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Structural Stability Certificate

19/06/2024

Project Name : Residential Building Stilt+05—Thiruvotriyur

Location : The proposed construction of stilt floor parking + 5 floors residential building (18.00m height) with 40 dwelling units availing premium fsi with tod benefits at door no - 27, plot no - 816 & 663, Thiruvotriyur high road, thiru nagar, Thiruvotriyur , chennai - 600 019. comprised in old s.no - 17/1m & 16/1b1c1m, new s.no - 50/11 & old s.no - 17/2m, new s.no - 51, block no - 01, ward - i, Thiruvotriyur village, with in the limit of greater Chennai corporation.

Type of structure : R.C.C FRAMED STRUCTURE - Stilt+05

- The structure is designed and constructed for minimum grade of For Concrete M25 and for steel Fe500
- The structure is analyzed and designed to resist the Dead and Live Load
- The loading is taken as per the requirements of Code of practice IS-875
- The design of the Structure is done as per the latest code IS-456.

We have designed the structural members and details are issued, with latest STAAD model created by us.

Accordingly , we hereby issue the **'Structural Stability Certificate'**

Accordingly , we hereby issue the Structure is **"Sound and Safe".**

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For Aura Engineering Consultants
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DESIGN CALCULATION

PLAN SHOWING THE PROPOSED CONSTRUCTION OF STILT FLOOR PARKING + 5 FLOORS RESIDENTIAL BUILDING (18.00m HEIGHT) WITH 40 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENEFITS AT DOOR NO - 27, PLOT NO - 816 & 663, THIRUVOTRIYUR HIGH ROAD, THIRU NAGAR, THIRUVOTRIYUR , CHENNAI - 600 019. COMPRISED IN OLD S.NO - 17/1M & 16/1B1C1M, NEW S.NO - 50/11 & OLD S.NO - 17/2M, NEW S.NO - 51, BLOCK NO - 01, WARD - I, THIRUVOTRIYUR VILLAGE, WITH IN THE LIMIT OF GREATER CHENNAI CORPORATION.

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1.0 DESIGN BRIEF:

THIS DOCUMENT FURNISHES PLAN SHOWING THE PROPOSED CONSTRUCTION OF STILT FLOOR PARKING + 5 FLOORS RESIDENTIAL BUILDING (18.00m HEIGHT) WITH 40 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENEFITS AT DOOR NO - 27, PLOT NO - 816 & 663, THIRUVOTRIYUR HIGH ROAD, THIRU NAGAR, THIRUVOTRIYUR , CHENNAI - 600 019. COMPRISED IN OLD S.NO - 17/1M & 16/1B1C1M, NEW S.NO - 50/11 & OLD S.NO - 17/2M, NEW S.NO - 51, BLOCK NO - 01, WARD - I, THIRUVOTRIYUR VILLAGE, WITH IN THE LIMIT OF GREATER CHENNAI CORPORATION.

2.0 GENERAL DESIGN CRITERIA

2.1. Description of the structure

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

1. Size of the building : 74.55 X 9.72M
2. Height of the building : 18.00M
3. Number of storeys above GL : Stilt Floor +5 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

- 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

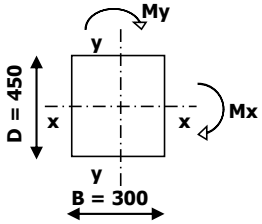
Design Calculations

Column Design

PROJECT	Residential Building, (STILT+05) AT DOOR NO - 27, PLOT NO - 816 & 663, THIRUVOTRIYUR HIGH ROAD, THIRU NAGAR, THIRUVOTRIYUR	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 = **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

PROJECT	Residential Building, (STILT+05) AT DOOR NO - 27, PLOT NO - 816 & 663, THIRUVOTRIYUR HIGH ROAD, THIRU NAGAR, THIRUVOTRIYUR	DOCUMENT. NO.	DATE	DESIGNED	DATE
TITLE	Design for a Short Column with Biaxial Bending	REVISION	DATE	CHECKED	DATE

CL. NO.	DESIGN CALCULATIONS	REFERENCES

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	

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	
α_n		=	1.186	Cl 39.6 , IS456:2000

7.0 Criteria for Biaxial Bending (Bresler's Formulation)

$(M_{ux}/M_{ux1})^{\alpha n} + (M_{uy}/M_{uy1})^{\alpha n}$ = **0.603** < 1 — Cl 39.6 , IS456:2000

Hence Safe

8.0 Longitudinal Reinforcement

Area of compression Steel	$A_{sc,reqd}$	=	**2700** mm^2	
10 Nos Y20 + 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 ,
(Based on the area of concrete reqd to resist direct stress)				IS 456 : 2000
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) ,
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

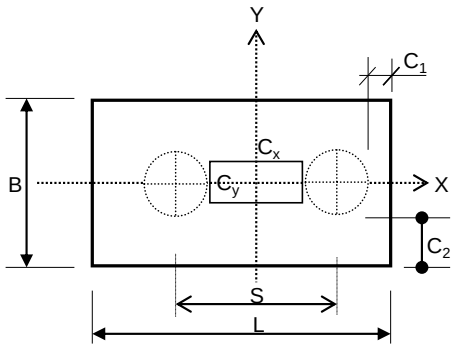
TITLE	:	Pilecap Design by Bending Theory	Designed :		Date : 24-Nov-2023
SUBJECT		Two(2) Pile Group - TYPE P2	Checked :		Date : 24-Nov-2023
PROJECT	:	Residential Building, (STILT+05) AT DOOR NO - 27, PLOT NO - 816 & 663, THIRUVOTRIYUR HIGH ROAD, THIRU NAGAR, THIRUVOTRIYUR	Job No. :		Page No :

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	L_f =	1.5	
Edge of pile to edge	C_1 =	150	mm
of pilecap distance	C_2 =	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	C_x =	230	mm
Column breadth	C_y =	450	mm
Bottom cover	c =	50	mm
Top cover	c_t =	50	mm
Side cover	c_s =	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 strength of ste	γ_{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, ϕ =		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

$A_{sx\,req} = M_u/(1/\gamma_{ms} \times f_y \times z)$ =	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 : 24-Nov-2023
SUBJECT		Two(2) Pile Group - TYPE P2	Checked :		Date : 24-Nov-2023
PROJECT	:	Residential Building, (STILT+05) AT DOOR NO - 27, PLOT NO - 816 & 663, THIRUVOTRIYUR HIGH ROAD, THIRU NAGAR, THIRUVOTRIYUR	Job No. :		Page No :

Y - direction

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

Reinforcement required			Reinforcement provided			
$A_{sy\ req}$ =	1692	mm²	As prov =	1810	mm²	
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/mm²
v_c = 0.55 N/mm²
a_v = 315 mm
Enhanced shear = 2.41 N/mm² > v, Normal shear O.K.

5. Punching shear

Allowable punching shear = 4.00 N/mm²
Perimeter of column = 1360 mm
Punching shear stress = 0.80 N/mm² ==> Punching shear O.K.

6. Bar anchorage

f_{bu} = 2.50 N/mm² (Deformed Bar Type 2) Where $f_{bu} = \beta\ (f_{cu})^{1/2}$

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

A_{st} provided = 603.19 mm^2

	I st Layer		II nd Layer	
	Nos	Dia	Nos	Dia
Compression Reinforcemen	**3**	**16**	**0**	

A_{sc} provided = 603.19 mm^2

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

PROJECT	Residential Building, (STILT+05) AT DOOR NO - 27, PLOT NO - 816 & 663, THIRUVOTRIYUR HIGH ROAD, THIRU NAGAR, THIRUVOTRIYUR	DOCUMENT. NO.	DATE	DESIGNED RMK	DATE
TITLE		REVISION	DATE	CHECKED RMK	DATE

CL. NO.	BEAM DESIGN CALCULATIONS	REFERENCES

Check for Shear

Shear		=	149	kN	
Nominal Shear Stress	τv	=	1.92	N/mm^2	Cl 40.1, IS456:2000
Permissible Shear Stress	τc	=	0.92	N/mm^2	β = 1.000
Maximum Shear Stress	$\tau c,max$	=	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

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	mm^2	
Required Area of compression steel	$A_{sc\ reqd}$	=	0	mm^2	

Detail of bars

	I st Layer		II nd Layer			
	Nos	Dia	Nos	Dia		
Tension Reinforcement	3	16	0	0		
	A_{st} provided =		603.1858	mm^2		
	Nos	Dia	Nos	Dia		
Compression Reinforcemen	3	16	0	0		
	A_{sc} provided =		603.19	mm^2		
Percentage of tension steel provided	p_t	=	0.777	%	Hence O.K	
Percentage of compression steel provide	p_c	=	0.777	%	Hence O.K	

Check for Shear

Shear		=	149	kN	
Nominal Shear Stress	τv	=	1.92	N/mm^2	Cl 40.1, IS456:2000
Permissible Shear Stress	τc	=	0.92	N/mm^2	β = 1.000
Maximum Shear Stress	$\tau c,max$	=	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

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TITLE		REVISION	DATE	CHECKED RMK	DATE

CL. NO.	BEAM DESIGN CALCULATIONS	REFERENCES

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 mm^2

Required Area of compression steel $A_{sc\ reqd}$ = 0 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 mm^2

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

A_{sc} provided = 603.19 mm^2

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

Percentage of compression steel provide p_c = 0.777 % **Hence O.K**

Check for Shear

Shear = 149 kN

Nominal Shear Stress	τv =	1.92	N/mm^2	Cl 40.1, IS456:2000
Permissible Shear Stress	τc =	0.92	N/mm^2	β = 1.000
Maximum Shear Stress	$\tau c,max$ =	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^2	
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

PROJECT	Residential Building, (STILT+05) AT DOOR NO - 27, PLOT NO - 816 & 663, THIRUVOTRIYUR HIGH ROAD, THIRU NAGAR, THIRUVOTRIYUR	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 D	=	525	mm	
Dia of bar	JAGADAI 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 Steel = 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 Reinforcemen	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 provide	p_c	=	1.302	%	**Hence O.K**

PROJECT	**Residential Building, (STILT+05) AT DOOR NO - 27, PLOT NO - 816 & 663, THIRUVOTRIYUR HIGH ROAD, THIRU NAGAR, THIRUVOTRIYUR**	**DOCUMENT. NO.**	**DATE**	**DESIGNED** RMK	**DATE**
TITLE		**REVISION**	**DATE**	**CHECKED** RMK	**DATE**

CL. NO.	BEAM DESIGN CALCULATIONS	REFERENCES

Check for Shear

Shear = 241 kN

Nominal Shear Stress	τv	=	1.66	N/mm^2	Cl 40.1, IS456:2000
Permissible Shear Stress	τc	=	0.92	N/mm^2	β = 1.000
Maximum Shear Stress	$\tau c,max$	=	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 = 1884.956 mm^2

	I st Layer		II nd Layer	
	Nos	Dia	Nos	Dia
Compression Reinforcemen	**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 provide	p_c	=	1.302	%	**Hence O.K**

Check for Shear

Shear = 241 kN

Nominal Shear Stress	τv	=	1.66	N/mm^2	Cl 40.1, IS456:2000
Permissible Shear Stress	τc	=	0.92	N/mm^2	β = 1.000
Maximum Shear Stress	$\tau c,max$	=	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

PROJECT	**Residential Building, (STILT+05) AT DOOR NO - 27, PLOT NO - 816 & 663, THIRUVOTRIYUR HIGH ROAD, THIRU NAGAR, THIRUVOTRIYUR**	**DOCUMENT. NO.**	**DATE**	**DESIGNED** RMK	**DATE**
TITLE		**REVISION**	**DATE**	**CHECKED** RMK	**DATE**

CL. NO.	BEAM DESIGN CALCULATIONS	REFERENCES

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 $A_{st\ reqd}$ = 1480.79 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

	I st Layer		II nd Layer	
	Nos	Dia	Nos	Dia
Compression Reinforcemen	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 provide p_c = 1.302 % **Hence O.K**

Check for Shear

Shear = 241 kN

Nominal Shear Stress	τv	=	1.66	N/mm^2	Cl 40.1, IS456:2000
Permissible Shear Stress	τc	=	0.92	N/mm^2	β = 1.000
Maximum Shear Stress	$\tau c,max$	=	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

PROJECT	**Residential Building, (STILT+05) AT DOOR NO - 27, PLOT NO - 816 & 663, THIRUVOTRIYUR HIGH ROAD, THIRU NAGAR, THIRUVOTRIYUR**	**DOCUMENT.NO.**	**DATE**	**DESIGNED**	**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	=	**125**	mm
Clear cover	cc	=	**25**	mm
Effective thickness of slab (d_{eff})	= 125 - 25 - 4	=	96	mm
Unit weight of concrete		=	25	KN/m^3
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	

Table 16 Cl.26.4.2 , IS 456 -2000

Cl 19.2.1, IS 456-2000

Hence designed as Two way slab

Edge Condition : **One Long edge Discontinuous**

Cl D-1.11, IS 456-2000

1.0.2 Load Data

Self Weight of Slab	= 0.125 x 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
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

IS 875 (Part 2) -1987

Table 18 Cl 36.4.1 IS 456 -2000

1.0.3 Moment and Shear Calculations

Short Span Direction

α_x for positive moment		1.75	→	0.059	
		2	→	0.065	
	for 2.00	α_x	=	0.065	
Positive moment M_x :	0.065 x 12.19 x 3.2 ^2	=		**8.11**	KN-m
α_x for negative moment		1.75	→	0.077	
		2	→	0.085	
	for 2.00	α_x	=	0.085	
Negative moment M_x :	0.085 x 12.19 x 3.2 ^2	=		**10.61**	KN-m

