



**NATIONAL
SENIOR CERTIFICATE**

GRADE 12



ENGINEERING GRAPHICS AND DESIGN P1
SEPTEMBER 2026
PREPARATORY EXAMINATION

MARKS: 200
TIME: 3 hours
This question paper consists of 6 pages.
Copyright reserved

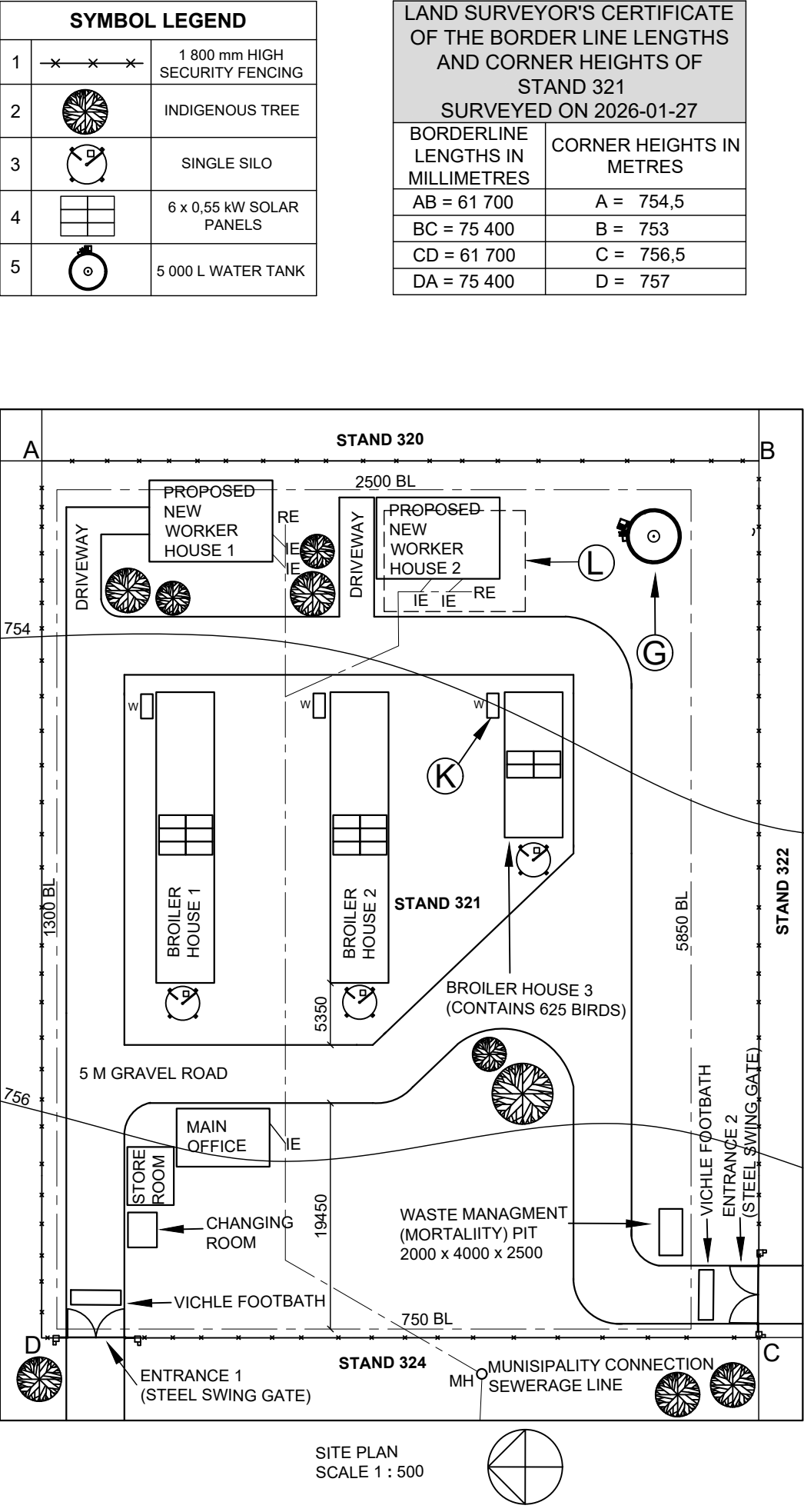
INSTRUCTIONS AND INFORMATION

1. This question paper consists of FOUR questions.
2. Answer ALL the questions.
3. ALL drawings must be drawn to scale 1 : 1, unless otherwise stated.
4. ALL drawings are in first angle orthographic projection, unless stated otherwise.
5. ALL drawings must be prepared using pencil and instruments, unless stated otherwise.
6. ALL answers must be drawn accurately and neatly.
7. The questions must be answered on the question paper, as instructed.
8. ALL the answer sheets must be re-stapled in numerical sequence and handed in irrespective of whether the question was attempted or not.
9. Time management is essential in order to complete all the questions.
10. Print your name in the block provided on every ANSWER SHEET.
11. Any details or dimensions not given, must be assumed in good proportion.

FOR OFFICIAL USE ONLY									
								MODERATED MARK	
1									
2									
3									
4									
TOTAL									
2				0				2	
0				0				0	
0									

FINAL CONVERTED MARK	CHECKED BY
100	

COMPLETE THE FOLLOWING:
NAME
NAME
EXAMINATION CENTRE
EXAMINATION CENTRE



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

ARCHITECT'S SIGNATURE

CLIENT'S SIGNATURE

ANSWER 17
In the space below, draw in neat freehand, the front view and top view of the SANS 10143 graphical symbol for a **WASH TUB**.

3		
2	2026-08-24	Add the vehicle footbath
1	2026-07-12	Indicate the solar panel capacity
REVISION	DATE	DESCRIPTION

CLAYTON AND ZUNCKLE ARCHITECTS
236 MAPLE ROAD
WESTDENE, BLOEMFONTEIN
071 597 7298
candz.architects@gmail.com

PRINTED BY: **BRITS PRINTERS** DATE OF PRINT: **2026-05-25**

DRAWING TITLE:
SITE PLAN

PROJECT:
NEW WORKER HOUSES PROPOSAL
ON STAND 321 FOR
MR L VAN NIEKERK
WILSON STREET, ADELAIDE

PROJECT NUMBER: 173-2026	DRAWING NUMBER: MF-22/01-26		
DATE: 2026-02-28	DRAWN: CAMERON	CHECKED: MATTHEW	SCALE: 1 : 500
REFERENCE CODE: SITE- 321-26	DRAWING NO.: 1 of 3		

QUESTION 1: ANALYTICAL (CIVIL)

Given:
The site plan of an existing broiler farm with alterations of two new proposed worker houses on stand 321, a title block and a table of questions. The drawing has not been prepared to the indicated scale.

