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Verified RealEstate™
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verified.realestate

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CHENNAI METROPOLITAN DEVELOPMENT AUTHORITY
Thalamuthu Natarajan Building, No.1, Gandhi Irwin Road, Egmore,
Chennai - 600 008
Phone : 28414600 Fax: 91-044-28548413
E-mail: mcmda@tn.gov.in
Web site: www.cmdachennai.gov.in

PROFESSIONAL REGISTRATION CERTIFICATE

This is to certify that the Thiru / Tmt. / Ms. **M.SHANKAR** has enrolled as **Registered Structural Engineer Grade-I(SE)** with Chennai Metropolitan Development Authority (CMDA) who has the qualification of **M.E Structures** and experience in the relevant field for 7 years.

He/She has been given the Registration No. **SE/2024/A/0037** on **15-Apr-2024** He/She shall be required to comply with the duties and responsibilities 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.19 MAWS (M1) Dept. Dated: 04.02.2019.

This Registration is valid upto **11-Apr-2029**.

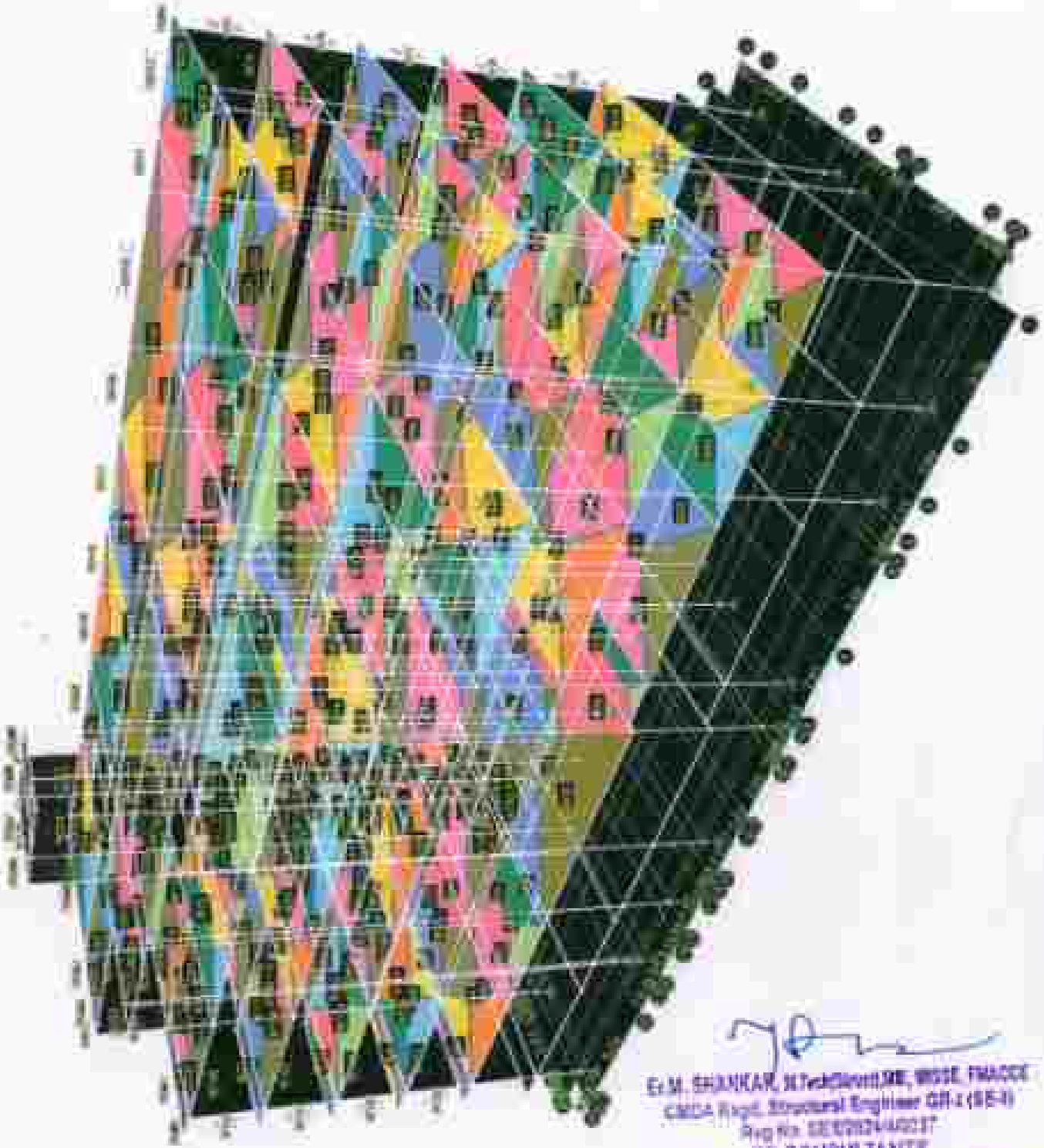
Signature valid
Name: A. Nagarathinam
Designation: Superintendent
Date: 15/04/2024 3:58:03 PM



A. Nagarathinam

Superintendent

Er.M. SHANKAR, M.Tech(Structure), MISTE, FNACCE
CMDA Regd. Structural Engineer GR-I (SE-I)
Reg.No. SE/2024/A/0037
SS CONSULTANTS
No.11, Thiruvalluvar Street, Pallikaranai, Chennai-600 100.
Cell: 9382182588 / 9962000443
Email: shivashankar47@yahoo.com



Er.M. SHANKAR, M.Tech(Struct),ME, MIStE, FMACCE
CMDA Regd. Structural Engineer GR-I (SE-I)
Reg No. SE/2023/402137
SB CONSULTANTS
No.11, Thomas Street, Pallikaranai, Chennai-600 100.
Cell: 9283103306 / 9952650643
Email: shankarsankar67@yahoo.com

STABILITY CALCULATIONS FOR THE PROPOSED CONSTRUCTION OD STILT FLOOR +4 FLOORS +5 TH FLOOR (PART) RESIDENTIAL BUILDING WITH 24 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENIFITAT PLOT NO. 29,17 TH CROSS STREET,NCBS COLONY,NANGANALLUR,CHENNAI-600061 AND COMPRISED IN OLD S.NO.19/3 (PART)4 (PART),20/1 (PART),3 (PART) AS PER PATTA NEW TS NO.16/11&18/2,BLOCK NO. 31,WARD -B OF NANAGANALLUER VILLAGE,ALANDUR TALUK WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION

Design Data Report :

Footing Data:

Soil Parameters :

SBC of soil	=320.00 kN/m²
SBC Increment Factor for Seismic Load	= 1.500
SBC Increment Factor for Wind Load	= 1.500
Angle of friction,(phi)	= 30.00 degrees
Cohesion	= 60.00
Permissible factor of safty	= 1.400
Depth From Ground	= 2000 mm

Material Properties :

fck	= 30.00 N/mm²
fy	= 500.00 N/mm²

Footing Parameters :

Minimum steel Percentage	= 0.12
Minimum spacing between bars	= 100 mm
Maximum spacing between bars	= 200 mm
Diameters of selected bars	= 10 mm , 12 mm ,
Bottom Cover	= 50 mm
End Cover	=50 mm
Minimum Footing Depth	= 150 mm
Top Offset	= 50 mm
Bottom PCCOffset	= 150 mm
Bottom PCC Depth	= 150 mm
Pedestal Offset	= 150 mm
Pedestal Depth	= 150 mm
Size RoundingFactor	= 25 mm
Depth RoundingFactor	= 25 mm
Number of Steps	= 1
Minimum Step Depth	= 150 mm

Er.M. SHANKAR, M.Tech(Struct),ME, MISE, FIMACCE
CMDA Regd. Structural Engineer GR I (SE-I)
Reg No. SE/2002/4(002)1
SB CONSULTANTS
No.11, Thandi Street, Pallikaranai, Chennai-600 100.
Cell: 9382102585 / 9551005643
Email: shankarsb72@yahoo.com

STABILITY CALCULATIONS FOR THE PROPOSED CONSTRUCTION OD STILT FLOOR +4 FLOORS +5 TH FLOOR (PART) RESIDENTIAL BUILDING WITH 24 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENIFITAT PLOT NO. 29,17 TH CROSS STREET,NCBS COLONY,NANGANALLUR,CHENNAI-600061 AND COMPRISED IN OLD S.NO.19/3 (PART)4 (PART),20/1 (PART),3 (PART) AS PER PATTA NEW TS NO.18/11&18/2,BLOCK NO. 31,WARD -B OF NANAGANALLUER VILLAGE,ALANDUR TALUK WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION

Column Data:

Material Properties :

fck	= 25.00 N/mm^2
fy	= 500.00 N/mm^2
fy - Stirrups	= 500.00 N/mm^2

Column Parameters :

Effective Length Factor (X - Axis)	= 1.00
Effective Length Factor (Y - Axis)	= 1.00
Minimum Eccentricity @ X-Axis	= 20 mm
Minimum Eccentricity @ Y-Axis	= 20 mm
Clear Cover	= 40 mm

Design Considerations :

Design is done as per IS 456.

Detailing is done as per IS 13920.

Confinement reinforcement is provided.

Live Load reduction is considered.

Minimum steel percentage is based on provided section.

Reinforcement Details :

Steel Ratio(AstX/AstY)	= 1.00
ReinForcement Placing (on two sides or on four sides)	= 2
Minimum steel Percentage	= 0.80
Maximum steel Percentage	= 4.00
Minimum spacing between main bars	= 25 mm
Maximum spacing between main bars	= 300 mm
Minimum spacing between Stirrups	= 150 mm
Diameters of selected bars	= 12 mm , 16 mm , 20 mm , 25 mm , 32 mm ,

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Slab Data: Use Bent-up bars for steel detailing.

Material Properties :

Er.M. SHANKAR, M.Tech(Struct.Engg), MIE, MISTE, FNAGCE
CMDA Regd. Structural Engineer GR-I (SE-I)
Reg.No. SE/S/2324/0037
SB CONSULTANTS
No.11, Thandi Street, Pallikaranai, Chennai-600 100.
Cell: 9382102388 / 9159059643
Email: shankarkrishna97@yahoo.com

STABILITY CALCULATIONS FOR THE PROPOSED CONSTRUCTION OD STILT FLOOR +4 FLOORS +5 TH FLOOR (PART) RESIDENTIAL BUILDING WITH 24 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENIFITAT PLOT NO. 29,17 TH CROSS STREET,NCBS COLONY,NANGANALLUR,CHENNAI-600061 AND COMPRISED IN OLD S.NO.19/3 (PART)4 (PART),20/1 (PART),3 (PART) AS PER PATTA NEW TS NO.19/11&19/2,BLOCK NO. 31,WARD -B OF NANAGANALLUER VILLAGE,ALANDUR TALUK WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION

RCC Grade	= M20
Main Steel Grade	= Fe550
Distribution Steel Grade	= Fe550

Slab Parameters :

Effective Cover	= 25 mm
Minimum spacing between Main bars	= 75 mm
Maximum spacing between Main bars	= 300 mm
Minimum spacing between Dist.bars	= 75 mm
Maximum spacing between Dist.bars	= 300 mm
Maximum Main/Dist. bar Diameter	= 32 mm
Minimum Main bar Diameter	= 8 mm
Minimum Dist.bar Diameter	= 8 mm
Maximum Dimension to be used for Trapizoidal Slab	= Average of two parellel sides
Maximum Dimension to be used for General Slab	= Maximum of two parellel sides

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Beam Data:

Shear Design Data :

Minimum Stirrup Dia	= 8 mm
Stirrup Legs	= 2
Minimum Stirrups Spacing	= 100 mm
Stirrups Steel Grade Name	= Fe500

Effect of Concrete in shear considered

Beam Covers :

Tension Cover	= 33 mm
Compression Cover	= 33 mm
Side Cover	= 25 mm

Beam sections are designed as Doubly Reinforced Section

Main Bars Detailing Straight + Curtailed

Detailing provision As per IS 13920 is followed

End Moments are calculated at c/c distance of the beam span for design

Torsion Moments are considered in beam design

Anchor bar Dia = 8 mm

E. N. BHASKAR, B.Tech(Hons)(IIT), ME, MIStructE, FIAACCE
Chartd. Regd. Structural Engineer GR-I (SE-I)
Reg No. SE/2020/140037
SB CONSULTANTS
No.11, Thirvalluvar Street, Pallikaranai, Chennai-600 100.
Cell: 9382102288 / 9382055543
Email: sbcottonbhaskar47@yahoo.com

STABILITY CALCULATIONS FOR THE PROPOSED CONSTRUCTION OD STILT FLOOR +4 FLOORS +5 TH FLOOR (PART) RESIDENTIAL BUILDING WITH 24 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENIFITAT PLOT NO. 29,17 TH CROSS STREET,NCBS COLONY,NANGANALLUR,CHENNAI-600061 AND COMPRISED IN OLD S.NO.19/3 (PART)4 (PART),20/1 (PART),3 (PART) AS PER PATTA NEW TS NO.18/11&19/2,BLOCK NO. 31,WARD -B OF NANAGANALLUER VILLAGE,ALANDUR TALUK WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION

Main Steel Grade	= Fe500
No. of division of the beam	= 10
Max. Aggregate size	= 20

Er.M. SHANKAR, M.Tech(Structural),MIE, MISSE, FMACCE
CMDA Regd. Structural Engineer (SR-I (SE-I)
Reg No. SE/S/2014/M0037
SB CONSULTANTS
No.11, Third Street, Pallikaranai, Chennai-600 100.
Cell: 9282183336 / 9952033843
Email: shankarkarki@yahoo.com

STABILITY CALCULATIONS FOR THE PROPOSED CONSTRUCTION OD STILT FLOOR +4 FLOORS +5 TH FLOOR (PART) RESIDENTIAL BUILDING WITH 24 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENIFITAT PLOT NO. 29,17 TH CROSS STREET,NCBS COLONY,NANGANALLUR,CHENNAI-600061 AND COMPRISED IN OLD S.NO.15/3 (PART)4 (PART),20/1 (PART),3 (PART) AS PER PATTA NEW TS NO.18/11&18/2,BLOCK NO. 31,WARD -B OF NANAGANALLUER VILLAGE,ALANDUR TALUK WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION

Annexure – XIV

[See rule 53 (3)]

Form 1

Structural Design Basis Report

(1) This report to accompany the application for Building Development

Part1	General Data		
S.No.	Description	Information	Notes
1.	Site Address		
2	Name of Owner		
3	Name of Registered Developer along with the Registration Number		
4	Name of Registered Architect/Engineer along with the Registration Number		
5	Name of Registered Structural engineer along with the Registration Number	**SE/-I2024/4/0037**	
6	Use of the building	**RESIDENTIAL**	
7	Number of stories above ground level (including storeys to be added later, if any)	**STILT+4 FLOORS+5TH FLOOR (PART)**	
8	Number of basements below ground level	**NIL**	
9	Type of structure Load bearing walls R.C.C. frame R.C.C. frame and Shear Walls Steel frame	**RC FRAME**	
10	Soil data Type of soil Design safe bearing capacity	**INDIVIDUAL ISOLATED FOOTING WITH SBC.**	IS:1893 Cl:6.3.5.3 IS: 1904 IS: 1892 IS: 2131 IS: 2720

Er.M. SHANKAR, M.Tech(Structural Engineering)
Govt. Regd. Structural Engineer GR-I (ST-I)
Reg No. SE/2018/4/0037
SB CONSULTANTS
No.11, Thendral Street, Pallikaranai, Chennai-600 100.
Cell: 9283192536 / 9962033643
Email: shankarsb1@yahoo.com

STABILITY CALCULATIONS FOR THE PROPOSED CONSTRUCTION OD STILT FLOOR +4 FLOORS +5 TH FLOOR (PART) RESIDENTIAL BUILDING WITH 24 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENIFITAT PLOT NO. 29,17 TH CROSS STREET,NCBS COLONY,NANGANALLUR,CHENNAI-600061 AND COMPRISED IN OLD S.NO.19/3 (PART)4 (PART),20/1 (PART),3 (PART) AS PER PATTA NEW TS NO.18/11&18/2,BLOCK NO. 31,WARD -B OF NANAGANALLUER VILLAGE,ALANDUR TALUK WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION

		320KN/SQ.M	
11	Dead loads (unit weight adopted) • Earth: **18KN/CUM** • Water: **10KN/CUM** • Brick masonry: **19.2KN/CUM** • Plain cement concrete **24KN/CUM** • Reinforced cement concrete **25 KN/CUM** • Floor finish **50KG/SQM** • Other fill materials		IS: 875 Part 1
12	Imposed (live) loads Floor loads Roof loads	**4KN/SQM** **1.5KN/SQM**	IS: 875 Part 2

13	Cyclone/Wind • Speed • Design pressure intensity	**N/A**	IS: 875 Part 3
14	Seismic zone	**III**	IS: 1893 (2002)
15	Importance factor	**1**	IS:1893(2002) Table 6
16	Seismic zone factor (Z)	**0.16**	IS:1893 Table 2
17	Response reduction factor		IS:1893 Table 7
18	Fundamental natural period – approx.	**0.255EC**	IS: 1893 Cl.7.6
19	Design horizontal acceleration spectrum value (Sa)		IS: 1893 Cl.6.4.2
20	• Expansion/Separation Joints	**N/A**	
21	Building is regular/irregular	**REGULAR**	IS 1893

• Enclose detailed drawings drawn to scale for each floor
• In case terrace garden is provided, indicate additional fill load and live load along with the detailed drawings drawn to scale

Part 2	**Load bearing masonry buildings**		
Sl.No.	**Description**	**Information**	**Notes**

Er.M. SHANKAR, M.Tech(Struct)ME, MISTE, FIAOCE
CMDA Regd. Structural Engineer GR-I (SE-I)
Reg No. SE/2001/400037
SB CONSULTANTS
No.11, Thiruvalluvar Street, Pallikaranai, Chennai-600 100.
Cell: 9282188888 / 9884038843
Email: shivasankar47@yahoo.com

STABILITY CALCULATIONS FOR THE PROPOSED CONSTRUCTION OD STILT FLOOR +4 FLOORS +5 TH FLOOR (PART) RESIDENTIAL BUILDING WITH 24 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENIFITAT PLOT NO. 29,17 TH CROSS STREET,NCBS COLONY ,NANGANALLUR,CHENNAI-600061 AND COMPRISED IN OLD S.NO.19/3 (PART)4 (PART),20/1 (PART),1 (PART) AS PER PATTA NEW TS NO.18/11&18/2,BLOCK NO. 31,WARD -B OF NANAGANALLUER VILLAGE,ALANDUR TALUK WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION

1	Building category	**N/A**	IS: 4326 C1.7 Read with IS:1893 Zone: II III IV V Bldg. Ordinary: B C D E Important: C D E E
2	Basement Provided	**N/A**	
3	Number of floors including Ground Floor (all floors including stepped floors in hill slopes)	**N/A**	
4	Type of wall masonry	**N/A**	
5	Type and mix of Mortar	**N/A**	IS: 4326 C1.8.1.2
6	Re: size and position of openings (See note No.(i)) • Minimum distance (b3) • Ratio $(b_1+b_2+b_3)/l_1$ or: $(b_4+b_5)/l_2$ • Minimum pier width between consequent opening (b_4) • Vertical distance (b_5) • Ratio of wall height to thickness 4 Ratio of wall length between cross wall to thickness	**N/A**	IS: 4326 Table 4, Fig 7
7	Horizontal seismic band • at plinth level **N/A** • at window sill level **N/A** • at lintel level **N/A** • at ceiling level **N/A**	P IP NA) |)) |)) |))) |	(see note No.2) (i)4326 C1 8.4.6 IS: 4326 C1 8.3 IS: 4326 C1 8.4.2 IS: 4326 C1 8.4.3 IS: 4326 C1 8.4.3
	• at eave level of sloping roof **N/A** • at top of gable walls **N/A** • at top of ridge walls **N/A**	))) |))) | |	IS: 4326 C1 8.4.3 IS: 4326 C1 8.4.4

Er.M. SHANKAR, M.Tech(Struct.ME, MBSE, FIE(I)
CMDA Regd. Structural Engineer Gr-I (SE-I)
Reg No. SE/2020/0010
RR CONSULTANTS
No.11, Thomas Street, Nungambakkam, Chennai-600 034
Cell: 9382115366 / 9382004943
Email: shankarrr1@yahoo.com

STABILITY CALCULATIONS FOR THE PROPOSED CONSTRUCTION OD STILT FLOOR +4 FLOORS +5 TH FLOOR (PART) RESIDENTIAL BUILDING WITH 24 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENIFITAT PLOT NO. 29,17 TH CROSS STREET,NCBS COLONY,NANGANALLUR,CHENNAI-600061 AND COMPRISED IN OLD S.NO.19/3 (PART)4 (PART),20/1 (PART),3 (PART) AS PER PATTA NEW TS NO.18/11&18/2,BLOCK NO. 31,WARD -B OF NANAGANALLUER VILLAGE,ALANDUR TALUK WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION

8	Vertical reinforcing bar **N/A** at corners and T junctions of walls or jambs of doors and window openings **N/A**	)	)	IS: 4326 C1 8.4.8, IS: 4326 C1 8.4.9
9	Integration of prefab roofing/flooring elements through reinforced concrete screed **N/A**	)	)	IS-4326 C1 9.1.4
10	Horizontal bracings in pitched truss in horizontal plane at the level of ties in the slopes of pitched roofs **N/A**	)	)	

Notes: (i) Information in item 6 should be given on separate A4 sheets for all walls with large number of openings

(ii) IP indicated "Information Provided"

IP indicates "Information to be provided" NA indicates "Not Applicable"

Tick mark one box

Part 3	Reinforced concrete framed buildings		
Sl. No.	Description	Information	Notes
1	Type of building • Regular frames • Regular frames with Shear Walls • Irregular frames • Irregular frames with Shear Walls • Soft storey	**REGULAR FRAMES**	IS: 1893 C1 7.1
2	Number of basements	**NIL**	
3	Number of floors including ground floor	**S+4&5 TH FLOOR (PART)**	

Er.M. SHANKAR, M.Tech(STRUCTURE), MISTE, FIMA,CE
CAT(A) Regd. Structural Engineer GR-3 (SE-1)
Reg No: SE/S/2019/0012
SB CONSULTANTS
No.16, Thiruvalluvar Street, Pallikaranai, Chennai-600 100.
Mob: 9841982089 / 9962080643
Email: structshankar97@yahoo.com

STABILITY CALCULATIONS FOR THE PROPOSED CONSTRUCTION OD STILT FLOOR +4 FLOORS +5 TH FLOOR (PART) RESIDENTIAL BUILDING WITH 24 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENIFITAT PLOT NO. 29,17 TH CROSS STREET,NCBS COLONY,NANGANALLUR,CHENNAI-600061 AND COMPRISED IN OLD S.NO.19/3 (PART)4 (PART),20/1 (PART),3 (PART) AS PER PATTA NEW TS NO.18/11&18/2,BLOCK NO. 31,WARD -B OF NANAGANALLUER VILLAGE,ALANDUR TALUK WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION

4	Horizontal floor system • Beams and slabs • Waffles • Ribbed floor • Flat slab with drops • Flat plate without drops	**BEAM AND SLAB**	
5	Soil data • Type of soil • Recommended type of foundation -Independent footings -Raft -Piles • Recommended bearing capacity of soil	**MEDIUM SOIL WITH ISOLATED FOOTING**	IS: 1498
	• Recommended type, length, diameter and load capacity of piles • Depth of water table • Chemical analysis of ground water • Chemical analysis of soil		
6	Foundations Depth below ground level Type Independent Interconnected Raft Piles	**INDIVIDUAL ISOLATED FOOTING**	
7	System of interconnecting foundations Plinth beams Foundation beams	**PLINTH BEAM**	IS: 1893 Cl.7.12.1
8	Grades of concrete used in different parts of building	**M25 FOR**	

Er.M. SHANKAR, M.Tech(Struct.ME.MISE.IE
CMDA Regd. Structural Engineer
Reg.No.
SD CONSULTANTS
No.11, Thiruvalluvar Street, Pallikaranai, Chennai
Cell:
Email:

STABILITY CALCULATIONS FOR THE PROPOSED CONSTRUCTION OD STILT FLOOR +4 FLOORS +5 TH FLOOR (PART) RESIDENTIAL BUILDING WITH 24 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENIFITAT PLOT NO. 29,17 TH CROSS STREET,NCBS COLONY,NANGANALLUR,CHENNAI-600061 AND COMPRISED IN OLD S.NO.19/3 (PART)4 (PART),20/1 (PART),3 (PART) AS PER PATTA NEW TS NO.16/11&19/2,BLOCK NO. 31,WARD -B OF NANAGANALLUER VILLAGE,ALANDUR TALUK WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION

		COLUMNS& M30 FOR REST	
9	Method of analysis used	**FEM**	
10	Computer software used	**SCADDS NUCLEUS 2022 VERSION**	
11	Torsion included	**INCLUDED**	IS: 1893 Cl 7.9
12	Base shear: a. Based on approximate fundamental period b. Based on dynamic analysis c. Ratio of a/b	**BASED ON APPROXIMATE FUNDAMENTAL PERIOD**	IS: 1893 CL 7.5.3
13	Distribution of seismic forces along the height of the building.	**REFER SEISMIC JUSTIFICATION**	IS: 1893 Cl.7.7 (Provide sketch)
14	The Column of soft ground stores specially designed.	**YES**	IS: 1893 Cl.7.10
15	Clear minimum cover provided to • **Footing 50MM** • **Column 40MM** • **Beams 25MM** • **Slabs 20MM** • **Walls**		IS: 456 Cl. 26.4

Er.M. SHANKAR, M.Tech(Struct), MIE, MSSE, FIAGCE
CM/CA Regd. Structural Engineer (SR-I (SE-I)
Reg No. SE/S/2/A/00217
SB CONSULTANTS
No.11, Thiruvalluvar Street, Pallikaranai, Chennai-600 100.
Cell: 9382133589 / 9952650643
Email: structshankar67@yahoo.com

STABILITY CALCULATIONS FOR THE PROPOSED CONSTRUCTION OD STILT FLOOR +4 FLOORS +5 TH FLOOR (PART) RESIDENTIAL BUILDING WITH 24 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENIFITAT PLOT NO. 29,17 TH CROSS STREET,NCBS COLONY,NANGANALLUR,CHENNAI-600061 AND COMPRISED IN OLD S.NO.19/3 (PART)4 (PART),20/1 (PART),3 (PART) AS PER PATTA NEW TS NO.18/11&18/2,BLOCK NO. 31,WARD -B OF NANAGANALLUER VILLAGE,ALANDUR TALUK WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION

16	Ductile detailing of RC frame • Type of reinforcement used **Fe 500D** • Minimum dimension of beams **230MM** • Minimum dimension of columns **230MM** • Minimum percentage of reinforcement of beams at any cross section **0.20%** • Maximum percentage of reinforcement at any section of beam **4%** • Spacing of transverse reinforcement in 2-d length of beams near the ends **100MM** • Ratio of capacity of beams in shear to capacity of beams in flexure **<1** • Maximum percentage of reinforcement in column **4%**		IS: 456 Cl. 5.6 IS: 13920 Cl.6.1 IS: 13920 Cl.7.1.2 IS: 456 Cl.26.5.1(a) IS: 13920 Cl.6.2.1 IS: 456 Cl.26.5.1.(b) IS: 13920 Cl.6.2.2 IS: 13920 Cl.6.3.5 IS: 456 Cl.26.5.3.1 IS: 13920 Cl. 7.4
	• Confining stirrups near ends of columns and in beam-column joints Diameter **8mm** Spacing **100MM** • Ratio of shear capacity of columns to maximum seismic shear in the stores **<1**		
17	Does the features require clearance by SEIAA Example: High rise building Prefab building Building in hazard prone areas	**N/A**	

Foundation

i. In case raft foundation has been adopted, indicate K value used for analysis of the raft.

ii. Incase pile foundations have been used, give full particulars of the piles, type, dia, length, capacity

iii. In case of high water table, indicate system of counteracting water

Er.M. SHANKAR, M.Tech(Structure), MISTE, FIE(I), CEng
Valid upto Structural Engineer GR-I (SE-I)
Reg No. S/0/2016/00537
SB CONSULTANTS
No.11, Thiruvalluvar Street, Pallikaranai, Chennai-600 100.
Cell: 9382103588 / 9952050943
Email: shankarsbe67@yahoo.com

pressure, and indicate the existing water table, and that assumed in design foundations.

Idealisation for Earthquake analysis

i. In case of composite system of shear walls and right frames, give distribution of base shear in the two systems on the basis of analysis, and that used for design of each system

ii. Indicate the idealisation of frames and shear walls adopted in the analysis with the help of sketches.

iii. Submit framing plans of each floor

iv. In case of basements, indicate the system used to contain earth pressures.

Part 4	**Buildings in structural steel**		
1	Adopted method of design	a Simple b Semi rigid c Rigid	IS:800 Cl.3.4.4 IS:800 Cl.3.4.5 IS:800 Cl.3.5.6
2	Design based on	a Elastic analysis b Plastic analysis	IS: 800 Section 9 IS:6 (b)
3	Floor construction	a Composite b Non composite c Bonded	
4	Roof construction	a Composite b Non composite c Metal d Any other	
5	Horizontal force resisting system adopted	Frames Braced frames Frames & shear walls	Note: Seismic force As per IS 1893 Would depend on system
6	Slenderness ratios maintained	Members defined in Table 3.1, IS:800	IS 800, Cl.3.7
7	Member deflection limited to	Beams, Rafters Crane Girders, Purlins Top of columns	IS:800 Cl.3.11
8	Structural members	a Encased in concrete Not encased	IS: 800 Section-10

Er.M. SHANKAR, M.Tech(Str.Engg), MIE, MIEE, FMACCE
Chartered Structural Engineer CR-1 (SE-I)
Reg No. SB/2003/4/00537
SB CONSULTANTS
No.11, Thandi Street, Pallikaranai, Chennai-600 100.
Cell: 9282102888 / 9952033543
Email: shankarsb1@yahoo.com

STABILITY CALCULATIONS FOR THE PROPOSED CONSTRUCTION OD STILT FLOOR +4 FLOORS +5 TH FLOOR (PART) RESIDENTIAL BUILDING WITH 24 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENIFITAT PLOT NO. 28,17 TH CROSS STREET,NCBS COLONY,NANGANALLUR,CHENNAI-600061 AND COMPRISED IN OLD S.NO.19/3 (PART)4 (PART),20/1 (PART),3 (PART) AS PER PATTA NEW TS NO.18/11&18/2,BLOCK NO. 31,WARD -B OF NANAGANALLUER VILLAGE,ALANDUR TALUK WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION

9	Proposed material	a. General weld-able b. High strength c. Cold formed d. Tubular	IS: 2062 IS: 8500 IS: 801, 811 IS: 806
10.	Minimum metal thickness Specified for corrosion protection	a. Hot rolled sections b. Cold formed sections c. Tubes	IS: 800: Cl.3.8 Cl.3.8.1 to Cl.3.8.4 Cl.3.8.5
11	Structural connections	a. Rivets b. CT Bolts c. S H F G Bolts d. Black Bolts e. Welding field fship (Specify welding type proposed) Composite	IS: 800, Section-8 IS: 1929, 2155, 1149 IS 6639, 1367 IS 3757, 4000 IS: 1363, 1367 IS: 816, 814,1395, 7280, 3613, 6419, 6560, 813, 9595
12	Minimum Fire rating proposed, with method	a. Rating ——— hour s b. Method proposed. -In tumescent painting -Spraying -Quilting -Fire retardant boarding	IS: 1641, 1642, 1643

STRUCTURAL ENGINEER



Er.M. SHANKAR, M.Tech(Struct),ME,MISE,FIMACE
CMDA Regd. Structural Engineer-OR-1 (SE-1)
Reg.No. SE/2004/0553
SB CONSULTANTS
No.11, Thandi Street, Pallikaranai, Chennai-600 100.
Cell: 9282102588 / 9952360443
Email: structshankar67@yahoo.com

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SCADDS/Nucleus 2022: RC-Footing Designer
Limit State Design of Wall Footings for
Axial Load & Uniaxial Bending.
Isolated Flat/Sloped Rectangular/Circular Footings
with or without Pedestals
for Axial Load, Uniaxial & Biaxial Bending.
Combined Rectangular/Trapezoidal Footings
with or without Pedestals
for Axial Load & Uniaxial Bending
in accordance with IS:456-2000 and IS:6403-1981

Introduction::

This Report contains the detailed solution for the given Reinforced Concrete Footing Design problem.

The given Footing is considered for flexural design and the output contains the following portions.

1. Footing Input Data
2. Flexural Design Output for Footing
3. Flexural Design Output for Pedestal, if provided
4. One Way Shear Check Output
5. Two Way Shear Check Output
6. Development Length / Bond Design Output

While detailed design will be carried out for Flexure and Bond, only checks for stresses are made for

Global Material Data

Concrete Clear Cover	=	50	mm.
Char. Comp. Strength of Concrete	=	25	N/sq.mm.
Yield Strength of Main Steel	=	500	N/sq.mm.
Main Rod Size-1	=	10	mm.
Main Rod Size-2		12	mm.
Yield Strength of Distribution Steel	=	500	N/sq.mm.
Distbn. Rod Size-1		10	mm.
Distbn. Rod Size-2		12	mm.

E.M. SHANFAR, B.Tech(Civil), MIE, MISE, FIE, MIV
CADD& Regd. Structural Engineer GR-I (SE-I)
Reg.No. SE/I/2/0405/07
SB CONSULTANTS
No.11, Thanahi Street, Pallikaranai, Chennai-600 100.
Cell: 9282107388 / 9952118043
Email: emushashan1@yahoo.com

Yield Strength of Dowel/Pedestal Steel	=	500	N/sq.mm.
Dowel/Pedestal Rod Size-1	=	12	mm
Dowel/Pedestal Rod Size-2	=	16	mm
Factor of Safety for Load	=	1	
Partial Safety Factor for Concrete	=	1.5	
Partial Safety Factor for Steel	=	1.15	
Max. Strain in Concrete	=	0.0035	mm/mm
Max. Strain in Steel	=	0.0055	mm/mm
Young's Modulus of Concrete	=	25000	N/sq.mm.
Young's Modulus of Steel	=	200000	N/sq.mm.

Bond / Development Length Output

Char. Comp. Strength of Concrete	=	25	N/sq.mm.
Yield Stress of Main Steel	=	500	N/sq.mm.
Yield Stress of Secondary Steel	=	500	N/sq.mm.
Yield Stress of Dowel/Pedestal Steel	=	500	N/sq.mm.
As Per IS: 456-2000, Clause 26.2.1.1,			
Design Bond Stress for Main Rods	=	2.24	N/sq.mm.
Design Bond Stress for Secondary Rods	=	2.24	N/sq.mm.
Design Bond Stress for Dowel/Pedestal Rods	=	2.24	N/sq.mm.
Rods in Tension:-			
Main Rod Diameter-1	=	10	mm.
Corresponding Development Length	=	485.491	mm.
Main Rod Diameter-2	=	12	mm.
Corresponding Development Length	=	582.589	mm.
Secondary Rod Diameter-1	=	10	mm.
Corresponding Development Length	=	485.491	mm.
Secondary Rod Diameter-2	=	12	mm.
Corresponding Development Length	=	582.589	mm.
Rods in Compression:-			
Dowel/Pedestal Rod Diameter-1	=	12	mm.
Corresponding Development Length	=	582.589	mm.
Dowel/Pedestal Rod Diameter-2	=	16	mm.
Corresponding Development Length	=	776.786	mm.