Table 26 Cl D-1.1, IS 456 -2000

Table 26 Cl D-1.1, IS 456 -2000

PROJECT	**Residential Building, (STILT+05) AT DOOR NO - 27, PLOT NO - 816 & 663, THIRUVOTRIYUR HIGH ROAD, THIRU NAGAR, THIRUVOTRIYUR**	**DOCUMENT.NO.**	**DATE**	**DESIGNED**	**DATE**
TITLE	**TWO WAY SLAB DESIGN**	**REVISION**	**DATE**	**CHECKED**	**DATE**

CL. NO.	DESIGN CALCULATIONS	REFERENCES

Long Span Direction

For positive moment α_y = 0.028 — Table 26 Cl D-1.1,

Positive moment M_y : 0.028 x 12.19 x 3.2 ^2 = **3.49** KN-m — IS 456 -2000

For negative moment α_y = 0.037 — Table 26 Cl D-1.1,

Negative moment M_y : 0.037 x 12.19 x 3.2 ^2 = **4.62** KN-m — IS 456 -2000

Shear force V_u = 12.19 x 3.2 x 0.5 = **19.50** KN

1.0.4 Check Effective Depth for Max.Bending Moment

Depth required = $(M_x / (0.133x\ fck \times b))^{1/2}$ = 56.48 mm — Table C,SP 16 :1980

Depth provided = 125 - 25 - 8 /2 = 96 mm > 56.48 mm — Cl 2.3

Hence the section is Safe against Bending

1.0.5 Check Depth for Shear

Nominal Shear Stress : $\tau_v = V_u / b\ d$ = 0.20 N/mm^2 — Cl.40.1, IS 456:2000

Design shear strength (τ_c) = 0.42 N/mm^2 — Table 19 , IS 456:2000

k = 1.30 — Cl.40.2.1.1,

$k * \tau_c$ = 0.55 N/mm^2 — IS 456:2000

τ_v < $k * \tau_c$ **Hence the section is Safe against Shear**

1.0.6 Check for Maximum Shear Stress:

Nominal Shear Stress : $\tau_v = V_u / b\ d$ = 0.20 N/mm^2 — Cl.40.1, IS 456:2000

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

$0.5\ \tau_{c,max}$ = 1.55 N/mm^2

τ_v < $0.5\ \tau_{c,max}$ **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^2 = $\frac{10.61 \times 10 \wedge 6}{1000 \times 96 \times 96}$ = **1.151**

Pt = **0.28** % — Table 2-4, SP16 :1980

PROJECT	**Residential Building, (STILT+05) AT DOOR NO - 27, PLOT NO - 816 & 663, THIRUVOTRIYUR HIGH ROAD, THIRU NAGAR, THIRUVOTRIYUR**	**DOCUMENT.NO.**	**DATE**	**DESIGNED**	**DATE**
TITLE	**TWO WAY SLAB DESIGN**	**REVISION**	**DATE**	**CHECKED**	**DATE**
CL. NO.	**DESIGN CALCULATIONS**			**REFERENCES**	

Area of steel Ast = 0.0028 x 1000 x 96 = 269.25 mm^2

Minimum area of steel: 0.0012 x 1000 x 125 = 150.00 mm^2 — Cl:26.5.2.1

Spacing of Y **8** bars 50.27 x 1000 / 269.25 = 186.59 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

$Mu/bd^2 = \frac{8.11 \times 10 \wedge 6}{1000 \times 96 \times 96} = 0.880$

Pt = 0.211 % — SP16 :1980 Table 2-4

Area of steel Ast = 0.0021 x 1000 x 96 = 202.93 mm^2 — IS 456:2000

Minimum area of steel: 0.0012 x 1000 x 125 = 150.00 mm^2 — Cl:26.5.2.1

Spacing of Y **8** bars 50.27 x 1000 / 202.93 = 247.57 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

$Mu/bd^2 = \frac{4.62 \times 10 \wedge 6}{1000 \times 96 \times 96} = 0.501$

Pt = 0.118 % — SP16 :1980 Table 2-4

Area of steel Ast = 0.0012 x 1000 x 96 = 113.3 mm^2 — IS 456:2000

Minimum area of steel: 0.0012 x 1000 x 125 = 150.00 mm^2 — Cl:26.5.2.1

Spacing of Y **8** bars 50.27 x 1000 / 150.00 = 334.93 mm

PROJECT	Residential Building, (STILT+05) AT DOOR NO - 27, PLOT NO - 816 & 663, THIRUVOTRIYUR HIGH ROAD, THIRU NAGAR, THIRUVOTRIYUR	DOCUMENT.NO.	DATE	DESIGNED	DATE
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

$Mu/bd^2 = \frac{3.49 \times 10 \wedge 6}{1000 \times 96 \times 96} = 0.379$

Pt = 0.089 % — SP16 :1980 Table 2-4

Area of steel Ast = 0.0009 x 1000 x 96 = 85.233 mm^2 — IS 456:2000
Minimum area of steel: 0.0012 x 1000 x 125 = 150.00 mm^2 — Cl:26.5.2.1
Spacing of Y **8** bars 50.27 x 1000 / 150.00 = 334.93 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 **Check for Deflection:** **(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_P) = 175.62 N/mm^2 — IS456:2000 Fig 4
Modification Factor for Tension Reinforcement (F_1) = 1.98 — Page 38
Allowable Span / Effective Depth Ratio = 51.51 — IS 456:2000 Cl:23.2.1
Actual Span/Eff Depth Ratic = 3.2 x 1000 / 96 = 33.33

Hence Safe against Deflection

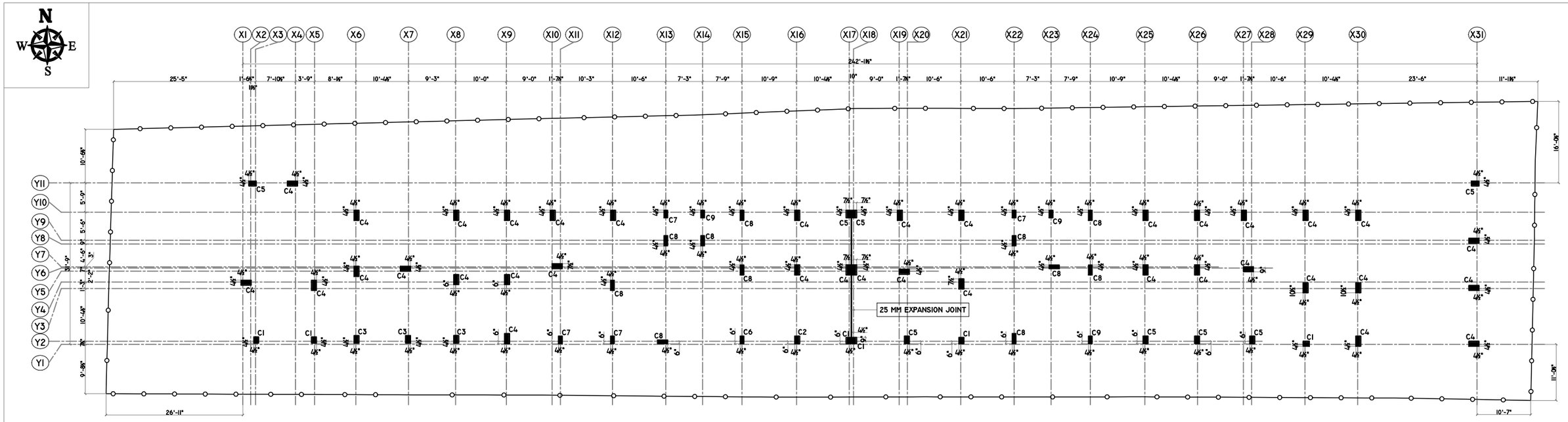
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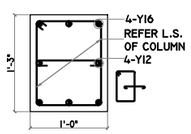
APPENDIX II

GENERAL ARRANGEMENT DRAWINGS

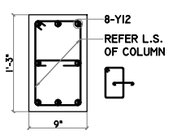
THIS DRAWING IS THE PROPERTY OF M/s. AURA ENGINEERING CONSULTANTS. AND MUST NOT BE COPIED WITHOUT THEIR WRITTEN CONSENT, NOR MADE KNOWN TO THE THIRD PARTY



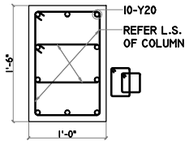
LAYOUT OF COLUMN



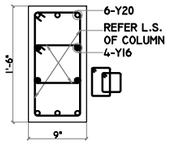
C.S. OF COLUMN "C1"
(1'-0" x 1'-3")
(UPTO STILT FLOOR ROOF)



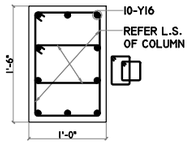
C.S. OF COLUMN "C1"
(0'-9" x 1'-3")
(STILT FLOOR ROOF TO TOP)



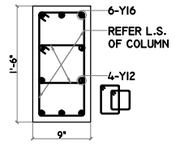
C.S. OF COLUMN "C2"
(1'-0" x 1'-6")
(UPTO STILT FLOOR ROOF)



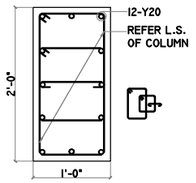
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(0'-9" x 1'-6")
(STILT FLOOR ROOF TO TOP)



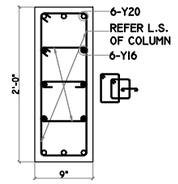
C.S. OF COLUMN "C3"
(1'-0" x 1'-6")
(UPTO STILT FLOOR ROOF)



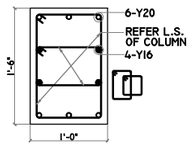
C.S. OF COLUMN "C3"
(0'-9" x 1'-6")
(STILT FLOOR ROOF TO TOP)



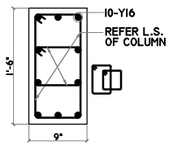
C.S. OF COLUMN "C4"
(1'-0" x 2'-0")
(UPTO STILT FLOOR ROOF)



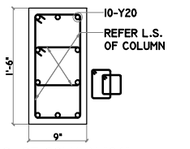
C.S. OF COLUMN "C4"
(0'-9" x 2'-0")
(UPTO STILT FLOOR ROOF)



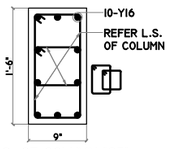
C.S. OF COLUMN "C5"
(1'-0" x 1'-6")
(UPTO STILT FLOOR ROOF)



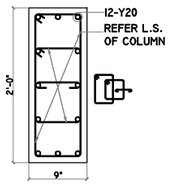
C.S. OF COLUMN "C5"
(0'-9" x 1'-6")
(STILT FLOOR ROOF TO TOP)



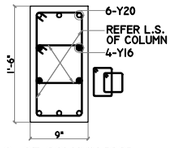
C.S. OF COLUMN "C6"
(0'-9" x 1'-6")
(UPTO TOP)



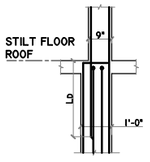
C.S. OF COLUMN "C7"
(0'-9" x 1'-6")
(UPTO TOP)



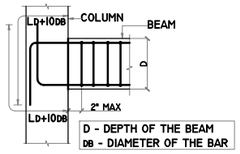
C.S. OF COLUMN "C8"
(0'-9" x 2'-0")
(UPTO TOP)



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



TYPICAL COLUMN REDUCTION DETAILS



D - DEPTH OF THE BEAM
DB - DIAMETER OF THE BAR

TYP. EXTERNAL JOINT DETAIL AT BEAM-COLUMN JUNCTION

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'-6"	0'-9" X 1'-6"
3.	C3	1'-0" X 1'-6"	0'-9" X 1'-6"
4.	C4	1'-0" X 2'-0"	0'-9" X 2'-0"
5.	C5	1'-0" X 1'-6"	0'-9" X 1'-6"
6.	C6	0'-9" X 1'-6"	0'-9" X 1'-6"
7.	C7	0'-9" X 1'-6"	0'-9" X 1'-6"
8.	C8	0'-9" X 2'-0"	0'-9" X 2'-0"
9.	C9	0'-9" X 1'-6"	0'-9" X 1'-6"



HOOK DETAIL

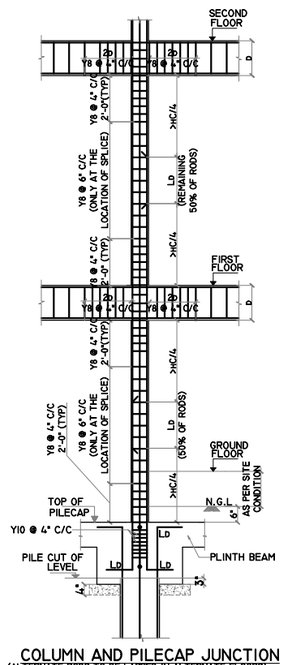
NOTE:

N.G.L - NATURAL GROUND LEVEL.

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

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

FOR APPROVAL ONLY



COLUMN AND PILECAP JUNCTION
(ALTERNATE RODS TO BE LAPPED IN ALTERNATE FLOORS)
(AS PER SEISMIC DETAILING CODE 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) COLUMN = 1½"
5. THIS DRG. READ IN CONJECTION WITH ARCH.DRGS.
6. COLUMNS AND FOOTINGS ARE DESIGNED FOR STILT+5 FUTURE FLOOR LOADS.
7. STRUCTURAL ENGINEER RESPONSIBILITY IS LIMITED TO DESIGN & ISSUAL OF STRUCTURAL DRAWING ONLY
8. ONUS OF CONSTRUCTION LIES WITH CONTRACTOR/OWNER

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.

