



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™





Er. K. MURALI, B.E. (Civil), M.E. (Structural), NDT (Civil), C.Engg (I), MIE, FIV, Dip-in-Arch., M.Sc. (Real Estate Valuation)
Registered Structural Engineer (CMDA, GCC, DTCP) Grade-1, Registered Engineer (GCC) Grade-1, Approved Income Tax Valuer Under Section 34AB,
Approved Valuer Reg No : F27167, Chartered Engineer Reg No : M-1590140, Consultant Engineer (Civil & Structural), Builder & Promoter

OFFICE :
PLAZA CENTER, Third Floor,
Shop No. 334, 206, Door No.129,
G.N. Chetty Road, Chennai - 600 006.

RESIDENCE :
New No. 51, Old No. 22A, Siddhi Vinayakar Koil Street,
(Behind T. Nagar, Bus Terminus)
T.Nagar, Chennai - 17.

Off : 2434 00 48
Cell : 9789018902

E-mail : muralirasi1971@gmail.com

Date : 22.09.2023

STRUCTURAL STABILITY OF THE EXISTING COMMERCIAL CONSTRUCTION
BUILDING COMPRISING OF BASEMENT+GROUND, 1ST FLOOR & PART OF 2ND
FLOOR WITH REVISED PLAN FOR BASEMENT, GROUND, 1ST & 2ND FLOOR FOR
COMMERCIAL USE, AT PLOT NO.10 PART,11 PART,13,14,&15,TRUNK
ROAD&OLD POLICE STATIONROAD,KARAYANCHAVADI,POONAMALEE,
CHENNAI-600 056,COMPRISED IN S NO 598/1A2,598/1A3,598/1A4,598/1A5,598/1A6,
OF POONAMALEE VILLAGE, POONAMALEE TALUK, THIRUVALLUR DISTRICT.

This is to Certify that the Existing Commercial Construction building of basement +G+ 2 Floors = 3 Floors only. These Existing building Site has been inspected by me and the required details like soil report have been collected.

The Existing Commercial Construction building which has been designed as per IS code IS 875/PII and 1893 for EQ structures of (basement+ G+ 2 Floors) = 3 Floors only. So, I hereby certify that the Building will be structurally safe. No more future Vertical Expansion will be allowed except stair head room and lift etc.


Er. K. MURALI, BE(Civil), M.E(Struct)
Registered CMDA Structural Engineer Grade 1 (SE)
Registration No. SE/GR-I-19/04/030
New No.14, Old No. 14, Damodaran Street,
T.Nagar, Chennai 17
Mobile: 97890 18902, Off: 2434 0048
Email id: muralirasi1971@gmail.com

INTRODUCTION :

The Existing Commercial Construction building is a framed structure, basement with Raft columns etc with side RCC vertical walls. And with 3.55m Ceiling height excluding slab thickness. Soil report particulars obtained at the site by providing trail pit and found a safe bearing capacity (SBC) of 9 t/ m² at 4 m below ground level has been adopted for the foundation (Raft + Isolated Footing).

STRUCTURAL DESIGN AS PER IS 875 / PII.

Dead load on roof	=	3.00 KN / m ²
Live load on floors	=	4.00 KN / m ²
Weathering course on roof	=	2.00 KN / m ²
Floor finish	=	1.00 KN / m ²
Weight of concrete	=	2500 kg / m ³
Weight of brick work	=	2000 kg / m ³


Er. K. MURALI, BE(Civil), M.E(Struct)
Registered CMDA Structural Engineer Grade-I (SE)
Registration No. SE/GR-1/19/03/030
New No.14, Old No.34, Damodaran Street,
T.Nagar, Chennai-17.
Mobile: 97890 18902, Off: 2434 0048
Email Id: muralirasi1971@gmail.com

DESIGN DETAILS

Design method	- working stress / ultimate stress Method for columns and limit state method for other structures.
Codes and special publications used	- SP 16 and IS 875 / PI - V
Concrete Grade	- M25
Steel Grade	- Fe 415
Least dimension of column Adopted in building	- 300 x 450 mm & 230 x 380 mm

PLINTH BEAM DESIGN

Load on beam

Longer span

$$\begin{aligned} & - 1 \times 0.30 \times 25 = 7.5 \text{ KN / m} \\ & \text{Self weight} = 0.30 \times 0.3 \times 25 \\ & \quad = 2.25 \text{ KN / m.} \\ & \text{Total load} = 9.75 \text{ KN / m.} \\ & \text{F.S} = 1.5 \\ & \text{Total load} = 14.62 \text{ KN / m.} \end{aligned}$$

$$\begin{aligned} \text{Maximun bending moment (B.M)} &= w l^2 / 10 \text{ (considering seismic condition)} \\ &= 14.62 \times 3.08^2 / 10 \\ &= 13.86 \text{ KN - m.} \\ \text{Ast} &= M / (t \times a). \\ &= \frac{13.86 \times 1000 \times 1000}{(0.87 \times 300 \times 300)} \\ &= 179 \text{ mm}^2. \end{aligned}$$

However,

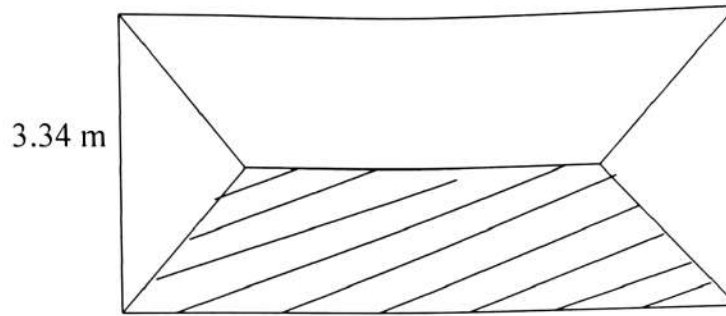
Providing 2 nos 12 mm = $2 \times 113 = 226 \text{ mm}^2$

But, safer side provide 3 Nos 12 mm tor @ Bottom, and 2 Nos 12 mm tor @ top

Stirrups 8 mm @ 6" c/c. uniformly.

