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RE REGULATORY RECORD

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DIGITALLY VERIFIED RECORD

VISDA 10 Vision Structural Design Aid

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E-mail : info@visda.co.in
Website : www.visda.co.in

STABILITY CERTIFICATE

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

The detailed engineering and structure design of the proposed building comprising of 93 Dwelling Units Stilt+5 floors in respect of all that piece and parcel of dry land situated at comprised in S.No.69/9D1A1 measuring an extent of 39 cents (Hectare 0- 15.80 Ares) and S.No.70/2A1 measuring an extent of 52.36 Cents (Hectare 0-21.20 Ares) totally admeasuring 91.39 cents (Hectare 0-37 Ares) Kanathur Reddikuppam Village, Thiruporur Taluk, Chengalpattu District [Previously Kancheepuram District], has been done by me based on the report of geotechnical investigation (soil test) done by Dr.Vergheese Chumar (F.S.Engineers PVT LTD) Report No. 7746 Dated 08.08.2023 and considering the functional requirement of the building.

1. 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 and sound.

2. I further certify that:

i. The minimum grade of concrete is M30

ii. Dead and Live loads as per IS 875-Part-1 and Partp-2, Wind loads are as per IS 875-Part-3, Seismic Loads as per IS 1893-2016 for Zone -2 and the soil pressures/SBC for the building foundation design and drawings have been considered as per the geotechnical investigation reports. The building is designed as per relevant earthquake resistant codes and fire safety norms.

iii. The design and analysis have been done using the code of practice for plain and reinforced concrete as per IS 456.

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

Place Chennai
Date 31.05.2025

AMARNATH. R. BORAIAH, M.Tech
Registered Structural Engineering Grade-1(RSE)
Reg: No. TVLR/RSE/Gr-1/2023/02/004
#17,C-Block, R.V. Nagar, Ashoknagar,
Chennai-83. Ph:9731303187
Stamp and Signature

Encl.: Structural Design Calculation

Survey No. 69/9 D1A1 &70/2A1 East coast road, Kanathur Reddykuppam Village, Thiruporur Taluk, Chengalpet District Residential DEVELOPMENT

STRUCTURAL DESIGN BRIEF REPORT

CLIENT : SIDHARTH FOUNDATIONS & HOUSING LTD

PROJECT : SIDHARTH BLISS

ARCHITECT:

DESIGN TRANSCEND
4th Floor, PR -1, Bootstart Co - Working Rishab
Arcade, Sanjay Nagar Main Rd, Raj Mahal Vilas 2nd Stage
Bengaluru - 560094

STRUCTURAL CONSULTANT:

VISION STRUCTURAL DESIGN AID
72, 3rd Floor, 50 Feet Road,
Hanumantha Nagar, Bangalore –560019.
Phone: 080 – 26615806, E-mail: amarnath@visda.co.in

ISSUE RECORD

DATE	ISSUE	PREPARED	CHECKED	REVISION
05-08-2024	R0	ROHAN	AMAR	PRELIMINARY

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AMARNATH. R. BORAIAH M.Tech
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A.0 INTRODUCTION

M/s Sidharth Foundations And Housing Ltd , *have* proposed the construction of a Residential Stilt +5 building at,

Survey No . 69/9 D1A1 &70/2A1 East coast road Kanathur Reddykuppam Village, Thiruporur Taluk, Chengalpet District HOUSING DEVELOPMENT

M/s Proposed Construction of Siddhartha bliss Residential (Stilt+5) Residential Buildings DESIGN TRANSCEND 4th Floor, PR -1, Boot start Co – Working Rishab Arcade, Sanjay Nagar Main Rd, Raj Mahal Vilas 2nd Stage **Bengaluru – 560094,** Architects for the project and the Structural Engineering service is provided by M/s VISION STRUCTURAL DESIGN AID, Bangalore. The approximate built up area of the building is about **1, 33,971 SQFT.**

The proposed residential building consists of 3 block in which each block has the following:

Stilt floor + 05 floors + Terrace and Above Terrace floor.

The criteria furnished in this document shall govern the design of civil and structural works of the proposed project. This document covers the general description of the applicable design codes and standards, characteristics of the building, specific building materials, design criteria, design loads and combination, design methodology adopted for the structures.

