higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE

BUILDING DRAWING N3

(8090023)

23 November 2022 (X-paper)
09:00–13:00

REQUIREMENTS: One A2 drawing sheet.

Drawing Instruments may be used.

This question paper consists of 9 pages.

158Q1E2223

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DEPARTMENT OF HIGHER EDUCATION AND TRAINING
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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 drawings, including candidate's information, must be done in pencil.
5. You may use both sides of the DRAWING PAPER.
6. All labelling must be written in capital letters.
7. All drawings must be drawn to scale with appropriate headings.
8. A balanced layout must be maintained.
9. Discretion must be used for dimensions not given.
10. All drawing work, abbreviations and symbols must comply with the latest National Building Regulations and all relevant SANS (SABS) codes.
11. Write neatly and legibly.

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QUESTION 1: THEORY

Indicate whether the following terms are TRUE or FALSE, by writing 'True' or 'False' next to the number (1.1–1.10) in the ANSWERING BOOK.

1.1 Portland cement is a fine powdered material, which when mixed with water, binds and sets to form a hard, solid material.

1.2 The capping at the apex of a tiled roof is called the region.

1.3 The chief advantage of a cavity wall, is to prevent water reaching the inside of the building.

1.4 Fittings is a term used for installing doors.

1.5 A junction is where one wall interacts with another wall.

1.6 A soldier arch is one or two parallel walls that are tied together.

1.7 A wall around the perimeter of a building at roof level or balconies, is called a parapet wall.

1.8 One advantage of PVC fittings is that it cannot rust.

1.9 A soffit is the exposed lower surface of any overhead component of a building.

1.10 Efflorescence is the chalk-like appearance on a building, due to the crystallisation of salt content in bricks and mortar. (10 × 1) (10)

[10]

QUESTION 2: FLOORS

Draw, to scale 1:10, the vertical section through an external wall, part of the suspended floor, part of the concrete floor and the foundation. Show the method of damp proofing the basement in the building that consists of a suspended wooden floor at the ground level and concrete floor at the basement. The height between the two floors is 2 000 mm, measured from the top of the concrete floor to the underside of the floor joist. The internal walls of the basement are cement bagged.

SPECIFICATIONS:

- Concrete foundation : 900 mm × 270 mm
- Hard core : 150 mm
- Basement wall : 330 mm up to the underside of wall plate
- Oversite concrete : 75 mm
- Horizontal DPC : 230 microns
- Concrete floor : 100 mm
- Concrete floor screed : 20 mm
- Vertical DPC : Asphalt paint
- Wall plate : 114 mm × 38 mm
- Floor joist : 220 mm × 50 mm
- Weep hole : 900 mm placed level with ground floor DPC
- Air vent : 220 mm × 150 mm placed level with floor joist
- Cavity wall : 270 mm
- Plaster : 19 mm only at ground floor, internally.
- Flooring : 75 mm × 22 mm T&G Boards
- Skirting : 75 mm × 22 mm

[20]

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QUESTION 3: WINDOW

Draw, to scale 1:5, a vertical section at the bottom of a casement window frame built into a cavity wall.

SPECIFICATIONS:

- Cavity wall : 270 mm
- Plaster : 19 mm internally only
- DPC : 375 micron
- External sill : Brick-on-edge
- Internal sill : 125 mm × 12 mm fibre cement
- Window sill : 125 mm × 75 mm
- Glass : 3 mm
- Bottom rail : 64 mm × 44 mm

[20]

QUESTION 4: ROOF

Draw, to scale 1:10, a vertical section showing the construction details of a roof at the ridge. Indicate clearly where a gang nail plate is used.

SPECIFICATIONS:

- King post : 114 mm × 38 mm
- Rafter : 114 mm × 38 mm
- Gang nail plate : SABS approved
- Battens : 38 mm × 38 mm at 300 mm apart
- Cement tiles : SABS
- Ridge capping : Own discretion
- Cement mortar
- Underlying sheeting
- Malthoid layer

[15]

QUESTION 5: STAIRS

Draw, to scale 1:10, a vertical section through parts of a straight flight of reinforced concrete stairs that includes a landing. Show three steps before the landing and three more steps after the landing. Show all reinforcement. The steps and the risers are finished with marble. No other details needed.

SPECIFICATIONS:

- Tensile bars : 12 mm
- Distribution bars : 8 mm
- Landing thickness : 125 mm
- Landing length : 900 mm
- Concrete cover : 25 mm
- Waist : 150 mm
- Finishing : 20 mm marble
- Tread 220 mm
- Rise : 150 mm

[16]

QUESTION 6: PLUMBING

Draw, not to scale, a vertical section of part of a bath showing overflow trays arrangement.

SPECIFICATIONS:

- Bath
- Overflow
- Overflow connected into side of trap
- Overflow pipe
- Waste pipe
- Trap
- Waste
- Cleaning eye

[10]

QUESTION 7: BRICKWORK

Draw, to scale 1:10, the front elevation of a wall built in Flemish Bond, showing different types of brick sizes. Show the stop end on the left side. Label your drawing correctly indicating the following specifications.

SPECIFICATIONS:

- Stretcher : 220 mm × 110 mm × 75 mm
- Header : 110 mm × 110 mm × 75 mm
- Queen Closer : 110 mm × 55 mm × 75 mm
- Length of the wall : 1 540 mm
- Height of the wall : 600 mm
- Stop end : Left side

[9]

TOTAL: 100

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