higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE:
MULTIDISCIPLINARY DRAWING-OFFICE PRACTICE

BUILDING DRAUGHTING

(2050035)

18 November 2022 (X-paper)
09:00–13:00

REQUIREMENTS: ONE A2 drawing sheet

Drawing instruments, calculators and CAD software may be used.

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

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MULTIDISCIPLINARY 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 according to the numbering system used in this question paper.
4. Use both sides of the DRAWING SHEET.
5. Draw a 15 mm border around the DRAWING SHEET (both sides).
6. Make all drawing work, including candidate information, in pencil.
7. All drawing work must comply with the SABS Recommended Code of Practice for Building Drawing as well as the SANS 10111-1990.
8. All building regulations must comply with the National Building Regulations SANS 10400-1990.
9. Take brick sizes as 230 mm × 115 mm × 75 mm.
10. All abbreviations and symbols must comply with the latest National Building Regulations and all relevant SANS (SABS) codes.
11. A balanced layout is very important, and candidates will be penalised for bad planning.
12. Write neatly and legibly.

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QUESTION 1

1.1 Copy the following table and complete it by writing the name of the drainage fitting next to each abbreviation.

NOTE: Print all information freehand or stencil 3 mm high.

ABBREVIATION	DRAINAGE FITTINGS
G	
SWP	
WSP	
VP	
DP	

(5)

1.2 Draw, to scale 1:10, a typical vertical section through a square 220 mm brick manhole. Label all parts of the manhole. (10)

[15]

QUESTION 2

DIAGRAM SHEET 1 (attached) shows a sketch plan that your client found on the Internet. Your client made some notes on the sketch.

Brief specifications	
Roof pitch	20°
Roof type	Gable roof (as per the sketch)
Roof truss	Premanufactured roof trusses
Roof cover	IBR roof sheets
Roof overhang	600 mm
Ceiling height	29 brick courses
Exterior walls	One-brick wall, 15 mm plaster on both sides Except at the entrance: one-brick wall with face-brick exterior and 15 mm plaster on the interior
Interior walls	Half-brick wall, 15 mm plaster both sides The garage wall is wrong on the sketch, make sure to use the correct wall.
Barge boards	250 mm × 10 mm Nutec fascia
Doors and windows available	
1 800 mm aluminium sliding door Steel frame with a hardwood exterior door Steel frame with a hollow-core interior door 600 × 600 aluminium window frame (6DT6) 900 × 900 aluminium window frame (9DT9) 1 200 × 1 200 aluminium window frame (12DT12) 1 200 × 1 800 aluminium window frame (12DT18)	

Your client wants you to design a house that looks more or less like the sketch she found. Use SA standard doors and DT aluminium-type windows.

Draw, to scale 1:100, a fully detailed working drawing of the floor-plan layout of the dwelling. Indicate the following on the plan:

2.1 Three bedrooms, kitchen, family/dining room, bathroom (basin, bath, and shower), WC, laundry, and garage (INFORMATION SHEET 1 (attached)) (12)

2.2 Room names and floor finishes (2)

2.3 All external, internal and wall dimensions (7)

2.4 Window and door symbols (2)

2.5 Sanitary installation symbols in accordance with the SABS Code of Practice for Building Drawing (2)

2.6 Window codes (See DIAGRAM SHEET 2 (attached)) (1)

2.7 Section arrows (2)

2.8 Title and scale (2)

2.9 True north (2)

[32]

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QUESTION 3

Draw, to scale 1:50, a section A–A through the family/dining room of the dwelling locking to the double garage. Indicate the following specifications:

3.1	Pitch, roof cover, truss and ceiling (INFORMATION SHEET 1 (attached))	(3)
3.2	Gutter on fascia	(2)
3.3	Roof covering (eaves projection) = 600 mm	(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	Dimensions of 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 the edge windowsill)	(4)
4.2	Window and door codes (See DIAGRAM SHEET 2 (attached))	(4)
4.3	Title and scale	(2)
		[10]

QUESTION 5

Refer to DIAGRAM SHEET 3 (attached).

