higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE: MULTI-DISCIPLINARY DRAWING OFFICE PRACTICE

BUILDING DRAUGHTING

(2050035)

24 November 2023 (X-paper)
09:00–13:00

REQUIREMENTS: ONE A2 drawing sheet
Candidates will require drawing instruments
Candidates may use CAD software

Calculators may be used.

This question paper consists of 6 pages, 3 diagram sheets, and a 2-page information sheet.

076Q1E2324

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DEPARTMENT OF HIGHER EDUCATION AND TRAINING
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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 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 (on 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 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 230 mm × 115 mm × 75 mm.
12. All the abbreviations and symbols must comply with the latest National Building Regulations and all relevant SANS (SABS) codes.
13. Use only a blue or black pen.
14. Write neatly and legibly.

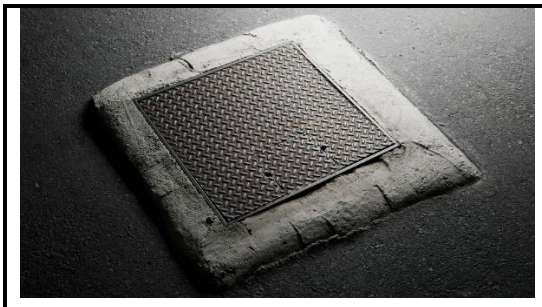
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QUESTION 1

1.1 The following plumbing fixtures/fittings are used in buildings. Give the abbreviations and meanings/names of the fixtures/fittings in the table below. Draw a table and write the abbreviations in COLUMN ONE, and complete the name of the drainage fittings in COLUMN TWO.

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

PHOTO	ABBREVIATION	MEANING
		
		
		
		

(10)

1.2 Draw the typical symbol for a PT99 aluminium window in plan view and the exterior elevation view at scale 1:20. (5)
[15]

QUESTION 2

FIGURE 1, DIAGRAM SHEET 1 (attached), shows a sketch plan/photo of a plan your client found on the internet (Facebook).

BRIEF SPECIFICATIONS	
Roof pitch	20°
Roof type	HIP roof
Roof truss	Pre-manufactured roof trusses
Roof cover	IBR roof sheets
Roof overhang	600 mm
Ceiling height	29 brick courses
Exterior walls	1 face-brick brick wall, 15 mm plaster on interior sides
Interior walls	½ brick wall, 15 mm plaster on both sides
Barge boards	250 mm × 10 mm Nutec fascia
Doors and Windows available	
	Steel frame, with hardwood exterior door
	Steel frame, with hollow-core interior door
	900 × 900 aluminium window frame (9DT9)
	1 500 × 900 aluminium window frame (15DT9)
	1 800 × 900 aluminium window frame (18DT9)

She wants you, as a draughtsperson, to design a house that looks more or less like the sketch/photo with a single garage, as shown. SA-type doors and SA-type DT aluminium windows must be used, as indicated on the attached DIAGRAM 2.

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:

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2.1	TWO bedrooms, a kitchen, lounge, bathroom (with basin, bath, and shower), and a single garage (INFORMATION SHEET 1, attached)	(12)
2.2	Room names and floor finishes	(2)
2.3	All external, internal, and wall dimensions	(5)
2.4	Window and door symbols	(2)
2.5	Symbols for sanitary installations must be in accordance with the SABS Code of Practice for Building Drawings	(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)

[30]

QUESTION 3

Draw, to scale 1:50, a section named A-A as shown in the sketch of the dwelling looking NORTH. Indicate the following specifications:

3.1	The pitch, roof cover, and ceiling (no need to show pre-manufactured roof trusses on section)	(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 finished ground level [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)

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3.12	Add dimensions for 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]

QUESTION 4

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

4.1	Wall finish (face brick with brick on edge window sill)	(6)
4.2	Window and door codes (see DIAGRAM 2, attached)	(4)
4.3	Title and scale	(2)

[12]

QUESTION 5

Refer to FIGURE 3, DIAGRAM SHEET 3 (attached), SITE 30470. Do NOT copy the given view, but draw the site plan to scale 1:200. The following must be included and indicated on the site plan:

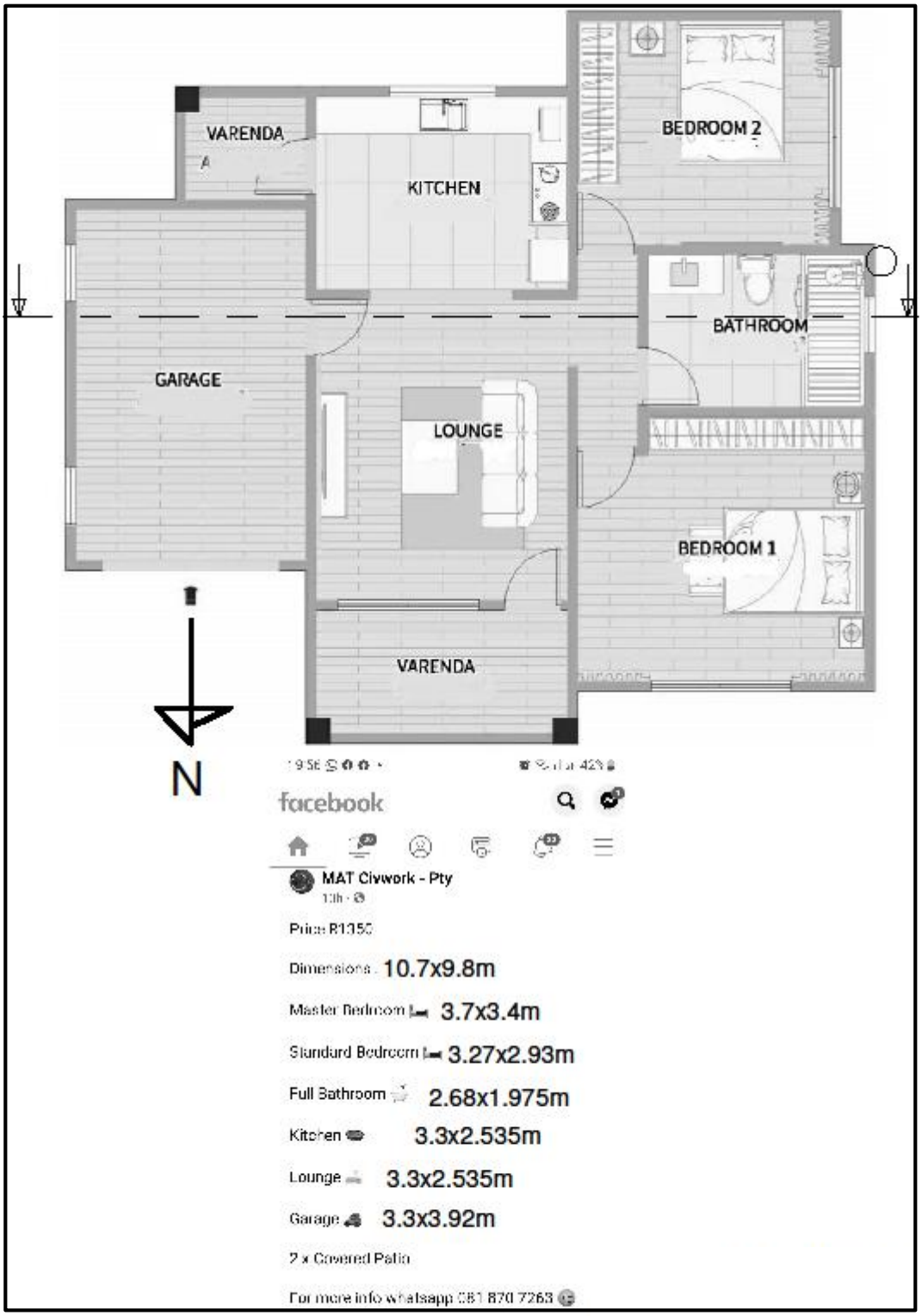
5.1	The boundary lines and pegs	(2)
5.2	The position of the driveway (carriage-way crossing)	(2)
5.3	The building lines	(2)
5.4	The complete dwelling and double garage in the correct position (show the roof as seen from the top)	(2)
5.5	The drainage system	(2)
5.6	The direction of true north	(2)
5.7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

