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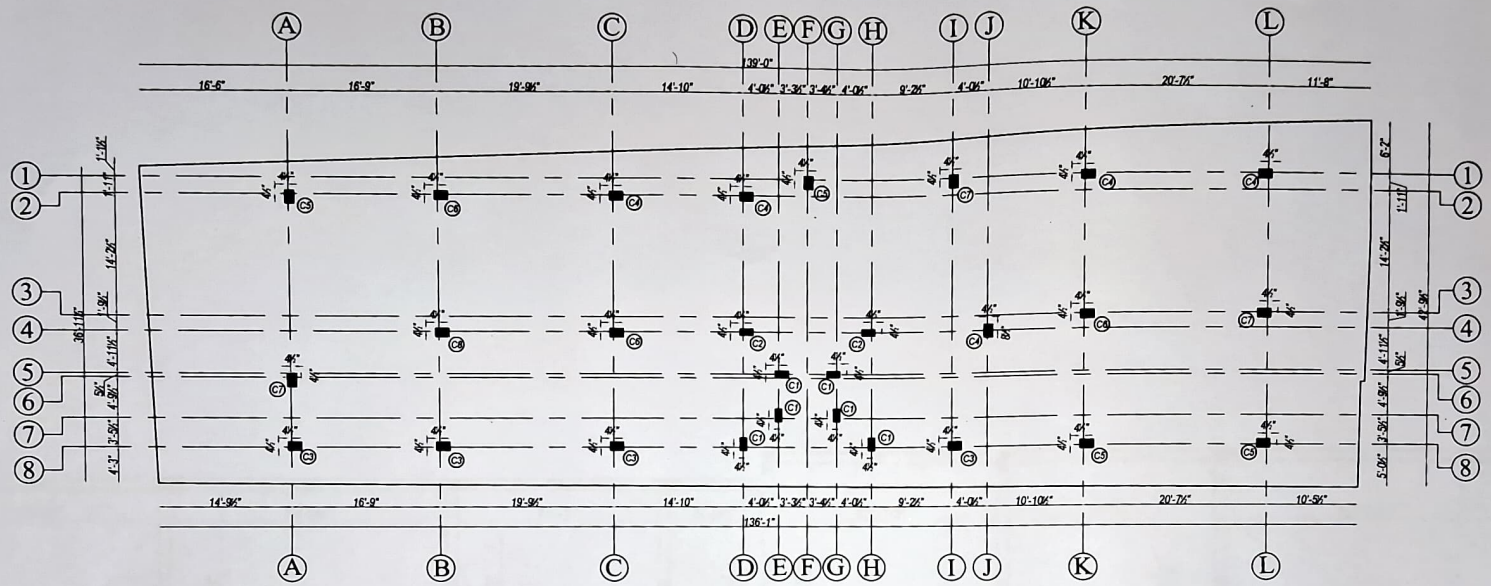
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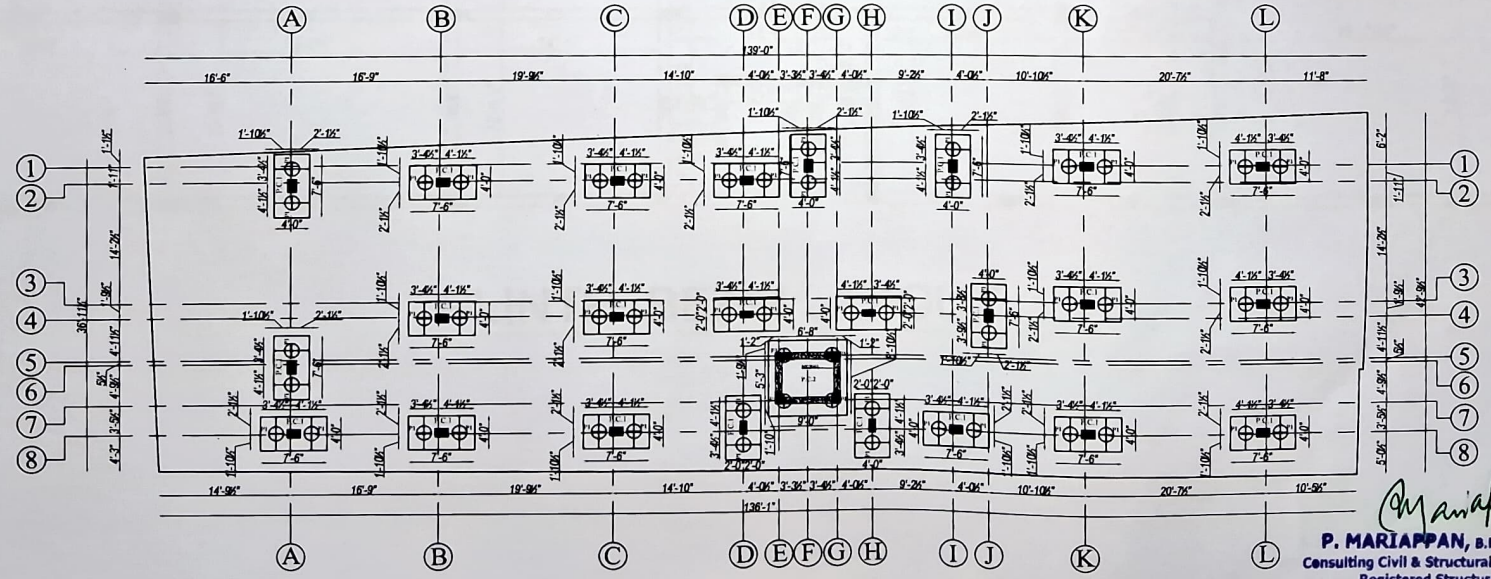
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DIGITALLY VERIFIED RECORD



COLUMN AXIS LAYOUT



FOUNDATION LAYOUT

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Registered Structural
Engineer Grade II (SE / GR-II / 19/03/028
CMDA
Ph : 26745655, Cell : 9841296750

STRUCTURAL DRAWING

GENERAL NOTES

1. THIS DRAWING SHOULD BE READ ALONG WITH RELEVANT ARCHITECTURAL DWG.
2. ALL DIMENSION ARE IN FEET & INCH, ONLY FIGURED DIMENSIONS TO BE FOLLOWED.
3. ANY DESCREPANCY IN THE DWG SHALL BE BROUGHT TO NOTICE OF ARCHITECT/CONSULTANT & CLARIFICATION OBTAINED IN WRITING PRIOR TO EXECUTION OF WORK.
4. THE REINFORCEMENT STEEL CONFIRMING TO IS 1786-1985 OF FE 500 GRADE SHOULD BE USED.
5. THE GRADE OF CONCRETE USED FOR ALL RCC ELEMENT SHALL BE M25 CONFIRMING TO IS 456-2000.
6. USE VIBRATOR FOR ALL CONCRETING WORKS. WATER USED FOR CONCRETE SHOULD BE POTABLE (pH VALUE-7).

SPECIFIC NOTES

1. STRUCTURE IS DESIGNED FOR STILT +3 FLOORS ONLY.
2. VERTICAL CAPACITY OF PILE IS TAKEN AS 900 KN OR 90 TON AT A DEPTH OF 27.5 m FROM N.G.L AS PER SOIL EXPLORATION REPORT SPECIFIED.
3. PCC (1:4:8) SHALL BE PROVIDED AT SPECIFIED LOCATION.
4. LAPPING LENGTH SHALL BE 50D (MAX.DIA) FOR ALL BAR.
5. CLEAR COVER FOR
   a) FOOTINGS- 2" b) COLUMN - 1.5" c) BEAM -1"
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11. NO BACKFILLING SHALL BE DONE AGAINST FOUNDATION AND RETAINING WALL UNTIL CONCRETE HAS ATTAINED 75% OF ITS DESIGN STRENGTH (10 DAYS).

REVISION DESCRIPTION

REV NO/DATE:	

PURPOSE OF RELEASE

FOR CONSTRUCTION

TITLE

COLUMN AXIS & FOUNDATION LAYOUT

PROJECT

PROPOSED CONSTRUCTION OF RESIDENTIAL BUILDING (STILT+03) AT OLD NO. 30, NEW NO.6, GIRI STREET, WEST MAMBALAM, CHENNAI - 600053.

CHECKED	: P.M	DATE :	12.10.2023
DEALT	: SK	SCALE :	NTS
DRAWN	: JAVITH	SHEET NO:	01

STRUCTURAL CONSULTANT

"M.R.ASSOCIATES"

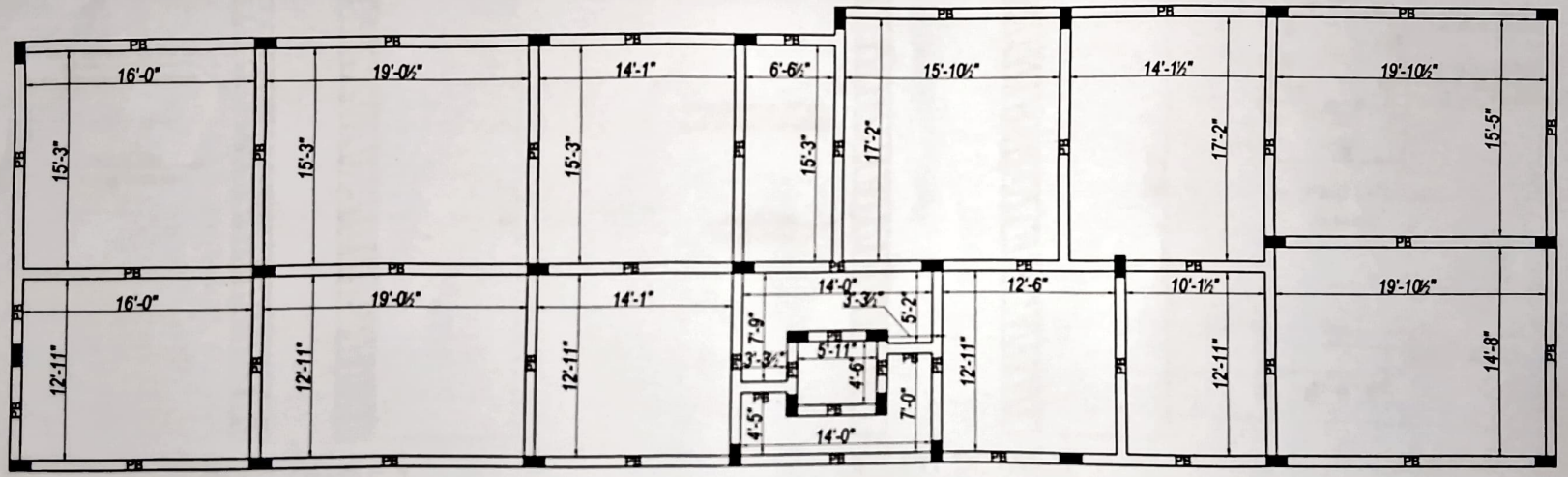
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CLASS I LICENCED SURVEYOR CORPORATION OF CHENNAI

ARCHITECT/BUILDER/CONTRACTOR

M/s. RATNAM HEIGHTS LLP, CHENNAI

CLIENT



PLINTH BEAM LAYOUT

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REVISION DESCRIPTION

REV NO/DATE:	

PURPOSE OF RELEASE

FOR CONSTRUCTION

TITLE

PLINTH BEAM LAYOUT

PROJECT

PROPOSED CONSTRUCTION OF RESIDENTIAL BUILDING (STILT+03) AT OLD NO. 30, NEW NO.6, GIRI STREET, WEST MAMBALAM, CHENNAI - 600053.

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STRUCTURAL CONSULTANT

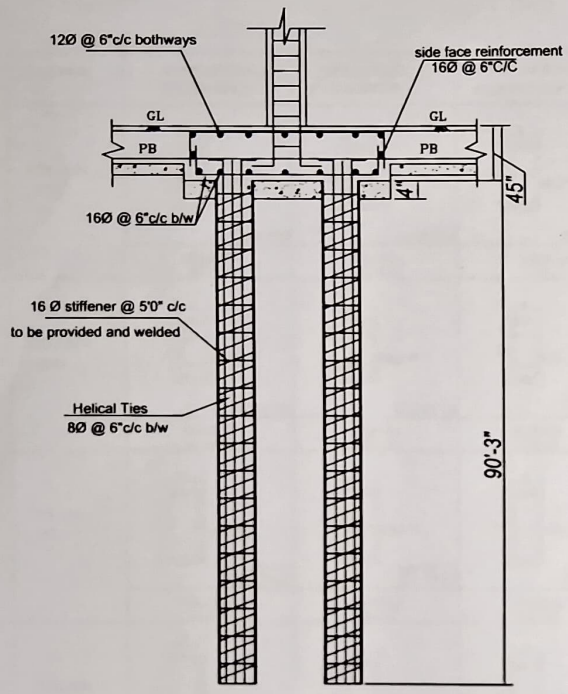
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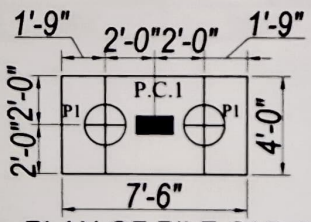
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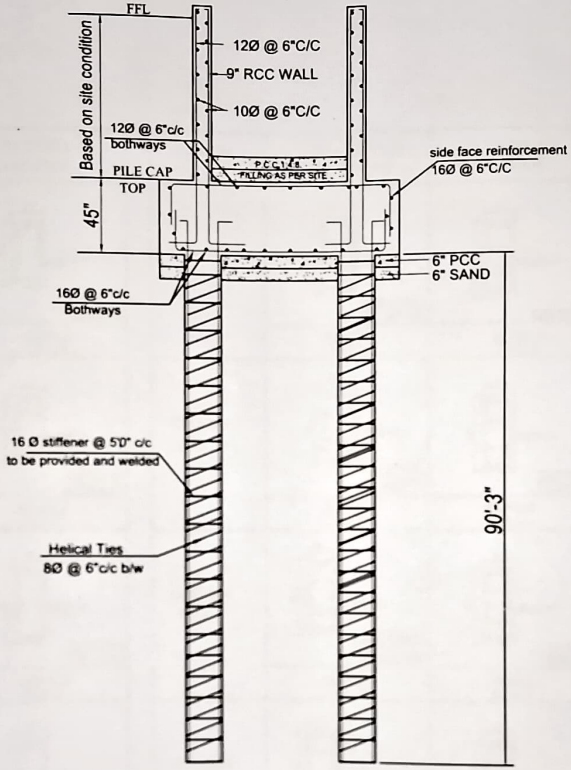
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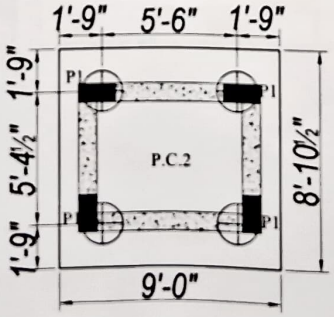
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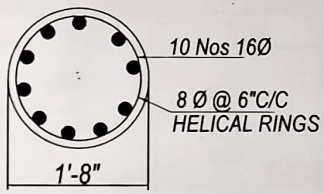
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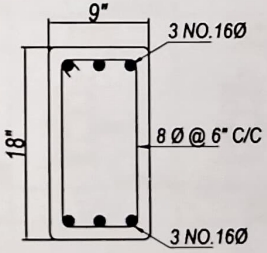
LIFT PIT DETAILS



