



**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)

6 March 2020 (X-paper)

09:00–13:00

REQUIREMENTS: A4 drawing sheets
Computers with CAD software

Calculators may be used.

This question paper consists of 5 pages and 3 diagram sheets.

269Q1S2006

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 on A4 drawing sheets.
 5. Take brick sizes as 220 mm × 110 mm × 75 mm.
 6. All drawing work must comply with the relevant SANS (SABS) recommended codes.
 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. Work neatly.
-

QUESTION 1

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

The detailed scaled drawing must clearly show the following:

- Profile of excavation 
- Edge thickening 450 mm to reinforced concrete raft 150 mm
- Brickwork to be a double loadbearing wall
- DPC (damp-proof course)
- DPM (damp-proof membrane) under floor screed
- 12 mm high-yield reinforcing bars in the bottom of the foundation beams and mesh reinforcement near the top of the slab
- Surface bed including the following specifications:
 - 50 mm sand-binding layer
 - 250 micron DPM
 - 150 mm layer compacted fill
 - screed

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

NOTE: For purposes of the scale take brick sizes as 220 × 110 × 75 with no cavity between the external and internal wall.



[22]

QUESTION 2

Draw, to scale 1:100, a detailed floor plan of DIAGRAM SHEET 1 (attached). Use DIAGRAM SHEET 2 (attached) for window and door specifications.

The floor plan layout must clearly show and incorporate the following:

- Positioning of the doors and windows
- Compliance with the SANS code of practice for building drawings
- Room titles
- Sanitary ware in the bathroom and a sink in the kitchen
- Dimensions, title and scale 

Loadbearing walls are 220 mm and non-loadbearing walls are 110 mm.

[25]

QUESTION 3

- 3.1 Draw, to scale 1:10, a vertical section through the roof eave and ceiling as shown in Detail A on DIAGRAM SHEET 3 (attached). Clearly show the detail of the intersection between the rafters, tie beam and load-bearing wall.

Use the following specifications:

- External wall: 220 mm wide with a 10 mm mortar joint
- Plaster on internal wall
- Roof pitch: 25° 
- Howe roof truss 
- IBR roof cover
- Rafter and tie beam: 114 mm × 38 mm
- Purlins: 75 mm × 50 mm at 900 mm centres
- Eave overhang: 400 mm
- Wall plate: 114 mm × 38 mm
- Ceiling: 6 mm Rhino board
- Branderings: 38 mm × 38 mm at 400 mm centres
- Cove cornice: 75 mm
- Facia: 150 mm
- Gutter
- Downpipe



Show the following details on the completed drawing:

- Two roof purlins
- Two ceiling branderings

(20)

- 3.2 Produce, to scale 1:50, a line drawing of a Howe truss with a pitch of 26° and a span of 9 m.

Insert the following annotations:

- Rafter: 152 mm × 38 mm
- Tie beam: 114 mm × 38 mm
- King post: 114 mm × 38 mm
- Queen post: 114 mm × 38 mm
- Jack post: 114 mm × 38 mm
- Strut:  114 mm × 38 mm

(8)

[28]

QUESTION 4

Draw, to scale 1:10, a typical timber doorframe elevation of a small-pane double door with sidelights.

The doorframe specifications are as follows:

- Doorframe size: 2 600 mm × 2 090 mm
- Door opening: 1 220 mm × 2 032 mm
- Two-sided glass light panels
- Sidelights to be small cottage paned
- Title, annotations and dimensions

**[10]****QUESTION 5**

Draw, in good proportion, a vertical section of a typical modified BS window.

Insert the following items on the view:

- 95 mm × 75 mm head
- 41 mm × 46 mm sash framing
- 134 mm × 70 mm sill
- Glass
- Putty
- Plastic draught sealer

