.8 \times (92 - 1) \times 1] + [0.5 \times 10 \times 0.8 \times 174 \times 0.6] = 0 + 73 + 420 = 493 \text{ t/m}^2$$

$$q_{\text{safe}} = q_u / F.S. = 493 / 3 = 164 \text{ t/m}^2$$

Conservatively restricted to 80 t/m² to limit settlement as shown below

CALCULATION OF SETTLEMENTS OF FOUNDATIONS (20M X 40M) EXERTING PRESSURE OF 80 T/M2:

1) Settlement of Highly Weathered Rock from -9.0m to -12.0m:

From Reference No. 1:

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

Where,

q_0 = Footing Pressure = 80 t/m²

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

Assuming highly weathered rock and very dense sand

E Value for over consolidated sand = 260N (Reference No. 1)

Using SPT value of 50, E = 13000 t/m²

$L' = 40/2 = 20$, $B' = 20/2 = 10$, $H = 3\text{m}$, and $D = 9.0\text{m}$

Therefore, $M = L/B = 2$; and $N = H/B' = 0.3$ and $D/B = 0.45$

Corresponding, $I_s = 0.049$, Conservative $I_f = 1.0$ (From Table 5-2, Reference 1)

$$\text{Settlement of Layer} = S_1 = 80 \times 10 \times \frac{1 - 0.3^2}{13000} \times 4 \times 0.049 \times 1.0 = 0.011\text{m} = 11\text{mm}$$

2) Settlement of Hard Breccia Rock Below -12.0m:

From Reference No. 1:

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

Z = depth of top of layer below footing = 3.0m

Therefore, (B/2)/z = 3.33

(L/2)/z = 6.67

Corresponding $I_b = 0.247$

Therefore, $dP = \text{Pressure increase at top of layer} = (4 \times I_b) \times 80 \text{ t/m}^2 = 79.1 \text{ t/m}^2$

E value for Breccia bedrock = 3, 00,000 t/m^2 (Reference 9)

Taking $1/3^{\text{rd}}$ of this value for Basalt bedrock, $E = 100,000 \text{ t/m}^2$

Depth of top of layer below raft = 3.0m

Assuming a 30 degree pressure dissipation,

Width of pressure distribution at top of the layer = 20m + 3m = 23m

Length of pressure distribution at top of the layer = 40m + 3m = 43m

$L' = 43/2 = 21.5$, $B' = 23/2 = 11.5$, $H = 37\text{m}$, and $D = 13.0\text{m}$

Therefore, $M = L/B = 1.87$; and $N = H/B' = 3.22$ and $D/B = 0.57$

Corresponding, $I_s = 0.462$, Conservative $I_f = 1.0$ (From Table 5-2, Reference 1)

$$\text{Settlement of Layer} = S_2 = 79.1 \times 11.5 \times \frac{1 - 0.25^2}{100,000} \times 4 \times 0.462 \times 1.0 = 0.0153\text{m} = 15.3\text{mm}$$

Therefore total settlement = 11mm + 15.3mm = 26.3mm

SAMPLE CALCULATION OF ALLOWABLE VERTICAL CAPACITY OF 600mm DIA. PILES SOCKETED 6D IN BEDROCK:

Layer I, Fill	GL +0.0m
Layer II, Marine Deposits (Sand)	-2.5m to -4.0m
Layer III, Completely Weathered Bedrock	-6.5m to -9.5m
Layer IV, Hard Breccia Bedrock	-7.0 m to -13.0m

A) SKIN FRICTION CAPACITY FROM -9.5m TO -13.0m:

As per Cole and Stroud Method (Reference No. 5) for soft rock, the zero strength bedrock is assumed to be a hard cohesive soil.
Using a minimum SPT N value of 100 in the bedrock.

Allowable Skin End Bearing Capacity = $q_{all} = aC / F.S.$ (Reference No. 5)

Where,

$$c = \text{cohesion} = N/1.5 = 100/1.5 = 66.67 \text{ t/m}^2$$

a = adhesion factor

F.S. = Factor of Safety

$$(a/FS) = 0.15$$

Therefore, Allowable Skin Friction Capacity = $0.15 \times 66.67 = 10 \text{ t/m}^2$

$$\text{Allowable End Bearing Capacity of 600mm dia piles} = \pi DL (10) = 3.142 \times 0.6 \times 3.5 \text{m} \times 10 \text{ t/m}^2 = 65 \text{ tons}$$

B) END BEARING CAPACITY:

Safe load carrying capacity = $Q_{eb} = Q_c \times N_{\phi} \times N_j \times A_p$ [Reference 7]

Where,

$$Q_c = \text{uniaxial compressive strength of rock} = 720 \text{ t/m}^2$$

$$N_{\phi} = \text{Depth factor} = 0.8 + 0.2(l_s/d) = 2.0 \text{ for 6Dm rock socket}$$

$$N_j = 0.1 \text{ to } 0.4 \text{ (assumed as } 0.25 \text{ for highly weathered bedrock at pile tip)}$$

$$A_p = \text{Area of pile toe} = 0.28 \text{m}^2$$

$$Q_{eb} = 720 \times 2.0 \times 0.25 \times 0.28 = 100 \text{ tons}$$

THEREFORE, TOTAL PILE CAPACITY = 65 + 100 = 165 tons

CALCULATION OF LATERAL CAPACITY OF PILE

Reference: Appendix-B (Revised) of IS 2911 (Part 1/Sec. 2) - 2010.

Strata near top of pile consists mostly of soft clay with average $N = 8$

Corresponding average $C_u = N/15 = 8/15 = 0.53 \text{ kg/cm}^2$.

Unconfined compressive strength, $q_u = 2 C_u = 1.07 \text{ kg/cm}^2$

As per Table 2 of Reference mentioned above,

Corresponding Constant $k_1 = 19.2 \times 10^3 \text{ KN/m}^3 = 19.2 \text{ MN/m}^3$

Now,

$$K = \frac{k_1}{1.5} \times \frac{0.3}{D} = \frac{19.2}{1.5} \times \frac{0.3}{0.6} = 6.4 \text{ MN/m}^3$$

(Value of K in kg/cm^3 for calculation of R : $1 \text{ MN/m}^3 = 0.1 \text{ kg/cm}^3$)

For long and flexible pile, depth of fixity,

$$R = \sqrt[4]{\frac{EI}{K \times D}}$$

Where,

E = Modulus of Elasticity of pile material = $2.7 \times 10^5 \text{ kg/cm}^2$ for concrete

I = Moment of Inertia = $\pi D^4/64 \text{ cm}^2$ (D is pile diameter in cm)

Therefore,

$$R = \sqrt[4]{\frac{2.70 \times 10^5 \times \pi D^4}{64 \times 0.64 \times 60}}$$

$$R = 4.3D \quad \quad \quad (D \text{ is pile diameter in cm})$$

Unsupported length of pile, $L_1 = 0.0 \text{ cm}$

Therefore, $L_1/R = 0.0$

A) FOR FIXED HEAD PILES

As per Figure 3 of Reference mentioned above,

For $L_1/R = 0.0$, $L_f/R = 2.0$

Therefore, length of fixity,

$$L_f = 2.0 \times R = 8.6D \text{ (where } D \text{ is pile diameter in cm)}$$

For a lateral deflection of 0.5cm at the top of the pile,

For fixed head pile, allowable lateral load, Q_a corresponding to a deflection $Y = 0.5$ cm,

