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MAHIMTURA CONSULTANTS PVT. LTD.
Shakti Towers, 3rd Floor, H, Wing- II,
No. 766, Anna Salai, Thousand Light,
Chennai -600002.
Tel – 044- 43156723

CHE/9206 /2024/04/1

Date: 25-01-2024

To,

The Real Estate Regulatory Authority (Tamil Nadu)
N 1A, First Floor
Gandhi Irwin Road
Egmore, Chennai – 600008.

Dear Sir,

Sub : PROPOSED CONSTRUCTION OF GROUP HOUSING DEVELOPMENT WITH TWO BLOCKS - BLOCK A: STILT FLOOR + 5 FLOORS RESIDENTIAL BUILDING WITH 173 DWELLING UNITS (HEIGHT 18.30M) & BLOCK B: STILT FLOOR + 5 FLOORS RESIDENTIAL BUILDING WITH 36 DWELLING UNITS (HEIGHT 18.30M) - TOTALLY 209 DWELLING UNITS AT THARAPAKKAM ROAD, GERUGAMBAKKAM, CHENNAI COMPRISED IN S.NO.446/1, 448/1A, 449/12B1, 450 & 451/2 OF GERUGAMBAKKAM VILLAGE WITHIN THE LIMITS OF KUNDRATHUR PANCHAYAT UNION"

I hereby certify that the above proposal will be designed for Stilt + 05 upper Floors + Terrace with 2 Blocks as above - The Structure designed as per following specifications:

- a) Steel of Grade Fe 500
- b) Minimum Concrete mix of M25.
- c) Design as per seismic zone III

with due consideration to Seismic Zone –III forces as per prevalent I. S. Code No. 1893–2002 and I.S. Code 4326-1993 and also as per NBC-2005 and that to the best of my knowledge and belief the said structure will be safe and sound for the purpose for which it is intended, if carried out as per my designs & details.

Thanking you,

Yours faithfully,

H.R. Mahimtura

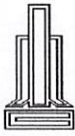
Consulting Structural Engineer

HITEN R. MAHIMTURA

Structural Engineers Grade-1 (SE)

Regn. No: SE/GR-1/19/03/021

Shakti Towers, 3rd Floor, H, Wing-2,
766, Anna Salai, Thousand Lights,
Chennai-600 002, Tel: 044-43156723
E-mail: brchennaihcpl@gmail.com



DESIGN BASIS REPORT

**PROJECT: PROPOSED SWIMMING POOL AT
RESIDENTIAL BUILDING "SIDHARTH SQAURE"
THARAPAKKAM ROAD, GERUGAMBAKKAM,
CHENNAI COMPRISED IN S.NO.446/1, 448/1A,
449/12B1, 450 & 451/2 OF GERUGAMBAKKAM
VILLAGE WITHIN THE LIMITS OF KUNDRATHUR
PANCHAYAT UNION**

CLIENT: M/S SIDHARTH FOUNDATION AND HSG. LTD.

ARCHITECT: M/S DESIGN TRANSCEND



MAHIMTURA CONSULTANTS PVT.LTD.

CONSULTING ENGINEERS

3rd Floor, Unique House,
25, S.A.Brelvi Road, Fort,
Mumbai - 400 001.

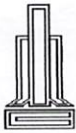
Tel. No. +91-22-4368 5000 - Fax No. +91-22-2266 2227

e-mail: info@mahimtura.net

Date: 21.12.2023

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Date – 21st December 2023

DESIGN BASIS REPORT

PROJECT : PROPOSED SWIMMING POOL AT
RESIDENTIAL BUILDING
“SIDHARTH SQAURE”
THARAPAKKAM ROAD,
GERUGAMBAKKAM, CHENNAI
COMPRIED IN S.NO.446/1, 448/1A, 449/12B1,
450 & 451/2 OF GERUGAMBAKKAM
VILLAGE WITHIN THE LIMITS OF
KUNDRATHUR PANCHAYAT UNION

CLIENT : M/S SIDHARTH FOUNDATION AND HSG. LTD.

DESIGN ARCHITECT : M/S DESIGN TRANSCEND

STRUCTURAL CONSULTANT : M/S MAHIMTURA CONSULTANTS PVT.LTD.

