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DIGITALLY VERIFIED RECORD

Project Name	PLAN SHOWING THE PROPOSED RESIDENTIAL APARTMENT BUILDING IN T.S .Nos. 318/3, 330, 331/2, WARD No. H, BLOCK No. 9 AT COIMBATORE TOWN, R.S.PURAM, COIMBATORE SOUTH TALUK, COIMBATORE CORPORATION.			Structural Consultant: SG STRUCTURAL ENGINEERS ENGINEERS/ARCHITECTS 53, M.A. Palaniswamy Street, K.K. Pudur, Coimbatore-38 PH: 0422-2450245, 2453323. Email:profgsv1968@gmail.com www.sgstructurals.com	
Client	M/s. SHRI ANEKAS VENTURES LLP				
	COIMBATORE.				
Doc. No	SGSE-HM-2026			PREPARED	CHECKED
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DESIGN BASIS REPORT

PROPOSED RESIDENTIAL APARTMENT BUILDING IN T.S .Nos. 318/3, 330, 331/2, WARD No. H, BLOCK No. 9 AT COIMBATORE TOWN, R.S.PURAM, COIMBATORE SOUTH TALUK, COIMBATORE CORPORATION.

Dr.G.S.VENKATASUBRAMANI
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Professional Engineer,
Chartered Civil Engineer & Approved Valuer,
53, M.A Palanisamy Street, K.K. Pudur Post
Coimbatore - 641 038

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1.0 SCOPE:

This Document covers the requirement of RCC structural Design of **PROPOSED RESIDENTIAL APARTMENT BUILDING IN T.S .Nos. 318/3, 330, 331/2, WARD No. H, BLOCK No. 9 AT COIMBATORE TOWN, R.S.PURAM, COIMBATORE SOUTH TALUK, COIMBATORE CORPORATION.** For M/s SHRI ANEKAS VENTURES LLP, COIMBATORE.

2.0 DETAILED DESCRIPTION FOR APARTMENT BUILDING:

S. No.	Description	Description
1	Building Size	
1.1	Width of Building	13600 mm
1.2	Length of Building	48800 mm
2	Column Spacing	As per architectural drawings
3	Floor height	
	Stilt floor roof	3270mm
	Up to First floor roof	3760mm
	Above First floor roof	3760mm
4	Headroom floor height	2500mm
5	Staircase	RCC Staircase with waist slab.

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3.0 TECHNICAL SPECIFICATION:

S. No.	Parameter	Specifications
1.	**Type of Building**	Rigid Frame Type
2.	**Design Consideration**	Designed as per IS CODE (Refer: 6.0).
3.	**Geometrical Requirements of Components**	
3.1	Beams	RCC
3.2	Columns	RCC
3.3	Slab	RCC
4.	**Grades of Material**	
4.1	Grade of concrete	M35 (Upto Stilt Floor Roof) ,M25 (For Above Stilt Floor Roof)
4.2	Grade of steel	Fe550

4.0 GENERAL:

- All design calculations are carried out in SI System.

5.0 SITE LEVELS:

- FFL is (+) 0.610m level from FGL as per architectural drawing.

6.0 STANDARDS ANDCODES:

Designs are in accordance with the latest editions of the Standards and Codes of Practice as described below:

- IS: 456-2000 - Code of Practice for Plain & Reinforced concrete.
- IS: 875-1987 & 2015 (Part1 to 5) - Code of Practice for Design loads (other than Earthquake) for Buildings and structures.
- IS: 1893 –(Part-1)-2016- Criteria for Earthquake resistant design of structures.
- IS: 13920-2016– Ductile detailing of reinforced concrete structures subjected to seismic force.

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7.0 LOADINGS:

- Load and Load combinations are generally as per IS: 875(Part 1 to 5)-1987& 2015, unless noted otherwise.

Dead Loads:

Dead Loads are generally taken as per unit weights given in IS: 875 (Part 1)-1987 and as per construction elements like RC slab, floor finishes, screeds, waterproofing, masonry wall, etc.

The following table gives the density of the major materials.

MATERIALS	DENSITY
PCC	24.0
Reinforced concrete	25.0
Brick work & Light weight bricks	20.0 & 8.0

BRICK MASONRY LOAD CALCULATION

Type-I (Basement Wall Load)

Height of the wall	=	0.610	m
Width of the wall	=	0.23	m
Unit Weight of the Brick Masonry	=	20.00	KN/m^3
Effective Height of the wall	=	0.610	m
Weight per meter length of wall	=	2.806	KN/m
Total UDL	=	2.806	KN/m

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Type-II (Main wall 230mm thick)

1. First floor, Second Floor, Third Floor

Height of the wall from beam plinth beam top	=	3.88	m
Width of the wall	=	0.23	m
Unit Weight of the Brick Masonry	=	20.00	KN/m^3
Assumed average height of beams	=	0.3	m
Effective Height of the wall	=	3.58	m
Weight per meter length of wall	=	16.5	KN/m
Total UDL	=	16.5	KN/m

