higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

T130**(E)**(A2)T

NATIONAL CERTIFICATE

BUILDING AND STRUCTURAL CONSTRUCTION N4

(8060004)

2 August 2018 (X-Paper)
09:00–13:00

REQUIREMENTS: ONE A2 drawing sheet

Drawing instruments may be used.

This question paper consists of 4 pages.

Copyright reserved

DEPARTMENT OF HIGHER EDUCATION AND TRAINING
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE
BUILDING AND STRUCTURAL CONSTRUCTION N4
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. Draw ALL drawings to the required scale.
5. Use both sides of the DRAWING SHEET.
6. ALL drawings, including the candidate's information, must be done in pencil.
7. Ink pens are NOT allowed.
8. ALL drawing work must comply with the relevant SANS (SABS) recommended codes.
8. Use your own discretion where dimensions are NOT given.
9. ALL abbreviations and symbols must comply with the latest National Building Regulations and ALL relevant SANS (SABS) codes.
10. A balanced layout is very important and candidates will be penalised for poor planning.
11. Sketches and/or diagrams must be neat, reasonably large, in proportion and fully labelled.
12. ALL labelling must be done in capital letters.
13. Write neatly and legibly.

Copyright reserved

QUESTION 1: BRICK BONDING

Draw, to scale 1 : 10, an isometric view of the alternate plan courses of a 385 mm cavity-wall corner with the length of the walls approximately 1 265 mm and 1 045 mm, each with stopped ends. The lower projection must be FOUR courses high and in English bond. **[10]**

QUESTION 2: STEEL DOORFRAMES

2.1 Explain each of the following terms regarding a steel doorframe:

2.1.1 Hinge jamb

2.1.2 Lock jamb

2.1.3 Rubber stop

2.1.4 Tie bar

2.1.5 Fixing lugs

(5 × 2) (10)

2.2 Draw, to scale 1 : 5, an isometric drawing of a steel doorframe. (10)
[20]

QUESTION 3: STEEL WINDOW

Draw, to scale 1 : 2, a horizontal section through a steel window. Indicate the side-hung window and the position of the timber strip. **[10]**

QUESTION 4: ARCH WORK

Draw, to scale 1 : 10, the front view of a rough three-ring semicircular arch. The span is 1 500 mm and only half of the brickwork in the arch must be shown. NO surrounding bricks must be shown. **[10]**

Copyright reserved

QUESTION 5: ROOF AND ROOF COVERINGS

Galvanised ridging with a pitch of 30° and a ridge brace of 152 mm × 38 mm must be constructed on a rafter of 152 mm × 38 mm which is supported by one-and-a-half brickwork.

Draw, to scale 1 : 10, the front view of the strutted truss with pin joints.

Brick wall:	One and a half
Span:	9 m
Tie beam:	152 mm × 38 mm
Strut:	114 mm × 38 mm
Queen post:	114 mm × 38 mm
King post:	152 mm × 38 mm
Ridge brace:	152 mm × 38 mm
Wall plate:	114 mm × 38 mm
Purlin:	76 mm × 50 mm

[20]

QUESTION 6: GUTTERING

Explain by means of a rough drawing each of the following gutters:

6.1 Half-round gutter with a fascia board and downpipe

6.2 Square gutter with a fascia board and downpipe

(2 × 5) **[10]**

QUESTION 7: STRUCTURAL STEEL WORK

A stanchion will be used as a pillar to hang a name board. A 305 mm × 305 mm × 96,8 kg/m H-section, with 9,9 mm web thickness and 15,4 mm flanged thickness, is secured to a 1 100 mm × 1 100 mm × 450 mm-thick chamfered edge concrete foundation through a base plate of 550 mm × 550 mm thick by means of M22 hold-down hook bolts cast 150 mm into a concrete slab. 15 mm-thick gusset plates are welded to the stanchion flange and secured to the base plate by 150 mm × 90 mm × 10 mm-thick angle iron cleats riveted to the gusset plates and base plates by means of 20 mm shop-driven rivets.

7.1 Draw, to scale 1 : 10, a vertical section through TWO hold-down bolts with ONE column flange facing forward. Clearly show the method followed to provide for the adjustment of the position of the hold-down bolts during installation. (10)

7.2 Draw, to scale 1 : 10, a top view of the stanchion assembly fitted to the foundation. Show by means of welding symbols how the stanchion and gusset plates must be welded to the base plate of the assembly. (10)

[20]

TOTAL: 100

Copyright reserved