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DESIGN AND ANALYSIS OF G+6 MULTI-STOREY BUILDING

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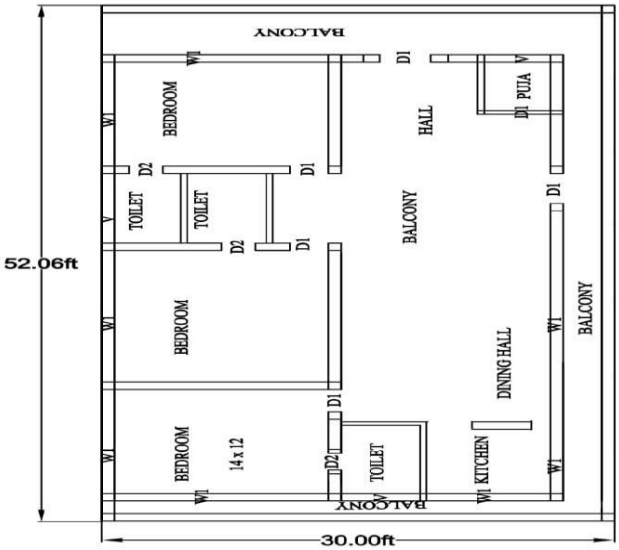
Abstract - The present project deals with the Analysis of a multi storied residential building of G+6 consisting of 5 apartments in each floor. The dead load &live loads are applied and the design for beams, column is obtained. We conclude that STAAD PRO is a very powerful tool which can save much time and is very accurate in Designs.

Key Words : STAAD PRO



1. INTRODUCTION-

The design is made using software on structural analysis design (staad-pro). The building subjected to both the vertical loads as well as horizontal loads. The vertical load consists of dead load of structural components such as beams, columns, slabs etc and live loads. The horizontal load consists of the wind forces thus building is designed for dead load, live load and wind load as per **IS 875 : 2007**. The building is designed as two dimensional vertical frame and analyzed for the maximum and minimum bending moments and shear forces by trial and error methods as per **IS 456 : 2000.**

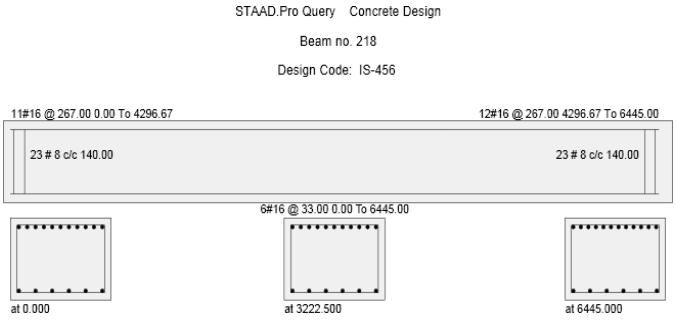
2. METHODOLOGY-

This the plan we took .

The entire plan area is about 1500 sq.ft.

i. BEAM DESIGN-

This is the beam design for above plan in staad pro.



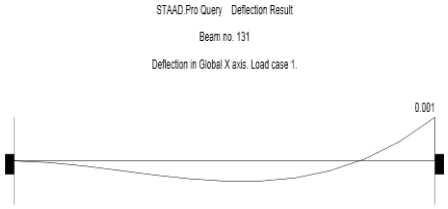
Design Load

Mz(Kn Met)	Distet	Load
92.300003	3.200000	5
-162.130005	0.000000	5
-175.589996	6.400000	5

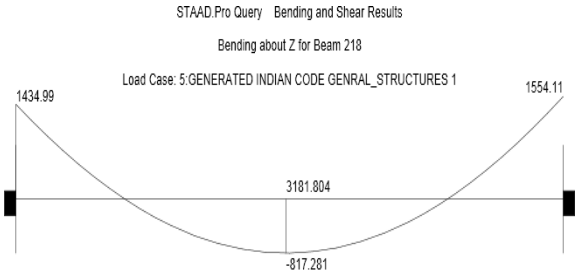
Design Parameter

Fy(Mpa)	415.000000
Fc(Mpa)	30.000000
Depth(mm)	299.999395
Width(mm)	399.999201
Length(mm)	6444.987183