REV.	DESCRIPTIONS	DRN	CHK	DATE
00	ISSUE FOR CONSTRUCTION	M.R	R.M	04.11.23

PROJECT :-

PLAN SHOWING THE PROPOSED CONSTRUCTION OF STILT FLOOR PARKING + 5 FLOORS RESIDENTIAL BUILDING (18.00m HEIGHT) WITH 40 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENEFITS AT DOOR NO - 27, PLOT NO - 816 & 663, THIRUVOTRIYUR HIGH ROAD, THIRU NAGAR, THIRUVOTRIYUR , CHENNAI - 600 019. COMPRISED IN OLD S.NO - 17/1M & 16/1B1C1M, NEW S.NO - 50/11 & OLD S.NO - 17/2M, NEW S.NO - 51, BLOCK NO - 01, WARD - I, THIRUVOTRIYUR VILLAGE, WITH IN THE LIMIT OF GREATER CHENNAI CORPORATION.

DRAWING TITLE :-

LAYOUT & R.C DETAILS OF COLUMN

DATE	SCALE	JOB.NO	DRG.NO
04.11.23	1" : 10'	--------	001

ARCHITECT / CONSULTANTS :-

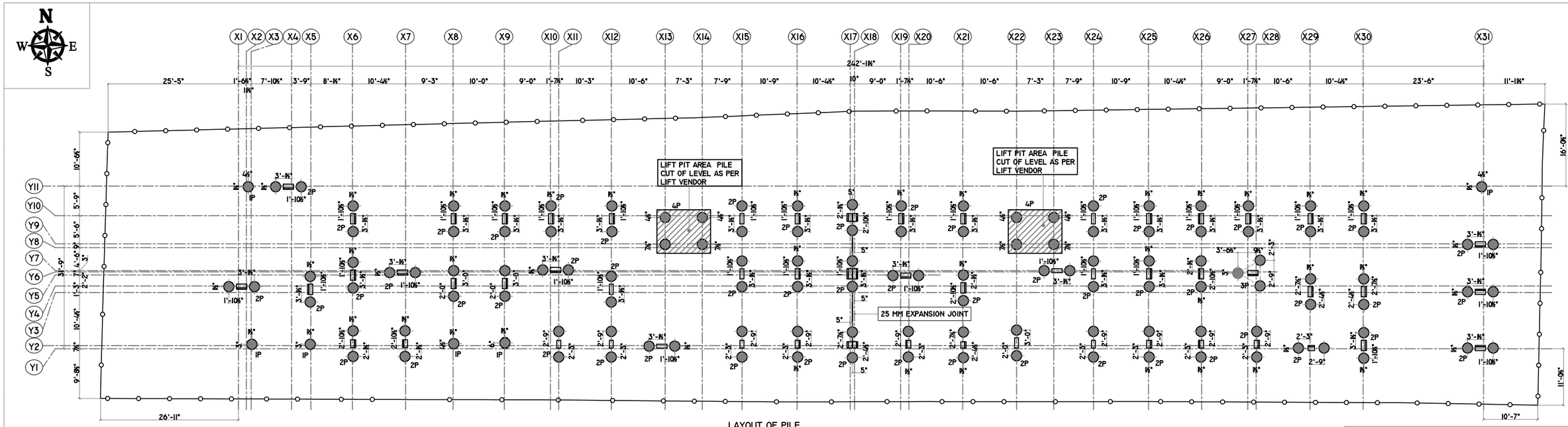
SSS
Architects and Interior Designers
Plot No 3A,Second Floor,
LIC Nagar Ext,1st Ingar,
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Mobile : 91-9600111318,
E mail-ssbartchr2006@gmail.com

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

A1

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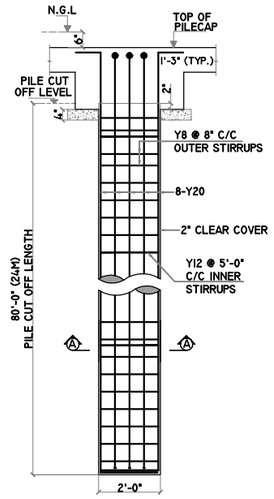


LAYOUT OF PILE

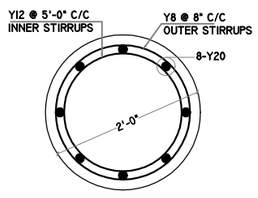
NOTE:
N.G.L - NATURAL GROUND LEVEL.

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.

FOR APPROVAL ONLY



L.S. OF 2'-0" DIA PILE



SECTION "A-A"
C.S OF PILE - 2'-0" DIA.

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. 2'-0" DIA. - 400KN. (AS PER GEOGRAPHICAL REPORT)
5. ROUTINE TESTS OF 1.5 TIMES DESIGN CAPACITY ON ONE PILES OF 2'-0" DIA IS TO BE CARRIED OUT.
6. CLEAR COVER FOR REINFORCEMENT
   A) PILE = 2"
7. THIS DRG. READ IN CONJECTION WITH ARCH.DRGS.
6. COLUMNS AND FOOTINGS ARE DESIGNED FOR STILT+5 FLOOR LOADS
9. STRUCTURAL ENGINEER RESPONSIBILITY IS LIMITED TO DESIGN & ISSUAL OF STRUCTURAL DRAWING ONLY
10. ONUS OF CONSTRUCTION LIES WITH CONTRACTOR/OWNER

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.

REV.	DESCRIPTIONS	DRN	CHK	DATE
00	ISSUE FOR CONSTRUCTION	M.R	R.M	06.11.23

PROJECT :-

PLAN SHOWING THE PROPOSED CONSTRUCTION OF STILT FLOOR PARKING + 5 FLOORS RESIDENTIAL BUILDING (18.00m HEIGHT) WITH 40 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENEFITS AT DOOR NO - 27, PLOT NO - 816 & 663, THIRUVOTRIYUR HIGH ROAD, THIRU NAGAR, THIRUVOTRIYUR , CHENNAI - 600 019. COMPRISED IN OLD S.NO - 17/1M & 16/1B1C1M, NEW S.NO - 50/11 & OLD S.NO - 17/2M, NEW S.NO - 51, BLOCK NO - 01, WARD - I, THIRUVOTRIYUR VILLAGE, WITH IN THE LIMIT OF GREATER CHENNAI CORPORATION.

DRAWING TITLE :-

LAYOUT & R.C DETAILS OF PILE

DATE	SCALE	JOB.NO	DRG.NO
06.11.23	1" : 10'	--------	002

ARCHITECT / CONSULTANTS :-

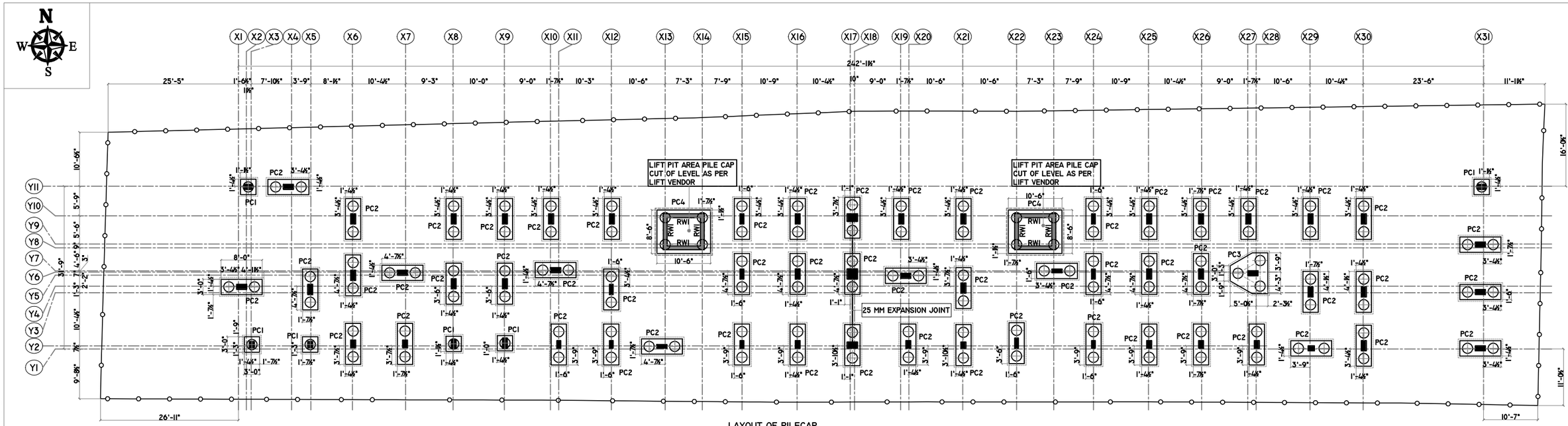
SSS
Architects and Interior Designers
Plot No 3A,Second Floor,
LIC Nagar Ext,Sri nagar,
Pallikaranai,Chennai-600 100
Mobile : 91-9600111318,
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STRUCTURAL CONSULTANTS :-

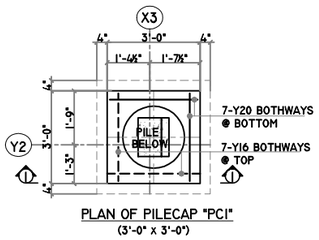
AURA ENGINEERING CONSULTANTS
#8, 50th St, Sarvamangala Colony, 7th Avenue,
ASHOK NAGAR, CHENNAI- 600 083.
Fixed Line :- 044 4859 7100
projects.auraengg@gmail.com
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http://auraengineers.co.in/
aura Engineering Consultants

A1

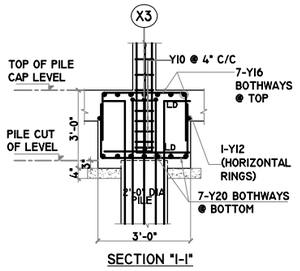
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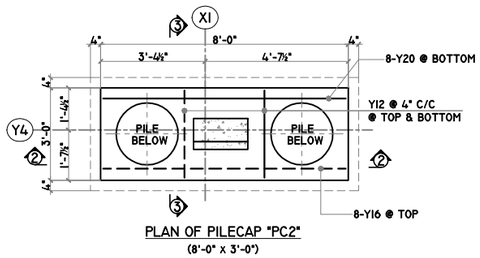
LAYOUT OF PILECAP



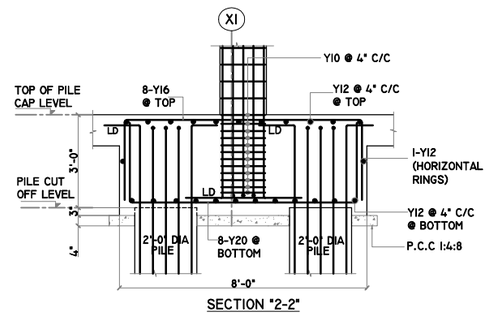
PLAN OF PILECAP "PCI"
(3'-0" x 3'-0")



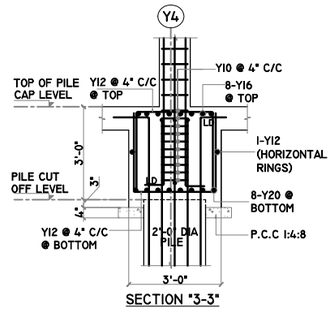
SECTION "I-I"



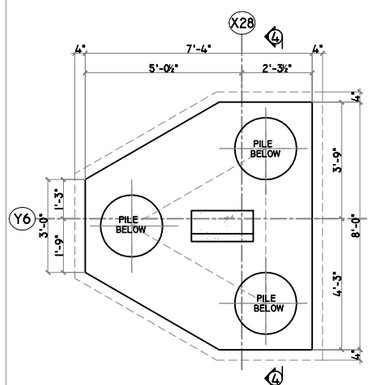
PLAN OF PILECAP "PC2"
(8'-0" x 3'-0")



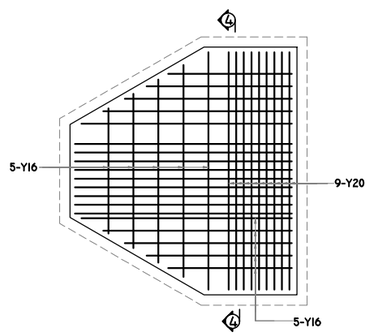
SECTION "2-2"



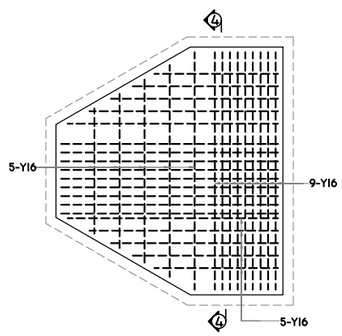
SECTION "3-3"



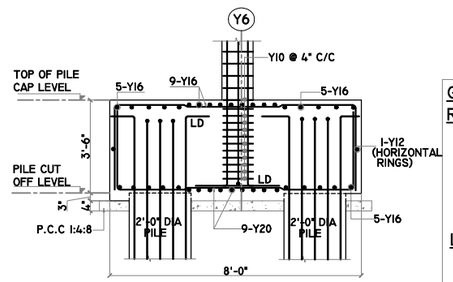
PLAN OF PILECAP "PC3"



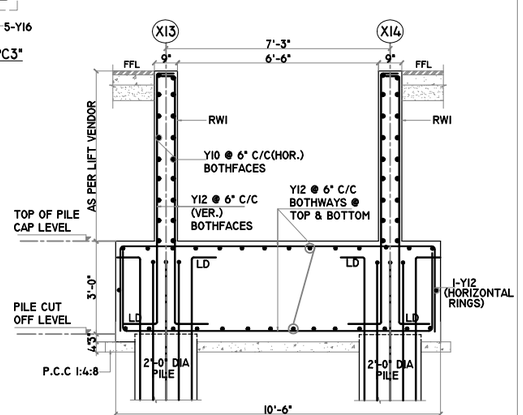
BOTTOM STEEL OF PILECAP - "PC3"



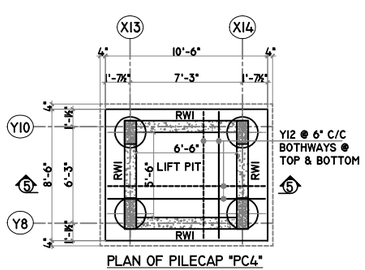
TOP STEEL OF PILECAP - "PC3"



SECTION "4-4"



SECTION "5-5"



PLAN OF PILECAP "PC4"
(10'-6" x 8'-6")

FOR APPROVAL ONLY

PILECAP SCHEDULE:

S.NO	NAME	SIZE
01.	PC1	3'-0" X 3'-0" X 3'-0"
02.	PC2	8'-0" X 3'-0" X 3'-0"
03.	PC3	D=3'-6"
04.	PC4	10'-6" X 8'-6" X 3'-0"

NOTE:

N.G.L - NATURAL GROUND LEVEL.

