higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

# NATIONAL CERTIFICATE

# BUILDING DRAWING N2

(8090012)

**6 April 2021 (X-paper)**
**09:00–13:00**

**REQUIREMENTS: One A2 drawing sheet**
**Drawing instruments**

**Only non programmable Calculators may be used.**

**This question paper consists of 6 pages and 2 diagram sheets.**



 

# DEPARTMENT OF HIGHER EDUCATION AND TRAINING
# REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE
BUILDING DRAWING N2
TIME: 4 HOURS
MARKS: 100

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**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. All the drawings must be drawn to the required scale.
5. Use both sides of the drawing paper.
6. All drawings, including candidate information, must be done in pencil.
7. Ink pen is not allowed.
8. All drawing work must comply with the relevant SANS (SABS) recommended codes.
9. Use your own discretion where dimensions are not given.
10. All the abbreviations and symbols must comply with the latest National Building Regulations and all relevant SANS (SABS) codes.
11. A balance layout is very important and candidates will be penalised for poor planning.
12. The sketches and/or diagrams must be neat, reasonably large, in proportion and fully labeled.
13. All labeling must be written in capital letters.
14. Provide an appropriate title and scale to all drawings.
15. Write neatly and legibly.

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## QUESTION 1: FOUNDATIONS AND FLOORS

FIGURE 1, DIAGRAM SHEET 1 (attached) shows a line diagram of a house and a garage with a lean-to roof. All the rooms in the house have a suspended floor and the garage has a concrete floor. The external wall of the house is fair-faced externally up to the top of the floor slab and plastered internally.

Draw to scale 1:10 a vertical section through 'A' to illustrate the construction detail.

SPECIFICATIONS:

- Concrete foundation 700 mm × 250 mm
- Foundation wall 330 mm reduced to 220 mm, SEVEN courses from the top of the concrete foundation.
- 75 mm Oversite concrete, cast on top of the concrete foundation
- Wall plate 114 mm × 38 mm
- Floor joist 114 mm × 38 mm
- Floor boards 100 mm × 22 mm
- 150 × 220 air-brick
- 150 mm hardcore
- Floor slab 75 mm thick, FIVE courses above the concrete foundation
- 20 mm screed
- 19 mm plaster
- DPC
- 76 mm × 22 mm skirting
- Insert the dimension of the concrete foundation and the 220 mm wall

**[22]**

## QUESTION 2: BRICKWORK

A one-brick garden wall built on the boundary is 1 540 mm long and 1 085 mm high, rests on a 450 mm × 235 mm concrete foundation which is two courses below ground level measured from the top of the foundation. The wall is built in English bond with stopped ends at both ends. The wall is plastered on the inside. The top of the wall is finished off with a brick-on-edge coping.

Draw to scale 1:10, the front view and a vertical section through the brick-on-edge coping, the wall and foundation.

NOTE: The drawing must include all the important labelling and dimensions, also show the brick work in the section.

**[18]**

 

## QUESTION 3: WINDOWS

FIGURE 2, DIAGRAM SHEET 1 (attached) shows a front view of a casement window with a fanlight.

Draw to scale 1:2, the vertical section through N-N to show the construction detail.

SPECIFICATIONS:

| | | |
|---|---|---|
| Head of frame | : | 100 mm x 75 mm |
| Top rail of fanlight | : | 50 mm x 44 mm |
| Glass | : | 3 mm clear glass |
| Bottom rail of fanlight | : | 50 mm x 44 mm |
| Transome | : | 100 mm x 75 mm |
| Top rail of sash | : | 50 mm x 44 mm |

**[10]**

## QUESTION 4: FLOORS

The internal dimensions of a room are 3 315 mm × 2 470 mm. The room is constructed with a suspended timber floor and a fire place. The fire place is constructed against the 3 830 mm long external wall, with floor joists running perpendicular to the hearth. The other three walls are internal walls. The fireplace floor is covered with encaustic tiles.

Draw to scale 1:20 a labelled horizontal section through the room to show a plan view of the floor construction as well as the fire place.

