



NATIONAL SENIOR CERTIFICATE	
GRADE 12	
DATE:	MAY/ JUNE 2024
SUBJECT:	ENGINEERING GRAPHICS AND DESIGN
PAPER:	1
MARKS:	100
TIME:	3 Hours
NUMBER OF PAGES:	6

INSTRUCTIONS AND INFORMATION

1. This paper consists of FOUR questions.
2. Answer all the questions.
3. ALL questions are in first-angle orthographic projection, unless otherwise stated.
4. ALL drawings must be prepared using pencil and instruments, unless otherwise stated.
5. ALL answers must be drawn accurately and neatly.
6. ALL questions, as prescribed, must be answered on the question paper.
7. ALL pages must be placed in numerical order and stapled in ONLY the TOP LEFT CORNER once complete, regardless whether the question was answered or not.
8. Time management is essential in order to complete all the questions.
9. Print your examination number in the supplied block on each page.
10. Dimension details not indicated must be estimated according to proportions.

FOR OFFICIAL USE ONLY															
QUESTION	MARK OBTAINED			½	SIGN	MODERATED			½	SIGN	RE-MARKING			½	SIGN
1															
2															
3															
4															
TOTAL:	2	0	0			2	0	0			2	0	0		

FINAL CALCULATED MARK	CHECKED
<u>100</u>	

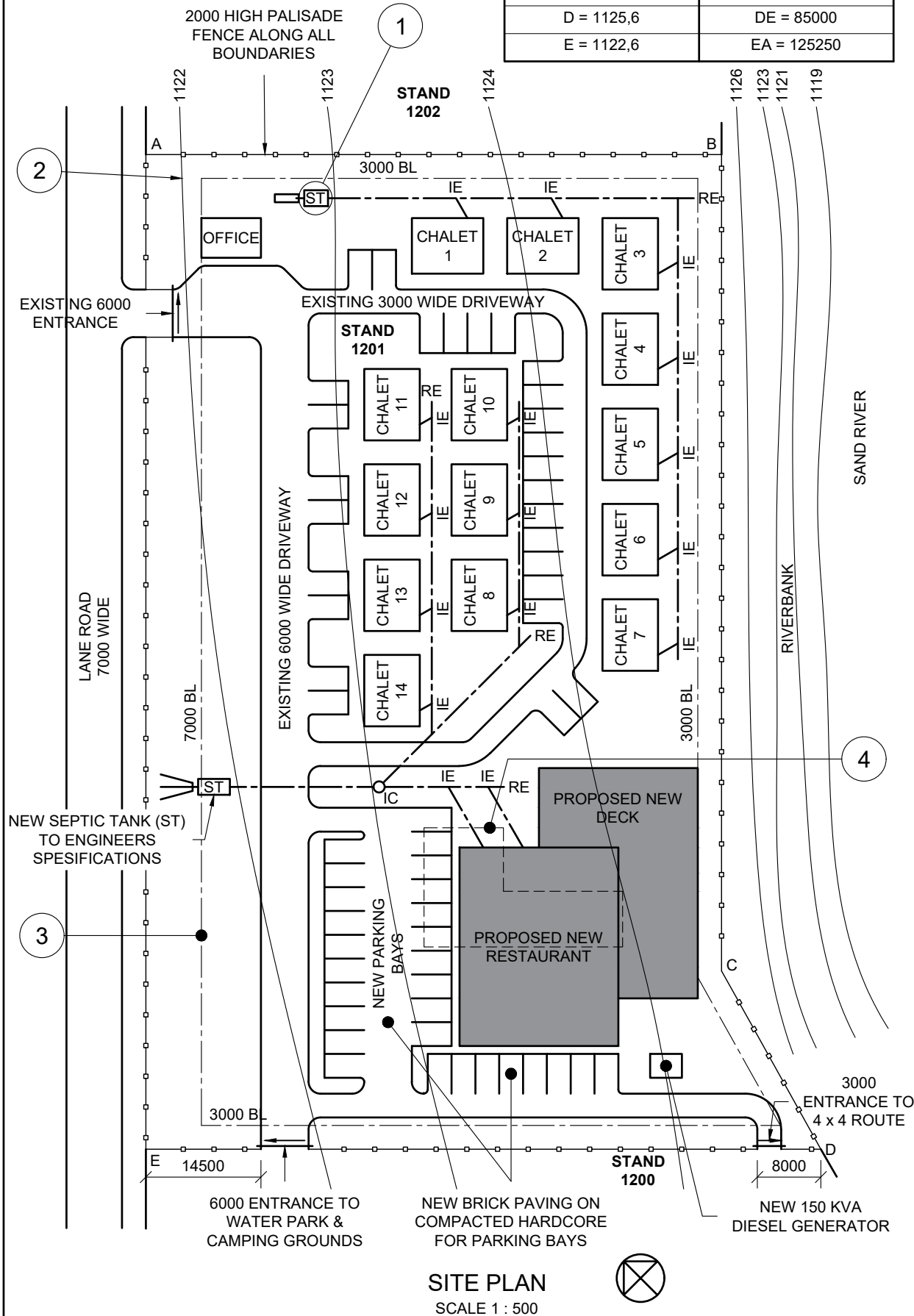


SOUTH AFRICAN COMPREHENSIVE ASSESSMENT INSTITUTE
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EXAMINATION NUMBER

STAPLE

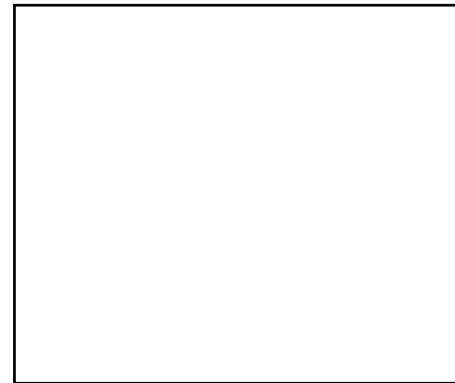
LAND SURVEYOR'S CERTIFICATE OF THE BOUNDARY LENGTHS AND CORNER HEIGHTS OF STAND 1201, SURVEYED ON 2023/05/23	
CORNER HEIGHTS IN METRES	BOUNDARY LENGTHS IN MILLIMETRES
A = 1121,7	AB = 72500
B = 1125,2	BC = 102800
C = 1125,3	CD = 25690
D = 1125,6	DE = 85000
E = 1122,6	EA = 125250



NOTES:
Contractors must verify all dimensions and levels on the site before commencing work.
Architects must be notified immediately of any discrepancies.

ARCHITECT SIGNATURE: _____
CLIENT'S SIGNATURE: _____

ANSWER 19
In the space below, draw, in neat freehand, the top view of the SANS 10143 graphical symbol for a ramp with a slope of 1 : 10.



QUESTION 1: CIVIL ANALYTICAL

Given:
A site plan of a resort with a proposed new restaurant and proposed new deck, a title panel and a table of questions. The drawing is not presented to the indicated scale.