F.F.L - FLOOR FINISH LEVEL

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. 2'-0" DIA. - 400kN. (As per Geographical Report)
5. ROUTINE TESTS OF 1.5 TIMES DESIGN CAPACITY ON ONE PILES OF 2'-0" DIA IS TO BE CARRIED OUT.
6. CLEAR COVER FOR REINFORCEMENT
   A) PILE = 2" B) PILECAP TOP & SIDE = 2"
   C) PILECAP BOTTOM = 3"
7. THIS DRG. READ IN CONJECTION WITH ARCH.DRGS.
8. COLUMNS AND FOOTINGS ARE DESIGNED FOR STILT+5 FLOOR LOADS
9. STRUCTURAL ENGINEER RESPONSIBILITY IS LIMITED TO DESIGN & ISSUAL OF STRUCTURAL DRAWING ONLY
10. MEANS OF CONSTRUCTION LIES WITH CONTRACTOR/OWNER

PLAN SHOWING THE PROPOSED CONSTRUCTION OF STILT FLOOR PARKING + 5 FLOORS RESIDENTIAL BUILDING (18.00m HEIGHT) WITH 40 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENEFITS AT DOOR NO - 27, PLOT NO - 816 & 663, THIRUVOTRIYUR HIGH ROAD, THIRU NAGAR, THIRUVOTRIYUR , CHENNAI - 600 019. COMPRISED IN OLD S.NO - 17/1M & 16/1B1C1M, NEW S.NO - 50/11 & OLD S.NO - 17/2M, NEW S.NO - 51, BLOCK NO - 01, WARD - I, THIRUVOTRIYUR VILLAGE, WITH IN THE LIMIT OF GREATER CHENNAI CORPORATION.

GENERAL NOTES:

REMOVAL OF FORMWORK(SHUTTERING) :-

SHUTTERING OF ANY PART OF THE STRUCTURE SHALL NOT BE REMOVED UNTIL THE CONCRETE ATTAINS 75% OF THE DESIGN STRENGTH. HOWEVER THE FOLLOWING TIME PERIODS SHALL BE ALLOWED BEFORE REMOVING THE SHUTTERING OF M25 GRADE CONCRETE OF OPC 53 GRADE CONFORMING TO 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.

REV	DESCRIPTIONS			
00	ISSUE FOR CONSTRUCTION	M.R	R.M	06.11.23
		DRN	CHK	DATE

PROJECT :-

PLAN SHOWING THE PROPOSED CONSTRUCTION OF STILT FLOOR PARKING + 5 FLOORS RESIDENTIAL BUILDING (18.00m HEIGHT) WITH 40 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENEFITS AT DOOR NO - 27, PLOT NO - 816 & 663, THIRUVOTRIYUR HIGH ROAD, THIRU NAGAR, THIRUVOTRIYUR , CHENNAI - 600 019. COMPRISED IN OLD S.NO - 17/1M & 16/1B1C1M, NEW S.NO - 50/11 & OLD S.NO - 17/2M, NEW S.NO - 51, BLOCK NO - 01, WARD - I, THIRUVOTRIYUR VILLAGE, WITH IN THE LIMIT OF GREATER CHENNAI CORPORATION.

DRAWING TITLE :-

LAYOUT & R.C DETAILS OF PILECAP

DATE	SCALE	JOB.NO	DRG.NO
06.11.23	1" : 10'	-------	003

ARCHITECT / CONSULTANTS :-

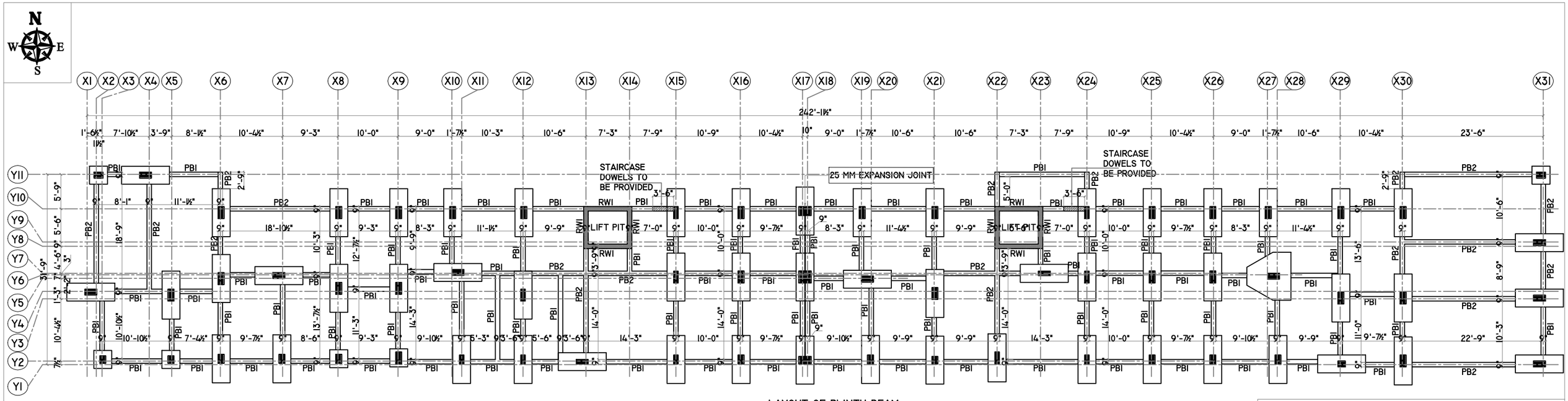
SSS
Architects and Interior Designers
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STRUCTURAL CONSULTANTS :-

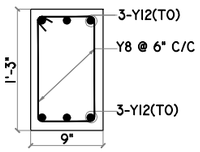
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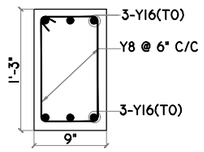
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LAYOUT OF PLINTH BEAM

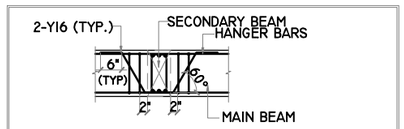


PLINTH BEAM "PBI"
(0'-9" x 1'-3")

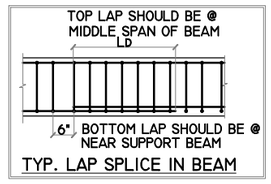


PLINTH BEAM "PB2"
(0'-9" x 1'-3")

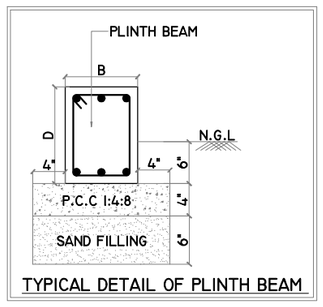
BEAM SCHEDULE		
SL.NO	NAME	SIZE
01	PBI	0'-9" x 1'-3"
02	PB2	0'-9" x 1'-3"



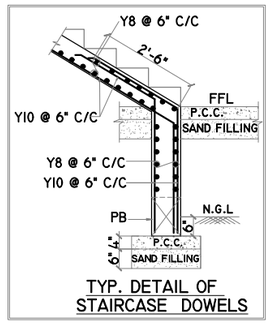
TYP. DET. OF HANGER BARS IN MAIN BEAM AT SECONDARY BEAM JUNCTION



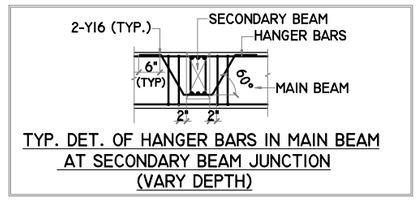
TYP. LAP SPLICE IN BEAM



TYPICAL DETAIL OF PLINTH BEAM



TYP. DETAIL OF STAIRCASE DOWELS



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

FOR APPROVAL ONLY

NOTE:

N.G.L - NATURAL GROUND LEVEL.

F.F.L - FLOOR FINISH LEVEL

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. 2'-0" DIA. - 400KN. (AS PER GEOGRAPHICAL REPORT)
5. ROUTINE TESTS OF 1.5 TIMES DESIGN CAPACITY ON ONE PILES OF 2'-0" DIA IS TO BE CARRIED OUT.
6. CLEAR COVER FOR REINFORCEMENT
   A) BEAM = A" B) R.C WALL = 1"
7. THIS DRG. READ IN CONJECTION WITH ARCH.DRGS.
6. COLUMNS AND FOOTINGS ARE DESIGNED FOR STILT+5 FLOOR LOADS
9. STRUCTURAL ENGINEER RESPONSIBILITY IS LIMITED TO DESIGN & ISSUAL OF STRUCTURAL DRAWING ONLY
10. ONUS OF CONSTRUCTION LIES WITH CONTRACTOR/OWNER

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.

REV.	DESCRIPTIONS	DRN	CHK	DATE
00	ISSUE FOR CONSTRUCTION	M.R	R.M	06.11.23

PROJECT :-

PLAN SHOWING THE PROPOSED CONSTRUCTION OF STILT FLOOR PARKING + 5 FLOORS RESIDENTIAL BUILDING (18.00m HEIGHT) WITH 40 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENEFITS AT DOOR NO - 27, PLOT NO - 816 & 663, THIRUVOTRIYUR HIGH ROAD, THIRU NAGAR, THIRUVOTRIYUR , CHENNAI - 600 019. COMPRISED IN OLD S.NO - 17/1M & 16/1B1C1M, NEW S.NO - 50/11 & OLD S.NO - 17/2M, NEW S.NO - 51, BLOCK NO - 01, WARD - I, THIRUVOTRIYUR VILLAGE, WITH IN THE LIMIT OF GREATER CHENNAI CORPORATION.

DRAWING TITLE :-

LAYOUT & R.C DETAILS OF PLINTH BEAM

DATE	SCALE	JOB.NO	DRG.NO
06.11.23	1" : 8'	-------	004

ARCHITECT / CONSULTANTS :-

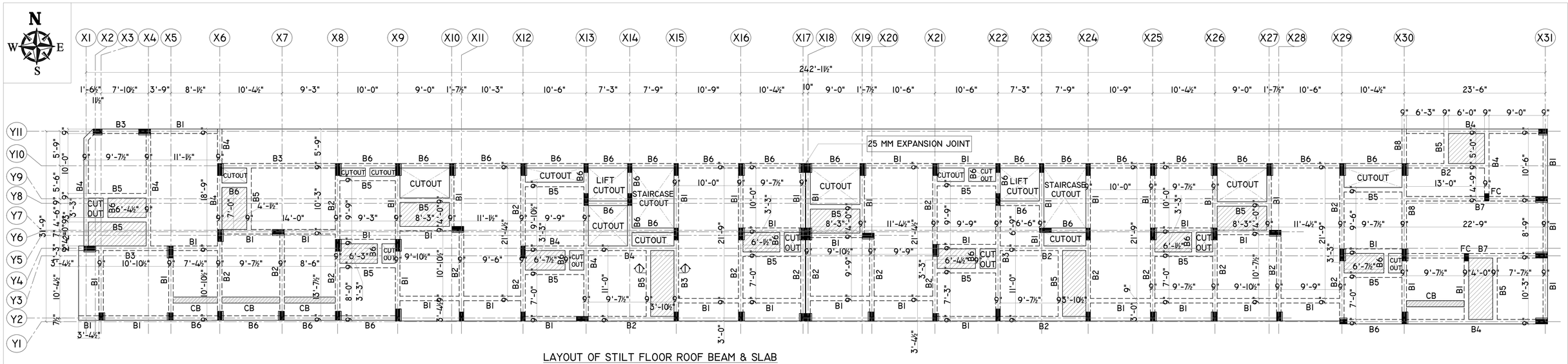
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E mail-sabaritrv2005@gmail.com

STRUCTURAL CONSULTANTS :-

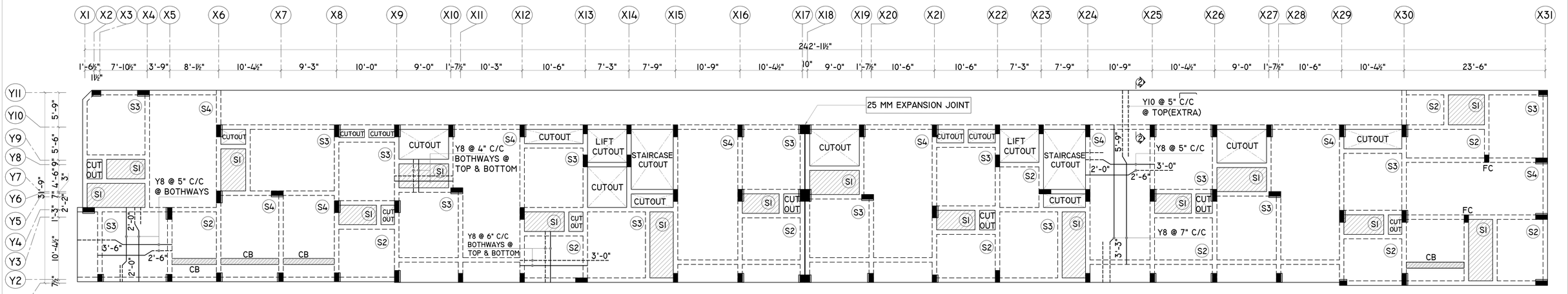
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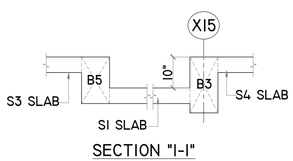


LAYOUT OF STILT FLOOR ROOF BEAM & SLAB

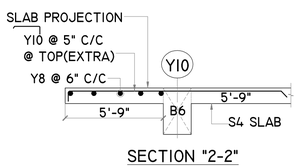


R.C LAYOUT OF STILT FLOOR ROOF BEAM & SLAB

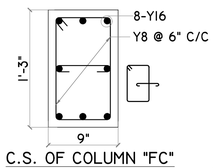
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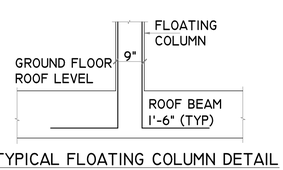
SECTION "I-I"



SECTION "2-2"



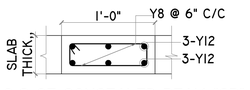
C.S. OF COLUMN "FC"
(0'-9" x 1'-3")
(UPTO TOP)



TYPICAL FLOATING COLUMN DETAIL

SLAB SCHEDULE

SL.NO	NAME	THICK
01	SI	5" THK.
02	S2	5" THK.
03	S3	5" THK.
04	S4	5" THK.

