UNIVERSITI TEKNOLOGI MARA

ECS 358
CIVIL ENGINEERING DESIGN PROJECT

REINFORCED CONCRETE BUILDING DESIGN PROJECT

PROJECT BASED LEARNING (CASE STUDY)

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ACKNOWLEDGEMENT

First of all, Alhamdulillah and all praise and thanks to the almighty Allah SWT for His showers of blessings throughout our research work and journey to complete the construction project successfully. I eventually succeeded on completing final year project ECS358 CIVIL ENGINEERING DESIGN PROJECT, about designing a double storey bungalow house. A lot of difficulties have been settled throughout my time producing this project study. Self discipline, lecturer support, hard work and commitment from both student and lecturer need to be praised and to be thanked as this case study able to finish on time since the first week of semester October 2020-February 2021session.

Even though, it is quite tough for us to complete this project, due to lack of physical discussion and interactions, we are very thankful to Him for what He allows us to do. However, an online study system was introduced by MARA University of Technology (UiTM) since 14th April 2020. Many online platforms used by lecturers such as, Microsoft Teams, Google Meets, and Google Classroom to deliver knowledge and convey teaching to their students even its difficult through online meeting or online material. Students also, include us do not miss it either, we share ideas, experiences, and discuss about the task given.

Next, I would like to express my deepest appreciation to all those who provided us the possibility to complete this case study and case study report. A special gratitude I give to my own lecturer for this subject from Faculty of Civil Engineering, Sir Ahmad Idzwan Yusuf and Sir Mohd Firdaus bin Mohd Akhbar whose contribution in stimulating suggestions and encouragement, helping the students to coordinate our project especially on guiding us on how to use Microsoft Project, AutoCAD, PROKON information and to write a proper report for this project. Their dynamism, vision, sincerity and motivation have deeply inspired us. It was a great privilege and honour to work and study under their guidance.

A special thanks goes to all of the classmates, whose have invested their full effort in helping and supporting each other all the way through the process of completing the project. It is not an easy process but we all managed to finish the project successfully.

Sincerely,

NURANISA BINTI MOHAMAD SAJIM

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1.1 INTRODUCTION

Building construction is the engineering deals with the construction of building such as residential house. In a simple building can be define as an enclose space by walls with roof. Building are important indicator of social progress of the country. Every human has desire to own comfortable homes on an average generally one spends his two-third life times in the house. The security civic sense of the responsibility. These are the few reasons which are responsible that the person does utmost effort and spend hard earned saving for owning a house.

Nowadays the house building is major work of the social progress of the country. Daily new techniques are being developed for the construction of houses economically, quickly and fulfilling the requirements of the community engineers and architects do the design work, planning and layout of the buildings.

In this final year project, students are required to design the RCC building components of the double storey bungalow. The procedure for analysis and design of a given building will depend on the type of building, its complexity, and the number of stories. First the architectural drawings of the building are studied, structural system is finalized sizes of structural members are decided and brought to the knowledge. The procedure for structural design will involve some steps which depend on the type of building which is in this project is a double storey bungalow and also the complexity and the time available for structural design and in this project.

Further, before starting the structural design, the following information were collected: (i) a set of architectural drawings, (ii) Soil Investigation report (SIR) of soil data, (iii) location of place or city, (iv) data for water tank capacities on top, special roof features and loadings.

The process of designing starts with design the structural key plan for Ground Floor Plan, First Floor Plan, and Roof Floor Plan from the architectural drawing. The software used to produce the drawings is AutoCAD. After that, the manual calculation for structural element will be done. The structural element selected are slab, simply supported beam, continuous beam, column, pad footing, and staircase. The detailing of each structural elements is then produced and the taking off for building quantities estimation is analyzed.

3.0 Conclusion

The final year project which consist of two project which are project 1 titled "Project of Double Storey Reinforced Concrete Building" and project 2 regarding the case study of designing a septic tank were successfully completed. Both of the project enhance student's soft and hard skill in civil engineering field in all aspect. The projects shows the importance of planning and designing every element of the building that is going to be constructed. The right step and procedure in order to start a construction project is very crucial thing to be consider before starting a construction project. Every single step done in this project follows the requirement needed in order to start a construction project.

3.1 Summary of Design Works

Overall, the concepts and procedures of designing the basic components of a double storey building are described. Apart from that, the planning of the building with regard to appropriate directions for the respective rooms, choosing position of beams and column are also properly explained.

The project design calculations were done by manual calculation and software which is PROKON. Both output data produced has a different value. It can be from the different formula used by manual calculation and PROKON. Software application in construction and engineering field very important to achieve better result and decision in the project implemented. This is because larger scale changes in the construction area and traditional method is no longer suitable to be used. There are many software in engineering such as steel structure, wood, concrete, aluminium and others. Difficult structures need longer time to be designed, with indirectly enhance project cost.

Therefore, with this structure engineering software, design structure were easier to do. System engineering software produce more accurate result and fast in the design. Hereby can reduce cost and save time needed compared with traditional method apply before this. On the other word, it can produce fast, economical and good quality in construction.

3.2 Recommendations

From the study those carried out, there are several proposals which can be considered to be improved and upgraded. Future scope of research on structure engineering software need to do detail in Malaysia to get more accurate data.

The application of software while designing is very helpful. Hence, the Faculty of Civil Engineering of University Teknologi MARA (UiTM) can help to expose all types of software to students by reshuffle and draft new syllabus for future curriculum in education especially in structure engineering. Design analysis structure can be quickly and easily input and viewed on the screen in various format. The most popular structure engineering software in construction industry are STAAD Pro, ESTEEM, PTOKON, ORION and SAP 200. All of this software engineering helps a lot in the development of the project and save time in the design structure.