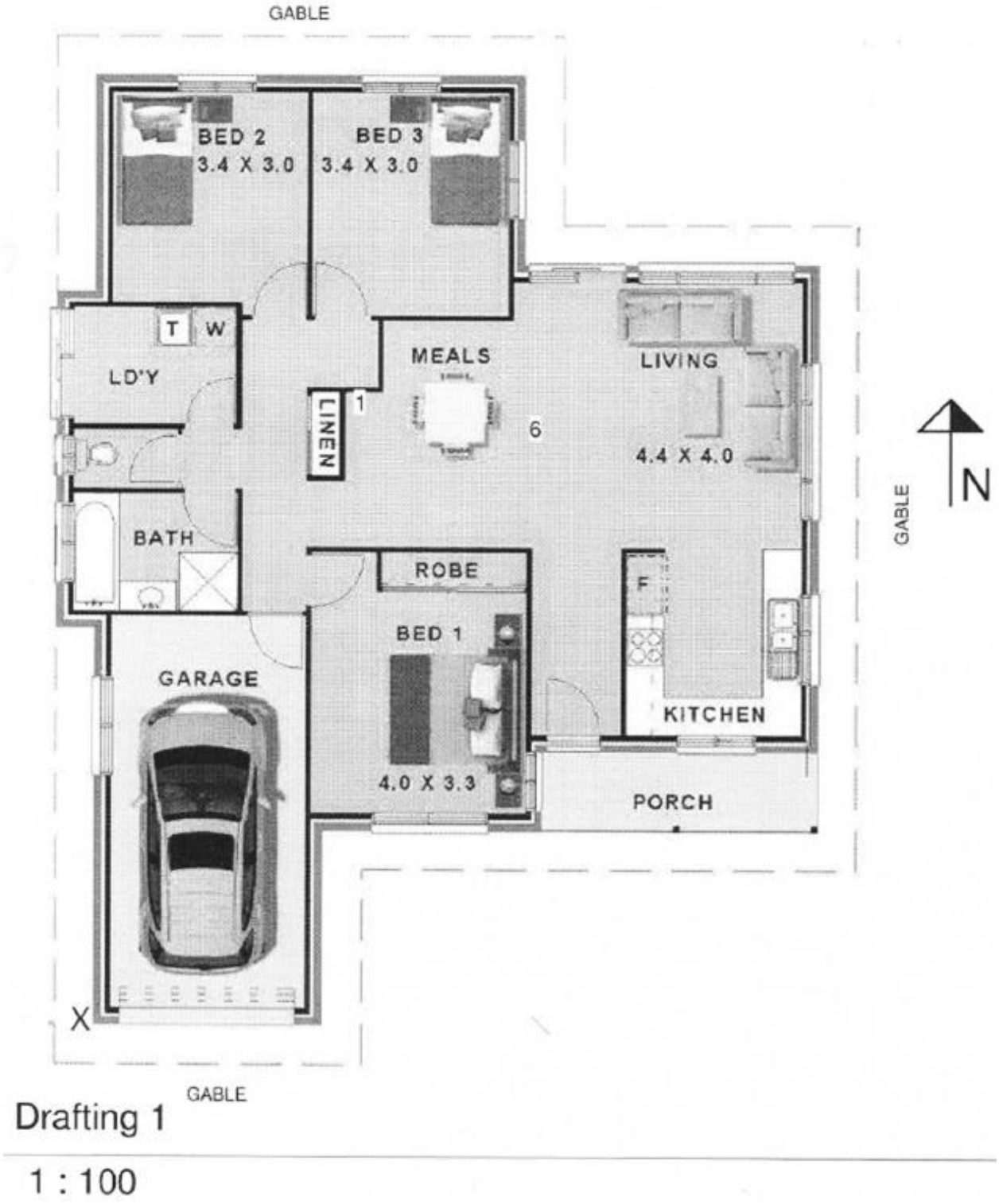
Do not copy the given view, but draw, to scale 1:200, the site plan. Include the following on the site plan:

5.1	Boundary lines and pegs	(2)
5.2	Position of the driveway (carriageway crossing)	(2)
5.3	Building lines	(2)
5.4	Complete dwelling and double garage in the correct position (show the roof as seem from the top)	(2)
5.5	Drainage system	(2)
5.6	Direction of the true north	(2)
5.7	Title and scale	(2)
5.8	Name of the street	(1)
		[15]

