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DESIGN CALCULATION

PLAN SHOWING THE PROPOSED CONSTRUCTION OF STILT FLOOR +2 FLOOR +3RD FLOOR (PART) + 4TH FLOOR +5TH FLOOR, RESIDENTIALBUILDING (18.30M HEIGHT) WITH 25 DWELLING UNITS AVAILING WITH PREMIUM FSI AT PLOT NO.10, DOOR NO.6, KUSHKUMAR ROAD, NUNGAMBAKKAM, CHENNAI-34 COMPRISED IN R.S. NO. 106/3 (DOCUMENT) R.S.NO.106/25 (PATTA), BLOCK NO.19 OF NUNGAMBAKKAM VILLAGE WITHIN THE LIMIT OF GREATER CHENNAI CORPORATION.

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1.0 DESIGN BRIEF:

THIS DOCUMENT PLAN SHOWING THE PROPOSED CONSTRUCTION OF STILT FLOOR +2 FLOOR +3RD FLOOR (PART) + 4TH FLOOR +5TH FLOOR, RESIDENTIAL BUILDING (18.30M HEIGHT) WITH 25 DWELLING UNITS AVAILING WITH PREMIUM FSI AT PLOT NO.10, DOOR NO.6, KUSHKUMAR ROAD, NUNGAMBAKKAM, CHENNAI-34 COMPRISED IN R.S. NO. 106/3 (DOCUMENT) R.S.NO.106/25 (PATTA), BLOCK NO.19 OF NUNGAMBAKKAM VILLAGE WITHIN THE LIMIT OF GREATER CHENNAI CORPORATION.

2.0 GENERAL DESIGN CRITERIA

2.1. Description of the structure

The Residential Building consists of Stilt Floor + 5 Upper floors and the structure is designed as a RCC framed structure.

1. Size of the building : 41.46 X 27.13M
2. Height of the building : 18.30M
3. Number of storeys above GL : Stilt Floor +5 upper floors
4. Floor to floor height of this building : Stilt and First floors - 3.05m
   : Typical floor – 3.05m
5. Type of foundation : Pile foundation as per geotechnical report

2.2. Materials Used

Following materials are generally used in the design of the various components of the structure.
For Concrete Structure

- M25 grade concrete for all reinforced concrete parts of the structure
- Fe500 grade Structural reinforcement steel
- Masonry for all walls : Brick / Block

2.3. Design Codes & Standards

Following codes and specifications have been generally used in the design of the members of the structure.

- IS 456 : 2000 Code of practice for Plain and Reinforced concrete
- SP: 16 Design Aids for Reinforced concrete
- IS 875 : 1987 Design Loads for building and structures
- IS 1893 : 2002 Criteria for Earthquake Resistant design of structures
- IS 13920: 1993 Ductile Detailing of R.C structures subjected to Seismic forces
- SP: 34 Handbook on Concrete Reinforcement & Detailing
- IS 800 : 1984 Code of practice for general construction in steel
- IS 2062 : 1999 Steel for general structural purposes specification
- IS 1786: 1985 Specification for high strength deformed bars and wires for concrete reinforcement

3.0 LOADING

Primary Load:

- Dead Load (DL)
- Live Load (LL)

3.1. Dead load (DL)

Material weight

- Density of Concrete =25 kN/m^3

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- D.L. due to partitions
  (Light Partition as per IS 875) =1.50 kN/m^2
- D.L due to floor finish 50mm thick = 0.05x25 = 1.25 kN/m^2

3.2. Live load (LL)

Minimum Uniformly Distributed Live Loads:

Occupancy or use	Live Load (kn/m^2)
All rooms and kitchens	2.00
Toilet and bath rooms	3.00
Corridors, passages, staircases	3.00
Balconies	3.00
Terrace Floor	1.50
Basic wind speed	=50 m/sec
Seismic Zone	=Zone III

3.5 Loading Combinations

The following combinations of Loads as per IS 1893 is considered in the STAAD Analysis

- 1.5(DL +LL)
- 1.2(DL + LL)

The below load combinations are used to check the structure in serviceability condition.

- 1.0(DL +LL)

4.0 STRUCTURAL MATERIAL:

4.1 Concrete Material Specifications:

Concrete compressive cube strength	- 25 N/mm^2
Minimum cement content	- Refer standard drawings for general & Legends
Cement type	- OPC
Free water cement ratio	- 0.5 (Maximum)
Nominal maximum size of aggregate	- 20mm UNO

4.2 Reinforcement:

Steel reinforcement shall be deformed bars, the characteristic of reinforcement bars shall conform to the following specification:

Grade of Steel	Actual Yield Strength (MPa)
Grade Fe500	Minimum 500 MPa,

4.4 Concrete cover:

Cover for Reinforcement is considered as per Table 16A of NBC, for a Fire resistance of 2 hrs.

- Raft Slab = 50mm
- Footing = 50mm
- RC Wall = 30mm
- Columns = 40mm

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- Beams = 30mm
- Slabs = 25mm

5.0 Structural Description

5.1. Method of analysis

Structure analysis & design:

The structure is analyzed as a Space frame structure in STADD Pro Vi8. Columns, Footing, Basement walls, slabs, Beams and Staircases are designed as reinforced concrete members.

5.2. Framing System, Analysis and Design

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 IS 456:2000. Cover for Reinforcement is considered as per Table 16A of NBC, for a Fire resistance of 2 hrs.

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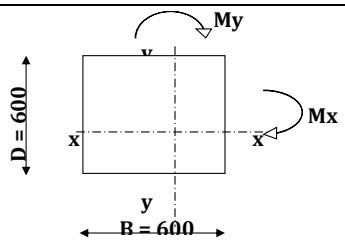
APPENDIX I

Design Calculations

Column Design

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PROJECT	RESIDENTIAL BUILDING (S+5) AT PLOT NO.10, DOOR NO.6, KUSHKUMAR ROAD, NUNGAMBAKKAM,	DOCUMENT. NO.	DATE	DESIGNED	DATE
TITLE	Design for a Short Column with Biaxial Bending	REVISION	DATE	CHECKED	DATE

CL. NO.	DESIGN CALCULATIONS	REFERENCES
	Column No:  **CRITICAL LOAD CASE:**	
1.0	**Basic Data**	
1.1	**Material Data**	
	Grade of Concrete M 25	
	Grade of Steel Fe 500	
1.2	**Codal Data**	
	Nominal Cover = 40 mm	Cl 26.4.2.1,IS456:2000
	Diameter of the Bar = 25 mm ≥ 12 mm	
	d' = 52.5 mm	
1.3	**Basic Dimensions**	
	Unsupported Length of the Column L_{ox} = 3000 mm	
	L_{oy} = 3000 mm	
	L_{ex} = 3000 mm	Table 28 ,
	L_{ey} = 3000 mm	IS456:2000
	Size of the Column B X D = 600 x 600 mm	
1.4	**Analysis Results**	
	Factored Axial Load P_u = 780.0 kN	STAAD
	Factored Moment M_{ux} = 22.00 kNm	OUTPUT
	Factored Moment M_{uy} = 71.00 kNm	
2.0	**Check for Slenderness**	
	Slenderness Ratio about Major Axis L_{ex} / D = 5.000	
	Slenderness Ratio about Minor Axis L_{ey} / B = 5.000	
	Since Leff / LLD <12 Designed as Short Column	Cl 25.1.2, IS456:2000
3.0	**Check for Eccentricity**	
	Minimum Eccentricit e_x = L_{ox} / 500 + D / 30 = 26.0 mm >20	Cl 25.4
	e_y = L_{oy} / 500 + B / 30 = 26.0 mm >20	IS456:2000
3.1	**Moments Due to Minimum Eccentricity**	
	Me_x = 20.28 kN.m	
	Me_y = 20.28 kN.m	
4.0	**Design Moment**	
	Design Moment about X axis M_{ux} = 22.00 kN.m	
	Design Moment about Y axis M_{uy} = 71.00 kN.m	

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CL. NO.	DESIGN CALCULATIONS	REFERENCES
5.0	**Uniaxial Moment Carrying capacity of the Section about X & Y- axis**	
	d' / D = 0.088	
	d' / B = 0.0875	
	Assume the Reinforcement Percentage p = **2.00**	
	p / f_{ck} = 0.080	
	$p_u / f_{ck}BD$ = 0.087	
	Reinforcement distributed equally on four sides **4**	
	$M_{ux1} / f_{ck}BD^2$ =	Chart 43 - 46
	$M_{uy1} / f_{ck}DB^2$ =	SP 16 : 1980
	Moment carrying capacity about X axis M_{ux1} = kN.m	
	Moment carrying capacity about Y axis M_{uy1} = kN.m	
	Pu < Axial Load Carrying capacity ; Hence O.K	
6.0	**Calculation of P_{uz}**	
	$P_{uz} = 0.45 f_{ck} A_c + 0.75 f_y A_{sc}$ = 6669.00 kN	Cl 39.6 , IS456:2000
	P_u/P_{uz} = 0.117	
	a_n = 1.000	Cl 39.6 , IS456:2000
7.0	**Criteria for Biaxial Bending (Bresler's Formulation)**	
	$(M_{ux}/M_{ux1})^{an} + (M_{uy}/M_{uy1})^{an}$ = 1	Cl 39.6 , IS456:2000
8.0	**Longitudinal Reinforcement**	
	Area of compression Steel $A_{sc,reqd}$ = **7200** mm^2	
	10 No Y20 + No Y20 $A_{sc,pro}$ = **3142** mm^2	
8.1	**Check for Minimum & Maximum Area of Steel**	
	Minimum Area of ste (0.8 % of A_g dir) = **441** mm^2	Cl 26.5.3.1 a & b ,
	(Based on the area of concrete reqd to resist direct stress)	IS 456 : 2000
	Maximum Area of ste (4 % of A_g) = **14400** mm^2	
	441 < **3142** < **14400** mm^2	
	Area of Steel is with in the permissible limit ; Hence O.K	
9.0	**Transverse Reinforcement**	
9.1	Diameter of Transverse Reinforcement = **8** mm ≥ 6 mm	Cl 26.5.3.2 c 2) ,
9.2	**Spacing of Lateral Ties :**	
	i) Least Lateral Dimension of the column = 600 mm	Cl 26.5.3.2 c 1) ,
	ii) 16 times the Smallest dia of Longitudinal Steel = 320 mm	IS 456 : 2000
	iii) = 300 mm	
	Reqd. Spacing of Ties (Minimum of the above) = 300 mm	
	Provide 8 mm dia Lateral Ties @ **300** mm Spacing	
	Provide closer spacing on either side of the column above and below beam / slab.	

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Footing Design

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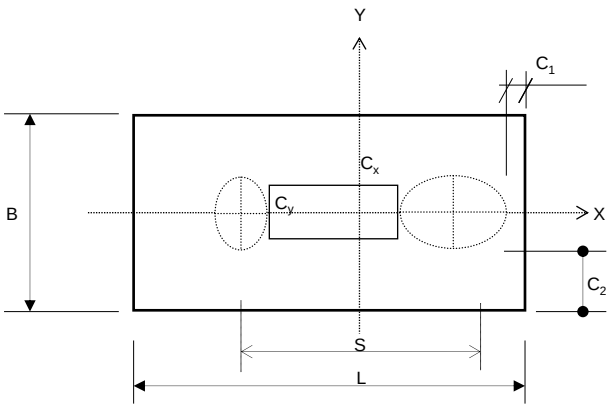
TITLE	: Pilecap Design by Bending Theory		Designed :	Date :	27-Jul-2026
SUBJECT	Two(2) Pile Group - TYPE P2		Checked :	Date :	27-Jul-2026
PROJECT	: RESIDENTIAL BUILDING (S+5) AT PLOT NO.10, DOOR NO.6, KUSHKUMAR ROAD, NUNGAMBAKKAM,		Job No. :	Page No :	

Pile spacing from center to center should not exceed 2.5 times the pile diameter

Total Column Axial Load	N =	500	kN (Service Load)
Total number of piles	=	2	Nos.
Pile Axial Load	P =	250	kN/pile
Combined Load Factor	Lf =	1.5	
Edge of pile to edge	C1 =	150	mm
of pilecap distance	C2 =	150	mm

1. Pile cap geometry

Pile diameter,	D =	450	mm
Pile spacing,	S =	2.50	x D
Pile cap length	L =	1880	mm
Pile cap breadth	B =	750	mm
Pile cap depth	H =	750	mm
Column length	Cx =	230	mm
Column breadth	Cy =	450	mm
Bottom cover	c =	50	mm
Top cover	ct =	50	mm
Side cover	cs =	50	mm
Minimum pilecap depth (Per Reynolds's Handbook)	=	750	mm



2. Pile cap material

Concrete strength	f_{cu} =	25	N/mm²
Steel strength	f_y =	500	N/mm²
Partial safety factor for stre	g_{ms} =	1.15	

3. Reinforcement design

X - direction

Pile center to pile cap center distance	=	565.0	mm
Pile center to column face distance	=	450.0	mm
Bar diameter, f =		25	mm
Ultimate design moment M_{ux} =		168.8	kNm
Eff. depth d_x =		687.5	mm
$K = M_{ux}/bd^2f_{cu}$ =		0.0190	< 0.156, So O.K !
Lever arm z_x =		653.1	mm

Reinforcement required			Reinforcement provided			
: $M_u/(1/g_{ms} \cdot f_y \cdot z)$ =	731	mm²	As prov =	3436	mm²	
No. of bars =	2	Nos.	No. of bars =	7	Nos.	O.K.!
Bar spacing =	625	mm	Bar spacing =	104	mm	
			100As/bd =	0.67		

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Y - direction

Bar diameter, f = 16 mm
Eff. depth d_y = 667 mm

Reinforcement required			Reinforcement provided			
$A_{sy\ req}$ =	1692	mm^2	As prov =	1810	mm^2	
No. of bars =	9	Nos.	No. of bars =	9	Nos.	O.K.!
Bar spacing =	221	mm	Bar spacing =	221	mm	
			100As/bd =	0.14		

4. Normal shear

X - direction

V_x = 375 kN
v = 0.73 N/mm^2
v_c = 0.55 N/mm^2
a_v = 315 mm
Enhanced shear = 2.41 N/mm^2 > v, Normal shear O.K.

5. Punching shear

Allowable punching shear = 4.00 N/mm^2
Perimeter of column = 1360 mm
Punching shear stress = 0.80 N/mm^2 ==> Punching shear O.K.

6. Bar anchorage

f_{bu} = 2.50 N/mm^2 (Deformed Bar Type 2) Where $f_{bu} = b\ (f_{cu})^{1/2}$

X - direction

Anchorage length required = 311 mm
Anchorage length available = 900 mm ==> Anchorage O.K.

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Plinth Beam Design

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1.1 **Geomentry Data**

Beam Number		=	**PB2**		
Type of Beam		=	Rectangular Beam		
Support Condition		=	Continuous Beam		
Width of beam	b	=	200	mm	
Overall Depth of Beam	D	=	380	mm	
Dia of bar	Φ	=	25	mm	
Nominal Cover	cc	=	30	mm	IS 456:2000 Table 19
Effective Depth	d	=	337.5	mm	IS 456:2000
Effective Cover		=	42.5	mm	Cl 23.0
Effective Span of beam	l_{eff}	=	4500	mm	
Concrete grade		=	M 25		
Steel Grade		=	Fe 500		
$p_{t,lim}$		=	0.944 %		
$p_{t,min}$		=	0.170 %		IS 456:2000
p_t & p_{cmax}		=	4.00 %		Cl 26.5.1.1

1.2 **Force Input**

Left negative moment	(Support 1)	=	84	kNm
Mid span positive moment		=	84	kNm
Right negative moment	(Support 2)	=	84	kNm
Shear @ (Support 1)		=	149	kN
Shear @ (Span)		=	149	kN
Shear @ (Support 2)		=	149	kN

1.3 **Limiting Moment**

M_{ulim} = 0.133 f_{ck} b d^2 = 75.75 kNm

1.4 **Area of Steel**

Minimum Area of Steel = 0.17% b d = 114.75 mm^2

Support 1

Negative moment	(Support 1)	=	84	kNm

Hence the Section is designed as Doubly Reinforced Section

	M_u/bd^2	=	3.687	
Percentage of tension steel reqd	p_t	=	1.039	%
Percentage of compression steel reqd	p_c	=	0.106	%
Required Area of tension steel	$A_{st\ reqd}$	=	701.33	mm^2
Required Area of compression steel	$A_{sc\ reqd}$	=	71.55	mm^2

Detail of bars

	I st Layer		II nd Layer	
	Nos	Dia	Nos	Dia
Tension Reinforcement	**3**	**16**		

A_{st} provided = 603.19 mm^2

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	Nos	Dia	Nos	Dia				
Compression Reinforcemer	3	16	0					
A_{sc} provided	=	603.19	mm^2					
Percentage of tension steel provided	p_t	=	0.894	%	**Not safe**			
Percentage of compression steel provid	p_c	=	0.894	%	**Hence O.K**			

Check for Shear

Shear		=	149	kN	
Nominal Shear Stress	tv	=	2.21	N/mm^2	Cl 40.1, IS456:2000
Permissible Shear Stress	tc	=	0.92	N/mm^2	β = 1.000
Maximum Shear Stress	tc,max	=	2.5	N/mm^2	Table 19, IS456:2000
Diameter of the Stirrup bar		=	8	mm	Table 20, IS456:2000
Number of Legs		=	2		
Spacing of Shear reinforcement Required		=	160.0		Cl 40.4, IS456:2000
Maximum Spacing of Shear Reinforcement		=	250		Cl 26.5.1.5,IS456:2000

Provide 8 mm dia 2 legged stirrups @ 160mm c/c spacing

Support 2

Negative moment		=	84	kNm
Hence the Section is designed as Doubly Reinforced Section				
	M_u/bd^2	=	3.687	
Percentage of tension steel reqd	p_t	=	1.039	%
Percentage of compression steel reqd	p_c	=	0.106	%
Required Area of tension steel	$A_{st\ reqd}$	=	701.33	mm^2
Required Area of compression steel	$A_{sc\ reqd}$	=	71.55	mm^2

Detail of bars

	I st Layer		II nd Layer	
	Nos	Dia	Nos	Dia
Tension Reinforcement	3	16	0	0

A_{st} provided = 603.19 mm²

	Nos	Dia	Nos	Dia
Compression Reinforcemer	3	16	0	0

A_{sc} provided = 603.19 mm²

Percentage of tension steel provided	p_t	=	0.894	%	**Not safe**
Percentage of compression steel provid	p_c	=	0.894	%	**Hence O.K**

Check for Shear

Shear		=	149	kN	
Nominal Shear Stress	tv	=	2.21	N/mm^2	Cl 40.1, IS456:2000
Permissible Shear Stress	tc	=	0.92	N/mm^2	β = 1.000
Maximum Shear Stress	tc,max	=	2.5	N/mm^2	Table 19, IS456:2000
Diameter of the Stirrup bar		=	8	mm	Table 20, IS456:2000

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CL. NO.	**BEAM DESIGN CALCULATIONS**				**REFERENCES**

Number of Legs = 2

Spacing of Shear reinforcement Required = 160.0 — Cl 40.4, IS456:2000

Maximum Spacing of Shear Reinforcement = 250 — Cl 26.5.1.5,IS456:2000

Provide 8 mm dia 2 legged stirrups @ 160mm c/c spacing

Span

Positive moment (Span) = 84 kNm

Hence the Section is designed as Doubly Reinforced Section

M_u/bd^2 = 3.325

Percentage of tension steel reqd p_t = 1.039 %

Percentage of compression steel reqd p_c = 0.106 %

Required Area of tension steel $A_{st\ reqd}$ = 701.33 mm^2

Required Area of compression steel $A_{sc\ reqd}$ = 71.55 mm

Detail of bars

	I st Layer		II nd Layer	
	Nos	Dia	Nos	Dia
Tension Reinforcement	3	16	0	0

A_{st} provided = 603.19 mm^2

	I st Layer		II nd Layer	
	Nos	Dia	Nos	Dia
Compression Reinforcemer	3	16	0	0

A_{sc} provided = 603.19 mm^2

Percentage of tension steel provided p_t = 0.894 % **Not safe**

Percentage of compression steel provid p_c = 0.894 % **Hence O.K**

Check for Shear

Shear = 149 kN

Nominal Shear Stress tv = 2.21 N/mm^2 — Cl 40.1, IS456:2000

Permissible Shear Stress tc = 0.92 N/mm^2 — β = 1.000

Maximum Shear Stress tc,max = 2.5 N/mm^2 — Table 19, IS456:2000

Diameter of the Stirrup bar = 8 mm — Table 20, IS456:2000

Number of Legs = 2

Spacing of Shear reinforcement Required = 160.0 — Cl 40.4, IS456:2000

Maximum Spacing of Shear Reinforcement = 250 — Cl 26.5.1.5,IS456:2000

Provide 8 mm dia 2 legged stirrups @ 160mm c/c spacing

Check For Deflection

Basic Value = 26 — Cl.23.2, IS456:2000

Service Stress in Steel f_s = **337.19** N/mm

Modification Factor(Tension Reinforcement) F_1 = 0.78

Allowable Span/Depth = 20.28

Actual Span/Depth = 13.33 **Hence Safe**

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Floor Beam Design

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PROJECT	**RESIDENTIAL BUILDING (S+5) AT PLOT NO.10, DOOR NO.6, KUSHKUMAR ROAD, NUNGAMBAKKAM,**	**DOCUMENT. NO.**	**DATE**	**DESIGNED** RMK	**DATE**
TITLE		**REVISION**	**DATE**	**CHECKED** RMK	**DATE**
CL. NO.	**BEAM DESIGN CALCULATIONS**			**REFERENCES**	

1.1 **Geomentry Data**

Beam Number		=	B3		
Type of Beam		=	Rectangular Beam		
Support Condition		=	Continuous Beam		
Width of beam	b	=	230	mm	
Overall Depth of Beam	D	=	600	mm	
Dia of bar	Φ	=	25	mm	
Nominal Cover	cc	=	30	mm	IS 456:2000 Table 19
Effective Depth	d	=	557.5	mm	IS 456:2000
Effective Cover		=	42.5	mm	Cl 23.0
Effective Span of beam	l_{eff}	=	3700	mm	
Concrete grade		=	M 25		
Steel Grade		=	Fe 500		
$p_{t,lim}$		=	0.944 %		
$p_{t,min}$		=	0.170 %		IS 456:2000
p_t & p_{cmax}		=	4.00 %		Cl 26.5.1.1

