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DHANAA SUNDARARAJULU AND ASSOCIATES

Structural Engineering Consultant

DSA

Er. G. DHANA LAKSHMI, CEng.,
M.Tech(Struct.,)B Tech(Civil), AMIA Struct E, AMIE,
Registered Structural Engineer- (CMDA, GCC,)

Plot No.1&2, Kabilar Street, Senthil Nagar,
Thirumullaivoyal, Chennai – 600 062,
Mob.: 98406 22035, Email: dhanastructural@gmail.com
dhanaasassociates@gmail.com

Dt.11.03.2025

STABILITY CERTIFICATE

PROPERTY AT:

REPORT FOR THE PROPOSED CONSTRUCTION OF A RESIDENTIAL APARTMENT AT PLOT NO. 104, 110, 111 & 112, MANIMEGALAI NAGAR EXTENSION, CHENNAI – 600 199, COMPRISED IN S.NO. 680/1B1A2, 680/ 1B2A1A2, PALLIKARANAI VILLAGE, SHOLINGANALLUR TALUK, CHENNAI DISTRICT, GREATER CHENNAI CORPORATION, DIVISION NO. 190, ZONE: XIV

PREPARED BY :

Er. G. DHANA LAKSHMI, CEng.,
M.Tech(Struct.,)B Tech(Civil), AMIA Struct E, AMIE,

Plot No.1&2, Kabilar Street, Senthil Nagar,
Thirumullaivoyal, Chennai – 600 062

Mob.: 98406 22035,
Email: dhanastructural@gmail.com
dhanaasassociates@gmail.com

THE SCHEDULE

FORM A

[Form of application under sub-section (1)/sub-section (2) of section 4 of the Tamil Nadu Public Buildings (Licensing) Act,1965 (Tamil Nadu Act XIII of 1965) referred to in rules 3 of the Tamil Nadu Public Buildings (Licensing) Rules,1966.]

From

1. Mr.R.Vijay Kannan (General Power of Attorney & Owner)
2. Mr.R.Ashok Kumar (Owner)
3. Mr.G.Mallinathan (Owner)
4. Mr.K.Sukumar (Owner)
5. Mr.S.Ramesh (Owner)
Plot No.104, 110, 111 & 112,
Manimegalai Nagar Extension,
Pallikaranai Village,
Sholinganallur Taluk, Chennai District.

Sir,

1. I intend/to use the Proposed Construction of Residential Apartment which is situated in the site or Plot of land at Survey No. **680 / 1B1A2, 680 / 1B2A1A2,** Manimegalai Nagar Extension, Pallikaranai Village, Sholinganallur Taluk, Chennai District and specified in the statement enclosed, as a Residential Apartment for a period of **3 Years** from **11.03.2025 to 10.03.2028**

2. The year of Construction and the present approximate cost of construction and the purpose for which it is to be used or is being used as Residential Apartment are also furnished in the statement accompanying this application.

3. I enclose a chalan for Rs.----------

4. I also enclose a certificate of structural soundness in the prescribed form furnished by the Engineer **Er.G.Dhana Lakshmi, C.E., B.Tech(Civil), M.Tech.(Struct.,)**

Signature of the Owner of the Building

Dated :

Enclosures: (1) Statement.

(2) Chalan for Rs ---------- towards the Application Fees

REPORT FOR THE PROPOSED CONSTRUCTION OF A RESIDENTIAL APARTMENT AT PLOT NO. 104, 110, 111 & 112, MANIMEGALAI NAGAR EXTENSION, CHENNAI – 600 199, COMPRISED IN S.NO. 680/1B1A2, 680/ 1B2A1A2, PALLIKARANAI VILLAGE, SHOLINGANALLUR TALUK, CHENNAI DISTRICT, GREATER CHENNAI CORPORATION, DIVISION NO. 190, ZONE: XIV

INTRODUCTION

The Report has been prepared for the Proposed Construction of Residential Apartment at Survey No. Survey No. **680 / 1B1A2, 680 / 1B2A1A2,** Manimegalai Nagar Extension, Pallikaranai Village, Sholinganallur Taluk, Chennai District. This Report deals with the Detailed Analysis and Design of Residential Building.

GEOMETRY

The Proposed Building is a R.C.C Framed Structure. The building consists of **Stilt + Five Floors only.** The usage of the building is enabled for Residential purpose.

MATERIAL

Reinforced Cement Concrete

Grade of Concrete - M 30 (Deign Mix) for Pile, Pile Caps and Columns.

Grade of Concrete - M 25 (Deign Mix) for RCC Beams, Slabs, etc.,

Grade of steel – Fe 500

LOADINGS :

a. Dead Load

Unit weight of Concrete	=	25 kN/m^3
Unit weight of Brick Work	=	20 kN/m^3 (9" / 4.5" BW)
Unit weight of Aerocon Block	=	6.50 kN/m^3
Weathering Course	=	1.50 kN/m^2

Er. G. DHANALAKSHMI, M.Tech., (Str...
B.Tech (Civil), AMIA Struct E. AMIE., C. E...
RSE No. 201662023/SE/Gr-II
Plot No. 1&2, Prabhu Homes, F3, 1st Floor,
Kabilar Street, Senthil Nagar,
Thirumullaivoyal, Chennai-600 062.
Ph: 9840622035, E-mail: dhanastructural@gmail...

b. Live Load

Live Load on Floor = 2.00 kN/m^2

c. Seismic Load

Seismic loads are considered as per IS 1893 2002.

Seismic Zone	- III
Zone Factor	- 0.16
Importance Factor	- 1
Soil Type	- Medium Type II
Response Reduction factor	- 1.5

All other Dead & Live loads are given as gravity loads. The detailing of reinforcement is done as per IS 456-2000, IS 13920:1993 and SP 34. The entire structure is analyzed for each load and Load combinations.

LOAD COMBINATIONS

1. 1.5 Dead Load + 1.5 Live Load
2. 0.9 Dead Load + 1.5 Earthquake X
3. 0.9 Dead Load + 1.5 Earthquake -X
4. 0.9 Dead Load + 1.5 Earthquake Z
5. 0.9 Dead Load + 1.5 Earthquake -Z
6. 0.9 Dead Load + 1.5 Windload X
7. 0.9 Dead Load + 1.5 Windload -X
8. 0.9 Dead Load + 1.5 Windload Z
9. 0.9 Dead Load + 1.5 Windload -Z

Er. G. DHANALAKSHMI, M.Tech., (Struct.)
B.Tech (Civil), AMIA Struct E. AMIE., C. Engg
RSE No. 201662023/SE/Gr-II
Plot No. 1&2, Prabhu Homes, F3, I Floor,
Kabilar Street, Senthil Nagar,
Thirumullaivoyal, Chennai-600 062.
Ph: 9840622035, E-mail: dhanastructural@gmail.com

Loads due to Slab

Self-Weight of Slab	-	(0.13 * 2500)	-	325 kg / sq m
Live Load	-		-	200 kg / sq m
Floor Finish	-		-	100 kg / sq m
Unforeseen Load	-		-	75 kg / sq m
Total Load	-		-	**700 kg / sq m**

ANALYSIS

The entire analysis is carried out using finite element method using the program of Staad pro package for Residential building as per approval drawing. The beams and columns are modeled as frame elements and the slabs are modeled as shell element. The columns are assumed to be Fixed at the base. Seismic Analysis is carried out for seismic forces corresponding to **Zone III** of seismic zones of India maps per IS 1893 -2002. Auto generation of lateral loads is done by the program itself for the corresponding seismic factors.

LOAD CASES :

1. Dead Load (DL) : Loads from Self weight of Slab, Beams, Walls, Staircase and Water Tank are taken as Dead Load of the structure.
2. Live Load (LL) : The live load of this structure is calculated as per IS:875 (part 2) for all types of Residential building should be taken as **2 kn/sqm.**

COVER FOR REINFORCEMENT:

Cover for reinforcement is considered as per table 16A of NBC, for a fire resistance of 2 hrs

1. Pile Foundation = 50 mm
2. Pile Cap = 60 mm
3. Columns = 40 mm
4. Roof Slabs = 20 mm
5. Roof Beams = 30 mm

Design for Stilt + Five Floors Only.

Er. G. DHANALAKSHMI, M.Tech.,
B.Tech (Civil), AMIA Struct E. AMIE., C. Engg.,
RSE No. 201662023/SE/Gr-II
Plot No. 1&2, Prabhu Homes, F3, 1st Floor,
Kabilar Street, Senthil Nagar,
Thirumullaivoyal, Chennai-600 062.
Ph: 9840622035, E-mail: dhanastructural@gmail.com

Codes Referred:

- I.S. 875 - 1987 CODES OF PRACTICES for design loads (Part 1,2 & 3)
- I.S. 456 - 2000 & SP – 16 CODES OF PRACTICES for Plain and Reinforced Concrete
- I.S. 1786 - 1985 CODE PF PRACTICES specified for high strength deformed steel bars & wires for concrete reinforcement.
- I.S. 1904-1986 CODE OF PRACTICES for design of construction of foundation in soils.
- IS 13920:1993 CODE OF PRACTICES for Ductile Detailing
- IS 1893-2002 CODE OF PRACTICES for Earthquake Resistant
- SP:34(S&T)-Hand Book on Concrete Reinforcement and Detailing – 1987.
- SP:23(S&T)-Hand Book of Concreter Mixes – 1982.

DESIGN CONCEPT:

- Limit state concept of design will be used as per IS: 456-2000 & SP-16
- The detailing of reinforcement shall be done satisfying the requirements of IS 465-2000
- SP-16, IS: 13920 and SP-34
- The slabs and beams are checked for deflection as per IS 456-2000
- Cover for reinforcement is considered as per Table 16A of NBC, for a Fire resistance of 2 Hrs.

PREAMBLE :

1. I hereby certify that the Structural Design Calculation is done for Critical Pile, Pile Cap, Columns, Beams and Slabs for the building.
2. The usage of the building is for Residential Purpose.
3. The building is designed for **Stilt + Five Floors Only.**
4. The Super Structure is built with 230 mm thick outer walls and 115 mm thick inner walls.

