Verified RealEstate™

RE REGULATORY RECORD

RERA Document

The document as the regulator published it, reproduced in full behind this page.

Published for reference. The authority's own register is the operative record.

Verified RealEstate™
3/350/2 Mettukuppam,
OMR Thoraipakkam,
Chennai 600 097, India

hello@verified.realestate
+91 9996 12 9996
verified.realestate

DIGITALLY VERIFIED RECORD

Er. S.PRAVEEN KUMAR, M.Tech., A.M.I.E.,
REGISTERED STRUCTURAL ENGINEER, GRADE-1,
PS STRUCTURES
#1105-2, Vijayaragavan Nagar, Jagir Ammapalayam, Salem - 636 302,
E-mail : structuresps@gmail.com, Mobile No.: +91 96295 68810.

STABILITY CERTIFICATE

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

The detailed engineering and structure design of the Proposed Construction of Residential building Stilt+8 floors in Ward-AA(27), Block No.22, New T.S.No. 1, (Old S.F.No. 435/1) Plot No. 1 to 7, at Sowripalayam Village, Coimbatore Corporation South Part, Coimbatore South Taluk, Coimbatore District has been done by me/us based on the report of geotechnical investigation (soil test) done by GLOBAL SOIL TESTING AND STRUCTURAL FORUM Report No. Global/Soil/2025/577 Dated 03.06.2025 and considering the functional requirement of the building.

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

3. I/We further certify that:

(i) The minimum grade of concrete is M35

(ii) The design and analysis has been done using the code of practice for plain and reinforced concrete as per IS 456, design loads as per IS Codes No 875 (Part 1 & 2) and design of earthquake resistant structure as per IS Code No 1893(Part-1):2016

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

STRUCTURAL CONSULTANT
PS STRUCTURES
SALEM - 636 302

Er.S.PRAVEEN KUMAR, M.Tech.,A.M.I.E.,
REGISTERED STRUCTURAL ENGINEER
SDTCP / RSE / GR-1 / 03 / 2022
PS STRUCTURES
1105-2, Vijayaragavan Nagar,
Jagir Ammapalayam, Salem - 636 302.
Email : structuresps@gmail.com.

GST IN : 33ABJFP5953F1Z3

Er. S.PRAVEEN KUMAR, M.Tech., A.M.I.E.,
REGISTERED STRUCTURAL ENGINEER, GRADE-1,
PS STRUCTURES
#1105-2, Vijayaragavan Nagar, Jagir Ammapalayam, Salem - 636 302,
E-mail : structuresps@gmail.com, Mobile No.: +91 96295 68810.

HAVEN - RESIDENTIAL APARTMENT
DESIGN CALCULATION REPORT

1.1 Introduction

The Proposed Construction of Residential building Stilt+8 floors in Ward-AA(27), Block No.22, New T.S.No. 1, (Old S.F.No. 435/1) Plot No. 1 to 7, at Sowripalayam Village, Coimbatore Corporation South Part, Coimbatore South Taluk, Coimbatore District. This report presents material properties, loads and load combinations, static & Dynamic analysis.

1.2 Building Description

The structure consists of Stilt + Eight Floors and has Irregular plan dimensions of approximately 87.64m x 26.15m on ground level.

The height of the building above ground level is 29.70m excluding lift & staircase, Head Room & Machine Room.

. The structure comprises of RC wall, column, beam & slabs. Lateral stability of the structure is mainly provided by Reinforced Concrete walls & columns.

Safe bearing capacity of the soil is taken as 27.0 t/m2 at 4.2m from existing ground level per Geo-technical Investigation report.

1.3 Grade of Concrete

Footing	:	M35
Column	:	M35
Wall	:	M35
Beam	:	M35
Slab	:	M35
All other Structural components	:	M35

1.4 Codes Followed

Following codes are used for designing and detailing of members.

IS 875-1987 (Part 1) Dead loads

IS 875-1987 (Part 2) Live loads

IS 875-2015 (Part 3) Wind loads

IS 875-1987 (Part 5) Special Loads and combinations

STRUCTURAL CONSULTANT
PS STRUCTURES
SALEM - 636 302

Er.S.PRAVEEN KUMAR, M.Tech.,A.M.I.E.,
REGISTERED STRUCTURAL ENGINEER
SDTCP / RSE / GR-1 / 03 / 2022
PS STRUCTURES
1105-2, Vijayaragavan Nagar,
Jagir Ammapalayam, Salem - 636 302.
Email : structuresps@gmail.com.

GST IN : 33ABJFP5953F1Z3

Er. S.PRAVEEN KUMAR, M.Tech., A.M.I.E.,
REGISTERED STRUCTURAL ENGINEER, GRADE-1,
PS STRUCTURES
#1105-2, Vijayaragavan Nagar, Jagir Ammapalayam, Salem - 636 302,
E-mail : structuresps@gmail.com, Mobile No.: +91 96295 68810.

IS 1893-2016 (Part 1) Earthquake loads

IS 13920-2016 - Ductile Design and Detailing of Reinforced Concrete Structures Subjected to Seismic Forces

1.4 Wall Load :

230mm thick RC wall load calculation = 0.23x8x3.0= 5.5 kN/m

115mm thick RC wall load calculation (Partition Wall) = 0.115x8x3.0= 2.76kN/m

1.5 Floor Finish :

Floor	Intensity in kN/m² of plan area
Hall, Bedroom,Kitchen, Dining, Sitout, corridor, Lobby, Power rooms, Balcony	1.0 (15mm Tile + 20 mm cement mortar + 12.5mm ceiling Plaster) (0.015x20+0.020x20.4+0.0125x20.4)=1.00 (Approximately)
Toilet	3.4 (300mm AAC Light weight Broken blocks with mortar at 8 kN/m² + 15mm Tile + 20 mm cement mortar +12.5mm ceiling Plaster)
Solar Panel Terrace	2.2 (75mm thick Lime & Surkhi with mortar & weathering Tile + 12.5mm ceiling Plaster + Solar Panel)
Staircase, Swimming Pool, Podium	1.5 (15mm Tile + 20 mm cement mortar + 12.5mm ceiling Plaster)+0.5 (0.015x20+0.020x20.4+0.0125x20.4)+0.5 =1.50 (Approximately)

1.6 Live Loads

These loads are considered for the analysis in addition to dead loads as follows,

Hall, Kitchen, Dining, Bedroom	=	2.0 kN/m²
WC & Toilet	=	2.0 kN/m²
Lobby, Corridor, Staircase	=	3.0 kN/m²
Services, Sunken Seater	=	3.0 kN/m² or as per actuals
Lift Machine rooms	=	10.0 kN/m² or as per actuals
Live Load on Terrace	=	1.5 kN/m²
Solar Panel Load on Roof	=	0.3 kN/m²

STRUCTURAL CONSULTANT PS STRUCTURES SALEM - 636 302

GST IN : 33ABJFP5953F1Z3

Er.S.PRAVEEN KUMAR, M.Tech.,A.M.I.E.,
REGISTERED STRUCTURAL ENGINEER
SDTCP / RSE / GR-1 / 03 / 2022
PS STRUCTURES
1105-2, Vijayaragavan Nagar,
Jagir Ammapalayam, Salem - 636 302.
Email : structuresps@gmail.com.

Er. S.PRAVEEN KUMAR, M.Tech., A.M.I.E.,
REGISTERED STRUCTURAL ENGINEER, GRADE-1,
PS STRUCTURES
#1105-2, Vijayaragavan Nagar, Jagir Ammapalayam, Salem - 636 302,
E-mail : structuresps@gmail.com, Mobile No.: +91 96295 68810.

1.7 Seismic Load Parameters

The building comes under the seismic zone III and the seismic parameters considered for analysis are as follows:

Height of the Building, H	=	29.70 m
Seismic Zone	=	III
Seismic Zone Factor, Z	=	0.16
Importance Factor, I	=	1.2
Response Reduction Factor, R	=	5 (SMRF)

(SMRF- Special Moment Resisting Frame, Designed & detailed as per IS 456 & SP34)

Percentage Damping	=	5%
Soil Type	=	I (Hard)
Average response acc. coefft. Sa/g	=	As per IS: 1893 : 2016

1.8 Wind Load Parameters

The building located in Coimbatore region and the wind parameters are considered as per IS 875 part : 3 (2015).

