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EFFECTIVE STEEL STRUCTURAL SYSTEM FOR TALL BUILDING (G+36)

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Abstract: Tall building developments have been quickly growing. For designing any kind of tall building, it should withstand again loads acting on it. There are two major load acting on Tall Building 1)Gravity load 2)Lateral Load. In this case of tall building, Lateral load is become predominate with increase in height of structure. Thus Tall buildings use different type of structural system to withstand again the load acting on it especially lateral load. In this project we compared different type structural system, which are mainly used up to 50 storey. Different structural system act differently to withstand against the gravity loads and laterals loads. For analysis of different types of structural system, we used ETABS (Extended three dimensional analysis of building systems) 2016 which is most commonly used software for designing and analysis of tall building. Use of ETABS becomes popular Because of modelling is easy for any kind of building like residential building, commercial building and even any kind of tall building. In this project we check different criteria for different structural system like displacement, drift and material consumption. By this we can find the best structural system among all in term of safety and economic.

Keywords: Tall Building, Structural system, Mega Braced system, and External Braced system. Etc....



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INTRODUCTION

In this paper, We compare the different structural system like frame structural system, frame tube structural system, Internal Cored braced system, External braced system and Mega Braced System in term of max Storey deflection and Material consumed in tall building. Here we used Structural steel for design the tall buildings in Etabs 2016.

2.1 Model data:

Plan : 32m*32m

Shape : octagonal

No of Storey : G+36

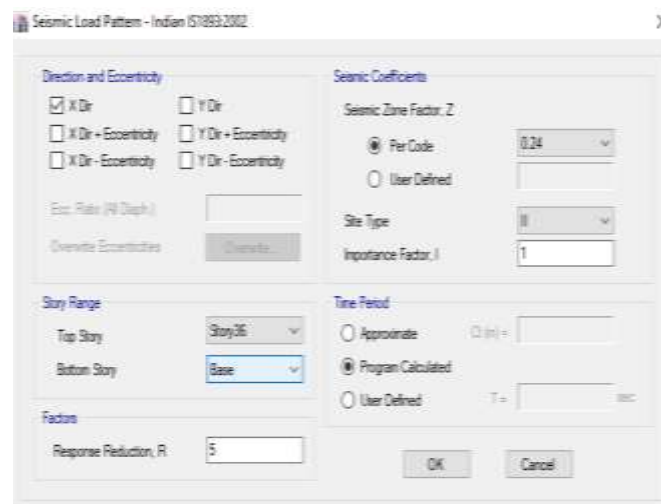
Material : Structural Steel

2.2 Loads applied on Models

Deal Load : Program generated using materials assigned

Live load : 2.5 KN/m² (office building as per is875 part 2)

Earthquake load : As per is 1982 2002



3.1 Structural System Used

1) Frame Structural system

- 2) Frame tube system
- 3) Internal core braced system
- 4) External braced System
- 5) Mega Braced System