A.1 STATUTORY REQUIREMENTS:

The design of structural and other building services will comply with the following requirements:

- National Building Code
- The Building Regulations Act
- The Environmental Protection Act in liaison with the Environmental Agency.
- Fire prevention and detection in compliance with the local Fire Regulation.
- ASHRAE.
- Any other applicable laws as advised by the client.
- Bureau of Indian Standard Codes.

B.0 DESIGN STANDARDS:

Specific applicable codes and standards will be identified and adopted in the design philosophies as appropriate to the structural elements. The latest editions of the Codes and Standards will be used in designs. All design work shall be based on Indian Standards and Codes with latest revision, with amendments if any, as on date.

Loads:

IS: 875(PART-1)-1987 Code of Practice for Design Loads (Other than earthquake) for Buildings and structure.
PART-1 DEAD LOADS - Unit Weights of Building Materials and Stored Materials.
PART-2 - IMPOSED LOADS
PART-4 - SNOW LOADS.

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IS: 432(part 2) Specification for mild steel and medium tensile steel bars and hard-drawn steel wire for concrete reinforcement

IS: 8112 43 grade Ordinary Portland cement specification.

IS: 6313(part II) Standards for anti-termite treatment

IS: 2751 Code of practice for welding of mild steel bars used for reinforced concrete construction

IS: 1346 Code of Practice for water proofing of roofs with bitumen felts

IS: 1742 Code of Practice for building drainage

IS: 1905 Code of Practice for structural use of unreinforced masonry

IS: 2470 Code of Practice for installation of septic tank:

(Part 1) Design criteria and construction

(Part 2) Secondary treatment and disposal of septic tank effluent

IS: 3067 Code of Practice for general design details and preparatory works for damp proofing and water proofing of buildings

SP: 6 Handbook for structural engineers (all parts)

SP: 7 National Building Code of India

SP: 16 Design Aids for reinforced concrete to IS: 456-1978

SP: 20 Handbook on masonry design and construction

SP: 22 Explanatory handbooks on codes for earthquake engineering (IS: 1983-1975 and IS: 4326-1976)

SP: 24 Explanatory handbook on Indian Standard code of Practice for plain and reinforced concrete

SP: 25 Handbook on causes and prevention of cracks in buildings

SP: 32 Handbook on functional requirements of industrial buildings

SP: 34 Handbook of concrete reinforcement and detailing (SCIP)

C.0 DESIGN DATA

C.1.1 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.

Materials	Unit weight kN/m²
Steel	78.50
Plain Concrete	24.00
Reinforced Concrete	25.00
Brickwork	20.00
Solid Block work	20.00
Cement plaster	17.82
Roof treatment (7 course bituminous)	1.25
Floor finish	24.00
Aerated block masonry	8.65
Soil	18.00
Water	10.00
Glass	0.167

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C.1.2 LIVE LOADS

The imposed loads shall be calculated in accordance with IS: 875(Part-2)-1987 based on Occupancy Classification. For multiple occupancies of use in the building, it shall be referred with the other appropriate comparable occupancy classification as per Table.1 of IS 875(Part-2)-1987.

1. Living rooms, Dining rooms	:	2.0	kN / sq.m
2. Bed rooms	:	2.0	kN / sq.m
3. Kitchen	:	2.0	kN / sq.m
4. Toilets	:	2.0	kN / sq.m
5. Store rooms	:	3.0	kN / sq.m
6. Foyer	:	3.0	kN / sq.m
7. Balconies	:	3.0	kN / sq.m
8. Corridors	:	3.0	kN / sq.m
9. Staircases	:	3.0	kN / sq.m
10. Passages	:	3.0	kN / sq.m
11. Lobbies	:	3.0	kN / sq.m
12. Parking Areas	:	5.0	kN / sq.m
13. STP Pump room	:	5.0	kN / sq.m
14. Generator room	:	5.0	kN / sq.m
15. Lumber room	:	5.0	kN / sq.m
16. Gymnasium	:	5.0	kN / sq.m
17. Terraces	:	3.0	kN / sq.m

C.1.3 SUPER DEAD LOADS

The super dead loads (SDL) are considered to have floor finishes, plastering, in addition with the toilet and balcony sunken slabs.