Wind Speed	=	39 m/s
Terrain Category	=	3
Importance factor	=	1.0
Risk Coefficient, K1	=	1.0
Topography, K3	=	1

Cp values are arrived based on the codal provisions.

1.9 Analysis of Structure

The analysis of the structure is carried out by mathematical modelling of the structure in ETABS and performing an analysis run.

The proposed Building is modeled and analyzed using ETABS. The physical structure of a building is transformed into a mathematical model for structural analysis using 3D frame & Shell elements.

STRUCTURAL CONSULTANT PS STRUCTURES SALEM - 636 302

GST IN : 33ABJFP5953F1Z3

Er.S.PRAVEEN KUMAR, M.Tech.,A.M.I.E.,
REGISTERED STRUCTURAL ENGINEER
SDTCP / RSE / GR-1 / 03 / 2022
PS STRUCTURES
1105-2, Vijayaragavan Nagar,
Jagir Ammapalayam, Salem - 636 302.
Email : structuresps@gmail.com.

Er. S.PRAVEEN KUMAR, M.Tech., A.M.I.E.,
REGISTERED STRUCTURAL ENGINEER, GRADE-1,
PS STRUCTURES
#1105-2, Vijayaragavan Nagar, Jagir Ammapalayam, Salem - 636 302,
E-mail : structuresps@gmail.com, Mobile No.: +91 96295 68810.

The entire structure is composed of an integrated three-dimensional structure of RC columns, beams and slabs, forming a building with a ductile frame system to act as one unit responding to the loading on the structure.

Staircase waist slab and terrace tank slabs are modelled with respect to architectural drawing.

2.1 Design of Structure

Limit State design using IS: 456-2000 is carried out for RC Footings, walls/Columns and beams using the forces obtained from the critical combination of loads from the analysis results in E-TABS software.

Components like Roof Slabs and staircases designed using simplified provisions as per applicable codes with the help of spread sheets developed in-house.

PIERWALL DESIGN - PIERWALL (230x1220) GRID E17

ETABS Shear Wall Design

IS 456:2000 Pier Design

Pier Details

Story ID	Pier ID	Centroid X (mm)	Centroid Y (mm)	Length (mm)	Thickness (mm)	LLRF
STILT	P30	26900	11058.8	1220	230	0.6

Material Properties

E_c (MPa)	f_{ck} (MPa)	Lt.Wt Factor (Unitless)	f_y (MPa)	f_{ys} (MPa)
29580.4	35	1	500	500

Design Code Parameters

Γ_S	Γ_C	IP_{MAX}	IP_{MIN}	P_{MAX}	MinEcc Major	MinEcc Minor
1.15	1.5	0.04	0.0025	0.8	Yes	Yes

Pier Leg Location, Length and Thickness

Station Location	ID	Left X_1 mm	Left Y_1 mm	Right X_2 mm	Right Y_2 mm	Length mm	Thickness mm
Top	Leg 1	26290	11058.8	27510	11058.8	1220	230
Bottom	Leg 1	26290	11058.8	27510	11058.8	1220	230

STRUCTURAL CONSULTANT PS STRUCTURES SALEM - 636 302

GST IN : 33ABJFP5953F1Z3

Er.S.PRAVEEN KUMAR, M.Tech.,A.M.I.E.,
REGISTERED STRUCTURAL ENGINEER
SDTCP / RSE / GR-1 / 03 / 2022
PS STRUCTURES
1105-2, Vijayaragavan Nagar,
Jagir Ammapalayam, Salem - 636 302.
Email : structuresps@gmail.com.

Er. S.PRAVEEN KUMAR, M.Tech., A.M.I.E.,

REGISTERED STRUCTURAL ENGINEER, GRADE-1,

PS STRUCTURES

#1105-2, Vijayaragavan Nagar, Jagir Ammapalayam, Salem - 636 302,

E-mail : structuresps@gmail.com, Mobile No.: +91 96295 68810.

Flexural Design for P_u, M_{u2} and M_{u3}

Station Location	Required Rebar Area (mm²)	Required Reinf Ratio	Current Reinf Ratio	Flexural Combo	P_u kN	M_{u2} kN-m	M_{u3} kN-m	Pier A_g mm²
Top	4195	0.015	0.0034	UDConS29	3256	138.9895	-323.8415	280600
Bottom	7655	0.0273	0.0034	UDConS29	3300	140.6838	883.8074	280600

Shear Design

Station Location	ID	Rebar mm²/m	Shear Combo	P_u kN	M_u kN-m	V_u kN	V_c kN	$V_c + V_s$ kN
Top	Leg 1	575	UDConS29	2045	268.0817	280	109	311
Bottom	Leg 1	575	UDConS29	2089	883.8074	280	109	311

Boundary Element Check

Station Location	ID	Edge Length (mm)	Governing Combo	P_u kN	M_u kN-m	Stress Comp MPa	Stress Limit MPa
Top–Left	Leg 1	345	UDConS19	3340	-283.0831	16.87	7
Top–Right	Leg 1	345	UDConS19	3256	268.0817	16.3	7
Bottom–Left	Leg 1	460	UDConS29	3300	-791.6123	25.64	7
Botttom–Right	Leg 1	460	UDConS29	3384	826.7896	26.55	7

ETABS Shear Wall Design

IS 456:2000 Pier Design

Pier Details

Story ID	Pier ID	Centroid X (mm)	Centroid Y (mm)	Length (mm)	Thickness (mm)	LLRF
1	P30	26900	11058.8	1220	230	0.6

Material Properties

E_c (MPa)	f_{ck} (MPa)	Lt.Wt Factor (Unitless)	f_y (MPa)	f_{ys} (MPa)
29580.4	35	1	500	500

Design Code Parameters

Γ_S	Γ_C	IP_{MAX}	IP_{MIN}	P_{MAX}	MinEcc Major	MinEcc Minor
1.15	1.5	0.04	0.0025	0.8	Yes	Yes

Pier Leg Location, Length and Thickness

Station Location	ID	Left X_1 mm	Left Y_1 mm	Right X_2 mm	Right Y_2 mm	Length mm	Thickness mm
Top	Leg 1	26290	11058.8	27510	11058.8	1220	230
Bottom	Leg 1	26290	11058.8	27510	11058.8	1220	230

Flexural Design for P_u, M_{u2} and M_{u3}

Station Location	Required Rebar Area (mm²)	Required Reinf Ratio	Current Reinf Ratio	Flexural Combo	P_u kN	M_{u2} kN-m	M_{u3} kN-m	Pier A_g mm²
Top	2836	0.0101	0.0034	UDConS29	3112	78.1901	588.4081	280600
Bottom	1429	0.0051	0.0034	UDConS29	3145	78.9394	-316.7579	280600

STRUCTURAL CONSULTANT
PS STRUCTURES
SALEM - 636 302

GST IN : 33ABJFP5953F1Z3

Er.S.PRAVEEN KUMAR, M.Tech.,A.M.I.E.,
REGISTERED STRUCTURAL ENGINEER
SDTCP / RSE / GR-1 / 03 / 2022
PS STRUCTURES
1105-2, Vijayaragavan Nagar,
Jagir Ammapalayam, Salem - 636 302.
Email : structuresps@gmail.com.

Er. S.PRAVEEN KUMAR, M.Tech., A.M.I.E.,

REGISTERED STRUCTURAL ENGINEER, GRADE-1,

PS STRUCTURES

#1105-2, Vijayaragavan Nagar, Jagir Ammapalayam, Salem - 636 302,

E-mail : structuresps@gmail.com, Mobile No.: +91 96295 68810.

