

**UNIVERSITI TEKNOLOGI MARA**

**ECS 358  
CIVIL ENGINEERING DESIGN PROJECT**

**REINFORCED CONCRETE BUILDING  
DESIGN PROJECT**

**PROJECT BASED LEARNING (CASE  
STUDY)**

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## 1.1 INTRODUCTION

This technical report portrays about the whole process of completing the construction of a double storey house. The construction stage begins with initiation the initiation process. For initiation process, the feasibility was conducted by examining the suitability of the project. The project's objective and its main purpose is defined and several solutions has been made. Every specific need related to the project has been written down in order to come out with the best solution that may appear during the construction.

The construction phase is continued with the planning phase. For the planning phase, the schedule for the project is listed by using Microsoft Project which is the most updated software for scheduling purposes. The scheduling and planning process of the construction is listed down and begins with the preliminary stage which consist of authority approval and tender process. Then, it proceeds with the substructure work such as site clearing and also several works such as foundation and ground floor beam construction. Then, the planning of superstructure work such as constructing the ground floor column, ground floor wall construction, first floor beam and roof construction. At the end of scheduling listing there will be internal, external and finishes work which consist of door installation, plastering work, plumbing, electrical work, floor finishes, inspection, cleaning and lastly handover process.

For the next step of construction, the structural keyplan is prepared. The structural keyplan consist of structural beam plan is set by preparing beam structural drawing such as ground floor beam plan, first floor beam plan and roof beam plan. The structural drawing is prepared by referring the proposed architectural drawing prepared by the architect. The position of the beam, column and foundation is located and determined based on the engineering prospects but not neglecting the objective and the construction criteria proposed initially by the architects and the clients.

Next, structural design for each structural is prepared. It consist of designing several structural member such as slab design, simply supported beam design, continuous beam design, column design, foundation design and staircase design. Each of the structural design is calculated by taking on the consideration towards the loading that act towards the structure itself. The standard calculation of construction is referring to the Eurocode Standard . From the calculations, the engineers can determine the most suitable and the most economical structural member based on the dimensions and the materials used to construct it. Then, all of the informations

### **3.1 Summary Of Design Works**

As conclusion, the objective of the project which is to design the main structural component in the building according to the Uniform Building By Law is achieved. From the project, we acknowledge the standards and specifications needed in order to follow the requirement of the UBBL and the local authority such as SPAN, Jabatan Bomba and Jabatan Kerja Raya. Then, from the planning process, the flow of the construction can be determined from the project schedule that was arranged by the software called as Microsoft Project.

For the next stage, the structural keyplan has been prepared by following the architectural drawing given by the architect. The structural keyplan plan drawing is prepared in terms of engineering and safety purposes but still follow the objective and the specifications proposed earlier by the architects and the client such as the type materials used. For the following stage, the design and detailing work of the structural elements has been carried out. All of the design use the same concrete and steel strength. For the slab design, the thickness of slab is determined by using the rule of thumb. Then, the parameter of the slab is obtained such as type of reinforcement which is H10-200 and 30mm concrete cover. For the simply supported beam design, the main reinforcement used is 2H20, the shear link used is H8-275, width of 250mm and overall depth is 750mm. For the continuous beam, the main reinforcement used is 2H20 and the main shear link is H8-275. For the foundation design, the size of footing is 2000mm x 2000mm x 500mm, the reinforcement used is 8H20. For the column design, the size used is 250mm x 250mm, the reinforcement used is 4H20 and the shear link is H8-175. Lastly, the staircase 1 and 2 use the reinforcement of H12-250.

### **3.2 Recommendations**

For the future construction method, it can be designed for physical security that consist of mitigation and measures towards airvbone hazards. By doing this, the more economically method can be practiced than modification of existing buildings, if the security needs are identified in a threat and risk assessment. The physical needs, including measures of any biological and chemical agents released become part of the budget and design prospect.