PLAN OF PILE CAP-2



PILE - P1
(500MM)



C.S. OF PLINTH BEAM
(PB)

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Registered Structural
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REVISION DESCRIPTION

REV NO/DATE:	

PURPOSE OF RELEASE

FOR CONSTRUCTION

TITLE

PILE REINFORCMENT DETAILS

PROJECT

PROPOSED CONSTRUCTION OF RESIDENTIAL BUILDING (STILT+03) AT OLD NO. 30, NEW NO.6, GIRI STREET, WEST MAMBALAM, CHENNAI - 600053.

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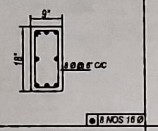
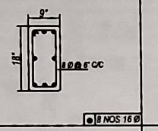
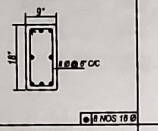
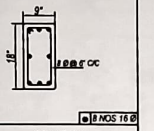
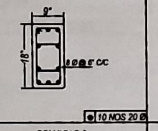
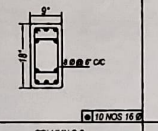
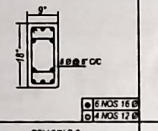
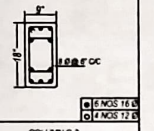
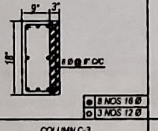
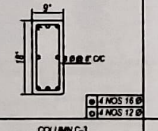
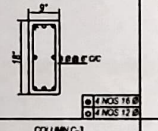
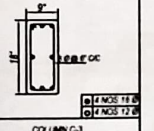
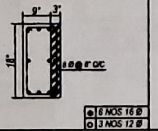
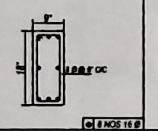
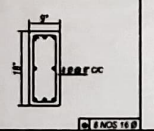
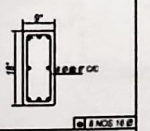
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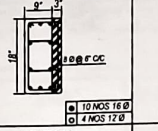
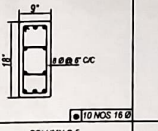
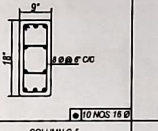
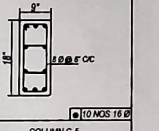
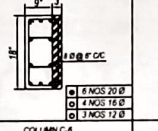
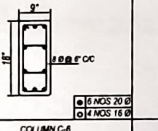
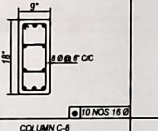
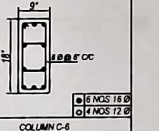
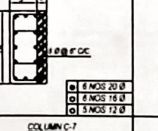
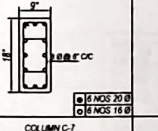
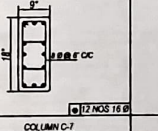
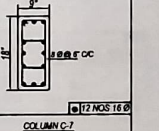
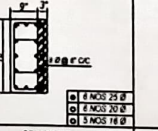
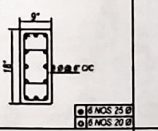
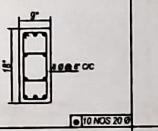
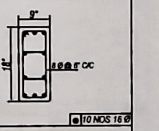
CLASS I LICENCED SURVEYOR CORPORATION OF CHENNAI

ARCHITECT/BUILDER/CONTRACTOR

M/s. RATNAM HEIGHTS LLP, CHENNAI

CLIENT

COLUMN	UPTO GROUND FLOOR ROOF	UP TO FIRST FLOOR ROOF	UP TO SECOND FLOOR ROOF	UP TO THIRD FLOOR ROOF
COLUMN (C1)	 8 NOS 16 Ø COLUMN C-1 0'9"X1'6"	 8 NOS 16 Ø COLUMN C-1 0'9"X1'6"	 8 NOS 16 Ø COLUMN C-1 0'9"X1'6"	 8 NOS 16 Ø COLUMN C-1 0'9"X1'6"
COLUMN (C2)	 10 NOS 20 Ø COLUMN C-2 0'9"X1'6"	 10 NOS 16 Ø COLUMN C-2 0'9"X1'6"	 6 NOS 16 Ø 4 NOS 12 Ø COLUMN C-2 0'9"X1'6"	 6 NOS 16 Ø 4 NOS 12 Ø COLUMN C-2 0'9"X1'6"
COLUMN (C3)	 8 NOS 16 Ø 3 NOS 12 Ø COLUMN C-3 0'1"X1'6"	 4 NOS 16 Ø 4 NOS 12 Ø COLUMN C-3 0'9"X1'6"	 4 NOS 16 Ø 4 NOS 12 Ø COLUMN C-3 0'9"X1'6"	 4 NOS 16 Ø 4 NOS 12 Ø COLUMN C-3 0'9"X1'6"
COLUMN (C4)	 6 NOS 16 Ø 3 NOS 12 Ø COLUMN C-4 1'0"X1'6"	 8 NOS 16 Ø COLUMN C-4 0'9"X1'6"	 8 NOS 16 Ø COLUMN C-4 0'9"X1'6"	 8 NOS 16 Ø COLUMN C-4 0'9"X1'6"

COLUMN	UPTO GROUND FLOOR ROOF	UP TO FIRST FLOOR ROOF	UP TO SECOND FLOOR ROOF	UP TO THIRD FLOOR ROOF
COLUMN (C5)	 10 NOS 16 Ø 4 NOS 12 Ø COLUMN C-5 1'0"X1'6"	 10 NOS 16 Ø COLUMN C-5 0'9"X1'6"	 10 NOS 16 Ø COLUMN C-5 0'9"X1'6"	 10 NOS 16 Ø COLUMN C-5 0'9"X1'6"
COLUMN (C6)	 6 NOS 20 Ø 4 NOS 16 Ø 3 NOS 12 Ø COLUMN C-6 1'0"X1'6"	 6 NOS 20 Ø 4 NOS 16 Ø COLUMN C-6 0'9"X1'6"	 10 NOS 16 Ø COLUMN C-6 0'9"X1'6"	 6 NOS 16 Ø 4 NOS 12 Ø COLUMN C-6 0'9"X1'6"
COLUMN (C7)	 6 NOS 20 Ø 5 NOS 16 Ø 3 NOS 12 Ø COLUMN C-7 0'1"X1'6"	 6 NOS 20 Ø 6 NOS 16 Ø COLUMN C-7 0'9"X1'6"	 12 NOS 16 Ø COLUMN C-7 0'9"X1'6"	 12 NOS 16 Ø COLUMN C-7 0'9"X1'6"
COLUMN (C8)	 6 NOS 25 Ø 6 NOS 20 Ø 3 NOS 16 Ø COLUMN C-8 1'0"X1'6"	 6 NOS 25 Ø 6 NOS 20 Ø COLUMN C-8 0'9"X1'6"	 10 NOS 20 Ø COLUMN C-8 0'9"X1'6"	 10 NOS 16 Ø COLUMN C-8 0'9"X1'6"

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STRUCTURAL DRAWING

GENERAL NOTES

1. THIS DRAWING SHOULD BE READ ALONG WITH RELEVANT ARCHITECTURAL DWG.
2. ALL DIMENSION ARE IN FEET & INCH, ONLY FIGURED DIMENSIONS TO BE FOLLOWED.
3. ANY DESCREPANCY IN THE DWG SHALL BE BROUGHT TO NOTICE OF ARCHITECT/CONSULTANT & CLARIFICATION OBTAINED IN WRITING PRIOR TO EXECUTION OF WORK.
4. THE REINFORCEMENT STEEL CONFIRMING TO IS 1786-1985 OF FE 500 GRADE SHOULD BE USED.
5. THE GRADE OF CONCRETE USED FOR ALL RCC ELEMENT SHALL BE M25 CONFIRMING TO IS 456-2000.
6. USE VIBRATOR FOR ALL CONCRETING WORKS. WATER USED FOR CONCRETE SHOULD BE POTABLE (pH VALUE-7).

SPECIFIC NOTES

1. STRUCTURE IS DESIGNED FOR STILT +3 FLOORS ONLY.
2. VERTICAL CAPACITY OF PILE IS TAKEN AS 900 KN OR 90 TON AT A DEPTH OF 27.5 m FROM N.G.L AS PER SOIL EXPLORATION REPORT SPECIFIED.
3. PCC (1:4:8) SHALL BE PROVIDED AT SPECIFIED LOCATION.
4. LAPPING LENGTH SHALL BE 50D (MAX.DIA) FOR ALL BAR.
5. CLEAR COVER FOR
   a) FOOTINGS- 2" b) COLUMN - 1.5" c) BEAM -1"
6. THE ADEQUATE SIZE OF COVER BLOCK MADE OF CEMENT MORTAR SHALL BE USED FOR CONSTRUCTION.
7. NOT MORE THAN 40% OF REINFORCEMENT SHALL BE LAPPED AT ANY PARTICULAR JUNCTION.
8. IN COLUMN OVER LAPPING BAR SHOULD BE STAGGERED.
9. OVER LAPPING ARE ALLOWED ONLY AT MIDDLE ZONE (L/2) OF COLUMN.
10. PROVIDE ADEQUATE CHAIR RODS, IF SLAB IS GIVEN AS DOUBLE LAYER REINFORCEMENT FOR KEEPING TOP REINFORCEMENT IN POSTION.
11. NO BACKFILLING SHALL BE DONE AGAINST FOUNDATION AND RETAINING WALL UNTIL CONCRETE HAS ATTAINED 75% OF ITS DESIGN STRENGTH (10 DAYS).

REVISION DESCRIPTION

REV NO/DATE:	

PURPOSE OF RELEASE

FOR CONSTRUCTION

TITLE

COLUMN REINFORCEMENT DETAIL

PROJECT

PROPOSED CONSTRUCTION OF RESIDENTIAL BUILDING (STILT+03) AT OLD NO. 30, NEW NO.6, GIRI STREET, WEST MAMBALAM, CHENNAI - 600053.

CHECKED	: P.M	DATE :	12.10.2023
DEALT	: SK	SCALE :	NTS
DRAWN	: JAVITH	SHEET NO:	04

STRUCTURAL CONSULTANT

"M.R.ASSOCIATES"

