higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

T190**(E)**(J31)T

NATIONAL CERTIFICATE:
MULTIDISCIPLINARY DRAWING OFFICE PRACTICE

BUILDING DRAUGHTING

(2050035)

31 July 2019 (X-Paper)
09:00–12:00

REQUIREMENTS: ONE A2 drawing sheet

Calculators, drawing instruments and CAD software may be used.

This question paper consists of 5 pages, 2 diagram sheets and 3 information sheets.

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DEPARTMENT OF HIGHER EDUCATION AND TRAINING
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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. Use both sides of the DRAWING SHEET.
5. Draw a 15 mm border around the DRAWING SHEET (both sides).
6. Clearly indicate question numbers.
7. Do ALL drawing work, including candidate information, in pencil.
8. ALL drawing work must comply with the SABS Recommended Code of Practice for Building Drawing as well as the SANS 10111-1990.
9. ALL building regulations must comply with the National Building Regulations SANS 10400-1990.
10. Take brick sizes as 230 × 115 × 75 mm.
11. ALL abbreviations and symbols must comply with the latest National Building Regulations and ALL relevant SANS (SABS) codes.
12. A balanced layout is very important and candidates will be penalised for bad planning.
13. Work neatly.

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QUESTION 1: CONSTRUCTION DRAWING

Draw, to scale 1:10, a typical vertical section through an external wall.

Show the following:

- Concrete foundation (600 × 250 mm)
- Brick footing (ONE brick)
- Damp-proof course (DPC)
- External wall (face-brick exterior with 15 mm plaster on the interior)
- Screed (25 mm)
- Concrete slab (75 mm)
- Compacted hard core
- Ground level
- ALL descriptions (skirting and quadrant)
- Overhang (500 mm)
- Wall plate (114 × 38 mm)
- Tie beam (152 × 38 mm)
- Rafter (152 × 38 mm)
- Purlin (76 × 52 mm)
- IBR roof sheets (30° pitch)
- Facia (225 × 10 mm)
- Gutter (100 mm)

Label ALL parts of the wall. **[15]**

QUESTION 2: FLOOR PLAN LAYOUT

DIAGRAM SHEET 1 (attached) shows a photo of a plan your client found on the internet. Your client made some notes on the photo.

Brief specifications:	
Roof pitch	30°
Roof type	Open-gable roof
Roof truss	Howe-type roof trusses (South African truss)
Roof cover	IBR roof sheets
Roof overhang	500 mm
Ceiling height	29 brick courses
Exterior walls	ONE face-brick wall with 15 mm plaster on the interior sides
Interior walls	½ brick wall with 15 mm plaster both sides
Barge boards	250 × 10 mm Nutec facia
Material available on-site:	
1 ×	1 830 mm aluminium sliding door
1 ×	Steel frame with hardwood exterior door
4 ×	Steel frame with hollow-core interior door
1 ×	Sliding door rail with hollow-core interior door
2 ×	1 800 × 900 aluminium window frame (18DT9)
2 ×	900 × 600 aluminium window frame (9T6)

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The client wants you to design a cottage that looks more or less like the photo by using material already available on-site.

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	TWO bedrooms, a kitchen/living room, a full bathroom and en-suite (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 (INFORMATION SHEET 2 (attached))	(1)
2.7	Section arrows	(2)
2.8	Title and scale	(2)
2.9	True north	(2)
		[32]

QUESTION 3: SECTION THROUGH A HOUSE

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

Indicate the following specifications:

3.1	Pitch, roof cover, truss and ceiling (INFORMATION SHEET 3 (attached))	(3)
3.2	Gutter on facia	(2)
3.3	Roof covering (eaves projection) of 500 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)

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3.10	External and internal walls	(2)
3.11	Finished ground level and finished floor level	(2)
3.12	Dimensioned 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: ELEVATION

Draw, to scale 1:100, ALL 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 (INFORMATION SHEET 2 (attached))	(4)
4.3	Title and scale	(2)

[10]

QUESTION 5: SITE PLAN

Refer to DIAGRAM SHEET 2 (attached) and do NOT copy the given view, but draw, to scale 1:200, the site plan.

