



basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

**NATIONAL
SENIOR CERTIFICATE**

GRADE 12

**ENGINEERING GRAPHICS AND DESIGN P1
EXEMPLAR 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	SIGN
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



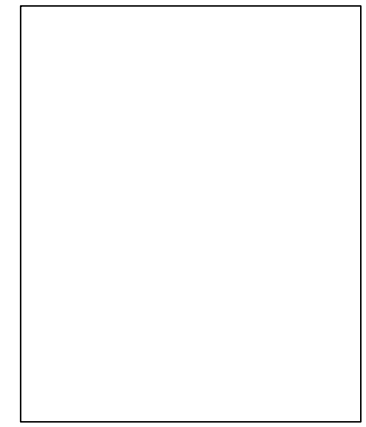
LAND SURVEYOR'S CERTIFICATE OF THE BOUNDARY LENGTHS AND CORNER HEIGHTS OF STAND 77 AT 5 DUIKER AVENUE PRETORIA. SURVEYED ON 01-10-2011

BOUNDARY LENGTHS IN MILLIMETRES	CORNER HEIGHTS IN METRES
AB = 42688	A = 1022
BC = 31684	B = 1024
CD = 42688	C = 1025
DA = 31684	D = 1021

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

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 kitchen sink.



QUESTION 1: ANALYTICAL (CIVIL)

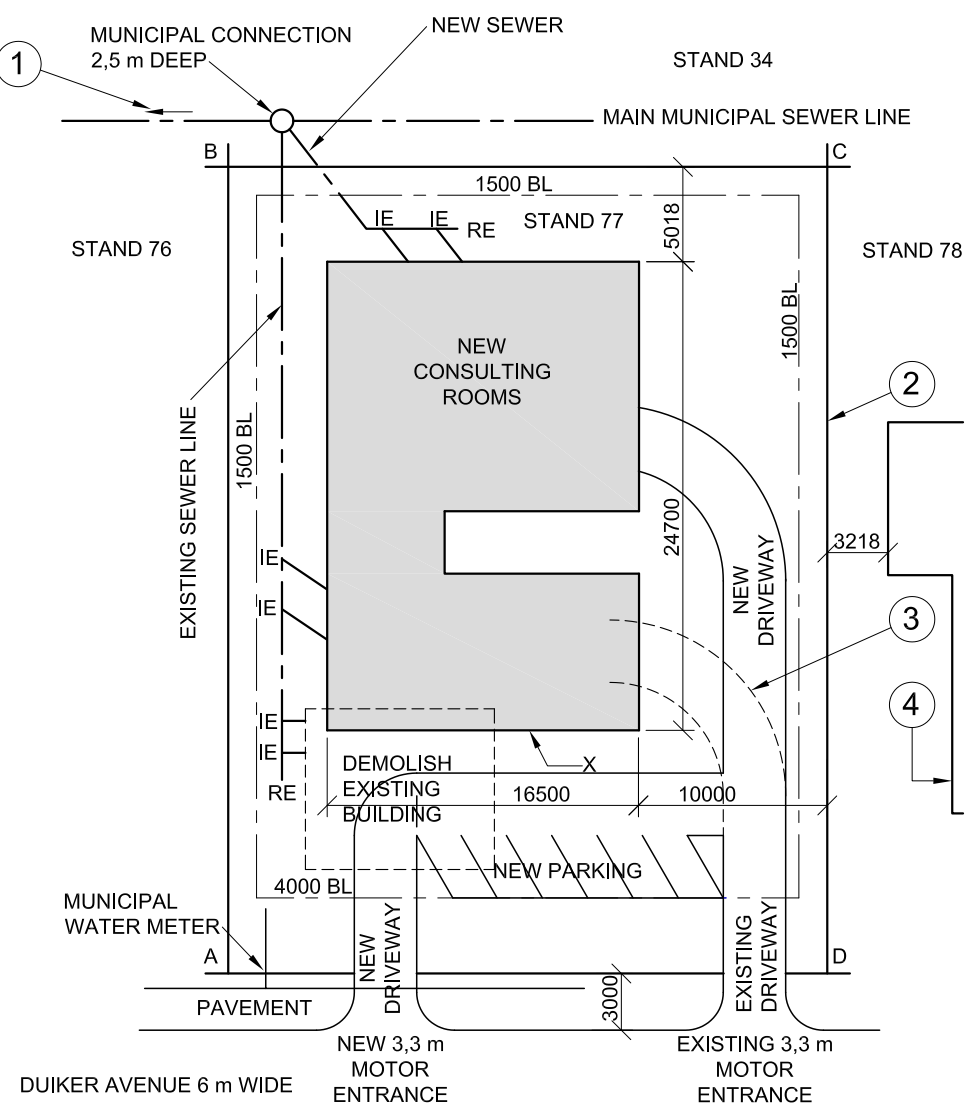
Given:

A site plan for proposed new consulting rooms, 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 all refer to the accompanying drawing and title panel. **[30]**

QUESTIONS		ANSWERS	
1	On what date was the stand surveyed?	1	
2	What was Vishnu responsible for?	1	
3	How wide is the pavement on Duiker Avenue in metres?	1	
4	What is the client's name?	1	
5	How many new parking bays are indicated?	1	
6	How many new inspection eyes are required?	1	
7	On which property is the municipal sewer connection located?	1	
8	In what colour is a new building presented on a site plan?	1	
9	In what colour is a new sewer line presented on a site plan?	1	
10	What does the arrow at 1 indicate?	1	
11	What does the line at 2 indicate?	1	
12	What does the line at 3 indicate?	1	
13	Name the feature at 4.	1	
14	What must be done to the existing building on the stand?	1	
15	What is the difference in height between the highest and the lowest corner of the stand in metres?	1	
16	What is the distance from wall X to Duiker Avenue in metres?	2	
17	What would the elevation of the new consulting rooms facing stand 78 be called?	2	
18	In the space below, determine the perimeter of the new consulting rooms in metres. Show ALL calculations.	4	
19	In the space below, determine, in square metres, the total floor area that needs to be tiled if the outside walls are 200 mm thick. Show ALL calculations.	4	
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 kitchen sink.	3	
TOTAL 30			



SITE PLAN
SCALE 1 : 250

REVISION	DATE	DESCRIPTION
3	2013-09-11	Remove ex driveway
2	2013-09-08	Add new driveway
1	2013-08-28	Move new RE

MINKI'S DREAM HOMES
101 PAUL KRUGER STREET
PRETORIA
Tel: 012 555 2735

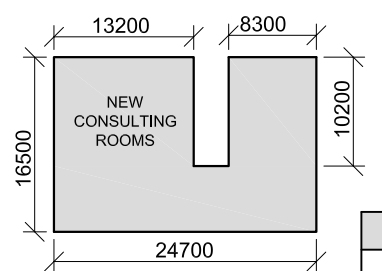
PRINTED BY DBE PRINTERS DATE OF PRINT 2013-10-30

DRAWING TITLE
SITE PLAN

PROJECT
PROPOSED NEW CONSULTING ROOMS FOR DR. AL SATION ON STAND 77 AT 5 DUIKER AVENUE PRETORIA.

PROJECT NUMBER 001	DRAWING NUMBER 1 of 4	
REFERENCE CODE Q1P1-EXEMP-2014	DRAWN BY BEYERS	CHECKED BY VISHNU
DATE 2013-09-12	SCALE 1 : 250	

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 equilateral triangular prism and a right regular octagonal pyramid
- The auxiliary view of the triangular prism
- The position of base edge 'A-B' on the answer sheet

Specifications:

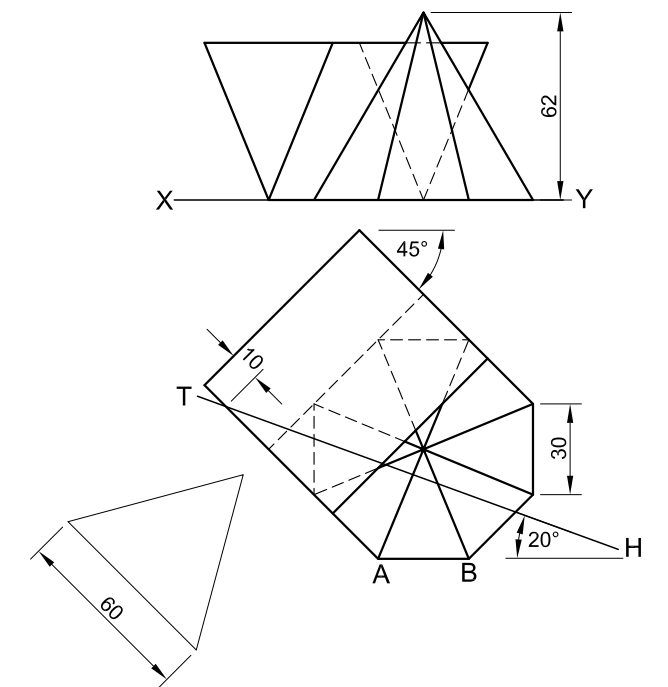
One face of the triangular prism is in contact with one face of the octagonal pyramid. Both solids are cut by a cutting plane HT.

