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RE REGULATORY RECORD

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DIGITALLY VERIFIED RECORD

CHENNAI METROPOLITAN DEVELOPMENT AUTHORITY
'Thalamuthu Natarajan Building', No.1, Gandhi Irwin Road,
Egmore, Chennai-600 008.

PROFESSIONAL REGISTRATION CERTIFICATE

This is to certify that the **Thiru J.PRABAKARAN** enrolled as **Registered Structural Engineer Grade-I (SE)** with Chennai Metropolitan Development Authority (CMDA) who has the qualification of **M.E., (Structural Engg.)** and experience in the relevant field for **6 years**.

He has been given the Registration No.**SE/GR-I/2020/03/263** on **12.03.2020.** He shall be required to comply with the duties and responsibilities prescribed by the Government of Tamil Nadu in Part-V, "Registration of Professionals", Tamil Nadu Combined Development and Building Rules, 2019 approved vide G.O.(Ms) No.18 MAWS (MA1) Dept. dated 04.02.2019.

This Registration is valid upto **11.03.2025.**



N. MUNIPRASAD
ASSISTANT PLANNER
CHENNAI METROPOLITAN DEVELOPMENT AUTHORITY
CHENNAI - 600 008.

J. Prabakaran

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Date : 10.02.2025

STRUCTURAL STABILITY CERTIFICATE

It is certified that the
PLAN SHOWING THE PROPOSED CONSTRUCTION OF STILT FLOOR (PARKING) + 2 FLOORS + 3rd FLOOR PART RESIDENTIAL BUILDING (HEIGHT-14.00m) WITH 10 DWELLING UNITS (8 DWELLING UNITS +2 DUPLEX DWELLING UNITS) AT OLD DOOR No. 3, 4, NEW DOOR No. 9/5, ETHIRAJ LANE, EGMORE, CHENNAI-600008, COMPRISED IN OLD S.No. 9 (PART), T.S.Nos. 1626/15, 1626/16, BLOCK No. 51 OF EGMORE VILLAGE, WITHIN THE LIMIT OF GREATER CHENNAI CORPORATION.

is designed to resist for earthquake. Check has been made and found safe and I hereby certify that

1. The minimum grade of concrete is M25
2. 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
3. Least dimension of column is 300mm in stilt floor.
4. Proposed structure will be structurally safe and sound.

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PLAN SHOWING THE PROPOSED CONSTRUCTION OF STILT FLOOR (PARKING) + 2 FLOORS + 3rd FLOOR PART RESIDENTIAL BUILDING (HEIGHT-14.00m) WITH 10 DWELLING UNITS (8 DWELLING UNITS +2 DUPLEX DWELLING UNITS) AT OLD DOOR No. 3, 4, NEW DOOR No. 9/5, ETHIRAJ LANE, EGMORE, CHENNAI-600008, COMPRISED IN OLD S.No. 9 (PART), T.S.Nos. 1626/15, 1626/16, BLOCK No. 51 OF EGMORE VILLAGE, WITHIN THE LIMIT OF GREATER CHENNAI CORPORATION.

TYPICAL STRUCTURAL DESIGN CALCULATION

1 **General:**

Proposed buildings are **S+3** floors. Stilt floor is used for car parking. Upper floors used for residential purpose.

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 4 stories, wind force is taken into account. Also a live load reduction factor of 0.1 is taken for foundation and column design.

Pile foundation is proposed as per as per soil report.

Fe-500 steel is used as main steel

3 **Earthquake consideration:**

For better stability during earhquake, the columns are braced in both direction 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")

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EARTHQUAKE LOAD

Design horizontal Seismic coeff. Ag = $\frac{Z}{2} \times \frac{I}{R} \times \frac{Sa}{g}$

Z = Zone Factor = 0.16 for Chennai

I = Importance Factor = 1.0

R = Response reduction Factor = 5

$\frac{Sa}{g}$ = Avg. response acc.coeff. Depends on Ta

Ta = Fundamental natural period

= $\frac{0.09\ h}{\sqrt{d}}$ for infill walls
h = height of the building
d = Width of the building

