Verified RealEstate™

Your trusted partner for buying, selling, and managing property, ensuring hassle-free service with 100% transparency.

3/350/2 Mettukuppam,
OMR Thoraipakkam,
Chennai, India

hello@verified.realestate
+91 9996 12 9996

Official Property Record

Digitally Verified Record - Powered by Verified RealEstate™



B & W STRUCTURAL DESIGN CONSULTANT

181/64 Gandhi Road Velacherry-600042

9677044466 ,044-43237175 bwstructuraldesign@gmail.com

STABILITY CERTIFICATE

(To be furnished while filing application for registration of building)

The detailed engineering and structure design of the proposed building comprising of **Stilt + 5 floors at.14/12 , 44th Street , Nanganallur , Chennai - 600061 S.No .29** has been done by me/us based on the report of geotechnical investigation (soil test) done by **VELTECH CONSULTING ENGINEER R.VENKATAKRISHNAIAH Report No. VCE/22/GIR/201 Dated 04.1.2022** and considering the functional requirement of the building.

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

3. I/We further certify that:

(i) The minimum grade of concrete is M25

(ii) The design and analysis has been done using the code of practice for plain and reinforced concrete as per IS 456, design loads as per IS Codes No.IS875 and design of earthquake resistant structure as per IS Code No.IS1893 & IS4326

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

Encl.: Structural Design Calculation

N.TAMILVANAN, M.E.(STRUCT.,)
Registration Structural Engineer GRADE-I (SE)
(CMDA) REG. No.SE/GR-I/19/02/005
B&W STRUCTURAL DESIGN CONSULTANT
181/64,Gandhi Road, Velachery, Chennai- 42.
Ph : 9677044466,044 - 43237175
bwstructuraldesign@gmail.com

Stamp and Signature

B&W STRUCTURAL DESIGN CONSULTANT

N.TAMILVANAN M.E (STRUCT.)
CLASS 1 LICENSED SURVEYOUR

181/64, GANDHI ROAD
VELACHERY

STABILITY CERTIFICATE

Date: 05/04/2023

THE PROPOSED CONSTRUCTION OF (STILT+5) RESIDENTIAL BUILDING AT BHARATH FLATS, 14/12, 44TH STREET, NANGANALLUR, CHENNAI.

It is certified that the Proposed building STILT+5 Floor is designed as per the Indian Code of Practice for concrete construction IS – 456-2000 Where the grade of concrete used for all structural elements is M25. Loading standards followed for design are IS – 875 part- I (DEAD LOAD), IS – 875 part- II (LIVE LOAD), Thus Analysis check has been made and we found it structurally stable and safe for construction.

N.TAMILVANAN, M.E.(STRUCT.,)
Registration Structural Engineer GRADE-I (SE)
(CMDA) REG.No.SE/GR-I/19/12/005
B&W STRUCTURAL DESIGN CONSULTANT
181/64, Gandhi Road, Velachery, Chennai-42.
Ph : 9677044466, 044-43237175
bwstructuraldesign@gmail.com

N.Tamilvanan
Structural Engineer
(B&W Structural Design Consultant)

N.TAMILVANAN M.E (STRUCT.)

STRUCTUAL ENGINEER
CONSULTANT

STRUCTURAL DESIGN REPORT

THE PROPOSED CONSTRUCTION OF (STILT+5) RESIDENTIAL BUILDING AT BHARATH FLATS, 14/12, 44TH STREET, NANGANALLUR, CHENNAI.

STRUCTURAL CONSULTANT:

B&W STRUCTURAL DESIGN CONSULTANTS

181/64, GANDHI ROAD, (NEAR CENTRAL BANK OF INDIA),

VELACHERY,

CHENNAI-600042.

THE PROPOSED CONSTRUCTION OF (STILT+5) RESIDENTIAL BUILDING AT BHARATH FLATS, 14/12, 44TH STREET, NANGANALLUR, CHENNAI.

1. INTRODUCTION

The Structure is a Residential building. It is designed as RCC building supported on Footing at 3.0 **m** depth from Existing Ground Level.

