higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

T190(E)(M23)T
APRIL 2012

NATIONAL CERTIFICATE: MULTI-DISCIPLINARY DRAWING OFFICE PRACTICE

BUILDING DRAUGHTING

(2050035)

23 March (X-Paper)
09:00 – 13:00

CLOSED-BOOK EXAMINATION

REQUIREMENTS: ONE A3 drawing paper

Calculators may be used.

This question paper consists of 6 pages and 4-page diagram sheets.

DEPARTMENT OF HIGHER EDUCATION AND TRAINING
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE: MULTI-DISCIPLINARY DRAWING OFFICE PRACTICE
BUILDING DRAUGHTING
TIME: 4 HOURS
MARKS: 100

INSTRUCTIONS AND INFORMATION

1. Answer ALL the questions.
2. Read ALL the questions carefully.
3. Number the answers correctly according to the numbering system used in this question paper.
4. Use BOTH sides of the drawing paper.
5. A balanced layout is very important and candidates will be penalised for bad planning.
6. A 15 mm border must be drawn around the drawing sheet (BOTH sides).
7. The question numbers must be clearly indicated.
8. ALL drawing work, including candidate information, must be done in pencil.
9. ALL the drawing work must comply with the SABS Recommended Code of Practice for Building Drawing as well as the SANS 10111-1990.
10. ALL the building regulations must comply with the National Building Regulations SANS 10400-1990.
11. For the purpose of the examination brick sizes should be taken as 220 mm x 110 mm x 75 mm.
12. ALL the abbreviations and symbols must comply with the latest National Building Regulations and all relevant SANS (SABS)-codes.
13. Write neatly and legibly.

QUESTION 1: APPLICATION OF THE NATIONAL BUILDING REGULATIONS

1.1 Plans, drawings and diagrams shall be drawn to a suitable scale selected from one of the following scales in the TABLE below. Complete the third column by writing TRUE or FALSE next to the question number (1.1.1 – 1.1.5) in your ANSWER BOOK.

DESCRIPTION	SCALES TO BE USED	TRUE or FALSE
SITE PLANS	SCALE 1:25; SCALE 1:20; SCALE 1:5	1.1.1
GENERAL STRUCTURAL ARRANGEMENT DRAWINGS AND STRUCTURAL DETAILS	SCALE 1:100; SCALE 1:50; SCALE 1:20; SCALE 1:10; SCALE 1:5; SCALE 2:1 OR SCALE 1:1	1.1.2
FLOOR PLAN LAYOUT	SCALE 1:10; SCALE 1:5	1.1.3
SECTIONS	SCALE 1:5; SCALE 1:2	1.1.4
ELEVATIONS / VIEWS	SCALE 1:100; SCALE 1:50	1.1.5

(5)

1.2 For the purposes of the NBR (National Building Regulations) the following definitions shall apply. Complete the third column by writing TRUE or FALSE next to the question number (1.2.1 – 1.2.5) in your ANSWER BOOK.

TERMS (in relation to a site)	DEFINITIONS	TRUE or FALSE
Building line	A line prescribed in any town planning scheme or any other law designating the boundaries of the area of the site outside of which the erection above ground of any building is prohibited.	1.2.1
Street boundary	The boundary of such site which abuts any highway or freeway.	1.2.2
Natural ventilation	The movement of air through a building due to natural causes.	1.2.3
Drainage installation	Any installation vested in the owner of a site and which is situated on such site and is intended for the reception, conveyance, storage or treatment of sewage, and may include sanitary fixtures, traps, discharge pipes, drains, ventilating pipes, septic tanks, and conservancy tanks.	1.2.4
Dwelling house	A single dwelling unit and any garage and other domestic outbuilding thereto, situated on its own site.	1.2.5

(5)
[10]

QUESTION 2: FLOOR PLAN LAYOUT

FIGURE 1, DIAGRAM SHEET 1, (attached) shows a site plan of a proposed single-storey dwelling with a garage.

