

X227/301

NATIONAL
QUALIFICATIONS
2007

FRIDAY, 8 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 5(a), 5(b), 9(c) and 10(c). Hand these in with your answer book.



SECTION A

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

Marks

1. (a) State **three** objectives of a site investigation. 3
- (b) Figure Q1 shows a common way to carry out ground investigation.
State the name given to this exploration technique. 1

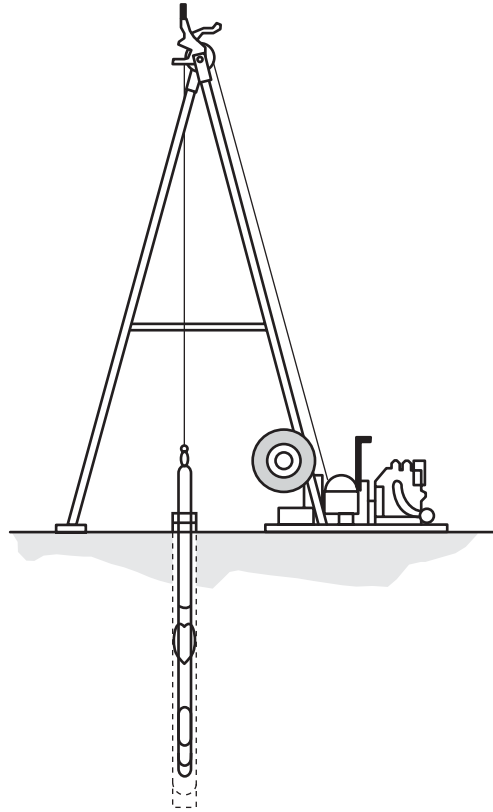


Figure Q1

2. A developer proposes to construct ten new detached houses on a greenfield site.
- (a) Briefly describe the temporary on-site accommodation that will be required by the contractor. 4
- (b) State **four** factors which should be considered when deciding where the temporary accommodation will be located. 2
3. Foundations for buildings in the United Kingdom are constructed from concrete.
- (a) State **four** materials used in the manufacture of a concrete mix. 2
- (b) Briefly explain how a contractor may obtain a supply of concrete for the foundations and state **one** reason why he may do so. 2

4. A contractor proposes to build five new houses on a greenfield site.
- (a) State **two** reasons for the removal of top soil to spoil heaps prior to excavating for the foundations. 2
- (b) Prepare an annotated sketch to show a typical vertical cross-section through **each** of the following foundations:
- a short bored pile supporting ground beam and external wall
 - a raft foundation
 - a pad foundation supporting an isolated masonry pier. 6
5. (a) **Worksheet Q5(a)** shows the elevation of three timber window types in common use.
- State, on the **Worksheet**, the name given to each window type. 3
- (b) **Worksheet Q5(b)** shows an incomplete vertical section through the sill of a window opening. The simplified vertical section through the sill of a window frame is shown in Figure Q5(b).

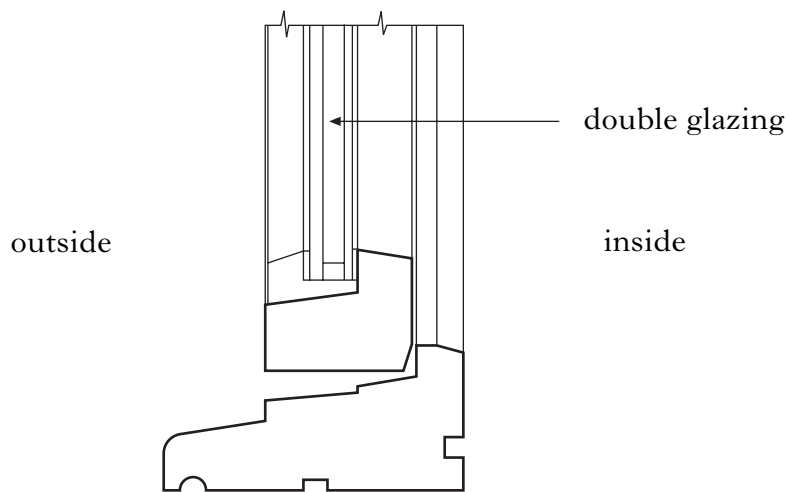


Figure Q5(b)

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. 5

[Turn over

6. Figure Q6 shows a vertical cross-section through a suspended timber ground floor of a dwelling house.

State the name of the component parts numbered 1 to 8 and explain the purpose of component number 8.

