higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE: MULTIDISCIPLINARY DRAWING OFFICE PRACTICE
BUILDING DRAUGHTING

(2050035)

19 November 2020 (X-paper)
09:00–12:00.

REQUIREMENTS: ONE A2 drawing sheet

Candidates may use CAD software.
Calculators may be used.

This question paper consists of 6 pages, 3 diagram sheets, and 2 information sheets.

151Q1E2019

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DEPARTMENT OF HIGHER EDUCATION AND TRAINING
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NATIONAL CERTIFICATE: MULTIDISCIPLINARY DRAWING OFFICE PRACTICE
BUILDING DRAUGHTING
TIME: 3 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. Start each section on a new page.
5. Use only a black or blue pen.
6. Use both sides of the drawing paper.
7. A balanced layout is important, and candidates will be penalised for bad planning.
8. A 15mm border must be drawn around the drawing sheet (both sides).
9. The question numbers must be clearly indicated.
10. All drawing work including candidate information, must be done in pencil.
11. All the drawing work must comply with the SABS Recommended Code of Practice for Building Drawing as well as the SANS 10111-1990.
12. All the building regulations must comply with the National Building Regulations SANS 10400-1990.
13. For examination purposes brick sizes should be taken as 230 x 115 x 75mm.
14. All the abbreviations and symbols must comply with the latest National Building Regulations and all relevant SANS (SABS)-codes.
15. Write neatly and legibly.

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QUESTION 1

1.1 The following abbreviations is used for drainage fittings.
Complete the following table:

ABBREVIATION	DRAINAGE FITTINGS
G	
SWP	
WSP	
VP	
DP	

Draw a table with the abbreviations in one column and complete the names of the drainage fittings in the second column.

NOTE: All information must be printed freehand or stencilled 3mm high.

(5)

1.2 Draw a typical vertical section through a ROUND PRECAST manhole.
Use SCALE 1 : 10

Label all the parts of the manhole. (10)

[15]

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QUESTION 2

DIAGRAM SHEET 1 (attached), shows a plan and a photo your client finds on the internet. Your client made some notes on the sketch/photo.

BRIEF SPECIFICATIONS	
Roof pitch	20°
Roof type	Hip roof
Roof truss	Pre-manufacturer roof trusses
Roof cover	IBR roof sheets
Roof overhang	600mm
Ceiling height	29 Brick courses
Exterior walls	1 brick wall, 15mm plaster on both sides. Except at the entrance, 1 brick wall, with face brick exterior and 15mm plater on the interior.
Interior walls	½ brick wall, 15mm plaster both sides. Note: some interior wall is 1brick walls with 15mm plaster both sides, for plumbing etc.
Reveal	1 Brick wall, with 15mm plaster. The reveal is above windows and doors to roof height.
Barge boards	250x10mm Nutec Fascia
MATERIAL AVAILIBLE ON-SITE	
1x	1830mm Aluminium sliding door
1x	Steel frame, with hardwood exterior door
4x	Steel frame, with hollow core interior door
1x	Sliding door rail, with hollow core interior door
4x	600x600 Aluminium window frame (6DT6)
1X	900x900 Aluminium window frame (9DT9)
3X	1200x1200 Aluminium window frame (12DT12)

As a draughtsperson, he wants you to design a cottage that looks like the sketch/photo, using what is already available on-site.

Draw, to 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 3 Bedrooms, kitchen/living-room, full bathroom (wc, basin, bath and shower), WC and double garage, with storerooms (INFORMATION SHEET 1 (attached)) (12)

2.2 Room names and floor finishes (2)

2.3 All external, internal and wall dimensions (7)

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2.4	Window and door symbols	(2)
2.5	Sanitary installation symbols must be in accordance with the SABS Code of Practice for Building Drawing	(2)
2.6	Window codes(SEE DIAGRAM 2 (attached))	(1)
2.7	Section arrows	(2)
2.8	Title and scale	(2)
2.9	True North	(2)

[32]

QUESTION 3

Draw, to scale 1:50, a section A-A through the middle of the dwelling. Indicate the following specifications:

3.1	The pitch, roof cover, truss and ceiling (INFORMATION SHEET 1 (attached)	(3)
3.2	Gutter on fascia	(2)
3.3	Roof covering (eaves projection) = 600mm	(2)
3.4	Strip foundation (to include sizes)	(2)
3.5	Concrete slab	(2)
3.6	Damp-proof course (to include minimum height above FGL)	(2)
3.7	Damp-proof membrane	(2)
3.8	Compacted fill	(2)
3.9	Screed	(2)
3.10	External and internal walls	(2)
3.11	Finished ground level and finished floor level	(2)
3.12	Dimension the ceiling height, roof overhang, total height and minimum damp-proof course distance from the ground level.	(3)
3.13	Title and scale	(2)

[28]

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QUESTION 4

Draw, to scale 1:100, all the views (north, east, south and west) from your design of the complete dwelling. Indicate the following on each elevation:

4.1	Wall finish (Face brick, with brick on edge window sill)	(4)
4.2	Window and door codes (SEE DIAGRAM 2 (attached))	(4)
4.3	Title and scale	(2)
		[10]

QUESTION 5

Refer to DIAGRAM SHEET 3 (attached). DO NOT copy the given view, but drawn the site plan, to scale 1:200. The following must be included and indicated on the site plan:

5.1	The boundary lines and pegs	(2)
5.2	The position of the driveway (carriage-way crossing)	(2)
5.3	The building lines	(2)
5.4	The complete dwelling and double garage in the correct position (show the roof as seem from the top)	(2)
5.5	The drainage system	(2)
5.6	The direction of the true north	(2)
5.7	Title and scale	(2)
5.8	The name of the street	(1)
		[15]

