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DIGITALLY VERIFIED RECORD

VRP CONSULTANTS
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STABILITY CERTIFICATE

08.09.2025

The detailed engineering and structure design of the proposed building comprising of **Proposed Construction of Residential Building (Stilt+05 Floors), Public purpose plot, T.S.No:7/II, Old S.Nos: 276,277,278 & 279, Glass factory road, Thiruvottiyur, Chennai-600019,** has been done by us based on the report of geotechnical investigation (Soil test) done by **Geo Mines Engineers Pvt. Ltd, Report No: GMEPL/HANSA ESTATE PVT. LTD./173/2024-25 dated 31st May 2024** and considering the functional requirement of the building.

2. It is certified that among other factors, the proposed building has been designed to resist earthquake. I/we have checked various parameters and found that the proposed building would be safe

3. I/We further certify that:

(i) The minimum grade of concrete is **M-25**

(ii) The design and analysis has been done using the code of practice for plain and reinforced concrete as per IS 456 design loads as per IS Codes No.8.75 and design of earthquake resistant structure as per Is code No.1893-2002 & IS 456:2000

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

Enel.: Structural Design Calculation

Stamp and Signature

V.R. **RAVINDRAN**, M.E.,M.I.E.,
Structural Consultant
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STABILITY CERTIFICATE

The Proposed Residential building **Proposed Construction of Residential Building (Stilt+05 Floors), Public purpose plot, T.S.No:7/11, Old S.Nos: 276,277,278 & 279, Glass factory road, Thiruvottiyur, Chennai-600019,** has been designed as per IS Codal regulations and the construction will be carried out as per Standard Engineering Practice and hence the building is certified to be structurally stable.

The cantilever projections shall be designed with all safety precautions as per IS Codal regulation to support the slab and walls at every floor level.

V.R.RAVINDRAN
Structural Engineer
VRP CONSULTANTS

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Design of Structure:

The structure has been modeled in software "ETABS". The columns and beams have been modeled as per plan. The slab has been given as plate model and loadings are applied as per IS Codal regulations. The wall load has been applied on beams as per plan.

The structure has been analysed as three dimensional structures. The earthquake forces are applied as per IS 1893-2002. The ductile detailing has been followed as per IS 13920-1993.

The loads on columns are taken and foundation is designed as per IS Code. Beams and columns are designed by ETABS. The floor slab is designed manually using IS Codal regulations.

Soil bearing capacity as per soil report is 200 kN/m^2 and this has been considered in the design of foundation.

V.R. RAVINDRAN
Structural Engineer
V R P CONSULTANTS

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STABILITY CERTIFICATE

It is certified that Residential building, at **Proposed Construction of Residential Building (Stilt+05 Floors), Public purpose plot, T.S.No:7/11, Old S.Nos: 276,277,278 & 279, Glass factory road, Thiruvottiyur, Chennai-600019,** has been designed to resist earthquake, check has been made and found safe and I hereby certify that

1. The least dimension of the column is 300 mm.
2. The grade of concrete is M-25.
3. The design and analysis is done using the codes of practice for loading standards as per IS: 875 Parts and Seismic force as per the code IS 1893-2002 & IS 456:2000.

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DESIGN OF SLAB

Data:

Concrete	M25	fck	=	25	N/mm²
Steel	Fe 500	fy	=	500	N/mm²
Shorter Span		Lx	=	3.81	m
Longer Span		Ly	=	4.22	m
Assuming Depth of Slab		D	=	150	mm
Assuming Dia of reinf.			=	8	mm
Clear Cover			=	20	mm
Eff. Depth of Slab		d	=	126	mm
Eff.Shorter Span		l_x	=	3.94	m
Eff. Longer Span		l_y	=	4.35	m

1. Load Calculations:

Self weight of slab	0.15	x	25.00	=	3.75	kN/m²
Floor Finish load	0.075	x	20.00	=	1.50	kN/m²
Live load				=	2.00	kN/m²
Total load				=	7.30	kN/m²
Load Factor				=	1.50	
Factored Load	7			=	10.95	kN/m²
Span Ratio			ℓ_y/ℓ_x	=	4.35 / 3.94	
				=	1.10	

2. Bending Moment Calculation:

Support Condition — 7 — Three edges Discontinuous (One long edge c
From IS 456-2000 Table 26 — 7

α_{Nx}	=	0.064
α_{Px}	=	0.048
α_{Ny}	=	0.000
α_{Py}	=	0.043

Shorter Span:

Negative Moment (Support)

$M_{Nx} = \alpha_{Nx} \times w_u \times l_x^2$
$= 0.064 \times 10.95 \times 3.94^2$
$= 10.91$ kN.m

Positive Moment (Mid span)

$M_{Px} = \alpha_{Px} \times w_u \times l_x^2$
$= 0.048 \times 10.95 \times 3.94^2$
$= 8.18$ kN.m

Longer Span :

Negative Moment (Support)

$M_{Ny} = \alpha_{Ny} \times w_u \times l_x^2$
$= 0.000 \times 10.95 \times 3.94^2$
$= 0.00$ kN.m

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Positive Moment (Mid span)	M_{Py}	=	$\alpha_{Py} \times w_u \times l_x^2$	
		=	0.043 x 10.95 x 3.94²	
		=	7.29	kN.m

Reinforcement:

	Reinf Required		Reinf Provided
Required in Shorter Span			
Support	8Ø @ 240mm c/c	-	8 dia @ 150 mm c/c
Mid span	8Ø @ 325mm c/c	-	8 dia @ 150 mm c/c
Required in Longer Span			
Support	8Ø @ 330mm c/c	-	8 dia @ 150 mm c/c
Mid span	8Ø @ 330mm c/c	-	8 dia @ 150 mm c/c

3. Check for Shear:

As per BS:8110 Shear coefficients

Max Shear coeff. for continuous edge in short direction	γcx =	0.48
Shear coefficient for discontinuous edge in short direction	γdcx =	0.32
Shear coefficient for continuous edge in long direction	γcy =	0.00
Shear coefficient for discontinuous edge in long direction	γdcx =	0.29

S.F for continuous edge in short direction	Vcx	=	γcx * ℓx * W	
Maximum Shear Force	Vu	=	0.48 x 3.936 x 10.95	
		=	20.74	kN
S.F for discontinuous edge in short direction	Vdcx	=	γdcx * ℓx * W	
		=	0.32 x 3.936 x 10.95	
		=	13.828kN	
S.F for continuous edge in long direction	Vcy	=	γcy * ℓx * W	
		=	0.00 x 3.936 x 10.95	
		=	0.000kN	
S.F for discontinuous edge in long direction	Vdcy	=	γdcy * ℓx * W	
		=	0.29 x 3.936 x 10.95	
		=	12.499kN	

S.F for continuous edge in short direction	Vu	=	20.741	
Design Shear stress τv	Vu/bd	=	20741 / (1000 x 126)	
		=	0.165	N/mm²

Reinforcement provided in the slab is		=	8Ø @ 150 mm c/c	
% of reinforcement provided	pt	=	0.266	
IS:456 Table 19				
Allowable shear stress	τc	=	0.37	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 0.375	
		=	0.487	N/mm²

Actual Shear Stress < Design Shear Stress 0.165 < 0.487

SAFE

4. Check for deflection

Allowable span / depth Ratio		l/d	= 26	
% of Tension reinforcement		pt	= 0.266	
Corresponding Compression reinf.		Bar dia	= 0	mm
		spacing	= 150	mm
% of Compression reinforcement		pc	= 0.000	
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	
		=	26 x 2.00 x 1.00	
		=	**52.00**	
Actual span/depth ratio		=	3936 / 126	
		=	**31.24**	

Actual span/depth ratio < Modified span/depth ratio 31.24 < 52.00

SAFE

DESIGN OF BEAM

Data:

Effective span		=	4.91 m
		=	4910 mm
Breadth of beam		=	230 mm
Overall depth (assumed)		=	450 mm
Characterstic strength of steel			
	fy	=	500 N/mm²
	fck	=	25 N/mm²
Cover		=	25 mm

Total load

Dead load from slab		=	3.75 kN/m²
Floor finish		=	1 kN/m²
Partition		=	1 kN/m²
Total dead load		=	5.75 kN/m²
Live load		=	2 kN/m²
	Total load	=	7.75 kN/m²

Effective depth = **d** = $450 - 25 - \frac{25}{2}$

= 412.5 mm

Distance of centroid of Compression reinforcement from the extreme compression fibre =

d' = 25 + (25/2)

= 37.5 mm

$$\frac{d'}{d} = \frac{37.5}{412.5}$$

= 0.1

Minimum Reinforcement

The min. area of tension reinforcement shall not be less than the given,

$$\frac{As}{bd} = \frac{0.85}{fy}$$

Where ,

As	=	Min. area of tension reinforcement
b	=	Breadth of the beam or breadth of web of T-beam
d	=	Effective depth

fy = Characterstic strength of reinforcement

$$As = \frac{0.85 \times b \times d}{fy}$$

$$= \frac{0.85 \times 230 \times 412.5}{500}$$

$$= 161.29 \text{ mm}^2$$

Refering Design Aids **IS:456**, The reinforcement as shown in the sketch

Overall depth of beam = $\frac{1}{12}$ to $\frac{1}{20}$ of the span

Provide over all depth = 450 mm

Width of rib = $\frac{2}{3}$ (depth of rib) = $\frac{2}{3}$ (450 - 150)

= 200 mm

Loading on the beam

From the slab = $\frac{7.75 \times 4.910}{3}$

= 13 kN/m

D.L of the rib = 0.23 x 0.3 x 25 kN/m

= 1.8 kN/m

Total = 14.8 kN/m

Provide 20 mm dia bars at clear cover 25 mm

Effective cover = 25 + 10

= 35 mm

Effective depth d = 415 mm

Center to Center bearing = 4.91 m

Effective span = 4.91 m

Max. BM = $\frac{14.8 \times 4.910 \times 4.910}{8}$

= 45 kN.m

Req.depth **d** = $\left[\frac{1.5 \times 45 \times 10 \wedge 6}{2.76 \times 230}\right]^{1/2}$

= 326 mm

Provided depth, D = 450 mm

$$\frac{Mu}{bd^2} = \left[\frac{1.5 \times 45 \times 10^{6}}{230 \times 415 \times 415}\right]^{1/2}$$

$$= 1.3$$

$$pt = \frac{fck}{2 \times fy}\left[1 - \left(\text{SQRT}\left[1 - \frac{4 \times (Mu/b \times d^2)}{0.87 \times fck}\right]\right)\right] \times 100$$

$$= 0.32\ \%$$

$$Ast = \left[\frac{0.32 \times 230 \times 415}{100}\right]$$

$$= 305\ mm^2$$

Provided 3 - Y16

Check for Shear

$$V = \frac{1.5 \times 14.8 \times 4.910}{2}$$

$$= 55\ kN$$

τ_c = 0.54 N/mm²

$$Vuc = \frac{0.54 \times 230 \times 412.5}{1000}$$

$$= 51.2\ kN$$

Vuc > Shear at support

Provide Y8 @ 150 c / c (stirrups)

DESIGN OF COLUMN

Data :

Total No. of floors		=	5
Total No. of Roof		=	6
Storey height		=	3.05 m
Breadth of column	b	=	230 mm
		=	0.23 m
Depth of column	D	=	450 mm
			0.45 m
	fck	=	25 N/mm²

Total axial load

Dead load & live load from one floor		=	300 kN
Total axial load all floors		=	6 x 300
		=	1800 kN
Column dimension		=	230 x 450 mm
Self weight of column		=	0.2 x 0.45 x 6 x 25 x 3.1
		=	47 kN
Total load		=	(1,800 + 47) x 1.5
	Pu	=	2770.5 kN

Area of Reinforcement

	$\frac{d'}{D}$	=	0.1
	d'	=	45 mm
	$\frac{Pu}{fck.b.D}$	=	$\frac{2,771 \times 10^{3}}{25 \times 230 \times 450}$
		=	1.07
	$\frac{Mu}{fck.b.D^2}$	=	$\frac{1.7 \times 1.5 \times 15.4 \times 10^{6}}{25 \times 230 \times 450 \times 450}$
		=	0.03

Refering to chart in SP:16 for values

$\frac{Pu}{fck.b.D}$ = 1.07 ; $\frac{Mu}{fck.b.D^2}$ = 0.03

The value of $\frac{P}{fck}$ = 0.05

$$p = 0.05 \times 25$$
$$= 1.25$$

$$As = \frac{p \times b \times D}{100}$$

$$= \frac{1.25 \times 230 \times 450}{100}$$

$$= 1294 \text{ mm}^2$$

Provide 8 - Y25 bars

Design of Lateral Ties

Dia of lateral ties = $\frac{1}{4} \times 25 = 6$ mm

Hence 8 dia bar is adopted

Pitch is min. of the following - (as per IS:456)

a. Least lateral dimension = 300 mm
b. 16 x dia of main reinforcement = 16 x 25 = 400mm
c. 300mm

Hence provide Y8 @ 200 c/c
Similarly other columns are calculated.

DESIGN OF FOUNDATION

Design of Isolated footing for intermediate column

Data :

Column size	L	=	230 mm
	B	=	450 mm
Size of footing	L	=	2.4 m
	B	=	2.4 m
Safe Bearing capacity of soil	SBC	=	200 kN/m²
Depth of footing below GL		=	2 m
Density of soil	g	=	18 kN/m³
Characterstic strength of concrete	fck	=	25 N/mm²
Characterstic strength of Steel	fy	=	500 N/mm²
Depth of footing provided	D	=	0.525 m
cover		=	50 mm

1. Loading on footing

Axial load on column		=	1847 kN
Self weight of footing (10%)		=	184.7 kN
Total load on footing	W	=	2031.7 kN
Adpot size of footing		=	2.40 x 2.40 m
		=	5.8 m²
Soil pressure,	$\frac{P}{A}$	=	$\frac{2031.7}{5.8}$
		=	203 kN/m²
Gross safe bearing capacity		=	250 kN/m²

Hence safe

2. Moment calculation

Face of the column		=	$\frac{2.40 - 0.23}{2}$
		=	1.09 m
Design pressure		=	154 kN/m²
Moment	M	=	$\left[\frac{154 \times (1.09)^2}{2}\right]$
		=	91 kN.m
Factored moment	Mu	=	136.5 kN.m

3. Area of Reinforcement

Effective depth d = 465 mm (or) 0.465 m

Dia of bar provided Ø = 20 mm

Provided spacing = 100 mm

$$\frac{Mu}{b.d^2} = \frac{137 \times 10\ \text{^6}}{1000 \times 465 \times 465}$$

$$= 0.63$$

Percentage of tension reinforcement

$$pt = \frac{fck}{2 \times fy}\left[1 - \left(SQRT\left[1 - \frac{4 \times (Mu/b \times d^2)}{0.87 \times fck}\right]\right)\right] \times 100$$

$$= 0.15\ \%$$

Required, Ast $= \frac{0.15 \times 1000 \times 465}{100}$

$= 697.5\ mm^2$

Provided, Ast = 3142 mm^2

= 0.68 %

Hence safe

4. Check for One way shear

Vu = 1.5 x 154.00 x(((2.40 x 0.5) - (0.23 x 0.5)) - 0.47)