Include the internal dimension of the room, the width of the chimney breast, fire place and wall thickness

SPECIFICATIONS:

| | | |
|---|---|---|
| External wall | : | 220 mm thick on 330 mm foundation wall |
| Internal walls | : | 110 mm thick on 220 mm foundation wall |
| Fender wall | | 110 mm thick |
| Bearer | : | 150 mm × 75 mm |
| Floor joists | : | 114 mm × 38 mm |
| Trimmer joist | : | 150 mm × 50 mm |
| Trimming joist | : | 150 mm × 50 mm |
| Trimmed joist | : | 114 mm × 38 mm at 400 mm centre to centre |
| Fire place opening | : | 820 mm wide |
| Chimney breasts | : | 440 mm wide, projecting 440 mm into the room |
| Wall plate | : | 114 mm × 38 mm |
| Brick pier | : | 220 mm × 220 mm |
| Encaustic tiles | : | 150 mm × 150 mm |
| Air vent | | 220 mm × 150 mm |
| Floor boards | : | Not required |

**[20]**

 

## QUESTION 5: DOOR

Draw to scale 1:10 the front elevation of a four-panel door with a low lock rail.

SPECIFICATIONS:

| | | |
|---|---|---|
| Height of door | : | 2 030 mm |
| Width of door | : | 820 mm |
| Top rail | : | 110 mm × 44 mm |
| Stile | : | 110 mm × 44 mm |
| Lock rail | : | 220 mm × 44 mm |
| Muntin | : | 100 mm × 44 mm |
| Bottom rail | | 220 mm × 44 mm |
| Panel | | |

**[10]**

## QUESTION 6: ROOFS, ROOF COVERING AND PLUMBING

FIGURE 3, DIAGRAM SHEET 2 (attached) shows a line diagram of a garage with a lean-to roof, leaning against an existing building wall. The existing wall is fair faced on both sides. The roof is covered with galvanized corrugated sheets and the rafters rest, by mean of a bird-mouth, on a wall plate bolted to the existing wall.

Draw to scale 1:5 a vertical section through the area marked 'A' to illustrate the construction detail.

The drawing must show the following:

- One brick thick, existing wall
- Roof slope 17°
- 114 mm × 38 mm rafter
- Apron flashing
- Cover flashing
- 75 mm × 50 mm purlin
- 76 mm × 114 mm wall plate
- Galvanized corrugated iron
- DPC
- Bird-mouth

**[10]**

## QUESTION 7: MATERIAL AND FITTING

Choose the correct tool, fitting or material for the following situations. Print your answer neatly between guidelines 3,5 mm apart. Skip a line between each answer

| | | |
|---|---|---|
| 7.1 | Lock for a ledged, braced and battened door. | [Mortise lock; Rim lock; Dead lock] |
| 7.2 | Ceiling for domestic house | [aluminium; rhino board; block board] |
| 7.3 | Lock for a flush door | [mortise lock; rim lock; dead lock] |
| 7.4 | Hinges for a solid door | [butt-hinge; T-hinge; counter-flap hinge] |
| 7.5 | Glass for a bathroom | [obscure; clear; armour plate |
| 7.6 | Bolt for a fire escape door | [flush bolt; panic bolt; neck bolt] |
| 7.7 | Nails used to fix cover strips | [clout nail; oval nail; 75 mm wire nail] |
| 7.8 | Hinge for a ledged, braced and batten door | [butt-hinge; T-hinge; counter-flap hinge] |
| 7.9 | Material used to patch rhino cornice | [cement mortar; gypsum plaster; silicon sealer] |
| 7.10 | Saw to scribe rhino cornice | [backsaw; cross-cut saw; coping saw] |