2. STRUCTURAL SYSTEM

The structural system adopted is as below.

- The entire structure is designed as R.C. Framed Beam-Slab Structure with Beams Framing in to Columns.
- The Foundation System considered for the Structure is an footing at 3.0 **m** depth from Existing Ground Level and SBC of soil 280kN/m^2.

3. MATERIAL SPECIFICATIONS

3.1. CONCRETE AND REINFORCEMENT

1. Concrete Grades: **M25**

(Minimum cement content-340kg/m3, water cement ratio – 0.45).

2. TMT High:max **Fe 500**Grade for all R.C. members

Yield Strength Bars (For efficient usage of Rebar (for all rebar) Consumption in Concrete).

4. ENVIRONMENTAL CONDITIONS, CORROSION AND FIRE PROTECTION FOR CONCRETE.

Environment – Severe

Exposure conditions – Concrete exposed to rain

Fire protection – Thickness of the structural elements proportioned to suit Fire rating (2hrsFire rating considered in the Design)

Nominal concrete cover to reinforcement – Exposure – severe –45 mm Nominal covers for 2 hr. fire resistance

N.TAMILVANAN, M.E.(STRUCT.,)
Registration Structural Engineer GRADE-I (SE)
(CMDA) REG.No.SE/GR-I/19/12/005
R&W STRUCTURAL DESIGN CONSULTANT
181/64, Gandhi Road, Velachery, Chennai-42.
Ph : 9677044466, 044-43237175

Nominal Cover to reinforcement

(As per IS 456:2000 , TABLE 16A) For 2 hr. fire resistance

Beams	-	25 mm
Slabs	-	20 mm
Columns	-	40mm
Foundation	-	50mm
pile and pile cap	-	75mm
RC wall	-	50 mm
waist slab	-	25 mm

5. STRUCTURAL ANALYSIS & DESIGN

- The entire Structure is analyzed using Software STAAD PRO-V8i Structural Analysis Package.
- In the 3D Model, Loads are applied and Analyzed for various Load Combinations. The results of all Load Combinations are reviewed and Members are designed for Maximum Forces arrived.
- The 3D Model Comprises Column-Beam Frame with Slabs contributing loads to the Frame and the effect of Slab stiffness has been ignored in the analysis.

Ultimate load combination

* * * WITH LOAD FACTOR * * *

1. LOAD COMB 1 1.5*DL + 1.5*L.L
2. LOAD COMB 2 1.0*DL + 1.0*L.L

A. Dead loads:

Dead Load shall include weight of all Structural and Architectural components.

Self-weight of the materials shall be calculated on the basis of unit weights given in IS: 875 PART I-1987.

1. Unit weight of concrete - 25 kN /m^3
2. Unit weight of steel - 78.5 kN /m^3
3. Floor finish considered - 1.5kN /m^2
5. Unit weight of Solid block -20kN/m

B. Live loads:

Following Live Loads are considered while designing the Structural Elements Apart from the Dead Loads as per codes.

1. Living, Kitchen and bed room floor slab	:	3KN / Sq. m
2. Toilet	:	2 KN / Sq. m
3. Corridor, staircase and passage	:	3 KN/ Sq.m

C. Additional Floor Provision & Equipment Load

In the Design intent, Loads arising due to Provision for additional Floors to be built in Future has not been considered. If any equipment has been proposed to be mounted on terrace, then the load details based on vendor inputs will be considered.

7. LOADING INTENSITIES ON SLABS:

1. REDENTIAL BUILDING FLOOR SLAB:

Self-wt. of the slab = 0.15m x 25 KN/m3	= 3.75 KN/m^2
Floor finishes	= 1 KN/m^2
False ceiling	= 0.5 KN/m^2
Total load	= 5.25 KN/m^2

2. RESIDENTIAL BUILDING TOILET FLOOR SLAB:

Self-wt. of the slab = 0.15m x 25 KN/m3	= 3.75 KN/m^2
Soil filling = 0.23*18	= 4.14 KN/m^2
Total load	= 7.89 KN/m^2

