

2705/204

2707/204

MEASUREMENT OF BUILDING AND  
CIVIL ENGINEERING WORKS, ESTIMATING  
AND COSTING 1

June/July 2021

Time: 3 hours

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RAMOGI INSTITUTE OF  
ADVANCED TECHNOLOGY  
P. O. Box 1738, KISUMU



THE KENYA NATIONAL EXAMINATIONS COUNCIL

**DIPLOMA IN BUILDING CONSTRUCTION**  
**DIPLOMA IN CIVIL ENGINEERING**

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 Standard method of Measurement of Building works;*

*A copy of 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 while each question in section B is 20 marks.*

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

*Candidates should answer the questions in English.*

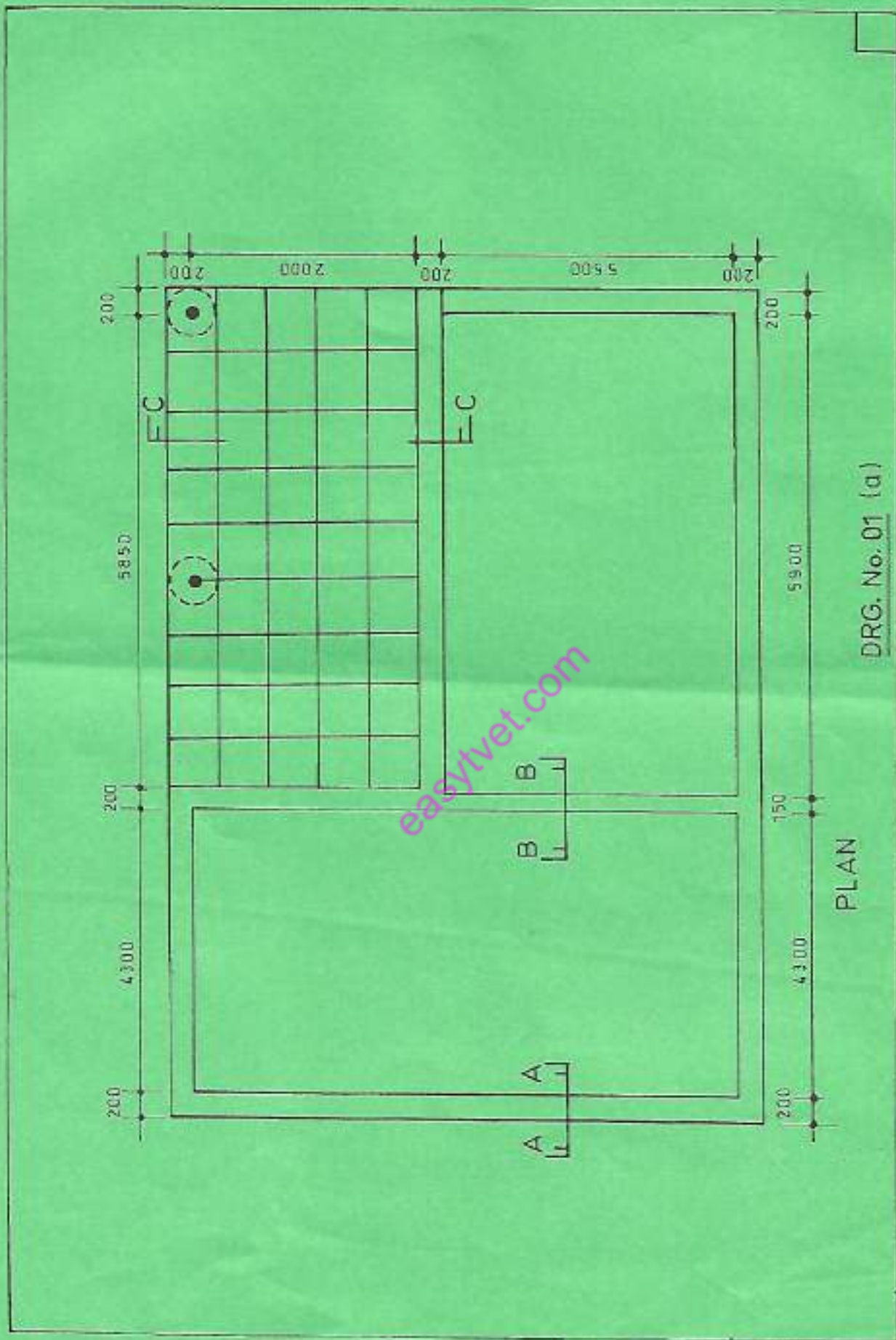
**This paper consists of 9 printed pages.**

