

# TYPICAL FIRE ALARM SECTION

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  ALL JUNCTIONS BETWEEN CONCRETE AND ANY OTHER MATERIAL TO BE PLASTERED ONLY AFTER FIXING CHICKEN MESH.
- EMBEDDED PLATE SHALL BE PROVIDED AT LINTEL LVL. WHERE DOOR / WINDOW IS ADJOINING TO COLUMN.
- PERIPHERAL PLINTH PROTECTION AS / TENDER ITEM.
- ALL DIM. ARE IN MM.

### LEGEND

MANUAL CALL POINT HOOTER **≟(**))

HOSE REEL

M.S. HYDRANT PIPE

SINGLE HEADED HYDRANT VALVE

ABC STORED PRESUURE FE

 $\times$ **BUTTER FLY VALVE** 

• CO2 TYPE FIRE EXT

 $\otimes$ MECHANICAL FOAM TYPE FE

WATER CO2 TYPE FIRE EXT 2-WAY FIRE BRIDGE CONNECTION

PROJECT: HOUSING FOR ALL UNDER PRADHAN MANTRI AWAS YOJNA (PMAY), INDORE

INDORE MUNICIPAL CORPORATION

DRAWING: FIRE ALARM SECTION DETAIL - EWS BLOCK (KANADIYA EXTENSION)

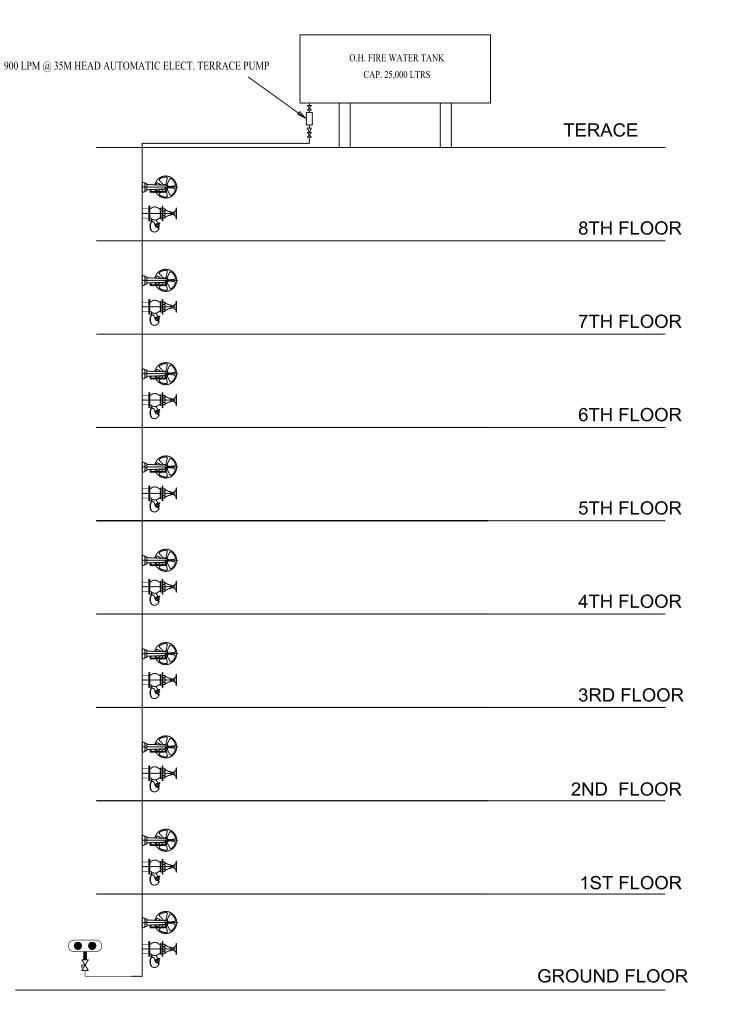
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NORTH



MEHTA & ASSOCIATES

ARCHITECTS PLANNERS INTERIOR DESIGNERS 102. Ist floor, Navneet Plaza, 5/2, Old Palasia, Indore-452001 Phone: 561124 .4065064 Fax-(0731) 4065064 Email: hitendramehta.architect@gmail.com



