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STRUCTURAL STABLITY CERTIFICATE

PLAN SHOWING PROPOSED CONSTRUCTION OF STILT + 5 FLOORS RESIDENTIAL APARTMENT BUILDING WITH 20 DWELLING UNITS FOR VGN LIMERICK PROJECTS PVT LTD IN OLD S. No: 362/1 & 362/2pt, AT No: 81, WARD No : H, BLOCK No:60, EDEN AVENUE, PANCHAYAT ROAD, GOLDEN GEORGE NAGAR, MUGAPPAIR VILLAGE, AMBATUR TALUK, CHENNAI DISTRICT WITHIN GREATER CHENNAI CORPORATION, DIVISION 93, ZONE VII.

RAVI CONSULTANTS

S. Ravindran., M. Tech.,
Structural Consultant & Charted Engineer

Mobile : 9444271195
Email: raviirs@gmail.com

Date: 18.07.2024

STABILITY CERTIFICATE

The Structural design of the Plan Showing Proposed Construction of Stilt + 5 Floors Residential Apartment Building with 20 Dwelling Units for VGN LIMERICK Projects Pvt Ltd in Old S.No: 362/1 & 362/2pt, at No: 81, Ward No : H, Block No:60, Eden Avenue, Panchayat Road, Golden George Nagar, Mugappair Village, Ambatur taluk, Chennai District within Greater Chennai Corporation, Division 93, Zone VII has been designed under the following standards,

1. The least lateral dimensions of the column adopted is 300 in Stilt & 200 mm in all othet floors.
2. The minimum grade of concrete is M25.
3. The foundation is designed for Stilt + 5 floors only.
4. The design/analysis done as per the following code of practice.
    a. Loading standards as per IS-875 by part-2.
    b. The building designed and detailing was done as per IS-456 and IS-13920 respectively.
    c. The structure is also designed for seismic forces in zone III as per IS 1893-2016
5. The super structure is designed to be supported on Isolated footings at a depth od about 2.5 meters below EGL as mentioned in the soil report.

We certify that the structural plan and details of building submitted for approval are **Safe & Sound** and satisfy the structural safety requirement for all situations stipulated under part-6 structural design of the national building code of India and other relevant codes; and the information given there in is factually correct to the best of our knowledge and understanding.

With Regards,

S.Ravindran
Structural Consultant
For Ravi Consultants

Er.S.RAVINDRAN M.Tech(Struct.)
REGISTERED STRUCTURAL ENGINEER (GR-I)
GCC: RSE 102142025
No:10/118, 5th Street, Agastheeswarar Nagar,
Pozhichalur, Chennai - 600 074.

INTROCUCTION

The proposed structure is framed structure for S+5 Floors. The foundation is designed for Stilt + 5 Floors only. The least lateral dimensions of the column is 300 mm in stilt floor and 200 mm in all other floors. The minimum grade of concrete is M25 for RCC and M10 for PCC. The grade of steel considered for design is Fe 500. The structural design has been carried out with Limit state method.

LOADING AND DESIGN DETAILS

IS 875 Part 2 Loading details considered for design:

Dead load of Slab (0.15m thick)	=	3.5 kN/Sq.m
Floor Finish	=	1.000 kN/Sq.m
Live Load on floors	=	2.000 kN/Sq.m
Live load on roof	=	1.500 kN/Sq.m
Live load on inaccessible roof	=	0.750 kN/Sq.m
Weathering coarse load	=	1.500 kN/Sq.m
Unit Weight of Concrete	=	25.000 kN/Cu.m
Unit Weight of block Work	=	20.000 kN/Cu.m

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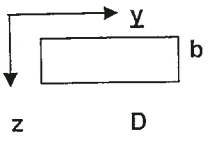
DESIGN OF COLUMN

COLUMN DESIGNATION :- C3

MEMBER NO :-

LOAD COMBINATION

Load Case	P (KN)	Muz (kN.m)	Muy (kN.m)
	1200	21	9



Description	Formula / Variable		Unit	Parameters
Column size :-				
Along z-axis	b		mm	200
Along y-axis	D		mm	750
Unsupported length	l_{ez}		m	3.00
Unsupported length	l_{ey}		m	3.00
Effective Length Factor 1.2	Lez		m	3.60
Effective Length Factor 1.2	Ley		m	3.60
(As per IS 456:2000, cl. E-3,table-28)				
Design Parameters :-				
Concrete mix	f_{ck}		N/mm²	25
Steel Grade	f_y		N/mm²	500
Effective cover for Muz	d^1		mm	52.5
Effective cover for Muy	d^1		mm	52.5
Slenderness ratio (about zz axis)	Lez/D	**short column**		4.80
Slenderness ratio (about yy axis)	Ley/b	**long column**		18.00
No addn. Mom. Reqd. due to slenderness				
Loadings :-				
Factored axial load	Pu		kN	1200.00
Factored moment around the z-axis	Mz(u)		kN.m	21.00
Factored moment around the y-axis	My(u)		kN.m	9.00
Minimum eccentricity z-axis	e=(Lez/500)*1000+D/30(or)20		mm	31.00
Minimum eccentricity y-axis	e=(Ley/500)*1000+b/30(or)20		mm	20.00
Moment around z-axis	Pu x e_z		kN.m	37.20
Moment around y-axis	Pu x e_y		kN.m	24.00
Additional eccentricity due to slenderness	eaz/D (SP16-Cl.3.4)			0.000
	e_{az} = 0.000 x 0.75			0.00
Additional eccentricity due to slenderness	eay/b (SP16-Cl.3.4)			0.162
	eay = 0.162 x 0.200			0.032
Additional moment due to slenderness	My(a) = Pu x e_{ay}		KN.m	38.880
Additional moment due to slenderness	Mz(a) = Pu x e_{az}		KN.m	0.00
DESIGN				
Provided reinforcement	*8 Nos. of 25 mm dia bar* *6 Nos. of 20 mm dia bar*			
Reinforcement percentage provided	p		%	3.87
Calculation of Puz				
Refering to Chart 63	Puz / Ag		N/mm²	22.586
	Puz		KN	3387.925
	p / fck			0.15

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Pozhichalur, Chennai - 600 074.

Calculation of Pb(about yy-axis)	long column		
	Ratio of d' / b		0.26
From table 60			
Pb(about yy-axis)	Pb = (k1 + k2 p/fck)fckbD	KN	706.27
	From table 60-SP16		
	k1 = **0.184** ; k2 = **0.028**		
Calculation of Pb(about zz-axis)	short column		
	Ratio of d' / D		0.07
From table 60			
Pb(about zz-axis)	Pb = (k1 + k2 p/fck)fckbD	KN	0.00
	From table 60-SP16		
	k1 = **0.000** ; k2 = **0.000**		
Modification factor	ky = (Puz - Pu)/(Puz-Pby)		0.816
Modification factor	kz = (Puz - Pu)/(Puz-Pbz)		0.646
Modified Additional moment	My(a)' =My(a) x ky	KN.m	31.722
	Mz(a)' =Mz(a) x kz	KN.m	0.000
Net design moment	Mz = Mez + Mz(a)'	KN.m	37.200
	My = Mey + My(a)'	KN.m	55.722
Uniaxial Mom. capacity about zz-axis	(p / fck) = 0.15		
	Ratio of d' / D		0.07
Use chart no. 49	Pu / fck b D		0.320
	Mu / fck b D^2		0.15
	Muz1	kN.m	421.88
Uniaxial Mom. capacity about yy-axis	Ratio of d' / b		0.26
0	Pu / fck b D		0.320
Use chart no. 44	Mu / fck D b^2		0.12
	Muy1	kN.m	90.00
Allowable moment capacity	Pu / Puz		0.354
	Mz / Muz1		0.088
	My / Muy1		0.619
	α_n		1
Interaction Ratio			0.595
			Safe
Provide 8 mm ties @ 200 c/c			

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Pozhichalur, Chennai - 600 074.

Design for area of steel and shear for singly reinforced beam by limit state design method

GRADE BEAM

Calculation of Ast req for beams

Ref IS 456-2000 Cl G-1.1b & G-1.1c For sections without compression reinforcement

f_y N/mm^2	f_{ck} N/mm^2	b mm	D mm	Cc mm	Cg of bar mm	d mm	$M_{u\ lim}$ kN.m	$p_{t\ lim}$ %
500	25	200	300	32	12.5	255.5	43.41	0.94

$M_{u\ support}$ kNm	Ast req. spt mm^2	p_t req.spt %	$M_{u\ span}$ kNm	Ast span mm^2	p_t req.span %	check for depth		
						d req mm	d prov mm	Result
15	143.04	0.28	20	194.91	0.38	150.19	255.5	okay

Reinforcement details provided at support and span of beam

Reinf. details at support				Result	Reinf. details at span				Result
Nos.	dia mm	Ast support mm^2	pt support %		Nos.	dia mm	Ast span mm^2	pt span %	
3	12	339.29	0.66	okay	3	12	339.29	0.66	okay
0	0				0	0			

Check for shear in beams (limit state design method)

Ref IS 456-2000 Cl 40.1, Cl 40.2.3, Table 19, Table 20 & Cl 40.2.1

f_{ck} N/mm^2	V_u kN	pt prov. %	τ_v Cl 40.1 N/mm^2	τ_c Table 19 N/mm^2	$\tau_{c\ max}$ Table 20 N/mm^2	Result
						Provide min shear reinf, Cl 26.5.1.6
25	20	0.66	0.39	0.55	3.1	tau_v <tau_cmax, Ok

Design for shear reinforcement (vertical stirrups)

Ref IS 456-2000 Cl 40.4a

V_u kN	τ_c b d kN	V_{us} req kN	V_{us}/d req kN/cm	f_y N/mm^2	assuming stirrup dia mm	no. of stirrup legs	stirrup sp assumed mm	V_{us}/d prov. kN/cm Cl 40.4 a	Result Cl 40.4a
20	28.11	-8.11	-0.32	415	8	2	200	1.815	Hence ok

Check for minimum and maximum spacing of stirrup

Min stirrup spacing mm Cl 26.5.1.6	Max stirrup spacing mm Cl 26.5.1.5	stirrup sp prov. mm	Result
546.64	191.625	200	Not ok

Side face reinforcement

Ref IS 456-2000 Cl 26.5.1.3

b mm	D of web mm	side face reinf. req. / face Cl 26.5.1.3	side face reinf. mm^2 /face prov.			spc b/w bars not to exceed Cl 26.5.1.3
			no. per face	dia of bar	Ast prov. mm^2	
200	300	not req	2	10	157.08	200 mm

Check for span to depth ratio

Ref IS 456-2000 Cl 23.2.1

Type of beam	f_y N/mm^2	span mm	d mm	$p_{t\ req.}$ %	$p_{t\ prov.}$ %	p_c %	MFt	MFc
Cont.Beam	500	7000	255.5	0.38	0.66	0	1.538	1

l/d prov	l/d Cl 23.2.1	Result Cl 23.2.1
27.40	39.99	Okay

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GCC: RSE 102142025
No:10/118, 5th Street, Agastheeswarar Nagar,
Pozhichalur, Chennai - 600 074.

