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DESIGN BASIS REPORT

FOR

M/S. SREEROSH PROPERTIES (P) LTD

THE PROPOSED CONSTRUCTION OF RESIDENTIAL BUILDING AT DOOR NO. 67(28), EARLIER NO. 4A, TAYLORS ROAD, KILPAUK, CHENNAI – 600010, COMPRISED IN O.S.NO 272, R.S.NO 154/16, AS PER PATTA R.S.NO 154/183 OF BLOCK NO 13, EGMORE VILLAGE, EGMORE TALUK. GREATER CHENNAI CORPORATION. DIVISION NO:183 , ZONE NO- 8.

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Reg. No. SE/GR-1/2024/02/009 dt. 27.02.2024
Grade-I (RSE) in Greater Chennai Corporation
Reg. No. RSE 100302019 Dt. 30.09.2019
Door No.50, Kirupasankari Street,
West Mambalam, Chennai-600 033.

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West Mambalam, Chennai-600 033.

1.0 OBJECTIVE

The Design basis covers the basic requirement that will be followed for the design of THE PROPOSED CONSTRUCTION OF RESIDENTIAL BUILDING FOR M/S. SREEROSH PROPERTIES (P) LTD AT DOOR NO. 67(28), EARLIER NO. 4A, TAYLORS ROAD, KILPAUK, CHENNAI 600010, COMPRISED IN O.S.NO 272, R.S.NO 154/16, AS PER PATTA R.S.NO 154/183 OF BLOCK NO 13, EGMORE VILLAGE, EGMORE TALUK, GREATER CHENNAI CORPORATION, DIVISION NO:183 , ZONE NO- 8.

The building is designed for Stilt + Five Floors. The structure is supported on column in turn resting on Pile Foundation. The Structural system comprises columns, beams, slabs and wall structure.

3-D Analysis of all the building structures will be carried out using STAAD PRO software package and analysis results shall be used for designing the various elements.

2.0 DESIGN LOADS

2.1 Dead Loads

The Dead loads that are envisaged to act permanently are considered as per IS: **875 (Part 1) – 1987 – Dead loads.** Indian Standard **"Code of Practice for Design Loads (other than earthquake) for Buildings and Structures"**.

1. Slab is assumed to be 150mm thick – 3.75 KN/m^2
2. Slab is assumed to be 125mm thick – 3.125 KN/m^2
3. Floor finish – 1.5KN/m^2
4. Brick work masonry walls 230thick are proposed to be used (location of walls per Architectural drawings) Unit weight is taken as 20 KN/m^3
5. Weathering course in Terrace finish – 3 KN/m^2

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2.2 Imposed Loads

The imposed loads that are envisaged to act permanently are considered as per **IS : 875 (Part 2) – 1987** . Indian Standard **"Code of Practice for Design Loads (other than earthquake) for Buildings and Structures"**.

1.	Living	=	2 KN/m^2
2.	Staircase	=	4 KN/m^2
3.	Toilets	=	2 KN/m^2
4.	Terrace floors	=	1.5 KN/m^2

2.3 Earthquake Load

The loading due to earthquake is assessed based on the provisions of **IS: 1893-2016.** Structure with ductile detailing is considered as per **IS: 13920-2016.**

CHENNAI falls under Seismic Zone III

Zone factor	=	**0.16**
Response reduction factor	=	**5**
Importance factor	=	**1.0**

Structure with ductile detailing is considered as per IS: 13920-2016

2.4 Load Combinations

The various loads shall be combined in accordance with the stipulations in IS: 875 (Part 5) – 1987. Whichever combinations produced the most unfavorable effect in the building, foundations or structural member concerned shall be adopted. The various load combinations considered in the analysis are as follows:

1. 1(DL+LL)
2. 1 DL+0.8 LL+ 0.8 SQX +1
3. 1 DL+0.8 LL+ 0.8 SQX -1
4. 1 DL+0.8 LL+ 0.8 SQZ +1
5. 1 DL+0.8 LL+ 0.8 SQZ -1

6. 1.0 (DL+SQX +)
7. 1.0 (DL+SQX -1)
8. 1.0 (DL+SQZ +1)
9. 1.0 (DL+SQZ -1)
10. 1.5(DL+LL)
11. 1.5(DL+SQX +1)
12. 1.5(DL+SQX -1)
13. 1.5(DL+SQZ +1)
14. 1.5(DL+SQZ -1)
15. 1.2(DL+LL+SQX +1)
16. 1.2(DL+LL+SQX -1)
17. 1.2(DL+LL+SQZ +1)
18. 1.2(DL+LL+SQZ -1)
19. 0.9DL+1.5SQX+1
20. 0.9DL+1.5SQX -1
21. 0.9DL+1.5SQZ +1
22. 0.9DL+1.5SQZ -1

The above load combinations will be considered and effect of worst combinations Will be taken for design of various building elements.

3.0 ANALYSIS METHODS

The analysis of the structures is carried out using the STAAD PRO. The entire super-structure is modeled using frame elements as appropriate. Beams and columns are modeled as frame elements. Appropriate loads and its combinations, as per relevant IS code clauses, for most unfavorable effects are chosen for design. Various load cases considered in the analysis are briefed above.

4.0 DESIGN ASSUMPTION

4.1.1 The Base of the Foundation is assumed to be FIXED.

4.1.2 All Concrete elements shall be designed in accordance with IS456:2000 Limit State Design.

4.1.3 Appropriate loads and its combinations, as per relevant clauses, for the most unfavorable effects are chosen for design.(Refer Load Combination below).

5.0 FOUNDATION DESIGN

Type of Foundation : Pile foundation.

Depth of Foundation : 20 m

6.0 MATERIALS

The self-weight of the various elements are computed based on the unit weight of materials as given below:

S.no	Materials	Unit weight KN/m^3
1	Reinforced Cement Concrete	25
2	Solid Block/Brick	20
3	Steel	78.50

Structural concrete shall be of grade M25 for Pile

Structural concrete shall be of grade M20 for Pile cap& Column

Structural concrete shall be of grade M20for Beam & Slab

Steel reinforcement shall be of Grade Fe500 confirming toIS:1786-2008.

7.0 NOMINAL COVER TO REINFORCEMENT

From Durability requirement, exposure condition is assumed as mild for structural elements above ground level and mode rate for structural elements below ground level.

The Clear cove to reinforcement to meet durability requirement shall be as follows:

Column –40mm

Pile cap – 100mm

Beam – 25mm

Slab – 20mm

DESIGN OF BEAM: 1

Beam size: 230mm x 450mm

Bending moment at support = 140kNm

Bending moment at mid span = 133kNm

Shear force, Vu = 149kN

Bending moment at support, Mu = 140kNm

$R = (140 \times 10^6)/230x409^2$

$= 3.64$

Pt/100 =Ast/bd = fck/2fy [1-Sq.rt (1-4.598xR/fck)\

fck = 20 N/mm^2

fy = 500 N/mm^2

Pt = 1.07%

Ast required = 1013 mm^2

Provide 6nos of 16Y

Ast provided = 1206 mm^2

Hence safe.

Bending moment at mid span, Mu = 133kNm

$R = (133 \times 10^6)/230 \times 409^2$

$= 3.46$

Pt = 1.0%

Ast required = 944 mm^2

Provide 6nos of 16Y

Ast provided = 1206 mm^2

Hence it is safe

Shear force, Vu, = 149kN

τv = Vu/bd

= $(149 \times 10^3)/ 230 \times 409$

= 1.58 N/mm^2

Hence ok.

Shear capacity of concrete:

Pt = 1.0 %

τc = 0.62

= τc bd

= 0.62X 230 X 409

= 58323 N (or) 58 kN

Shear to be carried by stirrups

Vu = Vs – τc bd

= 149 – 58 kN

= 91kN

Therefore, provide 2 legged 10Y @ 150 mm C/C at the supports.

Provide 2 legged 10Y @ 200mm C/C at the midspan.

DESIGN OF BEAM: 2

Beam size: 230mm x 525mm

Bending moment at support = 132kNm

Bending moment at mid span = 111kNm

Shear force, Vu = 96kN

Bending moment at support, Mu = 132kNm

R = $(132 \times 10^6)/230x484^2$

= 2.44

Pt/100 =Ast/bd = fck/2fy [1-Sq.rt (1-4.598xR/fck)\

fck = 20 N/mm^2

fy = 500 N/mm^2

Pt = 0.65%

Ast required = 725 mm^2

Provide 4nos of 16Y

Ast provided = 804 mm^2

Hence safe.

Bending moment at mid span, Mu = 111kNm

R = (111 x 10^6)/230 x 484^2

= 2.06

Pt = 0.53%

Ast required = 593 mm^2

Provide 4 nos of 16Y

Ast provided = 804 mm^2

Hence it is safe

Shear force, Vu, = 96kN

τv = Vu/bd

= 96 x 10^3 / 230 x 484

= 0.86 N/mm^2

Hence ok.

Shear capacity of concrete:

Pt = 0.65 %

τc = 0.53

= τc bd

= 0.53 X 230 X 484

	=	58999 N (or) 59kN

Shear to be carried by stirrups

Vu	=	Vs – Cc bd
	=	96 – 59 kN
	=	37kN

Therefore, provide 2 legged 8Y @ 100 mm C/C at the supports.

Provide 2 legged 8Y @ 200 mm C/C at the midspan.

Design of Pile Cap :

Safe load for 600mm Dia pile	=	1130 KN
Concrete grade for pile cap	=	M20
Un factored Column load	=	1442KN
No of piles required	=	1442/1130 = 1.28
Provide 2 nos of Pile (600Ø)		
Spacing of Piles	=	1800mm
	=	1.8m
Factored load	=	1442 x 1.5
	=	2163
Bending moment WL/4	=	2163 x 1.8 / 4
	=	973KNM
R = MU/bd^2	=	973 x 10^6 / 975 x 875^2
	=	1.3
fck	=	20N/mm^2
fy	=	500N/mm^2
Pt/100 = Ast/bd	=	fck/2fy [1-sqrt (1 - 4.598xR/20)]

Ast required = 2739 mm^2

Provide 7 nos of 25 Dia bar

Ast provided = 3437mm^2

Ast required > Ast provided

Hence it is safe.

DESIGN OF COLUMN C1

Length of column	D	450	mm	
Breadth of column	b	230	mm	
Unsupported length (longer direction)	L_x	2700	mm	
Unsupported length (shorter direction)	L_y	2700	mm	
Eff. Length (longer direction)	L_{ex}	2160	mm	
Eff. Length (shorter direction)	L_{ey}	2160	mm	
Factored Load	P_u	1051	kN	
Factored moment (longer direction)	Mux	65	kNm	
Factored moment (shorter direction)	Muz	21	kNm	
Charac. comp strength of concrete	f_{ck}	20	N/mm^2	
Yield stress of steel	f_y	500	N/mm^2	
Dia of bar used	Φ	20	mm	
Clear cover		40	mm	
Effective cover	d'	50	mm	
Effective depth	d	400	mm	
Check for slenderness				
Longer Direction				
Slenderness ratio	L_{ex}/D	4.80	**short**	
Additional moment due to slenderness	M_{ax}	0	kN-m	
Shorter Direction				
Slenderness ratio	L_{ey}/b	9.39	**short**	
Additional moment due to slenderness	M_{ay}	0	kN-m	
Calculation of P_{uz}				
No of bars used		8		
Area of reinforcement	Ast	2512		
Provided steel		8 nos Y20		
Percentage of reinforcement	p_t	2.427	%	
Area of concrete	Ag	103500	mm^2	
Ultimate axial load (without moments)	P_{uz}	1851	kN	
Calculation of P_b:				
Longer Direction				
	d'/D	0.111		
Coefficient k_1(from TABLE 60 of SP:1980)	k_{1x}	0.204	From Sp16	
Coefficient k_2(from TABLE 60 of SP:1980)	k_{2x}	0.398		
Axial load corresponding to balanced failure	P_{bx}	523	kN	
Reduction factor for additional moments	k_x	1.000		
Moment due to slenderness	M_{ax}	**0.00**	kN-m	
Shorter Direction				
	d'/b	0.217		
Coefficient k_1(from TABLE 60 of SP:1980)	k_{1y}	0.179		
Coefficient k_2(from TABLE 60 of SP:1980)	k_{2y}	0.143		
Axial load corresponding to balanced failure	P_{by}	406	kN	
Reduction factor for additional moments	k_y	0.554		
Moment due to slenderness	M_{ax}	**0.00**	kN-m	
Check for moments due to min. eccentricity				
Longer Direction				
Minimum eccentricity	e_x	20.40	mm	