Reinforcement details of beam



Distmm	X(in)	Y(in)	Z(in)
0.000000	0.0000	0.0000	0.0000
249.998491	-0.0000	-0.0005	0.0001
499.998983	-0.0001	-0.0009	0.0002
749.998474	-0.0002	-0.0014	0.0005
999.997965	-0.0003	-0.0019	0.0008
1249.997457	-0.0004	-0.0023	0.0012
1499.996948	-0.0005	-0.0028	0.0017
1749.996440	-0.0005	-0.0033	0.0023
1999.995931	-0.0004	-0.0037	0.0030
2249.995422	-0.0002	-0.0042	0.0037
2499.994914	0.0000	-0.0047	0.0045
2749.994405	0.0005	-0.0051	0.0053
2999.993896	0.0010	-0.0056	0.0062



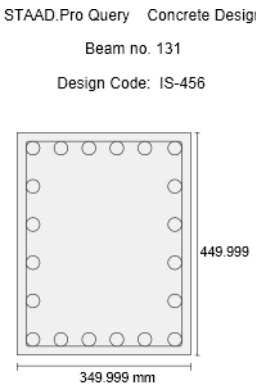
Distmm	Fy(N)	Mz(kip-in)
0.000000	154555.0864	1434.9900
537.082265	131379.4330	754.7840
1074.164530	106689.3721	188.3447
1611.246796	80484.9035	-257.1290
2148.329061	53040.4566	-574.7001
2685.411326	25476.0760	-761.3173
3222.493591	-2088.3047	-816.9051
3759.575857	-29652.6853	-741.4635
4296.658122	-57217.0660	-534.9924
4833.740387	-84661.5129	-197.5675
5370.822652	-110865.9814	267.7601
5907.904918	-135556.0424	854.0532
6444.987183	-158731.6957	1554.1130

Shear

Deflection

ii. COLUMN DESIGN-

This is the column design for the above plan in staad pro.



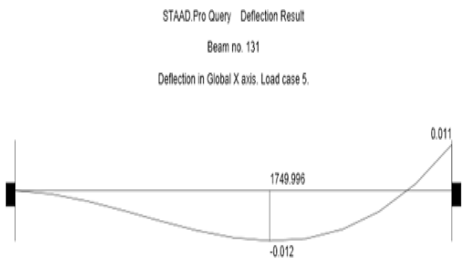
Design Load

Load	9
Location	End 1
Pu(Kns)	76.760002
Mz(Kns-Mt)	75.889999
My(Kns-Mt)	50.490002

Design Results

Fy(Mpa)	415
Fc(Mpa)	30
As Reqd(mm²)	2041.000000
As (%)	1.436000
Bar Size	12
Bar No	20

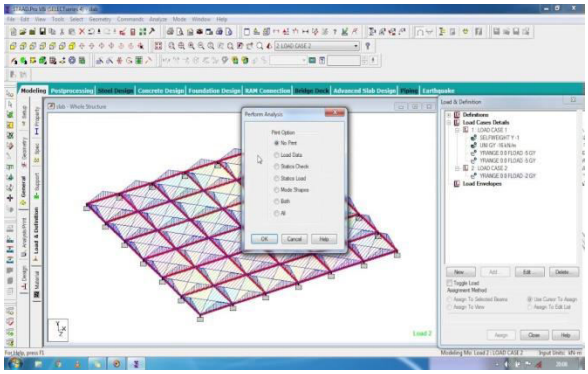
Reinforcement details of colum Deflection



Distmm	X(in)	Y(in)	Z(in)
0.000000	0.0000	0.0000	0.0000
249.999491	-0.0008	-0.0049	0.0002
499.998983	-0.0025	-0.0099	0.0011
749.998474	-0.0048	-0.0148	0.0025
999.997965	-0.0072	-0.0198	0.0046
1249.997457	-0.0094	-0.0247	0.0074
1499.996948	-0.0110	-0.0297	0.0109
1749.996440	-0.0117	-0.0346	0.0153
1999.995931	-0.0112	-0.0396	0.0205
2249.995422	-0.0091	-0.0445	0.0266
2499.994914	-0.0049	-0.0494	0.0337
2749.994405	0.0016	-0.0544	0.0417
2999.993896	0.0107	-0.0593	0.0508

iii. SLAB DESIGN –

This is the slab design output.



Output for slab

3. CONCLUSIONS-

From the work carried out in STADD Pro. can conclude that,

1. Comparison between manual calculation and STADD Pro. Software analysis and design, conclude analysis is same but design is some different.
2. Using STADD Pro., analysis and design of multi-storey building has completed much quickly and easier than the manual calculation.
3. Building plan was develop and draft in Auto-CAD with required dimension.
4. During designing G+ 6 storey residential building structure is capable to sustain all loads acting on building.
5. The design of slab, beam, column with IS 456-2000 as limit state method.

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