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DIGITALLY VERIFIED RECORD

STABILITY CERTIFICATE

The detailed engineering and structure design of the proposed

construction of Extended Double Basement floor (Parking) + Ground floor (BMS Room, Association Room, ATM, Badminton court (Double floor height), Squash court (Double floor height), Commercial space (Shop) + First Floor (Multipurpose Hall, Mini Theatre, SPA & Saloon, Yoga & Aerobics, Indoor Games, Business Centre room, Pre Function area) + 2nd floor to 16 floors Residential Building with 135 Dwelling Units at Poonamallee High Road, Old Survey No. 152 part, 153/3 part, T.S.No.2/1, Ward No.- 001, Block No 35 of Koyambedu Village, Aminjikarai Taluk, Chennai district, within the limit of Greater Chennai Corporation has been done by me based on the report of geotechnical investigation (soil test) done by **GEO MARINE CONSULTANTS (P) LTD.** Report No. **GT-2991** Dated **4th August 2025** and considering the functional requirement of the building.

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.

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 456-2000, design loads as per IS Codes 875 (Part-1) & (Part-2) 1987 and design of earthquake resistant structure as per IS Code 1893-2016.

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

Stamp and Signature

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Encl.: Structural Design Calculation

DEPARTMENT OF CIVIL ENGINEERING, CEGC
ANNA UNIVERSITY, CHENNAI - 600 025

DCE

Dr.R. Senthil
Professor of Structural Engineering

Tel: 2235 7406 / (M) 7598632796
Email: senthilr68@gmail.com

Date: 04-09-2025

STABILITY CERTIFICATE

This is to certify that Vetting of Structural Analysis & Design of Proposed residential project of Shriram Properties Limited, Located in T.S. No. 2/1 in Koyembedu, Chennai – Bangalore Road, Chennai – 600 107.

Structure designed as per following specifications,

Building Classification	: Residencial Building
Dead load	: As per IS 875 (Part-1)
Live load	: As per IS 875 (Part-2)
Seismic Load	: Zone –III, As per IS 1893 -2016.
Wind Load	: 50m/s, As per IS 875 (part –III).
Type of Structure	: R.C.C structure
Floor	: Tower-1, Combined Double Basement + Ground + 16 floors + Terrace
Grade of concrete	: M30/M50 (As per IS 456-2000).
Grade of steel	: Fe 500D (As per IS 1786-2008).
Type of Foundation	: Pile foundation.

The structure has been proposed to be constructed as per the design and details mentioned in the drawing. Hence, I hereby certify that the structural arrangement, structural member sizes and reinforcement provided are adequate for the load considered in the design.

The responsibility of Anna University Chennai shall be limited to checking of structural design calculations and drawings only. All procedural/legal/operational matters and architectural/functional details will be the responsibility of the owner/the party.

Thanking you

Yours faithfully,

4/9/25

(R. Senthil)

Dr. R. SENTHIL, M.E., Ph.D.,
Professor of Structural Engineering
Department of Civil Engineering
Anna University, Chennai - 600 025

PROPOSED HIGH RISE RESIDENTIAL PROJECT FOR SHRIRAM PROPERTIES, SHRIRAM KOYEMBEDU

OLD S.NO 152 PT & 153/3 PT AND NEW TS.NO-2/1, BLOCK NO.: 35,
WARD NO.: 001, SITUATED AT KOYEMBEDU VILLAGE,
AMINJIKARAI TALUK, CHENNAI DISTRICT.

PROJECT REFERENCE:
IECP-481

DOCUMENT TYPE :
STRUCTURAL DESIGN BASIS REPORT

REPORT NUMBER :
SBRONE/DBR/01-R0

REVISION NUMBER :
R0, Dated-12-01-2026

PREPARED BY :
VINOTH KUMAR M

CHECKED BY :
VINOTHKUMAR

APPROVED BY:
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CLIENT & ARCHITECTS	STRUCTURAL CONSULTANT	:
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1.0 PREAMBLE

2.0 M/s.Shriram properties are developing a High rise residential development at Koyembedu. Chennai with project name called Shriram Koyembedu. Architecture conceptualized by M/s.ED+ architects Chennai. Innotech engineering consult Pvt. Ltd has been appointed as the structural consultant for this prestigious project.

3.0 STATUTORY REQUIREMENTS

The design of the Structure will comply to the requirements of the following:

- National Building Code - **NBC 2016**
- Bureau of Indian standard codes
- International codes like ACI. Euro & BS Codes wherever required.

4.0 AIM OF THIS REPORT

The Structural engineering design basis defines the minimum design criteria that shall form the basis for carrying out detailed civil, architectural and structural design of all structures.

The aim of this design basis report is to identify and record all the provided input, analysis and design to an acceptable probability that the structure is being designed for and will perform satisfactorily during its life span.

This report provides structural concepts/scheme which is compatible with the architectural intent satisfy the services for functional needs and confirming to the Indian standards to achieve safe, stable and optimal economic structure.

5.0 SALIENT FEATURES OF PROJECT

Site Location

The site is located at Koyembedu, Chennai.

Building Description

The project has 2 Towers.

Tower 1 - 2B + GF + 20 Residential Floors + Terrace floor

The Tower 1 campus is designed for a built up area of 373499.08 Sq.ft (34699.20 Sq.m)

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TOWER 1	
Height of the building (From Ground Floor)	67.45 m
Tower dimension along X-axis	12.22 m varies to 36.48 m
Tower dimension along Y-axis	91.83 m

Description for Towers	
No. of Floors	2 Basement + Ground + 20 floors + Terrace
Shape of Building	Irregular Shape
Type of floor slab	Wall Slab system
Basements	Parking and MEP Services
Ground	Parking+ MEP
First Floor	Residential Units + Landscape
Typical Floors	Residential Units
19th floor	Refuge floor
Terrace	Accessible Terrace

Structural description	
Description of the foundation	Pile Foundation
Columns, core walls, shear walls, beams and slabs in the	Shear walls & Corewall-Varies as per drawing Columns – Varies, As per the Dwg Beams – Varies, As per the Dwg
Slab on grade for the Basement	300 thick Grade slabs (With uplift pressure)
Basement to Ground Floor	Flat Slab System
Transfer Slab	Solid Slab / Transfer Slab System
Typical Floor	RC wall-Slab system

The basements has been exclusively designed for car park. drive way and water treatment plant. The Ground floor slab is designed for Car park, fire driveway, electrical meter room ,landscaping according to architectural/services drawing (Awaited).

Columns/walls in basement will be worked out based on car parking and driveway location.

Typical floor from Third floor and above floors will be of Wall slab system.

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6.0 DESIGN PHILOSOPHY:

5.1 CONCRETE STRUCTURE

The proposed structure is to have a cast in-situ concrete construction. The systems adopted is with Reinforced concrete columns , shear walls and Beam and slab system is adopted .

The Structural design of the proposed project is based on Indian Standard Codes and is analysed for Dead, Live, Wind and Seismic Load conditions taking into relevant load combinations recommended by the code & the structural elements are designed in limit state design as per IS Code.

The Vertical Loads including the dead and super imposed loads and the Lateral loads due to wind and seismic forces are transferred to the soil through proposed Reinforced Concrete Core Walls/Shear Walls, columns and foundations. Footings/Foundations are sized with consideration to the safe bearing capacity of soil at the level of transfer of load recommended by specialist soil investigation consultants.

5.2 DESIGN LIFE

The design life of the building is assumed as per IS code recommendation satisfying for the criteria of environmental conditions. This requirement is applicable only for concrete works and not applicable to replaceable finishing materials, water proofing membrane and thermal insulations (if any). Hence periodic maintenance / refurbishment are required for all replaceable material for longer life.

5.3 LIQUID RETAINING STRUCTURES

Following are the considerations for the design of liquid retaining structures by limit state method.

- Crack width
- Strength and deflection.

5.4 DESIGN INTERFACE

This structure has physical interface with almost all the disciplines like Geotechnical, MEP Services and Landscape etc. The Structure proposed is of cast in-situ concrete construction with Columns, RC shear walls and suitable slab system at all floor and terrace level.

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7.0 CODES AND STANDARDS

Specific applicable codes and standards shall be identified in the Design Philosophy as appropriate. The latest editions of the Codes and Standards shall be used. All design work shall be based on Indian Standards and Codes latest revision, with amendments if any, as on date.

Following are the Indian CODES and STANDARDS followed while designing the structure:

6.1 LOADINGS

Code of Practice for Design Loads (Other than Earthquake) for Building and Structures

IS: 875 -1987 (Part 1)	Dead Loads –Unit Weights of Buildings Materials and Stored Material.
IS: 875 -1987 (Part 2)	Live loads or Imposed Loads
IS: 875 -2015 (Part 3)	Wind Loads
IS: 875 -1987 (Part 5)	Special Loads and Load Combinations

6.2 DESIGN OF REINFORCED CONCRETE ELEMENTS

IS: 456 – 2000	Code of Practice for Plain and Reinforced Concrete
IS: 1786-2008	Specification for High Strength Deformed Steel Bars and Wires for Concrete Reinforcement
SP: 16	Design aid for reinforced concrete to IS: 456.
SP: 23	Hand book on concrete mixes
SP: 24	Explanatory hand book on code of practice for PCC
IS 10262- 2009	Recommended Guidelines for Concrete Mix Design.
SP: 34	Hand book On Concrete Reinforcement and Detailing
IS 13920-2016	Ductile design and detailing of reinforced concrete structures subjected to Siesmic forces.

6.3 STRUCTURAL STEEL ELEMENTS

IS: 800-2007	Code of practice for general construction in steel.
SP: 6-(1)-1964	Hand book on structural steel sections.
IS: 2062 -2011	Indian standard Code of Practice for Hot rolled and high tensile structural steel – specifications

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6.4 LIQUID RETAINING STRUCTURES

IS: 3370 (Part-2)-2009	Concrete Structures for Storage of Liquids –code of Practice.

6.5 DESIGN FOR EARTHQUAKE RESISTANCE

IS: 1893 (Part-1)-2016	Criteria for Earthquake Resistant Design of Structures
IS: 4326: 1993	Earthquake resistant design and construction of buildings code of practice.
IS: 16700: 2023	Criteria for Structural Safety of Tall Concrete Building **(if building height exceeds 50m)**

6.6 EARTHWORK

IS 3764-1992	Code of safety for Excavation work

6.7 SOIL AND FOUNDATION

IS: 8009: 1976	Code of practice for calculation of settlements of foundations.
IS: 1904-1986	Indian Standard Code of practice for Design & Construction foundations in Soil: General Requirements.
IS 2950 (Part1)-1981	Indian Standard Code of Practice for Design & Construction of raft foundation – (Part –1)

6.8 FIRE SAFETY OF BUILDINGS

IS: 1642-1989	Indian Standard Code of practice for Fire Safety of Buildings (General): Details of Construction.
ANSI/UL263	Fire resistance rating

6.9 MECHANICAL COUPLERS

IS: 16172-2014	Reinforcement concrete for Mechanical splices of bars in concrete Specifications.

In case of 'no clarity' or 'non availability, of any regulation/ limitations for any particular criteria, and also to achieve Value Engineering in terms of design and detailing,if there is not enough clarity in Indian Codes, appropriate British standards and ACI-318-2011 shall be followed.

6.10 INTERNATIONAL STANDARDS FOR REFERENCE

ACI: 318-2014	Building Code Requirement for Structural Concrete.
ASCE: 7-05	Minimum Design Loads for Buildings and other structures.

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UBC: 1997	Uniform Building Code.
BS 8110 -1: 1997	Code of Practice for design and Construction.

8.0 MATERIALS

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

7.1 REINFORCEMENT STEEL

All reinforcement shall confirm to IS: 1786–2008 having minimum yield strength of 500 N/sq mm.550D N/sq mm can also be used however all design will confirm to 500 N/ Sqmm

Young's Modulus	: Es	200.000 N/Sq mm
Yield Stress	: fy	500 N/Sq mm
Diameters [in mm]	: d	8, 10. 12. 16, 20. 25 & 32
Density	:	78.5kN/cum

7.2 STRUCTURAL STEEL

All structural steel shall confirm to IS -2062-2011.

Grade : E-350	
Tensile Strength	350 N/Sq.mm
Yield Stress	250 N/Sq.mm (for t<20mm) 240 N/Sq.mm (for 20mm < t < 40mm) 230 N/Sq.mm (for t > 40mm)

7.3 CONCRETE

Compressive Strength of concrete:

Durability provisions for concrete structures shall be as per "Severe" conditions of environment in –accordance with IS 456: 2000. However, water retaining structures (UG sump, STP) and earth retaining structures (retaining wall & compound wall) is designed for "Moderate" condition.

Keeping the durability and structural requirement, the proposed Compressive Strength of structural concrete at 28 days, for various structural elements/ members are as indicated in the below table.

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Structural elements		Compressive strength at 28 days	Concrete grade
Minimum grade of concrete for any structural member considered as		30 N/Sq.mm	M30
All structural concrete for :			
Columns,Shear walls Core walls	Foundation to 1st floor/Transfer Level	50 N/Sq.mm	M50
	2nd Floor to Terrace Floor	30 N/Sq.mm	M30
Footing		30 N/Sq.mm	M30
Stitch slab / Grade slab		30 N/Sq.mm	M30
Basement Ground & Typical floor- Slabs & Beams		30 N/Sq.mm	M30
Transfer Slab & Transfer level Beams		50 N/Sq.mm	M50
UG Sump		30N/Sq.mm	M30
STP		30N/Sq.mm	M30
Rain Water Tank		30N/Sq.mm	M30
Plain cement concrete		10 N/Sq.mm	M10

7.4 MASONRY WALL

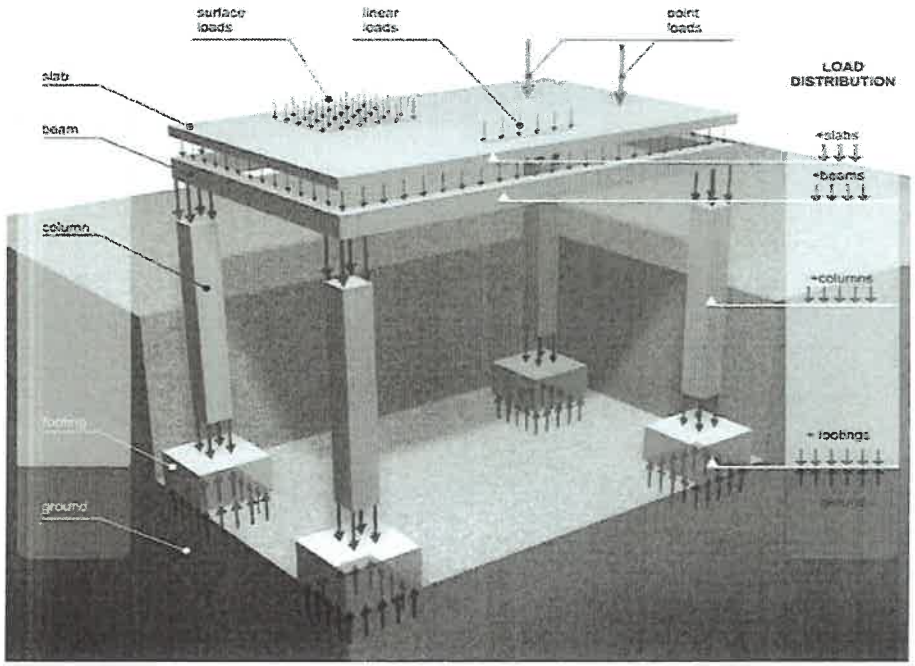
The detailing of the masonry walls to the RCC elements both vertical and horizontal along with RCC bands will be provided by architects.

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7.5 DESIGN DATA

Dead Loads, Live Loads. Wind Loads, Seismic Loads, Temperature Loads



7.6 DEAD LOADS & LIVE LOAD

Dead load shall include weight of all structural and Architectural components. Self-weight of the materials shall be calculated based on unit weights given in IS: 875(part 1)-1987.

Unit weight of Reinforced cement concrete	2500Kg/cum – 25 kN/cum
Unit weight of reinforcement steel	7850Kg/cum – 78.5 kN/cum
Water	1000Kg/cum – 10 kN/cum
Glass	2720Kg/cum – 27.2 kN/cum
Stainless steel	7850Kg/cum – 78.5 kN/cum

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Solid Block Masonry (SBM) Including plastering.	2200Kg/cum – 22 kN/cum
Light weight filling material	1000Kg/cum – 10 kN/cum
Soil –Dry	1800Kg/cum – 18 kN/cum
Soil – Perfectly Wet	2195Kg/cum – 21.95kN/cum
Unit weight of screed(finishes)	2400Kg/cum – 24 kN/cum
Reinforced cement concrete precast member	2500Kg/cum – 25 kN/cum
Aluminium composite panels (6mm thick)	3.5Kg/sq meter –0.03 kN/sqm
Thermocole	25Kg/cum – 0.25 kN/cum

Following loads are considered while designing the structural elements apart from dead load (self-weight) as per code. Blockwork wall loads shall be considered as per actuals

BASEMENT FLOOR				
Load components		Thickness (mm)	UDL (kN/sqm)	Annotations
Staircase	Dead load	Actuals		
	Live load	-	3.00	
	Finishes	50	3.6	Waist slab load + steps load
	Services	-	-	
Lift Lobby	Dead load	Actuals		
	Live load	-	3.00	
	Finishes	50	1.2	
Parking & Driveway	Dead load	Actuals		
	Live load	-	3.00	
	Stack	-	-	
	Finishes	100	2.4	
	Services	-	0.50	Service Ducts + Fire Sprinklers
Ramp without fire truck movement	Dead load	Actuals		
	Live load	-	5.00	
	Finishes	100	2.4	

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GROUND FLOOR				
Load components		**Thickness (mm)**	**UDL (kN/sqm)**	**Annotations**
Parking & Driveway	Dead load	Actuals		
	Live load	-	3.00	
	Stack	-	-	
	Finishes	100	2.4	
	Driveway filling	300	7.2	
	Services	-	0.50	Service Ducts + Fire Sprinklers
Staircase	Dead load	Actuals		
	Live load	-	3.00	
	Finishes	50	3.6	Waist slab load + steps load
	Services	-	-	
Lift Lobby	Dead load	Actuals		
	Live load	-	3.00	
	Finishes	50	1.2	
	Services& false ceiling	-	-	
Electrical Room	Dead load	Actuals		
	SIDL	-	7.5	Non Reducible live load
	Finishes	100	2.4	
	Services	-	0.50	Service Ducts + Fire Sprinklers
DG	Dead load	Actuals		
	Live load		15	Non Reducible live load.
	Finishes	100	2.4	
	Services	-	0.50	Service Ducts + Fire Sprinklers
Landscape Filling	Dead load	Actuals		
	Live load		-	
	Landscape Filling	-	15	As per landscpate details
	Finishes		2.4	100mm finishes slab
	Services	-	0.5	
Fire Tender	Dead Load	Actuals		

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	Live Load		15	
	Filling	450	9.45	
	Finishes	100	2.4	

TYPICAL FLOOR				
Load components		**Thickness (mm)**	**UDL (kN/sqm)**	**Annotations**
Staircase	Dead load	Actuals		
	Live load	-	3.00	
	Finishes	50	3.6	Waist slab load + steps load
	Services	-	-	
Lift Lobby / Corridor	Dead load	Actuals		
	Live load	-	3.00	
	Finishes	50	1.2	
	Services& false ceiling	-	-	
Rooms /Living Space	Dead load	Actuals		
	Live load	-	2.00	
	Finishes	50	1.20	
	False ceiling/Services	-	-	
Balconies	Live load	-	3.0	
	Finishes	75	3.0	75mm sunk + Finishes load
	False ceiling/Services	-	-	
Utilities	Live load	-	3.0	
	Finishes	150	4.8	150mm sunk + Finishes load
	False ceiling /Services	-	-	
Toilets	Dead load	Actuals		
	Live load	-	2.00	
	Finishes	75	3.0	75mm sunk + Finishes load.

Terrace & Above Terrace				
Load components		Thickness (mm)	UDL (kN/sqm)	Annotations
Accessible terrace	Dead load	Actuals		

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	Live load	-	3.00	
	Finishes	150	3.60	Average thickness including water proofing
OHT bottom slab	Dead load	Actuals		
	SIDL	As per MEP		
	Finishes	100	2.40	
	Services	-	-	
OHT roof	Dead load	Actuals		
	Live load	-	2.0	
	Finishes	100	2.40	Average thickness including water proofing
Staicase Headroom	Dead load	Actuals		
	Live load	-	0.75	Non Accessible Roof
	Finishes	100	3.6	Average thickness including water proofing
	Services	-	-	

Non – Tower Area				
Load components		Thickness (mm)	UDL (kN/sqm)	Annotations
Podium Floor	Dead load	Actuals		
	Live load	-		
	Fire Tender	-	15	
	Finishes	450mm	9.45	As per landscape details
	Services	-	0.5	

Wall load

200mm S.B.M wall load per meter ht.	4.4 kN/m
150mm S.B.M wall load per meter ht.	3.3 kN/m
100mm S.B.M wall load per meter ht.	2.2 kN/m
12 mm thick glazing load per meter	0.34 kN/m

Fire tender load on Podium slab .

Fire tender load = 45 Tonnes

Filling Depth = 450 mm

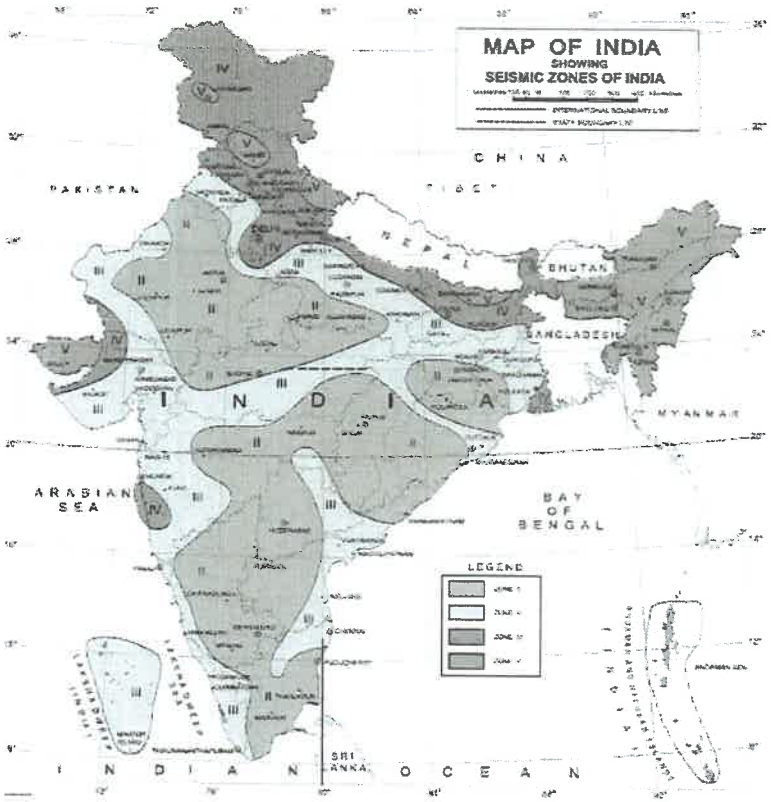
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However, as far as moving loads are considered, fire tender load of 1500Kg/m² (15 kN/m²) shall be considered for design of column, footings and slabs.

