basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

SENIOR CERTIFICATE EXAMINATIONS/
NATIONAL SENIOR CERTIFICATE EXAMINATIONS

ENGINEERING GRAPHICS AND DESIGN P1

MAY/JUNE 2026

MARKS: 100

TIME: 3 hours

This question paper consists of 6 pages.

Barcode label

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	½	SIGN	MODERATED	½	SIGN	RE-MARKING	½	SIGN
1											
2											
3											
4											
TOTAL											
	200			200			200		

FINAL CONVERTED MARK	CHECKED BY
100	

COMPLETE THE FOLLOWING:.
CENTRE NUMBER
CENTRE NUMBER
EXAMINATION NUMBER
EXAMINATION NUMBER

DO NOT FOLD THE QUESTION PAPER IN HALF.

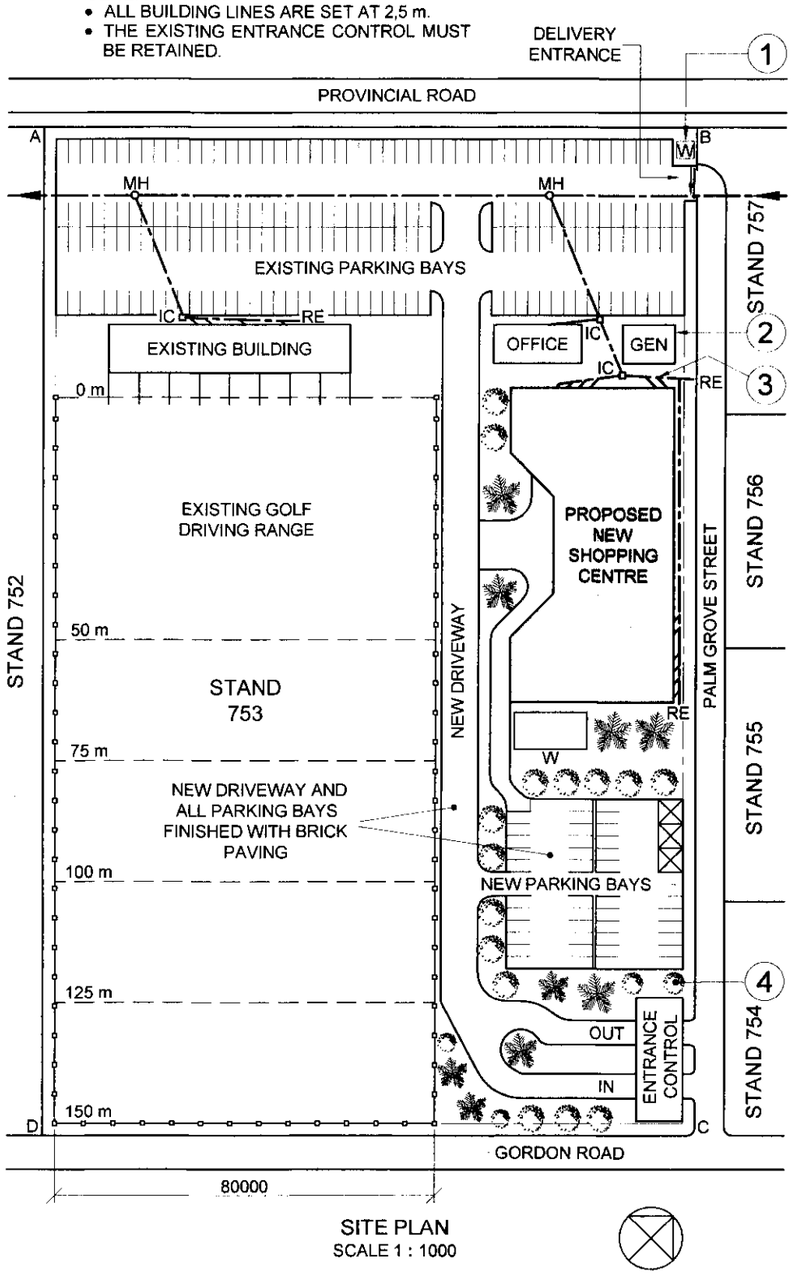
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STAPLE

LAND SURVEYOR'S CERTIFICATE OF THE CORNER HEIGHTS AND BOUNDARY LENGTHS OF STAND 753			
CORNER HEIGHTS IN METRES		BOUNDARY LENGTHS IN MILLIMETRES	
A	1477	AB	135000
B	1477,5	BC	208300
C	1477	CD	135000
D	1476,5	DA	208300

SYMBOL LEGEND	
PALM TREE	
SHRUBS	
6 m HIGH NET	
200 kVA GENERATOR	GEN
TWO COVERED PARKING BAYS	

GENERAL NOTES:
- ALL BUILDING LINES ARE SET AT 2,5 m.
- THE EXISTING ENTRANCE CONTROL MUST BE RETAINED.



