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DESIGN CALCULATION

PLAN SHOWING THE PROPOSED CONSTRUCTION OF STILT FLOOR(PARKING) +3 FLOORS RESIDENTIAL BUILDING WITH 14 DWELLING UNITS (HEIGHT-14.00M) AT PLOT NO.63,64 & 64B,DOOR NO: 3/147 ,3RD CROSS STREET, DEVARAJ AVENUE ,METTUKUPPAM, OKKIYAM THORAIPAKKAM,CHENNAI-600 097. COMPRISED IN OLD S.NOS : 405/13 AND NEW S.NO. 405/116,405/28,405/160 AND 405/157 OF THORAIPAKKAM VILLAGE WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION.)

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1.0 DESIGN BRIEF:

THIS DOCUMENT PLAN SHOWING THE PROPOSED CONSTRUCTION OF STILT FLOOR(PARKING) +3 FLOORS RESIDENTIAL BUILDING WITH 14 DWELLING UNITS (HEIGHT-14.00M) AT PLOT NO.63,64 & 64B,DOOR NO: 3/147 ,3RD CROSS STREET, DEVARAJ AVENUE ,METTUKUPPAM, OKKIYAM THORAIPAKKAM,CHENNAI-600 097. COMPRISED IN OLD S.NOS : 405/13 AND NEW S.NO. 405/116,405/28,405/160 AND 405/157 OF THORAIPAKKAM VILLAGE WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION.)

2.0 GENERAL DESIGN CRITERIA

2.1. Description of the structure

The Residential Building consists of Stilt Floor +3 Upper floors and the structure is designed as a RCC framed structure.

1. Size of the building : 25.15 X 16.05M
2. Height of the building : 14.00M
3. Number of storeys above GL : Stilt Floor +3 upper floors
4. Floor to floor height of this building : Ground and First floors - 3.0m
   : Typical floor – 3.0m
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

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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
- 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

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- Footing = 50mm
- RC Wall = 30mm
- Columns = 40mm
- 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.

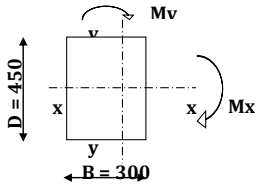
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APPENDIX I

Design Calculations

Column Design

PROJECT	STILT FLOOR(PARKING) +3 FLOORS RESIDENTIAL BUILDING WITH 14 DWELLING UNITS (HEIGHT-14.00M) AT PLOT NO.63,64 & 64B,DOOR NO: 3/147 ,3RD CROSS STREET, DEVARAJ AVENUE ,METTUKUPPAM, OKKIYAM THORAIPAKKAM	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 ≥ # 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 = 300 x 450 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 = 6.667	
	Slenderness Ratio about Minor Axis L_{ey} / B = 10.000	
	Since Leff / LLD <12 Designed as Short Column	Cl 25.1.2, IS456:2000
3.0	**Check for Eccentricity**	
	Minimum Eccentricity e_x = L_{ox} / 500 + D / 30 = 21.0 mm >20	Cl 25.4
	e_y = L_{oy} / 500 + B / 30 = 16.0 mm <20	IS456:2000
3.1	**Moments Due to Minimum Eccentricity**	
	Me_x = 16.38 kN.m	
	Me_y = 15.60 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	
5.0	**Uniaxial Moment Carrying capacity of the Section about X & Y- axis**	
	d' / D = 0.117	
	d' / B = 0.175	
	Assume the Reinforcement Percentage p = 2.00	
	p / f_{ck} = 0.080	
	$p_u / f_{ck}BD$ = 0.231	
	Reinforcement distributed equally on four sides 4	
	$M_{ux1} / f_{ck}BD^2$ = 0.137	Chart 43 , 46
	$M_{uy1} / f_{ck}DB^2$ = 0.119	SP 16 : 1980
	Moment carrying capacity about X axis M_{ux1} = 207.89 kN.m	
	Moment carrying capacity about Y axis M_{uy1} = 120.61 kN.m	

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TITLE	Design for a Short Column with Biaxial Bending	REVISION	DATE	CHECKED	DATE

CL. NO.	DESIGN CALCULATIONS	REFERENCES
6.0	**Calculation of P_{uz}**	
	$P_{uz} = 0.45\ f_{ck}\ A_c + 0.75\ f_y\ A_{sc}$ = 2500.88 kN	Cl 39.6 , IS456:2000
	P_u/P_{uz} = 0.312	
	a_n = 1.186	Cl 39.6 , IS456:2000
7.0	**Criteria for Biaxial Bending (Bresler's Formulation)**	
	$(M_{ux}/M_{ux1})^{an} + (M_{uy}/M_{uy1})^{an}$ = **0.603** < 1 **Hence Safe**	Cl 39.6 , IS456:2000
8.0	**Longitudinal Reinforcement**	
	Area of compression Steel $A_{sc,reqd}$ = **2700** mm^2	
	10 Nos # + Nos Y20 $A_{sc,pro}$ = **3142** mm^2	
8.1	**Check for Minimum & Maximum Area of Steel**	
	Minimum Area of steel (0.8 % of A_g dir) = **441** mm^2	Cl 26.5.3.1 a & b , IS 456 : 2000
	(Based on the area of concrete reqd to resist direct stress)	
	Maximum Area of steel (4 % of A_g) = **5400** mm^2	
	441 < **3142** < **5400** 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 = 300 mm	Cl 26.5.3.2 c 1) , IS 456 : 2000
ii)	16 times the Smallest dia of Longitudinal Steel = 320 mm	
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

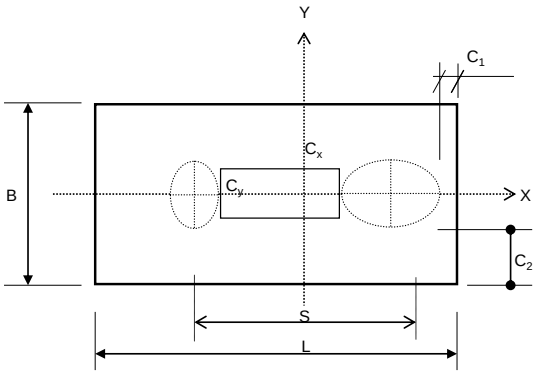
TITLE	: Pilecap Design by Bending Theory	Designed :	Date :	11-Jun-2025
SUBJECT	Two(2) Pile Group - TYPE P2	Checked :	Date :	11-Jun-2025
PROJECT	: STILT FLOOR(PARKING) +3 FLOORS RESIDENTIAL BUILDING WITH 14 DWELLING UNITS (HEIGHT-14.00M) AT PLOT NO.63,64 & 64B,DOOR NO: 3/147 ,3RD CROSS STREET, DEVARAJ AVENUE ,METTUKUPPAM, OKKIYAM THORAIPAKKAM	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	

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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

$M_u/(1/g_{ms} \cdot f_y \cdot z)$ =	731	mm²	
No. of bars =	2	Nos.	
Bar spacing =	625	mm	

Reinforcement provided

As prov =	3436	mm²	
No. of bars =	7	Nos.	O.K.!
Bar spacing =	104	mm	
100As/bd =	0.67		

TITLE	: Pilecap Design by Bending Theory		Designed :	Date :	11-Jun-2025
SUBJECT	Two(2) Pile Group - TYPE P2		Checked :	Date :	11-Jun-2025
PROJECT	: STILT FLOOR(PARKING) +3 FLOORS RESIDENTIAL BUILDING WITH 14 DWELLING UNITS (HEIGHT-14.00M) AT PLOT NO.63,64 & 64B,DOOR NO: 3/147 ,3RD CROSS STREET, DEVARAJ AVENUE ,METTUKUPPAM, OKKIYAM THORAIPAKKAM		Job No. :	Page No :	

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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TITLE		REVISION	DATE	CHECKED RMK	DATE

CL. NO.	BEAM DESIGN CALCULATIONS					REFERENCES
1.1	**Geomentry Data**					
	Beam Number		=	PB1		
	Type of Beam		=	Rectangular Beam		
	Support Condition		=	Continuous Beam		
	Width of beam	b	=	230	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		=	87.11	kNm	
1.4	**Area of Steel**					
	Minimum Area of Steel = 0.17% b d		=	131.9625	mm^2	
	Support 1					
	Negative moment (Support 1)		=	84	kNm	
	Hence the Section is designed as Singly Reinforced Section					
		M_u/bd^2	=	3.206		
	Percentage of tension steel reqd	p_t	=	0.028	%	
	Percentage of compression steel reqd	p_c	=	0	%	
	Required Area of tension steel	$A_{st\ reqd}$	=	131.96	mm^2	
	Required Area of compression steel	$A_{sc\ reqd}$	=	0.00	mm^2	
	Detail of bars					
		I st Layer Nos	Dia	II nd Layer Nos	Dia	
	Tension Reinforcement	3				
	A_{st} provi = 603.19 mm^2					
		Nos	Dia	Nos	Dia	
	Compression Reinforcement	3		0		
	A_{sc} provi = 603.19 mm^2					
	Percentage of tension steel provided	p_t	=	0.777	%	Hence O.K
	Percentage of compression steel provided	p_c	=	0.777	%	Hence O.K

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TITLE		REVISION	DATE	CHECKED RMK	DATE

CL. NO.	BEAM DESIGN CALCULATIONS	REFERENCES

Check for Shear

Shear		=	149	kN	
Nominal Shear Stress	tv	=	1.92	N/mm²	Cl 40.1, IS456:2000
Permissible Shear Stress	tc	=	0.92	N/mm²	β = 1.000
Maximum Shear Stress	tc,max	=	2.5	N/mm²	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		=	250		Cl 26.5.1.5,IS456:2000

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

Support 2

Negative moment		=	84	kNm	
Hence the Section is designed as Doubly Reinforced Section					
	M_u/bd^2	=	3.206		
Percentage of tension steel reqd	p_t	=	0.028	%	
Percentage of compression steel reqd	p_c	=	0	%	
Required Area of tension steel	$A_{st\ reqd}$	=	131.96	mm²	
Required Area of compression steel	$A_{sc\ reqd}$	=	0	mm²	

Detail of bars

	I st Layer		II nd Layer		
	Nos	Dia	Nos	Dia	
Tension Reinforcement	3		0	0	
	A_{st} provi =	603.19	mm²		
	Nos	Dia	Nos	Dia	
Compression Reinforcement	3		0	0	
	A_{sc} provi =	603.19	mm²		

Percentage of tension steel provided	p_t	=	0.777	%	Hence O.K
Percentage of compression steel provided	p_c	=	0.777	%	Hence O.K

Check for Shear

Shear		=	149	kN	
Nominal Shear Stress	tv	=	1.92	N/mm²	Cl 40.1, IS456:2000
Permissible Shear Stress	tc	=	0.92	N/mm²	β = 1.000
Maximum Shear Stress	tc,max	=	2.5	N/mm²	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		=	250		Cl 26.5.1.5,IS456:2000

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

Span

Positive moment (Span)		=	84	kNm	
Hence the Section is designed as Singly Reinforced Section					
	M_u/bd^2	=	3.325		
Percentage of tension steel reqd	p_t	=	0.029	%	
Percentage of compression steel reqd	p_c	=	0	%	
Required Area of tension steel	$A_{st\ reqd}$	=	131.96	mm²	
Required Area of compression steel	$A_{sc\ reqd}$	=	0	mm²	

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PROJEC	STILT FLOOR(PARKING) +3 FLOORS RESIDENTIAL BUILDING WITH 14 DWELLING UNITS (HEIGHT-14.00M) AT PLOT NO.63,64 & 64B,DOOR NO: 3/147 ,3RD CROSS STREET, DEVARAJ AVENUE ,METTUKUPPAM, OKKIYAM THORAIPAKKAM	DOCUMENT. NO.	DATE	DESIGNED RMK	DATE
TITLE		REVISION	DATE	CHECKED RMK	DATE

CL. NO.	BEAM DESIGN CALCULATIONS	REFERENCES

Detail of bars

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

A_{st} provi = 603.19 mm^{-}

	Nos	Dia	Nos	Dia
Compression Reinforcement	3		0	0

A_{sc} provi = 603.19 mm^{-}

Percentage of tension steel provided	p_t	= 0.777	%	**Hence O.K**
Percentage of compression steel provided	p_c	= 0.777	%	**Hence O.K**

Check for Shear

Shear		=	149	kN	
Nominal Shear Stress	tv	=	1.92	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		=	250		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	=	**63.44**	N/mm^{-}	
Modification Factor(Tension Reinforcement)	F_1	=	2.00		
Allowable Span/Depth		=	52.00		
Actual Span/Depth		=	13.33	**Hence Safe**	



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Floor Beam Design

PROJEC	STILT FLOOR(PARKING) +3 FLOORS RESIDENTIAL BUILDING WITH 14 DWELLING UNITS (HEIGHT-14.00M) AT PLOT NO.63,64 & 64B,DOOR NO: 3/147 ,3RD CROSS STREET, DEVARAJ AVENUE ,METTUKUPPAM, OKKIYAM THORAIPAKKAM	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	=	300	mm	
	Overall Depth of Beam	AT PLOT NO : 5 D	=	525	mm	
	Dia of bar	JAGADAMBAL N Φ	=	25	mm	
	Nominal Cover	cc	=	30	mm	IS 456:2000 Table 19
	Effective Depth	d	=	482.5	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		=	232.22	kNm	
1.4	**Area of Steel**					
	Minimum Area of S = 0.17% b d		=	246.075	mm^2	
	Support 1					
	Negative moment (Support 1)		=	254	kNm	
	Hence the Section is designed as Doubly Reinforced Section					
		M_u/bd^2	=	3.637		
	Percentage of tension steel reqd	p_t	=	1.023	%	
	Percentage of compression steel reqd	p_c	=	0.085	%	
	Required Area of tension steel	$A_{st\ reqd}$	=	1480.79	mm^2	
	Required Area of compression steel	$A_{sc\ reqd}$	=	123.04	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 Reinforce	3	20	3	20		
A_{sc} provided			=	1884.96	mm^2	
Percentage of tension steel provided		p_t	=	1.302	%	Hence O.K
Percentage of compression steel provid		p_c	=	1.302	%	Hence O.K

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TITLE		REVISION	DATE	CHECKED RMK	DATE

