



Province of the
EASTERN CAPE
DEPARTMENT OF EDUCATION

**NATIONAL
SENIOR CERTIFICATE**

GRADE 12

ENGINEERING GRAPHICS AND DESIGN P1

SEPTEMBER 2023

PREPARATORY EXAMINATION

MARKS: 100

TIME: 3 hours

This question paper consists of 6 pages.

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INSTRUCTIONS AND INFORMATION

1. The 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 otherwise stated.
6. ALL answers must be drawn accurately and neatly.
7. ALL 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 0								2 0 0	

FINAL CONVERTED MARK	CHECKED BY
100	

COMPLETE THE FOLLOWING:	
NAME	
NAME	
EXAMINATION CENTRE	
EXAMINATION CENTRE	

SYMBOL LEGEND		
1		BRICK PAVING
2		2 100 mm HIGH PALISADE FENCING
3		1 800 mm HIGH SECURITY FENCING
4		1 800 mm HIGH BRICK WALL
5		INDIGENOUS TREE
6		SHRUBS

LAND SURVEYOR'S CERTIFICATE OF THE BORDER LINE LENGTHS AND CORNER HEIGHTS OF STAND 1144 SURVEYED ON 2023-01-08	
LENGTHS IN MILLIMETRES	CORNER HEIGHTS IN METRES
AB = 36 400	A = 1 550
BC = 36 400	B = 1 552
CD = 5 600	C = 1 552,5
DE = 32 400	D = 1 552
AE = 40 400	E = 1 550

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 BIDET.

3		
2	2023-03-01	Show the position of the Watt meter
1	2023-02-24	Indicate the position of the new braai area
REVISION	DATE	DESCRIPTION

SPANGENBERG ARCHITECTS
13 MAIN ROAD
GQEBERHA
082 346 6373
aspang.architect@gmail.com

PRINTED BY: **FLEMMING PRINTERS** DATE OF PRINT: **2023-02-14**

DRAWING TITLE:

SITE PLAN

PROJECT:
ALTERATIONS ON STAND 1144 FOR
MR ROTHERHAM
Cnr. BOSKLOOF AVE & KEUR STREET, HUMANSDORP

PROJECT NUMBER: 01-2023		DRAWING NUMBER: LOUK01-2023	
DATE: 2023-01-06	DRAWN: GERHARD	CHECKED: LEAH	SCALE: 1 : 300
REFERENCE CODE: SITE- 1144-23		DRAWING NO.: 1 of 6	

QUESTION 1: ANALYTICAL (CIVIL)

