UNIVERSITI TEKNOLOGI MARA

ECS 358
CIVIL ENGINEERING DESIGN PROJECT

REINFORCED CONCRETE BUILDING DESIGN PROJECT
&
PROJECT BASED LEARNING

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Last but not least, I want to thank me, I want to thank me for believing in me, I want to thank me for doing all these hard works, I want to thank me for having no days off, I want to thank me for never quitting, I want to thank me for always being giver and try to give more than I receive. I want to thank me for try to do more right than wrong. I want to thank me for being me at all times. To conclude, this project would not be successfully completed without all the assistance form lecturers and people who involved by my side. Therefore, I am expressing my biggest gratitude for showering me with blessing.

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1.1.1 REQUIREMENT OF BUILDING BY LAW, FIRE SAFETY REGULATIONS.

Fire safety regulations need to take into consideration when designing the building and should comply with the requirements of Uniform Building by Law (UBBL). The designing of the architecture drawing needs to consider the preventative measure for the client's safety. Based on the UBBL, by law 143, any beam or column forming part of, and any structure carrying, and external wall which is required to be constructed of non-combustible materials shall comply with the provisions of by law 142 as to non-combustibility that if any external wall is carried across the end of a separating wall, such external wall and separating wall shall be bonded together or the junction of such walls shall be fire-stopped. Subject to the provisions relating to small garages and open car parks, any side of a building shall comply with any relevant requirements relating to the permitted limits of unprotected areas specified in the Sixth Schedule to these By-laws unless the building is so situated that such side might consist entirely of any unprotected area. All of the staircases shall have a fire-resistance rating of not less than 2 hours according to the by law 113, use of timber staircase. In addition, for every type of building, the exit door is needed in order to used as the emergency door when there is any emergency occur as the exit route is mean by a route where persons in a building can reach a place of safety outside the building that including the room, stairway and the list of that except the lift, escalator and revolving door.

In addition, unless otherwise provided for in by-law 194, every compartment shall feature at least two storey exits that are as far apart as practicable, but no closer that 4.5 m and are positioned so as it does not exceed the travel distances stipulated in the Seventh Schedule to these By-laws. Other than that, this building complies with the UBBL regulations as it does not exceed two storey of first floor with 6m height for a provided single staircase. Furthermore, the fire walls of a terrace building should not less than 100mm total thickness. Based on the drawings, the thickness of the wall is 115 mm thick clay brick wall with 20mm thick plaster on both sides. This is called fire wall that not being a party wall or external wall of materials having the fire resistance as required under Part VII, of these by-laws and either used or constructed to be used for the separation of the adjoining building or the separation of parts of a building in such a manner to prevent or reduce the spending of fire for one building to another building.

To sum it all, all calculations for all elements of the structure are successfully obtained and validated by satisfying their requirements for bending, shear, deflection, and cracking. It is anticipated that every design element will be stable and have a life duration of approximately 50 years. Since the purpose of the design is to keep the building in excellent condition with no fail identified and to endure the greatest load it can sustain, the safety of the residents is taken into consideration. As a result, the design elements assigned to each member of the structure are adequate to withstand any failure and balanced in terms of reinforcing.

In addition, Reinforcement is typically installed in regions of the concrete that are prone to tension, such as the lower portion of beams. Thus, the usage of reinforced concrete in this project gives stability and resistance to the compression and tension of the structure which can make it last longer and has high durability. The design also takes the fire regulations into consideration as the building structure needs to survive at least 60 minutes before it gets affected by fire, thus the UBBL is take into this design. In addition, the use of nominal cover helps the structure to make a distance between exposed concrete structure to the nearest reinforcement bar. Therefore, reinforced concrete is usually used in this country as it gives low maintenance and can be used with similar applications. All the design work were referred to the Malaysia National Annex for the validation of implication to the design of building. This gives the standardize to the engineers in order to avoid a wide range of solutions that could lead to an increase in the number of difficulties due to diverse methods.

Structural design is important in civil engineering because it helps to ensure the safety of the structure. Structural design provides all of the necessary information about foundations, stairs, slab, beams, column, and material quality to ensure that any structures built meet all of the safety requirements. It is critical for structural engineers to consider aesthetics when designing structures that can withstand pressures and loads without failing. A structure that does not take structural design into account will always fail. As a result, structural design is critical in all construction projects because it directly affects the durability and safety of the structures.