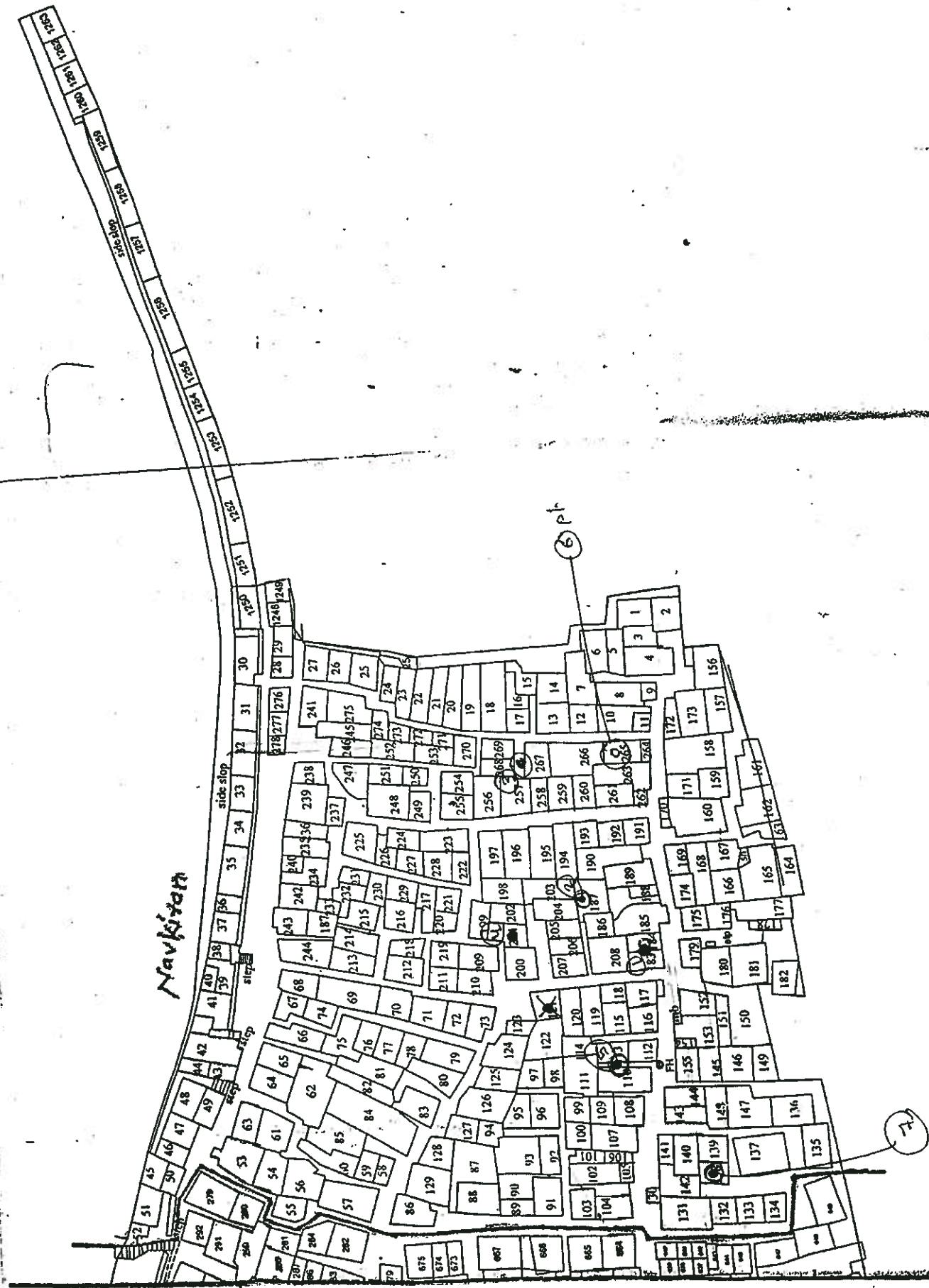
$$Q_a = \frac{12EIY}{(L_1 + L_2)^3} = \frac{12 \times 2.7 \times 10^5 \times \pi \times D^4 \times 0.5}{64 \times (0 + 9.2D)^3}$$

$$Q_a = 125 \times D \text{ kg} = 0.125D \text{ tons (where } D \text{ is pile diameter in cm)}$$

$$Q_a = 0.125 \times 60 = 7.5 \text{ t}$$

ANNEXURE

LOCATION PLAN



BOREHOLE LOGS

PRODUCED BY AN AUTODESK EDUCATIONAL PRODUCT

CLIENT : SHREE NIDHI CONCEPT PVT. LTD.	BOREHOLE NO.:BH-01
PROJECT : GEOTECHNICAL INVETIGATION WORK FOR PROPOSED HIGH-RISE DEVELOPMENT AT MAHIM (W) MUMBAI	SHEET NO. :1 OF 3
LOCATION :	
CO-ORDINATES :	DATE : 16/05/2017 TO 22/05/2017
GROUND R. L. :	METHOD : ROTARY DRILLING
GROUND W. T. : 2.65 MTR BGL.	CASING : 4.00 MTR BGL

DEPTH (m.)	DIA. OF BORE HOLE	LOG.	STRATA DESCRIPTION	SAMPLE		BLOWS/15cm				SPT N	C R %	RQD %	OTHER TESTS	
				DEPTH (m)	TYPE	15	15	15	15					
1.00	100 mm		Back Filling Materials	2.50	DS1									
2.00				3.00										
3.00			Brownish Stiff Clay	3.60	SPT1	10	20	30	50	50	08			
4.00				4.00										
4.00			Yellow With Brown Silty Sand	4.25	SPT2	18	50	-	-	-	R			
5.00				5.00										
5.00			Brownish SAND	5.20	SPT3	21	50	-	-	-	R			
6.00				6.00										
6.00				6.35	SPT4	21	24	50	-	-	R			
7.00				7.00										
7.00	Brownish SAND	7.10	SPT5	5	2	-	-	-	R					
8.00		8.00												
8.00	NX	8.15	SPT6	5	0	-	-	-	R					
9.00		Yellow & Brownish BRECCIA	9.00								35	18		
10.00	10.00										38	10		

SPT N = STANDARD PENETRATION TEST VALUE RQD = ROCK QUALITY DESIGNATION UDS = UNDISTURBED SOIL SAMPLE
 CR = CORE RECOVERY DS = DISTURBED SOIL SAMPLE

REMARKS : CONTINUE ON NEXT PAGE.

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CLIENT : SHREE NIDHI CONCEPT PVT. LTD.	BOREHOLE NO. :BH-01
PROJECT : GEOTECHNICAL INVESTIGATION WORK FOR PROPOSED HIGH-RISE DEVELOPMENT AT MAHIM (W) MUMBAI	SHEET NO. : 2 OF 3

DEPTH (m.)	DIA. OF BORE HOLE	LOG.	STRATA DESCRIPTION	SAMPLE		BLOWS/15cm				SPT N	CR %	RQD %	OTHER TESTS	
				DEPTH (m)	TYPE	15	15	15	15					
11.00	NX	▽	Grayish & Brownish BRECCIA	11.00							61	53		
12.00				12.00								93	93	
13.00				13.00								81	81	
14.00				14.00								67	NIL	
15.00				15.00								48	12	
16.00				16.00								60	35	
17.00				17.00								58	10	
18.00				18.00								75	68	
19.00				19.00								80	35	
20.00				20.00								71	65	

SPT N = STANDARD PENETRATION TEST VALUE RQD = ROCK QUALITY DESIGNATION UDS = UNDISTURBED SOIL SAMPLE
 CR = CORE RECOVERY DS = DISTURBED SOIL SAMPLE

REMARKS : CONTINUE ON NEXT PAGE.

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CLIENT	: SHREE NIDHI CONCEPT PVT. LTD.	BOREHOLE NO.	:BH-01
PROJECT	: GEOTECHNICAL INVESTIGATION WORK FOR PROPOSED HIGH-RISE DEVELOPMENT AT MAHIM (W) MUMBAI	SHEET NO.	: 3 OF 3

DEPTH (m.)	DIA. OF BORE HOLE	LOG.	STRATA DESCRIPTION	SAMPLE		BLOWS/15cm				SPT N	CR %	RQD %	OTHER TESTS		
				DEPTH (m)	TYPE	15	15	15	15						
21.00	NX	▽	Grayish & Brownish BRECCIA	21.00							74	45			
22.00				22.00								78	28		
23.00				23.00									70	36	
24.00				24.00									66	66	
25.00				25.00									73	75	
26.00															
27.00															
28.00															
29.00															
31.00															

SPT N = STANDARD PENETRATION TEST VALUE RQD = ROCK QUALITY DESIGNATION UDS = UNDISTURBED SOIL SAMPLE
 CR = CORE RECOVERY DS = DISTURBED SOIL SAMPLE

REMARKS : BORE HOLE IS TERMINATED AT DEPTH 25.00m. B.G.L.
 M/S. SHREE SAMARTH KRUPA GEOTECHNICS.

