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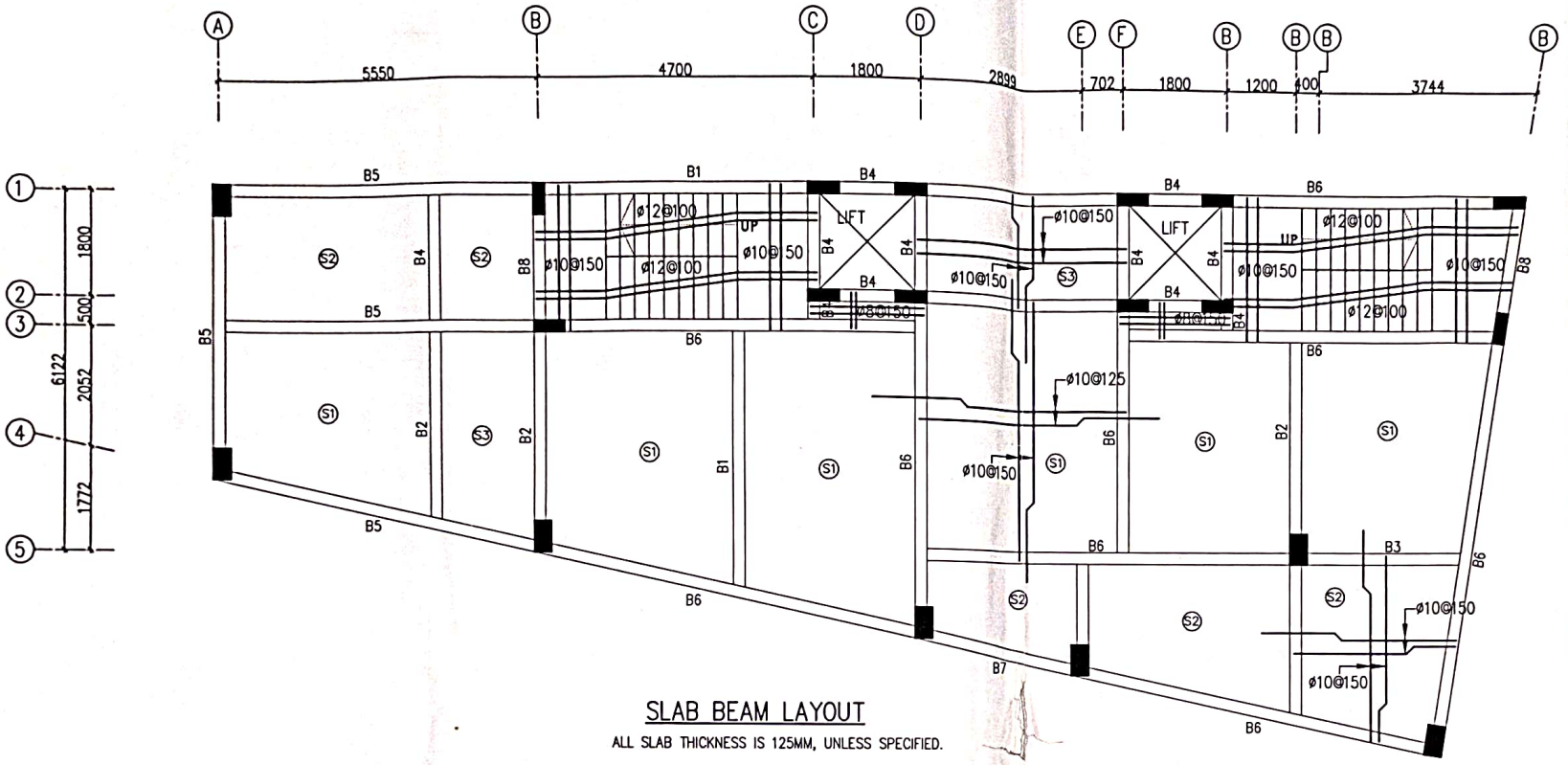
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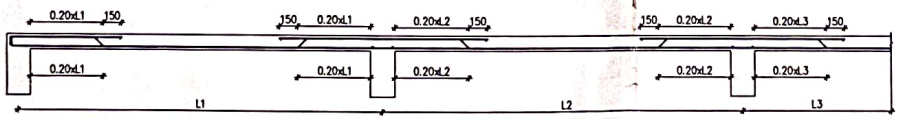
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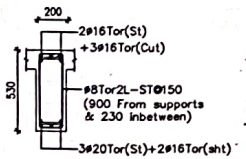