Er.M. SHANKAR, M.Tech(Struct.ME, MISTE, FIAOCE
Chartered Engineer (India)
Regd. Structural Engineer
Reg. No. SE/2003/44037
Sid CONSULTANTS
No.11, Thiruvalluvar Street, Pallikaranai, Chennai-600 100.
Cell: 9283103388 / 9962488643
Email: shankarsidhu@yahoo.com

F01 : Global Input Data (LC No. : 9)			
The footing is to be designed as an Isolated Footing			
Width of Column	=	230	mm
Length of Column	=	600	mm
Footing Shape	=	Rectangular	
Initial Depth at the Face of Wall/Column	=	300	mm
Initial Depth at the End	=	150	mm
The footing is subjected to Axial Load & Biaxial			
Working Axial Load	=	1145.476	KN
Working Moment about ZZ-axis	=	6.883	KN m
Working Moment about XX-axis	=	1.934	KN m
Safe Bearing Capacity of Soil	=	330	KN/sq.m.
Factor of Safety for Safe Bearing Capacity	=	1.5	

F01 : Flexure Output (LC No. : 9)			
Working Axial Load on Footing	=	1145.476	KN
Factored Axial Load on Footing	=	1145.476	KN
Percentage Factor for Self Weight of Footing	=	10	%
Factored Self Weight of Footing	=	114.548	KN
Total Factored Axial Load on Footing	=	1260.023	KN
Working Moment about ZZ-axis	=	6.883	KN m
Factored Moment about ZZ-axis	=	6.883	KN m
Working Moment about XX-axis	=	1.934	KN m
Factored Moment about XX-axis	=	1.934	KN m
Ultimate Bearing Capacity of Soil	=	495	KN/sq.m.
From Vertical Load and Bending considerations,			
Area of Footing Required	=		sq.m.

Er.M. SHANKAR, M.Tech(Struct),ME, MIE(I),FIV(I)
CMDA Regd. Structural Engineer GR I (SE II)
Reg No. SE/2004/A0037
S.S CONSULTANTS
No.11, Thaiyar Street, Pallikaranai, Chennai-600 100.
Cell: 9382101588 / 9962390543
Email: structshankar97@yahoo.com

Equal Projections were initially assumed from the
to arrive at the Footing Size.

Width of Footing Required	=	1.44	m
Length of Footing Required	=	1.81	m

Width of Footing Provided	=	1.45	m
Length of Footing Provided	=	1.825	m
Actual Bearing Area Provided	=	2.646	sq.m
Max. Bearing Pressure at the Base	=	467.73	KN/sq.m
Min. Bearing Pressure at the Base	=	464.573	KN/sq.m

Bending about ZZ-axis:-

Load Eccentricity lies within the limit causing total
Hence, the Footing Base about ZZ-axis will be in touch

Net Bearing Pressure at the Base - Right End	=	444.443	KN/sq.m
Net Bearing Pressure at the Base - Left End	=	427.34	KN/sq.m
Net Bearing Pressure at the Column Face	=	438.703	KN/sq.m
Net Bearing Pressure - 'd' from Face	=	442.864	KN/sq.m

As Per IS:456-2000, Clause
the critical section for Bending Moment is at the
of the Column

Projection of Footing from Critical Section	=	612.5	mm
Design Bending Moment	=	120.383	KN.m
Modified Depth of Footing at the Face of Wall	=	500	mm
Modified Depth of Footing at the End	=	350	mm
Effective Depth Required	=	286.041	mm
Effective Depth Provided	=	444	mm

Hence SAFE.

Percentage of Steel Required	=	0.099	%

As Per IS:456-2000, Clause 26.5.2.1,
the required percentage of Steel is less than the
to be provided. Hence, Minimum Steel is provided

E.M. SHANKAR, M.Tech (Structural Engg), MIE, MIEE, FIAOCE
CIMDA Regd. Structural Engineer GR-I (SE-I)
Reg No. SE/2003/4/0237
SB CONSULTANTS
No.11, Thanal Street, Pallikaranai, Chennai-600 100.
Cell: 9282162688 / 9962020943
Email: shanksbanker@yahoo.com

Percentage of Main Steel Provided	=	0.12	%
Area of Steel Provided	=	772.56	sq.mm
Dia. of Rod-1 in Central Band	=	10	mm
Required Spacing of Rods	=	147.41	mm
Max. Spacing allowed (Rounded off)	=	100	mm
Dia. of Rod-2 in Central Band	=	12	mm
Required Spacing of Rods	=	212.27	mm
Max. Spacing allowed (Rounded off)	=	200	mm

Bending about XX-axis:-

Load Eccentricity lies within the limit causing total
Hence, the Footing Base about XX-axis will be in

Net Bearing Pressure at the Base - Right End	=	444.443	KN/sq.m.
Net Bearing Pressure at the Base - Left End	=	438.395	KN/sq.m.
Net Bearing Pressure at the Column Face	=	441.899	KN/sq.m.
Net Bearing Pressure - 'd' from Face	=	443.75	KN/sq.m.

As Per IS:456-2000, Clause 34.2.3,
the critical section for Bending Moment is at the
of the Column

Projection of Footing from Critical Section	=	610	mm
Design Bending Moment	=	150.619	KN.m.
Modified Depth of Footing at the Face of Wall	=	500	mm
Modified Depth of Footing at the End	=	350	mm
Effective Depth Required	=	235.996	mm
Effective Depth Provided	=	432	mm

Hence SAFE.

Percentage of Steel Required	=	0.104	%

As Per IS:456-2000, Clause 26.5.2.1,
the required percentage of Steel is less than the
to be provided. Hence, Minimum Steel is provided.

Percentage of Main Steel Provided	=		

E.M. SHANKAR, B.Tech(Struct.)ME, MIStE, FIStructE
Chartered Structural Engineer CP-1 (SE-3)
Regd. No. STR/0001/2017
SB CONSULTANTS
No.11, Thanikachalam Street, Pallikaranai, Chennai-600 100.
Cell: +91 81125 00588 / 98402 33843
Email: shankar77@yahoo.com

Area of Steel Provided	=	946.08	sq mm.
Dia. of Rod-1 in Central Band	=	10	mm
Required Spacing of Rods	=	151.504	mm
Max. Spacing allowed (Rounded off)	=	150	mm
Dia. of Rod-2 in Central Band	=	12	mm
Required Spacing of Rods	=	218.166	mm
Max. Spacing allowed (Rounded off)	=	200	mm

Note (1) - The required Spacing of Main Rods will 300 mm. or 3d (300 mm. or 5d for Dist. Rods) If the required spacing exceeds this limit, the least

will be automatically provided. This is done in IS 456-2000 Clause 26.3.3

Note (2) - The required minimum area of as per IS:456-2000, Clause 34.5.2, if the Footing 1000 mm. This minimum area is 360.0 sq.mm. for

Note (3) - The assumed Depth of Footing will be so that a SAFE design is arrived at from both considerations

Note (4) - Spacing of Rods are also controlled by Value, User-defined Minimum and Maximum

F01 : Dowel Bars Output (LC No. : 9)

Factored Axial Load on Column	=	1145.476	KN
Char. Comp. Strength of Concrete	=	25	N/sq.mm.
Yield Stress of Pedestal Steel	=	500	N/sq.mm.
Width of Column Section	=	230	mm.
Depth of Column Section	=	600	mm.
Area of Column Section	=	138000	sq.mm.
Width of Footing	=	1.45	m.
Length of Footing	=	1.825	m.
Area of Footing	=		

As Per IS:456-2000, Clause 34.4,

[illegible]
CWDA Regd. Structural Engineer GR-I (SE-I)
Reg No. [illegible]
SB CONSULTANTS
No.11, Bharath Street, Padmanabha, Chennai-600 [illegible]
Cell: 9382102365 / 9962850843
Email: [illegible]@yahoo.com

Basic Permissible Bearing Stress	=	11.25	N/sq.mm.
Max. Bearing Stress based on Area Ratio	=	22.5	N/sq.mm.
Actual Bearing Stress	=	8.301	N/sq.mm.

As Per IS:456-2000, Clause 34.4.2,
Reinforcement is NOT required. However,

Percentage of Steel Required	=	0.5	%
Area of Steel Provided	=	880	sq.mm.
Dowel Rod Size-1	=	12	mm
No. of Rods to be Provided	=	6	Nos.
Corresponding Steel Area	=	678.584	sq.mm.
Dowel Rod Size-2	=	16	mm
No. of Rods to be Provided	=	4	Nos.
Corresponding Steel Area	=	804.248	sq.mm.

Note :- Calculation for Dowel Rods is only
However, Dowel Rods may not be required in all

F01 : One Way Shear Output (LC No. : 9)

As Per IS:456-2000, Clause 34.2.4,
the critical section for Shear Force is at a distance
the Effective Depth of the Footing, from the Face

Design Shear Force about Length	=	108.396	KN.
Modified Depth of Footing at the Face of Wall	=	500	mm.
Modified Depth of Footing at the End	=	350	mm.
Depth of Footing at Critical Section	=	335.265	mm
Projection of Footing from Critical Section	=	168.5	mm.

As Per IS:456-2000, Clause 40.1,

Actual Shear Stress	=	0.223	N/sq.mm.

As Per IS:456-2000, Table 19,

Design Shear Strength of Concrete	=	0.251	N/sq.mm.

As Per IS:456-2000, Table 20,

Max. Permissible Shear Stress	=	2.124	N/sq.mm.

E.M. SHANKAR, M.Tech(Struct), MIE, MISE, FNACCE
CMDA Regd. Structural Engineer CR-I (SE-I)
SB CONSULTANTS
No.11, Thiruvil Street, Pallikaranai, Chennai-600 100.
Cell: 9841925854 / 9952599943
Email: structshankar97@yahoo.com

The section is SAFE in Shear, about ZZ-axis.

Design Shear Force about Width	=	134.539	KN
Depth of Footing at Critical Section	=	322.82	mm
Projection of Footing from Critical Section	=	166	mm
As Per IS:456-2000, Clause 40.1, Actual Shear Stress	=	0.228	N/sq.mm.
As Per IS:456-2000, Table 19, Design Shear Strength of Concrete	=	0.264	N/sq.mm.
As Per IS:456-2000, Table 20, Max. Permissible Shear Stress	=	3.124	N/sq.mm.

The section is SAFE in Shear, about XX-axis.

Fdt : Punching Shear Output (LC No. : 9)

As Per IS:456-2000, Clause 34.2.4,
the critical section for Shear Force is at a distance the Half the Effective Depth of the Footing, from

the Column.

Length of Footing at Critical Section	=	1.032	m.
Width of Footing at Critical Section	=	0.662	m.
Ratio of Width to Length at Critical Section	=	0.641	
Modified Depth of Footing at the Face of Wall	=	500	mm
Modified Depth of Footing at the End	=	350	mm
Depth of Footing at Critical Section	=	383.633	mm
Design Shear Force	=	640.886	KN.
As Per IS:456-2000, Clause 31.6.2.1, Actual Shear Stress	=	0.647	N/sq.mm.
As Per IS:456-2000, Clause 31.6.3.1, Coefficient, ks	=	1	
Max. Permissible Shear Stress	=		

Er.R. SHANKAR, M.Tech(Struct. Engg.), MIE, MISTE, FIE(I)CE
CMICA Reg.No. [illegible]
Reg.No. SE/Struct/3/2007
R.R CONSULTANTS
No.11, Dhoulit Street, Pallikaranai, Chennai-100.
Cell: 9282103336 / 9884039847
Email: shankarkar97@yahoo.com

The section is SAFE in Shear.

F01 : Global Input Data (LC No. : 10)

The footing is to be designed as an Isolated

Width of Column	=	230	mm.
Length of Column	=	600	mm.
Footing Shape	=	Rectangular	
Initial Depth at the Face of Wall/Column	=	300	mm.
Initial Depth at the End	=	150	mm.

The footing is subjected to Axial Load & Biaxial

Working Axial Load	=	742.869	KN.
Working Moment about ZZ-axis	=	0.884	KN m.
Working Moment about XX-axis	=	50.357	KN m.
Safe Bearing Capacity of Soil	=	330	KN/sq.m.
Factor of Safety for Safe Bearing Capacity	=	1.5	

F01 : Flexure Output (LC No. : 10)

Working Axial Load on Footing	=	742.869	KN.
Factored Axial Load on Footing	=	742.869	KN.
Percentage Factor for Self Weight of Footing	=	10	%
Factored Self Weight of Footing	=	74.287	KN.
Total Factored Axial Load on Footing	=	816.935	KN.
Working Moment about ZZ-axis	=	0.884	KN m.
Factored Moment about ZZ-axis	=	0.884	KN m.
Working Moment about XX-axis	=	50.357	KN m.
Factored Moment about XX-axis	=	50.357	KN m.
Ultimate Bearing Capacity of Soil	=	495	KN/sq.m.

From Vertical Load and Bending considerations,

Area of Footing Required	=	2.131	sq.m.

Equal Projections were initially assumed from the to arrive at the Footing Size.

Width of Footing Required	=	1.267	m.
Length of Footing Required	=	1.667	m.
Width of Footing Provided	=		

Er.M. SHANKAR, M.Tech(Struct.Engg.), MISTE, FMACCE
Centre Head, Structural Engineer GR-I (SE-I)
Reg No. SE/TN/03/4/00317
SB CONSULTANTS
No.11, Thiruvalluvar Street, Parthasarathi Colony, Kodambakkam, Chennai-600 024.
Cell: 9382102586 / 9952900543
Email: structshankar@gmail.com

Length of Footing Provided	=	1.675	m.
Actual Bearing Area Provided	=	2.177	sq.m
Max. Bearing Pressure at the Base	=	483.361	KN/sq.m.
Min. Bearing Pressure at the Base	=	256.981	KN/sq.m.

Bending about ZZ-axis :-

Load Eccentricity lies within the limit causing total
Hence, the Footing Base about ZZ-axis will be in

Net Bearing Pressure at the Base - Right End	=	449.255	KN/sq.m.
Net Bearing Pressure at the Base - Left End	=	449.348	KN/sq.m.
Net Bearing Pressure at the Column Face	=	448.321	KN/sq.m.
Net Bearing Pressure - 'd' from Face	=	449.006	KN/sq.m.

As Per IS:456-2000, Clause 34.2.3,
the critical section for Bending Moment is at the
of the Column.

Projection of Footing from Critical Section	=	537.5	mm
Design Bending Moment	=	84.307	KN m
Modified Depth of Footing at the Face of Wall	=	450	mm
Modified Depth of Footing at the End	=	300	mm
Effective Depth Required	=	246.788	mm
Effective Depth Provided	=	394	mm

Hence SAFE.

Percentage of Steel Required	=	0.096	%

As Per IS:456-2000, Clause 26.5.2.1,
the required percentage of Steel is less than the
to be provided. Hence, Minimum Steel is provided.

Percentage of Main Steel Provided	=	0.12	%
Area of Steel Provided	=	614.64	sq.mm.
Dia. of Rod-1 in Central Band	=	16	mm
Required Spacing of Rods	=	166.116	mm
Max. Spacing allowed (Rounded off)	=	150	mm
Dia. of Rod-2 in Central Band	=	12	mm
Required Spacing of Rods	=	299.218	mm
Max. Spacing allowed (Rounded off)	=	250	mm

S.M. SHANKAR, B.E., M.I.E.
CM/IA Regd. Structural Engineer (IN LEVEL 1)
Reg No. IN/STR/24/0001
SS CONSULTANTS
No.11, Thiruvalluvar Street, Pallikaranai, Chennai-600 100
CHE: 9283102586 / 9952350643
Email: shankarsanjeevi@yahoo.com

Bending about XX-axis:-

Load Eccentricity lies within the limit causing total
Hence, the Footing Base about XX-axis will be in

Net Bearing Pressure at the Base - Right End	=	449.255	KN/sq.m.
Net Bearing Pressure at the Base - Left End	=	238.784	KN/sq.m.
Net Bearing Pressure at the Column Face	=	361.403	KN/sq.m.
Net Bearing Pressure - 'd' from Face	=	426.101	KN/sq.m.

As Per IS:456-2000, Clause 34.2.3,
the critical section for Bending Moment is at the
of the Column.

Projection of Footing from Critical Section	=	535	mm
Design Bending Moment	=	100.873	KN-m
Modified Depth of Footing at the Face of Wall	=	450	mm
Modified Depth of Footing at the End	=	300	mm
Effective Depth Required	=	196.113	mm
Effective Depth Provided	=	362	mm

Hence SAFE.

Percentage of Steel Required	=	0.097	%

As Per IS:456-2000, Clause 26.5.2.1,
the required percentage of Steel is less than the
to be provided. Hence, Minimum Steel is provided.

Percentage of Main Steel Provided	=	0.12	%
Area of Steel Provided	=	787.82	sq.mm.
Dia. of Rod-1 in Central Band	=	10	mm
Required Spacing of Rods	=	171.335	mm
Max. Spacing allowed (Rounded off)	=	175	mm
Dia. of Rod-2 in Central Band	=	12	mm
Required Spacing of Rods	=	249.722	mm
Max. Spacing allowed (Rounded off)	=	250	mm

Note (1):- The required Spacing of Main Rods will 300 mm, or 3d (300 mm, or 5d for Dist. Rods) if the required spacing exceeds this limit, the least will be automatically provided. This is done in IS: 456-2000 Clause 26.3.3.

Note (2):- The required minimum area of

E.M. SHANKAR, M.Tech(Struct), BE, MISE, FMACCE
CMDA Regd. Structural Engineer CR-1 (SE-I)
Reg No. SE/1/2024/00017
E3 CONSULTANTS
No.11, Tirumal Street, Pallikaranai, Chennai-600 100.
Cell: 9282193588 / 9952055842
Email: shankarshankar67@yahoo.com

as per IS:456-2000, Clause 34.5.2, if the Footing 1000 mm. The minimum area is 360.0 sq.mm. for

Note (3) - The assumed Depth of Footing will be so that a SAFE design is arrived at from both considerations

Note (4) - Spacing of Rods are also controlled by Value, User-defined Minimum and Maximum

F01 : Dowel Bars Output (LC No. : 10)

Factored Axial Load on Column	=	742.669	KN
Char. Comp. Strength of Concrete	=	25	N/sq.mm.
Yield Stress of Reqestal Steel	=	500	N/sq.mm.
Width of Column Section	=	230	mm
Depth of Column Section	=	600	mm
Area of Column Section	=	138000	sq.mm.
Width of Footing	=	1.3	m.
Length of Footing	=	1.675	m.
Area of Footing	=	2.177	sq.m.
As Per IS:456-2000, Clause 34.4,			
Basic Permissible Bearing Stress	=	11.25	N/sq.mm.
Max. Bearing Stress based on Area Ratio	=	22.5	N/sq.mm.
Actual Bearing Stress	=	5.382	N/sq.mm.
As Per IS:456-2000, Clause 34.4.3,			
Reinforcement is NOT required. However,			
Percentage of Steel Required	=	0.5	%
Area of Steel Provided	=	690	sq.mm.
Dowel Rod Size-1	=	12	mm
No. of Rods to be Provided	=	6	Nos.
Corresponding Steel Area	=	678.584	sq.mm.
Dowel Rod Size-2	=	16	mm
No. of Rods to be Provided	=	4	Nos.
Corresponding Steel Area	=	804.248	sq.mm.

Note :- Calculation for Dowel Rods is only However, Dowel Rods may not be required in all

F01 : One Way Shear Output (LC No. : 10)

Er.M. SHANKAR, M.Tech.,Struct.ME, MIEE, FIAGCE
Consulting Engineer CE-1 (SE-1)
SG CONSULTANTS
No.11, Thiruvalluvar Street, Pallikaranai, Chennai-600 100.
Cell: 9381192889 / 9952193843
Email: structshankar@yahoo.com

As Per IS:456-2000, Clause 34.2.4,
the critical section for Shear Force is at a distance the Effective Depth of the Footing, from the Face

Design Shear Force about Length	=	83.785	KN
Modified Depth of Footing at the Face of Wall	=	450	mm
Modified Depth of Footing at the End	=	300	mm
Depth of Footing at Critical Section	=	284.047	mm
Projection of Footing from Critical Section	=	143.5	mm
As Per IS:456-2000, Clause 40.1, Actual Shear Stress	=	0.227	N/sq.mm
As Per IS:456-2000, Table 19, Design Shear Strength of Concrete	=	0.276	N/sq.mm
As Per IS:456-2000, Table 20, Max. Permissible Shear Stress	=	3.124	N/sq.mm

The section is SAFE in Shear, about ZZ-axis.

Design Shear Force about Width	=	103.365	KN
Depth of Footing at Critical Section	=	271.533	mm
Projection of Footing from Critical Section	=	141	mm
As Per IS:456-2000, Clause 40.1, Actual Shear Stress	=	0.227	N/sq.mm
As Per IS:456-2000, Table 19, Design Shear Strength of Concrete	=	0.261	N/sq.mm
As Per IS:456-2000, Table 20, Max. Permissible Shear Stress	=	3.124	N/sq.mm

The section is SAFE in Shear, about XX-axis.

F01 : Punching Shear Output (LC No. : 10)

As Per IS:456-2000, Clause 34.2.4,
the critical section for Shear Force is at a distance the Half the Effective Depth of the Footing, from the Column

Length of Footing at Critical Section	=	0.982	m
Width of Footing at Critical Section	=	0.612	m
Ratio of Width to Length at Critical Section	=	[illegible]	

Er.M. [illegible] M.Tech(Structural), MISTE, FIE(I), FACCE
Chartered Structural Engineer,CII (156-F)
Reg.No. [illegible]
SB CONSULTANTS
No.11, Tirumal Street, Pallikaranai, Chennai-100.
Cell: 9382102648 / 9159330643
Email: [illegible]@yahoo.com

Modified Depth of Footing at the Face of Wall	=	450	mm
Modified Depth of Footing at the End	=	300	mm
Depth of Footing at Critical Section	=	333.023	mm
Design Shear Force	=	631.121	KN
As Per IS:456-2000, Clause 31.6.2.1, Actual Shear Stress	=	0.5	N/sq.mm
As Per IS:456-2000, Clause 31.6.3.1, Coefficient, ks	=	1	
Max. Permissible Shear Stress	=	1.25	N/sq.mm

The section is SAFE in Shear.

F01 : Global Input Data (LC No. : 11)

The footing is to be designed as an Isolated

Width of Column	=	230	mm
Length of Column	=	600	mm
Footing Shape	=	Rectangular	
Initial Depth at the Face of Wall/Column	=	300	mm
Initial Depth at the End	=	150	mm

The footing is subjected to Axial Load & Biaxial

Working Axial Load	=	1297.18	KN
Working Moment about ZZ-axis	=	8.751	KN m
Working Moment about XX-axis	=	54.841	KN m
Safe Bearing Capacity of Soil	=	330	KN/sq.m.
Factor of Safety for Safe Bearing Capacity	=	1.5	

F01 : Flexure Output (LC No. : 11)

Working Axial Load on Footing	=	1297.18	KN
Factored Axial Load on Footing	=	1297.18	KN
Percentage Factor for Self Weight of Footing	=	10	%
Factored Self Weight of Footing	=	129.718	KN
Total Factored Axial Load on Footing	=	1426.898	KN
Working Moment about ZZ-axis	=	8.751	KN m
Factored Moment about ZZ-axis	=	13.127	KN m

E.M. SHANKAR, M.Tech(Struct.Engg.), MIE, MISTE, FNLCCE
Chief Executive / Structural Engineer CR-I (SE-I)
Reg.No. E/0000/00000
SG CONSULTANTS
No.11, Thiraviti Street, Pallikaranai, Chennai-600 100.
Cell: 9282182285 / 9952559643
Email: shankarsg27@yahoo.com

Working Moment about XX-axis	=	54.641	KN.m
Factored Moment about XX-axis	=	54.641	KN.m
Ultimate Bearing Capacity of Soil	=	495	KN/sq.m
From Vertical Load and Bending considerations. Area of Footing Required	=	3.338	sq.m
Equal Projections were initially assumed from the to arrive at the Footing Size.			
Width of Footing Required	=	1.661	m.
Length of Footing Required	=	2.021	m.
Width of Footing Provided	=	1.675	m.
Length of Footing Provided	=	2.025	m.
Actual Bearing Area Provided	=	3.392	sq.m
Max. Bearing Pressure at the Base	=	488.242	KN/sq.m
Min. Bearing Pressure at the Base	=	355.12	KN/sq.m

Bending about ZZ-axis:-

Load Eccentricity lies within the limit causing total
Hence, the Footing Base about ZZ-axis will be in

Net Bearing Pressure at the Base - Right End	=	447.599	KN/sq.m.
Net Bearing Pressure at the Base - Left End	=	432.71	KN/sq.m
Net Bearing Pressure at the Column Face	=	442.619	KN/sq.m
Net Bearing Pressure - 'd' from Face	=	445.349	KN/sq.m.

As Per IS:456-2000, Clause 34.2.3,
the critical section for Bending Moment is at the
of the Column

Projection of Footing from Critical Section	=	712.5	mm
Design Bending Moment	=	189.71	KN.m
Modified Depth of Footing at the Face of Wall	=	550	mm
Modified Depth of Footing at the End	=	400	mm
Effective Depth Required	=	344.196	mm
Effective Depth Provided	=	494	mm

Hence SAFE.

Percentage of Steel Required	=	0.109	

Er.M.SHANKAR, M.Tech(Struct), ME, MIStE, FIMACE
Chartered Structural Engineer CM-1 (SE-I)
Reg No. SE/2003/400521
SG CONSULTANTS
No.11, Nanak Street, Pallikaranai, Chennai-600 100.
Cell: 9382102586 / 9952000643
Email: sgshankar1@yahoo.com

As Per IS:456-2000, Clause 26.5.2.1,
the required percentage of Steel is less than the
to be provided. Hence, Minimum Steel is provided

Percentage of Main Steel Provided	=	0.12	%
Area of Steel Provided	=	852.94	sq.mm.
Dia. of Rod-1 in Central Band	=	10	mm
Requirrd Spacing of Rods	=	132.49	mm.
Max. Spacing allowed (Rounded off)	=	125	mm
Dia. of Rod-2 in Central Band	=	12	mm.
Required Spacing of Rods	=	190.785	mm
Max. Spacing allowed (Rounded off)	=	175	mm

Bending about XX-axis:-

Load Eccentricity lies within the limit causing total
Hence, the Footing Base about XX-axis will be in

Net Bearing Pressure at the Base - Right End	=	447.999	KN/sq.m
Net Bearing Pressure at the Base - Left End	=	332.165	KN/sq.m

Net Bearing Pressure at the Column Face	=	398.035	KN/sq.m
Net Bearing Pressure - at from Face	=	432.197	KN/sq.m

As Per IS:456-2000, Clause 34.2.3,
the critical section for Bending Moment is at the
of the Column.

Projection of Footing from Critical Section	=	722.5	mm
Design Bending Moment	=	227.979	KN.m
Modified Depth of Footing at the Face of Wall	=	550	mm
Modified Depth of Footing at the End	=	400	mm
Effective Depth Required	=	284.321	mm
Effective Depth Provided	=	462	mm

Hence SAFE.

Percentage of Steel Required = 0.112 %

As Per IS:456-2000, Clause 26.5.2.1,

Er.M. SHANKAR M.Tech(Struct), ME, MIEE, FIMACS
CMDA Regd. Structural Engineer CR-1 (S)-0
Regn No. SE/2002/410037
SS CONSULTANTS
No.11, Thiruvalluvar Street, Pallikaranai, Chennai-600 100.
Cell: 9282103586 / 9952050943
Email: structshankar@yahoo.com

the required percentage of Steel is less than the
to be provided. Hence, Minimum Steel is provided.

Percentage of Main Steel Provided	=	0.12	%
Area of Steel Provided	=	1171.26	sq.mm.
Dia. of Rod-1 in Central Band	=	10	mm
Required Spacing of Rods	=	135.798	mm
Max. Spacing allowed (Rounded off)	=	125	mm
Dia. of Rod-2 in Central Band	=	12	mm
Required Spacing of Rods	=	195.535	mm
Max. Spacing allowed (Rounded off)	=	200	mm

Note (1) - The required Spacing of Main Rods with 300 mm. or 3d (300 mm. or 5d for Dist. Rods) if the required spacing exceeds this limit, the least will be automatically provided. This is done as IS 456-2000 Clause 26.3.3

Note (2) - The required minimum area of as per IS 456-2000, Clause 34.5.2, if the Footing 1000 mm. This minimum area is 360.0 sq.mm. for

Note (3) - The assumed Depth of Footing will be so that a SAFE design is arrived at from both considerations

Note (4) - Spacing of Rods are also controlled by Value, User-defined Minimum and Maximum

#01 : Dowel Bars Output (LC No. : 11)

Factored Axial Load on Column	=	1297.16	KN.
Char. Comp. Strength of Concrete	=	25	N/sq.mm.
Yield Stress of Pedestal Steel	=	500	N/sq.mm.
Width of Column Section	=	230	mm
Depth of Column Section	=	600	mm
Area of Column Section	=	138000	sq.mm.
Width of Footing	=	1.675	m
Length of Footing	=	[illegible]	

Er.M. SHANMUGAM Technocrat,METROPOL TRADE
Civil & Regd. Structural Engineer GR-I (SE-I)
Regn No. STR/2004/0027
SB CONSULTANTS
No.11, Thiruvalluvar Street, Pallavaram, Chennai-600 117.
Cell: 9283102588 / 9382018643
Email: structshanmugam51@yahoo.com

Area of Footing	=	3.392	sq.m.
As Per IS:456-2000, Clause 34.4,			
Basic Permissible Bearing Stress	=	11.25	N/sq.mm.
Max. Bearing Stress based on Area Ratio	=	22.5	N/sq.mm.
Actual Bearing Stress	=	9.4	N/sq.mm.
As Per IS:456-2000, Clause 34.4.3, Reinforcement is NOT required. However,			
Percentage of Steel Required	=	0.5	%
Area of Steel Provided	=	680	sq.mm.
Dowel Rod Size-1	=	12	mm.
No. of Rods to be Provided	=	6	Nos.
Corresponding Steel Area	=	678.584	sq.mm.
Dowel Rod Size-2	=	10	mm.
No. of Rods to be Provided	=	4	Nos.
Corresponding Steel Area	=	804.248	sq.mm.

Note :- Calculation for Dowel Rods is only. However, Dowel Rods may not be required in all

F01 : One Way Shear Output (LC No. : 11)

As Per IS:456-2000, Clause 34.2.4, the critical section for Shear Force is at a distance the Effective Depth of the Footing, from the Face

Design Shear Force about Length	=	153.66	KN
Modified Depth of Footing at the Face of Wall	=	550	mm.
Modified Depth of Footing at the End	=	400	mm.
Depth of Footing at Critical Section	=	390	mm.
Projection of Footing from Critical Section	=	216.5	mm.
As Per IS:456-2000, Clause 40.1, Actual Shear Stress	=	0.251	N/sq.mm.
As Per IS:456-2000, Table 19, Design Shear Strength of Concrete	=	0.37	N/sq.mm.

Er.M. SHANKAR, M.Tech(Struct.),ME, MIEE, FIVACCE
CSIDA Regd. Structural Engineer GR-I (SE-I)
SB CONSULTANTS
No.11, Tiruvalluvar Street, Pallikaranai, Chennai-600 100.
Cell: 9884132588 / 9952888648
Email: structshankar77@yahoo.com

As Per IS:456-2000, Table 20, Max. Permissible Shear Stress	=	3.124	N/sq.mm.
The section is SAFE in Shear, about ZZ-axis.			
Design Shear Force about Width	=	203.639	KN.
Depth of Footing at Critical Section	=	379.439	mm.
Projection of Footing from Critical Section	=	228.5	mm.
As Per IS:456-2000, Clause 40.1, Actual Shear Stress	=	0.265	N/sq.mm.
As Per IS:456-2000, Table 19, Design Shear Strength of Concrete	=	0.273	N/sq.mm.
As Per IS:456-2000, Table 20, Max. Permissible Shear Stress	=	3.124	N/sq.mm.
The section is SAFE in Shear, about XX-axis.			

FD1 : Punching Shear Output (LC No. : 11)

As Per IS:456-2000, Clause 24.2.4, the critical section for Shear Force is at a distance the Half the Effective Depth of the Footing, from the Column.			
Length of Footing at Critical Section	=	1.082	m.
Width of Footing at Critical Section	=	0.712	m.
Ratio of Width to Length at Critical Section	=	0.658	
Modified Depth of Footing at the Face of Wall	=	550	mm.
Modified Depth of Footing at the End	=	400	mm.
Depth of Footing at Critical Section	=	436	mm.
Design Shear Force	=	994.268	KN.
As Per IS:456-2000, Clause 31.6.2.1, Actual Shear Stress	=		
As Per IS:456-2000, Clause 31.6.3.1, Coefficient, ks	=		

CSCA Regd. Structural Engineer GR2 (SS-D)
Reg No. 66/2012/0007
GB CONSULTANTS
Cell: +91 9913132666 / 9913050944
Email: structjbankar57@yahoo.com

Max. Permissible Shear Stress	=	1.25	N/sq.mm.

The section is SAFE in Shear.

F01 : Global Input Data (LC No. : 12)

The footing is to be designed as an Isolated

Width of Column	=	230	mm
Length of Column	=	600	mm
Footing Shape	=	Rectangular	
Initial Depth at the Face of Wall/Column	=	300	mm
Initial Depth at the End	=	150	mm

The footing is subjected to Axial Load & Biaxial

Working Axial Load	=	1394.464	KN
Working Moment about ZZ-axis	=	103.598	KN m
Working Moment about XX-axis	=	1.485	KN m
Safe Bearing Capacity of Soil	=	330	KN/sq.m
Factor of Safety for Safe Bearing Capacity	=	1.5	

F01 : Flexure Output (LC No. : 12)

Working Axial Load on Footing	=	1394.464	KN
Factored Axial Load on Footing	=	1394.464	KN
Percentage Factor for Self Weight of Footing	=	10	%
Factored Self Weight of Footing	=	139.446	KN
Total Factored Axial Load on Footing	=	1533.91	KN
Working Moment about ZZ-axis	=	103.598	KN m
Factored Moment about ZZ-axis	=	103.598	KN m
Working Moment about XX-axis	=	1.485	KN m
Factored Moment about XX-axis	=	1.485	KN m

Ultimate Bearing Capacity of Soil	=	

From Vertical Load and Bending considerations.

Er.M. SHANKAR, M.Tech(Struct),ME, MIStE, FIMACCE
CMC-Regd. Structural Engineer: 0/1 (SE-1)
Reg No: SE/2022/0037
SB CONSULTANTS
No.11, Thanjai Street, Pallikaranai, Chennai-600 100
Cell: 9282162588 / 9962050843
Email: sivasankar67@yahoo.com

Area of Footing Required	=	3.702	sq.m

Equal Projections were initially assumed from the
to arrive at the Footing Size

Width of Footing Required	=	1.748	m.
Length of Footing Required	=	2.118	m.
Width of Footing Provided	=	1.75	m
Length of Footing Provided	=	2.125	m
Actual Bearing Area Provided	=	3.719	sq.m.
Max. Bearing Pressure at the Base	=	492.508	KN/sq.m
Min. Bearing Pressure at the Base	=	332.452	KN/sq.m

Bending about ZZ-axis:-

Load Eccentricity lies within the limit causing total
Hence, the Footing Base about ZZ-axis will be in

Net Bearing Pressure at the Base - Right End	=	455.009	KN/sq.m
Net Bearing Pressure at the Base - Left End	=	297.892	KN/sq.m
Net Bearing Pressure at the Column Face	=	388.98	KN/sq.m
Net Bearing Pressure - 'd' from Face	=	438.833	KN/sq.m

As Per IS:456-2000, Clause 34.2.3,
the critical section for Bending Moment is at the
of the Column.