Instructions:

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

- 2.1 The given top view
- 2.2 A sectional front view on cutting plane HT
- 2.3 The true shape of the cut surfaces

- Show ALL necessary construction and projection.
- Show ALL hidden detail. [38]



A ————— B

ASSESSMENT CRITERIA			
1	GIVEN TOP VIEW	7	
2	FRONT VIEW	21	
3	TRUE SHAPE	10	
TOTAL		38	
EXAMINATION NUMBER			
EXAMINATION NUMBER			
EXAMINATION NUMBER			3



QUESTION 3: PERSPECTIVE

Given:

Three views of a braai area and information needed to draw a two-point perspective drawing.

PP – Picture plane

HL – Horizon line

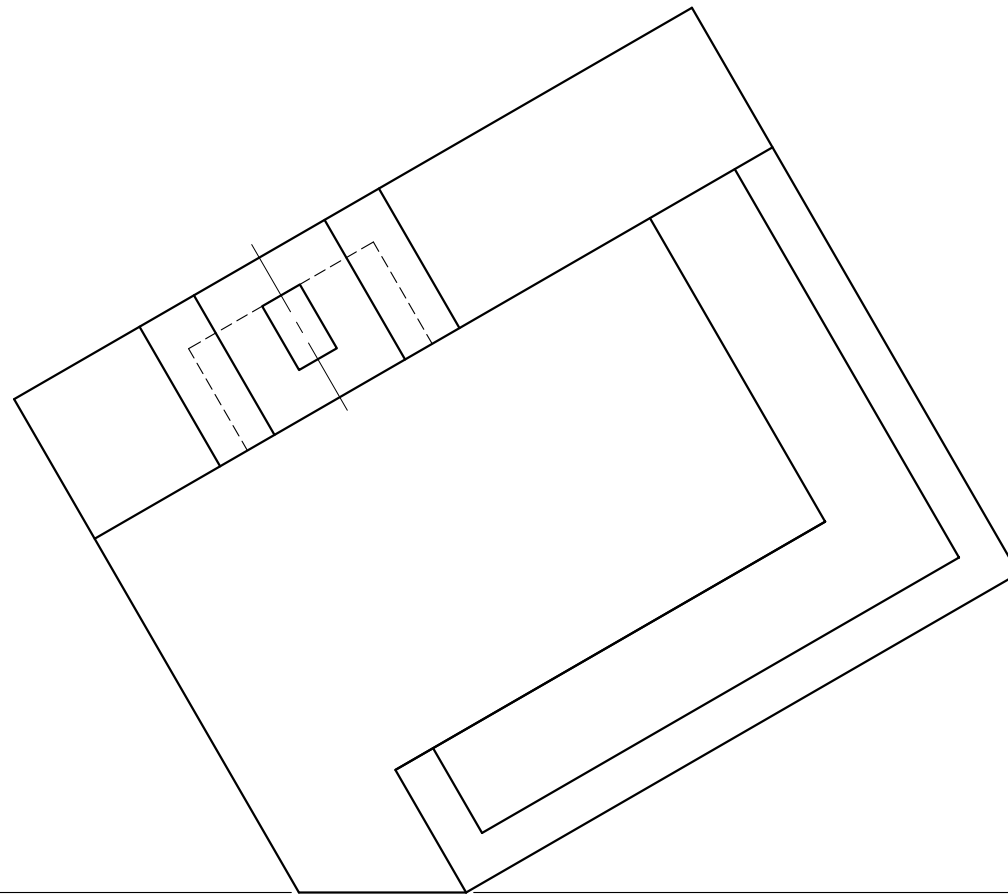
GL – Ground line

SP – Station point

Instructions:

Complete the perspective drawing.