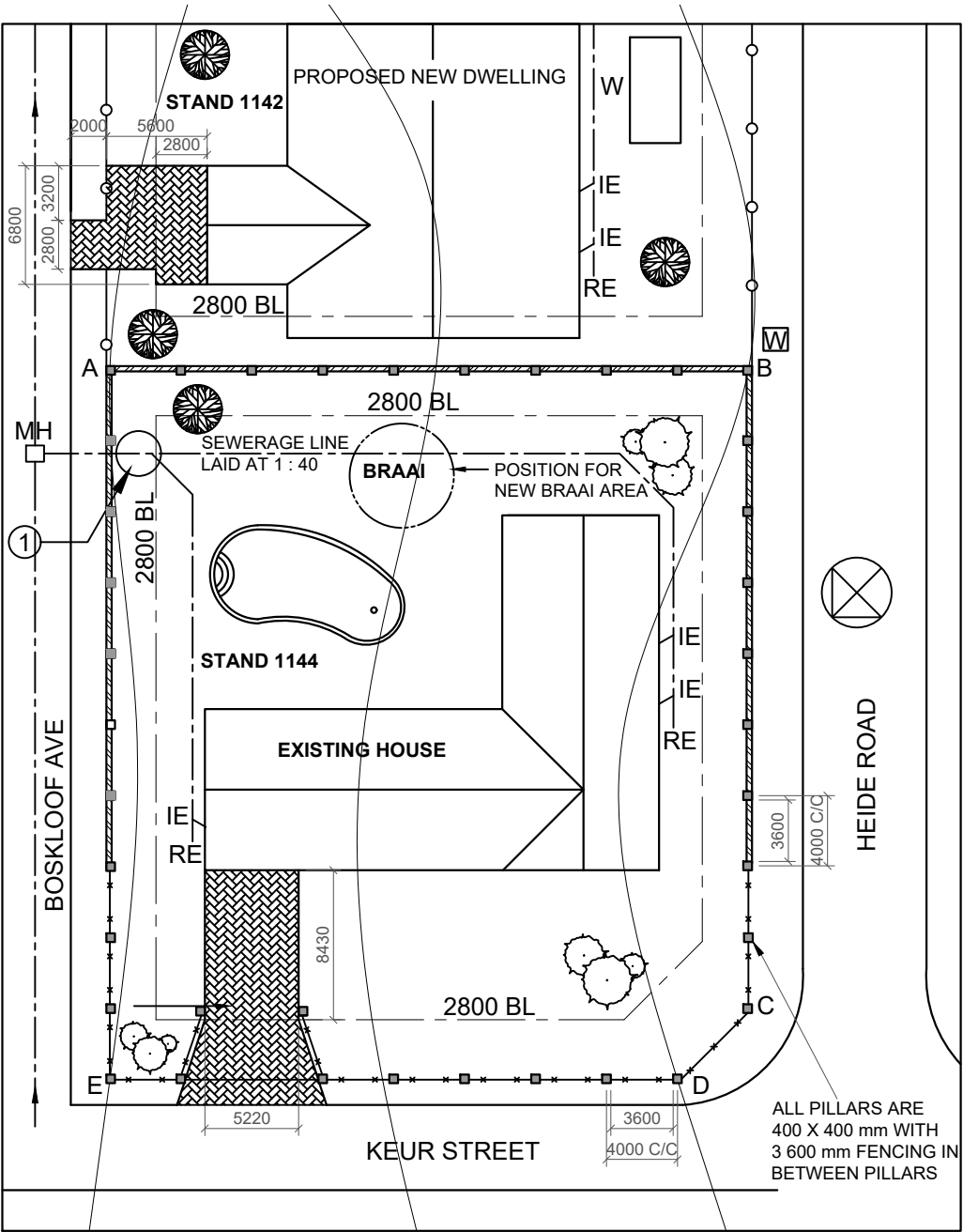
Given:

The site plan of an existing house with alterations and section of a new dwelling on the adjacent stand, 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 was responsible for checking the correctness of the drawing?		1	
2	Who is the owner of the stand 1144?		1	
3	What is the reference code of this drawing?		1	
4	How far, in meters, are the pillars of the brick wall spaced from one another on stand 1144?		1	
5	When was the second revision done?		1	
6	How many indigenous trees are on stand 1144?		1	
7	Indicate the direction of flow on the sewerage line with an arrow in the circle numbered 1.		1	
8	What type of fence does the owner want to use on stand 1142, on the street sides, to secure his house?		1	
9	In what colour should new alterations be indicated on the site plan?		1	
10	What is the minimum distance that the braai could be erected in, from the brick wall?		1	
11	How many roding eyes are installed on stand 1144 ?		1	
12	What is the height of the wall between the two stands, in meters?		2	
13	The municipality rejected the plans of stand 1142. Give a reason for the decision.		2	
14	With reference to the north point, on which side is the entrance of stand 1142?		2	
15	Determine, in the space provided below (ANSWER 15) the total length of the brick wall fencing on stand 1144.		4	
16	Determine, in the space provided below (ANSWER 16), the total area of the paved ramp on stand 1142 , in square meters.		4	
17	In the space at the title panel (ANSWER 17), draw in neat freehand, the top view and front view of the SANS 10143 graphical symbol for a bidet .		4	
ANSWER 15 Show ALL calculations.		ANSWER 16 Show ALL calculations.		TOTAL 29
		NAME		
		NAME		2



QUESTION 2: INTERPENETRATION AND DEVELOPMENT:

Given:

- The incomplete front view and top view of a square pipe penetrating a pentagonal pipe.
- The center of both pipes are in line with each other.
- Starting point **X**.

