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DESIGN BASIS REPORT

FOR

M/S.VIKAAN SHELTERS

THE PROPOSED CONSTRUCTION OF RESIDENTIAL BUILDING WITH 19 DWELLING UNITS AT E.V.R. PERIYAR STREET, KOVILAMBAKKAM, CHENNAI. COMPRISED IN OLD S.NO.149/1F2, 150/1 & 151/1A2, AS PER PATTA S.No., 151/1A2A & 151/1A2B, OF KOVILAMBAKKAM VILLAGE, TAMBARAM TALUK, WITHIN THE LIMITS OF ST THOMAS PANCHAYAT UNION.

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West Mambalam, Chennai-600 033.

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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.VIKAAN SHELTERS WITH 19 DWELLING UNITS AT E.V.R. PERIYAR STREET, KOVILAMBAKKAM, CHENNAI. COMPRISED IN OLD S.NO.149/1F2, 150/1 & 151/1A2, AS PER PATTA S.No., 151/1A2A & 151/1A2B, OF KOVILAMBAKKAM VILLAGE, TAMBARAM TALUK, WITHIN THE LIMITS OF ST THOMAS PANCHAYAT UNION.

The building is designed for Stilt +5 Floors. The structure is R.C.C framed 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/m²
2. Slab is assumed to be 125mm thick – 3.125 KN/m²
3. Floor finish – 1.5KN/m²
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. All floors = 2 KN/m^2
2. 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

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. 1.0 (DL+LL)
2. 1.0 DL+ 1.0 SQX+1
3. 1.0 DL+ 1.0 SQX-1
4. 1.0 DL+ 1.0 SQZ+1
5. 1.0 DL+ 1.0 SQZ-1
6. 1.0 DL+ 0.8 LL + 0.8 SQX+1

7. 1.0 DL+ 0.8 LL + 0.8 SQX-1
8. 1.0 DL+ 0.8 LL + 0.8 SQZ+1
9. 1.0 DL+ 0.8 LL + 0.8 SQZ-1
10. 1.5 (DL+LL)
11. 1.2 (DL+LL+EQX+1)
13. 1.2 (DL+LL-EQX-1)
14. 1.2 (DL+LL+EQZ+1)
15. 1.2 (DL+LL-EQZ-1)
16. 1.5 (DL+EQX+1)
17. 1.5 (DL+EQX-1)
18. 1.5 (DL+EQZ+1)
19. 1.5 (DL+EQZ-1)
20. 0.9 DL + 1.5 EQX+1
21. 0.9 DL + 1.5 EQX-1
22. 0.9 DL + 1.5 EQZ+1
23. 0.9 DL + 1.5 EQZ-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 DESIGNASSUMPTION

4.1.1 The Base of the Foundation is assumed to be PINNED

4.1.2 SBC of soil is taken as 350 kN/m2 at a depth of 2.00m.

4.1.3 AllConcreteelementsshallbedesignedinaccordancewithIS456:2000LimitState Design.

4.1.4 Appropriate load sand its combinations, as per relevant clauses, for the most unfavorable effects are chosen for design.(ReferLoad Combination below)

5.0 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 M20 for all structural Elements.

Steelreinforcement shall be of GradeFe500 confirming to IS:1786-2008.

6.0 NOMINAL COVER TO REINFORCEMENT

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

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

Column–40mm

Footing –50mm

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 = 415 N/mm^2

Pt = 1.19%

Ast required = 1119 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 = 1.1%

Ast required = 1035 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 = 1.28 %

τc = 0.68

= τc bd

= 0.68 X 230 X 409

= 63968 N (or) 64 kN

Shear to be carried by stirrups

Vu = Vs – τc bd

= 149 – 64 kN

= 85kN

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 = $(132 \times 10^6)/230 \times 484^2$

= 2.44

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

fck = 20 N/mm^2

fy = 415 N/mm^2

Pt = 0.81%

Ast required = 781 mm^2

Provide 4nos of 16Y

Ast provided = 804 mm^2

Hence safe.

Bending moment at mid span, Mu = 111kNm

R = $(111 \times 10^6)/230 \times 484^2$

= 2.06

Pt = 0.55%

Ast required = 612 mm^2

Provide 4 nos of 16Y

Ast provided = 804 mm^2

Hence it is safe

Shear force, Vu, = 96kN

τ_v = Vu/bd

= $96 \times 10^3 / 230 \times 484$

= 0.86 N/mm^2

Hence ok.

Shear capacity of concrete:

Pt = 0.72 %

τ_c = 0.55

= τ_c bd

= 0.55 X 230 X 484

= 61226 N (or) 61.23kN

Shear to be carried by stirrups

Vu = Vs – τ_c bd

= 96 – 61.23kN

= 35kN

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 COLUMN C1

Length of column	D	900	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	3175	kN
Factored moment (longer direction)	Mux	165	kNm
Factored moment (shorter direction)	Muz	59	kNm
Charac. comp strength of concrete	f_{ck}	20	N/mm^2
Yield stress of steel	f_y	415	N/mm^2
Dia of bar used	Φ	25	mm
Clear cover		40	mm
Effective cover	d'	52.5	mm
Effective depth	d	847.5	mm
Check for slenderness			
Longer Direction			
Slenderness ratio	L_{ex}/D	2.40	**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		14	
Area of reinforcement	Ast	6868.75	
Provided steel		14 nos Y25	
Percentage of reinforcement	p_t	3.318	%
Area of concrete	Ag	207000	mm^2
Ultimate axial load (without moments)	P_{uz}	3939	kN
Calculation of P_b:			
Longer Direction			
	d'/D	0.058	
Coefficient k_1(from TABLE 60 of SP:1980)	k_{1x}	0.217	From Sp16
Coefficient k_2(from TABLE 60 of SP:1980)	k_{2x}	0.525	
Axial load corresponding to balanced failure	P_{bx}	1259	kN
Reduction factor for additional moments	k_x	1.000	
Moment due to slenderness	M_{ax}	**0.00**	kN-m
Shorter Direction			
	d'/b	0.228	
Coefficient k_1(from TABLE 60 of SP:1980)	k_{1y}	0.176	
Coefficient k_2(from TABLE 60 of SP:1980)	k_{2y}	0.117	
Axial load corresponding to balanced failure	P_{by}	810	kN
Reduction factor for additional moments	k_y	0.244	
Moment due to slenderness	M_{ax}	**0.00**	kN-m
Check for moments due to min. eccentricity			
Longer Direction			
Minimum eccentricity	e_x	35.40	mm

Moment due to min. eccentricity		M_x	112.40	kN-m
Moment in longer direction		M_{ux}	165.00	kNm
Shorter direction				
Minimum eccentricity		e_y	13.07	mm
Moment due to min. eccentricity		M_y	41.49	kN-m
Moment in shorter direction		M_{uy}	59	kNm
Final design moments				
Moment in longer direction		M_{ux}	**165.00**	kNm
Moment in shorter direction		M_{uy}	**59.00**	kNm
Check for interaction				
		d'/D	0.058	
		d'/b	0.228	
p/f_{ck}		p/f_{ck}	0.166	
$P_u/f_{ck}bD$ value		$P_u/f_{ck}bD$	0.767	
$M_{ux1}/f_{ck}bD^2$ value (from SP 16:1980 charts)		$M_{ux1}/f_{ck}bD^2$	0.100	
Uniaxial moment capacity (longer direction)		M_{ux1}	**372.6**	kNm
$M_{uy1}/f_{ck}bD^2$ value (from SP 16:1980 charts)		$M_{uy1}/f_{ck}bD^2$	0.080	
Uniaxial moment capacity (shorter direction)		M_{uy1}	**76.176**	kNm
P_u/P_{uz} ratio		P_u/P_{uz}	**0.806**	
Value of exponent			2.000	
Interaction ratio			**0.796**	
Percentage reinforcement satisfactory or not			**safe**	
b/D ratio		b/D	0.25555556	
Status of dimensions			**OK**	
Gross area		A_g	207000	mm^2
Area of core		A_k	132800	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}	64.10	mm^2

DESIGN OF COLUMN C2

Length of column	D	600	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	2056	kN	
Factored moment (longer direction)	Mux	68	kNm	
Factored moment (shorter direction)	Muz	18	kNm	
Charac. comp strength of concrete	f_{ck}	20	N/mm^2	
Yield stress of steel	f_y	415	N/mm^2	
Dia of bar used	Φ	20	mm	
Clear cover		40	mm	
Effective cover	d'	50	mm	
Effective depth	d	550	mm	
Check for slenderness				
Longer Direction				
Slenderness ratio	L_{ex}/D	3.60	**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		14		
Area of reinforcement	Ast	4396		
Provided steel		14 nos Y20		
Percentage of reinforcement	p_t	3.186	%	
Area of concrete	Ag	138000	mm^2	
Ultimate axial load (without moments)	P_{uz}	2571	kN	
Calculation of P_b:				
Longer Direction				
	d'/D	0.083		
Coefficient k_1(from TABLE 60 of SP:1980)	k_{1x}	0.211	From Sp16	
Coefficient k_2(from TABLE 60 of SP:1980)	k_{2x}	0.465		
Axial load corresponding to balanced failure	P_{bx}	787	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}	557	kN	
Reduction factor for additional moments	k_y	0.256		
Moment due to slenderness	M_{ax}	**0.00**	kN-m	
Check for moments due to min. eccentricity				
Longer Direction				
Minimum eccentricity	e_x	25.40	mm	

Moment due to min. eccentricity			M_x	52.22	kN-m
Moment in longer direction			M_{ux}	68.00	kNm
Shorter direction					
Minimum eccentricity			e_y	13.07	mm
Moment due to min. eccentricity			M_y	26.87	kN-m
Moment in shorter direction			M_{uy}	26.8650667	kNm
Final design moments					
Moment in longer direction			M_{ux}	**68.00**	kNm
Moment in shorter direction			M_{uy}	**26.87**	kNm
Check for interaction					
			d'/D	0.083	
			d'/b	0.217	
p/f_{ck}			p/f_{ck}	0.159	
$P_u/f_{ck}bD$ value			$P_u/f_{ck}bD$	0.745	
$M_{ux1}/f_{ck}bD^2$ value (from SP 16:1980 charts)			$M_{ux1}/f_{ck}bD^2$	0.080	
Uniaxial moment capacity (longer direction)			M_{ux1}	**132.48**	kNm
$M_{uy1}/f_{ck}bD^2$ value (from SP 16:1980 charts)			$M_{uy1}/f_{ck}bD^2$	0.065	
Uniaxial moment capacity (shorter direction)			M_{uy1}	**41.262**	kNm
P_u/P_{uz} ratio			P_u/P	**0.800**	
Value of exponent				2.001	
Interaction ratio				**0.687**	
Percentage reinforcement satisfactory or not				**safe**	
b/D ratio			b/D	0.38333333	
Status of dimensions				**OK**	
Gross area			A_g	138000	mm^2
Area of core			A_k	84800	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}	71.97	mm^2

DESIGN OF FOOTING F1

Basic Data
Material Data

Grade of Concrete	f_{ck}	=	M20
Yield Strength of	f_y	=	415N/mm^2
Reinforcement Unit Weight of	γ_c	=	25.0kN/m^3
Concrete	γ_s	=	18.0kN/m^3
Unit Weight of Soil	μ	=	0.35

Soil Data:

Type of soil in foundation			MEDIUM
Net Safe Bearing	SBC	=	350kN/m^2

Clear cover to Reinforcement

Clear Cover to Footing	=	50.0 mm
Slab	=	40.0mm

Basic Dimensions
Size of Pedestal

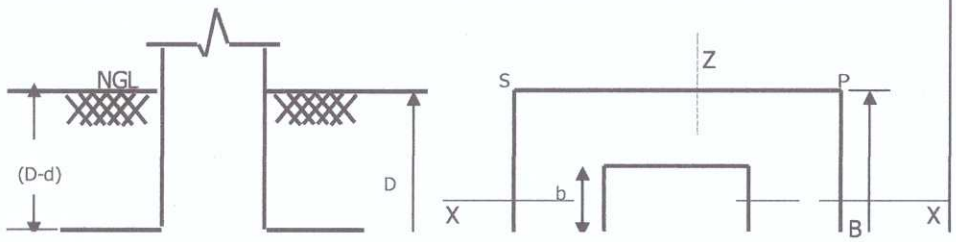
Length	l	=	0.375m
Breadth	b	=	0.375m
Depth of foundation from	D	=	1.750m