TOTAL: 100

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DIAGRAM SHEET 1



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INFORMATION SHEET 1

Table 4 — Howe-type roof trusses

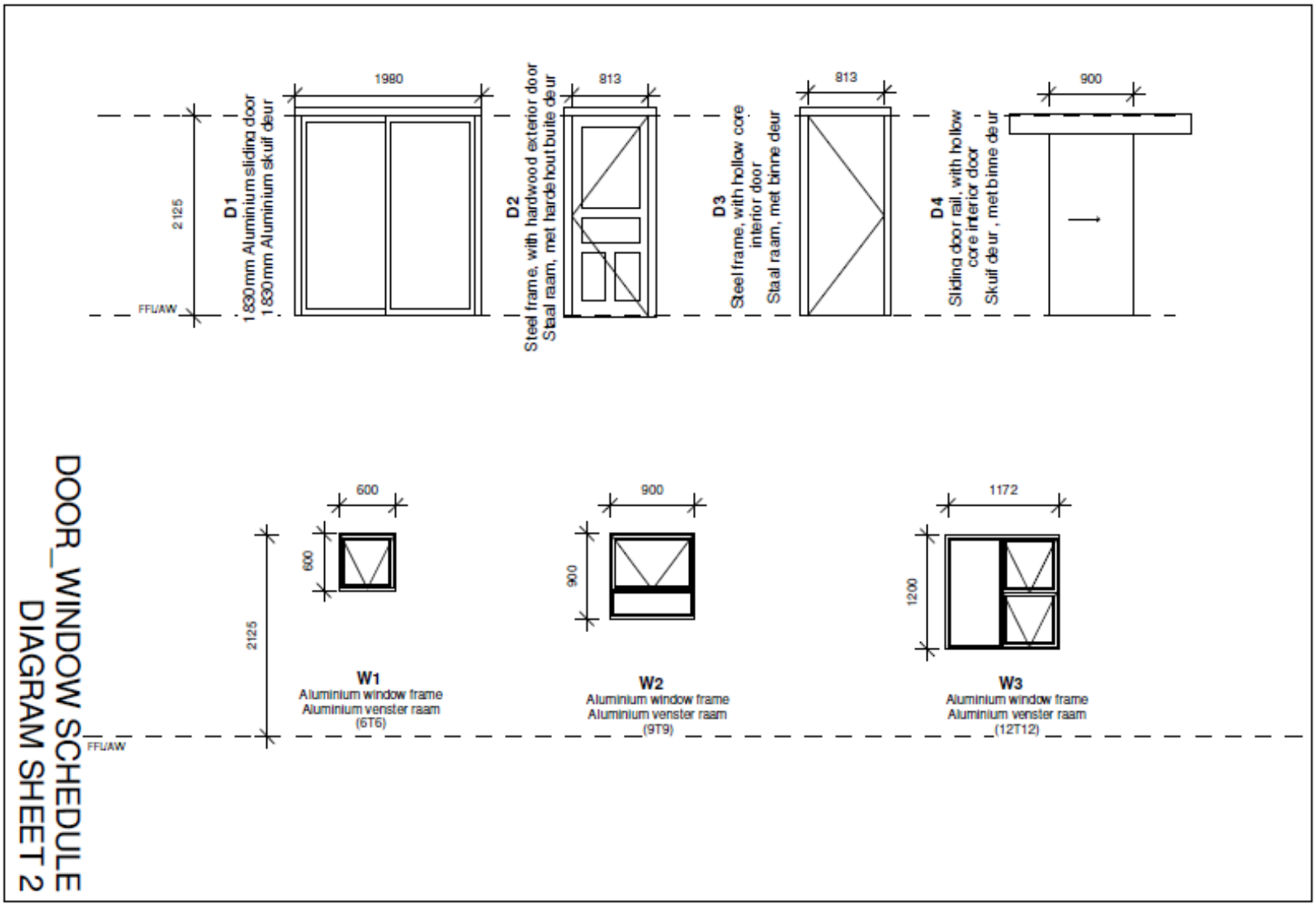
1	2	3	4	5	6	7	8	9	10	11	12	13	14
Roof covering	Pitch degrees			Maximum clear span m	Maximum centre-to-centre truss spacing mm	Bolts at heel and splice joints (number × type)[a]	Member sizes and grade of timber in accordance with SANS 1783-2[b, c]						Number of bays
	Minimum	Maximum	Recommended				TC[d]		BC		Web		
							Size mm	Grade	Size mm	Grade	Size mm	Grade	
Tiles and slates with 38 mm × 38 mm battens spaced at centres that do not exceed 345 mm maximum, and in accordance with the manufacturer's instructions	17,5	35	26	3,0 4,0 5,0 6,0 6,5 7,0 7,5 8,0	760 (650 where slates or tiles have a self-mass in excess of 55 kg/m^2)	2 × M12	114	5	114 114 114 114 114 152 152 152	5	114	5	2 4 4 4 6 6 6 6
Metal or fibre-cement sheets with 50 mm × 76 mm purlins on edge spaced at centres that do not exceed 1 200 mm	15	30	17,5	3,0 4,0 5,0 6,0 6,5 7,0 7,5 8,0	1 200	2 × M12	114	5	114 114 114 114 114 152 152 152	5	114	5	2 4 4 4 6 6 6 6
Metal tiles with 38 mm × 38 mm battens spaced in accordance with the manufacturer's instructions	15	30	20	3,0 4,0 5,0 6,0 6,5 7,0 7,5 8,0	1 000	2 × M12	114	5	114 114 114 114 114 152 152 152	5	114	5	2 4 4 4 6 6 6 6

TC = top chord or rafter
BC = bottom chord or tie beam

[a] Heel joints shall have 2 × M12 bolts per joint with 40 mm washers at each end.
[b] All timber members shall have a thickness of 38 mm (36 mm if planed).
[c] 38 mm × 114 mm grade 7 members may be substituted for 38 mm × 152 mm grade 5 material, if required.
[d] The maximum overhang of a 114 mm TC is 600 mm. The TC needs to be increased to 152 mm if the overhang is greater than 600 mm but less than or equal to 900 mm.