3.2 Modelling of Structural System

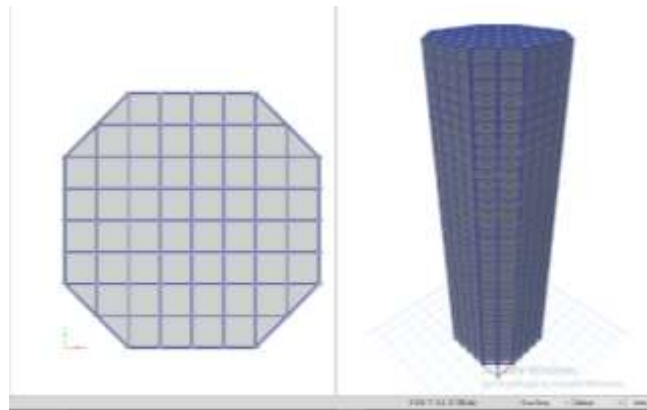


Figure 1 Frame System

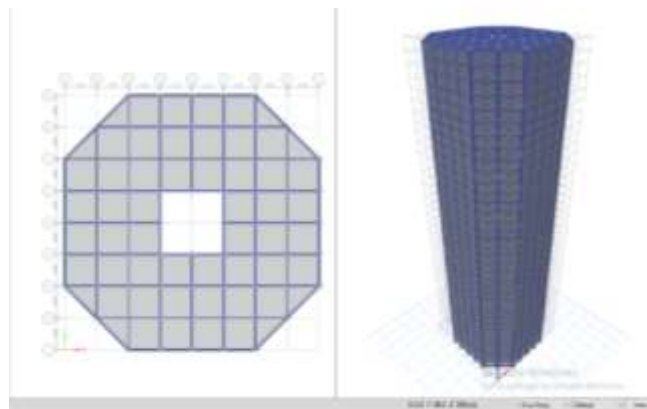


Figure 2 Frame tube system

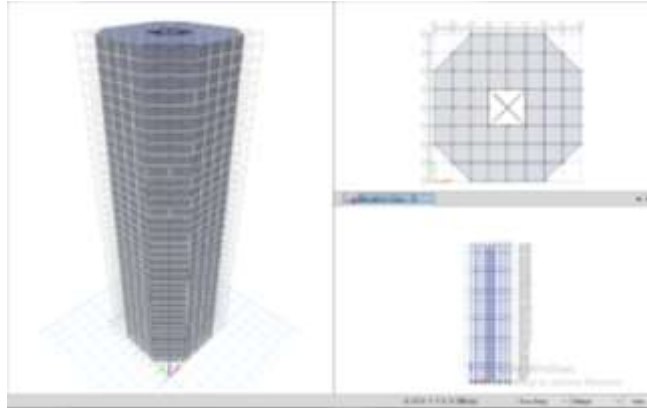


Figure 3 Internal Core Braced System

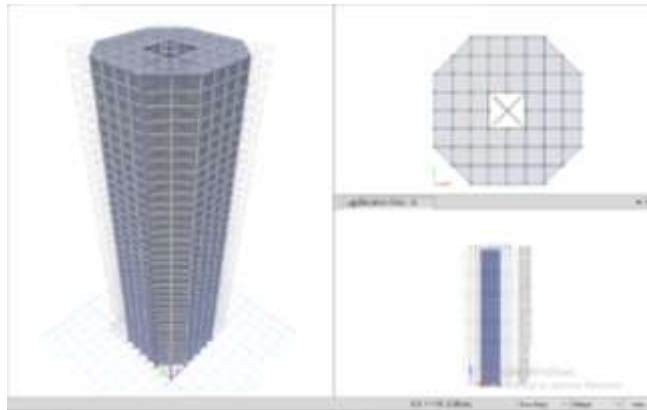


Figure 4 External Braced System

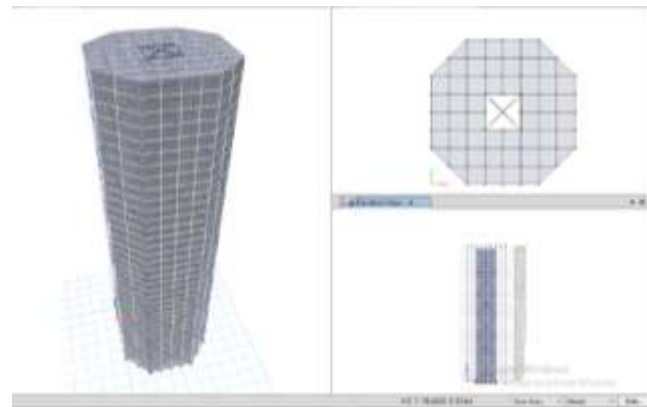


Figure 5 External Braced System

4.1 Result and Graphs

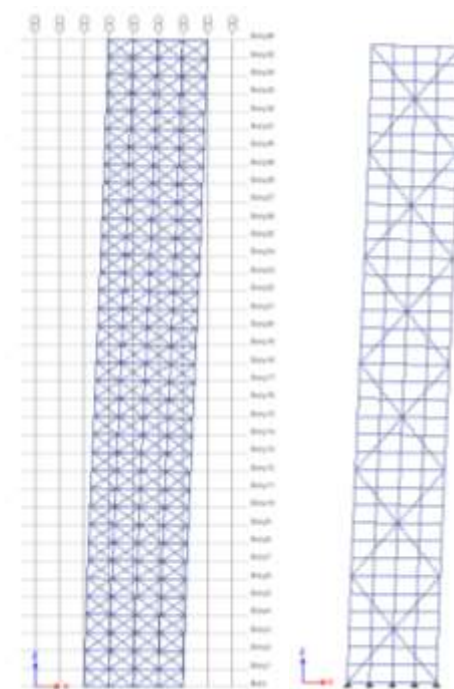
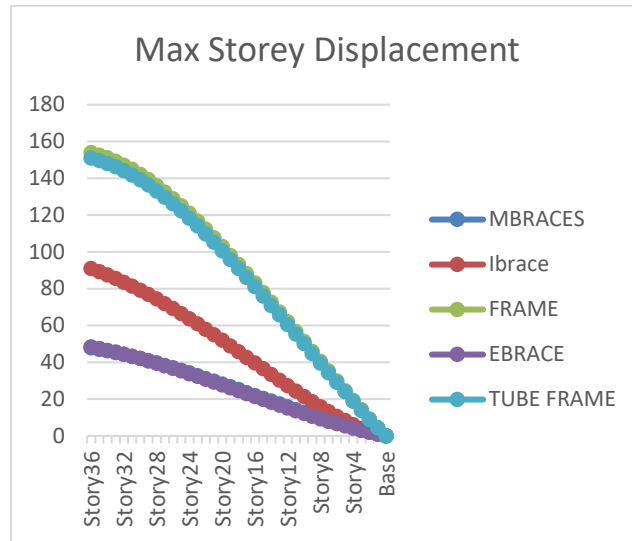
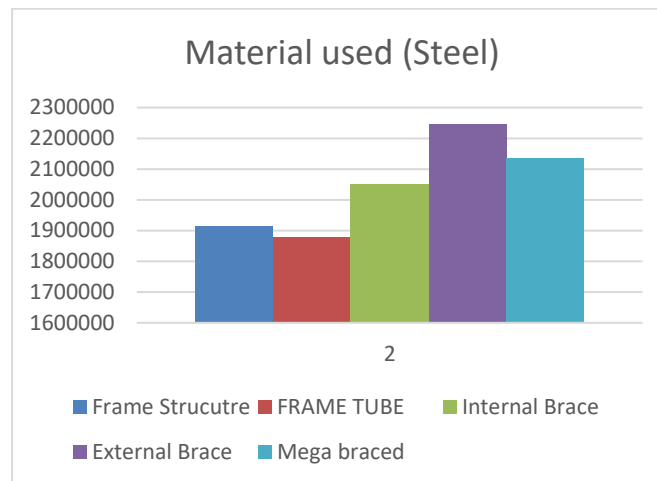
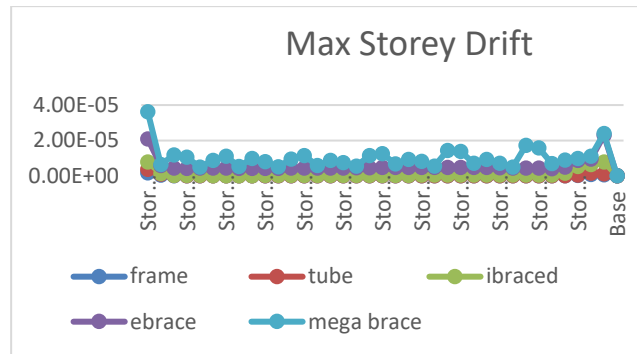


Figure 6 Deflection of External braced System and Mega Braced System



5.1 CONCLUSIONS

From the analysis of different types of structural system, We Found that Mega Braced System has only 47mm top storey maximum displacement which is one of the least among all with least steel consumed to construct it. So we can tell that Mega braced system is the most economical in terms of material consumption and provide better safety among all the structural systems.

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