

PARAMETRIC STUDY OF HOWE ROOF TRUSS

Name of Student : Brahamjeet Singh (100376480112)

Deptt. : Structure

Guide : Jagbir Singh

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ABSTRACT

In design of steel trusses different types of geometries (Howe truss, Pratt truss, Fink truss are etc.) and sections (Angle section, Tube section, rectangular hollow section etc.) are widely used. The purpose of this job is to study the effect of different spacing, span, and pitches, in order to find out the most economical truss by comparing the use of hollow sections and angle sections. The need of this study arises where sometimes it is difficult or taking too much time to choose an effective and economical truss span spacing and pitch during design and construction period. The design was done with the help of Staad pro- V8i software using Limit State Design Method. In present work, “**HOWE ROOF TRUSS**” of span varying as 10m, 20m, 30m, and 40m has been analyzed for different spacing such as 3m, 4m, 6m and 8m also at the different pitches 1/4, 1/5, 1/6, 1/7 to get the desired economical truss design. In investigating the effectiveness of various truss geometries, a total of **64** truss combinations were analyzed and designed by providing the **hollow square sections and angle sections**. The analysis of all sets of trusses enables comparisons to be made among the various **spans, spacing and pitches**. The loads (dead load, live load and wind load) at each panel and node are calculated manually as per Indian Standard Codes IS 800:2007, and IS 875(Part 3)-1987 and then the loads are entered into STAAD PRO-v8i software for analysis and designing of members. Loads are applied on the nodes (member joints considered as pinned joints) of truss the STAAD PRO-v8i output method is used for determining the member forces. After that the load combinations and design were applied according to the design method (Limit State Design Method). In designing of Howe roof truss both the angle sections and square hollow sections were provided to compare the weight of truss. In this Study the truss with a least value of weight is considered as most economical truss. At the end it was concluded that with the increase in spacing of truss the self-weight of truss was also enhanced. In most of the cases the pitch 1/5 and 1/6 was concluded as the most economical. Most of the times the trusses provided with angle sections were assumed to be more economical. On the other hand for 30m span with pitch 1/6 the hollow sections gave the economical design of truss. Also in case of 40m span and 1/7 pitch the hollow sections are seems to be more cost effective