## TYPICAL FIRE FIGHTING HYDRANT SYSTEM SECTION

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### **LEGEND**

MANUAL CALL POINT

**HOOTER** 

HOSE REEL

M.S. HYDRANT PIPE SINGLE HEADED HYDRANT VALVE

 $\times$ **BUTTER FLY VALVE** 

(•) CO2 TYPE FIRE EXT

ABC STORED PRESUURE FE  $\otimes$ MECHANICAL FOAM TYPE FE

WATER CO2 TYPE FIRE EXT

2-WAY FIRE BRIDGE CONNECTION

PROJECT: HOUSING FOR ALL UNDER PRADHAN MANTRI AWAS YOJNA

INDORE MUNICIPAL CORPORATION

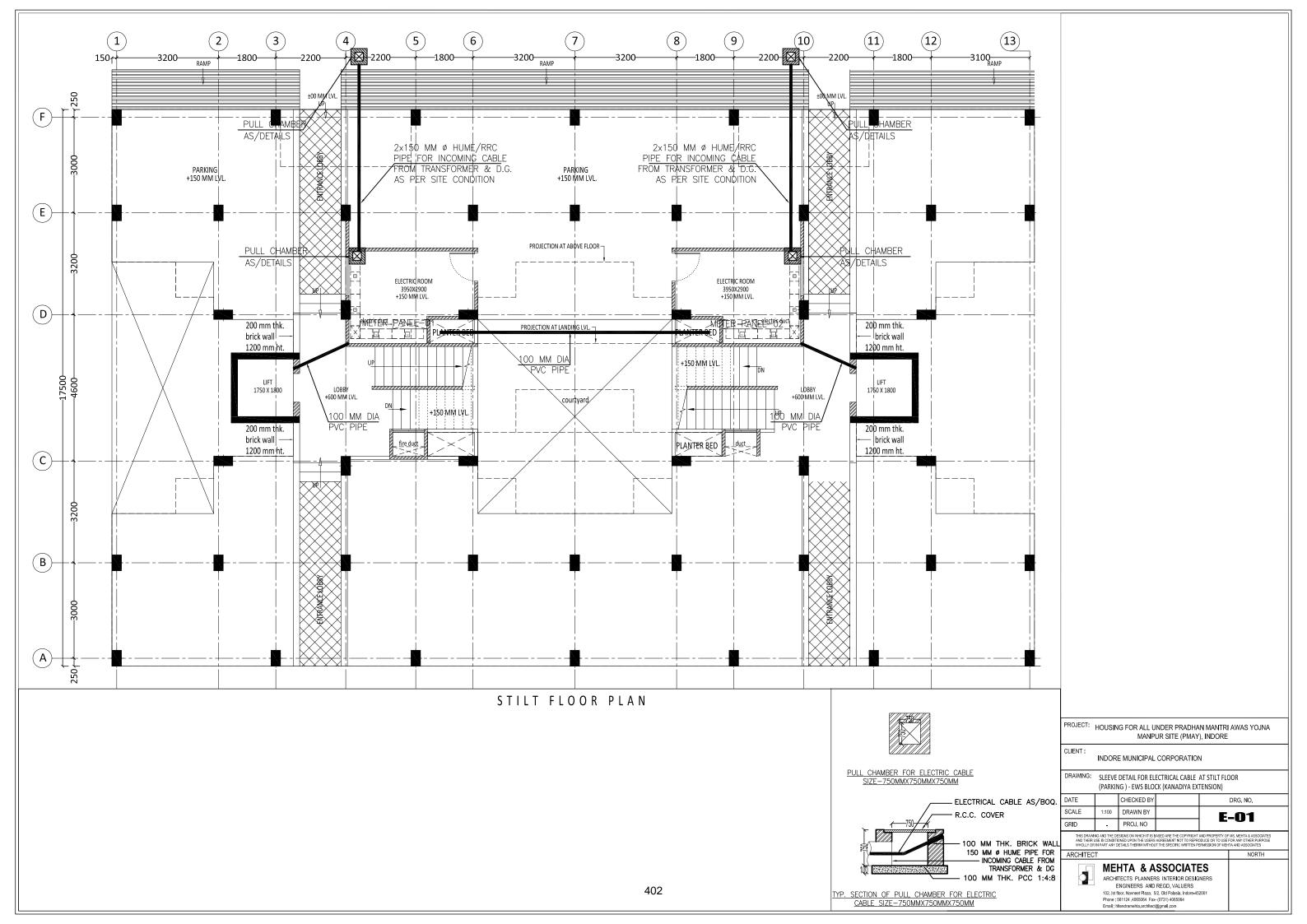
