DESIGN BASIS REPORT

FOR

RESIDENTIAL APPARTMENT - MP MAVIS - STILT FLOOR+ 5 FLOORS RESIDENTIAL BUILDING WITH 70 DWELLING UNITS AND STILT FLOOR +2 FLOORS CLUB HOUSE BUILDING AT 3RD MAIN ROAD EXTENSION, KURNJI NAGAR, PERUNGALATHUR, CHENNAI – 600 063, COMPRISED IN OLD S.NO. 97 & 99/1B AND AS PER PATTA S.NOS. 97/1, 97/2, 97/3 & 99/1B1B OF PERUNGALATHUR VILLAGE WITHIN THE LIMITS OF PERUNGALATHUR TOWN PANCHAYAT.

MP™ Developers

TRUST FOREVER

MP DEVELOPERS CONSTRUCTION Pvt Ltd.

SEPTEMBER –2025

1. DESIGN ASSUMPTION

a) STRUCTURAL SYSTEM

The structural system for the "PROPOSED **RESIDENTIAL APPARTMENT AT 3RD MAIN ROAD EXTENSION, KURNJI NAGAR, PERUNGALATHUR, CHENNAI – 600 063, COMPRISED IN OLD S.NO. 97 & 99/1B AND AS PER PATTA S.NOS. 97/1, 97/2, 97/3 & 99/1B1B OF PERUNGALATHUR VILLAGE WITHIN THE LIMITS OF PERUNGALATHUR TOWN PANCHAYAT – CHENNAI.",** consists of Stilt + 5 upper floors and OHT. The total height of the building is about 18 m from Stilt floor level. The structure is supported on shallow foundation below basement level as per the soil test report recommendation.

2. DESIGN LOADS

a) Dead Load:

Dead Load considered on slab: Self Weight + 1.5 kN/m^2 for Floor Finish.

Wall load	= 5 kN/m (200mm thick)
Wall load	= 3 kN/m (100mm thick)
Wall load(Parapet)	= 4.5kN/m (200mm thick)
Staircase load	= 15 kN/m (RCC staircase)
Sunken load	= 4kN/m^2
Water Tank	= 15kN/m^2 (1500 mm height)
Floor finish	= 2kN/m^2 (Terrace)

b) Roof Live Load:

The super imposed load or otherwise live load is assessed based on the occupancy classifications as per IS = 0.75 kN/m^2 on Solar panel roof.

Live Load considered on slab	=2 kN/m^2
Live Load considered on slab	=3 kN/m^2 (Lobby & Staircase)
Live Load considered on slab	=1.5 kN/m^2 (Terrace)

3. EARTHQUAKE LOAD

The loading due to earthquake is assessed based on the provisions of IS: 1893(Part-1):2016

Seismic Zone	= III
Table-2 Zone factor (Z)	= 0.16
Table-6 Importance Factor (I)	= 1.2
Table-7 Response Reduction Factor (R)	= 5

A.N.MAGESH RAJA, M.E.,(Structural Engineer)
CMDA/GCC REGISTERED STRUCTURAL ENGINEER GRADE-I(RSE)
CMDA REG.No:SE/GR-I/2022/06/325
GCC REG.No:RSE101432021
CELL:97870 72100
magistructure@gmail.com

Building frame system (SMRF) as per table 7 clause 6.4.2 of IS 1893 2016

Height of building (H) =18m

Base dimension of part of the building along the considered direction of lateral force (D)

Fundamental Natural time period

T_s **= 0.09H/√d** from CL - 7.6.2 - IS 1893 (Part-I) 2016

S_a/g = from FIG-2 IS 1893 (part-I) 2016

The respective natural time period can be referred from the respective model.

Horizontal Seismic Co-efficient

Ah = (Z/2) x (I/R) x (S_a/g)

Seismic Base Shear

Vb = Ah x W

Structure with ductile detailing is considered as per IS: 13920-2016

As per IS: 1893 – 2016, percentage of imposed loads to be considered for seismic weight calculation is mentioned below:

Imposed Uniformity Distributed Floor Load Loads (kN/ m2)	Percentage of Imposed
Up to & including 3.0	25
Above 3.0	50

4. WIND LOAD

Wind loads are one of the most significant lateral forces acting on medium and high-rise structures. For the proposed G+5 building, wind load calculations are carried out in accordance with IS 875 (Part 3): Code of Practice for Design Loads (Other than Earthquake) for Buildings and Structures – Wind Loads

Vz=Vb·k1·k2·k3·k4=50×1.0×1.0×1.0×1.0=50 m/s.

pz=0.6Vz2=0.6×502=0.6×2500=1500 Pa=1.50 kN/m2.

pnet,windward=pd·(Cpe−Cpi)=1500×(0.7−0.2)=1500×0.5=750 Pa=0.75 kN/m2.