CL. NO.	BEAM DESIGN CALCULATIONS	REFERENCES

Check for Shear

Shear		=	241	kN	
Nominal Shear Stress	tv	=	1.66	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	=	3.637		
Percentage of tension steel reqd	p_t	=	1.023	%	
Percentage of compression steel reqd	p_c	=	0.085	%	
Required Area of tension steel	$A_{st\ reqd}$	=	1480.79	mm^2	
Required Area of compression steel	$A_{sc\ reqd}$	=	123.04	mm^2	

Detail of bars

	I st Layer		II nd Layer		
	Nos	Dia	Nos	Dia	
Tension Reinforcement	3	20	3	20	
A_{st} provided	=	1884.9556	mm^2		
	Nos	Dia	Nos	Dia	
Compression Reinforce	3	20	3	20	
A_{sc} provided	=	1884.96	mm^2		

Percentage of tension steel provided	p_t	=	1.302	%	Hence O.K
Percentage of compression steel provic	p_c	=	1.302	%	Hence O.K

Check for Shear

Shear		=	241	kN	
Nominal Shear Stress	tv	=	1.66	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

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	=	1.023	%	
Percentage of compression steel reqd	p_c	=	0.085	%	
Required Area of tension steel	$A_{st\ reqd}$	=	1480.7	mm^2	
Required Area of compression steel	$A_{sc\ reqd}$	=	123.04	mm^2	

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TITLE		REVISION	DATE	CHECKED RMK	DATE
CL. NO.	BEAM DESIGN CALCULATIONS			REFERENCES	

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		
Compression Reinforce	3	20	3	20	
A_{sc} provided	=	1884.96	mm^2		

Percentage of tension steel provided	p_t	=	1.302	%	Hence O.K
Percentage of compression steel provic	p_c	=	1.302	%	Hence O.K

Check for Shear

Shear		=	241	kN	
Nominal Shear Stress	tv	=	1.66	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	=	**227.82**	N/mm^2	
Modification Factor(Tension Reinforcement)	F_1	=	0.97		
Allowable Span/Depth		=	25.22		
Actual Span/Depth		=	7.67	Hence Safe	

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Floor Slab Design

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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	=	**125**	mm	
Clear cover	cc	=	**25**	mm	Table 16 Cl.26.4.2 , IS 456 -2000
Effective thickness of slab (d_{eff}) = 125 - 25 - 4		=	96	mm	
Unit weight of concrete		=	25	KN/m^3	Cl 19.2.1, IS 456-2000
Effective Shorter Span	L_x	=	**3.2**	m	
Effective Longer Span	L_y	=	**6.4**	m	
Aspect ratio	L_y/L_x	=	2.00 =	2	

Hence designed as Two way slab — Cl D-1.11, IS 456-2000

Edge Condition : **One Long edge Discontinuous**

1.0.2 Load Data

Self Weight of Slab	= ### 25	=	3.125	KN/m^2
Floor finish		=	**1.500**	KN/m^2
Partition Load		=	**1.500**	KN/m^2
Sunken Filling		=	**0.000**	KN/m^2
Imposed Load		=	**2.000**	KN/m^2 — IS 875 (Part 2) -1987
Extra Load, (if Any)		=	**0.000**	KN/m^2
Total load		=	8.125	KN/m^2
Design load (Wu) = 1.5 x 8.125		=	**12.188**	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	1.75	→	0.059		Table 26 Cl D-1.1, IS 456 -2000
	2	→	0.065		
	for 2.00 a_x	=	0.065		
Positive moment M_x : 0.065 x	#### 3.2 ^2	=	**8.11**	KN-m	
a_x for negative moment	1.75	→	0.077		Table 26 Cl D-1.1, IS 456 -2000
	2	→	0.085		
	for 2.00 a_x	=	0.085		
Negative moment M_x : 0.085 x	### 3.2 ^2	=	**10.61**	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,
	Positive moment M_y : 0.028 x #### 3.2 ^2 = **3.49** KN-m	IS 456 -2000
	For negative moment a_y = 0.037	Table 26 Cl D-1.1,
	Negative moment M_y : 0.037 x #### 3.2 ^2 = **4.62** KN-m	IS 456 -2000
	Shear force V_u = 12.19 x 3 x 1 = **19.50** KN	
1.0.4	**Check Effective Depth for Max.Bending Moment**	
	Depth required = $(M_; (0.133x \; fck \; x \; b))^{1}$ = 56.48 mm	Table C,SP 16 :1980
	Depth provided = 125 - 25 - 8 /2 = 96 mm > ### mr	Cl 2.3
	Hence the section is Safe against Bending	
1.0.5	**Check Depth for Shear**	
	Nominal Shear Stress : $t_v = V_u / b\,d$ = 0.20 N/mm^2	Cl.40.1, IS 456:2000
	Design shear strength (t_c) = 0.42 N/mm^2	Table 19 , IS 456:2000
	k = 1.30	Cl.40.2.1.1,
	$k * t_c$ = 0.55 N/mm^2	IS 456:2000
	t_v < $k * t_c$ **Hence the section is Safe against Shear**	
1.0.6	**Check for Maximum Shear Stress:**	
	Nominal Shear Stress : $t_v = V_u / b\,d$ = 0.20 N/mm^2	Cl.40.1, IS 456:2000
	Maximum Shear Stress ($t_{c,max}$) = 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 Stress**	Cl.40.2.3.1, IS 456:200
1.0.7	**Reinforcement calculations**	
	Short Span Direction @ Support	
	Mu/bd = $\frac{10.61 \text{ x } 10 \text{ ^ } 6}{1000 \text{ x } 96 \text{ x } 96}$ = 1.151	
	Pt = **0.28** %	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 Ast = 0.0028 x 1000 96 = 269.25365 mm^2
Minimum area of steel 0.0012 x 1000 125 = 150.00 mm^2 Cl:26.5.2.1
Spacing of Y **8** bars 50.27 x 1000 269.25 = 186.58986 mm IS 456 -2000

Check for Spacing

Minimum of
1) 3d = 288 mm
2) = 300 mm Cl:26.3.3.(b).1
3) = 186.59 mm IS 456 -2000

Therefore provide Y **8** @ **180** mm C/C

Short Span Direction @ Mid Span

$$Mu/bd = \frac{8.11 \times 10^{6}}{1000 \times 96 \times 96} = 0.880$$

Pt = 0.211 % SP16 :1980 Table 2-4

Area of steel Ast = 0.0021 x 1000 96 = 202.92922 mm^2 IS 456:2000
Minimum area of steel 0.0012 x 1000 125 = 150.00 mm^2 Cl:26.5.2.1
Spacing of Y **8** bars 50.27 x 1000 202.93 = 247.574 mm

Check for Spacing

Minimum of
1) 3d = 288 mm IS 456:2000
2) = 300 mm Cl:26.3.3.(b).1
3) = 247.57 mm

Therefore provide Y **8** @ **150** mm C/C 150
Provided % of Tension Reinforcement (pt) = **0.349** %

Long Span Direction @ Support

$$Mu/bd = \frac{4.62 \times 10^{6}}{1000 \times 96 \times 96} = 0.501$$

Pt = 0.118 % SP16 :1980 Table 2-4

Area of steel Ast = 0.0012 x 1000 96 = 113.30457 mm^2 IS 456:2000
Minimum area of steel 0.0012 x 1000 125 = 150.00 mm Cl:26.5.2.1
Spacing of Y **8** bars 50.27 x 1000 150.00 = 334.9333 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 = 288 mm — IS 456:2000
2) = 300 mm — Cl:26.3.3.(b).1
3) = 334.93 mm

Therefore provide Y **8** @ **280** mm C/C

Long Span Direction @ mid Span

$$Mu/bd = \frac{3.49 \times 10^{6}}{1000 \times 96 \times 96} = 0.379$$

Pt = 0.089 % — SP16 :1980 Table 2-4

Area of steel Ast = 0.0009 x 1000 96 = 85.233489 mm^2 — IS 456:2000
Minimum area of steel 0.0012 x 1000 125 = 150.00 mm^2 — Cl:26.5.2.1
Spacing of Y **8** bars 50.27 x 1000 150.00 = 334.93333 mm

Check for Spacing

Minimum of 1) 3d = 288 mm — IS 456:2000
2) = 300 mm — Cl:26.3.3.(b).1
3) = 334.93 mm

Therefore provide Y **8** @ **280** 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)	=	0.349 %	
Service stress of steel (fs) 0.58 fy (Ast_R/Ast_	=	175.62 N/mm^2	IS456:2000 Fig 4
Modification Factor for Tension Reinforcemer	=	1.98	Page 38
Allowable Span / Effective Depth Ratio	=	51.51	IS 456:2000 Cl:23.2.1
Actual Span/Eff Depth Rat = 3.2 x 1000 / 96	=	33.33	

Hence Safe against Deflection

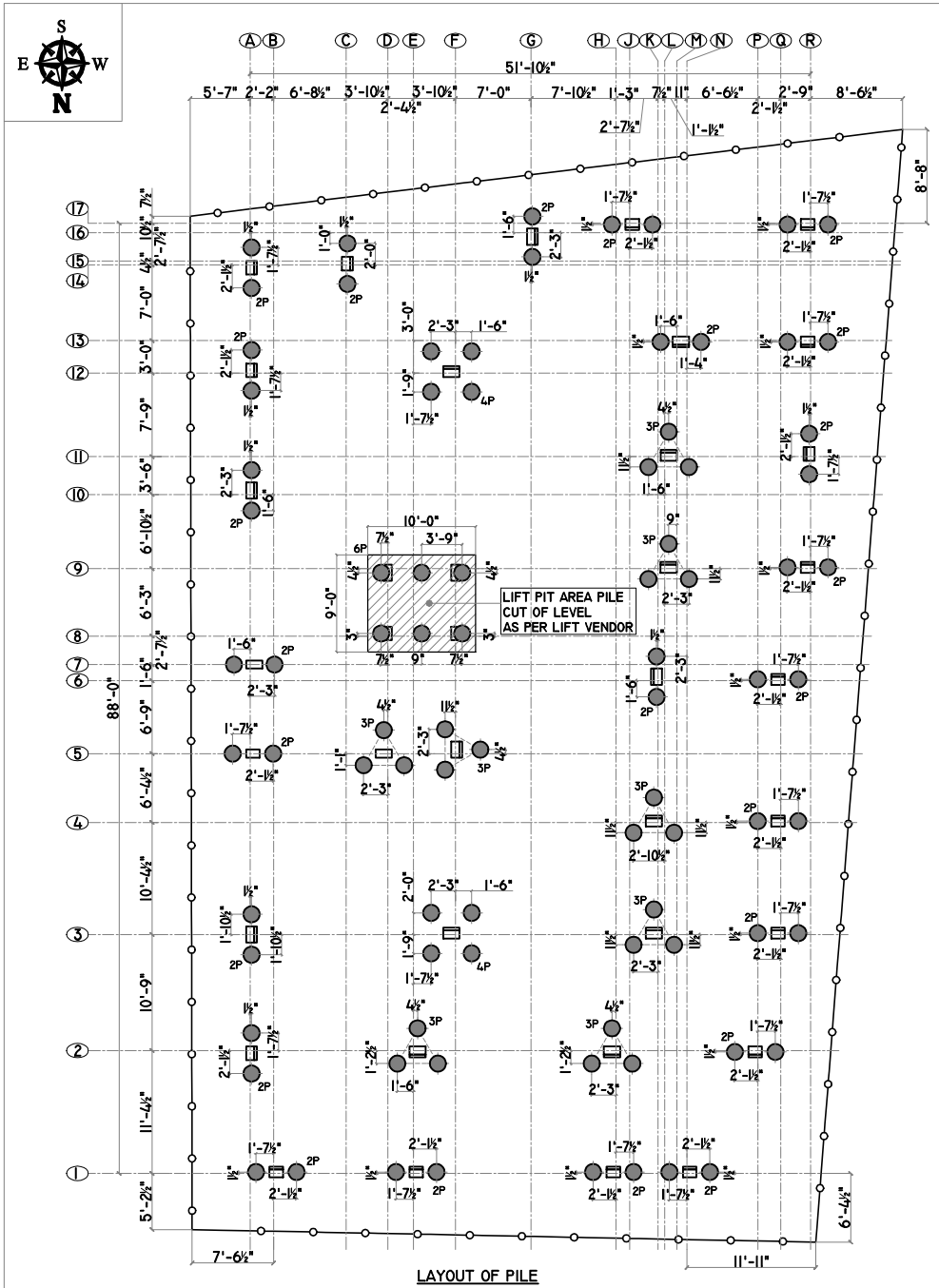
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APPENDIX II

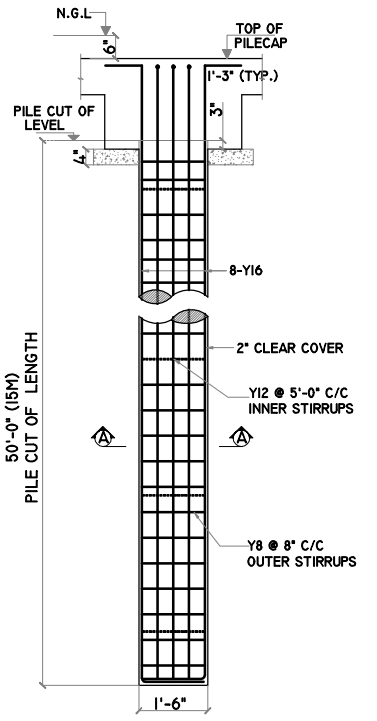
GENERAL ARRANGEMENT DRAWINGS

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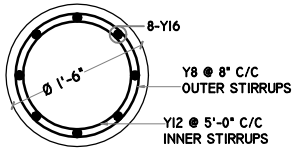
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LAYOUT OF PILE



L.S OF 1'-6" DIA. PILE



SECTION "A-A"

C.S OF PILE - 1'-6" DIA.

NOTE:

N.G.L - NATURAL GROUND LEVEL.

IMPORTANT NOTES:-

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.

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 SP-34 & IS 13920

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.