Instructions:
Complete the table below by neatly answering the questions which refer to the accompanying drawing and title block. **[29]**

QUESTIONS		ANSWERS							
1	Who is the client?		1						
2	On what date was the site plan surveyed?		1						
3	What was the reason for the first revision of the site plan?		1						
4	In what colour should the new worker houses be presented on the siteplan?		1						
5	Name the feature at G .		1						
6	Name the feature at K .		1						
7	What is the reason for the dashed lines at L ?		1						
8	Why would this site plan not be approved?		1						
9	What does the abbreviation MH stand for?		1						
10	How many birds do broiler house 3 contain?		1						
11	What is the depth of the waste management (mortality)pit, in meters?		2						
12	In relation to the north point, which elevation of the proposed new worker houses faces the main office?		2						
13	Determine the total electricity generation capacity of the broiler farm based on the number and rating of the solar panels installed.		2						
14	Determine the shortest distance from the broiler houses to borderline CD , in meters.		3						
15	Determine, in the space provided below (ANSWER 15) the perimeter of stand 321 , in meters. Show all calculations.		3						
16	Determine, in the space provided below (ANSWER 16), the total area of the ground on which the three broiler houses stands, on stand 321 , in square meters. Show all calculations and formula (round the answer to 2 decimal place).		3						
17	In the space at the title panel (ANSWER 17), draw in neat freehand, the front view and top view of the SANS 10143 graphical symbol for a wash tub .		4						
ANSWER 15 Show ALL calculations.		ANSWER 16 Show ALL calculations.	TOTAL 29						
		<table><tbody><tr><td colspan="2">NAME</td></tr><tr><td colspan="2"></td></tr><tr><td colspan="2">NAME</td></tr></tbody></table>	NAME				NAME		2
NAME									
NAME									

QUESTION 2: SOLID GEOMETRY
Given:

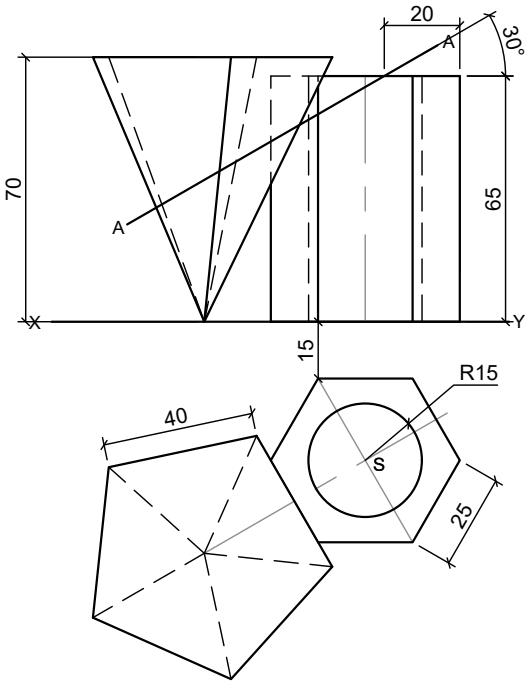
- The complete top view and front view of a pentagonal pyramid and a hexagonal prism with a circular hole.
- The starting point S.

Instructions:
Draw to scale 1 : 1, the following views of the two pipes:

- 2.1 The given front view.
- 2.2 The sectional top view on cutting plane A-A.
- 2.3 The sectional left view on cutting plane A-A.
- 2.4 The true shape on cutting plane A-A, only of the pyramid.

- ALL hidden detail is required.
- Show ALL necessary constructions.

[38½]



S

ASSESSMENT CRITERIA			
1	FRONT VIEW	7½	
2	SECTIONAL TOP VIEW	13	
3	SECTIONAL LEFT VIEW	14½	
4	TRUE SHAPE	3½	
PENALTIES (-)			
TOTAL		38½	

NAME	
NAME	3

QUESTION 3: PERSPECTIVE
Given:

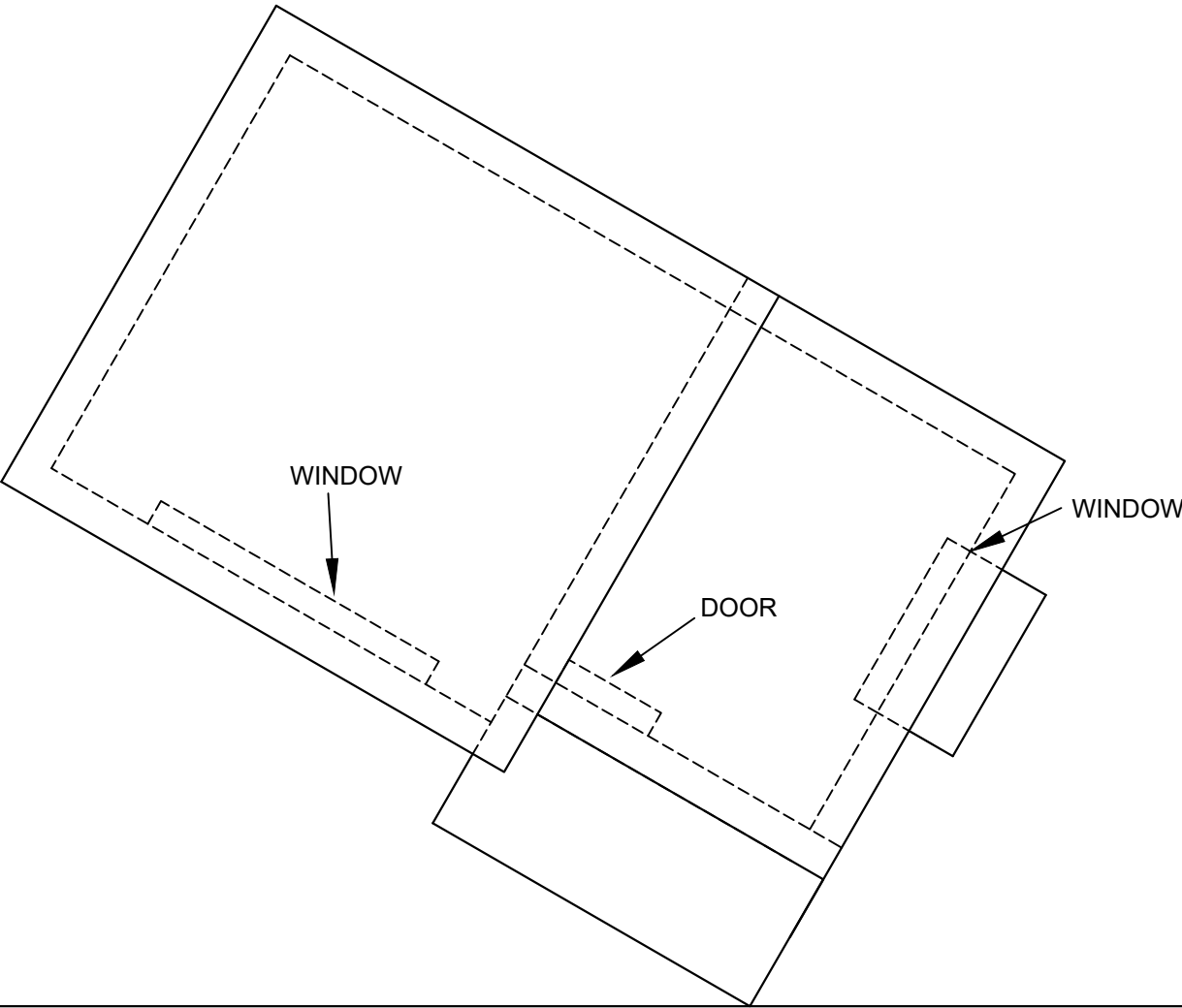
- Three views of a modern style house and the information needed to draw a two-point perspective drawing.

PP – Picture plane
HL – Horizon line
GL – Ground line
SP – Station point

Instructions:
Complete the perspective drawing.

- Align the drawing sheet with the ground line (GL).
- Determine and label the vanishing points.
- Show ALL necessary construction.
- NO hidden detail is required.

