



higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE

BUILDING DRAWING N2

(8090012)

1 April 2020 (X-paper)
09:00–13:00

REQUIREMENTS: ONE A2 drawing sheet

Calculators and drawing instruments may be used.

This question paper consists of 5 pages and 2 diagram sheets.

042Q1A2001

DEPARTMENT OF HIGHER EDUCATION AND TRAINING
REPUBLIC OF SOUTH AFRICA
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BUILDING DRAWING N2
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. Make all drawings to the required scale.
 5. Use both sides of the DRAWING SHEET.
 6. Make all drawings, including candidate information, in pencil. Pens are not allowed.
 7. Use your discretion where dimensions are not given.
 8. Sketches and/or diagrams must be neat, reasonably large, in proportion and fully labelled.
 9. Write all labels in capital letters.
 10. Give an appropriate title and scale to all drawings.
 11. All drawing work must comply with the relevant SANS (SABS) recommended codes.
 12. All abbreviations and symbols must comply with the latest National Building Regulations and all relevant SANS (SABS) codes.
 13. A balanced layout is very important and candidates will be penalised for poor planning.
 14. Work neatly.
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
QUESTION 1: FOUNDATIONS AND FLOORS

FIGURE 1 on DIAGRAM SHEET 1 (attached) shows the plan view and front elevation of a house. External walls are one-brick thick and internal walls are half-brick thick. All walls are plastered on both sides. The bedroom floors are finished off with carpet, while the kitchen and dining room floors are finished off with ceramic tiles.

Draw, to scale 1:10, a vertical section through A-A.



Show the following construction details:

- Concrete foundation: 700 mm × 230 mm
- Foundation and superstructure walls: 220 mm thick
- Hard core: 150 mm
- Ground level: Five courses above concrete foundation
- Floor slab: 100 mm thick, two courses above ground level
- Screed: 20 mm
- Internal plaster: 19 mm
- External plaster: 19 mm up to 150 mm below ground level
- Ceramic tiles: 300 mm × 300 mm × 10 mm
- Frame sill: 96 mm × 60 mm, nine courses above DPC
- Internal wooden sill: 120 mm × 22 mm
- Quarry tile external sill:  150 mm × 25 mm
- Clear glass: 4 mm
- Skirting: 76 mm × 22 mm
- Quadrant with a 22 mm radius fitted to cover the joint between the plaster and wooden sill
- Dimensions for the concrete foundation, depth from the top of the foundation to ground level and height of the frame sill from the DPC

[22]

QUESTION 2: BRICKWORK

FIGURE 2 on DIAGRAM SHEET 2 (attached) shows a plan view of a wall.



Draw, to scale 1:10, the alternate plan course of the wall built in Flemish bond. Insert all dimensions and label only the queen closer. The courses must be aligned below each other. Take brick sizes as 220 mm × 110 mm × 75 mm.

[15]

QUESTION 3: ARCHES AND LINTELS

FIGURE 3 on DIAGRAM SHEET 2 shows the front elevation of a half-glass door with a double-rebated skeleton jamb lining built into a one-brick wall plastered on both sides. The brickwork above the lining is strengthened with brick-force reinforcement in each course for four courses.



Draw, to scale 1:5, the vertical section through Y-Y to show the construction details.

Show the following:

- One-brick wall
- Plaster: 19 mm thick
- Rough grounds: 60 mm × 19 mm
- Backing piece: 50 mm × 22 mm
- Lining frame: 75 mm × 32 mm
- Stop: 12 mm thick
- Architrave: 100 mm × 32 mm
- Top rail: 100 mm × 44 mm
- Glazing bar: 25 mm × 44 mm
- Obscure glass: 4 mm
- Wall dimensions



[15]

QUESTION 4: DOORS

A panel door, 2 040 mm high, 820 mm wide and 45 mm thick, is constructed with five horizontal glass panels.

Draw, to scale 1:10, the front elevation of the panel door.

