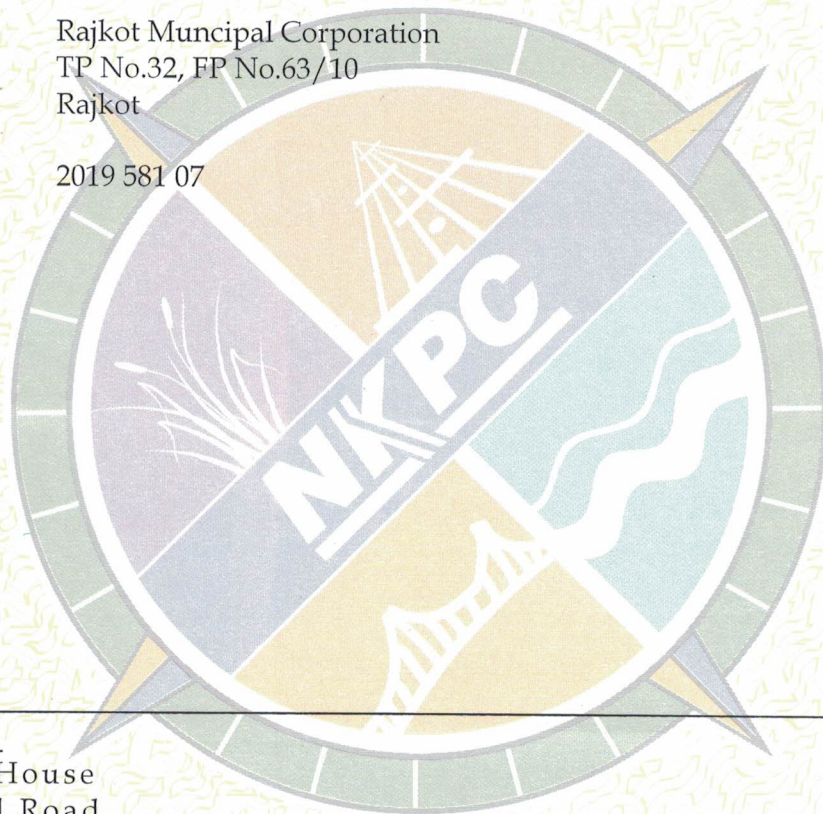


Geotechnical Investigation Report For EWS-II Type
Housing at TP No.32, FP No.63/10

Client : Rajkot Muncipal Corporation
TP No.32, FP No.63/10
Rajkot

Job No. 2019 581 07



N K P C

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					0

1.0 Introduction

Rajkot Municipal Corporation Rajkot has planned to construct EWS-II Type Housing at TP No.32, FP No.63/10 . For foundation analysis of the structures to be built on this site, it is necessary..

- To determine the Soil Profile of site.
- To know physical properties and strength characteristics of soils at various depth and to find SBC (Safe Bearing Capacity).

For this purpose the geo-technical investigation for the site was entrusted to us. The following points were decided.

- Bore hole 2 No.
- Depth of bore hole as in bore hole details
- Collecting disturbed samples.
- Collecting undisturbed samples.
- To find physical properties and strength characteristics of undisturbed samples.
- Strength characteristics for core samples.

2.0 Investigation

2.1 Field Investigation

- Drilling Bore hole
- Standard Penetration Tests
- Collection of soil samples (Disturbed & Undisturbed)
- Collection of core samples

2.2 Laboratory Investigation

- Bulk density & Moisture content
- Grain size analysis
- Index properties
- Shear Tests

2.3 Recommendations

Based on above investigations, the result were obtained. The recommendations are based on interpretation of Results, Analysis and computation as per relevant Indian Standards.

3.0 Field Investigation

3.1 Drilling

The field work consisted for Two No. of bore hole. Bore hole was drilled by rotary drilling machine. The depth of test bore and lithology at proposed location is shown in Fig No. 1 to 2

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3.2 Sampling

3.2.1 Disturbed Samples

Disturbed samples were collected during boring and also from the split spoon sampler. The samples were logged, labled and placed in polythene bags and sent to laboratory for testing.

