CHAPTER 1

INTRODUCTION

1.1. Background

Bridge is a structure build over a river, road or railway as over pass to allow people and vehicles to cross from one side to the other. Other definition of the bridge is a structure build to span physical obstacles without closing the way underneath such as a body of water, valley or road, for the purpose of providing passage over the obstacle. There are many different designs that each design serve a particular purpose and apply to different situations. Design of bridge is very depending on the function of the bridge, the nature of the terrain where the bridge is constructed and anchored, the material used to make it, and the funds available to build it. [1]

The first bridges made by humans were probably spans of cut wooden logs or planks and eventually stones, using a simple support and crossbeam arrangement. A common form of lashing sticks, logs, and deciduous branches together involved the use of long reeds or other harvested fibers woven together to form a huge rope capable of binding and holding together the materials used in early bridges.[1]

With the industrial revolution in the 19th century, truss systems of wrought iron were developed for larger bridges, but iron does not have the tensile strength to support large loads. With the advent of steel, which has a high tensile strength, much larger bridges were built, many using the ideas of Gustave Eiffel.[1]

In the railway construction most of the bridge are constructed using steel structure, since the rail easier to be erected in steel construction then in slab concrete.

The advantages of steel to be used as the bridge material are:

1. Hight strength, this means that the weight of structure that made of steel will be small.

2. Uniformity, the properties of steel do not change as appose to concrete.

3. Elasticity, steel follows Hooke's law very accurate.

4. Ductility, can withstand extensive deformation without failure under high tensile stresses.

5. Toughness, steel has both strength and ductility.

6. Maintain is strength indefinitely, does not deteriorate with age like timber and concrete.

7. Can be recycled.

8. Very strong and flexible, steel framed house are ideal in cyclone/ hurricane.

9. Steel has alaso high strength to weight ratio as compared to concrete.

10. Structure can be prefabrication in large section.

[2]

1.2. Problem Statement

From this explanation, shows that knowledge of steel truss bridge design is very important for civil engineering student. In this final assignment will be designed and calculated upperstructure of arch steel truss railway bridge. Selection of arch steel truss bridge for railway because it can have long spans without pillars in the middle of the span and the construction can pass through very deep and wide valley, so we are interesting to chose this design. For that reason, Design of Steel Arch Truss Railway Bridge is selected as the topic of this final assignment.

1.3. Objectives of The Final Assignment

From the above background and problem statement, the objectives of this Final Assignment can be mentioned as follows:

1. To design and calculate of steel arch truss railway bridge,
2. To get knowledge on designing steel arch truss railway bridge.

1.4. The Scope of Study

To accomplish those objectives, this study started with a literature review of the information pertaining to design and calculation of arch steel truss Railway Bridge. Some books, journals, papers pertaining to railway bridge design will be reviewed. Literature review and then will be followed by methodology. In the chapter of methodology, all parts of the bridge will be decribed and explained. Design and calculation of upperstructure and superstructure will be given in chapter four, while the results will be given and discuss in chapter five. In addition, design drawing will be given in attachment.