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

June/July 2018

Time: 3 hours



THE KENYA NATIONAL EXAMINATIONS COUNCIL

DIPLOMA IN BUILDING CONSTRUCTION
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 paper;

Scientific calculator;

A copy of the standard method of Measurement of Building works;

A copy of the Civil Engineering Standard Method of Measurement.

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

Answer FOUR questions choosing

TWO questions from section A;

TWO questions from section B.

Questions in section A carry 30 marks each while each question in section B carries 20 marks.

Maximum marks for each part of a question are as shown.

Candidates should answer the questions in English.

This paper consists of 7 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 OF BUILDING AND CIVIL ENGINEERING WORKS

Answer TWO questions from this section.

1. Drawing No. 01 shows an underground circular water tank. Using SMM take off all the quantities for the works. (30 marks)
2. Drawing No. 02 shows the plan, roof cover and vertical section of a 'pump chamber' constructed in vibrated reinforced concrete. Using the Civil Engineering Standard Method of measurement (CESMM), take off all quantities for the works. (30 marks)
3. (a) Explain each of the following as used in measurement of building works:
 - (i) prime cost sums;
 - (ii) provisional sums;
 - (iii) running through dimensions.(6 marks)
- (b) Explain each of the following in bill preparation:
 - (i) operational bill;
 - (ii) elemental bill.(4 marks)
- (c) (i) Explain two certificates used in construction project contract payments.
(ii) Describe the following methods of tendering in building projects:
 - (I) open tendering;
 - (II) selective tendering;
 - (III) negotiated tendering;
 - (IV) package deal.(12 marks)
- (d) (i) Explain the process used in traditional method of preparing bills of quantities.
(ii) State two reasons for referring substructures works as provisional. (8 marks)

**SECTION B: ESTIMATION AND COSTING**

Answer **TWO** questions from this section.

4. (a) State **six** roles of a quantity surveyor in the pre-contract stages. (6 marks)
- (b) Outline **four** contract documents. (6 marks)
- (c) Explain each of the following in estimating and costing:
- (i) unit rate;
 - (ii) overhead;
 - (iii) profit;
 - (iv) labour constant. (8 marks)
5. (a) (i) Explain **four** situations that lead to variations in the construction projects implementation. *Inflation* (16 marks)
- (ii) Explain **four** methods of valuing variations. (16 marks)
- (b) Describe the following types of contracts used in building construction process:
- (i) lumpsum contract;
 - (ii) cost reimbursement. (4 marks)
6. (a) Using illustrations, describe the following methods of approximating:
- (i) functional unit method;
 - (ii) storey enclosure method. (10 marks)
- (b) (i) List **four** sources of cost information to an estimator.
- (ii) Using the approximate quantities method and the information given in **table 1**, estimate the cost of "substructures works" shown on drawing No. 03. (10 marks)