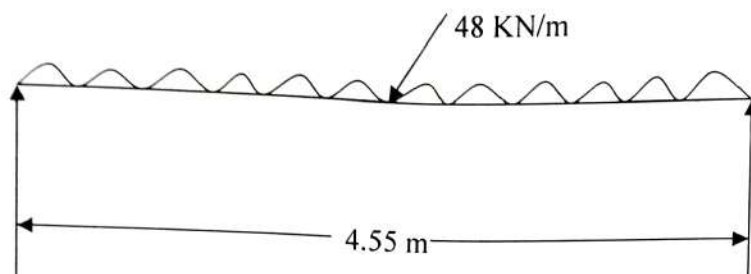

Registered Structural Engineer Grade-I (SE)
Registration No. SE/GR-1/19/03/030
New No.14, Old No.34, Damodaran Street,
T.Nagar, Chennai-17.
Mobile: 97890 18902, Off: 2434 0048
Email Id: muralirasi1971@gmail.com

LOAD CALCULATION:



Live load on slab	=	4.00 KN / m ²
Dead load of slab	=	25 x 0.13 = 3.25 KN / m ²
Floor finish etc...	=	1.50 KN / m ²
Total load	=	8.75 KN / m ²
	=	8.75 x 3.34 = 29.22 KN / m
Dead load from beam	=	25 x (0.45 – 0.13) x 0.30
	=	2.4 KN / m
Total load on slab	=	31.62 KN / m
Factored load	=	1.5 x 31.62 KN / m
	=	47.43 KN / m
		Say 48 KN / m


Er. K. MURALI, BE(Civil), M.E(Struct)
Registered CMDA Structural Engineer Grade-I (SE)
Registration No. SE/GR-I/19/03/030
New No.14, Old No.34, Damodaran Street,
T.Nagar, Chennai-17.
Mobile: 97890 18902, Off: 2434 0048
Email Id: muraliragi1971@gmail.com



$$\begin{aligned}
 \text{Maximum Bending Moment} &= (WL^2 / 10) \\
 &= ((48 \times 4.55 \times 4.55) / 10) \\
 \text{B.M} &= 99.3 \text{ KN-m}
 \end{aligned}$$

$$\begin{aligned}
 \text{Reaction at (A) \& (B)} &= WL / 2 \\
 &= (48 \times 4.55) / 2 \\
 &= 109.2 \text{ KN}
 \end{aligned}$$

DESIGN OF SLAB:

(Use M25 Concrete)

$$\begin{aligned}
 \text{Span} &= 3.34 \text{ m} \\
 \text{Assume (Span / Eff.depth)} &= 30 \\
 \text{Eff.depth} &= (3.34 / 30) = 0.113 \text{ m} \\
 \text{Over all depth of slab} &= 0.130 \text{ m (130 mm)} \\
 \text{Total load on slab} &= 8.75 \text{ KN / m}^2 \\
 \text{Say} &= 8.75 \text{ KN / m}^2
 \end{aligned}$$

Consider 1 m Length of slab,

$$\text{Total load on slab} = 8.75 \text{ KN / m}$$

$$\begin{aligned}
 \text{Maximum Bending Moment} &= (WL^2 / 10) \\
 &= ((8.75 \times 3.34 \times 3.34) / 10)
 \end{aligned}$$


 Er. K. MURALI, BE(Civil), M.E(Struct)
 Registered CMDA Structural Engineer Grade-I (SE)
 Registration No. SE/GR-I/19/03/030
 New No. 14, Old No. 34, Damodaran Street,
 T.Nagar, Chennai-17.
 Mobile: 97890 18902, Off: 2434 0048
 Email Id: muralirasi1971@gmail.com

$$\begin{aligned}
 \text{B.M} &= 9.76 \text{ KN-m Say } 10 \text{ KN-m} \\
 \text{Factored load} &= 1.5 \times 10 \text{ KN-m} \\
 &= 15 \text{ KN-m} \\
 \text{Area of steel (A}_{st}\text{)} &= (M / (0.87d \times \sigma_{st})) \\
 &= 600 \text{ mm}^2
 \end{aligned}$$

Provide 10 mm Tor @ 100 mm C/C as Main Reinforcement

Provide 10 mm Tor @ 150 mm C/C as Distribution Reinforcement

DESIGN BEAM:

(Use M25 Concrete)

$$\begin{aligned}
 \text{Span} &= 4.55 \text{ m (Max)} \\
 \text{Assume (Span / Eff.depth)} &= 25
 \end{aligned}$$

However provide over all depth of Beam as 450 mm

$$\begin{aligned}
 \text{Area of steel (A}_{st}\text{)} &= (M / (\text{Lever arm depth} \times 0.87 \times f_y)) \\
 &= \frac{110 \times 1000 \times 1000}{326.25 \times 0.87 \times 415} \\
 &= 933 \text{ mm}^2
 \end{aligned}$$

Provide Tor Steel Rod,

$$\text{Bottom Rod} = 6 \text{ Nos } 16 \text{ mm (Two Layer)}$$

$$\text{Top Rod} = 3 \text{ Nos } 16 \text{ mm}$$

$$\text{Crank Rod (or) Extra Rod at top (-Ve B.M)} = 3 \text{ Nos } 16 \text{ mm}$$

Stirrups, Provide 8 mm Tor @ 115 mm C/C at Ends upto (L / 4)

Provide 8 mm Tor @ 150 mm C/C at Mid Span


 Er. K. MURALI, BE(Civil), M. L. (Struct)
 Registered CMDA Structural Engineer Grade I (SE)
 Registration No. SLZGR-I/19/03/130
 New No. 14, Old No. 33, Damodaran Street,
 T. Nagar, Chennai-17
 Mobile: 97890 18902, 986 2424 9022
 Email Id: muralibrasil1975@gmail.com

DESIGN OF COLUMN :

(Use M25 Concrete)

Consider critical column which is taking more load

Load on column = 110 KN / floor (Which includes all parameters)

Add 10% for self weight = 11 KN

Add 30% for Earthquake = 33 KN

Total Load on column = 154 KN / floor

Total Load on column for 3 floors = 462 KN (or) 500 KN

Provide (300 x 380 mm) Size of Column

Effective length of column = $(15.25 \setminus 1.75) = 8.71$

Since , it is less than 12 , we may consider as short column

Safe stress in steel (σ_{sc}) = 230 N / mm²

Safe stress in concrete = 4 N / mm²

Total area of column = 114000 mm²

Total load = (area of concrete x safe stress in concrete)

+ (area of steel x safe stress in steel)

$$110 \times 10 \times 1000 = (300 \times 380 - A_{st}) \times 4 + (A_{st} \times 230)$$

$$A_{st} = 2849 \text{ mm}^2 \text{ (} A_{st} \text{ is 1.20 \%)}$$

Provide 10 Nos 20 mm Tor Steel Rods (3768 mm²)

and 8 mm stirrups (4 legged) @ 6" C/C


Er. K. MURALI, RE(Civil), M.E(Struct)
Registered CMDA Structural Engineer Grade-I (SE)
Registration No. SE/GR-I/19/03/030
New No.14, Old No.34, Damodaran Street,
T.Nagar, Chennai-17
Mobile: 97890 18902, Off: 2434 0048
Email Id: muralirasi1971@gmail.com

Safe load

= (area of concrete x safe stress in concrete)

+ (area of steel x safe stress in steel)

$$((300 \times 380 - 3768) \times 4) + (3768 \times 230) = 1307568 \text{ N}$$

$$= 1307 \text{ KN. Is more than actual 500 KN}$$

Which is more than actual , Hence it is safe.

