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Review on Design and Analysis of Pre Engineering Building

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Abstract: ***Nowadays, the pre engineering building (PEB) introducing the concept of design various structures. As compared to conventional structure it fulfils all the requirements with reducing time and cost of construction of any building. The quality of PEB has design of structures has helped to make the design economical. The PEB structures members are design as per bending moment diagram and thus reducing the steel requirement.***

Keywords: PEB, Design, Economical, Bending moment, Steel

I. INTRODUCTION

The onset of technological advancement enabling 3D modelling and detailing of the proposed structure and coordination has revolutionized conventional building construction. Now-a-days, Pre-Engineering Building system is mostly used and it is manufactured for residential and non - residential construction. This industry is growing at the rate of 28-33%. As per IS code, design of PEB structures are safe. It is the new technology for steel structures which is designed and adopted to replace conventional steel structures. Pre-Engineering Steel Building uses various accessories like mezzanine floor, canopies & interior partition etc. as per requirement. This concept of design gives better aesthetic look and it has unique construction technic. It is mostly used for offices, shops, warehouses, stadiums, shopping malls, etc. Pre Engineered Buildings are adopted for long span structures, they are economical, provide flexibility for future expansion, require low maintenance and are easily during its life cycle which has changed the conventional steel building practice.

A. What Is Pre-Engineered Building?

Pre-Engineered Building are new steel structure building which design and replaces conventional steel structure. PEB are uses combination of built up section by using Tapered section and I-Beam section. Tapering is done as per bending moment by total weight of structure. This structures are used for long span section. PEB are developed using potential design software. They can be easily expanded as per requirement in future. The PEB is economical and it takes less time in construction than conventional steel Building.

II. LITERATURE REVIEW

Mittal Parmar, Varsha Yadav, Samruddha Raje (2019); studied the PEB structure not only reduces the construction time but also cost of structure. It is lightweight structure and it's economical, and they analyzed G+1 & G+2 building to find most economical bay spacing study of structural analysis and design of multi-storey PEB by using IS 800-2000.

Deepti D. Katkar, Prof. N. P. Phadtare (2018); studied PEB helped in optimizing design, long span, column free structure as compared to conventional building. Rakesh D. Shambharkar, P. A. Deotale, et al. (2018); studied PEB having low span and analyzed for weight and cost reduction. The building was estimated and optimized for cost of building. Santosh S. Patil, Sujay Deshpande (2018); studied different span of structure and analyzed by STAAD pro and compared following factor such as weight, cost and time of construction.

Shashank Pattanshetti, Prof. Sachin M. Kulkarni (2017); studied both PEB and CSB structure on software to check the economy parameter on the basis of weight and material. Darshan Kalantri, Sujay Deshpande, Pavan Gudi (2017); carried the study of comparison between PEB and CSB with help of different IS codes. Performance of weight, cost and construction time were discussed.

Swati Wakchaure and N. C. Dubey (2016); shown that by using pre-engineered structure in construction, there are various advantages because according to the bending moment diagram, the designing of members is done. As a result, the steel is reduced. They have analyzed and studied according to IS 800-2007 and IS 800-1984 & the comparison of pre-engineered structure with

conventional steel-structure is done. Jinsha M S, Linda Ann Mathew (2016); studied the behaviour of structure by analysing and designing the structure on Staad Pro Software. Different length of bays are used to determine most economical section.

Neha Kolate and Shilpa Kewate (2015); carried out the comparison between conventional steel building and pre-engineering building. The designing is completed by applying various combination loads which includes dead load, crane load, wind load and earthquake load etc.

G. Sai Kiran, A. Kailasa Rao, R. Pradeep Kumar (2014); they observed that, the introduction of pre engineering building concept in the design of structure in recent years has helped in optimizing design. The adoptability of PEB in the place of conventional steel building design concept resulted in many advantages, including economy and easier fabrication. An industrial structure (Ware House) was analyzed and designed according to Indian Standards, IS 800-1984, IS 800-2007 and also by referring MBMA-96 and AISC-89. Milind Bhojkar and Milind Darade(2014); utilized optimum cross section of steel to optimize cost. The cost of pre engineered building is very effective in civil engineering field.

