



2705/204

2707/204

MEASUREMENTS OF BUILDING  
AND CIVIL ENGINEERING WORKS,  
ESTIMATING AND COSTING I

June/July 2017

Time: 3 hours



THE KENYA NATIONAL EXAMINATIONS COUNCIL

**DIPLOMA IN BUILDING TECHNOLOGY  
DIPLOMA IN CIVIL ENGINEERING  
MODULE II**

MEASUREMENT OF BUILDING AND CIVIL ENGINEERING WORKS, ESTIMATING AND  
COSTING I

3 hours

**INSTRUCTIONS TO CANDIDATES**

*You should have the following for this examination:*

*answer booklet;*

*dimension papers;*

*scientific pocket calculator;*

*a copy of Standard Method of Measurement of building and associated civil works for  
Eastern Africa (SMM);*

*a copy of Civil Engineering Standard Methods of Measurement (CESMM).*

*This paper consists of SIX questions in TWO sections; A and B.*

*Answer FOUR questions choosing TWO questions from each section in the answer booklet  
provided or on the dimension papers as necessary.*

*Questions in section A carry 30 marks each while those in section B carry 20 marks each.*

*Maximum marks for each part of a question are indicated.*

*Candidates should answer the questions in English.*

**This paper consists of 6 printed pages**

**Candidates should check the question paper to ascertain that all  
the pages are printed as indicated and that no questions are missing.**





## SECTION A: MEASUREMENT

Answer **TWO** questions from this section.

1. ✓ Take off all quantities for the substructure works shown on **drawing No. 01** upto and including the d.p.c. (Use SMM) (30 marks)
2. Take off all quantities for external works shown on **drawing No. 02**. (Use CESMM). (30 marks)
3. ✓ (a) Explain the following as used in measurements:
- (i) extra-over items; - *Additional work on major works*
  - (ii) schedules; ✓
  - (iii) preambles; - *specifications on what the contractor is going to do*
  - (iv) deemed to be included items. *work indicated in the scope of build items but not included in the specifications*
- (8 marks)
- 22 marks (b) Outline the procedure of preparing an interim payment certificate by a Quantity Surveyor. (10 marks)
- (c) Differentiate between "selective" and "negotiated" tendering. (3 marks)
- (d) (i) Define the term contract.
- (ii) Explain the following types of contracts:
- (I) cost reimbursement; -
  - (II) package deal;
  - (III) term.
- (9 marks)

## SECTION B: ESTIMATING AND COSTING

Answer **TWO** questions from this section.

4. ✓ (a) Explain the role of each of the following parties in the construction industry:
- (i) client;
  - (ii) architect;
  - (iii) quantity surveyor.
- (6 marks)
- (b) (i) Define the term 'variation'.
- (ii) Explain **three** ways of valuing variations. (10 marks)