DESIGN OF FOUNDATION:

(Use M25 Concrete)

Column footing is individual RCC footing

$$\text{SBC} = 90 \text{ KN/m}^2$$

$$\text{Load transformed on column} = 500 \text{ KN.}$$

$$\text{Area of Raft for max columns} = 500/90 = 5.55 \text{ m}^2$$

Say : 6 m² (Raft)

Hence O.K.

$$\text{Bending Moment} = (WL^2 / 2)$$

$$= ((150 \times 1.075 \times 1.075) / 2)$$

$$\text{B.M} = 86.67 \text{ KN-m}$$

Provide depth as 700 mm

$$\text{Area of steel (A}_{st}) = \frac{86.67 \times 1000 \times 1000}{230 \times 0.87 \times 700}$$

$$= 618.76 \text{ mm}^2$$

Provide 12 mm Tor @ 150 mm C/C on both ways


Er. K. MURALI, BE(Civil), M.E(Struct)
Registered CMDA Structural Engineer Grade-I (SE)
Registration No. SE/GR-I/19/01/030
Plot No. 14, Old No. 34, Damodaran Street,
T.Nagar, Chennai-17
Mobile : 97890 18902, Off: 2434 0048
Email id: murastrasi197162@gmail.com

CHECK FOR EARTH QUAKE FORCES:

Check the critical column and its foundation to earth quake forces as per IS 1893
critics for earth quake resistant design of structure.

Use seismic co-efficient method as per clause 3.4.2-3(a)

$$\alpha_h = \beta I (\alpha_b)$$

(α_h) = Horizontal seismic co-efficient

α_b = Basic Horizontal seismic co-efficient as per seismic zone (Chennai) – Zone III
= 0.04

β = A co-efficient depend up on soil foundation as per table – 5 = 1.20.

I = A co-efficient depend up on soil as per table – 4. = 1.0

$$(\alpha_h) = 1.2 \times 1.0 \times 0.04 = 0.048$$

Total load on column = 360 Tons as per column Load.

Size of individual footing = 11 m².

Safe bearing capacity of soil = 9 t /m²

H_Σ = Horizontal force component of earth quake

$$= (\alpha_h) \times w$$

$$= \text{Load on column}$$

$$= 50 \text{ Ton.}$$

$$H_\Sigma = 0.048 \times 50 \text{ ton}$$

$$= 2.4 \text{ ton.}$$


Er. K. MURALI, BE(Civil), M.E(Struct)
Registered CMDA Structural Engineer Grade-I (SE)
Registration No. SE/GR-I/19/03/030
New No.11, Old No. 34, Damodaran Street,
T.Nagar, Chennai-17.
Mobile: 97890 18902, Off: 2434 0048
Email Id: murashrao1971@gmail.com

Column size = 23 cm x 38 cm

Effective depth = 30 cm.

CONCRETE M 25 :

Shear due to earth quake = 2.48 tons.

Shear stress = H_{Σ} / bjd

$$= 2480 / (23 \times 0.87 \times 38)$$

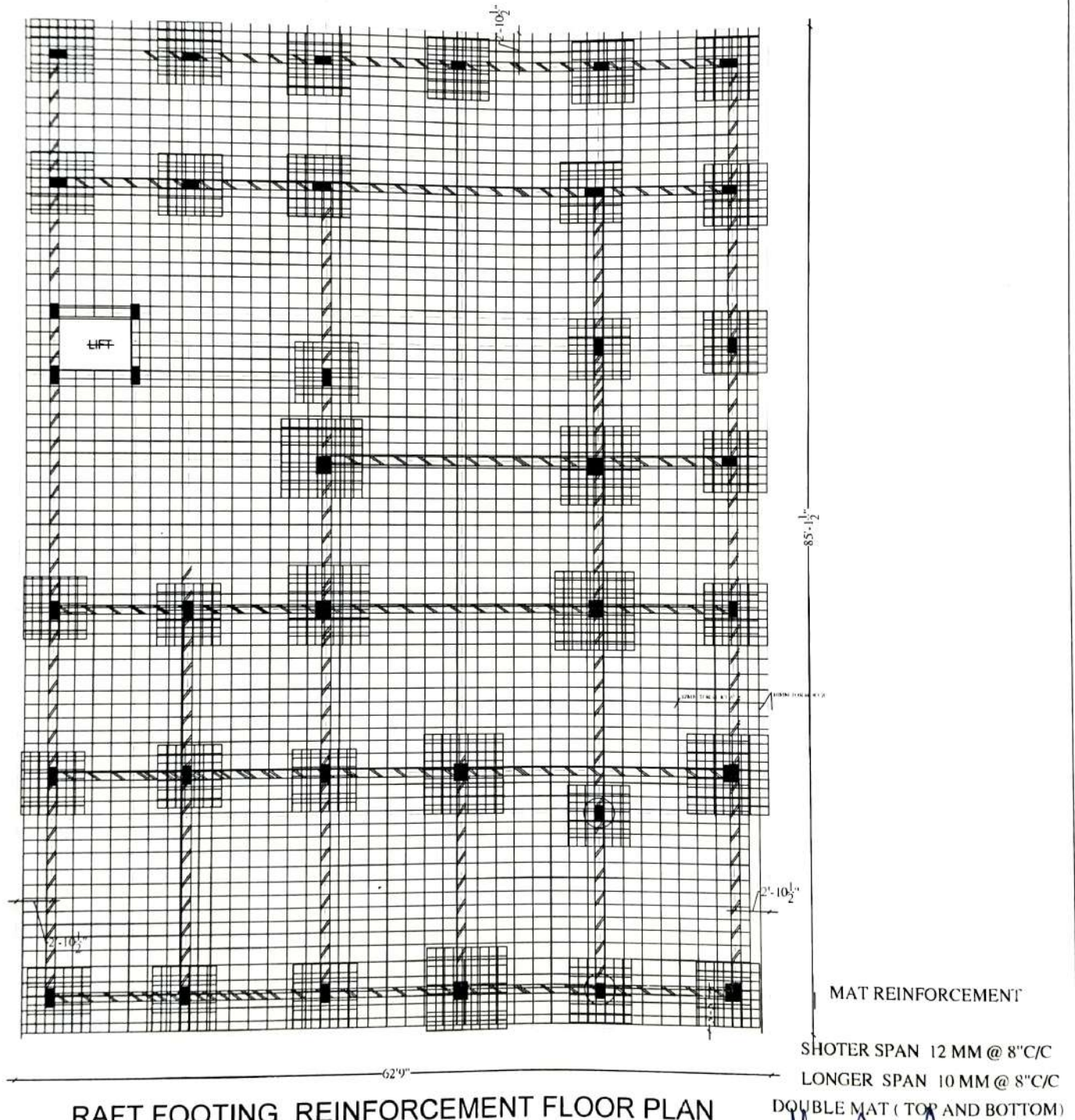
$$= 2480 / 760.38 = 3.3 \text{ Kg / cm}^2$$

$$3.3 \text{ Kg / cm}^2 < 8 \text{ Kg / cm}^2$$

Hence the column is safe against earth quake.