Design for area of steel and shear for singly reinforced beam by limit state design method

Calculation of Ast req for beams

Ref IS 456-2000 Cl G-1.1b & G-1.1c For sections without compression reinforcement

f_y N/mm^2	f_{ck} N/mm^2	b mm	D mm	Cc mm	Cg of bar mm	d mm	$M_{u\ lim}$ kN.m	$p_{t\ lim}$ %
500	25	230	450	35	12.5	402.5	123.89	0.94

$M_{u\ support}$ kNm	Ast req. spt mm^2	p_t req.spt %	$M_{u\ span}$ kNm	Ast span mm^2	p_t req.span %	check for depth		
						d req mm	d prov mm	Result
100	667.76	0.72	100	667.76	0.72	361.61	402.5	okay

Reinforcement details provided at support and span of beam

Reinf. details at support				Result	Reinf. details at span				Result
Nos.	dia mm	Ast support mm^2	pt support %		Nos.	dia mm	Ast span mm^2	pt span %	
2	16	804.25	0.87	okay	2	16	804.25	0.87	okay
2	16				2	16			

Check for shear in beams (limit state design method)

Ref IS 456-2000 Cl 40.1, Cl 40.2.3, Table 19, Table 20 & Cl 40.2.1

f_{ck} N/mm^2	V_u kN	pt prov. %	τ_v Cl 40.1 N/mm^2	τ_c Table 19 N/mm^2	$\tau_{c\ max}$ Table 20 N/mm^2	Result
						tau_v > tau_c,design for shear
25	65	0.87	0.70	0.61	3.1	tau_v <tau_cmax, Ok

Design for shear reinforcement (vertical stirrups)

Ref IS 456-2000 Cl 40.4a

V_u kN	τ_c b d kN	V_{us} req kN	V_{us}/d req kN/cm	f_y N/mm^2	assuming stirrup dia mm	no. of stirrup legs	stirrup sp assumed mm	V_{us}/d prov. kN/cm Cl 40.4 a	Result Cl 40.4a
65	56.47	8.53	0.21	415	8	2	200	1.815	Hence ok

Check for minimum and maximum spacing of stirrup

Min stirrup spacing mm Cl 26.5.1.6	Max stirrup spacing mm Cl 26.5.1.5	stirrup sp prov. mm	Result
475.34	300	200	Hence ok

Side face reinforcement

Ref IS 456-2000 Cl 26.5.1.3

b mm	D of web mm	side face reinf. req. / face Cl 26.5.1.3	side face reinf. mm^2 /face prov.			spc b/w bars not to exceed Cl 26.5.1.3
			no. per face	dia of bar	Ast prov. mm^2	
230	450	not req	2	10	157.08	230 mm

Check for span to depth ratio

Ref IS 456-2000 Cl 23.2.1

Type of beam	f_y N/mm^2	span mm	d mm	$p_{t\ req.}$ %	$p_{t\ prov.}$ %	p_c %	MFt	MFc
Cont.Beam	500	6620	402.5	0.72	0.87	0	1.039	1

l/d prov	l/d Cl 23.2.1	Result Cl 23.2.1
16.45	27.01	Okay

Er.S.RAVINDRAN M.Tech(Struct.)
REGISTERED STRUCTURAL ENGINEER (GR-I)
GCC: RSE 102142025
No:10/118, 5th Street, Agastheeswarar Nagar,
Pozhichalur, Chennai - 600 074.

Design for area of steel and shear for two way slab by limit state design method

Slab Geometry

Lx m	Ly m	Ly/Lx	Result
4.22	4.7	1.114	<2, Hence two way slab

Grade of concrete, steel, & overall depth of slab

f_y N/mm^2	f_{ck} N/mm^2	b mm	D mm
500	25	1000	150

Lx-shorter span					
Cc bot mm	Cg of bot bar mm	d bot mm	Cc top mm	Cg of top bar mm	d top mm
25	5	120	25	5	120

Ly-longer span					
Cc bot mm	Cg of bot bar mm	d bot mm	Cc top mm	Cg of top bar mm	d top mm
25	15	110	25	15	110

Load calculation of the slab

Dead Load of the slab DL kN/m^2	Floor finish of the slab FF kN/m^2	Live load of the slab LL kN/m^2	Misc. load of the slab ML kN/m^2	Total unfactored load of the slab TL kN/m^2	Partial safety factor γ_f Table 18 IS 456-2000	Design load of the slab w kN/m^2
3.75	1	2	0	6.75	1.5	10.125

Moment & Shear calculation

Moment calculation for '1m' strip of the slab spanning Lx

w kN/m^2	Lx m	w Lx^2 kNm	- $M_{ux\ cont.\ edge}$ 'kNm'		+ $M_{ux\ mid\text{-}span}$ 'kNm'		V_u 'kN' Table 13 IS 456	
			- α_x	- α_x w L_x^2	+ α_x	+ α_x w L_x^2	Coef-shear	C w Lx
10.125	4.22	180.31	0.085	15.33	0.063	11.36	0.400	17.09

Calculation of Ast req for slab spanning Lx

Ref IS 456-2000 Cl G-1.1b & G-1.1c

- $M_{ux\ cont.}$ kNm	Ast req.cont. mm^2	pt req.cont. %	+ $M_{ux\ span}$ kNm	Ast span mm^2	pt req.span %
15.32635	309.75	0.26	11.36	226.26	0.19

Reinforcement details provided at support and span of slab spanning Lx

Reinf. details at support				Result	Reinf. details at span				Result
dia prov. mm	spacing mm	Ast cont. mm^2	pt cont. %		dia prov. mm	spacing mm	Ast span mm^2	pt span %	
10	150	523.60	0.44	okay	10	150	523.60	0.44	okay
0	250				0	150			

Moment calculation for '1m' strip of the slab spanning Ly

w kN/m^2	Lx m	w Lx^2 kNm	- $M_{uycont.\ edge}$ 'kNm'		+ $M_{uy\ mid\text{-}span}$ 'kNm'	
			- α_y	- α_y w L_x^2	+ α_y	+ α_y w L_x^2
10.125	4.22	180.31	0.047	8.47	0.035	6.31

Calculation of Ast req for slab spanning Ly

Ref IS 456-2000 Cl G-1.1b & G-1.1c

- $M_{uy\ cont.}$ kNm	Ast req.cont. mm^2	pt req.cont. %	+ $M_{uy\ span}$ kNm	Ast min mm^2	pt req.span %
8.47	183.30	0.17	6.31	180.00	0.16

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Reinforcement details provided at support and span of slab spanning Ly

Reinf. details at support				Result	Reinf. details at span				Result
dia prov. mm	spacing mm	Ast cont. mm^2	pt cont. %		dia prov. mm	spacing mm	Ast span mm^2	pt span %	
10	150	523.60	0.48	okay	10	150	523.60	0.48	okay
0	250				0	250			

Check for shear in solid slabs for limit state design method
Ref IS 456-2000 Cl 40.1, Cl 40.2.3, Table 19, Table 20 & Cl 40.2.1.1

f_{ck} N/mm^2	V_u kN	b mm	D of slab mm	clear cover mm	c_g of bar mm	d mm
25	17.091	1000	150	25	5	120

p_t %	τ_v Cl 40.1 N/mm^2	k τ_c Cl 40.2.1.1 N/mm^2	$\tau_{c\,max}$ Table 20 N/mm^2	Result
				tau_v < k tau_c, Ok
0.44	0.14	0.60	3.1	tau_v <1/2 tau_c max,Ok

Check for span to depth ratio
Ref IS 456-2000 Cl 23.2.1

Type of beam	f_y N/mm^2	span mm	d mm	$p_{t\,req.}$ %	$p_{t\,prov.}$ %	p_c %	MFt	MFc
Cont.slab	500	4220	120	0.19	0.44	0	2.479	1

l/d prov	l/d Cl 23.2.1	Result Cl 23.2.1
35.17	64.45	Okay

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1.0 GENERAL NOTES

1.1 ALL STRUCTURAL DRAWINGS SHALL BE READ IN CONJUNCTION WITH ALL ARCHITECTURAL AND OTHER ENGINEERING DRAWINGS, SPECIFICATION, WRITTEN INSTRUCTIONS AS MAY BE ISSUED DURING THE COURSE OF THE CONTRACT. DISCREPANCIES SHALL BE REFERRED TO THE CONSULTANT FOR DECISION BEFORE PROCEEDING WITH THE WORK.

1.2 ALL DIMENSIONS SHALL BE VERIFIED BY THE CONTRACTOR BEFORE CONSTRUCTION AND FABRICATION IS COMMENCED.

2.0 SOIL AND FOUNDATIONS

2.1 ALL FOUNDATIONS SHALL BE PLACED ON UNDISTURBED SOIL ON PILE FOUNDATION AS RECOMMENDED IN SOIL REPORT THE FOUNDATION IS DESIGNED FOR S+3 FLOORS ONLY

2.2 ALL FOUNDATIONS SHOULD REST ON HARD STRATA WITH MIN. BEARING CAPACITY AND DEPTH OF FOUNDATION AS SPECIFIED IN RELAVENT STRUCTURAL DRAWINGS. IF THE HARD STRATA IS AVAILABLE AT MORE DEPTHS, THE REMAINING EXCAVATED SOIL SHALL BE REPLACED WITH PLUM CONCRETE OR PLAIN CONCRETE OF GRADE C–10.

2.3 BACKFILLING SHALL BE DONE UNIFORMLY PLACED IN LAYER NOT EXCEEDING 150mm AND COMPACTED BY VIBRATION TO THE SATISFACTION OF THE ENGINEER. BACKFILLING MATERIAL TO BE APPROVED BY THE ENGINEER.