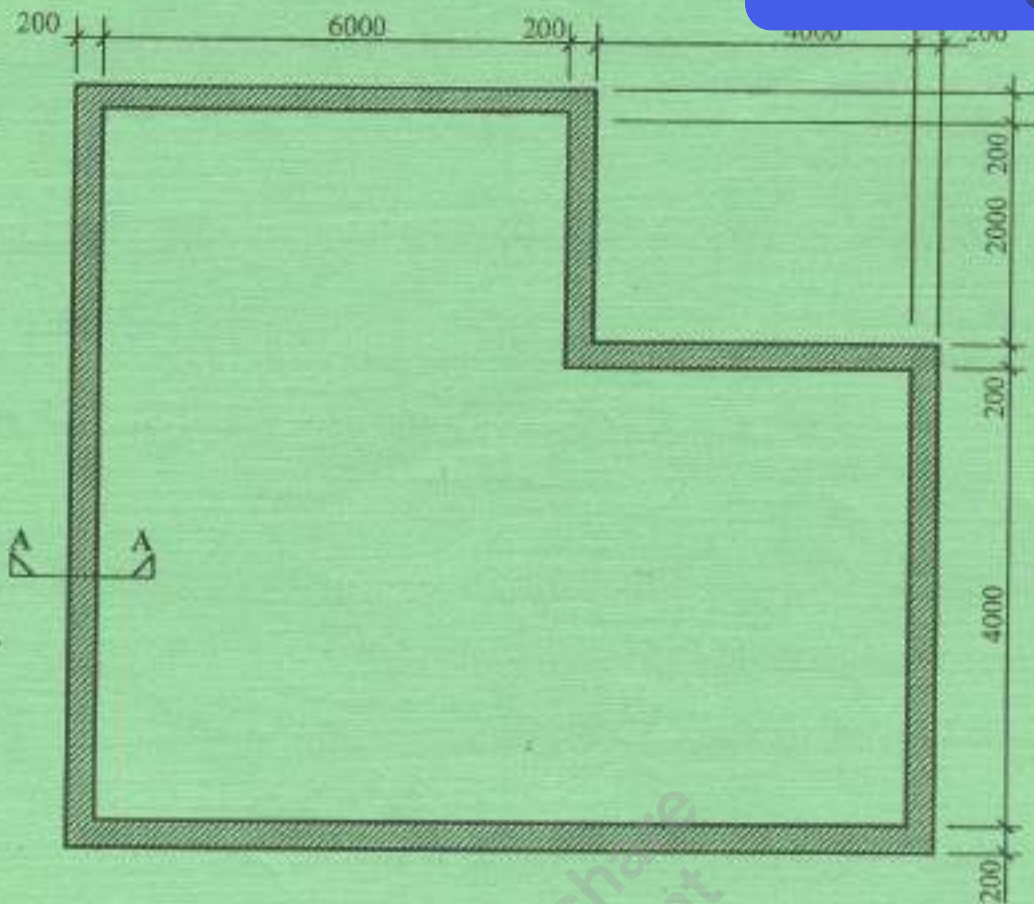
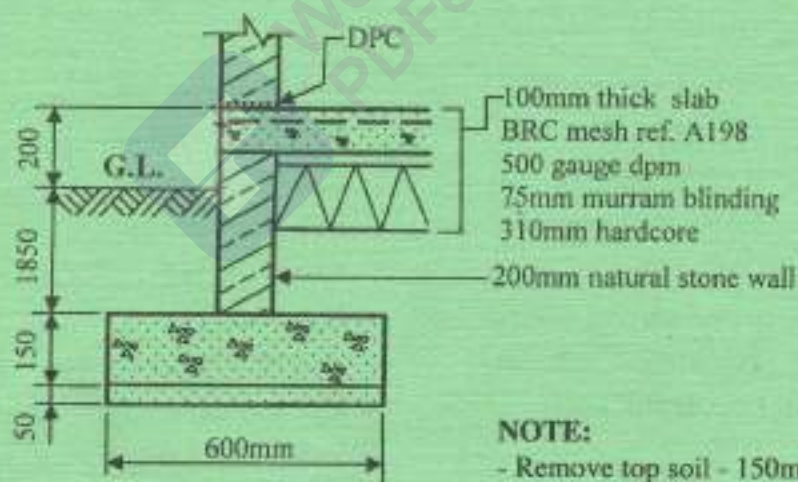
- (c) Explain the significance of a 'final payment certificate' in a building contract. (4 marks) 4
- 5/ (a) List **six** sources of cost information. (3 marks) ✓
- (b) Differentiate between tendering and estimate in building and civil engineering works. (4 marks)
- (c) Explain the following approximate estimating methods:
- (i) functional unit method, *for roof and walling are calculated by a floor area unit within the building, its total*
- (ii) superficial method. *total an amount by multiplying each unit by a unit rate factor* (6 marks) 6
- (d) Distinguish between prime cost and provisional sum. (4 marks) 4
- (e) (i) List **two** key types of contract documents. *is the cost of part of an item which is not known when the contract was entered into*
- (ii) Explain the importance of contract documents. *values of quantities, in quantities, in quantities, in quantities* (3 marks)
6. (a) Explain the approximate quantities method of estimation. (5 marks)
- (b) **Figure 1** is a line diagram plan and a section A - A of a substructure. Using the data given below, use approximate quantities method to estimate the cost of the works. (15 marks)

#### Data

I. Surface excavation	- Ksh 50.00 per sm
II. Trench excavation	- Ksh 100.00 per cm
III. Backfilling	- Ksh 80.00 per cm
IV. Disposal of surplus	- Ksh 90.00 per cm
V. Timbering	- Ksh 50.00 per sm
VI. Levelling and compacting	- Ksh 50.00 per sm
VII. Foundation concrete	- Ksh 10,000 per cm
VIII. Foundation wall	- Ksh 900 per sm
IX. DPC	- Ksh 50 per Lm