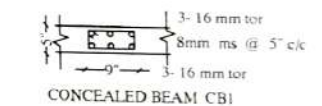
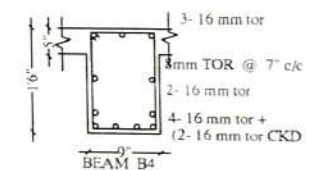
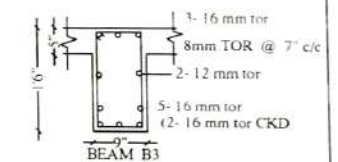
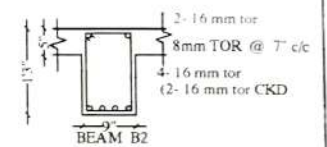
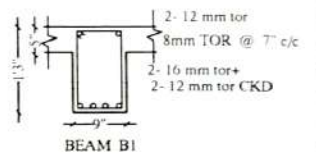
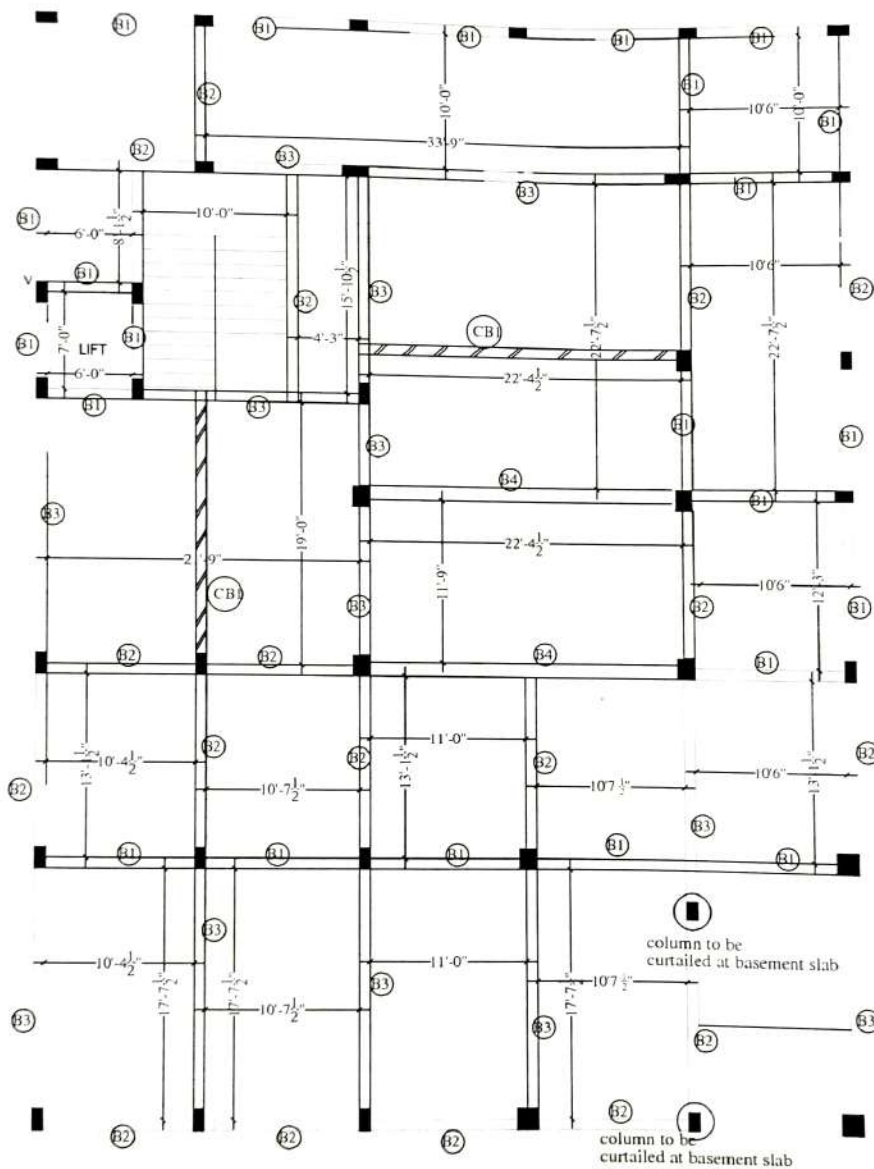

Er. K. MURALI, BE(Civil), M.E(Struct)
Registered CMDA Structural Engineer Grade-I (SE)
Registration No. SE/GR-I/19/03/030
New No.14, Old No.34, Damodaran Street,
T.Nagar, Chennai-17.
Mobile: 97890 18902, Off: 2434 0048
Email Id: muralirasi1971@gmail.com

