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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

STABILITY CERTIFICATE

(To be furnished while filing application for registration of building)

1. The detailed engineering and structure design of the proposed building Comprising of **Stilt + Five Floors only** at Plot 1, 2, 3, 4 & 5, Pillaiyar Kovil Street, Block No. 77, Thirumullaivoyil, Chennai – 600 062 of Thirumullaivoyil Village, Ambattur Taluk, S.No.631/1B, has been done by me / us based on the report of geotechnical investigation (soil test) done by **M/s. Geo Mines Engineers Pvt., Ltd.,** Report No. GMEPL/INTOUCH CONSTRUCTION & INFRA STRUCTURE PVT. LTD. /358/2020-21, Dated 04-02-2020 and considering the functional requirement of the building.

2. It is certified that among other factors, the proposed building has been designed to resist earthquake. I/We have checked various parameters and found that the proposed building would be safe.

3. I/We further certify that:
   (i) The minimum grade of concrete is **M30** for Pile, Pile Cap, Column and Plinth Beam and **M25** for Beams, Slabs, Lintel, Loft, Sunshade, Staircase etc.,
   (ii) The design and analysis have been done using the code of practice for plain and reinforced concrete as per IS 456, design loads as per IS Codes No IS 875-1987 Part -1 Dead Load, IS 875 – 1987 Part – 2 Live Load, IS 875 – 1987 Part – 3 Wind Load, I.S. 2911: Part 1 Driven Cast in – Situ Concrete Piles and design of earthquake resistant structure as per IS Code No. IS 1893 (Part I), 2002.

4. The building will be safe and sound when used for the purpose for which it is designed.

Encl.: Structural Design Calculation

Stamp and Signature

16/5/2025

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DHANAA SUNDARARAJULU AND ASSOCIATES

Survey, Quantity Survey & Structural Engineering Consultant

DSA

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Dt.18.03.2024

To

M/s. ICIPL
Thirumullaivoyil, Chennai.

Sub:

Change of Registered Structural Engineer - Taking over the services of **Thirumullaivoyil** Project **(Stilt + Five Floors only)** comprised Plot No.1,2,3,4&5, Pillaiyar Kovil Street, Chennai – 600 062 - Structural Stability Report and Drawings submitted for Approval – reg.

I wish to state that the "Registered Structural Engineer" **Dr.V. Sundararajulu., PhD.,** could not able to continue the Thirumullaivoyil project up to CC. Since, he is moving to other country. (Copy Attached). Myself **G. Dhana Lakshmi** Registered Structural Engineer, Grade – II worked along with him for Structural Design and Structural Foundation Drawings and completed for execution.

During execution, I will take care to check the reinforcement tied and laid before concreting as per the GFC Structural Drawings. I will take the responsibility for completing the Structural **Roof Drawings** and **Completion Certificate.**

Thanking You,

Yours Truly,

Encl.:

1. Letter from Dr.V. Sundararajulu
2. Copy of Registered Structural Engineer Grade II Certificate

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VSA
Since 1986

V. Sundararajulu & Associates
Structural Engineering | Quantity Surveying
New #146,Old #110, 40th Street, IVS Avenue, Annanagar West Extn, Chennai - 600101
Mail : vsachennai65@gmail.com | Web : vsa.org.in | Mob : 9840622035

Dr. V. Sundararajulu, PhD,
B.E.(Civil) M.E. (Struct) C.Eng.,FIE,FIV,
FIS, FICA, FICI, FIGS,FACCE,FASCE (USA)

Dt.13.03.2024

TO WHOMSOEVER IT MAY CONCERNED

I wish to inform all my Clients, Architects and Builders that I have closed my office and moving to other country.

I therefore request that **Mrs. Dhana Lakshmi,** MTech (Struct.,) Our Office Engineer will be handling the projects. Since, she had been working with me for the past 18 years she is possessing vast and best Knowledge on Designing, Inspecting the ongoing and Completed Structures and to issue the Structural Stability Certificate independently.

She is a Registered Structural Engineer in CMDA & GCC.

I wish her all success.

SUNDARARAJULU & ASSOCIATES
Engineers
Valuers
Surveyors
Arbitrators
MADRAS

Dr. V. Sundararajulu

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**



மாநகராட்சி சென்னை நாள்:10/5/23 நகரமைப்பு கிளை

Superintending Engineer (Electrical)
Greater Chennai Corporation.

9/5/2023

RGN No: RSE201662023
Dated :10.05.2023

10/5/2023

G. Dhanalakshmi

Er. G. DHANALAKSHMI, M.Tech., (Struct.,)
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REPORT FOR THE PROPOSED NEW CONSTRUCTION OF RESIDENTIAL BUILDING AT PLOT NO. -1, 2, 3, 4 & 5, PILLAIYAR KOVIL STREET, BLOCK NO.77, THIRUMULLAIVOYAL, CHENNAI- 600 062, COMPRISED IN S.NO.631 / 1B, T.S.NO 69, 70 & 71 OF THIRUMULLAIVOYAL VILLAGE, AMBATTUR TALUK, GREATER CHENNAI CORPORATION, DIVISION - II

REPORT FOR THE PROPOSED CONSTRUCTION OF RESIDENTIAL BUILDING AT PLOT NO - 1, 2, 3, 4 & 5, PILLAIYAR KOVIL STREET, BLOCK NO.77, THIRUMULLAIVOYAL, CHENNAI - 600 062, COMPRISED IN S.NO. 631 / 1B, T.S.NO 69, 70 & 71 OF THIRUMULLAIVOYAL VILLAGE, AMBATTUR TALUK, GREATER CHENNAI CORPORATION, DIVISION - II

INTRODUCTION

The Report has been prepared for the Proposed New Construction of Residential Building at Plot No.1, 2, 3, 4 & 5, Pillaiyar Kovil Street, Chennai – 600 062. 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 Cap and Column.

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

Grade of steel – Fe 500

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LOADINGS

a. Dead Load :

Unit weight of Concrete	=	25 kN/m^3
Unit weight of 8" Solid Block	=	23 kN/m^3
Unit weight of Aerocon Block	=	6.5 kN/m^3
Weathering Course	=	1.5 kN/m^2

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.