Moment due to min. eccentricity			M_x	21.44	kN-m
Moment in longer direction			M_{ux}	65.00	kNm
Shorter direction					
Minimum eccentricity			e_y	13.07	mm
Moment due to min. eccentricity			M_y	13.73	kN-m
Moment in shorter direction			M_{uy}	21	kNm
Final design moments					
Moment in longer direction			M_{ux}	**65.00**	kNm
Moment in shorter direction			M_{uy}	**21.00**	kNm
Check for interaction					
			d'/D	0.111	
			d'/b	0.217	
p/f_{ck}			p/f_{ck}	0.121	
$P_u/f_{ck}bD$ value			$P_u/f_{ck}bD$	0.508	
$M_{ux1}/f_{ck}bD^2$ value (from SP 16:1980 charts)			$M_{ux1}/f_{ck}bD^2$	0.130	
Uniaxial moment capacity (longer direction)			M_{ux1}	**121.095**	kNm
$M_{uy1}/f_{ck}bD^2$ value (from SP 16:1980 charts)			$M_{uy1}/f_{ck}bD^2$	0.110	
Uniaxial moment capacity (shorter direction)			M_{uy1}	**52.371**	kNm
P_u/P_{uz} ratio			P_u/P_{uz}	**0.568**	
Value of exponent				1.614	
Interaction ratio				**0.595**	
Percentage reinforcement satisfactory or not				**safe**	
b/D ratio			b/D	0.51111111	
Status of dimensions				OK	
Gross area			A_g	103500	mm^2
Area of core			A_k	60800	mm^2
Spacing of lateral ties			S	57.5	mm
Larger dimension of the hoop			H	230	mm
Cross sectional area of hoop			A_{sh}	66.87	mm^2

DESIGN OF COLUMN C2

Length of column	D	375	mm
Breadth of column	b	300	mm
Unsupported length (longer direction)	L_x	2700	mm
Unsupported length (shorter direction)	L_y	2700	mm
Eff. Length (longer direction)	L_{ex}	2160	mm
Eff. Length (shorter direction)	L_{ey}	2160	mm
Factored Load	P_u	895	kN
Factored moment (longer direction)	Mux	41	kNm
Factored moment (shorter direction)	Muz	11	kNm
Charac. comp strength of concrete	f_{ck}	20	N/mm^2
Yield stress of steel	f_y	500	N/mm^2
Dia of bar used	Φ	16	mm
Clear cover		40	mm
Effective cover	d'	48	mm
Effective depth	d	327	mm
Check for slenderness			
Longer Direction			
Slenderness ratio	L_{ex}/D	5.76	**short**
Additional moment due to slenderness	M_{ax}	0	kN-m
Shorter Direction			
Slenderness ratio	L_{ey}/b	7.20	**short**
Additional moment due to slenderness	M_{ay}	0	kN-m
Calculation of P_{uz}			
No of bars used		8	
Area of reinforcement	Ast	1607.68	
Provided steel		8 nos Y16	
Percentage of reinforcement	p_t	1.429	%
Area of concrete	Ag	112500	mm^2
Ultimate axial load (without moments)	P_{uz}	1601	kN
Calculation of P_b:			
Longer Direction			
	d'/D	0.128	
Coefficient k_1(from TABLE 60 of SP:1980)	k_{1x}	0.200	From Sp16
Coefficient k_2(from TABLE 60 of SP:1980)	k_{2x}	0.358	
Axial load corresponding to balanced failure	P_{bx}	508	kN
Reduction factor for additional moments	k_x	1.000	
Moment due to slenderness	M_{ax}	**0.00**	kN-m
Shorter Direction			
	d'/b	0.160	
Coefficient k_1(from TABLE 60 of SP:1980)	k_{1y}	0.193	
Coefficient k_2(from TABLE 60 of SP:1980)	k_{2y}	0.281	
Axial load corresponding to balanced failure	P_{by}	479	kN
Reduction factor for additional moments	k_y	0.629	
Moment due to slenderness	M_{ax}	**0.00**	kN-m
Check for moments due to min. eccentricity			
Longer Direction			
Minimum eccentricity	e_x	17.90	mm

Moment due to min. eccentricity		M_x	16.02	kN-m
Moment in longer direction		M_{ux}	41.00	kNm
Shorter direction				
Minimum eccentricity		e_y	15.40	mm
Moment due to min. eccentricity		M_y	13.78	kN-m
Moment in shorter direction		M_{uy}	13.783	kNm
Final design moments				
Moment in longer direction		M_{ux}	**41.00**	kNm
Moment in shorter direction		M_{uy}	**13.78**	kNm
Check for interaction				
		d'/D	0.128	
		d'/b	0.160	
p/f_{ck}		p/f_{ck}	0.071	
$P_u/f_{ck}bD$ value		$P_u/f_{ck}bD$	0.398	
$M_{ux1}/f_{ck}bD^2$ value (from SP 16:1980 charts)		$M_{ux1}/f_{ck}bD^2$	0.090	
Uniaxial moment capacity (longer direction)		M_{ux1}	**75.9375**	kNm
$M_{uy1}/f_{ck}bD^2$ value (from SP 16:1980 charts)		$M_{uy1}/f_{ck}bD^2$	0.090	
Uniaxial moment capacity (shorter direction)		M_{uy1}	**60.75**	kNm
P_u/P_{uz} ratio		P_u/P_{uz}	**0.559**	
Value of exponent			1.599	
Interaction ratio			**0.466**	
Percentage reinforcement satisfactory or not			**safe**	
b/D ratio		b/D	0.8	
Status of dimensions			**OK**	
Gross area		A_g	112500	mm^2
Area of core		A_k	70150	mm^2
Spacing of lateral ties		S	75	mm
Larger dimension of the hoop		H	230	mm
Cross sectional area of hoop		A_{sh}	74.98	mm^2

DESIGN OF SLAB S1

ROOF LEVEL SLAB

Design of two way Slab

Basic Data

Grade of concrete (fck)	=	M 20	
Grade of steel (fy)	=	Fe 500	
Thickness of slab (D)	=	125	mm
Clear cover (cc)	=	15	mm
Effective thickness of slab (deff) = 125 - 15 - 8 /2	=	106	mm
Unit weight of concrete	=	25	KN/m^3
Effective Shorter Span (Lx)	=	3.18	m
Effective Longer Span (Ly)	=	3.467	m
Aspect ratio Ly/Lx	=	1.09	**Two way slab**

Edge Condition : **Two adjacent Edges Discontinous**

Load Data

Dead Load	= 0.13 x 25	=	3.125	KN/m^2
Floor finish		=	1.50	KN/m^2
Imposed Load		=	2.00	KN/m^2
Total load		=	6.63	KN/m^2
Design load (Wu) = 1.5 x 6.625		=	**9.94**	KN/m^2

Moment and Shear Calculations

Short Span Direction

ax for positive moment

	1	→	0.035
	1.1	→	0.04
for	1.09	αx =	0.040

Positive moment Mx 0.040 x 9.94 x 3.18 ^2 = **3.97** KN-m

ax for negative moment

	1	→	0.047
	1.1	→	0.053
for	1.09	αx =	0.052

Negative moment Mx : 0.052 x 9.94 x 3.18 ^2 = **5.27** KN-m

Long Span Direction

For positive moment αy = 0.035

Positive moment My : 0.035 x 9.94 x 3.18 ^2 = **3.52** KN-m

For negative moment αy = 0.047

Negative moment My : 0.047 x 9.94 x 3.18 ^2 = **4.72** KN-m

Shear force V_u = 9.94 x 3.2 x 0.5 = **15.80** KN

Check Effective Depth for Bending

Depth required = $(M_x / (0.133x\ fck \times b))^{1/2}$ = 44.50 mm

Depth provided = 125 - 15 - 8 /2 = 106 mm

Hence O.K

Reinforcement calculations

Short Span Direction @ Support

$Mu/bd^2 = \frac{5.27 \times 10 \wedge 6}{1000 \times 106 \times 106} = \mathbf{0.469}$

Pt = **0.11** %

Area of steel Ast = 0.00111 x 1000 x 106 = 117.55 mm^2

Minimum area of steel 0.0012 x 1000 x 125 = 150.00 mm^2

Spacing of Y **8** bars 50.27 x 1000 / 150.00 = 334.93 mm

Ast provided = 335.1 mm^2

Check for Spacing

Minimum of

1) 3d = 318 mm

2) = 300 mm

3) = 334.93 mm

Therefore provide Y **8** @ **150** mm C/C

Short Span Direction @ Mid Span

$Mu/bd^2 = \frac{3.97 \times 10 \wedge 6}{1000 \times 106 \times 106} = 0.353$

Pt = 0.083 %

Area of steel Ast = 0.00083 x 1000 x 106 = 87.982 mm^2

Minimum area of steel 0.0012 x 1000 x 125 = 150.00 mm^2

Spacing of Y **8** bars 50.27 x 1000 / 150.00 = 334.93 mm

Ast provided = 335.1 mm^2

Check for Spacing

Minimum of

1) 3d = 318 mm

2) = 300 mm

3) = 334.93 mm

Therefore provide Y **8** @ **150** mm C/C

100

Provided % of Tension Reinforcement (pt) = **0.316** %

Long Span Direction @ Support

$Mu/bd^2 = \frac{4.72 \times 10 \wedge 6}{1000 \times 106 \times 106} = 0.420$

Pt = 0.099 %

Area of steel Ast = 0.00099 x 1000 x 106 = 105.09 mm^2

Minimum area of steel 0.0012 x 1000 x 125 = 150.00 mm^2

Spacing of Y **8** bars 50.27 x 1000 / 150.00 = 334.93 mm

Ast provided = 335.1 mm^2

Check for Spacing

Minimum of

1) 3d = 318 mm

2) = 300 mm

3) = 334.93 mm

Therefore provide Y **8** @ **150** mm C/C

Long Span Direction @ mid Span

$Mu/bd^2 = \frac{3.52 \times 10 \wedge 6}{1000 \times 106 \times 106} = 0.313$

Pt = 0.073 %

Area of steel Ast = 0.00073 x 1000 x 106 = 77.742 mm^2

Minimum area of steel 0.0012 x 1000 x 125 = 150.00 mm^2

Spacing of Y **8** bars 50.27 x 1000 / 150.00 = 334.93 mm

Ast provided = 335.1 mm^2

Check for Spacing

Minimum of

1) 3d = 318 mm

2) = 300 mm

3) = 334.93 mm

Therefore provide Y **8** @ **150** mm C/C

Check for Deflection:

Basic Span/depth Ratio = 22

% of Tension Reinforcement provided (pt) = 0.316 %

Service stress of steel (fs) : 0.58fy(Ast_r/Ast_p) = 76.14 N/mm^2

Modification Factor for Tension Reinforcement (F1) = 2.00

Allowable Span/Eff Depth Ratio = 44

Actual Span/Eff Depth Ratio = 3.18 x 1000 / 106 = 30.00

Hence O.K

DESIGN OF SLAB S2

ROOF LEVEL SLAB

Design of two way Slab

Basic Data

Grade of concrete (fck)	=	M 20	
Grade of steel (fy)	=	Fe 500	
Thickness of slab (D)	=	125	mm
Clear cover (cc)	=	15	mm
Effective thickness of slab (deff) = 125 - 15 - 8 /2	=	106	mm
Unit weight of concrete	=	25	KN/m^3
Effective Shorter Span (Lx)	=	3.35	m
Effective Longer Span (Ly)	=	3.467	m
Aspect ratio Ly/Lx	=	1.03	**Two way slab**

Edge Condition : **Two adjacent Edges Discontinous**

Load Data

Dead Load	= 0.13 x 25	=	3.125	KN/m^2
Floor finish		=	1.50	KN/m^2
Imposed Load		=	2.00	KN/m^2
Total load		=	6.63	KN/m^2
Design load (Wu) = 1.5 x 6.625		=	**9.94**	KN/m^2

Moment and Shear Calculations

Short Span Direction

ax for positive moment

1	→	0.035	
1.1	→	0.04	
for 1.03	αx	= 0.037	

Positive moment Mx: 0.037 x 9.94 x 3.35 ^2 = **4.10** KN-m

ax for negative moment

1	→	0.047	
1.1	→	0.053	
for 1.03	αx	= 0.049	

Negative moment Mx : 0.049 x 9.94 x 3.35 ^2 = **5.48** KN-m

Long Span Direction

For positive moment αy = 0.035

Positive moment My : 0.035 x 9.94 x 3.35 ^2 = **3.90** KN-m

For negative moment αy = 0.047

Negative moment My : 0.047 x 9.94 x 3.35 ^2 = **5.24** KN-m

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Door No.50, Kirupasankari Street,
West Mambalam, Chennai-600 033

Shear force V_u = 9.94 x 3.4 x 0.5 = **16.65** KN

Check Effective Depth for Bending

Depth required = $(M_u / (0.133x\ fck\ x\ b))^{1/2}$ = 45.37 mm

Depth provided = 125 - 15 - 8 /2 = 106 mm

Hence O.K

Reinforcement calculations

Short Span Direction @ Support

$Mu/bd^2 = \frac{5.48 \times 10 \wedge 6}{1000 \times 106 \times 106} = \mathbf{0.487}$

Pt = **0.12** %

Area of steel Ast = 0.00115 x 1000 x 106 = 122.33 mm^2

Minimum area of steel 0.0012 x 1000 x 125 = 150.00 mm^2

Spacing of Y **8** bars 50.27 x 1000 / 150.00 = 334.93 mm

Ast provided = 402.12 mm^2

Check for Spacing

Minimum of

1) 3d = 318 mm

2) = 300 mm

3) = 334.93 mm

Therefore provide Y **8** @ **125** mm C/C

Short Span Direction @ Mid Span

$Mu/bd^2 = \frac{4.10 \times 10 \wedge 6}{1000 \times 106 \times 106} = 0.365$

Pt = 0.086 %

Area of steel Ast = 0.00086 x 1000 x 106 = 90.868 mm^2

Minimum area of steel 0.0012 x 1000 x 125 = 150.00 mm^2

Spacing of Y **8** bars 50.27 x 1000 / 150.00 = 334.93 mm

Ast provided = 402.12 mm^2

Check for Spacing

Minimum of

1) 3d = 318 mm

2) = 300 mm

3) = 334.93 mm

Therefore provide Y **8** @ **125** mm C/C

Provided % of Tension Reinforcement (pt) = **0.379** %

100

Long Span Direction @ Support

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$Mu/bd^2 = \frac{5.24 \times 10 \wedge 6}{1000 \times 106 \times 106} = 0.467$