7.7 SEISMIC LOAD AS PER IS-1893-2016

SEISMIC MAP OF INDIA



Bureau of Indian Standards, based on the past seismic history, grouped the country into four seismic zones, viz. Zone-II, -III, -IV and –V. Of these, Zone V is the most seismically active region, while zone II is the least. The

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Modified Mercalli (MM) intensity, which measures the impact of the earthquakes on the surface of the earth, broadly associated with various zones, is as follows

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7.8 Seismic Zone Intensity on MM scale

Zones	Intensity
II (Low intensity zone)	VI (or less)
III (Moderate intensity zone)	VII
IV (Severe intensity zone)	VIII
V (Very severe intensity zone)	IX (and above)

Since Chennai is in zone III (Moderate intensity zone), Zone co-efficient is considered 0.16 f or design.

Seismic load as per IS:1893 -2016		
1	Location	Chennai
2	Seismic Zone – (Annex – E)	III
3	Zone co-efficient 'Z' (Table -02)	0.16
4	Importance factor 'I' (Table – 06)	1.2
5	Response reduction factor 'R' (Table-09)	4
6	Fundamental Natural period (Clause 7.6.2)	As per IS 1893(I):2016, clause 7.6.2
7	Ductile detailing As per IS-13920-2016	Required
8	N Values from Bore Logs Report	>30 (As per Soil report)
9	Soil Type- Table -01 of IS-1893:2016	Type 1
10	Damping ratio	5%

Percentage of imposed load to be considered in seismic weight calculation as per **IS-1893-2016 (cl. 7.3.1)**

Impose uniformity distributed floor loads(kN/m2)	Percentage of imposed loads
Up to and including 3.0	25
Above 3.0	50

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7.9 Design lateral force (IS-1893:2016)

The inertia forces are to be distributed along the height of the building as per Clause 7.7.1. The base shear shall be applied from ground of the building, which corresponds to the level of building where the forces are transferred to the foundation. In the case of non-uniform connections of retaining wall at ground floor, the height of the building for seismic loads shall be taken from the basement level.

7.10 Fundamental natural time period (Ta) with rc walls:

As per IS 16700:2023: clause - 6.3.4

The fundamental period, T (in sec) for a structure shall be determined by accounting for all structure shall be determined by accounting for all structural properties and inherent stiffness of the building through rigorously validated structural analysis procedures.The fundamental period shall however not exceed the value obtained from the approximate fundamental translational natural period Ta (in s) of oscillation estimated by following expression

Ta = 0.0672 H $^{0.75}$ for all other concrete structural systems.

Where H is the Building height from its base to roof level,

a) Excluding the height of basement storeys, if basement walls are connected with the ground floor slab or basement walls are fitted between the building columns, but

b) Including the height of basement storeys, if basement walls are not connected with the ground floor slab and basement walls are not fitted between the building columns.

As per above calculation minimum time period is considered for design.

Vb = Ah * W

W= Seismic weight of the structure

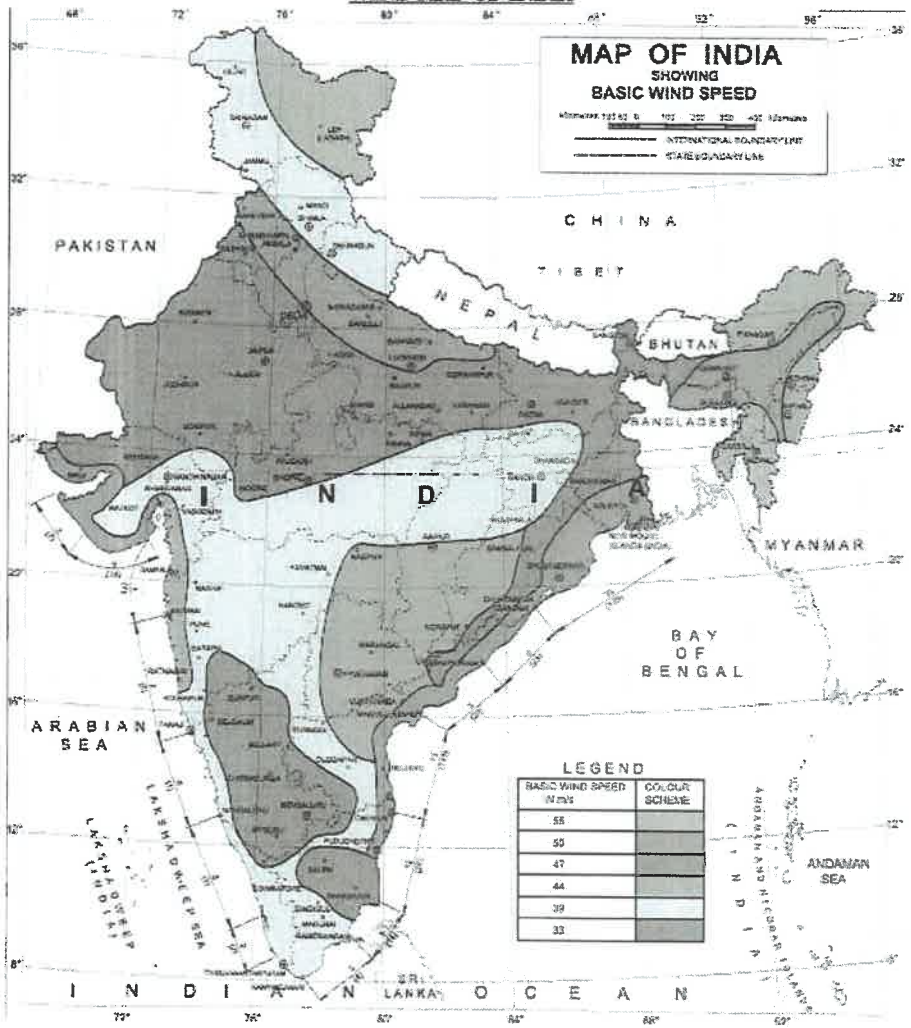
Ah = Horizontal seismic coefficient

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7.11 WIND LOADING AS PER IS:875 (PART III) -2015

WIND MAP OF INDIA



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Wind load as per IS:875 (Part iii)-2015		
1	Zone	Chennai
2	Basic wind speed (Vb) m/sec- Appendix-A	50 m/sec
3	Category of Building	1
4	Risk co-efficient (k1)-Table-01	1.0 (for general buildings)
5	Terrain, roughness and height factor(k2)	As per table 02 of cl 6.3.2.2
6	Topography factor (k3)	1.0
7	Importance factor for the cyclonic region(k4)	1.0
8	Design wind speed (Vz)	Vz = Vb*k1*k2*k3*k4
9	Design wing pressure (Pz)	$Pz = 0.6*Vz^2$
10	Internal and External co-efficient as per IS:875 (part 3)	Not Required As per Closed Structure

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 under the 50 year return Period wind loads.

Height of Building = 65.50 m from Ground Level

Permissible Deflection = 65500/500

= 131.00 mm

a) Calculation of design wind pressure (Pz) and wind speed (Vz)

The wind pressure has been calculated based on the data furnished below and other provisions laid in IS 875 (Part-3) – 2015

Design wind speed Vz=Vb*K1*K2*K3*K4

Design wind pressure $Pz=0.6*Vz^2$

b) Dynamic wind analysis check as per is 875 part iii clause 7.1

Detailed procedure and preliminary gust coefficients for the wind forces is enclosed below.

Flexible slender structures and structural elements shall be investigated to ascertain the importance of wind induced oscillations or excitations along and across the direction of wind. In general, the following guidelines may be used for examining the problems of wind induced oscillations:

- Buildings and closed structures with a height to minimum lateral dimension ratio of more than about 5.0.

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- Buildings and closed structures with natural frequency in the first mode less than 1.0 Hz.
- Any building or structure which satisfies either of the above two criteria shall be examined for dynamic effects of wind.

7.12 FIRE RATING:

- All structural elements are dessigned to satisfy the fire requirement specified in NBC 2016.
- As per NBC 2016, The structure comes under Type 2 construction.
- All vertical elements and horizontal elements shall be designed accordingly.

7.13 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 and IS : 800 for concrete and steel respectively.

The maximum and minimum temperatures for city of Chennai are published by the metrological department are According to IS : 875 (part 5) the following climatic data is assumed:

Maximum mean temperature	45°C
Minimum mean temperature	18°C

Therefore, a constant temperature variation is applied considering room temperature minus maximum mean temperature is +7.5°C, -12.5°C

7.14 SPECIAL LOADS:

Load 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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7.15 GEOTECHNICAL INVESTIGATION

-SBC consideration as per soil report:



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TABLE: - 5.1 RECOMMENDED SAFE LOAD CARRYING CAPACITIES OF BORED CAST-IN SITU PILES								
Sl.No	Reference Bore hole No.	Length of Pile below E.G.L	Assumed Length of Cut-Off Below E.G.L	Length of Pile below Cut-off	Dia.of Pile in (mm)	SAFE LOAD CARRYING CAPACITY (kN)		
						Vertical Load Carrying Capacity	Pull Out Capacity	Lateral Load Carrying Capacity
1.0	BH-08	32.0	9.0	23.00	500	1000	500	35
2.0					550	1150	550	40
3.0					600	1350	600	50
4.0					650	1500	650	55
5.0					750	1850	750	70
6.0					800	2050	800	75
7.0					900	2400	900	95

8.0 STRUCTURAL ANALYSIS & DESIGNS

The structural analysis is carried out by finite element method using the commercially available latest software **ETABS/ STAAD Pro V8i , RCDC , DraftWin & SAFE** for the load combinations as per standards. The designs of the RCC elements are made using the Limit State method with appropriate load factors as per IS: 456-2000 using spread sheet/E-Tab. etc. Designs of structural steel members are made using elastic method as per IS: 800-2007 with relevant allowable stresses.

8.1 SERVICIABILITY LIMIT STATE (SLS)

Permissible sway/Drift: As per IS 456, the lateral sway due to wind at the top of the structure shall not exceed **H/500** where H is the height of the building.

As per IS 1893: 2016 (part-1) the story drift due to minimum specified lateral force with partial load factor of 1.0 shall not exceed **Hs/250**, where H_s is the story height under consideration.

The vertical deflection under imposed load should be limited as follows:

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L/250 taking into account all imposed loading, including temperature and creep/shrinkage.

L/350 taking into account all imposed loading, including temperature and creep/shrinkage after erecting the finishes or 20mm whichever is less.

8.3 STORY STIFFNESS

- This Building consists of Transfer slab system at 2F level with solid slab thickness of 1.2 m.In order to calculate the Story stiffness at that level and 3F level centre to centre of slab is considered as storey height. For design of all structural elements actual floor to floor height will be considered.

Analysis method adopted for model on ETABS

Generation of ETABS model

- Initial preliminary analysis for each structural member shall be carried out and accordingly the shuttering layout shall be prepared.
- Preliminary sized cad formatted shuttering drawing of each floor shall be created and exported to E-tab and 3D model shall be generated.
- Sectional properties are assigned to all the structural elements as per preliminary drawings.
- Mesh size assigned for shell area is 1m x 1m as mesh size or finer mesh sizes
- External wall loads are assigned as line loads wherever the walls are well defined.
- Internal partition walls are assigned under SIDL load case.
- Slabs shall be modelled as shell elements and assigned as rigid/flexible diaphragm.
- Staircase flight / ramp slabs are modelled as horizontal element at respective floor levels
- Mechanical / Electrical / other equipment loads are applied as SIDL in the respective bays.
- Machine rooms, overhead tanks, staircase head rooms and parapet walls are not modelled however the loads are considered.
- Architectural features are not modelled, however the respective SIDL are accounted into analysis.
- Live load reduction is considered for designing of columns, shear walls and foundations.
- All lateral loads applied as per IS codes (wind and earthquake loads).
- 3D model shall be analysed by dynamic analysis.
- Temperature loads are applied to terrace and some part of podium area. Which are directly exposed to sun.
- Since Chennai is in zone III, Ductile detailing is required.
- Covers to reinforcement shall be in accordance with IS: 456-2000 corresponding to moderate exposure conditions.

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- All vertical walls elements are assigned with auto meshing to achieve accurate designs.
- As per IS 456 Clause: 41.1 beams where torsion is required to maintain equilibrium will be designed for torsion in accordance with 41.2, 41.3 and 41.40. However, for all other beams torsional stiffness is neglected in the analysis by applying stiffness modifier as 0.35 to torsional constant "J". Hence no specific design for torsion is required for these beams.
- Foundation shall be designed with spread sheet /SAFE.
- Long term deflection are checked using excel spread sheet.
- Crack width calculation is checked using excel spread sheet.
- Water pressure is considered on the footings/ grade slab and designed and also subsoil soil drainage system is proposed and the same to be confirmed by soil consultants.
- Actual OHT, staircase head room loadings are considered in the 3D analysis.

8.4 LOAD COMBINATIONS

The results obtained from the computer analysis in the form of member forces and reactions will be used for design the structural members. The following load combinations of the member forces will be considered for arriving at the design forces.

Live Load reductions are considered as per IS 875 Part –II for Column, Shear wall and Footing Design.

Dynamic Load Combinations

As per IS 1893-2016 cl 6.3.2.1 lateral load resisting elements are oriented along two mutually orthogonal directions, structure shall be designed for the effects due to full design earthquake load in one horizontal direction at a time and not in both directions simultaneously.

Since the structure has Re entrant corners Three Dimensional Dynamic analysis has been carried out.

TABLE1: Static Load Combinations

Name	Load Case/	Scale Factor
	Combo	
DCon1	DEAD	1.5
	SIDL	1.5
DCon2	DEAD	1.5
	LIVE	1.5
	SIDL	1.5
DCon3	DEAD	1.2
	LIVE	1.2
	SIDL	1.2

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	WX	1.2
DCon4	DEAD	1.2
	LIVE	1.2
	SIDL	1.2
	WX	-1.2
DCon5	DEAD	1.2
	LIVE	1.2
	SIDL	1.2
	WY	1.2
DCon6	DEAD	1.2
	LIVE	1.2
	SIDL	1.2
	WY	-1.2
DCon7	DEAD	1.5
	SIDL	1.5
	WX	1.5
DCon8	DEAD	1.5
	SIDL	1.5
	WX	-1.5
DCon9	DEAD	1.5
	SIDL	1.5
	WY	1.5
DCon10	DEAD	1.5
	SIDL	1.5
	WY	-1.5
DCon11	DEAD	0.9
	SIDL	0.9
	WX	1.5
DCon12	DEAD	0.9
	SIDL	0.9
	WX	-1.5
DCon13	DEAD	0.9
	SIDL	0.9

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	WY	1.5
DCon14	DEAD	0.9
	SIDL	0.9
	WY	-1.5
DCon15	DEAD	1.2
	LIVE	1.2
	SIDL	1.2
	EQX	-1.2
DCon16	DEAD	1.2
	LIVE	1.2
	SIDL	1.2
	EQX	-1.2
DCon17	DEAD	1.2
	LIVE	1.2
	SIDL	1.2
	EQY	1.2
DCon18	DEAD	1.2
	LIVE	1.2
	SIDL	1.2
	EQY	-1.2
DCon19	DEAD	1.5
	SIDL	1.5
	EQX	1.5
DCon20	DEAD	1.5
	SIDL	1.5
	EQX	-1.5
DCon21	DEAD	1.5
	SIDL	1.5
	EQY	1.5
DCon22	DEAD	1.5
	SIDL	1.5
	EQY	-1.5
DCon23	DEAD	0.9

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	SIDL	0.9
	EQX	1.5
DCon24	DEAD	0.9
	SIDL	0.9
	EQX	-1.5
DCon25	DEAD	0.9
	SIDL	0.9
	EQY	1.5
DCon26	DEAD	0.9
	SIDL	0.9
	EQY	-1.5

TABLE : Dynamic Load Combinations

Name	Load Case/Combo	Scale Factor
DCon27	DEAD	1.2
	LIVE	1.2
	SIDL	1.2
	SPECX	1.2
DCon28	DEAD	1.2
	LIVE	1.2
	SIDL	1.2
	SPECY	1.2
DCon29	DEAD	1.2
	LIVE	1.2
	SIDL	1.2
	SPECZ	1.2
DCon30	DEAD	1.5
	SIDL	1.5
	SPECX	1.5

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DCon31	DEAD	1.5
	SIDL	1.5
	SPECY	1.5
DCon32	DEAD	1.5
	SIDL	1.5
	SPECZ	1.5
DCon33	DEAD	0.9
	SIDL	0.9
	SPECX	1.5
DCon34	DEAD	0.9
	SIDL	0.9
	SPECY	1.5
DCon35	DEAD	0.9
	SIDL	0.9
	SPECZ	1.5
DCon36	DEAD	1.2
	LIVE	1.2
	SIDL	1.2
	SPECX	1.2
	SPECY	0.36
	SPECZ	0.36
DCon37	DEAD	1.2
	LIVE	1.2
	SIDL	1.2
	SPECY	1.2
	SPECX	0.36
	SPECZ	0.36
DCon38	DEAD	1.5
	SIDL	1.5
	SPECX	1.5
	SPECY	0.45
	SPECZ	0.45
DCon39	DEAD	1.5

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	SIDL	1.5
	SPECY	1.5
	SPECX	0.45
	SPECZ	0.45
DCon40	DEAD	0.9
	SIDL	0.9
	SPECX	1.5
	SPECY	0.45
	SPECZ	0.45
DCon41	DEAD	0.9
	SIDL	0.9
	SPECY	1.5
	SPECX	0.45
	SPECZ	0.45

Temperature Load Combinations

Combinations Load Combination	Load Factor							
	D.L	L.L	WL$_X$	WL$_Y$	EL$_X$	EL$_Y$	EL$_Z$	TL
DL+TL	1.5	-	-	-	-	-	-	1.0
DL+LL+WX+TL	1.2	1.2	1.2					1.0
DL+LL-WX+TL	1.2	1.2	-1.2					1.0
DL+LL+WY+TL	1.2	1.2		1.2				1.0
DL+LL-WY+TL	1.2	1.2		-1.2				1.0

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DL+WX+TL	1.5		1.5					1.0
DL-WX+TL	1.5		-1.5					1.0
DL+WY+TL	1.5			1.5				1.0
DL-WY+TL	1.5			-1.5				1.0
DL+WX+TL	0.9		1.5					1.0
DL-WX+TL	0.9		-1.5					1.0
DL+WY+TL	0.9			1.5				1.0
DL-WY+TL	0.9			-1.5				1.0
DL+LL+Spec X+TL	1.2	1.2			1.2			1.0
DL+LL- Spec X +TL	1.2	1.2			-1.2			1.0
DL+LL- Spec Y +TL	1.2	1.2				-1.2		1.0
DL+ Spec X +TL	1.5				1.5			1.0
DL- Spec X +TL	1.5				-1.5			1.0
DL+ Spec Y +TL	1.5					1.5		1.0
DL- Spec Y +TL	1.5					-1.5		1.0
DL+ Spec Y +TL	0.9				1.5			1.0
DL- Spec X +TL	0.9				-1.5			1.0
DL+ Spec Y +TL	0.9					1.5		1.0
DL- Spec Y +TL	0.9					-1.5		1.0

Service load combinations

DL + LL+WLX	1	1	1					
DL+LL - WLX	1	1	-1					
DL +LL+ WLY	1	1		1				
DL+LL-WLY	1	1		-1				
DL + WLX	1		1					
DL - WLX	1		-1					
DL + WLY	1			1				

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DL - WLY	1			-1				
DL + LL + SPECX	1	1			1			
DL + LL + SPECY	1	1				1		
DL + LL + SPECZ	1	1					1	
DL+SPECX	1				1			
DL+SPECY	1					1		
DL+SPECZ	1						1	

DL-Dead load, LL – Live load, WL- Wind load, EL – Seismic load, TL – Temperature Load.

Note:

- Live Load reductions is considered as per IS 875 Part –II for Column, Shear wall and Footing Design.
- For 3D Static and Dynamic load combinations and over strength load combinations(2.5 Times), Annexture shall be referred.
- For design of foundations and transfer slab 3D static load combination will be used.
- For design of foundations 0.5 live load reduction factor shall be considered as per IS 875- Part 2.
- For design of columns, shear walls, RC walls,corewalls and beams 3D dynamic load combineation shall be used.
- Please find Annexure for 3D Static and Dynamic, 3D-over strength factor (2.5 Times) Load combinations attached seperatley.

8.5 DESIGN METHODOLOGY

The structure 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 Codes IS 456:2000 , IS 875 (Part-5) 1987 &IS 1893 part-1 2016, for the most unfavourable effects are chosen for design.

Foundation:

- The footings are designed to resist the bending moments and shear forces developed due to soil reaction as specified in Indian standard code IS: 456-2000.
- The main purpose of the footing is to effectively transfer the super structure load to the soil without exceeding the safe bearing capacity and the settlement of the structure should be within tolerable limits.
- Isolated/Strip footings– Forces are derived from ETABS and component elements are designed using spread sheets.
- Combined footing-Combined footing will be designed using SAFE and subgrade modulus shall be based on geotechnical report.

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- Raft foundation-Designed using SAFE and in-house spread sheets.
- The foundations are designed based on the results and forces obtained from ETABS for the critical condition using modulus of sub grade reactions for designs both for independent and raft foundations.
- The depth of the footings has chosen in order to avoid the necessity for punching shear reinforcement.
- Live load reduction is considered for the design.

Columns

Columns will be designed using ETABS software and in-house spread sheets and manual calculations where necessary.
The columns were designed by considering with live load reducing factors.

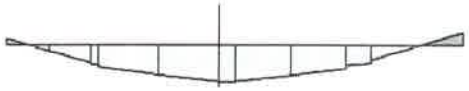
The design of the reinforcement shall be considering the limits for maximum reinforcement ratio as per standards as well as construction requirement.