Instructions:
Complete the table below by neatly answering the questions, which all refer to the accompanying drawing, title panel and civil content.

[30]

QUESTIONS		ANSWERS	
1	What scale is indicated for the SITE PLAN?	1	
2	Who prepared the drawing?	1	
3	Who is the client?	1	
4	Which printing company was used?	1	
5	What is the last revision?	1	
6	How many new structures must be added to STAND 1201?	1	
7	What does the abbreviation ST at 1 stand for?	1	
8	How many rodding eyes are shown on STAND 1201?	1	
9	In which color could new wood be indicated on a plan or section?	1	
10	In which two metric units can dimensions on a site plan be indicated?	2	
11	What does the line at 2 indicate?	1	
12	What does the line at 3 indicate?	1	
13	What does the line at 4 indicate?	1	
14	Determine the difference between the highest and lowest corner of STAND 1201, in metres.	2	
15	What is the shortest distance between the entrance to the water park & camping ground and the entrance to the 4 x 4 route, in metres?	3	
16	Which elevation of the proposed new deck is facing Sand river?	2	
17	In the space below, ANSWER 17, determine the total area for the new restaurant, including the new deck, in square metres. Show ALL calculations.	3	
18	In the space below, ANSWER 18, determine the perimeter of STAND 1201, in metres. Show ALL calculations.	3	
19	In the space in the title panel, ANSWER 19, draw, in neat freehand, the top view of the SANS 10143 graphical symbol for a ramp with a slope of 1 : 10.	3	
TOTAL:		30	

REVISION	DATE	DESCRIPTION
2	2022/06/09	FIX CHALET'S NUMBERS
1	2022/06/05	ADD NEW SEPTIC TANK (ST) ON EXISTING SEWER LINE

PRINTED BY: FUTURE PRINTERS DATE OF PRINT: 2022/06/12

CROXLEY & CO. ARCHITECTS
1025 LYNNWOOD AVENUE
PRETORIA
TELL: 012 256 368

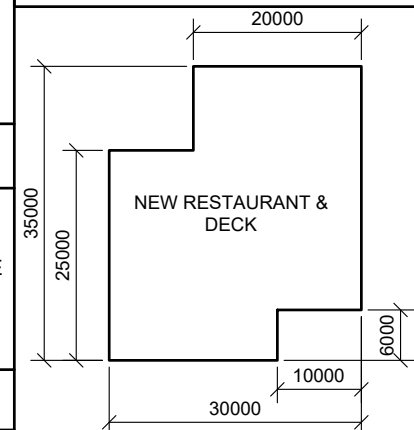
DRAWING TITLE: **SITE PLAN**

PROJECT: **PROPOSED NEW RESTAURANT AND DECK FOR WATER PARK FUN INC. ON STAND 1201 ON LANE ROAD, MOKOPANE.**

PROJECT NUMBER: EGD1B-2023 DRAWING NUMBER: 1 of 7

REFERENCE CODE: P1BQ1-2023 DRAWN: CHUCK CHECKED: ROB

DATE: 2023/06/01 SCALE: 1 : 500



ANSWER 17

ANSWER 18

EXAMINATION NUMBER

EXAMINATION NUMBER

2



QUESTION 2 SOLID GEOMETRY

Given:

- The front view and top view of a right equilateral triangular prism and a right hexagonal pyramid.
- An auxiliary view for the triangular prism
- Cutting plane A-A

Specifications:

- The two solids do not touch
- Both solids are cut by cutting plane A-A
- The cutting plane passes through point P

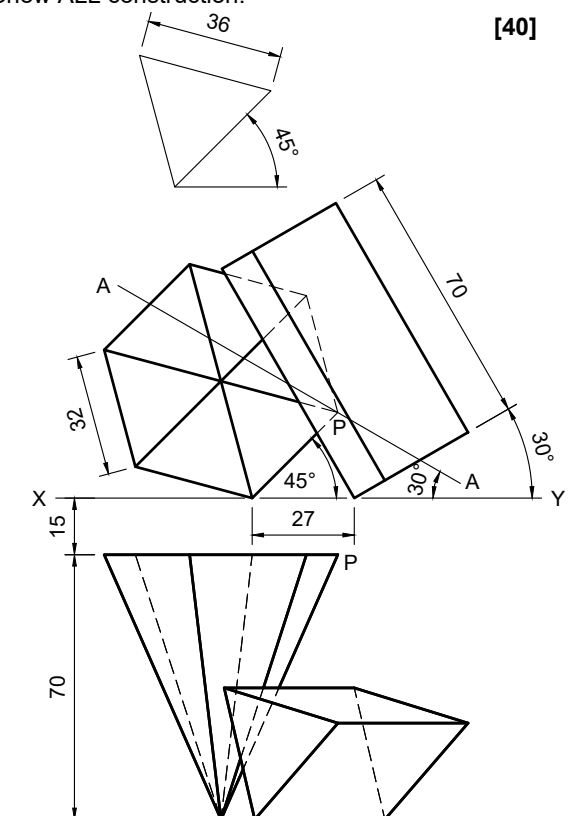
Instructions:

Draw, to a scale of 1 : 1, the following views of the two solids.

- 2.1. The given front view
- 2.2. A sectional top view
- 2.3. A sectional right view
- 2.4. The true shape of the cut surfaces of BOTH solids

- Planning is essential.
- Show ALL hidden detail.
- Show ALL construction.

[40]



ASSESSMENT CRITERIA			
1	FRONT VIEW	10½	
2	TOP VIEW	11	
3	RIGHT VIEW	12½	
4	TRUE SHAPE	6	
PENALTIES(-):			
TOTAL:		40	
EXAMINATION NUMBER			
			3

STAPLE

QUESTION 3 PERSPECTIVE

Given:

Three views of a house and all the information needed to draw a two point perspective drawing

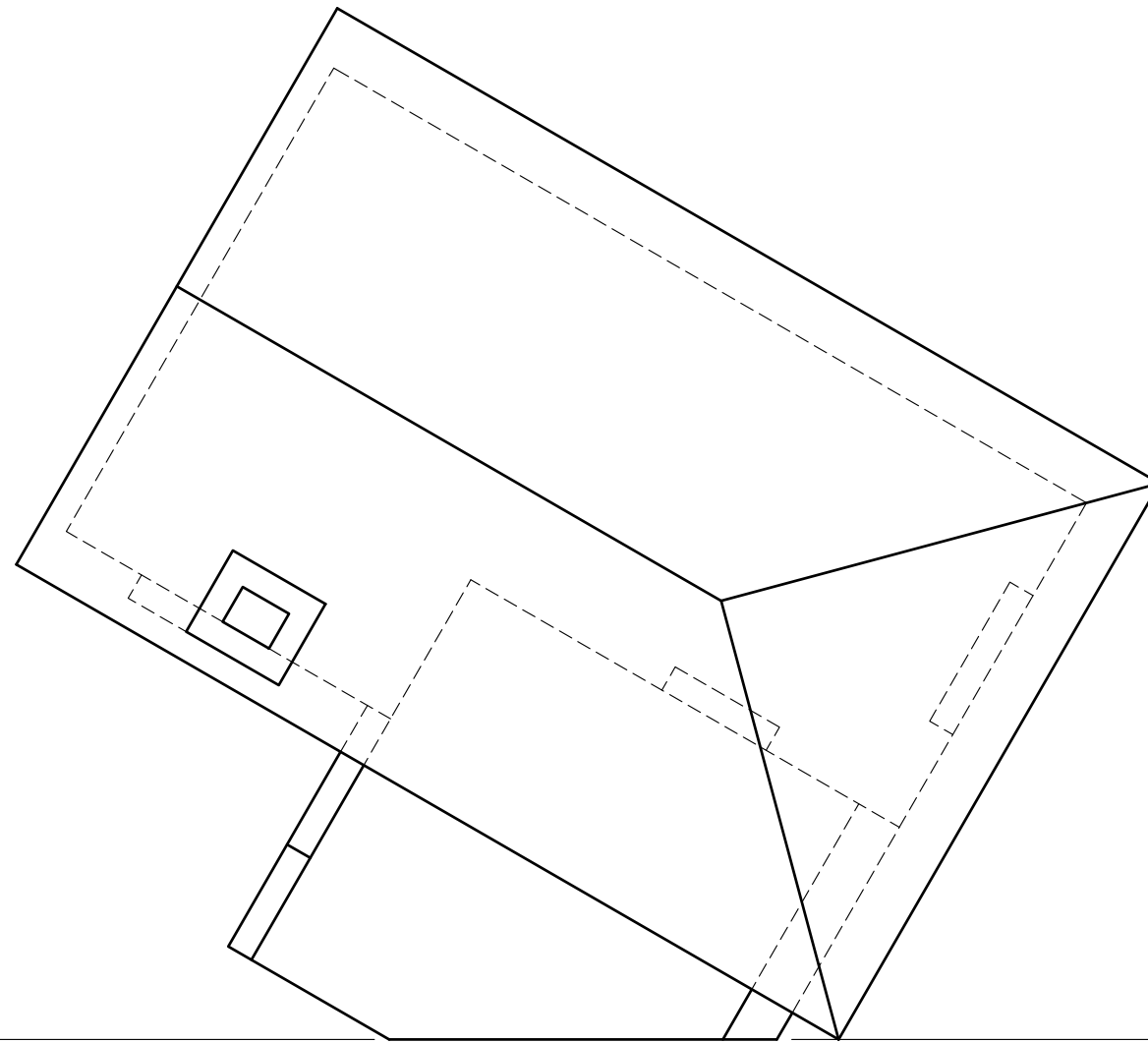
- PP - Picture Plane
- HL - Horizon Line
- GL - Ground Line
- SP - Station Point