Specifications:

- Stile: 100 mm × 44 mm
- Top rail: 100 mm × 44 mm
- Bottom rail: 220 mm × 44 mm
- Glazing bars: 40 mm × 44 mm
- Obscure glass: 4 mm



[10]

QUESTION 5: ROOFS AND ROOF COVERING

Draw, to scale 1:20, a vertical section through the roof of a building that has a span of 6 m to show the construction details. The laminated trusses rest on stone pads and are secured to the pads by means of a steel angle cleat. The roof is covered with fibre-cement sheeting.



Show the following:

- 4,5 m of the span
- 30° roof pitch
- 330 mm brick wall faced both sides
- 150 mm × 50 mm tie beams
- 150 mm × 50 mm rafters
- 150 mm × 50 mm boards nailed between the rafters and between the tie beams
- 600 mm × 220 mm × 150 mm stone pads
- Steel angle cleat
- 100 mm × 50 mm cleats to support purlin
- 2/114 mm × 38 mm collar cleats
- 125 mm × 75 mm purlin at 1 000 mm centre to centre
- 125 mm × 132 mm eaves purlin
- 114 mm × 50 mm struts
- Ridge cap
- Corrugated fibre-cement sheet
- 230 mm × 32 mm fascia board fixed to the wall



[20]

QUESTION 6: CEILINGS

Draw, not to scale, but to good proportion and fully labelled, each of the following:

- | | | |
|-----|--|-----|
| 6.1 | Sectional view of a wooden fibreboard ceiling butt joint showing the 38 mm × 38 mm brandering, wire nail, 18 mm wood fibre and the V-jointed butt joint | (6) |
| 6.2 | Sectional view of a concealed joint between chamfered, kerfed and rebated panels showing the rebate, V-jointed butt joint, aluminium T-bar, chamfer and kerf | (6) |
| 6.3 | Concealed joint between tongue-and-grooved and V-jointed panels showing the V-jointed butt joint, aluminium Z-bar, tongue and groove | (6) |



[18]