TOTAL: 100

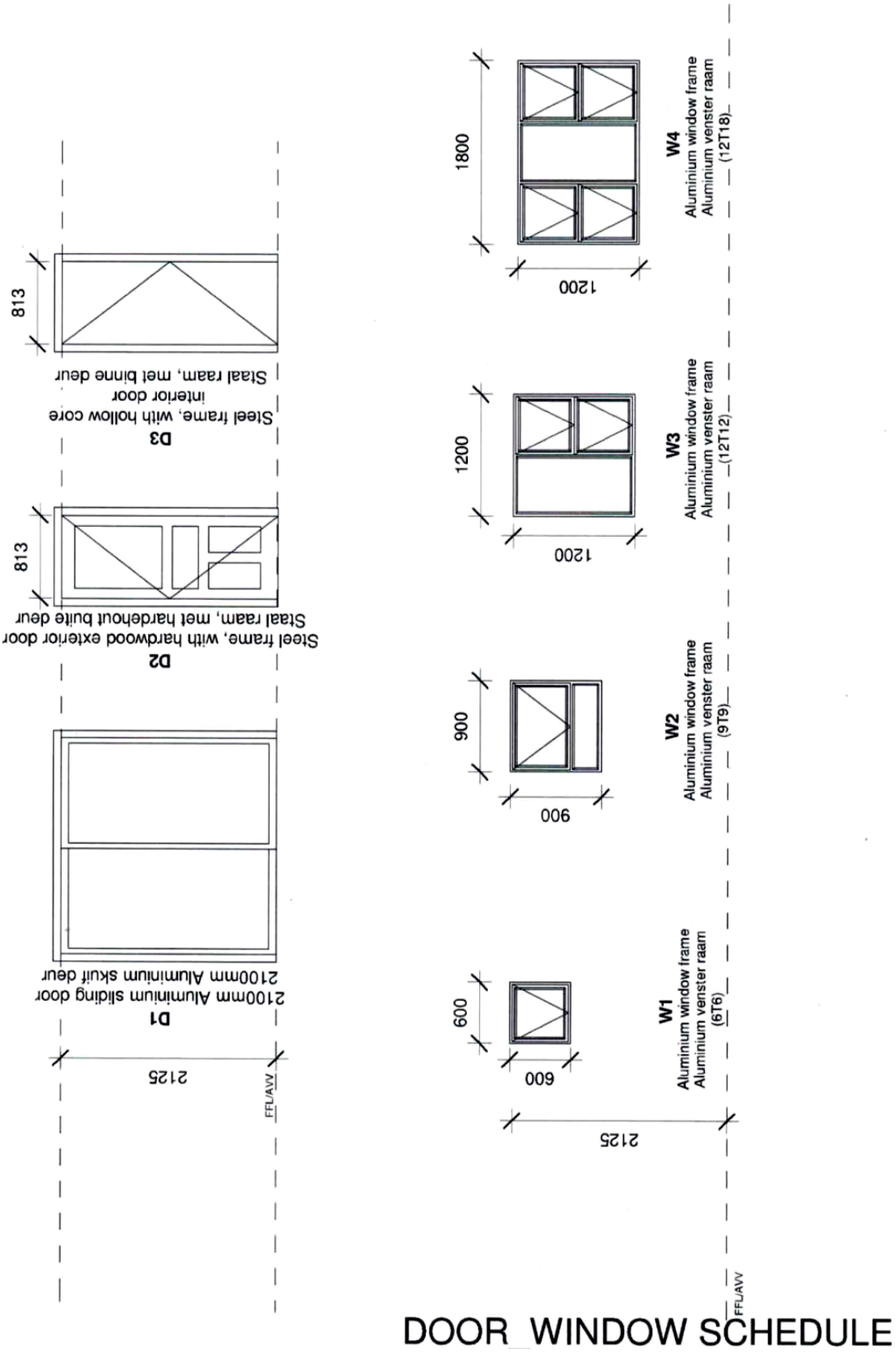
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DIAGRAM SHEET 1



