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S.UDAYAKUMAR,
B.E(CIVIL), M.E (STRUC.),MIE(I), C.ENG (I),

REGISTERED STRUCTURAL ENGINEER GRADE-1
(RSE-101312020) & (SE/GR-1/2021/01/286)
GREATER CHENNAI CORPORATION & CMDA
PLOT #5, DOOR #2, SAPTHAGIRI NAGAR MAIN RD,
NEHRU ST., SHOLINGANALLUR, CHENNAI-119.

STABILITY CERTIFICATE

(To be furnished while filling application for registration of building)

It is certified that the proposed construction **of Anantha Lakshmi Apartments, Type of structure: R.c.c Framed structure Stitt Floor Parking +5 Floors Residential Building, No 68, Lakshmi Apartments, Ambattur Industrial Estate Road, Anna Nagar West Extn Scheme, Chennai-600101, Comprised In Old S.No:284 Part, 288/2 Part (As Per Document) 253/14 Part. 284 Part. 285 Part, 288 Part. T.S.No:2/5, 2/8, Ward-1, Block No.58 of Padi Village Within The Limit Of Greater Chennai Corporation**. is designed to resist earthquake. Check has been made and found safe and I hereby certify that:

1. The minimum grade of concrete is **M25.**
2. The design and analysis using the code of practice for plain and reinforced concrete as per IS 456, Design Loads as per **IS 875:1987 (Part II) for Imposed Loads** and Design of Earthquake resistant structure as per **IS 1893:2002 (Part I) for Seismic force** are carried out.

The building will be safe and sound when used for the purpose for which it is designated.

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Stamp and Signature

Encl: Structural Design Calculation

DESIGN LOAD CALCULATION

1. Client,	: M/S QUALITY SHELTER CHENNAI
2. Location of the building	: Proposed Construction of Residential building (Silt +5)At No,68,Lakshmi Apartment ,Anna Nagar West Extension Chennai
3. Soil Report	: silty sand
4. Safe Bearing capacity of the soil as per soil report(Geo mines Engineering pvt ltd)	
a. Soil	: Silty sand – 140 t/sqm at 20.00 m Depth
b. Type of construction	: RCC column with Framed Structure
c. Foundation	: Pile foundation.
5. Loading standards as per I.S code	: IS 875 (part 2)1987
a. Live load for Residential buildings as per, IS 875 (part2) 1987 clause 3.1.1, table 1-IV b	: 200 kg per sqm.
b. Live load for open terrace with access as per IS 875 - 1987.	: 150 kg per sqm

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DESIGN OF PILE

Length of Pile	L =	2000	cm
Characteristic strength of Concrete	f_{ck} =	30	N/mm^2
Diameter of Pile	D =	60	cm
Length of pile cap	=	2.5	m
Depth of pile cap	=	0.75	m

Modulas of Elasticity of Concrete (E) $5000 \times SQRT(f_{ck})$ = $5000 \times SQRT(30)$ N/mm^2

[As per IS 456 :2000 pg. no : 16]

= 273861.2788 Kg/cm^2

Moment of Inertia of Pile (I) $\frac{\pi \times D^4}{64}$ $\frac{3.14 \times 60^4}{64}$ cm^4

= 635850.0 cm^4

K_1 (constant) = 0.146 Kg/cm^2

[As per IS : 2911(Part 1 / Sec 4)-appendix-B]

T (constant) = $\frac{5 \ (E \times I)}{K_1}$

[As per IS : 2911 (Part 1 / Sec 4) - appendix-B, B-1.2]

= 260.20 cm

Hence L / R = $\frac{L}{R}$

[As per IS : 2911 (Part 1 / Sec 4) - appendix-B]

= 7.686

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For free head pile $\frac{L_f}{R}$ = 1.85 [As per IS : 2911 (Part 1 / Sec 4) - appendix-B, B-1.1 fig 2]

Length of fixity L_f = 481.37 cm [As per IS : 2911 (Part 1 / Sec 4) - appendix-B]

= 4.81 m

Embedded Length Le > 4 x R [As per IS:2911(Part 1 / Sec 4) - appendix-B, B-1.2]

> 10.4 m

Length of pile, L_1 = L - Le

= 9.6

Calculation of Lateral capacity of pile

(From IS:2911, Part 1 / Sec. 4, B-1.3 - Appendix B)

$$\text{Lateral capacity , } Q = \frac{12\,E\,I\,Y}{(L_1 + L_f)^3}$$

Where ,

Y = Lateral deflection pf pile = 5 mm (As per IS2911, part4)

Modulas of Elasticity of Concrete (E) = 273861.2788 Kg/cm2

Moment of Inertia of Pile (I) = 635850.0 cm4

L1 + Lf = 0 + 481.37

= 2481.4 cm

= 24.81 m

Lateral capacity $Q = \frac{12 \times 223606.8 \times 306640.6 \times 0.5}{481.37 \times 481.37 \times 481.37}$

= 0.1 Mt

= 1 kN

DESIGN OF MAXIMUM MOMENT IN THE PILE

Lateral Load on each pile from Staad Q = 4.60 Mt

Lateral load taken by the pile cap (for 2 piles) = 3 x 18 x 2.5 x 0.75

= 10.13 Mt

Net lateral load in each pile = 4.6 - (10.125 / 2)

= 1.23 Mt

Considering the effect of passive pressure on piles

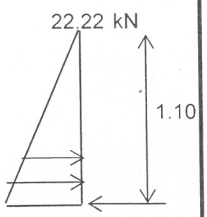
Angle of repose of soil φ = 30

Coeff of passive pressure Kp = $\frac{1+\sin\varphi}{1-\sin\varphi}$

Kp = 3.00

Unit weight of submerged soil γ = 16 KN/m^3

Shape factor s = 0.70



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Force due to passive pressure = $Kp*\gamma*s*h$

Equating the passive pressure to the shear force acting on the pile: 3x16x0.7x0.6

$20.16h \times h/2$ = 20.16 h = 1.23 t

$h = \sqrt{(1.225 \times 10 \times 2)/20.16}$

h = 1.10 m

Depth of soil = 1.10 m

20.16 h = 22.22

= 20.16h xh/2

F = 12.25 kN

Maximum Moment = F*h-F*(1/3)*h

= 9.00 kNm

Mu = 1.35 t-m

Vertical Load on each pile P = 90.00 t

Maximum Vertical load on Pile Pu = 1.5 x P

Pu = 135.00 t

$\frac{Pu}{f_{ck} D^2}$ = 0.13

$\frac{Mu}{f_{ck} D^3}$ = 0.00 0

Diameter of bar = 16 mm

Clear cover = 60 mm

d' = 50 + (16 / 2)

= 68 mm

$\frac{d'}{D}$ = $\frac{58}{600}$

= 0.11

DESIGN OF PILE

$\frac{Pu}{f_{ck} D^2}$ = 0.13

$\frac{Mu}{f_{ck} D^3}$ = 0.00

$\frac{p}{f_{ck}}$ = 0.020 (As per SP -16, chart 60)

Percentage of Steel required (p) = 0.60%

Min. Percentage of Steel required = 0.40% [As per IS : 2911 (Part 1/Sec 2) - 1979 Pg - 14]

Percentage of Steel = 0.60%

Area of Steel required A_{st} = 1695.6 mm^2

Using 20 mm dia bar 5.39726 nos

provided Ast

Hence provide 20 **mm dia bar** 8 **nos** 2513.274 mm^2

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C2

ANALYSIS & DESIGN OF 2-PILE CAP

INPUT DATA FOR FOUNDATION

NGL to FGL		= 0.60	m
Projection of pedestal above FGL		= 0.15	m
Founding lvl (Top - pdstl - Pile cap)	D	= 0.75	m
Density of soil	γ_s	= 18	kN/m^3
Bearing capacity factor		= 1.00	
Clear cover	d'	= 75	mm

COLUMN SIZE = 300 mm X 450 mm

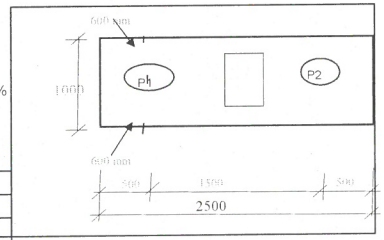
DEPTH OF PILE CAP = 0.60 m

TYPE OF PILE			-	
DAIMETER OF PILE			-	600 mm
CAPACITY OF PILE				
Compression(pile capacity)			-	70.00 t
Horiz. Thrust			-	4.60 t
Uplift			-	12.30 t

15%

Seismic zone			-	0.1	II
Wind Pressure			-	39	m/s
Soil - Foundation Coeff.			-	1	
Importance Factor			-	1.5	

PILE CAP DIMENSIONS



All loads are in kN-m

Sl.No	PILE	load comb		fy	fx	fz	Mx	Mz
1	C2	DL+LL	100	1115.281	2.403	1.721		
		DL+LL +WL+X	101	1071.069	-5.806	1.769		
		DL+LL +WL+X	102	1046.803	10.472	2.034		
		DL+LL +WL-X	103	1058.615	2.346	-2.354		
		DL+LL +WL-X	104	1059.243	2.392	6.368		
		DL+LL +WL+Z	105	848.597	-7.955	2.462		
		DL+LL +WL-Z	106	818.265	12.393	2.793		
		DL+LL +EL+X	107	833.029	2.235	-2.691		
		DL+LL +EL-X	108	833.815	2.293	8.211		
		DL+LL +EL+Z	109	1118.867	-24.567	1.566		
		DL+LL +EL-Z	110	998.938	29.321	2.239		
		DL+WL+X	111	1056.255	2.196	-22.47		
		DL+WL+X	112	1061.549	2.557	26.276		
		DL +WL-X	113	908.344	-31.407	2.209		
		DL+WL-X	114	758.433	35.953	3.05		
		DL+WL+Z	115	830.08	2.048	-27.837		
		DL+WL-Z	116	836.697	2.499	33.096		
		maximum forces of wl/sl comb		465.469	23.053	46.964	0	0
		minimum forces of wl/sl comb		758.433	-31.407	-27.837	0	0
		DL +LL		1115.281	2.403	1.721	0	0

No of piles = **1.593** DL + LL - COMB

No of piles = **-0.546** DL + LL + WL/SL - COMB

FOR PEDESAL DESIGN ONLY

FOOTING	CASE	Fy	Mxx	Mzz
C2	100	1115.281	1.29075	1.80225
	101	1071.069	1.32675	-4.3545
	102	1046.803	1.5255	7.854
	103	1058.615	-1.7655	1.7595
	104	1059.243	4.776	1.794
	105	848.597	1.8465	-5.96625
	106	818.265	2.09475	9.29475
	107	833.029	-2.01825	1.67625
	108	833.815	6.15825	1.71975
	109	1118.867	1.1745	-18.42525
	110	998.938	1.67925	21.99075
	111	1056.255	-16.8525	1.647
	112	1061.549	19.707	1.91775
	113	908.344	1.65675	-23.55525
	114	758.433	2.2875	26.96475
	115	830.08	-20.8778	1.536
	116	836.697	24.822	1.87425

ANALYSIS

Comp	lateral	Pull out
Safe	Safe	Safe
Safe	Safe	Safe
Safe	Safe	Safe
Safe	Safe	Safe
Safe	Safe	Safe
Safe	Safe	Safe
Safe	Safe	Safe
Safe	Safe	Safe
Safe	Safe	Safe
Safe	Safe	Safe
Safe	Safe	Safe
Safe	Safe	Safe
Safe	Safe	Safe
Safe	Safe	Safe
Safe	Safe	Safe
Safe	Safe	Safe
Safe	Safe	Safe
Safe	Safe	Safe
Safe	Safe	Safe

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All loads are in kN-m

	COLUMN	load comb	fy	fz	Mx	fx	mz
1	C2	DL+LL	1115.28	1.72	0.00	2.40	0.00
		DL+LL +WL+X	1071.07	1.77	0.00	-5.81	0.00
		DL+LL +WL+X	1046.80	2.03	0.00	10.47	0.00
		DL+LL +WL-X	1058.62	-2.35	0.00	2.35	0.00
		DL+LL +WL-X	1059.24	6.37	0.00	2.39	0.00
		DL+LL +WL+Z	848.60	2.46	0.00	-7.96	0.00
		DL+LL +WL-Z	818.27	2.79	0.00	12.39	0.00
		DL+LL +EL+X	833.03	-2.69	0.00	2.24	0.00
		DL+LL +EL-X	833.82	8.21	0.00	2.29	0.00
		DL+LL +EL+Z	1118.87	1.57	0.00	-24.57	0.00
		DL+LL +EL-Z	998.94	2.24	0.00	29.32	0.00
		DL+WL+X	1056.26	-22.47	0.00	2.20	0.00
		DL+WL+X	1061.55	26.28	0.00	2.56	0.00
		DL +WL-X	908.34	2.21	0.00	-31.41	0.00
		DL+WL-X	758.43	3.05	0.00	35.95	0.00
		DL+WL+Z	830.08	-27.84	0.00	2.05	0.00
		DL+WL-Z	836.70	33.10	0.00	2.50	0.00

	DIA	NOS	Vu / d
1	20 DIA	4	1000.00

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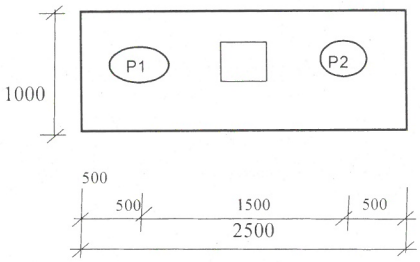
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Analysis of 2 Pile group

DL+LL - C2

Size of Column = 300 mm X 450 mm

	Sum	Column Load
Fy	1115	1115.28
Fz	1.721	1.72
Mx	0	0.00
Fx	2.403	2.40
Mz	0	0.00



pilecap Top level	dforct	1	
Pilecap bottom Lvl	dforcb	1.600	m
Depth for filling (soil)	df	2.00	m
Unit Weight of soil	γs	16.00	kN/m^3
Overburden Pressure	w_{over}	5.00	kN/m^2
Length of Pile Cap	l	2.50	m
Width of Pile Cap	b	1.00	m
Depth of Pile Cap	Dpc	0.60	m
No of Piles	n	2	Nos.
Area of pedestal	Ap_{each}	0.14	m^2
Total area of pedestal	Ap	0.14	m^2

5.00

capacity of pile

Vertical	Ppv	700	kN
Lateral	Pph	46	kN
Pullout	Ppp	123	kN
Increment Factor for Wind loads	Fincw	1.00	
Increment Factor for Seismic forces	Fincs	1.00	