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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

Loads due to Slab :

Self Weight of Slab	-	(0.14 * 2500)	-	350 kg / sq m
Live Load	-		-	200 kg / sq m
Floor Finish	-		-	100 kg / sq m
Unforseen Load	-		-	50 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.

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COVER FOR REINFORCEMENT :

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

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 + 5 Floors Only.

Codes Referred :

- I.S. 875 - 1987 CODE OF PRACTICES for design loads (Part 1,2 & 3)
- I.S. 456 - 2000 & SP – 16 CODE 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.
- I.S. 2911: Part 1 : Sec1 : 1979 Driven Cast in – Situ Concrete Piles

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, IS 4326-1993, SP-34 and IS: 2911(Part1/Sec2)
- 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 Hours.

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STATEMENT ACCOMPANYING FORM –"A"

1. Applicant	: M/s. ICIPL
2. Door No./S.No of the building	: Plot No.1, 2, 3, 4 & 5
3. Name &Location: Street/Ward No.	: Pillaiyar Kovil Street, Block No.77, Thirumullaivoyal, Chennai – 600 062.
4. Year of Construction	: Proposed Construction
5. Approximate Cost of construction as per Current rates for Residential Apartment	: Rs.5,27,00,000/-
6. Purpose for which the Building is Being used Or proposed to be used	: Enabled for Residential purpose
7. Purpose for which the Building has (in there to) been used	: Enabled for Residential purpose

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

(i)	Foundation	: Pile and Pile Cap
(ii)	Basement	: Yes, R.C.C. Framed Structure with Brick 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) (From 26.10.2021 to 25.10.2025)

Date: 19.03.2024

Signature of the Engineer

Er. G. DHANALAKSHMI, M.Tech., (Struct.,)
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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

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Structural Engineering Consultant

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FORM - B

[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 Additional & Alteration 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.1, 2, 3, 4 & 5, Pillaiyar Kovil Street, Block No.77, Thirumullaivoyal, Chennai- 600 062.
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 – 875 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.

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FORM – C

[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 Building 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 24.07.2021 to 23.07.2024 (Three Years) inclusive.

Signature of the Engineer

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1. FOUNDATION :

a) Depth below Ground Level : 15.00 m below Natural Ground Level

b) Nature of soil met with at foundation level : Greyish Hard Compacted Clay

c) Pressure at Foundation : Vide Soil Report From M/s. Geomines Engineers Pvt,Ltd.

d) Probable safe bearing capacity of the Strata met with foundation : Report No. GMEPL/Intouch Construction and Infrastructure Pvt. Ltd /358/2020-21.

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e) Safe Bearing Capacity of the pile met with at Foundation : 100 t (450 mm dia Pile for depth of 15 m)
120 t (500 mm dia Pile for depth of 15 m)
140 t (550 mm dia Pile for depth of 15 m)
160 t (600 mm dia Pile for depth of 15 m)

f) Load to be transmitted by column to Foundation : 265 t (Critical)

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, 23cm 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 Building loading as per latest Indian Standard -875 (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 24.07.2021 to 23.07.2024 (Three Years) inclusive.

Signature of the Engineer

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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.,)
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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 there of	:	18 Years of experience in the Engineering field of Civil, Structural and Construction Engineering and Management

Signature of the Engineer

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1. DESIGN OF PILE FOUNDATION :

Load carrying capacity of 450 mm dia pile = 100 t (or) 1000 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 dia bars.

Provide 8mm dia, helical binder @ 150mm c/c.

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Three Pile Group - PC1

Total Axial Load	**265**	**T**
Load Carring Capacity for dia pile	**100**	**T**
dia of pile	**450**	**MM**
Fck	**25**	**MM**
clear cover	**60**	**MM**
Dia of rod	**16**	**MM**
Fy	**415**	
No of piles	2.7	
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	88.33	T
Load on each pile In KN	883.3	KN
Add 10% for self wt of pile cap	88.33	KN
Total Load	971.7	KN
Factor load =1.5*total load	1458	KN
Factored Moment Mu=Factor load*2*(1/3)*center to certer pile	407	KNm
depth	397	MM
Toe arrest punching shear =d*2	793	MM
Say D	900	(Manual Entry)
Eff depth = D-60-(dia of rod/2)	832	MM
Ast=((factor moment)/(.875*Fy*.8*Eff depth))	1685	SQM
provide	8.38 Y 16	
Final result	**10 Y 16**	
	Y 16 @ 170 mm c/c	

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3.DESIGN OF REINFORCED CONCRETE COLUMN :

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

Grade of concrete = M 30

Grade of steel = Fe 500

Column load from staad Analysis,

P_u = 265 t (or) 2650 kn

M_{ux} = 0.294 knm

M_{uz} = 5.452 knm

d^1/D = 40 / 750 = 0.053 (say 0.10)

$$\frac{P_u}{Fck \times b \times d} = \frac{2650 \times 10^3}{30 \times 300 \times 750} = 0.3925$$

$$\frac{M_{uz}}{Fck \times b \times d^2} = \frac{5.432 \times 10^6}{30 \times 300 \times (750)^2} = 0.00107$$

As per reference from chart 47, from SP 16 for percentage of steel.

