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DIGITALLY VERIFIED RECORD

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STABILITY CERTIFICATE

The detailed engineering and structure design of the proposed building comprising of **(Stilt + 5 Floors) at Plot No: G, Survey No : 1A4 & 2A4 Varatharajapuram Village Kundrathur Taluk, Kancheepuram district,** has been done by **VRP Consultants, Kodambakkam, Chennai,** based on the report of geotechnical investigation done by **M/s. Geo Engineers Pvt. Ltd., Chennai, Report No. GMEPL/HANSA ESTATES PVT.LTD/521/2022-23 dated on 8th February 2023** 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 designed and analysis has been done using the code of practice for plain and reinforcement concrete as per IS 456 design loads as per IS Codes No.875 and design of earthquake resistant structure as per Is code No.1893-2002 & IS 456:2000

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

Encl.: Structural Design Calculation

Prakash. V.R.

PRAKASH RAVINDRAN, M.E., AMIE.,
Registered Structural Engineer
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GCC : RSE 100132026
DTCP : TVLR/RSE/GR-I/2024/05/003
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DESIGN OF SLAB

Data:

Concrete	M25	fck	=	25	N/mm²
Steel	Fe 500	fy	=	500	N/mm²
Shorter Span		Lx	=	3.33	m
Longer Span		Ly	=	3.90	m
Assuming Depth of Slab		D	=	150	mm
Assuming Dia of reinf.			=	10	mm
Clear Cover			=	20	mm
Eff. Depth of Slab		d	=	125	mm
Eff.Shorter Span		l_x	=	3.45	m
Eff. Longer Span		l_y	=	4.02	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	8		=	10.95	kN/m²
Span Ratio		ℓ_y/ℓ_x	=	4.02 / 3.45	
			=	1.17	

2. Bending Moment Calculation:

Support Condition 8 Three edges Discontinuous (One short edge c

From IS 456-2000 Table 26 8

α_{Nx}	=	0.000	
α_{Px}	=	0.056	
α_{Ny}	=	0.057	
α_{Py}	=	0.043	

Shorter Span:

Negative Moment (Support) M_{Nx} = $\alpha_{Nx} \times w_u \times l_x^2$

= 0.000 x 10.95 x 3.45²

= 0.00 kN.m

Positive Moment (Mid span) M_{Px} = $\alpha_{Px} \times w_u \times l_x^2$

= 0.056 x 10.95 x 3.45²

= 7.33 kN.m

Longer Span :

Negative Moment (Support) M_{Ny} = $\alpha_{Ny} \times w_u \times l_x^2$

= 0.057 x 10.95 x 3.45²

= 7.44 kN.m

Positive Moment (Mid span)	M_{Py}	=	$\alpha_{Py} \times w_u \times l_x^2$	
		=	0.043 x 10.95 x 3.45²	
		=	5.61	kN.m

Reinforcement:

Required in Shorter Span	Reinf Required		Reinf Provided
Support	10Ø @ 375mm c/c	-	10 dia @ 150 mm c/c
Mid span	10Ø @ 375mm c/c	-	10 dia @ 150 mm c/c
Required in Longer Span			
Support	10Ø @ 375mm c/c	-	10 dia @ 150 mm c/c
Mid span	10Ø @ 375mm c/c	-	10 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 =	0.00
Shear coefficient for discontinuous edge in short direction	γdcx =	0.35
Shear coefficient for continuous edge in long direction	γcy =	0.45
Shear coefficient for discontinuous edge in long direction	γdcx =	0.30

S.F for continuous edge in short direction	Vcx	=	$\gamma cx * \ell x * W$	
Maximum Shear Force	Vu	=	0.00 x 3.452 x 10.95	
		=	0.00	kN
S.F for discontinuous edge in short direction	Vdcx	=	$\gamma dcx * \ell x * W$	
		=	0.35 x 3.452 x 10.95	
		=	13.212kN	
S.F for continuous edge in long direction	Vcy	=	$\gamma cy * \ell x * W$	
		=	0.45 x 3.452 x 10.95	
		=	17.010kN	
S.F for discontinuous edge in long direction	Vdcy	=	$\gamma dcy * \ell x * W$	
		=	0.30 x 3.452 x 10.95	
		=	11.340kN	

S.F for continuous edge in short direction	Vu	=	17.010	
Design Shear stress τv	Vu/bd	=	17010 / (1000 x 125)	
		=	0.136	N/mm²

Reinforcement provided in the slab is		=	10Ø @	150 mm c/c
% of reinforcement provided	pt	=	0.419	
IS:456 Table 19				
Allowable shear stress	τc	=	0.45	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 0.454	
		=	0.591	N/mm²

Actual Shear Stress < Design Shear Stress 0.136 < 0.591

SAFE

4. Check for deflection

Allowable span / depth Ratio		l/d	=	26	
% of Tension reinforcement		pt	=	0.419	
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		=	3452 / 125		
		=	**27.62**		
Actual span/depth ratio < Modified span/depth ratio		27.62 < 52.00			
		SAFE			

DESIGN OF BEAM

Data:

Effective span		=	4.234 m
		=	4234 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 = $\frac{7.75 \times 4.234}{3}$

= 11 kN/m

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

= 1.8 kN/m

Total = 12.8 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 = 4.234 m

Effective span = 4.234 m

Max. BM = $\frac{12.8 \times 4.234 \times 4.234}{8}$

= 29 kN.m

Req.depth **d** = $\left[\frac{1.5 \times 29 \times 10 \text{ ^ } 6}{2.76 \times 230}\right]^{1/2}$

= 262 mm

Provided depth, D = 450 mm

$$\frac{Mu}{bd^2} = \left[\frac{1.5 \times 29 \times 10 \wedge 6}{230 \times 415 \times 415}\right]^{1/2}$$

$$= 1$$

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

$$= 0.24\ \%$$

$$Ast = \left[\frac{0.24 \times 230 \times 415}{100}\right]$$

$$= 229\ mm^2$$

Provided 3 - Y16

Check for Shear

$$V = \frac{1.5 \times 12.8 \times 4.234}{2}$$

$$= 41\ kN$$

$$\tau_c = 0.54\ N/mm^2$$

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

$$= 51.2\ kN$$

Vuc > Shear at support

Provide Y8 @ 150 c / c (stirrups)

DESIGN OF COLUMN

Data :

Total No. of floors		=	3
Total No. of Roof		=	4
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		=	4 x 300
		=	1200 kN
Column dimension		=	230 x 450 mm
Self weight of column		=	0.2 x 0.45 x 4 x 25 x 3.1
		=	32 kN
Total load		=	(1,200 + 32) x 1.5
	Pu	=	1848 kN