BEAM / FOOTING/ RAFT SLAB CONNECTING THE COLUMNS



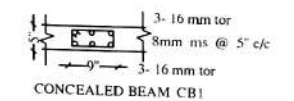
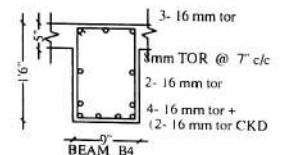
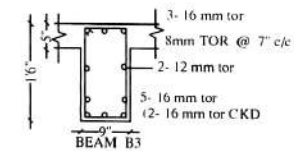
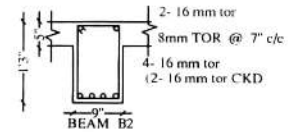
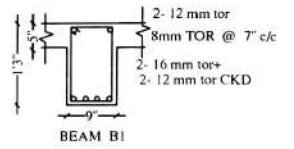
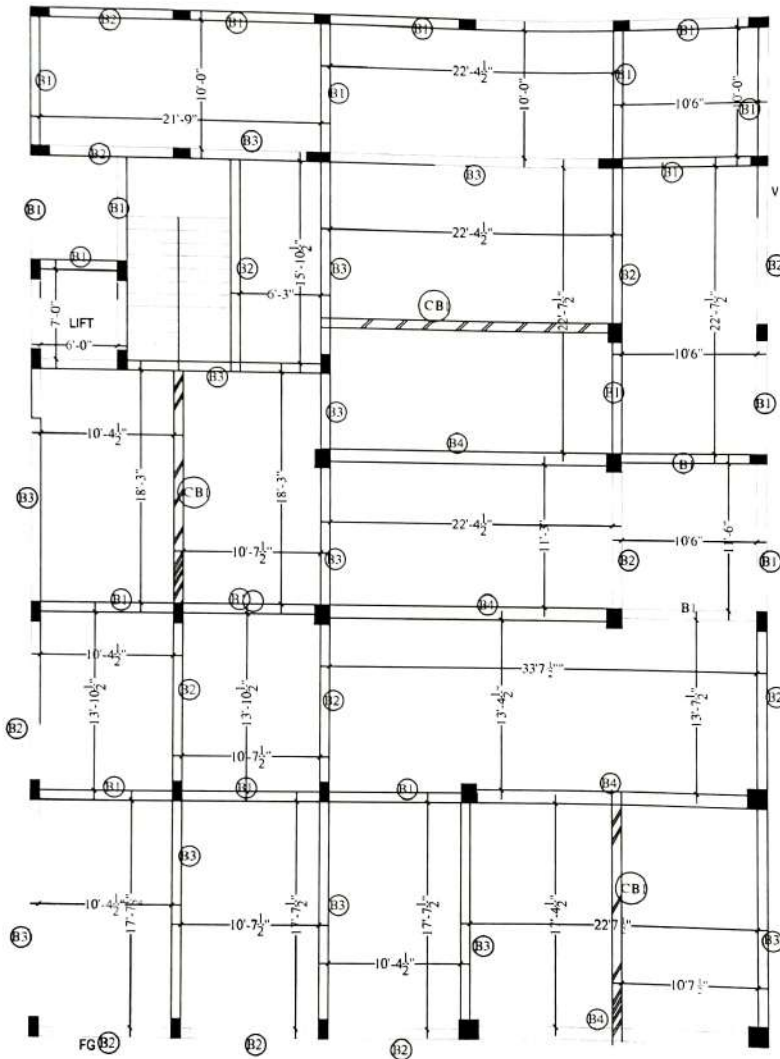
Er. K. MURALI, BE(Civil), M.E(Struct)
Registered CMDA Structural Engineer Grade-I (SE)
Registration No. SE/GR-I/19/01/030
New No. 14, Old No. 44, Damodaran Street,
T.Nagar, Chennai - 17
Mobile: 97890 18902, Off: 24 34 0048
Email Id: muralirasi1971@gmail.com

DETAILS OF BASEMENT FLOOR ROOF BEAM



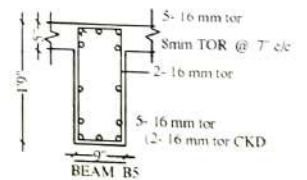
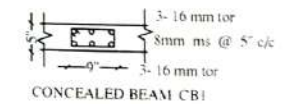
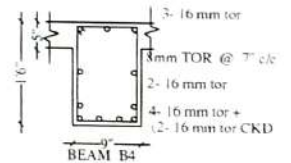
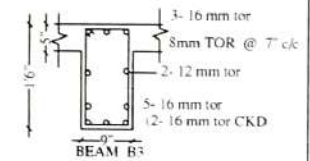
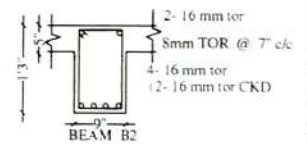
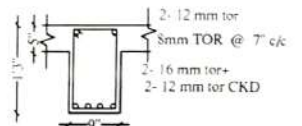
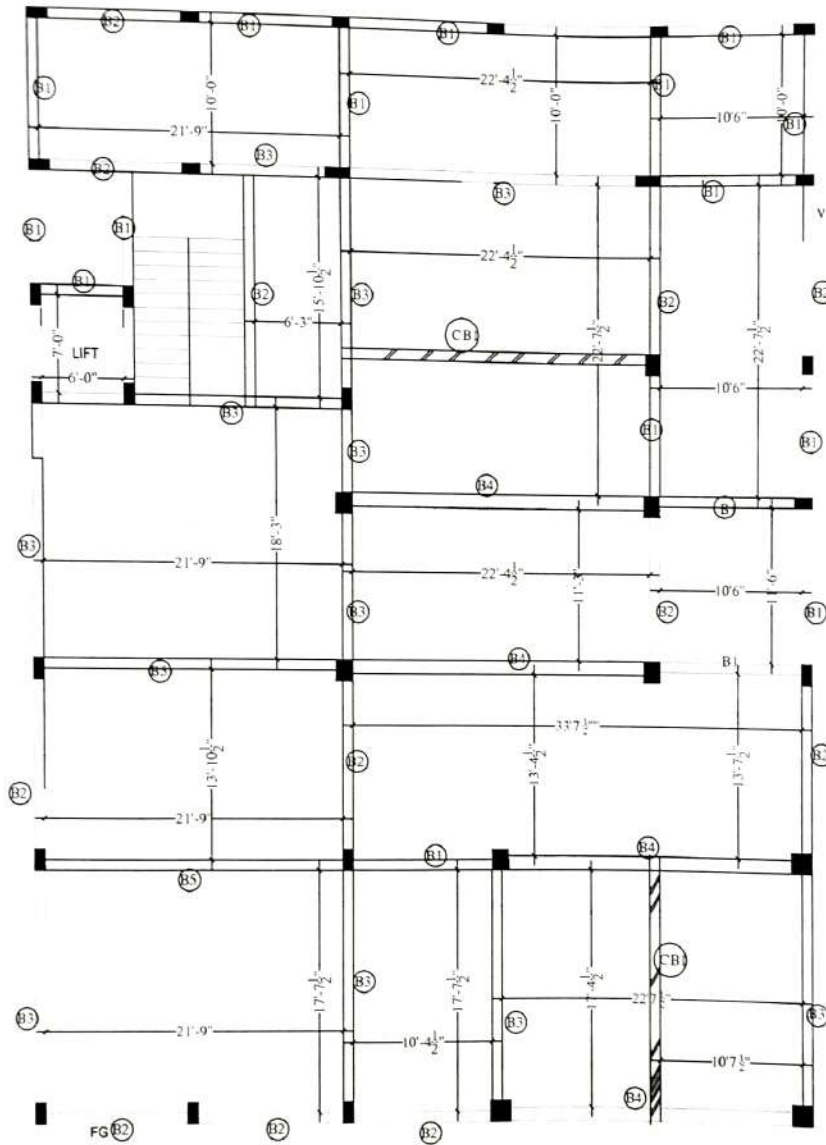
Er. K. MURALI, BE(Civil), M.E(Struct)
Registered CMDA Structural Engineer Grade-I (SE)
Registration No. SE/GR-I/19/03/030
New No.14, Old No.34, Damodaran Street,
T.Nagar, Chennai-17.
Mobile: 97890 18902, Off: 2434 0048
Email Id: muralirasi1971@gmail.com

