



basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

SENIOR CERTIFICATE EXAMINATIONS/ NATIONAL SENIOR CERTIFICATE EXAMINATIONS

ENGINEERING GRAPHICS AND DESIGN P1

MAY/JUNE 2025

MARKS: 100

TIME: 3 hours

This question paper consists of 6 pages.

Barcode label

DO NOT FOLD THE QUESTION PAPER IN HALF.

INSTRUCTIONS AND INFORMATION

1. This question paper consists of FOUR questions.
2. Answer ALL the questions.
3. ALL drawings 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 the questions must be answered on the QUESTION PAPER, as instructed.
7. ALL the pages, irrespective of whether the question was attempted or not, must be re-stapled in numerical sequence in the TOP LEFT-HAND CORNER ONLY.
8. Time management is essential in order to complete all the questions.
9. Print your examination number in the block provided on every page.
10. Any details or dimensions not given must be assumed in good proportion.

FOR OFFICIAL USE ONLY											
QUESTION	MARKS OBTAINED			$\frac{1}{2}$	SIGN	MODERATED			$\frac{1}{2}$	SIGN	RE-MARKING
1											
2											
3											
4											
TOTAL											
	2	0	0			2	0	0			2 0 0

FINAL CONVERTED MARK

100

CHECKED BY

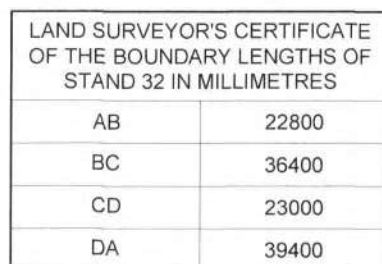
COMPLETE THE FOLLOWING:

CENTRE NUMBER

CENTRE NUMBER

EXAMINATION NUMBER

EXAMINATION NUMBER



SYMBOL LEGEND	
DECIDUOUS TREE	
EVERGREEN TREE	
SHRUB	

CLIENT'S SIGNATURE

In the space below, draw, in neat freehand, the SANS 10143 graphical symbol for:

- (a) BATH (elevation and plan)
- (b) DISTRIBUTION BOARD

(a) BATH (elevation and plan)

(b) DISTRIBUTION BOARD

2	07/02/2024	REPOSITION ELECTRICAL METER
1	05/02/2024	EXTENSION OF DRIVEWAY
REVISION	DATE	DESCRIPTION

PRINTED BY:	DATE:
CHERRY PRINTERS	08/02/2024

CJE ARCHITECTS
99 WILLOW TREE ROAD
ZEERUST
1091
CJE-ARC@gmail.com

PROJECT ARCHITECT:

SIPHO DLAMINI

PROJECT TITLE:

PROPOSED NEW WORKSHOP FOR
ANTEBELLA AND ASSOCIATES,
ON STAND 32, CAMP STREET,
ZEERUST

DRAWING TITLE

SITE PLAN

PROJECT NUMBER	82848-24
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DRAWING NUMBER:

W	S	-	4	A	-	0	5
---	---	---	---	---	---	---	---

REFERENCE CODE:
12186127

SCALE: 1 : 400

DRAWN:
JACK

DATE: 04/02/2024

CHECKED:
DIANNE

DATE:	07/02/2024
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Given:

The site plan of an existing building with a proposed new workshop and driveway, a title panel and a table of questions. The drawing is not presented to the indicated scale.

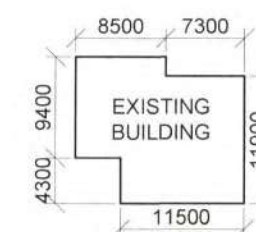
Instructions:

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

QUESTIONS			ANSWERS		
1	What is the name of the architectural firm?		1		
2	What scale is indicated for the site plan?		1		
3	What was the first revision?		1		
4	In which street is the entrance to STAND 32?		1		
5	What is the height of the highest corner of STAND 32 in metres?		1		
6	What new finish must be used on all the driveways?		1		
7	How many evergreen trees are on STAND 32?		1		
8	What new security feature must be added to STAND 32?		1		
9	What is the width of the pavements in millimetres?		1		
10	What does the ratio 1 : 40 on the municipal sewerage line indicate?		1		
11	What does the contour line at 1 indicate?		1		
12	What does the feature at 2 indicate?		1		
13	What line type indicates that a feature must be removed?		1		
14	What is the shortest distance from corner P on the existing building to Camp Street in metres?		1		
15	In what colour must new wood be indicated on elevations?		1		
16	With reference to the sewerage lines, what abbreviations are associated with the features at:	3: 4: 5:	3		
17	What will be built across the road north-east of STAND 32?		1		
18	In the space below (ANSWER 18), determine the perimeter of STAND 32 in metres.		3		
19	In the space below (ANSWER 19), determine the combined total area of the existing building and the proposed new workshop in square metres, if the total area of the new workshop is 41,59 m ² .		4		
20	In the space in the title panel (ANSWER 20), draw, in neat freehand, the <i>SANS 10143</i> graphical symbol for: (a) BATH (elevation and plan) and (b) DISTRIBUTION BOARD.		4		
			TOTAL	30	

ANSWER 18
Show ALL calculations.
(Do NOT round off the answer.)

ANSWER 19
Show ALL calculations.
(Do NOT round off the answer.)



EXAMINATION NUMBER

EXAMINATION NUMBER

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QUESTION 2: SOLID GEOMETRY

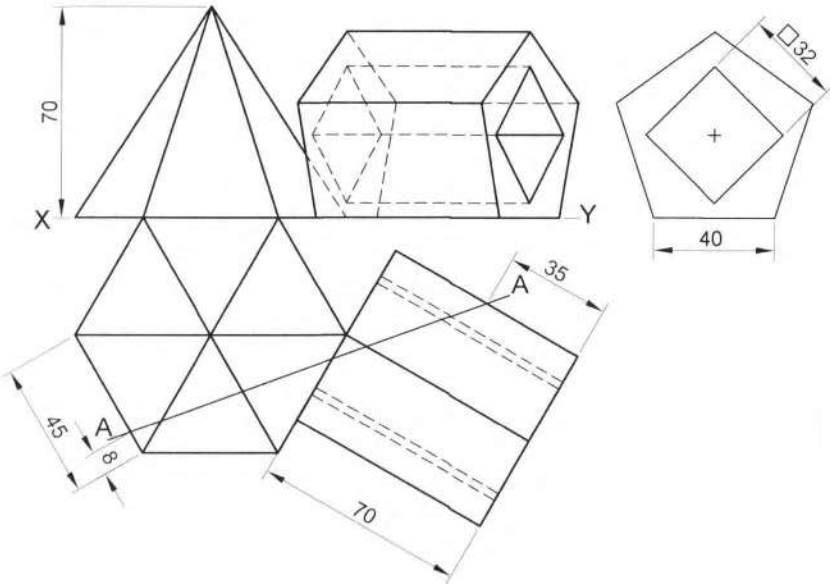
- Given:**
- The front view and top view of a right regular hexagonal pyramid and a right regular pentagonal prism that is centrally pierced by a right square prismatic hole
 - An auxiliary view of the pentagonal prism
 - Cutting plane A-A that cuts both solids

Instructions:
Draw, to scale 1 : 1, the following views of both solids:

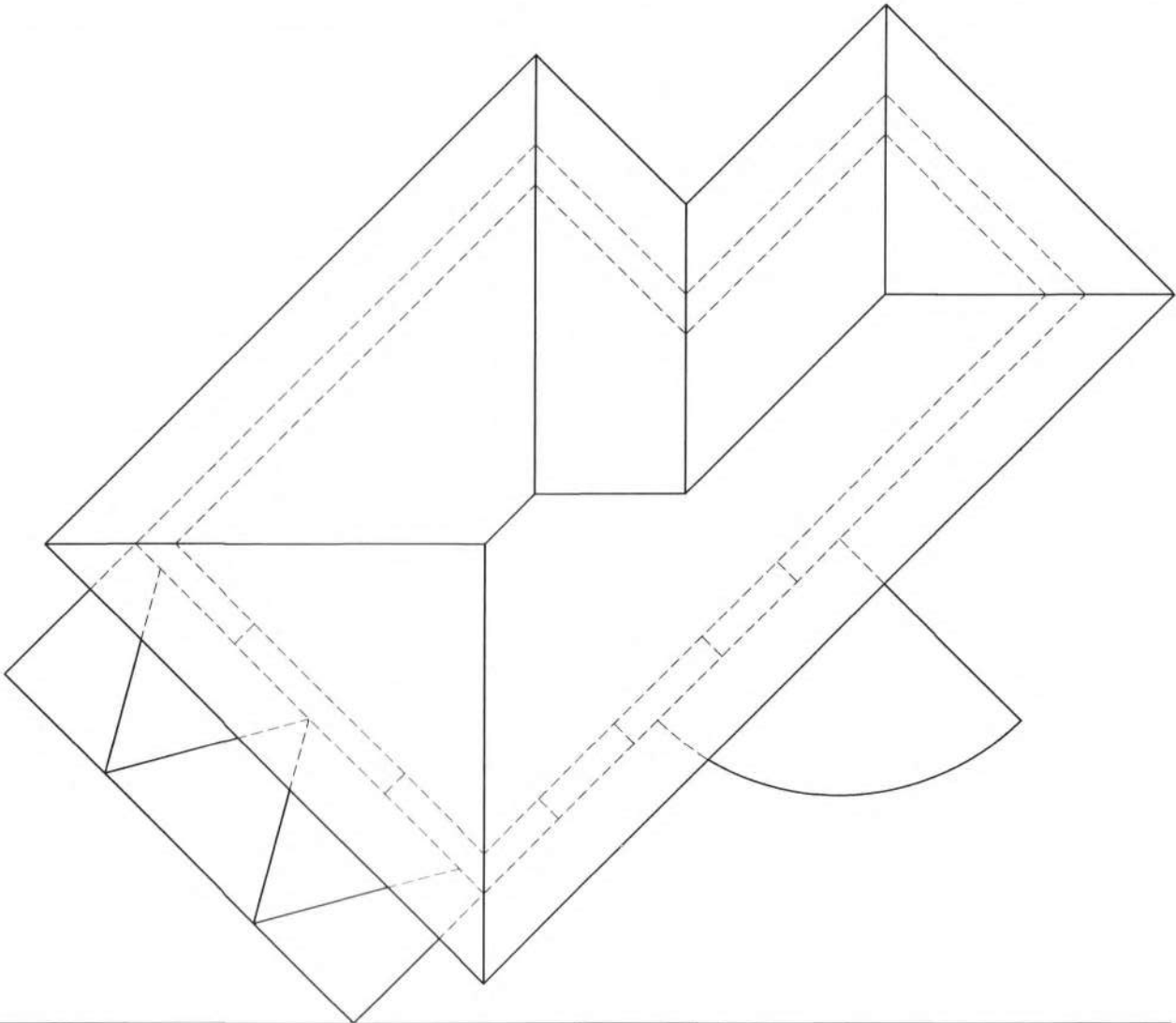
- 2.1 The given top view
- 2.2 A sectional front view
- 2.3 The true shape of the cut surface of the pentagonal prism

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

[38]



ASSESSMENT CRITERIA				
1	TOP VIEW + CONSTRUCTION	12 ¹ / ₂		
2	SECTIONAL FRONT VIEW	19		
3	TRUE SHAPE	6 ¹ / ₂		
PENALTIES (-)				
TOTAL		38		
EXAMINATION NUMBER				
EXAMINATION NUMBER				
				3

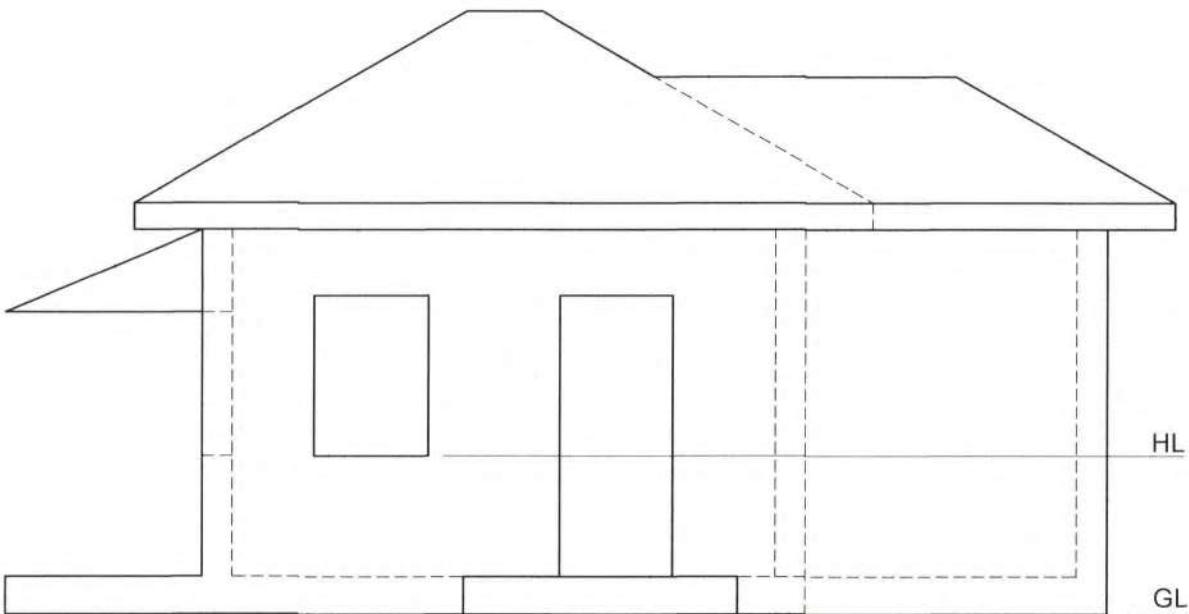
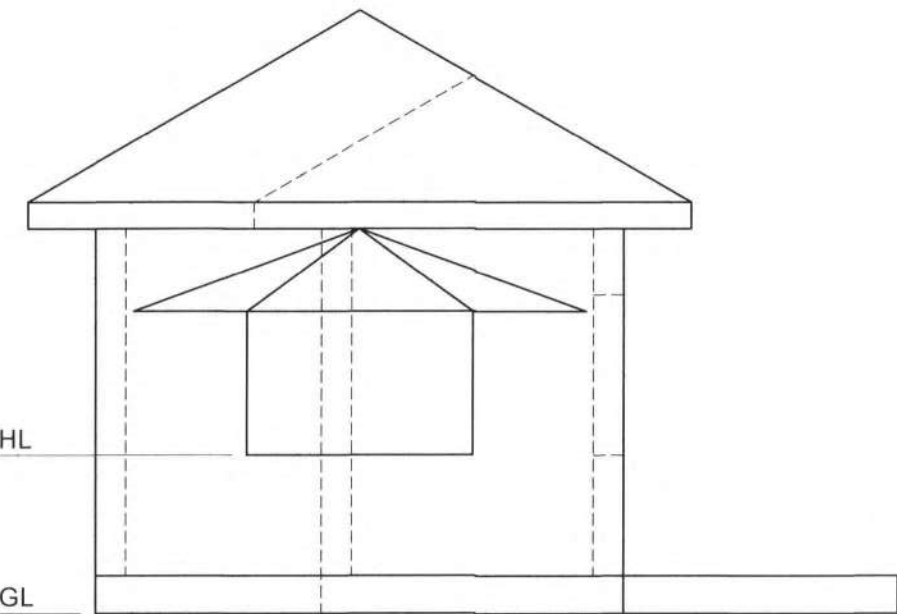