TOTAL: 100

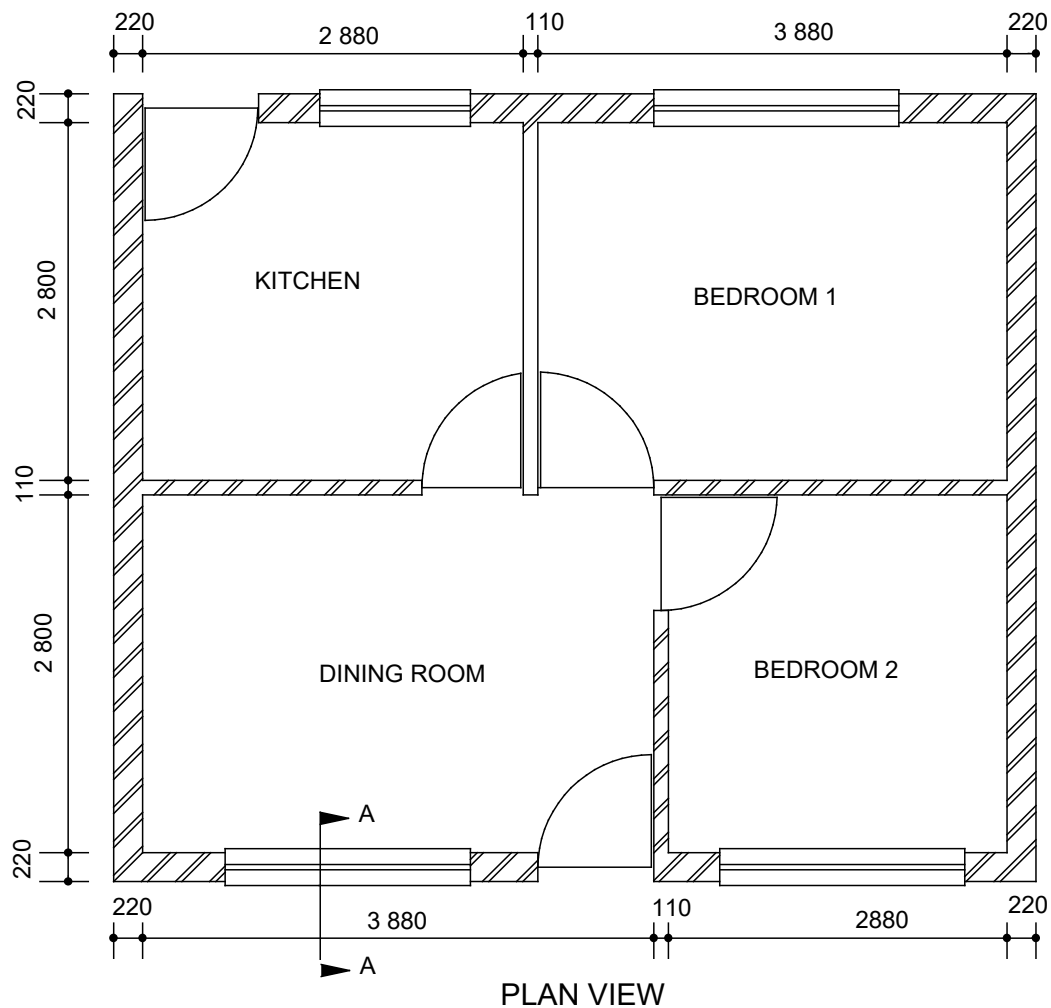
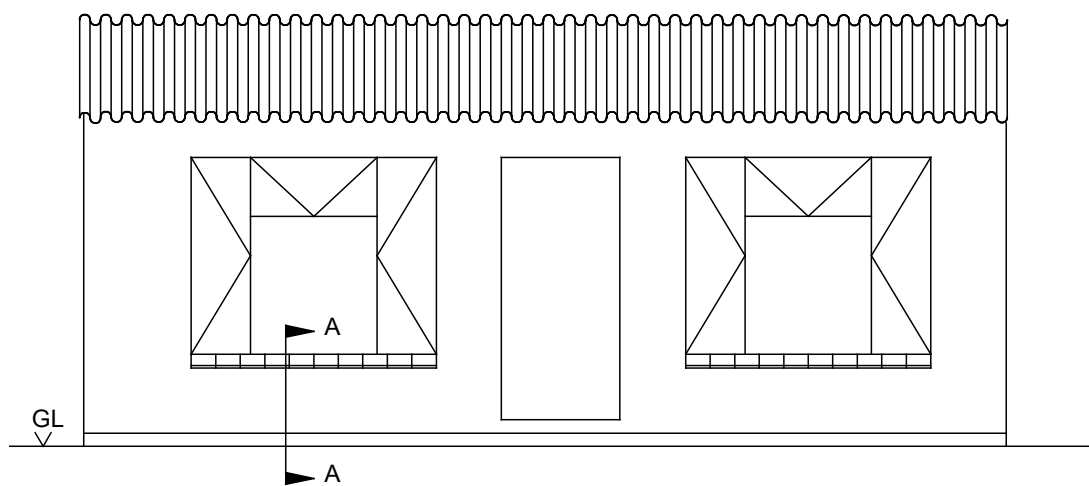
DIAGRAM SHEET 1**PLAN VIEW****FRONT ELEVATION****FIGURE 1**