3. Member load:

Grade beam	= (4.8m -0.38m) x 0.23m x 20 KN/ m^3	= 20 KN/m
Ground floor beam	= (3.5m -0.38m) x 0.23m x 20 KN/ m^3	= 14 KN/m
Parapet wall	= 0.9m x 0.23m x 20 KN/ m^3	= 4 KN/m

FOOTING DESIGN CALCULATIONS

Design Code : IS Code

Footing No	:	F1	
Column No	:	C1	(230mm X 450mm)
Analysis No	:	42	
Concrete Grade	:	M25	
Steel Grade	:	Fe500	
Clear Cover	:	40 mm	
Df	:	2.1M	
Dw	:	4 M	
Density of Soil	=	18	KN/cuM
Soil Bearing Capacity	=	180	KN/sqM
Permissible SBC Increse for EQ	=	25	%
Permissible SBC Increse for Wind	=	25	%
Live Load Reduction	=	50	%
Permissible area of loss of contact	=	0	%
Cross Section designed by	:	Maximum pressure	
Consider overburden pressure			
Surcharge Load	=	2	KN/sqM
Footing Type	:	Pad	
Footing Size (LxBxD)	:	4925 X1795mm X 450mm	
Soil Wt. + Footing Wt. + Surcharge Load	=	170.72+4.80	KN
	=	175.52	KN

Check For Maximum Soil Pressure:

Critical Analysis Load Combination	=	3
Critical Load Combination	=	[1] : (LOAD 1: DEAD LOAD) +(LOAD 2: LIVE LOAD)

Pcomb	=	4068.30	KN
P	=	Pcomb + Soil Wt. + Footing Wt. + Surcharge Load	
P	=	550	KN
Mx	=	0	KNM
My	=	0	KNM
P/A	=	199.09	KN/sqM
Mx/Zx	=	0	KN/sqM
My/Zy	=	0	KN/sqM
Maximum Soil Pressure	=	199.09	KN/sqM
Allowable Soil Pressure	=	1x200	KN/sqM
	=	200	KN/sqM

Check For Minimum Soil Pressure:

Critical Analysis Load Combination	=	3	
Critical Load Combination	=	[1] : (LOAD 1: DEAD LOAD) +(LOAD 2: LIVE LOAD)	
Pcomb	=	468.3	KN
P	=	Pcomb + Soil Wt. + Footing Wt. + Surcharge Load	
P	=	550	KN
Mx	=	0	KNM
My	=	0	KNM
P/A	=	199.09	KN/sqM
Mx/Zx	=	0	KN/sqM
My/Zy	=	0	KN/sqM
Minimum Soil Pressure	=	199.09	KN/sqM
	>	0	
Offset Along L (Loff)	=	610	mm
Offset Along B (Boff)	=	600	mm

Check For Bouyancy:

Critical Analysis Load Combination	=	3
Critical Load Combination	=	[1] : (LOAD 1: DEAD LOAD) +(LOAD 2: LIVE LOAD)

Factor of safety	=	1.4	
Depth of Founding Layer	=	2.1	M
Ground Water Level	=	4	M
Water Pressure	=	22	KN/sqM
Upward force	=	Water Pressure X L X B	
	=	53	KN
Downward force	=	321.81	KN
Factor of safety available	=	Downward Force / Upward Force	
	=	6.09	
		>	1.4

Check For Sliding:

Critical Analysis Load Combination	=	3	
Critical Load Combination	=	[1] : (LOAD 1: DEAD LOAD) +(LOAD 2: LIVE LOAD)	
Coefficient Of Friction	=	0.4	
Factor of safety	=	1.2	
Shear Vx	=	0.24	KN
shear Vy	=	1.30	KN
Resultant sliding force	=	1.32	KN
Downward force	=	321.81	KN
Upward water pressure	=	52.80	KN
Net downward force	=	269.01	KN
Force resisting sliding	=	Friction Coeff X Net Downward Force	
	=	107.60	KN
Factor of safety available	=	Resisting Force / Sliding Force	
	=	81.68	
	>	1.2	