Increment for current load case
finc = 1.00

Calculations :

	Sum	
Mxh	2.754	2.7536
Mzh	3.845	3.8448

Vertical Loads

Area of Pile Cap	Apc	l * b	2.5 m^2
	Apc_{nett} =	(Apc-Ap)	2.37 m^2
Soil Weight	Wsoil	df *γs * Apc_{nett}	75.68 kN
Overburden	Wover	wover * Apc_{nett}	11.83 kN
Self Weight of Pile Cap	Wswpc	Apc * Dpc * 25	37.5 kN
Self weight of pedestal	Wp = Ap*(dforcb-Dpc)*25		3.38 kN
Total	ΣW		128.38 kN
Vertical Load	Pv	$\Sigma Fy + \Sigma W$	1243.66 kN

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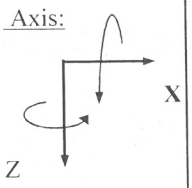
CG of load system

M_{xv}	$\Sigma(Fy\ z)$	0.00	v - represents vertical moment
M_{xh}	$\Sigma Fz * d_{forct}$	1.72	h - represents hori--zantal moment
Mxm	ΣMx	0.00	m - represents column moment
M_{xt}	$M_{xv} + M_{xh} + M_{xm}$	1.72 kNm	
Mz_v	$\Sigma(Fy\ x)$	0.00	
Mz_h	$\Sigma F_x * d_{forct}$	2.40	
Mz_m	ΣMz	0.00	
Mz_t	$Mz_v + Mz_h + Mz_m$	2.40 kNm	
ex	Mz_t / P_v	0.00 m	
ez	M_{xt} / P_v	0.00 m	
Final Moment about X axis	M_{xf}	1.721 kNm	
Final Moment about Z axis	Mz_f	2.403 kNm	

MX

Mz

Axis:



Pile Forces

Sl No	Pile Desig	x (m)	z (m)	Pv / n (kN)	Fp (kN)
1	P1	-0.75	0	620.2285	620.229
2	P2	0.75	0	623.4325	623.433

		ΣFp	1243.661	
Σx^2	1.125	Max	623.4	kN
Σz^2	0	Min	620.2	kN

Check for Compressive Force

Max force in Pile		623.43 kN	**Safe**
Permissible Compressive Force	Finc * Ppv	700 kN	

Check for Lateral Force

ΣHx	2.403	kN		
ΣHz	1.721	kN		
Resultant	H	sqrt($\Sigma Hx^2 + \Sigma Hz^2$)	2.96 kN	
Lateral Force per Pile		H / n	1.48 kN	**Safe**
Permissible Lateral force		Finc * Pph	46 kN	

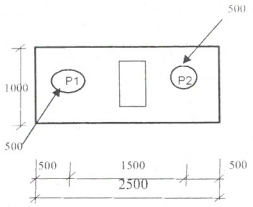
Check for Pull Out **Since all Piles are in Compression,There is No Uplift force in the piles**

Minimum compressive force		620.23 kN	**Safe**
Permissible Tensile Force	Finc * Ppp	153.75 kN	

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Analysis of 2 Pile group

C2



Pedestal Size
Width B = 300 mm
Depth D = 450 mm
Height hped = 0 m

Strength of Concrete fck = 30 N/mm²
Strength of Steel fy = 500 N/mm²

Assuming the Dia of Main Bar	20	mm	16 mm
Clear Cover to the Tie Reinf.	75	mm	
Effective Cover 75+20/2	85	mm	
Eff. Depth of Pile Cap deff	515	mm	

Loads on pile cap :
Overburden pressure

Due to Grade Slab	=	0.00	kN/m²
Due to Soling	=	0.00	kN/m²
Due to Live Load	=	0.00	kN/m²
Soil Weight	=	32	kN/m²
Self Weigth of pile cap	=	15	kN/m²
Total pressure	=	47.00	kN/m²

Depth of soil filling 2.00 m
unit wt. of Soil 16.00 kN/m³
Thickness of PC 0.60 m
pile diameter 600 mm

Max. pile reaction occur in pile = 700 + 700

Distance of Pile from the face of pedeatal = 600 mm

Distance from the face of col to edge of PC = 1100 mm

B.M at the face of pedestal = (700.00)x0.6 - 47 x 2.5 x 1.1²/2

= 348.913 + 0.00

Mu = 348.913 kN-m

Additional Moment due to torsion :

Horizontal load in Critical Direction = 5 **kN**

Torsion Tu = 4.5 **kN**

Equivalent BM due to torsion $Me = \frac{Tu\,(1+D/b)}{1.7}$

Me = 4.24 **KN-m**

Total BM = Mu + Me

= 348.9 + 4.24

= 353.15 **KN-m**

Shear force at d/2 from face of pedestal

Critical shear section = 257.5 mm from face of column (As per cl34.2.4.1 IS456:2000)
Factor = 1.00

Shear force at critical section = (700.00)x 1.000 -47x2.5 x 0.84

= 601.006 kN

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Additional Shear due to torsion :

Horizontal load in Critical Direction	=	5	**kN**	
Torsion	Tu =	4.5	**kN**	
Equivalent Shear due to torsion	Ve =	1.6 Tu /b		
	Ve =	7.20	**KN-m**	
Total Shear Force	=	Vu	+	Ve
	=	601.00625	+	7.2
	=	608.21	KN	

Load Factor	1.5	1.5	
Factored Moment	529.72	529.72	529.72 kN.m / m - width
Factored Shear	608.21	608.21	608.21 kN / m -width

Reinforcement:

Mu = 529.72
= 529.72 kN.m

Mu/bd^2 = 529.72 / (1000 x 515^2)
= 2.00 N/mm^2

P_t = 0.20 % Pc = 0.109 d'/d = 0.17

Bottom Reinforcement

Ast = 1030.00 mm^2

Required Spacing = 305.01 mm 314.159

3.2786

Provide 20 DIA 4 Nos

Hence Provide 20 DIA 4 **Nos**

If singly reinforced beam provide minimum reinforcement otherwise provide Pc of doubly reinforced beam

Top Reinforcement

Providing Minimum % of Steel = 0.12 % or 0.109

Ast = $\frac{0.12 \times 1000 \times 600}{100}$

= 0.12

= 720 mm^2

Required Spacing = 279.25 mm 201.062

3.581

Provide 16 DIA 4 Nos

Hence Provide 16 DIA 5 **Nos**

Check for Shear :

For Column load :

Maximum Shear Force = 608.21 kN Load Factor 1.5

V_u = 1.5 x 608.21
= 684.2 kN

Pt% = 0.20

Value of = Vu / d τc = 0.62

bo = 1000 mm

= 1.33

Hence Provide shear reinforcement

DIA =	12		LEG=	4		
Providing	4	LEG	12	DIA @	150	C/C

S.UDAYAKUMAR, M.E (Struc.), MIE(I), C.Eng (I),
REGISTERED STRUCTURAL ENGINEER GRADE-I
(RSE-101312020) & (SE/GR-1/2021/01/286)
GREATER CHENNAI CORPORATION & CMDA,
PLOT # 5, DOOR # 2, SAPTHAGIRI NAGAR MAIN RD,
NEHRU ST., SHOLINGANALLUR, CHENNAI-119.

DESIGN OF COLUMN FOR BIAXIAL BENDING

		C1			staad member no-	44
CRITICAL LOAD CASE: LOAD COMB	200				Fy-max	
DATA						
Length of column			D	=	600	mm
Breadth of column			b	=	230	mm
Unsupported length (longer direction)			L_x	=	3300	mm
Unsupported length (shorter direction)			L_y	=	3300	mm
Eff. length (longer direction)			L_{ex}	=	1.2 Lx	mm
Ref Tab-28 of IS456				=	**3960**	
Eff. length (shorter direction)			L_{ey}	=	1.2 Ly	mm
Ref Tab-28 of IS456				=	**3960**	
Check for Braced/Unbraced				=	**Unbraced**	
From Staad O/P Factored axial load			P_u	=	-347.214	kN
Factored moment (longer direction)			M_{ix}	=	3.087	kNm
Factored moment (shorter direction)			M_{iy}	=	-2.278	kNm
Charac. comp strength of concrete			f_{ck}	=	25	N/mm^2
Yield stress of steel			f_y	=	500	N/mm^2
Effective cover			d'	=	60.5	mm
Check for slenderness						
Longer Direction						
Slenderness ratio			L_{ex}/D	=	6.60	**short**
Additional moment due to slenderness			M_{ax}	=	0.000	kN-m
Shorter Direction						
Slenderness ratio			L_{ey}/b	=	17.22	**slender**
Additional moment due to slenderness			M_{ay}	=	-11.837	kN-m
Calculation of P_{uz}						
Assumed percentage of reinforcement			p_t	=	1.0	%
Area of concrete			Ag	=	138000	mm^2
Ultimate axial load (without moments)			P_{uz}	=	2054	kN
Calculation of P_b:						
Longer Direction						
From TABLE 60 of SP16:1980	FOR		d'/D	=	0.101	
Coefficient k_1			k_{1x}	=	0.2	
Coefficient k_2			k_{2x}	=	0.385	
Axial load corresponding to balanced failure			P_{bx}	=	743	kN
Reduction factor for additional moments			k_x	=	0.000	
Moment due to slenderness			M_{ax}	=	**0.00**	kN-m
Shorter Direction						
From TABLE 60 of SP16:1980	FOR		d'/b	=	0.263	
Coefficient k_1 Coefficient k_1(from TABLE 60 of SP:1980)			k_{1y}	=	0.184	
Coefficient k_2 Coefficient k_2(from TABLE 60 of SP:1980)			k_{2y}	=	0.056	
Axial load corresponding to balanced failure			P_{by}	=	643	kN
Reduction factor for additional moments			k_y	=	0.000	
Moment due to slenderness			M_{ax}	=	**0.00**	kN-m

S.UDAYAKUMAR, M.E(Struc.), MIE(I), C.Eng(I).
REGISTERED STRUCTURAL ENGINEER GRADE-I
(RSE-101312020) & (SE/GR-1/2021/01/286)
GREATER CHENNAI CORPORATION & CMDA,
PLOT # 5, DOOR # 2, SAPTHAGIRI NAGAR MAIN RD,
NEHRU ST., SHOLINGANALLUR, CHENNAI-119.

Check for moments due to min. eccentricity

Longer Direction

Minimum eccentricity	e_x	=	26.60	mm
Moment due to min. eccentricity	M_x	=	-9.24	kN-m
Moment in longer direction	M_{ux}	=	3.09	kNm

Shorter direction

Minimum eccentricity	e_y	=	14.27	mm
Moment due to min. eccentricity	M_y	=	-4.95	kN-m
Moment in shorter direction	M_{uy}	=	-2.278	kNm

Final design moments

Moment in longer direction (Mux)	M_{ux}	=	**3.09**	kNm
Moment in shorter direction (Muy)	M_{uy}	=	**-2.28**	kNm

Check for Interaction

p/f_{ck}	p/f_{ck}	=	0.040	
$P_u/f_{ck}bD$ value	$P_u/f_{ck}bD$	=	-0.101	
$M_{ux1}/f_{ck}bD^2$ value From chart 48 of SP16:1980	$M_{ux1}/f_{ck}bD^2$	=	0.09	
Uniaxial moment capacity (longer direction)	M_{ux1}	=	**186.30**	kNm
$M_{uy1}/f_{ck}bD^2$ value From chart 50 of SP16:1980	$M_{uy1}/f_{ck}bD^2$	=	0.09	
Uniaxial moment capacity (shorter direction)	M_{uy1}	=	**71.42**	kNm
P_u/P_{uz} ratio	P_u/P_{uz}	=	**-0.169**	
Value of exponent	α_n	=	1.0	

$$\left[\frac{M_{ux}}{M_{ux1}}\right]^{\alpha n} + \left[\frac{M_{uy}}{M_{uy1}}\right]^{\alpha n} \leq 1.00$$

Interaction ratio	=	**-0.02**	
Percentage reinforcement satisfactory or not	=	SAFE	
Area of steel required	=	1380	mm^2

Provide 10 # of Y 20 **as main reinforcement**

Area of steel provided	=	3141.6	mm^2
		SAFE	

Lateral ties

Tie diameter

As per IS 456:2000 clause 26.5.3.2	ϕ_T	>	a)20/4	5mm
			b)	6mm
Tie spacing	S_t		a)	230mm
		<	b)16x20	320mm
			c)	300mm

Hence provide 8 **mm dia ba @** 200 **mm c/c** SAFE

S.UDAYAKUMAR, M.E(Struc.), MIE(I), C.Eng (I),
REGISTERED STRUCTURAL ENGINEER GRADE-I
(RSE-101312020) & (SE/GR-1/2021/01/286)
GREATER CHENNAI CORPORATION & CMDA,
PLOT # 5, DOOR # 2, SAPTHAGIRI NAGAR MAIN RD,
NEHRU ST., SHOLINGANALLUR, CHENNAI-119.

