X226/301

NATIONAL QUALIFICATIONS 2011

THURSDAY, 9 JUNE
1.00 PM – 3.00 PM

ARCHITECTURAL TECHNOLOGY
HIGHER

100 marks are allocated to this paper.

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

Answer **two** questions from Section B (30 marks each).

An Ordnance Survey Sitemap is provided for use with the following questions, 11(*a*), (*b*) and (*c*).

A worksheet is provided for Questions 12 and 13.

PB X226/301 6/360

Marks

SECTION A

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

1. State **two** *financial constraints* that would have to be considered before undertaking a building development project. **2**

2. A company has applied for a *Building Warrant* for a housing project. State how long the Warrant lasts and what action needs to be taken if the building is not completed before the Warrant expires. **2**

3. When surveying on a construction site briefly describe the main safety hazard when using the Staff. **2**

4. State **four** factors to be considered when selecting a suitable material for a roof covering. **4**

5. Briefly describe **two** aesthetic factors that will influence the design of a new building. **4**

6. During a linear survey a slope was taped and two measurements taken. The first reading taken was 22·509 m with a slope of 7°, whilst the second reading was 35·543 m and a slope of 5°. Calculate the horizontal length of the slope. **4**

7. Briefly describe, with the aid of an annotated sketch, the difference between the *True Origin* and the *False Origin* in relation to the National Grid. **4**

8. *Offsetting* and *Trilateration* are **two** techniques used in linear surveying. Briefly describe how **each** technique is used. **8**

9. List **six** items which should be contained in a contouring survey report for presentation to the client. **6**

10. Briefly describe **one** method of providing fire protection in a small domestic building. **4**

(40)

[*END OF SECTION A*]

Marks

SECTION B

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

11. Refer to the scale 1:1250 Ordnance Survey Superplan Sheet NS5965SW and answer the following questions.

(*a*) Describe **four** details on plan square NS593651. **4**

(*b*) Identify the building that has the 10 m grid reference NS59326539. **2**

(*c*) Determine the average gradient of George Square between North Frederick Street and South Frederick Street. **4**

(*d*) Briefly describe **two** functions of the walls of a building. **4**

(*e*) Briefly describe, with the aid of annotated sketches, **two** common forms of domestic wall construction currently in use in the UK. Include an explanation of the construction methods and materials used in each form. **8**

(*f*) In the two forms of construction identified in Question 11(*e*) state **one** advantage and **one** disadvantage for **each** form of construction. **4**

(*g*) Buildings are designed to carry loads from different sources. Identify and briefly describe **two** sources of these loads. **4**

(30)

12. (*a*) **Figures Q12 1** and **Q12 2** show a site plan and a floor plan for a proposed domestic building.

(i) Briefly describe the site. **4**

(ii) On **Worksheet Q12 1** draw a cross-section of the site which runs from east to west and crosses the highest point. **6**

(iii) Explain where you might position the building giving reasons for your choice. **6**

(*b*) Before any building project begins it is important to assess the environmental impact that it will have. State **four** factors that should be considered in an environmental assessment of a proposed building project. **4**

(*c*) Briefly describe **two** methods to improve the μ values of a house that is being renovated. **4**

(*d*) Briefly describe **each** of the roles of the *Planning Department* and *Building Control Department* of the local authority. **6**

(30)

[Turn over for Question 13 on *Page four*

Marks

13. (*a*) **Figure Q13** shows a set of levels taken during a survey of a construction site.

Using **Table Q13**:

(i) book the levels; **5**

(ii) reduce the levels using an appropriate method; **5**

(iii) carry out an appropriate arithmetic check on the reduction; **2**

(iv) state the magnitude of the closing error in the survey and suggest a reason for this error. **2**

(*b*) Briefly describe **two** important properties of **each** of the following materials used in the construction of domestic buildings.

(i) Facing bricks.

(ii) Expanded polystyrene. **4**

(*c*) **Worksheet Q13(*c*)** shows the incomplete detail drawing for the foundation and substructure of a domestic building. On the worksheet:

(i) identify items A and B;

(ii) sketch the DPC, ventilation and thermal insulation requirements. **6**

(*d*) Identify and briefly explain **three** ways a building development can comply with guidelines on sustainability. **6**

(30)

[*END OF SECTION B*]

[*END OF QUESTION PAPER*]

FOR OFFICIAL USE

Mark

X226/302

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ARCHITECTURAL TECHNOLOGY
HIGHER
Worksheets for Questions 12 and 13