Therefore, percentage of steel, P = 3.00 %

Area of steel, Ast = 6750 mm^2

Provide 25 mm dia bars of 14 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 @ 125 mm c/c

Result :

Size or the Column : 300 mm x 750 mm

Longitudinal Main Reinforcement : 14 Nos. 25 mm Dia Rods

Ties : Y 10 @ 125 mm c/c (2 Legged Links)

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4. DESIGN OF REINFORCED CONCRETE BEAM

Sl..No	Decription		Nos	Length	Breadth	Depth	Density	Total Kg	Remarks
	S/W of Beam	1	1	6.3	0.305	0.6	2500	2882	
	B/w of load	1	1	6.3	0.1	3.05	2200	4227	
	R/S of load	1	1	2.31	1.37	-	700	2215	
		0.50	1	2.59	1.37	-	700	1242	
		0.50	1	1.75	1.50	-	700	919	
		1	0.5	1.73	0.87	-	1160	868	
		2	0.5	1.42	0.71	-	700	706	
		0.25	1	1.85	1.50	-	700	486	
	Total							13545	Kg
	Point Load - 1								
	S/W of Beam	1	1	3.00	0.20	0.38	2500	570	
	B/w of load	1	1	3	0.10	3.05	2200	2013	
	R/S of load	1	1	2.29	0.71	-	700	1138	
		1	0.50	3.00	1.50	-	700	1575	
	Total							5296	
							P1	**2648**	Kg
	Point Load - 2								
	S/W of Beam	1	1	3.00	0	0.38	2500	570	
	B/w of load	1	1	3.00	0.10	3.05	2200	2013	
	R/S of load	1	1	2.29	0.71	-	700	1138	
		1	1	1.07	0.87	-	1160	1069	
	Total							4790	
							P2	**2395**	Kg
	Point Load -3								
	S/W of Beam	1	1	3.00	0	0.38	2500	570	
	B/w of load	1	1	3.00	0.20	3.05	2200	4026	
	R/S of load	1	1	2.29	0.71	-	700	1138	
		1	1	1.07	0.87	-	1160	1069	
	Total							6803	
							P3	**3401**	Kg
	Point Load -4								
	S/W of Beam	1	1	3.00	0.20	0.38	2500	570	
	B/w of load	1	1	3	0.10	3.05	2200	2013	
	R/S of load	1	1	2.29	0.71	-	700	1138	
		1	0.50	3.00	1.50	-	700	1575	
	Total							5296	
							P4	**2648**	
	Point Load -5								
	S/W of Beam	1	1	3.15	0	0.38	2500	599	
	B/w of load	1	1	3.15	0.10	3.05	2200	2114	
	R/S of load	1	0.50	3.15	1.58	-	700	1736	
		1	0.50	0.56	0.28	-	1160	91	
		1	0.50	1.42	0.71	-	700	353	
		1	0.50	1.17	0.59	-	700	240	

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	Total								5132	
								P5	2566	
	Point Load 6									
	S/W of Beam		1	1	3.15	0	0.38	2500	599	
	B/w of load		1	1	3.15	0.20	3.05	2200	4227	
	R/S of load		1	0.50	3.15	1.58	-	700	1736	
			1	0.50	0.56	0.28	-	1160	91	
			1	0.50	1.42	0.71	-	700	353	
			1	0.50	1.17	0.59	-	700	240	
	Total								6653	
								P6	3327	Kg
	Point Load 7									
	S/W of Beam		1	1	0.00	0	0.38	2500	0	
	B/w of load		1	1	0.00	0.20	3.05	2200	0	
	R/S of load		1	0.50	0.00	0.00	-	700	0	
	Total								0	
								P7	0	Kg
	Point Load 8									
	S/W of Beam		1	1	0	0.23	0.38	2500	0	
	B/w of load		1	1	0	0.12	3.05	1850	0	
	R/S of load		1	1	0.00	0.00	-	900	0	
	Total								0	
								P8	0	Kg
	Point Load 9									
	S/W of Beam		1	1	0	0.23	0.38	2500	0	
	B/w of load		1	1	0	0.12	3.05	1850	0	
	R/S of load		1	1	0.00	0.00	-	900	0	
	Total								0	
								P8	0	Kg
	Main Beam			13545	Kg					
	Point Load - 1			2648	Kg					
	Point Load - 2			2395	Kg					
	Point Load - 3			3401	Kg					
	Point Load - 4			2648	Kg					
	Point Load - 5			2566	Kg					
	Point Load - 6			3327	Kg					
	Point Load - 7			0	Kg					
	Point Load - 8			0	Kg					
	Point Load - 9			0	Kg					

		FS	MB	P1	P2	P3	P4	P5	P6
		1.5	7111	2144	2115	3148	1047	2266	3078
	Mu		=	31364	Kg.m				
	Ast		=	1750	mm^2		Nos	3.57	491
d =	620.5							Dia	25
#REF!	*Provide @*		*3.6*	*25*	*Size*	*230*	*663*	130	533
			NOS	DIA		mm	mm	Slab Thick	Beam(d)

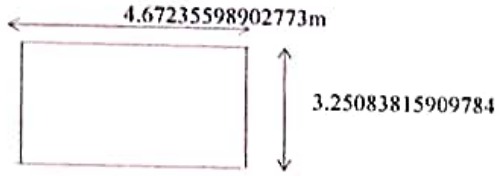
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5. DESIGN OF REINFORCED CEMENT CONCRETE SLAB

PROJECT NUMBER: 7
PROJECT NAME: Thirumullaivoyal
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)	=	4.67	m		
Lx (Short span)	=	3.25	m		
Ly/Lx	=	1.44	<	2	Two way slab condition satisfied

Slab

Slab thickness D	=	0.13	m
d	=	106	mm
Sunkan depth	=	0	m

Partion wall

Position of partion wall	=	No wall
Wall thick	=	m
Wall height	=	m

LOAD:

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

1 All edge continuous
2 One short edge discontinuous
3 One long edge discontinuous
4 Two adjacent edge discontinuous
5 Two short edge discontinuous
6 Two long edge discontinuous
7 Three edge discontinuous (one long edge continuous)
8 Three edge discontinuous (one short edge continuous)
9 Four edge discontinuous

DESIGN:

Edge conditions	=	9
Short span mid span co.eff. Msx	=	0.089
Long span mid span co.eff. Msx	=	0.056