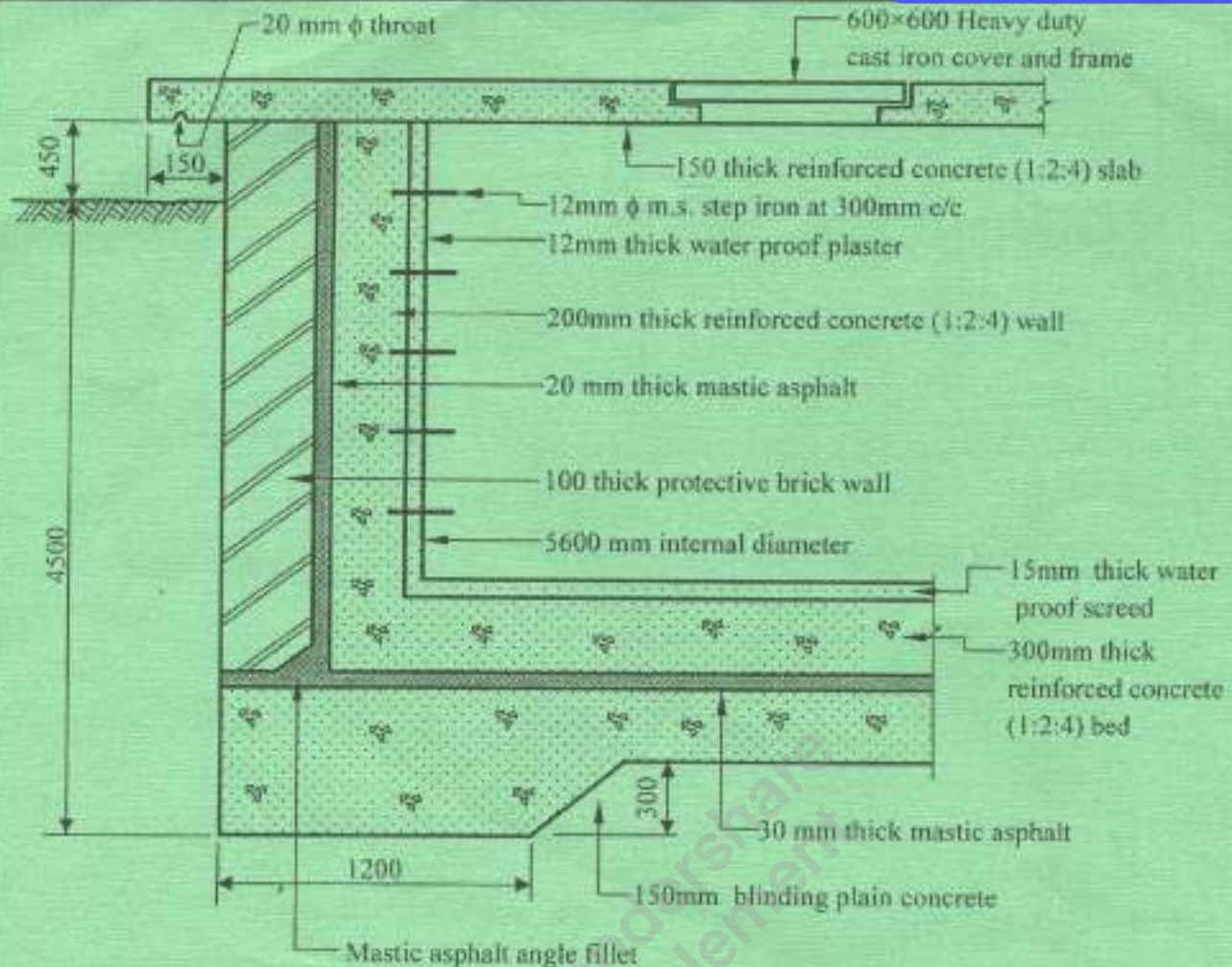
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**Table 1: Standard Rates**

S/No	Description	Rate in Ksh.
1.	Foundation trench excavation	230 per m ³
2.	Disposal of surplus spoil	430 per m ³
3.	Backfilling of excavated materials	350 per m ³
4.	Concrete in foundations	12,500 per m ³
5.	Damp proof course	230 per m ³
6.	Walling in foundation/basement	1,800 per m ³
7.	Plunking and strutting	20,000 item
8.	Keeping excavations free from general surface water	20,000 item

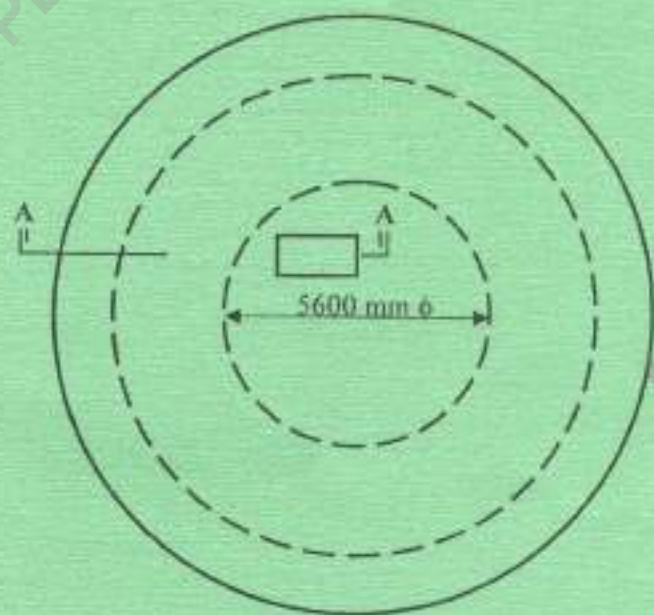




SECTION A-A

NOTE.