N.TAMILVANAN, M.E.(STRUCT.,)
Registration Structural Engineer GRADE-I (SE)
(CMDA) REG.No.SE/GR I/19/02/005
B&W STRUCTURAL DESIGN CONSULTANT
181/64, Gandhi Road, Velachery, Chennai-42.
Ph : 9677044466, 044-43237175
bwstructuraldesign@gmail.com

Design For Bending:

Bottom Steel Along L:

Critical Analysis Load Combination	=	4
Critical Load	=	[4] : 1.5 (LOAD 1: DEAD LOAD) +1.5

Combination	(LOAD 2: LIVE LOAD)	
Pu	= 550	KN
Mux	= 0	KNM
Muy	= 0	KNM
P/A	= 188.94	KN/sqM
Mx/Zx	= 0	KN/sqM
My/Zy	= 0	KN/sqM
Deff	= 277	mm
Beff	= 1500	mm
SPu	= 188.94	KN/sqM
Mu	= SPu X B X Loff X Loff / 2	
	= 52.73	KNM
Pt	= 0.141	%
Ast Rqd (BM)	= 585	Sqmm
Ast Prv	= T10 @ 150	
	= 628	Sqmm

Distributed Across Total Width

Bottom Steel Along B:

Critical Analysis Load Combination	= 4	
Critical Load Combination	= [4] : 1.5 (LOAD 1: DEAD LOAD) +1.5 (LOAD 2: LIVE LOAD)	
Pu	= 550	KN
Mux	= 0	KNM
Muy	= 0	KNM
P/A	= 188.94	KN/sqM
Mx/Zx	= 0	KN/sqM
My/Zy	= 0	KN/sqM
Deff	= 261	mm
Leff	= 1600	mm
SPu	= 188.94	KN/sqM
Mu	= SPu X L X Boff X Boff / 2	
	= 54.41	KNM
Pt	= 0.149	%
Ast Rqd (BM)	= 624	Sqmm
Ast Prv	= T10 @ 150	
	= 628	Sqmm

Distributed Across Total Length

Design For Shear:

One Way Shear Along L:

Critical Section @ d from Column Face

	= 277	mm
Critical Analysis Load Combination	= 4	
Critical Load Combination	= [4] : 1.5 (LOAD 1: DEAD LOAD) +1.5 (LOAD 2: LIVE LOAD)	
Pu	= 453.46	KN
Mux	= 0	KNM
Muy	= 0	KNM
P/A	= 188.94	KN/sqM
Mx/Zx	= 0	KN/sqM
My/Zy	= 0	KN/sqM
Deff	= 277	mm
Beff	= 1500	mm
SPu	= 188.94	KN/sqM
Vu	= SPu X (Loff - d) X B	
	= 94.38	KN
Tv	= Vu / (Beff X Deff)	
	= 0.23	N/Sqmm
Tc	= 0.29	N/Sqmm
Tv	< Tc	

One Way Shear Along B:

Critical Section @ d from Column Face

	= 261	mm
Critical Analysis Load Combination	= 4	
Critical Load Combination	= [4] : 1.5 (LOAD 1: DEAD LOAD) +1.5 (LOAD 2: LIVE LOAD)	
Pu	= 453.46	KN
Mux	= 0	KNM
Muy	= 0	KNM

P/A	=	188.94	KN/sqM
Mx/Zx	=	0	KN/sqM
My/Zy	=	0	KN/sqM
Deff	=	261	mm
Leff	=	1600	mm
SPu	=	188.94	KN/sqM
Vu	=	SPu X (Boff - d) X L	
	=	102.48	KN
Tv	=	Vu / (Leff X Deff)	
	=	0.25	N/Sqmm
Tc	=	0.29	N/Sqmm
Tv	<	Tc	

Design For Punching Shear:

Critical Section @ d/2 from Column Face

	=	134	mm
Critical Analysis Load Combination	=	4	
Critical Load Combination	=	[4] : 1.5 (LOAD 1: DEAD LOAD) +1.5 (LOAD 2: LIVE LOAD)	
Pu	=	453.46	KN
Mux	=	0	KNM
Muy	=	0	KNM
P/A	=	188.94	KN/sqM
Mx/Zx	=	0	KN/sqM
My/Zy	=	0	KN/sqM
Deff	=	269	mm
Leff	=	649	mm
Beff	=	569	mm
SPu	=	Max Pressure	
	=	188.94	KN/sqM
Vu	=	SPu X ((L X B)-(Leff X Beff)	
	=	383.69	KN
Tv	=	Vu / (2 X (Leff + Beff) X Deff))	
	=	0.586	N/Sqmm
Tc	=	1.25	N/Sqmm

Tv	<	Tc	

Load Transfer Check For Load Transfer From Column To Footing

Critical Analysis Load Combination	=	4	
Critical Load Combination	=	[4] : 1.5 (LOAD 1: DEAD LOAD) +1.5 (LOAD 2: LIVE LOAD)	
Pu	=	453.46	KN
A2	=	0.11	sqM
A1	=	2.69	sqM
Base Area	=	2.4	sqM
A1	>	Base Area	
Thus, A1	=	2.4	
Modification Factor	=	SquareRoot(A1/A2) < = 2	
SquareRoot(A1/A2)	=	4.671	
Thus, Modification Factor	=	2	
Concrete Bearing Capacity	=	0.45 X Fck X Modication Factor X Column Area	
	=	2565	KN
Concrete Bearing Capacity	>	Pu, Hence Safe.	

COLUMN DESIGN CALCULATIONS

General Data

Column No. : C1

Level	:	0m To 1.8m	
Design Code	=	IS Code	
Grade Of Concrete	=	M25	N/Sqmm
Grade Of Steel	=	Fe500	N/Sqmm
Column B	=	230	MM
Column D	=	450	MM
Clear Cover	=	40	MM
Clear Floor Height @ B	=	3000	MM
Clear Floor Height @ D	=	3000	MM
No Of Floors	=	1	
No Of Columns In Group	=	1	
Column Type	:	UnBraced	
Minimum eccentricity check	:	One Axis at a Time	

Load Data

Analysis Reference No.	=	47	
Critical Analysis Load Combination	:	4	
Load Combination	=	[2] : 1.5 (LOAD 1: DL) +1.5 (LOAD 2: LL)	
Critical Location	=	Top Joint	
Pu	=	550	KN
Mux	=	-30.31	KNM
Muy	=	-10.07	KNM
Vux	=	-8.55	KN
Vuy	=	15.6	KN

Minimum Eccentricity Check

Since Axial Force is compressive, Min. Eccentricity check to be performed

Most critical case is with Min. Eccentricity check in Y-direction

Minimum Eccentricity Along B :

Minimum Eccentricity	=	Unsupported Length / 500 + B / 30	
	=	14.32	MM
Mminy	=	Pu x Minimum Eccentricity	
	=	34.83	KNM

Slenderness Check

Max Slenderness Ratio(L/B)	=	6	
	<	60	(Hence Ok)

Column Is Unbraced Along D

Slenderness Check Along D:

Effective Length Factor	=	1.2	
Slenderness Ratio	=	Effective Length / D	
	=	2.7, Column not Slender Along D	

Column Is Unbraced Along B

Slenderness Check Along B:

Effective Length Factor	=	1.2	
Slenderness Ratio	=	Effective Length / B	
	=	7.2, Column not Slender Along B	

Calculation of Design Moment

Direction	Manalysis	Mmin	Mdesign	Mslndx	Mdesign-final
	A	B	C	E	F
Major Axis - Mux	30.31	---	30.31	0	30.31
Minor Axis - Muy	10.07	34.83	34.83	0	34.83

Where

A = Moments directly from analysis

B = Moments due to minimum eccentricity

C = Maximum of analysis moment and min. eccentricity = Max (A,B)