2. First floor, Second Floor, Third Floor

Height of the wall from beam plinth beam top	=	3.88	m
Width of the wall	=	0.115	m
Unit Weight of the Brick Masonry	=	20.00	KN/m^3
Assumed average height of beams	=	0.3	m
Effective Height of the wall	=	3.58	m
Weight per meter length of wall	=	8.25	KN/m
Total UDL	=	8.25	KN/m

Type-IV (Parapet wall 230mm thick)

1.Terrace Parapet wall

Height of the wall from beam top	=	0.91	m
Width of the wall	=	0.23	m
Unit Weight of the Brick Masonry	=	20.00	KN/m^3
Effective Height of the wall	=	0.91	m
Weight per meter length of wall	=	4.168	KN/m
Total UDL	=	4.168	KN/m

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FLOOR LOAD CALCULATIONS

DEAD LOADS:

Ground Floor and First floor Roof :

(i) Self weight of slab (Thk of slab (0.150)* 25 KN/m^3)	=	3.75 KN/m^2
(ii) Floor finish, Ceiling finish & Fixtures	=	1.5 KN/m^2
(iii) Total dead load on slab	=	5.25 KN/m^2

Terrace floor Roof :

(i) Self weight of slab (Thk of slab(0.150)* 25 KN/m^3)	=	3.75 KN/m^2
(ii) Floor finish, Ceiling finish & Fixtures	=	2.25 KN/m^2
(iii) Total dead load on slab	=	6.0 KN/m^2

LIVE LOADS:

Live Loads are considered as per IS: 875 – 1987 Part 2.

The load is considered as indicated below

i) Rooms	=	2.00 KN/m2
ii) Staircase	=	4.00 KN/m2
iii) Terrace	=	1.50 KN/m2

Seismic Loads:

The Seismic loads on the structure are calculated as per IS: 1893 – 2016. The zone factor considered as indicated below.

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- Location of structure: Coimbatore, India.
- Seismic zone: Zone III
- Z=Seismic zone factor: 0.16
- I=Importance factor: 1.1
- R=Response reduction factor: 5

Load Combinations:

- The load combinations are giving for the most critical conditions on foundations, structures or individual members shall be taken into account.
- The load combination indicated in IS:875 (Part 5)-1987& IS: 1893 – 2016 is adopted for the design of civil / structural members. The load combination with corresponding load factor is indicated below.

LIMIT STATE OF SERVICEABILITY:

LOAD COMB 101 1.0DL+1.0LL+1.0RLL
LOAD COMB 102 1.0DL+1.0EQ+X
LOAD COMB 103 1.0DL+1.0EQ-X
LOAD COMB 104 1.0DL+1.0EQ+Y
LOAD COMB 105 1.0DL+1.0EQ-Y
LOAD COMB 106 1.0DL+1.0EQ+Z
LOAD COMB 107 1.0DL+1.0EQ-Z
LOAD COMB 108 1.0DL+0.8EQ+X+0.8LL+0.8RLL
LOAD COMB 109 1.0DL+0.8EQ-X+0.8LL+0.8RLL
LOAD COMB 110 1.0DL+0.8EQ+Y+0.8LL+0.8RLL
LOAD COMB 111 1.0DL+0.8EQ-Y+0.8LL+0.8RLL
LOAD COMB 112 1.0DL+0.8EQ+Z+0.8LL+0.8RLL
LOAD COMB 113 1.0DL+0.8EQ-Z+0.8LL+0.8RLL

LIMIT STATE OF STRENGTH:

LOAD COMB 201 1.5DL+1.5LL+1.5RLL

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LOAD COMB 202 1.5DL+1.5EQ+X
LOAD COMB 203 1.5DL+1.5EQ-X
LOAD COMB 204 1.5DL+1.5EQ+Y
LOAD COMB 205 1.5DL+1.5EQ-Y
LOAD COMB 206 1.5DL+1.5EQ+Z
LOAD COMB 207 1.5DL+1.5EQ-Z
LOAD COMB 208 1.2DL+1.2EQ+X+1.2LL+1.2RLL
LOAD COMB 209 1.2DL+1.2EQ-X+1.2LL+1.2RLL
LOAD COMB 210 1.2DL+1.2EQ+Y+1.2LL+1.2RLL
LOAD COMB 211 1.2DL+1.2EQ-Y+1.2LL+1.2RLL
LOAD COMB 212 1.2DL+1.2EQ+Z+1.2LL+1.2RLL
LOAD COMB 213 1.2DL+1.2EQ-Z+1.2LL+1.2RLL
LOAD COMB 214 0.9DL+1.5EQ+X
LOAD COMB 215 0.9DL+1.5EQ-X
LOAD COMB 216 0.9DL+1.5EQ+Y
LOAD COMB 217 0.9DL+1.5EQ-Y
LOAD COMB 218 0.9DL+1.5EQ+Z
LOAD COMB 219 0.9DL+1.5EQ-Z

Where,

DL - Dead Load

LL - Live load

EQX, EQY, EQZ - Earthquake Load

8.0 METHOD OF DESIGN:

Response Spectrum Analysis is carried out using Staad Pro 2024 Software and load combinations giving the most critical conditions are considered for the design of foundations.

- Sub structure is designed for critical load combination by manual calculation.
- Reinforced cement concrete - Design as per IS: 456 – 2000 using STAAD Pro 2024 Software.

