X227/12/01

NATIONAL QUALIFICATIONS 2013

FRIDAY, 7 JUNE
1.00 PM – 3.00 PM

BUILDING CONSTRUCTION HIGHER

100 marks are allocated to this paper.

Attempt **all** questions in Section A (40 marks).

Attempt any **two** questions in Section B (30 marks each).

Worksheets are provided for Questions 7(*c*), 8(*e*) and 9(*e*). Hand these in with your answer book.

SECTION A

Marks

Attempt all the questions in this Section (total 40 marks)

1. (*a*) State **two** objectives of a site investigation. **2**

(*b*) State **two** common ways to carry out a ground exploration. **2**

(*c*) State **two** common *in-situ* field tests carried out during ground exploration and briefly describe what information each provides for the engineer. **4**

2. (*a*) Prepare an annotated sketch to show a typical vertical cross-section through **each** of the following foundation types:

- wide strip foundation;
- deep strip foundation. **4**

(*b*) Briefly explain how a contractor may obtain a supply of fresh concrete for the foundations. **3**

3. A dwelling house with traditional concrete strip foundations is to be constructed on a sloping site.

(*a*) State **two** factors which will control the width of the foundation. **2**

(*b*) **Figure Q3(*b*)** shows the stepped foundation (dotted) to a gable of the house.

Sketch and dimension the detail at **A** to illustrate compliance with current standards. **4**

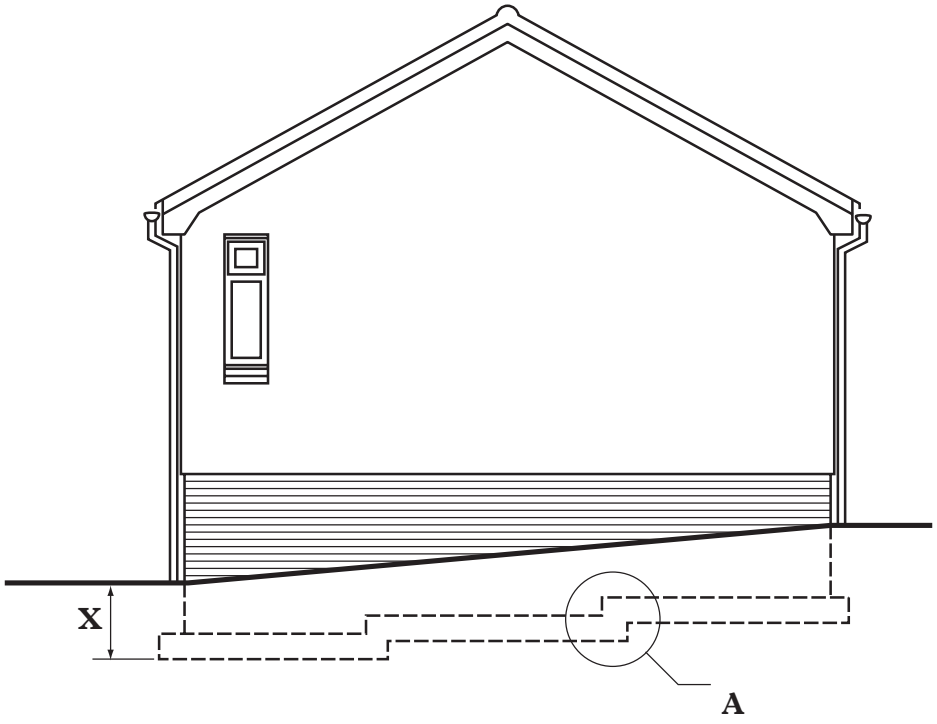

Figure Q3(*b*)

(*c*) State the minimum depth of the foundation lettered **X** in **Figure Q3(*b*)**. **1**

Marks

4. The external finish to a masonry cavity wall is to be a wet dash render finish.

List the materials which make up this render finish. **2**

5. (*a*) State **three** functional requirements of a door in an external wall. **3**

(*b*) Name the component parts A to D of the 4 panel internal door shown in **Figure Q5(*b*)** below. **2**

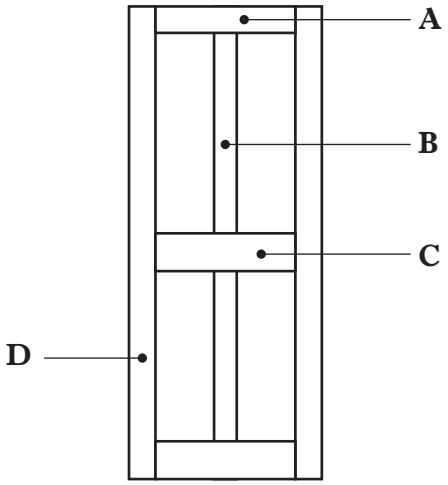

Figure Q5(*b*)