= 143 kN

Permissible shear stress, $= \frac{143 \times 1000}{1000 \times 465}$

$= 0.31\ N/mm^2$

Allowable shear stress, $= 0.55\ N/mm^2$

Hence safe

5. Check for Punching shear

Punching force Pf $= \left[154 \times (5.8 - ((0.23 + 0.47) \times (0.45 + 0.47)))\right] \times 1.5$

= 1193 kN

Punching shear stress $= \frac{1,193 \times 1000}{465 \times\ 2 \times (230 + 450 + (2 \times 465))}$

$= 0.80\ N/mm^2$

Allowable shear stress $= 1.25\ N/mm^2$

Hence safe

EARTH QUAKE ANALYSIS

1. Calculation of horizontal seismic Coefficient

As per IS 1893 - 2002

$$Ah = \frac{z \cdot I \quad Sa}{2 \cdot R \quad g}$$

Zone factor, $Z = 0.16$
Importance factor, $I = 1$
Response reduction factor, $R = 5$
(As per table 7)

$$\frac{sa}{g} = 2.5$$

Natural period, (Clause.7.6) $Ta = 0.075\ h^{3/4}$

$= 0.075 \times 18.3^{0.75}$

$= 0.66$ sec

h = height of the building

$$Ah = \frac{0.16 \times 1 \times 2.5}{2 \times 5}$$

$= 0.04$

2. Calculation of Base shear & seismic forces

Base shear $V = An \sum Wi$

$= 0.040 \times 1,847$

$= 73.9$ kN

Total no of columns = 44

Shear per column $= \frac{73.9}{44}$

$= 1.68$

Seismic moment per column $= \frac{1.68 \times 3}{4}$

$= 1.3$ T-m

Column Provided = 230 x 450 mm with 8 - Y25

Hence safe

3. *Checking for footing*

SBC = 25 T/m²

Soil pressure = 20.317 T/m²

$$= \frac{p}{A} \pm \frac{1.30 \times 6}{12}$$

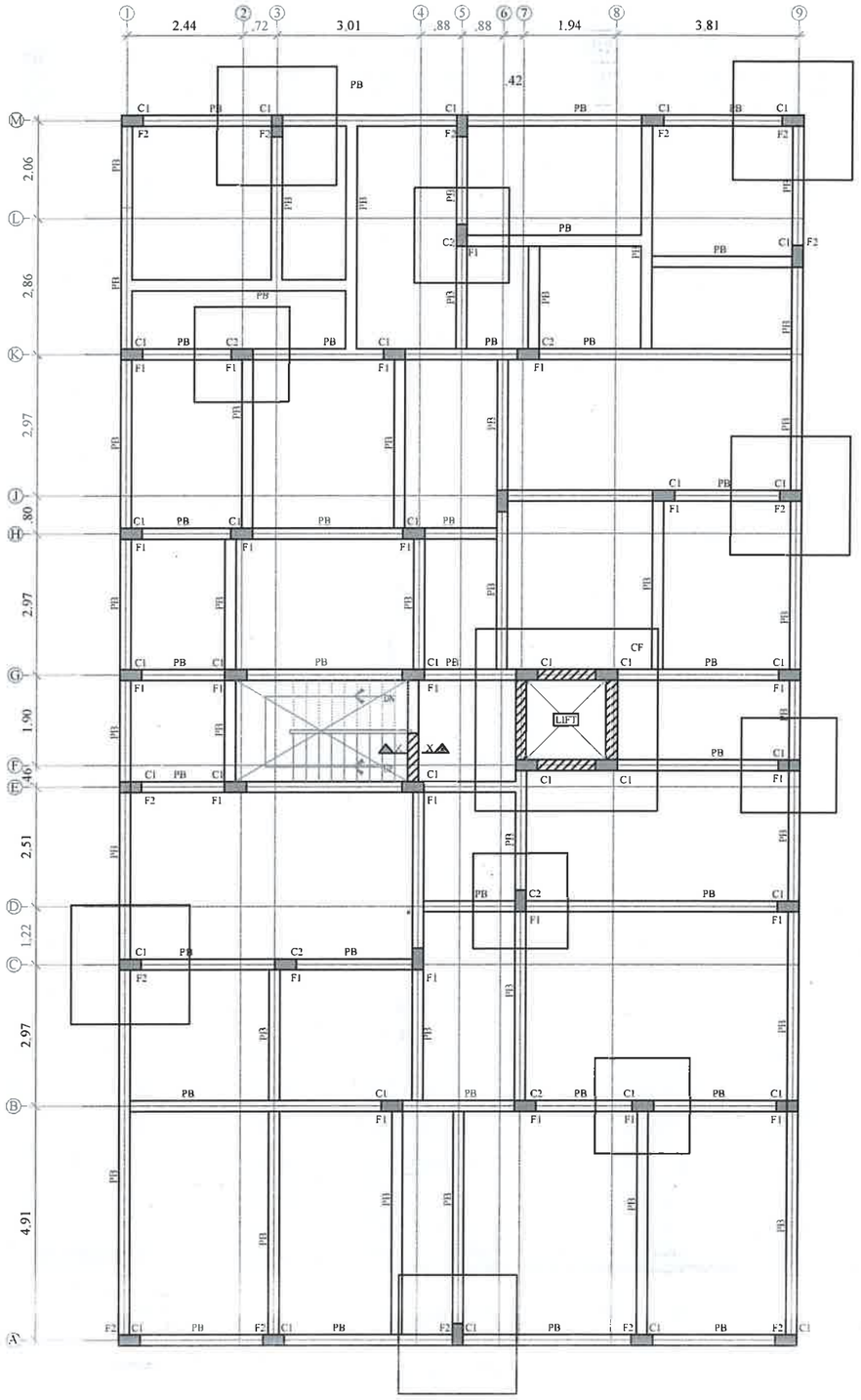
$$= 20.317 \pm 0.65$$

$$= 20.967$$

$$= 19.667 \text{ T/m}^2 < 25 \text{ T/m}^2$$

Hence safe

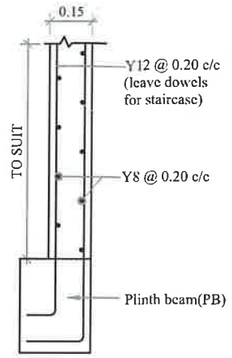
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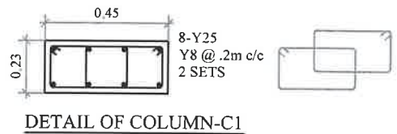
LAYOUT OF FOUNATION, PLINTH BEAM AND COLUMN (BLOCK-1)

(ALL GRID DIMENSIONS SHALL BE CHECKED WITH ARCHITECTURAL DRG.)

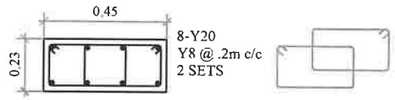
FOOTING SCHEDULE					
FOOTING MKD	FOOTING SIZE	EXCAVATION SIZE	D	REINFORCEMENT AT BOTTOM (BW)	REINFORCEMENT AT TOP (BW)
F1	2.00 x 2.00	2.15 x 2.15	0.45	Y12 @ 0.1 C/C	----
F2	3.00 x 3.00	3.15 x 3.15	0.525	Y16 @ 0.15 C/C	----
CF	4.00 x 4.00	4.15 x 4.15	0.60	Y16 @ 0.1 C/C	Y12 @ 0.1 C/C