SLAB BEAM LAYOUT

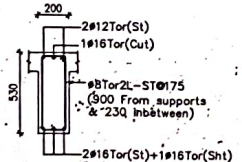
ALL SLAB THICKNESS IS 125MM, UNLESS SPECIFIED.



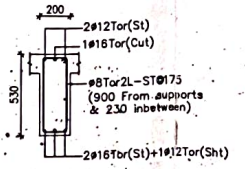
TYPICAL SLAB ROD BENDING DETAILS.



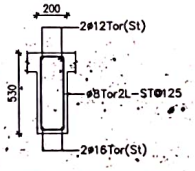
C.S OF BEAM-B1



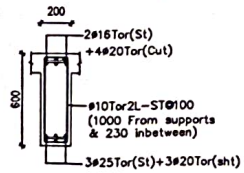
C.S OF BEAM-B2



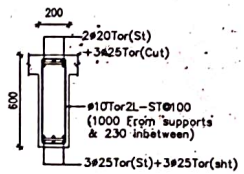
C.S OF BEAM-B3



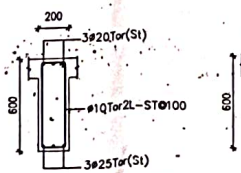
C.S OF BEAM-B4



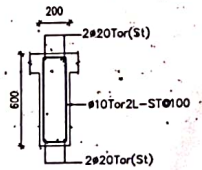
C.S OF BEAM-B5



C.S OF BEAM-B6



C.S OF BEAM-B7



C.S OF BEAM-B8

NOTES :

1. ALL DIMENSIONS ARE IN MILLIMETRES.
2. THIS DRG SHALL BE READ IN CONJUNCTION WITH RELEVANT ARCHITECTURAL DRAWINGS
3. ALL DIMENSIONS SHALL BE CHECKED AND VERIFIED BEFORE EXECUTION OF WORKS.
4. CONCRETE MIX : M30.

   (CEMENT CONTENT - 360 KG/M3)
   * CONTRACTOR / CLIENT SHALL SEND US CUBE TEST RESULTS TO SUBSTANTIATE THE CONCRETE MIX GRADE.
   * IF READY MIXED CONCRETE IS BEING USED, CLIENT/CONTRACTOR SHALL CAST CONCRETE CUBES INDEPENDENTLY AT SITE AND SEND CUBE RESULTS THUS OBTAINED TO US.
5. MAXIMUM WATER CEMENT RATIO :
   FOR 1:2:4 - 0.50
   FOR 1:1 1/2:3 - 0.45
6. REINFORCEMENT :
   TOR STEEL FOR ø8MM & ABOVE CONFORMING TO IS 1786 (LATEST REVISION)
7. CLEAR CONCRETE COVER TO MAIN BARS :
   FOR COLUMNS : 40MM ,FOR RC WALL : 25MM
   FOR FOOTINGS&RAFT SLAB : 50MM,
   PLINTH BEAM : 25MM.
8. USE STONE AGGREGATES AND SAND CONFORMING TO IS 383 (LATEST REVISION)
   STONE AGGREGATES SIZE - 20MM AND DOWN GRADE
9. USE GOOD WATER FOR CONCRETE MIXING AND CURING CONFORMING TO IS 456 (LATEST REVISION)
10. USE ORDINARY PORTLAND CEMENT CONFORMING TO IS 8112 (LATEST REVISION) FOR 43 GRADE CEMENT & IS 12269 FOR 53 GRADE CEMENT.
11. S.B.C OF SOIL IS ASSUMED AS -12T/SQ.M
12. FOUNDATION IS DESIGNED FOR STILT+5FLOOR
13. THE CENTERING AND SHUTTERING TO SUPPORT STRUCTURAL CONCRETE MUST BE SUFFICIENTLY STRONG AND RIGIDLY BRACED.HORIZONTAL TIES SHALL BE PROVIDED AT EVERY 1.5M HEIGHT.
14. THE STABILITY OF SUPPORTS AND STRENGTH OF THE CENTERING AND FORMWORK SHOULD BE ENSURED BY THE CONTRACTOR AND SITE ENGINEER BEFORE PLACING CONCRETE.

