



**UNIVERSITI  
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MARA**

**ECS358  
CIVIL ENGINEERING DESIGN PROJECT  
TECHNICAL REPORT**

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## **1.1.1 REQUIREMENTS OF BUILDING-BY-LAW, FIRE SAFETY REGULATIONS**

### **UNIFORM BUILDING BY- LAWS (UBBL) ACT:**

#### **BUILDING SITE**

No building shall be erected on any site that has been filled up with any matter impregnated with animal or vegetable matter until the entire ground surface or site of such building has been rendered or become innocuous and has been covered with a layer of hill earth, hardcore, clinker, or ash rammed solid to a thickness of at least 0.305m. The land upon which any structure is to be constructed must be thoroughly cleaned of turf and other plant debris.

#### **AIR CONDITIONING**

Air conditioning served to produce and maintain a programmed internal environment, despite of external conditions. To achieve these design criteria, equipment will include facilities control of temperature, humidity, air cleanliness, air movement and heat radiation. The permanent air conditioning system is provided alternative approved such that within half an hour of the air conditioning system failing, the specify volume of fresh air will be introduced during the period.

#### **VEHICULAR ACCESS TO SITE**

Restricted to specific hours to avoid obstructing flow of traffic if found to be necessary.

#### **BUILDING MATERIAL**

1) Any material used

- a. in the erection of a building.
- b. in the structural alteration or extension of a building.
- c. in the execution of works or the installation of fittings, being works or fittings to which any provision of these By-laws applies; or

### **3.1 Summary of design works**

Firstly, the students were initially assigned to draw their own double-story house. The student was tasked with creating the structural key plan using the provided drawing. It is the responsibility of the student to understand how to position the columns from the stump to the first floor and to distinguish between one- and two-way slabs. Furthermore, the student must understand that the  $L_y$  and  $L_x$  of the slab determine the appropriate thickness of the slab. It is the first calculation to be made. This is because no other structural building may proceed without a slab calculation. The student must also take notice of whether or not the slab has a drop, as this will need them to thin down their slab while maintaining a safe design range. The slab's design surrounding the restroom area or wash is what caused the drop. A plumber may be needed for some of the causes of a drop in toilet water level, while some are very simple and readily fixed.

A computation error occurred during the slab's design process, resulting in an overly designed slab. To avoid overdesigning, the learner must either recalculate or rework the slab. This is because the bill of quantities value calculation isn't going to end in an overbudget. Therefore, no design failures occurred throughout the slab's creation. If that were to occur, the student would supply a bar with a different diameter or a value representing a different apparent characteristic.

The value of load transmission from slab to beam presents multiple problems in beam design. When determining the maximum shear stress and maximum bending moment of a beam, it might be challenging if these values are not close to zero. The student can be required to adjust the beam's dimensions or supply a new bar's diameter. The diameter bar size for reinforcement is assigned by the student in this manner. In order for the beam to appear more consistent and organized, the student also supplies the majority of the beam in the same size.

Aside from that, when designing a column, students must use a minimum of four main reinforcing bars for square and rectangular columns. Furthermore, the bar's size must equal or exceed 12 mm. The student gets the column size in this way to ensure that it does not fail.

The student must calculate the soil bearing capability when creating pad footing in order to assess whether or not it failed. The site investigation report's  $q_f$  value is used to determine the soil bearing capacity. Understanding the kind of soil in the area of the construction site is crucial. Its purpose is to keep the house from breaking within the planned holding year. Additionally, it stops soil erosion following construction.