



اَوْنِيُوْزِيسِيْتِي تِيكْنُوْلُوْجِي مَارَا  
UNIVERSITI  
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MARA

**ECS 358  
CIVIL ENGINEERING DESIGN PROJECT**

**REINFORCED CONCRETE BUILDING  
DESIGN PROJECT**

**PROJECT BASED LEARNING  
(CASE STUDY)**

**MUHAMMAD DANISH AKMAL BIN KHALID**

Final project submitted in fulfillment  
of the requirements for the

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## ACKNOWLEDGEMENT

As many people knows, we currently facing a pandemic that effect a lot of people in term of financial, physical and spiritual. As a student, I also effected by this pandemic which is student need to attend class by using online meeting apps such as google meet and Microsoft teams. A bit hard for me because of connection sometime did not respond properly and causing lag that make me lose focus during class. Still I manage to faced this Online Distance Learning (ODL) even I felt disappointed which is student cannot learning face to face normally in class so that can asked directly in class and lecturer can explain it in front of class. But it cannot be the real problem for student because many apps had been created to help both student and lecturer so that the learning process can be run normally.

I would like to thank our class lecturer of ECS358 which is Mr. Ahmad Idzwan bin Yusuf for continuously guide us in order to finish our Diploma's study. So much patience, motivation and knowledge had been given to us so that we will not gave up and keep on doing and finishing the task given. Eventhough some of us cannot submit the task given on time, he still gave us chance to submit the task so that we won't lose our mark. He also easy to contact, which this is help us so much when doing correction and also asking question about the subject that we do not understand outside class hour.

Also, I am thankful to have friends that helping me in subject that I not understand and patiently explaining to me and advising me to keep on studying to finish this semester not to mention my parent that keep on supporting me going through this semester. They understand that our time be more difficult for us since we cannot get along with other student but sticking ourselves in room and keep on studying to finish this semester.

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### **1.1.1. Requirement of building-by-law, fire safety regulations**

#### **PART II: SUBMISSION OF PLANS FOR APPROVAL**

3. (1) All plans for buildings submitted to the local authority for approval in addition to the requirements of section 70 of the Act shall:-

- a) be deposited at the office of the local authority together with the fees prescribed for the submission of such plans in accordance with the First Schedule to these By-laws;
- b) bear upon them a statement showing for what purpose the building for which the plans are submitted is to be erected and used;
- c) bear the certification of the qualified persons on these plans together with Form A as set out in the Second Schedule to these By-laws for which they are respectively responsible; and
- d) have attached thereto a stamped copy of the relevant site plan approved by the competent planning authority and certified within twelve calendar months preceding the date on which the building plans are deposited unless otherwise exempted under any law relating to planning.

(2) Every plan, drawing or calculation in respect of any building shall be submitted by 2 qualified person.

4. (1) A local authority may if it is of the view that any plan, drawing or calculation is beyond the competence of such qualified person submitting the same, return such plan, drawing or calculation.

(2) A local authority shall accept any returned plan, drawing or calculation if the same were re-submitted together with a certificate from the relevant competent authority responsible for registering such qualified person, certifying that such plan, drawing or calculation is within the competence of such qualified person submitting the same.

### 3.1. Summary of design work

In conclusion for this project, it is really crucial to have a guideline when designing and constructing a building. Based on the guideline from the UBBL its focusing on the fire safety regulations which is important for all construction so that any accident can be reduce to the minimum effect to the current building and surrounding area and also keep the residential occupants safe. Any constructions company that did not obey the guideline will be subjected to a harsh action by the authority so that the construction company will take it seriously because it involved people life. It is sure the construction that following the UBBL guideline is guarantee safety of the occupant.

To achieve a safe building, the design of the building also be taking consideration. A proper design layout need to be draw. As for this project, we been provide an architectural drawing from the company we apply the drawing from. From the architectural drawing we come out with structural key plan to determine the slab, beam, column, staircase and pad footing placement and making a design calculation to determine the properties of slab, beam, column, staircase and pad footing. This is applied to the real situation which is architecture come out with architectural drawing and engineer come out with the structural key plan and calculated the design. From this project, the critical slab are a two way slab which will given four value of moment on each side and shear force. The beam for this project been calculated as flanged beam. This is due to critical slab been taken on the first floor level and it cater high load that needed to design the beam as flanged. The column design are short column which it is normal for reinforced concrete design. Staircase design come out with flight and landing calculation because of the stairs are supported by landing. Lastly, the pad footing achieve size 2m x 2m that passed the GBP and punching shear value given valid design. Lastly, the taking-off and bill of quantities been prepared to get the estimation of cost of the structure designed.

The last step for this project are designing the project using the Prokon software and excel spreadsheet. Prokon software are used to design the slab, beam and column and excel spreadsheet are for the foundation and staircase. The data from the software then been compared to manual calculation and been justified if the percentage different are more than 30%.