Er. G. DHANALAKSHMI, M.Tech., (Struct.)
B.Tech (Civil), AMIA Struct E. AMIE., C. Eng.
RSE No. 201662023/SE/Gr-II
Plot No. 1&2, Prabhu Homes, F3, 1st Floor,
Kabilar Street, Senthil Nagar,
Thirumullaivoyal, Chennai-600 062.
Ph: 9840622035, E-mail: dhanastructural@gmail

DHANAA SUNDARARAJULU AND ASSOCIATES

Structural Engineering Consultant

DSA

Er. G. DHANA LAKSHMI, CEng.,
M.Tech(Struct.,)B Tech(Civil), AMIA Struct E, AMIE,
Registered Structural Engineer- (CMDA, GCC,)

Plot No.1&2, Kabilar Street, Senthil Nagar,
Thirumullaivoyal, Chennai – 600 062,
Mob.: 98406 22035, Email: dhanastructural@gmail.com
dhanaasassociates@gmail.com

Dt.11.03.2025

STATEMENT ACCOMPANYING FORM –"A"

1. Applicant : **Mr.R.Vijay Kannan** (GPA& Owner)
Mr.R.Ashok Kumar (Owner)
Mr.G.Mallinathan (Owner)
Mr.K.Sukumar (Owner)
Mr.S.Ramesh (Owner)

2. Door No./S.No of the building : 680 / 1B1A2, 680 / 1B2A1A2,

3. Name &Location: Street/Ward No. : Plot No.104,110,111&112,
Manimegalai Nagar Extn.,
Pallikaranai Village,
Sholinganallur Taluk,
Chennai District.

2 Year of Construction : Proposed Construction

3 Approximate Cost of construction as per Current rates for Residential Apartment : **Rs.3,55,00,000/-**

4 Purpose for which the Building is Being used Or proposed to be used : Enabled for Residential purpose

5 Purpose for which the building has (in there to) been used : Enabled for Residential purpose

G. DHANALAKSHMI, M.Tech., (Struct.,)
B.Tech (Civil), AMIA Struct E, AMIE,
RSE No. 201662023/SE/Gr II
Plot No. 1&2, Prabhu Homes, F3, 1st Floor,
Kabilar Street, Senthil Nagar,
Thirumullaivoyal, Chennai-600 062.
Ph: 9840622035, E-mail: dhanastructural@gmail.com

6 Details of Construction of the Building (particulars)
of the foundation, soil Specification of the various parts as under.

(i)	Foundation	: Bored Cast-in-situ Pile Foundation connected with Pile Caps and Columns
(ii)	Basement	: Yes, R.C.C. Framed Structure with Block Masonry 1: 5
(iii)	Superstructure	: R.C.C. Framed Structure with Brick Masonry
(iv)	Floor and Roof are to be given	: Beams & Slabs are provided
(v)	Period for which the license required	: Three Years (Proposed Building) **(11.03.2025 to 10.03.2028)**

Date:11.03.2025

Signature of the Engineer

Er. G. DHANALAKSHMI, M.Tech., (Struct.)
B.Tech (Civil), AMIA Struct E. AMIE., C. Engg.
RSE No. 201662023/SE/Gr-II
Plot No. 1&2, Prabhu Homes, F3, 1st Floor,
Kabilar Street, Senthil Nagar,
Thiruvallur, Chennai-600 062.
Ph: 9840622035, E-mail: dhanastructural@gmail.com

9.(a) "CERTIFIED that no addition or alteration has been made to the existing or portion of a building for which this application has been made. I undertake to obtain a fresh license in case any addition of alteration is made to the existing or portion of building. I also undertake to obtain fresh license if the purpose for which the license was granted for the use of the building or a portion of the building originally is changed or altered subsequently.

Date:

Signature of the Owner of the Building

DHANAA SUNDARARAJULU AND ASSOCIATES

Structural Engineering Consultant

DSA

Er. G. DHANA LAKSHMI, CEng.,
M.Tech(Struct.,)B Tech(Civil), AMIA Struct E, AMIE,
Registered Structural Engineer- (CMDA, GCC,)

Plot No.1&2, Kabilar Street, Senthil Nagar,
Thirumullaivoyal, Chennai – 600 062,
Mob.: 98406 22035, Email: dhanastructural@gmail.com
dhanaasassociates@gmail.com

FORM-B

Dt.11.03.2025

[Form of certificate of structural soundness under Sub-Section(4) of the Tamil Nadu Public Buildings(Licensing) Act,1965(Tamil Nadu Act XIII of 1965) referred to in rule 4 of the Tamil Nadu Public Buildings (Licensing) Rules,1966.]

I certified that I have gone through the Plan of the Proposed Residential Apartment of the Public building mentioned in the statement and furnish below its Salient Technical Features.

STATEMENT TO ACCOMPANY THE CERTIFICATE OF STRUCTURAL SOUNDNESS

1.	Location of the Building	:	Plot No.104,110,111&112, S.No.680 / 1B1A2,680 / 1B2A1A2, Manimegalai Nagar Extn., Pallikaranai Village, Sholinganallur Taluk, Chennai District.
2.	Age of the Building	:	Proposed Building
3.	Purpose for which the Building is to be proposed	:	Proposed Construction of Residential Building and it is Enable for Residential Purpose.
4.	The Period for which the building will be structural sound	:	60 Years
5.	Remarks	:	Designed as per latest design codes of IS - 456 and IS 13920: 1993 are followed with SP – 16 Design Aid Books for the purpose of Calculations. It is designed by us. It will be safe and stable against all possible Dead loads, live loads and other combination of loads as per IS Code, the Structure is intended to carry.

Er. G. DHANALAKSHMI, M.Tech.,(C...)
B.Tech (Civil), AMIA Struct E, AMIE., C...
RSE No. 201662023/SE/Gr-II
Plot No. 1&2, Prabhu Homes, 13, 1st Floor,
Kabilar Street, Senthil Nagar,
Thirumullaivoyal, Chennai-600 062.
Ph: 9840622035, E-mail: dhanastructural@...

DHANAA SUNDARARAJULU AND ASSOCIATES

Structural Engineering Consultant

DSA

Er. G. DHANA LAKSHMI, CEng.,
M.Tech(Struct.,)B Tech(Civil), AMIA Struct E, AMIE,
Registered Structural Engineer- (CMDA, GCC,)

Plot No.1&2, Kabilar Street, Senthil Nagar,
Thirumullaivoyal, Chennai – 600 062,
Mob.: 98406 22035, Email: dhanastructural@gmail.com
dhanaasassociates@gmail.com

FORM –C

Dt.11.03.2025

[Form of Opinion under sub-section I of Section 5 of the Tamil Nadu Public Buildings (Licensing) Act,1965(Tamil Nadu Act XIII of 1965) referred to in rule 5 of the Tamil Nadu Public Buildings (Licensing) Rules,1966.]

I have gone through the Plan of the Proposed Construction of Residential Apartment specified in the statement below and I have satisfied myself that the Proposed Building is Structurally Sound if it is Constructed as per Structural Design and Plan prepared and supervised by the Qualified Structural Engineer and to be used as Public Building for the purpose noted in the statement, the structural – Soundness of the Building has been verified, taking into account, the loading as per the latest Indian Standard 875, I am therefore the opinion that the License may be granted for the period from **11.03.2025 to 10.03.2028 (Three Years)** inclusive.

Signature of the Engineer

Er. G. DHANALAKSHMI, M.Tech., (Struct.,)
B.Tech (Civil), AMIA Struct E. AMIE., C. Engg.
RSE No. 201662023/SE/Gr-II
Plot No. 1&2, Prabhu Homes, F3, 1st Floor,
Kabilar Street, Senthil Nagar,
Thirumullaivoyal, Chennai-600 062.
Ph: 9840622035, E-mail: dhanastructural@gmail.com

1. FOUNDATION :

a)	Depth below Ground Level	:	34'-0" from existing Ground Level
			Pile Foundation with Pile Cap
b)	Nature of soil met with at foundation level	:	Hard Strata
c)	Pressure at Foundation	:	
d)	Probable safe bearing capacity of the Strata met with foundation	:	Vide Soil Report by M/s.Minerva Civil Testing Lab Pvt., Ltd., Ref., No. R2308337

Er. G. DHANALAKSHMI, M.Tech., (Struct.,)
B.Tech (Civil), AMIA Struct E. AMIE., C. Engg.
RSE No. 201662023/SE/Gr-II
Plot No. 1&2, Prabhu Homes, F3, 1st Floor,
Kabilar Street, Senthil Nagar,
Thirumullaivoyal, Chennai-600 062.
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e) Load to be transmitted by column to Foundation: **240 t (Critical)**

Diameter of Pile **450 mm** considered for this project

Load carrying capacity of single pile for **450** mm diameter-**95 t**

2. SUPERSTRUCTURES :

I)	Maximum Compressive stress in the most Critical Section of masonry	:	5 kg/sq.cm
	Permissible maximum compressive stress in Masonry (BW in CM 1:6, 20cm thick), for (the crushing strength of 80 kg / cm^2) as per Table 4 of IS 1905	:	7 kg/sq.cm
II)	Maximum Compressive stress in the most Critical Section of concrete for M 25 Grade	:	a) Bending : 6 N/mm^2 (60 kg/cm^2) b) Direct : 4 N/mm^2 (40 kg/cm^2)
	Maximum Permissible compressive stress for concrete M25 Grade as per Table 21 of IS 456-2000	:	a) Bending : 8.5 N/mm^2 (85 kg/cm^2) b) Direct : 6 N/mm^2 (60 kg/cm^2)

The Structural Soundness of the Proposed Construction of Residential Apartment loading as per latest Indian Standards (Latest Version and other relevant Indian Standard Code of Practice and I declare that the Proposed Building is Structurally Sound if it is constructed as per Plan and Structural Design prepared by the Qualified Structural Engineer and his regular supervision and to be used as Public Building for the purpose noted in the statement. A License may be granted for the period from **11.03.2025** to **10.03.2028** (Three Years) inclusive.

Signature of the Engineer

Er. G. DHANALAKSHMI, M.Tech., (Struct.)
B.Tech (Civil), AMIA Struct E. AMIE., C. Engg.
RSE No. 201662023/SE/Gr-II
Plot No. 1&2, Prabhu Homes, F3, 1st Floor,
Kabilar Street, Senthil Nagar,
Thirumullaivoyal, Chennai-600 062.
Ph: 9840622325, E-mail: dhana[illegible]

DECLARATION

I, **G. DHANA LAKSHMI,** M.Tech. (Struct.,) Daughter of C. Ganesan, Plot No. 1 & 2, Kabilar Street, Senthil Nagar, Thirumullaivoyal, Chennai – 600 062 do hereby declare that I possess the Qualification and experience specified in the Table to Rule II, of the Tamil Nādu Public Buildings (Licensing Rules,1966) for issuing the Certificate of Structural Soundness of the Buildings covered by the Certificate.