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CLIENT : SHREE NIDHI CONCEPT PVT. LTD.	BOREHOLE NO. : BH-02
PROJECT : GEOTECHNICAL INVESTIGATION WORK FOR PROPOSED HIGH-RISE DEVELOPMENT AT MAHIM (W) MUMBAI	SHEET NO. : 1 OF 3
LOCATION :	
CO-ORDINATES :	DATE : 23/05/2017 TO 26/05/2017
GROUND R. L. :	METHOD : ROTARY DRILLING
GROUND W. T. : 2.20 MTR BGL.	CASING : 3.50 MTR BGL

DEPTH (m.)	DIA. OF BORE HOLE	LOG.	STRATA DESCRIPTION	SAMPLE		BLOWS/15cm				SPT N	C R %	RQD %	OTHER TESTS		
				DEPTH (m)	TYPE	15	15	15	15						
1.00	100 mm		Back Filling Materials												
2.00				2.50	DS1										
3.00				3.00											
4.00	100 mm		Yellow & Brownish Fine SAND	3.60		SPT1	10	20	30	6	09				
5.00				4.00											
6.00				4.60		SPT2	08	08	11	21	19				
7.00				5.00											
8.00				5.60		SPT3	07	09	14	20	23				
9.00	100 mm		Yellow & Brownish Coarse SAND	6.00											
10.00				6.35	SPT4	15	22	50	-	R					
11.00				7.00											
12.00				7.10	SPT5	50	-	-	-	R					
13.00	NX		Yellow & Brownish BRECCIA								20	NIL			
14.00				8.00											
15.00				9.00									36	15	
16.00											54	49			
17.00				10.00											

SPT N = STANDARD PENETRATION TEST VALUE RQD = ROCK QUALITY DESIGNATION UDS = UNDISTURBED SOIL SAMPLE
 CR = CORE RECOVERY DS = DISTURBED SOIL SAMPLE

REMARKS : CONTINUE ON NEXT PAGE.
 M/S. SHREE SAMARTH KRUPA GEOTECHNICS.

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CLIENT : SHREE NIDHI CONCEPT PVT. LTD.	BOREHOLE NO. :BH-02
PROJECT : GEOTECHNICAL INVESTIGATION WORK FOR PROPOSED HIGH-RISE DEVELOPMENT AT MAHIM (W) MUMBAI	SHEET NO. : 2 OF 3

DEPTH (m.)	DIA. OF BORE HOLE	LOG.	STRATA DESCRIPTION	SAMPLE		BLOWS/15cm				SPT N	CR %	RQD %	OTHER TESTS			
				DEPTH (m)	TYPE	15	15	15	15							
11.00	NX	▽	Grayish & Brownish BRECCIA	11.00							56	52				
12.00				12.00								63	63			
13.00				13.00								54	11			
14.00				14.00								47	26			
15.00				15.00								50	11			
16.00				16.00								65	23			
17.00			Grayish BRECCIA Rock In White Infilling	▽		17.00							58	11		
18.00						18.00							60	23		
19.00						19.00								63	49	
20.00						20.00								70	44	

SPT N = STANDARD PENETRATION TEST VALUE RQD = ROCK QUALITY DESIGNATION UDS = UNDISTURBED SOIL SAMPLE
 CR = CORE RECOVERY DS = DISTURBED SOIL SAMPLE

REMARKS : CONTINUE ON NEXT PAGE.

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CLIENT : SHREE NIDHI CONCEPT PVT. LTD.	BOREHOLE NO. :BH-02
PROJECT : GEOTECHNICAL INVETIGATION WORK FOR PROPOSED HIGH-RISE DEVELOPMENT AT MAHIM (W) MUMBAI	SHEET NO. : 3 OF 3

DEPTH (m.)	DIA OF BORE HOLE	LOG.	STRATA DESCRIPTION	SAMPLE		BLOWS/15cm				SPT N	CR %	RQD %	OTHER TESTS		
				DEPTH (m)	TYPE	15	15	15	15						
21.00	NX	▽	Grayish BRECCIA Rock In White Infilling	21.00							67	67			
22.00				22.00								73	24		
23.00				23.00									79	34	
24.00				24.00									63	55	
25.00				25.00									81	56	
26.00															
27.00															
28.00															
29.00															
31.00															

SPT N = STANDARD PENETRATION TEST VALUE RQD = ROCK QUALITY DESIGNATION UDS = UNDISTURBED SOIL SAMPLE
 CR = CORE RECOVERY DS = DISTURBED SOIL SAMPLE







REMARKS : BORE HOLE IS TERMINATED AT DEPTH 25.00m. B.G.L.
M/S. SHREE SAMARTH KRUPA GEOTECHNICS.

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CLIENT : SHREE NIDHI CONCEPT PVT. LTD.	BOREHOLE NO.:BH-03
PROJECT : GEOTECHNICAL INVESTIGATION WORK FOR PROPOSED HIGH-RISE DEVELOPMENT AT MAHIM (W) MUMBAI	SHEET NO. :1 OF 3
LOCATION :	
CO-ORDINATES :	DATE : 28/05/2017 TO 31/05/2017
GROUND R. L. :	METHOD : ROTARY DRILLING
GROUND W. T. : 5.20 MTR BGL.	CASING : 4.00 MTR BGL

DEPTH (m.)	DIA. OF BORE HOLE	LOG.	STRATA DESCRIPTION	SAMPLE		BLOWS/15cm				SPT N	C R %	RQD %	OTHER TESTS
				DEPTH (m)	TYPE	15	15	15	15				
1.00	100 mm		Back Filling Materials	2.50	DS1								
2.00													
3.00			Blackish Clay	3.00									
3.60				SPT1	10	20	30	50	08	08			
4.00			Yellow & Brownish Fine SAND	4.00									
4.35				SPT2	08	18	50	-	R				
5.00			Yellow & Brownish Coarse SAND	5.00									
5.40				SPT3	12	21	50	-	R				
6.00			Yellow & Brownish Coarse SAND	6.00									
6.50				SPT4	10	21	18	50	39				
7.00	NX		Yellow & Brownish BRECCIA	7.00							16	NIL	
8.00										37	37		
9.00									49	13			
10.00									56	33			

SPT N = STANDARD PENETRATION TEST VALUE RQD = ROCK QUALITY DESIGNATION UDS = UNDISTURBED SOIL SAMPLE
 CR = CORE RECOVERY DS = DISTURBED SOIL SAMPLE

REMARKS : CONTINUE ON NEXT PAGE.

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CLIENT	: SHREE NIDHI CONCEPT PVT. LTD.	BOREHOLE NO.	:BH-03
PROJECT	: GEOTECHNICAL INVESTIGATION WORK FOR PROPOSED HIGH-RISE DEVELOPMENT AT MAHIM (W) MUMBAI	SHEET NO.	: 2 OF 3

DEPTH (m.)	DIA. OF BORE HOLE	LOG.	STRATA DESCRIPTION	SAMPLE		BLOWS/15cm				SPT N	CR %	RQD %	OTHER TESTS	
				DEPTH (m)	TYPE	15	15	15	15					
11.00	NX	▽	Yellow & Brownish BRECCIA	11.00							73	66		
12.00				12.00								68	68	
13.00				13.00								67	54	
14.00				14.00								72	52	
15.00				15.00								65	58	
16.00				16.00								73	73	
17.00				17.00								73	73	
18.00				18.00								66	58	
19.00				19.00								58	48	
20.00				20.00								70	70	

SPT N = STANDARD PENETRATION TEST VALUE RQD = ROCK QUALITY DESIGNATION UDS = UNDISTURBED SOIL SAMPLE
 CR = CORE RECOVERY DS = DISTURBED SOIL SAMPLE

REMARKS : CONTINUE ON NEXT PAGE.