DESIGN OF COLUMN FOR BIAXIAL BENDING

	C1			staad member no	58
CRITICAL LOAD CASE: LOAD COMB	200			My- MAX	
DATA					
Length of column		D	=	600	mm
Breadth of column		b	=	230	mm
Unsupported length (longer direction)		L_x	=	3300	mm
Unsupported length (shorter direction)		L_y	=	3300	mm
Eff. length (longer direction)		L_{ex}	=	1.2 Lx	mm
Ref Tab-28 of IS456			=	3960	
Eff. length (shorter direction)		L_{ey}	=	1.2 Ly	mm
Ref Tab-28 of IS456			=	3960	
Check for Braced/Unbraced			=	Unbraced	
From Staad O/P	Factored axial load	P_u	=	258.623	kN
Factored moment (longer direction)		M_{ix}	=	-15.561	kNm
Factored moment (shorter direction)		M_{iy}	=	5.665	kNm
Charac. comp strength of concrete		f_{ck}	=	25	N/mm^2
Yield stress of steel		f_y	=	500	N/mm^2
Effective cover		d'	=	60.5	mm

Check for slenderness

Longer Direction				
Slenderness ratio	L_{ex}/D	=	6.60	short
Additional moment due to slenderness	M_{ax}	=	0.000	kN-m
Shorter Direction				
Slenderness ratio	L_{ey}/b	=	17.22	slender
Additional moment due to slenderness	M_{ay}	=	8.817	kN-m
Calculation of P_{uz}				
Assumed percentage of reinforcement	p_t	=	2.0	%
Area of concrete	Ag	=	138000	mm^2
Ultimate axial load (without moments)	P_{uz}	=	2556	kN
Calculation of P_b:				
Longer Direction				
From TABLE 60 of SP16:1980 FOR	d'/D	=	0.101	
Coefficient k_1 Coefficient k_1(from TABLE 60 of SP:1980)	k_{1x}	=	0	
Coefficient k_2 Coefficient k_2(from TABLE 60 of SP:1980)	k_{2x}	=	0	
Axial load corresponding to balanced failure	P_{bx}	=	0	kN
	Pu/P_{uz}	=	0.0000	
	Pb/P_{uz}	=	0.0000	
Reduction factor for additional moments(FROM CHART 65 OF SP16)	k_x	=	0.000	
Moment due to slenderness	M_{ax}	=	**0.00**	kN-m
Shorter Direction				
From TABLE 60 of SP16:1980 FOR	d'/b	=	0.263	
Coefficient k_1 Coefficient k_1(from TABLE 60 of SP:1980)	k_{1y}	=	0.184	
Coefficient k_2 Coefficient k_2(from TABLE 60 of SP:1980)	k_{2y}	=	0.056	
Axial load corresponding to balanced failure	P_{by}	=	650	kN
	Pu/P_{uz}	=	0.1012	
	Pb/P_{uz}	=	0.2544	
Reduction factor for additional moments(FROM CHART 65 OF SP16)	k_y	=	1.205	
Moment due to slenderness	M_{ax}	=	**10.63**	kN-m

S.UDAYAKUMAR, M.E (Struc.), MIE(I), C.Eng (I),
REGISTERED STRUCTURAL ENGINEER GRADE-I
(RSE-101312020) & (SE/GR-1/2021/01/286)
GREATER CHENNAI CORPORATION & CMDA,
PLOT # 5, DOOR # 2, SAPTHAGIRI NAGAR MAIN RD,
NEHRU ST., SHOLINGANALLUR, CHENNAI-119.

Check for moments due to min. eccentricity

Longer Direction				
Minimum eccentricity	e_x	=	26.60	mm
Moment due to min. eccentricity	M_x	=	6.88	kN-m
Moment in longer direction	M_{ux}	=	6.88	kNm
Shorter direction				
Minimum eccentricity	e_y	=	14.27	mm
Moment due to min. eccentricity	M_y	=	3.69	kN-m
Moment in shorter direction	M_{uy}	=	5.665	kNm

Final design moments

Moment in longer direction (Mux)	M_{ux}	=	**6.88**	kNm
Moment in shorter direction (Muy)	M_{uy}	=	**16.29**	kNm

Check for Interaction

p/f_{ck}	p/f_{ck}	=	0.080	
$P_u/f_{ck}bD$ value	$P_u/f_{ck}bD$	=	0.075	
$M_{ux1}/f_{ck}bD^2$ value From chart 48 of SP16:1980	$M_{ux1}/f_{ck}bD^2$	=	0.1	
Uniaxial moment capacity (longer direction)	M_{ux1}	=	**207.00**	kNm
$M_{uy1}/f_{ck}bD^2$ value From chart 50 of SP16:1980	$M_{uy1}/f_{ck}bD^2$	=	0.1	
Uniaxial moment capacity (shorter direction)	M_{uy1}	=	**79.35**	kNm
P_u/P_{uz} ratio	P_u/P_{uz}	=	**0.101**	
Value of exponent	α_n	=	1.0	

$$\left[\frac{M_{ux}}{M_{ux1}}\right]^{\alpha n} + \left[\frac{M_{uy}}{M_{uy1}}\right]^{\alpha n} \leq 1.00$$

Interaction ratio	=	**0.24**	
Percentage reinforcement satisfactory or not	=	SAFE	
Area of steel required	=	2760	mm^2

Provide 10 # of Y 20 **as main reinforcement**

Area of steel provided	=	3141.6	mm^2
		SAFE	

Lateral ties

Tie diameter

As per IS 456:2000 clause 26.5.3.2	ϕ_T	>	a)20/4	5mm
			b)	6mm
Tie spacing	S_t		a)	230mm
		<	b)16x20	320mm
			c)	300mm

Hence provide 8 **mm dia @** 150 **mm c/c** SAFE

S.UDAYAKUMAR, M.E (Struc.), MIE(I), C.Eng (I),
REGISTERED STRUCTURAL ENGINEER GRADE-I
(RSE-101312020) & (SE/GR-1/2021/01/286)
GREATER CHENNAI CORPORATION & CMDA,
PLOT # 5, DOOR # 2, SAPTHAGIRI NAGAR MAIN RD,
NEHRU ST., SHOLINGANALLUR, CHENNAI-119.

DESIGN OF COLUMN FOR BIAXIAL BENDING

	C1			staad member no	114	
CRITICAL LOAD CASE: LOAD COMB	200			Mx- MAX		
DATA						
Length of column		D	=	600	mm	
Breadth of column		b	=	230	mm	
Unsupported length (longer direction)		L_x	=	3300	mm	
Unsupported length (shorter direction)		L_y	=	3300	mm	
Eff. length (longer direction)		L_{ex}	=	1.2 Lx	mm	
Ref Tab-28 of IS456			=	3960		
Eff. length (shorter direction)		L_{ey}	=	1.2 Ly	mm	
Ref Tab-28 of IS456			=	3960		
Check for Braced/Unbraced			=	Unbraced		
From Staad O/P Factored axial load		P_u	=	152.629	kN	
Factored moment (longer direction)		M_{ix}	=	-15.515	kNm	
Factored moment (shorter direction)		M_{iy}	=	-6.644	kNm	
Charac. comp strength of concrete		f_{ck}	=	25	N/mm^2	
Yield stress of steel		f_y	=	500	N/mm^2	
Effective cover		d'	=	60.5	mm	
Check for slenderness						
Longer Direction						
Slenderness ratio		L_{ex}/D	=	6.60	short	
Additional moment due to slenderness		M_{ax}	=	0.000	kN-m	
Shorter Direction						
Slenderness ratio		L_{ey}/b	=	17.22	slender	
Additional moment due to slenderness		M_{ay}	=	5.203	kN-m	
Calculation of P_{uz}						
Assumed percentage of reinforcement		p_t	=	2.0	%	
Area of concrete		Ag	=	138000	mm^2	
Ultimate axial load (without moments)		P_{uz}	=	2556	kN	
Calculation of P_b:						
Longer Direction						
From TABLE 60 of SP16:1980	FOR	d'/D	=	0.101		
Coefficient k_1		k_{1x}	=	0.2		
Coefficient k_2		k_{2x}	=	0.385		
Axial load corresponding to balanced failure		P_{bx}	=	796	kN	
Reduction factor for additional moments		k_x	=	0.000		
Moment due to slenderness		M_{ax}	=	**0.00**	kN-m	
Shorter Direction						
From TABLE 60 of SP16:1980	FOR	d'/b	=	0.263		
Coefficient k_1 Coefficient k_1(from TABLE 60 of SP:1980)		k_{1y}	=	0.184		
Coefficient k_2 Coefficient k_2(from TABLE 60 of SP:1980)		k_{2y}	=	0.056		
Axial load corresponding to balanced failure		P_{by}	=	650	kN	
Reduction factor for additional moments		k_y	=	0.798		
Moment due to slenderness		M_{ax}	=	**4.15**	kN-m	

S.UDAYAKUMAR, M.E (Struc.), MIE(I), C.Eng (I),
REGISTERED STRUCTURAL ENGINEER GRADE-I
(RSE-101312020) & (SE/GR-1/2021/01/286)
GREATER CHENNAI CORPORATION & CMDA,
PLOT # 5, DOOR # 2, SAPTHAGIRI NAGAR MAIN RD,
NEHRU ST., SHOLINGANALLUR, CHENNAI-119.

Check for moments due to min. eccentricity

Longer Direction

Minimum eccentricity	e_x	=	26.60	mm
Moment due to min. eccentricity	M_x	=	4.06	kN-m
Moment in longer direction	M_{ux}	=	4.06	kNm

Shorter direction

Minimum eccentricity	e_y	=	14.27	mm
Moment due to min. eccentricity	M_y	=	2.18	kN-m
Moment in shorter direction	M_{uy}	=	2.177507067	kNm

Final design moments

Moment in longer direction (Mux)	M_{ux}	=	**4.06**	kNm
Moment in shorter direction (Muy)	M_{uy}	=	**6.33**	kNm

Check for Interaction

p/f_{ck}	p/f_{ck}	=	0.080	
$P_u/f_{ck}bD$ value	$P_u/f_{ck}bD$	=	0.044	
$M_{ux1}/f_{ck}bD^2$ value From chart 48 of SP16:1980	$M_{ux1}/f_{ck}bD^2$	=	0.1	
Uniaxial moment capacity (longer direction)	M_{ux1}	=	**207.00**	kNm
$M_{uy1}/f_{ck}bD^2$ value From chart 50 of SP16:1980	$M_{uy1}/f_{ck}bD^2$	=	0.1	
Uniaxial moment capacity (shorter direction)	M_{uy1}	=	**79.35**	kNm
P_u/P_{uz} ratio	P_u/P_{uz}	=	**0.060**	
Value of exponent	α_n	=	1.0	

$$\left[\frac{M_{ux}}{M_{ux1}}\right]^{\alpha n} + \left[\frac{M_{uy}}{M_{uy1}}\right]^{\alpha n} \leq 1.00$$

Interaction ratio	=	**0.10**	
Percentage reinforcement satisfactory or not	=	SAFE	
Area of steel required	=	2760	mm^2

Provide 10 # of Y 20 **as main reinforcement**

Area of steel provided	=	3141.6	mm^2
		SAFE	

Lateral ties

Tie diameter

As per IS 456:2000 clause 26.5.3.2	ϕ_T	>	a)20/4	5mm
			b)	6mm
Tie spacing	S_t		a)	230mm
		<	b)16x20	320mm
			c)	300mm

Hence provide 8 **mm dia ba @** 200 **mm c/c** SAFE

S.UDAYAKUMAR, M.E(Struc.), MIE(I), C.Eng(I),
REGISTERED STRUCTURAL ENGINEER GRADE-I
(RSE-101312020) & (SE/GR-1/2021/01/286)
GREATER CHENNAI CORPORATION & CMDA,
PLOT # 5, DOOR # 2, SAPTHAGIRI NAGAR MAIN RD,
NEHRU ST., SHOLINGANALLUR, CHENNAI-119.

DESIGN OF TWO WAY SLAB

S1

Data:

Concrete	M20	fck	=	20	N/mm²
Steel	Fe 500	fy	=	500	N/mm²
Shorter Span		Lx	=	3.00	m
Longer Span		Ly	=	3.50	m
Assuming Depth of Slab		D	=	125	mm
Assuming Dia of reinf.			=	8	mm
Clear Cover			=	20	mm
Eff. Depth of Slab		d	=	150	mm
Eff.Shorter Span		l_x	=	3.15	m
Eff. Longer Span		l_y	=	3.65	m

Load Calculations:

Self weight of slab			=	3.13	kN/m²
Finishing load			=	1.50	kN/m²
Live load			=	2.50	kN/m²
Total load			=	7.13	kN/m²
Load Factor			=	1.50	
Factored Load			=	10.69	kN/m²
Span Ratio		ℓ_y/ℓ_x	=	3.65 / 3.15	
			=	1.16	

Bending Moment Calculation:

Support Condition 4 — Two Adjacent edges Discontinuous

From IS 456-2000 Table 26

α_{Nx}	=	0.057	
α_{Px}	=	0.043	
α_{Ny}	=	0.047	
α_{Py}	=	0.035	

Shorter Span:

Negative Moment (Support)	M_{Nx}	=	$\alpha_{Nx} \times w_u \times l_x^2$
		=	$0.057 \times 10.69 \times 3.15^2$
		=	6.056 kN.m
Positive Moment (Mid span)	M_{Px}	=	$\alpha_{Px} \times w_u \times l_x^2$
		=	$0.043 \times 10.69 \times 3.15^2$
		=	4.553 kN.m

Longer Span :

Negative Moment (Support)	M_{Ny}	=	$\alpha_{Ny} \times w_u \times l_x^2$
		=	$0.047 \times 10.69 \times 3.15^2$
		=	4.984 kN.m
Positive Moment (Mid span)	M_{Py}	=	$\alpha_{Py} \times w_u \times l_x^2$
		=	$0.035 \times 10.69 \times 3.15^2$
		=	3.712 kN.m

S.UDAYAKUMAR, M.E (Struc.), MIE(I), C.Eng (I),
REGISTERED STRUCTURAL ENGINEER GRADE-I
(RSE-101312020) & (SE/GR-1/2021/01/286)
GREATER CHENNAI CORPORATION & CMDA,
PLOT # 5, DOOR # 2, SAPTHAGIRI NAGAR MAIN RD,
NEHRU ST., SHOLINGANALLUR, CHENNAI-119.

Reinforcement:

Required in Shorter Span	Reinf Required		Reinf Provided
Support	8Ø @ 275mm c/c	-	8 dia @ 100 mm c/c
Mid span	8Ø @ 275mm c/c	-	8 dia @ 100 mm c/c
Required in Longer Span			
Support	8Ø @ 275mm c/c	-	8 dia @ 125 mm c/c
Mid span	8Ø @ 275mm c/c	-	8 dia @ 125 mm c/c

Check for Shear:

Max Shear coeff. for continuous edge in short direction γcx = 0.46

S.F for continuous edge in short direction Vcx = $\gamma cx * \ell x * W$

Maximum Shear Force Vu = 0.46 x 3.150 x 10.69

= 15.406 kN

S.F for discontinuous edge in short direction Vdcx = $\gamma dcx * \ell x * W$

= 0.30 x 3.150 x 10.69 = 10.158kN

S.F for continuous edge in long direction Vcy = $\gamma cy * \ell x * W$

= 0.40 x 3.150 x 10.69 = 13.466kN

S.F for discontinuous edge in long direction Vdcy = $\gamma dcy * \ell x * W$

= 0.26 x 3.150 x 10.69 = 8.753kN

S.F for continuous edge in short direction Vu = 15.406 kN

Design Shear stress τv Vu/bd = 15406 / (1000 x 150)

= 0.103 N/mm²

Reinforcement provided in the slab is - 8Ø @ 100 mm c/c

% of reinforcement provided pt = 0.34

IS:456 Table 19

Allowable shear stress τc = 0.41 N/mm²

As per IS:456 cl. 40.2.1.1 k value for slab - 1.30

Design shear stress for concrete k x τc = 1.30 x 0.406

= 0.528 N/mm²

Actual Shear Stress < Design Shear Stress 0.103 < 0.528 **SAFE**

CHECK FOR DEFLECTION

Allowable span / depth Ratio	l/d	=	20	
% of Tension reinforcement	pt	=	0.335	
Corresponding Compression reinf.	Bar dia	=	10	mm
	spacing	=	150	mm
% of Compression reinforcement	pc	=	0.349	
Modification factor for Tension reinf.	F1	=	2.00	(From Fig 4 in IS 456 - 2000)
Modification factor for Comp. reinf.	F2	=	1.00	(From Fig 5 in IS 456 - 2000)

Modified span/depth ratio = l/d x F1 x F2

= 20 x 2.00 x 1.00

= **40.00**

Actual span/depth ratio = 3150 / 150

= **21.00**

Actual span/depth ratio < Modified span/depth ratio 21.00 < 40.00 **SAFE**

S.UDAYAKUMAR, M.E(Struc.), MIE(I), C.Eng (I),
REGISTERED STRUCTURAL ENGINEER GRADE-I
(RSE-101312020) & (SE/GR-1/2021/01/286)
GREATER CHENNAI CORPORATION & CMDA,
PLOT # 5, DOOR # 2, SAPTHAGIRI NAGAR MAIN RD,
NEHRU ST., SHOLINGANALLUR, CHENNAI-119.

