Verified RealEstate™

RE REGULATORY RECORD

RERA Document

The document as the regulator published it, reproduced in full behind this page.

Published for reference. The authority's own register is the operative record.

Verified RealEstate™
3/350/2 Mettukuppam,
OMR Thoraipakkam,
Chennai 600 097, India

hello@verified.realestate
+91 9996 12 9996
verified.realestate

DIGITALLY VERIFIED RECORD

Er. A. VEERAPPAN & ASSOCIATES
(TAMIL NADU) PRIVATE LTD
Engineers Designers & Structural Consultants
Er. Dr. A. Veerappan, ME (Struct), Ph.D (Struct) FIE, MICI, Dip. LL & AL - Managing Director

STABILITY CERTIFICATE

The detailed engineering and structure design of the proposed building comprising of **Stilt + 5 floors at Ayapakkam, Chennai– 77**. **S.No:361/2D,61/3A/2,61/3B/1** has been done by me/us based on the report of geotechnical investigation (soil test) done by **Chennai Soil Lab** Report No. **4012** Dated **19/01/2026** and considering the functional requirement of the building.

2. It is certified that among other factors, the proposed building has been designed to resist earthquake. I/We have checked various parameters and found that the proposed building would be safe.

3. I/We further certify that:

(i) The minimum grade of concrete is **M25 N/mm2**

(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 No. **IS 875 Part (1 – 5) - 1987** and design of earthquake resistant structure as per IS Code No. **IS 1893 - 2016**

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



Stamp and Signature

Encl.: Structural Design Calculation

Structural Design Basis Report

Project :

Proposed Construction of Stilt+5 Floors Residential Building in

S No:61/2D, 61/ 3A/2, 61/ 3B/1 @ Ayapakkam ,Chennai-600077.

ENGINEERS MAKE THE WORLD

Er. A. VEERAPPAN & ASSOCIATES

(TAMIL NADU) PRIVATE LTD

Engineers Designers & Structural Consultants

Er. Dr. A. Veerappan, ME (Struct), Ph.D (Struct) FIE, MICI, Dip. LL & AL - Managing Director

Structural Design Basis Report

Index :

1. Design Information and Criteria
2. Foundation System
3. Columns Schedule
4. Floor Beams Designs
5. Floor Slabs Designs
6. Staircase
7. Lift

ENGINEERS MAKE THE WORLD

Er. A. VEERAPPAN & ASSOCIATES

(TAMIL NADU) PRIVATE LTD

Engineers Designers & Structural Consultants

Er. Dr. A. Veerappan, ME (Struct), Ph.D (Struct) FIE, MICI, Dip. LL & AL - Managing Director

Design Information and Criteria

1.0 Introduction

The **Proposed Construction of Stilt + 5 floors Residential Building S No:61/2D, 61/ 3A/2, 61/ 3B/1 @ Ayapakkam ,Chennai-600077 .**Structurally, it is designed as RCC Framed structure shall be constructed using combined strip footing. The size and height of buildings are listed below:

(Stilt + 5 Floors)

Building Size	-	14.63m x 47.61 m
Plinth Area	-	3200.28 Sq.m
Floor Height	-	3.00 m
Building Height (Total)	-	18.60 m

This report generally discusses the structural concept, foundation system assumptions, objectives and design approach.

2.0 DESIGN CRITERIA

2.1 Codes of Practice

CODE	DESCRIPTION
IS 875(Part 1) 1987	Code of practice for Design Loads (other then earthquake) for buildings and structures – Unit weights of buildings materials and stored material
IS 875(Part 2) 1987	Code of practice for Design Loads (other than earthquake) for buildings and structures – Imposed Loads
IS 875(Part 3) 1987	Code of practice for Design Loads (other than earthquake) for buildings and structures – Wind Loads
IS 875(Part 4) 1987	Code of practice for Design Loads (other than earthquake) for buildings and structures – snow Loads
IS 875(Part 5) 1987	Code of practice for Design Loads (other than earthquake) for buildings and structures – Special Loads and load combinations
IS 456 – 2000	Code of Practice for Plain and Reinforced Concrete
IS 1786 – 2008	Specification for High strength Deformed bars and Wires for concrete reinforcement
IS 432 (Part 2) 1982	Specification for Mild Steel and Medium Tensile Shell Bars and Hard Drawn Steel Wire for concrete reinforcement – Hard Drawn Steel Wire
IS 13920 – 1993	Ductile detailing of reinforced concrete structures subjected to seismic forces – Code of practice
IS 2062 – 2011	Steel for General Structural Purposes Specification
IS 1893 – 2016	Criteria for earthquake resistant design of structures

2.2 LOADS

The following loads are taken into consideration while designing the structural elements if the building and the development.

2.2.1 Superimposed Dead Loads

TYPE OF LOADS	MINIMUM UDL (KN/m^2)
Screed and Finishes (50mm)	1.2
Partition Loads (Non load bearing Wall)	115mm thick Fly Ash Brick work or its Equivalent density 20Kn/Cum
Mechanical & Electrical Services (Ceiling)	0.5
Waterproofing (Terrace)	3.0

2.2.2 Live Loads

LOCATION	MINIMUM UDL (KN/m^2)
Rooms, Baths and Toilets	2.0
Lobby, Staircase & Balconies	4.0
Terrace	2.0
LMR	5.0
Water Tanks	As Per Capacity 1.20 m Liquid depth

2.2.3 LATERAL LOADS

2.2.3.1 Wind Loads

The wind pressure shall be calculated based on the basic wind speed and other provisions laid in IS 875 (part 3) – 1987. The wind speed is considered in the analysis for the specified location is 50m/sec. The design parameters for wind load calculation is as follows.

Design wind Pressure $Pz = 0.6\ Vz^{2}$

But $Vz = Vb*K1*K2*K3$.

Where Vb – Design wind Speed
K1 – 1.0, probability factor of risk coefficient
K2 – 1.02, Terrain height, structure size factor
Terrain Category – 2 and Structure Class – C
K3 – 1.0, Topography factor

Hence Design Wind Pressure $= 0.6\ X\ (50X1.0 \times 1.02 \times 1.0)^2\ N/m^2$
$= 1560\ N/m^2$
$= 1.56\ KN/m^2$

The design wind load will be calculated based on the surface area with the calculated design wind pressure and it shall be applied on surface area of the building in both the orthogonal direction.

2.2.3.2

Chennai is classified under Earthquake Zone III (Moderate) as per the latest classification. The loading due to earthquake shall be assessed based on the provisions is IS 1893 – 2016 and the ductile detailing of the Structural elements shall be complied with IS 13920 – 1993.

The design parameters adopted are as follows:

Seismic Zone III with seismic zone factor Z = 0.16 (Moderate) and Response reduction factor is to 1893 – 2016, Table – 7. Soil considered is to be Type – 11, medium soil.

2.3 LOAD COMBINATIONS

The various loads shall be combined in accordance with the stipulations in IS 875 (Part V) 1987 and IS 456:2000. The structural elements shall be designed for the combination that produces most unfavorable effect out of the following combinations.

Limit State of Serviceability

1. 1.0* (DL+IL)
2. 1.0* (DL+EQ/WL)
3. 1.0* DL+0.8*IL+0.8(EQ/WL)

Limit State of Collapse

1. 1.5* (DL+IL)
2. 1.2* (DL+IL+EQx)
3. 1.2* (DL+IL+WLx)

DL – Dead Load which includes all finishes and partition loads, IL – Imposed Load, EQ – Earthquake Load and WL – Wind Load.

2.4 Base Shear

Base Shear Calculation for Static Analysis

As per IS 1893:2016, the total design lateral force or design seismic base shear (Vb) is determined by the following expressions.

$$Vb = AhW$$

Where Ah is Design horizontal acceleration spectrum value using fundamental natural period and W is Seismic weight of the building.

The Seismic weight is estimated based on Full dead load + 25% Live Load.

The Fundamental natural period of vibration (Ta) id seconds of a DC building is estimated by using the following formula

$$Ta = 0.09h/(\sqrt{d})$$

Where h is the height of building in meters?
d is the base dimension of the building at the plinth level, in making the considered direction of the lateral force.

Height of the building, h = 18.60 m
d (along the length of the building) = 47.61 m
d (along the breadth of the building) = 14.63 m
Ta (along x&y) = 0.09x 14.63/(√18.60)
= 0. 100Sec.

From IS 1893: 2016, Clause 6.4.2, Design horizontal seismic coefficient

$$Ah = \frac{ZI\,Sa}{2Rg}$$

Where

Z for Zone III = 0.16
I for Residential Building = 1.20

R for Ordinary Moment Resisting Frame = 3.0
Sa/g, as per (Table 7) = 1.45 (Refer to IS 1893)

Design horizontal seismic coefficient Ah = 0.0232

Base Shear = 0.023w

As per IS 1893: 2016, Clause 7.7.1, static analysis shall be carried out to study the structural behavior of the building and to design the structural elements like columns and RC walls including floor elements like beam etc.

2.5 DEFLECTION CRITERIA

2.5.1 Lateral Deflection (Wind)

Overall Deflection	<	Height / 250
Storey Deflection	<	Storey height / 250

2.5.2 Lateral Deflection (Seismic)

Overall Drift	<	H / 250
Storey Drift	<	0.004 time storey height

2.5.3 Vertical Deflection of Beams and Slabs due to Gravity Loads:

Total Deflection (DL+LL)	<	Span / 250 upto 20mm maximum
Live Load Deflection	<	Span / 350

2.6 Material Properties

2.6.1 Concrete

Since the buildings are coming under severe exposure condition, M25 Grade of Concrete is proposed as per Table 5 of IS: 456-2000

Foundation System	- M25 (fck= 25N/mm^2)
Columns	- M25 (fck= 25N/mm^2)
RCC Slabs, Beams	- M25 (fck= 25N/mm^2)
RCC Lift Well	- M25 (fck= 25N/mm^2)
Staircases	- M25 (fck= 25N/mm^2)

2.6.2 Reinforcement

Steel reinforcement shall be of Grade Fe 500 Ductile conforming to IS 1786:2008 with a minimum elongation of 14.5% and structural steel of Grade Fe250 conforming to IS 432:1982.