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9.0 SOIL INFORMATION:

Soil type is considered as per soil investigation report

- Soil investigation report from M/s. Geodesign India Private limited, Coimbatore-641038. Dated: 23.06.2026 – 24.06.2026. **Ref: GEO – G - 073 – 2025 – 2026**
- Depth of foundation shall be 1.8m from existing ground level.
- SBC of soil is taken as 360 kN/m^2 at 1.8m existing ground level.

10.0 DESIGN:

10.1 FOUNDATIONS:S

Foundation is designed to carry all the loads from super-structure.

10.2 RCC COLUMNS:

RCC columns are designed using the STAAD pro analysis software for critical load conditions and are tabulated in the provided drawing.

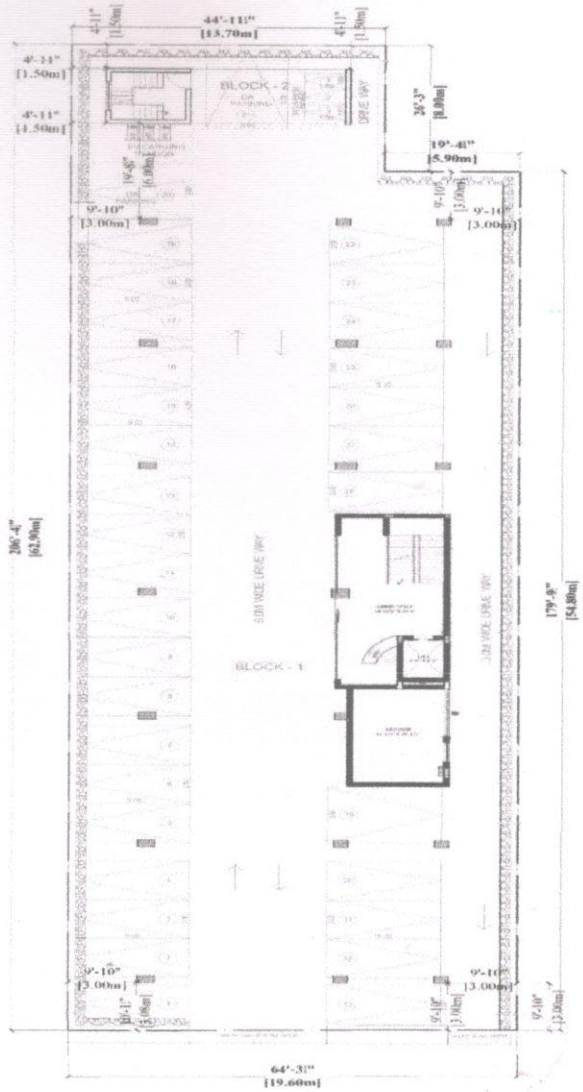
10.2 ROOF SLABS AND BEAMS:

All beams are designed using STAAD pro analysis software for critical load conditions. Slab design is carried out manually.

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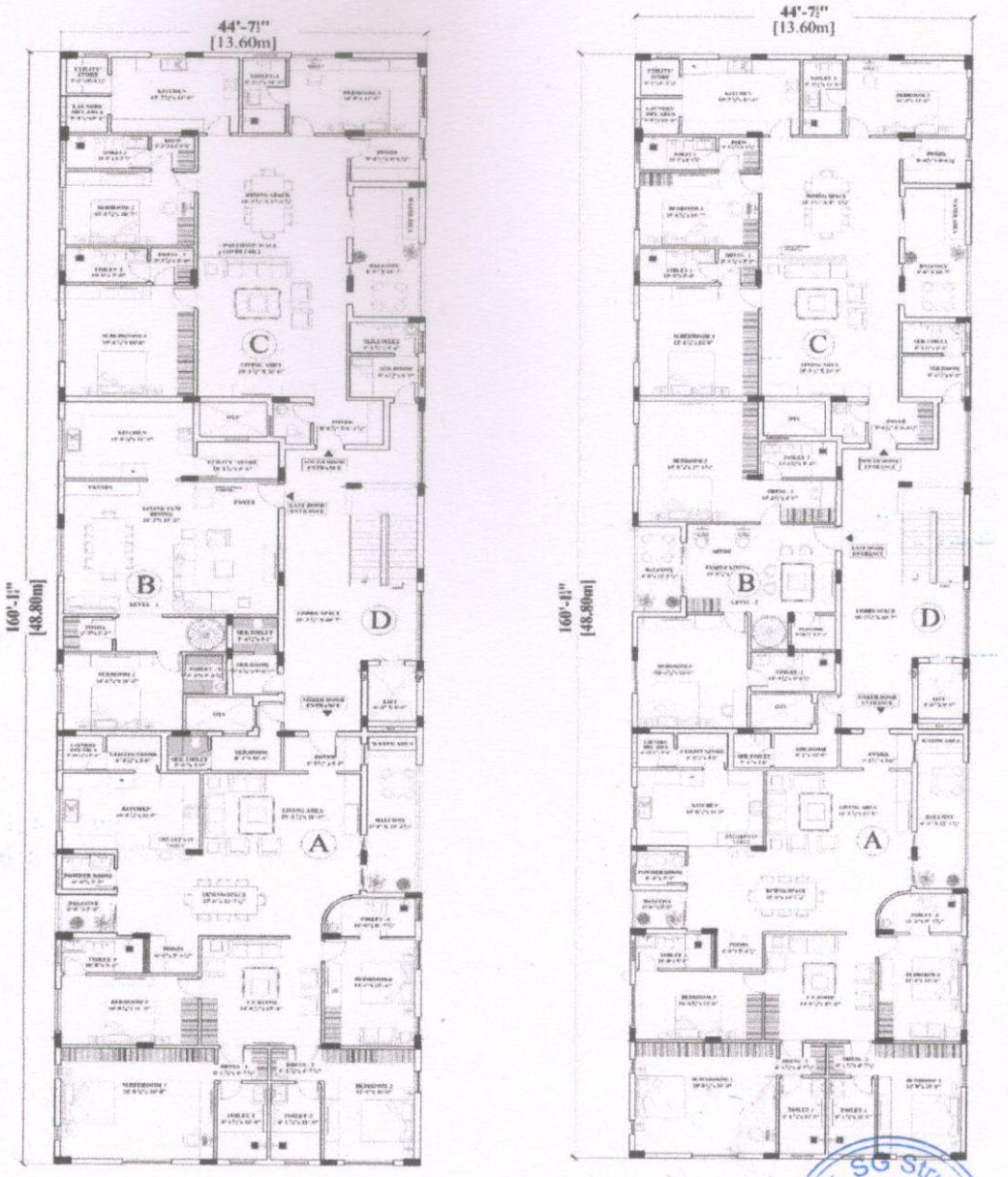
11.0 FLOOR PLAN, ELEVATION AND SECTION:



STILT FLOOR PLAN
PT BEAM @STILT FLOOR

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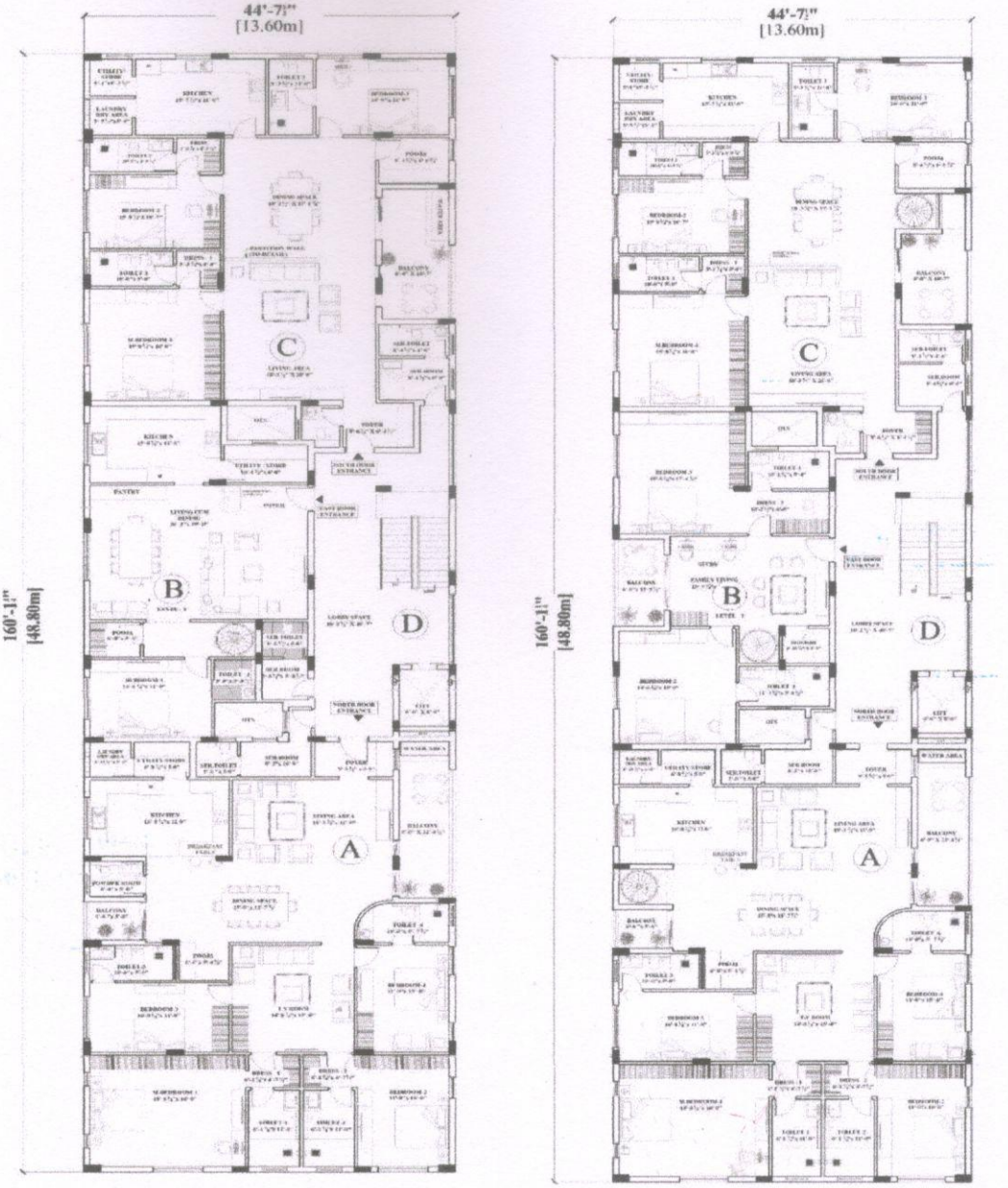
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FIRST AND SECOND FLOOR PLAN