Shear Design

Station Location	ID	Rebar mm²/m	Shear Combo	P_u kN	M_u kN-m	V_u kN	V_c kN	$V_c + V_s$ kN
Top	Leg 1	575	UDConS29	1966	588.4081	-270	133	336
Bottom	Leg 1	575	UDConS29	1999	299.9163	-270	125	328

Boundary Element Check

Station Location	ID	Edge Length (mm)	Governing Combo	P_u kN	M_u kN-m	Stress Comp MPa	Stress Limit MPa
Top–Left	Leg 1	345	UDConS19	3198	-284.7235	16.39	7
Top–Right	Leg 1	460	UDConS19	3112	588.4081	21.4	7
Bottom–Left	Leg 1	345	UDConS29	3145	-316.7579	16.76	7
Botttom–Right	Leg 1	345	UDConS29	3232	277.8616	16.39	7

ETABS Shear Wall Design

IS 456:2000 Pier Design

Pier Details

Story ID	Pier ID	Centroid X (mm)	Centroid Y (mm)	Length (mm)	Thickness (mm)	LLRF
2	P30	26900	11058.8	1220	230	0.6

Material Properties

E_c (MPa)	f_{ck} (MPa)	Lt.Wt Factor (Unitless)	f_y (MPa)	f_{ys} (MPa)
29580.4	35	1	500	500

Design Code Parameters

Γ_S	Γ_C	IP_{MAX}	IP_{MIN}	P_{MAX}	MinEcc Major	MinEcc Minor
1.15	1.5	0.04	0.0025	0.8	Yes	Yes

Pier Leg Location, Length and Thickness

Station Location	ID	Left X_1 mm	Left Y_1 mm	Right X_2 mm	Right Y_2 mm	Length mm	Thickness mm
Top	Leg 1	26290	11058.8	27510	11058.8	1220	230
Bottom	Leg 1	26290	11058.8	27510	11058.8	1220	230

Flexural Design for P_u, M_{u2} and M_{u3}

Station Location	Required Rebar Area (mm²)	Required Reinf Ratio	Current Reinf Ratio	Flexural Combo	P_u kN	M_{u2} kN-m	M_{u3} kN-m	Pier A_g mm²
Top	5157	0.0184	0.0034	UDConS29	2766	73.7983	-945.5024	280600
Bottom	7570	0.027	0.0034	UDConS19	2871	64.1891	1258.1983	280600

Shear Design

Station Location	ID	Rebar mm²/m	Shear Combo	P_u kN	M_u kN-m	V_u kN	V_c kN	$V_c + V_s$ kN
Top	Leg 1	1450.76	UDConS19	2836	-877.6258	642	131	642
Bottom	Leg 1	1450.76	UDConS19	2871	1258.1983	642	131	642

STRUCTURAL CONSULTANT
PS STRUCTURES
SALEM - 636 302

GST IN : 33ABJFP5953F1Z3

Er.S.PRAVEEN KUMAR, M.Tech.,A.M.I.E.,
REGISTERED STRUCTURAL ENGINEER
SDTCP / RSE / GR-1 / 03 / 2022
PS STRUCTURES
1105-2, Vijayaragavan Nagar,
Jagir Ammapalayam, Salem - 636 302.
Email : structuresps@gmail.com.

Er. S.PRAVEEN KUMAR, M.Tech., A.M.I.E.,
REGISTERED STRUCTURAL ENGINEER, GRADE-1,
PS STRUCTURES
#1105-2, Vijayaragavan Nagar, Jagir Ammapalayam, Salem - 636 302,
E-mail : structuresps@gmail.com, Mobile No.: +91 96295 68810.

Boundary Element Check

Station Location	ID	Edge Length (mm)	Governing Combo	P_u kN	M_u kN-m	Stress Comp MPa	Stress Limit MPa
Top–Left	Leg 1	460	UDConS19	2836	-877.6258	25.49	7
Top–Right	Leg 1	460	UDConS19	2766	895.5425	25.55	7
Bottom–Left	Leg 1	460	UDConS29	2800	-1010.7369	27.69	7
Botttom–Right	Leg 1	575	UDConS29	2871	1258.1983	32.28	7

ETABS Shear Wall Design

IS 456:2000 Pier Design

Pier Details

Story ID	Pier ID	Centroid X (mm)	Centroid Y (mm)	Length (mm)	Thickness (mm)	LLRF
3	P30	26900	11058.8	1220	230	0.6

Material Properties

E_c (MPa)	f_{ck} (MPa)	Lt.Wt Factor (Unitless)	f_y (MPa)	f_{ys} (MPa)
29580.4	35	1	500	500

Design Code Parameters

Γ_S	Γ_C	IP_{MAX}	IP_{MIN}	P_{MAX}	MinEcc Major	MinEcc Minor
1.15	1.5	0.04	0.0025	0.8	Yes	Yes

Pier Leg Location, Length and Thickness

Station Location	ID	Left X_1 mm	Left Y_1 mm	Right X_2 mm	Right Y_2 mm	Length mm	Thickness mm
Top	Leg 1	26290	11058.8	27510	11058.8	1220	230
Bottom	Leg 1	26290	11058.8	27510	11058.8	1220	230

Flexural Design for P_u, M_{u2} and M_{u3}

Station Location	Required Rebar Area (mm²)	Required Reinf Ratio	Current Reinf Ratio	Flexural Combo	P_u kN	M_{u2} kN-m	M_{u3} kN-m	Pier A_g mm²
Top	4381	0.0156	0.0034	UDConS19	2390	-58.8581	-956.6319	280600
Bottom	5485	0.0195	0.0034	UDConS19	2425	59.6614	1093.6638	280600

Shear Design

Station Location	ID	Rebar mm²/m	Shear Combo	P_u kN	M_u kN-m	V_u kN	V_c kN	$V_c + V_s$ kN
Top	Leg 1	1377.18	UDConS19	2390	-956.6319	616	131	616
Bottom	Leg 1	1377.18	UDConS19	2425	1093.6638	616	131	616

STRUCTURAL CONSULTANT
PS STRUCTURES
SALEM - 636 302

Er.S.PRAVEEN KUMAR, M.Tech.,A.M.I.E.,
REGISTERED STRUCTURAL ENGINEER
SDTCP / RSE / GR-1 / 03 / 2022
PS STRUCTURES
1105-2, Vijayaragavan Nagar,
Jagir Ammapalayam, Salem - 636 302.
Email : structuresps@gmail.com.

GST IN : 33ABJFP5953F1Z3

Er. S.PRAVEEN KUMAR, M.Tech., A.M.I.E.,

REGISTERED STRUCTURAL ENGINEER, GRADE-1,

PS STRUCTURES

#1105-2, Vijayaragavan Nagar, Jagir Ammapalayam, Salem - 636 302,

E-mail : structuresps@gmail.com, Mobile No.: +91 96295 68810.

Boundary Element Check

Station Location	ID	Edge Length (mm)	Governing Combo	P_u kN	M_u kN-m	Stress Comp MPa	Stress Limit MPa
Top–Left	Leg 1	460	UDConS19	2390	-956.6319	25.29	7
Top–Right	Leg 1	345	UDConS19	2368	861.504	23.54	7
Bottom–Left	Leg 1	345	UDConS29	2402	-837.3625	23.24	7
Botttom–Right	Leg 1	460	UDConS29	2425	1093.6638	27.81	7

ETABS Shear Wall Design

IS 456:2000 Pier Design

Pier Details

Story ID	Pier ID	Centroid X (mm)	Centroid Y (mm)	Length (mm)	Thickness (mm)	LLRF
4	P30	26900	11058.8	1220	230	0.6

Material Properties

E_c (MPa)	f_{ck} (MPa)	Lt.Wt Factor (Unitless)	f_y (MPa)	f_{ys} (MPa)
29580.4	35	1	500	500

Design Code Parameters

Γ_S	Γ_C	IP_{MAX}	IP_{MIN}	P_{MAX}	MinEcc Major	MinEcc Minor
1.15	1.5	0.04	0.0025	0.8	Yes	Yes

Pier Leg Location, Length and Thickness

Station Location	ID	Left X_1 mm	Left Y_1 mm	Right X_2 mm	Right Y_2 mm	Length mm	Thickness mm
Top	Leg 1	26290	11058.8	27510	11058.8	1220	230
Bottom	Leg 1	26290	11058.8	27510	11058.8	1220	230

Flexural Design for P_u, M_{u2} and M_{u3}

Station Location	Required Rebar Area (mm²)	Required Reinf Ratio	Current Reinf Ratio	Flexural Combo	P_u kN	M_{u2} kN-m	M_{u3} kN-m	Pier A_g mm²
Top	4325	0.0154	0.0034	UDConS19	1979	-49.2172	-1008.9674	280600
Bottom	4712	0.0168	0.0034	UDConS19	2014	50.0204	1052.0347	280600

Shear Design

Station Location	ID	Rebar mm²/m	Shear Combo	P_u kN	M_u kN-m	V_u kN	V_c kN	$V_c + V_s$ kN
Top	Leg 1	1389.79	UDConS19	1979	-1008.9674	620	131	620
Bottom	Leg 1	1389.79	UDConS19	2014	1052.0347	620	131	620

STRUCTURAL CONSULTANT
PS STRUCTURES
SALEM - 636 302

Er.S.PRAVEEN KUMAR, M.Tech.,A.M.I.E.,
REGISTERED STRUCTURAL ENGINEER
SDTCP / RSE / GR-1 / 03 / 2022
PS STRUCTURES
1105-2, Vijayaragavan Nagar,
Jagir Ammapalayam, Salem - 636 302.
Email : structuresps@gmail.com.