Instructions:

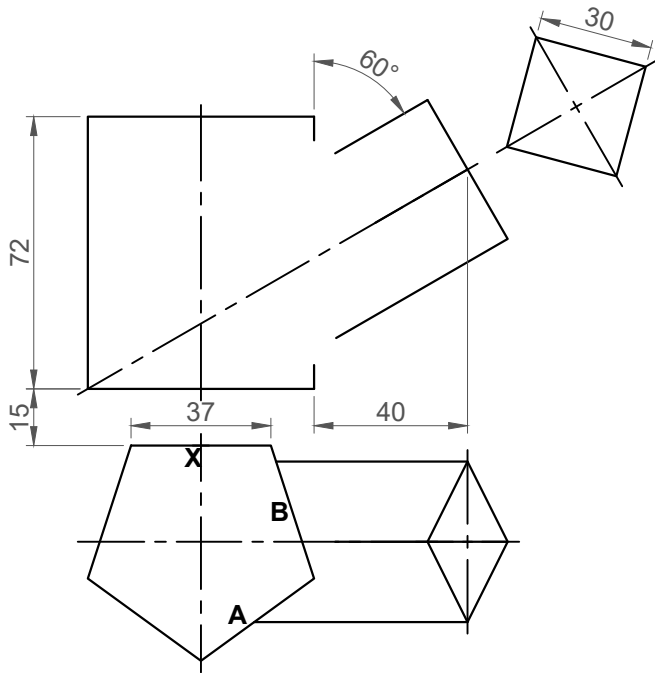
Draw to scale 1 : 1, the following views:

- 2.1 The complete top view.
- 2.2 The complete front view that clearly shows the curve of the penetration.
- 2.3 The development of ONLY the two surfaces (A and B) of the pentagonal pipe that clearly shows the curve.

- Show ALL centre lines and hidden detail.
- Show ALL necessary construction lines.

[38]

x+



ASSESSMENT CRITERIA					
1	TOP VIEW	10 ½			
2	FRONT VIEW	17			
3	DEVELOPMENT	10 ½			
PENALTIES (-)					
TOTAL		38			

NAME	
NAME	3

QUESTION 3: PERSPECTIVE

Given:

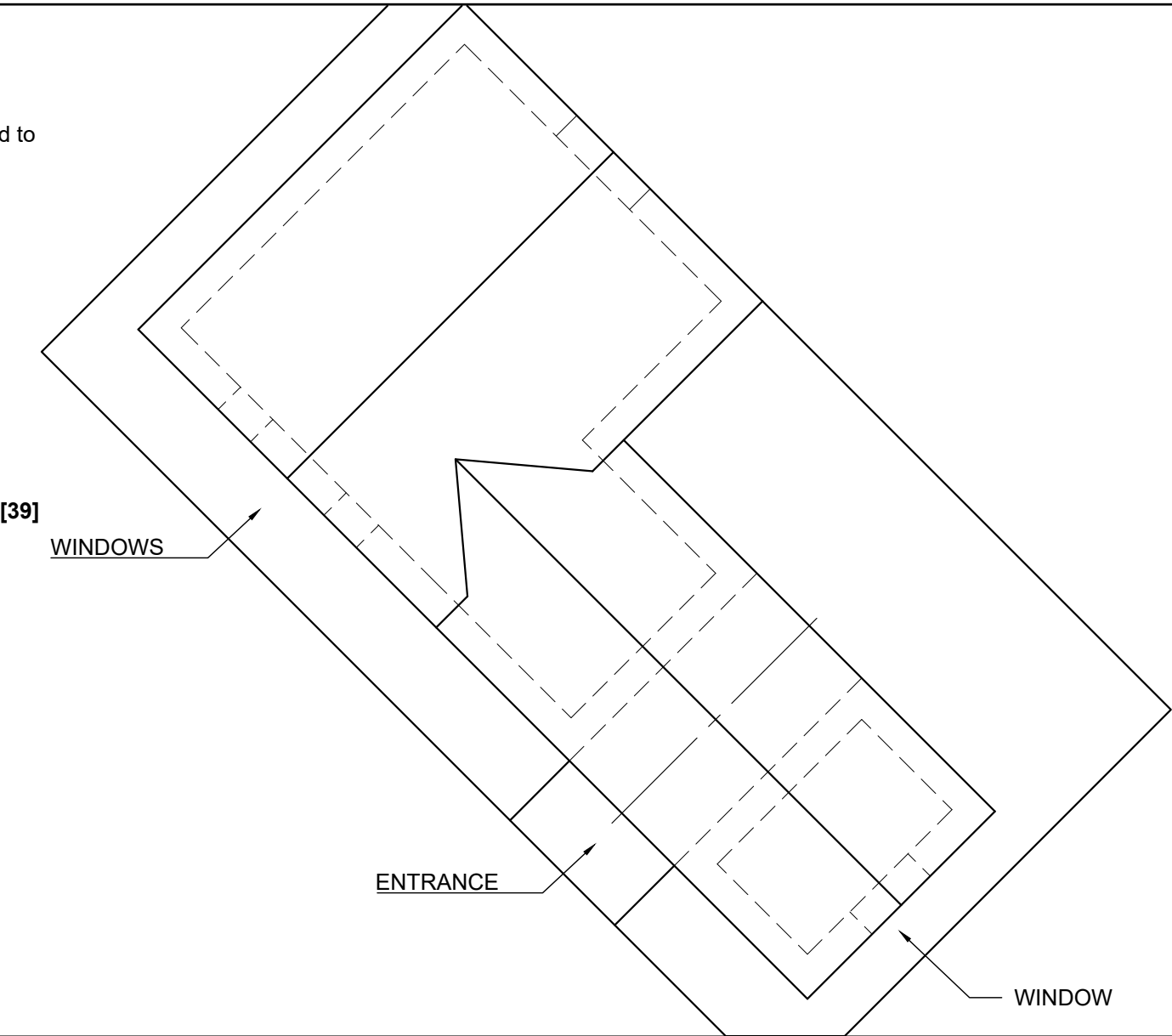
- Three views of a farm house and the information needed to draw a two-point perspective drawing.

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

Instructions:

Complete the perspective drawing.

