COMPUTER AIDED DESIGN OF STRUCTURAL STEELWORK CONNECTIONS IN ACCORDANCE TO BS 5950 PART 1

by

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"May Allah Bless Them All"

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SYNOPSIS

The objective of this project was to develop several computer programs which are important to Structural Engineering applications.

A computer programming language, FORTRAN 77 was developed for the optimization of steelwork connections design in accordance with the code of practice - British Standard BS 5950 : Part 1 : 1990 using IBM - PC system.

This report includes typical detail connections, manual calculations and flowcharts of the developed program. This program can be extended to include sub programs of other types of connection.

CHAPTER ONE

INTRODUCTION

1.1 Automatic Design Compared to Computer Aided Design.

In the programming of structural design problems, there are two fundamentally different approaches:-

(a) Automatic Design

(b) Computer Aided Design

In Automatic Design, when the computer receives information about the structural geometry, loading and material properties, a solution is automatically generated. The design process is taken out of the hands of the designer and he cannot influence the progress of a solution since the design techniques are an inherent part of the program. So, before he feed in information into the computer, he must choose a realistic value for his basic design parameter.

Automatic design techniques are only applicable to 'closed' problems, one for which a given set of parameters leads to a unique solution e.g. designs which are based upon a choice of standard section or any other problem for which a sufficient number of constraints can be introduced. In this case, the quality of solution depends on the program.

An automatic design program and its data form a package, which requires no external directive for it to produce result once it is in the computer. This program may be a batch processed or on an on-line operation.