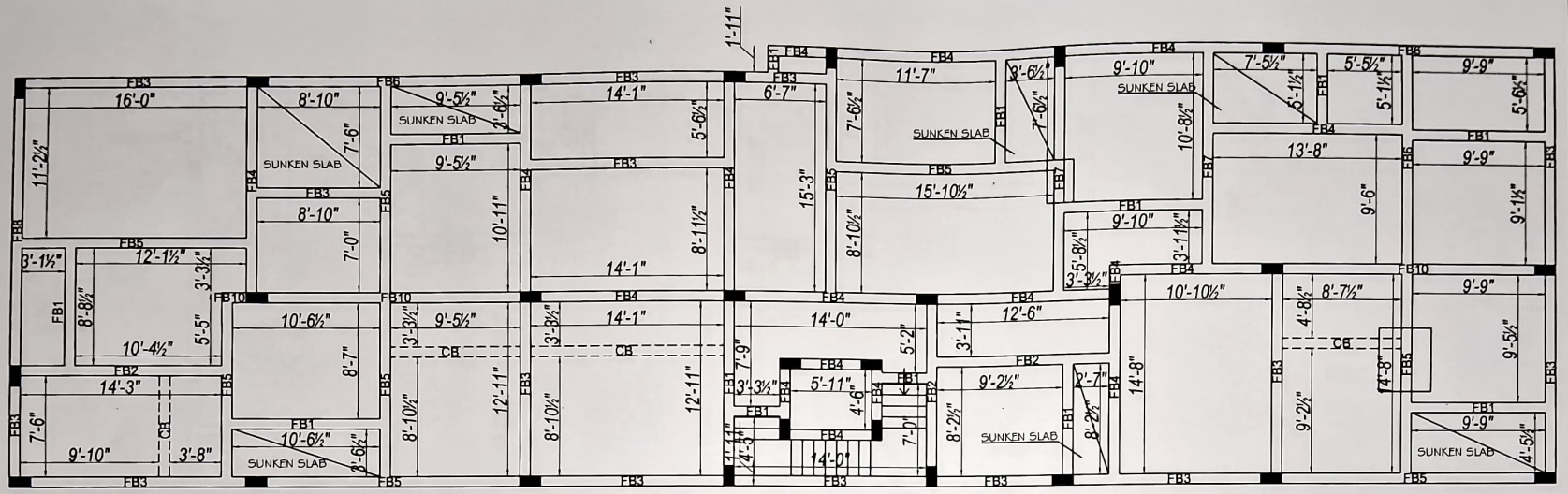
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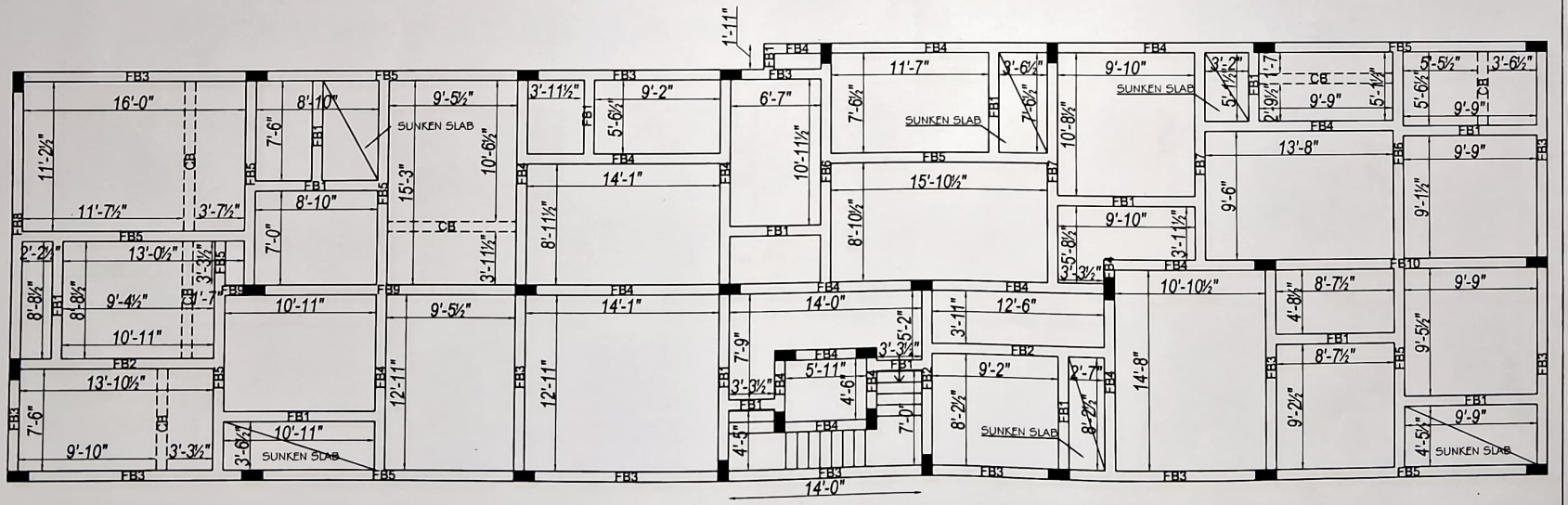
ARCHITECT/BUILDER/CONTRACTOR

M/s. RATNAM HEIGHTS LLP, CHENNAI

CLIENT



GF ROOF BEAM LAYOUT



FF ROOF BEAM LAYOUT

STRUCTURAL DRAWING

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6. USE VIBRATOR FOR ALL CONCRETING WORKS. WATER USED FOR CONCRETE SHOULD BE POTABLE (pH VALUE-7)

SPECIFIC NOTES

1. STRUCTURE IS DESIGNED FOR STILT +3 FLOORS ONLY.
2. LAPPING LENGTH SHALL BE 50D (MAX.DIA) FOR ALL BAR.
3. CLEAR COVER FOR ALL BEAM & RCC WALL- 1", SLAB- 0.75"
4. THE ADEQUATE SIZE OF COVER BLOCK MADE OF CEMENT MORTAR SHALL BE USED FOR CONSTRUCTION.
5. NOT MORE THAN 40% OF REINFORCEMENT SHALL BE LAPPED AT ANY PARTICULAR JUNCTION.
6. IN BEAM OVER-LAPPING TO BE PROVIDED AT MIDSPAN FOR TOP BARS AND NEAR SUPPORT FOR BOTTOM BARS.
7. SPACER BAR TO BE PROVIDED IN BETWEEN TWO LAYERS OF BEAM REINFORCEMENT OF DIA 20mm OR MORE, AS SPECIFIED AT EVERY 3' (= 1m) INTERVAL.
8. IN SLABS FIRST MAIN BAR SHALL BE PLACED AT 80mm OR HALF THE SPACING SPECIFIED, WHICHEVER IS LESS FROM FACE OF SUPPORT.
9. REMOVAL OF FORM WORKS.-
   - i) FOR SLABS
     - a) SLAB SPANNING UPTO 4.5m (15' 0") - 7 DAYS
     - b) SLAB SPANNING OVER 4.5m (15' 0") - 14 DAYS
   - i) FOR BEAMS
     - a) BEAMS SPANNING UPTO 6m (20' 0") - 14 DAYS
     - b) BEAMS SPANNING OVER 6m (20' 0") - 21 DAYS

REVISION DESCRIPTION

REV NO/DATE	

PURPOSE OF RELEASE

FOR CONSTRUCTION

TITLE

GF & FF ROOF BEAM LAYOUT

PROJECT

PROPOSED CONSTRUCTION OF RESIDENTIAL BUILDING (STILT+03) AT OLD NO. 30, NEW NO.6, GIRI STREET, WEST MAMBALAM, CHENNAI - 600053.

CHECKED :	P.M	DATE :	20.10.2023
DEALT :	S.K	SCALE :	NTS
DRAWN :	JAVITH	SHEET NO.	05

STRUCTURAL CONSULTANT

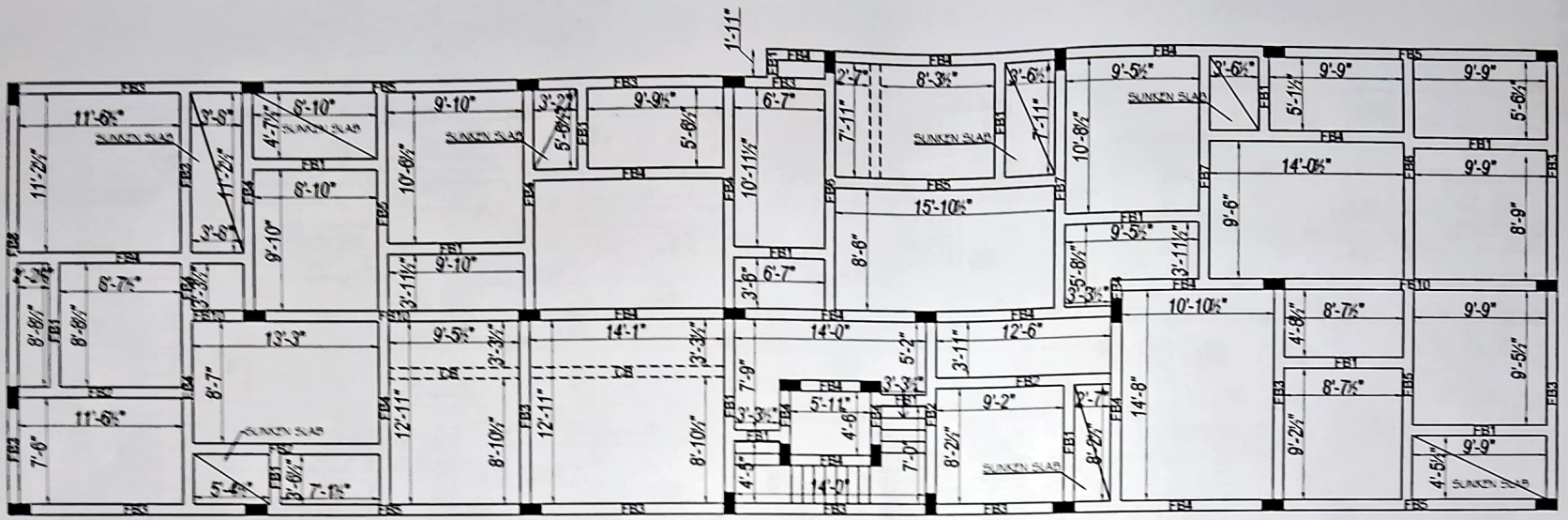
"M.R.ASSOCIATES"
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CLASS I LICENCED SURVEYOR CORPORATION OF CHENNAI

BUILDER/CONTRACTOR

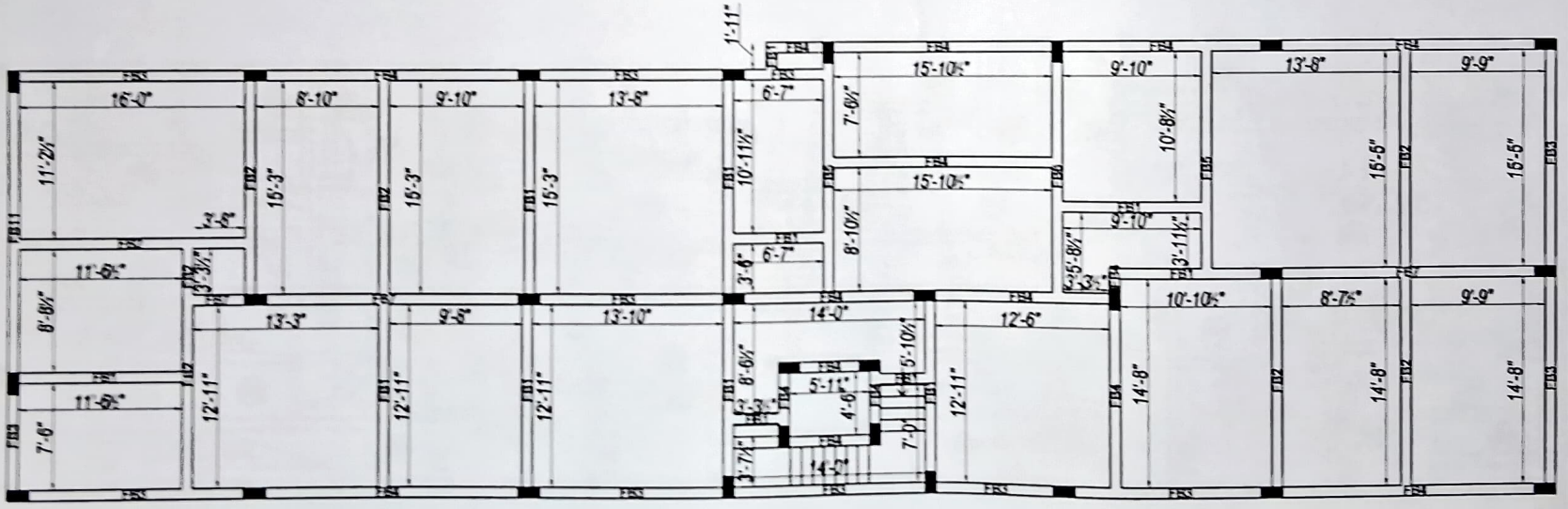
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SF ROOF BEAM LAYOUT



TF ROOF BEAM LAYOUT

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STRUCTURAL DRAWING

GENERAL NOTES

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4. THE REINFORCEMENT STEEL CONFIRMING TO IS 1786-1985 OF FE 500 GRADE SHOULD BE USED
5. THE GRADE OF CONCRETE USED FOR ALL RCC ELEMENT SHALL BE M25 CONFIRMING TO IS 456-2000
6. USE VIBRATOR FOR ALL CONCRETING WORKS. WATER USED FOR CONCRETE SHOULD BE POTABLE (pH VALUE-7)

SPECIFIC NOTES

1. STRUCTURE IS DESIGNED FOR STILT +3 FLOORS ONLY
2. LAPPING LENGTH SHALL BE 50D (MAX DIA) FOR ALL BAR.
3. CLEAR COVER FOR ALL BEAM & RCC WALL - 1", SLAB- 0.75"
4. THE ADEQUATE SIZE OF COVER BLOCK MADE OF CEMENT MORTAR SHALL BE USED FOR CONSTRUCTION.
5. NOT MORE THAN 40% OF REINFORCEMENT SHALL BE LAPPED AT ANY PARTICULAR JUNCTION.
6. IN BEAM OVER-LAPPING TO BE PROVIDED AT MIDSPAN FOR TOP BARS AND NEAR SUPPORT FOR BOTTOM BARS.
7. SPACER BAR TO BE PROVIDED IN BET WEEN TWO LAYERS OF BEAM REINFORCEMENT OF DIA 20mm OR MORE, AS SPECIFIED AT EVERY 3' (= 1m) INTERVAL.
8. IN SLABS FIRST MAIN BAR SHALL BE PLACED AT 80mm OR HALF THE SPACING SPECIFIED, WHICHEVER IS LESS FROM FACE OF SUPPORT
9. REMOVAL OF FORM WORKS -
   i) FOR SLABS
      a) SLAB SPANNING UPTO 4.5m (15' 0") - 7 DAYS
      b) SLAB SPANNING OVER 4.5m (15' 0") - 14 DAYS
   ii) FOR BEAMS
      a) BEAMS SPANNING UPTO 6m (20' 0") - 14 DAYS
      b) BEAMS SPANNING OVER 6m (20' 0") - 21 DAYS

REVISION DESCRIPTION	
REV NO	DATE

PURPOSE OF RELEASE: FOR CONSTRUCTION

TITLE: SF & TF ROOF BEAM LAYOUT

PROJECT: PROPOSED CONSTRUCTION OF RESIDENTIAL BUILDING (STILT+3) AT OLD NO. 30, NEW NO.6, GIRI STREET, WEST MAMBALAM, CHENNAI - 600033.