6

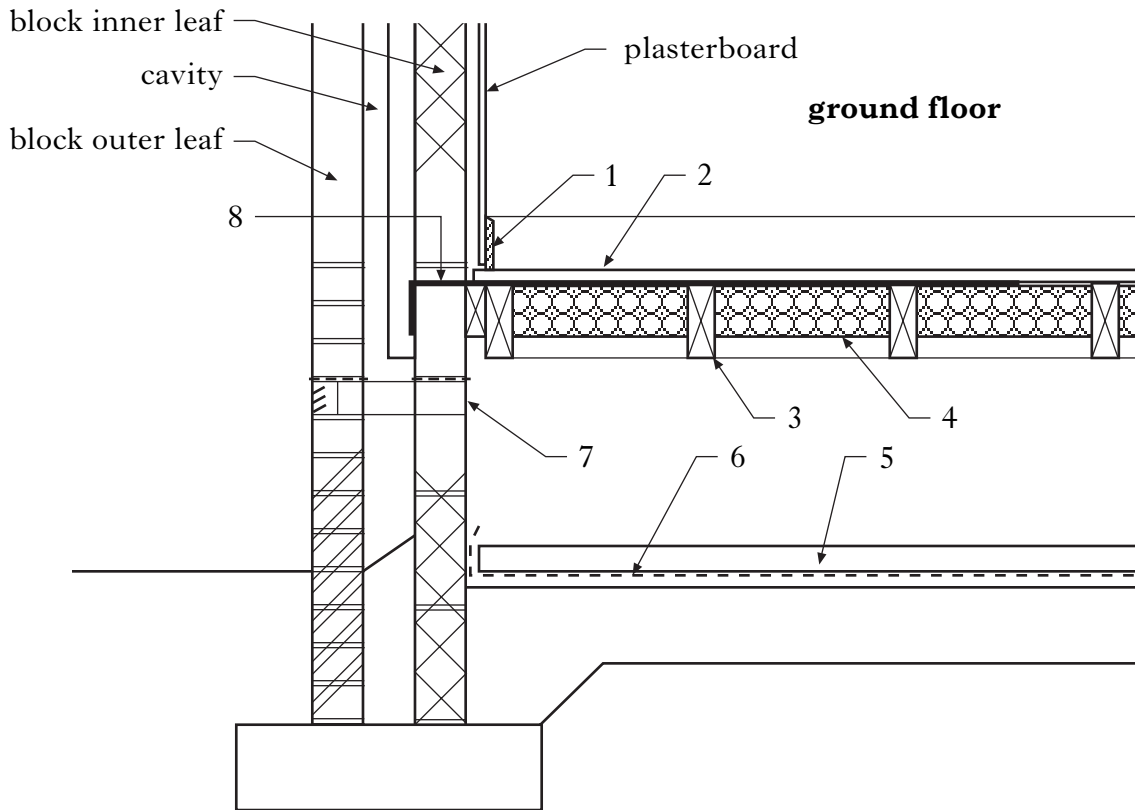


Figure Q6

7. The external render wall finish to a dwelling house is to be a dry dash finish. The building is in a geographical area of moderate exposure and is constructed with masonry cavity walls.

Briefly describe how the render would be applied to the structure.

4
(40)

SECTION B

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

Marks

8. (a) (i) Site investigation is to be carried out using trial pits dug by a mechanical backhoe excavator.
Briefly explain the advantages and disadvantages of this exploration technique. 4
- (ii) Briefly explain, with the aid of an annotated sketch, the operation of the *field vane* test. 4
- (iii) Briefly explain why laboratory tests are carried out on soil samples. Give **two** examples of tests carried out during site investigation for a low rise housing development. 6
- (b) Site investigation has shown the ground conditions where a two-storey house is to be built consist of a weak soil to a depth of 1.2 metres on top of firm clay.
Show, by means of an annotated sketch, a suitable foundation for the house. 4
- (c) Briefly explain the following terms relating to fresh concrete. Indicate how each is achieved in practice and why they are important to the quality of finished concrete.
- Compaction
 - Curing
- 8
- (d) State **two** types of reinforcing steels available to a contractor undertaking the construction of a reinforced *in-situ* ground supported floor slab for a garage. Show, with the aid of an annotated sketch, where the steel would be located in the slab. 4
- (30)

[Turn over

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

- Portland cement
- Concrete blocks
- Plasterboard laminate

6

- (b) Identify and explain **four** advantages of *beam and block* floor construction.