1.2 **Force Input**

Left negative moment	(Support 1)	=	254	kNm
Mid span positive moment		=	254	kNm
Right negative moment	(Support 2)	=	254	kNm
Shear @ (Support 1)		=	241	kN
Shear @ (Span)		=	241	kN
Shear @ (Support 2)		=	241	kN

1.3 **Limiting Moment**

M_{ulim} = 0.133 f_{ck} b d^2 = 237.69 kNm

1.4 **Area of Steel**

Minimum Area of Ste = 0.17% b d = 217.9825 mm^2

Support 1

Negative moment (Support 1) = 254 kNm

Hence the Section is designed as Doubly Reinforced Section

	M_u/bd^2	=	3.553	
Percentage of tension steel reqd	p_t	=	1.001	%
Percentage of compression steel reqd	p_c	=	0.061	%
Required Area of tension steel	$A_{st\ reqd}$	=	1283.53	mm^2
Required Area of compression steel	$A_{sc\ reqd}$	=	78.22	mm^2

Detail of bars

	I st Layer		II nd Layer		
	Nos	Dia	Nos	Dia	
Tension Reinforcement	3	20	3	20	
	A_{st} provided =		1884.96	mm^2	
	Nos	Dia	Nos	Dia	
Compression Reinforceme	3	20	3	20	

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TITLE		REVISION	DATE	CHECKED RMK	DATE

CL. NO.	BEAM DESIGN CALCULATIONS	REFERENCES

A_{sc} provided = 1884.96 mm^2

Percentage of tension steel provided p_t = 1.47 % **Hence O.K**

Percentage of compression steel provided p_c = 1.47 % **Hence O.K**

Check for Shear

Shear = 241 kN

Nominal Shear Stress	tv	=	1.88	N/mm^2	Cl 40.1, IS456:2000
Permissible Shear Stress	tc	=	0.92	N/mm^2	β = 1.000
Maximum Shear Stress	tc,max	=	2.5	N/mm^2	Table 19, IS456:2000
Diameter of the Stirrup bar		=	8	mm	Table 20, IS456:2000
Number of Legs		=	2		
Spacing of Shear reinforcement Required		=	190.0		Cl 40.4, IS456:2000
Maximum Spacing of Shear Reinforcement		=	300		Cl 26.5.1.5,IS456:2000

Provide 8 mm dia 2 legged stirrups @ 190mm c/c spacing

Support 2

Negative moment = 254 kNm

Hence the Section is designed as Doubly Reinforced Section

	M_u/bd^2	=	3.553	
Percentage of tension steel reqd	p_t	=	1.001	%
Percentage of compression steel reqd	p_c	=	0.061	%
Required Area of tension steel	$A_{st\ reqd}$	=	1283.53	mm^2
Required Area of compression steel	$A_{sc\ reqd}$	=	78.22	mm^2

Detail of bars

	I st Layer		II nd Layer	
	Nos	Dia	Nos	Dia
Tension Reinforcement	3	20	3	20

A_{st} provided = 1884.956 mm^2

	I st Layer		II nd Layer	
	Nos	Dia	Nos	Dia
Compression Reinforceme	3	20	3	20

A_{sc} provided = 1884.96 mm^2

Percentage of tension steel provided p_t = 1.47 % **Hence O.K**

Percentage of compression steel provided p_c = 1.47 % **Hence O.K**

Check for Shear

Shear = 241 kN

Nominal Shear Stress	tv	=	1.88	N/mm^2	Cl 40.1, IS456:2000
Permissible Shear Stress	tc	=	0.92	N/mm^2	β = 1.000
Maximum Shear Stress	tc,max	=	2.5	N/mm^2	Table 19, IS456:2000
Diameter of the Stirrup bar		=	8	mm	Table 20, IS456:2000
Number of Legs		=	2		
Spacing of Shear reinforcement Required		=	190.0		Cl 40.4, IS456:2000
Maximum Spacing of Shear Reinforcement		=	300		Cl 26.5.1.5,IS456:2000

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TITLE		REVISION	DATE	CHECKED RMK	DATE

CL. NO.	BEAM DESIGN CALCULATIONS	REFERENCES

Provide 8 mm dia 2 legged stirrups @ 190mm c/c spacing

Span

Positive moment (Span) = 254 kNm

Hence the Section is designed as Doubly Reinforced Section

M_u/bd^2 = 3.325

Percentage of tension steel reqd p_t = 1.001 %

Percentage of compression steel reqd p_c = 0.061 %

Required Area of tension steel $A_{st\ reqd}$ = 1283.53 mm^2

Required Area of compression steel $A_{sc\ reqd}$ = 78.22 mm^2

Detail of bars

	I st Layer		II nd Layer	
	Nos	Dia	Nos	Dia
Tension Reinforcement	3	20	3	20

A_{st} provided = 1884.96 mm^2

	Nos	Dia	Nos	Dia
Compression Reinforceme	3	20	3	20

A_{sc} provided = 1884.96 mm^2

Percentage of tension steel provided p_t = 1.47 % **Hence O.K**

Percentage of compression steel provided p_c = 1.47 % **Hence O.K**

Check for Shear

Shear = 241 kN

Nominal Shear Stress	tv	=	1.88	N/mm^2	Cl 40.1, IS456:2000
Permissible Shear Stress	tc	=	0.92	N/mm^2	β = 1.000
Maximum Shear Stress	tc,max	=	2.5	N/mm^2	Table 19, IS456:2000
Diameter of the Stirrup bar		=	8	mm	Table 20, IS456:2000
Number of Legs		=	2		
Spacing of Shear reinforcement Required		=	190.0		Cl 40.4, IS456:2000
Maximum Spacing of Shear Reinforcement		=	300		Cl 26.5.1.5,IS456:2000

Provide 8 mm dia 2 legged stirrups @ 190mm c/c spacing

Check For Deflection

Basic Value		=	26		Cl.23.2, IS456:2000
Service Stress in Steel	f_s	=	**197.47**	N/mm^2	
Modification Factor(Tension Reinforcement)	F_1	=	1.04		
Allowable Span/Depth		=	27.04		
Actual Span/Depth		=	6.64	**Hence Safe**	

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Floor Slab Design

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PROJECT	RESIDENTIAL BUILDING (S+5) AT PLOT NO.10, DOOR NO.6, KUSHKUMAR ROAD, NUNGAMBAKKAM,	DOCUMENT.N	DATE	DESIGNE	DATE
TITLE	TWO WAY SLAB DESIGN	REVISION	DATE	CHECKED	DATE

CL. NO.	DESIGN CALCULATIONS	REFERENCES

1.0 Design of Two Way Slab S3

1.0.1 Basic Input Data

Grade of concrete		=	**M 25**		
Grade of steel		=	**Fe 500**		
Thickness of slab	D	=	**150**	mm	
Clear cover	cc	=	**25**	mm	Table 16 Cl.26.4.2 , IS 456 -2000
Effective thickness of slab (d_{eff})	150 - 25 - 5	=	120	mm	
Unit weight of concrete		=	25	KN/m^3	Cl 19.2.1, IS 456-2000
Effective Shorter Span	L_x	=	**5**	m	
Effective Longer Span	L_y	=	**7.7**	m	
Aspect ratio	L_y/L_x	=	1.54	< 2	
Hence designed as Two way slab					Cl D-1.11, IS 456-2000
Edge Conditio	**One Long edge Discontinuous**				

1.0.2 Load Data

Self Weight of Slab	= 0.150 x 25	=	3.750	KN/m^2
Floor finish		=	**1.500**	KN/m^2
Partition Load		=	**0.000**	KN/m^2
Sunken Filling		=	**0.000**	KN/m^2
Imposed Load		=	**3.000**	KN/m^2 IS 875 (Part 2) -1987
Extra Load, (if Any)		=	**0.000**	KN/m^2
Total load		=	8.250	KN/m^2
Design load (Wu) = 1.5 x 8.25		=	**12.375**	KN/m^2 Table 18 Cl 36.4.1 IS 456 -2000

1.0.3 Moment and Shear Calculations

Short Span Direction

a_x for positive moment	1.5	→	0.051		Table 26 Cl D-1.1, IS 456 -2000
	1.75	→	0.059		
	for 1.54	a_x =	0.052		
Positive moment	0.052 x 12.38 x 5 ^2	=	**16.17**	KN-m	
a_x for negative moment	1.5	→	0.067		Table 26 Cl D-1.1, IS 456 -2000
	1.75	→	0.077		
	for 1.54	a_x =	0.069		
Negative momen	0.069 x 12.38 x 5 ^2	=	**21.22**	KN-m	

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TITLE	TWO WAY SLAB DESIGN	REVISION	DATE	CHECKED	DATE

CL. NO.	DESIGN CALCULATIONS	REFERENCES

Long Span Direction

For positive moment a_y = 0.028 — Table 26 Cl D-1.1, IS 456 -2000

Positive moment 0.028 x 12.38 x 5 ^2 = **8.66** KN-m

For negative moment a_y = 0.037 — Table 26 Cl D-1.1, IS 456 -2000

Negative moment 0.037 x 12.38 x 5 ^2 = **11.45** KN-m

Shear force V = 12.38 x 5 x 1 = **30.94** KN

1.0.4 Check Effective Depth for Max.Bending Moment

Depth require = $(M_j / (0.133x \ fck \times b))^{1/2}$ = 79.89 mm — Table C,SP 16 :1980

Depth provide = 150 - 25 - 10 /2 = 120 mn > ### mn — Cl 2.3

Hence the section is Safe against Bending

1.0.5 Check Depth for Shear

Nominal Shear Stress $t_v = V_u / b\ d$ = 0.26 N/mm^2 — Cl.40.1, IS 456:2000

Design shear stre (t_c) = 0.46 N/mm^2 — Table 19 , IS 456:2000

k = 1.30 — Cl.40.2.1.1, IS 456:2000

k * t_c = 0.60 N/mm^2

t_v < k * t_c **Hence the section is Safe against Shear**

1.0.6 Check for Maximum Shear Stress:

Nominal Shear Stress $t_v = V_u / b\ d$ = 0.26 N/mm^2 — Cl.40.1, IS 456:2000

Maximum Shear Stre ($t_{c,max}$) = 3.1 N/mm^2 — Table 20 , IS 456:2000

$t_{c,max}$ = 1.55 N/mm^2

t_v < 1 $t_{c,max}$ **Hence the section is Safe against Max.Shear Stres** — Cl.40.2.3.1, IS 456:200

1.0.7 Reinforcement calculations

Short Span Direction @ Support

$$Mu/bd = \frac{21.22 \times 10^6}{1000 \times \# \times 120} = \mathbf{1.474}$$

Pt = **0.37** % — Table 2-4, SP16 :1980

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TITLE	TWO WAY SLAB DESIGN	REVISION	DATE	CHECKED	DATE

CL. NO.	DESIGN CALCULATIONS	REFERENCES

Area of steel = 0.0037 x 1000 x 120 = 439 mm^2
Minimum area of 0.001 x 1000 x 150 = #### mm^2 Cl:26.5.2.1
Spacing of # bar 78.54 x 1000 / 438.88 = 179 mm IS 456 -2000

Check for Spacing

Minimum of 1) 3d = 360 mm
2) = 300 mm Cl:26.3.3.(b).1
3) = 178.86 mm IS 456 -2000
Therefore provid # @ **170** mm C/C

Short Span Direction @ Mid Span

$$Mu/bd = \frac{16.17 \times 10^{6}}{1000 \times \# \times 120} = 1.123$$

Pt = 0.273 % SP16 :1980 Table 2-4

Area of steel = 0.0027 x 1000 x 120 = 328 mm^2 IS 456:2000
Minimum area of 0.001 x 1000 x 150 = #### mm^2 Cl:26.5.2.1
Spacing of # bar 78.54 x 1000 / 327.93 = 239 mm

Check for Spacing

Minimum of 1) 3d = 360 mm IS 456:2000
2) = 300 mm Cl:26.3.3.(b).1
3) = 239.38 mm

Therefore provid # @ **150** mm C/C 150
Provided % of Tension Reinforcement (pt) = **0.436** %

Long Span Direction @ Support

$$Mu/bd = \frac{11.45 \times 10^{6}}{1000 \times \# \times 120} = 0.795$$

Pt = 0.190 % SP16 :1980 Table 2-4

Area of steel = 0.0019 x 1000 x 120 = 228 mm^2 IS 456:2000
Minimum area of 0.001 x 1000 x 150 = #### mm^2 Cl:26.5.2.1
Spacing of # bar 78.54 x 1000 / 228.07 = 344 mm

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TITLE	TWO WAY SLAB DESIGN	REVISION	DATE	CHECKED	DATE

CL. NO.	DESIGN CALCULATIONS	REFERENCES

Check for Spacing

Minimum of 1) 3d = 360 mm — IS 456:2000
2) = 300 mm — Cl:26.3.3.(b).1
3) = 344.20 mm
Therefore provid # @ **300** mm C/C

Long Span Direction @ mid Span

$Mu/bd = \frac{8.66 \times 10 \wedge 6}{1000 \times \# \times 120} = 0.602$

Pt = 0.142 % — SP16 :1980 Table 2-4

Area of steel = 0.0014 x 1000 x 120 = 171 mm^2 — IS 456:2000
Minimum area of 0.001 x 1000 x 150 = #### mm^2 — Cl:26.5.2.1
Spacing of # bar 78.54 x 1000 / 180.00 = 436 mm

Check for Spacing

Minimum of 1) 3d = 360 mm — IS 456:2000
2) = 300 mm — Cl:26.3.3.(b).1
3) = 436.11 mm
Therefore provid # @ **300** mm C/C

1.0.8 **<u>Check for Deflection:</u> (Simplified Approach)**

Basic Span/depth Ratio = 26 — IS 456:2000 Cl:23.2.1
% of Tension Reinforcement provided (p_t) = 0.436 %
Service stress of stee 0.58 fy (Ast_R/Ast_P) = 181.63 N/mm^2 — IS456:2000 Fig 4
Modification Factor for Tension Reinforcen = 1.71 — Page 38
Allowable Span / Effective Depth Ratio = 44.47 — IS 456:2000 Cl:23.2.1
Actual Span/Eff Dept = 5 x 1000 / 120 = 41.67

Hence Safe against Deflection

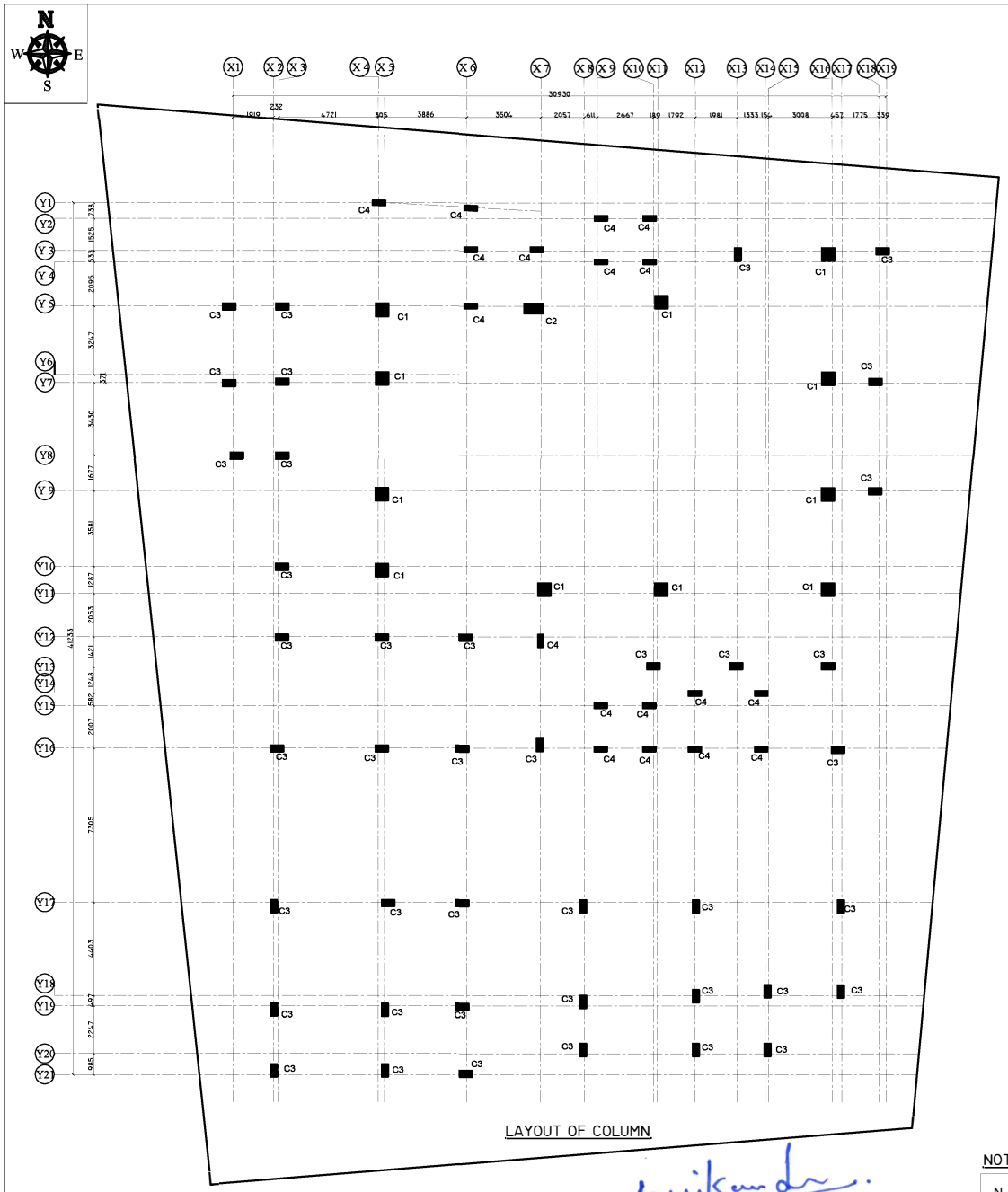
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APPENDIX II

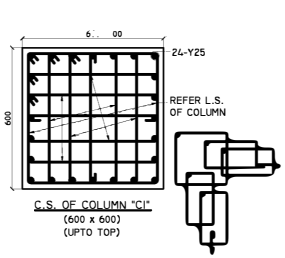
GENERAL ARRANGEMENT DRAWINGS

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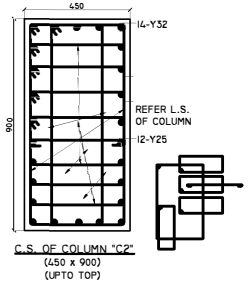
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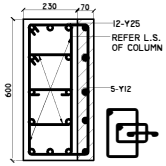
LAYOUT OF COLUMN



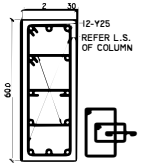
C.S. OF COLUMN "C1"
(600 x 600)
(UPTO TOP)



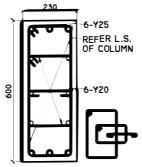
C.S. OF COLUMN "C2"
(450 x 900)
(UPTO TOP)



C.S. OF COLUMN "C3"
(300 x 600)
(UPTO SFR)



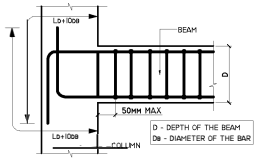
C.S. OF COLUMN "C3"
(230 x 600)
(SFR TO TOP)



C.S. OF COLUMN "C4"
(230 x 600)
(UPTO TOP)

COLUMN SCHEDULE		
S.NO.	NAME	SIZE
1.	C1	600 x 600
2.	C2	450 x 900
3.	C3	300 x 600
4.	C4	230 x 600

FOR APPROVAL ONLY



TYP. EXTERNAL JOINT DETAIL AT BEAM-COLUMN JUNCTION.



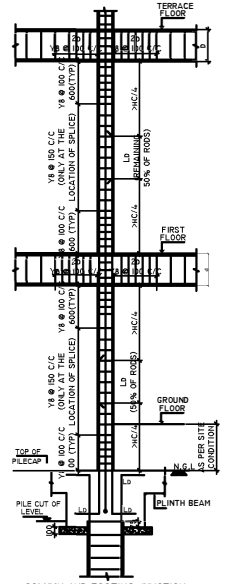
HOOK DETAIL

NOTE:

N.G.L - NATURAL GROUND LEVEL.

WHEREVER LAP SPLICES AND CONFINING TIES ARE NOT REQUIRED, SPACING OF LATERAL TIES SHALL BE Y8 @ 200 C/C.

ALL HOOKS SHOULD BE BENT TO AN ANGLE OF 135° WITH A LENGTH NOT LESS THAN 75 MM



COLUMN AND FOOTING JUNCTION
(ALTERNATE RODS TO BE LAPPED IN ALTERNATE FLOORS)
(AS PER SEISMIC DETAILING CODE IS:13920)

R. Manikandan.

R. MANIKANDAN, M.Tech.,(Structures)
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Ph: 044-48597100 Cell: 9790751378

GENERAL NOTES:.

REMOVAL OF FORMWORK(SHUTTERING) :.

SHUTTERING OF ANY PART OF THE STRUCTURE SHALL NOT BE REMOVED UNTIL THE CONCRETE ATTAINS 70% THE SPECIFIED STRENGTH OF CONCRETE. HOWEVER THE FOLLOWING MINIMUM PERIOD (AFTER FINAL POUR) SHALL BE ALLOWED BEFORE REMOVAL OF SHUTTERING AS PER CLAUSE 11.3.1, IS 456:2000

A) VERTICAL SIDE OF SHUTTERING OF COLUMNS,WALLS

LAP JOINTS FOR REINFORCEMENT BARS :

I) AT ANY CROSS SECTION OF THE MEMBER,NOT MORE THAN 50% THE BARS SHALL BE LAPPED.

II) LAPS SHALL BE STAGGERED WITH A MINIMUM CENTRE TO CENTRE DISTANCE OF1.3 TIMES LAP LENGTH OF THE BAR FOR TENSION & COMPRESSION MEMBERS.

III) DEVELOPMENT LENGTH (Ld) SHALL BE AS PER (SP:34-1999) TABLE BELOW:

A) DEVELOPMENT LENGTH FOR COLUMN BARS -40D

B) DEVELOPMENT LENGTH FOR BEAM BARS -50D

IV) LAPS IN COLUMNS SHALL BE PROVIDED AT MID HEIGHT OF FLOOR AND NOT AT SLAB LEVEL .