Area of Reinforcement

	$\frac{d'}{D}$	=	0.1
	d'	=	45 mm
	$\frac{Pu}{fck.b.D}$	=	$\frac{1,848 \times 10^3}{25 \times 230 \times 450}$
		=	0.71
	$\frac{Mu}{fck.b.D^2}$	=	$\frac{1.7 \times 1.5 \times 15.4 \times 10^6}{25 \times 230 \times 450 \times 450}$
		=	0.03

Refering to chart in SP:16 for values

$\frac{Pu}{fck.b.D}$ = 0.71 ; $\frac{Mu}{fck.b.D^2}$ = 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 PILE FOUNDATION

Design of Pile Foundation for Intermediate Column

Axial load on column	=	585 kN
Coumn Size	=	230 x 450

Capacity of Pile as per soil report

650 dia	=	678 KN

Provide 650 dia Pile

678 KN > 585 KN

Depth of Pi 24 m

Pile Reinforcement

Minimum Ast	=	0.4 % of Area of Pile
	=	0.4 % x ((3.14/4) x450^2)
	=	636 sq.mm

Provide 6 nos. of 12mm dia bar

Ast Provided	=	6 x 113
	=	678 sq.mm
	>	636 sq.mm

Hence Safe

DESIGN OF PILE CAP

Centre line of column passes through the centre line of pile as only one pile is provided for each column. No eccentricity or no moments are produced in the pile cap.

Hence minimum reinforcement is provided for pile cap

Minimum reinforcement	=	0.12 %
Width of pile cap	=	Dia. Of pile + 150mm + 150 mm
	=	650 + 150 + 150
	=	950 mm
Depth of pile cap provided	=	900 mm
Minimum reinforcement	=	0.12/100 x 900 x 750
	=	810 sq.mm

Required Y12 @ 116 mm c/c
Provided Y12 @ 100 mm c/c

EARTH QUAKE ANALYSIS

1. Calculation of horizontal seismic Coefficient

As per IS 1893 - 2002

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

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

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

Natural period, Ta = 0.075 h ¾

(Clause.7.6) = 0.075 x 12.2 ^0.75

= 0.49 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 ∑ Wi

= 0.040 x 1,232

= 49.3 kN

Total no of columns = 142

Shear per column = $\frac{49.3}{142}$

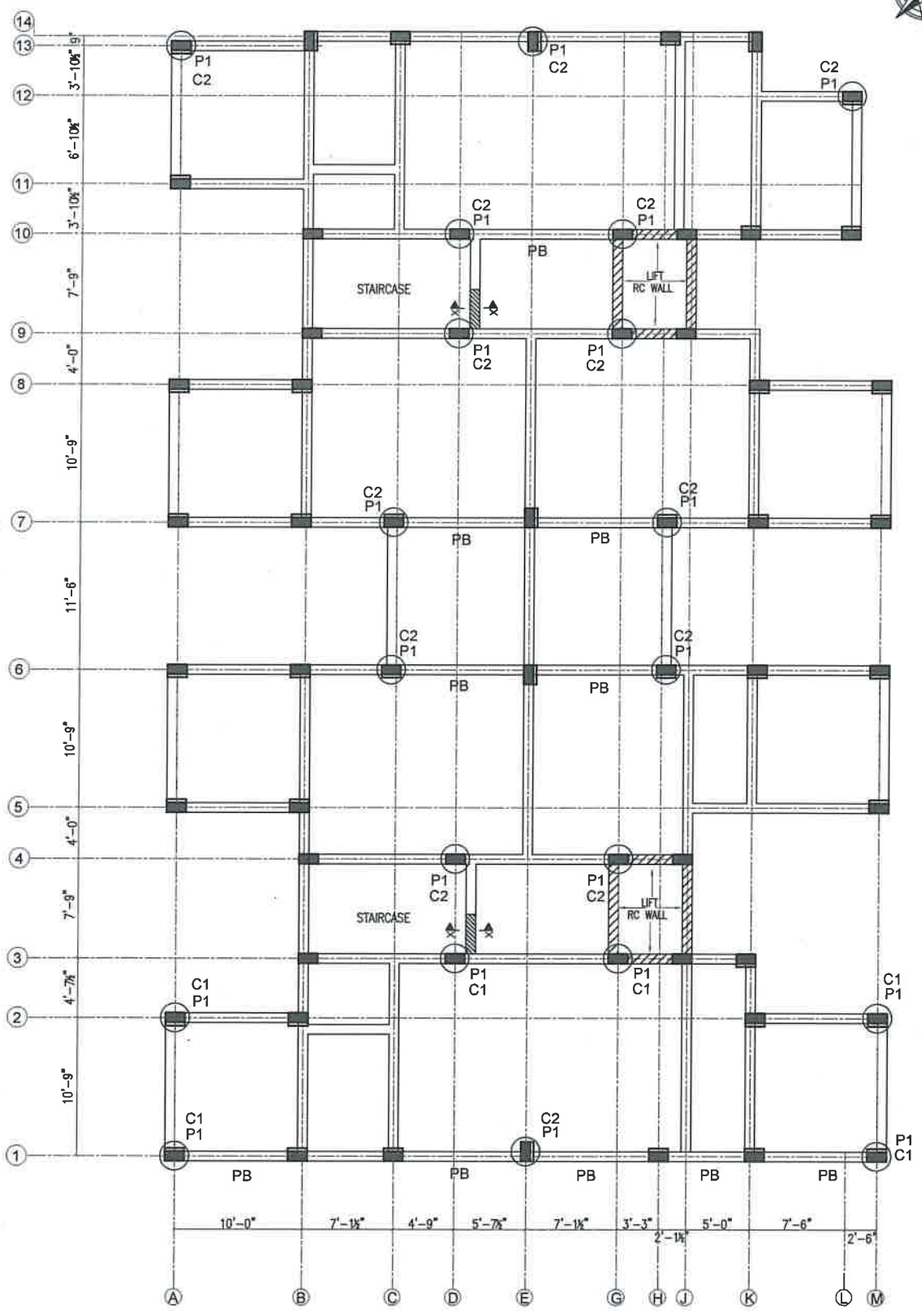
= 0.35

Seismic moment per column = $\frac{0.35 \times 3}{4}$

= 0.3 T-m

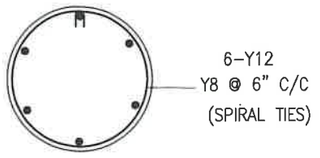
Column Provided = 230 x 450 mm with 8 - Y25

Hence safe



LAYOUT OF FOUNDATION, COLUMN & PLINTH BEAM

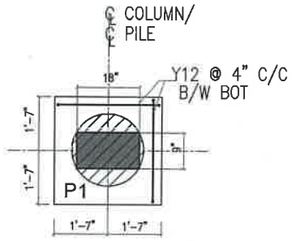
(ALL GRID DIMENSIONS SHALL BE CHECKED WITH ARCHITECTURAL DRG.)