Pt = 0.110 %

Area of steel Ast	=	0.00110	x	1000 x	106	=	116.96 mm^2
Minimum area of steel		0.0012	x	1000 x	125	=	150.00 mm^2
Spacing of Y **8** bars		50.27	x	1000 /	150.00	=	334.93 mm
Ast provided						=	335.1 mm^2

Check for Spacing

Minimum of

1) 3d = 318 mm
2) = 300 mm
3) = 334.93 mm

Therefore provide Y **8** @ **150** mm C/C

Long Span Direction @ mid Span

$Mu/bd^2 = \frac{3.90 \times 10 \wedge 6}{1000 \times 106 \times 106} = 0.347$

Pt = 0.082 %

Area of steel Ast	=	0.00082	x	1000 x	106	=	86.458 mm^2
Minimum area of steel		0.0012	x	1000 x	125	=	150.00 mm^2
Spacing of Y **8** bars		50.27	x	1000 /	150.00	=	334.93 mm
Ast provided						=	335.1 mm^2

Check for Spacing

Minimum of

1) 3d = 318 mm
2) = 300 mm
3) = 334.93 mm

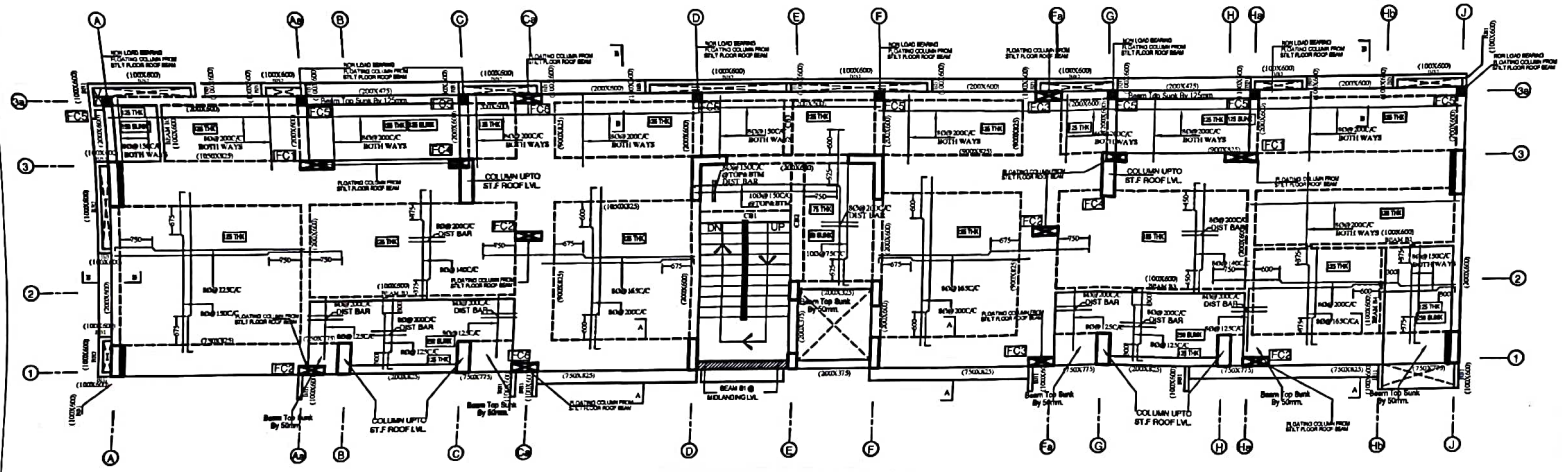
Therefore provide Y **8** @ **150** mm C/C

Check for Deflection:

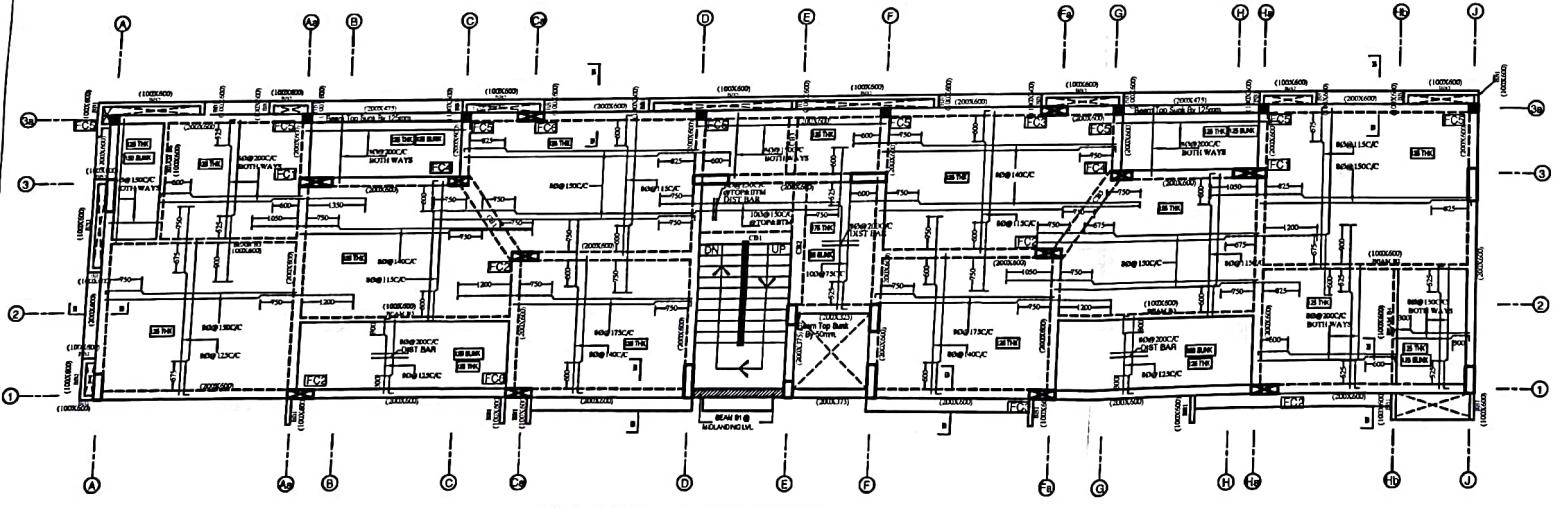
Basic Span/depth Ratio	= 22	
% of Tension Reinforcement provided (pt)	= 0.379	%
Service stress of steel (fs) : 0.58fy(Ast_r/Ast_p)	= 65.53	N/mm^2
Modification Factor for Tension Reinforcement (F1)	= 2.00	
Allowable Span/Eff Depth Ratio	= 44	
Actual Span/Eff Depth Ratio = 3.35 x 1000 / 106	= 31.60	

Hence O.K

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STILT FLOOR ROOF SLAB LAYOUT



TYPICAL FLOOR ROOF SLAB LAYOUT
(FIRST FLOOR,SECOND FLOOR & THIRD FLOOR)

IMPORTANT NOTES :-

1. ALL SLABS ARE 4"(100mm)THICK UNLESS NOTED OTHER WISE.
2. PROVIDE 6mmϕ"(150mm)C/C (OR) 8MM ϕ"(250mm)C/C DISTRIBUTORS WHERE EVER NEEDED AT TOP AND BOTTOM OF SLAB.
3. ———— LINE INDICATES BAR AT TOP IN PLAN. ———— LINE INDICATES BAR AT BOTTOM IN PLAN.
4. PROVIDE L - BEND FOR TOP REINFORCEMENT BAR AT END OF THE BEAM FOR BEAMS DETAIL GIVEN IN CROSS SECTION. PROVIDE L - BEND 7"(175mm) IN THE SLAB CRANKED REINFORCEMENT BAR IN TO THE BEAM. WHICH ARE NOT CONTINUING TO THE ADJACENT SLAB.

IMPORTANT NOTE FOR M-SAND :-

SAND SHALL BE REPLACED BY M-SAND FULLY OR PARTIALLY IN ANY PROPORTION FOR PLAIN CEMENT CONCRETE, REINFORCEMENT CEMENT CONCRETE EXCEPT COLUMN CONCRETE. FOR COLUMN CONCRETE BETTER TO USE SAND ALONE FOR CONCRETE.
M-SAND SHOULD BE FREE FROM DUST AT SITE AT THE TIME OF USING FOR CONCRETE.
TO CHECK THE M-SAND FOR DUST CONTENT, DRY THE M-SAND AND SPRAY IT AT CERTAIN HEIGHT LEVEL. IF ANY DUST PRESENCE WILL FLY ON THE AIR, ALSO IF WE TAKE A PINCH ALSO IF WE TAKE A PINCH OF DRIED M-SAND ON OUR HAND ANY DUST PRESENCE WILL STICK ON TO OUR PALM OF OUR HAND.

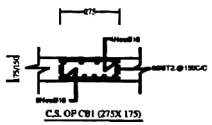
IMPORTANT NOTE FOR LAYING METHOD FOR READY MIX CONCRETE (RMC) :-

1. FOR M25 GRADE CONCRETE PROVIDE 340 KG CEMENT PER CUBIC METTER OF READY MIX CONCRETE.
2. THE TIME DURATION OF READY MIX CONCRETE SHALL BE AT THE MAXIMUM OF 90 MINUTES TO 100 MINUTES FOR THE BEST STRENGTH RESULT OF CONCRETE.
3. TIME DURATION INCLUDES FROM THE TIME OF WATER ADDING IN THE BATCHING PLANT (i.e) TIME OF LORRY DEPARTURE FROM PLANT, TRAVEL TIME, PUMP CONNECTING TIME , PUMPING AND LAYING OF CONCRETE ON FORM WORK.
4. AFTER 60 MINUTES TO 90 MINUTES ON LAYING OF CONCRETE SOME HAIRLINE / MINOR SHRINKAGE CRACKS WILL DEVELOP ON THE TOP SURFACE OF THE CONCRETE. TO RECTIFY THIS, POUR THICK CEMENT SLURRY, FILL IT AND PACK IT WITH BROOM.
5. THE CONCRETE TOP SURFACE SHOULD BE SPRAYED WITH WATER TO START CURING AFTER 120 MINUTES TO 150 MINUTES FROM THE TIME OF CONCRETE LAYING.
6. START CURING WITH STORING WATER ON TOP OF CONCRETE AFTER 240 MINUTES TO 300 MINUTES FROM THE TIME OF CONCRETE LAYING.

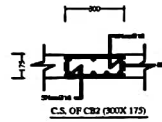
CONCRETE SHALL BE GRAD OF M35 MIX (1:1:2) FOR ALL COLUMN

COLUMN DETAILS Lst.F.= FIRST FLOOR, 2nd.F.= SECOND FLOOR, 3rd.F.= THIRD FLOOR.

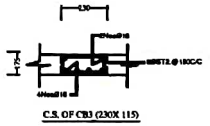
Sl. No.	Name Of Column		Column Size	Main Reinforcement	Column Tie	Column Section Rod Detail
1.	FC1	1st.F. = (200X750)		18Nos@20	2Nos@c/c @200C/C	(1st.F) (2nd.F) (3rd.F) (4th.F) (5th.F)
		2nd.F. = (200X750)		18Nos@16		
		3rd.F. = (200X750)		18Nos@12		
		4th.F. = (200X600)		12Nos@12		
		5th.F. = (200X450)		8Nos@12		
2.	FC2	1st.F. = (200X600)		10Nos@20	2Nos@c/c @200C/C	(1st.F) (2nd.F) (3rd.F) (4th.F) (5th.F)
		2nd.F. = (200X600)		10Nos@16		
		3rd.F. = (200X600)		10Nos@12		
		4th.F. = (200X450)		8Nos@12		
		5th.F. = (200X450)		8Nos@12		
3.	FC3	1st.F. = (200X600)		10Nos@16	2Nos@c/c @200C/C	(1st.F) (2nd.F) (3rd.F) (4th.F) (5th.F)
		2nd.F. = (200X600)		4Nos@16 6Nos@12		
		3rd.F. = (200X600)		10Nos@12		
		4th.F. = (200X450)		8Nos@12		
		5th.F. = (200X450)		8Nos@12		
4.	FC4	1st.F. = (200X450)		10Nos@16	2Nos@c/c @200C/C	(1st.F) (2nd.F) (3rd.F) (4th.F) (5th.F)
		2nd.F. = (200X450)		4Nos@16 4Nos@12		
		3rd.F. = (200X450)		8Nos@12		
		4th.F. = (200X450)		8Nos@12		
		5th.F. = (200X450)		8Nos@12		
5.	FC5	1st.F. = (200X200)		4Nos@16	2Nos@c/c @200C/C	(1st.F) (2nd.F) (3rd.F) (4th.F) (5th.F)
		2nd.F. = (200X200)		4Nos@16		
		3rd.F. = (200X200)		4Nos@16		
		4th.F. = (200X200)		4Nos@16		
		5th.F. = (200X200)		4Nos@16		
6.	FC6	1st.F. = (200X800)		12Nos@16	2Nos@c/c @200C/C	(1st.F) (2nd.F) (3rd.F) (4th.F) (5th.F)
		2nd.F. = (200X800)		4Nos@16 8Nos@12		
		3rd.F. = (200X800)		10Nos@12		
		4th.F. = (200X800)		10Nos@12		
		5th.F. = (200X800)		10Nos@12		



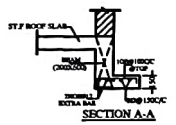
C.S. OF CB1 (275X 175)



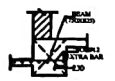
C.S. OF CB2 (300X 175)



C.S. OF CB3 (230X 115)



SECTION A-A



SECTION B-B



C.S OF BEAM BB1 (100X300)

REV	DESCRIPTION	DATE
R1.	ROOF SLAB FULLY REVISED	9.05.2024
R2.	FOUNDATION FULLY REVISED AS PER NEW PLAN	8.P.S.I
R3.	STAIRCASE COLUMN REVISED	8.P.S.I

PROPOSED RESIDENTIAL BUILDING FOR M/S. SHREEROSH PROPERTIES AT TAYLORS ROAD,KILPAUK, CHENNAI.

