

Truss Building

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Abstract – This paper presents a study on behavior and economical of truss building and purlins by truss provided along large span due to material saving as compare to other types of building structure. Roof trusses and purlins are therefore an integral part of an industrial building and the like for supporting the roofing system. This paper presents a study on behavior and economical of truss building, this study involves in examination of theoretical investigations of specimens in series. The specimens are designed under uniformly distributed loading with simply supported condition. The research project aims to provide which span of truss is economical, high bending strength, more load carrying capacity and high flexural strength.

Indexed Terms: Truss, Partitions, Joints, Roof bolting

I. INTRODUCTION

Industrial buildings are low rise steel structures, characterized by their low height, lack of interior floors, walls and partitions. Sometimes the truss is also called an open web beam. It consists of a triangular network of compression and tension members. On the basis of structural behavior, trusses can be classified a simple truss supported over masonry walls, and roof trusses supported over columns and connected to it with knee braces. Theoretically, truss members are subjected only to direct tension and direct compression.

We were assigned to design and build a truss building using normal wooden sticks with column of 8mmX8mm rectangular size and stirrups of 6mm×6mm size. The wooden sticks have to withstand higher load to achieve better efficiency. It is a perfect truss building which is fulfill the criteria of high aesthetic and utilize minimum construction material.

Through these investigations, we are able to explore truss member in different arrangement understanding it strength by applying knowledge in load distribution of truss system.

We are also able to understand and apply the knowledge on calculating the reaction force, internal force and determine the force distribution in truss. By doing so, we are able to identify which member in truss system needs to be strengthened in term of its tension or compression.

Trusses are mainly triangulated framed structures resisting loading by developing axial forces, either tension or compression in the component members. A truss performs the same functions as a beam; hence it is also called open web beam. Individually they are also in tension and compression, the exact arrangement of forces will depend on the type of truss and on the direction of loading.

II. AIMS AND OBJECTIVE

In this investigation, we can understand tension force and compression force in truss building. Through exploring different arrangement of truss, we will able to identify the type of truss building. We are also exposed to different method of placing the elements and joints construction, based on type of forces applied to the members. It also trains the student to design a perfect truss building which is fulfill the criteria of high aesthetic and utilize minimum construction material.

III. MATERIALS SPECIFICATIONS

1. 20 column (8mm×8mm size)
2. A plywood for foundation
3. Stirrups (6mm × 6mm size)
4. Adhesive material (FEVICOL)
5. Paint brush
6. Black and brown color

IV. GENERAL PROPERTIES OF WOODEN
[5][6][7][8][9]

Moisture	8.25%
Shrinkage	10.26%
Hardness	30%
mechanical strength	39.29%
Color	dark brown
Specific Gravity.	0.86

V. METHODOLOGY[1][2][3]

Design and build a truss building using normal wooden sticks.

Firstly, precedent study had been conducted to gain an insight how a truss building could affect the structural strength and its construction method.

To achieve a higher efficiency of wooden building, the strength of wooden was being tested to examine its ability of load sustaining. Moreover various type of glues are tested by applying a point load at the centre of a three layer of wooden sticks.

Secondly, model making and testing of wooden truss structure are the primary steps throughout this project. An AutoCAD design is also made before model making to attain a better measurement.

Thirdly, the main structure of wooden is constructed first. Then intermediate members at different position of the building are installed to connect the gaps between the main structures.

VI. LOAD CALCULATIONS[2][3][4]

The main loads on trusses are:

- Dead loads
- wooden plyboard : 11.772 N/m²
- Stirrups: 13.3416N/m²

- Truss Load Combinations
- Dead Load + Imposed Load
- Dead Load + Snow Load
- Dead Load + Wind Load

VII. CONCLUSION

In conclusion, it has been a great experience working on this project. Using normal wooden sticks to construct a wooden truss building and gaining so much knowledge after that have amazed us how strong a structure can be, if it is properly designed and constructed.

It is very important to understand how each members work together as a whole in structural system in attaining a higher efficiency. Other than understanding how each member work, there are other few factors, we took into consideration very carefully from construction of truss building until the end stage of load testing.

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