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STRUCTURAL DESIGN STABILITY CERTIFICATE.

I hereby certify that The Proposed Construction of Residential Apartment Building at old SF no 18/2(part), 21/(1A part), 21/(2 part) , New T.S. No. 1/13 Ward - AI Block No : 26, K.SATHANUR Village, Truchirappalli City Corporation. The building will withstand against the Earthquake,(Seismic Zone II as per IS 1893 (Part I) 2002) loading stress parameters are within limits of National Building Code and Bureau of Indian standards code of practice for concrete and loading. The building consists of stilt + five floors. For external and internal partition walls 230/100/ thick A. A. C block work walls are used.

The R.C.C building frame of the structure is designed as per the Indian Standard code of practice for concrete and loading as follows:

1. IS: 456-2000 Code of Practice for Plain and Reinforced concrete

2. IS: 875-1987 Code of Practice for Design loads for Buildings and structures

3. IS: 1893-2002 Criteria for Earthquakes resistant design of structures Part-1 General Provisions and Buildings

4. IS: 4326-1993 Code of Practice for Earthquakes resistant design & Construction of Buildings.

5 .IS:13920-1993 Code of Practice for Ductile detailing of concrete structures subjected to seismic forces and

6. National Building code of India-2005.

It is further certified that the above structure will be constructed from foundation to roof, as per structural designs and detailing of reinforcements furnished in our drawings. The building will be safe and Sound as per the design.

R. GANESAN M.E., (Structres)
Structural Consultant
GSTRUDS
Structural Engineering
Consultancy Centre
No:64, Nandavanam Street,
Indra Nagar, L.I.C Colony,
Trichy - 620 021. Ph: 0431-4024691
Email: ganesan _ struct@ rediffmail.com
LPA REG NO: SE/Gr/TLPA/MAY2019/029

Annexure –XIV
[See rule 51(3)]
Form 1
Structural Design Basis Report
(1) This report to accompany the application for Building Developments

Part 1	General Data		
S.No.	Description	Information	Notes
1.	Site Address	No.1/13, Pandian Salai, LIC Colony, Ayyappa Nagar, K K Nagar, Tiruchirappalli, Tamil Nadu, Pincode - 620021	
2	Name of Owner	M/s. JEYAM BUILDERS	
3	Name of Registered Developer along with the Registration Number	Regn.No: **148 /2016**	
4	Name of Registered Architect/Engineer along with the Registration Number	Ar.JANARTHANAN V **CA-95-18772**	
5	Name of Registered Structural engineer along with the Registration Number	R. GANESAN	
6	Use of the building	Residential	
7	Number of stories above ground level (including storeys to be added later, if any)	Six stories only	
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	R.C.C Frame	
10	Soil data Type of soil Design safe bearing capacity	Soft rock 390 Kn/m^2	IS:1893 C1.6.3.5.2 IS:1904 IS:1892 IS:2131 IS:2720
11	Dead loads (unit weight adopted) • Earth • Water • Brick masonry • Plain cement concrete • Reinforced cement concrete • Floor finish • Other fill materials	18 Kn/m^3 10 Kn/m^3 20 Kn/m^3 24 Kn/m^3 25 Kn/m^3 23 Kn/m^3 10 Kn/m^3	IS : 875 Part 1

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12	Imposed (live) loads		
	Floor loads Roof loads	2 Kn/m^2 1.50 Kn/m^2	IS: 875 Part 2
13	Cyclone/Wind • Speed • Design pressure intensity	47 m/sec 1.47 Kn/m^2	IS: 875 Part 3
14	Seismic zone	II	IS: 1893 (2002)
15	Importance factor	1	IS:1893(2002) Table 6
16	Seismic zone factor (Z)	0.10	IS:1893 Table 2
17	Response reduction factor	3	IS:1893 Table 7
18	Fundamental natural period – approx.	T_a- 0.66 5sec	IS:1893 C1.7.6
19	Design horizontal acceleration spectrum value (A_h)	0.034	IS: 1893 C1.6.4.2
20	♠Expansion/Separation Joints	Separate	
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

Part2	Load bearing masonry buildings		
Sl.No.	**Description**	**Information**	**Notes**
1	Building category	Does not arise	IS: 4326 C1.7 Read with IS:1893 Zone Bldg. | II III IV V Ordinary | B C D E Important | C D E E
2	Basement Provided	Does not arise	
3	Number of floors including Ground Floor (all floors including stepped floors in hill slopes)	Does not arise	
4	Type of wall masonry	Does not arise	
5	Type and mix of Mortar	Does not arise	IS: 4326 C1.8.1.2

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(3)/(7)

6	Re: size and position of openings (See note No.[i]) • Minimum distance(b5) • Ratio $(b_1+b_2+b_3)/1_1$ or $(b_6+b_7)/1_2$ • Minimum pier width between consequent opening(b_4) • Vertical distance(h_3) • Ratio of wall height to thickness 4 Ratio of wall length between cross wall to thickness	Does not arise	IS: 4326 Table 4, Fig.7
7	Horizontal seismic band • at plinth level • at window sill level • at lintel level • at ceiling level • at eave level of sloping roof	P IP NA ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐	(see note No.2) IS:4326 C18.4.6 IS: 4326 C18.3 IS: 4326 C18.4.2 IS: 4326 C18.4.3 IS: 4326 C18.4.3
	• at top of gable walls • at top of ridge walls	☐ ☐ ☐ ☐ ☐ ☐	IS: 4326 C1 8.4.4
8	Vertical reinforcing bar at corners and T junction of walls at jambs of doors and window openings	☐ ☐ ☐ ☐ ☐ ☐	IS: 4326 C1 8.4.8. IS: 4326 C1 8.4.9
9	Integration of prefab roofing/flooring elements through reinforced concrete screed.	☐ ☐ ☐	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	☐ ☐ ☐ ☐ ☐ ☐	