SITE PLAN
SCALE 1 : 1000

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

ARCHITECT'S SIGNATURE .....

CLIENT'S SIGNATURE .....

ANSWER 20
In the space below, draw, in neat freehand, the *SANS 10143 graphical symbol* for:
(a) FACE BRICK HATCHING
(b) The top view of a SHOWER

(a) FACE BRICK HATCHING

(b) SHOWER

REVISION	DATE	DESCRIPTION
1	14/05/2025	ADD 200 kVA GENERATOR

PRINTED BY: OUR PRINTERS	DATE: 11/07/2025

ENGINEERING COMPANY:
HAGE CIVIL ENGINEERS
222 TRICHARDT AVENUE
VANDERBIJLPARK
1911
hage-civileng@gmail.com

PROJECT ARCHITECT:
E MOKOENA

PROJECT TITLE:
PROPOSED NEW SHOPPING CENTRE, DRIVEWAY AND PARKING BAYS FOR MR F DE JONGH, ON STAND 753, PALM GROVE STREET, VANDERBIJLPARK

DRAWING TITLE:
SITE PLAN

PROJECT NUMBER:	DRAWING NUMBER:
7530701-24	S P - 2 4 A 1 -
REFERENCE CODE: 04050124	SCALE: 1 : 1000

DRAWN:	DATE:	CHECKED:	DATE:
HENNIE	05/05/2025	GOUTA	05/06/2025

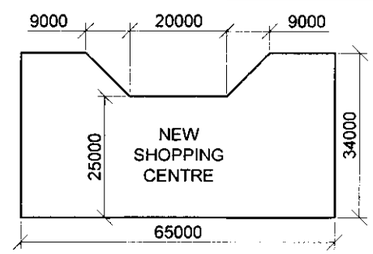
QUESTION 1: ANALYTICAL (CIVIL)

Given:
The site plan of an existing golf driving range with a proposed new shopping centre, driveway and parking bays, 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. Abbreviations may not be used, unless otherwise stated. **[30]**

	QUESTIONS	ANSWERS			
1	What scale is indicated for the site plan?		1		
2	Who checked the drawing?		1		
3	What is the project architect's name?		1		
4	What must the contractors do on site before they commence with the work?		1		
5	In what street is the delivery entrance?		1		
6	How many palm trees are shown on the site plan?		1		
7	What is the distance from the building lines to the boundary lines on STAND 753 in millimetres?		1		
8	Name the feature at 1.		1		
9	What is the kVA capacity of the feature at 2?		1		
10	What feature has not been labelled on the sewerage line at 3?		1		
11	Name the feature at 4.		1		
12	How many covered parking bays are there on STAND 753?		1		
13	Which corner of STAND 753 is the highest above sea level?		1		
14	What is the finish on the new driveway and parking bays?		1		
15	What does the abbreviation *IC* on a sewerage line stand for?		2		
16	What is indicated in GREEN on elevations?		2		
17	With reference to the north point, what is the direction of flow in the municipal sewerage line?		2		
18	In the space below (ANSWER 18), determine the total length of the 6 m high net.		3		
19	In the space below (ANSWER 19), determine the total area of the proposed new shopping centre in square metres.		3		
20	In the space in the title panel (ANSWER 20), draw, in neat freehand, the *SANS 10143* graphical symbol for: (a) FACE BRICK HATCHING and (b) the top view of a SHOWER.		4		
		TOTAL	**30**		

ANSWER 18
Show ALL calculations.



ANSWER 19
Show ALL calculations.