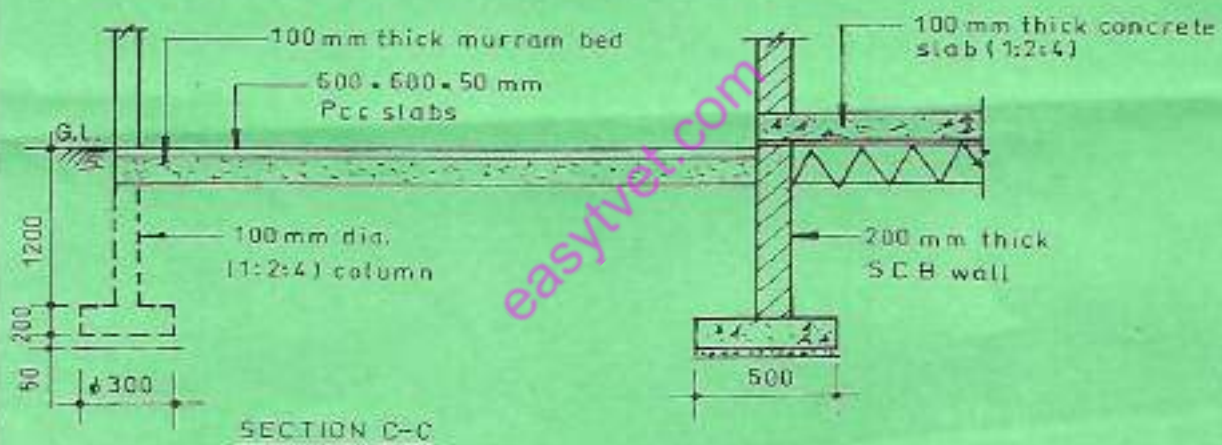
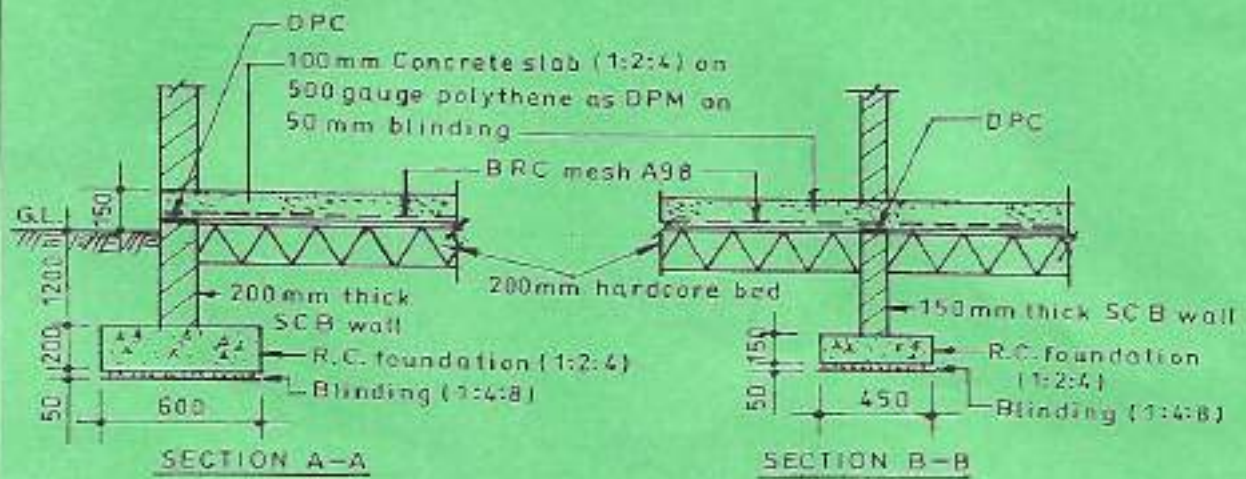
**Candidates should check the question paper to ascertain that all the  
pages are printed as indicated and that no questions are missing.**