MEP CONSULTANT : M/S PDA

GEOTECH CONSULTANT : F.S ENGINEERS PVT. LTD

1. STRUCTURAL SYSTEM

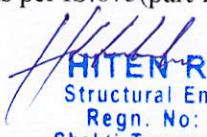
The design has been done in accordance with the provision given in the architectural drawing. The structural system for the proposed Swimming Pool at Gerugambakkam, Chennai consist of conventional system of framed structure with Beam, Column & Slab designed by using Etabs Software. The sections outline the key structural engineering systems to cater for the loads expected to be carried in service for the economic life of the building.

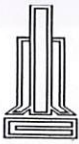
2. DESIGN LOADS

2.1 GRAVITY LOADS

The super imposed dead load that are envisaged to act permanently (wherever applicable) & Live loads for each occupancy category as per IS:875(part-2)–1987 are as follows:

SWIMMING POOL


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2.2 WIND LOAD

Wind Load (875 – PART 3- 2015):-

- | | | | |
|----|---|---|---|
| a) | Basic Wind Speed, Vb | : | 50 m/s |
| b) | Terrain category | : | 3 |
| c) | Risk Coefficient, K ₁ | : | 1 |
| d) | Topography Factor, K ₃ | : | 1 |
| e) | Terrain Factor, K ₂ | : | AS PER IS 875 PART3 2015
TABLE 2(CLAUSE 6.3.2.2) |
| f) | Importance Factor, K ₄ | : | 1.0 |
| g) | Design Wind Speed, V _{z max} | : | VbK ₁ K ₂ K ₃ K ₄ |
| h) | Wind Pressure (max), P _{z max} | : | 0.6 V _z ² |

2.3 EARTHQUAKE LOAD

Earthquake load(1893 – 2016):-

- | | | | |
|----|-------------------------------|---|--|
| a) | Seismic Zone No. | : | III |
| b) | Zone Factor (Z) | : | 0.16 |
| c) | Response Reduction Factor (R) | : | 4 (Ductile shear wall) |
| d) | Importance Factor (I) | : | 1.2 |
| e) | Type of Soil | : | Soil type I (Hard Rock) |
| f) | Building Dimension | : | 83.7m in 'x' direction & 88.1m in 'y' direction. |
| g) | Height of Building(H) | : | 18.3m from Ground to Terrace slab |
| h) | Dynamic analysis | : | Response spectrum method of analysis as per |
| i) | Time period | : | EQX= 0.18 EQY= 0.175 |

$$T_a = \frac{0.09h}{\sqrt{d}}$$

Clause 7.6.2 is used in evaluating design earthquake force.(WITH BRICK IN FILL)

- j) Horizontal seismic co-efficient

$$A_{hx} = \frac{Z \times I \times S_a/g}{2 \times R} = (0.16 \times 1.2 \times 2.5)/2 \times 4 = 0.06$$

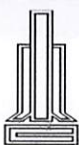
$$A_{hy} = \frac{Z \times I \times S_a/g}{2 \times R} = (0.16 \times 1.2 \times 2.5)/2 \times 4 = 0.06$$

- k) Design base shear

$$V_{bx} = A_{hx} \times W$$

$$V_{by} = A_{hy} \times W$$





Note : Vertical Earthquakes Effects shall be considered in accordance with Clause 6.3.3 of IS: 1893 (Part 1): 2016.

3. DEFLECTION

Beam Slab deflection: -Span /Depth ratio as per IS: 456-2000

4. BUILDING SWAY AND INTER-STOREY DRIFT

It is generally recognized that absolute sway is not a perceivable parameter; however limiting sway is used to provide a reasonable level of stiffness and in order to limit damage to non-structural elements as well as limit size of curtain wall joints, etc. Generally tall building lateral load resisting systems are sized on the basis of limiting overall lateral sways to limits of approximately Overall Height/500 as per clause 5.4.1 of IS 16700:2017 under the 20 year return period wind loads. Storey drift shall not exceed 0.004H i.e (1/250)H. Where, H is the total height of building as per clause 7.11.1 of IS 1893 (Part-1): 2016

5. BASIC LOADS AND LOAD COMBINATIONS

The various loads are combined in accordance with the stipulations in IS:875 (Part 5):1987. Wherever imposed load is combined with earthquake load the appropriate part of the imposed load as specified in IS: 1893-2016 is adopted both for evaluating earthquake effect and for combined load effects, used in such combination.

