STAPLE

basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

SENIOR CERTIFICATE EXAMINATIONS/
NATIONAL SENIOR CERTIFICATE EXAMINATIONS

ENGINEERING GRAPHICS AND DESIGN P1

2023

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															
	2	0	0			2	0	0			2	0	0		

FINAL CONVERTED MARK	CHECKED BY
$\overline{100}$	

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

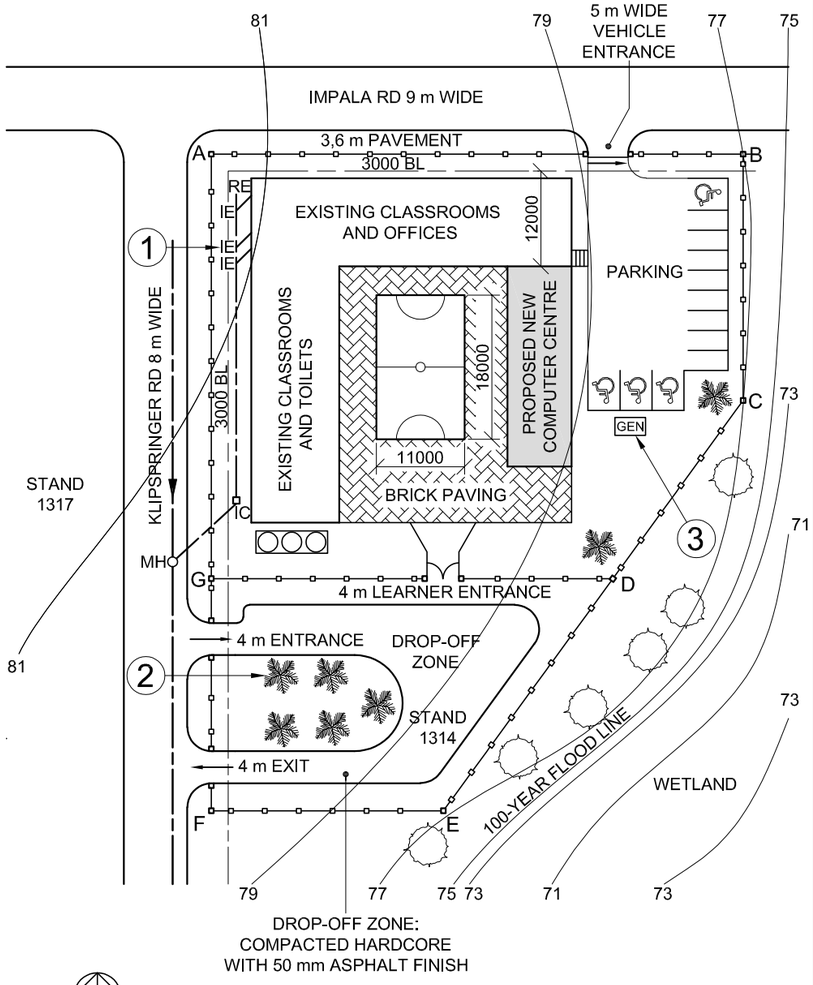
DO NOT FOLD THE QUESTION PAPER IN HALF.

STAPLE

LAND SURVEYOR'S CERTIFICATE OF THE CORNER HEIGHTS AND BOUNDARY LENGTHS OF STAND 1314			
CORNER HEIGHTS AND CONTOUR LINES IN METRES		BOUNDARY LENGTHS IN MILLIMETRES	
A	82,3	AB	59700
B	77	BC	33000
C	77	CD	22000
D	78,5	DG	50500
E	77,2	DE	33400
F	80,4	EF	36600
G	80,5	FG	30400
		GA	53000

SYMBOL LEGEND:

1. INDIGENOUS TREES
2. PALM TREES
3. 2500 LITRE WATER TANK ON BASE
4. 25 kVA POWER GENERATOR (GEN)
5. 1,9 m PALISADE FENCE
6. PARKING FOR DISABLED PEOPLE



