



Your trusted partner for buying, selling, and managing property,
ensuring hassle-free service with 100% transparency.

3/350/2 Mettukuppam,
OMR Thoraipakkam,
Chennai, India

hello@verified.realestate

+91 9996 12 9996

Official Property Record

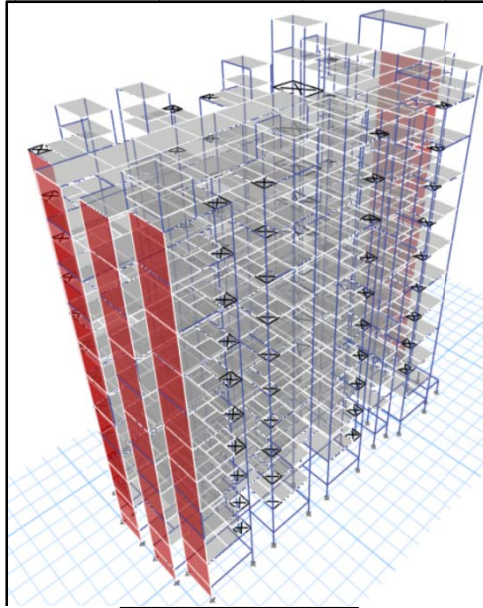
Digitally Verified Record - Powered by Verified  RealEstate™





TNUHDB - BARVA NAGAR Scheme

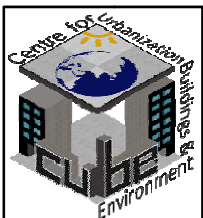
PROPOSED BUILDING PLAN FOR RECONSTRUCTION OF GROUPDEVELOPMENT WITH 01 BLOCKS OF STILT FLOOR+9 FLOORRESIDENTIAL BUILDING WITH 359 DWELLING UNITS AND ONEUNIT FOR REFUGE AREA TOTALLY 360 DWELLING UNITS AT KBDASAN SALAI, BARVA NAGAR IN R.S.NO.3760 PT IN MYLAPORE VILLAGE WITHIN THE LIMIT OF GREATER CHENNAI CORPORATION, CORPORATION DIVISION NO 123, ZONE XI.



**A Centre of Excellence of Govt of Tamil Nadu
Joint Initiative of IIT Madras &GoTN**

Table of Content

1. INTRODUCTION.	1
2. OBJECTIVE.	3
3. STRUCTURAL DESIGN BASIS.	4
4. ANALYSIS AND DESIGN.	15
5. REFERENCES	17
6. CONCLUSION.	18



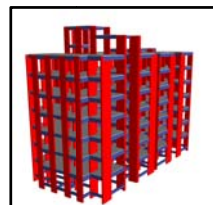
Project Name: BARVA NAGAR

Re-Construction of 360 DUs in 01 Block of (S+9)

Project ID: CUBE/B&C/2022-23/023/TNUHDB_BHN

Revision No.: R0

Submitted on:



**Structural Design Basis
Report**



STRUCTURAL DESIGN REPORT

RE-CONSTRUCTION OF GROUP DEVELOPMENT WITH 01 BLOCKS OF STILT FLOOR+9 FLOOR RESIDENTIAL BUILDING WITH 359 DWELLING UNITS AND ONE UNIT FOR REFUGE AREA TOTALLY 360 DWELLING UNITS AT KB DASAN SALAI, BARVA NAGAR IN R.S.NO.3760 PT IN MYLAPORE VILLAGE WITHIN THE LIMIT OF GREATER CHENNAI CORPORATION, CORPORATION DIVISION NO 123, ZONE XI.

1. INTRODUCTION.

Tamil Nadu Urban Habitat Development Board [TNUHDB] has entrusted Centre for Urbanization Buildings & Environment [CUBE] with the Structural Design & Engineering for Re-Construction of Group Development with 01 Blocks of Stilt Floor+9 Floor Residential Building with 359 Dwelling Units and One Unit for Refuge Area Totally 360 Dwelling Units at KB DasanSalai, Barva Nagar in R.S.No.3760 Pt in Mylapore Village within the limit of Greater Chennai Corporation, Corporation Division No 123, Zone XI.

This report outlines the concept approach of the structural design carried out with the basic parameters adopted and design assumptions considered towards the structural analysis catering the functional and structural requirements compatible with the architectural requirements of the building.

