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# UTHM

Universiti Tun Hussein Onn Malaysia

**UNIVERSITI TUN HUSSEIN ONN MALAYSIA**

**FINAL EXAMINATION  
SEMESTER I  
SESSION 2022/2023**

COURSE NAME : CONSTRUCTION ENGINEERING

COURSE CODE : BFC 21002

PROGRAMME CODE : BFF

EXAMINATION DATE : FEBRUARY 2023

DURATION : 2 HOURS

INSTRUCTION

1. ANSWER ALL QUESTIONS

2. THIS FINAL EXAMINATION IS CONDUCTED VIA **CLOSED BOOK**.

3. STUDENTS ARE **PROHIBITED** TO CONSULT THEIR OWN MATERIAL OR ANY EXTERNAL RESOURCES DURING THE EXAMINATION CONDUCTED VIA CLOSED BOOK

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THIS QUESTION PAPER CONSISTS OF FIVE (5) PAGES

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**Q1** Based on **Table 1**,

- (a) Draw a typical cross-section as a guide to calculate earthwork volume.  
Given,
  - Dimension for single carriageway is 3.25 meter
  - Both direction LHS and RHS is design for double carriageway
  - Road shoulder is 1.75 meter for each side
  - Slope design ratio is 1 to 1.5 meter (vertical to horizontal ratio)

(2 marks)
- (b) Outline the method to calculate the earthwork volume. 

(3 marks)
- (c) Calculate the earthwork volume. 

(20 marks)

**Q2** (a) Based on **Figure Q2**,

- (i) Identify the main problem that will occur during the construction of the pad foundation. 

(2 marks)
- (ii) Discuss a method to overcome the problem in **Q2(a)(i)** with a proper sketch. 

(6 marks)
- (b) Compare **THREE (3)** different fundamental concepts between Bore Pile and RC Spun Pile. 

(6 marks)
- (c) Two-story houses will be built at the adjacent to the existing terrace houses. Based on the Soils Investigation (SI) report, it was found that the layer of rock is at an average of 5 meters depth.
  - i) Select a suitable type of pile for this project 

(2 marks)
  - ii) Justify the reason of your proposed pile in **Q2(c)(i)**

(2 marks)
- (d) State **TWO (2)** importance of piling records in the construction. 

(2 marks)
- (e) List **FIVE (5)** steps for the pile cap construction. 

(5 marks)

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- Q3** (a) The strength of the floor structure should be adequate to carry the dead load of the floor, finishes, fixtures, partitions, services and expected imposed loads of occupants. Evaluate **FIVE (5)** challenges in the following construction;
- (i) non-suspended reinforced concrete slabs on the ground floor (5 marks)
  - (ii) suspended reinforced concrete slabs on the first floor. (5 marks)
- (b) Column is an element that was designed to receive compressive stress and to distribute loading from the upper floor to the ground. However, it is a challenge for the contractor especially for the Project Engineer to transform the imagination from the architect to the real construction. Evaluate **FIVE (5)** challenges in the construction of columns as shown in **Figure Q3 (b)**. (10 marks)
- (c) Good concreting work is important to ensure the strength of building structures. It can be a major problem for the entire project if the concrete strength does not reach the targeted strength. Predict the **TWO (2)** challenges for a massive concreting of the floor area for Malaysia's weather climates. (5 marks)
- Q4** (a) Prepare a method of construction for retaining wall as shown in **Figure Q4 (a)** (15 marks)
- (b) List the best practice of construction work of formwork. (5 marks)
- (c) List **FIVE (5)** reasons of honeycomb problem in concrete structures. (5 marks)

– END OF QUESTIONS –

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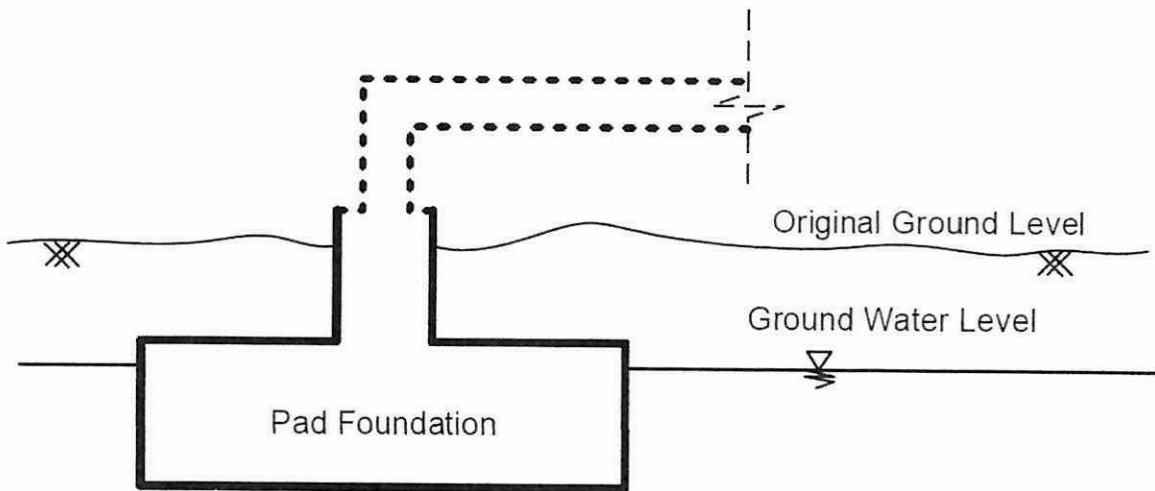
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**Table 1**

CH (m)	OGL (m)	FL (m)	Slope Ratio
100.0	12	15.0	1:1.5
112.5	11.8	15.0	1:1.5
125.0	12.5	15.0	1:1.5
132.5	13.0	15.0	1:1.5
150.0	12.8	15.0	1:1.5
162.5	12.2	15.0	1:1.5
175.0	12.4	15.0	1:1.5



**Figure Q2**

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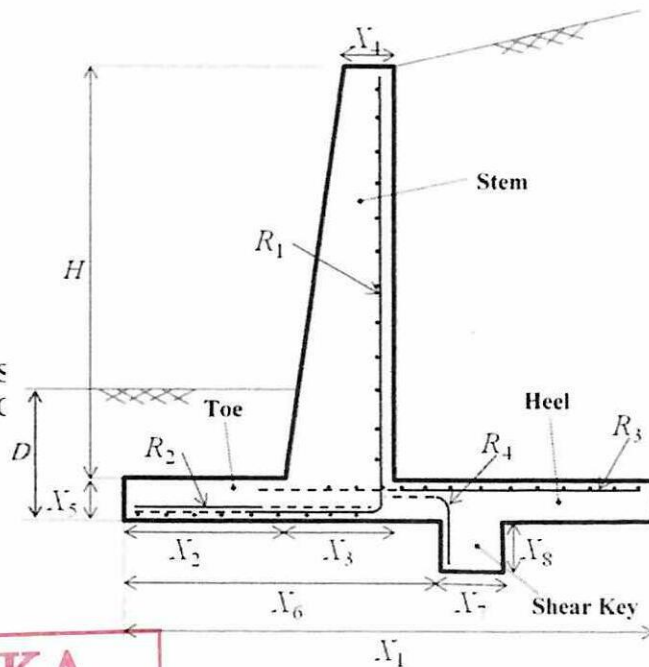
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Figure Q3 (b)

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Figure Q4 (a)