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REPORT ON STRUCTURAL DESIGN

THE PROPOSED CONSTRUCTION OF GROUP HOUSE RESIDENTIAL BUILDINGS IN S.F NO : 459/1A,1B1,2B,2C1,460/1A,3A1,3B,461/1A,2A1,2B AT SOMAYAMPALAYAM VILLAGE AND PANCHAYAT COIMBATORE NORTH TALUK,COIMBATORE DISTRICT.

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SANKAR & ASSOCIATES, ARCHITECTS & PLANNERS,
COIMBATORE-641 009

CLIENT:	M/S ANANYA SHELTERS	DESIGN:	GROUND + 1 Floors	ARCHITECT & PLANNERS **SANKAR & ASSOCIATES** 27 SENGUPTA STREET, RAMNAGAR, COIMBATORE.
STRUCTURE NAME :	GROUP HOUSE RESIDENTIAL BUILDING	TITLE: REPORT ON STRUCTURAL DESIGN.		
PLACE:	COIMBATORE			

REPORT ON STRUCTURAL DESIGN

Name of Project:		**Name of the Structure:**
THE PROPOSED CONSTRUCTION GROUP HOUSE RESIDENTIAL BUILDINGS IN S.F NO : 459/1A,1B1,2B,2C1,460/1A,3A1,3B,461/1A,2A1,2B AT SOMAYAMPALAYAM VILLAGE AND PANCHAYAT COIMBATORE NORTH TALUK,COIMBATORE DISTRICT		RESIDENTIAL BUILDING
Report by:	**Checked by:**	**Approved by:**
R.PREM KUMAR	R.PRAKASH	S.MURUGESH

DESCRIPTION OF THE PROJECT:

The Proposed structure belongs to in IN S.F NO : 459/1A,1B1,2B,2C1,460/1A,3A1,3B,461/1A,2A1,2B AT SOMAYAMPALAYAM VILLAGE AND PANCHAYAT COIMBATORE NORTH TALUK,COIMBATORE DISTRICT. Purpose of this structure is to house "RESIDENTIAL BUILDING". The structure is designed for Ground floor + one upper floor. The structural design was carried out as per IS 456-2000. The dead load and live load are calculated based on IS 875: Part I & II. The structure was analyzed using the software STAAD-PRO V8i**.**

STRUCTURAL DESIGN CALCULATION

I DESIGN PARAMETERS:

(1) This structure is designed for Ground floor + one upper floor.

(2) SBC Adopted : 300 kN/sq.m.

(3) Concrete grade adopted :

For Footing : M20

Foundation to Terrace : M20 & M25

(4) Grade of steel adopted : Fe 500.

(5) Floor height is 3.58m. (Typical)

II LOAD DETAILS:

DEAD LOAD:

1. Self weight of slab (Assumed as 150mm Tk.) - 3.750 KN/m^2.
2. Self weight of slab (Assumed as 125mm Tk.) - 3.125 KN/m^2.

SUPER IMPOSED DEAD LOAD:

1. Floor finish - 1.5 KN/m^2.
2. Partition loads - 1.0 KN/m^2.
3. Unit wt. of brick * Tk of wall * Ht of wall
   (20 x 0.23 x (0.8 x (3.58-0.46)) - 11.50KN/m.

SUPER IMPOSED LIVE LOAD: (As per IS 875 Part II)

1. For Staircase - 3 KN/m^2
2. For Rooms - 2 KN/m^2

III LOAD COMBINATION

Loads considered for calculation of horizontal seismic load = DL + 25 % LL

Load case:

1. Seismic Load in 'X' direction (EQX)
2. Seismic load in 'Y' direction (EQY)
3. Dead Load (DL)
4. Live Load (LL)

Load combination:

1. LOAD COMB (1.0 DL + 1.0 LL)
2. LOAD COMB (1.5 DL + 1.5 LL)

Location and thickness of walls as depicted in the architectural drawings were considered for loads at appropriate locations in the analysis.

IV ANALYSIS:

The analysis is performed using software STAAD Pro V8i.

V DESIGN OF STRUCTURE:

From analysis the columns and beams were grouped as shown in centerline drawing depending on the forces. The footing, column and beams were designed for the maximum forces in-group as per IS456-2000. Illustrate design calculation for Column, Footing, Beam and Slab enclosed below for reference.

- Annexure (I) – Extract of Design Output (Typical).