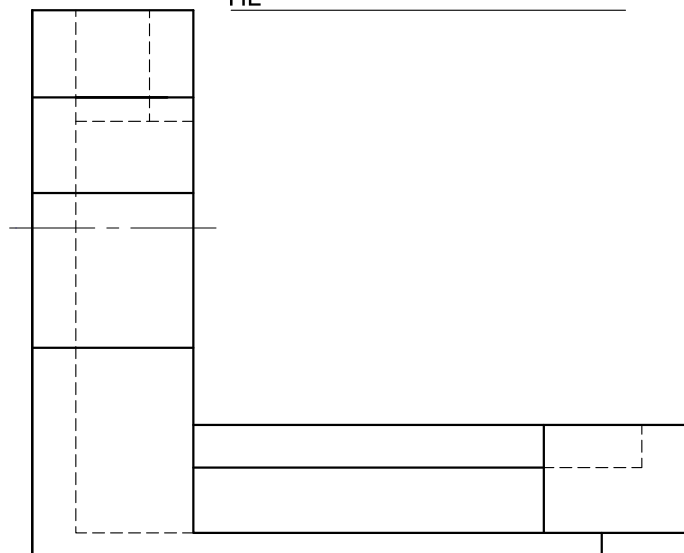
- Align the drawing sheet with the ground line.
- Determine and label the vanishing points.
- Show ALL necessary construction.
- NO hidden detail is required. [40]



