



basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

NATIONAL
SENIOR CERTIFICATE

GRADE 12

ENGINEERING GRAPHICS AND DESIGN P1

NOVEMBER 2014

MARKS: 100

TIME: 3 hours

This question paper consists of 6 pages.



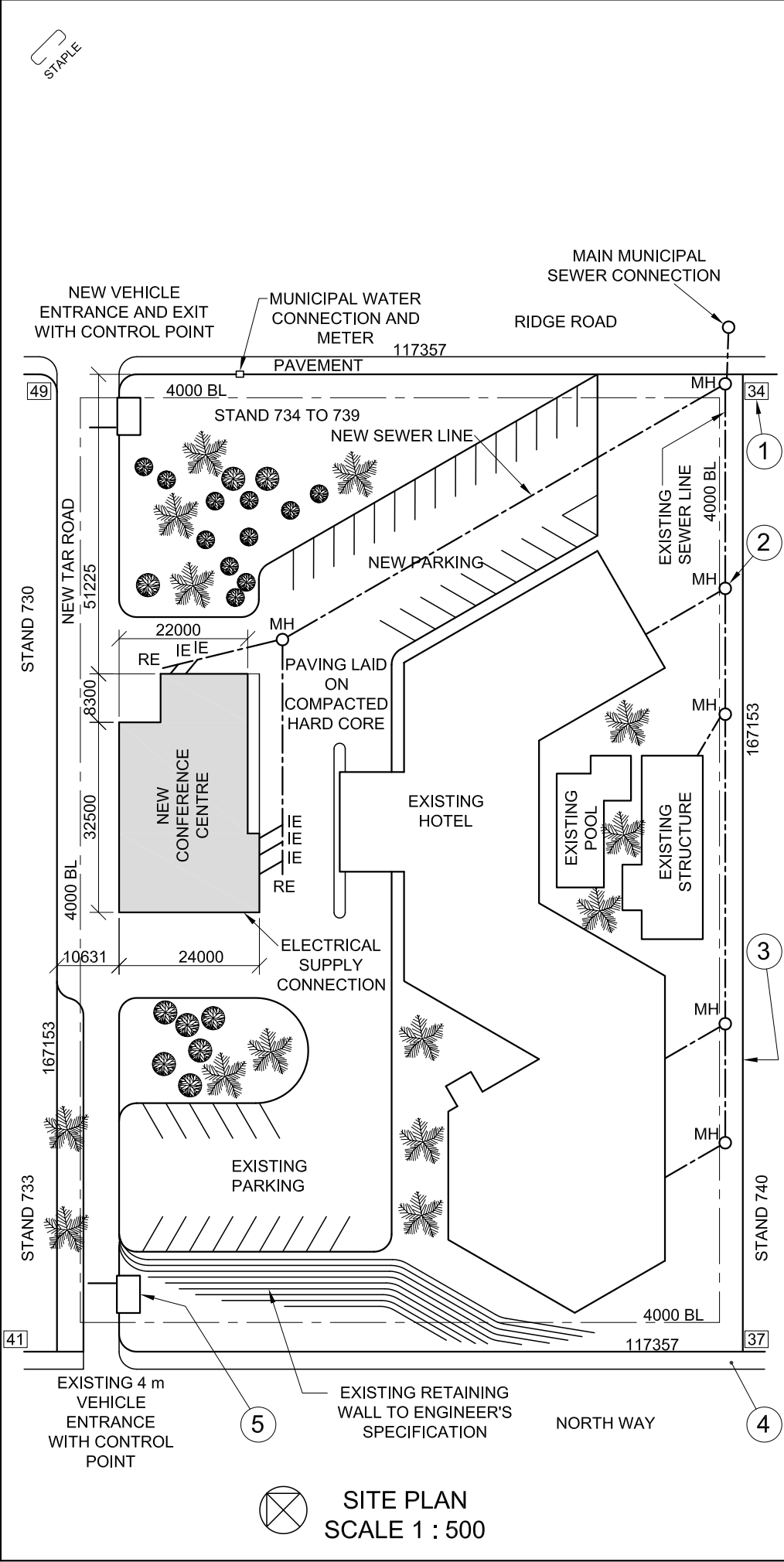
INSTRUCTIONS AND INFORMATION

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 completed using 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 must be re-stapled in numerical sequence, irrespective of whether the question was attempted.
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
1									
2									
3									
4									
TOTAL									
	2	0	0			2	0	0	