2.4 ALL WATER MUST BE REMOVED FROM THE FOUNDING PIT AND SOFTENED MATERIAL IF ANY MUST BE REMOVED AND REPLACED WITH LEAN–MIX CONCRETE OR BLINDING OR COMPACTED APPROVED GRANULAR FILL TO ENGINEER'S DIRECTION.

2.6 ANTI–TERMITE TREATMENT:
THE CONTRACTOR SHALL PROVIDE ANTI–TERMITE TREATMENT BELOW FOUNDATION, BELOW GRADE SLAB, AROUND THE BUILDING AND OTHER LOCATIONS AS PER SPECIFICATIONS.

3.0 CONCRETE WORKS

3.1 UOS MINIMUM CLEAR COVER TO REINFT. SHALL BE AS FOLLOWS :

ITEM		COVER
FOR COLUMNS		40 mm
FOR BEAMS		30 mm
FOR SLABS		20 mm
FOR WALLS		20 mm
FOR WATER TANK INNER SURFACES IN CONTACT WITH WATER		50 mm
FOR WATER TANK OUTER SURFACES IN CONTACT WITH EARTH FACE	DRY CONDITION	40 mm
	SUBMERGED CONDITION	40 mm

3.2 FOR SPECIAL CASES WHERE GROUND WATER CONTAINS SULPHATES/CHLORIDES MORE THAN THE ALLOWABLE LIMITS THEN COVER SHOULD BE SUITABLY INCREASED AS PER THE INSTRUCTION OF ENGINEER IN CHARGE.

3.3 WATER STOP SHALL BE 150mm WIDE WITH MIN. 6 THK. RIBBED/SERRATED PVC WITH A CENTRAL BULB UOS.

3.4 FOR P.C.C M10, R.C.C CONCRETE GRADE M20 CONFIRMING TO IS: 456–2000, STEEL GRADE Fe–500 CONFIRMING TO IS: 1786–2008

3.5 CONCRETING FOR WATER RETAINING AND BASEMENT STRUCTURES SHALL BE MADE WATER–TIGHT BY ADDITION OF WATER PROOFING ADMIXTURES IN THE PROPORTION AS RECOMMENDED BY MANUFACTURER.

3.6 FORMWORK SHALL REMAIN IN POSITION FOR NOT LESS THAN THE MINIMUM PERIODS. AS PER IS 14687–1999

3.7 ALL SAMPLING AND TESTING OF SITE MIXED CONCRETE SHALL BE CARRIED OUT BY THE CONTRACTOR UNDER THE ENGINEER'S SUPERVISION IN ACCORDANCE WITH RELEVANT IS CODES.

3.8 THE TEST CUBES SHALL BE SEPARATELY CAST AND CURED IN ACCORDANCE WITH RELEVANT IS CODES METHOD OF TESTING CONCRETE.

3.9 THE MINIMUM RATE OF SAMPLING AND TESTING OF CUBES SHALL BE AS INDICATED IN THE SPECIFICATION.

4.0 REINFORCEMENT

4.1 'T' DENOTES HYSD BARS (Fe 500) CONFIRMING TO IS : 1786–2008.

4.2 LAPS FOR HYSD BARS SHALL BE AS FOLLOWS

DIA. OF BAR	LAP LENGTH (50D)
8	400
10	500
12	600
16	800
20	1000
25	1250
32	1600

FOR PLAIN BARS THE ABOVE VALUES SHOULD BE INCREASED BY 60%.

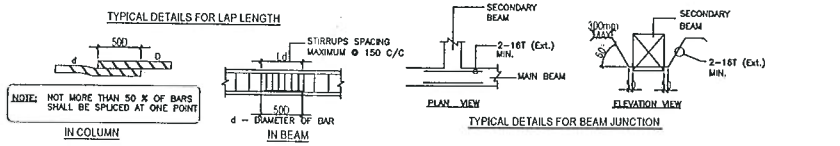
4.3 LAPS SHALL BE STAGGERED SUCH THAT NOT MORE THAN 50% OF STEEL IS LAPPED AT ANY LOCATION.

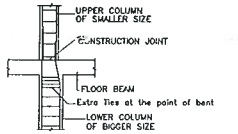
4.4 TOP BARS IN BEAMS & SLABS SHALL BE LAPPED AT MID SPAN AND NOT AT SUPPORT ZONE.

4.5 BOTTOM BARS IN BEAMS & SLABS SHALL BE LAPPED AT END ONE THIRD SPAN.

4.6 ALL HOOKS, BENDS AND LAPS SHALL BE AS PER IS : 2502 UNLESS OTHERWISE INDICATED.

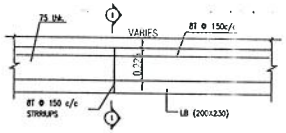
4.7 REINFT. SHALL BE SUITABLY ADJUSTED AT SITE TO CLEAR POCKETS, BOLTS, OPENINGS, CUTOUTS, ETC. AS APPROVED BY THE ENGINEER AT SITE UNLESS SHOWN OTHERWISE IN THE DRAWINGS.



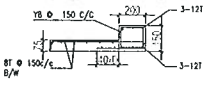


DETAIL OF COLUMN BARS WHEN LOWER COLUMN IS BIGGER AND THE UPPER COLUMN IS SMALL

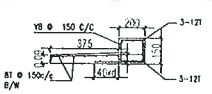
RECOMMENDED WHEN OFFSET IS ≤75mm (OFFSET ON ONE SIDE)



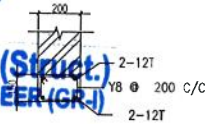
PLAN OF LINTEL AND LOFT



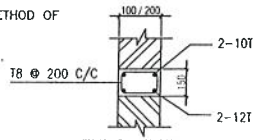
SECTION 1-1
UPTO 600 WIDTH



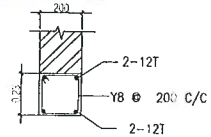
TYPICAL SUNSHADE DETAILS



OPENING UP TO 1.50M LINTEL



THRO. LINTEL



OPENING 1.5M & ABOVE LINTEL

NOTES:

1. ALL DIMENSIONS ARE IN mm

REV.NO	DESCRIPTION	DRAWN	DESIGNED	CHECKED	APPROVED
0	FOR APPROVAL	SJ 17.07.24	SR 17.07.24	SR 17.07.24	

REVISIONS

1. GRADE OF CONCRETE – M20
2. GRADE OF STEEL – FE 500

STRUCTURAL CONSULTANT

RAVI CONSULTANTS
ER. S RAVINDRAN
NO.10/118, V STREET,
AGASTHEESWARAR NAGAR,
POZHICHALUR, CHENNAI – 74
E–MAIL : RAVIRS@GMAIL.COM

PROJECT
PROPOSED RESIDENTIAL APARTMENT AT MUGAPPAIR CHENNAI

JOB No. : 504	NAME	SIGN	DATE
DSGN	S.R		17.07.24
DRWN	S.F		17.07.24
CHKD	S.R		17.07.24
APPD	S.R		17.07.24

TITLE : GENERAL NOTES

SCALE

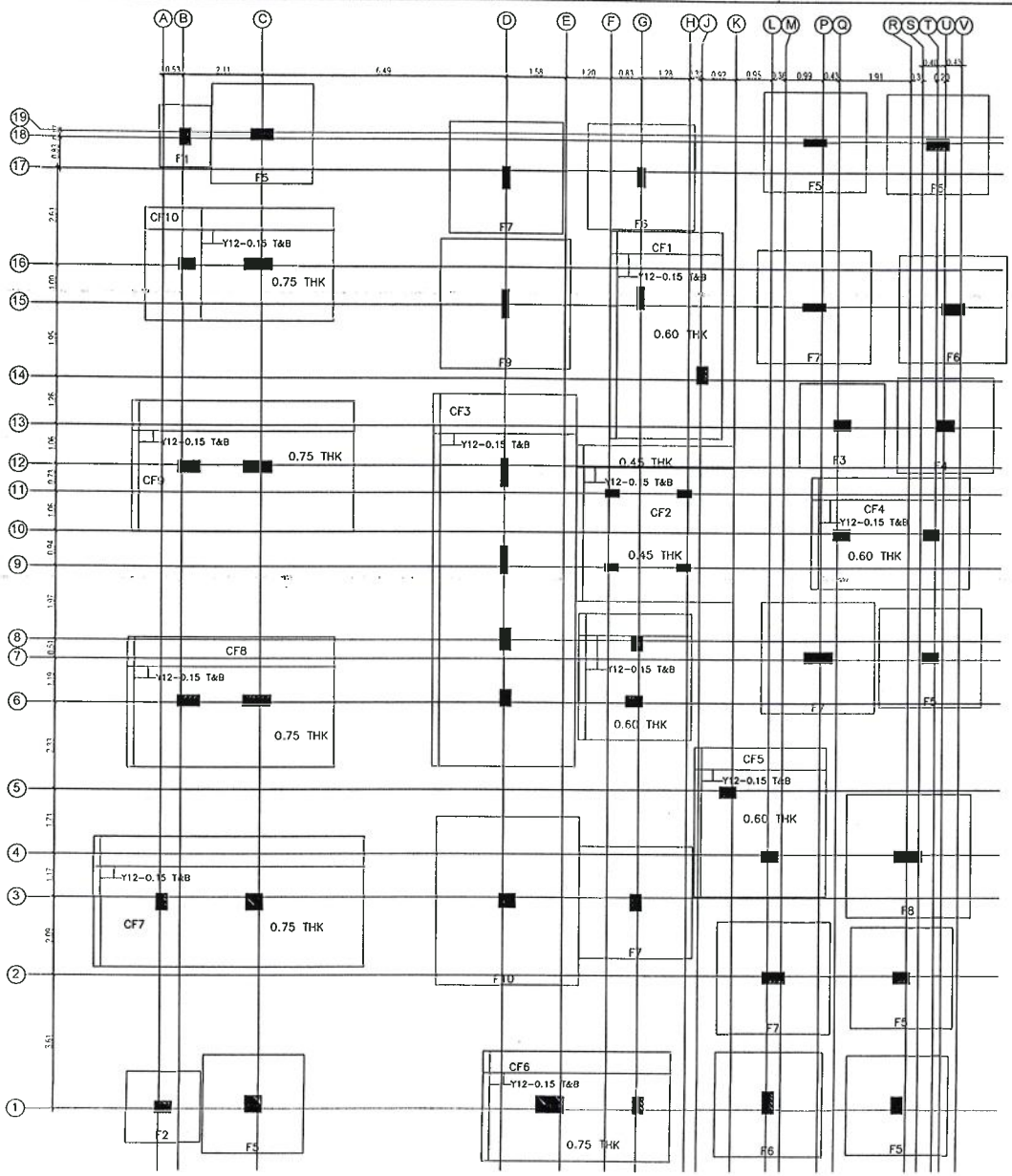
PROJECTION

DRAWING No. 0504-CAMC-01-RC-SH-01
SHEET 1 OF 1

SIZE A3 | REV. 0

RELEASED FOR ☐ PRELIMINARY ☐ TENDER ☐ INFORMATION ☑ APPROVAL ☐ CONSTRUCTION

S.Ravi
Er.S.RAVINDRAN M.Tech(Struct.)
REGISTERED STRUCTURAL ENGINEER-(GR-I)
GCC: RSE 102142025
No:10/118, 5th Street, Agastheeswarar Nagar,
Pozhichalur, Chennai - 600 074.