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DRAWN	JAVITH	SHEET NO.	06

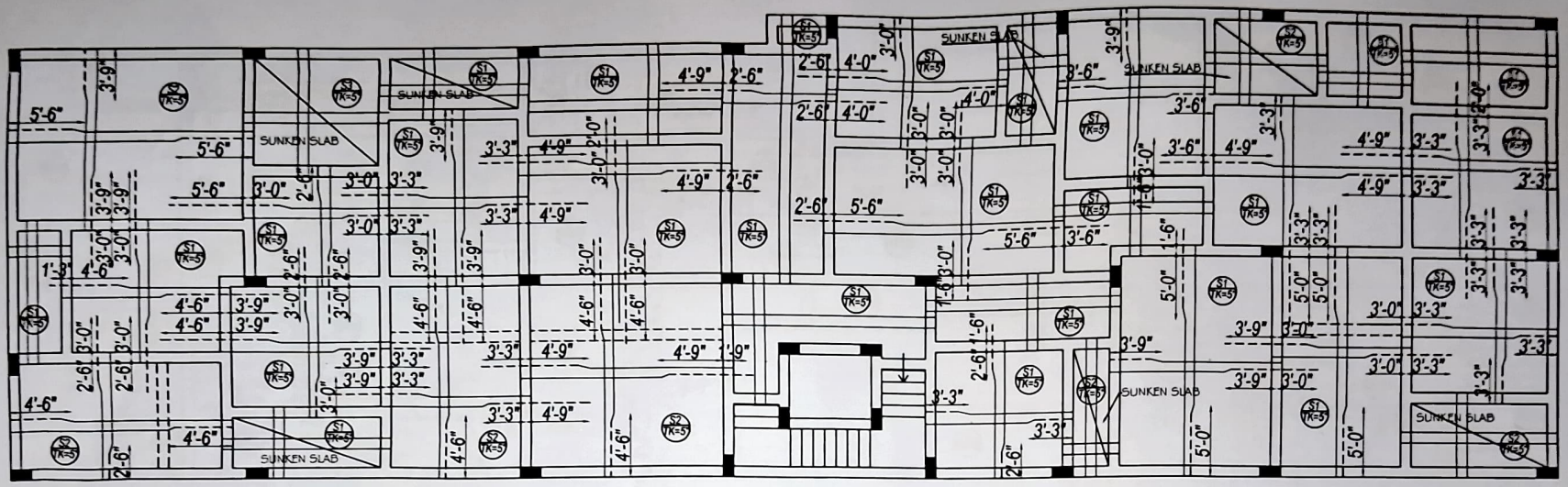
STRUCTURAL CONSULTANT

"M.R.ASSOCIATES"
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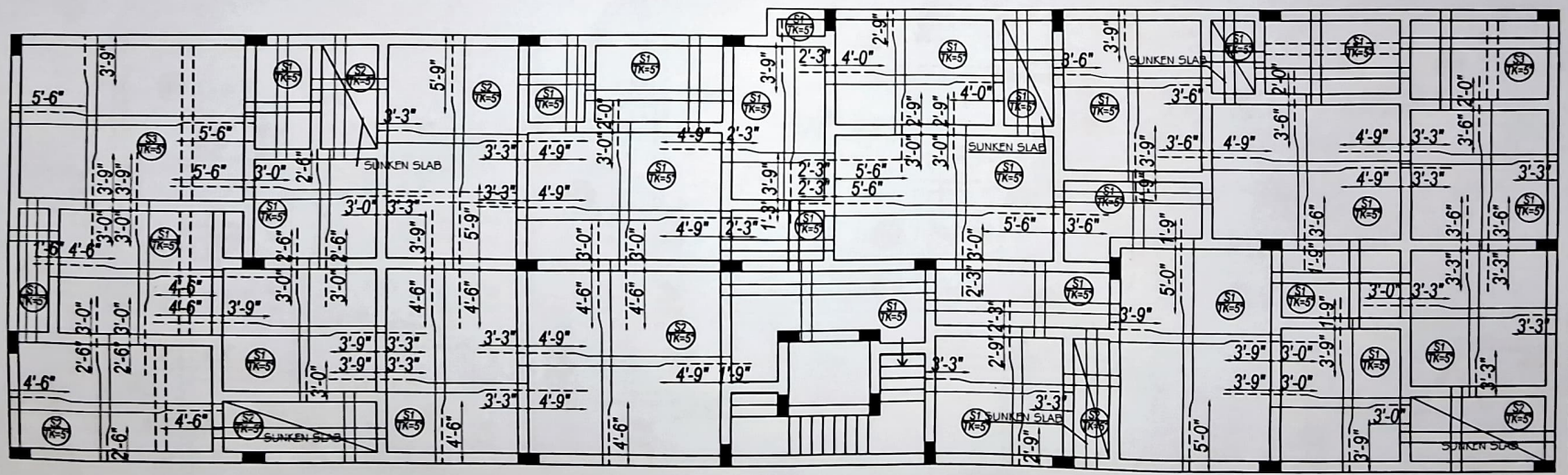
CLASS I LICENCED SURVEYOR CORPORATION OF CHENNAI

BUILDER/CONTRACTOR
M/s. RATNAM HEIGHTS LLP, CHENNAI

CLIENT



GF ROOF SLAB LAYOUT



FF ROOF SLAB LAYOUT

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STRUCTURAL DRAWING

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4. THE REINFORCEMENT STEEL CONFORMING TO IS 1786-1985 OF FE 500 GRADE SHOULD BE USED.
5. THE GRADE OF CONCRETE USED FOR ALL RCC ELEMENT SHALL BE M25 CONFORMING TO IS 456-2000.
6. USE VIBRATOR FOR ALL CONCRETING WORKS. WATER USED FOR CONCRETE SHOULD BE POTABLE (pH VALUE-7).

SPECIFIC NOTES

1. STRUCTURE IS DESIGNED FOR STILT +3 FLOORS ONLY.
2. LAPPING LENGTH SHALL BE 50D (MAX DIA) FOR ALL BAR.
3. CLEAR COVER FOR ALL BEAM & RCC WALL - 1" SLAB - 1 ½"
4. THE ADEQUATE SIZE OF COVER BLOCK MADE OF CEMENT MORTAR SHALL BE USED FOR CONSTRUCTION.
5. NOT MORE THAN 40% OF REINFORCEMENT SHALL BE LAPPED AT ANY PARTICULAR JUNCTION.
6. IN BEAM OVER-LAPPING TO BE PROVIDED AT MIDSPAN FOR TOP BARS AND NEAR SUPPORT FOR BOTTOM BARS.
7. SPACER BAR TO BE PROVIDED IN BETWEEN TWO LAYERS OF BEAM REINFORCEMENT OF DIA 25mm OR MORE, AS SPECIFIED AT EVERY 2 m c/c INTERVAL.
8. IN SLABS FIRST MAIN BAR SHALL BE PLACED AT 50mm OR HALF THE SPACING SPECIFIED, WHICHEVER IS LESS FROM FACE OF SUPPORT.
9. REMOVAL OF FORM WORKS :
   i) FOR SLABS
      a) SLAB SPANNING UPTO 4.5m (15' 0") - 7 DAYS
      b) SLAB SPANNING OVER 4.5m (15' 0") - 14 DAYS
   ii) FOR BEAMS
      a) BEAMS SPANNING UPTO 6m (20' 0") - 14 DAYS
      b) BEAMS SPANNING OVER 6m (20' 0") - 21 DAYS

REVISION DESCRIPTION	
REV NO/DATE	

PURPOSE OF RELEASE: FOR CONSTRUCTION

TITLE: GF & FF ROOF SLAB LAYOUT

PROJECT: PROPOSED CONSTRUCTION OF RESIDENTIAL BUILDING (STILT+03) AT OLD NO. 30, NEW NO.8 GIRI STREET, WEST MAMBALAM, CHENNAI - 600053.

CHECKED	P.M	DATE :	20.10.2021
DEALT	S.K	SCALE :	NTS
DRAWN	JAVITH	SHEET NO.	07

STRUCTURAL CONSULTANT

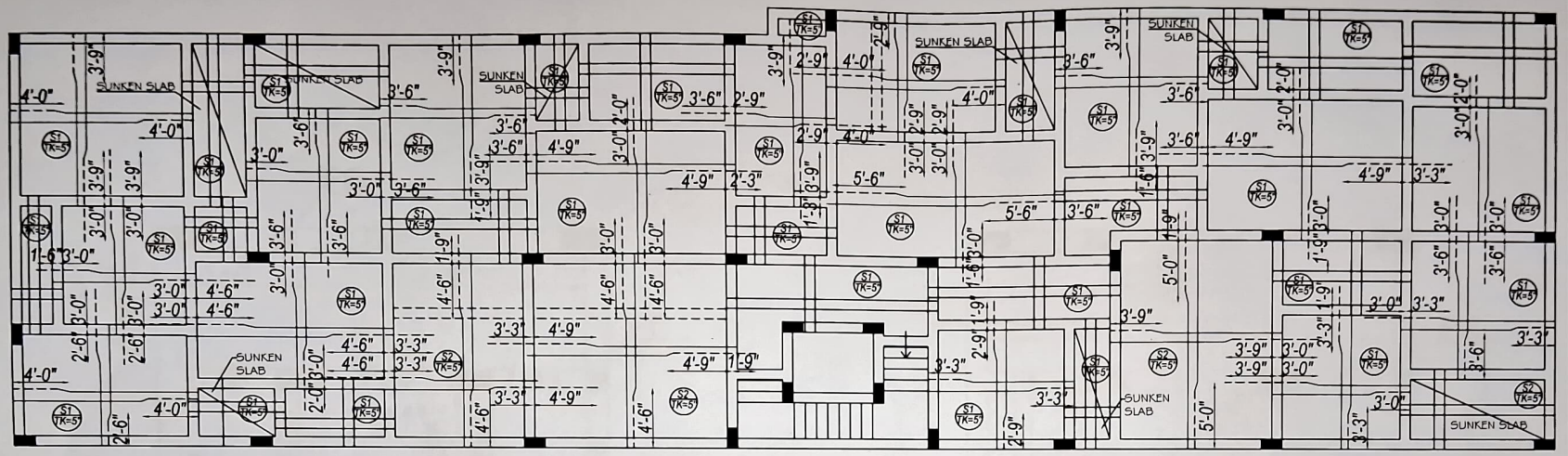
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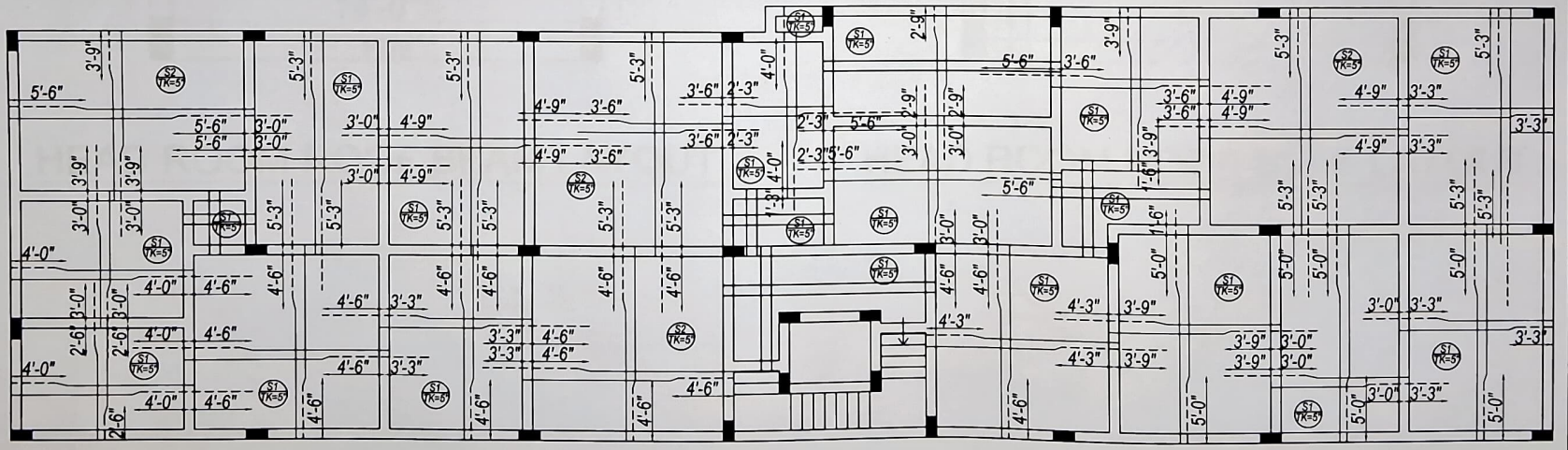
CLASS I LICENCED SURVEYOR CORPORATION OF CHENNAI

BUILDER/CONTRACTOR: M/s. RATNAM HEIGHTS LLP, CHENNAI

CLIENT:



SF ROOF SLAB LAYOUT



TF ROOF SLAB LAYOUT

STRUCTURAL DRAWING

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SPECIFIC NOTES

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5. NOT MORE THAN 40% OF REINFORCEMENT SHALL BE LAPPED AT ANY PARTICULAR JUNCTION.
6. IN BEAM OVER LAPPING TO BE PROVIDED AT MIDSPAN FOR TOP BARS AND NEAR SUPPORT FOR BOTTOM BARS
7. SPACER BAR TO BE PROVIDED IN BETWEEN TWO LAYERS OF BEAM REINFORCEMENT OF DIA 25mm OR MORE, AS SPECIFIED AT EVERY 3 m to 1m) INTERVAL
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REVISION DESCRIPTION

REV NO/DATE	

PURPOSE OF RELEASE

FOR CONSTRUCTION

TITLE

GF & FF ROOF SLAB LAYOUT

PROJECT

PROPOSED CONSTRUCTION OF RESIDENTIAL BUILDING (STILT+03) AT OLD NO. 30, NEW NO.6, GIRI STREET, WEST MAMBALAM, CHENNAI - 600053.