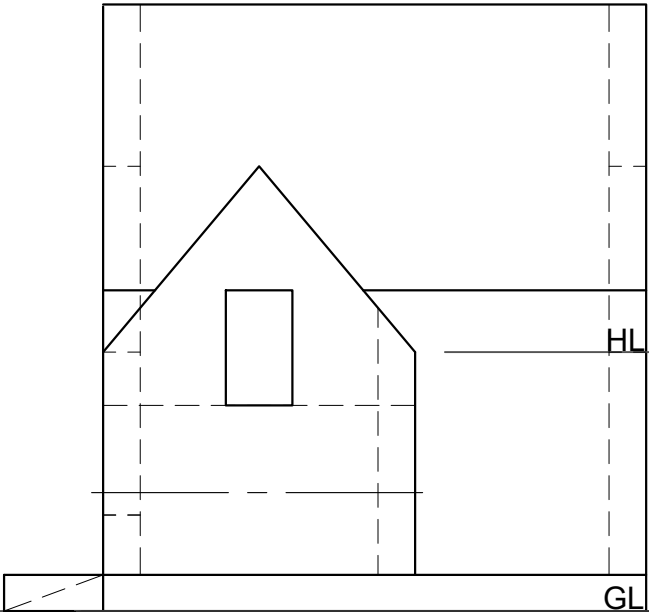
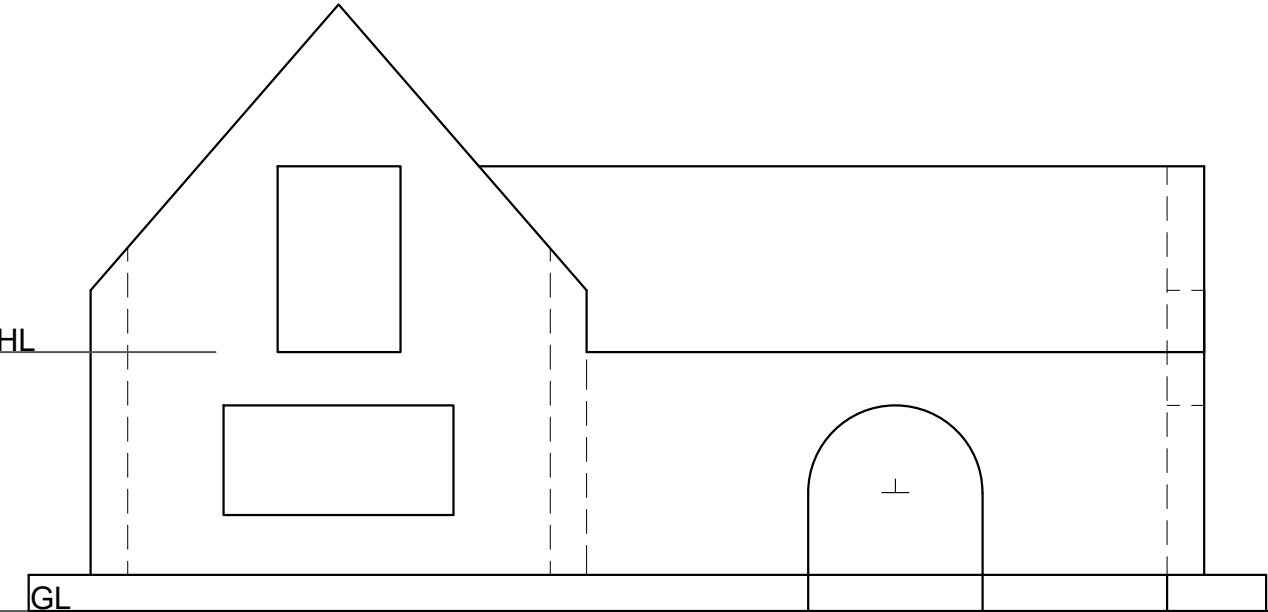
- Align the drawing sheet with the ground line (GL).
- Determine and label the vanishing points.
- Show ALL necessary construction.
- NO hidden detail is required.



ASSESSMENT CRITERIA					
1	CONSTRUCTION + VP's	6			
2	WALLS + PORCH	12			
3	ROOF	5½			
4	WINDOWS + DOOR	11			
5	ARCH + CONSTRUCTION	4½			
PENALTIES (-)					
TOTAL		39			

PP

PP



SP

NAME

NAME

4

DOOR AND WINDOW SCHEDULE

TO FIT TO FIT

2100

DOOR (D1)

DOUBLE DOOR (D2)

800 300 950

WINDOW (NC2)

1200 475 950

WINDOW (NC3)

WINDOW NOTES
A = OPENING SIDE
B = FIXED PANEL
THICKNESS OF ALL FRAMES: 50 mm

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

FIREPLACE AND CHIMNEY DETAIL

400 2760 500 600 700

ELECTRICAL SYMBOLS

ONE-WAY SWITCH - SINGLE-POLE	TWO-WAY SWITCH - SINGLE-POLE
SWITCHED SOCKET OUTLET	FLUORESCENT LIGHT 2 x 40 W
Ceiling Light	Ground Symbol

ROOM DESIGNATIONS AND FLOOR FINISHES

1. KITCHEN:	TILES
2. BEDROOM:	CARPET
3. BATHROOM:	TILES
4. LIVING AREA:	WOOD
5. PORCH / FIREPIT AREA:	GRANO

FLOOR PLAN

FEATURES
D1 + D2 DOORS
NC2 + NC3 WINDOWS

FIXTURES
S SINK
WT WASH TUB
WC TOILET
WB WASH BASIN
SH SHOWER
BIC BUILD IN CUPBOARD

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

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

INCOMPLETE NORTH ELEVATION

RIDGE COVER ROOF CAP VALLEY GUTTER

30°

240 x 20 mm FASCIA BOARD

DOUBLE DOOR OPENING

FINISHED FLOOR LEVEL GROUND LEVEL

FLOOR PLAN SCALE 1 : 50

ROOF NOTES:
30° 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 75 x 50 mm PURLINS @ 900 mm c/c
240 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