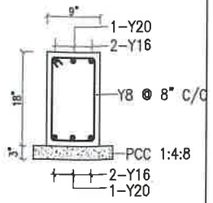
SETION B-B - PLAN

DETAIL OF PILE - P1

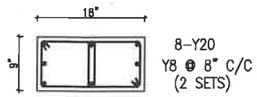
(650 DIA) (26" DIA)



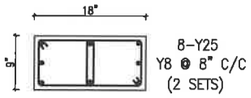
PLAN OF PILE CAP - PC1



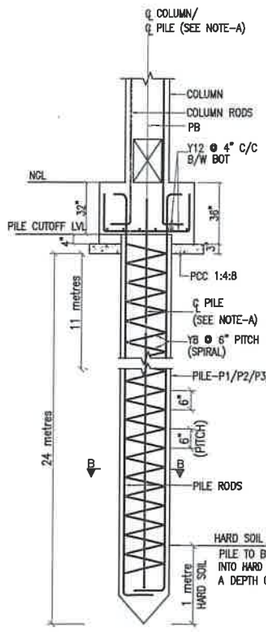
C.S OF PLINTH BEAM-PB



DETAIL OF COLUMN-C1



DETAIL OF COLUMN-C2

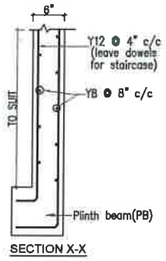


SECTION THRU' PILE

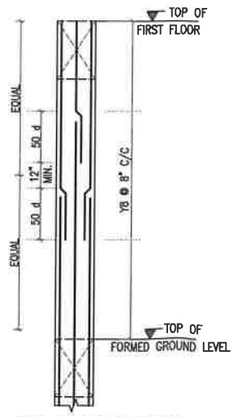
(FOR SINGLE PILE SYSTEM COLUMN ONLY)

NOTE:A – (FOR SINGLE PILE SYSTEM COLUMN ONLY)
CENTRE LINE OF PILE AND CENTRE LINE OF COLUMN SHOULD BE ALONG THE SAME LINE.
IF CENTRE LINE OF COLUMN AND CENTRE LINE OF PILE ARE NOT ALONG THE SAME LINE, IT SHOULD BE INTIMATED TO THE STRUCTURAL CONSULTANT FOR CHANGING THE DESIGN OF PILE CAP

PILE SHOULD PENETRATE INTO PILE CAP BY ATLEAST 4"



SECTION X-X



TYPICAL DETAIL OF COLUMN

FOR LAPPING OF COLUMN BARS

GENERAL NOTES :

1. Grade of Concrete and steel : M–20 & Fe–500.
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:
   - Footing – 2"
   - Column – 1½"
   - Plinth beam – 1"
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. Safe load carrying capacity of a pile 650mm is 678 kN for 24m depth as per soil test report.

Prakash. V.R.

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BLOCK-1

NOTES:

1. This drawing should be read along with Architectural drawing.
2. Foundation has been designed for STILT+FIVE FLOORS ONLY
3. All dimensions are in feet & inches.

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CONSULTING ENGINEERS
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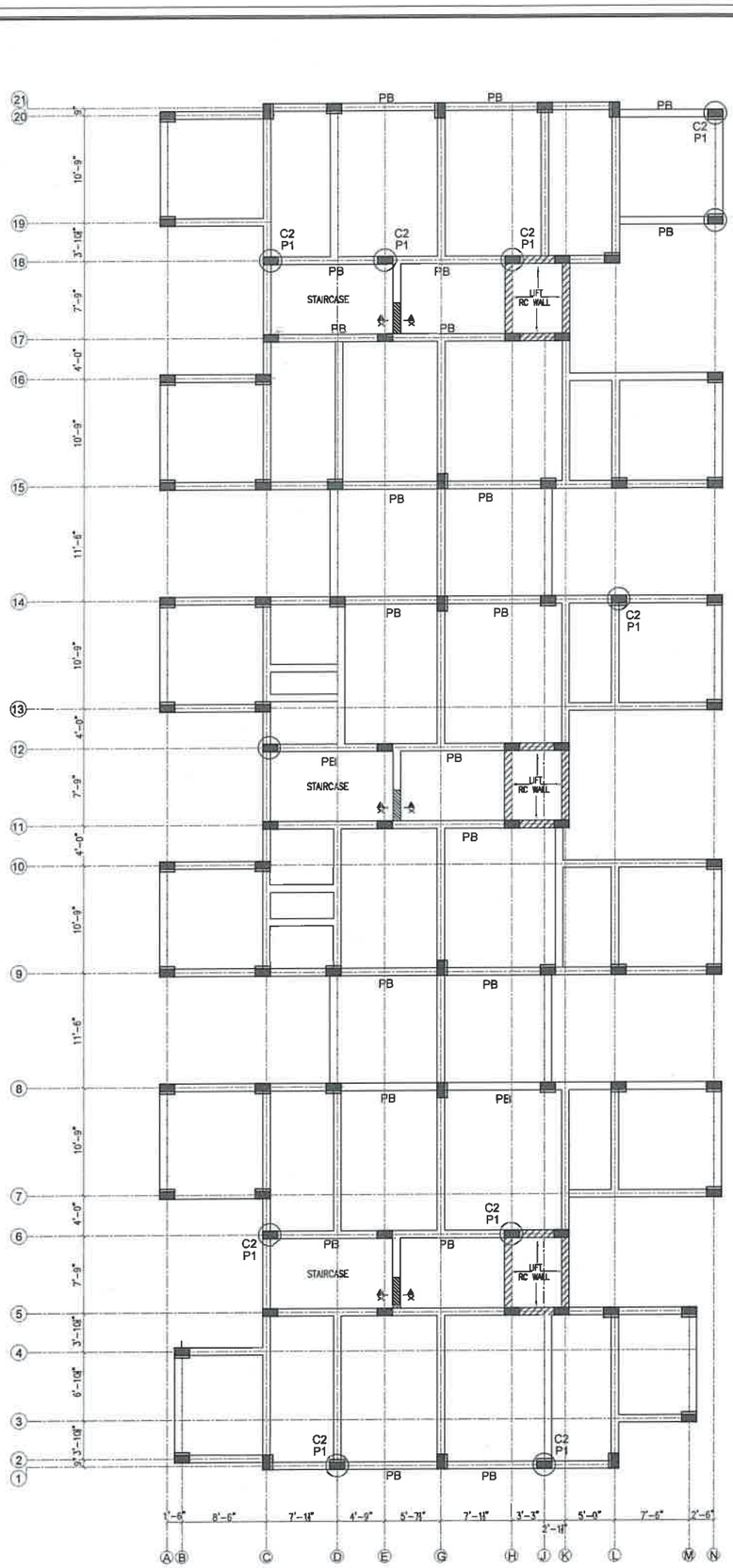
PROPOSED RESIDENTIAL BUILDING AT PLOT NO: 4, VARATHARAJAPURAM VILLAGE, KUNDRATHUR TALUK, KANCHEEPURAM DISTRICT