NO.	AMENDMENTS	BY	DATE
R1	-		

SCALE	1:100	DESIGN BY	-
JOB NO	001	DRAWN BY	-
DRG NO	S02	DATE	-

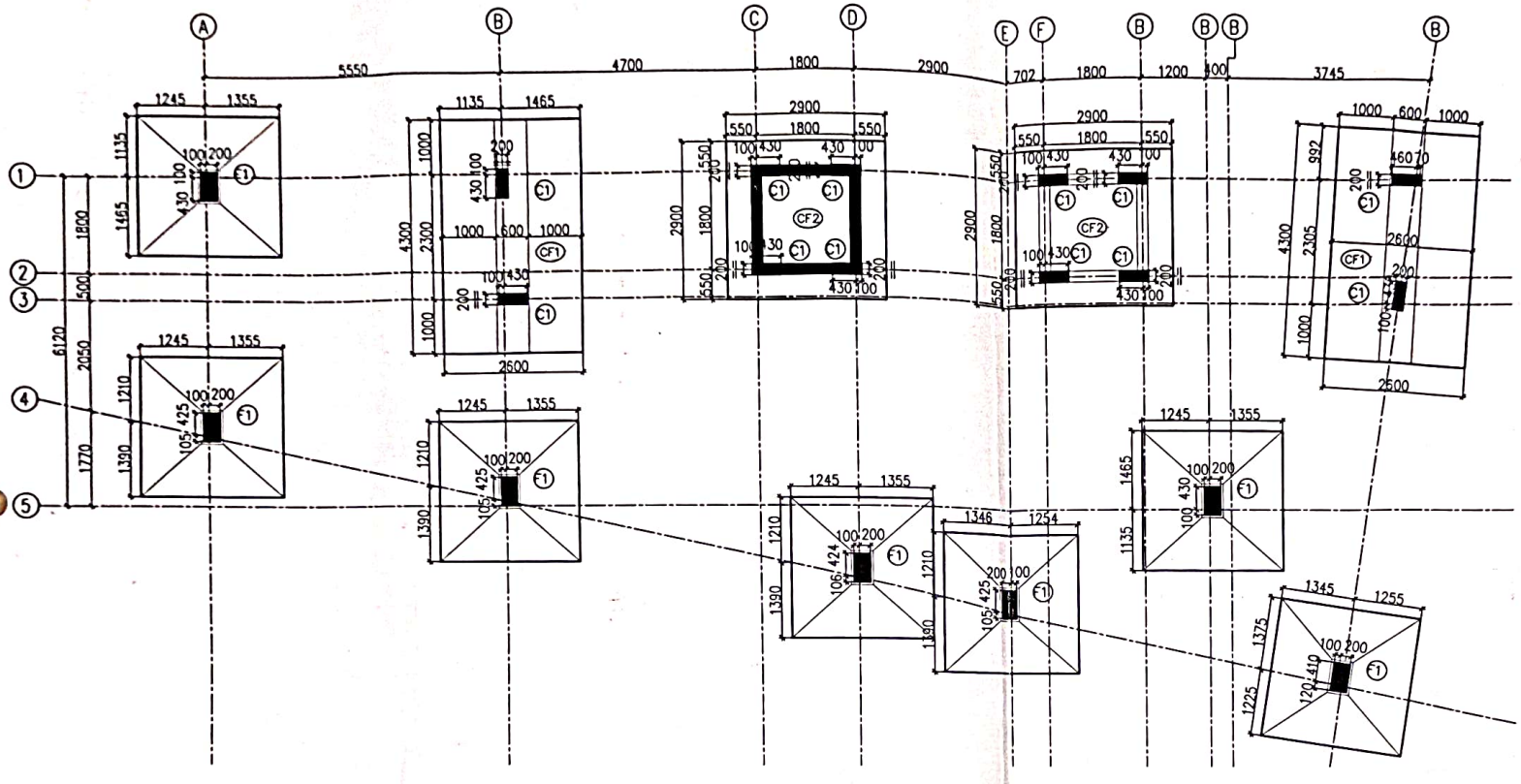
DRAWING TITLE:
SLAB BEAM LAYOUT

PROJECT TITLE :