QUESTION 3: PERSPECTIVE

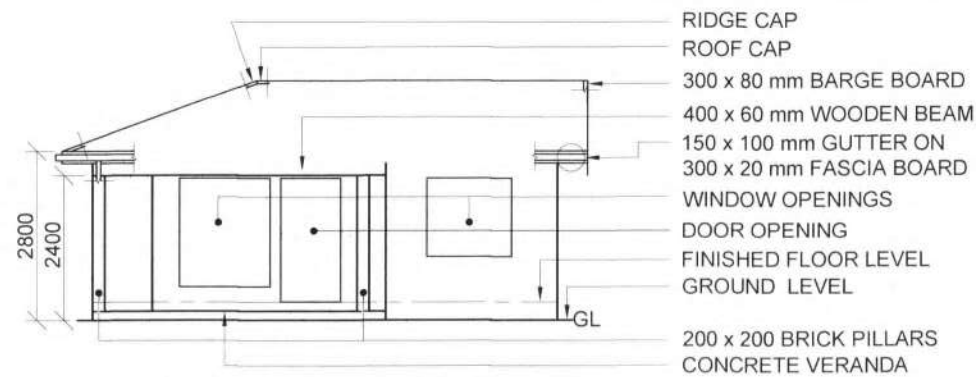
Given:
Three views of a truck shop, with closed eaves and the information needed to draw a two-point perspective drawing
PP – Picture plane
HL – Horizon line
GL – Ground line
SP – Station point

- Instructions:**
Complete the perspective drawing.
- Align the drawing sheet with the ground line (GL).
 - Determine and label the vanishing points.
 - Show ALL construction.
 - Show depth at the door and windows.
 - NO hidden or internal detail is required. **[40]**

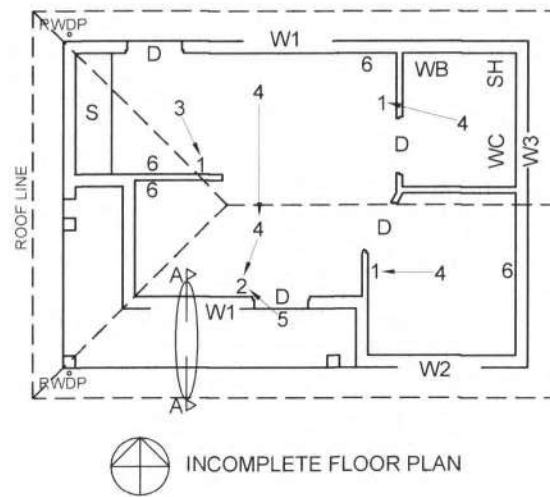
ASSESSMENT CRITERIA					
1	CONSTRUCTION	6			
2	WALLS	7 1/2			
3	WINDOW + DOOR	10 1/2			
4	ROOFS	11 1/2			
5	ARC	4 1/2			
PENALTIES (-)					
TOTAL		40			



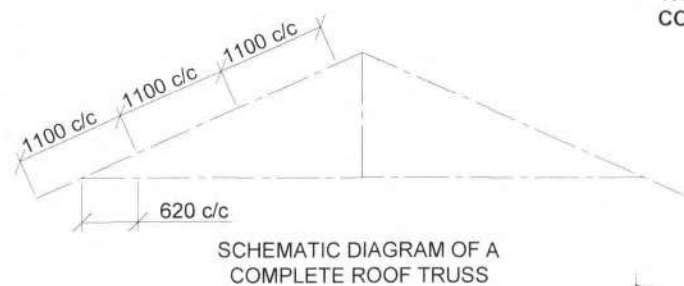
EXAMINATION NUMBER	
EXAMINATION NUMBER	4



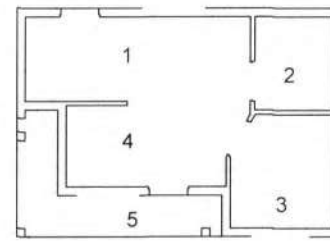
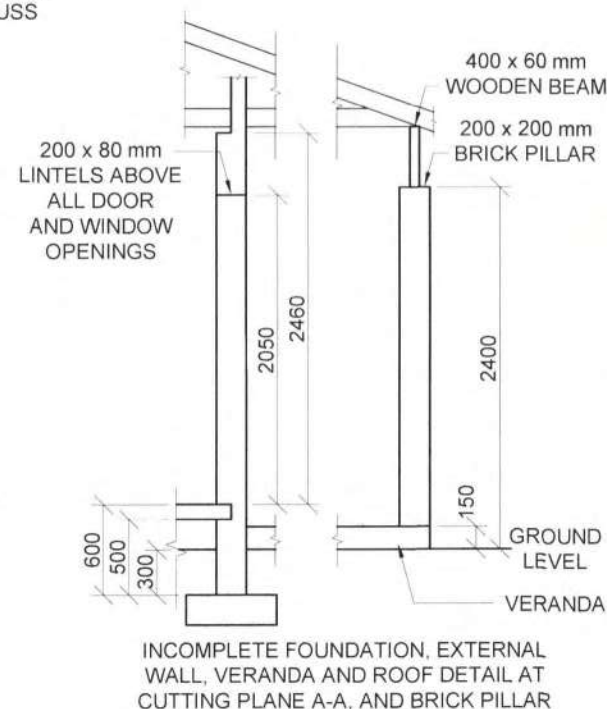
INCOMPLETE SOUTH ELEVATION