LAYOUT & DETAILS OF FOUNDATION,COLUMN AND PLINTH BEAM

DATE : 23.02.23

DWG NO : 01

FILE : D/HANSA ESTATE/Fdn



LAYOUT OF FOUNDATION, COLUMN & PLINTH BEAM

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



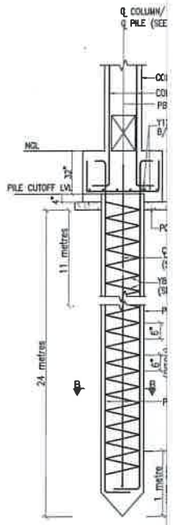
SETION B-B - PLAN

DETAIL OF PILE - P1

(650 DIA) (26" DIA)



DETAIL O



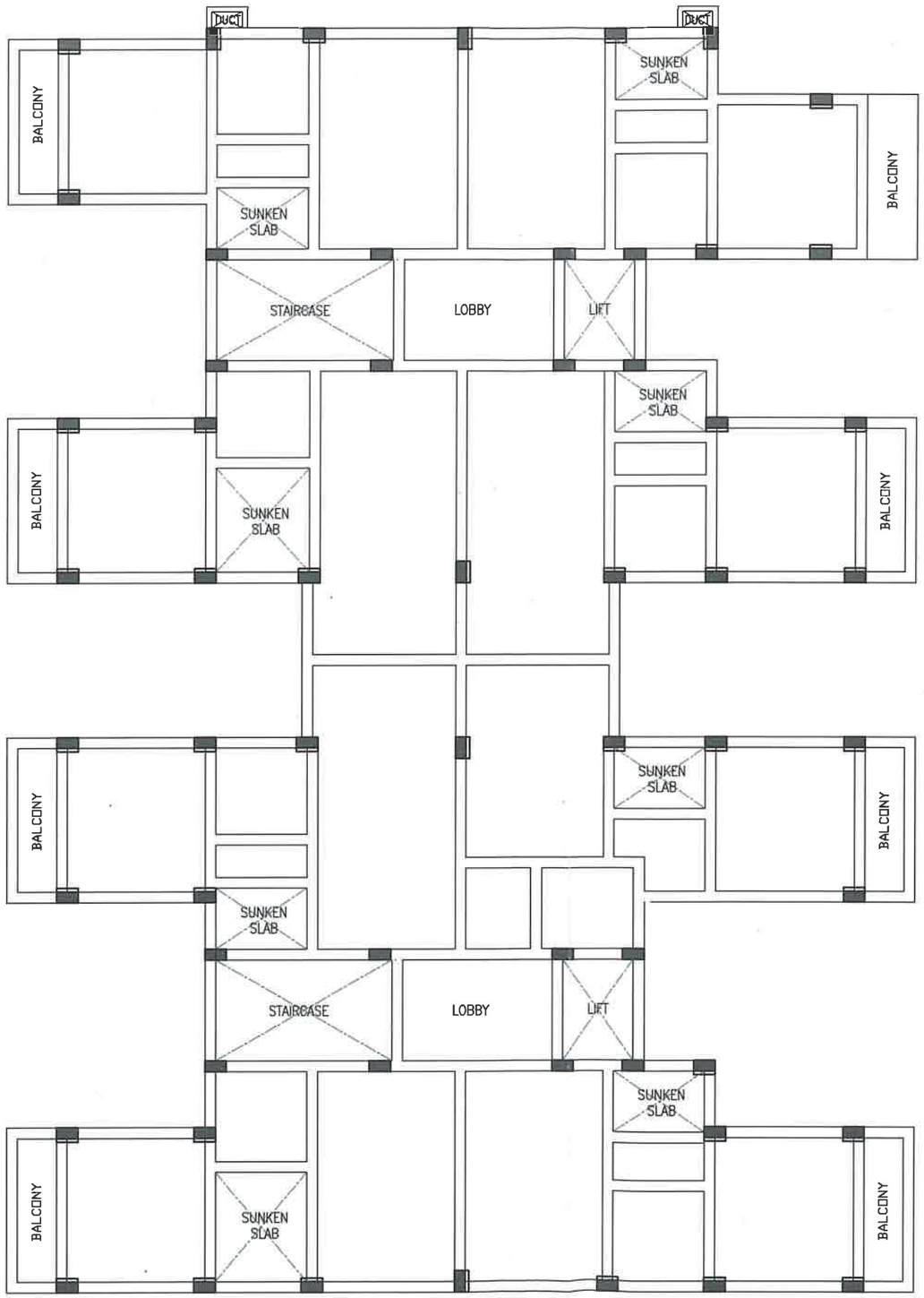
SECTION THRU' PIL

(FOR SINGLE PILE SYSTEM CO

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DESIGN OF PILE CAP

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LAYOUT OF TYPICAL ROOF SLAB & BEAMS

N

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GENERAL NOTES :

1. Grade of Concrete and steel : M–20 & Fe–500.
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:
   - Floor beam – 1"
   - Floor slab – 3/4"
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 (i.e) at span.
8. For beams, lapping of bars shall be avoided at top of beam at Column – Beam joint (i.e) at support.
9. For Slabs–Chair rods shall be provided to keep Top reinforcement in place.
10. For Slabs–Provide Y8 @ 8" 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.

BLOCK-1

NOTES:

1. This drawing should be read along with Architectural drawing.
2. All dimensions are in feet & inches.

Structural Consultant :
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E–MAIL : vrpconsultants@gmail.com
Website : www.vrpconsultants.com

