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RE REGULATORY RECORD

RERA Document

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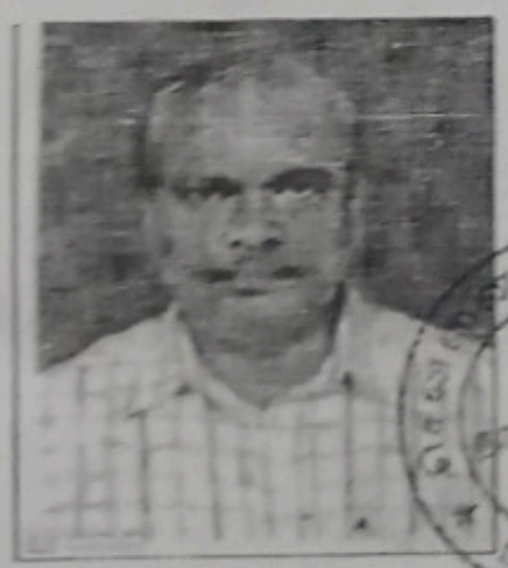
GREATER CHENNAI CORPORATION
WORKSDEPARTMENT

PROFESSIONAL REGISTRATION CERTIFICATE

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

The Registration No.**RSE100262019 dated 16.09.2019** 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 MAWS (MA1) Dept. dated 04.02.2019.

This Registration is valid upto**15.09.2024.**



16/9/19

Superintending Engineer (Works)
Greater Chennai Corporation.

RGN No:RSE100262019
Dated: 16.09.2019

16/9/19

16.09.19

Project Name:
Plan Showing the Proposed residential buildings at R.K Shanmugam Salai.

Attested

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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 150mm thick	=(.15)(25)	=3.75kN/m^2
Dead load	=5.75kN/m^2	
Live load	=1.50kN/m^2	
Total load on Roof	= 7.25kN/m^2	

2.2 Loading on Floor slabs:

Floor finish	= 1.00kN/m^2
S/w of slab 150mm thick	= 3.75kN/m^2
Dead load	=4.75kN/m^2
Live load	=2.00kN/m^2
Total load on Roof	= 6.75kN/m^2

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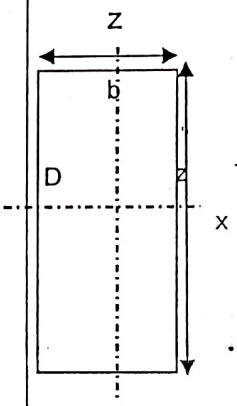
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3 DESIGN:

3.1 COLUMN DESIGN

Grade of Concrete			M 30	
Characteristic Strength of Reinf.		N/mm^2	500	
Width of Column	b	mm	300	
Depth of Column	D	mm	600	
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	mm^2	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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	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	1.525
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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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	105 KN/sqm
Footing Size required	A req	3.60 sqmm
Footing Size Provided	L	**2.80 meters**
	B	**2.80 meters**
Area Provided	A prvd	7.84 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	16 mm dia	@ 125 mm c/c	905 sqmm
Ast across y direction	16 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 Design

Beam Data

width	200 mm	d'	48 mm	.= cc+ sdia + mdia/2
depth	600 mm	eff depth	552 mm	.= d - d'
clear cover to main reinf.	30 mm			
Slab Thickness	150 mm			

Material Grades

Concrete	30 MPa
Steel	500 MPa

			Span Moment	Support Moment
Span Moment	230 KN-m	Mu/bd²	3.77	3.64
		xumax	252	252
		Mulim	243	243
Support Moment	222 KN-m	Mulim/bd²	3.99	3.99
	222 KN-m			
	0 KN-m			

Span Reinforcement

Beam is designed as Singly Reinforced Beam

Area of Steel	Tension (Ast)	Compr (Asc)
Percentage	1.054 %	-----
Area of Steel	1163 sqmm	

Refer Table 2 SP 16 pg 48

452 KN-m

Tension Reinforcement

Type	Bar dia	Nos	Area of Steel
Layer 1	20 mm	2	628 sqmm
Layer 2	25 mm	3	1473 sqmm
Layer 3			
Total Steel Provided			2101 sqmm

2042 sqmm

1.903 %

Provided Steel OK

Compression Reinforcement

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Type	Bar dia	Nos	Area of Steel
Layer 1	-		
Layer 2	-		
Layer 3			
Total Steel Provided			#VALUE!