Signature of the Engineer

Er. G. DHANALAKSHMI, M.Tech., (Struct.,)
B.Tech (Civil), AMIA Struct E. AMIE., C. Engg.
RSE No. 201662023/SE/Gr-II
Plot No. 1&2, Prabhu Homes, F3, 1st Floor,
Kabilar Street, Senthil Nagar,
Thirumullaivoyal, Chennai-600 062.
Ph: 9840622035, E-mail: dhanastructural@gmail.c

1. Name & Address	:	Er. G. DHANA LAKSHMI, C.ENG., B.Tech.(Civil),M.Tech. (Struct.,) Plot No. 1 & 2, Kabilar Street, Senthil Nagar, Thirumullaivoyal, Chennai – 600 062.
2. Educational Qualification	:	B.Tech.(Civil), M.Tech.(Struct.,)
3. No. of Years of Experience & Nature thereof	:	18 Years of experience in the Engineering Field of Civil, Structural and Construction Engineering and Management

Signature of the Engineer

Er. G. DHANALAKSHMI, M.Tech., (Struct.,)
B.Tech (Civil), AMIA Struct E. AMIE., C. Engg.
RSE No. 201662023/SE/Gr-II
Plot No. 1&2, Prabhu Homes, F3, 1st Floor,
Kabilar Street, Senthil Nagar,
Thirumullaivoyal, Chennai-600 062.
Ph: 9840622035, E-mail: dhanastructural@gmail.c

1. DESIGN OF PILE FOUNDATION :

Load carrying capacity of 450 mm dia pile = 95 t (or) 950 kn (For Single Pile)

(As per soil report)

As per **IS :2911(Part1/Section 1) : 2010,** The design of the reinforcing cage varies depending upon the installation condition, the nature of the sub soil and the nature of load to be transmitted by the shaft axial or otherwise.

The minimum area of longitudinal reinforcement of any type of grade with in the pile shaft be 0.4% of the Cross-Sectional area of the Pile Shaft. The minimum reinforcement shall be provided throughout the length of the shaft

$$\frac{3.14 \times (450)^2}{4} \times \frac{0.8}{100} = 1272 \text{ mm}^2$$

Provide 8 Nos. of Y 16 mm diameter bars.

Provide 8 mm diameter, Helical Binder @ 150mm c/c

Er. G. DHANALAKSHMI, M.Tech., (Struct.)
B.Tech (Civil), AMIA Struct E. AMIE., C. Engg.
RSE No. 201662023/SE/Gr-II
Plot No. 1&2, Prabhu Homes, F3, 1st Floor,
Kabilar Street, Senthil Nagar,
Thirumullaivoyal, Chennai-600 062.
Ph: 9840622035, E-mail: dhanastructural@gmail.com

2. DESIGN OF RCC PILE CAP

Three Pile Group - PC1

Total Axial Load	**240**	**T**
Load Carring Capacity for dia pile	**95**	**T**
Dia of Pile	**450**	**MM**
Fck	**30**	**MM**
Clear cover	**60**	**MM**
Dia of rod	**20**	**MM**
Fy	**500**	

No of piles	2.5		
say	3	piles (Manual Entry)	
C/C Spacing Btw 2 piles should not less than 2.5 times the diameter of the shaft as per (IS Code Pg*11			
ie 2.5*dia of pile	1125	MM	
Load on each pile In Ton	80	T	
Load on each pile In KN	800	KN	
Add 10% for self wt of pile cap	80	KN	
Total Load	880	KN	
Factor load =1.5*total load	1320	KN	
load*2*(1/3)*center to certer pile	1006	KNm	
depth	569	MM	
Toe arrest punching shear =d*2	1138	MM	
Say D	1200	(Manual Entry)	
Eff depth = D-60-(dia of rod/2)	1130	MM	
Ast=((factor moment)/(.875*Fy*.8*Eff depth))	2543	SQM	
provide	8.10	Y	20
Final result	**10**	**Y**	**20**

Y 20 @ 130 mm c/c

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RSE No. 201662023/SE/Gr-II
Plot No. 1&2, Prabhu Homes, F3, 1st Floor,
Kabilar Street, Senthil Nagar,
Thirumullaivoyal, Chennai-600 062.
Ph: 9840622035, E-mail: dhanastructural@gmail

3. DESIGN OF REINFORCED CONCRETE COLUMN

Column size = 300 mm x 750 mm (or) 12" x 2'-6"

Grade of concrete = M 25

Grade of steel = Fe 500

Column load from Staad Analysis,

P_u = 240 t (or) 2400 kn

M_{ux} = 0.735 knm

M_{uz} = 3.870 knm

d^1/D = 40 / 750 = 0.053 (say 0.100)

$$\frac{P_u}{Fck \times b \times d} = \frac{2400 \times 10^3}{25 \times 300 \times 750} = 0.43$$

$$\frac{M_{uz}}{Fck \times b \times d^2} = \frac{3.870 \times 10^6}{25 \times 300 \times (750)^2} = 9.17$$

As per reference from chart 48, from SP 16 for percentage of steel.

Therefore, percentage of steel, P = 2.60%

Area of steel, Ast = 5850 mm^2

Provide 25 mm diameter of bars of 12 Nos.

Lateral Ties:

Spacing of the lateral ties should be minimum of the following:

a. Least lateral dimension = 300 mm

b. 16 d = 16 x 25 = 400 mm

Therefore, Provide lateral ties Y 10 @ 130 mm c/c

Result:

Size or the Column : 300 mm x 750 mm

Longitudinal Main Renforcement : 12 Nos. 25 mm Dia Rods

Ties : Y 10 @ 125 mm c/c (2 Ties) + (1 Link)

Er. G. DHANALAKSHMI, M.Tech., (Struct)
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Plot No. 1&2, Prabhu Homes, F3, 1st Floor,
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Thirumullaivoyal, Chennai-600 062.
Ph: 9840622035, E-mail: dhanastructural@gmail.

4. DESIGN OF REINFORCED CONCRETE BEAM

SL. No	Decription		Nos	Length	Breadth	Depth	Density	Total Kg	Remarks
	S/W of Beam	1.00	1.00	5.07	0.23	0.45	2500	1312	
	B/w of load	1.00	1.00	5.07	0.12	3.05	2000	3711	
	R/S of load	1.00	1.00	0.76	0.57	-	700	303	
		1.00	0.50	1.22	0.61	-	700	260	
		1.00	1.00	1.94	1.79	-	700	2431	
		0.67	1.00	4.48	1.74	-	700	3623	
	Total							**11641**	Kg
	Point Load - 1								
	S/W of Beam	1.00	1.00	3.58	0.23	0.45	2500	926	
	B/w of load	1.00	1.00	3.58	0.12	3.05	2000	2621	
	R/S of load	1.00	0.50	3.58	1.79	-	700	2243	
		1.00	0.50	1.14	0.57	-	700	227	
		1.00	1.00	1.78	0.67	-	1160	1369	
	Total							7386	
							P1	**3693**	Kg
	Point Load - 2								
	S/W of Beam	1.00	1.00	3.47	0.23	0.45	2500	898	
	B/w of load	1.00	1.00	3.47	0.12	3.05	2000	2540	
	R/S of load	1.00	0.50	3.47	1.74	-	700	2107	
		1.00	1.00	2.86	0.61	-	700	1221	
	Total							6766	
							P2	**3383**	Kg
	Point Load -3								
	S/W of Beam	1.00	1.00	3.47	0.23	0.45	2500	898	
	B/w of load	1.00	1.00	3.47	0.23	0.91	2000	1453	
	R/S of load	1.00	1.00	2.86	0.61	-	700	1221	
	Total							3572	
							P3	**1786**	Kg

Main Beam	**11641**	Kg
Point Load - 1	**3693**	Kg
Point Load - 2	**3383**	Kg
Point Load - 3	**1786**	Kg

Er. G. DHANALAKSHMI, M.Tech., (Str
B.Tech (Civil), AMIA Struct E. AMIE., C. E
RSE No. 201662023/SE/Gr-II
Plot No. 1&2, Prabhu Homes, F3, 1st Floor,
Kabilar Street, Senthil Nagar,
Thirumullaivoyal, Chennai-600 062.
Ph: 9840622035, E-mail: dhanastructural@gmail

SL. No	Decription		Nos	Length	Breadth	Depth	Density	Total Kg	Remarks
				FS	**MB**	**P1**	**P2**	**P3**	
				1.5	4918	2659	2528	843	16422
		Mu	=	16422	Kg.m				
		Ast	=	**1053**	mm^2				
							Nos	**3.35**	**314**
d = 540								Dia	20
	Provide @		*3.35*	*20*	***Size***	*230*	*580*	130	450
			NOS	DIA		**mm**	**mm**	Slab Thick	BD

Provide 4 - Y 20

Result :

Provide Width of Beam: 0.23m, Depth of Beam : 580mm(2'-0") including Slab Thickness

Provide 4 - Y 20Top & Bottom Rods Run Through

Stirrups : Y 8 @ 4" c/c throughout

Er. G. DHANALAKSHMI, M.Tech., (Struct.)
B.Tech (Civil), AMIA Struct E. AMIE., C. Engg.
RSE No. 201662023/SE/Gr-II
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Kabilar Street, Senthil Nagar,
Thirumullaivoyal, Chennai-600 062.
Ph: 9840622035, E-mail: dhanastructural@gmail.c

5. DESIGN OF REINFORCED CONCRETE SLAB :

DATA:

Floor		Stilt Floor		
S. No.	=	S1		
Grade of concrete	=	25	N/mm2	
Grade of steel	=	500	N/mm2	
Cover	=	20	mm	
Ly (Long span)	=	6.44	m	
Lx (Short span)	=	3.47	m	
Ly/Lx	=	1.86	<	2

Slab

Slab thickness D	=	0.13	m	
d	=	105	mm	
Sunkan depth	=	0	m	

LOAD:

Dead load	=	3.25	kN/m2
F.Finish	=	1.00	kN/m2
Wall load	=	0.75	kN/m2
Sunkan load	=	0.00	kN/m2
Live load	=	2.00	kN/m2
(DL+LL)	=	**7.00**	**kN/m2**

DESIGN:

Edge conditions	=	**9**
Short span mid span co.eff. Msx =		**0.107**
Long span mid span co.eff. Msx =		**0.056**