1. Floor finishes	:	1 kn / sq mt (50mm thk, Density 20kN/m^3)
2. Ceiling plastering (15mm)	:	0.3 kn / sq mt
3. Sunken loads (50mm)	:	1 kn / sq mt

Sunk Considered is 50mm and the filling material density should not exceed 20KN/cum.

The floor finishes at the parking levels are considered to be 100 mm Thick with the density of the flooring material Considered is 20 KN/ cum and SDL works out to be 2 kN / Sq.mt.

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C.1.4 WIND LOADS

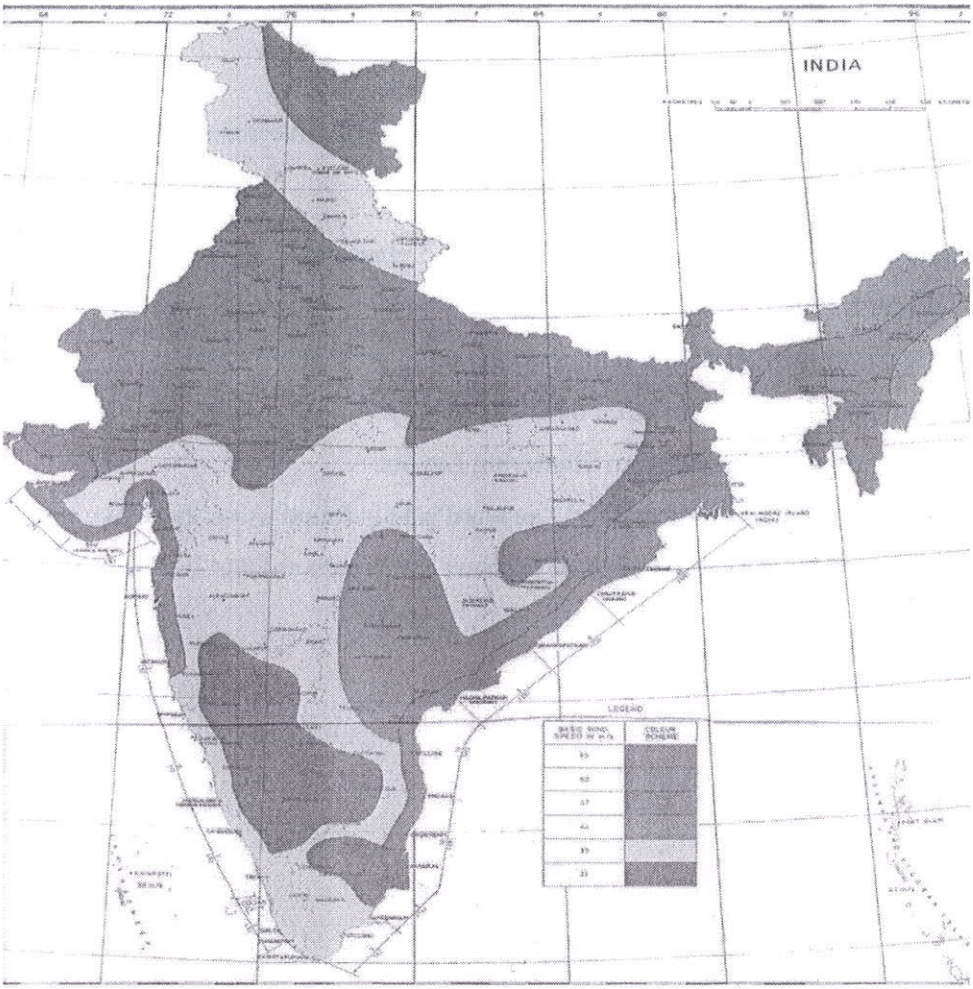


Fig.2 Basic Wind Speed

The proposed project is located at, Vellore in Tamilnadu and the wind loads as per IS 875 part 3-2015 has been considered. The following parameters are considered for the calculation of wind pressure for the proposed residential apartment,

Basic Wind Speed (Vb)	:	50 m/sec
Risk Coefficient (k1)	:	1.0
Terrain, category and class	:	Category 2
Size factor (k2) Structure)	:	1.205 (Calculated by considering the actual height of the
Topography factor (k3)	:	1.0

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Importance Factor (k4) : 1.0

Design wind speed, Vz : *Vb x k1 x k2 x k3 x k4*

Design wind pressure, Pz : $0.6 \times Vz^2$

The external and internal pressure co-efficient shall be as per respective clause of IS: 875 (Part 3)

C.1.5 DYNAMIC WIND ANALYSIS

Dynamic wind analysis check as per IS 875-part (III) -2015 clause-9.1,

H = 18.3 m, L = 64.05 m, and B = 21.51 m

1. Structure height to minimum lateral dimensions ratio: 18.3/21.51 =0.85
2. Length of the structure to width ratio: 64.05/21.51= 2.97
3. The Above values are obtained from Shuttering Layout.

