

Study On Lateral Load Analysis Conventional RC Structure With Diagrid Structure

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ABSTRACT

The present study focuses on the comparative analysis of lateral load performance between a conventional Reinforced Concrete (RC) framed structure and a diagrid structural system. As modern high-rise buildings continue to grow in height and complexity, structural efficiency under lateral loads such as wind and seismic forces has become a critical design consideration. The diagrid system, characterized by its diagonal grid framework, offers enhanced stiffness, reduced bending moments, and improved architectural flexibility compared to traditional RC frames.

In this study, both structural systems are modelled using standard design parameters, and lateral load analysis is performed in accordance with relevant Indian Standards. Key performance indicators including storey drift, storey displacement, base shear, and member forces are evaluated. The comparative results reveal significant improvements in lateral stiffness and reduction in overall displacement for the diagrid structure, demonstrating its superior capability in resisting lateral loads.

The findings highlight the structural efficiency, material optimisation, and enhanced stability achieved through diagrid systems, making them a viable alternative for high-rise construction. This study contributes valuable insights for engineers, designers, and architects in selecting optimal structural systems for modern tall buildings subjected to lateral forces.

Keywords: Diagrid, Structure, Load Analysis

INTRODUCTION

1.1 GENERAL

The importance of conducting safe analyses and construction procedures for tall buildings is growing as their height increases. The structural load resistance system, which can withstand gravity loads, becomes more crucial as the building's height increases. When compared to traditional construction methods, the Diagrid structure is more cost-effective and well-suited to tall structures.

"Diagrid" might be a portmanteau of the terms "diagonal" and "grid," which together describe a single-thickness structure that obtains its structural integrity by use of triangulation. A full net is formed by connecting materials such as steel tube rounds, pipes, precast pipes, and inclined concrete columns diagonally. This net distributes the lateral stresses evenly to the foundation of tall buildings. This method is known as triangulation. The externally supplied diagonal element takes up the majority of the lateral stresses, allowing the diagrid construction to forgo interior and corner columns. The diagrid construction is more efficient than the standard one because of this reason. Compared to conventional structures, diagrid structures utilize 20% less steel.

1.2 WHAT IS DIAGRID STRUCTURE:

A combination of the words "diagrid" and "grid" forms the term. A diagonal is a framework device in which the components of a construction cross with each other on a diagonal. Thus, the diagrid form is a useful framing device where people cross on diagonals based on a certain grid. You may use this framing technique with angled components (in place of the same ancient columns), which are likely used as vertical parts (Xiaolei, H., Chao, H., Jing, J., & Jiamin, T., 2008). Consequently, due to the device's distinctive geometric association, which results in both structural overall performance and aesthetic cappotential. Due to the decrease in nearly vertical allowed, it has become the top goal for creating upward push buildings. (Moon, 2009).

LITERATURE REVIEW

1. **Mohammed Ibrahim, Veena Narayankar:** The research used non-static methods to simulate a 31-story typical CR structure together with three additional buildings that had inclines of 36.86°, 56.30°, and 66.03°, in accordance with the requirements of IS (Part 1): 2002. evaluates ETABS 2015's linear program. The response parameters of conventional and diagonal buildings are analyzed in relation to ground displacement, ground drag, membrane drift, segment acceleration, segment shift, and phase shear. The results show that all the parameters are at least equal at a diagonal angle of 66.03 degrees, which is deemed the optimal screen angle for the building's performance.
2. **Trupti A. Kinjawadekar:** In this post, we take a look at how different Diagrid structural frameworks for multi-story systems handle seismic residences. Findings portray as these systems can fulfill most modern design specifications. Finding out if Diagrid systems in high-upward thrust systems are appropriate for use on traditional building structures is main objective of the study. Using SAP2016, we validated the Diagrid contributors' numerical models and seismic homes.
3. **Premdas S, M. Sirajuddin:** In the last ten years, research have focused on Diagrid structures. Experts in field have come up with cutting-edge design ideas to improve efficiency and cost-effectiveness of Diagrid structure systems since they came to recognize significance of these structures. A revolutionary structure for supporting skyscrapers. Research into common connections & recommended approach for design have both been published. Consequently, this study's overarching goal is offering comprehensive review of Diagrid structure system's prior research accomplishments as they pertain to tall structures.
4. **Anshuman R. Hansora:** The behavior of diagrid structural systems having shear walls at their cores was the subject of their studies. This research models and analyzes a square plan structure with a diagonal of 30 meters by 30 meters, taking into account various story modules (i.e. 4, 6, 8, and 12) with and without core shear walls. Various plan shapes of shear walls taken for least displacement and drift, and the one that yields the best results is then selected for further analysis. Then, taking 24, 36, and 48 stories into account, the behavior of diagrid structures with and without shear walls along the height is also investigated. When it comes to analysis and design, etabs is the way to go. Parameters such as the inter-story drift-ratio, displacement between stories, shear stress, and decrease in lateral load on diagonal are considered.
5. **KYOUNG SUN MOON:** Various types of complexly formed tall structures, including leaning, inclined, and freely shaped towers, are analyzed in this article to determine their structural performance. The load-bearing capability of each kind of complex form is evaluated alongside the structural shapes when designing high-rise structures using Diagrid systems. In this work, geometric structural modes are used to examine the consequences of changes in crucial geometric configurations of complex-shaped tall structures, such as torsion rate and angle of inclination. Diagrid structures for tall buildings of complicated form.

OBJECTIVES AND SCOPE OF WORK

3.1 Objectives:

The main objective of the study is to know the seismic performance of diagrid for different angles and conventional structure under seismic zone 5.

