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)

14 November 2024 (Y-paper)
13:00–17:00

REQUIREMENTS: Candidates will require CAD software programme and SIX sheets of A4 drawing paper

Calculators may be used.

This question paper consists of 6 pages.

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NQF LEVEL 3
(First paper)
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. The sketches and/or diagrams must be done in CAD, be neat, reasonably large, in proportion and fully labelled.
5. Use ONE drawing sheet for each drawing.
6. All drawing work must comply with the relevant SANS (SABS) recommended codes.
7. Brick sizes should be taken as 220 × 110 × 75 mm.
8. All the abbreviations and symbols must comply with the latest National Building Regulations and all relevant SANS (SABS)-codes.
9. Work neatly.

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QUESTION 1

Draw, to a scale of 1:10, a cross-sectional drawing of a strip footing foundation and a foundation cavity wall. Use an A4 sheet.

The detailed scaled drawing must clearly show all labels according to the specification:

1.1 Excavation depth

1.2 Size of concrete footing 200 × 850

1.3 Foundation brickwork, including a face brick plinth; (plinth dimensions above NGL to be 300 mm)

1.4 Brick ties every 5 courses

1.5 Damp-proof course (DPC)

1.6 Damp-proof membrane (DPM)

1.7 Compacted hard-core fill, 150 mm

1.8 Surface bed, 85 mm

1.9 Superstructure cavity brickwork plastered internally

1.10 Screed 25 mm

1.11 Cavity filled with mortar up to DPC

Insert dimensions, specifications, annotations, and instructions on the drawing. Print a suitable title and scale beneath the sectional view. Brick sizes are as per information and instruction sheet at the beginning of the paper.

[22]

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QUESTION 2

Draw to a scale of 1:10 on an A4 sheet, a detailed cross-section of a steel window in vertical elevation, of a 220 mm load bearing plastered interior and exterior wall.

The cross-section drawing must clearly show the following:

2.1 DPC above lintels and under sill

2.2 External windowsill

2.3 Internal windowsill

2.4 Steel window frame

2.5 Lintel (pre-stressed)

2.6 Plastered finish on walls and reveal

2.7 Mortar filling

2.8 Polysulphide sealant

2.9 NFP bricks

Insert dimensions (wall thickness only), specifications, annotations and instructions on the drawing.

Print a suitable title and scale beneath the sectional view. Brick sizes are as per information and instruction sheet in the beginning of the paper.

[23]

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QUESTION 3

Draw, to a scale of 1:10 and on an A4 sheet, a detailed cross-section of an eaves detail. Show in clear detail the intersection between the rafters and the top of the loadbearing wall.

The cross-section detail drawing must clearly show the following:

3.1 114 × 38 wall plate

3.2 Rafter 152 × 38

3.3 Tie beam 152 × 38

3.4 Embedded roof anchorage; double galvanised wire 4 mm in diameter, secured with an 8 mm reinforced bar

3.5 Rafters at a pitch of 25°

3.6 Reflective bubble under roof sheeting plastic

3.7 38 × 38 battens and tilting batten

3.8 IBR sheeting

3.9 Ceiling board with cornice

3.10 Insulation blanket

3.11 Gutter on facia board

3.12 38 × 38 brandering at 450 mm CTC

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

Print a suitable title and scale beneath the sectional view. Brick sizes are as per information and instruction sheet in the beginning of the paper.

[25]

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QUESTION 4

4.1 Show by means of a schematic sketch the difference between the following truss configurations: couple truss; couple close truss; couple close with post truss and a collar truss, all on an A4 sheet. The sketches should be in good proportion and a balanced layout on the A4 paper.

All labels must be according to specification.

4.1.1 Rafter

4.1.2 Tie beam

4.1.3 Collar tie

4.1.4 Post

4.1.5 Couple truss span 3 500 mm

4.1.6 Couple close truss span 4 000 mm

4.1.7 Collar truss span 4 500 mm

4.1.8 Couple close truss span 5 000 mm

Print a suitable title

(10)

4.2 Draw double line drawings in a good proportion, on an A4 page, for the following roof trusses: (a) Howe (b) inverted truss (10)

[20]

QUESTION 5

Reproduce, in a scale of 1:10, a framed ledge and braced door on an A4 sheet.

Indicate the following parts of the door on the drawing:

5.1 Top rail

5.2 Brace

5.3 Stile

5.4 Middle rail

5.5 Hanging edge

5.6 Bottom rail

Door dimensions are: 838 × 1 981 mm

[10]

TOTAL: 100

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