CHAPTER 1

INTRODUCTION

1.1 Background

Country of Indonesia astronomically is located at 60^{o} NL (North Latitude) to 110^{o} SL (South Latitude) and 95^{o} EL (East Longitude) to 141^{o} EL (East Longitude), and the largest archipelagic country in the world, which consist of 17,504 islands with 5 large islands (Sumatra, Java, Kalimantan, Sulawesi, Papua), several other middle islands like Madura, Bali, Sumbawa, Sumba, Timor, Bangka and Belitung, Halmahera as well as thousands of small islands.[1] With the distance from West to the East 5120,8 km and from North to the South 1887 km ,and transportation from one place to another place or from one island to another island are carried out using air and sea transportation. Moda of sea transportation for long distances using large ships, while short distances such as crossing the Sunda Strait, Bali Strait, Madura Strait using medium sized ships call Ferry.

Ferry besides being used for passenger transportation are also used for goods. In line with the economic growth rate, the number of passengers and goods crossing Sunda Strait both from Java Island to Sumatra Island or vice versa and from Java Island to Bali Island or vice versa, increase. The increasing number of passengers and goods, are too large compare to the capacity of available Ferry, have caused buses and trucks to accumulate in the port, especially during bad weather or during holiday season. Those condition causes the que time become longer and crossing expenses become high. To overcome those problem, like in Madura Strait, in Sunda Strait the bridge need to be built.

In this Final Assignment, will be designed Sunda Strait Bridge. The type of bridge which will be designed was suspension bridge. This type was chosen because the long distance of Sunda Strait. The total length of bridge crossing Sunda Strait will be 28,5 km devide into four parts as shown in Figure 1.1. Start from East direction as the first part is about 3,8 km connecting Anyer in West Java to Ular island the bridge construction will be conventional bridge. The second part is about 11 km connecting Ular island and Sangiang island the construction will be designed suspension bridge. Similar to the second part, the third part have 10 km length connecting Sangiang island and Prajurit island the constuction will also suspension bridge. The construction of the end part, 3,7 km length connecting Prajurit island to Lampung will also using conventional bridge.

Figure 1.1 Plan of Sunda Strait Bridge

1.2 Problem Statements

The problem statements in this Final Assignment is as follows:

1. How to design a suspension bridge that can be built on the Sunda Strait?

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 the upper structure of suspension bridge of Sunda Strait

1.4 Scope of the Study

To accomplish those objectives, this study started with a literature review of the information pertaining to design and calculation of Suspension Bridge. Some books, journal, papers pertaining of Suspension Bridge design and calculation will be reviewed. Literature review and then will be followed by methodology. In the chapter of methodology, dimension of pylon, cable, anchor will be determined. Design and calculation of upperstructure will be given in chapter four, while the result will be given and discuss in chapter five.