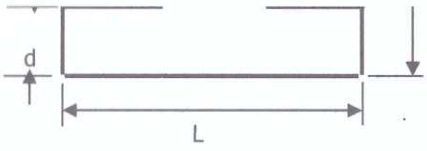
Size of Foundation Pad

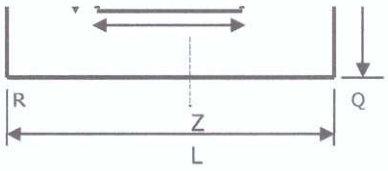
Length	L	=	3.150m
Breadth	B	=	3.150m
Thickness of Base Slab	d	=	0.975m
Thickness @edge of footing	e	=	0.230m

Analysis Results

Loads	V	Mzz	Hx	Mxx	Hz
	kN	kNm	kN	kNm	kN
Dead Load	1309.00	0.00	0.00	0.00	0.00
Live Load	0.00	0.00	0.00	0.00	0.00
Wind or Seismic Load	±0.00	±0.00	±0.00	±0.00	±0.00







Load Combination

Load Combination for Design

1) 1.5DL+1.5LL
2)1.2DL+1.2LL+1.2WL(OR)SL
3)1.5DL+1.5WL(OR)SL
4)0.9DL+1.5WL(OR)SL

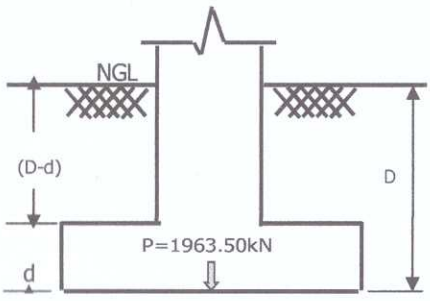
Unfactored Loads

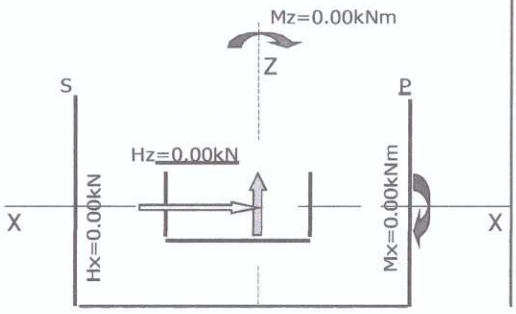
Load Combination	V	Mzz	Hx	Mxx	Hz
	kN	kNm	kN	kNm	kN
Case1)DL+LL	1309.00	0.00	0.00	0.00	0.00
Case2)DL+LL+WL(OR)SLCas	1309.00	0.00	0.00	0.00	0.00
e3)DL+WL(OR)SL	1309.00	0.00	0.00	0.00	0.00

Factored loads

Load	V	Mzz	Hx	Mxx	Hz
	kN	kNm	kN	kNm	kN
Case1)1.5DL+1.5LL	1963.50	0.00	0.00	0.00	0.00
Case2)1.2DL+1.2LL+1.2WL(OR)SL	1570.80	0.00	0.00	0.00	0.00
Case3)1.5DL+1.5WL(OR)SL	1963.50	0.00	0.00	0.00	0.00
Case4)0.9DL+1.5WL(OR)SL	1178.10	0.00	0.00	0.00	0.00

Design of Footing for Case3







Calculation of Bearing Pressure under the Footing

eccentricity	e_z	=	M_{xx}/W	=	0.000m	
			e_z/B	=	0.000	
			B/6	=	0.525 >	0.000
eccentricity	e_x	=	M_{zz}/W	=	0.000m	
			e_x/L	=	0.000	
			L/6	=	0.525 >	0.000

HenceallthefouredgesareincontactwithSoil

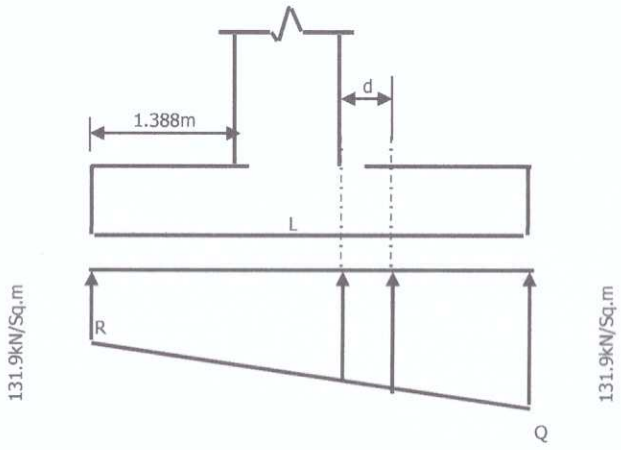
Soil Pressure at Point Q qmax = 131.9223986kN/m^2

S.B.C .of Soil = 100 kN/m^2

HENCE SAFE

Design of Foundation Padalong X direction

Bearing Pressure Distribution



PRESSUREDISTRIBUTIONDIAGRAM

Depth of Pad	d	=	975mm
Therefore, effective depth	d_{eff}	=	919mm
Pressure at face of Pedestal			197.88kN/m^2
		=	197.88kN/m^2

Depth required for Bending Moment

Critical section for moment will be at the face of the pedestal.

Overhang distance	x	=	1.388m
Bending Moment at face of		=	190.5kNm/m
Pedestal Depth reqd for the above	d_{eff1}	=	263mm
moment		=	919mm
		>	263HENCEOK

AreaofSteelRequiredforBending

$\frac{x}{d}$ =

= 0.0318

LeverArmDepth Z =

= 906.84mm

ReinforcementRequired A_{st} = $\frac{M_u}{0.87 f_y Z}$

= 581.765593mm^2

MinimumAreaofSteelRequired

Minimumreinforcementrequired: = 1170mm^2

ReinforcementProvided

Spacingof Y 12 bars = 96.66461538mm

ProvideY 12 at 90 mmc/c = 1256.6mm^2

> 1170.00HENCE OK

PercentageofReinforcementProvided = 0.14%

CheckforOneWayShear

DesignShearStrengthofConcrete τ_c = 0.28N/mm^2

K = 1.00

$\tau_c$forSolidSlab $\tau_c k$ = 0.28N/mm^2

Pressureatdist"d"fromfaceofpedestalSFat = 197.88kN/m^2

dist"d"fromfaceofpedestalDepthrequiredf V = 92.71kN3

oronewayshear d_{eff2} = 36mm4

ProvidedDepth = 40mm

> 336HENCEOK

CheckforTwoWayShear

Maximumshearstress=0.25(fck)$^{0.5}$V τ_c = 1.12N/mm^2

erticalloadpunchingthebaseslabPrei = 1963.50kN5

meter = 176mm3

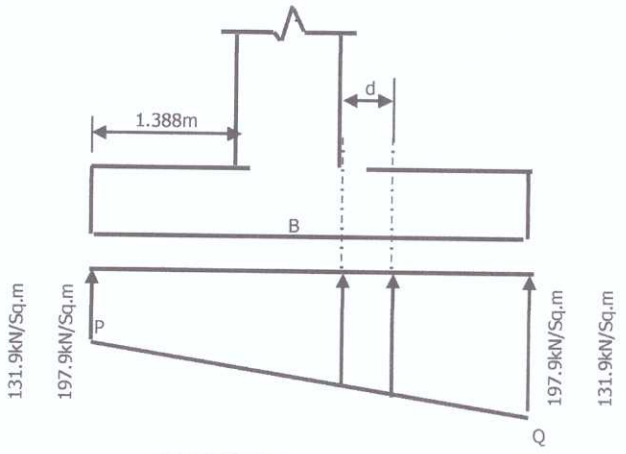
Depthrequiredfortwowayshear d_{eff3} = 39mm

ProvidedDepth = 701mm

> 339HENCEOK

DesignofFoundationPadalongZdirection

BearingPressureDistribution



PRESSUREDISTRIBUTIONDIAGRAM

DepthofPad	d	=	975mm
Therefore,effectivedepth	d_{eff}	=	907mm
PressureatfaceofPedestal			197.88kN/m^2
		=	197.88kN/m^2

DepthrequiredforBendingMoment

Criticalsectionformomentwillbeatthefaceofthepedestal.

Overhangdistance	y	=	1.388m
BendingMomentatfaceofPedestal		=	190.48kNm/m
Depthreqdfortheabovemoment	d_{eff1}	=	263mm
ProvidedDepth		=	907mm
		>	263HENCEOK

AreaofSteelRequiredforBending

	$\frac{x}{d}$	=	
		=	0.0327
LeverArmDepth	Z	=	
		=	894.67mm
ReinforcementRequired	A_{st}	=	$\frac{M_u}{0.87f_yZ}$
		=	589.68mm^2

MinimumAreaofSteelRequired

Minimumreinforcementrequired:		=	1170.00mm^2

Reinforcement Provided

Spacingof Y 12 bars	=	96.66mm	
ProvideY 12 at 90 mmc/c	=	1256.64mm^2	
	>	1170.00HENCE OK	
PercentageofReinforcementProvided	=	0.14%	

CheckforOneWayShear

DesignShearStrengthofConcrete	t_c	=	0.28N/mm^2
	K	=	1.00
$t_c$forSolid Slab	t_ck	=	
	0.28N/mm^{2}Pressureatdist"d"fro		
mfaceofpedestal	=		
	197.88kN/m^{2}SFatdist"d"fromfa		
ceofpedestal	V	=	
	95.08kNDepthrequiredforonew		
ayshear	d_{eff2}	=	343mm
ProvidedDepth	=	440mm	
	>	343HENCEOK	

CheckforTwoWayShear

Maximumshearstress=0.25(fck)$^{0.5}$	τ_c	=	
	1.12N/mm^{2}Verticalloadpunchin		
gthebaseslab	=		
	1963.50kNPreimeter		
	=	5128mm	
Depthrequiredfortwowayshear	d_{eff3}	=	
	342mmProvidedDepth		
	=	701mm	
	>	342HENCEOK	

DESIGN OF FOOTING F2

Basic Data
Material Data

Grade of Concrete	f_{ck}	=	M20
Yeild Strength of	f_y	=	415N/mm^2
Reinforcement Unit Weight of	γ_c	=	25.0kN/m^3
Concrete	γ_s	=	18.0kN/m^3
Unit Weight of Soil	μ	=	0.35

Soil Data:

Type of soil in foundation			MEDIUM
Net Safe Bearing	SBC	=	350kN/m^2

Clear cover to Reinforcement

Clear Cover to Footing	=	50.0 mm
Slab	=	40.0mm

Basic Dimensions
Size of Pedestal

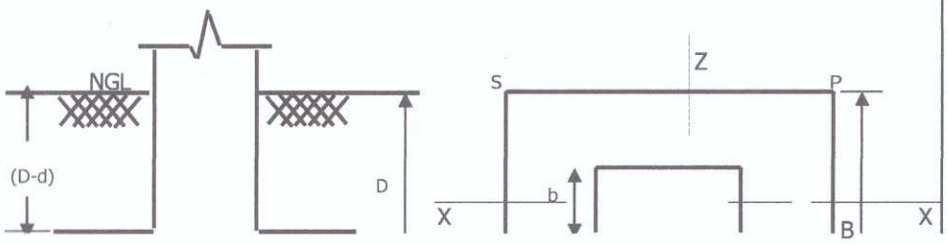
Length	l	=	0.375m
Breadth	b	=	0.375m
Depth of foundation from	D	=	1.750m

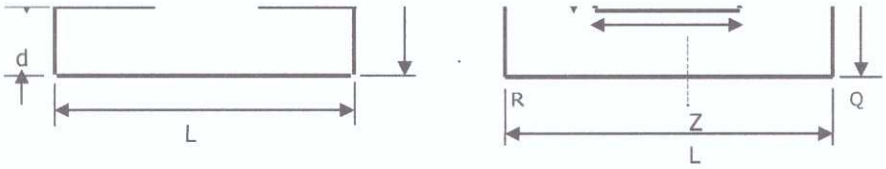
Size of Foundation Pad

Length	L	=	2.900m
Breadth	B	=	2.900m
Thickness of Base Slab	d	=	0.935m
Thickness @ edge offooting	e	=	0.230m