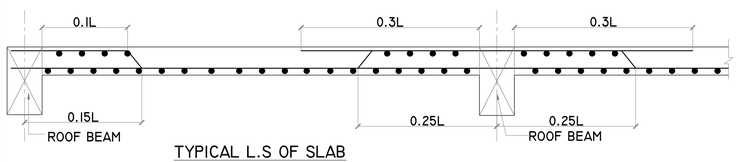


C.S OF CONCEALED BEAM-"CB"
(1'-0" X "SLAB THICKNESS")

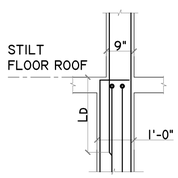
NOTE:
- SLAB SUNK BY 0'-10"
- FOR BEAM REINFORCEMENT DETAILS REFER DWG.NO : 006
- PROVIDE Y8 @ 8" C/C AS DISTRIBUTORS WHERE EVER REQUIRED

BEAM SCHEDULE

SL.NO	NAME	SIZE
01	BI	0'-9" x 1'-3"
02	B2	0'-9" x 1'-3"
03	B3	0'-9" x 1'-6"
04	B4	0'-9" x 1'-6"
05	B5	0'-9" x 1'-3"
06	B6	0'-9" x 1'-3"
07	B7	0'-9" x 2'-0"
08	B8	0'-9" x 2'-0"



TYPICAL L.S OF SLAB



TYPICAL COLUMN REDUCTION DETAILS

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

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.

REV.	DESCRIPTIONS	DRN	CHK	DATE
00	ISSUE FOR CONSTRUCTION	M.R	R.M	23.11.23

PROJECT :-

PLAN SHOWING THE PROPOSED CONSTRUCTION OF STILT FLOOR PARKING + 5 FLOORS RESIDENTIAL BUILDING (18.00m HEIGHT) WITH 40 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENEFITS AT DOOR NO - 27, PLOT NO - 816 & 663, THIRUVOTRIYUR HIGH ROAD, THIRU NAGAR, THIRUVOTRIYUR , CHENNAI - 600 019. COMPRISED IN OLD S.NO - 17/1M & 16/1B1C1M, NEW S.NO - 50/11 & OLD S.NO - 17/2M, NEW S.NO - 51, BLOCK NO - 01, WARD - I, THIRUVOTRIYUR VILLAGE, WITH IN THE LIMIT OF GREATER CHENNAI CORPORATION.

DRAWING TITLE :-

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

DATE	SCALE	JOB.NO	DRG.NO
23.11.23	1" : 8'	-------	005

ARCHITECT / CONSULTANTS :-

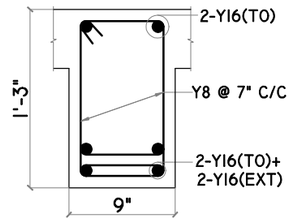
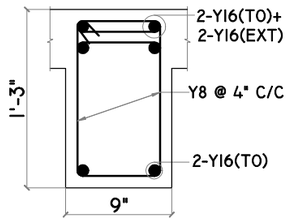
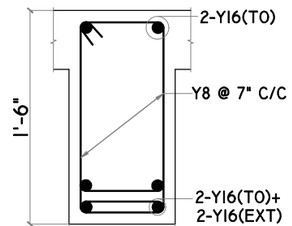
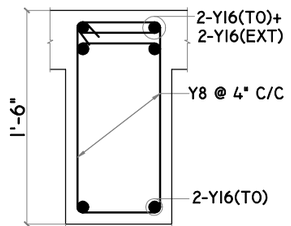
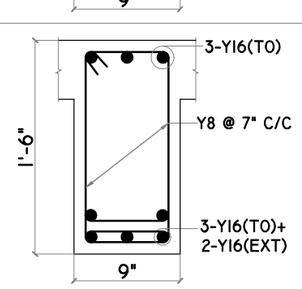
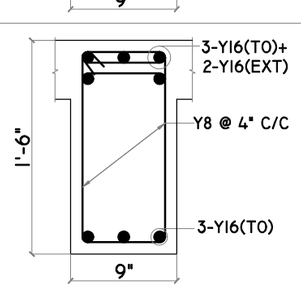
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E mail-sabaritvr2006@gmail.com

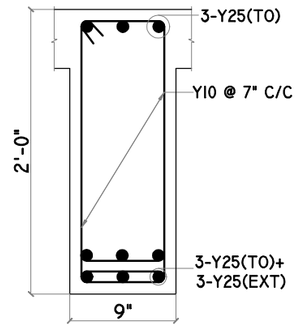
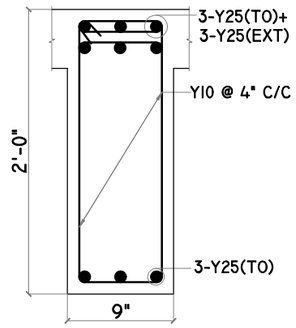
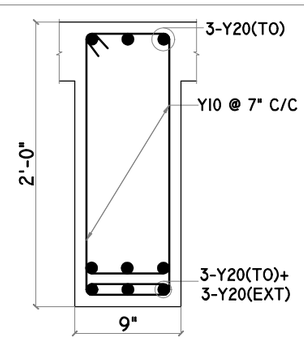
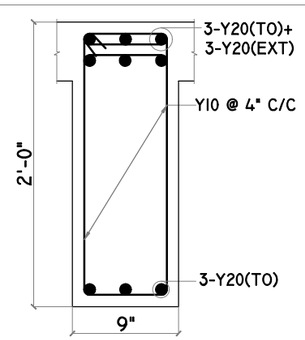
STRUCTURAL CONSULTANTS :-

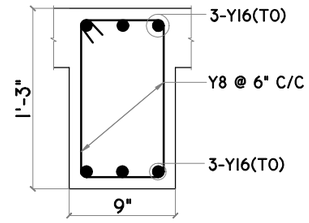
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aura Engineeering Consultants

A1

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NAME	MID SPAN	END SUPPORT
B2 (0'-9" X 1'-3")		
B3 (0'-9" X 1'-6")		
B4 (0'-9" X 1'-6")		

NAME	MID SPAN	END SUPPORT
B7 (0'-9" X 2'-0")		
B8 (0'-9" X 2'-0")		



C.S. OF BEAM "B1"
(0'-9" X 1'-3")

BEAM SCHEDULE		
SL.NO	NAME	SIZE
01	B1	0'-9" X 1'-3"
02	B2	0'-9" X 1'-3"
03	B3	0'-9" X 1'-6"
04	B4	0'-9" X 1'-6"
05	B5	0'-9" X 1'-3"
06	B6	0'-9" X 1'-3"
07	B7	0'-9" X 2'-0"
08	B8	0'-9" X 2'-0"

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	M.R	R.M	23.11.23

PROJECT :-
PLAN SHOWING THE PROPOSED CONSTRUCTION OF STILT FLOOR PARKING + 5 FLOORS RESIDENTIAL BUILDING (18.00m HEIGHT) WITH 40 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENEFITS AT DOOR NO - 27, PLOT NO - 816 & 663, THIRUVOTRIYUR HIGH ROAD, THIRU NAGAR, THIRUVOTRIYUR, CHENNAI - 600 019. COMPRISED IN OLD S.NO - 17/1M & 16/1B1C1M, NEW S.NO - 50/11 & OLD S.NO - 17/2M, NEW S.NO - 51, BLOCK NO - 01, WARD - I, THIRUVOTRIYUR VILLAGE, WITH IN THE LIMIT OF GREATER CHENNAI CORPORATION.

DRAWING TITLE :-
R.C DETAILS OF STILT FLOOR ROOF BEAM

DATE	SCALE	JOB.NO	DRG.NO
23.11.23	1" : 9'	------	006

ARCHITECT / CONSULTANTS :-

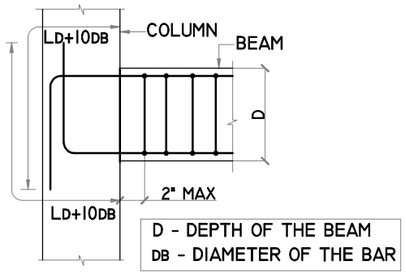
SSS
Architects and Interior Designers
Plot No 3A,Sceond Floor,
LIC Nagar Ext,Sri nagar,
Pallikaranai,Chennai-600 100
Mobile : 91-9600111318,
E mail-sabaritvr2006@gmail.com

STRUCTURAL CONSULTANTS :-

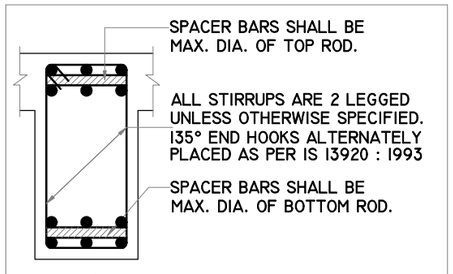
AURA ENGINEERING CONSULTANTS
#8, 50th St, Sarvamangala Colony, 7th Avenue,
ASHOK NAGAR, CHENNAI- 600 083.
Fixed Line :- 044 4859 7100
projects.auraengg@gmail.com
projects@auraengineers.co.in
http://auraengineers.co.in/
Engineering Consultants

A3

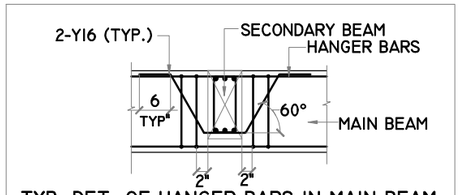
FOR APPROVAL ONLY



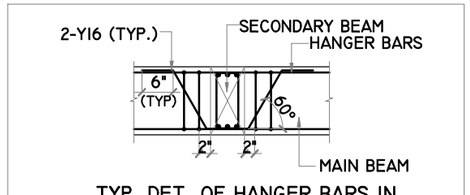
TYP. EXTERNAL JOINT DETAIL AT BEAM-COLUMN JUNCTION



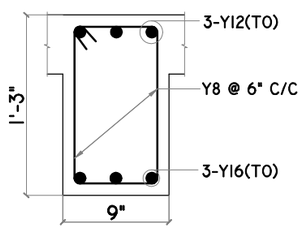
TYP. DETAIL



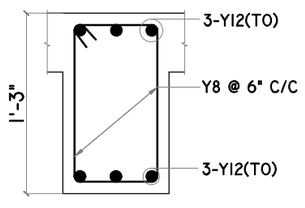
TYP. DET. OF HANGER BARS IN MAIN BEAM AT SECONDARY BEAM JUNCTION (VARY DEPTH)



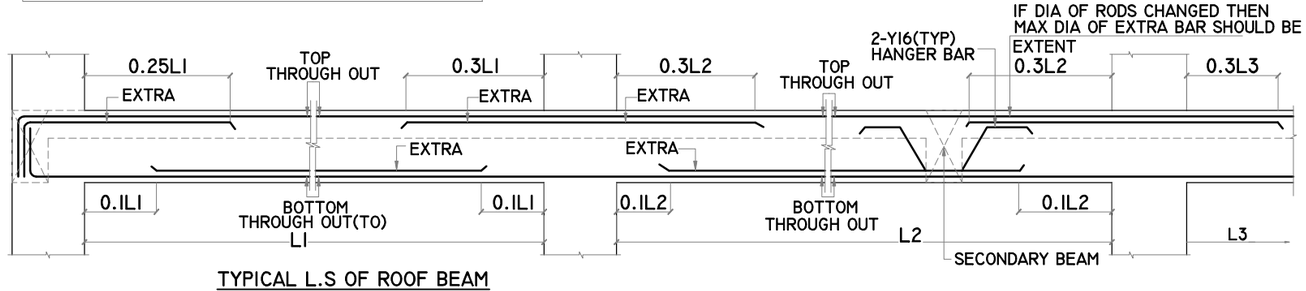
TYP. DET. OF HANGER BARS IN MAIN BEAM AT SECONDARY BEAM JUNCTION



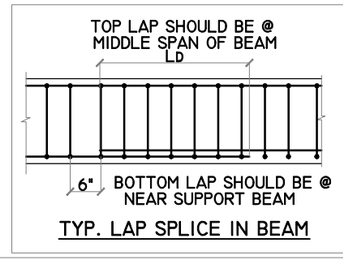
C.S. OF BEAM "B5"
(0'-9" X 1'-3")