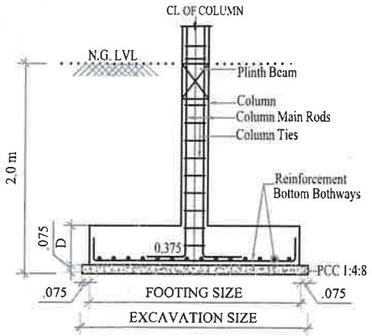
SECTION X-X



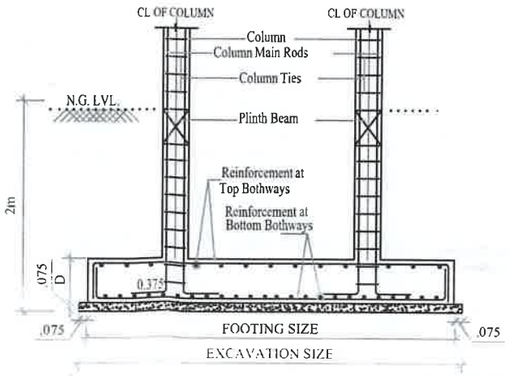
DETAIL OF COLUMN-C1



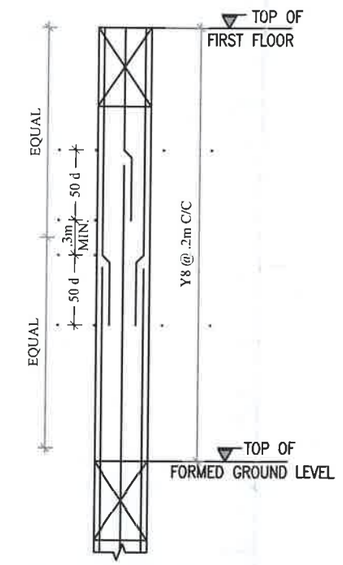
DETAIL OF COLUMN-C2



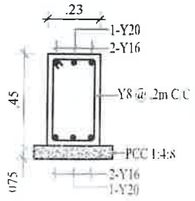
DETAIL OF FOOTING - F1 & F2



DETAIL OF FOOTING - CF



TYPICAL DETAIL OF COLUMN FOR LAPPING OF COLUMN BARS



C.S OF PLINTH BEAM-PB

LEGENDS:

LVL : LEVEL
T&B : TOP & BOTTOM
B/W : BOTHWAYS
---- : TOP BAR
—— : BOTTOM BAR

GENERAL NOTES :

1. Grade of Concrete and steel : M-25 & Fe-550-D.
2. Mix of Concrete shall be designed as per IS 456 – 2000.
3. Cement shall be generally be of 53 Grade – unless otherwise specified.
4. Clear cover to reinforcement shall be as follows:
   Slab – 20 mm (3/4")
   Beam – 25 mm (1")
   Column – 40 mm (1½")
5. Lapping shall be 50 times diameter of smaller bar
6. Lapping shall be staggered.
7. For columns, if lapping is required, it shall be provided at midway between two floors.
8. For beams, lapping of bars shall be avoided at bottom at center of beam (i.e)at span.
9. For beams, lapping of bars shall be avoided at top of beam at Column – Beam joint (i.e) at support.
10. All dimensions are in "metres"
10. SBC is considered as 200 kN/sq.m at 2.0 m depth as per Soil report.

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REV	DESCRIPTION	DRAWN	CHKD.	DATE
0	RELEASED FOR CONSTRUCTION	RAHMAN	PRIYA	15.10.24

NOTES:
1. This drawing should be read along with Architectural drawing.
2. Foundation has been designed for STILT + FIVE FLOORS ONLY

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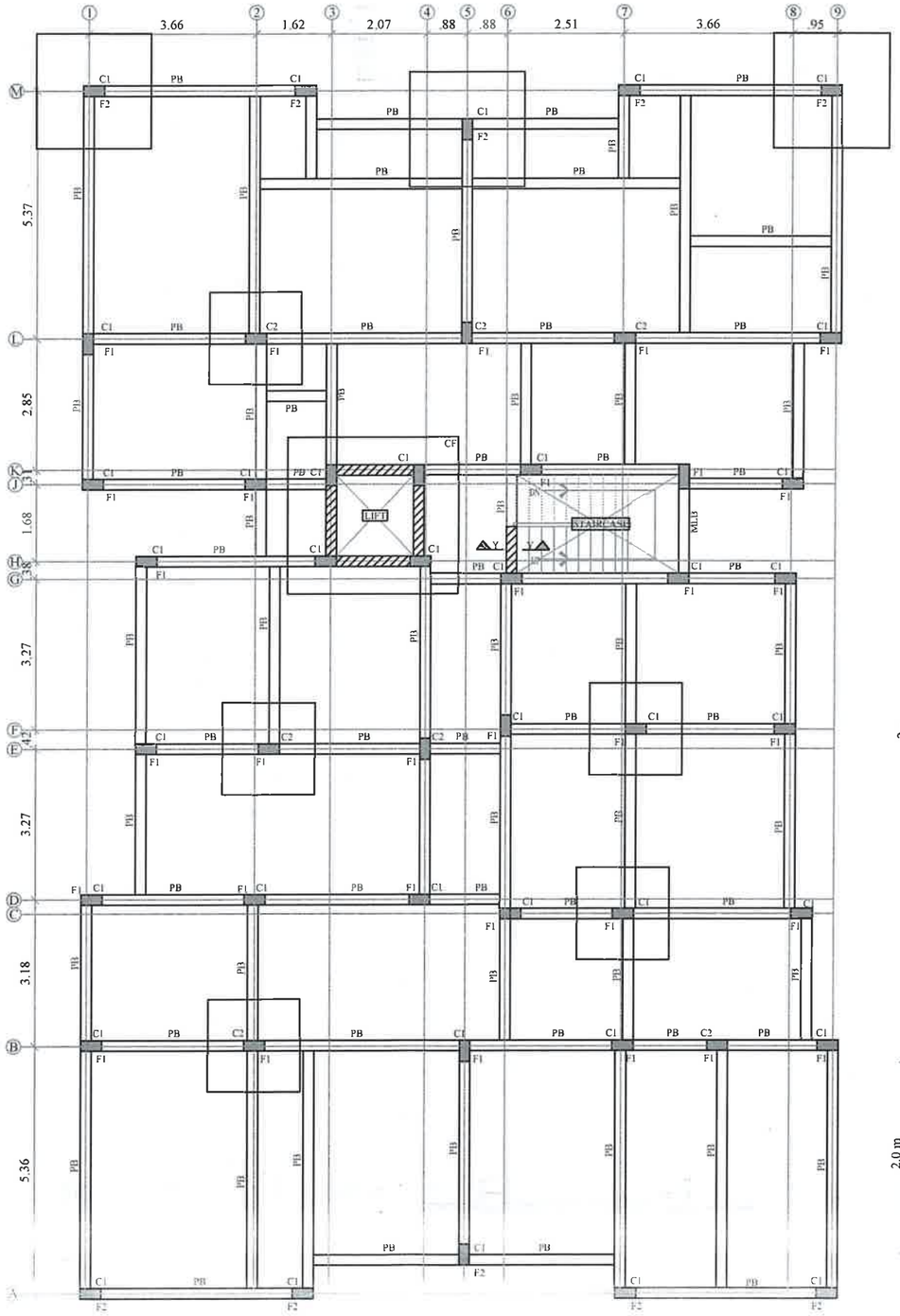
Client:
HANSA ESTATES,
CHENNAI.

Project Title:
PROPOSED RESIDENTIAL BUILDING, BLOCK-1
AT THIRUVOTTIYUR, CHENNAI.

Drawing Title:
LAYOUT & DETAILS OF FOUNDATION, COLUMN AND PLINTH BEAM

DATE : 15.10.2024
DESIGN : PRIYA
DWG NO : 01
FILE: VR-4//VRPC2022/800 Series/Diamond – Gems Park

STABILITY CERTIFICATE

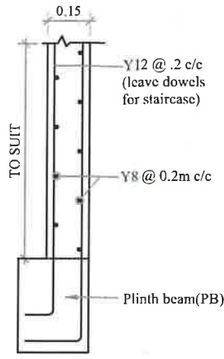


LAYOUT OF FOUNATION, PLINTH BEAM AND COLUMN (STILT, I, II & III) BLOCK-2

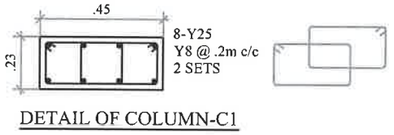
ALL GRID DIMENSIONS SHALL BE CHECKED WITH ARCHITECTURAL DRG.