3.2.2 Undisturbed Samples

Undisturbed Samples were collected in thin walled shelby tubes as per IS 2132. The samples were sealed with wax labled and transported to laboratory at Rajkot for testing.

3.3 Standard Penetration Test

The Standard Penetration Test were conducted in accordance with IS 2131 using Indian Standard Split Spoon Sampler driven by 63.5 kg. hammer falling freely from a height for 75 cm. through a guide rod. The standard size of spoon sampler is 35mm internal and 50.8 mm outer diameter. The blow count is made three times for every 15 cm penetration of the spoon. If full penetration is obtained, the number of blows for the first 15 cm of penetration is neglected due to possible caving and disturbance of soil into the hole. The number of blows for next 30 cm. (15 cm. intervals) penetration are recorded as N values of the soil at the depth of tests.

4.0 Laboratory Investigation

The following laboratory tests were conducted on undisturbed and disturbed soil samples collected from various depths to find physical properties and strength characteristics.

Measurement of Soil Properties in Laboratory

Sr.	Test	Recommended Procedure	Type of Samples
1	Samples Preparation	IS 2720 Pt.-I	DS/UDS
2	Moisture Content	IS 2720 Pt.-II	DS/UDS
3	Dry Unit Weight	Lambe	UDS
4	Specific Gravity	IS 2720 Pt.-III	DS
5	Liquid Limit	IS 2720 Pt.-V	DS
6	Plastic Limit	IS 2720 Pt.-V	DS
7	Grain Size Analysis	IS 2720 Pt.-IV	DS
8	Soil Classification	IS 1488	-
9	Box Shear Test	IS 2720 Pt.-VI	UDS
10	Uniaxial Compression		Core/Rock

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	4.1	Location	Rev	0

Rajkot Municipal Corporation
TP No.32, FP No.63/10
Dist. Rajkot

5.0 Results & Discussion

The SPT values are given in Bore Log No. 1 to 2
The bore log details are shown in Fig. No. 1 to 2
SBC were calculated on basis of soil and rock strata

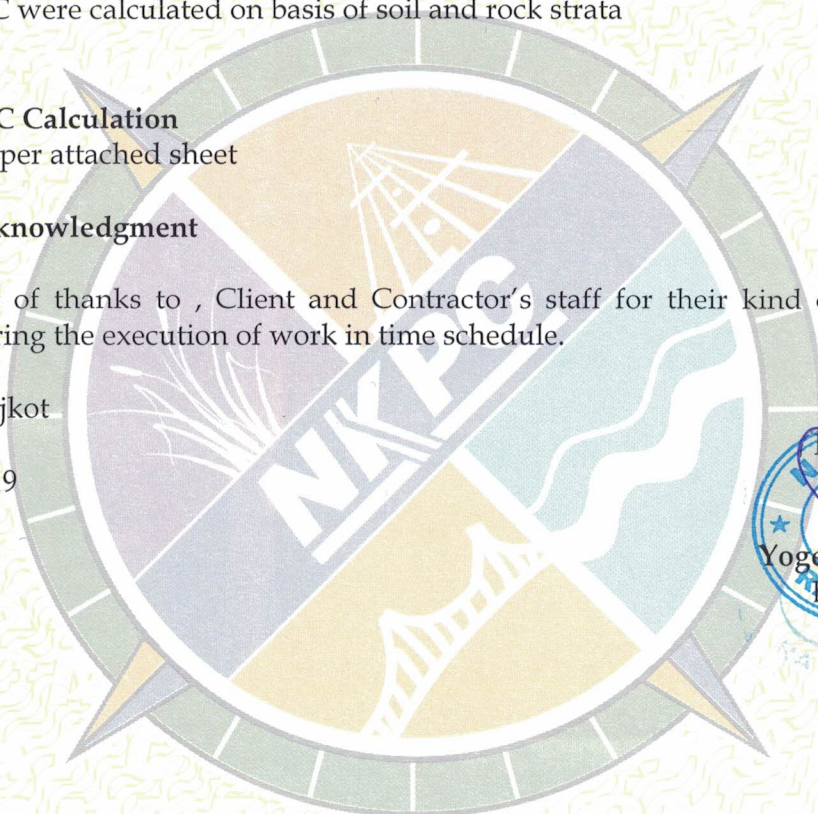
SBC Calculation
As per attached sheet

6.0 Acknowledgment

Lot of thanks to , Client and Contractor's staff for their kind cooperation during the execution of work in time schedule.