VII) DETAILING OF REBARS SHALL CONFIRM TO IBC

EXCAVATION AND BACKFILL.

I) BACKFILL FOR FOUNDATIONS AND PITS SHALL BE PLACED EVENLY LAYERS OF 300 MM THICKNESS AND SHALL BE WELL COMPACTED. THE FILL SHALL CONTAIN NO STONES WITH A DIAMETER GREATER THAN 100 MM. THE DEGREE OF COMPACTION OF BACKFILL SHALL BE 95% OF THE MAXIMUM DRY DENSITY AT OPTIMUM MOISTURE CONTENT OBTAINED BY THE MODIFIED PROCTOR COMPACTION TEST.

II) UNSUITABLE MATERIALS LIKE ROCKS/ EXISTING FOOTINGS ARE DETECTED BELOW FOUNDATION LEVEL IN AREAS OF CUT SHALL BE EXCAVATED TO FIRM GROUND. THE RESULTANT EXCAVATION SHALL BE FILLED TO THE REQUIRED LEVELS WITH MASS CONCRETE GRADE M10. ALSO WHEREVER EXCAVATION OCCURS BELOW THE FOUNDATION LEVEL STATED ON THE DESIGN DRAWING THE RESULTING VOID SHALL BE BACK FILLED WITH MASS CONCRETE GRADE-10.

III) BEFORE CASTING FOUNDATIONS, ANY IMMEDIATE OR ADJACENT AREAS OF DISTURBED OR SOFT SOIL MUST BE REMOVED AND REPLACED WITH MASS CONCRETE OF GRADE 10

IV) A LAYER OF BLINDING CONCRETE 100 MM THICK SHALL BE PLACED UNDER ALL FOUNDATIONS. BLINDING CONCRETE SHALL HAVE A CHARACTERISTIC STRENGTH OF 10 N/MM AT 28 DAYS.

V) EXCAVATED FINE-GRAINED SOIL ENCOUNTERED AT SHALLOW DEPTHS SHALL BE IN NO CASE USED FOR BACK FILLING PURPOSES.

GENERAL NOTES:

1. ALL DIMENSIONS ARE IN MM.
2. CONCRETE GRADE SHALL BE M25 CONFIRMING TO IS 456:2000
3. GRADE OF REINFORCEMENT MARKED THUS (Y) SHALL BE FE 500 CONFIRMING TO IS 1786-2008
4. CLEAR COVER FOR REINFORCEMENT
   A) COLUMN = 40MM
5. THIS DRG. READ IN CONJECTION WITH ARCH.DRGS.
6. COLUMNS AND PILE ARE DESIGNED FOR S+5 FLOOR LOADS
7. STRUCTURAL ENGINEER RESPONSIBILITY IS LIMITED TO DESIGN & ISSUAL OF STRUCTURAL DRAWING ONLY
8. ONUS OF CONSTRUCTION LIES WITH CONTRACTOR/OWNER

REV	DESCRIPTIONS	DRN	CHK	DATE
00	ISSUE FOR APPROVAL	A.P	R.M	27.07.26

PROJECT :-

PLAN SHOWING THE PROPOSED CONSTRUCTION OF STILT FLOOR +2 FLOOR +3RD FLOOR (PART) + 4TH FLOOR +5TH FLOOR, RESIDENTIAL BUILDING (18.30M HEIGHT) WITH 25 DWELLING UNITS AVAILING WITH PREMIUM FSI AT PLOT NO.10, DOOR NO.6, KUSHKUMAR ROAD, NUNGAMBAKKAM, CHENNAI-34 COMPRISED IN R.S. NO. 106/3 (DOCUMENT) R.S.NO.106/25 (PATTA), BLOCK NO.19 OF NUNGAMBAKKAM VILLAGE WITHIN THE LIMIT OF GREATER CHENNAI CORPORATION.

DRAWING TITLE :-

LAYOUT & R.C DETAILS OF COLUMN

DATE	SCALE	JOB.NO	DRG.NO
27.07.26	1 : 140	--------	001

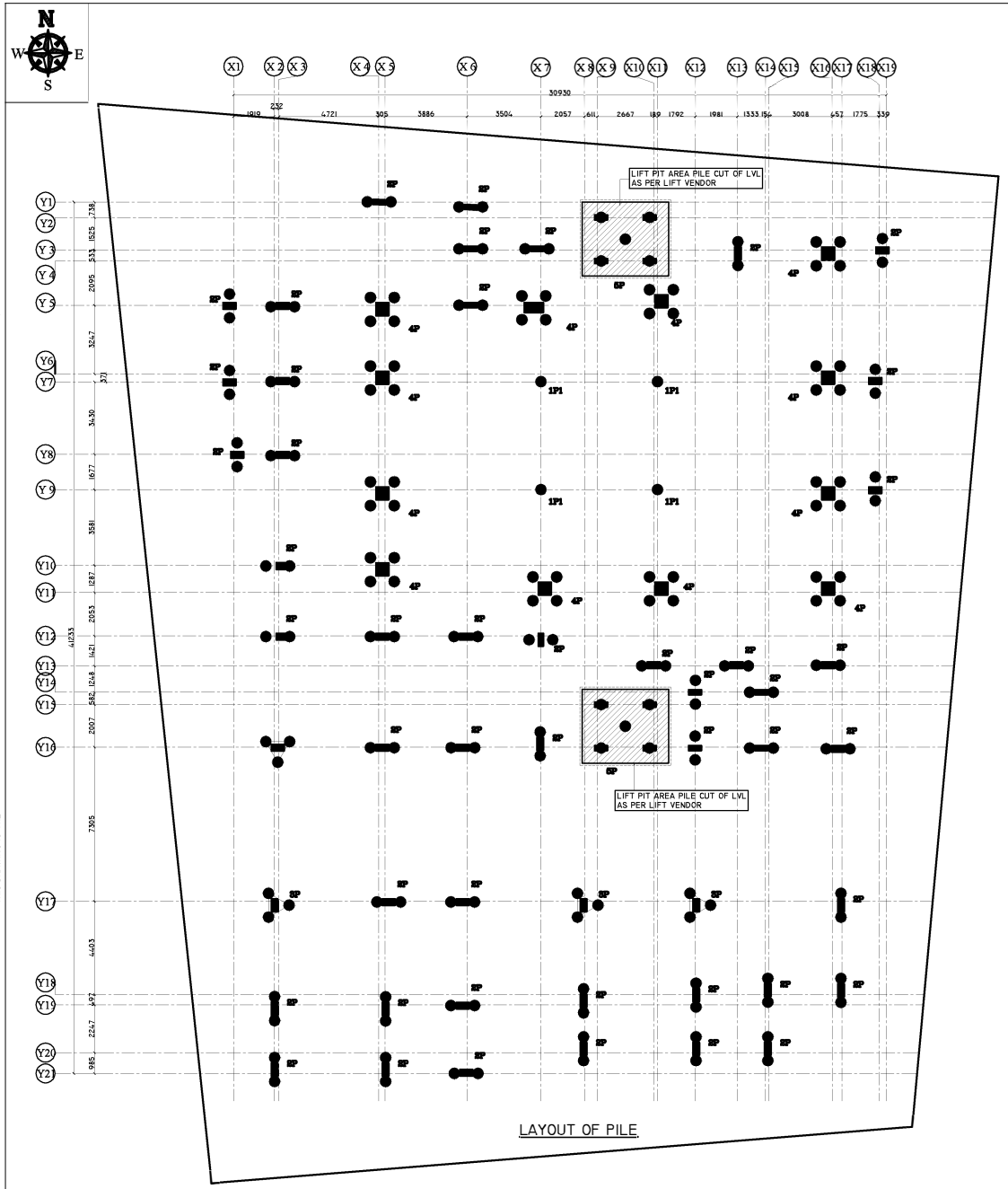
ARCHITECT / CONSULTANTS :-

STRUCTURAL CONSULTANTS :-

AURA ENGINEERING CONSULTANT
#8, 50th St, Sarvamangala Colony, 7th
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Fixed Line :– 044 4859 7100
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http://auraengineers.co.in/
aura
Engineeering Consultants

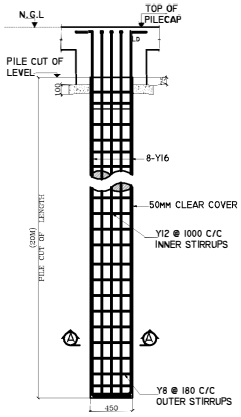
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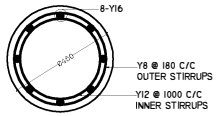


LAYOUT OF PILE

FOR APPROVAL ONLY



L.S OF 450MM DIA. PILE



C.S OF PILE - 450 DIA.
SECTION "A-A"

NOTE:

N.G.L - NATURAL GROUND LEVEL.

MINIMUM M25. THE MINIMUM CEMENT CONTENT SHALL BE 400 KG/M3. HOWEVER WITH PROPER MIX DESIGN AND USE OF PROPER ADMIXTURE THE CEMENT CONTENT MAY BE REDUCED BUT IN NO CASE THE CEMENT CONTENT SHALL BE LESS THAN 350 KG/M3..

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SHUTTERING OF ANY PART OF THE STRUCTURE SHALL NOT BE REMOVED UNTIL THE CONCRETE ATTAINS 70% THE SPECIFIED STRENGTH OF CONCRETE. HOWEVER THE FOLLOWING MINIMUM PERIOD (AFTER FINAL POUR) SHALL BE ALLOWED BEFORE REMOVAL OF SHUTTERING AS PER CLAUSE 11.3.1, IS 456:2000

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II) LAPS SHALL BE STAGGERED WITH A MINIMUM CENTRE TO CENTRE DISTANCE OF1.3 TIMES LAP LENGTH OF THE BAR FOR TENSION & COMPRESSION MEMBERS.

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IV) LAPS IN COLUMNS SHALL BE PROVIDED AT MID HEIGHT OF FLOOR AND NOT AT SLAB LEVEL .

VII) DETAILING OF REBARS SHALL CONFIRM TO IBC

EXCAVATION AND BACKFILL

I) BACKFILL FOR FOUNDATIONS AND PITS SHALL BE PLACED EVENLY LAYERS OF 300 MM THICKNESS AND SHALL BE WELL COMPACTED. THE FILL SHALL CONTAIN NO STONES WITH A DIAMETER GREATER THAN 100 MM. THE DEGREE OF COMPACTION OF BACKFILL SHALL BE 95% OF THE MAXIMUM DRY DENSITY AT OPTIMUM MOISTURE CONTENT OBTAINED BY THE MODIFIED PROCTOR COMPACTION TEST.

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6. ROUTINE TESTS OF 1.5 TIMES DESIGN CAPACITY ON 2 PILES OF 450MM DIA IS TO BE CARRIED OUT.
7. CLEAR COVER TO THE MAIN STEEL
   A) R.C. COLUMN = 40MM B) PILE = 50MM
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REV	DESCRIPTIONS	DRN	CHK	DATE
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DRAWING TITLE :-

LAYOUT & R.C DETAILS OF PILE

DATE	SCALE	JOB.NO	DRG.NO
27.07.26	1 : 140	--------	002

ARCHITECT / CONSULTANTS :-

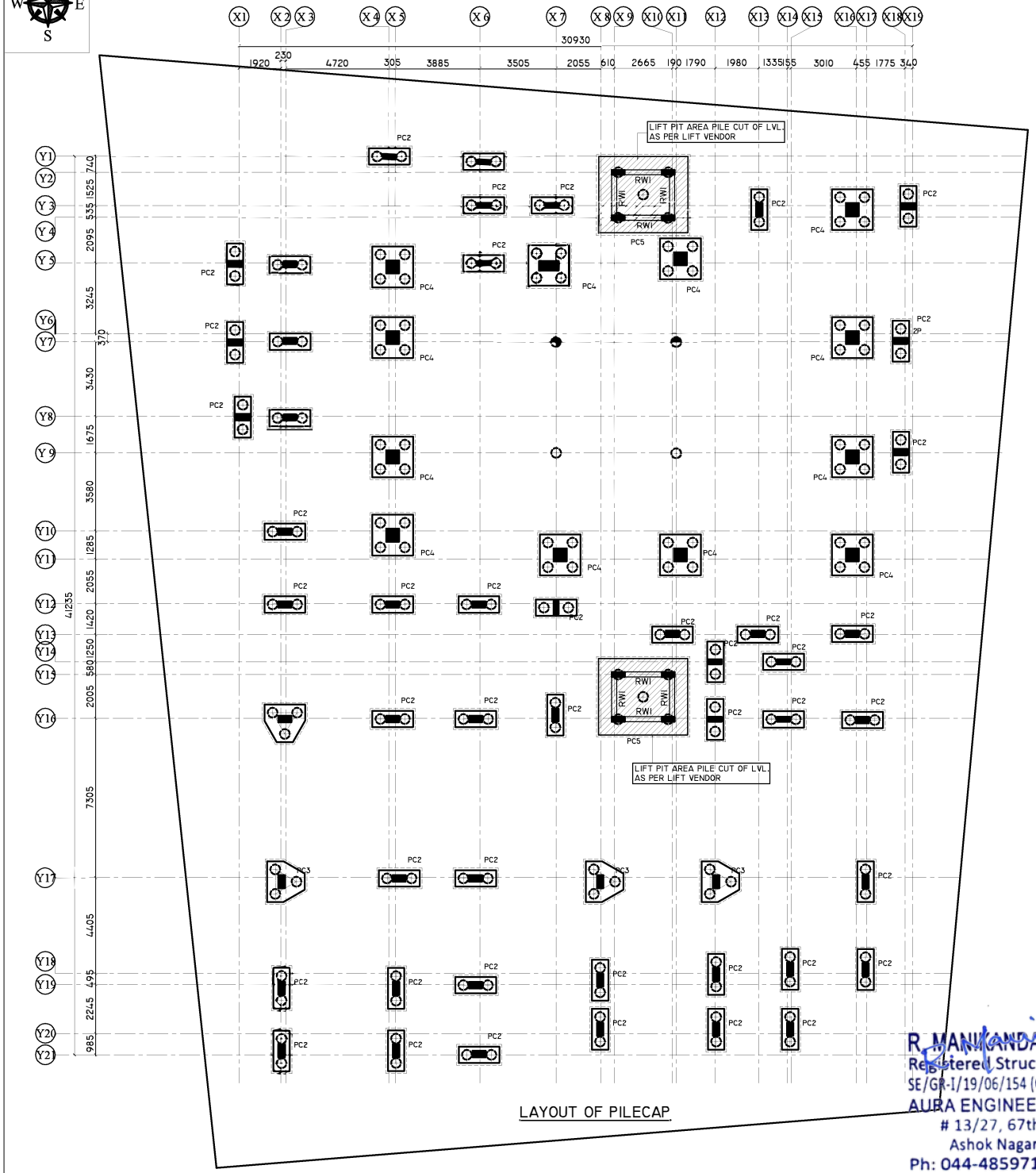
STRUCTURAL CONSULTANTS :-

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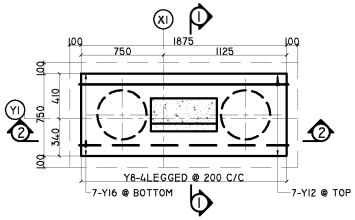
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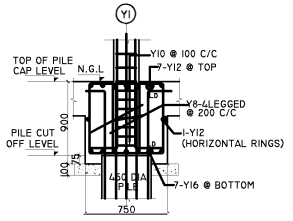
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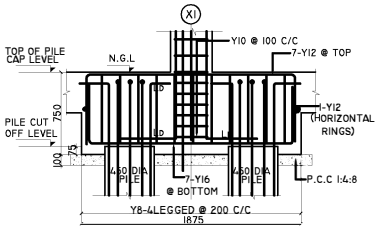
LAYOUT OF PILECAP



PLAN OF PILECAP "PC2"
(1875 X 750 X 750)

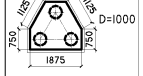


SECTION "1-1"



SECTION "2-2"

PILECAP SCHEDULE:

S.NO.	NAME	SIZE
01.	PC2	1875 X 750 X 900
02.	PC3	
03.	PC4	1875 X 1875 X 1200
04.	PC5	4500 X 3500 X 1200

NOTE:
N.G.L - NATURAL GROUND LEVEL.
F.F.L - FLOOR FINISH LEVEL.

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REV.	DESCRIPTIONS	DRN	CHK	DATE
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DRAWING TITLE :-

LAYOUT OF PILECAP

DATE	SCALE	JOB.NO	DRG.NO
27.07.26	1 : 140	--------	003

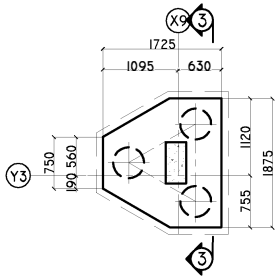
ARCHITECT / CONSULTANTS :-

STRUCTURAL CONSULTANTS :-

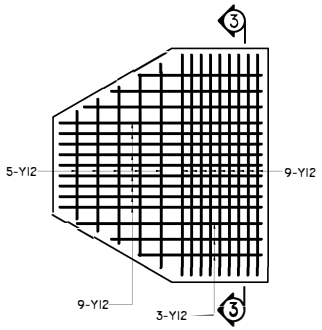
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A2

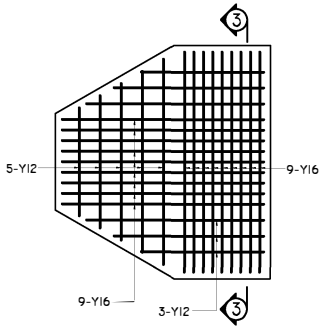
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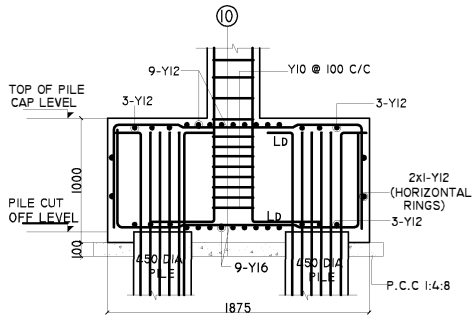
PLAN OF PILECAP "PC3"



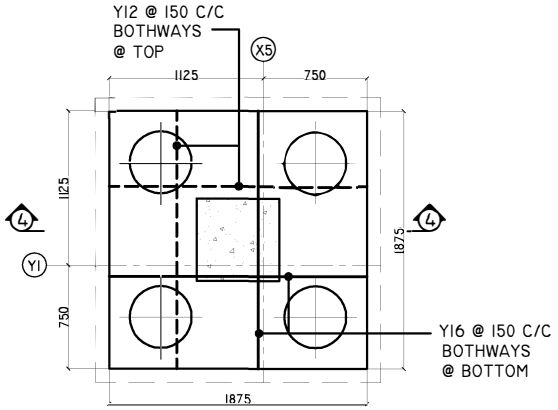
TOP STEEL OF PILECAP - "PC3"



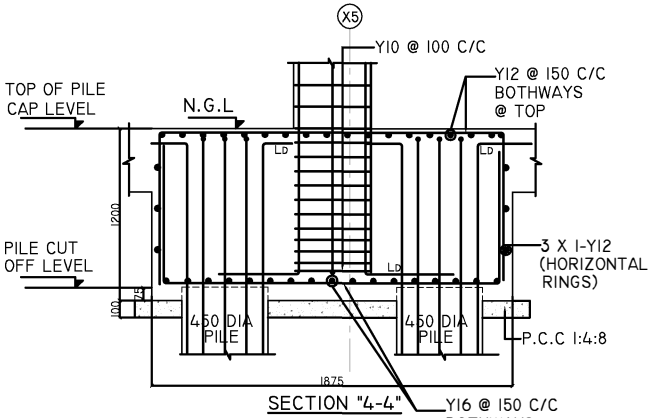
BOTTOM STEEL OF PILECAP - "PC3"



SECTION "3-3"



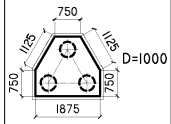
PLAN OF PILECAP "PC4"
(1875 X 1875 X 750)

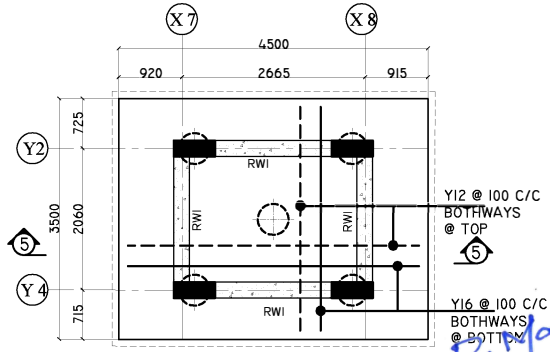


SECTION "4-4"

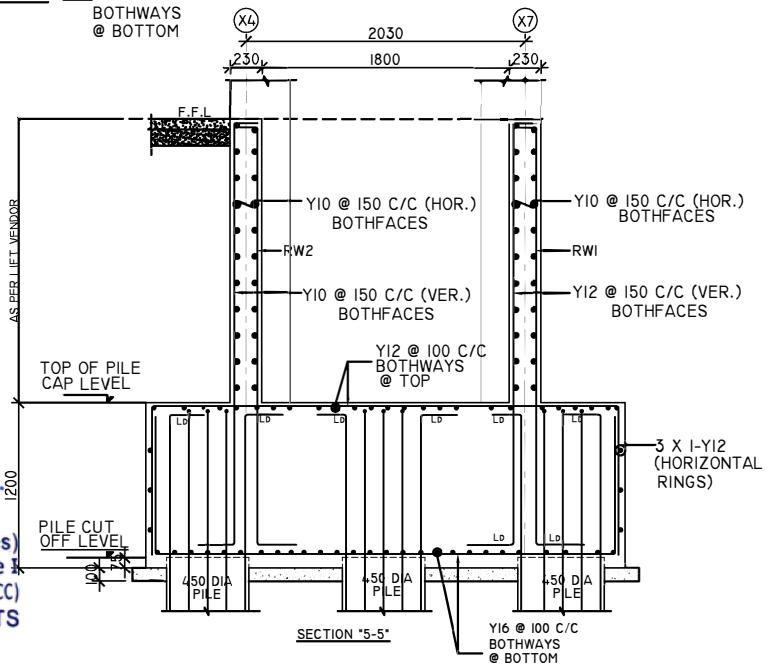
Y16 @ 150 C/C BOTHWAYS @ BOTTOM

PILECAP SCHEDULE:

S.NO.	NAME	SIZE
01.	PC2	1875 X 750 X 900
02.	PC3	
03.	PC4	1875 X 1875 X 1200
04.	PC5	4500 X 3500 X 1200



PLAN OF PILECAP "PC5"



SECTION "5-5"

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II) UNSUITABLE MATERIALS LIKE ROCKS/ EXISTING FOOTINGS ARE DETECTED BELOW FOUNDATION LEVEL IN AREAS OF CUT SHALL BE EXCAVATED TO FIRM GROUND. THE RESULTANT EXCAVATION SHALL BE FILLED TO THE REQUIRED LEVELS WITH MASS CONCRETE GRADE M10. ALSO WHEREVER EXCAVATION OCCURS BELOW THE FOUNDATION LEVEL STATED ON THE DESIGN DRAWING THE RESULTING VOID SHALL BE BACK FILLED WITH MASS CONCRETE GRADE-10.

