CHAPTER 1
PRELIMINARY

1.1. BACKGROUND

Improvement of transportation facilities is very necessary because it must be in line with rapid social and economic growth, basically the construction of transportation facilities and infrastructure is very decisive in supporting the achievement of the planned programs.

Improvement of transportation facilities in the form of roads and bridges must follow developments in the area concerned, for the construction of transportation facilities, both roads and bridges, efforts are made to follow the existing paths or roads in the area concerned.

Considering the important role of bridges, because the bridge is a connection between two sides that are far apart and there are obstacles in the form of rivers, roads, and others, the aspects that are reviewed include reviewing the feasibility of the bridge construction, classification of bridges according to service and ability to accept loads. Bridge engineering planning and bridge replacement is one of the efforts to improve the function and role of the bridge, basically the evaluation of traffic around the bridge is very necessary, this is the first step in planning a bridge.

Likewise, the Ciledug Wetan bridge requires widening so that it can function optimally and can reduce congestion and basically the bridge can only be traversed by one motorcyclist, because the width of the bridge is too small so that to access cars and other vehicles you have to turn around to get to the destination. In this case, it is necessary to plan the widening of the bridge in the area.

In planning this bridge widening using prestressed concrete bridge construction, prestressed concrete is a combination of

concrete and steel reinforcement that is connected to get the prestressing force on the concrete. The prestressing force is provided by pulling high-strength steel in the form of strands of cable which are often referred to as tendons. Because the steel used has a high tensile strength, it demands the use of concrete with a high compressive strength (fc' 40 MPa).

The use of prestressed concrete bridges is now increasingly being used, due to the ease of implementation, this prestressed concrete bridge has requirements, namely using high-quality concrete (fc' 40 MPa), and using high-quality steel (fy ≥ 1000 MPa). In planning this bridge has a span of 72 m divided into 2 spans, each spanning 36 m. In planning this bridge using the LRFD (Load Resistance and Force Design) method, by considering the advantages of this method, LRFD also tends to provide a safer structure when compared to other methods such as ASD in combining live and dead loads treating them in a way that same

1.2. PROBLEM FOCUS

From the background that has been discussed, this thesis focuses planning of a bridge, this bridge connects the village of Ciledug with villages in the district of Brebes, this bridge is a very important connecting point for the surrounding community, therefore there must be widening of the bridge so that cars and other vehicles can pass it, not just two-wheelers.

In the formulation of the problem of this final project includes:

1. Knowing the planning of the calculation of the lower structure and planning on a girder.
2. Calculating the dimensions and reinforcement of the bridge construction
3. Know the level of safety factor of a bridge

1.3. PROBLEM FORMULATION AND PROBLEM IDENTIFICATION

1.3.1. Problem Formulation

Based on the description above, the problems that can be identified are as follows:

1. How to design a bridge building using prestressed concrete structures?
2. How to plan the dimensions of girder, slab, abutments and foundation?
3. What is the force load on the bridge?

1.3.2. Problem Identification

Identification of this problem is focused on designing the bridge structure whether the structure is safe or not.

1.4. LIMITATION OF THE PROBLEM

Comparative studies of bridge structures involve several interrelated factors, in order to obtain an analysis that must be clarified, therefore it is necessary to simplify and limit. Problem limitations that will be emphasized include:

1. Reinforcement in the superstructure of the bridge includes: vehicle floors, road dividers.
2. The repetition of the sub-bridge structure includes: Bridge abutments, and bridge foundation structures.
3. On the limitation of this problem does not discuss costs, a review of the economic side of the bridge calculation.
4. For this construction using a reference
    a. SNI 1725:2016
    b. Bina Marga Bridge Management System (BMS) 1992
    c. ASTM A-416
    d. AASHTO LRFD 12
    e. SNI 2833:2016

1.5. PURPOSE AND OBJECTIVES

1.5.1. Purpose

a thesis entitled "Ciledug Wetan Bridge Construction Design in Ciledug Sub-district, Cirebon District". will explain the design of the bridge building with the superstructure using a prestressed beam girder.

1.5.2. Objective

The objective of writing this research are:

1. Designing Bridge based on SNI 1725:2016 and SNI 2833:2016
2. To find out the appropriate dimensions, slabs, girder, abutments and foundation on Ciledug Wetan Bridge.

1.6. BENEFITS OF RESEARCH

The benefits obtained from this research are as follows:

1. Used as a reference for structural planning in a bridge
2. As a reference for reading materials or library reference to conduct further research.

1.7. RESEARCH USES

1.7.1. Theoretical Uses

The framework of thought in this thesis uses qualitative research methods, namely by collecting data, while the data obtained come from:

1. Study literature
2. Browse the internet the following is the framework for the problems studied and the problems found

1.7.2. Practical Uses

This research is expected to be used as a reference for consideration in choosing the right material. Both in terms of construction, bridge planning and also its implementation.

1.8. RESEARCH LOCATION

For the location of the bridge in this study research is in the Ciledug area.

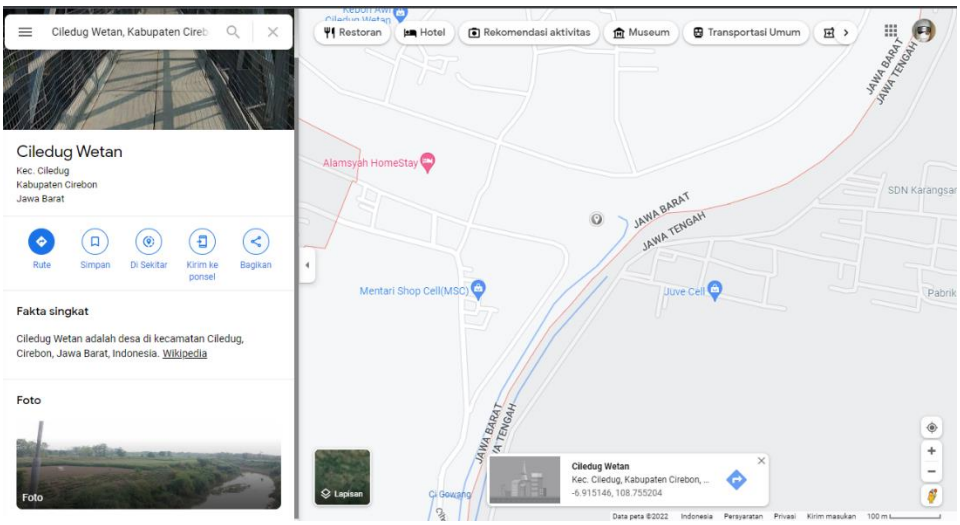

Figure 1.1 Research Location

1.9. SYSTEMATIC WRITING

CHAPTER 1 INTRODUCTION

This chapter will explain the background, problem focus, research objectives, usability research, systematic framework and thesis writing.

CHAPTER 2 BASIC THEORY

Contains theoretical foundation derived from books, journals and electronic media information (internet)

CHAPTER 3 OBJECT AND RESEARCH METHOD

The chapter describes the flowchart, Preliminary Data Collection and Literature Study, Preliminary Design, Top Structure Analysis, Design Bottom Structure.

CHAPTER 4 CONTENTS

The chapter describes the planning technical data, Preliminary design PCI girder, load analysis, PCI girder structural analysis, abutment structural analysis

CHAPTER 5 CLOSING

The chapter includes the conclusion from the discussion from the previous chapter and also contains suggestions for improving the results of a study.

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