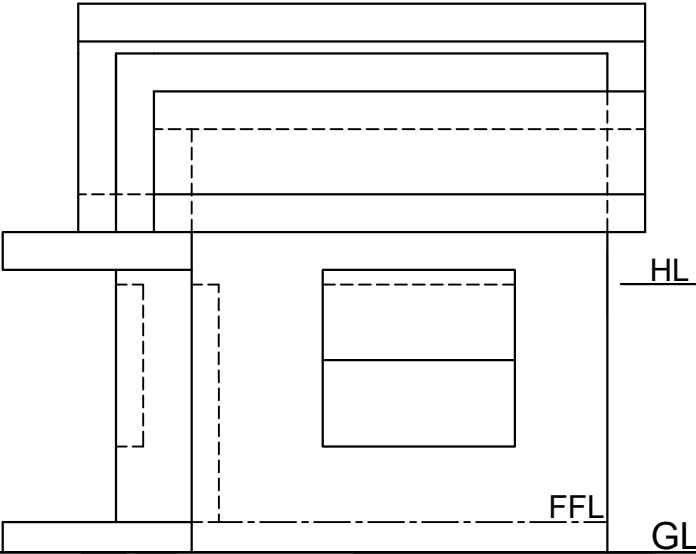
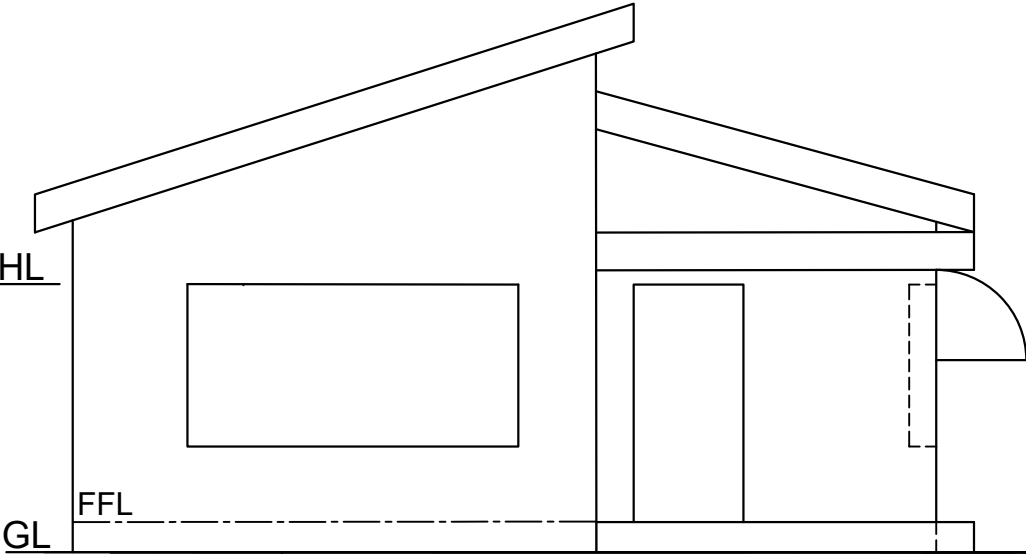
[41]



ASSESSMENT CRITERIA			
1	CONSTRUCTION + VP's	6	
2	WALLS + PORCH	10	
3	ROOF	12	
4	WINDOWS + DOOR + WALL INSERT	8	
5	ARCH + CONSTRUCTION	5	
PENALTIES (-)			
TOTAL		41	

PP

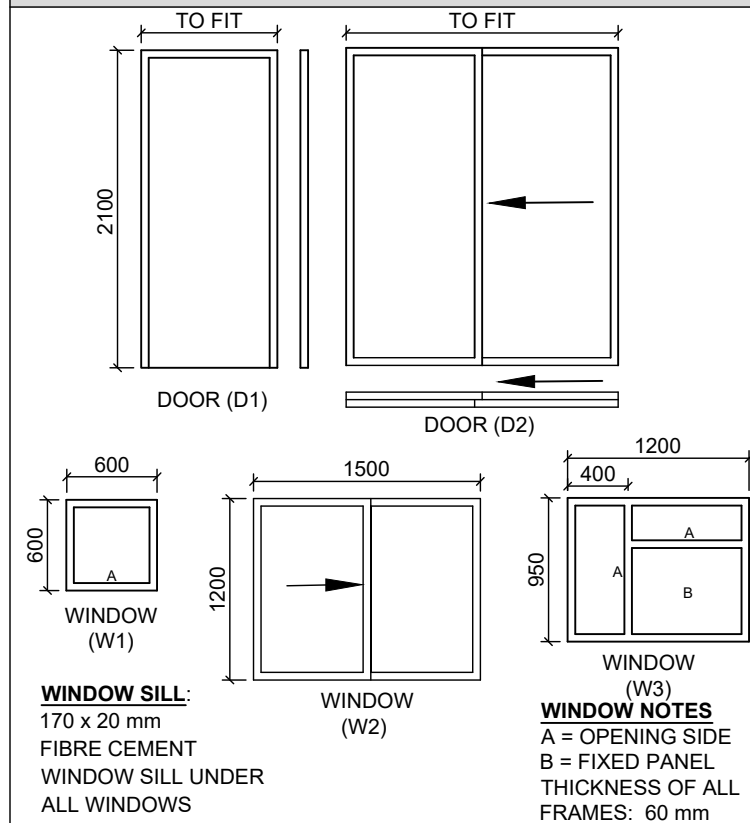
PP



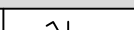
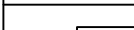
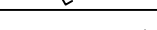
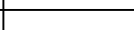
SP +

NAME	
NAME	4

DOOR AND WINDOW SCHEDULE

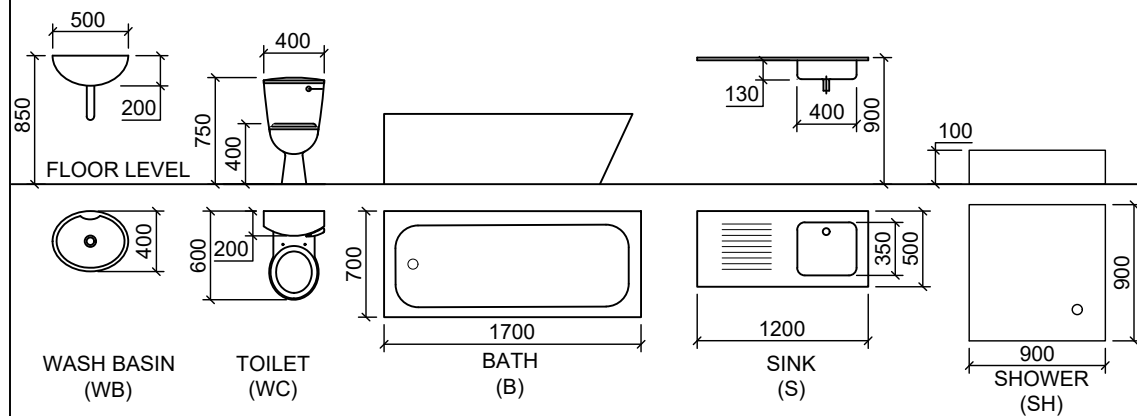


ROOF COMPONENTS	
RIDGE COVER	
200 x 20 mm FASCIA BOARD	
150 x 100 GUTTER	

ELECTRICAL SYMBOLS	
	
	
	
	

Technical drawing of a barbecue (BBQ) showing dimensions. The drawing is a front elevation. The top section is a chimney with a width of 600 and a height of 800. Below the chimney is a trapezoidal body. The total height of the body is 2700. The body has two rectangular compartments, each with a height of 800. The bottom width of the body is 1200. The top width of the body is 900. The drawing is labeled "BARBEQUE" at the top.