Projection of Footing from Critical Section	=	762.5	mm
Design Bending Moment	=	221.805	KN.m
Modified Depth of Footing at the Face of Wall	=	600	mm
Modified Depth of Footing at the End	=	450	mm
Effective Depth Required	=	367.312	mm
Effective Depth Provided	=	544	mm

Hence SAFE.

Percentage of Steel Required	=	0.101	%

As Per IS:456-2000, Clause 26.5.2.1,
the required percentage of Steel is less than the

Er.M. SUNDAR, M.Tech(Struct.Engg), MIE, MIEME, FMACCE
CNDA Regd. Structural Engineer Cat-I (SE-I)
Reg.No: SE/01/2014/037
SB CONSULTANTS
No.11, Thiruvalluvar Street, Pallavaram, Chennai-600 117.
Cell: 9791192585 / 9952050643
Email: sbconsultants@yahoo.com

to be provided. Hence, Minimum Steel is provided.

Percentage of Main Steel Provided	=	0.12	%
Area of Steel Provided	=	1142.4	sq.mm.
Dia. of Rod-1 in Central Band	=	10	mm
Required Spacing of Rods	=	120.512	mm
Max. Spacing allowed (Rounded off)	=	125	mm
Dia. of Rod-2 in Central Band	=	12	mm
Required Spacing of Rods	=	173.25	mm
Max. Spacing allowed (Rounded off)	=	175	mm

Bending about XX-axis:-

Load Eccentricity lies within the limit causing total
Hence, the Footing Base about XX-axis will be in

Net Bearing Pressure at the Base - Right End	=	455.009	KN/sq.m
Net Bearing Pressure at the Base - Left End	=	452.272	KN/sq.m.
Net Bearing Pressure at the Column Face	=	453.821	KN/sq.m
Net Bearing Pressure - 'd' from Face	=	454.572	KN/sq.m

As Per IS:456-2000, Clause 34.2.3,
the critical section for Bending Moment is at the
of the Column

Projection of Footing from Critical Section	=	760	mm
Design Bending Moment	=	278.996	KN.m
Modified Depth of Footing at the Face of Wall	=	600	mm
Modified Depth of Footing at the End	=	450	mm
Effective Depth Required	=	311.35	mm
Effective Depth Provided	=	532	mm

Hence SAFE.

Percentage of Steel Required =

As Per IS:456-2000, Clause 26.5.2.1,
the required percentage of Steel is less than the
to be provided. Hence, Minimum Steel is provided.

S.S. [illegible] M.E., M.I.E., F.I.V.E., M.I.S.E., F.I.A.C.E.
Chartered Engineer, Structural Engineer, DPI-I (SE-S)
Reg No. SE/2022/4/7031
SB CONSULTANTS
No.11, Third Street, Pallikaranai, Chennai-600 100.
Cell: 9382163388 / 9952193443
Email: [illegible]@yahoo.com

Percentage of Main Steel Provided	=	0.12	%
Area of Steel Provided	=	1356.6	sq.mm.

Dia. of Rod-1 in Central Band	=	10	mm.
Required Spacing of Rods	=	123.026	mm.
Max. Spacing allowed (Rounded off)	=	125	mm.
Dia. of Rod-2 in Central Band	=	12	mm.
Required Spacing of Rods	=	177.157	mm.
Max. Spacing allowed (Rounded off)	=	175	mm.

Note (1) - The required Spacing of Main Rods will 200 mm. or 3d (300 mm. or 5d for Dist. Rods) If the required spacing exceeds this limit, the least will be automatically provided. This is done in IS 456-2000 Clause 26.3.3

Note (2) - The required minimum area of as per IS:456-2000, Clause 34.5.2, if the Footing 1000 mm. This minimum area is 360.0 sq.mm. for

Note (3) - The assumed Depth of Footing will be so that a SAFE design is arrived at from both considerations.

Note (4) - Spacing of Rods are also controlled by Value, User-defined Minimum and Maximum

FC1 : Dowel Bars Output (LC No. : 12)

Factored Axial Load on Column	=	1394.464	KN
Char. Comp. Strength of Concrete	=	25	N/sq.mm.
Yield Stress of Pedestal Steel	=	500	N/sq.mm.
Width of Column Section	=	230	mm.
Depth of Column Section	=	600	mm.
Area of Column Section	=	138000	sq.mm.
Width of Footing	=	1.75	m.
Length of Footing	=	2.185	m.
Area of Footing	=	3.718	Sq.m.

S.B.CONSULTANTS
No.11, Thandi Street, Pallikaranai, Chennai-600 100.
Cell: 9382103849 / 9952659643
Email: structchandar07@yahoo.com

As Per IS:456-2000, Clause 34.4,			
Basic Permissible Bearing Stress	=	11.25	N/sq.mm.
Max. Bearing Stress based on Area Ratio	=	22.5	N/sq.mm.
Actual Bearing Stress	=	10.105	N/sq.mm.
As Per IS:456-2000, Clause 34.4.3,			
Reinforcement is NOT required. However,			
Percentage of Steel Required	=	0.5	%
Area of Steel Provided	=	690	sq.mm.
Dowel Rod Size-1	=	12	mm
No. of Rods to be Provided	=	6	Nos.
Corresponding Steel Area	=	678.584	sq.mm.
Dowel Rod Size-2	=	16	mm
No. of Rods to be Provided	=	4	Nos.
Corresponding Steel Area	=	804.248	sq.mm.
Note :- Calculation for Dowel Rods is only			
However, Dowel Rods may not be required in all			

F01 : One Way Shear Output (LC No. : 12)

As Per IS:456-2000, Clause 34.2.4,			
the critical section for Shear Force is at a distance			
the Effective Depth of the Footing, from the Face			
Design Shear Force about Length	=	170.892	KN
Modified Depth of Footing at the Face of Wall	=	600	mm
Modified Depth of Footing at the End	=	450	mm.
Depth of Footing at Critical Section	=	436.984	mm
Projection of Footing from Critical Section	=	218.5	mm
As Per IS:456-2000, Clause 40.1,			
Actual Shear Stress	=	0.223	N/sq.mm.
As Per IS:456-2000, Table 19,			
Design Shear Strength of Concrete	=	0.259	N/sq.mm.
As Per IS:456-2000, Table 20,			
Max. Permissible Shear Stress	=	2.124	N/sq.mm.

S.M. SHANKAR, B.E., M.S. (Struct. Engg.), MIACCE
CECA Regd. Structural Engineer SR-I (SE-I)
Reg No. [illegible]
SS CONSULTANTS
No.11, Thirch Street, Pallikaranai, Chennai-600 100.
Cell: [illegible]
Email: [illegible]

The section is SAFE in Shear, about ZZ-axis.

Design Shear Force about Width	=	208.772	KN
Depth of Footing at Critical Section	=	424.632	mm
Projection of Footing from Critical Section	=	216	mm
As Per IS:456-2000, Clause Actual Shear Stress	=	0.231	N/sq.mm.
As Per IS:456-2000, Table 19, Design Shear Strength of Concrete	=	0.261	N/sq.mm.

As Per IS:456-2000, Table 20, Max. Permissible Shear Stress	=	3.124	N/sq.mm.

The section is SAFE in Shear, about XX-axis.

F01 : Punching Shear Output (LC No. : 12)

As Per IS:456-2000, Clause the critical section for Shear Force is at a distance the Half the Effective Depth of the Footing, from the Column.

Length of Footing at Critical Section	=	1.132	m.
Width of Footing at Critical Section	=	0.762	m.
Ratio of Width to Length at Critical Section	=	0.673	
Modified Depth of Footing at the Face of Wall	=	600	mm
Modified Depth of Footing at the End	=	450	mm
Depth of Footing at Critical Section	=	484.482	mm
Design Shear Force	=	1062.434	KN
As Per IS:456-2000, Clause Actual Shear Stress	=	0.579	N/sq.mm.
As Per IS:456-2000, Clause Coefficient, ks	=		
Max. Permissible Shear Stress			N/sq.mm.

V.N. SHANKAR, M.Tech(Struct Engg), MIE, MISTE, FIV, CEng
Chief Regd. Structural Engineer (SE-3 (SE-3)
Reg No. E/3/3/2344/07
SB CONSULTANTS
No.11, Thanal Street, Padmavathi, Chennai-600 116.
Cell: 9283110388 / 9444024041
Email: shankarvn@yahoo.com

The section is SAFE in Shear.

F01 : Global Input Data (LC No. : 13)

The footing is to be designed as an Isolated

Width of Column	=	230	mm
Length of Column	=	600	mm
Footing Shape	=	Rectangular	
Initial Depth at the Face of Wall/Column	=	300	mm
Initial Depth at the End	=	150	mm

The footing is subjected to Axial Load & Biaxial

Working Axial Load	=	645.384	KN
Working Moment about ZZ-axis	=	93.963	KN m
Working Moment about XX-axis	=	3	KN m
Safe Bearing Capacity of Soil	=	330	KN/sq m
Factor of Safety for Safe Bearing Capacity	=	1.5	

F01 : Flexure Output (LC No. : 13)

Working Axial Load on Footing	=	645.384	KN
Factored Axial Load on Footing	=	645.384	KN
Percentage Factor for Self Weight of Footing	=	10	%
Factored Self Weight of Footing	=	64.538	KN
Total Factored Axial Load on Footing	=	709.923	KN
Working Moment about ZZ-axis	=	93.963	KN m
Factored Moment about ZZ-axis	=	93.963	KN m
Working Moment about XX-axis	=	3	KN m
Factored Moment about XX-axis	=	3	KN m
Ultimate Bearing Capacity of Soil	=	495	KN/sq m
From Vertical Load and Bending considerations, Area of Footing Required	=	2.448	Sq m

Equal Projections were initially assumed from the

E.M.M. ... M.E., M.I.E., M.I.S.T.E., M.I.E., M.I.A.C.S.
CMDA Regd. Structural Engineer GP-1 (SE-I)
Regn No. SE/2012/0137
SJS CONSULTANTS
No.11, Thandi Street, Pallavaram, Chennai-600 043.
Cell: 9382112566 / 9677009661
Email: structsharan@yahoo.com

to arrive at the Footing Size:

Width of Footing Required	=	1.282	m.
Length of Footing Required	=	1.662	m.
Width of Footing Provided	=	1.3	m.
Length of Footing Provided	=	1.675	m.
Actual Bearing Area Provided	=	2.177	sq.m.
Max. Bearing Pressure at the Base	=	486.959	KN/sq.m.
Min. Bearing Pressure at the Base	=	165.095	KN/sq.m.

Bending about ZZ-axis):

Load Eccentricity lies within the limit causing total
Hence, the Footing Base about ZZ-axis will be in

Net Bearing Pressure at the Base - Right End	=	457.32	KN/sq.m.
Net Bearing Pressure at the Base - Left End	=	348.173	KN/sq.m.
Net Bearing Pressure at the Column Face	=	368.116	KN/sq.m.
Net Bearing Pressure - 'd' from Face	=	430.835	KN/sq.m.

As Per IS:456-2000, Clause
the critical section for Bending Moment is at the
of the Column

Projection of Footing from Critical Section	=	537.5	mm
Design Bending Moment	=	79.67	KN.m
Modified Depth of Footing at the Face of Wall	=	450	mm
Modified Depth of Footing at the End	=	300	mm
Effective Depth Required	=	239.906	mm
Effective Depth Provided	=	394	mm

Hence SAFE.

Percentage of Steel Required	=	0.093	%

As Per IS:456-2000, Clause
the required percentage of Steel is less than the
to be provided. Hence, Minimum Steel is provided.

Percentage of Main Steel Provided	=	0.12	%
Area of Steel Provided	=	1584	sq.mm.
Dia. of Rod-1 in Central Band		16	mm
Required Spacing of Rods		196.119	c/c mm

Er.M. SHANKAR, B.Tech(Struct.Engg.), M.I.E., M.I.V.E.
CMDA Regd. Structural Engineer SR-I (SE-1)
Regd No. SE/2010/40037
S.S CONSULTANTS
No.11, Thelugu Street, Pallikaranai, Chennai-600 100.
Cell: 9791103888 / 9941000643
Email: sivashankar07@rediffmail.com

Max. Spacing allowed (Rounded off)	=	155	mm
Dia. of Rod-2 in Central Band	=	12	mm
Required Spacing of Rods	=	239.208	mm
Max. Spacing allowed (Rounded off)	=	225	mm

Bending about XX-axis :-

Load Eccentricity lies within the limit causing total
Hence, the Footing Base about XX-axis will be in

Net Bearing Pressure at the Base - Right End	=	457.32	KN/sq.m
Net Bearing Pressure at the Base - Left End	=	444.603	KN/sq.m
Net Bearing Pressure at the Column Face	=	452.086	KN/sq.m
Net Bearing Pressure - 'd' from Face	=	455.94	KN/sq.m

As Per IS:456-2000, Clause
the critical section for Bending Moment is at the
of the Column

Projection of Footing from Critical Section	=	535	mm
Design Bending Moment	=	109.258	KN.m
Modified Depth of Footing at the Face of Wall	=	450	mm
Modified Depth of Footing at the End	=	300	mm
Effective Depth Required	=	204.257	mm
Effective Depth Provided	=	382	mm

Hence SAFE.

Percentage of Steel Required	=	0.105	%

As Per IS:456-2000, Clause
the required percentage of Steel is less than the
to be provided. Hence, Minimum Steel is provided.

Percentage of Main Steel Provided	=	0.12	%
Area of Steel Provided	=	767.82	sq.mm.
Dia. of Rod-1 in Central Band	=	10	mm
Required Spacing of Rods	=	171.335	mm
Max. Spacing allowed (Rounded off)	=	175	mm
Dia. of Rod-2 in Central Band	=	12	mm
Required Spacing of Rods	=	246.722	mm
Max. Spacing allowed (Rounded off)	=	250	mm

Note (1):- The required Spacing of Main Rods will

Er.M. SHANKAR, M.Tech(Struct),ME(Struct),FIE(I),MICI,
Central Regd. Structural Engineer GR.I (SE-I)
Reg.No. SE/I/2324/0037
SB CONSULTANTS
No.11, Thiruvi Street, Pallavaram, Chennai-600 156.
Cell: 9382102586 / 9962369443
Email: shankarm1@yahoo.com

300 mm. or 3d (300 mm. or 5d for Dist. Rods)
If the required spacing exceeds this limit, the least will be automatically provided. This is done in IS 456-2000 Clause 26.3.3

Note (2) - The required minimum area of as per IS 456-2000, Clause 34.5.2, if the Footing 1000 mm. This minimum area is 360.0 sq.mm. for

Note (3) - The assumed Depth of Footing will be so that a SAFE design is arrived at from both considerations.

Note (4) - Spacing of Rods are also controlled by Value, User-defined Minimum and Maximum

F01 : Dowel Bars Output (LC No. : 13)

Factored Axial Load on Column	=	645.384	KN
Char. Comp. Strength of Concrete	=	25	N/sq.mm.
Yield Stress of Pedestal Steel	=	500	N/sq.mm.
Width of Column Section	=	230	mm.
Depth of Column Section	=	600	mm.
Area of Column Section	=	138000	sq.mm.
Width of Footing	=	1.3	m.
Length of Footing	=	1.675	m.
Area of Footing	=	2.177	sq.m.
As Per IS:456-2000, Clause 34.4,			
Basic Permissible Bearing Stress	=	11.25	N/sq.mm.
Max. Bearing Stress based on Area Ratio	=	22.5	N/sq.mm.
Actual Bearing Stress	=	4.677	N/sq.mm.
As Per IS:456-2000, Clause 34.4.3, Reinforcement is NOT required. However,			
Percentage of Steel Required	=	0.5	%
Area of Steel Provided	=	690.	sq.mm.
Dowel Rod Size-1	=	12	mm
No. of Rods to be Provided	=	6	Nos
Corresponding Steel Area	=	678.584	sq.mm.
Dowel Rod Size-2	=	16	mm
No. of Rods to be Provided	=	4	Nos

[illegible] M.E., M.I.E., F.I.V.S.E.
CMDA Regd. Structural Engineer GR-I (SE-I)
[illegible]
SSC CONSULTANTS
No.11, Transit Street, Puthagaram, Chennai-600 126.
Cell: 9282123555 / 9952555843
Email: [illegible]

Corresponding Steel Area	=	604.248	sq.mm.

Note :- Calculation for Dowel Rods is only
However, Dowel Rods may not be required in all

F01 : One Way Shear Output (LC No. : 13)

As Per IS:456-2000, Clause 34.2.4,
the critical section for Shear Force is at a distance the Effective Depth of the Footing, from the Face

Design Shear Force about Length	=	82.843	KN.
Modified Depth of Footing at the Face of Wall	=	450	mm.
Modified Depth of Footing at the End	=	300	mm.
Depth of Footing at Critical Section	=	284.047	mm.
Projection of Footing from Critical Section	=	143.5	mm.

As Per IS:456-2000, Clause 40.1,

Actual Shear Stress	=	0.224	N/sq.mm.

As Per IS:456-2000, Table 19,

Design Shear Strength of Concrete	=	0.275	N/sq.mm.

As Per IS:456-2000, Table 20,

Max. Permissible Shear Stress	=	3.124	N/sq.mm.

The section is SAFE in Shear, about ZZ-axis.

Design Shear Force about Width	=	107.845	KN.
Depth of Footing at Critical Section	=	271.533	mm.
Projection of Footing from Critical Section	=	141	mm.

As Per IS:456-2000, Clause 40.1,

Actual Shear Stress	=	0.237	N/sq.mm.

As Per IS:456-2000, Table 19,

Design Shear Strength of Concrete	=	0.281	N/sq.mm.

As Per IS:456-2000, Table 20,

Max. Permissible Shear Stress	=	3.124	N/sq.mm.

The section is SAFE in Shear, about XX-axis.

F01 : Punching Shear Output (LC No. : 13)

As Per IS:456-2000, Clause 34.2.4,
the critical section for Shear Force is at a distance the Half the Effective Depth of the Footing, from

Er.M. SHANKAR, M.Tech(Struct.Engg), MIE, MISTE, FM(ICCE)
CWDA Regd. Structural Engineer CR-1 (SE-I)
Reg.No. [illegible]
SSS CONSULTANTS
No.11, [illegible], Pallikaranai, Chennai-600 100.
Cell: [illegible]
Email: shivashankar51@yahoo.com

the Column

Length of Footing at Critical Section	=	0.982	m.
Width of Footing at Critical Section	=	0.812	m.
Ratio of Width to Length at Critical Section	=	0.823	
Modified Depth of Footing at the Face of Wall	=	450	mm.
Modified Depth of Footing at the End	=	300	mm.
Depth of Footing at Critical Section	=	333.023	mm.
Design Shear Force	=	461.548	KN.
As Per IS:456-2000, Clause 31.6.2.1, Actual Shear Stress	=	0.435	N/sq.mm.
As Per IS:456-2000, Clause 31.6.3.1, Coefficient, ks	=	1	
Max. Permissible Shear Stress	=	1.25	N/sq.mm.

The section is SAFE in Shear.

F01 : Global Input Data (LC No. : 14)

The footing is to be designed as an Isolated

Width of Column	=	230	mm.
Length of Column	=	600	mm.
Footing Shape	=	Rectangular	
Initial Depth at the Face of Wall/Column	=	300	mm.
Initial Depth at the End	=	150	mm.

The footing is subjected to Axial Load & Biaxial

Working Axial Load	=	694.576	KN.
Working Moment about ZZ-axis	=	2.36	KN.m.
Working Moment about XX-axis	=	40.532	KN.m.
Safe Bearing Capacity of Soil	=	330	KN/sq.m.
Factor of Safety for Safe Bearing Capacity	=	1.5	

F01 : Flexure Output (LC No. : 14)

Working Axial Load on Footing	=	694.576	KN.
Factored Axial Load on Footing	=	694.576	KN.
Percentage Factor for Self Weight of Footing	=		

Er.M. SHANKAR, M.Tech(Struct.Engg.), MISTE, FIASCE
Chennai No. 96, Structural Engineer Gr.I (SE-I)
Reg.No. ASN/2004/40037
SB CONSULTANTS
No.11, Thiruvalluvar Street, Pallikaranai, Chennai-600 100.
Cell: 9282188486 / 9952155143
Email: shankarsb4u@yahoo.com

Factored Self Weight of Footing	=	69.458	KN
Total Factored Axial Load on Footing	=	184.034	KN
Working Moment about ZZ-axis	=	2.36	KN m
Factored Moment about ZZ-axis	=	2.36	KN m
Working Moment about XX-axis	=	40.532	KN m
Factored Moment about XX-axis	=	40.532	KN m
Ultimate Bearing Capacity of Soil	=	495	KN/sq.m.
From Vertical Load and Bending considerations, Area of Footing Required	=	1.992	sq.m.
Equal Projections were initially assumed from the to arrive at the Footing Size.			
Width of Footing Required	=	1.226	m.
Length of Footing Required	=	1.598	m.
Width of Footing Provided	=	1.25	m
Length of Footing Provided	=	1.6	m.
Actual Bearing Area Provided	=	2	sq.m.
Max. Bearing Pressure at the Base	=	483.719	KN/sq.m.
Min. Bearing Pressure at the Base	=	280.315	KN/sq.m.

Bending about ZZ-axis:-

Load Eccentricity lies within the limit causing total
Hence, the Footing Base about ZZ-axis will be in

Net Bearing Pressure at the Base - Right End	=	448.99	KN/sq.m.
Net Bearing Pressure at the Base - Left End	=	440.141	KN/sq.m.
Net Bearing Pressure at the Column Face	=	446.225	KN/sq.m.
Net Bearing Pressure - 'd' from Face	=	446.255	KN/sq.m.

As Per IS 456-2000, Clause 34.2.3,
the critical section for Bending Moment is at the
of the Column.

Projection of Footing from Critical Section	=	500	mm
Design Bending Moment	=	70.011	KN m
Modified Depth of Footing at the Face of Wall	=	425	mm
Modified Depth of Footing at the End	=	275	mm
Effective Depth Required	=		

E.M. SHANKAR, M.Tech(Struct.ME), MIEE, FIV, FACCE
Chartered Structural Engineer Gr.I (SE-0)
Reg No. SE/2324/0227
SS CONSULTANTS
No.11, Thiruvalluvar Street, Pallikaranai, Chennai-600 100.
Cell: 9382102884 / 9840033643
Email: shankarshankar97@yahoo.com

Effective Depth Provided	=	368	mm

Hence SAFE.

Percentage of Steel Required	=	0.099	%

As Per IS:456-2000, Clause 26.5.2.1,
the required percentage of Steel is less than the
to be provided. Hence, Minimum Steel is provided.

Percentage of Main Steel Provided	=	0.12	%
Area of Steel Provided	=	553.5	sq.mm.
Dia. of Rod-1 in Central Band	=	10	mm
Required Spacing of Rods	=	177.371	mm
Max. Spacing allowed (Rounded off)	=	175	mm
Dia. of Rod-2 in Central Band	=	12	mm
Required Spacing of Rods	=	255.414	mm
Max. Spacing allowed (Rounded off)	=	250	mm

Bending about XX-axis :-

Load Eccentricity lies within the limit causing total
Hence, the Footing Base about XX-axis will be in

Net Bearing Pressure at the Base - Right End	=	448.99	KN/sq.m.
Net Bearing Pressure at the Base - Left End	=	254.435	KN/sq.m.
Net Bearing Pressure at the Column Face	=	369.812	KN/sq.m.
Net Bearing Pressure - 'd' from Face	=	427.044	KN/sq.m.

As Per IS:456-2000, Clause 34.2.3,
the critical section for Bending Moment is at the
of the Column.

Projection of Footing from Critical Section	=	510	mm
Design Bending Moment	=	87.92	KN m
Modified Depth of Footing at the Face of Wall	=	425	mm
Modified Depth of Footing at the End	=	275	mm
Effective Depth Required	=	184.811	mm
Effective Depth Provided	=	367	mm

Hence SAFE.

Percentage of Steel Required	=	0.101	

As Per IS:456-2000, Clause 26.5.2.1,

Er.M. SHANKAR, M.Tech(Struct),MIE, MISTE, FIAACCE
CMDA Regd. Structural Engineer CR 1 (95-0)
Reg.No. SE/2/2004/40037
SB CONSULTANTS
No.11, Thanjai Street, Pattalamman, Chennai-600 088.
Cell: 9282182588 / 9952050643
Email: structshankar97@yahoo.com

the required percentage of Steel is less than the to be provided. Hence, Minimum Steel is provided.

Percentage of Main Steel Provided	=	0.12	%
Area of Steel Provided	=	565.44	sq.mm
Dia. of Rod-1 in Central Band	=	10	mm
Required Spacing of Rods	=	193.393	mm
Max. Spacing allowed (Rounded off)	=	175	mm
Dia. of Rod-2 in Central Band	=	12	mm
Required Spacing of Rods	=	283.999	mm
Max. Spacing allowed (Rounded off)	=	250	mm

Note (1) - The required Spacing of Main Rods will 300 mm, or 3d (300 mm, or 5d for Dist. Rods).

If the required spacing exceeds this limit, the least will be automatically provided. This is done in IS:456-2000 Clause 26.3.3.

Note (2) - The required minimum area of as per IS:456-2000, Clause 34.5.2, if the Footing 1000 mm. The minimum area is 360.0 sq.mm. for

Note (3) - The assumed Depth of Footing will be so that a SAFE design is arrived at from both considerations.

Note (4) - Spacing of Rods are also controlled by Value, User-defined Minimum and Maximum

F01 : Dowel Bars Output (LC No. : 14)

Factored Axial Load on Column	=	894.576	KN
Char. Comp. Strength of Concrete	=	25	N/sq.mm
Yield Stress of Pedestal Steel	=	500	N/sq.mm
Width of Column Section	=	230	mm
Depth of Column Section	=	600	mm
Area of Column Section	=	138000	sq.mm.
Width of Footing	=	1.25	m.
Length of Footing	=	1.6	m.
Area of Footing	=	2	sq.m.
As Per IS:456-2000, Clause 34.4, Basic Permissible Bearing Stress	=	11.25	N/sq.mm.
Max. Bearing Stress based on Area Ratio	=	22.5	N/sq.mm.

E.M. SHANKAR, B.E(CIVIL),M.E(STRUCTURAL ENGG.), MISTE, FIABCCE
Chartered Structural Engineer GR-I (SE-I)
Reg.No. SE/01/2344/2007
EB CONSULTANTS
No.11, Dhanji Street, Padmanaban, Chennai-600 096.
Cell: 9841102988 / 9962052843
Email: emshankar1@yahoo.com

As Per IS:456-2000, Clause 40.1,			
Actual Shear Stress	=	0.249	N/sq.mm
As Per IS:456-2000, Table 19,			
Design Shear Strength of Concrete	=	0.289	N/sq.mm
As Per IS:456-2000, Table 20,			
Max. Permissible Shear Stress	=	3.124	N/sq.mm

The section is SAFE in Shear, about XX-axis.

F01 : Punching Shear Output (LC No. : 14)

As Per IS:456-2000, Clause 34.2.4,
the critical section for Shear Force is at a distance

the Half the Effective Depth of the Footing, from the Column.

Length of Footing at Critical Section	=	0.957	m
Width of Footing at Critical Section	=	0.687	m
Ratio of Width to Length at Critical Section	=	0.613	
Modified Depth of Footing at the Face of Wall	=	425	mm
Modified Depth of Footing at the End	=	275	mm
Depth of Footing at Critical Section	=	327.65	mm
Design Shear Force	=	492.999	KN
As Per IS:456-2000, Clause 31.6.2.1,			
Actual Shear Stress	=	0.519	N/sq.mm
As Per IS:456-2000, Clause 31.6.3.1,			
Coefficient, ks	=	1	
Max. Permissible Shear Stress	=	1.25	N/sq.mm

The section is SAFE in Shear.

F01 : Global Input Data (LC No. : 15)

The footing is to be designed as an Isolated

Width of Column	=	230	mm
Length of Column	=	600	mm
Footing Shape	=	Rectangular	
Initial Depth at the Face of Wall/Column	=	300	mm
Initial Depth at the End	=	150	mm

The footing is subjected to Axial Load & Biaxial



Ex.M. SHANMUGA R, B.E.(Structural) ME. MISE. FIMACCE
Chief Regd. Structural Engineer GR-I (SE-II)
Reg No. SE/2/2004/1137
SBI CONSULTANTS
No 11, Thergal Street, Pallikaranai, Chennai-600 100.
Cell: 9382141883 / 9841915843
Email: shanmugakarthi@yahoo.com

Actual Shear Stress	=	0.597	N/sq.mm
As Per IS:456-2000, Clause 31.6.3.1,			
Coefficient, ks	=	1	
Max. Permissible Shear Stress	=	1.25	N/sq.mm

The section is SAFE in Shear.

F01 : Global Input Data (LC No. : 16)

The footing is to be designed as an Isolated

Width of Column	=	230	mm
Length of Column	=	600	mm

Footing Shape	=	Rectangular	
Initial Depth at the Face of Wall/Column	=	300	mm
Initial Depth at the End	=	150	mm

The footing is subjected to Axial Load & Biaxial

Working Axial Load	=	1216.012	KN
Working Moment about ZZ-axis	=	84.531	KN.m
Working Moment about XX-axis	=	0.941	KN.m
Safe Bearing Capacity of Soil	=	330	KN/sq.m
Factor of Safety for Safe Bearing Capacity	=	1.5	

F01 : Flexure Output (LC No. : 16)

Working Axial Load on Footing	=	1216.012	KN
Factored Axial Load on Footing	=	1216.012	KN
Percentage Factor for Self Weight of Footing	=	10	%
Factored Self Weight of Footing	=	121.601	KN
Total Factored Axial Load on Footing	=	1337.613	KN
Working Moment about ZZ-axis	=	84.531	KN.m
Factored Moment about ZZ-axis	=	84.531	KN.m
Working Moment about XX-axis	=	0.941	KN.m
Factored Moment about XX-axis	=	0.941	KN.m

[illegible], B.E., [illegible], MIE, FNACCE
CAIDA Regd. Structural Engineer GR-I (SE-I)
Reg No. [illegible]
SB CONSULTANTS
No.11, [illegible] Street, Pallavaram, Chennai-600 [illegible]
Cell: [illegible]
Email: [illegible]

Ultimate Bearing Capacity of Soil	=	485	KN/sq.m.
From Vertical Load and Bending considerations.			
Area of Footing Required	=	3.224	sq.m.
Equal Projections were initially assumed from the to arrive at the Footing Size.			
Width of Footing Required	=	1.62	m.
Length of Footing Required	=	1.99	m.
Width of Footing Provided	=	1.625	m.
Length of Footing Provided	=	2	m.
Actual Bearing Area Provided	=	3.25	sq.m.
Max. Bearing Pressure at the Base	=	490.671	KN/sq.m.
Min. Bearing Pressure at the Base	=	332.476	KN/sq.m.

Bending about ZZ-axis:-

Load Eccentricity lies within the limit causing total
Hence, the Footing Base about ZZ-axis will be in

Net Bearing Pressure at the Base - Right End	=	453.255	KN/sq.m.
Net Bearing Pressure at the Base - Left End	=	297.198	KN/sq.m.
Net Bearing Pressure at the Column Face	=	396.635	KN/sq.m.
Net Bearing Pressure - 'd' from Face	=	437.181	KN/sq.m.

As Per IS:456-2000, Clause 34.2.3,
the critical section for Bending Moment is at the
of the Column

Projection of Footing from Critical Section	=	700	mm
Design Bending Moment	=	173.394	KN.m.
Modified Depth of Footing at the Face of Wall	=	550	mm
Modified Depth of Footing at the End	=	400	mm
Effective Depth Required	=	331.865	mm
Effective Depth Provided	=	454	mm

Hence SAFE.

Percentage of Steel Required	=	0.103	

As Per IS:456-2000, Clause 26.5.2.1,
the required percentage of Steel is less than the
to be provided. Hence, Minimum Steel is provided.

Er.M. SHANKAR, M.Tech (Struct), ME, MIStE, FIAGES
CMDA Regd. Structural Engineer (SE-II)
Reg No. SE/2020/0000
SJ CONSULTANTS
No.11, Tiruvalluvar Street, Pallikaranai, Chennai-600 100.
Cell: 9789109189 / 9962969943
Email: shankarsj77@yahoo.com

Percentage of Main Steel Provided	=	0.12	%
Area of Steel Provided	=	963.3	sq.mm.
Dia. of Rod-1 in Central Band	=	10	mm
Required Spacing of Rods	=	132.49	mm
Max. Spacing allowed (Rounded off)	=	125	mm
Dia. of Rod-2 in Central Band	=	12	mm
Required Spacing of Rods	=	190.785	mm
Max. Spacing allowed (Rounded off)	=	175	mm

Bending about XX-axis :

Load Eccentricity lies within the limit causing total
Hence, the Footing Base about XX-axis will be in

Net Bearing Pressure at the Base - Right End	=	453.255	KN/sq.m.
Net Bearing Pressure at the Base - Left End	=	451.117	KN/sq.m.
Net Bearing Pressure at the Column Face	=	452.338	KN/sq.m.
Net Bearing Pressure - at from Face	=	452.887	KN/sq.m.

As Per IS:456-2000, Clause 34.2.3,
the critical section for Bending Moment is at the
of the Column

Projection of Footing from Critical Section	=	897.5	mm
Design Bending Moment	=	220.383	KN m
Modified Depth of Footing at the Face of Wall	=	550	mm
Modified Depth of Footing at the End	=	400	mm
Effective Depth Required	=	280.253	mm
Effective Depth Provided	=	462	mm

Hence SAFE

Percentage of Steel Required	=	0.112	%

As Per IS:456-2000, Clause 26.5.2.1,
the required percentage of Steel is less than the
to be provided. Hence, Minimum Steel is provided.

Percentage of Main Steel Provided	=	0.12	%
Area of Steel Provided	=	1155.6	
Dia. of Rod-1 in Central Band	=	10	
Required Spacing of Rods	=	135.785	

Ex.M. SHANKAR, M.Tech.(Struct),ME, MIE(I), FIV(I),CEng
CAD& Regd. Structural Engineer Gr-I (SE-II)
M/s. RK SERVICES
CONSULTANTS
No.11, Thirvil Road, Pallikaranai, Chennai-600 100.
Cell: 9382103883 / 9003003643
Email: shankarkaka97@yahoo.com

Max. Spacing allowed (Rounded off)	=	125	mm
Dia. of Rod 2 in Central Band	=	12	mm.
Required Spacing of Rods	=	196.535	mm
Max. Spacing allowed (Rounded off)	=	200	mm

Note (1) - The required Spacing of Main Rods will 300 mm. or 3d (300 mm. or 5d for Dist. Rods) If the required spacing exceeds this limit, the least will be automatically provided. This is done in IS:456-2000 Clause 26.3.3

Note (2) - The required minimum area of as per IS:456-2000, Clause 34.5.2, if the Footing 1000 mm. The minimum area is 360.0 sq.mm. for

Note (3) - The assumed Depth of Footing will be so that a SAFE design is arrived at from both considerations.