Moment

				say	
Mx	(+ve)	=	13.528	14.528	kNm
My	(+ve)	=	7.080	8.080	kNm

Depth check

Short span Effective depth d = 45.30 < 105 mm

Hence Safe

Deflection

Basic	L/d	=	20			M.F	=	1.54
Allowable	L/d	=	30.884	<	Actual	L/d	=	33.048

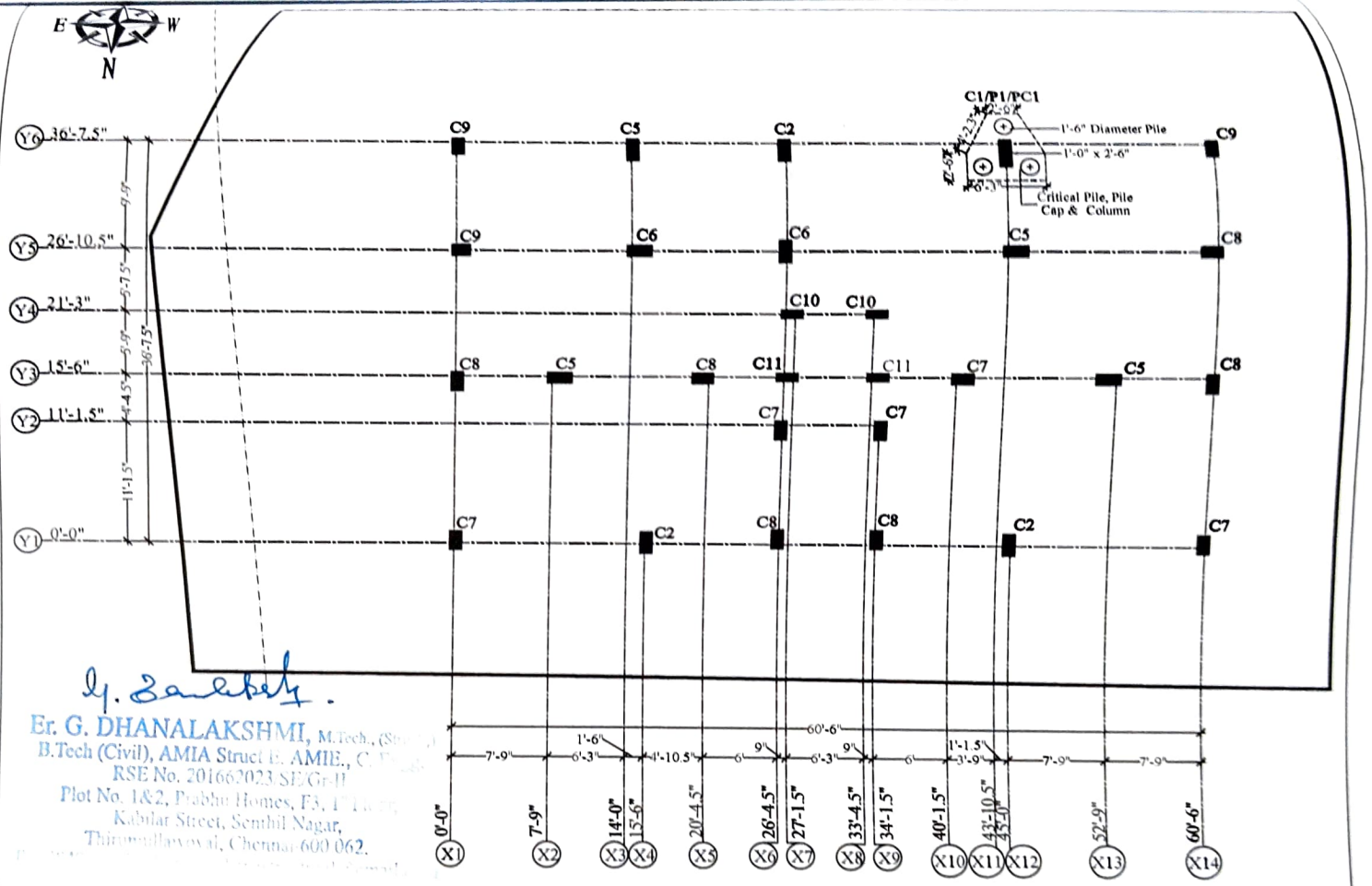
REINFORCEMENT

	Ast req (mm2/m)	Min Ast (mm2/m)	st provided (mm2/m)	dia of ba mm	Spacing mm	inch
(+ve)	397.59	156	**604**	10	130	5
(+ve)	221.13	156	**387**	8	130	5

Main Rod
10Y-130mm

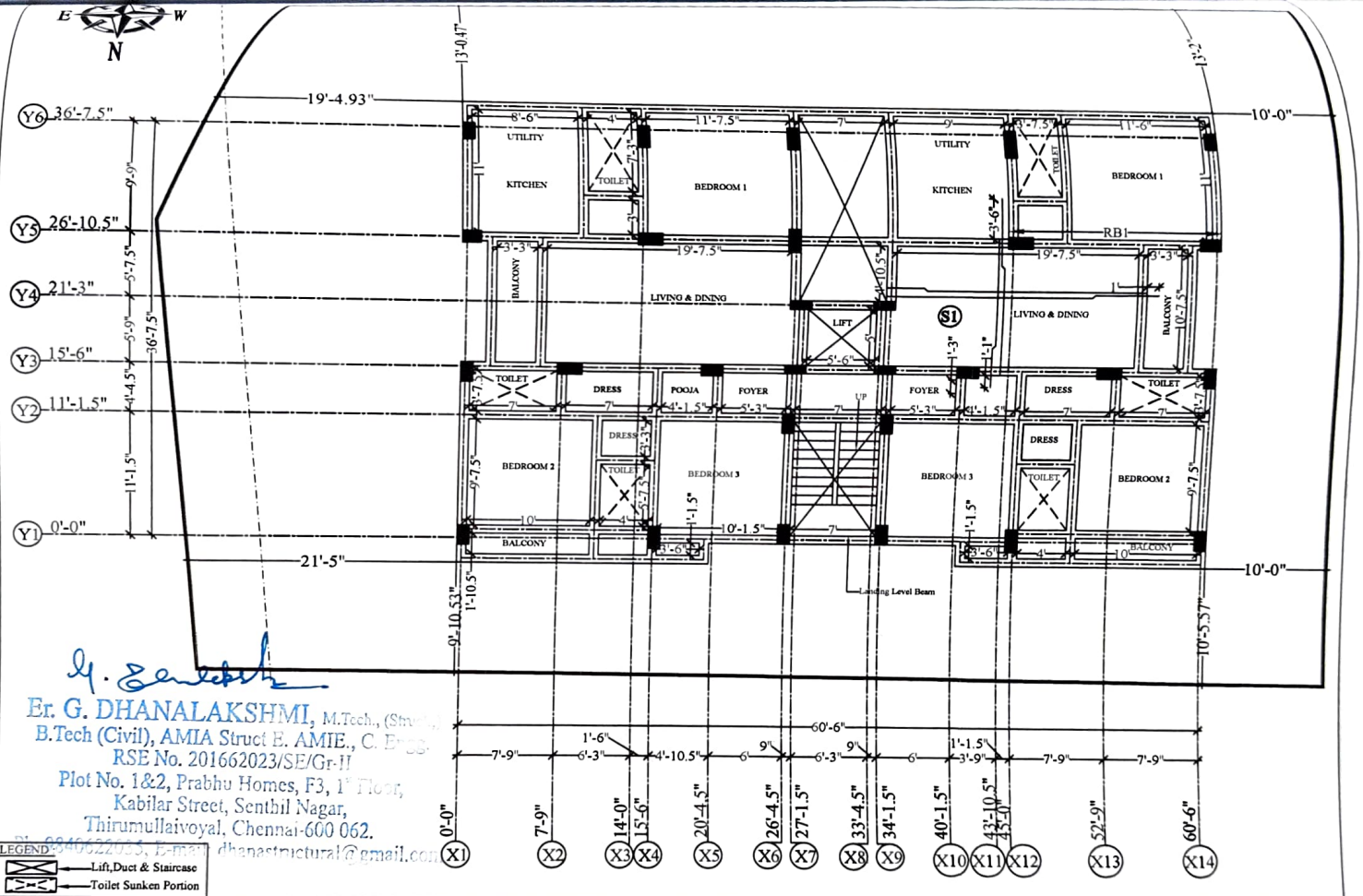
Distributor
8Y-130mm

G. Dhanalakshmi
Er. G. DHANALAKSHMI, M.Tech., (Str...
B.Tech (Civil), AMIA Struct E. AMIE., C. E...
RSE No. 201662023/SE/Gr-II
Plot No. 1&2, Prabhu Homes, F3, 1st Floor,
Kabilar Street, Senthil Nagar,
Thirumullaivoyal, Chennai-600 062.
Ph: 9840622035, E-mail: dhanastructural...



Er. G. DHANALAKSHMI, M.Tech., (Str...)
B.Tech (Civil), AMIA Struct E, AMIE., C...
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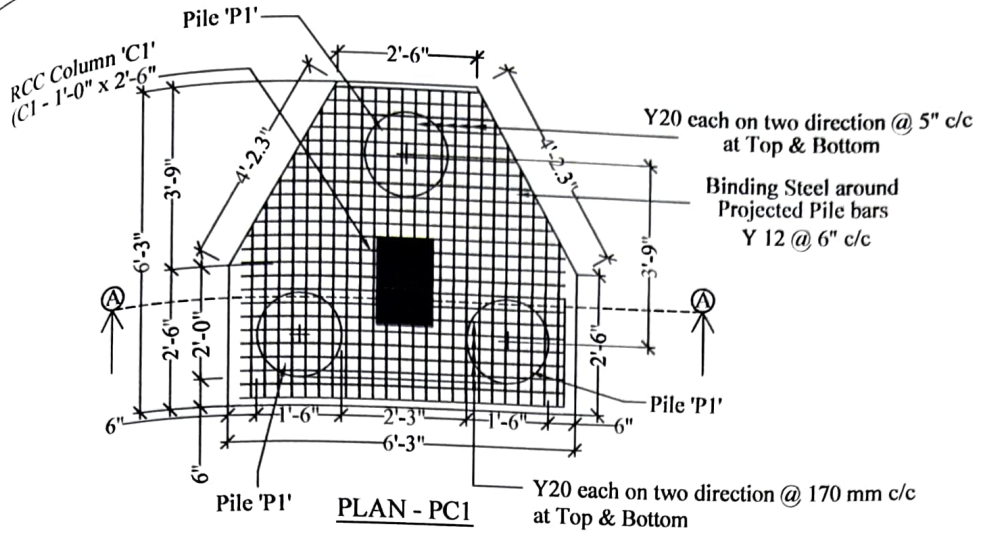
Title : Pile,Pile Cap & Column Marking Layout	**Architect :** Arch. Avinash **Owner :** Mr. R.Vijay Kannan (M/s.VJR Builders)		**Structural Consultant :** DHANAA SUNDARARAJULU AND ASSOCIATES Survey, Quantity Survey & Structural Engineering Consultant DSA Plot No.1 & 2, Kabilar Street, Senthil Nagar, Thirumullaivoyal, Chennai - 62. Mob.: 98406 22035 E-mail : dhanastructural@gmail.com dhanaasassociates@gmail.com
Site : Plot No. 104,110,111&112, Manimegalai Nagar Extn., Pallikaranai Village	**Scale** : 1" - 10'-0"	**File no** : Dwg.- 14 / 2023	
	Date : 11.03.2025	Sheet no: 1 / 10	
	Dsgn. by : G.D	**Drn. by** : G.D	