F=pnet×W×h=0.75×10×18=135 kN (acting as lateral resultant).

A.N.MAGESH RAJA, M.E., (Structural Engineer)
CMDA/GCC REGISTERED STRUCTURAL ENGINEER GRADE-I(RSE)
CMDA REG.No:SE/GR-I/2022/06/325
GCC REG.No:RSE101432021
CELL:97870 72100
magistructure@gmail.com

5. LOAD COMBINATIONS

Strength combinations:

- 1.5DL + 1.5 LL
- 1.5DL (+/-)1.5 WL/EQ Load
- 1.2DL +1.2LL (+/-) 1.5 WL/EQ Load
- 0.9DL (+/-) 1.5 WL/EQ Load

Serviceability combinations:

- DL + LL
- DL +0.8 LL(+/-) 0.8 WL/EQ Load
- DL (+/-) WL/EQ Load

6. ANALYSIS METHOD

The structure is analyzed by static for gravity due to Earthquake loads and its combinations.

7. DESIGN METHODOLOGY

All structures have been designed according to the Limit State Method as specified in IS: 456-2000 & IS 1893 - 2016. Appropriate loads and its combinations, as per relevant clauses in IS 456:2000 code, for the most unfavorable effects are chosen for design.

8. MATERIALS

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

Materials	Unit weight in kN/m^3
Steel	78.5
Plain concrete	24
Reinforced concrete	25
Soil	18
AAC Brick	6.5

9. CONCRETE

All the concrete items for the construction have the following characteristics

Grade of Concrete = M25

Aggregate = 20mm and down size, mechanically crushed Aggregate.

A.N.MAGESH RAJA, M.E.,(Structural Engineer)
CMDA/GCC REGISTERED STRUCTURAL ENGINEER GRADE-I(RSE)
CMDA REG.No:SE/GR-I/2022/06/325
GCC REG.No:RSE101432021
CELL:97870 72100
magistructure@gmail.com

10. STEEL

Steel reinforcement shall be of Grade Fe500 & Fe550 conforming to IS: 1786-2008.

11. COVER TO REINFORCEMENT

The clear cover to main reinforcement shall be as follows.

Foundation	= Bottom: 50mm, Sides: 50mm
Slab	= 20mm
Columns	= 40mm
Beams	= 25m

12. FOUNDATION SYSTEM

Foundation systems are based on recommendations given as per soil investigation report by GLOBE GEOTECHNIQUES.

13. CODES & STANDARDS

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

	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:456 (Part-1)-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-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:1904	Indian Standard Code of practice for Design & Construction foundations in Soil: General Requirements.
IS:1642-1989	Indian Standard Code of practice for Fire Safety Of Buildings (General): Details Of Construction.

A.N.MAGESH RAJA, M.E.,(Structural Engineer)
CMDA/GCC REGISTERED STRUCTURAL ENGINEER GRADE-I(RSE)
CMDA REG.No:SE/GR-I/2022/0325
GCC REG.No:RSE101432021
CELL:97870 72100
mag.structure@gmail.com

IS: 1786-2008 Specification for High Strength Deformed Steel Bars and Wires for Concrete Reinforcement. IS: 1904 Indian Standard Code of practice for Design & Construction foundations in Soil: General Requirements IS: 1642-1989 Indian Standard Code of practice for Fire Safety of buildings (General): Details of Construction.

14. STRUCTURAL ANALYSIS

The structural analysis of the proposed G+5 building has been carried out using **STAAD.Pro** software. The building is modeled as a three-dimensional space frame system with beam, column, and slab elements. Supports are assumed fixed at foundation level.

- Linear elastic analysis is performed.
- Distribution of wind loads across storeys is modeled by applying calculated pressures at each floor diaphragm.
- Seismic loads are modeled using STAAD's seismic definition command, specifying zone factor, importance factor, response reduction factor, and soil type.
- Member forces, bending moments, shear forces, axial forces, and deflections are extracted from the software for design

A.N.MAGESH RAJA, M.E.,(Structural Engineer)
CMDA/GCC REGISTERED STRUCTURAL ENGINEER GRADE-I(RSE)
CMDA REG.No:SE/GR-I/2022/06/325
GCC REG.No:RSE101432021
CELL:97870 72100
magistructure@gmail.com