GENERAL NOTES:

1. ALL DIMENSIONS ARE IN FOOT 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. PILE CARRYING CAPACITY
   A. 1'-6" DIA. -350KN. (AS PER GEOGRAPHICAL REPORT)
5. ROUTINE TESTS OF 1.5 TIMES DESIGN CAPACITY ON ONE PILES OF 1'-6" DIA IS TO BE CARRIED OUT.
6. CLEAR COVER FOR REINFORCEMENT
   A) PILE = 2"
7. THIS DRG. READ IN CONJECTION WITH ARCH.DRGS.
6. PILE,PILE CAP AND COLUMNS ARE DESIGNED FOR S+3 FLOOR LOADS
9. STRUCTURAL ENGINEER RESPONSIBILITY IS LIMITED TO DESIGN & ISSUAL OF STRUCTURAL DRAWING ONLY
10. ONUS OF CONSTRUCTION LIES WITH CONTRACTOR/OWNER

REV.	DESCRIPTIONS	DRN	CHK	DATE
00	ISSUE FOR CONSTRUCTION	S.K	R.M	11.06.25

PROJECT :-

PLAN SHOWING THE PROPOSED CONSTRUCTION OF STILT FLOOR(PARKING) +3 FLOORS RESIDENTIAL BUILDING WITH 14 DWELLING UNITS (HEIGHT-14.00M) AT PLOT NO.63,64 & 64B,DOOR NO: 3/147 ,3RD CROSS STREET, DEVARAJ AVENUE ,METTUKUPPAM, OKKIYAM THORAIPAKKAM,CHENNAI-600 097 COMPRISED IN OLD S.NOS : 405/13 AND NEW S.NO. 405/116,405/28,405/160 AND 405/157 OF THORAIPAKKAM VILLAGE WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION.)

DRAWING TITLE :-

LAYOUT & R.C DETAILS OF PILE

DATE	SCALE	JOB.NO	DRG.NO
11.06.25	1" : 10'	-------	002

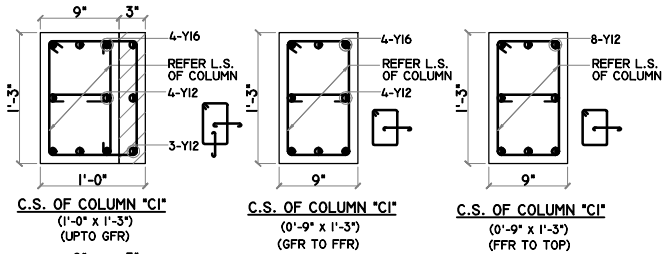
ARCHITECT / CONSULTANTS :-

STRUCTURAL CONSULTANTS :-

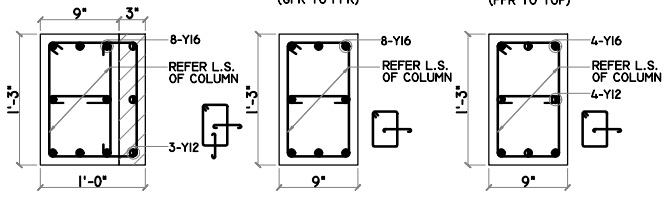
AURA ENGINEERING CONSULTANTS
NO:63/27, 64th STREET
R.V NAGAR, ASHOK NAGAR,CHENNAI- 600 083.
Fixed Line :- 044 4859 7100
projects.auraengg@gmail.com
projects@auraengineers.co.in
http://auraengineers.co.in/
aura Engineering Consultants

A3

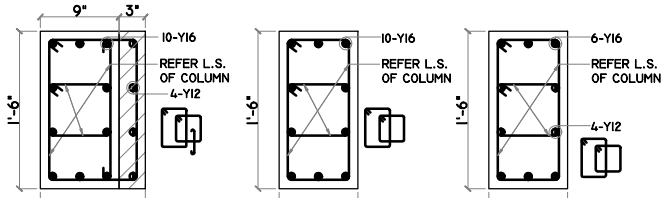
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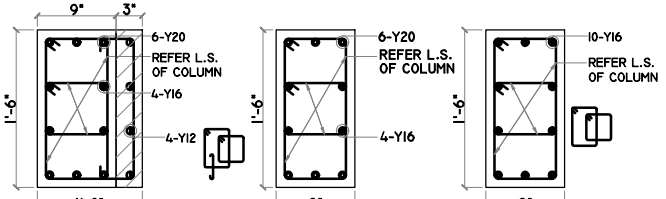
C.S. OF COLUMN "C1" (1'-0" x 1'-3") (UPTO GFR)
C.S. OF COLUMN "C1" (0'-9" x 1'-3") (GFR TO FFR)
C.S. OF COLUMN "C1" (0'-9" x 1'-3") (FFR TO TOP)



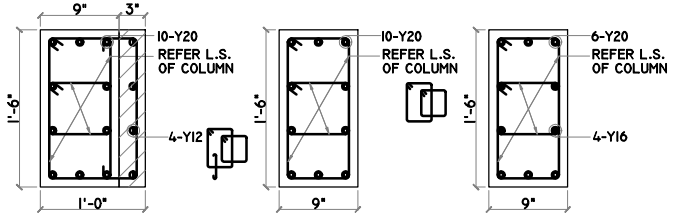
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C.S. OF COLUMN "C2" (0'-9" x 1'-3") (FFR TO TOP)



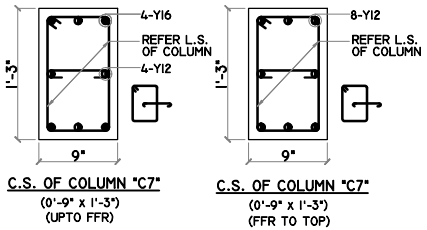
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C.S. OF COLUMN "C3" (0'-9" x 1'-6") (GFR TO FFR)
C.S. OF COLUMN "C3" (0'-9" x 1'-6") (FFR TO TOP)



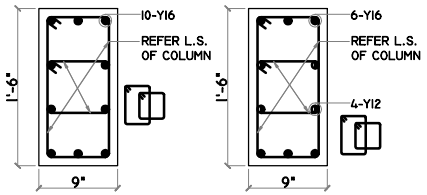
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C.S. OF COLUMN "C4" (0'-9" x 1'-6") (GFR TO FFR)
C.S. OF COLUMN "C4" (0'-9" x 1'-6") (FFR TO TOP)



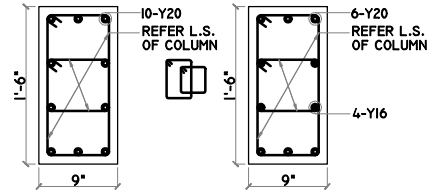
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C.S. OF COLUMN "C5" (0'-9" x 1'-6") (GFR TO FFR)
C.S. OF COLUMN "C5" (0'-9" x 1'-6") (FFR TO TOP)



C.S. OF COLUMN "C7" (0'-9" x 1'-3") (UPTO FFR)
C.S. OF COLUMN "C7" (0'-9" x 1'-3") (FFR TO TOP)



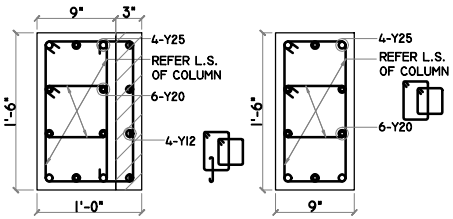
C.S. OF COLUMN "C8" (0'-9" x 1'-6") (UPTO FFR)
C.S. OF COLUMN "C8" (0'-9" x 1'-6") (FFR TO TOP)



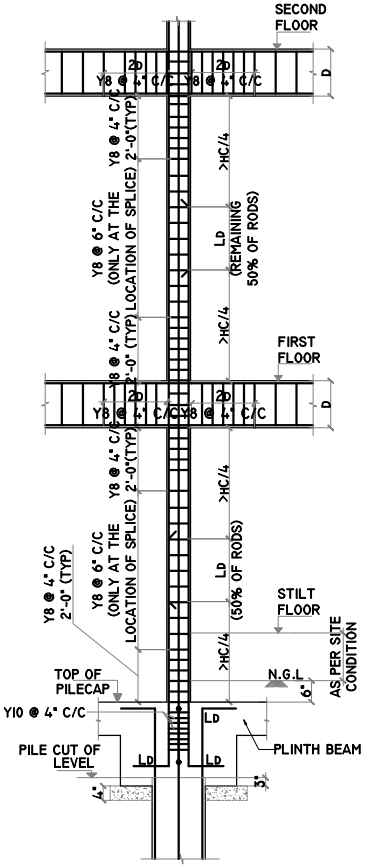
C.S. OF COLUMN "C9" (0'-9" x 1'-6") (UPTO FFR)
C.S. OF COLUMN "C9" (0'-9" x 1'-6") (FFR TO TOP)

COLUMN SCHEDULE

S.NO.	NAME	SIZE	
		UPTO GROUND ROOF	GROUND ROOF TO TOP
1.	C1	1'-0" X 1'-3"	0'-9" X 1'-3"
2.	C2	1'-0" X 1'-3"	0'-9" X 1'-3"
3.	C3	1'-0" X 1'-6"	0'-9" X 1'-6"
4.	C4	1'-0" X 1'-6"	0'-9" X 1'-6"
5.	C5	1'-0" X 1'-6"	0'-9" X 1'-6"
6.	C6	1'-0" X 1'-6"	0'-9" X 1'-6"
7.	C7	0'-9" X 1'-3"	0'-9" X 1'-3"
8.	C8	0'-9" X 1'-6"	0'-9" X 1'-6"
9.	C9	0'-9" X 1'-6"	0'-9" X 1'-6"



C.S. OF COLUMN "C6" (1'-0" x 1'-6") (UPTO GFR)
C.S. OF COLUMN "C6" (0'-9" x 1'-6") (GFR TO FFR)
C.S. OF COLUMN "C6" (0'-9" x 1'-6") (FFR TO TOP)



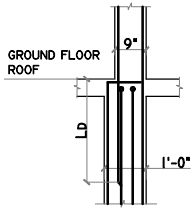
COLUMN AND PILECAP JUNCTION
(ALTERNATE RODS TO BE LAPPED IN ALTERNATE FLOORS)
(AS PER SEISMIC DETAILING CODE IS:13920)

NOTE:

N.G.L - NATURAL GROUND LEVEL.

G.F.R - GROUND FLOOR ROOF.

F.F.R - FIRST FLOOR ROOF.



TYPICAL COLUMN REDUCTION DETAILS

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 :

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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 SP-34 & IS 13920

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.

GENERAL NOTES:

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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 = 1½ "
5. THIS DRG. READ IN CONJECTION WITH ARCH.DRGS.
6. PILE,PILE CAP AND COLUMNS ARE DESIGNED FOR S+3 FLOOR LOADS
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8. ONUS OF CONSTRUCTION LIES WITH CONTRACTOR/OWNER

REV.	DESCRIPTIONS	DRN	CHK	DATE
00	ISSUE FOR CONSTRUCTION	S.K	R.M	11.06.25

PROJECT :-

PLAN SHOWING THE PROPOSED CONSTRUCTION OF STILT FLOOR(PARKING) +3 FLOORS RESIDENTIAL BUILDING WITH 14 DWELLING UNITS (HEIGHT-14.00M) AT PLOT NO.63,64 & 64B,DOOR NO: 3/147 ,3RD CROSS STREET, DEVARAJ AVENUE ,METTUKUPPAM, OKKIYAM THORAIPAKKAM,CHENNAI-600 097 COMPRISED IN OLD S.NOS : 405/13 AND NEW S.NO. 405/116,405/28,405/160 AND 405/157 OF THORAIPAKKAM VILLAGE WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION.)