III) BEFORE CASTING FOUNDATIONS, ANY IMMEDIATE OR ADJACENT AREAS OF DISTURBED OR SOFT SOIL MUST BE REMOVED AND REPLACED WITH MASS CONCRETE OF GRADE 10

IV) A LAYER OF BLINDING CONCRETE 100 MM THICK SHALL BE PLACED UNDER ALL FOUNDATIONS. BLINDING CONCRETE SHALL HAVE A CHARACTERISTIC STRENGTH OF 10 N/MM AT 28 DAYS.

GENERAL NOTES:

1. ALL DIMENSIONS ARE IN MM.
2. CONCRETE GRADE SHALL BE M25 CONFIRMING TO IS 456:2000
3. GRADE OF REINFORCEMENT MARKED THUS (Y) SHALL BE Fe 500 CONFIRMING TO IS 1786-1985
5. PILE, PILECAP & COLUMNS ARE DESIGNED FOR S+5 FLOORS LOAD ONLY.
6. ROUTINE TESTS OF 1.5 TIMES DESIGN CAPACITY ON 2 PILES OF 450MM DIA IS TO BE CARRIED OUT.
7. CLEAR COVER TO THE MAIN STEEL
   A) R.C. COLUMN = 40MM
   C) PILECAP BOTTOM = 75MM B) PILE = 50MM
   D) RETAINING WALLS & TOP = 50MM
8. THIS DRG. READ IN CONJECTION WITH ARCHITECTURAL DRGS.
9. STRUCTURAL ENGINEER RESPONSIBILITY IS LIMITED TO DESIGN & ISSUAL OF STRUCTURAL DRAWING ONLY
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REV.	DESCRIPTIONS	DRN	CHK	DATE
00	ISSUE FOR APPROVAL	A.P	R.M	27.07.26

PROJECT :-

PLAN SHOWING THE PROPOSED CONSTRUCTION OF STILT FLOOR +2 FLOOR +3RD FLOOR (PART) + 4TH FLOOR +5TH FLOOR, RESIDENTIAL BUILDING (18.30M HEIGHT) WITH 25 DWELLING UNITS AVAILING WITH PREMIUM FSI AT PLOT NO.10, DOOR NO.6, KUSHKUMAR ROAD, NUNGAMBAKKAM, CHENNAI-34 COMPRISED IN R.S. NO. 106/3 (DOCUMENT) R.S.NO.106/25 (PATTA), BLOCK NO.19 OF NUNGAMBAKKAM VILLAGE WITHIN THE LIMIT OF GREATER CHENNAI CORPORATION.

DRAWING TITLE :-

R.C DETAILS OF PILE CAP

DATE	SCALE	JOB.NO	DRG.NO
27.07.26	1 : 150	---------	003A

ARCHITECT / CONSULTANTS :-

STRUCTURAL CONSULTANTS :-

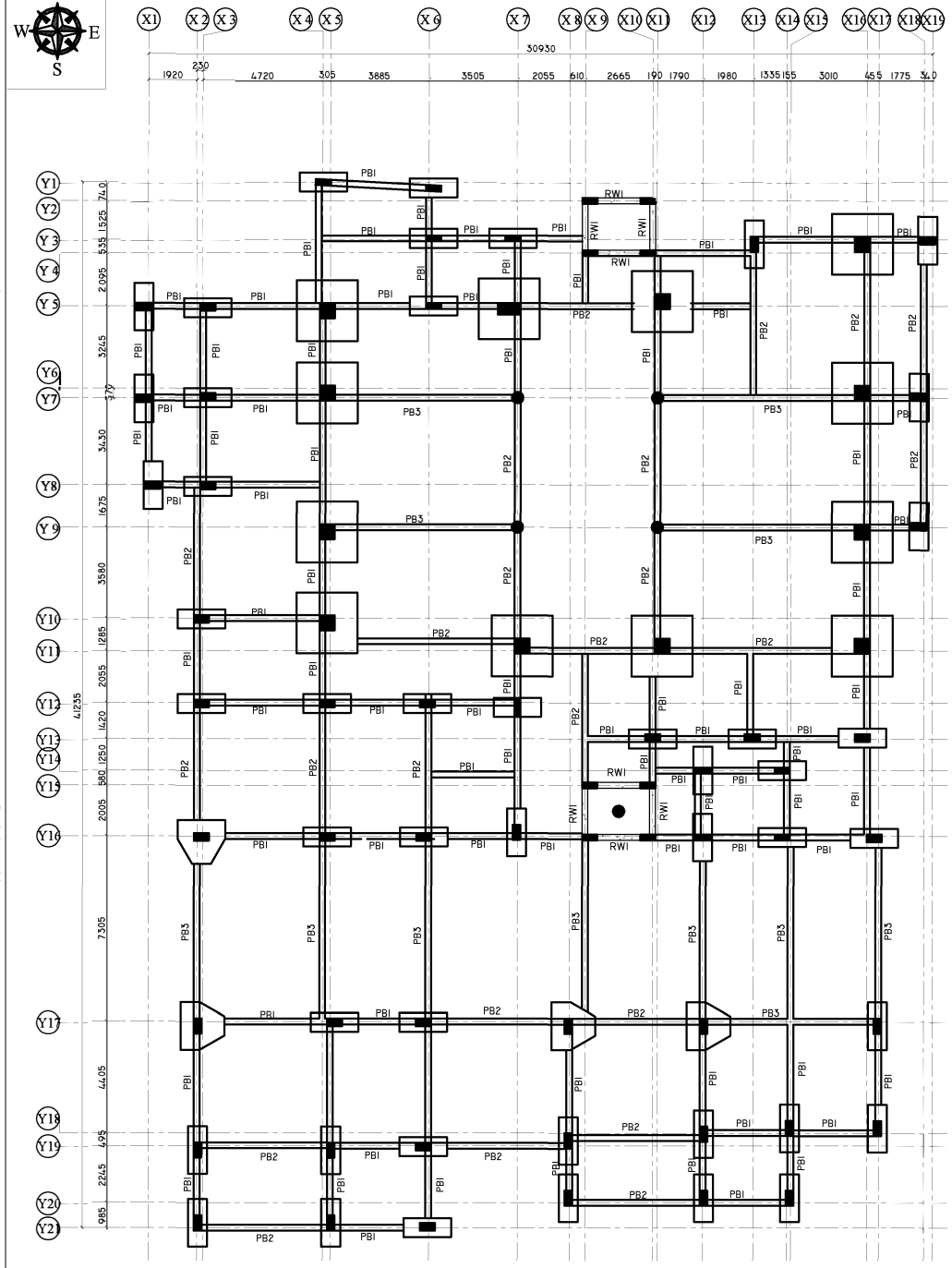
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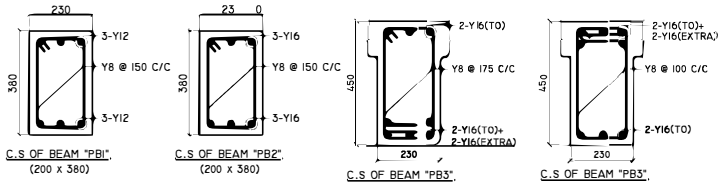
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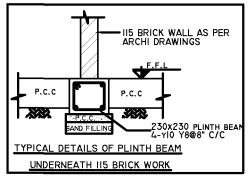
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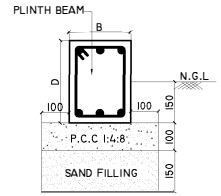
LAYOUT OF PLINTH BEAM



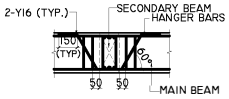
BEAM SCHEDULE		
SL.NO	NAME	SIZE
01	PBI	230 x 380
02	PB2	230 x 380
03	PB3	230 x 450



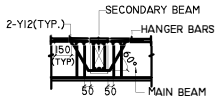
TYPICAL DETAILS OF PLINTH BEAM UNDERNEATH 115 BRICK WORK.



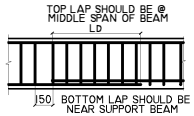
TYPICAL DETAIL OF PLINTH BEAM.



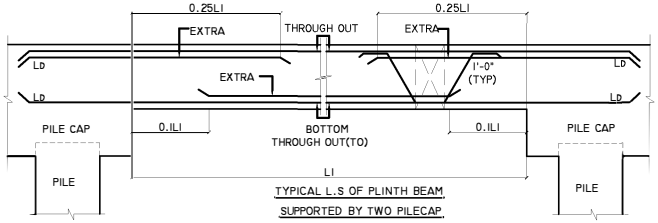
TYP. DET. OF HANGER BARS IN MAIN BEAM AT SECONDARY BEAM JUNCTION.



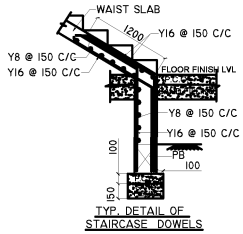
TYP. DET. OF HANGER BARS IN MAIN BEAM AT SECONDARY BEAM JUNCTION. (VARY DEPTH)



TYP. LAP SPLICE IN BEAM



TYPICAL L.S OF PLINTH BEAM SUPPORTED BY TWO PILECAP.



TYP. DETAIL OF STAIRCASE DOWELS

NOTE:

N.G.L - NATURAL GROUND LEVEL.

F.F.L - FINISHED FLOOR LEVEL

GENERAL NOTES:.

REMOVAL OF FORMWORK(SHUTTERING) :.

SHUTTERING OF ANY PART OF THE STRUCTURE SHALL NOT BE REMOVED UNTIL THE CONCRETE ATTAINS 70% THE SPECIFIED STRENGTH OF CONCRETE. HOWEVER THE FOLLOWING MINIMUM PERIOD (AFTER FINAL POUR) SHALL BE ALLOWED BEFORE REMOVAL OF SHUTTERING AS PER CLAUSE 11.3.1, IS 456:2000

A) VERTICAL SIDE OF SHUTTERING OF COLUMNS,WALLS

LAP JOINTS FOR REINFORCEMENT BARS :.

I) AT ANY CROSS SECTION OF THE MEMBER,NOT MORE THAN 50% THE BARS SHALL BE LAPPED.

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A) DEVELOPMENT LENGTH FOR COLUMN BARS -40D

B) DEVELOPMENT LENGTH FOR BEAM BARS -50D

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VII) DETAILING OF REBARS SHALL CONFIRM TO IBC

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DRAWING TITLE :-

LAYOUT & R.C DETAILS OF PLINTH BEAM

DATE	SCALE	JOB.NO	DRG.NO
27.07.26	1 : 140	--------	004

ARCHITECT / CONSULTANTS :-

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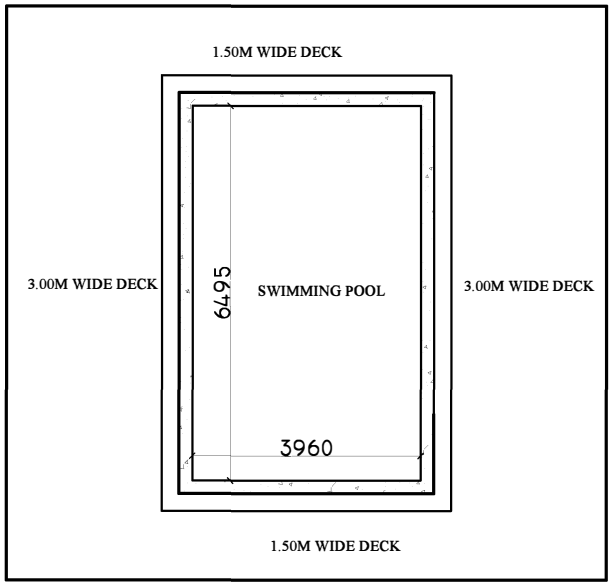
STRUCTURAL CONSULTANTS :-

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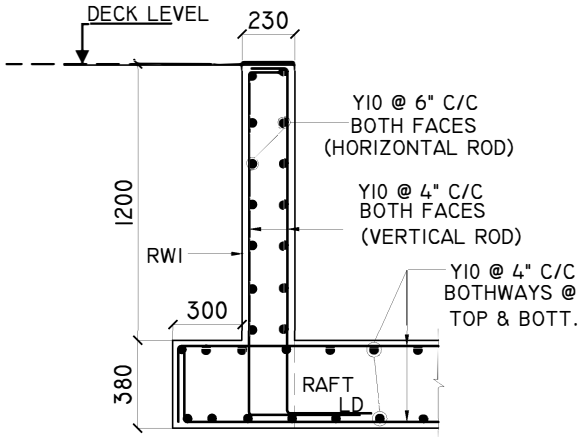
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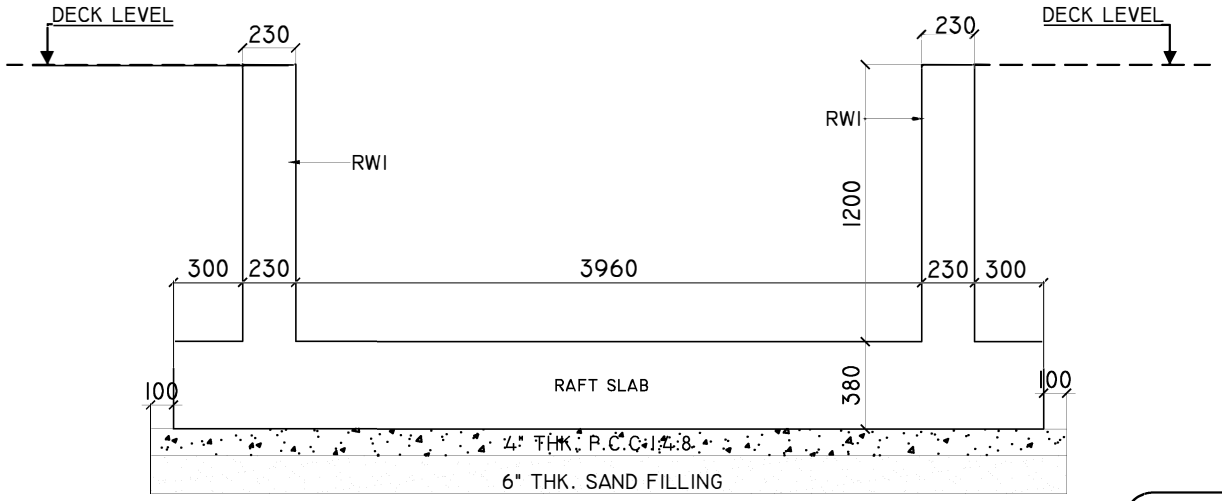
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SWIMMING POOL PLAN



C.S OF R.C WALL - "RWI"



SECTION "I-I"

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DRAWING TITLE :-

LAYOUT & R.C DETAILS OF SWIMMING POOL

DATE	SCALE	JOB.NO	DRG.NO
27.07.26	1 : 140	--------	004A

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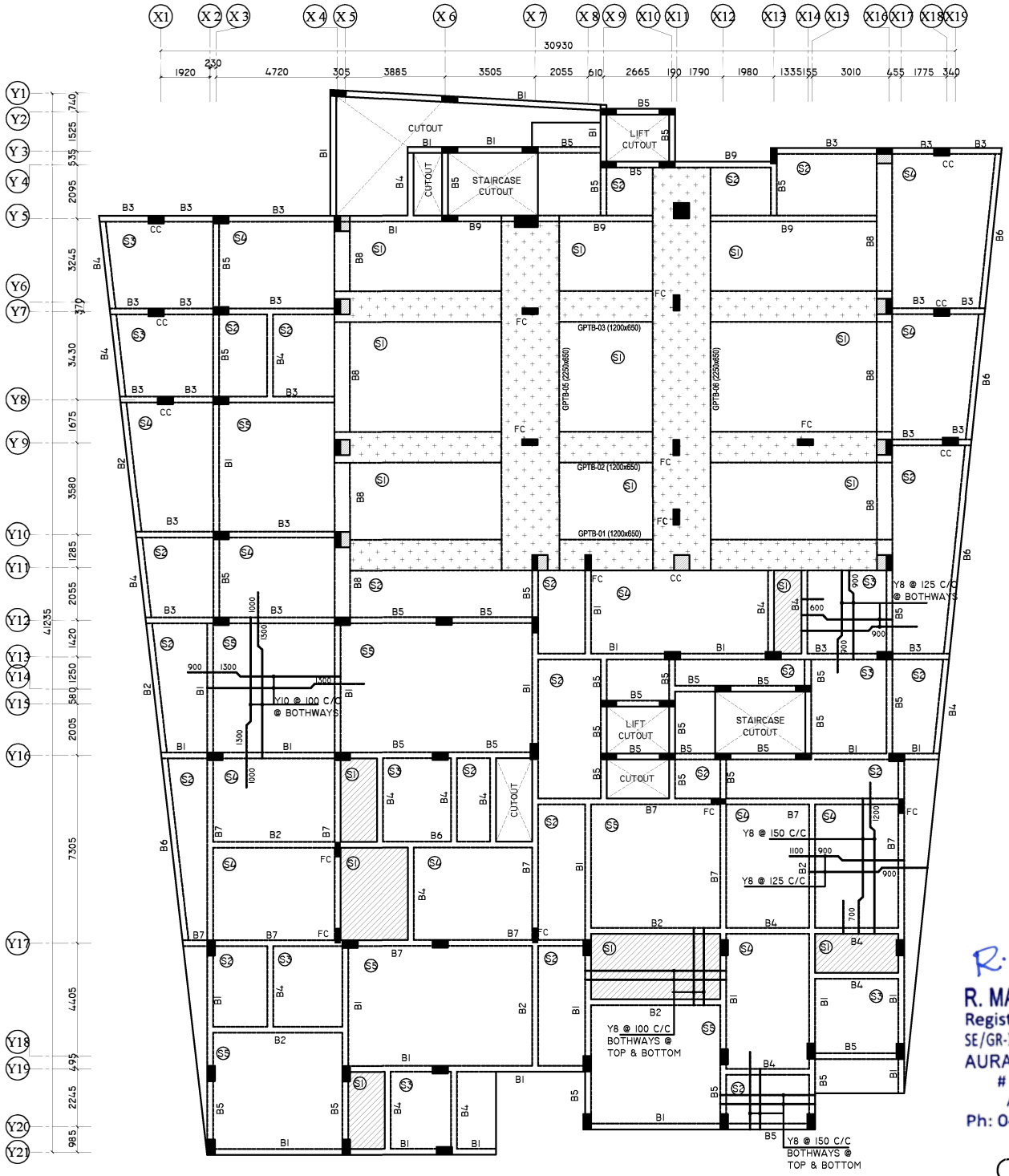
ARCHITECT / CONSULTANTS :-

STRUCTURAL CONSULTANTS :-

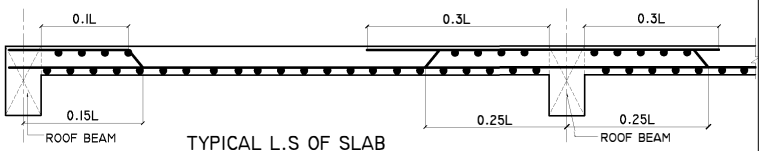
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LAYOUT OF GROUND FLOOR ROOF SLABS & BEAMS



TYPICAL L.S OF SLAB

BEAM SCHEDULE

SL.NO	NAME	SIZE
01	B1	230 X 450
02	B2	230 X 450
03	B3	230 X 600
04	B4	230 X 380
05	B5	230 X 380
06	B6	230 X 600
07	B7	230 X 600
08	B8	600 X 750
09	B9	230 X 750

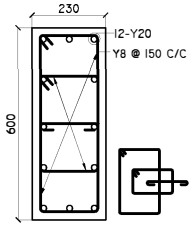
SLAB SCHEDULE

SL.NO	NAME	THICK
01	S1	125MM THK.
02	S2	125MM THK.
03	S3	125MM THK.
04	S4	125MM THK.
05	S5	180MM THK.