FINAL CONVERTED MARK	CHECKED BY
100	

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



SITE PLAN
SCALE 1 : 500

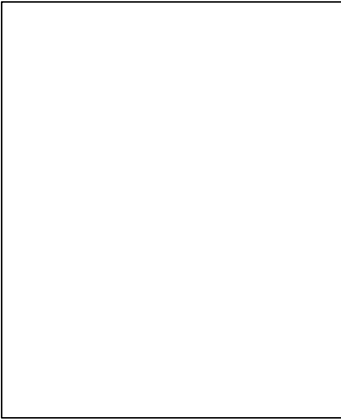
NOTE:
Contractors must verify all dimensions and levels on site before commencing work. Architects to be notified immediately of any discrepancies.

ARCHITECT'S SIGNATURE

CLIENT'S SIGNATURE

ANSWER 20

In the space provided below, draw, in neat freehand, the front view and top view of the *SANS 10143* graphical symbol for a SINGLE URINAL.



3		
2	2014-07-15	Include a new MH
1	2014-07-11	Change road
REVISION	DATE	DESCRIPTION
NEW HORIZON ARCHITECTS 17 MAIN ROAD DURBAN Tel: 031 335 2835		
PRINTED BY DUNNIT PRINTERS		DATE OF PRINT 2014-08-05
DRAWING TITLE SITE PLAN		
PROJECT PROPOSED NEW CONFERENCE CENTRE FOR THE SA HOTEL GROUP ON STANDS 734 TO 739 AT 261 NORTH WAY, DURBAN		
PROJECT NUMBER 04		DRAWING NUMBER 10-B708
DATE 2014-05-30	DRAWN SAREL	CHECKED PERTO
REFERENCE CODE N14-Q1		SCALE 1 : 500



QUESTION 1: ANALYTICAL (CIVIL)

Given:

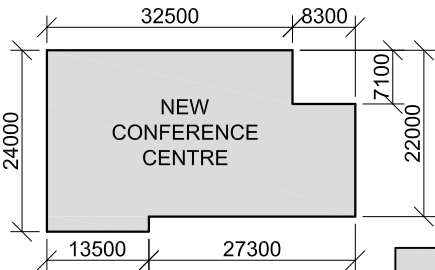
A site plan of a hotel with a proposed new conference centre, a title panel and a table of questions. The drawing has not been prepared to the indicated scale.

Instructions:

Complete the table below by neatly answering the questions, which refer to the accompanying drawing and title panel. [30]

QUESTIONS		ANSWERS		
1	On what date was the site plan printed?		1	
2	What must the contractors do on site before commencing with any work?		1	
3	What scale is indicated for the drawing?		1	
4	What was the first revision?		1	
5	What is the surface finish of the new road?		1	
6	What new development is proposed for the hotel?		1	
7	In what colour would new timber be presented on a drawing?		1	
8	In what colour would new steel be presented on a drawing?		1	
9	What does the number at 1 indicate?		1	
10	Name the feature at 2.		1	
11	What does the line at 3 indicate?		1	
12	Name the feature at 4.		1	
13	Name the feature at 5.		1	
14	On what must the paving in the new parking lot be laid?		1	
15	In which road is the new exit from the hotel?		2	
16	What is the length of the south western wall on the new conference centre in metres?		2	
17	What is the shortest distance from the new conference centre to the boundary line on North Way in metres?		2	
18	In the space below, determine the perimeter of the new conference centre in metres.		3	
19	In the space below, determine the total area of the new conference centre in square metres.		3	
20	In the space provided in the title panel, draw, in neat freehand, the front view and top view of the <i>SANS 10143</i> graphical symbol for a SINGLE URINAL.		4	
		TOTAL	30	

ANSWER 18
Show ALL calculations.



ANSWER 19
Show ALL calculations.

