higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE

BUILDING DRAWING N3

(8090023)

28 November 2024 (X-paper)
09:00–13:00

REQUIREMENTS: ONE A2 drawing sheet

Drawing instruments and non-programmable calculators may be used.

This question paper consists of 6 pages.

143Q1E2428

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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 drawings, including candidate's information, must be done in pencil.
5. Write all labels in capital letters.
6. Provide an appropriate title and scale for all drawings.
7. Maintain a balanced layout.
8. Use your discretion for dimensions not given.
9. All drawing work, abbreviations and symbols must comply with the latest National Building Regulations and all relevant SANS (SABS) codes.
10. Work neatly.

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QUESTION 1: BRICKWORK – ENGLISH BOND

Draw, to scale 1:10, the TWO alternate plan courses of a T-junction between TWO two-brick walls built in English bond. Show only ONE stopped end on the left-hand side. Label the position of the queen closers in both views.

Specifications:

- Length: 1 320 mm
- Depth: 825 mm
- Width of each wall: 440 mm
- Brick: 220 mm × 110 mm × 75 mm
- Queen closer: 220 mm × 55 mm × 75 mm **[10]**

QUESTION 2: ROOF

Draw, to scale 1:10, a vertical section through a parapet gutter, part of the parapet wall and part of the roof with fibre-cement slates. Show only up to the first two battens. Show the one-and-a-half-brick wall, reduced to a one-brick wall at wall-plate level, rising up to coping level. The entire wall is plastered on both sides. The ceiling is fixed directly to the tie beam.

Specifications:

- Roof pitch: 25°
- Rafter: 150 mm × 38 mm
- Tie beam: 150 mm × 38 mm
- Roof battens: 38 mm × 38 mm
- Tilting batten: 50 mm × 38 mm
- Roof covering: 600 mm × 300 mm × 4 mm fibre-cement slates
- Parapet gutter: 300 mm wide
- Parapet boarding: 22 mm
- Parapet lining: Bituminous sheeting
- Flashing: Metal
- Boarding cleat: Own discretion
- Wall: 330 mm and 220 mm
- Coping stone: 280 mm × 75 mm feather-edged
- Brandering: 38 mm × 38 mm
- Ceiling: 4 mm fibre cement
- Cornice: Cove
- Plaster: 19 mm **[20]**

QUESTION 3: CONCRETE STAIRCASE

Draw, to scale 1:10, a vertical section through a section of precast concrete stairs. Show at least THREE steps to show the reinforcement details. The drawing must show the bearing nib and part of the floor with a screed finish.

Specifications:

- Floor: 160 mm
- Riser: 150 mm
- Tread: 230 mm
- Bearing nib: 80 mm × 80 mm
- Main bar: 16 mm
- Distribution bar: 6 mm
- Waist: 150 mm
- Joint: 10 mm flexible joint
- Screed: 20 mm

[20]

QUESTION 4: PLUMBING

Draw, to scale 1:5, a vertical longitudinal section through an earthenware gulley. Show the flow of water, water seal and the socket joint on the drainpipe. The grid and the mortar must be also shown.

Specifications:

- Gulley: 385 mm × 265 mm
- Grid: 150 mm
- Drainpipe: 100 mm diameter
- Water seal: 65 mm
- Gasket: 40 mm
- Mortar: 40 mm

[10]

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QUESTION 5: BASEMENT SUSPENDED FLOOR

The basement of a wooden suspended floor is situated 415 mm below ground level. The ground level is 900 mm above the top of the foundation. The floor joist rests on a wall plate, which is supported by a sleeper wall. The sleeper wall is three courses high, resting on oversite concrete. The two-brick external wall is reduced to a one-and-a-half brick wall, two courses above the ground level, consisting of a ventilation shaft. The drainpipe is externally installed at the bottom of the external wall to relay seeping water to a lower area.

Draw, to scale 1:10, a vertical section through the basement and suspended floor. Show all as per the specifications.

Specifications:

- Concrete foundation: 700 mm × 300 mm
- Oversite concrete: 75 mm
- Hard core: 150 mm
- Drainpipe: 100 mm diameter
- Wall plate: 110 mm × 75 mm
- Floor joist: 110 mm × 50 mm
- Skirting: 75 mm × 22 mm
- Two-brick wall: 440 mm, 1 050 mm above foundation
- One-and-a-half-brick wall: 330 mm
- DPC: Vertical and horizontal
- Air vent: 150 mm
- NGL: 900 mm above the foundation
- Plaster: 19 mm internal
- Flooring: T & G joint **[20]**

QUESTION 6: JOINERY – SOLID JAM

Draw, to scale 1:2, a horizontal section through a double-rebated doorjamb. Show the jamb with the surrounding construction details and part of the internal wall.

Specifications:

- Solid wall: 220 mm
- Plaster: 19 mm both sides
- Rough ground: 60 mm × 19 mm
- Jamb lining: 258 mm × 32 mm
- Rebate: 12 mm × 48 mm both sides
- Architraves: 75 mm × 22 mm both sides
- Skirting: 75 mm × 22 mm both sides
- Backing: 220 mm × 32 mm **[10]**

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QUESTION 7: PLASTERWORK AND PAINTING

Indicate whether the following statements are TRUE or FALSE by writing only 'True' or 'False' next to the question number (7.1–7.10) in the ANSWER BOOK.

7.1 Damp-proof materials should be impervious.

7.2 Plaster of Paris is also known as calcium sulphate plaster.

7.3 Balsam is one of the chemical ingredients of wood vanish.

7.4 Ventilation pipes assist in circulating fresh air.

7.5 PVC fittings cannot rust.

7.6 A water closet consists mainly of a pan containing water and receiving excrement.

7.7 Emulsion, synthetic and cellulose are types of calcium sulphate plasters.

7.8 Anhydride and Kenees are types of paints.

7.9 Ventilation cannot assist in circulating fresh air.

7.10 Primers are basecoats applied to a surface to improve the adhesion of paint or vanish.

(10 × 1) **[10]**

TOTAL: 100

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