**SECTION A: MEASUREMENT OF BUILDING AND CIVIL ENGINEERING WORKS**

*Answer TWO questions from this section.*

1. Drawing No. 01 shows the plan and sections of a building. Using SMM take off all the quantities for substructure works upto and including dpc. (30 marks)
2. Drawing No. 02 shows the plan and section of a bridge. Using CESMM take off quantities for the works. (30 marks)
3.
  - (a) Outline **four** types of bills of quantities. (6 marks)
  - (b) Outline the procedure used in traditional method of preparing bills of quantities. (8 marks)
  - (c) With the aid of hypothetical examples, explain each of the following principles of measurements:
    - (i) extra over;
    - (ii) deductions;
    - (iii) grouping of descriptions;
    - (iv) dotting on.(12 marks)
  - (d) Explain **two** sums included in the bill of quantities. (4 marks)

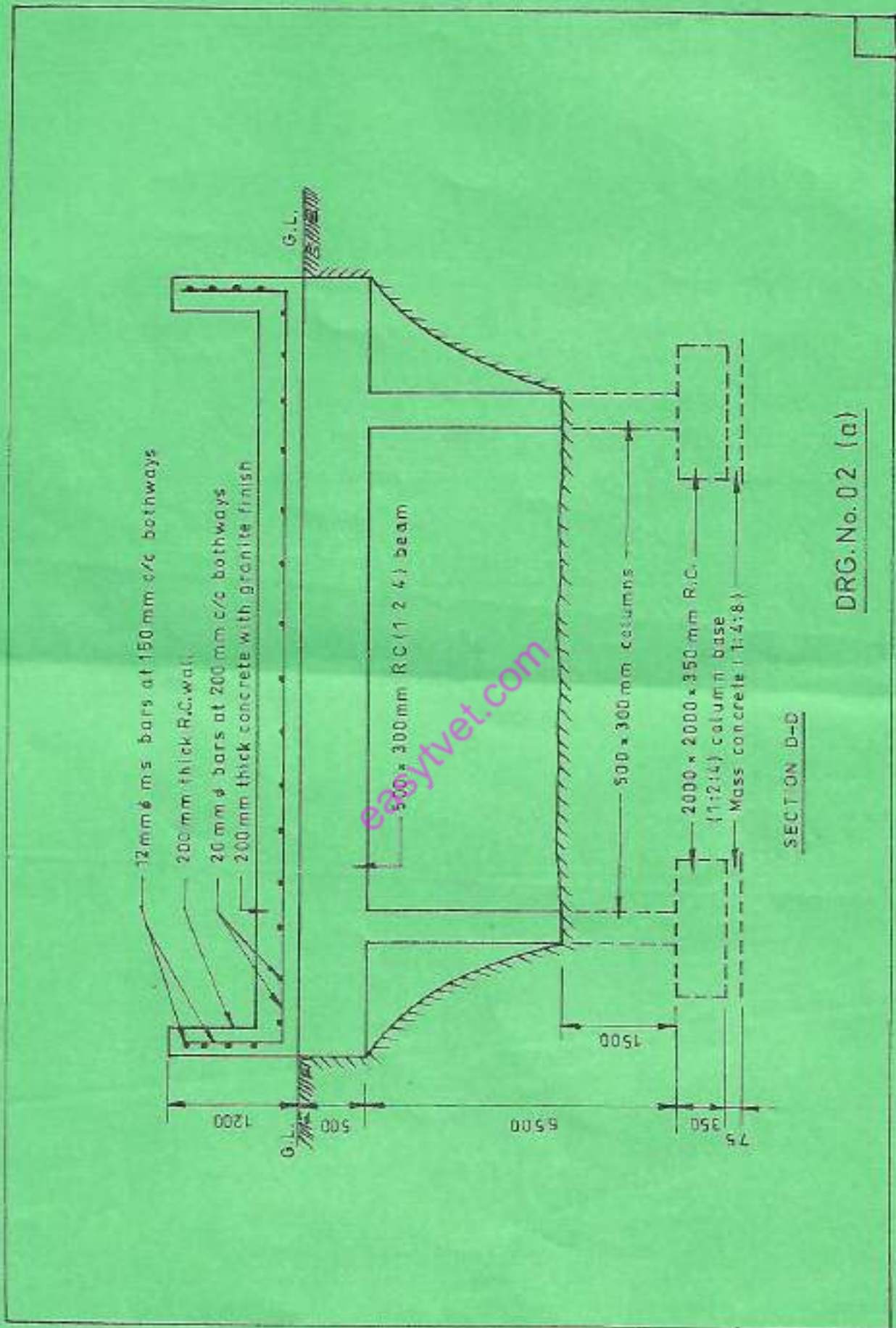


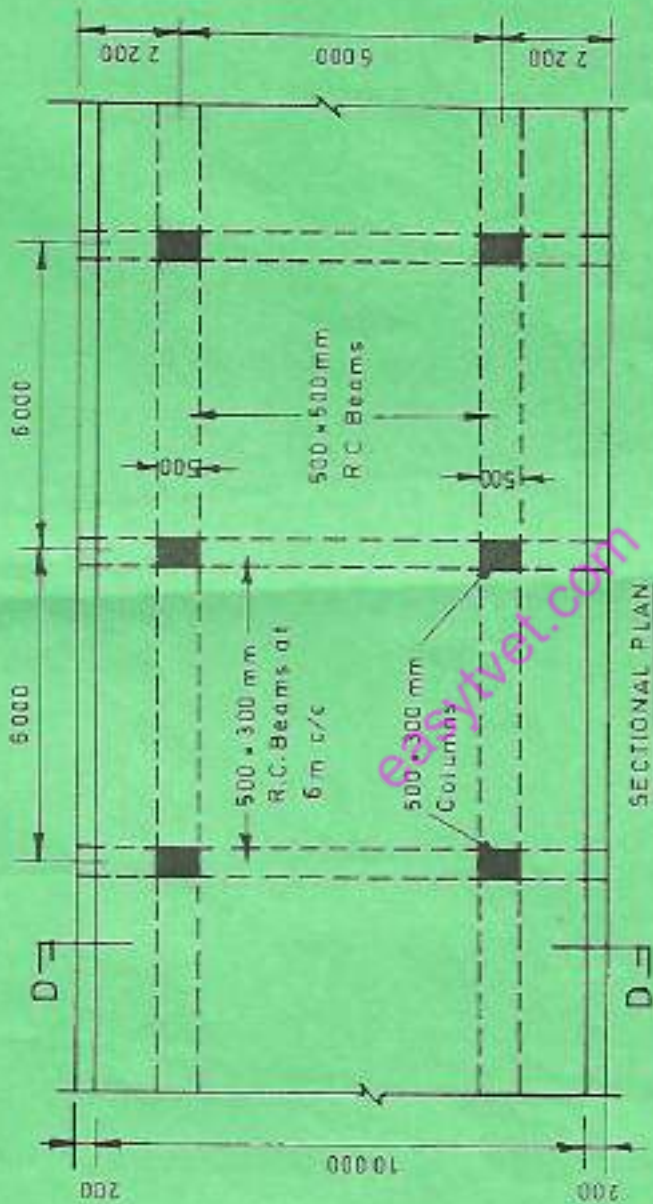


NOTE

1. Site is bushy
2. Top soil of depth 150 mm to be deposited on site

DRG. No. 01 (b)





