



basic education

Department:  
Basic Education  
REPUBLIC OF SOUTH AFRICA

NATIONAL  
SENIOR CERTIFICATE

GRADE 12

ENGINEERING GRAPHICS AND DESIGN P1

NOVEMBER 2011

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 stated otherwise.
- 4. ALL drawings must be drawn to scale 1 : 1, unless stated otherwise.
- 5. ALL the questions must be answered on the QUESTION PAPER as instructed.
- 6. ALL the pages must be restapled in numerical sequence, irrespective of whether the question was attempted.
- 7. Time management is essential in order to complete all the questions.
- 8. Print your examination number in the block provided on every page.
- 9. Any details or dimensions not given, must be assumed in good proportion.
- 10. ALL answers must be drawn accurately and neatly.

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	

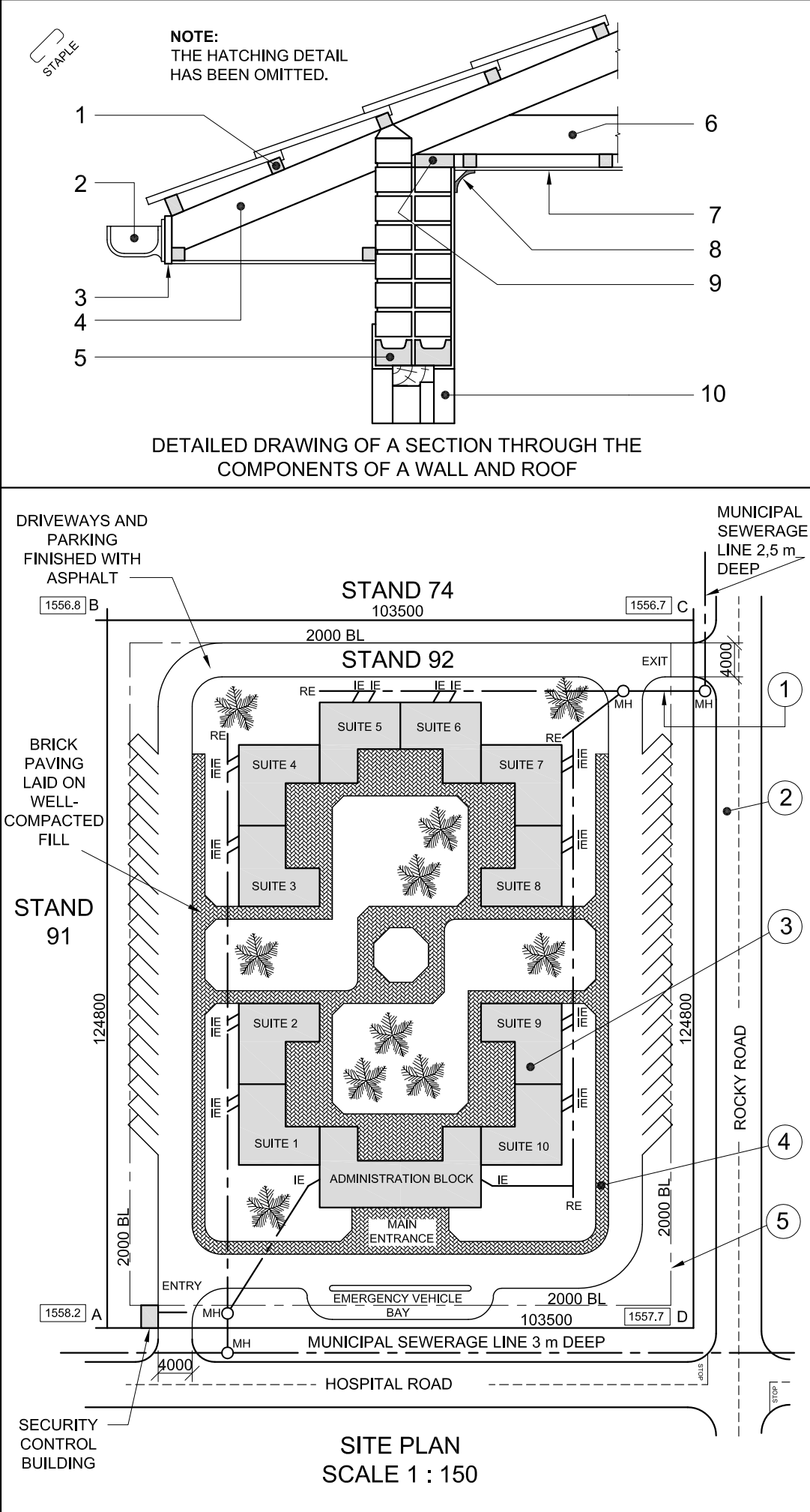
COMPLETE THE FOLLOWING:

CENTRE NUMBER

CENTRE NUMBER

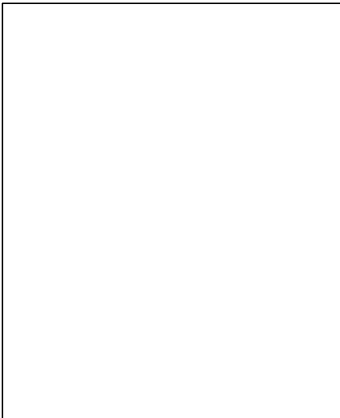
EXAMINATION NUMBER

EXAMINATION NUMBER




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

14. In the space provided below, draw, in neat freehand, the symbol for the north point according to *SABS 0143*.



ARCHITECT'S SIGNATURE .....

CLIENT'S SIGNATURE .....

REVISION	DATE	DESCRIPTION
<div>MEDI-DESIGN ARCHITECTS 121 CHURCH STREET PRETORIA Tel: 012 312 8459</div>		
PRINTED BY DDP		DATE OF PRINT 2011-06-17
DRAWING TITLE SITE PLAN		
PROJECT PROPOSED MEDICAL CENTRE FOR DR SMITH AND PARTNERS ON STAND 92 AT 19 HOSPITAL ROAD BENONI.		
PROJECT NUMBER 34		DRAWING NUMBER 2/08
REFERENCE CODE Q1P1-S-2011	DRAWN BY SANELE	CHECKED BY LEBO
DATE 2011-05-30	SCALE 1 : 150	



**QUESTION 1: ANALYTICAL (CIVIL)**

**Given:**  
A detailed drawing of a section through the components of a wall and roof, the site plan for a proposed medical centre, a title panel and a table of questions. The drawings have not been prepared to the indicated scale.

**Instructions:**  
Complete the table below by neatly answering the questions, which all refer to the accompanying drawings and title panel. **[30]**

QUESTIONS		ANSWERS		
1	With reference to the detailed section through the components of a wall and roof, link the number on the drawing with the correct component in the column to the right of this question.	CEILING BOARD		10
		GUTTER		
		REVEAL		
		RAFTER		
		WALL PLATE		
		FASCIA BOARD		
		BATTEN		
		TIE BEAM		
		CORNICE		
		LINTEL		
2	What is the drawing number?			1
3	In which road is the exit of the property located?			1
4	What does the line at 1 indicate?			1
5	Name the feature at 2.			1
6	Name the feature at 3.			1
7	Name the feature at 4.			1
8	What does the line at 5 indicate?			1
9	How many rodding eyes are shown on the site plan?			1
10	How many proposed suites must be built?			1
11	Which is the highest corner of the stand?			2
12	Determine the perimeter of stand 92 in metres. Show ALL calculations.			3
13	Determine the total area of stand 92 in square metres. Show ALL calculations.			3
14	In the space provided in the title panel, draw, in neat freehand, the symbol for the north point according to <i>SABS 0143</i> .			3
TOTAL				30