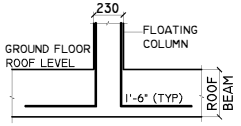
NOTE:

PROVIDE Y8 @ 200 C/C AS DISTRIBUTORS WHERE EVER REQUIRED

FOR BEAM REINFORCEMENT DETAILS REFER DWG.NO : 006



C.S. OF COLUMN "FC"
(230 x 600)
(UPTO TOP)



TYPICAL FLOATING COLUMN DETAIL

GENERAL NOTES:

1. ALL DIMENSIONS ARE IN MM UNITS.
2. CONCRETE GRADE SHALL BE M25 CONFIRMING TO IS 456:2000
3. GRADE OF REINFORCEMENT MARKED THUS (Y) SHALL BE Fe 500 CONFIRMING TO IS 1786-2008
4. CLEAR COVER FOR REINFORCEMENT
   a) COLUMN = 40MM b) BEAM = 30MM
   c) SLAB = 25MM
5. THIS DRG. READ IN CONJECTION WITH ARCH.DRGS.
6. STRUCTURAL ENGINEER RESPONSIBILITY IS LIMITED TO DESIGN & ISSUAL OF STRUCTURAL DRAWING ONLY
7. DEVELOPMENT LENGTH (Ld) SHALL BE AS PER (SP:34-1999) TABLE BELOW:

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REV	DESCRIPTIONS	DRN	CHK	DATE
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DRAWING TITLE :-

LAYOUT & R.C. DETAILS OF GROUND FLOOR ROOF BEAMS & SLAB

DATE	SCALE	JOB.NO	DRG.NO
27.07.26	1 : 140	---------	005

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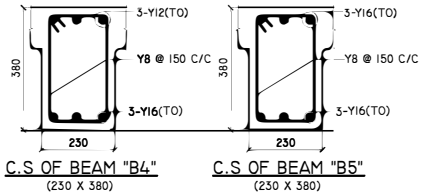
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NAME	MID SPAN	END SUPPORT
B1 (230 X 450)	3-Y16(TO); Y8 @ 175 C/C; 3-Y16(TO)+ 2-Y16(EXTRA); 450; 230	3-Y16(TO)+ 2-Y16(EXTRA); Y8 @ 100 C/C; 3-Y16(TO); 450; 230
B2 (230 X 450)	3-Y16(TO); Y8 @ 175 C/C; 2-Y16(TO)+ 2-Y16(EXTRA); 450; 230	3-Y16(TO); Y8 @ 100 C/C; 2-Y16(TO); 450; 230
B3 (230 X 600)	3-Y25(TO); Y10 @ 175 C/C; 3-Y25(TO); 600; 230	3-Y25(TO)+ 3-Y20(EXTRA); Y10 @ 100 C/C; 3-Y25(TO); 600; 230
B6 (230 X 600)	3-Y16(TO); Y8 @ 175 C/C; 3-Y16(TO)+ 2-Y20(EXTRA); 600; 230	3-Y16(TO); Y8 @ 100 C/C; 3-Y16(TO); 600; 230
B7 (230 X 600)	3-Y25(TO); Y10 @ 175 C/C; 3-Y25(TO)+ 3-Y25(EXTRA); 600; 230	3-Y25(TO)+ 3-Y25(EXTRA); Y10 @ 100 C/C; 3-Y25(TO); 600; 230

NAME	MID SPAN	END SUPPORT
B8 (600 X 750)	6-Y32(TO); Y10 @ 4 LEGGED 180 C/C; 2-Y12(TO); 6-Y32(TO) 6-Y25(EXTRA); 750; 600	6-Y32(TO) 6-Y25(EXTRA); Y10 @ 4 LEGGED 180 C/C; 2-Y12(TO); 6-Y32(TO); 750; 600
B9 (230 X 750)	3-Y25(TO); Y10 @ 175 C/C; 2-Y12(TO); 3-Y25(TO)+ 3-Y25(EXTRA); 750; 230	3-Y25(TO)+ 3-Y25(EXTRA); Y10 @ 100 C/C; 2-Y12(TO); 3-Y25(TO); 750; 230

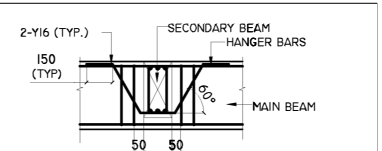


C.S OF BEAM "B4" (230 X 380)

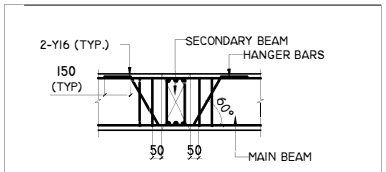
C.S OF BEAM "B5" (230 X 380)

BEAM SCHEDULE

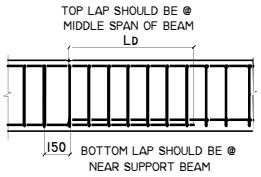
SL.NO	NAME	SIZE
01	B1	230 X 450
02	B2	230 X 450
03	B3	230 X 600
04	B4	230 X 380
05	B5	230 X 380
06	B6	230 X 600
07	B7	230 X 600
08	B8	600 X 750
09	B9	230 X 750



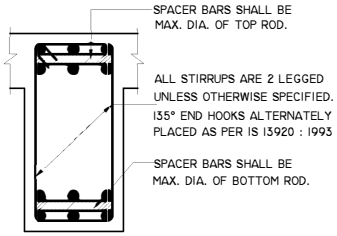
TYP. DET. OF HANGER BARS IN MAIN BEAM AT SECONDARY BEAM JUNCTION (VARY DEPTH)



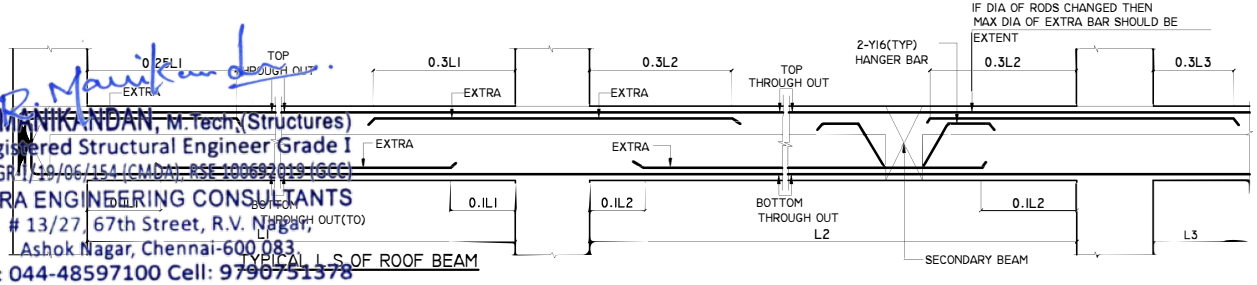
TYP. DET. OF HANGER BARS IN MAIN BEAM AT SECONDARY BEAM JUNCTION



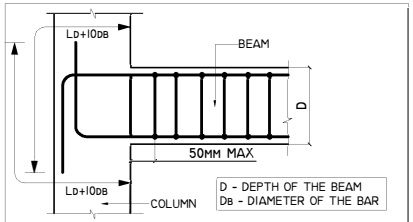
TYP. LAP SPLICE IN BEAM



TYP. DETAIL



TYPICAL L.S OF ROOF BEAM



TYP. EXTERNAL JOINT DETAIL AT BEAM-COLUMN JUNCTION

GENERAL NOTES:

REMOVAL OF FORMWORK(SHUTTERING) :

THE FOLLOWING MINIMUM PERIOD (AFTER FINAL POUR) SHALL BE ALLOWED BEFORE REMOVAL OF SHUTTERING AS PER CLAUSE 11.3.1 OF IS456 : 2000

A. VERTICAL SIDE OF SHUTTERING OF COLUMNS, WALLS AND & BEAMS ----------24 HOURS.

B. BOTTOM SHUTTERING OF SLABS (KEEP THE PROPS UNDER) ----------3 DAYS.

C. BOTTOM SHUTTERING OF BEAMS (KEEP THE PROPS UNDER) ----------7 DAYS.

D. BOTTOM PROPS TO SLAB
I) SPANNING UP TO 4.50M ----------7 DAYS.
II) SPANNING OVER 4.50M ----------14 DAYS.

E. BOTTOM PROPS TO BEAMS
I) SPANNING UP TO 6.00M ----------14 DAYS.
II) SPANNING OVER 6.00M ----------21DAYS.

LAP JOINTS FOR REINFORCEMENT BARS:

I). AT ANY CROSS SECTION OF A MEMBER NOT MORE THAN 50% OF THE BARS SHALL BE LAPPED.

II). LAPS SHALL BE STAGGERED WITH A MINIMUM CENTRE TO CENTRE DISTANCE OF 1.3 TIMES THE LAP LENGTH OF THE BAR FOR TENSION AND COMPRESSION MEMBERS.

III). LAPS IN COLUMNS SHALL BE PROVIDED AT MID HEIGHT OF FLOOR AND NOT AT SLAB LEVEL.

IV). LAPS IN BEAM AND SLAB SHALL BE PROVIDED AT THE POINT OF CONTRAFLEXURE.

V). WELDING OF BARS SHALL BE DONE AS A STITCH WELD FOR 5 TIMES THE DIAMETER OF BAR AND A GAP OF 5 TIMES OF BAR AND AGAIN WELDING FOR ANOTHER 5 TIMES DIAMETER OF BAR USING ARC WELDING AND SPECIAL ELECTRODES AFTER GETTING PRIOR WRITTEN APPROVAL FROM THE STRUCTURAL CONSULTANT.

VI). DETAILING OF REBARS SHALL CONFIRM TO SP-34 & IS 13920.

GENERAL NOTES:

1. ALL DIMENSIONS ARE IN MM UNITS.
2. CONCRETE GRADE SHALL BE M25 CONFIRMING TO IS 456:2000
3. GRADE OF REINFORCEMENT MARKED THUS (Y) SHALL BE Fe 500 CONFIRMING TO IS 1786-2008
4. CLEAR COVER FOR REINFORCEMENT
   a) COLUMN = 40MM b) BEAM = 30MM
   c) SLAB = 25MM
5. THIS DRG. READ IN CONJECTION WITH ARCH.DRGS.
6. STRUCTURAL ENGINEER RESPONSIBILITY IS LIMITED TO DESIGN & ISSUAL OF STRUCTURAL DRAWING ONLY
7. DEVELOPMENT LENGTH (Ld) SHALL BE AS PER (SP:34-1999) TABLE BELOW:

DEVELOPMENT LENGTH FOR COLUMNS	= 40D
DEVELOPMENT LENGTH FOR BEAMS	= 50D

REV	DESCRIPTIONS	DRN	CHK	DATE
00	ISSUE FOR APPROVAL	A.P	R.M	27.07.26

PROJECT :-

PLAN SHOWING THE PROPOSED CONSTRUCTION OF STILT FLOOR +2 FLOOR +3RD FLOOR (PART) + 4TH FLOOR +5TH FLOOR, RESIDENTIAL BUILDING (18.30M HEIGHT) WITH 25 DWELLING UNITS AVAILING WITH PREMIUM FSI AT PLOT NO.10, DOORNO.6, KUSHKUMAR ROAD, NUNGAMBAKKAM, CHENNAI-34 COMPRISED IN R.S. NO. 106/3 (DOCUMENT) R.S.NO.106/25 (PATTA), BLOCK NO.19 OF NUNGAMBAKKAM VILLAGE WITHIN THE LIMIT OF GREATER CHENNAI CORPORATION.

DRAWING TITLE :-

R.C. DETAILS OF GROUND FLOOR ROOF BEAMS

DATE	SCALE	JOB.NO	DRG.NO
27.07.26	1 : 140	--------	006

ARCHITECT / CONSULTANTS :-

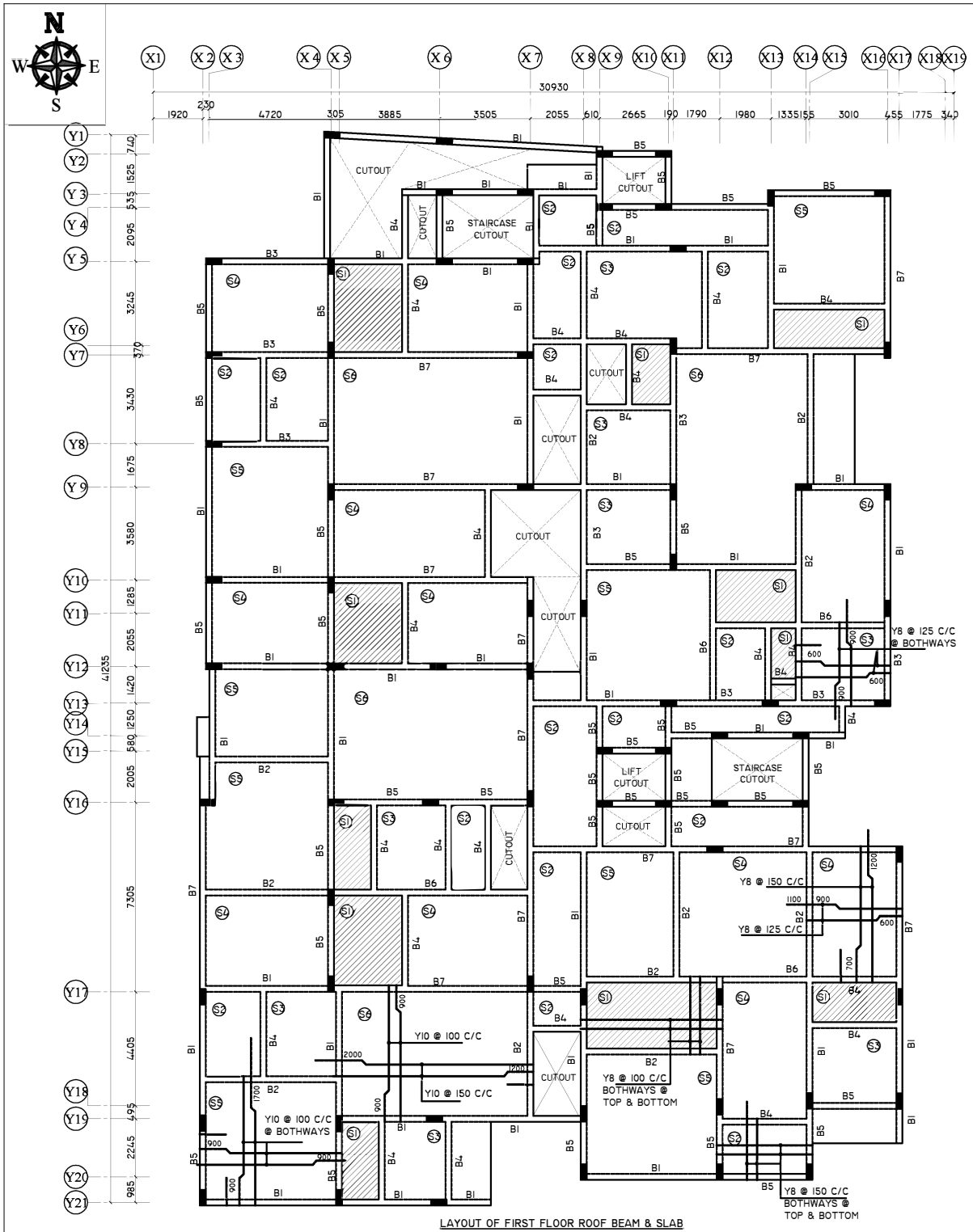
STRUCTURAL CONSULTANTS :-

R. MANIKANDAN, M.Tech.(Structures)
Registered Structural Engineer Grade I
SE/GR1/19/06/154 (CMDA) RSE 100693019 (GCC)
AURA ENGINEERING CONSULTANTS
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Ashok Nagar, Chennai-600 083.
Ph: 044-48597100 Cell: 9790751378

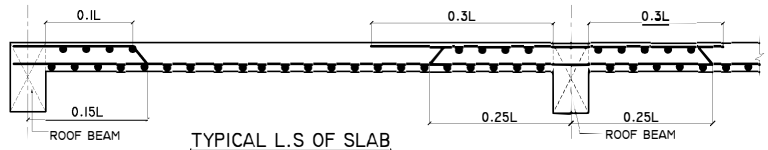
AURA ENGINEERING CONSULTANTS
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ASHOK NAGAR, CHENNAI– 600 083.
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Engineering Consultants

A2

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LAYOUT OF FIRST FLOOR ROOF BEAM & SLAB



TYPICAL L.S OF SLAB

BEAM SCHEDULE

SL.NO	NAME	SIZE
01	B1	230 X 450
02	B2	230 X 450
03	B3	230 X 600
04	B4	230 X 380
05	B5	230 X 380
06	B6	230 X 450
07	B7	230 X 600

SLAB SCHEDULE

SL.NO	NAME	THICK
01	S1	125MM THK.
02	S2	125MM THK.
03	S3	125MM THK.
04	S4	125MM THK.
05	S5	180MM THK.
06	S6	180MM THK.

NOTE:

PROVIDE Y8 @ 200 C/C AS DISTRIBUTORS WHERE EVER REQUIRED

FOR BEAM REINFORCEMENT DETAILS REFER DWG.NO : 008

GENERAL NOTES:

1. ALL DIMENSIONS ARE IN MM UNITS.
2. CONCRETE GRADE SHALL BE M25 CONFIRMING TO IS 456:2000
3. GRADE OF REINFORCEMENT MARKED THUS (Y) SHALL BE Fe 500 CONFIRMING TO IS 1786-2008
4. CLEAR COVER FOR REINFORCEMENT
   a) COLUMN = 40MM b) BEAM = 30MM
   c) SLAB = 25MM
5. THIS DRG. READ IN CONJECTION WITH ARCH.DRGS.
6. STRUCTURAL ENGINEER RESPONSIBILITY IS LIMITED TO DESIGN & ISSUAL OF STRUCTURAL DRAWING ONLY
7. DEVELOPMENT LENGTH (Ld) SHALL BE AS PER (SP:34-1999) TABLE BELOW:

DEVELOPMENT LENGTH FOR COLUMNS	= 40D
DEVELOPMENT LENGTH FOR BEAMS	= 50D

REV.	DESCRIPTIONS	DRN	CHK	DATE
00	ISSUE FOR APPROVAL	A.P	R.M	27.07.26

PROJECT :-

PLAN SHOWING THE PROPOSED CONSTRUCTION OF STILT FLOOR +2 FLOOR +3RD FLOOR (PART) + 4TH FLOOR +5TH FLOOR, RESIDENTIAL BUILDING (18.30M HEIGHT) WITH 25 DWELLING UNITS AVAILING WITH PREMIUM FSI AT PLOT NO.10, DOOR NO.6, KUSHKUMARROAD, NUNGAMBAKKAM, CHENNAI-34 COMPRISED IN R.S. NO. 106/3 (DOCUMENT) R.S.NO.106/25 (PATTA), BLOCKNO.19 OF NUNGAMBAKKAM VILLAGE WITHIN THE LIMIT OF GREATER CHENNAI CORPORATION.

DRAWING TITLE :-

LAYOUT & R.C. DETAILS OF FIRST FLOOR ROOF BEAMS & SLAB

DATE	SCALE	JOB.NO	DRG.NO
27.07.26	1 : 140	--------	007

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Ph: 044-48597100 Cell: 9790751378

FOR APPROVAL ONLY

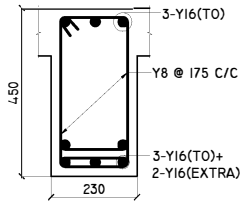
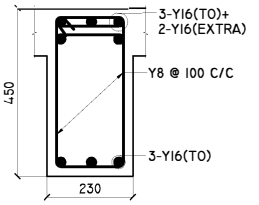
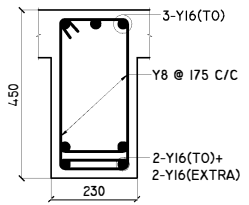
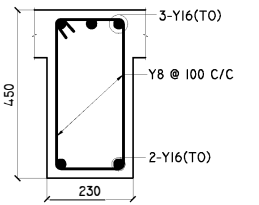
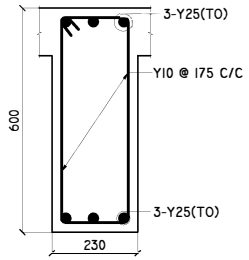
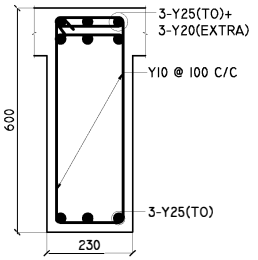
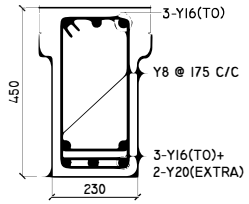
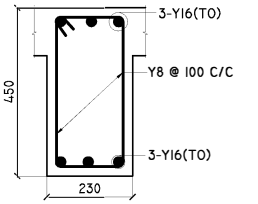
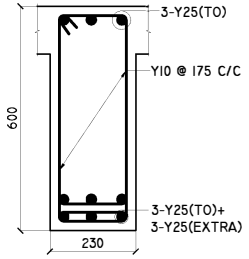
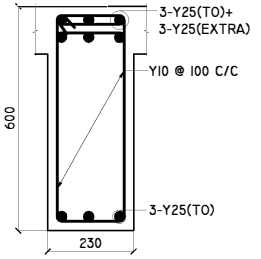
ARCHITECT / CONSULTANTS :-

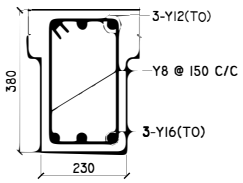
STRUCTURAL CONSULTANTS :-

AURA ENGINEERING CONSULTANT
#8, 50th St, Sarvamangala Colony, 7th
ASHOK NAGAR, CHENNAI– 600 083.
Fixed Line :– 044 4859 7100
projects.auraengg@gmail.com
projects@auraengineers.co.in
http://auraengineers.co.in/
aura Engineeering Consultants

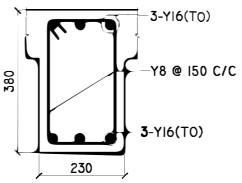
A2

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NAME	MID SPAN	END SUPPORT
B1 (230 X 450)		
B2 (230 X 450)		
B3 (230 X 600)		
B6 (230 X 450)		
B7 (230 X 600)		



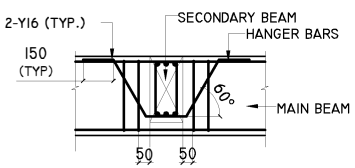
C.S OF BEAM "B4"
(230 X 380)



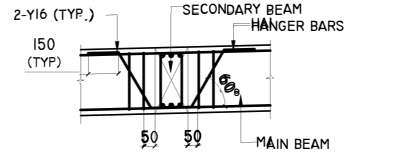
C.S OF BEAM "B5"
(230 X 380)

BEAM SCHEDULE

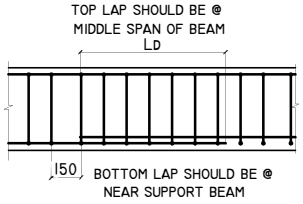
SL.NO	NAME	SIZE
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02	B2	230 X 450
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07	B7	230 X 600



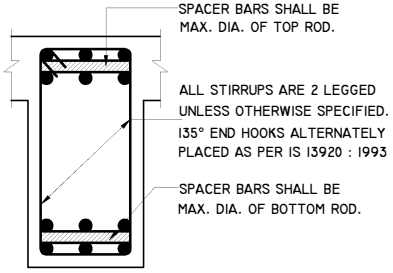
TYP. DET. OF HANGER BARS IN MAIN BEAM AT SECONDARY BEAM JUNCTION (VARY DEPTH)



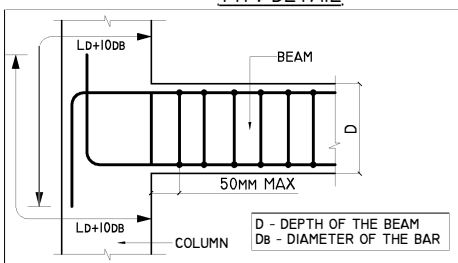
TYP. DET. OF HANGER BARS IN MAIN BEAM AT SECONDARY BEAM JUNCTION



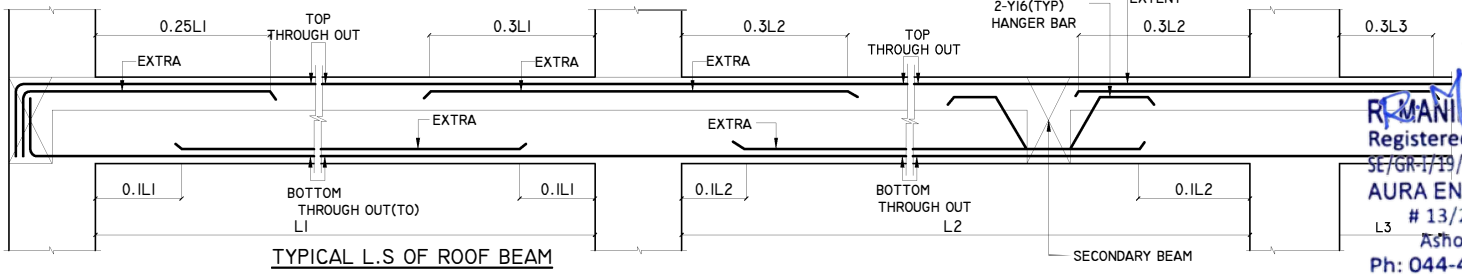
TYP. LAP SPLICE IN BEAM



TYP. DETAIL



TYP. EXTERNAL JOINT DETAIL AT BEAM-COLUMN JUNCTION



TYPICAL L.S OF ROOF BEAM

GENERAL NOTES:

REMOVAL OF FORMWORK(SHUTTERING) :

THE FOLLOWING MINIMUM PERIOD (AFTER FINAL POUR) SHALL BE ALLOWED BEFORE REMOVAL OF SHUTTERING AS PER CLAUSE 11.3.1 OF IS456 : 2000

A. VERTICAL SIDE OF SHUTTERING OF COLUMNS, WALLS AND & BEAMS ----------24 HOURS.

B. BOTTOM SHUTTERING OF SLABS (KEEP THE PROPS UNDER) ----------3 DAYS.

C. BOTTOM SHUTTERING OF BEAMS (KEEP THE PROPS UNDER) ----------7 DAYS.

D. BOTTOM PROPS TO SLAB
I) SPANNING UP TO 4.50M ----------7 DAYS.
II) SPANNING OVER 4.50M ----------14 DAYS.

E. BOTTOM PROPS TO BEAMS
I) SPANNING UP TO 6.00M ----------14 DAYS.
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LAP JOINTS FOR REINFORCEMENT BARS:

I). AT ANY CROSS SECTION OF A MEMBER NOT MORE THAN 50% OF THE BARS SHALL BE LAPPED.