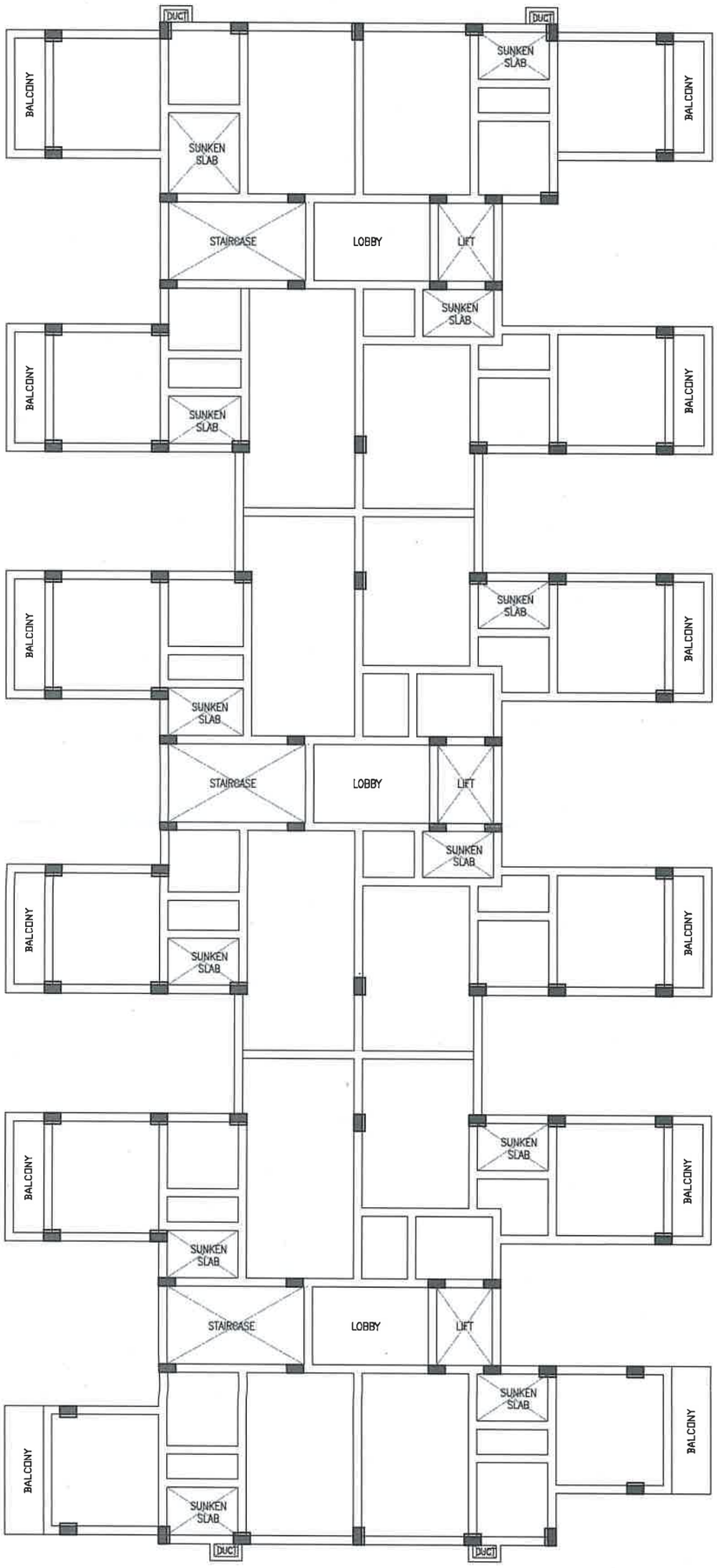
PROPOSED RESIDENTIAL BUILDING AT PLOT NO: 4, VARATHARAJAPURAM VILLAGE, KUNDRATHUR TALUK, KANCHEEPURAM DISTRICT

LAYOUT OF ROOF SLAB & BEAMS OVER TYPICAL FLOOR

DATE : 23.02.2023

DWG NO : 03

FILE :D/HANSA ESTATE/GF Roof



LAYOUT OF ROOF SLAB & BEAMS OVER GROUND FLOOR

GENERAL NOTES :

1. Grade of Concrete and steel : M–20 & Fe–500.
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:
   - Floor beam – 1"
   - Floor slab – 3/4"
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 (i.e) at span.
8. For beams, lapping of bars shall be avoided at top of beam at Column – Beam joint (i.e) at support.
9. For Slabs–Chair rods shall be provided to keep Top reinforcement in place.
10. For Slabs–Provide Y8 @ 8" 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.

BLOCK-2

Prakash. V.R.
PRAKASH RAVINDRAN, M.E., AMIE.,
Registered Structural Engineer
CMDA : SE/II/2026/3/0100
GCC : RSE 100132026
DTCP : TVLR/RSE/GR-I/2024/05/003
Ph : +91 97910 20760
Email : vrpconsultants@gmail.com
Web : www.vrpconsultants.com

NOTES:

1. This drawing should be read along with Architectural drawing.
2. All dimensions are in feet & inches.

Structural Consultant :
V.R.P. CONSULTANTS
CONSULTING ENGINEERS
V.R.RAVINDRAN. M.E., M.I.E.,
5/3, FIRST STREET, AZIZ NAGAR, KODAMBAKKAM, CHENNAI–24.
PH: 044–4861 0096
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Website : www.vrpconsultants.com

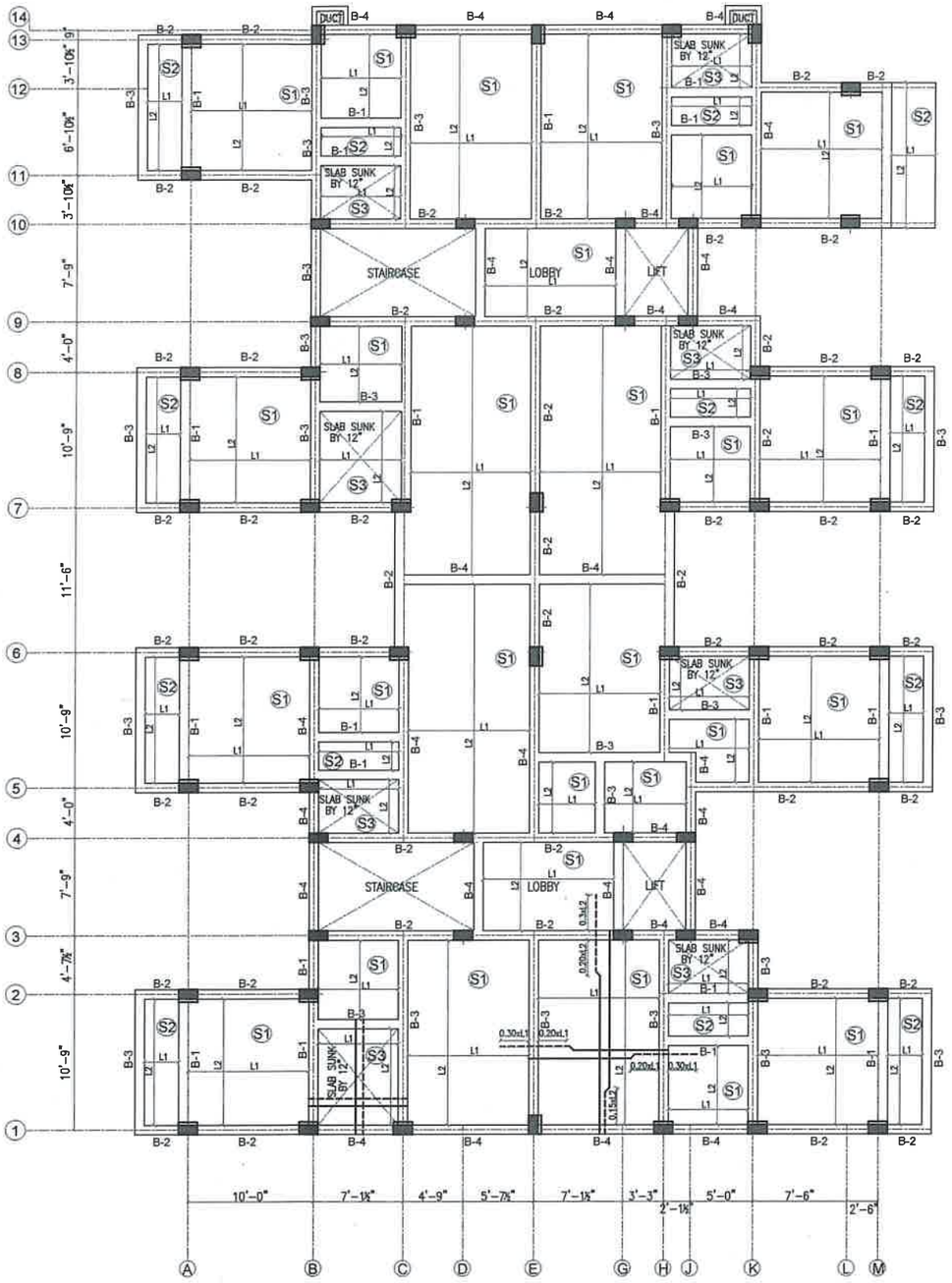
PROPOSED RESIDENTIAL BUILDING AT PLOT NO: 4, VARATHARAJAPURAM VILLAGE, KUNDRATHUR TALUK, KANCHEEPURAM DISTRICT