DETAILA OF GROUND FLOOR ROOF BEAM



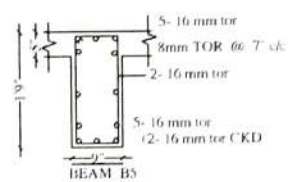
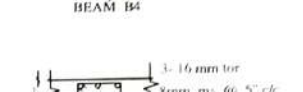
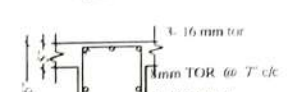
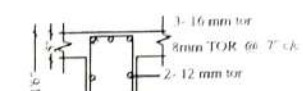
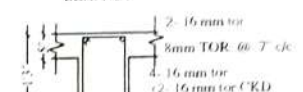
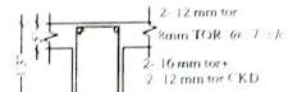
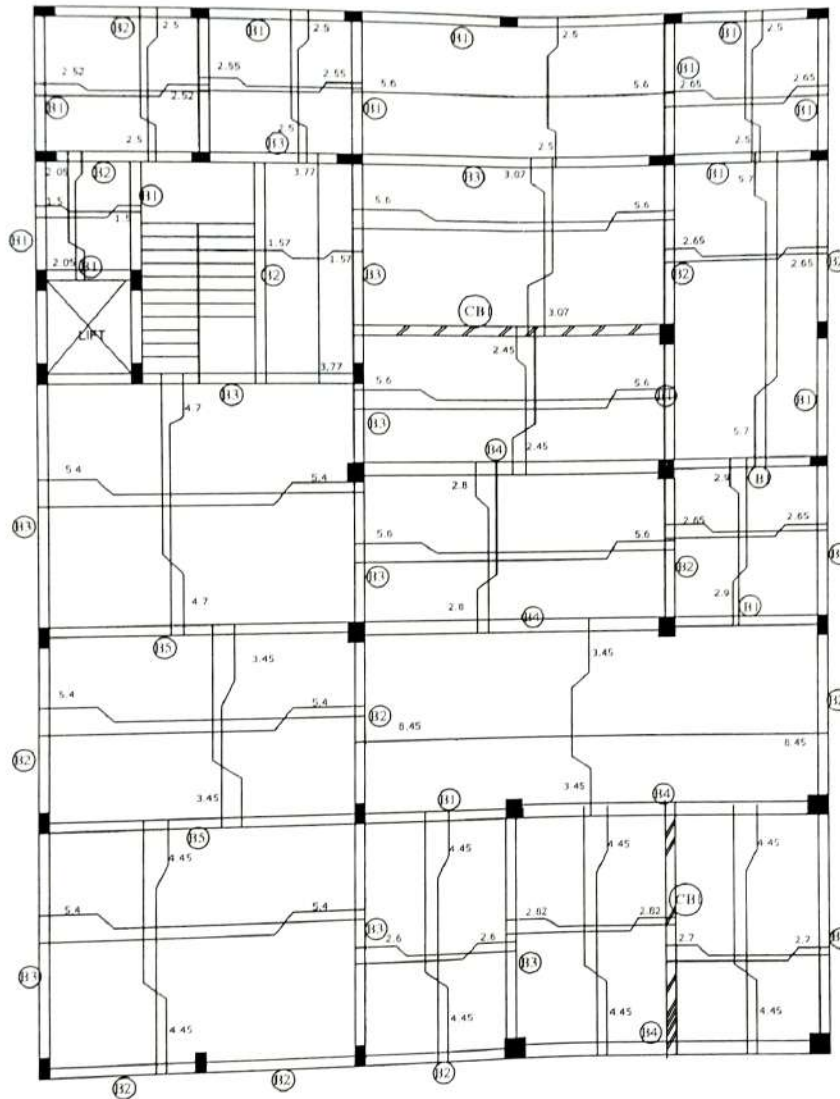

Er. K. MURALI, BE(Civil), M.E(Struct)
 Registered CMDA Structural Engineer Grade-I (SE)
 Registration No. SE/GR-17/19/03/030
 New No.14, Old No.34, Damodaran Street,
 T.Nagar, Chennai-17.
 Mobile: 97890 18902, Off: 2434 0048
 Email Id: muralirasi1971@gmail.com

DETAILS OF FIRST FLOOR ROOF BEAM



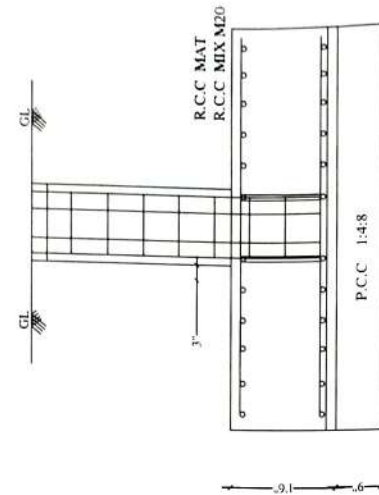
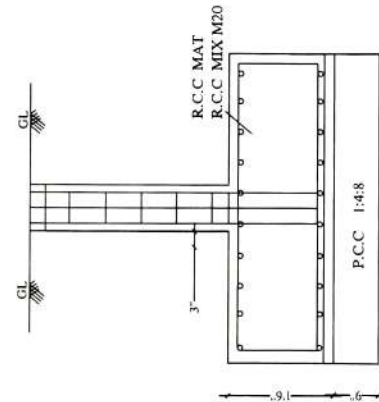
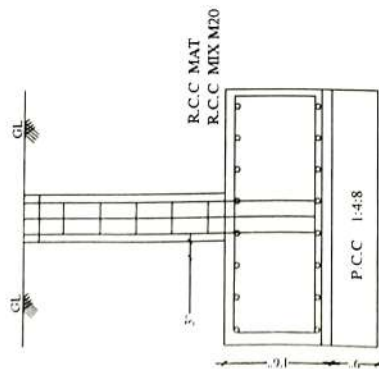
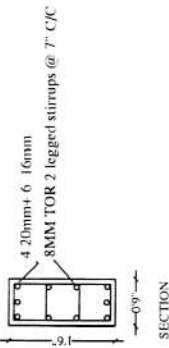
Er. K. MURALI, BE(Civil), M.E(Struct)
 Registered CMDA Structural Engineer Grade-I (SE)
 Registration No. SE/GR-1/19/03/030
 New No.14, Old No.34, Damodaran Street,
 T.Nagar, Chennai-17.
 Mobile: 97890 18002, Off: 2434 0048
 Email Id: muralirasi1971@gmail.com

DETAILS OF SECOND FLOOR ROOF BEAM

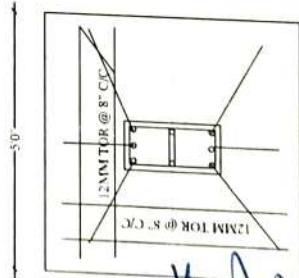



Er. K. MURALI, BE(Civil), M.E(Struct)
 Registered CMDA Structural Engineer Grade-I (SE)
 Registration No. SE/GR-I/19/03/010
 New No.14, Old No. 34, Damodaran Street,
 T.Nagar, Chennai 17
 Mobile: 97890 18902, Off: 2434 0048
 Email ID: muraliast9710@gmail.com