The Co-efficient of Pressure for Windward and Lee ward side is found using the above ratios by referring to IS 875-part (III). The Co-efficient of Pressure for Windward and Lee ward side is found to be:

1. X-Direction: Angle = 0^0
   Windward (Cp) = 0.7
   Lee ward (Cp) = 0.3

2. In Y- Direction Angle = 90^0
   Windward (Cp) = 0.7
   Lee ward (Cp) = 0.1

C.1.5 SEISMIC FORCES

Vellore, Tamilnadu comes under **Seismic zone III** as per **IS 1893-2016** (Part 1) (Sixth Revision) and has the following factors to be considered for designs:

Seismic Zone	: III
Seismic Zone factor, Z	: 0.16 (As per Table 3-IS: 1893-2016)
Importance factor, I	: 1.2 (As per Table 8-IS: 1893-2016)
Response reduction Factor, R	: 4 (Buildings with ductile RC Structural walls, As per Table 7 – IS 1893-2016)

Time Period is being calculated by considering RC structural walls, i.e. as per Clause 7.6.2 of IS 1893-2016.

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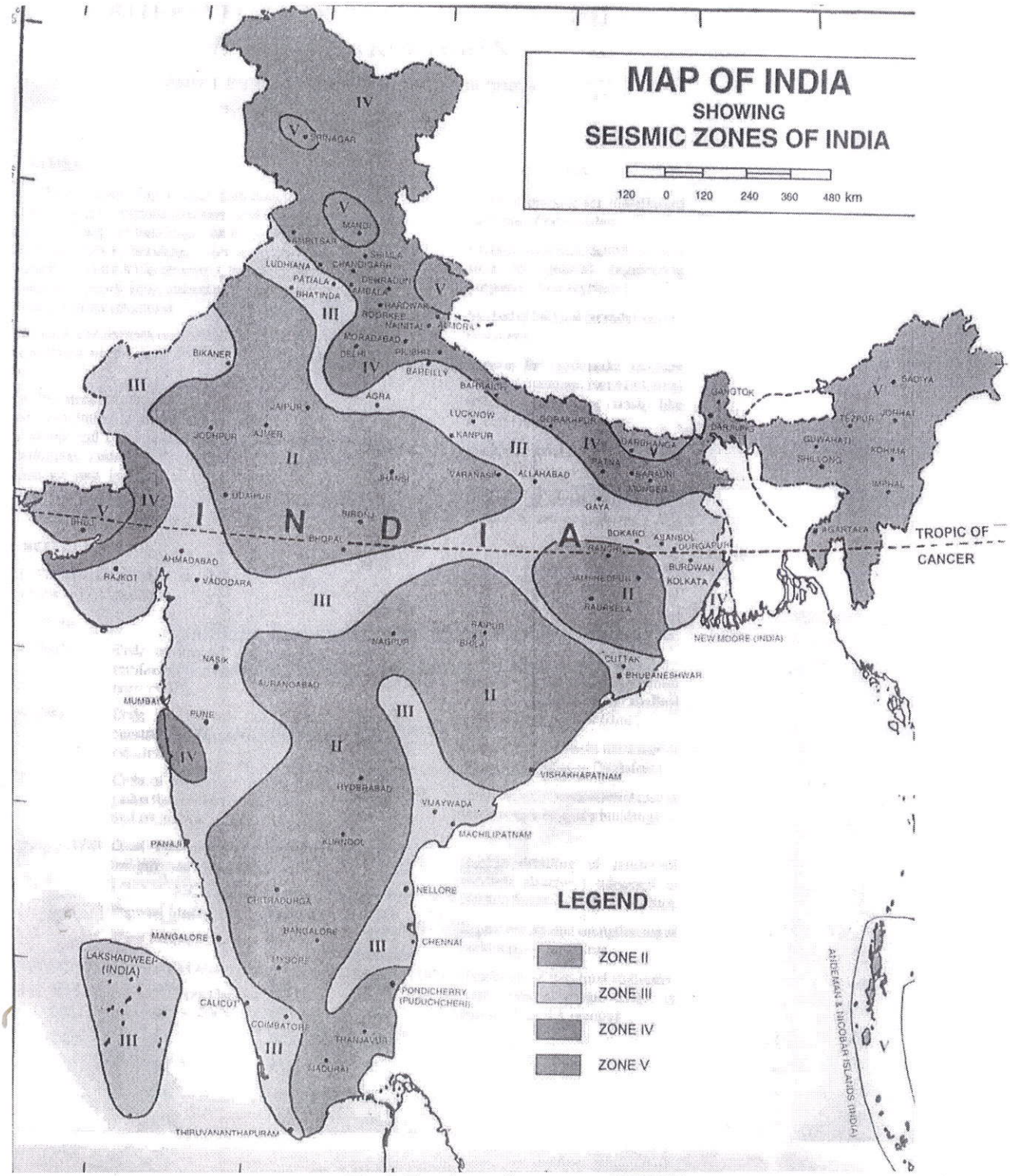