E = Moment due to slenderness effect

F = Final design Moment = Max(C- Top Bottom , D- Top Bottom) + E

Final Critical Design Forces

Critical Case - Axial Load & BiAxial Bending

Pu	=	550	KN
Mux	=	30.31	KNM
Muy	=	34.83	KNM

Biaxial Bending Check

Pt Calculated	=	2.07	
Steel Provided	=	4-T16 +2-T12	
Mux1	=	306.98	KNM
Muy1	=	154.32	KNM
Puz	=	0.45 x Fck x Ac + 0.75 x Fy x Asc	
	=	3378.02	KN
Pu/Puz	=	0.52	
Alpha	=	1.53	
Interaction Ratio	=	(Mux / Mux1)^Alpha + (Muy / Muy1)^Alpha)	
	=	0.13 < 1	

Design Of Shear

Design for shear along D

Critical Analysis Load Combination	:	4	
Critical Load Combination	=	[2] : 1.5 (LOAD 1: DL) +1.5 (LOAD 2: LL)	KN
Design shear force, Vuy	=	15.5958	KN
Pu	=	1741.62	
Design shear stress, Tvy	=	Vuy / (B x Deff)	N/Sqmm
	=	0.0945	N/Sqmm
Design shear strength, Tc	=	0.6493	N/Sqmm
Shear Strength Enhancement Factor	=	1 + 3 x Pu / (B x D x Fck)	
	=	2.1611	
Shear Strength Enhancement Factor (max)	=	1.5	
Shear Strength Enhancement Factor	=	1.5	
Enhanced shear strength, Tc-e	=	0.9739	N/Sqmm
Design shear check	=	Tvy < Tc x Enhancement factor	

Link for Shear Design along D are not required

Design for shear along B

Critical Analysis Load Combination	:	4	

Critical Load Combination	=	[2] : 1.5 (LOAD 1: DL) +1.5 (LOAD 2: LL)	KN
Design shear force, Vux	=	-8.5535	kN
Pu	=	550	
Design shear stress, Tvx	=	Vux / (D x Beff)	kN
	=	0.057	N/Sqmm
Design shear strength, Tc	=	0.6493	N/Sqmm
Shear Strength Enhancement Factor	=	1 + 3 x Pu / (B x D x Fck)	
	=	2.1611	
Shear Strength Enhancement Factor (max)	=	1.5	
Shear Strength Enhancement Factor	=	1.5	
Enhanced shear strength, Tc-e	=	0.9739	N/Sqmm
Design shear check	=	Tvx < Tc x Enhancement factor	

Link for Shear Design along B are not required

Design Of Links

Links in the zone where special confining links are not required

Normal Links

Diameter of link	= 8	mm
	> Max. longitudinal bar dia / 4	
	= 5	mm
Criterion for spacing of normal links		
Min. Longitudinal Bar dia X 16	= 256	mm
Min. dimension of column	= 230	mm
Max. 300 mm	= 300	mm
Maximum B/2	= 150	
Provided spacing	= 150	mm

Table For Links

	Required			Provided	
	Normal Design	Shear Design	Ductile Design	Normal Zone	Ductile Zone
Link Dia.	8	---	---	8	---
Spacing	150	---	---	150	---

BEAM DESIGN CALCULATION

Group	: **G1**
Beam No	: **B1**
Analysis Reference (Member)	4.2m : 125
Beam Length	: 3800 mm
Breadth (B)	: 230 mm
Depth (D)	: 450 mm
Effective Depth (d)	: 395 mm
Design Code	: IS Code
Beam Type	: Regular Beam
Grade Of Concrete	: M25
Grade Of Steel	: Fe500
Clear Cover (Cmin)	: 25 mm
Es	: 2x10^5 N/Sqmm

Flexure Design

	Beam Bottom			Beam Top		
	Left	**Mid**	**Right**	**Left**	**Mid**	**Right**
Critical L/C - Analysis	4	4	4	4	4	4
Critical L/C - RCDC	2	2	2	2	2	2
Mu (KNm)	4.56	23.9	1.77	48.43	0	54.01
Tu (KNm)	3.39	3.39	3.39	3.39	3.39	3.39
M_{Tu} (KNm)	4.99	4.99	4.99	4.99	4.99	4.99
Mud (KNm)	9.55	28.88	6.76	53.41	4.99	59
MuLim (KNm)	156	156	156	156	156	156
R	0.204	0.617	0.144	1.141	0.107	1.26