EXAMINATION NUMBER	
EXAMINATION NUMBER	
2	



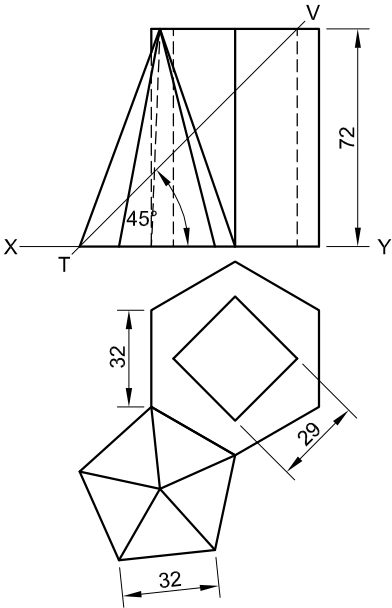
QUESTION 2: SOLID GEOMETRY

Given:
The front view and the top view of a right regular hexagonal prism with a right square hole and a right regular pentagonal pyramid

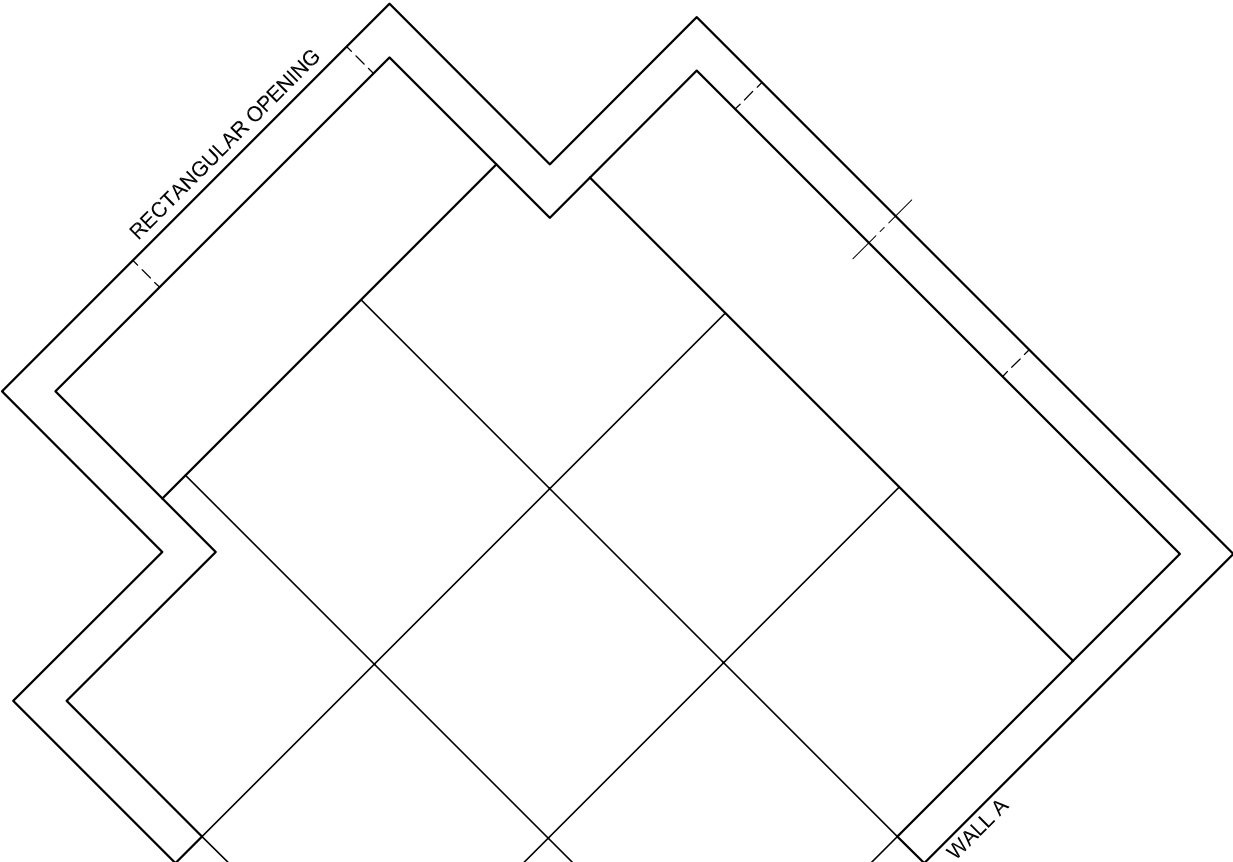
- Specifications:**
- One base edge of the hexagonal prism is in contact with one base edge of the pentagonal pyramid.
 - Both solids are cut by a cutting plane VT.