SANITARY FIXTURES



FLOOR FINISHES

- | | |
|-------------------|--------|
| 1. OPEN PLAN: | WOOD |
| 2. BEDROOM : | CARPET |
| 3. BATHROOM: | TILES |
| 4. BARBEQUE AREA: | TILES |

FEATURES

- D1 + D2** DOORS
W1 + W2 + W3 WINDOWS

FIXTURES

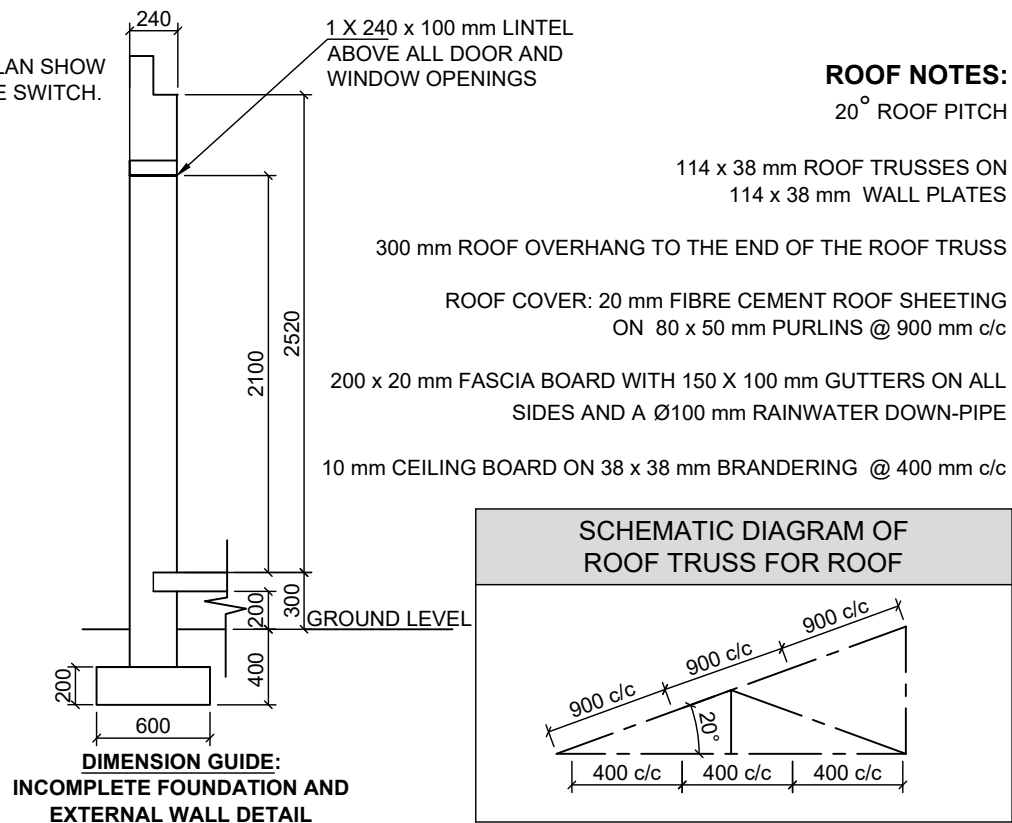
- | | |
|------------|-------------------|
| S | SINK |
| B | BATH |
| WC | TOILET |
| WB | WASH BASIN |
| SH | SHOWER |
| BIC | BUILD IN CUPBOARD |

ELECTRICAL FITTINGS

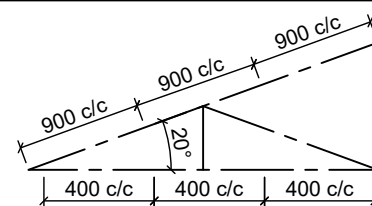
1. ONE-WAY SWITCH - SINGLE-POLE
2. ONE- WAY SWITCH - THREE-POLES
3. SWITCHED SOCKET OUTLET
4. FLUORESCENT LIGHT 2 x 40 W
5. CEILING LIGHT
6. WALL-MOUNTED LIGHT

NOTE:
THE ARROWS ON THE FLOOR PLAN SHOW
THE LIGHT CONNECTION TO THE SWITCH.

FLOORPLAN
SCALE 1 : 50



SCHEMATIC DIAGRAM OF
ROOF TRUSS FOR ROOF



QUESTION 4: CIVIL DRAWING

Given:

- The incomplete west elevation of a **new house**, showing the walls, windows and door openings, patio with a pillar, the roof and notes
- The incomplete floor plan showing the walls, patio with a pillar, position of the doors, windows, fixtures and the electrical layout
- A schematic diagram of a single roof truss and roof notes
- The incomplete foundation and external wall with dimensions
- A door and window schedule
- A table of electrical symbols
- A table of roof components
- A table of the barbeque
- Floor finishes
- A table of sanitary fixtures
- The incomplete floor plan, of a **new house**, drawn to scale 1 : 50, and the incomplete foundation and break lines for the detailed section, drawn to scale 1 : 20, on page 6

Instructions:

Answer this question on page 6.

- 4.1 Use the given incomplete floor plan, to draw, in first-angle orthographic projection to **scale 1 : 50**, the following views of the **new house**:

4.1.1 THE COMPLETE FLOOR PLAN

Add the following features to the drawing:

- ALL doors and windows
- ALL sanitary fixtures as indicated by the abbreviations
- ALL electrical fittings as indicated by the numbers
- ALL hatching detail

4.1.2 THE COMPLETE WEST ELEVATION

Show the following features on the drawing:

- The outside walls, door, patio with a pillar and the detailed windows.
- The roof detail, including the fascia boards, ridge covers, gutters and chimney.
- The finished floor level.

- 4.2 Using the given foundation and break line on page 6, draw, to scale 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 complete foundation-, concrete slab-, external wall-, lintel and window frame detail.
- The barbeque, to the north of the cutting plane **A-A**
- The roof detail, including the fascia board and gutter.
- ALL hatching detail. **ONLY** the substructure hatching may be drawn in neat freehand.

