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RE REGULATORY RECORD

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DIGITALLY VERIFIED RECORD

MURUGU CONSULTANT
9A/10, Ist Floor, Umapathy Street Ext.
West Mambalam, Chennai – 600 033.

PH: 91 – 9884400273

Dated : 17 - 07 - 2025

STABILITY CERTIFICATE

The detailed engineering and structural design of thr proposed building comprising of Group Housing Development consisting of Combined Stilt Floor with 3 Blocks - Block A: Combined Stilt Floor (Parking) + 5 Floors with 18 dwelling units (Height – 18.30m), Block B: Combined Stilt Floor (Parking) + 5 Floors with 28 dwelling units (Height – 18.30m), Block C: Combined Stilt Floor (Parking) + 5 Floors with 18 dwelling units (Height – 18.30m) - Totally 64 dwelling units availing Premium FSI with TOD benefit (Video Room, Gym, Home theatre, Indoor Games & Children Activity At First Floor Only) at Plot no. A, TVH Bloom Main Road, TVH Bloom 1st street, Sholinganallur, Chennai – 600119, Comprised in S.No.602/5B1A1A3 part & 602/5B2A part of Sholinganallur village, within the limits of Greater Chennai Corporation, has been done by us based on the report of geotechnical investigation (soil test0 done by MARS SYNERGY GEOTECH PRIVATE LIMITED, Report No.MSGTPL/SI 6189/24-25, Dated June 24 and considered the functional requirement of the building.

It is certified that among other factors, the proposed building has been designed to resis earthquake. We have Checked various parameters and found that the proposed building would be safe.

We further certify that:

(i) The Minimum grade of concrete is M25

(ii) The design and analysis has been done using code of practice for plain and reinforced concrete as per IS 456, design loads as per is Code No. 875 and design of earthquake resistant structure as per IS code no. 1893

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

M. PUNITHAN B.Sc.,M.I.E.
Registered Structural Engineer Grade-II
CMDA Reg. No. SE/GR-II/19/04/044
Renewed 10-04-2024. Valid upto 09-04-2029
2/141, Flat C2, PJM Apartments, East Vanniar Street,
West K.K. Nagar, Chennai-600 078.
Mobile: 9884400273, Email: mpunithan@yahoo.com

BLUEMOON YASH
M/S PROTECK MACHINERY PVT LTD AND M/S PROTECK DEVELPOMENTS LLP

DESIGN CALCULATION

FOR

CONSTUCTION OF GROUP HOUSING DEVELOPMENT CONSISTING OF COMBINED STILT FLOOR WITH 3 BLOCKS – BLOCK A : COMBINED STILT FLOOR (PARKING) + 5 FLOORS WITH 18 DWELLING UNITS (HEIGHT – 18.30M), BLOCK-B : COMBINED STILT FLOOR (PARKING) + 5 FLOORS WITH 28 DWELLING UNITS (HEIGHT – 18.30M), BLOCK – C : COMBINED STILT FLOOR (PARKING) + 5 FLOORS WITH 18 DWELLING UNITS (HEIGHT – 18.30M) - TOTALLY 64 DWELLING UITS AVAILING PREMIUM FSI WITH TOD BENEFIT (VIDEO ROOM, GYM, HOME THEATRE, INDOOR GAMES & CHILREN ACTIVITY AT FIRST FLOOR ONLY)

AT PLOT NO. A, TVH BLOOM MAIN ROAD, TVH BLOOM IST STREET SOLINGANALLUR, CHENNAI – 600 119, COMPRISED IN S NO. 602/5B1A1A3 PART, 602/5B2A PART OF SHOLINGANALLUR VILLAGE, WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION.

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ARCHITECTS:
M/S DIASTYLE
NO. 65/55, 12TH AVENUE,
ASHOK NAGAR,
CHENNAI .-600083
PHONE:65853326

ENGINEERS:
M/S MURUGU CONSULTANT
NO.9A/10, UMAPATHI STREET EXT,
WEST MAMBALAM,
CHENNAI – 600 033.
PHONE : 9884400273.

Pile cap

Column size			300	x	600			
Pedestal size			700	x	1950			
Area of pedestal	=		70	x	195	=	13650	sq-cm
Actual stress	=	110	x	1500	/		13650	
	=	12.09	kg/sq-cm					
Permissible stress	=	0.45	x	300	/	(	13650	/ 1800
	=	135	x	2.754	=		372	kg/sq-cm

So use plain concrete pedestal of 30cm all around

Coinciding the critical section for shear with outerface of the pile in each direction

			0.5	/	2	+	0.3	+	d/2	=	0.63	+ 0.25
			0.55	+	d/2	=	0.875					
	d/2	=	0.875	-	0.55	=	0.325					
	d	=	0.65									
Provide	d	=	0.715									
	D	=	0.8									
BM		=	1	x	110	(	0.75	-	0.3)			
		=	49.5	m-t								
Mu/bd2		=	49.5	x	1.5	x	100000	/(	225.0	x	71.5	x 71.5 x 300)
		=	0.022	x	30	=	0.65					
Area of steel required		=	0.09	x	225.0	x	71.5	/	100			
		=	14.8	sq-cm								
Min steel required		=	0.0012	x	90	x	225					
		=	24.3	sq-cm								
Use 20dia. HSD bars		=	10	x	3.14	=	31.40					