EXAMINATION NUMBER

EXAMINATION NUMBER

2

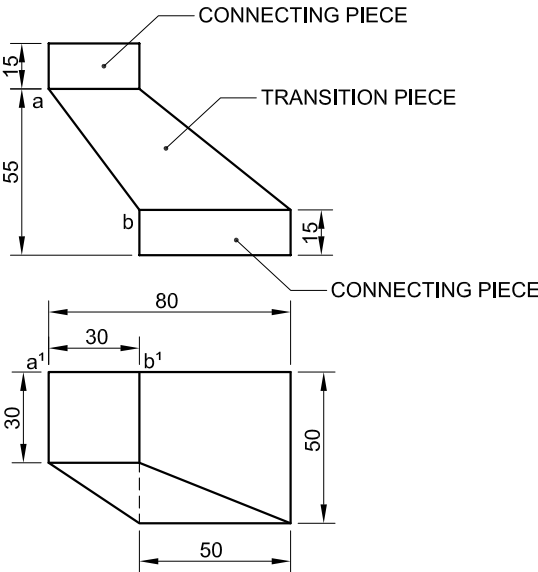


QUESTION 2: DEVELOPMENT

**Given:**  
The front view and top view of a portion of a duct showing an offset square-to-square transition piece with two connecting pieces.

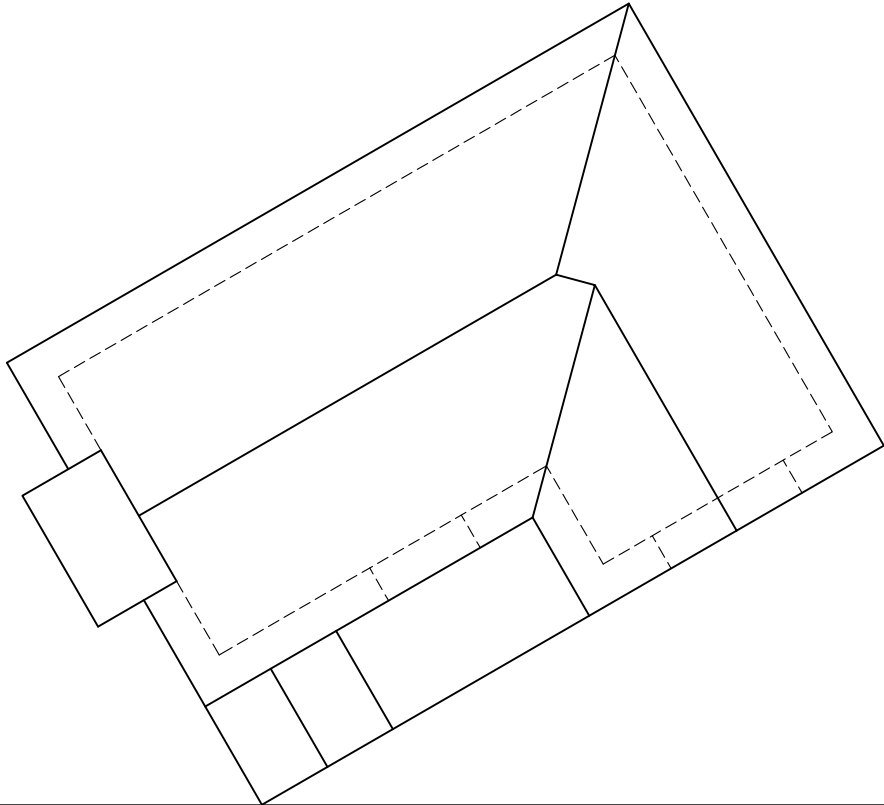
- Instructions:**
- 2.1 Draw, to scale 1 : 1, the given front view and top view of the given portion of the duct.
  - 2.2 Develop the surface of the transition piece ONLY. Make edge AB the seam.

Show ALL necessary construction and fold lines. **[34]**



EDGE **AB** IS THE SEAM.

ASSESSMENT CRITERIA				
FRONT VIEW + TOP VIEW	10			
TRUE LENGTH + METHOD	10			
DEVELOPMENT	14			
TOTAL	34			
EXAMINATION NUMBER				
EXAMINATION NUMBER				3



QUESTION 3: PERSPECTIVE

**Given:**  
Two views of a cottage and the information needed to draw a two-point perspective drawing.  
PP – Picture plane  
HL – Horizon line  
GL – Ground line  
SP – Station point