6

- (c) **Worksheet Q9(c)** shows an incomplete detail drawing of a foundation and suspended *beam and block* floor to a dwelling house.

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

- how moisture is prevented from entering the building
- finished ground level
- floor structure and finish
- insulation
- ventilation
- two critical dimensions.

10

- (d) In the design of an *in-situ* concrete ground supported floor slab, thermal insulation may be located either above the structure or below the structure.

For **each** situation, prepare an annotated sketch to show the junction of the ground supported floor slab with an external masonry wall. The location of the insulation, damp proofing and floor finish should be clearly shown.

8

(30)

10. (a) Briefly explain, with the aid of an annotated sketch, how any **two** of the following finishes would be applied to the structure of a building:

- clay quarry tiles
- ceramic wall tiles
- hardwood flooring.

8

(b) Prepare annotated sketches to illustrate the following terms relating to a stair:

- (i) pitch line;
- (ii) balustrade;
- (iii) headroom;
- (iv) quarter landing.

4

(c) **Worksheet Q10(c)** shows a plan view of a new timber private stair which rises to the first floor of a dwelling house.

On the **Worksheet** clearly identify the following:

- (i) stringer;
- (ii) landings;
- (iii) newel post;
- (iv) handrail;
- (iv) tread;
- (v) nosing.

3

(d) Refer to **Worksheet Q10(c)**.

Assuming that the private stair is to comply with the recommendations made in current standards.

- (i) Select a suitable rise and going for a single step of the stair and calculate the pitch of the stair you have designed.
- (ii) State the overall rise from finished ground floor level to finished first floor level.

6

1

(e) Briefly explain, with the aid of an annotated sketch, how each of the following roof finishes are applied and fixed to the structure of a building:

- (i) single lap concrete roof tiles;
- (ii) mastic asphalt.

8

(30)

[END OF QUESTION PAPER]

[BLANK PAGE]

FOR OFFICIAL USE

--	--	--	--	--	--

X227/302

NATIONAL
QUALIFICATIONS
2007

FRIDAY, 8 JUNE
1.00 PM – 3.00 PM

**BUILDING
CONSTRUCTION
HIGHER**

Worksheets for Questions 5(a),
5(b), 9(c) and 10(c)

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

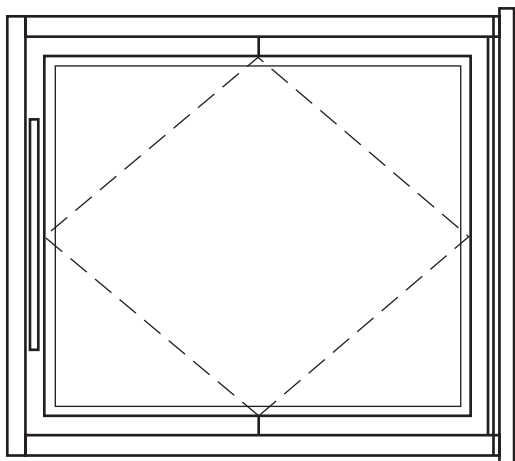
--	--	--	--	--	--	--	--	--	--

Number of seat

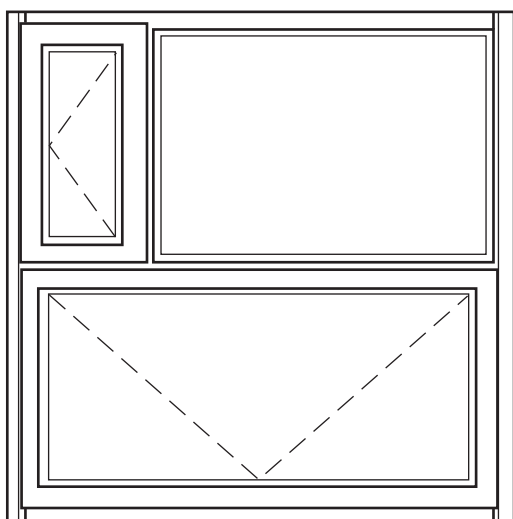
To be inserted inside the front cover of the candidate's answer book and returned with it.