6. (*a*) Prepare sketches to illustrate the following terms relating to a stair:

(i) quarter space landing;

(ii) half space landing;

(iii) taper treads (winders). **6**

(*b*) **Figure Q6(*b*)** below illustrates a section through a private stair in a dwelling house. Using the information given:

(i) calculate the rise, going and pitch of the stair; **3**

(ii) state whether or not the stair complies with current standards, giving a reason for your answer. **2**

(40)

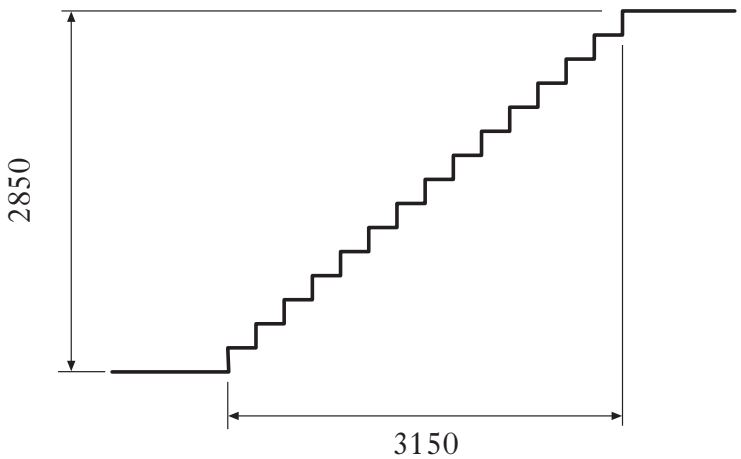

Figure Q6(*b*)

SECTION B

Attempt any TWO questions in this Section (total 60 marks)

7. (*a*) State **four** functional requirements of a floor and briefly explain **each** one. **8**

(*b*) Briefly describe how a contractor may reinforce an *in-situ* concrete ground supported floor slab and explain why this reinforcement is necessary. **4**

(*c*) **Worksheet Q7(*c*)** shows an incomplete detail drawing of a foundation and *in-situ* concrete ground supported floor slab to a dwelling house.

On the **Worksheet**, complete the drawing in proportion to show the following:

- support for the concrete slab;
- how moisture is prevented from entering the building;
- finished ground level;
- insulation. **8**

(*d*) Ready mixed concrete is required for an *in-situ* ground floor. Curing is an important process in the early life of concrete to minimise shrinkage, ensure adequate surface strength and durability.

Briefly describe **two** ways in which successful curing may be achieved in the floor slab. **4**

(*e*) Briefly describe, with the aid of an annotated sketch, how the following floor finishes should be applied to the *in-situ* concrete ground floor slab:

- clay ceramic floor tiles;
- sheet vinyl. **6**

(30)

Marks

8. (*a*) Briefly describe how the following materials should be correctly stored on site:

- clay facing bricks;
- quilt insulation;
- timber floor joists. **6**

(*b*) Briefly explain the terms *designed mix* and *standardised prescribed mix* as used in the specification of concrete. **8**

(*c*) Briefly describe **one** common method of placing fresh concrete in foundations on a site where there is restricted access for ready mixed concrete trucks. **2**

(*d*) Briefly explain why the compaction of fresh concrete is important and describe how it may be carried out. **4**

(*e*) **Worksheet Q8(*e*)** shows an incomplete detail of a raft foundation for an extension to an existing house. The walls are masonry cavity construction finished internally with plaster.

On the **Worksheet**, complete the drawing in proportion to show the following:

- ground preparation;
- cavity wall construction;
- floor construction;
- how moisture is prevented from entering the building;
- insulation;
- floor and wall finishes. **8**

(*f*) Briefly explain how a plaster wall finish is applied to the structure. **2**

(30)

[Turn over for Question 9 on *Page six*

Marks

9. (*a*) Ten new detached houses are to be constructed on a greenfield site.

(i) State the title of the current construction regulations which control site accommodation. **1**

(ii) Identify **four** items of temporary accommodation required on site by the contractor. **4**

(*b*) Prepare annotated sketches to show **two** methods of supporting a suspended timber floor at the junction with a traditional masonry cavity wall. **4**

(*c*) Prepare an annotated vertical cross-section to show a suitable arrangement for the cold water service entry to a dwelling house.