1.1. Project Details.

Table 1 Detail of the Project

S. No.	Description	Details
1	Scheme Name	BARVA NAGAR.
2	Location	Barva Nagar, Mylapore, Chennai 600 004.
3	Tenements	360
4	Use Purpose	Residential.

Project Name: BARVA NAGAR

Re-Construction of 360 DUs in 01 Block of (S+9)

Project ID: CUBE/B&C/2022-23/023/TNUHDB_BHN

Revision No.: R0

Submitted on:

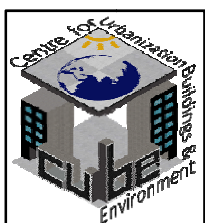
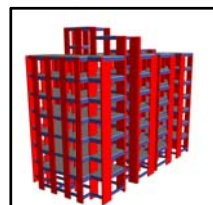




Table 1 Detail of the Project (Contd.)

S. No.	Description	Details
5	Total Built-up Area	14,634.31 m ²
6	Buildings & Configuration	RCC S+9 Framed Structures.
7	Architect	Planning Division, TNUHDB.
8	Soil Investigation Agency	Division of Soil Mechanics and Foundation Engineering, College of Engineering, Guindy Campus.
9	Preferred Construction Technology	RCC Framed Structure.
10	Superstructure	RCC Columns & Beams.
11	Sub Structure	Bored Cast in Site Pile Foundations.
12	Floor Details	(a) Stilt Floor. Two-wheeler parking spaces and two electrical meter room. (b) Typical floors [Level 1 to 9]. 40 Nos. dwelling units with hall, bedroom, kitchen, and toilets. (c) Terrace Floor. Four lift machine room, staircase headroom and 40 Nos. of domestic RCC overhead water tanks, 2 Nos of Sullage tank, 2 Nos. of Fire/Rain water tank. (d) Services. (i) One service lift and staircase at all floors. (ii) Open corridors and service shafts at all floors.

1.2. Site Location.

The proposed project site is located at KB DasanSalai, Barva Nagar in R.S.No.3760 Pt in Mylapore Village, site map of the same is depicted in Fig 1.



Project Name: BARVA NAGAR

Re-Construction of 360 DUs in 01 Block of (S+9)

Project ID: CUBE/B&C/2022-23/023/TNUHDB_BHN

Revision No.: R0

Submitted on:

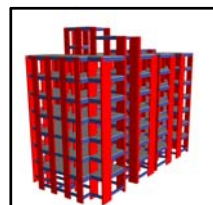




Fig 1: Site Map.

2. OBJECTIVE.

(a) The design and engineering have been carried out with an uncompromised safety, stability, strength, serviceability, and durability of the structures meet all codal provisions, economical, and supports easy / comfort living.

(b) Consequently, the following activities have been completed in lieu with the above objectives: -

- (i) Designing of structural elements in coordination with TNUHDB Engineers & the Architect.
- (ii) Structural analysis of foundation & superstructure with detailed design calculations in ETABS model.
- (iii) Detailed structural plans / drawings for the foundation and superstructures.
- (iv) Proof checking of structural design models & drawings from IIT Madras.

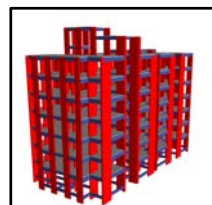
Project Name: BARVA NAGAR

Re-Construction of 360 DUs in 01 Block of (S+9)

Project ID: CUBE/B&C/2022-23/023/TNUHDB_BHN

Revision No.: R0

Submitted on:





3. STRUCTURAL DESIGN BASIS.

3.1. Structural Design.

The main considerations adopted for the design are: -

- Design has been carried out as Special Moment Resisting Frame System.
- The Wire Frame Model has been considered for designing duly correlated with the architect drawing.
- Based on market availability of materials like aggregates, reinforcement, masonry items etc. are considered in design calculation.

3.2. Structural System.

The structure has been analysed as Ductile RCC Framed Structure as per IS: 1893 (Part1) 2016. The structural system consists of wall-beam arrangements and suspended slabs supported over the beams. The structural system has been designed to resist the total design force in proportion to their lateral stiffness considering the interaction at each floor level. The structure has been designed and detailed as per IS13920 - 2016.

General.