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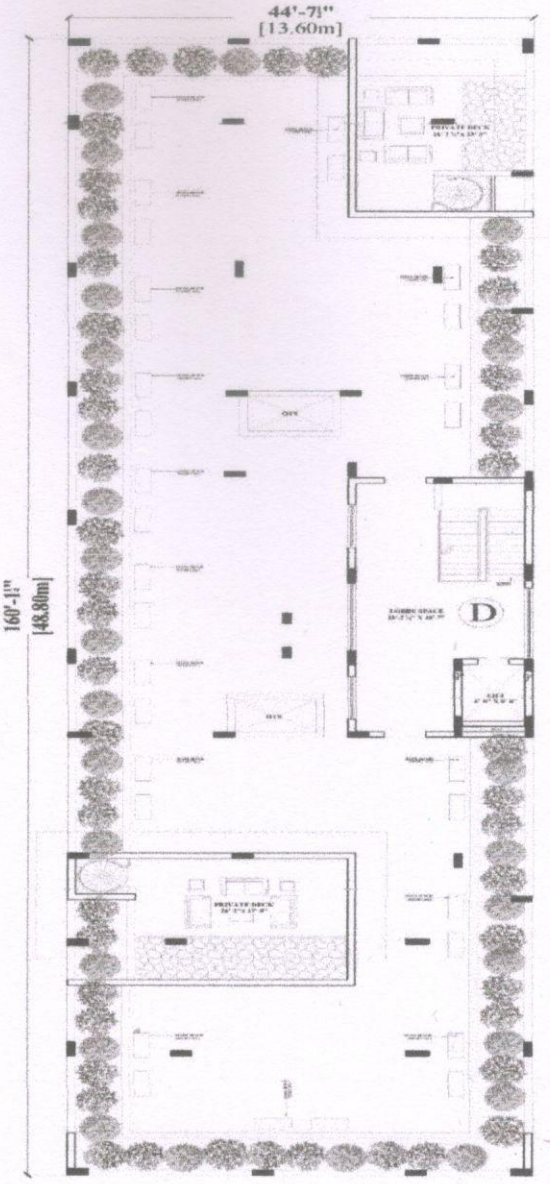
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THIRD AND FOURTH FLOOR PLAN

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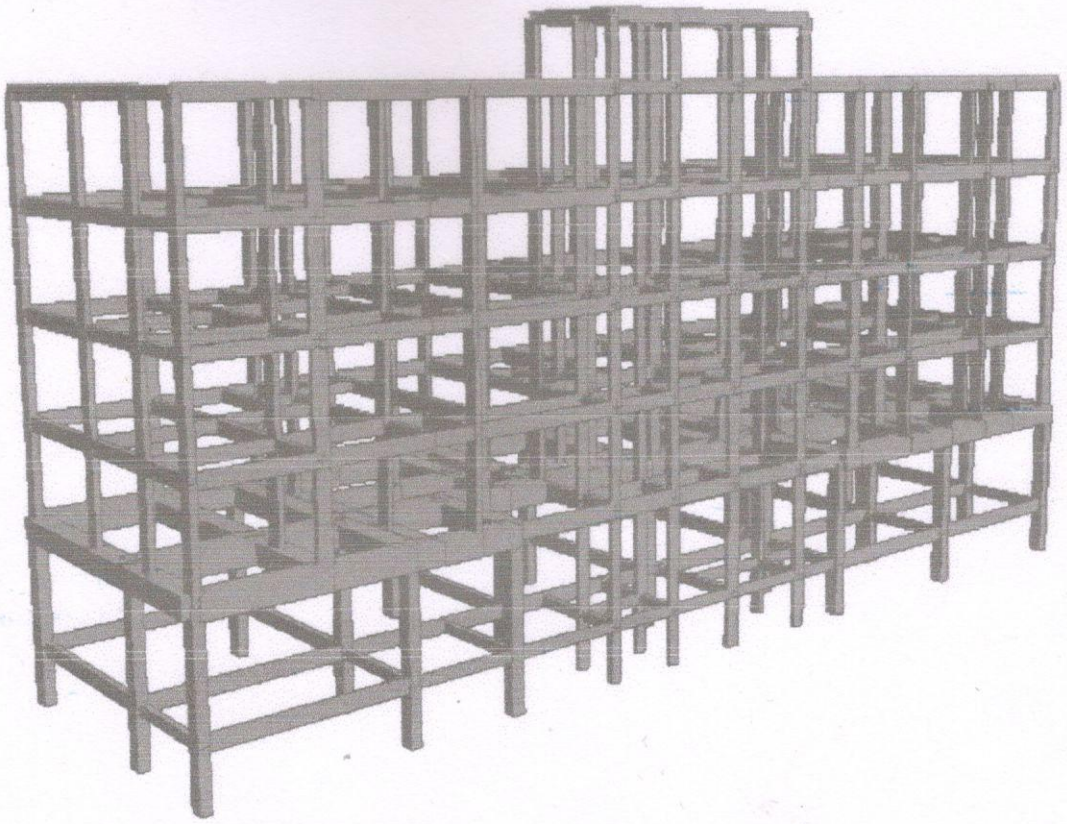