STILT & FIRST FLOOR ROOF SLAB LAYOUT

Dwg No. 11502 S-04

DATE: 02.02.2024 SCALE: 1:50

DRN: I.MD.BILTHAKA

CHKD: S.P.S.I

ARCHITECT:

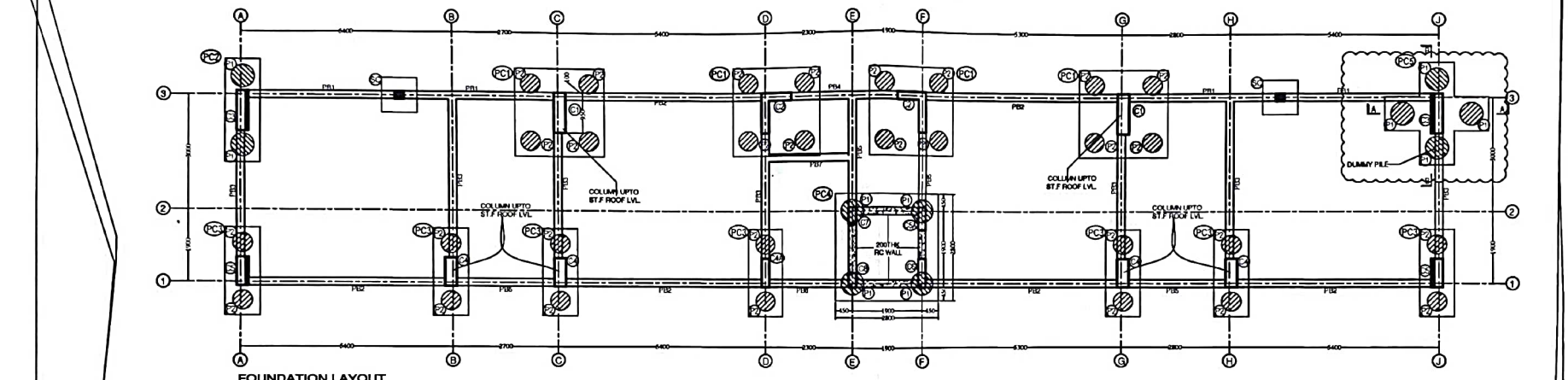
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Consultants - Engineers

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North, Dhyanandhar Streets, Vasan Nagar, Virugambakkam, Chennai - 600 092. Ph: 2 2620 42 03

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Door No.50 Kirupasankari Street,
West Mambalam Chennai-600 033.



FOUNDATION LAYOUT

IMPORTANT NOTE :-

1. ALL CENTER LINE DIMENSIONS TO BE CHECKED BY ARCHITECT BEFORE SETTING OUT OF PLAN AT SITE.
2. FOR COLUMN WHICH ARE ADJACENT TO THE SUMP BASE SLAB , SEPTIC TANK BASE SLAB , FOR THIS DEPTH OF COLUMN FOUNDATION SHOULD BE TAKEN IN LEVEL WITH THE SUMP BASE SLAB / SEPTIC TANK BASE SLAB LEVEL. IF THE SUMP , SEPTIC TANK BASE SLAB COMES OVER THE FOOTING FOR THIS DEPTH OF COLUMN FOUNDATION SHALL BE TAKEN BELOW THE SEPTIC TANK/ SUMP BASE SLAB BOTTOM LEVEL.
3. IF THE HEIGHT OF THE COLUMN BETWEEN FIRST LEVEL PLINTH BEAM TOP LEVEL TO GROUND FLOOR ROOF SLAB TOP LEVEL EXCEED 12'3" THEN PROVIDE SECOND LEVEL PLINTH BEAM AT BASEMENT LEVEL DETAIL FOR THIS SAME LEVEL PLINTH BEAM SHALL BE OF SIZE (9"X9") (230mmX230mm) WITH 3#6mmØ 3@TOP AND 3#6mmØ 12@9"C/C AND 8#8"C/C @ 200mmC/C STIRRUPS.

IMPORTANT NOTE FOR LAYING METHOD FOR READY MIX CONCRETE (RMC) :-

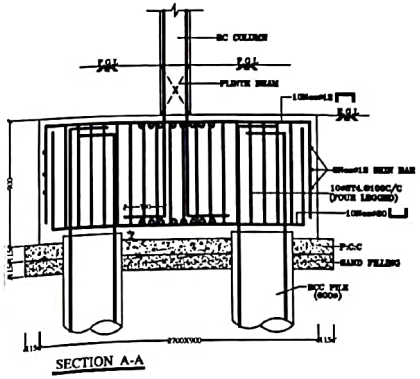
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3. TIME DURATION INCLUDES FROM THE TIME OF WATER ADDING IN THE BATCHING PLANT (i.e) TIME OF LORRY DEPARTURE FROM PLANT, TRAVEL TIME, PUMP CONNECTING TIME , PUMPING AND LAYING OF CONCRETE ON FORM WORK.
4. AFTER 60 MINUTES TO 90 MINUTES ON LAYING OF CONCRETE SOME HAIRLINE / MINOR SHRINKAGE CRACKS WILL DEVELOP ON THE TOP SURFACE OF THE CONCRETE. TO RECTIFY THIS, FOUR THICK CEMENT SLURRY, FILL IT AND PACK IT WITH BROOM.
5. THE CONCRETE TOP SURFACE SHOULD BE SPRAYED WITH WATER TO START CURING AFTER 120 MINUTES TO 150 MINUTES FROM THE TIME OF CONCRETE LAYING.
6. START CURING WITH STORING WATER ON TOP OF CONCRETE AFTER 240 MINUTES TO 300 MINUTES FROM THE TIME OF CONCRETE LAYING.
7. READY MIX CONCRETE IS NOT ADVISED FOR PILE AND COLUMN CONCRETING.

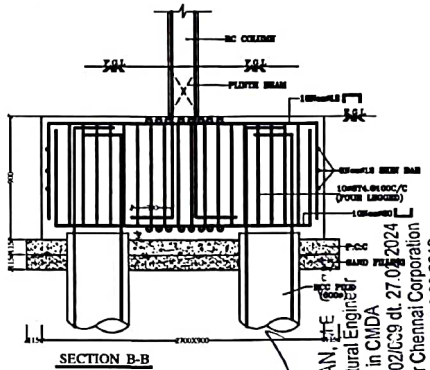
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IMPORTANT NOTE :-

1. CONCRETING AT SITE SHALL BE STARTED ONLY AFTER VERIFYING ALL FABRICATION OF REINFORCEMENT BAR DONE FOR VARIOUS MEMBERS, (Viz) BEAMS, SLABS, COLUMNS, FOOTINGS, ETC. AND SHALLS BE CHECKED AS PER THE STRUCTURAL LATEST REVISION DRAWINGS FOR FABRICATION OF REINFORCEMENT BAR.
2. CONCRETE SHOULD BE DONE MONOLITHICALLY FOR CANTILEVER SLABS AND BEAMS. CONSTRUCTION JOINT IN CONCRETE SHOULD BE FOLLOWED AS PER DIRECTIONS GIVEN BY QUALIFIED CIVIL ENGINEER / SITE IN-CHARGE ENGINEER.





SOIL NOTES :- (APPLICABLE ONLY IF THE TOP SOIL IS GRAVELLY/SANDY)

1. THE EXCAVATED SOIL CANNOT BE USED FOR BACKFILLING PURPOSE. (IT IS MASS CONSUMABLE SOIL NOTED)
2. IF THE TOP SOIL IS OF MEDIUM TO HARD TYPE THEN EXCAVATION SHALL BE DONE UPTO FOUNDATION BOTTOM LEVEL FOR FOOTINGS, BEAMS, IT IS RECOMMENDED TO REMOVE TOP 12" - 18" (30 CM TO 45 CM) FULL SOIL AND REPLACE WITH QUALITY SOIL (SAND) ONLY.
3. AFTER THE EXCAVATION, THE FOUNDATION TRENCHES SHOULD BE COMPACTED PROPERLY BEFORE LAYING THE FOUNDATION. THE TOP 9" (23 CM) SHOULD BE HARD (MEASURED BY SOIL TESTING EQUIPMENT) AND COMPACTED WITH MECHANICAL VIBRATORY EQUIPMENT.
4. LAY LEAN MIX (1:4:8) OF 6" (15 CM) THICK AS PCC BELOW FOOTINGS AND BEAMS.
5. FOUNDATION IS DESIGNED FOR SAFE BEARING CAPACITY OF SOIL AS PER SOIL REPORT.

REV	DESCRIPTION	DRN	DATE
1.	COLUMN REVISED	S.P.J	15.11.2019
2.	STAIRCASE COLUMN REVISED	S.P.J	15.11.2019
3.	LIFT COLUMN NUMBER ADDED	S.P.J	15.11.2019
4.	PILE REVISED	S.P.J	15.11.2019
5.	SECTION A-A AND B-B ADDED	S.P.J	15.11.2019

DRWG.S.P.J.
CHK: SENTHIL.R

Dwg No.- 11502 S-01

FOUNDATION LAYOUT.

DATE 06.01.2024 SCALE 1:25, 1:50

ARCHITECT:

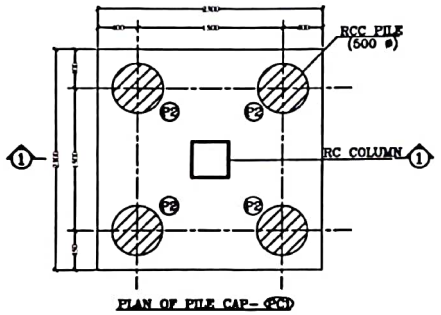
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Consultants - Engineers

Chennai - 600 083. Ph : 2442 48 49

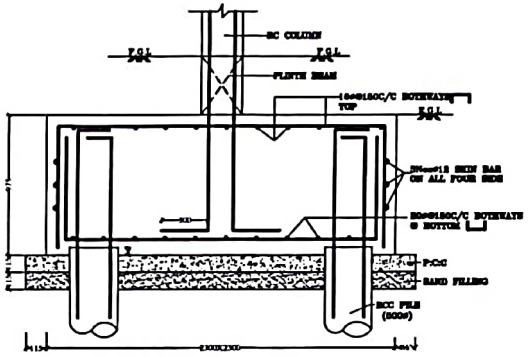
S.P.S.Inbarajan, M.E., A.M.I.E.,
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PROPOSED RESIDENTIAL BUILDING FOR M/S. SHREEROSH PROPERTIES
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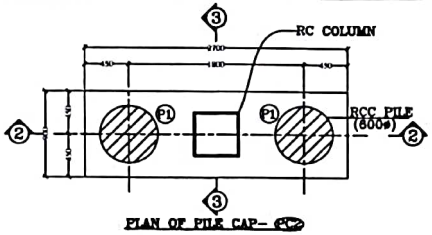
S. P. S. INBARAJAN, M.E
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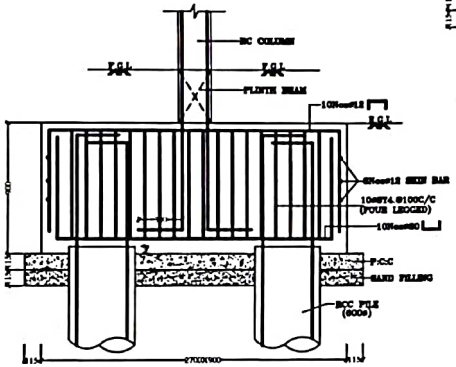
PLAN OF PILE CAP- (PC1)



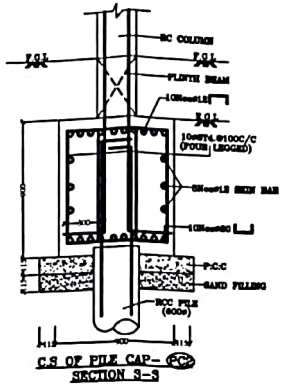
L.S OF PILE CAP- (PC1)
SECTION 1-1



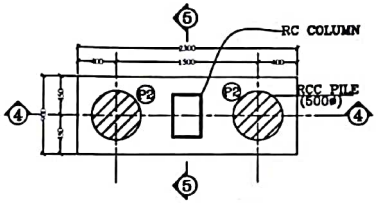
PLAN OF PILE CAP- (PC2)