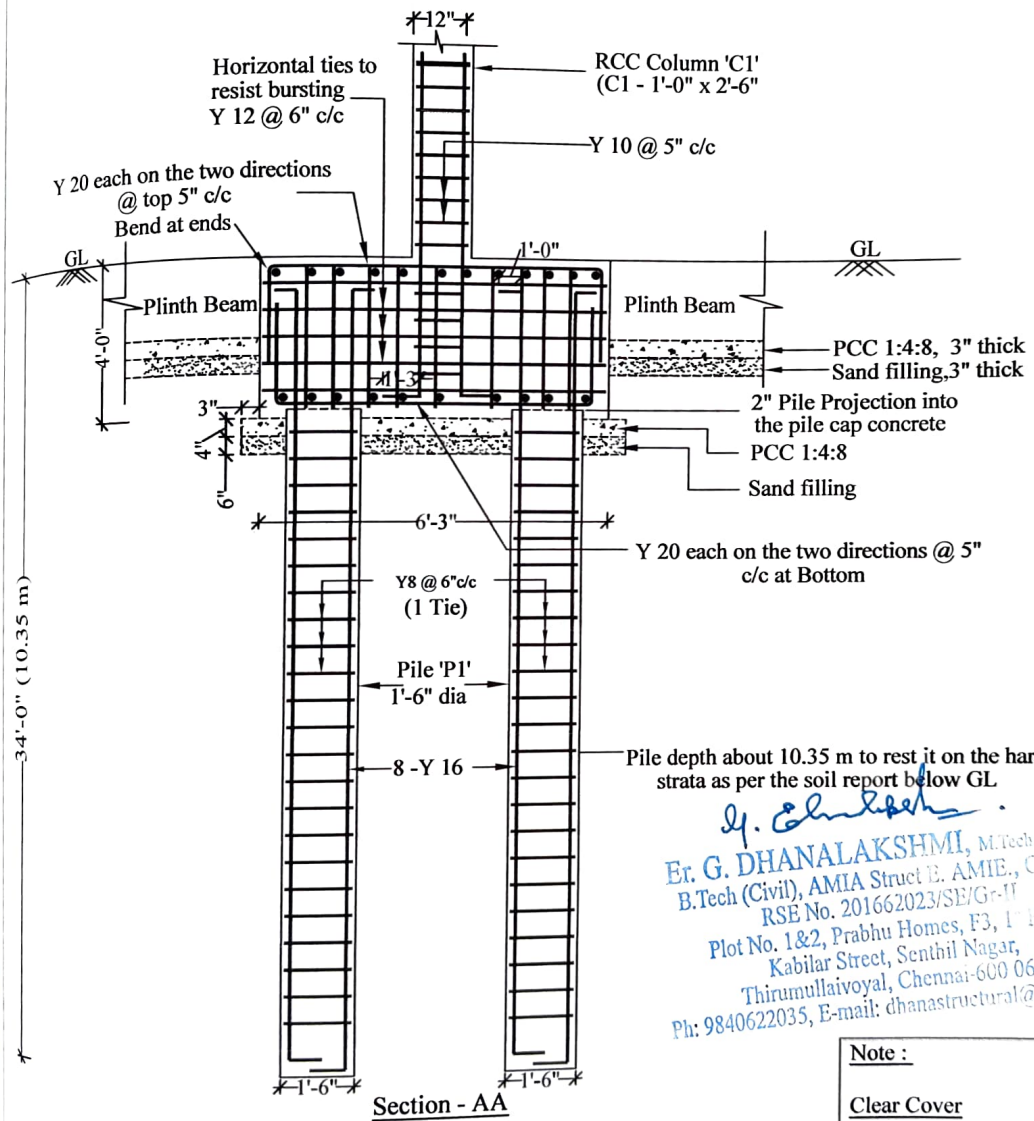
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B.Tech (Civil), AMIA Struct E. AMIE., C. ENGG.
RSE No. 201662023/SE/Gr-II
Plot No. 1&2, Prabhu Homes, F3, 1st Floor,
Kabilar Street, Senthil Nagar,
Thirumullaivoyal, Chennai-600 062.
Ph: 9840622033, E-mail: dhanastructural@gmail.com

LEGEND
Lift,Duct & Staircase
Toilet Sunken Portion

Title : Typical Floor Roof Beam Layout **(Stilt Floor to Fourth Floor)**	**Architect :** Arch. Avinash **Owner :** Mr. R.Vijay Kannan (M/s.VJR Builders)	**Structural Consultant :** DHANAA SUNDARARAJULU AND ASSOCIATES Survey, Quantity Survey & Structural Engineering Consultant DSA Plot No.1 & 2, Kabilar Street, Senthil Nagar, Thirumullaivoyal, Chennai - 62. Mob.: 98406 22035 E-mail : dhanastructural@gmail.com dhanaasassociates@gmail.com
Site : Plot No. 104,110,111&112, Manimegalai Nagar Extn., Pallikaranai Village	**Scale** : 1" - 10'-0" / **File no** : Dwg.- 14 / 2023 **Date** : 11.03.2025 / **Sheet no:** 2 / 10 **Dsgn. by :** G.D / **Drn. by :** G.D	



PLAN - PC1



Section - AA

PILE CAP mkd. PC1 (For C1 - 1 No.)

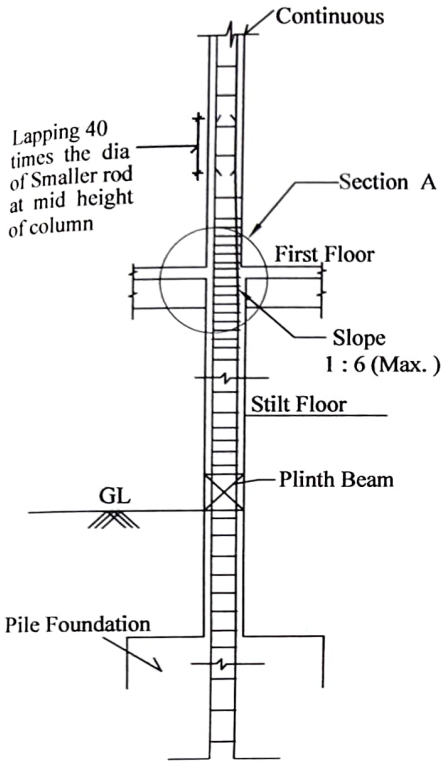
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B.Tech (Civil), AMIA Struct E. AMIE., C.
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Ph: 9840622035, E-mail: dhanastructural@gmail.com

Note :

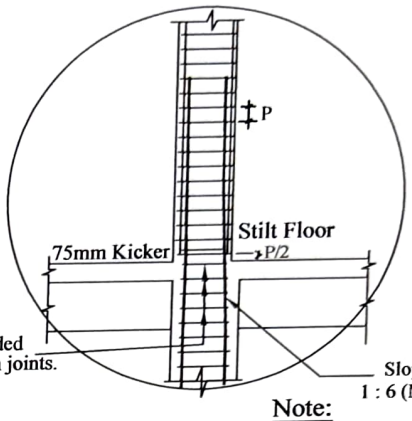
Clear Cover

1.For Pile = 50 mm
2.For Pile cap = 60 mm

Title: Details of Pile Cap - PC1	Architect: Arch. Avinash	Structural Consultant: DHANAA SUNDARARAJULU AND ASSOCIATES Survey, Quantity Survey & Structural Engineering Consultant DSA Plot No.1 & 2, Kabilar Street, Senthil Nagar, Thirumullaivoyal, Chennai - 62. Mob.: 98406 22035 E-mail : dhanastructural@gmail.com dhanaasassociates@gmail.com	
	Owner: Mr. R.Vijay Kannan (M/s.VJR Builders)		
Plot No. 104,110,111&112, Manimegalai Nagar Extn., Pallikaranai Village	Scale : NTS	File no : Dwg.- 14 / 2023	
	Date : 11.03.2025	Sheet no : 3 / 10	
	Dsgn. by : G.D	Drn. by : G.D	



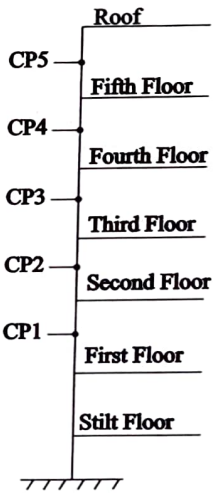
Column Curtailment Details



Rings should be continued and provided inside the columns at Column - Beam joints.

Section A

Note:
Where P - Pitch of Ties



Note :

CP1 - Mid height between First floor & Second floor

CP2 - Mid height between Second floor & Third floor

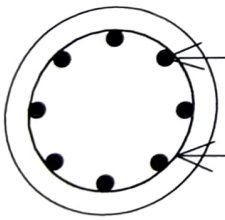
CP3 - Mid height between Third floor & Fourth Floor

CP3 - Mid height between Fourth floor & Fifth Floor

CP4 - Mid height between Fifth floor & Roof

* **Reinforcement shall be curtailed at CP1, CP2, CP3, CP4 & CP5 in staggered way more or less at mid height of columns all rods kinked with 1:6 slope for lapping.**

Details of Pile



8 - Y 16

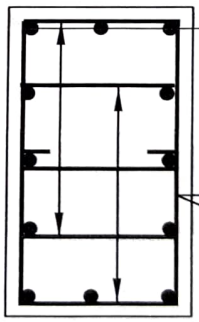
Y 8 @ 6" c/c
(1 Helical Tie)

Pile mkd. P1

(1'-6" Ø)

Schedule of Column

Cross Section at Stilt Floor (Column mkd. 'C1')



12 - Y 25

Y 10 @ 5" c/c
(2 Ties + 1 Link)