[15]

TOTAL: 100

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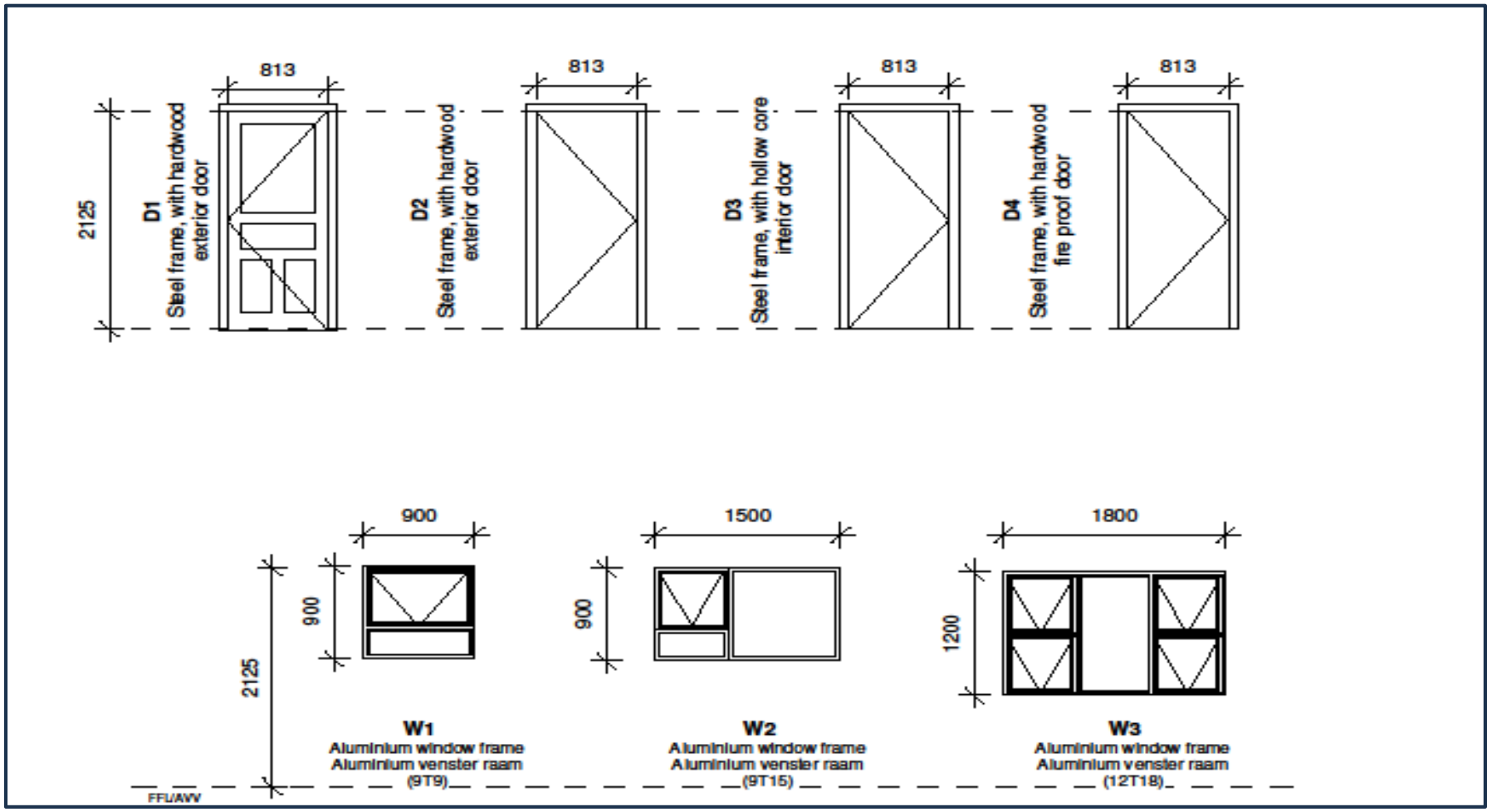
DIAGRAM SHEET 1