INCOMPLETE FLOOR PLAN

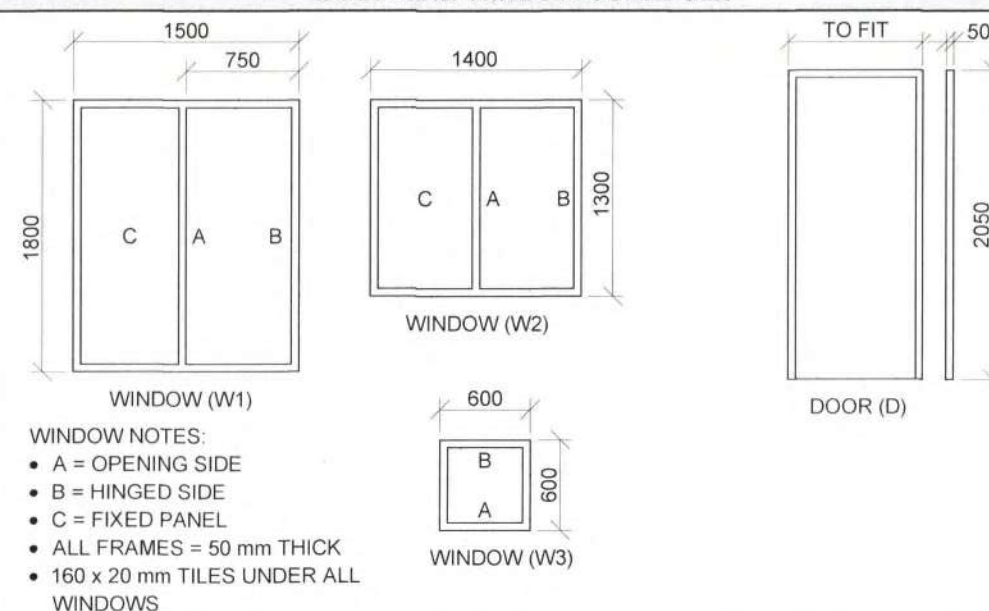
**ROOF NOTES:**

20° ROOF PITCH

120 x 40 mm ROOF TRUSSES ON
120 x 40 mm WALL PLATES500 mm ROOF OVERHANG TO END OF
ROOF TRUSS20 mm FIBRE CEMENT ROOF SHEETING
ON 80 x 50 mm PURLINS @ 1100 mm c/c300 x 20 mm FASCIA BOARDS WITH
150 x 100 mm GUTTERS ON ALL SIDES,
AND Ø75 RWDP300 x 80 mm BARGE BOARDS ON GABLED
END, FLUSH WITH OUTSIDE EDGE OF
GUTTERS10 mm CEILING BOARDS ON 40 x 40 mm
BRANDING STRIPS @ 620 c/c**FLOOR FINISHES**

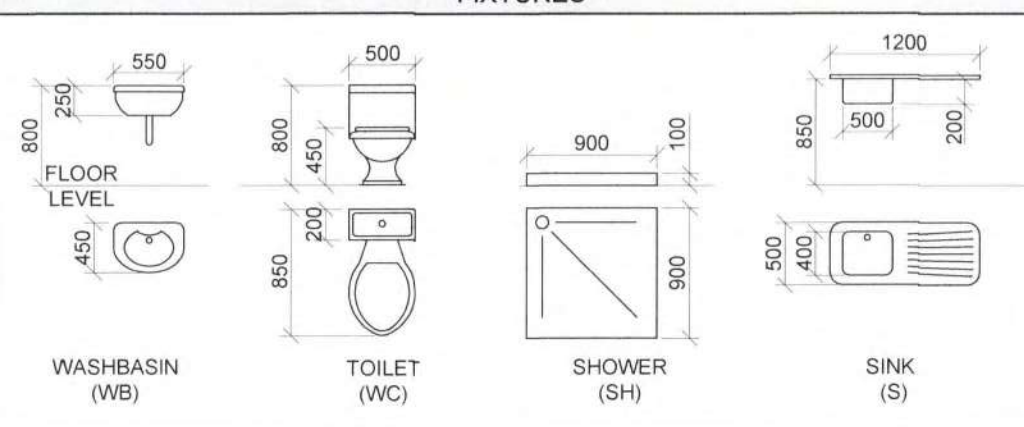
- 1 KITCHEN: TILE
 2 BATHROOM: TILE
 3 BEDROOM: WOOD
 4 LIVING AREA: WOOD
 5 VERANDA: GRANO

ROOM DESIGNATIONS

DOOR AND WINDOW SCHEDULE**ROOF COMPONENTS**

	300 x 20 mm FASCIA BOARD
	150 x 100 mm GUTTER
	80 x 50 mm PURLINS
	300 x 80 mm BARGE BOARD
	ROOF CAP AND RIDGE CAP

ELECTRICAL SYMBOLS

FIXTURES**QUESTION 4: CIVIL DRAWING****Given:**

- The incomplete south elevation of a **new house**, showing the walls, veranda, brick pillars, the door and window openings, roof and labels
- The incomplete floor plan showing the walls, veranda, brick pillars, the positions of the doors, windows, electrical layout, fixtures and the roof line
- Schematic diagram of a complete roof truss and roof notes
- The incomplete foundation, external wall, veranda and roof detail at cutting plane A-A, and brick pillar
- Room designations and floor finishes
- A door and window schedule
- A table of roof components
- A table of electrical symbols
- A table of fixtures
- The incomplete floor plan and position of the ground level of the **new house**, drawn to scale 1 : 50, and the incomplete foundation and break line for the detailed section, drawn to scale 1 : 20, on page 6

Instructions:

Answer this question on page 6.

- 4.1 Using the given incomplete floor plan and the position of the ground level, draw, 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 fixtures as indicated by the abbreviations
- ALL electrical fittings as indicated by the numbers
- ALL hatching detail

4.1.2 THE COMPLETE SOUTH ELEVATION**Show the following features on the drawing:**

- The outside walls, windows, door, brick pillars, wooden beam and veranda detail
- The roof detail including the fascia board, gutter, rainwater downpipe and barge board
- The finished floor level

- 4.2 Using the incomplete foundation and break line, 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:

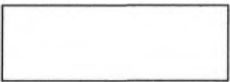
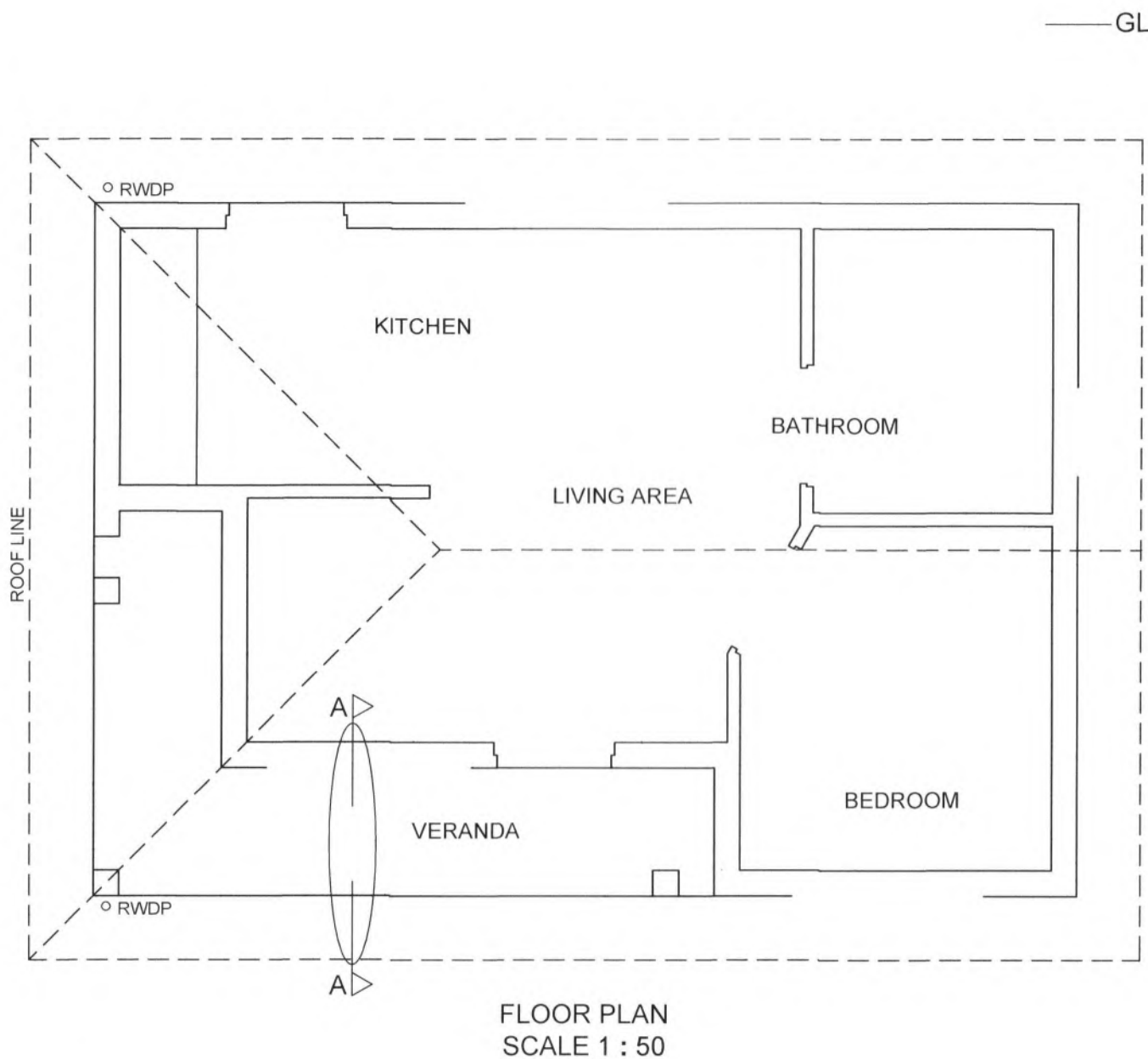
- The complete foundation, external wall, slab, veranda, beam and window detail
- The roof detail, including the fascia board, gutter and barge board
- The brick pillar and wall detail to the right (east) of cutting plane A-A
- ALL hatching detail. ONLY the substructure hatching may be drawn in neat freehand.

Label the following:

- The south elevation
- The floor finishes
- Ground level, finished floor level and damp-proof course (use the correct abbreviations and show them on ALL relevant views)

NOTE: ALL drawings must comply with the **guidelines** and **graphical symbols** as contained in the **SANS 10143**. [92]

STAPLE



SECTION A-A
SCALE 1 : 20

MARK ALLOCATION FOR SECTION OF ROOF		FOR OFFICIAL USE ONLY	
A		INCORRECT SCALE(S) USED	
B		NON-ALIGNMENT OF VIEWS	
C		VIEW(S) ROTATED	
D		SECTION VIEWED INCORRECTLY	
E		INCORRECT LETTERING	
F			
G			
H			
J			
TOTAL		TOTAL	

ASSESSMENT CRITERIA					
FLOOR PLAN					
		POSSIBLE	OBTAINED	SIGN	MODERATED
1	DOORS + WINDOWS	12			
2	FIXTURES	7 ¹ / ₂			
3	ELECTRICAL	10 ¹ / ₂			
4	HATCHING	3			
5	LABELS	2 ¹ / ₂			
SUBTOTAL		35 ¹ / ₂			
SOUTH ELEVATION					
1	ROOF + RWDP + BEAM	7			
2	WALLS + FFL + VERANDA	5			
3	DOOR + WINDOW	10			
4	LABELS	1			
SUBTOTAL		23			
DETAILED SECTION					
1	ROOF DETAIL	12			
2	SLAB + WALL + VERANDA	10			
3	HATCHING	6 ¹ / ₂			
4	WINDOW	3 ¹ / ₂			
5	LABELS	1 ¹ / ₂			
SUBTOTAL		33 ¹ / ₂			
TOTAL		92			
PENALTIES (-)					
GRAND TOTAL					
EXAMINATION NUMBER					
EXAMINATION NUMBER					



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ENGINEERING GRAPHICS AND DESIGN P1

MAY/JUNE 2025

MARKING GUIDELINES

MARKS: 100

These marking guidelines consist of 7 pages.

ANSWERS		
1	CJE ARCHITECTS	1
2	1 : 400	1
3	EXTENSION OF DRIVEWAY	1
4	CAMP STREET	1
5	619,75	1
6	ASPHALT	1
7	4	1
8	FENCE	1
9	2000	1
10	FALL	1
11	HEIGHT ABOVE SEA-LEVEL	1
12	WATT / ELECTRICAL METER	1
13	HIDDEN OR DASHED	1
14	8,219	1
15	YELLOW	1
16	3. MH 4. RE 5. IE	3
17	RELIGIOUS BUILDING	1
18	See below	3
19		4
20		4
TOTAL		30

ANSWER 18

Show ALL calculations.

APPLYING CORRECT FORMULA ✓

$$P = AB + BC + CD + DA$$

$$= 22,8 + 36,4 + 23 + 39,4$$

$$= 121,6 \text{ m} \text{ ANSWER IN METRES } ✓$$

ANSWER 19

Show ALL calculations.

APPLYING CORRECT FORMULA ✓

EXISTING BUILDING AREA

$$\text{AREA} = (L \times B) + (L \times B) \dots$$

$$= (11,5 \times 4,3) (7,6 \times 15,8) (8,5 \times 1,8)$$

$$= 184,83$$

TOTAL AREA

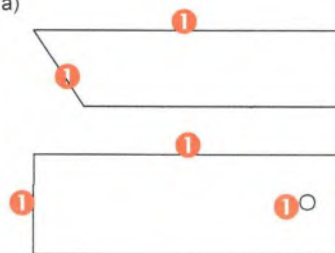
$$= 184,83 + 41,59 ✓$$

$$= 226,42 \text{ m}^2 ✓$$

ANSWER IN SQUARE METRES (m²) ✓

ANSWER 20

a)



b)