The structure has been analysed as a 'Space Frame' and modelled using the latest version of the ETABS V19.0 software. SI units are followed for the entire analysis and design. The modelled space frame is analysed for Dead Loads (DL), Live Loads (LL), Wind Loads (WL), and Seismic Loads (EQ) and their combinations (as per IS: 875-2015, IS 1893 (Part1) 2016). The design is done for limit states of serviceability and collapse. All supports of the superstructure are considered as fixed joints for analysis. The effective length of the RC wall is considered as per the standard codes of practice. The structure is designed and detailed as per Indian Codes of Practice only.

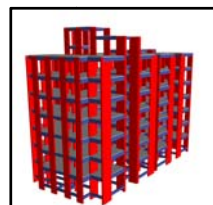
Project Name: BARVA NAGAR

Re-Construction of 360 DUs in 01 Block of (S+9)

Project ID: CUBE/B&C/2022-23/023/TNUHDB_BHN

Revision No.: R0

Submitted on:





Lateral Stability Analysis.

The design of the structural elements is carried out as per the analysis output results and Indian Standard codes. The slab acts as a rigid diaphragm which transfers the lateral load to the vertical element. The three-dimensional analysis using ETABS has been carried out for the lateral load analysis of the structure. The structure has been created as the 3D model and analysed for all vertical and horizontal loads mentioned in Section 3.5. The drifts, lateral displacements, base shear parameters, etc. have been verified and confirmed before the commencement of the design of the structural elements.

Lateral loads due to Wind and Earthquake forces have been calculated as indicated in the subsequent section.

3.3. Deflection Limits.

For reinforced concrete works, limiting values of deflection (short term and long term) as per Clause 35.3 of IS: 456-2000 is followed in the design.

Limiting value for short-term deflection are considered as follows: -

- (i) Lateral Deflection (Wind).
 - (aa) Overall deflection < Height, $H / 500$.
 - (ab) Storey Deflection < Storey height / 500.
- (ii) Lateral Deflection (Seismic).
 - (aa) Overall Deflection < $H / 250$.
 - (ab) Storey Drift < 0.004 times storey Height (Design Loads).
- (iii) Vertical Deflection of Beams and Slabs due to Gravity Loads.
 - (aa) Short Term Deflection < Span / 350 or 20mm, whichever is minimum.
 - (ab) Long Term Deflection < Span / 250.



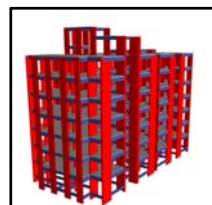
Project Name: BARVA NAGAR

Re-Construction of 360 DUs in 01 Block of (S+9)

Project ID: CUBE/B&C/2022-23/023/TNUHDB_BHN

Revision No.: R0

Submitted on:





3.4. Construction Materials.

3.4.1. Concrete Grade.

- (i) All RCC members like footings, columns, beams, slabs, staircases, ramps, shear walls, retaining walls, water tank walls, etc., are designed for **M30** Grade of concrete.
- (ii) All PCC are designed for **M10** mix unless otherwise specified.

3.4.2. Reinforcement Steel Grade.

- (i) All reinforcement steel grades are considered as **Fe 500D** as per IS 1786–2008 having a minimum yield strength of 500MPa.
- (ii) Minimum elongation / ductility of rebar considered is 14.5%.

3.5. Structural Loads.

3.5.1 Dead Load.

Dead loads include weight of all structural and architectural components. Density of the materials are calculated based on unit weight given in IS 875 (Part-1), as listed below: -

Table 2 Dead Load

Item	Load Intensity
Floor finishes for Residential	0.75kN/sqm
Density of Plain Concrete	24 kN/cum
Density of RCC	25 kN/cum
Aerated Block Masonry	7 kN/cum
Soil (Dry)	18 kN/cum
Soil (Wet)	21 kN/cum
Glass	28 kN/cum
Steel	78.5 kN/cum
Waterproofing on Terrace	0.5kN/sqm
Any other equipment loads(Solar Panel)	0.20 kN/sqm



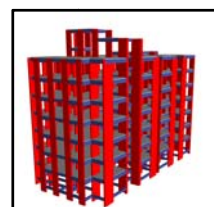
Project Name: BARVA NAGAR

Re-Construction of 360 DUs in 01 Block of (S+9)

Project ID: CUBE/B&C/2022-23/023/TNUHDB_BHN

Revision No.: R0

Submitted on:



Page 6 of 18

**Structural Design Basis
Report**



3.5.2 Live Load.

The superimposed loads calculated are in accordance with IS: 875 (Part - 2) based on Occupancy Classification, as follows: -