TERRACE FLOOR PLAN

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12.0 STAAD IMAGE:



13.0 DESIGN CALCULATION:

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13.1 FOOTING DESIGN

GENERAL DATA

Design Method	=	Limit-State of IS:456-2000
Unfactored axial load (without selfwt)	=	1820.43 kN
Unfactored moment about X (Anticlock +ve)	=	16 kN.m
Unfactored moment about Z (Anticlock +ve)	=	2.3 kN.m
Net Safe bearing capacity of soil @ 1.8 m below Finished grade lvl	=	360 kN/m²
Concrete mix	=	M 35
Density of concrete	=	25 kN/m³
Density of soil	=	18 kN/m³
Factor of Safety	=	1.50
Provide size of footing	=	2.74 x 2.43 x 0.75 m
Size of Column	=	0.75 x 0.45 m
Depth of footing below ground level	=	1.8 m
Clear cover to steel	=	75 mm

VERTICAL LOAD:
Weight of entire foundation

(2.74*2.43*0.75*25)

= 124.84 kN

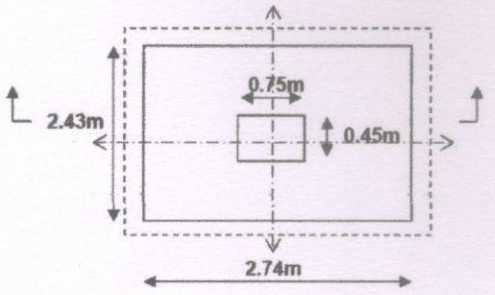
Weight of soil

(2.74*2.43*1.05*18)

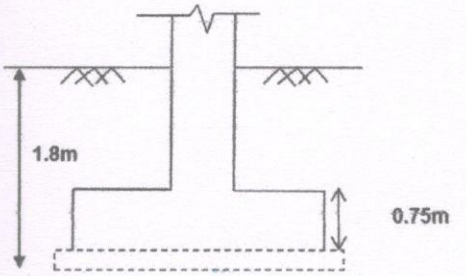
= 125.84 kN

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Project Name	PLAN SHOWING THE PROPOSED RESIDENTIAL APARTMENT BUILDING IN T.S .Nos. 318/3, 330, 331/2, WARD No. H, BLOCK No. 9 AT COIMBATORE TOWN, R.S.PURAM, COIMBATORE SOUTH TALUK, COIMBATORE CORPORATION.			Structural Consultant: SG STRUCTURAL ENGINEERS ENGINEERS/ARCHITECTS 53, M.A. Palaniswamy Street, K.K. Pudur, Coimbatore-38 PH: 0422-2450245, 2453323. Email:profgsv1968@gmail.com www.sgstructurals.com	
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PLAN



SECTION

DESIGN CALCULATION

CHECK FOR BEARING PRESSURE:

Total Vertical Load

a) Weight of foundation = 124.84 kN

b) Weight of soil = 125.84 kN

c) Vertical load from structures = 1820.4 kN

TOTAL DOWNWARD LOAD = 124.84+125.84+1820.43
= **2071.1 kN**

Section Modulus about XX (Zxx) = 2.74*2.43^2/6
= 2.697 Cum

Section Modulus about YY (Zyy) = 2.43*2.74^2/6
= 3.041 Cum

Actual base pressure = (2071.11/2.74/2.43)+(ABS(16)/2.697)+(ABS(2.3)/3.041)

qmax = **317.75 kN/m²**

qmin = **304.37 kN/m²** **Hence Safe**

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Max Net Pressure, qmax-γ H = 317.75-1.8*18

= **285.35 kN/m²**

< **360 kN/m²**

Hence Safe

DESIGN OF FOOTING SLAB:

Maximum base pressure = 317.75 kN/m²

Maximum overhang of pad = (2.74-0.75)/2 =

= 1 m

Pressure due to over burden of soil & pad = (1.8-0.75)*18+0.75*25

= 37.65 kN/m²

Base pressure at face of the pedestal = = (304.372700399455+((317.75-304.372700399455)/2.74*(2.74-

= 312.87 kN/m²

Maximum cantilever moment at the face of pedestal = 0.5*(317.75+312.87)*1*(1/3*(312.87+2*317.75)/(312.87+317.75))-37.65*1*(1/2)

= 139.240 kNm

Overall depth provided 750 mm

Diameter of reinforcement bar = 10 mm

Effective depth provided = 750-75-10/2

= 670 mm

Mu/bd² = 1.5*139.24*1000000/(1000*670^2)

= 0.4653

Percentage of reinforcement required (Pt) = 0.119

(As per Table 2 of SP16)

A_{st} required = 0.119/100*(1000*670)

= 797.3 mm²

Minimum reinforcement = 0.12/100*(1000*670) = 804 mm²

Provide 12 @ 100 c/c m both ways at bottom.