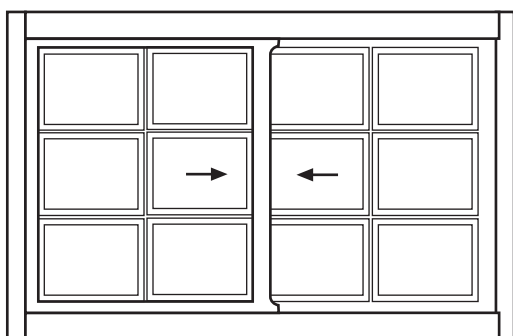
WORKSHEET Q5(a)



(iii)

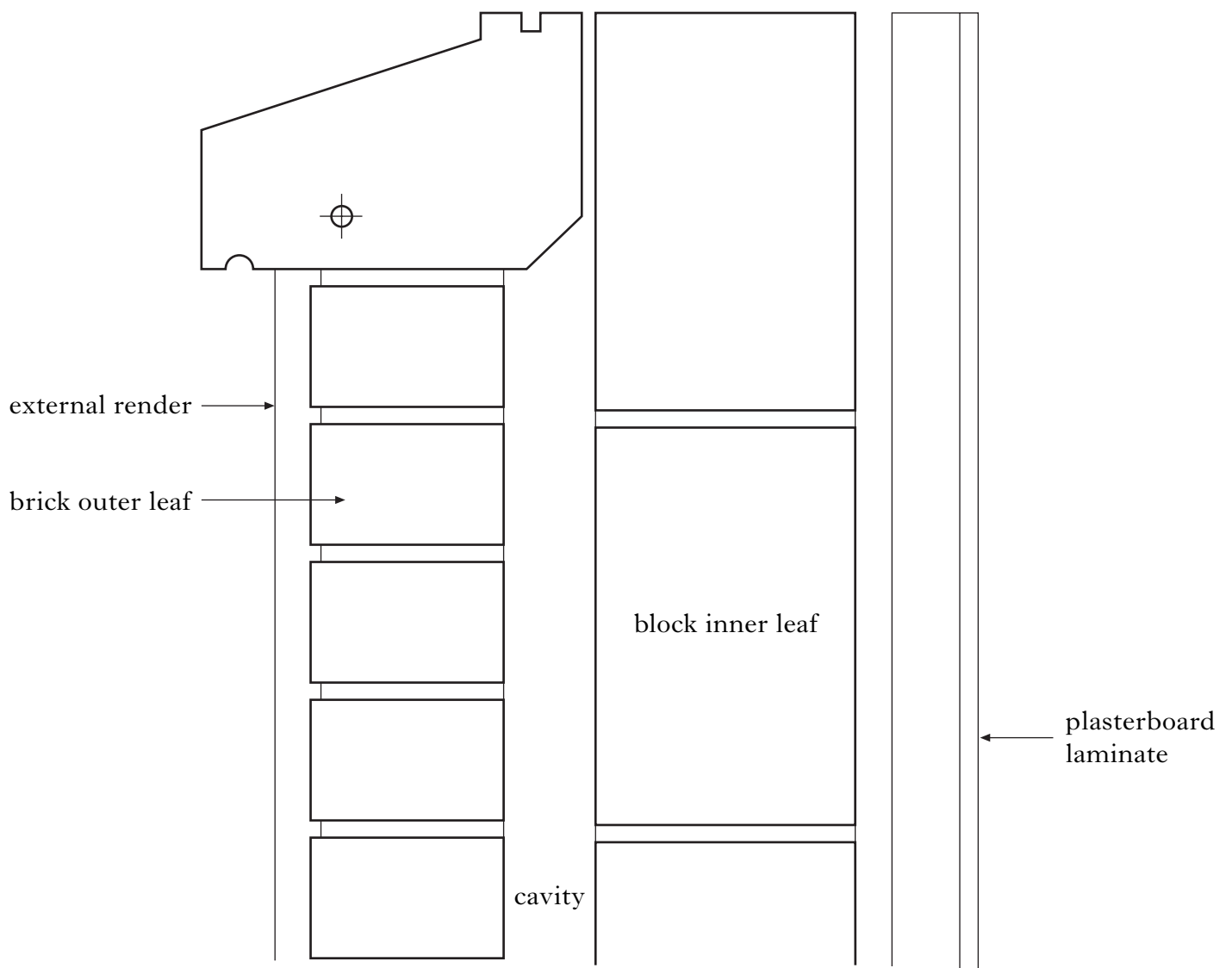


(ii)