Table 3 Live Load

Space	Load Intensity
Bedroom, Hall, Kitchen, Bathroom and Toilet	2.00 kN/sqm
Balconies, Corridor, Staircase	3.00 kN/sqm
Lift Machine Room	10.00 kN/sqm (or as per actual, if more)
Terrace (accessible)	1.50 kN/sqm
Terrace (inaccessible)	0.75 kN/sqm
Water Tank	Ht.(m) × 10.00 kN/sqm
Refugee Area	5.00 kN/sqm
Live Load Reduction	As per IS 875

3.5.3 Super Imposed Dead Loads.

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

Table 4 Super Dead Load

Items	Load Intensity
8" thick wall	6.0 kN/m
4" thick wall	3.0 kN/m
Parapet wall	2.5 kN/m
Floor finishes	1.0kN / sqm
Sunken Load	5.0kN / sqm



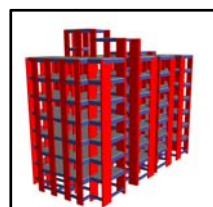
Project Name: BARVA NAGAR

Re-Construction of 360 DUs in 01 Block of (S+9)

Project ID: CUBE/B&C/2022-23/023/TNUHDB_BHN

Revision No.: R0

Submitted on:





3.5.5 Wind Load.

The wind pressure has been calculated in accordance with IS 875 (Part-3): 2015. The key inputs considered are as follows: -

Table 5 Wind load

Item		Calculation	Clause
Basic Wind Speed for Chennai		$V_b = 50 \text{ m/s}$	6.2
Risk Coefficient <i>Corresponds to 50 years mean probable design life of structure</i>		$k_1 = 1.00$	6.3.1
Terrain Roughness and Height Factor <i>Category 2</i>		$k_2 = 1.13$	6.3.2
Topography Factor		$k_3 = 1.00$	6.3.3
Importance Factor for the Cyclonic Region		$k_4 = 1.00$	6.3.4
Design Wind speed, V_z , at height z		$V_z = 50 \times 1.00 \times 1.13 \times 1.0 \times 1.00$ $= 56.5 \text{ m/s}$	6.3
Wind Pressure		$P_z = 0.6 V_z^2$ $= 0.6 \times 56.5 \times 56.5 = 1915.15$ N/sqm	
For 0 degree	Windward coefficient (Cpe)	0.70	7.3.3.1
	Leeward coefficient (Cpe)	-0.40	7.3.3.1
For 90 degrees	Windward coefficient (Cpe)	0.80	7.3.3.1
	Leeward coefficient (Cpe)	-0.10	7.3.3.1

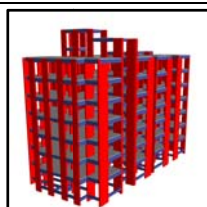
Project Name: BARVA NAGAR

Re-Construction of 360 DUs in 01 Block of (S+9)

Project ID: CUBE/B&C/2022-23/023/TNUHDB_BHN

Revision No.: R0

Submitted on:



Page 8 of 18

Structural Design Basis Report





3.5.5 Earthquake Load.

(i) Seismic Design Parameters.

Chennai is classified under Seismic Zone III as per IS 1893 (Part 1): 2016, and hence loading due to earthquake has been assessed accordingly. The key inputs considered are as follows: -

Table 6 Seismic Load

Item	Calculation	Clause
Zone Factor	$Z = 0.16$	6.4.2
Importance Factor	$I = 1.2$	7.2.3
Response Reduction Factor (SMRF) <i>Capacity design and ductile detailing shall be performed</i>	$R = 5$	7.2.6
Design horizontal seismic coefficient	$A_h = Z/2 \times (S_a/g) \times (I/R)$	6.4.2
Design seismic base shear <i>To be determined in two principal plan directions</i>	$V_b = A_h \times W$	7.6.1
Seismic weight	$W = DL + 0.25LL$	7.3.1
Fundamental Time Period	$T_a = (0.075 \times h^{0.75} / \sqrt{A_w}) \geq (0.09 \text{ h } / \sqrt{d})$ <i>where,</i> A_w - Total effective area of walls h = height of the building (m); d = base dimension of the building at plinth level in the direction of the earthquake (m)	7.6.2



Project Name: BARVA NAGAR

Re-Construction of 360 DUs in 01 Block of (S+9)