II). LAPS SHALL BE STAGGERED WITH A MINIMUM CENTRE TO CENTRE DISTANCE OF 1.3 TIMES THE LAP LENGTH OF THE BAR FOR TENSION AND COMPRESSION MEMBERS.

III). LAPS IN COLUMNS SHALL BE PROVIDED AT MID HEIGHT OF FLOOR AND NOT AT SLAB LEVEL.

IV). LAPS IN BEAM AND SLAB SHALL BE PROVIDED AT THE POINT OF CONTRAFLEXURE.

V). WELDING OF BARS SHALL BE DONE AS A STITCH WELD FOR 5 TIMES THE DIAMETER OF BAR AND A GAP OF 5 TIMES OF BAR AND AGAIN WELDING FOR ANOTHER 5 TIMES DIAMETER OF BAR USING ARC WELDING AND SPECIAL ELECTRODES AFTER GETTING PRIOR WRITTEN APPROVAL FROM THE STRUCTURAL CONSULTANT.

VI). DETAILING OF REBARS SHALL CONFIRM TO SP-34 & IS 13920.

GENERAL NOTES:

1. ALL DIMENSIONS ARE IN MM UNITS.
2. CONCRETE GRADE SHALL BE M25 CONFIRMING TO IS 456:2000
3. GRADE OF REINFORCEMENT MARKED THUS (Y) SHALL BE Fe 500 CONFIRMING TO IS 1786-2008
4. CLEAR COVER FOR REINFORCEMENT
   a) COLUMN = 40MM b) BEAM = 30MM
   c) SLAB = 25MM
5. THIS DRG. READ IN CONJECTION WITH ARCH.DRGS.
6. STRUCTURAL ENGINEER RESPONSIBILITY IS LIMITED TO DESIGN & ISSUAL OF STRUCTURAL DRAWING ONLY
7. DEVELOPMENT LENGTH (LD) SHALL BE AS PER (SP:34-1999) TABLE BELOW:

DEVELOPMENT LENGTH FOR COLUMNS	= 40D
DEVELOPMENT LENGTH FOR BEAMS	= 50D

REV.	DESCRIPTIONS	DRN	CHK	DATE
00	ISSUE FOR APPROVAL	A.P	R.M	27.07.26

PROJECT :-

PLAN SHOWING THE PROPOSED CONSTRUCTION OF STILT FLOOR +2 FLOOR +3RD FLOOR (PART) + 4TH FLOOR +5TH FLOOR, RESIDENTIAL BUILDING (18.30M HEIGHT) WITH 25 DWELLING UNITS AVAILING WITH PREMIUM FSI AT PLOT NO.10, DOOR NO.6, KUSHKUMAR ROAD, NUNGAMBAKKAM, CHENNAI-34 COMPRISED IN R.S. NO. 106/3 (DOCUMENT) R.S.NO.106/25 (PATTA), BLOCK NO.19 OF NUNGAMBAKKAM VILLAGEWITHIN THE LIMIT OF GREATER CHENNAI CORPORATION.

DRAWING TITLE :-

R.C. DETAILS OF FIRST FLOOR ROOF BEAMS

DATE	SCALE	JOB.NO	DRG.NO
27.07.26	1 : 140	--------	008

ARCHITECT / CONSULTANTS :-

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13/27, 67th Street, R.V. Nagar, Ashok Nagar, Chennai-600 083.
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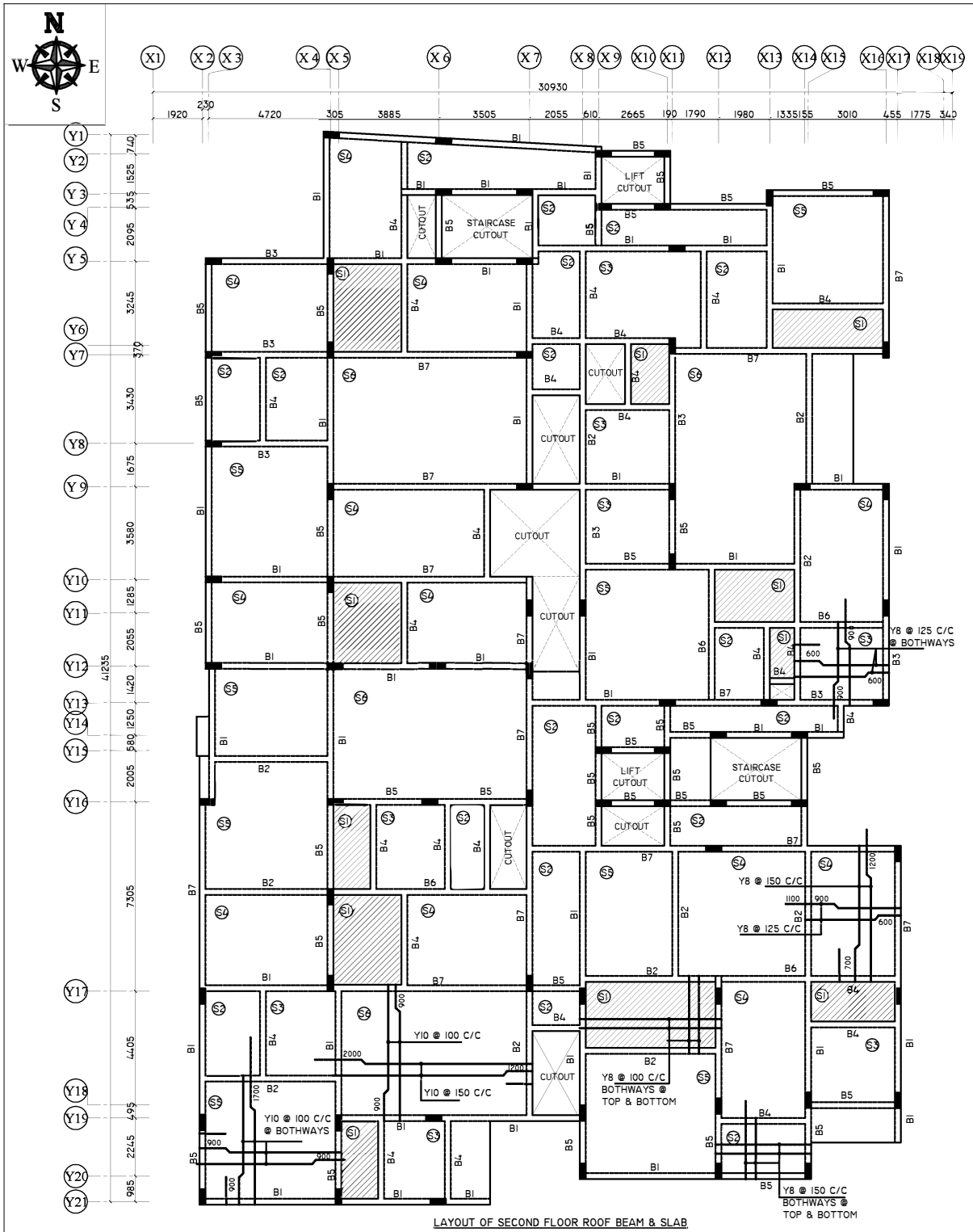
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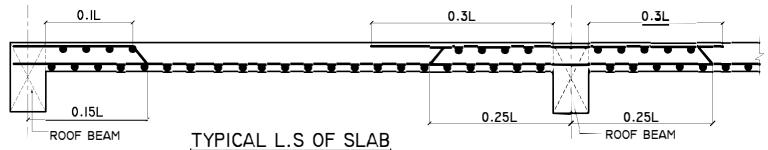
aura Engineeering Consultants

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LAYOUT OF SECOND FLOOR ROOF BEAM & SLAB



TYPICAL L.S OF SLAB

BEAM SCHEDULE

SL.NO	NAME	SIZE
01	B1	230 X 450
02	B2	230 X 450
03	B3	230 X 600
04	B4	230 X 380
05	B5	230 X 380
06	B6	230 X 450
07	B7	230 X 600

SLAB SCHEDULE

SL.NO	NAME	THICK
01	S1	125MM THK.
02	S2	125MM THK.
03	S3	125MM THK.
04	S4	125MM THK.
05	S5	180MM THK.
06	S6	180MM THK.

NOTE:

PROVIDE Y8 @ 200 C/C AS DISTRIBUTORS WHERE EVER REQUIRED

FOR BEAM REINFORCEMENT DETAILS REFER DWG.NO : 010

GENERAL NOTES:

1. ALL DIMENSIONS ARE IN MM UNITS.
2. CONCRETE GRADE SHALL BE M25 CONFIRMING TO IS 456:2000
3. GRADE OF REINFORCEMENT MARKED THUS (Y) SHALL BE Fe 500 CONFIRMING TO IS 1786-2008
4. CLEAR COVER FOR REINFORCEMENT
   a) COLUMN = 40MM b) BEAM = 30MM
   c) SLAB = 25MM
5. THIS DRG. READ IN CONJECTION WITH ARCH.DRGS.
6. STRUCTURAL ENGINEER RESPONSIBILITY IS LIMITED TO DESIGN & ISSUAL OF STRUCTURAL DRAWING ONLY
7. DEVELOPMENT LENGTH (Ld) SHALL BE AS PER (SP:34-1999) TABLE BELOW:

DEVELOPMENT LENGTH FOR COLUMNS	= 40D
DEVELOPMENT LENGTH FOR BEAMS	= 50D

REV	DESCRIPTIONS	DRN	CHK	DATE
00	ISSUE FOR APPROVAL	A.P	R.M	27.07.26

PROJECT :-

PLAN SHOWING THE PROPOSED CONSTRUCTION OF STILT FLOOR +2 FLOOR +3RD FLOOR (PART) + 4TH FLOOR +5TH FLOOR, RESIDENTIAL BUILDING (18.30M HEIGHT)WITH 25 DWELLING UNITS AVAILING WITH PREMIUM FSI AT PLOT NO.10, DOORNO.6, KUSHKUMAR ROAD, NUNGAMBAKKAM, CHENNAI-34 COMPRISED IN R.S. NO. 106/3 (DOCUMENT) R.S.NO.106/25 (PATTA), BLOCKNO.19 OF NUNGAMBAKKAM VILLAGE WITHIN THE LIMIT OF GREATER CHENNAI CORPORATION.

DRAWING TITLE :-

LAYOUT & R.C. DETAILS OF SECOND FLOOR ROOF BEAMS & SLAB

DATE	SCALE	JOB.NO	DRG.NO
27.07.26	1 : 140	--------	009

ARCHITECT / CONSULTANTS :-

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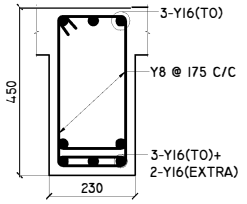
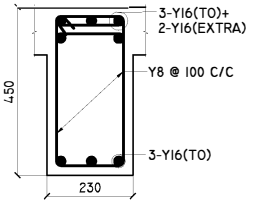
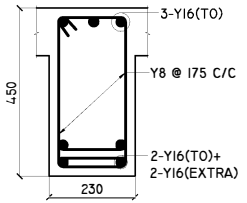
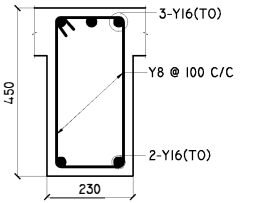
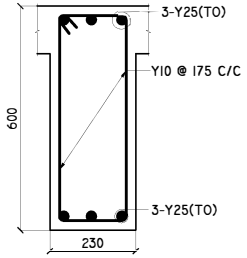
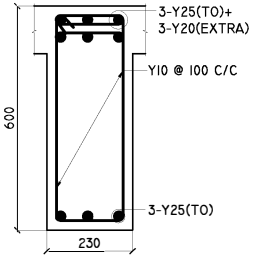
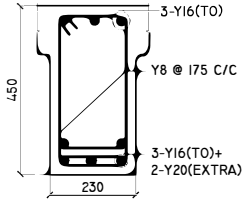
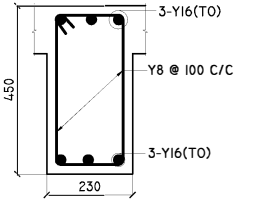
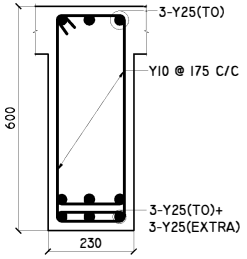
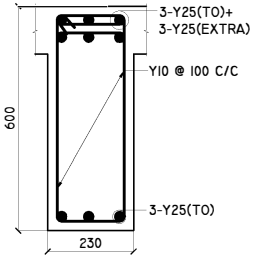
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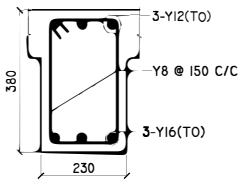
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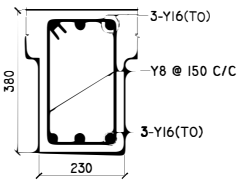
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NAME	MID SPAN	END SUPPORT
B1 (230 X 450)		
B2 (230 X 450)		
B3 (230 X 600)		
B6 (230 X 450)		
B7 (230 X 600)		



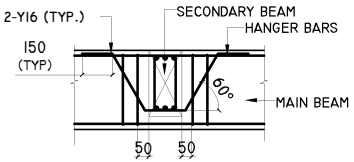
C.S OF BEAM "B4"
(230 X 380)



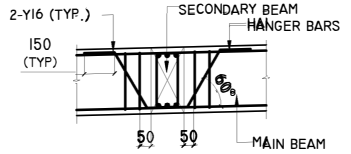
C.S OF BEAM "B5"
(230 X 380)

BEAM SCHEDULE

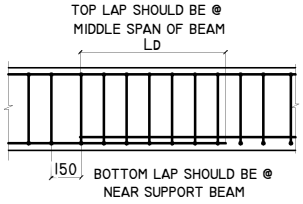
SL.NO	NAME	SIZE
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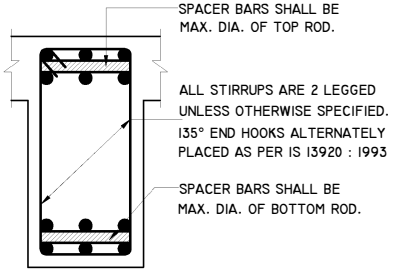
TYP. DET. OF HANGER BARS IN MAIN BEAM AT SECONDARY BEAM JUNCTION (VARY DEPTH)



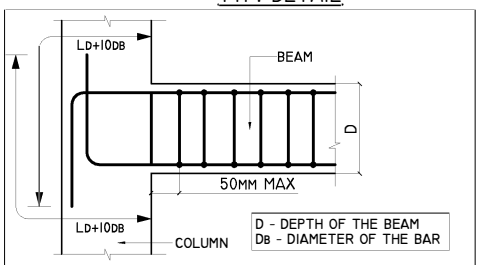
TYP. DET. OF HANGER BARS IN MAIN BEAM AT SECONDARY BEAM JUNCTION



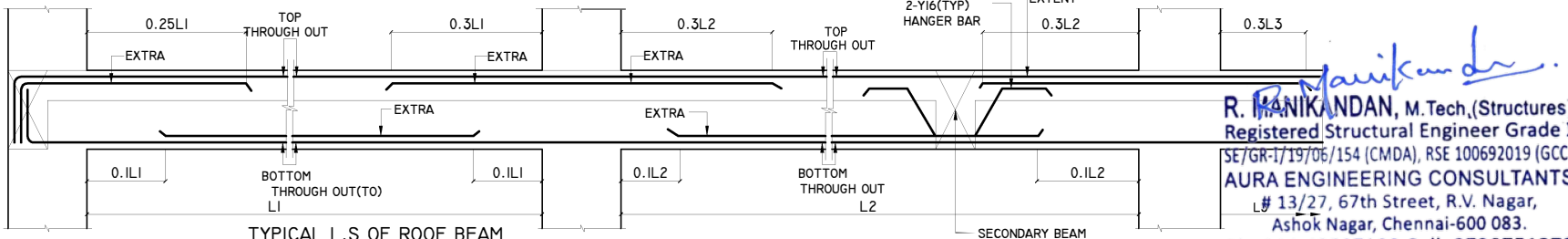
TYP. LAP SPLICE IN BEAM



TYP. DETAIL



TYP. EXTERNAL JOINT DETAIL AT BEAM-COLUMN JUNCTION



TYPICAL L.S OF ROOF BEAM

GENERAL NOTES:

REMOVAL OF FORMWORK(SHUTTERING) :

THE FOLLOWING MINIMUM PERIOD (AFTER FINAL POUR) SHALL BE ALLOWED BEFORE REMOVAL OF SHUTTERING AS PER CLAUSE 11.3.1 OF IS456 : 2000

A. VERTICAL SIDE OF SHUTTERING OF COLUMNS, WALLS AND & BEAMS ----------24 HOURS.

B. BOTTOM SHUTTERING OF SLABS (KEEP THE PROPS UNDER) ----------3 DAYS.

C. BOTTOM SHUTTERING OF BEAMS (KEEP THE PROPS UNDER) ----------7 DAYS.

D. BOTTOM PROPS TO SLAB
I) SPANNING UP TO 4.50M ----------7 DAYS.
II) SPANNING OVER 4.50M ----------14 DAYS.

E. BOTTOM PROPS TO BEAMS
I) SPANNING UP TO 6.00M ----------14 DAYS.
II) SPANNING OVER 6.00M ----------21DAYS.

LAP JOINTS FOR REINFORCEMENT BARS:

I). AT ANY CROSS SECTION OF A MEMBER NOT MORE THAN 50% OF THE BARS SHALL BE LAPPED.

II). LAPS SHALL BE STAGGERED WITH A MINIMUM CENTRE TO CENTRE DISTANCE OF 1.3 TIMES THE LAP LENGTH OF THE BAR FOR TENSION AND COMPRESSION MEMBERS.

III). LAPS IN COLUMNS SHALL BE PROVIDED AT MID HEIGHT OF FLOOR AND NOT AT SLAB LEVEL.

IV). LAPS IN BEAM AND SLAB SHALL BE PROVIDED AT THE POINT OF CONTRAFLEXURE.

V). WELDING OF BARS SHALL BE DONE AS A STITCH WELD FOR 5 TIMES THE DIAMETER OF BAR AND A GAP OF 5 TIMES OF BAR AND AGAIN WELDING FOR ANOTHER 5 TIMES DIAMETER OF BAR USING ARC WELDING AND SPECIAL ELECTRODES AFTER GETTING PRIOR WRITTEN APPROVAL FROM THE STRUCTURAL CONSULTANT.

VI). DETAILING OF REBARS SHALL CONFIRM TO SP-34 & IS 13920.