FOOTING SCHEDULE

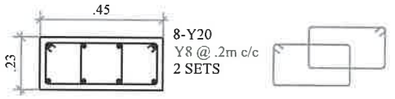
FOOTING MKD	FOOTING SIZE	EXCAVATION SIZE	D	REINFORCEMENT AT BOTTOM (BW)	REINFORCEMENT AT TOP (BW)
F1	2.00 x 2.00	2.15 x 2.15	.450	Y16 @ 0.15 C/C	----
F2	3.00 x 3.00	3.15 x 3.15	.525	Y12 @ 0.1 C/C	----
CF	4.00 x 3.00	4.15 x 3.15	.600	Y16 @ 0.1 C/C	Y12 @ 0.1 C/C



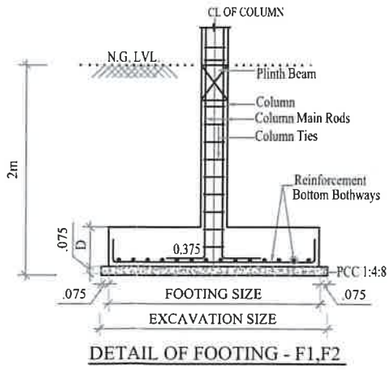
SECTION Y-Y



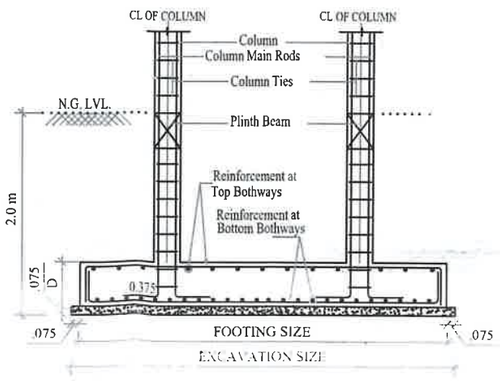
DETAIL OF COLUMN-C1



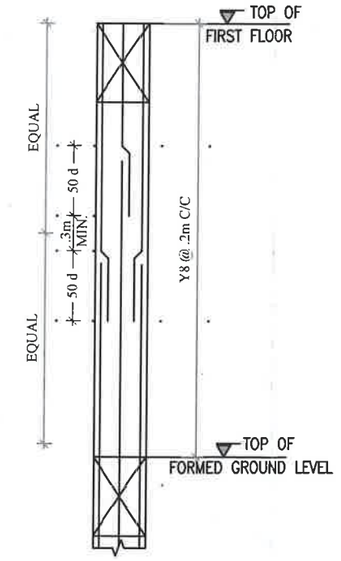
DETAIL OF COLUMN-C2



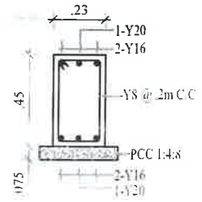
DETAIL OF FOOTING - F1,F2



DETAIL OF FOOTING - CF



TYPICAL DETAIL OF COLUMN FOR LAPPING OF COLUMN BARS



C.S OF PLINTH BEAM-PB

LEGENDS:

LVL : LEVEL
T&B : TOP & BOTTOM
B/W : BOTHWAYS
---- : TOP BAR
——— : BOTTOM BAR

GENERAL NOTES :

1. Grade of Concrete and steel : M-25 & Fe-550-D.
2. Mix of Concrete shall be designed as per IS 456 – 2000.
3. Cement shall be generally be of 53 Grade – unless otherwise specified.
4. Clear cover to reinforcement shall be as follows:
   Slab – 20 mm (3/4")
   Beam – 25 mm (1")
   Column – 40 mm (1½")
5. Lapping shall be 50 times diameter of smaller bar
6. Lapping shall be staggered.
7. For columns, if lapping is required, it shall be provided at midway between two floors.
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9. For beams, lapping of bars shall be avoided at top of beam at Column – Beam joint (i.e) at support.
10. All dimensions are in "metres"
10. SBC is considered as 200 kN/sq.m at 2.0 m depth as per Soil report.

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NOTES:
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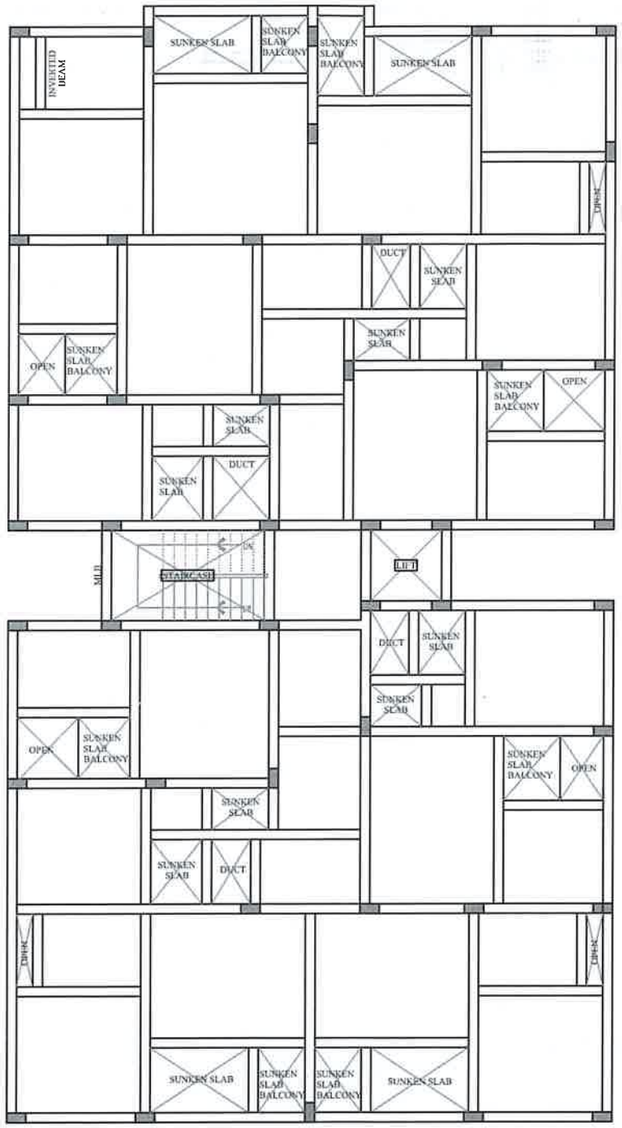
Client:
HANSA ESTATES,
CHENNAI