Instructions:

Complete the perspective drawing.

- Align the drawing sheet with the horizon line (HL).
- Determine and label the vanishing points.
- Show ALL construction.
- Show depth at the door and window.
- No interior detail is required.
- No hidden detail is required.

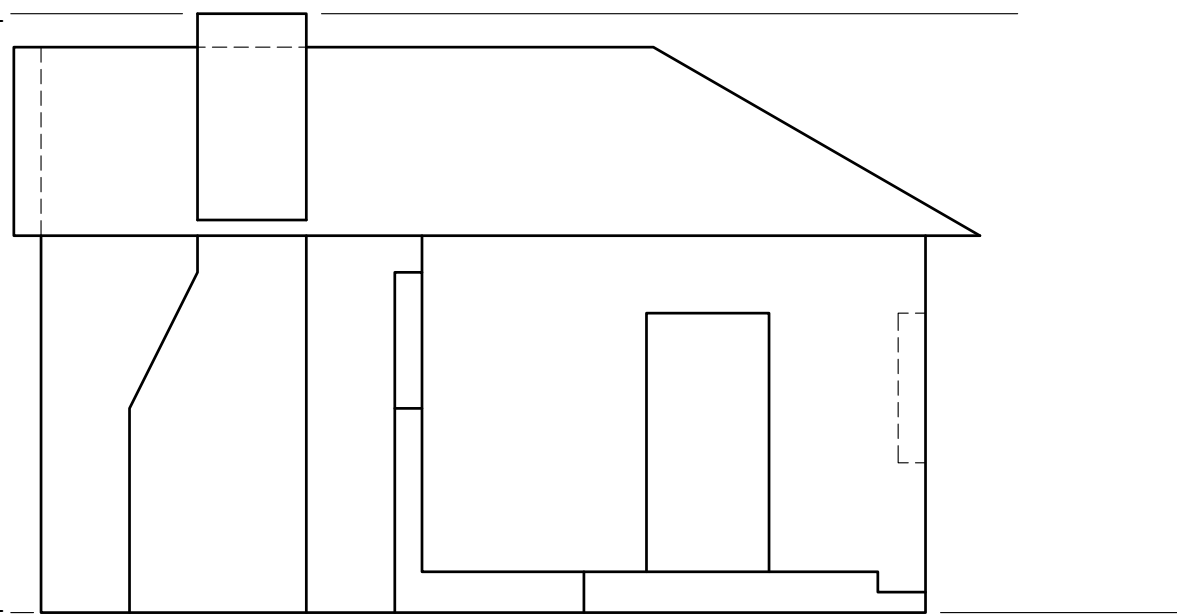
[38]