Shear

Critical section for shear	=	250	+	300	+	357.5	=	907.5 mm
The pile outer edge	=	625	+	250	=	875	<	907.5

So shear reinforcement is not provided

For top of pile cap and pedestal use nominal Reinforcement
Use 16 dia. At 200 crsS

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Design of sections

Piles

Using M30 concrete and TMT bars 500 grade

σ ac in concrete	=	81.6	kg/sq-cm
σ bc in concrete	=	102	kg/sq-cm
σ ac in steel	=	1938	kg/sq-cm

Vertical load, V (t) 220 / 2 = 110

I. For 500 dia. pile with end bearing

a) Safe bearing capacity of pile (t) = 3.142 x 0.5 x 0.5 x 750 / 4 = 147.3

b) Bearing load / sq-m. 110 / 0.785
140 < 147.3 o.k

c) V / bc d d = 110 x 1500 / 250000 x 30
= 0.022

d) Ve / bc d d d = 0 x 1500 / 125000000 x 30
= 0.000

Using 16 dia HSD rods d'/D = 83 / 500 = 0.166
Using chart 57 & 58 of SP:16-1980

e) As required (sq-cm.) 0 x 3.142 x 500 x 500 x 30 / 400
0.0

Min area of reinforcement = 0.004 x 3.142 x 50 x 50 / 4
= 7.854 sq-cm

Use 10/20 dia. HSD rods = 8 x 2.011
= 16.08 sq-cm > 7.85 sq-cm

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RESIDENTIAL FLATS

COLUMN A1

No. of floors	=	1	+	5	=	6						
Foundation depth	=	1.5	m									
Ground to floor level	=	1	m									
GFloor to floor height	=	3.00	m									
FFloor to floor height	=	3.00	m									
Thickness of slab assumed	=	0.125	m									
Slab loading t/ sqm	=	0.623	t									
Breadth of beams	=	0.23	m									
Depth of beams assumed	=	0.528	m									
Parapet wall height	=	1	m									
Plinth beams assumed	=	0.264	m									
Total height of wall	=	16.09	m									
Total height of column	=	21.5	m									
Size of column	=	0.60	x	0.3	m							

Total load:

Due to slab	=	6	x	3.1	x	2.175	x	0.623			=	25.18	t
Wall	=	2	x	0.23	x	5.275	x	16.09			=	39.03	t
Roof beams	=	2.5	x	0.23	x	0.403	x	0.264	x	6	=	0.366	t
Plinth beam	=	2.5	x	0.23	x	0.264	x	0.264	x	1	=	0.04	t
Self wt	=	2.5	x	0.6	x	0.3	x	21.5			=	9.675	t
												74.29	t
						Total					=	**74.29**	**t**

Using size of column to be	=	**600**	**X**	**300**	**mm**						
With 8/20 + 0/12 Rods, Ast	=	8	x	314	+	0	x	113	=	2512	sqmm

Capacity of column	=	600	x	300	x	6	+	2512	x	190		
	=	**155.7**	**t**	>		**111**	**t**					
Minimum Reinforcement	=	0.008	x	60	x	30	=	14.4	sqcm	<	25.12	sqcm
% of Reinforcement	=	2512	/	60	x	30	=	1.396	<	4		

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COLUMN N4

No. of floors	=	1	+	5	=	6						
Foundation depth	=	1.5	m									
Ground to floor level	=	1	m									
GFloor to floor height	=	3.00	m									
FFloor to floor height	=	3.00	m									
Thickness of slab assumed	=	0.125	m									
Slab loading t/ sqm	=	0.623	t									
Breadth of beams	=	0.23	m									
Depth of beams assumed	=	0.393	m									
Parapet wall height	=	1	m									
Plinth beams assumed	=	0.393	m									
Total height of wall	=	16.9	m									
Total height of column	=	21.5	m									
Size of column	=	0.60	x	0.3	m							

Total load:

Due to slab	=	6	x	5.775	x	2.075	x	0.623			=	44.76 t
Wall	=	2	x	0.23	x	7.85	x	16.9			=	61.01 t
Roof beams	=	2.5	x	0.2	x	0.268	x	0.393	x	6	=	0.315 t
Plinth beam	=	2.5	x	0.2	x	0.393	x	0.393	x	1	=	0.077 t
Self wt	=	2.5	x	0.6	x	0.3	x	21.5			=	9.675 t
												115.8 t
						Total					=	**115.8 t**

Using size of column to be	=	**600**	**X**	**300**	**mm**							
With 8/25 + 0/12 Rods, Ast	=	8	x	490.6	+	0	x	113	=	3925	sqmm	
Capacity of column	=	600	x	300	x	6	+	3925	x	190		
	=	**182.6 t**		>		**174 t**						
Minimum Reinforcement	=	0.008	x	60	x	30	=	14.4	sqcm	<	39.25	sqcm
% of Reinforcement	=	3925	/	60	x	30	=	2.181	<	4		