Note (4) - Spacing of Rods are also controlled by Value, User-defined Minimum and Maximum

F01 : Dowel Bars Output (LC No. : 16)

Factored Axial Load on Column	=	1216.012	KN.
Char. Comp. Strength of Concrete	=	25	N/sq.mm.
Yield Stress of Pedestal Steel	=	500	N/sq.mm.
Width of Column Section	=	230	mm.
Depth of Column Section	=	600	mm.
Area of Column Section	=	138000	sq.mm.
Width of Footing	=	1.625	m
Length of Footing	=	2	m
Area of Footing	=	3.25	sq.m.
As Per IS:456-2000, Clause 34.4, Basic Permissible Bearing Stress	=	11.25	N/sq.mm.
Max. Bearing Stress based on Area Ratio	=	22.5	N/sq.mm.
Actual Bearing Stress	=	8.812	N/sq.mm.
As Per IS:456-2000, Clause 34.4.3, Reinforcement is NOT required. However,			
Percentage of Steel Required	=	0.5	%
Area of Steel Provided	=	690	sq.mm.

Er.M. SHANKAR, M.Tech(Struct)ME, MIIE, MACCE
Chief Consultant, Structural Engineer (01-1 (SE-I)
Regn.No. SB/2021/M/0017
SB CONSULTANTS
Cell: 9382102888 / 9952910643
Email: consultshankar01@yahoo.com

Dowel Rod Size-1	=	12	mm
No. of Rods to be Provided	=	6	Nos
Corresponding Steel Area	=	678.584	sq.mm.
Dowel Rod Size-2	=	16	mm
No. of Rods to be Provided	=	4	Nos
Corresponding Steel Area	=	804.248	sq.mm.

Note :- Calculation for Dowel Rods is only
However Dowel Rods may not be required in all

F01 : One Way Shear Output (LC No. : 16)

As Per IS:456-2000, Clause 34.2.4,
the critical section for Shear Force is at a distance the Effective Depth of the Footing, from the Face

Design Shear Force about Length	=	145.037	KN
Modified Depth of Footing at the Face of Wall	=	550	mm
Modified Depth of Footing at the End	=	400	mm
Depth of Footing at Critical Section	=	388.143	mm
Projection of Footing from Critical Section	=	206	mm
As Per IS:456-2000, Clause 40.1, Actual Shear Stress	=	0.236	N/sq.mm.
As Per IS:456-2000, Table 19, Design Shear Strength of Concrete	=	0.27	N/sq.mm.
As Per IS:456-2000, Table 20, Max. Permissible Shear Stress	=	3.124	N/sq.mm.

The section is SAFE in Shear, about ZZ-axis.

Design Shear Force about Width	=	164.42	KN
Depth of Footing at Critical Section	=	375.783	mm
Projection of Footing from Critical Section	=	203.5	mm
As Per IS:456-2000, Clause 40.1, Actual Shear Stress	=	0.246	N/sq.mm.
As Per IS:456-2000, Table 19, Design Shear Strength of Concrete	=	[illegible]	
As Per IS:456-2000, Table 20, Max. Permissible Shear Stress	=	3.124	[illegible]

Er.M. [illegible] ENGINEERING CONSULTANTS
CMDA Regd. Structural Engineer GR-I (SE-I)
Reg No. SE/2021/[illegible]
No.11, Thiruvalluvar Street, Pallikaranai, Chennai-600 100.
Cell: 9381122988 / 9952650143
Email: abrucekalidass@yahoo.com

The section is SAFE in Shear, about XX-axis.

F01 : Punching Shear Output (LC No. : 16)

As Per IS:456-2000, Clause 34.2.4,
the critical section for Shear Force is at a distance the Half the Effective Depth of the Footing, from the Column.

Length of Footing at Critical Section	=	1.082	m.
Width of Footing at Critical Section	=	0.712	m.
Ratio of Width to Length at Critical Section	=	0.658	
Modified Depth of Footing at the Face of Wall	=	550	mm.
Modified Depth of Footing at the End	=	400	mm.
Depth of Footing at Critical Section	=	435.671	mm.
Design Shear Force	=	919.858	KN.

As Per IS:456-2000, Clause 31.6.2.1,

Actual Shear Stress	=	0.589	N/sq.mm.

As Per IS:456-2000, Clause 31.6.3.1,

Coefficient ks	=	1	
Max. Permissible Shear Stress	=	1.25	N/sq.mm.

The section is SAFE in Shear.

F01 : Global Input Data (LC No. : 17)

The footing is to be designed as an Isolated

Width of Column	=	230	mm.
Length of Column	=	600	mm.
Footing Shape	=	Rectangular	
Initial Depth at the Face of Wall/Column	=	300	mm.
Initial Depth at the End	=	150	mm.

The footing is subjected to Axial Load & Biaxial

Working Axial Load	=	616.749	KN.
Working Moment about ZZ-axis	=	73.518	KN.m.
Working Moment about XX-axis	=	2.162	KN.m.
Safe Bearing Capacity of Soil	=	300	KN/sq.m.
Factor of Safety for Safe Bearing Capacity	=	1.5	

CIVIL ENGINEER, M.E.(STRUCTURE), MIE(I), AMACCE
CIDA Regd. Structural Engineer (SE-I)
STRUCTURAL CONSULTANTS
No.11, Thiruvalluvar Street, Pallikaranai, Chennai-600 100.
Cell: 9283102286 / 9952600643
Email: structuralkarthi87@yahoo.com

STABILITY CALCULATIONS FOR THE PROPOSED CONSTRUCTION OD STILT FLOOR +4 FLOORS +5 TH FLOOR (PART) RESIDENTIAL BUILDING WITH 24 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENIFITAT PLOT NO. 29,17 TH CROSS STREET,NCBS COLONY,NANGANALLUR,CHENNAI-600061 AND COMPRISED IN OLD S.NO.19/3 (PART)4 (PART),20/1 (PART),3 (PART) AS PER PATTA NEW TS NO.18/11&18/2,BLOCK NO. 31,WARD -B OF NANAGANALLIJER VILLAGE,ALANDUR TALUK WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION

SCADDS/RC-Column Designer 2022 [Release: 4.01.3010]

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SCADDS/Nucleus 2022: RC-Column Designer
Limit State Design of Braced/Unbraced Short/Long
Rectangular/Circular Cracked/Uncracked Column Sections
Subjected to Axial Load/Uni-axial & Bi-axial Bending
as per IS:456-2000 upto Amendment 5 (Reaffirmed 2021)

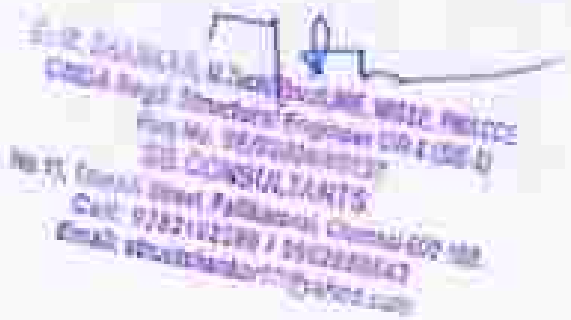
Introduction:-

This Report contains the detailed solution for the Reinforced Concrete Column Design problem

The given Column Section is considered for Design and the output contains the following

1. Global Input Data
2. Development Length Output
3. Slenderness & Eccentricity Output
4. Flexural Design Output
5. Tie Design Output

While detailed design will be carried out for design for Axial Tension and Shear is not



STABILITY CALCULATIONS FOR THE PROPOSED CONSTRUCTION OD STILT FLOOR +4 FLOORS +5 TH FLOOR (PART) RESIDENTIAL BUILDING WITH 24 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENIFITAT PLOT NO. 29,17 TH CROSS STREET,NCBS COLONY,NANGANALLUR,CHENNAI-600061 AND COMPRISED IN OLD S.NO.19/3 (PART)4 (PART),20/1 (PART),3 (PART) AS PER PATTA NEW TS NO.18/11&18/2,BLOCK NO. 31,WARD -B OF NANAGANALLUER VILLAGE,ALANDUR TALUK WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION

Global Material Data			
Concrete Clear Cover	=	40	mm.
Char. Comp. Strength of Concrete	=	30	N/sq.mm.
Yield Strength of Main Steel	=	500	N/sq.mm.
Main Rod Size-1	=	25	mm.
Yield Strength of Tie Steel	=	415	N/sq.mm.
Tie Rod Size-1	=	8	mm.
Tie Rod Size-2	=	10	mm.
Factor of Safety for Load	=	1	
Partial Safety Factor for Concrete	=	1.5	
Partial Safety Factor for Steel	=	1.15	
Max. Strain in Concrete	=	0.0035	mm./mm.
Max. Strain in Steel	=	0.0065	mm./mm.
Young's Modulus of Concrete	=	27386.128	N/sq.mm.
Young's Modulus of Steel	=	200000	N/sq.mm.

Er.M. SHANKAR, M.Tech (Structural Engineering), MISTE, FIMACE
CMDA Panel Structural Engineer Gr.I (SE-I)
Reg.No. SE/I/2024/00037
SB CONSULTANTS
No.17, Thiruvalluvar Street, Pallikaranai, Chennai-600 100.
Cell: 9787103589 / 9952956643
Email: structshankar@yahoo.com

STABILITY CALCULATIONS FOR THE PROPOSED CONSTRUCTION OD STILT FLOOR +4 FLOORS +5 TH FLOOR (PART) RESIDENTIAL BUILDING WITH 24 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENIFITAT PLOT NO. 29,17 TH CROSS STREET,NCBS COLONY,NANGANALLUR,CHENNAI-600061 AND COMPRISED IN OLD S.NO.19/3 (PART)4 (PART),20/1 (PART),3 (PART) AS PER PATTA NEW TS NO.18/11&18/2,BLOCK NO. 31,WARD -B OF NANAGANALLUER VILLAGE,ALANDUR TALUK WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION

Bond / Development Length Output			
Char. Comp. Strength of Concrete	=	30	N/sq mm
Yield Stress of Main Steel	=	500	N/sq mm
As Per IS:456-2000, Clause			
Design Bond Stress for Main Rods	=	3	N/sq mm
Rods in Compression:-			
Main Rod Diameter-1	=	25	mm
Corresponding Development Length	=	908.25	mm

Er.M. SHANKAR, M.TECH(Structural Engg), MISTE, FIE(I)
CWDA Regd. Structural Engineer GR-I (SE-II)
Reg No: [illegible]
SB CONSULTANTS
No.11, Thiyagi Street, Pallikaranai, Chennai-600 100.
Cell: 9282182386 / [illegible]
Email: [illegible]

STABILITY CALCULATIONS FOR THE PROPOSED CONSTRUCTION OD STILT FLOOR +4 FLOORS +5 TH FLOOR (PART) RESIDENTIAL BUILDING WITH 24 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENIFITAT PLOT NO. 29,17 TH CROSS STREET,NCBS COLONY,NANGANALLUR,CHENNAI-600061 AND COMPRISED IN OLD S.NO.19/3 (PART)4 (PART),20/1 (PART),3 (PART) AS PER PATTA NEW TS NO.18/11&18/2,BLOCK NO. 31,WARD -B OF NANAGANALLUER VILLAGE,ALANDUR TALUK WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION

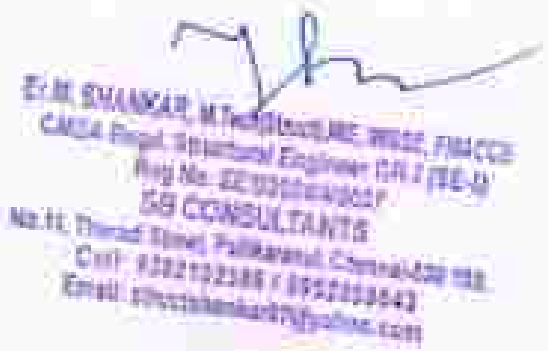
C1 : Global Input Data (LC No. : 9)			
Column Section	=	Rectangular	
Width of Column	=	230	mm.
Depth of Column	=	600	mm.
The Effective Lengths about ZZ and YY axes based on actual framing conditions from the 3D			
Effective Length Coeff. about ZZ axis	=	0.783	
Effective Length Coeff. about YY axis	=	0.699	
Unsupported Length-ZZ of Column	=	1.5	m.
Unsupported Length-YY of Column	=	1.5	m.
Effective Length-ZZ of Column	=	1.175	m.
Effective Length-YY of Column	=	1.049	m.
Working Axial Load on Column	=	1145.476	KN.
Working Moment about ZZ-axis at Top	=	-6.683	KN m.
Working Moment about YY-axis at Top	=	-1.934	KN m.
Working Moment about ZZ-axis at Bottom	=	-7.703	KN m.
Working Moment about YY-axis at Bottom	=	-3.879	KN m.

C1 : Slenderness & Eccentricity Output (LC No. : 9)			
Effective Length-ZZ of Column	=	1.175	m.
Effective Length-YY of Column	=	1.049	m.
Slenderness Ratio about ZZ-axis The Column is Short about the ZZ-axis.	=	4.559	
Slenderness Ratio about YY-axis The Column is Short about the YY-axis.	=	1.958	
As Per IS:456-2000, 25.4,			
Minimum Eccentricity	=	20	mm.
Lo/500 + b/30	=	10.667	mm.
Lo/500 + D/30	=	23	mm.
Actual Minimum Eccentricity about ZZ	=	23	mm.
Actual Minimum Eccentricity about YY	=	20	mm.

Er.M. SHANKAR, M.Tech(Struct),ME, MGSE, FMACCE
CMDA Regd. Structural Engineer GR-I (SE-I)
Reg No. SE/S/2014/0037
SB CONSULTANTS
No.11, Thiruvalluvar Street, Pallikaranai, Chennai-600 100.
Cell: 9282102288 / 8925030843
Email: shankarkumar67@yahoo.com

STABILITY CALCULATIONS FOR THE PROPOSED CONSTRUCTION OD STILT FLOOR +4 FLOORS +5 TH FLOOR (PART) RESIDENTIAL BUILDING WITH 24 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENIFITAT PLOT NO. 29,17 TH CROSS STREET,NCBS COLONY,NANGANALLUR,CHENNAI-600061 AND COMPRISED IN OLD S.NO.19/3 (PART)4 (PART),20/1 (PART),3 (PART) AS PER PATTA NEW TS NO.18/11&18/2,BLOCK NO. 31,WARD -B OF NANAGANALLUER VILLAGE,ALANDUR TALUK WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION

As Per IS:456-2000, 39.5,			
0.05 times D (Limiting Value about ZZ)	=	30	mm
0.05 times b (Limiting Value about YY)	=	11.5	mm
Actual Eccentricity about ZZ due to Moment-ZZ	=	5.724	mm



STABILITY CALCULATIONS FOR THE PROPOSED CONSTRUCTION OD STILT FLOOR +4 FLOORS +5 TH FLOOR (PART) RESIDENTIAL BUILDING WITH 24 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENIFITAT PLOT NO. 29,17 TH CROSS STREET,NCBS COLONY,NANGANALLUR,CHENNAI-600061 AND COMPRISED IN OLD S.NO.19/3 (PART)4 (PART),20/1 (PART),3 (PART) AS PER PATTA NEW TS NO.18/11&18/2,BLOCK NO. 31,WARD -B OF NANAGANALLUER VILLAGE,ALANDUR TALUK WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION

Actual Eccentricity about YY due to Moment-YY	=	3.387	mm
Design Eccentricity about ZZ due to Moment ZZ	=	23	mm
Design Eccentricity about YY due to Moment-YY	=	20	mm
As Per IS:456-2000, 39.3, Design Eccentricity about ZZ is not more than the Hence, the Column carries only Axial Load about			
Design Eccentricity about YY is more than the Hence, the Column has Axial Load & Bending			
Revised Design Bending Moment about YY	=	22.91	KN m

C1 : Flexural Design Output (LC No. : 9)

Axial Load on Column	=	1145.476	KN
Factored Axial Load	=	1145.476	KN
Revised Design Moment about YY axis	=	22.91	KN m
The Column is subjected to Axial Load & Uni-axial			
Main Reinforcement is provided along all the			
Characteristic Comp. Strength of Concrete	=	30	N/sq.mm
Yield Stress of Main Steel	=	500	N/sq.mm
Min. Percentage of Reinforcement Required	=	0.8	%
Max. Percentage of Reinforcement Allowed	=	6	%
Depth of Neutral Axis	=	6	mm
Width of Column	=	230	mm
Depth of Column	=	600	mm
Gross Sectional Area	=	138000	sq.mm
Percentage of Reinforcement to be Provided	=	0.8	%
Area of Longitudinal Reinforcement Required	=	1104	sq.mm
Main Rod Size-1	=	[illegible]	mm
No. of Rods Required	=	[illegible]	Nos
No. of Rods Provided	=	4	Nos

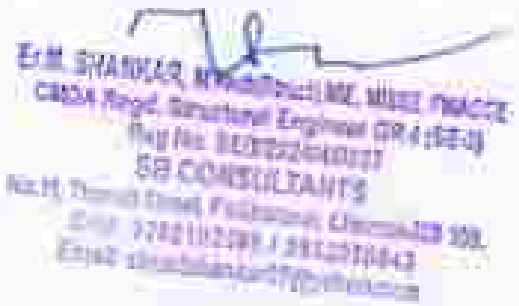
SB CONSULTANTS
No.11, Thanjai Road, Pallikaranai, Chennai-600 100.
Cell: 9282102288 / 9710104443
Email: sbconsultants@yahoo.com

STABILITY CALCULATIONS FOR THE PROPOSED CONSTRUCTION OD STILT FLOOR +4 FLOORS +5 TH FLOOR (PART) RESIDENTIAL BUILDING WITH 24 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENIFITAT PLOT NO. 29,17 TH CROSS STREET,NCBS COLONY,NANGANALLUR,CHENNAI-600061 AND COMPRISED IN OLD S.NO.19/3 (PART)4 (PART),20/1 (PART),3 (PART) AS PER PATTA NEW TS NO.18/11&18/2,BLOCK NO. 31,WARD -B OF NANAGANALLUER VILLAGE,ALANDUR TALUK WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION

Corresponding Steel Area	=	1963.495	sq.mm

Note :- Please note that the minimum number of will be always FOUR for Rectangular Columns. Columns. as per IS:456-2000 Clause 26.5.3.1.(c)

C1 : Tie Pitch Output (LC No. : 9)



STABILITY CALCULATIONS FOR THE PROPOSED CONSTRUCTION OD STILT FLOOR +4 FLOORS +5 TH FLOOR (PART) RESIDENTIAL BUILDING WITH 24 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENIFITAT PLOT NO. 29,17 TH CROSS STREET,NCBS COLONY,NANGANALLUR,CHENNAI-600061 AND COMPRISED IN OLD S.NO.19/3 (PART)4 (PART),20/1 (PART),3 (PART) AS PER PATTA NEW TS NO.18/11&18/2,BLOCK NO. 31,WARD -B OF NANAGANALLUER VILLAGE,ALANDUR TALUK WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION

Tie Rod Size-1	=	8	mm.
Tie Rod Size-2	=	10	mm.
Main Rod Size-1	=	25	mm.
As Per IS:456-2000,			
Least Lateral Dimension	=	230	mm
16 times dia. of Main Rod	=	400	mm
Maximum allowable value as per Code	=	300	mm.
Minimum of the above values for 25# Rods	=	225	mm
Spacing of Rods are also controlled by Value, User-defined Minimum and Maximum			

C1 : Global Input Data (LC No. : 10)

Column Section	=	Rectangular	
Width of Column	=	230	mm.
Depth of Column	=	900	mm.
The Effective Lengths about ZZ and YY axes based on actual framing conditions from the 3D			
Effective Length Coeff. about ZZ axis	=	0.783	
Effective Length Coeff. about YY axis	=	0.699	
Unsupported Length-ZZ of Column	=	1.5	m.
Unsupported Length-YY of Column	=	1.5	m.
Effective Length-ZZ of Column	=	1.175	m.
Effective Length-YY of Column	=	1.049	m.
Working Axial Load on Column	=	742.609	KN
Working Moment about ZZ-axis at Top	=	-0.884	KN m.
Working Moment about YY-axis at Top	=	90.357	KN m.
Working Moment about ZZ-axis at Bottom	=	-7.144	KN m.
Working Moment about YY-axis at Bottom	=	33.315	KN m.

C1 : Slenderness & Eccentricity Output (LC No. : 10)

Effective Length-ZZ of Column	=	1.175	m.
Effective Length-YY of Column	=	1.049	m.

[illegible] Structural Engineer (SR-I) (SE-I)
Reg No. [illegible]
SB CONSULTANTS
No.11, Thanal Street, Puzhanthal, Chennai-600 [illegible]
Cell: [illegible]
Email: [illegible]

STABILITY CALCULATIONS FOR THE PROPOSED CONSTRUCTION OD STILT FLOOR +4 FLOORS +5 TH FLOOR (PART) RESIDENTIAL BUILDING WITH 24 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENIFITAT PLOT NO. 29,1T TH CROSS STREET,NCBS COLONY,NANGANALLUR,CHENNAI-600061 AND COMPRISED IN OLD S.NO.19/3 (PART)4 (PART),20/1 (PART),3 (PART) AS PER PATTA NEW TS NO.18/11&18/2,BLOCK NO. 31,WARD -B OF NANAGANALLUER VILLAGE,ALANDUR TALUK WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION

Slenderness Ratio about ZZ-axis The Column is Short about the ZZ-axis	=	4.559
Slenderness Ratio about YY-axis The Column is Short about the YY-axis	=	1.958

Er.M. SHANKAR, M.Tech
CMDA Regd. Structural Engineer Cat-I (SE-I)
Reg.No. SE/2002/40007
SB CONSULTANTS
No.11, Thiruvalluvar Street, Pallikaranai, Chennai-600 100.
Cell: 9382193568 / 9962048643
Email: shankarsekar97@yahoo.co.in

STABILITY CALCULATIONS FOR THE PROPOSED CONSTRUCTION OD STILT FLOOR +4 FLOORS +5 TH FLOOR (PART) RESIDENTIAL BUILDING WITH 24 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENIFITAT PLOT NO. 29,17 TH CROSS STREET,NCBS COLONY,NANGANALLUR,CHENNAI-600061 AND COMPRISED IN OLD S.NO.19/3 (PART)4 (PART),20/1 (PART),3 (PART) AS PER PATTA NEW TS NO.18/11&18/2,BLOCK NO. 31,WARD -B OF NANAGANALLUER VILLAGE,ALANDUR TALUK WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION

As Per IS:456-2000, 25.4,			
Minimum Eccentricity	=	20	mm.
Lo/500 + b/30	=	10.667	mm.
Lo/500 + D/30	=	23	mm.
Actual Minimum Eccentricity about ZZ	=	23	mm.
Actual Minimum Eccentricity about YY	=	20	mm.
As Per IS:456-2000, 39.3,			
0.05 times D (Limiting Value about ZZ)	=	30	mm
0.05 times b (Limiting Value about YY)	=	11.5	mm
Actual Eccentricity about ZZ due to Moment-ZZ	=	9.619	mm.
Actual Eccentricity about YY due to Moment-YY	=	67.805	mm.
Design Eccentricity about ZZ due to Moment-ZZ	=	23	mm.
Design Eccentricity about YY due to Moment-YY	=	67.805	mm.
As Per IS:456-2000, 39.3,			
Design Eccentricity about ZZ is not more than the			
Hence, the Column carries only Axial Load about			
Design Eccentricity about YY is more than the			
Hence, the Column has Axial Load & Bending			
Revised Design Bending Moment about YY	=	50.357	KN.m.

C1 : Flexural Design Output (LC No. : 10)

Axial Load on Column	=	742.669	KN.
Factored Axial Load	=	742.669	KN.
Revised Design Moment about YY axis	=	50.357	KN.m.
The Column is subjected to Axial Load & Uni-axial			
Main Reinforcement is provided along all the			
Characteristic Comp. Strength of Concrete	=	35	N/sq.mm.
Yield Stress of Main Steel	=	500	N/sq.mm.
Min. Percentage of Reinforcement Required	=	0.8	%
Max. Percentage of Reinforcement Allowed	=	6	%
Depth of Neutral Axis	=		

S.M. SHANKAR, M.Tech(Struct.ME, MIEE, FIE(CE)
CMDA Registered Structural Engineer CR I (SE-I)
Reg No. SER/2024/0037
SS CONSULTANTS
No.11, Thiraid Street, Pallikaranai, Chennai-600 100.
Cell: 9382103386 / 9952210043
Email: shankarkarki67@yahoo.com

STABILITY CALCULATIONS FOR THE PROPOSED CONSTRUCTION OD STILT FLOOR +4 FLOORS +5 TH FLOOR (PART) RESIDENTIAL BUILDING WITH 24 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENIFITAT PLOT NO. 29,17 TH CROSS STREET,NCBS COLONY,NANGANALLUR,CHENNAI-600061 AND COMPRISED IN OLD S.NO.19/3 (PART)4 (PART),20/1 (PART),3 (PART) AS PER PATTA NEW TS NO.18/11&18/2,BLOCK NO. 31,WARD -B OF NANAGANALLUER VILLAGE,ALANDUR TALUK WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION

Width of Column	=	230	mm
Depth of Column	=	600	mm
Gross Sectional Area	=	138000	sq.mm
Percentage of Reinforcement to be Provided	=	0.8	%

Ex.AE, SHANKAR, M.Tech(Struct.),ME, MIEE, FIMACE
CMDA Regd. Structural Engineer Gr.I (SE-I)
Reg No. SE/2002/140057
SB CONSULTANTS
No.11, Third Street, Pallikaranai, Chennai-600 100.
Cell: 9382182884 / 9962010643
Email: shanmukhankar67@yahoo.com

STABILITY CALCULATIONS FOR THE PROPOSED CONSTRUCTION OD STILT FLOOR +4 FLOORS +5 TH FLOOR (PART) RESIDENTIAL BUILDING WITH 24 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENIFITAT PLOT NO. 29,17 TH CROSS STREET,NCBS COLONY,NANGANALLUR,CHENNAI-600061 AND COMPRISED IN OLD S.NO.19/3 (PART)4 (PART),20/1 (PART),3 (PART) AS PER PATTA NEW TS NO.18/11&18/2,BLOCK NO. 31,WARD -B OF NANAGANALLUER VILLAGE,ALANDUR TALUK WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION

Area of Longitudinal Reinforcement Required	=	1104	sq.mm
Main Rod Size-1	=	25	mm
No. of Rods Required	=	2.249	Nos
No. of Rods Provided	=	4	Nos
Corresponding Steel Area	=	1963.495	sq.mm

Note :- Please note that the minimum number of will be always FOUR for Rectangular Columns Columns, as per IS:456-2000 Clause 26.5.3.1 (c)

C1 : Tie Pitch Output (LC No. : 10)

Tie Rod Size-1	=	8	mm
Tie Rod Size-2	=	10	mm
Main Rod Size-1	=	25	mm
As Per IS:456-2000,			
Least Lateral Dimension	=	230	mm
16 times dia. of Main Rod	=	400	mm
Maximum allowable value as per Code	=	300	mm
Minimum of the above values for 25# Rods	=	225	mm

Spacing of Rods are also controlled by Value, User-defined Minimum and Maximum

C1 : Global Input Data (LC No. : 11)

Column Section	=	Rectangular	
Width of Column	=	230	mm
Depth of Column	=	600	mm
The Effective Lengths about ZZ and YY axes based on actual framing conditions from the 3D			
Effective Length Coeff. about ZZ axis	=	0.783	
Effective Length Coeff. about YY axis	=	0.699	
Unsupported Length-ZZ of Column	=	3.5	m
Unsupported Length-YY of Column	=	1.5	m

Structural Engineer GR-I (SE-I)
GB CONSULTANTS
No.11, Ganesh Street, Pallavaram, Chennai-600 117

STABILITY CALCULATIONS FOR THE PROPOSED CONSTRUCTION OD STILT FLOOR +4 FLOORS +5 TH FLOOR (PART) RESIDENTIAL BUILDING WITH 24 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENIFITAT PLOT NO. 29,17 TH CROSS STREET,NCBS COLONY,NANGANALLUR,CHENNAI-600061 AND COMPRISED IN OLD S.NO.15/3 (PART)4 (PART),20/1 (PART),3 (PART) AS PER PATTA NEW TS NO.18/11&18/2,BLOCK NO. 31,WARD -B OF NANAGANALLUER VILLAGE,ALANDUR TALUK WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION

Effective Length-ZZ of Column	=	1.175	m
Effective Length-YY of Column	=	1.049	m
Working Axial Load on Column	=	1297.18	KN
Working Moment about ZZ-axis at Top	=	-8.751	KN m
Working Moment about YY-axis at Top	=	-54.841	KN m
Working Moment about ZZ-axis at Bottom	=	-5.397	KN m

Ex.M. SHANKAR, M.Tech(Struct),ME, MIGSE, FIMACCE
CM(Gr.I)Regd. Structural Engineer Gr-I (SE-I)
Reg No. SE/I/2024/0037
SB CONSULTANTS
No.11, Thiruvalluvar Street, Pallikaranai, Chennai-600 100.
Cell: 1282102586 / 9952055643
Email: shrishankar47@yahoo.com

STABILITY CALCULATIONS FOR THE PROPOSED CONSTRUCTION OD STILT FLOOR +4 FLOORS +5 TH FLOOR (PART) RESIDENTIAL BUILDING WITH 24 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENIFITAT PLOT NO. 29,17 TH CROSS STREET,NCBS COLONY,NANGANALLUR,CHENNAI-600061 AND COMPRISED IN OLD S.NO.19/3 (PART)4 (PART),20/1 (PART),3 (PART) AS PER PATTA NEW TS NO.18/11&18/2,BLOCK NO. 31,WARD -B OF NANAGANALLUER VILLAGE,ALANDUR TALUK WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION

Working Moment about YY-axis at Bottom	=	-42.413	KN m

C1 : Slenderness & Eccentricity Output (LC No. : 11)

Effective Length-ZZ of Column	=	1.175	m
Effective Length-YY of Column	=	1.049	m
Slenderness Ratio about ZZ-axis	=	4.559	
The Column is Short about the ZZ-axis			
Slenderness Ratio about YY-axis	=	1.956	
The Column is Short about the YY-axis			
As Per IS:456-2000, 25.4,			
Minimum Eccentricity	=	20	mm
Lo/500 + b/30	=	10.667	mm
Lo/500 + D/30	=	23	mm
Actual Minimum Eccentricity about ZZ	=	23	mm
Actual Minimum Eccentricity about YY	=	20	mm
As Per IS:456-2000, 39.3,			
0.05 times D (Limiting Value about ZZ)	=	30	mm
0.05 times b (Limiting Value about YY)	=	11.5	mm
Actual Eccentricity about ZZ due to Moment-ZZ	=	6.746	mm
Actual Eccentricity about YY due to Moment-YY	=	42.277	mm
Design Eccentricity about ZZ due to Moment-ZZ	=	23	mm
Design Eccentricity about YY due to Moment-YY	=	42.277	mm
As Per IS:456-2000, 39.3,			
Design Eccentricity about ZZ is not more than the			
Hence, the Column carries only Axial Load about			
Design Eccentricity about YY is more than the			
Hence, the Column has Axial Load & Bending			
Revised Design Bending Moment about YY	=	54.841	KN m

C1 : Flexural Design Output (LC No. : 11)

Axial Load on Column	=	[illegible]	KN
Factored Axial Load	=	[illegible]	KN

[illegible] Structural Engineer GR.I (RE-I)
Reg No. [illegible]
SB CONSULTANTS
No.11, Thevar Street, Puliyanthoppu, Chennai-600 012.
Cell: [illegible]

STABILITY CALCULATIONS FOR THE PROPOSED CONSTRUCTION OD STILT FLOOR +4 FLOORS +5 TH FLOOR (PART) RESIDENTIAL BUILDING WITH 24 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENIFITAT PLOT NO. 29,17 TH CROSS STREET,NCBS COLONY,NANGANALLUR,CHENNAI-600061 AND COMPRISED IN OLD S.NO.19/3 (PART)4 (PART),20/1 (PART),3 (PART) AS PER PATTA NEW TS NO.18/11&18/2,BLOCK NO. 31,WARD -B OF NANAGANALLUER VILLAGE,ALANDUR TALUK WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION

Revised Design Moment about YY axis	=	54.841	KN m
The Column is subjected to Axial Load &			
Main Reinforcement is provided along all the			
Characteristic Comp. Strength of Concrete	=	30	N/sq mm

Er.M. SHANKAR, M.Tech(Struct),MIE, MISTE,FIMAGES
CM/A Regd. Structural Engineer GR-I (SE:I)
Reg No. SE/I/0824/A/0017
SB CONSULTANTS
No 11, Thiruvil Street, Pallikaranai, Chennai-600 100.
Cell: +(91)-9382165845 / 8939050843
Email: shankarkan67@yahoo.com

STABILITY CALCULATIONS FOR THE PROPOSED CONSTRUCTION OD STILT FLOOR +4 FLOORS +5 TH FLOOR (PART) RESIDENTIAL BUILDING WITH 24 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENIFITAT PLOT NO. 29,17 TH CROSS STREET,NCBS COLONY,NANGANALLUR,CHENNAI-600061 AND COMPRISED IN OLD S.NO.19/3 (PART)4 (PART),20/1 (PART),3 (PART) AS PER PATTA NEW TS NO.18/11&18/2,BLOCK NO. 31,WARD -B OF NANAGANALLUER VILLAGE,ALANDUR TALUK WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION

Yield Stress of Main Steel	=	500	N/sq.mm
Min. Percentage of Reinforcement Required	=	0.8	%
Max. Percentage of Reinforcement Allowed	=	6	%
Depth of Neutral Axis	=	6	mm
Width of Column	=	230	mm
Depth of Column	=	600	mm
Gross Sectional Area	=	138000	sq.mm
Percentage of Reinforcement to be Provided	=	0.8	%
Area of Longitudinal Reinforcement Required	=	1104	sq.mm
Main Rod Size-1	=	25	mm
No. of Rods Required	=	2.249	Nos.
No. of Rods Provided	=	4	Nos.
Corresponding Steel Area	=	1963.495	sq.mm

Note :- Please note that the minimum number of will be always FOUR for Rectangular Columns Columns, as per IS: 456-2000 Clause 26.5.3.1 (c)

C1 : Tie Pitch Output (LC No. : 11)

Tie Rod Size-1	=	8	mm
Tie Rod Size-2	=	10	mm
Main Rod Size-1	=	25	mm
As Per IS:456-2000,			
Least Lateral Dimension	=	230	mm
16 times dia. of Main Rod	=	400	mm
Maximum allowable value as per Code	=	300	mm
Minimum of the above values for 25# Rods	=	225	mm

Spacing of Rods are also controlled by Values, User-defined Minimum and Maximum

C1 : Global Input Data (LC No. : 11)

Column Section	=	Rectangular	

Prof. SUBRAMANIAN M. [illegible]
CIMSA Regd. Structural Engineer GR-3 (SE-I)
Reg No. SE/3/3264/2017
SB CONSULTANTS
No.11, Third Road, Pallavaram, Chennai-600 166.
Cell: 9003152888 / 9962165843
Email: sbsuchandar67@yahoo.com

STABILITY CALCULATIONS FOR THE PROPOSED CONSTRUCTION OD STILT FLOOR +4 FLOORS +5 TH FLOOR (PART) RESIDENTIAL BUILDING WITH 24 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENIFITAT PLOT NO. 29,17 TH CROSS STREET,NCBS COLONY,NANGANALLUR,CHENNAI-600061 AND COMPRISED IN OLD S.NO.19/3 (PART)4 (PART),20/1 (PART),3 (PART) AS PER PATTA NEW TS NO.18/11&18/2,BLOCK NO. 31,WARD -B OF NANAGANALLUER VILLAGE,ALANDUR TALUK WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION

Width of Column	=	230	mm.
Depth of Column	=	600	mm.