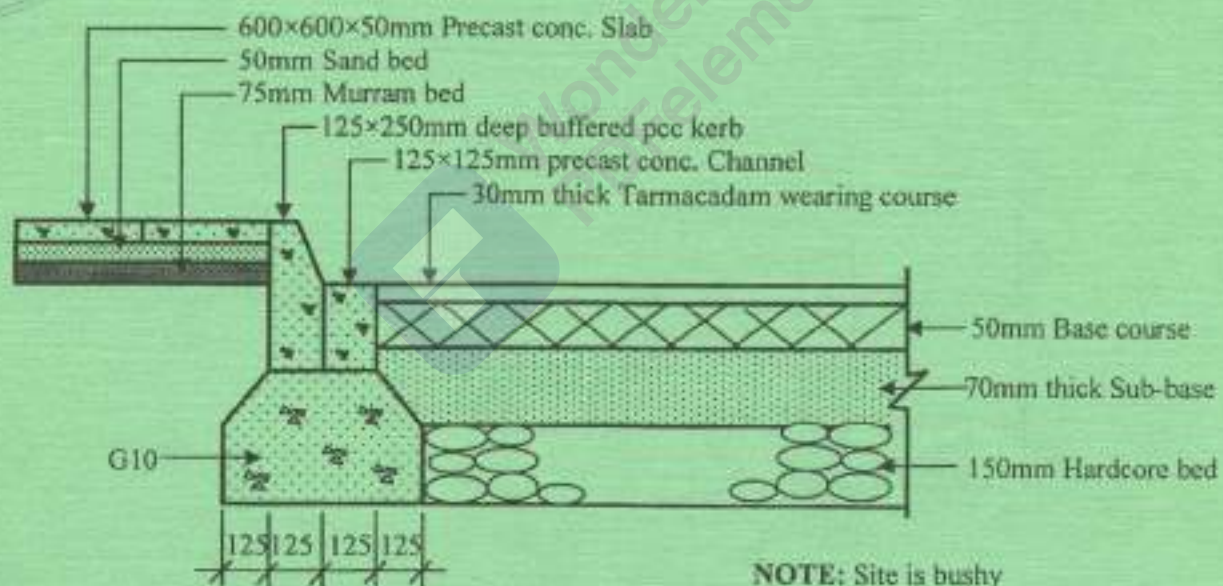
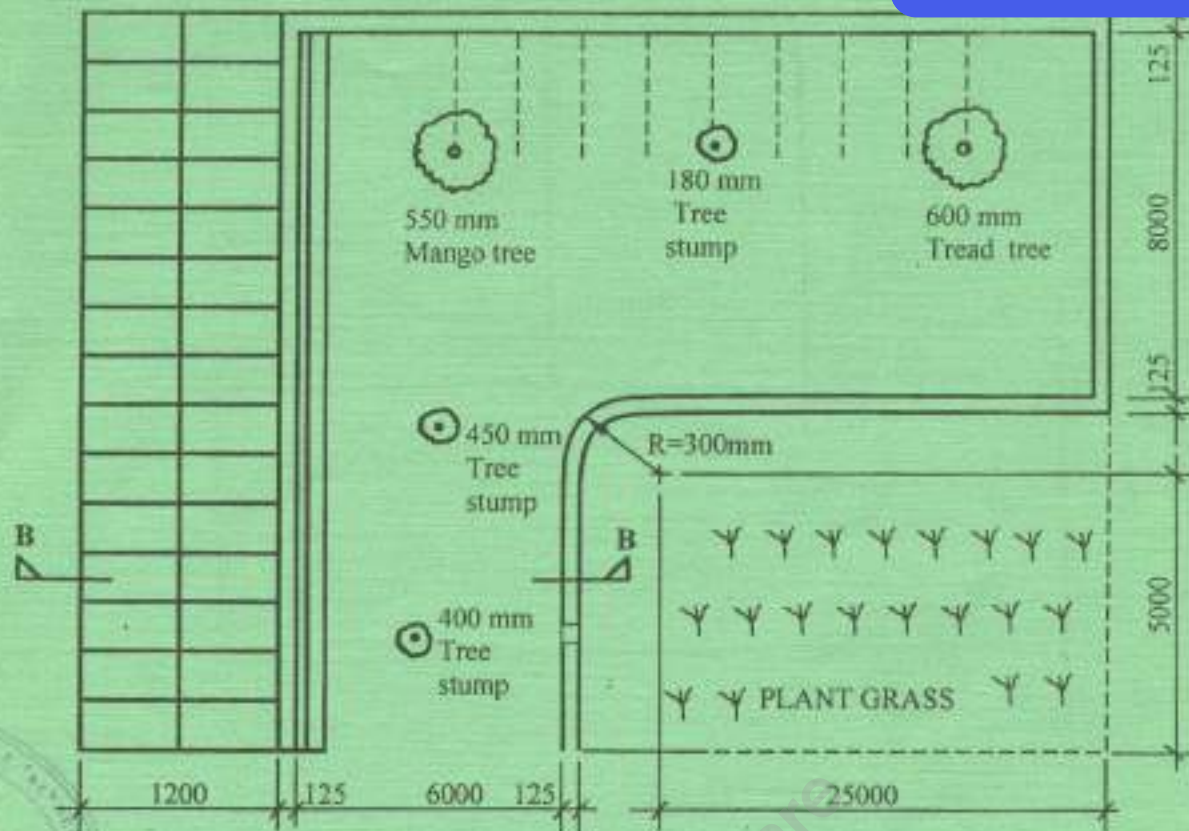
(Assume any information not given)