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CLIENT	: SHREE NIDHI CONCEPT PVT. LTD.	BOREHOLE NO.	: BH-03
PROJECT	: GEOTECHNICAL INVESTIGATION WORK FOR PROPOSED HIGH-RISE DEVELOPMENT AT MAHIM (W) MUMBAI	SHEET NO.	: 3 OF 3

DEPTH (m.)	DIA. OF BORE HOLE	LOG.	STRATA DESCRIPTION	SAMPLE		BLOWS/15cm				SPT N	CR %	RQD %	OTHER TESTS		
				DEPTH (m)	TYPE	15	15	15	15						
21.00	NX	▽ ▽ ▽ ▽ ▽	Grayish BRECCIA Rock In White Infilling	21.00							68	52			
22.00				22.00								73	33		
23.00				23.00									73	20	
24.00				24.00									63	52	
25.00				25.00									70	55	
26.00															
27.00															
28.00															
29.00															
31.00															

SPT N = STANDARD PENETRATION TEST VALUE RQD = ROCK QUALITY DESIGNATION UDS = UNDISTURBED SOIL SAMPLE
 CR = CORE RECOVERY DS = DISTURBED SOIL SAMPLE



REMARKS : BORE HOLE IS TERMINATED AT DEPTH 25.00m. B.G.L.
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CLIENT : SHREE NIDHI CONCEPT PVT. LTD.	BOREHOLE NO.:BH-04
PROJECT : GEOTECHNICAL INVESTIGATION WORK FOR PROPOSED HIGH-RISE DEVELOPMENT AT MAHIM (W) MUMBAI	SHEET NO. : 1 OF 3
LOCATION :	
CO-ORDINATES :	DATE : 04/06/2017 TO 08/06/2017
GROUND R. L. :	METHOD : ROTARY DRILLING
GROUND W. T. : 3.20 MTR BGL.	CASING : 4.50 MTR BGL

DEPTH (m.)	DIA. OF BORE HOLE	LOG.	STRATA DESCRIPTION	SAMPLE		BLOWS/15cm				SPT N	C R %	RQD %	OTHER TESTS	
				DEPTH (m)	TYPE	15	15	15	15					
1.00	100 mm		Back Filling Materials	2.50	DS1									
2.00				3.00										
3.00			Yellow & Brownish Shell SAND	3.25	SPT1	10	50	-	-	R				
4.00				4.00										
4.40				SPT2	08	09	50	-	R					
5.00				5.00										
6.00			Yellow & Brownish Coarse SAND	5.35	SPT3	10	21	50	-	R				
6.35				SPT4	08	12	50	-	R					
7.00				7.00										
7.15			SPT5	50	-	-	-	R						
8.00	NX		Yellow & Brownish BRECCIA	8.00							15	NIL		
9.00				9.00								20	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

REMARKS : CONTINUE ON NEXT PAGE.

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CLIENT	: SHREE NIDHI CONCEPT PVT. LTD.	BOREHOLE NO.	:BH-04
PROJECT	: GEOTECHNICAL INVESTIGATION WORK FOR PROPOSED HIGH-RISE DEVELOPMENT AT MAHIM (W) MUMBAI	SHEET NO.	: 2 OF 3

DEPTH (m.)	DIA. OF BORE HOLE	LOG.	STRATA DESCRIPTION	SAMPLE		BLOWS/15cm				SPT N	CR %	RQD %	OTHER TESTS			
				DEPTH (m)	TYPE	15	15	15	15							
11.00	NX	▽	Yellow & Brownish BRECCIA	11.00							37	12				
12.00				12.00								58	58			
13.00				13.00								60	50			
14.00				14.00								77	65			
15.00				15.00								76	64			
16.00				16.00								67	67			
17.00				17.00								75	75			
18.00				18.00								74	74			
19.00				Grayish BRECCIA	▽		19.00							76	68	
20.00							20.00								84	75

SPT N = STANDARD PENETRATION TEST VALUE RQD = ROCK QUALITY DESIGNATION UDS = UNDISTURBED SOIL SAMPLE
 CR = CORE RECOVERY DS = DISTURBED SOIL SAMPLE

REMARKS : CONTINUE ON NEXT PAGE.
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CLIENT : SHREE NIDHI CONCEPT PVT. LTD.	BOREHOLE NO. :BH-04
PROJECT : GEOTECHNICAL INVESTIGATION WORK FOR PROPOSED HIGH-RISE DEVELOPMENT AT MAHIM (W) MUMBAI	SHEET NO. : 3 OF 3

DEPTH (m.)	DIA. OF BORE HOLE	LOG.	STRATA DESCRIPTION	SAMPLE		BLOWS/15cm				SPT N	CR %	RQD %	OTHER TESTS		
				DEPTH (m)	TYPE	15	15	15	15						
21.00	NX	▽	Grayish BRECCIA Rock In White Infilling	21.00							65	52			
22.00				22.00								76	68		
23.00				23.00									72	54	
24.00				24.00									68	20	
25.00				25.00									78	37	
26.00															
27.00															
28.00															
29.00															
31.00															
SPT N = STANDARD PENETRATION TEST VALUE RQD = ROCK QUALITY DESIGNATION UDS = UNDISTURBED SOIL SAMPLE CR = CORE RECOVERY DS = DISTURBED SOIL SAMPLE															
REMARKS : BORE HOLE IS TERMINATED AT DEPTH 25.00m. B.G.L. M/S. SHREE SAMARTH KRUPA GEOTECHNICS.															

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CLIENT : SHREE NIDHI CONCEPT PVT. LTD.	BOREHOLE NO. :BH-05
PROJECT : GEOTECHNICAL INVIETIGATION WORK FOR PROPOSED HIGH-RISE DEVELOPMENT AT MAHIM (W) MUMBAI	SHEET NO. :1 OF 3
LOCATION :	
CO-ORDINATES :	DATE : 10/06/2017 TO 14/06/2017
GROUND R. L. :	METHOD : ROTARY DRILLING
GROUND W. T. : 2.80 MTR BGL.	CASING : 8.00 MTR BGL

DEPTH (m.)	DIA. OF BORE HOLE	LOG.	STRATA DESCRIPTION	SAMPLE		BLOWS/15cm				SPT N	C R %	RQD %	OTHER TESTS	
				DEPTH (m)	TYPE	15	15	15	15					
1.00	100 mm		Back Filling Materials											
2.00				2.50	DS1									
3.00			Grayish Hard Boulders	3.00							23	NIL		
4.00				4.00								22	NIL	
5.00			Yellow & Brownish Fine SAND	5.00										
6.00				5.35	SPT1	08	21	50	-	R				
6.00				6.00										
6.00				6.40	SPT2	12	20	50	-	R				
7.00			Yellow & Brownish Weathered Rock Pieces	7.00										
8.00				7.10	SPT3	50	-	-	-	R				
8.00	NX		Yellow & Brownish BRECCIA	8.00							22	NIL		
9.00				9.00								25	25	
10.00				10.00									33	23

SPT N = STANDARD PENETRATION TEST VALUE RQD = ROCK QUALITY DESIGNATION UDS = UNDISTURBED SOIL SAMPLE
 CR = CORE RECOVERY DS = DISTURBED SOIL SAMPLE

REMARKS : CONTINUE ON NEXT PAGE.
 M/S. SHREE SAMARTH KRUPA GEOTECHNICS.

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CLIENT	: SHREE NIDHI CONCEPT PVT. LTD.	BOREHOLE NO.	:BH-05
PROJECT	: GEOTECHNICAL INVESTIGATION WORK FOR PROPOSED HIGH-RISE DEVELOPMENT AT MAHIM (W) MUMBAI	SHEET NO.	: 2 OF 3

DEPTH (m.)	DIA. OF BORE HOLE	LOG.	STRATA DESCRIPTION	SAMPLE		BLOWS/15cm				SPT N	CR %	RQD %	OTHER TESTS			
				DEPTH (m)	TYPE	15	15	15	15							
11.00	NX	▽	Yellow & Brownish BRECCIA	11.00							53	42				
12.00				12.00								60	53			
13.00				13.00								38	38			
14.00				14.00								48	25			
15.00			Brownish Grayish BRECCIA Rock In White Infilling	▽		15.00							40	NIL		
16.00						16.00								27	NIL	
17.00						17.00								40	18	
18.00						18.00								60	60	
19.00						19.00								40	15	
20.00						20.00								36	12	

SPT N = STANDARD PENETRATION TEST VALUE RQD = ROCK QUALITY DESIGNATION UDS = UNDISTURBED SOIL SAMPLE
 CR = CORE RECOVERY DS = DISTURBED SOIL SAMPLE

REMARKS : CONTINUE ON NEXT PAGE.

