GOVT. OF TAMILNADU
TOWN AND COUNTRY PLANNING DEPARTMENT

SALEM DTCP

THE SALEM DISTRICT TOWN AND COUNTRY PLANNING

6,Sannathi St,Subramanya Nagar,Suramangalam,
Salem-636 005.
Phone: 0427-2448625.
Email: ddslmregion@gmail.com
Website: WWW.tn.gov.in/tcp

PROFESSIONAL REGISTRATION CERTIFICATE

This is to certify that Tmt.*V.BHUVANESHWARI* has enrolled as Structural Engineer Grade-II (SE) with Salem District Town and Country Planning **(SDTCP).who has the qualification of M.*E.STRUCTURAL ENGG.*, and experience in the relevant field for more than 04 years.**

She has been given the Registration No: *06/2022, SE- GR II* on *20-12-2022*. She 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 *19-12-2027*.



10.1.23
ASSISTANT DIRECTOR,
SALEM DISTRICT TOWN AND COUNTRY PLANNING,
SALEM.
10/01/2023
10/1/23

SALEM DTCP

NARAYANAN CONSTRUCTION
LICENSED BUILDING SURVEYOR
17/18-B, CONVENT ROAD,
PERIYAPUDUR, (OPP St.John School)
SALEM – 636 016.
Narayanaconstructions555@gmail.com

Er.N.RANJITHKUMAR,B.E.,
Er.V.BHUVANESHWARI, M.E.(Struct)

Ph: 96555 52121, 96555 57679

8.04.2026

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

1. The detailed engineering and structure design of the proposed building comprising of **Stilt + Five (5) floors at 09 Dwelling units Old S.F.No: 116, New S.F. No: 84/2, Corresponding Reservey S.F.No: 84/5, Plot No: C-19, Ward-D, Block-31, T.S.No.-21 in Alagapuram Village, Fairlands, Salem(Tk) & Salem District** has been done by me based on the report of geotechnical investigation (soil test) done by **Shri Balaji Geotech** Report No. **SBGT/CIV/2024-2025/136** Dated: **18/11/2024** 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 grade of concrete for PT is M35.

(iii) 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 875 and design of earthquake resistant structure As per IS Code No 1893 & 13920 are Carried out.

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

Encl: Structural Design Calculation

V. Bhuvaneshwari

Er.V.BHUVANESHWARI M.E.(S).
NARAYANAN CONSTRUCTIONS
LICENSED BUILDING SURVEYOR
DTCP/SALEM/RE-III/06/2022
No:17/18-B, CONVENT ROAD,
ALAGAPURAM PUDHUR, SALEM-636 016.
Cell: 96555 52121, 96555 57679

LOAD CALCULATIONS

PROPOSED CONSTRUCTION OF METROPOLE APARTMENTS AT FAIRLANDS IN SALEM

1		LOAD CALCULATION REPORT				
Rev.	8.4.26	Description/issued for	Prepared by	Checked by	Approved by	
		Client:	1. MR.SHIVASHANKAR KAMATH, 2.MRS.USHA KAMATH, 3.MR.MANMOHAN KAMATH, 4. MRS.BHUVANA KAMATH.			
		Project:	METROPOLE — APARTMENT AT FAIRLAND IN SALEM TAMILNADU - INDIA.			
		Title:	LOAD CALCULATION REPORT			

Office:	India	Order:		document;		Rev:	0	Sheet:		of:	3

V.Bhuvaneshwari

Er.V.BHUVANESHWARI M.E (Struct.)
NARAYANAN CONSTRUCTIONS
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DTCP/SALEM/RE-III/06/2022
No:17/18-B, CONVENT ROAD,
ALAGAPURAM PUDHUR, SALEM-636 016.
Cell: 96555 52171, 0427 255 57679

FLOOR LOADS:

I. **FLOOR LOADS:**

Floor finish	0.075x20	=	1.5 kN/m^2
Sand filling (0.2x18)		=	4.14kN/m^2
Sunken		=	5.64 kN/m^2
	Say	=	**5.6 kN/m^2**

II. **TERRACE FLOOR:**

Floor finish & weathering coarse (0.15x20)		=	3.0 kN/m^2

III. **LIVE LOADS:**

•	Live load	=	2.5 kN/m^2
•	Terrace	=	1.5 kN/m^2
•	Corridor	=	4 kN/m^2

IV. **WALL LOAD CALCULATIONS:**

GROUND FLOOR:

1. Wall load for plinth beam to stilt beam level:
   (3.15-0.600-0.38 x0.23 x20) = 15.5 kN/m^2

FIRST FLOOR TO FIFTH FLOOR (TYPICAL FLOORS):

2. Wall load for stilt floor Roof level to First Floor Roof Level:
   (3.15-0.38 x0.23 x20) = 12.5 kN/m^2

WATER TANK:

3. Wall load for Water tank bottom level:
   (1.52-0.38x0.23x25) = 6.55 kN/m^2

PARAPET:

4. Wall load for Parapet level:

0.9x0.23x20		=	4.14 kN/m^2

HEAD ROOM:

5. Wall load for terrace level to Head Room Roof top level:

(3.15x0.23x20)		=	14.49 kN/m^2

V. STAIRCASE LOAD CALCULATION:

Self-weight	(0.20x1x25)	=	5.00 kN/m^2
Floor Finish		=	1.00 kN/m^2
R.C.C Steps	(0.15/2)x22	=	1.65 kN/m^2
Live Loads		=	4.00 kN/m^2
		=	11.65 kN/m^2
		=	12.00 kN/m^2
Total Load	(12x4.88)	=	58.56 kN/m^2
Load on One beam	(58.56/2)	=	29.28 kN/m^2
		Say =	30 kN/m^2
Plint Beam full wall load		=	15.5 kN/m^2
Plinth beam Mid Landing Load (15.5/2+30)		=	37.75 kN/m^2
Stilt beam full wall load		=	12.5 kN/m^2
Stilt beam Mid landing load	**(12.5+30)**	=	**42.5 kN/m^2**

DESIGN BASIS REPORT

PROPOSED CONSTRUCTION OF METROPOLE APARTMENTS

AT NEW FAIRLANDS IN SALEM

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3.REFERENCES, CODES AND STANDARDS: The following codes and standards have been referred.

CODE OF PRACTICE FOR DESIGN LOADS (OTHER THAN EARTHQUAKE) FOR BUILDINGS AND STRUCTURES	
IS 875 Part 1- 1987	Dead Loads - Unit weights of building Materials and stored materials.
IS 875 Part 2- 1987	imposed loads.
IS 875 Part 3-2015	Wind Loads.
IS 875 Part 5- 1987	Special Loads and Combinations.
CODE OF PRACTICE FOR DESIGN	
IS 456 : 2000	Plain and Reinforced Concrete Code of Practice.
IS 1893(Part - 1): 2016	Criteria for Earthquake resistant design of structures (General provision and buildings).
IS3370-(Part-1&2)-2009 IS 3370-Part-IV-1967	Code of practice for concrete structures for storage of liquids. & Design Tables.
IS 13920-2016	Code of practice for ductile design and detailing of reinforced concrete Structures subjected to seismic forces.
IS 1786-2008	Specification for high strength deformed steel bars and wires for concrete reinforcement.
SP - 24-1983	Explanatory hand book on Indian standard code of practice for plain and reinforced concrete.
SP - 16 : 1980	Design aids for reinforced concrete to IS 456 - 1978.
SP – 34(S&T)- 1987	Hand book on concrete reinforcement and detailing.
IS 1904 - 1986	Code of Practice for design and construction of foundations in soil : General requirements.
IS 2950 (Part I) -1981	Code of Practice for design & construction of raft Foundation.
SP- 38 (S&T) -1987	Handbook of typified designs for structures with steel Roof trusses.
IS 800 : 2007	Code of practice for General construction in steel.

IS 808 : 1989	Dimensions for hot Rolled steel Beam, Column, Channel and Angle section.

4.LOAD DEFINITIONS:

4.1 Dead Loads (DL) :

Dead Load shall be the total weight of the materials forming the permanent part of structure. The Unit weights of materials and components shall be as per the code defined.

Self weights of the slabs are inbuilt with ETABS software at the time of application.

(i) Concrete unit weight is taken as 25 kN/m3

(ii) Brick unit weight is taken as 20 kN/m^3

(iii) Water unit weight is taken as 10 kN/m^3

(iv) Sand (Toilet sunken) unit weight is taken as 18 kN/m^3

4.2 Live Loads (LL):

Live Loads are all movable super imposed loads such as movable partitions, occupants and movable equipment, but not including wind or equipment dynamic loads. Live Loads shall be as specified in IS 875 Part 2 - 1987 Table 1.

I. EARTHQUAKE LOAD CALCULATIUON (EL):

Seismic loads are considered for Zone II as per IS 1893 (Part-I): 2016.

Zone Factor	=	0.16
Importance Factor	=	1
Response reduction Factor (Special Moment Resisting Frames)	=	5
Damping	=	5%
Soil Type	=	II

Time Period:

Time period are considered as per IS 1893(PART- 1): 2016 Clause No. 7.6.2(C)

$0.075*(18.9)^{0.75}$ =0.67

4.5 Loading Combinations:

SERVICEABILITY COMBINATION

1) 1.0 D.L + 1.0 L.L
2) 1.0 D.L+ 1.0 W.L- (+X DIRECTION)
3) 1.0 D.L + 1.0 W.L- (-X DIRECTION)
4) 1.0 D.L + 1.0 W.L - (+Y DIRECTION) 5) 1.0 D.L+ 1.0 W.L- (-Y DIRECTION)
6) 1.0 D.L + 1.0 E.L - (+X DIRECTION)
7) 1.0 D.L + 1.0 EL - (-X DIRECTION)

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8) 1.0 D.L+ 1.0 E.L-(+Y DIRECTION)
9) 1.0 D.L+ 1.0 E.L-(-Y DIRECTION)
10) 1.0 D.L + 0.8 L.L + 0.8 w.L DIRECTION)

11) 1.0 D.L + 0.8 L.L+ 0.8 w.L (-X DIRECTION)

