



اَوْنُوْرَسِيْتِي تِيْكُوْلُوْ كِي مَارَا
UNIVERSITI
TEKNOLOGI
MARA

**ECS 358
CIVIL ENGINEERING DESIGN PROJECT**

**REINFORCED CONCRETE BUILDING
DESIGN PROJECT**

PROJECT BASED LEARNING

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DIPLOMA

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1. PROJECT 1 - REINFORCED CONCRETE BUILDING DESIGN PROJECT

1.1. Introduction

- ✓ 1.1.1. Requirements of building-by-law, fire safety regulations
- ✓ 1.1.2. Architecture drawings of the building with TITLE BLOCK ✗
- ✗ 1.1.3. Project background / details
- ✗ 1.1.4. Design parameters for every element (Materials strength, grades, etc.)
- ✗ 1.1.5. Weights of materials used in the building (list of Gk and Qk for slab panels and construction materials)

1.2. Project Schedule

- ✓ 1.2.1. List of activities and time frame
- ✗ 1.2.2. Project schedule using Microsoft Project

1.3. Design of Structural Elements (Manual Design)

- ✗ 1.3.1. Structural Key Plans of the building with TITLE BLOCK
- ✓ 1.3.2. Slab design calculations and detailing (AutoCAD with TITLE BLOCK)
- ✓ 1.3.3. Continuous beam design calculations and detailing (AutoCAD with TITLE BLOCK)
- ✓ 1.3.4. Column design calculations and detailing (AutoCAD with TITLE BLOCK)
- ✓ 1.3.5. Pad footing design calculations and detailing (AutoCAD with TITLE BLOCK)
- ✓ 1.3.6. Staircase design calculations and detailing (AutoCAD with TITLE BLOCK)


1.4. Design of Structural Elements (Software Design)

- ✓ 1.4.1. Slab design (input and output)
- ✓ 1.4.2. Continuous beam (input and output)
- ✓ 1.4.3. Column design (input and output)
- ✓ 1.4.4. Pad footing design (input and output)
- ✓ 1.4.5. Summary comparison and justification between manual calculation and design software

1.5. Taking Off and Bill of Quantities (Designed Elements)

- ✓ 1.5.1. Slab
- ✓ 1.5.2. Continuous beam
- ✓ 1.5.3. Column
- ✓ 1.5.4. Pad footing

2. PROJECT 2 - PROJECT BASED LEARNING

- ✓ 2.1. Soil Bearing Capacity or Flexible pavement design (Solution for PBL)
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1.1.3. Project backgrounds/details

This project is about a proposal to build a double-storey house that is located at Taman Desaru Utama, Bandar Penawar, Tanjung Surat, Kota Tinggi, Johor. This project was designed by Vantage Architects Sdn. Bhd. which originated from Johor Bahru. The project was proposed in July 2013. As stated in the architecture drawing, there are 102 unit double-storey house and 102 two-story terraced house that were to build on the land. All the dimensions and size of the houses are shown in the architectural drawing. The drawing was prepared for Continental Management Sdn. Bhd. which is the client of this project.

TITLE	DESCRIPTION
NAME OF PROJECT	CADANGAN MEMBINA:- 1) 102 UNIT RUMAH DUA TINGKAT (22' X 70') TYPE A DI ATAS PTB 10916-PTB 10949, PTB 11012 - PTB 11045 DAN PTB 11046 - PTB 11079 2) 102 UNIT RUMAH TERES DUA TINGKAT (22' X 70') TYPE B DI ATAS PTB 11105 - PTB 11138, PTB 11139 - PTB 11158, PTB 11160 - PTB 11173 DAN PTB 11236
SITE LOCATION	
CLIENT	CONTINENTAL MANAGEMENT SDN. BHD.
DRAWN BY	AMMAR
COMPANY OF ARCHITECT	VANTAGE ARCHITECT SDN. BHD.

3.1 Summary of design works

To conclude this design works, all the elements was successfully designed as all the design passed in the analysis calculation. Furthermore, the comparison between the manual calculation and software calculation also did not exceed 30% in percentage error. This means that the calculation that was done manually is still acceptable to be used if it were to be used in the real life. The uses of the software which is PROKON practically ease the calculation process of the design works. However, we cannot neglect the manual way of calculating it as it is part of the traditional way. Sometimes, the software also makes mistakes and we needed to compare it with our manual calculation so we can identify the mistakes.

We also need to calculate our cost of project accurately by using the taking-off sheet. With this way, we can estimate our cost with the lowest loss and waste. The total cost also can be known by the bill of quantities. We can know the current cost of each material and the total cost of designing each of the elements.

Lastly, we can estimate the time needed to construct each of the elements by using Microsoft Project. With this software we can know the time required to complete the construction and the list of works that involved in the construction. With so, our project will become more organized and can complete in time required by the client. As known, if a project was not completed by the time, we will be fined by the client as we breach the contract.

3.3 Recommendations/reflections

My recommendations to improve this design works is to push the limit of our design so we can save more in our cost. However, we should not neglect the safety factor of our buildings as any error can cost severe damage to the occupants.

We also should use a constant number of decimals during all the manual calculation works. So, this will make our calculation result more constant and accurate. It also will make our comparison with the software calculation having lesser differences between them.

Lastly, we must have become more skilled using the software which is PROKON. As the more developed the world is, the process of using technology can be more tricky and hard. So we need to truly understand how to use the software so we do not make any human error when entering the values for the calculation. This will make our calculation more accurate and have a correct analysis.