GENERAL NOTES:

1. ALL DIMENSIONS ARE IN MM UNITS.
2. CONCRETE GRADE SHALL BE M25 CONFIRMING TO IS 456:2000
3. GRADE OF REINFORCEMENT MARKED THUS (Y) SHALL BE Fe 500 CONFIRMING TO IS 1786-2008
4. CLEAR COVER FOR REINFORCEMENT
   a) COLUMN = 40MM b) BEAM = 30MM
   c) SLAB = 25MM
5. THIS DRG. READ IN CONJECTION WITH ARCH.DRGS.
6. STRUCTURAL ENGINEER RESPONSIBILITY IS LIMITED TO DESIGN & ISSUAL OF STRUCTURAL DRAWING ONLY
7. DEVELOPMENT LENGTH (LD) SHALL BE AS PER (SP:34-1999) TABLE BELOW:

DEVELOPMENT LENGTH FOR COLUMNS	= 40D
DEVELOPMENT LENGTH FOR BEAMS	= 50D

REV	DESCRIPTIONS	DRN	CHK	DATE
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DRAWING TITLE :-

R.C. DETAILS OF SECOND FLOOR ROOF BEAMS

DATE	SCALE	JOB.NO	DRG.NO
27.07.26	1 : 140	--------	010

ARCHITECT / CONSULTANTS :-

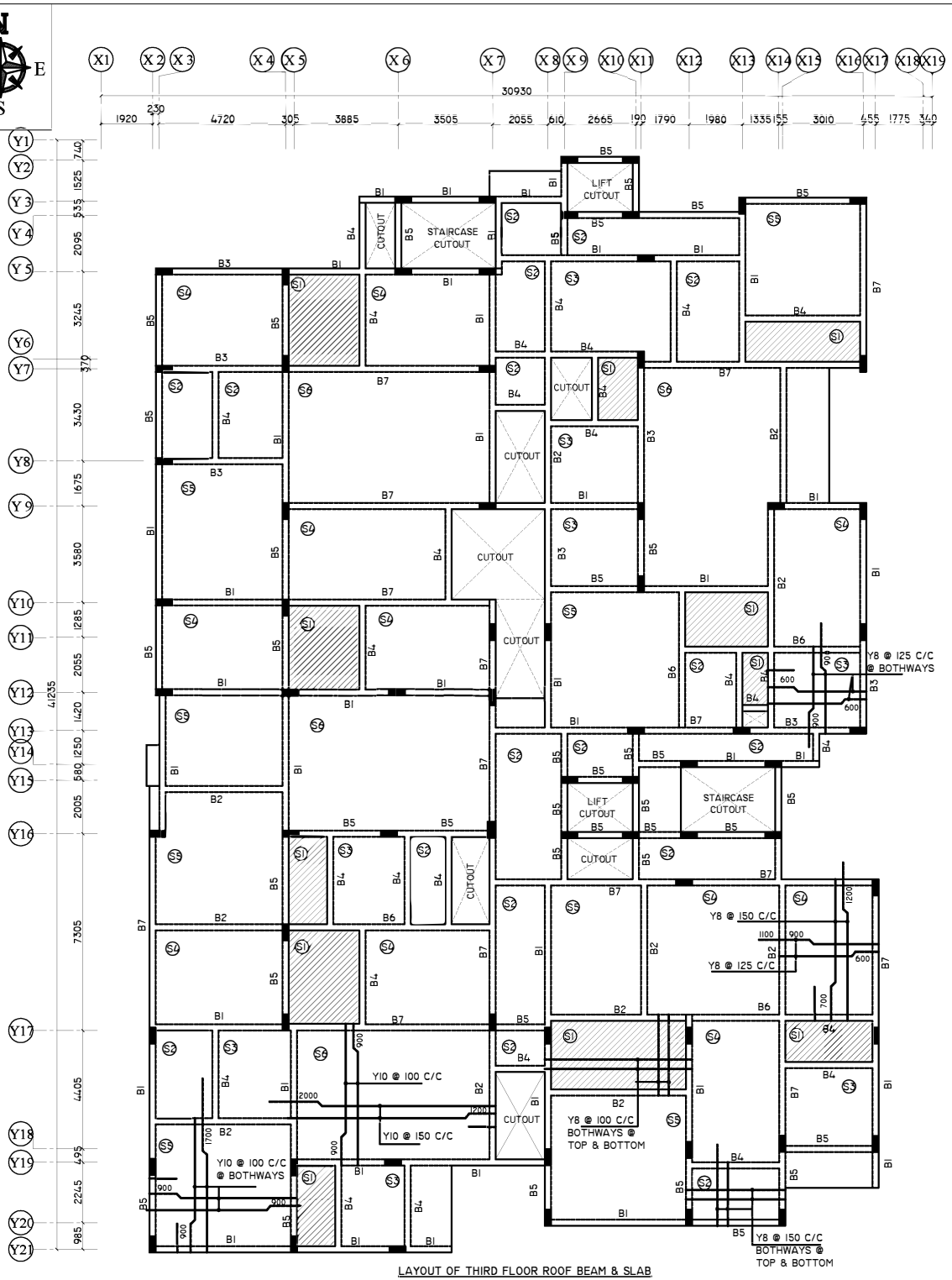
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STRUCTURAL CONSULTANTS :-

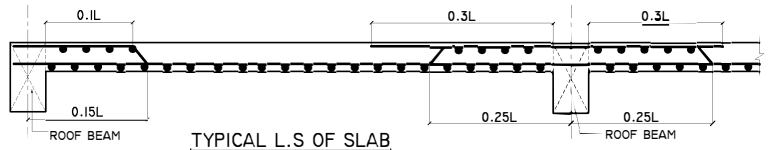
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LAYOUT OF THIRD FLOOR ROOF BEAM & SLAB



TYPICAL L.S OF SLAB

BEAM SCHEDULE

SL.NO	NAME	SIZE
01	B1	230 X 450
02	B2	230 X 450
03	B3	230 X 600
04	B4	230 X 380
05	B5	230 X 380
06	B6	230 X 450
07	B7	230 X 600

SLAB SCHEDULE

SL.NO	NAME	THICK
01	S1	125MM THK.
02	S2	125MM THK.
03	S3	125MM THK.
04	S4	125MM THK.
05	S5	180MM THK.
06	S6	180MM THK.

NOTE:

PROVIDE Y8 @ 200 C/C AS DISTRIBUTORS WHERE EVER REQUIRED

FOR BEAM REINFORCEMENT DETAILS REFER DWG.NO : 012

GENERAL NOTES:

1. ALL DIMENSIONS ARE IN MM UNITS.
2. CONCRETE GRADE SHALL BE M25 CONFIRMING TO IS 456:2000
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DRAWING TITLE :-

LAYOUT & R.C. DETAILS OF THIRD FLOOR ROOF BEAMS & SLAB

DATE	SCALE	JOB.NO	DRG.NO
27.07.26	1 : 140	--------	011

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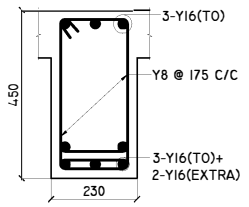
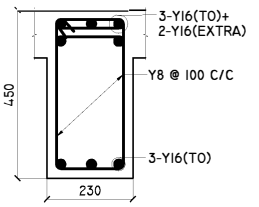
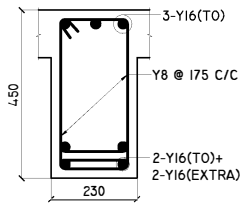
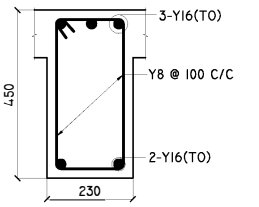
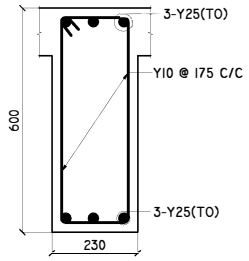
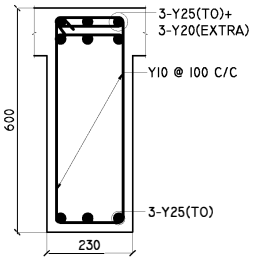
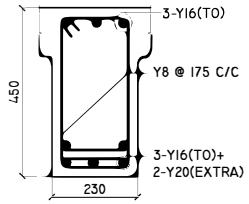
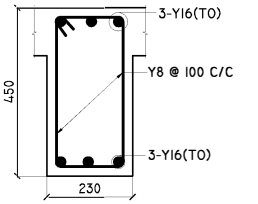
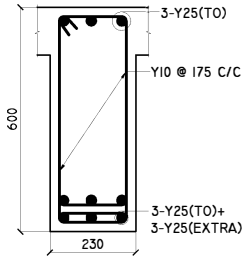
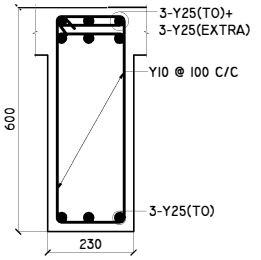
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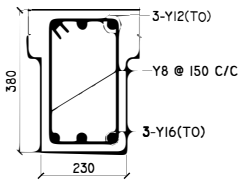
STRUCTURAL CONSULTANTS :-

AURA ENGINEERING CONSULTANT
#8, 50th St, Sarvamangala Colony, 7th
ASHOK NAGAR, CHENNAI– 600 083.
Fixed Line :– 044 4859 7100
projects.auraengg@gmail.com
projects@auraengineers.co.in
http://auraengineers.co.in/
aura
Engineeering Consultants

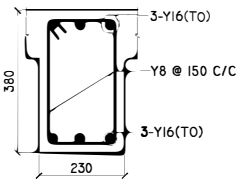
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NAME	MID SPAN	END SUPPORT
B1 (230 X 450)		
B2 (230 X 450)		
B3 (230 X 600)		
B6 (230 X 450)		
B7 (230 X 600)		



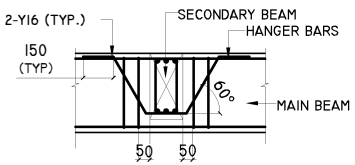
C.S OF BEAM "B4"
(230 X 380)



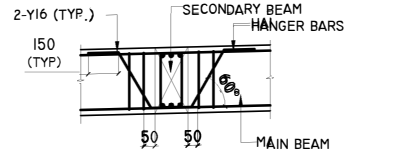
C.S OF BEAM "B5"
(230 X 380)

BEAM SCHEDULE

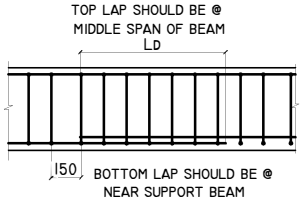
SL.NO	NAME	SIZE
01	B1	230 X 450
02	B2	230 X 450
03	B3	230 X 600
04	B4	230 X 380
05	B5	230 X 380
06	B6	230 X 450
07	B7	230 X 600



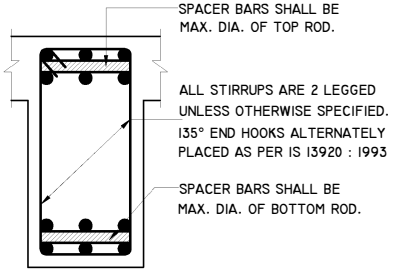
TYP. DET. OF HANGER BARS IN MAIN BEAM AT SECONDARY BEAM JUNCTION (VARY DEPTH)



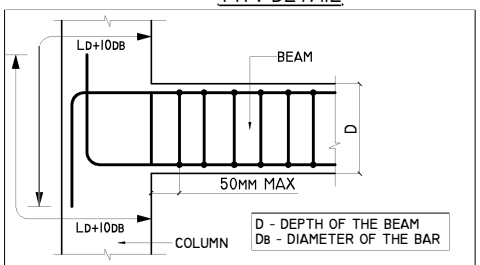
TYP. DET. OF HANGER BARS IN MAIN BEAM AT SECONDARY BEAM JUNCTION



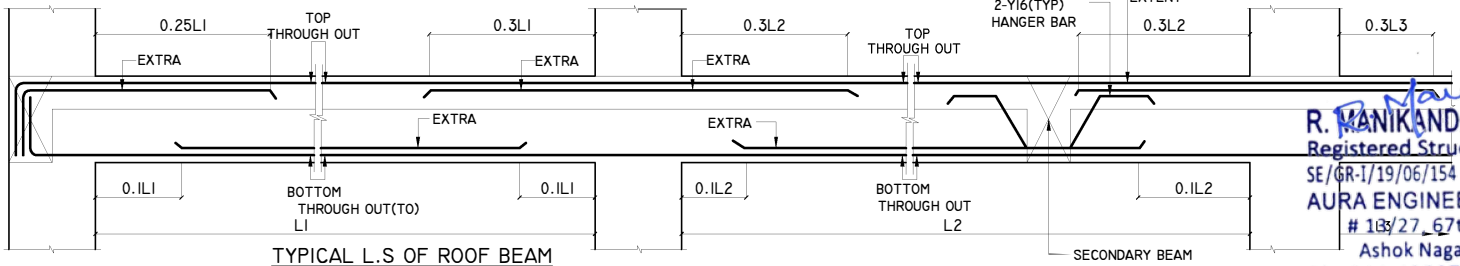
TYP. LAP SPLICE IN BEAM



TYP. DETAIL



TYP. EXTERNAL JOINT DETAIL AT BEAM-COLUMN JUNCTION



TYPICAL L.S OF ROOF BEAM

GENERAL NOTES:

REMOVAL OF FORMWORK(SHUTTERING) :

THE FOLLOWING MINIMUM PERIOD (AFTER FINAL POUR) SHALL BE ALLOWED BEFORE REMOVAL OF SHUTTERING AS PER CLAUSE 11.3.1 OF IS456 : 2000

A. VERTICAL SIDE OF SHUTTERING OF COLUMNS, WALLS AND & BEAMS ----------24 HOURS.

B. BOTTOM SHUTTERING OF SLABS (KEEP THE PROPS UNDER) ----------3 DAYS.

C. BOTTOM SHUTTERING OF BEAMS (KEEP THE PROPS UNDER) ----------7 DAYS.

D. BOTTOM PROPS TO SLAB
I) SPANNING UP TO 4.50M ----------7 DAYS.
II) SPANNING OVER 4.50M ----------14 DAYS.

E. BOTTOM PROPS TO BEAMS
I) SPANNING UP TO 6.00M ----------14 DAYS.
II) SPANNING OVER 6.00M ----------21DAYS.

LAP JOINTS FOR REINFORCEMENT BARS:

I). AT ANY CROSS SECTION OF A MEMBER NOT MORE THAN 50% OF THE BARS SHALL BE LAPPED.

II). LAPS SHALL BE STAGGERED WITH A MINIMUM CENTRE TO CENTRE DISTANCE OF 1.3 TIMES THE LAP LENGTH OF THE BAR FOR TENSION AND COMPRESSION MEMBERS.

III). LAPS IN COLUMNS SHALL BE PROVIDED AT MID HEIGHT OF FLOOR AND NOT AT SLAB LEVEL.

IV). LAPS IN BEAM AND SLAB SHALL BE PROVIDED AT THE POINT OF CONTRAFLEXURE.

V). WELDING OF BARS SHALL BE DONE AS A STITCH WELD FOR 5 TIMES THE DIAMETER OF BAR AND A GAP OF 5 TIMES OF BAR AND AGAIN WELDING FOR ANOTHER 5 TIMES DIAMETER OF BAR USING ARC WELDING AND SPECIAL ELECTRODES AFTER GETTING PRIOR WRITTEN APPROVAL FROM THE STRUCTURAL CONSULTANT.

VI). DETAILING OF REBARS SHALL CONFIRM TO SP-34 & IS 13920.

GENERAL NOTES:

1. ALL DIMENSIONS ARE IN MM UNITS.
2. CONCRETE GRADE SHALL BE M25 CONFIRMING TO IS 456:2000
3. GRADE OF REINFORCEMENT MARKED THUS (Y) SHALL BE Fe 500 CONFIRMING TO IS 1786-2008
4. CLEAR COVER FOR REINFORCEMENT
   a) COLUMN = 40MM b) BEAM = 30MM
   c) SLAB = 25MM
5. THIS DRG. READ IN CONJECTION WITH ARCH.DRGS.
6. STRUCTURAL ENGINEER RESPONSIBILITY IS LIMITED TO DESIGN & ISSUAL OF STRUCTURAL DRAWING ONLY
7. DEVELOPMENT LENGTH (LD) SHALL BE AS PER (SP:34-1999) TABLE BELOW:

DEVELOPMENT LENGTH FOR COLUMNS	= 40D
DEVELOPMENT LENGTH FOR BEAMS	= 50D

REV.	DESCRIPTIONS	DRN	CHK	DATE
00	ISSUE FOR APPROVAL	A.P	R.M	27.07.26

PROJECT :-

PLAN SHOWING THE PROPOSED CONSTRUCTION OF STILT FLOOR +2 FLOOR +3RD FLOOR (PART) + 4TH FLOOR +5TH FLOOR, RESIDENTIAL BUILDING (18.30M HEIGHT) WITH 25 DWELLING UNITS AVAILING WITH PREMIUM FSI AT PLOT NO.10, DOOR NO.6, KUSHKUMAR ROAD, NUNGAMBAKKAM, CHENNAI-34 COMPRISED IN R.S. NO. 106/3 (DOCUMENT) R.S.NO.106/25 (PATTA), BLOCK NO.19 OF NUNGAMBAKKAM VILLAGE WITHIN THE LIMIT OF GREATER CHENNAI CORPORATION.

DRAWING TITLE :-

R.C. DETAILS OF THIRD FLOOR ROOF BEAMS

DATE	SCALE	JOB.NO	DRG.NO
27.07.26	1 : 140	--------	012

ARCHITECT / CONSULTANTS :-

R. MANIKANDAN, M.Tech.,(Structures)
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AURA ENGINEERING CONSULTANTS
13/27, 67th Street, R.V. Nagar,
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Ph: 044-48597100 Cell: 9790751378

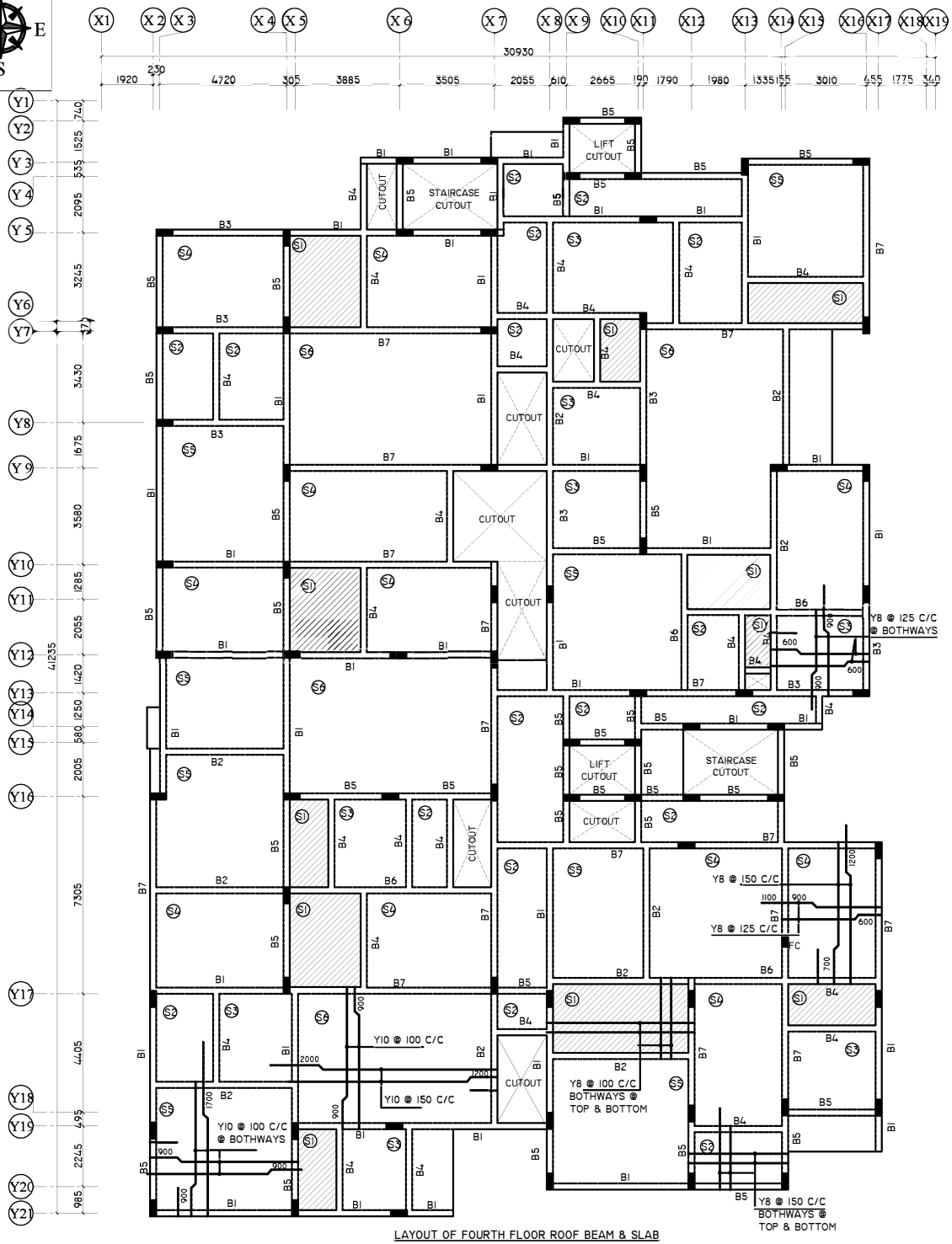
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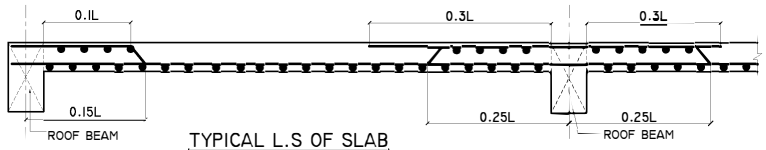
aura Engineering Consultants

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LAYOUT OF FOURTH FLOOR ROOF BEAM & SLAB



TYPICAL L.S OF SLAB

BEAM SCHEDULE

SL.NO	NAME	SIZE
01	B1	230 X 450
02	B2	230 X 450
03	B3	230 X 600
04	B4	230 X 380
05	B5	230 X 380
06	B6	230 X 450
07	B7	230 X 600

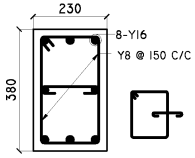
SLAB SCHEDULE

SL.NO	NAME	THICK
01	S1	125MM THK.
02	S2	125MM THK.
03	S3	125MM THK.
04	S4	125MM THK.
05	S5	180MM THK.
06	S6	180MM THK.