Fig.3 Earth quake zones of INDIA

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C.1.6 Temperature Loads

Temperature Load Calculation:

Average Annual Minimum Temperature: 20°

Average Annual Maximum Temperature: 40°
(Considered Avg annual Min / Max Temp)
Design Temperature Differential: ((40 -20) x 2/3) x 0.5 = 6.7°

Temperature variation has been considered as 2/3 of the average annual variation and designed for 50% of the Temperature variation

C.2 ENVIRONMENTAL CONDITIONS, CORROSION AND FIRE PROTECTION FOR CONCRETE AND STRUCTURAL STEEL

C.2.1

- **Environment** : Moderate for all structures other than water retaining structure
- **Exposure conditions** : Concrete surfaces protected against weather or aggressive condition except those situated in coastal area.
- **Fire protection** : Thickness of the structural elements as per cl.21.0 of IS456:2000

Fire Resistance h	*Minimum Beam Width b*	*Rib Width of Slabs b_w*	*Minimum Thickness of Floors D*	*Column Dimension (b or D)*			*Minimum Wall Thickness*		
				Fully Exposed	50% Exposed	One Face Exposed	$p<0.4\%$	$0.4\% \le p \le 1\%$	$p>1\%$
	mm	mm	mm	mm	mm	mm	mm	mm	mm
0.5	200	125	75	150	125	100	150	100	100
1	200	125	95	200	160	120	150	120	100
1.5	200	125	110	250	200	140	175	140	100
2	200	125	125	300	200	160	–	160	100
3	240	150	150	400	300	200	–	200	150
4	280	175	170	450	350	240	–	240	180

NOTES

1 These minimum dimensions relate specifically to the covers given in Table 16A.

2 p is the percentage of steel reinforcement.

FIG. 1 MINIMUM DIMENSIONS OF REINFORCED CONCRETE MEMBERS FOR FIRE RESISTANCE

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- **Minimum grade of concrete** : Severe exposure – M30
- **Nominal cover to reinforcement** not : For Sever Exposure Nominal cover should be less than 30 mm.

Type of Structural element	Min. Cover to reinforcement
Retaining wall	40 mm
Footing	50 mm
Raft	50 mm

For 2.0 hr Fire Resistance Beams, Slabs and Columns Shall have the min Cover as Specified below:

Ref: (Table 16 A of IS456:2000)

Type of Structural element	Min. Cover to reinforcement
Beam	30 mm
Slabs	25mm
Columns	40 mm
RC Walls	20 mm

C.3 TEMPERATURE AND SHRINKAGE EFFECT:

Horizontal floor displacement due to differential temperatures and shrinkage is of importance in long concrete buildings. It can be taken care of by either providing expansion joints at an appropriate spacing or designing structural members for the additional moments caused by the temperature and shrinkage effects.