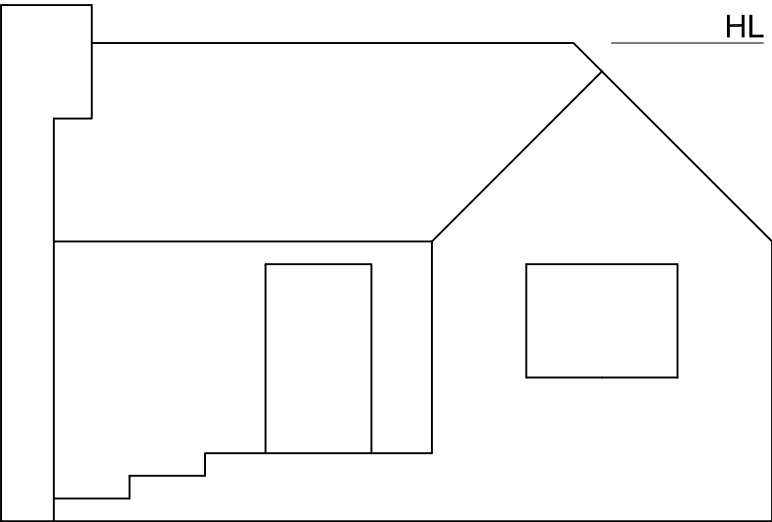
- Instructions:**  
Complete the perspective drawing.
- Align the drawing sheet with the ground line (GL).
  - Show ALL necessary construction.
  - Show the wall thickness at the door and the window.
  - NO hidden detail is required.
- [41]

PP


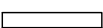

HL

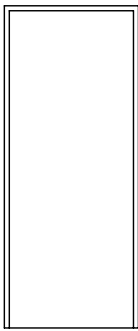
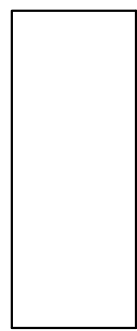
GL

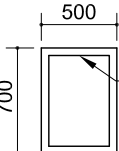
SP

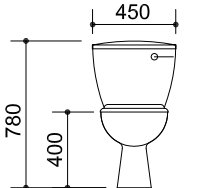
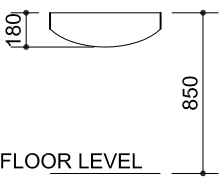
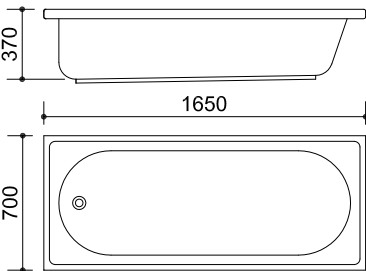
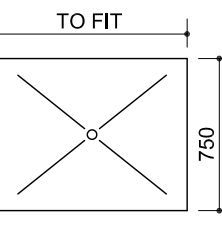











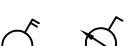

ASSESSMENT CRITERIA				
CONSTRUCTION + VPs	7			
BUILDING	18			
ROOF + CHIMNEY	16			
TOTAL	41			
EXAMINATION NUMBER				
EXAMINATION NUMBER				4

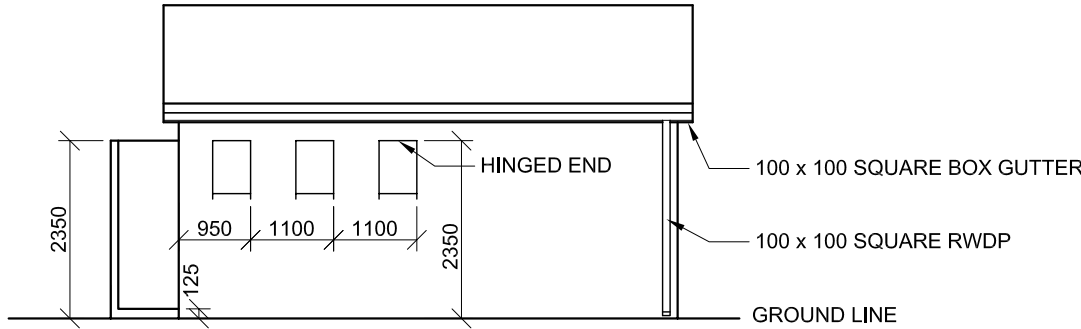
ROOF COMPONENTS	
	75 x 50 PURLINS
	228 x 20 FASCIA BOARD
	114 x 38 WALL PLATE