DRAWING TITLE :-

R.C DETAILS OF COLUMN

DATE	SCALE	JOB.NO	DRG.NO
11.06.25	1" : 10'	--------	001A

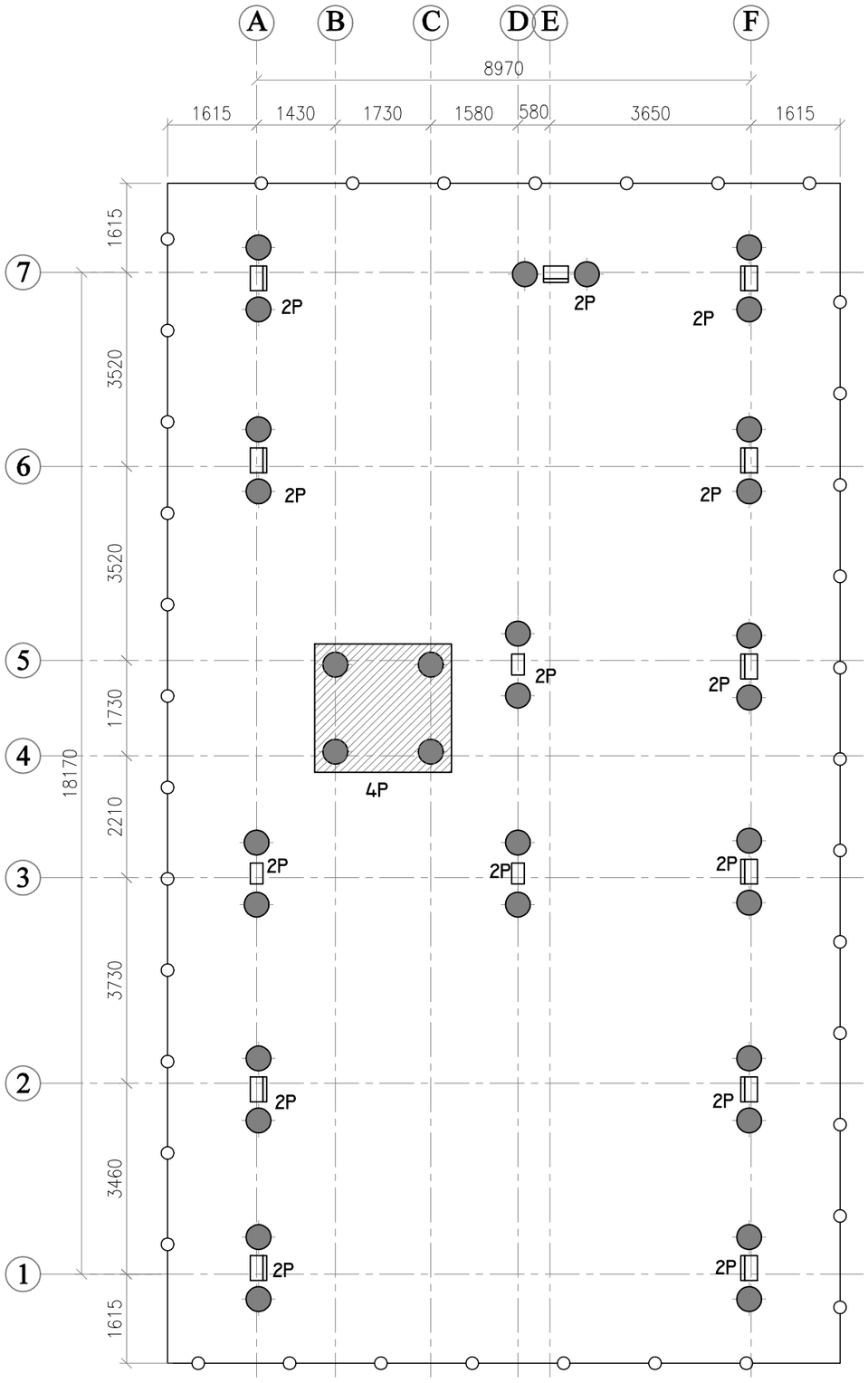
ARCHITECT / CONSULTANTS :-

STRUCTURAL CONSULTANTS :-

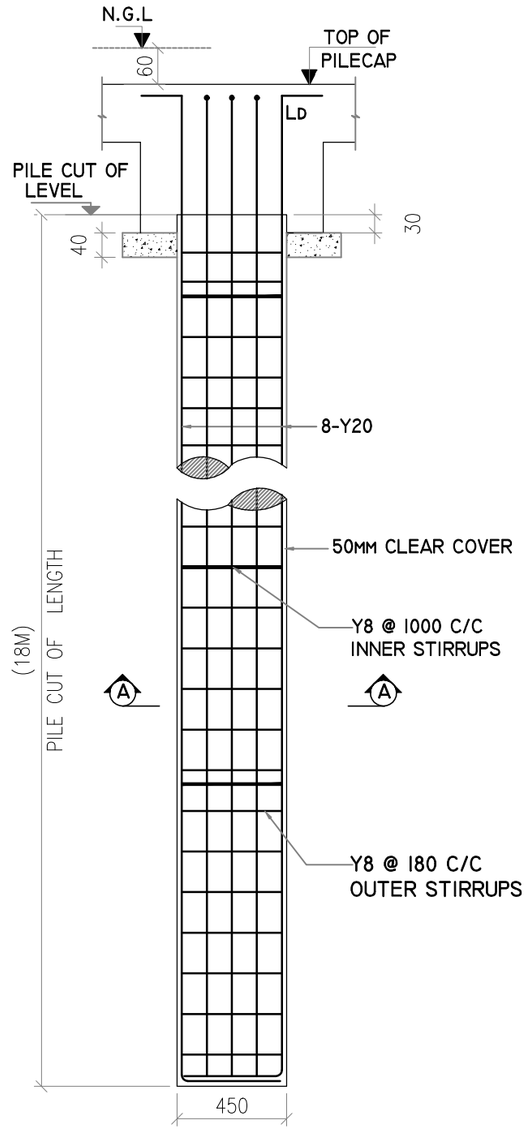
AURA ENGINEERING CONSULTANTS
#8, 50th St, Sarvamangala Colony, 7th Avenue, ASHOK NAGAR, CHENNAI- 600 083.
Fixed Line :- 044 4859 7100
projects.auraengg@gmail.com
projects@auraengineers.co.in
http://auraengineers.co.in/
aura Engineering Consultants

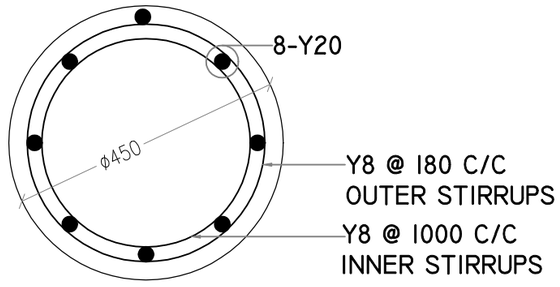
A3

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LAYOUT OF PILE





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

FOR APPROVAL ONLY

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GENERAL NOTES:

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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 OFI.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

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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.

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

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
4. PILE CARRYING CAPACITY
   A. 450MM DIA. - 540KN. (AS PER GEOGRAPHICAL REPORT)
5. PILE, PILECAP & COLUMNS ARE DESIGNED FOR S+3 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 B) PILE = 50MM
   C) PILECAP BOTTOM = 75MM D) PILECAP SIDES & TOP = 50MM
8. THIS DRG. READ IN CONJECTION WITH ARCH.DRGS.
9. STRUCTURAL ENGINEER RESPONSIBILITY IS LIMITED TO DESIGN & ISSUAL OF STRUCTURAL DRAWING ONLY
10. ONUS OF CONSTRUCTION LIES WITH CONTRACTOR/OWNER

REV.	DESCRIPTIONS	DRN	CHK	DATE
00	ISSUE FOR APPROVAL	R.P	R.M	06.03.25

PROJECT :-

PLAN SHOWING THE PROPOSED CONSTRUCTION OF RESIDENTIAL BUILDING AT DOOR NO.10(149) PLOT NO:149,3rd STREET,SRI SAI NAGAR,VIRUGAMBAKKAM, CHENNAI-600092. T.S.NO.25, BLOCK NO:8 OF SENJERI VILLAGE. DIV.NO.127 ZONE-10 GREATER CHENNAI CORPORATION.

DRAWING TITLE :-

LAYOUT OF PILE

DATE	SCALE	JOB.NO	DRG.NO
06.03.25	1 : 100	———	002

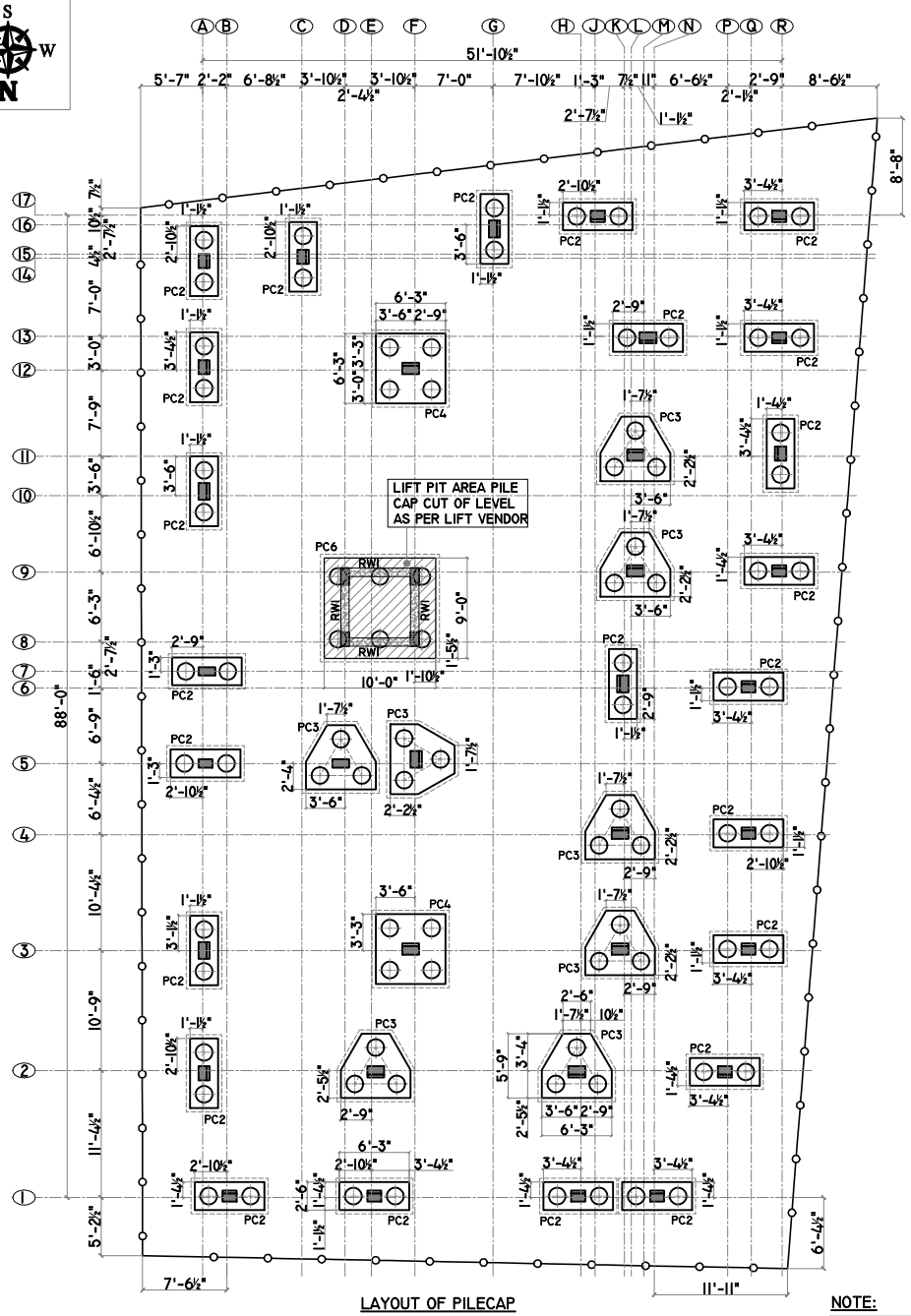
ARCHITECT / CONSULTANTS :-

STRUCTURAL CONSULTANTS :-

AURA ENGINEERING CONSULTANTS
NO:13/27, 66th STREET
R.V NAGAR, 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

A3

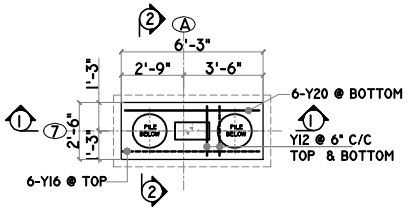
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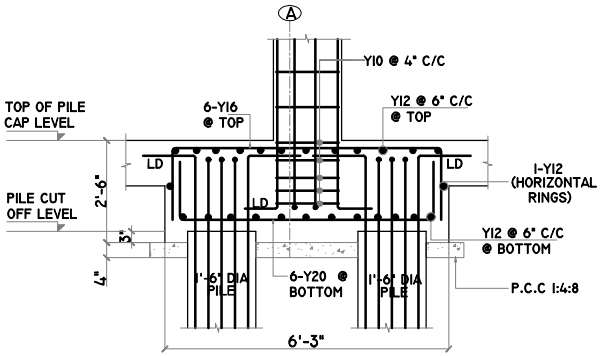
LAYOUT OF PILECAP

NOTE:

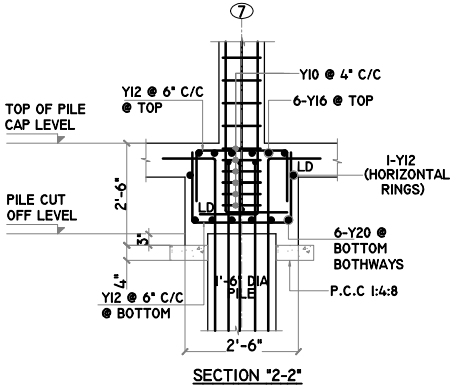
FOR PILECAP REINFORCEMENT DETAILS REFER DWG.NO: 003A



PLAN OF PILECAP "PC2"
(6'-3" x 2'-6")



SECTION "1-1"



SECTION "2-2"

PILECAP SCHEDULE:

S.NO	NAME	SIZE
01.	PC2	6'-3" X 2'-6" X 2'-6"
02.	PC3	D = 3'-0"
03.	PC4	6'-3" X 6'-3" X 2'-6"
04.	PC6	10'-0" X 9'-0" X 3'-0"

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 SP-34 & IS 13920

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.

GENERAL NOTES:

1. ALL DIMENSIONS ARE IN FOOT 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) PILECAP BOTTOM = 3"
   B) PILECAP TOP & SIDE = 2"
   C) R.C COLUMN = 1"
5. THIS DRG. READ IN CONJECTION WITH ARCH.DRGS.
6. PILE,PILE CAP AND COLUMNS ARE DESIGNED FOR S+3 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 CONSTRUCTION	S.K	R.M	11.06.25

PROJECT :-

PLAN SHOWING THE PROPOSED CONSTRUCTION OF STILT FLOOR(PARKING) +3 FLOORS RESIDENTIAL BUILDING WITH 14 DWELLING UNITS (HEIGHT-14.00M) AT PLOT NO.63,64 & 64B,DOOR NO: 3/147 ,3RD CROSS STREET, DEVARAJ AVENUE ,METTUKUPPAM, OKKIYAM THORAIPAKKAM,CHENNAI-600 097 COMPRISED IN OLD S.NOS : 405/13 AND NEW S.NO. 405/116,405/28,405/160 AND 405/157 OF THORAIPAKKAM VILLAGE WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION.)