EXAMINATION NUMBER	
EXAMINATION NUMBER	2

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QUESTION 2: INTERPENETRATION AND DEVELOPMENT

Given:

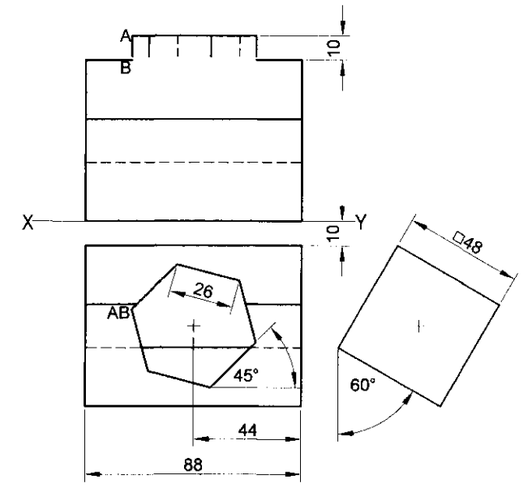
- The top view and the incomplete front view of a right regular hexagonal tube that has been shaped to join onto a right square tube. The axes of both tubes lie in a common vertical plane.
- An auxiliary view of the square tube

Instructions:

Draw, to scale 1 : 1, the following views of the TWO tubes:

2.1 The given top view
2.2 A right view
2.3 The complete front view, clearly showing the curve of interpenetration
2.4 Develop the hexagonal tube. Make edge 'AB' the seam.

- Planning is essential.
- Show ALL construction.
- Show ALL hidden detail. **[38]**



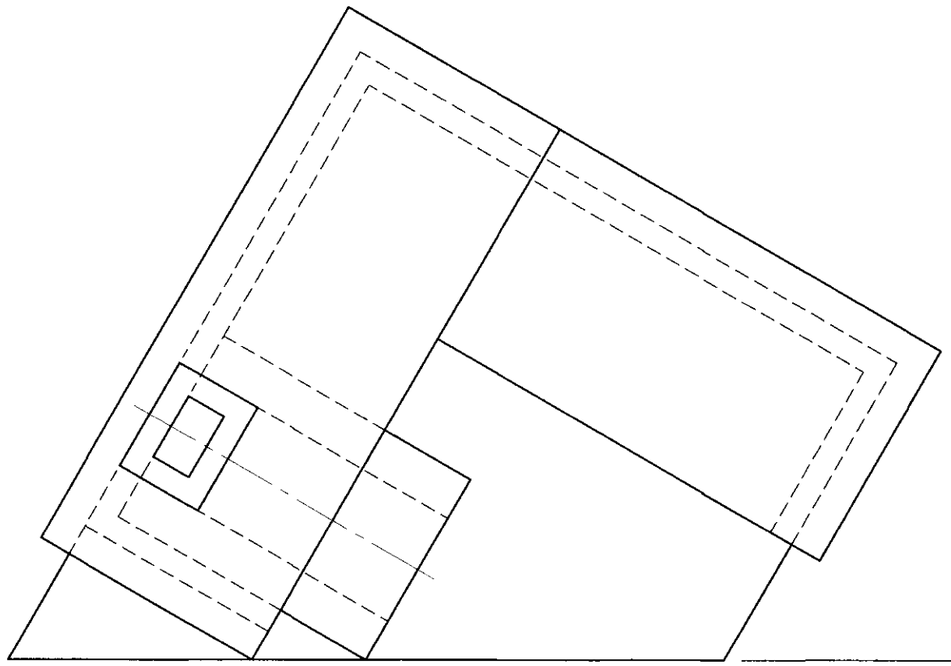
ASSESSMENT CRITERIA					
1	TOP VIEW	10 ½			
2	RIGHT VIEW	7 ½			
3	FRONT VIEW	11 ½			
4	DEVELOPMENT	8 ½			
PENALTIES (-)					
	TOTAL	38			

EXAMINATION NUMBER

EXAMINATION NUMBER 3

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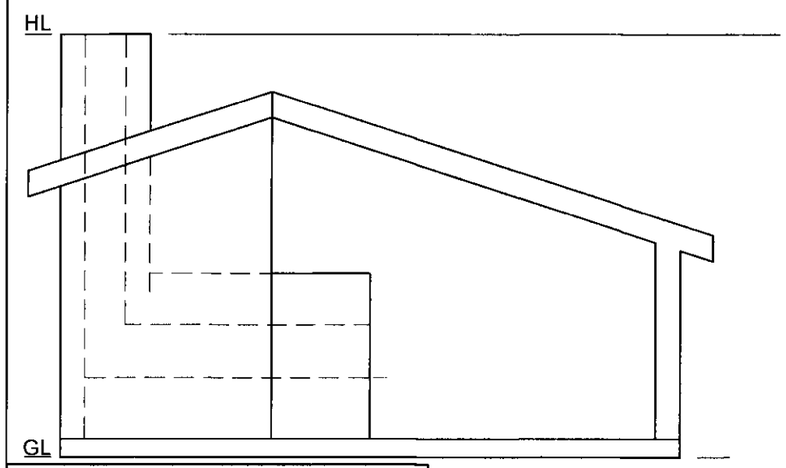
STAPLE