1. Rock commences at 3.2m below ground level
2. Protective wall constructed after structural wall is cast.
3. Ignore reinforcement
4. Top soil is 150mm average
5. The site is bushy
6. All dimensions in mm
7. Excavated material to be deposited away from site.



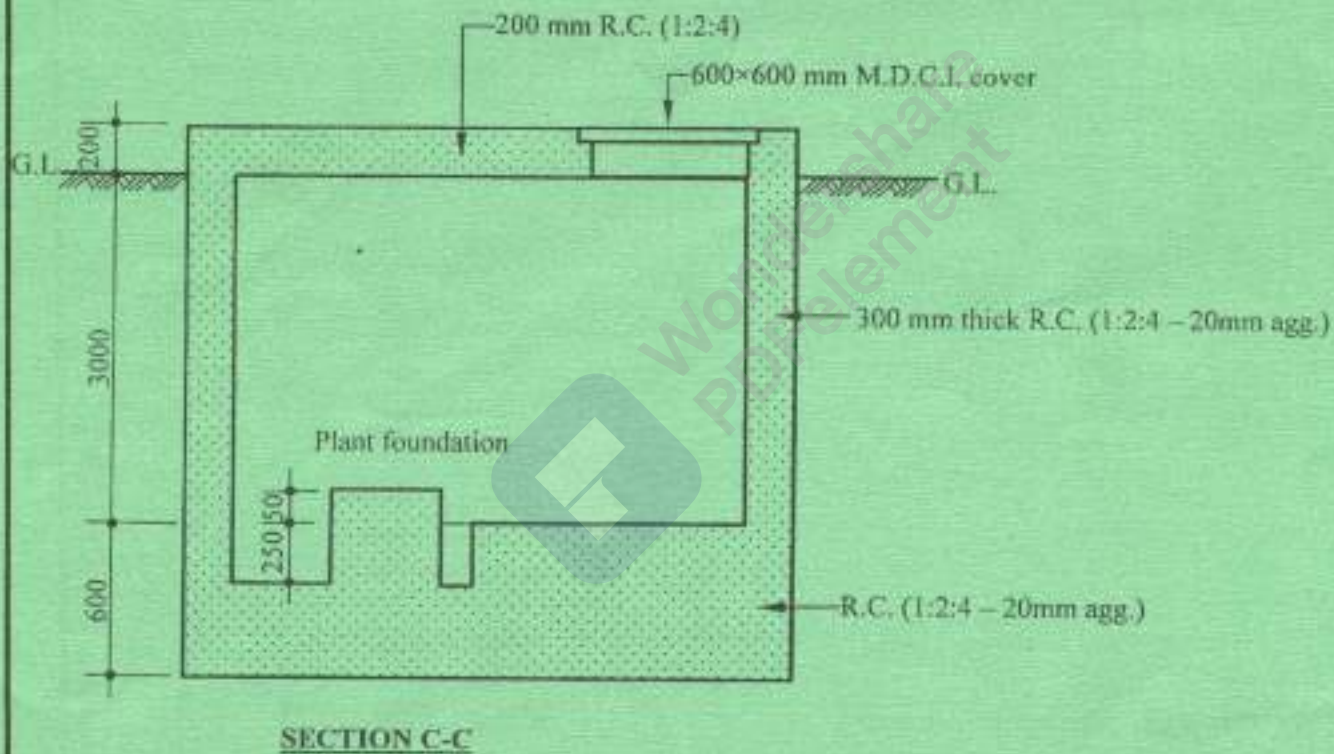
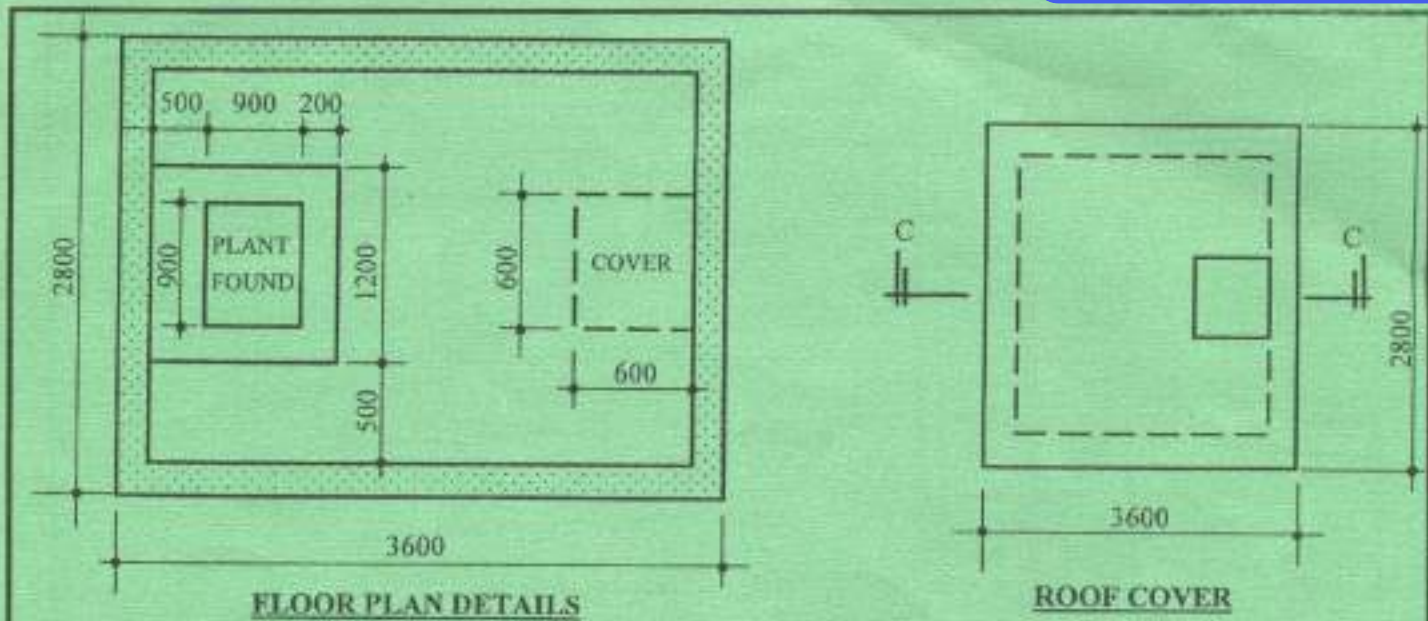
PLAN: UNDERGROUND WATER TANK