Place : Rajkot

Date : 1.7.19



For NKPC
Partner
Yogesh N. Patel
(B.E. (Civil))

BORE LOG No. 01

Project : Construction of EWS-II Type Housing/RMC

Job No. 2019 581 07

Location : TP No.32, FP No.63/10

Water Level (M)

Total Depth (M):

Casing (M)

Elevation(M)

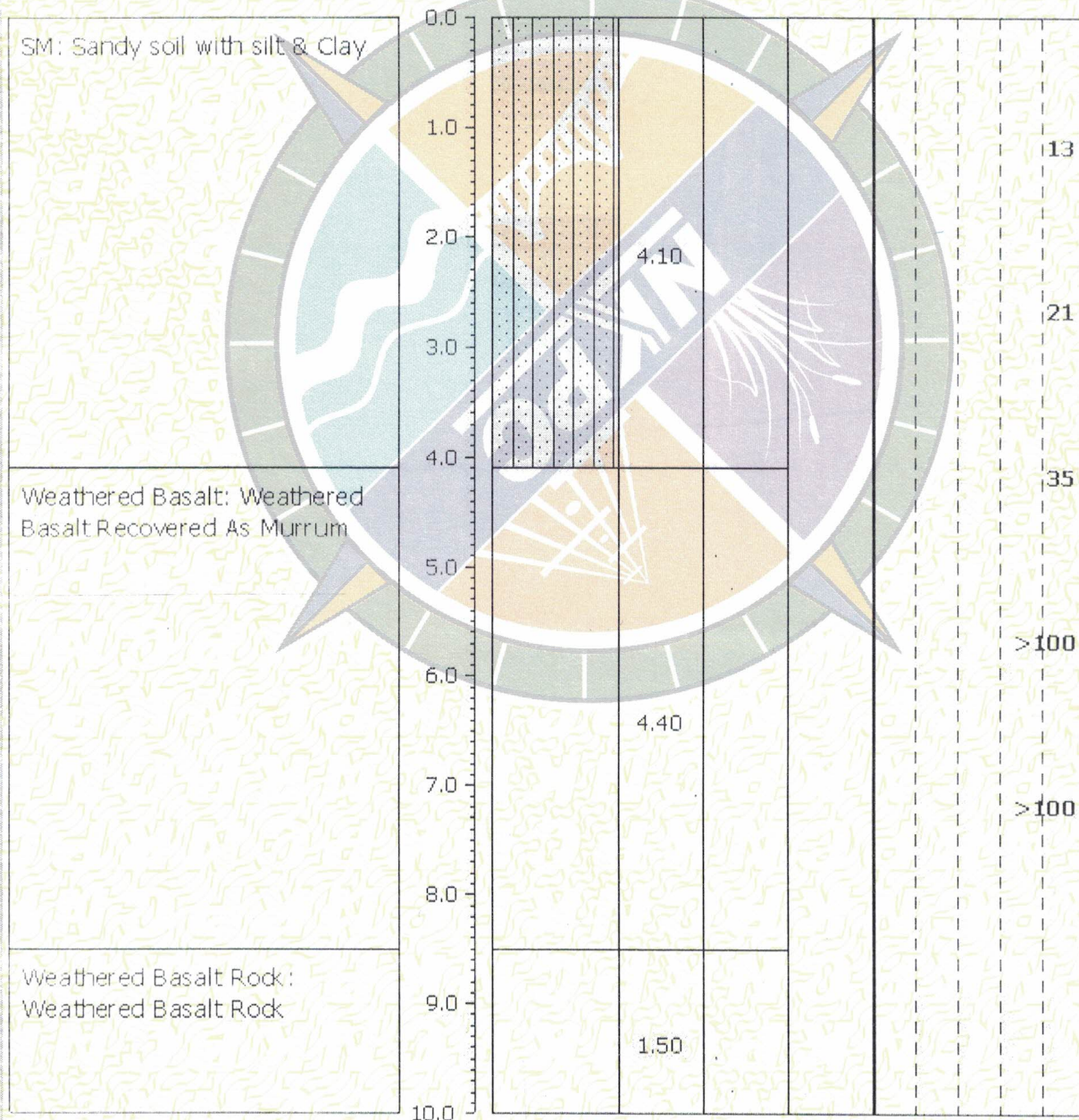
Bore dia (mm) 100 / NX

Method of boring: Core drilling

Co-Ordinates (M)

Undisturbed Sample
 SPT
 Disturbed Sample

Description	Depth (M)	Lithology	Thickness of layer (M)	Elevation (M)	Type of Sample	Penetration test SPT N - Values					Remarks
						20	40	60	80	100	



BORE LOG No. 02

Project : Construction of EWS-II Type Housing/RMC

Job No. 2019 581 07

Location : TP No.32, FP No.63/10

Water Level (M)

Total Depth (M):

Casing (M)

Elevation(M)

Bore dia (mm) 100 / NX

Method of boring: Core drilling

Co-Ordinates (M)

Undisturbed Sample

SPT

Disturbed Sample

Description	Depth (M)	Lithology	Thickness of layer (M)	Elevation (M)	Type of Sample	Penetration test SPT N - Values					Remarks	
						20	40	60	80	100		
SM: Sandy soil with silt & Clay	0.0											
	1.0											15
	2.0			4.30								24
	3.0											33
	4.0											
Weathered Basalt: Weathered Basalt Recovered As Murrum	5.0		1.70									>100
	6.0											
Weathered Basalt Rock : Weathered Basalt Rock	7.0											>100
	8.0		4.00									
	9.0											
	10.0											

NKPC

Project : TP No.32, FP No.63/10

B.H. No.1

Client : Rajkot Municipal Corporation

2019 581 06

Summary of Results of Laboratory Tests on Soil Samples

Lab No.	Type of Sample	Depth (m)	Density			Particulate Size			Consistency Properties			Soil		Strength Test					Swell Test		