Moment

				say	
Mx	(+ve)	=	9.876	10.876	kNm
My	(+ve)	=	6.214	7.214	kNm

Depth check

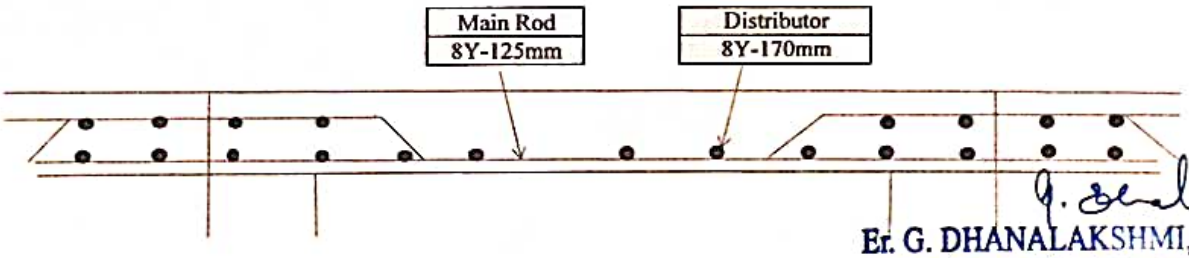
Short span Effective depth d = 42.44 < 106 mm **Hence Safe**

Deflection

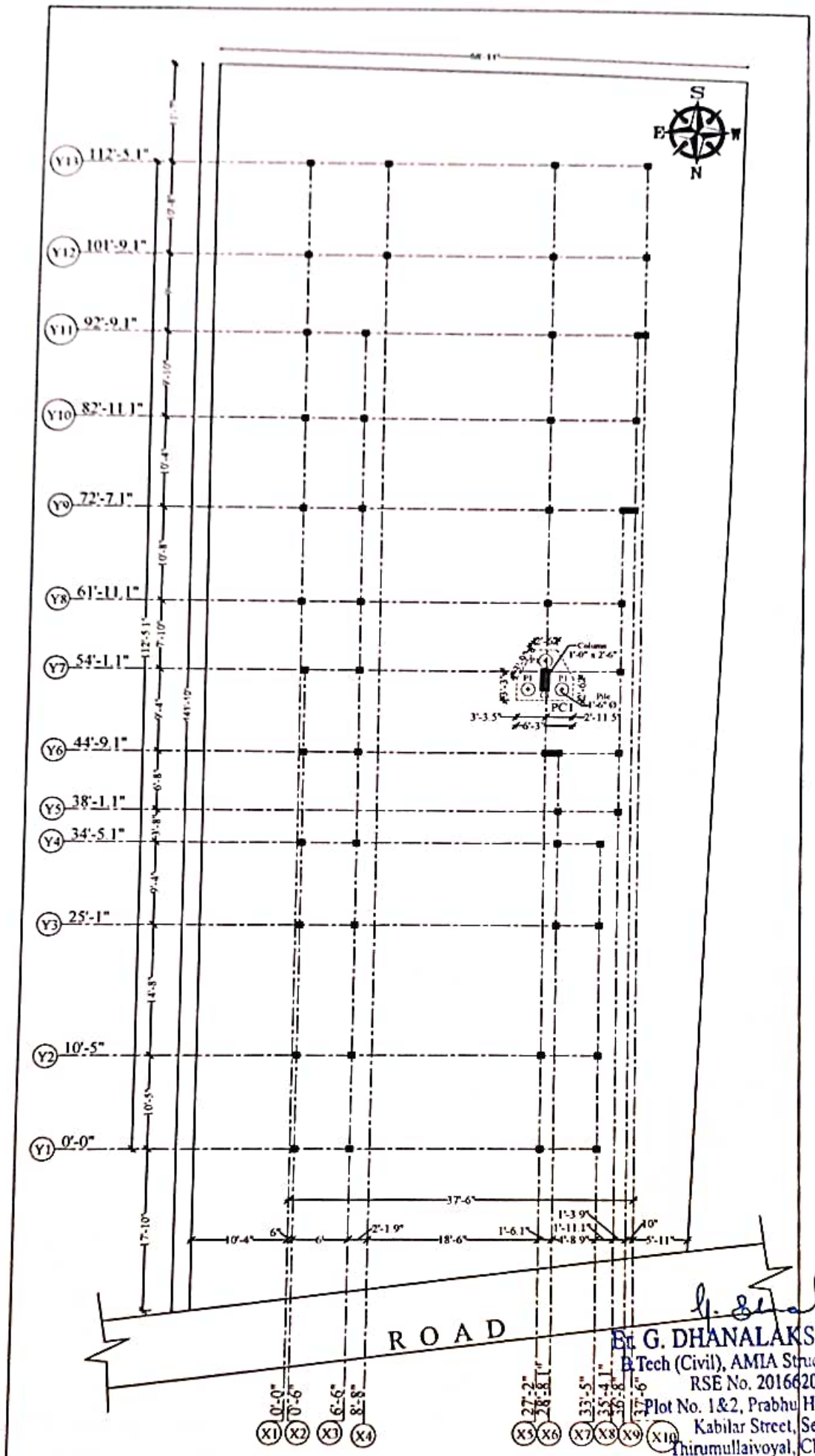
Basic	L/d	=	20			M.F	=	1.67
Allowable	L/d	=	33.339	>	Actual	L/d	=	30.668

REINFORCEMENT

			Ast req (mm2/m)	Min Ast (mm2/m)	Ast provided (mm2/m)		dia of bar mm	Spacing mm	inch
Mx	(+ve)	=	294.83	156	402		8	125	5
My	(+ve)	=	195.56	156	296		8	170	7