M/S. SHREE SAMARTH KRUPA GEOTECHNICS.

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CLIENT : SHREE NIDHI CONCEPT PVT. LTD.	BOREHOLE NO.: BH-06
PROJECT : GEOTECHNICAL INVEITIGATION WORK FOR PROPOSED HIGH-RISE DEVELOPMENT AT MAHIM (W) MUMBAI	SHEET NO. : 1 OF 3
LOCATION :	
CO-ORDINATES :	DATE : 16/06/2017 TO 20/06/2017
GROUND R. L. :	METHOD : ROTARY DRILLING
GROUND W. T. : 3.10 MTR BGL.	CASING : 7.00 MTR BGL

DEPTH (m.)	DIA. OF BORE HOLE	LOG.	STRATA DESCRIPTION	SAMPLE		BLOWS/15cm				SPT N	C R %	RQD %	OTHER TESTS
				DEPTH (m)	TYPE	15	15	15	15				
1.00	100 mm		Back Filling Materials	2.50	DS1								
2.00				3.00									
3.00	100 mm		Yellow & Brownish Fine SAND	3.35	SPT1	08	18	50	-	R			
4.00				4.00									
4.40				SPT2	12	21	50	-	R				
5.00				5.00									
5.35				SPT3	12	20	50	-	R				
6.00				6.00									
6.40				SPT4	10	18	50	-	R				
7.00				7.00									
7.40	SPT5	15	21	50	-	R							
8.00	NX		Yellow & Brownish WEATHERED ROCK PIECES	8.00							21	NIL	
9.00				9.00								24	NIL
10.00				10.00								27	14

SPT N = STANDARD PENETRATION TEST VALUE RQD = ROCK QUALITY DESIGNATION UDS = UNDISTURBED SOIL SAMPLE
 CR = CORE RECOVERY DS = DISTURBED SOIL SAMPLE

REMARKS : CONTINUE ON NEXT PAGE.

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CLIENT : SHREE NIDHI CONCEPT PVT. LTD.	BOREHOLE NO. :BH-06
PROJECT : GEOTECHNICAL INVESTIGATION WORK FOR PROPOSED HIGH-RISE DEVELOPMENT AT MAHIM (W) MUMBAI	SHEET NO. : 2 OF 3

DEPTH (m.)	DIA. OF BORE HOLE	LOG.	STRATA DESCRIPTION	SAMPLE		BLOWS/15cm				SPT N	CR %	RQD %	OTHER TESTS	
				DEPTH (m)	TYPE	15	15	15	15					
11.00	NX	▽	Yellow & Brownish BRECCIA	11.00							30	10		
12.00				12.00								35	NIL	
13.00				13.00								40	20	
14.00				14.00								47	47	
15.00				15.00								55	55	
16.00				16.00								54	43	
17.00				17.00								50	40	
18.00				18.00								47	35	
19.00				19.00								47	20	
20.00				20.00								45	NIL	

SPT N = STANDARD PENETRATION TEST VALUE RQD = ROCK QUALITY DESIGNATION UDS = UNDISTURBED SOIL SAMPLE
 CR = CORE RECOVERY DS = DISTURBED SOIL SAMPLE

REMARKS : CONTINUE ON NEXT PAGE.

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CLIENT	: SHREE NIDHI CONCEPT PVT. LTD.	BOREHOLE NO.	:BH-06
PROJECT	: GEOTECHNICAL INVESTIGATION WORK FOR PROPOSED HIGH-RISE DEVELOPMENT AT MAHIM (W) MUMBAI	SHEET NO.	: 3 OF 3



DEPTH (m.)	DIA. OF BORE HOLE	LOG.	STRATA DESCRIPTION	SAMPLE		BLOWS/15cm				SPT N	CR %	RQD %	OTHER TESTS		
				DEPTH (m)	TYPE	15	15	15	15						
21.00	NX	▽	Grayish Brownish BRECCIA	21.00							47	10			
22.00				22.00								48	NIL		
23.00				23.00									60	50	
24.00				24.00									65	65	
25.00				25.00									72	72	
26.00															
27.00															
28.00															
29.00															
31.00															

SPT N = STANDARD PENETRATION TEST VALUE RQD = ROCK QUALITY DESIGNATION UDS = UNDISTURBED SOIL SAMPLE
 CR = CORE RECOVERY DS = DISTURBED SOIL SAMPLE

REMARKS : BORE HOLE IS TERMINATED AT DEPTH 25.00m. B.G.L.
 M/S. SHREE SAMARTH KRUPA GEOTECHNICS.

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CLIENT : SHREE NIDHI CONCEPT PVT. LTD.	BOREHOLE NO.:BH-07
PROJECT : GEOTECHNICAL INVIETIGATION WORK FOR PROPOSED HIGH-RISE DEVELOPMENT AT MAHIM (W) MUMBAI	SHEET NO. :1 OF 3
LOCATION :	
CO-ORDINATES :	DATE : 23/06/2017 TO 30/06/2017
GROUND R. L. :	METHOD : ROTARY DRILLING
GROUND W. T. : 2.95 MTR BGL.	CASING : 9.00 MTR BGL

DEPTH (m.)	DIA. OF BORE HOLE	LOG.	STRATA DESCRIPTION	SAMPLE		BLOWS/15cm				SPT N	C R %	RQD %	OTHER TESTS
				DEPTH (m)	TYPE	15	15	15	15				
1.00	100 mm		Back Filling Materials	2.50	DS1								
3.00				3.00									
3.50				SPT1	03	02	18	50	20				
4.00				4.00									
4.25				SPT2	21	50	-	-	R				
5.00				5.00									
5.35				SPT3	12	21	50	-	R				
6.00				6.00									
6.35				SPT4	10	23	50	-	R				
7.00				7.00									
7.40	SPT5	21	23	50	-	R							
8.00	8.00												
8.25	SPT6	24	50	-	-	R							
9.00	9.00												
9.50	SPT7	21	20	21	50	41							
10.00	NX		Grayish Yellow Brownish BRECCIA	10.00						13	NIL		

SPT N = STANDARD PENETRATION TEST VALUE RQD = ROCK QUALITY DESIGNATION UDS = UNDISTURBED SOIL SAMPLE
 CR = CORE RECOVERY DS = DISTURBED SOIL SAMPLE

REMARKS : CONTINUE ON NEXT PAGE.

M/S. SHREE SAMARTH KRUPA GEOTECHNICS.

PRODUCED BY AN AUTODESK EDUCATIONAL PRODUCT

CLIENT : SHREE NIDHI CONCEPT PVT. LTD.	BOREHOLE NO. :BH-07
PROJECT : GEOTECHNICAL INVETIGATION WORK FOR PROPOSED HIGH-RISE DEVELOPMENT AT MAHIM (W) MUMBAI	SHEET NO. : 2 OF 3

DEPTH (m.)	DIA. OF BORE HOLE	LOG.	STRATA DESCRIPTION	SAMPLE				BLOWS/15cm	SPT N	CR %	RQD %	OTHER TESTS	
				DEPTH (m)	TYPE	15	15						15
11.00	NX	▽	Yellow & Brownish BRECCIA	11.00						22	NIL		
12.00				12.00							35	13	
13.00				13.00							61	60	
14.00				14.00							53	23	
15.00				15.00							52	22	
16.00				16.00							56	50	
17.00				17.00							56	56	
18.00				18.00							58	58	
19.00				19.00							55	44	
20.00				20.00							57	30	

SPT N = STANDARD PENETRATION TEST VALUE RQD = ROCK QUALITY DESIGNATION UDS = UNDISTURBED SOIL SAMPLE
 CR = CORE RECOVERY DS = DISTURBED SOIL SAMPLE

REMARKS : CONTINUE ON NEXT PAGE.

