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Parametric Study on Design Various Steel with Various Design Codes for Selecting a Better Option for Construction of Steelstructure

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Abstract— *Construction projects require many decisions. A key decision is to find the most effective option, as well as determining which process could produce ideal results. Construction work is done mainly by two types, Steel structures and Concrete structures. Following are some points how Steel structure is advantageous over concrete structure. This chapter presents briefly review of relevant studies of various papers published related to this dissertation. The main objective of this literature is to explore related studies of analysis and design used in this dissertation of analysis and design of conventional steel building and pre-engineered building.*
Keywords—*Seismic load, stresses, shear force, high rise building, staad Pro, bending moment, deflection*

I. Introduction

BACKGROUND OF PRESENT WORK

Construction projects require many decisions. A key decision is to find the most effective option, as well as determining which process could produce ideal results. Construction work is done mainly by two types, Steel structures and Concrete structures. Following are some points how Steel structure is advantageous over concrete structure.

Costs: A large majority of all steel manufactured today comes from recycled materials, this recycling usage makes the material much cheaper when compared to other materials. Although the price of steel can fluctuate, it typically remains a less expensive option compared to reinforced concrete.

Strength: Structural steel is extremely strong, stiff, tough and ductile; making it one of the leading material used in commercial and industrial building construction.

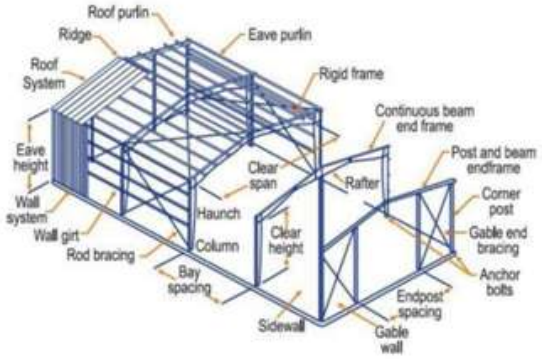
Fire resistance: Steel is inherently a non-combustible material. However, when heated to extreme temperatures, it's strength can be significantly compromised. Therefore, the IBC requires steel to be covered additional fire resistant materials to improve safety.

Sustainability: Structural steel is nearly 100% recyclable as well as 90% of all structural steel used today is created from recycled steel. Due to its long lifespan, steel can be used as well as adopted multiple times with little to no compromise to its structural integrity. When manufactured, fabricated and treated properly, structural steel will have a minimum impact on the environment. Steel with such processes such as water resistant seals and paint care. Fire resistant features may be included when water-resisting seals are applied. By considering all the above points, Steel structures are the most preferable type of construction.

II. Methodology

Analysis and design by STAAD Pro v8i

The power tool for computerized structural engineering STAAD Pro is the most popular structural engineering software product for 2D, 3D model generation, analysis and multi-material design. It has an intuitive, user-friendly, visualization tools, powerful analysis and design facilities and seamless integration to several other modeling and design software products. The software is fully compatible with all Windows operating systems. In STAAD Pro utilization ratio is the critical value that indicates the suitability of the member as per codes. Normally, a value higher than 1.0 indicates the extent to which the member is over-stressed, and a value below 1.0 tells us the reserve capacity available. Critical conditions used as criteria to determine Pass/Fail status are slenderness limits, Axial Compression and Bending, Axial Tension and Bending, Maximum w/t ratios and Shear. For static or dynamic analysis of Pre-engineered building, STAAD Pro has been the choice of design professionals around the world for their specific analysis needs.



III. Conclusion

Steel structure are becoming more popular in construction industry more or less PEB system is also becoming an eminent segment in pre-engineered construction industry. It has become possible because pre-engineered building encompasses all the characteristics that are compatible to modern demands, namely speed, quality and value of money.

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