The Effective Lengths about ZZ and YY axes based on actual framing conditions from the 3D

Er.M. SHANKAR, M.Tech(Struct), ME, MIEE, FNACCE
CMDA Regd. Structural Engineer (SR-I (SE-I))
Reg No. SE/2003/4/0037
SB CONSULTANTS
No.11, Thiruvalluvar Street, Pallikaranai, Chennai-600 100.
Cell: 9282162588 / 9962990643
Email: shankarkarthi@yahoo.com

STABILITY CALCULATIONS FOR THE PROPOSED CONSTRUCTION OD STILT FLOOR +4 FLOORS +5 TH FLOOR (PART) RESIDENTIAL BUILDING WITH 24 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENIFITAT PLOT NO. 29,17 TH CROSS STREET,NCBS COLONY,NANGANALLUR,CHENNAI-600061 AND COMPRISED IN OLD S.NO.19/3 (PART)4 (PART),20/1 (PART),3 (PART) AS PER PATTA NEW TS NO.18/11&18/2,BLOCK NO. 31,WARD -B OF NANAGANALLUER VILLAGE,ALANDUR TALUK WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION

Effective Length Coeff. about ZZ axis	=	0.783	
Effective Length Coeff. about YY axis	=	0.699	
Unsupported Length-ZZ of Column	=	1.5	m.
Unsupported Length-YY of Column	=	1.5	m.
Effective Length-ZZ of Column	=	1.175	m.
Effective Length-YY of Column	=	1.049	m.
Working Axial Load on Column	=	1304.404	KN
Working Moment about ZZ-axis at Top	=	-103.598	KN m
Working Moment about YY-axis at Top	=	-1.455	KN m
Working Moment about ZZ-axis at Bottom	=	-27.345	KN m
Working Moment about YY-axis at Bottom	=	-4.017	KN m

C1 : Slenderness & Eccentricity Output (LC No. : 12)

Effective Length-ZZ of Column	=	1.175	m.
Effective Length-YY of Column	=	1.049	m.
Slenderness Ratio about ZZ-axis	=	4.559	
The Column is Short about the ZZ-axis			
Slenderness Ratio about YY-axis	=	1.958	
The Column is Short about the YY-axis			
As Per IS:456-2000, 25.4,			
Minimum Eccentricity	=	20	mm
Lo/500 + b/30	=	10.667	mm
Lo/500 + D/30	=	23	mm
Actual Minimum Eccentricity about ZZ	=	23	mm
Actual Minimum Eccentricity about YY	=	20	mm
As Per IS:456-2000, 38.3,			
0.05 times D (Limiting Value about ZZ)	=	30	mm
0.05 times b (Limiting Value about YY)	=	11.5	mm
Actual Eccentricity about ZZ due to Moment-ZZ	=	74.293	mm
Actual Eccentricity about YY due to Moment-YY	=	2.68	mm
Design Eccentricity about ZZ due to Moment-ZZ	=	74.293	mm
Design Eccentricity about YY due to Moment-YY	=	23	mm
As Per IS:456-2000, 39.3,			

Er.V. SHANKAR, Structural Technologist ME, MIEE, FIV, CCEA
Certified Regd. Structural Engineer GR-I (SE-I)
Reg No. SE/2022/4/0017
SS CONSULTANTS
No.11, Ground Floor, Pallikaranai Chennai-600 100.
Cell: 9282192188 / 9952218842
Email: shankarkaka1@yahoo.com

STABILITY CALCULATIONS FOR THE PROPOSED CONSTRUCTION OD STILT FLOOR +4 FLOORS +5 TH FLOOR (PART) RESIDENTIAL BUILDING WITH 24 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENIFITAT PLOT NO. 29,17 TH CROSS STREET,NCBS COLONY,NANGANALLUR,CHENNAI-600061 AND COMPRISED IN OLD S.NO.19/3 (PART)4 (PART),20/1 (PART),3 (PART) AS PER PATTA NEW TS NO.18/11&18/2,BLOCK NO. 31,WARD -B OF NANAGANALLUER VILLAGE,ALANDUR TALUK WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION

Design Eccentricity about ZZ is more than the
Hence, the Column has Axial Load & Bending

Revised Design Bending Moment about ZZ = 103.598 KN.m

Design Eccentricity about YY is more than the
Hence, the Column has Axial Load & Bending

Er.M. SHANKAR, M.Tech(Struct), ME, MSSE, MIACCE
Chartd. Regd. Structural Engineer GR-I (SE-I)
Reg No. SE/V/2124/00037
SB CONSULTANTS
No.11, Thiruvalluvar Street, Pallikaranai, Chennai-600 100.
Cell: 9282192588 / 9789088643
Email: shankar97@yahoo.com

STABILITY CALCULATIONS FOR THE PROPOSED CONSTRUCTION OD STILT FLOOR +4 FLOORS +5 TH FLOOR (PART) RESIDENTIAL BUILDING WITH 24 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENIFITAT PLOT NO. 29,17 TH CROSS STREET,NCBS COLONY,NANGANALLUR,CHENNAI-600061 AND COMPRISED IN OLD S.NO.19/3 (PART)4 (PART),20/1 (PART),3 (PART) AS PER PATTA NEW TS NO.18/11&18/2,BLOCK NO. 31,WARD -B OF NANAGANALLUER VILLAGE,ALANDUR TALUK WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION

Revised Design Bending Moment about YY	=	27.889	KN m

C1 : Flexural Design Output (LC No. : 12)

Axial Load on Column	=	1394.464	KN
Factored Axial Load	=	1394.464	KN
Revised Design Moment about ZZ axis	=	103.588	KN m
Revised Design Moment about YY axis	=	27.889	KN m

The Column is subjected to Axial Load & Bi-axial

Main Reinforcement is provided along all the

Characteristic Comp. Strength of Concrete	=	30	N/sq.mm
Yield Stress of Main Steel	=	500	N/sq.mm
Min. Percentage of Reinforcement Required	=	0.8	%
Max. Percentage of Reinforcement Allowed	=	6	%
Percentage of Reinforcement Required	=	0.441	%

As Per IS:456-2000,
the required percentage of Reinforcement is less the Minimum value to be provided. Therefore, Reinforcement will be provided

Depth of Neutral Axis about ZZ-axis	=	509.4	mm
Depth of Neutral Axis about YY-axis	=	505.8	mm
Ultimate Axial Load, Puz	=	2093.002	KN
Ratio of Pu/Puz	=	0.666	
Value of Coefficient, Alpha-n	=	1.782	
Ultimate Moment Capacity about ZZ-axis	=	135.482	KN m
Ultimate Moment Capacity about YY-axis	=	48.156	KN m
Ratio of Actual to Ultimate Moment, Muz/Muz1	=	0.765	
Ratio of Actual to Ultimate Moment, Muy/Muy1	=	0.579	
Sum of above Ratios, applied with Alpha-n	=	0.[illegible]	
Width of Column	=	230 mm	

Er.M. SHANKAR, M.Tech(Struct),ME, MISTE, FIE(IND)
CWDA Regd. Structural Engineer: GR-I (05-I)
Reg No: SE/I/2344/2017
SSS CONSULTANTS
No.11, Thenral Street, Pallavaram, Chennai-600 196
Cell: 9789103355 / 9962512643
Email: structshankar67@yahoo.com

STABILITY CALCULATIONS FOR THE PROPOSED CONSTRUCTION OD STILT FLOOR +4 FLOORS +5 TH FLOOR (PART) RESIDENTIAL BUILDING WITH 24 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENIFITAT PLOT NO. 29,17 TH CROSS STREET,NCBS COLONY,NANGANALLUR,CHENNAI-600061 AND COMPRISED IN OLD S.NO.19/3 (PART)4 (PART),20/1 (PART),3 (PART) AS PER PATTA NEW TS NO.18/11&18/2,BLOCK NO. 31,WARD -B OF NANAGANALLUER VILLAGE,ALANDUR TALUK WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION

Depth of Column	=	600	mm.
Gross Sectional Area	=	136000	sq.mm
Percentage of Reinforcement to be Provided	=	0.8	%
Area of Longitudinal Reinforcement Required	=	1104	sq.mm

Er.M. SHANKAR, M.Tech(Struct)ME, MIE(I), FIV(CC),
CMDA Regd. Structural Engineer GR-I (SE)-12
Reg No. SE/2007/443027
S-Z CONSULTANTS
No.11, Thamil Road, Pallikaranai, Chennai-600 100.
Cell: 9382102588 / 9952050643
Email: structshanka1972@yahoo.com

STABILITY CALCULATIONS FOR THE PROPOSED CONSTRUCTION OD STILT FLOOR +4 FLOORS +5 TH FLOOR (PART) RESIDENTIAL BUILDING WITH 24 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENIFITAT PLOT NO. 29,17 TH CROSS STREET,NCBS COLONY,NANGANALLUR,CHENNAI-600061 AND COMPRISED IN OLD S.NO.19/3 (PART)4 (PART),20/1 (PART),3 (PART) AS PER PATTA NEW TS NO.18/11&18/2,BLOCK NO. 31,WARD -B OF NANAGANALLUER VILLAGE,ALANDUR TALUK WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION

Main Rod Size-1	=	25	mm
No. of Rods Required	=	2.249	Nos
No. of Rods Provided	=	4	Nos
Corresponding Steel Area	=	1963.495	sq mm

Note : Please note that the minimum number of will be always FOUR for Rectangular Columns Columns as per IS:456-2000 Clause 26.5.3.1.(c)

C1 : Tie Pitch Output (LC No. : 12)

Tie Rod Size-1	=	8	mm
Tie Rod Size-2	=	10	mm
Main Rod Size-1	=	25	mm
As Per IS:456-2000,			
Least Lateral Dimension	=	230	mm
16 times dia. of Main Rod	=	400	mm
Maximum allowable value as per Code	=	300	mm
Minimum of the above values for 25# Rods	=	225	mm

Spacing of Rods are also controlled by Value, User-defined Minimum and Maximum

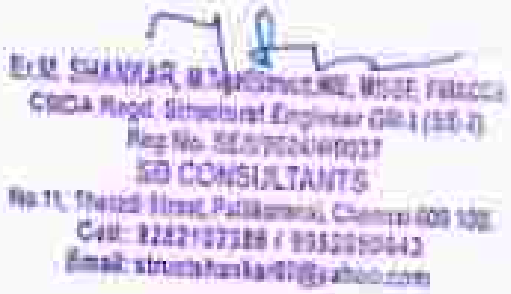
C1 : Global Input Data (LC No. : 13)

Column Section	=	Rectangular	
Width of Column	=	230	mm
Depth of Column	=	600	mm
The Effective Lengths about ZZ and YY axes based on actual framing conditions from the 3D			
Effective Length Coeff. about ZZ axis	=	0.783	
Effective Length Coeff. about YY axis	=	0.699	
Unsupported Length-ZZ of Column	=		
Unsupported Length-YY of Column	=		
Effective Length-ZZ of Column	=		
Effective Length-YY of Column	=		

E.M. SHANKAR, B.E.(Civil), M.I.E., M.I.S.E., F.I.V.
CIVIL Retd. Structural Engineer Gr.I (SE-I)
SB CONSULTANTS
No.11, Dhanalakshmi Pattabiraman, Chennai-600 108.
Cell : 9444172388 / 9952058643
Email : shankarsb@yahoo.com

STABILITY CALCULATIONS FOR THE PROPOSED CONSTRUCTION OD STILT FLOOR +4 FLOORS +5 TH FLOOR (PART) RESIDENTIAL BUILDING WITH 24 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENIFITAT PLOT NO. 29,17 TH CROSS STREET,NCBS COLONY,NANGANALLUR,CHENNAI-600061 AND COMPRISED IN OLD S.NO.19/3 (PART)4 (PART),20/1 (PART),3 (PART) AS PER PATTA NEW TS NO.18/11&18/2,BLOCK NO. 31,WARD -B OF NANAGANALLUER VILLAGE,ALANDUR TALUK WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION

Working Axial Load on Column	=	645.384	KN.
Working Moment about ZZ-axis at Top	=	93.963	KN m.
Working Moment about YY-axis at Top	=	-3	KN m.
Working Moment about ZZ-axis at Bottom	=	14.804	KN m.
Working Moment about YY-axis at Bottom	=	-5.081	KN m.



STABILITY CALCULATIONS FOR THE PROPOSED CONSTRUCTION OD STILT FLOOR +4 FLOORS +5 TH FLOOR (PART) RESIDENTIAL BUILDING WITH 24 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENIFITAT PLOT NO. 23,17 TH CROSS STREET,NCBS COLONY,NANGANALLUR,CHENNAI-600061 AND COMPRISED IN OLD S.NO.19/3 (PART)4 (PART),20/1 (PART),3 (PART) AS PER PATTA NEW TS NO.18/11&18/2,BLOCK NO. 31,WARD -B OF NANAGANALLUER VILLAGE,ALANDUR TALUK WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION

C1 : Slenderness & Eccentricity Output (LC No. : 13)			
Effective Length-ZZ of Column	=	1.175	m
Effective Length-YY of Column	=	1.048	m
Slenderness Ratio about ZZ-axis The Column is Short about the ZZ-axis.	=	4.559	
Slenderness Ratio about YY-axis The Column is Short about the YY-axis.	=	1.958	
As Per IS:456-2000, 25.4,			
Minimum Eccentricity	=	20	mm.
La/500 + b/30	=	10.667	mm.
La/500 + D/30	=	23	mm.
Actual Minimum Eccentricity about ZZ	=	23	mm.
Actual Minimum Eccentricity about YY	=	20	mm.
As Per IS:456-2000, 39.3,			
0.05 times D (Limiting Value about ZZ)	=	30	mm.
0.05 times b (Limiting Value about YY)	=	11.5	mm.
Actual Eccentricity about ZZ due to Moment-ZZ	=	145.592	mm.
Actual Eccentricity about YY due to Moment-YY	=	7.872	mm.
Design Eccentricity about ZZ due to Moment-ZZ	=	145.592	mm.
Design Eccentricity about YY due to Moment-YY	=	20	mm.
As Per IS:456-2000, 39.3, Design Eccentricity about ZZ is more than the Hence, the Column has Axial Load & Bending			
Revised Design Bending Moment about ZZ	=	93.963	KN.m.
Design Eccentricity about YY is more than the *Hence, the Column has Axial Load & Bending*			
Revised Design Bending Moment about YY	=	12.908	KN.m.

C1 : Flexural Design Output (LC No. : 13)			
Axial Load on Column	=	[illegible]	KN
Factored Axial Load	=	645.384	KN

Er.M. SHANKAR, M.TECH(STRUCTURAL ENGG.)
CHENNAI Structural Engineer OM-4156/17
Cell: [illegible]
ES CONSULTANTS
No.11, Thiruvalluvar Street, Pallavaram, Chennai-600 100.
Cell: 9381101588 / 9884051843
Email: [illegible]

STABILITY CALCULATIONS FOR THE PROPOSED CONSTRUCTION OD STILT FLOOR +4 FLOORS +5 TH FLOOR (PART) RESIDENTIAL BUILDING WITH 24 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENIFITAT PLOT NO. 29,17 TH CROSS STREET,NCBS COLONY,NANGANALLUR,CHENNAI-600061 AND COMPRISED IN OLD S.NO.19/3 (PART)4 (PART),20/1 (PART),3 (PART) AS PER PATTA NEW TS NO.18/11&18/2,BLOCK NO. 31,WARD -B OF NANAGANALLUER VILLAGE,ALANDUR TALUK WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION

Main Rod Size-1	=	25	mm
As Per IS:456-2000,			
Least Lateral Dimension	=	230	mm
16 times dia. of Main Rod	=	400	mm
Maximum allowable value as per Code	=	300	mm
Minimum of the above values for 25# Rods	=	225	mm
Spacing of Rods are also controlled by Value, User-defined Minimum and Maximum			

C1 : Global Input Data (LC No. : 14)

Column Section	=	Rectangular	
Width of Column	=	230	mm
Depth of Column	=	600	mm
The Effective Lengths about ZZ and YY axes based on actual framing conditions from the 3D			
Effective Length Coeff. about ZZ axis	=	0.765	
Effective Length Coeff. about YY axis	=	0.699	
Unsupported Length-ZZ of Column	=	1.5	m.
Unsupported Length-YY of Column	=	1.5	m.
Effective Length-ZZ of Column	=	1.175	m.
Effective Length-YY of Column	=	1.049	m.
Working Axial Load on Column	=	694.570	KN
Working Moment about ZZ-axis at Top	=	-2.36	KN m.
Working Moment about YY-axis at Top	=	40.532	KN m
Working Moment about ZZ-axis at Bottom	=	-6.861	KN m
Working Moment about YY-axis at Bottom	=	27.168	KN m

C1 : Slenderness & Eccentricity Output (LC No. : 14)

Effective Length-ZZ of Column	=	1.175	m.
Effective Length-YY of Column	=	1.049	m.
Slenderness Ratio about ZZ-axis	=	Er.M. S[illegible]	
The Column is Short about the ZZ-axis			

Er.M. S[illegible], M.E (Structural), MISTE, FIE(I), FAPACE
CMDA Regd. Structural Engineer GR-I (SE-I)
Reg No. SE/2020/00007
SB CONSULTANTS
No.11, Thanal Street, Pallikaranai, Chennai-600 100
Cell: 9[illegible] / 9[illegible]
Email: [illegible]@yahoo.com

STABILITY CALCULATIONS FOR THE PROPOSED CONSTRUCTION OD STILT FLOOR +4 FLOORS +5 TH FLOOR (PART) RESIDENTIAL BUILDING WITH 24 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENIFITAT PLOT NO. 29,17 TH CROSS STREET,NCBS COLONY,NANGANALLUR,CHENNAI-600061 AND COMPRISED IN OLD S.NO.19/3 (PART)4 (PART),20/1 (PART),3 (PART) AS PER PATTA NEW TS NO.18/11&18/2,BLOCK NO. 31,WARD -B OF NANAGANALLUER VILLAGE,ALANDUR TALUK WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION

Slenderness Ratio about YY-axis	=	1.958	
The Column is Short about the YY-axis.			
As Per IS:456-2000, 25.4,			
Minimum Eccentricity	=	20	mm
Lo/500 + b/30	=	10.867	mm

Er.M. SHANKAR, M.Tech(Struct),MIE, MISE, FMACCE
GMDA Regd. Structural Engineer GR-I (SE-I)
Reg No. SE/2/2024/0037
SB CONSULTANTS
No.11, Dhiraj Street, Pallikaranai, Chennai-600 100.
Cell: 9282142238 / 9952332643
Email: shankarbalaji1@rediffmail.com

STABILITY CALCULATIONS FOR THE PROPOSED CONSTRUCTION OD STILT FLOOR +4 FLOORS +5 TH FLOOR (PART) RESIDENTIAL BUILDING WITH 24 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENIFITAT PLOT NO. 29,17 TH CROSS STREET,NCBS COLONY,NANGANALLUR,CHENNAI-600061 AND COMPRISED IN OLD S.NO.19/3 (PART)4 (PART),20/1 (PART),3 (PART) AS PER PATTA NEW TS NO.18/11&18/2,BLOCK NO. 31,WARD -B OF NANAGANALLUER VILLAGE,ALANDUR TALUK WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION

Lo/500 + D/30	=	23	mm
Actual Minimum Eccentricity about ZZ	=	23	mm
Actual Minimum Eccentricity about YY	=	20	mm
As Per IS:456-2000, 39.3,			
0.05 times D (Limiting Value about ZZ)	=	30	mm
0.05 times b (Limiting Value about YY)	=	11.5	mm
Actual Eccentricity about ZZ due to Moment-ZZ	=	8.678	mm
Actual Eccentricity about YY due to Moment-YY	=	58.355	mm
Design Eccentricity about ZZ due to Moment-ZZ	=	23	mm
Design Eccentricity about YY due to Moment-YY	=	58.355	mm
As Per IS:456-2000, 39.5,			
Design Eccentricity about ZZ is not more than the			
Hence, the Column carries only Axial Load about			
Design Eccentricity about YY is more than the			
Hence, the Column has Axial Load & Bending			
Revised Design Bending Moment about YY	=	40.532	KN.m

C1 : Flexural Design Output (LC No. : 14)

Axial Load on Column	=	694.576	KN
Factored Axial Load	=	694.576	KN
Revised Design Moment about YY axis	=	40.532	KN.m
The Column is subjected to Axial Load & Uni-axial			
Main Reinforcement is provided along all the			
Characteristic Comp. Strength of Concrete	=	30	N/sq.mm
Yield Stress of Main Steel	=	500	N/sq.mm
Min. Percentage of Reinforcement Required	=	0.8	%
Max. Percentage of Reinforcement Allowed	=	6	%
Depth of Neutral Axis	=	0	mm
Width of Column	=		
Depth of Column	=		

Ex-SE, Structural Engineer GR-I (SE-I)
Regn No. SE/STR/2014/0037
SS CONSULTANTS
No.11, Thiruvalluvar Street, Pallikaranai, Chennai-600 100.
Cell: 9282102586 / 9884550843
Email: structshankar@yahoo.com

STABILITY CALCULATIONS FOR THE PROPOSED CONSTRUCTION OD STILT FLOOR +4 FLOORS +5 TH FLOOR (PART) RESIDENTIAL BUILDING WITH 24 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENIFITAT PLOT NO. 29,17 TH CROSS STREET,NCBS COLONY,NANGANALLUR,CHENNAI-600061 AND COMPRISED IN OLD S.NO.19/3 (PART)4 (PART),20/1 (PART),3 (PART) AS PER PATTA NEW TS NO.18/11&18/2,BLOCK NO. 31,WARD -B OF NANAGANALLUER VILLAGE,ALANDUR TALUK WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION

Main Rod Size-1	=	25	mm.
No. of Rods Required	=	2.249	Nos.
No. of Rods Provided	=	4	Nos.
Corresponding Steel Area	=	1963.495	sq.mm

Note :- Please note that the minimum number of will be always FOUR for Rectangular Columns Columns, as per IS:456-2000 Clause 26.5.3.1 (c)

C1 : Tie Pitch Output (LC No. : 14)

Tie Rod Size-1	=	8	mm
Tie Rod Size-2	=	10	mm.
Main Rod Size-1	=	25	mm.
As Per IS:456-2000,			
Least Lateral Dimension	=	230	mm.
16 times dia. of Main Rod	=	400	mm.
Maximum allowable value as per Code	=	300	mm.
Minimum of the above values for 25# Rods	=	225	mm.

Spacing of Rods are also controlled by Value, User-defined Minimum and Maximum

C1 : Global Input Data (LC No. : 15)

Column Section	=	Rectangular	
Width of Column	=	230	mm.
Depth of Column	=	600	mm.
The Effective Lengths about ZZ and YY axes based on actual framing conditions from the 3D			
Effective Length Coeff. about ZZ axis	=	0.783	
Effective Length Coeff. about YY axis	=	0.699	
Unsupported Length-ZZ of Column	=	1.5	m.
Unsupported Length-YY of Column	=	1.5	m.
Effective Length-ZZ of Column	=	1.175	m.
Effective Length-YY of Column	=	1.048	m.

E.M. SHANKAR, M.Tech (Structural Engg.), MIStructE
LicNo. Regd. Structural Engineer: CR-1 (SE-I)
Reg No: SE/I/2004/00037
SB CONSULTANTS
No.11, Thiruvalluvar Street, Pallikaranai, Chennai-600 100.
Cell: 9283102584 / 9952555643
Email: shankarbe@yahoo.com

STABILITY CALCULATIONS FOR THE PROPOSED CONSTRUCTION OD STILT FLOOR +4 FLOORS +5 TH FLOOR (PART) RESIDENTIAL BUILDING WITH 24 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENIFITAT PLOT NO. 29,17 TH CROSS STREET,NCBS COLONY,NANGANALLUR,CHENNAI-600061 AND COMPRISED IN OLD S.NO.19/3 (PART)4 (PART),20/1 (PART),3 (PART) AS PER PATTA NEW TS NO.18/11&18/2,BLOCK NO. 31,WARD -B OF NANAGANALLIJER VILLAGE,ALANDUR TALUK WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION

Working Axial Load on Column	=	1138.185	KN
Working Moment about ZZ-axis at Top	=	-8.653	KN m
Working Moment about YY-axis at Top	=	-43.626	KN m
Working Moment about ZZ-axis at Bottom	=	-5.463	KN m
Working Moment about YY-axis at Bottom	=	-33.395	KN m

C1 : Slenderness & Eccentricity Output (LC No. : 18)

Er.M. SHANKAR, M.Tech(Struct),ME, MISTE, FMICCE
GWDA Regd. Structural Engineer GR-I (SE-I)
Reg.No. SE/2003/4/0037
SB CONSULTANTS
No.11, Thiruvil Street, Pallikaranai, Chennai-600 100.
Cell: 9282192588 / 9884268643
Email: shankarsb67@yahoo.com

STABILITY CALCULATIONS FOR THE PROPOSED CONSTRUCTION OD STILT FLOOR +4 FLOORS +5 TH FLOOR (PART) RESIDENTIAL BUILDING WITH 24 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENIFITAT PLOT NO. 29,17 TH CROSS STREET,NCBS COLONY,NANGANALLUR,CHENNAI-600061 AND COMPRISED IN OLD S.NO.19/3 (PART)4 (PART),20/1 (PART),3 (PART) AS PER PATTA NEW TS NO.18/11&18/2,BLOCK NO. 31,WARD -B OF NANAGANALLUER VILLAGE,ALANDUR TALUK WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION

Effective Length-ZZ of Column	=	3.175	m.
Effective Length-YY of Column	=	1.049	m.
Slenderness Ratio about ZZ-axis	=	4.559	
The Column is Short about the ZZ-axis			
Slenderness Ratio about YY-axis	=	1.958	
The Column is Short about the YY-axis			
As Per IS:456-2000, 25.4,			
Minimum Eccentricity	=	20	mm
Lo/500 + b/30	=	10.667	mm
Lo/500 + D/30	=	23	mm
Actual Minimum Eccentricity about ZZ	=	23	mm
Actual Minimum Eccentricity about YY	=	20	mm
As Per IS:456-2000, 39.3,			
0.05 times D (Limiting Value about ZZ)	=	30	mm
0.05 times b (Limiting Value about YY)	=	11.5	mm
Actual Eccentricity about ZZ due to Moment-ZZ	=	7.003	mm
Actual Eccentricity about YY due to Moment-YY	=	38.33	mm
Design Eccentricity about ZZ due to Moment-ZZ	=	23	mm
Design Eccentricity about YY due to Moment-YY	=	38.33	mm
As Per IS:456-2000, 39.3,			
Design Eccentricity about ZZ is not more than the			
Hence, the Column carries only Axial Load about			
Design Eccentricity about YY is more than the			
Hence, the Column has Axial Load & Bending			
Revised Design Bending Moment about YY	=	43.628	KN m

C1 : Flexural Design Output (LC No. : 15)

Axial Load on Column	=	1138.185	KN
Factored Axial Load	=	1138.185	KN
Revised Design Moment about YY axis	=	43.628	KN m
The Column is subjected to Axial Load &			

Er.P. SHANKAR, M.Sc(Struct), ME, MISTE, FNAE(I)
CMDA Regd. Structural Engineer CR-1 (SE-I)
Reg No. STR/2016/0037
SB CONSULTANTS
No.11, Thiruvil Nagar, Pallikaranai, Chennai-600 100.
Cell: 9282102263 / 9884094443
Email: sbmstructures97@yahoo.com

STABILITY CALCULATIONS FOR THE PROPOSED CONSTRUCTION OD STILT FLOOR +4 FLOORS +5 TH FLOOR (PART) RESIDENTIAL BUILDING WITH 24 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENIFITAT PLOT NO. 29,17 TH CROSS STREET,NCBS COLONY,NANGANALLUR,CHENNAI-600061 AND COMPRISED IN OLD S.NO.19/3 (PART)4 (PART),20/1 (PART),3 (PART) AS PER PATTA NEW TS NO.18/11&18/2,BLOCK NO. 31,WARD -B OF NANAGANALLUER VILLAGE,ALANDUR TALUK WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION

Main Reinforcement is provided along all the

Characteristic Comp. Strength of Concrete	=	20	N/sq.mm
Yield Stress of Main Steel	=	500	N/sq.mm
Min. Percentage of Reinforcement Required	=	0.8	%

Er.M. SHANKAR, M.Tech(Struct.),MIE, MISE, FIMACCE
CMDA Regd. Structural Engineer GR-4 (SE-I)
Reg No. SE/2015/0437
SB CONSULTANTS
No.11, Thenali Street, Pallikaranai, Chennai-600 100.
Cell: 9382182388 / 9962259442
Email: shivashankar47@yahoo.com

STABILITY CALCULATIONS FOR THE PROPOSED CONSTRUCTION OD STILT FLOOR +4 FLOORS +5 TH FLOOR (PART) RESIDENTIAL BUILDING WITH 24 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENIFITAT PLOT NO. 29,17 TH CROSS STREET,NCBS COLONY,NANGANALLUR,CHENNAI-600061 AND COMPRISED IN OLD S.NO.19/3 (PART)4 (PART),20/1 (PART),3 (PART) AS PER PATTA NEW TS NO.18/11&18/2,BLOCK NO. 31,WARD -B OF NANAGANALLUER VILLAGE,ALANDUR TALUK WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION

Max. Percentage of Reinforcement Allowed	=	6	%
Depth of Neutral Axis	=	6	mm
Width of Column	=	230	mm
Depth of Column	=	600	mm
Gross Sectional Area	=	138000	sq.mm.
Percentage of Reinforcement to be Provided	=	0.8	%
Area of Longitudinal Reinforcement Required	=	1104	sq.mm.
Main Rod Size-1	=	25	mm
No. of Rods Required	=	2.249	Nos.
No. of Rods Provided	=	4	Nos.
Corresponding Steel Area	=	1963.495	sq.mm.

Note :- Please note that the minimum number of will be always FOUR for Rectangular Columns Columns. as per IS:456-2000 Clause 26.5.3.1 (c)

C1 : Tie Pitch Output (LC No. : 15)

Tie Rod Size-1	=	8	mm
Tie Rod Size-2	=	10	mm
Main Rod Size-1	=	25	mm
As Per IS:456-2000,			
Least Lateral Dimension	=	230	mm
16 times dia. of Main Rod	=	400	mm
Maximum allowable value as per Code	=	300	mm
Minimum of the above values for 25# Rods	=	225	mm

Spacing of Rods are also controlled by Value, User-defined Minimum and Maximum

C1 : Global Input Data (LC No. : 16)

Column Section	=	Rectangular	
Width of Column	=	230	mm
Depth of Column	=	600	mm

Er.M. SRIDHAR, B.E (Hons), M.E. (Struct. Engg.), MISTE, MIEEE, FIMACS
CMDA Regd. Structural Engineer GR-I (SR-I)
Reg No: RE/2003/00027
SB CONSULTANTS
No.13, Venkata Street, Parthasarathy Nagar, Chennai-600 106.
Cell: 9962182538 / 9962269043
Email: sbvsridharan@yahoo.com

STABILITY CALCULATIONS FOR THE PROPOSED CONSTRUCTION OD STILT FLOOR +4 FLOORS +5 TH FLOOR (PART) RESIDENTIAL BUILDING WITH 24 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENIFITAT PLOT NO. 29,17 TH CROSS STREET,NCBS COLONY,NANGANALLUR,CHENNAI-600061 AND COMPRISED IN OLD S.NO.19/3 (PART)4 (PART),20/1 (PART),3 (PART) AS PER PATTA NEW TS NO.18/11&18/2,BLOCK NO. 31,WARD -B OF NANAGANALLUER VILLAGE,ALANDUR TALUK WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION

The Effective Lengths about ZZ and YY axes
based on actual framing conditions from the 3D

Effective Length Coeff. about ZZ axis	=	0.783
Effective Length Coeff. about YY axis	=	0.699

Dr.R. SHANKAR, M.Tech.,Ph.D.,MIE, MISSE, FMACCE
CANDA Regd. Structural Engineer GR-I (SE-I)
Reg No. EE/97/2004/40027
SB CONSULTANTS
No.11, Thiruvalluvar Street, Pallikaranai, Chennai-600 100.
Cell: 9382710336 / 9382310943
Email: structshankar97@yahoo.com

STABILITY CALCULATIONS FOR THE PROPOSED CONSTRUCTION OD STILT FLOOR +4 FLOORS +5 TH FLOOR (PART) RESIDENTIAL BUILDING WITH 24 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENIFITAT PLOT NO. 29,17 TH CROSS STREET,NCBS COLONY,NANGANALLUR,CHENNAI-600061 AND COMPRISED IN OLD S.NO.19/3 (PART)4 (PART),20/1 (PART),3 (PART) AS PER PATTA NEW TS NO.18/11&18/2,BLOCK NO. 31,WARD -B OF NANAGANALLUER VILLAGE,ALANDUR TALUK WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION

C1 : Tie Pitch Output (LC No. : 17)			
Tie Rod Size-1	=	8	mm
Tie Rod Size-2	=	10	mm
Main Rod Size-1	=	25	mm

Er.M. SHANKAR, B.Tech(Civil), ME, MISE, FIMACCE
CMDA Regd. Structural Engineer OR-2 (SE-I)
Reg No. SE/2234/09/07
SB CONSULTANTS
No.11, Thiruvil Street, Pallikaranai, Chennai-600 100.
Cell: 9282192589 / 8939010843
Email: shankarsb77@yahoo.com

STABILITY CALCULATIONS FOR THE PROPOSED CONSTRUCTION OD STILT FLOOR +4 FLOORS +5 TH FLOOR (PART) RESIDENTIAL BUILDING WITH 24 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENIFITAT PLOT NO. 29,17 TH CROSS STREET,NCBS COLONY,NANGANALLUR,CHENNAI-600061 AND COMPRISED IN OLD S.NO.19/3 (PART)4 (PART),20/1 (PART),3 (PART) AS PER PATTA NEW TS NO.18/11&18/2,BLOCK NO. 31,WARD -B OF NANAGANALLUER VILLAGE,ALANDUR TALUK WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION

As Per IS:456-2000,			
Least Lateral Dimension	=	230	mm.
16 times dia. of Main Rod	=	400	mm.
Maximum allowable value as per Code	=	300	mm.
Minimum of the above values for 25# Rods	=	225	mm.

Spacing of Rods are also controlled by Value, User-defined Minimum and Maximum

Er.M. SHANKAR, M.Tech(Struct),ME, MIStE, FIAACCE
CMDA Regd. Structural Engineer Gr I (SE-I)
Reg No. SE/2002/0037
SE CONSULTANTS
No:11, Thiruvalluvar Street, Pallikaranai, Chennai-600 100.
Cell: 9382103389 / 9382303643
Email: shankarsk97@yahoo.com

STABILITY CALCULATIONS FOR THE PROPOSED CONSTRUCTION OD STILT FLOOR +4 FLOORS +5 TH FLOOR (PART) RESIDENTIAL BUILDING WITH 24 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENIFITAT PLOT NO. 29,17 TH CROSS STREET,NCBS COLONY,NANGANALLUR,CHENNAI-600061 AND COMPRISED IN OLD S.NO.19/3 (PART)4 (PART),20/1 (PART),3 (PART) AS PER PATTA NEW TS NO.18/11&18/2,BLOCK NO. 31,WARD -B OF NANAGANALLUER VILLAGE,ALANDUR TALUK WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION

Er.M. SHANKAR, M.Tech(Struct),ME, MISE, FIMACE
CMDA Regd. Structural Engineer (LR-I (SE,I))
Reg. No. SE/2024/40037
SB CONSULTANTS
No.11, Thandi Street, Pallikaranai, Chennai-600 100
Cell: 9382182588 / 9512230843
Email: shankarsbcivil@yahoo.com

STABILITY CALCULATIONS FOR THE PROPOSED CONSTRUCTION OD STILT FLOOR +4 FLOORS +5 TH FLOOR (PART) RESIDENTIAL BUILDING WITH 24 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENIFITAT PLOT NO. 29,17 TH CROSS STREET,NCBS COLONY,NANGANALLUR,CHENNAI-600061 AND COMPRISED IN OLD S.NO.19/3 (PART)4 (PART),20/1 (PART),3 (PART) AS PER PATTA NEW TS NO.18/11&18/2,BLOCK NO. 31,WARD -B OF NANAGANALLUER VILLAGE,ALANDUR TALUK WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION.