GST IN : 33ABJFP5953F1Z3

Er. S.PRAVEEN KUMAR, M.Tech., A.M.I.E.,
REGISTERED STRUCTURAL ENGINEER, GRADE-1,
PS STRUCTURES
#1105-2, Vijayaragavan Nagar, Jagir Ammapalayam, Salem - 636 302,
E-mail : structuresps@gmail.com, Mobile No.: +91 96295 68810.

Boundary Element Check

Station Location	ID	Edge Length (mm)		Governing Combo	P_u kN	M_u kN-m	Stress Comp MPa	Stress Limit MPa
Top–Left	Leg 1	345		UDConS29	2009	-920.3851	23.29	7
Top–Right	Leg 1	345		UDConS29	2009	854.9672	22.14	7
Bottom–Left	Leg 1	345		UDConS29	2044	-810.4231	21.49	7
Botttom–Right	Leg 1	460		UDConS29	2014	1052.0347	25.61	7

ETABS Shear Wall Design

IS 456:2000 Pier Design

Pier Details

Story ID	Pier ID	Centroid X (mm)	Centroid Y (mm)	Length (mm)	Thickness (mm)	LLRF
5	P30	26900	11058.8	1220	230	0.6

Material Properties

E_c (MPa)	f_{ck} (MPa)	Lt.Wt Factor (Unitless)	f_y (MPa)	f_{ys} (MPa)
29580.4	35	1	500	500

Design Code Parameters

Γ_S	Γ_C	IP_{MAX}	IP_{MIN}	P_{MAX}	MinEcc Major	MinEcc Minor
1.15	1.5	0.04	0.0025	0.8	Yes	Yes

Pier Leg Location, Length and Thickness

Station Location	ID	Left X_1 mm	Left Y_1 mm	Right X_2 mm	Right Y_2 mm	Length mm	Thickness mm
Top	Leg 1	26290	11058.8	27510	11058.8	1220	230
Bottom	Leg 1	26290	11058.8	27510	11058.8	1220	230

Flexural Design for P_u, M_{u2} and M_{u3}

Station Location	Required Rebar Area (mm²)	Required Reinf Ratio	Current Reinf Ratio	Flexural Combo	P_u kN	M_{u2} kN-m	M_{u3} kN-m	Pier A_g mm²
Top	4382	0.0156	0.0034	UDConS19	1569	-39.3332	-1044.4022	280600
Bottom	4084	0.0146	0.0034	UDConS19	1604	40.1364	1007.1321	280600

Shear Design

Station Location	ID	Rebar mm²/m	Shear Combo	P_u kN	M_u kN-m	V_u kN	V_c kN	$V_c + V_s$ kN
Top	Leg 1	1386.09	UDConS19	1569	-1044.4022	619	131	619
Bottom	Leg 1	1386.09	UDConS19	1604	1007.1321	619	131	619

Boundary Element Check

Station Location	ID	Edge Length (mm)	Governing Combo	P_u kN	M_u kN-m	Stress Comp MPa	Stress Limit MPa
Top–Left	Leg 1	345	UDConS29	1653	-910.2094	21.84	7
Top–Right	Leg 1	345	UDConS29	1653	836.2549	20.55	7
Bottom–Left	Leg 1	345	UDConS29	1687	-780.1225	19.69	7
Botttom–Right	Leg 1	345	UDConS29	1687	876.1659	21.37	7

STRUCTURAL CONSULTANT
PS STRUCTURES
SALEM - 636 302

GST IN : 33ABJFP5953F1Z3

Er.S.PRAVEEN KUMAR, M.Tech.,A.M.I.E.,
REGISTERED STRUCTURAL ENGINEER
SDTCP / RSE / GR-1 / 03 / 2022
PS STRUCTURES
1105-2, Vijayaragavan Nagar,
Jagir Ammapalayam, Salem - 636 302.
Email : structuresps@gmail.com.

Er. S.PRAVEEN KUMAR, M.Tech., A.M.I.E.,
REGISTERED STRUCTURAL ENGINEER, GRADE-1,
PS STRUCTURES
#1105-2, Vijayaragavan Nagar, Jagir Ammapalayam, Salem - 636 302,
E-mail : structuresps@gmail.com, Mobile No.: +91 96295 68810.

ETABS Shear Wall Design

IS 456:2000 Pier Design

Pier Details

Story ID	Pier ID	Centroid X (mm)	Centroid Y (mm)	Length (mm)	Thickness (mm)	LLRF
6	P30	26900	11058.8	1220	230	0.7

Material Properties

E_c (MPa)	f_{ck} (MPa)	Lt.Wt Factor (Unitless)	f_y (MPa)	f_{ys} (MPa)
29580.4	35	1	500	500

Design Code Parameters

Γ_S	Γ_C	IP_{MAX}	IP_{MIN}	P_{MAX}	MinEcc Major	MinEcc Minor
1.15	1.5	0.04	0.0025	0.8	Yes	Yes

Pier Leg Location, Length and Thickness

Station Location	ID	Left X_1 mm	Left Y_1 mm	Right X_2 mm	Right Y_2 mm	Length mm	Thickness mm
Top	Leg 1	26290	11058.8	27510	11058.8	1220	230
Bottom	Leg 1	26290	11058.8	27510	11058.8	1220	230

Flexural Design for P_u, M_{u2} and M_{u3}

Station Location	Required Rebar Area (mm²)	Required Reinf Ratio	Current Reinf Ratio	Flexural Combo	P_u kN	M_{u2} kN-m	M_{u3} kN-m	Pier A_g mm²
Top	4054	0.0144	0.0034	UDConS24	541	14.4558	930.6103	280600
Bottom	3325	0.0119	0.0034	UDConS23	776	20.2452	859.1918	280600

Shear Design

Station Location	ID	Rebar mm²/m	Shear Combo	P_u kN	M_u kN-m	V_u kN	V_c kN	$V_c + V_s$ kN
Top	Leg 1	1207.73	UDConS19	1187	-968.0095	556	131	556
Bottom	Leg 1	1207.73	UDConS19	1221	872.0002	556	131	556

Boundary Element Check

Station Location	ID	Edge Length (mm)	Governing Combo	P_u kN	M_u kN-m	Stress Comp MPa	Stress Limit MPa
Top–Left	Leg 1	345	UDConS29	1304	-829.2254	19.18	7
Top–Right	Leg 1	345	UDConS29	1304	782.4764	18.36	7
Bottom–Left	Leg 1	230	UDConS29	1338	-712.5545	17.26	7
Botttom–Right	Leg 1	345	UDConS29	1338	776.5964	18.38	7

STRUCTURAL CONSULTANT
PS STRUCTURES
SALEM - 636 302

Er.S.PRAVEEN KUMAR, M.Tech.,A.M.I.E.,
REGISTERED STRUCTURAL ENGINEER
SDTCP / RSE / GR-1 / 03 / 2022
PS STRUCTURES
1105-2, Vijayaragavan Nagar,
Jagir Ammapalayam, Salem - 636 302.
Email : structuresps@gmail.com.