AnalysisResults

Loads	V	Mzz	Hx	Mxx	Hz
	kN	kNm	kN	kNm	kN
Dead Load	1045.00	0.00	0.00	0.00	0.00
Live Load	0.00	0.00	0.00	0.00	0.00
Wind or Seismic Load	±0.00	±0.00	±0.00	±0.00	±0.00





LoadCombination

LoadCombinationforDesign

1) 1.5DL+1.5LL
2)1.2DL+1.2LL+1.2WL(OR)SL
3)1.5DL+1.5WL(OR)SL
4)0.9DL+1.5WL(OR)SL

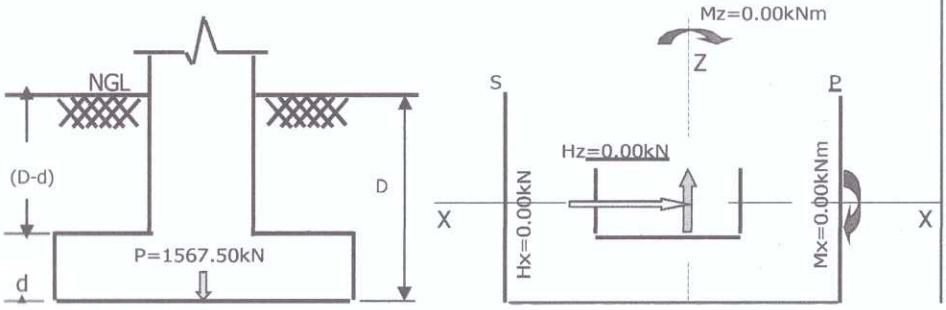
UnfactoredLoads

LoadCombinaion	V	Mzz	Hx	Mxx	Hz
	kN	kNm	kN	kNm	kN
Case1)DL+LL	1045.00	0.00	0.00	0.00	0.00
Case2)DL+LL+WL(OR)SLCas	1045.00	0.00	0.00	0.00	0.00
e3)DL+WL(OR)SL	1045.00	0.00	0.00	0.00	0.00

Factoredloads

LoadCombinaion	V	Mzz	Hx	Mxx	Hz
	kN	kNm	kN	kNm	kN
Case1)1.5DL+1.5LL	1567.50	0.00	0.00	0.00	0.00
Case2)1.2DL+1.2LL+1.2WL(OR)SL	1254.00	0.00	0.00	0.00	0.00
Case3)1.5DL+1.5WL(OR)SL	1567.50	0.00	0.00	0.00	0.00
Case4)0.9DL+1.5WL(OR)SL	940.50	0.00	0.00	0.00	0.00

DesignofFootingfor Case3





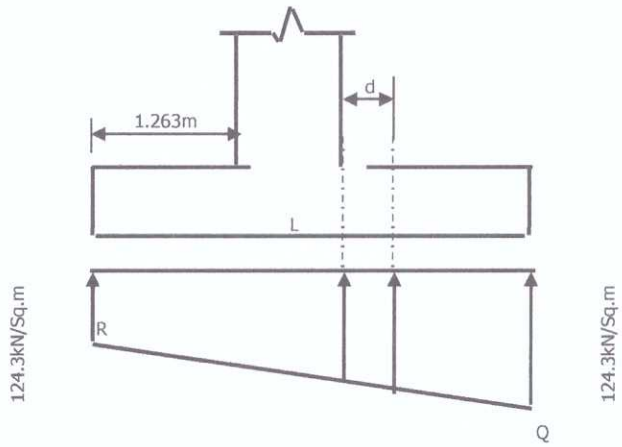
CalculationofBearingPressureundertheFooting

eccentricity	e_z	=	M_{xx}/W	=	0.000m	
			e_z/B	=	0.000	
			B/6	=	0.483 >	0.000
eccentricity	e_x	=	M_{zz}/W	=	0.000m	
			e_x/L	=	0.000	
			L/6	=	0.483 >	0.000

HenceallthefouredgesareincontactwithSoil

SoilPressureatPointQqmax = 124.2568371kN/m^2
S.B.C.ofSoil = 100 kN/m^2
HENCESAFE

DesignofFoundationPadalongXdirection
BearingPressureDistribution



PRESSUREDISTRIBUTIONDIAGRAM

DepthofPad	d	=	935mm
Therefore,effectivedepth	d_{eff}	=	879mm
PressureatfaceofPedestal			186.39kN/m^2
		=	186.39kN/m^2

DepthrequiredforBendingMoment

Criticalsectionformomentwillbeatthefaceofthepedestal.

Overhangdistance	x	=	1.263m
BendingMomentatfaceofPedestalDe		=	148.5kNm/m
pthreqdfortheabovemoment	d_{eff1}	=	232mm
ProvidedDepth		=	879mm
		>	232HENCEOK

AreaofSteelRequiredforBending

$\frac{x}{d}$ =

= 0.0271

LeverArmDepth Z =

= 869.11mm

ReinforcementRequired A_{st} = $\frac{M_u}{0.87 f_y Z}$

= 473.3742723mm^2

MinimumAreaofSteelRequired

Minimumreinforcementrequired: = 1122mm^2

ReinforcementProvided

Spacingof Y 12 bars = 100.8mm

ProvideY 12 at 90 mmc/c = 1256.6mm^2

> 1122.00HENCEOK

PercentageofReinforcementProvided = 0.14%

CheckforOneWayShear

DesignShearStrengthofConcrete τ_c = 0.28N/mm^2

K = 1.00

$\tau_c$forSolidSlab $\tau_c k$ = 0.28N/mm^2

Pressureatdist"d"fromfaceofpedestalSFat = 186.39kN/m^2

dist"d"fromfaceofpedestalDepthrequiredf V = 71.48kN2

oronewayshear d_{eff2} = 54mm4

ProvidedDepth = 02mm

> 254HENCEOK

CheckforTwoWayShear

Maximumshearstress=0.25(fck)$^{0.5}$V τ_c = 1.12N/mm^2

erticalloadpunchingthebaseslabPrei = 1567.50kN5

meter = 016mm2

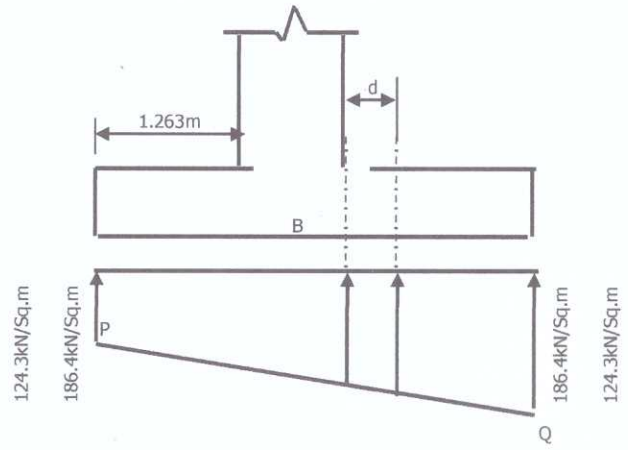
Depthrequiredfortwowayshear d_{eff3} = 80mm

ProvidedDepth = 663mm

> 280HENCEOK

DesignofFoundationPadalongZdirection

BearingPressureDistribution



PRESSUREDISTRIBUTIONDIAGRAM

DepthofPad	d	=	935mm
Therefore,effectivedepth	d_{eff}	=	867mm
PressureatfaceofPedestal			186.39kN/m^2
		=	186.39kN/m^2

DepthrequiredforBendingMoment

Criticalsectionformomentwillbeatthefaceofthepedestal.

Overhangdistance	y	=	1.263m
BendingMomentatfaceofPedestal		=	148.54kNm/m
Depthreqdfortheabovemoment	d_{eff1}	=	232mm
ProvidedDepth		=	867mm
		>	232HENCEOK

AreaofSteelRequiredforBending

	$\frac{x}{d}$	=	
		=	0.0278
LeverArmDepth	Z	=	
		=	856.96mm
ReinforcementRequired	A_{st}	=	$\frac{M_u}{0.87f_yZ}$
		=	480.08mm^2

MinimumAreaofSteelRequired

Minimumreinforcementrequired:		=	1122.00mm^2

ReinforcementProvided

Spacingof Y 12 bars		=	100.80 mm
ProvideY 12 at 90 mmc/c		=	1256.64mm^2
		>	1122.00HENCE OK
PercentageofReinforcementProvided		=	0.14%

CheckforOneWayShear

DesignShearStrengthofConcrete	t_c=		0.28N/mm^2
	K	=	1.00
$t_c$forSolidSlab	t_{ck}=		0.28N/mm^2
Pressureatdist"d"fromfaceofpedestal			186.39kN/m^2
	=SFatdi		73.72kN2
st"d"fromfaceof pedestal	V		60mm4
=Depthrequiredforonewayshear	d_{eff2}	=	02mm
ProvidedDepth		=	260HENCEOK
		>	

CheckforTwoWayShear

Maximumshearstress=0.25(fck)$^{0.5}$	τ_c		1.12N/mm^2
	=Verti		1567.50kN4
calloadpunchingthebaseslab		=	968mm2
Preimeter		=	82mm
Depthrequiredfortwowayshear	d_{eff3}		663mm
=ProvidedDepth		=	282HENCEOK
		>	

DESIGN OF SLAB S1

Design of one way slab

Basic Data

Grade of concrete		=	25	Mpa
Grade of steel		=	500	Mpa
Thickness of slab	D	=	115	mm
Effective thickness of slab		=	95	mm
Unit weight of concrete		=	25	KN/m^3
Effective span in X- direction		=	2.85	m
Effective span in Y- direction		=	6.85	m

Load Data

Dead load		=	2.875	KN/m^2
Floor finish		=	2.00	KN/m^2
Live load		=	3.00	KN/m^2
Total load		=	7.88	KN/m^2
Total factored load		=	11.81	KN/m^2

Moment and Shear Calculations

Total load on slab per meter width		W	=	33.666	KN/m
Bending moment	M = (W * L)/9		=	9.5947	KN-m
Shear force	V = W/2		=	16.833	KN

Check for Depth from Bending

Depth required,d	= $(M/(0.138*f_{ck}*b))^{1/2}$	=	52.74	mm
Depth provided		=	95	mm **Hence O.K**

Check for Depth from Shear

Calculated shear strength	τ_v = V / bd	=	0.1772	Mpa
Design shear strength	τ_c	=	0.59	Mpa **Hence O.K**

Reinforcement Calculations

Main Reinforcement

Mu = 0.87*fy*Ast(d-0.42*xu)

Xu = 0.0483 Ast

$8.8305\ Ast^2 - 41325\ Ast + 9594703.125 = 0$

Area of steel Ast	=	245	mm^2
Minimum area of steel Astmin	=	161.50	mm^2
Spacing of ϒ **10** bars	=	320	mm

Check for Spacing

Minimum of	1) 3d	=	285	mm
	2)		300	mm

Therefore provide ϒ **10** @ 150 mm C/C

Ast Provided	=	523.6	mm^2
Percentage of Reinforcement	=	0.551	

Distribution reinforcement

Area of steel	=	138.00	mm^2
Spacing of ϒ **8** bars	=	569	mm

Check for spacing

Minimum of	1) 5d	=	475	mm
	2)		450	mm

Therefore provide ϒ **8** @ 200 mm C/C

Provided Reinforcement	=	251.33	mm^2

Check for Deflection:

Basic Span/depth Ratio	=	23	
% of Tension Reinforcement provided (pt)	=	0.551	%
Service stress of steel (fs) : 0.58fy(Ast_r/Ast_p)	=	135.70	N/mm^2
Modification Factor for Tension Reinforcement (F1)	=	2.00	
Allowable Span/Eff Depth Ratio	=	45.978	
Actual Span/Eff Depth Ratio	=	30.00	

Hence O.K

DESIGN OF SLAB S2

Design of two way Slab

Basic Data

Grade of concrete (fck)	=	M 20	
Grade of steel (fy)	=	Fe 415	
Thickness of slab (D)	=	165	mm
Clear cover (cc)	=	15	mm
Effective thickness of slab (deff) = 165 - 15 - 10 /2	=	145	mm
Unit weight of concrete	=	25	KN/m^3
Effective Shorter Span (Lx)	=	4.8	m
Effective Longer Span (Ly)	=	5.79	m
Aspect ratio Ly/Lx	=	1.21	**Two way slab**