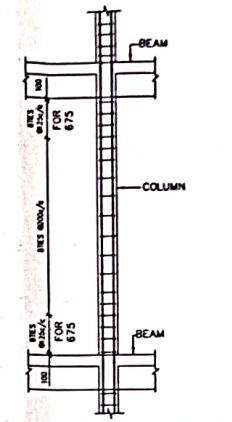
PLAN SHOWING THE PROPOSED CONSTRUCTION OF RESIDENTIAL CUM COMMERCIAL BUILDING STILT FLOOR (PARKING) + 1ST AND 2ND FLOORS (OFFICE) + 3RD TO 5TH FLOORS (RESIDENTIAL), WITH 3 DWELLING UNITS AT OLD DOOR NO: 28, NEW DOOR NO: 44, JUBILEE ROAD AND THAMBIAH REDDY STREET , WEST MAMBALAM, CHENNAI - 600 033. COMPRISED IN O.S.NO: 5-7 PART, T.S.NO: 56, BLOCK NO: 47 OF PULIYUR VILLAGE, WITH IN THE LIMITS OF GREATER CHENNAI CORPORATION.
DIVISION : 134 ZONE : 10

STRUCTURAL CONSULTANT

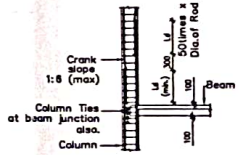
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FOUNADTION LAYOUT



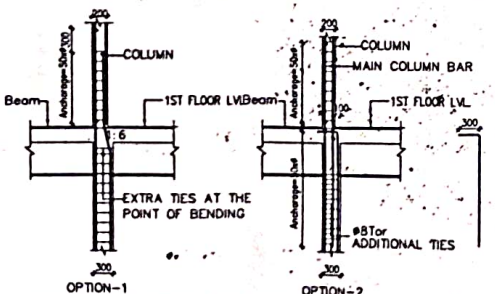
TYPICAL TIES ARRANGEMENT IN COLUMN



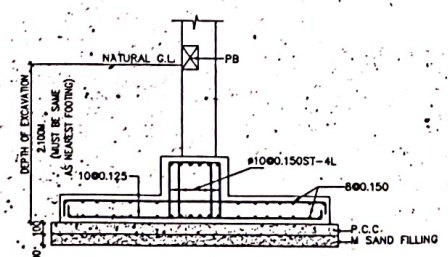
SPLICE WITH UPPER BARS CRANKED INTO POSITION INSIDE LOWER BARS

SCHEDULE OF COLUMNS (MIX:30)

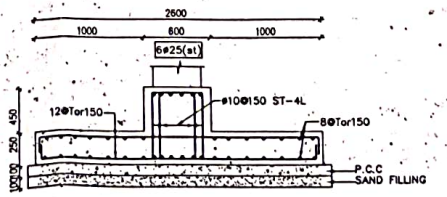
SL.NO.	FOOTING TYPE	DEPTH		FOOTING REINFORCEMENT		COLUMN REINFORCEMENT						
		h1	h2	L	B	GROUND FLOOR	FIRST FLOOR	SECOND FLOOR	THIRD FLOOR	4TH FLOOR	5TH FLOOR	STIRRUPS
F1	2600x2600	230	600	ø16Tor@125	ø16Tor@125	12-ø20	10-ø20	10-ø20	10-ø20	10-ø20	10-ø20	ø8Tor
C1	COMBINED FOOTING					10-ø20	10-ø20	8-ø20+2-ø16	8-ø20+2-ø16	8-ø20+2-ø16	8-ø20+2-ø16	ø8Tor