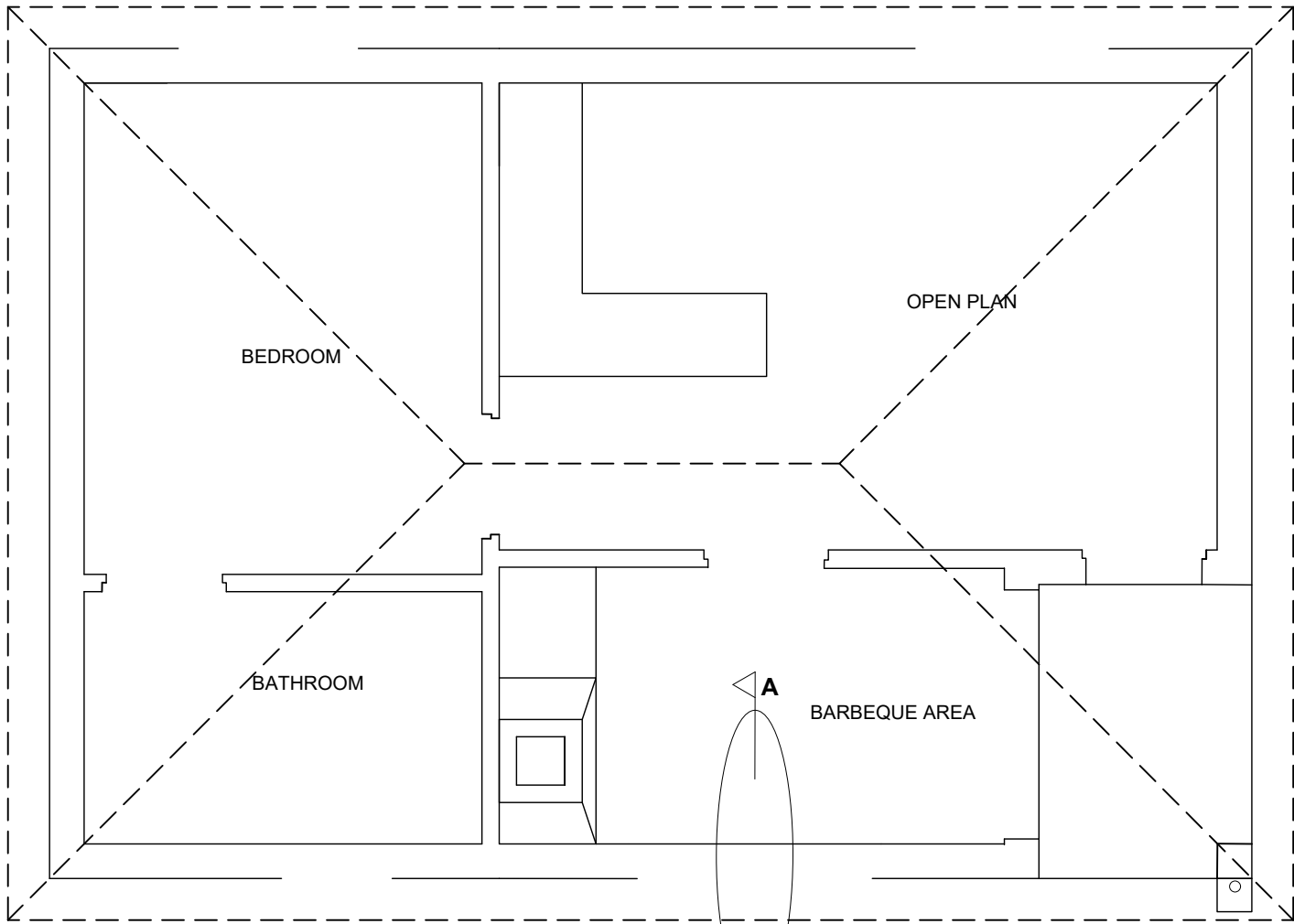
Label the following:

- The west elevation.
- The floor finishes.
- Ground level and finished floor level (use the correct abbreviations and show it on ALL the relevant views)

NOTE:

ALL drawings must comply with the **guidelines** and **graphical symbols** as contained in the *SANS 10143*. [91½]

NGL —



FLOOR PLAN
SCALE 1 : 50

DETAILED SECTION A-A
SCALE 1 : 20

ROOF DETAIL: MARK ALLOCATION			
A	ROOF ANGLE	$\frac{1}{2}$	
B	ROOF SHEET	1	
C	ROOF TRUSS OVERHANG	$2\frac{1}{2}$	
D	PURLIN + SPACING	$1\frac{1}{2}$	
E	BRANDERING + SPACING	$1\frac{1}{2}$	
F	CEILING BOARD	$\frac{1}{2}$	
G	WALL PLATE	1	
H	FACIA BOARD	$1\frac{1}{2}$	
I	GUTTER	1	
TOTAL		11	

PENALTIES		
1	INCORRECT SCALE	
2	NON-ALIGNMENT OF VIEWS	
3	INCORRECT LETTERING	
TOTAL PENALTIES (-)		

ASSESSMENT CRITERIA			
FLOOR PLAN			
1	DOORS + WINDOWS	14	
2	ELECTRICAL	9	
3	FIXTURES	10	
4	HATCHING	3	
5	LABELS	2	
SUBTOTAL		38	
WEST ELEVATION			
1	ROOF DETAIL	9	
2	WALLS + PATIOS + PILLAR + FFL	$3\frac{1}{2}$	
3	DOOR + WINDOW	$8\frac{1}{2}$	
4	LABELS	1	
SUBTOTAL		22	
DETAILED SECTION			
1	ROOF DETAIL	11	
2	FOUNDATIONS + WALLS + FLOOR + BARBEQUE	9	
3	WINDOW + LINTEL	4	
4	HATCHING	6	
5	LABELS	$1\frac{1}{2}$	
SUBTOTAL		$31\frac{1}{2}$	
TOTAL		$91\frac{1}{2}$	
PENALTIES (-)			
GRAND TOTAL			

NAME	
NAME	6



**NATIONAL SENIOR CERTIFICATE
NASIONALE SENIOR SERTIFIKAAT**

**GRADE 12
GRAAD 12**

**ENGINEERING GRAPHICS AND DESIGN P1
INGENIEURSGRAFIKA EN -ONTWERP V1**

**SEPTEMBER 2026
PREPARATORY EXAMINATION / VOORBEREIDINGSEKSAMEN
MARKING GUIDELINE / NASIENRIGLYN**

MARKS/PUNTE: 200

**This marking guideline consists of 7 pages.
Hierdie nasienriglyn bestaan uit 7 bladsye.**

Copyright reserved/Kopiereg voorbehou

PAPER 1
QUESTION 1: ANALYTICAL
Gr. 12
SEPTEMBER 2026
MARKING GUIDELINE

VRAESTEL 1
VRAAG 1: ANALITIES
Gr. 12
SEPTEMBER 2026
NASIENRIGLYN

QUESTION 1 ANSWERS		
1	MR L VAN NIEKERK	1
2	2026-01-27	1
3	INDICATE THE SOLAR PANEL CAPACITY	1
4	RED	1
5	5 000 L WATER TANK	1
6	WATER STORAGE TANK	1
7	BUILDING IS TO BE DEMOLISHED/CLEARED/REMOVED	1
8	THE PROPOSED NEW WORKER HOUSE 1 IS OVER THE BUILDING LINE	1
9	MANHOLE	1
10	625 BIRDS	1
11	2500 MM = 2,5 M	2
12	WEST VIEW	2
13	16 PANELS x 0,55 kW = 8,8 kW	2
14	CALCULATION BELOW	3
15	CALCULATION BELOW	3
16	CALCULATION BELOW	3
17	SKETCH BELOW	4
TOTAL		29

VRAAG 1 ANTWOORDE		
1	MNR. L. VAN NIEKERK	1
2	2026-01-27	1
3	DUI DIE SONPANEELKAPASITEIT AAN	1
4	ROOI	1
5	5 000 L WATER TENK	1
6	WATEROPGAARTENK	1
7	GEBOU MOET VERWYDER/WEGGEVAT WORD	1
8	DIE VOORGESTELDE WERKERSHUIS 1 IS OOR DIE BOULYN	1
9	MANGAT	1
10	625 HOENDERS	1
11	2500 MM = 2,5 M	2
12	WESTELIKE AANSIG	2
13	16 PANELS x 0,55 kW = 8,8 kW	2
14	BEREKENINGE ONDER	3
15	BEREKENINGE ONDER	3
16	BEREKENINGE ONDER	3
17	SKETS ONDER	4
TOTAAL		29

QUESTION/VRAAG 14

$$5,35 \text{ m} + 5 \text{ m} + 19,45 \text{ m} + 0,75 \text{ m} = \underline{\underline{30,55 \text{ m}}}$$

calculation: (+) berekening: (+) 1
correct values korrekte waardes 1
correct answer korrekte antwoord 1
correct unit korrekte eenheid

[3]

