UNIVERSITI TEKNOLOGI MARA

ECS 358
CIVIL ENGINEERING DESIGN PROJECT

REINFORCED CONCRETE BUILDING DESIGN PROJECT & PROJECT BASED LEARNING

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ACKNOWLEDGEMENT

In the name of Allah, the Most Almighty

My instructor for ECS 358, the Civil Engineering Design project, Sir Ahmad Idzwan bin Yusuf has been a tremendous help in ensuring that I am able to successfully complete this project for my senior year. I would want to use this opportunity to extend my most heartfelt appreciation and gratitude to my lecturer for assisting me during the whole of this fantastic assignment. I would want to pay a special thanks to all of my lecturers since they have been quite helpful to me in finishing this project and clearing up any confusion I may have had about the designing of beams, slabs, columns, staircases, and pad footing. Because each phase of this design process was executed with such care and precision, I am filled with gratitude for the good fortune that has been bestowed upon me. Not to be overlooked either, but also a special thanks goes out to all of my other friends that assisted me in either a physical or mental capacity in order to finish my project within the allotted amount of time. In addition, the successful completion of this project for a two-story home will assist me in preparing for the industrial training that will take place over the following semester. This project helped me to increase my knowledge in the Civil Engineering aspect of how this course takes place in the real world.

Additionally, this project gives the representation of Civil Engineering as it claimed all sorts of the designing aspect as including the safety regulation, cost estimation, and also all of the rules that are being used in the real-life project. I have high hopes that the fact that I am putting all of this information to use on this project will help me become a good civil engineer in the future.

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1. PROJECT 1 – REINFORCED CONCRETE BUILDING DESIGN PROJECT

1.1 INTRODUCTION

A Final Year Project with the number ECS358 was assigned to our group of semesters 5 students at UiTM Campus Pasir Gudang who are enrolled in the Faculty of Civil Engineering for this academic year. This Final Year Project consists of two projects that students must be able to complete within our 14 weeks in this semester. The first project is a reinforced concrete building design project, and the second project is a project-based learning project. Both of these projects are due at the end of this semester (case study).

First of all, a reinforced concrete building design assignment requires the students to create the two-story house's structural components. Find a double storey architectural drawing from the architecture with their permission, according to the assignment given to the students. Following that, students must translate the architectural designs into structural drawings. This is necessary because we must choose structural components from the structural drawings, analyze them, and then design it. We must decide between a slab, a continuous beam, a column, stairs, and pad footing as our structural components. Additionally, depending on our calculations and design, we must also sketch up the details for each structural component and use software to compare all of the calculations and the detailing.

The project also includes doing a case study there. The students were given the option of selecting one of the two case studies that were specified in the instruction. The first case study focuses on a soil's carrying capacity. To construct pad footing for reinforced concrete structures, students must determine the soil bearing capacity using the soil study report. The second case study focuses on the adjustable pavement design. Depending on where our site is located, students are expected to submit a thorough design for flexible pavement for this case study. The objective is to ensure that the transmitted stresses are sufficiently reduced and do not exceed the carrying capacity of the subgrade underneath.

We will become better engineers in the future because to the knowledge we've gathered from these two projects. For instance, creating a home's structural elements might provide us a sneak peek at what we can expect from our future work in the area.

3. CONCLUSION

3.1 Summary of design works

To conclude, all structure and component calculations have been approved. Bending, shear, deflection, and cracking requirements were met. This design expects all structures to last 50 years. The design aims to preserve the building in good condition with no failures and to make sure it can withstand its maximum load. The design method considers resident safety. Thus, the design that gave each section of the structure suitable strength assures that it can resist any failure while keeping a balanced degree of reinforcing. In addition, adding steel rods, wires, mesh, or cables before the concrete hardens increases its strength.

As a reference for carrying out its duties in terms of design and workmanship, the civil engineering department relies on Standards and Codes of Practice. The cumulative knowledge and technical competence within the building and construction sector serve as a codified version of standards or codes of practise. We need to have a strong understanding of concrete in order to build reinforced concrete that is not as simple as we anticipated.

As we all know, concrete is used more in building projects than steel. Thus, Code of Practice-compliant reinforced concrete design is needed. All building projects must follow the Malaysia Standard Eurocode Code of Practice. We must also follow the Uniform Building By Law. If we broke the law, our project could be delayed and costlier. Reinforced concrete design is also crucial to building a customer-use structure.

To put it another way, as designers, it is our responsibility to ensure that our work is error-free so that we can protect our clients from harm. As civil engineers, it is our duty to ensure that the components that we design are capable of withstanding potentially dangerous conditions, such as earthquakes, flash floods, intense winds, and other types of extreme weather.

For the diploma level, all that is required of us is to design a static bu' ding in which the activity of wind is not taken into account in the design processes. As onsequence of this, this is a fundamental understanding that we, as students of civil engi eering, need to acquire. The application of the standard Code of Practice will result in the standardisation of all aspects of the construction. If we reject the Code of Practice, it will be clear that we are engineers without ethics.