Indicate the following on the site plan:

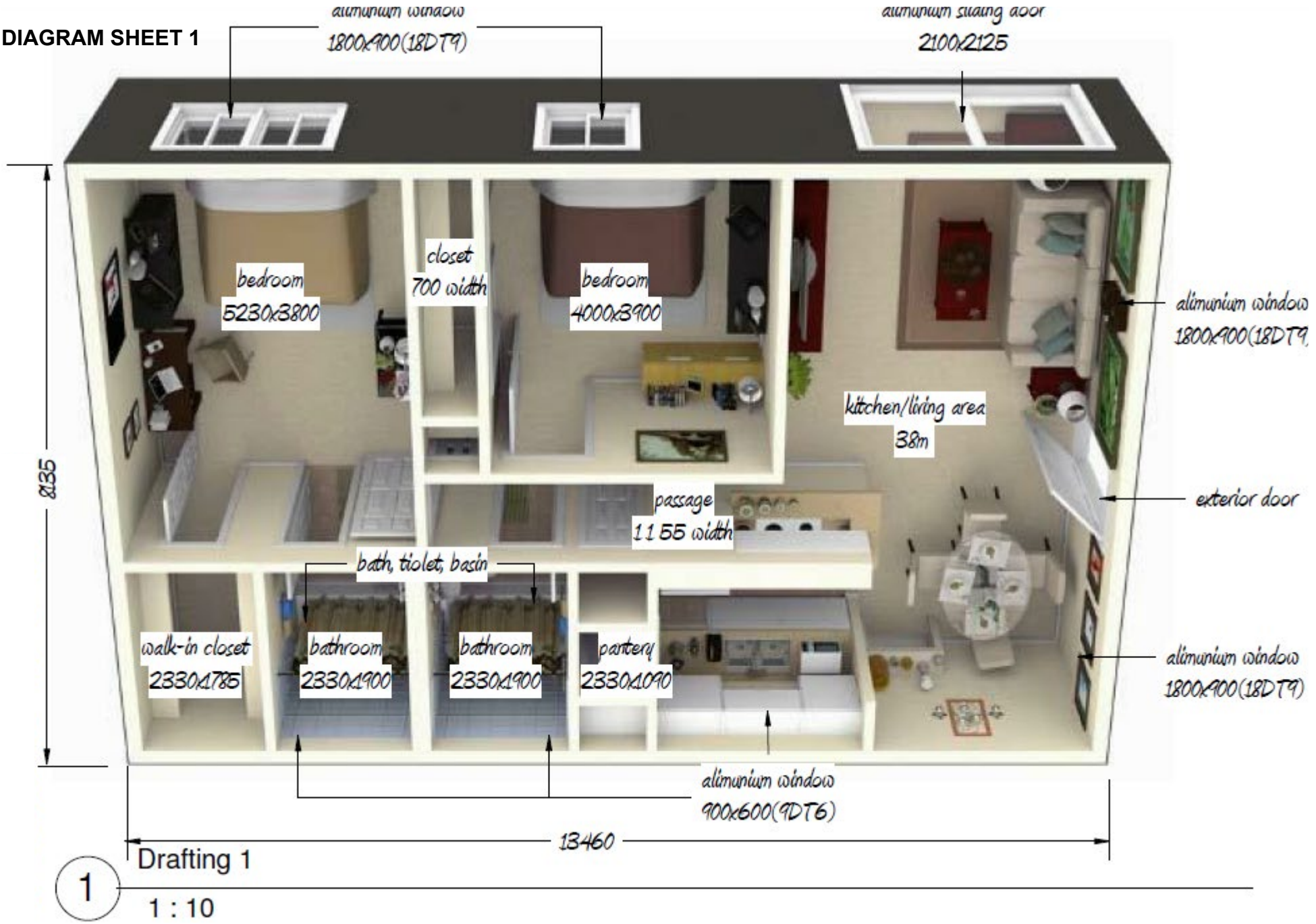
5.1	Boundary lines and pegs	(2)
5.2	Position of the driveway (carriage-way crossing)	(2)
5.3	Building lines	(2)
5.4	Complete dwelling and double garage in the correct position (show the roof as seen from the top)	(2)
5.5	Drainage system	(2)
5.6	Direction of true north	(2)
5.7	Title and scale	(2)
5.8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

[15]