Ptmin (%)	0.2	0.2	0.2	0.2	0.2	0.2
Ptclc (%)	0.2	0.2	0.2	0.278	0.2	0.309
Pcclc (%)	0.002	0	0.016	0	0.025	0
PtPrv (%)	0.679	0.679	0.679	0.87	0.679	0.87
AstCalc (Sqmm)	237	237	237	329.24	237	366.11
AstPrv (Sqmm)	804.24	804.24	804.24	1030.44	804.24	1030.44
Reinforcement	3-T12 2-T12	3-T12 2-T12	3-T12 2-T12	3-T12 2-T12	3-T12 2-T12	3-T12 2-T12

Shear Design

	Left	Mid	Right
Critical L/C - Analysis	4	4	4
Critical L/C - RCDC	2	2	2
Vu (KN)	69.77	32.17	72.73
Tu (KNm)	3.39	3.39	3.39
V_{Tu} (KN)	18.08	18.08	18.08
Vut (KN)	87.85	50.25	90.81
Tv (N/Sqmm)	0.74	0.42	0.77
Tc (N/Sqmm)	0.61	0.55	0.61
Vc (KN)	72.1	65.5	72.1
Vus=Vut-Vc (KN)	15.75	0	18.71
Asv Torsion (Sqmm)	327.085	213.898	335.988
Asv Reqd (Sqmm)	332.364	332.364	332.364
Legs	2	2	2
Stirrup Dia	8	8	8
SvCalc (mm)	165	175	165

SvPrv (mm)	165	175	165
Asv Torsion Prv (Sqmm)	609.33	574.51	609.33
Asv Total Prv (Sqmm)	609.33	574.51	609.33

Maximum Spacing Criteria

Basic

Spc1 =0.75d = 296 mm

Spc2 = 300 mm

For Torsion

(X1 = 260, Y1 = 410)

Spc3 = X1 = 260 mm

Spc4=(X1+Y1)/4 = 167.5 mm

SFR Design

Beam Width =300 mm

Beam Depth =450 mm

Web Depth =450 <= 750 mm

Side Face Reinforcement Not Required.

SLAB DESIGN CALCULATIONS

Level = 4.2m

Design Code = IS Code

Grade Of Concrete	=	M25	N/Sqmm
Grade Of Steel	=	Fe500	N/Sqmm
Clear Cover	=	20.000	mm
Long Span, Ly	=	4.195	M
Short Span, Lx	=	3.765	M
Imposed Load	=	1.000	KN/Sqm
Live Load	=	2.000	KN/Sqm
Slab Thickness	=	150.000	mm
Effective Depth Along LX, Deffx	=	125.000	mm
Effective Depth Along LY, Deffy	=	125.000	mm
Self Weight	=	5.000	KN/Sqm
Total Load, TL	=	14.000	KN/Sqm
Span	=	2-Way	
Panel Type	=	Two Adjacent Edge continuous	

Design Moments:

Short Span Positive Moment At Midspan -

Moment Coefficient	=	0.043	
BM	=	20.382	KNM
Mu = 1.5 X BM	=	30.573	KNM
Area Of Steel Required (Mu)	=	422.079	Sqmm/M
Steel Provided	=	**T8 @ 150 c/c**	
	=	931.000	Sqmm/M

Short Span Negative Moment At Continuous Support -

Moment Coefficient	=	0.058	
BM	=	27.176	KNM
Mu = 1.5 X BM	=	40.764	KNM
Area Of Steel Required (Mu)	=	573.231	Sqmm/M
Steel Provided	=	**T10@ 150 c/c**	
	=	931.000	Sqmm/M

Long Span Positive Moment At Midspan -

Moment Coefficient	=	0.028	
BM	=	12.951	KNM

Mu = 1.5 X BM	=	19.427	KNM
Area Of Steel Required (Mu)	=	280.233	Sqmm/M
Steel Provided	=	**T10@ 150 c/c**	
	=	1131.000	Sqmm/M