GST IN : 33ABJFP5953F1Z3

Er. S.PRAVEEN KUMAR, M.Tech., A.M.I.E.,
REGISTERED STRUCTURAL ENGINEER, GRADE-1,
PS STRUCTURES
#1105-2, Vijayaragavan Nagar, Jagir Ammapalayam, Salem - 636 302,
E-mail : structuresps@gmail.com, Mobile No.: +91 96295 68810.

ETABS Shear Wall Design

IS 456:2000 Pier Design

Pier Details

Story ID	Pier ID	Centroid X (mm)	Centroid Y (mm)	Length (mm)	Thickness (mm)	LLRF
7	P30	26900	11058.8	1220	230	0.8

Material Properties

E_c (MPa)	f_{ck} (MPa)	Lt.Wt Factor (Unitless)	f_y (MPa)	f_{ys} (MPa)
29580.4	35	1	500	500

Design Code Parameters

Γ_S	Γ_C	IP_{MAX}	IP_{MIN}	P_{MAX}	MinEcc Major	MinEcc Minor
1.15	1.5	0.04	0.0025	0.8	Yes	Yes

Pier Leg Location, Length and Thickness

Station Location	ID	Left X_1 mm	Left Y_1 mm	Right X_2 mm	Right Y_2 mm	Length mm	Thickness mm
Top	Leg 1	26290	11058.8	27510	11058.8	1220	230
Bottom	Leg 1	26290	11058.8	27510	11058.8	1220	230

Flexural Design for P_u, M_{u2} and M_{u3}

Station Location	Required Rebar Area (mm²)	Required Reinf Ratio	Current Reinf Ratio	Flexural Combo	P_u kN	M_{u2} kN-m	M_{u3} kN-m	Pier A_g mm²
Top	4392	0.0157	0.0034	UDConS23	513	-13.5465	-969.1631	280600
Bottom	3210	0.0114	0.0034	UDConS31	332	16.9741	733.6314	280600

Shear Design

Station Location	ID	Rebar mm²/m	Shear Combo	P_u kN	M_u kN-m	V_u kN	V_c kN	$V_c + V_s$ kN
Top	Leg 1	1165.77	UDConS19	830	-982.8057	541	131	541
Bottom	Leg 1	1165.77	UDConS19	865	802.9803	541	131	541

Boundary Element Check

Station Location	ID	Edge Length (mm)	Governing Combo	P_u kN	M_u kN-m	Stress Comp MPa	Stress Limit MPa
Top–Left	Leg 1	230	UDConS29	956	-861.4382	18.51	7
Top–Right	Leg 1	230	UDConS29	956	793.2255	17.31	7
Bottom–Left	Leg 1	230	UDConS29	991	-676.6535	15.39	7
Botttom–Right	Leg 1	230	UDConS29	991	747.8759	16.64	7

STRUCTURAL CONSULTANT
PS STRUCTURES
SALEM - 636 302

Er.S.PRAVEEN KUMAR, M.Tech.,A.M.I.E.,
REGISTERED STRUCTURAL ENGINEER
SDTCP / RSE / GR-1 / 03 / 2022
PS STRUCTURES
1105-2, Vijayaragavan Nagar,
Jagir Ammapalayam, Salem - 636 302.
Email : structuresps@gmail.com.

GST IN : 33ABJFP5953F1Z3

Er. S.PRAVEEN KUMAR, M.Tech., A.M.I.E.,
REGISTERED STRUCTURAL ENGINEER, GRADE-1,
PS STRUCTURES
#1105-2, Vijayaragavan Nagar, Jagir Ammapalayam, Salem - 636 302,
E-mail : structuresps@gmail.com, Mobile No.: +91 96295 68810.

ETABS Shear Wall Design

IS 456:2000 Pier Design

Pier Details

Story ID	Pier ID	Centroid X (mm)	Centroid Y (mm)	Length (mm)	Thickness (mm)	LLRF
8	P30	26900	11058.8	1220	230	0.9

Material Properties

E_c (MPa)	f_{ck} (MPa)	Lt.Wt Factor (Unitless)	f_y (MPa)	f_{ys} (MPa)
29580.4	35	1	500	500

Design Code Parameters

Γ_S	Γ_C	IP_{MAX}	IP_{MIN}	P_{MAX}	MinEcc Major	MinEcc Minor
1.15	1.5	0.04	0.0025	0.8	Yes	Yes

Pier Leg Location, Length and Thickness

Station Location	ID	Left X_1 mm	Left Y_1 mm	Right X_2 mm	Right Y_2 mm	Length mm	Thickness mm
Top	Leg 1	26290	11058.8	27510	11058.8	1220	230
Bottom	Leg 1	26290	11058.8	27510	11058.8	1220	230

Flexural Design for P_u, M_{u2} and M_{u3}

Station Location	Required Rebar Area (mm²)	Required Reinf Ratio	Current Reinf Ratio	Flexural Combo	P_u kN	M_{u2} kN-m	M_{u3} kN-m	Pier A_g mm²
Top	2872	0.0102	0.0034	UDConS23	304	-8.1149	-686.8621	280600
Bottom	2232	0.008	0.0034	UDConS31	220	13.9845	538.7384	280600

Shear Design

Station Location	ID	Rebar mm²/m	Shear Combo	P_u kN	M_u kN-m	V_u kN	V_c kN	$V_c + V_s$ kN
Top	Leg 1	721.97	UDConS23	304	-686.8621	378	124	378
Bottom	Leg 1	760.2	UDConS23	324	558.3373	378	110	378

Boundary Element Check

Station Location	ID	Edge Length (mm)	Governing Combo	P_u kN	M_u kN-m	Stress Comp MPa	Stress Limit MPa
Top–Left	Leg 1	230	UDConS29	610	-608.6828	12.84	7
Top–Right	Leg 1	230	UDConS29	610	579.1454	12.33	7
Bottom–Left	Leg 1	230	UDConS29	645	-510.4944	11.25	7
Botttom–Right	Leg 1	230	UDConS29	645	545.7994	11.86	7

STRUCTURAL CONSULTANT
PS STRUCTURES
SALEM - 636 302

Er.S.PRAVEEN KUMAR, M.Tech.,A.M.I.E.,
REGISTERED STRUCTURAL ENGINEER
SDTCP / RSE / GR-1 / 03 / 2022
PS STRUCTURES
1105-2, Vijayaragavan Nagar,
Jagir Ammapalayam, Salem - 636 302.
Email : structuresps@gmail.com.

GST IN : 33ABJFP5953F1Z3

Er. S.PRAVEEN KUMAR, M.Tech., A.M.I.E.,
REGISTERED STRUCTURAL ENGINEER, GRADE-1,
PS STRUCTURES
#1105-2, Vijayaragavan Nagar, Jagir Ammapalayam, Salem - 636 302,
E-mail : structuresps@gmail.com, Mobile No.: +91 96295 68810.

ETABS Shear Wall Design

IS 456:2000 Pier Design

Pier Details

Story ID	Pier ID	Centroid X (mm)	Centroid Y (mm)	Length (mm)	Thickness (mm)	LLRF
TERRACE	P30	26900	11058.8	1220	230	1

Material Properties

E_c (MPa)	f_{ck} (MPa)	Lt.Wt Factor (Unitless)	f_y (MPa)	f_{ys} (MPa)
29580.4	35	1	500	500

Design Code Parameters

Γ_S	Γ_C	IP_{MAX}	IP_{MIN}	P_{MAX}	MinEcc Major	MinEcc Minor
1.15	1.5	0.04	0.0025	0.8	Yes	Yes

Pier Leg Location, Length and Thickness

Station Location	ID	Left X_1 mm	Left Y_1 mm	Right X_2 mm	Right Y_2 mm	Length mm	Thickness mm
Top	Leg 1	26290	11058.8	27510	11058.8	1220	230
Bottom	Leg 1	26290	11058.8	27510	11058.8	1220	230

Flexural Design for P_u, M_{u2} and M_{u3}

Station Location	Required Rebar Area (mm²)	Required Reinf Ratio	Current Reinf Ratio	Flexural Combo	P_u kN	M_{u2} kN-m	M_{u3} kN-m	Pier A_g mm²
Top	5000	0.0178	0.0034	UDConS23	126	3.5047	-982.3177	280600
Bottom	3208	0.0114	0.0034	UDConS31	108	10.7125	671.1873	280600