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 Q12 1

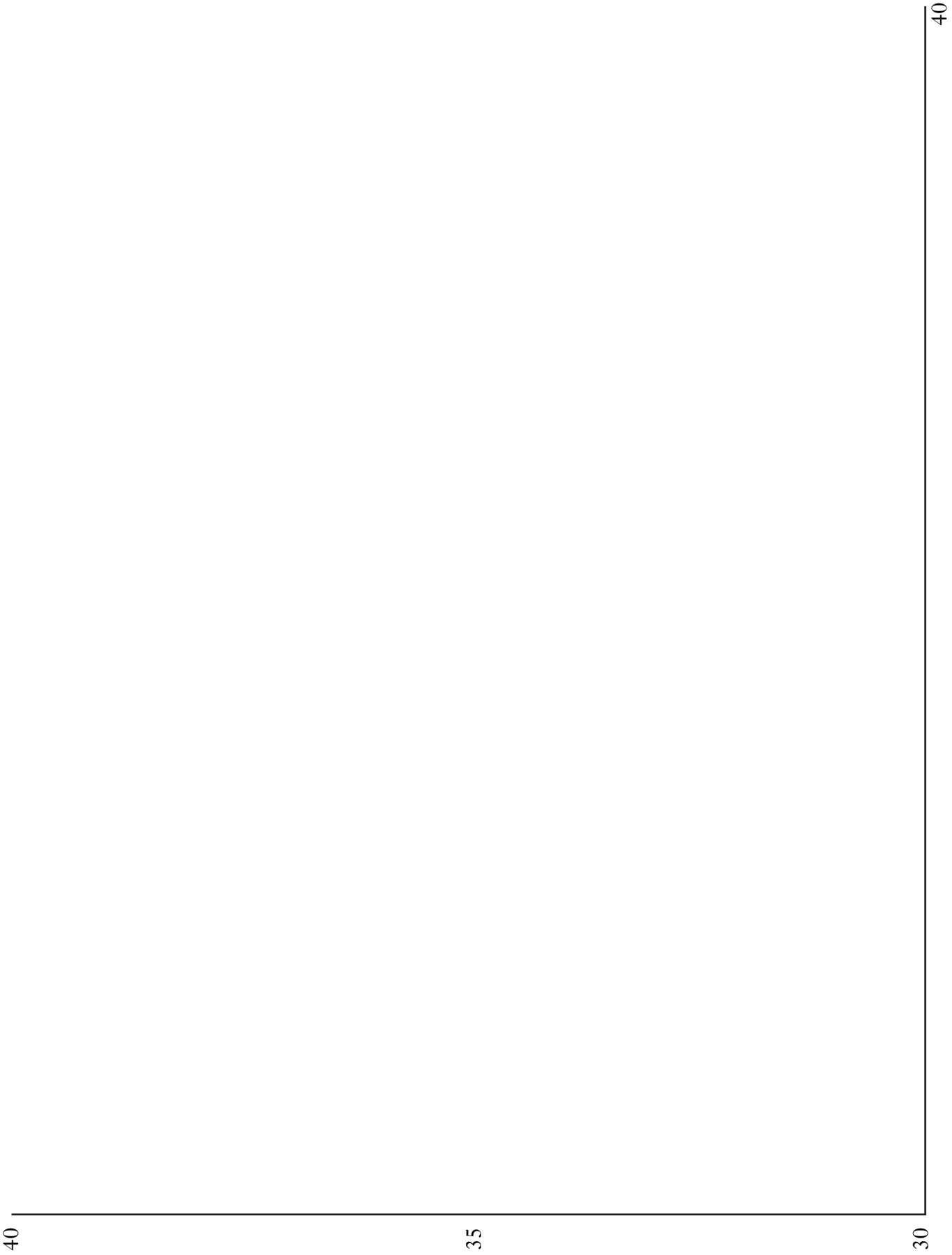


FIGURE Q12 1