SITE PLAN
SCALE 1 : 900

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 provided below, draw, in neat freehand, the *SANS 10143* graphical symbol for:
20.1 A GREASE TRAP
20.2 An ELECTRICAL EARTH

20.1 GREASE TRAP
20.2 ELECTRICAL EARTH

1	2022/05/16	50 mm ASPHALT FOR DROP-OFF ZONE
REVISION	DATE	DESCRIPTION

MDR ARCHITECTS
14 LILLY RD
STONE HILL
EAST LONDON
3411

www.mdr-arch.co.za
018 385 7123

PRINTED BY:	DATE OF PRINT:
EXPRESS PRINTERS	03/07/2022

DRAWING TITLE: SITE PLAN

PROJECT: PROPOSED NEW COMPUTER CENTRE ON STAND 1314, 7 IMPALA RD, BEACONHURST, EAST LONDON

PROJECT NUMBER:		DRAWING NUMBER:
84-0213		1402-01
DATE: 17/03/2022	DRAWN: DIANNE	CHECKED: CAMERON
REFERENCE CODE: MDR-1143/J		SCALE: 1 : 900

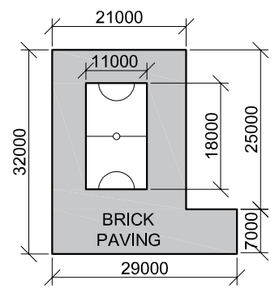
QUESTION 1: ANALYTICAL (CIVIL)

Given:
The site plan of an existing school with a proposed new computer centre, a title panel and a table of questions. The drawing has not been 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. **[30]**

	QUESTIONS	ANSWERS			
1	What is the project number?		1		
2	Name the company that printed the site plan.		1		
3	What type of fencing surrounds STAND 1314?		1		
4	In which suburb is the architectural firm situated?		1		
5	What scale is indicated for the drawing?		1		
6	What is the proposed new extention on STAND 1314?		1		
7	How many parking bays are reserved for people with disabilities?		1		
8	What is the surface finish for the drop-off zone?		1		
9	What does the abbreviation *IE* at 1 stand for?		1		
10	Name the feature at 2.		1		
11	Name the feature at 3.		1		
12	Which elevation of the proposed new computer centre faces the parking area?		1		
13	What is the total amount of water that can be stored in all the water tanks shown on STAND 1314?		2		
14	What is significant about the contour line at 75 m?		2		
15	What does the abbreviation *WC* for a toilet stand for?		1		
16	In what colour must new glass be indicated on sectional elevations?		1		
17	What is the distance between the new computer centre and Impala Road in metres?		2		
18	In the space below (ANSWER 18), determine the total length of the fencing around the **drop-off zone** in metres.		3		
19	In the space below (ANSWER 19), determine the total area of the brick paving in square metres.		3		
20	In the space in the title panel (ANSWER 20), draw, in neat freehand, the *SANS 10143* graphical symbol for: 20.1 a GREASE TRAP, and 20.2 an ELECTRICAL EARTH.		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:

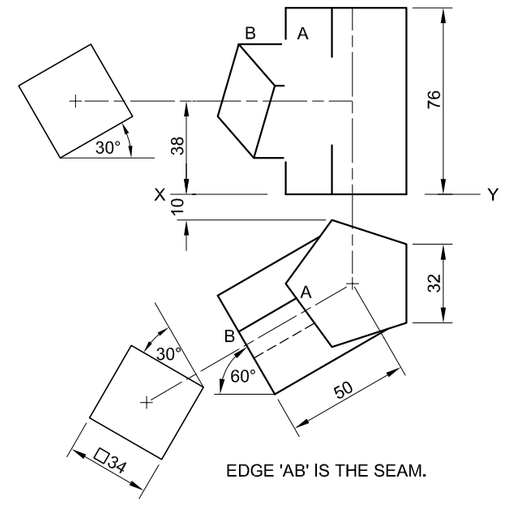
- The top view and incomplete front view of a right square prism that has been shaped to fit around a right regular pentagonal prism. The axes of both solids lie in a common vertical plane.
- Auxiliary views of the square prism

Instructions:

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

2.1 The given top view
2.2 The complete front view, clearly showing the curve of interpenetration
2.3 The complete left view, clearly showing the curve of interpenetration
2.4 The development of the surface of the square prism. Make edge 'AB' the seam.