C.S. OF BEAM "B6"
(0'-9" X 1'-3")

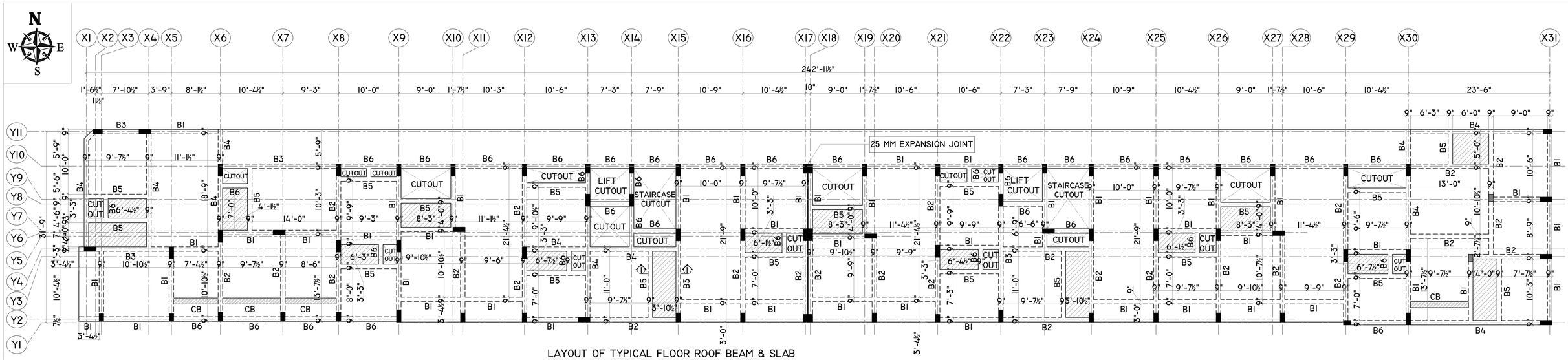


TYPICAL L.S OF ROOF BEAM

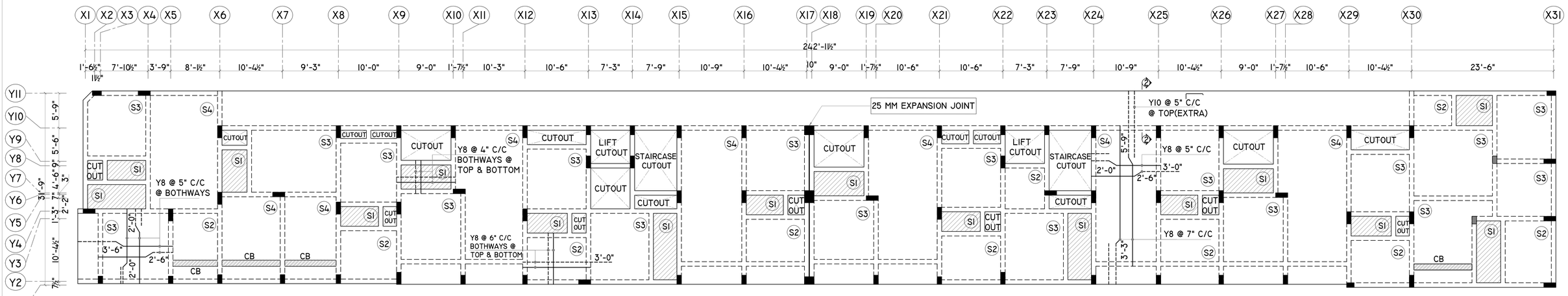


TYP. LAP SPLICE IN BEAM

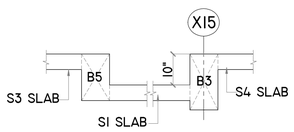
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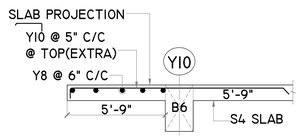
LAYOUT OF TYPICAL FLOOR ROOF BEAM & SLAB



R.C LAYOUT OF TYPICAL FLOOR ROOF BEAM & SLAB



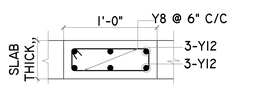
SECTION "1-1"



SECTION "2-2"

SLAB SCHEDULE		
SL.NO	NAME	THICK
01	S1	5" THK.
02	S2	5" THK.
03	S3	5" THK.
04	S4	5" THK.

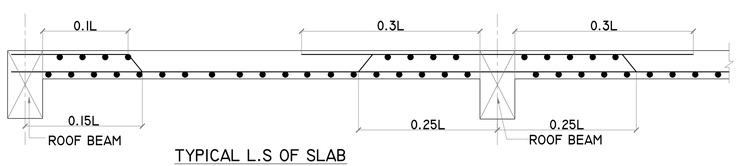
BEAM SCHEDULE		
SL.NO	NAME	SIZE
01	B1	0'-9" x 1'-3"
02	B2	0'-9" x 1'-3"
03	B3	0'-9" x 1'-6"
04	B4	0'-9" x 1'-6"
05	B5	0'-9" x 1'-3"
06	B6	0'-9" x 1'-3"



C.S OF CONCEALED BEAM-"CB"
(1'-0" X "SLAB THICKNESS")

NOTE:
- SLAB SUNK BY 0'-10"
- FOR BEAM REINFORCEMENT DETAILS REFER DWG.NO : 008
- PROVIDE Y8 @ 8" C/C AS DISTRIBUTORS WHERE EVER REQUIRED

FOR APPROVAL ONLY



TYPICAL L.S OF SLAB

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

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.

REV.	DESCRIPTIONS	DRN	CHK	DATE
00	ISSUE FOR CONSTRUCTION	M.R	R.M	23.11.23

PROJECT :-

PLAN SHOWING THE PROPOSED CONSTRUCTION OF STILT FLOOR PARKING + 5 FLOORS RESIDENTIAL BUILDING (18.00m HEIGHT) WITH 40 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENEFITS AT DOOR NO - 27, PLOT NO - 816 & 663, THIRUVOTRIYUR HIGH ROAD, THIRU NAGAR, THIRUVOTRIYUR , CHENNAI - 600 019. COMPRISED IN OLD S.NO - 17/1M & 16/1B1C1M, NEW S.NO - 50/11 & OLD S.NO - 17/2M, NEW S.NO - 51, BLOCK NO - 01, WARD - I, THIRUVOTRIYUR VILLAGE, WITH IN THE LIMIT OF GREATER CHENNAI CORPORATION.

DRAWING TITLE :-

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

DATE	SCALE	JOB.NO	DRG.NO
23.11.23	1" : 8'	-------	007

ARCHITECT / CONSULTANTS :-

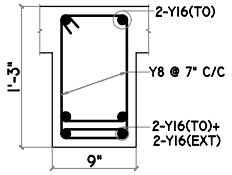
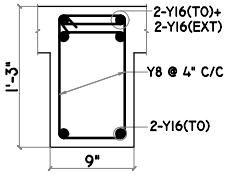
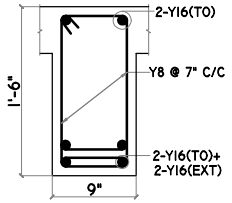
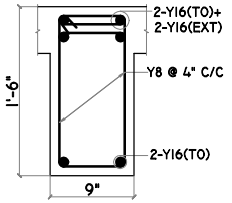
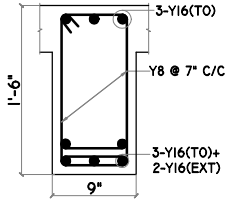
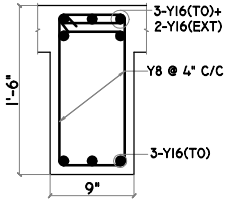
SSS
Architects and Interior Designers
Plot No 3A,Soceond Floor,
LIC Nagar Ext,Srt nagar,
Pallikaranai,Chennai-600 100
Mobile : 91-9600111318,
E mail-sabaritvr2006@gmail.com

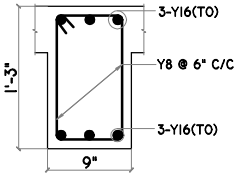
STRUCTURAL CONSULTANTS :-

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 Engineeering Consultants

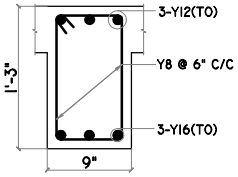
A1

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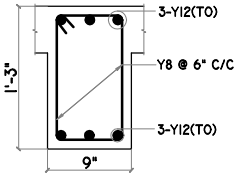
NAME	MID SPAN	END SUPPORT
B2 (0'-9" X 1'-3")		
B3 (0'-9" X 1'-6")		
B4 (0'-9" X 1'-6")		



C.S. OF BEAM "B1"
(0'-9" X 1'-3")

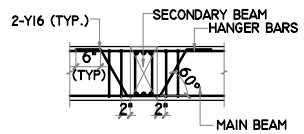


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(0'-9" X 1'-3")

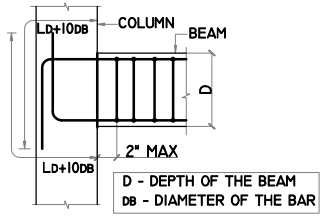


C.S. OF BEAM "B6"
(0'-9" X 1'-3")

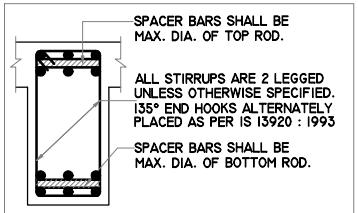
BEAM SCHEDULE		
SL.NO	NAME	SIZE
01	B1	0'-9" X 1'-3"
02	B2	0'-9" X 1'-3"
03	B3	0'-9" X 1'-6"
04	B4	0'-9" X 1'-6"
05	B5	0'-9" X 1'-3"
06	B6	0'-9" X 1'-3"



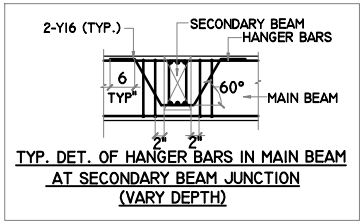
TYP. DET. OF HANGER BARS IN MAIN BEAM AT SECONDARY BEAM JUNCTION



TYP. EXTERNAL JOINT DETAIL AT BEAM-COLUMN JUNCTION

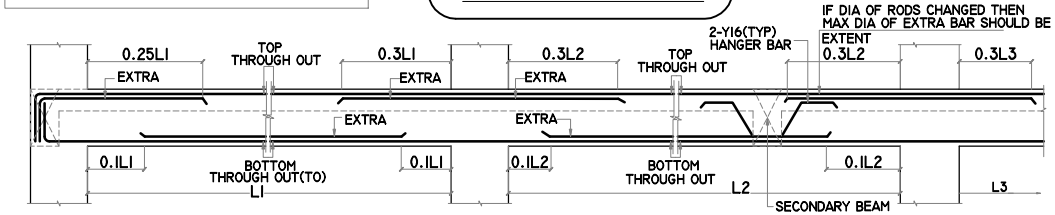


TYP. DETAIL

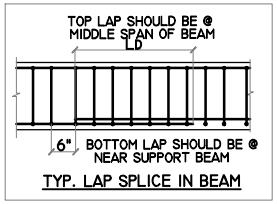


TYP. DET. OF HANGER BARS IN MAIN BEAM AT SECONDARY BEAM JUNCTION (VARY DEPTH)

FOR APPROVAL ONLY



TYPICAL L.S OF ROOF BEAM



TYP. LAP SPLICE IN BEAM

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"
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REV.	DESCRIPTIONS	DRN	CHK	DATE
00	ISSUE FOR CONSTRUCTION	M.R	R.M	23.11.23

PROJECT :-

PLAN SHOWING THE PROPOSED CONSTRUCTION OF STILT FLOOR PARKING + 5 FLOORS RESIDENTIAL BUILDING (18.00m HEIGHT) WITH 40 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENEFITS AT DOOR NO - 27, PLOT NO - 814 & 863, THIRUVOTRIYUR HIGH ROAD, THIRU NAGAR, THIRUVOTRIYUR, CHENNAI - 600 019. COMPRISED IN OLD S.NO - 17/1M & 16/1B1C1M, NEW S.NO - 50/11 & OLD S.NO - 17/2M, NEW S.NO - 51, BLOCK NO - 01, WARD - I, THIRUVOTRIYUR VILLAGE, WITH IN THE LIMIT OF GREATER CHENNAI CORPORATION.