12) 1.0 D.L + 0.8 L.L + 0.8 w.L (+Y DIRECTION)

13) 1.0 D.L + 0.8 L.L + 0.8 w.L (-Y DIRECTION)

14) 1.0 D.L + 0.8 L.L + 0.8 E.L (+X DIRECTION)

15) 1.0 D.L + 0.8 L.L + 0.8 E.L (-X DIRECTION)

16) 1.0 D.L + 0.8 L.L + 0.8 E.L (+Y DIRECTION)

17) 1.0 D.L + 0.8 L.L + 0.8 E.L (-Y DIRECTION)

ULTIMATE COMBINATION

18) 1.5 D.L + 1.5 L.L

19) 1.5 D.L + 1.5 W.L (+X DIRECTION)

20) 1.5 D.L + 1.5 w.L (-X DIRECTION)

21) 1.5 D.L + 1.5 W.L (+Y DIRECTION)

22) 1.5 D.L + 1.5 W.L (-Y DIRECTION)

23) 1.5 D.L + 1.5 E.L DIRECTION)

24) 1.5 D.L+ 1.5 E.L (-X DIRECTION)

25) 1.5 D.L + 1.5 E.L (+Y DIRECTION)

26) 1.5 D.L + 1.5 E.L (-Y DIRECTION)

27) 0.9 D.L+ 1.5 W.L (+X DIRECTION)

28) 0.9 D.L + 1.5 W.L (-X DIRECTION).

29) 0.9 D.L + 1.5 W.L (+Y DIRECTION)

30) 0.9 D.L + 1.5 W.L (-Y DIRECTION)

31) 0.9 D.L + 1.5 E.L (+X DIRECTION)

32) 0.9 D.L + 1.5 E.L (-X DIRECTION)

33)0.9 D.L+ 1.5 E.L (+Y DIRECTION)

34) 0.9 D.L + 1.5 E.L (-Y DIRECTION)

35) 1.2 D.L+ 1.2L.L+1.2W.L DIRECTION)

36) 1.2 D.L+ 1.2L.L+1.2W.L (-X DIRECTION)

37) 1.2 D.L+ 1.2L.L+1.2W.L (+Y DIRECTION)

38) 1.2 D.L+ 1.2L.L+1.2W.L (-Y DIRECTION)

39) 1.2 D.L+ 1.2L.L+1.2E.L (+X DIRECTION)

40) 1.2 D.L+ 1.2L.L+1.2E.L (-X DIRECTION)

41) 1.2 D.L+ 1.2L.L+1.2E.L (+Y DIRECTION)

42) 1.2 D.L+ 1.2L.L+1.2E.L (-Y DIRECTION)

(D.L = Dead load, L.L = Live load, W.L = wind load, E.L = Earthquake load,).

Temperature Load is not considered since the lateral dimension of the building is limited as per Clauses 19.5.1 & 27.20 of IS 456:2000.

5 Reinforced concrete works:

5.1 General:

Design of Structural Concrete works shall be in accordance with IS 456:2000.

Design of Truss steel member works shall be in accordance with IS 800:2007.

5.2 Cement and Aggregates:

Cement to be ordinary Portland cement in accordance with (IS 269).

Aggregates shall be accordance with (IS 383).

5.3 **Concrete Grades:**

Structural Concrete:

Sub & Super Structure — M25

P.C.C - M7.5

5.4 **Reinforcing Steel:**

Reinforcing Steel Bars shall be CRS (Corrosion resistant steel) Uncoated High Yield deformed bars Fe 500 D of Minimum Characteristic Yield strength of 500 N/mm^2 having elongation of 16%. Deformed bars confirming to IS 1786:2008.

5.5 **Description of structural arrangement:**

Super structure:

The buildings will be designed as framed structure with columns and beams are Interconnected with flat R.C.C Roof Slab.

Sub structure:

The foundation will be designed generally as per the soil report recommendations.

5.6 **Properties for design purpose:**

a. Grade of Concrete fck - 25 N/mm^2

b. Grade of Steel fy - 500 N/mm^2

c. Young's Modulus of Steel Es - 200000 N/mm^2

d. Modulus of Elasticity of Concrete Ec -500 root of fck - 25000 N/mm^2

5.7 **Development Length of bars:**

For M25:

(Ld) In Tension	=	50ø
(Ld) In Compression	=	40ø

5.8 **Cover to Concrete :**

Footing	=	50 mm
Column	=	40 mm
Beam	=	30 mm
Slab	=	25 mm
Shear wall	=	25 mm
R.C.C Retaining Wall	=	25 mm

SOIL PROPERTIES & FOUNDATION DEPTH:

6.1 **Safe Bearing Capacity of Soil:**

Net Allowable bearing capacity of soil is taken as per soil report = 345 KN/m^2

6.2 **Analysis and design methodology:**

The Building is analyzed as 3-D space structure using finite element method in ETABS the foundations is designed in 'SAFE' software & XL sheets. Fixed condition is considered at supports for 3-D structure & the steel member designed for the using 'ETABS' software, to carryout analysis for various load combinations as per design basis.