**NOTES:**

1. The bridge is to be constructed during the dry season for the seasonal river
2. Total length of the seasonal river is 36 m
3. 100 mm wide road marking

**DRG. No.02 ( b )**

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**SECTION B: ESTIMATING AND COSTING I**

*Answer TWO questions from this section.*

4. (a) State **four** roles of each of the following during construction:
- (i) quantity surveyor;
  - (ii) contractor.
- (8 marks)
- (b) Explain the **three** types of payment certificates in construction projects. (6 marks)
- (c) (i) Explain the term variation.
- (ii) State **four** causes of variations in construction projects. (6 marks)
5. (a) Explain **four** types of contract documents in construction industry. (8 marks)
- (b) Explain each of the following terms as used in estimating and costing:
- (i) overheads;
  - (ii) unit rate;
  - (iii) all in labour rate;
  - (iv) all in mechanical rate.
- (6 marks)
- (c) Describe each of the following methods of approximate estimation:
- (i) cubic content;
  - (ii) functional unit.
- (6 marks)
6. (a) State **two** advantages of each of the following methods of approximate estimation:
- (i) superficial area;
  - (ii) superficial enclosure.
- (4 marks)

- (b) Figure 1 shows a line diagram and a cross section through a substructure of a building. Use approximate quantities method to estimate the cost of the substructure works including floor slab using the following data.

- Trench excavation	Kshs 345/cm
- Backfilling	Kshs 163/cm
- Disposal of surplus	Kshs 538 /cm
- Timbering	Kshs 550 /sm
- Levelling and compacting	Kshs 250/cm
- Foundation concrete	Kshs 12825/cm
- Foundation wall	Kshs 2400 /sm
- Hardcore	Kshs 1600/cm
- DPM/DPC	Kshs 225/sm
- Lean concrete	Kshs 8638/cm
- Oversite concrete	Kshs 10255/cm
- Murram blinding	Kshs 109/sm

(16 marks)

