# ECS 358
# CIVIL ENGINEERING DESIGN PROJECT

# REINFORCED CONCRETE BUILDING DESIGN PROJECT

# &

# PROJECT BASED LEARNING

# (CASE STUDY)

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Acknowledgement

In the name of Allah, the Most Gracious and the Most Merciful.

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May God shower the above cited personalities with success and honour in their life.

Contents

## 1.1 Introduction

This chapter gives a brief overview about the project that have been conducted. In this chapter, the subtopic will be the requirement Building By Law and Fire Resistance Regulation that need to be follow and understand by the engineer before construct a building. After that, followed by the architecture drawing and some of simple background of the project. Then the design parameters and weights of materials used in the building also will be include in this chapter.

### 1.1.1 Requirement of Building-By-Law and Fire Resistance Regulation

Uniform Building By-Law 1984 was enacted by the Minister/State Authority in exercise of the powers conferred by section 133 of the Street, Drainage and Building Act 1974 (Act 133), to ensure that all building within its jurisdiction are constructed in accordance with these By-Laws. The objective behind the formulation of these By-Laws are to set a standardized building regulations for the whole of Malaysia and applicable to all Local Authorities and building professionals and to regulate architectural, structural, health & safety, fire protection capabilities and constructional requirements of buildings with a clear references to the approved standards. In UBBL there are consist of 9 parts and each part briefly explain the regulation that the engineer need to be followed.

For example in UBBL at part V where it explain about the structural requirements and considerations such as dead, superimposed and dynamic loads and, structural materials and elements to build and calculate the building. In example we take staircase that need to be provided according to UBBL to compare with the architectural drawing. In UBBL stated that in any staircase, the rise of any staircase shall be not more than 180 mm and the tread shall be be not less than 255 mm [By-Laws Section 103-107]. Compare with the architecture drawing, the tread provided by the architect is 260 mm and the rise is 165mm which is the dimension provided by the architect is suitable with the requirement of UBBL.

While for fire resistance regulation, in UBBL stated that, every building shall be providing with means of detecting and extinguisher fire appliance. It must be served by at least one fire hydrant located not more than 91.5 meters from the nearest point of fire bridge access.

## 3.1 Summary of Design Work

To sum up, it is very important to understand the specification of architectural drawing before start to design a building. After that, the location of the beams, column and the load of the slab can be trace. All the important load for example load from trusses need to be consider and to be calculate. Afterward, one critical beam beam were chosen based on the most critical slab and column. During the designing phase it is very important to understand the appendix and the used of the formula. Most of the calculation need an assumption first before start to design. For example diameter of bar and link need to assume but at the same time it must be relevant in order to minimize the failure. So, during the assumption, students need to do more research and observation since they still have no experience in construction. Last but not least, after design phase, detailing is needed as it is very crucial in order to be use in the construction site and to estimate the bill of quantity. Any mistakes from the detailing will lead to fatal and failure at the site.

## 3.2 Recommendation/ Reflection

From this project, students able to design a structural elements in designing a double storey house individually. Even though there might be a slightly mistakes during the manual calculation, students at least can learn the mistakes and try to prevent it in the future. Apart from that, students also able to understand on how to used the Esteem Software and read the result from the software. It is not very easy to understand the result so that is why they need to keep asking lecturer or friends to guide them. To understand the concept and theory, student must refer to the book which is REINFORCED CONCRETE DESIGN TO EUROCED 2 that has been produced by the Senior Lecturer and Associate Professor which is Mohammad Salleh Yassin and Ramli Abdullah from Univeristi Teknologi Malaysia.

## 3.3 References


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