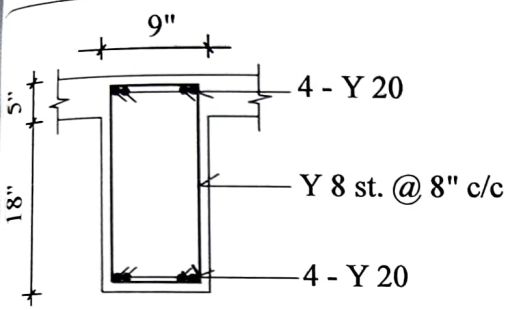
1'-0" x 2'-6"

s of Pile,Column Curtailment nd Schedule of Column	Architect : Arch. Avinash Owner : Mr. R.Vijay Kannan (M/s.VJR Builders)	Structural Consultant : DHANAA SUNDARARAJULU AND ASSOCIATES Survey, Quantity Survey & Structural Engineering Consultant DSA
Plot No. 104,110,111&112, Manimegalai Nagar Extn., Pallikaranai Village	Scale : NTS Date : 11.03.2025 Dsgn. by : G.D	File no : Dwg.- 14 / 2023 Sheet no : 4 / 10 Drn. by : G.D

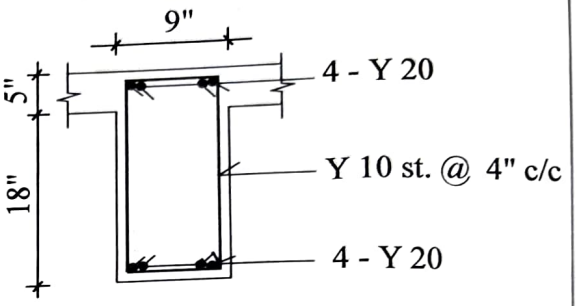
Plot No.1 & 2, Kabilar Street, Senthil Nagar, Thirumullaivoyal, Chennai - 62. Mob.: 98406 22035
E-mail : dhanastructural@gmail.com
dhanaasassociates@gmail.com

Er. G. DHANALAKSHMI, M.Tech.,
B.Tech (Civil), AMIA Struct E. AMIE., C.
RSE No. 201662023/SE/Gr-II
Plot No. 1&2, Prabhu Homes, F3, 1st Floor,
Kabilar Street, Senthil Nagar,
Thirumullaivoyal, Chennai-600 062.
Ph: 9840622035, E-mail: dhanastructural@gmail.com

Details of Roof Beam



Mid section - MM



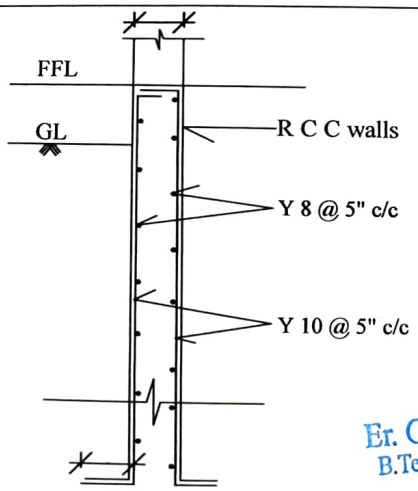
End section - EE

Beam mkd. RB1

Details of Roof Slab :

* Slab Thickness = 5" Thick
unless otherwise mentioned

(S1) **Shorter span : Y - 10 @ 5" c/c**
Longer span : Y - 8 @ 5" c/c

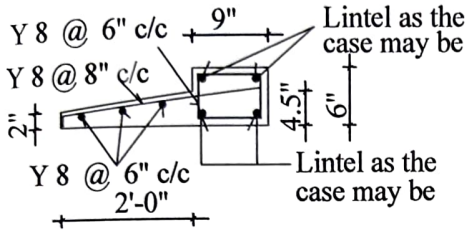


**FFL - Finished Floor Level

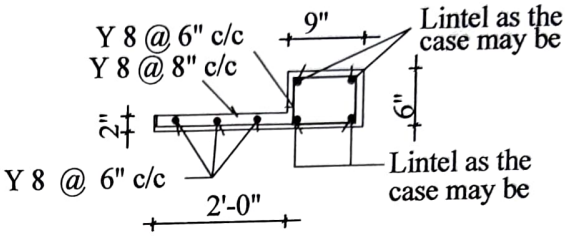
Details of Shear Wall - (Lift)

Er. G. DHANALAKSHMI, M.Tech., (Struct.)
B.Tech (Civil), AMIA Struct E. AMIE., C. Engg.
RSE No. 201662023/SE/Gr-II
Plot No. 1&2, Prabhu Homes, F3, 1st Floor,
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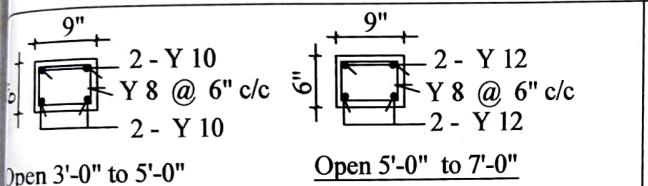
ails of Roof Beam,Roof Slab and Shear Wall	Architect : Arch. Avinash		Structural Consultant : DHANAA SUNDARARAJULU AND ASSOCIATES Survey, Quantity Survey & Structural Engineering Consultant DSA Plot No.1 & 2, Kabilar Street, Senthil Nagar, Thirumullaivoyal, Chennai - 62. Mob.: 98406 22035 E-mail : dhanastructural@gmail.com dhanaasassociates@gmail.com
	Owner : Mr. R.Vijay Kannan (M/s.VJR Builders)		
Plot No. 104,110,111&112, Manimegalai Nagar Extn., Pallikaranai Village	Scale : NTS	File no : Dwg.- 14 / 2023	
	Date : 11.03.2025	Sheet no : 5 / 10	
	Dsgn. by : G.D	Drn. by : G.D	



Sunshade cum Lintel Details

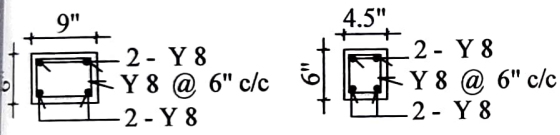


Loft Details



Open 3'-0" to 5'-0"

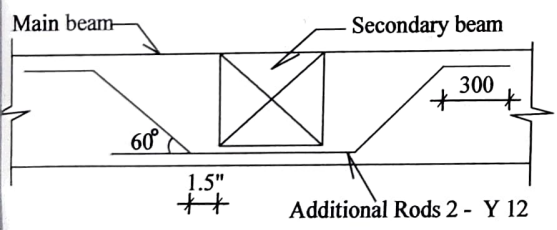
Open 5'-0" to 7'-0"



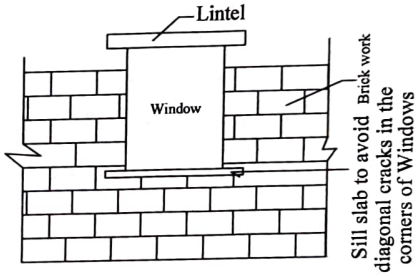
Open upto 3'-0"

Over 4.5" Walls

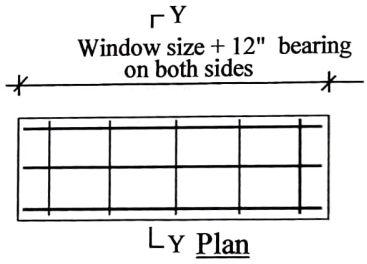
Cut Lintel Details



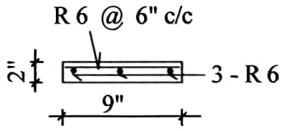
A Main & Secondary Beam Junction Details



ELEVATION



Plan

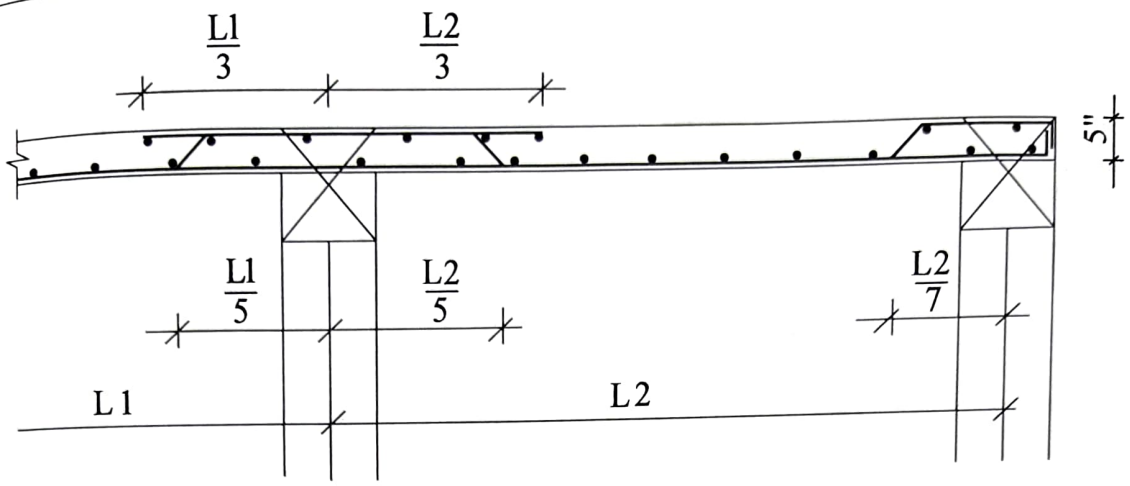


Section - Y

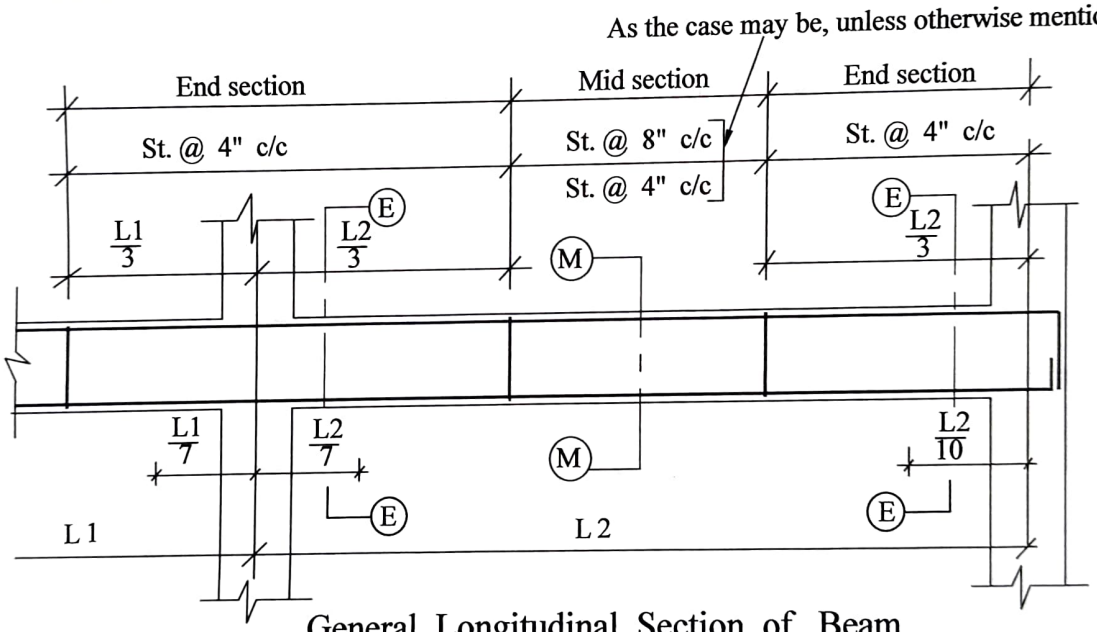
Window Sill Slab Details

tails of Lintel Cum Sunshade, Loft, l, Window Sill Slab & Beam Junction	Architect: Arch. Avinash Owner: Mr. R.Vijay Kannan (M/s.VJR Builders)	Structural Consultant: DHANAA SUNDARARAJULU AND ASSOCIATES Survey, Quantity Survey & Structural Engineering Consultant DSA Plot No.1 & 2, Kabilar Street, Senthil Nagar, Thirumullaivoyal, Chennai - 62. Mob.: 98406 22035 E-mail : dhanastructural@gmail.com dhanaasassociates@gmail.com
Plot No. 104,110,111&112, Manimegalai Nagar Extn., Pallikaranai Village	Scale : NTS Date : 28.09.2024 Dsgn. by : G.D	File no : Dwg.- 14 / 2023 Sheet no : 6 / 10 Drn. by : G.D

