



higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE

BUILDING DRAWING N3

(8090023)

14 April 2021 (X-paper)
09:00–13:00

REQUIREMENTS: ONE A2 drawing paper

Calculator and drawing instruments may be used.

This question paper consists of 7 pages.

163Q1A2114

DEPARTMENT OF HIGHER EDUCATION AND TRAINING
REPUBLIC OF SOUTH AFRICA
NATIONAL CERTIFICATE
BUILDING DRAWING N3
TIME: 4 HOURS
MARKS: 100

INSTRUCTIONS AND INFORMATION

1. Answer all the questions.
 2. Read all the questions carefully.
 3. Number the answers according to the numbering system used in this question paper.
 4. All the drawings must be drawn to the required scale.
 5. Use both sides of the drawing paper.
 6. All drawings, including candidate's information, must be done in pencil.
 7. AN INK PEN IS NOT ALLOWED.
 8. All drawing work must comply with the relevant SANS (SABS) recommended codes.
 9. Use your own discretion where dimensions are not given.
 10. All the abbreviations and symbols must comply with the latest National Building Regulations and all relevant SANS (SABS) codes.
 11. A balanced layout is very important and candidates will be penalised for poor planning.
 12. The sketches and/or diagrams must be neat, reasonably large, in proportion and fully labelled.
 13. All labelling must be written in capital letters.
 14. Provide an appropriate title and scale to all drawings.
 15. Write neatly and legibly.
-

QUESTION 1: FLOOR CONSTRUCTION

Draw, to scale 1:10, the vertical section through a wooden double floor with a suspended ceiling and show part of the one and half brick wall which reduces from the bottom of the wall plate to a one brick wall and part of the suspended ceiling.

SPECIFICATIONS:

Wall plate	: 114 mm × 76 mm	
Skirting	: 76 mm × 20 mm	
Tie beam	: 380 mm × 152 mm	
Ceiling joist	: 114 mm × 38 mm	
Cornice	: 75 mm	
Hangers	: 50 mm × 50 mm	
Tongue and groove floor boards	: 100 mm × 25 mm	
Floor joist	152 mm × 50 mm	
Fibre cement Ceiling board	: 4 mm	
Branding	: 38 mm × 38 mm	

[20]

QUESTION 2: ROOFWORK (PITCH ROOF WITH FIBRE CEMENT TILES)

A house needs to be provided with a pitch roof covered with fibre cement slate tiles.

Draw, to scale 1:10, a vertical section through the flush eaves of the roof. The drawing must include the fibre cement slate tiles up to the FOURTH batten, part of the external wall, the rain water goods and part of the ceiling up to the SECOND batten.

SPECIFICATIONS:

Roof pitch	: 30 degrees	
Roof truss	: S.A. roof truss with gang-nailed plates	
Roof members	: all members 114 mm × 38 mm gang nailed	
Wall plate	: 114 mm × 38 mm	

Eaves	: flush eave
Roof covering	: Fibre cement slate tiles
External wall	: 270 mm cavity plastered internally only
Underlay	: 230 micron 
Battens	: 38 mm × 38 mm at 146 mm center to center
Tilting batten	: 50 mm × 50 mm
Ceiling cover	: 10 mm Rhino board
Branding	: 38 mm × 38 mm at 400 mm center to center
Cove cornice	: 75 mm
Gutter	: 100 mm PVC
Plaster	: 19 mm

[20]



QUESTION 3: BASEMENT CONSTRUCTION

The basement of a building consists of a suspended wooden floor. The suspended wooden floor is situated 600 mm below the natural ground level which is 900 mm above the top of the foundation. The floor joists of the basement floor rest on a wall plate on sleeper walls. The sleeper walls are three courses high and are supported by 100 mm oversite concrete. The external wall is 440 mm thick but reduces to 330 mm two courses above the ground level and consists of ventilated shafts 220 mm × 110 mm at 1 500 mm centers. The walls are plastered on the inside only. A drainpipe is installed externally at the bottom of the external wall to relay seeping water to a lower area or to a sump.