C.3.1 TEMPERATURE LOADS:

The effect of temperature will be considered wherever applicable in accordance with relevant Indian Codes. The coefficient for thermal expansion and contraction will be in accordance with IS: 456 for concrete.

C.4 EXCEPTIONAL LOADS:

- Loads due to the following catastrophe scenarios are not considered in the design.
- Exceptional loads due to terrorist attacks (Explosions)
- Accidental loads (Falling of aircraft on the building)
- Accidental hitting of vehicle on the façade
- Snow Load

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D.0 MATERIALS:

Materials specified will confirm to the latest edition of the relevant Indian Standard or other accepted standard. Specifications for materials will include sampling and testing as stipulated in the design standards. Detailed material specifications will be included in the Technical Specification.

D.1 CONCRETE:

- Unless otherwise specified all structural concrete shall have cube crushing strength of minimum 30 N/sq.mm or greater (M30) at 28 days.
- Plain cement concrete shall have cube crushing strength of 10 N/sq.mm (M10) at 28 days.

D.1.1 CONCRETE MIX

Concrete Item	Grade
Raft	M30
RC Walls	M30
Columns	M30
Girder Beams/ Conventional Beams	M40/M30
Slabs/Staircase/Ramp/Tank	M30

The grade of concrete for structural elements varies from M40 to M30 based on the number of floors contained in that block of the building.

D.2 REINFORCEMENT STEEL:

All reinforcement shall confirm to IS: 1786 – 2008 having minimum yield strength of 550 N/sq-mm.

E.0 STRUCTURAL CONCEPT

The proposed Residential multi storied building, with Structural Wall system that contains three blocks in which each block has the following number of floors,

Ground floor + 05 Upper floors + Terrace and Above Terrace floors.
The proposed building is of the following structural concept

- RC Structural wall system.
- Girder level Slabs/ beams are being provided at Level to support the planted walls going above.
- Staircases are provided with mid-landing between the floors as per architectural layout.

Analysis and design of the structure have been carried out using commercially available software packages like Etabs and Safe.

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E.1 STRUCTURAL CONFIGURATION

FRAMING SYSTEM

RC structural wall system as per IS 16700- 2017 consisting of

1. RC walls, Columns, Beams, and Slabs.
2. Detailing is done as per SP 34 & IS 13920 -2016 for all vertical and frame members

	DESCRIPTION	BUILDING SYSTEM
a)	Structural system	RC Structural Frame System
b)	Plinth beams	Varies
c)	Slab thickness	125mm, 150mm VARIES.
d)	Girder Beams	varies
e)	No. of slabs	Ground floor + 5 Upper floors + Terrace and Above Terrace floors.

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STRUCTURAL ANALYSIS AND DESIGN:

E.2.1. GENERAL

- The structural analysis is carried out by finite element method using the commercially available software tool for the load combinations as per standards.
- Forces and moments from the 3D analysis output for the worst combinations are used for the design of the structure.
- The structure is analyzed for specific loads like dead load, live load, wind and seismic loads and for the load combinations as given in the relevant codes.
- The structure shall be designed according to the Limit State Method as specified in IS: 456 – 2000.
- Construction sequence analysis is also carried out to obtain proper axial load transfer in the transfer beams at Plinth level.

E.2.2. FOUNDATION

Depends as per soil report.

E.3 DEFLECTION LIMITS:

For Reinforced concrete works:

- Limiting values of deflection (Short and Long term) as per **cl. 35.3and 23.2 of IS: 456-2000** is followed in the design.
- Limiting value for short term deflection is considered as span/250 and for the long term deflection is considered as span/350 or 20mm whichever less as per IS 456 – 2000.
- The vertical deflection limits may generally be assumed to be satisfied provided that the span to depth ratios is not greater than the values obtained as below:

  Continuous..... 26
  Simply Supported.....20
  Cantilever.....07
- As per IS1893 (Part1): 2016, Story drift in any storey due to minimum specified design seismic lateral force shall not exceed 0.004 times the storey height.
- Lateral sway due to wind load should not exceed H/500 (H is the total height of structure).

E.4 CRACKING LIMITS

- Limiting values of crack width as per cl. 35.3 of IS: 456-2000 is followed in the design.
- In general for slabs and beams, the crack width is limited to 0.3mm.
- For water retaining structures, the water retaining portion of the structure will be designed as uncracked section.