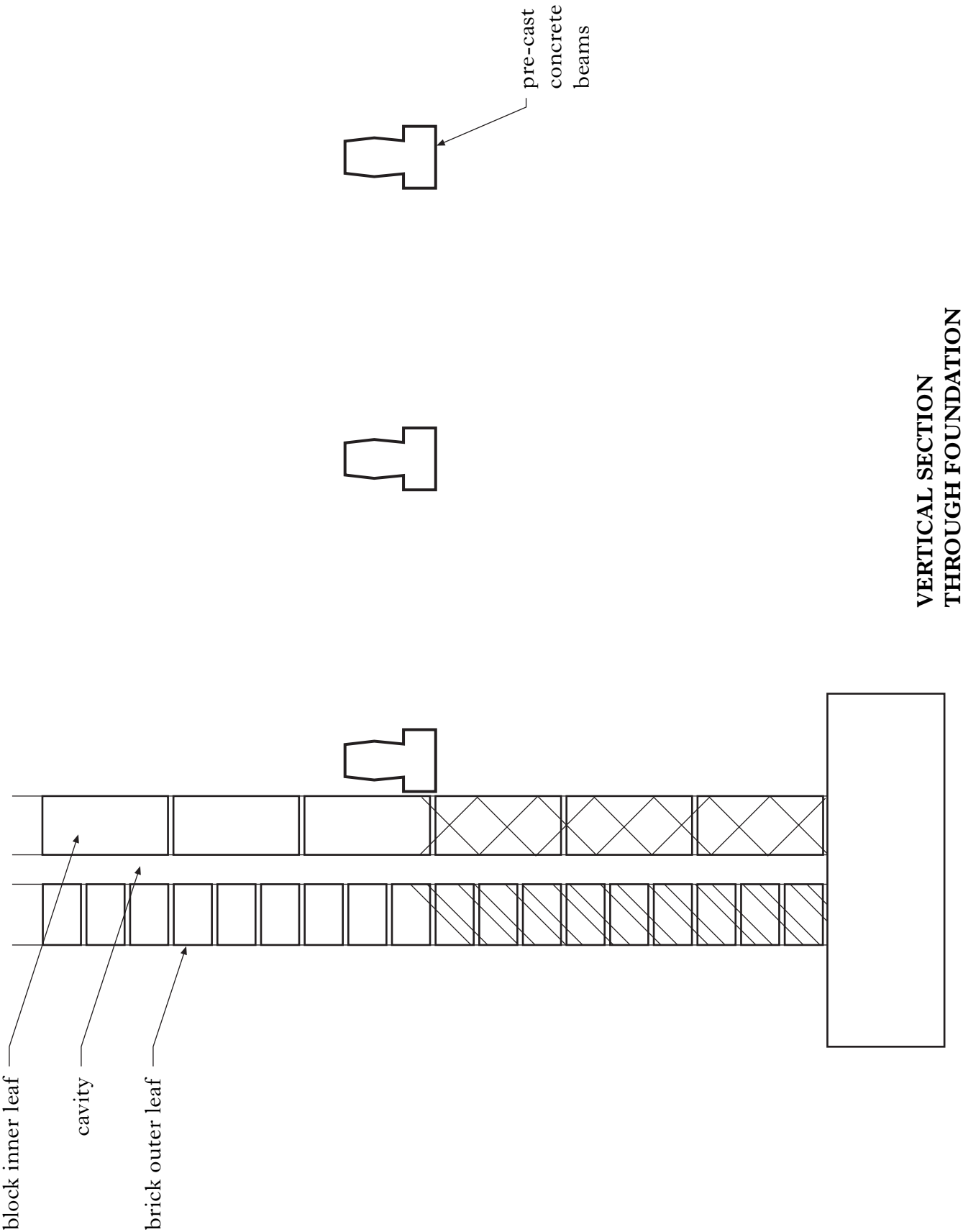


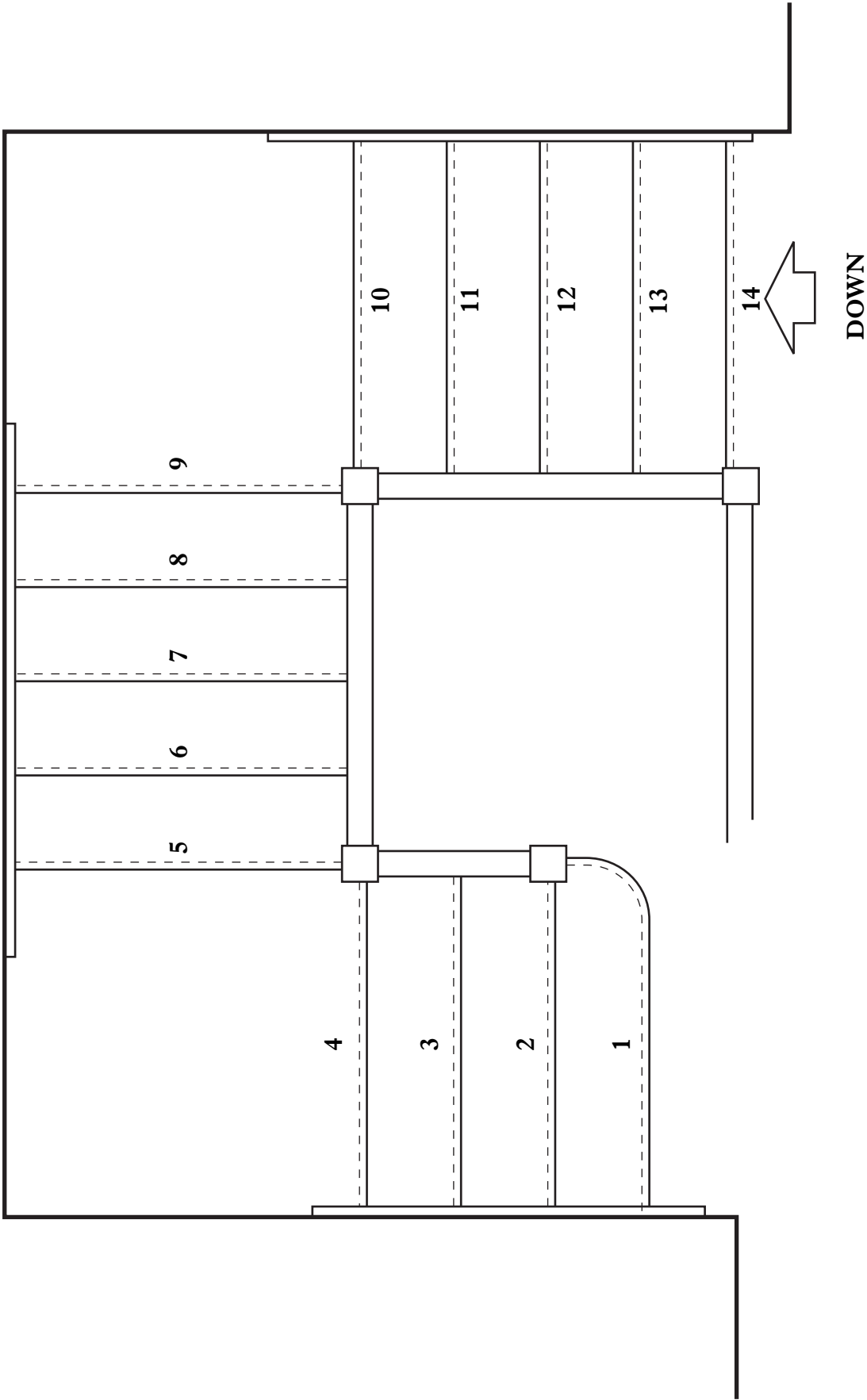
(i)

WORKSHEET Q5(b)



[Turn over





[BLANK PAGE]

[BLANK PAGE]

[BLANK PAGE]