basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

NATIONAL SENIOR CERTIFICATE

GRADE 12

ENGINEERING GRAPHICS AND DESIGN P1

NOVEMBER 2010

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.

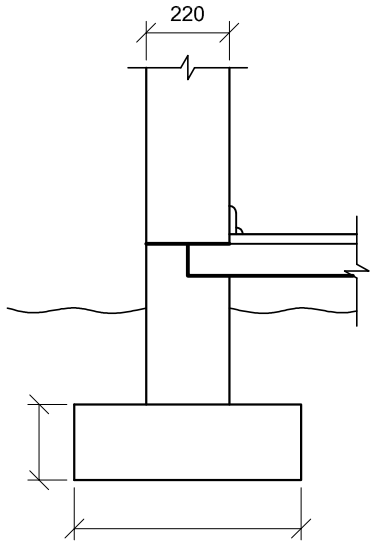
FOR OFFICIAL USE ONLY										
QUESTION	MARKS OBTAINED			½	SIGN	MODERATED			½	SIGN	
1											
2											
3											
4											
TOTAL											
	2	0	0			2	0	0			

FINAL CONVERTED MARK	CHECKED BY
100	

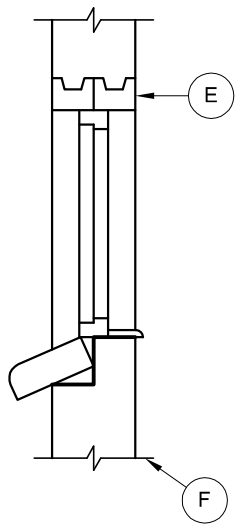
COMPLETE THE FOLLOWING:
CENTRE NUMBER
CENTRE NUMBER
EXAMINATION NUMBER
EXAMINATION NUMBER