DESIGN OF TWO WAY SLAB

S2

Data:

Concrete	M20	fck	=	20	N/mm²
Steel	Fe 500	fy	=	500	N/mm²
Shorter Span		Lx	=	3.20	m
Longer Span		Ly	=	3.80	m
Assuming Depth of Slab		D	=	125	mm
Assuming Dia of reinf.			=	8	mm
Clear Cover			=	20	mm
Eff. Depth of Slab		d	=	150	mm
Eff.Shorter Span		l_x	=	3.35	m
Eff. Longer Span		l_y	=	3.95	m

Load Calculations:

Self weight of slab			=	3.13	kN/m²
Finishing load			=	1.50	kN/m²
Live load			=	2.50	kN/m²
Total load			=	7.13	kN/m²
Load Factor			=	1.50	
Factored Load			=	10.69	kN/m²
Span Ratio		ℓ_y/ℓ_x	=	3.95 / 3.35	
			=	1.18	

Bending Moment Calculation:

Support Condition 4 — Two Adjacent edges Discontinuous

From IS 456-2000 Table 26

α_{Nx}	=	0.059	
α_{Px}	=	0.044	
α_{Ny}	=	0.047	
α_{Py}	=	0.035	

Shorter Span:

Negative Moment (Support)	M_{Nx}	=	$\alpha_{Nx} \times w_u \times l_x^2$
		=	$0.059 \times 10.69 \times 3.35^2$
		=	7.021 kN.m
Positive Moment (Mid span)	M_{Px}	=	$\alpha_{Px} \times w_u \times l_x^2$
		=	$0.044 \times 10.69 \times 3.35^2$
		=	5.272 kN.m

Longer Span :

Negative Moment (Support)	M_{Ny}	=	$\alpha_{Ny} \times w_u \times l_x^2$
		=	$0.047 \times 10.69 \times 3.35^2$
		=	5.637 kN.m
Positive Moment (Mid span)	M_{Py}	=	$\alpha_{Py} \times w_u \times l_x^2$
		=	$0.035 \times 10.69 \times 3.35^2$
		=	4.198 kN.m

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GREATER CHENNAI CORPORATION & CMDA,
PLOT # 5, DOOR # 2, SAPTHAGIRI NAGAR MAIN RD,
NEHRU ST., SHOLINGANALLUR, CHENNAI-119.

Reinforcement:

Required in Shorter Span	Reinf Required		Reinf Provided
Support	8Ø @ 275mm c/c	-	8 dia @ 150 mm c/c
Mid span	8Ø @ 275mm c/c	-	8 dia @ 150 mm c/c
Required in Longer Span			
Support	8Ø @ 275mm c/c	-	8 dia @ 150 mm c/c
Mid span	8Ø @ 275mm c/c	-	8 dia @ 150 mm c/c

Check for Shear:

Max Shear coeff. for continuous edge in short direction γcx = 0.46

S.F for continuous edge in short direction Vcx = $\gamma cx * \ell x * W$

Maximum Shear Force Vu = 0.46 x 3.350 x 10.69

= 16.603 kN

S.F for discontinuous edge in short direction Vdcx = $\gamma dcx * \ell x * W$

= 0.31 x 3.350 x 10.69 = 10.949kN

S.F for continuous edge in long direction Vcy = $\gamma cy * \ell x * W$

= 0.40 x 3.350 x 10.69 = 14.321kN

S.F for discontinuous edge in long direction Vdcy = $\gamma dcy * \ell x * W$

= 0.26 x 3.350 x 10.69 = 9.309kN

S.F for continuous edge in short direction Vu = 16.603 kN

Design Shear stress τv Vu/bd = 16603 / (1000 x 150)

= 0.111 N/mm²

Reinforcement provided in the slab is - 8Ø @ 150 mm c/c

% of reinforcement provided pt = 0.22

IS:456 Table 19

Allowable shear stress τc = 0.34 N/mm²

As per IS:456 cl. 40.2.1.1 k value for slab - 1.30

Design shear stress for concrete k x τc = 1.30 x 0.342

= 0.445 N/mm²

Actual Shear Stress < Design Shear Stress 0.111 < 0.445 **SAFE**

CHECK FOR DEFLECTION

Allowable span / depth Ratio	l/d	=	20	
% of Tension reinforcement	pt	=	0.223	
Corresponding Compression reinf.	Bar dia	=	10	mm
	spacing	=	150	mm
% of Compression reinforcement	pc	=	0.349	
Modification factor for Tension reinf.	F1	=	2.00	(From Fig 4 in IS 456 - 2000)
Modification factor for Comp. reinf.	F2	=	1.00	(From Fig 5 in IS 456 - 2000)

Modified span/depth ratio = l/d x F1 x F2

= 20 x 2.00 x 1.00

= **40.00**

Actual span/depth ratio = 3350 / 150

= **22.33**

Actual span/depth ratio < Modified span/depth ratio 22.33 < 40.00 **SAFE**

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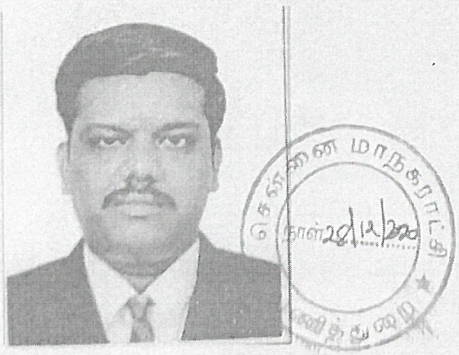
GREATER CHENNAI CORPORATION
WORKS DEPARTMENT

PROFESSIONAL REGISTRATION CERTIFICATE

This is to certify that **Thiru. Udayakumar S** has been enrolled as **Registered Structural Engineer Grade- I (RSE)** in Greater Chennai Corporation (GCC) who has the qualification of **M.E.,(Structural Engg.,)** with minimum of **5 years** experience in the relevant field.

The Registration No. is **RSE101312020** dated **28.12.2020** It is informed herewith to comply with the scope of work, duties and responsibilities as prescribed by the Government of Tamil Nadu in Part – V, "Registration of Professionals", Tamil Nadu Combined Development and Building Rules, 2019 approved vide G.O.(Ms) No.18 MA&WS (MA1) Dept. dated 04.02.2019. and as amended in G.O.(MS) No.16 MA&WS (MA1) Dept, dated 31.01.2020.

This Registration is valid upto **27.12.2025.**



28/12/2020

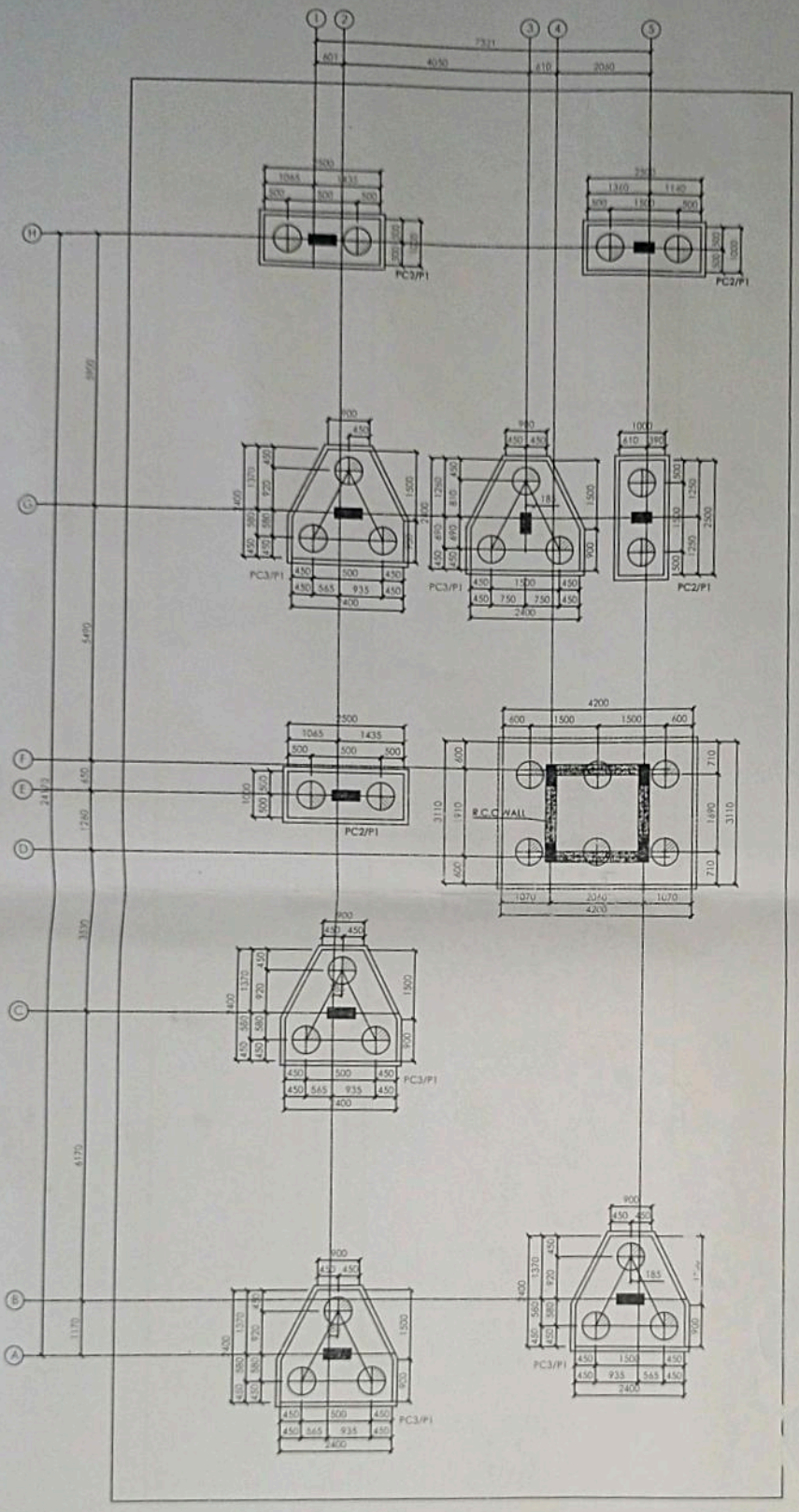
Superintending Engineer (Works)
Greater Chennai Corporation.

RGN No: RSE101312020
Dated: 28.12.2020

28/12/2020

28/12/2020

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NEHRU ST., SHOLINGANALLUR, CHENNAI-119.



PILE FOUNDATION LAYOUT
(SCALE - 1:75)

NOTES:

1. ALL DIMENSIONS ARE IN 'mm'
2. USE CONCRETE MIX : M30 GRADE
3. LAP LENGTH 50ø
4. CLEAR COVER TO THE REINFORCEMENT FOR PILE CAP : 50mm PILE : 50mm, COLUMN :40mm, R.C.C WALL : 40mm, SLAB : 20mm
5. HIGH YIELD STRENGTH DEFORMED BARS CONFIRMING IS 1786-2008 TO BE USED, Fe 500
6. Y DENOTES FOR HYSD BARS
7. ALL STRUCTURAL DRG. TO BE READ ALONG WITH ARCHITECTURAL DRG.

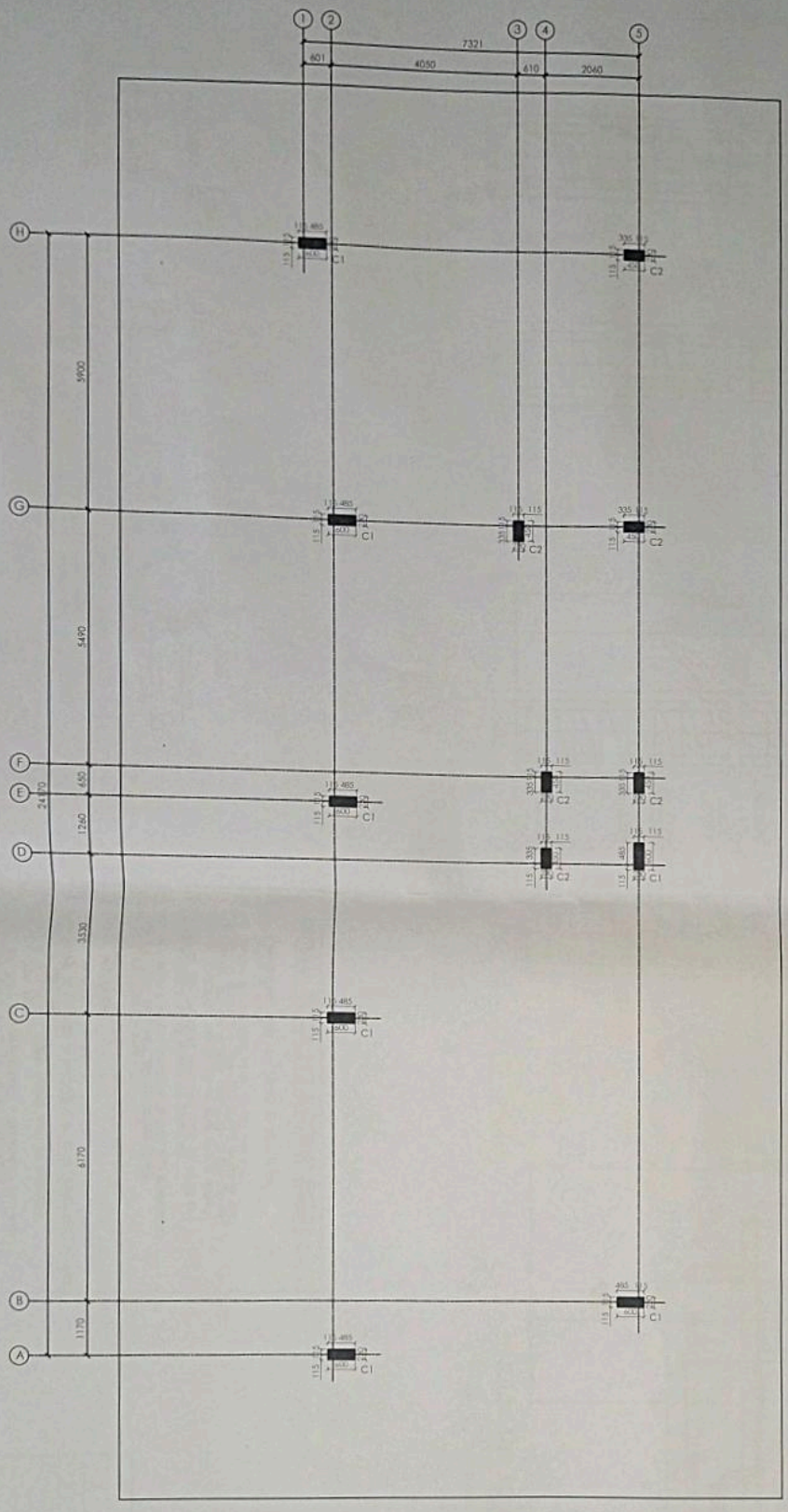
PILE Ø	COMPRESSION	UPLIFT	HORIZONTAL
600	140 Ton	100 Ton	10 Ton

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GREATER CHENNAI CORPORATION & CMDA,
PLOT # 5, DOOR # 2, SAPTHAGIRI NAGAR MAIN RD.
NEHRU ST., SHOLINGANALLUR, CHENNAI-119.