2.7 DURABILTY

Cover to reinforcement

Foundation	- 75mm
Columns (min dimension >200mm	- 40mm
RC Wall	- 30mm
Beams	- 25mm
Slabs	- 20mm

3.0 **SUBSOIL CONDITION**

Based on the soil investigation report:

Based on the field and Lab test results, it's concluded that,

The sub soil profile consists of **Medium to Fine sand with silty clay**

4.0 STRUCTURAL SYSTEM

4.1 General Description

The Commercial cum Residential Building consists of Stilt + 5 floors. Structurally, it is designed as RCC framed structure cast in situ structure shall be constructed using conventional method of construction

4.2 Super structure

The structural system of superstructure from ground floor to terrace is be RCC beam of 230mm to 300mm wide and depth varies between 300mm to 900mm, depends upon the beam span. The RCC slab thickness is 150mm in the superstructure.

4.3 Lateral Stability Analysis

Lateral loads due to wind and earthquake loads has been calculated as per relevant IS codes and it has been considered in the analysis, found the wind forces is not governing the design and hence design of the building carried out according to Indian Standard codes IS 1893 and IS 13920 with ductile detailing of rebars. The slab acts as rigid diaphragm which transfers the lateral load to the vertical element. The drifts, lateral deformation, base shear parameters has been verified and confirmed before commencement of the design of structural elements.

5.0 FOUNDATION SYSTEM

The foundation system designed such that the building will be resting on Combined Strip Footing.

For Lift portion, Raft foundation is provided.

Structural Design Computations

Design Sheets

Proposed Construction of Stilt + 5 floors Residential Building Floors

S No:61/2D, 61/ 3A/2, 61/ 3B/1 @ Ayapakkam ,Chennai-600077.

Input Data

Stilt+ 5 Floors

M25 Concrete / Fe 500 D

Load for 5 Floors = 5 x 16 KN/m^2 = 80KN/m^2

Load for Stilt floor = 1 x 12 KN/m^2 = 12 KN/m^2

Total Load = 92 KN/m^2 for all columns

Load for Staircase & lift =6 x 18 KN/m^2 + 1 x 12 KN/m^2 = 120 KN/m^2

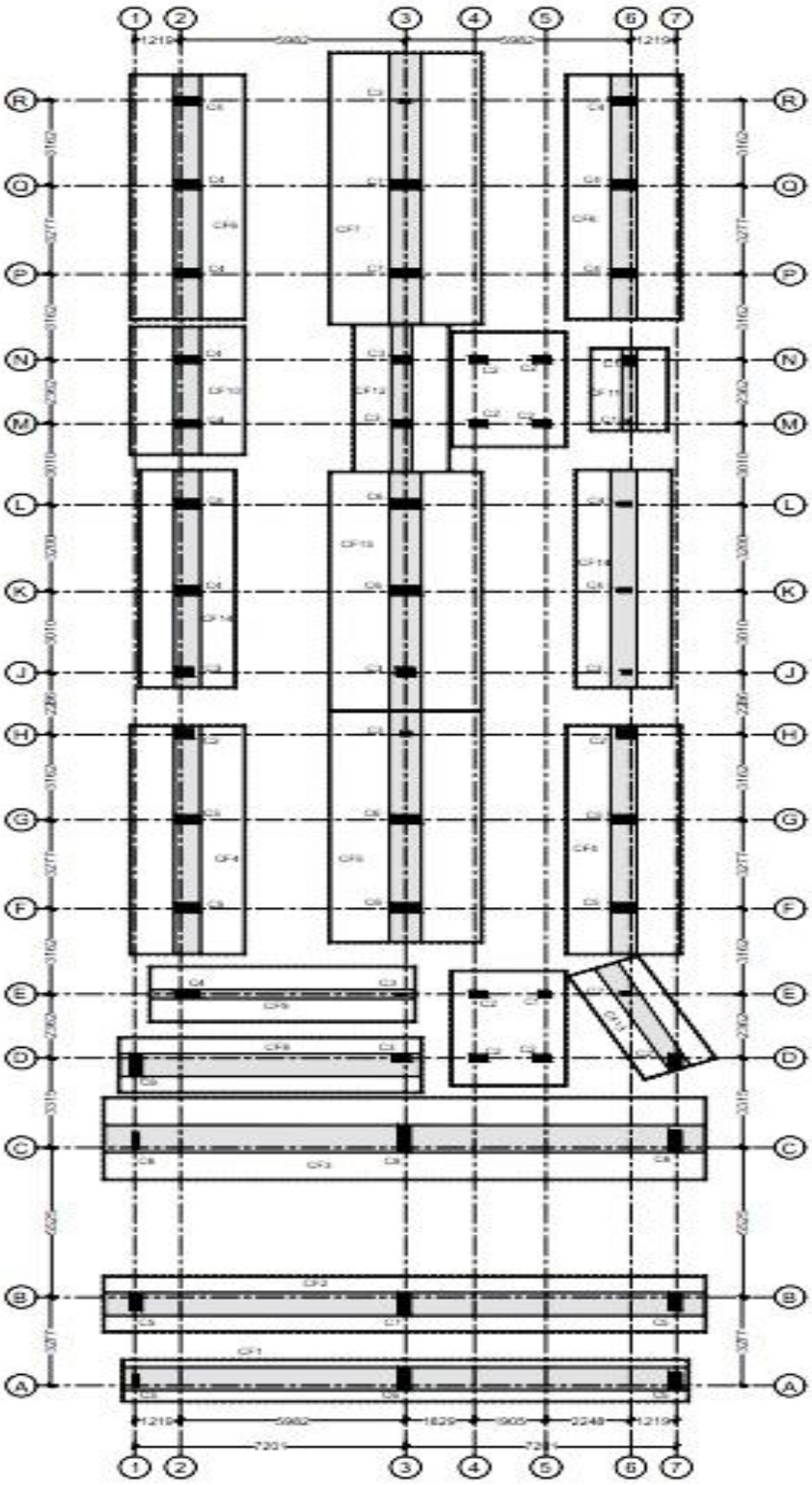
Total Load = 120 KN /m^2 for Staircase & lift columns

Load Computation :

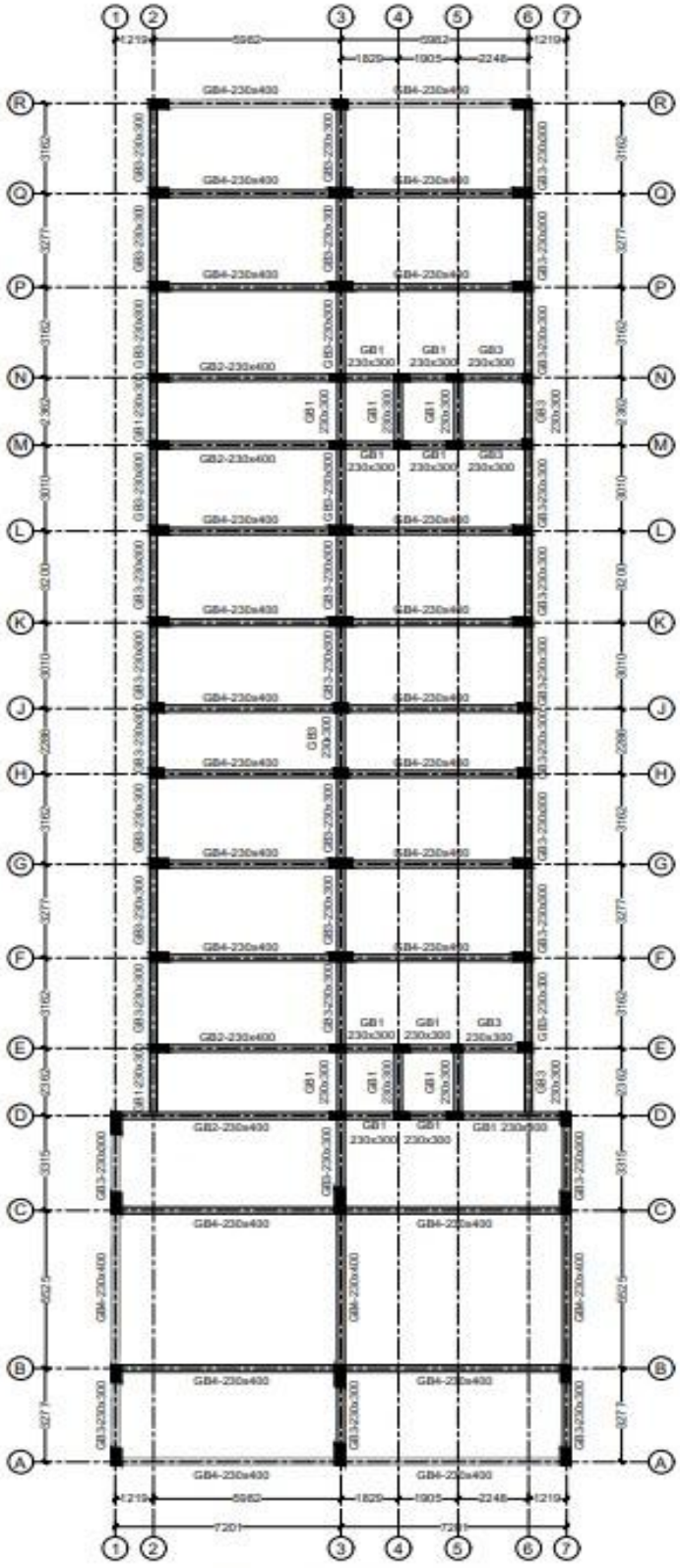
Description	Design Calculation	Foundation	Moment factor	Column Load
A1 & A7	7.20/2 x 3.28/2 x 92 x 1.3 4.88/2 x 1.00 x 60 x1.3	**900**	**1.8**	**1620**
A3	7.20 x 3.28/2 x 92 x 1.1 4.88/2 x 1.00 x 60 x1.1	**1520**	**1.3**	**1980**
B1 & B7	7.20/2 x 3.28+3.53/2 x 92 x 1.1	**1240**	**1.3**	**1615**
B3	7.20/2 x 3.28+3.53/2 x 92	**2225**	**1.1**	**2485**
C1 & C7	7.20/2 x 5.53+3.32/2 x 92 x1.1	**1615**	**1.3**	**2100**
C3	7.20/2 x 5.53+3.32/2 x 92	**2930**	**1.1**	**3225**
D1	7.20/2 x 3.32/2 x 92 x 1.3 5.11/2 x 2.36 /2x 120 x 1.3	**1165**	**1.8**	**2100**
D3	7.20/2 x 3.32/2 x 92 5.11/2 x 2.36/2 x 120 1.83/2 x 3.32+2.36/2 x 92	**1155**	**1.1**	**1275**
D4	1.83 + 1.91/2 x 3.32/2 x 92 1.83/2 x 2.36/2 x 92 1.91/2 x 2.36/2 x 120	**520**	**1.1**	**575**
D5	1.91+3.47/2 x 3.32/2 x 92 x1.1 1.91/2 x 2.36/2 x 120 x 1.1	**605**	**1.3**	**790**
D7	3.47/2 x 3.32/2 x 92 x 1.3	**345**	**1.8**	**625**
E2	5.11/2 x 2.36/2 x 120 x 1.1 5.98/2 x 3.16/2 x 92 x 1.1 1.22 x 3.16/2 x 92 x 1.1	**1075**	**1.3**	**1400**
E3	5.11/2 x 2.36/2 x 120 5.18+1.83/2 x 3.16/2 x 92 1.83/2 x 2.36/2 92	**890**	**1.1**	**980**
E4	1.83/2 x 2.36/2 x 92 1.91/2 x 2.36/2 x 120 1.83+1.91/2 x 3.16/2 x 92	**510**	**1.1**	**565**
E5	1.91/2 x 2.36/2 x 120 x 1.1 1.91+2.25/2 x 3.16/2 x 92 x 1.1	**285**	**1.3**	**370**
E6	2.25/2 x 3.16/2 92 x 1.3 1.22 x 3.16/2 92 1.3	**445**	**1.8**	**800**
F2,F6,G2 & G6	5.98/2 x 3.16+3.28/2 x 92 1.1 1.22 x 3.16/2 x 92 x 1.1	**1330**	**1.3**	**1730**
F3 & G3	5.98 x 3.16+ 3.28/2 x 92	**1775**	**1.1**	**1955**
H2 & H6	5.98/2 x 3.16/2 x 92 x 1.1 2.29/2 x 2.29/2 x 92 x 1.1	**615**	**1.3**	**800**
H3	5.98 x 3.16/2 x 92 2.29 x 2.29/2 x 92	**1110**	**1.1**	**1225**
J2 & J6	2.29/2 x 2.29/2 x 92 x 1.1 5.98/2 x 3.01/2 x 92 x 1.1 1.22 x 3.01/2 x 92 x 1.1	**775**	**1.3**	**1010**
J3	2.29 x 2.29/2 x 92 5.98 x 3.01/2 x 92	**1070**	**1.1**	**1180**

