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MITHRAN STRUCTURES PRIVATE LIMITED

STRUCTURAL CONSULTANTS

" MARAGATHAM " #1, Jawahar Nagar, S.A.H.S. Post, Coimbatore - 641 043.
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Phone : 0422 - 2445500, Fax : 0422 - 2434021

STABILITY CERTIFICATE

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

The detailed engineering and structure design of the proposed building comprising of Stilt+5 floors at Block No-19 & 20, Vellalar Street, Mogappair, Chennai-600 037, Comprised in Old S.No - 249/2A PART and T.S.NO. 76/2, Block No-36, Ward 9 (059), Mogappair Ward-H of Ambattur Town within the limits of Greater Chennai Corporation has been done by me/us based on the report of geotechnical investigation (soil test) done by UDAYAM PILE FOUNDATION Report No. 01 Dated 16.11.2024 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/We have checked various parameters and found that the proposed building would be safe.

3. I/We further certify that:

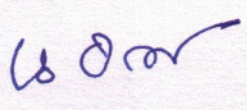
- (i) The minimum grade of concrete is M30
- (ii) The design and analysis has been done using the code of practice for plain and reinforced concrete as per IS 456, design loads as per IS Codes No 875 (Part 1 & 2) and design of earthquake resistant structure as per IS Code No 1893(Part-1):2016

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

Stamp and Signature
Dr. L.S. JAYAGOPAL B.E., M.Tech., Ph.D., FIE.,
Chartered Engineer (F12987)
CMDA/SE/GR-I/2019/05/117
No: 1, Jawahar Nagar, SAHS P.O.,
Coimbatore - 641 043.

DOCUMENT NO.:	Mithran Structures Pvt. Limited	DATE: 11.03.2025
	Detailed Analysis & Design Report – CINNAMON HOMES- BLOSSOM	Page 0 of 9

Project :	PROPOSED APARTMENT REDEVELOPMENT Chennai.
Structural Consultant	Mithran Structures Private Limited Coimbatore - 641043
Architect	NAMBI+PARTNERS COIMBATORE
Title :	CINNAMON HOMES- BLOSSOM – Analysis & Design Report



Dr. L.S. JAYAGOPAL B.E., M.Tech., Ph.D., FIE.,
Chartered Engineer (F12987)
CMDA/SE/GR-I/2019/05/117
No: 1, Jawahar Nagar, SAHS P.O.,
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Chapter 1 INTRODUCTION 1.1 General This document details the input data, principles, methods and performance criteria to be used in the structural engineering design of the project. 1.2 Scope The Proposed Stilt+5 Floors residential building located at Block No-19 & 20, Vellalar Street, Mogappair, Chennai-600 037, Comprised in Old S.No- 249/2A PART and T.S.NO. 76/2, Block No-36, Ward 9 (059), Mogappair Ward-H of Ambattur Town within the limits of Greater Chennai Corporation. This report presents details of structural analysis and design of the building for static loading. The sizes and details of the sections of RC elements are based on detailed analysis, which is elaborated in this report. This report specifies the details of structural layout, mathematical model, material properties, loads and load combinations, static analysis results, design summary for Pile footings, columns, beams and slabs. Chapter 2 DESCRIPTION OF BUILDING The Proposed Building consists of Stilt+5 floors. Stilt floor consists of parking space, remaining floors comprises of residential flats. Pile footings are provided. Safe load of pile is taken as per Geo-technical Investigation report.		

Chapter 3 **LOADS & LOAD COMBINATIONS****3.1 General**

This chapter discusses applicable loading for structural analysis & design of the proposed building. The loading is classified and described in the following paragraphs

3.2 Description of types of loading & Load calculation

Dead load & Live Loads are considered for analysis and design as per relevant Indian Standards and Specifications applicable to Chennai region.

The sizes of members have been fixed based on stiffness criterion and based on compatibility with architectural drawings.

3.2.1 Dead load comprises of self-weight of various structural elements indicated below:

- Self-weight of Columns, beams, slabs, brick walls.
- Floor & roof finishes.