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COLUMN N4

No. of floors	=	1	+	5	=	6						
Foundation depth	=	1.5	m									
Ground to floor level	=	1	m									
GFloor to floor height	=	3.00	m									
FFloor to floor height	=	3.00	m									
Thickness of slab assumed	=	0.125	m									
Slab loading t/ sqm	=	0.623	t									
Breadth of beams	=	0.23	m									
Depth of beams assumed	=	0.483	m									
Parapet wall height	=	1	m									
Plinth beams assumed	=	0.678	m									
Total height of wall	=	16.35	m									
Total height of column	=	21.5	m									
Size of column	=	0.60	x	0.3	m							

Total load:

Due to slab	=	6	x	5.775	x	3.89	x	0.623			=	83.91 t
Wall	=	2	x	0.115	x	13.56	x	16.35			=	50.98 t
Roof beams	=	2.5	x	0.2	x	0.358	x	0.678	x	6	=	0.728 t
Plinth beam	=	2.5	x	0.2	x	0.678	x	0.678	x	1	=	0.23 t
Self wt	=	2.5	x	0.6	x	0.3	x	21.5			=	9.675 t
												145.5 t
						Total					=	**145.5 t**

Using size of column to be	=	**600**	**X**	**300**	**mm**						
With 8/32 Rods, Ast	=	8	x	803.8	+	0	x	113	=	6431	sqmm
Capacity of column	=	600	x	300	x	6	+	6431	x	190	
	=	**230.2 t**		>		**218 t**					
Minimum Reinforcement	=	0.008	x	60	x	30	=	14.4	sqcm	<	64.31 sqcm
% of Reinforcement	=	6431	/	60	x	30	=	3.573	<	4	

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COLUMN M4

No. of floors	=	1	+	5	=	6						
Foundation depth	=	1.5	m									
Ground to floor level	=	1	m									
GFloor to floor height	=	3.00	m									
FFloor to floor height	=	3.00	m									
Thickness of slab assumed	=	0.125	m									
Slab loading t/ sqm	=	0.623	t									
Breadth of beams	=	0.23	m									
Depth of beams assumed	=	0.475	m									
Parapet wall height	=	1	m									
Plinth beams assumed	=	0.475	m									
Total height of wall	=	16.4	m									
Total height of column	=	21.5	m									
Size of column	=	0.6	x	0.3	m							

Total load:

Due to slab	=	6	x	4.75	x	4.75	x	0.623			=	84.27	t
Wall	=	2	x	0.23	x	9.5	x	16.4			=	71.67	t
Roof beams	=	2.5	x	0.23	x	0.350	x	9.5	x	6	=	11.47	t
Plinth beam	=	2.5	x	0.23	x	0.475	x	9.5	x	1	=	2.595	t
Self wt	=	2.5	x	0.6	x	0.3	x	21.5			=	9.675	t
												179.7	t
						Total					=	**179.7**	**t**

Using size of column to be	=	**600**	**X**	**300**	**mm**						
With 8/32 Rods, Ast	=	8	x	803.8	+	0	x	113	=	6431	sqmm
Capacity of column	=	600	x	300	x	6	+	6431	x	190	
	=	**230.2 t**		**>**		**225 t**					
Minimum Reinforcement	=	0.008	x	60	x	30	=	14.4	sqcm	<	64.31 sqcm
% of Reinforcement	=	6431	/	60	x	30	=	3.573	<	4	

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COLUMN J10

No. of floors	=	1	+	5	=	6						
Foundation depth	=	1.5	m									
Ground to floor level	=	1	m									
GFloor to floor height	=	3.00	m									
FFloor to floor height	=	3.00	m									
Thickness of slab assumed	=	0.125	m									
Slab loading t/ sqm	=	0.623	t									
Breadth of beams	=	0.23	m									
Depth of beams assumed	=	0.174	m									
Parapet wall height	=	1	m									
Plinth beams assumed	=	0.256	m									
Total height of wall	=	18.21	m									
Total height of column	=	21.5	m									
Size of column	=	0.60	x	0.23	m							

Total load:

Due to slab	=	6	x	1.825	x	1.65	x	0.623			=	11.25	t
Wall	=	2	x	0.23	x	5.125	x	18.21			=	42.92	t
Roof beams	=	2.5	x	0.23	x	0.049	x	0.256	x	6	=	0.043	t
Plinth beam	=	2.5	x	0.23	x	0.256	x	0.256	x	1	=	0.038	t
Self wt	=	2.5	x	0.6	x	0.23	x	21.5			=	7.418	t
												61.67	t
						Total					=	**61.67**	**t**

Using size of column to be	=	**600**	**X**	**230**	**mm**						
With 10/16 Rods, Ast	=	8	x	201	+	0	x	113	=	1608	sqmm
Capacity of column	=	600	x	230	x	6	+	1608	x	190	
	=	**113.3**	**t**	>		**93**	**t**				
Minimum Reinforcement	=	0.008	x	60	x	23	=	11.04	sqcm	<	16.08 sqcm
% of Reinforcement	=	1608	/	60	x	23	=	1.165	<	4	