**[10]**

**TOTAL: 100**

**DIAGRAM SHEET 1**

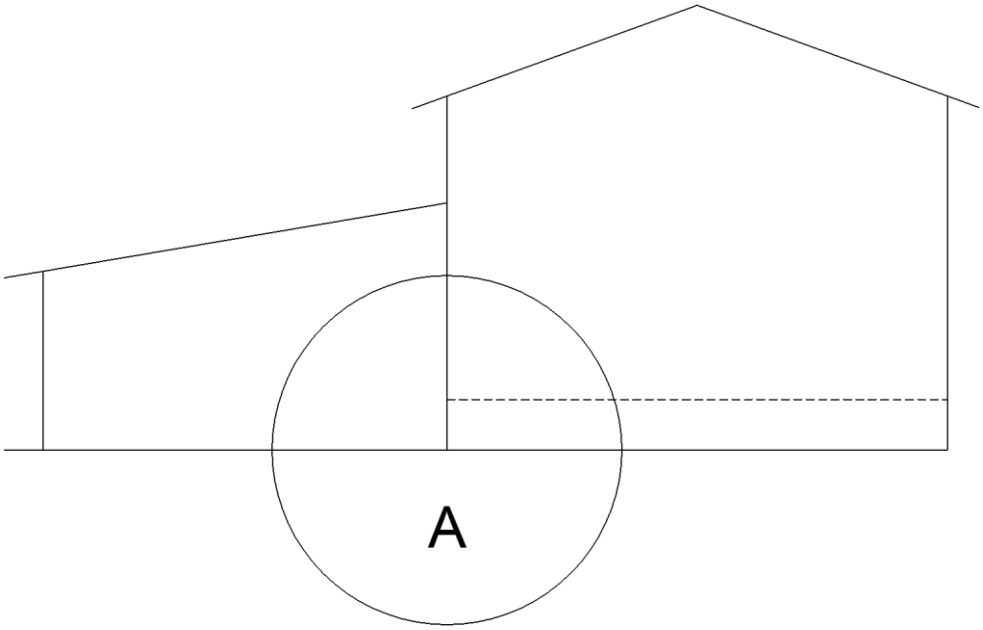


**FIGURE 1**

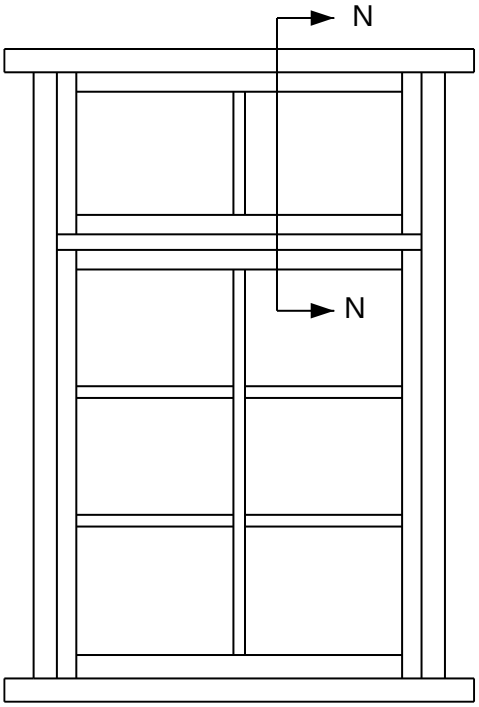


**FIGURE 2**

 

**DIAGRAM SHEET 2**

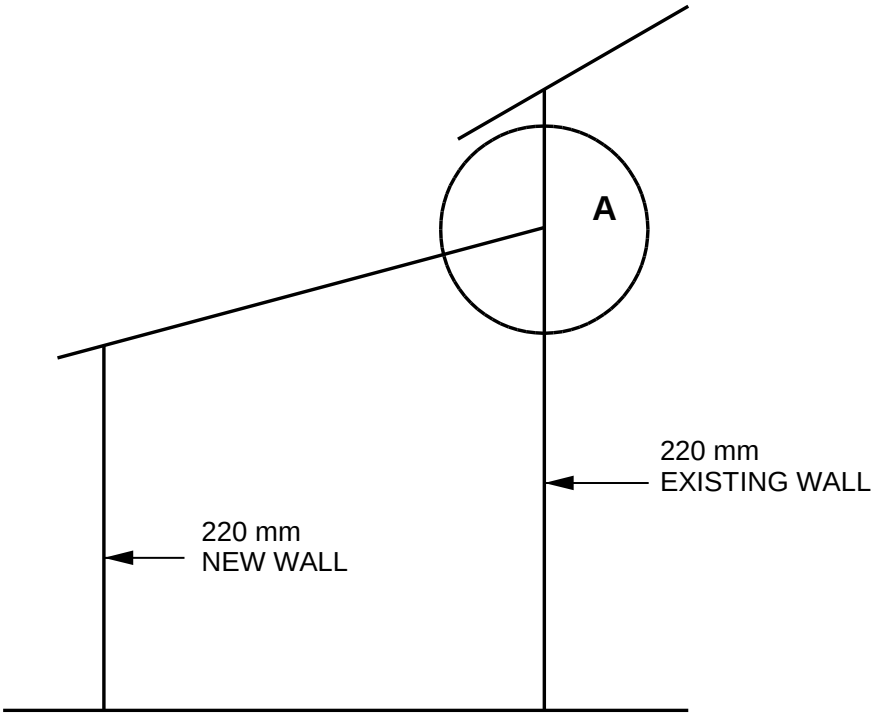


**FIGURE 3**