VI STRUCTURAL ARRANGEMENT:

Column arrangements, Foundation reinforcement details, Plinth Beam Roof Beam & Roof Slab layout and Reinforcement details were presented as below

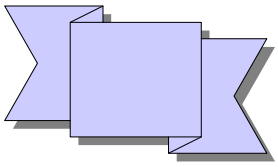
- Annexure (II) – As per drawing enclosed here for reference

VII LIST OF STRUCTURAL DRAWINGS:

Following drawings showing the dimension of structural member and reinforcement details are enclosed here with for reference

1. ST-CL-001 - Centreline Layout & Column Reinforcement details
2. ST-FL-001 - Lift pit Detail
3. ST-PL-001 - Plinth Beam Layout
4. ST-RF-GF-001 - Ground Floor Roof slab & Beam Layout
5. ST-RF-fF-001 - First Floor Roof slab & Beam Layout
6. ST-OT-001 - Typical Ductility details

ANNEXURE – I



CLIENT:	M/S ANANYA SHELTERS	DESIGN:	GROUND + 1 Floors	ARCHITECT & PLANNERS **SANKAR & ASSOCIATES** 27 SENGUPTA STREET, RAMNAGAR, COIMBATORE.
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TYPICAL DESIGN OF COLUMN

Input Data

Breadth		b	=	230.00	mm
Depth		D	=	380.00	mm
Clear cover		cc	=	40.00	mm
Effective cover		d'	=	56.00	mm
Effective Breadth		b'	=	174.00	mm
Effective Depth		D'	=	324.00	mm
Length of column		L	=	3.58	m
Depth of Beam/Slab framing into coln (Major)		Bd	=	0.45	m
Depth of Beam/Slab Framing into coln (Minor)		Bd	=	0.45	m
Clear length in major axis		Lc or Lo	=	3.13	m
Clear height in minor axis		Lc or Lo	=	3.13	m
Effective length factor		β	=	0.80	
Effective length of column		Leff (x-dir)	=	2.50	m
Effective length of column		Leff (y-dir)	=	2.50	m
Axial Load (Factored)		N	=	300.00	KN
Moment about major axis (Factored)		Mx	=	37.00	KN-m
Moment about minor axis (Factored)		My	=	20.00	KN-m
Characteristic strength of concrete		fck	=	25.00	N/mm^2
Characteristic strength of steel		fy	=	500	N/mm^2

Design Calculations:

Step1:	Check for Slenderness ratio :	Leff/D	=	6.59	<12
	Check for Slenderness ratio :	Leff/b	=	10.89	<12
		Design a: Short Column			
		eax	=	0.00	mm
		eay	=	0.00	mm
	Slenderness limits for column	Lo < 60 b	3.13 m	< 13.80	m

Step:2 Check for moment due to minimum eccentricity

Minimum Eccentricity (L/500 + d or b/30) or 20 (whichever is		ex	=	18.93	mm
		ey	=	13.93	mm
	A.) Moments due to Min eccentricity	Mex	=	5.68	KN-m
		Mey	=	4.18	KN-m

Step:3 Calculation of Additional Moments

Assume Percentage of Reinforcement		p	=	**1.30**	%
Reinforcement Equally Distributed on		**Two Face**			
		Puz	=	1409.33	KN
	d'/d along x-dir		=	0.15	
	d'/b along y-dir		=	0.20	
	Along x-direction				
		k1	=	0.196	
		k2	=	0.104	

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Along y-direction

	k1	=	0.184	
	k2	=	-0.001	
Pb=(k1 + k2 p/Fck)Fck b d)	Pbx	=	440.08	KN
	Pby	=	401.93	KN
k = (Puz - Pu)/(Puz - Pb)	Kx	=	1.14	
	Ky	=	1.10	
B.) Additional Moments	Max	=	0.00	KN-m
	May	=	0.00	KN-m

Step:4 Total Moments for which the column is to be designed are

D.) Final Moment	**Mux**	**=**	**37.00**	KN-m
	Muy	**=**	**20.00**	KN-m

Step:5

Pu / Fck bd = 0.14

p/Fck = 0.05

*Refer **CHART 37** From SP 16 : 1980 for red values

Pu / Fck bD= 0.14 p/Fck= 0.052 d'/D = 0.15

Mux1 / Fck bD^2 = **0.025**

Mux1 = **20.76** KN-m

*Refer **CHART 38** From SP 16 : 1980 for red values

Pu / Fck 0.14 p/Fck= 0.052 d'/b = 0.20

Muy1 / Fck bD^2 = **0.025**

Muy1 = **12.56** KN-m

Mux/Mux1 = 1.78

Muy/Muy1 = 1.59

Pu/Puz = 0.21

αn = 1.02

(Mux/Mux1)^αn + (Muy/Muy1)^αn = 3.41 >1

Step:6 Longitudinal Reinforceme Area of steel Required Asc = 1136.20 mm^2

Larger dia		**Smaller dia**		
Select Bar dia	16 mm	Select Bar dia	=	12 mm
No. of bars Req	5.7	No. of bars Req	=	-0.6
No. of bars Prov	**6**	No. of bars Prov	=	**0**
Area Prov.	1206.37	Area Prov.	=	0