Er.S.RAVINDRAN M.Tech(Struct.)
REGISTERED STRUCTURAL ENGINEER (GR-I)
GCC: RSE 102142025
No:10/118, 5th Street, Agastheeswarar Nagar,
Pozhichalur, Chennai - 600 074.

NOTES:

1. ALL DIMENSIONS ARE IN METERS
2. FOR GENERAL NOTES REFER 504-VGNM-01-RC-SH-01

REV.NO	DESCRIPTION	DRAWN	DESIGNED	CHECKED	APPROVED
0	FOR APPROVAL	S.F 17.07.24	S.R 17.07.24	S.R 17.07.24	S.R 17.07.24

REVISIONS

1. GRADE OF CONCRETE - M25
2. GRADE OF STEEL - FE 500

STRUCTURAL CONSULTANT

RAVI CONSULTANTS
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NO.10/118, V STREET,
AGASTHEESWARAR NAGAR,
POZHICHALUR, CHENNAI - 74
E-MAIL : RAVIIRS@GMAIL.COM

PROJECT

PROPOSED RESIDENTIAL APARTMRNT AT MUGAPPAIR, CHENNAI

JOB No. : 504	NAME	SIGN	DATE
DSGN	S.R		17.07.24
DRWN	S.F		17.07.24
CHKD	S.R		17.07.24
APPD	S.R		17.07.24

TITLE : FOOTING LAYOUT

SCALE

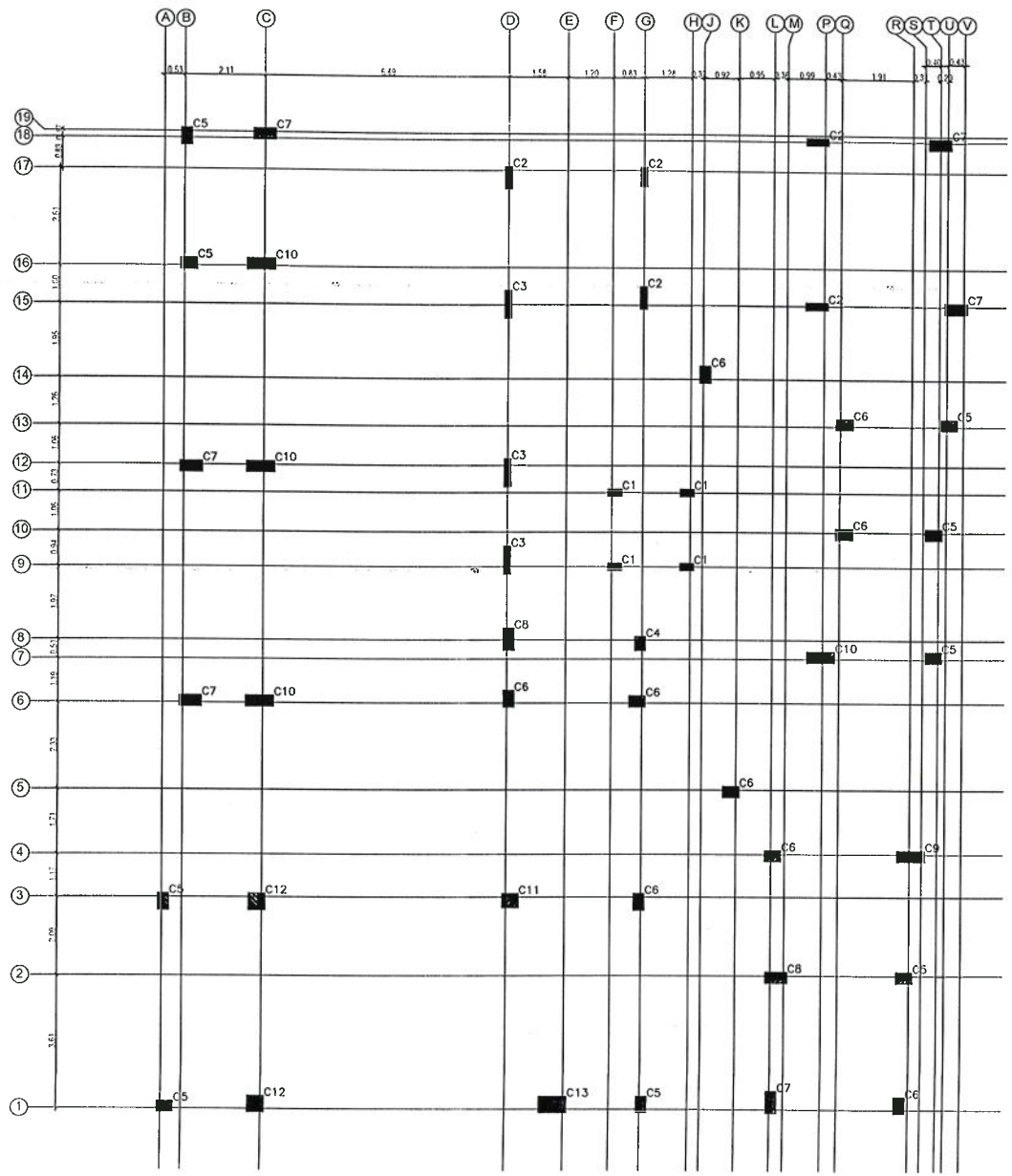
PROJECTION

DRAWING No. 0 5 0 4 - V G N M - 0 2 - R C - S H - 0 1

SHEET 1 OF 1

SIZE A3 | REV. 0

RELEASED FOR ☐ PRELIMINARY ☐ TENDER ☐ INFORMATION ☑ APPROVAL ☐ CONSTRUCTION



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GCC: RSE 102142025
No:10/118, 5th Street, Agastheeswarar Nagar,
Pozhichalur, Chennai - 600 074.

NOTES:
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REV.NO	DESCRIPTION	DRAWN	DESIGNED	CHECKED	APPROVED
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REVISIONS
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2. GRADE OF STEEL – FE 500

STRUCTURAL CONSULTANT

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E-MAIL : RAVIRS@GMAIL.COM

PROJECT
PROPOSED RESIDENTIAL APARTMRNT AT MUGAPPAIR, CHENNAI

JOB No. : 504

	NAME	SIGN	DATE
DSGN	S.R		17.07.24
DRWN	S.F		17.07.24
CHKD	S.R		17.07.24
APPD	S.R		17.07.24

TITLE : COLUMN LAYOUT

SCALE

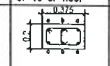
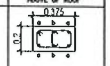
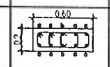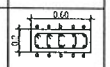
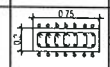
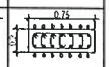
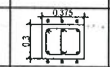
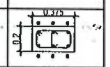
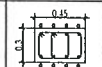
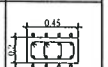
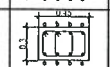
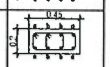
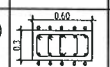
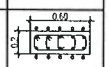
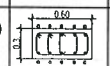
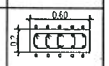
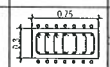
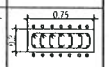
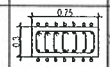
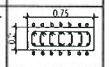
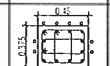
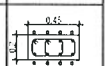
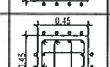
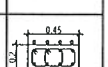
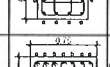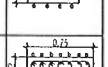
PROJECTION

DRAWING No. 0504-VGNM-03-RC-SH-01
SHEET 1 OF 1

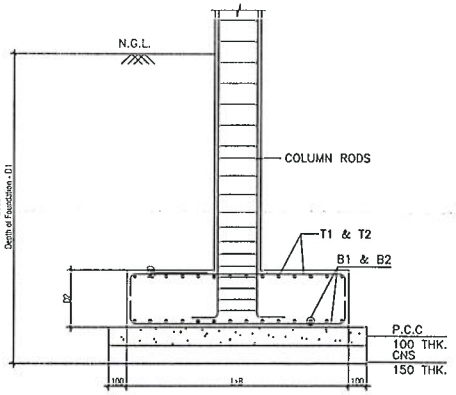
SIZE A3 | REV. 0

RELEASED FOR ☐ PRELIMINARY ☐ TENDER ☐ INFORMATION ☑ APPROVAL ☐ CONSTRUCTION

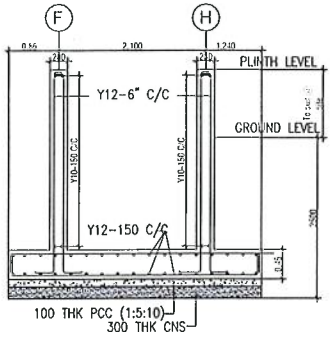
SCHEDULE OF COLUMN REINFORCEMENT DETAILS:

SL. NO	COLUMN MARKING	SIZE UPTO GF ROOF	SIZE ABOVE GF ROOF	COLUMN VERTICALS UPTO GF ROOF	COLUMN VERTICALS ABOVE GF ROOF	CROSS SECTION UP TO GF ROOF	CROSS SECTION ABOVE GF ROOF
1	C1	0.2x0.375	0.2x0.375	4-16Y (a) 2-12Y (b)	4-16Y (a) 2-12Y (b)		
2	C2	0.2x0.6	0.2x0.6	8-25Y (a) 2-20Y (b)	8-25Y (a) 2-20Y (b)		
3	C3	0.2x0.75	0.2x0.75	8-25Y (a) 6-20Y (b)	8-25Y (a) 6-20Y (b)		
4	C4	0.3x0.375	0.2x0.375	6-16Y (a)	6-16Y (a)		
5	C5	0.3x0.45	0.2x0.45	8-16Y (a)	8-16Y (a)		
6	C6	0.3x0.45	0.2x0.45	4-20Y (a) 4-16Y (b)	4-20Y (a) 4-16Y (b)		
7	C7	0.3x0.6	0.2x0.6	10-20Y (a)	10-20Y (a)		
8	C8	0.3x0.6	0.2x0.6	10-25Y (a)	10-25Y (a)		
9	C9	0.3x0.75	0.2x0.75	14-20Y (a)	14-20Y (a)		
10	C10	0.3x0.75	0.2x0.75	8-25Y (a) 6-20Y (a)	8-25Y (a) 6-20Y (a)		
11	C11	0.375x0.45	0.2x0.45	12-20Y (a)	8-20Y (a)		
12	C12	0.45x0.45	0.2x0.45	12-25Y (a)	8-25Y (a)		
13	C13	0.45x0.75	0.2x0.75	14-25Y (a) 4-20Y (b)	10-25Y (a) 4-20Y (b)		

FOOTING SIZE			REINFORCEMENT	
MARK	LxB	D2	B1	B2
F1	1.650 x 1.350	0.400	12T @ 0.15 C/C	12T @ 0.15 C/C
F2	1.950 x 1.950	0.500	12T @ 0.15 C/C	12T @ 0.15 C/C
F3	2.250 x 2.250	0.600	12T @ 0.15 C/C	12T @ 0.15 C/C
F4	2.550 x 2.550	0.600	12T @ 0.15 C/C	12T @ 125 C/C
F5	2.700 x 2.700	0.800	16T @ 0.15 C/C	16T @ 0.15 C/C
F6	2.850 x 2.850	0.800	16T @ 0.15 C/C	16T @ 0.15 C/C
F7	3.000 x 3.300	0.1900	16T @ 0.15 C/C	16T @ 0.15 C/C
F8	3.300 x 3.300	1.000	16T @ 0.15 C/C	16T @ 0.15 C/C
F9	3.450 x 3.450	1.000	16T @ 0.15 C/C	16T @ 0.15 C/C
F10	4.500 x 3.800	1.000	16T @ 0.15 C/C	16T @ 0.15 C/C



TYP. SECTION OF ISOLATED FOOTING



SECTION AA – CF2

NOTES:

1. ALL DIMENSIONS ARE IN METERS
2. FOR GENERAL NOTES REFER 504-VGNM-01-RC-SH-01

REV.NO	DESCRIPTION	DRAWN	DESIGNED	CHECKED	APPROVED
0	FOR APPROVAL	S.R 17.07.24	S.R 17.07.24	S.R 17.07.24	S.R 17.07.24

REVISIONS

1. GRADE OF CONCRETE – M25
2. GRADE OF STEEL – FE 500

STRUCTURAL CONSULTANT

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PROJECT
PROPOSED RESIDENTIAL APARTMRNT AT MUGAPPAIR, CHENNAI

JOB No. : 504	NAME	SIGN	DATE
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DRWN	S.F		17.07.24
CHKD	S.R		17.07.24
APPD	S.R		17.07.24

TITLE : COLUMN & FOOTING SCHEDULE

SCALE

PROJECTION

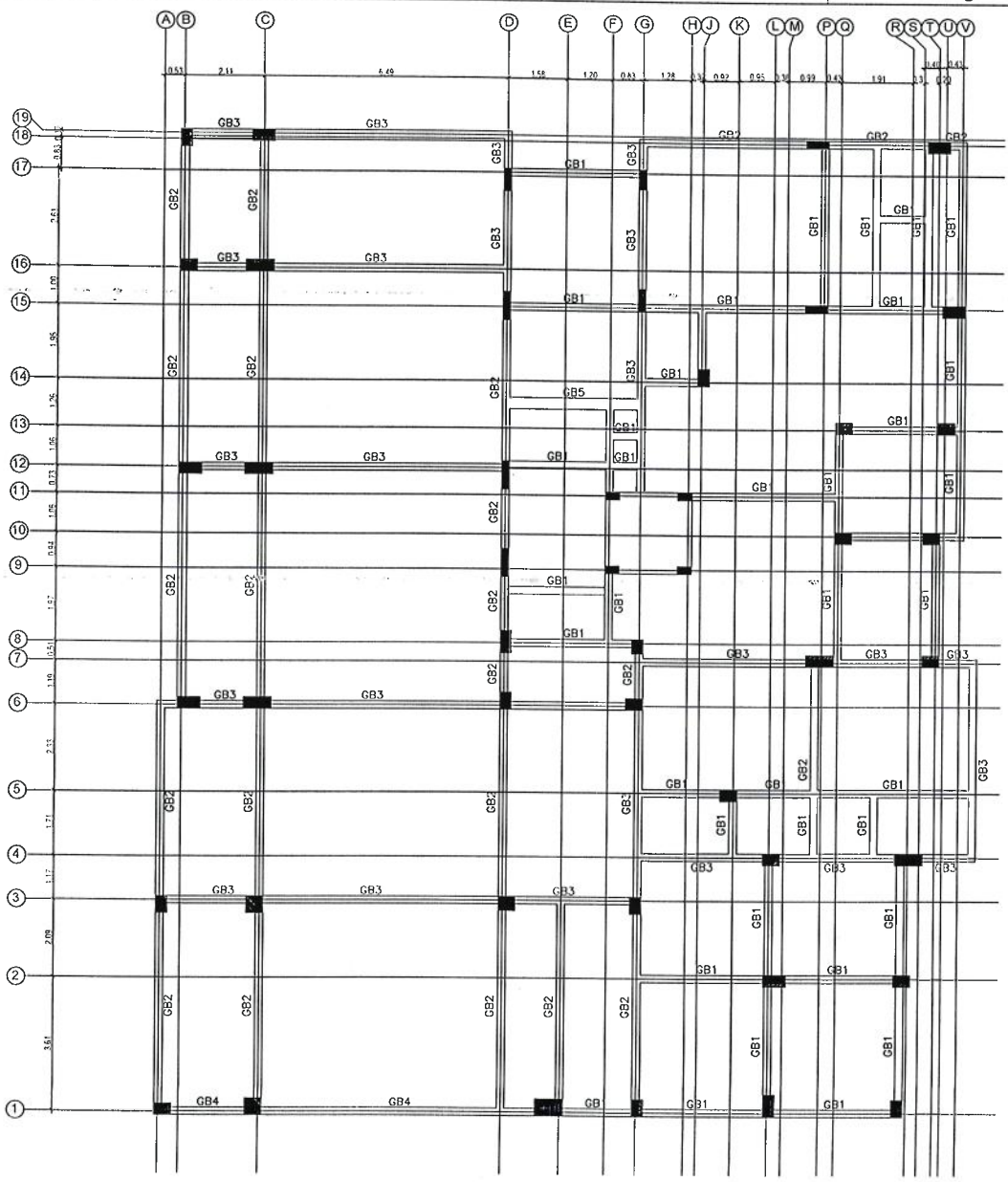
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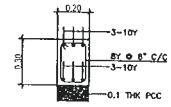
SHEET 1 OF 1

SIZE A3 | REV. 0

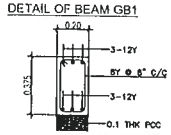
RELEASED FOR ☐ PRELIMINARY ☐ TENDER ☐ INFORMATION ☑ APPROVAL ☐ CONSTRUCTION

Er.S.RAVINDRAN M.Tech(Struct.)
REGISTERED STRUCTURAL ENGINEER (GR-I)
GCC: RSE 102142025
No:10/118, 5th Street, Agastheeswarar Nagar,
Pozhichalur, Chennai - 600 074.

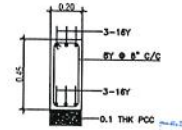




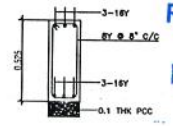
DETAIL OF BEAM GB1



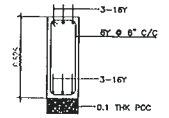
DETAIL OF BEAM GB2



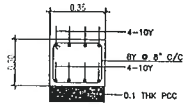
DETAIL OF BEAM GB3



DETAIL OF BEAM GB4



DETAIL OF BEAM GB4



DETAIL OF BEAM GB5

Er.S.RAVINDRAN M.Tech(Struct.)
REGISTERED STRUCTURAL ENGINEER (GR-I)
GCC: RSE 102142025
No:10/118, 5th Street, Agastheeswarar Nagar,
Pozhichalur, Chennai - 600 074.

NOTES:

1. ALL DIMENSIONS ARE IN METERS
2. FOR GENERAL NOTES REFER 504-VGNM-01-RC-SH-01

REV.NO	DESCRIPTION	DRAWN	DESIGNED	CHECKED	APPROVED
0	FOR APPROVAL	SJ 17.07.24	S.R 17.07.24	S.R 17.07.24	S.R 17.07.24

REVISIONS

1. GRADE OF CONCRETE - M25
2. GRADE OF STEEL - FE 500

STRUCTURAL CONSULTANT

RAVI CONSULTANTS
ER. S RAVINDRAN
NO.10/118, V STREET,
AGASTHEESWARAR NAGAR,
POZHICHALUR, CHENNAI - 74
E-MAIL : RAVIRS@GMAIL.COM