LAYOUT OF ROOF SLAB & BEAMS OVER TYPICAL FLOOR

DATE : 23.02.2023

DWG NO : 03

FILE : D/HANSA ESTATE/GF Roof



LAYOUT OF TYPICAL ROOF SLAB & BEAMS

(ALL GRID DIMENSIONS SHALL BE CHECKED WITH ARCHITECTURAL DRG.)
(ALL SLABS ARE OF 6" THK (U.N.O.))

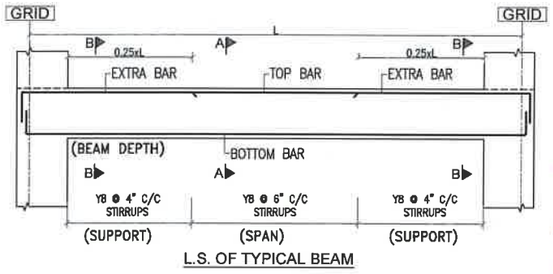
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BEAM REINFORCEMENT DETAIL

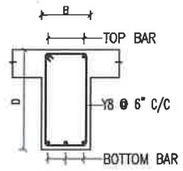
BEAM MKD	BEAM SIZE (B X D)	TOP BAR		BOTTOM BAR
		AT SUPPORT	AT SPAN	
B1	9" X 18"	2-Y16+1-Y20	2-Y16	2-Y16+1-Y20
B2	9" X 21"	2-Y20+1-Y20	2-Y20	2-Y20+1-Y25
B3	9" X 18"	2-Y16+1-Y16	2-Y16	2-Y16+1-Y12
B4	9" X 21"	2-Y20+1-Y16	2-Y20	2-Y20+1-Y16

SLAB REINFORCEMENT DETAIL

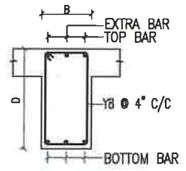
SLAB MKD	SLAB THK.	SHORTER SPAN	LONGER SPAN
S1	6"	Y8 @ 6" C/C	Y8 @ 6" C/C
S2	6"	Y8 @ 6" C/C	Y8 @ 8" C/C
S3	6"	Y8 @ 4" C/C	Y8 @ 6" C/C
S4	6"	Y8 @ 4" C/C	Y8 @ 4" C/C



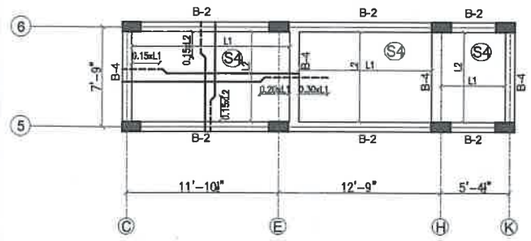
L.S. OF TYPICAL BEAM



SECTION A-A
(AT SPAN)



SECTION B-B
(AT SUPPORT)



LAYOUT OF ROOF SLAB & BEAMS OVER STAIRCASE & LIFT HEADROOM

(ALL SLABS ARE OF 6" THK (U.N.O.))

PRAKASH RAVINDRAN, M.E., AMIE.,
Registered Structural Engineer
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GCC : RSE 100132026
DTCP : TVLR/RSE/GR-I/2024/05/003
Ph : +91 97910 20760
Email : vrpconsultants@gmail.com
Web : www.vrpconsultants.com

GENERAL NOTES :

1. Grade of Concrete and steel : M-20 & Fe-500.
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:
   Floor beam - 1"
   Floor slab - 3/4"
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 (i.e) at span.
8. For beams, lapping of bars shall be avoided at top of beam at Column - Beam joint (i.e) at support.
9. For Slabs-Chair rods shall be provided to keep Top reinforcement in place.
10. For Slabs-Provide Y8 @ 8" 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.