Area of Steel Provided Asc (pro) = 1206.37 mm^2

Percentage of Steel Provided = 1.38 %

Provide 6Y16+ 0Y12 as longitudinal reinforcement

Step:7 Lateral Ties

1. Pitch: (take whichever is lesser)

i. 16x smaller dia of main steel = 175.00 mm

ii. 300 mm = 300.00 mm

Pi = 175.00 mm

2. Diameter (whichever is greater)

i. 1/4 x largest dia of main steel = 4.00 mm

ii. 8mm = 8.00 mm

Dia = 8.00 mm

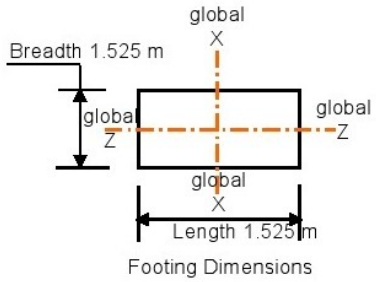
Therefore provide Y8 @175c/c as Lateral ties.

TYPICAL DESIGN OF FOOTING

Input Data

COLUMN

Length (l, dim. || Z axis) =	230	mm
Breadth (b, dim. || X axis) =	380	mm



Footing Dimensions

FOOTING

Foot length (L, dim. || Z axis) =	1.53	m
Foot Breadth (B, dim. || X axis) =	1.53	m
Thickness of footing (t) =	450	mm
Clear cover of footing =	50	mm
Main bar dia of footing =	10	mm
Effective depth of footing =	**395**	mm
Selfweight of the footing =	**26.16**	KN
Area of Footing(A) =	**2.33**	m^2
Sect mod of foot about Z axis (Zz) =	**0.59**	m^3
Sec mod of foot about X axis (Zx) =	**0.59**	m^3

MATERIALS OF CONSTRUCTION

Grade of concrete f_{ck} =	20	N/mm^2
Grade of steel f_y =	500	N/mm^2

CHECK FOR GROSS BEARING PRESSURE

Safe **NET** bearing pressure =	300	KN/m^2
Safe gross bearing pr. =	**346.55**	KN/m^3 (net pr. + depth of foot * soil unit wt)
Unfactored load case number =	0	
Axial load from output (P1) =	540.00	KN
Moment about Z axis (M_z) =	3.00	KN-m
Moment about X axis (M_x) =	1.00	KN-m
Depth of top of foot. from ground =	2	m
Unit wt of soil =	19	KN/m^3
Weight of soil retained above foot =	**85.05**	KN
P = (P1+soil+foot self wt) =	**651.22**	KN
Maximum bearing pressure =	**286.78**	KN/m^2
Minimum bearing pressure =	**273.25**	**KN/m^2**

$$\frac{P}{A} \pm \frac{M_y}{Z_y} \pm \frac{M_x}{Z_x}$$

Hence footing is safe against max gross bearing pr.

DESIGN FORCES

Factored load comb. no.	3	
Axial load:(P_u) =	810	**KN**
Moment about Z axis (M_{uz}) =	4.5	**KN-m**
Moment about X axis (M_{ux}) =	1.5	**KN-m**

Maximum effective soil pressure $p_{e\,max}$

(Pu/Area+ Muz/Zz + Mux/Zx) = **358.44** **KN/m^2**

Minimum effective soil pressure $p_{e\,min}$

(Pu/Area - Muz/Zz - Mux/Zx) = **338.14** **KN/m^2**

Design of footing is done using above maximum effective soil pressure

CALCULATION FOR BOTTOM STEEL

Mu about X1 X1 = (pe max x length^2/2)= **75.14** KN-m per meter

Mulimit = **415.11** KN-m per meter

The section is singly reinforced

$$A_{st} = \frac{0.5 f_{ck}}{f_y}\left[1 - \sqrt{1 - \frac{4.6 M_u}{f_{ck} bd^2}}\right] bd$$

Hence, Ast =	**450.361**	mm^2	
Min Ast =	**474.000**	mm^2	(0.12 % for slab, cl 26.5.2.1)
Spacing =	**165.70**	mm	(considering max of above two calculated values of Ast)
pt provided =	**0.12**	%	

Hence provide 10 mm dia bar @ 165 mm c/c parellel to length of footing (|| to Z)

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Mu about N1 N1 = (pe max x length^2/2)= **58.74** KN-m per meter