Edge Condition : **Three Edges Discontinuous(One Short Edge Continuous)**

Load Data

Dead Load	= 0.17 x 25	=	4.125	KN/m^2
Floor finish		=	2.00	KN/m^2
Imposed Load		=	3.00	KN/m^2
Total load		=	9.13	KN/m^2
Design load (Wu) = 1.5 x 9.125		=	**13.69**	KN/m^2

Moment and Shear Calculations

Short Span Direction

ax for positive moment	1.2	→	0.059	
	1.3	→	0.065	
	for 1.21 αx	=	0.059	
Positive moment Mx	0.059 x 13.69 x 4.8 ^2	=	**18.72**	KN-m
ax for negative moment	1.2	→	0.000	
	1.3	→	0.000	
	for 1.21 αx	=	0.000	
Negative moment Mx :	0.000 x 13.69 x 4.8 ^2	=	**0.00**	KN-m

Long Span Direction

For positive moment	αy	=	0.043	
Positive moment My :	0.043 x 13.69 x 4.8 ^2	=	**13.56**	KN-m
For negative moment	αy	=	0.057	

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West Mambalam, Ch

Shear force V_u = 13.69 x 4.8 x 0.5 = **32.85** KN

Check Effective Depth for Bending

Depth required = $(M_x / (0.138x\ fck \times b))^{1/2}$ = 82.37 mm

Depth provided = 165 - 15 - 10 /2 = 145 mm

Hence O.K

Reinforcement calculations

Short Span Direction @ Support

Mu/bd^2 = $\frac{0.00 \times 10 \wedge 6}{1000 \times 145 \times 145}$ = **0.000**

Pt = **0.00** %

Area of steel Ast = 0.00000 x 1000 x 145 = 0 mm^2

Minimum area of steel 0.0012 x 1000 x 165 = 0.00 mm^2

Spacing of Y **10** bars 78.54 x 1000 / 0.00 = 0 mm

Ast provided = 785.4 mm^2

Check for Spacing

Minimum of

1) 3d = 435 mm

2) = 300 mm

3) = 0.00 mm

Therefore provide Y **10** @ **100** mm C/C

Short Span Direction @ Mid Span

Mu/bd^2 = $\frac{18.72 \times 10 \wedge 6}{1000 \times 145 \times 145}$ = 0.891

Pt = 0.261 %

Area of steel Ast = 0.00261 x 1000 x 145 = 378.32 mm^2

Minimum area of steel 0.0012 x 1000 x 165 = 198.00 mm^2

Spacing of Y **10** bars 78.54 x 1000 / 378.32 = 207.49 mm

Ast provided = 785.4 mm^2

Check for Spacing

Minimum of

1) 3d = 435 mm

2) = 300 mm

3) = 207.49 mm

Therefore provide Y **10** @ **100** mm C/C 100

Provided % of Tension Reinforcement (pt) = **0.542** %

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$Mu/bd^2 = \frac{17.98 \times 10 \wedge 6}{1000 \times 145 \times 145} = 0.855$

Pt = 0.250 %

Area of steel Ast = 0.00250 x 1000 x 145 = 362.31 mm^2

Minimum area of steel 0.0012 x 1000 x 165 = 198.00 mm^2

Spacing of Y **10** bars 78.54 x 1000 / 362.31 = 216.66 mm

Ast provided = 628.32 mm^2

Check for Spacing

Minimum of

1) 3d = 435 mm

2) = 300 mm

3) = 216.66 mm

Therefore provide Y **10** @ **125** mm C/C

Long Span Direction @ mid Span

$Mu/bd^2 = \frac{13.56 \times 10 \wedge 6}{1000 \times 145 \times 145} = 0.645$

Pt = 0.186 %

Area of steel Ast = 0.00186 x 1000 x 145 = 269.55 mm^2

Minimum area of steel 0.0012 x 1000 x 165 = 198.00 mm^2

Spacing of Y **10** bars 78.54 x 1000 / 269.55 = 291.23 mm

Ast provided = 628.32 mm^2

Check for Spacing

Minimum of

1) 3d = 435 mm

2) = 300 mm

3) = 291.23 mm

Therefore provide Y **10** @ **125** mm C/C

Check for Deflection:

Basic Span/depth Ratio = 20

% of Tension Reinforcement provided (pt) = 0.542 %

Service stress of steel (fs) : 0.58fy(Ast_r/Ast_p) = 115.94 N/mm^2

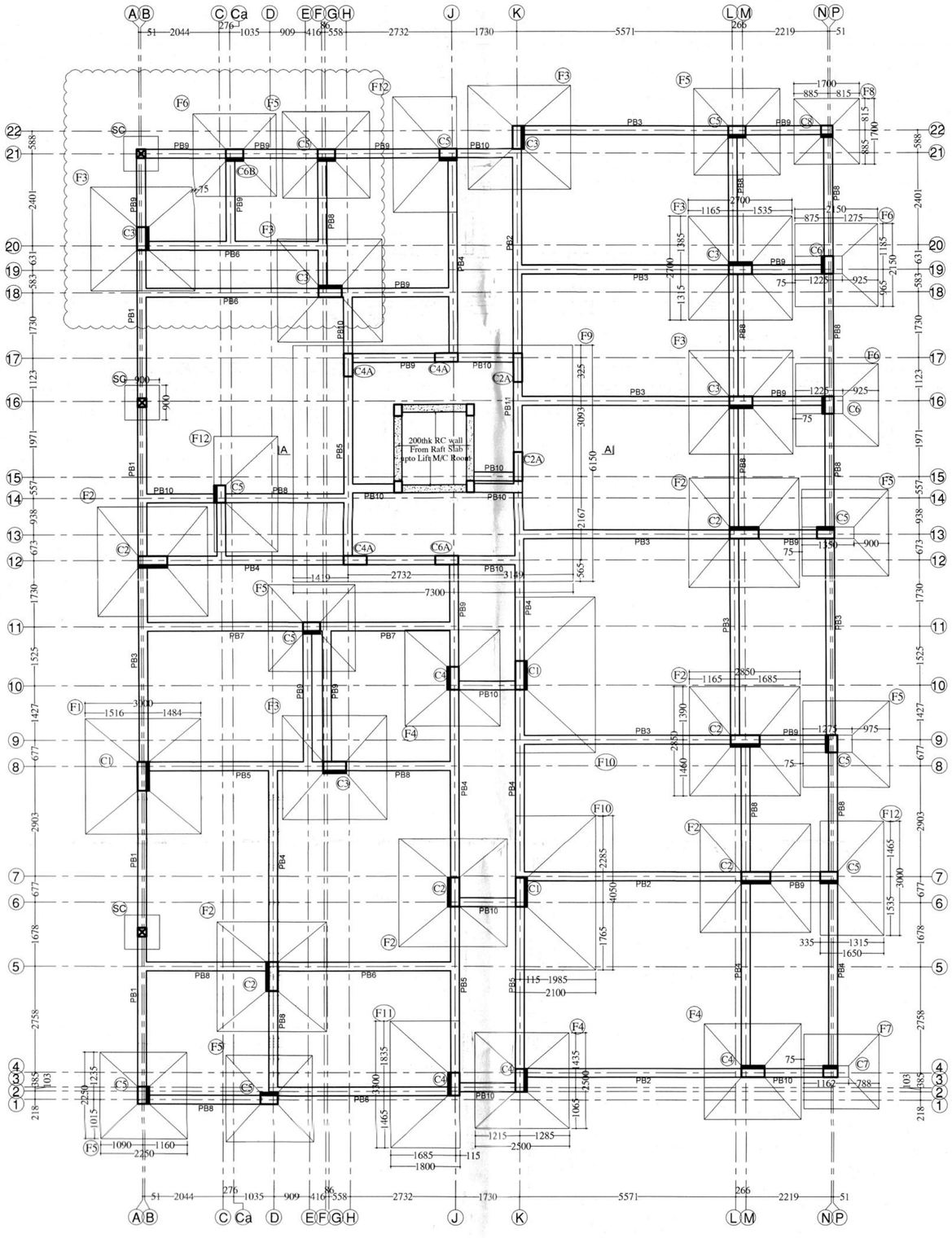
Modification Factor for Tension Reinforcement (F1) = 2.00

Allowable Span/Eff Depth Ratio = 40

Actual Span/Eff Depth Ratio = 4.8 x 1000 / 145 = 33.10

Hence O.K

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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 3Nos⌀12@TOP AND 3Nos⌀12@BTM AND 8⌀ST2.@⌀200mm)C/C STIRRUPS.

IMPORTANT NOTE FOR M-SAND :-

SAND SHALL BE REPLACED BY M-SAND FULLY FOR PLAIN CEMENT CONCRETE, REINFORCEMENT CEMENT 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 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.

IMPORTANT NOTE :-

1. CONCRETING AT SITE SHALL BE STARTED ONLY AFTER VERIFYING ALL FABRICATION OF REINFORCEMENT BAR DONE FOR VARIOUS MEMBERS, (Vis) 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.

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REV	DESCRIPTION	CHKD	DRN	DATE
R1.	DRAWING REVISED AS PER COMMENTS	S.P.S.I	SULTHAN.A	02.08.25

PROPOSED GAUSHALA BUILDING FOR M/S. MS.VIKAAN SHELTERS AT KOVILAMBAKKAM, CHENNAI.

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

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FOUNDATION LAYOUT.

DATE: 21 :05: 2025 | SCALE:1/4",3/4"

ARCHITECT:

Dwg No...
12198 S -01

DSND : S.P.S.I

DRN : SENTHIL.R

CONCRETE NOTES:-

1. CONCRETE SHALL BE OF GRADE M20 (MIX 1:1.5:3) FOR CONVENTIONAL MIXTURE MACHINE CONCRETE AND CONCRETE SHALL BE OF GRADE M25 FOR READY MIX CONCRETE. (340KG CEMENT PER C_{um} OF READY MIX CONCRETE WITHOUT FLYASH) EXPECT FOR PILE , COLUMN CONCRETING.
READY MIX SHOULD BE AVOID FOR PILE AND COLUMN CONCRETE.
2. 6⌀ BARS ARE MILDSTEEL REMAINING ALL OTHERS BARS ARE TORSTEEL CONFORMING TO GRADE Fe500.
3. CLEAR COVER TO MAIN R/F SHALL BE AS FOLLOWS:-
COLUMN FOOTING 2"(50mm), COLUMN 1½"(40mm),
RC WALL 1"(25mm), ROOF SLAB ⅝"(15mm),
ROOF BEAM 1"(25mm), PILE CAP 2"(50mm) & PILE 2"(50mm).
RAFT SLAB 1½"(40mm), RAFT BEAM 2" (50mm).
4. LAP LENGTH SHALL BE OF 50 TIMES THE DIAMETER OF SMALLER BAR IN COMPRESSION AND 60 TIMES THE DIAMETER OF SMALLER BAR IN TENSION.
5. FOUNDATION IS DESIGNED FOR STILT,FIRST,SECOND,THIRD,FOURTH & FIFTH FLOOR ONLY

SOIL NOTES:- (APPLICABLE ONLY IF THE TOP SOIL IS CLAY STRATA

1. THE EXCAVATED SOIL CANNOT BE USED FOR BACKFILLING PURPOSE.
2. *IF THE TOP SOIL IS* OF MEDIUM SWELLING TYPE .THEN , IT WILL EXERT UPWARD THRUST ON THE GROUND FLOOR FLOORING. HENCE , IT IS SUGGESTED TO REMOVE TOP 30 - 40 CMS OF NATURAL SOIL AND REPLACE WITH QUARRY DUST / SAND / GRAVEL FOR GROUND FLOOR FLOORING.
3. AFTER THE EXCAVATION , THE FOUNDATION TRENCHES SHOULD BE COMPACTED PROPERLY BEFORE LAYING THE FOUNDATION. THE TOP SLUSH SHOULD DE REMOVED AND THE SURFACE COMPACTED PROPERLY, AS A PRECAUTIONARY MEASURE, SPREAD BRICK-BATS / GRAVELS AND COMPACT THE BOTTOM OF THE PIT. THE FOUNDATIONS CAN BE SUBSEQUENTLY BE PLACED OVER THIS PREPARED SURFACE.

