Province of the
EASTERN CAPE
DEPARTMENT OF EDUCATION

NATIONAL SENIOR CERTIFICATE

GRADE 12

GRDSE1

ENGINEERING GRAPHICS AND DESIGN P1

SEPTEMBER 2026

PREPARATORY EXAMINATION

MARKS: 200

TIME: 3 hours

This question paper consists of 6 pages.

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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							
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4							
TOTAL							
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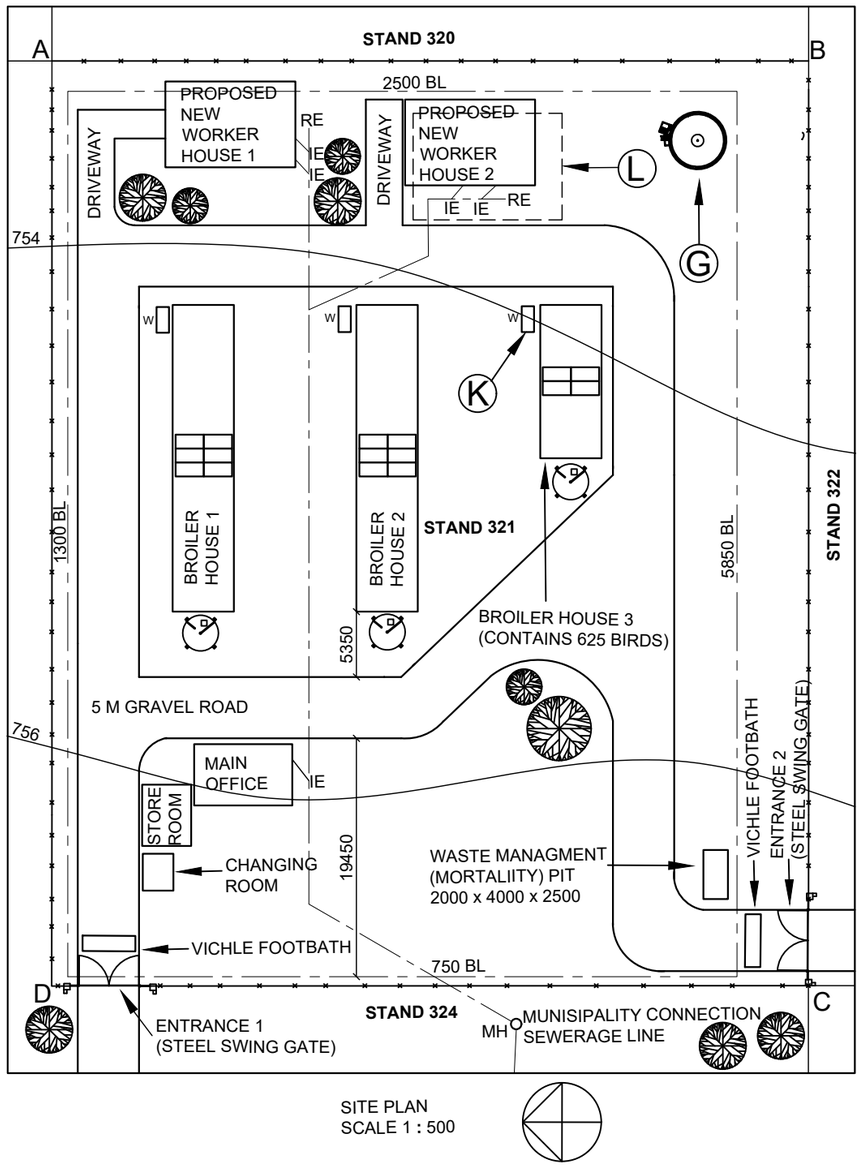
FINAL CONVERTED MARK	CHECKED BY
100	

COMPLETE THE FOLLOWING:
NAME
NAME
EXAMINATION CENTRE
EXAMINATION CENTRE

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SYMBOL LEGEND		
1		1 800 mm HIGH SECURITY FENCING
2		INDIGENOUS TREE
3		SINGLE SILO
4		6 x 0,55 kW SOLAR PANELS
5		5 000 L WATER TANK

