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)

3 December 2020 (Y-paper)
13:00–17:00

REQUIREMENTS: **A4 drawing sheets**
CAD software

Calculators may be used.

This question paper consists of 5 pages and 1 diagram sheet.

245Q1N2003

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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 clearly and according to the numbering system used in this question paper.
4. All drawing work, including candidate information, must be done using CAD software.
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. A balanced layout is very important and candidates will be penalised for poor planning.

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QUESTION 1

Draw to scale 1:100, the FOUR elevations for the floor plan in FIGURE 1 on the DIAGRAM SHEET. Draw each elevation on a separate A4 sheet. Insert the elevation title and scale for each drawing according to the North indicator. The pitch of the roof is 30°. **[20]**

QUESTION 2

2.1 On an A4 sheet, draw to scale 1:10, a detailed cross-sectional view of an eave showing the intersection between the rafters and the top of the wall in double-leaf brickwork.

The cross-section drawing must clearly show the following:

- Embedded galvanised steel wire anchorage (double strand of Ø 4 mm galvanized wire secured by Ø 8 mm reinforcing bar)
- Wall plate 114 × 38 mm
- Double wedges to level the trusses on top of the wall plate
- Rafters 114 × 38 mm
- Tie beam 152 × 38 mm
- Pitch of 25°
- Tilting batten 70 × 56 mm
- Purlins 38 × 38 mm
- Roof covering: concrete tiles
- Gutter and facia
- Under-tile plastic
- Ceiling and cornice
- Fibreglass insulation
- Overhang 400 mm

Insert dimensions, specifications, annotations, title and scale.
NOTE: Brick sizes are as indicated on page 2. (20)

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2.2 On an A4 sheet, draw to scale 1:10, a detailed sectional drawing of a waffle raft foundation with and edge beam, including seven courses of cavity wall on top of the raft foundation.

The sectional drawing must clearly show the following:

- Cavity wall with cavity ties
- Weep hole
- DPC and DPM
- 70 mm of sand binding layer
- 250-micron water proof membrane
- 200 mm of compacted fill layer
- Reinforced concrete edge beam 700 × 350
- Mesh reinforcing
- Concrete raft of 200 mm

Insert dimensions, specifications, annotations.
NOTE: Brick sizes are as indicated on page 2.

(25)
[45]

QUESTION 3

On a A4 sheet, draw to scale 1:50, a Howe truss with a span of 3 200 mm. All members are 114 × 38 mm.

Insert the following specifications on the Howe truss:

- Tie beam
- Rafter
- Bay
- Heel
- Apex
- King post and queen post
- Web members
- Nodes
- Clear span
- Effective span

Insert specifications, annotations, title and scale. **[15]**

QUESTION 4

On an A4 sheet, draw to scale 1:10, a flush door with the following dimensions:
838 × 1 981 mm

Insert the flush door specifications as follow:

- Skeleton framing
- Lightweight core filling
- Plywood facing
- Edge lipping

Insert annotations and dimensions on the drawing. **[10]**

QUESTION 5

On an A4 sheet, draw in good proportion, the following TWO strip foundations.
Do not insert any annotations or dimensions.
Insert the title of each foundation below the drawing.

- Thickened slab foundation
- Footings for piers and columns

[10]

TOTAL: 100

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DIAGRAM SHEET

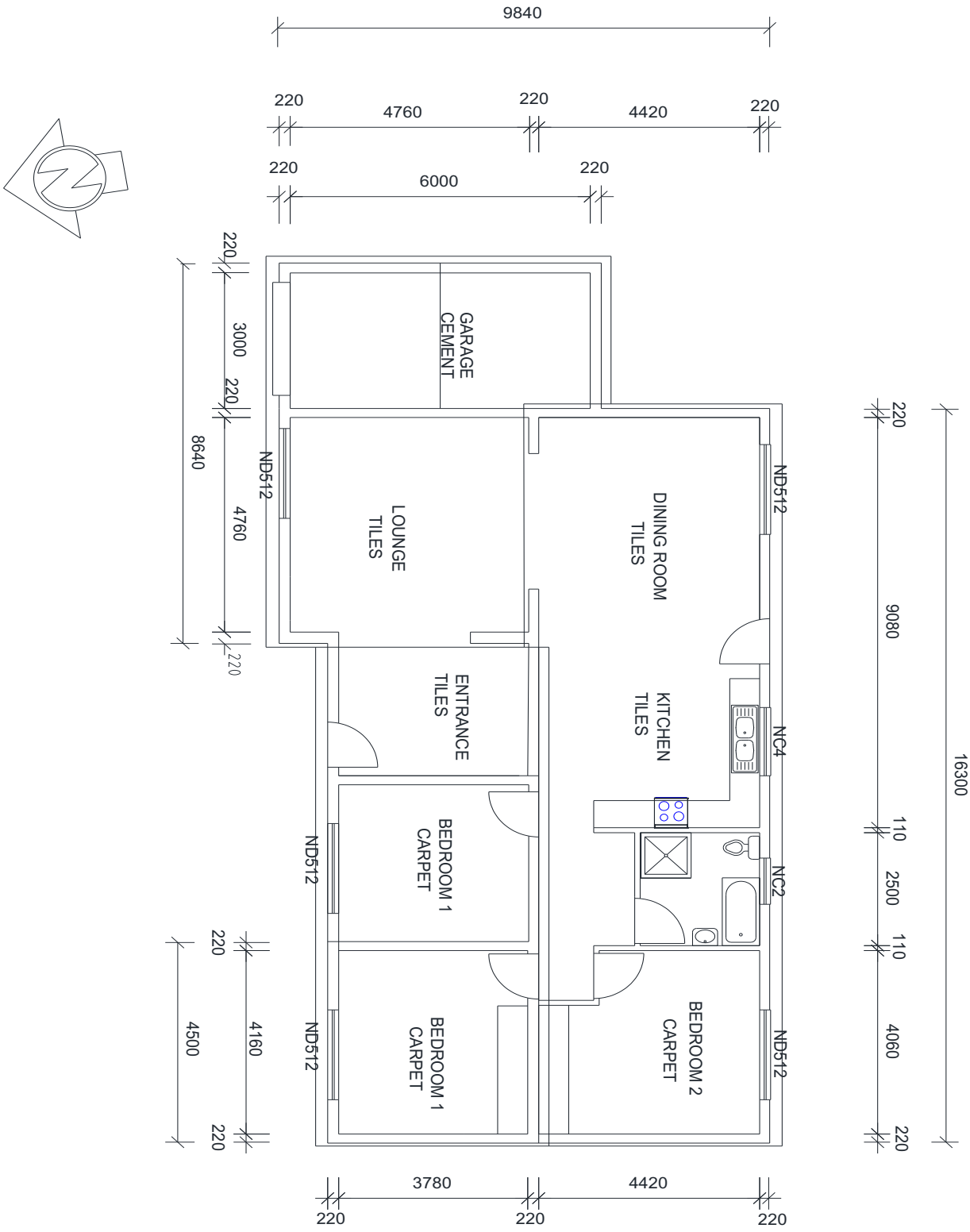


FIGURE 1

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