



JAYAM CONSULTANTS PRIVATE LIMITED

H.O. : G-2, "SESHADRI MANOR" #1, SESHADRI ROAD, ALWARPET, CHENNAI - 600 018.

PHONE : 91 44 24990477, 91 44 24994734 E-mail : email@jayamcpl.com

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STABILITY CERTIFICATE

The detailed engineering and structure design of the proposed building comprising of Stilt Floor (parking) + 5 Floors at Residential building S.No.9/1,9/3,4/6/5Part, 9/7Part, and T.S.No.4/4,10, 4/11,12, Block No.7, Nelson Manickam Road, Vada Agaram Village, Aminjikarai Taluk, Chennai District, has been done by us based on the report of Geo Technical investigation (soil test) done by Geo Marine Consultants (P) Ltd. No.811, 2nd Main Road, KannappaNagar Extn.Kottivakkam, Chennai Report No.GT-3005(A) Dated 23/06/2025 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 have checked various parameters and found that the proposed building would be safe.

3. I 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.I.S.875-2015 and design of earthquake resistant structure as per IS Code No.I.S.1893-2016.

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

Encl :Structural Design Calculation

J S PADMANABHAN

STRUCTURAL ENGINEER

S. PADMANABHAN

Registered Structural Engineer

Grade - 1 (SE)

Regn. No. SE/GR-1/19/05/123



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STABILITY CERTIFICATE

It is certified that the plan Showing the proposed Construction of stilt +5 floors residential building with 28 dwelling units + Gym and multipurpose hall in 1st floor lvl (18.30m) at Nelson Manickam Road, comprised in S.NO 9/1 , 9/3 & 9/6 and as per patta present T.S.No-4/4,4/10,4/11,4/12, Block no-7, Vada agaram village, Aminjikarai taluk, Chennai-600029, within the limits of greater Chennai corporation, division-107, Zone-VIII, is designed to resist the earthquake. Check has been made and found safe and I hereby certify that

The minimum grade of concrete is M25

The Minimum column size is 300 mm in stilt areas

The design analysis using the code of practice for loading standards as per BIS-875 and seismic forces as per the latest code BIS- 1893 & BIS- 456.

I.S.456	-	2000 (Code of practice for PCC & RCC)
I.S.875	-	2015 (Code of practice for design loads for buildings & structures)
S.P.16 & S.P.34-	-	2002 (Code of practice for design and detailing)
I.S.13920	-	2016 (Code of practice for design and detailing for earthquake)
I.S.1893	-	2016 (Criteria for earthquake resistant building)
I.S.4236	-	1993 (Code of practice for design earthquake resistant building)
NBC	-	2005.

The structure is safe and sound when used for the purpose for which it is designed.

Signature of structural engineer,

J.S PADMANABHAN

S. PADMANABHAN
Registered Structural Engineer
Grade - 1 (SE)
Regn. No. SE/GR-I/19/05/123

PLAN SHOWING THE PROPOSED CONSTRUCTION OF STILT +5 FLOORS RESIDENTIAL BUILDING WITH 28 DWELLING UNITS + GYM AND MULTIPURPOSE HALL IN 1ST FLOOR LVL (18.30M) AT NELSON MANICKAM ROAD, COMPRISED IN S.NO 9/1 , 9/3 & 9/6 AND AS PER PATTA PRESENT T.S.NO-4/4,4/10,4/11,4/12, BLOCK NO-7, VADA AGARAM VILLAGE, AMINJIKARAI TALUK, CHENNAI-600029, WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION, DIVISION-107, ZONE-VIII

TYPICAL STRUCTURAL DESIGN CALCULATION

01. General

Proposed Building S+5 upper floors for residential purpose. Stilt Floor is provided for car parking.

02. Design Basis :

Latest Design codes of BIS-456, 875 AND 1893 are followed with SP-16. Design Aid book. A Typical Frame was taken for analysis to arrive at the bending moment for column design, since the building is S+5 stories, wind force is taken in to account. Live Load reduction factor is applied in design. Isolated and combined foundation is proposed as per soil report. Fe-550 grade steel of 16mm dia bars is used as main steel and 8 mm dia bars for distributors.