Show **one** critical dimension. **3**

(*d*) A door and door frame have to be fitted into an internal timber stud partition wall. The wall is finished with 10 mm plasterboard to each side.

Describe, by means of an annotated sketch, a typical plan detail of the construction to show the door, door frame, door stop and architraves. **4**

(*e*) **Worksheet Q9(*e*)** shows an incomplete vertical section through the sill of a window opening. The simplified vertical section through the sill of a uPVC window frame is shown in **Figure Q9(*e*)**.

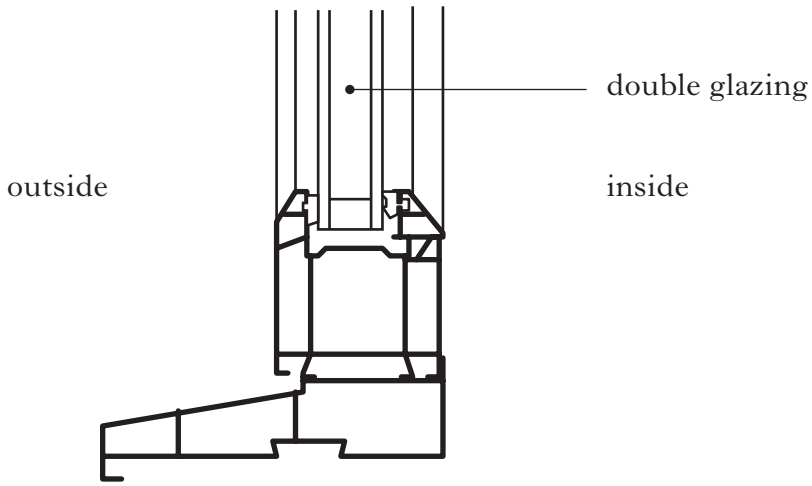

Figure Q9(*e*)

On the **Worksheet**, sketch this vertical section to complete the sill detail. Show the location of the window frame and all adjoining components and finishes. **8**

(*f*) Briefly describe, with the aid of annotated sketches, how the following roof finishes would be applied to the structure of the building:

- natural slates;
- built-up felt roofing. **6**

(30)

[*END OF QUESTION PAPER*]

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FOR OFFICIAL USE

X227/12/11

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FRIDAY, 7 JUNE
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BUILDING CONSTRUCTION HIGHER

Worksheets for Questions 7(*c*), 8(*e*) and 9(*e*)

Fill in these boxes and read what is printed below.

Full name of centre

Town

Forename(s)