- Planning is essential.
- Show ALL hidden detail.
- Show folding lines on the development.
- Show ALL construction. **[38]**



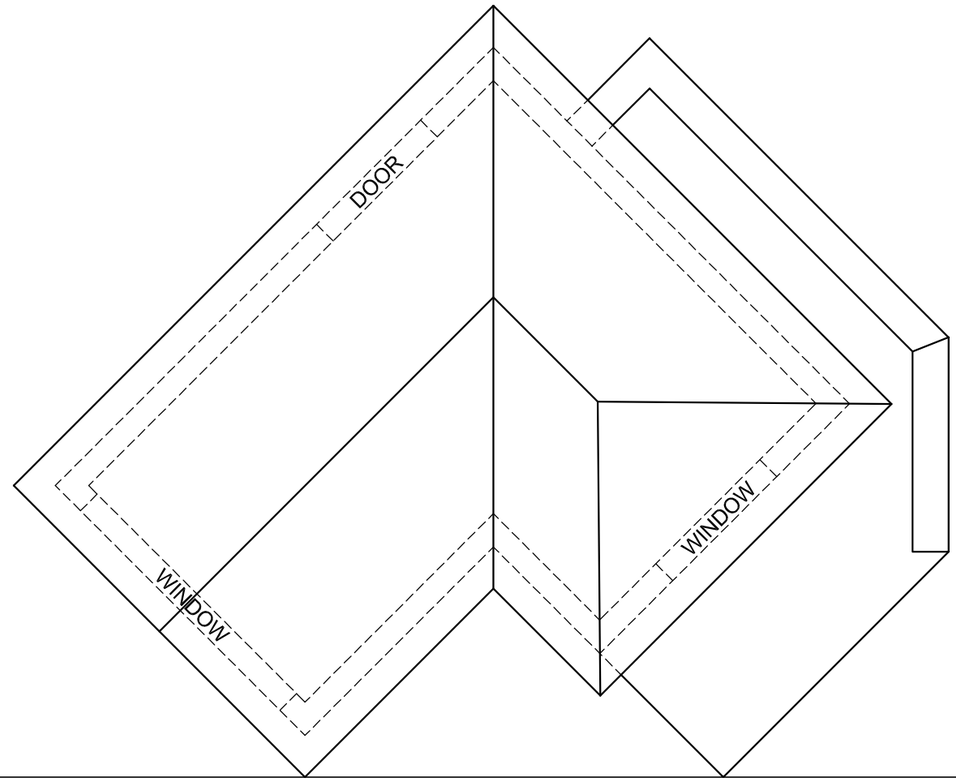
EDGE 'AB' IS THE SEAM.

ASSESSMENT CRITERIA						
1	TOP VIEW	6 ½				
2	FRONT VIEW	11 ½				
3	LEFT VIEW	12 ½				
4	DEVELOPMENT	7 ½				
PENALTIES (-)						
	TOTAL	**38**				

EXAMINATION NUMBER

EXAMINATION NUMBER 3

STAPLE



PP

QUESTION 3: PERSPECTIVE

Given:
Three views of a 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.