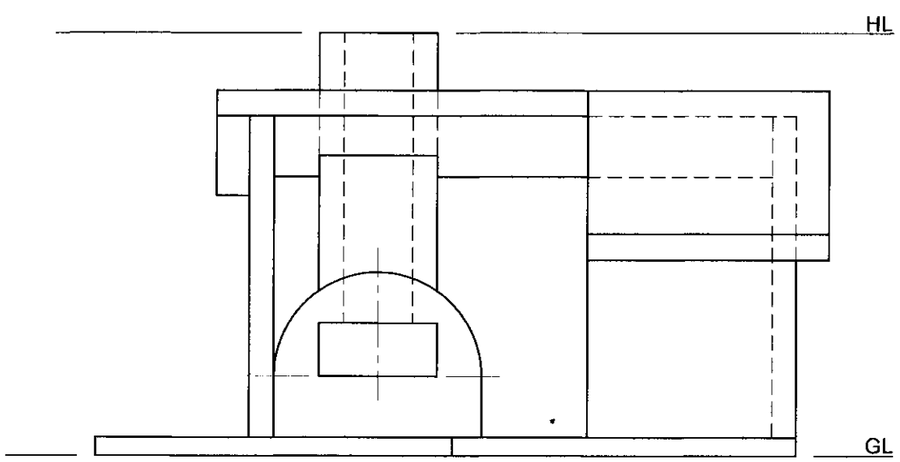


QUESTION 3: PERSPECTIVE

Given:
Three views of an outdoor pottery studio 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 ALL visible details.
- NO hidden detail is required. **[40]**



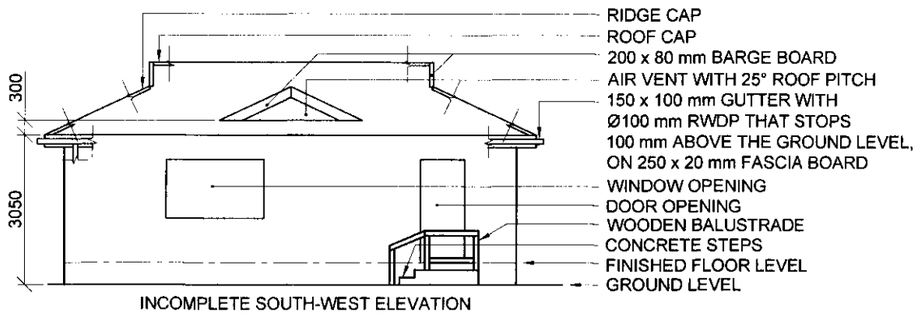


SP

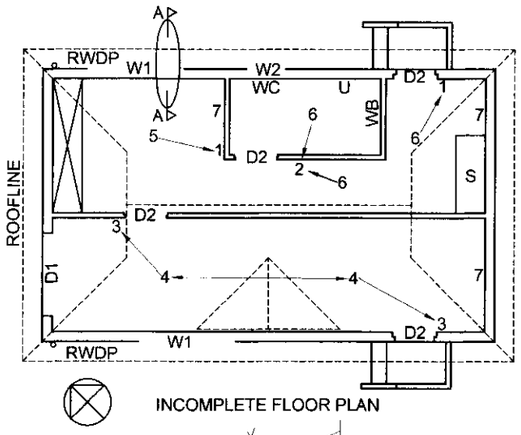
ASSESSMENT CRITERIA					
1	CONSTRUCTION	6			
2	FLOOR + WALLS	9 ½			
3	ROOF + CHIMNEY	12 ½			
4	OVEN	12			
PENALTIES (-)					
	TOTAL	**40**			

EXAMINATION NUMBER	
EXAMINATION NUMBER	4

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INCOMPLETE SOUTH-WEST ELEVATION