QUESTION/VRAAG 15

Show all calculations/Toon alle berekeninge

$$\begin{aligned} \text{calculation: (+)} & \quad 2(61,7 \text{ m}) + 2(75,4 \text{ m}) & \text{berekening: (+)} \\ \text{correct values} & \quad = 123,4 + 150,8 & \text{korrekte waardes} \\ \text{correct answer} & \quad = \underline{\underline{274,2 \text{ m}}} & \text{korrekte antwoord} \\ \text{correct unit} & & \text{korrekte eenheid} \end{aligned}$$

[3]

QUESTION/VRAAG 16

Toon alle berekeninge / Show all calculations

$$31,8 \text{ m} \times 38,68 \text{ m} = 1229,07 \text{ m}^2$$

$$31,8 \text{ m} - 15,35 \text{ m} = 16,45 \text{ m}$$

$$17,25 \text{ m} \times 16,45 \text{ m} = 283,7625 \text{ m}^2$$

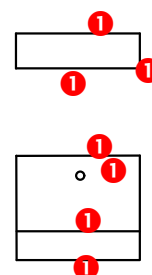
$$\frac{283,7625 \text{ m}^2}{2} = 141,88125 \text{ m}^2$$

$$\begin{aligned} 1229,07 \text{ m}^2 - 141,88125 \text{ m}^2 \\ = \underline{\underline{1087,18875 \text{ m}^2}} \\ = \underline{\underline{1087,19 \text{ m}^2}} \end{aligned}$$

Multiply formula
correct answer
correct unit m²
Vermenigvuldig formule
korrekte antwoord
korrekte eenheid m²

[3]

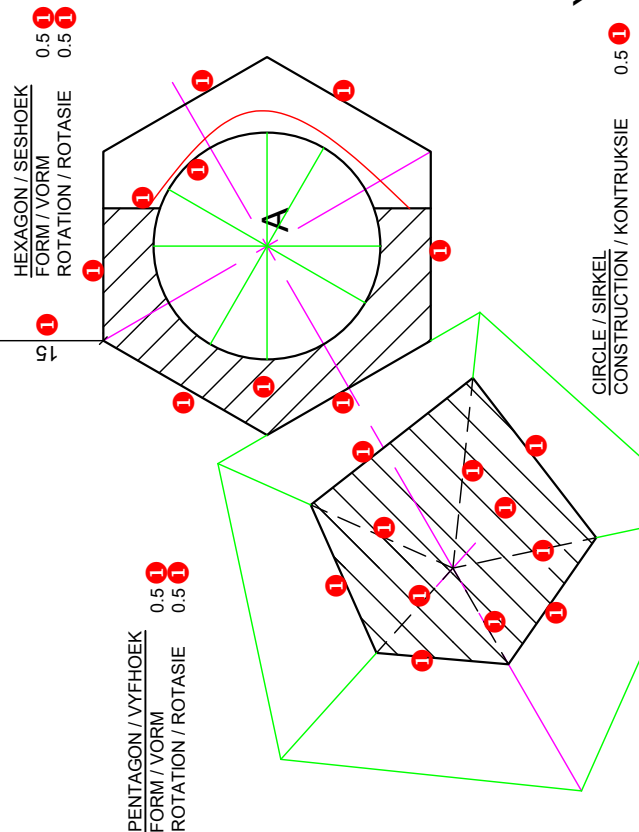
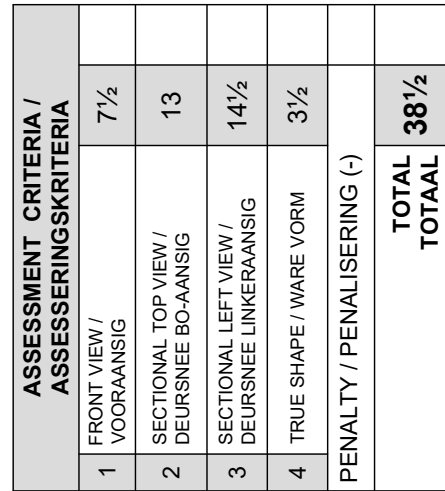
QUESTION/VRAAG 17



Vryhand
Freehand

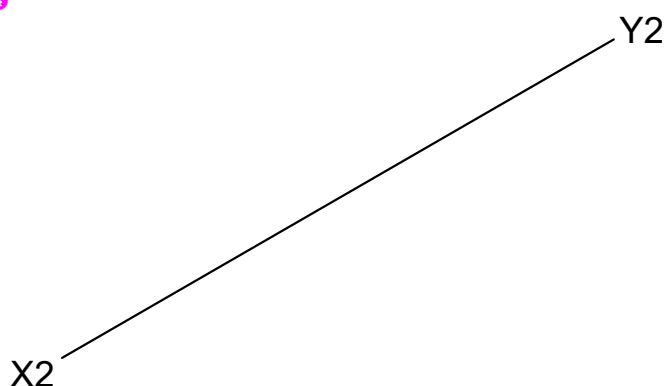
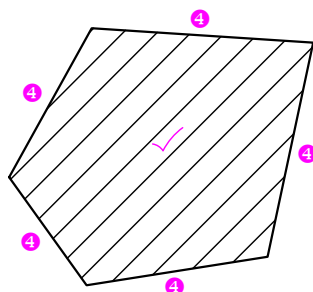
[4]

VRAESTEL 1
VRAAG 1: VASTE LIGGAME
Gr. 12
SEPTEMBER 2026
NASIENRIGLYN



PAPER 1
QUESTION 2: SOLID GEOMETRY
SEPTEMBER 2026
MARKING GUIDELINE

VRAESTEL 1
VRAAG 1: VASTE LIGGAME
Gr. 12
SEPTEMBER 2026
NASIENRIGLYN



ASSESSMENT CRITERIA / ASSESSERINGSKRITERIA			
1	FRONT VIEW / VOORAANSIG	7½	
2	SECTIONAL TOP VIEW / DEURSNEE BO-AANSIG	13	
3	SECTIONAL LEFT VIEW / DEURSNEE LINKERAANSIG	14½	
4	TRUE SHAPE / WARE VORM	3½	
PENALTY / PENALISERING (-)			
TOTAL TOTAAL		38½	

