



higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

T120(E)(J28)T
AUGUST 2010

NATIONAL CERTIFICATE

BUILDING A AND STRUCTURAL CONSTRUCTION N4

(8060004)

28 July (X-Paper)
09:00 – 13:00

REQUIREMENTS: ONE A2 drawing paper
Standard hot-rolled structural steel section tables
(BOE 8/2)

This question paper consists of 4 pages.

DEPART

DUCK
SOUTH

NG

NATIONAL CERTIFICATE
BUILDING AND STRUCTURAL CONSTRUCTION
TIME: 4 HOURS
MARKS: 100

INSTRUCTIONS AND INFORMATION

1. Read ALL the questions carefully.
2. Use BOTH sides of the drawing paper.
3. A balanced layout is very important and candidates will be penalised for bad planning.
4. A 15 mm border must be drawn around the drawing sheet (BOTH sides).
5. Number the answers correctly according to the numbering system used in this question paper.
6. ALL drawing work, including candidate information, must be done in pencil.
7. ALL the drawing work must comply with the SABS Recommended Code of Practice for Building Drawing as well as the SABS 0111-1990.
8. ALL the Building Regulations must comply with the National Building Regulations SABS 0400-1990.

QUESTION 1

The apex (top end) of a saw-tooth truss is composed of 70 mm x 70 mm x 8 mm x 8,36 kg/m rafters and struts bolted to 8 mm thick gusset plates. The rafters are positioned at 30° and 60° to the horizontal plane. The roof covering consists of adjustable asbestos ridging and 'Big Six' asbestos sheets, secured by means of hook bolts to 100 mm x 65 mm x 8 mm x 9,94 kg/m angle purlins which are bolted to suitable angle cleats to the rafters.

The side lights are to be constructed of wired glass onto patent glazing bars with lead flashing dressed over onto the wired glass roof 'light' panes.

Draw, to scale 1:5, a vertical section view through the apex and clearly show the construction of the roof and insulation material.

[20]

PTO

QUESTION 2

- 2.1 Draw, to scale 1:10, the front elevation of a gauge segmental arch one-and-half-brick deep.

The arch spans 1 200 mm and the rise is one sixth of the span. Only half of the brickwork in the arch need be shown. The remaining half of the arch must clearly illustrate the construction method used.

(15)

- 2.2 Give brief description with regard to the construction and purpose of centring for arches.

(5)

[20]**QUESTION 3**

- 3.1 Draw, to scale 1:2, a vertical section through only the bottom section of a steel casement window, set in a one-brick face brick wall, plastered on the inside, with quarry tile sill and terrazzo window board.

Clearly show the damp-proof course and also a portion of the clear sheet glass with putty in the steel frame.

(10)

- 3.2 Draw, to scale 1:5, a vertical section through the top end of a 26° lean-to roof built against a brick wall showing a 114 mm × 38 mm rafter supported by a 114 mm × 76 mm wall plate bolted to the wall.

Show the galvanised apron and under flashing for the corrugated roof covering on 51 mm × 76 mm purlins as well.

(10)

[20]**QUESTION 4**

There are many methods and ways of fixing (hanging) ceiling to branderling. Draw, to scale 1:1, the detail of the following ceiling and show how you would secure 19 mm thick fibre board with V-shaped joints:

- 4.1 To 38 mm × 38 mm branderling by means of nails

(4)

- 4.2 To aluminium T-sections

(4)

[8]

QUESTION 5

- 5.1 State the purpose of a wall plate. (3)
- 5.2 State TWO advantages of gypsum ceiling board. (2)
- 5.3 Describe or draw to no scale the TWO ways of later joining unfinished brickwork:
- 5.3.1 Raking back (3)
- 5.3.2 Toothing (4)

[12]**QUESTION 6**

- 6.1 Draw, to scale 1:10, the isometric view of a two-brick corner built to English bond. Both projections are to be approximately 1 000 mm long and lower projection must be four courses high. (15)
- 6.2 Briefly explain or describe how you would set up a steel door frame in position to ensure that it is plumb-level and in line with the wall. (5)

[20]**TOTAL: 100**