Project ID: CUBE/B&C/2022-23/023/TNUHDB_BHN

Revision No.: R0

Submitted on:



Page 9 of 18

Structural Design Basis Report



3.6 Method of Analysis as per code.

Aspects of structural analysis has been proceeded for structural design shall include the following:

- (i) Chennai falls under Seismic Zone-III and accordingly Dynamic analysis and suspicious structural design has been carried out as per clause 7.7.1 of IS 1893-2016. The Dynamic analysis has been carried using Response Spectrum method.
- (ii) Design base shear obtained from analysis has been corrected for static base shear with the fundamental time period T_a .
- (iii) Percentage of imposed load considered as analysis for calculation of seismic weight is as per clause 7.3.1 of IS 1893-2016.
- (iv) Design Eccentricity for the Response Spectrum has been considered as per clause 7.8.2.
- (v) All the RC Walls, which are designed and found on a properly designed foundations and are continuous over full height of building as per clause 7.10.2. of IS 1893-2016.
- (vi) For RC Wall, Strip Raft foundation has been considered with adequate number of piles as per recommendation of geotechnical report.
- (vii) Plan density of RC structural walls provided are within the codal provision as per clause 7.10.4. of IS 1893-2016.
- (viii) Torsional irregularity has been checked as per IS 1893 (Part 1) – 2016



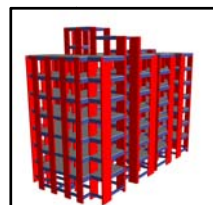
Project Name: BARVA NAGAR

Re-Construction of 360 DUs in 01 Block of (S+9)

Project ID: CUBE/B&C/2022-23/023/TNUHDB_BHN

Revision No.: R0

Submitted on:



Page 10 of 18

**Structural Design Basis
Report**



3.7 Load Combinations.

Structural analysis has been carried out be based on the following load combinations:

Table 7 Combination of CollapseLoad

Combo	Limit State of Collapse									
	DL	LL	ELX	ELY	WLX	WLY	RSM X +esi	RSMX- esi	RSMY +esi	RSMY- esi
DL+LL	1.5	1.5								
DL+LL+EL	1.5	1.5	±1.0							
DL+LL+EL	1.5	1.5		±1.0						
DL+LL+RSM	1.5	1.5					1.0			
DL+LL+RSM	1.5	1.5						1.0		
DL+LL+RSM	1.5	1.5							1.0	
DL+LL+RSM	1.5	1.5								1.0
DL+LL +EL	1.2	1.2	±1.2							
DL+LL +EL	1.2	1.2		±1.2						
DL+LL +WL	1.2	1.2			±1.2					
DL+LL +WL	1.2	1.2				±1.2				
DL+LL +WL	1.5	1.5			±1.0					
DL+LL +WL	1.5	1.5				±1.0				
DL+EL	1.5		±1.5							
DL+EL	1.5			±1.5						
DL+WL	1.5				±1.5					
DL+WL	1.5					±1.5				
DL+EL	0.9		±1.5							
DL+EL	0.9			±1.5						

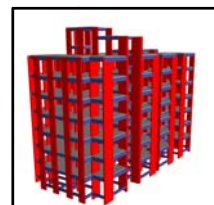




Table 7 Combination of Collapse Load(Contd.)

Combo	Limit State of Collapse									
	DL	LL	ELX	ELY	WLX	WLY	RSM X +esi	RSM X-esi	RSM Y +esi	RSM Y-esi
DL+WL	0.9				±1.5					
DL+WL	0.9					±1.5				
DL+LL+RSM	1.2	1.2					1.2			
DL+LL+RSM	1.2	1.2						1.2		
DL+LL+RSM	1.2	1.2							1.2	
DL+LL+RSM	1.2	1.2								1.2
DL+RSM	1.5						1.5			
DL+RSM	1.5							1.5		
DL+RSM	1.5								1.5	
DL+RSM	1.5									1.5
DL+RSM	0.9						1.5			
DL+RSM	0.9							1.5		
DL+RSM	0.9								1.5	
DL+RSM	0.9									1.5

Table 8 Combination of Serviceability Load

Combo	Limit State of Serviceability									
	DL	LL	ELX	ELY	WL X	WL Y	RSM X+esi	RSM X-esi	RSM Y+esi	RSM Y-esi
DL+LL	1	1								
DL+WL	1				±1.0					
DL+WL	1					±1.0				
DL+LL +WL	1	0.8			±0.8					



Project Name: BARVA NAGAR

Re-Construction of 360 DUs in 01 Block of (S+9)

Project ID: CUBE/B&C/2022-23/023/TNUHDB_BHN

Revision No.: R0

Submitted on:

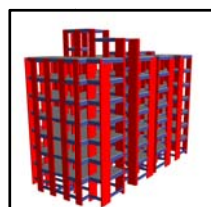




Table 8 Combination of Serviceability Load(Contd.)