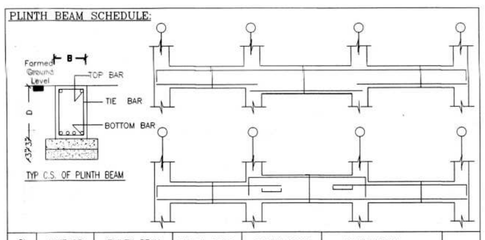
CONCRETE SHALL BE GRAD OF M35 MIX (1:1:2) FOR ALL COLUMN

COLUMN DETAILS:

FLOOR DETAILS: ST.F.= STILT FLOOR. 1st.F= FIRST FLOOR. 2nd.F.= SECONDFLOOR. 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.= (1'0"X2'6")	18Nos Ø20+ 8Nos Ø12	4Nos/Set. 8#@8"C/C	
		1st.F.= (9"X2'6")	18Nos Ø20		
		2nd.F.= (9"X2'6")	4Nos Ø20+ 14Nos Ø12	3Nos/Set. 8#@8"C/C	
		3rd.F.= (9"X2'6")	4Nos Ø20+ 14Nos Ø12		
		4th.F.= (9"X2'6")	18Nos Ø12		
		5th.F.= (9"X2'0")	10Nos Ø12	8#@8"C/C	
2.	C2	ST.F.= (1'0"X2'6")	18Nos Ø16+ 8Nos Ø12	4Nos/Set. 8#@8"C/C	
		1st.F.= (9"X2'6")	18Nos Ø16		
		2nd.F.= (9"X2'6")	6Nos Ø16+ 12Nos Ø12	3Nos/Set. 8#@8"C/C	
		3rd.F.= (9"X2'6")	16Nos Ø12		
		4th.F.= (9"X2'0")	12Nos Ø12	8#@8"C/C	
		5th.F.= (9"X1'6")	8Nos Ø12		
3.	C3	ST.F.= (1'0"X2'0")	14Nos Ø20+ 6Nos Ø12	4Nos/Set. 8#@8"C/C	
		1st.F.= (9"X2'0")	14Nos Ø20		
		2nd.F.= (9"X2'0")	14Nos Ø16	3Nos/Set. 8#@8"C/C	
		3rd.F.= (9"X2'0")	14Nos Ø12		
		4th.F.= (9"X1'6")	10Nos Ø12	8#@8"C/C	
		5th.F.= (9"X1'6")	8Nos Ø12		
4.	C4	ST.F.= (1'0"X2'0")	10Nos Ø20+ 6Nos Ø12	3Nos/Set. 8#@8"C/C	
		1st.F.= (9"X2'0")	10Nos Ø20	2Nos/Set. 8#@8"C/C	
		2nd.F.= (9"X2'0")	10Nos Ø16		
		3rd.F.= (9"X2'0")	10Nos Ø12	8#@8"C/C	
		4th.F.= (9"X1'6")	8Nos Ø12		
		5th.F.= (9"X1'6")	8Nos Ø12		
5.	C5	ST.F.= (1'0"X1'6")	8Nos Ø20+ 4Nos Ø12	3Nos/Set. 8#@8"C/C	
		1st.F.= (9"X1'6")	8Nos Ø20	2Nos/Set. 8#@8"C/C	
		2nd.F.= (9"X1'6")	8Nos Ø16		
		3rd.F.= (9"X1'3")	8Nos Ø12	8#@8"C/C	
		4th.F.= (9"X1'3")	8Nos Ø12		
		5th.F.= (9"X1'3")	8Nos Ø12		
6.	C6	ST.F.= (1'0"X1'6")	10Nos Ø16+ 4Nos Ø12	3Nos/Set. 8#@8"C/C	
		1st.F.= (9"X1'6")	10Nos Ø16	2Nos/Set. 8#@8"C/C	
		2nd.F.= (9"X1'6")	4Nos Ø16+ 6Nos Ø12		
		3rd.F.= (9"X1'3")	10Nos Ø12	8#@8"C/C	
		4th.F.= (9"X1'3")	8Nos Ø12		
		5th.F.= (9"X1'3")	8Nos Ø12		
7.	C7	ST.F.= (1'0"X1'3")	8Nos Ø16+ 3Nos Ø12	2Nos/Set. 8#@8"C/C	
		1st.F.= (9"X1'3")	8Nos Ø16		
		2nd.F.= (9"X1'3")	8Nos Ø12	8#@8"C/C	
		3rd.F.= (9"X1'3")	8Nos Ø12		
		4th.F.= (9"X1'3")	8Nos Ø12		
		5th.F.= (9"X1'3")	8Nos Ø12		
8.	C8	ST.F.= (1'0"X1'0")	4Nos Ø16+ 4Nos Ø12+ 2Nos Ø12	2Nos/Set. 8#@8"C/C	
		1st.F.= (9"X1'0")	4Nos Ø16+ 4Nos Ø12		
		2nd.F.= (9"X1'0")	8Nos Ø12		
		3rd.F.= (9"X1'0")	6Nos Ø12	8#@8"C/C	
		4th.F.= (9"X1'0")	6Nos Ø12		
		5th.F.= (9"X1'0")	6Nos Ø12		
9.	C9	ST.F.= (8"X1'0")	4Nos Ø16+ 4Nos Ø12		
		1st.F.= (8"X1'0")	4Nos Ø16+ 4Nos Ø12		
		2nd.F.= (8"X1'0")	8Nos Ø12		
		3rd.F.= (8"X1'0")	6Nos Ø12	8#@8"C/C	
		4th.F.= (8"X1'0")	6Nos Ø12		
		5th.F.= (8"X1'0")	6Nos Ø12		
10.	C2A	ST.F.= (9"X2'6")	18Nos Ø20		
		1st.F.= (9"X2'6")	18Nos Ø16	3Nos/Set. 8#@8"C/C	
		2nd.F.= (9"X2'6")	6Nos Ø16+ 12Nos Ø12		
		3rd.F.= (9"X2'6")	16Nos Ø12		
		4th.F.= (9"X2'0")	12Nos Ø12	8#@8"C/C	
		5th.F.= (9"X1'6")	8Nos Ø12		
11.	C4A	ST.F.= (9"X2'0")	14Nos Ø20	2Nos/Set. 8#@8"C/C	
		1st.F.= (9"X2'0")	10Nos Ø20		
		2nd.F.= (9"X2'0")	10Nos Ø16		
		3rd.F.= (9"X2'0")	10Nos Ø12	8#@8"C/C	
		4th.F.= (9"X1'6")	8Nos Ø12		
		5th.F.= (9"X1'6")	8Nos Ø12		
12.	C6A	ST.F.= (9"X2'0")	12Nos Ø16	2Nos/Set. 8#@8"C/C	
		1st.F.= (9"X1'6")	10Nos Ø16		
		2nd.F.= (9"X1'6")	4Nos Ø16+ 6Nos Ø12		
		3rd.F.= (9"X1'3")	10Nos Ø12	8#@8"C/C	
		4th.F.= (9"X1'3")	8Nos Ø12		
		5th.F.= (9"X1'3")	8Nos Ø12		
13.	C6B	ST.F.= (1'0"X1'6")	8Nos Ø20+ 4Nos Ø12	3Nos/Set. 8#@8"C/C	
		1st.F.= (9"X1'6")	8Nos Ø20	2Nos/Set. 8#@8"C/C	
		2nd.F.= (9"X1'6")	8Nos Ø16		
		3rd.F.= (9"X1'6")	8Nos Ø16	8#@8"C/C	
		4th.F.= (9"X1'6")	8Nos Ø16		
		5th.F.= (9"X1'6")	8Nos Ø16		

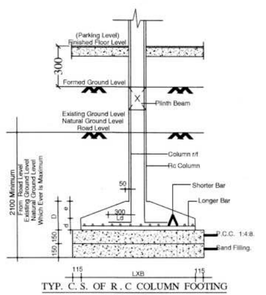
PLINTH BEAM SCHEDULE:



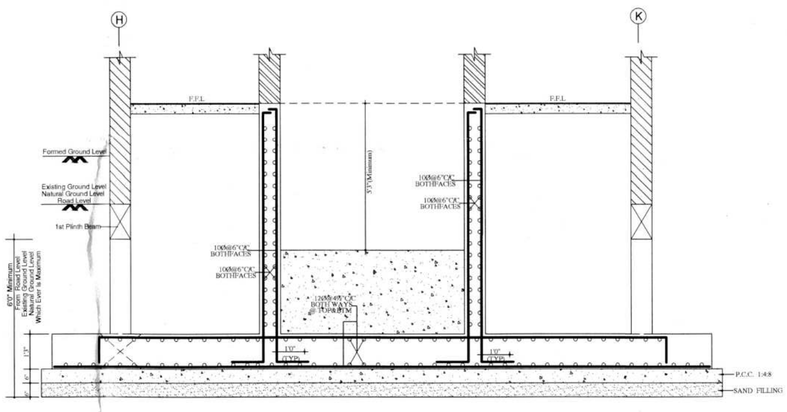
SL. No.	NAME OF PLINTH BEAM	PLINTH BEAM SIZE (BXD)	PLINTH BEAM TOP BAR	PLINTH BEAM BOTTOM BAR	PLINTH BEAM TIE	
1.	PB1	(9"X1'6")	3NosØ16	4NosØ16	8ØST2.@8"C/C	
2.	PB2	(9"X1'6")	3NosØ16	3NosØ16 2NosØ16	8ØST2.@4"C/C(End 1/3rd Span) 8ØST2.@8"C/C(Mid 1/3rd Span) 8ØST2.@4"C/C(End 1/3rd Span)	
3.	PB3	(9"X1'6")	3NosØ16	3NosØ16 3NosØ12	8ØST2.@6"C/C(End 1/3rd Span) 8ØST2.@12"C/C(Mid 1/3rd Span) 8ØST2.@6"C/C(End 1/3rd Span)	
4.	PB4	(9"X1'6")	2NosØ16	4NosØ16	8ØST2.@8"C/C	
5.	PB5	(9"X1'6")	2NosØ16	3NosØ16 1NosØ12	8ØST2.@8"C/C	
6.	PB6	(9"X1'3")	2NosØ16	4NosØ16	8ØST2.@8"C/C	Formed Ground Level
7.	PB7	(9"X1'3")	2NosØ16	3NosØ16 1NosØ12	8ØST2.@8"C/C	
8.	PB8	(9"X1'3")	2NosØ12	2NosØ16 1NosØ12	8ØST2.@8"C/C	
9.	PB9	(9"X1'3")	2NosØ12	3NosØ12	8ØST2.@10"C/C	
10.	PB10	(9"X1'3")	2NosØ12	2NosØ12	8ØST2.@10"C/C	
11.	PB11	(9"X1'6")	2NosØ16	2NosØ16	8ØST2.@8"C/C	

FOOTING SCHEDULE:

SL. No.	FOOTING MARK	FOOTING SIZE L	B	D	d	e	FOOTING REINFORCEMENT LONGER BAR	SHORTER BAR	Nos Of FOOTING
1.	F1	10'0"	10'0"	3'4½"	0'9"	2'7½"	33Nos Ø12	33Nos Ø12	
2.	F2	9'4½"	9'4½"	3'1½"	0'9"	2'4½"	30Nos Ø12	30Nos Ø12	
3.	F3	9'0"	9'0"	3'0"	0'9"	2'3"	28Nos Ø12	28Nos Ø12	
4.	F4	8'3"	8'3"	2'9"	0'9"	2'0"	24Nos Ø12	24Nos Ø12	
5.	F5	7'6"	7'6"	2'6"	0'9"	1'9"	21Nos Ø12	21Nos Ø12	
6.	F6	7'1½"	7'1½"	2'4½"	0'9"	1'7½"	20Nos Ø12	20Nos Ø12	
7.	F7	6'4½"	6'4½"	2'1½"	0'9"	1'4½"	20Nos Ø10	20Nos Ø10	
8.	F8	5'7½"	5'7½"	1'10½"	0'9"	1'1½"	20Nos Ø10	20Nos Ø10	
9.	F9 (LIFT)	22'0"	20'6"	2'6"	-	-	12Ø@4½"C/C BOTHWAYS @TOP&BOTTOM		
10.	SC	3'0"	3'0"	0'9"	-	-	5NosØ8	5NosØ8	



TYP. C. S. OF R. C COLUMN FOOTING CONCENTRIC



SECTION A-A

IMPORTANT NOTE FOR M-SAND :-

SAND SHALL BE REPLACED BY M-SAND FULLY FOR PLAIN CEMENT CONCRETE, REINFORCEMENT CEMENT 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 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.

