Verified RealEstate™

Your trusted partner for buying, selling, and managing property, ensuring hassle-free service with 100% transparency.

3/350/2 Mettukuppam,
OMR Thoraipakkam,
Chennai, India

hello@verified.realestate
+91 9996 12 9996

Official Property Record

Digitally Verified Record - Powered by Verified RealEstate™



KSB Consultants & Engineers
P.R.Jeyaprakash B.E, M.I.E
BBCL Ashraya Block-C, Flat-2C,
Pillayar koil street,
Thuraipakkam, Chennai-600 097.

Mobile: 98409 22092
E-mail: s_balas_bala@yahoo.co.in

June 6,'24

Stability Certificate

It is certified that the plan showing the proposed construction of residential building in t.s.no:38/1,ward - j udaiyatchi , block no:7, devakottai taluk & municipality,sivagangai district. is designed to resist for earthquake. This design is made structurally safe and sound and I hereby certify that

1. The minimum grade of concrete is M25
2. The Minimum column size is 300 mm in stilt areas,
3. The design analysis using the code of practice for loading standards as per BIS-875 and Seismic forces as per the latest code BIS-1893 & BIS-456.

P.R.JEYAPRAKASH, B.E., M.I.E.,
Structural Engineer
Reg No: CGLDIST/SE/Gr-II/2021/10/006
BBCL Ashraya Block-C, Flat-2C,
Pillayar Koil Street, Thoraipakkam,
Chennai - 600 097.

PLAN SHOWING THE PROPOSED CONSTRUCTION OF RESIDENTIAL BUILDING IN T.S.NO:38/1,WARD - J UDAIYATCHI , BLOCK NO:7, DEVAKOTTAI TALUK & MUNICIPALITY,SIVAGANGAI DISTRICT.

TYPICAL STRUCTURAL DESIGN CALCULATION

1 **General:**

Proposed building is S+ 3 upper floors for residential purpose. Stilt floor is used for car parking. The floor height is 3.0 m in upper floors

2 **Design Basis:**

Latest Design codes of BIS-456, 875 and 1893 are followed with SP-16 Design Aid book. A typical Frame was taken for analysis to arrive at the bending moment for column design. Since the building is 4 stories, wind force is taken into account. Live load reduction factor is applied in design. isolated foundation is proposed. Fe-500 steel is used as main steel and M25 grade concrete.

3 **Earthquake consideration:**

For better stability during earhquake, the columns are tied with plinth beams. Continuous lintels are specified for outer walls and column ties are closely spaced for better ductility. For building on stilt, minimum size of column is taken as 300 mm(12")

4 **WIND LOAD**

Vz	=	Vb x K1 x K2 x k3	
Vb	=	50 m/sec in Chennai	
K1	=	Probability Factor =	1
K2	=	Terrain, Height Factor =	1
K3	=	Topography Factor =	1
p	=	0.6 x Vz x Vz	
	=	0.6 x 50 x 50	
	=	1500 N/Sq.m	

P.R.JEYAPRAKASH, B.E., M.I.E.,
Structural Engineer
Reg No: CGLDIST/SE/Gr-II/2021/10/006
BBCL Ashraya Block-C, Flat-2C,
Pillayar Koil Street, Thoraipakkam,
Chennai - 600 097.

5 **Design Loads:**

Slab thk	130	=	3.25 KN/sq.m
Live load		=	2.00 KN/sq.m
Finishes		=	1.25 KN/sq.m
			6.50 KN/sq.m

Say 6.50 KN/sq.m/floor for slab and beam design
Applying live load reduction of = 0.3 ,
For column and foundation design, 6.00 Kn/sqm is taken.

This value is also taken for frame analysis

Block work 200 thick for exterior walls

	0.2	x	2.4	x	20		=	10	KN/m/floor
Beams	0.2	x	0.45	x	25		=	2.3	KN/m/floor
Columns	0.3	x	0.45	x	2.45	x 25	=	8.3	KN/floor

These are taken for analysis with WL+LL+DL combination.

P.RAJEYAPRAKASH, B.E., M.I.E.
Structural Engineer
Reg No: CGLDIST/SE/G/1/2021/10006
BBCL Ashraya Block-2, Flat-2C,
Pillayar Koil Street, Thoraipakkam,
Chennai - 600 097.