DRAWING TITLE :-

LAYOUT OF PILECAP

DATE	SCALE	JOB.NO	DRG.NO
11.06.25	1" : 10'	--------	003

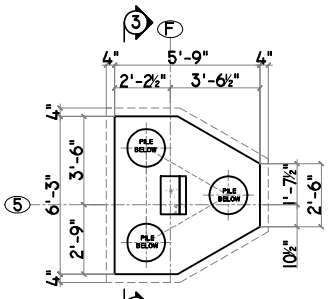
ARCHITECT / CONSULTANTS :-

STRUCTURAL CONSULTANTS :-

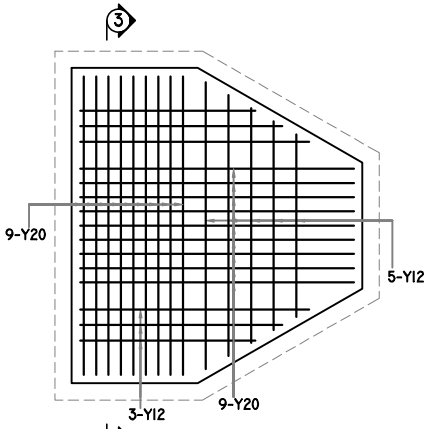
AURA ENGINEERING CONSULTANTS
NO:62/27, 64th STREET
R.V NAGAR, ASHOK NAGAR,CHENNAI- 600 083.
Fixed Line :- 044 4859 7100
projects.auraengg@gmail.com
projects@auraengineers.co.in
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aura Engineering Consultants

A3

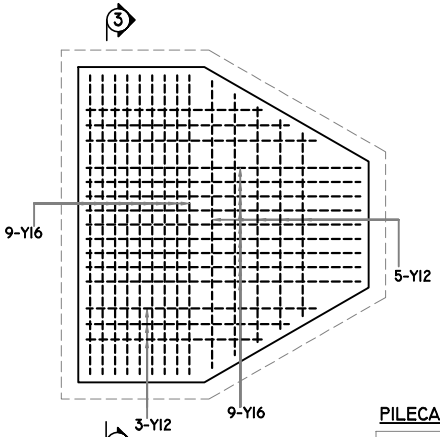
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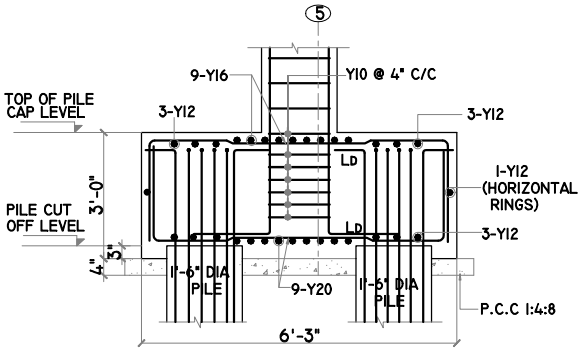
PLAN OF PILECAP "PC3"



BOTTOM STEEL OF PILECAP - "PC3"



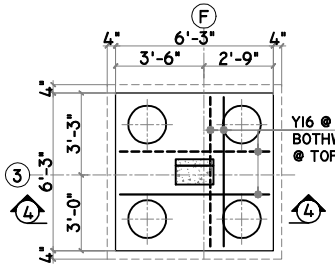
TOP STEEL OF PILECAP - "PC3"



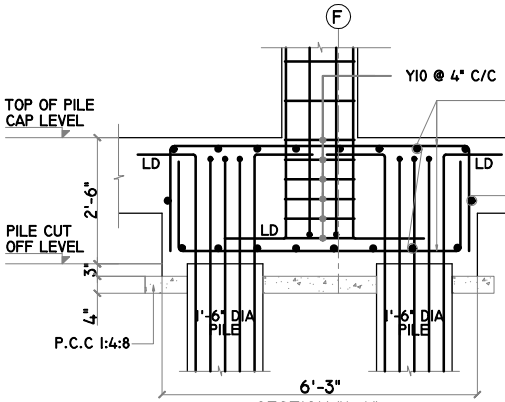
SECTION "3-3"

PILECAP SCHEDULE:

S.NO	NAME	SIZE
01.	PC2	6'-3" X 2'-6" X 2'-6"
02.	PC3	D = 3'-0"
03.	PC4	6'-3" X 6'-3" X 2'-6"
04.	PC6	10'-0" X 9'-0" X 3'-0"



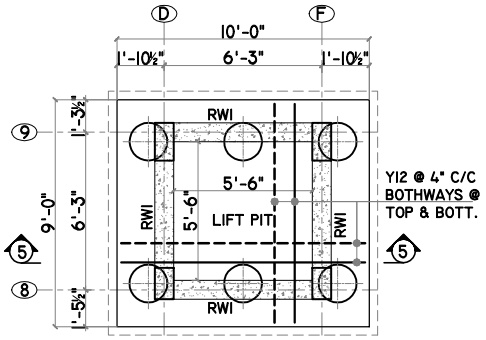
PLAN OF PILECAP "PC4"
(6'-3" X 6'-3")



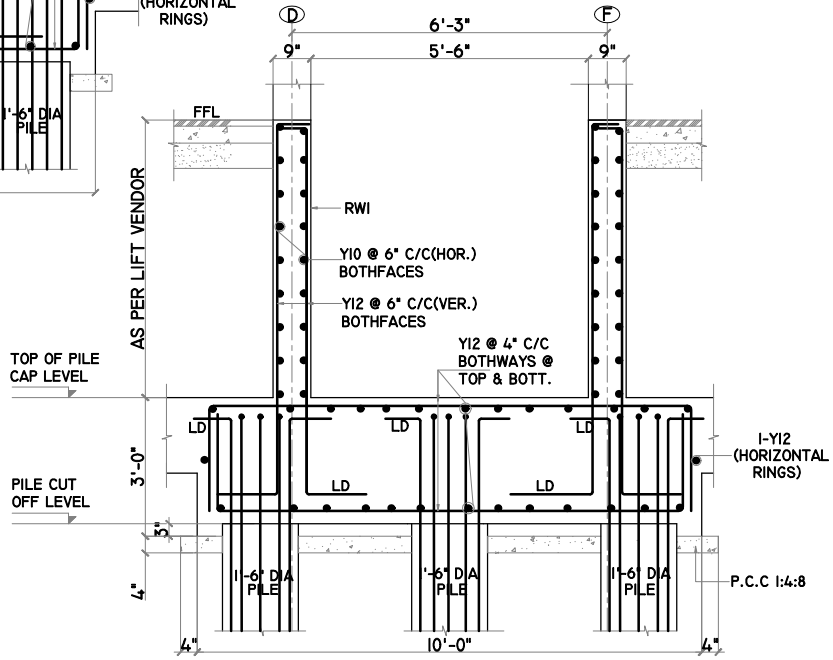
SECTION "4-4"

NOTE:

F.F.L - FLOOR FINISH LEVEL



PLAN OF PILECAP "PC6"
(10'-0" X 9'-0")



SECTION "5-5"

GENERAL NOTES:

1. ALL DIMENSIONS ARE IN FOOT 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) PILECAP BOTTOM = 3"
   b) PILECAP TOP & SIDE = 2"
   c) R.C COLUMN = 1"
5. THIS DRG. READ IN CONJECTION WITH ARCH.DRGS.
6. PILE,PILE CAP AND COLUMNS ARE DESIGNED FOR S+3 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 CONSTRUCTION	S.K	R.M	11.06.25

PROJECT :-

PLAN SHOWING THE PROPOSED CONSTRUCTION OF STILT FLOOR(PARKING) +3 FLOORS RESIDENTIAL BUILDING WITH 14 DWELLING UNITS (HEIGHT-14.00M) AT PLOT NO.63,64 & 64B,DOOR NO: 3/147 ,3RD CROSS STREET, DEVARAJ AVENUE ,METTUKUPPAM, OKKIYAM THORAIPAKKAM,CHENNAI-600 097 COMPRISED IN OLD S.NOS : 405/13 AND NEW S.NO. 405/116,405/28,405/160 AND 405/157 OF THORAIPAKKAM VILLAGE WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION.)

DRAWING TITLE :-

R.C DETAILS OF PILECAP

DATE	SCALE	JOB.NO	DRG.NO
11.06.25	1" : 9'	--------	003A

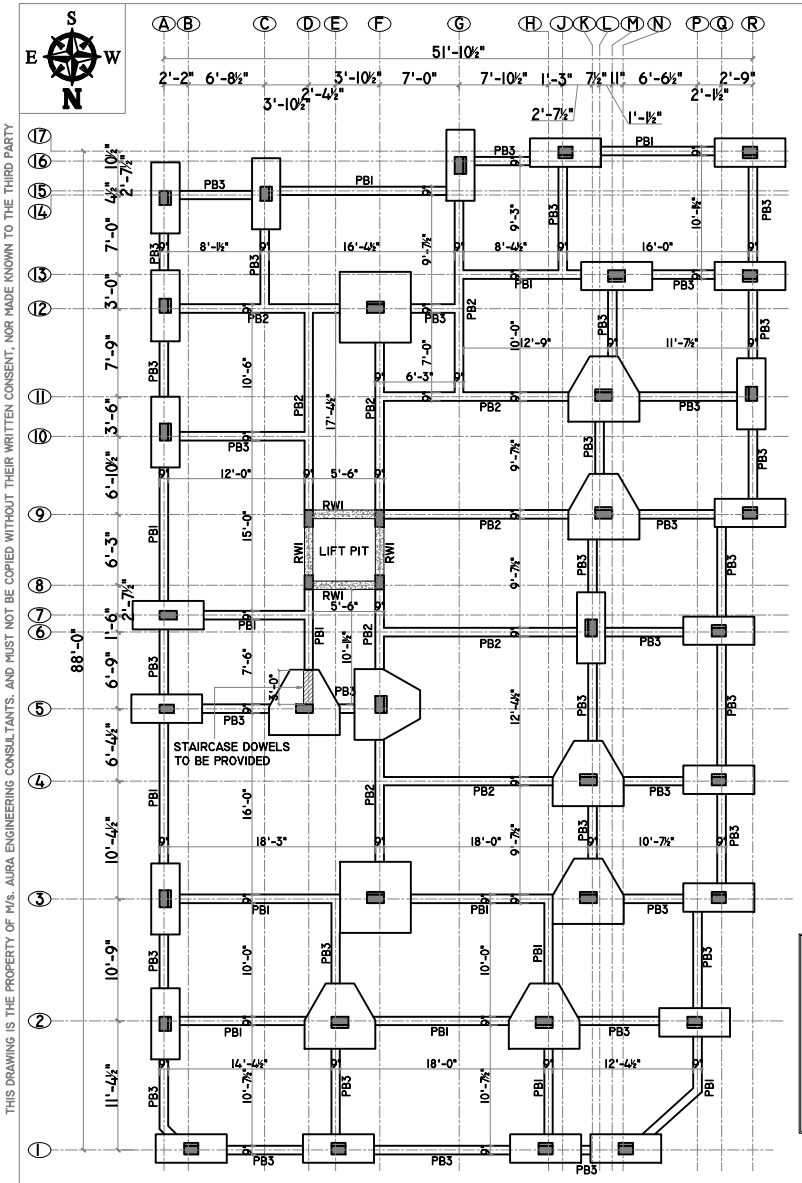
ARCHITECT / CONSULTANTS :-

STRUCTURAL CONSULTANTS :-

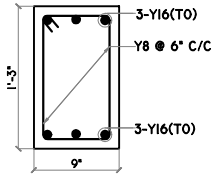
AURA ENGINEERING CONSULTANTS
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R.V NAGAR, ASHOK NAGAR,CHENNAI- 600 083.
Fixed Line :- 044 4859 7100
projects.auraengg@gmail.com
projects@auraengineers.co.in
http://auraengineers.co.in/
aura Engineering Consultants

A3

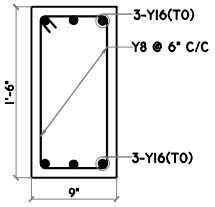
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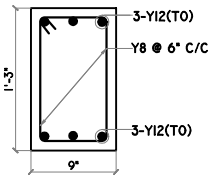
LAYOUT OF PLINTH BEAM



PLINTH BEAM "PB1"
(0'-9" X 1'-3")

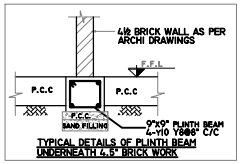


PLINTH BEAM "PB2"
(0'-9" X 1'-6")



PLINTH BEAM "PB3"
(0'-9" X 1'-0")

BEAM SCHEDULE		
SL.NO	NAME	SIZE
01	PB1	0'-9" X 1'-3"
02	PB2	0'-9" X 1'-6"
03	PB3	0'-9" X 1'-3"

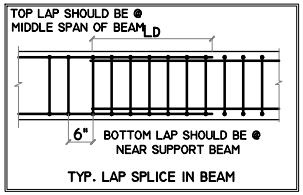


TYPICAL DETAILS OF PLINTH BEAM UNDERNEATH 4.5" BRICK WORK

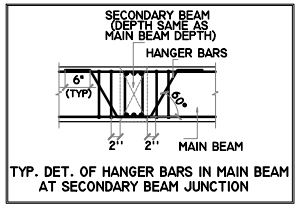
NOTE:

N.G.L - NATURAL GROUND LEVEL.

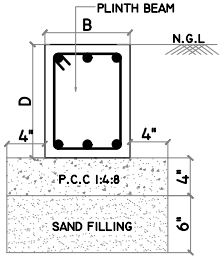
F.F.L - FLOOR FINISHED LEVEL.



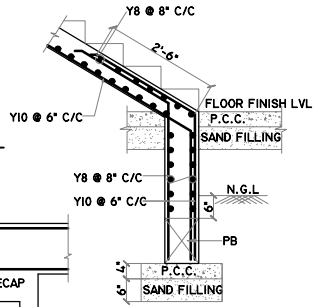
TYP. LAP SPLICE IN BEAM



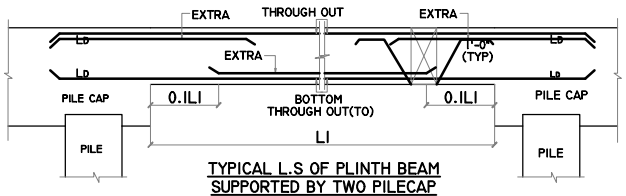
TYP. DET. OF HANGER BARS IN MAIN BEAM AT SECONDARY BEAM JUNCTION



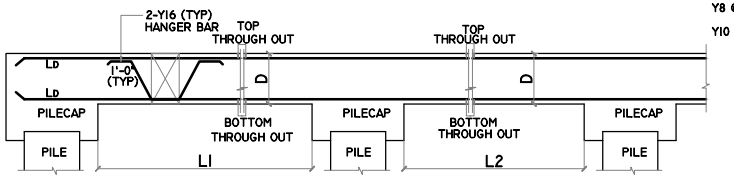
TYPICAL DETAIL OF PLINTH BEAM



TYP. DETAIL OF STAIRCASE DOWELS



TYPICAL L.S OF PLINTH BEAM SUPPORTED BY TWO PILECAP



TYPICAL L.S CONTINUES PLINTH BEAM

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 OFI.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 SP-34 & IS 13920

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.