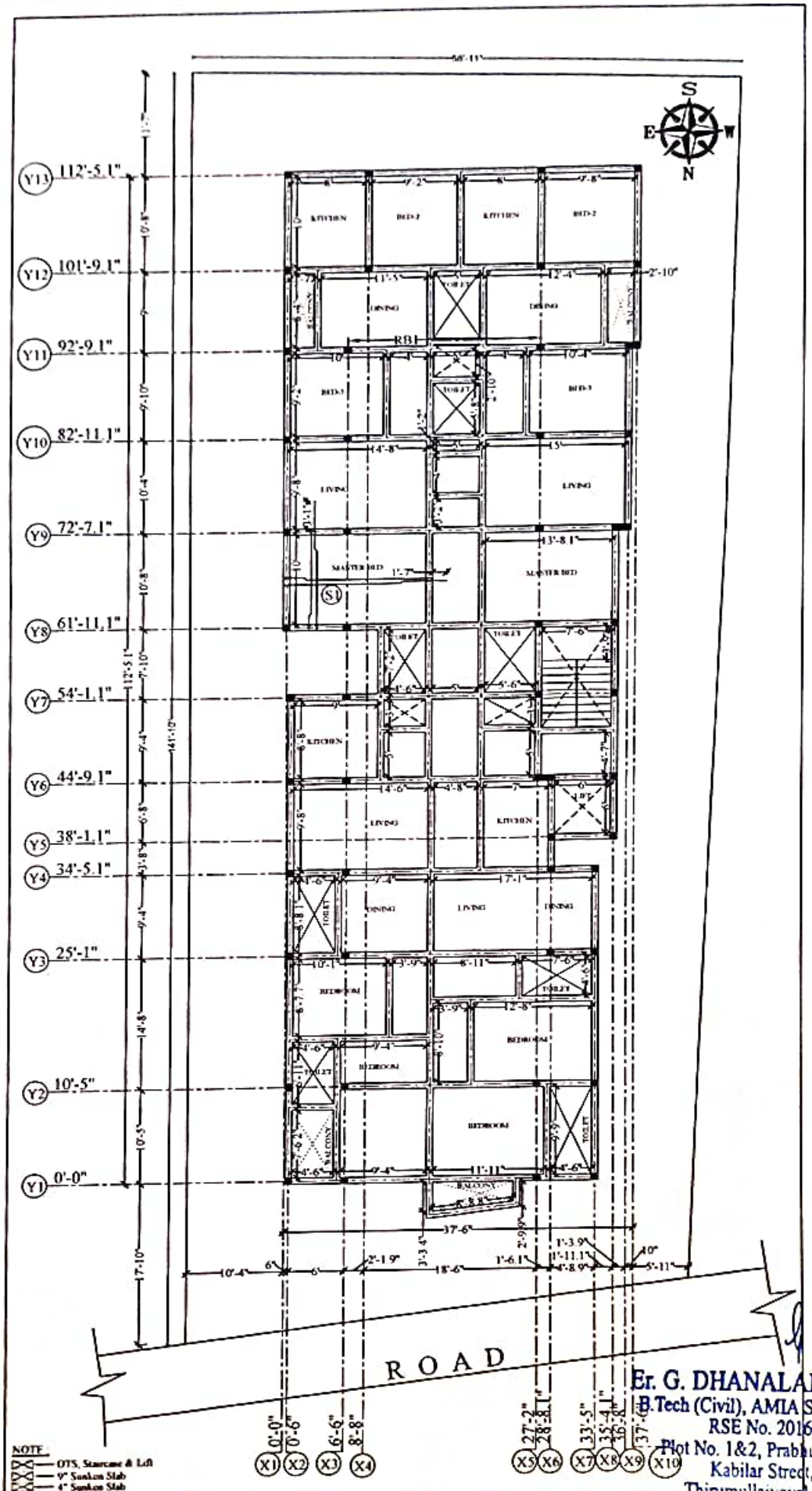


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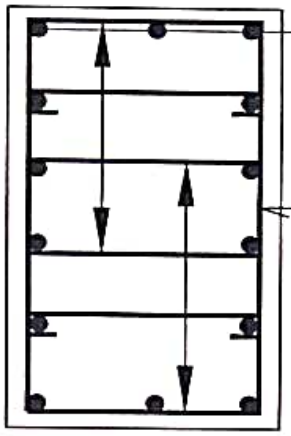
Title: Pile, Pile Cap and Column Marking Layout	Client: M/s. ICIPL		Structural Consultant: DHANAA SUNDARARAJULU AND ASSOCIATES (DSA)
Site: Plot No 1,2,3,4 & 5, Block No 77, Pilayar Kovil Street, Thirumullaivoyal, Chennai- 600 112	Scale : 1" = 10'-0"	File no : Dwg - 07 / 2021	
	Date : 26.10.2022	Sheet no : 1 / 7	
	Dsgn. by : G.D	Drn by : G.D Ckd by : Dr. V.S	

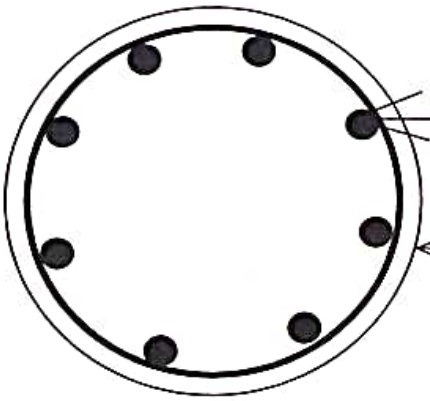


Title: Typical Floor Roof Beam & Slab Layout	Client: M/s. ICIPL		Structural Consultant: DHANAA SUNDARARAJULU AND ASSOCIATES (DSA)
Site: Plot No.1,2,3,4 & 5, Block No.77, Pilayar Kovil Street, Thirumullaivoyal, Chennai- 600 112.	Scale : 1" = 10'-0"	File no : Dwg - 07 / 2021	
	Date : 26.10.2022	Sheet no : 2 / 7	
	Dsgn. by : G.D	Drn by : G.D	Ckd. by : Dr. V.S.

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Schedule Of Column

Columns	Cross section at Stilt Floor
C1	 14 - Y 25 Y 10 @ 5" c/c (2 Ties + 2 Links) 1'-0" x 2'-6"



8 - Y 16

Y 8 @ 6" c/c

(1 Tie)