Surname

Date of birth

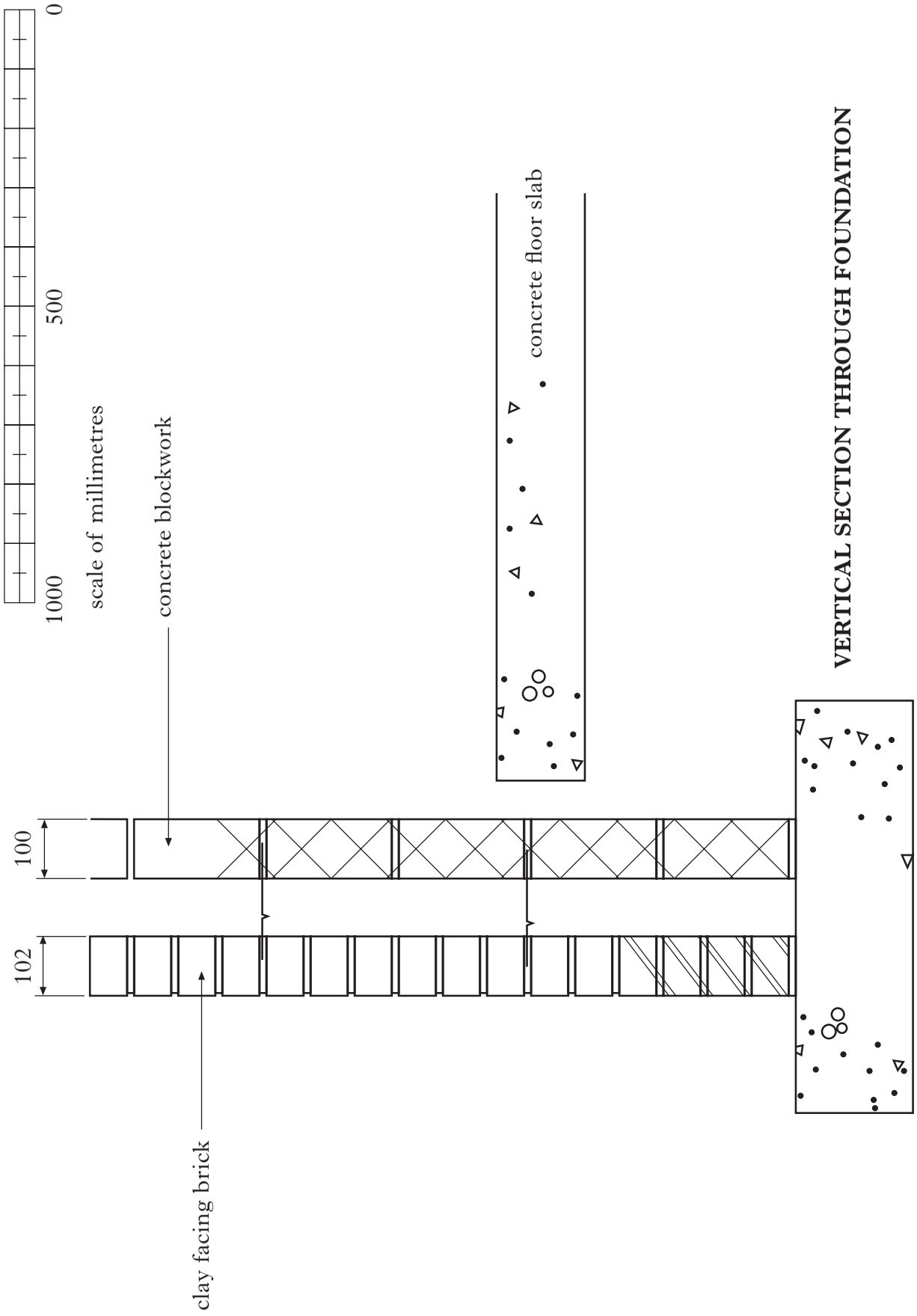
Day Month Year

Scottish candidate number

Number of seat

To be inserted inside the front cover of the candidate's answer book and returned with it.

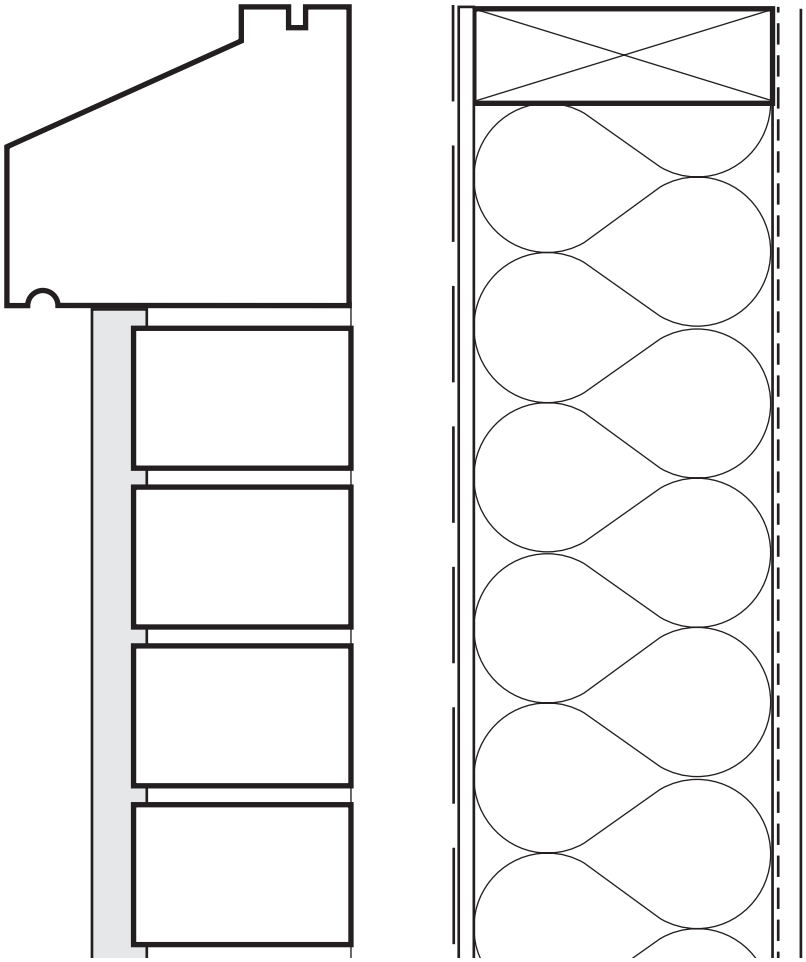
WORKSHEET Q7(*c*)