6 **SLAB DESIGN:**

Thickness	=	130 mm		Concrete mix	Fck	= M 25	N/sq.mm
Cover	=	20 mm		Steel Grade	Fy	=Fe 500	N/sq.mm
Eff.Depth	=	105 mm					

Panel (3.2 x 7) m

=

One way slab Ly / Lx 7 / 3.2 .= 2.2

Support condition - interior panel

short span=	α x	=	0.120	(- BM at continuous edge)	Table:26
		=	0.000	(+ BM at midspan)	in IS-456-2000
long span=	α y	=	0.020	(+ BM at continuous edge)	
		=	0.000	(+ BM at midspan)	

Designed for 0.120 co.efficient

Mu .= 0.120 x 6.5 x 1.5 x 3.2 x 3.2 = 11.98 knm/m

$$\text{Mu / b.d.d} = \frac{11.98 \times 1000 \times 1000}{1000 \times 105 \times 105} = 1.09 \text{ N/sq.mm}$$

From Table-3 of SP-16, Pt .= 0.267 %

Minimum Pt = 0.12 % as per code, for Fe-500

At = 0.267 x 1000 x 105 ./ 100 = **280** sq.mm/m

Provide 8 dia @ 130 c/c = **387** sq.mm/m Short span

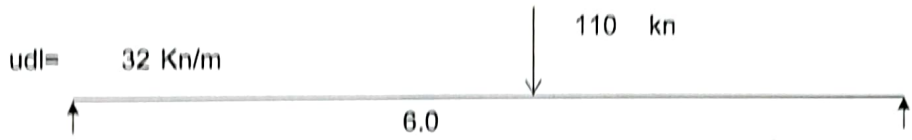
Provide 8 dia @ 230 c/c = **219** sq.mm/m Long span

P.RAJEYAPRAKASH, B.E., M.I.E.,
Structural Engineer
Reg No: CGLDIST/SE/Gr-II/2021/10/006
BBCL Ashraya Block-C, Flat-2C,
Pillayar Koil Street, Thoraipakkam,
Chennai - 600 097.

7 **Beam design:**

Effective span = 6.0 m Beam size 200 x 600

Fck = M 25 d = 560 mm



Max. Bending Moment at mid span udl = w.l.l / 12 + pl/8

$= \frac{32 \times 6.00 \times 6.00}{12} + \frac{110 \times 6.0}{8} =$ 179 Knm

Mu = 179 x 1.5 x 10-e6 = 267.8 x 10-e6 Nmm

$Mu/b.d.d = \frac{268 \times 10\text{-e}6}{200 \times 560 \times 560} =$ 4.27 N/sq.mm

From table-55 SP-16 d'/d = 40 / 560 = 0.07

Pt = **1.190** % for Pc = **0.270** %

At = 1.190 x 200 x 560 / 100 = **1333** sq.mm (bot)

Ac = 0.270 x 200 x 560 / 100 = **302** sq.mm (top)

provided 2 No 25 = **982** sq.mm

\+ 2 No 20 = 628 sq.mm

1610 sqmm bot

provided 2 No 20 = 628 sq.mm

\+ 2 No 25 = 982 sq.mm

1610 sqmm top of support

Shear Design:

Shear force = $\frac{32 \times 6}{2} + \frac{110}{2} =$ 151 KN

Factored shear force = 1.5 x 151 = 227 KN

for 1.19 % steel Shear resisted by concrete section

from table-61 0.69 x 230 x 560 / 1000 = 89 KN

Balance shear (Vus) = 226.5 - 89 = 138 KN

Vus/d = 138 / 41 = 3.4 KN/cm

from table 62 of SP-16

Required 2 legged 10 stirrups @ 160 mm c/c

Provided 2 legged **10** stirrups @ **130** mm c/c

P.R.JEYAPRAKASH, B.E., M.I.E.,
Structural Engineer
Reg No: CGLDIST/SE/Gr-II/2021/10/006
BBCL Ashraya Block-C, Flat-2C,
Pillayar Koil Street, Thoraipakkam,
Chennai - 600 097.

8 **COLUMN DESIGN:** **COL SIZE 300 X 450**

Maximum load on column in basement — P = 105 t

Pu = 1.5 x 105 x10 = 1575 KN

Max.Bending Moment = 6 t.m — Mu = 1.5 x 6.0 x10= 90 Kn.m

Cover = 40 mm

d'/d = 0.09

Fck = M 30 = 30 N/sq.mm Fy = Fe500

Provide bars equaly all sides

Refer chart 48 of SP-16

$$\frac{Pu}{Fck\ b\ d} = \frac{1575 \times 1000}{30 \times 300 \times 450} = 0.39$$

$$\frac{Mu}{Fck\ b\ d^2} = \frac{90 \times 10^6}{30 \times 300 \times 450 \times 450} = 0.05$$