NO	DATE	DRWN	DESCRIPTION

PROJECT:
PLAN SHOWING THE PROPOSED CONSTRUCTION OF STILT FLOOR + 5 FLOORS (18.30m HEIGHT) RESIDENTIAL BUILDING WITH 10 DWELLING UNITS AVAILING PREMIUM FSI AT BLOCK : No.7, R.S. RAJAN SALAI, KALINGA COLONY, K.K.NAGAR, CHENNAI-600 078. COMPR. TO S.No.OLD SURVEY Nos.55/14Part AND 56/18Part, T.S.No.2/14, BLOCK No.98 OF KODAMBAKKAM VILLAGE WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION.

CLIENT:
M/s. QUALITY SHELTERS,
CHENNAI.



COLUMN LAYOUT
(SCALE - 1:75)

S. UDAYAKUMAR, M.E (Struc.), MIE(I), C.Eng (I),
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(RSE-101312020) & (SE/GR-1/2021/01/286)
GREATER CHENNAI CORPORATION & CMDA,
PLOT # 5, DOOR # 2, SAPTHAGIRI NAGAR MAIN RD,
NEHRU ST., SHOLINGANALLUR, CHENNAI-119.

REV	DATE	DRWN	DESCRIPTION

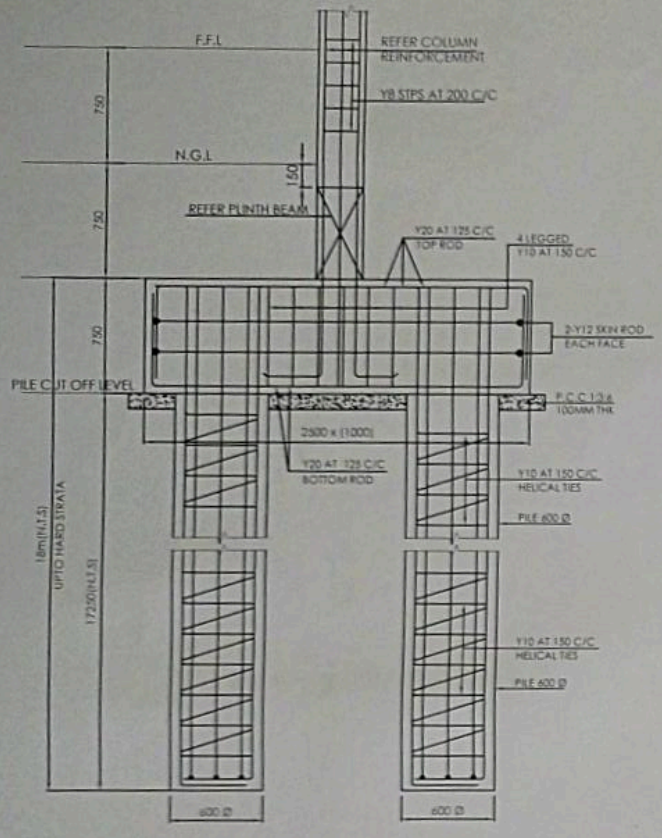
PROJECT:

PLAN SHOWING THE PROPOSED CONSTRUCTION OF STILT FLOOR + 5 FLOORS (19.20m HEIGHT) RESIDENTIAL BUILDING WITH 10 DWELLING UNITS AVAILING PREMIUM FSI AT BLOCK No.7, P.T. RAJAN SALAI, KALINGA COLONY, K.K.NAGAR, CHENNAI-600 078, COMPRISED IN OLD SURVEY Nos.55/1A Part AND 56/1BPart, T.S.No.2/14, BLOCK No.98 OF KODAMBAKKAM VILLAGE WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION.

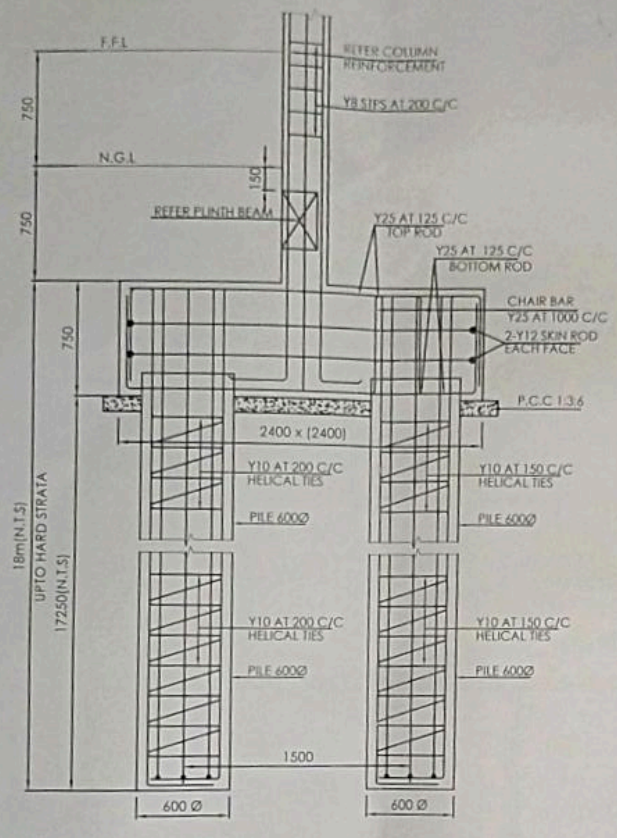
CLIENT:

M/s. QUALITY SHELTERS,
CHENNAI.

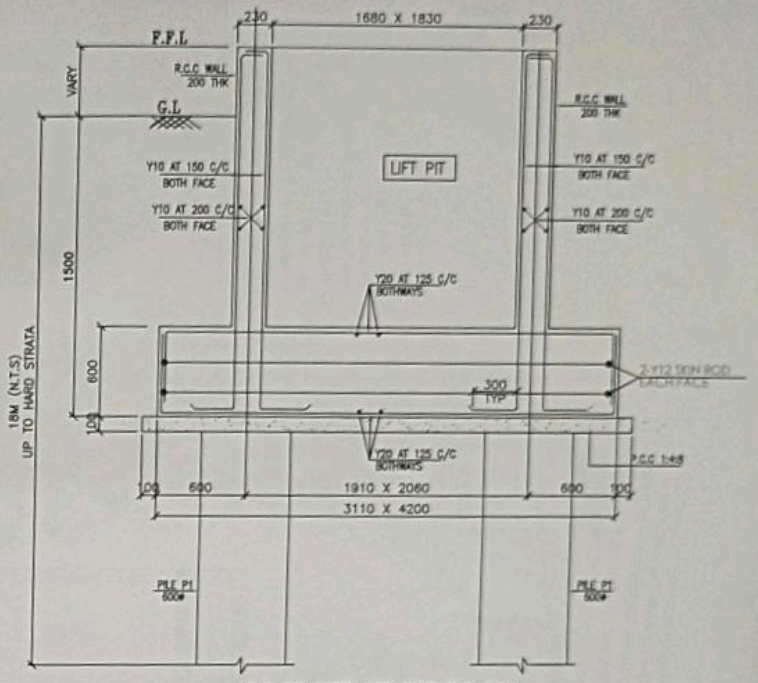
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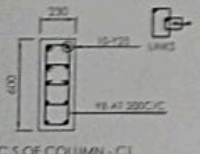
C.S OF PILE CAP-PC2/P1
PC2-(2500x1000)
(SCALE 1:25)



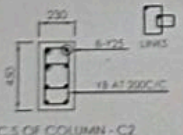
C.S OF PILE CAP-PC3/P1
PC3-(2400x2400)
(SCALE 1:30)



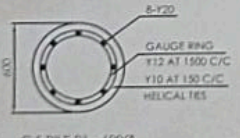
C.S OF LIFT PIT DETAILS PC4
PC4-(3110x4200)
(SCALE 1:25)



C.S OF COLUMN - C1
(230x600)
(SCALE 1:25)



C.S OF COLUMN - C2
(230x450)
(SCALE 1:25)



C.S PILE P1 - 600Ø
(18m LONG)
(SCALE 1:25)

SPECIAL NOTES FOR FRICTION PILING:-

1. ALL REINFORCEMENT FROM PILE SHOULD BE TAKEN UPTO TOP OF CAP AS SHOWN
2. PILE DRILLING & CONCRETING TO BE CARRIED OUT FOR EACH PILE IN SEQUENCE & COMPLETED BEFORE TAKING UP NEXT PILE DRILLING. TIME GAP BETWEEN COMPLETION OF DRILLING AND START OF CONCRETING SHOULD NOT BE MORE THAN 4 HOURS.
3. CASTING OF PILE CAP TO BE DONE ONLY AFTER ALL PILING FOR OTHER STRUCTURE IN THE VICINITY ARE COMPLETED
4. USE OF BENTONITE SLURRY SHOULD BE ENSURE WITH CONSECTENCY FROM STABILISING BORE HOLE TILL CONCRETING AS PER IS-2911(PART1/SEC-2)-1979
5. CONCRETING MUST BE ADOPTED USING TERMIE METHOD WITH GENERAL PRECAUTIONS
6. LOWERING OF WATER TABLE MUST BE ENSURED TO MAXIMUM LEVEL
7. DATA SHEETS AS PROVIDED IN APPENDIX-D OF IS-2911(PART1/SEC-2)-1979 SHOULD BE MAINTAINED
8. SLUMP OF CONCRETE BY TERMIE METHOD SHALL BE MAINTAINED NOT LESS THAN 150MM
9. CONCRETING SHALL GO UNINTERRUPTED, IF INTERRUPTED NECESSARY PRECAUTIONS SHOULD BE ENSURED AS PER IS-2911(PART1/SEC-2)-1979
10. INCASE OF DEFECTIVE PILING SHOULD BE INFORMED TO DESIGN OFFICE TO GO AHEAD WITH CHANGE IN DESIGN THEREAFTER
11. TEMPORARY CASING SHALL BE CONSIDERED INTO ACCOUNT DUE TO HIGH WATER TABLE AT THE TIME OF CONCRETING

S.UDAYAKUMAR, M.E (Struc.), MIE(I), C.Eng (I),
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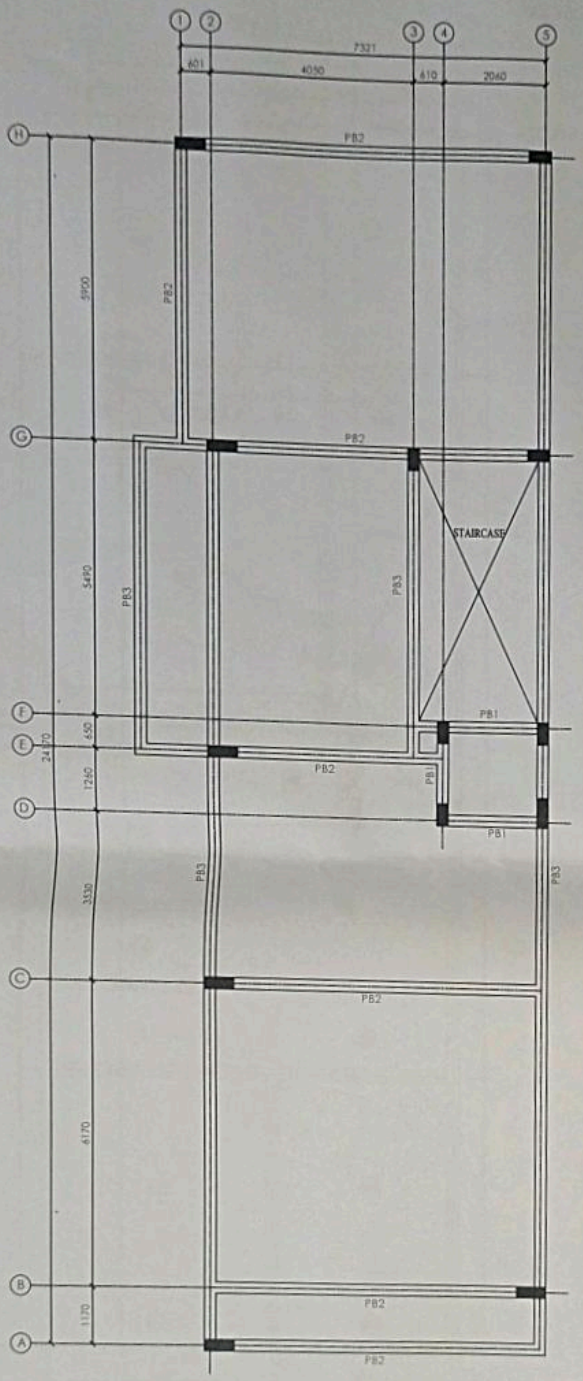
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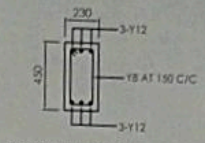
PLAN SHOWING THE PROPOSED CONSTRUCTION OF STILT FLOOR + 5 FLOORS (18.30m HEIGHT) RESIDENTIAL BUILDING WITH 10 DWELLING UNITS AWARDED PREMIUM FSI AT BLOCK No.7, R.T. RAJAN SALAI, KALINGA COLONY, K.K.NAGAR, CHENNAI-600 078, COMPRISED IN G.D.S. SURVEY No.58/1A PART AND SUB PART 1.5 mts.DTH, BLOCK No.118 OF KODAMBAKKAM VILLAGE WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION.