Calc. Ast = **349.781** mm^2 The section is singly reinforced

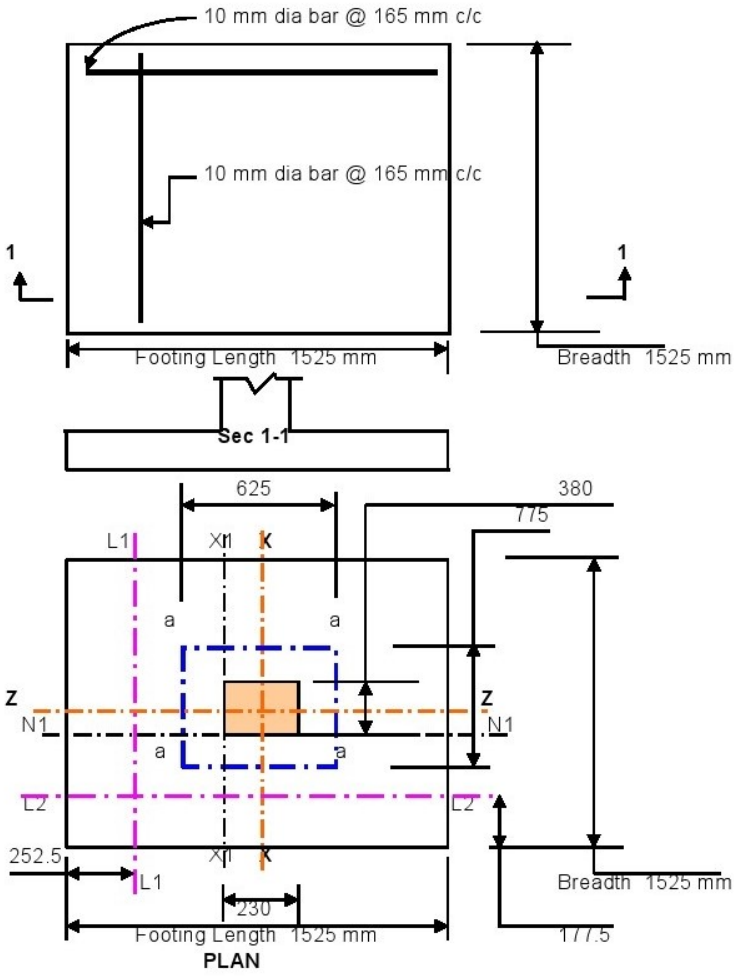
Min Ast = **474** mm^2 (0.12 % for slab, cl 26.5.2.1)

Spacing = **165.70** mm (considering max of above two calculated values of Ast)

pt provided = **0.12** %

Hence provide 10 mm dia bar @ 165 mm c/c parellel to breadth of footing (|| to X)

Arrangement of bottom reinforcement as per above design is shown below



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CHECK FOR ONE WAY SHEAR :

One way shear at critical section L1- L1

Distance of critical sec. from edge of footing = **0.2525** m

Shear force Vs =pe max x 0.2525 x 1m width of footing = **90.507** KN

Shear stress τ_v = Vs/bd = **0.229** N/mm^2

τ_c = **0.26** N/mm^2

tv < tc hence O.K.

One way shear at critical section L2- L2

Distance of critical sec. from edge of footing = **0.1775** m

Shear force Vs =pe max x 0.1775 x 1m width of footing = **63.624** KN

Shear stress τ_v = Vs/bd = **0.161** N/mm^2

τ_c = **0.26** N/mm^2

tv < tc hence O.K.

CHECK FOR TWO WAY SHEAR

Ref. cl 34.2.4 and cl.31.6.3 of IS 456 : 2000

Allowable shear stress $\tau_{v\ allowable}$ = $k_s \tau_c$

k_s = (0.5 + bc) = **1.5** >1

Hence, k_s= **1**

τ_c = 0.25 (fck)$^{0.5}$ = **1.11803** N/mm^2

$\tau_{v\ allowable}$ = k_s x τ_c = **1.11803** N/mm^2

Shear force Vs = 358.444 (1.525 x 1.525 - 0.625 x 0.775) = **659.99** KN

Length of critical section = 2 x (625 + 775) = **2800** mm

Area of the critical section (length of critical sec x eff. d) = **1106000** mm^2

Hence shear stress τ_v = **0.597** N/mm^2

tv < allowable hence O.K.

TYPICAL DESIGN OF TWO WAY SLAB

Input Data :

Grade of concrete	f_{ck} =	20.00	N/mm^2
Grade of steel	f_y =	500.00	N/mm^2
Density of concrete	=	25	kN/m^3
Clear cover	=	15.00	mm

Classification of slab

Clear Size of Room/Panel	5.105 m x 5.105 m			
Longer span	5.105 m + 0.230 m	l_y =	5.335	m
shorter span	5.105 m + 0.230 m	l_x =	5.335	m
Aspect ratio		l_y/l_x =	1.000 < 2	

Slab to be designed as Two way slab

Assumed Span/effective depth ratio	=	26.00	
Overall depth provided	D =	150.00	mm
Effective depth provided	d =	130.00	mm
Effective span	L =	5.235	m

Design load

Self weight of the slab	=	3.750	kN/m^2
Floor finish	=	1.50	kN/m^2
Other loads	=	1.000	kN/m^2
Total dead load	=	6.25	kN/m^2
Live load	=	2.00	kN/m^2
Total load	=	8.25	kN/m^2
Factored load	W_u =	12.38	kN/m^2