BRIEF SPECIFICATIONS

Roof pitch	18 degrees
Roof truss	Howe-type roof trusses
Roof covering	Clay tiles
Concrete foundations	600 x 200 mm
Foundation walls	1 brick solid
Concrete floor	75 mm
Barge boards	222 x 32 mm SA pine
Rain-water goods	PVC
Windows and doors	As per attached DIAGRAM SHEET 3

As a draughtsperson, you must design a single-storey dwelling by using the outside dimensions given on the site plan.

Draw, using scale 1:100, a fully detailed working drawing of the floor plan layout of the dwelling. The following must be included and indicated on the plan:

2.1 A garage, 2 bedrooms, kitchen, dining/living-room and a full bathroom

2.2 Room names and floor finishes

2.3 All external, internal and wall dimensions

2.4 Window and door symbols

2.5 Sanitary installation symbols must be in accordance with the SANS (SABS) Code of Practice for Building Drawing

2.6 Window codes

2.7 Section arrows

2.8 Title and scale

2.9 True North **[30]**

QUESTION 3: SECTION THROUGH DWELLING

Draw, using scale 1:50, a section A-A through the dwelling as shown on the site plan (DIAGRAM SHEET 1). Indicate the following specifications:

3.1 The pitch, roof cover, truss and ceiling

3.2 Gutter on fascia

3.3 Roof covering (eaves projection) = 300 mm

3.4 Strip foundation (to include sizes)

3.5 Concrete slab

3.6 Damp-proof course (to include minimum height above FGL)

3.7 Damp-proof membrane

3.8 Compacted fill

3.9 Screed

3.10 External and internal walls

3.11 Finished ground level and finished floor level

3.12 Dimension the ceiling height, roof overhang and the minimum damp-proof course distance from the ground level.

3.13 Title and scale **[28]**

QUESTION 4: ELEVATIONS

Draw using scale 1:100, ALL the views (north, east, south and west) from your design.

4.1 Wall finish (plaster)

4.2 Roof bracing (use hidden lines on roof)

4.3 Title and scale **[16]**

QUESTION 5: SITE PLAN

Refer to FIGURE 1, DIAGRAM SHEET 1 and copy the site plan using a scale 1:200. The following must be included and indicated on the site plan:

5.1 The boundary lines and pegs

5.2 The position of the driveway (carriage-way crossing)

5.3 The building lines as shown

5.4 The proposed dwelling in the correct position (show the roof as seen from the top)

5.5 The drainage system

5.6 The direction of the true north

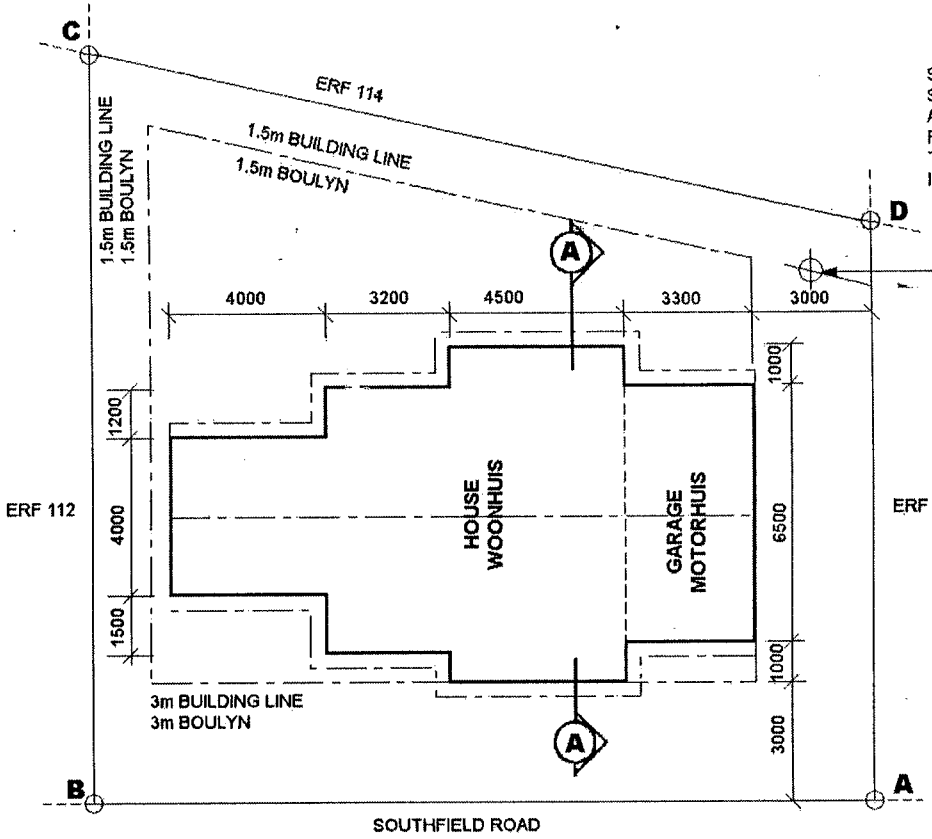
5.7 Title and scale

5.8 The name of the street **[16]**

TOTAL: 100

DIAGRAM SHEET 1

THIS FIGURE ABCD REPRESENTS ERF 115
DIE FIGUUR ABCD VERTEENWOORDIG ERF 115
SITUATED IN CAPE TOWN
GELLE IN KAAPSTAD
SURVEYED IN 04 - 03 - 09
OPGEMEET IN 04 - 03 - 09
LAND SURVEYOR
LANDMETER



SEWAGE CONNECTION POINT IS 1.5m
SETBACK FROM SIDE AND ROAD BOUNDARIES
AND IS THE DEPTH OF 1.2m
RIOLERING AANSLUITINGSPUNT IS 1.5m
TERUG VANAF SY-EN STRATT GRENSE EN
IS 1.2m DIEP