Description	Design Calculation	Foundation	Moment factor	Column Load
K2,K6,L2 & L6	1.22 x 3.01/2 x 92 x 1.1 5.98/2 x 3.01+3.20/2 x 92 x 1.1	**1125**	**1.3**	**1425**
K3 & L3	5.98 x 3.01+3.20/2 x 92	**1710**	**1.1**	**1880**
M2	1.22 x 3.01/2 x 92 x 1.1 5.98/2 x 3.01/2 x 92 x 1.1 5.11/2 x 2.36/2 x 120 x 1.1	**1030**	**1.3**	**1340**
M3	5.98 + 1.83/2 x 3.01/2 x 92 5.11/2 x 2.36/2 x 120 1.83/2 x 2.36/2 x 92	**1005**	**1.1**	**1105**
M4	1.83+1.91/2 x 3.01/2 x 92 1.83/2 x 2.36/2 x 92 1.91/2 x 2.36/2 x 120	**495**	**1.1**	**545**
M5	1.91+2.25/2 x 3.01/2 x 92 x 1.1 1.91/2 x 2.36/2 x 120 x 1.1	**470**	**1.3**	**615**
M6	2.25/2 x 3.01/2 x 92 x1.1 1.22 x 3.01/2 x 92 x 1.1	**360**	**1.3**	**470**
N2	5.11/2 x 2.36/2 x 120 x 1.1 1.22 x 3.16/2 x 92 x 1.1 5.98/2 x 3.16/2 x 92 x 1.1	**1075**	**1.3**	**1400**
N3	5.98+1.83/2 x 3.16/2 x 92 5.11/2 x 2.36/2 x 120 1.83/2 x 2.36/2 x 92	**935**	**1.1**	**1030**
N4	1.83+1.91/2 x 3.16/2 x 92 1.83/2 x 2.36/2 x 92 1.91/2 x 2.36/2 x 120	**510**	**1.1**	**565**
N5	1.83+2.25/2 x 3.16/2 x 92 x 1.1 1.91/2 x 2.36/2 x 120 x 1.1	**345**	**1.3**	**625**
N6	2.25/2 x 3.16/2 x 92 x 1.1 1.22 x 3.16/2 92 1.1	**375**	**1.3**	**490**
P2	1.22 x 3.16/2 x 92 1.1 5.98/2 x 3.16+3.28/2 x 92 x 1.1	**1170**	**1.3**	**1525**
P3	5.98 X 3.16+3.28/2 X 92	**1780**	**1.1**	**2315**
P6 & Q6	5.98/2 x 3.16+3.28/2 x 92 x1.1 1.22 x 3.16/2 x 92 x 1.1	**1170**	**1.3**	**1525**
Q2	5.98/2 x 3.28+3.16/2 92 x 1.1 1.22 x 3.16/2 x 92 x 1.1	**1170**	**1.3**	**1525**
Q3	5.98 x 3.28+3.16/2 x 92	**1780**	**1.1**	**2315**
R2 & R6	5.98/2 x 3.16/2 x 92 x 1.3 1.22 x 3.16/2 x 92 x 1.3	**795**	**1.8**	**1430**
R3	5.98 x 3.16/2 x 92 x 1.1	**960**	**1.3**	**1250**

Footing Schedule



LAYOUT OF COMBINED STRIP FOOTINGS



LAYOUT OF GRADE BEAMS

COMBINED STRIP FOOTINGS

NAME OF THE WORK : PROPOSED CONSTRUCTION OF RESIDENTIAL BUILDING (S+5)
IN S.NOS: 61/2D, 61/3A2,61/3B1,
AT 'D' - PLOT, DEVI NAGAR, AYAPAKKAM CHENNAI

NO.OF FLOORS : STILT + 5 FLOORS

S.B.C OF SOIL (IMPROVED) - 150 KN/Sq.m
DEPTH OF FOUNDATION - 3.00m
GRADE OF CONCRETE - M25
CEMENT QUARRY DUST MIX 1:10 - 300mm
2 Layers of Geogrid Non Woven 40x40x20N/sq.mm Sandwiched

STEEL : Fe 500D TMT Bars
CLEAR COVER(BOTTOM) : 75mm
CLEAR COVER(SIDES) : 50mm

SL.NO	LOAD ON COLUMN IN KN	COLUMNS ADOPTED	COLUMN SIZE "mm" (b1 x d1)	TOTAL NO OF COLUMN	BEAM SIZE "mm"			COMBINED STRIP FOOTING SIZE "mm"				REINFORCEMENT	
					a	b	c	L	B	D	Do	Ast.in Sq.cm	ON BOTH DIRECTION
CF1.	900+1520 +900 KN	A1-A3-A7	300 x 600 300 x 750	3	850	900	250	15000	1500	250	250	PLEASE REFER DETAILS ATTACHED IN SEPARATE DRAWING	
CF2.	1240+2225 1240 KN	B1-B3-B7	300 x 600 300 x 750	3	850	900	300	16000	2000	300	300		
CF3.	1615+2930 1615 KN	C1-C3-C7	300 x 750 300 x 900	3	1000	900	300	16000	3000	300	300		
CF4.	1330+1330 615 KN	F2-G2-H2 / F6-G6-H6	300 x 600 300 x 450	6	700	600	300	8500	3000	300	300		
CF5.	1775+1775 1110 KN	F3-G3-H3	300 x 750 300 x 450	3	850	600	450	9000	4000	450	450		
CF6.	1170+1176 795 KN	P2-Q2-R2 / P6-Q6-R6	300 x 600	6	700	600	300	8500	3000	300	300		
CF7.	1780+1780 960 KN	P3-Q3-R3	300 x 750 300 x 600	3	850	600	450	10000	4000	450	450		
CF8.	1165+ 1155 KN	D1-D3	300 x 750 300 x 450	2	850	900	300	8000	2000	300	300		
CF9.	1075+890 1965 KN	E2 - E3	230 x 600 230 x 450	2	850	900	300	7000	2000	300	300		
CF10.	1030+1075 2165 KN	M2 - N2	230 x 600	2	700	450	400	4700	3000	400	400		
CF11.	360+375 735 KN	M6 - N6	230 x 300	2	400	450	200	3000	2000	200	200		
CF12.	1005+935 1940 KN	M3 - N3	230 x 450	2	550	750	300	5400	2500	300	300		
CF13.	345+840 1185 KN	D7 - E6	300 x 450	2	550	450	300	4000	2000	300	300		
CF14.	775+1125 +1125 3025 KN	J2-K2-L2 / J6-K6-L6	300 x 450 300 x 600	6	700	600	300	8000	2500	300	300		
CF15.	1070+1710 +1710 4490 KN	J3 - K3 - L3	300 x 450 300 x 750	3	850	600	450	8800	4000	450	450		
LIFT	520+605 +510+285 1990 KN	D4-D5-E4-E5	230 x 300 230 x 450	4	-	-	-	3200	4200	200	200		
LIFT	495+470 +510+480 1950 KN	M4-M5-N4-N5	230 x 450	4	-	-	-	3200	4200	200	200		
TOTAL				56									

Column Schedule

COLUMN SCHEDULE

NAME OF THE WORK : PROPOSED CONSTRUCTION OF RESIDENTIAL BUILDING (S+5) IN S.NOS: 61/2D, 61/3A2,61/3B1, AT 'D' - PLOT, DEVI NAGAR, AYAPAKKAM CHENNAI