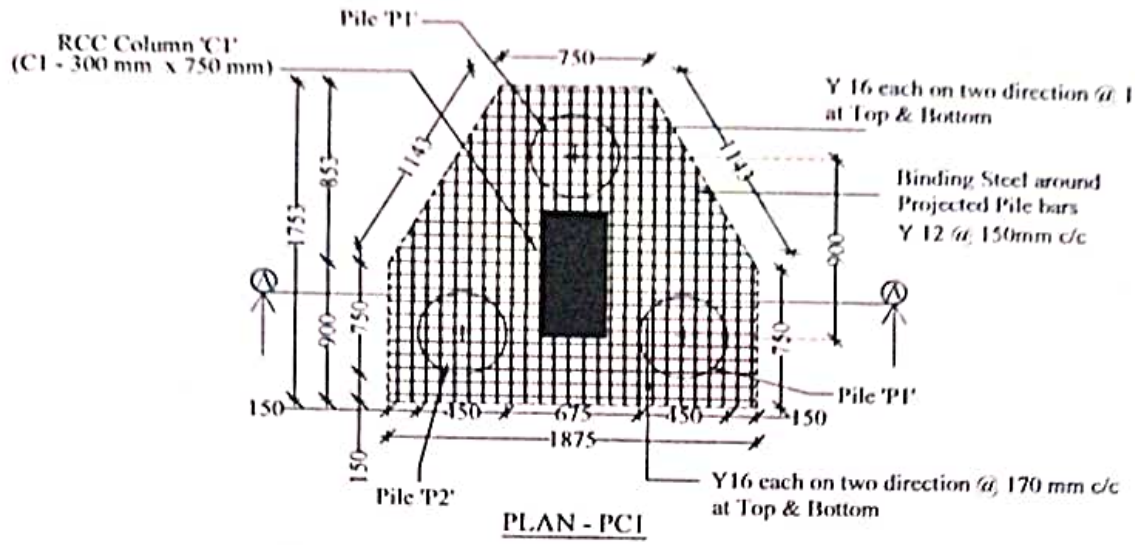
Pile mkd. P1

(1'-6" Ø)

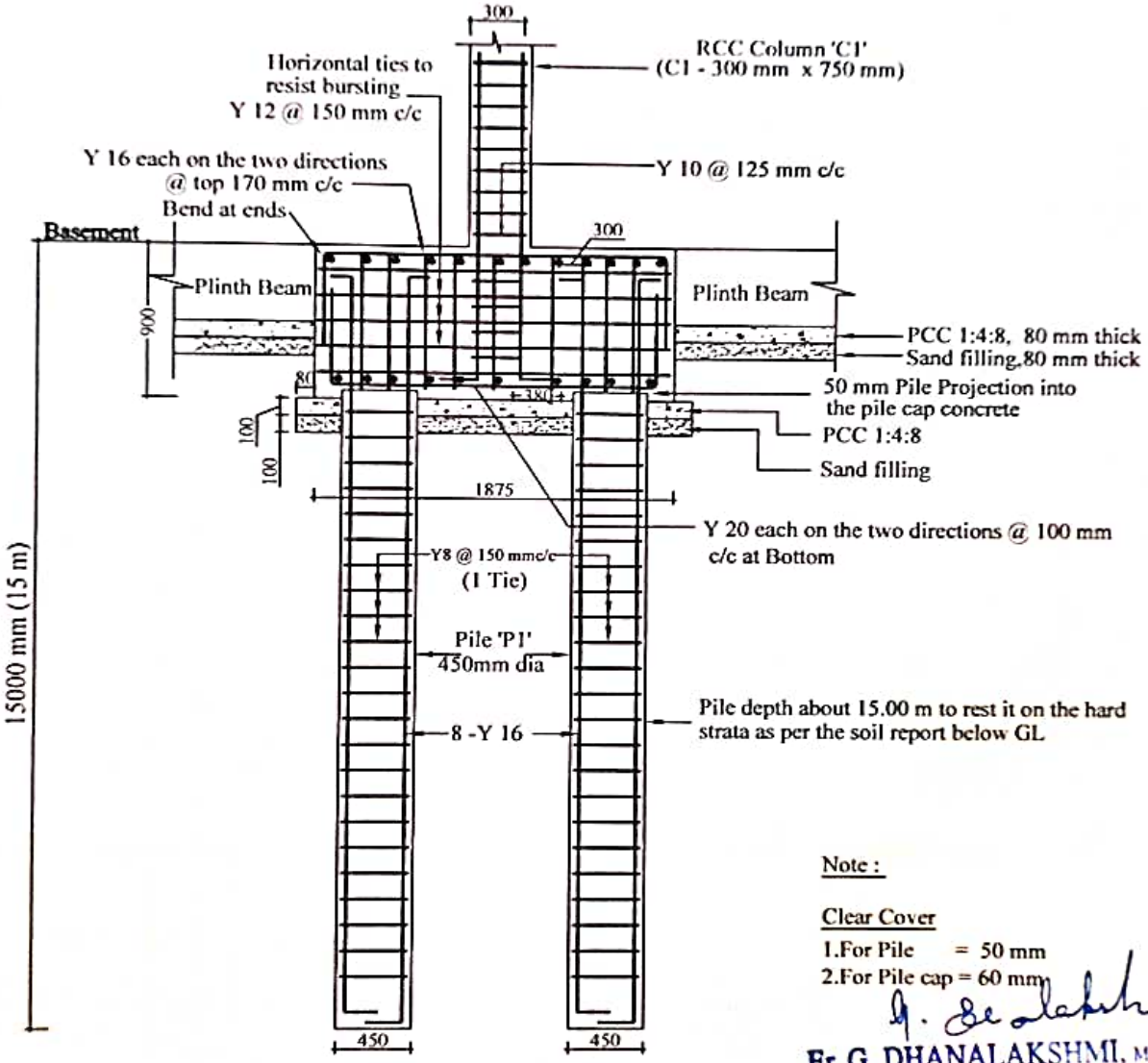
Details Of Pile

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Title : Details of Pile & Schedule of Column	Client : M/s. ICIPL	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, dhanaaassociates@gmail.com
Site: Plot No.1,2,3,4 & 5, Block No.77, Pilayar Kovil Street, Thirumullaivoyal, Chennai- 600 112.	Scale : NTS; File no : Dwg.- 07 / 2021 Date : 26.10.2022; Sheet no : 3 / 7 Dsgn. by : G.D; Drn. by : G.D; Ckd. by : Dr. V.S.	