			Bulk g / cm ³	Dry g / cm ³	Water Contents (%)	Graevl (%)	Sand (%)	Silt (%)	Clay (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	IS Classification	Specific Gravity G	Type of Test	c = Cohesion kg/cm ²	θ Degree	φ kg/cm ²	Shrinkage Limit (%)	Swelling Pressure kg/cm ²	Free Swell (%)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
581.0	UDS	2.00	1.94	1.74	11.5	20	39	28	13	25	19	6	SM	2.63	BS	0	26				
581.1	UDS	4.00	1.96	1.76	11.6	21	38	28	13	26	19	7	SM	2.64	BS	0	27				

UCS = Unconfined Compressive Strength Test

BS = Box Shear Test

UU = Triaxial Shear Test (Unconsolidated Undrained)

NKPC

Project : TP No.32, FP No.63/10

B.H. No.2

Client : Rajkot Municipal Corporation

2019 581 06

Summary of Results of Laboratory Tests on Soil Samples

Lab No.	Type of Sample	Depth (m)	Density			Particulate Size			Consistency Properties			Soil			Strength Test				Swell Test		
			Bulk g / cm ³	Dry g / cm ³	Water Contents (%)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	IS Classification	Specific Gravity G	Type of Test	c = Cohesion kg/cm ²	θ Degree	φ kg/cm ²	Shrinkage Limit (%)	Swelling Pressure kg/cm ²	Free Swell (%)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
581.3	UDS	2.00	1.92	1.72	11.4	20	40	28	12	26	19	7	SM	2.64	BS	0	26				
581.4	UDS	4.00	1.91	1.71	11.5	20	40	28	12	26	19	7	SM	2.64	BS	0	27				

UCS = Unconfined Compressive Strength Test

BS = Box Shear Test

UU = Triaxial Shear Test (Unconsolidated Undrained)

N K P C, Boring House, Prahald Road, Rajkot 360 001

APPENDIX - I

Calculation of Safe Bearing Capacity based on Shear Parameter C - ϕ

$$q_u = 1 / FS \{ C \cdot N_c \cdot D_c \cdot S_c \cdot i_c + y_d (N_d - 1) S_q d_q i_q + 0.5 \cdot y \cdot B N_y S_y d_y i_y W_y \}$$

Project :

TP No.32, FP No.63/10

Job No.

