higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

T220**(E)**(J18)T

NATIONAL CERTIFICATE

BUILDING DRAWING N3

(8090023)

18 July 2018 (X-Paper)
09:00–13:00

REQUIREMENTS: A2 drawing sheet

Drawing instruments may be used.

This question paper consists of 8 pages.

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DEPARTMENT OF HIGHER EDUCATION AND TRAINING
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE
BUILDING DRAWING N3
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. Use BOTH sides of the drawing sheet.
5. ALL drawings must be fully dimensioned and neatly finished off with descriptive titles and notes to conform with the SANS Recommended Practice for Building Drawings.
6. Maintain a balanced layout.
7. Use your own discretion where dimensions are not given.
8. ALL 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: BRICKWORK – ENGLISH BOND

Draw, to scale 1 : 10, the alternate plan layer of a stopped intersection between TWO brick walls build in English bond.

Specifications:

Bricks	:	220 mm × 110 mm × 75 mm
Queen closer	:	220 mm × 55 mm × 75 mm
Wall thickness	:	440 mm
Length on both sides	:	880 mm

No stopped ends are required but the queen closer must be indicated at ONE of the intersections to avoid straight joints. **[10]**

QUESTION 2: JOINERY – STAIRS

Draw, to scale 1 : 20, the plan view of a stair with a half-space landing built against one of the external walls of a room. The drawing should include the external wall, the landing, SEVEN steps in the lower flight, SIX steps in the upper flight, the handrail and newel post.

Specifications:

External wall	:	220 mm
Landing	:	900 mm × 1 800 mm
Treads	:	230 mm
Lower flight	:	900 mm wide
Upper flight	:	900 mm wide
Handrail	:	own design
Newel post	:	own design **[10]**

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QUESTION 3: STONE DRESSING TO OPENINGS

The surrounding opening of a wall is built with masonry on sides with a flat arch at the top. The flat arch consists of stepped extrados.

Draw, to scale 1 : 10, the front elevation of the arch. The drawing must include the keystone with bevelled corner stone and bevelled voussoirs, the construction lines to show how you obtained the slant of the voussoirs and TWO stones below the bevelled corner stone.

Specifications:

Opening or span	:	1 000 mm
Camber	:	10 mm
Keystone	:	600 mm × 390 mm
Corner stone	:	300 mm × 150 mm
Stone steps	:	200 mm
Side stones	:	300 mm × 150 mm and 150 mm × 150 mm
Stone slant or angle	:	60 degrees **[16]**

QUESTION 4: ROOF WORK – PITCHED ROOF WITH BROSELEY TILES

A house must be provided with a pitched roof covered with Broseley tiles.

Draw, to scale 1 : 5, a vertical section through the eaves of the roof. The drawing must include the Broseley tiles up to the FIFTH batten from the fascia board, the torching, the fascia board, the gutter, part of the rafter, part of the tie beam, the wall plate and part of the external wall.

Specifications:

Roof pitch	:	45 degrees
Eaves	:	open eaves
Overhang	:	200 mm
Wall	:	220 mm
Fascia	:	230 mm × 32 mm
Gutter	:	100 mm round
Rafter	:	114 mm × 38 mm

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Tie beam	:	114 mm × 38 mm
Wall plate	:	114 mm × 38 mm
Battens	:	38 mm × 38 mm at 102 mm centre to centre
Broseley tiles	:	267 mm × 165 mm
Tile lap	:	102 mm
Torching	:	own discretion **[16]**

QUESTION 5: STEEL BEAM AND CONCRETE FLOOR

FIGURE 1 shows the plan view of a reinforced concrete floor with steel beams that are supported by concrete columns.

Draw, to scale 1 : 20, a section through the floor as indicated by B–B. The drawing must include the main beam, the secondary beam, the filler beam, the cleats, part of the concrete floor and part of the screed.