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SI NO	STRUCTURAL ELEMENT	UN-FACTORED LOADS	FACTORED LOADS
1	SLABS	$0.35I_g$	$0.25I_g$
2	BEAMS	$0.7I_g$	$0.35I_g$
3	COLUMNS	$0.9I_g$	$0.7I_g$
4	WALLS	$0.9I_g$	$0.7I_g$

E.5 LOAD COMBINATIONS

Load Combination	Limit State of Collapse			Limit State of Serviceability		
	DL	LL	WL/EL/TL	DL	LL	WL/EL/TL
DL +LL	1.5	1.5	—	1	1	—
DL +/- WL+TL	1.5	—	1.5	1	—	1
DL +/- EL+TL	1.5	—	1.5	1	—	1
DL +/- WL	0.9*	—	1.5	1	—	1
DL +/- EL	0.9*	—	1.5	1	—	1
DL+LL+/-WL+TL	1.2	1.2	1.2	1	0.8	1
DL+LL+/-EL+TL	1.2	1.2	1.2	1	0.8	1

Other than the above mentioned combinations, some more combinations (*this value is to be considered when stability against overturning and stress reversal is critical.)

The various loads are combined in accordance with the stipulations in IS: 875 (Part 5)-1987; whichever combination produces the most unfavorable effect in the building foundation or structural member concerned may be adopted.

Where DL/LL/WL/EL/TL denotes,

DL- Dead Load- Includes Self Weight of Structure and Super Imposed Load (SDL)

LL- Live Load

WL- Wind Load

EL- Earthquake Load

TL- Temperature Load

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Wind load and Earthquake loads are considered for both x & y directions. Whenever imposed load is combined with earthquake load, the appropriate part of imposed load as specified in IS: 1893-2016 / Cl. 7.3.1 of seismic code will be used both for evaluating earthquake effect and for combined load effects used in such combination.

G. GEOTECHNICAL RECOMMENDATIONS:

AS PER SOIL REPORT, The area explored has got top soil of 0.50M is non-uniform. The underlying layers comprises of sand, soft to medium expansive sandy clay up to 10 to 11.5M. The layer below is clayey sand and disintegrated rock. The DR layer is very dense from 13.6 depth. No water table was met with in the bore holes at the time of exploration. The water table could however rise to about 2M below G.L during heavy rain. For the proposed structure shallow foundations are feasible only for unimportant structures like compound wall as indicated. Pile foundation is needed for regular structures with length of pile of 15M with capacities as given. Suggested precautions and piling method should be adopted while undertaking the construction.

Accordingly the pile capacities are given below

Pile dia D	Vertical Capacity T	Lateral Capacity T	Pull out Capacity T
45	63	6	Pull out capacity is 25% of vertical capacity
50	98	10	
60	141	14	

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A.0 INTRODUCTION

M/s sidharth, have proposed the construction of a Residentiai multi storied building at,

S. NOS 69/9 D1A1 &70/2A1 East coast road Kanathur Reddy kuppam village Thiruporur Taluk, Chengalpet District HOUSING DEVELOPMENT

M/s Proposed Construction of Siddhartha bliss Residential (S+5) Residential Buildings DESIGN TRANSCEND 4th Floor, PR -1, Bootstart Co - Working Rishab Arcade, Sanjay Nagar Main Rd, Raj Mahal Vilas 2nd Stage **Bengaluru – 560094,** Architects for the project and the Structural Engineering service is provided by M/s VISION STRUCTURAL DESIGN AID, Bangalore. The approximate built up area of the building is about **1, 33,971 SQFT.**

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- Bureau of Indian Standard Codes.

B.0 DESIGN STANDARDS:

Specific applicable codes and standards will be identified and adopted in the design philosophies as appropriate to the structural elements. The latest editions of the Codes and Standards will be used in designs. All design work shall be based on Indian Standards and Codes with latest revision, with amendments if any, as on date.

Loads:

IS: 875(PART-1)-1987 Code of Practice for Design Loads (Other than earthquake) for Buildings and structure.
PART-1 DEAD LOADS - Unit Weights of Building Materials and Stored Materials.
PART-2 - IMPOSED LOADS
PART-4 - SNOW LOADS.

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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

Verified RealEstate™

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.