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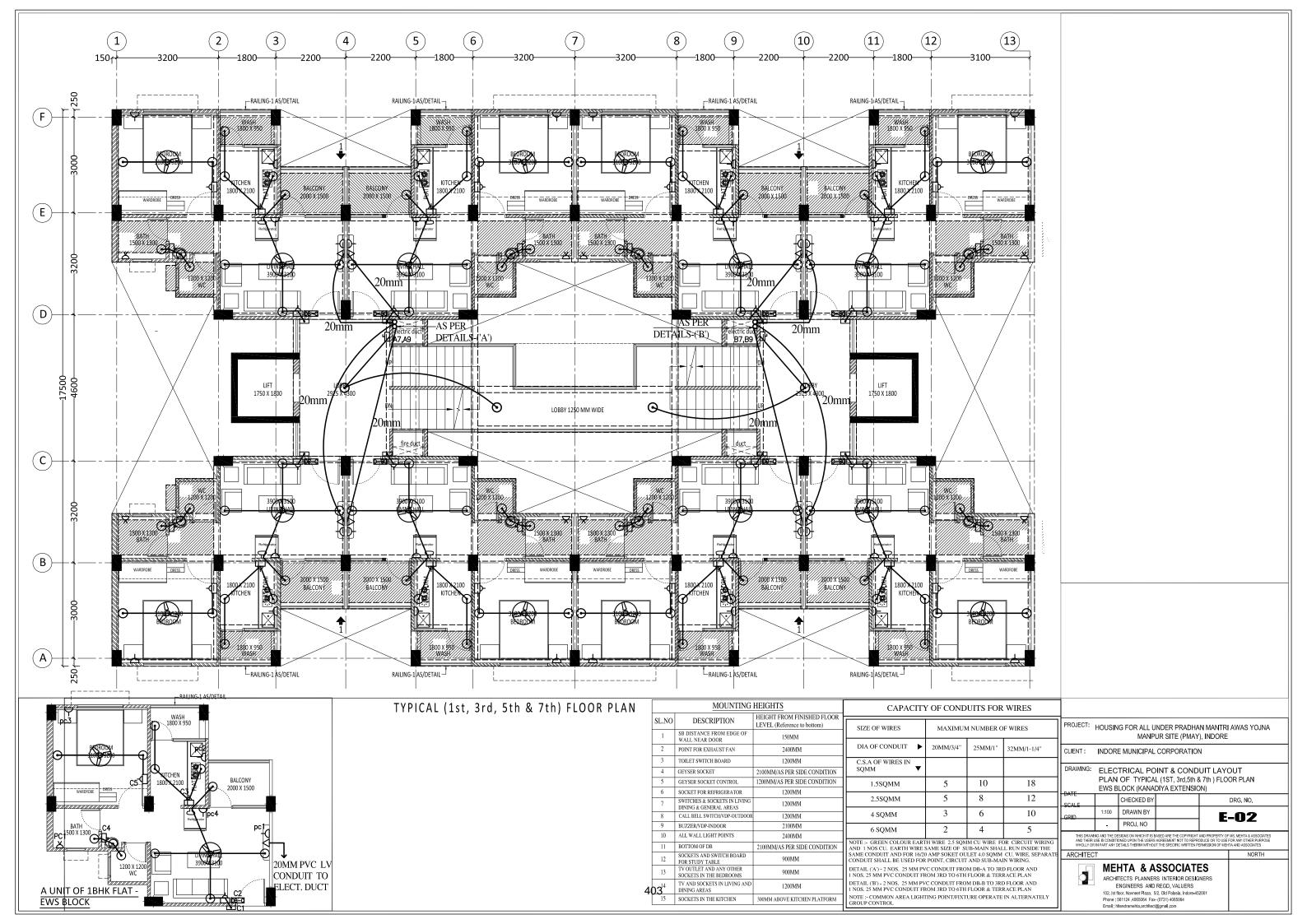
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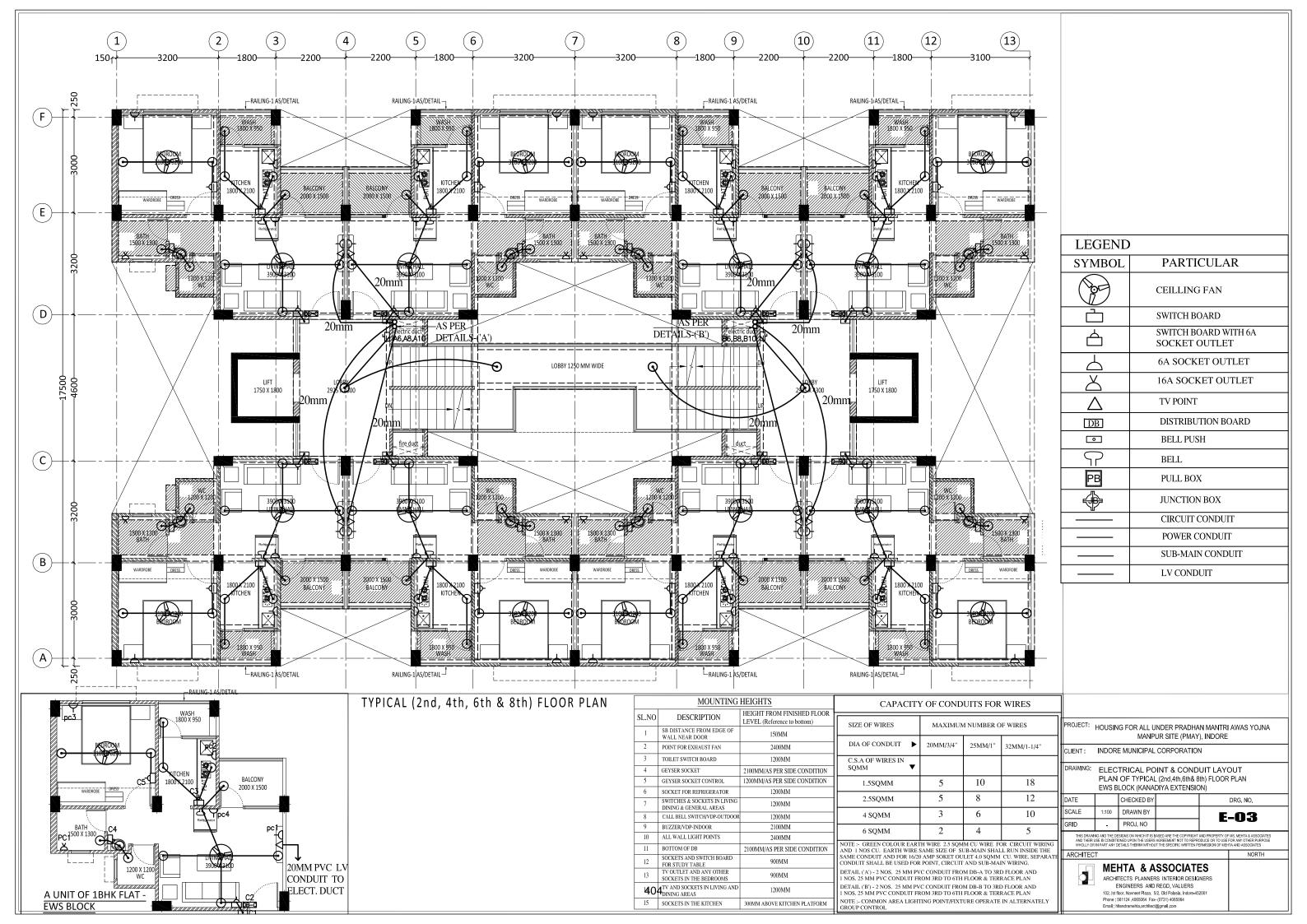
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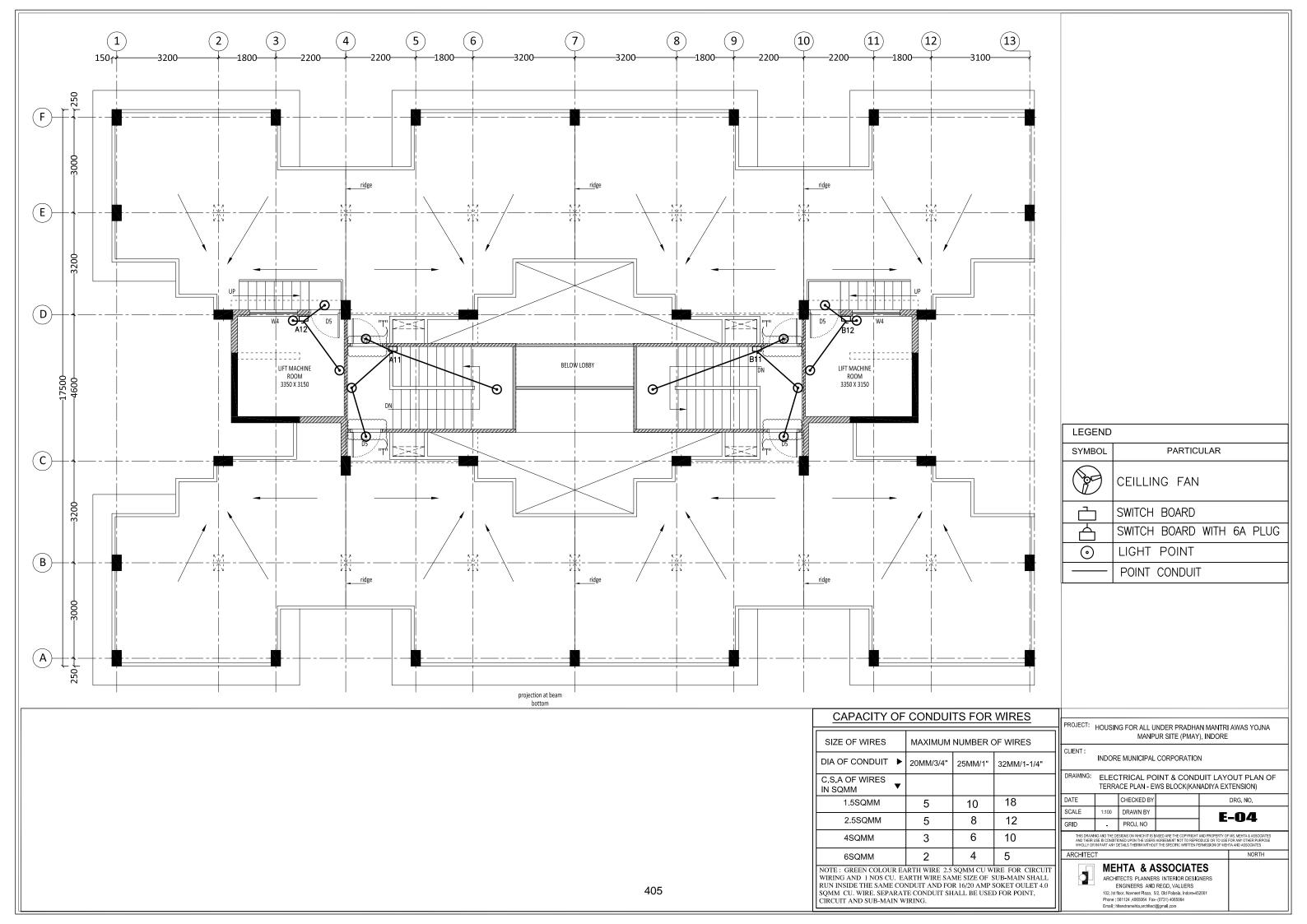
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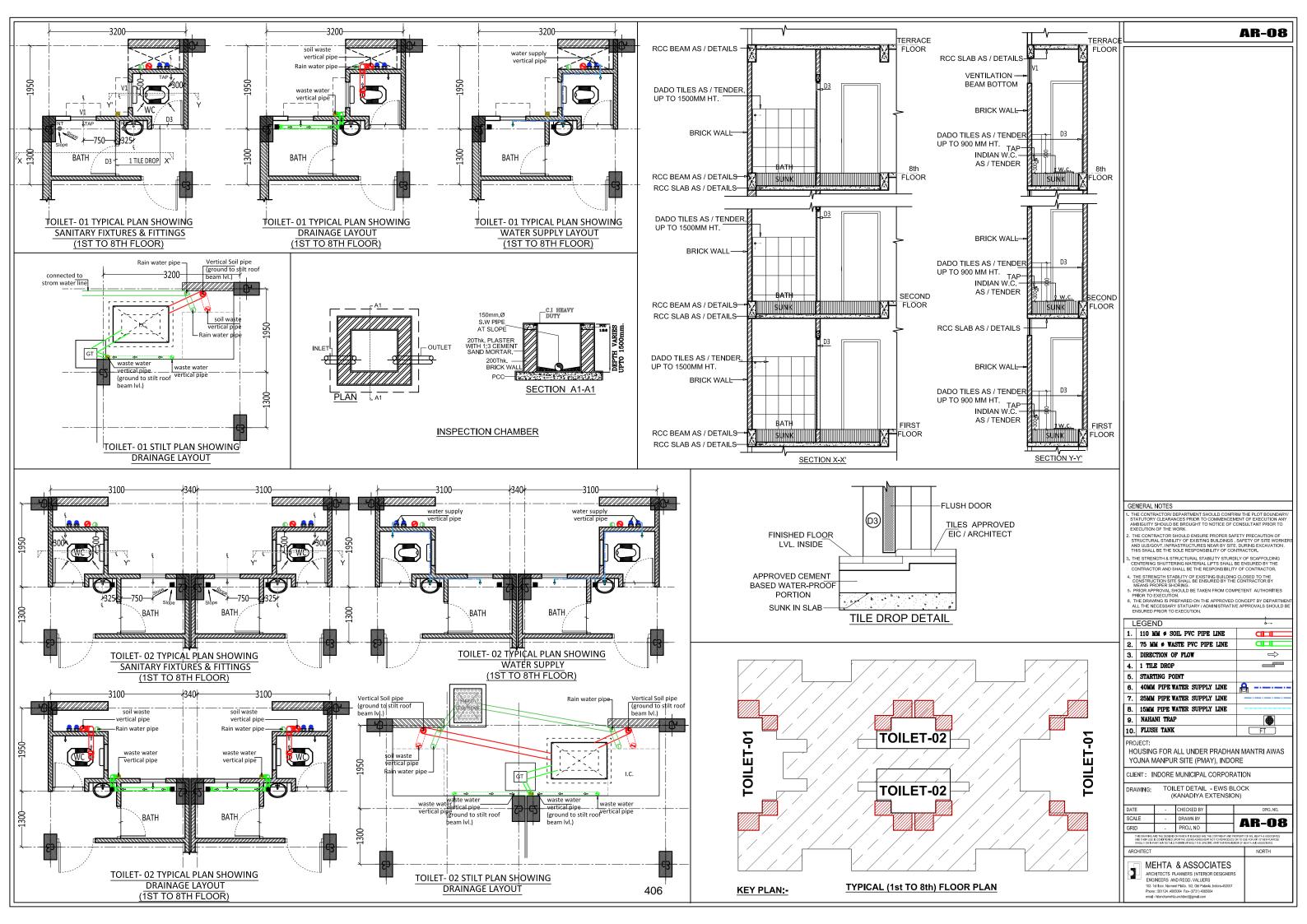
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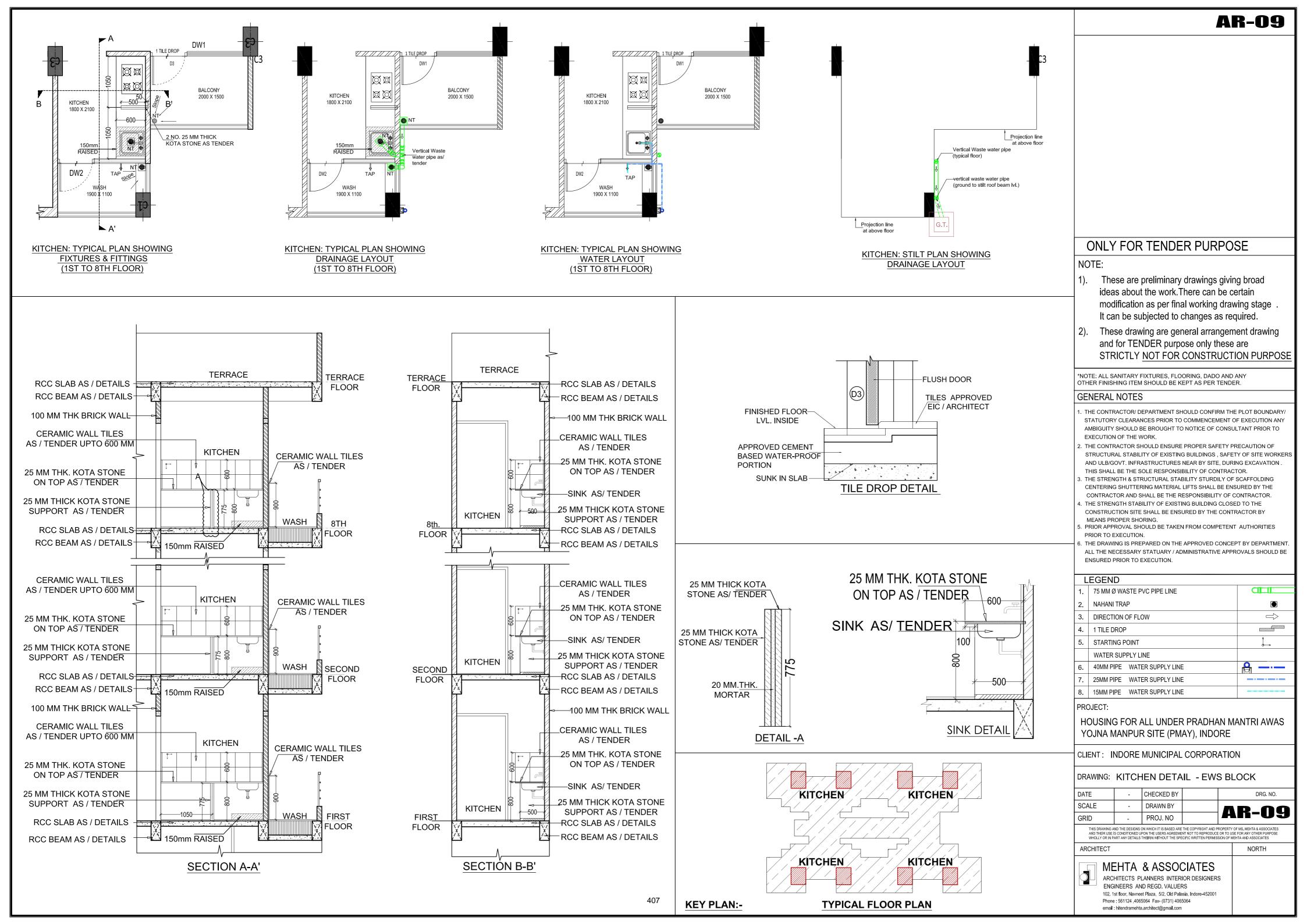


