

**UNIVERSITI TEKNOLOGI MARA**

**ECS 358 or ECS356  
CIVIL ENGINEERING DESIGN PROJECT**

**REINFORCED CONCRETE BUILDING  
DESIGN PROJECT  
&  
PROJECT BASED LEARNING  
(CASE STUDY)**

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I hope that our report has fulfill the requirement needed and will be accepted by our lecturer as I have already put all of my efforts in order to finish this project.

## TABLE OF CONTENT

NO	CONTENT	PAGE NUMBER
1.	INTRODUCTION	3
2	OBJECTIVE	
3	UNIFORM BUILDING BY LAW	4 - 12
	BACKGROUND OF THE PROJECT	13
4	MATERIAL PROPERTIES	14
5	DESIGN DOUBLE STOREY HOUSES	15
6	TYPE OF ROOM	15
7	DESIGN STRUCTURAL	17
8	MICROSOFT PROJECT	18 - 19
9	STRUCTURAL KEY PLAN	19 – 20
10	PERMANENT ACTION AND VARIABLE ACTION	20 - 21
11	ARCHITECTURE DRAWING AND STRUCTURAL KEY PLAN	22
12	3 D HOUSE PLAN LAYOUT	24
13	TABLE OF COMPARISON BETWEEN MANUAL CALCULATION AND ESTEEM	26 – 30
14	MANUAL CALCULATION REINFORCE CONCRETE DESIGN	31
15	ESTEEM CALCULATION REINFORCE CONCRETE DESIGN	32
16	SLAB CALCULATION BY ESTEEM	34 - 37
17	BEAM CALCULATION BY ESTEEM	39 - 50
18	COLUMN CALCULATION BY ESTEEM	52 - 64
19	PAD FOOTING CALCULATION BY ESTEEM	66 - 74
20	ESTEEM COST ESTIMATION	76 - 78
23	CASE STUDY - ( SOIL REPORT INVESTIGATION AND WATER DEMAND)	80 – 88
24	CONCLUSION	89
25	REFERENCE	89

## **INTRODUCTION**

This report is discussing about the designing of double storey bungalow house. It involves in manual calculation and Esteem software. My final year project report will includes the manual calculation, Esteem result, architectural drawing, structural drawing, and soil investigation report. The title of the project is “CADANGAN MEMBINA SEBUAH RUMAH BANGLO DUA TINGKAT DI ATAS LOT PTD 10532, MUKIM SRI GADING, DAERAH BATU PAHAT, JOHOR DARUL TAKZIM”

My company as a consultant required to design the double storey building which is in my cases we choose a bungalow which is estimated about RM1.8 Milion. We are required to design all structural part in the building such as beam which are include ground floor, first floor, and roof beam. In addition, our consultant team also need to propose a design for slab, column, pad footing and staircase. The failures attain for both manual calculation and esteem design should be recalculate and redesign until it pass. This is too ensure the structure is safe to the client and can cater the load applied. This acquire a lot effort from personnel to complete this project.

The process of designing and all the calculation being referred by the Eurocode 1 for all the action that being apply at the slab. And the usage of Eurocode 2 for the designing all the reinforcement for all the design component that is beam, slab, column, staircase, and pad footing.

The second project that being given to me is to analyse the soil investigation report, the report than being tabulated for the case study for the usage of the soil bearing and to find the suitable design for the pad footing that applied in the first project as a completion on the analysis segment for the whole building

Last but not least, we hope that our aim to successfully designing the structural design of the bungalow with the optimum and economical design can be accomplished.

## **OBJECTIVE OF THE PROJECT**

1. To construct the suitable structure key plan by following architecture drawing.
2. To design the structure by using manual calculation.
3. To design the structure by using Esteem Software.
4. To compare the different between manual calculation value and from Esteem Software value.
5. To calculate the cost material by using Esteem Bill Quantity.
6. To calculate the total cost for the project by using Microsoft Project software.

## **DISCUSSION**

Manual calculation was used to determine suitable size of critical structural member size only. This method is not really economical since only one size is applied throughout all related structural members. As an example, if a beam only loaded with minimum load, a critical size of beam will be applied. It is very complicated for an engineer to calculate on each particular beam. Therefore, esteem software was introduced. This is to ease the engineers work and produce more economical and might be cheaper value of particular project.

There are few differences were determined after finished with both manual calculation and esteem result of our RC Design Project. All the differences were affected by few reasons. One of the reasons is in manual calculation, we only calculate on critical structural members. While in esteem, the calculations and result were shown precisely through each structural members. This is to help in produce more economical value of a particular project. Which we only increase the structural members size that are failed. Moreover, all the data such as permanent and variable action were inserted separately depends on the particular member. Other than that, at a first place, we did draw structural drawing manually and simply assign few unnecessary structural members especially column. During running esteem, we are about to design by using our manual drawn structural drawing, however, whenever we tried to running to obtain the results, it showed that few columns are not needed. Which might effect to uplift forces. This contribute in difference result between esteem and manual calculation.

As for steel design project, we chose on designing elevated water tank. The design was calculated manually. In our course ECS358, we did not carry out any software to calculate on steel design. Therefore, the results are not compared with any other results.

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