higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

ARCHITECTURAL GRAPHICS AND TECHNOLOGY
NQF LEVEL 3
(Second paper)

(12050633)

20 November 2024 (Y-paper)
13:00–16:00

REQUIREMENTS: A4 drawing sheets

Calculators may be used.

This question paper consists of 6 pages.

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NQF LEVEL 3
(Second paper)
TIME: 3 HOURS
MARKS: 100

INSTRUCTIONS AND INFORMATION

1. Answer all the questions.
2. Read all the questions carefully.
3. Number the answers clearly and correctly according to the numbering system used in this question paper.
4. All drawing work must comply with the relevant SANS (SABS) recommended codes.
5. Brick size should be taken as 220 × 110 × 75 mm.
6. All the 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. The sketches and/or diagrams must be done in pencil, be neat, reasonably large, in proportion and fully labelled.

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QUESTION 1

1.1 Communication is vital on any construction project. The client's needs and expectations are sometimes compromised due to poor communication or lack of it.

Give FOUR examples of these challenges. (4)

1.2 Indicate whether the following statements are TRUE or FALSE by writing only 'True' or 'False' next to the question number (1.2.1–1.2.6) in the ANSWER BOOK.

1.2.1 Drawings are identified in terms of types and application for a construction process.

1.2.2 Communication in two or three languages on a site is challenging but will not cause delays.

1.2.3 Architectural drawings do not form part of a legal contract between the supplier and user.

1.2.4 The building inspector is employed by the local authority to inspect buildings.

1.2.5 The site plan on the drawings shows you where the building is on the site and which direction each side of the building must face.

1.2.6 We do not use code reference in the title block where the project is linked to a major project, as a code reference is not needed.

(6 × 1) (6)

[10]

QUESTION 2

2.1 Explain the FOUR aspects of freehand drawings. (8)

2.2 Describe the FOUR responsibilities of an architect. (4)

2.3 Write down FIVE responsibilities of the resident engineer. (5)

[17]

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QUESTION 3

3.1 Define each of the following terms used in construction and building:

3.1.1 Backfill

3.1.2 Facia board

3.1.3 Mesh reinforcement

3.1.4 Reinforcing bars

3.1.5 Screed

(5 × 2) (10)

3.2 3.2.1 Describe the importance of drawing a construction detail before attempting to erect it. (3)

3.2.2 Give TWO reasons why construction detail drawings are drawn. (2)

3.3 Draw a freehand sketch in good proportion to fit an A4 sheet, of a pile foundation with a double-leaf brickwork foundational wall. The detail drawing must clearly show the following:

- Pile foundation with specs (reinforcing beam 300 mm × 300 mm)
- DPC
- Brick force every 4 courses
- 25 mm screed
- 75 mm concrete slab
- 250 micron DPM
- Hardcore layer 150 mm
- Foundation wall (substructure)
- Dimension 150 mm minimum between NGL and DPC
- Dimension 450 mm minimum above strip foundation and NGL
- Plaster on interior wall

(Marks 10 × 1 = 10 annotations)
(Sketch 5 × 1 = 5) (15)

3.4 Calculate the rise of a roof truss that has a 26º pitch and a span over the wall-plates of 3 228 mm. It has a clear span of 3000 mm. Show your calculation. (3)

[33]

QUESTION 4

4.1 Choose the term from COLUMN B that matches the descriptions in COLUMN A. Write only the letter (A–F) next to the question number (4.1.1–4.1.5) in the ANSWER BOOK.

COLUMN A		COLUMN B	
4.1.1	The top of the truss where the two top chords (rafters) meet	A	apex
4.1.2	The part of the roof that extends beyond the wall	B	chord
4.1.3	The part of a jack truss that extends over a truncated truss	C	eave
4.1.4	One of the beams that supports a floor or ceiling.	D	fascia
4.1.5	One of the main members (timbers) that forms the outline of the truss	E	fly rafter
		F	joist

(5 × 1) (5)

4.2 4.2.1 Name FIVE different roof types. (5)

4.2.2 Give ONE advantage each of the roof types mentioned above. (5)

4.2.3 Describe the following trusses:

- Mono
- Dual-slope
- Ridge
- Cut-off
- Inverted

(5)

4.2.4 Give THREE advantages of a nail plate connection on trusses. (3)

4.2.5 Name the TWO requirements that must be met in terms of SANS 10400 to satisfy regulations when roof trusses are constructed. (2)

[25]

QUESTION 5

5.1 Define each of the following terms used in construction and building:

5.1.1 Single glazing

5.1.2 French door

5.1.3 Head

5.1.4 Lintel

5.1.5 Panel

(5 × 2) (10)

5.2 Give TWO main types of both traditional and modern windows. (2)

5.3 Casement windows, which open outwards and inwards, are constructed with one, two, three or four lights.

Write down THREE types of casement windows. (3)

[15]

TOTAL: 100

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