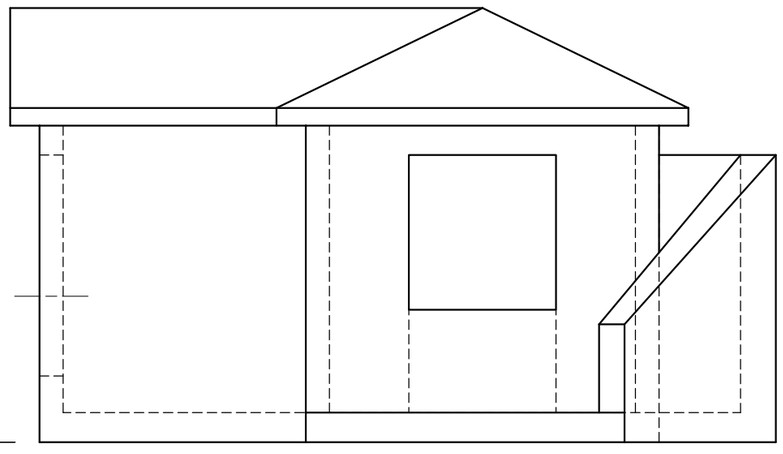
- Align the drawing sheet with the ground line (GL).
- Determine and label the vanishing points.
- Show ALL construction.
- Show the depth at the windows.
- No hidden detail or internal detail is required.

[40]

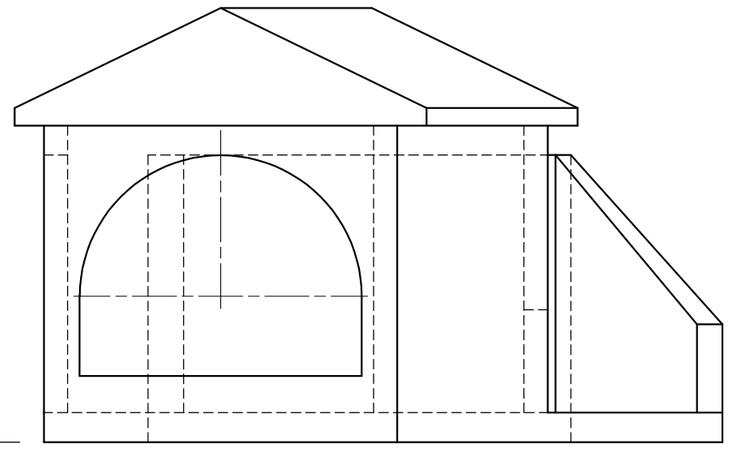
ASSESSMENT CRITERIA					
1	CONSTRUCTION	6			
2	STOEP + WALLS	12 ½			
3	ARCH + CONSTR	8 ½			
4	WINDOW	3 ½			
5	ROOF	9 ½			
PENALTIES (-)					
	TOTAL	**40**			