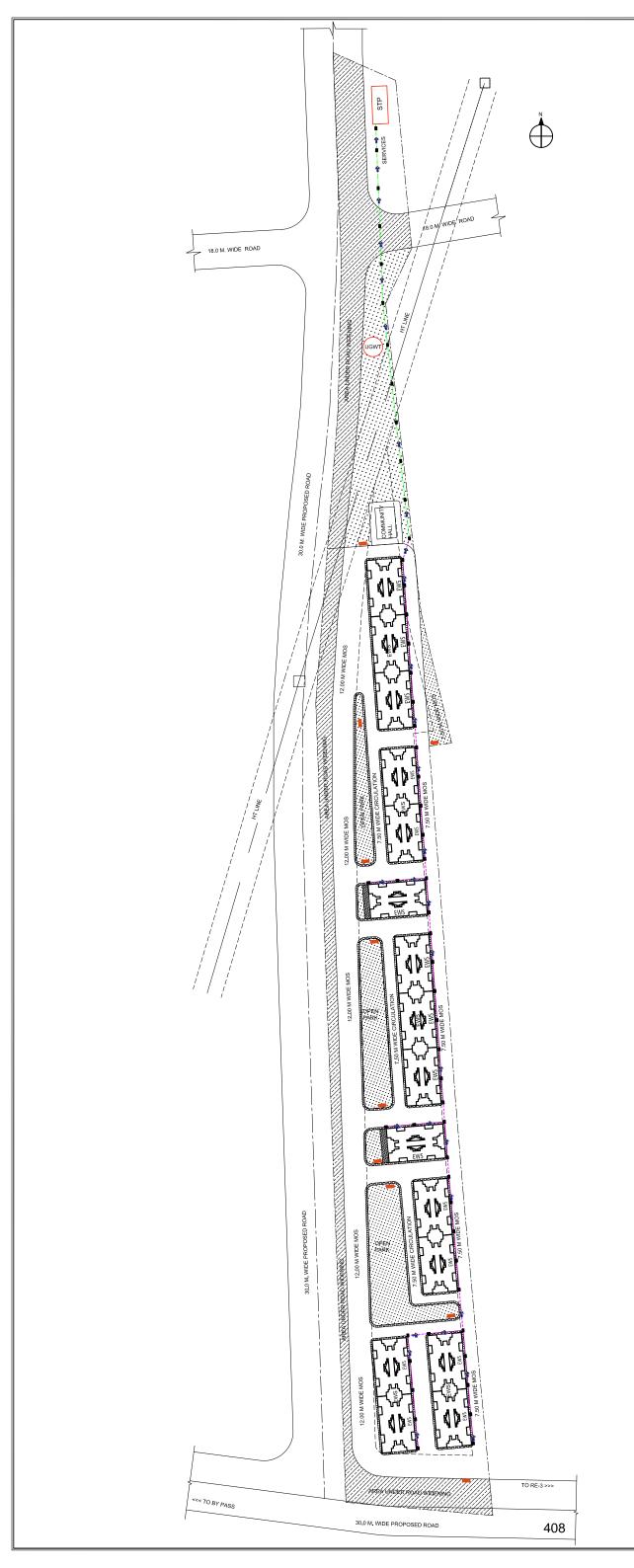


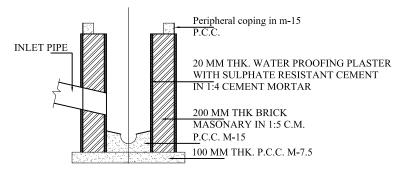








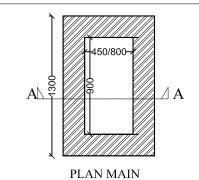




### SECTION AT AA OF MAIN CHAMBER

### NOTE:-

- d' depends as per site condition.
- d varies from 0.60 m. to 3.00 m.



SEWER CHAMBER

LEGEND:-	
PARTICULAR	SYMBOL
SEWER CHAMBER	
SEWER LINE	
A 225 mm Ø RCC PIPE	
B 300 mm Ø RCC PIPE	

PROJECT - HOUSING FOR ALL UNDER PRADHAN MANTRI AWAS YOJNA (PMAY),INDORE

CLIENT - INDORE MUNICIPAL CORPORATION

DRAWING - SEWER LINE LAYOUT PLAN (KANADIYA EXTENSION)