= 0.09x18/ sqrt 23.7

= 0.33

= $0.075\ h^{0.75}$ for office building

W = seismic weight of building

= 100% D.L + 25% L.L for residential <=300

= 100% D.L + 50% L.L for residential >300

Base Seismic Shear Vb = Ag x W

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 150mm thk	=	3.75	KN/sq.m
Live load	=	2.00	KN/sq.m
Finishes	=	1.50	KN/sq.m
		7.25	KN/sq.m

Say 7KN/sq.m/floor for slab and beam design

Applying live load reduction of = 0.5 ,

For column and foundation design, 6.25 Kn/sqm is taken.

This value is also taken for frame analysis

Blockwork 200 thick for exterior walls

0.2 x 3 x 8 = 5 KN/m/floor

Blockwork 100 thick for interior walls

0.100 X 3 x 8 = 2.4 KN/m/floor

Beam 0.2 x 0.60 x 25 .= 3.00 KN/m/floor

Columns 0.3 x 0.60 x 3.00 x 25 .= 13.5 KN/floor

for 4 upper 4 X 13.5 KN/floo .= 54 KN

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

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6 **SLAB DESIGN:** Refer sheet-1 SLAB - S1

Thickness	=	150 mm		Fck	= M 30	N/sq.mm
Cover	=	25 mm		Fy	=Fe 500	N/sq.mm
Eff.Depth	=	120 mm				

Panel (4.1 x 6.2) m

Twoway slab Ly / Lx = 6.2 / 4.1 .= 1.51

Support condition - One long edge discontinuous

short span= α x = 0.055 (- BM at continuous edge) Table:26

= 0.067 (+ BM at midspan) in IS-456-2000

short span= α y = 0.043 (+ BM at midspan)

= 0.000 (- BM at continuous edge)

Designed for 0.067 co.efficient

Mu .= 0.067 x 8.5 1.5 x 4.1 x 4.1 = 14.36 KNm/m

$$\text{Mu / b.d.d} = \frac{14.36 \times 1000 \times 1000}{1000 \times 120 \times 120} = 1.00 \text{ N/sq.mm}$$

From Table-2 of SP-16, Pt 0.250 %

Minimum Pt = 0.12 % as per code, for Fe-500

At = 0.250 x 1000 120 ./ 100 = **300** sq.mm/m

Provide 10 dia @ 150 = **524** sq.mm/m Short span

Provide 8 dia @ 175 = **287** sq.mm/m Long span

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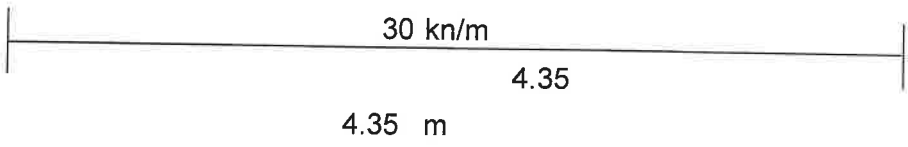
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7 **Beam design:** Beam-1 (Refer sheet -01)

span = 4.35 m Beam size 200 x 600

d = 560 mm

Fck = M 30



4.35 m

Bending moment for UDL load = 71.00 Kn.m

Max. B.M = 71.0 Knm (top of support)

This is taken for design

Mu = 71.0 x 1.5 x 10-e6

106.5 x **10-e6** Nmm

$$Mu/b.d.d = \frac{106.5 \times 10\text{-}e6}{200 \times 560 \times 560} = 1.70 \text{ N/sq.mm}$$

From table-2 SP-16 for d'/d = 40 / 600 = 0.07

Pt = **0.800** % Pc = **0.250** %

At = 0.800 x 200 x 560 / 100 = **896** sq.mm (Bot)

Ac = 0.250 x 200 x 560 / 100 = **280** sq.mm (Top)

provided 2 No 12 = **226** sq.mm +

2 No 20 = **628**

855 sq.mm

No of bars at top of support = **2 Nos** **12** dia + **2 Nos** **20** dia

%age of steel at top of support = 0.8 %

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Shear Design:

Shear force 65 KN

Factored shear force = 1.5 x 65 = 97.5 KN

for 0.76 % steel Shear resisted by concrete section

from table-61 0.64 x 200 x 560 / 1000 = 72 KN

Balance shear (Vus) = 98 - 72 = 26 KN

Vus/d = 26 / 56 = 0.46 KN/cm

from table 62 of SP-16

Required 2 legged 8 stirrups @ 250 mm c/c

Provided 2 legged **8** stirrups @ **150** mm c/c

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8 **COLUMN DESIGN:** **COL-C1** **COL SIZE** **400 X 1000**

Maximum load is with wind force P = 235 t

Pu = 1.5 x 235 x10 = 3525 KN

Max.Bending Moment = 17 t.m Mu = 1.5 x 17.0 x10= 255 Kn.m

Cover = 40 mm

d'/d = 0.10

Fck = **M30** = 35 N/sq.mm

Provide bars equaly all sides

Refer chart 44 of SP-16

$$\frac{Pu}{Fck\ b\ d} = \frac{3525 \times 1000}{35 \times 400 \times 960} = 0.25$$

$$\frac{Mu}{Fck\ b\ d^2} = \frac{255 \times 10^6}{35 \times 400 \times 960} = 0.02$$

$$\frac{p}{Fck} = 0.03 \qquad p\% = 0.03 \times 35 \times 960 \quad 1.05\ \%$$

Minimum %age of steel is 0.8 %

$$As = \frac{1.05 \times 400 \times 1000}{100} = 4200 \text{ sq.mm}$$

Provided 6 Nos 25 dia + = 2945 sq.mr +

6 Nos 25 dia = 2945 sq.mm

TOTAL PROVIDED = 5891 sq.mm

Ties 8 @ 110 c/c & 8 @ 170 c/c

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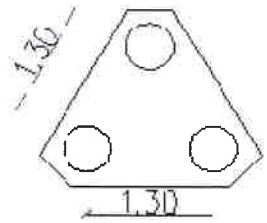
9 Pile cap and pile

As per soil report, 18 m bored cast-in-situ pile can be adopted.

500 dia pile safe capacity	=	100	t		
Col-A carries maximum load of (P)	=	235	t		
So No of piles provided	=	3	Nos		
Pile cap size	=	refer plan		X	1100 mm
M-30 grade	=	30	N/sq.mm		
Pile to pile distance(L)	=	1.25	m		