GENERAL NOTES:

1. ALL DIMENSIONS ARE IN FOOT 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. PILE CARRYING CAPACITY
   A. 1'-6" DIA. -350KN. (AS PER GEOGRAPHICAL REPORT)
5. ROUTINE TESTS OF 1.5 TIMES DESIGN CAPACITY ON ONE PILES OF 1'-6" DIA IS TO BE CARRIED OUT.
6. CLEAR COVER FOR REINFORCEMENT
   A) PILE = 2" B) BEAM = 1" C) PILE CAP SIDES & TOP = 2"
7. THIS DRG. READ IN CONJECTION WITH ARCH.DRGS.
8. PILE,PILE CAP AND COLUMNS ARE DESIGNED FOR S+3 FLOOR LOADS
9. STRUCTURAL ENGINEER RESPONSIBILITY IS LIMITED TO DESIGN & ISSUAL OF STRUCTURAL DRAWING ONLY
10. ONUS OF CONSTRUCTION LIES WITH CONTRACTOR/OWNER

REV.	DESCRIPTIONS	DRN	CHK	DATE
00	ISSUE FOR CONSTRUCTION	R.S	R.M	11.06.25

PROJECT :-

PLAN SHOWING THE PROPOSED CONSTRUCTION OF STILT FLOOR(PARKING) +3 FLOORS RESIDENTIAL BUILDING WITH 14 DWELLING UNITS (HEIGHT-14.00M) AT PLOT NO.63,64 & 64B,DOOR NO: 3/147 ,3RD CROSS STREET, DEVARAJ AVENUE ,METTUKUPPAM, OKKIYAM THORAIPAKKAM,CHENNAI-600 097 COMPRISED IN OLD S.NOS : 405/13 AND NEW S.NO. 405/116,405/28,405/160 AND 405/157 OF THORAIPAKKAM VILLAGE WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION.)

DRAWING TITLE :-

LAYOUT & R.C DETAILS OF PLINTH BEAM

DATE	SCALE	JOB.NO	DRG.NO
11.06.25	1" : 10'	-------	004

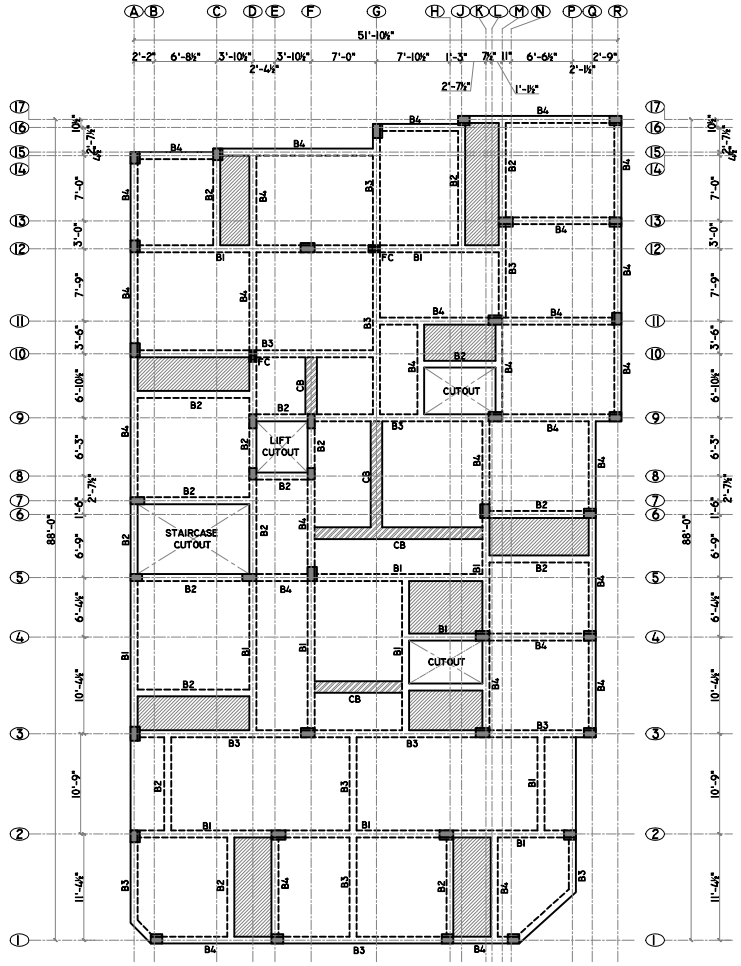
ARCHITECT / CONSULTANTS :-

STRUCTURAL CONSULTANTS :-

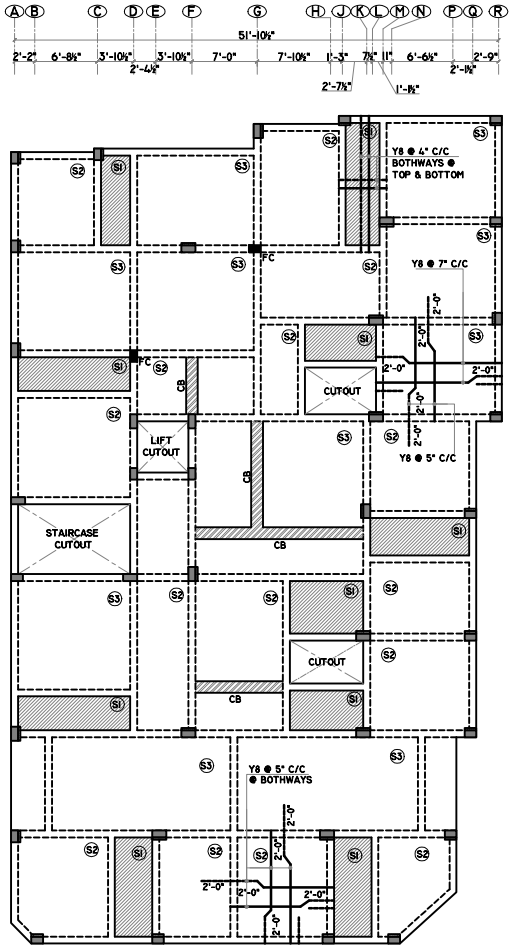
AURA ENGINEERING CONSULTANTS
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projects@auraengineers.co.in
http://auraengineers.co.in/
aura Engineering Consultants

A3

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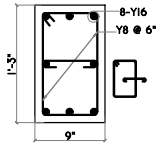
LAYOUT OF GROUND FLOOR ROOF BEAM & SLAB



R.C LAYOUT OF GROUND FLOOR ROOF BEAM & SLAB

SLAB SCHEDULE		
SL.NO	NAME	THICK
01	S1	5" THK.
02	S2	5" THK.
03	S3	5" THK.

BEAM SCHEDULE		
SL.NO	NAME	SIZE
01	B1	0'-9" x 1'-9"
02	B2	0'-9" x 1'-6"
03	B3	0'-9" x 2'-0"
04	B4	0'-9" x 1'-6"



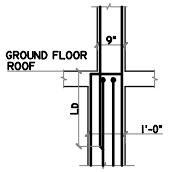
C.S. OF COLUMN "FC"
(0'-9" x 1'-3")
(UPTO TOP)

NOTE:

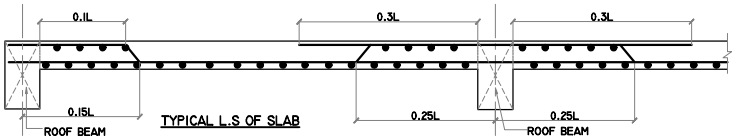
SLAB SUNK BY 0'-10"

PROVIDE Y8 @ 8" C/C AS DISTRIBUTORS WHERE EVER REQUIRED

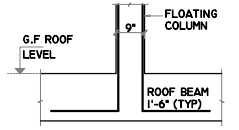
FOR BEAM REINFORCEMENT DETAILS REFER DWG.NO : 006



TYPICAL COLUMN REDUCTION DETAILS



TYPICAL L.S OF SLAB



TYPICAL FLOATING COLUMN DETAIL

GENERAL NOTES:

REMOVAL OF FORM WORK (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 FOOT 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) BEAM = 1" B) SLAB = 3/4"
5. THIS DRG. READ IN CONJECTION WITH ARCH.DRGS.
6. STRUCTURAL ENGINEER RESPONSIBILITY IS LIMITED TO DESIGN & ISSUAL OF STRUCTURAL DRAWING ONLY
7. ONUS OF CONSTRUCTION LIES WITH CONTRACTOR/OWNER

REV.	DESCRIPTIONS	DRN	CHK	DATE
00	ISSUE FOR CONSTRUCTION	R.P	R.M	11.06.25

PROJECT :-

PLAN SHOWING THE PROPOSED CONSTRUCTION OF STILT FLOOR(PARKING) +3 FLOORS RESIDENTIAL BUILDING WITH 14 DWELLING UNITS (HEIGHT-14.00M) AT PLOT NO.63,64 & 64B,DOOR NO: 3/147 ,3RD CROSS STREET, DEVARAJ AVENUE ,METTUKUPPAM, OKKIYAM THORAIPAKKAM,CHENNAI-600 097 COMPRISED IN OLD S.NOS : 405/13 AND NEW S.NO. 405/116,405/28,405/160 AND 405/157 OF THORAIPAKKAM VILLAGE WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION.)

DRAWING TITLE :-

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

DATE	SCALE	JOB.NO	DRG.NO
11.06.25	1" : 8'	-------	005

ARCHITECT / CONSULTANTS :-

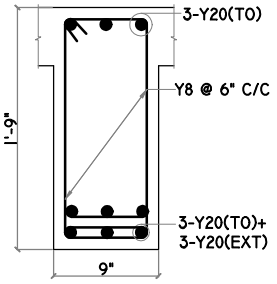
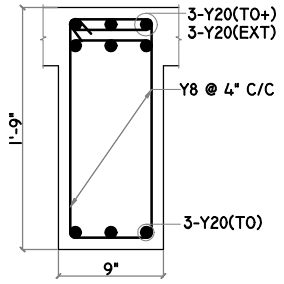
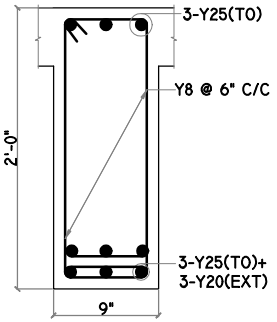
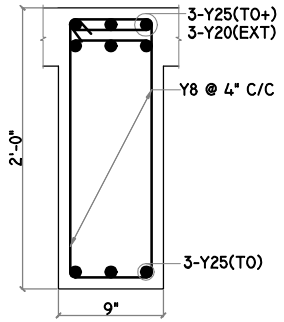
STRUCTURAL CONSULTANTS :-

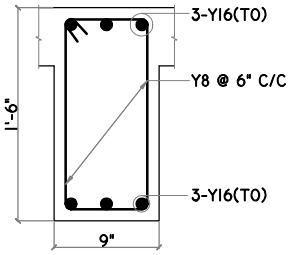
AURA ENGINEERING CONSULTANTS
#8, 50th St, Sarvamangala Colony, 7th Avenue, ASHOK NAGAR, CHENNAI- 600 083.
Fixed Line :- 044 4859 7100
projects.auraengg@gmail.com
projects@auraengineers.co.in
http://auraengineers.co.in/
aura Engineering Consultants

A3

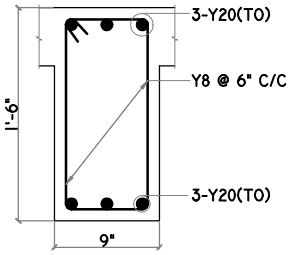
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BEAM REINFORCEMENTS

NAME	MID SPAN	END SUPPORT
B1 (0'-9" X 1'-9")		
B3 (0'-9" X 2'-0")		



C.S. OF BEAM "B2"
(0'-9" X 1'-6")



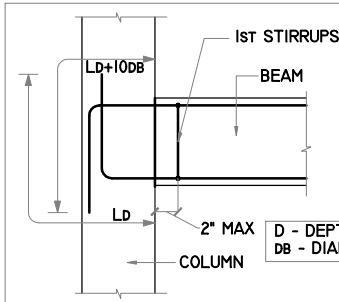
C.S. OF BEAM "B4"
(0'-9" X 1'-6")

GENERAL NOTES:

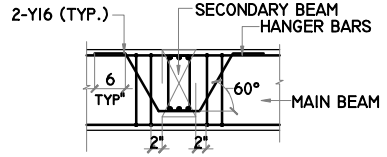
1. ALL DIMENSIONS ARE IN FOOT UNITS.
2. CONCRETE GRADE SHALL BE M25 CONFIRMING TO IS 456:2000
3. GRADE OF REINFORCEMENT MARKED THUS (Y) SHALL BE Fe 500 CONFIRMING TO IS 1786-2008
4. CLEAR COVER FOR REINFORCEMENT
   A) BEAM = 1" B) SLAB = 3/4"
5. THIS DRG. READ IN CONJECTION WITH ARCH.DRGS.
6. STRUCTURAL ENGINEER RESPONSIBILITY IS LIMITED TO DESIGN & ISSUAL OF STRUCTURAL DRAWING ONLY
7. ONUS OF CONSTRUCTION LIES WITH CONTRACTOR/OWNER

BEAM SCHEDULE		
SL.NO	NAME	SIZE
01	B1	0'-9" x 1'-9"
02	B2	0'-9" x 1'-6"
03	B3	0'-9" x 2'-0"
04	B4	0'-9" x 1'-6"

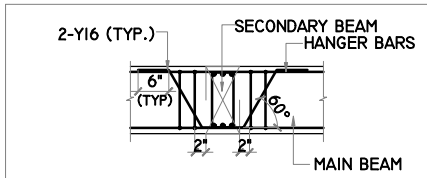
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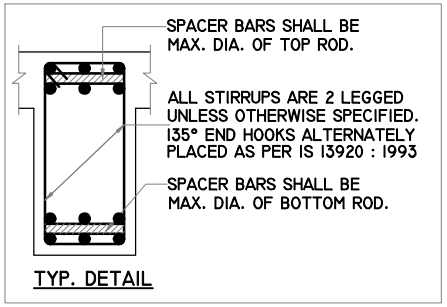
TYP. EXTERNAL JOINT DETAIL AT BEAM-COLUMN JUNCTION