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DESIGN OF PLINTH BEAM

Span considered	=	5.525	m								
Assuming beam size to be		230	x	450	mm						
Load /m :											
Self wt. of beam	=	2.5	x	0.23	x	0.45	=	0.26	t		
Wall	=	2.0	x	0.23	x	2.400	=	1.10	t		
								1.36	t		
Effective Depth of beam	=	450	-	25	-	8	=	417	mm		
Design negative B.M	=	1.36	x	5.525	x	5.525	x	0.100	=	4.16	t-m
Mu/ fck bdd	=	4.16	x	1.5	x	100000			=	0.062	
		250	x	23	x	41.70	x	41.70			
Ast required	=	0.0905	x	250	x	23.00	x	41.70	=	4.34	sqcm
				5000							
Use 2/12 + 2/16 dia hsd rods,				**Ast**	**=**	**8.54**	**sqcm**		**>**	**4.34**	**sqcm**
Design Positive B.M	=	1.36	x	5.525	x	5.525	x	0.08333	=	3.47	t-m
Mu/ fck bdd	=	3.47	x	1.5	x	100000			=	0.052	
		250	x	23	x	41.70	x	41.70			
Ast required	=	0.0754	x	250	x	23.00	x	41.70	=	4.30	sqcm
				4200							
Use 2/12 + 2/16 dia hsd rods,				**Ast**	**=**	**6.28**	**sqcm**		**>**	**4.30**	**sqcm**
Shear force	=	1.36	x	1.000	/	1.00	=	1.36	t		
Shear stress	=	1.36	x	1.00	x	10000	/	230	x	417 =	0.14 N/sqmm
100As/ bd	=	100	x	8.54	/	23.00	x	41.70	=	0.89	
Permissible shear stress	=	0.44	N/sqmm		<	0.14	N/sqmm				
Unbalanced shear stress	=	0.14	-	0.442	=	-0.30	N/sqmm				
Unbalanced shear force	=	-0.30	x	230	x	417	/	10000	=	-2.88	t
Using 8 dia TMT 2 legged stirrups at				100	crs						
Shear Capacity	=	0.87	x	415	x	100.48	x	417	/	100 x	10000
	=	15.1	t	>	-3	t					

RESULT :

Beam section	=	**230**	**X**	**450**	**mm**
Use 2/12 + 2/16 dia hsd rods,		**at top**		
Use 2/12 + 2/16 dia hsd rods,		**at bottom**		
Using 8 dia TMT 2 legged stirrups at		**100**	**crs**	

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DESIGN OF PLINTH BEAM

Span considered	=	8.041	m								
Assuming beam size to be		230	x	450	mm						
Load /m :											
Self wt. of beam	=	2.5	x	0.23	x	0.45	=	0.26	t		
Wall	=	2.0	x	0.23	x	1.500	=	0.69	t		
								0.95	t		
Effective Depth of beam	=	450	-	25	-	8	=	417	mm		
Design negative B.M	=	0.95	x	8.041	x	8.041	x	0.100	=	6.14	t-m
	=	6.14	x	1.5	x	100000			=	0.092	
		250	x	23	x	41.70	x	41.70			
Ast required	=	0.1335	x	250	x	23.00	x	41.70	=	6.40	sqcm
				5000							
Use 2/12+4/16 dia hsd rods,				**Ast**	**=**	**10.30**	**sqcm**		**>**	**6.40**	**sqcm**
Design Positive B.M	=	0.95	x	8.041	x	8.041	x	0.08333	=	5.11	t-m
Mu/ fck bdd	=	5.11	x	1.5	x	100000			=	0.077	
		250	x	23	x	41.70	x	41.70			
Ast required	=	0.1112	x	250	x	23.00	x	41.70	=	6.35	sqcm
				4200							
Use 2/12+4/16 dia hsd rods,				**Ast**	**=**	**10.30**	**sqcm**		**>**	**6.35**	**sqcm**
Shear force	=	0.95	x	8.041	/	2.00	=	3.81	t		
Shear stress	=	3.81	x	1.50	x	10000	/	230	x	417	= 0.60 N/sqmm
100As/ bd	=	100	x	10.30	/	23.00	x	41.70	=	1.07	
Permissible shear stress	=	0.44	N/sqmm		<	0.60	N/sqmm				
Unbalanced shear stress	=	0.60	-	0.442	=	0.15	N/sqmm				
Unbalanced shear force	=	0.15	x	230	x	417	/	10000	=	1.48	t
Using 8 dia TMT 2 legged stirrups at				100	crs						
Shear Capacity	=	0.87	x	415	x	100.48	x	417	/	100	x 10000
	=	15.1	t	>	1	t					

RESULT :

Beam section	=	**230 X**	**450**	**mm**
Use 2/12+4/16 dia hsd rods,		**at top**		
Use 2/12+4/16 dia hsd rods,		**at bottom**		
Using 8 dia TMT 2 legged stirrups at		**100 crs**		

