UNIVERSITI TEKNOLOGI MARA

**ECS 358**
**CIVIL ENGINEERING DESIGN PROJECT**

# REINFORCED CONCRETE BUILDING DESIGN PROJECT & PROJECT BASED LEARNING (CASE STUDY)

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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيم

In the name of Allah Most Gracious and Most Merciful.

First and foremost, Alhamdulillah praise and thanks to Allah for giving me strength and His Blessing, I finally managed to successfully accomplish this assignment report for subject Civil Engineering Design Project (ECS358). I need to embrace this challenge because it demonstrates my desire and capacity to succeed.

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### 1.1.1 Requirements of building-by-law, fire safety regulations

Based on Fire Safety Regulation that was provided by the Uniform Building by Law, the design of the building must comply all the safety features from the regulation. The building should have all the requirement in order to ensure the safety of the user. And this requirement also need to be applied in the design of the structure elements of the building later in the report.

First of all, as stated under UBBL 227, portable fire extinguishers are required for first aid use. Portable fire extinguishers intended for use by the occupants during the early stages of the fire. It is importance for a building to have portable fire extinguisher in order to prevent the fire from spreading as a first step. Next, the thickness of wall for terrace house building that will be provided need to be more than 100mm in order to avoid fire to spread through the wall easily and damaging other structure. As for the building that has been selected, the thickness of wall given is 120mm. The house should have two exits, the entrance in front and at the back in order to make sure that it is easier to escape when fire started. Other than that, all of the structure needs to be fire resistance for at least half and hour and above in order to prevent fire from spreading too soon. All of the structure elements that has been design has been design to resistance fire for at least half an hour and above. So, it will provide more time to the user and the safety unit. Every building needs to install with at least one fire alarm or smoke detector to detect any smoke or fire that about to start in the building.

Thus, it shows that the designer of this building has provide as many as he could in order to ensure the safety of the user. The building that has been selected does satisfy the Fire Safety Regulation that has been provided by Uniform Building by Law. This is really important in order to prevent any harm toward the user and other people.

## 3.1 Summary of design works

In conclusion, the design work for each of the structure elements has been succeed. In order to complete the task, we need to take consideration of some of the parameter such as shear, moment, deflection and last but not least the cracking. The design for each of the elements has been stated in the table below.

| Structure | Dimension (mm) | Proposed | Remarks |
|---|---|---|---|
| **Slab** | 5750 x 5475 | H10-300 | All Checking Pass |
| **Simply supported beam** | 200 x 450 | 2H16 | All Checking Pass |
| **Continuous beam** | 150 x 450 | 2H16 | All Checking Pass |
| **Column** | 150 x 150 | 4H16 | All Checking Pass |
| **Foundation** | 2000 x 2000 | 12H16 | All Checking Pass |
| **Staircase** | - | H10-150 | All Checking Pass |

All of the propo ed design has been analysed one after one in order to get the actual value. All of the proposed value has passed all the checking such as bending check and cracking check. All of the checking is required in order to design a structure that is stable, and rigid structure with a great and adequate strength. The structure needs to be strong enough in order to cater the load that come from the structure itself and the user soon.

All the parameter has been obtained by assumption and analysis. The analysis will help to design the structure elements as it will show us the load that need to be cater by the structure element. Mo t of them will have to cater some loading from other elements such as beam, column, and pad footing. So, it is really important for us to do the analysis right before doing the design.