



**higher education
& training**

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

**NATIONAL CERTIFICATE
BUILDING AND CIVIL TECHNOLOGY N3**

(11010273)

**4 December 2023 (X-paper)
09:00–12:00**

Drawing instruments and nonprogrammable calculators may be used.

This question paper consists of 6 pages.

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DEPARTMENT OF HIGHER EDUCATION AND TRAINING
REPUBLIC OF SOUTH AFRICA
NATIONAL CERTIFICATE
BUILDING AND CIVIL TECHNOLOGY N3
TIME: 3 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. Start each section on a new page.
 5. Use only a black or blue pen.
 6. Write neatly and legibly.
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QUESTION 1

1.1 State SIX qualities or abilities of a leader. (6)

1.2 Various options are provided as possible answers to the following questions. Choose the answer and write only the letter (A–D) next to the question number (1.2.1–1.2.10) in the ANSWER BOOK.

1.2.1 The painter sees to it that ...

- A all sheet iron is well lapped, jointed and wedged.
- B enough access points are available.
- C specified coats are applied.
- D all dust is swept up beforehand.



1.2.2 A ... checks the contour level from dwelling to connection point.

- A plasterer
- B roofer
- C drain layer
- D concreter

1.2.3 A ... checks that no tears exist between coatings.

- A glazier
- B plasterer
- C carpenter
- D painter

1.2.4 ... checks that timber is of specified quality.

- A The internal works staff
- B A joiner
- C An electrician
- D A plumber



1.2.5 A ... takes samples and test cubes.

- A bricklayer
- B site supervisor
- C concreter
- D plasterer

1.2.6 ... checks that glass has been properly back puttied and cleaned off.

- A The internal works staff
- B A glazier
- C An electrician
- D A plumber



1.2.7 A/An ... ensures that trenches are according to specified width and depth.

- A bricklayer
- B supervisor
- C carpenter
- D excavator



1.2.8 A ... is responsible for the smooth running of branch offices or contracts.

- A town planner
- B supervisor
- C site supervisor
- D contracts manager

1.2.9 A/An ... submits their tender price to the architect within a stipulated time period.

- A engineer
- B owner
- C contractor
- D subcontractor

1.2.10 A/An ... is the designer and manager of a project.



- A clerk of works
- B architect
- C client
- D local authority

(10 × 1)

(10)
[16]

QUESTION 2

2.1 The pad or isolated foundation is used to support the load from piers and columns.

List the SEVEN parts that are found on this type of foundation.

(7)

2.2 Make a neat sketch to determine pipe levels using a U-tube method.

(6)

2.3 Briefly discuss the *stepped foundation*.

(3)
[16]



QUESTION 3

- 3.1 During the transport of concrete from the plant to the destination, important issues are at stake. 

State THREE issues that are at stake during the transportation process. (3)

- 3.2 How much water would you need (litres) in the following situation?

Calculate 100 kg of cement with a water-cement ratio of 0,5. (3)

- 3.3 Because there is never any certainty that soil will not collapse, it is vitally important to take precautions that will prevent this from happening.

State SEVEN safety checks that should be done before excavation. (7)

- 3.4 Calculate the volume of concrete that you would require in m³ to cast a foundation 15 m long by 0,710 m wide and 0,400 m thick.

(3)
[16]

QUESTION 4

- 4.1 State FOUR advantages of a combination geyser. (4)

- 4.2 Differentiate between:

-  4.2.1 V5
4.2.2 M5

(2 × 1) (2)

- 4.3 State FOUR disadvantages of knots in timber. (4)

- 4.4 Make a large, neat sketch of two channels welded to a base plate to ensure that the vertical load of the column does not penetrate or cut through the concrete surface.

(6)
[16]

QUESTION 5

- 5.1 Complete the following sentences by writing only the missing words next to the question number (5.1.1–5.1.4) in the ANSWER BOOK. 

5.1.1 25 ampere circuit breaker serves up to ... rooms.

5.1.2 16 ampere circuit breaker serves up to ... rooms.

5.1.3 20 ampere circuit breaker serves up to ... rooms.

 5.1.4 30 ampere circuit breaker serves up to ... rooms.

(4 × 1) (4)

5.2 Give FOUR reasons why walls are plastered. (4)

5.3 Draw a neat sketch of a light controlled by a two-way switch. (8)

[16]



QUESTION 6

6.1 A road consists of different layers of different materials, the strongest materials being placed on top and forming the actual running surface.

List FIVE different layers of a road. (5)

6.2 Give THREE reasons for the use of paving. (3)

6.3 A one-brick wall has to be built. The length of the wall is 15 m and the height is 2,7 m. The wall has a door opening of 2 m high and 1 m wide and a window opening of 2 m wide and 1,5 m high. Labour cost is R275 m².

NOTE: $\frac{1}{2}$ Brick walling (50 bricks/m²)
1 m³ sand = 1 000 kg (1 tonne)

Calculate the following:



6.3.1 The square area if given 11 500 bricks (bricks in 1 m² of one-brick wall = 100).

6.3.2 Calculate the labour costs. (2 × 2) (4)

6.4 A brick wall has an area of 180 m².

NOTE: (bricks in 1 m² one-brick walling = 100)
(1 000 kg = 1 ton)



6.4.1 Calculate the number of bricks required.

6.4.2 Calculate the amount of sand required. (2 × 2) (4)

6.5 A foundation of 25 mm long, 600 mm wide, and 250 mm thick must be cast.

Calculate the amount of concrete required and the cost of the concrete if the concrete cost is R475 m³. (4)
[20]

TOTAL: 100