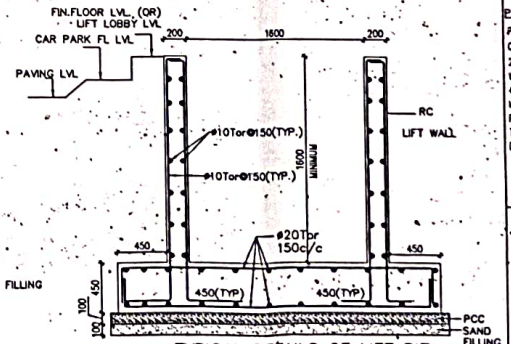
ANCHORAGE DETAIL FOR REDUCTION IN SIZE OF COLUMN AT 1ST FLOOR LEVEL



VERTICAL SECTION THROUGH COMBINED FOOTING



C.S OF COMBINED FOOTING-CF1



TYPICAL DETAILS OF LIFT PIT COMBINED FOOTING (CF2)

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   (CEMENT CONTENT - 380 KG/M3)
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NO.	AMENDMENTS	BY	DATE
R1	-		

SCALE	1:100	DESIGN BY	-
JOB NO	001	DRAWN BY	-
DRG NO	S01	DATE	-

DRAWING TITLE:
FOUNDATION LAYOUT

PROJECT TITLE :
PLAN SHOWING THE PROPOSED CONSTRUCTION OF RESIDENTIAL CUM COMMERCIAL BUILDING STILT FLOOR (PARKING) + 1ST AND 2ND FLOORS (OFFICE) + 3RD TO 5TH FLOORS (RESIDENTIAL) WITH 3 DWELLING UNITS AT OLD DOOR NO: 28, NEW DOOR NO: 44, JUBILEE ROAD AND THAMBIAH REDDY STREET, WEST MAMBALAM, CHENNAI - 600 033. COMPRISED IN O.S.NO: 5-7 PART, T.S.NO: 58, BLOCK NO: 47 OF PULIYUR VILLAGE, WITH IN THE LIMITS OF GREATER CHENNAI CORPORATION, DIVISION : 134 ZONE : 10

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CALCULATION OF SEISMIC CO-EFFICIENT

Name of city	: Chennai
Type of Building	: Residential Building
Building Frame System	: Special RC-Moment resisting frame (SMRF)
Fundamental Natural Period (Ts)	: (0.075)h ^3/4 =0.489sec.
Soil conditions	: medium
Zone Factor (Refer Table:2) (Z)	: 0.16 (moderate)
Importance Factor (Refer Table:6) (I)	: 1
Response Reduction (Refer Table:7)	: 5.0
Average response acceleration Co-efficient (Sa/g)	: 2.35

EARTH QUAKE ANALYSIS:

Horizontal Seismic Co-efficient (Ah)	= (Z/2)(I / R)(Sa/g) = (0.16/2) (1/5.0) (2.35) = 0.038
Design value of Ah	= 0.038
Type of Foundation	: Combined Strip and Isolated Foundation

1. GENERAL LOADING CONDITIONS:

(a) Imposed loads on Roof	- 1.50kN/m^2
(b) Imposed loads on Hall, Kitchen. & Bed, Residential	- 2.00kN/m^2
(d) Dead weight of R.C.C	- 25kN/m^3
(e) Dead weight of Brick Work	- 20kN/m^3

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2. LOADING ON SLABS:

2.1 Loading on Roof slab:

Roof finished with lime concrete terracing	=(0.10)(20)	=2.000kN/m^2
S/W of slab 125mm thick	=(.125)(25)	=3.125kN/m^2
Dead load	=5.125kN/m^2	
Live load	=1.50kN/m^2	
Total load on Roof	= 6.625kN/m^2	

2.2 Loading on Floor slabs:

Floor finish	= 1.00kN/m^2
S/w of slab 125mm thick	= 3.125kN/m^2
Dead load	=4.125kN/m^2
Live load	=2.00kN/m^2
Total load on Roof	= 6.125kN/m^2

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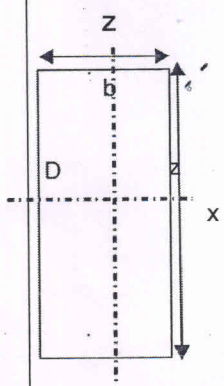
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3 DESIGN:

3.1 COLUMN DESIGN

Grade of Concrete			M 30	
Characteristic Strength of Reinf.		N/mm²	500	
Width of Column	b	mm	300	
Depth of Column	D	mm	530	
Unsupported Length of Column	l_x	mm	3000	
Unsupported Length of Column	l_y	mm	3000	
Clear Cover to Reinf.		mm	40	
Diameter of Bar		mm	20	
Load		T		
Moment	M_{xx}	T.m		
Moment	M_{zz}	T.m		
Factored Load	P_u	kN	1637.000	1
Factored Moment	M_{ux}	kN.m	11.000	1
Factored Moment	M_{uz}	kN.m	56.000	1
Effective Length of Column	l_{ex}	mm	3600	1.2
	l_{ez}	mm	3600	1.2
	l_{ex}/D		6.7924528	0
			<12- Short Column	
	l_{ey}/b		12	0
			<12- Short Column	
Additional Moment due to Slender	M_{ax}	kN.m	0	
Additional Moment due to Slender	M_{az}	kN.m	0	
Percentage of Reinf.	p		2	
Gross Area of Cross Section	A_g	mm²	159000	
Ultimate Axial Load	P_{uz}	kN	3181.113	
d'/D (about x-x axis)			0.095	0.1
d'/D (about y-y axis)			0.167	0.2
(Table 60)	k1		0.207	



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3.2 FOUNDATION DESIGN

3.2.1 ISOLATED FOOTING DESIGN

1 Footing Size Design

Load	Pu	1474 KN
Design Load	P	1081 KN
Moment in x dir	Mux	2 KN-m
Moment in y dir	Muy	4 KN-m
Column size	cx	300 mm
	cy	530 mm
SBC	q	120 KN/sqm
Footing Size required	A req	3.60 sqmm
Footing Size Provided	L	2.50 meters
	B	2.50 meters
Area Provided	A prvd	6.25 meters
	Zx	2.03
	Zx	2.03
Net upward pressure	Nup	273 KNm2

Footing Size OK

2 Slab Design

	lx	0.850
	ly	0.735
Bending Moment in x dir	Mx	148 KN-m
Bending Moment in y dir	My	111 KN-m
Concrete	fck	30 MPa
Steel	fy	500 MPa
Minimum Depth Required	dmin	193
Depth Provided	D	600 mm

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Clear Cover	c	50 mm
Effective Cover	d'	56 mm
Effective Depth	d'	544 mm

Area of Steel	Spacing c/c in mm			
	10#	12#	16#	20#
653 sqmm	120 c/c	173 c/c	308 c/c	481 c/c
653 sqmm	120 c/c	173 c/c	308 c/c	481 c/c

Minimum Ast required across x direcion

Minimum Ast required across y direcion

Ast across x direction	12 mm dia	@ 125 mm c/c	905 sqmm
Ast across y direction	12 mm dia	@ 125 mm c/c	905 sqmm

3 **One Way Shear along x direction**

Vu1	251 KN
ζv	0.231 MPa
ζc	0.265 MPa
Vc1	288 KN

One Way Shear Check OK

4 **One Way Shear along y direction**

Vu1	157 KN
ζv	0.144 MPa
ζc	0.265 MPa
Vc1	288 KN

One Way Shear Check OK

5 **Two Way Shear**

Vu2	1268 KN
ζv	0.608 MPa
ks*ζc	1.369 MPa
Vc1	2857 KN

Two Way Shear Check OK

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3.3 BEAM DESIGN

Beam Data

width	200 mm
depth	530 mm
clear cover to main reinf.	25 mm
Slab Thickness	125 mm

d' 43 mm *.= cc+ sdia + mdia/2*
eff depth 487 mm *.= d - d'*

Material Grades

Concrete	30 MPa
Steel	500 MPa

	Span Moment	Support Moment
Span Moment 155 KN-m	Mu/bd² 2.84	2.35
	xumax 222	222
	Mulim 218	218
Support Moment 128 KN-m / 128 KN-m	Mulim/bd² 3.99	3.99
0 KN-m		