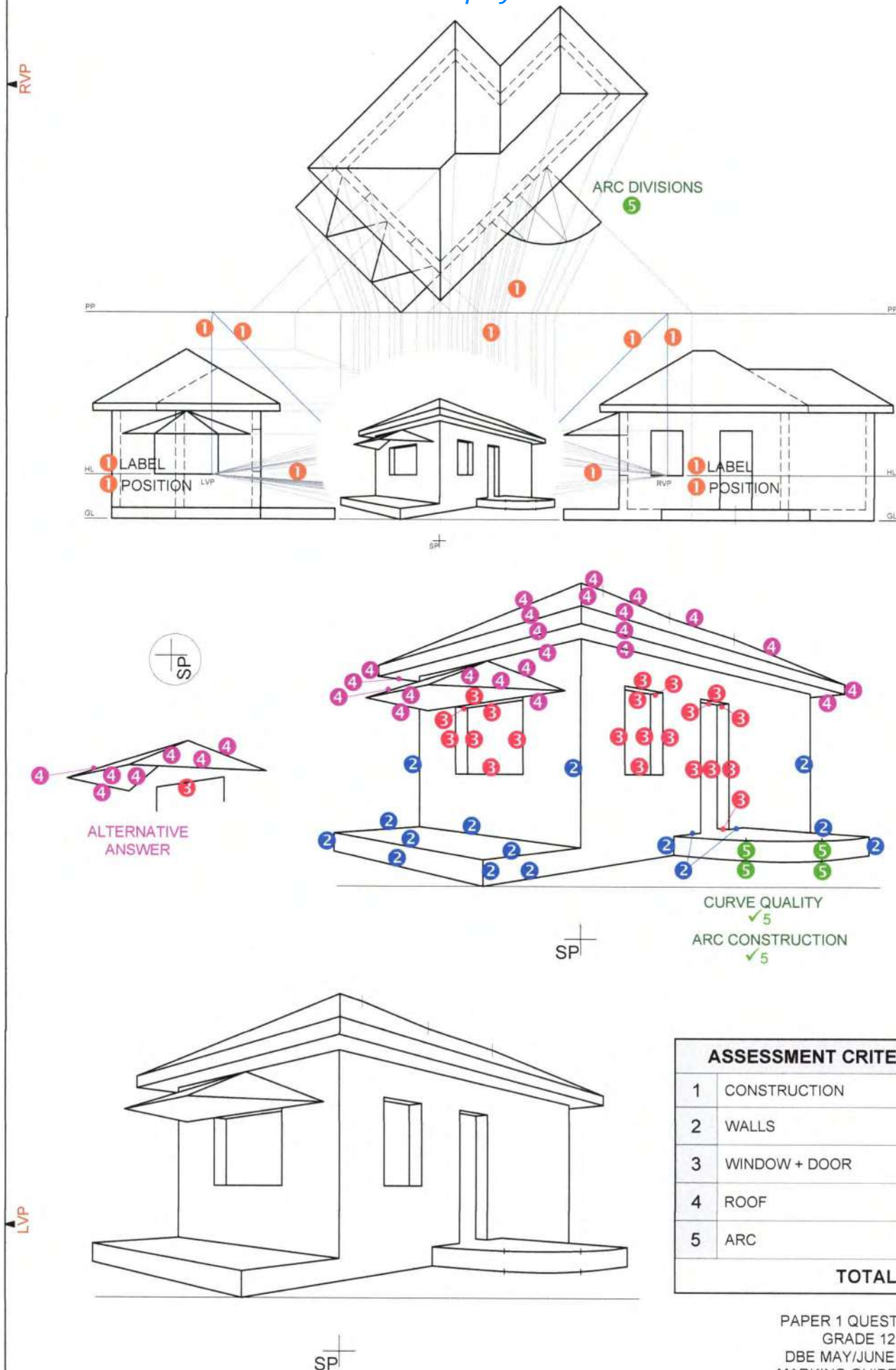
RECTANGLE ✓1

1 FREEHAND

[illegible]

ASSESSMENT CRITERIA		
1	TOP VIEW + CONSTRUCTION	12 $\frac{1}{2}$
2	SECTIONAL FRONT VIEW	19
3	TRUE SHAPE	6 $\frac{1}{2}$
TOTAL		38

PAPER 1 QUESTION 2
GRADE 12
DBE MAY/JUNE 2025
MARKING GUIDELINES



FLOOR PLAN		
1	DOORS + WINDOWS	12
2	FIXTURES	7 $\frac{1}{2}$
3	ELECTRICAL	10 $\frac{1}{2}$
4	HATCHING	3
5	LABELS	2 $\frac{1}{2}$
SUBTOTAL		35 $\frac{1}{2}$

DETAIL OF MARK ALLOCATION FOR A DOOR (1 x 4 doors = 4)

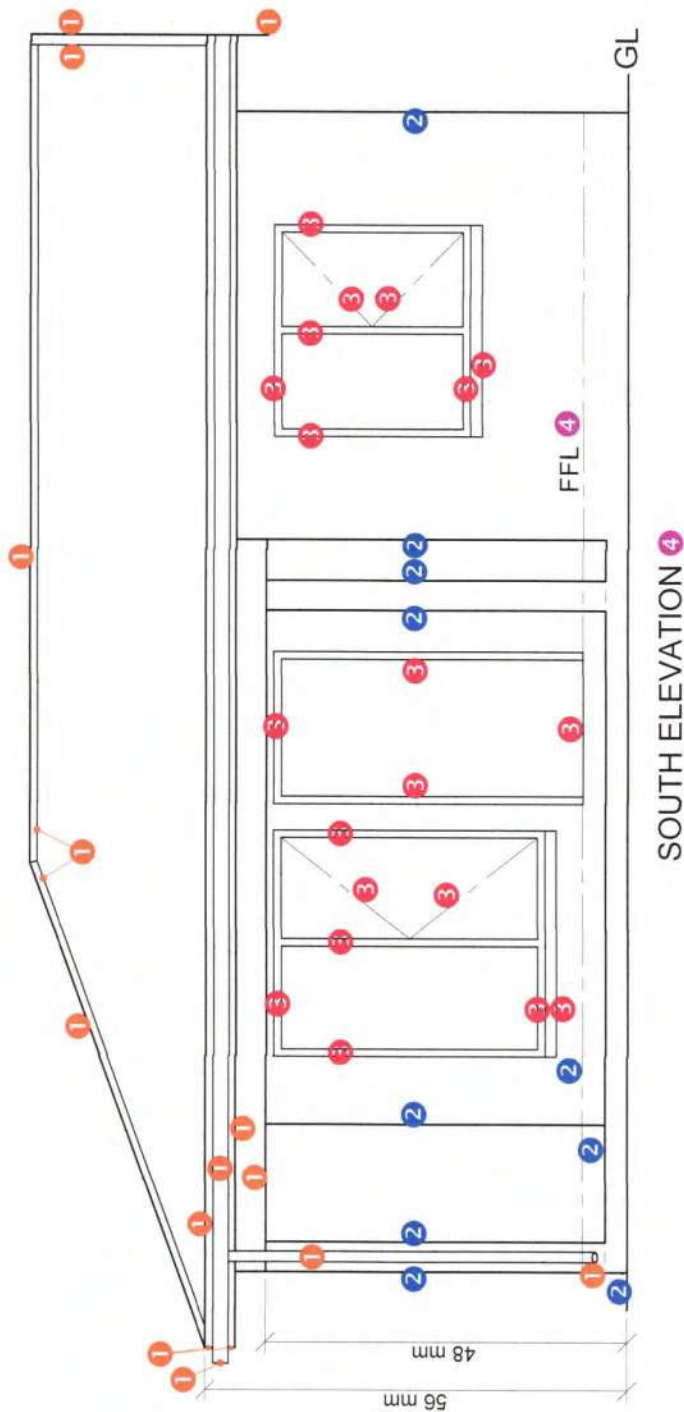
DETAIL OF MARK ALLOCATION FOR A WINDOW (2 x 4 windows = 8)

