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**HIGHER TECHNICAL INSTITUTE
NICOSIA-CYPRUS
CIVIL ENGINEERING DEPARTMENT**

DIPLOMA PROJECT

C/1054

COMPUTERIZED DESIGN OF AN INDUSTRIAL BUILDING

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CHAPTER 1: INTRODUCTION

1.1 GENERAL:

The aim of structural design is to provide, with due regard to economy, a structure capable of fulfilling its intended function and sustaining the specified loads for its intended life.

This can be done by hand calculation or with structural engineering software such as STAADPro.

STAADPro is structural engineering software for 3D model generation, and it is a general purpose program for performing the analysis and design of a wide variety of types of structures. The basic three activities which are to be carried out to achieve that goal:

- a) Model generation
- b) The calculations to obtain the analytical results
- c) Results verification is all facilitated by tools contained in the program's graphical environment.

Also, STAADPro is used for static or dynamic analysis of bridges, transmission tower, steel, concrete, aluminum or timber buildings, embedded structures (tunnels and culverts), stadium or other simple or complex structures.

The program is readily available to analyze plane frames and space frames. The program is in two parts – input data and output. In details, this part consists of:

Data i) joint coordinates referenced to the frame axis

ii) member incidence and their properties

iii) support conditions pinned or fixed

iv) separate load cases

output i) joints displacement

ii) the axial forces, shears and moments at ends of each member

iii) equilibrium checks.

1.2 PROJECT DESCRIPTION

The objectives of the project include the following:

- To familiarize with the structural analysis and design commercial program STAADPro. This is achieved by modeling, analyzing and designing a simply supported beam in STAADPro and verifying results by hand calculations.
- To study braced and unbraced framing system carrying vertical and lateral, by defining them and see how they affect the stability of the building.

- To study and evaluate the framing system of an existing industrial building with fixed supports according to BS5950.
- To propose, model and design using STAADPro two alternative framing systems for the above building
- To discuss the merits of the three framing alternatives system, by pointing out the role and influence of fixed and pinned supports in a structure. Also, the effect of bracing on a structure.
- Finally, to prepare typical structural drawings of each framing system studied.

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