CLIENT:-

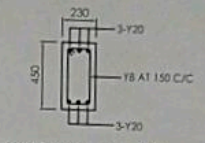
M/S. QUALITY SHELTERS
CHENNAI.



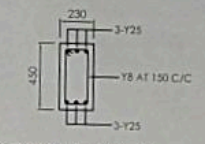
PLINTH BEAM LAYOUT
(SCALE - 1:75)



C.S OF PLINTH BEAM - PB1
[230x450]
(SCALE 1:25)

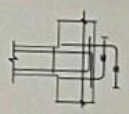


C.S OF PLINTH BEAM - PB2
[230x450]
(SCALE 1:25)



C.S OF PLINTH BEAM - PB3
[230x450]
(SCALE 1:25)

Ld FOR TENSION & COMP BAR		
12mm dia	:	544 mm
16mm dia	:	725 mm
20mm dia	:	906 mm
25mm dia	:	1133 mm



TYPICAL TENSION & COMP BAR

NOTES:-

1. ALL DIMENSIONS ARE IN 'MILLIMETER'
2. USE CONCRETE MIX : M30 GRADE
3. LAP LENGTH 56Ø
4. CLEAR COVER TO THE REINFORCEMENT FOR PLINTH BEAM : 40MM
5. HIGH YIELD STRENGTH DEFORMED BARS CONFIRMING IS 1786-1985 TO BE USED, Fe 500
6. 'Y' DENOTES FOR HYSD BARS

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REV	DATE	DRWN	DESCRIPTION

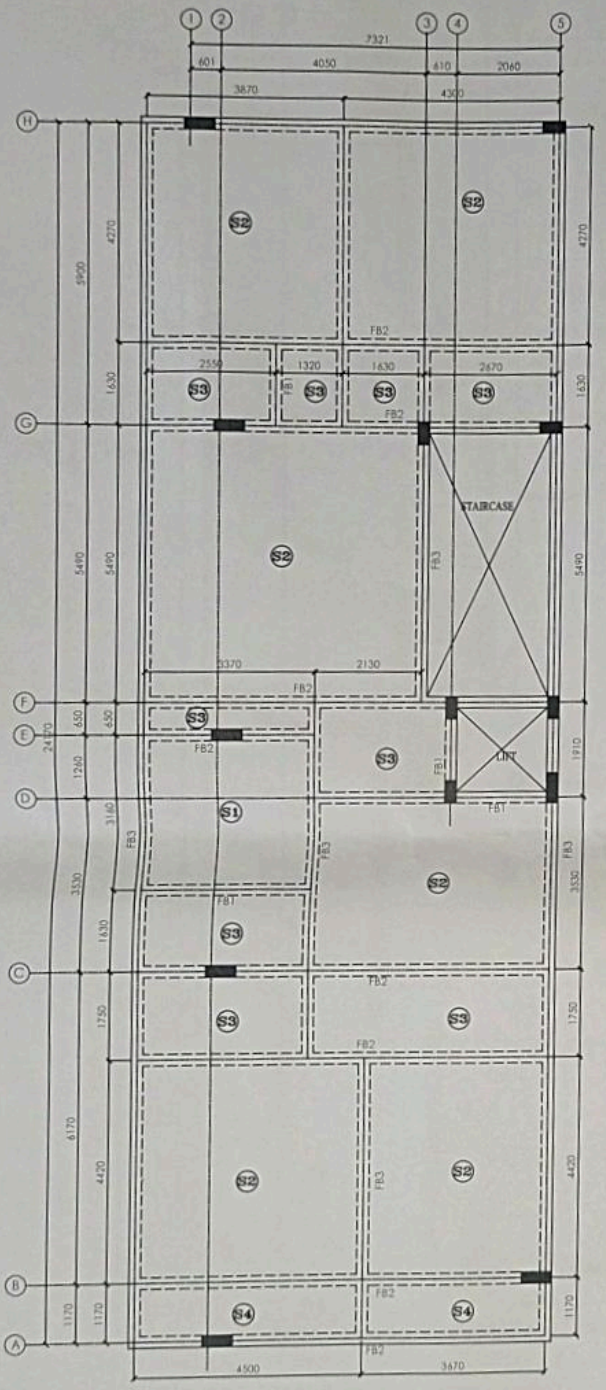
PROJECT:-

PLAN SHOWING THE PROPOSED CONSTRUCTION OF STILT FLOOR + 5 FLOORS (16.30m HEIGHT) RESIDENTIAL BUILDING WITH 10 DWELLING UNITS AVAILING PREMIUM FSI AT BLOCK No.7, P.T. RAJAN SALAI, KALINGA COLONY, K.K.NAGAR, CHENNAI-600 078 COMPRISED IN OLD SURVEY Nos.55/1A,Plot AND 56/1BPart, T.S.No.2/14, BLOCK No.19 OF KODAMBAKKAM VILLAGE WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION.

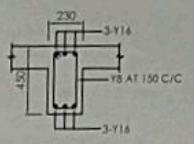
CLIENT:-

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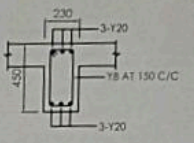
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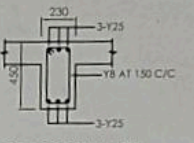
GROUND FLOOR ROOF BEAM & SLAB LAYOUT
(SCALE - 1:75)



C.S OF FLOOR BEAM - FB1
[230x450]
(SCALE 1:25)

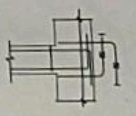


C.S OF FLOOR BEAM - FB2
[230x450]
(SCALE 1:25)



C.S OF FLOOR BEAM - FB3
[230x450]
(SCALE 1:25)

Ld FOR TENSION & COMP BAR		
12mm dia	:	544 mm
16mm dia	:	725 mm
20mm dia	:	906 mm
25mm dia	:	1133 mm



TYPICAL TENSION & COMP BAR

SLAB REINFORCEMENT DETAILS :-

S1	125 THK	Y8 AT 150 C/C (SHORTER) Y8 AT 200 C/C (LONGER)
S2	125 THK	Y10 AT 150 C/C (SHORTER) Y10 AT 150 C/C (LONGER)
S3	125 THK	Y8 AT 125 C/C (BOTHWAYS) TOP & BOTTOM
S4	125 THK	Y8 AT 150 C/C (BOTHWAYS) TOP & BOTTOM

NOTES:-

1. ALL DIMENSIONS ARE IN 'MILLIMETER'
2. USE CONCRETE MIX : M30 GRADE
3. LAP LENGTH 56Ø
4. CLEAR COVER TO THE REINFORCEMENT FOR FLOOR BEAM : 25 & FLOOR SLAB :20
5. HIGH YIELD STRENGTH DEFORMED BARS CONFIRMING IS 1786-1985 TO BE USED. Fe 500
6. Y DENOTES FOR HYSD BARS

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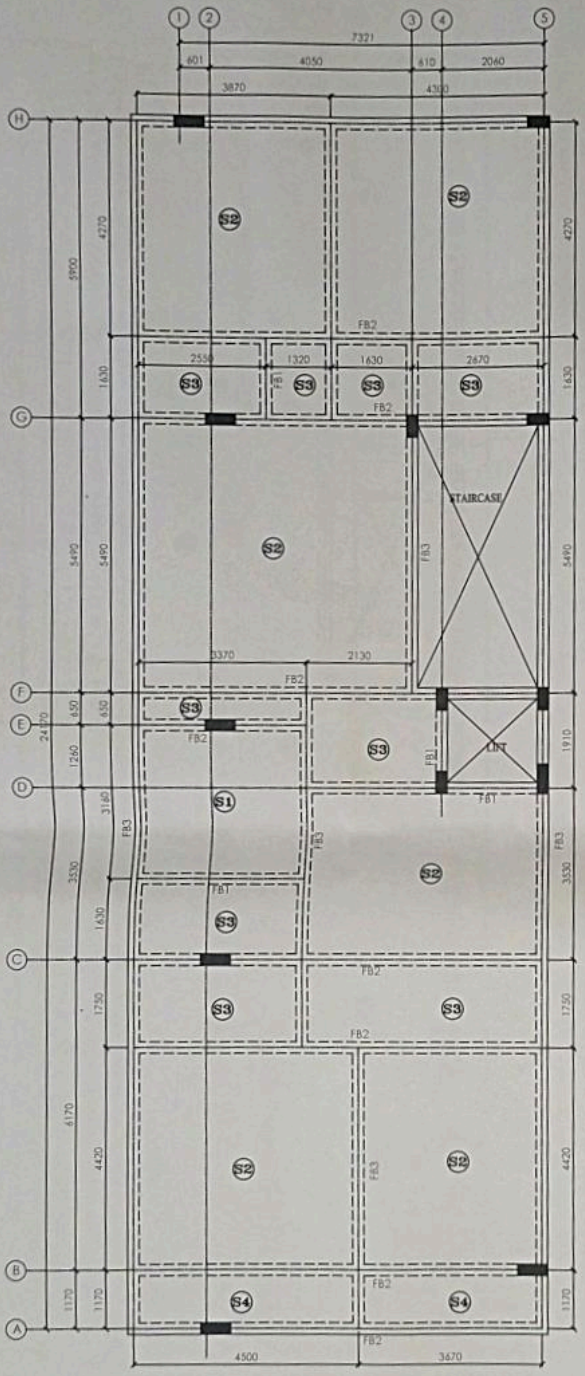
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PROJECT:-

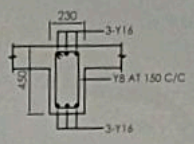
PLAN SHOWING THE PROPOSED CONSTRUCTION OF STILT FLOOR + 5 FLOORS (18.30m HEIGHT) RESIDENTIAL BUILDING WITH 10 DWELLING UNITS AVAILING PREMIUM FSI AT BLOCK No.7, P.T. RAJAN SALAI, KALINGA COLONY, K.K.NAGAR, CHENNAI-600 078, COMPRISED IN OLD SURVEY Nos.55/1APart AND 56/1BPart, T.S.No.2/14, BLOCK No.98 OF KODAMBAKKAM VILLAGE WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION.

CLIENT:-

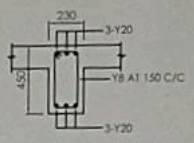
M/s. QUALITY SHELTERS,
CHENNAI.



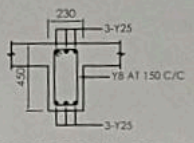
FIRST FLOOR ROOF BEAM & SLAB LAYOUT
(SCALE - 1:75)



C.S OF FLOOR BEAM - FB1
(230x450)
(SCALE 1:25)

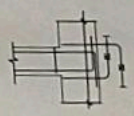


C.S OF FLOOR BEAM - FB2
(230x450)
(SCALE 1:25)



C.S OF FLOOR BEAM - FB3
(230x450)
(SCALE 1:25)

Ld FOR TENSION & COMP BAR		
12mm dia	:	544 mm
16mm dia	:	725 mm
20mm dia	:	906 mm
25mm dia	:	1133 mm



TYPICAL TENSION & COMP BAR

SLAB REINFORCEMENT DETAILS :-

S1	125 THK	Y8 AT 150 C/C (SHORTER) Y8 AT 200 C/C (LONGER)
S2	125 THK	Y10 AT 150 C/C (SHORTER) Y10 AT 150 C/C (LONGER)
S3	125 THK	Y8 AT 125 C/C (BOTHWAYS) TOP & BOTTOM
S4	125 THK	Y8 AT 150 C/C (BOTHWAYS) TOP & BOTTOM

NOTES:-

1. ALL DIMENSIONS ARE IN "MILLIMETER"
2. USE CONCRETE MIX : M30 GRADE
3. LAP LENGTH 56Ø
4. CLEAR COVER TO THE REINFORCEMENT FOR FLOOR BEAM : 25 & FLOOR SLAB :20
5. HIGH YIELD STRENGTH DEFORMED BARS CONFIRMING IS 1786-1985 TO BE USED. Fe 500
6. Y DENOTES FOR HYSD BARS

S.UDAYAKUMAR, M.E (Struc.), MIE(I), C.Eng (I),
REGISTERED STRUCTURAL ENGINEER GRADE-I
(RSE-101312020) & (SE/GR-1/2021/01/286)
GREATER CHENNAI CORPORATION & CMDA,
PLOT # 5, DOOR # 2, SAPTHAGIRI NAGAR MAIN RD,
NEHRU ST., SHOLINGANALLUR, CHENNAI-119.