PROJECT

PROPOSED RESIDENTIAL APARTMRNT AT MUGAPPAIR, CHENNAI

JOB No. : 504	NAME	SIGN	DATE
DSGN	S.R		17.07.24
DRWN	S.F		17.07.24
CHKD	S.R		17.07.24
APPD	S.R		17.07.24

TITLE : GRADE BEAM LAYOUT

SCALE

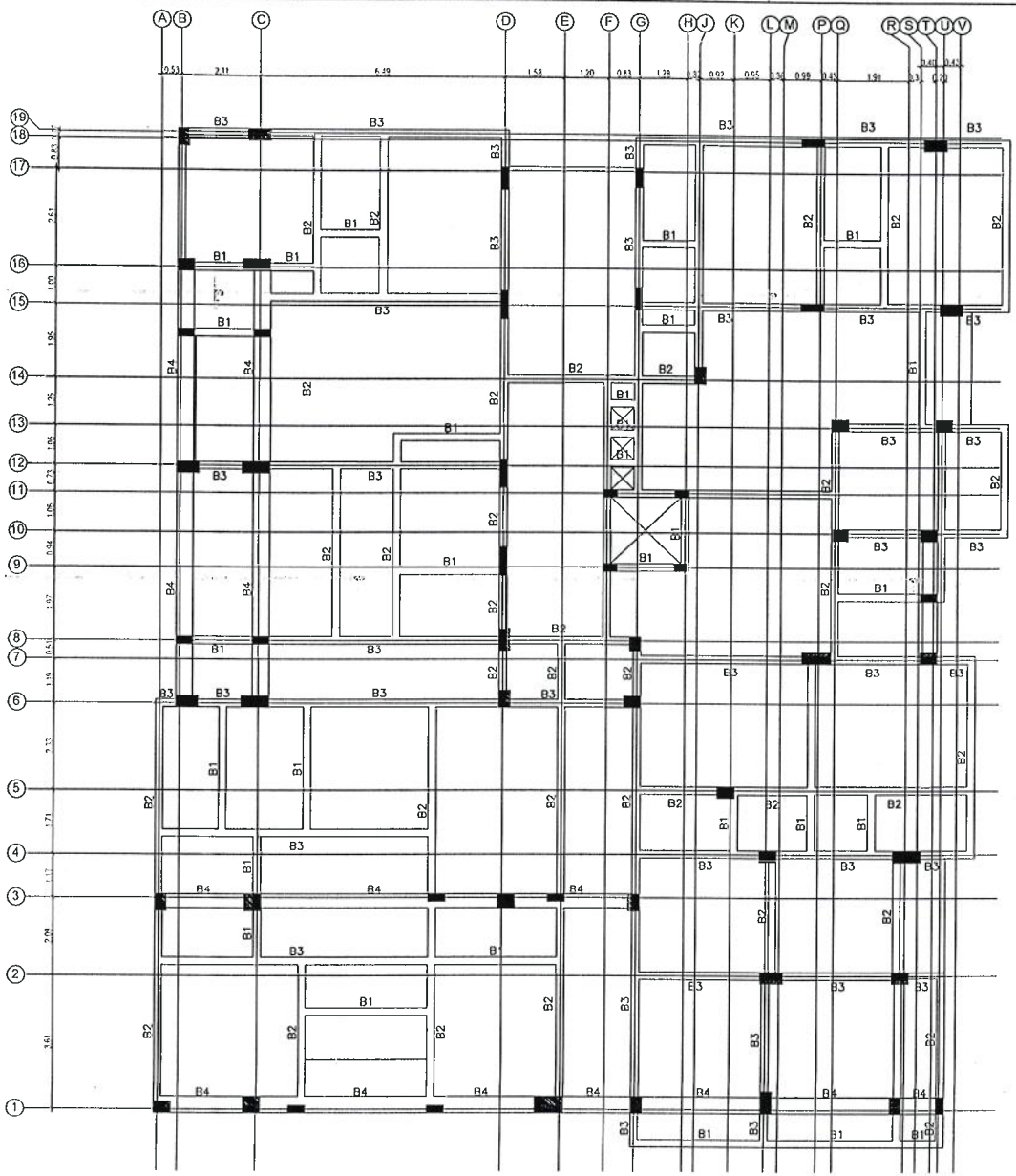
PROJECTION

DRAWING No. 0504-VGNM-05-RC-SH-01

SHEET 1 OF 1

SIZE A3 | REV. 0

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Er.S.RAVINDRAN M.Tech(Struct.)
REGISTERED STRUCTURAL ENGINEER (GR-I)
GCC: RSE 102142025
No:10/118, 5th Street, Agastheeswarar Nagar,
Pozhichalur, Chennai - 600 074.

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REV.NO	DESCRIPTION	DRAWN	DESIGNED	CHECKED	APPROVED
0	FOR APPROVAL	S.R 17.07.24	S.R 17.07.24	S.R 17.07.24	S.R 17.07.24

REVISIONS

1. GRADE OF CONCRETE - M25
2. GRADE OF STEEL - FE 500

STRUCTURAL CONSULTANT

RAVI CONSULTANTS
ER. S RAVINDRAN
NO.10/118, V STREET,
AGASTHEESWARAR NAGAR,
POZHICHALUR, CHENNAI - 74
E-MAIL : RAVIIRS@GMAIL.COM

PROJECT

PROPOSED RESIDENTIAL APARTMRNT AT MUGAPPAIR, CHENNAI

JOB No. : 504

	NAME	SIGN	DATE
DSGN	S.R		17.07.24
DRWN	S.R		17.07.24
CHKD	S.R		17.07.24
APPD	S.R		17.07.24

TITLE : FIRST FLOOR BEAM LAYOUT

SCALE

PROJECTION

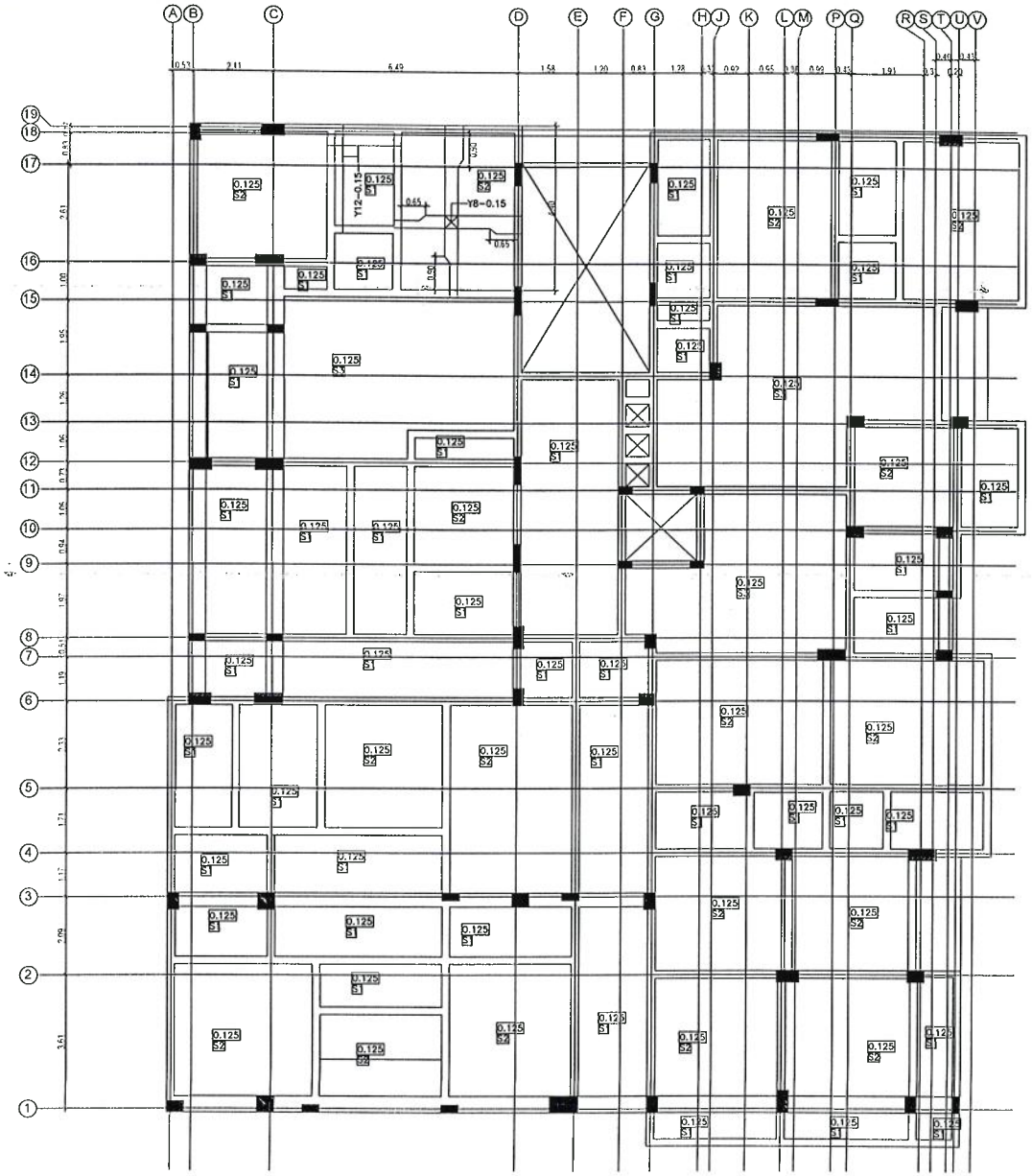
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SHEET 1 OF 1

SIZE A3

REV. 0

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Er.S.RAVINDRAN M.Tech(Struct.)
REGISTERED STRUCTURAL ENGINEER (GR-I)
GCC: RSE 102142625
No:10/118, 5th Street, Agastheeswarar Nagar,
Pozhichalur, Chennai - 600 074.

NOTES:

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2. FOR GENERAL NOTES REFER 504-VGNM-01-RC-SH-01

REV.NO	DESCRIPTION	DRAWN	DESIGNED	CHECKED	APPROVED
0	FOR APPROVAL	S.R 17.07.24	S.R 17.07.24	S.R 17.07.24	S.R 17.07.24

REVISIONS

1. GRADE OF CONCRETE - M25
2. GRADE OF STEEL - FE 500

STRUCTURAL CONSULTANT

RAVI CONSULTANTS
ER. S RAVINDRAN
NO.10/118, V STREET,
AGASTHEESWARAR NAGAR,
POZHICHALUR, CHENNAI - 74
E-MAIL : RAVIRS@GMAIL.COM