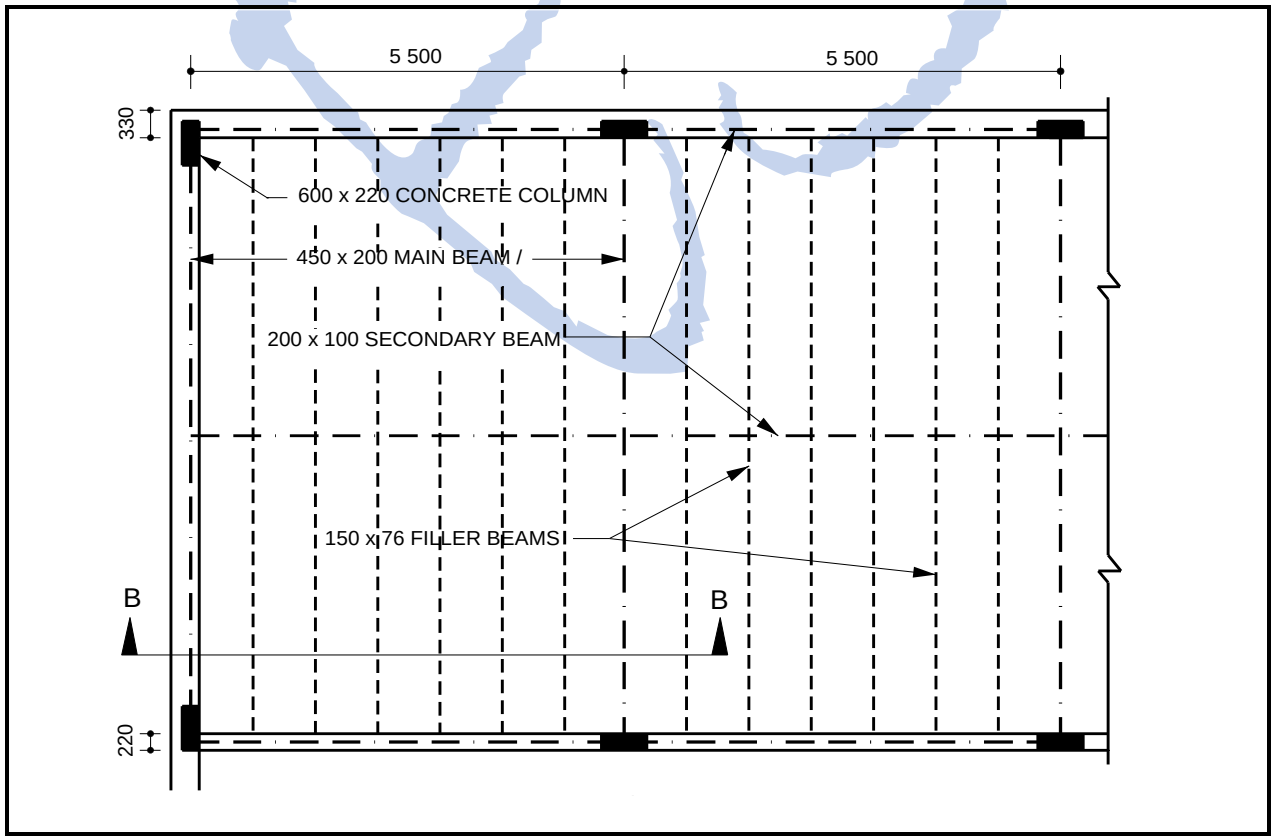

FIGURE 1

Specifications:

Main beam	:	530 mm × 200 mm
Secondary beam	:	200 mm × 100 mm
Filler beam	:	150 mm × 76 mm
Cleats	:	76 mm × 76 mm × 8 mm
Concrete floor	:	200 mm
Screed	:	20 mm

[16]

QUESTION 6: COLD WATER SUPPLY FOR A DOUBLE STOREY

A double storey building must be provided with cold water draw-off points. The double storey consists of a bathroom and toilet on the first floor and a kitchen and laundry on the ground floor.

Show by means of a line diagram (not to scale) the pipe arrangement for the cold-water system from the municipal stopcock outside the building up to the geyser and draw-off points. The cold-water supply must branch off just after the pressure-reducing valve at the geyser. The diagram must include the supply and draw-off points to the geyser, the bath, the hand basin, the toilet and the TWO sinks, the municipality stopcock, a boundary wall, the municipality water meter and the line diagram of the building.

