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RE REGULATORY RECORD

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DIGITALLY VERIFIED RECORD

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30-12-2025

STRUCTURAL STABILITY CERTIFICATE

The detailed engineering and structure design of the proposed construction of stilt floor + 5 floors residential building (height -18.30m) with 45 dwelling units, at plot no. 02, (as per CMDA subdivision ppd/lo no. 137/2021), Mudichur, Chengalpattu 600043 comprised in s.no. 292./1, 293/1a & 315/1a, Mudichur village, Tambaram taluk, Chengalpattu district. has been done by me based on the report of geotechnical investigation (soil test) done by Geo Foundations & Structures Pvt. Ltd. Report N0. 1793 Dated 19-04-2025 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 IS875 and design of earthquake resistant structure as per IS 1893

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

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ENCL: Structural Design Calculations

PLAN SHOWING THE PROPOSED CONSTRUCTION OF STILT FLOOR + 5 FLOORS RESIDENTIAL BUILDING (HEIGHT -18.30M) WITH 45 DWELLING UNITS, AT PLOT NO. 02, (AS PER CMDA SUBDIVISION PPD/LO NO. 137/2021), MUDICHUR, CHENGALPATTU 600043 COMPRISED IN S.NO. 292./1, 293/1A & 315/1A, MUDICHUR VILLAGE, TAMBARAM TALUK, CHENGALPATTU DISTRIC

TYPICAL STRUCTURAL DESIGN CALCULATION

1 **General:**

Proposed building is **Stilit + 5** upper floors for residential purpose. Stilt is used for car parking. Upper floors are for residential use.

2 **Design Basis:**

Latest Design codes of BIS-456, 875 and 1893 are followed with SP-16 Design Aid book. A typical 2-D Frame was taken for analysis to arrive at the bending moment for column design. Since the building is 6 stories, wind force is taken into account. And live load reduction factor 0.5 is applied

Independent foundation is proposed since sbc=25 t/sqm at 2.5m depth.

Fe- 500D steel is used as main steel and M25 concrete adopted

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3 **Earthquake consideration:**

For better stability during earhquake, the columns are tied with plinth beams. Continuous lintels are specified for outer walls and column ties are closely spaced for better ductility. For building on stilt, minimum size of column is taken as 300 mm

4 **WIND LOAD**

Vz = Vb x K1 x K2 x k3

Vb = 50 m/sec in Chennai

K1 = Probability Factor = 1

K2 = Terrain, Height Factor = 1

K3 = Topography Factor = 1

p = 0.6 x Vz x Vz

= 0.6 x 50 x 50

= 1500 N/Sq.m

150 Kg/Sq.m

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5 **Design Loads:**

Slab 130 mm thk avg	=	3.25 KN/sq.m
Live load	=	2.00 KN/sq.m
Finishes	=	1.25 KN/sq.m
		6.50 KN/sq.m

Applying live load reduction of = 0.5 ,

For column and foundation design, 6.1 Kn/sqm is taken.

This value is also taken for frame analysis

Porothrm work 200 thick for exterior walls

0.2 x 2.59 x 7.5 = 4 KN/m/floor

100 thk for interior panels

0.1 X 2.59 x 8 = 2.07 KN/m/floor

Beams 0.2 x 0.55 x 25 .= 2.75 KN/m/floor

Columns 0.3 x 0.90 x 3.00 x 25 .= 20.25 KN/floor

These are taken for analysis with WL+LL+DL combination.

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6 **SLAB DESIGN:** Refer drawing SLAB - S1

Thickness = 130 mm Fck = M 25 N/sq.mm
Cover = 20 mm Fy =Fe 500 N/sq.mm
Eff.Depth = 105 mm

Panel (3.6 X 8.03) m

Twoway slab Ly / Lx = 8.03 / 3.60 .= 2.2
Support condition - One way slab

Designed for 0.070 co.efficient

Mu .= 0.065 x 6.5 1.5 x 3.60 x 3.60 = 8.21 KNm/m

$$\text{Mu / b.d.d} = \frac{8.21 \times 1000 \times 1000}{1000 \times 105 \times 105} = 0.74 \text{ N/sq.mm}$$