M/S. SHREE SAMARTH KRUPA GEOTECHNICS.

PRODUCED BY AN AUTODESK EDUCATIONAL PRODUCT

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PRODUCED BY AN AUTODESK EDUCATIONAL PRODUCT

CLIENT : SHREE NIDHI CONCEPT PVT. LTD.	BOREHOLE NO. :BH-07
PROJECT : GEOTECHNICAL INVESTIGATION WORK FOR PROPOSED HIGH-RISE DEVELOPMENT AT MAHIM (W) MUMBAI	SHEET NO. : 3 OF 3

DEPTH (m.)	DIA. OF BORE HOLE	LOG.	STRATA DESCRIPTION	SAMPLE		BLOWS/15cm				SPT N	CR %	RQD %	OTHER TESTS		
				DEPTH (m)	TYPE	15	15	15	15						
21.00	NX	▽	Grayish Brownish BRECCIA	21.00							52	NIL			
22.00				22.00								60	44		
23.00				23.00									38	NIL	
24.00				24.00									50	34	
25.00				25.00									65	10	
26.00															
27.00															
28.00															
29.00															
31.00															

SPT N = STANDARD PENETRATION TEST VALUE RQD = ROCK QUALITY DESIGNATION UDS = UNDISTURBED SOIL SAMPLE
 CR = CORE RECOVERY DS = DISTURBED SOIL SAMPLE

REMARKS : BORE HOLE IS TERMINATED AT DEPTH 25.00m. B.G.L.
 MS. SHREE SAMARTH KRUPA GEOTECHNICS.



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PRODUCED BY AN AUTODESK EDUCATIONAL PRODUCT

PRODUCED BY AN AUTODESK EDUCATIONAL PRODUCT

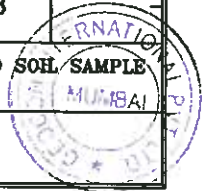
CLIENT : SHREE NIDHI CONCEPT PVT. LTD.	BOREHOLE NO. :BH-08
PROJECT : GEOTECHNICAL INVESTIGATION WORK FOR PROPOSED HIGH-RISE DEVELOPMENT AT MAHIM (W) MUMBAI	SHEET NO. :1 OF 3
LOCATION :	
CO-ORDINATES :	DATE : 04/07/2017 TO 08/07/2017
GROUND R. L. :	METHOD : ROTARY DRILLING
GROUND W. T. : 3.45 MTR BGL.	CASING : 5.00 MTR BGL

DEPTH (m.)	DIA. OF BORE HOLE	LOG.	STRATA DESCRIPTION	SAMPLE		BLOWS/15cm				SPT N	C R %	RQD %	OTHER TESTS	
				DEPTH (m)	TYPE	15	15	15	15					
1.00	100 mm	[Pattern]	Back Filling Materials	2.50	DS1									
2.00				3.00										
3.00			Yellow & Brownish Fine SAND	3.25	SPT1	21	50	-	-	R				
4.00				4.00										
				4.35	SPT2	18	15	50	-	R				
5.00				5.00										
				5.40	SPT3	14	17	50	-	R				
6.00				Yellow & Brownish SAND	6.00									
					6.25	SPT4	19	50	-	-	R			
7.00					7.00									
	7.35	SPT5	21		15	50	-	R						
8.00	Yellow & Brownish BRECCIA	[Pattern]	8.00						23	NIL				
9.00			9.00						25	NIL				
10.00			10.00						30	13				

SPT N = STANDARD PENETRATION TEST VALUE RQD = ROCK QUALITY DESIGNATION UDS = UNDISTURBED SOIL SAMPLE
 CR = CORE RECOVERY DS = DISTURBED SOIL SAMPLE

REMARKS : CONTINUE ON NEXT PAGE.

M/S. SHREE SAMARTH KRUPA GEOTECHNICS.



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PRODUCED BY AN AUTODESK EDUCATIONAL PRODUCT

PRODUCED BY AN AUTODESK EDUCATIONAL PRODUCT

CLIENT : SHREE NIDHI CONCEPT PVT. LTD.	BOREHOLE NO. :BH-08
PROJECT : GEOTECHNICAL INVESTIGATION WORK FOR PROPOSED HIGH-RISE DEVELOPMENT AT MAHIM (W) MUMBAI	SHEET NO. : 2 OF 3

DEPTH (m.)	DIA. OF BORE HOLE	LOG.	STRATA DESCRIPTION	SAMPLE		BLOWS/15cm				SPT N	CR %	RQD %	OTHER TESTS	
				DEPTH (m)	TYPE	15	15	15	15					
11.00	NX	▽	Yellow & Brownish BRECCIA	11.00							40	40		
12.00				12.00								63	44	
13.00				13.00								56	56	
14.00				14.00								50	30	
15.00				15.00								54	54	
16.00				16.00								60	45	
17.00				17.00								57	51	
18.00				18.00								52	52	
19.00				19.00								58	37	
20.00				20.00								45	NIL	

SPT N = STANDARD PENETRATION TEST VALUE RQD = ROCK QUALITY DESIGNATION UDS = UNDISTURBED SOIL SAMPLE
 CR = CORE RECOVERY DS = DISTURBED SOIL SAMPLE

REMARKS : CONTINUE ON NEXT PAGE.

M/S. SHREE SAMARTH KRUPA GEOTECHNICS.



PRODUCED BY AN AUTODESK EDUCATIONAL PRODUCT

PRODUCED BY AN AUTODESK EDUCATIONAL PRODUCT

PRODUCED BY AN AUTODESK EDUCATIONAL PRODUCT

CLIENT	: SHREE NIDHI CONCEPT PVT. LTD.	BOREHOLE NO.	:BH-08
PROJECT	: GEOTECHNICAL INVESTIGATION WORK FOR PROPOSED HIGH-RISE DEVELOPMENT AT MAHIM (W) MUMBAI	SHEET NO.	: 3 OF 3

DEPTH (m.)	DIA. OF BORE HOLE	LOG.	STRATA DESCRIPTION	SAMPLE		BLOWS/15cm				SPT N	CR %	RQD %	OTHER TESTS		
				DEPTH (m)	TYPE	15	15	15	15						
21.00	NX	▽	Yellow & Brownish BRECCIA	21.00							47	30			
22.00				22.00								41	NIL		
23.00				23.00									45	20	
24.00				24.00									70	70	
25.00				25.00									60	40	
26.00															
27.00															
28.00															
29.00															
31.00															

SPT N = STANDARD PENETRATION TEST VALUE RQD = ROCK QUALITY DESIGNATION UDS = UNDISTURBED SOIL SAMPLE
 CR = CORE RECOVERY DS = DISTURBED SOIL SAMPLE

REMARKS : BORE HOLE IS TERMINATED AT DEPTH 25.00m. B.G.L.

M/S. SHREE SAMARTH KRUPA GEOTECHNICS.



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PRODUCED BY AN AUTODESK EDUCATIONAL PRODUCT

LABORATORY TEST RESULTS



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

CLIENT: SHREE NIDHI CONCEPT PVT. LTD.