Combo	Limit State of Serviceability									
	DL	LL	EL X	EL Y	WL X	WL Y	RSM X+esi	RSM X-esi	RSM Y+esi	RSM Y-esi
DL+LL+WL	1	0.8				±0.8				
DL+LL+EL	1	0.8	±0.8							
DL+LL+EL	1	0.8		±0.8						
DL+EL	1		±1							
DL+EL	1			±1						
DL+LL+RSM	1	0.8					0.8			
DL+LL+RSM	1	0.8						0.8		
DL+LL+RSM	1	0.8							0.8	
DL+LL+RSM	1	0.8								0.8
DL+RSM	1						1			
DL+RSM	1							1		
DL+RSM	1								1	
DL+RSM	1									1

where,

DL : Dead Load

LL : Live Load

WL : Wind Load

RSM : Response Spectrum

EL : Earthquake Load applied in orthogonal directions X (ELX) and Y (ELY)



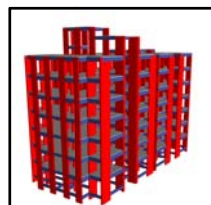
Project Name: BARVA NAGAR

Re-Construction of 360 DUs in 01 Block of (S+9)

Project ID: CUBE/B&C/2022-23/023/TNUHDB_BHN

Revision No.: R0

Submitted on:





3.8 Environmental Conditions & Fire Protection.

(a) Environment Exposure Conditions.

Severe for internal elements and very severe for external elements (exposed to coastal environment). Classification of members based on exposure as tabulated as under: -

Table 9 Environment Exposure

Exposure	Classification
Members in contact with the ground	Very Severe
Members in interior environments	Severe
Members in above-ground exterior environments	Severe

(b) Fire Protection.

(i) Type of Construction: Type-2 fire rating. Minimum concrete cover and member dimensions required for fire rating as per Cl.21.1, 21.2 in IS456-2000 and NBC-2016.

Element / Location	Minimum Cover (mm)	Minimum Thickness (mm)	Minimum strength of concrete - fck (N/mm ²)
Concrete cast against and permanently exposed to earth	75	200	30
Concrete exposed to weather and not in contact with ground			
a) RC slabs	25	125	30
b) RC beams	30	200	30
c) RC columns	40	300	30

(ii) The Structural steel members encased by concrete/ cement-based board and exposed areas painted with fire retardant/ intumescent paint are



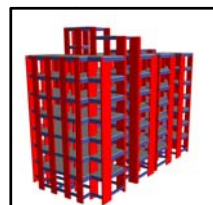
Project Name: BARVA NAGAR

Re-Construction of 360 DUs in 01 Block of (S+9)

Project ID: CUBE/B&C/2022-23/023/TNUHDB_BHN

Revision No.: R0

Submitted on:



Page 14 of 18

Structural Design Basis Report



Structural Member	Fire resistance in hour
Beam	2
slab	2
RC wall	2

3.9 Geotechnical Consideration.

(a) Based on the Geotechnical Investigation Report, the following parameters has been considered in the design: -

- (i) Type of foundation = Bored Cast-In-Situ Pile
- (ii) Depth of foundation = 24.0 M
- (iii) Depth of water table = 2.0 M
- (iv) Existing ground level = 0.0 M
- (v) Bearing capacity as per soil report: -

Diameter of Pile (mm)	Recommended Safe Load carrying capacity of Bored Cast-In-Situ Piles, (kN)	Recommended Lateral Load carrying capacity for 5mm deflection, (kN)	Depth of fixity from bore-hole level, (m)
450	800	48.30	4.09
500	1000	57.60	4.44
600	1400	77.00	5.14
700	1800	98.20	5.82
900	2900	147.20	7.11

4. ANALYSIS AND DESIGN.

The structural analysis for the sub-structure and super structure of the Residential Building for Re-Construction of Group Development with 01 Blocks of Stilt Floor+9 Floor Residential Building with 359 Dwelling Units and One Unit for Refuge Area Totally 360 Dwelling Units at KB Dasan Salai, Barva Nagar in R.S.No.3760 Pt in Mylapore Village within the limit of Greater Chennai Corporation,