2019 581 07

For Isolated Footing

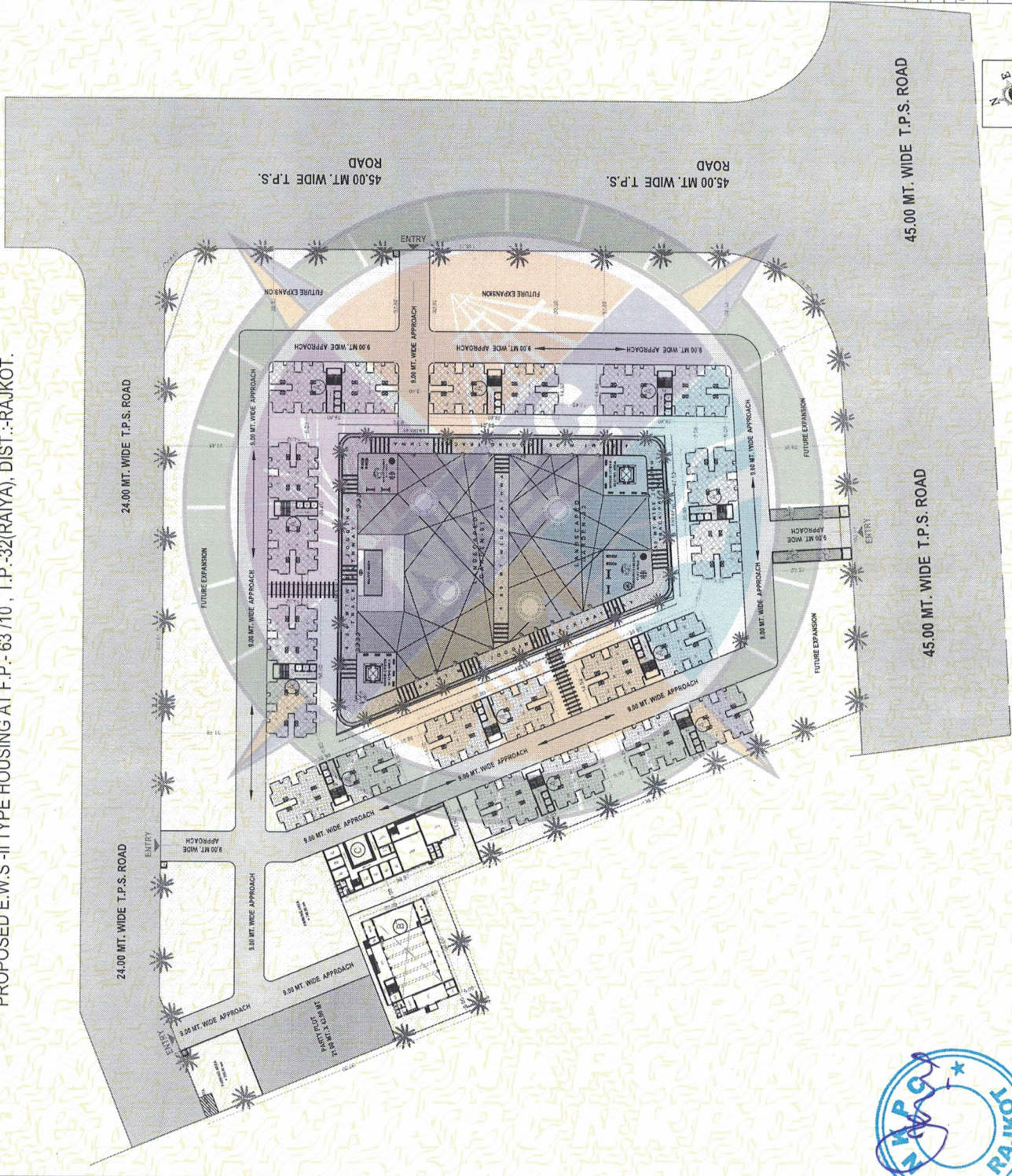
Sr. No.	L = Length of footing m.	B = Width of footing m.	Df = Depth of footing m.	C ton/m ²	ϕ degree	Nc	Sc=1 +0.2B /L	dc=1+0 .2(Df/B) SQRO OTN ϕ	γ gm/c	ic	Nq-1	Sq	dq=1+ 0.2(Df /B)SQ ROOT N ϕ	iq	0.5 γ N γ	sY=1- 0.4B/ L	dq=1+ 0.1(Df /B)SQ ROOT N ϕ	Water Table correction		SBC t/m ²		
																		Wq	Wy			
B.H.NO.1	2	2	2	0.00	26	22.60	1.2	1.320	1	1	11.16	1.2	1.16	1	1	13.18	1.1	1.16	1	1	0.5	16
B.H.NO.1	2	2	3	0.00	26	22.60	1.2	1.480	1	1	11.16	1.2	1.24	1	1	13.18	1.1	1.24	1	1	0.5	24
B.H.NO.1	2	2	4	0.00	27	24.49	1.2	1.652	1	1	12.72	1.2	1.326	1	1	15.49	1.1	1.326	1	1	0.5	37
B.H.NO.2	2	2	2	0.00	26	22.60	1.2	1.320	1	1	11.16	1.2	1.16	1	1	13.18	1.1	1.16	1	1	0.5	16
B.H.NO.2	2	2	3	0.00	26	22.60	1.2	1.480	1	1	11.16	1.2	1.24	1	1	13.18	1.1	1.24	1	1	0.5	24
B.H.NO.2	2	2	4	0.00	27	24.49	1.2	1.652	1	1	12.72	1.2	1.326	1	1	15.49	1.1	1.326	1	1	0.5	37