REV	DATE	DRWN	DESCRIPTION

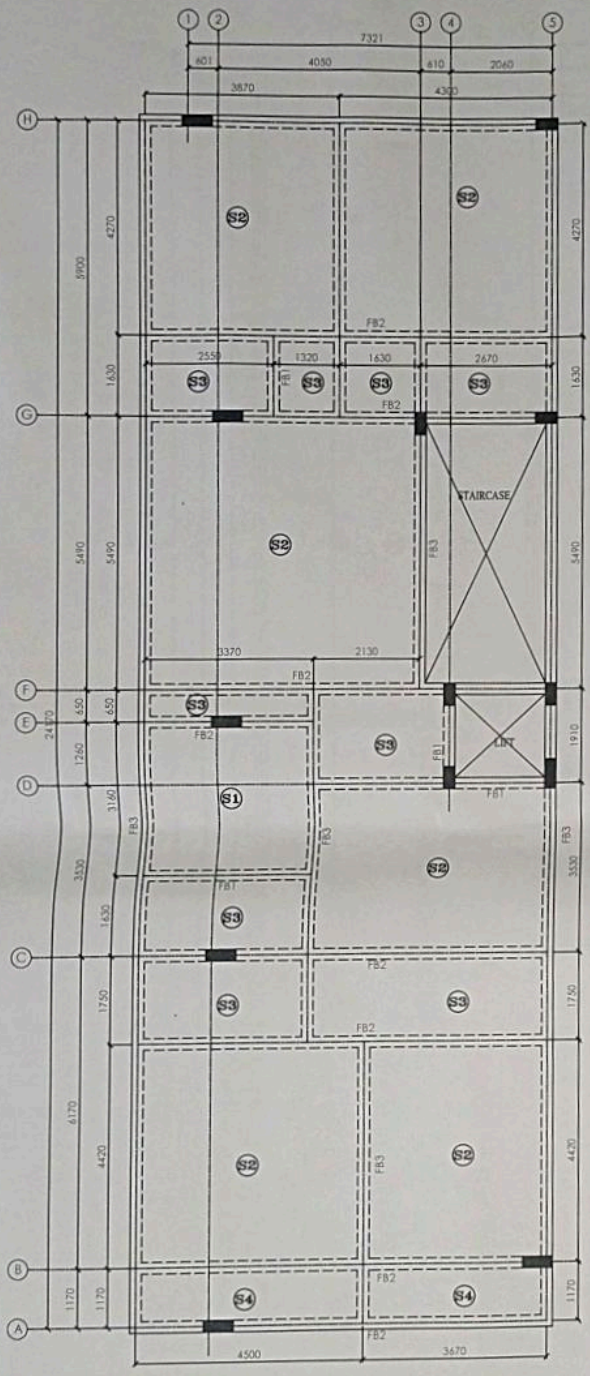
PROJECT:-

PLAN SHOWING THE PROPOSED CONSTRUCTION OF STILT FLOOR + 5 FLOORS (18.30m HEIGHT) RESIDENTIAL BUILDING WITH 10 DWELLING UNITS AVAILING PREMIUM FSI AT BLOCK No.7, P.T. RAJAN SALAI, KALINGA COLONY, K.K.NAGAR, CHENNAI-600 078. COMPRISED IN OLD SURVEY Nos.55/1A Part AND 56/1B Part, T.S.No.2/14, BLOCK No.98 OF KODAMBAKKAM VILLAGE WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION.

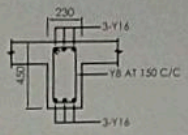
CLIENT:-

M/s. QUALITY SHELTERS,
CHENNAI.

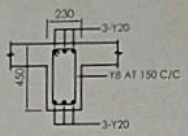
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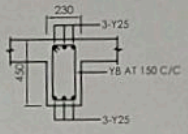
SECOND FLOOR ROOF BEAM & SLAB LAYOUT
(SCALE - 1:75)



C.S OF FLOOR BEAM - FB1
(230x450)
(SCALE 1:25)

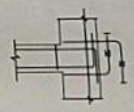


C.S OF FLOOR BEAM - FB2
(230x450)
(SCALE 1:25)



C.S OF FLOOR BEAM - FB3
(230x450)
(SCALE 1:25)

Ld FOR TENSION & COMP BAR		
12mm dia	:	544 mm
16mm dia	:	725 mm
20mm dia	:	906 mm
25mm dia	:	1133 mm



TYPICAL TENSION & COMP BAR

SLAB REINFORCEMENT DETAILS :-

S1	125 THK	Y8 AT 150 C/C (SHORTER) Y8 AT 200 C/C (LONGER)
S2	125 THK	Y10 AT 150 C/C (SHORTER) Y10 AT 150 C/C (LONGER)
S3	125 THK	Y8 AT 125 C/C (BOTHWAYS) TOP & BOTTOM
S4	125 THK	Y8 AT 150 C/C (BOTHWAYS) TOP & BOTTOM

NOTES:-

1. ALL DIMENSIONS ARE IN `MILLIMETER'
2. USE CONCRETE MIX : M30 GRADE
3. LAP LENGTH 56Ø
4. CLEAR COVER TO THE REINFORCEMENT FOR FLOOR BEAM : 25 & FLOOR SLAB :20
5. HIGH YIELD STRENGTH DEFORMED BARS CONFIRMING IS 1786-1985 TO BE USED. Fe 500
6. Y DENOTES FOR HYSD BARS

S.UDAYAKUMAR, M.E (Struc.), MIE(I), C.Eng (I),
REGISTERED STRUCTURAL ENGINEER GRADE-I
(RSE-101312020) & (SE/GR-1/2021/01/286)
GREATER CHENNAI CORPORATION & CMDA,
PLOT # 5, DOOR # 2, SAPTHAGIRI NAGAR MAIN RD,
NEHRU ST., SHOLINGANALLUR, CHENNAI-119.

REV	DATE	DRWN	DESCRIPTION

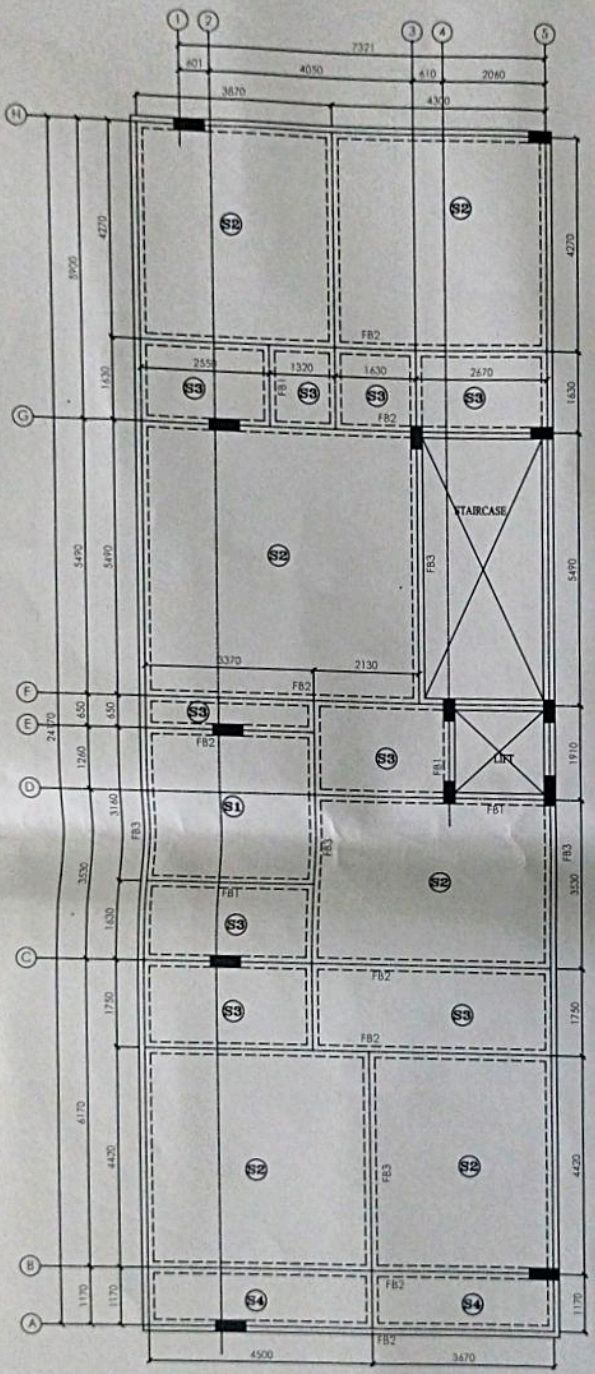
PROJECT:-

PLAN SHOWING THE PROPOSED CONSTRUCTION OF STILT FLOOR + 5 FLOORS (18.30m HEIGHT) RESIDENTIAL BUILDING WITH 10 DWELLING UNITS AVAILING PREMIUM FSI AT BLOCK No.7, P.T. RAJAN SALAI KALINGA COLONY, K.K.NAGAR, CHENNAI-600 078. COMPRISED IN OLD SURVEY Nos.55/1A Part AND 56/1BPart, T.S.No.2/14, BLOCK No.98 OF KODAMBAKKAM VILLAGE WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION.

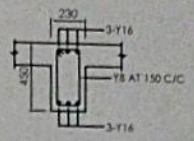
CLIENT:-

M/s. QUALITY SHELTERS,
CHENNAI

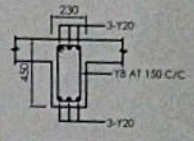
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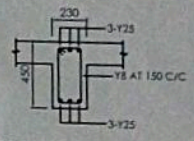
THIRD FLOOR ROOF BEAM & SLAB LAYOUT
(SCALE - 1:75)



C.S OF FLOOR BEAM - FB1
(230x450)
(SCALE 1:25)

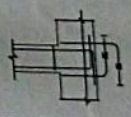


C.S OF FLOOR BEAM - FB2
(230x450)
(SCALE 1:25)



C.S OF FLOOR BEAM - FB3
(230x450)
(SCALE 1:25)

Ld FOR TENSION & COMP BAR		
12mm dia	:	544 mm
16mm dia	:	725 mm
20mm dia	:	906 mm
25mm dia	:	1133 mm



TYPICAL TENSION & COMP BAR

SLAB REINFORCEMENT DETAILS :-

S1	125 THK	Y8 AT 150 C/C (SHORTER) Y8 AT 200 C/C (LONGER)
S2	125 THK	Y10 AT 150 C/C (SHORTER) Y10 AT 150 C/C (LONGER)
S3	125 THK	Y8 AT 125 C/C (BOTHWAYS) TOP & BOTTOM
S4	125 THK	Y8 AT 150 C/C (BOTHWAYS) TOP & BOTTOM

NOTES:-

1. ALL DIMENSIONS ARE IN `MILLIMETER'
2. USE CONCRETE MIX : M30 GRADE
3. LAP LENGTH 56Ø
4. CLEAR COVER TO THE REINFORCEMENT FOR FLOOR BEAM : 25 & FLOOR SLAB :20
5. HIGH YIELD STRENGTH DEFORMED BARS CONFIRMING IS 1786-1985 TO BE USED. Fe 500
6. Y DENOTES FOR HYSD BARS

S.UDAYAKUMAR, M.E (Struc.), MIE(I), C.Eng (I),
REGISTERED STRUCTURAL ENGINEER GRADE-I
(RSE-101312020) & (SE/GR-1/2021/01/286)
GREATER CHENNAI CORPORATION & CMDA,
PLOT # 5, DOOR # 2, SAPTHAGIRI NAGAR MAIN RD,
NEHRU ST., SHOLINGANALLUR, CHENNAI-119.

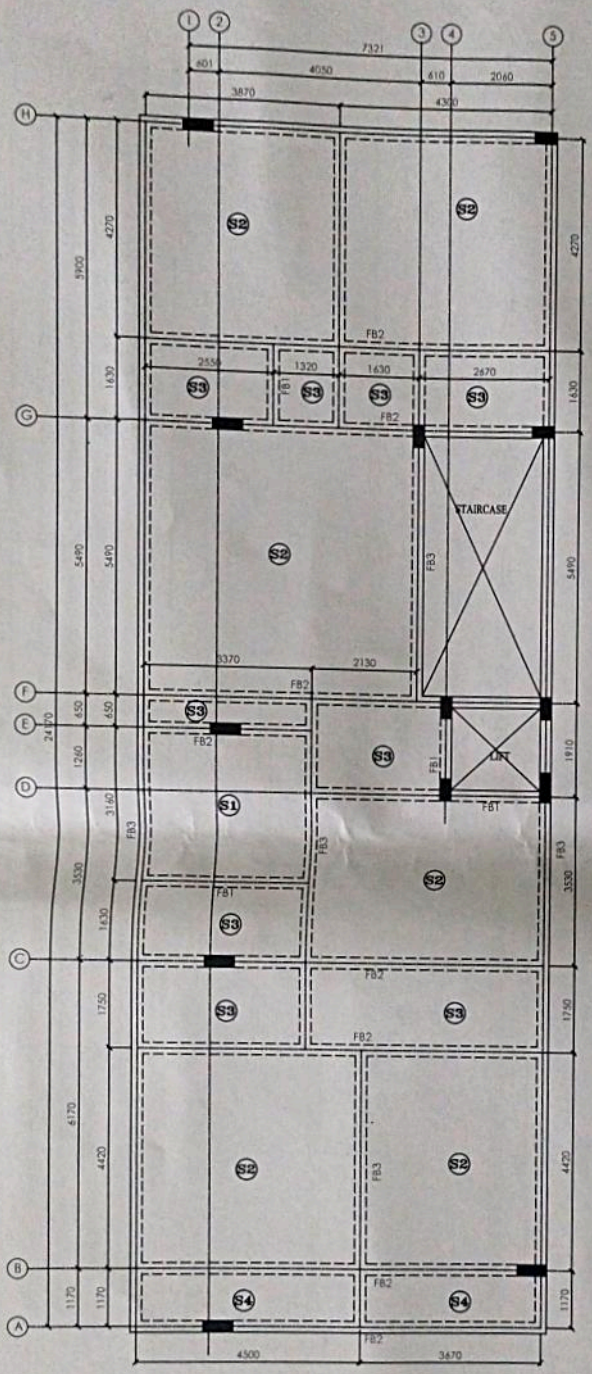
REV	DATE	DRWN	DESCRIPTION

PROJECT:-

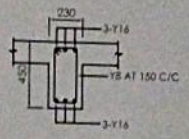
PLAN SHOWING THE PROPOSED CONSTRUCTION OF STILT FLOOR + 5 FLOORS (18.30m HEIGHT) RESIDENTIAL BUILDING WITH 10 DWELLING UNITS AVAILING PREMIUM FSI AT BLOCK No.7, P.T. RAJAN SALAI, KALINGA COLONY, K.K.NAGAR, CHENNAI-600 078, COMPRISED IN OLD SURVEY Nos.55/1A Part AND 56/1B Part, T.S.No.2/14, BLOCK No.98 OF KODAMBAKKAM VILLAGE WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION.

CLIENT:-

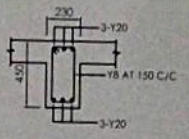
M/s. QUALITY SHELTERS,
CHENNAI.



