CHAPTER 1

INTRODUCTION

1.1 BACKGROUND

Arch shape is more impressive to transfer loading against the beam line, due to its ability to withstand general loading by combination of compression and reduced major axis bending different action along its length (Pi Y-L, Trahair NS, 1998). Steel arches that are widely used in the global environment, development, especially in length along the span elements such as terminal roof, bridges and airports. Steel as the material known for having a rather extensive durability, versatility, ductility and strength to weight ratio as compared with the usual material used in construction. This useful properties, coupled with the advances in technology that allow efficient production of steel structure design standard and complex, which popular use of the steel arches.

Civil engineers design and build structures and facilities that are essential in our daily life's primary. Civil engineering maybe be in the area of engineering, because it is associated with the creation, enhancement and protection of the environment, providing facilities for living, industry and transport, including large buildings, road, bridges, canal and other engineering construction. Throughout history, civil engineering has made significant contributions and advances towards the environment and the world we
live in today. In the recent year, there are advances in computer technology and there is a trend toward the use of computer for modeling in the design structure analysis. Engineers are often dealing with the problem of choosing the proper dimension structure consistent with safety, cost effective, aesthetically appealing design.

Currently available a lot of software which already used to design and structural analysis. The main function of this software is to make the work becomes easier to get a more precise result. Software has performed some equations that govern the behavior of similar elements and solve problem. STADD III, AXIS VM, ANSYS and ETABS are several software that can be used to analyze the steel structure.

1.2 PROBLEM STATEMENT

In Malaysia, a major problem in the construction of buildings and civil engineering is preferred concrete structure design comparable to steel structure design. Lack of use of lead exposure steel structure design software application that helps engineering firms to analysis steel structure regarding the increasingly widespread use in other countries. The introduction of ANSYS CivilFEM software has resulted in considerable advances in the analysis and design of the steel arch structure. Therefore, it is great encouragement to study and understand the use or software in solving the practical problem.

1.3 RESEARCH OBJECTIVE

Every thesis has its own objectives. The objective depends on what we want to achieve. The objective is target for everything that we want to do. This thesis has a few objectives that related to the arch frame analysis. So many things we need to find to realize these objectives are:
1. To analyze the steel arch frame using ANSYS software.

2. To determine the deflection on the arch frame when the load is applied.

3. To study probabilistic response analysis of arch frame.

1.4 SCOPE STUDY

To achieve the objectives of this research, the scope of which has been identified in this project. The scope id to analyze the design steel arch frame using ANSYS. Before analyzing, I need to study and become familiar with software ANSYS. In order to start, getting and learning tutorial from the CivilFEM. There are many tutorials to try and explore before I start my steel arch frame analysis. The study shows how the load will affect general structure and more specifically, how load affect the moment, stress and strain of arch structure.

For this project, the design height must minimum height of four storey building and all member structure is passed without having any member failed during model is the analysis. The material for this analysis will chose from the Ansys CivilFEM material library. By using the Eurocode 3, steel grade is used is Fe510 and shape is pipes.