FOR DPR PURPOSE
 LAYOUT PLAN
 A - TYPE11.BLDG.....PARKING + TPL
 TOTAL NO. OF UNITS = 1144
 CARPET AREA = 39,77 SM.

REVISION :
 SCALE : N.T.S
 DATE :
 TYPE :
 LAY OUT PLAN
 CLIENT : RAJKOT MUNICIPAL CORPORATION
 PROJECT : PROPOSED E.W.S-II TYPE HOUSING AT
 P.P-63/10, T.P-32(RAIYA), DIST.-RAJKOT.
 JAYESSH A DALAL
 PROJECT MANAGEMENT
 CONSULTANT
 DRAWN BY :
 CHECK BY :
 SHEET NO :
 A-001
 2017/13

PROPOSED E.W.S-II TYPE HOUSING AT F.P.-63 /10 , T.P.-32(RAIYA), DIST.-RAJKOT.



GROUND FL. LAYOUT PLAN



NKPC
Project

PROJECT NAME: LIGHT HOUSE TP 32, FP NO. 63/10

RAJKOT MUNICIPAL CORPORATION

Client :

Job No. RL19-2206

Ref. Dt: 27.05.2019

Test.Dt: 01.06.2019

Summary of Results of Laboratory Tests

Identification	Type of Sample	Depth (m)	Density			Particulate Size				Consistency Properties			Soil		Strength Test				Swell Test		
			Bulk g / cm ³	MDD g / cm ³	OMC (%)	Graeval	Sand	Silt	Clay	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	IS Classification	Specific Gravity G	Type of Test	c = Cohesion kg/cm ²	θ Degree	Silt facot %	UCS Kg/cm ²	Swelling Pressure kg/cm ²	Free Swell (%)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
Sample I	RM	3.20	-	1.79	7.4	44	43	13	-	-	NP	-	SM	2.67	BS	0.00	28				
Sample II	RM	3.00	-	1.77	8.1	41	43	16	-	-	NP	-	SM	2.64	BS	0.00	27				
UU =			Triaxial Shear Test (Unconsolidated Undrained)			RM			Remoulded Sample			BS =			Box Shear Test						