PAPER 1 - QUESTION 3: PERSPECTIVE

Gr. 12

SEPTEMBER 2026

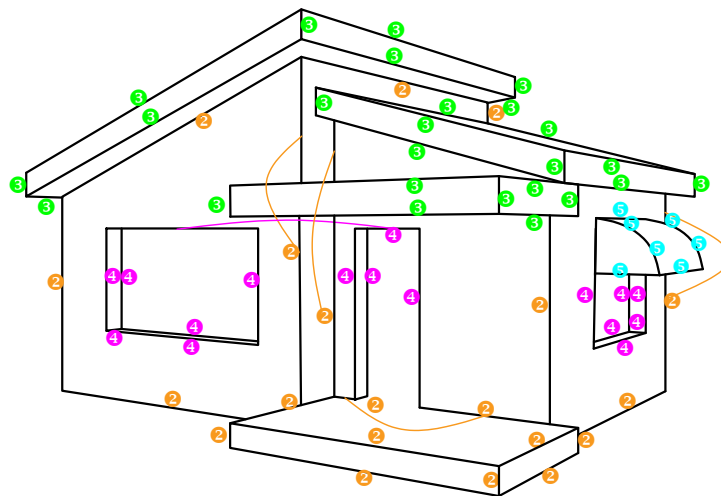
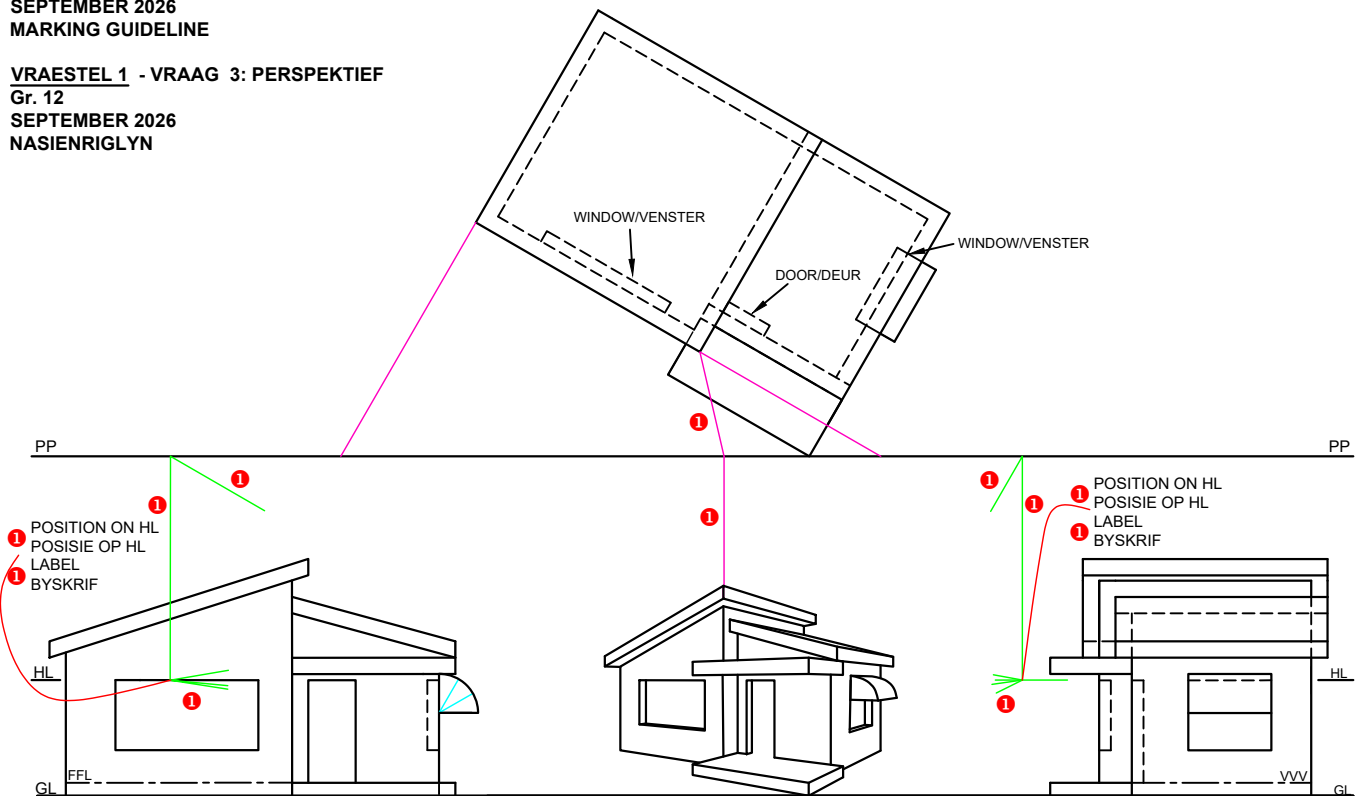
MARKING GUIDELINE

VRAESTEL 1 - VRAAG 3: PERSPEKTIEF

Gr. 12

SEPTEMBER 2026

NASIENRIGLYN



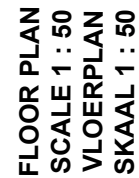
USE TO DETERMINE LVP AND RVP
POSITION
GEBRUIK OM LVP EN RVP SE
POSISIE TE BEPAAL



ASSESSMENT CRITERIA		
1	CONSTRUCTION + VP's	6
2	WALLS + PORCH	10
3	ROOF	12
4	WINDOWS + DOOR	8
5	ARCH + CONSTRUCTION	5
TOTAL		41

ASSESSERINGSKRITERIA		
1	KONSTRUKSIE + VP'te	6
2	MURE + STOEP	10
3	DAK	12
4	VENSTERS + DEUR	8
5	BOOG + KONSTRUKSIE	5
TOTAAL		41

ASSESSERINGSKRITERIA		
VLOERPLAN		
1	DEURE + VENSTERS	14
2	ELEKTRIES	9
3	TOEBEHORE	10
4	ARSERING	3
5	BYSKRIFTE	2
SUBTOTAAL		38



**DETAILS OF MARK
ALLOCATION /
BESONDERHEDE
VAN PUNTTOEKENING**



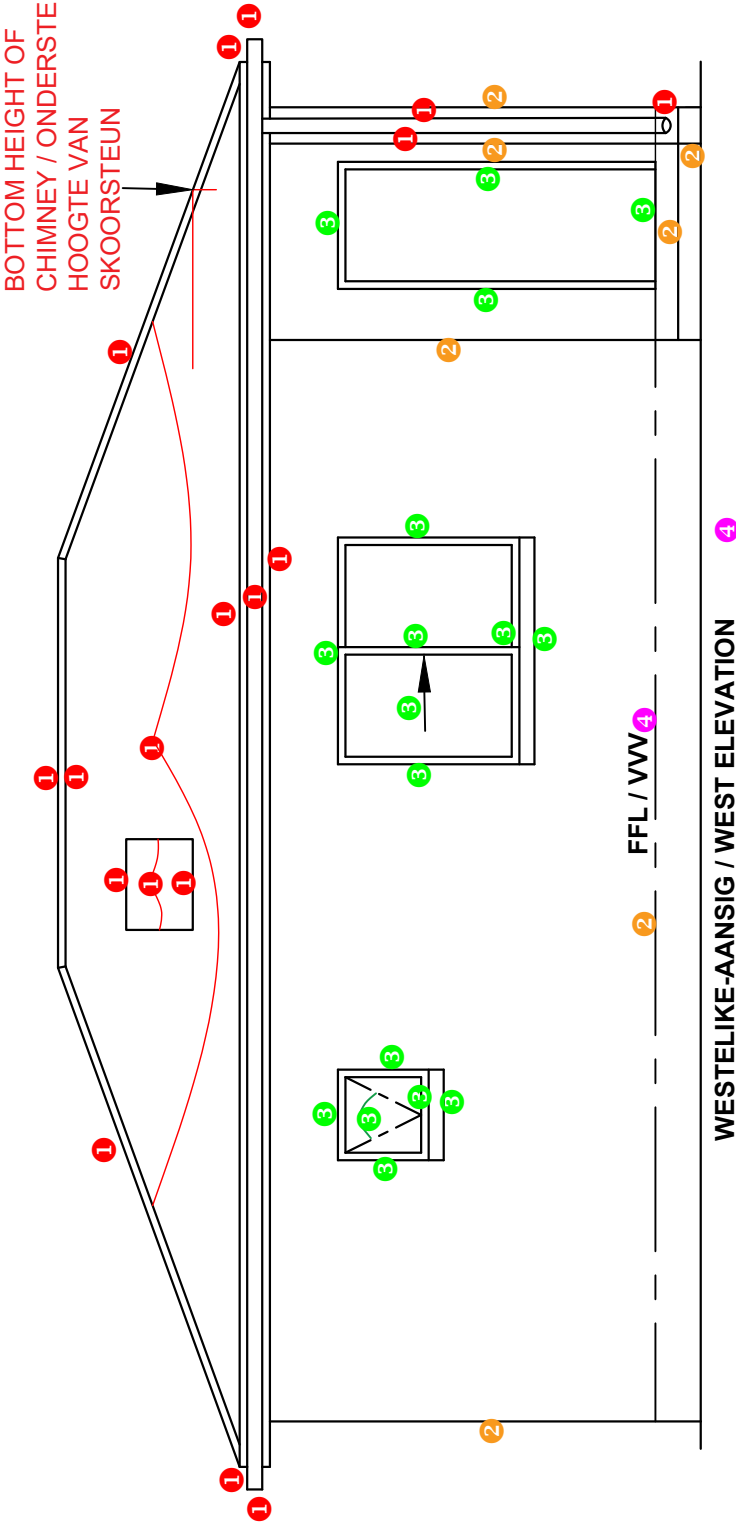
4 X DOORS
4 X DEURE

4 X 1 = 4

[illegible]