HL

HL

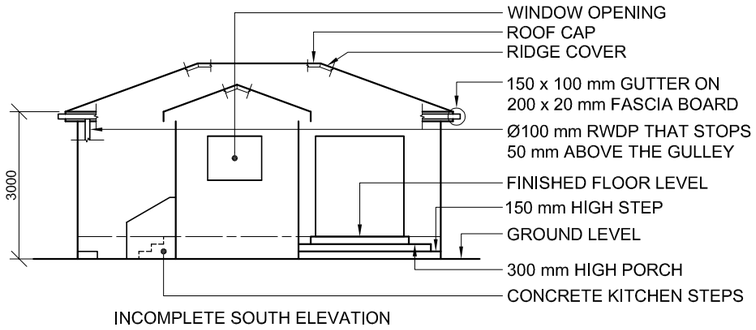


GL

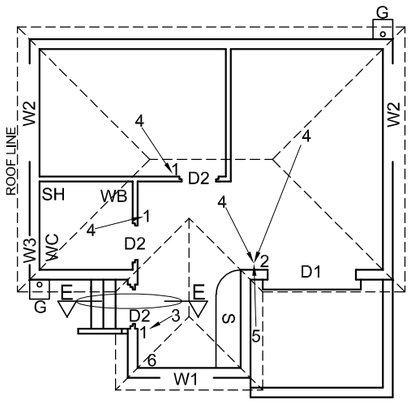


SP

EXAMINATION NUMBER	
EXAMINATION NUMBER	4



INCOMPLETE SOUTH ELEVATION



INCOMPLETE FLOOR PLAN

FEATURES

D1	SLIDING DOOR
D2	DOOR
W1	WINDOW
W2	WINDOW
W3	WINDOW

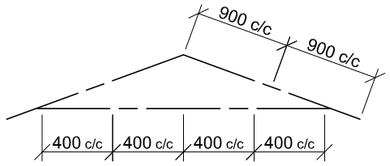
FIXTURES

WC	TOILET
SH	SHOWER
WB	WASH BASIN
S	SINK

ELECTRICAL FITTINGS

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

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



SCHEMATIC DIAGRAM OF
A ROOF TRUSS AT E-E

ROOF NOTES:
20° ROOF PITCH

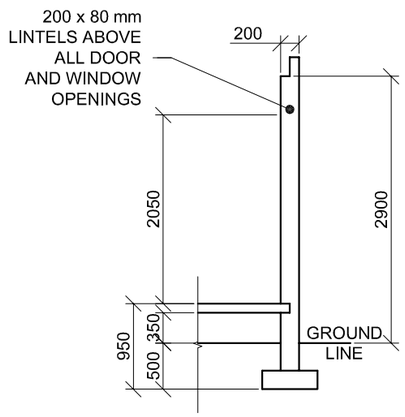
114 x 40 mm ROOF TRUSSES ON
114 x 40 mm WALL PLATES

250 mm ROOF OVERHANG TO END OF
ROOF TRUSSES

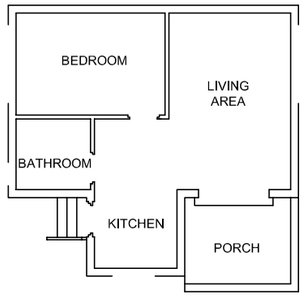
20 mm FIBRE CEMENT ROOF SHEETING ON
80 x 50 mm PURLINS @ 900 c/c

