ANALYSIS OF THIN-WALLED

FRAME STRUCTURE

by

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SYNOPSIS

The analysis of engineering structures provides a natural introduction to Finite Element Methods. In this project the analysis of thin-walled open channel section structures with different angle of discontinuity is considered.

The structure to be analysed composed of two parts loaded member and unloaded member. The length of loaded member is approximately 1922 mm and 920 mm length of unloaded member. The software that being used in this project is ANSYS (ANALYSIS SYSTEM).

To make a comparison on the theoretical result obtained by ANSYS the DEVELOPED PACKAGE (BY MOHD. RAZALI IBRAHIM, NOV 1995) was used. The package was developed by using FORTRAN LANGUAGE. Analysis by ANSYS using shell element whereas for DEVELOPED PACKAGE the line element analysis is chosen.

CHAPTER 1

INTRODUCTION

1.1 General

Almost all steel buildings now use cold-formed steel products in some manner. Approximately 70% of the components by weight of a typical pre-engineered metal building are cold-formed members. They are used in the floor systems of high-rise buildings, as permanent formwork for concrete bridge decks, components of trusses and storage racks, diaphragms to resist seismic forces, and many, many other uses.

Cold formed steel is made from steel sheet, strip, plates, or flat bars shaped at ambient temperatures in special roll forming machines, or in press or bending brake machines. The steel sheets normally have a thickness ranging from 0.0149 to 0.25 inch (0.4 to 6.4 mm); steel plates and bars can be up to 0.75 inch (19 mm) thick. Cold formed sections are used in many industries and often specially shaped to suit the particular application. In building uses, the most common sections are the **C, I,** and **Z** shapes.

Cold formed steel could be treated like timber in its versatility and use, instead of being a variant of fabricated structural steelwork. The principal advantages that steel has over timber are increased strength or longer spans for a given depth of section, and longer life (if properly protected).[1]