DRAINAGE CONNECTION POINT
RIOLERING AANSLUITING PUNT

LAND SURVEYOR'S CERTIFICATE
LANDEMETERSETIFIKAAT

SIDES / SYE

AB = 20.00m
AD = 14.63m
BC = 19.13m
CD = 20.50m

N

SITE PLAN
SCALE 1:200

PERSEELPLAN
SCALE 1:200

FIGURE 1

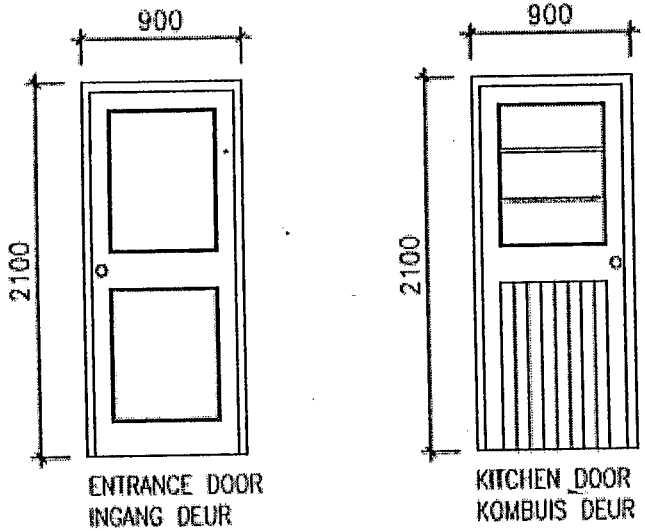
DIAGRAM SHEET 2

TABLE 1 – MAXIMUM TRUSS SPANS FOR VARIOUS RAFTER AND TIE-BEAM SIZES: SANS 10400 1990

1	2	3	4 Max. span, m/	5 Max. span, m/	6 Max. span, m/
ROOF COVERING	**TRUSS MEMBER**	**NOMINAL TIMBER SIZE mm**	**TIMBER GRADE 4**	**TIMBER GRADE 6**	**TIMBER GRADE 8**
Class A	Rafter	38 x 114 mm 38 x 152 mm 38 x 228 mm	3,1 4,0 6,1	4,6 5,8 8,5	5,8 7,2 10,0
	Tie-beam	38 x 114 mm 38 x 152 mm 38 x 228 mm	3,1 4,5 7,1	4,5 6,4 10,0	6,2 8,3 10,0
Class B	Rafter	38 x 114 mm 38 x 152 mm 38 x 228 mm	6,0 8,2 10,0	9,0 10,0 10,0	10,0 10,0 10,0
	Tie-beam	38 x 114 mm 38 x 152 mm 38 x 228 mm	4,7 5,9 7,2	6,7 8,5 10,0	9,4 10,0 10,0
Class C	Rafter	38 x 114 mm 38 x 152 mm 38 x 228 mm	6,2 8,0 10,0	9,0 10,0 10,0	10,0 10,0 10,0
	Tie-beam	38 x 114 mm 38 x 152 mm 38 x 228 mm	4,5 5,9 8,7	6,7 8,7 10,0	9,0 10,0 10,0

Class A roof covering includes metal sheets and fibre-cement sheets
Class B roof covering includes concrete tiles, clay tiles or similar materials and thatch
Class C roof covering includes metal roof tiles

DIAGRAM SHEET 3



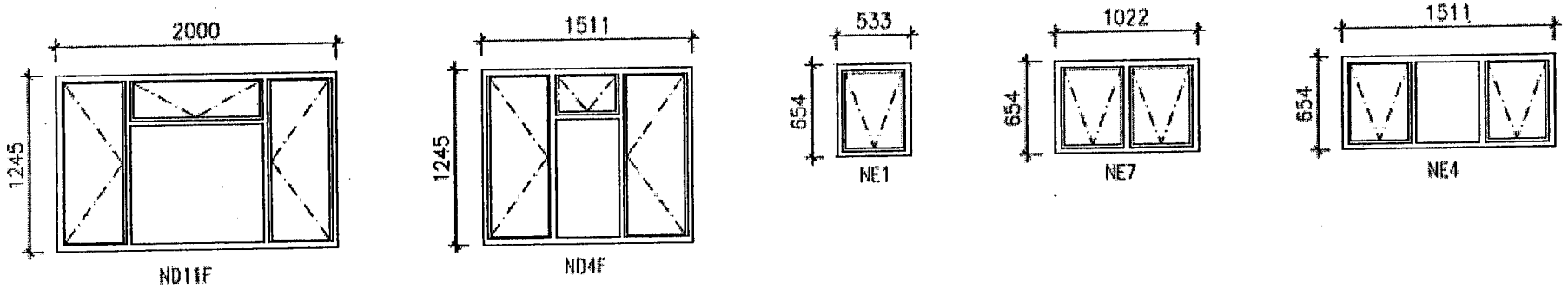


DIAGRAM SHEET 4

ROOMS AND THEIR DIMENSIONS: SANS 10400:1990

1	2
ROOM OR SPACE	**MINIMUM HEIGHT AND FLOOR AREA**
Any habitable room other than a kitchen, scullery or laundry	2,4 m over a minimum of 70% of the floor area, and not less than 2,1 m over the remaining floor area 6 m^2 with no linear dimension of less than 2 m
Bedroom	2,4 m over a floor area of at least 6 m^2 with a clear height of at least 1,8 m at any point more than 0,75 m from the edge of the floor space
All habitable rooms other than those listed above	2,4 m 6 m^2 with no linear dimension of less than 2 m
Passage or entrance hall	2,1 m
Bathroom, shower-room, laundry or room containing a WC pan	2,1 m over any area where a person would normally be in a standing position
Open mezzanine floor which has an area not exceeding 25% of the area of the floor immediately below it	2,1 m above and below the mezzanine floor