ASSESSMENT CRITERIA			
1	CONSTRUCTION + VPs	7	
2	BRAAI	14½	
3	SEATING	13	
4	SEMI-CIRCLE	5½	
TOTAL		40	

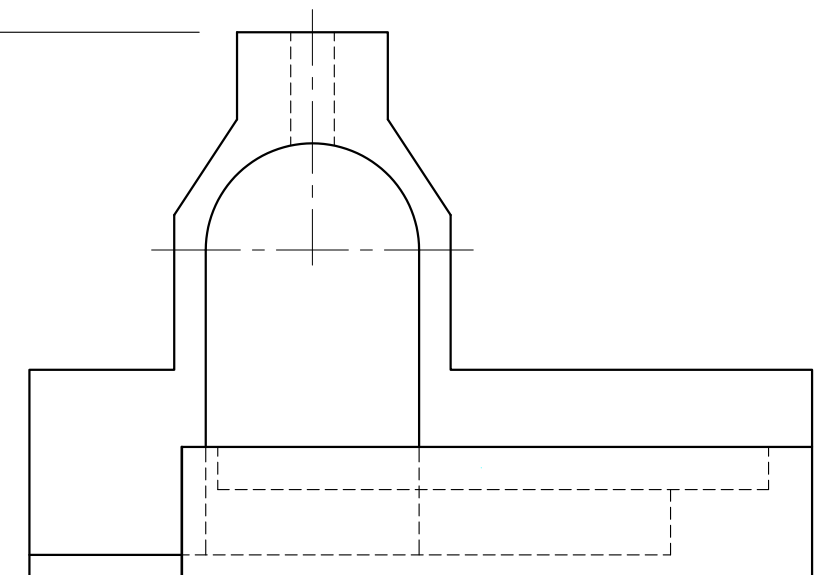
PP

HL



GL

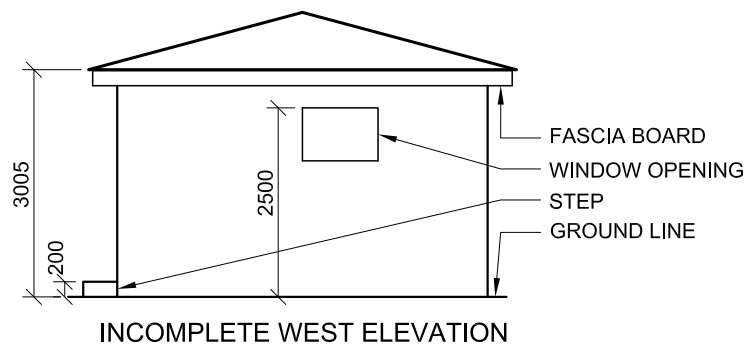
SP



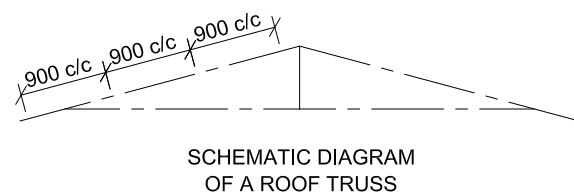
EXAMINATION NUMBER

EXAMINATION NUMBER

4



ROOF NOTES:
 ROOF PITCH 15° WITH 200 x 20 mm FASCIA BOARD ON ALL SIDES
 ROOF COVER 15 mm FIBRE CEMENT SHEET ON 75 x 50 mm PURLINS @ 900 mm c/c
 115 x 38 mm ROOF TRUSS ON 115 x 38 mm WALL PLATES
 PLASTER CEILING BOARD ON 38 x 38 mm BRANDING STRIPS @ 700 mm c/c
 100 x 100 mm GUTTER ON ALL SIDES



DOOR AND WINDOW SCHEDULE

TO FIT

1900

1700

DOOR FRAME AND DOOR FOR TOILETS

1000

500

900

OPEN OUT

HINGED

OPEN IN

WINDOW (W1)

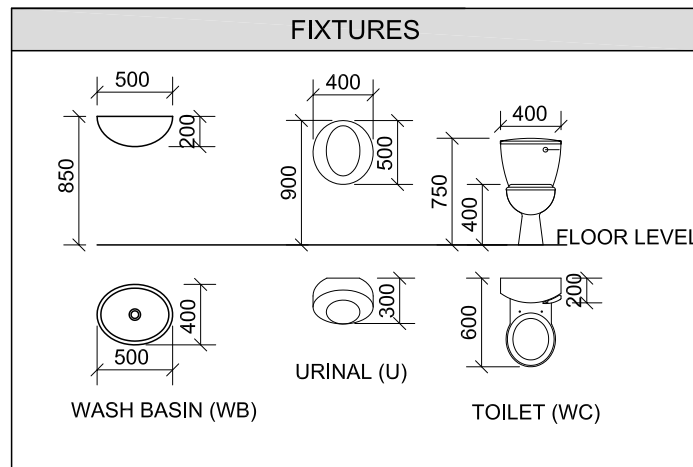
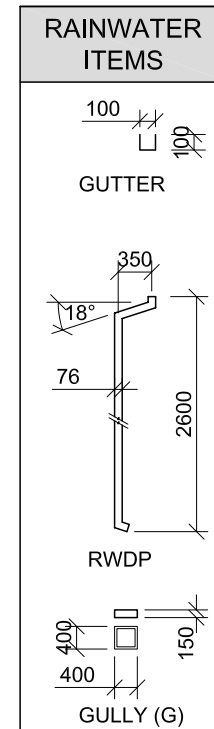
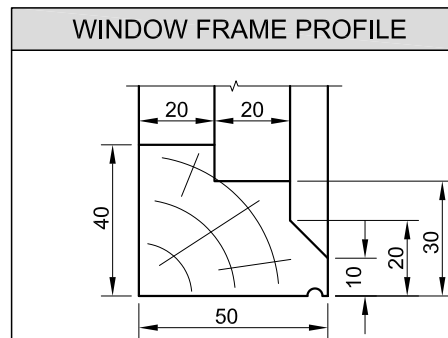
WINDOW (W2)

NOTES:
 150 x 20 FIBRE CEMENT SILL UNDER ALL WINDOWS

ELECTRICAL SYMBOLS

ROOF COMPONENTS

	ROOF CAP
	115 x 38 WALL PLATE
	75 x 50 PURLINS



QUESTION 4: CIVIL DRAWING

Given:

- The incomplete west elevation of a new **public toilets**, showing the walls, the roof and notes
- The incomplete floor plan showing the walls, position of the doors and windows, fixtures and electrical layout
- Roof notes and a schematic diagram of a roof truss
- The incomplete foundation/footing, slab and wall detail of the three walls to be used in the construction of the new **public toilets**
- A door and window schedule
- A table of roof components
- A table of the wooden window frame profile
- A table of fixtures
- A table of electrical symbols
- A table of rainwater items
- The incomplete plan of the new **public toilets**, drawn to scale 1 : 50, 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 **public toilets**:

4.1.1 THE COMPLETE FLOOR PLAN

Add the following features to the drawing:

- ALL the doors and the window
- ALL fixtures as indicated by abbreviations
- The electrical layout as indicated by numbers
- ALL hatching detail

4.1.2 THE WEST ELEVATION

Show the following features on the drawing:

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

4.2 Draw, to scale 1 : 20, a **DETAILED SECTION** on cutting plane A-A of the area in the ellipse shown on the floor plan on page 6.