SCADDS/RC-Beam Desioner 2022 [Release: 4.01.3010]

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SCADDS/Nucleus 2022: RC-Beam Designer
Limit State Design of Singly/Doubly Reinforced
Rectangular/Tee/El Beam Sections
subjected to Moment/Torsion/Shear
as per IS:456-2000 upto Amendment 5 (Reaffirmed 2021)

Introduction:-

This Report contains the detailed solution for the Reinforced Concrete Beam Design problem.

The given Beam Section is considered for design and the output contains the following

1. Global Input Data
2. Development Length Output
3. Flexural Design Output
4. Shear Design Output
5. Side Face Steel Output
6. Deflection Check Output
7. Slender Beam Check Output
8. Deep Beam Check Output

While detailed design will be carried out for and Side Face Steel, only checks are made for

Er.M. SHANKAR, M.Tech(Struct.), MIE, MISE, FIV(CS)
CIAD4 Regd. Structural Engineer (GN-4 (SE-II)
Regd No. [illegible]
[illegible] CONSULTANTS
[illegible]

STABILITY CALCULATIONS FOR THE PROPOSED CONSTRUCTION OD STILT FLOOR +4 FLOORS +5 TH FLOOR (PART) RESIDENTIAL BUILDING WITH 24 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENIFITAT PLOT NO. 29,17 TH CROSS STREET,NCBS COLONY,NANGANALLUR,CHENNAI-600061 AND COMPRISED IN OLD S.NO.19/3 (PART)4 (PART),20/1 (PART),3 (PART) AS PER PATTA NEW TS NO.18/11&18/2,BLOCK NO. 31,WARD -B OF NANAGANALLUER VILLAGE,ALANDUR TALUK WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION.

Global Material Data			
Concrete Clear Cover	=	25	mm.
Char. Comp. Strength of Concrete	=	25	N/sq.mm
Yield Strength of Main Steel	=	500	N/sq.mm
Main Rod Size-1	=	12	mm.
Main Rod Size-2	=	16	mm
Yield Strength of Tie Steel	=	500	N/sq.mm
Stirrup Rod Size-1	=	8	mm
Stirrup Rod Size-2	=	10	mm.
Factor of Safety for Load	=	1	
Partial Safety Factor for Concrete	=	1.5	
Partial Safety Factor for Steel	=	1.15	
Max. Strain in Concrete	=	0.0035	mm./mm.
Max. Strain in Steel	=	0.0055	mm./mm.
Young's Modulus of Concrete	=	25000	N/sq.mm
Young's Modulus of Steel	=	200000	N/sq.mm

Er.M. SHANKAR, M.Tech (Struct.),MIE, MIStE, FMACCE
CIMDA Regd. Structural Engineer GR-I (SE-I)
Reg.No. SE/S/2944/2007
SB CONSULTANTS
No.11, Thanal Street, Pallikaranai, Chennai-600 100.
Cell: 9382103586 / 9962960643
Email: shankarkan17@yahoo.com

STABILITY CALCULATIONS FOR THE PROPOSED CONSTRUCTION OD STILT FLOOR +4 FLOORS +5 TH FLOOR (PART) RESIDENTIAL BUILDING WITH 24 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENIFITAT PLOT NO. 29,17 TH CROSS STREET,NCBS COLONY,NANGANALLUR,CHENNAI-600061 AND COMPRISED IN OLD S.NO.19/3 (PART)4 (PART),20/1 (PART),3 (PART) AS PER PATTA NEW TS NO.18/11&18/2,BLOCK NO. 31,WARD -B OF NANAGANALLUER VILLAGE,ALANDUR TALUK WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION.

Bond / Development Length Output:			
Char. Comp. Strength of Concrete	=	25	N/sq.mm
Yield Stress of Main Steel	=	500	N/sq.mm
As Per IS:456-2000, Clause			
Design Bond Stress for Main Rods	=	2.24	N/sq.mm
Rods in Tension:-			
Main Rod Diameter-1	=	12	mm
Corresponding Development Length	=	582.589	mm
Main Rod Diameter-2	=	16	mm
Corresponding Development Length	=	776.786	mm
Rods in Compression:-			
Main Rod Diameter-1	=	12	mm
Corresponding Development Length	=	466.071	mm
Main Rod Diameter-2	=	16	mm
Corresponding Development Length	=	621.429	mm

Er.M. SHANKAR, B.Tech(Civil),ME,MIStE,FIA&SEE
CAT-A Regd. Structural Engineer GR-I (SE-I)
Reg.No. SE/2020/A0937
SB CONSULTANTS
No.11, Bharati Street, Pallikaranai, Chennai-600 100
Cell: 9382142588 / 9962020943
Email: shanthanka-87@yahoo.com

STABILITY CALCULATIONS FOR THE PROPOSED CONSTRUCTION OD STILT FLOOR +4 FLOORS +5 TH FLOOR (PART) RESIDENTIAL BUILDING WITH 24 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENIFITAT PLOT NO. 29,17 TH CROSS STREET,NCBS COLONY,NANGANALLUR,CHENNAI-600061 AND COMPRISED IN OLD S.NO.19/3 (PART)4 (PART),20/1 (PART),3 (PART) AS PER PATTA NEW TS NO.18/11&18/2,BLOCK NO. 31,WARD -B OF NANAGANALLUER VILLAGE,ALANDUR TALUK WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION.

Main Rod Size-1	=	12	mm.
No. of Rods Required	=	5.198	Nos.
No. of Rods Provided	=	5	Nos.
Corresponding Steel Area	=	565.487	sq.mm
Main Rod Size-2	=	16	mm.
No. of Rods Required	=	2.918	Nos.
No. of Rods Provided	=	3	Nos.
Corresponding Steel Area	=	603.186	sq.mm

Compression Steel is NOT required. However, 2 are provided, irrespective of the size, for holding

Main Rod Size-1	=	12	mm.
No. of Rods Provided	=	2	Nos.
Corresponding Steel Area	=	226.195	sq.mm

Compression Steel is NOT required. However, 2 are provided, irrespective of the size, for holding

Main Rod Size-2	=	16	mm.
No. of Rods Provided	=	2	Nos.
Corresponding Steel Area	=	402.124	sq.mm.

Note :- Please note that the minimum number of should be always TWO, even if the number of ONE or less. This is to be done during detailing

B91 : End-1 Min - Shear Output

Shear Force	=	76.757	KN.
Factored Shear	=	76.757	KN.
As Per IS:456-2000, Clause			
Actual Shear Stress	=	0.63	N/sq.mm.
As Per IS:456-2000, Table 19,			
Design Shear Strength of Concrete	=	0.474	N/sq.mm
As Per IS:456-2000, Table 20,			
Max. Permissible Shear Stress	=		

Stirrups have to be Designed for Shear.

Ex.M. [illegible]
CMDA Regd. Structural Engineer GR-I (SE.I)
Reg No. [illegible]
BS CONSULTANTS
No:11, Thenoli Street, Pallikaranai, Chennai-600 100
Cell: 9283103586 / 9952050543
Email: [illegible]

STABILITY CALCULATIONS FOR THE PROPOSED CONSTRUCTION OD STILT FLOOR +4 FLOORS +5 TH FLOOR (PART) RESIDENTIAL BUILDING WITH 24 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENIFITAT PLOT NO. 29,17 TH CROSS STREET,NCBS COLONY,NANGANALLUR,CHENNAI-600061 AND COMPRISED IN OLD S.NO.19/3 (PART)4 (PART),20/1 (PART),3 (PART) AS PER PATTA NEW TS NO.18/11&18/2,BLOCK NO. 31,WARD -B OF NANAGANALLUER VILLAGE,ALANDUR TALUK WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION.

B81 : Global Input Data			
Effective Span	=	4.12	m
Section Type	=	Rectangular	
Width of Web	=	230	mm
Overall Depth	=	600	mm
Effective Cover at Top	=	70	mm
Effective Cover at Bottom	=	70	mm
Number of Stirrup Legs	=	2	Nos.
Max. Bending Moment at End-1	=	146.046	KN m
Min. Bending Moment at End-1	=	-122.186	KN m
Max. Bending Moment at End-2	=	136.853	KN m
Min. Bending Moment at End-2	=	-127.12	KN m
Max. Bending Moment at Middle	=	71.54	KN m
Min. Bending Moment at Middle	=	-66.959	KN m
Max. Shear Force at Left	=	76.757	KN
Max. Shear Force at Right	=	73.326	KN
Max. Torsional Moment	=	0	KN m
Torsion, as per Analysis Results, is partially			
Ignore Torsion Limit	=	10	%
If Torsion is less than the above % of the Max. it will be ignored. Otherwise, the Beam is			

B81 : End-1 Max - Flexure Output			
Bending Moment	=	146.046	KN m
Factored Moment	=	146.046	KN m
Overall Depth of Section	=	600	mm
Bottom Effective Cover	=	70	mm
Effective Depth	=		

E.M. SHANKAR, M.Tech(Struct), ME, MIE(I), FIV(C)(I)
Chartered Structural Engineer CAT-I (SE-1)
Reg No. SE/2/2019/00317
SAB CONSULTANTS
No.11, Thiruvalluvar Street, Pallikaranai, Chennai-600 100
Cell: 9282102588 / 9551028843
Email: shankarkumar67@yahoo.com

STABILITY CALCULATIONS FOR THE PROPOSED CONSTRUCTION OD STILT FLOOR +4 FLOORS +5 TH FLOOR (PART) RESIDENTIAL BUILDING WITH 24 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENIFITAT PLOT NO. 29,17 TH CROSS STREET,NCBS COLONY,NANGANALLUR,CHENNAI-600061 AND COMPRISED IN OLD S.NO.19/3 (PART)4 (PART),20/1 (PART),3 (PART) AS PER PATTA NEW TS NO.18/11&18/2,BLOCK NO. 31,WARD -B OF NANAGANALLUER VILLAGE,ALANDUR TALUK WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION.

Maximum N.A. Ratio	=	0.456	
Total Limiting Moment	=	214.882	KN.m

Er.M. SHANKAR, M.Tech(Struct),ME, MIIBE, FIMACE
CMDA Regd. Structural Engineer GR-I (SE-I)
Reg No. SE/I/2004/00037
SB CONSULTANTS
No.11, Thiruvalluvar Street, Pallikaranai, Chennai-600 100.
Cell: 9841162385 / 9962450943
Email: shankarbe67@yahoo.com

STABILITY CALCULATIONS FOR THE PROPOSED CONSTRUCTION OD STILT FLOOR +4 FLOORS +5 TH FLOOR (PART) RESIDENTIAL BUILDING WITH 24 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENIFITAT PLOT NO. 29,17 TH CROSS STREET,NCBS COLONY,NANGANALLUR,CHENNAI-600061 AND COMPRISED IN OLD S.NO.19/3 (PART)4 (PART),20/1 (PART),3 (PART) AS PER PATTA NEW TS NO.18/11&18/2,BLOCK NO. 31,WARD -B OF NANAGANALLUER VILLAGE,ALANDUR TALUK WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION.

Total Design Moment	=	146.046	KN.m.
Depth of Neutral Axis	=	151.012	mm.
Tensile Reinforcement Required	=	0.59	%
Compression Reinforcement is NOT Necessary.			
As Per IS:456-2000, Clause Min. Tensile Reinforcement Percentage	=	0.17	%
As Per IS:456-2000, Clause Max. Reinforcement Percentage	=	4	%
Area of Tensile Reinforcement	=	718.609	sq.mm.
Main Rod Size-1	=	12	mm.
No. of Rods Required	=	6.354	Nos.
No. of Rods Provided	=	7	Nos.
Corresponding Steel Area	=	791.681	sq.mm.
Main Rod Size-2	=	16	mm.
No. of Rods Required	=	3.574	Nos.
No. of Rods Provided	=	4	Nos.
Corresponding Steel Area	=	804.248	sq.mm.
Compression Steel is NOT required. However, 2 are provided, irrespective of the size, for holding			
Main Rod Size-1	=	12	mm.
No. of Rods Provided	=	2	Nos.
Corresponding Steel Area	=	226.195	sq.mm.
Compression Steel is NOT required. However, 2 are provided, irrespective of the size, for holding			
Main Rod Size-2	=	16	mm.
No. of Rods Provided	=	2	Nos.
Corresponding Steel Area	=	402.124	sq.mm.

Note :- Please note that the minimum number of should be always TWO, even if the number of ONE or less. This is to be done during detailing.

E.M. SHANKAR, B.Tech(Civil), MIE, MISE, FIMACE
CMDA Regd. Structural Engineer GR-I (SE-II)
Regn No. [illegible]
SB CONSULTANTS
No.11, Third Cross, Pallikaranai, Chennai-600 100.
Cell: [illegible]
E-mail: [illegible]

B81 : End-1 Max - Shear Output

STABILITY CALCULATIONS FOR THE PROPOSED CONSTRUCTION OD STILT FLOOR +4 FLOORS +5 TH FLOOR (PART) RESIDENTIAL BUILDING WITH 24 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENIFITAT PLOT NO. 29,17 TH CROSS STREET,NCBS COLONY,NANGANALLUR,CHENNAI-600061 AND COMPRISED IN OLD S.NO.19/3 (PART)4 (PART),20/1 (PART),3 (PART) AS PER PATTA NEW TS NO.16/11&16/2,BLOCK NO. 31,WARD -B OF NANAGANALLUER VILLAGE,ALANDUR TALUK WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION.

Shear Force	=	78.757	KN
Factored Shear	=	78.757	KN
As Per IS:456-2000, Clause			
Actual Shear Stress	=	0.83	N/sq.mm

Er.M. SHANKAR, M.Tech(Struct), MIE, MISE, FNAGC,
CMDA Regd. Structural Engineer GR-I (SE/I)
Reg No. SE/2006/0027
SB CONSULTANTS
No.11, Thiruvalluvar Street, Pallikaranai, Chennai-600 100.
Cell: 9382102103 / 9962259643
Email: shrichshankar@yahoo.com

STABILITY CALCULATIONS FOR THE PROPOSED CONSTRUCTION OD STILT FLOOR +4 FLOORS +5 TH FLOOR (PART) RESIDENTIAL BUILDING WITH 24 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENIFITAT PLOT NO. 29,17 TH CROSS STREET,NCBS COLONY,NANGANALLUR,CHENNAI-600061 AND COMPRISED IN OLD S.NO.19/3 (PART)4 (PART),20/1 (PART),3 (PART) AS PER PATTA NEW TS NO.18/11&18/2,BLOCK NO. 31,WARD -B OF NANAGANALLUER VILLAGE,ALANDUR TALUK WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION.

As Per IS:456-2000, Table 19, Design Shear Strength of Concrete	=	0.543	N/sq.mm
As Per IS:456-2000, Table 20, Max. Permissible Shear Stress	=	3.124	N/sq.mm
Stirrups have to be Designed for Shear			
Shear for which Stirrups are Provided	=	10.544	KN
Stirrup Steel Yield Strength	=	500	N/sq.mm
No. of Stirrup Legs	=	2	Nos.
Stirrup Rod Diameter-1	=	8	mm
Spacing of Stirrups Required	=	300	mm
Stirrup Rod Diameter-2	=	10	mm
Spacing of Stirrups Required	=	300	mm

As per IS 456-2000 Clause 26.5.1.5, if the stirrup exceeds 0.75d or 300 mm, whichever is less, the value will be provided as the Spacing of Stirrups

B81 : End-1 Min - Flexure Output

Bending Moment	=	122.186	KN.m
Factored Moment	=	122.186	KN.m
Overall Depth of Section	=	600	mm
Bottom Effective Cover	=	70	mm
Effective Depth	=	530	mm
Maximum N.A. Ratio	=	0.458	
Total Limiting Moment	=	214.682	KN.m
Total Design Moment	=	122.186	KN.m
Depth of Neutral Axis	=	123.298	mm
Tensile Reinforcement Required	=	0.481	%

Compression Reinforcement is NOT Necessary

Er.N. SHANKAR, M.Tech(Struct.Engg), MISTE, FIM(IOI)
CAIIA Regd. Structural Engineer-GR.I (SE-II)
Reg.No. SE/I/2284/2007
SS CONSULTANTS
No.11, Thiruvil Street, Pallikaranai, Chennai-600 100
Cell: 9283182585 / 9952935443
Email: shivalshankar@yahoo.com

STABILITY CALCULATIONS FOR THE PROPOSED CONSTRUCTION OD STILT FLOOR +4 FLOORS +5 TH FLOOR (PART) RESIDENTIAL BUILDING WITH 24 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENIFITAT PLOT NO. 29,17 TH CROSS STREET,NCBS COLONY,NANGANALLUR,CHENNAI-600061 AND COMPRISED IN OLD S.NO.19/3 (PART)4 (PART),20/1 (PART),3 (PART) AS PER PATTA NEW TS NO.18/11&18/2,BLOCK NO. 31,WARD -B OF NANAGANALLUER VILLAGE,ALANDUR TALUK WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION.

As Per IS:456-2000, Clause Min. Tensile Reinforcement Percentage	=	0.17	%
As Per IS:456-2000, Clause Max. Reinforcement Percentage	=	4	%
Area of Tensile Reinforcement	=	586.726	sq.mm.

Er.M. SHANKAR, M.Tech(Struct), ME, MICE, FIMACCE
CMDA Regd. Structural Engineer (SR-I (SE-I))
Reg No. SE/S/3324/2022
S.B CONSULTANTS
No.11, Thandi Street, Pallikaranai, Chennai-600 100.
Cell: 9282102589 / 9962550643
Email: sbventakanka97@yahoo.com

STABILITY CALCULATIONS FOR THE PROPOSED CONSTRUCTION OD STILT FLOOR +4 FLOORS +5 TH FLOOR (PART) RESIDENTIAL BUILDING WITH 24 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENIFITAT PLOT NO. 29,17 TH CROSS STREET,NCBS COLONY,NANGANALLUR,CHENNAI-600061 AND COMPRISED IN OLD S.NO.19/3 (PART)4 (PART),20/1 (PART),3 (PART) AS PER PATTA NEW TS NO.18/11&18/2,BLOCK NO. 31,WARD -B OF NANAGANALLUER VILLAGE,ALANDUR TALUK WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION

Gross Sectional Area	=	138000	sq.mm.
Percentage of Reinforcement to be Provided	=	0.8	%
Area of Longitudinal Reinforcement Required	=	1104	sq.mm

Er.M. SHANKAR, M.Tech(Struct),ME,MISE,FIAEES
CMDA Regd. Structural Engineer GR-I (SE-3)
Reg No. SE/S/334/0037
SB CONSULTANTS
No.11, Thiruvalluvar Street, Pallikaranai, Chennai-600 100.
Cell: 9282102286 / 9952698643
Email: shankarbalaji37@yahoo.com

STABILITY CALCULATIONS FOR THE PROPOSED CONSTRUCTION OD STILT FLOOR +4 FLOORS +5 TH FLOOR (PART) RESIDENTIAL BUILDING WITH 24 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENIFITAT PLOT NO. 29,17 TH CROSS STREET,NCBS COLONY,NANGANALLUR,CHENNAI-600061 AND COMPRISED IN OLD S.NO.19/3 (PART)4 (PART),20/1 (PART),3 (PART) AS PER PATTA NEW TS NO.18/11&18/2,BLOCK NO. 31,WARD -B OF NANAGANALLUER VILLAGE,ALANDUR TALUK WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION.

Shear for which Stirrups are Provided	=	18.959	KN
Stirrup Steel Yield Strength	=	500	N/sq.mm.
No. of Stirrup Legs	=	2	Nos.
Stirrup Rod Diameter-f	=	8	mm.
Spacing of Stirrups Required	=	300	mm.

Er.M. SHANKAR, M.Tech(Struct.)ME, MISTE, FIStructE
CMDA Regd. Structural Engineer (SE-I) (SE-II)
Reg.No.
SS CONSULTANTS
No.1C, Thirumal Street, Pallikaranai, Chennai-600 100.
Cell:
Email:

STABILITY CALCULATIONS FOR THE PROPOSED CONSTRUCTION OD STILT FLOOR +4 FLOORS +5 TH FLOOR (PART) RESIDENTIAL BUILDING WITH 24 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENIFITAT PLOT NO. 29,17 TH CROSS STREET,NCBS COLONY,NANGANALLUR,CHENNAI-600061 AND COMPRISED IN OLD S.NO.19/3 (PART)4 (PART),20/1 (PART),3 (PART) AS PER PATTA NEW TS NO.18/11&18/2,BLOCK NO. 31,WARD -B OF NANAGANALLUER VILLAGE,ALANDUR TALUK WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION.

Stirrup Rod Diameter-2	=	10	mm
Spacing of Stirrups Required	=	300	mm

As per IS:456-2000 Clause 26.5.1.5, If the stirrup exceeds 0.75d or 300 mm , whichever is less, the value will be provided as the Spacing of Stirrups

B81 : End-2 Max - Flexure Output

Bending Moment	=	136.853	KN m
Factored Moment	=	136.853	KN m
Overall Depth of Section	=	600	mm
Bottom Effective Cover	=	70	mm
Effective Depth	=	530	mm
Maximum N.A. Ratio	=	0.456	
Total Limiting Moment	=	214.882	KN m
Total Design Moment	=	136.853	KN m
Depth of Neutral Axis	=	140.151	mm
Tensile Reinforcement Required	=	0.547	%

Compression Reinforcement is NOT Necessary

As Per IS:456-2000, Clause Min. Tensile Reinforcement Percentage	=	0.17	%
As Per IS:456-2000, Clause Max. Reinforcement Percentage	=	4	%
Area of Tensile Reinforcement	=	868.827	sq.mm.
Main Rod Size-1	=	12	mm
No. of Rods Required	=	5.897	Nos
No. of Rods Provided	=	6	Nos
Corresponding Steel Area	=	678.584	sq.mm.
Main Rod Size-2	=	16	mm
No. of Rods Required	=	3.317	Nos

Dr.M. SHANKAR, M.Tech(Str.), MIE, MISE, FIBCCE
Chief Structural Engineer CR-I (SE-I)
CMDA Regd. Structural Engineer
Ph: 9382142338 / 9952015643
SS CONSULTANTS
No.11, Thandi Street, Pallavaram, Chennai-600 156.
Cell: 9382142338 / 9952015643
Email: shankar1957@yahoo.com

STABILITY CALCULATIONS FOR THE PROPOSED CONSTRUCTION OD STILT FLOOR +4 FLOORS +5 TH FLOOR (PART) RESIDENTIAL BUILDING WITH 24 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENIFITAT PLOT NO. 29,17 TH CROSS STREET,NCBS COLONY,NANGANALLUR,CHENNAI-600061 AND COMPRISED IN OLD S.NO.19/3 (PART)4 (PART),20/1 (PART),3 (PART) AS PER PATTA NEW TS NO.18/11&18/2,BLOCK NO. 31,WARD -B OF NANAGANALLUER VILLAGE,ALANDUR TALUK WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION.

No. of Rods Provided	=	4	Nos.
Corresponding Steel Area	=	804.248	sq.mm.
Compression Steel is NOT required. However, 2 are provided, irrespective of the size, for holding			
Main Rod Size-1	=	12	mm.

Er.M. SHANKAR, M.Tech(Struct.),ME, MIE(I), FMACCE
CMDA Regd. Structural Engineer GR-I (SE-I)
Reg.No. SE/2023/0037
SB CONSULTANTS
No.11, Thiruvalluvar Street, Pallikaranai, Chennai-600 100.
Cell: 9282102888 / 9952103443
Email: structshankar97@yahoo.com

STABILITY CALCULATIONS FOR THE PROPOSED CONSTRUCTION OD STILT FLOOR +4 FLOORS +5 TH FLOOR (PART) RESIDENTIAL BUILDING WITH 24 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENIFITAT PLOT NO. 29,17 TH CROSS STREET,NCBS COLONY,NANGANALLUR,CHENNAI-600061 AND COMPRISED IN OLD S.NO.19/3 (PART)4 (PART),20/1 (PART),3 (PART) AS PER PATTA NEW TS NO.18/11&18/2,BLOCK NO. 31,WARD -B OF NANAGANALLUER VILLAGE,ALANDUR TALUK WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION.

No. of Rods Provided	=	2	Nos.
Corresponding Steel Area	=	226.195	sq.mm
Compression Steel is NOT required. However, 2 are provided, irrespective of the size, for holding			
Main Rod Size-2	=	16	mm
No. of Rods Provided	=	2	Nos.
Corresponding Steel Area	=	402.124	sq.mm
Note :- Please note that the minimum number of should be always TWO, even if the number of ONE or less. This is to be done during detailing.			

B81 : End-2 Max - Shear Output

Shear Force	=	72.328	KN
Factored Shear	=	72.328	KN
As Per IS:456-2000, Clause			
Actual Shear Stress	=	0.602	N/sq.mm
As Per IS:456-2000, Table 19,			
Design Shear Strength of Concrete	=	0.511	N/sq.mm
As Per IS:456-2000, Table 20,			
Max. Permissible Shear Stress	=	3.124	N/sq.mm
Stirrups have to be Designed for Shear.			
Shear for which Stirrups are Provided	=	11.077	KN
Stirrup Steel Yield Strength	=	500	N/sq.mm
No. of Stirrup Legs	=	2	Nos.
Stirrup Rod Diameter-1	=	8	mm
Spacing of Stirrups Required	=	300	mm
Stirrup Rod Diameter-2	=	10	mm
Spacing of Stirrups Required	=	300	mm
As per IS:456-2000 Clause 26.5.1.5, if the stirrup exceeds 0.75d or 300 mm , whichever is less, the value will be provided as the Spacing of Stirrups.			

Er.M. SHANKAR, M.Tech(Struct),ME, MIEE, FIMACCE
CMDA Regd. Structural Engineer GR-I (SE-I)
Reg No: SE/2012/4/0037
SB CONSULTANTS
No.11, Thandi Street, Pallikaranai, Chennai-600 100.
Cell: 9283101626 / 9952000643
Email: shankarsb67@yahoo.com

STABILITY CALCULATIONS FOR THE PROPOSED CONSTRUCTION OD STILT FLOOR +4 FLOORS +5 TH FLOOR (PART) RESIDENTIAL BUILDING WITH 24 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENIFITAT PLOT NO. 29,17 TH CROSS STREET,NCBS COLONY,NANGANALLUR,CHENNAI-600061 AND COMPRISED IN OLD S.NO.19/3 (PART)4 (PART),20/1 (PART),3 (PART) AS PER PATTA NEW TS NO.18/11&18/2,BLOCK NO. 31,WARD -B OF NANAGANALLUER VILLAGE,ALANDUR TALUK WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION.

B81 : End-2 Min - Flexure Output			
Bending Moment	=	127.12	KN m
Factored Moment	=	127.12	KN m
Overall Depth of Section	=	600	mm
Bottom Effective Cover	=	70	mm



Dr.M. SHANKAR, M.Tech(Struct.)[illegible], MISTE, FIMACCE
CMDA Regd. Structural Engineer CBE I (SES)
Reg No. SE/2022/642/0037
SB CONSULTANTS
No.11, Third Street, Pallikaranai, Chennai-600 100.
Cell: 9382182540 / 9952000643
Email: mr.shankar97@yahoo.com

STABILITY CALCULATIONS FOR THE PROPOSED CONSTRUCTION OD STILT FLOOR +4 FLOORS +5 TH FLOOR (PART) RESIDENTIAL BUILDING WITH 24 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENIFITAT PLOT NO. 29,17 TH CROSS STREET,NCBS COLONY,NANGANALLUR,CHENNAI-600061 AND COMPRISED IN OLD S.NO.19/3 (PART)4 (PART),20/1 (PART),3 (PART) AS PER PATTA NEW TS NO.18/11&18/2,BLOCK NO. 31,WARD -B OF NANAGANALLUER VILLAGE,ALANDUR TALUK WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION.

Effective Depth	=	530	mm
Maximum N.A. Ratio	=	0.456	
Total Limiting Moment	=	214.882	KN m
Total Design Moment	=	127.12	KN m
Depth of Neutral Axis	=	128.906	mm
Tensile Reinforcement Required	=	0.583	%
Compression Reinforcement is NOT Necessary.			
As Per IS:456-2000, Clause Min. Tensile Reinforcement Percentage	=	0.17	%
As Per IS:456-2000, Clause Max. Reinforcement Percentage	=	4	%
Area of Tensile Reinforcement	=	613.409	sq.mm
Main Rod Size-1	=	12	mm
No. of Rods Required	=	5.424	Nos.
No. of Rods Provided	=	6	Nos.
Corresponding Steel Area	=	678.584	sq.mm
Main Rod Size-2	=	16	mm
No. of Rods Required	=	3.051	Nos.
No. of Rods Provided	=	3	Nos.
Corresponding Steel Area	=	603.186	sq.mm
Compression Steel is NOT required. However, 2 are provided, irrespective of the size, for holding			
Main Rod Size-1	=	12	mm
No. of Rods Provided	=	2	Nos.
Corresponding Steel Area	=	226.195	sq.mm.
Compression Steel is NOT required. However, 2 are provided, irrespective of the size, for holding			
Main Rod Size-2	=	10	mm
No. of Rods Provided	=	2	Nos.

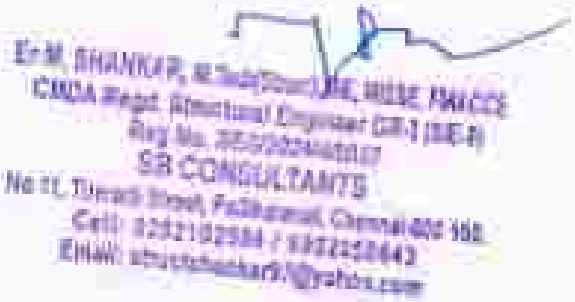
Er.M. SHANKAR, B.E., M.I.E., M.I.S.E., FIM.C.C.E.
Chartered Structural Engineer CR-1 (SE-4)
Reg No. SE/2/2648/2007
SB CONSULTANTS
No.11, Thiruvalluvar Street, Pallikaranai, Chennai-600 100.
Cell: 9382152648 / 9962058642
Email: shivasankar67@yahoo.com

STABILITY CALCULATIONS FOR THE PROPOSED CONSTRUCTION OD STILT FLOOR +4 FLOORS +5 TH FLOOR (PART) RESIDENTIAL BUILDING WITH 24 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENIFITAT PLOT NO. 29,17 TH CROSS STREET,NCBS COLONY,NANGANALLUR,CHENNAI-600061 AND COMPRISED IN OLD S.NO.19/3 (PART)4 (PART),20/1 (PART),3 (PART) AS PER PATTA NEW TS NO.16/11&16/2,BLOCK NO. 31,WARD -B OF NANAGANALLUER VILLAGE,ALANDUR TALUK WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION.

Corresponding Steel Area	=	402.124	sq.mm

Note:- Please note that the minimum number of should be always TWO, even if the number of ONE or less. This is to be done during detailing

B81 : End-2 Min - Shear Output



STABILITY CALCULATIONS FOR THE PROPOSED CONSTRUCTION OD STILT FLOOR +4 FLOORS +5 TH FLOOR (PART) RESIDENTIAL BUILDING WITH 24 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENIFITAT PLOT NO. 29,17 TH CROSS STREET,NCBS COLONY,NANGANALLUR,CHENNAI-600061 AND COMPRISED IN OLD S.NO.19/3 (PART)4 (PART),20/1 (PART),3 (PART) AS PER PATTA NEW TS NO.18/11&18/2,BLOCK NO. 31,WARD -B OF NANAGANALLUER VILLAGE,ALANDUR TALUK WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION.

Shear Force	=	73.328	KN
Factored Shear	=	73.328	KN
As Per IS:456-2000, Clause			
Actual Shear Stress	=	0.602	N/sq.mm.
As Per IS:456-2000, Table 19,			
Design Shear Strength of Concrete	=	0.511	N/sq.mm.
As Per IS:456-2000, Table 20,			
Max. Permissible Shear Stress	=	3.124	N/sq.mm.
Stirrups have to be Designed for Shear.			
Shear for which Stirrups are Provided	=	11.077	KN
Stirrup Steel Yield Strength	=	500	N/sq.mm.
No. of Stirrup Legs	=	2	Nos.
Stirrup Rod Diameter-1	=	8	mm
Spacing of Stirrups Required	=	300	mm
Stirrup Rod Diameter-2	=	10	mm
Spacing of Stirrups Required	=	300	mm

As per IS:456-2000 Clause 26.5.1.5, If the stirrup exceeds 0.75d or 300 mm , whichever is less, the value will be provided as the Spacing of Stirrups.

Sb1 : Mid. Max - Flexure Output

Bending Moment	=	71.54	KN m
Factored Moment	=	71.54	KN m
Overall Depth of Section	=	600	mm
Bottom Effective Cover	=	70	mm
Effective Depth	=	530	mm
Maximum N.A. Ratio	=	0.456	
Total Limiting Moment	=	214.682	KN m
Total Design Moment	=	71.54	KN m

Er.M. SHANKAR, [illegible], MISTE, FIStructE
Chief & Retd. Structural Engineer GR.I (SAG-II)
Regn No. SLI/2003/0027
SB CONSULTANTS
No.11, Thandi Street, Pallikaranai, Chennai-600 100.
Cell: 9382102188 / 9952150543
Email: shankarsb@yahoo.com

STABILITY CALCULATIONS FOR THE PROPOSED CONSTRUCTION OD STILT FLOOR +4 FLOORS +5 TH FLOOR (PART) RESIDENTIAL BUILDING WITH 24 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENIFITAT PLOT NO. 29,17 TH CROSS STREET,NCBS COLONY,NANGANALLUR,CHENNAI-600061 AND COMPRISED IN OLD S.NO.19/3 (PART)4 (PART),20/1 (PART),3 (PART) AS PER PATTA NEW TS NO.18/11&18/2,BLOCK NO. 31,WARD -B OF NANAGANALLUER VILLAGE,ALANDUR TALUK WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION.