DRAWING TITLE :-
R.C DETAILS OF TYPICAL FLOOR ROOF BEAM

DATE	SCALE	JOB.NO	DRG.NO
23.11.23	1" : 9'	------	008

ARCHITECT / CONSULTANTS :-

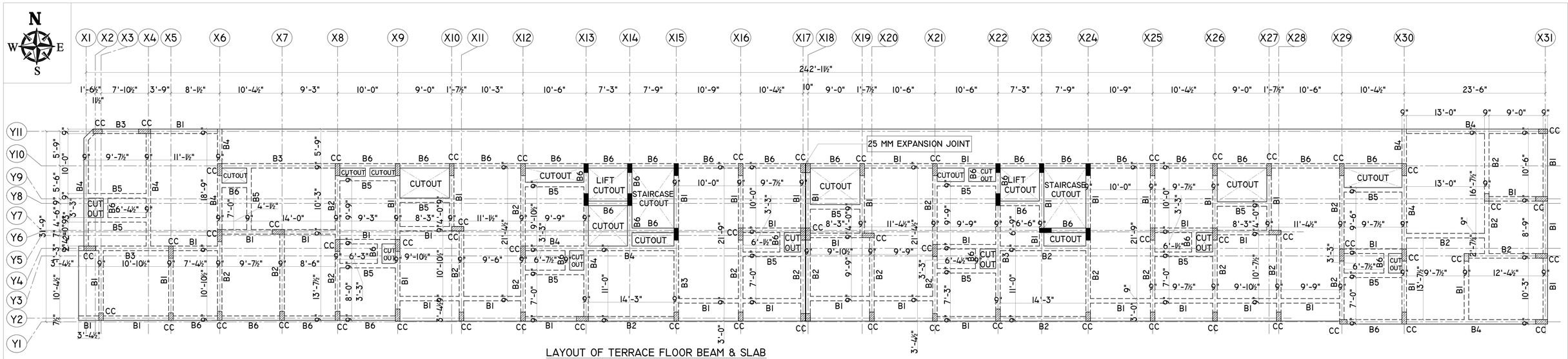
SSS

STRUCTURAL CONSULTANTS :-

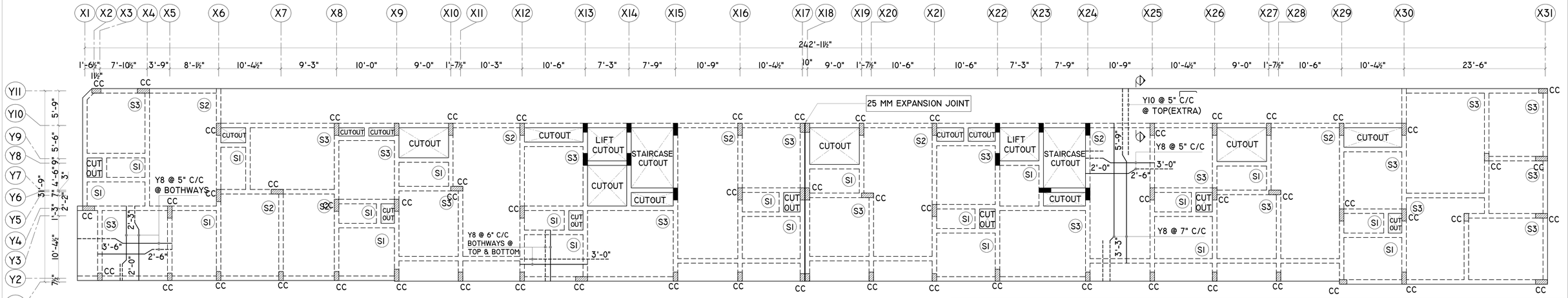
AURA ENGINEERING CONSULTANTS
#8, 50th St, Saravanangala Colony, 7th Avenue, ASHOK NAGAR, CHENNAI- 600 083.
Head Line :- 044 4859 7100
projects.auraengg@gmail.com
projects@auraengineers.co.in
http://auraengineers.co.in/
aura Engineering Consultants

A3

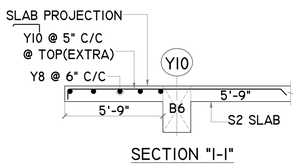
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LAYOUT OF TERRACE FLOOR BEAM & SLAB



R.C LAYOUT OF TERRACE FLOOR BEAM & SLAB



SECTION "1-1"

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'-3"
02	B2	0'-9" x 1'-3"
03	B3	0'-9" x 1'-6"
04	B4	0'-9" x 1'-6"
05	B5	0'-9" x 1'-3"
06	B6	0'-9" x 1'-3"

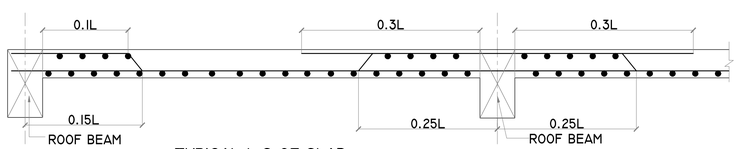
FOR APPROVAL ONLY

NOTE:

FOR BEAM REINFORCEMENT DETAILS REFER DWG.NO : 010

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

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



TYPICAL L.S OF SLAB

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

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.

REV.	DESCRIPTIONS	DRN	CHK	DATE
00	ISSUE FOR CONSTRUCTION	M.R	R.M	23.11.23

PROJECT :-

PLAN SHOWING THE PROPOSED CONSTRUCTION OF STILT FLOOR PARKING + 5 FLOORS RESIDENTIAL BUILDING (18.00m HEIGHT) WITH 40 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENEFITS AT DOOR NO - 27, PLOT NO - 816 & 663, THIRUVOTRIYUR HIGH ROAD, THIRU NAGAR, THIRUVOTRIYUR , CHENNAI - 600 019. COMPRISED IN OLD S.NO - 17/1M & 16/1B1C1M, NEW S.NO - 50/11 & OLD S.NO - 17/2M, NEW S.NO - 51, BLOCK NO - 01, WARD - I, THIRUVOTRIYUR VILLAGE, WITH IN THE LIMIT OF GREATER CHENNAI CORPORATION.

DRAWING TITLE :-

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

DATE	SCALE	JOB.NO	DRG.NO
23.11.23	1" : 8'	-------	009

ARCHITECT / CONSULTANTS :-

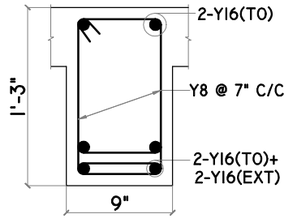
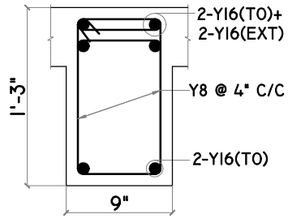
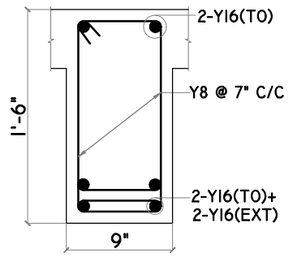
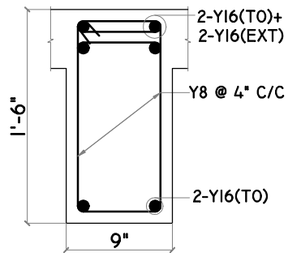
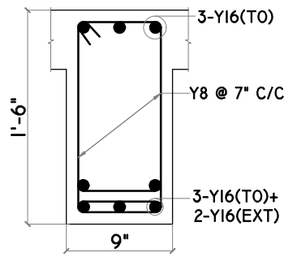
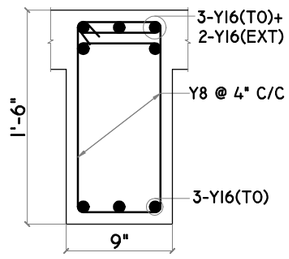
SSS
Architects and Interior Designers
Plot No 3A,Second Floor,
LIC Nagar Ext,Sri nagar,
Pallikaranai,Chennai-600 100
Mobile : 91-9600111318,
E mail-sabarirv2006@gmail.com

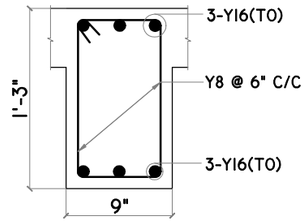
STRUCTURAL CONSULTANTS :-

AURA ENGINEERING CONSULTANTS
#8, 50th St, Sarvamangala Colony, 7th Avenue,
ASHOK NAGAR, CHENNAI- 600 083.
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aura Engineeering Consultants

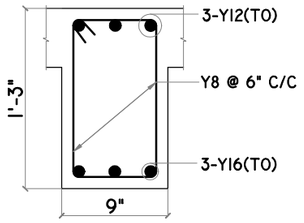
A1

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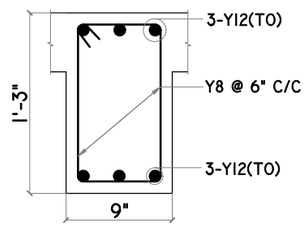
NAME	MID SPAN	END SUPPORT
B2 (0'-9" X 1'-3")		
B3 (0'-9" X 1'-6")		
B4 (0'-9" X 1'-6")		



C.S. OF BEAM "B1"
(0'-9" X 1'-3")



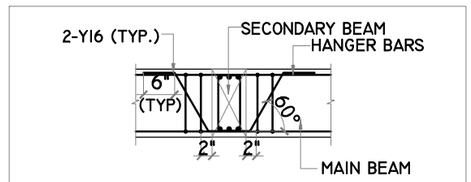
C.S. OF BEAM "B5"
(0'-9" X 1'-3")



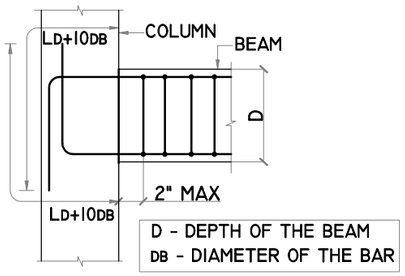
C.S. OF BEAM "B6"
(0'-9" X 1'-3")

BEAM SCHEDULE

SL.NO	NAME	SIZE
01	B1	0'-9" X 1'-3"
02	B2	0'-9" X 1'-3"
03	B3	0'-9" X 1'-6"
04	B4	0'-9" X 1'-6"
05	B5	0'-9" X 1'-3"
06	B6	0'-9" X 1'-3"

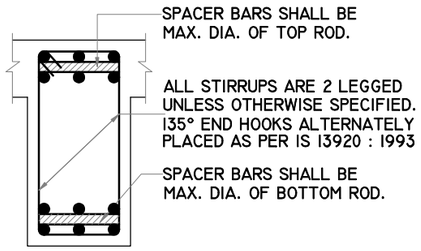


TYP. DET. OF HANGER BARS IN MAIN BEAM AT SECONDARY BEAM JUNCTION

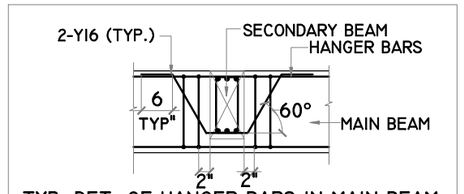


D - DEPTH OF THE BEAM
DB - DIAMETER OF THE BAR

TYP. EXTERNAL JOINT DETAIL AT BEAM-COLUMN JUNCTION

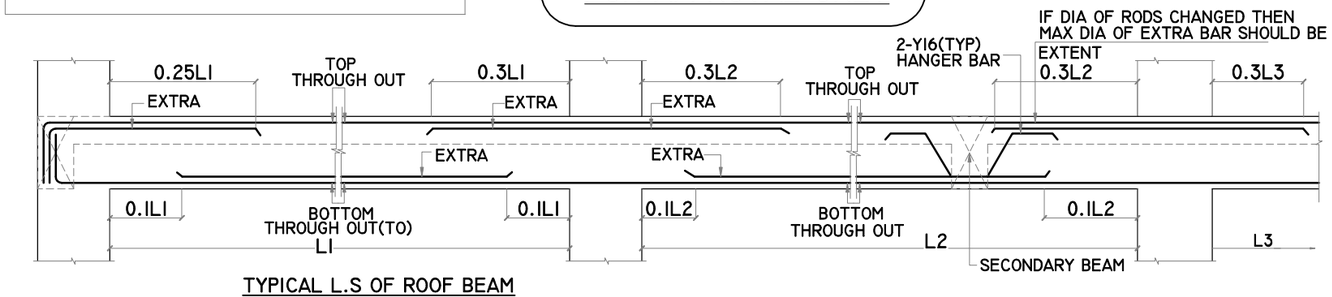


TYP. DETAIL

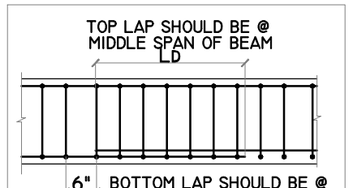


TYP. DET. OF HANGER BARS IN MAIN BEAM AT SECONDARY BEAM JUNCTION (VARY DEPTH)

FOR APPROVAL ONLY



TYPICAL L.S OF ROOF BEAM



TYP. LAP SPLICE IN BEAM

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	M.R	R.M	23.11.23

PROJECT :-
PLAN SHOWING THE PROPOSED CONSTRUCTION OF STILT FLOOR PARKING + 5 FLOORS RESIDENTIAL BUILDING (18.00m HEIGHT) WITH 40 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENEFITS AT DOOR NO - 27, PLOT NO - 816 & 663, THIRUVOTRIYUR HIGH ROAD, THIRU NAGAR, THIRUVOTRIYUR , CHENNAI - 600 019. COMPRISED IN OLD S.NO - 17/1M & 16/1B1C1M, NEW S.NO - 50/11 & OLD S.NO - 17/2M, NEW S.NO - 51, BLOCK NO - 01, WARD - I, THIRUVOTRIYUR VILLAGE, WITH IN THE LIMIT OF GREATER CHENNAI CORPORATION.