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DESIGN OF PLINTH BEAM

Span considered	=	4.382	m								
Assuming beam size to be		230	x	450	mm						
Load /m :											
Self wt. of beam	=	2.5	x	0.23	x	0.45	=	0.26	t		
Wall	=	2.0	x	0.23	x	3.900	=	1.79	t		
								2.05	t		
Effective Depth of beam	=	450	-	25	-	8	=	417	mm		
Design negative B.M	=	2.05	x	4.382	x	4.382	x	0.083	=	3.28	t-m
Mu/ fck bdd	=	3.28	x	1.5	x	100000			=	0.049	
		250	x	23	x	41.70	x	41.70			
Ast required	=	0.0714	x	250	x	23.00	x	41.70	=	4.08	sqcm
				4200							
Use 2/12+1/16 dia hsd rods,				**Ast**	=	**4.27**	**sqcm**		>	**4.08**	**sqcm**
Design Positive B.M	=	2.05	x	4.382	x	4.382	x	0.08333	=	3.28	t-m
Mu/ fck bdd	=	3.28	x	1.5	x	100000			=	0.049	
		250	x	23	x	41.70	x	41.70			
Ast required	=	0.0714	x	250	x	23.00	x	41.70	=	4.08	sqcm
				4200							
Use 2/12+1/16 dia hsd rods,				**Ast**	=	**4.27**	**sqcm**		>	**4.08**	**sqcm**
Shear force	=	2.05	x	4.382	/	2.00	=	4.50	t		
Shear stress	=	4.50	x	1.50	x	10000	/	230	x	417 =	0.70 N/sqmm
100As/ bd	=	100	x	4.27	/	23.00	x	41.70	=	0.45	
Permissible shear stress	=	0.44	N/sqmm		<	0.70	N/sqmm				
Unbalanced shear stress	=	0.70	-	0.442	=	0.26	N/sqmm				
Unbalanced shear force	=	0.26	x	230	x	417	/	10000	=	2.51	t
Using 8 dia TMT 2 legged stirrups at				150	crs						
Shear Capacity	=	0.87	x	415	x	100.48	x	417	/	150 x	10000
	=	10.1	t	>	3	t					

RESULT :

Beam section = 230 X 450 mm
Use 2/12+1/16 dia hsd rods, at top
Use 2/12+1/16 dia hsd rods, at bottom
Using 8 dia TMT 2 legged stirrups at **150 crs**

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DESIGN OF ROOF BEAM

Span considered	=	5.525	m								
Assuming beam size to be		230	x	450	mm	2.76225					
Load /m :						7.63003					
Self wt. of beam	=	2.5	x	0.23	x	0.325	=	0.19	t		
Wall	=	2.0	x	0.23	x	2.591	=	1.19	t		
Slab	=	0.71	x	2.40	/	1.000	=	1.71	t		
								3.09	t		
Effective Depth of beam	=	450	-	25	-	8	=	417	mm		
Breadth of flange	=	3867 / 12	+	230	+	3	x	150			
	=	1002	mm								
Design negative B.M	=	3.09	x	5.525	x	5.525	x	0.100	=	9.43	t-m
Mu/ fck bdd	=	9.43	x	1.5	x	100000			=	0.141	
		250	x	23	x	41.70	x	41.70			
Ast required	=	0.2121	x	250 / 5000	x	23.00	x	41.70	=	10.17	sqcm
Use 6/16 dia hsd rods,				**Ast**	=	**12.06**	**sqcm**		>	**10.17**	**sqcm**
Design Positive B.M	=	3.09	x	5.525	x	5.525	x	0.1	=	9.43	t-m
Mu/ fck bdd	=	9.43	x	1.5	x	100000			=	0.041	
		200	x	100.2263	x	41.70	x	41.70			
Ast required	=	0.0588	x	200 / 5000	x	100.23	x	41.70	=	9.83	sqcm
Use 6/16 dia hsd rods,				**Ast**	=	**12.06**	**sqcm**		>	**9.83**	**sqcm**
Shear force	=	3.09	x	5.525	/	2.00	=	8.53	t		
Shear stress	=	8.53	x	1.50	x	10000	/	230	x	417 =	1.33 N/sqmm
100As/ bd	=	100	x	12.06	/	23.00	x	41.70	=	1.26	
Permissible shear stress	=	0.53	N/sqmm		<	1.33	N/sqmm				
Unbalanced shear stress	=	1.33	-	0.525	=	0.81	N/sqmm				
Unbalanced shear force	=	0.81	x	230	x	417	/	10000	=	7.76	t
Using 8 dia TMT 2 legged stirrups at				150	crs						
Shear Capacity	=	0.87	x	500	x	100.48	x	417 /		150 x	10000
	=	12.2	t	>	8	t					

RESULT :

Beam section = 230 X 450 mm
Use 6/16 dia hsd rods, at top
Use 6/16 dia hsd rods, at bottom
Using 8 dia TMT 2 legged stirrups at **150 crs**