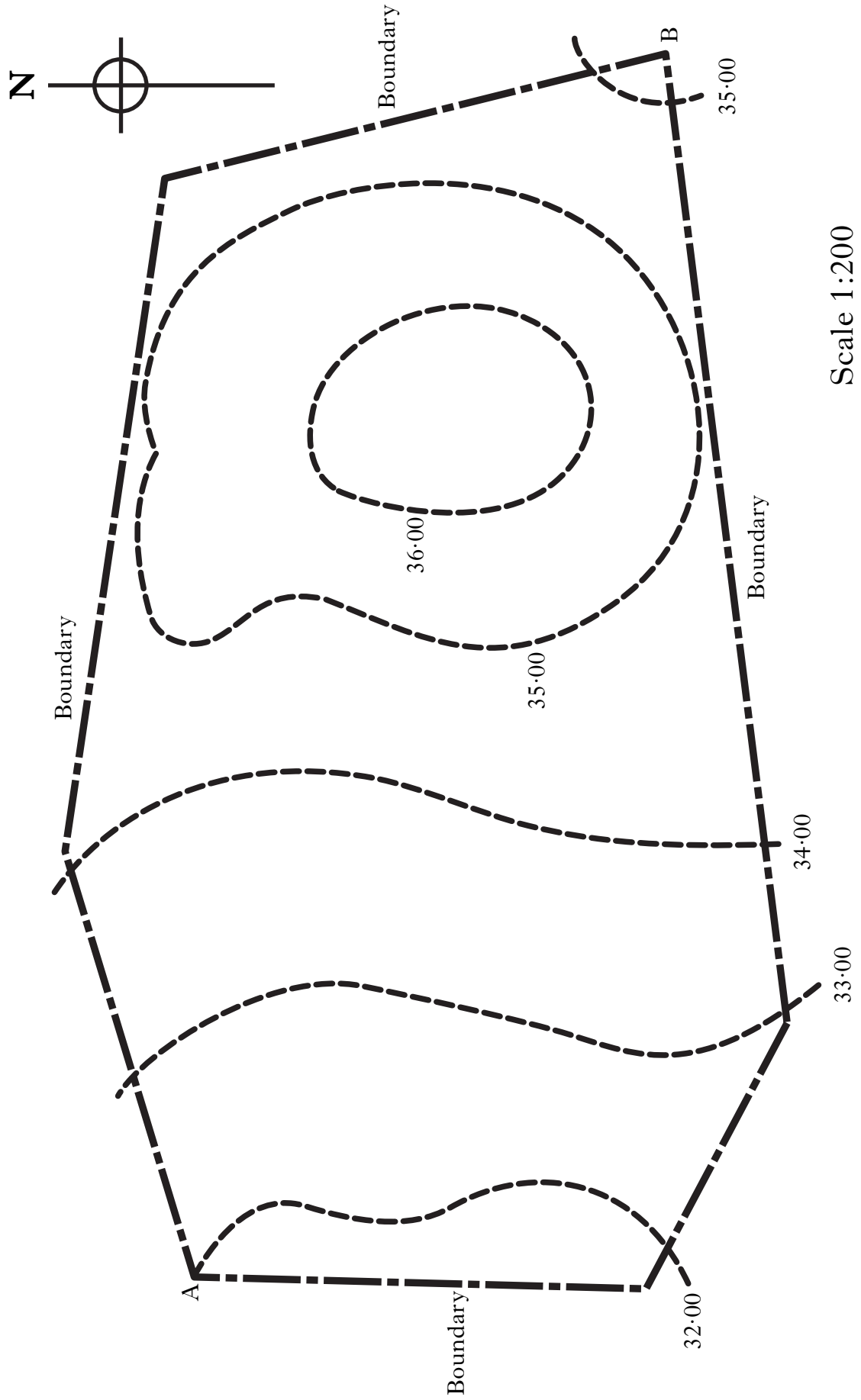
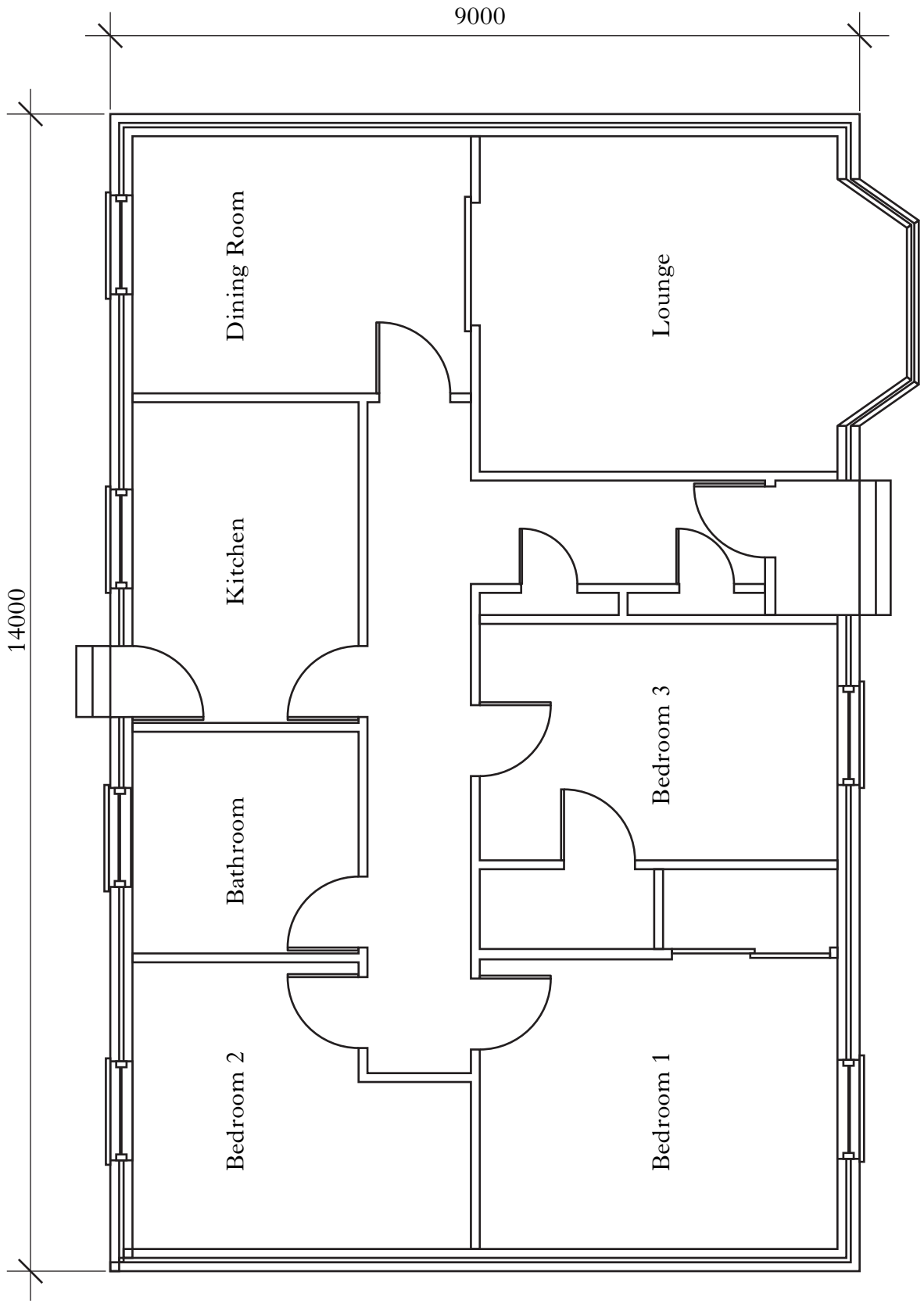

