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)

19 November 2018 (X-Paper)
09:00–13:00

REQUIREMENTS: ONE A4 drawing sheet

Calculators and drawing instruments may be used.

This question paper consists of 6 pages.

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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. Do ALL drawing work, including candidate information, in pencil.
5. ALL drawing work must comply with the relevant SANS (SABS) recommended codes.
6. Take brick sizes as 220 × 110 × 75 mm.
7. ALL abbreviations and symbols must comply with the latest National Building Regulations and ALL relevant SANS (SABS) codes.
8. A balanced layout is very important and candidates will be penalised for poor planning.
9. Write neatly and legibly.

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QUESTION 1: CONCRETE PILE FOUNDATIONS

Draw, in good proportion, a CAD drawing of a load-bearing reinforced ground beam on a concrete pile foundation.

The drawing must clearly show the following:

1.1 Concrete foundation

1.2 Steel reinforcement

1.3 Damp-proof course (DPC)

1.4 Screed

1.5 Concrete slab

1.6 Pile

1.7 Ground level

Insert ALL descriptions. Print a suitable title and scale beneath the sectional view. **[10]**

QUESTION 2: CONSTRUCTION OF DRAWINGS

2.1 Produce, to scale 1:10, a detailed scale cross section of a steel window-frame opening in a cavity wall.

The drawing must show the following detail:

2.1.1 Brick reveal

2.1.2 Window sill

2.1.3 Lintel

2.1.4 Cavity closure

2.1.5 Wall ties

Insert specifications, annotations and instructions on the drawing.

NOTE: Brick size: 220 × 110 × 75. The cavity between the bricks is 50 mm. (10)

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2.2 Draw, to scale 1:10, a cross section through a waffle raft foundation with an edge thickening.

The detailed scale drawing must clearly show the following:

2.2.1 Depth of excavation

2.2.2 Thickness of the concrete

2.2.3 Foundation brickwork, including a face-brick plinth

2.2.4 DPC (damp-proof course)

2.2.5 DPM (damp-proof membrane)

2.2.6 Backfill, including compaction specifications

2.2.7 Surface bed, including specifications

2.2.8 The start of superstructure cavity wall brickwork, plastered externally and internally (the cavity must be filled with concrete)

2.2.9 Screed

Insert dimensions, specifications, annotations and instructions on the drawing.

NOTE: Brick size: 220 × 110 × 75. The cavity between the external and internal wall is 50 mm. (20)

2.3 Produce, to scale 1:10, a detailed cross-sectional view of an eaves detail clearly showing the intersection between rafters and the top of the wall in double-leaf brickwork.

The detailed drawing must show the following:

2.3.1 Wall plate

2.3.2 Double wedges to level the trusses on top of the wall plate

2.3.3 Rafter at a pitch of 23°

2.3.4 Purlins

2.3.5 Concrete roof tiles

2.3.6 Facia board

2.3.7 Gutter

2.3.8 Ceiling brandering

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2.3.9 Rhino-board ceiling and cornice

Insert dimensions, specifications, annotations and instructions on the drawing.

NOTE: Brick size: 220 × 110 × 75 (15)
[45]

QUESTION 3: ROOF STRUCTURES

3.1 Draw, in good proportion and with CAD on the A4 DRAWING SHEET, double-line drawings for each of the following roof trusses:

3.1.1 Triangular

3.1.2 Inverted truss

3.1.3 Cut-off bobtail stub-end

Give a short description and use of each roof truss underneath the drawings. (15)

3.2 Draw, in good proportion and with CAD on the A4 DRAWING SHEET, a cross-sectional view of the ridge detail for a tiled roof.

Insert the following terms on the view:

3.2.1 Galvanised bale tack

3.2.2 Rafter

3.2.3 Sheet lead ridging

3.2.4 38 × 38 battens

3.2.5 38 × 250 ridge board

3.2.6 Roof tiles (10)
[25]

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QUESTION 4: WINDOWS AND DOORS

4.1 Draw vertical construction details of a timber casement window on the A4 DRAWING SHEET.

Insert the following terms on the view:

4.1.1 40 × 45 vent-light framing

4.1.2 Weathered transom

4.1.3 70 × 45 head

4.1.4 70 × 40 bottom rail

4.1.5 120 × 57 weathered hardwood sill

4.1.6 45 × 40 fixed light top rail and stiles (10)

4.2 Draw a Georgian-style door on the A4 DRAWING SHEET.

Insert the following terms on the view:

4.2.1 Top rail

4.2.2 Frieze rail

4.2.3 Stile

4.2.4 Lock rail

4.2.5 Muntin

4.2.6 Bottom rail

4.2.7 Solid bevelled and raised panels (10)
[20]

TOTAL: 100

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