NO.OF FLOORS : STILT + 5 FLOORS

GRADE OF CONCRETE : M25

GRADE OF STEEL : Fe 500D - TMT BARS

CLEAR COVER : 40mm

SL.NO	LOAD ON COLUMN KN	COLUMNS ADOPTED	TOTAL NO OF COLUMNS	COLUMN SIZE (mm x mm) STILT FLOOR	COLUMN SIZE (mm x mm) FIRST FLOOR	Pt %	Ast Sq.mm	MAIN REBARS	LATERAL TIES	SKETECH
C1.	500 KN	E5	1	230 x 300	230 x 300	0.80	552	6 NOS - 12 #	8 # @ 200 c/c	230 / 300
		N6, M6	2	300 x 300	230 x 300	0.80	720	4 NOS - 16 #	8 # @ 200 c/c	230 / 300
C2.	800 KN	D4, D5, E4, M4, M5, N4, N5	7	230 x 450	230 x 450	0.80	828	4 NOS - 16 # + 4 NOS - 12 #	8 # @ 200 c/c	300/230 / 450
		D7, E6, H2, H6	4	300 x 450	230 x 450	0.80	1080			
C3.	1200 KN	D3, E3, M3, N3	4	230 x 450	230 x 450	2.50	2588	8 NOS - 20 # + 4 NOS - 12 #	8 # @ 200 c/c	300/230 / 450
		J2, J3, J6, H3, R3	5	300 x 450	230 x 450	1.50	2025			
C4.	1500 KN	E2, M2, N2	3	230 x 600	230 x 600	2.00	2760	8 NOS - 20 # + 4 NOS - 12 #	8 # @ 200 c/c	300/230 / 600
		P2, P6, Q2, Q6, R2, R6, K2, K6, L2, L6	10	300 x 600	230 x 600	1.50	2700			
C5.	1800 KN	A1, A7, B1, B7, F2, F6, G2, G6,	8	300 x 600	230 x 600	2.00	3600	10 NOS - 20 # + 4 NOS - 16 #	8 # @ 200 c/c	300/230 / 600
C6.	2100 KN	A3, D1, C1, C7, F3, G3, K3, L3	8	300 x 750	230 x 750	2.00	4500	8 NOS - 25 # + 4 NOS - 16 #	8 # @ 200 c/c	300/230 / 750
C7.	2500 KN	B3, P3, Q3	3	300 x 750	230 x 750	2.25	5063	8 NOS -25 # + 4 NOS - 20 #	8 # @ 200 c/c	300/230 / 750
C8.	3200 KN	C3	1	300 x 900	230 x 900	2.50	6750	12 NOS -25 # + 4 NOS - 20 #	8 # @ 200 c/c	300/230 / 900
TOTAL			56							

Column Carrying Capacity as per IS 456-2000 :- Checking

Concrete Grade M25 / Steel Fe 500 D Bars

1) Column Size 230 x 300 mm Load transmitted = 500 KN

Pu = 0.4fck Ac + 0.67 fy Asc

= 0.4 x 25 x 230 x 300 + 0.67 x 500 x 552

P = 690000 +184920 = 874920/1500 = **581 KN**

2) Column Size 300x 300 mm Load transmitted = 500 KN

Pu = 0.4fck Ac + 0.67 fy Asc

= 0.4 x 25 x 300 x 300 + 0.67 x 500 x 804

P = 900000 + 269340 = 1169340 /1500 = **780 KN**

3) Column Size 300 x 450 mm Load transmitted = 800 KN

Pu = 0.4fck Ac + 0.67 fy Asc

= 0.4 x 25 x 300 x 450 + 0.67 x 500 x 1256

P = 1350000 + 420760 = 1770760 /1500 = **1180 KN**

4) Column Size 230 x 450 mm Load transmitted = 800 KN

Pu = 0.4fck Ac + 0.67 fy Asc

= 0.4 x 25 x 230 x 450 + 0.67 x 500 x 1256

P = 1035000 + 420760 = 1455760 /1500 = **970 KN**

5) Column Size 300 x 450 mm Load transmitted = 1200 KN

Pu = 0.4fck Ac + 0.67 fy Asc

= 0.4 x 25 x 300 x 450 + 0.67 x 500 x 2964

P = 1350000 + 992940 = 2342940 /1500 = **1562 KN**

6) Column Size 230 x 450 mm Load transmitted = 1200 KN

Pu = 0.4fck Ac + 0.67 fy Asc

= 0.4 x 25 x 230 x 450 + 0.67 x 500 x 2964

P = 1035000 + 992940 = 2027940 /1500 = **1352**

7) Column Size 300 x 600 mm Load transmitted = 1500 KN

Pu = 0.4fck Ac + 0.67 fy Asc

= 0.4 x 25 x 300 x 600 + 0.67 x 500 x 2964

P = 1800000 + 992940 = 2792940 /1500 = **1862 KN**

8) Column Size 230 x 600 mm Load transmitted = 1500 KN

Pu = 0.4fck Ac + 0.67 fy Asc

= 0.4 x 25 x 230 x 600 + 0.67 x 500 x 2964

P = 1380000 + 992940 = 2372940 /1500 = **1582 KN**

9) Column Size 300 x 600 mm Load transmitted = 1800 KN

Pu = 0.4fck Ac + 0.67 fy Asc

= 0.4 x 25 x 300 x 600 + 0.67 x 500 x 3944

P = 1800000 + 1321240 = 3121240 /1500 = **2081 KN**

10) Column Size 230 x 600 mm Load transmitted = 1800 KN

Pu = 0.4fck Ac + 0.67 fy Asc

= 0.4 x 25 x 230 x 600 + 0.67 x 500 x 3944

P = 1380000 + 1321240 = 2701240 /1500 = **1801 KN**

11) Column Size 300 x 750 mm Load transmitted = 2100 KN

Pu = 0.4fck Ac + 0.67 fy Asc

= 0.4 x 25 x 300 x 750 + 0.67 x 500 x 4732

P = 2250000 + 1585220 = 3835220 /1500 = **2557 KN**

12) Column Size 230 x 750 mm Load transmitted = 2100 KN

Pu = 0.4fck Ac + 0.67 fy Asc

= 0.4 x 25 x 230 x 750 + 0.67 x 500 x 4732

P = 1725000 + 1585220 = 3310220 /1500 = **2207 KN**

13) Column Size 300 x 750 mm Load transmitted = 2500 KN

Pu = 0.4fck Ac + 0.67 fy Asc

= 0.4 x 25 x 300 x 750 + 0.67 x 500 x 5184

P = 2250000 + 1736640= 3986640 /1500 = **2658 KN**

14) Column Size 300 x 900 mm Load transmitted = 3200 KN

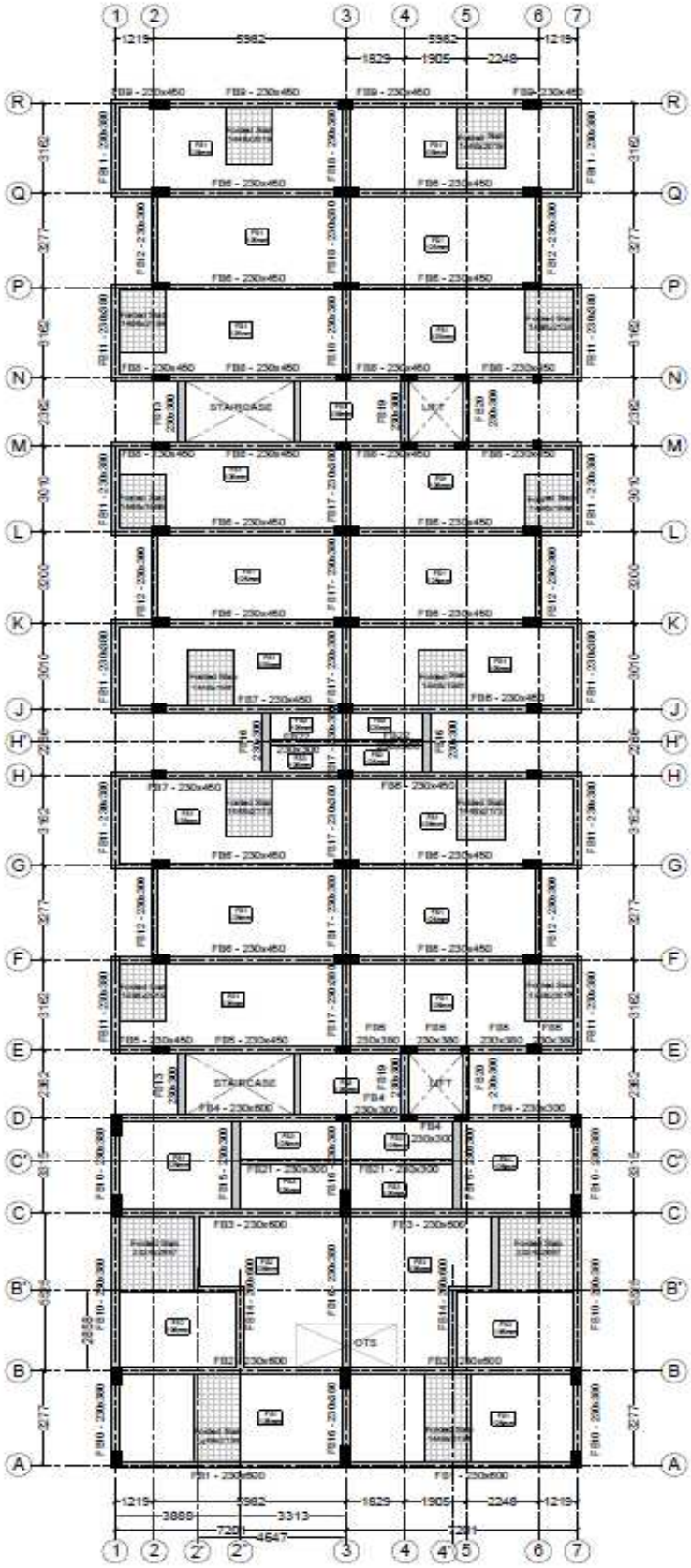
Pu = 0.4fck Ac + 0.67 fy Asc

= 0.4 x 25 x 300 x 900 + 0.67 x 500 x 7148

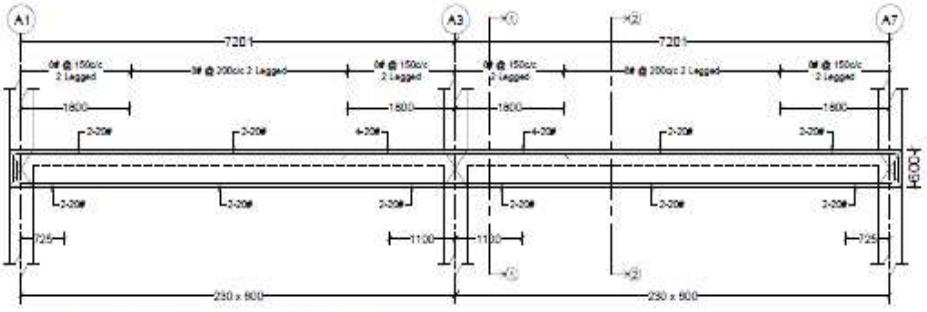
P = 2700000 + 2394580 = 5094580 /1500 = **3396 KN**

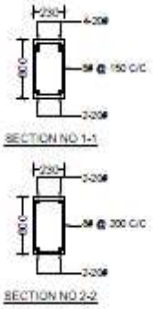
Since the carrying capacity of RC Columns is greater than the loads transmitted, all columns are safe.