1. This study aims for analysing and elegance diagrid structures for higher structures with diagrid at wholly completely with different angles.
2. Examine the comportment of lateral forces upon tall buildings with variable diagrid at different angles.
3. The purpose of this test is to evaluate the effectiveness of a typical 26-story RC building and similar structures with diagonals at angles of 39°, 58°, 67°, 730°, and 760°.
4. In terms of factors such as story displacement, & base shear, we will examine the behavior of both

conventional structures and those with diagonals that have angles of inclinations of 39o, 58o, 67o, 73o, and 76o.

5. The optimal angle of diagrids is determined so that the structure can withstand seismic forces to its fullest capacity.

METHODOLOGY

A three-dimensional model of RC structure's framework is the starting point for this investigation. Structure 's analysis and design were conducted with erected structure's DL, LL, and seismic loads in mind. Indian standard code, with help of design software Etabs, will handle all of work.

High-rise structure's square shape was compared using Etabs program for diagrid system. A procedure was selected.

1. The Etabs program was used to identify a 26-story structure for the study.
2. A bare frame model and five additional versions with varying diagonal angles made up the total of six models.
3. According to the IS codes, loading was applied.
4. Analyses are conducted using linear static and linear dynamic methods.
5. Differentiating factors in findings were base shear, & deflection/displacement.

4.3 MODELS DESCRIPTION:

Model-01: A regular G+25 storey conventional RC framed building

Model-02: An RC-framed structure with 25 stories and no perimeter columns, using a steel I-section with a 39 degree diagonal.

Model-03: The structure is 25 stories tall and is RC framed. There is no perimeter column and the diagonal part is a steel I-section with a 58 degree angle.

Model-04: Structure is a G+25 storey RC frame without perimeter columns, with a diagrid section that is 67 degrees steel I-section.

Model-05: Structure in question is a 25-story RC structure with no perimeter columns and a diagrid section made of steel I-sections at an angle of 73 degrees.

Model-06: The building in question is a 25-story RC structure with no perimeter columns and a diagrid section made of steel I-sections at an angle of 76 degrees.

4.4 GEOMETRIC DETAILS OF BUILDING:

Sl. No	Description	Values
01	Plan Dimension	32mx32m
02	Total number of storey	26
03	Each storey ht	3.2m
04	Footing end condition	Fixed support
05	Support condition of diagrid connecting node	pinned
06	Span between two successive column	4m
07	Panel size obtained	4mx4m
08	Size of RCC Column	800x800mm
09	Size of RCC Beam	300x500mm
10	Slab thickness	150mm
11	Concrete grade used	M40
12	Rebar grade used	Fe500
13	Grade of steel for Diagrid	Fe345
14	Diagrid member	ISWB500
15	Diagrid angle considered	39°, 58°, 67°, 73°, and 76°

4.5 DETAILS OF LOAD APPLIED AND SEISMIC PARAMETERS:

Sl. No	Description	Values
01	DL (dead load)	Self-weight of structure
02	Live Load	3.5KN/m ²
03	Wall Load	13.11KN/m
04	Floor finish	1.0 KN/m ²
05	Structure type	Special RC moment resisting frame
06	Earth quake zone	V
07	Zone factor	0.36
08	Type of soil	Medium
09	Response Reduction factor	5
10	Importance factor	1.5

4.6 LOAD ANALYSIS:

4.7.1 Dead load as per IS 875 (part I)- 1987

It has load of all materials and glued instrumentality designed into the structure, however weight of every structural element is automatically calculated victimization the input data of the Etabs software package. First of all, in IS 875: 1987 (Part I), the material unit weight advantages are determined, which enable the dead weight to be estimated with known design loads.

4.7.2 Live load as per IS 875 (part II)- 1987

Live loads are volatile, of short duration or in motion, at some point it is also called probabilistic load, on which they include all forces that are changeable within the normal cycle of activity of the article, knows them as imposed charges & has other loads than the DL of the structure. Standard values are specified in IS 875: 1 (Part II).

4.7.3 Earthquake load as per IS 1893- 2002

The strategy begins as a straightforward method since it requires less computational work and concentrates on formulae as per training code. Initially, it processing flat base shear for full stage, and then it processing base shear which is developed and created by cover-phase.

Seismic Base Shear (V_b):

The rated seismic shear force (V_b) or total rated shear force with any major bend is deliberated utilising following relationship.

$$V_b = A_h \times w \text{ Where,}$$

$$A_h = \text{Designing Horizontal Acceleration Spectrum Value, } A_h = (Z/2) (I/R) (S_a/g)$$

$$Z = \text{zone factor for earthquake}$$

$$I = \text{Importance factor}$$

$$R = \text{Response Reduction factor}$$

$$S_a/g = \text{Response Acceleration Coefficient. } w = \text{Seismic Weight of the platform.}$$

Desna force Distribution:

The design base shear of structure (V_b) is distributed over the height of structure as per following ratio.

$$Q_i = V_b \times (W_i h_i^2 / \sum W_j h_j^2) \text{ Were}$$

$$Q_i = \text{design lateral force at floor } i$$

$$n = \text{Number of storey's in the building.}$$

METHODS OF SEISMIC ANALYSIS

As seen by the horizontal power design, the current buildings are meant to resist earthquakes. Seismic activity causes waves to propagate outward from the epicenter at velocities proportional to the magnitude and intensity of the earthquake. Quake forces are supported in IS 1893:2016 (part-I), although the influence of seismic on designs depends on factors such as building firmness, soil medium solidness, building height and area, and so on.

Methods for seismic analysis of structure may be classified as follows:

5.1 EQUIVALENT STATIC ANALYSIS:

Because it requires less process work and concentrates on the formulae in step with coaching code, this approach begins as a fundamental method. It first registers anticipated basic shear for full provided section and then distributes subsequent basic shear across structure.