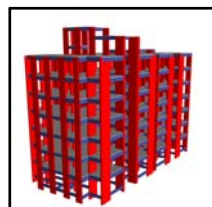
Project Name: BARVA NAGAR

Re-Construction of 360 DUs in 01 Block of (S+9)

Project ID: CUBE/B&C/2022-23/023/TNUHDB_BHN

Revision No.: R0

Submitted on:



Page 15 of 18

Structural Design Basis Report



Corporation Division No 123, Zone XI and the design and detailing of the structure have been carried out as per the following considerations: -

- (a) Dynamic Method is used for the seismic analysis to have the seismic effect for entire building.
- (b) Based on the Seismic analysis and Wind analysis for higher value of load combinations, the design and detailing are carried out for the structural elements like RC Pile, Pile cap, RC walls, Plinth Beams, Floor Beams, Roof Beam, Lift room and Staircase room.
- (c) Pile design is carried as per IS Code 2911 (Part 1/Sec 1): 2010. A minimum factor of safety is adopted by the Soil Consultant as per clause 6.8.2.
- (d) All the Pile cap/Strap Beam are analysed in ETabs model for the critical load combination. The percentage of reinforcement obtained from ETabs model output has been adopted for top and bottom reinforcement of pile caps/strip Beam.
- (e) Superstructures are analysed in the ETABS 19.0 VERSION. The RC wall, Plinth beam, Floor beam, Roof beam, Lift room beam, and Staircase beam of reinforcements are designed and detailed as per IS Code 13920 – 2016.
- (f) One way slab and Two-way slab have been designed and detailed as per IS 875 and SP34.
- (g) Staircases are designed and detailed as dog-legged staircase.
- (h) Lift headroom and Stair headroom are designed and detailed as corresponding loads.
- (i) Water tanks are designed and detailed for domestic purpose as per IS: 3370.



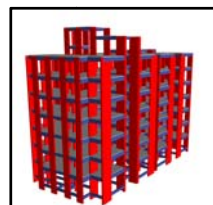
Project Name: BARVA NAGAR

Re-Construction of 360 DUs in 01 Block of (S+9)

Project ID: CUBE/B&C/2022-23/023/TNUHDB_BHN

Revision No.: R0

Submitted on:



Page 16 of 18

**Structural Design Basis
Report**

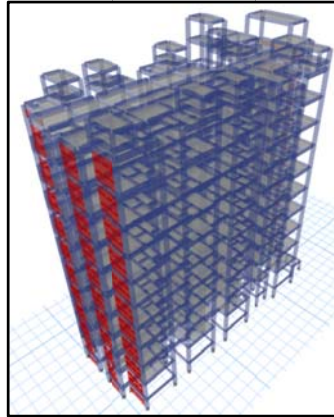


Fig 2: 3D Model - Rendered View

5. REFERENCES.

- | | |
|--|--|
| 1. IS: 456- 2000 | Plain and Reinforced Concrete (Code of practice). |
| 2. IS: 800-2007 | Code of Practice for general Construction in Steel. |
| 3. IS: 875 – 2015 (Part I to III & Part V) | Code and Practice for Design Loads (Other than earthquake) for Building and Structures like Dead, Imposed, Wind and other Loads. |
| 4. IS :1786 | Specification for High Strength Deformed Steel bars and wires for concrete reinforcement. |
| 5. IS: 1893-2016 | Criteria for Earthquake resistant design of Structures. |
| 6. IS: 1904 | Code and Practice for design and Construction of Foundations in Soils. |
| 7. IS: 1905 | Code and Practice for structural use of unreinforced masonry. |
| 8. IS 2062 - 1999 | Steel for general structure purposes – Specification. |
| 9. IS 2911 | Code of practice for Design and Construction of Pile Foundation. |
| 10 IS: 2950 | Code and Practice for Design and Construction of Raft Foundations. |
| 11 IS: 3370 Part I, Part II and Part IV | Code of practice for Concrete structures for the storage of liquids. |
| 12 IS: 4326 – 2013 | Earthquake resistant Design and construction of Buildings. |
| 13 IS 13920 - 2016 | Code of practice for ductile detailing of RCC Structures. |
| 14 IS: 16700 | Criteria for structural safety of Tall Concrete Buildings. |
| 15 SP: 16 | Design aids for Reinforced concrete Structure. |
| 16 SP: 20 | Hand book on masonry design and construction. |

