

2307/305

MEASUREMENT, ESTIMATING AND COSTING

Oct./Nov. 2010

Time: 3 hours

THE KENYA NATIONAL EXAMINATIONS COUNCIL

DIPLOMA IN CIVIL ENGINEERING

MEASUREMENT, ESTIMATING AND COSTING

3 hours

INSTRUCTIONS TO CANDIDATES

You should have the following for this examination:

Answer booklet;

Dimension paper;

Pocket calculator;

A copy of SMM for Building and Associated Civil Works for Eastern Africa;

A copy of the CESMM.

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

Answer any TWO questions from each section.

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

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

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 any TWO questions from this section.

1. Take off all quantities for the 'Basement works' shown on drawing No. 01 (use SMM).
(30 marks)
2. Take off all quantities for the 'machine chamber' shown on drawing No.02 (Use CESMM).
(30 marks)
3. (a) (i) Explain the **four** Methods of Valuing Variations.
(ii) Outline the "Ideal sequence of events" that should be followed before a variation order is executed. (12 marks)
- (b) (i) Explain the purpose of the provision for the granting of 'extension of time' clause in the conditions of contract.
(ii) Outline **five** situations which may give rise to the application of extension of time clause. (13 marks)
- (c) Explain the following as used in building and civil engineering contracts:
(i) reduction Bills;
(ii) adenda Bills. (5 marks)

SECTION B: ESTIMATING AND COSTING

*Answer any TWO questions from this section.
Use the data given in Appendix 'A' for price build up.*

4. (a) Outline **three** situations which may necessitate the use of approximate quantities. (6 marks)
- (b) (i) Using illustrations, explain the Cube Method of approximate estimating.
- (ii) Outline **two** drawbacks of cube method of estimating. (14 marks)
5. Build up the unit rate for 'flexible road base', hardcore, depth 250 - 300 mm laid and compacted in layers not exceeding 200 mm thick, per m² (measured as per CESMM). (20 marks)
6. (a) (i) Define the term 'overheads'.
- (ii) List **eight** constituents of overheads. (6 marks)
- (b) Explain the following pricing methods, citing **one** advantage of each:
- (i) net pricing;
- (ii) gross pricing. (8 marks)
- (c) "The use of mechanical plant in construction works does not necessarily reduce the cost of the works". Outline **four** factors which may justify this statement. (6 marks)

APPENDIX 'A'