Shear Design

Station Location	ID	Rebar mm²/m	Shear Combo	P_u kN	M_u kN-m	V_u kN	V_c kN	$V_c + V_s$ kN
Top	Leg 1	1078.25	UDConS19	215	-997.2105	510	131	510
Bottom	Leg 1	1088.73	UDConS19	250	677.7577	510	127	510

Boundary Element Check

Station Location	ID	Edge Length (mm)	Governing Combo	P_u kN	M_u kN-m	Stress Comp MPa	Stress Limit MPa
Top–Left	Leg 1	230	UDConS29	271	-957.5653	17.75	7
Top–Right	Leg 1	230	UDConS29	271	883.1011	16.44	7
Bottom–Left	Leg 1	230	UDConS29	305	-639.3382	12.29	7
Botttom–Right	Leg 1	230	UDConS29	305	679.1496	12.99	7

PROVIDED :

MAIN REINFORCEMENT : 16-Y25 (FOUNDATION TO SECOND FLOOR LEVEL)
: 16-Y20 (SECOND TO TERRACE FLOOR)

STRUCTURAL CONSULTANT
PS STRUCTURES
SALEM - 636 302

Er.S.PRAVEEN KUMAR, M.Tech.,A.M.I.E.,
REGISTERED STRUCTURAL ENGINEER
SDTCP / RSE / GR-1 / 03 / 2022
PS STRUCTURES
1105-2, Vijayaragavan Nagar,
Jagir Ammapalayam, Salem - 636 302.
Email : structuresps@gmail.com.

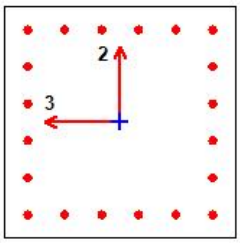
GST IN : 33ABJFP5953F1Z3

Er. S.PRAVEEN KUMAR, M.Tech., A.M.I.E.,
REGISTERED STRUCTURAL ENGINEER, GRADE-1,
PS STRUCTURES
#1105-2, Vijayaragavan Nagar, Jagir Ammapalayam, Salem - 636 302,
E-mail : structuresps@gmail.com, Mobile No.: +91 96295 68810.

COLUMN DESIGN - COLUMN C2 (600x600) GRID F2

ETABS Concrete Frame Design

IS 456:2000 + IS 13920:2016 Column Section Design



Column Element Details Type: Ductile Frame (Summary)

Level	Element	Unique Name	Section ID	Combo ID	Station Loc	Length (mm)	LLRF
STILT	C13	2263	C600x600	UDConS31	3600	4200	0.9

Section Properties

b (mm)	h (mm)	dc (mm)	Cover (Torsion) (mm)
600	600	60	30

Material Properties

E_c (MPa)	f_{ck} (MPa)	Lt.Wt Factor (Unitless)	f_y (MPa)	f_{ys} (MPa)
29580.4	35	1	500	500

Design Code Parameters

γ_c	γ_s
1.5	1.15

Axial Force and Biaxial Moment Design For P_u , M_{u2} , M_{u3}

Design P_u kN	Design M_{u2} kN-m	Design M_{u3} kN-m	Minimum M_2 kN-m	Minimum M_3 kN-m	Rebar Area mm^2	Rebar % %
446	249.6454	109.3	12.1221	12.1221	2880	0.8

Axial Force and Biaxial Moment Factors

	K Factor Unitless	Length mm	Initial Moment kN-m	Additional Moment kN-m	Minimum Moment kN-m
Major Bend(M3)	1	3600	-74.359	0	12.1221
Minor Bend(M2)	1	3600	-45.1192	0	12.1221

STRUCTURAL CONSULTANT
PS STRUCTURES
SALEM - 636 302

Er.S.PRAVEEN KUMAR, M.Tech.,A.M.I.E.,
REGISTERED STRUCTURAL ENGINEER
SDTCP / RSE / GR-1 / 03 / 2022
PS STRUCTURES
1105-2, Vijayaragavan Nagar,
Jagir Ammapalayam, Salem - 636 302.
Email : structuresps@gmail.com.

GST IN : 33ABJFP5953F1Z3

Er. S.PRAVEEN KUMAR, M.Tech., A.M.I.E.,
REGISTERED STRUCTURAL ENGINEER, GRADE-1,
PS STRUCTURES
#1105-2, Vijayaragavan Nagar, Jagir Ammapalayam, Salem - 636 302,
E-mail : structuresps@gmail.com, Mobile No.: +91 96295 68810.

Shear Design for V_{u2} , V_{u3}

	Shear V_u kN	Shear V_c kN	Shear V_s kN	Shear V_p kN	Rebar A_{sv} /s mm²/m
Major, V_{u2}	109	169	130	109	665.06
Minor, V_{u3}	135	169	130	135	665.06

Joint Shear Check/Design

	Joint Shear Force kN	Shear V_{Top} kN	Shear $V_{u,Tot}$ kN	Shear V_c kN	Joint Area cm²	Shear Ratio Unitless
Major Shear, V_{u2}	0	78	477	2130	3600	0.224
Minor Shear, V_{u3}	0	96	571	2130	3600	0.268

(1.4) Beam/Column Capacity Ratio

Major Ratio	Minor Ratio
0.516	0.639

Additional Moment Reduction Factor k (IS 39.7.1.1)

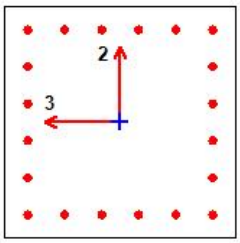
A_g cm²	A_{sc} cm²	P_{uz} kN	P_b kN	P_u kN	k Unitless
3600	28.8	6750	2569	446	1

Additional Moment (IS 39.7.1)

	Consider M_a	Length Factor	Section Depth (mm)	KL/Depth Ratio	KL/Depth Limit	KL/Depth Exceeded	M_a Moment (kN-m)
Major Bending (M_3)	Yes	0.857	600	6	12	No	0
Minor Bending (M_2)	Yes	0.857	600	6	12	No	0

ETABS Concrete Frame Design

IS 456:2000 + IS 13920:2016 Column Section Design



Column Element Details Type: Ductile Frame (Summary)

Level	Element	Unique Name	Section ID	Combo ID	Station Loc	Length (mm)	LLRF
1	C13	511	C600x600	UDConS29	2600	3200	1

STRUCTURAL CONSULTANT
PS STRUCTURES
SALEM - 636 302

GST IN : 33ABJFP5953F1Z3

Er.S.PRAVEEN KUMAR, M.Tech.,A.M.I.E.,
REGISTERED STRUCTURAL ENGINEER
SDTCP / RSE / GR-1 / 03 / 2022
PS STRUCTURES
1105-2, Vijayaragavan Nagar,
Jagir Ammapalayam, Salem - 636 302.
Email : structuresps@gmail.com.

Er. S.PRAVEEN KUMAR, M.Tech., A.M.I.E.,

REGISTERED STRUCTURAL ENGINEER, GRADE-1,

PS STRUCTURES

#1105-2, Vijayaragavan Nagar, Jagir Ammapalayam, Salem - 636 302,

E-mail : structuresps@gmail.com, Mobile No.: +91 96295 68810.