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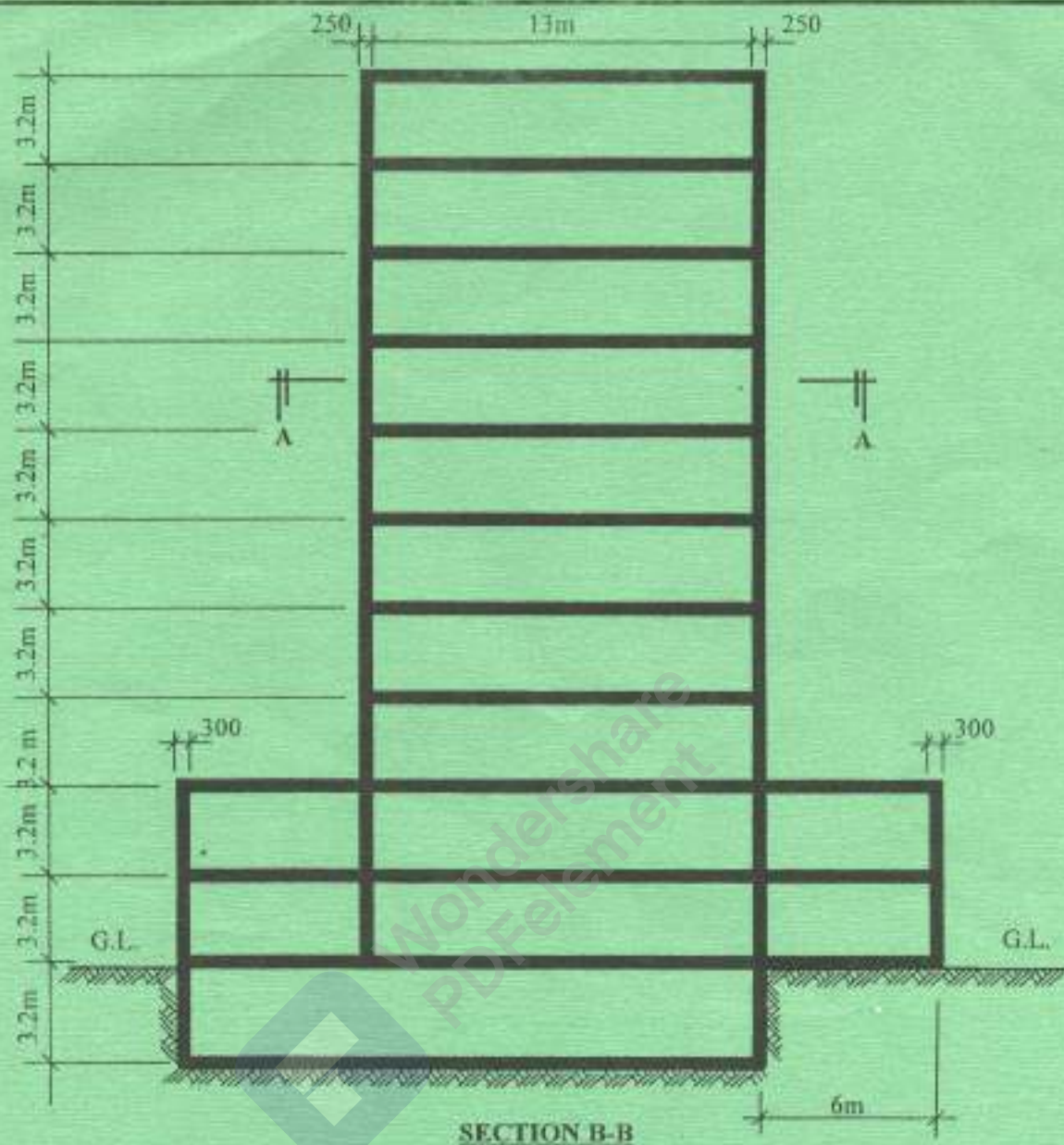
**NOTE:**