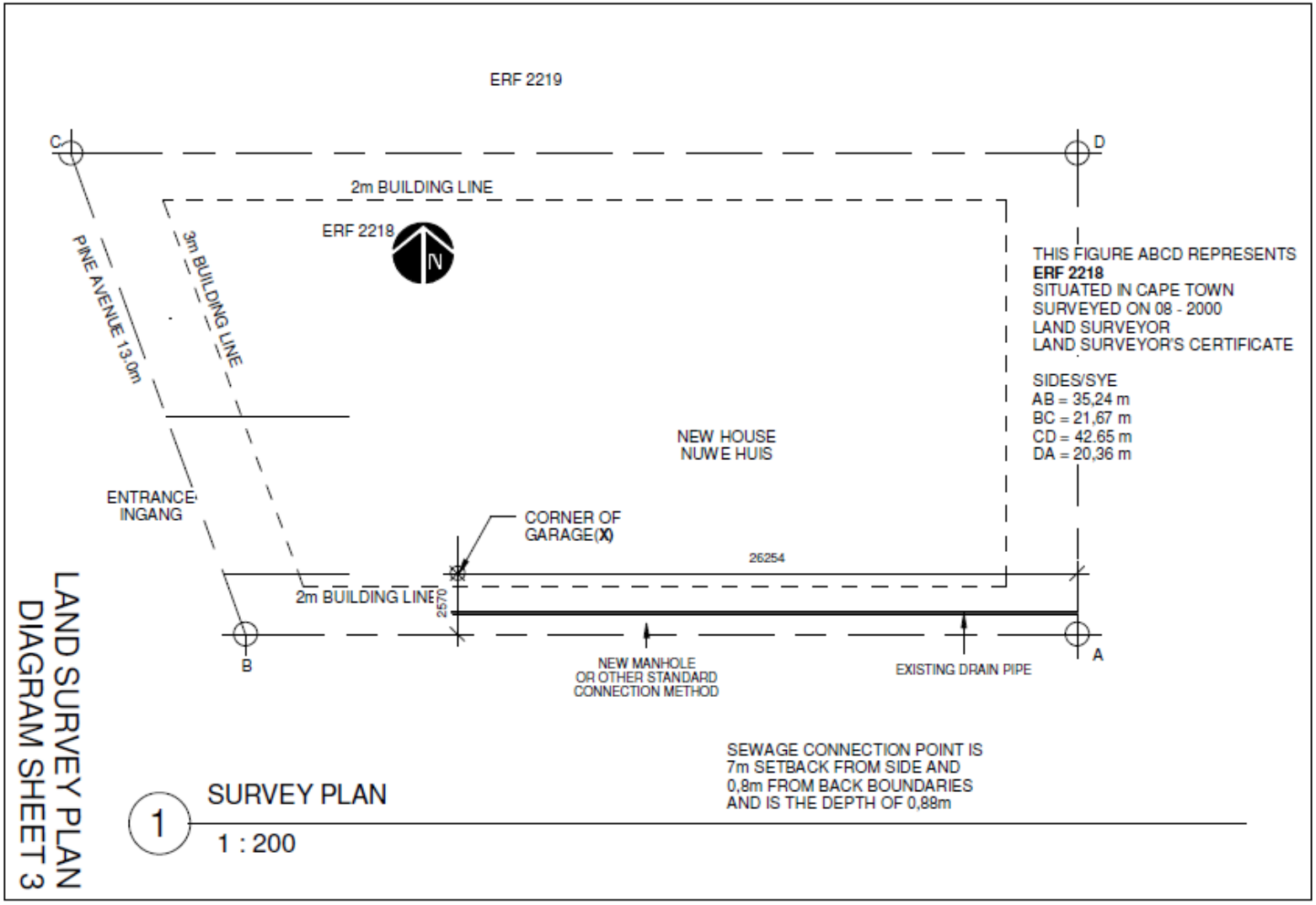
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DIAGRAM SHEET 2



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DIAGRAM SHEET 3



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INFORMATION SHEET 2

Table 1 – Room area		
Type of occupancy	**Room**	**Minimum plan area**
All occupancies	Any habitable room other than kitchen, scullery and laundry.	6m² with no linear dimension of less than 2m.
B,D or J	Change rooms and dining rooms.	Population 1 – 15: 0.8m² per person but not less than 6m². Population 16 – 100: 0.6m² per person but not less than 12m². Population more than 100: 0.5m² per person but not less than 60m².

Table 2 - Rooms and their dimensions	
Room or space	**Minimum height**
Bedroom	2,4 m above a floor area of at least 6 m² 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
Any other habitable room in a dwelling house or a dwelling unit	2,4 m above a minimum of 70 % of the floor area, and not less than 2,1 m above the remaining floor area
All habitable rooms other than those listed above	2,4 m
Passage or entrance hall	2,1 m
Bathroom, shower-room, laundry or room containing a toilet pan	2,1 m above 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

SANS 10400-C: 2010

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