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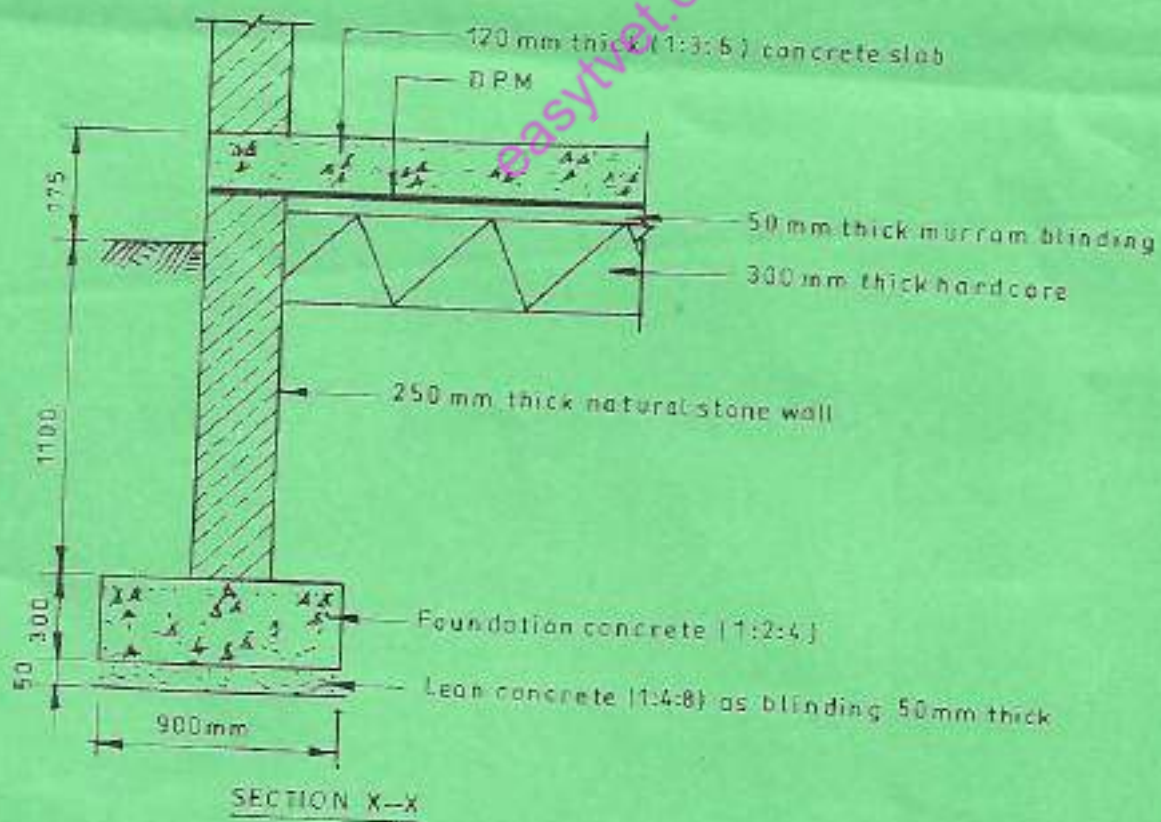
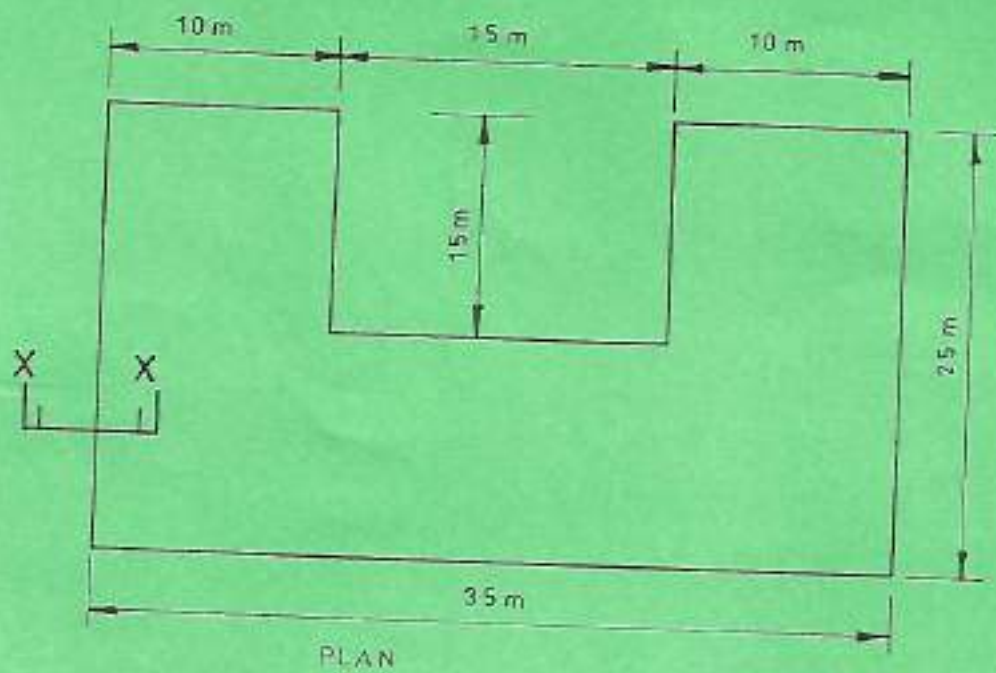


Fig.1

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