Rcc core wall / shear wall

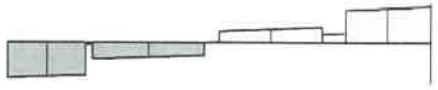
- Core walls are designed for critical of two cases.
- ✓ Case 1 – Check individual legs with respect to gravity loads (DL + SIDL+LL)
- ✓ Case 2 – Check combined wall for lateral load combination
- The RC core wall / Shear wall design is carried out by finite element method using the commercially available latest software ETABS the walls are mainly designed for vertical as well as horizontal load from structure and also ensure the overall structural stability.

Beams

Beams will be designed using ETABS software and in-house spread sheets.The RC beam design is carried out by finite element method using the commercially available latest software ETABS and also using by spread sheet wherever complexity in ETABS designs.



Bending Moment Diagram



Shear Force Diagram

Slabs:

Slabs designs will be using SAFE software and in house spread sheets.
The RCC slab analysis and design is carried out by finite element method using the commercially available latest software SAFE-12.1.3 and in house spread sheets.

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The Slab is designed based on the results and forces obtained from ETABS for the critical condition.

Staircase:

Staircase is designed using STAAD pro/ manually as per limit state method as specified in IS: 456-2000.

Wherever possible going will be supported on landing slabs & effective span shall be applied as per the IS Code.

The RCC Staircase slab analysis and design is carried out by 3D finite element method using the commercially available latest software STAAD PRO V8i and in house spread sheets

8.6 COVER FOR ENVIRONMENTAL CONDITIONS, CORROSION AND FIRE PROTECTION FOR CONCRETE AND STRUCTURAL STEEL.

As per clause 8.2.2 IS 456:2000, the general environment to which the concrete will be exposed during its working life is classified into five levels of severity, that is, mild, moderate, severe, very severe and extreme as described in below table.

Cover for steel to protect from fire and corrosion, moderate environment condition is considered.

- As per table 16, IS 456-2000, nominal cover to meet durability requirement is for moderate condition is 30mm (type of exposure-Concrete surfaces sheltered from saturated salt air in coastal area) is considered for all internal structural element.
- Nominal cover to meet durability requirement is for severe condition is 45mm (type of exposure- Concrete exposed to coastal environment) is considered for all external structural element.

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Table 3 Environmental Exposure Conditions

(*Clauses* 8.2.2.1 *and* 35.3.2)

Sl No. (1)	Environment (2)	Exposure Conditions (3)
i)	Mild	Concrete surfaces protected against weather or aggressive conditions, except those situated in coastal area.
ii)	Moderate	Concrete surfaces sheltered from severe rain or freezing whilst wet
		Concrete exposed to condensation and rain
		Concrete continuously under water
		Concrete in contact or buried under non-aggressive soil/ground water
		Concrete surfaces sheltered from saturated salt air in coastal area
iii)	Severe	Concrete surfaces exposed to severe rain, alternate wetting and drying or occasional freezing whilst wet or severe condensation.
		Concrete completely immersed in sea water
		Concrete exposed to coastal environment
iv)	Very severe	Concrete surfaces exposed to sea water spray, corrosive fumes or severe freezing conditions whilst wet
		Concrete in contact with or buried under aggressive sub-soil/ground water
v)	Extreme	Surface of members in tidal zone
		Members in direct contact with liquid/ solid aggressive chemicals

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Concrete cover for structural elements

Structural Elements		Environment Conditions	Fire resistance		Cover to Reinforcement adopted	Remarks Refer clause 26.4.2,21.4 and 26.4.3 and Table16& 16A
		Severe	1.5 hours	2 hours		
Footing		50	-	-	50	
Interior columns		-	40	40	40	Concrete surfaces sheltered from saturated salt air in coastal area
Exterior columns		45	40	40	45	
Shear wall/core wall(interior)		-	-	25	30	
Beams interior (simply supported)		-	20	40	40	
Beams exterior (simply supported)		45	40	40	45	
Beams interior (continuous)		-	20	30	30	
Beams exterior (continuous)		45	30	30	45	
Slabs (simply supported)		-	25	35	30	
Slabs (continuous)		-	20	25	30	
Staircase		-	25	25	30	
Retaining wall Earth side		-	45	45	45	
Water Retaining wall	Inner face	45			45	
	Exterior face	45			45	

8.7 EXPANSION JOINTS:

Expansion joints are normally provided when structure exceeds 45m length. The width of the joints is being calculated as per IS-1893-2016, clause 7.11.3.

The width of the building is more than 45m.however no expansion joint is proposed, and the building shall be designed for temperature stress.

8.8 CONSTRUCTION JOINTS:

Construction joints and shrinkage strips will be planned with the coordination of construction agencies.

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8.9 EXCAVATION METHODOLOGY:

- Sloping will be carried out depending on the Soil condition & its texture and as per Soil consultants advice or soil protection system shall be designed based on site condition.
- Slush formed by any water accumulation should be removed and refilled by lean concrete.
- If water accumulates in the pile cap trenches, necessary dewatering should be done by pumping out water from a level lower than the pile cap level to maintain downward flow of water.

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8.10 ETABS 3D MODEL



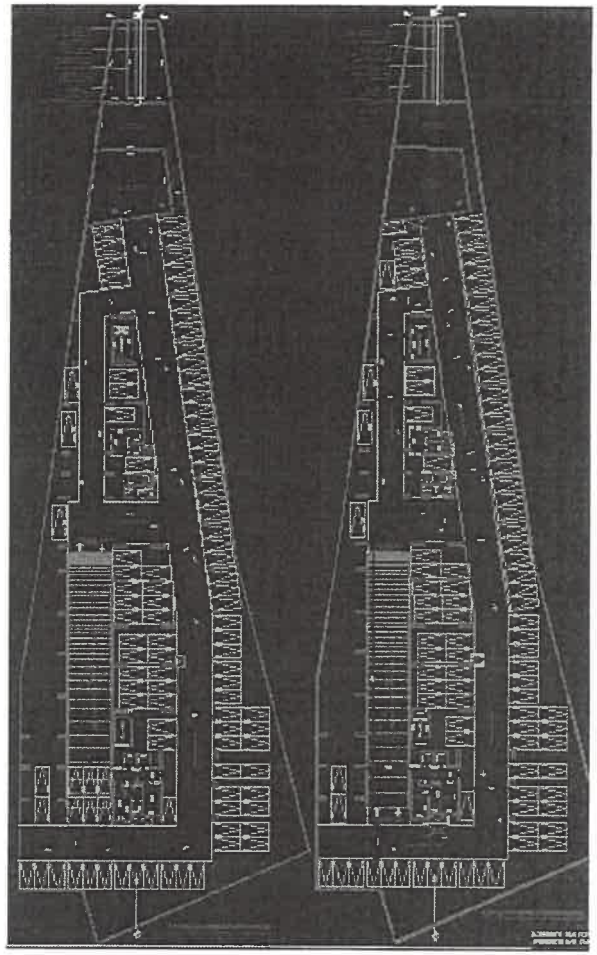
3D View

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9 DRAWINGS

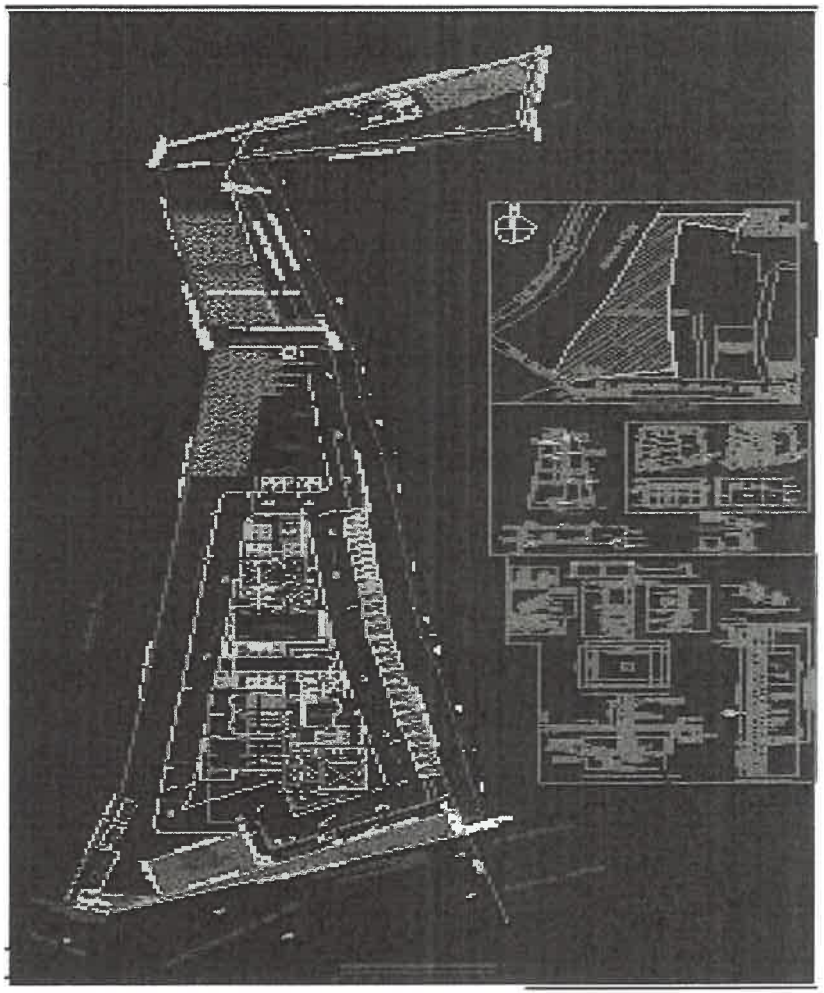
9.3 ARCHITECTURAL DRAWING



BASEMENT-2 & BASEMENT-1

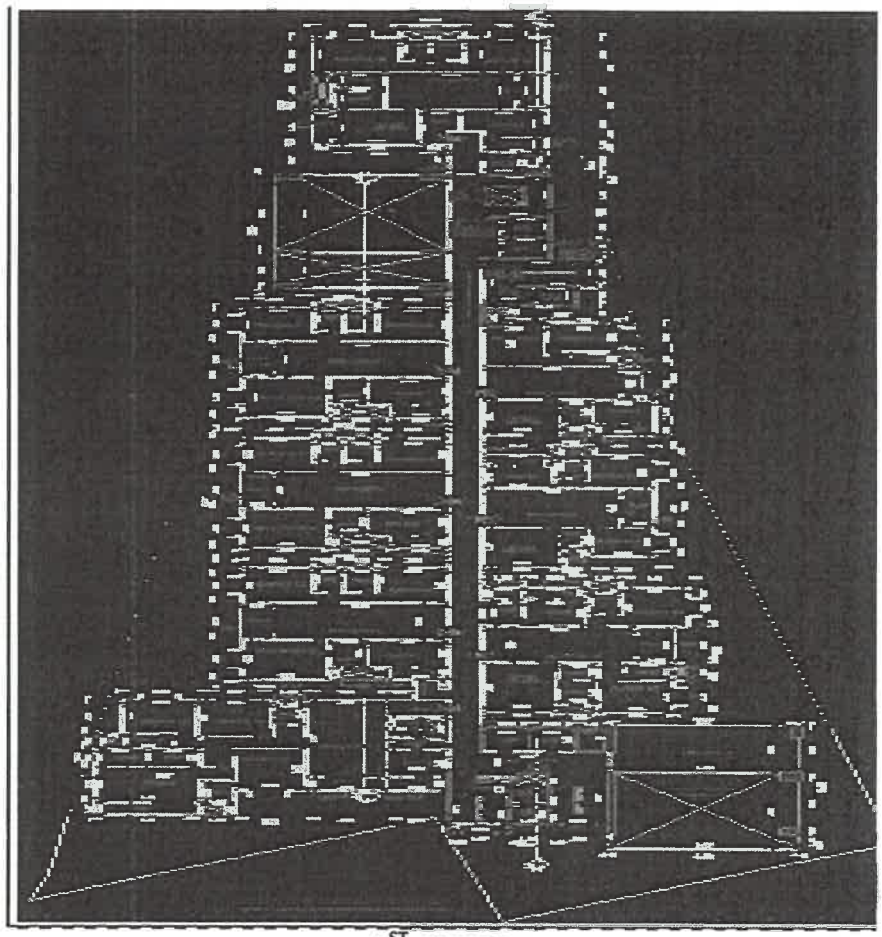
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GROUND FLOOR

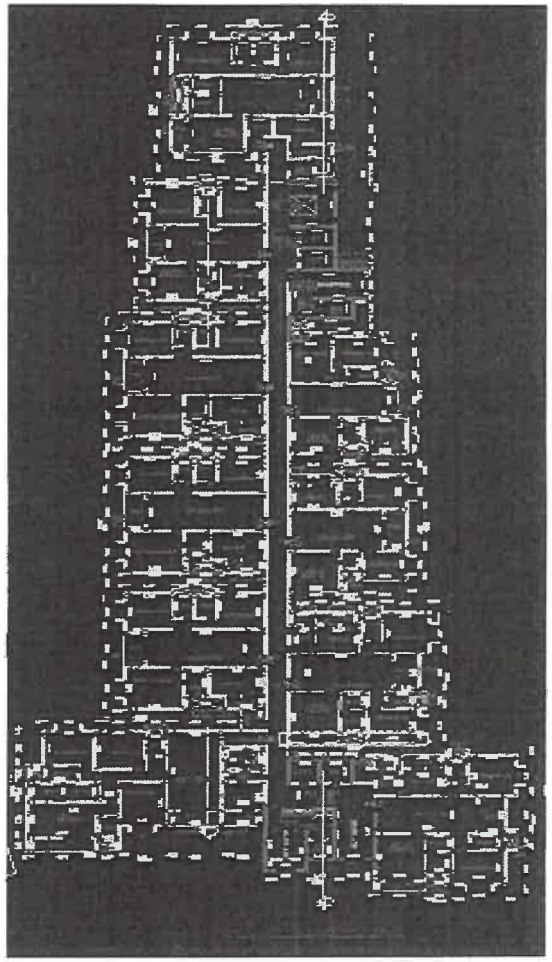
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1ST FLOOR

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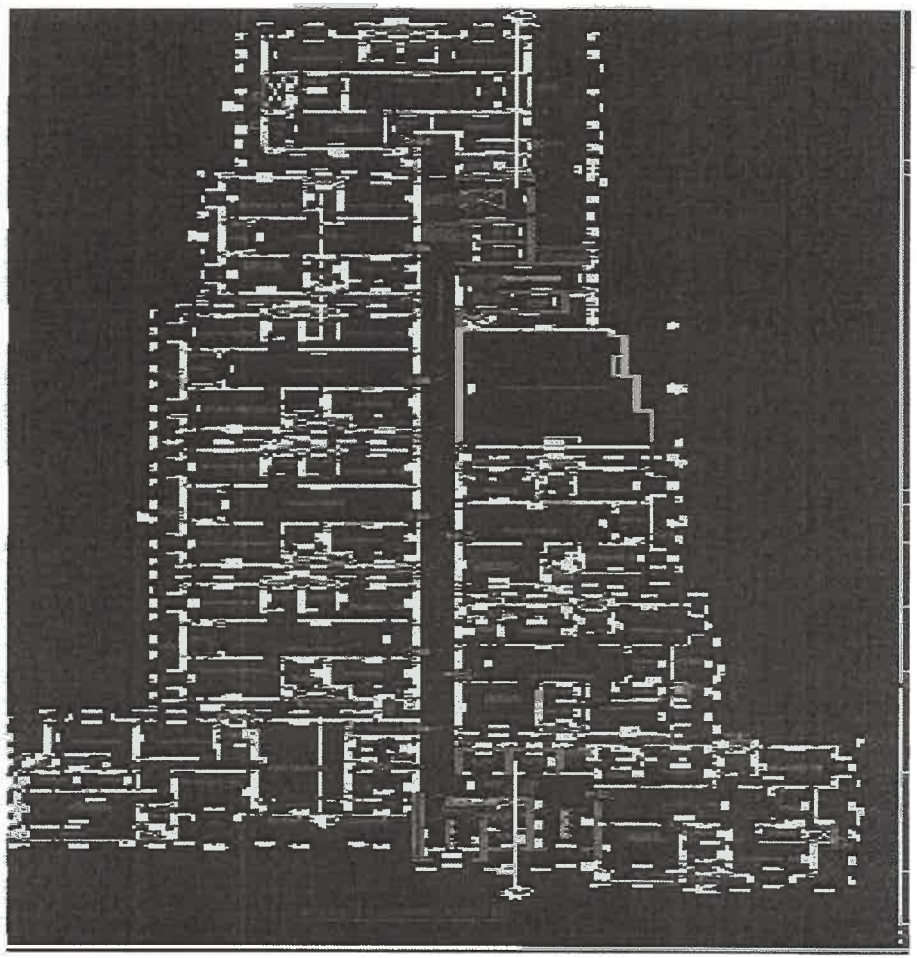
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2ND TO 18TH FLOOR PLAN

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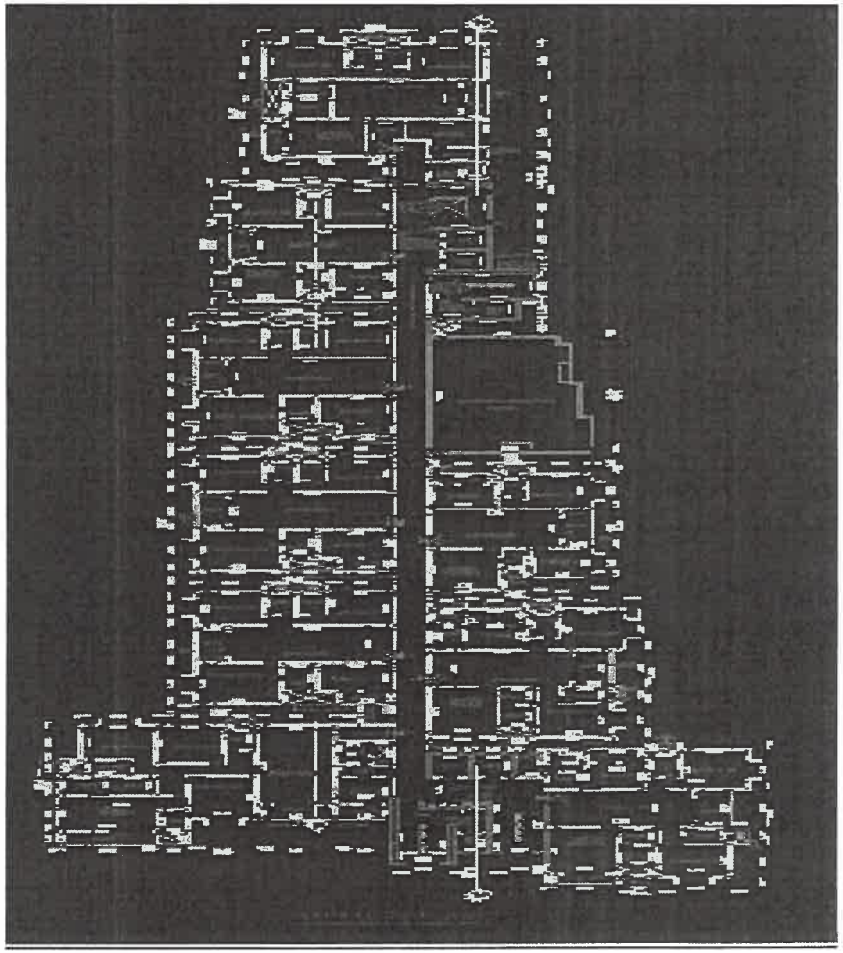
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19TH FLOOR

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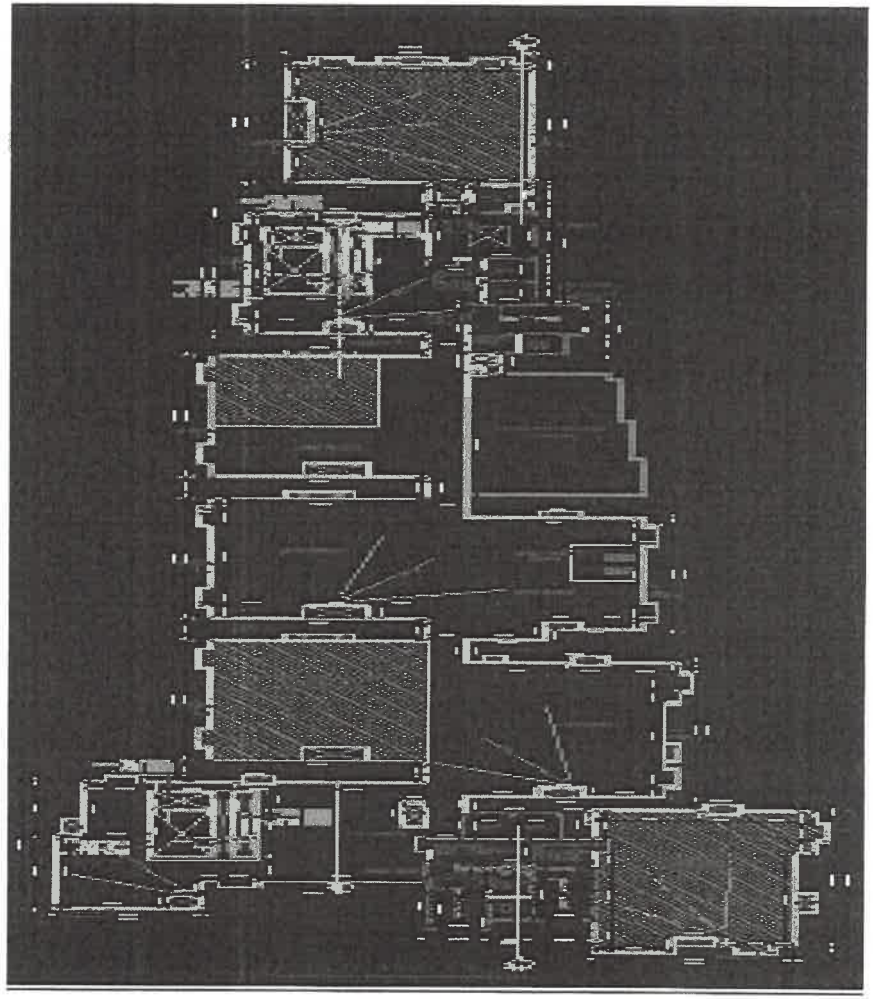
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20TH FLOOR

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GENERAL NOTE & INFORMATIONS FOR STRUCTURE

DESIGN PHASE

1. GENERAL :

1.1 ALL DIMENSIONS ARE IN S.I UNITS.
1.2 FOLLOW WRITTEN DIMENSIONS ONLY AND DO NOT SCALE THE DRAWING.
1.3 ALL STRUCTURAL DRAWINGS SHALL BE READ IN CONJUNCTION WITH RELEVANT ARCHITECTURAL AND SERVICE DRAWINGS.
1.4 ANY DISCREPANCY IN THE DRAWING SHALL BE BROUGHT TO THE NOTICE OF CONSULTANTS BEFORE COMMENCING THE WORK AT SITE.
1.5 THE ± 0.00 LEVEL OF THE PROJECT REFERS TO ARCHITECTURAL DRAWING. MENTION THE CORRESPONDING REDUCED LEVEL (R.L)
1.6 THIS DRAWING IS THE PROPERTY OF INNOTECH ENGINEERING CONSULT Pvt. Ltd., REPRODUCTION/DUPLICATION OF THE DRAWING IN PART (OR) WHOLE IS NOT PERMITTED.
1.7 STRUCTURAL CONSULTANTS NOT RESPONSIBLE FOR ANY MISMATCHING/WRONG DETAILS FOLLOWED AT SITE OTHER THAN DETAILS BY STRUCTURAL CONSULTANTS.
1.8 THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DESIGN OF ALL TEMPORARY WORKS RELATED TO THE CONSTRUCTION PROCESS.
1.9 THE STRUCTURE IS DESIGNED AS LISTED BELOW :
G8 BASEMENTS + GROUND FLOOR + 16 UPPER FLOORS + Ch ADDITIONAL FLOORS
1.10 NO ADDITIONAL FLOOR IS CONSIDERED FOR DESIGN OF THE STRUCTURE.