Seismic Base Shear (V_b):

Following this connection, one may determine overall lateral design force along any main direction or seismic base's lateral design force (V_b).

$$V_b = A_h \times W$$

5.2 RESPONSE SPECTRUM ANALYSIS:

An example of a response spectrum is shown as a "graphic depiction of the dynamic reaction of a" sequence of cantilevered Edenulenes subjected to a conventional late seismal motion of the Base, where the natural quantity increases. A single graph, illustrated in figure 4.1, summarizes the response of a building with a wide range of periods; this is what the term "spectrum" means in seismic engineering. A normal response spectrum displays the acceleration, rate, and deflection-related reactions throughout a whole area or spectrum of periods for a particular seismic motion and requiring damping percentage.

Pierre Anthony Boot's PhD thesis at Cambridge revealed the response spectrum method 19 years ago. There are "a given number of supposed typical vibration ways, each of which compares a specific recurrence," according to Biot. To follow the highest-frequency fluctuations in the frame, Biot used the Fourier spectrum.

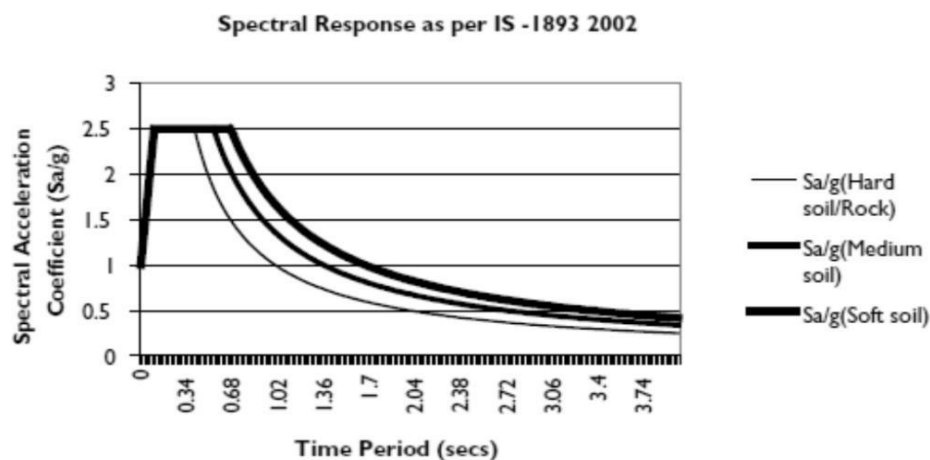


Fig 5.2: Time Period v/s Spectral Acceleration Coefficient

About halfway through 20th century, the concept of the reaction spectrum was used in context of plan need.

Whenever solid movement of accelerograph data became available in 1970s, it became widely used as fundamental hypothetical device in tremor design.

RESULTS AND DISCUSSION

6.1 GENERAL

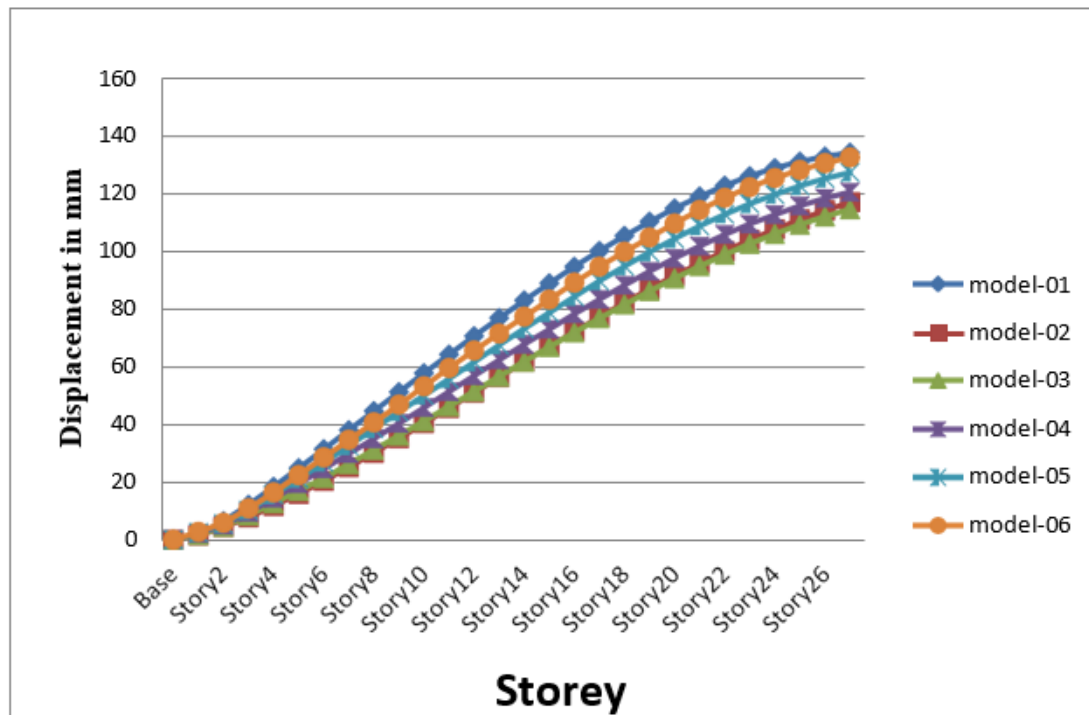
Seismic load is used to evaluate all six RC construction models. Evaluation of all various architectural styles is completed with help of ETABs 2015 software. All building styles' assessment impacts, including displacements, storey drifts, term, and foundation shear, are provided and contrasted.

6.2 DISPLACEMENT:

Term "storey displacement" refers to movement of a floor compared to base of a structure, often ground level of building. The maximum allowable deflection is $H/500$, where H-is the height of the structure above the crush. 6.1 Indian time - ~00:207.