Span Reinforcement

Beam is designed as Singly Reinforced Beam

Area of Steel	Tension (Ast)	Compr (Asc)
Percentage	0.747 %	-------
Area of Steel	836 sqmm	

Refer Table 2 SP 16 pg 48

283 KN-m

Tension Reinforcement

Type	Bar dia	Nos	Area of Steel
Layer 1	20 mm	3	942 sqmm
Layer 2	25 mm	0	0 sqmm
Layer 3	20 mm	0	0 sqmm
	Total Steel Provided		942 sqmm

1602 sqmm

0.841 %

Provided Steel OK

Compression Reinforcement

Type	Bar dia	Nos	Area of Steel
Layer 1	16 mm	2	
Layer 2	25 mm	0	
Layer 3			

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Total Steel Provided		#VALUE!

Support Reinforcement
Beam is designed as Singly Reinforced Beam

Area of Steel	Tension (Ast)	Compr (Asc)	
Percentage	0.600 %	-------	*Refer Table 2 SP 16 pg 48*
Area of Steel	672 sqmm		

1.96332011205504
-0.375320891489092

Tension Reinforcement

Type	Bar dia	Nos	Area of Steel
Layer 1	20 mm	4	1257 sqmm
Layer 2	25 mm	0	0 sqmm
Layer 3	12 mm		0 sqmm
Total Steel Provided			1257 sqmm

0.146914433817085

1.122 %

Provided Steel OK

1392 sqmm
1033 sqmm

Compression Reinforcement

2074 sqmm

Type	Bar dia	Nos	Area of Steel
Layer 1	20 mm	3	
Layer 2	25 mm	0	
Layer 3			
Total Steel Provided			

#VALUE!

Shear Force (Vu)	107 KN		
ζv	0.921	*=Vu / (b * d)*	*or =(0.85*√(0.8*fck)*√(1+5β)-1)) / (6β)*
ζc	0.613	*Refer Table 61 SP 16 pg 179*	
ζcmax	3.5	*Refer Table J SP 16 pg 175*	

Type	Bar Dia	Nos	Area of Steel
Layer 1	25 mm	0	0 sqmm
Layer 2	25 mm	0	0 sqmm
Layer 3	20 mm	0	0 sqmm
			0 sqmm

0.000 %

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Sectional Dimensions OK
Shear Reinforcements required

Steel	**415 MPa**	Vus/d	0.787 kN/cm	1.458
Type of stirrup	**2 legged**			
Stirrup diameter	**8 mm**			
Spacing	300 c/c	Safe		

3.4 TWO WAY SLAB DESIGN

Slab thickness	t	125 mm
Concrete	fck	30 MPa
Steel	fy	500 MPa

Sunken Depth: 0 mm

Loading

Slab Load

Dead Load	DL	3.125 KN/m
Live Load	LL	2.000 KN/m
Finishes Load	WL	1.000 KN/m
Total Load	Ws	6.125 KN/m
Factored Load	Wsu	9 KN/m

Sunken Slab Load

Dead Load	DL	3.125 KN/m
Filler Load	FL	0 KN/m
Live Load	LL	3.0 KN/m
Finishes Load	WL	1.0 KN/m
Total Load	Wsk	7.13 KN/m
Factored Load	Wsku	11 KN/m

Slab Data

Slab Type	Regular
Load	9 KN/m
Longer Span (ly)	4.3 m
Shorter Span (lx)	3.5 m

ly/lx ratio	1.22
Slab type	+

Loading on edges		one way	two way
W_{longer}	**12 KN/m**	.=w*lx/2	.=(w*lx/2) + (1-(1/3)*(lx/ly)²)

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$W_{shorter}$	10 KN/m	.=w*lx/3

Moments		one way	two way
Mx	7 KN-m	.=w*lx²/ 8	.=ax * w*lx²
My	6 KN-m		.=ay * w*lx²

Thickness Check	OK	.=Mulim > Mux or Muy
Deflection	6 mm	.= 5*W*l³/(384EI)

Area of Steel	Astx	Asty
	162 sqmm	133 sqmm

Refer Chart 4 SP 16 pg 21
Refer Table 5-44 SP 16 pg 51-80

or

Spacing required in mm

8#		10#		12#		16#	
x	y	x	y	x	y	x	x
311 c/c	378 c/c	486 c/c	590 c/c	699 c/c	850 c/c	########	1511 c/c