IMPORTANT NOTE :-

1. CONCRETING AT SITE SHALL BE STARTED ONLY AFTER VERIFYING ALL FABRICATION OF REINFORCEMENT BAR DONE FOR VARIOUS MEMBERS, (Via) 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.

S. P. S. INBARAJAN,
M.E., (Struct)A.M.I.E.,
Structural Consultant
Registered Structural Engineer
Grade-I (SE) in CMDA
Reg. No SE/GR-1/2024/02/009 Dt. 27.02.2024
Door No.50, Kirupasankari Street,
West Mambalam, Chennai-600 033

REV	DESCRIPTION	CHKD	DRN	DATE
R1.	DRAWING REVISED AS PER COMMENTS	S.P.S.I	SULTHAN.A	02.08.25

PROPOSED GAUSHALA BUILDING FOR M/S. MS.VIKAAN SHELTERS AT KOVILAMBAKKAM, 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
BOURNA Consultants - Engineers

FOUNDATION DETAILS.

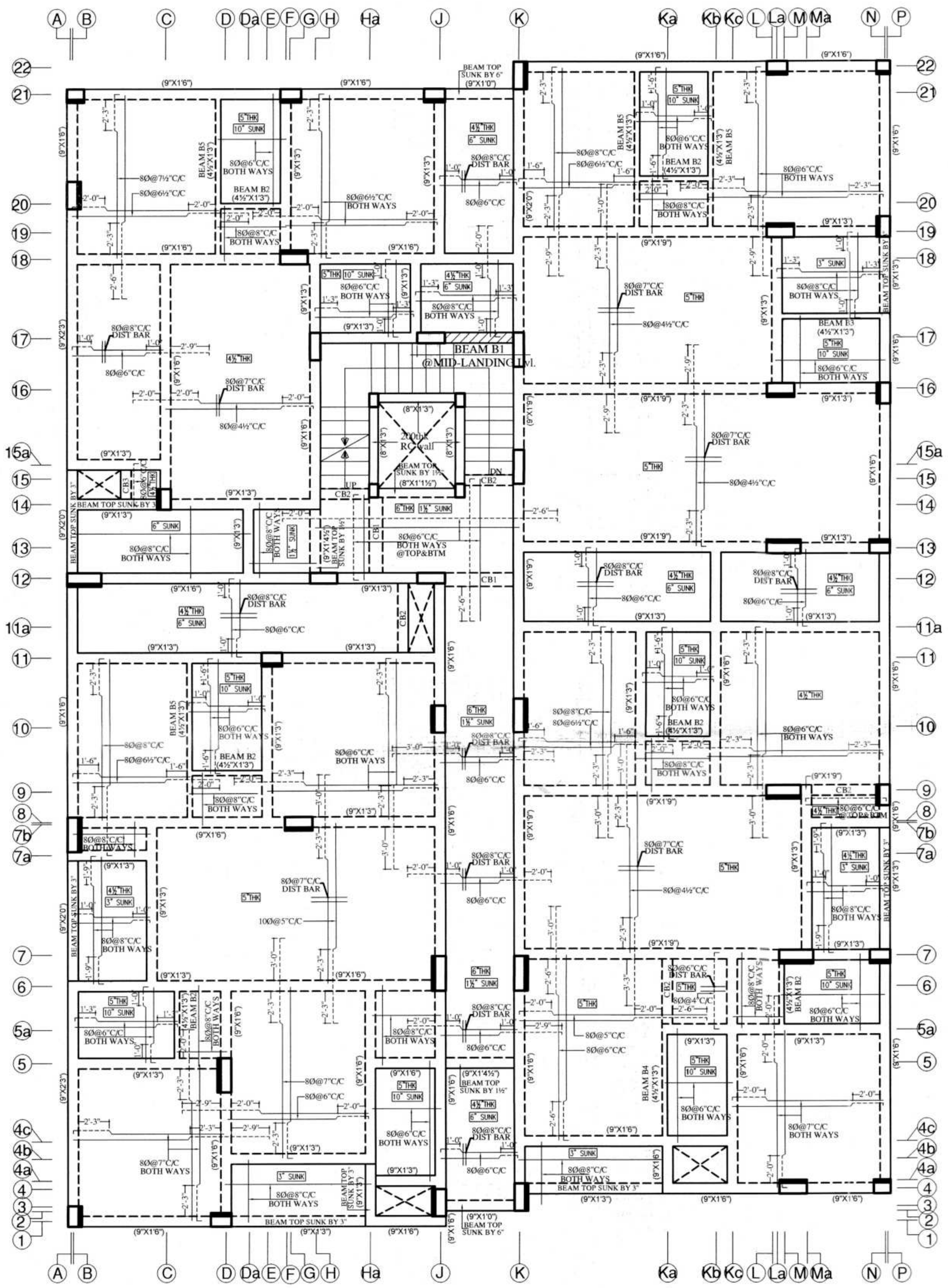
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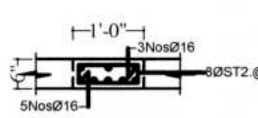
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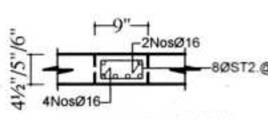
DRN : SENTHIL.R



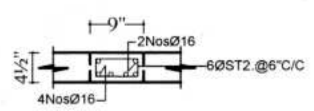
STILT FLOOR ROOF SLAB LAYOUT



C.S. OF CB1 (1'0"X 6")



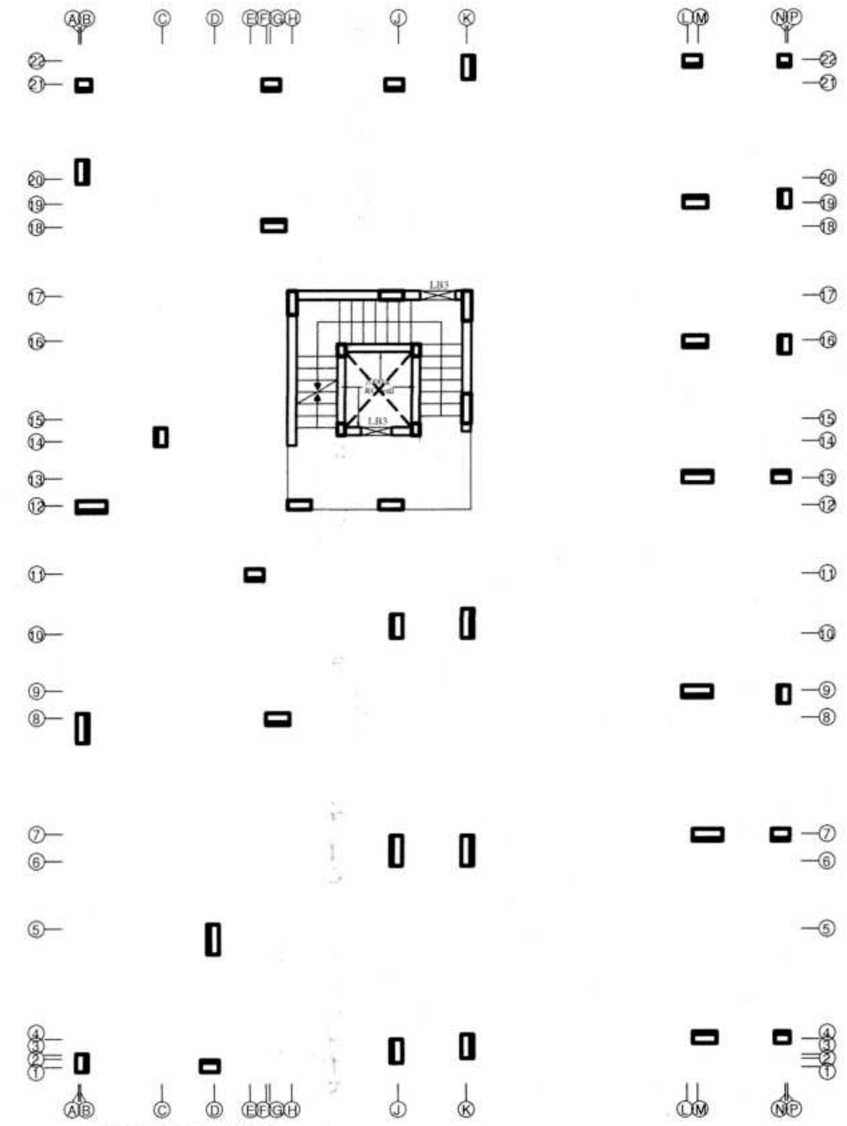
C.S. OF CB2 (9"X 4½"/5"/6")



C.S. OF CB3 (9"X 4½")

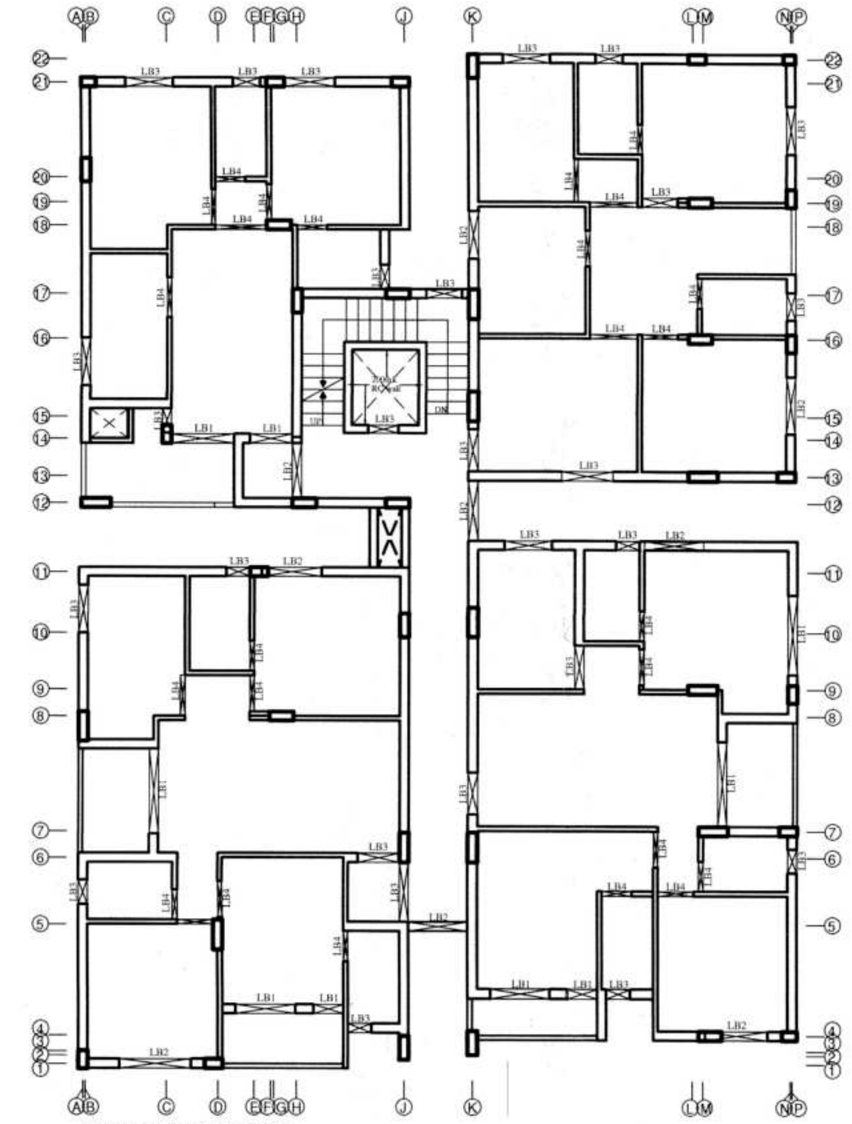
IMPORTANT NOTES :-

1. ALL SLABS ARE 4"(100mm)THICK, UNLESS NOTED OTHER WISE.
2. PROVIDE 6Ø@6"(150mm)C/C, (OR) 8Ø@10"(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.