Section Properties

b (mm)	h (mm)	dc (mm)	Cover (Torsion) (mm)
600	600	60	30

Material Properties

E_c (MPa)	f_{ck} (MPa)	Lt.Wt Factor (Unitless)	f_y (MPa)	f_{ys} (MPa)
29580.4	35	1	500	500

Design Code Parameters

ɣc	ɣs
1.5	1.15

Axial Force and Biaxial Moment Design For P_u , M_{u2} , M_{u3}

Design P_u kN	Design M_{u2} kN-m	Design M_{u3} kN-m	Minimum M_2 kN-m	Minimum M_3 kN-m	Rebar Area mm²	Rebar % %
503	498.4549	394.5186	12.6698	12.6698	6365	1.77

Axial Force and Biaxial Moment Factors

	K Factor Unitless	Length mm	Initial Moment kN-m	Additional Moment kN-m	Minimum Moment kN-m
Major Bend(M3)	1	2600	157.8074	0	12.6698
Minor Bend(M2)	0.86378	2600	116.1952	0	12.6698

Shear Design for V_{u2} , V_{u3}

	Shear V_u kN	Shear V_c kN	Shear V_s kN	Shear V_p kN	Rebar A_{sv} /s mm²/m
Major, V_{u2}	304	241	130	304	665.06
Minor, V_{u3}	312	241	130	312	665.06

Joint Shear Check/Design

	Joint Shear Force kN	Shear V_{Top} kN	Shear $V_{u,Tot}$ kN	Shear V_c kN	Joint Area cm²	Shear Ratio Unitless
Major Shear, V_{u2}	0	0	651	1881	3180	0.346
Minor Shear, V_{u3}	0	0	655	2556	3600	0.256

(1.4) Beam/Column Capacity Ratio

Major Ratio	Minor Ratio
0.676	0.692

Additional Moment Reduction Factor k (IS 39.7.1.1)

A_g cm²	A_{sc} cm²	P_{uz} kN	P_b kN	P_u kN	k Unitless
3600	63.7	8057	2727	503	1

STRUCTURAL CONSULTANT
PS STRUCTURES
SALEM - 636 302.

Er.S.PRAVEEN KUMAR, M.Tech.,A.M.I.E.,
REGISTERED STRUCTURAL ENGINEER
SDTCP / RSE / GR-1 / 03 / 2022
PS STRUCTURES
1105-2, Vijayaragavan Nagar,
Jagir Ammapalayam, Salem - 636 302.
Email : structuresps@gmail.com.

GST IN : 33ABJFP5953F1Z3

Er. S.PRAVEEN KUMAR, M.Tech., A.M.I.E.,
REGISTERED STRUCTURAL ENGINEER, GRADE-1,
PS STRUCTURES
#1105-2, Vijayaragavan Nagar, Jagir Ammapalayam, Salem - 636 302,
E-mail : structuresps@gmail.com, Mobile No.: +91 96295 68810.

Additional Moment (IS 39.7.1)

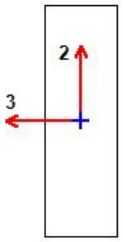
	Consider M_a	Length Factor	Section Depth (mm)	KL/Depth Ratio	KL/Depth Limit	KL/Depth Exceeded	M_a Moment (kN-m)
Major Bending (M_3)	Yes	0.813	600	4.333	12	No	0
Minor Bending (M_2)	Yes	0.813	600	3.743	12	No	0

PROVIDED :
MAIN REINFORCEMENT : 16-Y25 (FOUNDATION TO FIRST FLOOR LEVEL)

BEAM DESIGN - BEAM B7 (230x750) GRID B17-E17

ETABS Concrete Frame Design

IS 456:2000 + IS 13920:2016 Beam Section Design



Beam Element Details Type: Ductile Frame (Summary)

Level	Element	Unique Name	Section ID	Combo ID	Station Loc	Length (mm)	LLRF
2	B126	1383	B230x750	UDConS21	4950	4950	1

Section Properties

b (mm)	h (mm)	b_f (mm)	d_s (mm)	d_{ct} (mm)	d_{cb} (mm)
230	750	230	0	40	40

Material Properties

E_c (MPa)	f_{ck} (MPa)	Lt.Wt Factor (Unitless)	f_y (MPa)	f_{ys} (MPa)
29580.4	35	1	500	500

Design Code Parameters

ɣc	ɣs
1.5	1.15

Factored Forces and Moments

Factored M_{u3} kN-m	Factored T_u kN-m	Factored V_{u2} kN	Factored P_u kN
-356.5829	5.0765	269	0

STRUCTURAL CONSULTANT PS STRUCTURES SALEM - 636 302

Er.S.PRAVEEN KUMAR, M.Tech.,A.M.I.E.,
REGISTERED STRUCTURAL ENGINEER
SDTCP / RSE / GR-1 / 03 / 2022
PS STRUCTURES
1105-2, Vijayaragavan Nagar,
Jagir Ammapalayam, Salem - 636 302.
Email : structuresps@gmail.com.

GST IN : 33ABJFP5953F1Z3

Er. S.PRAVEEN KUMAR, M.Tech., A.M.I.E.,
REGISTERED STRUCTURAL ENGINEER, GRADE-1,
PS STRUCTURES
#1105-2, Vijayaragavan Nagar, Jagir Ammapalayam, Salem - 636 302,
E-mail : structuresps@gmail.com, Mobile No.: +91 96295 68810.

Design Moments, M_{u3} & M_t

Factored Moment kN-m	Factored M_t kN-m	Positive Moment kN-m	Negative Moment kN-m
-356.5829	12.7237	0	-369.3066

Design Moment and Flexural Reinforcement for Moment, M_{u3} & T_u

	Design -Moment kN-m	Design +Moment kN-m	-Moment Rebar mm²	+Moment Rebar mm²	Minimum Rebar mm²	Required Rebar mm²
Top (+2 Axis)	-369.3066		1361	0	1361	464
Bottom (-2 Axis)		0	680	0	0	680

Shear Force and Reinforcement for Shear, V_{u2} & T_u

Shear V_e kN	Shear V_c kN	Shear V_s kN	Shear V_p kN	Rebar A_{sv} /s mm²/m
392	0	427	149	1666.15

Torsion Force and Torsion Reinforcement for Torsion, T_u & V_{U2}

T_u kN-m	V_u kN	Core b_1 mm	Core d_1 mm	Rebar A_{svt} /s mm²/m
5.0765	269	170	690	795.21

PROVIDED

	LEFT SUPPORT	MIDDLE	RIGHT SUPPORT
TOP REINFORCEMENT	2-Y20+3-Y20	2-Y20	2-Y20+3-Y20
BOTTOM REINFORCEMENT	2-Y20	2-Y20+2-Y20	2-Y20
SHEAR REINFORCEMENT	2L-Y8@100c/c	2L-Y8@150c/c	2L-Y8@100c/c

SLAB DESIGN

Design of Slab S3 (FIRST FLOOR)

Size of the slab

Breadth of the slab = 4.88 m
Length of the slab = 4.88 m
Assumed thickness of the slab = 150 mm
Grade of Concrete = 35 N/sq.mm
Grade of Steel = 550 N/sq.mm
Slab Condition = One short edges discontinuous

STRUCTURAL CONSULTANT PS STRUCTURES SALEM - 636 302

GST IN : 33ABJFP5953F1Z3

Er.S.PRAVEEN KUMAR, M.Tech.,A.M.I.E.,
REGISTERED STRUCTURAL ENGINEER
SDTCP / RSE / GR-1 / 03 / 2022
PS STRUCTURES
1105-2, Vijayaragavan Nagar,
Jagir Ammapalayam, Salem - 636 302.
Email : structuresps@gmail.com.

Er. S.PRAVEEN KUMAR, M.Tech., A.M.I.E.,
REGISTERED STRUCTURAL ENGINEER, GRADE-1,
PS STRUCTURES
#1105-2, Vijayaragavan Nagar, Jagir Ammapalayam, Salem - 636 302,
E-mail : structuresps@gmail.com, Mobile No.: +91 96295 68810.