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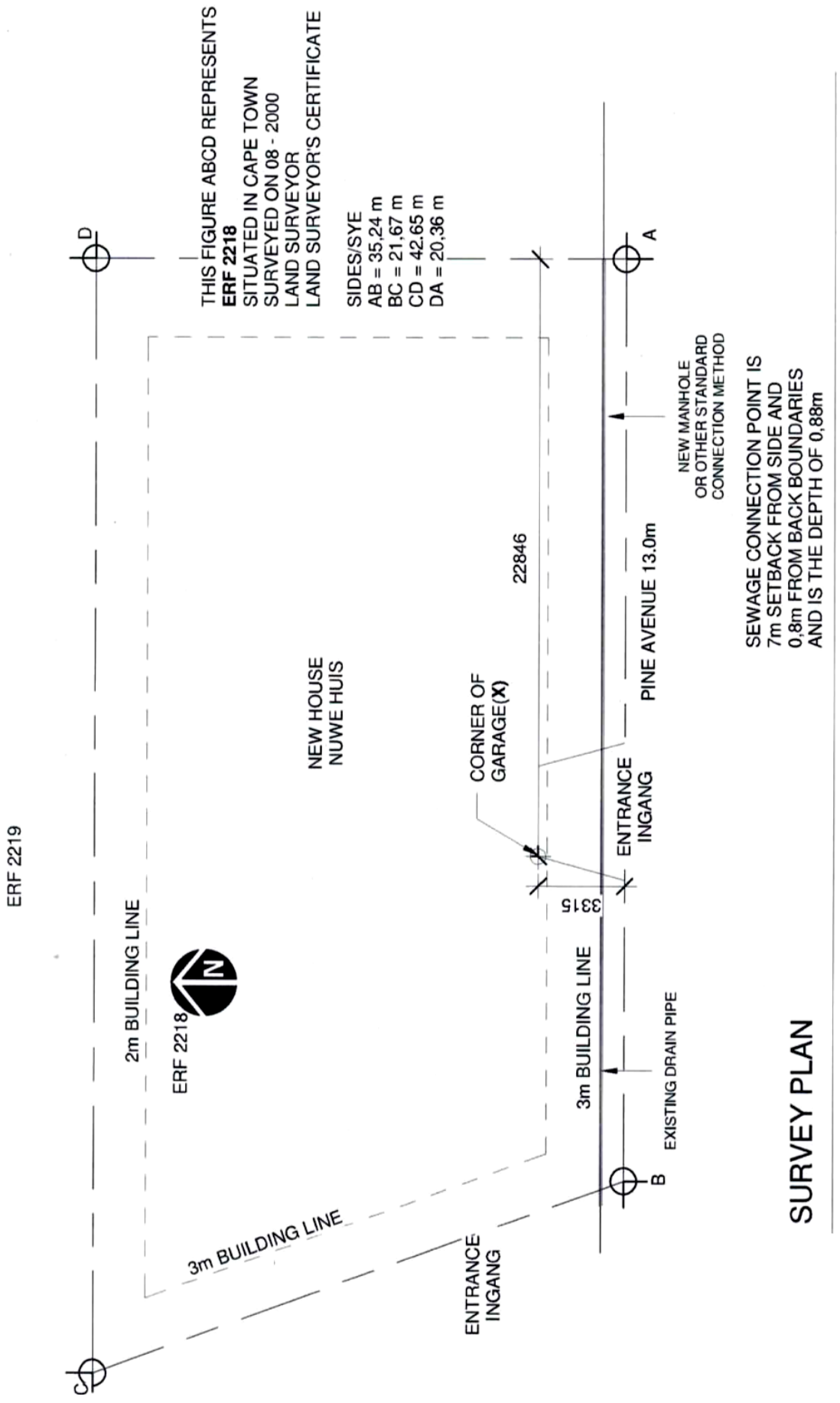
DIAGRAM SHEET 2



DOOR WINDOW SCHEDULE

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DIAGRAM SHEET 3



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INFORMATION SHEET 1

Room area		
Type of occupancy	**Room**	**Minimum plan area**
All occupancies	Any habitable room other than a kitchen, scullery and laundry	6 m² with no linear dimension of less than 2 m
B, D or J	Change rooms and dining rooms	Population 1–15: 0,8 m² per person but not less than 6 m² Population 16–100: 0,6 m² per person but not less than 12 m² Population more than 100: 0,5 m² per person but not less than 60 m²

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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INFORMATION SHEET 2

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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