PLANSECTION A-A**NOTE:**

- Remove top soil - 150mm
- Rock level - 1000mm from ground level

DRG. 01



NOTE: Site is bushy

## DRG 02 - EXTERNAL WORKS

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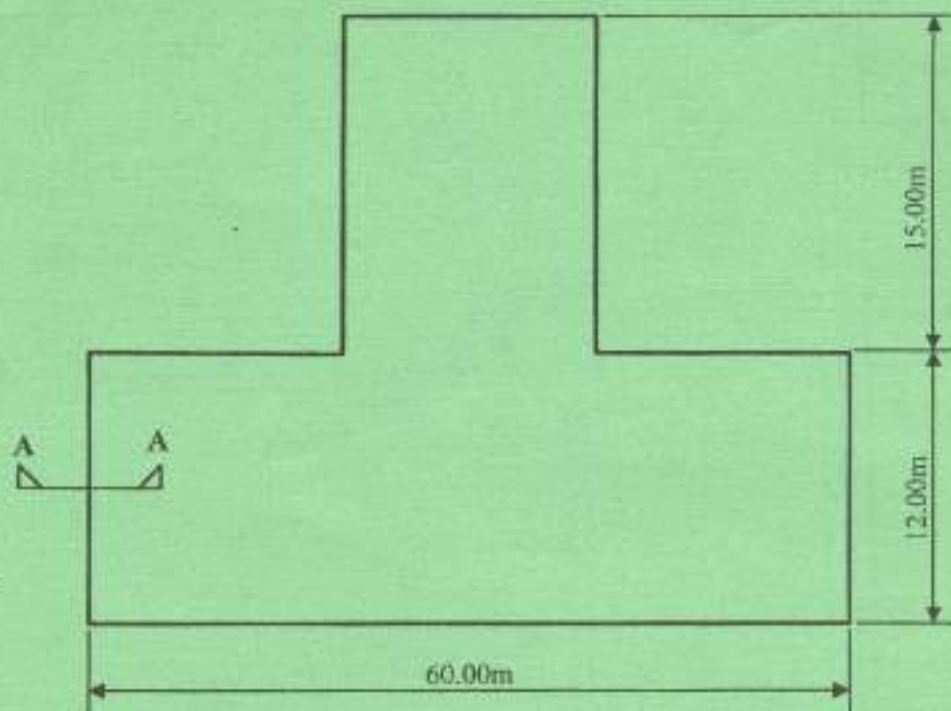
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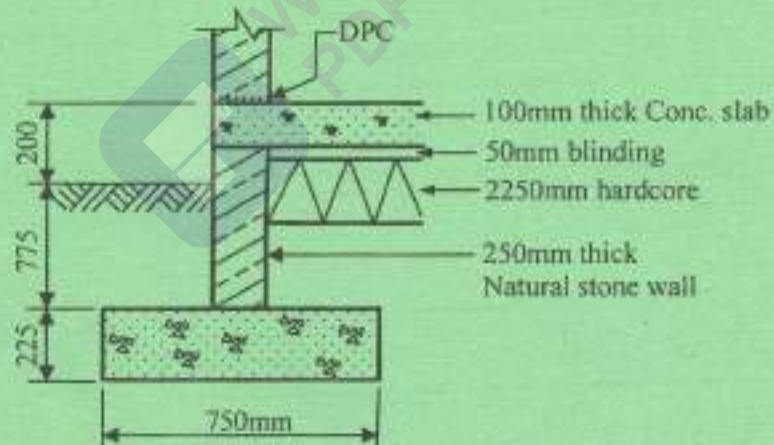
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Turn over





PLAN



SECTION A-A

**FIGURE 1**

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