4 HATCHING ALLOCATION
SANS COMPLIANT (TYPE)
HATCHING CORRECTLY APPLIED

1	2	3
TOTAL		

PAPER 1 QUESTION 4.1.1
GRADE 12
DBE MAY/JUNE 2025
MARKING GUIDELINES

SOUTH ELEVATION		
1	ROOF + RWDP + BEAM	7
2	WALLS + FFL + VERANDA	5
3	DOOR + WINDOW	10
4	LABELS	1
SUBTOTAL		23

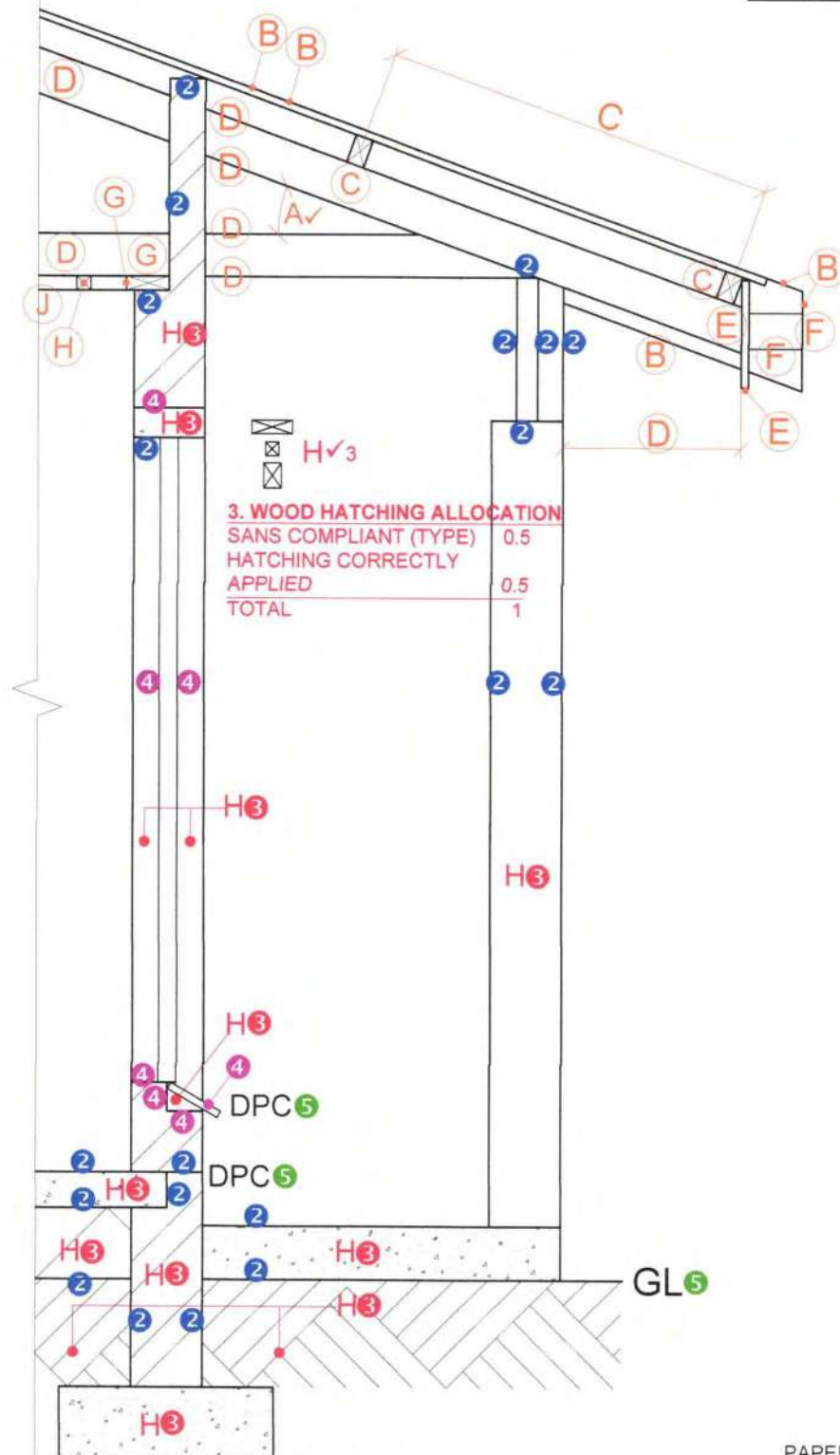


1. MARK ALLOCATION FOR ROOF

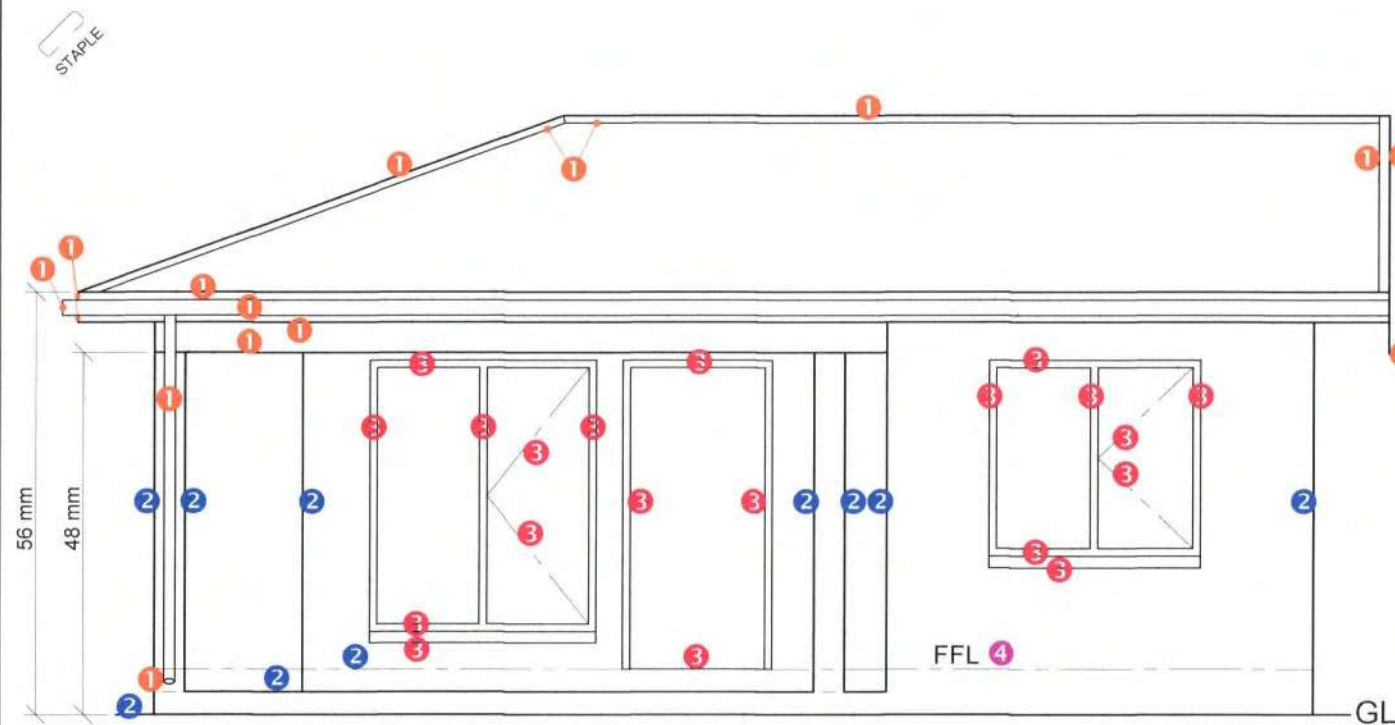
A: ROOF ANGLE	1
B: ROOF SHEET + BARGE BOARD	2
C: PURLIN + SPACING	1,5
D: TRUSS + OVERHANG	3,5
E: FASCIA	1
F: GUTTER	1
G: WALL PLATE	1
H: BRANDERING	0,5
J: CEILING BOARD	0,5
TOTAL	12