Calculation of reinforcement required

Slab End condition :- 4 **Two adjacent edges discontinuous**

		Shorter direction		Longer direction		
		αx(-ve) support	αx(+ve) mid span	αy(-ve) support	αy(+ve) mid span	
Bending moment Coefficient		**0.0474**	**0.0356**	**0.045**	**0.034**	
Bending moment		16.707	12.530	15.967	11.975	kNm
Percentage of reinforcement requir	$P_{t,req}$	0.2	0.178	0.230	0.170	%
Area of reinforcement required	A_{st}	314.48	231.94	299.642	221.19	mm^2
Minimum area of reinforcement	$A_{st,min}$	180.00	180.00	180.00	180.00	mm^2
Area of reinforcement required	$A_{st,req}$	314.48	231.94	299.64	221.19	mm^2
Diameter of Reinforcement	Φ	10.00	10.00	10.00	10.00	mm
Spacing of Reinforcement required		249.75	250.00	250.00	250.00	mm
Spacing of Reinforcement provided		150.00	150.00	150.00	150.00	mm
Area of main reinforcement provide	$A_{st,pro}$	523.81	523.81	523.81	523.81	mm^2
Percentage of reinforcement provi	$P_{t,pro}$	0.403	0.403	0.403	0.403	%

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Check for Deflection

Span / effective depth ratio		=	26.00	
Service stress in steel	f_s	=	128.41	N/mm^2
Modification factor		=	2.00	
Effective depth required for deflection limit		=	100.67	mm
Effective depth provided	d	=	130	mm
Overall depth provided	D	=	150.00	mm

Hence the limit state of deflection is satisfied

Check for Shear

Factored Shear force	V_u	=	32.39	kN
Nominal shear stress	τ_v	=	0.249	N/mm^2
Percentage of steel	p_t	=	0.403	%
Designed shear stress	τ_c	=	0.439	N/mm^2

Safe in Shear

Check for Crack width

Modular ratio	m	=	8.94	
Modulus of elasticity of steel	E_s	=	200000	N/mm^2
Tension steel percentage provided	p_t	=	0.403	%
Neutral axis depth factor	k	=	0.235	
Depth of neutral axis	x	=	30.530	mm
Area of steel provided	$A_{st,pro}$	=	523.81	mm^2
Cracked moment of inertia	I_{cr}	=	5.58E+07	mm^4
Service load moment	$M_{(+)}$	=	8.35	kNm/m
Service stress in steel	f_{st}	=	133.09	N/mm^2
Strain in concrete at the level considered	ε_1	=	0.000799	
Average strain in concrete	ε_m	=	0.000343	
Distance of point from surface of reinforcing bar	a_{cr}	=	72.621	mm
Crack width	w_{cr}	=	**0.038**	< 0.2 mm

Crack width is within limit, Hence Safe

Check for long term deflection

Short term modulus of elasticity	E_c	=	22361	N/mm^2
Flexural strength	f_{cr}	=	3.130	N/mm^2

Second moment of area of cracked and gross section

Distance of centroid of steel from neutral axis	r	=	99.47	mm
Second moment of area of cracked section	I_r	=	5.584E+07	mm^4
Gross second moment of area	I_{gr}	=	2.813E+08	mm^4

Service load and cracking moment

Moment due to deal load and live load	M_{DL+LL}	=	8.354 kNm
Distance of extreme fibre in tension from centroidal axes of gross section	y_t	=	75.00 mm
Cracking moment	M_r	=	1.174E+07 Nmm
	$0.7*M_r$	=	8.218E+06 Nmm
Lever arm	z	=	119.823 mm
Effective moment of Inertia	I_{eff}	=	1.103E+08 mm^4

$I_r<I_{eff}<I_{gr}$ Hence ok

Maximum short term deflection

	$a_{i\,(perm)}$	=	9.668 mm
	a_i	=	7.324 mm

Long term deflection

Deflection due to shrinkage

constant	k_3	=	0.063
Total shrinkage strain	ε_{cs}	=	0.0003
	k_4	=	0.457 < 1
Shrinkage curvature	ψ_{cs}	=	9.141E-07
Deflection due to shrinkage	a_{cs}	=	1.578 mm

Deflection due to creep

Creep deflection due to permanent loads $a_{cc(perm)} = a_{i,cc(perm)} - a_{i(perm)}$

creep coefficient	θ	=	1.600
Effective modulus of elasticity	E_{ce}	=	8600.261 N/mm^2
	m	=	23.255
	x	=	45.399 mm
	I_r	=	1.184E+08 mm^4
Lever arm	z	=	114.867 mm
Effective moment of Inertia	I_{eff}	=	1.866E+08 mm^4
Moment due to deal load	M_{DL}	=	6.328 kNm
	$a_{i,cc(perm)}$	=	11.257 mm
	$a_{cc(perm)}$	=	3.932 mm
Long term deflection	a_{LD}	=	15.179 mm
Maximum permissible long term deflection		=	20.940 mm