Tension Force = $\frac{N \times L}{9 \times d}$

= 664893 N



Pile Cap in plan

D = 1.1 m

d = 1.04 m

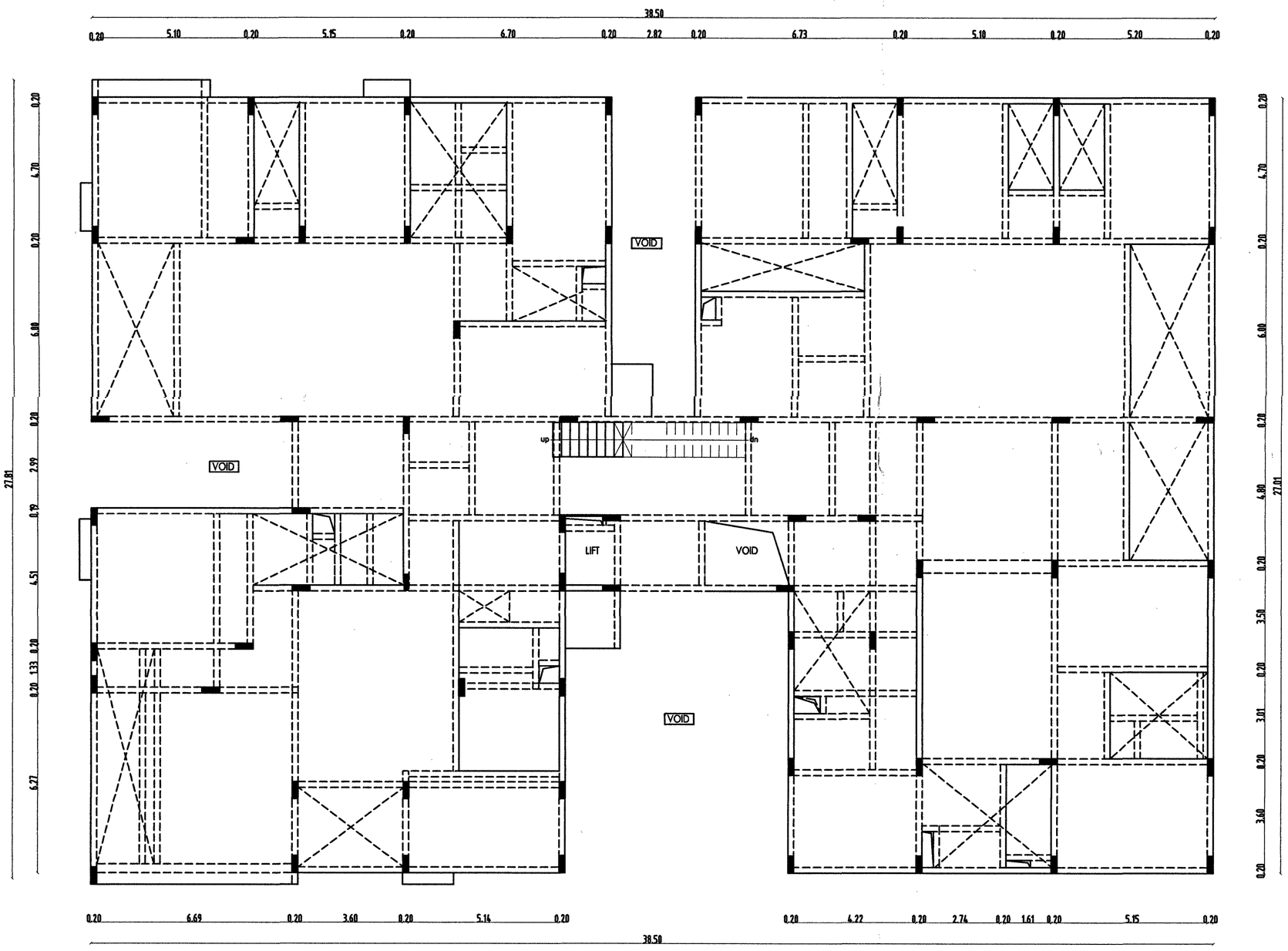
Rebar required = $\frac{664893}{0.87 \times 500}$ = 1528.4897 sq.mm