200 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 @ 400 mm c/c



INCOMPLETE FOUNDATION AND
EXTERNAL WALL DETAIL



ROOM AND AREA DESIGNATIONS

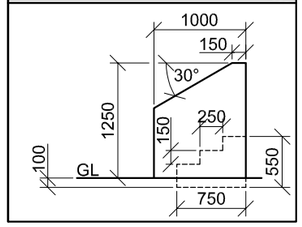
FLOOR FINISHES

BEDROOM:	CARPET
BATHROOM:	TILES
LIVING AREA:	WOOD
KITCHEN:	TILES
PORCH:	WOOD

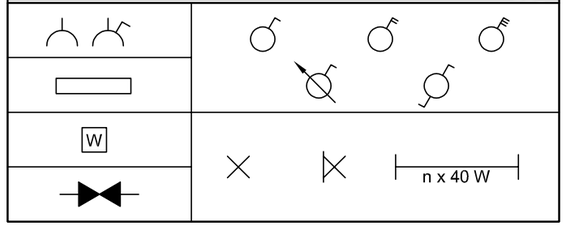
ROOF COMPONENTS

	150 x 100 mm GUTTER
	200 x 20 mm FASCIA BOARD AND BARGE BOARD
300	ROOF CAP

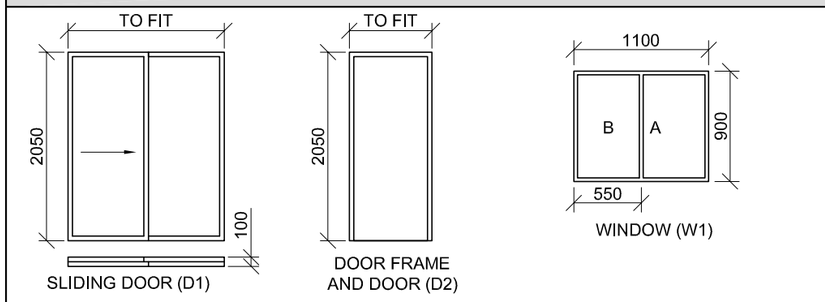
KITCHEN STEP DETAIL



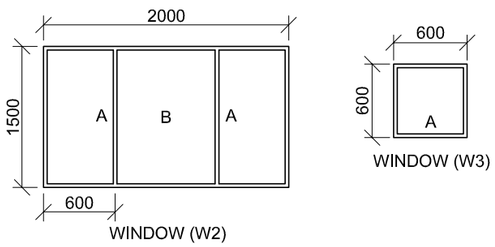
ELECTRICAL SYMBOLS



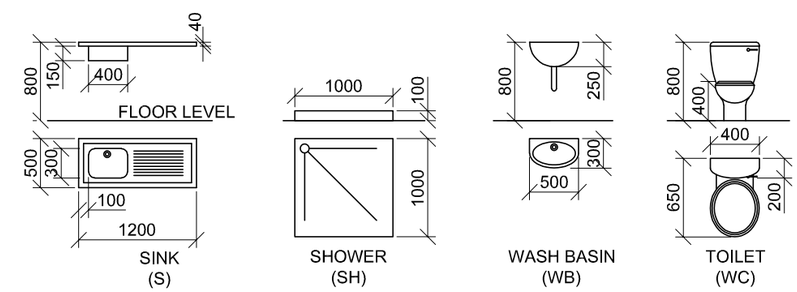
DOOR AND WINDOW SCHEDULE



WINDOW NOTES:
- A = OPENING SIDE
- B = FIXED PANEL
- ALL FRAMES = 50 mm
- 150 x 20 mm SILL TILES UNDER ALL WINDOWS



FIXTURES



QUESTION 4: CIVIL DRAWING

Given:

- The incomplete south elevation of a **new house**, showing the walls, the sliding door and window openings, steps, porch, the roof and labels
- The incomplete floor plan showing the roof lines, walls, steps, positions of doors, windows and fixtures, as well as electrical layout
- Schematic diagram of a roof truss at E-E and roof notes
- The incomplete foundation and external wall detail
- Room designations and floor finishes
- A table of roof components
- Kitchen step detail
- A table of electrical symbols
- A door and window schedule
- A table of fixtures
- The incomplete floor plan of the **new house**, drawn to scale 1 : 50, and the incomplete foundation and a breakline 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, draw, in first-angle orthographic projection and 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, steps, porch, sliding door and window detail
- The roof detail, including the fascia boards, gutters and rainwater down-pipe
- The finished floor level

4.2 Using the incomplete foundation and break line on page 6, draw, to scale 1 : 20, a **DETAILED SECTION** on cutting plane E-E of the area in the ellipse shown on the incomplete floor plan.

Show the following features on the drawing:

- The complete foundation, kitchen step, external wall and door detail
- The roof detail, including the fascia board and gutter
- The kitchen step wall, window frame and fascia board below (south of) cutting plane E-E
- ALL hatching detail. ONLY the substructure hatching may be drawn in neat freehand.

Label the following:

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

NOTE:

- ALL drawings must comply with the **guidelines** and **graphical symbols** as contained in the *SANS 10143*.
- NO hidden detail is required.