CHECKED	P.M	DATE	20.10.2023
DEALT	S.K	SCALE	NTS
DRAWN	JAVITH	SHEET NO.	08

STRUCTURAL CONSULTANT

"M.R.ASSOCIATES"

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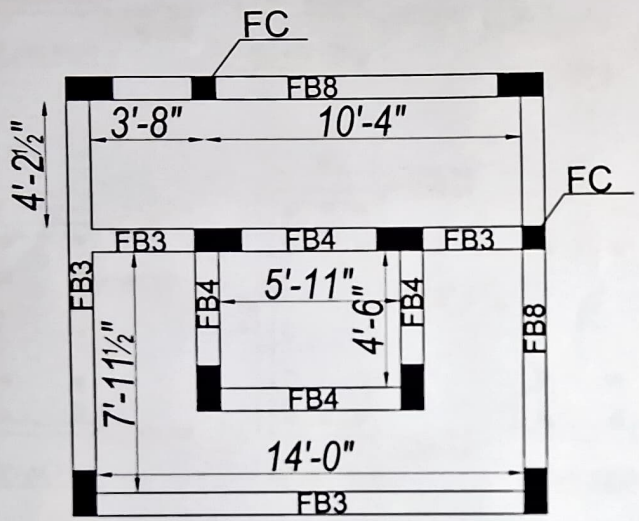
CLASS I LICENCED SURVEYOR CORPORATION OF CHENNAI

BUILDER/CONTRACTOR

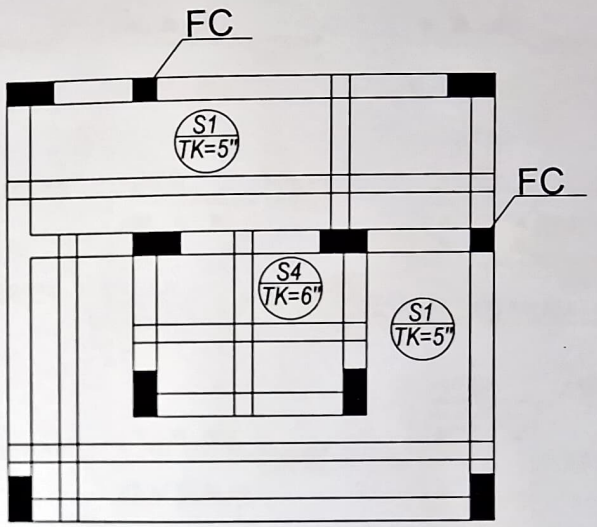
M/s. RATNAM HEIGHTS LLP, CHENNAI

CLIENT

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HEAD ROOM ROOF BEAM LAYOUT



HEAD ROOM ROOF SLAB LAYOUT

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Engineer Grade II (SE / GR-II / 19/03/029
CMDA
Ph : 26745655, Cell : 9841296750

STRUCTURAL DRAWING

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      a) BEAMS SPANNING UPTO 6m (20'0") - 14 DAYS
      b) BEAMS SPANNING OVER 6m (20'0") - 21 DAYS

REVISION DESCRIPTION

REV NO/DATE	

PURPOSE OF RELEASE

FOR CONSTRUCTION

TITLE

HEAD ROOM ROOF BEAM & SLAB LAYOUT

PROJECT

PROPOSED CONSTRUCTION OF RESIDENTIAL BUILDING (STILT+03) AT OLD NO. 30, NEW NO.6, GIRI STREET, WEST MAMBALAM, CHENNAI - 600053.

CHECKED	P.M	DATE	20.10.2023
DEALT	S.K	SCALE	NTS
DRAWN	JAVITH	SHEET NO.	09

STRUCTURAL CONSULTANT

"M.R.ASSOCIATES"

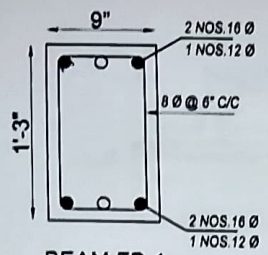
P.MARIAPPAN B.E., M.Tech., M.I.E.,
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Email :mrassociates engineers @gmail com
Mobile 98412 96750, Ph 044-26745655.

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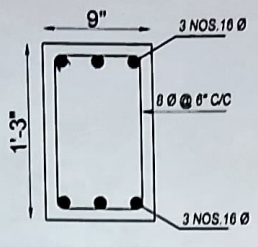
BUILDER/CONTRACTOR

M/s. RATNAM HEIGHTS LLP, CHENNAI

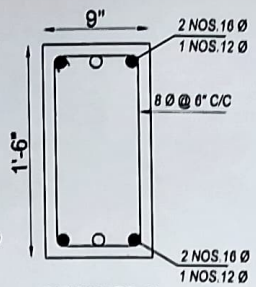
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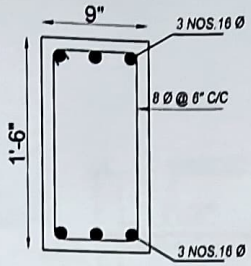
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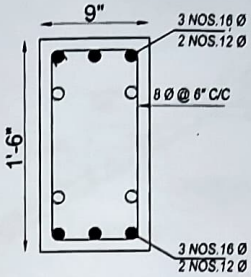
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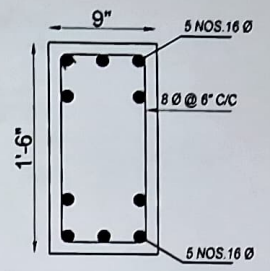
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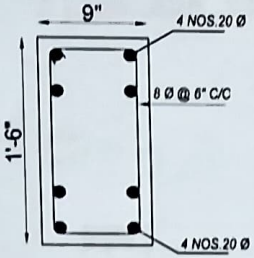
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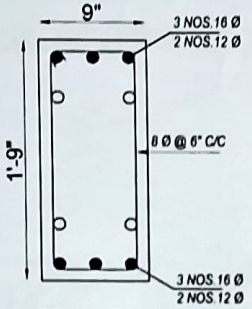
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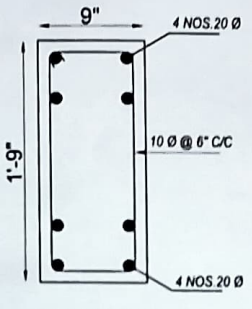
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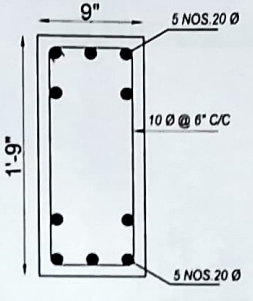
BEAM FB-7



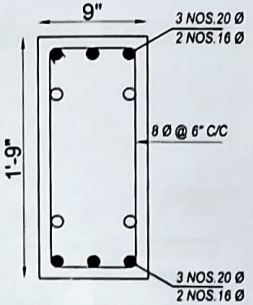
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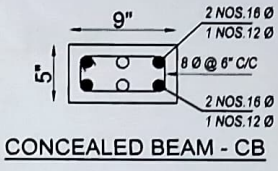
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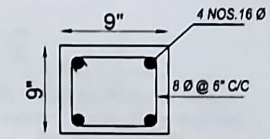
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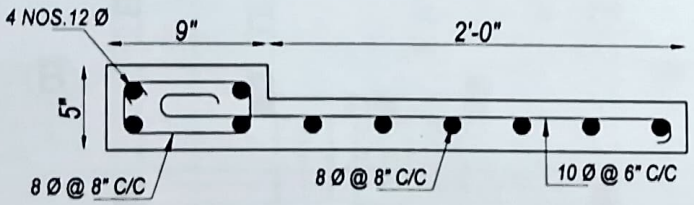
BEAM FB-11



CONCEALED BEAM - CB



FLOATING COLUMN-FC



LINTEL cum SUNSHADE @ 7' Lvl.

SLAB DETAILS

SLAB NAME	MAIN ROD	DISTRIBUTION ROD	SLAB THICK
S-1	8Ø @ 5" C/C	8Ø @ 7" C/C	5"
S-2	10Ø @ 5" C/C	8Ø @ 7" C/C	5"
S-3	10Ø @ 5" C/C	10Ø @ 7" C/C	5"
S-4	10Ø @ 5" C/C	10Ø @ 7" C/C	6"
ALL BEAMS ARE INCLUSIVE OF SLAB THICKNESS			

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STRUCTURAL DRAWING

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REVISION DESCRIPTION

REV NO/DATE	

PURPOSE OF RELEASE

FOR CONSTRUCTION

TITLE

BEAM AND SLAB REINFORCEMENT DETAILS

PROJECT

PROPOSED CONSTRUCTION OF RESIDENTIAL BUILDING (STILT+03) AT OLD NO. 30, NEW NO.6, GIRI STREET, WEST MAMBALAM, CHENNAI - 600053.

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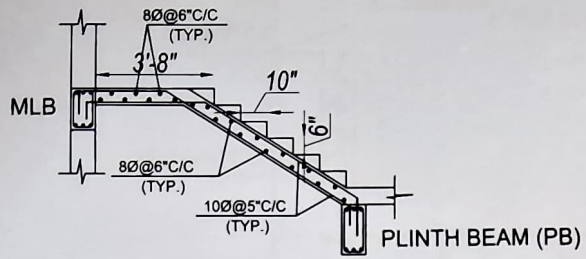
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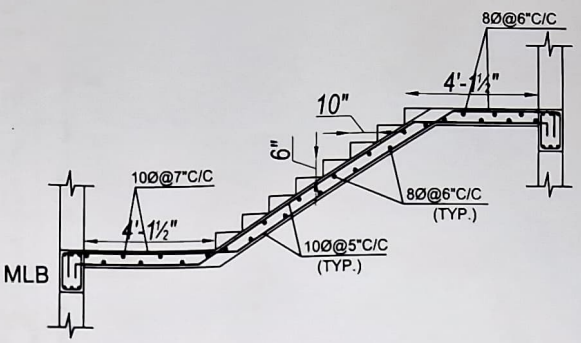
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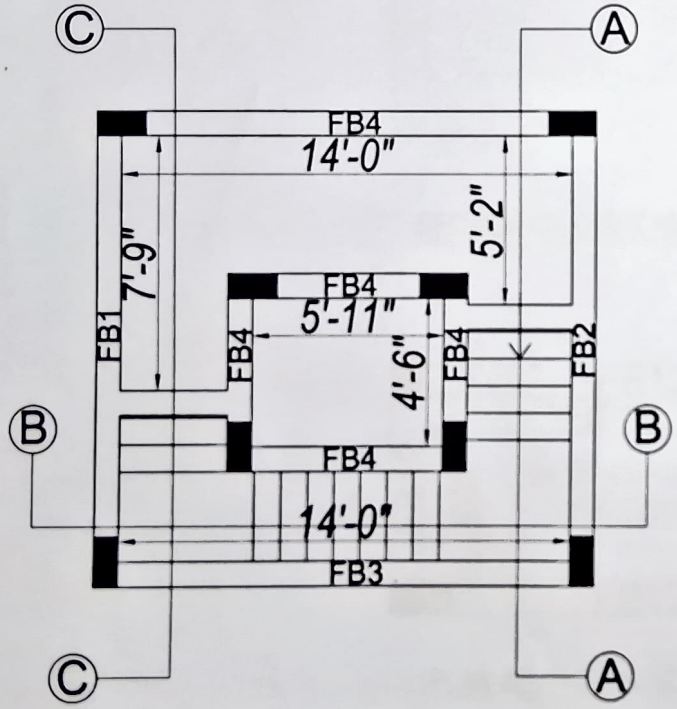
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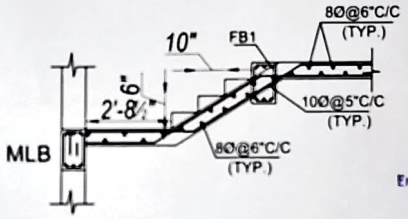
STAIRCASE CROSS SECTION – (A–A)



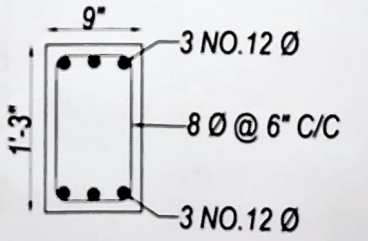
STAIRCASE CROSS SECTION – (B–B)



STAIRCASE PLAN



STAIRCASE CROSS SECTION – (C–C)



MLB (MID LANDING BEAM)

RISER - 6"
WAISH SLAB - 6"
THREAD - 10"

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REVISION DESCRIPTION	
REV NO/DATE	

PURPOSE OF RELEASE

FOR CONSTRUCTION

TITLE

STAIRCASE DETAIL

PROJECT

PROPOSED CONSTRUCTION OF RESIDENTIAL BUILDING (STILT+03) AT OLD NO. 30, NEW NO.6, GIRI STREET, WEST MAMBALAM, CHENNAI - 600053.