Provided bottom = **16 @ 125mm C/C**

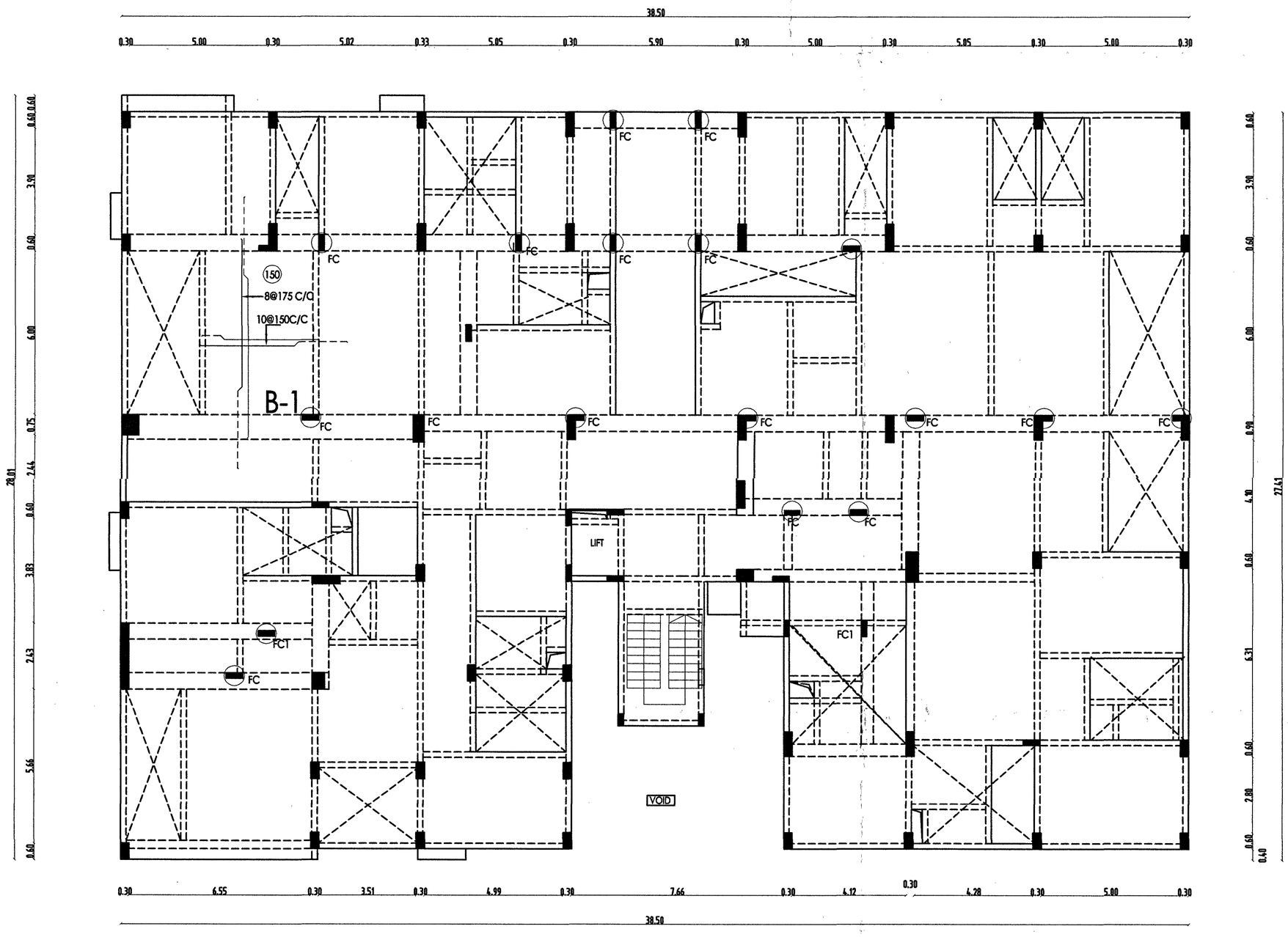
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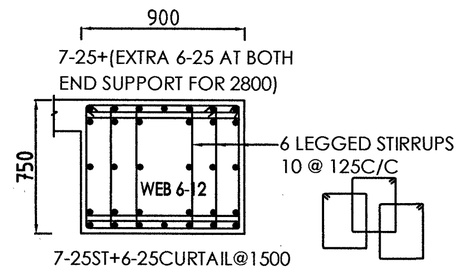
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SUBMISSION DRAWING



FIRST FLOOR ROOF LAYOUT





DETAIL OF B–1
MIX GRADE = M–35

STILT FLOOR ROOF LAYOUT

TITLE

PLAN SHOWING THE PROPOSED CONSTRUCTION OF STILT FLOOR (PARKING) + 2 FLOORS + 3rd FLOOR PART RESIDENTIAL BUILDING (HEIGHT–14.00m) WITH 10 DWELLING UNITS (8 DWELLING UNITS +2 DUPLEX DWELLING UNITS) AT OLD DOOR No. 3, 4, NEW DOOR No. 9/5, ETHIRAJ LANE, EGMORE, CHENNAI–600008, COMPRISED IN OLD S.No. 9 (PART), T.S.Nos. 1626/15, 1626/16, BLOCK No. 51 OF EGMORE VILLAGE, WITHIN THE LIMIT OF GREATER CHENNAI CORPORATION.