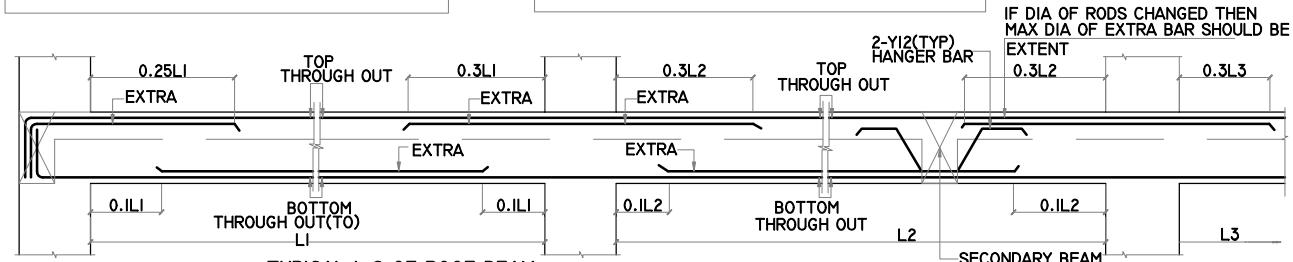
TYP. DET. OF HANGER BARS IN MAIN BEAM AT SECONDARY BEAM JUNCTION (VARY DEPTH)



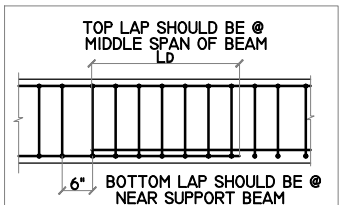
TYP. DET. OF HANGER BARS IN MAIN BEAM AT SECONDARY BEAM JUNCTION



TYP. DETAIL



TYPICAL L.S OF ROOF BEAM



TYP. LAP SPLICE IN BEAM

REV.	DESCRIPTIONS	DRN	CHK	DATE
00	ISSUE FOR CONSTRUCTION	R.P	R.M	11.06.25

PROJECT :-

PLAN SHOWING THE PROPOSED CONSTRUCTION OF STILT FLOOR(PARKING) +3 FLOORS RESIDENTIAL BUILDING WITH 14 DWELLING UNITS (HEIGHT-14.00M) AT PLOT NO.63,64 & 64B,DOOR NO: 3/147 ,3RD CROSS STREET, DEVARAJ AVENUE ,METTUKUPPAM, OKKIYAM THORAIPAKKAM,CHENNAI-600 097 COMPRISED IN OLD S.NOS : 405/13 AND NEW S.NO. 405/116,405/28,405/160 AND 405/157 OF THORAIPAKKAM VILLAGE WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION.)

DRAWING TITLE :-

R.C DETAILS FOR ALL FLOOR STILT ROOF BEAM

DATE	SCALE	JOB.NO	DRG.NO
11.06.25	1" : 10'	—	006

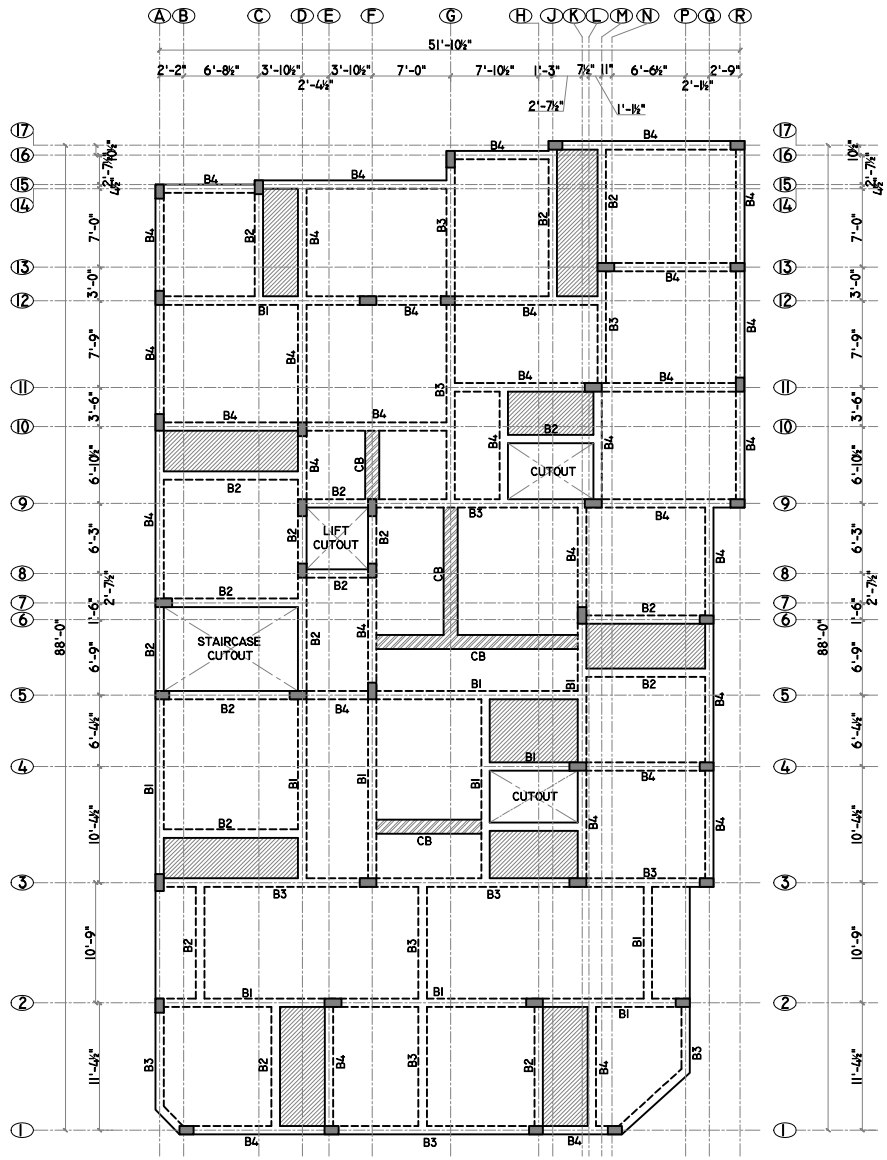
ARCHITECT / CONSULTANTS :-

STRUCTURAL CONSULTANTS :-

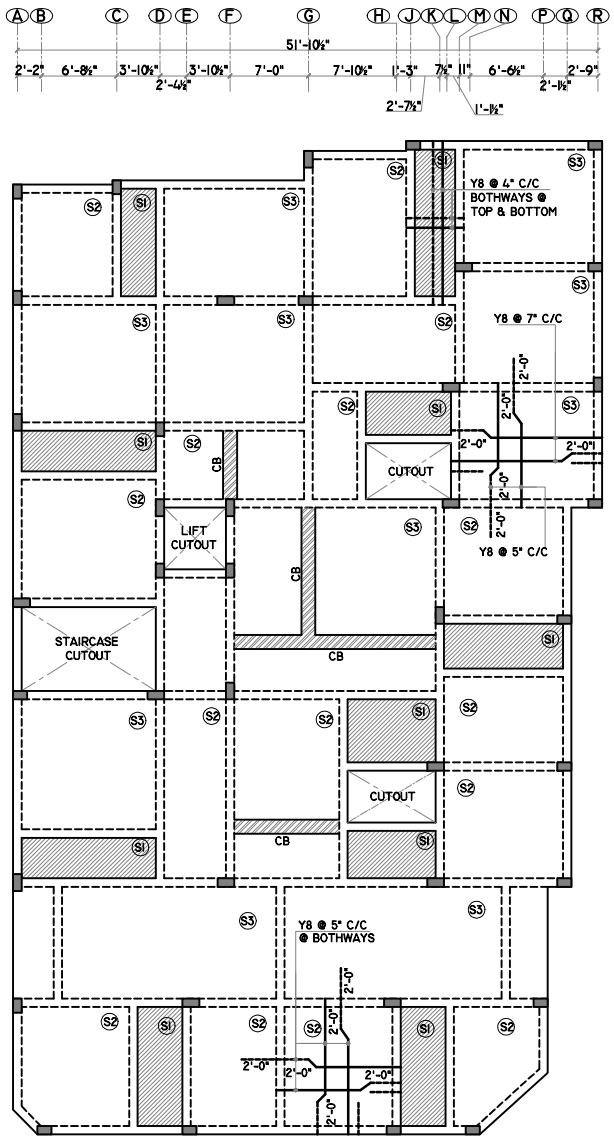
AURA ENGINEERING CONSULTANTS
NO:13/27, 66th STREET
R.V NAGAR, ASHOK NAGAR,CHENNAI- 600 083.
Fixed Line :- 044 4859 7100
projects.auraengg@gmail.com
projects@auraengineers.co.in
http://auraengineers.co.in/
aura Engineering Consultants

A3

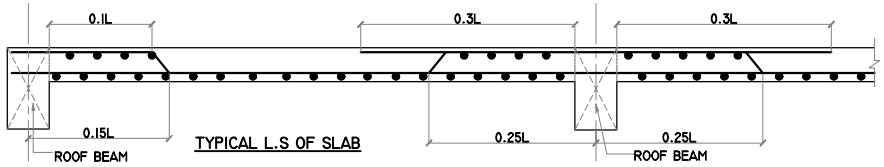
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LAYOUT OF TYPICAL FLOOR ROOF BEAM & SLAB



R.C LAYOUT OF TYPICAL FLOOR ROOF BEAM & SLAB



TYPICAL L.S OF SLAB

SLAB SCHEDULE		
SL.NO	NAME	THICK
01	S1	5" THK.
02	S2	5" THK.
03	S3	5" THK.

BEAM SCHEDULE		
SL.NO	NAME	SIZE
01	B1	0'-9" x 1'-9"
02	B2	0'-9" x 1'-6"
03	B3	0'-9" x 2'-0"
04	B4	0'-9" x 1'-6"

NOTE:

SLAB SUNK BY 0'-10"

PROVIDE Y8 @ 8" C/C AS DISTRIBUTORS WHERE EVER REQUIRED

FOR BEAM REINFORCEMENT DETAILS REFER DWG.NO : 009

GENERAL NOTES:

REMOVAL OF FORM WORK (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 FOOT 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) BEAM = 1" B) SLAB = 3/4"
5. THIS DRG. READ IN CONJECTION WITH ARCH.DRGS.
6. STRUCTURAL ENGINEER RESPONSIBILITY IS LIMITED TO DESIGN & ISSUAL OF STRUCTURAL DRAWING ONLY
7. ONUS OF CONSTRUCTION LIES WITH CONTRACTOR/OWNER

REV.	DESCRIPTIONS	DRN	CHK	DATE
00	ISSUE FOR CONSTRUCTION	R.P	R.M	11.06.25

PROJECT :-

PLAN SHOWING THE PROPOSED CONSTRUCTION OF STILT FLOOR(PARKING) +3 FLOORS RESIDENTIAL BUILDING WITH 14 DWELLING UNITS (HEIGHT-14.00M) AT PLOT NO.63,64 & 64B,DOOR NO: 3/147 ,3RD CROSS STREET, DEVARAJ AVENUE ,METTUKUPPAM, OKKIYAM THORAIPAKKAM,CHENNAI-600 097 COMPRISED IN OLD S.NOS : 405/13 AND NEW S.NO. 405/116,405/28,405/160 AND 405/157 OF THORAIPAKKAM VILLAGE WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION.)