WORKSHEET Q8(*e*)

SECTION THROUGH RAFT FOUNDATION

WORKSHEET Q9(*e*)



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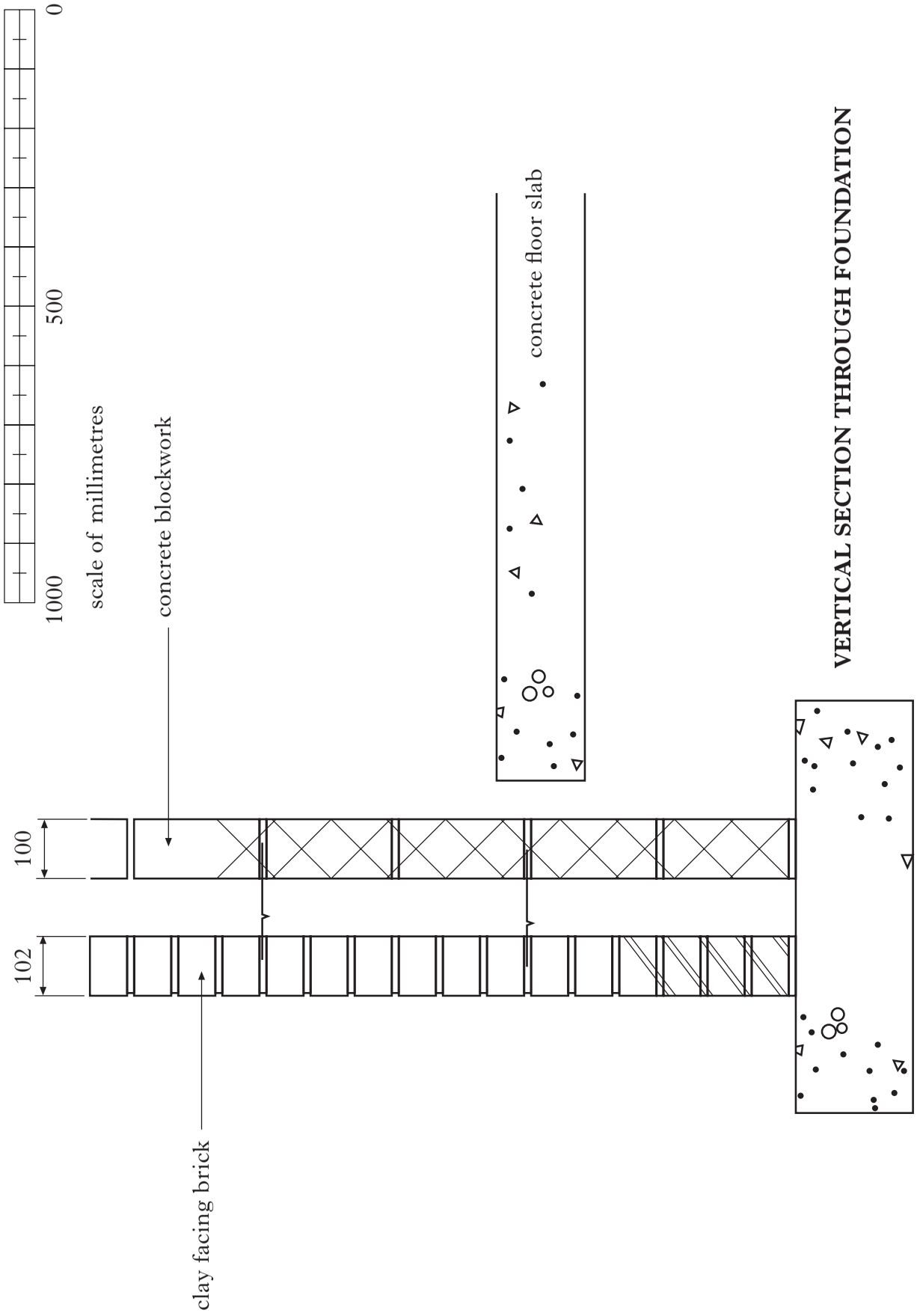
WORKSHEET Q7(*c*)



WORKSHEET Q8(*e*)

SECTION THROUGH RAFT FOUNDATION