Table 6.2.1: Displacement along x and y-direction in mm due to ESA

Story	Model-1	Model-2	Model-3	Model-4	Model-5	Model-6
Story27	134.211	117.008	114.552	120.49	127.313	132.542
Story26	132.859	114.137	112.04	118.345	125.228	130.554
Story25	131.098	111.016	109.212	115.743	122.669	128.157
Story24	128.832	107.608	106.004	112.692	119.657	125.391
Story23	126.048	103.96	102.58	109.425	116.411	122.207
Story22	122.765	100.03	98.834	105.807	112.828	118.519
Story21	119.016	95.882	94.834	101.785	108.789	114.304
Story20	114.841	91.483	90.569	97.538	104.318	109.64
Story19	110.279	86.9	86.157	93.035	99.657	104.802
Story18	105.368	82.111	81.537	88.232	94.827	99.85
Story17	100.146	77.177	76.767	83.312	89.705	94.66
Story16	94.65	72.095	71.841	78.26	84.258	89.133
Story15	88.915	66.912	66.829	72.999	78.715	83.262
Story14	82.973	61.645	61.728	67.689	73.164	77.326
Story13	76.854	56.326	56.615	62.345	67.475	71.481
Story12	70.589	50.992	51.456	56.851	61.589	65.596
Story11	64.206	45.657	46.268	51.313	55.742	59.526
Story10	57.729	40.384	41.11	45.818	50.041	53.189
Story9	51.183	35.164	36.093	40.311	44.315	46.82
Story8	44.592	30.091	31.142	34.967	38.423	40.663
Story7	37.979	25.128	26.208	29.789	32.518	34.617
Story6	31.373	20.408	21.428	24.585	26.808	28.539
Story5	24.811	15.864	16.967	19.387	21.187	22.359
Story4	18.357	11.675	12.686	14.36	15.574	16.373
Story3	12.143	7.741	8.464	9.489	10.234	10.856
Story2	6.448	4.307	4.54	5.039	5.481	5.87
Story1	1.923	1.454	1.648	2.181	2.484	2.73
Base	0	0	0	0	0	0

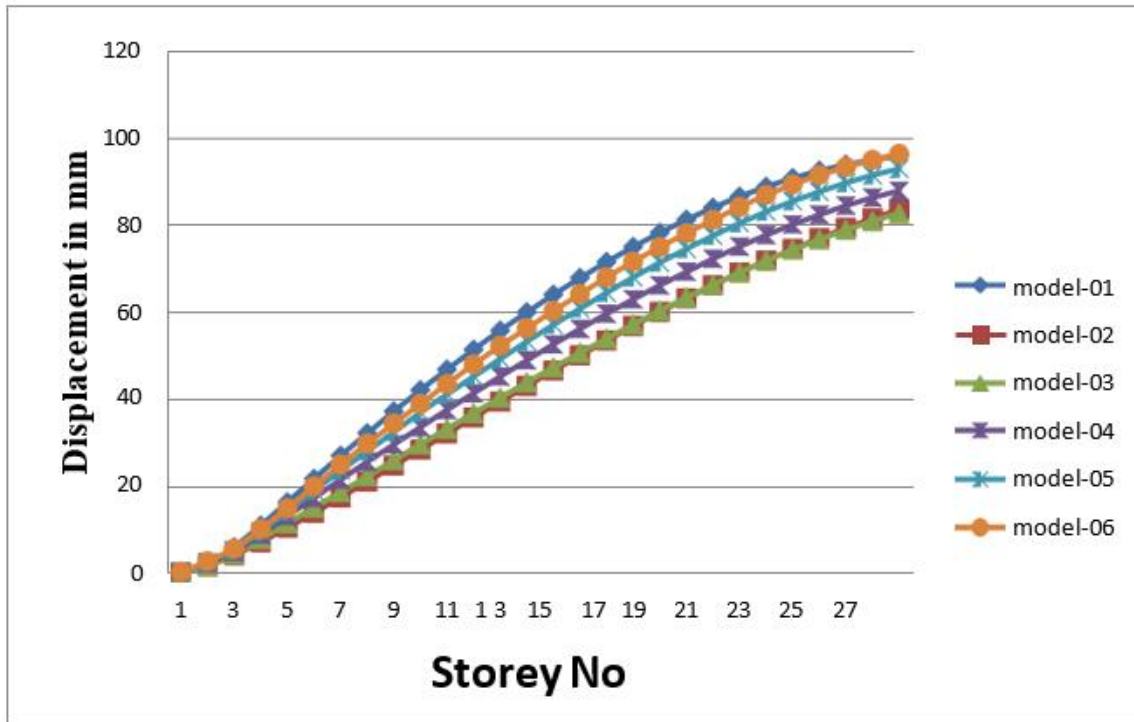


Graph 6.1: Displacement in mm due to ESA along X and Y

Portrays deflection is maximum in Model-1 as the diagrid was introduced at periphery for model-2 with 39° inclination the displacement was reduced with 12.81%, when the diagrid inclination was changed to 58° in model-03 the displacement was decreased by 14.64%, and whenever diagrid inclination was changed to 67° in model-04 displacing reduces 10.22%, as the diagrid inclination was changed to 73° in model-05 the displacement decreases by 5.13%, as the diagrid inclination was changed to 76° displacement is decreases by 1.24%.

