

**HIGHER TECHNICAL INSTITUTE**

**CIVIL ENGINEERING  
DEPARTMENT**

**DIPLOMA PROJECT**

**DEVELOPMENT OF A COMPUTER  
PROGRAM FOR PLANE FRAMES**

**C/722**

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## INTRODUCTION

The purpose of the project is to develop a computer program to analyze plane vertilinear frames. The program is written in FORTRAN language and its theory of analysis is based on the equation  $KU = P$ .  $K$  is the total global stiffness matrix of a structure,  $U$  is the displacements and  $P$  the load vector (forces on points and members.)

The program is able to analyze frames which may have ( $x$ ,  $y$ , &  $u$ ) axial, vertical and moment forces on joints but the members must have only uniformly distributed loads.

The program is able to solve any kind of frame in shape, when the correct informations are supplied by the user. The shape of the frame is denoted by the coordinates of joints & connectivities of members. Connectivities indicates the number of joint start and number of joint finished of a member. Connectivities helps to find the length of the member by subtracting the coordinates of last joint with those of jointstart. Other informations wanted are the dimensions of all members (width & depth). Also the number of members with UDL which their value must be declared. Number of joints fixed and number of joints loaded must be defined too. Specific instructions about the information that has to be supplied to the program are going to be given to the user at the input file chapter. The results for the specific input file will be appeared in a different file called "OUT".

The most important element of the theory such as stiffness matrix and load vector are proved in the theory chapter.

At the end of this book verification problem, and examples are listed to guide the user to use this program.

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