(A_{st} provided = 1131 mm²)

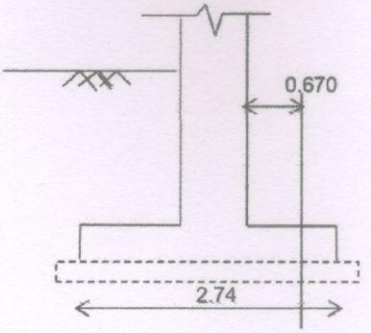
Pt provided = 100*1131/(1000*670)= 0.169 **mm² Hence Safe**

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CHECK FOR SHEAR

One Way Shear



Overhang of footing beyond critical section for shear	=	(2.74-0.75)/2-0.67 0.325 m
Maximum base pressure	=	317.75 KN/m²
Depth at Critical Section	=	0.67 m
Base pressure at a distance "d" from face of the pedestal =	=	(304.372700399455+((317.75-304.372700399455)/2.74*(2.74- 314.48 KN/m²
Downward force from footing	=	37.65 KN/m²
Shear force at critical section V	=	0.5*(317.75+314.48)*0.325-37.65*0.325 90.501 kN/m
Shear stress τ_v	=	1.5*90.501*1000/(1000*1000*0.67)
	=	0.2026 N/mm²
τ_c (Table 19 of IS 456-2000)	=	0.37 N/mm² **Hence Safe**

Two Way Shear

Perimeter of the critical section around the pedetal at a distance d/2 from face of pedestal	=	((0.75+2*(670/2/1000))*2)+((0.45+2*(670/2/1000))*2)
	=	5.080 m
Depth at Critical Section	=	0.67 m
Allowable punching shear stress		
$\tau_c' = k_s \cdot \tau_c$		
$ks = 0.5 + \beta_c$		
$\beta_c = 0.75/0.45 = 1.66667$		
ks	=	0.5 + 2
	=	2.2
ks should not be greater than 1	=	1
$\tau_c = 0.25 \sqrt{f_{ck}}$	=	0.25 x √ 35
	=	**1.479 N/mm²**
Allowable maximum load (unfactored) on pedestal from punching shear point of view	=	1.479*(5.08*1000)*0.67/1.5
	=	3355.995 kN
Total Downward load	=	1820 kN

Hence Safe

13.2 COLUMN DESIGN

Project Name	PLAN SHOWING THE PROPOSED RESIDENTIAL APARTMENT BUILDING IN T.S .Nos. 318/3, 330, 331/2, WARD No. H, BLOCK No. 9 AT COIMBATORE TOWN, R.S.PURAM, COIMBATORE SOUTH TALUK, COIMBATORE CORPORATION.			Structural Consultant: SG STRUCTURAL ENGINEERS ENGINEERS/ARCHITECTS 53, M.A. Palaniswamy Street, K.K. Pudur, Coimbatore-38 PH: 0422-2450245, 2453323. Email:profgsv1968@gmail.com www.sgstructurals.com	
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REV. NO	0	DATE	18.06.2026	MP	VS

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================================================================================
                IS-456   L I M I T   S T A T E   D E S I G N
                B E A M  N O.   425   D E S I G N  R E S U L T S

      M25                      Fe500 (Main)                 Fe500 (Sec.)

    LENGTH:  1600.2 mm      SIZE:   230.0 mm X  530.0 mm   COVER: 30.0 mm

  DXF IMPORT OF 1                                          -- PAGE NO.  575

                        SUMMARY OF REINF. AREA (Sq.mm)
--------------------------------------------------------------------------------
SECTION       0.0 mm       400.0 mm      800.1 mm      1200.1 mm     1600.2 mm
--------------------------------------------------------------------------------
 TOP          1229.06       777.77        373.69        193.54          0.00
REINF.       (Sq. mm)      (Sq. mm)      (Sq. mm)      (Sq. mm)      (Sq. mm)

BOTTOM        170.77          0.00          0.00        193.54        354.24
REINF.       (Sq. mm)      (Sq. mm)      (Sq. mm)      (Sq. mm)      (Sq. mm)
--------------------------------------------------------------------------------

                      SUMMARY OF PROVIDED REINF. AREA
--------------------------------------------------------------------------------
SECTION       0.0 mm       400.0 mm      800.1 mm      1200.1 mm     1600.2 mm
--------------------------------------------------------------------------------
 TOP          4-20d         3-20d         2-20d         2-20d         2-20d
REINF.     1 layer(s)    1 layer(s)    1 layer(s)    1 layer(s)    1 layer(s)

BOTTOM       3-10d         3-10d         3-10d         3-10d         5-10d
REINF.     1 layer(s)    1 layer(s)    1 layer(s)    1 layer(s)    1 layer(s)

SHEAR    2 legged  8d  2 legged  8d  2 legged  8d  2 legged  8d  2 legged  8d
REINF.  @ 130 mm c/c  @ 135 mm c/c  @ 140 mm c/c  @ 135 mm c/c  @ 155 mm c/c
--------------------------------------------------------------------------------