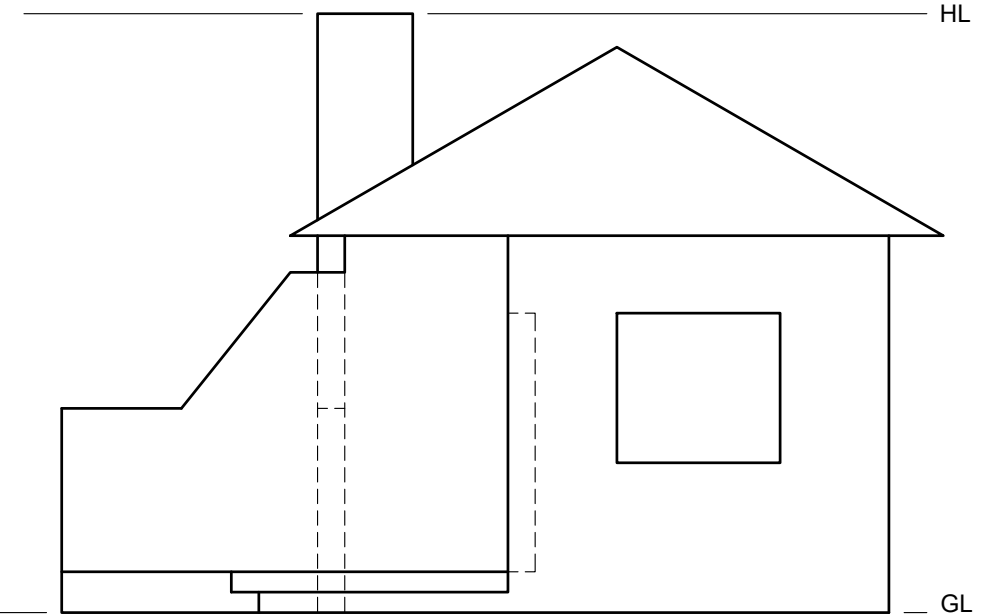
ASSESSMENT CRITERIA			
1	CONSTRUCTION & VP'S	6	
2	FLOOR + WALLS + STEP	17	
3	WINDOW + DOOR	6½	
4	ROOF + CHIMNEY	8½	
PENALTIES(-):			
TOTAL:		38	

PP

HL



GL



HL

GL

SP

EXAMINATION NUMBER	
EXAMINATION NUMBER	4

QUESTION 4 CIVIL DRAWING

Given:

- The incomplete south-west elevation of a **new chalet**, showing the walls, the sliding door and window openings, the roof and labels
- The incomplete floor plan showing the walls, positions of the doors, windows, fixtures and the electrical layout
- A schematic diagram of a roof truss and roof notes
- The incomplete porch, external walls and foundation detail
- A door and window schedule
- A table of roof components
- Room designations and floor finishes
- The rainwater down-pipe detail
- A table of fixtures
- A table of electrical symbols
- The incomplete floor plan of the **new chalet**, drawn to a scale of 1 : 50, and the incomplete foundation and break line for the scale 1 : 20 detailed section, on page 6

Instructions:

Answer the following questions on page 6.

- 4.1. Using the given incomplete floor plan, draw, to a scale of 1 : 50, the following views of the **new chalet**:

4.1.1. THE COMPLETE FLOOR PLAN

Add the following features to the drawing:

- All doors and windows
- All fixtures as indicated by the abbreviations
- All electrical detail as indicated by the numbers
- All hatching detail

4.1.2. THE COMPLETE SOUTH-WEST ELEVATION

Show the following features on the drawing:

- The outside walls, porch, sliding door and window detail
- The roof detail, including the roof cap, fascia boards, gutters, rainwater down-pipe and barge boards
- The finished floor level

- 4.2. Using the incomplete foundation and the break line on page 6, draw, to a scale of 1 : 20, a **DETAILED SECTION** on cutting plane A-A of the area in the ellipse shown on the incomplete floor plan.

Show the following features on the drawing:

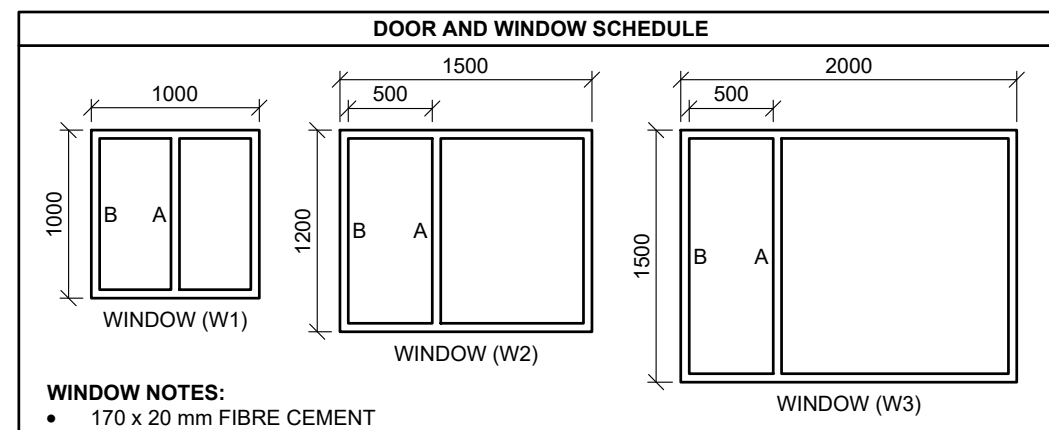
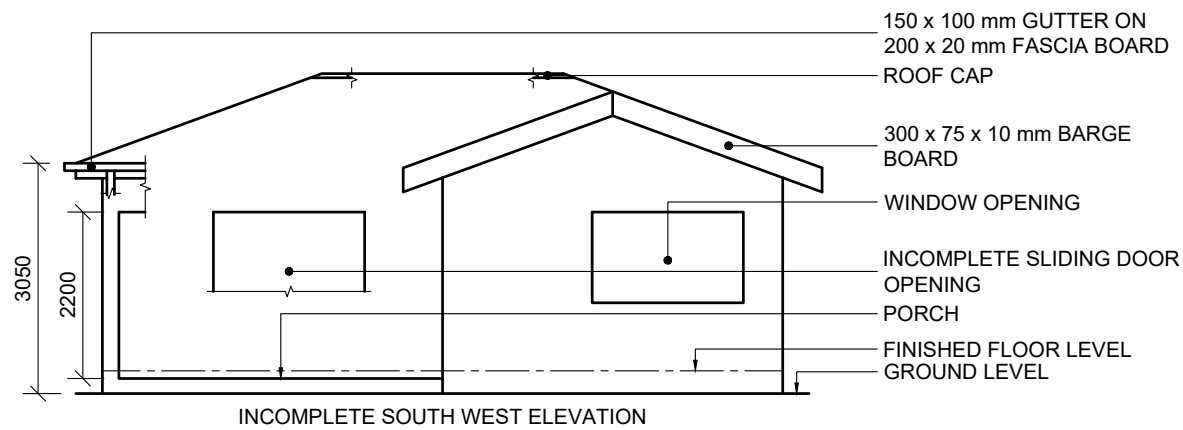
- The porch, external walls and foundation detail
- The sliding door detail
- The roof detail, including the fascia board, gutter and rainwater down-pipe
- The porch opening left (north-west) of the ellipse
- All hatching detail. ONLY the substructure hatching may be drawn in freehand.