Table 6.2.2: Displacement along x and y-direction in mm because of RS

Story	Model-1	Model-2	Model-3	Model-4	Model-5	Model-6
Story27	95.797	83.436	82.575	87.734	92.818	96.272
Story26	94.919	81.404	80.793	86.173	91.328	94.875
Story25	93.806	79.22	78.795	84.338	89.563	93.236
Story24	92.401	76.864	76.566	82.243	87.537	91.365
Story23	90.695	74.373	74.213	80.02	85.361	89.232
Story22	88.699	71.718	71.673	77.587	82.982	86.799
Story21	86.429	68.947	68.982	74.92	80.328	84.061
Story20	83.898	66.03	66.14	72.115	77.424	81.077
Story19	81.119	63.014	63.228	69.143	74.4	77.999
Story18	78.103	59.871	60.189	65.992	71.243	74.828
Story17	74.861	56.644	57.049	62.78	67.874	71.469
Story16	71.404	53.309	53.799	59.462	64.295	67.863
Story15	67.741	49.905	50.503	55.98	60.66	64.019
Story14	63.881	46.414	47.122	52.436	56.968	60.107
Story13	59.833	42.868	43.69	48.802	53.116	56.174
Story12	55.604	39.259	40.177	45.017	49.076	52.11
Story11	51.202	35.611	36.627	41.193	45.014	47.825
Story10	46.635	31.932	33.029	37.321	40.945	43.302
Story9	41.909	28.233	29.443	33.347	36.731	38.731
Story8	37.028	24.544	25.8	29.404	32.307	34.209
Story7	31.994	20.86	22.12	25.436	27.831	29.608
Story6	26.811	17.24	18.437	21.31	23.368	24.799
Story5	21.497	13.663	14.862	17.12	18.784	19.751
Story4	16.106	10.237	11.276	12.92	14.029	14.719
Story3	10.767	6.922	7.662	8.681	9.366	9.904
Story2	5.765	3.904	4.189	4.678	5.075	5.406
Story1	1.728	1.394	1.557	2.06	2.327	2.529
Base	0	0	0	0	0	0



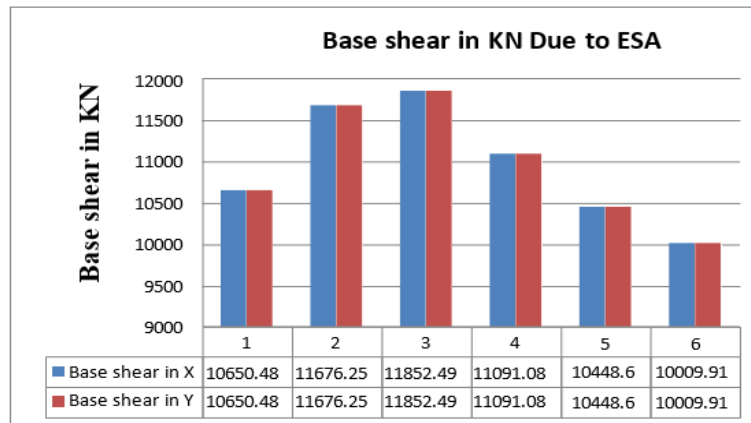
Graph 6.2: Displacement in mm because of RS along X and Y

As seen displacement/deflection is maximum in Model- 1 as the diagrid was introduced at periphery for model- 2 with 39° inclination the displacement was reduced with 12.90%, when the diagrid inclination was changed to 58° in model-03 the displacement was decreased by 13.80%, & whenever diagrid inclination was changed to 67° in model-04 displacement reduces by 8.41%, as the diagrid inclination was changed to 73° in model-05 the displacement decreases by 3.10%, as the diagrid inclination was changed to 76° the displacing is increases by 0.49%.

6.4 BASE SHEAR: It is the calculation of the highest occurring / expected horizontal forces that occur due to the movement of the earthquake floor at the base of a structure.

Table 6.4.1: Base shear in KN due to ESA for all models

Model No	Base shear in X	Base shear in Y
1	10650.48	10650.48
2	11676.25	11676.25
3	11852.49	11852.49
4	11091.08	11091.08
5	10448.6	10448.6
6	10009.91	10009.91

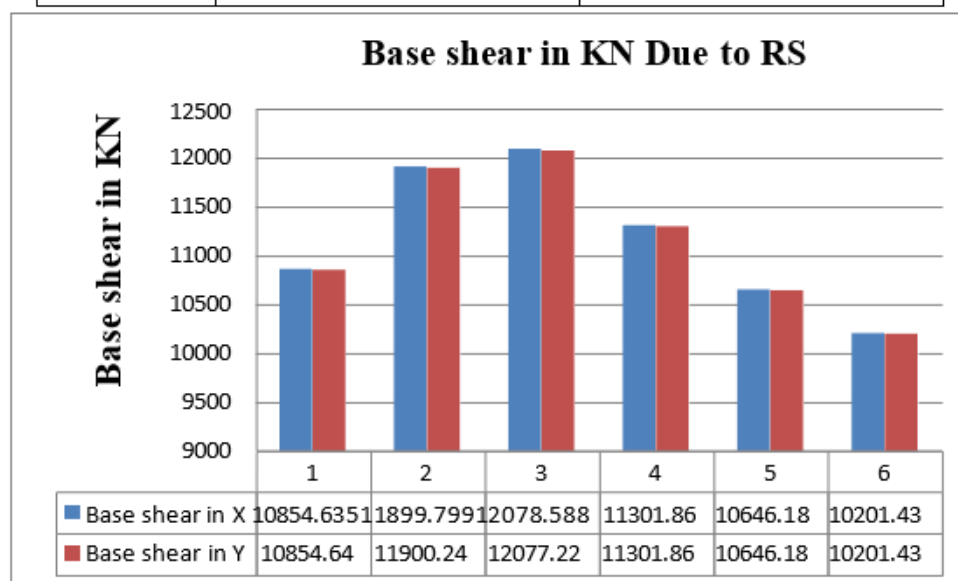


Graph 6.5: Base shear in KN due to ESA along X and Y

From the above graph it is noted that the base shear is minimum for model-01 as the diagrid was introduced at periphery with an inclination of 39° in model-02 the base shear was increased by 8.78%, and as the diagrid was introduced at periphery with an inclination of 58° , in model-03 the base shear value was increased by 10.14%, as the diagrid was introduced at periphery with an inclination of 67° in model-04 the base shear was increased by 3.97%, as the diagrid inclination was changed to 73° in model-05 the base shear value decreases by 1.90%, and as the diagrid inclination was changed to 76° in model-06 the base shear was decreases by 6%.