**[15]****TOTAL: 100**

DIAGRAM SHEET 1

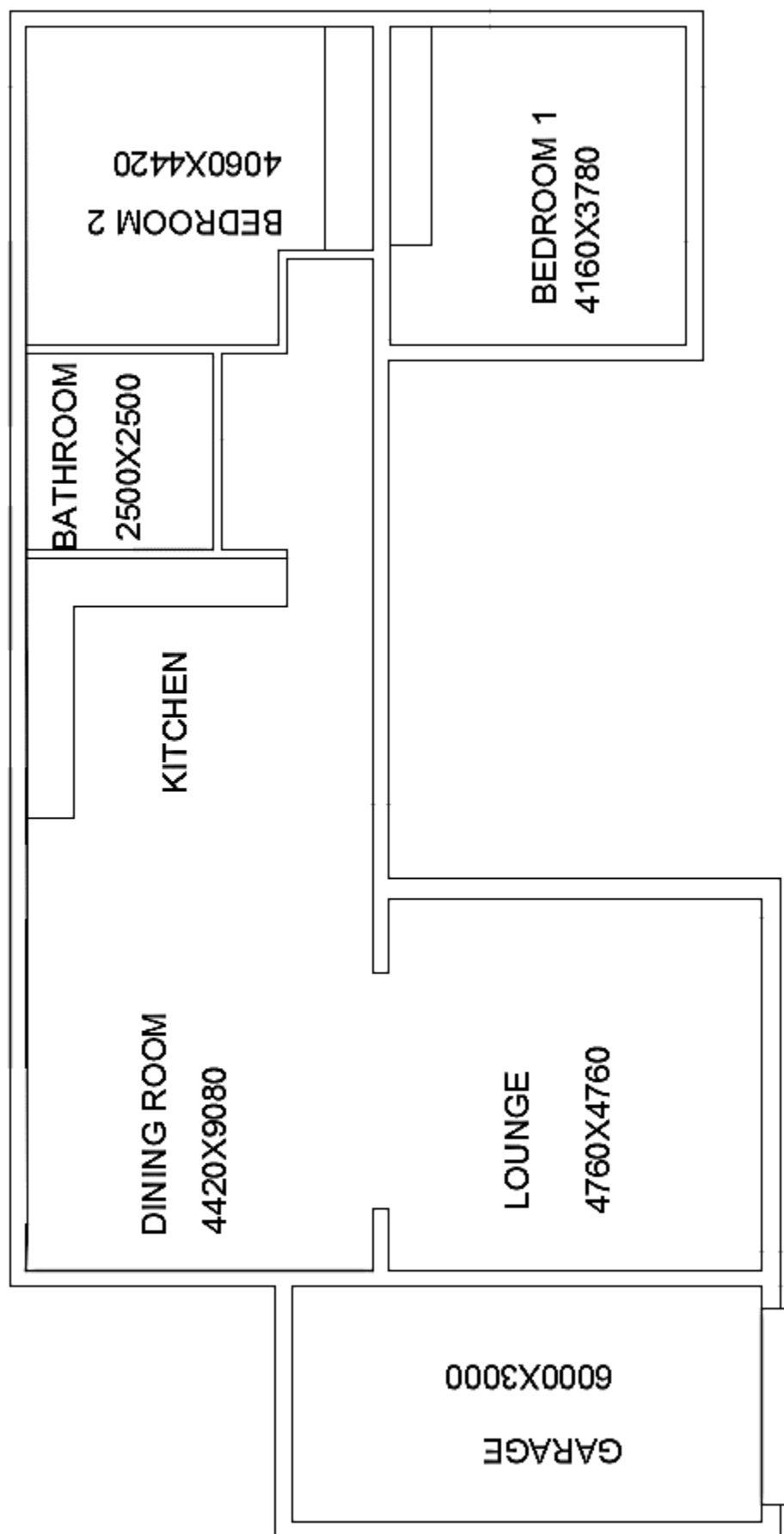
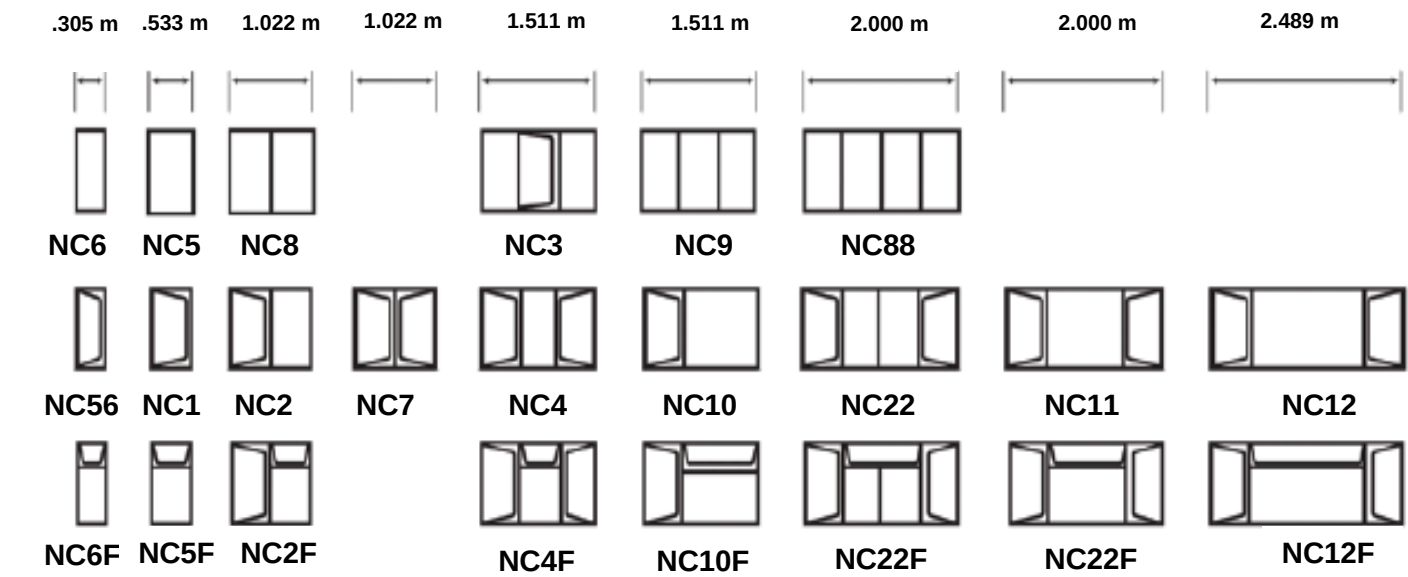