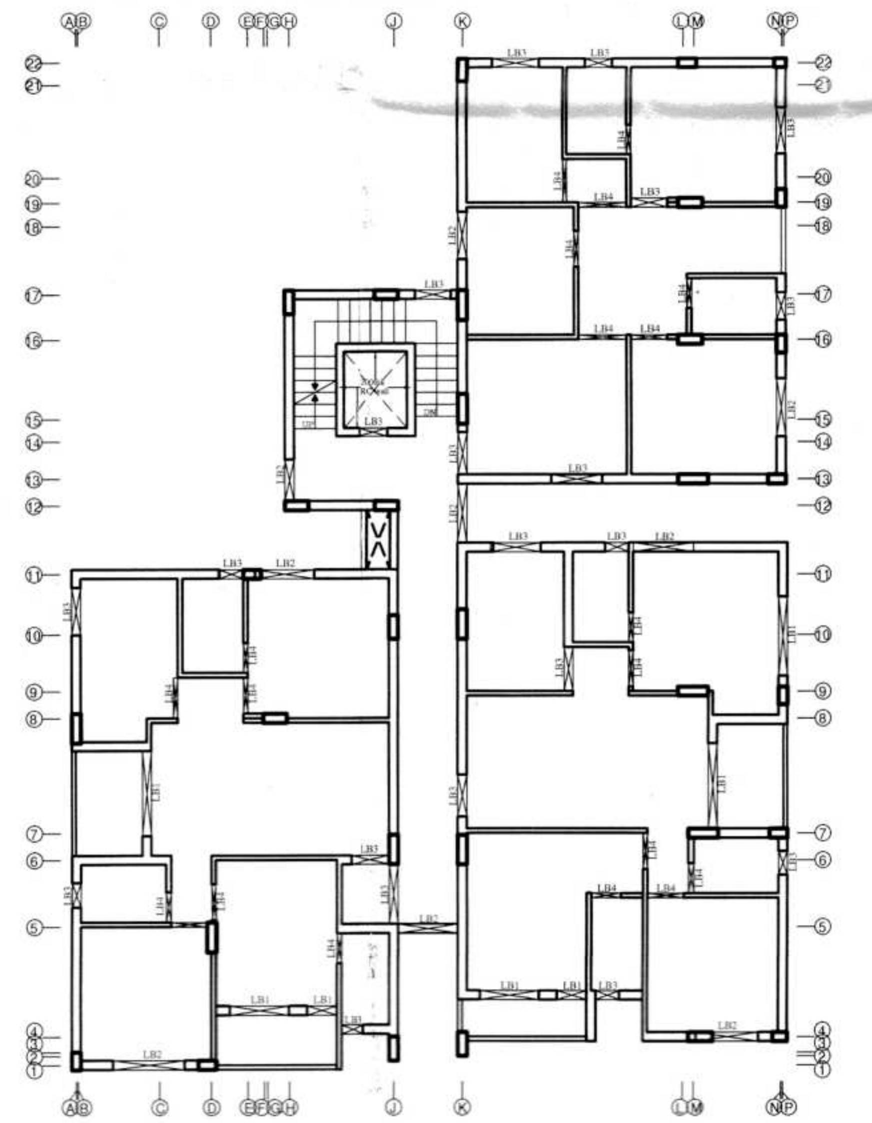
STILT FLOOR LINTEL LAYOUT

LB3+LB4 ARE CONTINOUS LINTEL IN ALL 9"BRICK WALL / OPENING AND 4½" BRICK WALL / OPENING IN BETWEEN COLUMN AND ALSO ON WALLS WITHOUT OPENING UNLESS NOTED OTHERWISE.



TYPICAL FLOOR LINTEL LAYOUT
(FIRST,SECOND,THIRD&FOURTH FLOOR)

LB3+LB4 ARE CONTINOUS LINTEL IN ALL 9"BRICK WALL / OPENING AND 4½" BRICK WALL / OPENING IN BETWEEN COLUMN AND ALSO ON WALLS WITHOUT OPENING UNLESS NOTED OTHERWISE.

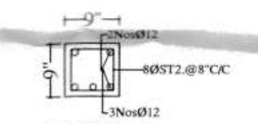


FIFTH FLOOR LINTEL LAYOUT

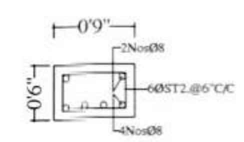
LB3+LB4 ARE CONTINOUS LINTEL IN ALL 9"BRICK WALL / OPENING AND 4½" BRICK WALL / OPENING IN BETWEEN COLUMN AND ALSO ON WALLS WITHOUT OPENING UNLESS NOTED OTHERWISE.

IMPORTANT NOTES

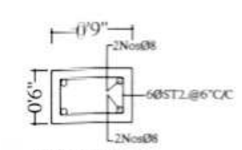
PROVIDE SILL LVL BEAM (9"X 4½") WITH 1'0" BEARING ON EITHER SIDE FOR ALL WINDOWS, FRENCH WINDOWS, A/C OPENINGS.
PROVIDE 4NosØ8 FOR SILL BEAM WITH STIRRUPS 8ØST2.@6"C/C.



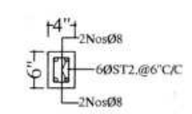
C.S OF LB -1



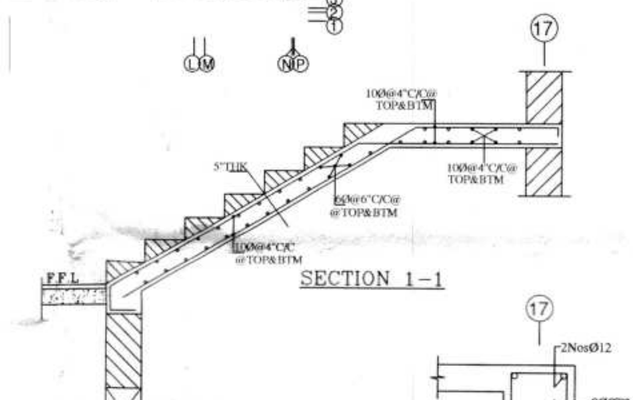
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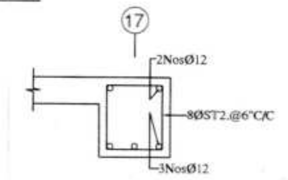
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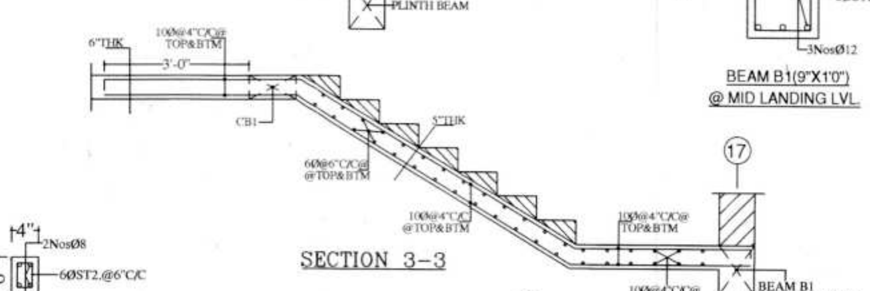
C.S OF LB - 4



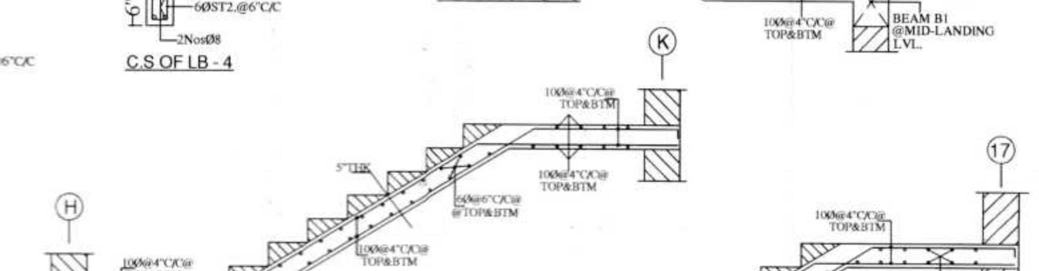
SECTION 1-1



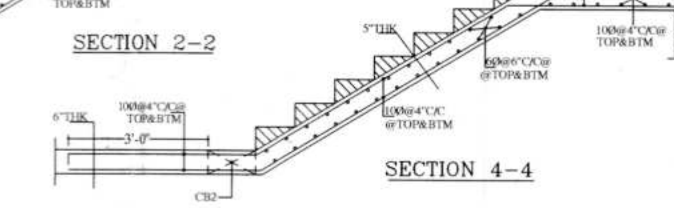
BEAM B1(9"X1'0")
@ MID LANDING LVL.



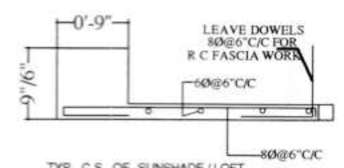
SECTION 3-3



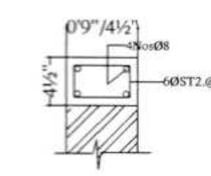
SECTION 2-2



SECTION 4-4



TYP. C.S. OF SUNSHADE / LOFT



TYP. C.S. OF SILL LVL BEAM

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 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.
7. READY MIX CONCRETE IS NOT ADVISED FOR PILE AND COLUMN CONCRETING.

S. P. S. INBARAJAN
M.E., (Struct) A.M.I.E.,
Structural Consultant
Registered Structural Engineer
Grade-I (SE) in CMDA
Reg. No SE/GR-1/2024/09/009 Dt. 27.02.2024
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West Mambalam, Chennai-600 033.

PROPOSED GAUSHALA BUILDING FOR M/S. MS.VIKAAN SHELTERS AT KOVILAMBAKKAM, CHENNAI.

STILT FLOOR ROOF SLAB LAYOUT& STILT,TYPICAL&FIFTH FLOOR LINTEL LAYOUT&STAIRCASE DETAILS

Dwg No... 12198 S -03

DATE: 29 :05: 2025 | SCALE:1/4",3/4"

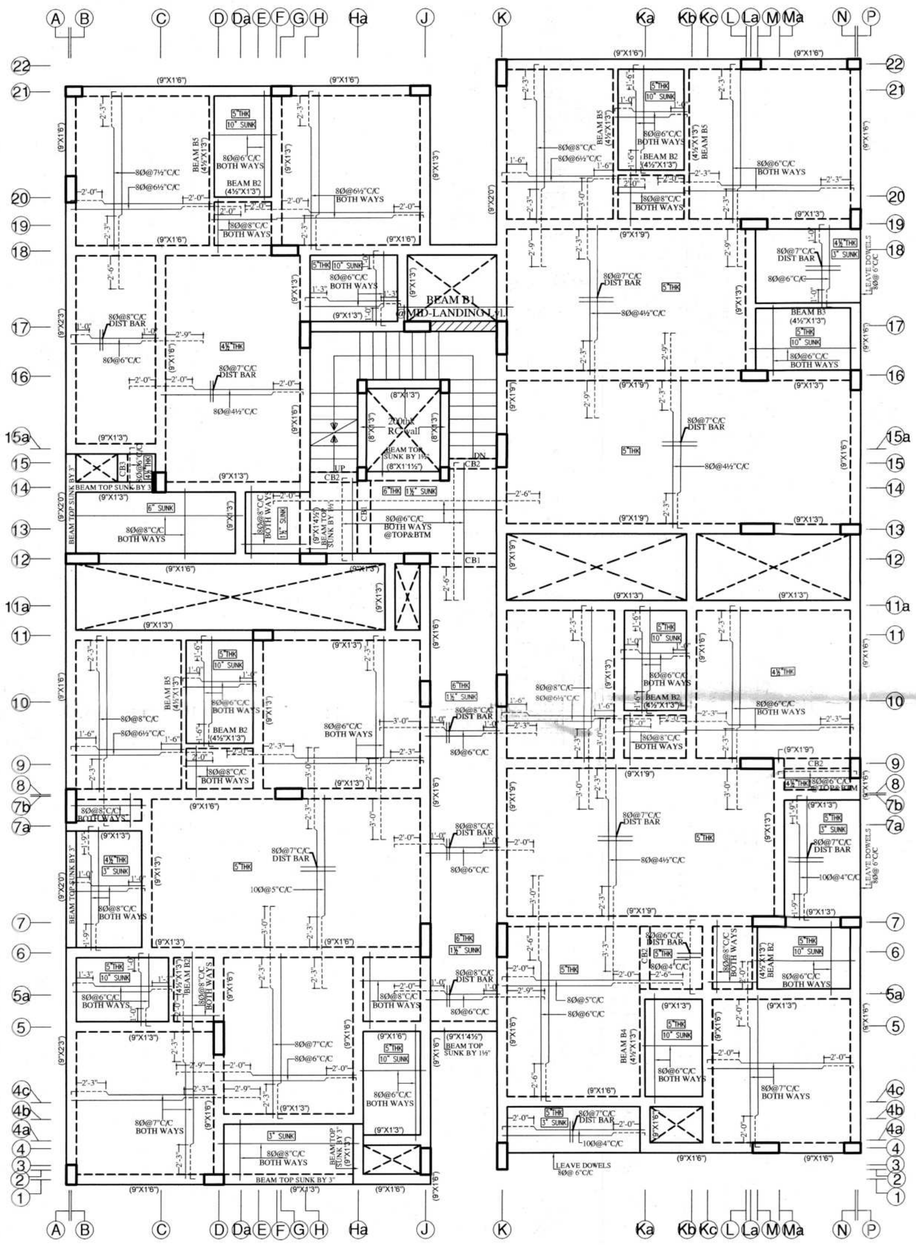
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DSND : S.P.S.I
DRN : SUDHA