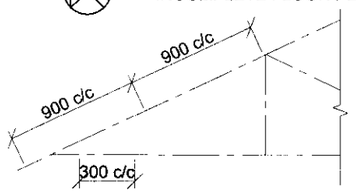
INCOMPLETE FLOOR PLAN

FEATURES
D1 ROLL-UP DOOR
D2 DOOR
W1 WINDOW
W2 WINDOW

FIXTURES
S SINK
WC TOILET
WB WASHBASIN
U WALL-MOUNTED URINAL

ELECTRICAL FITTINGS
1. ONE-WAY SWITCH - SINGLE-POLE
2. ONE-WAY SWITCH - DOUBLE-POLE
3. TWO-WAY SWITCH
4. FLUORESCENT LIGHT 4 x 40 W
5. FLUORESCENT LIGHT 2 x 40 W
6. CEILING LIGHT
7. SWITCHED SOCKET OUTLET

NOTE:
THE ARROW SHOWS THE LIGHT CONNECTION TO THE SWITCH.



INCOMPLETE SCHEMATIC DIAGRAM OF A ROOF TRUSS

ROOF NOTES:
25° ROOF PITCH

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

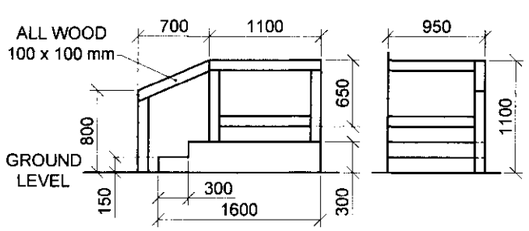
400 mm ROOF OVERHANG TO END OF ROOF TRUSS

40 mm CORRUGATED ROOF SHEET ON 80 x 50 mm PURLINS @ 900 mm c/c

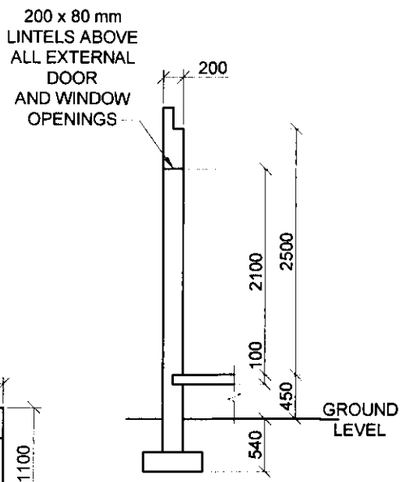
200 x 80 mm BARGE BOARDS ON GABLE ENDS

250 x 20 mm FASCIA BOARDS WITH
150 x 100 mm GUTTERS ON ALL SIDES

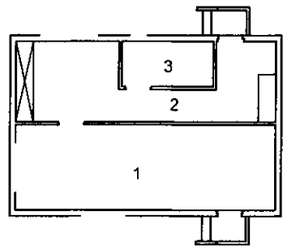
10 mm CEILING BOARDS ON 40 x 40 mm BRANDERING STRIPS @ 300 mm c/c



STEPS AND WOODEN BALUSTRADE DETAIL



INCOMPLETE FOUNDATION AND EXTERNAL WALL DETAIL

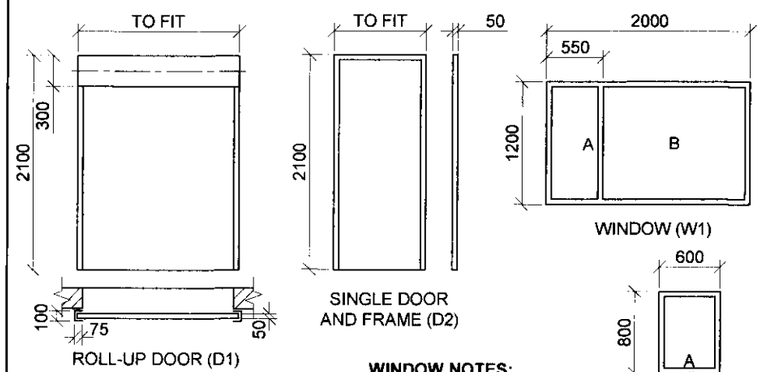


ROOM DESIGNATIONS

FLOOR FINISHES

1.	WORKSHOP:	EPOXY
2.	OFFICE AND KITCHEN:	TILE
3.	TOILET:	TILE

DOOR AND WINDOW SCHEDULE



ROLL-UP DOOR (D1)