Floor Beams Designs (Computer output)



LAYOUT OF GROUND FLOOR ROOF BEAMS

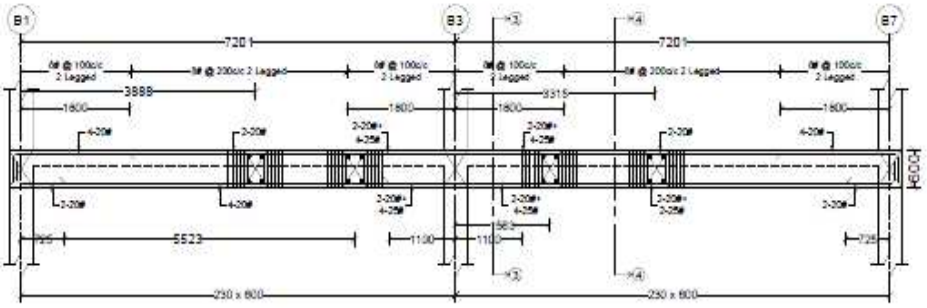


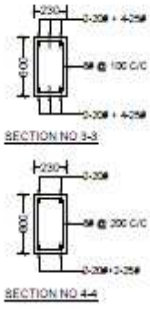


SECTION NO 1-1

SECTION NO 2-2

L.S OF FLOOR BEAM FB1 - (230 x 600) A1-A3-A7

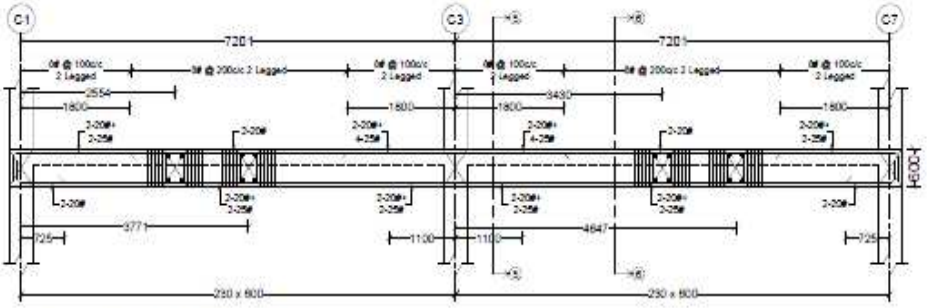


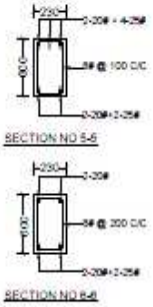


SECTION NO 3-3

SECTION NO 4-4

L.S OF FLOOR BEAM FB2 - (230 x 600) B1-B3-B7

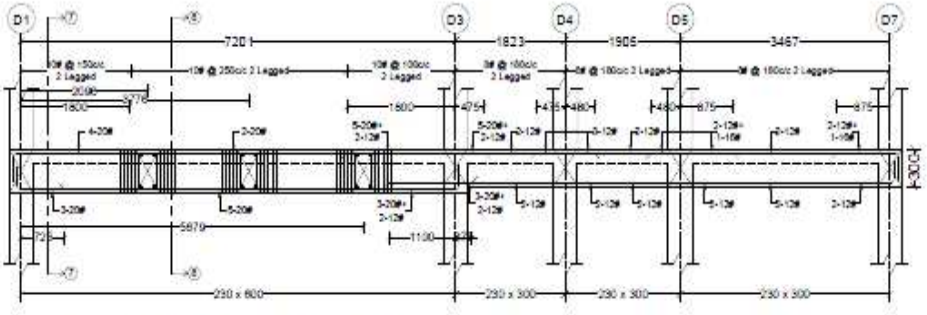


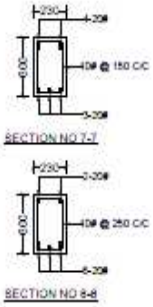


SECTION NO 5-5

SECTION NO 6-6

L.S OF FLOOR BEAM FB3 - (230 x 600) C1-C3-C7

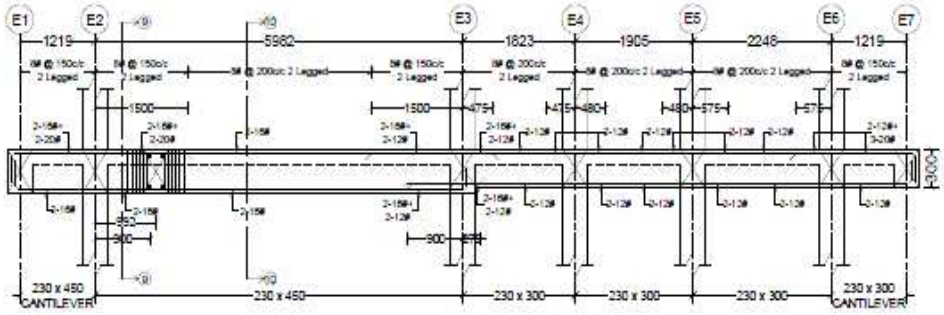




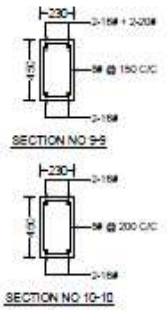
SECTION NO 7-7

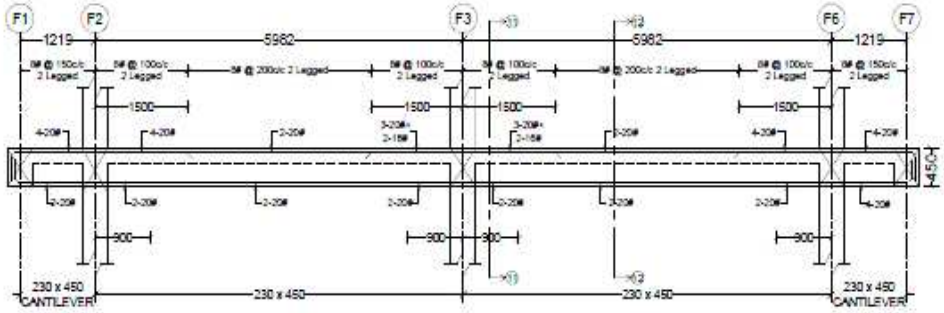
SECTION NO 8-8

L.S OF FLOOR BEAM FB4 - (230 x 600) / (230x300) D1-D3-D4-D5-D7

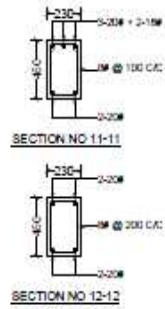


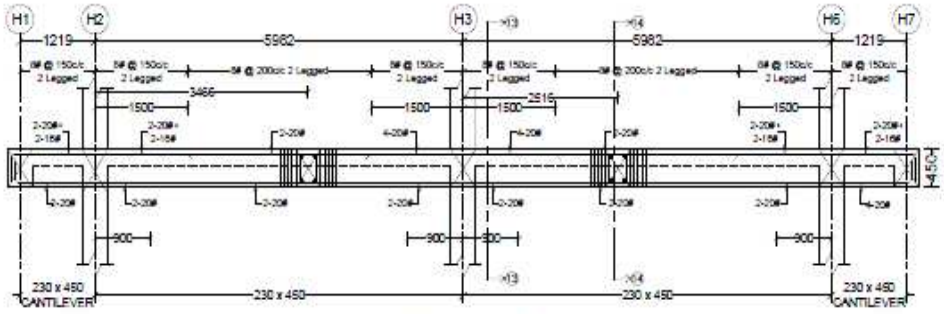
L.S OF FLOOR BEAM FB5 - (230 x 450) / (230x300) E1-E2-E3-E4-E5-E6-E7



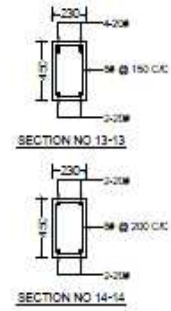


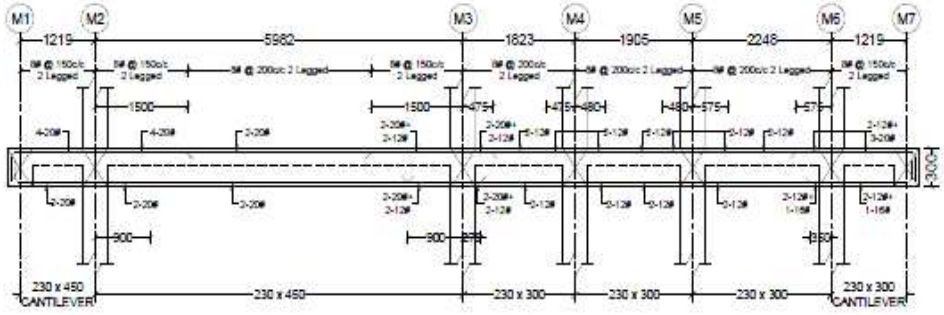
L.S OF FLOOR BEAM FB6 - (230 x 450) F1-F2-F3-F6-F7 / G1-G2-G3-G6-G7 / K1-K2-K3-K6-K7 / L1-L2-L3-L6-L7 / P1-P2-P3-P6-P7 / Q1-Q2-Q3-Q6-Q7