BLOCK-1

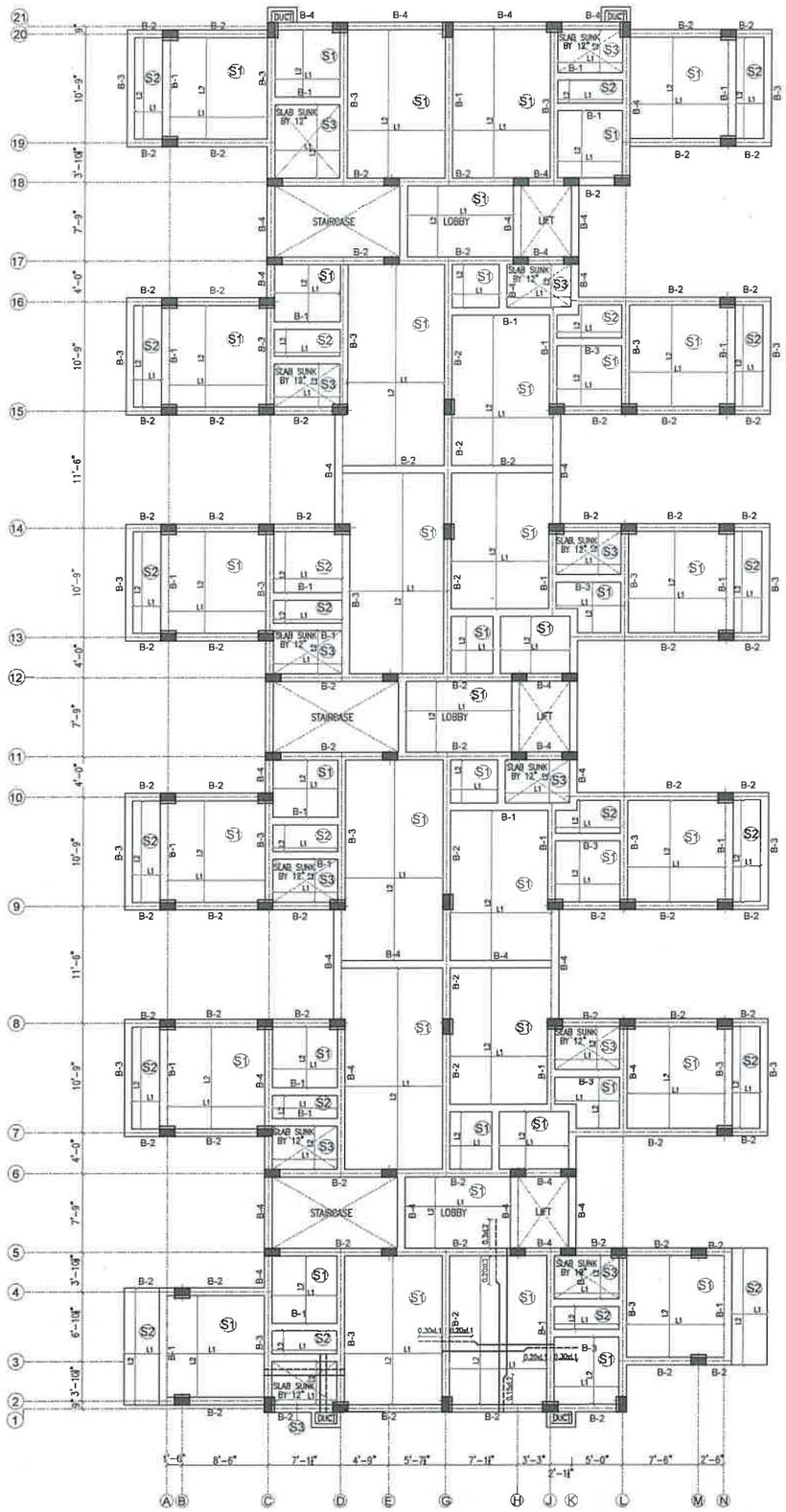
NOTES:
1. This drawing should be read along with Architectural drawing.
2. All dimensions are in feet & inches.

Structural Consultant :
V.R.P. CONSULTANTS
CONSULTING ENGINEERS
V.R.RAVINDRAN. M.E., M.I.E.,
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PROPOSED RESIDENTIAL BUILDING AT PLOT NO: 4, VARATHARAJAPURAM VILLAGE, KUNDRATHUR TALUK, KANCHEEPURAM DISTRICT

LAYOUT OF ROOF SLAB & BEAMS OVER TYPICAL FLOOR & SHR

DATE : 23.02.2023
DWG NO : 02
FILE : D/HANSA ESTATE/GF Roof



LAYOUT OF TYPICAL ROOF SLAB & BEAMS

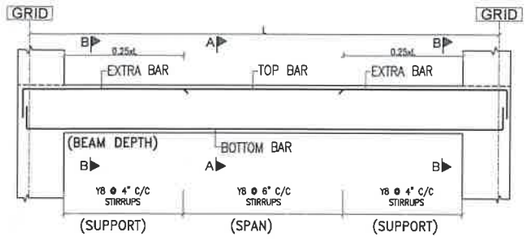
(ALL GRID DIMENSIONS SHALL BE CHECKED WITH ARCHITECTURAL DRG.)
(ALL SLABS ARE OF 6" THK (U.N.O.))

BEAM REINFORCEMENT DETAIL

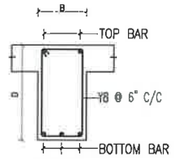
BEAM MKD	BEAM SIZE (B X D)	TOP BAR		BOTTOM BAR
		AT SUPPORT	AT SPAN	
B1	9" X 18"	2-Y16+1-Y20	2-Y16	2-Y16+1-Y20
B2	9" X 21"	2-Y20+1-Y20	2-Y20	2-Y20+1-Y25
B3	9" X 18"	2-Y16+1-Y16	2-Y16	2-Y16+1-Y12
B4	9" X 21"	2-Y20+1-Y16	2-Y20	2-Y20+1-Y16

SLAB REINFORCEMENT DETAIL

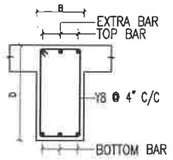
SLAB MKD	SLAB THK.	SHORTER SPAN	LONGER SPAN
S1	6"	Y8 @ 6" C/C	Y8 @ 6" C/C
S2	6"	Y8 @ 6" C/C	Y8 @ 8" C/C
S3	6"	Y8 @ 4" C/C	Y8 @ 6" C/C
S4	6"	Y8 @ 4" C/C	Y8 @ 4" C/C



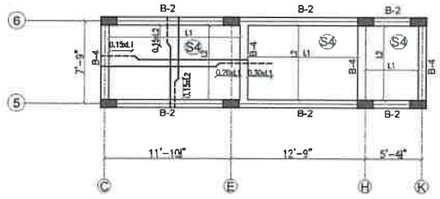
L.S. OF TYPICAL BEAM



SECTION A-A
(AT SPAN)



SECTION B-B
(AT SUPPORT)



LAYOUT OF ROOF SLAB & BEAMS OVER STAIRCASE & LIFT HEADROOM

(ALL SLABS ARE OF 6" THK (U.N.O.))

GENERAL NOTES :

1. Grade of Concrete and steel : M-20 & Fe-500.
2. Mix of Concrete shall be designed as per IS 456 – 2000.
3. Cement shall be generally be of 43 Grade – unless otherwise specified.
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6. Lapping shall be staggered.
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10. For Slabs–Provide Y8 @ 8" C/C wherever bars are not shown.

STRIPPING TIME FOR FORMWORK

	Time duration
1. Vertical Formwork to Columns, Walls and Beams	1 day
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3. Soffit Formwork to Beams	7 days
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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.