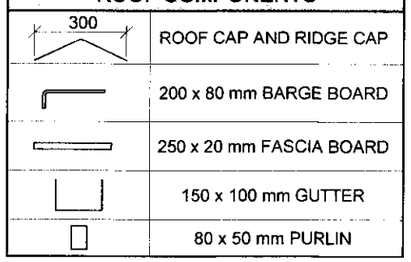
SINGLE DOOR AND FRAME (D2)

WINDOW (W1)

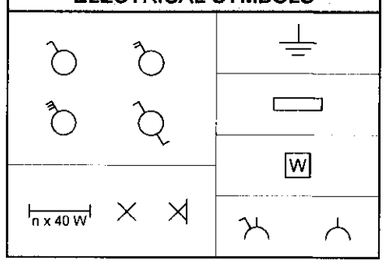
WINDOW (W2)

WINDOW NOTES:
- A = OPENING SIDE
- B = FIXED PANEL
- ALL FRAMES = 50 mm THICK
- 160 x 25 mm FIBRE CEMENT SILL UNDER ALL WINDOWS

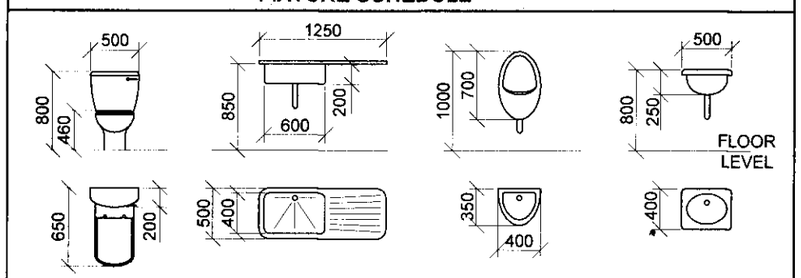
ROOF COMPONENTS



ELECTRICAL SYMBOLS



FIXTURE SCHEDULE



TOILET (WC) SINK (S) WALL- MOUNTED URINAL (U) WASHBASIN (WB)

QUESTION 4: CIVIL DRAWING

Given:
- The incomplete south-west elevation of a **new workshop**, showing the walls, the window and door openings, steps, wooden balustrade, roof and labels
- The incomplete floor plan showing the walls, roof lines, steps, positions of the doors, windows, fixtures and electrical layout
- An incomplete schematic diagram of a roof truss
- The steps and wooden balustrade detail
- The incomplete foundation and external wall detail
- Room designations and floor finishes
- A door and window schedule
- A table of roof components
- A table of electrical symbols
- A fixture schedule
- The incomplete floor plan and position of the ground level of the **new workshop**, 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 ground level, draw, to scale 1 : 50, the following views of the **new workshop**:

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-WEST ELEVATION**
Show the following features on the drawing:
- The wall, window, door, step and wooden balustrade detail
- The roof detail including air vent, barge boards, fascia board, gutter and rainwater downpipe
- The finished floor level