Long Span Negative Moment At Continuous Support -

Moment Coefficient	=	0.037	
BM	=	17.269	KNM
Mu = 1.5 X BM	=	25.903	KNM
Area Of Steel Required (Mu)	=	378.325	Sqmm/M
Steel Provided	=	**T10@ 150 c/c**	
	=	1131.000	Sqmm/M

Distribution Steel @ 0.12% -

Area Of Steel Required	=	210.000	Sqmm
Steel Provided	=	**T10@ 150 c/c**	
	=	931.000	Sqmm/M

Shear Check :

Along Short Span

Shear Coefficient(Lx), SF1	=	0.447	
V = SF1 x TL x Lx	=	36.316	KN
Vu = 1.5 X V	=	54.474	KN
Shear Stress, Tv	=	0.311	N/Sqmm
Nominal Shear Stress, Tc	=	0.410	N/Sqmm
Modification Factor 'K'	=	1.200	
K x Tc	=	0.492	
	>	0.311	Slab Is Safe In Shear

Along Long Span

Shear Coefficient(Ly), SF2	=	0.360	
V = SF2 x TL x Lx	=	29.232	KN
Vu = 1.5 X V	=	43.848	KN

Shear Stress, Tv	=	0.266	N/Sqmm
Nominal Shear Stress, Tc	=	0.342	N/Sqmm
Modification Factor 'K'	=	1.200	
K x Tc	=	0.411	
	>	0.266	Slab Is Safe In Shear

Deflection Check:

Basic Span To Depth Ratio	=	26	
Span Correction Factor	=	1.000	
Tensile Steel Factor	=	2.198	
Compression Steel Factor	=	1.000	
Flange Correction Factor	=	1.000	
Max Span To Depth Ratio	=	26.00 x 1.00 x 2.20 x 1.00 x 1.00	
	=	57.142	
Lx/d	=	33.143	
	<	57.142	Slab Is Safe In Deflection

N.TAMILVANAN, M.E.(STRUCT.,)
Registration Structural Engineer GRADE-I (SE)
(CMDA) REG.No.SE/GR-I/19/12/005
B&W STRUCTURAL DESIGN CONSULTANT
181/64, Gandhi Road, Velachery, Chennai-42.
Ph : 9677044466, 044-43237175
bwstructuraldesign@gmail.com



our services doesn't just end there

Buying & Selling Services

Property Buying Assistance, Property Selling Support, Market Price Analysis, Owner Outreach and Negotiation.

Legal & Documentation Services

Certified EC, Patta, legal opinions, property verification, due diligence, litigation solutions, and legal heir certificates.

Property Development & Approvals

Building plan approvals, construction, layout and sub-division approvals, zone conversion, and occupancy certification.

NRI & Investment Services

Escrow Services, Rentals, Litigation Solutions, Property Valuation and Property Management

Compliance & Special Services

Demolition, Vaasthu checks, regularization of unauthorized buildings, and office space solutions.



empowering your real estate decisions with smart tools

Property Valuation & Cost Estimation

Guideline Value, Apartment Composite Value, Stamp Duty & Registration Fees Calculator, Building Value Calculator, Capital Gains Calculator, Area Unit Converter, Length Unit Converter

Ownership, Compliance & Legal Verification

Encumbrance Certificate (EC) Search, Find Your SRO, Temple Property Check, WAQF Property Check, View Patta/Chitta, View FMB, Patta Analyzer, EC Analyzer

Zoning & Land Use Analysis

Land Use Zone Finder, CRZ Zone Check, Aquifer Zone Check, CBA Check, EWS Check, Road Width Check, Proposed Road Widening Check, FSI Calculator

Property Documentation & Workflow Tools

Forms & Templates, Document Generator, Document Translation, Dictionary

Vastu & Property Management Tools

Home Vastu Shastra, Plot Vastu Shastra, Property Management

Verified RealEstate™

We're honored to be part of your real estate journey

3/350/2 Mettukuppam,
OMR Thoraipakkam,
Chennai, India

hello@verified.realestate
+91 9996 12 9996
www.verified.realestate