ECS 358

CIVIL ENGINEERING DESIGN PROJECT

REINFORCED CONCRETE BUILDING

DESIGN PROJECT

&

PROJECT BASED LEARNING (CASE STUDY)

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ACKNOWLEDGEMENT

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Generally, the acronym UBBL stands for Uniform Building By Law. It is required to refer to this law when constructing any type of buildings as they have their own safety and permissions. For this project, the fire department establishes its standards to be used for firefighting services.

1.1.1.1 FIRE REQUIREMENTS

1. Separation of fire risk areas.

   The following areas used must be isolated from the other parts of the of the occupancy in which they are located by fire-resistant construction of structural components of FRP specified by the local authority on the degree of fire hazard : 19

   a) Boiler rooms and fuel storage areas
   b) Linen rooms
   c) Laundries
   d) Repair shops
   e) Flammable liquid stores
   f) Transformer rooms and substations
   g) Liquefied petroleum gas storage areas.

2. Beam and Column

   Any beam or column and any structure bearing an exterior wall that is required

   to be made using non-combustible materials must conform with the non-combustibility standards of the by-law.

3. Staircase

   a) Stairs shall be of such width that can be used as an escape route and can withstand the greatest occupancy load.

   b) The width of a staircase is the space between walls, but railings may intrude of this width up 75 millimetres.

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Throughout this semester, I gained countless information on how to design a structure and the process to construct a building from the ground up. The first was obtaining an architectural drawing and it must meet all aspects mentioned in the Uniform Building By-Laws (1984). With the help of Microsoft Project, the project was planned out carefully.

Then, the project is carried out by sketching the main plan in AutoCad. The structural key plan must consist of ground floor, first floor, and roof floor. This will help students to arrange the position of columns, locate simply supported and continuous beams to be used in design calculations. The area of the slab must not exceed 25 cubic metre as mentioned by the lecturer.

After the key plan is approved by the lecturer, students began stage one of concrete slab. For this stage, the type of slab, variable load and live load is determined to proceed to stage 2 and the same for the other structural members which are simply supported, continuous beam, column, pad footing and staircase.

All of the manual calculations is then compared to PROKON software calculations. This software exposes students in determining the most accurate size for all structural parts. Furthermore, students conducted a case study on flexible pavement design. We used Highway Engineering (ECG344) knowledge since we need to choose a suitable flexible pavement design depending on their on-site location for this ECS358 project.