Safe with regard to limit state of deflection

TYPICAL DESIGN OF BEAM

Input :

Breath of the beam,B	300	mm
Depth of the beam,D	600	mm
Clear cover of the beam	25	mm
Grade of concrete	20	N/mm^2
Grade of steel	500	N/mm^2
Span of the beam	7500	mm
Effective depth, d	567	mm
Effective cover, d'	33	mm

End Section :

Support moment of the beam,M_u	155	kN.m
Shear force at End section of the beam,V_u	225	kN
Mu lim	256.55	kN.m
pt lim	0.75	%
Ast1 req at Top	0.00	mm^2
d' / d	0.10	
Ast2 req at Top	0.00	mm^2
Asc req at Top	0.00	mm^2
Total Ast Required at End Support	**700.96**	mm^2

	No. of Rods	Dia of Rod	
Reinforcement provided at End Support	3	20	ST
	3	16	CTLD

Ast Provided at End Support **1546.29** mm^2

Prov > req

Mid Section :

Mid moment of the beam,$M_{u\ Bottom}$	**350**	kN.m
d'/d	0.10	
Total Ast Required at Mid Support	**1686.22**	mm^2

	No. of Rods	Dia of Rod	
Reinforcement provided at Mid Support	3	20	ST
	3	16	CTLD

Ast Provided at Mid Support **1546.29** mm^2

not ok

Check for shear in beams :

Shear force ,Vu	65	kN
ζv	0.38	N/mm^2
ζc	0.6	N/mm^2
ζc max	2.8	N/mm^2
	ζv < ζc max, Ok	
ζc b d	102.06	kN
Assuming dia of Stirrup	8	mm
No. of Stirrrup Legs	2	nos.
Stirrrup spacing	150	mm

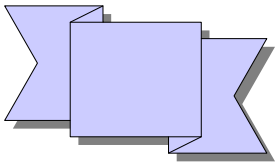
Check for Deflecion:

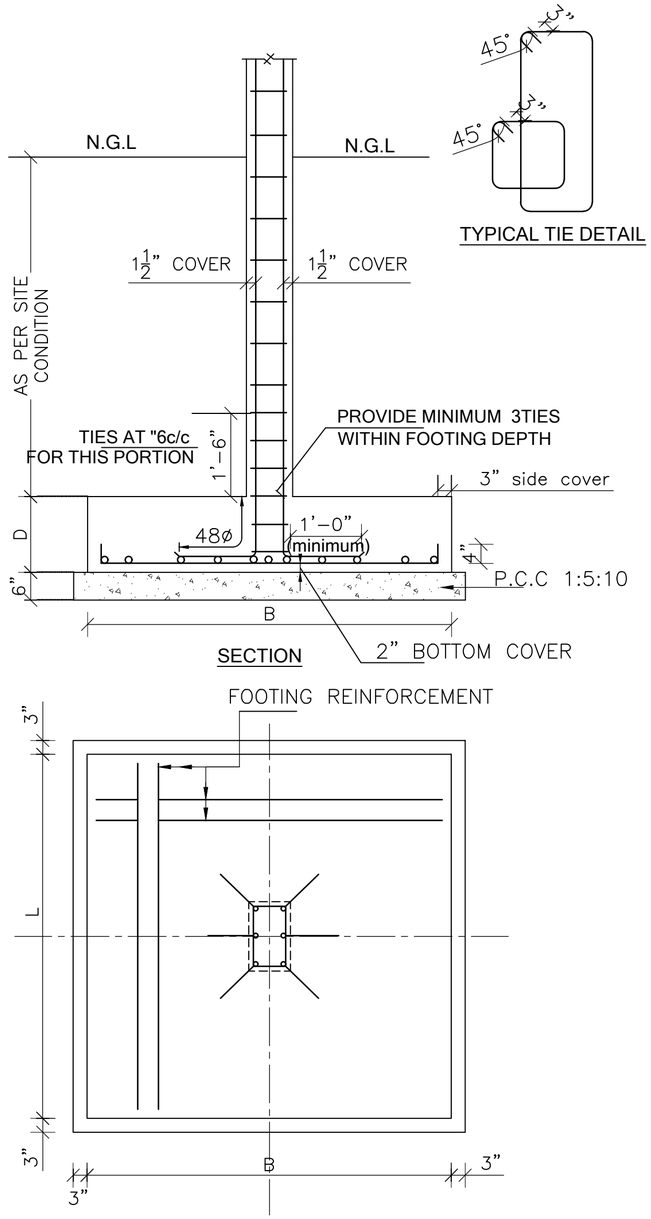
Type of Beam	Cont.Beam	
Span of the beam	7500	mm
Actual Span / Effective depth Ratio	13.23	
Allowable Span /Effective depth Ratio	26.68	