PROJECT
PROPOSED RESIDENTIAL APARTMRNT AT MUGAPPAIR, CHENNAI

JOB No. : 504

	NAME	SIGN	DATE
DSGN	S.R		17.07.24
DRWN	S.F		17.07.24
CHKD	S.R		17.07.24
APPD	S.R		17.07.24

TITLE : FIRST FLOOR SLAB LAYOUT

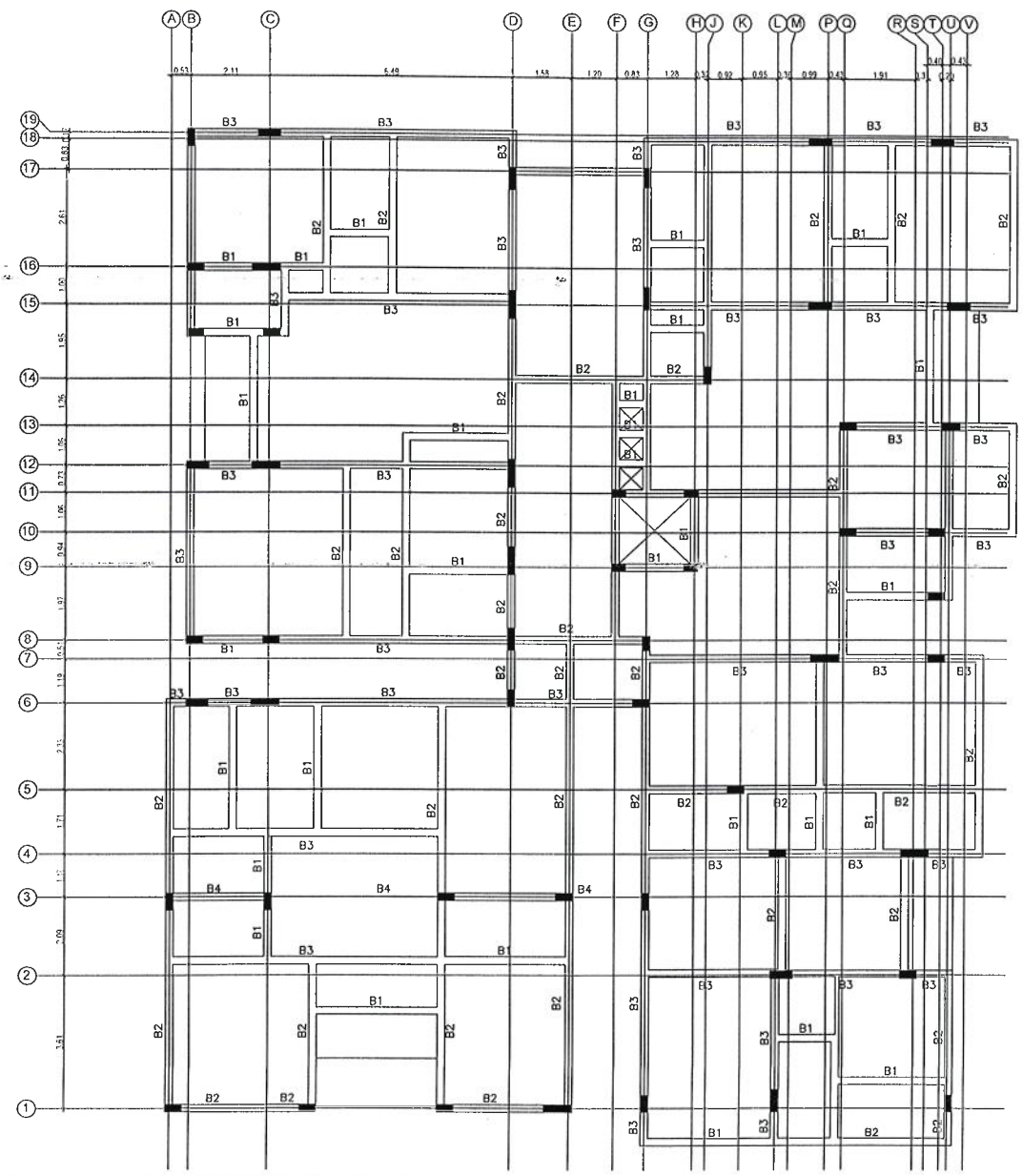
SCALE

PROJECTION

DRAWING No. 0 5 0 4 - V G N M - 0 7 - R C - S H - 0 1
SHEET 1 OF 1

SIZE A3 | REV. 0

RELEASED FOR ☐ PRELIMINARY ☐ TENDER ☐ INFORMATION ☑ APPROVAL ☐ CONSTRUCTION



Er.S.RAVINDRAN M.Tech(Struct.)
REGISTERED STRUCTURAL ENGINEER (GR-I)
GCC: RSE 102142025
No:10/118, 5th Street, Agastheeswarar Nagar,
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0	FOR APPROVAL	S.R 17.07.24	S.R 17.07.24	S.R 17.07.24	S.R 17.07.24

REVISIONS

1. GRADE OF CONCRETE - M25
2. GRADE OF STEEL - FE 500

STRUCTURAL CONSULTANT

RAVI CONSULTANTS
ER. S RAVINDRAN
NO.10/118, V STREET,
AGASTHEESWARAR NAGAR,
POZHICHALUR, CHENNAI - 74
E-MAIL : RAVIIRS@GMAIL.COM

PROJECT
PROPOSED RESIDENTIAL APARTMRNT AT MUGAPPAIR, CHENNAI

JOB No. : 504	NAME	SIGN	DATE
DSGN	S.R		17.07.24
DRWN	S.F		17.07.24
CHKD	S.R		17.07.24
APPD	S.R		17.07.24

TITLE : TYPICAL & TERRACE BEAM LAYOUT

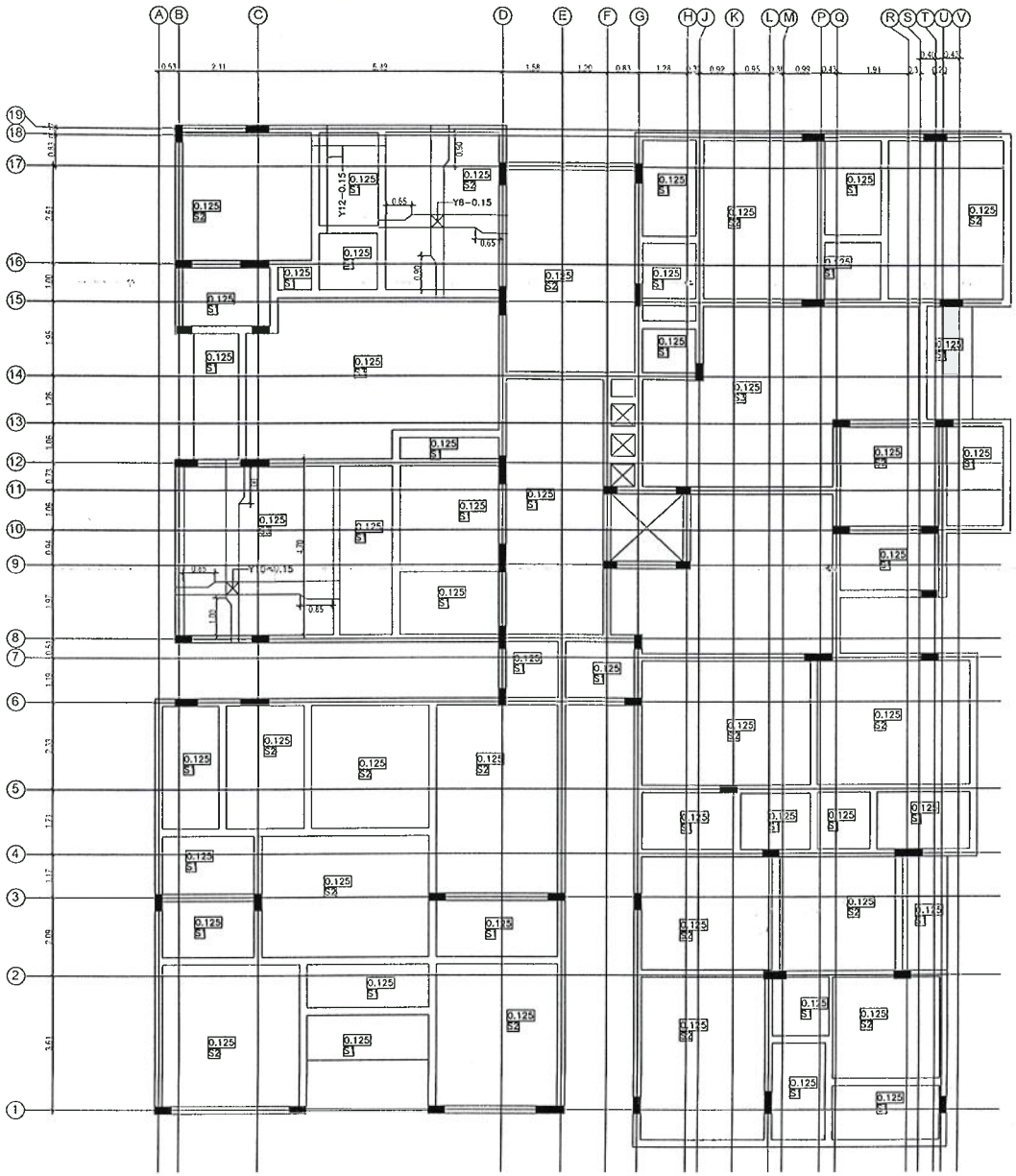
SCALE

PROJECTION

DRAWING No. 0504-VGNM-08-RC-SH-01 SHEET 1 OF 1

SIZE A3 | REV. 0

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Er.S.RAVINDRAN M.Tech(Struct.)
REGISTERED STRUCTURAL ENGINEER (GR-I)
GCC: RSE 102142025
o:10/118, 5th Street, Agastheeswarar Nagar,
Pozhichalur, Chennai - 600 074.