PLAN - PC1



Section - AA

PILE CAP mkd. PC1 (For C1)

Note :

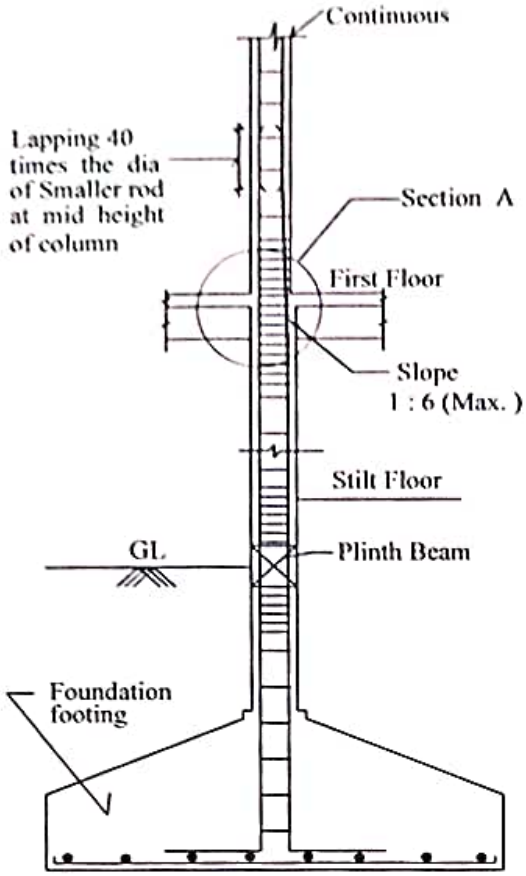
Clear Cover

1.For Pile = 50 mm

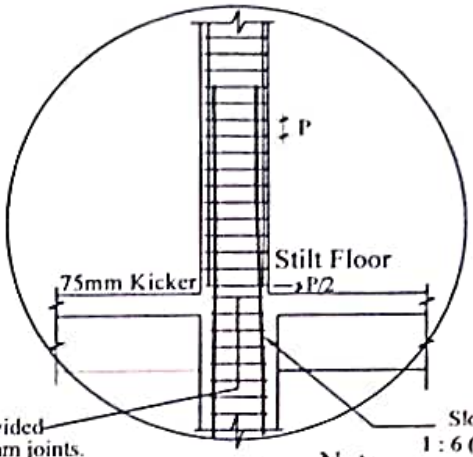
2.For Pile cap = 60 mm

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Title: Details of Pile Cap - PC1	Client: M/s. ICIPL		DHANA SUNDARARAJULU AND ASSOCIATES (DSA)
Site: Plot No 1,2,3,4 & 5, Block No 77, Pilayar Kovil Street, Thirumullaivoyal, Chennai- 600 112.	Scale : NTS	File no : Dwg.- 07 / 2021	
	Date : 26.10.2022	Sheet no : 4 / 7	
	Dsgn. by : G.D	Drn. by : G.D	Ckd. by : Dr. V.S.



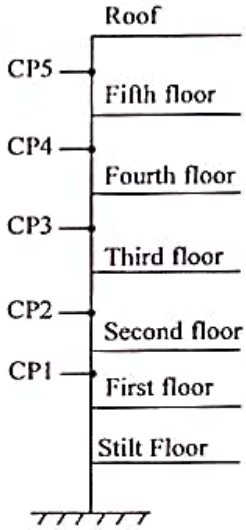
Column Curtailment Details



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

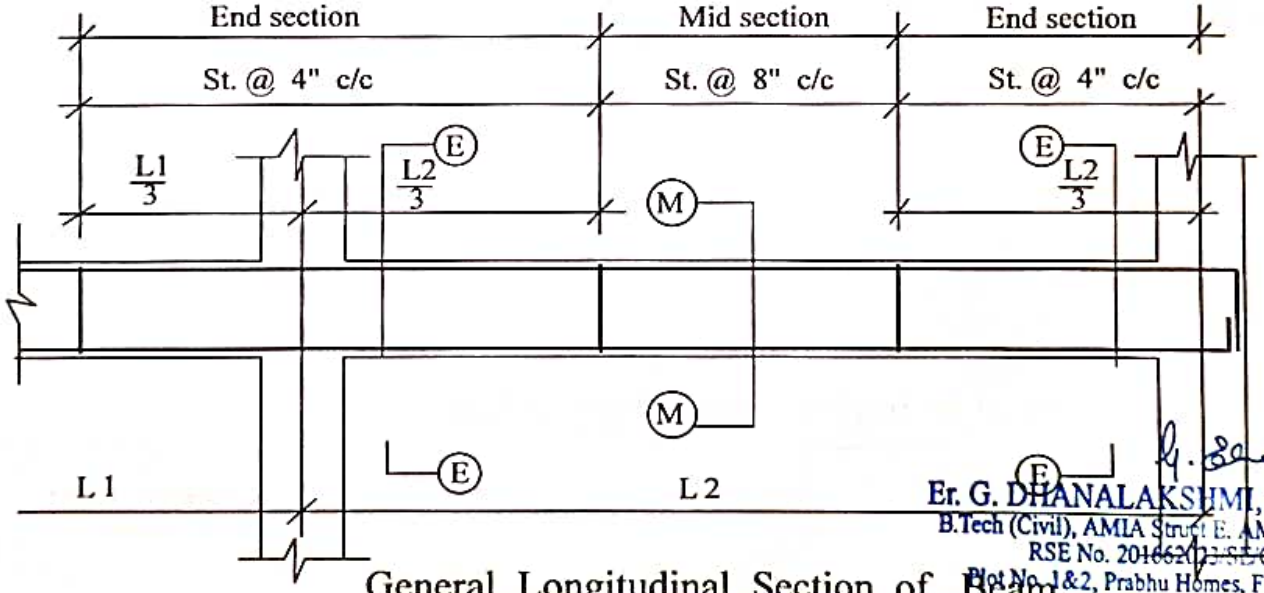
CP2 - Mid height between Second floor & Third floor