Instructions:
Draw, to scale 1 : 1, the following views of the TWO solids:
2.1 The given front view
2.2 The sectional top view
2.3 The sectional left view. Show ALL hidden detail.

Show ALL necessary construction. **[38]**



ASSESSMENT CRITERIA				
1	CONST. + FRONT VIEW	7		
2	SECTIONAL TOP VIEW	12½		
3	SECTIONAL LEFT VIEW	15		
4	HATCHING	3½		
PENALTIES (-)				
TOTAL		38		
EXAMINATION NUMBER				
EXAMINATION NUMBER				3

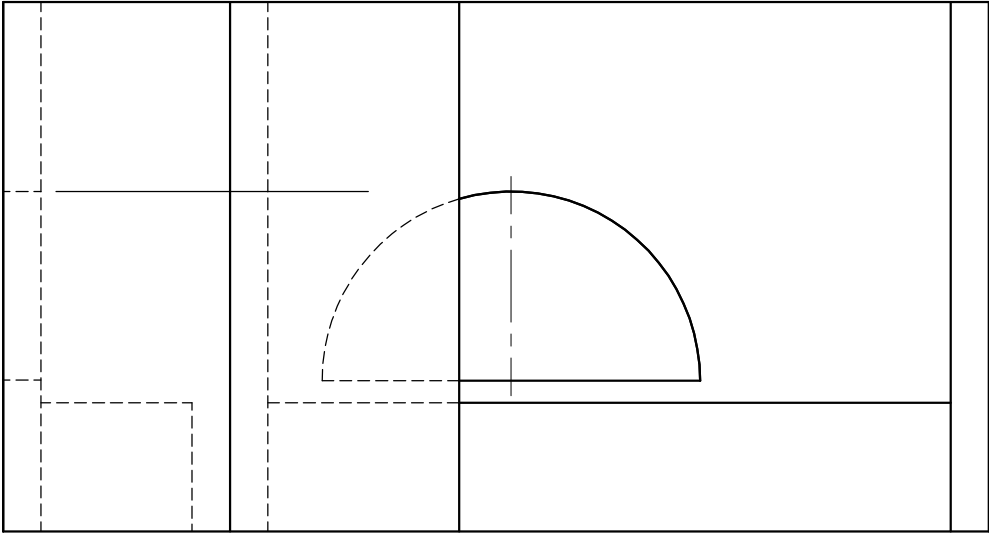


PP

HL

GL

SP



QUESTION 3: PERSPECTIVE

Given:
Two views of an outside entertainment area
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.
- Show the wall thickness at the openings.
- Show the floor tiles.
- NO hidden detail is required.

[39]

ASSESSMENT CRITERIA				
1	CONSTRUCTION + VP's	7		
2	WALLS + TILES	15		
3	OPENINGS + SEATING	10		
4	SEMI-CIRCLE	7		
PENALTIES (-)				
TOTAL		39		

INCOMPLETE NORTH ELEVATION

INCOMPLETE FLOOR PLAN

INCOMPLETE FOOTING AND INTERNAL WALL DETAIL

INCOMPLETE FOUNDATION AND EXTERNAL WALL DETAIL

SCHEMATIC DIAGRAM OF A TRUSS FOR ROOF '1'

SCHEMATIC DIAGRAM OF A TRUSS FOR ROOF '2'

ROOM DESIGNATIONS

FEATURES
D DOOR
W1 WINDOW
W2 WINDOW

FIXTURES
S SINK
B BATH
BIC BUILT-IN CUPBOARD (600 mm deep)
WC TOILET
WB WASH BASIN

ELECTRICAL FIXTURES
1. CEILING LIGHT
2. WALL-MOUNTED LIGHT
3. DISTRIBUTION BOARD
4. FLUORESCENT LIGHT 2 X 40 W
5. LIGHT SWITCH - SINGLE-POLE
6. LIGHT SWITCH - TWO-POLE
7. SWITCHED SOCKET OUTLET

NOTE:
THE ARROWS SHOW THE LIGHT CONNECTION TO THE SWITCHES.