From Table-3 of SP-16, Pt 0.350 %
Minimum Pt = 0.12 % as per code,

At = 0.350 x 1000 105 ./ 100 = **368** sq.mm/m

Provide 10 dia @ 125 = **628** sq.mm/m Short span

Provide 10 dia @ 175 = **449** sq.mm/m Long span

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7 **Beam design:** Beam-1 sheet - 2 in drawings

Beam size 200 x 600

40 kn d = 560 mm

udl= **18** Kn/m Fck = M 25

6.7 m

Max. Bending Moment at support top = WL^2/12+ p1*ab^2/l^2 + P2 ab^2/l^2

= 6.2 Kn.m

Mu = 6 x 1.5 x 10-e6

9 x **10-e6** Nmm

Mu/b.d.d = $\frac{9 \times 10\text{-e}6}{200 \times 560 \times 560}$ = 0.15 N/sq.mm

From table 55 SP-16 for d'/d = 40 / 600 = 0.07

Pt = **0.695** % Pc = **0.40** %

At = 0.695 x 200 x 600 / 100 = **834** sq.mm (top)

Ac = 0.400 x 200 x 600 / 100 = **480** sq.mm (bot)

provided 2 No 16 = **402** **sq.mm**

\+ 1 No 20 = **314**

\+ 2 nos 20 = **628**

1345 **sq.mm** at top of support

Shear Design:

Shear force 90 KN

Factored shear force = 1.5 x **90** = 135 KN

for 0.70 % steel Shear resisted by concrete section

from table-61 0.7 x 200 x 560 / 1000 = 78 KN

Balance shear (Vus) = 135 - 78 = 57 KN

Vus/d = 57 / 56 = 1.0 KN/cm

from table 62 of SP-16

Required 2 legged 8 stirrups @ 170 mm c/c

Provided 2 legged **10** stirrups @ **125** mm c/c

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8 **COLUMN DESIGN:** **COL-A** **COL SIZE** **450** **X** **600**

Maximum load P = 260 t

Pu = 1.5 x 260 x10 = 3900 KN

Max.Bending Moment = 5 t.m Mu = 1.5 x 5.0 x10= 75 Kn.m

Cover = 40 mm

d'/d = 0.07

Fck = 40 N/sq.mm

Provide bars equaly all sides

Refer chart 48 of SP-16

$$\frac{Pu}{Fck\ b\ d} = \frac{3900 \times 1000}{40 \times 450 \times 600} = 0.36$$

$$\frac{Mu}{Fck\ b\ d^2} = \frac{75 \times 10^6}{40 \times 450 \times 600} = 0.01$$

$$\frac{p}{Fck} = \frac{p\%}{40} = \frac{0.03}{0.03} \times 40 = 1.2\ \%$$

Minimum steel 0.8%

$$As = \frac{1.2 \times 450 \times 600}{100} = 3240 \text{ sq.mm}$$

Provided 16 Nos 25 dia = 7854 sq.mm

Ties 8 @ 100 c/c and 8 @ 175 c/c

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9 **FOOTING DESIGN** for **COL-A** refer sheet - 1 of drawing

Maximum load on column type " A P = 320 t

Add 10% footing load = 352 t

S.B.C of Soil at 2.5 m depth = 25 t/sqm

Assume square base of 4.5 m x 3.2 m. footing

So pressure on soil is and depth = 1000 mm

Eff. Depth = 950 mm

$$\frac{352}{4.5 \times 3.2} = 24 \text{ t/sqm} < 25 \text{ t/sqm}$$

Pedestal size = 0.9 m

Cantilever projection of footing = $\frac{3.3 - 0.15 - 0.90}{2} = 1.13$ m

B.M on footing at face of column

BM = $24.4 \times 1.13 \times \frac{1.13}{2} = 15.47$ tm

Mu = 15.47 x 1.5= 23.20 tm

Mu/b.d.d = $\frac{23.20 \times 1000 \times 10000}{900 \times 950 \times 950} = 0.29$ N/sqm

Fck = 30 n/sqmm

From Table-4of SP-16, pt% .= 0.200 %

At = 0.200 x 950 X 4350 /100 = 1710 sq.mm

Provide 16 dia @ 150 c/c = 4088 sq.mm bothways

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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

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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.