Table 6.4.2: Base shear in KN for all models due to RS

Model No	Base shear in X	Base shear in Y
1	10854.63	10854.64
2	11899.79	11900.24
3	12078.58	12077.22
4	11301.86	11301.86
5	10646.18	10646.18
6	10201.43	10201.43



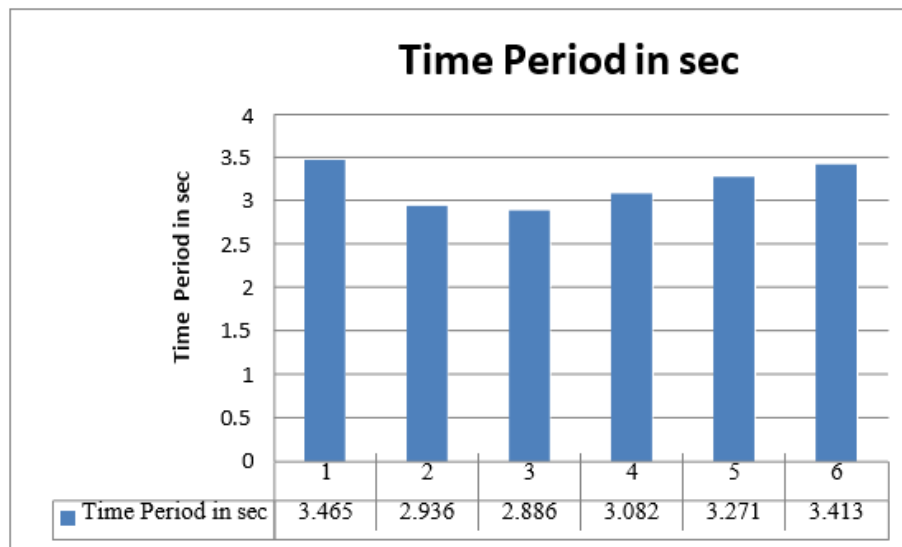
Graph 6.6: Base shear in KN due to RS along X and Y

From the above graph it is noted that the base shear is minimum for model-01 as the diagrid was introduced at periphery with an inclination of 39° in model-02 the base shear was increased by 8.78%, and as the diagrid was introduced at periphery with an inclination of 58° , in model-03 the base shear value was increased by 10.13%, as the diagrid was introduced at periphery with an inclination of 67° in model-04 the base shear was increased by 3.95 %, as the diagrid inclination was changed to 73° in model-05 the base shear value decreases by 1.92%, and as the diagrid inclination was changed to 76° in model-06 the base shear was decreases by 6.01%.

Time Period: It is time required for completing one cycle of vibrations to Pass in a given point.

Table6.5.1: Time period for each model

Model No	Time Period in sec
1	3.465
2	2.936
3	2.886
4	3.082
5	3.271
6	3.413

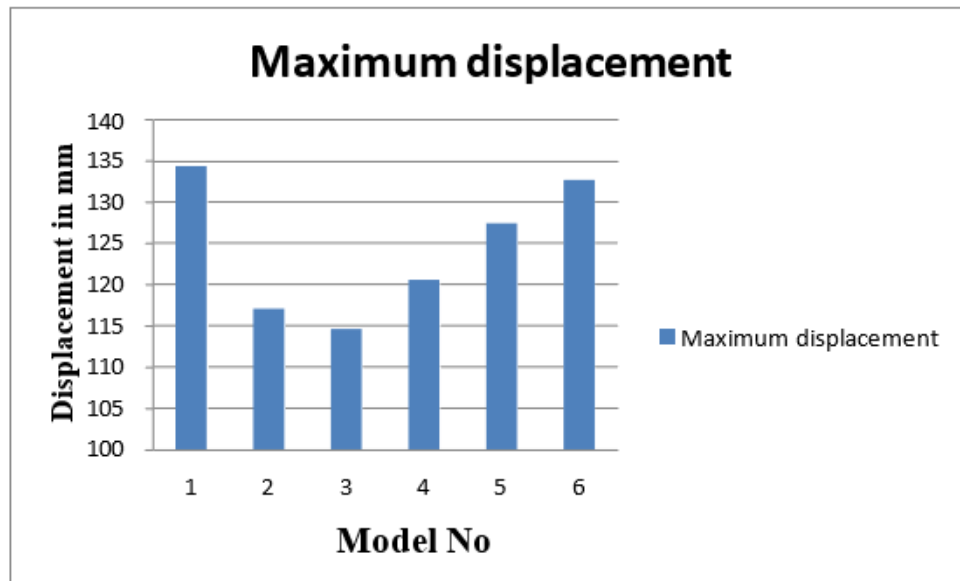


Graph 6.7: Time period in seconds due to ESA

The above graph represent that the time period is maximum in model-01 as the diagrid was introduced at periphery with an inclination of 39° , in model-02 the time period was decreases by 15.26%, as the diagrid was introduced at periphery with an inclination of 58° in model-03 the time period was decreases by 16.7%, as the diagrid was introduced at periphery with an inclination of 67° in model-04 the time period was decreases by 11.05%, as the diagrid was introduced at periphery with an inclination of 73° in model-05 the time period was decreases by 5.59%, as the diagrid was introduced at periphery with an inclination of 76° in model-06 the time period was decreases by 1.5%.