Project Title:
PROPOSED RESIDENTIAL BUILDING, BLOCK-2 AT THIRUVOTTIYUR, CHENNAI

Drawing Title:
LAYOUT & DETAILS OF FOUNDATION, COLUMN AND PLINTH BEAM

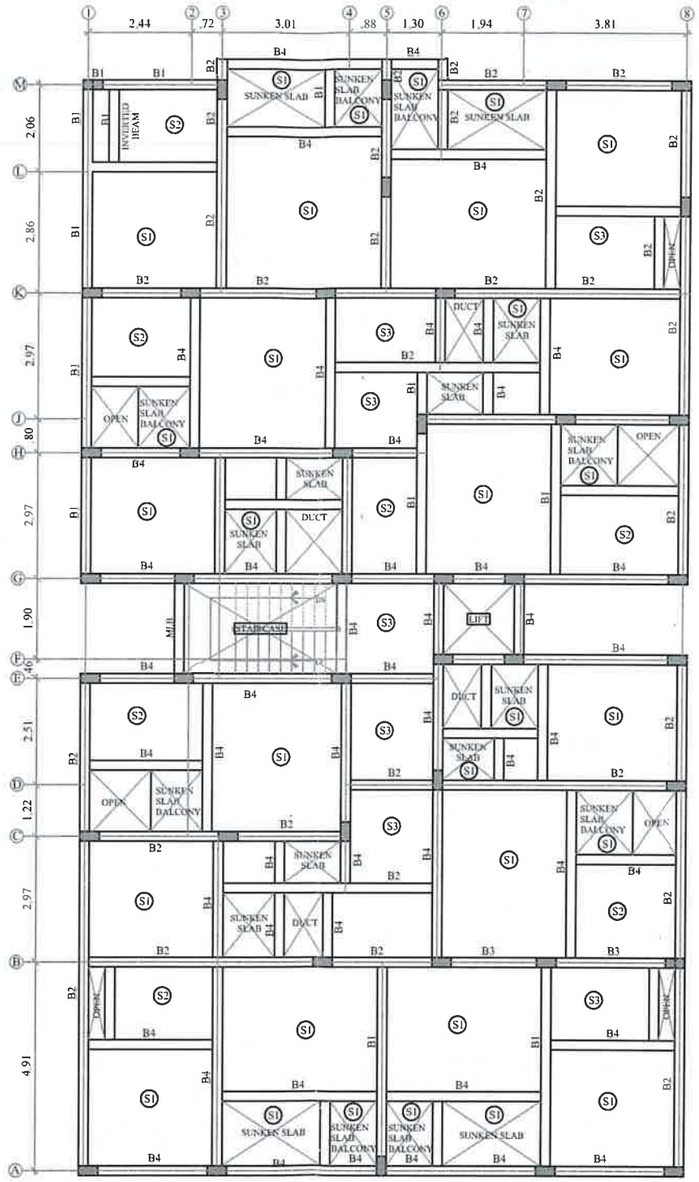
DATE : 15.10.24
DESIGN : PRIYA
DWG NO : 01

FILE: VR-4//VRPC2022/600 Series/Diamond – Gems Park



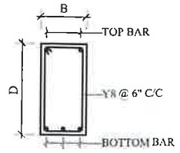
LAYOUT OF ROOF BEAM AND SLAB OVER TYP FLOORS (STILT, I, II & III) BLOCK-1

(ALL GRID DIMENSIONS SHALL BE CHECKED WITH ARCHITECTURAL DRG.)



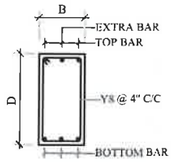
LAYOUT OF ROOF BEAM AND SLAB OVER TYP FLOORS (STILT, I, II & III) BLOCK-1

(ALL GRID DIMENSIONS SHALL BE CHECKED WITH ARCHITECTURAL DRG.)



SECTION A-A

(AT SPAN)



SECTION B-B

(AT SUPPORT)

LEGENDS:

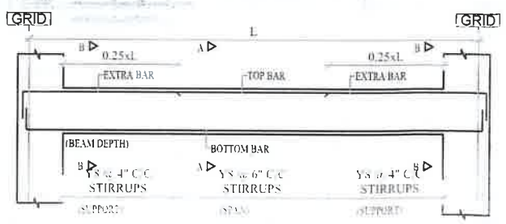
LVL	: LEVEL
T&B	: TOP & BOTTOM
B/W	: BOTHWAYS
----	: TOP BAR
——	: BOTTOM BAR

GENERAL NOTES :

1. Grade of Concrete and steel : M-25 & Fe-550-D.
2. Mix of Concrete shall be designed as per IS 456 – 2000.
3. Cement shall be generally be of 53 Grade – unless otherwise specified.
4. Clear cover to reinforcement shall be as follows:
   - Slab – 20 mm (3/4")
   - Beam – 25 mm (1")
   - Column – 40 mm (1½")
5. Lapping shall be 50 times diameter of smaller bar
6. Lapping shall be staggered.
7. For columns, if lapping is required, it shall be provided at midway between two floors.
8. For beams, lapping of bars shall be avoided at bottom at center of beam (i.e)at span.
9. For beams, lapping of bars shall be avoided at top of beam at Column – Beam joint (i.e) at support.
10. For slab, wherever bars are not shown, provide Y10 @ 0.25 C/C (Distribution Steel)
11. For slab, chair rods shall be provided to keep top reinforcement in place
12. All dimensions are in "metres"

BEAM REINFORCEMENT DETAIL				
BEAM MKD	BEAM SIZE (B X D)	TOP BAR		BOTTOM BAR
		AT SUPPORT	AT SPAN	
B1	.230 X .525	2-Y20+1-Y16	2-Y20	2-Y20+1-Y16
B2	.230 X .600	2-Y20+1-Y25	2-Y20	2-Y20+1-Y25
B3	.230 X .525	2-Y20+1-Y20	2-Y20	2-Y20+1-Y20
B4	.230 X .450	2-Y16+1-Y16	2-Y16	2-Y16+1-Y20

SLAB REINFORCEMENT DETAIL			
BEAM MKD	SLAB THK	SHORTER SPAN	LONGER SPAN
S1	.15	Y8 @ .15 C/C	Y8 @ .15 C/C
S2	.15	Y8 @ .2 C/C	Y8 @ .15 C/C
S3	15	Y8 @ .2" C/C	Y8 @ .2 C/C



E.G.: TYPICAL BEAM

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NOTES:
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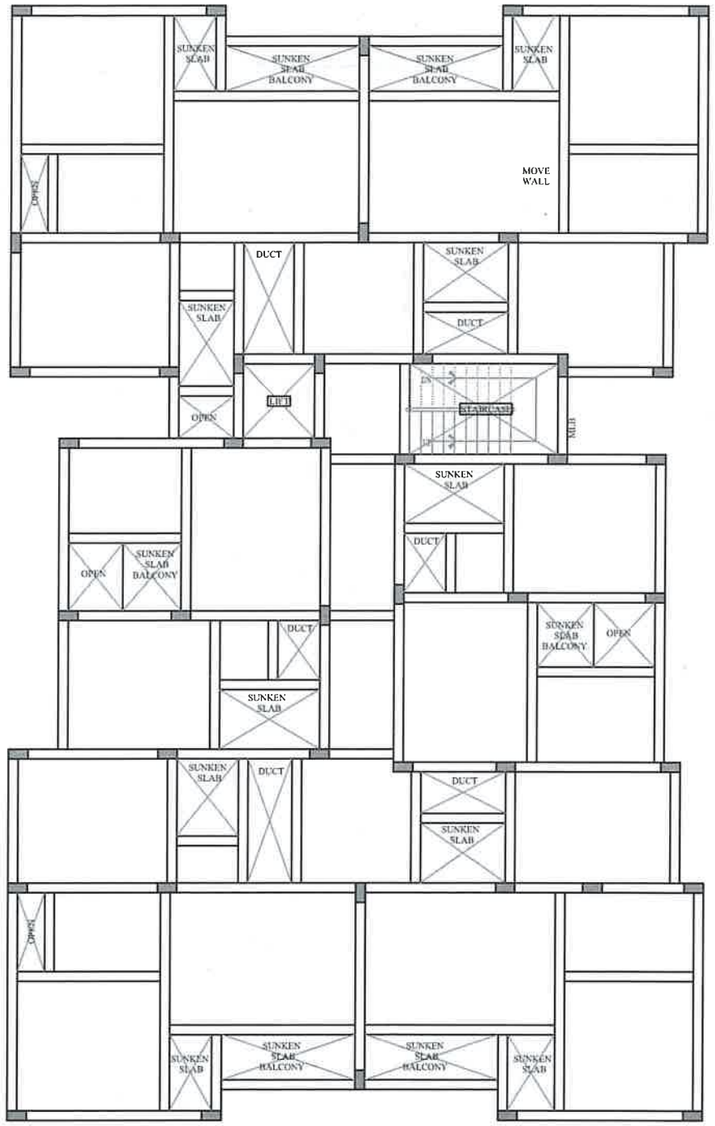
Client:
HANSA ESTATES,
CHENNAI