Draw, to scale 1:10, a vertical section through ONE of the external walls and PART of the basement floor. The drawing must include the foundation, the basement floor with sleeper wall and oversite concrete, the external wall with DPC and ventilated shaft, the natural ground level and the drainpipe.

SPECIFICATIONS:

Foundation	: 700 mm × 300 mm
Oversite concrete	: 75 mm 
External wall	: 440 mm/330 mm

Vertical DPC	:	Asphalt paint
Horizontal DPC	:	370 micron 
Floor joists basement floor	:	110 mm × 50 mm
Flooring boards	:	100 mm × 22 mm tongue- and -groove
Skirting	:	75 mm × 22 mm both floors
Plaster	:	19 mm
Drain pipe	:	100 mm diameter agricultural
Wall plate	:	110 mm × 75 mm

[25]



QUESTION 4: CONCRETE STAIRS

Draw, to scale 1:10, a vertical section through a straight flight of a precast concrete stairs. The stairs are jointed to the floor and the landing by means of a bearing nib. The drawing must include the different parts of the straight flight with part of the floor and part of the landing. The landing and the floor are both cast in situ.

SPECIFICATIONS:

Tread	:	230 mm
Rise	:	150 mm
Waist	:	150 mm
Floor	:	130 mm
Landing	:	130 mm 
Bearing nib	:	65 mm × 65 mm
Steel reinforcement	:	Not required

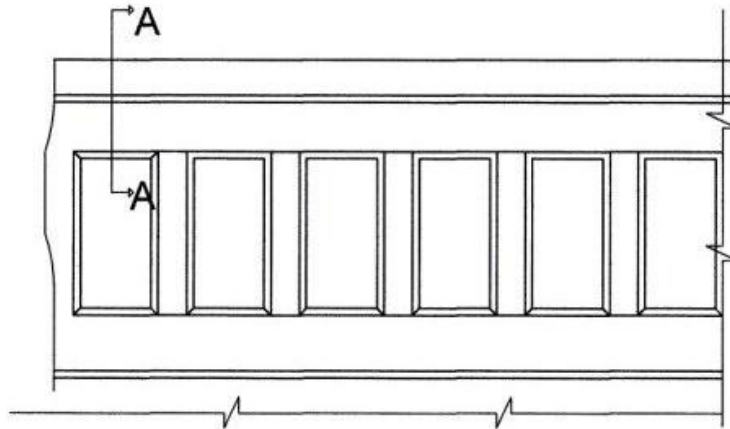
[10]

QUESTION 5: WALL PANELLING

The front elevation of a raised and fielded panel is shown below.



Draw, to scale 1:5, a vertical section through the panel as indicated at A–A.



**FRONT ELEVATION OF A RAISED AND FIELDED
PANEL**

SPECIFICATIONS:

Wall	:	110 mm
Grounds	:	18 mm
Head rail	:	100 mm × 32 mm
Top rail	:	100 mm × 32 mm
Raised and fielded panel	:	25 mm
Bolection mould	:	Own design
Top capping	:	22 mm



[12]

QUESTION 6

Complete the following sentences by filling in the missing word or words. Choose the correct word from the list below. Write only the word or words next to the question number (6.1–6.5) in the ANSWER BOOK.

flashing; drainage; sewage; P- trap; gravitation; flushed; soil

- 6.1 Water closets are normally ... by operating a chain pull or lever. 
- 6.2 is used to finish off the brickwork and roof interface around chimneys.
- 6.3 A ... prevents the escape of unpleasant odours to the inside of the building.
- 6.4 The flow of water on drains is entirely dependent on
- 6.5 is a waste water, soil or other liquid waste, excluding storm surface, subsoil spring or rain water.

(5 × 1)

[5]**QUESTION 7: APPLICATION OF VARNISH TO NEW WOOD**

Describe, in sequential order, the steps that should be followed to prepare and varnish new timber for internal use. 

[8]**TOTAL:****100**