DOOR SCHEDULE	
TO FIT	TO FIT
	
FRAME	HOLLOW CORE DOOR (D)

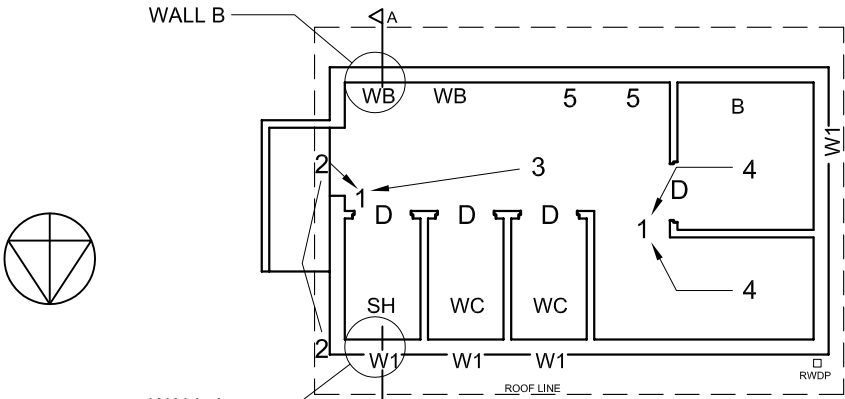
WINDOW SCHEDULE	
	HINGED END
WOODEN FRAME (W1)	
<b>NOTE:</b> 150 x 20 FIBRE CEMENT SILL UNDER ALL WINDOWS	

DIMENSIONS OF SANITARY FIXTURES	
	
TOILET (WC)	WASHBASIN (WB)
	
BATH TUB (B)	SHOWER (SH)

ELECTRICAL SYMBOLS	
	
	
	
	
	
	
	
	
	
	
	



INCOMPLETE NORTH ELEVATION



INCOMPLETE FLOOR PLAN

**FIXTURES**

- D DOORS
- W1 WINDOW OPENINGS
- B BATH
- SH SHOWER
- WC TOILET
- WB WASHBASIN

**ELECTRICAL FIXTURES**

- 1. TWO-POLE LIGHT SWITCH
- 2. OUTSIDE LIGHT
- 3. 2 x 40 W FLUORESCENT TUBES
- 4. CEILING LIGHT
- 5. SWITCH SOCKET OUTLET

**NOTE: THE ARROWS SHOW THE LIGHT CONNECTION TO THE SWITCH.**

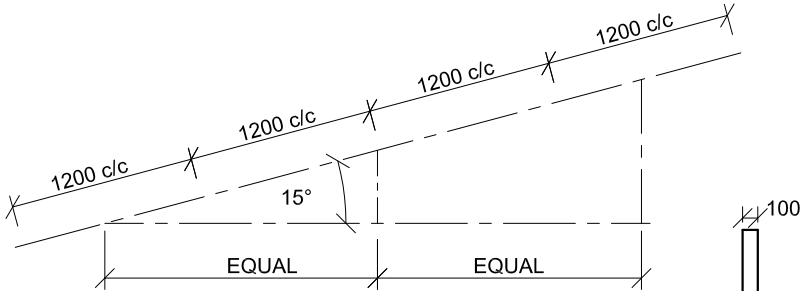
**ROOF NOTES:**  
ROOF COVER 15 mm FIBRE CEMENT BOARD ON 75 x 50 mm PURLINS @ 1200 c/c