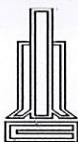
• **BASIC LOAD CASES :-**

LOAD CASE	TYPE	LOAD DESCRIPTION
1	DEAD &SIDL	Floor slab, Finish load & wall load
2	LIVE	Live load
3	EQXP	Seismic load in X direction (+ve)
4	EQXN	Seismic load in X direction (-ve)
5	EQYP	Seismic load in Y direction (+ve)
6	EQYN	Seismic load in Y direction (-ve)
7	SPECX	Seismic load in X direction
8	SPECY	Seismic load in Y direction
9	WIND X	Wind load in X direction
10	WIND Y	Wind load in Y direction

• **Ultimate Load combination :-**

Description of Load Combination	Load Factor for Primary Load Cases			
	Dead Load	Live Load	Wind Load	Seismic Load





Dead load + Live load	1.5	1.5	0.0	0.0
Dead load $\pm$ Wind load	1.5	0.0	± 1.5	0.0
Dead load $\pm$ Seismic load	1.5	0.0	0.0	± 1.5
Dead load + Live load $\pm$ Wind load	1.2	1.2	± 1.2	0.0
Dead load + Live load $\pm$ Seismic	1.2	1.2	0	± 1.2
Dead Load $\pm$ Wind Load	0.9	0.0	± 1.5	0.0
Dead Load $\pm$ Seismic Load	0.9	0.0	0.0	± 1.5

- Serviceability Load combination :-**

Description of Load Combination	Load Factor for Primary Load Cases			
	Dead Load	Live load	Wind Load	Seismic Load
Dead load + Live load	1.0	1.0	0.0	0.0
Dead load $\pm$ Wind load	1.0	0.0	± 1.0	0.0
Dead load $\pm$ Seismic load	1.0	0.0	0.0	± 1.0
Dead load + Live load $\pm$ Wind load	1.0	0.8	± 0.8	0.0
Dead load + Live load $\pm$ Seismic	1.0	0.8	0.0	± 0.8

Note: Combinations to account for three directional earthquake ground motions shall be Consider as per Clause 6.3.4 of IS 1893 (Part-1)-2016

6. **ANALYSIS METHODOLOGY & MODELLING**

The structure is analyzed for Static loads (both dead and live loads) and Lateral loads due to Earthquake/Wind loads and its combinations. Software used is ETabs version 18 & for foundation safe version 16. The structure will be modeled as 3D space frame. Vertical elements with aspect ratio less than 2.5 and floor beams shall be modeled as single line elements, Vertical elements not satisfying criteria shall be modeled as shell elements accounting for in plane and out of plane behavior. P-Delta effect shall be considered in analysis. Floor slabs shall be modeled as shell/membrane elements for diaphragm effect only.

Gravity load resisting system

The gravity load resisting system consists of conventional beams and slabs at typical floor. Gravity loads from floors system is transferred to column/wall raft foundation is provided.

Lateral load resisting system

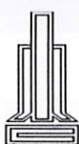
Buildings with ductile RC structural walls with RC SMRFs

For structural analysis, the moment of inertia shall be taken as:

In RC and masonry structures : 70% of I_{gross} of columns and 35% of I_{gross} of beams

In steel structures : I_{gross} of both beams and columns





7. **DESIGN LIFE**

The design life of the structure is assumed as 50 years. This requirement is not applicable to replaceable materials. Detailed requirements of this shall form as part of drawing and details.

8. **DESIGN METHODOLOGY**

All structures shall be designed according to the Limit State Method as specified in IS: 456-2000. Appropriate loads and its combinations, as per relevant clauses in IS 456:2000 code, for the most unfavorable effects are chosen for design.

9. **CONSTRUCTION DETAILS**

- | | | |
|---------------------------|---|--|
| 1. Foundation | - | All foundations, retaining walls
Mix M:30 |
| 2. Wall/Columns Conc. Mix | - | M:30 Foundation to terrace |
| 3. Beams & Slab Conc. Mix | - | M:30 |
| 4. External Wall | - | 200mm thick AAC Block |
| 5. Internal Wall | - | 100mm thick AAC Block |

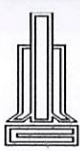
10. **REINFORCEMENT**

Steel reinforcement shall be of Grade Fe550 conforming to IS: 1786-2008.

11. **EXPOSURE CONDITION**

Structural elements below Plinth level and External column and beam are designed for moderate exposure condition and internal column, floor beams and slabs are designed for mild exposure condition as per Table 16 of IS 456-2000.