2. CRITERIA FOR DESIGN OF STRUCTURE :

2.1 THE CONCRETE DESIGN IS BASED ON IS : 456-2000.
2.2 SUPER IMPOSED DEAD LOADS ARE BASED ON IS : 875 (Part 01)-1987

a) Floor finish 50mm ⊕ Residential area	}	120 kg/sq.m
b) Floor finish 100mm ⊕ Parking	}	240 kg/sq.m
c) Service load (basement & ground floor)	}	50 kg/sq.m
d) 100mm Thick Solid Block masonry (for 1.0M height)		220 kg/m
e) 150mm Thick Solid Block masonry (for 1.5M height)		330 kg/m
f) 200mm Thick Solid Block masonry (for 1.0M height)		440 kg/m
g) Landscape		AS PER LANDSCAPE DRAWINGS/BRIEF

2.3 LIVE LOADS ARE BASED ON IS : 875 (Part 02)-1987

I) RESIDENTIAL BUILDINGS :		
a) Car parking/movement	:	300 kg/sq.m
b) Car parking/1 Stack	:	500 kg/sq.m
c) Residential area	:	200 kg/sq.m
d) Corridor & balconies	:	300 kg/sq.m
e) Stair case	:	300 kg/sq.m
f) Bath & toilets	:	200 kg/sq.m
g) Lift machine rooms	:	1,000 kg/sq.m
h) Terrace	:	200 kg/sq.m
i) Fire truck on podium slabs	:	45M.Tonne Moving Load
II) RESIDENTIAL CLUB HOUSE :		
a) Entrance lobby/Reception	:	400 kg/sq.m
b) Indore games	:	300 kg/sq.m
c) Home Theatre	:	400 kg/sq.m
d) Banquet hall	:	400 kg/sq.m
e) Gym	:	400 kg/sq.m
f) Party hall	:	400 kg/sq.m

2.4 WIND LOADS ARE BASED ON IS : 875 (PART 03)-2015

a) Basic wind speed at 10.0m height for CHENNAI	}	: 50 m/sec.
b) Risk co-efficent for general structure, 50 years mean return period (k1)	}	: 1.0
c) Terrain, height & structure size factor (k2)	}	: 1.0
d) Topography factor (k3)	}	: 1.0
e) Importance Cyclone factor (k4)	}	: 1.0

2.5 SEISMIC LOADS ARE BASED ON IS : 1893 (Part 01)-2016

a) Town/City	:	CHENNAI
b) Seismic Zone	:	III
c) Zone factor (Z) (Moderate intensity)	} :	0.16
d) Importance factor (I)	:	1.20
e) Response Reduction Factor (R), building with ductile RC structure wall with RC OMRF	} :	4.00

2.6 SNOW LOAD NOT CONSIDERED FOR DESIGN OF STRUCTURE.
2.7 SPECIAL LOADS LIKE EXPLOSIONS, FALLING OF AIRCRAFT, VIBRATION DUE TO EQUIPMENTS ON STRUCTURE NOT BEEN ACCOUNTED FOR DESIGN OF STRUCTURES

3. LIST OF LS CODES :

3.1 IS : 456-2000 CODE OF PRACTICE FOR PLAIN AND REINFORCED CONCRETE.
3.2 IS : 800-2007 CODE OF PRACTICE FOR GENERAL CONSTRUCTION IN STEEL.
3.3 IS : 875 (Part-01 TO Part-05) IMPOSED LOADS AND WIND LOADS.
3.4 IS : 1893(PART-1)-2016 CODE OF PRACTICE FOR EARTHQUAKE RESISTANT DESIGN OF STRUCTURES.
3.5 IS : 13920-2016 CODE OF PRACTICE FOR DUCTILE DESIGN AND DETAILING OF REINFORCED CONCRETE STRUCTURES SUBJECTED TO SEISMIC FORCES.
3.6 IS : 4326-2013 CODE OF PRACTICE FOR EARTHQUAKE RESISTANT DESIGN AND CONSTRUCTION OF BUILDINGS.
3.7 IS : 1786-2008 SPECIFICATION FOR HIGH STRENGTH DEFORMED STEEL BARS AND WIRES FOR CONCRETE REINF.
3.8 IS : 1904-1986 CODE OF PRACTICE FOR DESIGN AND CONSTRUCTION OF FOUNDATIONS IN SOILS GENERAL REQUIREMENTS.
3.9 IS : 3414-1968 CODE OF PRACTICE FOR DESIGN AND INSTALLATION OF JOINTS IN BUILDINGS.
3.10 IS : 3370 (PART-1;1967) CODE OF PRACTICE FOR CONCRETE STRUCTURES FOR STORAGE OF LIQUIDS.
3.11 IS : 10262-2009 CODE FOR CONCRETE MIX PROPORTIONING- GUIDELINES.
3.12 S.P-23 (1982) HAND BOOK ON CONCRETE MIX.
3.13 IS : 16700-2023 CODE FOR CRITERIA FOR STRUCTURAL SAFETY OF TALL CONCRETE BUILDINGS .
3.14 IS : 1343-2012 CODE OF PRACTICE FOR PRE STRESSED CONCRETE.
3.15 IS : 16172-2023 REINFORCEMENT CONCRETE FOR MECHANICAL SPLICES OF BARS IN CONCRETE-SPECIFICATIONS.

4. SOIL DATA & WATER TABLE :

4.1 IT IS ADVISIBLE TO ADOPT DEEP PILE FOUNDATION SYSTEM AS PER GEOTECHNICAL REPORT THE STARTA BEYOND 30M FROM THE EXISTING GROUND LEVEL MEETS THE REQUIREMENT OF BEARING STRATA
4.2 WATER TABLE IS ENCOUNTERED AT THE DEPTH OF 3.5M TO 6M BELOW THE EXISTING GROUND LEVEL AS PER GEOTECHNICAL REPORT
4.3 MINIMUM DEPTH OF EXCAVATION SHALL BE AS INDICATED IN DRAWINGS.
4.4 SUBSOIL DRAINAGE SYSTEM IS PROPOSED FOR BASEMENT TO DRAIN PURGED WATER

5. CONCRETE :

5.1 ALL STRUCTURAL CONCRETE SHALL HAVE CUBE CRUSHING STRENGTH OF 30 N/Sq.mm AT 28 DAYS EXCEPT AS MENTIONED IN 5.2
5.2 ALL STRUCTURAL CONCRETE OF CUBE CRUSHING STRENGTH AT 28DAYS
5.2(a) FOR FOUNDATIONS (INCLUDING RAFTCUM RAFT SLAB) : M30 (30N/sq.mm)
5.2(b) FOR COLUMNS,CORE WALLS AND SHEAR WALLS (FOUNDATION TO FIRST FLOOR) : M50 (50N/sq.mm)
(FIRST FLOOR TO TERRACE FLOOR) : M30 (30N/sq.mm)
5.3 RCC SLABS & BEAM AS BELOW :
a) BASEMENT-01 AND GROUND FLOOR : M30 (30N/sq.mm)
b) FIRST FLOOR/TRANSFER LEVEL : M30 (30N/sq.mm)
c) FIRST FLOOR TO TERRACE LEVEL : M30 (30N/sq.mm)
5.4 RC WALLS
a) ALL LEVELS : M30 (30N/sq.mm)
5.5 GRADE OF CONCRETE FOR UG SUMP, STP & OTHER WATER RETAINING STRUCTURES : M30 (30N/sq.mm)
5.6 GRADE OF CONCRETE FOR RETAINING WALLS, STAIRCASE, RAMP SLABS & BEAMS, RC UPSTANDS & LINTELS : M30 (30N/sq.mm)
5.7 MAXIMUM SIZE OF AGGREGATE SHALL PREFERABLY BE 20mm AND SHALL BE GRADED.
5.8 PLAIN CEMENT CONCRETE SHALL HAVE CUBE STRENGTH OF 10 N/sq.mm AT 28 DAYS.
5.9 ALL CONCRETE SHALL BE OF DESIGN MIX AND ARE TO BE OBTAINED FROM REPUTED TESTING LABORATORIES AND APPROVED BY CONSULTANTS, THE MATERIALS THAT ARE PROPOSED TO BE USED IN THE PROJECT SHALL BE TESTED AND TEST CERTIFICATE FURNISHED BEFORE USE OF MATERIAL AT SITE.

6. REINFORCING STEEL :

6.1 ALL REINFORCING STEEL SHALL CONFORM TO IS:1786-2008 HAVING MINIMUM YIELD STRENGTH OF 415 N/sq.mm DENOTED AS : "Y"
6.2 ALL REINFORCEMENT STEEL SHALL CONFORM TO IS:1786 -2008 HAVING MINIMUM YIELD STRENGTH OF 550N/sq.mm DENOTED AS : "T"
6.3 ALL REINFORCEMENT STEEL SHALL CONFORM TO IS 432(II)-1982 HAVING MINIMUM YIELD STRENGTH OF 250 N/mm DENOTED AS : "M"
6.4 ALL REINFORCEMENT STEEL SHALL BE TESTED AND CERTIFICATES FURNISHED BEFORE THE USAGE OF STEEL AT SITE. ALONG WITH MANUFACTURER'S TEST CERTIFICATE
6.5 GRADE OF REINFORCING STEEL : Fe550D

7. CLEAR COVER TO REINFORCEMENT TO MEET FIRE RESISTANCE AND ENVIRONMENTAL CONDITIONS;

7.1 NOMINAL COVER TO MEET 2 Hours FIRE RESISTANCE TO REINFORCEMENT.

FOUNDATION	:	75mm (AT BOTTOM), 75mm (FOR SIDES)
GRADE SLAB/ STITCH SLAB	:	40mm (AT BOTTOM) 20mm (AT TOP)
LINTELS	:	20mm
BEAMS		
simply supported	:	40mm
continuous	:	30mm
COLUMNS/SHEAR WALLS	:	20mm (FOR COLUMNS LESS THAN 200mm) and reinforcing bar not greater than 12mm 40mm (FOR COLUMNS MORE THAN & EQUAL 200mm)
SLABS		
simply supported	:	35mm
continuous	:	25mm
RETAINING WALL	:	40mm (ON EARTH SIDE/WATER SIDE) 30mm (ON BASEMENT SIDE)
RC WALLS/CORE WALL	:	25mm
RIBS	:	35mm
PANEL BEAMS	:	30mm

7.2 NOMINAL COVER TO MEET DURABILITY REQUIREMENTS

EXPOSURE		NOMINAL CONCRETE COVER NOT LESS THAN
MILD	:	20mm
MODERATE	:	30mm
SEVERE	:	45mm
VERY SEVERE	:	50mm
EXTREME	:	75mm

7.3 P.V.C. COVER BLOCKS OF APPROVED MAKE SHALL BE USED IN CONCRETE.

8. DEVELOPMENT AND ANCHORAGE LENGTHS :

8.1 THE FOLLOWING DEVELOPMENT LENGTHS SHALL BE PROVIDED FOR REINFORCEMENT IN M34

FOR 'Y' 550 GRADE	BAR IN FLEXURAL TENSION					BAR IN COMPRESSION				
	M20	M25	M30	M35	M40 & ABOVE	M20	M25	M30	M35	M40 & ABOVE
8	500	488	400	358	316	455	345	319	282	252
10	624	535	500	447	395	500	428	400	352	316
12	748	642	599	538	473	599	514	479	423	379
16	998	855	798	704	632	798	685	638	564	504
20	1247	1070	998	880	788	998	855	798	704	631
25	1559	1338	1247	1100	985	1247	1070	998	880	788
32	1995	1710	1595	1406	1260	1595	1368	1276	1127	1008

* FOR DIRECT TENSION DEVELOPMENT LENGTH WILL BE TWICE THE LENGTH IN FLEXURAL TENSION
* FOR FINAL DEVELOPMENT LENGTH, ABOVE VALUES ARE TO BE ADDED WITH 10 TIMES THE DIA OF BAR.

DEVELOPMENT LENGTH Ld IS GIVEN BY

(i) For Tension Bars $Ld = \frac{\phi}{4} \times \frac{\sigma_s}{\tau_{bd}}$
(ii) For Compression Bars $Ld = \frac{\phi}{4} \times \frac{0.87 f_y}{0.87 f_{ck} \alpha \beta}$

ϕ = Dia of bar
σ_s = Stress in the bar i.e., 0.87f_y.
f_y= characteristic strength of reinforcement.
Const Design Bond Stress as per clause 26.2.1.1-IS 456 : 2000.

8.2 LAPS FOR REINFORCEMENT IN COMPRESSION SHALL BE ACCOUNTED ONLY AS STRAIGHT LENGTHS AND NO HOOKS OR BENDS ARE ACCOUNTED FOR COMPRESSION LAPS OR ANCHORAGES.
8.3 STANDARD HOOKS OR BENDS SHALL BE PROVIDED WHERE NECESSARY IN TENSION REINFORCEMENTS IN BEAMS, COLUMNS, SLABS, ETC.
8.4 ALL SPLICE (LAPS) FOR COLUMN REINFORCEMENTS SHALL BE PROVIDED ONLY AT THE TOP OF EACH FLOOR LEVEL UNLESS OTHERWISE SHOWN ON DRAWINGS AND SHALL NOT BE MORE THAN 6% STEEL.
8.5 MECHANICAL ANCHORAGES OF APPROVED MANUFACTURERS SHALL BE USED FOR COLUMN SPLICES FOR 20mm DIA AND ABOVE AND ARE TO BE AS PER DESIGN DRAWINGS AND SHALL HAVE YIELD STRENGTH OF 125% MORE THAN GRADE OF MAIN STEEL. TYPE II MECHANICAL THREADED COUPLERS TO BE USED, AS PER IS16172-2023
8.6 LAPS SHALL BE STAGGERED AS INDICATED IN DRAWINGS.
8.7 IN FOUNDATION, ALL CONNECTORS/LAPPING WILL BE MECHANICAL COUPLERS FOR DIA > 20mm.

CONSTRUCTION PHASE

9. WATER PROOFING

9.1 WATER PROOFING SHALL BE DONE FOR : SUMP TANKS, OVERHEAD TANK, BASEMENT WALLS TOILET SLABS, TERRACE, PODIUM LEVEL LANDSCAPE AREAS AS PER TENDER SPECIFICATIONS.

10. CURING

10.1 CURING COMPOUNDS SHALL BE USED FOR ALL VERTICAL ELEMENTS PROVIDED IT IS PIGMENTED.
10.2 CURING BY WATER SHALL BE DONE FOR THE OTHER ELEMENTS FOR A MINIMUM PERIOD OF 7 DAYS.

11. DESHUTTERING TIME

11.1 TYPE OF FORM WORK FOR : MINIMUM PERIOD BEFORE STRIKING (EXCLUDING THE DAY OF CASTING)

a. SLABS UPTO 4.6M	:	7 DAYS
OVER 4.5M	:	14 DAYS
b. BEAMS UPTO 6.0M	:	14 DAYS
OVER 6.0M	:	21 DAYS
c. WALL/BEAM/COLUMN VERTICAL FACES	:	1 DAY

11.2 SHUTTERING CAN BE RELEASED EARLIER THAN SPECIFIED ABOVE PROVIDED THE PROPS ARE RETAINED AT REASONABLE SPACINGS AND CONCRETE ATTAINS THE FULL STRENGTH AT THE TIME OF DESHUTTERING AS PER IS 456 - 2000. DESHUTTERING SHALL BE DONE BY PROVIDING DAMPENING MATERIAL BELOW IN ORDER TO REDUCE THE IMPACT AT THE LOWER LEVEL.
11.3 SIMPLY SUPPORTED AND CONTINUOUS SPANS SHALL BE DESHUTTERED FROM MID SPAN TOWARDS SUPPORTS.
CANTILEVERS SHALL BE DESHUTTERED FROM FREE END TOWARDS SUPPORTS
11.4 SLAB/BEAMS SHALL BE REPROPPED UNTIL THE NEXT LEVEL SLAB IS CAST AND DESHUTTERED.

12. CONSTRUCTION JOINTS

12.1 SLABS : AT MIDDLE ONE THIRD OF THE SPAN.
12.2 BEAMS : AT MIDDLE ONE THIRD OF THE SPAN. IF ANY CROSS BEAMS ARE LOCATED IN THIS REGION THE JOINT SHALL BE LOCATED TWO TIMES THE WIDTH OF THE BEAM AWAY FROM THE BEAM.
12.3 RETAINING WALL : AT THE JUNCTION OF THE WALL AND FOOTING WITH A KEY JOINT AND AT MIDDLE OF VERTICAL SPAN. VERTICAL JOINTS TO BE AVOIDED.
12.4 RAFT SLAB : AT MIDDLE ONE THIRD OF THE SPAN. WITH A KEY JOINT
12.5 GENERAL : CONSTRUCTION JOINTS SHALL BE STRAIGHT
12.6 CANTILEVERS : CONSTRUCTION JOINT SHALL NOT BE PROVIDED IN CANTILEVERS.

13. ADMIXTURE

13.1 CONCRETE ADMIXTURES OF APPROVED MAKE SHALL BE USED TO IMPROVE WORKABILITY AND STRENGTH AS PER TENDER SPECIFICATIONS.
13.2 CONCRETE ADMIXTURES OF APPROVED MAKE SHALL BE USED FOR WATER PROOFING AS PER TENDER SPECIFICATIONS.

14. CONSULTANTS APPROVAL

14.1 CONSULTANTS SHALL APPROVE THE CONCRETING SURFACE AFTER INSPECTION AND REMEDIAL MEASURES IF ANY TO BE DONE BEFORE ANY PLASTERING WORK IS TAKEN UP ON CONCRETE SURFACE. HOWEVER THIS DOES NOT DEVOLVE THE CONTRACTOR OF HIS RESPONSIBILITY FOR GETTING THE REQUIRED STRENGTH OF CONCRETE.

15. CAMBER FOR CANTILEVERS

FOR UP TO 1.5M CANTILEVERS ---- 15MM
FROM 1.5M TO 2.5M CANTILEVERS -- 20MM
FROM 2.5M TO 3.5M CANTILEVERS -- 25MM

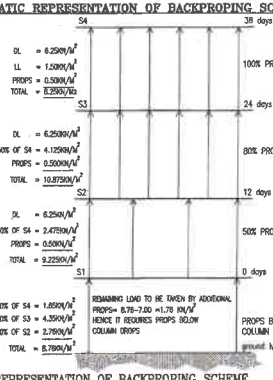
16. MECHANICAL COUPLERS

THE COUPLERS SHALL SATISFY MINIMUM YIELD STRENGTH OF 125% COMPARED TO YIELD STRENGTH OF REINFORCEMENT BARS AND ALSO THE RELEVANT IS CODAL TEST CRITERIA.



(TYPE OF COUPLER CLASS-H, AS PER IS-16172 : 2023)
SPLICING OF BAR DIAMETER > OR EQUAL TO 20mm

16. SCHEMATIC REPRESENTATION OF BACKPROPING SCHEME



SCHEMATIC REPRESENTATION OF BACKPROPING SCHEME
(CONTRACTOR TO SUBMIT BASED ON COLUMN SPAN & CONSTRUCTION SCHEDULE)

PROJECT: -
PLAN SHOWING THE PROPOSED CONSTRUCTION OF HIGH RISE BUILDINGS WITH TOWER CONSISTING OF DOUBLE BASEMENT FLOOR(PARKING) + GROUND FLOOR (CLUB HOUSE, BMS ROOM, ASSOCIATION ROOM, ATM) WITH 2 COMMERCIAL SPACES + FIRST FLOOR CLUB HOUSE + 2ND TO 16TH FLOORS: 1-09 DWELLING UNITS/FLOOR, DWELLING UNITS TOTALLY 135 UNITS, IN S.NO-2/1, THE LIMIT OF GREATER CHENNAI CORPORATION. ZONE: -10; DIVISION: -127

"Structural Design Proof Checked and Found Satisfactory"
Anna University, Chennai - 600 025
24 JAN 2026

SUBMISSION DRAWING

ALL DIMENSIONS ARE IN METRES

SCALE = 1:120

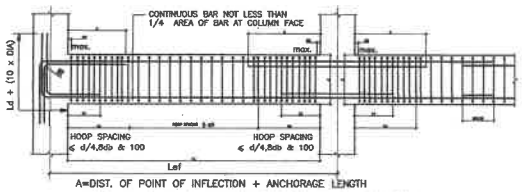
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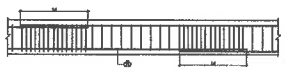
DRAWING TITLE:	DRG NO:
GENERAL NOTES	ST-SD-001



A=DIST. OF POINT OF INFLECTION + ANCHORAGE LENGTH
BUT NOT LESS THAN Ln/4 THE DESIGNER MAY CUT SOME BARS SHORTER THAN THIS, BUT ATLEAST 1/3 OF AREA OF BAR AT THE FACE OF COL. MUST EXTENDED THIS DIST.
d= EFFECTIVE DEPTH OF BEAM
L1=Ln/8
IR=INTERNAL RADIUS, Ld=DEVELOPMENT LENGTH

TYPICAL ARRANGEMENT OF REINFORCEMENT IN BEAMS
TYP. BAR DETAIL FOR SPECIAL DUCTILE MOMENT RESISTING FRAME

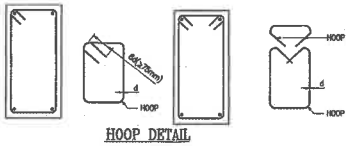
AS PER IS3920 -2016 & S.P 34(S & T)-1987
SECOND LAYER OF TOP REINF. TO BE SPREAD IN THE SLAB(TYP) REFER SECTION -B (TYP)



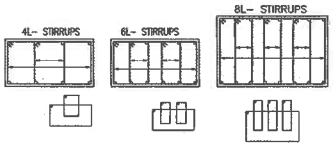
Ld=DEVELOPMENT LENGTH IN TENSION
db=DIA OF BAR

1.THE HOOP ARE PROVIDED OVER THE ENTIRE SPLICE LENGTH SHALL NOT EXCEED 150MM.
2.THE LAP LENGTH SHALL NOT BE LESS THAN BAR DEVELOPMENT LENGTH IN TENSION.
3. LAP SPLICES SHALL NOT BE PROVIDED
I. WITHIN A JOINT
II. WITHIN A DISTANCE OF 2d FROM FACE OF THE COLUMN &
III. WITHIN A QUARTER LENGTH OF MEMBER WHERE FLEXURAL YIELDING MAY GENERALLY OCCUR UNDER THE EFFECT OF EARTH QUAKE FORCE.
4. NOT MORE THAN 50% OF BARS SPLICED AT ONE SECTION
5. USE OF WELD SPLICES & MECHANICAL CONNECTIONS MAY ALSO BE MADE AS PER IS 456-2000.