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DESIGN OF ROOF BEAM

Span considered	=	7.584	m								
Assuming beam size to be		230	x	450	mm	3.792069					
Load /m :						14.3798					
Self wt. of beam	=	2.5	x	0.23	x	0.325	=	0.19	t		
Wall	=	2.0	x	0.23	x	2.591	=	1.19	t		
Slab	=	0.91	x	2.40	/	1.000	=	2.19	t		
								3.57	t		
Effective Depth of beam	=	450	-	25	-	8	=	417	mm		
Breadth of flange	=	5309	+	230	+	3	x	150			
		12									
	=	1122	mm								
Design negative B.M	=	3.57	x	7.584	x	7.584	x	0.100	=	20.53	t-m
Mu/ fck bdd	=	10.00	x	1	x	100000			=	0.100	
		250	x	23	x	41.70	x	41.70			
Ast required	=	0.1450	x	250	x	23.00	x	41.70	=	6.95	sqcm
				5000							
Use 2/16+4/32 dia hsd rods,				**Ast**	=	**25.91**	**sqcm**		>	**6.95**	**sqcm**
Design Positive B.M	=	3.57	x	7.584	x	7.584	x	0.1	=	20.53	t-m
Mu/ fck bdd	=	20.53	x	1.5	x	100000			=	0.063	
		250	x	112.2408	x	41.70	x	41.70			
Ast required	=	0.0915	x	250	x	112.24	x	41.70	=	21.41	sqcm
				5000							
Use 2/16+4/25 dia hsd rods,				**Ast**	=	**23.64**	**sqcm**		>	**21.41**	**sqcm**
Shear force	=	3.57	x	7.584	/	2.00	=	13.53	t		
Shear stress	=	13.53	x	1.50	x	10000	/	230	x	417 =	2.12 N/sqmm
100As/ bd	=	100	x	25.91	/	23.00	x	41.70	=	2.70	
Permissible shear stress	=	0.75	N/sqmm		<	2.12	N/sqmm				
Unbalanced shear stress	=	2.12	-	0.75	=	1.37	N/sqmm				
Unbalanced shear force	=	1.37	x	230	x	417	/	10000	=	13.11	t
Using 8 dia TMT 2 legged stirrups at				125	crs						
Shear Capacity	=	0.87	x	500	x	100.48	x	417	/	125 x	10000
	=	14.6	t	>	13	t					

RESULT :

Beam section = **230 X 450 mm**
Use 2/16+4/32 dia hsd rods, at top
Use 2/16+4/25 dia hsd rods, at bottom
Using 8 dia TMT 2 legged stirrups at **125 crs**

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DESIGN OF ROOF BEAM

Span considered	=	4.382	m								
Assuming beam size to be		230	x	450	mm	2.19075					
Load /m :						4.79939					
Self wt. of beam	=	2.5	x	0.23	x	0.325	=	0.19	t		
Wall	=	2.0	x	0.23	x	3.150	=	1.45	t		
Slab	=	0.91	x	4.19	/	1.000	=	3.82	t		
								5.46	t		
Effective Depth of beam	=	450	-	25	-	8	=	417	mm		
Breadth of flange	=	3067 / 12	+	230	+	3	x	150			
	=	936	mm								
Design negative B.M	=	5.46	x	4.382	x	4.382	x	0.083	=	8.73	t-m
Mu/ fck bdd	=	8.73	x	1.5	x	100000			=	0.151	
		250	x	20	x	41.70	x	41.70			
Ast required	=	0.2260	x	250 / 5000	x	20.00	x	41.70	=	9.42	sqcm
Use 2/25 + 6/32 dia hsd rods,				**Ast**	=	**58.04**	**sqcm**		>	**9.42**	**sqcm**
Design Positive B.M	=	5.46	x	4.382	x	4.382	x	0.1	=	10.48	t-m
Mu/ fck bdd	=	10.48	x	1.5	x	100000			=	0.039	
		250	x	93.55875	x	41.70	x	41.70			
Ast required	=	0.0560	x	250 / 4200	x	93.56	x	41.70	=	13.02	sqcm
Use 2/25 + 6/32 dia hsd rods,				**Ast**	=	**58.04**	**sqcm**		>	**13.02**	**sqcm**
Shear force	=	5.46	x	4.382	/	2.00	=	11.96	t		
Shear stress	=	11.96	x	1.50	x	10000	/	230	x	417	= 1.87 N/sqmm
100As/ bd	=	100	x	58.04	/	23.00	x	41.70	=	6.05	
Permissible shear stress	=	0.53	N/sqmm		<	1.87	N/sqmm				
Unbalanced shear stress	=	1.87	-	0.525	=	1.35	N/sqmm				
Unbalanced shear force	=	1.35	x	230	x	417	/	10000	=	12.90	t
Using 8 dia TMT 2 legged stirrups at				150	crs						
Shear Capacity	=	0.87	x	415	x	100.48	x	417	/	150	x 10000
	=	10.1	t	>	13	t					

RESULT :

Beam section = **230 X 450 mm**

Use 2/25 + 6/32 dia hsd rods, at top

Use 2/25 + 6/32 dia hsd rods, at bottom

Using 8 dia TMT 2 legged stirrups at **150 crs**

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ROOF SLAB DESIGN

LOAD/ m2

Clear short span	=	3950	mm		3.95							
	=	5220	mm		5.22							
Ly / Lx	=	1.3215		<	1.50	DESIGN AS TWO WAY SLAB						
Slab Thickness Assumed	=	125	mm									
Self weight of slab	=	2.4		x	0.125	=	0.3	t				
LIVE LOAD	=					=	0.50	t				
Floor finish	=	0.1		x	2.00	=	0.20	t				
					Total	=	1.000	or	**1.00**	t		
Effective Depth of slab	=	125		-	25	-	4	=	96	mm		
Effective short span	=	3950		+	96	=	4046	mm				
Effective long span	=	5220		+	96	=	5316	mm				