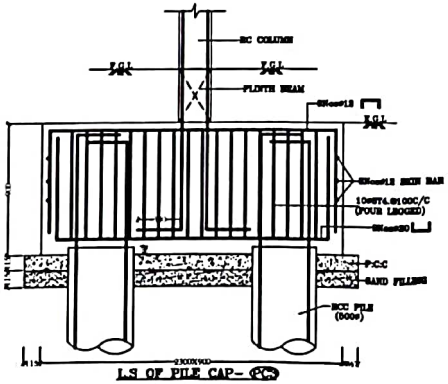
L.S OF PILE CAP- (PC2)
SECTION 2-2



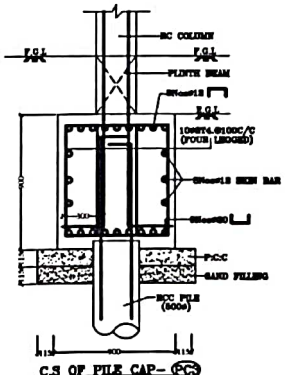
C.S OF PILE CAP- (PC2)
SECTION 3-3



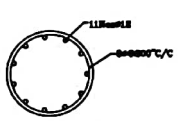
PLAN OF PILE CAP- (PC3)



L.S OF PILE CAP- (PC4)
SECTION 4-4



C.S OF PILE CAP- (PC4)
SECTION 5-5



C.S.OF PILE (P1)
(600ø)



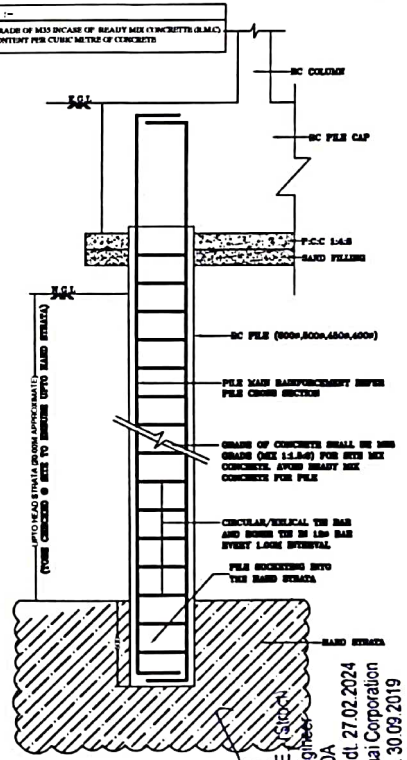
C.S.OF PILE (P2)
(600ø)

PILE NOTES :-

BORED CAST IN SITU END BEARING DRIVEN PILE BY DIRECT MUD CIRCULATION METHOD (DMC).
BORING TERMINATED AT A DEPTH WHERE 'N' VALUE IN SPT TEST IS MORE THAN 100 FOR MULTI STOREY BUILDING (HEIGHT EXCEEDING 15.0 METER) AND 50 FOR OTHER BUILDING (HEIGHT LIMITED 15.0 METER) AND AN EXTRA PENETRATION FOR MINIMUM OF 500mm (PILE SCUFFING) BE TURNED ABOVE LEVEL IN THE HARD STRATA.
APPROXIMATELY LENGTH OF PILE SHALL BE 20.00M. CONCRETING FOR THIS PILE SHALL BE DONE USING THE TREMIE PIPE IN THE SHAFT FOR PROPER PLACING AND COMPACTION OF CONCRETE. THE DESIGN SAFE LOADS FOR THE PILES ARE AS FOLLOWS 600ø 113 TONNES,500ø 78 TONNES,450ø 63 TONNES,400ø 50 TONNES.
INITIAL LOAD TEST ON PILES SHALL BE DONE FOR 2.0 TIMES THE DESIGN SAFE LOAD AND ROUTINE LOAD TEST ON WORKING PILES SHALL BE DONE FOR 1.5 TIMES THE DESIGN SAFE LOAD OR FOR 12mm SETTLEMENT WHICH EVER IS MINIMUM AS PER THE IS 2911 (PART IV). CHIPPING OF PILE SHALL BE DONE FOR A LENGTH OF MINIMUM 500mm BEFORE LAYING OF PILE CAP
METHOD OF CONCRETING OF PILE:
AFTER COMPLETION OF PILE BORING FLUSH THE BORE INITIALLY AND THEN PLACE THE PILE REINFORCEMENT CAGE INSIDE THE PILE BORE. PLACE TIP TREMIE PIPE INSIDE THE REINFORCEMENT CAGE UP TO THE BOTTOM LEVEL OF BORE THEN START THE CONCRETING OF PILE THROUGH THE TREMIE PIPE. MAINTAIN ALWAYS TREMIE PIPE FOR A LENGTH OF 0.5 METER INSIDE THE CONCRETE DURING THE TIME OF CONCRETING
THEORITICAL ACTUAL VOLUME OF CONCRETE TO BE CHECKED AT THE TIME OF CONCRETING
READY MIX CONCRETE SHOULD NOT BE USED FOR PILE CONCRETING

IMPORTANT NOTE :-

1 CONCRETE SHALL BE GRADE OF M35 INCASE OF READY MIX CONCRETE (RMC) WITH 400KG CEMENT CONTENT PER CUBIC METRE OF CONCRETE



TYPICAL VERTICAL THROUGH PILE

IMPORTANT NOTE FOR M-SAND :-

SAND SHALL BE REPLACED BY M-SAND FULLY OR PARTIALLY IN ANY PROPORTION FOR PLAIN CEMENT CONCRETE, REINFORCEMENT CEMENT CONCRETE EXCEPT COLUMN CONCRETE. FOR COLUMN CONCRETE BETTER TO USE SAND ALONE FOR CONCRETE.
M-SAND SHOULD BE FREE FROM DUST AT SITE AT THE TIME OF USING FOR CONCRETE.
TO CHECK THE M-SAND FOR DUST CONTENT, DRY THE M-SAND AND SPRAY IT AT CERTAIN HEIGHT LEVEL. IF ANY DUST PRESENCE WILL FLY ON THE AIR. ALSO IF WE TAKE A PINCH ALSO IF WE TAKE A PINCH OF DRIED M-SAND ON OUR HAND ANY DUST PRESENCE WILL STICK ON TO OUR PALM OF OUR HAND.

IMPORTANT NOTE FOR LAYING METHOD FOR READY MIX CONCRETE (RMC) :-

1. FOR M25 GRADE CONCRETE PROVIDE 340 KG CEMENT PER CUBIC METER OF READY MIX CONCRETE.
2. THE TIME DURATION OF READY MIX CONCRETE SHALL BE AT THE MAXIMUM OF 90 MINUTES TO 100 MINUTES FOR THE BEST STRENGTH RESULT OF CONCRETE.
3. TIME DURATION INCLUDES FROM THE TIME OF WATER ADDING IN THE BATCHING PLANT (i.e) TIME OF LORRY DEPARTURE FROM PLANT, TRAVEL TIME, PUMP CONNECTING TIME , PUMPING AND LAYING OF CONCRETE ON PLACE WISE.
4. AFTER 60 MINUTES TO 90 MINUTES ON LAYING OF CONCRETE SOME HAIRLINE / MINOR SURFACE CRACKS WILL DEVELOP ON THE TOP SURFACE OF THE CONCRETE. TO RECTIFY THIS, POUR THICK CEMENT SLURRY, FILL IT AND PACE IT WITH BROOM.
5. THE CONCRETE TOP SURFACE SHOULD BE SPRAYED WITH WATER TO START CURING AFTER 120 MINUTES TO 150 MINUTES FROM THE TIME OF CONCRETE LAYING.
6. START CURING WITH STORING WATER ON TOP OF CONCRETE AFTER 240 MINUTES TO 300 MINUTES FROM THE TIME OF CONCRETE LAYING.
7. READY MIX CONCRETE IS NOT ADVISED FOR PILE AND COLUMN CONCRETING.

IMPORTANT NOTE :-

1 CONCRETING AT SITE SHALL BE STARTED ONLY AFTER VERIFYING ALL FABRICATION OF REINFORCEMENT BAR DONE FOR VARIOUS MEMBERS, (Viz) BEAMS, SLABS, COLUMNS, FOOTINGS, ETC AND SHOULD BE CHECKED AS PER THE STRUCTURAL LATEST REVISION DRAWINGS FOR FABRICATION OF REINFORCEMENT BAR.
2 CONCRETE SHOULD BE DONE MONOLITHICALLY FOR CANTILEVER SLABS AND BEAMS. CONSTRUCTION JOINT IN CONCRETE SHOULD BE FOLLOWED AS PER DIRECTIONS GIVEN BY QUALIFIED CIVIL ENGINEER / SITE IN-CHARGE ENGINEER

PROPOSED RESIDENTIAL BUILDING FOR M/S. SHREEROSH PROPERTIES
AT TAYLORS ROAD,KILPAUK, CHENNAI.

FOUNDATION DETAIL-II

Dwg No. 11502 S -03

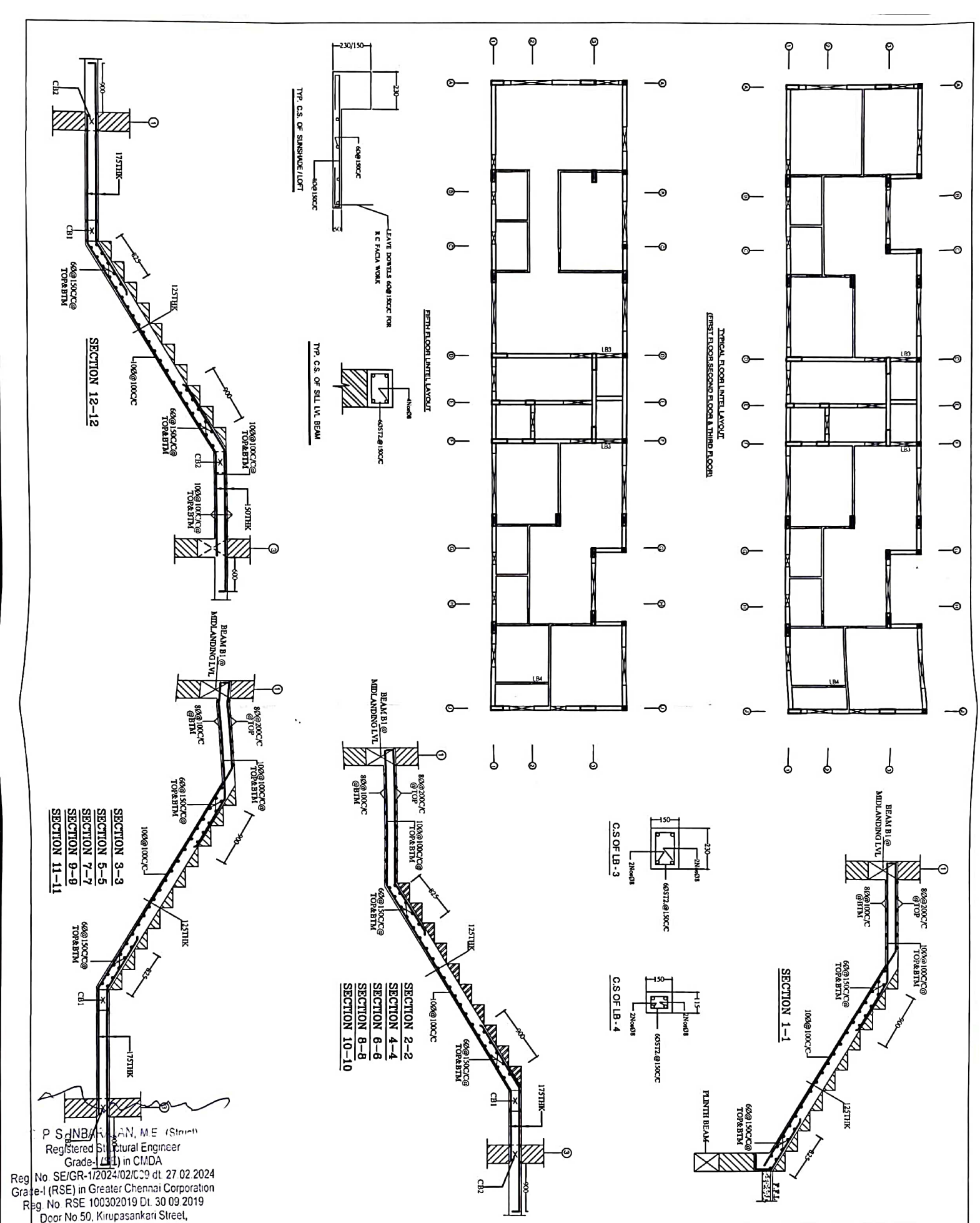
DATE 05.01.2024 SCALE 1:50

ASSOCIATES

BOURNA
Consultancy Engineers

DSGD S.P.S.I.
DRN SENTHILS

S. P. S. INBARAJAN, M.E., (Struct.)
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Reg. No. SE/GR-1/2024/02/C9 dt. 27.02.2024
Grade-I (RSE) in Greater Chennai Corporation
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Reg. No. RSE 100302019 Dt. 30.09.2019
Door No 50, Kirupasankari Street,
West Mambalam, Chennai 600 033.

PROPOSED RESIDENTIAL BUILDING FOR M/S. SHREEROSH PROPERTIES
AT TAYLORS ROAD,KILPAUK , CHENNAI.

No:50, Kirupasankari Street, West Mambalam,
Chennai - 600 033. Ph : 2485 46 03

S.P.S.Inbarajan, M.E., A.M.I.E.,
Structural Consultant

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Consultants - Engineers

LINTEL & STAIRCASE DETAILS...