DETAIL-OF-ROOF-LAYOUT

NORTH POINT

W S N E

DATE: 11–02–2025

DESIGN:PRABHAKARAN

DRAWN: C.S.K.

SCALE: 1:120

SHEET:NO: 02

NOTES

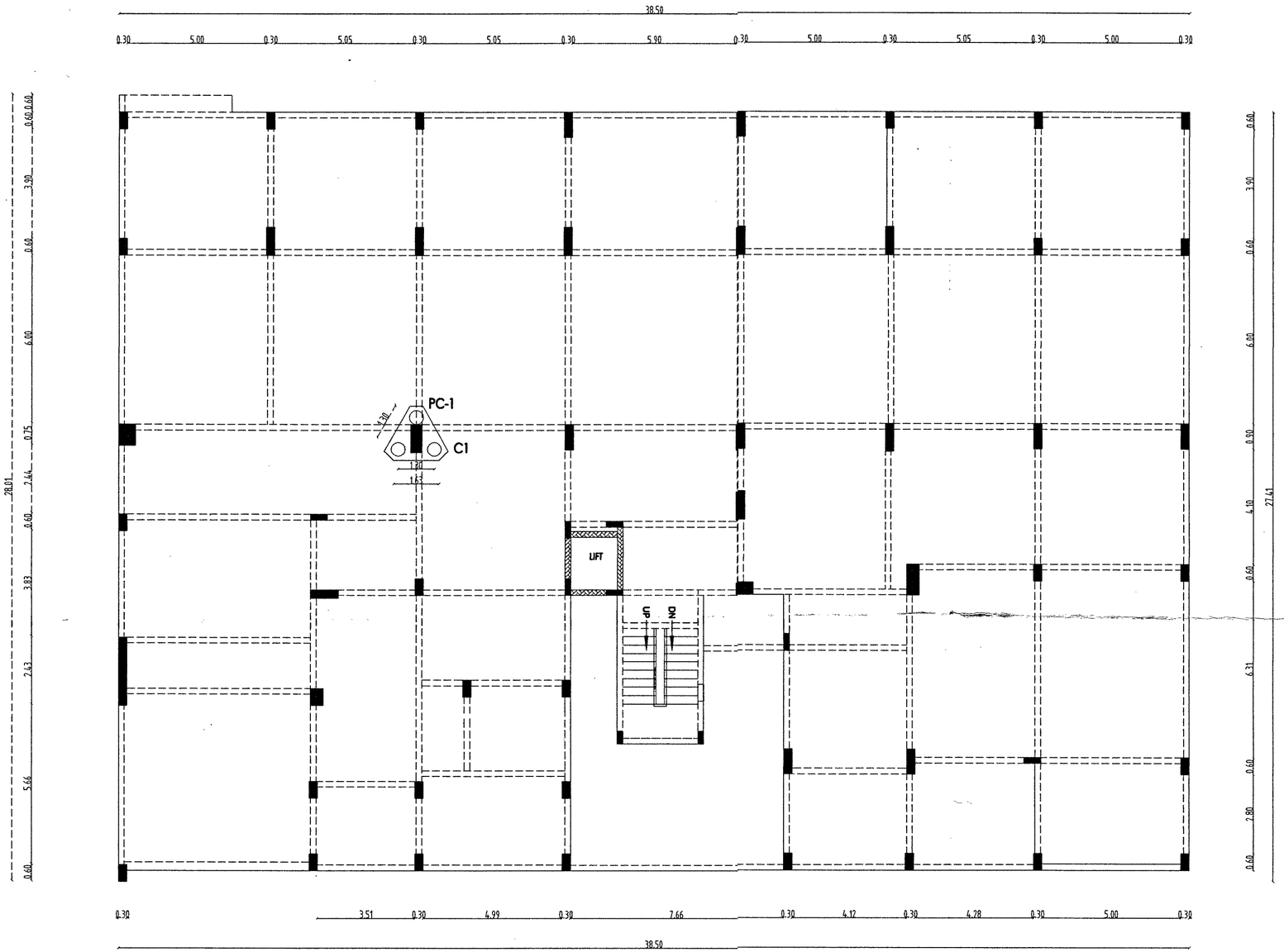
* CONCRETE MIX SHOULD BE M–30
* CLEAR COVER TO THE MAIN REINFORCEMENT FOR COLUMN–40mm,BEAM–30mm, SLAB–25mm
* STEEL SHOULD BE OF GRADE Fe500
* LAP LENGTH FOR SLAB,BEAM,LINTEL–50d,FOR COLUMN–40d
* NOT MORE THAN 50% OF BARS LAPPED AT ONE POINT
* CONDUIT PIPES SHOULD NOT GO THROUGH COLUMNS HORIZONTAL (OR) VERTICAL
* FOUNDATION DESIGNED FOR SEISMIC ZONE–III
* FOUNDATION DESIGNED FOR S+3 UPPER FLOORS

