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 2019 (X-Paper)
09:00–13:00

REQUIREMENTS: **A4 drawing sheets**
CAD software

Calculators may be used.

This question paper consists of 5 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, with CAD software.
5. ALL drawing work must comply with the relevant SANS (SABS) recommended codes.
6. ALL abbreviations and symbols must comply with the latest National Building Regulations and ALL relevant SANS (SABS) codes.
7. A balanced layout is very important and candidates will be penalised for poor planning.
8. Work neatly.

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QUESTION 1

Draw, to scale 1:10, a detailed section through the sub- and superstructure brickwork of a dwelling. The substructure has a reinforced ground beam on concrete pile foundations.

The detailed scaled drawing must clearly show the following:

- Pitch: 23°
- Load-bearing reinforced ground beam: 200 mm × 300 mm
- Concrete pile: 200 mm
- Foundation wall: 5 courses on reinforced concrete beam
- Concrete slab: 75 mm (surface bed)
- Screed with wooden skirting: 25 mm
- Damp-proof course (DPC)
- Damp-proof membrane (DPM)
- Compacted hard-core fill: 150 mm
- Roof cover: galvanised sheeting
- Fascia: 150 mm × 15 mm
- Ceiling and cornice
- Brandering: 38 mm × 38 mm
- Prestressed concrete lintels over window
- Sill: brick-on-edge
- Internal sill: ceramic tile
- Rafters: 114 mm × 38 mm
- Tie beam: 152 mm × 38 mm
- Wall plate: 114 mm × 38 mm
- Superstructure brickwork: internally and externally plastered

Insert dimensions only on the foundation. Print a suitable title and scale beneath the sectional view. Take brick size as 220 × 110 × 75 mm. **[43]**

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QUESTION 2

Draw, to scale 1:10, detailed cross-sectional views of an eave showing the intersection between the rafters and the top of the wall where a continuously reinforced concrete ring beam is cast within the cavity on an expanded metal closure above all openings.

The TWO cross-section drawings must clearly show the following:

- Galvanised steel wire
- 15 MPa concrete
- U-beam fixed to the roof truss and anchored to the wall
- 3 mm fibre-cement board
- Wall plate
- Rafter 114 × 38
- Tie beam 114 × 38
- Rafters at a pitch of 27°

Insert specifications, annotations and instructions on the drawing. Print a suitable title and scale beneath the sectional view. Take brick size as 220 × 110 × 75 mm. **[20]**

QUESTION 3

Draw, to scale 1:10, the elevation view of a Georgian door.

Indicate the following parts on the door:

- Door size: 838 × 2 032
- Top rail: 150 mm
- Frieze rail: 100 mm
- Stile: 90 mm
- Lock rail: 100 mm
- Muntin
- Bottom rail: 200 mm
- Solid bevelled and raised panels **[10]**

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QUESTION 4

Draw, to scale 1:10, the typical elevation of a steel window.

The window specifications are as follow:

- Window size 1 500 mm × 1 500 mm
- 1 × side-hung casement 500 mm wide
- Fixed light
- Fixed sublight 250 mm high
- Top-hung vent light 200 mm high

Insert a suitable title, annotations and dimensions on the drawing. **[12]**

QUESTION 5

Draw, in good proportion, a double-line drawing of the following truss configurations:

- Howe truss
- Inverted truss
- Cut-off truss
- Dual slope truss
- Parallel cord truss

Insert the name of each truss beneath the drawing. **[15]**

TOTAL: 100

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