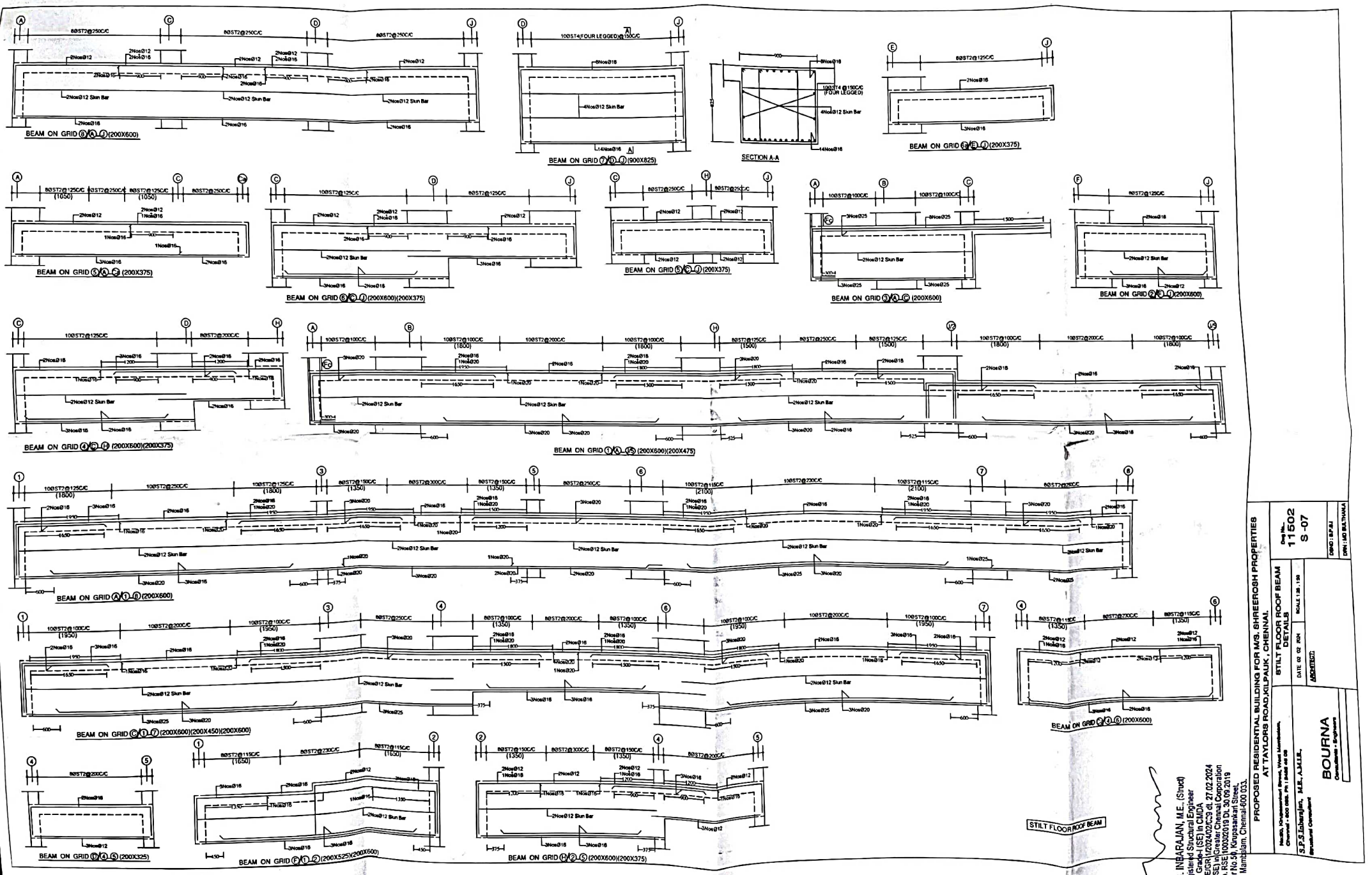
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ARCHITECT:

Dwg No...
11502
S -06

DSND : S.P.S.I

DRN : MD SULTHAN.A



PROPOSED RESIDENTIAL BUILDING FOR M/S. SHREEROSH PROPERTIES
AT TAYLORS ROAD,KILPAUK, CHENNAI.

STILT FLOOR ROOF BEAM DETAILS

Dwg No. 11502 S -07

DATE 02 02 2024 | SCALE 1:25 : 1:50

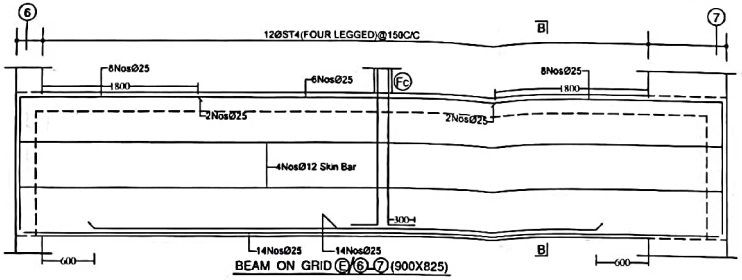
DSN : S.P.J.I | DRN : M/S BALTHANA

S.P.S.Inbarajan, M.E., A.M.I.E.,
Structural Consultant

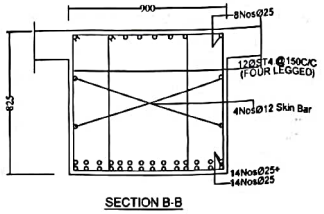
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Consultancies - Engineers

Nandha, Kanagambikai Street, West Mambalam, Chennai - 600 033. Ph : 24848 488

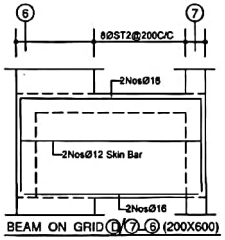
S. P. S. INBARAJAN, M.E., (Struct)
Registered Structural Engineer
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Reg. No. SE/GR1/12024/02/C9 dt. 27.02.2024
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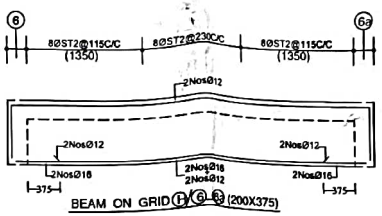
BEAM ON GRID Ⓔ Ⓖ Ⓖ (900X825)



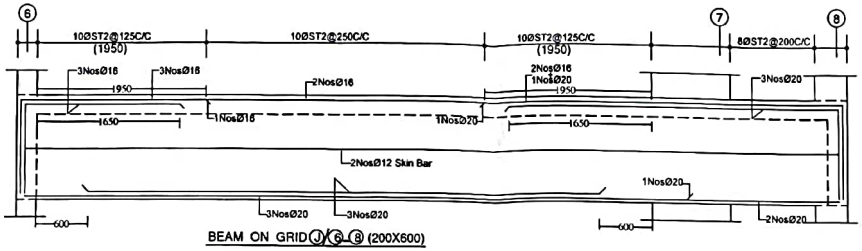
SECTION B-B



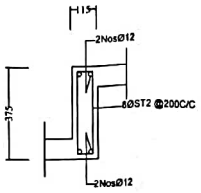
BEAM ON GRID Ⓓ Ⓖ Ⓖ (200X600)



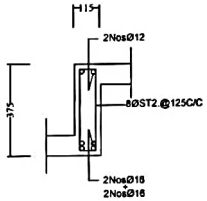
BEAM ON GRID Ⓕ Ⓖ Ⓖ (200X375)



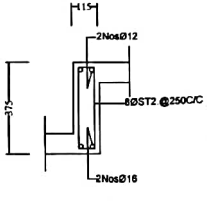
BEAM ON GRID Ⓙ Ⓖ Ⓘ (200X600)



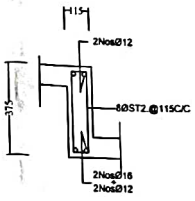
C.S. OF BEAM B2 (100X375)



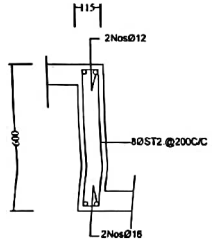
C.S. OF BEAM B4 (100X375)



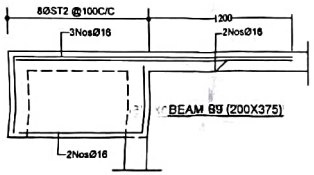
C.S. OF BEAM B3 (100X375)



C.S. OF BEAM B5 (100X375)

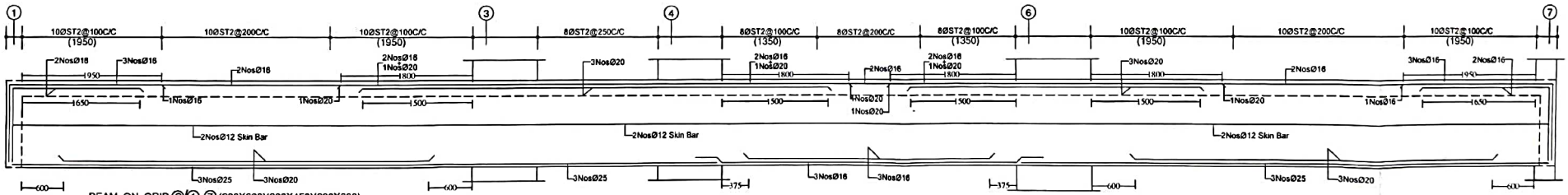


C.S. OF BEAM B6 (100X600)

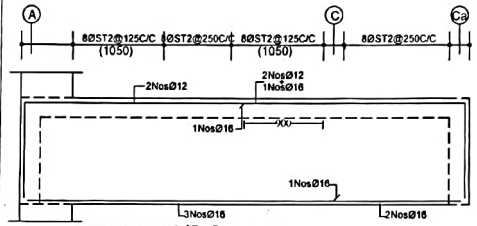


BEAM B9 (200X375)

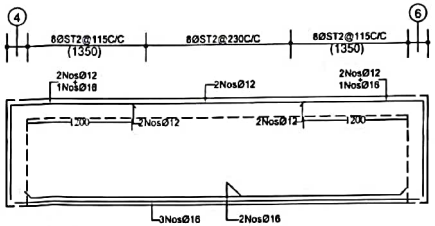
STILT FLOOR ROOF BEAM



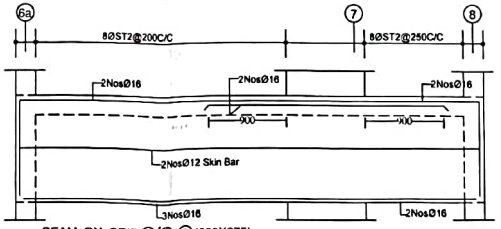
BEAM ON GRID Ⓒ Ⓘ Ⓖ (200X600)(200X450)(200X600)



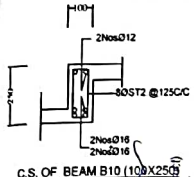
BEAM ON GRID Ⓔ Ⓐ Ⓒ (200X600)



BEAM ON GRID Ⓒ Ⓐ Ⓔ (200X600)



BEAM ON GRID Ⓔ Ⓖ Ⓘ (200X375)



C.S. OF BEAM B10 (100X250)

IMPORTANT NOTES :-

FOR BEAM DETAILS NOT GIVEN FOLLOW STILT FLOOR ROOF BEAM DETAILS

TYPICAL FLOOR ROOF BEAM
FIRST & SECOND FLOOR ROOF BEAM

PROPOSED RESIDENTIAL BUILDING FOR M/S. SHREEROSH PROPERTIES
Door No 50, Kilpauk Garden Road, AT TAYLORS ROAD, KILPAUK, CHENNAI.