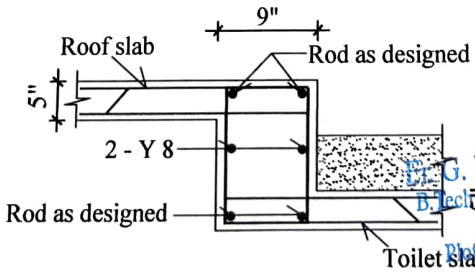
Er. G. DHANALAKSHMI, M.Tech., (Struct)
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RSE No. 201662023/SE/Gr-II
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Ph: 9840622035, E-mail: dhanastructural@gmail.com



General Longitudinal Section of Roof Slab



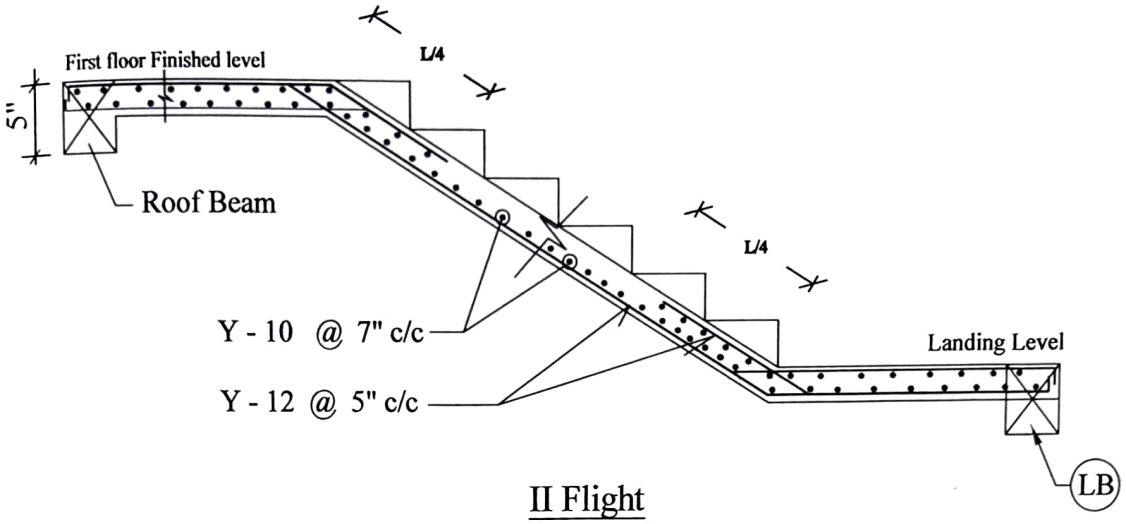
General Longitudinal Section of Beam



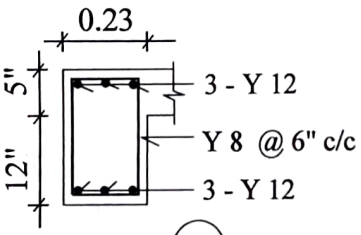
Details of Toilet Sunken Portion

Dr. G. DHANALAKSHMI, M.Tech., (S...
B.Tech.(Civil), AMIA Struct. E. AMIE., C...
RSE No. 201662023/SE/Gr-I/...
Plot No. 1&2, Prabhu Homes, F3, 1st F...
Kabilar Street, Senthil Nagar,
Thirumullaivoyal, Chennai-600 062.
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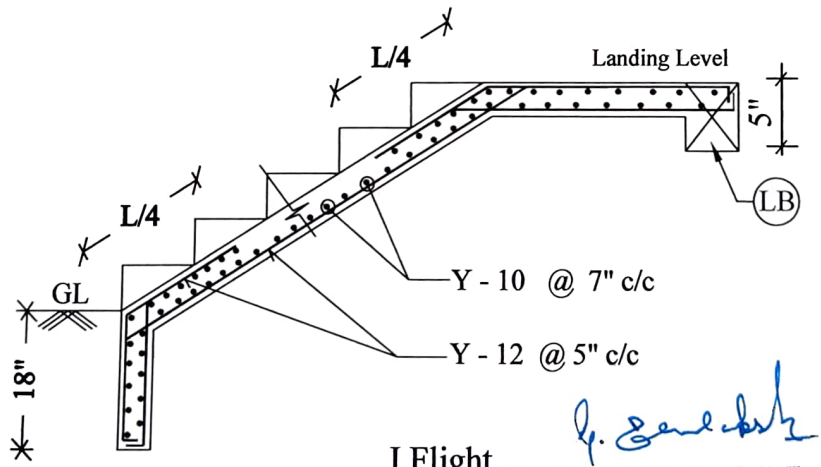
General Longitudinal Section of Roof Beam, Roof Slab & Toilet Sunken Portion	Architect : Arch. Avinash Owner : Mr. R.Vijay Kannan (M/s.VJR Builders)		Structural Consultant : DHANAA SUNDARARAJULU AND ASSOCIATES Survey, Quantity Survey & Structural Engineering Consultant DSA Plot No.1 & 2, Kabilar Street, Senthil Nagar, Thirumullaivoyal, Chennai - 62. Mob.: 98406 22035 E-mail : dhanastructural@gmail.com dhanaasssociates@gmail.com
Plot No. 104,110,111&112, Manimegalai Nagar Extn., Pallikaranai Village	Scale : NTS	File no : Dwg.- 14 / 2023	
	Date : 28.09.2024	Sheet no : 7 / 10	
	Dsgn. by : G.D	Drn. by : G.D	



II Flight



Beam mkd. (LB)

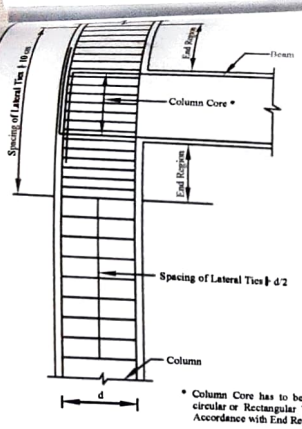


I Flight

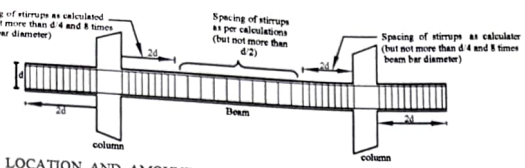
STAIRCASE DETAILS

Er. G. DHANALAKSHMI, M.Tech., (S...
B.Tech (Civil), AMIA Struct E. AMIE., C...
LR. No. 201662023/SE/Gr-II
Plot No. 1&2, Prabhu Homes, F3, 1st Floor,
Kabilar Street, Senthil Nagar,
Thirumullaivoyal, Chennai-600 062.
Ph: 9840622035, E-mail: dhanastructural@gmail.com

Details of Staircase	Architect : Arch. Avinash	Structural Consultant : DHANAA SUNDARARAJULU AND ASSOCIATES Survey, Quantity Survey & Structural Engineering Consultant DSA Plot No.1 & 2, Kabilar Street, Senthil Nagar, Thirumullaivoyal, Chennai - 62. Mob.: 98406 22035 E-mail : dhanastructural@gmail.com dhanaasassociates@gmail.com
	Owner : Mr. R.Vijay Kannan (M/s.VJR Builders)	
Plot No. 104,110,111&112, Manimegalai Nagar Extn., Pallikaranai Village	Scale : NTS Date : 28.09.2024 Dsgn. by : G.D	File no : Dwg.- 14 / 2023 Sheet no : 8 / 10 Drn. by : G.D

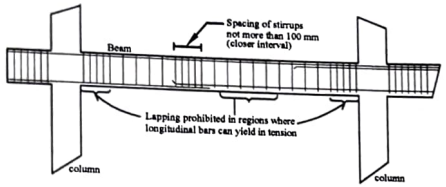


BEAM COLUMN JOINT AT EXTERNAL COLUMNS



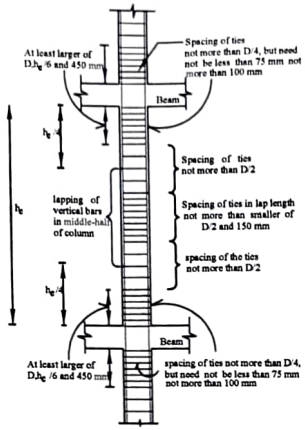
LOCATION AND AMOUNT OF VERTICAL STIRRUPS IN BEAMS

(IS 13920 - 1993 limit on maximum spacing ensures good earthquake behaviour)



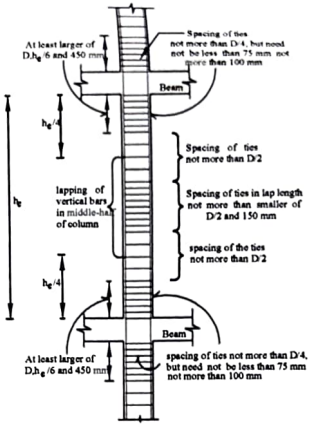
DETAILS OF LAPPING STEEL REINFORCEMENT IN SEISMIC BEAMS

(As per IS 13920 - 1993)



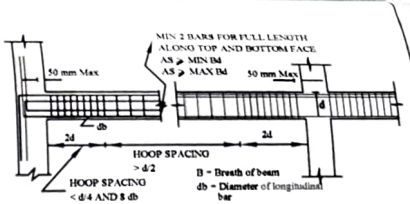
PLACING VERTICAL BARS AND CLOSED TIES IN COLUMNS