DRAWING TITLE :-
R.C DETAILS OF TERRACE FLOOR BEAM

DATE	SCALE	JOB.NO	DRG.NO
23.11.23	1" : 9'	------	010

ARCHITECT / CONSULTANTS :-

SSS
Architects and Interior Designers
Plot No 3A,Second Floor,
LIC Nagar Ext,Sri nagar,
Palikaranai,Chennai-600 100
Mobile : 91-9600111316,
E mail-saberbir2006@gmail.com

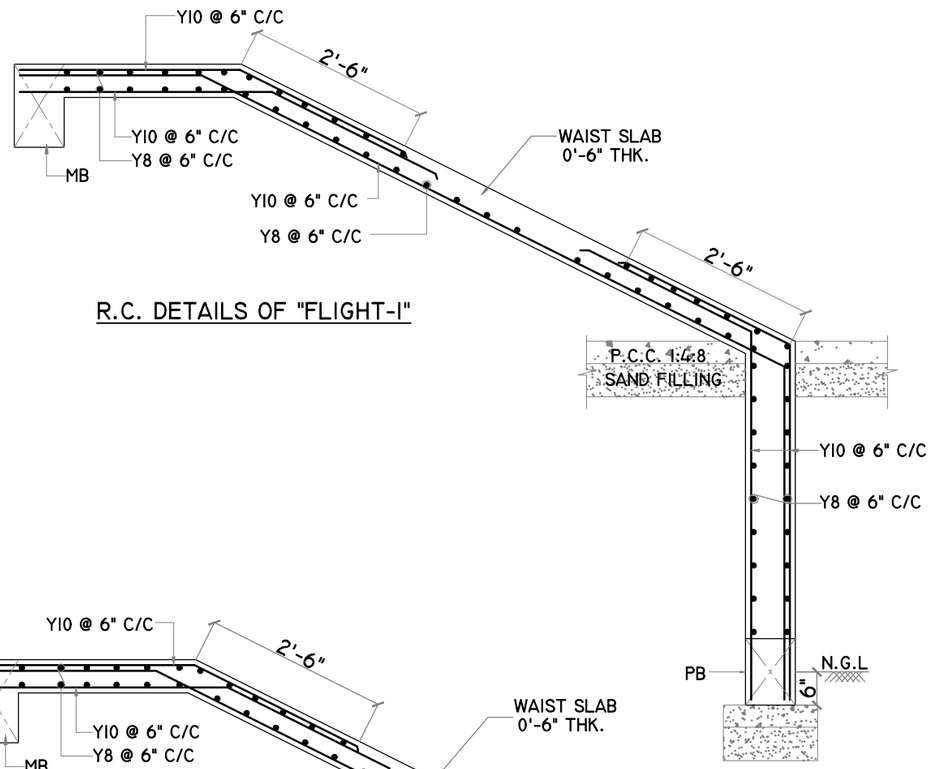
STRUCTURAL CONSULTANTS :-

AURA ENGINEERING CONSULTANTS
#8, 50th St, Sarvamangala Colony, 7th Avenue,
ASHOK NAGAR, CHENNAI- 600 083.
Fixed Line :- 044 4859 7100
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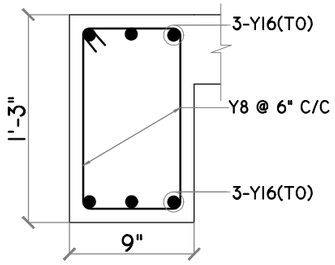
aura Engineering Consultants

A3

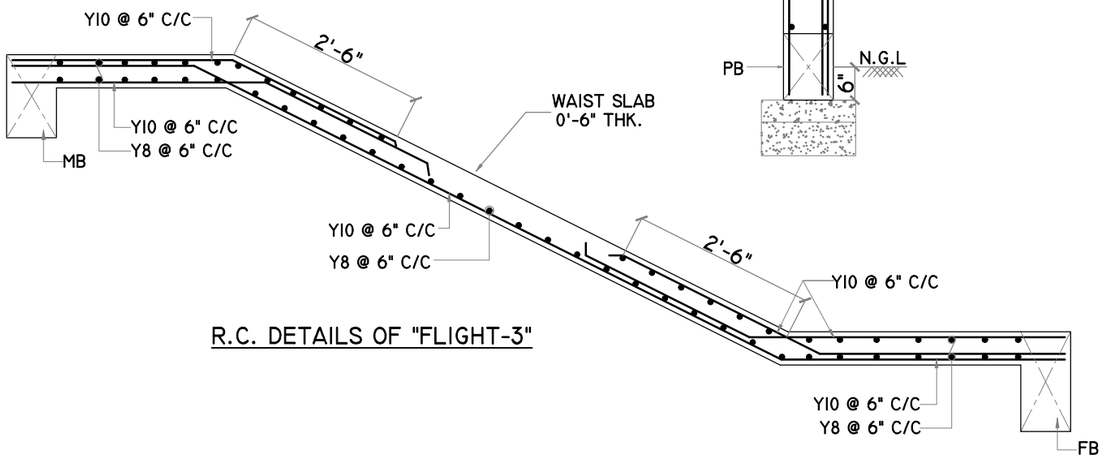
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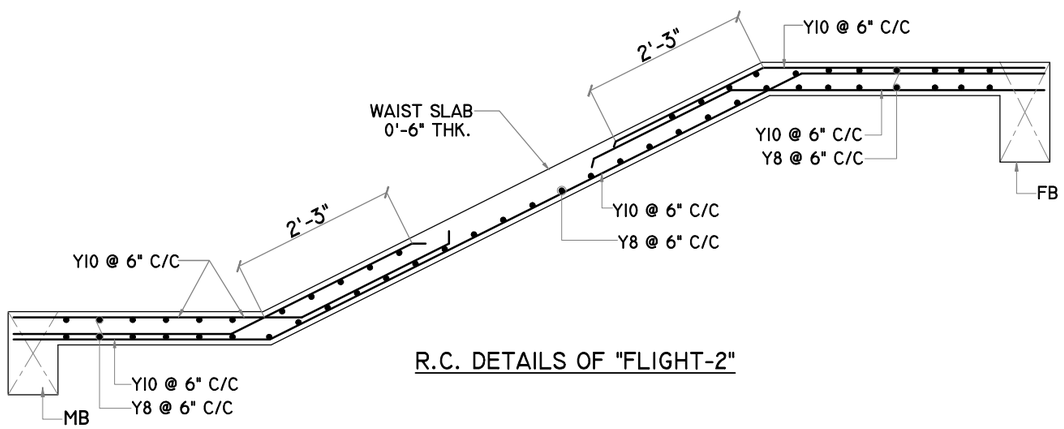
R.C. DETAILS OF "FLIGHT-I"



C.S. OF BEAM "MBI"
(0'-9" x 1'-3")



R.C. DETAILS OF "FLIGHT-3"



R.C. DETAILS OF "FLIGHT-2"

NOTE:

PROVIDE Y8 @ 8" C/C AS DISTRIBUTORS WHERE EVER REQUIRED
FOR CLEAR DIMENSIONS LEVELS REFER ARCHI DRG.

FOR APPROVAL ONLY

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) COLUMN = 1½" B) BEAM = 1"
   C) SLAB = ¾"
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

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

REV.	DESCRIPTIONS	DRN	CHK	DATE
00	ISSUE FOR CONSTRUCTION	R.S	R.M	24.11.23

PROJECT :-

PLAN SHOWING THE PROPOSED CONSTRUCTION OF STILT FLOOR PARKING + 5 FLOORS RESIDENTIAL BUILDING (18.00m HEIGHT) WITH 40 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENEFITS AT DOOR NO - 27, PLOT NO - 816 & 663, THIRUVOTRIYUR HIGH ROAD, THIRU NAGAR, THIRUVOTRIYUR , CHENNAI - 600 019. COMPRISED IN OLD S.NO - 17/1M & 16/1B1C1M, NEW S.NO - 50/11 & OLD S.NO - 17/2M, NEW S.NO - 51, BLOCK NO - 01, WARD - I, THIRUVOTRIYUR VILLAGE, WITH IN THE LIMIT OF GREATER CHENNAI CORPORATION.

DRAWING TITLE :-

R.C. DETAILS OF STAIRACSE

DATE	SCALE	JOB.NO	DRG.NO
24.11.23	1" : 11'	——	011

ARCHITECT / CONSULTANTS :-

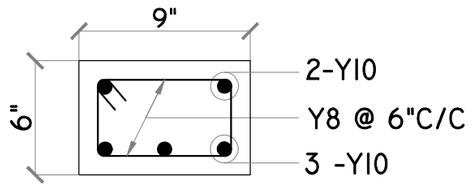
SSS
Architects and Interior Designers
Plot No 3A,Sceond Floor,
LIC Nagar Ext,Sri nagar,
Pallikaranai,Chennai-600 100
Mobile : 91-9600111318,
E mail-sabaritvr2006@gmail.com

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

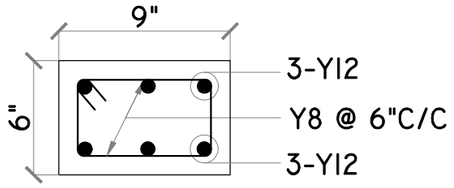
A3

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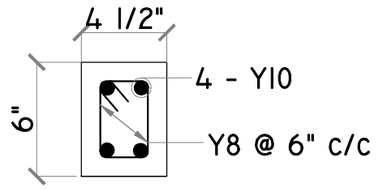
TYP. LINTEL OVER 0'-9" THK. WALL

(UPTO 4'-0" OPENING)

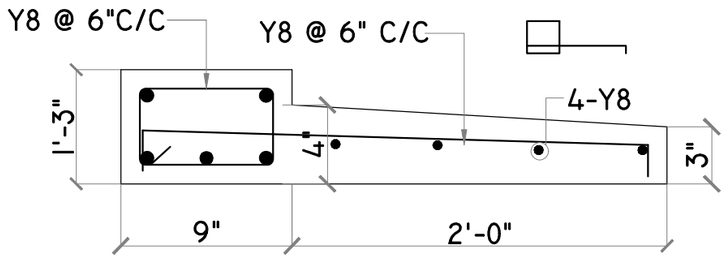


TYP. LINTEL OVER 0'-9" THK. WALL

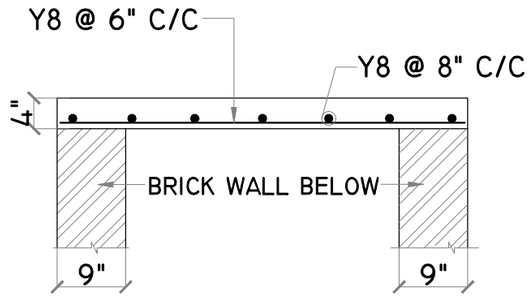
(4'-0" TO 6'-0" OPENING)



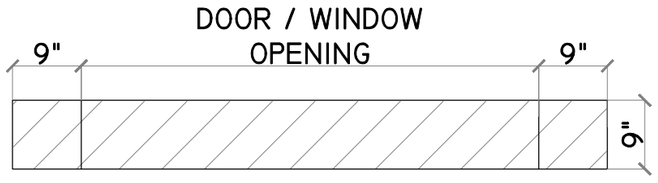
TYP. LINTEL OVER 4½" THK. WALL



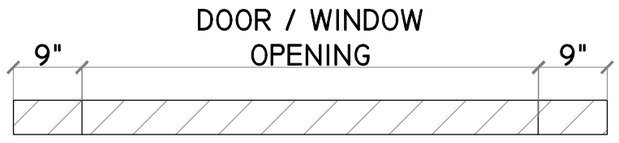
TYPICAL SUNSHADE PROJECTION



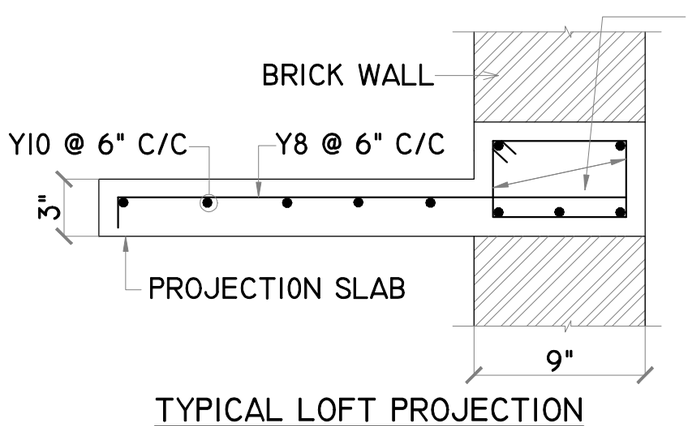
TYPICAL C/S OF SILL SLAB



TYPICAL DETAIL FOR 9" THK CUT LINTEL



TYPICAL DETAIL FOR 4 1/2" THK CUT LINTEL



TYPICAL LOFT PROJECTION

FOR APPROVAL ONLY

NOTE:

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

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.

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) SLAB = ¾" B) BEAM = 1"
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
8. DETAILING OF REBARS SHALL CONFIRM TO SP-34 & IS 13920.

REV.	DESCRIPTIONS	DRN	CHK	DATE
00	ISSUE FOR CONSTRUCTION	M.R	R.M	24.11.23

PROJECT :-

PLAN SHOWING THE PROPOSED CONSTRUCTION OF STILT FLOOR PARKING + 5 FLOORS RESIDENTIAL BUILDING (18.00m HEIGHT) WITH 40 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENEFITS AT DOOR NO - 27, PLOT NO - 816 & 663, THIRUVOTRIYUR HIGH ROAD, THIRU NAGAR, THIRUVOTRIYUR , CHENNAI - 600 019. COMPRISED IN OLD S.NO - 17/1M & 16/1B1C1M, NEW S.NO - 50/11 & OLD S.NO - 17/2M, NEW S.NO - 51, BLOCK NO - 01, WARD - I, THIRUVOTRIYUR VILLAGE, WITH IN THE LIMIT OF GREATER CHENNAI CORPORATION.

DRAWING TITLE :-

PLAN & R.C. DETAILS OF LINTEL

DATE	SCALE	JOB.NO	DRG.NO
24.11.23	1" : 9'	——	012

ARCHITECT / CONSULTANTS :-

SSS
Architects and Interior Designers
Plot No 3A,Sceond Floor,
LIC Nagar Ext,Sri nagar,
Pallikaranai,Chennai-600 100
Mobile : 91-9600111318,
E mail-sabaritvr2006@gmail.com

STRUCTURAL CONSULTANTS :-

AURA ENGINEERING CONSULTANTS
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R.V NAGAR, ASHOK NAGAR,CHENNAI- 600 083.
Fixed Line :- 044 4859 7100
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aura Engineering Consultants

A3



our services doesn't just end there

Buying & Selling Services

Property Buying Assistance, Property Selling Support, Market Price Analysis, Owner Outreach and Negotiation.

Legal & Documentation Services

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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