III. CONCLUSION

On reviewing all there literature following conclusions can be drawn:

A. PEB is more economical than CSB structures.
B. The PEB structures requires shallow foundations even if the height of structure is more as the weight of building is reduced due to the reduction in dead load of structure.
C. Primary components of pre engineering building greatly affects the quantity of steel. Steel consumption is decreased if spacing between bays increased.
D. The PEB structures are low cost, durable, flexible, and it requires less time for construction as mentioned in above published papers.
E. We can conclude that pre engineering building can be used for larger spans which gives column free space.
F. Various design codes were studied in [4]. It is observed that weight is increased in IS 800-1984 as compared to IS 800-2007 and AISC/MBMA gives lesser weight as compared to IS 800-2007. Therefore, it is concluded that loading as per Indian codes is greater than MBMA code.

IV. FUTURE SCOPE

The pre engineering building technology can be implemented in designing a residential building.

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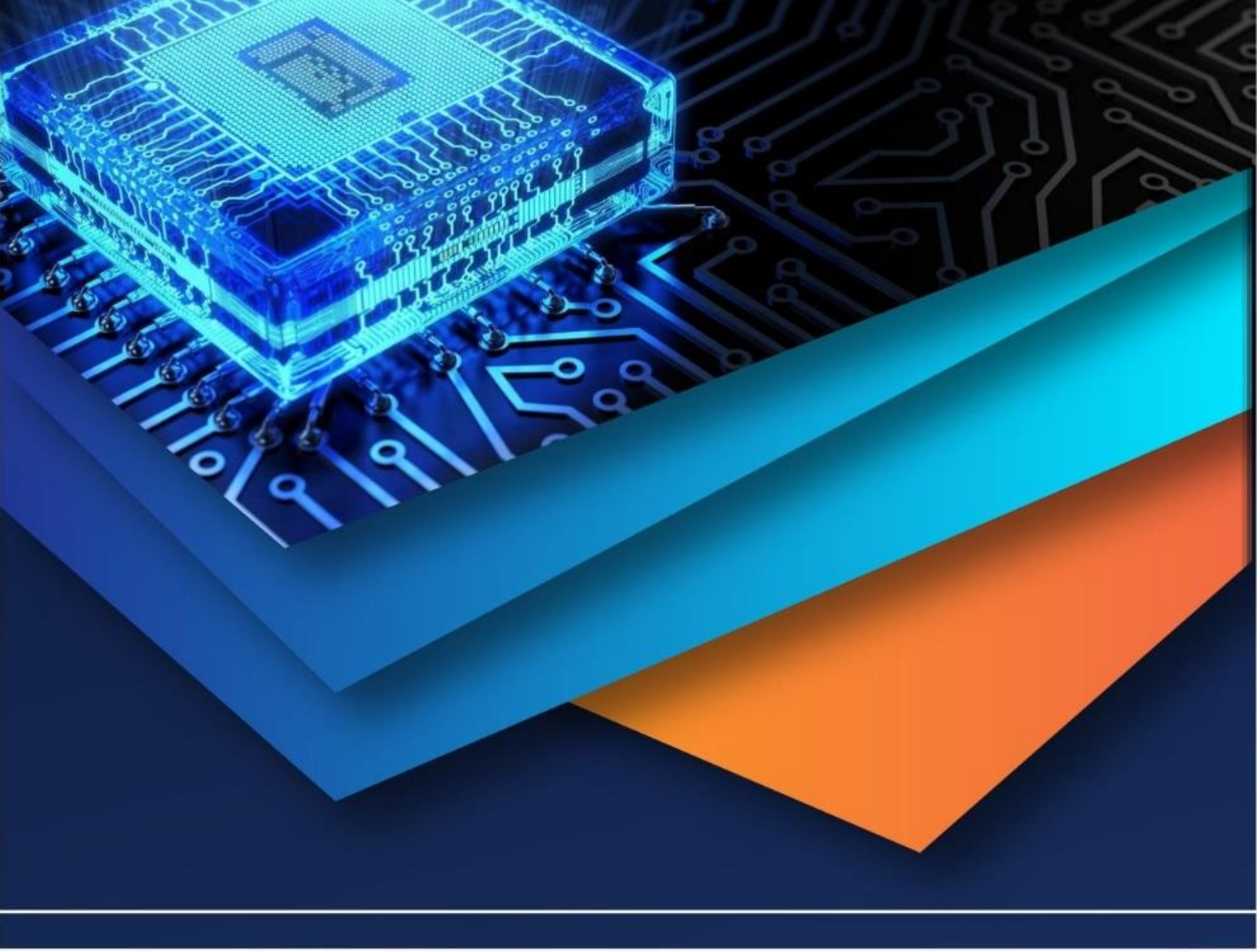

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