PROJECT: PROPOSED HIGH-RISE DEVELOPMENT AT MAHIM (W) MUMBAI

Date: 16.06.17

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 kN	Uniaxial Compressive Strength kg/cm ²	Modulus of Elasticity kg/cm ²	Point Load Index kg/cm ²	Brazilian Test kg/cm ²	Porosity %	Water Absorption %	Dry Density gm/cm ³	Specific Gravity	Remark
				cm	cm	cm	cm													
1	BH-01	1	8.10-9.00	4.72	11.34	2.40	1.04	Soaked	26.9	163	--	--	--	--	13.61	6.26	2.17			
2	BH-01	18	11.00-12.00	5.19	11.51	2.22	1.02	Soaked	20.9	103	--	--	--	--	21.97	10.36	2.12			
3	BH-01	71	19.00-20.00	5.35	11.47	2.14	1.02	Soaked	18.6	86	--	--	--	--	15.51	7.55	2.06			
4	BH-02	9	8.00-9.00	5.10	11.12	2.18	1.02	Soaked	21.6	110	--	--	--	--	25.53	11.67	2.19			
5	BH-02	16	11.00-12.00	5.29	11.68	2.21	1.02	Soaked	16.5	78	--	--	--	--	0.78	0.38	2.05			
6	BH-02	59	17.00-18.00	5.30	10.87	2.05	1.01	Soaked	17.6	82	--	--	--	--	-38.78	-18.94	2.05			
7	BH-03	3	7.00-8.00	4.68	10.74	2.29	1.03	Soaked	9.2	56	--	--	--	--	56.56	28.63	1.98			
8	BH-03	17	10.00-11.00	4.69	11.45	2.44	1.04	Soaked	22.0	135	--	--	--	--	15.67	7.09	2.21			
9	BH-03	45	14.00-15.00	5.30	11.14	2.10	1.01	Soaked	15.5	72	--	--	--	--	17.09	7.98	2.14			

GEOCON INTERNATIONAL PVT. LTD. MUMBAI ISO 9001:2015

Job. No. : L-17/253

Checked by: Ravindra Jagdale





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

CLIENT: SHREE NIDHI CONCEPT PVT. LTD.

PROJECT: PROPOSED HIGH-RISE DEVELOPMENT AT MAHIM (W) MUMBAI

Date : 16.06.17

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 kN	Uniaxial Compressive Strength kg/cm ²	Modulus of Elasticity kg/cm ²	Point Load Index kg/cm ²	Brazilian Test kg/cm ²	Porosity %	Water Absorption %	Dry Density gm/cm ³	Specific Gravity	Remark
				cm	cm														
10	BH-04	1	7.10-8.00	4.29	7.86	1.83	0.98	0.98	Soaked	0.6	--	--	3.26	--	15.84	7.47	2.12		
11	BH-04	9	11.00-12.00	5.10	11.00	2.16	1.02	1.02	Soaked	14.8	75	--	--	--	16.02	7.69	2.08		
12	BH-04	26	16.00-17.00	5.09	10.99	2.16	1.02	1.02	Soaked	21.0	107	--	--	--	12.52	5.63	2.22		
13	BH-05	3	8.00-9.00	5.27	7.96	1.51	0.93	0.93	Soaked	0.7	--	--	2.52	--	17.28	8.55	2.02		
14	BH-05	14	11.00-12.00	5.31	11.04	2.08	1.01	1.01	Soaked	19.6	91	--	--	--	9.82	4.73	2.07		
15	BH-05	27	17.00-18.00	5.40	10.86	2.01	1.00	1.00	Soaked	29.4	131	--	--	--	7.64	3.57	2.14		
16	BH-06	1	9.00-10.00	5.18	10.94	2.11	1.01	1.01	Soaked	17.2	84	--	--	--	9.98	4.82	2.07		
17	BH-06	14	13.00-14.00	5.33	11.08	2.08	1.01	1.01	Soaked	28.1	130	--	--	--	9.30	4.41	2.11		
18	BH-06	39	17.00-18.00	5.38	11.00	2.04	1.00	1.00	Soaked	32.8	148	--	--	--	8.00	3.70	2.16		

Job. No. : L-17/253

Checked by: Ravindra Jagdale

GEOCON INTERNATIONAL PVT. LTD. MUMBAI ISO 9001:2015



CHEMICAL TEST RESULT OF GROUND WATER SAMPLES.



As per IS 3025 Part 11, 24, 32

Date: 15.06.2017

CLIENT: SHREE NIDHI CONCEPT PVT. LTD.

PROJECT: PROPOSED HIGH-RISE DEVELOPMENT AT MAHIM (W) MUMBAI

SR NO.	BH NO.	DEPTH IN METERS	TYPE OF SAMPLE	pH ELECTROMETRICALLY	SULPHATE AS SO ₃ ppm	CHLORIDE AS Cl ppm	REMARKS
					* Limit <400ppm Maximum	* Limit <2000ppm Maximum	
1	BH-01	--	Water	7.56	63.00	136.00	
2	BH-02	--	Water	7.52	59.00	109.00	
3	BH-03	--	Water	7.61	74.00	143.00	
4	BH-04	--	Water	7.55	66.00	129.00	
GEOCON INTERNATIONAL PVT. LTD. MUMBAI ISO 9001:2015							
						Job. No. :	L-17/253
						Checked By	Ravindra Jagdale



**CORE BOX
PHOTOGRAPHS**

Client :- SHREE NIDHI CONSPET PVT LTD
Site :- MAHIM-WEST
Bore Hole No. :- P-01 Box-1
Depth :- 0.00 To 25.00 mtr
Start Date :- 16/05/2017
Compt. Date :- 22/05/2017
Sub. :- Geotechnical Investigation
Cont. :- Shree Samarth Krupa Geotechnic, Dombivli

SHREE NIDHI CONSPET PVT LTD

P-01
BOX-1



Client : **SHREE NIDHI CONSPET PVT. LTD.**

Site : Mahim West

Contractor : **Shree Samarth Krupa Geotechnic**

BH No. : **BH 01 Box No. 01**

Client :- Shree Nidhi Conspect Pvt Ltd
 Site :- MAHIM-WEST
 Bore Hole No. :- P-01 Box No. :- 02
 Depth :- 0.00 To 25.00 MTR
 Start Date :- 16/05/2017
 Compt. Date :- 22/05/2017
 Sub. :- Geotechnical Investigation
 Cont. :- Shree Samarth Krupa Geotechnic Dombivli

BH-01
 Box-2



Client : SHREE NIDHI CONSPET PVT. LTD.	Contractor : Shree Samarth Krupa Geotechnic
Site : Mahim West	BH No. : BH 01 Box No. 02

Client :- Shree Nidhi Conspect PVT LTD
Site :- MAHIM - W
Bore Hole No. :- P-01 Box No. 03
Depth :- 0.00 To 2.5-0.2 MTR
Start Date :- 16/08/2017
Compt. Date :- 22/06/2017
Sub. :- Geotechnical Investigation
Cont. :- Shree Samarth Krupa Geotechnic, Dombivli

BH-1
Box 3



Client : SHREE NIDHI CONSPET PVT. LTD.	Contractor : Shree Samarth Krupa Geotechnic
Site : Mahim West	BH No. : BH 01 Box No. 03

Client :: SHREE NIDHI CONSPET PVT LTD
 Site :: MAHIM - (W)
 Bore Hole No. :: P-02 Box No. :: 01
 Depth :- 0.00 To 25.00 MTR
 Start Date :: 23 / 05 / 2017
 Compt. Date :: 26 / 05 / 2017
 Sub :: Geotechnical Investigation
 Cont. :: Shree Samarth Krupa Geotechnic, Dombivli

BH-02
 Box No. 1



Client : SHREE NIDHI CONSPET PVT. LTD.
 Site : Mahim West

Contractor : Shree Samarth Krupa Geotechnic
 BH No. : BH 02 Box No. 01

Client : SHREE NIDHI CONSPET PVT. LTD.
 Site : MAHIM - (W)
 Bore Hole No. : P-02 Box No. : 02
 Depth : 0.00 To 25.00 MTR
 Start Date : 23/05/2017
 Compt. Date : 26/05/2017
 Sub. : Geotechnical Investigation
 Cont. : Shree Samarth Krupa Geotechnic, Dombivli

BOX = 2
 BH-02



Client : **SHREE NIDHI CONSPET PVT. LTD.**
 Site : Mahim West

Contractor : **Shree Samarth Krupa Geotechnic**
 BH No. : **BH 02** Box No. **02**



Client :- SHREE NIDHI CONSPET PVT. LTD.
Site :- MAHIM - W
Bore Hole No. :- P-03 Box No. :- 01
Depth :- 0.00 To 25.00 MTR
Start Date :- 28/05/2017
Compt. Date :- 31/05/2017
Sub. :- Geotechnical Investigation
Cont. :- Shree Samarth Krupa Geotechnic, Dombivli