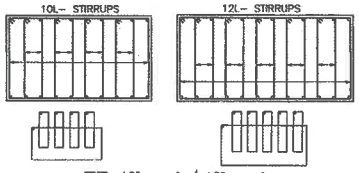
LAP SPLICE IN BEAM



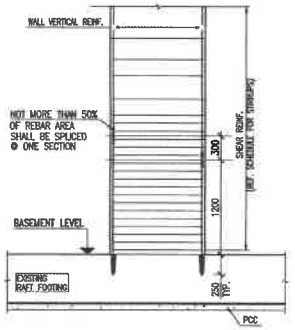
HOOP DETAIL



TYP. 4Legged / 6Legged / 8Legged STIRRUP ARRANGEMENT DETAILS



TYP. 10Legged / 12Legged STIRRUP ARRANGEMENT DETAILS



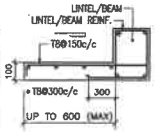
TYPICAL COUPLER SPLICE DETAIL FOR NEW COLUMN/ SHEAR WALL FROM EXISTING RAFT (REBAR 16MM & ABOVE DIAMETER)

LINTEL SCHEDULE

SL.	TYPE	SPAN	SIZE 200 THK.	SIZE 150 THK.	SIZE 100 THK.
1.	L3	3M. TO 4M	200 × 300: • 2 T12, • 2 T16+ • 1 T12, T8@75c/c	150 × 300: • 2 T12, • 1 T16+ • 2 T12, T8@75c/c	100 × 300: • 2 T16, T8@100c/c
2.	L4	4M. TO 5M.	200 × 350: • 2 T12, • 2 T16+ • 1 T12, T8@75c/c	150 × 350: • 2 T12, • 2 T16+ • 1 T12, T8@75c/c	100 × 350: • 2 T16, T8@100c/c

LINTEL SCHEDULE

SL.	TYPE	SPAN	SIZE 200 THK.	SIZE 150 THK.	SIZE 100 THK.
1.	L1	UP TO 2M.	200 × 200: • 2 T12, • 2 T12, T8@75c/c	150 × 200: • 2 T12, • 2 T12, T8@75c/c	100 × 200: • 2 T12, T8@75c/c
2.	L2	2M. TO 3M.	200 × 300: • 2 T12, • 3 T12, T8@75c/c	150 × 300: • 2 T12, • 3 T12, T8@75c/c	100 × 300: 2 T12, T8@100c/c



TYP.CHEJJA DETAILS

NOTE:

1) 200mm BEARING FOR ALL LINTELS
2) HEIGHT OF WALL ABOVE LINTEL IS 2m (MAX)
3) GRADE OF CONCRETE M30.
4) PRECAST LINTEL DETAILS.

PROJECT: -
PLAN SHOWING THE PROPOSED CONSTRUCTION OF HIGH RISE BUILDINGS WITH TOWER CONSISTING OF DOUBLE BASEMENT FLOOR(PARKING) + GROUND FLOOR (CLUB HOUSE, BMS ROOM, ASSOCIATION ROOM, ATM) WITH 2 COMMERCIAL SPACES + FIRST FLOOR CLUB HOUSE + 2ND TO 16TH FLOORS: 1-09 DWELLING UNITS/FLOOR, DWELLING UNITS TOTALLY 135 UNITS, IN S.NO-2/1, THE LIMIT OF GREATER CHENNAI CORPORATION.
ZONE: -10; DIVISION: -127

Structural Design Proof Checked and Found Satisfactory
Dr.A.SENTHIL, M.E., Ph.D.
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Anna University, Chennai - 600 025
24 JAN 2026

SUBMISSION DRAWING

N

ALL DIMENSIONS ARE IN METRES

SCALE = NTS

OWNER'S SIGNATURE

For SHRIRAM PROPERTIES LIMITED
Authorised Signatory

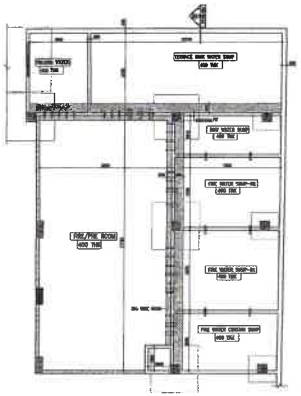
STRUCTURAL ENGINEER'S SIGNATURE

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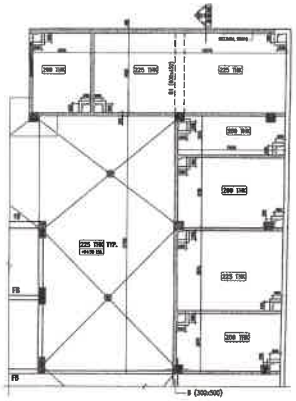
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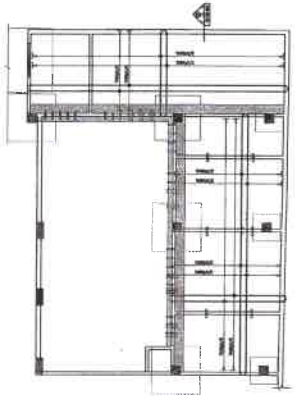
DRAWING TITLE:	DRG NO:
TYPICAL RC DETAILS (SHEET 02 OF 02)	ST-SD-002



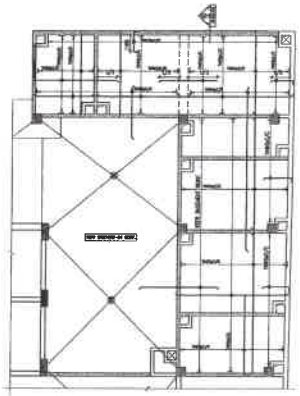
PLAN : UG SUMP BOTTOM SLAB SHUTTERING LAYOUT



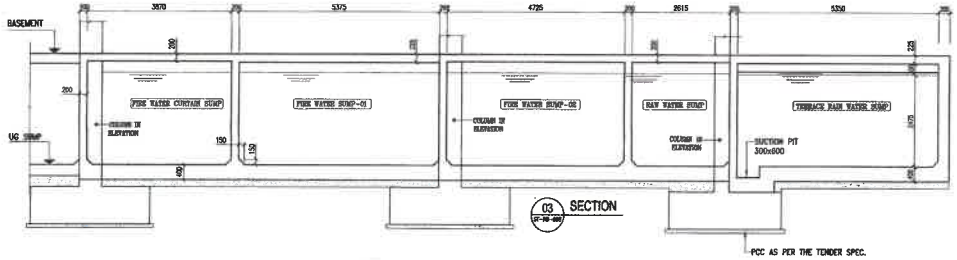
PLAN : UG SUMP TOP SLAB SHUTTERING LAYOUT

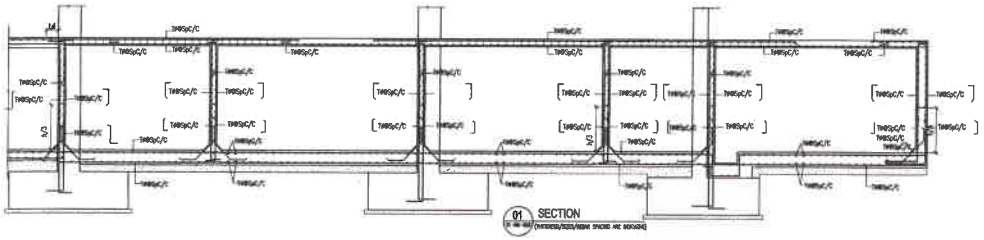


PLAN : UG SUMP BOTTOM SLAB BOTTOM REINFORCEMENT LAYOUT



PLAN : UG SUMP TOP SLAB BOTTOM REINFORCEMENT LAYOUT





PROJECT: –
PLAN SHOWING THE PROPOSED CONSTRUCTION OF HIGH RISE BUILDINGS WITH TOWER CONSISTING OF DOUBLE BASEMENT FLOOR(PARKING) + . GROUND FLOOR (CLUB HOUSE, BMS ROOM,ASSOCIATION ROOM,ATM)WITH 2 COMMERCIAL SPACES + FIRST FLOOR CLUB HOUSE + 2ND TO 16TH FLOORS:1–09 DWELLING UNITS/FLOOR, DWELLING UNITS TOTALLY 135 UNITS, IN S.NO–2/1,THE LIMIT OF GREATER CHENNAI CORPORATION.
ZONE: –10; DIVISION: –127

Structural Design: Proof Checked and Found Satisfactory

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Former Prof. & Ad Deputy Director
Professor of Structural Engineering
RECOM Approved, ACCAT Engineering
Anna University, Chennai - 600 025

24 JAN 2026

SUBMISSION DRAWING

N

ALL DIMENSIONS ARE IN METRES

SCALE = NTS

OWNER'S SIGNATURE

For SHRIRAM PROPERTIES LIMITED
Authorised Signatory

STRUCTURAL ENGINEER'S SIGNATURE

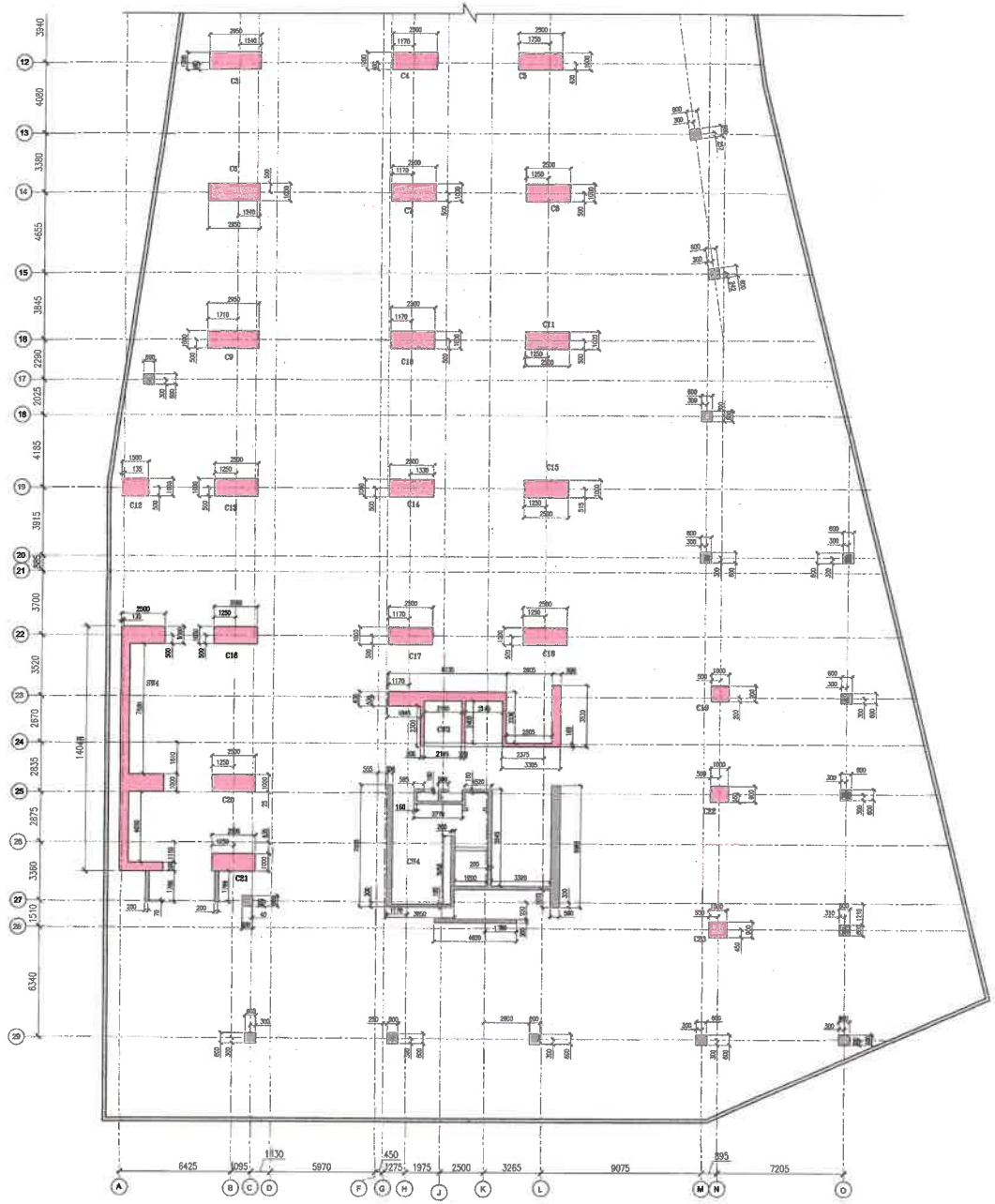
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E-mail : contact@edarch.in

DRAWING TITLE:	DRG NO:
MISCELLANEIOUS RCC DETAILS (SHEET 02 OF 03)	ST-SD-003



PROJECT: –
PLAN SHOWING THE PROPOSED CONSTRUCTION OF HIGH RISE BUILDINGS WITH TOWER CONSISTING OF DOUBLE BASEMENT FLOOR(PARKING) + GROUND FLOOR (CLUB HOUSE, BMS ROOM,ASSOCIATION ROOM,ATM)WITH 2 COMMERCIAL SPACES + FIRST FLOOR CLUB HOUSE + 2ND TO 16TH FLOORS: 1–09 DWELLING UNITS/FLOOR, DWELLING UNITS TOTALLY 135 UNITS, IN S.NO–2/1,THE LIMIT OF GREATER CHENNAI CORPORATION.
ZONE: –10; DIVISION: –127

Structural Design Proof Checked and Found Satisfactory
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Professor & Head of the Department
Department of Structural Engineering
Anna University, Chennai - 600 025
24 JAN 2025

SUBMISSION DRAWING

ALL DIMENSIONS ARE IN METRES

SCALE = 1:120

OWNER'S SIGNATURE

For SRIRAM PROPERTIES LIMITED
Authorised Signatory

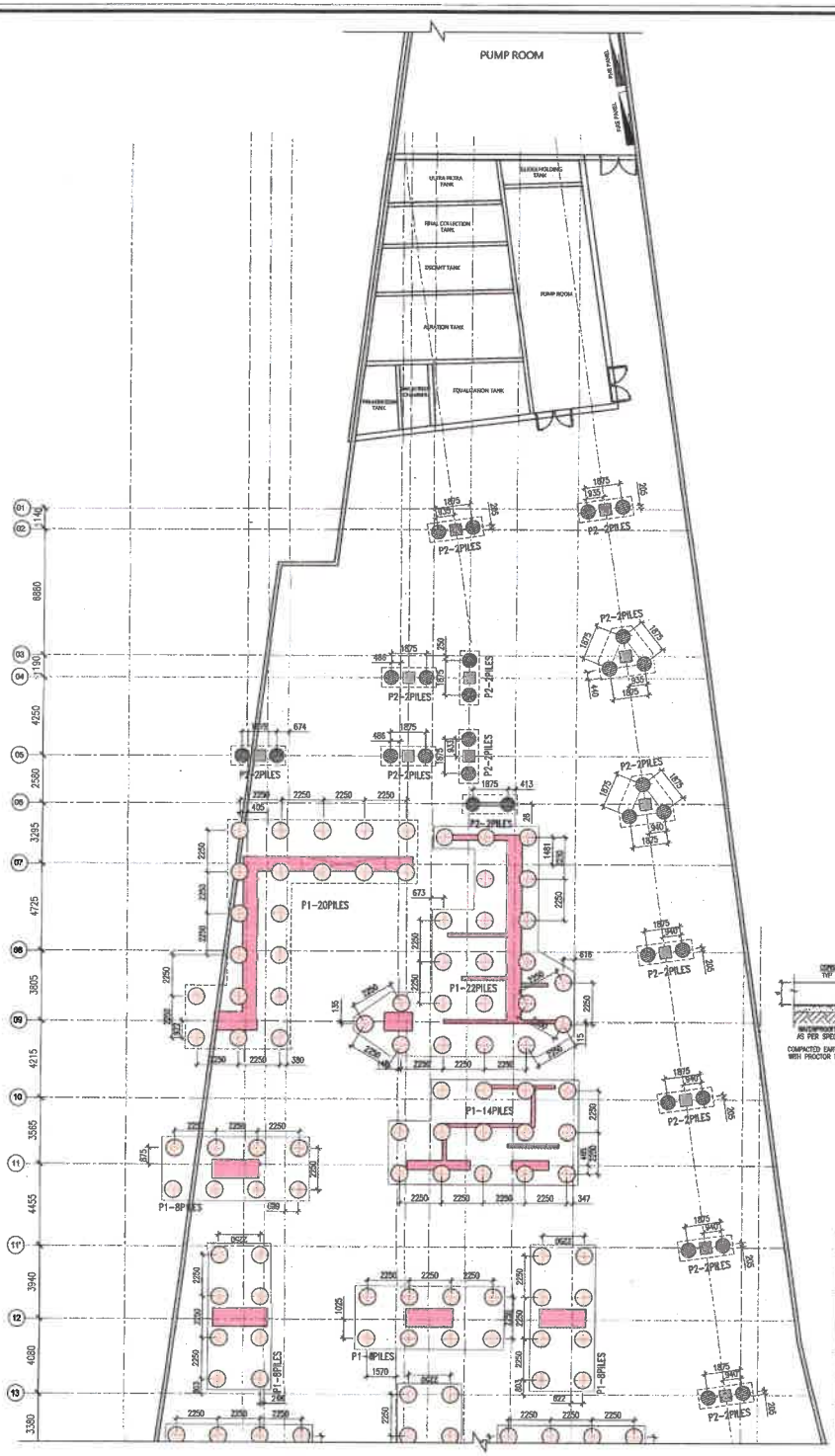
STRUCTURAL ENGINEER'S SIGNATURE

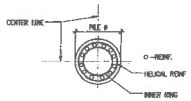
Innotech Engineering Consult Pvt. Ltd.
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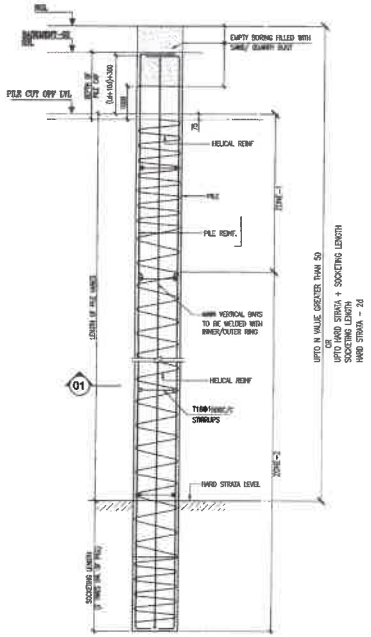
ED+ ARCHITECTURE
Kalleshr, 6/25, Canotaph Road,
First Street, Teynampet, Chennai - 600 018.
Tel : 24357906, 24362396, 24362397
E-mail : contact@edarch.in

DRAWING TITLE:	DRG NO:
COLUMN LAYOUT (SHEET 02 OF 02)	ST-SD-004

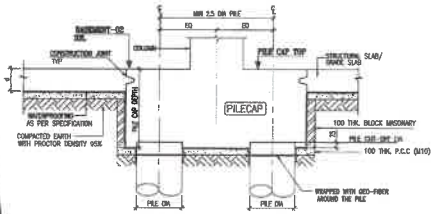




(BORED CAST IN-SITU PILE)
SECTION-01



TYPICAL PILE DETAILS



TYPICAL PILE CAP DETAILS

BORED CAST-IN-SITU PILE				
PILE TYPE	P1		P2	
	ZONE-1	ZONE-2	ZONE-1	ZONE-2
PILE DIA	900		750	
MAIN REINFORCEMENT	15-T20	15-T26	10-T20	10-T20
ZONE 1 LENGTH(MM)	4000		3750	
HELICAL REINFORCEMENT	T8@100C/C	T8@150C/C	T8@100C/C	T8@150C/C
PILE VERTICAL CAPACITY	300.0MT		210.0MT	
PILE HORIZONTAL CAPACITY	---		---	
PILE TENSION CAPACITY	---		---	
NUMBER OF PILES	---		---	

NOTE:- PILE LAYOUT IS DESIGNED BASED ON SAFE LOAD SUGGESTED BY INNOTECH AND TEST PILE RESULTS.