DIAGRAM SHEET 2

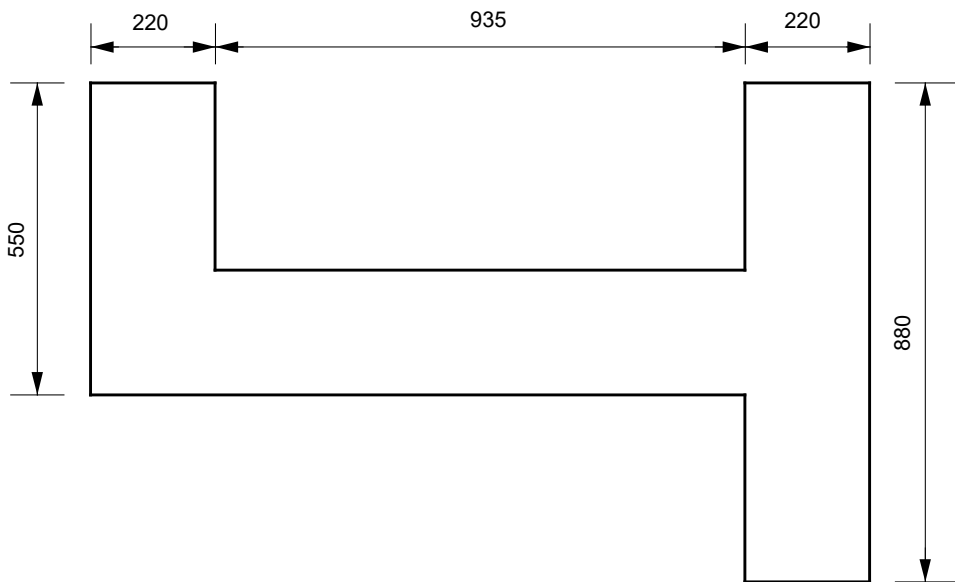


FIGURE 2

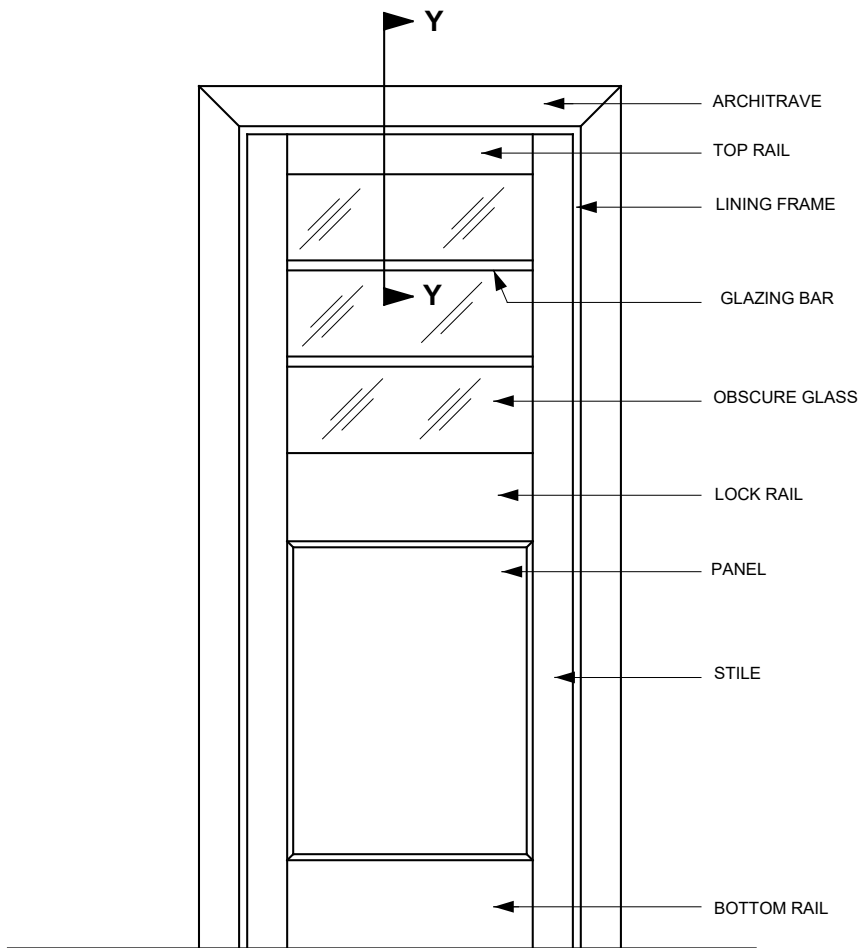


FIGURE 3