Label the following:

- The south-west elevation
- The room designations and floor finishes
- Ground level, finished floor level and damp-proofed course (use the correct abbreviations and show it on all relevant views)

NOTE:

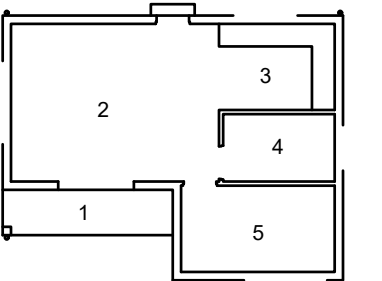
ALL drawings must comply with the **guidelines** and **graphical symbols** contained in the **SANS 10143**.



WINDOW NOTES:

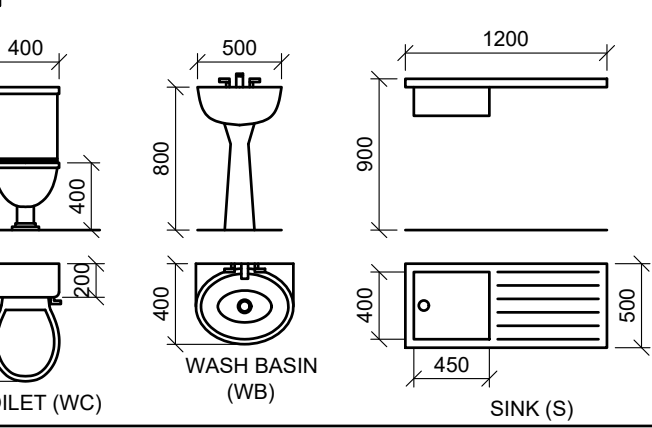
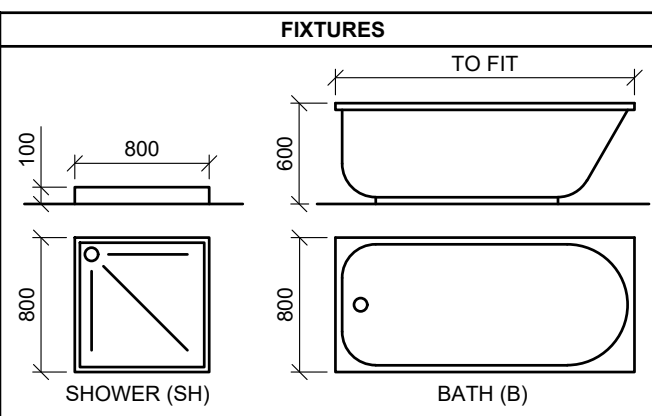
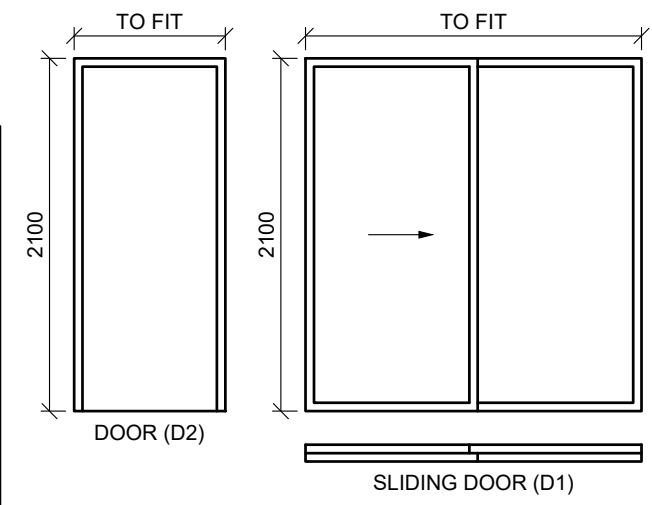
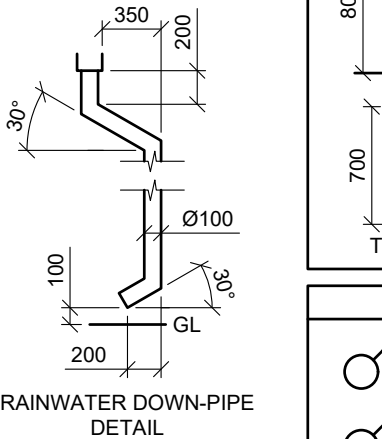
- 170 x 20 mm FIBRE CEMENT SILL UNDER ALL WINDOWS
- ALL FRAMES 50 mm THICK
- A = OPENING SIDE
- B = HINGED SIDE