$$\frac{p}{Fck} = 0.03\ p\% = 0.03 \times 30 = 0.9\ \%$$

Minimum steel = 0.8 %

$$As = \frac{0.9 \times 300 \times 450}{100} = 1215\ sq.mm$$

Provided 6 Nos 25 dia = 2945 sq.mm

2945 sq.mm

Ties 8 @ 110c/c and 8 @ 190c/c

P.R.JEYAPRAKASH, B.E., M.I.E.,
Structural Engineer
Reg No: CGLDIST/SE/Gr-II/2021/1[illegible]
BBCL Ashraya Block-C, Flat-2
Pillayar Koil Street, Thoraipakkam
Chennai - 600 097.

9 **FOOTING DESIGN**

Maximum load on column P = 105 t Fck = M25
Add 10% footing load = 115.5 t
Max.Bending Moment = 6 t.m

S.B.C of Soil at 17 t/sqm at depth = 3 m
Assume footing base of 3 X 3 m and depth = 900 mm
So pressure on soil is Eff. Depth = 850 mm

$$\frac{116}{2.85 \times 2.85}$$

= 14.22 t/sqm < 17 t/sqm

Cantilever projection of footing = $\frac{2.85 - 0.30}{2}$ = 1.28 m

B.M on footing at face of column pedestal

BM = $\frac{14.22 \times 1.28 \times 1.28}{2}$ = 11.56 tm

Mu = 11.56 x 1.5= 17.34 tm

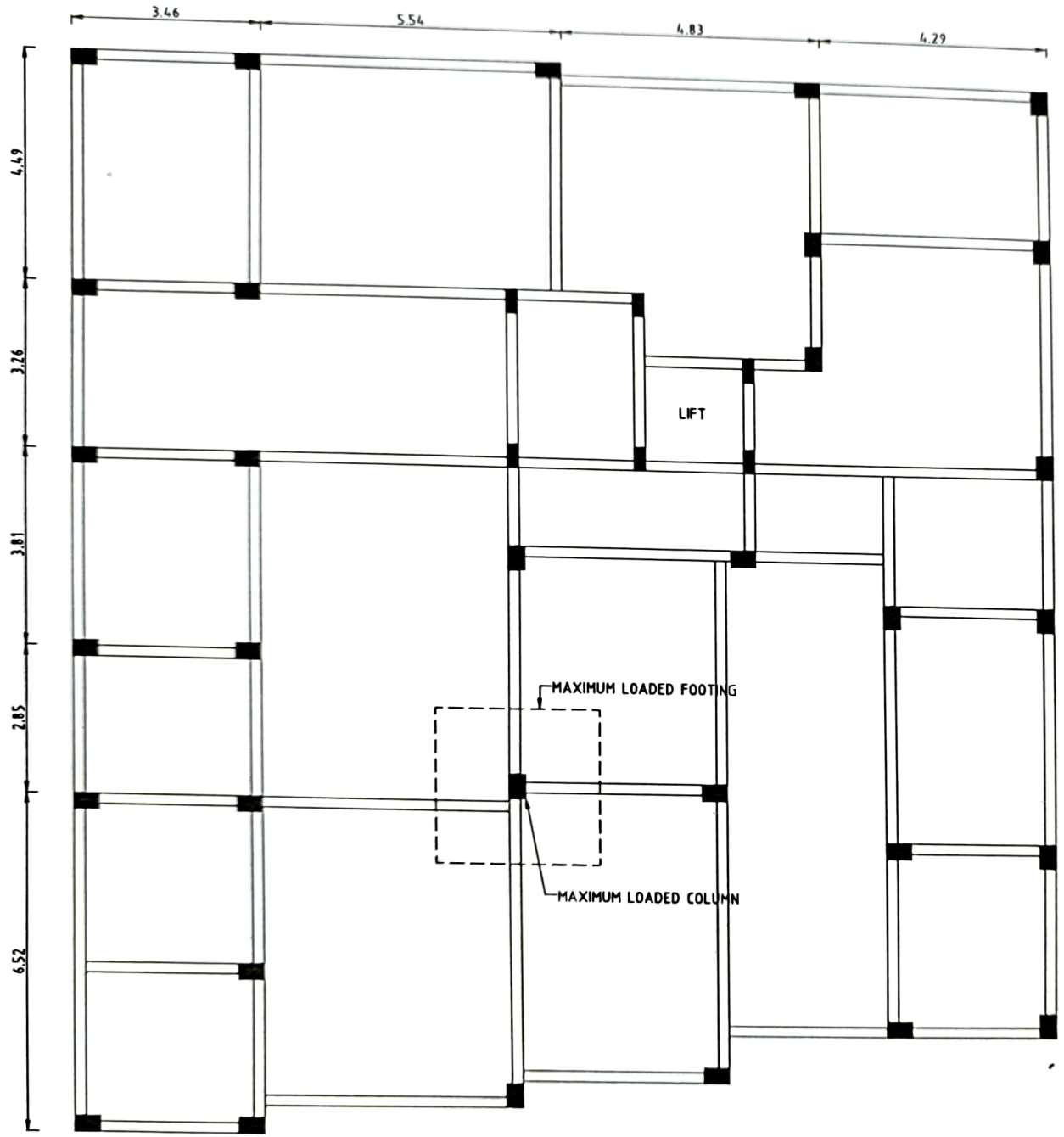
Mu/b.d.d = $\frac{17.34}{450} \times \frac{1000}{850} \times \frac{10000}{850}$ = 0.53 N/sqm