ST.F & TYP. (F.F,S.F&T.F)
ROOF BEAM DETAILS

Dwg No... 11502 S -08

DATE 02 02 2024 | SCALE 1:25, 1:50

DSN'D : B.P.S.I

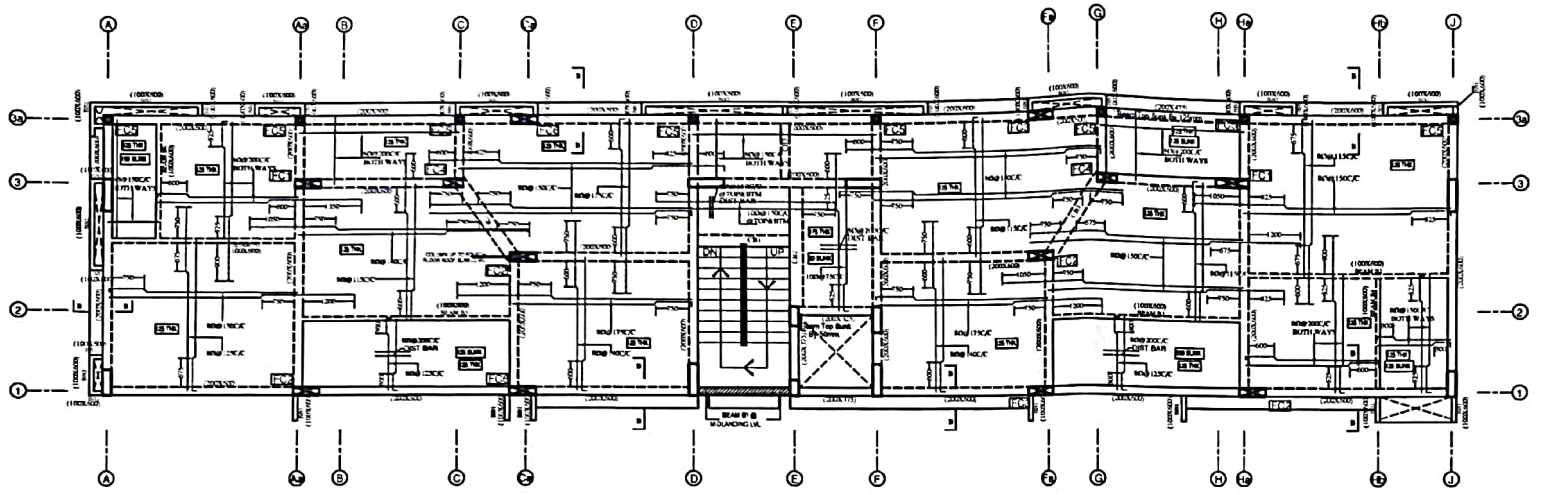
DRN : MD SULTHAN

ARCHITECT:

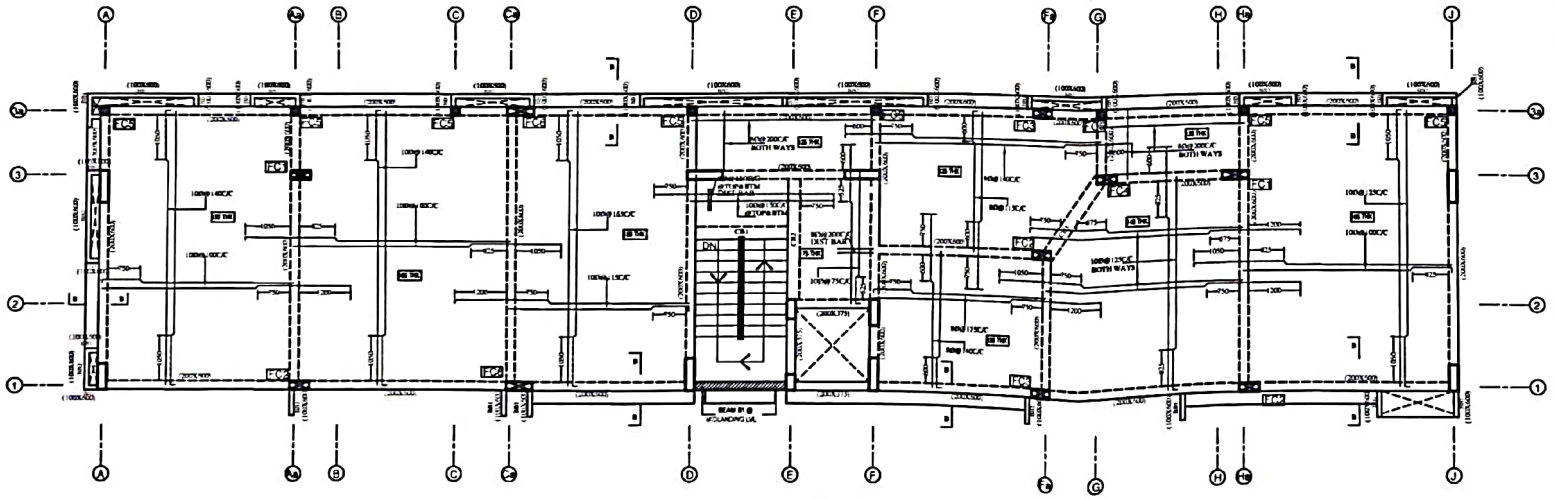
S.P.S.Inbarajan, M.E., A.M.I.E.,
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BOURNA
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Gr(I)et (RSE) in Greater Chennai Corporation
Reg No RSE/



FOURTH FLOOR ROOF SLAB LAYOUT



FIFTH FLOOR ROOF SLAB LAYOUT

COLUMN DETAILS 1st.F.= FIRST FLOOR 2nd.F.= SECOND FLOOR 3rd.F.= THIRD FLOOR

SL No.	Name Of Column	Column Size	Main Reinforcement	Column Tie	Column Section Rod Detail
1	FC1	1st.F = (200X750)	16Nos@20	8mmø@ 200C/C	(1st.F) (2nd F) (3rd F) (4th F) (5th F)
		2nd F = (200X750)	16Nos@16		
		3rd F = (200X750)	16Nos@12		
		4th F = (200X600)	12Nos@12		
		5th F = (200X450)	8Nos@12		
2	FC2	1st.F = (200X600)	10Nos@20	8mmø@ 200C/C	(1st.F) (2nd F) (3rd.F) (4th F) (5th.F)
		2nd F = (200X600)	10Nos@16		
		3rd F = (200X600)	10Nos@12		
		4th F = (200X450)	8Nos@12		
		5th F = (200X450)	8Nos@12		
3	FC3	1st.F = (200X600)	10Nos@16	8mmø@ 200C/C	(1st.F) (2nd.F) (3rd F) (4th F) (5th F)
		2nd F = (200X600)	4Nos@16 & 6Nos@12		
		3rd F = (200X600)	10Nos@12		
		4th F = (200X450)	8Nos@12		
		5th F = (200X450)	8Nos@12		
4	FC4	1st.F = (200X450)	10Nos@16	8mmø@ 200C/C	(1st.F) (2nd F) (3rd F) (4th F) (5th F)
		2nd F = (200X450)	4Nos@16 & 4Nos@12		
		3rd F = (200X450)	8Nos@12		
		4th F = (200X450)	8Nos@12		
		5th F = (200X450)	8Nos@12		
5	FC5	1st.F = (200X200)	4Nos@16	8mmø@ 200C/C	(1st.F) (2nd F) (3rd F) (4th F) (5th F)
		2nd F = (200X200)	4Nos@16		
		3rd F = (200X200)	4Nos@16		
		4th F = (200X200)	4Nos@16		
		5th F = (200X200)	4Nos@16		
6	FC6	1st.F = (200X800)	12Nos@16	8mmø@ 200C/C	(1st.F) (2nd F) (3rd F) (4th F) (5th F)
		2nd F = (200X800)	4Nos@16 & 8Nos@12		
		3rd F = (200X800)	10Nos@12		
		4th F = (200X800)	10Nos@12		
		5th F = (200X800)	10Nos@12		

IMPORTANT NOTES :-

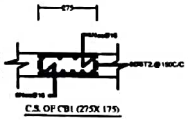
1. ALL SLABS ARE 4"(100mm)THICK, UNLESS NOTED OTHER WISE.
2. PROVIDE 8mmø@150mm C/C (OR) 8MM Ø @250mm C/C DISTRIBUTORS WHERE EVER NEEDED AT TOP AND BOTTOM OF SLAB.
3. ——— LINE INDICATES BAR AT TOP IN PLAN. - - - - - LINE INDICATES BAR AT BOTTOM IN PLAN.
4. PROVIDE L- BEND FOR TOP REINFORCEMENT BAR AT END OF THE BEAM FOR BEAMS DETAIL GIVEN IN CROSS SECTION. PROVIDE L- BEND 7"(175mm) IN THE SLAB CRANKED REINFORCEMENT BAR IN TO THE BEAM. WHICH ARE NOT CONTRIBUTING TO THE ADJACENT SLAB.

IMPORTANT NOTE FOR M-SAND :-

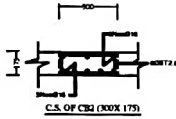
SAND SHALL BE REPLACED BY M-SAND FULLY OR PARTIALLY IN ANY PROPORTION FOR PLAIN CEMENT CONCRETE, REINFORCEMENT CEMENT CONCRETE EXCEPT COLUMN CONCRETE. FOR COLUMN CONCRETE BETTER TO USE SAND ALONE FOR CONCRETE.
M-SAND SHOULD BE FREE FROM DUST AT SITE AT THE TIME OF USING FOR CONCRETE.
TO CHECK THE M-SAND FOR DUST CONTENT, DRY THE M-SAND AND SPRAY IT AT CERTAIN HEIGHT LEVEL, IF ANY DUST PRESENCE WILL FLY ON THE AIR. ALSO IF WE TAKE A PINCH ALSO IF WE TAKE A PINCH OF DRIED M-SAND ON OUR HAND ANY DUST PRESENCE WILL STICK ON TO OUR PALM OF OUR HAND

IMPORTANT NOTE FOR LAYING METHOD FOR READY MIX CONCRETE (RMC) :-

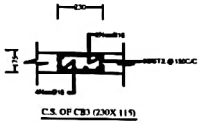
1. FOR M25 GRADE CONCRETE PROVIDE 340 KG CEMENT PER CUBIC METER OF READY MIX CONCRETE.
2. THE TIME DURATION OF READY MIX CONCRETE SHALL BE AT THE MAXIMUM OF 90 MINUTES TO 100 MINUTES FOR THE BEST STRENGTH RESULT OF CONCRETE.
3. TIME DURATION INCLUDES FROM THE TIME OF WATER ADDING IN THE BATCHING PLANT (i.e) TIME OF LORRY DEPARTURE FROM PLANT, TRAVEL TIME, PUMP CONNECTING TIME , PUMPING AND LAYING OF CONCRETE ON ROOF WORK.
4. AFTER 60 MINUTES TO 90 MINUTES ON LAYING OF CONCRETE SOME HAIRLINE / MINOR SHRINKAGE CRACKS WILL DEVELOP ON THE TOP SURFACE OF THE CONCRETE. TO RECTIFY THIS, FOUR THICK CEMENT SLURRY, FILL IT AND PACE IT WITH BROOM.
5. THE CONCRETE TOP SURFACE SHOULD BE SPRAYED WITH WATER TO START CURING AFTER 120 MINUTES TO 150 MINUTES FROM THE TIME OF CONCRETE LAYING.
6. START CURING WITH STORING WATER ON TOP OF CONCRETE AFTER 240 MINUTES TO 300 MINUTES FROM THE TIME OF CONCRETE LAYING.



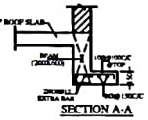
C.S. OF CB1 (275X 175)



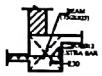
C.S. OF CB2 (300X 175)



C.S. OF CB3 (230X 115)



SECTION A-A



SECTION B-B



C.S. OF BEAM BB1 (100X300)

PROPOSED RESIDENTIAL BUILDING FOR M/S. SHREEROSH PROPERTIES AT TAYLORS ROAD,KILPAUK, CHENNAI.

STILT & FIRST FLOOR ROOF SLAB LAYOUT

Dwg No.: 11502 S-05

No.	DESCRIPTION	DRN	DATE
R4	COP & ADD LIFT (TYP VOID) AS PER NEW PLAN	S P S I	04.11.2024
R3	AS PER NEW PLAN	S P S I	27.10.2024
R2	STAIRCASE COLUMN REVISED	S P S I	19.10.2024
R1	ROOF SLAB FULLY REVISED	S P S I	04.10.2024

DRWG : S P S I

DRN : MD BALTHAKA

S P S. INBARAJAN, M.E., (Struct)
Registered Structural Engineer
Grade-I (SE) in CCMDA
Reg. No. SE/GR-1/2024/0C39 dt. 27.02.2024
Grade-I (R&E) in Greater Chennai Corporation
Reg. No. RSE 1003020 dt. 04.09.2419
Door No.50, Kirupasankari Street
Tambaram, Chennai-600 045.

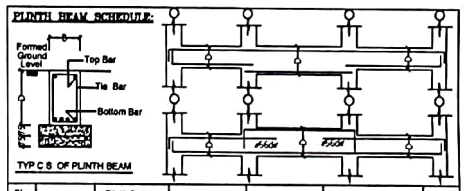
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CONCRETE SHALL BE GRAD OF M35 MIX (1:1:2) FOR ALL COLUMN

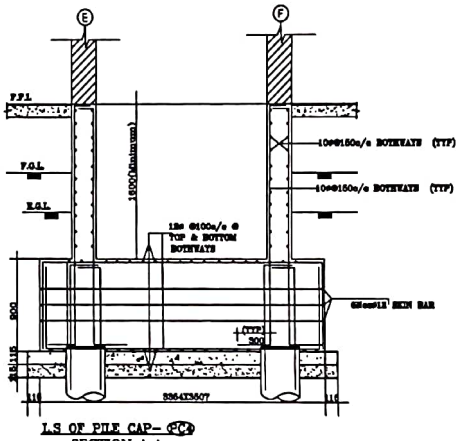
COLUMN DETAILS — G.F.= GROUND FLOOR 1st.F.= FIRST FLOOR 2nd.F.= SECOND FLOOR 3rd.F.= THIRD FLOOR 4th.F.= FOURTH FLOOR 5th.F.= FIFTH FLOOR