As Per IS:456-2000, Clause			
Min. Tensile Reinforcement Percentage	=	0.17	%
As Per IS:456-2000, Clause			
Max. Reinforcement Percentage	=	4	%
Area of Tensile Reinforcement	=	328.037	sq.mm.
Main Rod Size-1	=	12	mm.
No. of Rods Required	=	2.9	Nos
No. of Rods Provided	=	3	Nos.
Corresponding Steel Area	=	339.292	sq.mm.
Main Rod Size-2	=	16	mm.
No. of Rods Required	=	1.632	Nos
No. of Rods Provided	=	2	Nos.
Corresponding Steel Area	=	402.124	sq.mm.
Compression Steel is NOT required. However, 2 are provided, irrespective of the size, for holding			
Main Rod Size-1	=	12	mm.
No. of Rods Provided	=	2	Nos
Corresponding Steel Area	=	226.195	sq.mm.
Compression Steel is NOT required. However, 2 are provided, irrespective of the size, for holding			
Main Rod Size-2	=	16	mm.
No. of Rods Provided	=	2	Nos
Corresponding Steel Area	=	402.124	sq.mm
Note:- Please note that the minimum number of should be always TWO, even if the number of ONE or less. This is to be done during detailing			

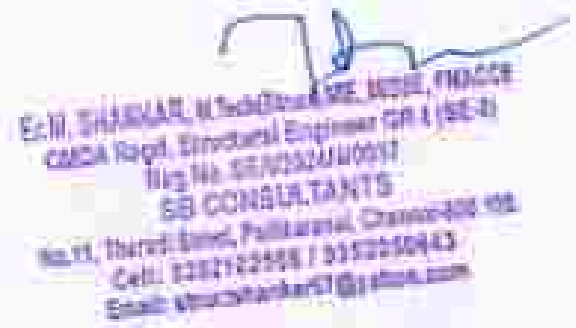
BR1 : Mid. Max - Shear Output

Shear Force	=	71.662	KN.
Factored Shear	=	71.662	KN.
As Per IS:456-2000, Clause			
Actual Shear Stress	=	0.588	N/sq.mm.
As Per IS:456-2000, Table 19,			

Er.M. SHANKAR, M.Tech (Struct), ME, MIE, SE, FMICCE
CIMDA Regd. Structural Engineer GR-I (SE-II)
Reg No. SE/I/524/2007
SB CONSULTANTS
No.11, Thiruvalluvar Street, Pallikaranai, Chennai-600 100.
Cell: 9282182586 / 9952999643
Email: shankarsb47@yahoo.com

STABILITY CALCULATIONS FOR THE PROPOSED CONSTRUCTION OD STILT FLOOR +4 FLOORS +5 TH FLOOR (PART) RESIDENTIAL BUILDING WITH 24 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENIFITAT PLOT NO. 29,17 TH CROSS STREET,NCBS COLONY,NANGANALLUR,CHENNAI-600061 AND COMPRISED IN OLD S.NO.19/3 (PART)4 (PART),20/1 (PART),3 (PART) AS PER PATTA NEW TS NO.18/11&18/2,BLOCK NO. 31,WARD -B OF NANAGANALLUER VILLAGE,ALANDUR TALUK WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION.

Main Rod Size-1	=	12	mm
No. of Rods Required	=	2.706	Nos.
No. of Rods Provided	=	3	Nos.
Corresponding Steel Area	=	339.292	sq mm.
Main Rod Size-2	=	16	mm
No. of Rods Required	=	1.522	Nos.



STABILITY CALCULATIONS FOR THE PROPOSED CONSTRUCTION OD STILT FLOOR +4 FLOORS +5 TH FLOOR (PART) RESIDENTIAL BUILDING WITH 24 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENIFITAT PLOT NO. 29,17 TH CROSS STREET,NCBS COLONY,NANGANALLUR,CHENNAI-600061 AND COMPRISED IN OLD S.NO.19/3 (PART)4 (PART),20/1 (PART),3 (PART) AS PER PATTA NEW TS NO.18/11&18/2,BLOCK NO. 31,WARD -B OF NANAGANALLUER VILLAGE,ALANDUR TALUK WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION.

No. of Rods Provided	=	2	Nos.
Corresponding Steel Area	=	402.124	sq.mm.
Compression Steel is NOT required. However, 2 are provided, irrespective of the size, for holding			
Main Rod Size-1	=	12	mm.
No. of Rods Provided	=	2	Nos.
Corresponding Steel Area	=	226.195	sq.mm.
Compression Steel is NOT required. However, 2 are provided, irrespective of the size, for holding			
Main Rod Size-2	=	16	mm.
No. of Rods Provided	=	2	Nos.
Corresponding Steel Area	=	402.124	sq.mm.
Note :- Please note that the minimum number of should be always TWO, even if the number of ONE or less. This is to be done during detailing			

B81 : Mid. Min - Shear Output

Shear Force	=	71.682	KN.
Factored Shear	=	71.682	KN.
As Per IS:456-2000, Clause			
Actual Shear Stress	=	0.568	N/sq.mm.
As Per IS:456-2000, Table 19,			
Design Shear Strength of Concrete	=	0.382	N/sq.mm.
As Per IS:456-2000, Table 20,			
Max. Permissible Shear Stress	=	3.124	N/sq.mm.
Stirrups have to be Designed for Shear.			
Shear for which Stirrups are Provided	=	25.082	KN.
Stirrup Steel Yield Strength	=	500	N/sq.mm.
No. of Stirrup Legs	=	2	Nos.
Stirrup Rod Diameter-1	=	8	mm.
Spacing of Stirrups Required	=	300	mm.

E.M.GHANSHAM, B.Tech(Civil),ME (Struct),FIE,CCE
Govt. Approved Structural Engineer GR-I (SE-II)
Reg No. SE/2022/0512
SB CONSULTANTS
No.11, Thiruvalluvar Street, Pallikaranai, Chennai-600 100.
Cell: 9382102686 / 9952986643
Email: structuralengineer47@gmail.com

STABILITY CALCULATIONS FOR THE PROPOSED CONSTRUCTION OD STILT FLOOR +4 FLOORS +5 TH FLOOR (PART) RESIDENTIAL BUILDING WITH 24 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENIFITAT PLOT NO. 29,17 TH CROSS STREET,NCBS COLONY,NANGANALLUR,CHENNAI-600061 AND COMPRISED IN OLD S.NO.19/3 (PART)4 (PART),20/1 (PART),3 (PART) AS PER PATTA NEW TS NO.18/11&18/2,BLOCK NO. 31,WARD -B OF NANAGANALLUER VILLAGE,ALANDUR TALUK WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION.

B81 : Side Face Steel Output			
Overall Depth of Section	=	600	mm
As Per IS:456-2000, Clauses 26.5.1.3, Side Face Reinforcement is NOT Required			

B81 : Deflection Check Output			
Type of Beam	=	Ends	Fixed or Continuous
Effective Span of Beam	=	4.12	m
Effective Depth of Beam	=	530	mm
Actual Span to Depth Ratio	=	7.774	
As Per IS:456-2000, Clause Factor Alpha	=	26	
As Per IS:456-2000, Clause Factor Zigma	=	1	
As Per IS:456-2000, Clause Factor Gamma	=	1.232	
As Per IS:456-2000, Clause Factor Delta	=	1	
As Per IS:456-2000, Clause Factor Lamda	=	1	
Allowable Span to Depth Ratio	=	32.033	
Deflection Requirements are O.K.			

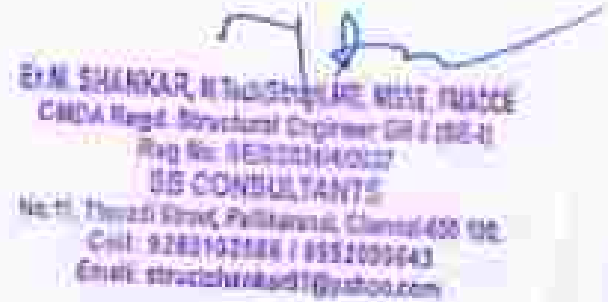
B81 : Deep Beam Check Output			
Effective Span of Beam	=	4.12	m
Overall Depth	=	600	mm
Effective Span to Depth Ratio	=	6.867	
Minimum Value for the above	=	2.5	
As Per IS:456-2000, Clause 29.1, this Beam is NOT a Deep Beam.			

S.M. SHANKAR, M.Tech (Struct), ME, MISE, FIE(I), CE
CMDA Regd. Structural Engineer GR-I (SE-3)
Reg No. S/[illegible]/2017
SS CONSULTANTS
No.11, Thiruvalluvar Street, Pallavaram, Chennai-600 117.
Cell: 9282102888 / 9940050643
Email: smshankarkarthy@yahoo.com

STABILITY CALCULATIONS FOR THE PROPOSED CONSTRUCTION OD STILT FLOOR +4 FLOORS +5 TH FLOOR (PART) RESIDENTIAL BUILDING WITH 24 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENIFITAT PLOT NO. 29,17 TH CROSS STREET,NCBS COLONY,NANGANALLUR,CHENNAI-600061 AND COMPRISED IN OLD S.NO.19/3 (PART)4 (PART) 20/1 (PART),3 (PART) AS PER PATTA NEW TS NO.18/11&18/2,BLOCK NO. 31,WARD -B OF NANAGANALLUER VILLAGE,ALANDUR TALUK WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION.

B81 : Slender Beam Check Output			
Clear Distance between Lateral Restraints	=	4.12	m
Allowable Value for the above	=	13.8	m

As Per IS:456-2000, Clause 23.3,



STABILITY CALCULATIONS FOR THE PROPOSED CONSTRUCTION OD STILT FLOOR +4 FLOORS +5 TH FLOOR (PART) RESIDENTIAL BUILDING WITH 24 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENIFITAT PLOT NO. 29,17 TH CROSS STREET,NCBS COLONY,NANGANALLUR,CHENNAI-600061 AND COMPRISED IN OLD S.NO.19/3 (PART)4 (PART),20/1 (PART),3 (PART) AS PER PATTA NEW TS NO.18/11&18/2,BLOCK NO. 31,WARD -B OF NANAGANALLUER VILLAGE,ALANDUR TALUK WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION.

this Beam is NOT a Slender Beam.

Note :-
Actually, the clear distance between lateral taken as against the effective span. But, the taken for simplifying the calculations. In fact, it's to consider the effective span rather than the

E. M. SHANKAR, M.Tech(Structures), MCSE, FIAACCE
CAIDA Regd. Structural Engineer CR 8 (SE-II)
Reg.No. SE/2010/0007
SS CONSULTANTS
No.11, Thanal Street, Pallikaranai, Chennai-600 100.
Cell: 9283103566 / 9952150543
Email: shankarsmc@yahoo.com

STABILITY CALCULATIONS FOR THE PROPOSED CONSTRUCTION OD STILT FLOOR +4 FLOORS +5 TH FLOOR (PART) RESIDENTIAL BUILDING WITH 24 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENIFITAT PLOT NO. 29,17 TH CROSS STREET,NCBS COLONY,NANGANALLUR,CHENNAI-600061 AND COMPRISED IN OLD S.NO.19/3 (PART)4 (PART),20/1 (PART),3 (PART) AS PER PATTA NEW TS NO.18/11&18/2,BLOCK NO. 31,WARD -B OF NANAGANALLUER VILLAGE,ALANDUR TALUK WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION.

B145 : Global Input Data			
Effective Span	=	6.95	m.
Section Type	=	Rectangular	
Width of Web	=	230	mm.
Overall Depth	=	600	mm.
Effective Cover at Top	=	70	mm.
Effective Cover at Bottom	=	70	mm.
Number of Stirrup Legs	=	2	Nos.
Max. Bending Moment at End-1	=	86.826	KN m.
Min. Bending Moment at End-1	=	-42.386	KN m.
Max. Bending Moment at End-2	=	48.903	KN m.
Min. Bending Moment at End-2	=	-38.678	KN m.
Max. Bending Moment at Middle	=	29.39	KN m.
Min. Bending Moment at Middle	=	-40.172	KN m.
Max. Shear Force at Left	=	35.694	KN.
Max. Shear Force at Right	=	30.606	KN.
Max. Torsional Moment	=	0	KN m.
Torsion, as per Analysis Results, is partially			
Ignore Torsion Limit	=	10	%
If Torsion is less than the above % of the Max it will be ignored. Otherwise, the Beam is			

B145 : End-1 Max - Flexure Output			
Bending Moment	=	86.826	KN m.
Factored Moment	=	86.826	KN m.
Overall Depth of Section	=	600	mm.
Bottom Effective Cover	=	70	mm.
Effective Depth	=	530	mm.

Er.M. SIVASHANKAR, M.Tech(Structure), ME, MIESL, FNAGC
Chartered Structural Engineer GR I (SE-I)
Reg No. SE/2018/0000
SIS CONSULTANTS
No.11, Theradi Street, Pallikaranai, Chennai-600 100.
Cell: 9382103066 / 9952952443
Email: sivashankar87@yahoo.com

STABILITY CALCULATIONS FOR THE PROPOSED CONSTRUCTION OD STILT FLOOR +4 FLOORS +5 TH FLOOR (PART) RESIDENTIAL BUILDING WITH 24 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENIFITAT PLOT NO. 29,17 TH CROSS STREET,NCBS COLONY,NANGANALLUR,CHENNAI-600061 AND COMPRISED IN OLD S.NO.19/3 (PART)4 (PART),20/1 (PART),3 (PART) AS PER PATTA NEW TS NO.18/11&18/2,BLOCK NO. 31,WARD -B OF NANAGANALLUER VILLAGE,ALANDUR TALUK WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION.

Maximum N.A. Ratio	=	0.456	
Total Limiting Moment	=	214.882	KN m

S.M. SHANKAR, M.Tech(Struct Engg), MIE, MIStructE, FIAStructE
CSCA Regd. Structural Engineer Gr-I (SE-I)
Reg No. MC/2003/00037
SB CONSULTANTS
No.11, Thiruvil Street, Pallikaranai, Chennai-600 100.
Cell: 91821 83558 / 9841885643
Email: shivashankar91@yahoo.com

STABILITY CALCULATIONS FOR THE PROPOSED CONSTRUCTION OD STILT FLOOR +4 FLOORS +5 TH FLOOR (PART) RESIDENTIAL BUILDING WITH 24 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENIFITAT PLOT NO. 29,17 TH CROSS STREET,NCBS COLONY,NANGANALLUR,CHENNAI-600061 AND COMPRISED IN OLD S.NO.19/3 (PART)4 (PART),20/1 (PART),3 (PART) AS PER PATTA NEW TS NO.18/11&18/2,BLOCK NO. 31,WARD -B OF NANAGANALLUER VILLAGE,ALANDUR TALUK WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION.

Total Design Moment	=	66.826	KN m
Depth of Neutral Axis	=	84.779	mm
Tensile Reinforcement Required	=	0.331	%
Compression Reinforcement is NOT Necessary.			
As Per IS:456-2000, Clause Min. Tensile Reinforcement Percentage	=	0.17	%
As Per IS:456-2000, Clause Max. Reinforcement Percentage	=	4	%
Area of Tensile Reinforcement	=	403.431	sq.mm
Main Rod Size-1	=	12	mm
No. of Rods Required	=	3.567	Nos.
No. of Rods Provided	=	4	Nos.
Corresponding Steel Area	=	452.389	sq.mm
Main Rod Size-2	=	16	mm
No. of Rods Required	=	2.007	Nos.
No. of Rods Provided	=	2	Nos.
Corresponding Steel Area	=	402.124	sq.mm
Compression Steel is NOT required. However, 2 are provided, irrespective of the size, for holding			
Main Rod Size-1	=	12	mm
No. of Rods Provided	=	2	Nos.
Corresponding Steel Area	=	226.195	sq.mm
Compression Steel is NOT required. However, 2 are provided, irrespective of the size, for holding			
Main Rod Size-2	=	16	mm
No. of Rods Provided	=	2	Nos.
Corresponding Steel Area	=	402.124	sq.mm

Note:- Please note that the minimum number of should be always TWO, even if the number of ONE or less. This is to be done during detailing.

Er.M. SHANKAR, M.Tech (Struct.Engg), MISTE, FIMACES
CMDA Approved Structural Engineer (GR-I) (SE-I)
Regd. No. SE/2020/00937
SS CONSULTANTS
No.11, Thiruvi Street, Pallikaranai, Chennai-600 100.
Cell: 7338102686 / 9952093643
Email: structshankar87@yahoo.com

B145 : End-1 Max - Shear Output

STABILITY CALCULATIONS FOR THE PROPOSED CONSTRUCTION OD STILT FLOOR +4 FLOORS +5 TH FLOOR (PART) RESIDENTIAL BUILDING WITH 24 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENIFITAT PLOT NO. 29,17 TH CROSS STREET,NCBS COLONY,NANGANALLUR,CHENNAI-600061 AND COMPRISED IN OLD S.NO.19/3 (PART)4 (PART),20/1 (PART),3 (PART) AS PER PATTA NEW TS NO.18/11&18/2,BLOCK NO. 31,WARD -B OF NANAGANALLUER VILLAGE,ALANDUR TALUK WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION.

Shear Force	=	35.694	KN
Factored Shear	=	35.694	KN
As Per IS:456-2000, Clause			
Actual Shear Stress	=	0.293	N/sq.mm

Er.M. SHANKAR, M.Tech(Struct.),ME, MISTE, FIMACES
CMDA Regd. Structural Engineer (SR-I) (SE-I)
Reg No. SE/2012/0007
SB CONSULTANTS
No.11, Thenali Street, Puthamallee, Chennai-600 100.
Cell: 9381145385 / 9551555543

STABILITY CALCULATIONS FOR THE PROPOSED CONSTRUCTION OD STILT FLOOR +4 FLOORS +5 TH FLOOR (PART) RESIDENTIAL BUILDING WITH 24 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENIFITAT PLOT NO. 29,17 TH CROSS STREET,NCBS COLONY,NANGANALLUR,CHENNAI-600061 AND COMPRISED IN OLD S.NO.19/3 (PART)4 (PART),20/1 (PART),3 (PART) AS PER PATTA NEW TS NO.18/11&18/2,BLOCK NO. 31,WARD -B OF NANAGANALLUER VILLAGE,ALANDUR TALUK WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION.

As Per IS:456-2000, Table 19, Design Shear Strength of Concrete	=	0.432	N/sq.mm
As Per IS:456-2000, Table 20, Max. Permissible Shear Stress	=	3.124	N/sq.mm
Minimum Shear Reinforcement is provided			
Stirrup Steel Yield Strength	=	500	N/sq.mm
No. of Stirrup Legs	=	2	Nos.
Stirrup Rod Diameter-1	=	8	mm
Spacing of Stirrups Required	=	300	mm
Stirrup Rod Diameter-2	=	10	mm
Spacing of Stirrups Required	=	300	mm
As per IS:456-2000 Clause 26.5.1.5, if the stirrup exceeds 0.75d or 300 mm, whichever is less, the value will be provided as the Spacing of Stirrups			

B145 : End-1 Min - Flexure Output

Bending Moment	=	42.386	KN.m
Factored Moment	=	42.386	KN.m
Overall Depth of Section	=	600	mm
Bottom Effective Cover	=	70	mm
Effective Depth	=	530	mm
Maximum N.A. Ratio	=	0.456	
Total Limiting Moment	=	214.852	KN.m
Total Design Moment	=	42.386	KN.m
Depth of Neutral Axis	=	39.852	mm
Tensile Reinforcement Required	=	0.17	%
Compression Reinforcement is NOT Necessary			
As Per IS:456-2000, Clause Min. Tensile Reinforcement Percentage	=	0.17	%

Er.M. SHANKAR, M.Tech(Struct.)BE.,MISE, FNAGCE
CMDA Regd. Structural Engineer (SR-I) (SE-I)
Reg No. SE/2003/A0031
SS CONSULTANTS
No.11, [illegible] Street, Pallikaranai, Chennai-600 100.
Cell: [illegible]
Email: [illegible]

STABILITY CALCULATIONS FOR THE PROPOSED CONSTRUCTION OD STILT FLOOR +4 FLOORS +5 TH FLOOR (PART) RESIDENTIAL BUILDING WITH 24 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENIFITAT PLOT NO. 29,17 TH CROSS STREET,NCBS COLONY,NANGANALLUR,CHENNAI-600061 AND COMPRISED IN OLD S.NO.19/3 (PART)4 (PART),20/1 (PART),3 (PART) AS PER PATTA NEW TS NO.18/11&18/2,BLOCK NO. 31,WARD -B OF NANAGANALLUER VILLAGE,ALANDUR TALUK WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION.

No. of Rods Required	=	1.833	Nos.
No. of Rods Provided	=	2	Nos.
Corresponding Steel Area	=	226.195	sq.mm.
Main Rod Size-2	=	16	mm.
No. of Rods Required	=	1.031	Nos.
No. of Rods Provided	=	1	Nos.
Corresponding Steel Area	=	201.062	sq.mm.
Compression Steel is NOT required. However, 2 are provided, irrespective of the size, for holding			
Main Rod Size-1	=	12	mm.
No. of Rods Provided	=	2	Nos.
Corresponding Steel Area	=	226.195	sq.mm.
Compression Steel is NOT required. However, 2 are provided, irrespective of the size, for holding			
Main Rod Size-2	=	16	mm.
No. of Rods Provided	=	2	Nos.
Corresponding Steel Area	=	402.124	sq.mm.
Note :- Please note that the minimum number of should be always TWO, even if the number of ONE or less. This is to be done during detailing			

B145 : End-1 Min - Shear Output

Shear Force	=	35.694	KN
Factored Shear	=	35.694	KN
As Per IS:456-2000, Clause			
Actual Shear Stress	=	0.293	N/sq.mm.
As Per IS:456-2000, Table 19,			
Design Shear Strength of Concrete	=	0.32	N/sq.mm.
As Per IS:456-2000, Table 20,			
Max. Permissible Shear Stress	=	3.124	N/sq.mm.
Minimum Shear Reinforcement is provided.			
Stirrup Steel Yield Strength	=	500	N/sq.mm.
No. of Stirrup Legs	=	2	Nos.

Er.M. SHANKAR, B.Tech(Civil), ME(Str.), FIE(I), FIV(I), CMDA Regd. Structural Engineer GR-I (SE-I)
Reg No. 9203004/0037
SHANKAR CONSULTANTS
No.11, Tamil Street, Pallikaranai, Chennai-600 100.
Cell: 9382105586 / 9962555843
Email: shankarkarthi42@yahoo.com

STABILITY CALCULATIONS FOR THE PROPOSED CONSTRUCTION OD STILT FLOOR +4 FLOORS +5 TH FLOOR (PART) RESIDENTIAL BUILDING WITH 24 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENIFITAT PLOT NO. 29,17 TH CROSS STREET,NCBS COLONY,NANGANALLUR,CHENNAI-600061 AND COMPRISED IN OLD S.NO.19/3 (PART)4 (PART),20/1 (PART),3 (PART) AS PER PATTA NEW TS NO.18/11&18/2,BLOCK NO. 31,WARD -B OF NANAGANALLUER VILLAGE,ALANDUR TALUK WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION.

Stirrup Rod Diameter-1	=	8	mm
Spacing of Stirrups Required	=	300	mm
Stirrup Rod Diameter-2	=	10	mm
Spacing of Stirrups Required	=	300	mm

Er.M. SHANKAR, M.Tech(Struct),ME, MISTE, FMACCE
CMDA Regd. Structural Engineer GR-I (SE-I)
Reg No. SE/2018/445/R2
SB CONSULTANTS
No.11, Thiruvil Street, Pallikaranai, Chennai-600 100
Cell: 9282182588 / 9962330442
Email: sbconsultants97@yahoo.com

STABILITY CALCULATIONS FOR THE PROPOSED CONSTRUCTION OD STILT FLOOR +4 FLOORS +5 TH FLOOR (PART) RESIDENTIAL BUILDING WITH 24 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENIFITAT PLOT NO. 29,17 TH CROSS STREET,NCBS COLONY,NANGANALLUR,CHENNAI-600061 AND COMPRISED IN OLD S.NO.19/3 (PART)4 (PART),20/1 (PART),3 (PART) AS PER PATTA NEW TS NO.18/11&18/2,BLOCK NO. 31,WARD -B OF NANAGANALLUER VILLAGE,ALANDUR TALUK WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION.

As per IS:456-2000 Clause 26.5.1.5, If the stirrup exceeds 0.75d or 300 mm., whichever is less, the value will be provided as the Spacing of Stirrups

B145 : End-2 Max - Flexure Output

Bending Moment	=	49.903	KN m
Factored Moment	=	49.903	KN m
Overall Depth of Section	=	600	mm
Bottom Effective Cover	=	70	mm
Effective Depth	=	530	mm
Maximum N.A. Ratio	=	0.456	
Total Limiting Moment	=	214.882	KN m
Total Design Moment	=	49.903	KN m
Depth of Neutral Axis	=	47.236	mm
Tensile Reinforcement Required	=	0.184	%

Compression Reinforcement is NOT Necessary.

As Per IS:456-2000, Clause Min. Tensile Reinforcement Percentage	=	0.17	%
As Per IS:456-2000, Clause Max. Reinforcement Percentage	=	4	%
Area of Tensile Reinforcement	=	224.779	sq.mm.
Main Rod Size-1	=	12	mm
No. of Rods Required	=	1.987	Nos.
No. of Rods Provided	=	2	Nos.
Corresponding Steel Area	=	226.195	sq.mm.
Main Rod Size-2	=	16	mm
No. of Rods Required	=	[illegible]	
No. of Rods Provided	=	[illegible]	
Corresponding Steel Area	=	201.062	sq.mm.

Er.M. Shankar, B.E., M.I.E., M.I.S.T.E., FM.I.C.C.E.
Govt. Regd. Structural Engineer GR-I (SE-I)
Reg No: E/0220004/2021
SS CONSULTANTS
No.11, Thendi Road, Pallikaranai, Chennai-600 100.
Cell: 9282102086 / 9952050843
Email: vinoshankar24@yahoo.com

STABILITY CALCULATIONS FOR THE PROPOSED CONSTRUCTION OD STILT FLOOR +4 FLOORS +5 TH FLOOR (PART) RESIDENTIAL BUILDING WITH 24 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENIFITAT PLOT NO. 29,17 TH CROSS STREET,NCBS COLONY,NANGANALLUR,CHENNAI-600061 AND COMPRISED IN OLD S.NO.19/3 (PART)4 (PART),20/1 (PART),3 (PART) AS PER PATTA NEW TS NO.18/11&18/2,BLOCK NO. 31,WARD -B OF NANAGANALLUER VILLAGE,ALANDUR TALUK WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION.

Compression Steel is NOT required. However, 2
are provided, irrespective of the size, for holding

Main Rod Size-1	=	12	mm.
No. of Rods Provided	=	2	Nos.
Corresponding Steel Area	=	226.195	sq.mm.

Compression Steel is NOT required. However, 2

E. M. SHANKAR, M.Tech(Struct),ME, MIStE, FMACCE
CMDA Regd. Structural Engineer GR-I (SE-I)
Reg No. SE/2012/0443/2017
GB CONSULTANTS
No.11, Thiruvil Street, Pallikaranai, Chennai-600 100.
Cell: 9382102588 / 9962050643
Email: structshankar@yahoo.com

STABILITY CALCULATIONS FOR THE PROPOSED CONSTRUCTION OD STILT FLOOR +4 FLOORS +5 TH FLOOR (PART) RESIDENTIAL BUILDING WITH 24 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENIFITAT PLOT NO. 29,17 TH CROSS STREET,NCBS COLONY,NANGANALLUR,CHENNAI-600061 AND COMPRISED IN OLD S.NO.19/3 (PART)4 (PART),20/1 (PART),3 (PART) AS PER PATTA NEW TS NO.16/11&18/2,BLOCK NO. 31,WARD -B OF NANAGANALLUER VILLAGE,ALANDUR TALUK WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION.

are provided, irrespective of the size, for holding

Main Rod Size-2	=	16	mm
No. of Rods Provided	=	2	Nos
Corresponding Steel Area	=	402.124	sq.mm

Note :- Please note that the minimum number of should be always TWO, even if the number of ONE or less. This is to be done during detailing

B145 : End-2 Max - Shear Output

Shear Force	=	30.606	KN
Factored Shear	=	30.606	KN
As Per IS:456-2000, Clause			
Actual Shear Stress	=	0.251	N/sq.mm
As Per IS:456-2000, Table 19,			
Design Shear Strength of Concrete	=	0.32	N/sq.mm
As Per IS:456-2000, Table 20,			
Max. Permissible Shear Stress	=	3.124	N/sq.mm

Minimum Shear Reinforcement is provided

Stirrup Steel Yield Strength	=	500	N/sq.mm
No. of Stirrup Legs	=	2	Nos
Stirrup Rod Diameter-1	=	8	mm
Spacing of Stirrups Required	=	300	mm
Stirrup Rod Diameter-2	=	10	mm
Spacing of Stirrups Required	=	300	mm

As per IS 456-2000 Clause 26.5.1.5, if the stirrup exceeds 0.75d or 300 mm, whichever is less, the value will be provided as the Spacing of Stirrups

B145 : End-2 Min - Flexure Output

Bending Moment	=	[illegible]	
Factored Moment	=	[illegible]	
Overall Depth of Section	=	600	mm

Er.M. SHANKAR [illegible] ME, MISTE, FIV(CCE)
Chief Structural Engineer-Gr-I (S.E.1)
Reg No: [illegible]
SSD CONSULTANTS
No.11, The [illegible] Street, Pallikaranai, Chennai-600 100.
Cell: [illegible]
Email: [illegible]

STABILITY CALCULATIONS FOR THE PROPOSED CONSTRUCTION OD STILT FLOOR +4 FLOORS +5 TH FLOOR (PART) RESIDENTIAL BUILDING WITH 24 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENIFITAT PLOT NO. 29,17 TH CROSS STREET,NCBS COLONY,NANGANALLUR,CHENNAI-600061 AND COMPRISED IN OLD S.NO.19/3 (PART)4 (PART),20/1 (PART),3 (PART) AS PER PATTA NEW TS NO.18/11&18/2,BLOCK NO. 31,WARD -B OF NANAGANALLUER VILLAGE,ALANDUR TALUK WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION.

Bottom Effective Cover	=	70	mm
Effective Depth	=	530	mm
Maximum N.A. Ratio	=	0.456	
Total Limiting Moment	=	214.882	kN.m

Er.M. SHANKAR, M.Tech(Structure),ME, MISAE, PMACCE
CMDA Regd. Structural Engineer GR-I (SE-I)
Reg No. SE/2023/AA/0027
GB CONSULTANTS
No.11, Thanal Street, Pallikaranai, Chennai-600 100
Cell: 9382102168 / 9952590943
Email: structshanka17@yahoo.com

STABILITY CALCULATIONS FOR THE PROPOSED CONSTRUCTION OD STILT FLOOR +4 FLOORS +5 TH FLOOR (PART) RESIDENTIAL BUILDING WITH 24 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENIFITAT PLOT NO. 29,17 TH CROSS STREET,NCBS COLONY,NANGANALLUR,CHENNAI-600061 AND COMPRISED IN OLD S.NO.19/3 (PART)4 (PART),20/1 (PART),3 (PART) AS PER PATTA NEW TS NO.18/11&18/2,BLOCK NO. 31,WARD -B OF NANAGANALLUER VILLAGE,ALANDUR TALUK WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION.

Total Design Moment	=	38.675	KN m
Depth of Neutral Axis	=	38.287	mm
Tensile Reinforcement Required	=	0.17	%
Compression Reinforcement is NOT Necessary			
As Per IS:456-2000, Clause Min. Tensile Reinforcement Percentage	=	0.17	%
As Per IS:456-2000, Clause Max. Reinforcement Percentage	=	4	%
Area of Tensile Reinforcement	=	207.23	sq.mm
Main Rod Size-1	=	12	mm
No. of Rods Required	=	1.832	Nos
No. of Rods Provided	=	2	Nos
Corresponding Steel Area	=	226.195	sq.mm
Main Rod Size-2	=	16	mm
No. of Rods Required	=	1.031	Nos
No. of Rods Provided	=	1	Nos
Corresponding Steel Area	=	201.062	sq.mm
Compression Steel is NOT required. However, 2 are provided, irrespective of the size, for holding			
Main Rod Size-1	=	12	mm
No. of Rods Provided	=	2	Nos
Corresponding Steel Area	=	226.195	sq.mm
Compression Steel is NOT required. However, 2 are provided, irrespective of the size, for holding			
Main Rod Size-2	=	16	mm
No. of Rods Provided	=	2	Nos
Corresponding Steel Area	=		

Note :- Please note that the minimum number of should be always TWO, even if the number of ONE or less. This is to be done during detailing

Er.M[illegible] Agarwal, Grad.IE, MSTE, FIEACS
CMEA Regd. Structural Engineer GR-I (SE-II)
Reg No: [illegible]
BD CONSULTANTS
No.11, [illegible], Pallikaranai, Chennai-100
[illegible]
Email: [illegible]

STABILITY CALCULATIONS FOR THE PROPOSED CONSTRUCTION OD STILT FLOOR +4 FLOORS +5 TH FLOOR (PART) RESIDENTIAL BUILDING WITH 24 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENIFITAT PLOT NO. 29,17 TH CROSS STREET,NCBS COLONY,NANGANALLUR,CHENNAI-600061 AND COMPRISED IN OLD S.NO.19/3 (PART)4 (PART),20/1 (PART),3 (PART) AS PER PATTA NEW TS NO.18/11&18/2,BLOCK NO. 31,WARD -B OF NANAGANALLUER VILLAGE,ALANDUR TALUK WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION.

B145 : End-2 Min - Shear Output			
Shear Force	=	30.606	KN
Factored Shear	=	30.606	KN
As Per IS:456-2000, Clause			
Actual Shear Stress	=	0.251	N/sq.mm

Er.M. SHANKAR, M.Tech(Struct),ME, MIE, MIE, FMACCE
CMDA Regd. Structural Engineer CR-1 (SE-I)
Reg No. SE/2020/0507
SB CONSULTANTS
No.11, Thiruvil Street, Pallikaranai, Chennai-600 100.
Cell: 9282102586 / 9952550643
Email: structshanka57@yahoo.com

STABILITY CALCULATIONS FOR THE PROPOSED CONSTRUCTION OD STILT FLOOR +4 FLOORS +5 TH FLOOR (PART) RESIDENTIAL BUILDING WITH 24 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENIFITAT PLOT NO. 29,17 TH CROSS STREET,NCBS COLONY,NANGANALLUR,CHENNAI-600061 AND COMPRISED IN OLD S.NO.19/3 (PART)4 (PART),20/1 (PART),3 (PART) AS PER PATTA NEW TS NO.18/11&18/2,BLOCK NO. 31,WARD -B OF NANAGANALLUER VILLAGE,ALANDUR TALUK WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION.

As Per IS:456-2000, Table 19,			
Design Shear Strength of Concrete	=	0.32	N/sq mm
As Per IS:456-2000, Table 20,			
Max. Permissible Shear Stress	=	3.124	N/sq mm
Minimum Shear Reinforcement is provided.			
Stirrup Steel Yield Strength	=	500	N/sq mm
No. of Stirrup Legs	=	2	Nos.
Stirrup Rod Diameter-1	=	8	mm.
Spacing of Stirrups Required	=	300	mm.
Stirrup Rod Diameter-2	=	10	mm.
Spacing of Stirrups Required	=	300	mm.
As per IS 456-2000 Clause 26.5.1.5, if the stirrup exceeds 0.75d or 300 mm., whichever is less, the value will be provided as the Spacing of Stirrups.			