BLOCK-2

NOTES:

1. This drawing should be read along with Architectural drawing.
2. All dimensions are in feet & inches.

Structural Consultant :

V.R.P. CONSULTANTS
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5/3, FIRST STREET, AZIZ NAGAR, KODAMBAKKAM, CHENNAI-24.
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PROPOSED RESIDENTIAL BUILDING AT PLOT NO: 4, VARATHARAJAPURAM VILLAGE, KUNDRATHUR TALUK, KANCHEEPURAM DISTRICT

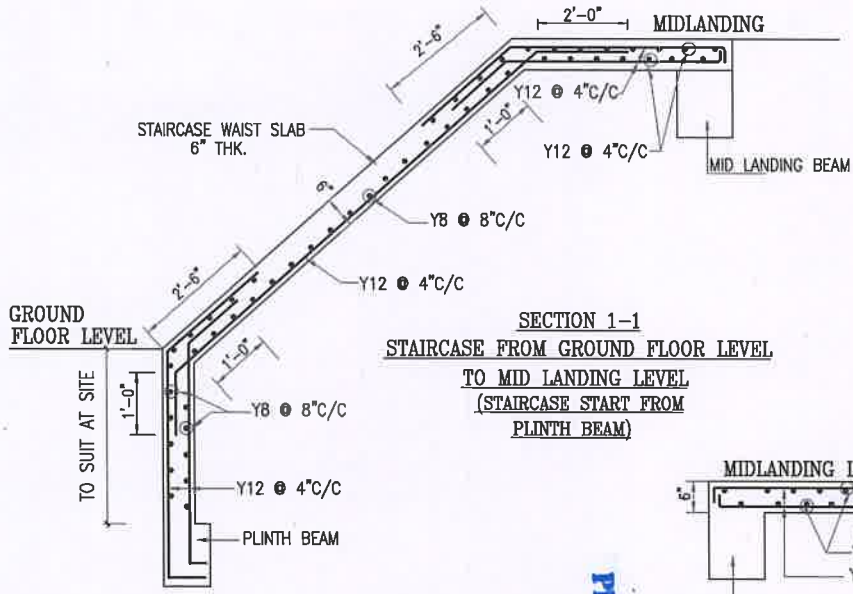
LAYOUT OF ROOF SLAB & BEAMS OVER TYPICAL FLOOR & SHR

DATE : 23.02.2023

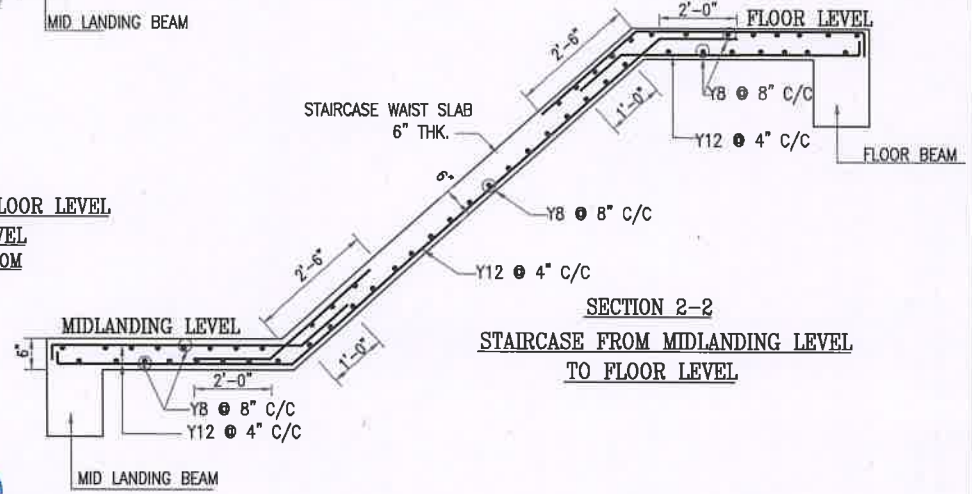
DWG NO : 02

FILE : D/HANSA ESTATE/GF Roof

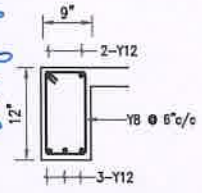
Prakash. V. R.
PRAKASH RAVINDRAN, M.E., AMIE.,
Registered Structural Engineer
CMDA : SE/E/2805/2010
GCC : RSE 100132026
DTCP : TVLR/RSE/GR-I/2024/05/003
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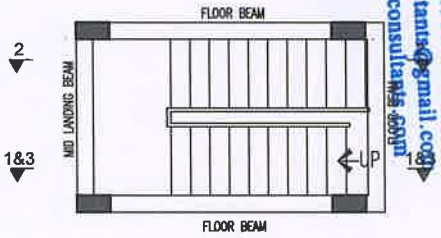
SECTION 1–1
STAIRCASE FROM GROUND FLOOR LEVEL
TO MID LANDING LEVEL
(STAIRCASE START FROM
PLINTH BEAM)



SECTION 2–2
STAIRCASE FROM MIDLANDING LEVEL
TO FLOOR LEVEL



Mid Landing Beam



PLAN OF STAIRCASE
(This drawing should be read along with Architectural drg.)

SECTION 3–3
STAIRCASE FROM FLOOR LEVEL
TO MID LANDING LEVEL

Prakash V.R.
PRAKASH RAVINDRAN, M.E., AMIE.,
Registered Structural Engineer
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GCC : RSE 100132026
DTCP : TVLR/RSE/GR-I/2024/05/003
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   Beam – 1"
   Waist slab – 3/4"
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STRIPPING TIME FOR FORMWORK

	Time duration
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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 :

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NOTES:

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Website : www.vrpconsultants.com

PROPOSED RESIDENTIAL BUILDING AT PLOT NO: 4, VARATHARAJAPURAM VILLAGE, KUNDRATHUR TALUK, KANCHEEPURAM DISTRICT

LAYOUT & DETAILS OF STAIRCASE

DATE : 23.02.2023

DWG NO : 04

FILE :D/HANSA ESTATE/STAIRCASE

CHENNAI METROPOLITAN DEVELOPMENT AUTHORITY
Thalamuthu Natarajan Building, No.1, Gandhi Irwin Road, Egmore,
Chennai - 600 008
Phone : 28414855 Fax: 91-044-28548416
E-mail: mscmda@tn.gov.in
Web site: www.cmdachennai.gov.in.

PROFESSIONAL REGISTRATION CERTIFICATE

This is to certify that the Thiru / Tmt. / M/s. **Prakash V R** has enrolled as **Registered Structural Engineer Grade-II(SE)** with Chennai Metropolitan Development Authority (CMDA) who has the qualification of **M.E in Structures/ Earthquake or Ph.D. in the subject or Equivalent degree** and experience in the relevant field for **11** years.

He/She has been given the Registration No. **SE/II/2026/3/0100** on **18-Mar-2026** He/She shall be required to comply with the duties and responsibilities 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 MAWS (MA1) Dept. Dated. 04.02.2019.

This Registration is valid upto **17-Mar-2031**.



Signature Not Verified
Name :M K Asha Parveen
Designation :Superintendent
Date :03/18/2026 1:43:24 PM

M K Asha Parveen

Superintendent

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

Verified RealEstate
3/350/2 Mettukuppam,
OMR Thoraipakkam,
Chennai 600 097, India
hello@verified.realestate
+91 9996 12 9996

Prepared from the registers named on the page each finding sits on. Where a register could not be read, this document says so in its place rather than leaving the gap to be read as a clean result.