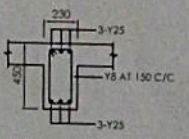
FOURTH FLOOR ROOF BEAM & SLAB LAYOUT
(SCALE - 1:75)



C.S OF FLOOR BEAM - FB1
(230x450)
(SCALE 1:25)

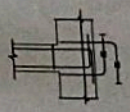


C.S OF FLOOR BEAM - FB2
(230x450)
(SCALE 1:25)



C.S OF FLOOR BEAM - FB3
(230x450)
(SCALE 1:25)

Ld FOR TENSION & COMP BAR		
12mm dia	:	544 mm
16mm dia	:	725 mm
20mm dia	:	906 mm
25mm dia	:	1133 mm



TYPICAL TENSION & COMP BAR

SLAB REINFORCEMENT DETAILS :-

S1	125 THK	Y8 AT 150 C/C (SHORTER) Y8 AT 200 C/C (LONGER)
S2	125 THK	Y10 AT 150 C/C (SHORTER) Y10 AT 150 C/C (LONGER)
S3	125 THK	Y8 AT 125 C/C (BOTHWAYS) TOP & BOTTOM
S4	125 THK	Y8 AT 150 C/C (BOTHWAYS) TOP & BOTTOM

NOTES:-

1. ALL DIMENSIONS ARE IN 'MILLIMETER'
2. USE CONCRETE MIX : M30 GRADE
3. LAP LENGTH 56Ø
4. CLEAR COVER TO THE REINFORCEMENT FOR FLOOR BEAM : 25 & FLOOR SLAB :20
5. HIGH YIELD STRENGTH DEFORMED BARS CONFIRMING IS 1786-1985 TO BE USED, Fe 500
6. Y DENOTES FOR HYSD BARS

S.UDAYAKUMAR, M.E (Struc.), MIE(I), C.Eng (I),
REGISTERED STRUCTURAL ENGINEER GRADE-I
(RSE-101312020) & (SE/GR-1/2021/01/286)
GREATER CHENNAI CORPORATION & CMDA,
PLOT # 5, DOOR # 2, SAPTHAGIRI NAGAR MAIN RD,
NEHRU ST., SHOLINGANALLUR, CHENNAI-119.

REV	DATE	DRWN	DESCRIPTION

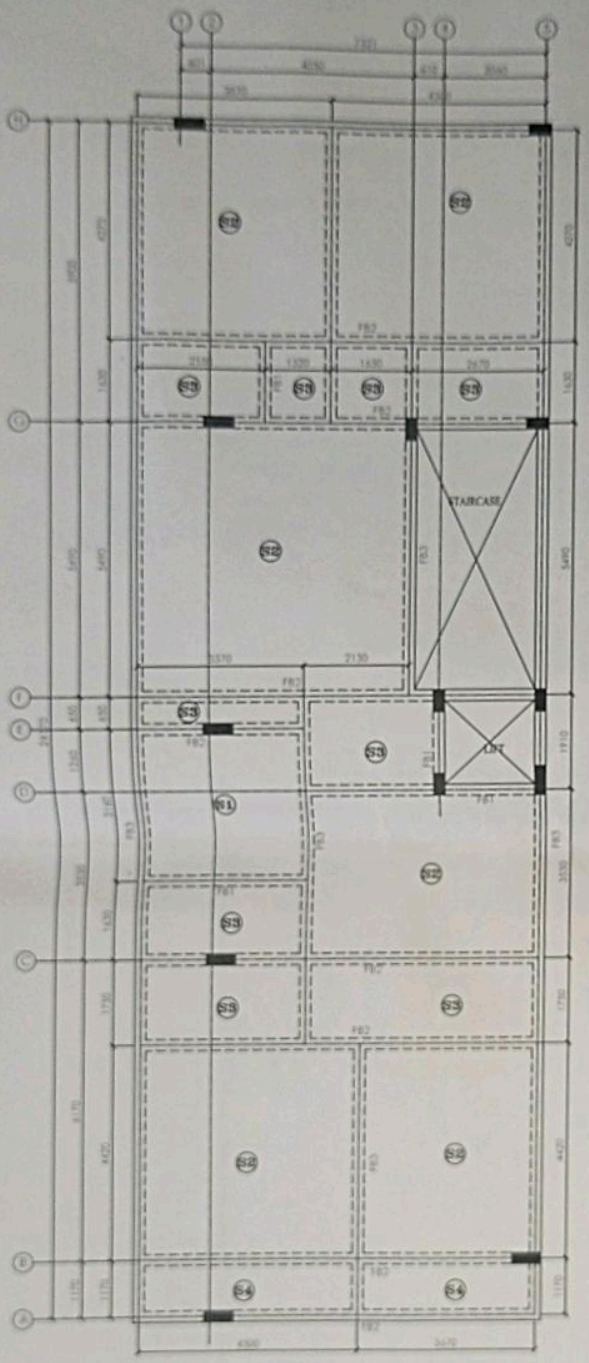
PROJECT:-

PLAN SHOWING THE PROPOSED CONSTRUCTION OF STILT FLOOR + 5 FLOORS (16.30m HEIGHT) RESIDENTIAL BUILDING WITH 10 DWELLING UNITS AVAILING PREMIUM FSI AT BLOCK No.7, P.T. RAJAN SALAI, KALINGA COLONY, K.K.NAGAR, CHENNAI-600 078. COMPRISED IN OLD SURVEY Nos.55/1A Part AND 56/1BPart, T.S.No.2/14, BLOCK No.98 OF KODAMBAKKAM VILLAGE WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION

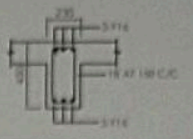
CLIENT:-

M/s. QUALITY SHELTERS,
CHENNAI.

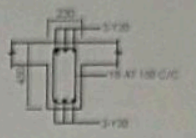
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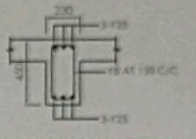
TARRACE FLOOR ROOF BEAM & SLAB LAYOUT
(SCALE : 1:75)



C.S OF FLOOR BEAM : FB1
(230x450)
(SCALE 1:25)

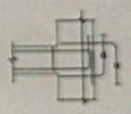


C.S OF FLOOR BEAM : FB2
(230x450)
(SCALE 1:25)



C.S OF FLOOR BEAM : FB3
(230x450)
(SCALE 1:25)

Ld FOR TENSION & COMP BAR		
12mm dia	:	544 mm
16mm dia	:	725 mm
20mm dia	:	906 mm
25mm dia	:	1133 mm



TYPICAL TENSION & COMP BAR

SLAB REINFORCEMENT DETAILS :-

S1	125 THK	Y8 AT 150 C/C (SHORTER) Y8 AT 200 C/C (LONGER)
S2	125 THK	Y10 AT 150 C/C (SHORTER) Y10 AT 150 C/C (LONGER)
S3	125 THK	Y8 AT 125 C/C (BOTH WAYS) TOP & BOTTOM
S4	125 THK	Y8 AT 150 C/C (BOTH WAYS) TOP & BOTTOM

NOTES:-

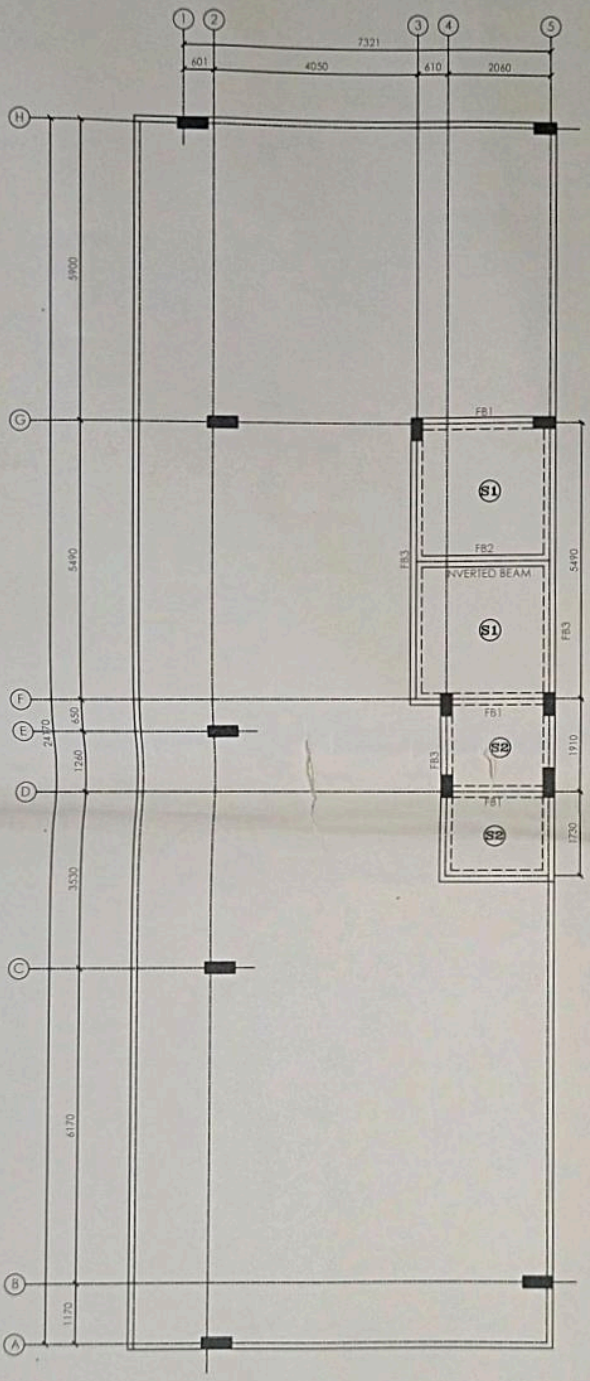
1. ALL DIMENSIONS ARE IN MILLIMETER
2. USE CONCRETE MIX : M30 GRADE
3. LAP LENGTH 56Ø
4. CLEAR COVER TO THE REINFORCEMENT FOR FLOOR BEAM : 25 & FLOOR SLAB :20
5. HIGH YIELD STRENGTH DEFORMED BARS CONFORMING IS 1786-1985 TO BE USED, Fe 500
6. Y - DENOTES FOR HYSD BARS

S. UDAYAKUMAR, M.E (Struc.), MIE(I), C.Eng (I),
REGISTERED STRUCTURAL ENGINEER GRADE-I
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GREATER CHENNAI CORPORATION & CMDA,
PLOT # 5, DOOR # 2, SAPTHAGIRI NAGAR MAIN RD,
NEHRU ST., SHOLINGANALLUR, CHENNAI-119.

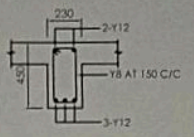
REV	DATE	SIGN	DESCRIPTION

PROJECT:-
PLAN SHOWING THE PROPOSED CONSTRUCTION OF G+1 FLOOR + S.FLOOR (10.80m HEIGHT) RESIDENTIAL BUILDING WITH 10 DWELLING UNITS AVAILING PREMIUM TO AT DOOR No.7, 9-2, ANJAN NAGAR, ANJANGA COLONY, K.K.NAGAR, CHENNAI-600 078. COMPRISED IN OLD SURVEY Nos.55/1A(Part) AND 56/1B(Part), T.S.No.2/1-4, BLOCK No.88 OF KODAMBAKKAM VILLAGE WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION.

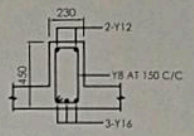
OWNER:-
M/S. QUALITY SHELTERS,
CHENNAI.



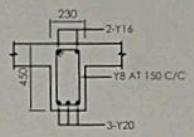
HEAD ROOM ROOF BEAM & SLAB LAYOUT
(SCALE - 1:75)



C.S OF FLOOR BEAM - FB1
[230x450]
(SCALE 1:25)

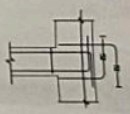


C.S OF FLOOR BEAM - FB2
[230x450]
(SCALE 1:25)



C.S OF FLOOR BEAM - FB3
[230x450]
(SCALE 1:25)

Ld FOR TENSION & COMP BAR		
12mm dia	:	544 mm
16mm dia	:	725 mm
20mm dia	:	906 mm
25mm dia	:	1133 mm



TYPICAL TENSION & COMP BAR

SLAB REINFORCEMENT DETAILS :-

S1	125 THK	Y8 AT 150 C/C (SHORTER) Y8 AT 200 C/C (LONGER)
S2	125 THK	Y10 AT 150 C/C (SHORTER) Y10 AT 150 C/C (LONGER)

NOTES:-

1. ALL DIMENSIONS ARE IN "MILLIMETER"
2. USE CONCRETE MIX : M30 GRADE
3. LAP LENGTH 56Ø
4. CLEAR COVER TO THE REINFORCEMENT FOR FLOOR BEAM : 25 & FLOOR SLAB :20
5. HIGH YIELD STRENGTH DEFORMED BARS CONFIRMING IS 1786-1985 TO BE USED. Fe 500
6. Y DENOTES FOR HYSD BARS

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PLOT # 5, DOOR # 2, SAPTHAGIRI NAGAR MAIN RD,
NEHRU ST., SHOLINGANALLUR, CHENNAI-119.

REV	DATE	DRWN	DESCRIPTION

PROJECT:-

PLAN SHOWING THE PROPOSED CONSTRUCTION OF STILT FLOOR + 5 FLOORS (18.30m HEIGHT) RESIDENTIAL BUILDING WITH 10 DWELLING UNITS AVAILING PREMIUM FSI AT BLOCK No.7, P.T. RAJAN SALAI, KALINGA COLONY, K.K.NAGAR, CHENNAI-600 078. COMPRISED IN OLD SURVEY Nos.55/1A Part AND 56/1B Part, T.S.No.2/14, BLOCK No.9B OF KODAMBAKKAM VILLAGE WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION.

CLIENT:-

M/s. QUALITY SHELTERS,
CHENNAI.



our services doesn't just end there

Buying & Selling Services

Property Buying Assistance, Property Selling Support, Market Price Analysis, Owner Outreach and Negotiation.

Legal & Documentation Services

Certified EC, Patta, legal opinions, property verification, due diligence, litigation solutions, and legal heir certificates.

Property Development & Approvals

Building plan approvals, construction, layout and sub-division approvals, zone conversion, and occupancy certification.

NRI & Investment Services

Escrow Services, Rentals, Litigation Solutions, Property Valuation and Property Management

Compliance & Special Services

Demolition, Vaasthu checks, regularization of unauthorized buildings, and office space solutions.



empowering your real estate decisions with smart tools

Property Valuation & Cost Estimation

Guideline Value, Apartment Composite Value, Stamp Duty & Registration Fees Calculator, Building Value Calculator, Capital Gains Calculator, Area Unit Converter, Length Unit Converter

Ownership, Compliance & Legal Verification

Encumbrance Certificate (EC) Search, Find Your SRO, Temple Property Check, WAQF Property Check, View Patta/Chitta, View FMB, Patta Analyzer, EC Analyzer

Zoning & Land Use Analysis

Land Use Zone Finder, CRZ Zone Check, Aquifer Zone Check, CBA Check, EWS Check, Road Width Check, Proposed Road Widening Check, FSI Calculator

Property Documentation & Workflow Tools

Forms & Templates, Document Generator, Document Translation, Dictionary

Vastu & Property Management Tools

Home Vastu Shastra, Plot Vastu Shastra, Property Management

Verified RealEstate™

We're honored to be part of your real estate journey

3/350/2 Mettukuppam,
OMR Thoraipakkam,
Chennai, India

hello@verified.realestate
+91 9996 12 9996
www.verified.realestate