[92]

 Please turn over

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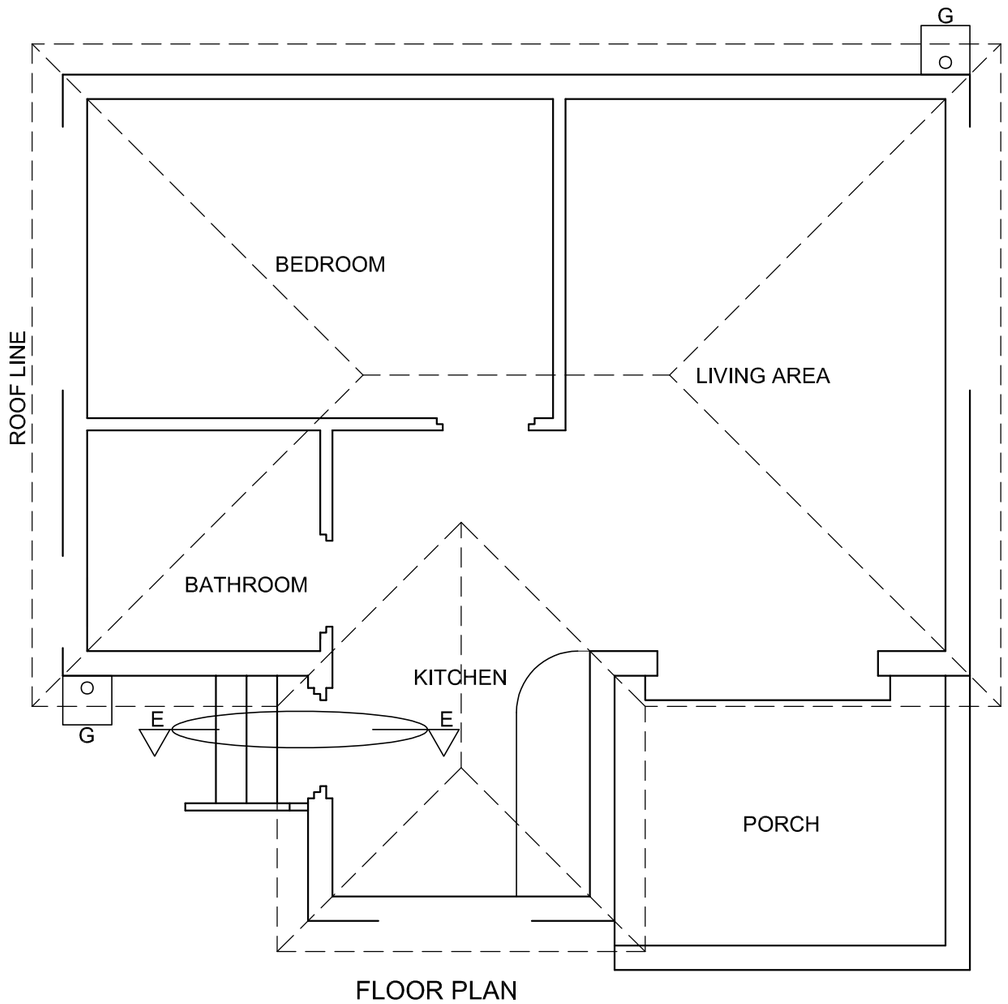
SOUTH ELEVATION



FLOOR PLAN
SCALE 1 : 50

SECTION ON E-E
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	13			
2	FIXTURES	8			
3	ELECTRICAL	9			
4	HATCHING	3			
5	LABELS	$2\frac{1}{2}$			
SUBTOTAL		**$35\frac{1}{2}$**			
SOUTH ELEVATION					
1	ROOF + RWDP + GULLEY	12			
2	WALLS + FFL	7			
3	DOOR + WINDOW	7			
4	LABELS	1			
SUBTOTAL		**27**			
DETAILED SECTION					
1	ROOF DETAIL	$11\frac{1}{2}$			
2	SLAB + WALL + STEP	9			
3	HATCHING	$5\frac{1}{2}$			
4	WINDOW + DOOR	$2\frac{1}{2}$			
5	LABELS	1			
SUBTOTAL		**$29\frac{1}{2}$**			
TOTAL		**92**			
PENALTIES (-)					
GRAND TOTAL					

EXAMINATION NUMBER

EXAMINATION NUMBER 6