Three edges discontinuous, one short edge continuous

B.M. due to UDL

Negative short span B.M	=	0.054	x	4.046	x	4.046	x	1.00	=	0.884	m.t			
positive short span B.M	=	0.076	x	4.046	x	4.046	x	1.00	=	1.244	m.t			
Negative long span B.M	=	0.057	x	4.046	x	4.046	x	1.00	=	0.933	m.t			
positive long span B.M	=	0.043	x	4.046	x	4.046	x	1.00	=	0.704	m.t			

Short span

Mu / bdd	=	0.88	x	1.00	x	100000			=	0.98				
		9.807	x	100	x	9.60	x	9.6	=					
Ast Required	=	0.2400	x	1.00	x	100.00	x	9.60	=	2.3	sqcm			
					100									
Use 8 dia hsd rods at	**150**	**crs**	**Ast**		**=**	**50.24**	**/**	**15.00**	**=**	**3.3**	**Sqcm**	**>**	**2.3**	**Sqcm**
Mu / bdd	=	1.24	x	1.00	x	100000			=	1.38				
		9.807	x	100	x	9.60	x	9.6	=					
Ast Required	=	0.2400	x	1.00	x	100.00	x	9.60	=	2.3	sqcm			
					100									
Use 8 dia hsd rods at	**150**	**crs**	**Ast**		**=**	**50.24**	**/**	**15.00**	**=**	**3.3**	**Sqcm**	**>**	**2.3**	**Sqcm**

Long span

Mu / bdd	=	0.93	x	1.50	x	100000			=	1.84				
		9.807	x	100.00	x	8.80	x	8.8	=					
Ast Required	=	0.3250	x	1.00	x	100.00	x	8.80	=	2.9	sqcm			
					100									
Use 8 dia hsd rods at	**150**	**crs**	**Ast**		**=**	**50.24**	**/**	**15.00**	**=**	**3.3**	**Sqcm**	**>**	**2.9**	**Sqcm**
Mu / bdd	=	0.70	x	1.50	x	100000			=	1.39				
		9.807	x	100.00	x	8.80	x	8.8	=					
Ast Required	=	0.2430	x	1.00	x	100.00	x	8.80	=	2.1	sqcm			
					100									
Use 8 dia hsd rods at	**150**	**crs**	**Ast**		**=**	**50.24**	**/**	**15.00**	**=**	**3.3**	**Sqcm**	**>**	**2.1**	**Sqcm**

RESULT :

Use Thickness of Slab	=	**125**	**mm**	
Main rods	=	**Use 8 dia hsd rods at**	**150**	**crs**
Distributors	=	**Use 8 dia hsd rods at**	**150**	**crs**

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LOAD/ m2

Clear short span	=	3950	mm		3.95							
	=	10475	mm		10.48							
Ly / Lx	=	2.6519		<	1.00	**DESIGN AS One WAY SLAB**						
Slab Thickness Assumed	=	125	mm									
Self weight of slab	=	2.4		x	0.115	=	0.276	t				
LIVE LOAD	=					=	0.75	t				
Floor finish	=	0.1		x	2.00	=	0.20	t				
					Total	=	1.226	or	**1.25**	t		
Effective Depth of slab	=	115		-	20	-	5	=	90	mm		
Effective short span	=	3950		+	90	=	4040	mm				
Effective long span	=	10475		+	90	=	10565	mm				

Two long edges discontinuous

B.M. due to UDL

Negative short span B.M	=	0.100	x	4.040	x	4.04	x	1.25	=	2.04	m.t			
positive short span B.M	=	0.056	x	4.040	x	4.04	x	1.25	=	1.143	m.t			
Negative long span B.M	=	0.000	x	4.040	x	4.04	x	1.25	=	0	m.t			
positive long span B.M	=	0.056	x	4.040	x	4.04	x	1.25	=	1.143	m.t			

Short span

Mu / bdd	=	2.04	x	1.00	x	100000			=	2.57				
		9.807	x	100	x	9.00	x	9.0	=					
Ast Required	=	0.3600	x	1.00	x	100.00	x	9.00	=	3.2	sqcm			
					100									
Use 8 dia hsd rods at	**150**	**crs**	**Ast**		**=**	**50.24**	**/**	**15.00**	**=**	**3.3**	**Sqcm**	**>**	**3.2**	**Sqcm**

Mu / bdd	=	1.14	x	1.00	x	100000			=	1.44				
		9.807	x	100	x	9.00	x	9.0	=					
Ast Required	=	0.2590	x	1.00	x	100.00	x	9.00	=	2.3	sqcm			
					100									
Use 8 dia hsd rods at	**150**	**crs**	**Ast**		**=**	**50.24**	**/**	**15.00**	**=**	**3.3**	**Sqcm**	**>**	**2.3**	**Sqcm**