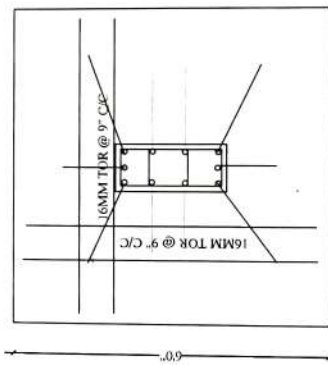
FOOTING WITH COLUMN DETAILS



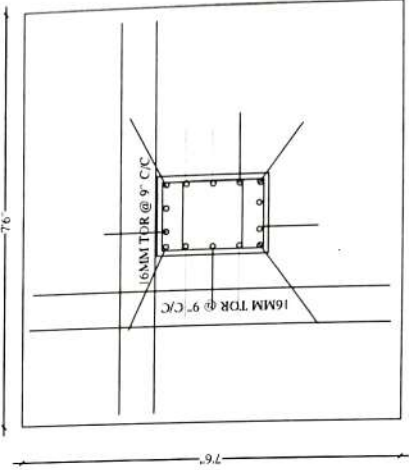
COLUMN SECTION



COLUMN SECTION



COLUMN SECTION

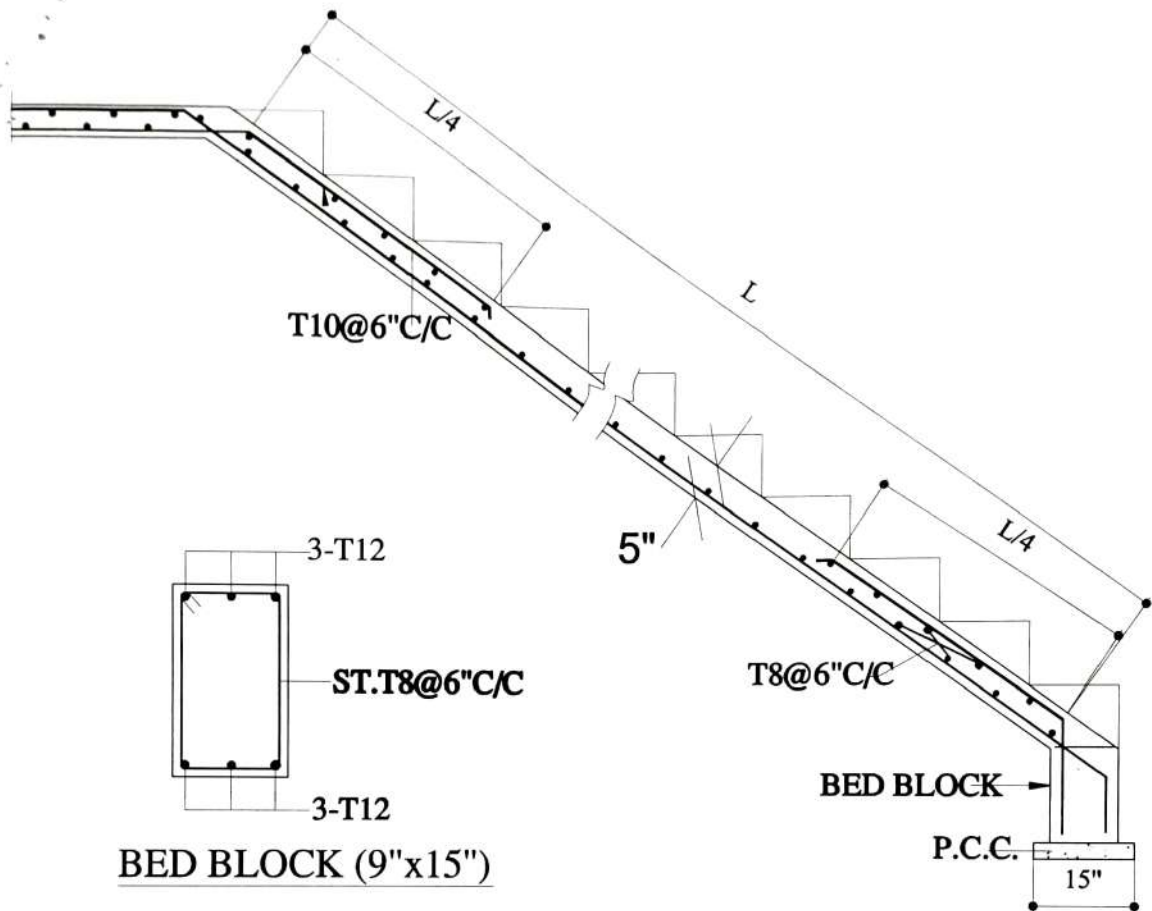


COLUMNS A3,A4,A5,A6,B7,B3,C1,C2,
D7,F7,G7,I6, J6(13 NO)

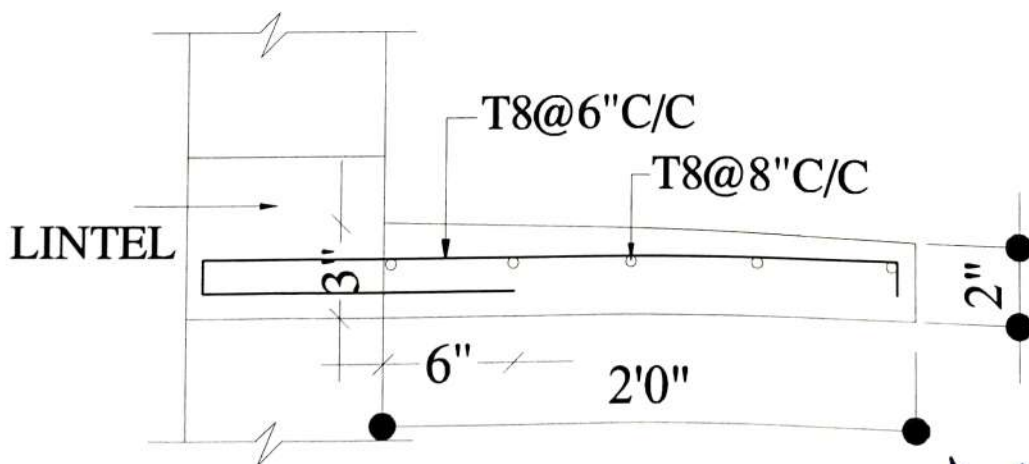
COLUMNS A1,A7, B1,B4,B6,D6,E1,E2,E4,G1
G3, H1,H3,H4,J1,J3,J4(17NOS)

COLUMNS F4,F6,G4,G6,H5,H7,J5,J7(8 NO)