LEGEND : DUSTBIN

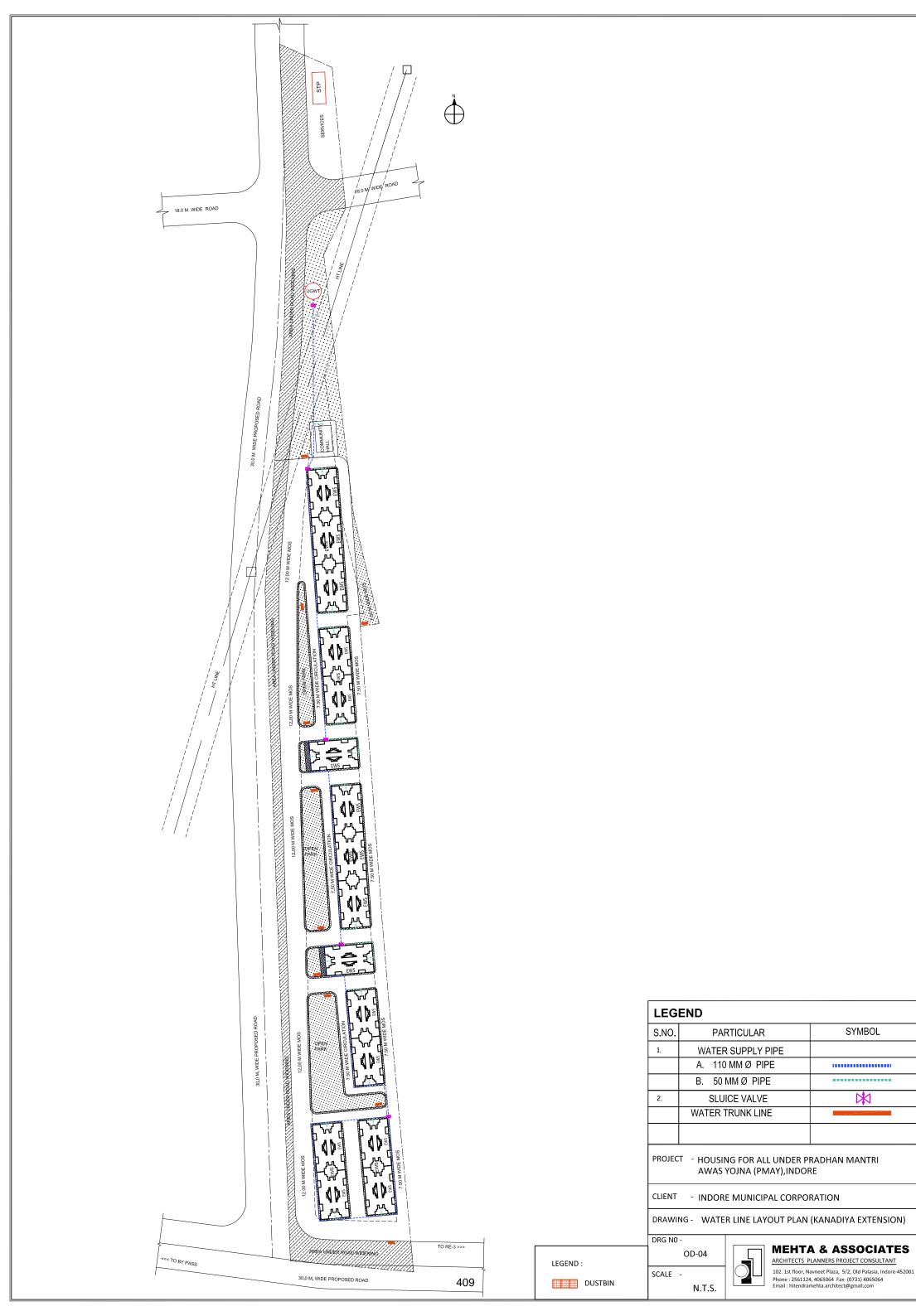
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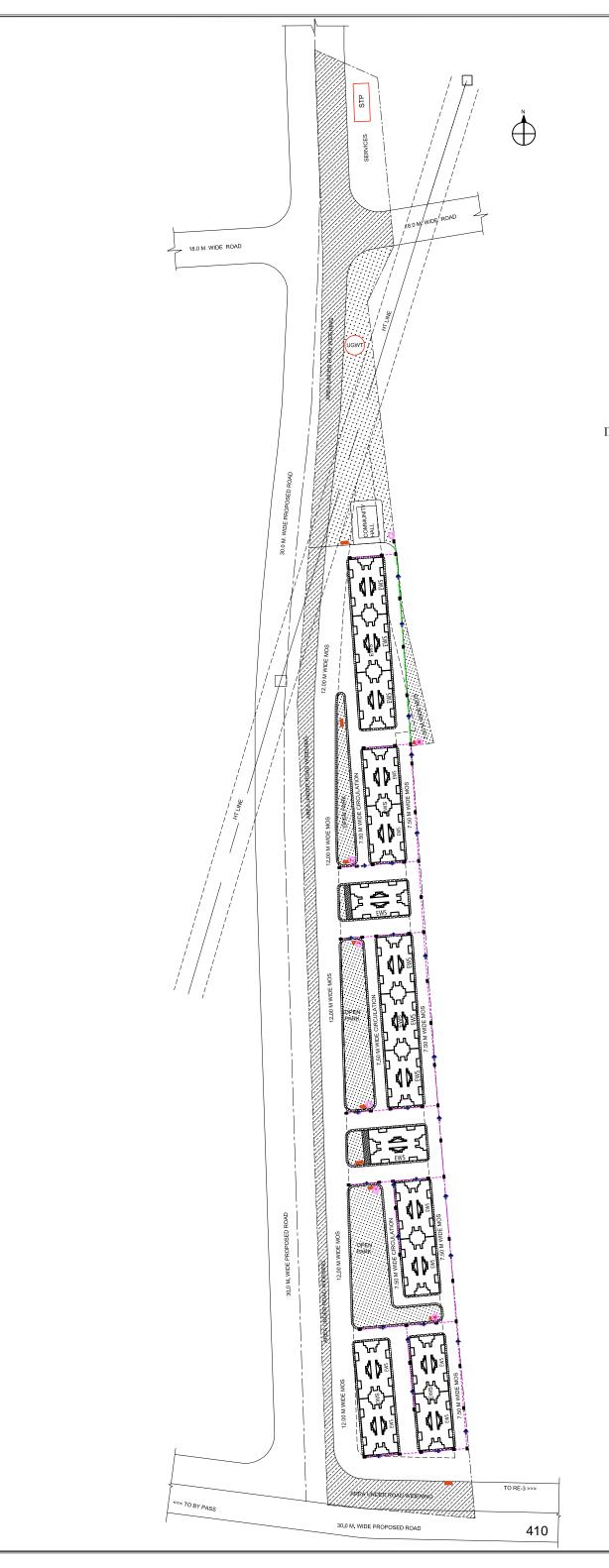
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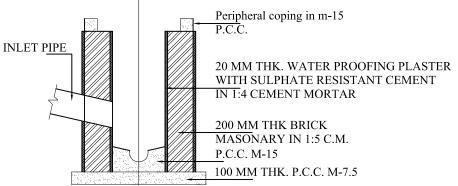


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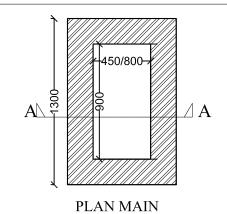




### SECTION AT AA OF MAIN CHAMBER

### NOTE:-

- d' depends as per site condition.
- d varies from 0.60 m. to 3.00 m.



STORM CHAMBER

LE	GEND:-	
S.NO.	Particular	Symbol
1.	STORM Chamber	
2.	STORM Line	
a.	225 mm Ø	
b.	300 mm Ø	
3.	OUT FALL POINT	O
4.	WATER RECHARGE PIT	0

PROJECT - HOUSING FOR ALL UNDER PRADHAN MANTRI AWAS YOJNA (PMAY),INDORE

CLIENT - INDORE MUNICIPAL CORPORATION

DRAWING - STORM LINE LAYOUT PLAN (KANADIYA EXTENSION)

LEGEND :

DUSTBIN

SCALE -

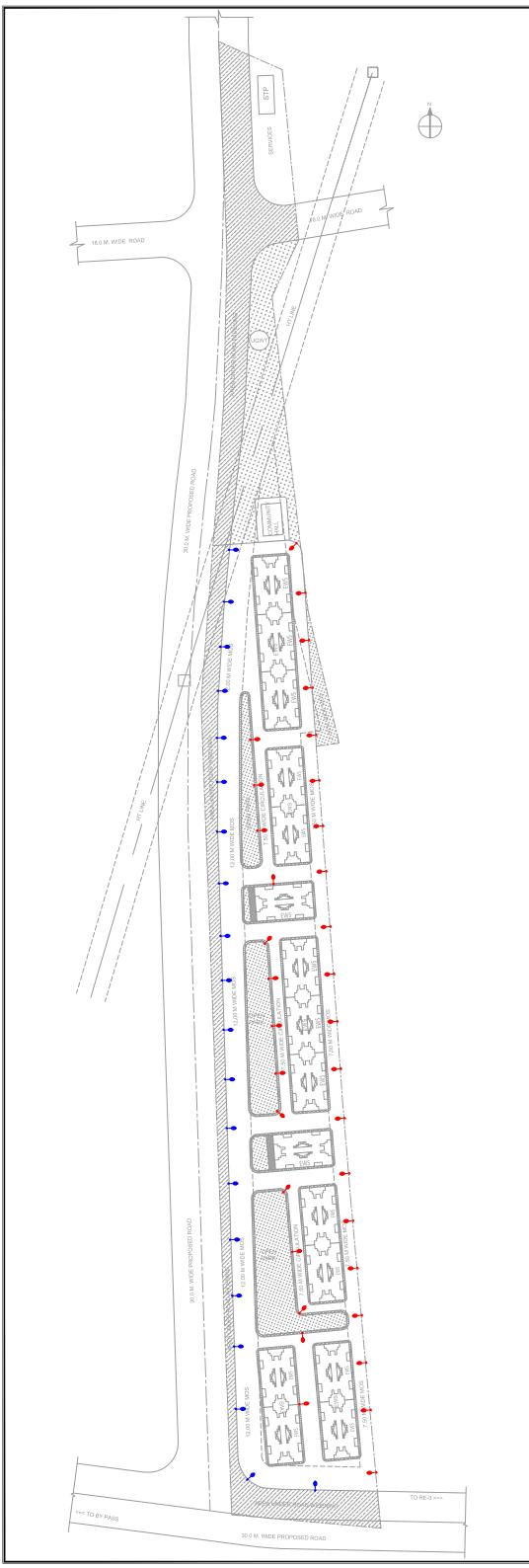
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Email: hitendramehta.architect@gmail.com