ROOF COMPONENTS	
	114 x 40 mm WALLPLATE
	200 x 20 mm FASCIA BOARD
	300 x 75 x 10 mm BARGE BOARD
	100 x 150 mm GUTTER
	300 ROOF CAP

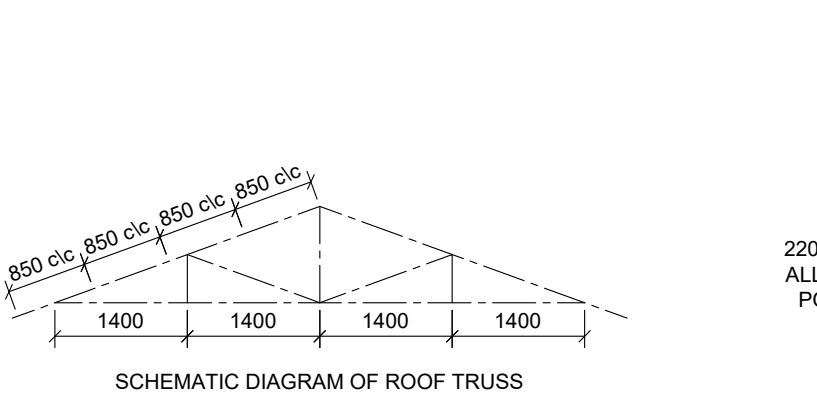
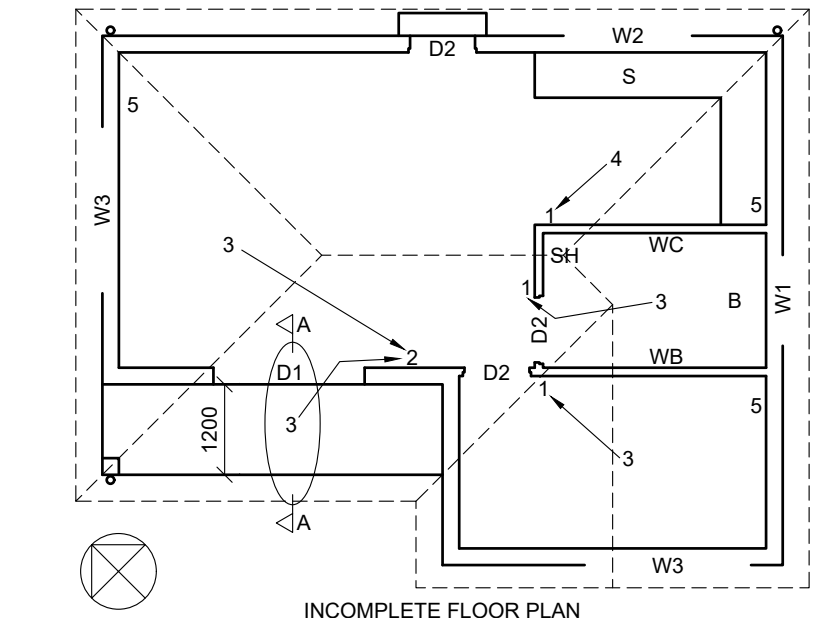


ROOM DESIGNATIONS AND FLOOR FINISHES

1. PORCH -TILES
2. LIVING AREA -TILES
3. KITCHEN -TILES
4. BATHROOM -TILES
5. BEDROOM -CARPET



ELECTRICAL SYMBOLS					



ROOF NOTES:

20° ROOF PITCH

114 x 40 mm ROOF TRUSSES ON 114 x 40 mm WALL PLATES

350 mm ROOF OVERHANG TO END OF ROOF TRUSS

30 mm CORRUGATED ROOF SHEETING ON 75 x 50 mm PURLINS @ 850 c/c

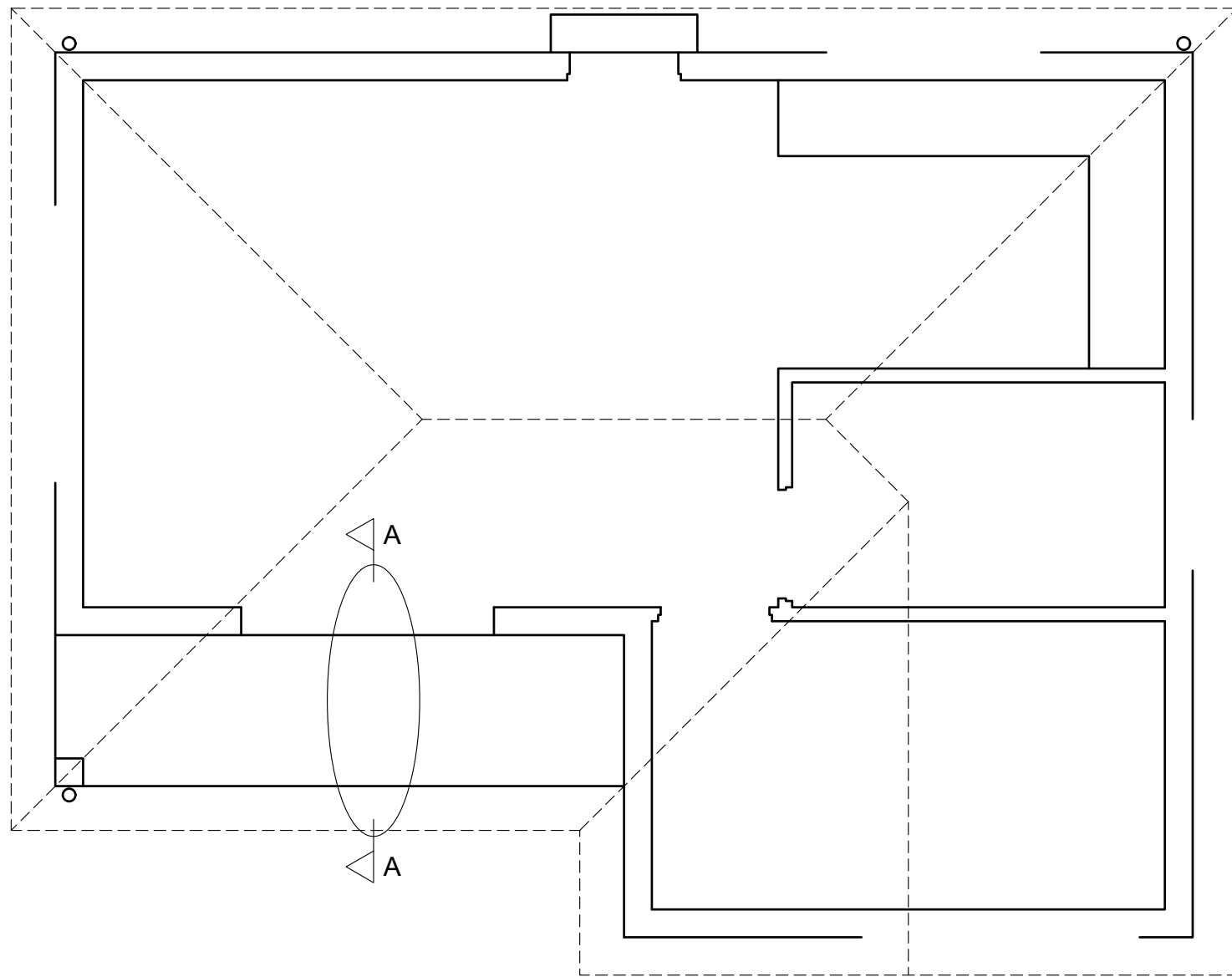
100 x 150 mm GUTTERS ON 220 x 20 mm FASCIA BOARDS ON ALL SIDES

300 x 75 x 10 mm BARGE BOARD ON GABLE END FLUSH WITH GUTTER

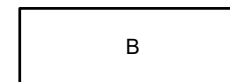
6 mm GYPSUM BOARD ON 40 x 40 mm BRANDING STRIPS @ 450 c/c

STAPLE

GL



FLOOR PLAN
SCALE 1 : 50



SECTION A-A
SCALE 1 : 20

MARK ALLOCATION FOR ROOF SECTION	
A	
B	
C	
D	
E	
F	
G	
H	
I	
TOTAL:	

PENALTIES	
INCORRECT SCALE	
NON-ALIGNMENT OF VIEWS	
VIEWS ROTATED	
SECTION VIEWED INCORRECTLY	
INCORRECT LETTERING	
TOTAL:	

ASSESSMENT CRITERIA				
FLOOR PLAN				
1	WINDOWS + DOORS	12½		
2	FIXTURES	8		
3	ELECTRICAL	9		
4	HATCHING	3		
5	LABELS	5		
SUBTOTAL:		37½		
SOUTH-WEST ELEVATION				
1	WALLS + FFL	4		
2	ROOF + GUTTER	8		
3	DOOR + WINDOW	7		
4	LABELS	1		
SUBTOTAL:		20		
DETAILED SECTION				
1	ROOF DETAIL	15		
2	WALL + SLAB	9½		
3	DOOR + LINTEL + PATIO OPENING	3		
4	HATCHING	6		
5	LABELS	1		
SUBTOTAL:		34½		
TOTAL:		92		
PENALTIES(-):				
GRAND TOTAL:				
EXAMINATION NUMBER				
				6