CHAPTER I
INTRODUCTION

1.1 Background

In civil engineering the manufacture of a building is required to be properly designed. Good and well-organized infrastructure helps a certain economy of a region by facilitating access to the distribution of goods so it can be evenly distributed, this also help humans to live in comfort from natural phenomenon such as rain, etc.

1.2 Building Design Practice

During the construction of a building there are several things that need to be considered during the design process; building type of function, total stories needed, etc. In the process of designing a building the structure of the building has to be stable to stand for the designed years, and not forget to design to be able to handle earthquake to a certain degree.

1. Scope of Problem

How to design a 4 story building with reinforced concrete and a steel roof truss based on SNI standards?

2. Objective

The objective of this practice is to design a 4 story building that uses steel truss as a roof, reinforced concrete columns, reinforced concrete beams, and reinforced foundation.

3. Methodology

The method in this practice is by using the software of AutoCAD to draw the main layout of building, ETABS to simulate the building structure, and PCACOL to calculate the steel bar reinforcement needed for column.

4. Outline

The outline of this design practice is to calculate the stability and safety of the designed building structure, including roof truss, beams, columns, slab, stairs, and foundation.

1.3 Road Design Practice

Traffic signals are a part of a road infrastructure that should be designed to be safe and comfortable for its users. A good traffic signal is one that is designed to be able to time precisely to allow and stop traffic in order to reduce traffic jams, so that people who are using the roads facilitated by well-designed traffic lights can reach one destination and another quickly.

1. Scope of Problem

How to design a traffic light cycle and estimate the delay of traffic vehicles in an intersection?

2. Objective

The objective of this practice is to design to the cycle time of traffic signals and estimate the traffic delay in a certain intersection.

3. Methodology

The method used in this practice is by using Webster's method to calculate the traffic signal cycles and also use Webster's method to estimate the delay of traffics.

4. Outline

This practice outline is to design a traffic control signal and to estimate the delay of vehicles at a three-way junction.

1.4 Water Building Design Practice

Water infrastructure is also needed to help people's lives. So to help people that are living where water is a difficulty to get, a weir is used. In general, the purpose of a weir is to raise the water level for the purpose of irrigation channels or to elevate the height of a river water level. Another function of a weir is that it can be used as a warning of a flood.

1. Scope of Problem

How to calculate the weir flood discharge at the future for the future return period and analyse the stability of a weir?

2. Objective

The objective of this practice is to calculate the weir floor discharge for the future, and analyse the stability of weir design.

3. Methodology

The method used in the practice of weir design is the Frequency Analysis method based on the rainfall data, Logarithm distribution method to estimate the upcoming rainfall data, and Haspers' method to estimate the flood discharge. And calculating the stability analysis of the weir structure.

4. Outline

The outline of this project is to use reference in the design of a Kadirojo weir with coordinates 7 ° 45'31.9" S and 110 °26'41.7" E.

1.5 Cost and Time Planning Practice

One of the main keys to build a structure is to manage the cost and time. A project needs to be properly calculated the cost in order not to make the developer or contractor incur losses. In the process of estimating or calculating the project designed time, it is useful to be used as a reference in field, and to monitor the project. A good planning can be achieved if the whole process of the activities in it can be applied in accordance with the real life conditions with little deviation or errors.

1. Scope of Problem

   How to estimate the total cost of a construction project and the time required to complete a construction project?

2. Objective

   The objective of this project is to estimate the total cost of the construction project and calculate the time required to build this structure.

3. Methodology

   The method of this project is to use the manual calculation to calculate the construction work volume, and bt using SNI as a reference to estimate the unit price of materials and labour then calculate total price of a building. And estimate the duration of construction project by estimating the duration of each work, then plot to the microsoft project to create the network diagram.

4. Outline

   The overview of this project is to use reference in the design of Karinakas office building AutoCAD drawings.