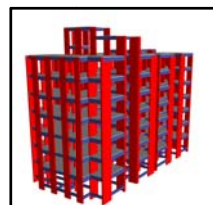
Project Name: BARVA NAGAR

Re-Construction of 360 DUs in 01 Block of (S+9)

Project ID: CUBE/B&C/2022-23/023/TNUHDB_BHN

Revision No.: R0

Submitted on:



Page 17 of 18

**Structural Design Basis
Report**





17 SP 23

18 SP 24

19 SP: 34

20 NBC-2016

Hand book on concrete mixtures.

Hand book on Indian standard codes of practice for plain and reinforced concrete.

Handbook on Concrete Reinforcement and Detailing.

National Building Code of India – 2016.

6. CONCLUSION.

The structural design has been carried out with the Architectural drawings produced by TNUHDB and Geotechnical carried out and vetted by IIT Madras. Pile foundation has been designed for serviceability load condition and designed with axial load and lateral load produced by seismic loads. Structural analyses and drawings have been prepared as per the relevant IS code provisions, NBC & ULB norms for the geometry and usage of this structure and the same have been proof checked by IIT Madras.

Prepared By:

Dr. P. Nallathambi
ME, Ph.D(Structural Engg),
Centre for Urbanization, Buildings & Environment [CUBE]
IIT Madras Research Park, Chennai – 600113

Checked & vetted by:

Dr. Sathish Kumar, Professor,
Indian Institute of Technology Madras,
Chennai, Tamil Nadu-600036.

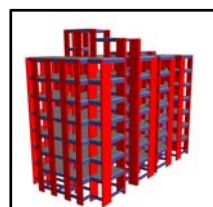
Project Name: BARVA NAGAR

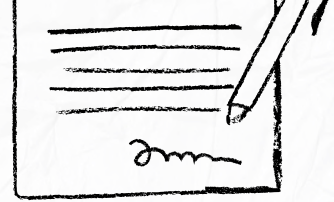
Re-Construction of 360 DUs in 01 Block of (S+9)

Project ID: CUBE/B&C/2022-23/023/TNUHDB_BHN

Revision No.: R0

Submitted on:





our services doesn't just end there



Buying & Selling Services

Property Buying Assistance, Property Selling Support, Market Price Analysis, Owner Outreach and Negotiation.



Legal & Documentation Services

Certified EC, Patta, legal opinions, property verification, due diligence, litigation solutions, and legal heir certificates.



Property Development & Approvals

Building plan approvals, construction, layout and sub-division approvals, zone conversion, and occupancy certification.



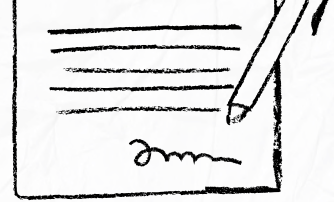
NRI & Investment Services

Escrow Services, Rentals, Litigation Solutions, Property Valuation and Property Management



Compliance & Special Services

Demolition, Vaasthu checks, regularization of unauthorized buildings, and office space solutions.



 **empowering your real estate decisions
with smart tools**



Property Valuation & Cost Estimation

Guideline Value, Apartment Composite Value, Stamp Duty & Registration Fees Calculator, Building Value Calculator, Capital Gains Calculator, Area Unit Converter, Length Unit Converter



Ownership, Compliance & Legal Verification

Encumbrance Certificate (EC) Search, Find Your SRO, Temple Property Check, WAQF Property Check, View Patta/Chitta, View FMB, Patta Analyzer, EC Analyzer



Zoning & Land Use Analysis

Land Use Zone Finder, CRZ Zone Check, Aquifer Zone Check, CBA Check, EWS Check, Road Width Check, Proposed Road Widening Check, FSI Calculator



Property Documentation & Workflow Tools

Forms & Templates, Document Generator, Document Translation, Dictionary



Vastu & Property Management Tools

Home Vastu Shastra, Plot Vastu Shastra, Property Management



We're honored to be part of your
real estate journey

3/350/2 Mettukuppam,
OMR Thoraipakkam,
Chennai, India

hello@verified.realestate
[+91 9996 12 9996](tel:+919996129996)
www.verified.realestate