DRAWING TITLE :-

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

DATE	SCALE	JOB.NO	DRG.NO
11.06.25	1" : 8'	-------	007

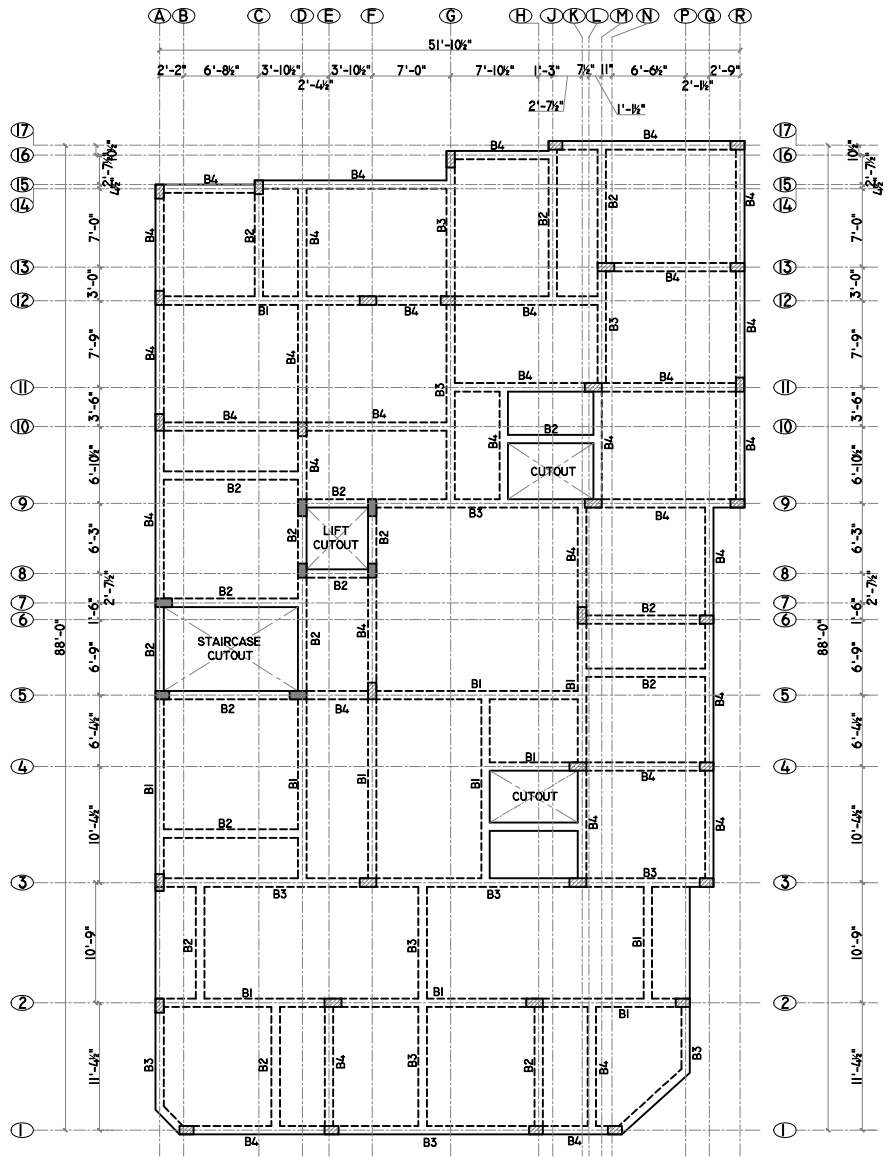
ARCHITECT / CONSULTANTS :-

STRUCTURAL CONSULTANTS :-

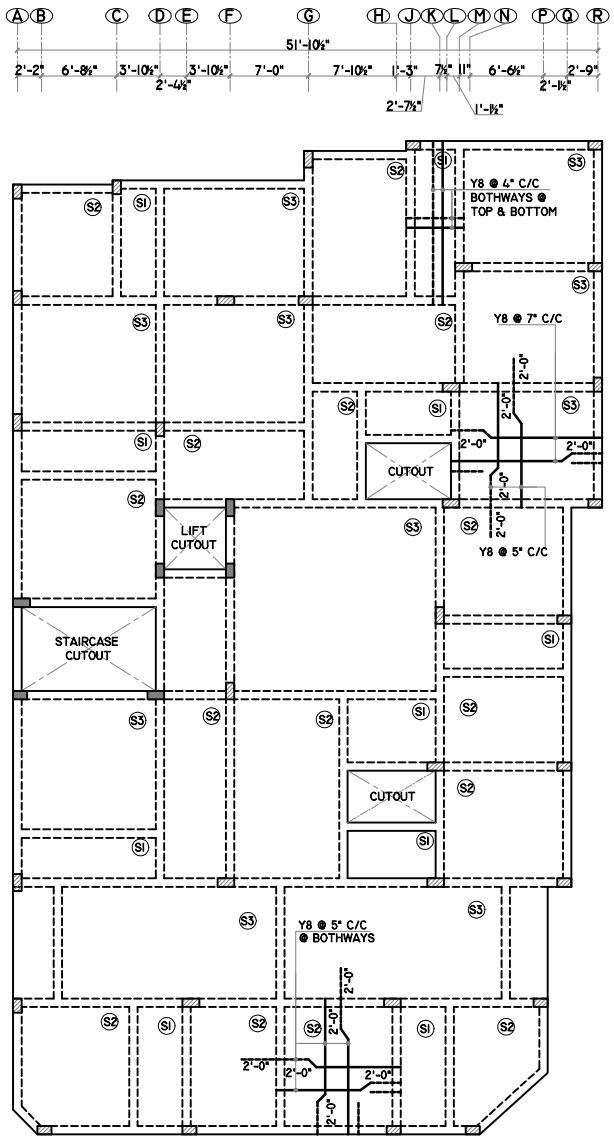
AURA ENGINEERING CONSULTANTS
#8, 50th St, Sarvamangala Colony, 7th Avenue, ASHOK NAGAR, CHENNAI- 600 083.
Fixed Line :- 044 4859 7100
projects.auraengg@gmail.com
projects@auraengineers.co.in
http://auraengineers.co.in/
aura Engineering Consultants

A3

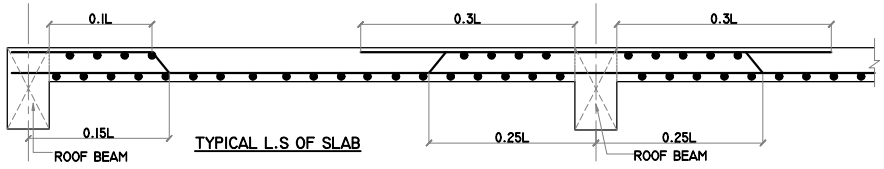
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LAYOUT OF TYPICAL FLOOR ROOF BEAM & SLAB



R.C LAYOUT OF TYPICAL FLOOR ROOF BEAM & SLAB



TYPICAL L.S OF SLAB

SLAB SCHEDULE		
SL.NO	NAME	THICK
01	S1	5" THK.
02	S2	5" THK.
03	S3	5" THK.

BEAM SCHEDULE		
SL.NO	NAME	SIZE
01	B1	0'-9" x 1'-9"
02	B2	0'-9" x 1'-6"
03	B3	0'-9" x 2'-0"
04	B4	0'-9" x 1'-6"

NOTE:

CC - COLUMN CURTAILED & RODS TO BE BEND IN TO TOP OF THE SLAB

PROVIDE Y8 @ 8" C/C AS DISTRIBUTORS WHERE EVER REQUIRED

FOR BEAM REINFORCEMENT DETAILS REFER DWG.NO : 009

GENERAL NOTES:

REMOVAL OF FORM WORK (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 FOOT 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) BEAM = 1" B) SLAB = 3/4"
5. THIS DRG. READ IN CONJECTION WITH ARCH.DRGS.
6. STRUCTURAL ENGINEER RESPONSIBILITY IS LIMITED TO DESIGN & ISSUAL OF STRUCTURAL DRAWING ONLY
7. ONUS OF CONSTRUCTION LIES WITH CONTRACTOR/OWNER

REV.	DESCRIPTIONS	DRN	CHK	DATE
00	ISSUE FOR CONSTRUCTION	R.P	R.M	11.06.25

PROJECT :-

PLAN SHOWING THE PROPOSED CONSTRUCTION OF STILT FLOOR(PARKING) +3 FLOORS RESIDENTIAL BUILDING WITH 14 DWELLING UNITS (HEIGHT-14.00M) AT PLOT NO.63,64 & 64B,DOOR NO: 3/147 ,3RD CROSS STREET, DEVARAJ AVENUE ,METTUKUPPAM, OKKIYAM THORAIPAKKAM,CHENNAI-600 097 COMPRISED IN OLD S.NOS : 405/13 AND NEW S.NO. 405/116,405/28,405/160 AND 405/157 OF THORAIPAKKAM VILLAGE WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION.)

DRAWING TITLE :-

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

DATE	SCALE	JOB.NO	DRG.NO
11.06.25	1" : 8'	-------	008

ARCHITECT / CONSULTANTS :-

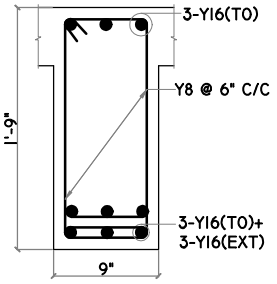
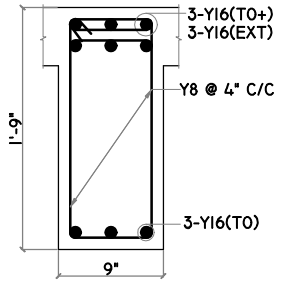
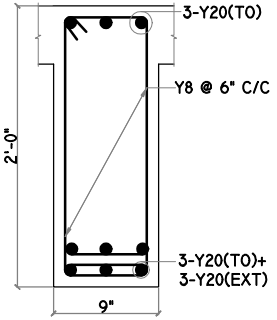
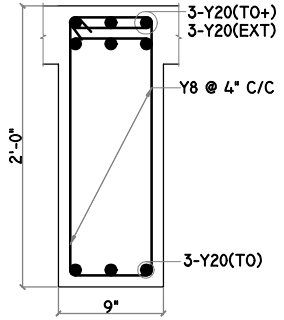
STRUCTURAL CONSULTANTS :-

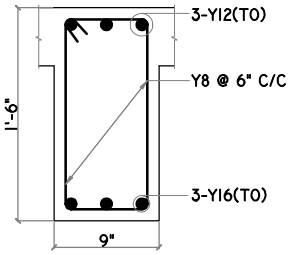
AURA ENGINEERING CONSULTANTS
#8, 50th St, Sarvamangala Colony, 7th Avenue, ASHOK NAGAR, CHENNAI- 600 083.
Fixed Line :- 044 4859 7100
projects.auraengg@gmail.com
projects@auraengineers.co.in
http://auraengineers.co.in/
aura Engineering Consultants

A3

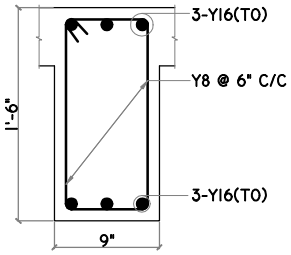
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BEAM REINFORCEMENTS

NAME	MID SPAN	END SUPPORT
B1 (0'-9" X 1'-9")		
B3 (0'-9" X 2'-0")		



C.S. OF BEAM "B2"
(0'-9" X 1'-6")



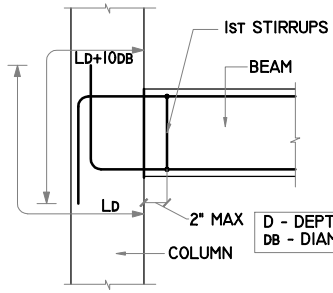
C.S. OF BEAM "B4"
(0'-9" X 1'-6")

GENERAL NOTES:

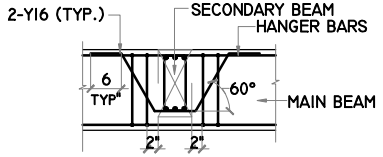
1. ALL DIMENSIONS ARE IN FOOT UNITS.
2. CONCRETE GRADE SHALL BE M25 CONFIRMING TO IS 456:2000
3. GRADE OF REINFORCEMENT MARKED THUS (Y) SHALL BE Fe 500 CONFIRMING TO IS 1786-2008
4. CLEAR COVER FOR REINFORCEMENT
   A) BEAM = 1" B) SLAB = 3/4"
5. THIS DRG. READ IN CONJECTION WITH ARCH.DRGS.
6. STRUCTURAL ENGINEER RESPONSIBILITY IS LIMITED TO DESIGN & ISSUAL OF STRUCTURAL DRAWING ONLY
7. ONUS OF CONSTRUCTION LIES WITH CONTRACTOR/OWNER

BEAM SCHEDULE		
SL.NO	NAME	SIZE
01	B1	0'-9" x 1'-9"
02	B2	0'-9" x 1'-6"
03	B3	0'-9" x 2'-0"
04	B4	0'-9" x 1'-6"

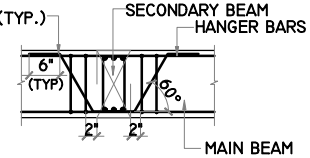
FOR APPROVAL ONLY



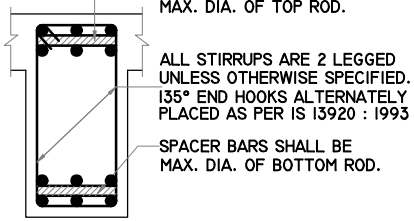
TYP. EXTERNAL JOINT DETAIL AT BEAM-COLUMN JUNCTION



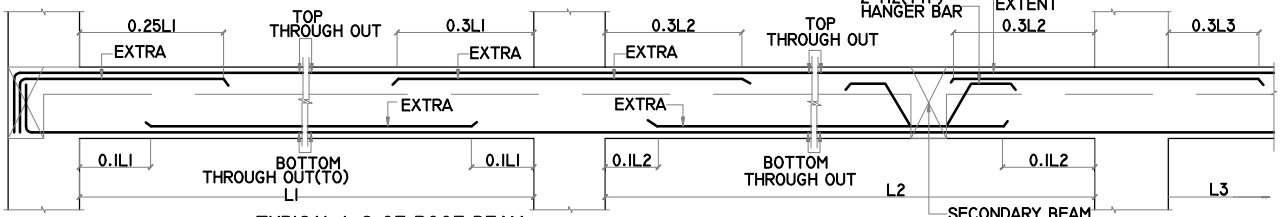
TYP. DET. OF HANGER BARS IN MAIN BEAM AT SECONDARY BEAM JUNCTION (VARY DEPTH)



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



TYP. DETAIL



TYPICAL L.S OF ROOF BEAM



TYP. LAP SPLICE IN BEAM

REV.	DESCRIPTIONS	DRN	CHK	DATE
00	ISSUE FOR CONSTRUCTION	R.P	R.M	11.06.25

PROJECT :-

PLAN SHOWING THE PROPOSED CONSTRUCTION OF STILT FLOOR(PARKING) +3 FLOORS RESIDENTIAL BUILDING WITH 14 DWELLING UNITS (HEIGHT-14.00M) AT PLOT NO.63,64 & 64B,DOOR NO: 3/147 ,3RD CROSS STREET, DEVARAJ AVENUE ,METTUKUPPAM, OKKIYAM THORAIPAKKAM,CHENNAI-600 097 COMPRISED IN OLD S.NOS : 405/13 AND NEW S.NO. 405/116,405/28,405/160 AND 405/157 OF THORAIPAKKAM VILLAGE WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION.)

DRAWING TITLE :-

R.C DETAILS FOR ALL FLOOR STILT ROOF BEAM

DATE	SCALE	JOB.NO	DRG.NO
11.06.25	1" : 10'	—	009

ARCHITECT / CONSULTANTS :-

STRUCTURAL CONSULTANTS :-

AURA ENGINEERING CONSULTANTS
NO:13/27, 66th STREET
R.V NAGAR, ASHOK NAGAR,CHENNAI- 600 083.
Fixed Line :- 044 4859 7100
projects.auraengg@gmail.com
projects@auraengineers.co.in
http://auraengineers.co.in/
aura Engineering Consultants

A3



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Certified EC, Patta, legal opinions, property verification, due diligence, litigation solutions, and legal heir certificates.

Property Development & Approvals

Building plan approvals, construction, layout and sub-division approvals, zone conversion, and occupancy certification.

NRI & Investment Services

Escrow Services, Rentals, Litigation Solutions, Property Valuation and Property Management

Compliance & Special Services

Demolition, Vaasthu checks, regularization of unauthorized buildings, and office space solutions.



empowering your real estate decisions with smart tools

Property Valuation & Cost Estimation

Guideline Value, Apartment Composite Value, Stamp Duty & Registration Fees Calculator, Building Value Calculator, Capital Gains Calculator, Area Unit Converter, Length Unit Converter

Ownership, Compliance & Legal Verification

Encumbrance Certificate (EC) Search, Find Your SRO, Temple Property Check, WAQF Property Check, View Patta/Chitta, View FMB, Patta Analyzer, EC Analyzer

Zoning & Land Use Analysis

Land Use Zone Finder, CRZ Zone Check, Aquifer Zone Check, CBA Check, EWS Check, Road Width Check, Proposed Road Widening Check, FSI Calculator

Property Documentation & Workflow Tools

Forms & Templates, Document Generator, Document Translation, Dictionary

Vastu & Property Management Tools

Home Vastu Shastra, Plot Vastu Shastra, Property Management

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