Self-weight of the modeled elements is calculated by Etabs by default. The applied floor loads are distributed on the beams as trapezoidal or triangular loads in two way slabs and as rectangular loads in one way slab.

Loads from components like brick walls are applied explicitly as member loads and UDL (Uniformly Distributed Load) as applicable.

Component	Unit weight (kN/m ³)	Thickness (mm)	Area load (kN/m ²)
RCC Slab	25	150	3.75
Floor Finish	-	-	1.00
Partition wall load	-	-	0.50
Terrace Floor Finish	-	-	1.50

Calculation of Brick wall load.

Height of brick wall = 2.7m (3.0m - 0.30m)

DL of 230mm tk. Brick wall = 11.8 kN/m. (0.23x2.7x19)

DL of 115mm tk. Brick wall = 5.9 kN/m. (0.115x2.7x19)

FLOOR FINISHES:

Living, Kitchen, Bedroom, Toilet, Parking	-	1 kN/sq.m + 0.5 kN/sq.m (Partition wall Load) = 1.5 kN/sq.m
Terrace	-	1.5 kN/sq.m

3.2.2 Live Loads are considered for the analysis in addition to dead loads as follows,

Living, Kitchen, Bedroom, Toilet	-	2 kN/sq.m
Staircase, Balcony, Corridor	-	3 kN/sq.m
Lift	-	10 kN/sq.m
Terrace	-	1.5 kN/sq.m

3.3 LOAD COMBINATIONS**STRENGTH LOAD COMBINATIONS**

1.5 (DL)

1.5 (DL + LL)

SERVICE LOAD COMBINATIONS

1.0 (DL + LL)

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Chapter 4 MATERIAL PROPERTIES

4.1 General

This chapter describes the physical and elastic properties for various materials used. These are used for defining the stiffness calculation of the modelled structural members and lumped mass calculations for static analysis model.

4.2 Elastic & Physical Properties

The elastic properties of materials used are tabulated below in Table 1

Table.1 – Elastic properties of materials

S.No.	Material	Elastic Modulus (MPa)	Poisson's Ratio
1	Normal density reinforced concrete (M30 Grade)	27386.127 calculated using $5000\sqrt{f_{ck}}$	0.15

4.3 Grade of Reinforcement

Reinforcement of Fe-500 is used for RCC design.

4.4 Unit Weight of Materials

Unit weight of various materials used are given below

Reinforced cement concrete = 25 kN/m³

Brick Weight = 19 kN/m³

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Chapter 5 ANALYSIS

5.1 General

The analysis of the structure is carried out by mathematical modelling of the structure in Etabs and performing an analysis run.

5.2 Mathematical Modeling of Structure

The Proposed building is modeled and analyzed using Etabs. The physical structure of building is transformed into a mathematical model for structural analysis using 3D frame elements. Entire structure is composed of integrated three dimensional structure of columns and beams forming frames tied together with slabs to act as one unit responding to the loading on the structure. The discretization of the structure involves structural components such as RC Pile Footings & columns, RC beams and RC slabs.