**12. MATERIALS**

The self-weight of the various elements are computed based on the built weight of materials as given below:-

Materials	Unit Weight in kN/m ³
Steel	78.50
Plain Concrete	24.00
P.C.C	10.00
Reinforced Concrete	25.00
Soil	18.00
Saturated Soil	20.00
Water	10.00
Concrete Block	24.00
Fly ash Brick	18.00
Toilet Sunk Filling Load	20.0
Plaster	20.0
Plum concrete	24.0
AAC Block	7.50

13. COVER TO REINFORCEMENT

The clear cover to main reinforcement is provided for 2 hours fire rating for primary load resisting system (Gravity/Lateral).

	<u>Cover</u>	<u>Fire Resistance(Hours)</u>
Staircase waist slab	30mm	2
Terrace and Floor Slabs	30mm	2
Shear Walls & Columns	40mm	2
Floor Beams	40mm	2
footing	75mm	-
Raft slab	75mm	
Retaining Walls (Backfilling side)	50mm	-
Retaining Walls (Internal side)	40mm	-

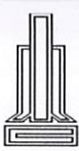
14. FOUNDATION SYSTEM

Pile Foundation is proposed Water level was met at 2.5m-2.8m below ground level.

15. CODES & STANDARDS

All the designs are conforming to the relevant Indian Standards with latest amendments. Some of the relevant Indian Standard Codes, which have been followed for the structural design, are given below:

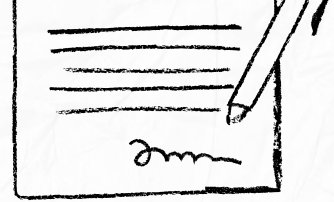




CODE	DESCRIPTION
IS:875(Part-1)-1987	Code of Practice for Design Loads (Other than Earthquake) for Building and Structures-Unit Weights of Buildings Materials and Stored Material.
IS:875 (Part-2)-1987	Code of Practice for Design Loads (Other than Earthquake) for Building and Structures-Imposed loads
IS:875 (Part-3)-2015	Code of Practice for Design Loads (Other than Earthquake) for Buildings and Structures –Wind Load.
IS:875 (Part-5)-1987	Code of Practice for Design Loads (Other than Earthquake) for Buildings and Structures - Special Loads and Load Combinations
IS:456 -2000	Code of Practice for Plain and Reinforced Concrete
IS:1893(Part-1)-2016	Indian Standard Criteria for Earthquake Resistant Design of Structures
IS:432 (Part-1)-1982	Specification of Mild Steel and Medium Tensile Steel bars and Hard drawn Steel Wire for concrete reinforcement –Mild Steel and Medium Tensile Steel Bars
IS:432(Part-2)-1982	Specification of Mild Steel and Medium Tensile Steel bars and Hard drawn Steel Wire for concrete reinforcement –Hard drawn Steel Wire.
IS:1786-2008	Specification for High Strength Deformed Steel Bars and Wires for Concrete Reinforcement
IS:13920-2016	Ductile Detailing of reinforced concrete structures subjected to seismic forces – code of practice.
IS:1904-1986	Codes of practice for design & construction of foundation in soils: General requirements (third revision)
IS:2911(Part 1/Sec 1) : 2010	Code of practice for design & construction of pile foundations : Part 1 concrete piles, Section 1 Driven cast in – situ concrete piles (second revision)
IS:2911(Part 1/Sec 2) : 2010	Code of practice for design & construction of pile foundations : Part 1 concrete piles, Section 2 Bored cast in – situ piles (second revision)
IS:2911(Part 1/Sec 3) : 2010	Code of practice for design & construction of pile foundations : Part 1 concrete piles, Section 3 Driven precast concrete piles (second revision)
IS:2911(Part 1/Sec 4) : 2010	Code of practice for design & construction of pile foundations : Part 1 concrete piles, Section 4 Bored precast concrete piles
IS:2950(Part 1): 1981	Code of practice for design & construction of raft foundations: Part 1 Design (second revision)
IS:4326: 2013	Earthquake Resistant Design and construction of building code of practice (second revision)
IS:3370(Part1):2009 (Part 2): 2009	Code of Practice concrete structures for the storage of liquid General requirements Reinforced concrete structures
IS:800:2007	Code of practice for general construction in steel
IS:16700:2017	Criteria for Structural Safety of Tall Concrete Buildings

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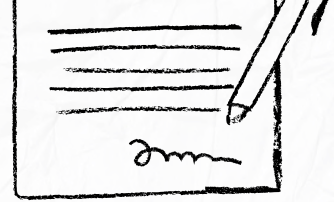
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Vastu & Property Management Tools

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

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