شبكة المعلومات الجامعية
التوثيق الإلكتروني والميكروفيلم

بسم الله الرحمن الرحيم

HANAA ALY

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Faculty of Engineering
Department of Structural Engineering

Behavior of Double Layer Steel Roof Joints to Different Loads

A THESIS
Submitted in Partial Fulfillment for the Requirements of the Degree of

MASTER OF SCIENCE IN CIVIL ENGINEERING (STRUCTURAL)

Submitted by

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Bachelor of Science in Civil Engineering

Faculty of Engineering, Ain Shams University, 2017

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This thesis is submitted as partial fulfillment of the requirements for the Degree of Master in Science in Civil Engineering (Structural), Faculty of Engineering, Ain Shams University.

No part of the thesis has been submitted for a degree or a qualification at any other University or Institution.

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ABSTRACT

During the past decades, Space trusses have been used due their aesthetic appearance and capacity to cover large spans. There are types of steel space trusses such as double layer grid system, two parallel layers interconnected by vertical, horizontal, and diagonal members. Double layer grid system provides more rigidity and prevents the deflection of the structure. The jointing system is the main component in these structures. Many researchers are required to behavior of the joints in space trusses. The best way to cover this point is the parametric study on behavior of the joint in the double layer space trusses. There are different methods used in these decades the proposed method is not covered yet. The main purpose of this study is to propose a methodology that the behavior of double layer steel roof joints. The data used in this research was collected according to theoretical values, model geometry, and different loads. The models use the finite element method to give recommendations or guidelines to study the stability of behavior of double layer steel space truss joints. The Node and bolts have been modelled on SolidWorks and comparison between results of analytical model has been made by ANSYS and collector models are used to validate the proposed models. The joint has been analyzed to study the distribution of surface and internal stresses using Finite Element Method.

Keywords: *Space truss; Double layer grid system; Nodes; MERO system; Analytical Model; Finite Element Model; SolidWorks® ANSYS® Software.*

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