*.=ast of bar*1000/ast req*

Final Ast provided	x	y
	10# @ 150c/c	8# @ 150c/c

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	k2		0.328	
	P_{bx}	kN	1081.264	
	k1		0.184	
	k2		0.028	
	P_{bz}	kN	885.694	
	k_x		0.735	
	k_y		0.673	
Minimum Eccentricity	e_x	mm	23.666667	
	e_y	mm	16	
Moments due to min. eccentricity	M_{ex}	kN.m	38.74 > 11.000	kN.m
Moments due to min. eccentricity	M_{ez}	kN.m	26.19 < 56.000	kN.m
Total Moments for which the column is to be designed are				
	M_{ux}	kN.m	38.742	
	M_{uz}	kN.m	56.000	
The section is to be checked for biaxial bending				
	$P_u/f_{ck}bD$		0.343	
	p/f_{ck}		0.06	
Referring (d'/D is0.1)	$M_u/f_{ck}bD^2$		0.11	
	M_{ux1}	kN.m	278.091	
Referring to (d'/D = 0.2)	$M_u/f_{ck}bD^2$		0.100	
	M_{uy1}	kN.m	143.100	
	M_{ux}/M_{ux1}		0.139	
	M_{uy}/M_{uy1}		0.391	
	P_u/P_{uz}		0.515	
		a	1	1.525 < 1
Mux/Mux1 + Muy/Muy1			0.289	OK
Area of Reinforcement	As	mm^2	2862	
Minimum no of to be provided			6	
No of Bars to be provided	Nos.		10	
Provide 12 Nos of 20 Diameter				

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THE LANDLENS SUITE

Eight ways to know a piece of land before you pay for it.

This report covers one part of the picture. These cover the rest, drawn from the same government records, for any property in Tamil Nadu.

LandLens One
Ask anything about a property and get an answer grounded in live government records, with the sources shown.
/landlens/one

Verify My Land
Every record check run on one property and returned as a single report.
/landlens/verify-my-land

Legal Opinion
An advocate's written opinion on the title, built on the records we pull for it.
/landlens

One Map
Every layer on one map: the parcel, its boundary, zoning, water bodies and what sits around it.
/landlens/one/map

PriceMap
What land actually changed hands for around this plot, taken from the registered deeds.
/landlens/pricemap

Build Scope
What you are allowed to build here: floor space, height, coverage and setbacks.
/landlens/build-scope

Property Tracker
Watch a property and hear about it when something new is registered against it.
/landlens/property-tracker

Deal Room
Run the transaction in one place: documents, stamping, signatures and the parties.
/landlens/deal-room

FREE TOOLS · NO ACCOUNT NEEDED

Twenty-four checks you can run yourself, at no cost.

Records and verification

The registers themselves, read for you.

- Encumbrance Certificate
- Patta and Chitta
- Field Measurement Sketch
- EC Analyzer
- Bank charge check
- Court case search
- Seller background check
- Approval check by survey

Value and duty

What it is worth and what it costs to register.

- Guideline value by street
- Guideline value by survey
- Stamp duty and registration fees
- Capital gains
- Floor space index
- Area unit converter

Zoning and land use

What the plan says can happen on this land.

- Land use zone finder
- CMDA land use check
- Coastal regulation zone
- Master plan check
- Water bodies finder
- Airport height clearance

Registers and directories

Who holds it, and which office keeps the record.

- Find your registering office
- Temple property check
- Waqf property check
- RERA register

Every free tool
/tools

Services we run for you
/services

The LandLens suite
/landlens/one

Verified RealEstate™

Every claim in this document traces back to a government record.

- Legal opinions, due diligence and title verification
- Building plan, layout and sub-division approvals
- Completion and occupancy certificates, regularisation
- Escrow, negotiation and NRI property management
- Land survey, soil testing, architecture and construction

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Prepared from the registers named on the page each finding sits on. Where a register could not be read, this document says so in its place rather than leaving the gap to be read as a clean result.