	L	EGEND
S.NO.	SYMBOL	PARTICULAR
1.	⊶	LED STREET LIGHT-1X48W
2.	0	LED STREET LIGHT-1X25W

PROJECT - HOUSING FOR ALL UNDER PRADHAN MANTRI AWAS YOJNA (PMAY),INDORE

CLIENT - INDORE MUNICIPAL CORPORATION

DRAWING - STREET LIGHT LAYOUT PLAN (KANADIYA EXTENSION)

DRG N0 -

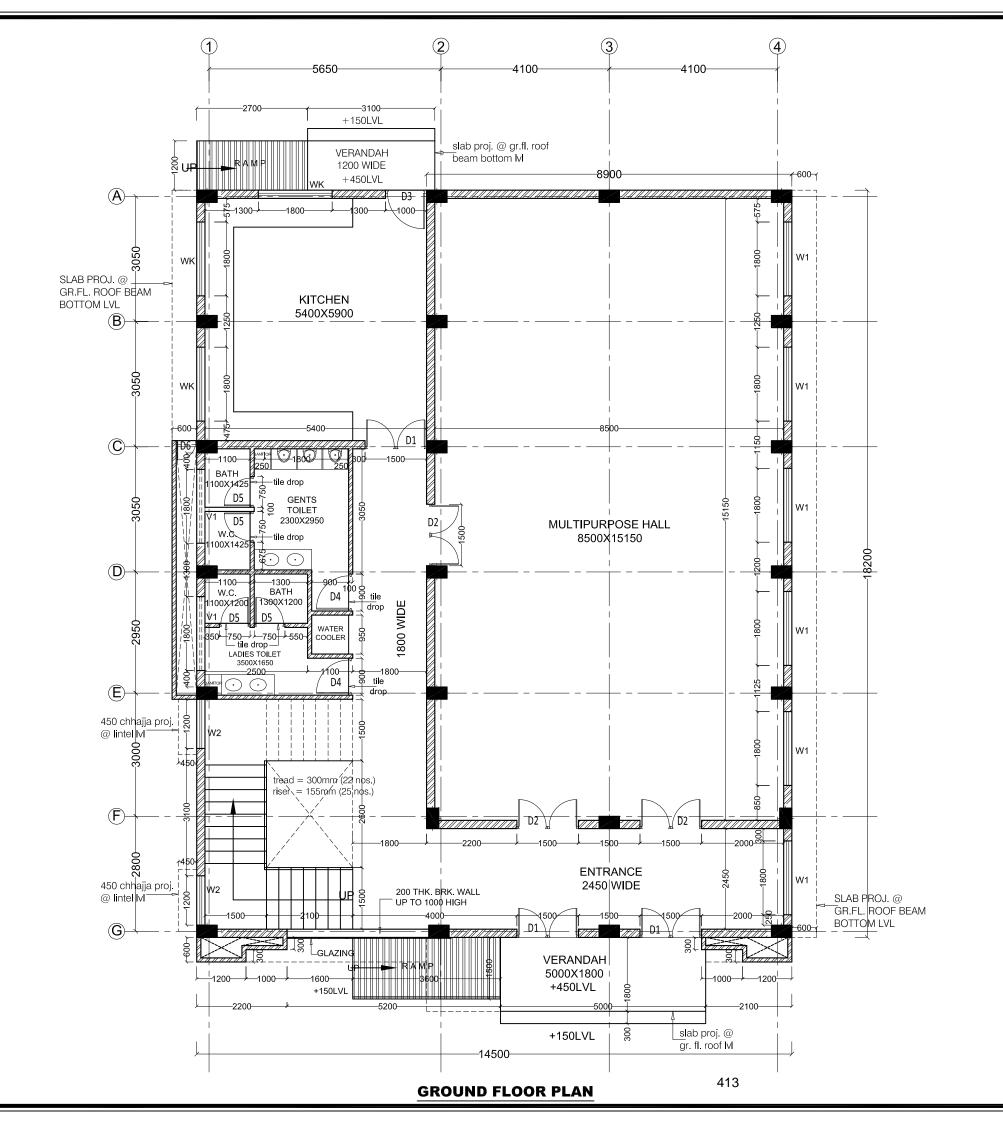
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# 2.3.8 <u>Social Infrastructure Building Drawings</u>



SCH	IEDULE	OF DOORS	
S.NO.	TYPE	SIZE	DESCRIPTION
1.	D1	1500X2400	ALLUMINIUM FRAME GLAZED DOOR
2.	D2	1500X2450	FLUSH DOOR (PRESSED STEEL FRAME)
3.	D3	1000X2450	FLUSH DOOR (PRESSED STEEL FRAME)
4.	D4	900X2150	FLUSH DOOR (PRESSED STEEL FRAME)
5.	D5	750X2150	FLUSH DOOR (PRESSED STEEL FRAME)
6.	D6	500X2150	M.S. TRAP DOOR(M.S. ANGLE FRAME)
7.	D7	1000X2150	M. S. DOOR (AT TERRACE)

### SCHEDULE OF WINDOWS & VENTILATOR

S.NO.	TYPE	SIZE	DESCRIPTION
1.	W1	1800X1500	ALLUMINIUM FRAME GLAZED SLIDING WINDOW
2.	W2	1200X1500	ALLUMINIUM FRAME GLAZED FIXED WINDOW
3.	WK	1800X1200	ALLUMINIUM FRAME GLAZED SLIDING WINDOW
4.	V1	1800X600	ALUMINIUM LOUVERED VENTILATOR with exhaust fan provision

#### **GENERAL NOTES**

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### **SPECIFIC NOTES**

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- 2 ALL BRICK WALLS ARE 200/100 MM THK. UNLESS OTHERWISE SPECIFIED.
- 3 ALL TILE DROPS ARE 15MM UNLESS OTHERWISE SPECIFIED.
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PROJECT - HOUSING FOR ALL UNDER PRADHAN MANTRI AWAS YOJNA (PMAY), INDORE

CLIENT - INDORE MUNICIPAL CORPORATION

DRAWING - COMMUNITY HALL (KANADIYA EXTENSION)

DRG NO -

SCALE

COMH-01

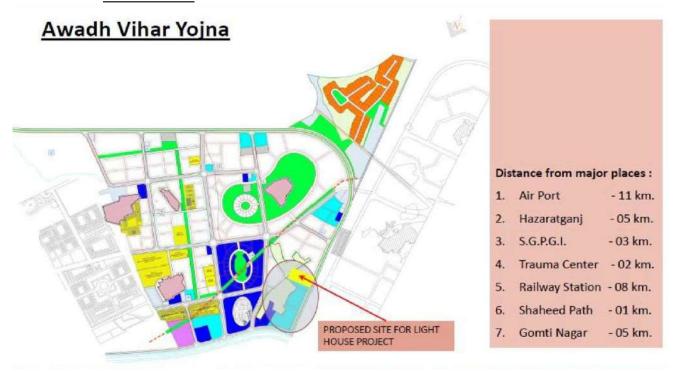
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N.T.S.

