higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

ARCHITECTURAL GRAPHICS AND TECHNOLOGY

(First paper)

NQF LEVEL 3

(12050633)

20 November 2023 (Y-paper)
13:00–17:00

REQUIREMENTS: CAD software.

Calculators may be used.

This question paper consists of 5 pages.

165Q1N2320

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ARCHITECTURAL GRAPHICS AND TECHNOLOGY
NQF LEVEL 3
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 must be made with a CAD software package on a computer and printed.
5. All drawing work must comply with the relevant SANS (SABS) recommended codes.
6. Brick sizes should be taken as 220 × 110 × 75 mm.
7. All the abbreviations and symbols must comply with the latest National Building Regulations and all relevant SANS (SABS)-codes.
8. Because a balanced layout is important, candidates will be penalised for poor planning.
9. Use only a black or blue pen.
10. Write neatly and legibly.

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QUESTION 1

Draw on a scale of 1:10 on an A4 sheet of paper a stepped footing foundation.

The drawing must clearly show the following:

1.1 Concrete foundation 200 mm × 700 mm

1.2 Brick footings

1.3 Damp-proof course (DPC)

1.4 Screed 20 mm

1.5 Concrete slab 75 mm

1.6 Compacted hard core 150 mm

1.7 Ground level

1.8 Dimensions of foundation

Insert all the descriptions.
Print a suitable title and scale beneath the sectional view. Brick sizes should be taken as 220 × 110 × 75 mm.

[15]

QUESTION 2

On a scale of 1:10, produce a detailed cross-section of a steel window frame opening in double-leaf brickwork on an A4 sheet of paper.

The drawing must show the following detail:

2.1 Horizontal and vertical DPC (Above and below the window)

2.2 Windowsill details

2.3 Steel window frame

2.4 Lintel (pre-stressed)

2.5 Brick force in the course above the lintel

2.6 Wall ties

Insert specifications, annotations and instructions in your drawing.

NOTE: Brick size is: 220 × 110 × 75.

[15]

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QUESTION 3

Draw to a scale of 1:10 a cross-section through a waffle raft foundation with an edge beam on an A4 sheet. The loadbearing wall is a cavity wall.

The detailed scale drawing must show the following:

3.1 Profile of excavation

3.2 Edge thickening to reinforced concrete raft 150 mm

3.3 Reinforced concrete edge beam 750 mm x 300 mm

3.4 Brickwork, including weep holes in external brickwork

3.5 DPC (damp-proof course)

3.6 DPM (damp-proof membrane)

3.7 12 mm high-yielding reinforcing bars at the bottom of the foundation

3.8 Beams and mesh reinforcement near the top of the slab

3.9 Surface bed, including specifications

3.10 The start of the superstructure, which is cavity wall brickwork

Note for purposes of the scale: brick size of 220 × 110 × 75 mm and a 50-mm cavity between the external and the internal wall.

[25]

QUESTION 4

4.1 Draw in good proportion on A4 paper a cross-sectional view of the ridge detail of a tiled roof.

Include the following in the view:

4.1.1 38 × 38 batten

4.1.2 38 × 250 ridge board

4.1.3 60 × 60 wooden roll

4.1.4 38 × 152 rafter

4.1.5 Sheet lead ridging

4.1.6 Galvanized iron bale tack

4.1.7 Roof tiles

Insert a suitable title.

(15)

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4.2 Draw, in good proportion on an A4 page, an engineered fink roof truss and insert the following labels:

4.2.1 Nail plate

4.2.2 Apex

4.2.3 Bottom panel

4.2.4 Brandering

4.2.5 Tilting batten

4.2.6 Runner

4.2.7 Web member

4.2.8 Rafter

4.2.9 Tie beam

4.2.10 Heel

(15)
[30]

QUESTION 5

Draw, in good proportion, a typical elevation of a modified BS window with a fixed sub-light to fit an A4 page.

Insert the following terms in the view:

5.1 Transom

5.2 Horn

5.3 Mullion

5.4 Frame sill

5.5 Side-hung sash

5.6 Frame jamb

5.7 Glass

Insert a suitable title.

[15]

TOTAL: 100

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