SHEAR DESIGN RESULTS AT DISTANCE d (EFFECTIVE DEPTH) FROM FACE OF THE SUPPORT
--------------------------------------------------------------------------------

SHEAR DESIGN RESULTS AT    640.0 mm AWAY FROM START SUPPORT
  VY =    169.35 MX =      6.67 LD=     4
  Provide 2 Legged  8d  @ 135 mm c/c

================================================================================
```

13.3

BEAM DESIGN

SG Structural Engineers Coimbatore

Beam Group Name: B5
Beam No. (From Staad): 425

The steel requirement for B5 is

At Top = 1229.06 mm^2

At bottom = 354.24 mm^2

Adopt 3 nos. of Y20 bars + 3 nos. of Y20 bars (Extra bars) at Top.

Adopt 3 nos. of Y20 bars at Bottom.

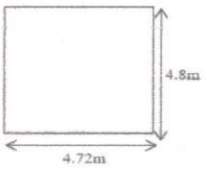
Adopt 2 legged stirrups with Y8 at 125 mm C/C (at end) & Y8 at 150 mm (at mid) as spacing.

13.4 SLAB DESIGN

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GENERAL DATA

Shorter dimension of slab, l_x		4.72	m
Longer dimension of slab, l_y		4.80	m
	l_y/l_x	1.02	Twoway Slab
Assuming thickness of slab		150	mm
Consider width		1000	mm
	f_{ck}	25	kN/m^2
	f_y	550	kN/m^2



Type of panel -	Interior panel	
Clear cover to reinforcement	20	mm

Loads

Live load	2	kN/m^2
Dead load	3.75	kN/m^2
Floor Finish	1.5	kN/m^2
Total load	7.25	kN/m^2
Fact. load	10.88	kN/m^2

Typical design calculation

Mu = Coeff*W_u*l_x*l_x (Coefficient from IS:456)

= 0.032*10.88*4.72*4.72

= 7.76 kN-m

Mu /bd^2 = (7.76*10^6)/(1000*125^2)

0.497 N/mm^2

P_t = 0.207685818 (From SP-16, Table-3)

Ast = (0.207685818181818*1000*125)/100

= 259.6072727 mm^2

Spacing = (3.14*12*12/4/259.607272727273)*1000

435.43 mm

Short span direction	Coeff	Mu (kNm)	Mu /bd2	P_t	Ast	Dia	Spacing
Negative moment @ continuous edge	0.032	7.76	0.496	0.116908	146.1355336	12	773.53
Positive moment @ midspan	0.024	5.82	0.37	0.08715	108.9377689	12	1037.66

Long span direction	Coeff	Mu (kNm)	Mu /bd^2	P_t	Ast	Dia	Max. Spacing
Negative moment @ continuous edge	0.032	7.76	0.50	0.116908	146.1355336	12	773.53
Positive moment @ midspan	0.024	5.82	0.37	0.08715	108.9377689	12	1037.66

Reinforcement provided

Ast provided in short span =	753.60	mm^2	Ast provided in long spa	753.60	mm^2
Spacing provided in short span =	150.00	mm	Spacing provided in lon	150.00	mm
P_t provided in short span =	0.60		P_t provided in long span	0.60	
Hence spacing is safe			Hence spacing is safe		

Minimum effective depth required dreqd. = 47.42 mm (SQRT(MAX(Mu/0.138*fck*1000)))*1000

Minimum effective depth provided dprov. = (150-20-10/2)

125 mm

Minimum reinforcement Ast min = (0.12*1000*125/100)

= 150 mm^2

Depth provided is greater than minimum effective depth required

Hence safe

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Check for shear

Maximum shear force @ support $Vu = Wl_e/2$

$= (10.88*4.72)/2$

$= 25.68$ kN

Actual shear force $\zeta v = Vu / bd$

$= (25.68*1000)/(1000*125)$

$= 0.21$ N/mm^2

% of tension rft. provided in support pt $= 0.60$

IS:456-2000 Table-19

Allowable shear stress $\zeta c = 0.48$

As per IS:456,cl:40.2.1.1 k value for slab = 1.3

Design shear stress for concrete $k \times \zeta c = 0.624$

Actual shear stress < Design shear stress

Hence safe

Check for deflection

Type of slab Continous

Allowable span / depth ratio = l/d = 20 [As per IS:456-2000, Cl:23.2.1(a)]

Percentage of tension reinforcement = 0.60

Steel stress of service loads fs= 0.58fy(Area of steel required/Area of steel provided)

46.11 N/mm^2

Corresponding comp. rft.

Percentage of comp. reinforcement = 0.60

Modification factor for tension rft. F1= 2.00 (From fig:4 ,IS:456-2000)

Modification factor for comp. rft. F2= 1.100 (From fig:5 ,IS:456-2000)

Modified span/depth ratio = l/d x F1x F2

44

Actual span/ depth ratio = 37.76

Actual span/ depth ratio < Modified span / depth ratio

Hence safe

At Short span direction

Provided T12@ 150mm c/c

At Longer span direction

Provided T12@ 150mm c/c

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What land actually changed hands for around this plot, taken from the registered deeds.
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