

BAB I

PREFACE

1.1 Description of the study topic and background

Design in the field of civil engineering is a basic part of making a building, because the design in the field of civil engineering has several designs related to the existing infrastructure.

Infrastructure is basically related to 3 places, namely, water, land and air. Good and well-organized infrastructure development helps for human progress and comfort, with existing facilities it can advance the economy of a region by facilitating access to the distribution of goods so as to even out the price of goods even in small areas in the corners of the region.

1.1.1 Building Design Practice

The construction of a building, especially a building, is an effort to ensure that the city has land that is still wide open and can be used more for other infrastructure purposes, as well as utilizing existing land but can still accommodate it according to its intended purpose. There are several things that need to be considered in building design such as the level of security of a building, the function of the building, and others. And it is hoped that the building can become a facility that improves the economic life of the surrounding community.

1.1.2 Road Design Practice

Roads are the main means for users of land vehicles, roads with good design can help humans in reducing the length of vehicle travel from one place to another. In addition, roads should of course be designed to be safe and comfortable for road users, environmentally friendly and then made as much as possible at a very economical cost. So that the road infrastructure is also expected to be a facility for areas that are difficult to reach so that they can get their needs easily and quickly.

1.1.3 Water Building Design Practice

Water is one of the main human needs, so good use of water can help life in society. For example, the use of reservoirs and dams for areas that have difficulty getting clean water or weirs to help agriculture and plantations. In addition, there is also a water structure in the form of a port to help transport people or distribute goods.

1.1.4 Cost and Time Planning Practices

Managing the cost and time of a development is the main key to the speed and economy of a development, so that we can calculate the length of time a project will take and how much it will cost a project that is expected to be on time and also not waste the cost of building an infrastructure.

1.2 Project overview

1.2.1 Building Design Practice

In the practice of building design this time, the construction of the building is in the city of Yogyakarta with the function of the building as an office. The soil condition at the construction site is a soft soil type and the foundation design will be designed at a depth of 3 meters, the building will be planned using:
Column size : 400x400mm²

- f_c' : 25 MPa
- f_y : 400 MPa
- thickness of foundation: 0,5m
- thickness of the concrete blanket: 0,05m

1.2.2 Road Design Practice

The practice of road design only analyzes the volume of roads on Jalan Raya Utama and the condition of road facilities.

1.2.3 Water Building Design Practices

The reference in the design of the water structure is to use a Bangeran weir with coordinates 7o47'31,4952"LS and 110o23'45,762"E which is located in the Gajahwong river with:

- Watershed area : 44.1875 km²
- Riverbed slope : 0.0262o
- River length : 26.75km

1.2.4 Cost and Time Planning Practices

The project that was reviewed in the cost planning was the Widyaaiswara training building and supporting facilities for the South Sumatra Provincial Public Works Office, this building has 3 floors. The project site area is $\pm 774\text{m}^2$ with a total building area of 1890m^2 .

1.3 Problems studied, objectives and scope of problems

1.3.1 Building Design Practices

Calculating building design

1.3.2 Road Design Practices

Determining the volume of vehicles and the condition of road facilities at the research site.

1.3.3 Water Building Design Practices

Determine the design of the dam

1.3.4 Cost and Time Planning Practices

Determine the cost required in a project

1.4 Approaches and research methods used

1.4.1 Building Design Practices

The method used in the design of the building is ETABS software to help with calculations

1.4.2 Road Design Practice

The method used in determine volume of vehicles uses the method published by Bina Marga (1997)

1.4.3 Water Building Design Practices

The method used in the practice of designing waterworks is the Thiessen polygon method for calculating the average daily rainfall analysis

1.4.4 Cost and Time Planning Practices

The method used for cost planning is the SMM (Standard Method of Measurement) method to calculate the volume of work

1.5 Final Project Systematics

In the systematics of the final project, it requires problem boundaries to stay focused on the discussion that has been determined

1.5.1 Building Design Practices

Building planning only focuses on calculating the structure of a building

1.5.2 Road Design Practices

The discussion only consists of:

- Vehicle volume
- Pavement condition
- Environmental conditions
- Transportation type
- Observation time which is divided into 3 sessions, namely, morning (07.15-09.15), afternoon (12.00-14.00) and afternoon (16.15-18.15)
- The length of the observation site is 100 meters

1.5.3 Water Building Design Practices

The limitations of the problem used:

- Daily rainfall data used from 7 stations, namely prumpung, coconut milk, bronggang, kemput, beran, wind - wind stations, kaliurang with a time limit of 10 years
- Calculation of flood discharge with a return period of 50 years

1.5.4 Cost and Time Planning Practices

The limitation of the problem used are:

- The unit price used is the price in Sumatra
- Calculation of the volume according to the project