Project Title:
PROPOSED RESIDENTIAL BUILDING, BLOCK-1
AT THIRUVOTTIYUR, CHENNAI

Drawing Title:
LAYOUT & DETAILS OF ROOF SLAB & BEAMS OVER TYPICAL FLOOR

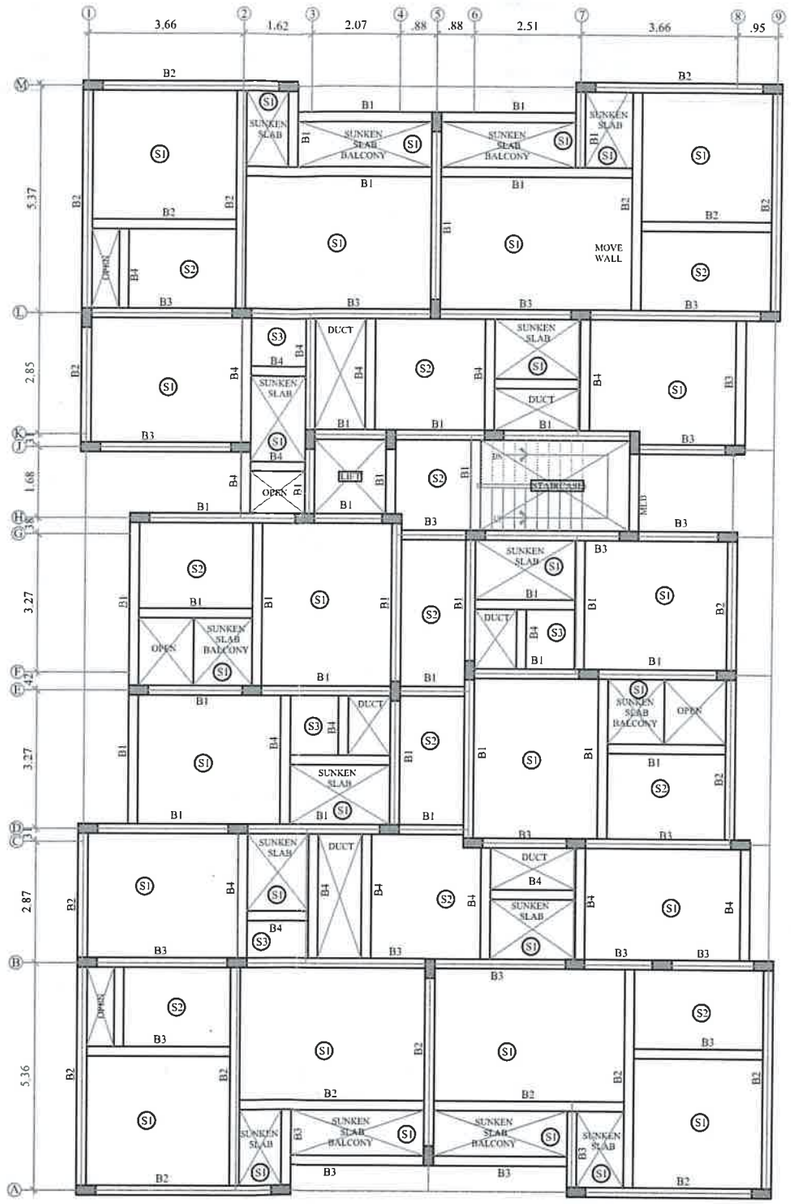
DATE : 15.10.2024

FILE: VR-4//VRPC2022/600 Series/Diamond – Gems Park



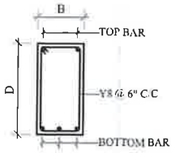
LAYOUT OF ROOF BEAM AND SLAB OVER TYP FLOORS (STILT, I, II & III) BLOCK-2

(ALL GRID DIMENSIONS SHALL BE CHECKED WITH ARCHITECTURAL DRG.)



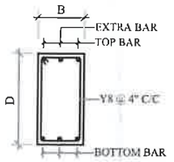
LAYOUT OF ROOF BEAM AND SLAB OVER TYP FLOORS (STILT, I, II & III) BLOCK-2

(ALL GRID DIMENSIONS SHALL BE CHECKED WITH ARCHITECTURAL DRG.)



SECTION A-A

(AT SPAN)



SECTION B-B

(AT SUPPORT)

LEGENDS:

LVL	: LEVEL
T&B	: TOP & BOTTOM
B/W	: BOTHWAYS
----	: TOP BAR
——	: BOTTOM BAR

GENERAL NOTES :

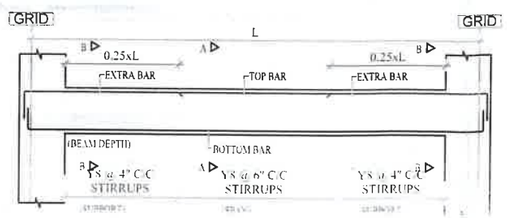
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9. For beams, lapping of bars shall be avoided at top of beam at Column – Beam joint (i.e) at support.
10. For slab, wherever bars are not shown, provide Y10 @ 0.25 C/C (Distribution Steel)
11. For slab, chair rods shall be provided to keep top reinforcement in place
12. All dimensions are in "metres"

BEAM REINFORCEMENT DETAIL

BEAM MKD	BEAM SIZE (B X D)	TOP BAR AT SUPPORT	TOP BAR AT SPAN	BOTTOM BAR
B1	.230 X .525	2-Y20+1-Y16	2-Y20	2-Y20+1-Y16
B2	.230 X .600	2-Y20+1-Y25	2-Y20	2-Y20+1-Y25
B3	.230 X .525	2-Y20+1-Y20	2-Y20	2-Y20+1-Y20
B4	.230 X .450	2-Y16+1-Y16	2-Y16	2-Y16+1-Y20

SLAB REINFORCEMENT DETAIL

BEAM MKD	SLAB THK	SHORTER SPAN	LONGER SPAN
S1	.15	Y8 @ .15 C/C	Y8 @ .15 C/C
S2	15	Y8 @ .2 C/C	Y8 @ .15 C/C
S3	15	Y8 @ .2" C/C	Y8 @ .2 C/C



L.S OF TYPICAL BEAM

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Client:
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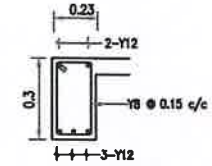
Project Title:
PROPOSED RESIDENTIAL BUILDING, BLOCK-2
AT THIRUVOTTIYUR, CHENNAI.