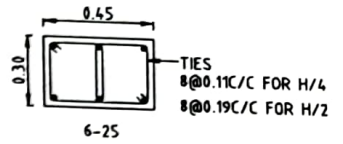
Fck = 25 n/sqmm
From Table-3 of SP-16, Pt 0.13 % min pt% .= 0.120 %

At = $\frac{0.130 \times 450 \times 850}{100}$ = **497.3** sq.mm

Provide 12 dia @ 130 c/c = **2410** sq.mm

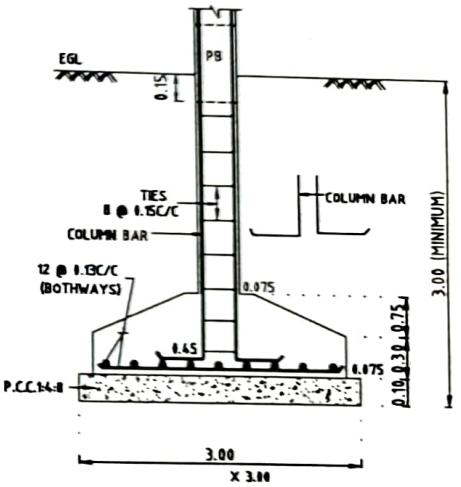
P.R.JEYAPRAKASH, B.E., M.I.E.,
Structural Engineer
Reg No: CGLDIST/SE/Gr-II/2021/10/006
BBCL Ashraya Block-C, Flat-2C,
Pillayar Koil Street, Thoraipakkam,
Chennai - 600 097.