TOTAL: 100

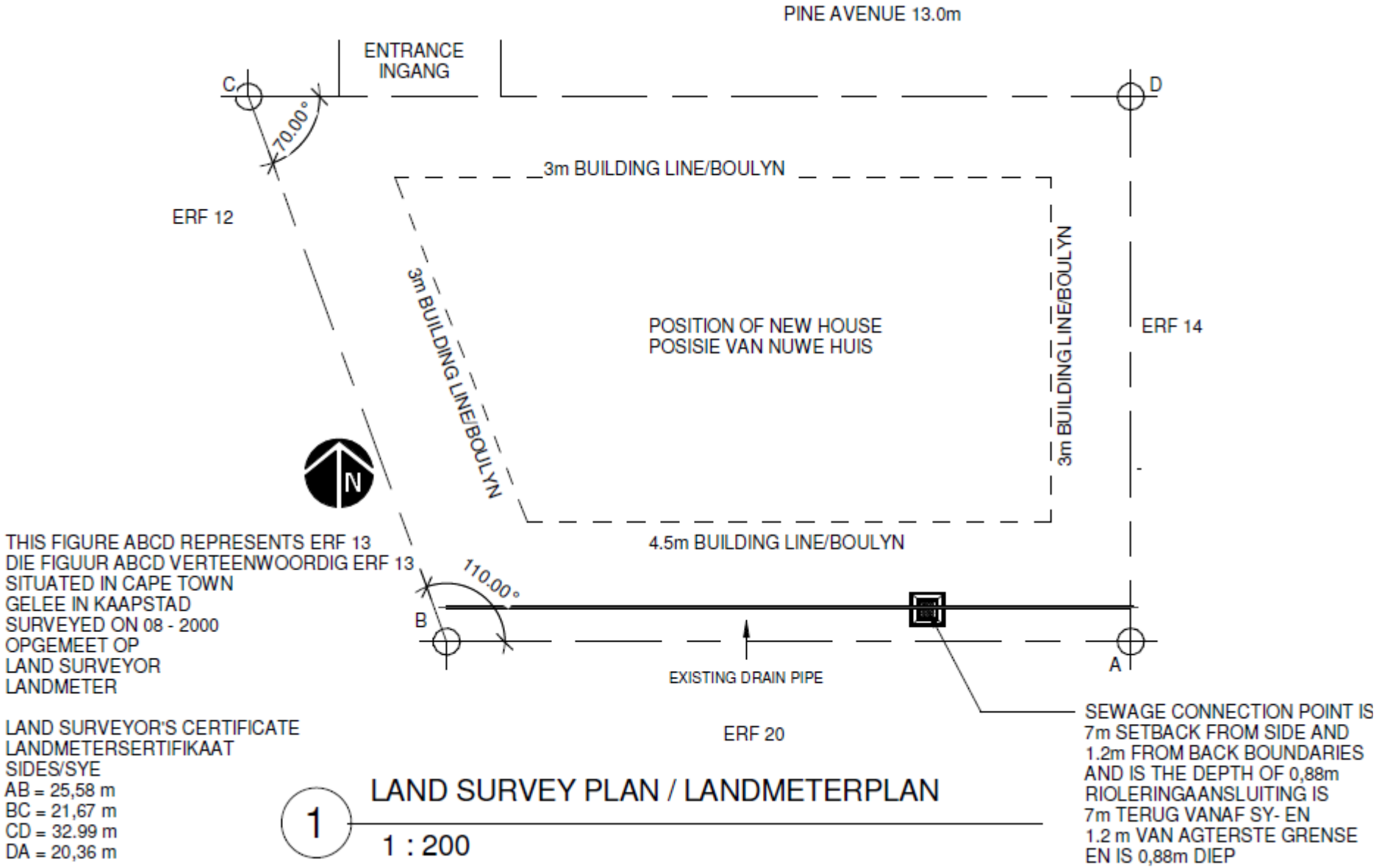
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DIAGRAM SHEET 1



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DIAGRAM SHEET 2



THIS FIGURE ABCD REPRESENTS ERF 13
DIE FIGUUR ABCD VERTEENWOORDIG ERF 13
SITUATED IN CAPE TOWN
GELEE IN KAAPSTAD
SURVEYED ON 08 - 2000
OPGEMEET OP
LAND SURVEYOR
LANDMETER