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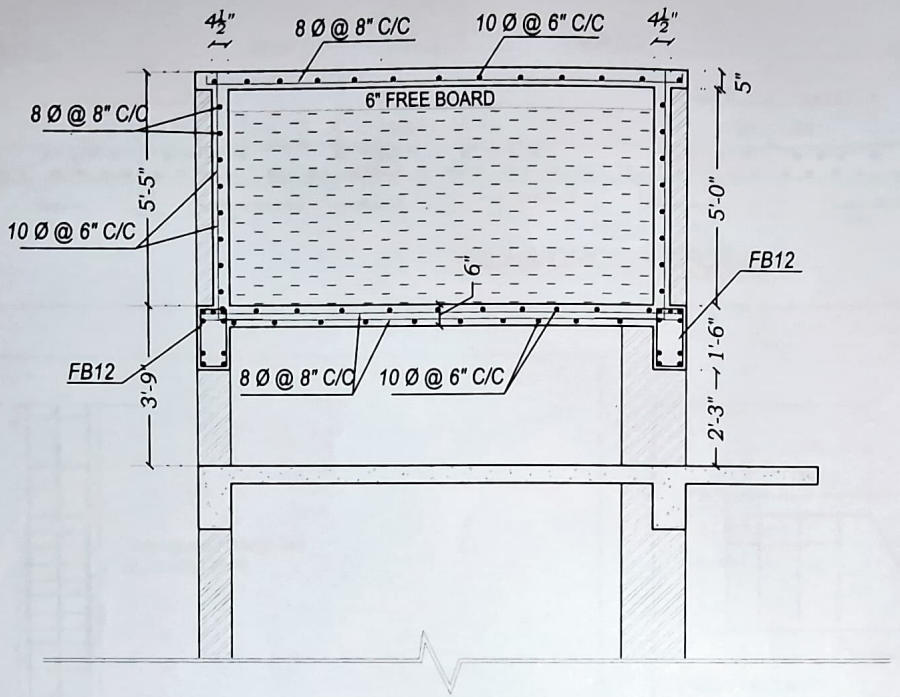
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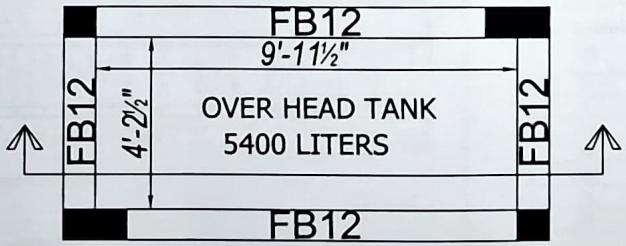
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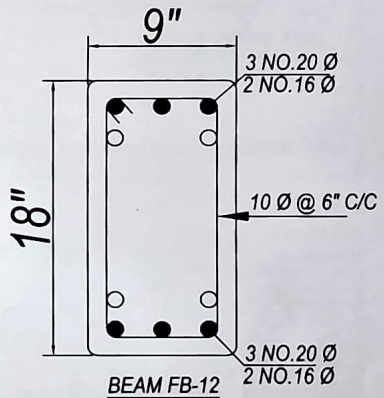
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SECTION OF OVER HEAD WATER TANK



PLAN OF OVER HEAD WATER TANK



BEAM FB-12

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REVISION DESCRIPTION	
REV NO/DATE	

PURPOSE OF RELEASE

FOR CONSTRUCTION

TITLE

OVER HEAD WATER TANK DETAIL

PROJECT

PROPOSED CONSTRUCTION OF RESIDENTIAL BUILDING (STILT+03) AT OLD NO. 30, NEW NO.6, GIRI STREET, WEST MAMBALAM, CHENNAI - 600053.

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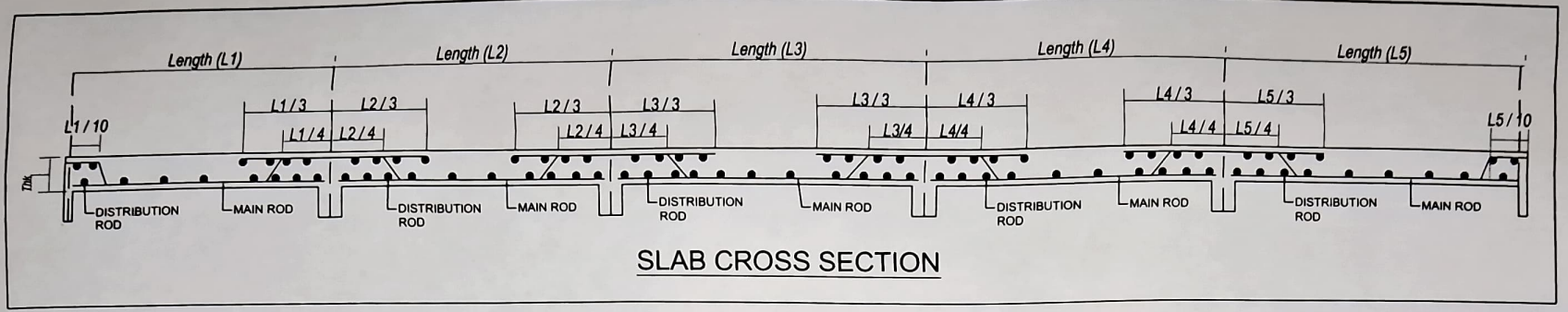
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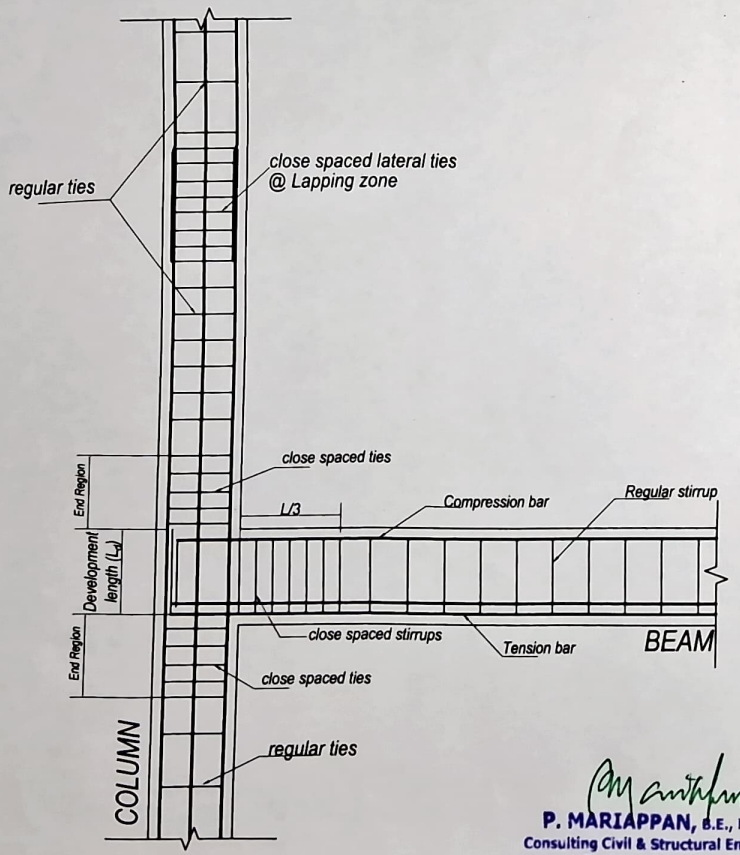
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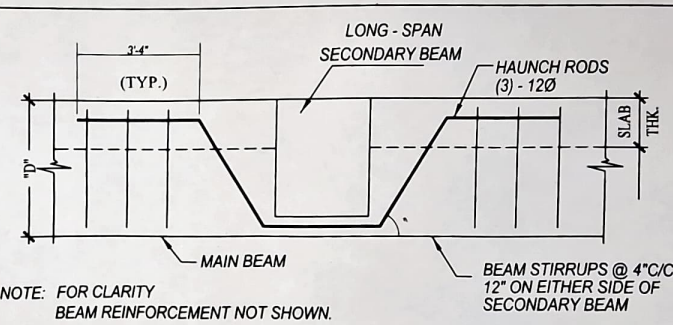
CLIENT



SLAB CROSS SECTION



BEAM AND COLUMN JUNCTION



NOTE: FOR CLARITY
BEAM REINFORCEMENT NOT SHOWN.

HAUNCH DETAIL FOR MAIN BEAM WITH LONGER SPAN SECONDARY BEAM INTERSECTIONS

Development length for Fully stressed Deformed Bars (Fy = 500 Mpa)

Bar Diameter, mm	Tension Bars Grade of Concrete				Compression Bars Grade of Concrete			
	M15	M20	M25	M30	M15	M20	M25	M30
6	408	340	291	272	326	272	233	218
8	544	453	388	362	435	362	310	290
10	680	566	485	453	544	453	388	363
12	816	679	582	544	653	544	466	436
16	1088	906	776	725	870	725	621	581
18	1224	1019	873	815	979	815	698	653
20	1360	1132	970	906	1088	906	776	726
22	1496	1245	1067	997	1197	997	854	799
25	1700	1415	1213	1133	1360	1133	970	908
28	1904	1585	1358	1268	1523	1268	1086	1016
32	2176	1811	1552	1450	1741	1450	1242	1162
36	2448	2038	1746	1631	1958	1631	1397	1307
Ld =	68 x D	56.6 x D	48.5 x D	45.3 x D	54.4 x D	45.3 x D	38.8 x D	36.3 x D

The development lengths given above are for a stess of 0.87Fy in the bar.

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STRUCTURAL DRAWING

GENERAL NOTES

1. THIS DRAWING SHOULD BE READ ALONG WITH RELEVANT ARCHITECTURAL DWG.
2. ALL DIMENSION ARE IN FEET & INCH, ONLY FIGURED DIMENSIONS TO BE FOLLOWED.
3. ANY DESCREPANCY IN THE DWG SHALL BE BROUGHT TO NOTIE OF THE ARCHITECT/CONSULTANT & CLARIFICATION OBTAINED IN WRITING PRIOR TO EXECUTION OF WORK.
4. THE REINFORCEMENT STEEL CONFIRMING TO IS 1786-1985 OF FE 500 GRADE SHOULD BE USED.
5. THE GRADE OF CONCRETE USED FOR ALL RCC ELEMENT SHALL BE M25 CONFIRMING TO IS 456-2000
6. USE VIBRATOR FOR ALL CONCRETING WORKS. WATER USED FOR CONCRETE SHOULD BE POTABLE (pH VALUE-7)

SPECIFIC NOTES

1. STRUCTURE IS DESIGNED FOR STILT +3 FLOORS ONLY
2. LAPPING LENGTH SHALL BE 50D (MAX.DIA) FOR ALL BAR
3. CLEAR COVER FOR ALL BEAM & RCC WALL- 1" SLAB- 0.75"
4. THE ADEQUATE SIZE OF COVER BLOCK MADE OF CEMENT MORTAR SHALL BE USED FOR CONSTRUCTION.
5. NOT MORE THAN 40% OF REINFORCEMENT SHALL BE LAPPED AT ANY PARTICULAR JUNCTION.
6. IN BEAM OVER-LAPPING TO BE PROVIDED AT MIDSPAN FOR TOP BARS AND NEAR SUPPORT FOR BOTTOM BARS.
7. SPACER BAR TO BE PROVIDED IN BETWEEN TWO LAYERS OF BEAM REINFORCEMENT OF DIA 20mm OR MORE, AS SPECIFIED AT EVERY 3' (= 1m) INTERVAL.
8. IN SLABS FIRST MAIN BAR SHALL BE PLACED AT 80mm OR HALF THE SPACING SPECIFIED, WHICHEVER IS LESS FROM FACE OF SUPPORT
9. REMOVAL OF FORM WORKS:-
   - i) FOR SLABS
     - a) SLAB SPANNING UPTO 4.5m (15' 0") - 7 DAYS
     - b) SLAB SPANNING OVER 4.5m (15' 0") - 14 DAYS
   - i) FOR BEAMS
     - a) BEAMS SPANNING UPTO 6m (20' 0") - 14 DAYS
     - b) BEAMS SPANNING OVER 6m (20' 0") - 21 DAYS

REVISION DESCRIPTION

REV NO/DATE:	

PURPOSE OF RELEASE

FOR CONSTRUCTION

TITLE

COLUMN, BEAM & SLAB STANDARD DETAILS

PROJECT

PROPOSED CONSTRUCTION OF RESIDENTIAL BUILDING (STILT+03) AT OLD NO. 30, NEW NO.6, GIRI STREET, WEST MAMBALAM, CHENNAI - 600053.

CHECKED :	P.M	DATE :	20.10.2023
DEALT :	S.K	SCALE :	NTS
DRAWN :	JAVITH	SHEET NO.	13

STRUCTURAL CONSULTANT

"M.R.ASSOCIATES"
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CLASS I LICENCED SURVEYOR CORPORATION OF CHENNAI

BUILDER/CONTRACTOR

M/s. RATNAM HEIGHTS LLP, CHENNAI

CLIENT

PROJECT DESIGN REPORT

PROPOSED CONSTRUCTION OF SINGLE BLOCK - STILT FLOOR + 3 FLOORS RESIDENTIAL BUILDING WITH 15 DWELLING UNITS IN THE PROJECT NAMED "KALA FLATS" COMPRISED IN NEW T.S. NO. 56/7, OLD T.S. NO. 56/1 IN BLOCK NO. 54, SITUATED AT OLD NO. 30, NEW NO. 6, GIRI STREET, WEST MAMBALAM,PULIYUR VILLAGE, EGMORE TALUK, CHENNAI DISTRICT, TAMIL NADU STATE – 600 033

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8. STRUCTURAL DESCRIPTION……...

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1. PROJECT INFORMATION

1.1	Project Title	:	Proposed Construction Of Single Block - Stilt Floor + 3 Floors Residential Building With 15 Dwelling Units In The Project Named "Kala Flats"
1.2	Site location	:	Giri Street, West Mambalam,Puliyur Village, Egmore Taluk, Chennai District, Tamil Nadu State – 600 033
1.3	Survey Nos	:	Comprised In New T.S. No. 56/7, Old T.S. No. 56/1 In Block No. 54, Situated At Old No. 30, New No. 6,
1.4	Approach road	:	
1.5	Wind Data		
	a) Basic Wind Speed	:	50 m/sec
	b) Wind Pressure	:	As per IS 875 part-3-1987
1.6	Soil Data		
	a) Depth of foundation	:	27.5 m from GL
	b) PILE Bearing Capacity	:	900 kN
	c) Allowable Settlement	:	50 mm
1.7	Seismic data		
	a) Zone Classification	:	Zone III as per IS 1893-2002
1.8	General Condition of site	:	Non-coastal region

2. SCOPE OF WORK

This document presents the overall basics for Analysis and Design of Proposed structure under Indian Standard and other facility requirement with report from `ETABS.

3. GENERAL INFORMATION

The Commercial Building consists of SILT+3 Upper floors and the structure is designed as a RCC framed structure.