PROJECT:-
PLAN SHOWING THE PROPOSED CONSTRUCTION OF HIGH RISE BUILDINGS WITH TOWER CONSISTING OF DOUBLE BASEMENT FLOOR(PARKING) + GROUND FLOOR (CLUB HOUSE, BMS ROOM,ASSOCIATION ROOM,ATM)WITH 2 COMMERCIAL SPACES + FIRST FLOOR CLUB HOUSE + 2ND TO 16TH FLOORS:1-09 DWELLING UNITS/FLOOR, DWELLING UNITS TOTALLY 135 UNITS, IN S.NO-2/1,THE LIMIT OF GREATER CHENNAI CORPORATION.
ZONE: -10; DIVISION: -127

Structural Design Proof Checked and Found Satisfactory
24 JAN 2025

SUBMISSION DRAWING

ALL DIMENSIONS ARE IN METRES

SCALE = 1:120

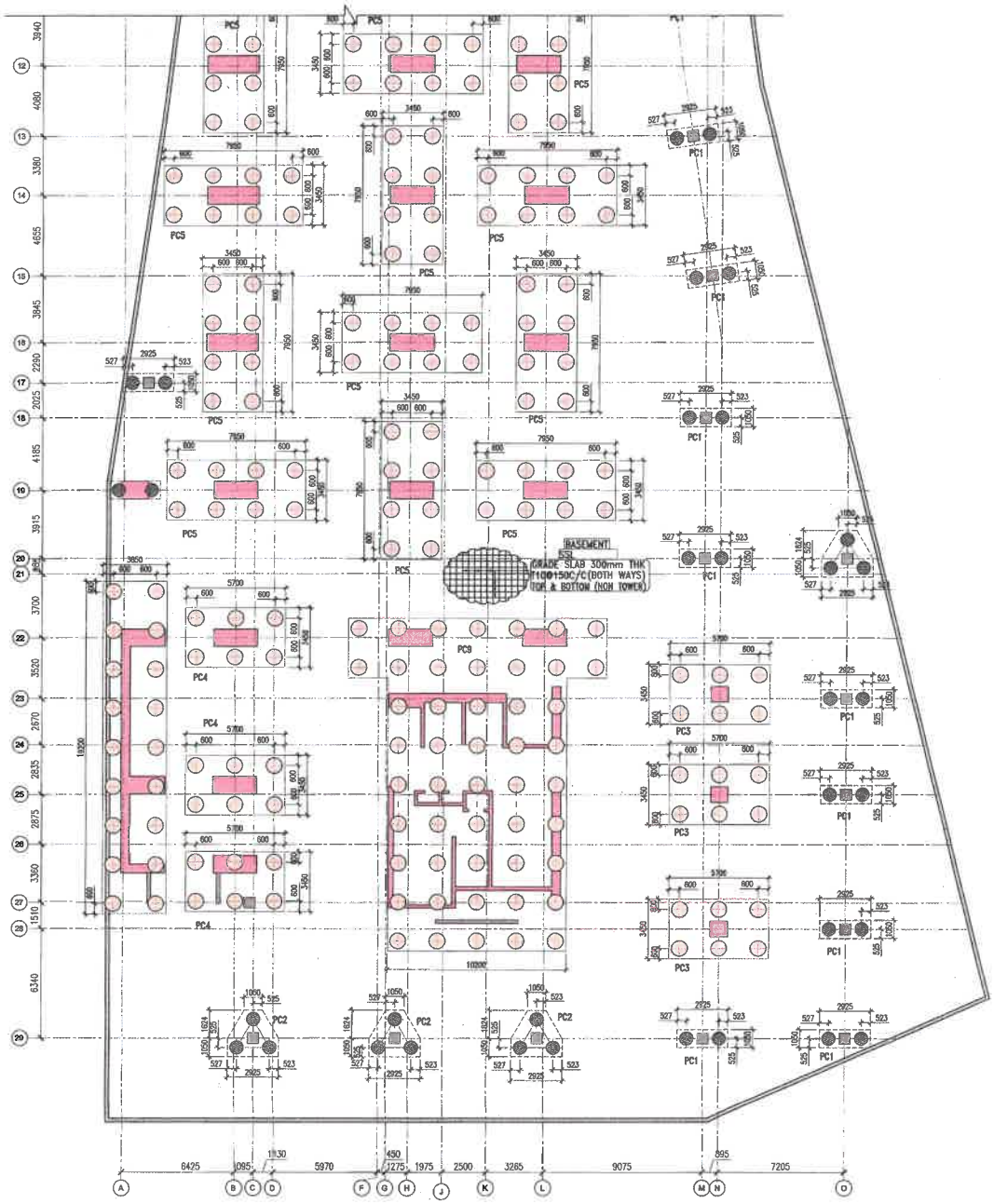
OWNER'S SIGNATURE
For SHRIRAM PROPERTIES LIMITED
Authorised Signatory

STRUCTURAL ENGINEER'S SIGNATURE

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E-mail : contact@edarch.in

DRAWING TITLE:	DRG NO:
PILE LAYOUT AND DETAILS (SHEET 01 OF 02)	ST-SD-005



PLAN : PILE CAP LAYOUT

PROJECT: –
PLAN SHOWING THE PROPOSED CONSTRUCTION OF HIGH RISE BUILDINGS WITH TOWER CONSISTING OF DOUBLE BASEMENT FLOOR(PARKING) + GROUND FLOOR (CLUB HOUSE, BMS ROOM,ASSOCIATION ROOM,ATM)WITH 2 COMMERCIAL SPACES + FIRST FLOOR CLUB HOUSE + 2ND TO 16TH FLOORS: 1–09 DWELLING UNITS/FLOOR, DWELLING UNITS TOTALLY 135 UNITS, IN S.NO–2/1,THE LIMIT OF GREATER CHENNAI CORPORATION.
ZONE: –10; DIVISION: –127

Structural Design Proof Checked and Found Satisfactory
D.V.RENUKE, M.E., Ph.D.,
Chief Engineer (Retd.)
Former Professor of Structural Engineering
Consultant in Civil Engineering
Anna University, Chennai - 600 025
21 JAN 2026

SUBMISSION DRAWING

ALL DIMENSIONS ARE IN METRES

SCALE = 1:120

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For SHRIRAM PROPERTIES LIMITED
Authorised Signatory

STRUCTURAL ENGINEER'S SIGNATURE

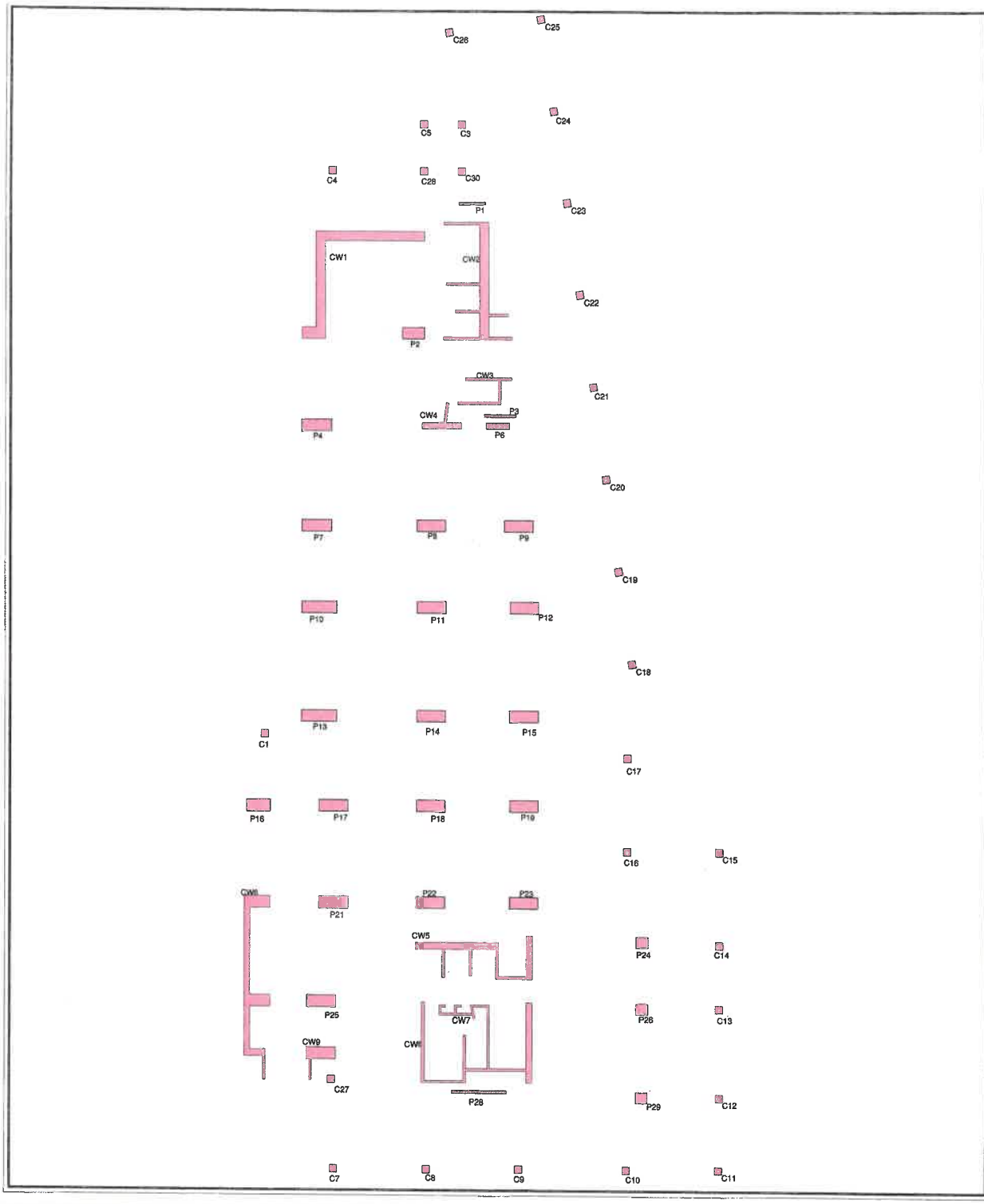
INNOTECH

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DRAWING TITLE:	DRG NO:
PILE CAP LAYOUT (SHEET 02 OF 02)	ST-SD-006



PROJECT: –
PLAN SHOWING THE PROPOSED CONSTRUCTION OF HIGH RISE BUILDINGS WITH TOWER CONSISTING OF DOUBLE BASEMENT FLOOR(PARKING) + GROUND FLOOR (CLUB HOUSE, BMS ROOM,ASSOCIATION ROOM,ATM)WITH 2 COMMERCIAL SPACES + FIRST FLOOR CLUB HOUSE + 2ND TO 16TH FLOORS:1–09 DWELLING UNITS/FLOOR, DWELLING UNITS TOTALLY 135 UNITS, IN S.NO–2/1,THE LIMIT OF GREATER CHENNAI CORPORATION.
ZONE: –10; DIVISION: –127

Structural Design Proof Checked and Found Satisfactory

24 JAN 2025

SUBMISSION DRAWING

ALL DIMENSIONS ARE IN METRES

SCALE = 1:120

OWNER'S SIGNATURE

For SIRIRAM PROPERTIES LIMITED

Authorised Signatory

STRUCTURAL ENGINEER'S SIGNATURE

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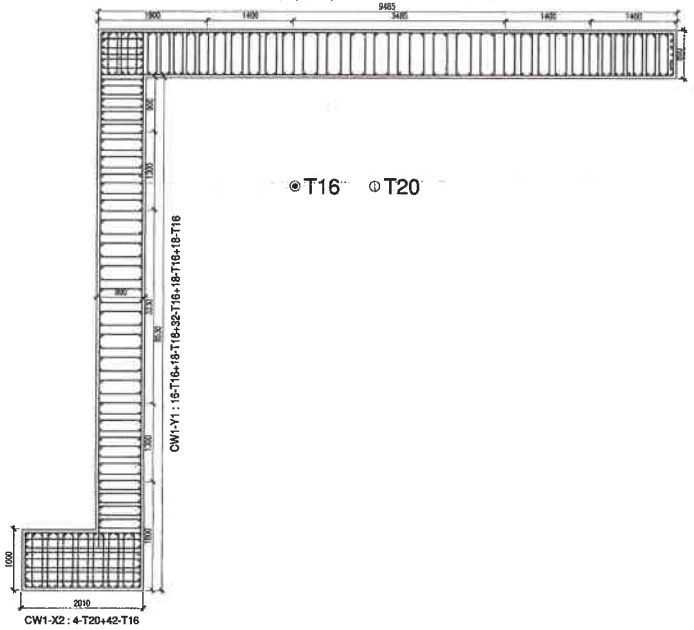
ED+ ARCHITECTURE
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E-mail : contact@edarch.in

DRAWING TITLE:	DRG NO:
COLUMN LAYOUT FOR COLUMN SCHEDULE DETAILS (SH 01 OF 02)	ST-SD-007

B1 TO GF

M50 : Fe415 , COVER = 50MM

CW1-X1 : (24-T16)+20-T16+20-T16+34-T16+20-T16+33-T16



CW1-X2
CONFINING ZONE = FULL HEIGHT

Z1 MAIN LINK	Z1 OTHERS	Z2 LINKS
T8 @ 70	T8 @ 70	-

CW1-Y1

MAIN LINKS	OTHER LINKS
T12 @ 100	T8@ 100

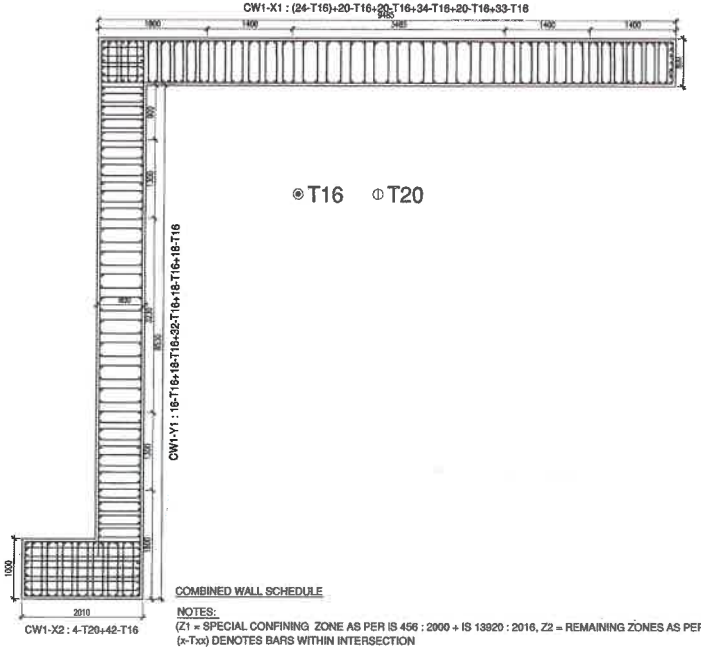
CW1-X1

MAIN LINKS	OTHER LINKS
T12 @ 100	T8@ 100

BASE TO B1

M50 : Fe415 , COVER = 50MM

CW1-X1 : (24-T16)+20-T16+20-T16+34-T16+20-T16+33-T16



CW1-X2
CONFINING ZONE = 1610 MM

Z1 MAIN LINK	Z1 OTHERS	Z2 LINKS
T8 @ 70	T8 @ 70	T8 @ 150

CW1-Y1

MAIN LINKS	OTHER LINKS
T12 @ 100	T8@ 100

CW1-X1

MAIN LINKS	OTHER LINKS
T12 @ 100	T8@ 100

COMBINED WALL SCHEDULE

NOTES:
(Z1 = SPECIAL CONFINING ZONE AS PER IS 456 : 2000 + IS 13920 : 2016, Z2 = REMAINING ZONES AS PER IS 456 : 2000 + IS 13920 : 2016
(x-Txx) DENOTES BARS WITHIN INTERSECTION

COMBINED WALL | CW1

PROJECT: –
PLAN SHOWING THE PROPOSED CONSTRUCTION OF HIGH RISE BUILDINGS WITH TOWER CONSISTING OF DOUBLE BASEMENT FLOOR(PARKING) + GROUND FLOOR (CLUB HOUSE, BMS ROOM, ASSOCIATION ROOM, ATM)WITH 2 COMMERCIAL SPACES + FIRST FLOOR CLUB HOUSE + 2ND TO 16TH FLOORS: 1–09 DWELLING UNITS/FLOOR, DWELLING UNITS TOTALLY 135 UNITS, IN S.NO–2/1, THE LIMIT OF GREATER CHENNAI CORPORATION. ZONE: –10; DIVISION: –127

Structural Design Proof Checked and Found Satisfactory
Dr. R. SENTHIL, M.E., Ph.D.,
Former Head of the Department
Professor of Structural Engineering
Department of Civil Engineering
Anna University, Chennai-600 025
24 JAN 2025

SUBMISSION DRAWING

ALL DIMENSIONS ARE IN METRES

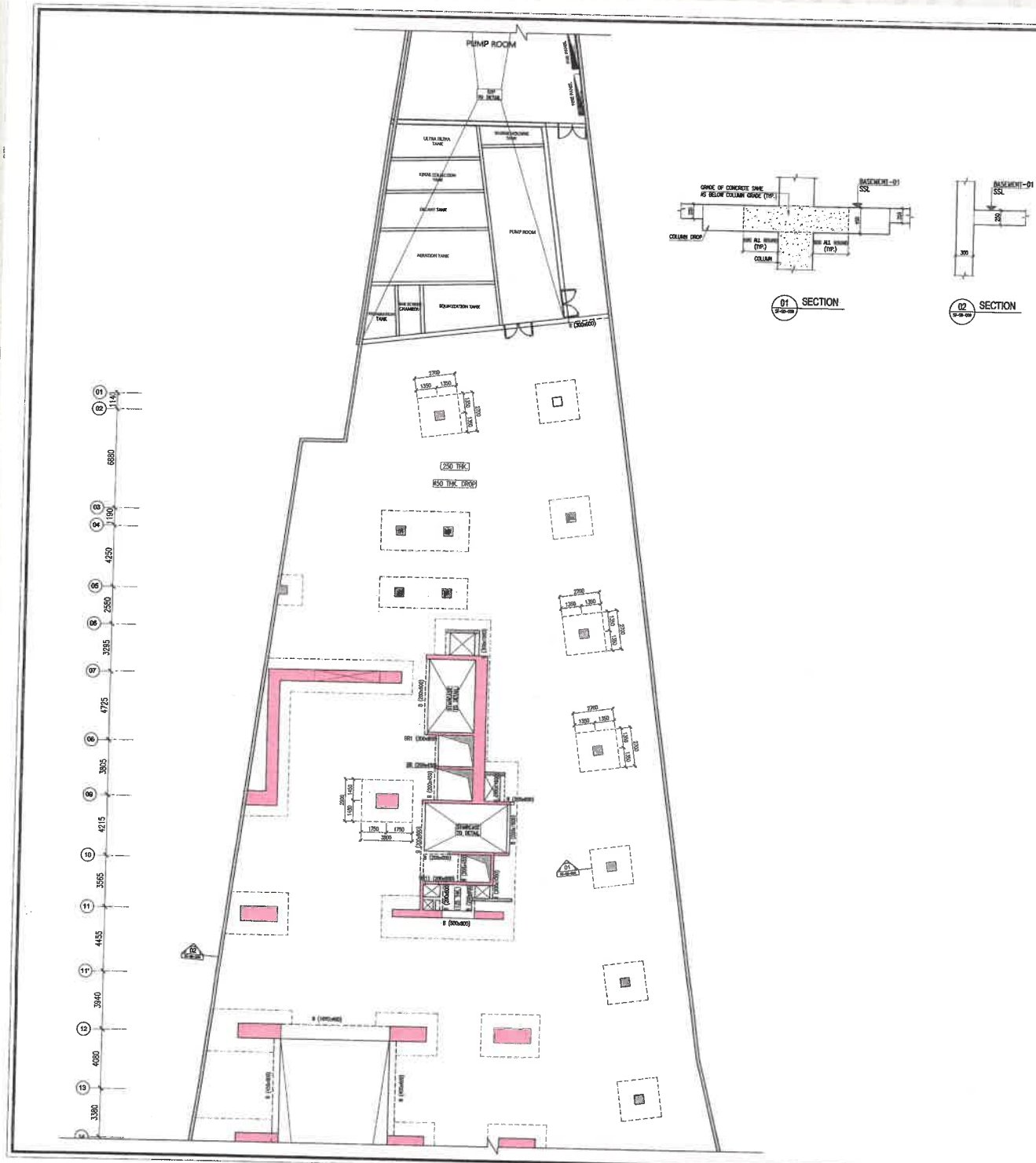
SCALE = 1:120

OWNER'S SIGNATURE
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First Street, Teynampet, Chennai - 600 018.
Tel : 24357006, 24362366, 24362397
E-mail : contact@edarch.in

DRAWING TITLE:	DRG NO:
CORE WALL DETAILS	ST-SD-008



PROJECT:-
PLAN SHOWING THE PROPOSED CONSTRUCTION OF HIGH RISE BUILDINGS WITH TOWER CONSISTING OF DOUBLE BASEMENT FLOOR(PARKING) + GROUND FLOOR (CLUB HOUSE, BMS ROOM,ASSOCIATION ROOM,ATM)WITH 2 COMMERCIAL SPACES + FIRST FLOOR CLUB HOUSE + 2ND TO 16TH FLOORS: 1-09 DWELLING UNITS/FLOOR, DWELLING UNITS TOTALLY 135 UNITS, IN S.NO-2/1,THE LIMIT OF GREATER CHENNAI CORPORATION. ZONE:-10; DIVISION:-127

Structural Design Proof Checked and Found Satisfactory
D.JAYANTHI, M.E., Ph.D.,
24 JAN 2020