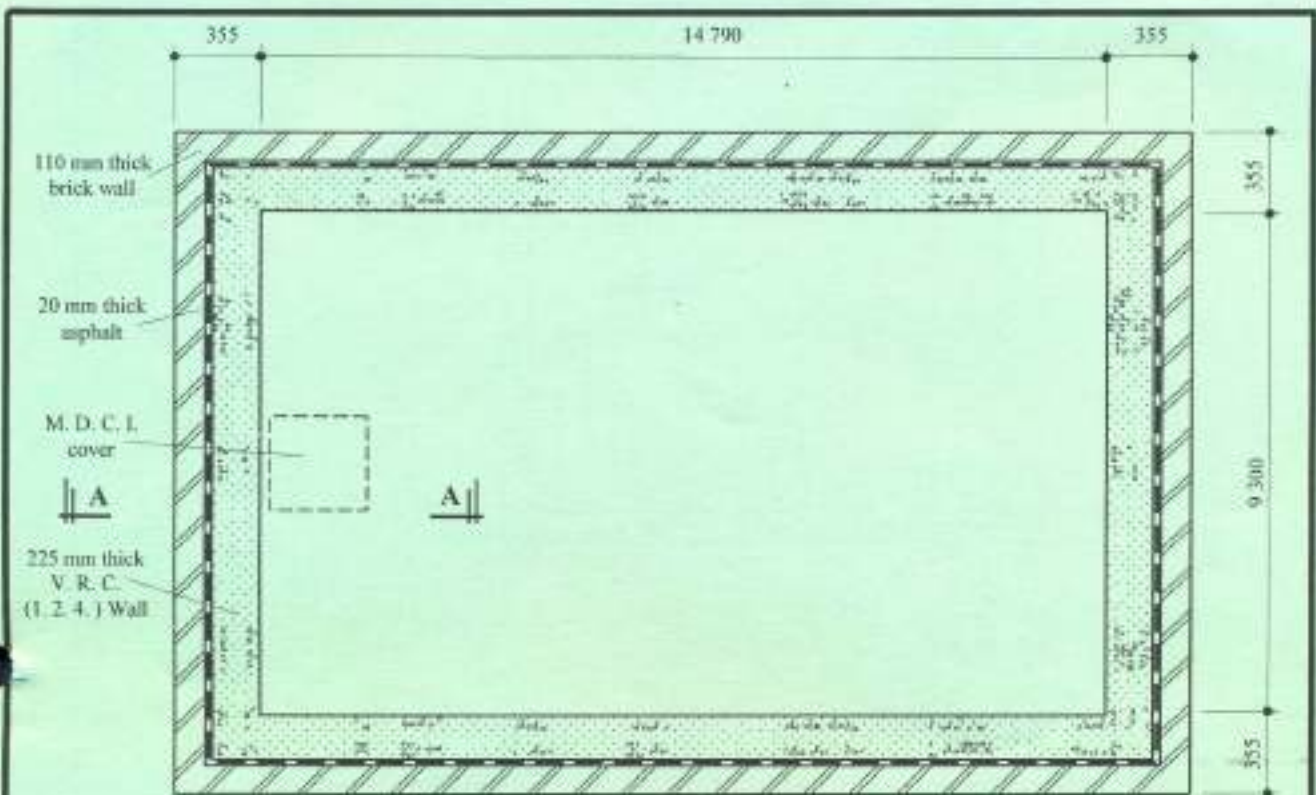
GENERAL INFORMATION

Skilled labour per hour	-	sh 75.00
Unskilled labour per hour	-	sh 37.50
Overheads and profit	-	25%

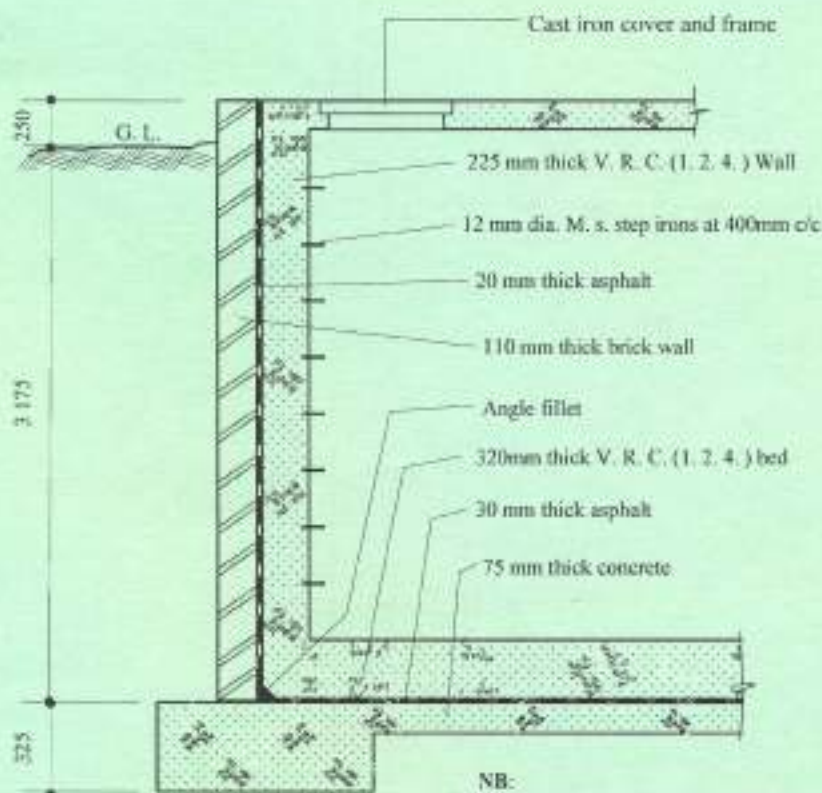
Make reasonable assumption where necessary.

HARDCORE (Machine compacted)

Density of hardcore	-	1,750 kg/m ³
Hardcore	-	sh 150 per tonne.
Purchase price of 8 tonne roller	-	sh 2,750,000.00
Economic working life of roller	-	7 years
Working hours per year	-	1800 hours
Working hours per week	-	40 hours
Diesel consumption of 8 tonne groller per day	-	60 litres @ sh.75 per litre
Oil consumption of roller per week	-	10 litres @ sh.180 per litre
Salvage value of roller	-	sh. 350,000.00
Haulage cost to and from site per year	-	sh.40,000.00
Insurance per annum	-	4% of purchase price
Licence per annum	-	sh.10,000.00
General repairs and maintenance per annum	-	30% of annual depreciation.