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

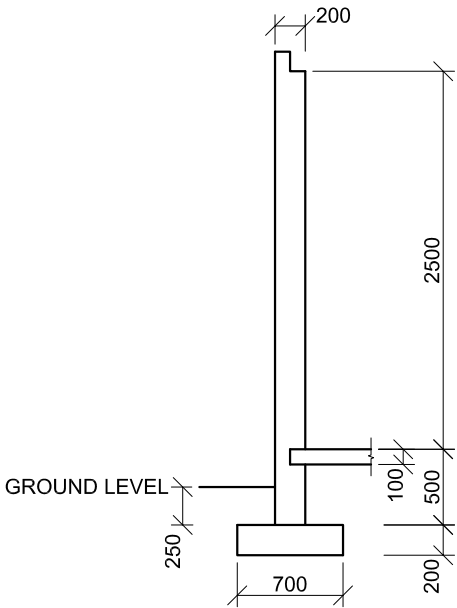
228 x 20 mm FASCIA BOARD ON BOTH ENDS

ROOF PITCH 15°

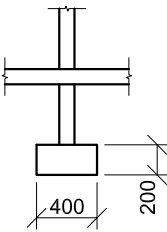
100 mm SQUARE BOX GUTTER



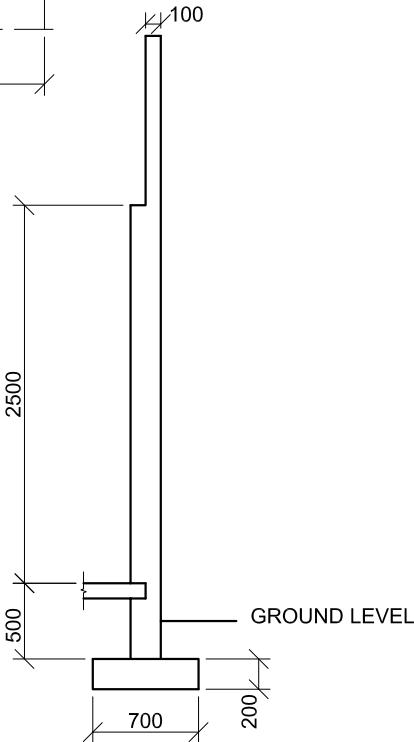
SCHEMATIC DIAGRAM OF A ROOF TRUSS



INCOMPLETE FOUNDATION AND WALL 'A' DETAIL ON A-A



INCOMPLETE FOUNDATION AND INTERNAL WALL DETAIL



INCOMPLETE FOUNDATION AND WALL 'B' DETAIL ON A-A

**QUESTION 4: CIVIL DRAWING**

**Given:**

- The incomplete north elevation of a new **ablution block** for a campsite showing the walls, the position of the windows, the roof and notes
- The incomplete floor plan showing the walls, position of the windows, doors, sanitary fixtures and the electrical fixtures
- Roof notes and a schematic diagram of a roof truss
- The incomplete foundation and wall detail of wall 'A' and wall 'B' on cutting plane A-A
- A table of roof components
- A door and window schedule
- A table of electrical symbols
- A table of sanitary fixtures
- The incomplete floor plan of the new **ablution block**, drawn to scale 1 : 50, on page 6

**Instructions:**

- Answer this question on page 6.
- Using the given incomplete floor plan, draw, to scale 1 : 50 and to the specifications, the following views of the new **ablution block**:
  - 4.1 The complete floor plan**
  - 4.2 The north elevation**
  - 4.3 A sectional elevation** on cutting plane A-A
- ALL drawings must comply with the guidelines and conventions contained in the *SABS 0143*.

**SPECIFICATIONS:**

**THE FLOOR PLAN**

**Add the following features to the drawing:**

- ALL the doors and windows
- The sanitary fixtures as indicated with the abbreviations
- ALL the electrical fixtures as indicated with the numbers

**THE NORTH ELEVATION**

**Show the following features on the drawing:**

- The outside walls
- The roof detail including the gutter, fascia board and rainwater downpipe
- The window detail
- The finished floor level

**THE SECTIONAL ELEVATION**

**Show the following features on the drawing:**

- The complete foundation, wall, slab and roof detail
- The window, with a single lintel, and door detail
- ALL features and fixtures on and to the east of cutting plane A-A
- ALL hatching detail