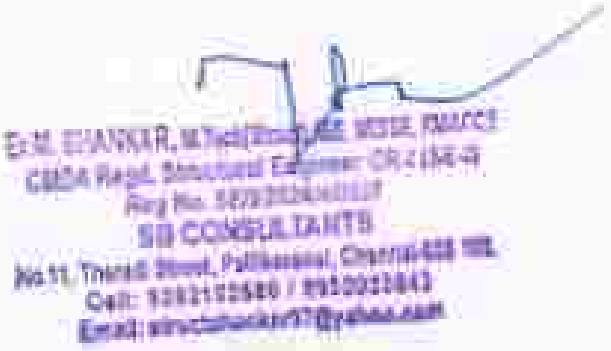
B145 : Mid. Max - Flexure Output

Bending Moment	=	40.172	KN m
Factored Moment	=	40.172	KN m
Overall Depth of Section	=	600	mm.
Bottom Effective Cover	=	70	mm.
Effective Depth	=	530	mm.
Maximum N.A. Ratio	=	0.456	
Total Limiting Moment	=	214.862	KN m
Total Design Moment	=	40.172	KN m
Depth of Neutral Axis	=	37.733	mm.
Tensile Reinforcement Required	=	0.17	%
Compression Reinforcement is NOT Necessary			
As Per IS:456-2000, Clause			

E.M. SHANKAR, M.Tech(Struct), ME, MIStE, FMACEC
CMDA Regd. Structural Engineer (SR-I)
Reg No. SE/2020/40037
SE CONSULTANTS
No.51, Thiruvalluvar Street, Pallikaranai, Chennai-600 100
Cell: 9282499588 / 9551553643
Email: seconsultant@yahoo.com

STABILITY CALCULATIONS FOR THE PROPOSED CONSTRUCTION OD STILT FLOOR +4 FLOORS +5 TH FLOOR (PART) RESIDENTIAL BUILDING WITH 24 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENIFITAT PLOT NO. 29,17 TH CROSS STREET,NCBS COLONY,NANGANALLUR,CHENNAI-600061 AND COMPRISED IN OLD S.NO.19/3 (PART)4 (PART),20/1 (PART),3 (PART) AS PER PATTA NEW TS NO.18/11&18/2,BLOCK NO. 31,WARD -B OF NANAGANALLUER VILLAGE,ALANDUR TALUK WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION.

Min. Tensile Reinforcement Percentage	=	0.17	%
As Per IS:456-2000, Clause Max. Reinforcement Percentage	=	4	%
Area of Tensile Reinforcement	=	227.23	sq.mm.



STABILITY CALCULATIONS FOR THE PROPOSED CONSTRUCTION OD STILT FLOOR +4 FLOORS +5 TH FLOOR (PART) RESIDENTIAL BUILDING WITH 24 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENIFITAT PLOT NO. 29,17 TH CROSS STREET,NCBS COLONY,NANGANALLUR,CHENNAI-600061 AND COMPRISED IN OLD S.NO.19/3 (PART)4 (PART),20/1 (PART),3 (PART) AS PER PATTA NEW TS NO.18/11&18/2,BLOCK NO. 31,WARD -B OF NANAGANALLUER VILLAGE,ALANDUR TALUK WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION.

Main Rod Size-1	=	12	mm.
No. of Rods Required	=	1.832	Nos.
No. of Rods Provided	=	2	Nos.
Corresponding Steel Area	=	226.195	sq.mm.
Main Rod Size-3	=	16	mm.
No. of Rods Required	=	1.031	Nos.
No. of Rods Provided	=	1	Nos.
Corresponding Steel Area	=	201.062	sq.mm.

Compression Steel is NOT required. However, 2 are provided. Irrespective of the size, for holding

Main Rod Size-1	=	12	mm.
No. of Rods Provided	=	2	Nos.
Corresponding Steel Area	=	226.195	sq.mm.

Compression Steel is NOT required. However, 2 are provided. Irrespective of the size, for holding

Main Rod Size-3	=	16	mm.
No. of Rods Provided	=	2	Nos.
Corresponding Steel Area	=	402.124	sq.mm.

Note :- Please note that the minimum number of should be always TWO, even if the number of ONE or less. This is to be done during detailing

B145 : Mid. Max - Shear Output

Shear Force	=	26.288	KN
Factored Shear	=	26.288	KN
As Per IS:456-2000, Clause Actual Shear Stress	=	0.218	N/sq.mm
As Per IS:456-2000, Table 19, Design Shear Strength of Concrete	=	0.32	N/sq.mm
As Per IS:456-2000, Table 20, Max. Permissible Shear Stress	=	1.174	N/sq.mm

Minimum Shear Reinforcement is provided.

Stirrup Steel Yield Strength	=	500	N/sq.mm

B.M. SHANKAR, M.E., (Struct. Engg.), MIE, FIStructE
Chartered Structural Engineer CE-1 (ES-I)
Reg No. S/2013/24/0017
SB CONSULTANTS
No.11, Thiruvalluvar Street, Pallavaram, Chennai-600 100.
Cell: 9381102888 / 9952005643
Email: structshankar@yahoo.com

STABILITY CALCULATIONS FOR THE PROPOSED CONSTRUCTION OD STILT FLOOR +4 FLOORS +5 TH FLOOR (PART) RESIDENTIAL BUILDING WITH 24 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENIFITAT PLOT NO. 29,17 TH CROSS STREET,NCBS COLONY,NANGANALLUR,CHENNAI-600061 AND COMPRISED IN OLD S.NO.19/3 (PART)4 (PART),20/1 (PART),3 (PART) AS PER PATTA NEW TS NO.18/11&18/2,BLOCK NO. 31,WARD -B OF NANAGANALLUER VILLAGE,ALANDUR TALUK WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION.

No. of Stirrup Legs	=	2	Nos
Stirrup Rod Diameter-1	=	8	mm
Spacing of Stirrups Required	=	300	mm
Stirrup Rod Diameter-2	=	10	mm
Spacing of Stirrups Required	=	300	mm

E. M. SHANKAR, M.Tech(Structural Engg.), MIStructE
CWDPA Regd. Structural Engineer GR-II (SE-I)
Reg No. SE/2003/0003
SD CONSULTANTS
No.11, Thiruvalluvar Street, Pallikaranai, Chennai-600 100.
Cell: 9382102555 / 9962888643
Email: structshankar@yahoo.com

STABILITY CALCULATIONS FOR THE PROPOSED CONSTRUCTION OD STILT FLOOR +4 FLOORS +5 TH FLOOR (PART) RESIDENTIAL BUILDING WITH 24 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENIFITAT PLOT NO. 29,17 TH CROSS STREET,NCBS COLONY,NANGANALLUR,CHENNAI-600061 AND COMPRISED IN OLD S.NO.19/3 (PART)4 (PART),20/1 (PART),3 (PART) AS PER PATTA NEW TS NO.18/11&18/2,BLOCK NO. 31,WARD -B OF NANAGANALLUER VILLAGE,ALANDUR TALUK WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION

SCADDS/RC-Slab Designer 2022 [Release: 4.01.3010]

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SCADDS/Nucleus 2022: RC-Slab Designer
Limit State Design of R.C.C. One Way/Two Way
Rectangular/Square Slabs & Trapezoidal/Triangular Slabs
and Circular/Hexagonal/Octagonal Slabs
with Simple/Fixed/Continuous/Cantilever Supports
as per IS:456-2000 upto Amendment 5 (Reaffirmed 2021)
and IS:875-1987(Part-2)

INTRODUCTION

This Report contains detailed design solutions for

The R.C.C. Slabs are considered for Flexural Design.
the output contains the following portions

1. Global Input Data
2. Flexural Design Output
3. Shear Check Output
4. Deflection Check Output
5. Development Length / Bond Design Output

While detailed design is carried out for Flexure,
only checks are made for items 3 and 4.

GLOBAL MATERIAL DATA

Concrete Clear Cover	=	20	mm.
Char. Comp. Strength of Concrete	=	25	N/sq.mm.
Density of Concrete	=	24.517	kN/cu.m.
Yield Strength of Main Steel	=	500.000	N/sq.mm.

Er.M. SHANMUGAM, B.E., M.S.(Structures), FIE(I), FIV(I)
Chartered Engineer, Senior Structural Engineer, Govt. Approved Valuer, Govt. Approved Fire Safety Consultant
Chartered Engineer, Senior Structural Engineer, Govt. Approved Valuer, Govt. Approved Fire Safety Consultant
Regd. No. SE/2/2024/0537
SS CONSULTANTS
No.11, Thandi Street, Pallavaram, Chennai-600 043
Cell: 9382103584 / 9176299843
Email: ssvaluationchennai@yahoo.com

STABILITY CALCULATIONS FOR THE PROPOSED CONSTRUCTION OD STILT FLOOR +4 FLOORS +5 TH FLOOR (PART) RESIDENTIAL BUILDING WITH 24 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENIFITAT PLOT NO. 29,17 TH CROSS STREET,NCBS COLONY,NANGANALLUR,CHENNAI-600061 AND COMPRISED IN OLD S.NO.19/3 (PART)4 (PART),20/1 (PART),3 (PART) AS PER PATTA NEW TS NO.18/11&18/2,BLOCK NO. 31,WARD -B OF NANAGANALLUER VILLAGE,ALANDUR TALUK WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION

Main Rod Diameter-2	=	10	mm
Corresponding Development Length	=	534.04	mm
Secondary Rod Diameter-1	=	8	mm
Corresponding Development Length	=	427.232	mm
Secondary Rod Diameter-2	=	10	mm
Corresponding Development Length	=	534.04	mm

S001 - PANEL INPUT

Slab Number	=	S001	
Slab Shape	=	Rectangular	
Centre to Centre Short Span	=	1.32	m
Centre to Centre Long Span	=	4.75	m

Effective Short Span	=	1.1	m

Support Type : Continuous Supports
It is a One way Slab.

Initial Thickness of Slab	=	125	mm

Type of Building is "Residential Building"
Type of Floor is "All Rooms and Kitchens"

Live Load	=		
Floor Finish Load	=		
Partition Load	=		

E.M. SHANKAR, B.Tech., M.S.(Struct. Engg.), MIEEE, FIAEEE
CBIDA Regd. Structural Engineer CA-LDM-II
Reg No. S/[illegible]/2012
SSI CONSULTANTS
No.11, Thanikachalam Street, Pallikaranai, Chennai-600 100.
Cell: [illegible]
Email: shivashankar97@yahoo.com

STABILITY CALCULATIONS FOR THE PROPOSED CONSTRUCTION OD STILT FLOOR +4 FLOORS +5 TH FLOOR (PART) RESIDENTIAL BUILDING WITH 24 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENIFITAT PLOT NO. 29,17 TH CROSS STREET,NCBS COLONY,NANGANALLUR,CHENNAI-600061 AND COMPRISED IN OLD S.NO.19/3 (PART)4 (PART),20/1 (PART),3 (PART) AS PER PATTA NEW TS NO.18/11&18/2,BLOCK NO. 31,WARD -B OF NANAGANALLUER VILLAGE,ALANDUR TALUK WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION

Miscellaneous Load	=	NIL	

S001 - FLEXURE OUTPUT

Slab Identification Number	=	**S001**	
Effective Short Span	=	1.1	m.
Effective Long Span	=	4.595	m
Long Span to Short Span Ratio	=	4.177	
It is a One way Slab.			
Thickness of Slab Provided	=	**125**	**mm.**
Concrete Clear Cover	=	20	mm.
Density of Reinforced Concrete	=	24.517	KN/cu.m.
Dead Weight of Slab	=	**2.819**	**KN/sq.m.**
Loads on the Slab Panel			
Live Load	=	2	KN/sq.m.
Floor Finish Load	=	1	KN/sq.m.
Partition Load	=	1	KN/sq.m.
Miscellaneous Load	=	NIL	
Total Dead Load on Slab Panel	=	**4.819**	**KN/sq.m.**
Total Load on Slab Panel	=	**6.819**	**KN/sq.m.**
Safety Factor for Load	=	1.5	
Total Factored Load on Slab Panel	=	**10.229**	**KN/sq.m.**
Effective Depth Required	=	20.078	mm
Effective Depth Provided	=	90	mm
Hence SAFE.			

Er.M. SHANKAR, M.Tech(Struct), MIE, MISTE, FIV, CCE
Class-I Regd. Structural Engineer GR-I (SE-5)
Reg No. SE/2022/0000017
SB CONSULTANTS
No.11, Durga Street, Pallikaranai, Chennai-600 100
Cell: +91 97910 72886 / 9952693643
Email: shankarsb47@yahoo.com

Short Span Reinforcement over Centre Portion

STABILITY CALCULATIONS FOR THE PROPOSED CONSTRUCTION OD STILT FLOOR +4 FLOORS +5 TH FLOOR (PART) RESIDENTIAL BUILDING WITH 24 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENIFITAT PLOT NO. 29,17 TH CROSS STREET,NCBS COLONY,NANGANALLUR,CHENNAI-600061 AND COMPRISED IN OLD S.NO.19/3 (PART)4 (PART),20/1 (PART),3 (PART) AS PER PATTA NEW TS NO.18/11&18/2,BLOCK NO. 31,WARD -B OF NANAGANALLUER VILLAGE,ALANDUR TALUK WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION

Short Span Positive Moment	=	1 092	KN m.
Short Span Positive Steel	=	**106**	**sq.mm.**
Dia. of Rod-1 along Short Span	=	8	mm.
Required Spacing along Short Span (+)	=	465.421	mm.
Max. Spacing allowed (Rounded off) (+)	=	**275**	**mm.**
Dia. of Rod-2 along Short Span	=	10	mm.
Required Spacing along Short Span (+)	=	727.221	mm.
Max. Spacing allowed (Rounded off) (+)	=	**275**	**mm.**

Short Span Reinforcement over Support Portion

Short Span Negative Moment	=	1 278	KN m.
Short Span Negative Steel	=	**100**	**sq.mm.**
Dia. of Rod-1 along Short Span	=	8	mm.
Required Spacing along Short Span (-)	=	465.421	mm.
Max. Spacing allowed (Rounded off) (-)	=	**275**	**mm.**
Dia. of Rod-2 along Short Span	=	10	mm.
Required Spacing along Short Span (-)	=	727.221	mm.
Max. Spacing allowed (Rounded off) (-)	=	**275**	**mm.**

Distribution Reinforcement

Distribution Steel Percentage	=	0.12	%
Long Span Distribution Steel	=	**138**	**sq.mm.**
Spacing of Rod-1 along Long Span (+)	=	364.243	mm.
Max. Spacing allowed (Rounded off) (+)	=	**300**	**mm.**
Spacing of Rod-2 along Long Span (+)	=	369.129	mm.
Max. Spacing allowed (Rounded off) (+)	=	**300**	**mm.**

Note:- The required Spacing of Main Rods will be compared 300 mm. (11.811") or 3d whichever is less. If the required this limit, the least value will be automatically provided. This is done in accordance with IS:456-2000 Clause 26.3.3.

Similarly, the required Spacing of Dist. Rods will be 300 mm. (11.811") or 5d whichever is less. If the required this limit, the least value will be automatically provided. This is done in accordance with IS:456-2000 Clause 26.3.3.

Er.R. SHANKAR, M.Tech.(STRUCTURAL ENGG), MIE(I), MIGS(I)
Chartered Engineer (I), Structural Engineer (I), F.I.V. (I)
Reg.No. SE/1/2/2007
SS CONSULTANTS
No.11, Thanga Street, Pallikaranai, Chennai-600 100.
Cell: 9282103888 / 9952000883
Email: shankarsudan@yahoo.com

STABILITY CALCULATIONS FOR THE PROPOSED CONSTRUCTION OD STILT FLOOR +4 FLOORS +5 TH FLOOR (PART) RESIDENTIAL BUILDING WITH 24 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENIFITAT PLOT NO. 29,17 TH CROSS STREET,NCBS COLONY,NANGANALLUR,CHENNAI-600061 AND COMPRISED IN OLD S.NO.19/3 (PART)4 (PART),20/1 (PART),3 (PART) AS PER PATTA NEW TS NO.18/11&18/2,BLOCK NO. 31,WARD -B OF NANAGANALLUER VILLAGE,ALANDUR TALUK WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION

If the User has fixed Minimum and Maximum Spacing practical considerations, those values will be used as and implemented in the Drawings and Quantity

S001 – SHEAR CHECK			
Effective Short Span	=	1.1	m.
Effective Long Span	=	4.595	m.
Total Factored Load per Unit Length	=	**16.229**	**KN/m.**
Shear Coeff. for Continuous Edge-X	=	0.6	
Corresponding Design Shear	=	6.751	KN.
Shear Coeff. for Discontinuous Edge-X	=	0	
Corresponding Design Shear	=	0	KN.
Shear Coeff. for Continuous Edge-Y	=	0.6	
Corresponding Design Shear	=	6.751	KN.
Shear Coeff. for Discontinuous Edge-Y	=	0	
Corresponding Design Shear	=	0	KN.
Maximum Design Shear	=	**6.751**	**KN.**
As Per IS:456-2000, Clause 40.1, Actual Shear Stress	=	0.075	N/sq.mm.
As Per IS:456-2000, Clause 40.2.1.1 & Table 19, Design Shear Strength of Concrete	=	0.342	N/sq.mm.
As Per IS:456-2000, Table 20, Max. Permissible Shear Stress	=	3.124	N/sq.mm.
It can be seen that 0.075 < 0.342 and 0.075 < 3.124. The Slab Panel is SAFE in Shear.			

S001 - DEFLECTION CHECK

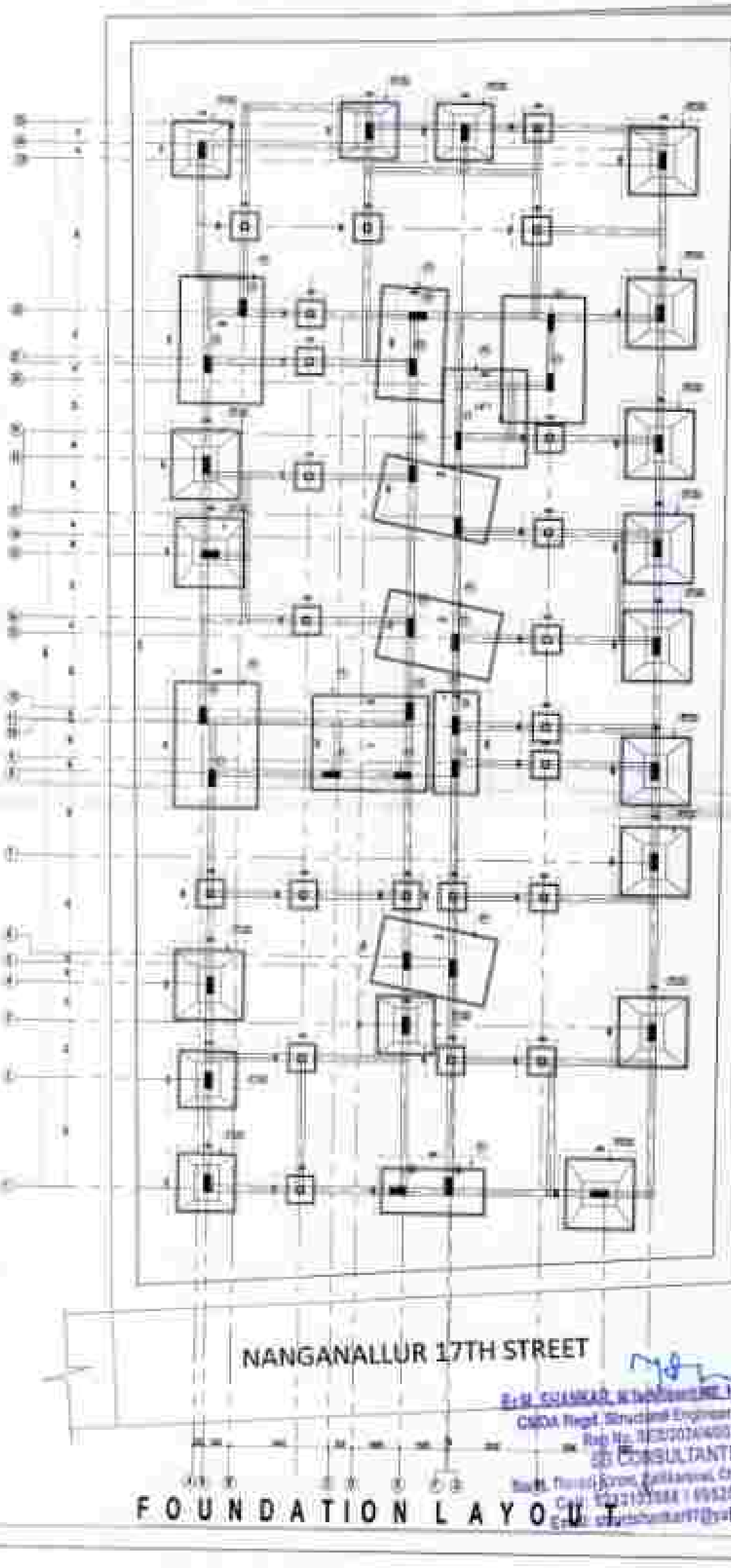
Er.M. SHANKAR, M.Tech (Struct.Engg.), MIE, FIStructE
CMDA Regd. Structural Engineer Gr-I (SE-I)
Reg.No. STR/2124/R/2017
S.D. CONSULTANTS
No.11, Thiruvalluvar Street, Gandhinagar, Chennai-600 116
Cell: 9283183888 / 9283099948
Email: shankarsd1@yahoo.com

STABILITY CALCULATIONS FOR THE PROPOSED CONSTRUCTION OD STILT FLOOR +4 FLOORS +5 TH FLOOR (PART) RESIDENTIAL BUILDING WITH 24 DWELLING UNITS AVAILING PREMIUM FSI WITH TOD BENIFITAT PLOT NO. 29,17 TH CROSS STREET,NCBS COLONY,NANGANALLUR,CHENNAI-600061 AND COMPRISED IN OLD S.NO.19/3 (PART)4 (PART),20/1 (PART),3 (PART) AS PER PATTA NEW TS NO.18/11&16/2,BLOCK NO. 31,WARD -B OF NANAGANALLUER VILLAGE,ALANDUR TALUK WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION

Effective Short Span	=	1.1	m.
Effective Depth of Slab	=	90	mm.
Actual Span to Depth Ratio	=	12.222	
As Per IS:456-2000, Clause 23.2.1.a, Factor Alpha	=	26	
As Per IS:456-2000, Clause 23.2.1.b, Factor Zigma	=	1	
As Per IS:456-2000, Clause 23.2.1.c, Factor Gamma	=	1.478	
Allowable Span to Depth Ratio	=	38.424	> 12.222

Deflection Requirements are O.K.

E.M. SHANKAR, [illegible] ME, MISE, TRACCE
CMDA Regd. Structural Engineer Gr.I (SE-II)
Reg No. [illegible]
SB CONSULTANTS
No.11,Thread Street, Pallikaranai, Chennai-600 100.
Cell: [illegible]
Email: [illegible]



FOUNDATION LAYOUT

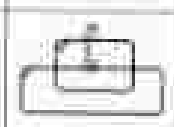
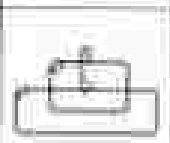
FOUNDATION LAYOUT

AANIRUDH FOUNDATION PVT LTD

N

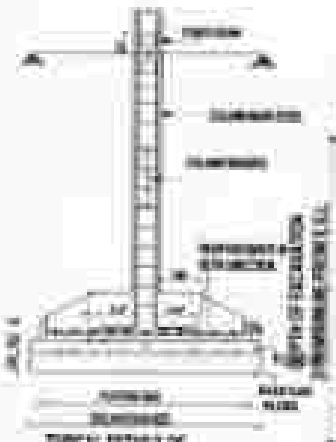
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COLUMN SCHEDULE

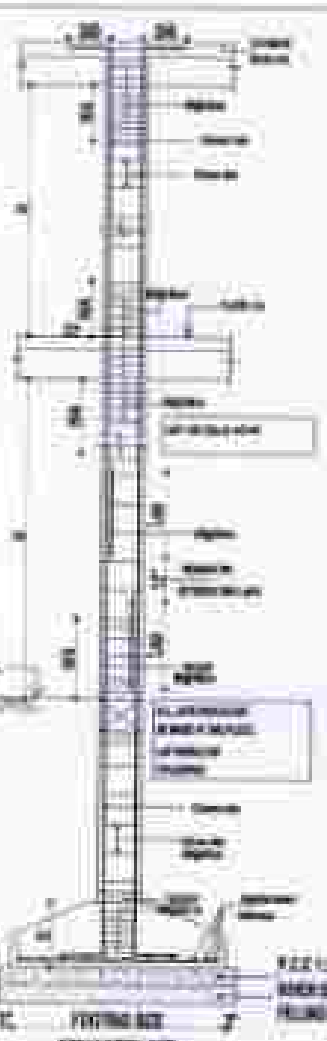
MARK	COLUMN REFERENCE	SIZE	COLUMN SHAPE	REINFORCEMENT	MARKING	DIAGRAM	TIE DETAILS
C1	C1	[illegible]		[illegible]	[illegible]	[illegible]	
C2	C2	[illegible]		[illegible]	[illegible]	[illegible]	
C3	C3	[illegible]		[illegible]	[illegible]	[illegible]	

FOOTING SCHEDULE

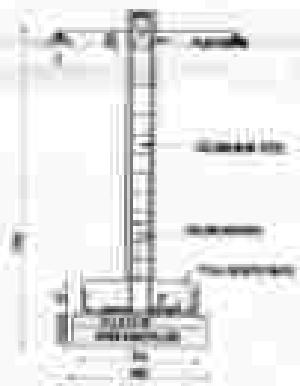
MARK	FOOTING REFERENCE	SIZE	FOOTING SIZE	A	B	DEPTH	REMARKS
1	F1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
2	F2	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
3	F3	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
4	F4	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
5	F5	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
6	F6	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
7	F7	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
8	F8	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
9	F9	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]



TYPICAL DETAILS OF SQUARE SLOPED FOOTING



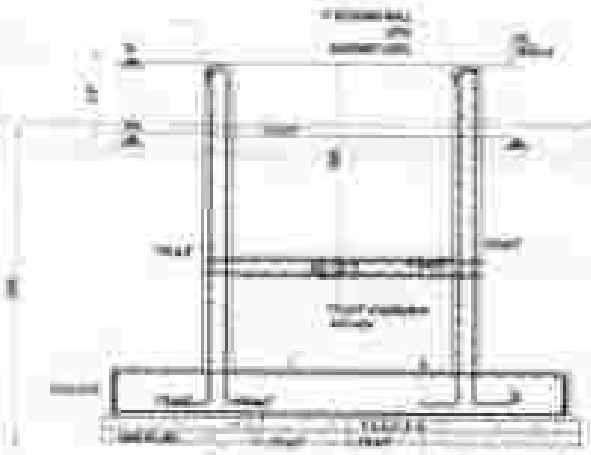
TYPICAL SECTION THROUGH



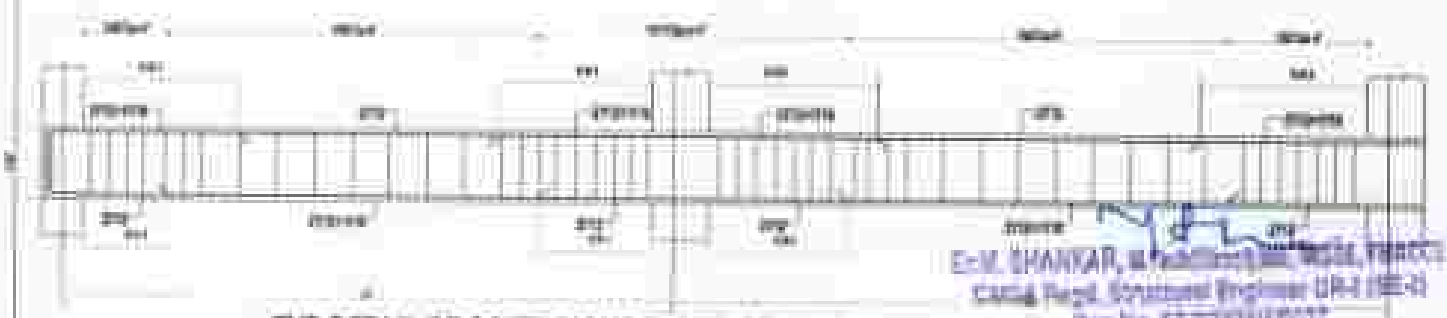
TYPICAL DETAILS OF [illegible] COLUMN FOOTING



C.S OF PB



TYPICAL LIFT RETAINING WALL DETAILS P2



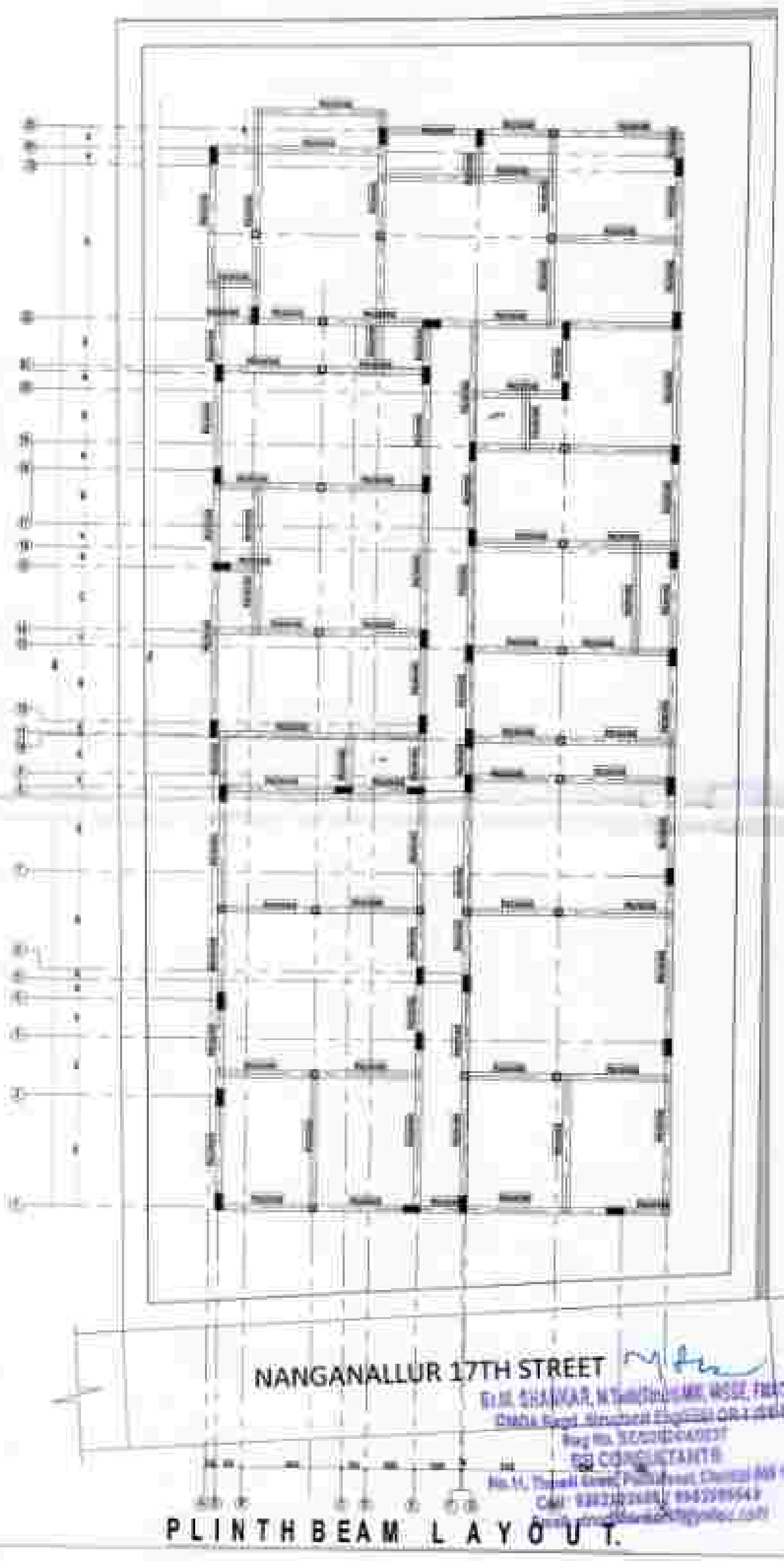
TYP.DETAIL OF CONTINUOUS PLINTH BEAM PB

E.M. SHANKAR, M.E. (Structural), MIE, FIV, C.Eng.
Chartered Engineer
Reg No. [illegible]
SB CONSULTANTS
No.11, Thandi Street, Pallikaranai, Chennai-600 100.
Cell: [illegible]
Email: [illegible]

FOUNDATION LAYOUT

ANANLEIGH FOUNDATION PVT LTD

SB CONSULTANTS



PLINTH BEAM LAYOUT.

PROJECT:

PLAN SHOWING THE PROPOSED CONSTRUCTION OF STILT FLOOR + 4 FLOORS + SU FLOOR (Part) RESIDENTIAL BUILDING WITH 37 DWELLING UNITS AVAILING PREMIUM FSI WITH TDR BENEFIT AT PLOT NO. 28, 17TH STREET, MODEL COLONY, NANGANALLUR, CHENNAI - 600061 AND COMPRISED IN OLD SURVEY NO. 19/1 (Part), 4(Part), 19/1 (Part), 3 (Part) AS PER PATTA BOOK T.S. NO. 191 & 192, BLOCK NO. 31, WARD-K OF NANGANALLUR VILLAGE, ALAMBAKKAM TALUK AND WITHIN THE LIMITS OF GREATER CHENNAI CORPORATION.

NOTES:

- THIS DRAWING IS THE PROPERTY OF THE ISSUE CENTRE AND IS NOT TO BE REPRODUCED, COPIED, HANDED OVER TO A THIRD PERSON, PARTLY OR WHOLLY, FOR ANY PURPOSE OF OTHER THAN FOR WHICH IT HAS BEEN LOANED.
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- ELEVATION LEVELS ARE FINISHED FLOOR LEVEL.
- STRUCTURAL ENGINEER RESPONSIBILITY IS LIMITED TO DESIGN & DETAILS OF STRUCTURAL DRAWING ONLY.
- MODE OF CONSTRUCTION AS PER CONSTRUCTION METHODOLOGY.

NO.	REVISION	DATE	SIGN
1			
2			

PROJECT NO.

DRG TITLE: **PLINTH BEAM LAYOUT**

STRUCTURAL DRAWING

DRG NO. : SK-01 (R1)

SCALE : 1:100 @ A1

DATE : 11.12.2024

REVISED NO. : R1

DRAWN BY : S.Das

LAY OUT & STRUCTURAL DESIGN OF RCC STRUCTURE AS PER IS CODES

BUILDING CONTRACTOR

AANRUDH FOUNDATION PVT LTD

No.4, Lakshmi Nagar, 18th Street, Velachery, Chennai - 600 042.
Phone : Mobile 94440 87574 / 2242 2222
E-mail : engg@aanrudhfoundations.in
Web : www.aanrudhfoundations.in

N

STRUCTURAL CONSULTANTS

Er.M.SHANKAR, M.Tech(Structure), MISE, FIEI(C)
CHARTERED ENGINEER-STRUCTURAL ENGINEER
SENIOR PROFESSIONAL ENGINEER
REGISTERED STRUCTURAL ENGINEER GRADE-I (RCC)

SB CONSULTANTS,
13, THIRAVIA STREET, PALLIKARANAI, CHENNAI-600 100.
MOBILE : 9940087543, 9500045543
e-mail : shankarsgpm@yahoo.co.in

Er.M.SHANKAR, M.Tech(Structure), MISE, FIEI(C)
Chartered Engineer-Structural Engineer
Senior Professional Engineer
Reg.No. SE/2010/04037
SB CONSULTANTS
No.13, Thiravia Street, Pallikaranai, Chennai-600 100
Cell: 9940087543, 9445098543
e-mail : shankarsgpm@yahoo.co.in

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

Verified RealEstate™

Every claim in this document traces back to a government record.

- Legal opinions, due diligence and title verification
- Building plan, layout and sub-division approvals
- Completion and occupancy certificates, regularisation
- Escrow, negotiation and NRI property management
- Land survey, soil testing, architecture and construction

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

Prepared from the registers named on the page each finding sits on. Where a register could not be read, this document says so in its place rather than leaving the gap to be read as a clean result.