Load Considerations

Self Weight of the slab	=	4.75 kN/sq.mm
Floor finish loads on slab	=	1.0 kN/sq.mm
Live Load on slab	=	2.00 kN/sq.mm
Factored Load on slab	=	10.125 kN/sq.mm

Coefficients

Shorter Direction

(-)ve Moment coeff at Continuous Edge	=	0.039
(+)ve Moment coeff at Midspan	=	0.029
(-)ve Moment at Dis-Continuous Edge	=	0.042

Longer Direction

(-)ve Moment coeff at Continuous Edge	=	0.037
(+)ve Moment at Midspan	=	0.028
(-)ve Moment at Dis-Continuous Edge	=	0.042

Bending Moment

Shorter Direction

(-)ve Moment at continuous Edge	=	9.4 kNm
(+)ve Moment at Midspan	=	7.0 kNm
(-)ve Moment at Dis-continuous Edge	=	10.0 kNm

Longer Direction

(-)ve Moment at continuous Edge	=	8.8 kNm
(+)ve Moment at Midspan	=	6.6 kNm
(-)ve Moment at Dis-continuous Edge	=	10.0 kNm

Reinforcement Required

Shorter Direction & Longer Direction

(-)ve Moment at Continuous Edge	=	8Y @ 300mm c/c/ 8Y @ 300mm c/c
(+)ve Moment at Mid span	=	8Y @ 300mm c/c /8Y @ 300mm c/c
(-)ve Moment at Dis-Continuous Edge	=	8Y @ 300mm c/c/ 8Y @ 300mm c/c

Reinforcement Provided

Shorter Direction

(-)ve Moment at Continuous Edge	=	8Y @ 150mm c/c
(+)ve Moment at Mid span	=	8Y @ 150mm c/c
(-)ve Moment at Dis-Continuous Edge	=	8Y @ 150mm c/c

Reinforcement Provided

Longer Direction

(-)ve Moment at Continuous Edge	=	8Y @ 150mm c/c
(+)ve Moment at Mid span	=	8Y @ 150mm c/c
(-)ve Moment at Dis-Continuous Edge	=	8Y @ 150mm c/c

Check for Under reinforced section

Limiting Moment of Resistance Mu lim = $0.133 f_{ck} b d^2$

= 78.7 kNm > 10.0kNm

(Under reinforced section)

STRUCTURAL CONSULTANT PS STRUCTURES SALEM - 636 302

Er.S.PRAVEEN KUMAR, M.Tech.,A.M.I.E.,
REGISTERED STRUCTURAL ENGINEER
SDTCP / RSE / GR-1 / 03 / 2022
PS STRUCTURES
1105-2, Vijayaragavan Nagar,
Jagir Ammapalayam, Salem - 636 302.
Email : structuresps@gmail.com.

GST IN : 33ABJFP5953F1Z3

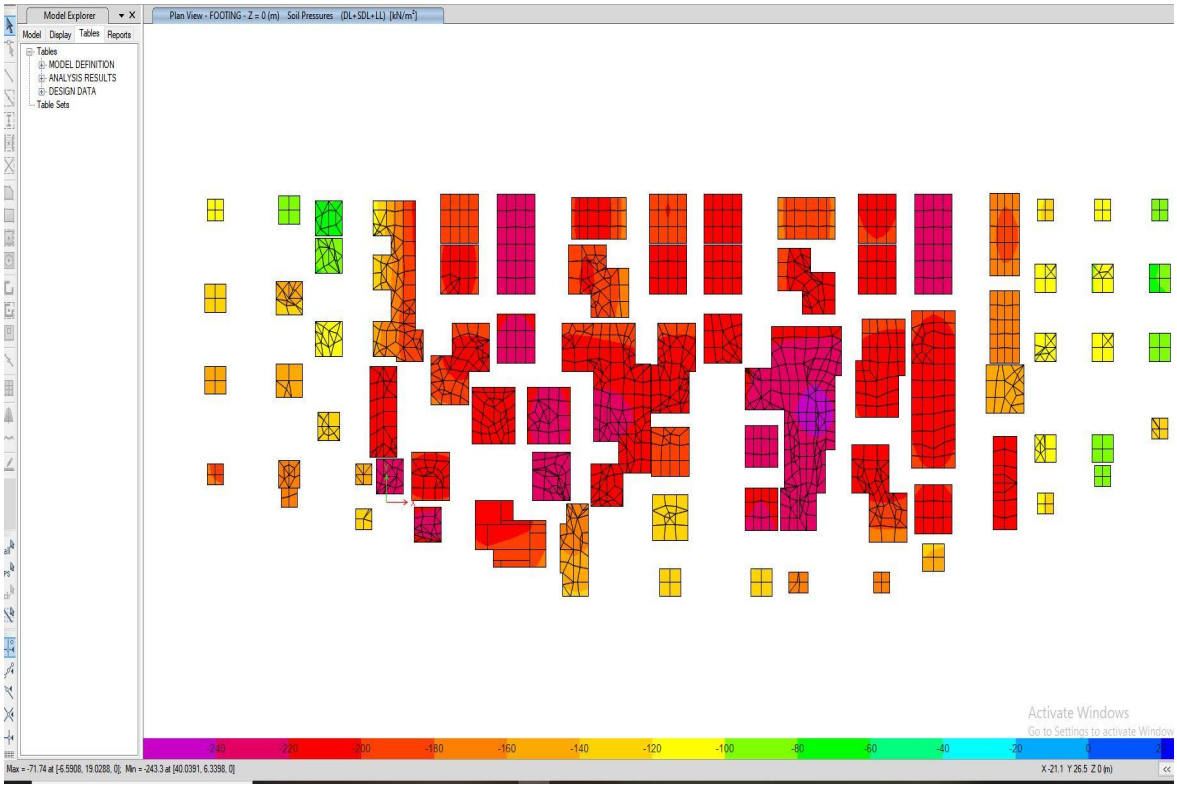
Er. S.PRAVEEN KUMAR, M.Tech., A.M.I.E.,
REGISTERED STRUCTURAL ENGINEER, GRADE-1,
PS STRUCTURES
#1105-2, Vijayaragavan Nagar, Jagir Ammapalayam, Salem - 636 302,
E-mail : structuresps@gmail.com, Mobile No.: +91 96295 68810.

Depth required for Flexure = 45.6 mm < 130 mm
(Depth is sufficient)

Check for Deflection

Diameter of the reinforcement used = Y8 mm
Percentage of steel = 0.26%
MF due to effect of tension steel = 2.45
Depth required for deflection = 77 mm < 130 mm
(Slab safe for deflection)

FOOTING DESIGN



STRUCTURAL CONSULTANT
PS STRUCTURES
SALEM - 636 302

Er.S.PRAVEEN KUMAR, M.Tech.,A.M.I.E.,
REGISTERED STRUCTURAL ENGINEER
SDTCP / RSE / GR-1 / 03 / 2022
PS STRUCTURES
1105-2, Vijayaragavan Nagar,
Jagir Ammapalayam, Salem - 636 302.
Email : structuresps@gmail.com.

THE LANDLENS SUITE

Eight ways to know a piece of land before you pay for it.

This report covers one part of the picture. These cover the rest, drawn from the same government records, for any property in Tamil Nadu.

LandLens One
Ask anything about a property and get an answer grounded in live government records, with the sources shown.
/landlens/one

Verify My Land
Every record check run on one property and returned as a single report.
/landlens/verify-my-land

Legal Opinion
An advocate's written opinion on the title, built on the records we pull for it.
/landlens

One Map
Every layer on one map: the parcel, its boundary, zoning, water bodies and what sits around it.
/landlens/one/map

PriceMap
What land actually changed hands for around this plot, taken from the registered deeds.
/landlens/pricemap

Build Scope
What you are allowed to build here: floor space, height, coverage and setbacks.
/landlens/build-scope

Property Tracker
Watch a property and hear about it when something new is registered against it.
/landlens/property-tracker

Deal Room
Run the transaction in one place: documents, stamping, signatures and the parties.
/landlens/deal-room

FREE TOOLS · NO ACCOUNT NEEDED

Twenty-four checks you can run yourself, at no cost.

Records and verification

The registers themselves, read for you.

- Encumbrance Certificate
- Patta and Chitta
- Field Measurement Sketch
- EC Analyzer
- Bank charge check
- Court case search
- Seller background check
- Approval check by survey

Value and duty

What it is worth and what it costs to register.

- Guideline value by street
- Guideline value by survey
- Stamp duty and registration fees
- Capital gains
- Floor space index
- Area unit converter

Zoning and land use

What the plan says can happen on this land.

- Land use zone finder
- CMDA land use check
- Coastal regulation zone
- Master plan check
- Water bodies finder
- Airport height clearance

Registers and directories

Who holds it, and which office keeps the record.

- Find your registering office
- Temple property check
- Waqf property check
- RERA register

Every free tool
/tools

Services we run for you
/services

The LandLens suite
/landlens/one

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.