28/05/2017
B1-1-03
Depth

7.00 TO 7.00
8.00 TO 8.00
9.00 TO 9.00
10.00 TO 10.00
11.00 TO 11.00
12.00 TO 12.00
13.00 TO 13.00
14.00 TO 14.00
15.00 TO 15.00
16.00 TO 16.00
17.00 TO 17.00
18.00 TO 18.00
19.00 TO 19.00
20.00 TO 20.00
21.00 TO 21.00
22.00 TO 22.00
23.00 TO 23.00
24.00 TO 24.00
25.00 TO 25.00

Client : SHREE NIDHI CONSPET PVT. LTD.
Site : Mahim West

Contractor : Shree Samarth Krupa Geotechnic
BH No. : BH 03 Box No. 01

Client :- SHREE NIDHI CONSPET PVT. LTD.
 Site :- MAHIM - W2
 Bore Hole No. :- P-03 Box No. :- 02
 Depth :- 0.00 To 25.00 MTR
 Start Date :- 28/05/2017
 Compt. Date :- 31/05/2017
 Sub. :- Geotechnical Investigation
 Cont. :- Shree Samarth Krupa Geotechnic, Dombivli

P-03-2
 BH-3



Client : SHREE NIDHI CONSPET PVT. LTD.
 Site : Mahim West

Contractor : Shree Samarth Krupa Geotechnic
 BH No. : BH 03 Box No. 02



Client :- **SHREE NIDHI CONSPET PVT. LTD.**
 Site :- **MAHIM - W**
 Bore Hole No. :- **B-03** Box No. :- **03**
 Depth :- **0.00** To **25.00** MTR
 Start Date :- **28/05/2017**
 Compt. Date :- **31/05/2017**
 Sub. :- **Geotechnical Investigation**
 Cont. :- **Shree Samarth Krupa Geotechnic, Dombivli**

BH-03
BOX-3

Client : **SHREE NIDHI CONSPET PVT. LTD.**
 Site : Mahim West

Contractor : **Shree Samarth Krupa Geotechnic**
 BH No. : **BH 03 Box No. 03**

Client : Shree Nidhi Conspect Pvt Ltd
 Site : Mahim - W
 Bore Hole No. : P-04 Box No. : 01
 Depth : 0.00 To 2.5.00 MTR
 Start Date : 04/06/2017
 Compt. Date : 08/06/2017
 Sub. : Geotechnical Investigation
 Cont. : Shree Samarth Krupa Geotechnic, Dombivli

~~SHREE NIDHI~~
 04/06/2017
 BH-04
 Box-1



Client : **SHREE NIDHI CONSPET PVT. LTD.**
 Site : Mahim West

Contractor : **Shree Samarth Krupa Geotechnic**
 BH No. : **BH 04 Box No. 01**



Client : Shree Nidhi Conspect Pvt Ltd
 Site : Mahim - West
 Bore Hole No. : P-04 Box No. : 02
 Depth : 0.00 To 25.00 MTR
 Start Date : 04/06/2017
 Compt. Date : 08/06/2017
 Sub : Geotechnical Investigation
 Cont : Shree Samarth Krupa Geotechnic, Dombivli

BH-4
 BOX-2

BH-04-BOX-2

Client : **SHREE NIDHI CONSPET PVT. LTD.**
 Site : Mahim West

Contractor : **Shree Samarth Krupa Geotechnic**
 BH No. : **BH 04 Box No. 02**



Client : Shree Nidhi ConsPET PVT LTD
Site : Mahim - 00
Bore Hole No. : P-4 Box No. : 03
Depth : 0.00 To 2.5.00 MTR
Start Date : 04/06/2017
Compt Date : 08/06/2017
Sub : Geotechnical Investigation
Cont. : Shree Samarth Krupa Geotechnic, Dombivli

Client : **SHREE NIDHI CONSPET PVT. LTD.**

Site : Mahim West

Contractor : **Shree Samarth Krupa Geotechnic**

BH No. : **BH 04 Box No. 03**

Client :- SHREE NIDHI CONSPET PVT LTD
Site :- MAHIM-1/W
Bore Hole No. :- P-05 Box No. :- 02
Depth :- 0.00 To 25.00 MTR
Start Date :- 10/06/2017
Compt. Date :- 14/06/2017
Sub :- Geotechnical Investigation
Cont. :- Shree Samarth Krupa Geotechnic, Dombivli

BH-5
Box-2



Client : SHREE NIDHI CONSPET PVT. LTD.

Site : Mahim West

Contractor : Shree Samarth Krupa Geotechnic

BH No. : BH 05 Box No. 02



Client : **SHREE NIDHI CONSPET PVT. LTD.**

Site : Mahim West

Contractor : **Shree Samarth Krupa Geotechnic**

BH No. : **BH 06** Box No. **01**

Client :- **SHREE NIDHI CONSPET PVT LTD**
 Site :- **MAHIM W**
 Bore Hole No. :- **P-06** Box No. :- **02**
 Depth :- **0.00** To **2.5-00** MTR
 Start Date :- **16/06/2017**
 Compt. Date :- **20/06/2017**
 Sub. :- **Geotechnical Investigation**
 Cont. :- **Shree Samarth Krupa Geotechnic, Dombivli**

BH-06
 100 x 2



Client : **SHREE NIDHI CONSPET PVT. LTD.**
 Site : Mahim West

Contractor : **Shree Samarth Krupa Geotechnic**
 BH No. : **BH 06 Box No. 02**

Client :- SHREE NIDHI CONSPET PVT LTD
 Site :- MAHIM-W
 Bore Hole No. :- P-07 BOX-1
 Depth :- 0.00 To 25.00 MTR
 Start Date :- 23/06/2017
 Compt. Date :- 30/06/2017
 Sub. :- Geotechnical Investigation
 Cont. :- Shree Samarth Krupa Geotechnic, Dombivli

BH-07
 P-07
 BOX-1



Client : SHREE NIDHI CONSPET PVT. LTD.
 Site : Mahim West

Contractor : Shree Samarth Krupa Geotechnic
 BH No. : BH 07 Box No. 01

Client :- SHREE NIDHI CONSPET PVT. LTD.
 Site :- MAHIM - W
 Bore Hole No. :- P-07 Box No. :- 02
 Depth :- 0.00 To 25.00 MTR
 Start Date :- 23/06/2017
 Compt. Date :- 30/06/2017
 Sub. :- Geotechnical Investigation
 Cont. :- Shree Samarth Krupa Geotechnic, Dombivli

BH-07
 BOX-2



Client : SHREE NIDHI CONSPET PVT. LTD.
 Site : Mahim West

Contractor : Shree Samarth Krupa Geotechnic
 BH No. : BH 07 Box No. 02

Client :- SHREE NIDHI CONSPET PVT LTD
 Site :- MAHIM - W
 Bore Hole No. :- P-08 Box No. :- 01
 Depth :- 0.00 To 25.00 MTR
 Start Date :- 04/07/2017
 Compt. Date :- 08/07/2017
 Sub. :- Geotechnical Investigation
 Cont. :- Shree Samarth Krupa Geotechnic, Domh

START
 ON 04/07/2017
 :- BH-08
 Box-1



Client : SHREE NIDHI CONSPET PVT. LTD.
 Site : Mahim West

Contractor : Shree Samarth Krupa Geotechnic
 BH No. : BH 08 Box No. 01

Handwritten signature

Client :- SHREE NIDHI CONSPET PVT LTD
 Site :- MAHIM W
 Bore Hole No. :- P-08 Box No. :- 02
 Depth :- 0.00 To 25.00 MTR
 Start Date :- 04/07/2017
 Compt. Date :- 08/07/2017
 Sub. :- Geotechnical Investigation
 Cont. :- Shree Samarth Krupa Geotechnic, Domh

SM-08
 BOX-2



Client : SHREE NIDHI CONSPET PVT. LTD.

Site : Mahim West

Contractor : Shree Samarth Krupa Geotechnic

BH No. : BH 08 Box No. 02

H