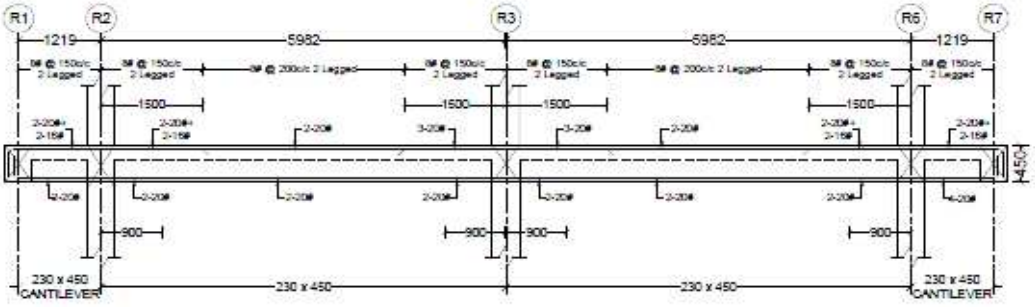


L.S OF FLOOR BEAM FB7 - (230 x 450) H1-H2-H3-H6-H7 / J1-J2-J3-J6-J7

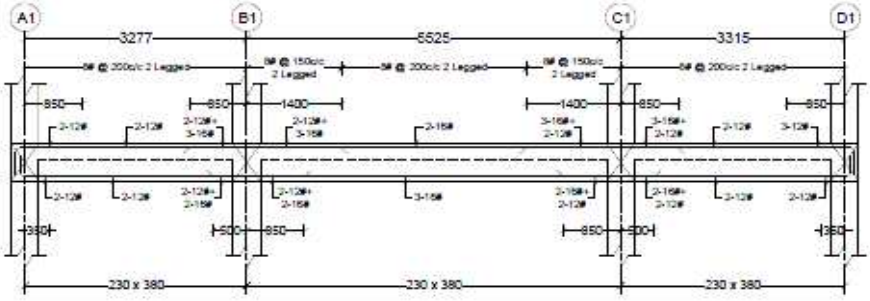




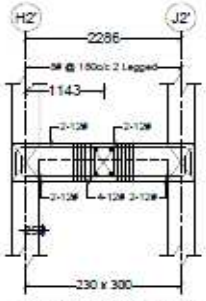
L.S OF FLOOR BEAM FB8 - (230 x 450) M1-M2-M3-M4-M5-M6-M7 / N1-N2-N3-N4-N5-N6-N7



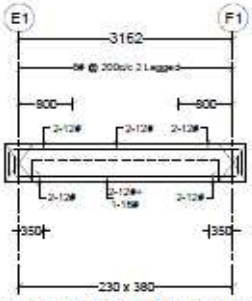
L.S OF FLOOR BEAM FB9 - (230 x 450) R1-R2-R3-R6-R7



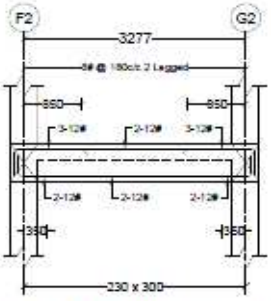
L.S OF FLOOR BEAM FB10 - (230 x 380) A1-B1-C1-D1 / A7-B7-C7-D7



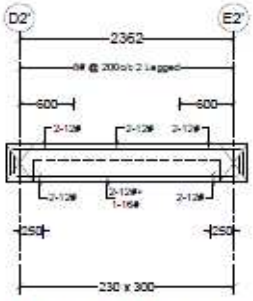
L.S OF FLOOR BEAM FB15 (230 x 300) / H2'-J2' / H4'-J4'



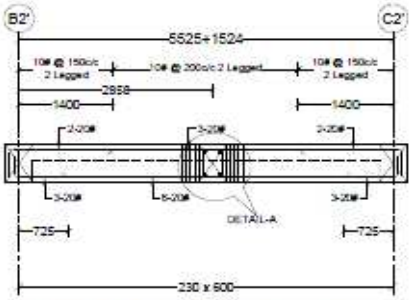
L.S OF FLOOR BEAM FB11 - (230 x 380)
E1-F1 / E7-F7 / G1-H1 / G7-H7 / J1-K1 / J7-K7 / L1-M1 / L7-M7 / N1-P1 / N7-P7 / Q1-R1 / Q7-R7



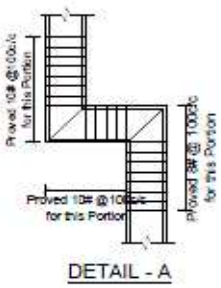
L.S OF FLOOR BEAM FB12 - (230 x 300)
F2-G2 / K2-L2 / P2-Q2 / F6-G6/ K6-L6 / P6-Q6



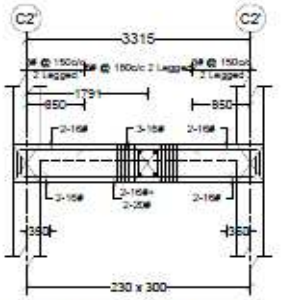
L.S OF FLOOR BEAM FB13 - (230 x 300)
D2'-E2' / M2'-N2' / D2'-E2' / M2'-N2'



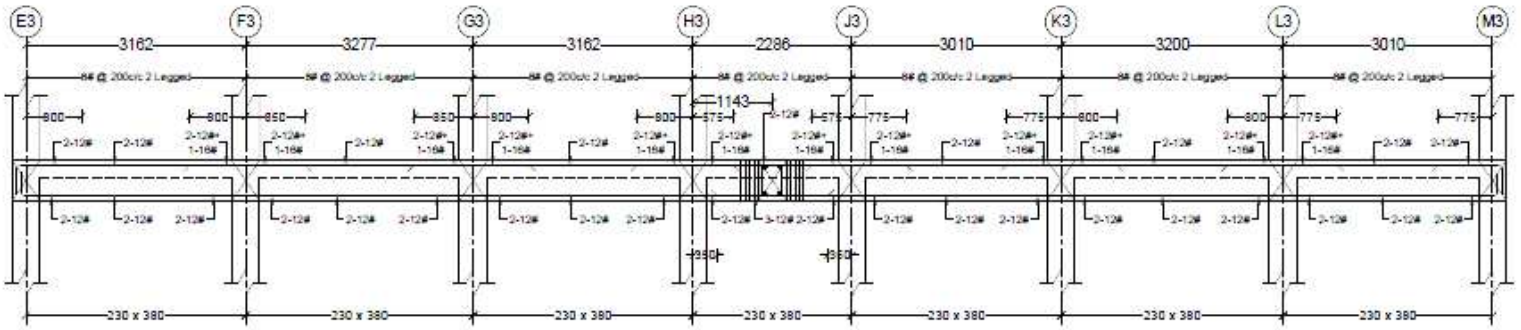
L.S OF FLOOR BEAM FB14 - (230 x 600)
B2'-C2' / B4'-C4'



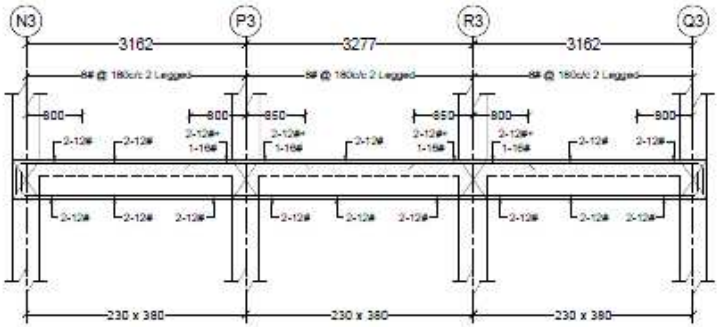
DETAIL - A



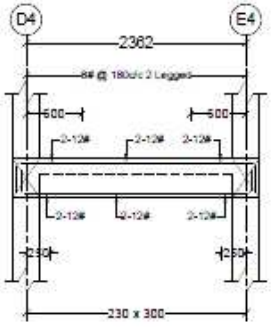
L.S OF FLOOR BEAM FB15 - (230 x 300)
C2'-D2' / C4'-D4'



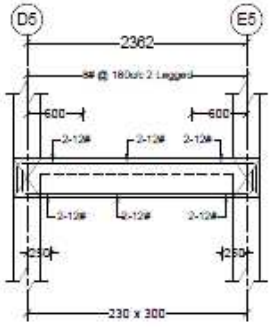
L.S OF FLOOR BEAM FB17 - (230 x 380) E3-F3-G3-H3-J3-K3-L3-M3



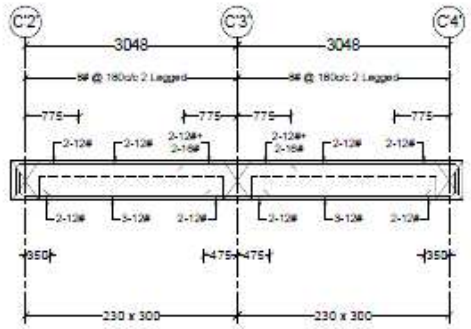
L.S OF FLOOR BEAM FB18 - (230 x 380) N3-P3-Q3-R3



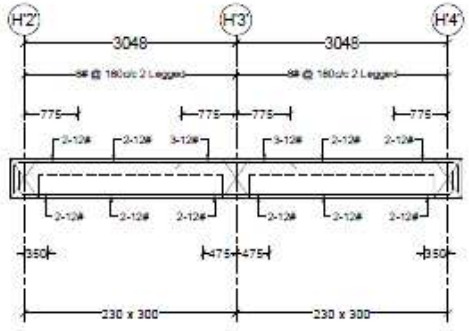
L.S OF FLOOR BEAM FB19 - (230 x 300)
D4-E4 / M4-N4



L.S OF FLOOR BEAM FB20 - (230 x 300)
D5-E5 / M5-N5



L.S OF FLOOR BEAM FB21 - (230 x 300) C'2'-C'3'-C'4'



L.S OF FLOOR BEAM FB22 - (230 x 300) H'2'-H'3'-H'4'

Floors Slabs Designs (Computer Output)