LAND SURVEYOR'S CERTIFICATE OF THE BORDER LINE LENGTHS AND CORNER HEIGHTS OF STAND 321 SURVEYED ON 2026-01-27	
BORDERLINE LENGTHS IN MILLIMETRES	CORNER HEIGHTS IN METRES
AB = 61 700	A = 754,5
BC = 75 400	B = 753
CD = 61 700	C = 756,5
DA = 75 400	D = 757



SITE PLAN
SCALE 1 : 500

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**.

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

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

PRINTED BY:	DATE OF PRINT:
BRITS PRINTERS	**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:	DRAWING NUMBER:
173-2026	**MF-22/01-26**

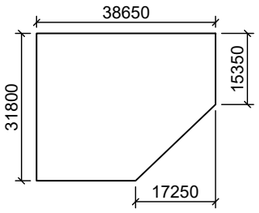
DATE:	DRAWN:	CHECKED:	SCALE:
2026-02-28	**CAMERON**	**MATTHEW**	**1 : 500**

REFERENCE CODE:	DRAWING NO.:
SITE- 321-26	**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**



NAME
NAME 2

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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.

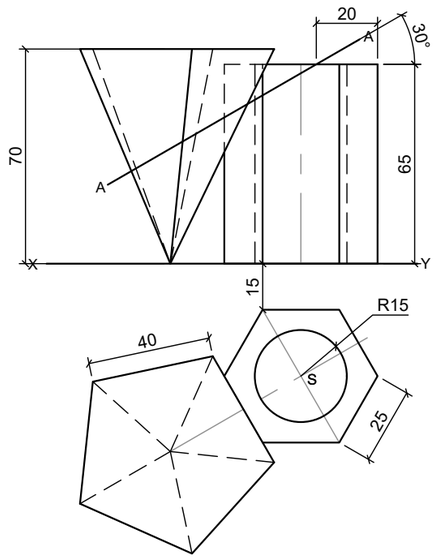
Instructions:

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

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QUESTION 3: PERSPECTIVE

Given:

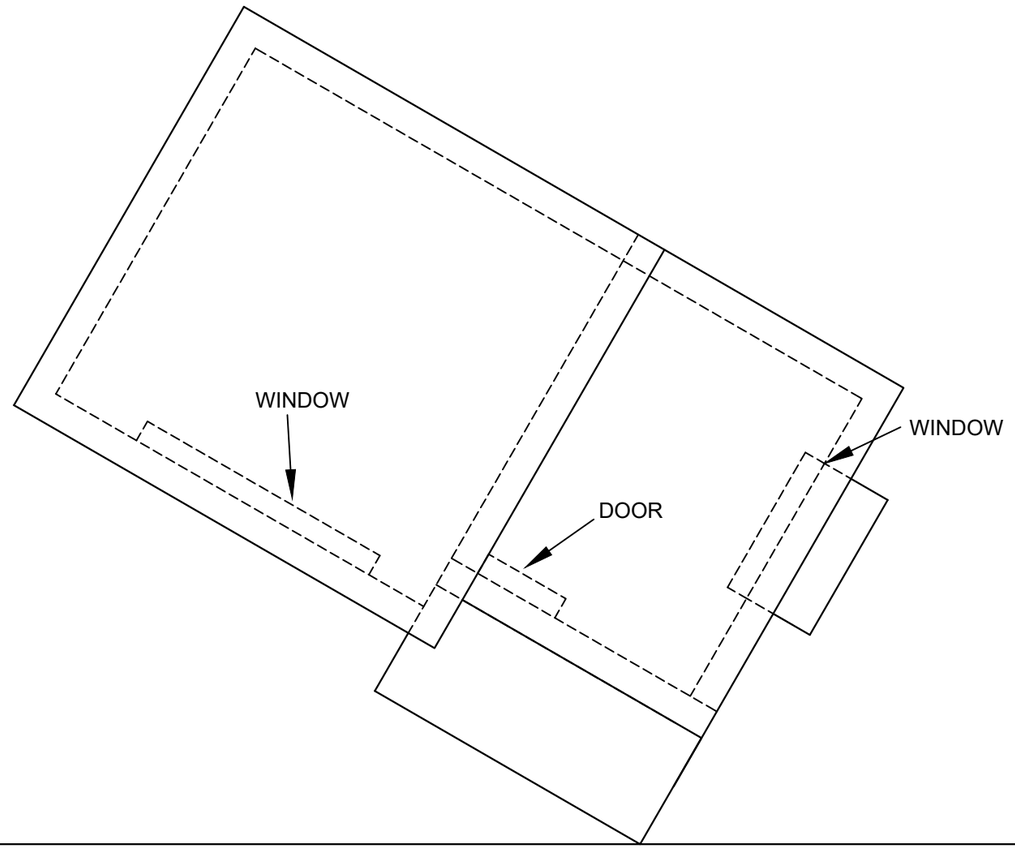
- Three views of a modern style house and the information needed to draw a two-point perspective drawing.