Long span

Mu / bdd	=	0.00	x	1.50	x	100000			=	0.00				
		9.807	x	100.00	x	8.20	x	8.2	=					
Ast Required	=	0.2520	x	1.00	x	100.00	x	8.20	=	2.1	sqcm			
					100									
Use 8 dia hsd rods at	**150**	**crs**	**Ast**		**=**	**50.24**	**/**	**15.00**	**=**	**3.3**	**Sqcm**	**>**	**2.1**	**Sqcm**
Mu / bdd	=	1.14	x	1.50	x	100000			=	2.60				
		9.807	x	100.00	x	8.20	x	8.2	=					
Ast Required	=	0.1950	x	1.00	x	100.00	x	8.20	=	1.6	sqcm			
					100									
Use 8 dia hsd rods at	**150**	**crs**	**Ast**		**=**	**50.24**	**/**	**15.00**	**=**	**3.3**	**Sqcm**	**>**	**1.6**	**Sqcm**

RESULT :

Use Thickness of Slab	=	*125 mm*		
Main rods	=	**Use 8 dia hsd rods at**	**150**	**crs**
Distributors	=	**Use 8 dia hsd rods at**	**150**	**crs**

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LOAD/ m2

Clear short span	=	3.77	mm		0.00									
	=	6900	mm		6.90									
Ly / Lx	=	1830.2		<	1.20	**DESIGN AS TWO WAY SLAB**								
Slab Thickness Assumed	=	125	mm											
Self weight of slab	=	2.4		x	0.175	=	0.42	t						
LIVE LOAD	=					=	0.20	t						
Floor finish	=	0.05		x	2.00	=	0.10	t						
					Total	=	0.720	or	**0.72**	t				
Effective Depth of slab	=	175		-	20	-	5	=	150	mm				
Effective short span	=	4		+	150	=	154	mm						
Effective long span	=	6900		+	150	=	7050	mm						

one long edges continuous

B.M. due to UDL

Negative short span B.M	=	0.071	x		0.154	x	0.15377	x	0.72	=	0.001	m.t						
positive short span B.M	=	0.053	x		0.154	x	0.15377	x	0.72	=	9E-04	m.t						
Negative long span B.M	=	0.000	x		0.154	x	0.15377	x	0.72	=	0	m.t						
positive long span B.M	=	0.043	x		0.154	x	0.15377	x	0.72	=	7E-04	m.t						

Short span

Mu / bdd	=	0.00	x		1.50	x	100000			=	0.00							
		9.807	x		100	x	15.00	x	15.0	=								
Ast Required	=	0.3590	x		1.00	x	100.00	x	15.00	=	5.4	sqcm						
						100												
Use 10 dia hsd rods at	**150**	**crs**	**Ast**			**=**	**78.50**	**/**	**15.00**	**=**	**5.2**	**Sqcm**	**>**	**5.4**	**Sqcm**			

Mu / bdd	=	0.00	x		1.50	x	100000			=	0.00							
		9.807	x		100	x	15.00	x	15.0	=								
Ast Required	=	0.2590	x		1.00	x	100.00	x	15.00	=	3.9	sqcm						
						100												
Use 8 dia hsd rods at	**150**	**crs**	**Ast**			**=**	**50.24**	**/**	**15.00**	**=**	**3.3**	**Sqcm**	**>**	**3.9**	**Sqcm**			

Long span

Mu / bdd	=	0.00	x		1.50	x	100000			=	0.00							
		9.807	x		100.00	x	14.20	x	14.2	=								
Ast Required	=	0.2520	x		1.00	x	100.00	x	14.20	=	3.6	sqcm						
						100												
Use 8 dia hsd rods at	**150**	**crs**	**Ast**			**=**	**50.24**	**/**	**15.00**	**=**	**3.3**	**Sqcm**	**>**	**3.6**	**Sqcm**			
Mu / bdd	=	0.00	x		1.50	x	100000			=	0.00							
		9.807	x		100.00	x	14.20	x	14.2	=								
Ast Required	=	0.1950	x		1.00	x	100.00	x	14.20	=	2.8	sqcm						
						100												
Use 8 dia hsd rods at	**150**	**crs**	**Ast**			**=**	**50.24**	**/**	**15.00**	**=**	**3.3**	**Sqcm**	**>**	**2.8**	**Sqcm**			

RESULT :

Use Thickness of Slab	=	*125 mm*		
Main rods	=	**Use 10 dia hsd rods at**	**150**	**crs**
Distributors	=	**Use 8 dia hsd rods at**	**150**	**crs**

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THE LANDLENS SUITE

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

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

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

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

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

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

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

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

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

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

FREE TOOLS · NO ACCOUNT NEEDED

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

Records and verification

The registers themselves, read for you.

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

Value and duty

What it is worth and what it costs to register.

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

Zoning and land use

What the plan says can happen on this land.

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

Registers and directories

Who holds it, and which office keeps the record.

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

Every free tool
/tools

Services we run for you
/services

The LandLens suite
/landlens/one

Verified RealEstate™

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

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

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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.