===<<< Hence SAFE in Deflection >>>===

CLIENT:	M/S ANANYA SHELTERS	DESIGN:	GROUND + 1 Floors	ARCHITECT & PLANNERS **SANKAR & ASSOCIATES** 27 SENGUPTA STREET, RAMNAGAR, COIMBATORE.
STRUCTURE NAME :	GROUP HOUSE RESIDENTIAL BUILDING	TITLE: REPORT ON STRUCTURAL DESIGN.		
PLACE:	COIMBATORE			

ANNEXURE – II





FOOTING BASE PLAN - TYPE - 'A'

TYPICAL FOOTING DETAILS

COLUMN SCHEDULE:-

TYPE	COLUMN (USE M25 GRADE CONCRETE)	
	SECTION OF COLUMN	TIES
C1	9" × 9" — 4#12 ϕ (STUB COLUMN) COLUMN TO BE TERMINATED AT PLINTH BEAM LEVEL	8 ϕ AT 8" C/C
C2	12" × 9" — 6#12 ϕ	8 ϕ AT 8" C/C
C3	15" × 9" — 6#16 ϕ	8 ϕ AT 8" C/C
C4	18" × 1'-0" — 10#16 ϕ	8 ϕ AT 8" C/C(2TIES)

FOOTING SCHEDULE:-

FOOTING (USE M20 GRADE CONCRETE)					
FOOTING TYPE	L	B	D	REINFORCEMENT	TYPE
F1	3'-0"	3'-0"	12"	10 ϕ AT 7"C/C	TYPE-A
F2	4'-0"	4'-0"	15"	10 ϕ AT 7"C/C	TYPE-A
F3	5'-0"	4'-6"	18"	10 ϕ AT 6"C/C	TYPE-A
F4	5'-0"	5'-0"	18"	10 ϕ AT 6"C/C	TYPE-A

NOTES :

1. THE DIMENSIONS ARE NOT TO BE SCALED.
2. ALL DIMENSIONS ARE TO BE VERIFIED PROPERLY AT SITE.
3. ALL DRAWINGS ARE TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DRAWINGS.
4. ϕ - DIA OF TOR STEEL
5. CLEAR COVER TO MAIN REINFORCEMENT (MILD EXPOSURE)
   a) FOR FOOTINGS = 50 mm (ALL AROUND)
   b) FOR COLUMNS = 40 mm
6. LAPPING:
   a) LAP LENGTH SHALL BE = 50 x DIA OF BAR.
   b) DEVELOPMENT LENGTH SHALL BE = 48 x DIA OF BAR.
7. ALL ISOLATED FOOTINGS SHALL BE CONCENTRIC WITH COLUMN UNLESS OTHERWISE SPECIFIED
8. GRADE OF CONCRETE IS M25 FOR COLUMNS M20 FOR FOOTINGS
9. GRADE OF REINFORCING STEEL IS Fe 500
10. SBC OF SOIL = 280 KN / Sqm.
11. MINIMUM DEPTH OF FOUNDATION = 2.5 m BELOW NGL
12. THIS STRUCTURE IS DESIGNED FOR G+1 FLOOR

REV.,	DESCRIPTION	REV BY.,	DATE	APP BY.,

RELEASE STATUS	DATE	SIGNATURE
PRELIMINARY/ TENDER		
FOR CONSTRUCTION		

IMPORTANT NOTES:-

* ONLY APPROVED DRAWINGS (i.e., SEALED AND DULY SIGNED AS GOOD FOR CONSTRUCTION) MUST BE USED FOR EXECUTION OF WORKS AT SITE.
* ANY DISCREPANCY IN THE DRAWING SHALL BE IMMEDIATELY BROUGHT TO THE NOTICE OF STRUCTURAL ENGINEER.
* ANY MODIFICATION IN THE DESIGNER'S STRUCTURAL SYSTEM BEFORE/AFTER COMPLETION OF WORK SHALL BE IMMEDIATELY INTIMATED TO THE CONSULTANT
* CLIENT / BUILDER ENSURES THAT STRICT ADHERENCE TO THE GOOD CONSTRUCTION PRACTICE IS FOLLOWED AT SITE AS PER THE RELEVANT B.I.S. CODES.
* STRUCTURAL ENGINEER'S RESPONSIBILTY IS LIMITED TO DESIGNING & ISSUAL OF STRUCTURAL DRAWINGS ONLY

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ANANYA SHELTERS

AT COIMBATORE

CLIENT:-

REFERENCE:

This Drg. is Prepared Based On The Source Drg.

