



higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE
BUILDING AND CIVIL TECHNOLOGY N3

(11010273)

10 August 2021 (X-paper)
09:00–12:00

Drawing instruments and nonprogrammable calculators may be used.

This question paper consists of 7 pages.

239Q1G2110

**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. Write neatly and legibly.
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QUESTION 1

1.1 Various options are given as possible answers to the following questions. Choose the answer and write only the letter (A–D) next to the question number (1.1.1–1.1.10) in the ANSWER BOOK.

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

- A Internal works
- B A glazier
- C An electrician
- D A plumber



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

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

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



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

1.1.4 A/An ... submits her/his tender price to the architect within a stipulated time period.



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

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

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



1.1.6 A/An ... ensures that a labourer pushes a loaded wheelbarrow.

- A local Authority
- B town planner
- C client
- D electrician

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

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

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

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

1.1.9 The ... checks that timber is of specified quality.

- A internal works 
- B joiner
- C electrician
- D plumber

1.1.10 A ... takes samples and test cubes.

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

(10 × 1) (10)

1.2 State the qualities of a leader.



(6)
[16]

QUESTION 2

2.1 State FIVE foundation checks.

(5)

2.2 Make a large, neat sketch of a pad foundation, indicating the following details clearly:



- Pad foundation
- Starter bars
- Weak concrete blinding
- Main bars
- Ground floor position
- Reinforced concrete column

(8)

2.3 Briefly explain an *independent scaffold*.

(3)
[16]

QUESTION 3

- 3.1 State FOUR causes of the collapse of soil within trenches. (4)
- 3.2 Calculate the amount (litres) of water necessary to mix concrete using 160 kg of cement if the cement ration is 0,4.  (3)
- 3.3 Name FIVE factors influencing the hardening and strengthening of concrete mixtures. (5)
- 3.4 Briefly explain each of the following terms:
- 3.4.1 Fine aggregate 
- 3.4.2 Coarse aggregate (2 × 2) (4)
- [16]**

QUESTION 4

- 4.1 Write each of the following abbreviations in full:
- 4.1.1 AO 
- 4.1.2 CE
- 4.1.3 SW
- 4.1.4 SP
- 4.1.5 SC
- 4.1.6 WB (6 × 1) (6)
- 4.2 Name TWO advantages of a combination geyser.  (2)
- 4.3 Make a neat drawing of a vertical section through a structural steel column fixed to a concrete base and label all details. (8)
- [16]**

QUESTION 5

- 5.1 Define *footway*. (2)
- 5.2 State FIVE characteristics of a floor construction to function properly. (5)
- 5.3 Make neat, large sketches of each of the following electrical symbols:
- 5.3.1 Distribution board 
- 5.3.2 Earth
- 5.3.3 Fluorescent light
- 5.3.4 Two-way switch
- 5.3.5 Socket outlet
- 5.3.6 Electricity outlet
- 5.3.7 Regulation switch 
- 5.3.8 One-way switch (three poles) (8 × 1) (8)
- 5.4 Where would clay tiles be used? (1)
-  [16]

QUESTION 6

- 6.1 Explain where granolithic flooring would be used. (2)
- 6.2 Describe the manufacturing of clay tiles. (2)
- 6.3 Explain each of the following road terms:
- 6.3.1 Crown of road
- 6.3.2 Haunch 
- 6.3.3 Fine cold asphalt
- 6.3.4 Wearing course (4 × 1) (4)

- 6.4 A one-brick wall has a length of 16 m and a height of 3 m. The wall has a door opening of 2 m high and 1,8 m wide and a window of 1,5 m wide and 1,5 m high. Labour cost is R200 per m².



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

Calculate each of the following:

- 6.4.1 Area of wall 
- 6.4.2 Number of bricks required
- 6.4.3 Amount of sand required
- 6.4.4 Labour cost

(4 × 3) (12)
[20]

TOTAL: 100