EL. K. MURALI, BE(Civ), M.E(Struct)
Registered CMDA Structural Engineer Grade-I (SE)
Registration No. SE/GR-I/19/03/030
New No.14, Old No.34, Damodaran Street,
T.Nagar, Chennai-17.
Mobile: 97890 18902, Off: 2434 0048
Email id: muralirasi1971@gmail.com



STAIR CASE DETAILS



SUNSHADE DETAILS

S. Murali
S. MURALI, BE(Civil), M.E(Struct)
 Registered CMDA Structural Engineer Grade-I (SE)
 Registration No. SE/GR-I/19/03/030
 New No.14, Old No.34, Damodaran Street,
 T.Nagar, Chennai-17.
 Mobile: 97890 18902, Off: 2434 0048
 Email id: muralirasi1971@gmail.com

LC

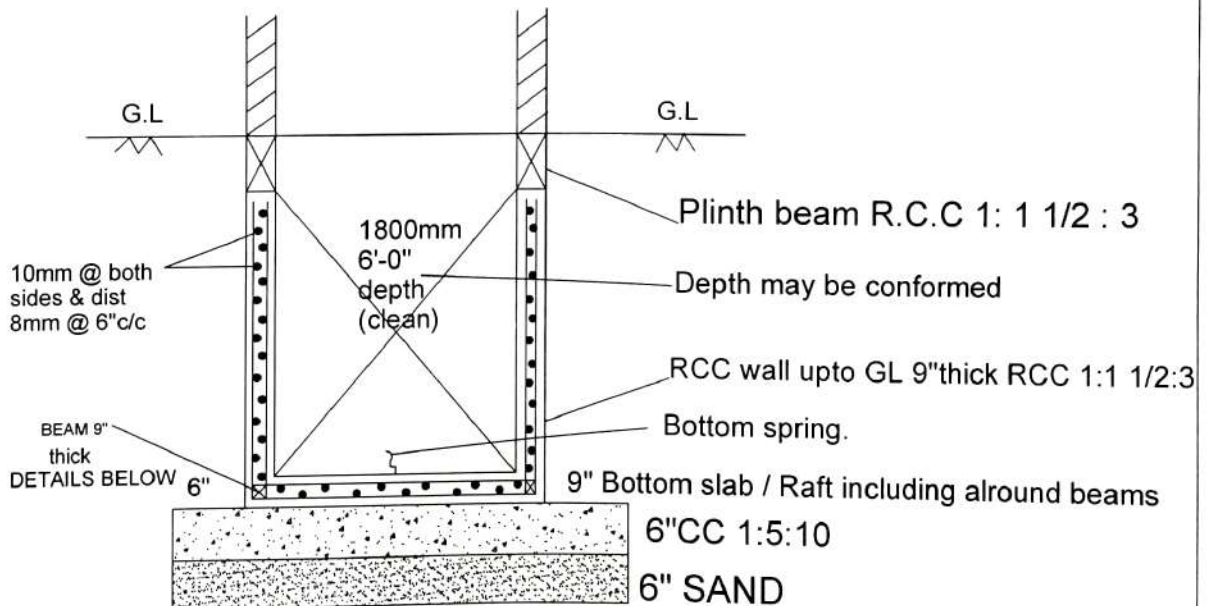
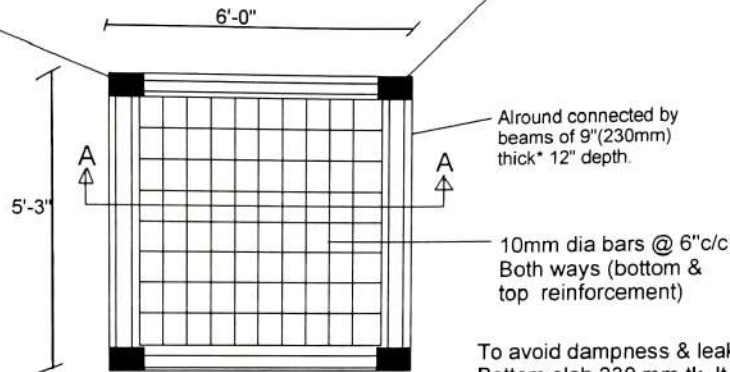
LIFT COLUMN (SIZE- 9"x18")

DETAILS OF LIFT FOUNDATION

LIFT COLUMN (SIZE- 9"x18")

4 Nos 20 mm

4 Nos 20 mm



SECTION A-A

Er. K. MURALI, BE(Civil), M.E(Struct)
 Registered CMDA Structural Engineer Grade-I (SE)
 Registration No. SE/GR-I/19/03/030
 New No.14, Old No.34, Damodaran Street,
 T.Nagar, Chennai-17.
 Mobile: 97890 18902, Off. 24 34 0048
 Email Id: muralirasi1971@gmail.com



CHENNAI METROPOLITAN DEVELOPMENT AUTHORITY
"Thalamuthu 'Nagaraj' Building", No.1, Gandhi Irwin Road,
T. Nagar, Chennai-600 008.

PROFESSIONAL REGISTRATION CERTIFICATE

This is to certify that the **Thiru K. MURALI** has enrolled as **Registered Structural Engineer Grade-I (SE)** with Chennai Metropolitan Development Authority (CMDA) who has the qualification of **M.E.,(Structural Engg.)** and experience in the relevant field for 14 years.

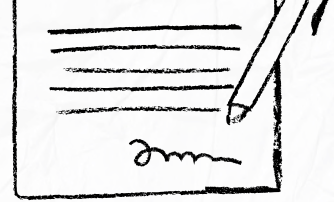
He has been given the Registration No **SE/GR-1/19/03/030** on **22.03.2019**. He shall be required to comply with the duties and responsibilities prescribed by the Government of Tamil Nadu, Part-V, "Registration of Professionals", Tamil Nadu Combined Development and Building Rules, 2019 approved vide G.O.(Ms) No.18 MAWS (MAI) Dept. dated 04.02.2019.

This Registration is valid upto **21.03.2024**



M. MUNIPRASAD
ASSISTANT PLANNER
CHENNAI METROPOLITAN DEVELOPMENT AUTHORITY
CHENNAI - 600 008.


Er. K. MURALI, BE(Civil), M.E(Struct)
Registered CMDA Structural Engineer Grade-I (SE)
Registration No. SE/GR-1/19/03/030
New No.14, Old No.34, Damodaran Street,
T.Nagar, Chennai-17.
Mobile: 97890 18902, Off: 2434 0048
Email Id: muralirasi1971@gmail.com



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.



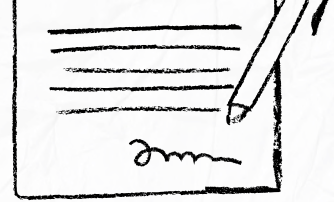
NRI & Investment Services

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



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](tel:+919996129996)
www.verified.realestate