### 2.4 LHP 4 Uttar Pradesh

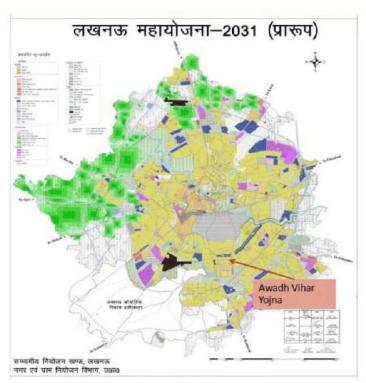
### 2.4.1 Location

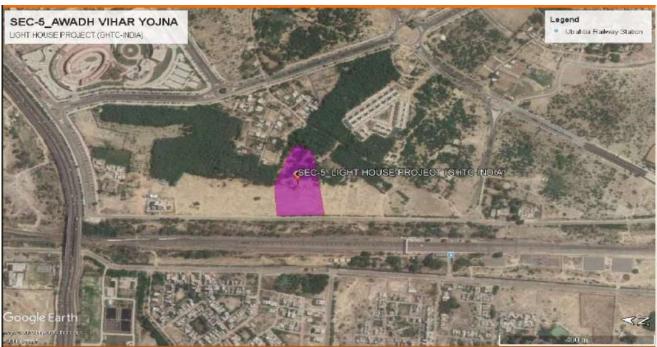




### **LOCATION MAP**







### 2.4.2 Total Station Survey Map



# 2.4.3 <u>Soil Testing Report</u>

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		E-mail: net.consultants @ grant.com	
	NORTH INDIA ENGINE		
		ERS' LAB & CONSULTANTS	
	Mother Nehro National Institu	JSTRIAL ESTATE Ite of Technology, Allahabad - 211 004	
	Laboratory and Fiel	d Testing of Court v	
	Design Solutions to	r Civil Engineering	
	No. 015G/NIEL/UPAVP/2017	Dated: 07.03.2017	
	To.		
	The Executive Engineer	AND	
	Construction Division-14	☆—五子 <sub>———</sub>	
	Office Complex, Sector-9	A STATE OF THE POSTER	
	Vrindavan Yojana, Lucknow	1950 10 10 30 8017	
	Subject: Regarding Geotechnical Investigation Report of Lie	S & EWS Site	
	Dear Sir,		
	In reference to your letter No. 0503 50501 and		
	In reference to your letter No. 06/Y-57(PMY)/01 dated	03.01.2017, the Report of Geotechnical	
	Investigation conducted at Awadh Vihar Yojana, Sect	or-05. Lucknew for LIG & EWS all .	
	enclosed herewith.	THE EAS SHE IS	
	The report is checked and vetted by M.N.N.I.T., Allahab	and the same of th	
2			
	For any further query/clarification, please feel free to cor	itact the undersigned.	
1601			
	Thanking You.		
	Value of the state		
	Yours Sincerely		
	LA LA VM		
	(Er. Utkarsh Tiwari)		
	Director		
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A

Report

on

Sub-Soil Exploration

for

Design of Foundation

of

Multi Storeyed Buildings (EWS & LIG)

at

Awadh Vihar Yojna, Sector-05, Lucknow (U.P.)

. Submitted to

# U.P.Avas Avam Vikas Parishad

Construction Div.-14, Lucknow (U.P.)

by



GEOTECHNICAL ENGINEERING LABORATORY NORTH INDIA ENGINEERS' LAB & CONSULTANTS

(An ISO 9001:2008 Certified Company) Shed No.62, Industrial Estate, M.N.N.I.T. Allahabad Allahabad



#### ACKNOWLEDGEMENT

The team is thankful to Er. P.K.Singh, Executive Engineer of U.P. Avas Avam Vikas Parishad, Construction Division-14, Lucknow for the sponsoring the project and co-operation extended during the field investigations.

Team is also thankful to the staff of North India Engineers' Lab & Consultants for their co-operation and assistance rendered during the project.

(Er. Utkarsh Tiwa

GEOTECHNICAL ENGINEERING LABORATORY NORTH INDIA ENGINEERS' LAB & CONSULTANTS (An ISO 9001:2008 Certified Company) Shed No.62, Industrial Estate, M.N.N.I.T. Allahabad Allahabad

Geotechnical Investigation for the Design of Foundation for Multi Storeyed Buildings (EWS & LIG) at Awadh Vihar Yojana, Sector-05, Lucknow

Project : Sub-soil Exploration for the Design of Foundation for Multi Storeyed Buildings (EWS & LIG).

Agency : U.P. Avas Avam Vikas Parishad, Construction Division-14, Lucknow
Site : Awadh Vihar Yojana, Sector-5, Lucknow

The investigations have been carried out according to the requirements and limitations of the client during January-February, 2017.

Team: Evaluation of the Geotechnical properties of the soils of various strata & subsequent analysis, and the final report for the project have been carried out by the team comprising of:

- (i) Er. Utkarsh Tiwari.
- (ii) Dr. S.G.Tripathi, Ph.D. (Geotech.)

The team acknowledge the assistance given by Shri. Dinesh Kumar Soni, Laboratory Technician and Mr.R.K.Shukla & Mr.Vaibhav Singh, Laboratory Assistant for supervision of the field and laboratory works.

The assistance rendered by the staff of U.P. Avas Avam Vikas Parishad. Construction Division-14, Lucknow during the field investigation work is also acknowledged.

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Civil Engineering Department Uttanh

Civil Engineering Division

#### 1.0 INTRODUCTION

The proper design of Civil Engineering Structure requires adequate knowledge of subsurface condition of the site of the structure. The aim of the present Geotechnical Investigations has been to determine the sub-soil characteristics for the design of Foundation for multi storeyed buildings (EWS & LIG) for at Awadh Vihar Yojana, Sector-5, Lucknow.

The investigations were carried out to evaluate the load bearing and settlement characteristics of the soil for the design of foundation as required by the agency. Other allied properties of soils were also studied and are reported herein in this report.

The basic consideration in the design of the foundations is that of safety, dependability, functional utility and economy. Amongst these, tolerable settlement and safety against shear failure are of far most important w.r.t. soil conditions. Therefore for a safe and functional foundation, the allowable bearing pressure is worked out from shear as well as permissible settlement considerations.

For the evaluation of safe ultimate load bearing capacity of soil failing in shear, various theoretical analysis and empirical formulae are available e.g. Terzaghi (1943), Skempton (1951), Meyerhoff (1951, 1953), Hansen (1972) Chan and Devidson (1973) etc. These formulae give value of load bearing capacity of soil as function of shear strength parameters shape, depth, inclination of the foundation and several other parameters. Further field tests, such as standard penetration tests, provide empirical relationships for assessing allowable bearing pressure from 'N-value'.

In the present investigations, the strength parameters viz. Cohesion (Cu) and angle of internal friction  $(\Phi_u)$  have been evaluated from the Triaxial Test/Direct shear test, using undisturbed/Remoulded samples of various strata recovered during the field investigations. In addition SPT test have been carried out to supplement the results of laboratory studies. The results of field and laboratory investigation carried out would provide the designer the necessary data for evaluating the allowable bearing pressure for shear failure of the strength parameters viz. Cohesion (Cu) and angle of internal friends and the strength parameters viz. Cohesion (Cu) and angle of internal friends and the strength parameters viz. Cohesion (Cu) and angle of internal frieds and the strength parameters viz. Cohesion (Cu) and angle of internal frieds and the strength parameters viz. Cohesion (Cu) and angle of internal frieds and the strength parameters viz. Cohesion (Cu) and angle of internal frieds and the strength parameters viz. Cohesion (Cu) and angle of internal frieds and the strength parameters viz. Cohesion (Cu) and angle of internal frieds and the strength parameters viz. Cohesion (Cu) and angle of internal frieds and the strength parameters viz. Cohesion (Cu) and the strength paramete

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The settlement studies are based on consolidation properties of the soil, for which Oedometer tests have been carried out. Using Terzaghi's analysis or Scot's method using Undisturbed / Remoulded Samples recovered from field. The value of settlements has been obtained.

The studies reported herein i.e.  $C_u$ ,  $\Phi_u$  parameters,  $C_c$  and other characteristics of soil strata would provide the designer with necessary data for the selection of the type of foundation and thereby the design of the foundation.

### 2.0 FIELD WORK AND LABORATORY INVESTIGATIONS

#### 2.1 Field Work

The number, type, location, size and depth of explorations of boreholes are dependent upon the nature and size of project and on the degree of complexity and critical nature of the surface conditions.

In the present case, the field work consists of advancing three bore holes at the site of U.P. Avas Avam Vikas Parishad, CD-14, Lucknow at Awadh Vihar Yojana, Sector-05 in Lucknow District as decided by the department. The borehole was of 12.5 cm. in diameter. Four boreholes (Nos.1, 3, 5 & 6) were explored up to 20.0m and two bore holes (Nos. 2 & 4) up to 30.0m below G.L. The field work consisted of drilling of bore hole, preparation of bore-log charts based on field identification, conducting standard penetration test (SPT) at every 1.5 m. depth. Disturbed and undisturbed samples were collected for various laboratory tests. The location of water table was also to be observed in the investigated bore holes.