03. Earthquake consideration.

For better stability during earthquake, the columns are braced in both directions with beams, continuous lintels are specified for outer walls and column ties are closely spaced for better ductility. For Building on stilt, Minimum size is taken as 300 mm (12")

04. WIND LOAD

$$V_z = V_b \times K_1 \times K_2 \times K_3$$

$$V_b = 50\text{m/sec in chennai}$$

$$K_1 = \text{Probability Factor} = 1$$

$$K_2 = \text{Terrain, Height Factor} = 1.03$$

$$K_3 = \text{Topography Factor} = 1$$

$$K_4 = \text{Cyclonic Factor} = 1.15$$

$$P = 0.6 \times V_z \times V_z$$

$$= 0.6 \times 60 \times 60$$

$$= 2160 \text{ N / Sq.m}$$

FLOOR LOADS :

DEAD LOADS

$$\text{Assuming 5"thk slab dead load} = 313 \text{ kg/sqm}$$

Weight of floor finish, partitions etc., = 131 kg/sqm

Total dead load = 444 kg/sqm

LIVE LOADS

Live load on typical floor = 200 kg/sqm

Total load on typical floor = 644 kg/sqm

ROOF LOADS

Assuming 5"thk slab dead load = 313 kg/sqm

Weight of weathering course = 273 kg/sqm

Total dead load = 586 kg/sqm

Live load on roof with success assumed = 150 kg/sqm

Total roof load = 736 kg/sqm

Staircase loading liable to overcrowding = 500 kg/sqm

Wind load considering height of building = 200 kg/sqm

BRICK LOADS

Weight of brick per sqm = 1890 kg/cum

Assuming beam size of 9"x24" = 335 kg/rm

R.C.C Mix to be adopted = M25

LOAD ON TYPICAL COLUMN

Slab load of stilt floor = 9.02 ton

Slab load for five floors = 36.08ton

Roof load = 10.31ton

Beam load = 12.57ton

Brick work load = 37.50ton

Self weight of column assuming (12"x18") = 5.07ton

Total load on column = 110.55ton

Say	=	111ton
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Provide 10-Y25

Safe capacity of above section	=	184ton
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Hence safe

TYPICAL FOUNDATION

SBC of soil As per soil report	=	25 Mt/sqm.
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Area of footing required	=	4.44 sqm.
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Area of footing provided	=	9.0 sqm.
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Hence safe

TYPICAL SLAB

$$L_y/L_x = 4.0/3.5 = 1.14$$

Hence two way slab

Provide 5"thk slab

Provide Y10 @ 5" C/C (shorter direction)

Provide Y10 @ 6" C/C (longer direction)

TYPICAL BEAM

Span	=	5.965m
Slab load	=	1805kg/m
Self weight	=	350 kg/m
Total load	=	2155kg/m
Bending moment	=	8028.01kg-m
B.M due to conc 1	=	6545.3kg-m
B.M due to conc 2	=	3145.00kg-m

Total bending moment = 17718.31kg-m

EARTHQUAKE ANALYSIS

Calculation of horizontal seismic coefficient
As per code I.S.1893/2016

$$A_h = ZI/2R \times S_a/g$$

Zone factor (Chennai zone)

$$z = 0.16$$

Importance factor

$$I = 1.2$$

Response reduction factor

$$R = 5.0$$

Natural period

$$\begin{aligned} T_a &= 0.075h \\ &= 0.075 \times 18.25 \\ &= 1.368 \text{secs} \\ H &= (\text{Ht of buildg}) \end{aligned}$$

$$S_a/g = 1.67/t$$

$$S_a/g = 1.67/1.368 = 1.22$$

$$\begin{aligned} S_a/g &= \frac{0.16 \times 1.2}{2 \times 5.0} \times 1.22 \\ &= 0.0233 \end{aligned}$$

CALCULATION OF BASE SHEAR/SEISMIC FORCES

Floor	Wi	Hi	Wi x Hi ²	Qi
Terrace	87.108	18.25	29012.08	11.825
5	113.483	15.25	26391.89	11.825

4	113.483	12.25	20258.05	11.825
3	113.483	9.15	9501.08	1.8718
2	113.483	6.3	4504.14	0.887
1	113.483	3.45	1350.73	0.266
Stilt	14.691	0.6	5.288	1.04×10^{-3}
EWI	442.248		E 91023.258	

$$\begin{aligned} \text{Base shear } V &= A_h \text{ EWI} \\ &= 0.0233 \times 442.24 = 10.3 \text{ ton} \end{aligned}$$

$$\text{Seismic force per column} = 10.3/4 = 2.58$$

$$\text{Seismic moment per column} = 2.58 \times 3/2 = 3.86$$

Column provided is safe against the additional seismic moment of 3.86 tm.

CHECK FOR FOUNDATION

P/A+M/Z

$$\begin{aligned} \frac{111}{9} \pm \frac{3.86}{(3 \times 3^2)/6} \\ 12.33 \pm 0.855 \\ = 13.186 \\ = 1.25 \times 25 \\ = 31.25 \text{ ton} \end{aligned}$$

Hence safe

3.8. Rev
S. PADMANABHAN
 Registered Structural Engineer
 Grade - 1 (SE)
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