

CHAPTER I

INTRODUCTION

1.1 Background

Bridge is a transportation building functions as a connection of 2 ends of the street separate by natural factor such as river, valley, lake, sea and Artificial factor like irrigation channel, highway, and railway. Bridge must be designs carefully in order to get the optimal result.

The bridge that will be design is located in Gunung Nago, Padang, West Sumatera. Gunung Nago already has an existing bridge, but this bridge can only be passed by pedestrian and lightweight vehicle. The bridge is already old, the deck already not in a good condition and the bridge is no longer able to handles the traffics now. According to that conditon the bridge is need to be redesign, because the existence of this bridge is very important for Gunung Nago society as main access to Pauh and Andalas university.

The existing bridge has 90 meter span and 3 meter width. The bridge that will be design has 140 meter span and 9 meter width. This bridge is use cable stayed bridge method as alternative design of Gunung Nago bridge. Cable stayed method is use because the bridge is a long span bridge and consider the aesthetics of the bridge is fit the location that is one of tour destination from local society. The bridge is expected to become a landmark and larger tour destination for Gunung Nago.

Cable stayed bridge is one of best technology for builds a long span bridge. Cable stayed bridge is a structure consists row of cables and bear stiff horizontal element (such as beam or truss). Cable stayed bridge has a lighter structure so it will fit for middle and long span bridge. On aesthetics factor the arrangement and the pattern of the cables are support the beauty of the bridge construction.

Some consideration for choose cable stayed method for design the bridge is the deflection from this method is smaller than suspension bridge. Cable stayed method is no need anchor block because cable can connect directly to girder or deck. Cable stayed bridge can complete aesthetics aspect that is one of the most important factor from choose a design method.

1.2 Goals and Benefits

The goals of this research is to design a bridge with cable stayed method that follow design code so the result of the bridge is strong, safe, comfortable, elegant from aesthetics factor, and convert the design result to engineering drawing.

The benefits of this research is to become reference for design a long span bridge with cable stayed method and give alternative design for Gunung Nago Bridge.

1.3 Problems Scope

- a. The type of the bridge is cable stayed
- b. The design is just for upper structures, pylon, bottom structures, shop drawing and cost estimation.

- c. The design is use SAP2000 software for structure analysis and AUTOCAD for drawing.
- d. Aerodynamic analysis is not calculated.
- e. Construction method load is not calculated.
- f. Environmental impact is not reviewed.
- g. The Pavement is not designed.
- h. Horizontal load is not calculated for under structure design.

1.4 Research Outline

To produce good writing and understanding, the research is divided into several chapters that discuss the following matters :

CHAPTER I INTRODUCTION

Consist of Background, Research goal, Benefit of the research and problems scope.

CHAPTER II LITERATURE REVIEW

Consist of general data of cable stayed bridge and the development of cable stayed bridge, bridge load analysis, foundation and preliminary design.

CHAPTER III RESEARCH METODOLOGY

Explain about the flowchart and the steps of cable stayed bridge design.

CHAPTER IV PROCEDURE AND RESULT

Consist of procedures, result from bridge structure design, understructure design, estimation cost and shop drawing.

CHAPTER V CONCLUSION AND ADVISE

Contained the conclusion and the advices from this research