Support Reinforcement
Beam is designed as Singly Reinforced Beam

Area of Steel	Tension (Ast)	Compr (Asc)	
Percentage	1.007 %	------	*Refer Table 2 SP 16 pg 48*
Area of Steel	1112 sqmm		

4.57081811578678
-1.614256091975960

Tension Reinforcement

0.046088629822542

Type	Bar dia	Nos	Area of Steel
Layer 1	25 mm	3	1473 sqmm
Layer 2	25 mm	3	1473 sqmm
Layer 3	-		
Total Steel Provided			2945 sqmm
Provided Steel OK			2.668 %

1832 sqmm
1473 sqmm

2514 sqmm

Compression Reinforcement

Type	Bar dia	Nos	Area of Steel
Layer 1	-		
Layer 2	-		
Layer 3			
Total Steel Provided			#VALUE!

Shear Force (Vu)	90 KN.		
ζv	0.815	*=Vu / (b * d)*	*or =(0.85*√(0.8*fck)*√(1+5β)-1)) / (6β)*
ζc	0.829	*Refer Table 61 SP 16 pg 179*	
ζcmax	3.5	*Refer Table J SP 16 pg 175*	

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Type	Bar Dia	Nos	Area of Steel
Layer 1	8 mm	0	0 sqmm
Layer 2	25 mm	0	0 sqmm
Layer 3	20 mm	0	0 sqmm
			0 sqmm

0.000 %

Sectional Dimensions OK
Shear Check OK

Provide Nominal Shear Reinforcement

Steel	415 MPa
Type of stirrup	2 legged
Stirrup diameter	8 mm
Spacing	300 c/c

Safe

Vus/d -0.027 kN/cm 1.458

3.4 TWO WAY SLAB DESIGN

Slab Design

Slab thickness	t	150 mm
Concrete	fck	30 MPa
Steel	fy	500 MPa

Sunken Depth: 0 mm

Loading

Slab Load

Dead Load	DL	3.750 KN/m
Live Load	LL	2.000 KN/m
Finishes Load	WL	1.000 KN/m
Total Load	Ws	6.750 KN/m
Factored Load	Wsu	10 KN/m

Sunken Slab Load

Dead Load	DL	3.750 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	7.75 KN/m
Factored Load	Wsku	12 KN/m

Slab Data

Slab Type	Regular

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Load	10 KN/m
Longer Span (ly)	4.50 m
Shorter Span (lx)	3.70 m

ly/lx ratio	1.22
Slab type	+

Loading on edges		one way	two way
W_{longer}	15 KN/m	.=w*lx/2	.=(w*lx/2) + (1-(1/3)*(lx/ly)^2)
$W_{shorter}$	12 KN/m		.=w*lx/3

Moments		one way	two way
Mx	10 KN-m	.=w*lx^2/ 8	.=ax * w*lx^2
My	8 KN-m		.=ay * w*lx^2

Thickness Check	OK
Deflection	7 mm

.=Mulim > Mux or Muy
.= 5*W*l^4/(384EI)

.Area of Steel	Astx	Asty
	184 sqmm	180 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
274 c/c	279 c/c	428 c/c	436 c/c	616 c/c	628 c/c	#######	1117 c/c

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

Final Ast provided	x	y
	10# @ 150c/c	10# @ 160c/c

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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.
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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

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/services

The LandLens suite
/landlens/one

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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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