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

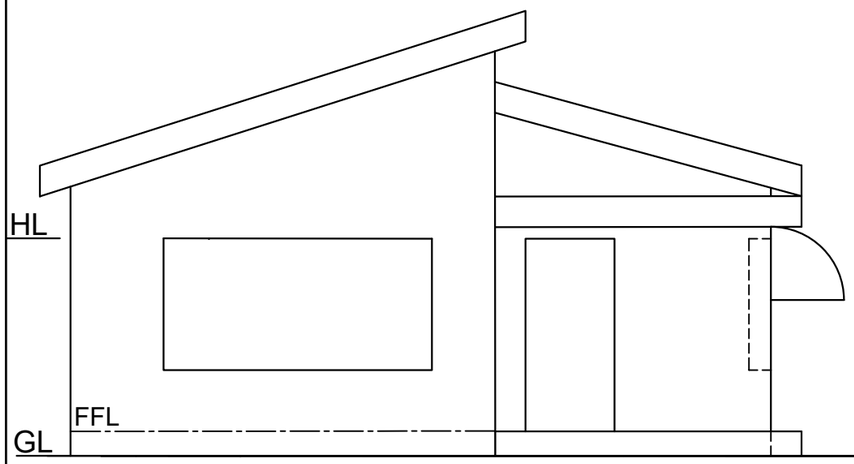
Instructions:

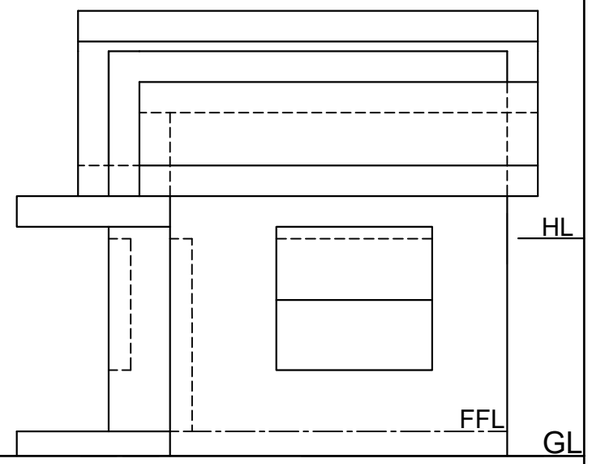
Complete the perspective drawing.