Drawing Title:
LAYOUT & DETAILS OF ROOF SLAB & BEAMS OVER TYPICAL FLOOR

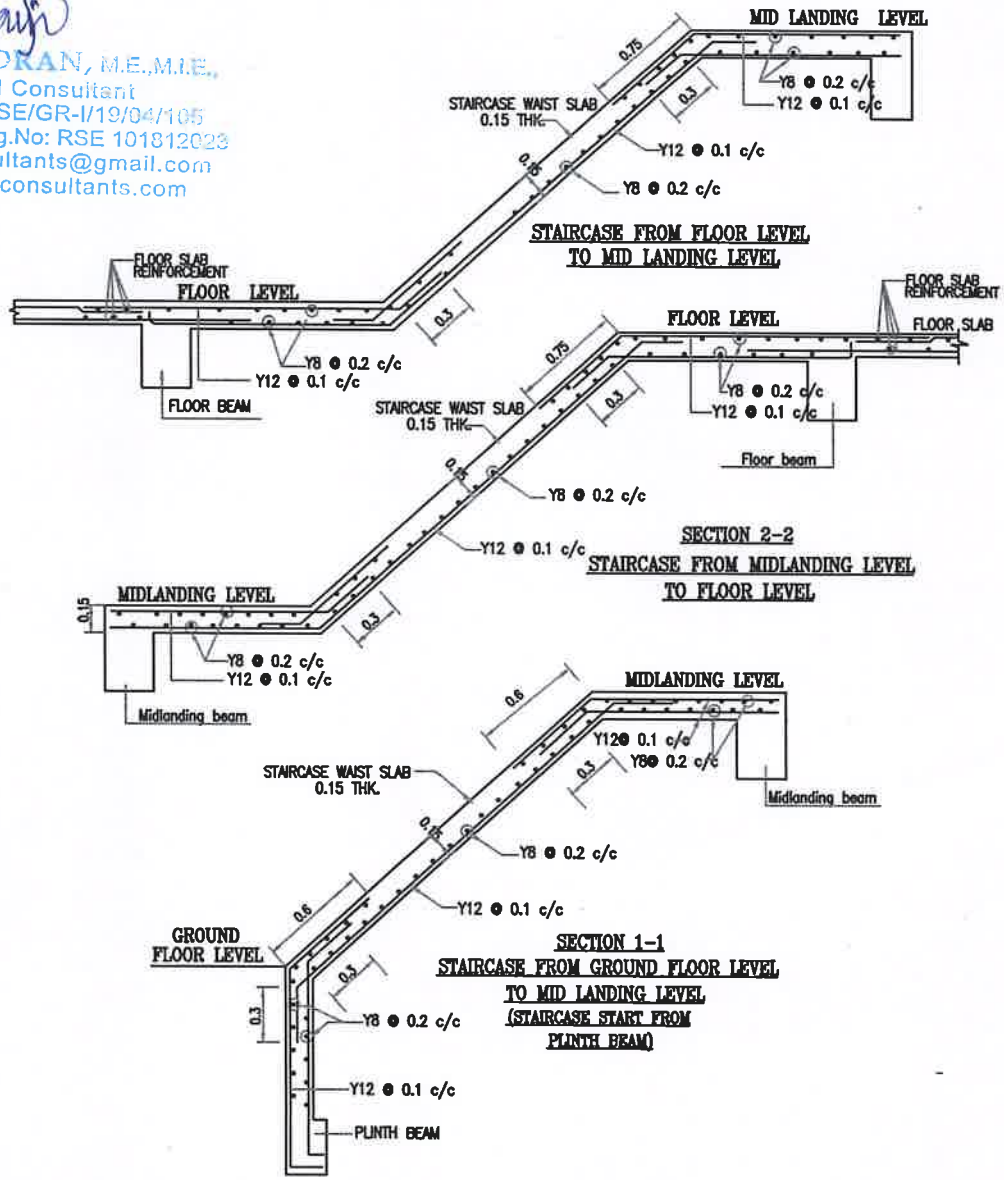
DATE : 15.10.2024

FILE: VR-4//VRPC2022/600 Series/Diamond – Gems Park

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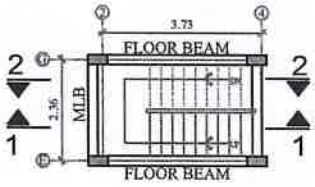
Mid Landing Beam



STAIRCASE FROM FLOOR LEVEL
TO MID LANDING LEVEL

SECTION 2-2
STAIRCASE FROM MIDLANDING LEVEL
TO FLOOR LEVEL

SECTION 1-1
STAIRCASE FROM GROUND FLOOR LEVEL
TO MID LANDING LEVEL
(STAIRCASE START FROM
PLINTH BEAM)



PLAN OF STAIRCASE

GENERAL NOTES :

1. Grade of Concrete and steel : M-25 & Fe-550-D.
2. Mix of Concrete shall be designed as per IS 456 - 2000.
3. Cement shall be generally be of 43 Grade - unless otherwise specified.
4. Clear cover to reinforcement shall be as follows:
   - Beam - 25
   - Waist slab - 20
5. Lapping shall be 50 times diameter of smaller bar
6. Lapping shall be staggered.
7. For beams, lapping of bars shall be avoided at bottom at center of beam (Le) at span.
8. For beams, lapping of bars shall be avoided at top of beam at Column - Beam joint (Le) at support.
9. For Slabs-Chair rods shall be provided to keep Top reinforcement in place.
10. For Slabs-Provide Y8 @ 0.2 C/C wherever bars are not shown.

STRIPPING TIME FOR FORMWORK

	Time duration
1. Vertical Formwork to Columns, Walls and Beams	1 day
2. Soffit Formwork to Slabs	3 days
3. Soffit Formwork to Beams	7 days
4. Props to Slabs	
a. Spanning upto 4.5m(15'-0")	7 days
b. Spanning over 4.5m(15'-0")	14 days
5. Props to Beams	
a. Spanning upto 6m(20'-0")	14 days
b. Spanning over 6m(20'-0")	21 days

Props to be refixed immediately after removal of formwork at soffit of slabs and beams.

SPECIFICATION FOR SHUTTERING :

Shuttering of adequate strength with necessary props, bracing and struts shall be provided as per IS 456:2000 & IS 14687.

NOTES:

1. This drawing should be read along with Architectural drawing.

Structural Engineer :
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CONSULTING ENGINEERS
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MOB: +91-97910 20780

Project Title:
PROPOSED RESIDENTIAL BUILDING, BLOCK-1 & 2 AT THIRUVOTTIYUR, CHENNAI.

LAYOUT & DETAILS OF STAIRCASE

DATE : 16.10.2024
DWG NO : 03
FILE : \VRPC_2022\Hansa\Diamond\staircase

THE LANDLENS SUITE

Eight ways to know a piece of land before you pay for it.

This report covers one part of the picture. These cover the rest, drawn from the same government records, for any property in Tamil Nadu.

LandLens One
Ask anything about a property and get an answer grounded in live government records, with the sources shown.
/landlens/one

Verify My Land
Every record check run on one property and returned as a single report.
/landlens/verify-my-land

Legal Opinion
An advocate's written opinion on the title, built on the records we pull for it.
/landlens

One Map
Every layer on one map: the parcel, its boundary, zoning, water bodies and what sits around it.
/landlens/one/map

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

Build Scope
What you are allowed to build here: floor space, height, coverage and setbacks.
/landlens/build-scope

Property Tracker
Watch a property and hear about it when something new is registered against it.
/landlens/property-tracker

Deal Room
Run the transaction in one place: documents, stamping, signatures and the parties.
/landlens/deal-room

FREE TOOLS · NO ACCOUNT NEEDED

Twenty-four checks you can run yourself, at no cost.

Records and verification

The registers themselves, read for you.

- Encumbrance Certificate
- Patta and Chitta
- Field Measurement Sketch
- EC Analyzer
- Bank charge check
- Court case search
- Seller background check
- Approval check by survey

Value and duty

What it is worth and what it costs to register.

- Guideline value by street
- Guideline value by survey
- Stamp duty and registration fees
- Capital gains
- Floor space index
- Area unit converter

Zoning and land use

What the plan says can happen on this land.

- Land use zone finder
- CMDA land use check
- Coastal regulation zone
- Master plan check
- Water bodies finder
- Airport height clearance

Registers and directories

Who holds it, and which office keeps the record.

- Find your registering office
- Temple property check
- Waqf property check
- RERA register

Every free tool
/tools

Services we run for you
/services

The LandLens suite
/landlens/one

Verified RealEstate™

Every claim in this document traces back to a government record.

- Legal opinions, due diligence and title verification
- Building plan, layout and sub-division approvals
- Completion and occupancy certificates, regularisation
- Escrow, negotiation and NRI property management
- Land survey, soil testing, architecture and construction

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