COMPARISON

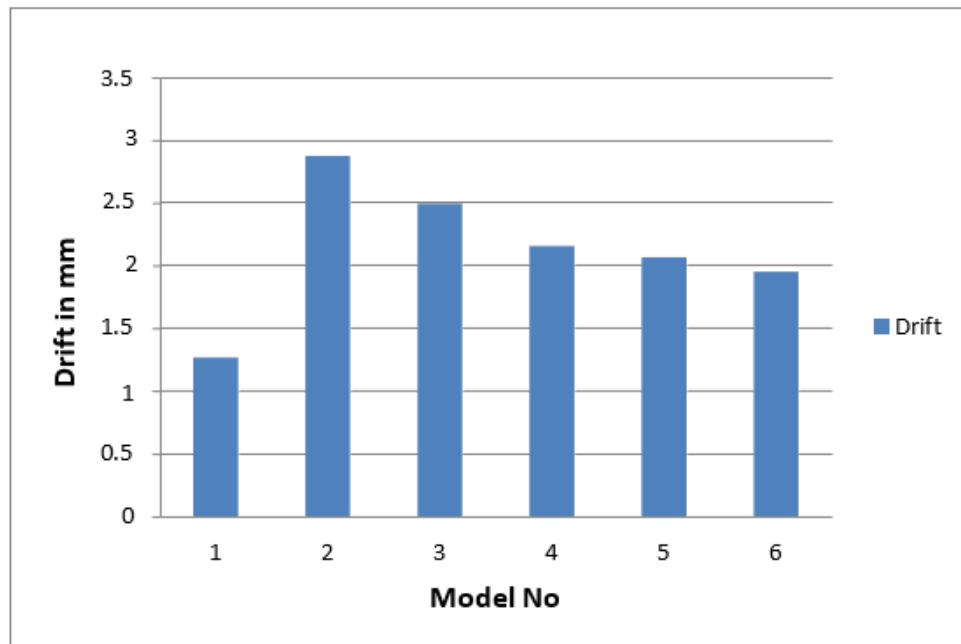
7.1 COMPARISON OF DISPLACEMENT DUE TO EQUIVALENT STATIC METHOD:



Graph 6.8: Comparison of displacement for all models due to ESA

7.2 COMPARISON OF DRIFT DUE TO EQUIVALENT STATIC METHOD:

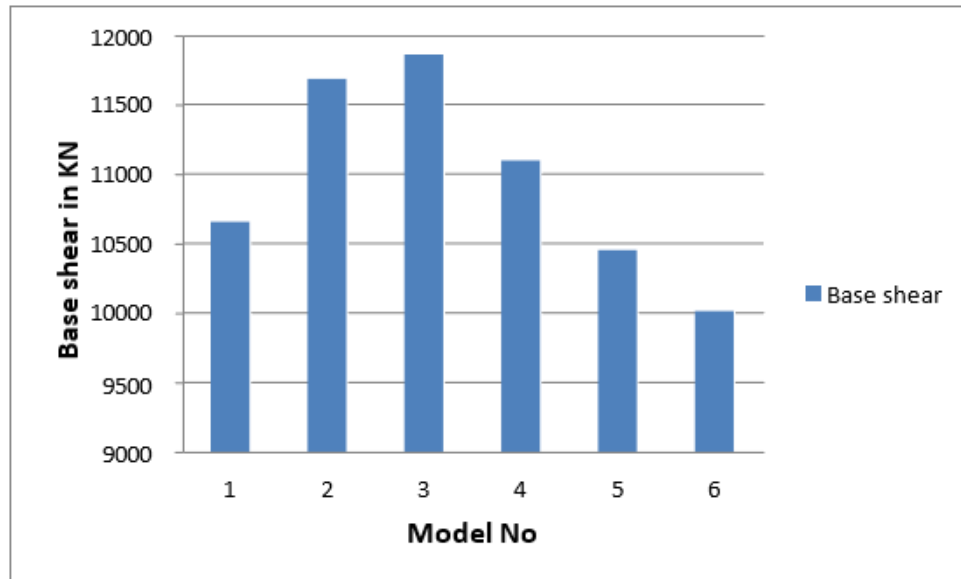
Model No	Drift	Diagrid Inclination	Percentage increase compare to model 1
1	1.26	No Diagrid	-----
2	2.864	39 ⁰	56%
3	2.485	58 ⁰	49.33%
4	2.148	67 ⁰	41.34%
5	2.059	73 ⁰	38.80%
6	1.943	76 ⁰	35.15%



Graph 6.9: Comparison of drift for all models due to ESA

7.3 COMPARISON OF BASE SHEAR DUE TO EQUIVALENT STATIC METHOD:

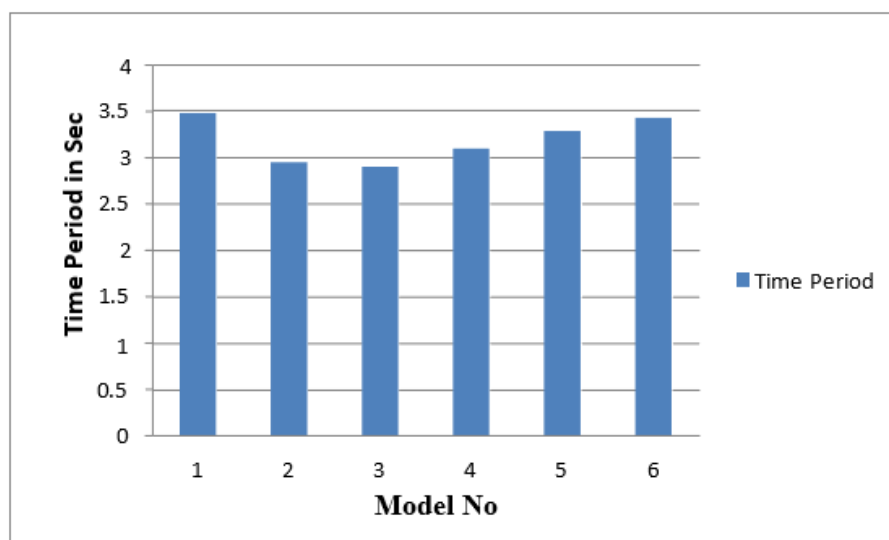
Model No	Base shear	Diagrid Inclination	Percentage increase or decrease compare to model 1
1	10650.48	No Diagrid	-----
2	11676.25	39 ⁰	8.78% increase
3	11852.49	58 ⁰	10.14% increase
4	11091.08	67 ⁰	3.97% increase
5	10448.6	73 ⁰	1.89% decrease
6	10009.91	76 ⁰	6.01% decrease