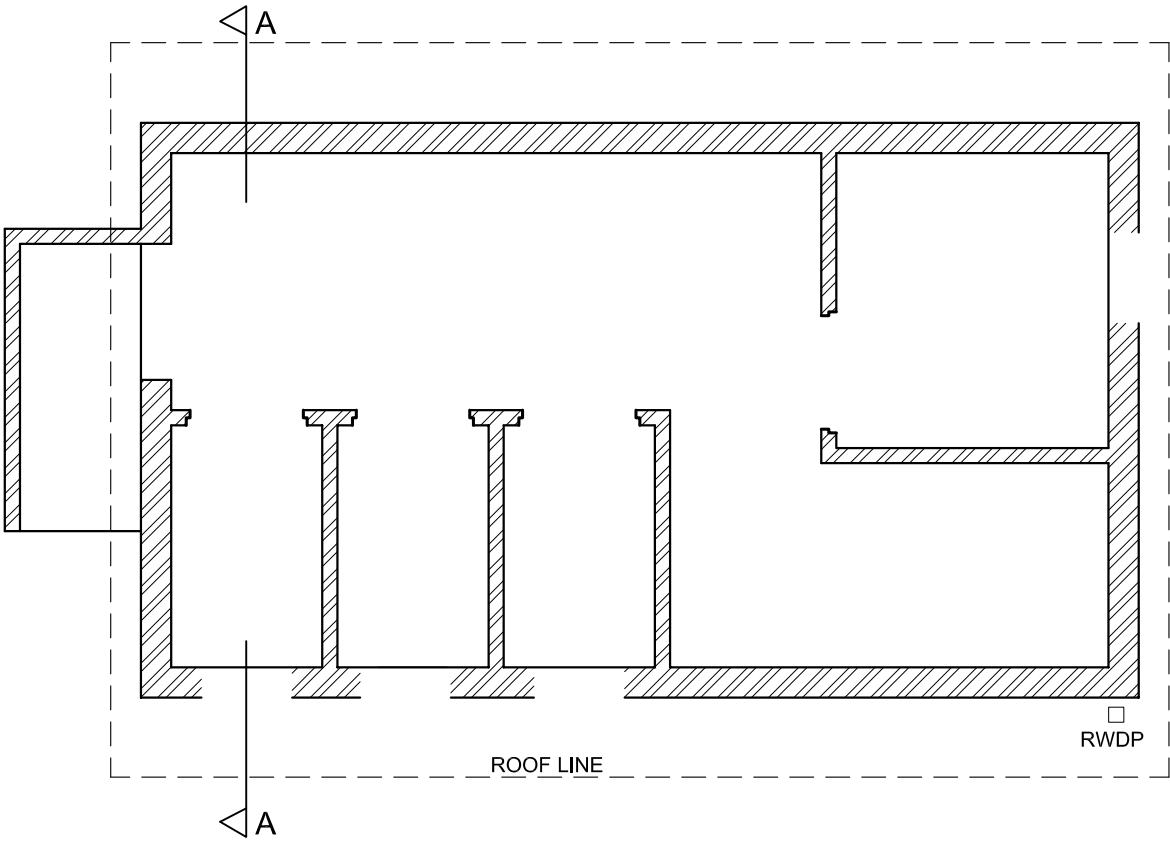
**Label the following:**

- The floor plan, including the scale
- The room designation and floor finish (ceramic tile)
- The north elevation and the sectional elevation
- Using the correct abbreviations, label the following features in the correct view: ground level, finished floor level and damp-proof course.

**NOTE:**

- ALL substructure hatching may be drawn in freehand. **[95]**





ASSESSMENT CRITERIA					
FLOOR PLAN					
1	LABELS	2			
2	ELECTRICAL	7			
3	FIXTURES	8			
4	DOORS + WINDOWS	14			
SUBTOTAL		31			
NORTH ELEVATION					
1	WALLS + FFL	4			
2	ROOF + FACIA + GUTTER + RWDP	5			
3	WINDOWS	10½			
4	LABELS	1½			
SUBTOTAL		21			
SECTIONAL ELEVATION					
1	ROOF	11			
2	WALLS + FLOOR + FOUNDATION	14½			
3	WINDOW + DOORS + FIXTURES	8			
4	HATCHING	7			
5	LABELS	2½			
SUBTOTAL		43			
TOTAL		95			
EXAMINATION NUMBER					
EXAMINATION NUMBER					6