ROOF NOTES:
ROOF PITCH 20°

ROOF COVER 15 mm FIBRE CEMENT SHEET ON 75 x 50 mm PURLINS

115 x 38 mm ROOF TRUSS ON 115 x 38 mm WALL PLATES

9 mm CEILING BOARD ON 38 x 38 mm BRANDING STRIPS

200 x 25 mm FASCIA BOARDS WITH 150 x 100 mm GUTTER ON BOTH ENDS

Ø100 mm RAIN-WATER DOWN PIPE

400 x 400 x 200 mm GULLY

FLOOR FINISHES
KITCHEN: TILES
LOUNGE: CARPET
BATHROOM: TILES
BEDROOM: CARPET

DOOR AND WINDOW SCHEDULE	
<p>DOOR FRAME AND DOOR (D)</p>	<p>WINDOW (W1)</p>
	<p>WINDOW (W2)</p>
<p>WINDOW NOTE: A = OPENING SIDE B = HINGED SIDE C = FIXED PANEL</p> <p>NOTE: 150 x 25 mm FIBRE CEMENT SILL UNDER ALL WINDOWS</p>	

ELECTRICAL SYMBOLS

ROOF COMPONENTS
 115 x 38 mm WALL PLATE
 75 x 50 mm PURLINS
 FASCIA BOARD
 ROOF CAP

FIXTURES	
<p>SINK (S)</p>	<p>BATH TUB (B)</p>
<p>TOILET (WC)</p>	<p>WASHBASIN (WB)</p>

- QUESTION 4: CIVIL DRAWING**
- Given:**
- The incomplete north elevation of a new **dwelling**, showing the walls, the roof and notes
 - The incomplete floor plan showing the walls, position of the doors and windows, the fixtures and electrical layout
 - The incomplete detail of the footing/foundation of an internal and an external wall
 - Roof notes with schematic diagrams of the TWO types of roof trusses
 - A diagram showing the room designations and a list of floor finishes
 - A door and window schedule
 - A table of electrical symbols
 - A table of roof components
 - A table of fixtures
 - The incomplete floor plan of the new **dwelling**, drawn to scale 1 : 50, on page 6

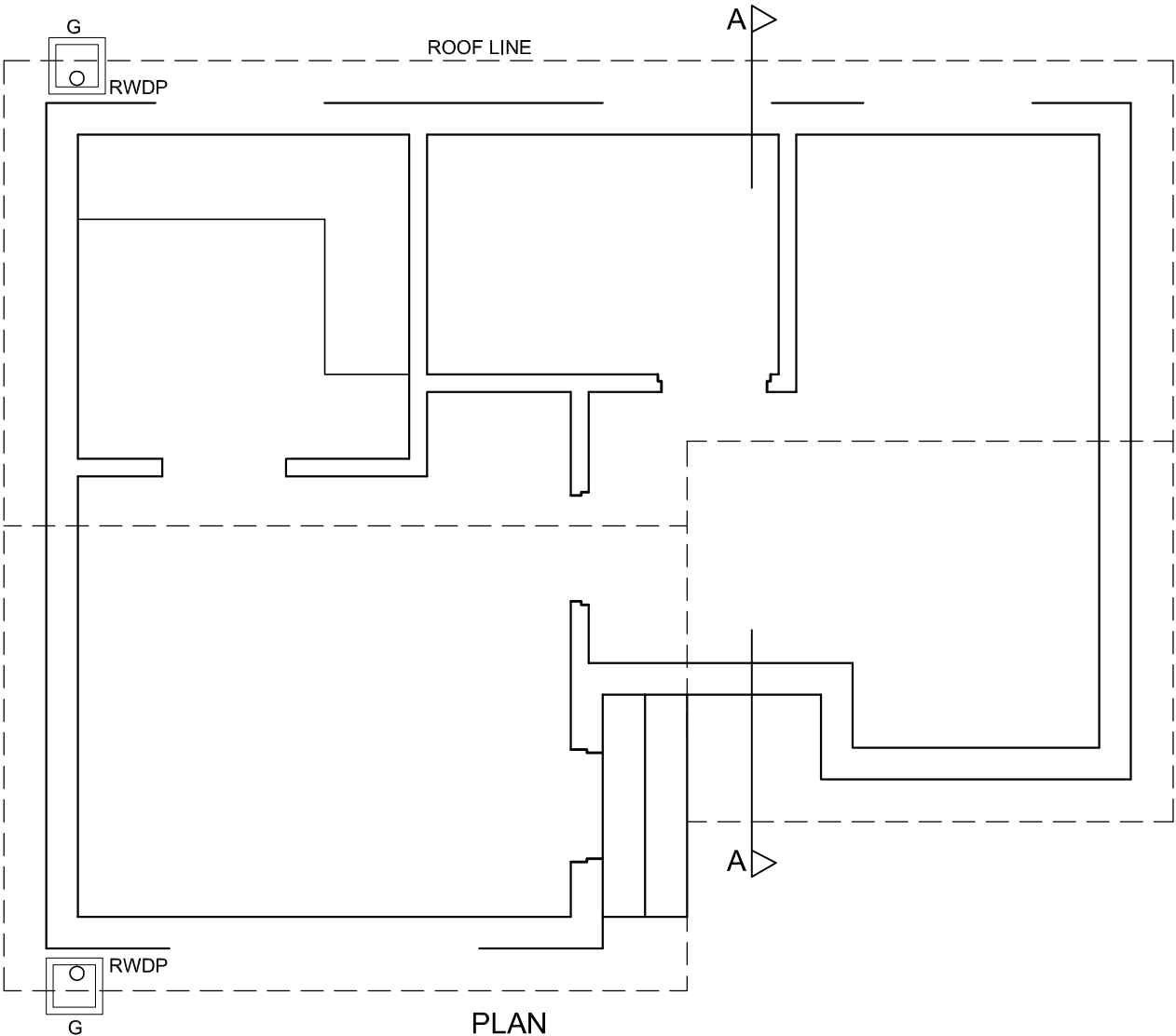
- Instructions:**
- Answer this question on page 6.
 - Using the given incomplete floor plan, draw, in first-angle orthographic projection and to scale 1 : 50, the following views of the new **dwelling**:
 - 4.1 The complete floor plan
 - 4.2 The complete north elevation
 - 4.3 A sectional elevation on cutting plane A-A
 - ALL drawings must comply with the **guidelines** and **graphical symbols** contained in the *SANS 10143*.

