CHAPTER 3

METHODOLOGY

3.1 INTRODUCTION

Methodology is a guiding system for solving a problem, with specific components such as phases, tasks, methods, techniques and tools. By using this approach, the project can run in a smooth way. This research consists of four phases. First, a study produced by the objective and purpose. Second, the data obtained from previous studies, carried out the source book and journal. Third, the study conducted. Finally, the result will be compared and conclusions are made.

3.1.1 INFORMATION GATHERING

This process starts in the beginning of the research. The purpose of this process is to find the useful information about the topics and start collecting the information to give more understanding for what's supposed to do in this topic generally. All the information about the steel arch frame structure and the Ansys CivilFEM are being searched. The methods that being used information gathering are from reading the articles, journal, past thesis, books and from the internet.
3.1.2 LITERATURE REVIEW

A literature review knows as substantive findings as well as theoretical and methodological contributions to a particular topic. It can be secondary sources, it also can be interpreted as a review of an abstract accomplishment. Most often associated with academic-oriented literature, such as a thesis, literature review usually proceeds a research proposal and result section. Its main goals are to situate the current study within the body of literature and to provide context for the particular reader.

The purpose of this process is to give the knowledge more detail about research topics. Review of the literature has used the steel structure of journal articles, conference papers, theses and books relevant prior test associated with the topic. Numerous studies describe the versatility of ANSYS CivilFEM and also success in solving the problem of steel structures is discussed.

3.1.3 ANSYS SOFTWARE

As start for this project, the basic step of Ansys CivilFEM software had to be learned. By using the tutorial form CivilFEM, makes the learning process much easier. The other resource, such as the internet and past thesis are being used to make better understanding about this software. ANSYS is general purpose finite element modeling package for the numerical solution of various problems of mechanical problems. These problems include the study of static and dynamic structure, heat transfer and fluid problems and also problems of acoustic and electro-magnet. In general, finite element solution can be divided into several stages. This is a general guideline that can be used to provide any finite element study.
3.1.4 MODELING THE MODEL

The method we used to create the steel arch frame model is using the Ansys CivilFEM software. After creating the model, we analyze the model using the same software, Ansys CivilFEM software. From the analyzing, we obtain the moment, stress and strain of the steel arch frame.

![Flowchart](image-url)

**Figure 3.1**: Simplified research methodology for this study