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

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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	Six only	
4	Horizontal floor system • Beams and slabs • Waffles • Ribbed floor • Flat slab with drops • Flat plate without drops	Beams and slabs	
5	Soil data Type of soil Recommended type of foundation -Independent footings -Raft -Piles	Soft rock independent & Combined footing	IS: 1498
	Recommended bearing capacity of soil Recommended type, length, diameter and load capacity of piles Depth of water table Chemical analysis of groundwater Chemical analysis of soil	39 T/m^2 - 3m below ground level - -	
6	Foundations Depth below ground level Type Independent Interconnected Raft Piles	3.25m Independent	
7	System of interconnecting foundations Plinth beams Foundation beams	Foundations Plinth beams	IS: 1893 C1 7.12.1
8	Grades if concrete used in different parts of building	M25	
9	Method of analysis used	Finite Element Method	

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10	Computer software used	STAAD PRO	
11	Torsion included	Designed	IS: 1893 C1 7.9
12	Base shear Based on approximate fundamental period Based on dynamic analysis Ratio of a/b	1961 kn	 IS: 1893 Cl. 7.5.3
13	Distribution of seismic forces along the height of the building.	Separately enclosed	IS:1893 Cl.7.7 (Provide sketch)
14	The Column of soft ground storey specially designed.	Designed	IS: 1893 Cl.7.10
15	Clear minimum cover provided in Footing Column Beams Slabs Walls	 50 mm 32 mm 32 mm 25 mm 32 mm	IS: 456 Cl. 26.4
16	Ductile detailing of RC frame Type of reinforcement used Minimum dimension of beams Minimum dimension of columns Minimum percentage of reinforcement of beams at any cross section Maximum percentage of reinforcement at any section of beam Spacing of transverse reinforcement in 2-d length of beams near the ends Ratio of capacity of beams in shear to capacity of beams in flexure Maximum percentage of reinforcement in column	 TMT Bars 0.30 X 0.38 0.30 X 0.45 0.24% 2.50% d/4 0.50 % 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.26.5.1.1(b) IS: 13920 Cl.6.2.2 IS: 13920 Cl.6.3.5
	Confining stirrups near ends of columns and in beam-column joints Diameter Spacing Ratio of shear capacity of columns to maximum seismic shear in the storey.	 10mm Dia 75 mm C/C Less than 1	IS: 456 Cl.26.5.3.1 IS: 13920 Cl. 7.4
17	Does the features require clearance by SDRP Example: High rise building Prefab building Building in hazard prone areas	Does not arise	

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Foundation

i. In case raft foundation has been adopted, indicate K value used for analysis of theraft.
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 countering water pressure, and indicate the existing water table, and that assumed to design foundations.

Idealization for Earthquake analysis

i In case of composite system of shear walls and rigid 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 idealization 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	o Simple o Semi-rigid o Rigid	IS:800 Cl3.4.4 IS:800 Cl.3.4.5 IS:800Cl.3.5.6
2	Design based on	o Elastic analysis o Plastic analysis	IS: 800 Section-9 SP;6 (6)
3	Floor construction	o Composite o Non composite o Boarded	
4	Roof construction	o Composite o Non composite o Metal o 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.3.13
8	Structural members	o Encased in concrete Not encased	IS: 800 Section-10

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9	Proposed material	○ General weld-able ○ High strength ○ Cold formed ○ Tubular	IS:2062 IS:8500 IS: 801, 811 IS: 806
10.	Minimum met al thickness Specified for corrosion protection	○ Hot rolled sections ○ Cold formed sections ○ Tubes	IS: 800, Cl.3.8 Cl.3.8.1 to Cl.3.8.4 Cl.3.8.5
11	Structural connections	○ Rivets ○ CT Bolts ○ S H F G Bolts ○ Black Bolts ○ Welding field Shop (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, wit h method	○ Rating .....hours ○ Method proposed. -In tumescent painting -Spraying -Quilting -Fire retardant boarding	IS: 1641, 1642, 1643

Part-5

Any special weakness in the building making it vulnerable for stability related failure and the precaution to be taken during execution/completion and finishing to be indicated.

Part-6

Recommendations of structural Engineer with respect to special requirements needed With respect to structural safety and stability to be taken note of by competent authority feature like incorporation of swimming pool, heavy load on roof ,prefabricated structure or any other hazardous features should be included.

For JEYAM BUILDERS

Managing Partner

R. GANESAN M.E., (Structres)
Structural Consultant
GSTRUDS
Structural Engineering
Consultancy Centre
No:64, Nandavanam Street,
Indra Nagar, L.I.C Colony,
Trichy - 620 021. Ph: 0431-4024691
Email: ganesan _ struct@ rediffmail.com
LPA REG NO: SE/Gr/TLPA/MAY2019/029



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Property Valuation & Cost Estimation

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

Ownership, Compliance & Legal Verification

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

Zoning & Land Use Analysis

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

Property Documentation & Workflow Tools

Forms & Templates, Document Generator, Document Translation, Dictionary

Vastu & Property Management Tools

Home Vastu Shastra, Plot Vastu Shastra, Property Management

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