Design Of Reinforced Concrete Slab As Per IS-456-2000	
Slab Designation	FS1
Nature of Slab panel	TWO ADJ.EDGES DISCONTINUOUS
Live Load Intensity [t/m2]	0.2
Floor Finish [mm]	38
Ceiling Finish [mm]	12
Patition Load Intensity [t/m2]	0.1
Slab Thickness	125
Applied Load Factor	1.5
Shorter Span [m]	3.277
Longer Span [m]	7.201
Exposure Condition	MILD
Fire Rating	0.50 Hour.
Concrete Grade Required	M 25
Char. Reinforcement Strength (fy) [N/sq mm]	415
Ratio LY/LX	2.19
Clear Cover to Shorter Steel [mm]	20
Slab Intensity [t/m2]	0.72
+ ve Factored BM @ Shorter dir. [t-m]	0.8
- ve Factored BM @ Shorter dir. [t-m]	1.06
+ ve Factored BM @ Longer dir. [t-m]	0.41
- ve Factored BM @ Longer dir. [t-m]	0.55
Ultimate BM capacity of Slab [t-m]	3.51
Factored Actual Shear Stress [kg/cm2]	1.78
Permissible Shear Stress [kg/cm2]	5.16
Bottom Steel @ Shorter dir.	8 MM dia @ 219 mm c/c
Support Top Steel @ Shorter dir.	8 MM dia @ 163 mm c/c
Bottom Steel @ Longer dir.	8 MM dia @ 300 mm c/c
Support Top Steel @ Longer dir.	8 MM dia @ 297 mm c/c
Min.Cement content required in Concrete [kg/m3]	300
Maximum Water to Cement Ratio	0.55
Actual L/d Raio	32.44
Permissible L/d Raio [safe in deflection]	38.83
Crack width under the bar on tension face	0.05 mm
Crack width midway between bars at tension face	0.11 mm
Permissible Crack width	0.3 mm
<<	PRINT

However provide short 8@150mm c/c ; Long 8@ 200mm c/c

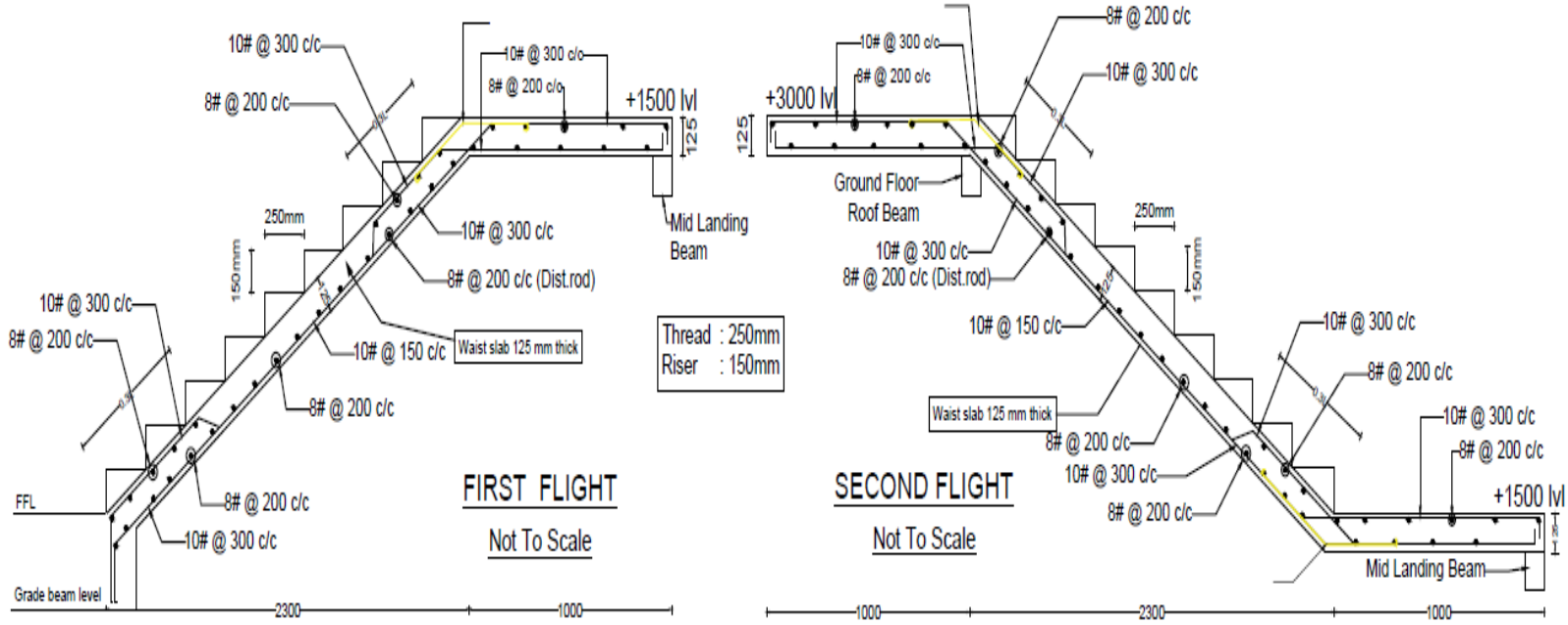
Design Of Reinforced Concrete Slab As Per IS-456-2000	
Slab Designation	FS2
Nature of Slab panel	ONE LONG EDGE DISCONTINUOUS
Live Load Intensity [t/m2]	0.2
Floor Finish [mm]	38
Ceiling Finish [mm]	12
Patition Load Intensity [t/m2]	0.1
Slab Thickness	135
Applied Load Factor	1.5
Shorter Span [m]	4.153
Longer Span [m]	5.525
Exposure Condition	MILD
Fire Rating	0.50 Hour.
Concrete Grade Required	M 25
Char. Reinforcement Strength (fy) [N/sq mm]	415
Ratio LY/LX	1.33
Clear Cover to Shorter Steel [mm]	20
Slab Intensity [t/m2]	0.75
+ ve Factored BM @ Shorter dir. [t-m]	0.87
- ve Factored BM @ Shorter dir. [t-m]	1.14
+ ve Factored BM @ Longer dir. [t-m]	0.54
- ve Factored BM @ Longer dir. [t-m]	0.72
Ultimate BM capacity of Slab [t-m]	4.17
Factored Actual Shear Stress [kg/cm2]	1.73
Permissible Shear Stress [kg/cm2]	4.93
Bottom Steel @ Shorter dir.	10 MM dia @ 300 mm c/c
Support Top Steel @ Shorter dir.	10 MM dia @ 260 mm c/c
Bottom Steel @ Longer dir.	10 MM dia @ 300 mm c/c
Support Top Steel @ Longer dir.	10 MM dia @ 300 mm c/c
Min.Cement content required in Concrete [kg/m3]	300
Maximum Water to Cement Ratio	0.55
Actual L/d Raio	37.75
Permissible L/d Raio [safe in deflection]	44.77
Crack width under the bar on tension face	0.05 mm
Crack width midway between bars at tension face	0.11 mm
Permissible Crack width	0.3 mm
<<	PRINT

However provide short 10@150mm c/c ; Long 10@ 150mm c/c

Design Of Reinforced Concrete Slab As Per IS-456-2000	
Slab Designation	FS3
Nature of Slab panel	INTERIOR PANEL
Live Load Intensity [t/m2]	0.2
Floor Finish [mm]	38
Ceiling Finish [mm]	12
Patition Load Intensity [t/m2]	0.1
Slab Thickness	125
Applied Load Factor	1.5
Shorter Span [m]	2.362
Longer Span [m]	3.353
Exposure Condition	MILD
Fire Rating	0.50 Hour.
Concrete Grade Required	M 25
Char. Reinforcement Strength (fy) [N/sq mm]	415
Ratio LY/LX	1.41
Clear Cover to Shorter Steel [mm]	20
Slab Intensity [t/m2]	0.72
+ ve Factored BM @ Shorter dir. [t-m]	0.23
- ve Factored BM @ Shorter dir. [t-m]	0.31
+ ve Factored BM @ Longer dir. [t-m]	0.14
- ve Factored BM @ Longer dir. [t-m]	0.19
Ultimate BM capacity of Slab [t-m]	3.51
Factored Actual Shear Stress [kg/cm2]	1
Permissible Shear Stress [kg/cm2]	3.76
Bottom Steel @ Shorter dir.	8 MM dia @ 300 mm c/c
Support Top Steel @ Shorter dir.	8 MM dia @ 300 mm c/c
Bottom Steel @ Longer dir.	8 MM dia @ 300 mm c/c
Support Top Steel @ Longer dir.	8 MM dia @ 300 mm c/c
Min.Cement content required in Concrete [kg/m3]	300
Maximum Water to Cement Ratio	0.55
Actual L/d Raio	23.38
Permissible L/d Raio [safe in deflection]	104.81
Crack width under the bar on tension face	0 mm
Crack width midway between bars at tension face	0 mm
Permissible Crack width	0.3 mm
<<	PRINT

However provide short 8@200mm c/c ; Long 8@ 200mm c/c

Staircase


10# @ 300 c/c
8# @ 200 c/c
10# @ 300 c/c
8# @ 200 c/c
+1500 lvl
125
Mid Landing Beam
250mm
150mm
10# @ 300 c/c
8# @ 200 c/c (Dist.rod)
10# @ 300 c/c
8# @ 200 c/c
10# @ 150 c/c
Waist slab 125 mm thick
8# @ 200 c/c
FFL
8# @ 200 c/c
10# @ 300 c/c
Grade beam level
2300
1000
FIRST FLIGHT
Not To Scale
Thread : 250mm
Riser : 150mm
8# @ 200 c/c
10# @ 300 c/c
10# @ 300 c/c
8# @ 200 c/c
+3000 lvl
125
Ground Floor
Roof Beam
250mm
10# @ 300 c/c
8# @ 200 c/c (Dist.rod)
150mm
10# @ 150 c/c
10# @ 300 c/c
8# @ 200 c/c
Waist slab 125 mm thick
8# @ 200 c/c
10# @ 300 c/c
10# @ 300 c/c
8# @ 200 c/c
+1500 lvl
8# @ 200 c/c
Mid Landing Beam
1000
2300
1000
SECOND FLIGHT
Not To Scale

Design of Staircase 1st and 2nd Flight

Data :

Concrete : M25
Steel : Fe 500
Span : 3.50m

Imposed Load = 3.0 KN/m^2
Steps = 2.0 KN/m^2
Tiles = 0.5 KN/m^2
Ceiling = 1.0 KN/m^2
Hand rail = 1.5 KN/m^2
Total Load = **8.00 KN/m^2**

Total loading = 8 KN /m^2

Bending Moment M = 8 x 3.50^2 /8 = 12.25 KN m

Factored Moment Mu = 1.5 x 13.69 = 18.38 KN m

Adopt a thickness of D = 125 mm, d = 100mm

K = Mu / bd^2 = 18.38 x 1000 x 1000 / (1000 x 100 x 100) = 1.84 N / mm^2

From Table 2 of Design Aids SP:16, Pt = 0.47%

Ast = 470 mm^2 (4.70 cm^2)