SUBMISSION DRAWING

ALL DIMENSIONS ARE IN METRES

SCALE = 1:120

OWNER'S SIGNATURE

For SHRIRAM PROPERTIES LIMITED
Authorised Signatory

STRUCTURAL ENGINEER'S SIGNATURE

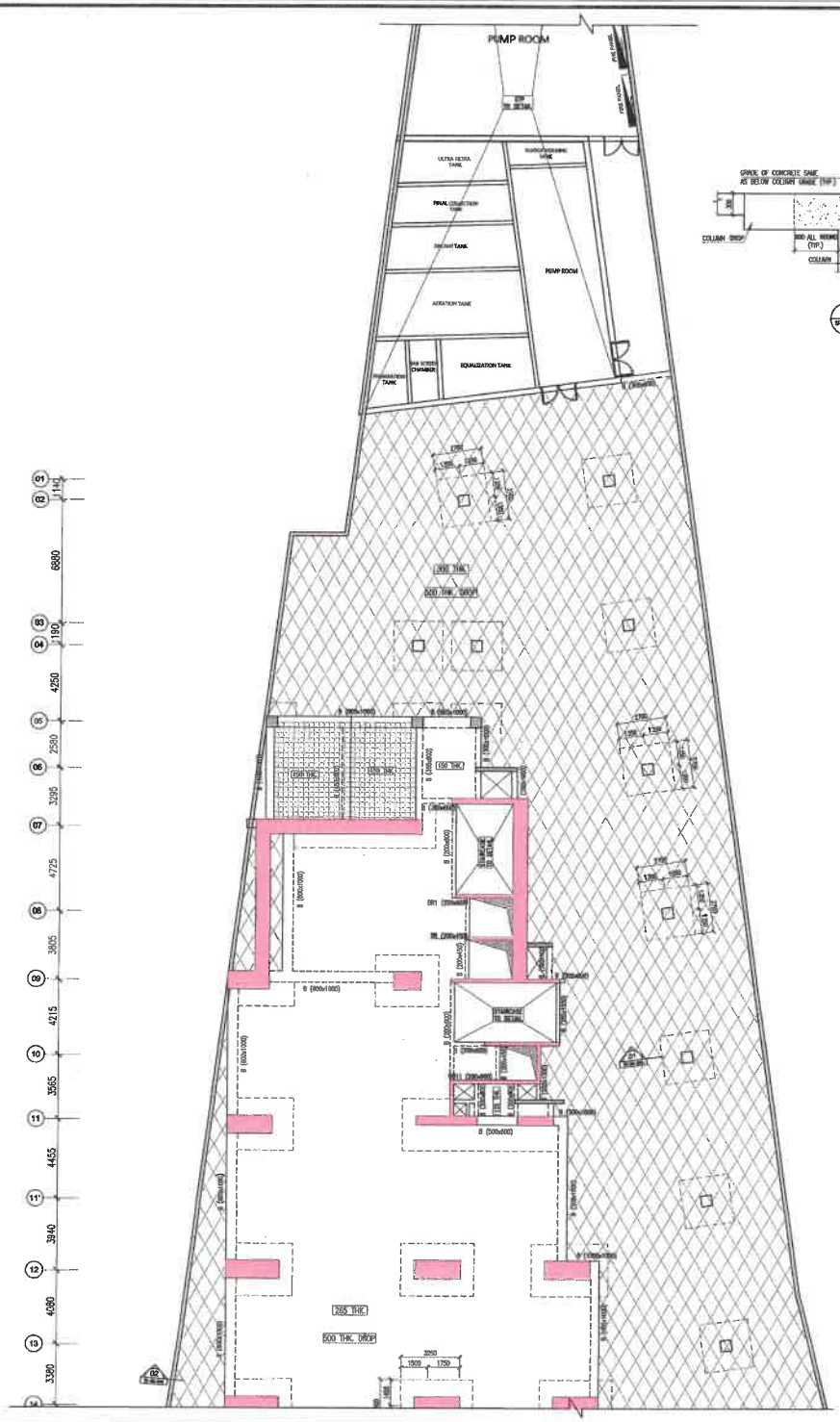
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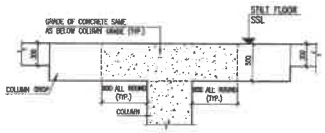
Innotech Engineering Consult Pvt. Ltd.
PERMIRA HOUSE, 80/2, 1st Floor, 1st Main Road,
3rd Phase, JP Nagar, Bangalore, Karnataka-560078
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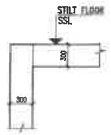
ED+ ARCHITECTURE
'Kailash', 8/25, Canotaph Road,
First Street, Teynampet, Chennai - 600 018.
Tel : 24357908, 24362398, 24362397
E-mail : contact@edarch.in

DRAWING TITLE:	DRG NO:
BASEMENT-01 FLOOR SHUTTERING LAYOUT (SHEET 01 OF 02)	ST-SD-009





01 SECTION



02 SECTION

PROJECT:–
PLAN SHOWING THE PROPOSED CONSTRUCTION OF HIGH RISE BUILDINGS WITH TOWER CONSISTING OF DOUBLE BASEMENT FLOOR(PARKING) + GROUND FLOOR (CLUB HOUSE, BMS ROOM,ASSOCIATION ROOM,ATM)WITH 2 COMMERCIAL SPACES + FIRST FLOOR CLUB HOUSE + 2ND TO 16TH FLOORS:1–09 DWELLING UNITS/FLOOR, DWELLING UNITS TOTALLY 135 UNITS, IN S.NO–2/1,THE LIMIT OF GREATER CHENNAI CORPORATION. ZONE:–10; DIVISION:–127

Structural Design Proof Checked and Found Satisfactory
Dr.P. SENTHIL, M.E., Ph.D.,
24 JAN 2025

SUBMISSION DRAWING

ALL DIMENSIONS ARE IN METRES

SCALE = 1:120

OWNER'S SIGNATURE

For SHRIRAM PROPERTIES LIMITED
Authorised Signatory

STRUCTURAL ENGINEER'S SIGNATURE

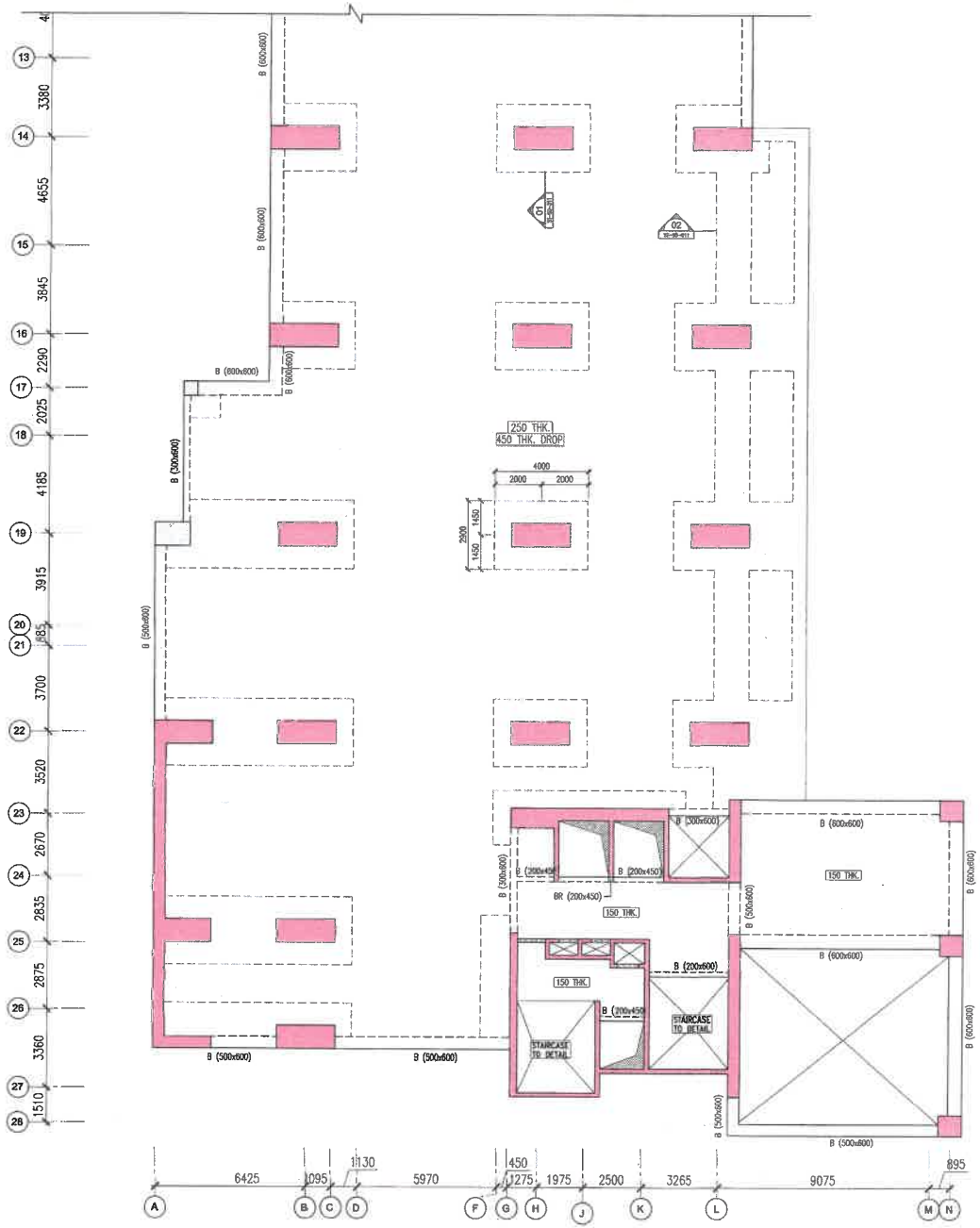
INNOTECH

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E-mail : contact@edarch.in

DRAWING TITLE:	DRG NO:
STILT FLOOR SHUTTERING LAYOUT (SHEET 01 OF 02)	ST-SD-010



PLAN : FIRST FLOOR FLOOR SHUTTERING LAYOUT

(UNLESS OTHERWISE SPECIFIED ALL THE SLAB THICKNESS SHALL BE 150mm THK)

PROJECT: –
PLAN SHOWING THE PROPOSED CONSTRUCTION OF HIGH RISE BUILDINGS WITH TOWER CONSISTING OF DOUBLE BASEMENT FLOOR(PARKING) + GROUND FLOOR (CLUB HOUSE, BMS ROOM,ASSOCIATION ROOM,ATM)WITH 2 COMMERCIAL SPACES + FIRST FLOOR CLUB HOUSE + 2ND TO 16TH FLOORS: 1–09 DWELLING UNITS/FLOOR, DWELLING UNITS TOTALLY 135 UNITS, IN S.NO–2/1,THE LIMIT OF GREATER CHENNAI CORPORATION. ZONE: –10; DIVISION: –127

Structural Design Proof Checked and Found Satisfactory

Dr.K.SRITHAR, M.E., Ph.D.,
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Anna University, Chennai - 600 025

24 JAN 2025

SUBMISSION DRAWING

ALL DIMENSIONS ARE IN METRES

SCALE = 1:120

OWNER'S SIGNATURE

For SHRIRAM PROPERTIES LIMITED
Authorised Signatory

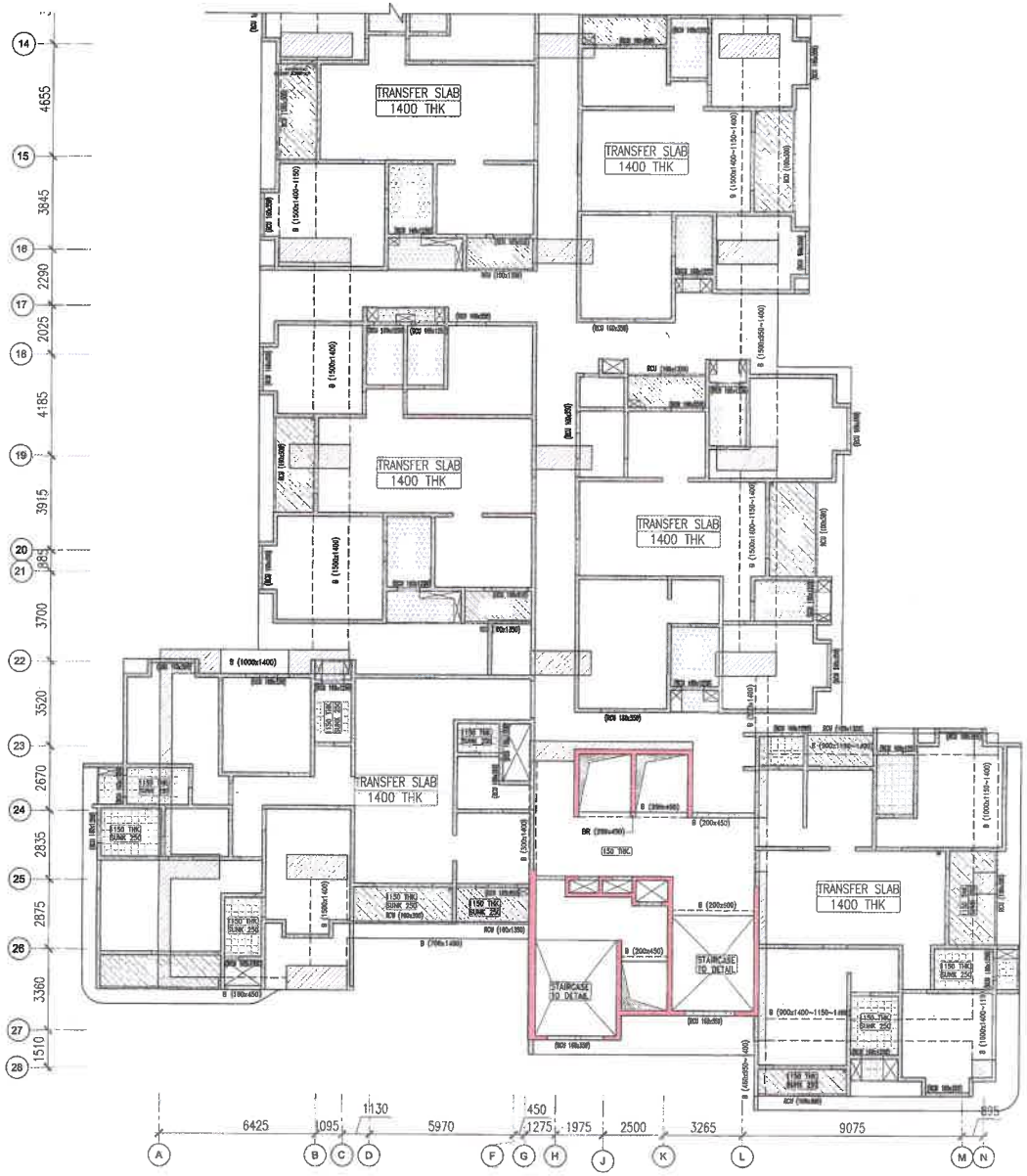
STRUCTURAL ENGINEER'S SIGNATURE

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E-mail : contact@edarch.in

DRAWING TITLE:	DRG NO:
1ST FLOOR SHUTTERING LAYOUT (SHEET 02 OF 02)	ST-SD-011



PLAN : SECOND FLOOR FLOOR SHUTTERING LAYOUT

(UNLESS OTHERWISE SPECIFIED ALL THE SLAB THICKNESS SHALL BE 150mm THK)

PROJECT: –
PLAN SHOWING THE PROPOSED CONSTRUCTION OF HIGH RISE BUILDINGS WITH TOWER CONSISTING OF DOUBLE BASEMENT FLOOR(PARKING) + GROUND FLOOR (CLUB HOUSE, BMS ROOM,ASSOCIATION ROOM,ATM)WITH 2 COMMERCIAL SPACES + FIRST FLOOR CLUB HOUSE + 2ND TO 16TH FLOORS: 1–09 DWELLING UNITS/FLOOR, DWELLING UNITS TOTALLY 135 UNITS, IN S.NO–2/1,THE LIMIT OF GREATER CHENNAI CORPORATION.
ZONE: –10; DIVISION: –127

Structural Design Proof Checked and Found Satisfactory
Dr. K. SENTHIL, M.E., Ph.D.,
24 JAN 2026

SUBMISSION DRAWING

ALL DIMENSIONS ARE IN METRES

SCALE = 1:120

OWNER'S SIGNATURE

For SHRIRAM PROPERTIES LIMITED
Authorised Signatory

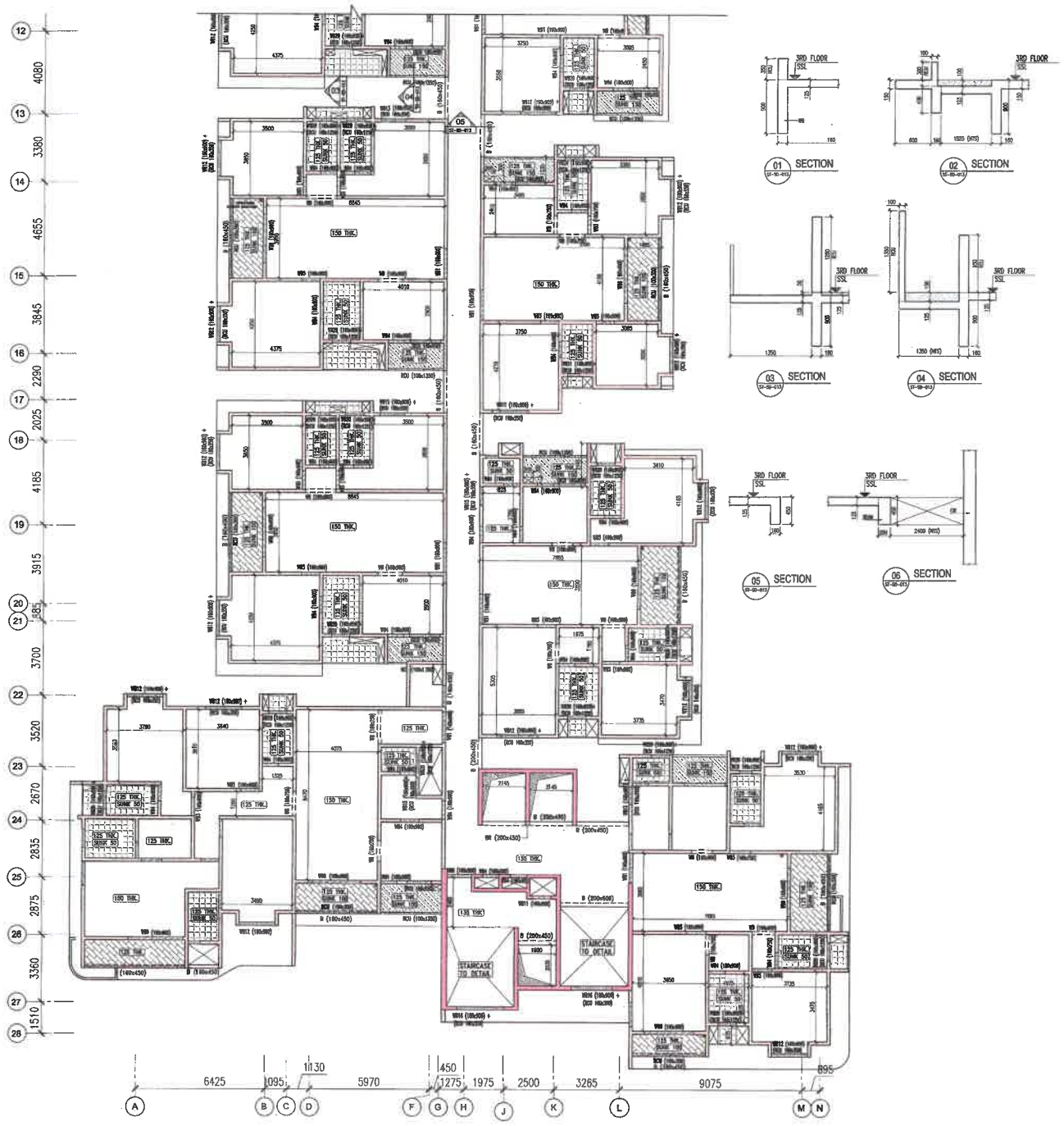
STRUCTURAL ENGINEER'S SIGNATURE

INNOTECH

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E-mail : contact@edarch.in

DRAWING TITLE:	DRG NO:
2ND FLOOR SHUTTERING LAYOUT (SHEET 02 OF 02)	ST-SD-012



PLAN : THIRD TO SIXTEENTH FLOOR SHUTTERING LAYOUT

(UNLESS OTHERWISE SPECIFIED ALL THE SLAB THICKNESS SHALL BE 125mm THK)

PROJECT: –
PLAN SHOWING THE PROPOSED CONSTRUCTION OF HIGH RISE BUILDINGS WITH TOWER CONSISTING OF DOUBLE BASEMENT FLOOR(PARKING) + GROUND FLOOR (CLUB HOUSE, BMS ROOM,ASSOCIATION ROOM,ATM)WITH 2 COMMERCIAL SPACES + FIRST FLOOR CLUB HOUSE + 2ND TO 16TH FLOORS:1–09 DWELLING UNITS/FLOOR, DWELLING UNITS TOTALLY 135 UNITS, IN S.NO–2/1,THE LIMIT OF GREATER CHENNAI CORPORATION.
ZONE: –10; DIVISION: –127

Structural Design Proof Checked and Found Satisfactory
Dr. K.SAKTHI, M.E., Ph.D.,
Professor of Structural Engineering
Anna University, Chennai - 600 025
24 JAN 2026

SUBMISSION DRAWING

ALL DIMENSIONS ARE IN METRES

SCALE = 1:120

OWNER'S SIGNATURE

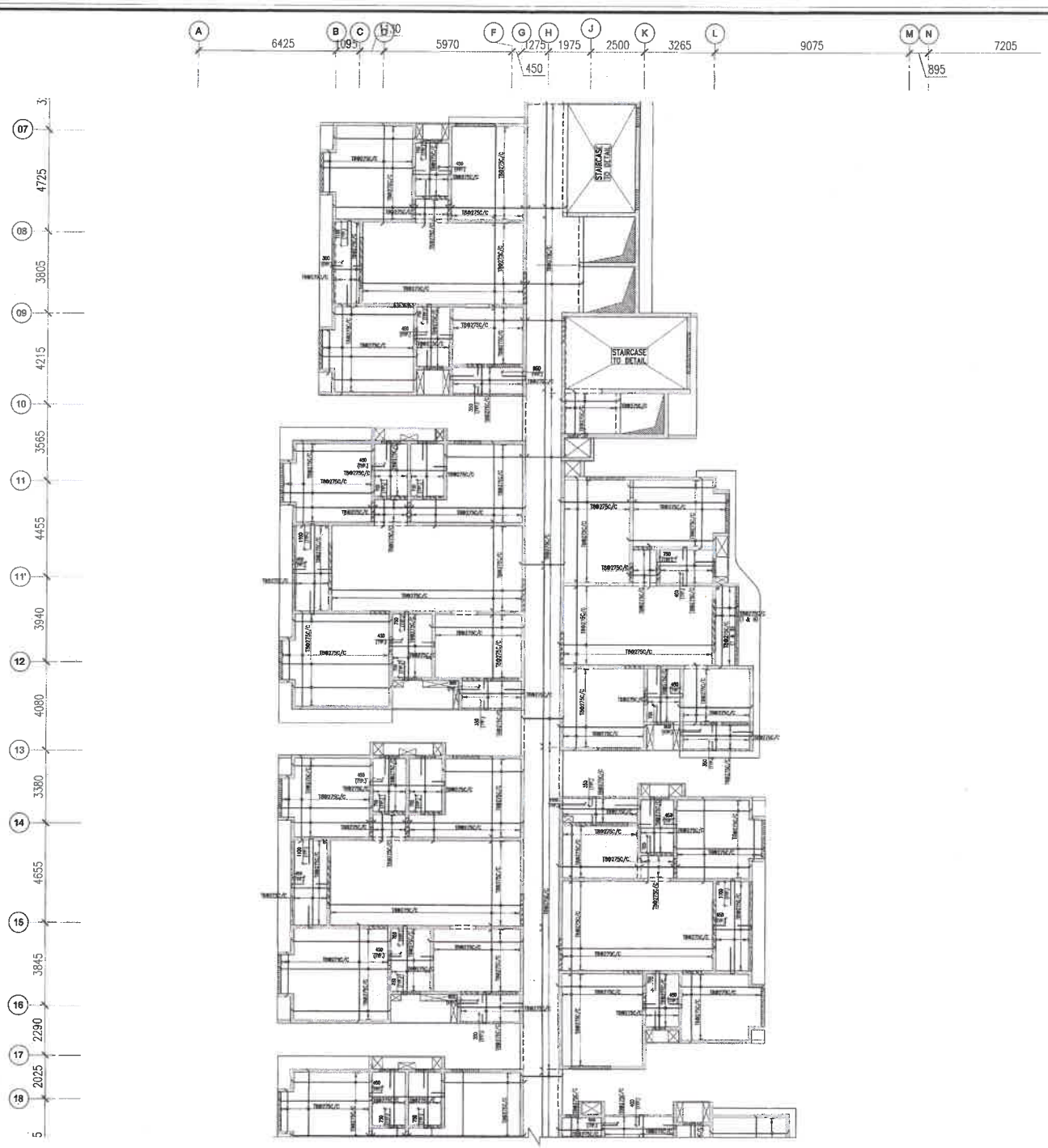
For SHRIRAM PROPERTIES LIMITED
Authorised Signatory