PAPER 1 - QUESTION 4: ELEVATION
Gr. 12
SEPTEMBER 2026
MARKING GUIDELINE

VRAESTEL 1 - VRAAG 4: ELEVASIE
Gr. 12
SEPTEMBER 2026
NASIENRIGLYN



ASSESSERINGSKRITERIA	
WES - AANSIG	
1	DAK + FASSIE + GEUT + VORSES 9
2	MURE + STOEP + PILAAR + VVV $3\frac{1}{2}$
3	DEUR + VENSTER $8\frac{1}{2}$
4	BYSKRIFTE 1
SUBTOTAAL 22	

ASSESSMENT CRITERIA	
WEST ELEVATION	
1	ROOF + FACIA + GUTTER + COVERS 9
2	WALLS + PORCH + PILLAR + FFL $3\frac{1}{2}$
3	DOOR + WINDOW $8\frac{1}{2}$
4	LABELS 1
SUBTOTAL 22	

PAPER 1 - QUESTION 4: SECTION
Gr. 12
SEPTEMBER 2026
MARKING GUIDELINE

VRAESTEL 1 - VRAAG 4: DEURSNEE
Gr. 12
SEPTEMBER 2026
NASIENRIGLYN

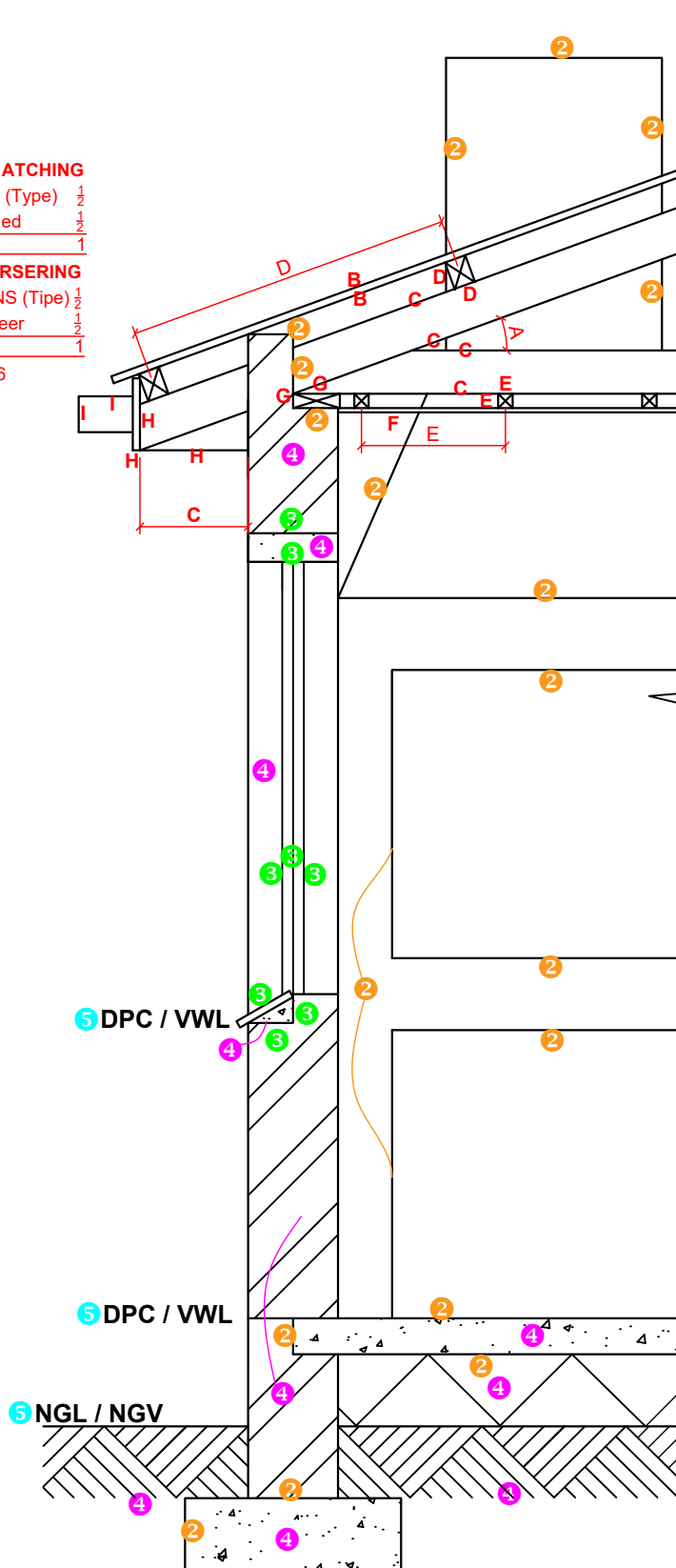
TIMBER HATCHING

- 4 SANS Compliant (Type) $\frac{1}{2}$
4 ALL timber hatched $\frac{1}{2}$
TOTAL 1

HOUTARSERING

- 4 Voldoen aan SANS (Tipe) $\frac{1}{2}$
4 ALLE hout gearseer $\frac{1}{2}$
TOTAAL 1

$5 + 1 = 6$



DETAILED SECTION A-A
SCALE 1 : 20
GEDETAILLEERDE SNIT A-A
SKAAL 1 : 20

ROOF DETAIL: MARK ALLOCATION DAKBESONDERHEDE: PUNTETOEKENNING		
A	ROOF ANGLE / DAKHELLING	$\frac{1}{2}$
B	ROOF SHEET DAKPLAAT	1
C	ROOF TRUSS + OVERHANG / DAKKAP+ OORHANG	$2\frac{1}{2}$
D	PURLIN + SPACING / DAKLAT + SPASIERING	$1\frac{1}{2}$
E	BRANDERING + SPACING / PLAFONLATTE + SPASIERING	$1\frac{1}{2}$
F	CEILING BOARD / PLAFONBORD	$\frac{1}{2}$
G	WALL PLATE / MUURPLAAT	1
H	FACIA BOARD / FASSIEBORD	$1\frac{1}{2}$
I	GUTTER / GEUT	1
TOTAL / TOTAAL		11

ASSESSERINGSKRITERIA		
GEDETAILLEERDE SNIT		
1	DAKBESONDER- HEDE	11
2	FONDASIE + MURE + VLOER + BRAAI	9
3	VENSTER + LATEI	4
4	ARSERING	6
5	BYSKRIFTE	$1\frac{1}{2}$
SUBTOTAAL		$31\frac{1}{2}$

ASSESSMENT CRITERIA		
DETAILED SECTION		
1	ROOF DETAIL	11
2	FOUNDATIONS + WALLS + FLOOR + BARBEQUE	9
3	WINDOW + LINTEL	4
4	HATCHING	6
5	LABELS	$1\frac{1}{2}$
SUBTOTAL		$31\frac{1}{2}$