DETAIL OF MAXIMUM LOADED COLUMN

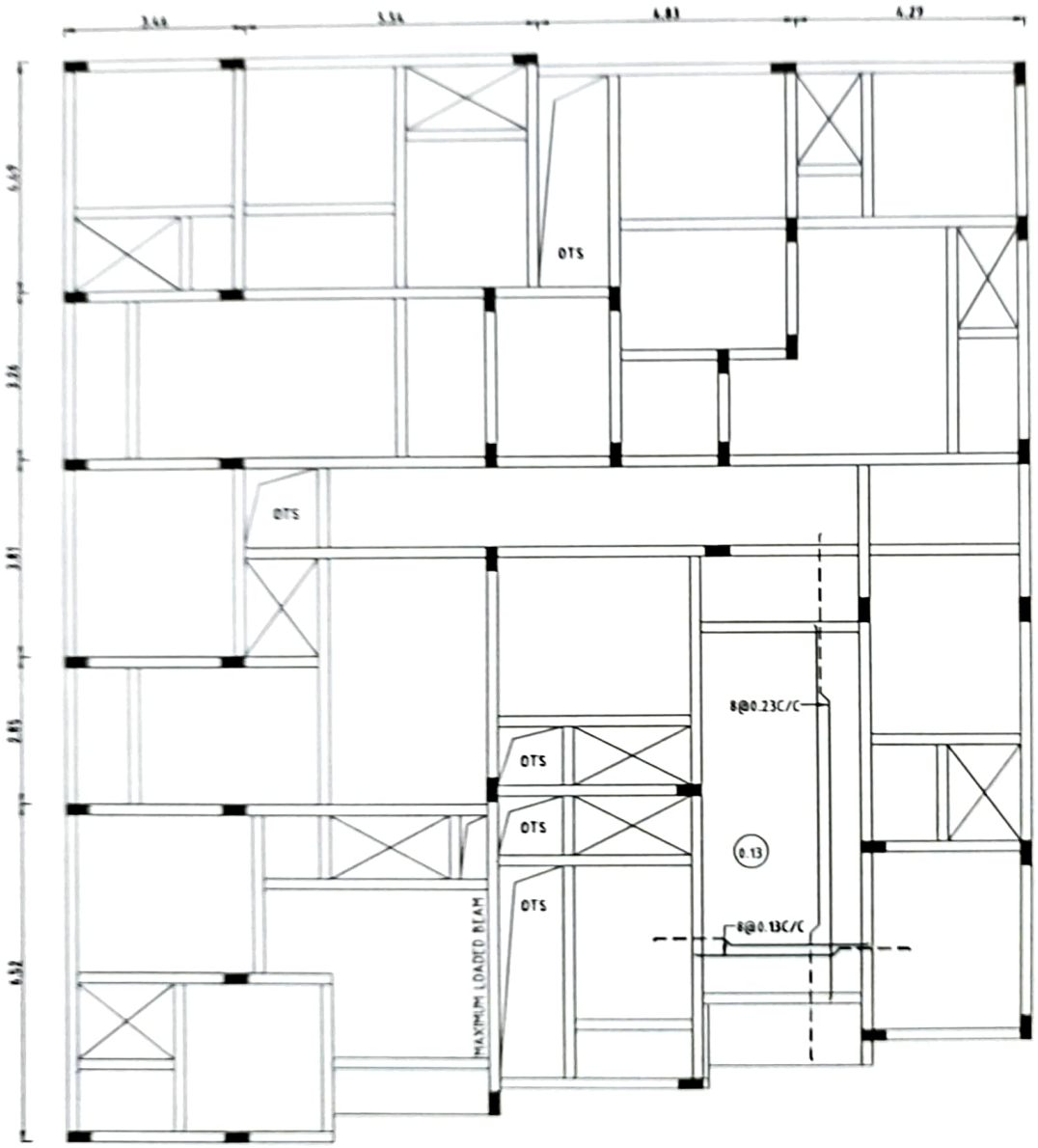
M-30

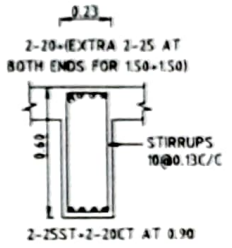


DETAIL OF MAXIMUM LOADED FOOTING

M-25

P.R.JEYAPRAKASH, B.E., M.I.E.,
Structural Engineer
Reg No: CGLDIST/SE/Gr-II/2021/10/006
BBCL Ashraya Block-C, Flat-2C,
Pillayar Koil Street, Thoraipakkam,
Chennai - 600 097.





DETAIL OF MAXIMUM LOADED BEAM
M-25

P.R.JEYAPRAKASH, B.E., M.I.E.,
Structural Engineer
Reg No: CGLDIST/SE/Gr-II/2021/10/006
BBCL Ashraya Block-C, Flat-2C,
Pillayar Koil Street, Thoraipakkam,
Chennai - 600 097.



our services doesn't just end there

Buying & Selling Services

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

Legal & Documentation Services

Certified EC, Patta, legal opinions, property verification, due diligence, litigation solutions, and legal heir certificates.

Property Development & Approvals

Building plan approvals, construction, layout and sub-division approvals, zone conversion, and occupancy certification.

NRI & Investment Services

Escrow Services, Rentals, Litigation Solutions, Property Valuation and Property Management

Compliance & Special Services

Demolition, Vaasthu checks, regularization of unauthorized buildings, and office space solutions.



empowering your real estate decisions with smart tools

Property Valuation & Cost Estimation

Guideline Value, Apartment Composite Value, Stamp Duty & Registration Fees Calculator, Building Value Calculator, Capital Gains Calculator, Area Unit Converter, Length Unit Converter

Ownership, Compliance & Legal Verification

Encumbrance Certificate (EC) Search, Find Your SRO, Temple Property Check, WAQF Property Check, View Patta/Chitta, View FMB, Patta Analyzer, EC Analyzer

Zoning & Land Use Analysis

Land Use Zone Finder, CRZ Zone Check, Aquifer Zone Check, CBA Check, EWS Check, Road Width Check, Proposed Road Widening Check, FSI Calculator

Property Documentation & Workflow Tools

Forms & Templates, Document Generator, Document Translation, Dictionary

Vastu & Property Management Tools

Home Vastu Shastra, Plot Vastu Shastra, Property Management

Verified RealEstate™

We're honored to be part of your real estate journey

3/350/2 Mettukuppam,
OMR Thoraipakkam,
Chennai, India

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