STRUCTURAL ENGINEER'S SIGNATURE

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Tel : 24357906, 24362396, 24362397
E-mail : contact@edarch.in

DRAWING TITLE:	DRG NO:
TYPICAL FLOOR (3RD to 16TH) SHUTTERING LAYOUT (SHEET 02 OF 02)	ST-SD-013



PLAN : TYPICAL FLOOR BOTTOM REINFORCEMENT LAYOUT

PROJECT:-
PLAN SHOWING THE PROPOSED CONSTRUCTION OF HIGH RISE BUILDINGS WITH TOWER CONSISTING OF DOUBLE BASEMENT FLOOR(PARKING) + GROUND FLOOR (CLUB HOUSE, BMS ROOM,ASSOCIATION ROOM,ATM)WITH 2 COMMERCIAL SPACES + FIRST FLOOR CLUB HOUSE + 2ND TO 16TH FLOORS:1-09 DWELLING UNITS/FLOOR, DWELLING UNITS TOTALLY 135 UNITS, IN S.NO-2/1,THE LIMIT OF GREATER CHENNAI CORPORATION.
ZONE:-10; DIVISION:-127

Structural Design Proof Checked and Found Satisfactory
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24 JAN 2025

SUBMISSION DRAWING

ALL DIMENSIONS ARE IN METRES

SCALE = 1:120

OWNER'S SIGNATURE

For BHURAM PROPERTIES LIMITED
Authorised Signatory

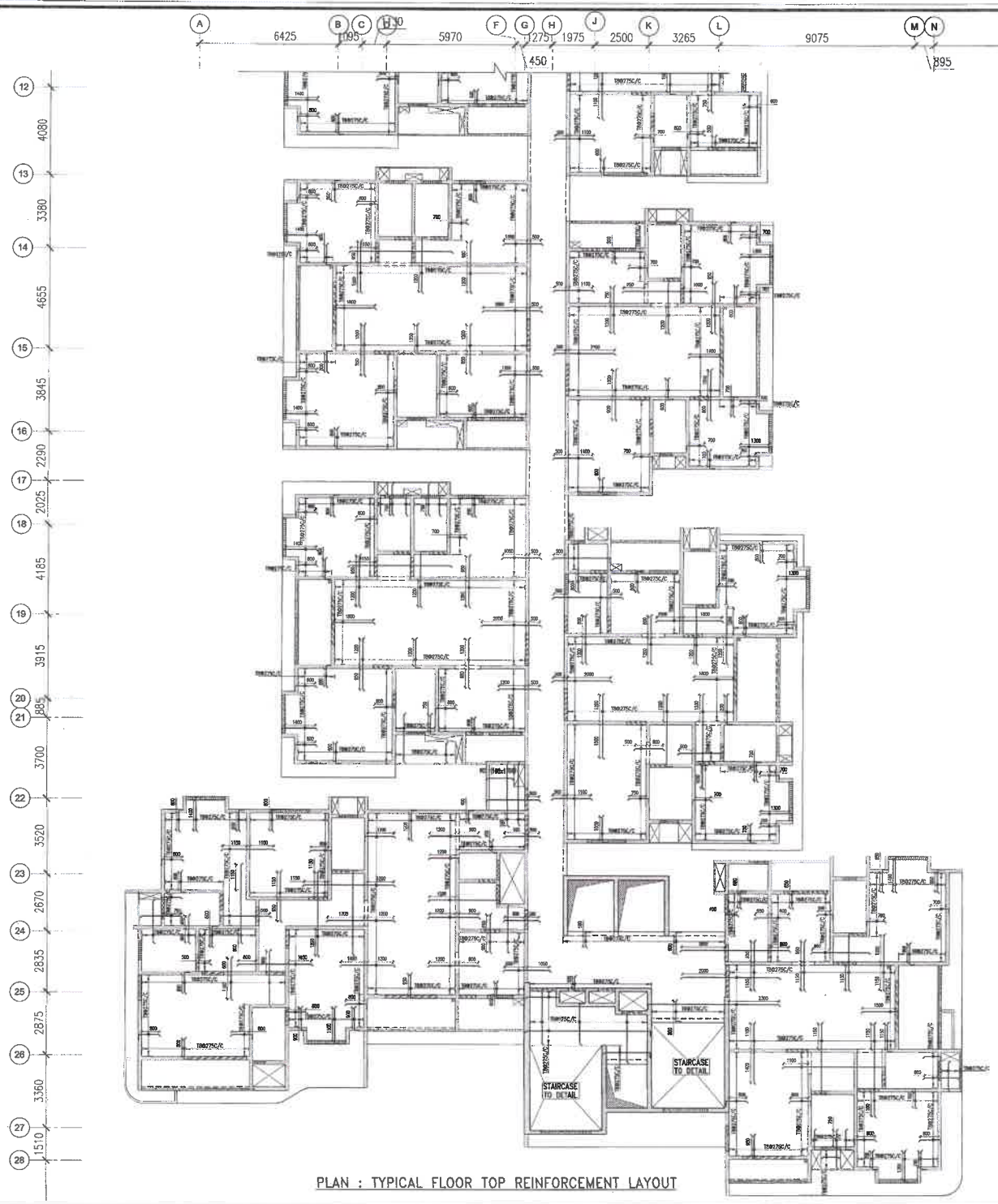
STRUCTURAL ENGINEER'S SIGNATURE

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Tel : 24357906, 24362396, 24362397
E-mail : contact@edarch.in

DRAWING TITLE:	DRG NO:
TYPICAL FLOOR BOTTOM REINFORCEMENT DETAILS (SH 02 OF 02)	ST-SD-014



PLAN : TYPICAL FLOOR TOP REINFORCEMENT LAYOUT

PROJECT:-
PLAN SHOWING THE PROPOSED CONSTRUCTION OF HIGH RISE BUILDINGS WITH TOWER CONSISTING OF DOUBLE BASEMENT FLOOR(PARKING) + GROUND FLOOR (CLUB HOUSE, BMS ROOM,ASSOCIATION ROOM,ATM)WITH 2 COMMERCIAL SPACES + FIRST FLOOR CLUB HOUSE + 2ND TO 16TH FLOORS:1-09 DWELLING UNITS/FLOOR, DWELLING UNITS TOTALLY 135 UNITS, IN S.NO-2/1,THE LIMIT OF GREATER CHENNAI CORPORATION.
ZONE:-10; DIVISION:-127

Structural Design Proof Checked and Found Satisfactory
Dr. R. SEKHAR, M.E., Ph.D.,
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Professor of Structural Engineering
Department of Civil Engineering
Anna University, Chennai - 600 025
24 JAN 2025

SUBMISSION DRAWING

ALL DIMENSIONS ARE IN METRES

SCALE = 1:120

OWNER'S SIGNATURE

For SHRIRAM PROPERTIES LIMITED
Authorised Signatory

STRUCTURAL ENGINEER'S SIGNATURE

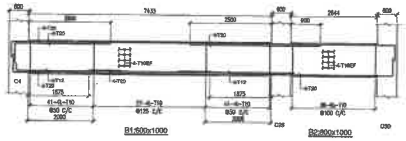
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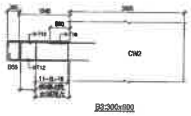
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3rd Phase, JP Nagar, Bangalore, Karnataka- 560078
Tel : +91 80-41538255/4074646/4074699
Web: www.innotechconsult.in

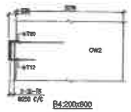
H.P. YOGESH
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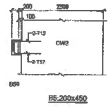
ED+ ARCHITECTURE
'Kailash', 6/25, Cenotaph Road,
First Street,Teynampet, Chennai - 600 018.
Tel : 24357906, 24362396, 24362397
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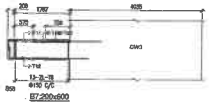
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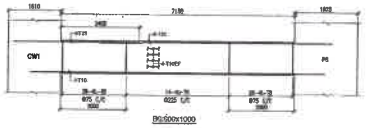

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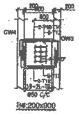

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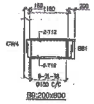

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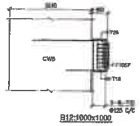

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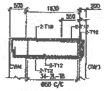

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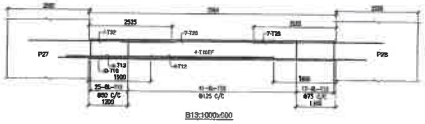

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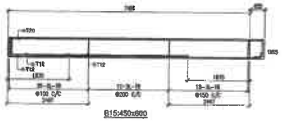

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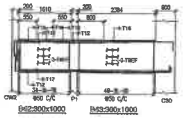

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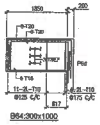

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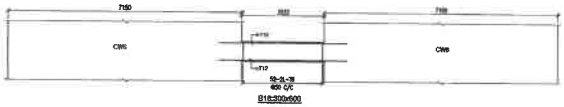

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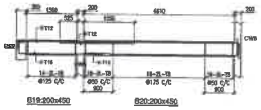

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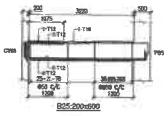

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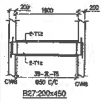
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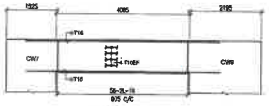

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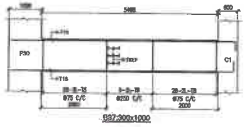

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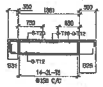
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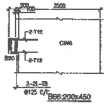

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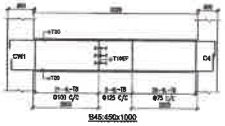

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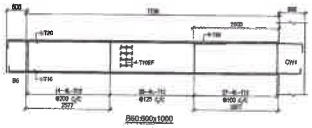

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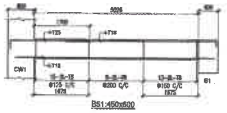

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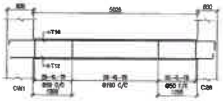

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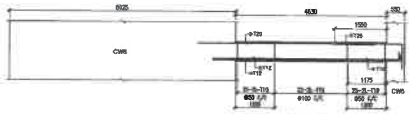

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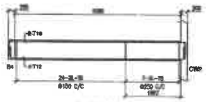

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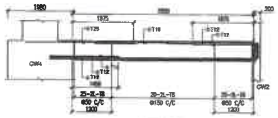

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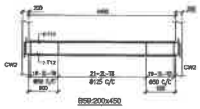

B51:450x600


B56:365x600


B52:300x600


B57:200x600


B58:200x600


B59:200x450

PROJECT:-
PLAN SHOWING THE PROPOSED CONSTRUCTION OF HIGH RISE BUILDINGS WH TOWER CONSISTING OF DOUBLE BASEMENT FLOOR(PARKING) + GROUND FLOOR (CLUB HOUSE, BMS ROOM,ASSOCIATION ROOM,ATM)WITH 2 COMMERCIAL SPACES + FIRST FLOOR CLUB HOUSE + 2ND TO 16TH FLOORS:1-09 DWELLING UNITS/FLOOR, DWELLING UNITS TOTALLY 135 UNITS, IN S.NO-2/1,THE LIMIT OF GREATER CHENNAI CORPORATION.
ZONE:-10; DIVISION:-127

Structural Design Proof Checked and Found Satisfactory
Dr. R. SEATHIL, M.E., Ph.D.,
Former Head of the Department
Professor of Structural Engineering
Anna University, Chennai-600 025
24 JAN 2026

SUBMISSION DRAWING

ALL DIMENSIONS ARE IN METRES

SCALE = 1:120

OWNER'S SIGNATURE

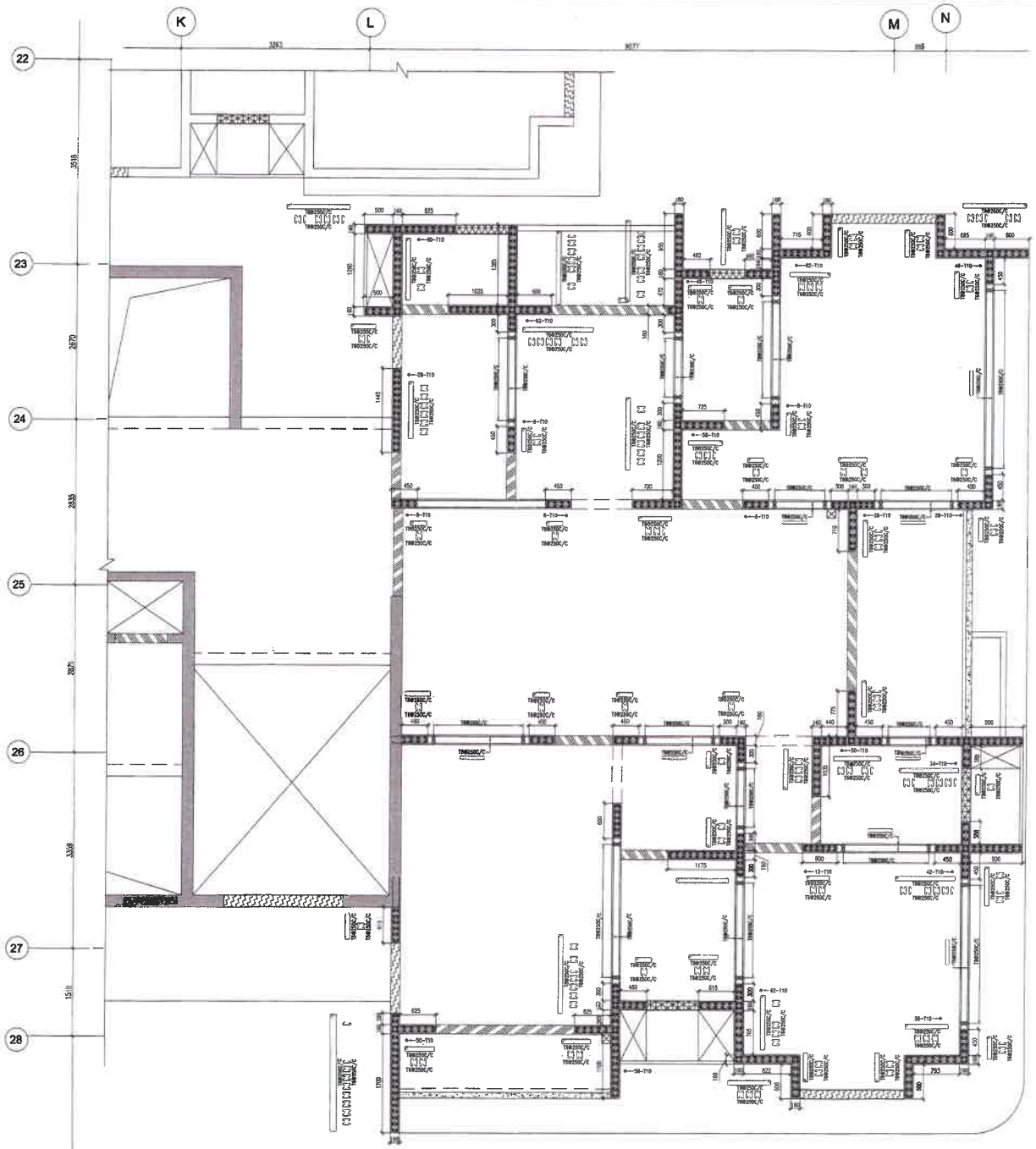
For SHRIRAM PROPERTIES LIMITED
Authorised Signatory

STRUCTURAL ENGINEER'S SIGNATURE

INNOTECH
Innotech Engineering Consult Pvt. Ltd.
H.P. YOGESH
B.E. (Civil), M.Tech (Structure)
Registration No. 50268-07/01/2022
Structural Engineer Grade-2 (SE)
Mobile : +91 97413 95669

ED+ ARCHITECTURE
'Kailash', 6/25, Cenotaph Road,
First Street,Teynampet, Chennai - 600 018.
Tel : 24357006, 24362368, 24362367
E-mail : contact@edarch.in

DRAWING TITLE:	DRG NO:
BEAM SCHEDULE (SH 02 OF 02)	ST-SD-016



PLAN : TYPICAL FLOOR RC WALL REINFORCEMENT LAYOUT

PROJECT:-
PLAN SHOWING THE PROPOSED CONSTRUCTION OF HIGH RISE BUILDINGS WITH TOWER CONSISTING OF DOUBLE BASEMENT FLOOR(PARKING) + GROUND FLOOR (CLUB HOUSE, BMS ROOM,ASSOCIATION ROOM,ATM)WITH 2 COMMERCIAL SPACES + FIRST FLOOR CLUB HOUSE + 2ND TO 16TH FLOORS:1-09 DWELLING UNITS/FLOOR, DWELLING UNITS TOTALLY 135 UNITS, IN S.NO-2/1,THE LIMIT OF GREATER CHENNAI CORPORATION. ZONE:-10; DIVISION:-127

Structural Design Proof Checked and Found Satisfactory
Dr. R. ROOPA, M.E., Ph.D.
Former Head of the Department
Professor in Civil Engineering
Government Thiagarajar College of Engineering
Madurai Main Road, Kalavasal, Madurai - 625 015
24 JAN 2020

SUBMISSION DRAWING

ALL DIMENSIONS ARE IN METRES

SCALE = 1:120

OWNER'S SIGNATURE

For BHUMAN PROPERTIES LIMITED
Authorised Signatory

STRUCTURAL ENGINEER'S SIGNATURE

Innotech Engineering Consult Pvt. Ltd.
H.P. YOGESH
B.E. (Civil), M.Tech (Structure)
Registration No. 55768-C/CN/S/E22
Structural Engineer Grade-I (SE1)
Mobile : +91 97411 99668

ED+ ARCHITECTURE
'Kailash', 6/25, Cenotaph Road,
First Street,Teynampet, Chennai - 600 018.
Tel : 24357008, 24352336, 24352397
E-mail : contact@edarch.in

DRAWING TITLE:	DRG NO:
TYPICAL FLOOR RC WALL DETAILS	ST-SD-017

DEPARTMENT OF CIVIL ENGINEERING, CEGC
ANNA UNIVERSITY, CHENNAI - 600 025

DCE

Dr.R. Senthil
Professor of Structural Engineering

Tel: 2235 7406 / (M) 7598632796
Email: senthilr68@gmail.com

Date: 04-09-2025

STABILITY CERTIFICATE

This is to certify that Vetting of Structural Analysis & Design of Proposed residential project of Shriram Properties Limited, Located in T.S. No. 2/1 in Koyembedu, Chennai – Bangalore Road, Chennai – 600 107.

Structure designed as per following specifications,

Building Classification	: Residencial Building
Dead load	: As per IS 875 (Part-1)
Live load	: As per IS 875 (Part-2)
Seismic Load	: Zone –III, As per IS 1893 -2016.
Wind Load	: 50m/s, As per IS 875 (part –III).
Type of Structure	: R.C.C structure
Floor	: Tower-1, Combined Double Basement + Ground + 16 floors + Terrace
Grade of concrete	: M30/M50 (As per IS 456-2000).
Grade of steel	: Fe 500D (As per IS 1786-2008).
Type of Foundation	: Pile foundation.

The structure has been proposed to be constructed as per the design and details mentioned in the drawing. Hence, I hereby certify that the structural arrangement, structural member sizes and reinforcement provided are adequate for the load considered in the design.

The responsibility of Anna University Chennai shall be limited to checking of structural design calculations and drawings only. All procedural/legal/operational matters and architectural/functional details will be the responsibility of the owner/the party.

Thanking you

Yours faithfully,

4/9/25

(R. Senthil)

Dr. R. SENTHIL, M.E., Ph.D.,
Professor of Structural Engineering
Department of Civil Engineering
Anna University, Chennai - 600 025

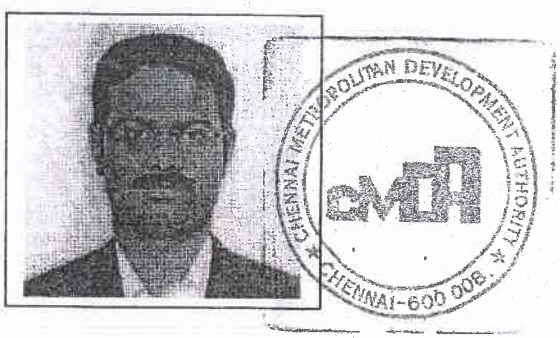
CHENNAI METROPOLITAN DEVELOPMENT AUTHORITY
'ThalamuthuNatarajan Building', No.1, Gandhi Irwin Road,
Egmore, Chennai-600 008.

PROFESSIONAL REGISTRATION CERTIFICATE

This is to certify that the **Thiru. H. P. YOGESH** has enrolled as **Registered Structural Engineer Grade-I (SE)** with Chennai Metropolitan Development Authority (CMDA) who has the qualification of **M.Tech.,(Industrial Structures)** and experience in the relevant field for **17years.**

He has been given the Registration No.**SE/GR-I/2019/03/022 Renewed** on **22.03.2024.** He shall be required to comply with the duties and responsibilities prescribed by the Government of Tamil Nadu in Part-V, "Registration of Professionals", Tamil Nadu Combined Development and Building Rules, 2019 approved vide G.O.(Ms) No.18 MAWS (MA1) Dept. dated 04.02.2019.

This Registration is valid upto **21.03.2029.**



(A. MEGANATHAN)
Superintendent

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

Verified RealEstate
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OMR Thoraipakkam,
Chennai 600 097, India
hello@verified.realestate
+91 9996 12 9996

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.