INFLUENCE OF FLANGES STIFFNESS ON SHEAR CAPACITY OF SINUSODAL PROFILED WEB GIEDER USING FINITE ELEMENT METHOD

by

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APPROVAL AND DECLARATION SHEET

This project report titled Influence of Flange Stiffness on Shear Capacity of Sinusoidal Profiled Web Girder using Finite Element Method was prepared and submitted by Haslinah binti Mohd Ali (Matrix Number: 101200281) and has been found satisfactory in terms of scope, quality and presentation as partial fulfillment of the requirement for the Bachelor of Engineering (Civil Engineering) in Universiti Malaysia Perlis (UniMAP).

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PENGARUH KEKUATAN BEBIBIR TERHADAP KEUPAYAAN SHEAR BAGI WEB YANG BERKERUT SECARA SINUSOIDAL MENGGUNAKAN KAEDAH ELEMENT TERHAD

ABSTRAK

Satu analisis elemen terhad telah dilakukan untuk mengkaji pengaruh kekuatan bebibir terhadap keupayaan shear bagi web yang berkerut secara sinusoidal. Model elemen terhad tiga dimensi dibentuk menggunakan perisian LUSAS (versi 13.6) dan dibandingkan dengan kajian-kajian yang berkaitan dan BS5950 Bahagian 1. Kajian parametric dilakukan terhadap web yang berkerut secara sinusoidal berkenaan dengan dimensi bebibir dan ketebalan dan nisbah segi bagi web. Beberapa model telah diuji untuk membandingkan keupayaan shear bagi web yang berkerut secara sinusoidal dan web konventional flat. Bebibir dibentuk dalam saiz yang berbeza tetapi web dibentuk dengan saiz yang sama. Hasil kajian menunjukkan web yang dibentuk berkerut secara sinusoidal boleh menampung beban yang lebih tinggi berbanding web konvensional yang rata. Kajian parametric juga menunjukkan ketebalan bebibir tidak mempunyai pengaruh yang banyak terhadap keupayaan menampung beban. Bagi medel yang dibentuk dengan nisbah segi kurang daripada satu boleh menampung beban yang lebih tinggi berbanding model yang dibentuk dengan nisbah segi lebih daripada satu.

INFLUENCE OF FLANGES STIFFNESS ON SHEAR CAPACITY OF SINUSOIDAL PROFILED WEB GIRDER USING FINITE ELEMENT METHOD

ABSTRACT

A finite element analysis had been done to study the influence of the flange stiffness on shear capacity of sinusoidal profiled web girder. A three-dimensional finite element model is proposed using LUSAS (version 13.6) software and compare to other related research and BS5950 Part 1. A parametric study was carried out on the sinusoidal web regarding the flange dimensions and the thickness and the aspect ratio of the web. Several models had been tested to compare the shear capacity of sinusoidal profiled web girder with the conventional flat web girder. The flange was designed in different dimension but the web was kept constant. The results show that the sinusoidal profiled web girder could carry higher ultimate shear capacity as compared to the conventional flat web girder. A parametric study showed the difference flange thickness has not great influence in shear capacity of the girder. For the models designed with aspect ratio less than one could support high shear capacity as compared to the aspect ratio more than one.

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