CHAPTER I
INTRODUCTION

1.1. Background

Girder is a bridge beam located between two abutments, or an abutment and a pier, or between a pier and a pier. The girder includes the upper structure of the bridge and serves to support the bridge floor plate and forward it to the abutment or pier. Based on the material used, there are wood girder, steel, concrete, and precast concrete girders. In terms of its shape there are several girders, type I profile girder, long rectangular girder, and girder with a middle cavity or commonly called a box girder as shown in Figure 1.1.

Figure 1.1. Pre-cast Concrete Box Girder

Box girder can be made with a span of more than 100 m as seen in Figure 1.2.

Figure 1.2. Bridge Box Girder under Construction

In this final assignment, bridge will be designed using steel box girder material. The selection of steel box girder instead of the concrete box girder because it has advantages as follows:

1. Steel has a power structure that is more stable when compared to the strength of the concrete structure was changed based on a mixture of cement and water.
2. Because it is produced in factories, steel has a uniform quality and thoroughness of the high size rather than concrete.
3. Wind Load also becomes smaller in a bridge using steel materials. This is because the material structure using steel smaller than the bridge of concrete.
4. Steel is a very hard material so that by the time the condition of the steel structure had already reached the melting point due to the load of the bridge, the steel can still return to its original form, in contrast to a very brittle concrete, once he stretched it will crack. When the concrete stretch in a long time, concrete tends to shrink and the deformation will result in cracks. While the steel will not be problematic such as concrete that had a tendency to crack during a time draining effects due to casting.

5. In terms of the strength of the received earthquake, steel also has stronger durability of concrete material.
6. Installation of steel bridges in the field more quickly than with a concrete bridge, and also requires only a relatively small space in the construction site. This is one of the advantages of the steel bridge when that location is associated with the project location and cramped.

Figure 1.3 show under construction of steel box girder.

Figure 1.3. Steel box girder under construction

1.2. Objectives of the study

From the description above, the objectives of this study are:

1. To design highway bridge using steel box girder.
2. To calculate steel box girder support capacity on simple span girder with 45m of length.

1.3. The scope of the study

The scope of this study begins with the search for information and review of the literature relating to the design of the steel box girder. Design and calculation of bridge steel box girder will be done based on data AASTHO LRFD Bridge Design Specification 6th Edition that will be given in chapter IV and discussed in chapter V. In addition, the design drawings will be given in the Appendix.