1. Site is bushy
2. Vegetable soil 200mm av. deep
3. Ignore the reinforcement

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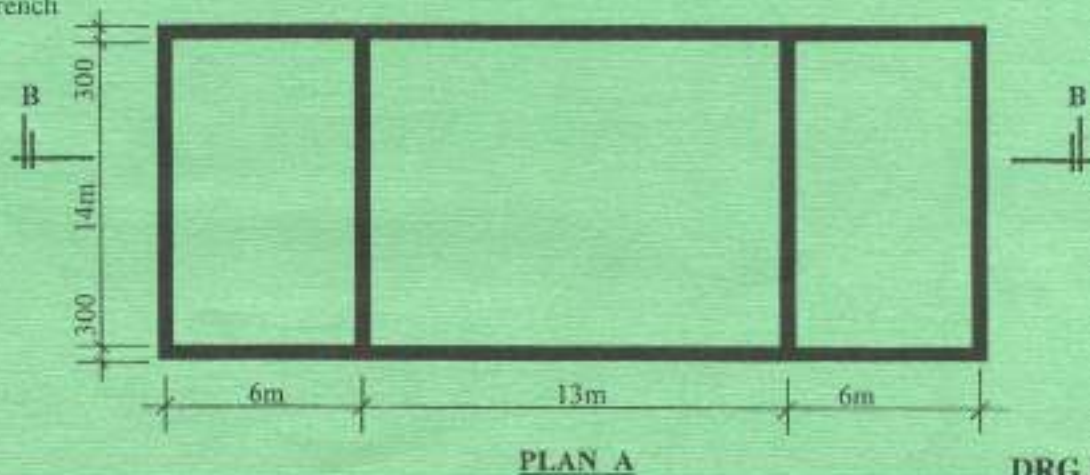
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Note:

- Depth of trench
= 1500mm



DRG No. 03

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