#### 2.2 Laboratory Investigations:

These were carried out on disturbed/undisturbed soil samples collected during the fieldwork for determination of moisture content, specific gravity, bulk and dry densities, triaxial tests (unconsolidated undrained), Direct Shear Tests and Oedometer tests using undisturbed samples, and classification tests including determination of Atterberg's limits on representative disturbed samples. A brief remarks on these tests are as follows:

Civil Engineering

#### Soil Classification Tests:

These tests were performed as per IS: 2720(Part IV) 1965, IS: 1498-1970 and IS:, 2720 (Part V)- 1970. The soil classification is based on Mechanical analysis and Atterberg's limits on disturbed representative samples from bore holes according to IS soil classification system. The results are reported in the form of bore log chart for the boreholes.

### (ii) Bulk Density, Moisture Content and Specific Gravity of Soils:

These tests were carried out as per IS: 2720(Part-III/ Sec.-1 & 2, 1980), IS: 2720 (Part II),1973. The Bulk Density and Moisture content in the field were determined from undisturbed samples recovered from the liners and dry density was computed from these. Specific gravity of the soil of these samples was also determined in the laboratory. The results are given in bore log chart for the boreholes.

#### (iii) Shear Strength Tests:

These tests were performed as per IS: 2720 (Part-13)-1986 and IS: 2720 (Part-11)-1993. The Direct Shear tests and triaxial shear strength tests were carried out using at least three undisturbed / remoulded samples in each case. Strength envelopes were plotted to determine the values of shear strength parameters  $C_0$  and  $\phi_0$ . These values are also given in the respective bore log charts.

#### (iv) Consolidation Tests:

These tests were carried out as per IS: 2720(Part-15)-1986. Consolidated tests were performed on undisturbed/remoulded samples from the given location as per above-mentioned IS code. The value of compression index Cc was obtained from a plot between void ratio (e) on natural solidated and pressor (p) on logarithmic scale.

Civil Engineering Department

#### 3.0 TEST RESULTS

The results of various tests conducted at site and in the laboratory are given in the bore-log charts. The location of borehole was decided by the agency.

#### 4.0 DISCUSSION OF TEST RESULTS

The results for the various boreholes are discussed as follows.

### 4.1 Strata and their Engineering Properties:

The soil classification according to IS classification indicates presence of four types of strata viz. CI, CL, ML & SM. The general characteristics associated with these types of strata are given below:

#### 4.1.2 Stratum CI:

This stratum consists of silty clay with medium plasticity and also experience high volume changes when subjected to moisture fluctuations. Sometimes a little moisture can produce high differential settlements. This type of soil is more or less impervious in nature. This stratum was found between 6.0 m to 7.2m in bore hole No. 1. In bore hole No. 4, it was present at the top up to 2.5m depth, between 9.0m to 17.5m and at the bottom from 21.0m to depth of exploration of 30.0m. This stratum was also found at bottom depth from 18.0m to depth of exploration of 20.0m in bore hole No.5.

#### 4.1.3 Stratum CL:

This type of soil is characterised by presence of inorganic clays of low plasticity. These soils have very low permeability and low compressibility. This stratum was encountered at middle dapth between 6.5m to 13.5 in bore hole No.5 only.

#### 4.1.4 Stratum ML:

This stratum is characterized by presence of inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with none to low plasticity. It has none to low dry strength and exhibit a quick reaction. This stratum was observed with varying thicknesses at various depths in all the investigated bore holes. It has good bearing value in the natural condition. In general, this foundation soils are of semi-pervious to impervious in nature and it is suggested that measures to control permeability may be considered because it is susceptible to liquefaction.

#### 4.1.5 Stratum SM:

The stratum SM contains fine sand with appreciable percentage of fines which are predominantly sand size. This strata is semi-impervious, has fairly good strength when compacted even in saturated condition. Further its susceptibility to volume changes such as shrinkage & swelling is little. At present site, this stratum was present only in bore hole No.6 between 13.0m to 17.0 m depth.

#### 4.2 N - Value:

Standard penetration tests have been carried out and N-values are determined at every 1.5m depth and these have been reported in the bore log chart. At the present site N — values indicated that the consistency of soil is stiff at shallow depths and hard consistency at lower depths.

### 5.0 BEARING CAPACITY AND RECOMMENDATIONS

The sub soil investigation work was carried out to find the soil parameters in order to design the foundation for Multi-storeyed buildings (EWS & LIG) of U.P. Avas Avam Vikas Parishad, Construction Division-14, Lucknow at Awadh Vihar Yojana, Sector-05, in Lucknow District. Four boreholes (Nos. 1, 3, 5 & 6) were investigated at site up to a depth of 20.0m & the other two bore hole (Nos. 2 & 4) up to a depth of 30.0m from the existing ground level.

At the present site, in bore hole No. 1, non-plastic silty soil (ML) was found with varying thicknesses at different depths accept from 6.0m to 7.2m depth where clay with medium compressibility (CI) was observed.

In bore hole Nos. 2 and a non-plastic site (ML) was found with varying thicknesses at various depths proughout the investigated depth.

In bore hole No. 4, clay with medium compressibility (CI) was present at top up to 2.5 m followed by non-plastic silty soil (ML) up to 9.0m depth. After this stratum, clay with medium compressibility (CI) was found up to 17.5m. Again, non-plastic silty soil (ML) was found up to 21.0m depth followed by clay with medium compressibility (CI) up to depth of exploration of 30.0m.

In bore Hole No. 5, non-plastic silty soil (ML) was present at the top up to 6.5m followed by clay with low compressibility (CL) up to 13.5m depth. After this stratum, again non-plastic silty soil (ML) was found up to 18.0m depth followed by clay with medium compressibility (Cl) up to depth of exploration of 20.0m.

In bore hole No. 6, non-plastic silty soil (ML) was present at the top up to 13.0m with variable thicknesses from existing ground level followed by non-plastic silty sand (SM) up to 17.0m depth. After this stratum, again non-plastic silty soil (ML) was present up to depth of exploration of 20.0m.

At the present site, water table was encountered at a depth of 14.0m in all the investigated bore holes.

Based on soil test results and N-values, the net safe bearing capacity / allowable bearing pressure for a raft foundation placed at a depth of  $1.5 \, m$ ,  $3.0 \, m$  and  $4.5 \, m$  below existing ground level comes out to be  $11.0 \, t/m^2$ ,  $13.0 \, t/m^2$  and  $15.0 \, t/m^2$  respectively with respect to settlement. The allowable settlement was considered as  $50 \, mm$ .

Typical curves of grain size distribution, tri-axial test and direct shear test for each bore hole are presented after the bore-log charts.

Final load on foundation would be determined by the structural designer and final type & dimensions of the foundation for multi storeyed buildings for Figure 2.1.1G would be decided by the design engineer using bore log charts.

(Er. Utkarsh Tiwari) Director

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ivi) Engineering Department

	4	Site:	ПРАМ	.P., Luckno		North Shed N	111 d No. 62	ia E , Indi	ngin Istria BORE	eers'   Estat   LOG	Lab e, M.N CHAR	T.I.N.I.T	onsi Alla		ts i			
	5					Structure: EW Particle Size Distribution			EWS,	Multi S			4				Bore	Hole No.: 1
	Depth	SPT Value		Soil Description	Chessification		%			Natural Moisture	Bulk Unit	Dry Unit Weight	Specific Gravity	Atter	berg's Lim in %	its Shear	r Strength ameters	Compression Index
	0.0	-		So.]	Ö	Gravel	Sand	Silt,	Clay	%	gm/ec		Specific	LaLa	P.L.	C <sub>a</sub> kg/cm <sup>2</sup>	φ <sub>a</sub>	(C <sub>c</sub> )
	1.5 3.0 4.5	9 18 13	Non-P	Pastic Silty Suit	ML.	1.56	6.76	88.75	2.93	10.6	1.94	1.75	2.64	No	n-Plustic	0.03	Degree 18	150
	7.2	18	Clay v	yith Medium	CI	0.00	0.20	71.57	28.23	21.4	2.15	1.00						
		17								21.4	-13	1.77	2.70	39	19 20	0.89	6	0.195
	9.0 10.5 12.0 13.5	20 17 28	Non-Pla	istic Silty Suit	NL	0.78	28.02	70.06	1.14	20.3	2.16	1.80	2.64	Non-	Plastic	0.02	19	-++
	15.0 16.5 18.0	11 34 37 41			ML	0.02	N Partis		Section 182	21.4	2,30	1.89 2	1.64	Non-P	lustie neur's z	0.05	15	Desg
L	20.0	r Table:		femulis chu	Jul 40	* :   E	Male of the second	incerior incer	PEV X			Ahau	1	The Civil	Enginering	Colonia		