1.	Type of Structure	:	Residential building
2.	Size of Structure	:	9.756 X 33.84 m
3.	Total Height of Structure	:	12.2 m
4.	Number of floors in the Structure	:	4 (S+3)
5.	Type of foundation	:	Pile foundation as per the Geotechnical Report

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4. CODES AND STANDARDS

The following Indian Codes and Standards have followed for Load Calculation and Load Combination in Structural Analysis and for stability, safety& performance in Structural Design.

Structural Load :

IS 875-Part1	:	1987	Code of practice for Dead loads- unit weights of building
IS 875-Part2	:	1987	Code of practice for Imposed loads
IS 875-Part 3	:	2015	Code of practice for Wind loads
IS 875-Part 4	:	1987	Code of practice for Special loads and load combinations
IS 1893-Part 1	:	2002	Earthquake Resistant Design of Structures

RCC:

IS 456	:	2000	Code of practice for Plain and Reinforced Concrete
IS 3370 -Part 1	:	1965	Code of practice for concrete structure storage of liquids - General requirement
IS 3370 -Part 2	:	1965	Code of practice for concrete structure storage of liquids – RCC structure
IS 3370 -Part 3	:	1965	Code of practice for concrete structure storage of liquids – Prestressed Concrete structures
IS 3414	:	1968	Code of practice for design and installation of joints in building
IS 13920	:	1993	Code of practice for ductile detailing of RCC structures subjected to seismic forces

Steel:

IS 800	:	1984	Code of practice for general construction in steel
IS 801	:	1975	Code of practice for cold formed steel structural members
IS 808	:	1989	Code of practice for dimensions for hot rolled steel beam, column, channel and angle sections
IS 1161	:	1998	Code of practice for Steel tubes for structural purposes-specification
IS 2062	:	2006	Code of practice for Steel for structural purposes-specification
IS 4000	:	1992	Code of practice for high strength bolts in steel structures
IS 8640	:	1977	Recommendations for dimensional parameters for industrial building

5. MATERIAL SPECIFICATION

Following materials are generally used in the Design of the various components of the structure for concrete Structure.

1.	Grade of concrete	:	M 25
2.	Grade of steel	:	Fe500

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6. LOADINGS

Different types of loads can cause stress, displacement, deformation on a structure. This results in structural problems and failure. Determining the total load acting on a structure is very important and complex.

DEAD LOAD	:	1) Self-weight of the structure (DL)
		2) Super-Imposed dead load (SIDL)
IMPOSED LOAD	:	1) Live load (LL)
		2) Roof live (LL)
LATERAL LOAD	:	1) Seismic load (EQ)

7. LOAD COMBINATIONS

When more than one load type acts on the structure. Building codes usually specify a variety of load combinations together with load factors for each load type in order to ensure the safety of the structure under different maximum expected loading scenarios.

Limit state of Collapse	:	1) 1.5 (DL+SIDL+LL)
		2) 1.2 (DL+SIDL+LL±EQ)
		3) 1.5 (DL+SIDL±EQ)
		4) 0.9 (DL+SIDL)±1.5 EQ
Limit state of Serviceability	:	1) 1.0 (DL+SIDL+LL)
		2) 1.0 (DL+SIDL+LL±EQ)
		3) 1.0 (DL+SIDL)+0.8LL±0.8 EQ

8. STRUCTURAL DESCRIPTION

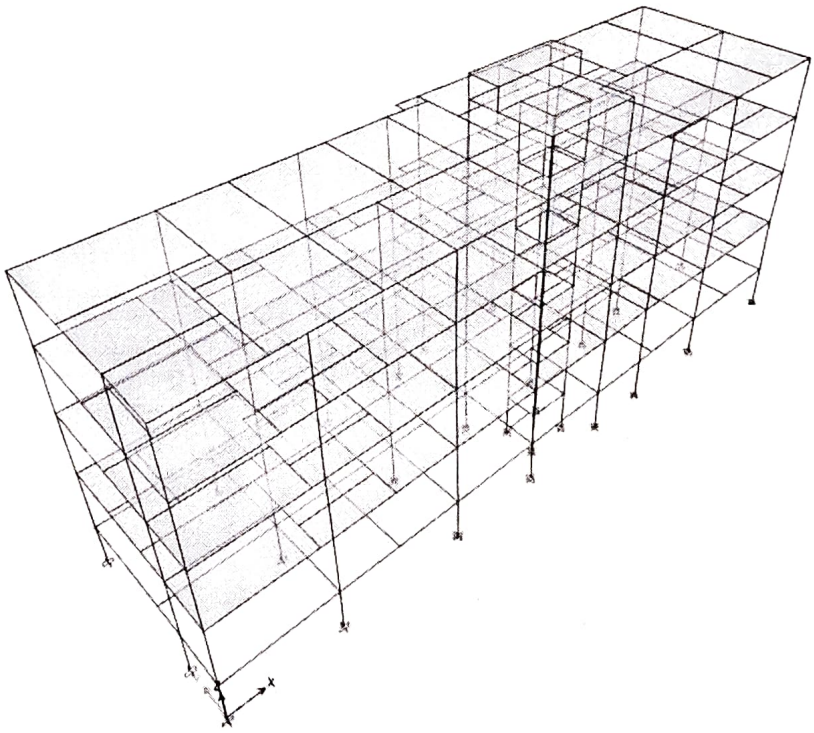
The structure is analyzed as a Space frame structure in ETABS. All Structural members are designed as reinforced concrete elements. Limit State concept of design will be used as per IS: 456-2000 & SP - 16. The detailing of reinforcement shall be done satisfying the requirements of IS: 456-2000, SP-16, IS: 13920, IS: 4326-1993 and SP-34.The slabs and beams are checked for deflection as per IS456:2000. Cover for reinforcement is considered as per Table 16A of NBC, for a fire resistance of 2hrs.

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ETABS®



Summary Report

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1 Structure Data

This chapter provides model geometry information, including items such as story levels, point coordinates, and element connectivity.

1.1 Story Data

Table 1.1 - Story Definitions

Tower	Name	Height m	Master Story	Similar To	Splice Story	Color
T1	WATERTANK	1	No	None	No	Blue
T1	HR ROOF BEAM	2.5	No	None	No	Blue
T1	TF ROOF BEAM	3.05	No	None	No	Green
T1	SF ROOF BEAM	3.05	No	None	No	Cyan
T1	FF ROOF BEAM	3.05	No	None	No	Red
T1	GF ROOF BEAM	3.05	No	None	No	Magenta
T1	PLINTH BEAM	2	No	None	No	Yellow

2 Loads

This chapter provides loading information as applied to the model.

2.1 Load Patterns

Table 2.1 - Load Pattern Definitions

Name	Is Auto Load	Type	Self Weight Multiplier	Auto Load
~LLRF	Yes	Other	0	
Dead	No	Dead	1	
EQX	No	Seismic	0	IS 1893:2016
EQX(1/2)	Yes	Seismic	0	IS 1893:2016
EQX(2/2)	Yes	Seismic	0	IS 1893:2016
EQZ	No	Seismic	0	IS 1893:2016
floor finish	No	Super Dead	0	
floor live	No	Live	0	
sunken load	No	Super Dead	0	
wall load	No	Super Dead	0	

2.2 Auto Seismic Loading

IS 1893:2016 Auto Seismic Load Calculation

This calculation presents the automatically generated lateral seismic loads for load pattern EQX according to IS 1893:2016, as calculated by ETABS.

Direction and Eccentricity

Direction = Multiple

Structural Period

Period Calculation Method = Program Calculated

Factors and Coefficients

Seismic Zone Factor, Z [IS Table 3] Z = 0.16

Response Reduction Factor, R [IS Table 9] R = 5

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Importance Factor, I [IS Table 8] $I = 1$

Site Type [IS Table 1] = II

Seismic Response

Spectral Acceleration Coefficient, S_a/g [IS 6.4.2] $\frac{S_a}{g} = \frac{1.36}{T}$ $\frac{S_a}{g} = 1.409845$

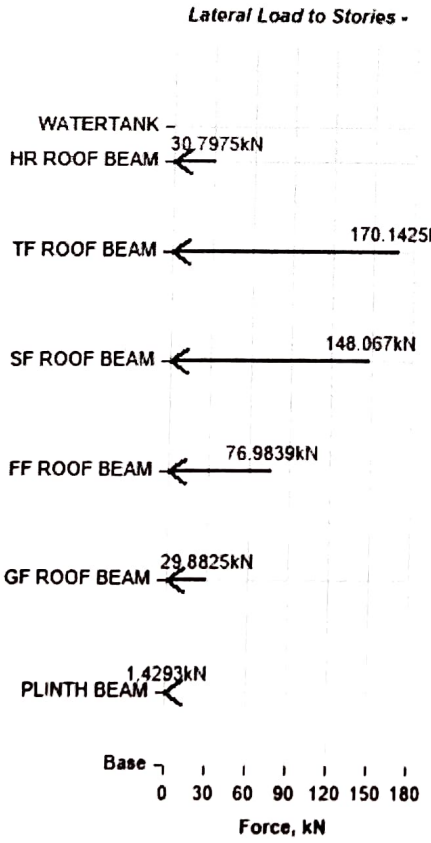
Equivalent Lateral Forces

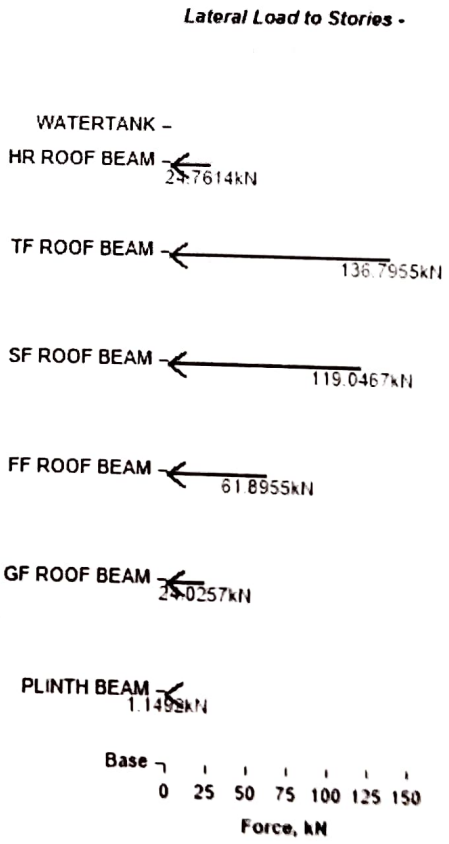
Seismic Coefficient, A_h [IS 6.4.2] $A_h = \frac{ZI\frac{S_a}{g}}{2R}$

Calculated Base Shear

Direction	Period Used (sec)	W (kN)	V_b (kN)
X	0.965	20272.7488	457.3028
Y	1.2	20272.7488	367.6741

Applied Story Forces





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Story	Elevation	X-Dir	Y-Dir
	m	kN	kN
WATERTANK	17.7	0	0
HR ROOF BEAM	16.7	30.7975	0
TF ROOF BEAM	14.2	170.1425	0
SF ROOF BEAM	11.15	148.067	0
FF ROOF BEAM	8.1	76.9839	0
GF ROOF BEAM	5.05	29.8825	0
PLINTH BEAM	2	1.4293	0
Base	0	0	0

Story	Elevation	X-Dir	Y-Dir
	m	kN	kN
WATERTANK	17.7	0	0
HR ROOF BEAM	16.7	0	24.7614
TF ROOF BEAM	14.2	0	136.7955
SF ROOF BEAM	11.15	0	119.0467
FF ROOF BEAM	8.1	0	61.8955
GF ROOF BEAM	5.05	0	24.0257
PLINTH BEAM	2	0	1.1492
Base	0	0	0

2.3 Functions

2.3.1 Response Spectrum Functions

Table 2.3 - Functions - Response Spectrum - IS1893 2016

Name	Period sec	Value	Seismic Zone	I	Soil Type	R	Damping Ratio
Func2	0	0.016	III	1	I	5	0.05
Func2	0.1	0.04					
Func2	0.4	0.04					
Func2	0.6	0.026667					
Func2	0.8	0.02					
Func2	1	0.016					
Func2	1.2	0.013333					
Func2	1.4	0.011429					
Func2	1.6	0.01					
Func2	1.8	0.008889					
Func2	2	0.008					
Func2	2.5	0.0064					
Func2	3	0.005333					
Func2	3.5	0.004571					
Func2	4	0.004					
Func2	4.5	0.004					
Func2	5	0.004					
Func2	5.5	0.004					
Func2	6	0.004					
Func2	6.5	0.004					
Func2	7	0.004					
Func2	7.5	0.004					
Func2	8	0.004					
Func2	8.5	0.004					
Func2	9	0.004					
Func2	9.5	0.004					
Func2	10	0.004					

2.4 Load Cases

Table 2.4 - Load Case Definitions - Summary

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Name	Type
Modal	Modal - Eigen
Dead	Linear Static
Live	Linear Static
9" wall load	Linear Static
floor finish for rooms	Linear Static
sunken load	Linear Static
EQX	Linear Static
EQZ	Linear Static

3 Analysis Results

This chapter provides analysis results.