(Column ends and lap lengths are to be protected with closely spaced ties)

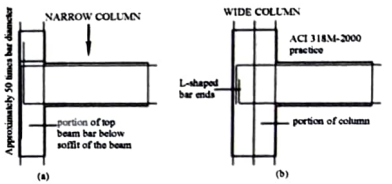


PLACING VERTICAL BARS AND CLOSED TIES IN COLUMNS

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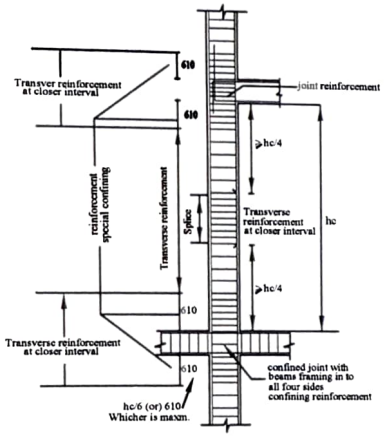


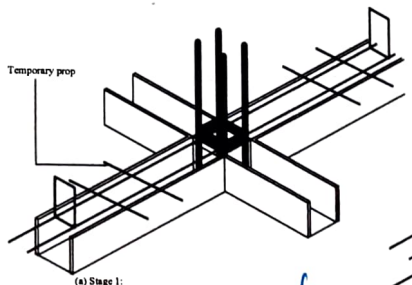
DUCTILE DETAILING



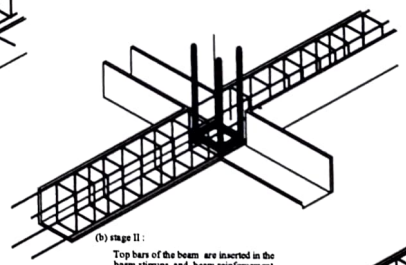
ANCHOROAGE OF BEAMS BARS IN EXTERIOR JOINTS

(diagrams show elevation of joint region)

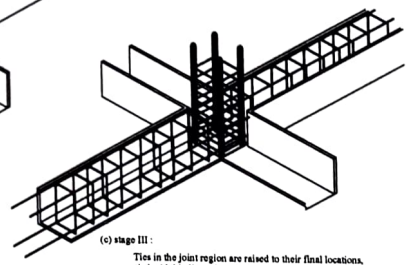




(a) Stage I:
Beam top bars are not placed, but horizontal ties in the joint region are stacked up.



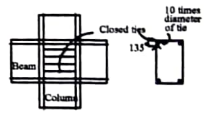
(b) stage II :
Top bars of the beam are inserted in the beam stirrups, and beam reinforcement cage is lowered into the formwork



(c) stage III :
Ties in the joint region are raised to their final locations, tied with binding wire, and column ties are continued

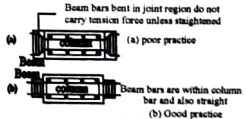
PROVIDING HORIZONDAL TIES IN THE JOINTS

(Three - Stage procedure is required)



CLOSED LOOP STEEL TIES IN BEAM - COLUMN JOINTS

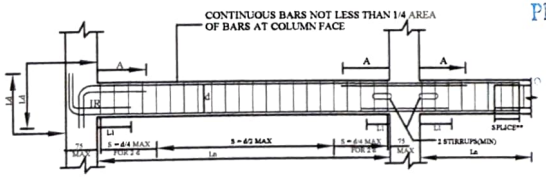
(Such ties with 135 hooks resist the ill effects of distortion of joints)



ANCHORAGE OF BEAM BARS IN INTERIOR JOINTS

(Diagrams (a) and (b) show cross - sectional views in plan of joint region)

Er. G. DHANALAKSHMI, M.Tech., (Struct.)
B.Tech (Civil), AMIA Struct E. AMIE
RSE No. 201662023/SE/Gr-II
Plot No. 1&2, Prabhu Homes, F3, 1st Floor,
Kabilar Street, Senthil Nagar,
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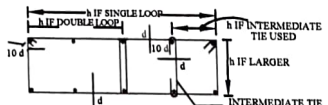
TYPICAL BAR DETAILS FOR SPECIAL DUCTILE MOMENT RESISTING FRAMES

(COLUMN DETAILS EXCLUDED)

- Distance to point of inflection plus anchorage length but not less than Ld/4.
- Designer may cut some bars shorter than this but at least one- third the area of bars at the face of column must extend this distance
- d = Effective depth of beam
- IR = Internal radius = 4 db minimum, 6 db preferable
- Ld = development length
- db = diameter of bar

Note :

1. Provide dimension A, S, d an chanage length, cut off points of discontinuous bars, ect., as the case may be
2. Provide not less than two stirrups throughout splice length



DETAILS OF RECTANGULAR HOOPS & LINKS FOR COLUMNS

ADDITIONAL TIPS FOR GOOD SEISMIC PROTECTION

- special care to be exercised while splicing bars-not more than hooks in opposite corners alternately.
- Provide half the top steel at bottom at all supports in beams.
- All hooks to be of min 10 dia and of bars bent at 135 degrees and provided 50% bars to be spliced at a section and the spacing to be done only in the middle half of the columns
- Adopt spacing of long. Bars at < to avoid ductile stirrup dia exceeding 10mm dia. Avoid congestion of bars and a spacing < 75 mm

Title : Ductile Detailing	Architect : Arch. Avinash		Structural Consultant : DHANAA SUNDARARAJULU AND ASSOCIATES Survey, Quantity Survey & Structural Engineering Consultant DSA
	Owner : Mr. R.Vijay Kannan (M/s.VJR Builders)		
Site : Plot No. 104,110,111&112, Manimegalai Nagar Extn., Pallikaranai Village	Scale : NTS	File no : Dwg.- 14 / 2023	Plot No.1 & 2, Kabilar Street, Senthil Nagar, Thirumullaivoyal, Chennai - 62. Mob.: 98406 22035 E-mail : dhanastructural@gmail.com dhanaasssociates@gmail.com
	Date : 28.09.2024	Sheet no : 9 / 10	
	Dsgn. by : G.D	Drn. by : G.D	

Note : (To be Considered During Execution of works)

* All dimensions are in Feet & Inches.
* Size of Footings Shown in dotted line for Concrete edge.
* Grade of concrete mix shall be M - 30 for Pile, Pile Cap, Column upto Basement and Plinth Beam & M - 25 for Lintel, Loft, Staircase etc.,conforming to IS 456 - 2000.
* Reinforcement shall be high strength deformed bars of grade Fe - 500 Confirming to IS 1786 - 1985.
* Clear cover to the main reinforcement 50 mm for Pile, 60 mm for Pile Cap, 40 mm for Columns, 30 mm for Beams & 25 mm for Slabs.
* The foundation is designed for Stilt + Five Floors only.
* Potable water should be used for all the concrete works.
* Use 50 needle vibrators for all RCC works.
* The marked layout should be checked by a Structural Engineer.
* Do not measure the drawing.
* Before pouring concrete the reinforcement tied & laid should be checked by a structural engineer.
* Refilling around column footings and basement may be done with quarry dust / River sand to avoid swelling of soil.
* SBC : Hard strata at 10.35 m for Pile Foundation.
* Soil : Vide Soil Report by M/s.Minerva Civil Testing Lab Pvt., Ltd., Ref., No. R2308337, Dt.14.08.2023.
* Lapping of rods should be avoided near the column and beam joints .
* Lap length for column 40 times of the smaller dia rod and for beam 50 times of smaller dia of the rod.
* The beam rods should be bent at all the ends.
* Rings should be continued and provided inside the columns at Column - Beam joints.

For Piling Work:-

1. Type of Foundation : "Bored cast - in - situ"Pile Foundation.
2. Temporary casting & Bentonite mud supply are needed to stabilise the boreholes & bottom.
3. Concreting shall be done using tremmie.
4. Proper cleaning of the borehole bottom is needed for realising the estimated safe capacity.
5. Column centre & Pile cap centre are at one & the same point.

REMOVING PERIOD OF FORMWORK

Type of FormWork	Min. Period for Removing Formwork.
* Vertical formwork to Columns, Walls, Beams	24 Hours
* Form work to Beams	
a) Spanning upto 5m	14 days
b) Spanning over 5m	21 days

Er. G. DHANALAKSHMI, M.Tech., (Str...
B.Tech (Civil), AMIA Struct E. AMIE., C. Eng.
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Ph: 9840622035, E-mail: dhanastructural@gmail...

General Notes

Architect : Arch. Avinash

Owner : Mr. R.Vijay Kannan (M/s.VJR Builders)

Plot No. 104,110,111&112, Manimegalai Nagar Extn., Pallikaranai Village

Scale : NTS	File no : Dwg.- 14 / 2023
Date : 28.09.2024	Sheet no : 10 / 10
Dsgn. by : G.D	Drn. by : G.D

Structural Consultant :
DHANAA SUNDARARAJULU AND ASSOCIATES
Survey, Quantity Survey & Structural Engineering Consultant
DSA
Plot No.1 & 2, Kabilar Street, Senthil Nagar, Thirumullaivoyal, Chennai - 62. Mob.: 98406 22035
E-mail : dhanastructural@gmail.com
dhanaasassociates@gmail.com

GREATER CHENNAI CORPORATION
WORKS DEPARTMENT

PROFESSIONAL REGISTRATION CERTIFICATE

This is to certify that **Mrs. Dhana Lakshmi G** has been enrolled as **Registered Structural Engineer Grade- II (RSE)** in Greater Chennai Corporation (GCC) who has the qualification of **M.Tech.,(Structural Engineering..)** with minimum of **5 years** experience in the relevant field.

The Registration No. is **RSE201662023** dated **10.05.2023** 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 . **09.05.2028**





10/5/2023
Superintending Engineer (Electrical)
Greater Chennai Corporation.

RGN No: RSE201662023
Dated :10.05.2023

10/5/2023

G. Dhanalakshmi.

Er. G. DHANALAKSHMI, M.Tech., (Struct.)
B.Tech (Civil), AMIA Struct E, AMIE., C.Eng.,
RSE No. 201662023/SE/Gr-II
Plot No. 1&2, Prabhu Homes, F3, 1st Floor,
Kasilar Street, Senthil Nagar,
Thirumullaivoyal, Chennai-600 062.
Ph: 9840622336, E-mail: dhanastructural@gmail.com

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

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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
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Verified RealEstate
3/350/2 Mettukuppam,
OMR Thoraipakkam,
Chennai 600 097, India
hello@verified.realestate
+91 9996 12 9996

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