CP3 - Mid height between Third floor & Fourth floor

CP4 - Mid height between Fourth floor & Fifth floor

CP5 - Mid height between Fifth floor & Roof

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

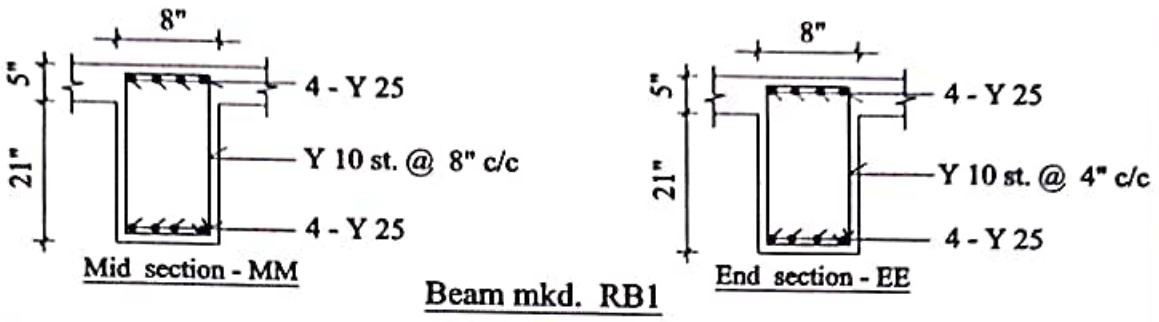


General Longitudinal Section of Beam

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Title: Details of Column Curtailment & General L.S.of Beam	Client: M/s. ICIPL		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 dhanaaassociates@gmail.com
Site: Plot No.1,2,3,4 & 5, Block No.77, Pilayar Kovil Street, Thirumullaivoyal, Chennai- 600 112.	Scale : NTS	File no : Dwg.- 07 / 2021	
	Date : 26.10.2022	Sheet no : 5 / 7	
	Dsgn. by : G.D	Drn. by : G.D	Ckd. by : Dr. V.S.

Details of Roof Beam

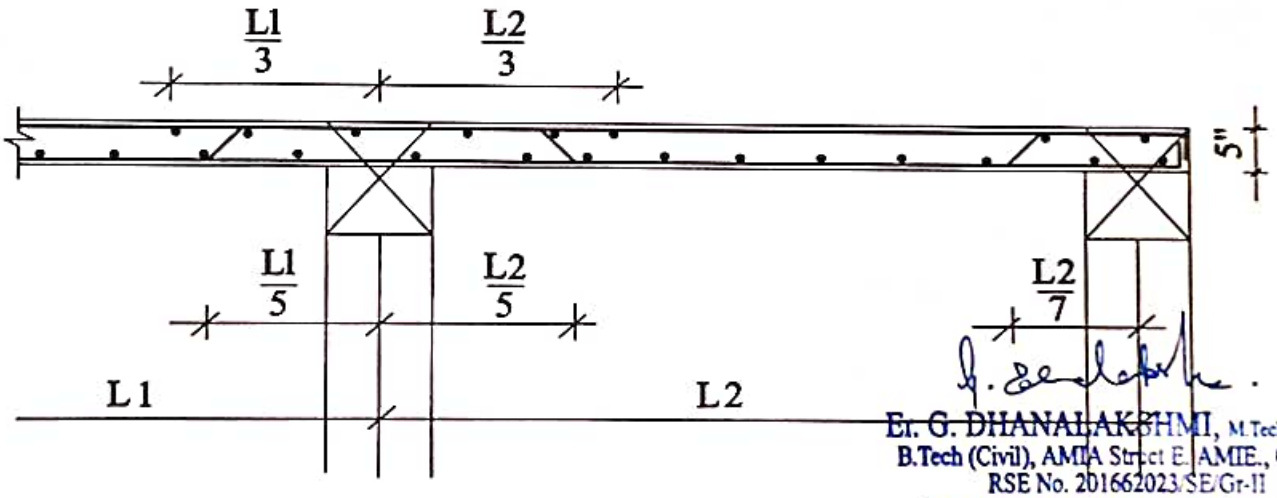


Beam mkd. RB1

Details of Roof Slab :

* All the Slab Thickness = 5" Thick

(S1) Shorter span : Y - 8 @ 5" c/c
Longer span : Y - 8 @ 7" c/c



General Longitudinal Section of Roof Slab

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Title : Details of Beam, Slab & General L.S.of Slab	Client : M/s. ICIPL		Structural Consultant : DHANAA SUNDARARAJULU AND ASSOCIATES, Survey, Quantity Survey & Structural Engineering Consultants, DSA, Plot No 1 & 2, Kabilar Street, Senthil Nagar, Thirumullaivoyal, Chennai - 62. Mob. 98406 22035, E-mail : dhanastructural@gmail.com, dhanaanna.sales@gmail.com
Site : Plot No.1,2,3,4 & 5, Block No.77, Pilayar Kovil Street, Thirumullaivoyal, Chennai- 600 112.	Scale : NTS	File no : Dwg.- 07 / 2021	
	Date : 26.10.2022	Sheet no : 6 / 7	
	Dsgn. by : G.D	Drn. by : G.D	Ckd. by : Dr. V.S.

Note : (To be Considered During Execution of works)

* All dimensions are in Feet & Inces
* Size of Footings Shown in dotted line for Concrete edge.
* Grade of concrete mix shall be M - 30 for Pile, Pile Cap, Column 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 15.00 m for Pile Foundation
* Soil : Vide Soil Report by No.(Geo Mines Engineers Pvt., Ltd.,GMEPL/INTOUCH CONSTRUCTION & INFRA STRUCTURE PVT. LTD./358/2020-21, Dt.04.02.2020)
* 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

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Title	Client	
General Notes	M/s. ICIPL	DHANAA SUNDARARAJULU AND ASSOCIATES Survey, Quantity Survey & Structural Engineering Consultant DSA Plot No 1 & 2, Kabilar Street, Senthil Nagar, Thirumullaivoyal, Chennai - 62. Mob: 98400 22035 E-mail: dhanastructural@gmail.com, dhanaassociates@gmail.com
Site: Plot No.1,2,3,4 & 5, Block No.77, Pilayar Kovil Street, Thirumullaivoyal, Chennai- 600 112.	Scale : NTS	File no : Dwg.- 07 / 2021
	Date : 26.10.2022	Sheet no : 6 / 7
	Dsgn. by : G.D	Drn. by : G.D / Ckd. by : Dr. V.S.



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