- 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**	





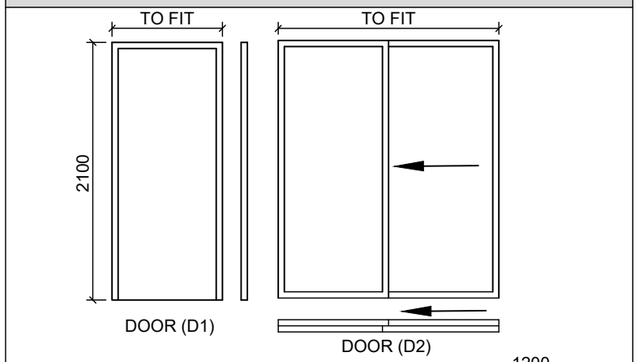
SP

NAME	
NAME	4

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DOOR AND WINDOW SCHEDULE



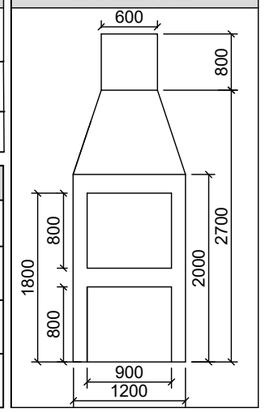
WINDOW SILL:
170 x 20 mm
FIBRE CEMENT
WINDOW SILL UNDER
ALL WINDOWS