Show the following features on the drawing:

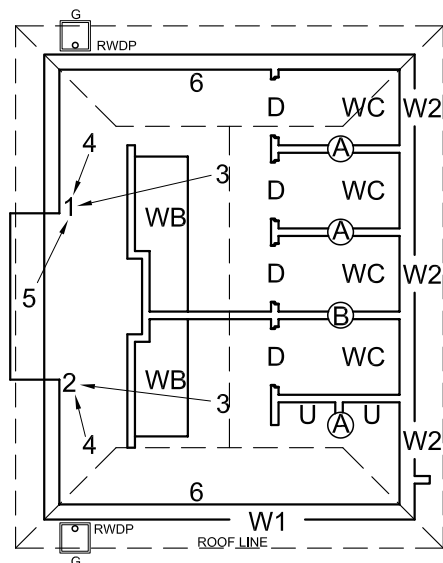
- The complete foundation and external wall detail
- The complete footing and wall A detail
- The roof detail
- The window detail with a double lintel
- ALL features to the east of the cutting plane A-A
- ALL hatching detail. ONLY the substructure hatching may be drawn in freehand.

Label the following:

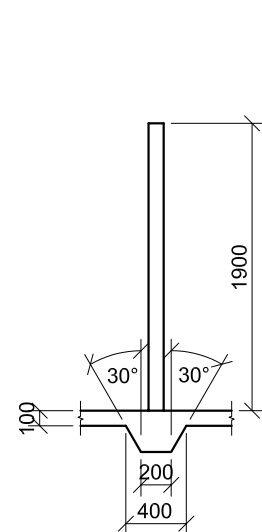
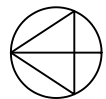
- The west elevation
- The room designations and floor finish (tiles)
- Using correct abbreviations, label the following features in the correct view: ground level, finished floor level and damp-proof course.

NOTE:

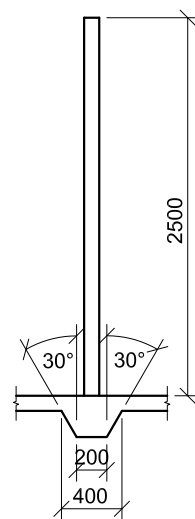
- ALL drawings must comply with the **guidelines** and **graphic symbols** contained in the **SANS 10143**. [92]