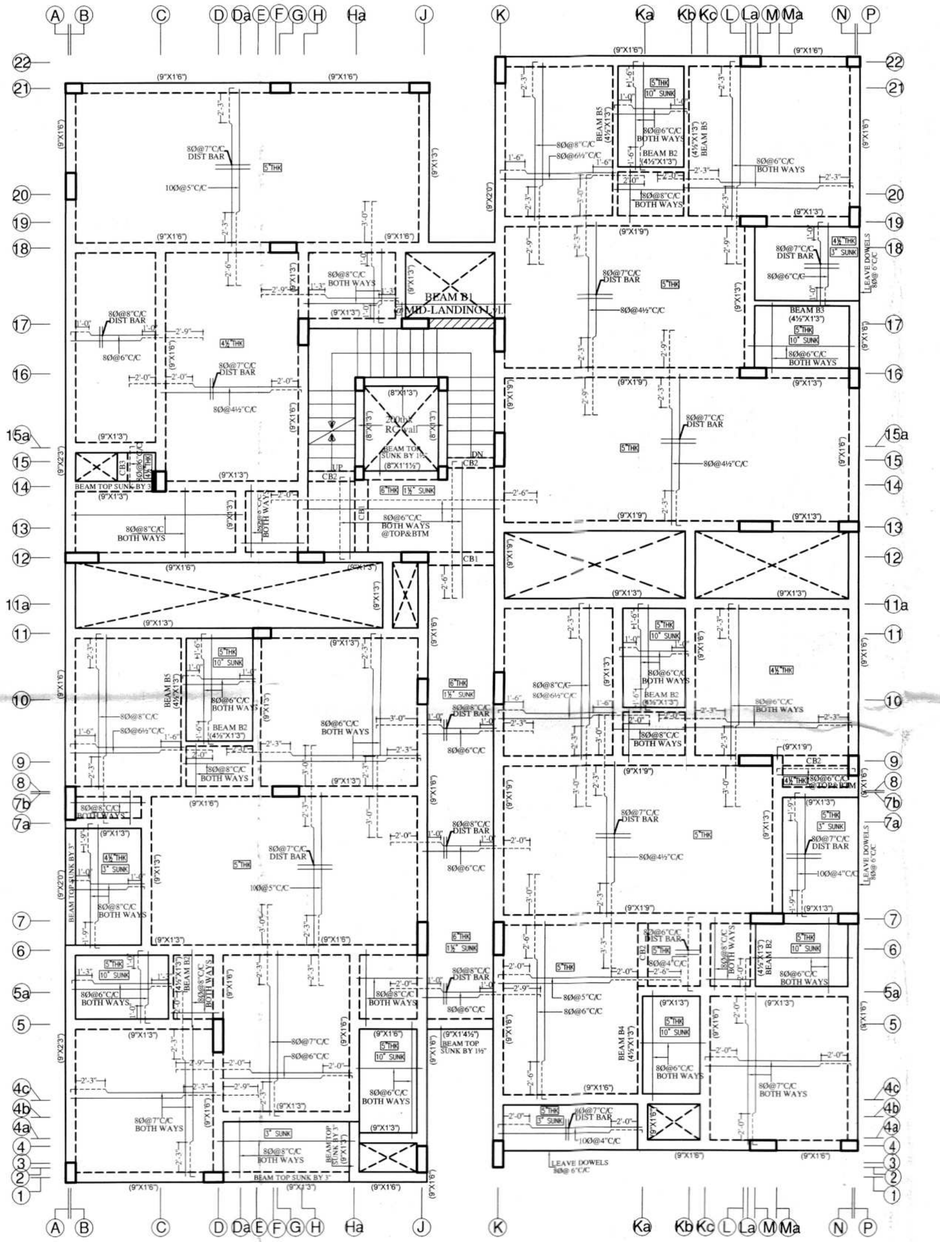
No:50, Kirupasankari Street, West Mambalam,
Chennai - 600 033. Ph : 2485 46 03

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

BOURNA
Consultants - Engineers



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



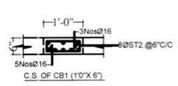
FOURTH FLOOR ROOF SLAB LAYOUT

IMPORTANT NOTES :-

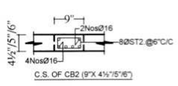
1. ALL SLABS ARE 4"(100mm)THICK, UNLESS NOTED OTHER WISE.
2. PROVIDE 6Ø@6"(150mm C/C. (OR) 8Ø@10"(250mm C/C. DISTRIBUTORS WHERE EVER NEEDED AT TOP AND BOTTOM OF SLAB.
3. ———— LINE INDICATES BAR AT TOP IN PLAN, ———— LINE INDICATES BAR AT BOTTOM IN PLAN.
4. PROVIDE L - BEND FOR TOP REINFORCEMENT BAR AT 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 :-

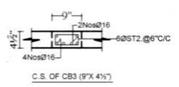
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C.S. OF CB1 (10"X 6")



C.S. OF CB2 (9"X 4½"/5"/6")



C.S. OF CB3 (9"X 4½")

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

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PROPOSED GAUSHALA BUILDING FOR M/S. MS.VIKAAN SHELTERS
AT KOVILAMBAKKAM, CHENNAI.

FIRST,SECOND,THIRD&FOURTH FLOOR ROOF SLAB LAYOUT

Dwg No... 12198 S -04

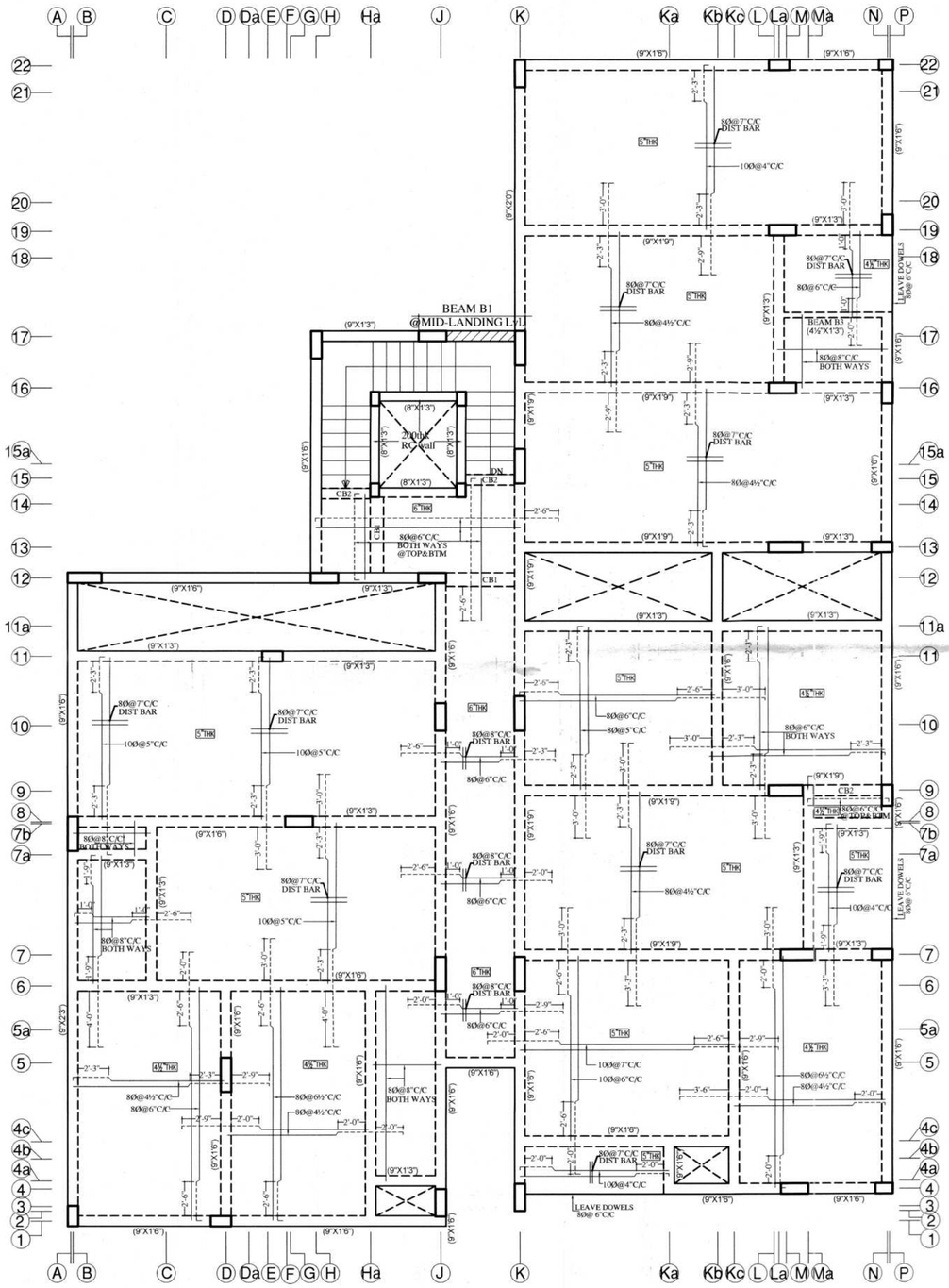
DATE: 29 .05. 2025 | SCALE:1/4"-3/4"

DRWD : S.P.S.I | DRN : SUDHA

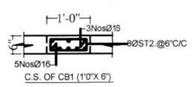
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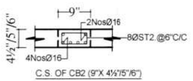
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Consultants - Engineers
No:50, Kirupasankari Street, West Mambalam, Chennai - 600 033. Ph : 2466 46 03

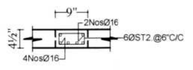
S.P.S.Inbarajan, M.E., A.M.I.E.,
Structural Consultant
Registered Structural Engineer
Grade-I (SE) in CMDA
Reg. No: SE(SR-I)/2/2439/2009 Dt. 27.02.2024
Door No.50, Kirupasankari Street,
West Mambalam, Chennai-600 033.



FOURTH FLOOR ROOF SLAB LAYOUT







IMPORTANT NOTES :-

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S.P.S. NBARAJAN, M.E., I.Structl.A.M.I.E., Structural Consultant, Registered Structural Engineer Grade-I (SE) in CMDA, Reg No. SE/GR-I/24/02693 Dt. 27.02.2024, Door No. 50, Kirupasankari Street, West Mambalam, Chennai - 600 033.

PROPOSED GAUSHALA BUILDING FOR M/S. MS.VIKAAN SHELTERS AT KOVILAMBAKKAM, CHENNAI.

FIFTH FLOOR ROOF SLAB LAYOUT

DATE: 29 : 05: 2025 | SCALE: 1'/4"-3/4" | ARCHITECT:

Dwg No... 12198 S -05

DSND : S.P.S.I | DRN : SUDHA

BOURNA Consultants - Engineers

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

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.