WINDOW NOTES
A = OPENING SIDE
B = FIXED PANEL
THICKNESS OF ALL
FRAMES: 60 mm

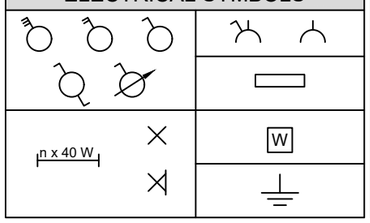
ROOF COMPONENTS

RIDGE COVER	300
200 x 20 mm FASCIA BOARD	
150 x 100 GUTTER	

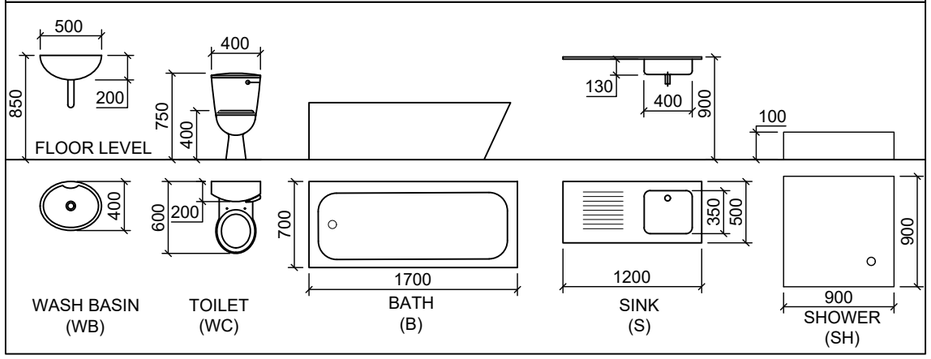
BARBEQUE

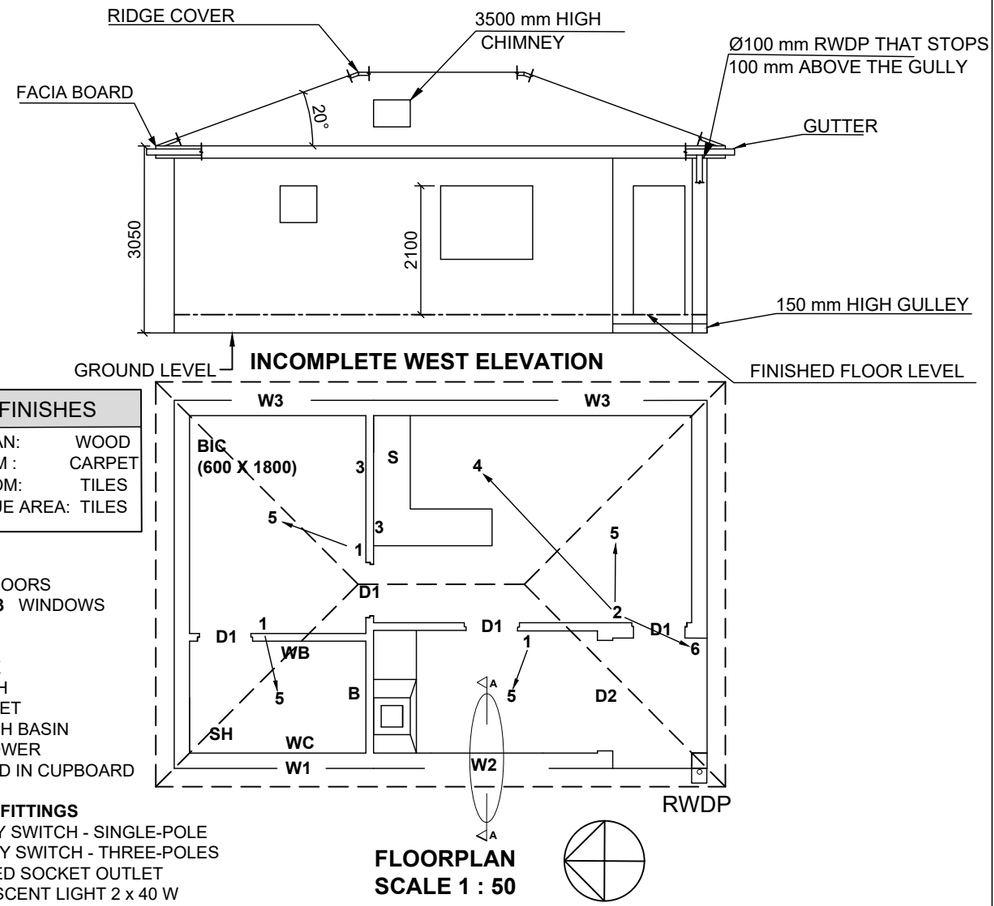


ELECTRICAL SYMBOLS



SANITARY FIXTURES





INCOMPLETE WEST ELEVATION

FLOOR FINISHES

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

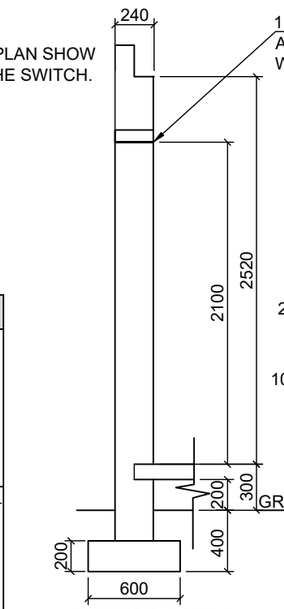
FEATURES
D1 + D2 DOORS
W1 + W2 + W3 WINDOWS

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



DIMENSION GUIDE:
INCOMPLETE FOUNDATION AND EXTERNAL WALL DETAIL

ROOF NOTES:
20° ROOF PITCH

114 x 38 mm ROOF TRUSSES ON 114 x 38 mm WALL PLATES

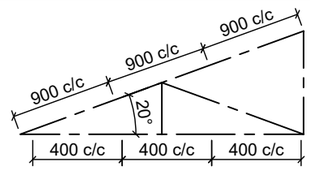
300 mm ROOF OVERHANG TO THE END OF THE ROOF TRUSS

ROOF COVER: 20 mm FIBRE CEMENT ROOF SHEETING ON 80 x 50 mm PURLINS @ 900 mm c/c

200 x 20 mm FASCIA BOARD WITH 150 X 100 mm GUTTERS ON ALL SIDES AND A Ø100 mm RAINWATER DOWN-PIPE

10 mm CEILING BOARD ON 38 x 38 mm BRANDERING @ 400 mm c/c

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)