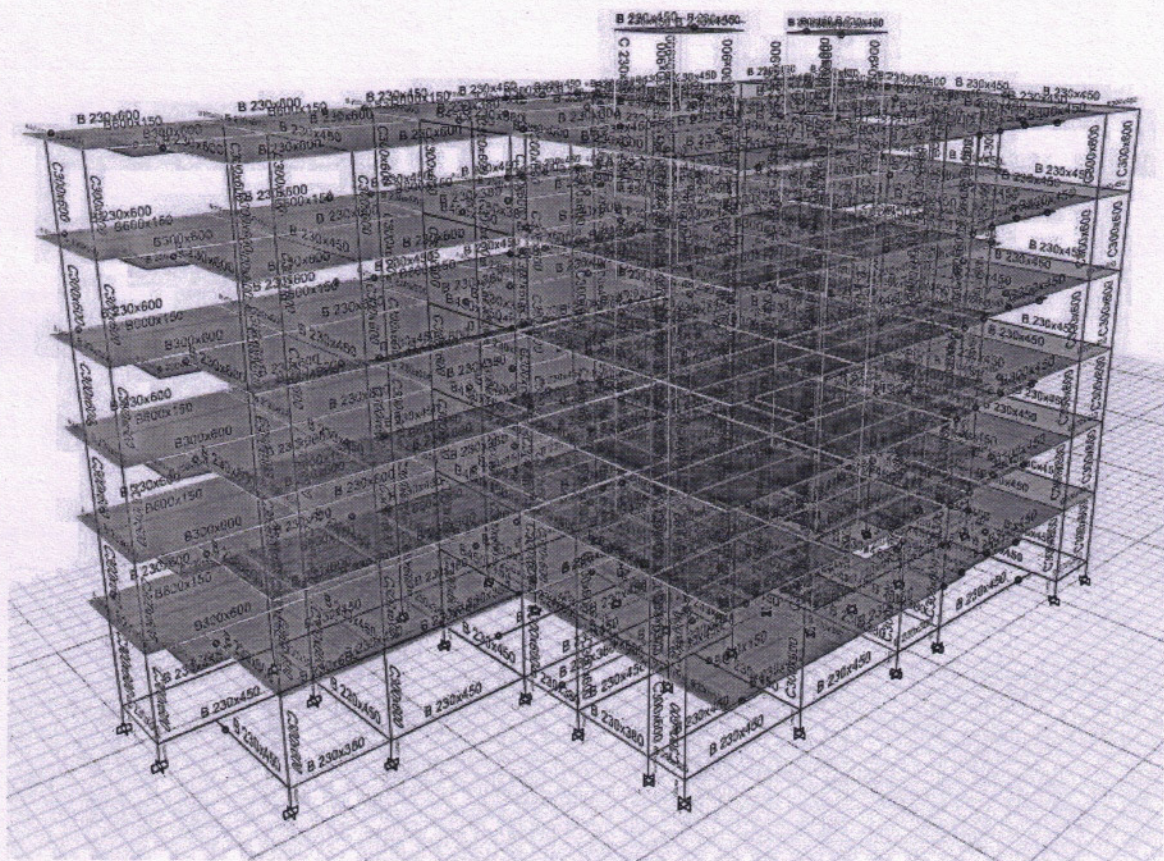


Fig. 1 – 3D Model of the Structure

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5.3 Approximations in Modelling

Following approximations are made in the modelling of the building:

1. Offset eccentricities between centre-line of column & beams are ignored. Accordingly, nodal co-ordinates are fixed.
2. The non-structural components like brick walls are neglected in modelling, but their loading effect on the structure is accounted.
3. Column positions are shifted marginally for aligning them along the grid lines.

5.4. Boundary Conditions

For the purpose of analysis and design, the bottoms of the columns are fixed at the pilecap level.

5.5 Analysis for Static Loading

The static analysis is carried out to obtain the internal forces and moments on all the member of the structure under static loads. Analysis is performed for each of the load cases mentioned below.

1. Dead load
2. Live load

Chapter 6 DESIGN OF RC MEMBERS

6.1 General

Limit State design using IS: 456-2000 is carried out for RC beams and columns using the forces obtained from the critical combination of loads from the analysis results in Etabs. Other components like Pile foundations and Slabs are designed using simplified provisions as per applicable codes with the help of spread sheets developed in-house.

6.2 Nominal Clear Cover to Reinforcement

Nominal clear cover used for various elements are listed below:

Pile cap	:	75mm
Piles	:	50mm
Column	:	40mm
Roof beam	:	25mm
Slab	:	20mm

6.3 Foundation Parameters

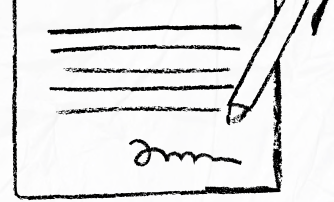
The following parameters are used in the design of Pile foundation.

Safe load of Pile = 80.0 MT.

Dia of Pile = 500mm

Pile depth from GL = 16.0m

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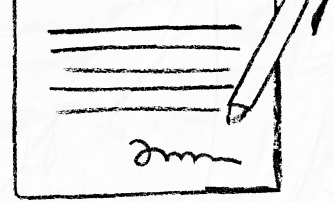
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real estate journey

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