SANITARY FIXTURES

500 200 850

400 750 400

2050 800

600 400 100

1200 350 500

WASH BASIN (WB) TOILET (WC) SHOWER (SH) WASH TUB (WT) SINK (S)

DIMENSION GUIDE: INCOMPLETE FOUNDATION AND EXTERNAL WALL DETAIL

2600 2100 250 100 400 600 200 300 400

GROUND LEVEL

1 X 250 x 100 mm LINTEL ABOVE ALL DOOR AND WINDOW OPENINGS

SCHEMATIC DIAGRAM OF THE ROOF TRUSSES FOR ROOF

30° 900 c/c

SCHEMATIC DIAGRAM OF ROOF TRUSS (A) FOR ROOF

30° 900 c/c 400 c/c 400 c/c 400 c/c

Given:

- The incomplete north elevation of a **new house**, showing the walls, windows and door openings, the fire pit, the position of the chimney, the roof and labels.
- The incomplete floor plan showing the walls, steps, fire pit, position of the doors, windows, fixtures and the electrical layout.
- A schematic diagram of the roof trusses, single truss and roof notes.
- The incomplete foundation and external wall with dimensions.
- A door and window schedule.
- A fireplace and chimney detail.
- A table of electrical symbols.
- A table of roof components.
- Room designations as well as floor finishes.
- A table of sanitary fixtures.
- The incomplete floor plan, ground line and roof cap of a **new house**, drawn to scale 1 : 50, and the incomplete foundation and a break line 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 NORTH ELEVATION

Show the following features on the drawing:

- The outside walls, double door, steps, fire pit and the detailed windows.
- The roof detail, including the fascia boards, ridge covers, gutters and chimney of the fireplace.
- The finished floor level.

- 4.2 Use 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:

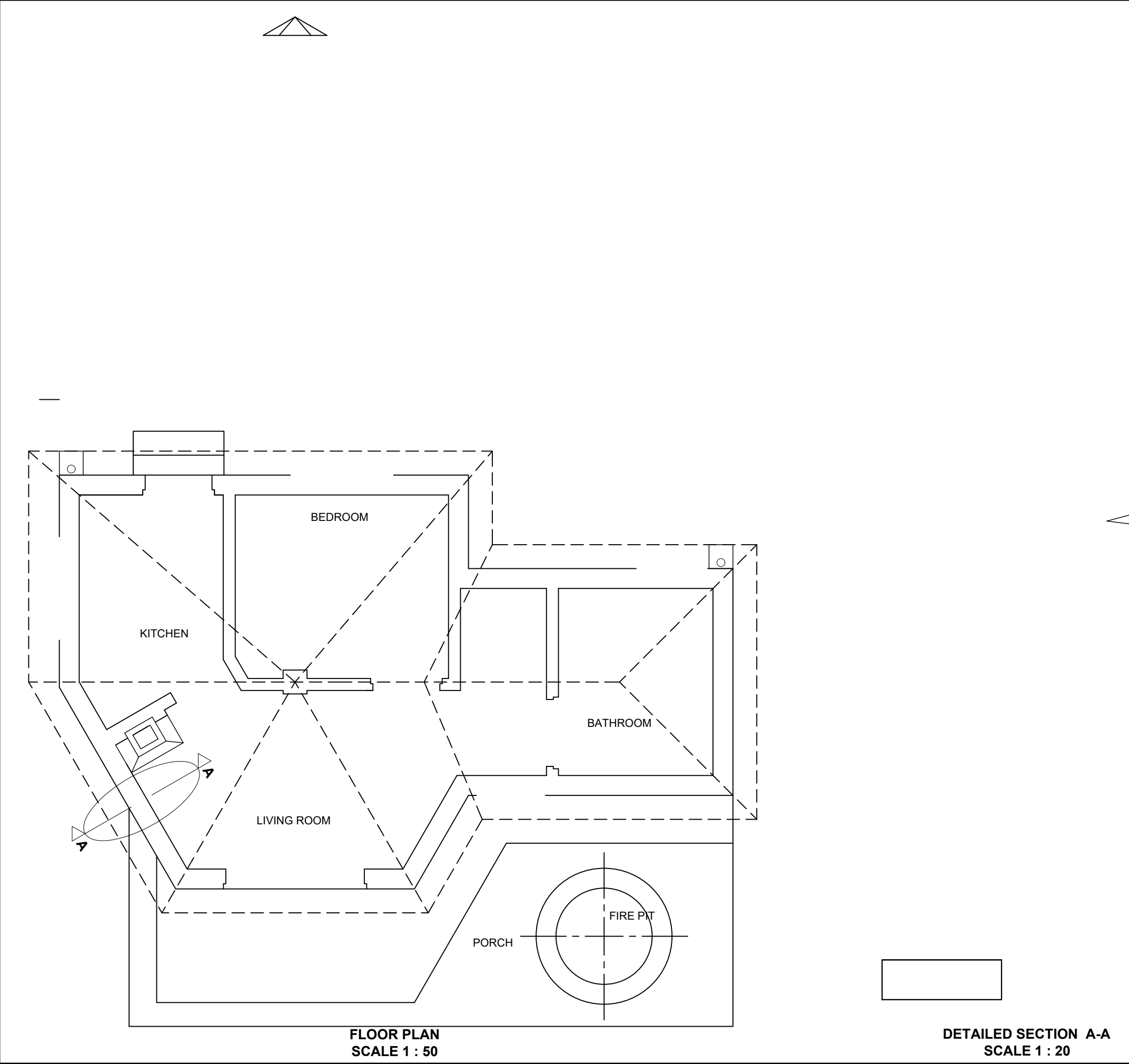
- The complete foundation and external wall detail.
- The fireplace, with the chimney, to the southeast side of the cutting plane **A-A**.
- The roof detail, including the fascia board and gutter.
- ALL hatching detail. **ONLY** the substructure hatching may be drawn in neat freehand.

Label the following:

- The north elevation.
- The floor finishes.
- Ground level, finished floor level and damp proof course (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*. [94]



ROOF DETAIL:			
MARK ALLOCATION			
A	ROOF ANGLE	1	
B	ROOF SHEET	1	
C	ROOF TRUSS	3	
D	PURLIN + SPACING	1½	
E	BRANDERING + SPACING	1½	
F	CEILING BOARD	½	
G	WALL PLATE	1	
H	FACIA BOARD	1½	
I	GUTTER	1	
TOTAL		12	

PENALTIES				
1	INCORRECT SCALE			
2	NON-ALIGNMENT OF VIEWS			
3	INCORRECT LETTERING			
TOTAL PENALTIES (-)				
ASSESSMENT CRITERIA				
FLOOR PLAN				
1	DOORS + WINDOWS	13		
2	ELECTRICAL	8 $\frac{1}{2}$		
3	FIXTURES	10 $\frac{1}{2}$		
4	HATCHING	3		
5	LABELS	2 $\frac{1}{2}$		
SUBTOTAL		37 $\frac{1}{2}$		
NORTH ELEVATION				
1	ROOF + FACIA + GUTTER + COVERS + CHIMNEY	14		
2	WALLS + PORCH + STEPS + FIRE PIT + FFL	7		
3	DOOR + WINDOW	6		
4	LABELS	1 $\frac{1}{2}$		
SUBTOTAL		28 $\frac{1}{2}$		
DETAILED SECTION				
1	ROOF DETAIL	12		
2	FOUNDATION + WALLS + FLOOR	5		
3	FIREPLACE + CHIMNEY	6		
4	HATCHING	4		
5	LABELS	1		
SUBTOTAL		28		
TOTAL		94		
PENALTIES (-)				
GRAND TOTAL				

NAME	
NAME	6