3.1 Structure Results

Output Case	Case Type	Step Type	FX kN	FY kN	FZ kN	MX kN-m	MY kN-m	MZ kN-m
Dead	LinStatic		0	0	8164.6569	37148.1037	-140605.094	0
Live	LinStatic		0	0	2557.7602	11587.2734	-43954.1279	0
9" wall load	LinStatic		0	0	9086.4406	40916.485	-159624.1463	0
floor finish for rooms	LinStatic		0	0	2316.5928	10730.1736	-39718.9799	0
sunken load	LinStatic		0	0	329.1039	1659.3536	-5788.7907	0
AutoSeq	Staged	Max	0	0	8164.6569	37148.1037	-11842.2531	0
AutoSeq	Staged	Min	0	0	684.9031	3026.9914	-140605.094	0
EQX	LinStatic	Max	0	0	0	4308.3646	0	2031.588
EQX	LinStatic	Min	-457.3028	-367.6741	0	0	-5358.6246	-6364.1078
EQZ	LinStatic		0	-367.6741	0	4308.3646	0	-6364.1078
TOTAL	Combination		0	0	24700.0098	112245.5281	-428660.2527	0
FACTORED	Combination		0	0	33681.8315	153062.0838	-584536.7082	0
ENVELOPE	Combination	Max	0	0	33681.8315	153062.0838	-428660.2527	0
ENVELOPE	Combination	Min	0	0	24700.0098	112245.5281	-584536.7082	0
UDConS1	Combination		0	0	29845.1912	135681.1737	-518605.5164	0
UDConS2	Combination		0	0	33681.8315	153062.0838	-584536.7082	0
UDConS3	Combination	Max	0	0	26945.4652	127619.7046	-467629.3666	2437.9056
UDConS3	Combination	Min	-548.7634	-441.2089	26945.4652	122449.667	-474059.7161	-7636.9294
UDConS4	Combination	Max	548.7634	441.2089	26945.4652	122449.667	-461199.0171	7636.9294
UDConS4	Combination	Min	0	0	26945.4652	117279.6295	-467629.3666	-2437.9057
UDConS5	Combination		0	-441.2089	26945.4652	127619.7046	-467629.3666	-7636.9294
UDConS6	Combination		0	441.2089	26945.4652	117279.6295	-467629.3666	7636.9294
UDConS7	Combination	Max	0	0	29845.1912	142143.7207	-518605.5164	3047.3821
UDConS7	Combination	Min	-685.9542	-551.5111	29845.1912	135681.1737	-526643.4533	-9546.1617
UDConS8	Combination	Max	685.9542	551.5111	29845.1912	135681.1737	-510567.5795	9546.1617
UDConS8	Combination	Min	0	0	29845.1912	129218.6267	-518605.5164	-3047.3821
UDConS9	Combination		0	-551.5111	29845.1912	142143.7207	-518605.5164	-9546.1617
UDConS10	Combination		0	551.5111	29845.1912	129218.6267	-518605.5164	9546.1617
UDConS11	Combination	Max	0	0	17907.1147	87871.2512	-311163.3098	3047.3821
UDConS11	Combination	Min	-685.9542	-551.5111	17907.1147	81408.7042	-319201.2467	-9546.1617
UDConS12	Combination	Max	685.9542	551.5111	17907.1147	81408.7042	-303125.373	9546.1617
UDConS12	Combination	Min	0	0	17907.1147	74946.1573	-311163.3098	-3047.3821
UDConS13	Combination		0	-551.5111	17907.1147	87871.2512	-311163.3098	-9546.1617
UDConS14	Combination		0	551.5111	17907.1147	74946.1573	-311163.3098	9546.1617

Table 3.2 - Centers Of Mass And Rigidity (Part 1 of 2)

Story	Diaphragm	Mass X kg	Mass Y kg	XCM m	YCM m	Cum Mass X kg	Cum Mass Y kg	XCCM m	YCCM m

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Story	Diaphragm	Mass X kg	Mass Y kg	XCM m	YCM m	Cum Mass X kg	Cum Mass Y kg	XCCM m	YCCM m
WATERTANK	D1	17676.98	17676.98	17.895	3.4088	17676.98	17676.98	17.895	3.4088
HR ROOF BEAM	D1	47091.58	47091.58	17.8952	2.0369	64768.57	64768.57	17.8951	2.4113
TF ROOF BEAM	D1	359829.14	359829.14	17.0974	4.5269	424597.71	424597.71	17.2191	4.2042
SF ROOF BEAM	D1	507889.1	507889.1	17.2992	4.6754	932486.82	932486.82	17.2627	4.4609
FF ROOF BEAM	D1	500368.76	500368.76	17.5072	4.681	1432855.57	1432855.57	17.3481	4.5377
GF ROOF BEAM	D1	499683.3	499683.3	17.4474	4.6853	1932538.87	1932538.87	17.3738	4.5759

Table 3.2 - Centers Of Mass And Rigidity (Part 2 of 2)

Story	Diaphragm	XCR m	YCR m
WATERTANK	D1		
HR ROOF BEAM	D1		
TF ROOF BEAM	D1		
SF ROOF BEAM	D1		
FF ROOF BEAM	D1		
GF ROOF BEAM	D1		

3.2 Story Results

Table 3.8 - Story Stiffness

Story	Output Case	Case Type	Step Type	Shear X kN	Drift X mm	Stiff X kN/m	Shear Y kN	Drift Y mm	Stiff Y kN/m
WATERTANK	EQX	LinStatic	Step By Step	0.0894	0.1	897.714	0.0012	0.036	0
HR ROOF BEAM	EQX	LinStatic	Step By Step	31.1378	0.59	52807.013	0.0047	0.077	0
TF ROOF BEAM	EQX	LinStatic	Step By Step	203.3991	1.176	173010.443	0.0372	0.013	0
SF ROOF BEAM	EQX	LinStatic	Step By Step	354.7511	1.957	181232.631	0.0916	0.062	0
FF ROOF BEAM	EQX	LinStatic	Step By Step	435.0047	2.418	179870.058	0.1463	0.096	0
GF ROOF BEAM	EQX	LinStatic	Step By Step	467.7788	2.244	208466.145	0.187	0.056	0
PLINTH BEAM	EQX	LinStatic	Step By Step	469.7402	0.731	642357.589	0.1932	0.024	0
WATERTANK	EQX	LinStatic	Step By Step	0.0001	0.009	0	0.1083	0.112	963.656
HR ROOF BEAM	EQX	LinStatic	Step By Step	0.0033	0.015	0	25.1723	0.728	34561.365
TF ROOF BEAM	EQX	LinStatic	Step By Step	0.0268	0.04	0	164.4881	1.532	107388.869
SF ROOF BEAM	EQX	LinStatic	Step By Step	0.0795	0.065	0	287.3872	2.39	120246.023
FF ROOF BEAM	EQX	LinStatic	Step By Step	0.1311	0.089	0	353.0623	2.857	123558.242
GF ROOF BEAM	EQX	LinStatic	Step By Step	0.1723	0.096	0	380.3517	2.557	148771.338
PLINTH BEAM	EQX	LinStatic	Step By Step	0.1754	0.026	0	382.1033	0.864	442229.043
WATERTANK	EQZ	LinStatic	Step By Step	0.0001	0.009	0	0.1083	0.112	963.656
HR ROOF BEAM	EQZ	LinStatic	Step By Step	0.0033	0.015	0	25.1723	0.728	34561.365
TF ROOF BEAM	EQZ	LinStatic	Step By Step	0.0268	0.04	0	164.4881	1.532	107388.869
SF ROOF BEAM	EQZ	LinStatic	Step By Step	0.0795	0.065	0	287.3872	2.39	120246.023
FF ROOF BEAM	EQZ	LinStatic	Step By Step	0.1311	0.089	0	353.0623	2.857	123558.242
GF ROOF BEAM	EQZ	LinStatic	Step By Step	0.1723	0.096	0	380.3517	2.557	148771.338
PLINTH BEAM	EQZ	LinStatic	Step By Step	0.1754	0.026	0	382.1033	0.864	442229.043

3.3 Modal Results

Table 3.9 - Modal Periods And Frequencies

Case	Mode	Period sec	Frequency cyc/sec	CircFreq rad/sec	Eigenvalue rad2/sec2

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Case	Mode	Period sec	Frequency cyc/sec	CircFreq rad/sec	Eigenvalue rad2/sec2
Modal	1	1.2	0.833	5.2369	27.4248
Modal	2	1.059	0.945	5.9353	35.2282
Modal	3	0.965	1.037	6.5135	42.4253
Modal	4	0.391	2.559	16.0769	258.4667
Modal	5	0.343	2.914	18.3088	335.2103
Modal	6	0.312	3.202	20.1181	404.737
Modal	7	0.232	4.319	27.1402	736.5882
Modal	8	0.206	4.858	30.5238	931.7053
Modal	9	0.19	5.25	32.9871	1088.1456
Modal	10	0.178	5.632	35.3855	1252.1319
Modal	11	0.169	5.921	37.2039	1384.1289
Modal	12	0.152	6.59	41.4045	1714.3346

Table 3.10 - Modal Participating Mass Ratios (Part 1 of 2)

Case	Mode	Period sec	UX	UY	UZ	SumUX	SumUY	SumUZ	RX	RY	RZ
Modal	1	1.2	0.0032	0.638	0	0.0032	0.638	0	0.1132	0.0002	0.2073
Modal	2	1.059	0.0109	0.2079	0	0.0142	0.8459	0	0.0425	0.0008	0.6219
Modal	3	0.965	0.8414	5.478E-06	0	0.8555	0.8459	0	7.015E-06	0.1439	0.0136
Modal	4	0.391	0.0002	0.0661	0	0.8558	0.9121	0	0.4706	0.0016	0.0212
Modal	5	0.343	0.0009	0.0227	0	0.8566	0.9348	0	0.15	0.0061	0.0685
Modal	6	0.312	0.0793	4.512E-06	0	0.9359	0.9348	0	9.872E-06	0.6299	0.0011
Modal	7	0.232	4.001E-05	0.0155	0	0.936	0.9503	0	0.0269	6.495E-06	0.0066
Modal	8	0.206	0.0001	0.0067	0	0.936	0.957	0	0.0102	0.0001	0.0172
Modal	9	0.19	0.0182	0	0	0.9543	0.957	0	5.182E-06	0.0265	3.55E-05
Modal	10	0.178	0.0005	0.0001	0	0.9548	0.9571	0	0.0008	0.0003	0.0019
Modal	11	0.169	4.36E-05	0.0043	0	0.9548	0.9613	0	0.0228	0.0002	0.001
Modal	12	0.152	0.0001	0.0023	0	0.9549	0.9636	0	0.0139	0.0004	0.0038

Table 3.10 - Modal Participating Mass Ratios (Part 2 of 2)

Case	Mode	SumRX	SumRY	SumRZ
Modal	1	0.1132	0.0002	0.2073
Modal	2	0.1557	0.001	0.8293
Modal	3	0.1557	0.1449	0.8429
Modal	4	0.6263	0.1465	0.8641
Modal	5	0.7763	0.1526	0.9326
Modal	6	0.7764	0.7825	0.9337
Modal	7	0.8032	0.7825	0.9403
Modal	8	0.8135	0.7826	0.9575
Modal	9	0.8135	0.8091	0.9575
Modal	10	0.8143	0.8094	0.9594
Modal	11	0.8371	0.8096	0.9604
Modal	12	0.851	0.81	0.9641

Table 3.11 - Modal Load Participation Ratios

Case	ItemType	Item	Static %	Dynamic %
Modal	Acceleration	UX	99.96	95.49
Modal	Acceleration	UY	99.98	96.36
Modal	Acceleration	UZ	0	0

Table 3.12 - Modal Direction Factors

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Case	Mode	Period sec	UX	UY	UZ	RZ
Modal	1	1.2	0.004	0.75	0	0.245
Modal	2	1.059	0.014	0.25	0	0.735
Modal	3	0.965	0.984	0	0	0.016
Modal	4	0.391	0.004	0.752	0	0.244
Modal	5	0.343	0.014	0.249	0	0.738
Modal	6	0.312	0.988	0	0	0.012
Modal	7	0.232	0.005	0.699	0	0.296
Modal	8	0.206	0.015	0.303	0	0.682
Modal	9	0.19	0.967	0	0	0.033
Modal	10	0.178	0.093	0.036	0	0.871
Modal	11	0.169	0.01	0.606	0	0.384
Modal	12	0.152	0.019	0.376	0	0.604

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Column Design

Design Loads

Load	Pu	650 KN
Moment	Mu	20 KN-m

Column Data

width	b	230 mm
depth	d	450 mm
length	l	3.00 meters

Grade

Concrete	fck	25 MPa
Steel	fy	500 MPa

Pu/(fckbd)	0.25
Mu/(fckbd^2)	0.01
d'/d	0.05

Minimum eccentricity

ex	1.37 mm	OK
ey	2.10 mm	OK

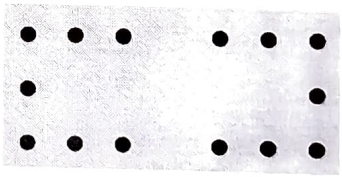
Refer Chart 35 of SP 16, Page no: 120

pt/fck	0.09

pt	2.25%
Ast	2329 sqmm

Number of bars

dia	nos	ast
20 mm	6	1885 sqmm
16 mm	4	804 sqmm
-	4	
Total	14	2689 sqmm



Steel provided OK

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Beam Design

Beam Data

width	230 mm
depth	450 mm
clear cover to main	20 mm

Material Grades

Concrete	25 MPa
Steel	500 MPa

Moment	180 KN-m

d'	38 mm	.= cc+ sdia + mdia/2
eff depth	412 mm	.= d - d'
Mu/bd^2	4.61	
xumax	188	.= (700/(1100 * (0.87 * fy)) * d
Mulim	130	.= 0.36*fck*b*xumax*(d-(0.42*xumax))
$Mulim/bd^2$	3.33	

Beam is designed as Doubly Reinforced Beam

Area of Steel	Tension (Ast)	Compr (Asc)
Percentage	1.269 %	0.353 %
Area of Steel	1202 sqmm	335 sqmm

Refer Table 45-56 SP 16 pg 81-92

Tension Reinforcement

Type	Bar dia	Nos	Area of Steel
Layer 1	20 mm	4	1257 sqmm
Layer 2	-	0	
Layer 3	-	0	
		Total Steel Provided	1257 sqmm

1.326 %

Provided Steel OK

Compression Reinforcement

Type	Bar dia	Nos	Area of Steel
Layer 1	20 mm	4	1257 sqmm
Layer 2	-	0	
Layer 3			0 sqmm
		Total Steel Provided	1257 sqmm

1.326 %

Provided Steel OK

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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

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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.