DETAILED SECTION

1	ROOF DETAIL	12
2	SLAB + WALL + VERANDA	10
3	HATCHING	6 $\frac{1}{2}$
4	WINDOW	3 $\frac{1}{2}$
5	LABELS	1 $\frac{1}{2}$
SUBTOTAL		33 $\frac{1}{2}$

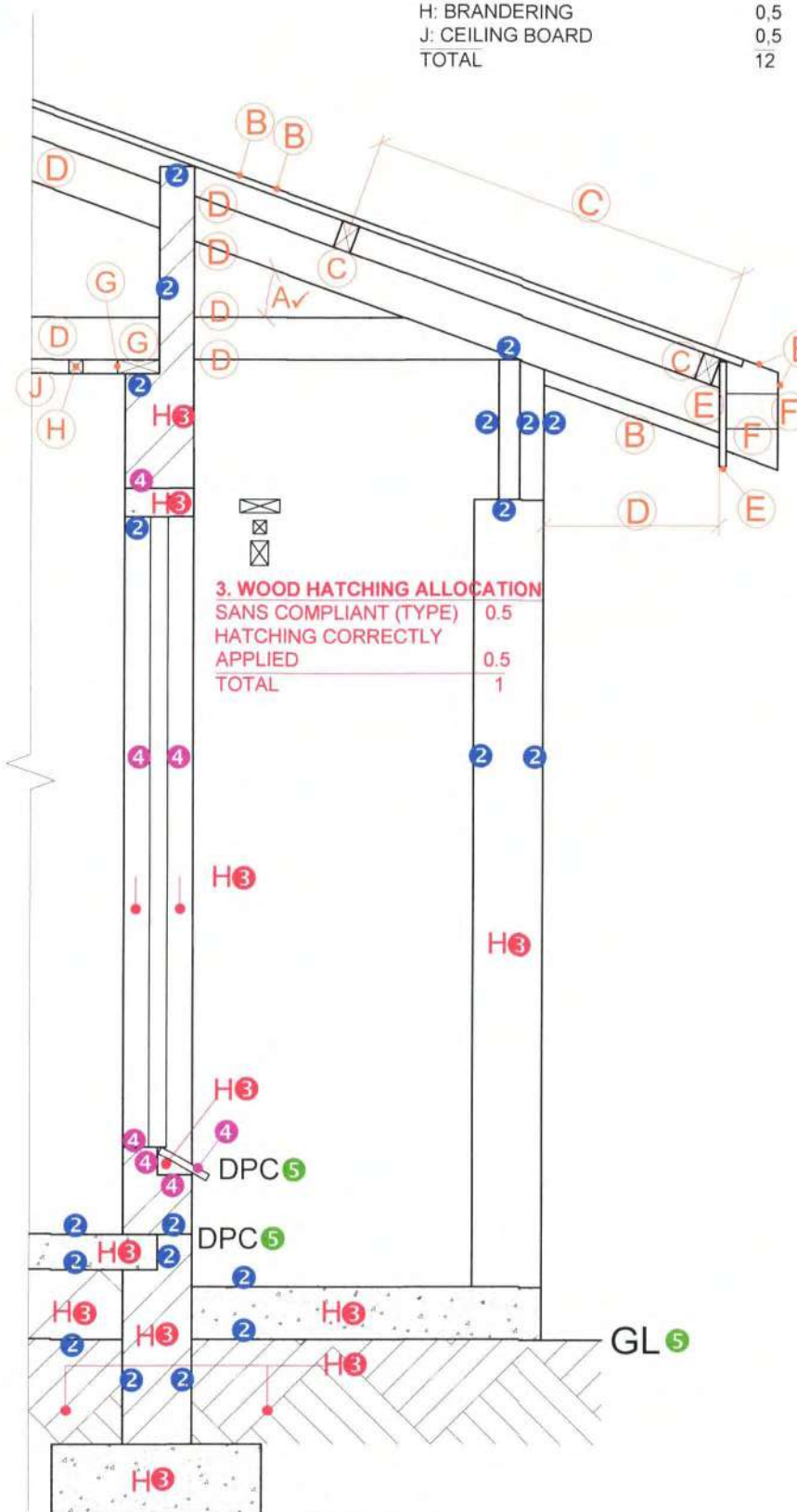


PAPER 1 QUESTION 4.2
GRADE 12
DBE MAY/JUNE 2025
MARKING GUIDELINES



SOUTH ELEVATION 4

4 HATCHING ALLOCATION	
SANS COMPLIANT (TYPE)	1
HATCHING CORRECTLY APPLIED	2
TOTAL	3



SECTION A-A
SCALE 1 : 20

1. MARK ALLOCATION FOR ROOF	
A: ROOF ANGLE	1
B: ROOF SHEET + BARGE BOARD	2
C: PURLIN + SPACING	1,5
D: TRUSS + OVERHANG	3,5
E: FASCIA	1
F: GUTTER	1
G: WALL PLATE	1
H: BRANDERING	0,5
J: CEILING BOARD	0,5
<u>TOTAL</u>	<u>12</u>

MARK ALLOCATION FOR SECTION OF ROOF		FOR OFFICIAL USE ONLY	
A		INCORRECT SCALE(S) USED	
B		NON-ALIGNMENT OF VIEWS	
C		VIEW(S) ROTATED	
D		SECTION VIEWED INCORRECTLY	
E		INCORRECT LETTERING	
F			
G			
H			
J			
TOTAL		TOTAL	

ASSESSMENT CRITERIA					
FLOOR PLAN					
		POSSIBLE	OBTAINED	SIGN	MODERATED
1	DOORS + WINDOWS	12			
2	FIXTURES	7 $\frac{1}{2}$			
3	ELECTRICAL	10 $\frac{1}{2}$			
4	HATCHING	3			
5	LABELS	2 $\frac{1}{2}$			
SUBTOTAL		35 $\frac{1}{2}$			
SOUTH ELEVATION					
1	ROOF + RWDP + BEAM	7			
2	WALLS + FFL + VERANDA	5			
3	DOOR + WINDOW	10			
4	LABELS	1			
SUBTOTAL		23			
DETAILED SECTION					
1	ROOF DETAIL	12			
2	SLAB + WALL+ VERANDA	10			
3	HATCHING	6 $\frac{1}{2}$			
4	WINDOW	3 $\frac{1}{2}$			
5	LABELS	1 $\frac{1}{2}$			
SUBTOTAL		33 $\frac{1}{2}$			
TOTAL		92			
PENALTIES (-)					
GRAND TOTAL					