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REV.NO	DESCRIPTION	DRAWN	DESIGNED	CHECKED	APPROVED
0	FOR APPROVAL	S.F 17.07.24	S.R 17.07.24	S.R 17.07.24	S.R 17.07.24

REVISIONS

1. GRADE OF CONCRETE - M25
2. GRADE OF STEEL - FE 500

STRUCTURAL CONSULTANT

RAVI CONSULTANTS
ER. S RAVINDRAN
NO.10/118, V STREET,
AGASTHEESWARAR NAGAR,
POZHICHALUR, CHENNAI - 74
E-MAIL : RAVIIRS@GMAIL.COM

PROJECT

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JOB No. : 504	NAME	SIGN	DATE
DSGN	S.R		17.07.24
DRWN	S.F		17.07.24
CHKD	S.R		17.07.24
APPD	S.R		17.07.24

TITLE : TYPICAL & TERRACE SLAB LAYOUT

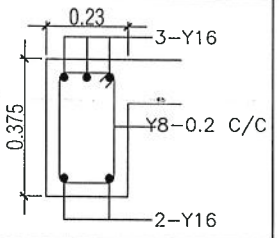
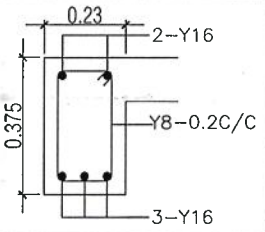
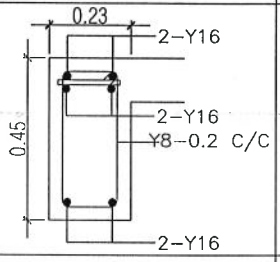
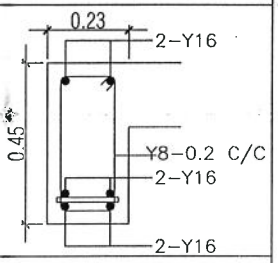
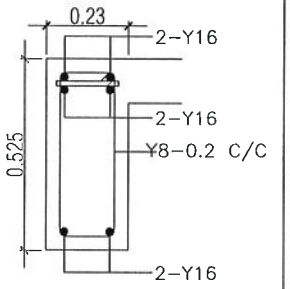
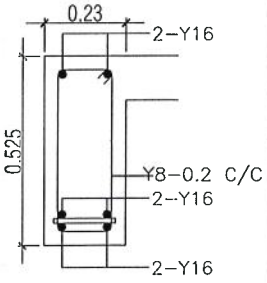
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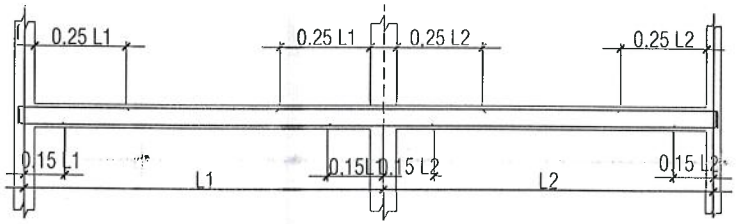
PROJECTION

DRAWING No. 504-VGNM-09-RC-SH-01 SHEET 1 OF 1

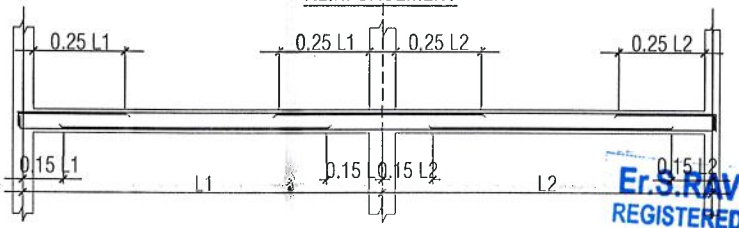
SIZE A3 | REV. 0

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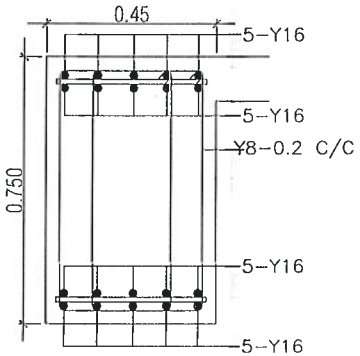
SEC 1-1	SEC 2-2
	
CS OF BEAM B1	CS OF BEAM B1
	
CS OF BEAM B2	CS OF BEAM B2
	
CS OF BEAM B3	CS OF BEAM B3



LS FOR SINGLE LAYER REINFORCEMENT



LS FOR DOUBLE LAYER REINFORCEMENT



CS OF BEAM B4

Er.S.RAVINDRAN M.Tech(Struct.)
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Pozhichalur, Chennai - 600 074.

NOTES:

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REV.NO	DESCRIPTION	DRAWN	DESIGNED	CHECKED	APPROVED
0	FOR APPROVAL	S.F 17.07.24	S.R 17.07.24	S.R 17.07.24	S.R 17.07.24

REVISIONS

1. GRADE OF CONCRETE - M25
2. GRADE OF STEEL - FE 500

STRUCTURAL CONSULTANT

RAVI CONSULTANTS
ER. S RAVINDRAN
NO.10/118, V STREET,
AGASTHEESWARAR NAGAR,
POZHICHALUR, CHENNAI - 74
E-MAIL : RAVIIRS@GMAIL.COM

PROJECT
PROPOSED RESIDENTIAL APARTMRNT AT MUGAPPAIR, CHENNAI

JOB No. : 504

	NAME	SIGN	DATE
DSGN	S.R		17.07.24
DRWN	S.F		17.07.24
CHKD	S.R		17.07.24
APPD	S.R		17.07.24

TITLE : BEAM DETAILS

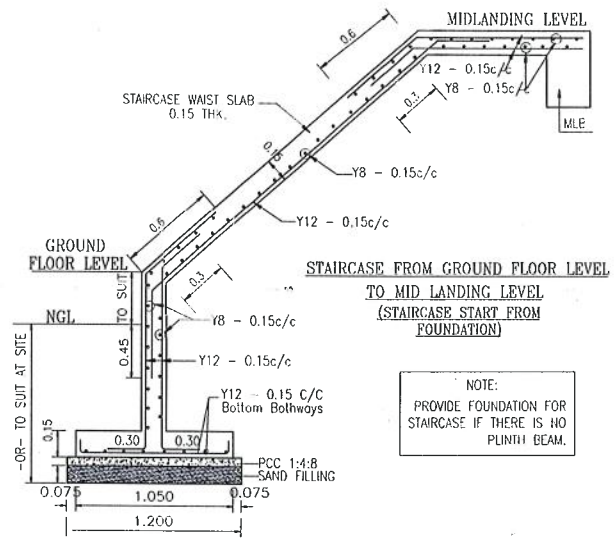
SCALE

PROJECTION

DRAWING No. 0504-VGNM-100-RC-SH-001
SHEET 1 OF 1

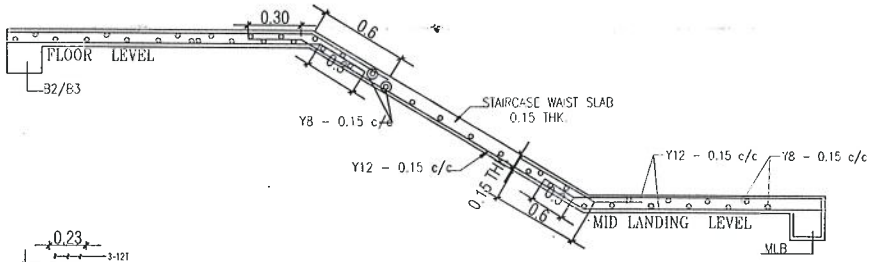
SIZE A3 | REV. 0

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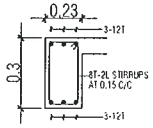


STAIRCASE FROM GROUND FLOOR LEVEL
TO MID LANDING LEVEL
(STAIRCASE START FROM
FOUNDATION)

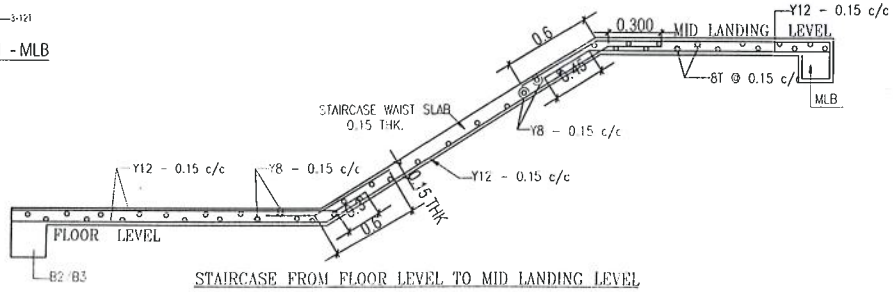
NOTE:
PROVIDE FOUNDATION FOR
STAIRCASE IF THERE IS NO
PLINTH BEAM.



STAIRCASE FROM MID LANDING TO FLOOR LEVEL



C.S.OF BEAM - MLB



STAIRCASE FROM FLOOR LEVEL TO MID LANDING LEVEL

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REV.NO	DESCRIPTION	DRAWN	DESIGNED	CHECKED	APPROVED
0	FOR APPROVAL	SR 17.07.24	SR 17.07.24	SR 17.07.24	SR 17.07.24

REVISIONS
1. GRADE OF CONCRETE - M25
2. GRADE OF STEEL - FE 500

STRUCTURAL CONSULTANT

RAVI CONSULTANTS
ER. S RAVINDRAN
NO.10/118, V STREET,
AGASTHEESWARAR NAGAR,
POZHICHALUR, CHENNAI - 74
E-MAIL : RAVIRS@GMAIL.COM

PROJECT
PROPOSED RESIDENTIAL APARTMRNT AT MUGAPPAIR, CHENNAI

JOB No. : 504

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DSGN	S.R		17.07.24
DRWN	S.F		17.07.24
CHKD	S.R		17.07.24
APPD	S.R		17.07.24

TITLE : STAIRCASE DETAILS

SCALE

PROJECTION

DRAWING No. 0504-VGNM-10-RC-SH-01
SHEET 1 OF 1

SIZE A3 | REV. 0

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GREATER CHENNAI CORPORATION
TOWN PLANNING DEPARTMENT

PROFESSIONAL REGISTRATION CERTIFICATE

This is to certify that **Mr. S. Ravindran** has been enrolled as **Registered Engineer Grade- I (RSE)** in Greater Chennai Corporation (GCC) who has the qualification of **M.Tech.,(Structural Engg.,)** with minimum of **5 years** experience in the relevant field.

The Registration No. is **RSE102142025** dated **07.01.2025** It is informed herewith to comply with the scope of work, duties and responsibilities as prescribed by the Government of Tamil Nadu in Part – V, "Registration of Professionals", Tamil Nadu Combined Development and Building Rules, 2019 approved vide G.O.(Ms) No.18 MA&WS (MA1) Dept. dated 04.02.2019, and as amended in G.O.(MS) No.16 MA&WS (MA1) Dept, dated 31.01.2020.

This Registration is valid upto **06.01.2030**



GREATER CHENNAI CORPORATION
Dated:7/01/25
TOWN PLANNING DEPARTMENT

RGN No: RE102142025
Dated :07.01.2025

Superintending Engineer (TP)
Greater Chennai Corporation.

/Self Attested/

Er.S.RAVINDRAN M.Tech(Struct.)
REGISTERED STRUCTURAL ENGINEER (GR-I)
GCC: RSE 102142025
No:10/118, 5th Street, Agastheeswarar Nagar,
Pozhichalur, Chennai - 600 074.

Our services go beyond

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.

Smarter Tools, Stronger Decisions

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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real estate journey

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Chennai, India

hello@verified.realestate
+91 9996 12 9996
www.verified.realestate