SECTIONAL PLAN

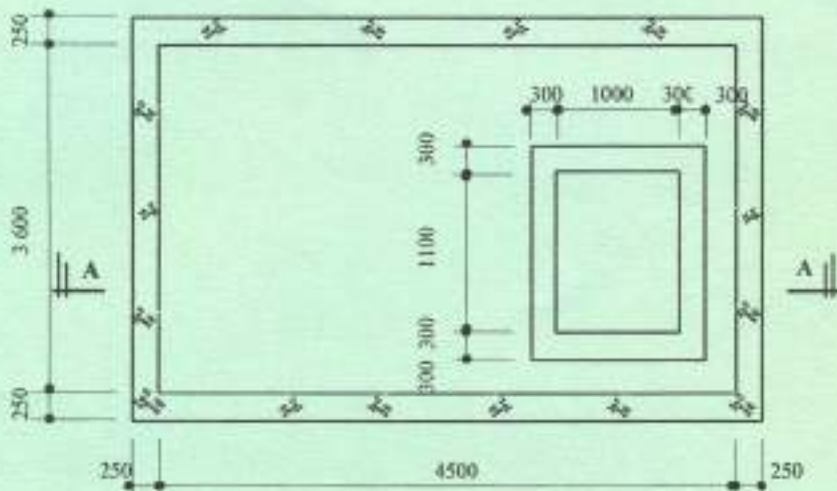


SECTION A - A

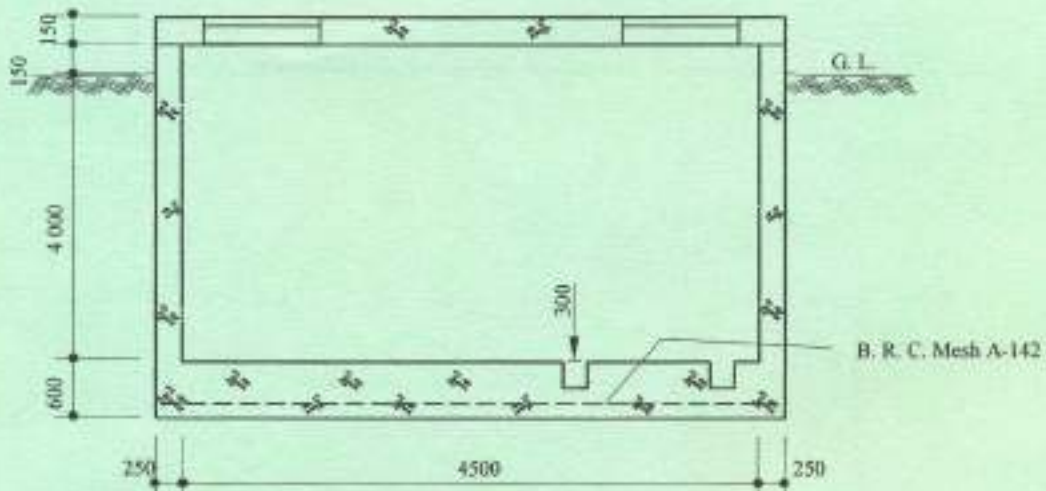
- NB:**
1. 175 mm top soil to be removed from site
 2. Rock exists 3m below ground level
 3. Ignore reinforcement work
 4. Site is clear.

DRG NO. 01

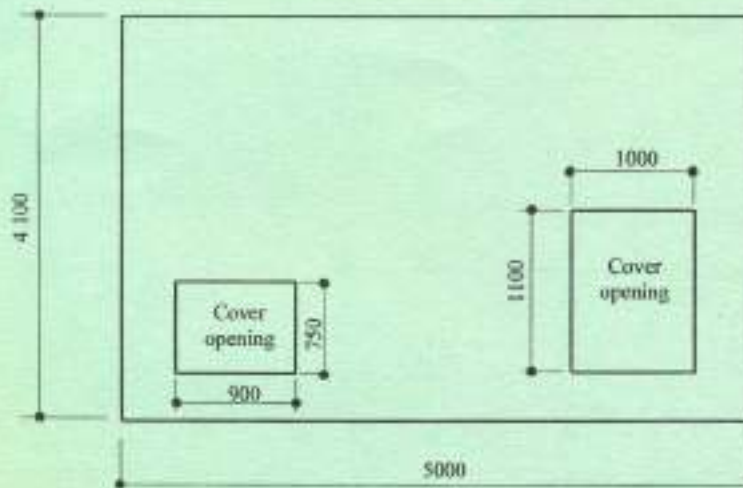
MACHINE CHAMBER



FLOOR PLAN



SECTION A - A



ROOF PLAN

DRG NO. 02