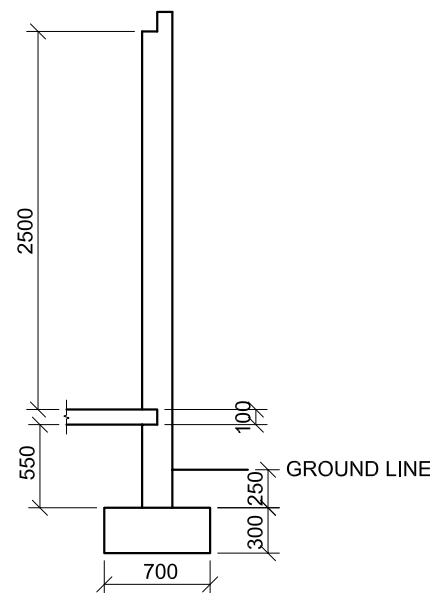
INCOMPLETE FLOOR PLAN



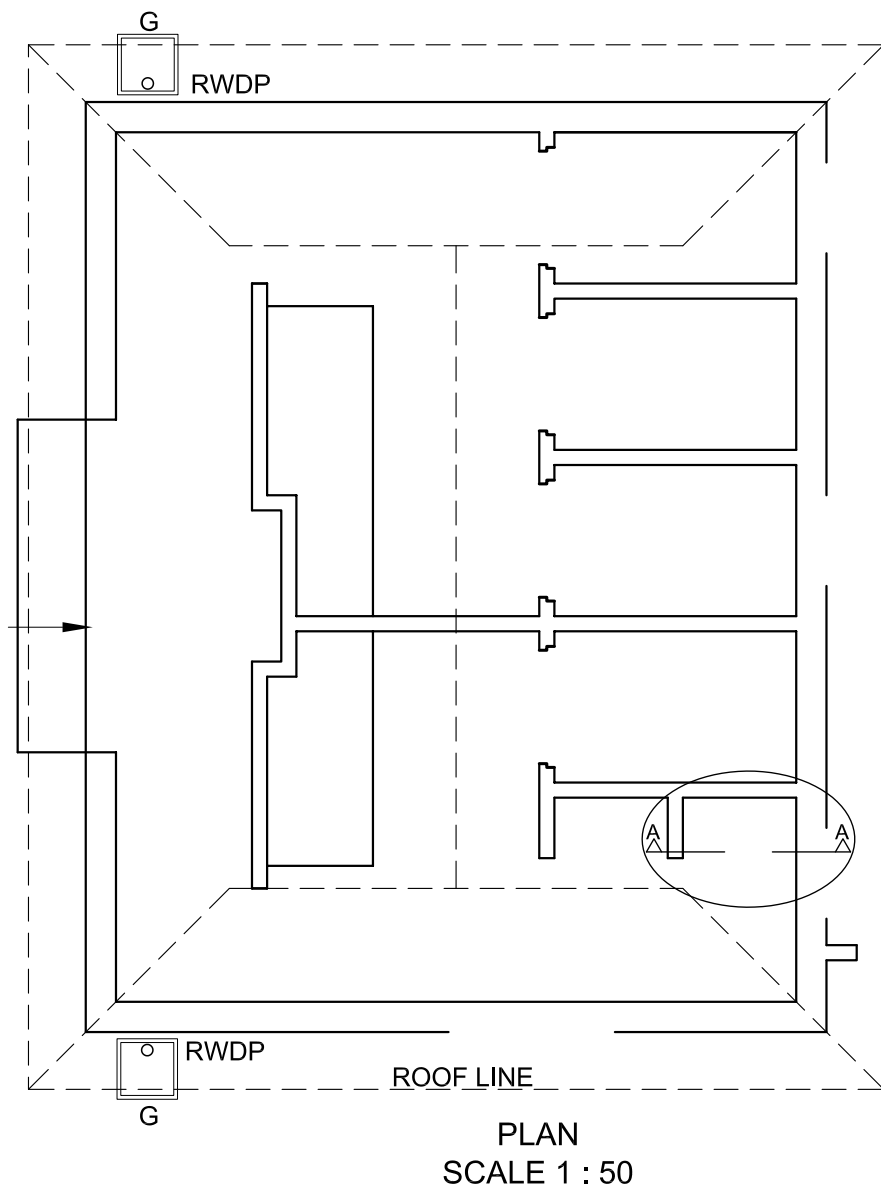
WALL (A)
 INCOMPLETE FOOTING, SLAB AND WALL DETAIL OF THE INTERNAL WALLS BETWEEN THE CUBICLES AND THE URINALS



WALL (B)
 INCOMPLETE FOOTING, SLAB AND INTERNAL WALL DETAIL



INCOMPLETE FOUNDATION, SLAB AND EXTERNAL WALL DETAIL



DETAILED SECTION
SCALE 1 : 20

ASSESSMENT CRITERIA					
PLAN					
		POSSIBLE	OBTAINED	SIGN	MODERATE
1	DOORS + WINDOWS	12			
2	ELECTRICAL	7			
3	FIXTURES	8			
4	HATCHING	4			
5	LABELS	1			
SUBTOTAL		32			
WEST ELEVATION					
1	ROOF	6			
2	WALLS + RWDP + FFL + G + STEP	5			
3	WINDOW	5			
4	LABELS	2			
SUBTOTAL		18			
DETAILED DRAWING					
1	ROOF	13			
2	WINDOW + SILL	8½			
3	FOUNDATIONS + WALLS + SLAB	10½			
4	HATCHING	5			
5	URINAL + LABELS	5			
SUBTOTAL		42			
PENALTIES (-)					
TOTAL		92			
EXAMINATION NUMBER					
EXAMINATION NUMBER					
6					