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

In design process, a designer is responsible for the overall design, including stability and should ensure the compatibility of the design and details of parts and components. The structure should be it can transmit dead load and imposed loads in a direct manner to the foundations. The arrangement structure elements should ensure to be strong enough and stable so that the structure will not collapse progressively under the effects of misuse or accidental damage to any one element.

There are two projects in this report. The first project is about to design a double storey terrace house and project 2 is project based learning with two case studies. The first case is to get the value of soil bearing capacity for designing the pad footing at project 1. The second case is to calculate the water demand and water tank size for the double storey house.

The Architecture drawings are obtained from one of the developer company which is TEMOKIN DEVELOPMENT SDN BHD. The structural plans are then produced and all the structure elements of the building such as slab, beam, column and pad footing are designed in manually and in ESTEEM. Staircase is only design in manually and represent as void in the ESTEEM.

A building to be design and construct should meet the requirement of Uniform Building by Law (UBBL). This is because to ensure that the building is in safe conditions for occupants to stay. These legal instruments stipulate the procedures for building plans approval and other means of development and construction control. The building also should meet the fire safety regulations as the precaution when any incident may happen.

The soil condition of the project area should be investigate to know the soil bearing capacity of the soil to cater all the load of structure transfer from the roof to the foundations. The soil bearing capacity can be calculated by referring to the Site Investigation(SI) report. The type of foundation can be identified base on the soil condition.

The water demand for the house also need to be consider to ensure the water capacity that will supply to the occupants is sufficient. The water capacity that been suggested from architect in architecture drawings should be check and compare with SPAN or Syabas in order to know the effective amount of water capacity that will supply to the house.

CONCLUSION

t the end of this report, two projects are presented in detailed. Project 1 is designed a double orey terrace house and project 2 is project based learning with two case study. The first case ne is to get the value of soil bearing capacity used for designing the pad footing at project The second case is done to calculate the water demand and water tank size used for the uble storey house.

project 1, a double storey terrace house is designed based on the structural drawings that ve been produced. A double storey terrace house was designed in manually and in TEEM to compare the results. Bills of quantities were calculated by referring the detailing structures designed. A project schedule of this project is done to shows the duration of oject and the list of activities and sources involve in this construction project.

1 SUMMARY OF DESIGN WORKS

designing a double storey terrace house, the Architecture drawings are obtained first from e of the developer company which is TEMOKIN DEVELOPMENT SDN BHD. The ctural plans are then produced by tracing the architecture drawings key plan. The size of , column pad footing and thickness of slab are determined first before all the structure ements of the building are designed in manually and in ESTEEM. Staircase is only design manually and represent as void in the ESTEEM. In this project, not all structure was igned. Only selected slab, beam, column and pad footing are designed.

e first structure designed is slab. This is because we need to calculate the load that going to sfer from the selected slab to beam in order to design beam later. The load is transferred m slab to beams by distributing the load over the beam. The slab load (permanent and able), expressed in units of weight per area, is converted into weight per length of the . The slab should rest on the beam that carries its weight.

er get the value of load transfer from slab, beam were analysed and designed to get the oments that used to design the column. The beam designed is continuous beam and the must be rest at the chosen column. The column are then analysed and designed by g the moment value from the beam. The classification of column is checked weather the lumn is braced/ unbraced and slender/ non-slender. The axial loads from roof floor column the stump are calculated to get the load transfer to pad footing.

m load transfer by column, the pad footing then designed. The soil bearing capacity ould be calculated first in project 2. This is because soil bearing is very important in order know the soil strength weather it can cater the entire load from the building or not. The e of footing is determined and the arrangement of steel bar at pad footing was identified.

er designed all the structure elements in manually and ESTEEM, a comparison is done to the value of percentage error. The accepted percentage error should not exceed 30% in er to know the manual calculation is wrong or correct. However, there are some culations that exceed 30% of error after designed the structure. The percentage error urred because some formula or ways to determine the design value are different between two methods and it may contribute to different output of value. The ESTEEM also should check in details if any error happen. The error may occur from wrongly input the project eters at ESTEEM. For example, the size of link used to design the beam is different in ually and ESTEEM which 8mm is in manually and 6mm in ESTEEM. This is because