UNIVERSITI TEKNOLOGI MARA

ECS 358
CIVIL ENGINEERING DESIGN PROJECT

REINFORCED CONCRETE BUILDING DESIGN PROJECT & PROJECT BASED LEARNING

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1.1 INTRODUCTION

As a part 5 of civil engineering student at UiTM Campus Pasir Gudang, I have been given the Final Year Project, which is one of the subjects this semester, ECS 358. This subject consists of two projects: reinforced concrete building design and project-based learning (case study). I, as the student, must complete the project within the time is given, which is in 14 weeks.

The first project is a reinforced concrete building design. In the first step, an architect directed me to search for a double-storey house. Next, this project instructed me to trace the architectural drawing I had gained before moving to the next step. The main purpose of this project is to design the structure. For this project, I was assigned to do slab, beam and column from my, lecturer Sir Idzwan to analyse and design them. In addition, I also instructed to design a staircase and pad footing. For others, I should detail the designed structures and take off and bill quantities of the structures. After I had finished all the design structures, I should compare these structures with PROKON.

The second project is about the case study. First, I was asked permission for a project soil investigation report from the JKR. This case study was divided into two parts. Case study one is about the proposal for soil-bearing capacity. In order to design the pad footing for the RC design project, I was required to perform an investigation of the soil-bearing capacity from my project soil investigation report. The second case study is about the proposal for flexible pavement design. I was required to carry out a suitable road pavement for the house.

This project gives me some knowledge as a student to work as an engineer in the future. This subject is very important because to construct the house; I must know the loading distribution, the strength of the slab, the number of tension steel used and more. As a student also can know better about this particular job because when I get into the industry, I will know to start the project design.

3. CONCLUSION

This Final Year Project, one of the subjects for this semester 5, is the most challenging subject for me. This subject consists of two projects: reinforced concrete building design and project-based learning (case study). For the RC building design project, I do the structural plan from the architectural plan that I get from the architect. Then, my lecturer Sir Idzwan assigned me to do the structural for the slab, beam, column, pad footing and staircase. Moreover, I do the bill of quantities for each structure, referring to the structures' detailing. I also do PROKON to compare it with manual calculation. , I do the project schedule in the Microsoft Project to know how much time the construction work has to be done. For the second project, I did Project Based Learning (case study), a proposal for bearing capacity and flexible pavement design. Then, I want to estimate the road pavement based on the residential pro and propose a suitable capacity for residents in that area. In conclusion, th roject is important and useful for me as a student in order to work as an engine in the future

3.1. Summary of design works

From the structural plan that I traced from the architectural plan, my lecturer Sir Idzwan has already assigned me to the slab that has been chosen. Before the calculation started, the permanent load, gk and variable load, qk was determined. I design my slab as two adjacent edges discontinue. For the beam, I have been assigned to do the longest beam that attached which attached to the end of the building for both sides. I analyse the beam before designing it to get the highest moment. Then, I choose the highest moment for the design calculation. The column I have been assigned is continuous from the ground floor to the roof floor attached to the slab and beams. In this project, I only design the short column. For others, I design the flight and the landing for the staircase. Before designing the staircase calculation, I determine the shape of the staircase first. Lastly, pad footing designs were related to the case study, which gave me the soil-bearing capacity to do the pad footing design.

3.2. Consequences to safety, construction practicality, costing and economical aspects of structure/ building/ project

Construction sites are dangerous places to work, and every year, thousands of people get injuries that could kill them. This is why there must be enough safety measures in place at construction sites to keep everyone safe. When you work at a height, you often run the risk of falling. This is especially true on poorly designed construction sites. In addition to falling, construction workers can also get hurt when structures fall while they are being put up, taken down, or installed. So, supervisors should always check the site to make sure all the safety measures are in place to stop the risk of collapse.

Keeping all parts of a country's economy at a high level is one of the most important things a country can do to help its economy grow. Competition in the industrial production market, both at home and around the world, makes it necessary to find new, modern technologies, production management systems, ways to use raw materials, etc., and, as a result, to keep improving, modernizing, and growing. The construction industry is a part of the national economy that requires much capital and is linked to industries like mining, processing, metallurgy, machine building, etc. One part of the national economy that makes things is construction. Its activities include making industrial and non-industrial basic funds for the industrial, agricultural, and other economic and social sectors and restoring, capitalizing, nd maintaining real estate. Construction directly affects the speed of scientifi nd technical progress in the economic and social fields, the formation of a material-technical base for improving the regional and global balance of development, the growth of a country's economic potential, and its ability to protect itself. Its institutional units are construction-installation organizations with modern tools and machines.

3.3. Recommendations/ reflection

PROKON Structural Analysis and Design is a collection of more than forty structural analysis, design, and detailing applications. PROKON's initial applications were created in 1989, and it is now utilised in over eighty countries worldwide. Although the suite is modular in structure, its actual value resides in the close integration of analytic, design, and detailing tools. PROKON is designed for use by structural engineers and technicians and is created and maintained by a team of experienced engineers.

The PROKON suite is modula while emaining integrated. Some modules may be used alone or in combination with othe s. The suite provides a robust workflow that includes structural analysis, steel and concrete design, and detailing. PROKON Structural Analysis and Design supports ll British and South African design codes. Most (but not all) modules also accept de ign codes from Europe, the United States, Canada, Australia, and a few Asian cou ries.