STRUCTURAL ENGINEER

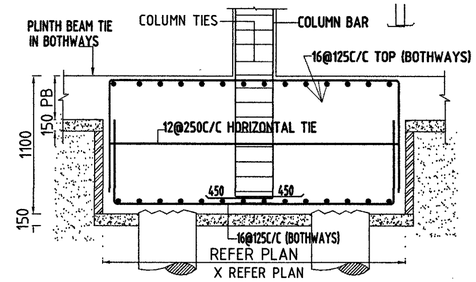
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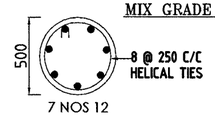
SUBMISSION DRAWING



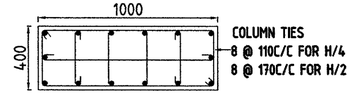
DETAIL OF FOUNDATION & PLINTH BEAM LAYOUT



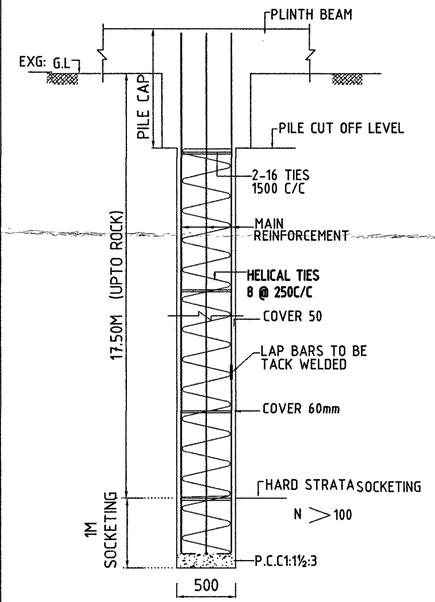
DETAIL OF PC-1
MIX GRADE = M-25



DETAIL OF 500 DIA PILE
SAFE CAPACITY 100 TON.
MIX GRADE = M-30



DETAIL OF COLUMN-A
MIX GRADE = M-30



TYPICAL CROSS SECTION OF
BORED CAST INSITU PILE
MIX GRADE = M-30

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DETAIL OF FOUNDATION & PLINTH BEAM LAYOUT

NORTH POINT

W
S N
E

DATE: 11-02-2025

DESIGN:PRABHAKARAN

DRAWN: CSK

SCALE: 1:100

SHEET:NO: 1

NOTES

* CONCRETE MIX SHOULD BE M-30
* CLEAR COVER TO THE MAIN REINFORCEMENT FOR COLUMN-40mm,PILE&PILE CAP-50mm,P.BEAM-25mm
* STEEL SHOULD BE OF GRADE Fe500
* LAP LENGTH FOR SLAB,BEAM,LINTEL-50d,FOR COLUMN-40d
* NOT MORE THAN 50% OF BARS LAPPED AT ONE POINT
* CONDUIT PIPES SHOULD NOT GO THROUGH COLUMNS HORIZONTAL (OR) VERTICAL

* PROVIDE PILE FOUNDATION AS PER SOIL REPORT
* FOUNDATION DESIGNED FOR SEISMIC ZONE-III
* FOUNDATION DESIGNED FOR S+3 UPPER FLOORS

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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.