N
Boundary
B
35·00
Scale 1:200
36·00
35·00
Boundary
Boundary
34·00
33·00
A
Boundary
32·00

FIGURE Q12 2


9000
14000
Dining Room
Lounge
Kitchen
Bedroom 3
Bathroom
Bedroom 2
Bedroom 1

WORKSHEET Q13(*a*)

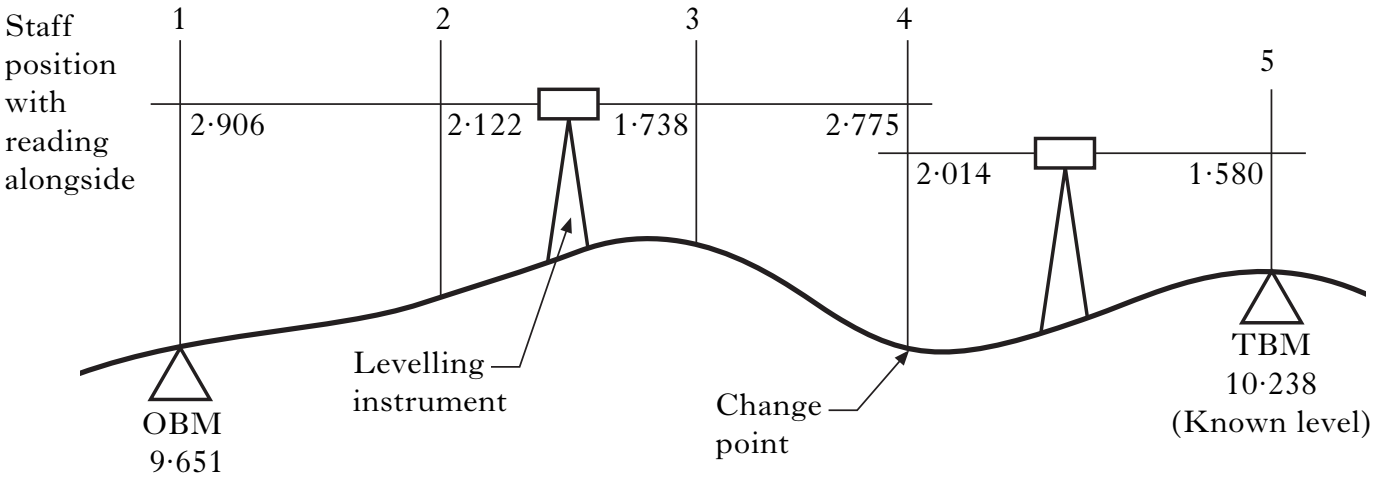


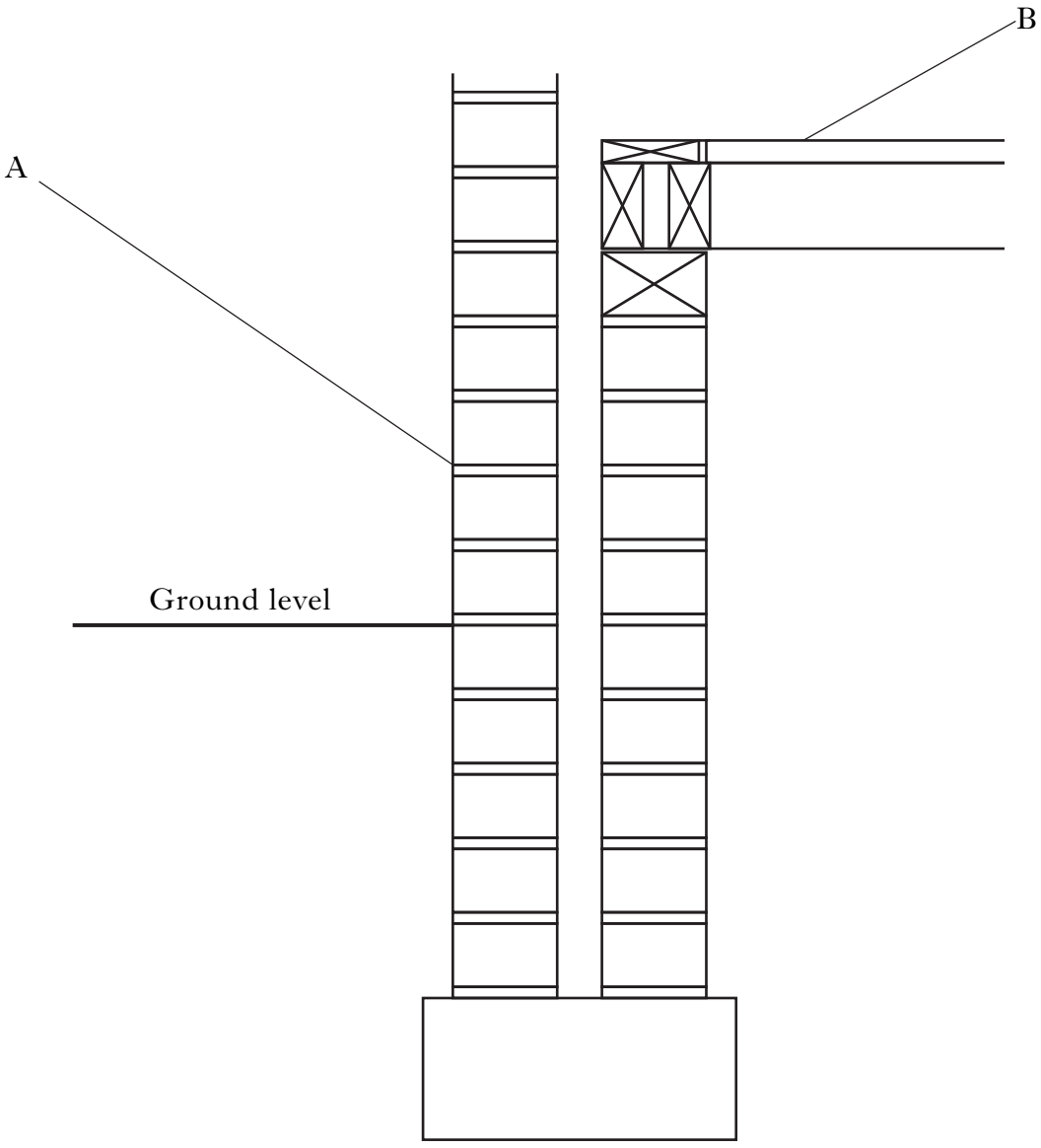
Figure Q13

Back Sight	Intermediate Sight	Fore Sight	Ht of Collimation Or Rise & Fall	Reduced Level	Remarks
					OBM
					TBM

Table Q13

[Turn over

WORKSHEET Q13(*c*)



NOT TO SCALE

[*END OF WORKSHEET*]

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