Specifications:

Supply points	:	to geyser, to bath, to hand basin, to sinks and to toilet
Draw-off points	:	at hand basin, at bath and at sinks
Stopcocks	:	at consumer supply, at municipality supply, at toilet and at geyser
Water meter	:	situated outside of boundary wall just before municipality stopcock
Boundary wall	:	4 500 mm from building

[10]

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QUESTION 7: FLOOR FINISHES

Many patterns or bonds are used for placing wooden blocks or ceramic tiles on solid floors.

Make neat, large, proportional sketches to show the difference between the following patterns or bonds:

7.1 Stretcher bond pattern

7.2 Basket pattern

7.3 Herringbone pattern

(3 × 4) **[12]**

QUESTION 8: WALL PANELLING

FIGURE 2 shows the front elevation of a wall that is covered with resoboard panels.

Draw, to scale 1 : 20, a section through the panel and wall as indicated by A–A. The drawing must include the wall, the rough grounds, the resoboard panel, the cover strip, the dado capping, the dado mould, the plaster and the skirting.

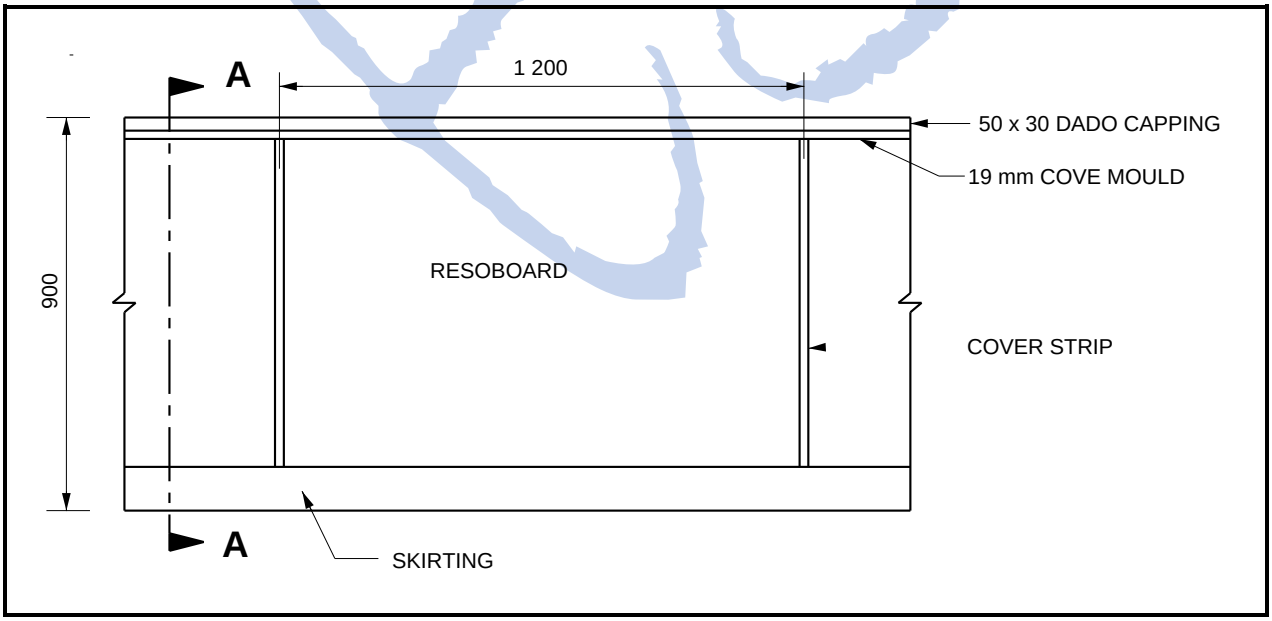

FIGURE 2

Specifications:

Wall	:	110 mm
Rough grounds	:	75 mm × 19 mm
Resoboard	:	1 200 mm × 20 mm
Cover strip	:	20 mm × 8 mm
Skirting	:	100 mm × 20 mm
Dado capping	:	50 mm × 30 mm
Cove moulding	:	19 mm

[10]

TOTAL: 100

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