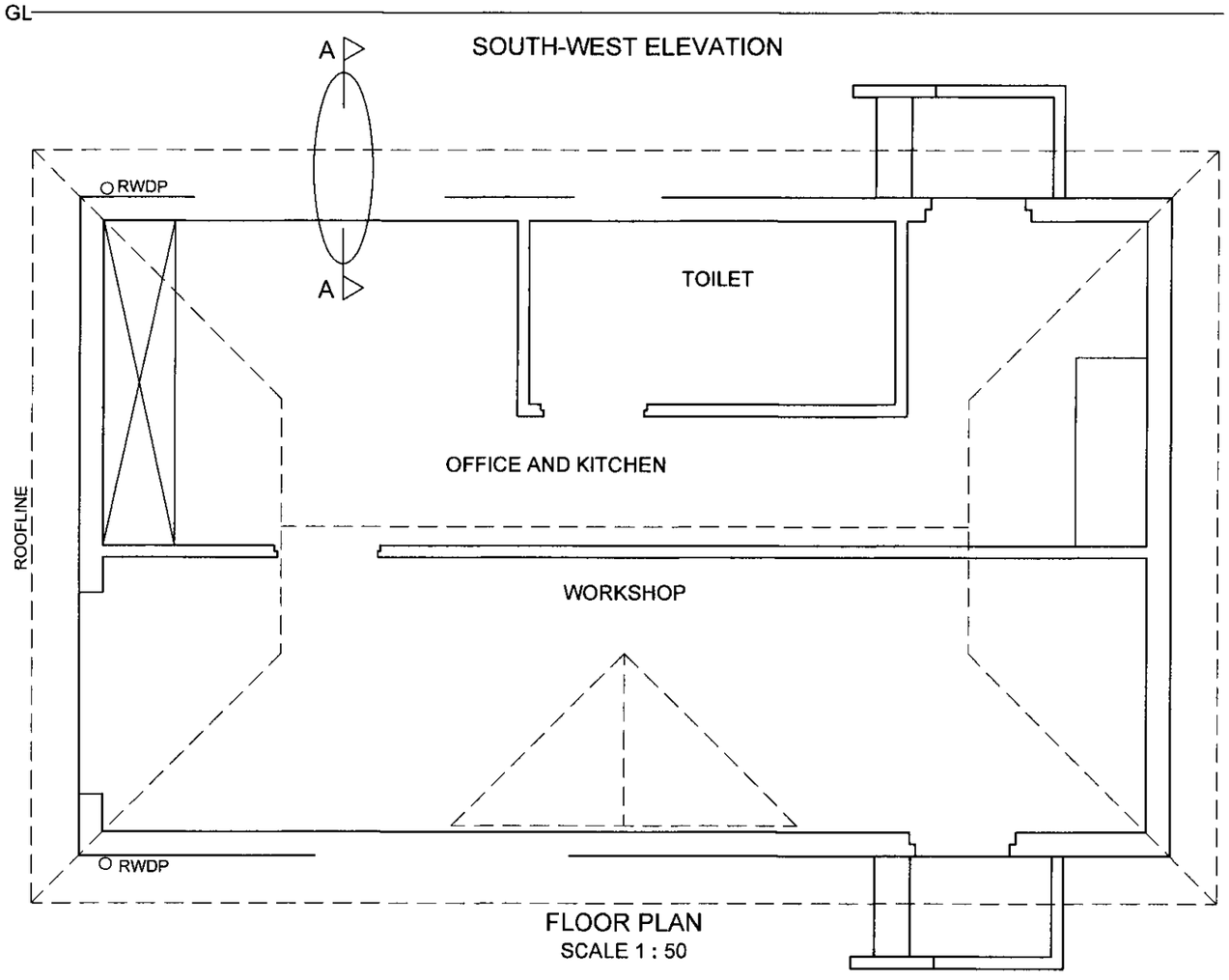
4.2 Using the incomplete foundation and break lines on page 6, draw, to scale 1 : 20, a **DETAILED SECTION** on cutting plane A-A of the area in the ellipse shown on the incomplete floor plan.
Show the following features on the drawing:
- The complete foundation, external wall, slab and window detail
- The roof detail, including the fascia board and gutter
- The steps and balustrade detail to the right (south-east) of cutting plane A-A
- ALL hatching detail. ONLY the substructure hatching may be drawn in neat freehand.

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

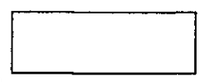
NOTE:
ALL drawings must comply with the **guidelines** and **graphical symbols** as contained in *SANS 10143*. **[92]**

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FLOOR PLAN
SCALE 1 : 50



SECTION A-A
SCALE 1 : 20

MARK ALLOCATION FOR SECTION OF ROOF		
A		
B		
C		
D		
E		
F		
G		
H		
J		
TOTAL		

FOR OFFICIAL USE ONLY		
INCORRECT SCALE(S) USED		
NON-ALIGNMENT OF VIEWS		
VIEW(S) ROTATED		
SECTION VIEWED INCORRECTLY		
INCORRECT LETTERING		
TOTAL		

ASSESSMENT CRITERIA					
FLOOR PLAN					
		POSSIBLE	OBTAINED	SIGN	MODERATED
1	DOORS + WINDOWS	11½			
2	FIXTURES	7½			
3	ELECTRICAL	12			
4	LABELS	1½			
5	HATCHING	3			
SUBTOTAL		35½			
SOUTH-WEST ELEVATION					
1	ROOF + RWDP	11			
2	WALLS + BALUSTRADE	7½			
3	DOORS + WINDOWS	6½			
4	LABELS	½			
SUBTOTAL		25½			
DETAILED SECTION					
1	ROOF DETAIL	11			
2	SLAB + WALL	8½			
3	WINDOW	4½			
4	HATCHING	5½			
5	LABELS	1½			
SUBTOTAL		31			
TOTAL		92			
PENALTIES (-)					
GRAND TOTAL					

EXAMINATION NUMBER	
EXAMINATION NUMBER	6

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