higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

T220**(E)**(M20)T

NATIONAL CERTIFICATE

BUILDING DRAWING N3

(8090023)

20 March 2018 (X-Paper)
09:00–13:00

REQUIREMENTS: A2 drawing sheet

Drawing instruments may be used.

This question paper consists of 7 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: STONE DRESSING

Draw, to scale 1 : 10, the vertical section through the external wall, foundation and concrete floor of a building. The external wall consists of hammered or squared faced ashlar while the internal skin consists of brickwork that lies in THREE courses with the ashlar. The wall is plastered internally only.

The drawing must include the foundation, part of the external wall, ground level, part of the concrete floor, part of the flooring board, TWO floor bearers, the skirting and plaster.

SPECIFICATIONS

Concrete foundation	:	700 mm × 240 mm
External wall	:	330 mm
Ashlars	:	225 mm high by 165 mm wide and 225 mm high by 110 mm wide
Bricks	:	220 mm × 110 mm × 75 mm
Concrete floor	:	125 mm situated 375 mm above the top of the foundation
Hard core	:	150 mm
Ground level	:	150 mm below the DPC
Floor	:	Wooden floor fixed on top of floor bearers
Floor bearers	:	75 mm × 50 mm splayed and sunk 40 mm into concrete floor
Flooring boards	:	100 mm × 22 mm knotty pine
Skirting	:	150 mm × 25 mm
Plaster	:	19 mm
DPC	:	230 micron

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QUESTION 2: ROOF WITH PARAPET GUTTER

Draw, to scale 1 : 10, a vertical section through a parapet gutter, part of the parapet wall, part of the roof and part of the ceiling fixed directly to the tie beam. The wall is plastered on both sides.

Show only TWO roof battens with the bottom layers of slates and TWO ceiling branderings.

SPECIFICATIONS

Roof pitch	:	30 degrees
Rafter	:	150 mm × 38 mm
Tie beam	:	150 mm × 38 mm
Wall plate	:	114 mm × 38 mm
Roof battens	:	38 mm × 38 mm
Tilting fillet	:	50 mm × 38 mm
Roof covering	:	Fibre cement slates
Parapet gutter	:	300 mm wide
Parapet boarding	:	22 mm
Parapet lining	:	Bituminous sheeting
Flashing	:	Metal flashing
Boarding cleat	:	Own discretion
Wall	:	330 mm reduce to 220 mm at wall plate height up to coping stone height
Coping stone	:	280 mm × 75 mm feather-edged coping stone
Ceiling brandering	:	38 mm × 38 mm
Ceiling board	:	4 mm fibre cement
Cornice	:	75 mm round
Plaster	:	19 mm

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QUESTION 3: BRICKWORK – BONDING OF WALLS

A plot is to be provided with a freestanding garage built on the boundary. The wall is 2 800 mm in height measured from the top of the foundation up to the underside of the wall plate. The wall is built in Flemish bond.

Draw, to scale 1 : 10, a complete vertical section through the boundary wall from the foundation up to underside of the wall plate, including the wall plate. Show the bonding of the brickwork, the foundation, part of the compacted filling, part of the concrete slab, the DPC, the natural ground level and wall plate. The height of the wall can be presented by means of a broken line.

SPECIFICATIONS

Foundation	:	900 mm × 230 mm cast on boundary line
Wall	:	330 mm built on edge of foundation
Concrete slab	:	75 mm FIVE courses above the top of the foundation
Compact filling	:	200 mm
Wall plate	:	114 mm × 38 mm
DPC	:	230 micron
NGL	:	150 mm below DPC
Roof	:	NOT required

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QUESTION 4: FINISHING AT OPENINGS – HEAD OF CASEMENT WINDOW

Draw, to scale 1 : 5, the vertical cross section of the top of a casement window frame built into a cavity brick wall. The wall is plastered internally only.

The drawing must include part of the wall, the lintels, the DPC, the plaster, the head of the frame, the top rail and part of the glazing.

SPECIFICATIONS

Wall	:	270 mm cavity
External skin	:	Face brick
Internal skin	:	Ordinary bricks
Plaster	:	19 mm
Brick force	:	SANS-approved every second layer
Tie wires	:	SANS-approved every third layer
DPC	:	375 micron
External lintel	:	164 mm × 75 mm precast prestressed
Internal lintel	:	106 mm × 75 mm precast prestressed
Frame head	:	100 mm × 75 mm
Top rail	:	50 mm × 44 mm
Glass	:	3 mm clear glass

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QUESTION 5: JOINERY – WOODEN STAIRS

Draw, to scale 1 : 10, a vertical longitudinal section through a wooden timber stair case. The staircase is constructed within a closed stringer.

The drawing must include at least THREE complete steps.

SPECIFICATIONS

Tread	:	300 mm × 32 mm
Rise	:	180 mm × 32 mm
Carriage	:	100 mm × 50 mm
Rough bracket	:	100 mm × 22 mm
Wedges	:	Own discretion
Stringer	:	450 mm × 50 mm

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QUESTION 6: METAL JAMB LININGS

A single rebated steel door jamb is to be built into a one-brick wall which is plastered on both sides.

Draw, to scale 1 : 2, a horizontal section through one half of the opening. The drawing must include the wall, the steel doorframe, the plaster, fixing lug and part of the door.

SPECIFICATIONS

Wall	:	220 mm
Frame	:	Single rebated
Plaster	:	19 mm
Fixing lug	:	Own discretion
Door	:	44 mm

[10]

TOTAL: 100

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