SKETCH PLAN

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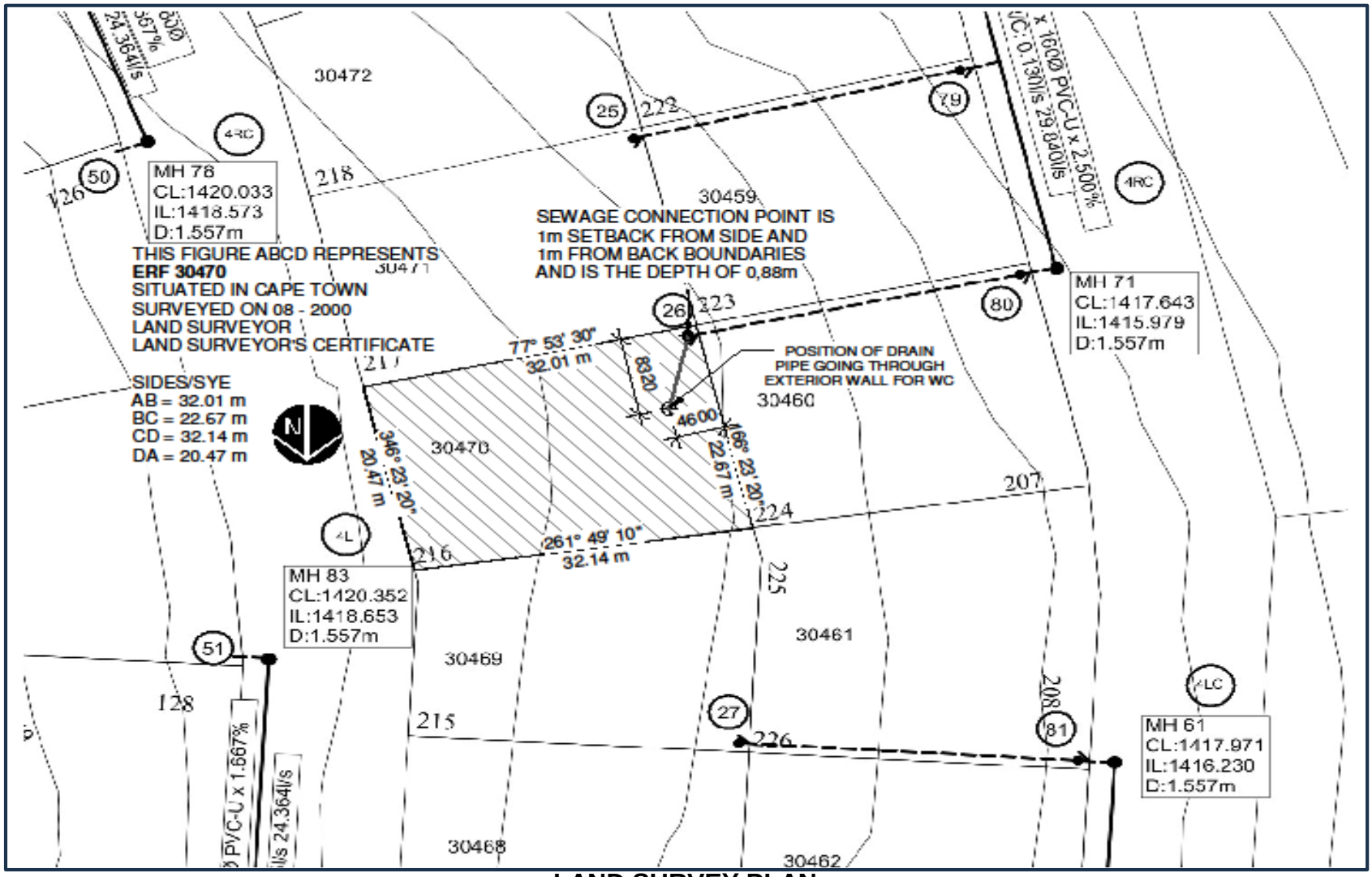
DIAGRAM SHEET 2



DOOR–WINDOW SCHEDULE

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DIAGRAM SHEET 3



LAND SURVEY PLAN

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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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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.	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.

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

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