Graph 6.10: Comparison of Base shear for each model due to ESA

7.4 COMPARISON OF TIME PERIOD DUE TO EQUIVALENT STATIC METHOD:

Model No	Time Period	Diagrid Inclination	Percentage decrease compare to model 1
1	3.465	No Diagrid	-----
2	2.936	39 ⁰	15.26%
3	2.886	58 ⁰	16.70%
4	3.082	67 ⁰	11.05%
5	3.271	73 ⁰	5.59%
6	3.413	76 ⁰	1.5%



Graph 6.11: Comparison of time period for all models due to ESA

OBSERVATION AND CONCLUSION

8.1 OBSERVATIONS:

1. The study shows that most of the side loads are withstood by the Diagrid element provided in the periphery of the Diagrid frame, which improves its performance compared to the traditional frame.
2. The Diagrid Structural system is more efficient than the conventional system.
3. The storey displacement in diagrid building is less than conventional building.
4. The angle 67° is the optimum angle for the diagrid building which shows better results compared to other angles.
5. The storey drift in diagrid building is lesser conventional building.
6. The bending movement in interior column is found decreasing in diagrid building when compared with conventional building.
7. It was noticed that the time period of diagrid structure is reduced compared to conventional building.
8. The base shear for a structure with provision of diagrid up to 58° is higher as the diagrid inclination increases the base shear value decreases.
9. The storey drift value is lesser for conventional building as the diagrid was introduced at periphery the story drift value increases for inclination up to 39° and later it decreases as the inclination of diagrid increases.
10. The displacement is higher for conventional building as the giagrid was introduced with an inclination of 58° the displacement decreases.

8.2 CONCLUSION:

1. Compared to orthogonal structures, diagrid structures are drastically different in terms of the load-transfer mechanism, structural style, and aesthetic appeal.
2. One crucial aspect of developing Diagrid structures is ensuring a solid joint connection.
3. The building is also well-suited to seismically active regions due to its increased seismic resilience.
4. A large body of research shows that diagrid increases a material's ductile capability in addition to its strength and stiffness.
5. So, as new construction technologies make advanced structures simpler to construct, Diagrids have a good chance of becoming a lot of a standard in high- and mid-rise building development.
6. The versatility of diagrids in creating intricately formed buildings has been acknowledged globally.
7. After removing all of the diagrid constructions' periphery vertical columns, the diagrid elements still provide enough efficiency for lateral loads.
8. That is why diagrids can tolerate a moderate degree of lateral stresses even in the absence of peripheral columns.
9. One other thing we can say is that diagrids are better at resisting lateral displacements than regular braced frame constructions.
10. From these findings, we may deduce that diagrids provide higher member stiffness compared to

traditional braced systems.

11. As there are less supports and a better design of building's open area, Diagrid structures ultimately provide greater internal space and a more attractive impact.
12. All six models have deflection/displacement and drift values that are within the permissible range.

8.3 SCOPE OF FURTHER STUDY:

- 8.3.1 The present work is carried out for 26 storey the work can be extended for higher storey.
- 8.3.2 The work may extended for different diagrid inclinations.
- 8.3.3 The present work is performed with seismic analysis the work can be extended for Wind analysis.
- 8.3.4 The work can be extended to hard soils or soft soils because the work is taken up by considering medium soils,

REFERENCE

1. **Mohammed Ibrahim, Veena Narayankar:** Comparative Study of Performance of Conventional R.C Framed Structures and Diagrid Structures Subjected to Ground Motions, International research journal of engineering and technology (irjet) Volume: 03 ISSUE: 10 | OCT -2016
2. **Trupti A. Kinjawadekar, Amit C. Kinjawadekar:** Comparative Study Of Seismic Characteristics Of Diagrid Structural Systems In High Rise Construction, International Journal of Civil Engineering and Technology (IJCIET) Volume 9, Issue 6, June 2018.
3. **Premdas S, M. Sirajuddin:** Diagrid Structural System for Tall Buildings: State of the Art Review, International Research Journal of Engineering and Technology (IRJET) Volume: 06 Issue: 06 | June 2019.
4. **Anshuman R. Prajapati¹, Ashwin G. Hansora:** Parametric Study on Diagrid Structural System with and without Shear Walls, International Journal of Civil, Mechanical and Energy Science, 7(3) May-Jun, 2021.
5. **KYOUNG SUN MOONA:** Diagrid Structures for Complex-Shaped Tall Buildings, The Twelfth East Asia-Pacific Conference on Structural Engineering and Construction, Available online at www.sciencedirect.com
6. **Sameeran R. Takle , Prof. Aparna S. Patil , Prof. Bharati V. Mahajan:** Dynamic Analysis of Diagrid Structural System in High Rise RCC Buildings with Varying Geometry, International Journal of Engineering Research & Technology (IJERT), Vol. 9 Issue 12, December-2020.
7. **DeepaVarkey, Manju George:** Study on Performance of Diagrid System on High Rise Buildings with Complex Shape, International Journal of Scientific & Engineering Research, Volume 7, Issue 10, October-2016