1. Drg. no. Dt. 7-12-23 OF

NP

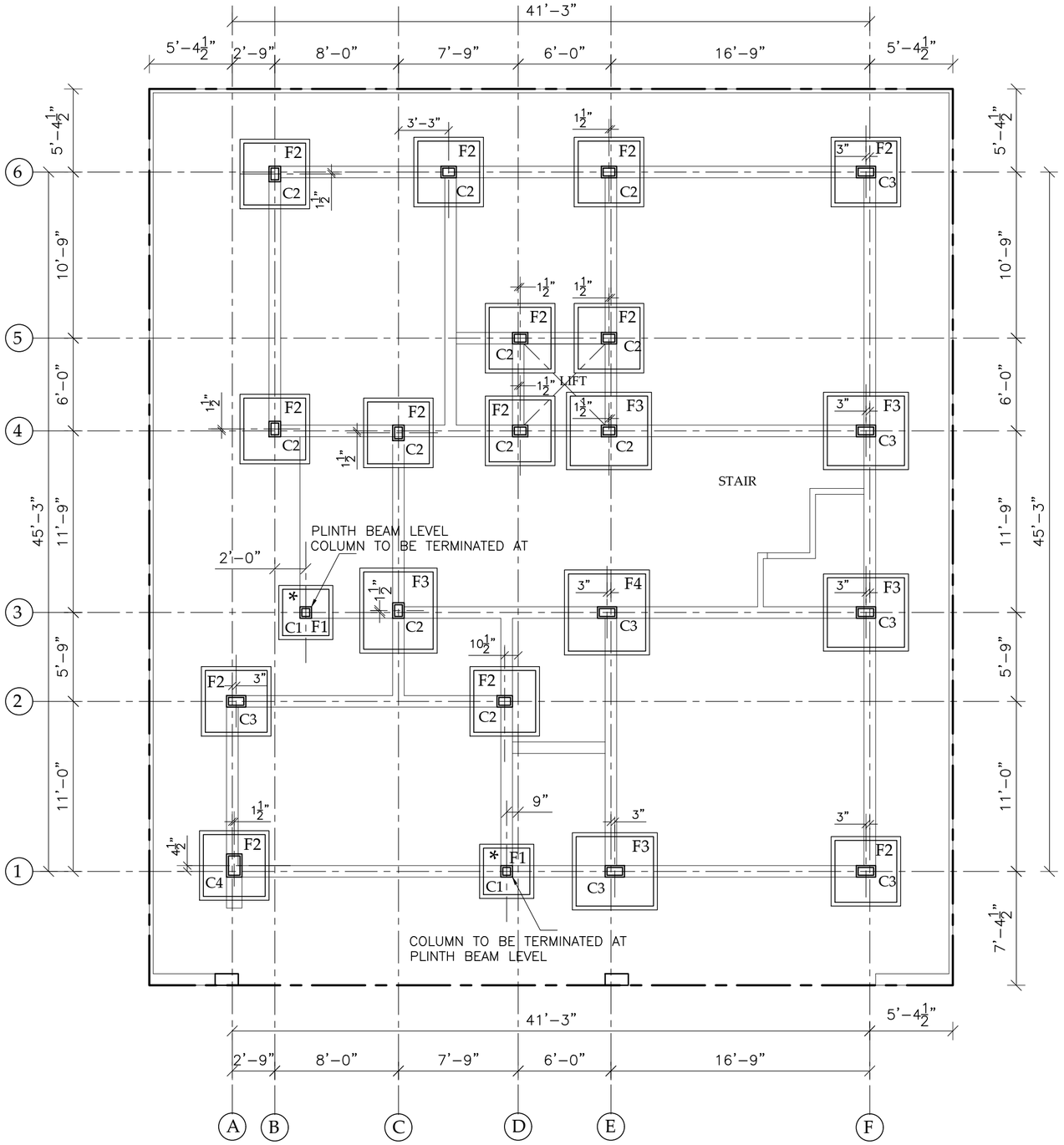
BUILDING: TYPE-A(SITE NO.5,7,8,13-16,21-22,47)

DETAIL: COLUMN & FOOTING RFT,DIMENSIONS DETAIL

SCALE: 1"=8'&2'	JOB NO: 23-ANY-01	REV	DRN BY: J B	
DATE: 12-03-2024	DRG NO: ST-CL-001		CKD BY:	
	SHEET NO: 02 OF 02		APD BY:	

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Website : www.sankarassociates.in

A3 - F



CENTRELINE,COLUMN & FOOTING LAYOUT

NOTES :

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2. ALL DIMENSIONS ARE TO BE VERIFIED PROPERLY AT SITE.
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1. Drg. no. Dt. 7-12-23 OF

N

NP

BUILDING: TYPE-A(SITE NO.5,7,8,13-16,21-22,47)

DETAIL: CENTRELINE,COLUMN & FOOTING DETAIL

SCALE: 1"=8'&2'	JOB NO: 23-ANY-01	REV	DRN BY: J B
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A3 - F



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