Provide 10 # @ 150 mm c/c (= 680 mm^2)

Distributors : 0.12% x b x d = (0.12 x 1000 x 125)/100 = 150mm^2

Distributors : Provide 8# @ 200 mm c/c

Output Data:

Waist Slab D = 125 mm

Main Rebars : 10# @ 150mm c/c

Distributors : 8# @ 200mm c/c

Lift

Design of Lift 1

Load Transmitted on Lift Columns

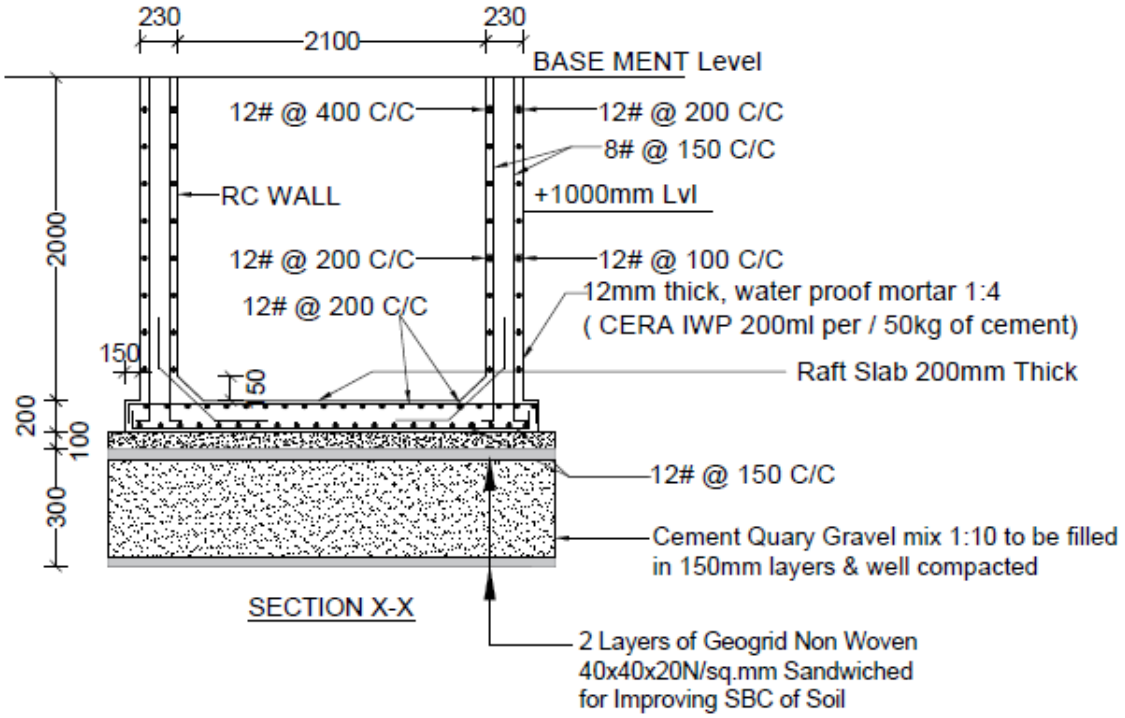
D4 = 520 KN
D5 = 605 KN
E4 = 510 KN
E5 = 285 KN

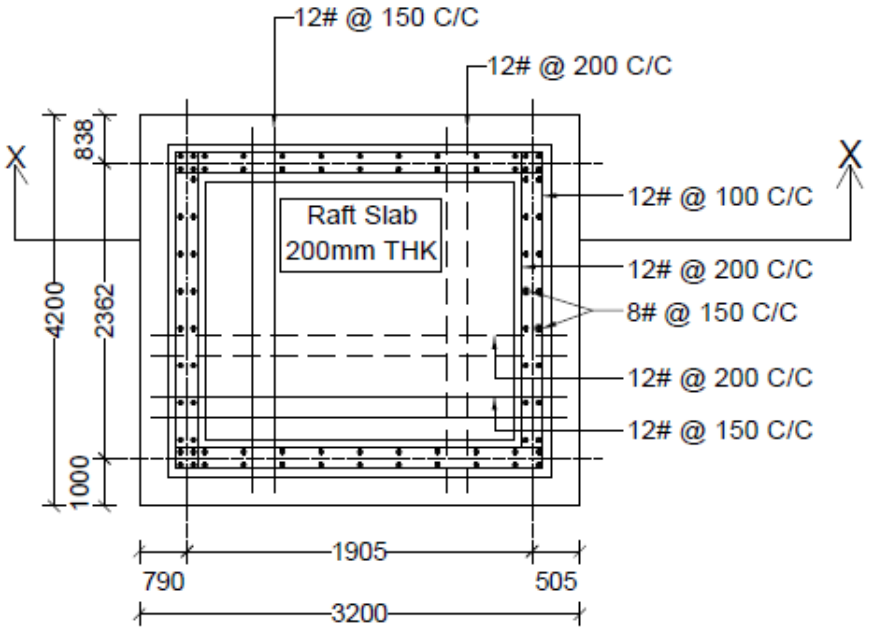
Total Load = 1920KN

Safe Bearing Capacity of Soil = 150 KN / m^2

Area required for Raft Foundation 1920/ 150 = 12.80m^2

Provide a size of raft as 3.00m x 4.30m = 12.90m^2





PLAN

Detailing Of Lift Pit

D4-D5-E4-E5

Design of Lift 2

Load Transmitted on Lift Columns

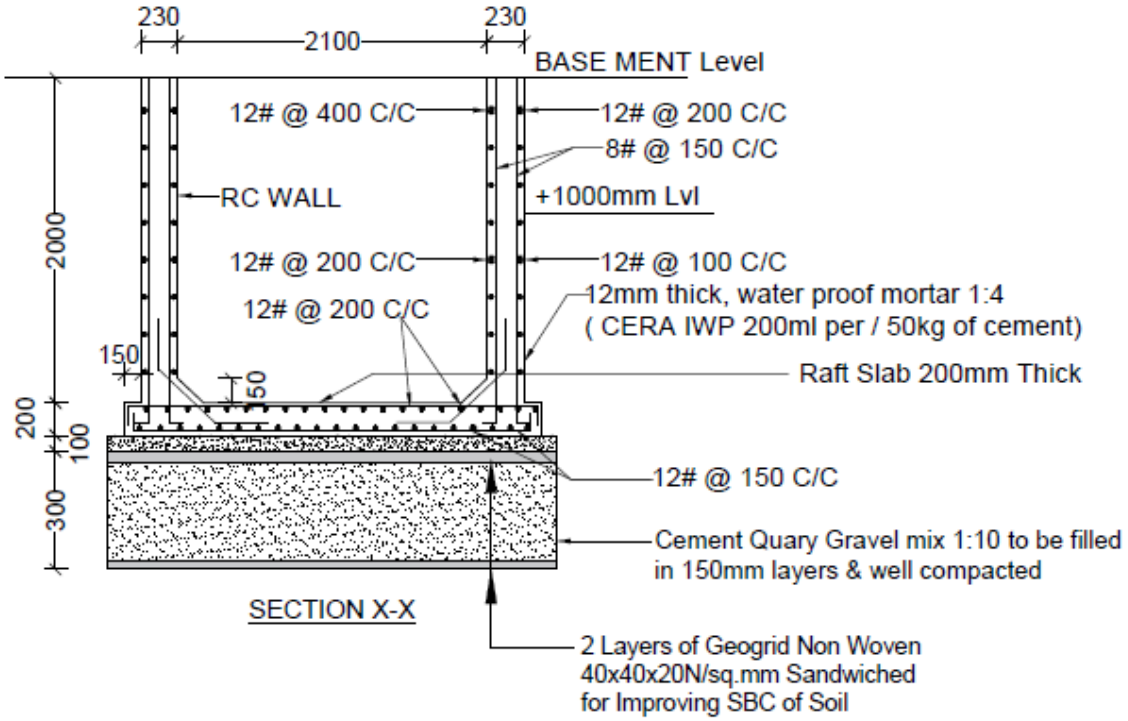
M4 = 495 KN
M5 = 470 KN
N4 = 510 KN
N5 = 480 KN

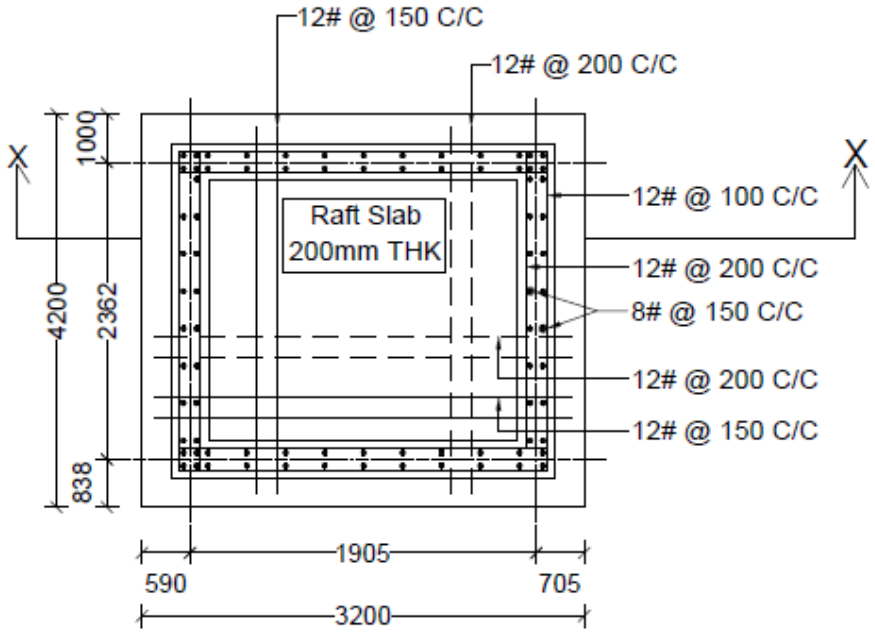
Total Load = 1950KN

Safe Bearing Capacity of Soil = 150 KN / m^2

Area required for Raft Foundation 1950/ 150 = 13.00m^2

Provide a size of raft as 3.00m x 4.30m = 12.90m^2





PLAN

Detailing Of Lift Pit

M4-M5-N4-N5

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
3/350/2 Mettukuppam,
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.