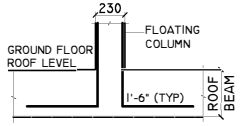
NOTE:

PROVIDE Y8 @ 200 C/C AS DISTRIBUTORS WHERE EVER REQUIRED

FOR BEAM REINFORCEMENT DETAILS REFER DWG.NO : 014



C.S. OF COLUMN "FC"
(230 x 380)



TYPICAL FLOATING COLUMN DETAIL

FOR APPROVAL ONLY

R. MANIKANDAN, M.Tech.,(Structures)
Registered Structural Engineer Grade I
SE/GR-I/19/06/154 (CMDA), RSE 100692019 (GCC)
AURA ENGINEERING CONSULTANTS
13/27, 67th Street, R.V. Nagar,
Ashok Nagar, Chennai-600 083.
Ph: 044-48597100 Cell: 9790751378

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3. GRADE OF REINFORCEMENT MARKED THUS (Y) SHALL BE Fe 500 CONFIRMING TO IS 1786-2008
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   DEVELOPMENT LENGTH FOR COLUMNS = 40D
   DEVELOPMENT LENGTH FOR BEAMS = 50D

REV.	DESCRIPTIONS	DRN	CHK	DATE
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PROJECT :-

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DRAWING TITLE :-

LAYOUT & R.C. DETAILS OF FOURTH FLOOR ROOF BEAMS & SLAB

DATE	SCALE	JOB.NO	DRG.NO
27.07.26	1 : 140	--------	013

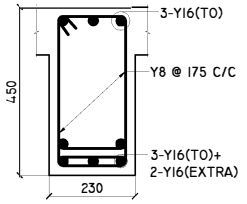
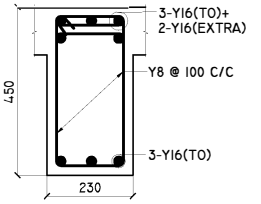
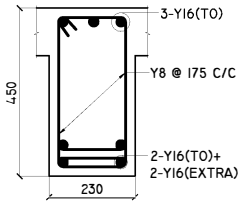
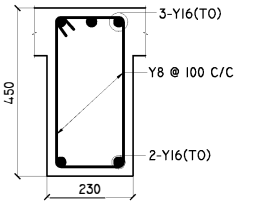
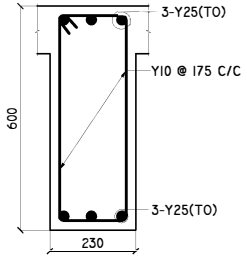
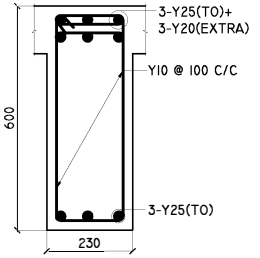
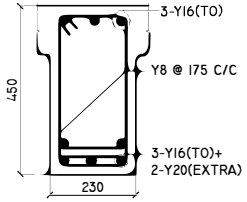
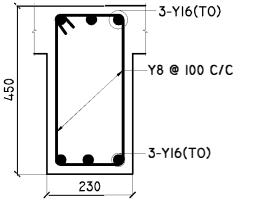
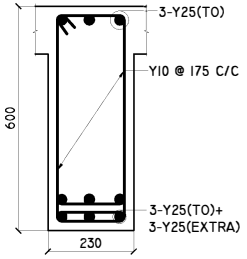
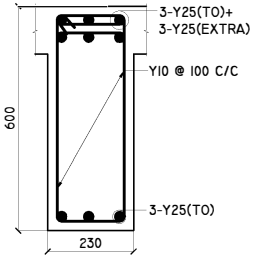
ARCHITECT / CONSULTANTS :-

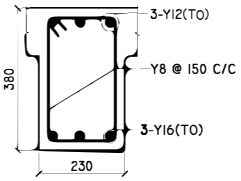
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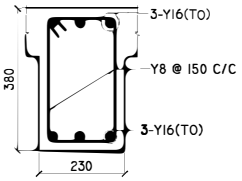
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NAME	MID SPAN	END SUPPORT
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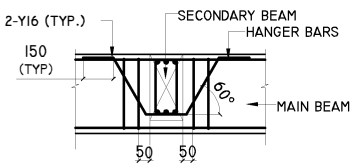
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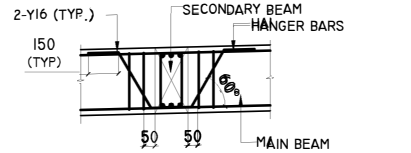
C.S OF BEAM "B5"
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BEAM SCHEDULE

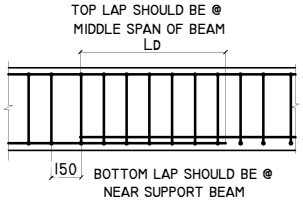
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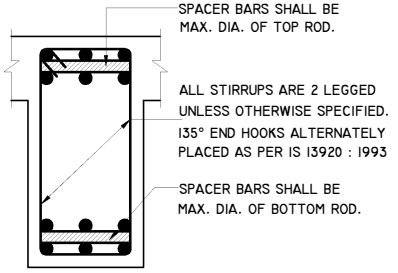
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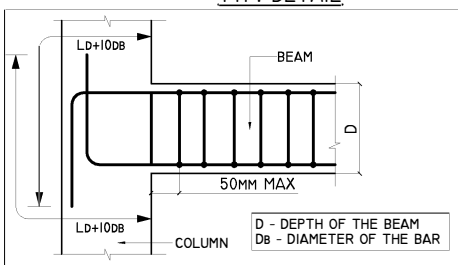
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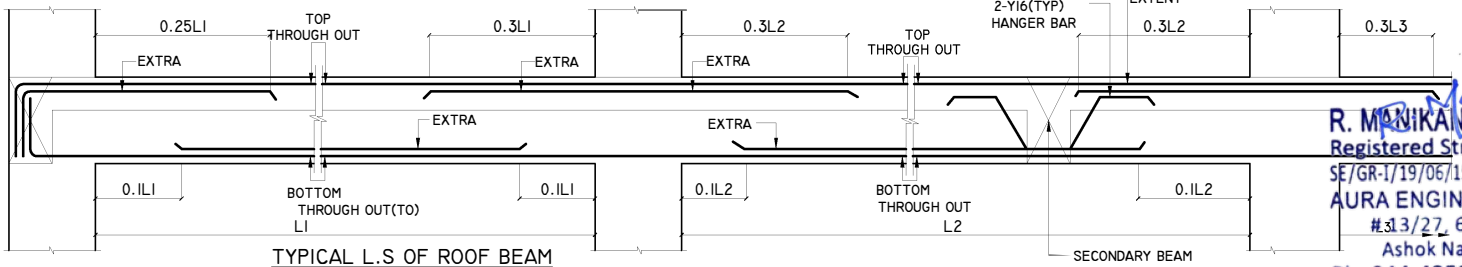
TYP. LAP SPLICE IN BEAM



TYP. DETAIL



TYP. EXTERNAL JOINT DETAIL AT BEAM-COLUMN JUNCTION



TYPICAL L.S OF ROOF BEAM

GENERAL NOTES:

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VI). DETAILING OF REBARS SHALL CONFIRM TO SP-34 & IS 13920.

GENERAL NOTES:

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DRAWING TITLE :-

R.C. DETAILS OF FOURTH FLOOR ROOF BEAMS

DATE	SCALE	JOB.NO	DRG.NO
27.07.26	1 : 140	--------	014

ARCHITECT / CONSULTANTS :-

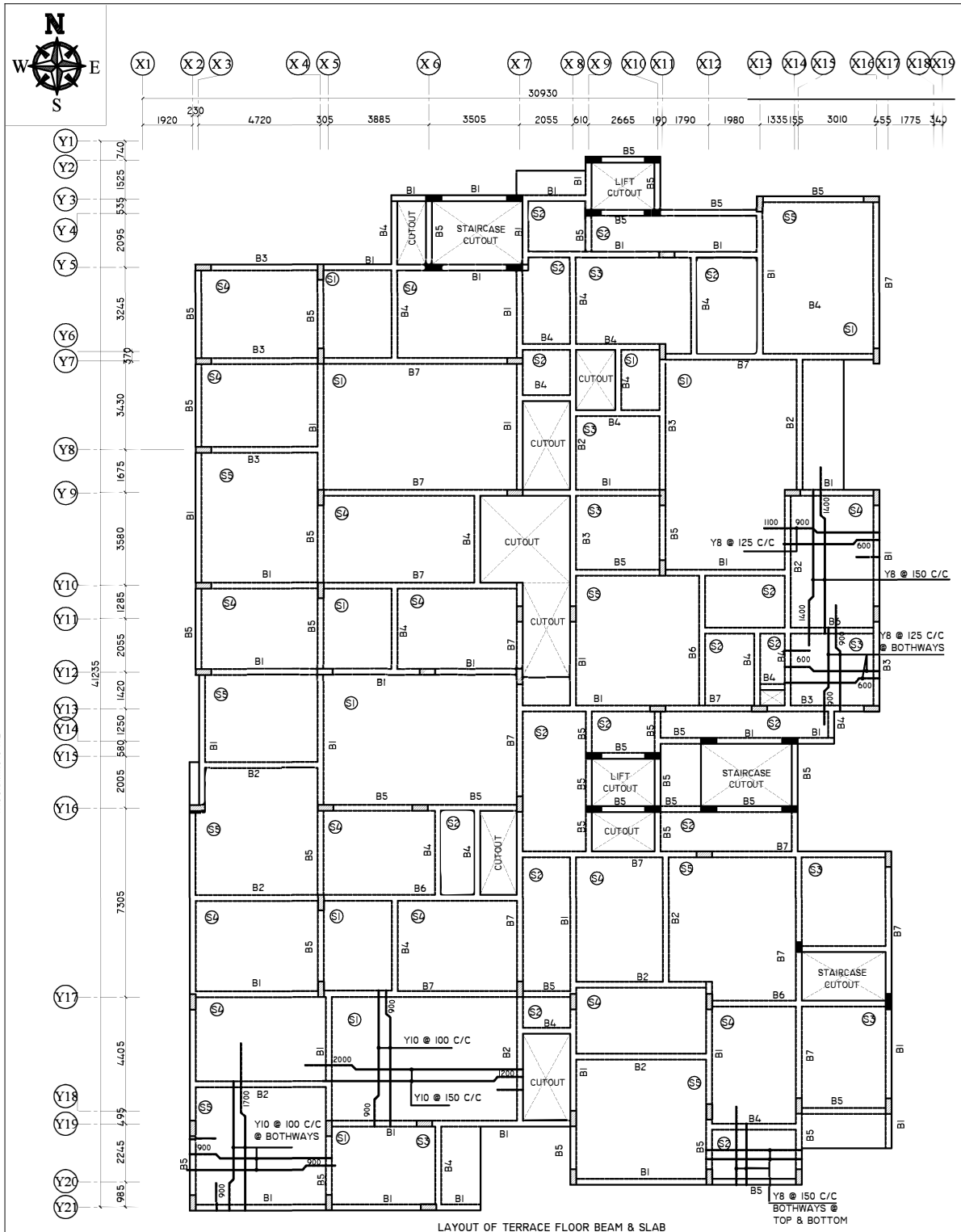
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Ph: 044-48597100 Cell: 9790751378

STRUCTURAL CONSULTANTS :-

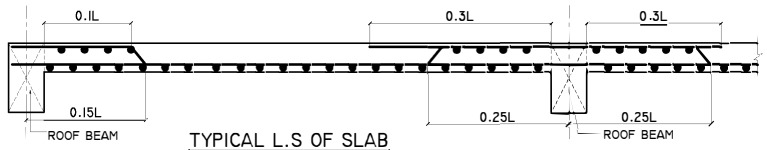
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LAYOUT OF TERRACE FLOOR BEAM & SLAB



TYPICAL L.S OF SLAB

BEAM SCHEDULE

SL.NO	NAME	SIZE
01	B1	230 X 450
02	B2	230 X 450
03	B3	230 X 600
04	B4	230 X 380
05	B5	230 X 380
06	B6	230 X 450
07	B7	230 X 600

SLAB SCHEDULE

SL.NO	NAME	THICK
01	S1	180MM THK.
02	S2	125MM THK.
03	S3	125MM THK.
04	S4	125MM THK.
05	S5	180MM THK.

NOTE:

PROVIDE Y8 @ 200 C/C AS DISTRIBUTORS WHERE EVER REQUIRED

FOR BEAM REINFORCEMENT DETAILS REFER DWG.NO : 016

GENERAL NOTES:.

1. ALL DIMENSIONS ARE IN MM UNITS.
2. CONCRETE GRADE SHALL BE M25 CONFIRMING TO IS 456:2000
3. GRADE OF REINFORCEMENT MARKED THUS (Y) SHALL BE Fe 500 CONFIRMING TO IS 1786-2008
4. CLEAR COVER FOR REINFORCEMENT
   a) COLUMN = 40MM b) BEAM = 30MM
   c) SLAB = 25MM
5. THIS DRG. READ IN CONJECTION WITH ARCH.DRGS.
6. STRUCTURAL ENGINEER RESPONSIBILITY IS LIMITED TO DESIGN & ISSUAL OF STRUCTURAL DRAWING ONLY
7. DEVELOPMENT LENGTH (Ld) SHALL BE AS PER (SP:34-1999) TABLE BELOW:

DEVELOPMENT LENGTH FOR COLUMNS	= 40D
DEVELOPMENT LENGTH FOR BEAMS	= 50D

REV	DESCRIPTIONS	DRN	CHK	DATE
00	ISSUE FOR APPROVAL	A.P	R.M	27.07.26

PROJECT :-

PLAN SHOWING THE PROPOSED CONSTRUCTION OF STILT FLOOR +2 FLOOR +3RD FLOOR (PART) + 4TH FLOOR +5TH FLOOR, RESIDENTIAL BUILDING (18.30M HEIGHT)WITH 25 DWELLING UNITS AVAILING WITH PREMIUM FSI AT PLOT NO.10, DOOR NO.6, KUSHKUMARROAD, NUNGAMBAKKAM, CHENNAI-34 COMPRISED IN R.S. NO. 106/3 (DOCUMENT)R.S.NO.106/25 (PATTA), BLOCKNO.19 OF NUNGAMBAKKAM VILLAGE WITHIN THE LIMIT OF GREATER CHENNAI CORPORATION.

DRAWING TITLE :-

LAYOUT & R.C. DETAILS OF TERRACE FLOOR ROOF BEAMS & SLAB

DATE	SCALE	JOB.NO	DRG.NO
27.07.26	1 : 140	--------	015

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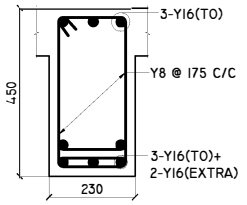
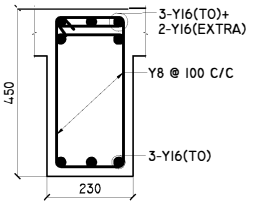
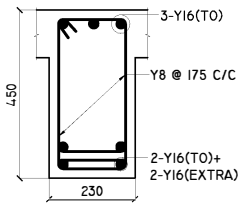
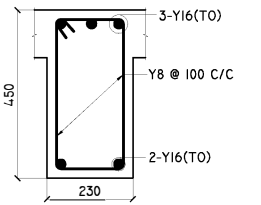
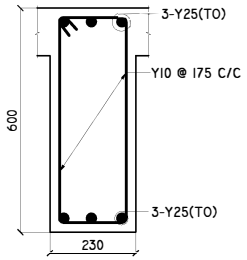
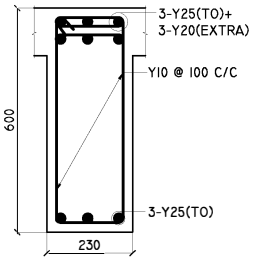
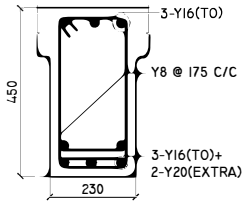
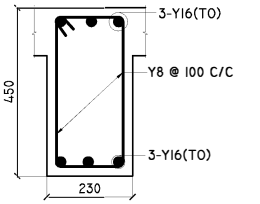
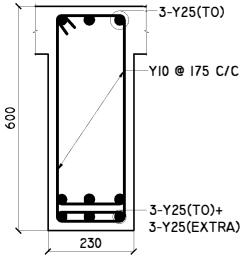
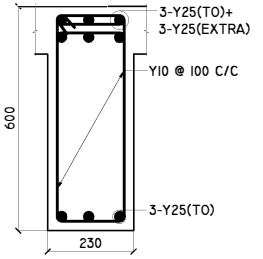
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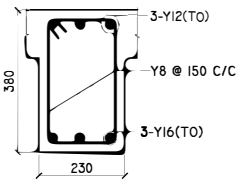
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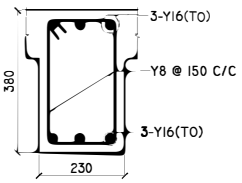
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NAME	MID SPAN	END SUPPORT
B1 (230 X 450)		
B2 (230 X 450)		
B3 (230 X 600)		
B6 (230 X 450)		
B7 (230 X 600)		



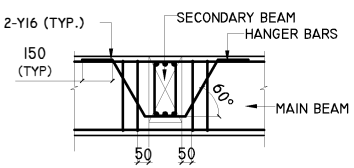
C.S OF BEAM "B4"
(230 X 380)



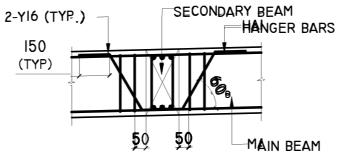
C.S OF BEAM "B5"
(230 X 380)

BEAM SCHEDULE

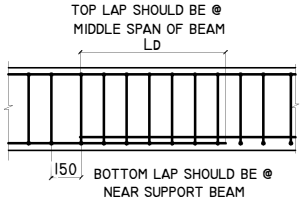
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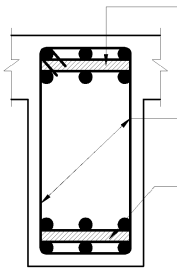
TYP. DET. OF HANGER BARS IN MAIN BEAM AT SECONDARY BEAM JUNCTION (VARY DEPTH)



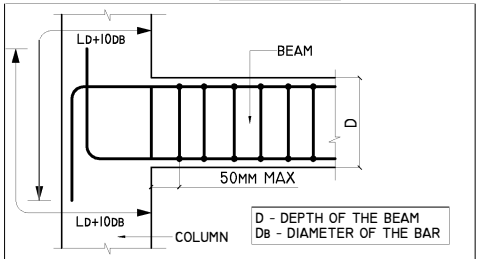
TYP. DET. OF HANGER BARS IN MAIN BEAM AT SECONDARY BEAM JUNCTION



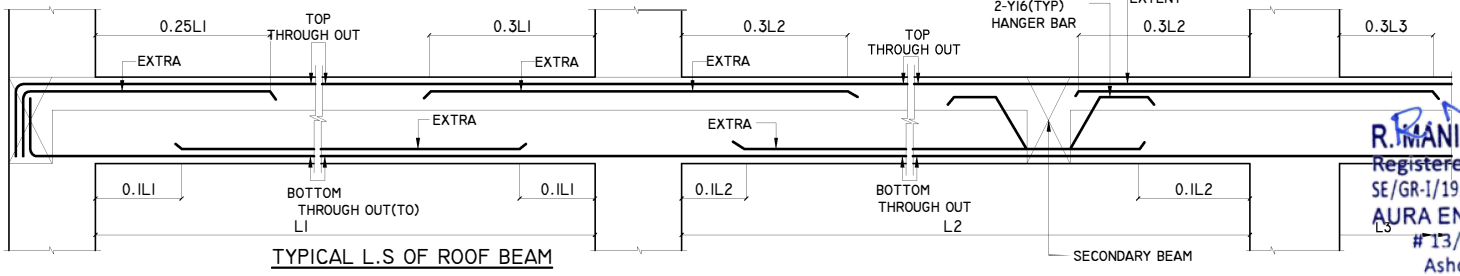
TYP. LAP SPLICE IN BEAM



TYP. DETAIL



TYP. EXTERNAL JOINT DETAIL AT BEAM-COLUMN JUNCTION



TYPICAL L.S OF ROOF BEAM

GENERAL NOTES:

REMOVAL OF FORMWORK(SHUTTERING) :

THE FOLLOWING MINIMUM PERIOD (AFTER FINAL POUR) SHALL BE ALLOWED BEFORE REMOVAL OF SHUTTERING AS PER CLAUSE 11.3.1 OF IS456 : 2000

A. VERTICAL SIDE OF SHUTTERING OF COLUMNS, WALLS AND & BEAMS ----------24 HOURS.

B. BOTTOM SHUTTERING OF SLABS (KEEP THE PROPS UNDER) ----------3 DAYS.

C. BOTTOM SHUTTERING OF BEAMS (KEEP THE PROPS UNDER) ----------7 DAYS.

D. BOTTOM PROPS TO SLAB
I) SPANNING UP TO 4.50M ----------7 DAYS.
II) SPANNING OVER 4.50M ----------14 DAYS.

E. BOTTOM PROPS TO BEAMS
I) SPANNING UP TO 6.00M ----------14 DAYS.
II) SPANNING OVER 6.00M ----------21DAYS.

LAP JOINTS FOR REINFORCEMENT BARS:

I). AT ANY CROSS SECTION OF A MEMBER NOT MORE THAN 50% OF THE BARS SHALL BE LAPPED.

II). LAPS SHALL BE STAGGERED WITH A MINIMUM CENTRE TO CENTRE DISTANCE OF 1.3 TIMES THE LAP LENGTH OF THE BAR FOR TENSION AND COMPRESSION MEMBERS.

III). LAPS IN COLUMNS SHALL BE PROVIDED AT MID HEIGHT OF FLOOR AND NOT AT SLAB LEVEL.

IV). LAPS IN BEAM AND SLAB SHALL BE PROVIDED AT THE POINT OF CONTRAFLEXURE.

V). WELDING OF BARS SHALL BE DONE AS A STITCH WELD FOR 5 TIMES THE DIAMETER OF BAR AND A GAP OF 5 TIMES OF BAR AND AGAIN WELDING FOR ANOTHER 5 TIMES DIAMETER OF BAR USING ARC WELDING AND SPECIAL ELECTRODES AFTER GETTING PRIOR WRITTEN APPROVAL FROM THE STRUCTURAL CONSULTANT.

VI). DETAILING OF REBARS SHALL CONFIRM TO SP-34 & IS 13920.

GENERAL NOTES:

1. ALL DIMENSIONS ARE IN MM UNITS.
2. CONCRETE GRADE SHALL BE M25 CONFIRMING TO IS 456:2000
3. GRADE OF REINFORCEMENT MARKED THUS (Y) SHALL BE Fe 500 CONFIRMING TO IS 1786-2008
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DRAWING TITLE :-

R.C. DETAILS OF TERRACE FLOOR ROOF BEAMS

DATE	SCALE	JOB.NO	DRG.NO
27.07.26	1 : 140	--------	016

ARCHITECT / CONSULTANTS :-

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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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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.