- SPECIFICATIONS:**
- THE FLOOR PLAN**
- Add the following features to the drawing:**
- ALL the doors and windows
 - ALL the fixtures as indicated by abbreviations
 - ALL the electrical fittings as indicated by numbers
 - ALL hatching detail
- THE NORTH ELEVATION**
- Show the following features on the drawing:**
- The outside walls, steps and finished floor level
 - The roof detail, including the fascia board, gutter, rainwater down pipe and gully
 - The window detail

- THE SECTIONAL ELEVATION**
- Show the following features on the drawing:**
- The complete footing or foundation, wall, roof and ceiling detail
 - The window detail, with a DOUBLE lintel
 - ALL features to the west of the cutting plane
 - ALL hatching detail

- Label the following:**
- The room designations and floor finishes
 - The sectional elevation and the north elevation
 - Using the correct abbreviations, label the following features in the correct view: ground level, finished floor level and damp-proof course.

NOTE:
ONLY the substructure hatching may be drawn in neat freehand.



PLAN
SCALE 1 : 50



PENALTIES		
INCORRECT OVERALL SCALE		
INCORRECT POSITIONING OF VIEWS		
NON-ALIGNMENT OF VIEWS		
TOTAL		

ASSESSMENT CRITERIA					
FLOOR PLAN					
		POSSIBLE	OBTAINED	SIGN	MODERATE
1	LABELS	4			
2	ELECTRICAL	9			
3	DOORS + WINDOWS	11			
4	FIXTURES	4			
5	HATCHING	4			
SUBTOTAL		32			
NORTH ELEVATION					
1	WALLS + FFL	5			
2	ROOF + FACIA BOARD + GUTTER + RWDP	7			
3	WINDOW	5½			
4	LABELS	1½			
SUBTOTAL		19			
SECTIONAL ELEVATION					
1	ROOF + FACIA BOARD + GUTTER + RWDP	15			
2	WALLS + FLOOR + FOUNDATION	18			
3	HATCHING	6½			
4	LABELS	2½			
SUBTOTAL		42			
PENALTIES (-)					
TOTAL		93			
EXAMINATION NUMBER					
EXAMINATION NUMBER					6