LAND SURVEYOR'S CERTIFICATE
LANDMETERSERTIFIKAAT
SIDES/SYE
AB = 25,58 m
BC = 21,67 m
CD = 32.99 m
DA = 20,36 m

1 LAND SURVEY PLAN / LANDMETERPLAN

1 : 200

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INFORMATION SHEET 1

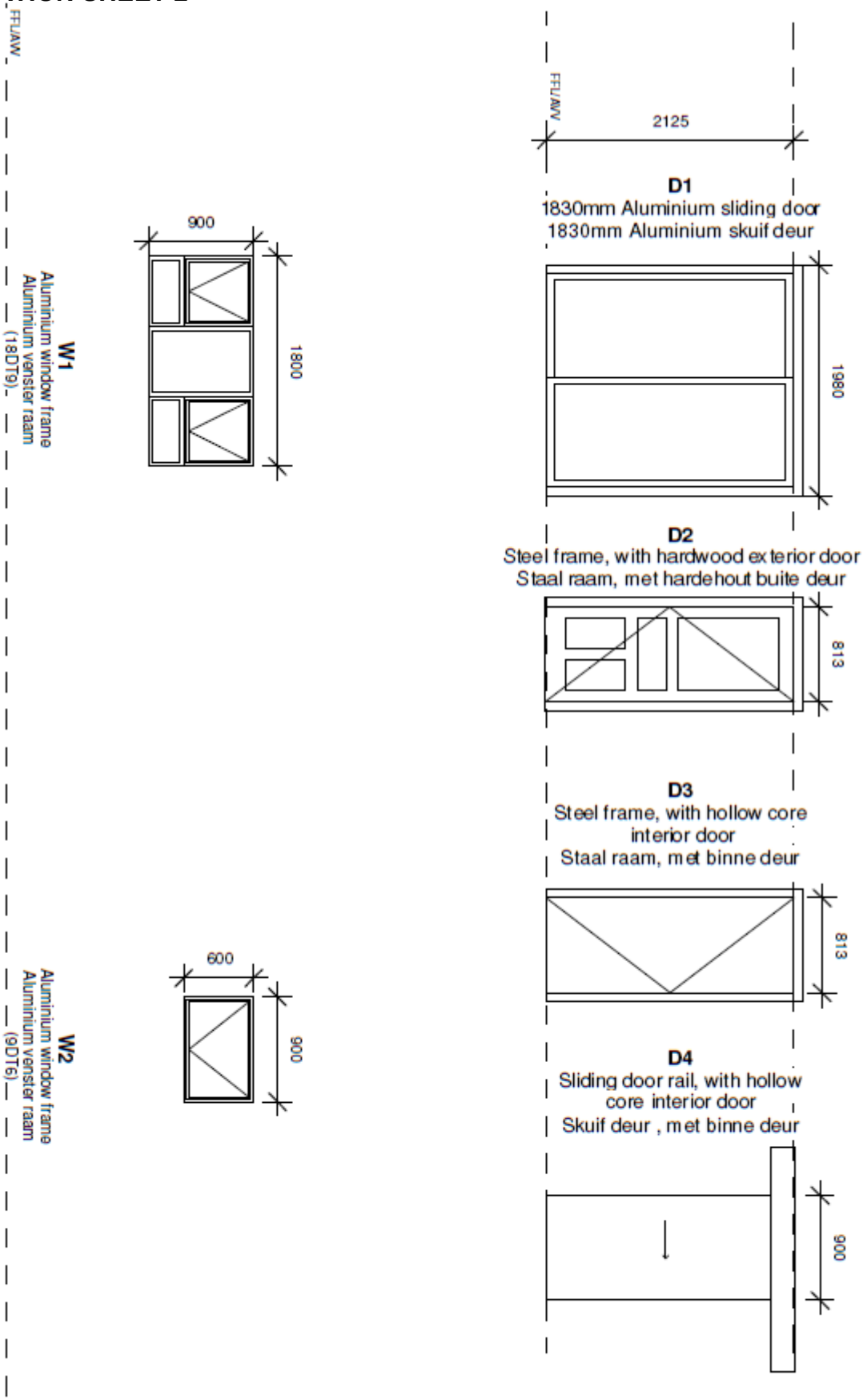
Table 1 – Room area		
Type of occupancy	**Room**	**Minimum plan area**
All occupancies	Any habitable room other than the kitchen, scullery and laundry	6 m² with no linear dimension of less than 2 m
B, D or J	Change rooms and dining rooms	Population 1 – 15: 0,8 m² per person but not less than 6 m² Population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

SANS 10400-C: 2010

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INFORMATION SHEET 2



DOOR AND WINDOW SCHEDULE

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INFORMATION SHEET 3

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**
							TC[d]		**BC**		**Web**		
	Minimum	**Maximum**	**Recommended**				**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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