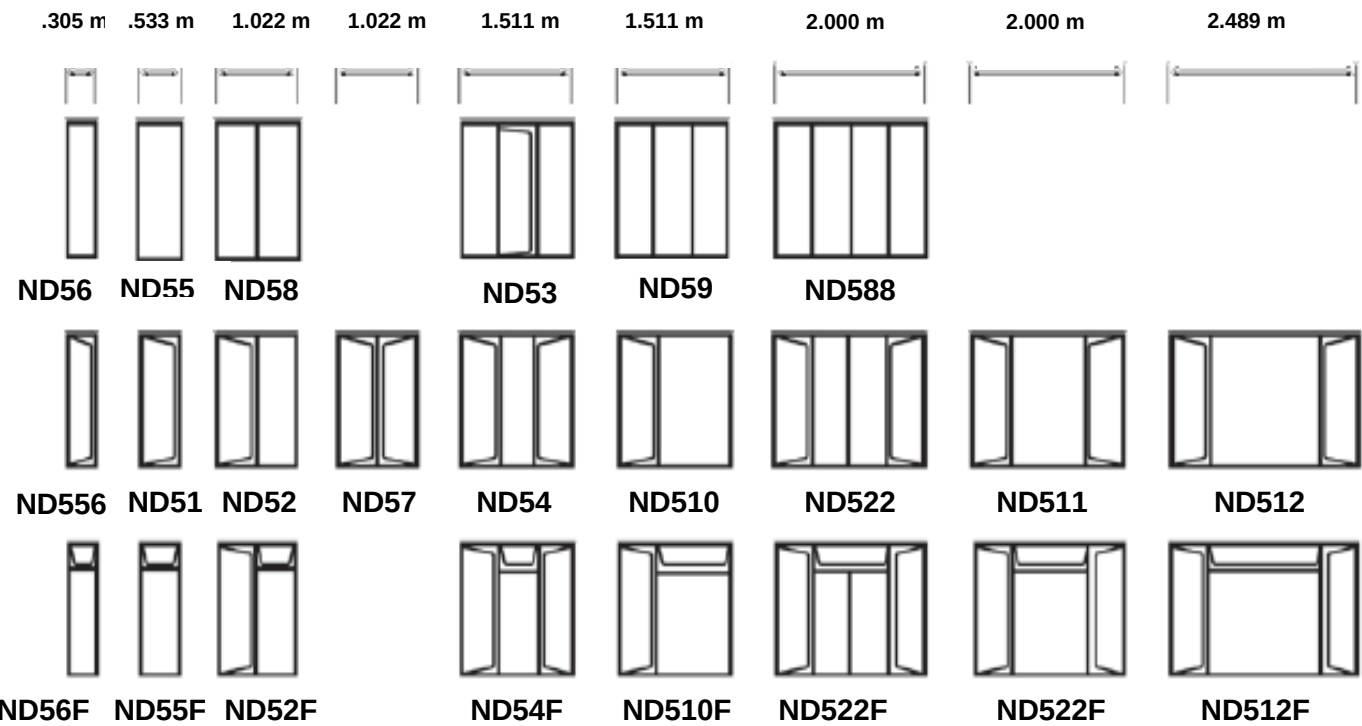


DIAGRAM SHEET 2



Height 0.949 m



Height 1.540 m

DIAGRAM SHEET 3