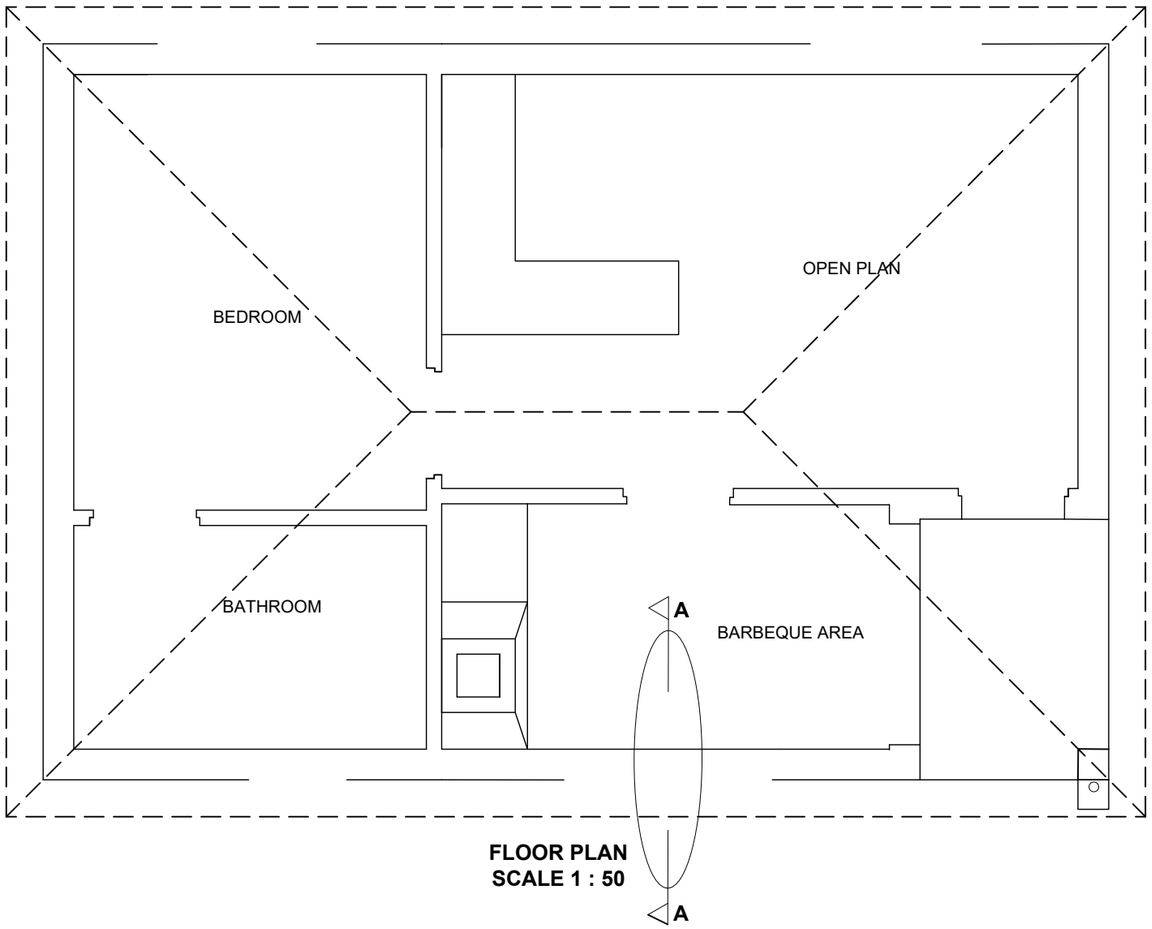
NOTE:
ALL drawings must comply with the **guidelines** and **graphical symbols** as contained in the *SANS 10143*. **[91½]**

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NGL



FLOOR PLAN
SCALE 1 : 50

DETAILED SECTION A-A
SCALE 1 : 20

ROOF DETAIL: MARK ALLOCATION			
A	ROOF ANGLE	½	
B	ROOF SHEET	1	
C	ROOF TRUSS OVERHANG	2½	
D	PURLIN + SPACING	1½	
E	BRANDERING + SPACING	1½	
F	CEILING BOARD	½	
G	WALL PLATE	1	
H	FACIA BOARD	1½	
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	3½	
3	DOOR + WINDOW	8½	
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	1½	
	SUBTOTAL	**31½**	
	TOTAL	**91½**	
PENALTIES (-)			
	GRAND TOTAL		

NAME	
NAME	6

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