SL. No.	Name Of Column	Column Size	Main Reinforcement	Column Tie	Column Section Rod Detail
1	C1	St.F = (300X1050)	30Nos⌀20	(4Nos Of Set) 8⌀@200C/C	
		1st.F = -	-	(2Nos Of Set) 8⌀@200C/C	
		2nd F = -	-		
		3rd.F = -	-	8⌀@200C/C	
		4th.F = -	-		
		5th.F = -	-		
2	C2	St.F = (1100X800)	14Nos⌀20+ 12Nos⌀20		
		1st.F = (200X800)	14Nos⌀20		
		2nd F = (200X800)	14Nos⌀16	(3Nos Of Set) 8⌀@200C/C	
		3rd.F = (200X800)	14Nos⌀12		
		4th.F = (200X800)	14Nos⌀12		
		5th.F = (200X800)	14Nos⌀12	8⌀@200C/C	
3	C3	St.F = (300X1050)	22Nos⌀16 +12Nos⌀12	(4Nos Of Set) 8⌀@200C/C	
		1st.F = (200X750)	18Nos⌀16	(3Nos Of Set) 8⌀@200C/C	
		2nd F = (200X750)	18Nos⌀12		
		3rd.F = (200X800)	12Nos⌀12	8⌀@200C/C	
		4th.F = (200X800)	10Nos⌀12		
		5th.F = (200X800)	10Nos⌀12		
4	C4	St.F = (300X750)	18Nos⌀16	(3Nos Of Set) 8⌀@200C/C	
		1st.F = -	-		
		2nd.F = -	-		
		3rd.F = -	-		
		4th.F = -	-		
		5th.F = -	-		
5	C5	St.F = (300X750)	14Nos⌀16+ 8Nos⌀12	(4Nos Of Set) 8⌀@200C/C	
		1st.F = (200X800)	12Nos⌀16	(2Nos Of Set) 8⌀@200C/C	
		2nd F = (200X800)	10Nos⌀16		
		3rd F = (200X800)	10Nos⌀12	8⌀@200C/C	
		4th.F = (200X450)	8Nos⌀12		
		5th.F = (200X450)	8Nos⌀12		
6	C6	St.F = (200X750)	16Nos⌀16	(3Nos Of Set) 8⌀@200C/C	
		1st.F = (200X800)	12Nos⌀16	(2Nos Of Set) 8⌀@200C/C	
		2nd F = (200X800)	12Nos⌀12		
		3rd.F = (200X450)	8Nos⌀12		
		4th.F = (200X450)	8Nos⌀12	8⌀@200C/C	
		5th.F = (200X450)	8Nos⌀12		
7	C7	St.F = (200X450)	10Nos⌀16	(2Nos Of Set) 8⌀@200C/C	
		1st.F = (200X450)	8Nos⌀16		
		2nd F = (200X450)	8Nos⌀12		
		3rd F = (200X450)	8Nos⌀12	8⌀@200C/C	
		4th.F = (200X450)	8Nos⌀12		
		5th.F = (200X450)	8Nos⌀12		
8	C8	St.F = (200X375)	8Nos⌀12		
		1st.F = (200X375)	8Nos⌀12		
		2nd F = (200X375)	8Nos⌀12		
		3rd F = (200X375)	8Nos⌀12	8⌀@200C/C	
		4th.F = (200X375)	8Nos⌀12		
		5th.F = (200X375)	8Nos⌀12		
9	C4A	St.F = (200X750)	16Nos⌀20	(3Nos Of Set) 8⌀@200C/C	
		1st.F = (200X750)	16Nos⌀16		
		2nd F = (200X800)	12Nos⌀16	(2Nos Of Set) 8⌀@200C/C	
		3rd F = (200X800)	12Nos⌀12		
		4th.F = (200X450)	8Nos⌀12	8⌀@200C/C	
		5th.F = (200X450)	8Nos⌀12		
9	C5A	St.F = (200X800)	12Nos⌀20	(2Nos Of Set) 8⌀@200C/C	
		1st.F = (200X800)	12Nos⌀16		
		2nd F = (200X800)	10Nos⌀16		
		3rd F = (200X800)	10Nos⌀12	8⌀@200C/C	
		4th.F = (200X450)	8Nos⌀12		
		5th.F = (200X450)	8Nos⌀12		

PLINTH BEAM SCHEDULE:



SL. No.	Name Of Plinth Beam	Plinth Beam Size (BXD)	Plinth Beam Top Bar	Plinth Beam Bottom Bar	Plinth Beam Tie	
1.	PB1	(200X450)	3Nos⌀16	3Nos⌀16+ 2Nos⌀12	10⌀ST2 @175C/C	Formed Ground Level
2.	PB2	(200X450)	3Nos⌀16	3Nos⌀16+ 3Nos⌀12	8⌀ST2 @150C/C 8⌀ST2 @300C/C 8⌀ST2 @150C/C	
3.	PB3	(200X450)	2Nos⌀16	3Nos⌀16+ 2Nos⌀12	8⌀ST2 @200C/C	
4	PB4	(200X450)	2Nos⌀16	3Nos⌀16	8⌀ST2 @200C/C	
5	PB5	(200X375)	2Nos⌀12	2Nos⌀16	8⌀ST2 @250C/C	
6	PB6	(200X450)	2Nos⌀12	3Nos⌀12	8⌀ST2 @250C/C	



L.S OF PILE CAP– PC4
SECTION A-A

IMPORTANT NOTE FOR M-SAND :-

SAND SHALL BE REPLACED BY M-SAND FULLY OR PARTIALLY IN ANY PROPORTION FOR PLAIN CEMENT CONCRETE, REINFORCEMENT CEMENT CONCRETE EXCEPT COLUMN CONCRETE. FOR COLUMN CONCRETE BETTER TO USE SAND ALONE FOR CONCRETE.
M-SAND SHOULD BE FREE FROM DUST AT SITE AT THE TIME OF USING FOR CONCRETE.
TO CHECK THE M-SAND FOR DUST CONTENT, TAKE THE M-SAND AND SPRAY IT AT CERTAIN HEIGHT LEVEL, IF ANY DUST PRESENCE WILL FLY ON THE AIR, ALSO IF WE TAKE A PINCH ALSO IF WE TAKE A PINCH OF DRIED M-SAND ON OUR HAND ANY DUST PRESENCE WILL STICK ON TO OUR PALM OF OUR HAND.

IMPORTANT NOTE :-

1 CONCRETING AT SITE SHALL BE STARTED ONLY AFTER VERIFYING ALL FABRICATION OF REINFORCEMENT BAR DONE FOR VARIOUS MEMBERS, (Viz) BEAMS, SLABS, COLUMNS, FOOTINGS, ETC. AND SHOULD BE CHECKED AS PER THE STRUCTURAL LATEST REVISION DRAWINGS FOR FABRICATION OF REINFORCEMENT BAR.

2 CONCRETE SHOULD BE DONE MONOLITHICALLY FOR CANTILEVER SLABS AND BEAMS. CONSTRUCTION JOINT IN CONCRETE SHOULD BE FOLLOWED AS PER DIRECTIONS GIVEN BY QUALIFIED CIVIL ENGINEER / SITE IN-CHARGE ENGINEER.

IMPORTANT NOTE FOR LAYING METHOD FOR READY MIX CONCRETE (RMC) :-

1. FOR M25 GRADE CONCRETE PROVIDE 340 KG CEMENT PER CUBIC METER OF READY MIX CONCRETE.
2. THE TIME DURATION OF READY MIX CONCRETE SHALL BE AT THE MAXIMUM OF 90 MINUTES TO 100 MINUTES FOR THE BEST STRENGTH RESULT OF CONCRETE.
3. TIME DURATION INCLUDES FROM THE TIME OF WATER ADDING IN THE BATCHING PLANT (i.e) TIME OF LORRY DEPARTURE FROM PLANT, TRAVEL TIME, PUMP CONNECTING TIME , PUMPING AND LAYING OF CONCRETE ON FORM WORK.
4. AFTER 60 MINUTES TO 90 MINUTES ON LAYING OF CONCRETE SOME HAIRLINE / MINOR SHRINKAGE CRACKS WILL DEVELOP ON THE TOP SURFACE OF THIS CONCRETE. TO RECTIFY THIS, POUR THICK CEMENT SLURRY, FILL IT AND PACK IT WITH BROOM.
5. THE CONCRETE TOP SURFACE SHOULD BE SPRAYED WITH WATER TO START CURING AFTER 120 MINUTES TO 150 MINUTES FROM THE TIME OF CONCRETE LAYING.
6. START CURING WITH STORING WATER ON TOP OF CONCRETE AFTER 240 MINUTES TO 300 MINUTES FROM THE TIME OF CONCRETE LAYING.
7. READY MIX CONCRETE IS NOT ADVISED FOR PILE AND COLUMN CONCRETING.

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Grade-I (RSE) in Greater Chennai Corporation
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Door No.60, Kirupasankari Street,
West Mambalam, Chennai-600 033.

PROPOSED RESIDENTIAL BUILDING FOR M/S. SHREEROSH PROPERTIES AT TAYLORS ROAD,KILPAUK , CHENNAI.

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S.P.S Inbarajan, M.E., A.M.I.E.,
Structural Consultant
BOURNA
Consultants - Engineers

FOUNDATION DETAIL-I.

DATE 06.01.2024 SCALE 1:25 1:50

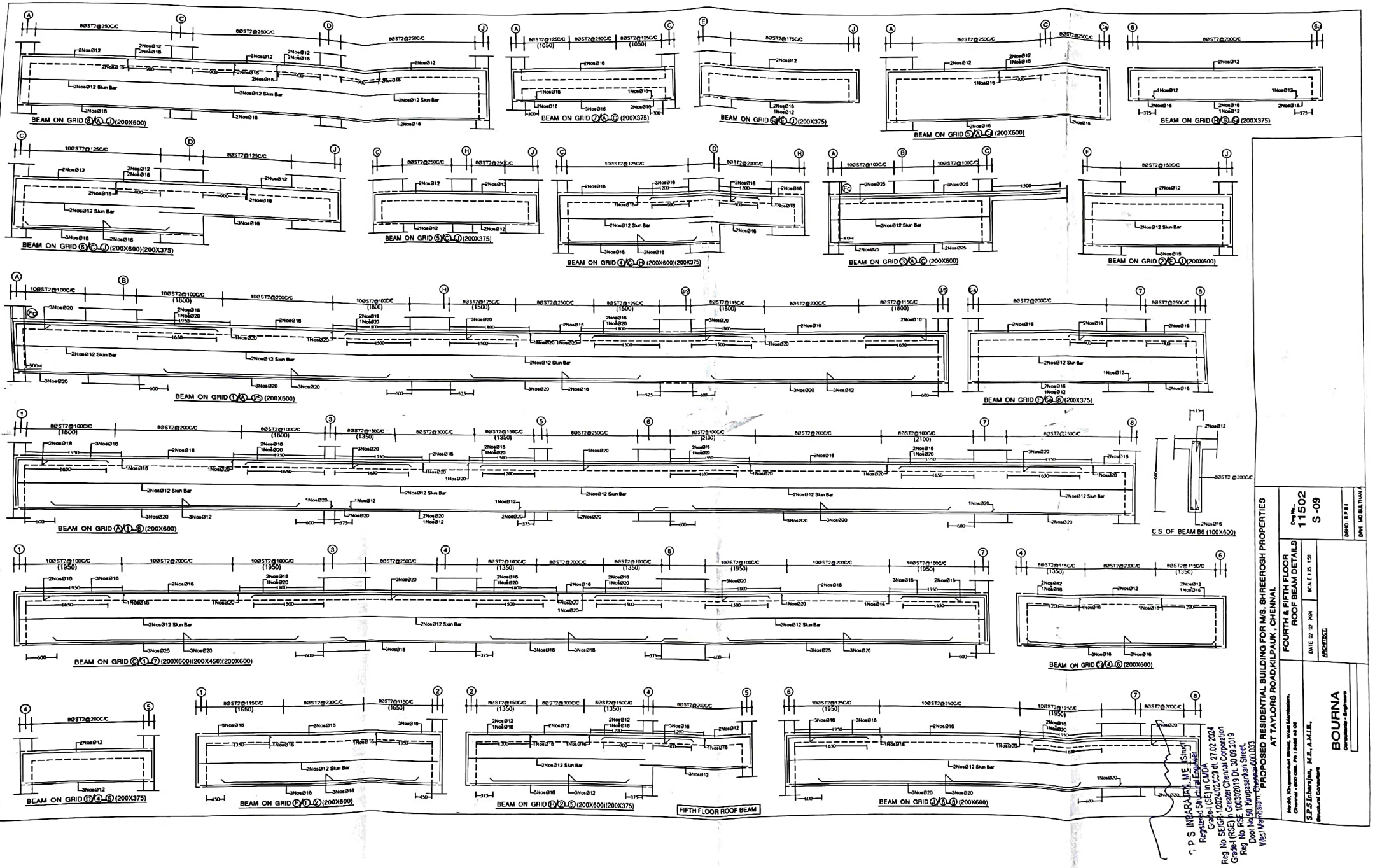
ARCHITECT:

Dwg No. 11502 S -02

DSND : S.P.S.I

DRN : SENTHILR

REV	DESCRIPTION	CHKD	DRN	DATE
R3.	COLUMN & REVISED	S.P.S.I	RAJ THANJA	05.03.2024
R2.	COLUMN & REVISED	S.P.S.I	RAJ THANJA	01.03.2024
R1.	COLUMN & REVISED	S.P.S.I	RAJ THANJA	22.02.2024



PROPOSED RESIDENTIAL BUILDING FOR M/S. SHREEROSH PROPERTIES
AT TAYLORS ROAD,KILPAUK , CHENNAI.

FOURTH & FIFTH FLOOR
ROOF BEAM DETAILS

Dwg No. 11502 S -09

DATE 02 09 2024

SCALE 1:25 1:50

DRWD : S.P.S.I

DRN : MD SULTHAN

ARCHITECT

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Consultants - Engineers

S.P.S.Inbaraj,M.E.,A.M.I.E.,
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