



# higher education & training

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Department:  
Higher Education and Training  
**REPUBLIC OF SOUTH AFRICA**

## **NATIONAL CERTIFICATE BUILDING DRAWING N2**

(8090012)

**19 August 2021 (X-paper)  
09:00–13:00**

**REQUIREMENTS: A2 drawing sheet**

**Drawing instruments and nonprogrammable calculators may be used.**

**This question paper consists of 6 pages.**

044Q1G2127

**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. Use both sides of the DRAWING PAPER.
  5. All the drawings are to be fully dimensioned and neatly finished off with descriptive titles and notes to conform with the SANS Recommended Practice for Building Drawings.
  6. A balanced layout must be maintained.
  7. Use your own discretion where dimensions are not given.
  8. All the drawings must be drawn to the required scale.
  9. All work you do not want to be marked must be clearly crossed out.
  10. Write neatly and legibly.
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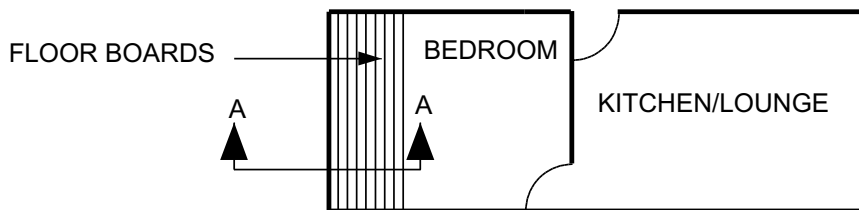
**QUESTION 1: FOUNDATION AND FLOORS**

FIGURE 1 shows the plan view of a house with two rooms. The external walls are built with concrete blocks of 190 mm thick, while the internal walls are built with concrete blocks of 90 mm thick. The internal walls rest on foundation walls of 190 mm thick, which rest on a concrete foundation of 550 mm × 220 mm. The bedroom has a timber floor, with floor boards nailed to 50 mm × 50 mm battens that are anchor to a concrete slab by means of floor clips.



Draw to a scale 1:10 a vertical section through A-A and show the following details:

- 550 mm × 220 mm concrete foundation
- 190 mm thick foundation wall
- 90 mm internal wall
- 19 mm plaster
- 100 mm thick concrete slab
- 150 mm hard-core
- DPC
- Floor clips
- 50 mm × 50 mm battens at 450 centres
- 100 mm × 22 mm floor boards
- 75 mm × 19 mm skirting
- 19 mm quadrant
- Concrete foundation dimensions
- Dimensions indicating the height of the concrete slab above the concrete foundation
- Dimensions for internal wall
- Dimensions for batten spacing



**FIGURE 1**

**[23]**

**QUESTION 2: BRICKWORK**

FIGURE 2 shows a plan view of a one-brick wall, built for interlocking fireplaces. The wall is built in Flemish bond.



Draw to scale 1:10 the alternate plan course of the wall.

Label only one Queen closer and all 3/4 bats. Do not insert dimensions



**FIGURE 2**

[17]

**QUESTION 3: JOINERY**

An external door, 2 040 mm high, 820 mm wide and 45 mm thick with a high lock rail and segmental shaped top tail is constructed with stiles of 110 mm wide. The top rail is 110 mm wide, but 75 mm wide at its centre. The lock rail and bottom rail are each 220 mm wide. The upper portion of the door is glazed with single pane frosted glass fixed with glazing beads on the outside. The bottom part of the door consists of a single 30 mm thick raised and fielded panel with planted mould on the inside.



3.1 Draw to scale 1:10 the outside view of the external door (label and insert the dimensions).



(12)

3.2 Draw to scale 1:2 a vertical section through part of the glass, lock rail and part of the panel (label the drawing).

(9)

[21]

### QUESTION 4: ROOF AND ROOF COVERING

FIGURE 3 shows a side view of a house with a fire place. The roof is covered with 420 mm × 250 mm Marseilles pattern tiles



Draw to scale 1:10 a vertical section of the area marked 'A' in FIGURE 3 and show the following

- Chimney stack
- Flue
- Parging
- Marseilles pattern tiles
- 45° pitch
- 114 mm × 38 mm rafters
- 38 mm × 38 mm battens at 340 mm centres
- Fillet
- Cover flashings
- Apron flashing
- Gutter
- Dimensions of chimney and flue

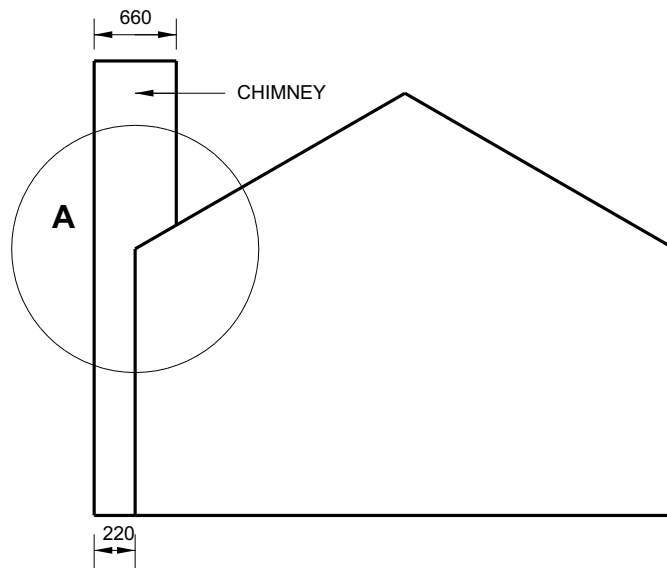



FIGURE 3

[18]

**QUESTION 5: PLUMBING**

Draw to scale 1:5 a vertical section through a closed valley of a roof covered with slates:

The drawing must include labelling and show the following:


- 114 mm × 38 jack rafters 
- 220 mm × 38 valley rafters
- 38 mm × 38 mm battens at 300 mm centres
- Slates
- Sheet lead
- Soakers
- Dimensions of the batten spacing

**[13]**



**QUESTION 6: MATERIALS**

Specify the ingredients and proportions for each of the following mixes

- 6.1 Concrete for reinforced floors, slabs and beams
- 6.2 Concrete for foundation of a house 
- 6.3 Cement mortar for laying bricks
- 6.4 Cement screed on floors to lay vinyl tiles

(4 × 2) **[8]**

**TOTAL: 100**