STAPLE

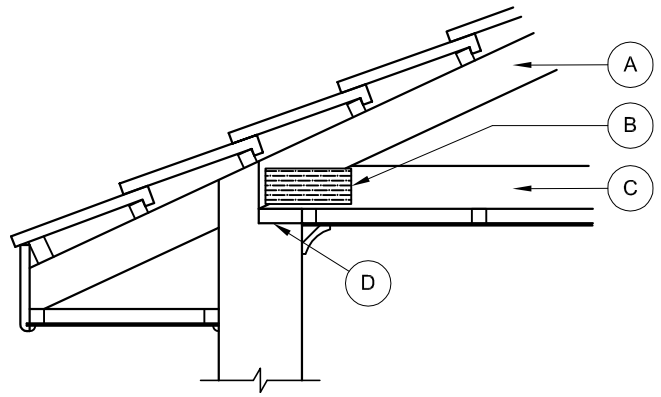
PART SECTION OF A FOUNDATION

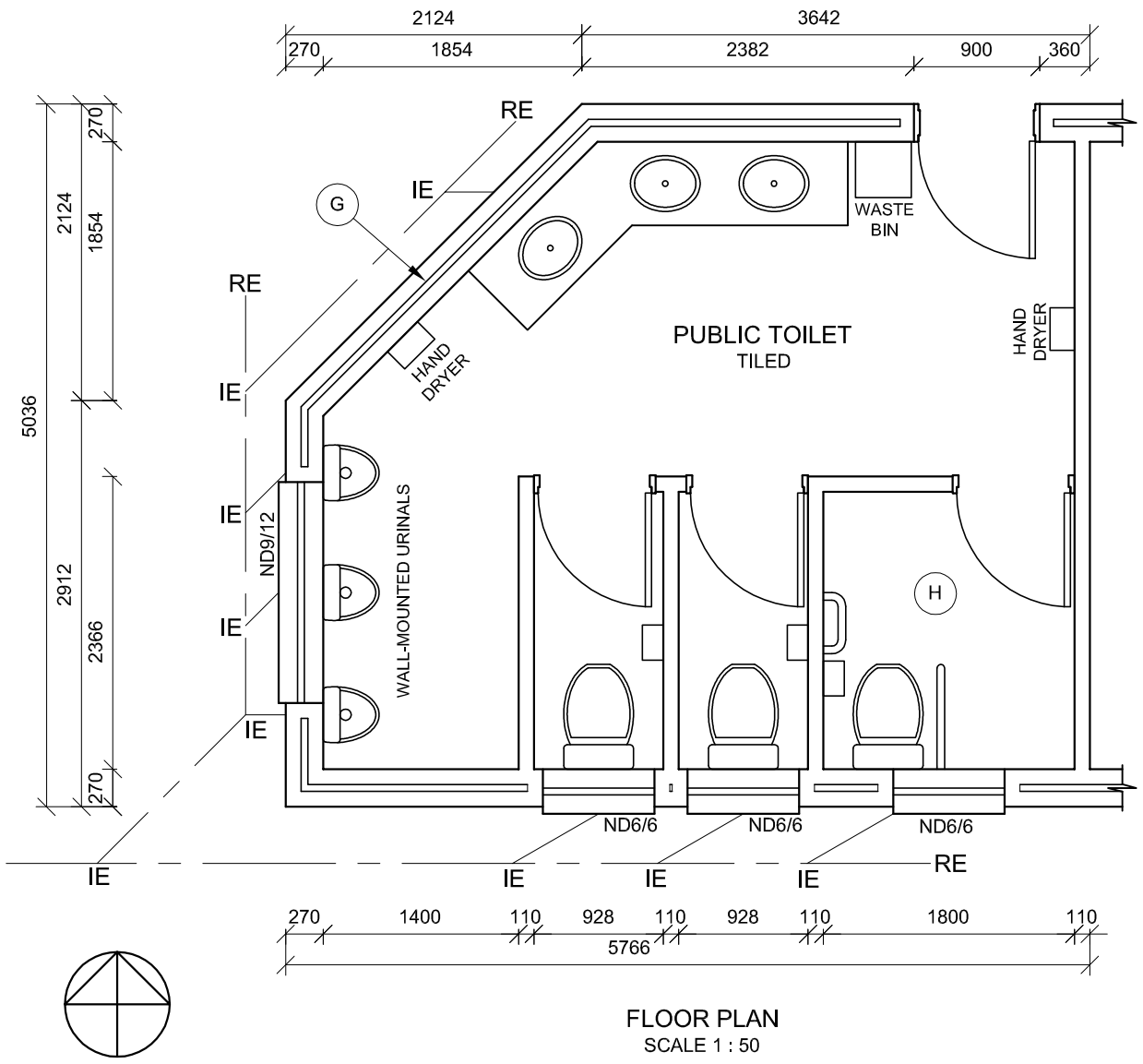


PART SECTION OF A WALL



PART SECTION OF A ROOF





FLOOR PLAN
SCALE 1 : 50

ANSWER 13

QUESTION 1: ANALYTICAL (CIVIL)

Given:
The part sections of a foundation, a wall and a roof, as well as a floor plan of a proposed new public toilet and a table of questions. The drawings are not to scale and no hatching detail is shown.

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

	QUESTIONS	ANSWERS	
1	Label and indicate the Natural Ground Level on the part section of the foundation.		$\frac{1}{2}$
2	Label and indicate, on the part sections of the foundation and the wall, all the places where damp-proof course must be used.		1
3	Name parts A, B, C and D on the part section of the roof.	A.	1
		B.	1
		C.	1
		D.	1
4	What type of roof covering is shown on the part section of the roof?		1
5	Name part E on the part section of the wall.		1
6	What is the function of part E on the part section of the wall?		1
7	What is the function of line F on the part section of the wall?		1
8	What does the double line at G on the outside wall indicate?		1
9	Why is the area of the toilet marked H bigger than the area for the other two toilets?		1
10	How many rodding eyes are indicated on the floor plan?		1
11	What are the codes for the TWO types of windows to be used for the public toilet?		2
12	Determine the total area of the public toilet in square metres. Show ALL calculations.		4
13	In the space provided above (ANSWER 13), draw, in neat freehand, the front view of the *SABS* convention for a water closet (WC).		$3\frac{1}{2}$
14	Draw, in neat freehand, ALL the hatching detail for the part section of the foundation.		6
15	Insert the minimum dimensions of the foundation for a load-bearing wall on the part section of the foundation.		2
	TOTAL		**30**

EXAMINATION NUMBER

EXAMINATION NUMBER 2

STAPLE

QUESTION 2: DEVELOPMENT

A company that installs extraction systems has designed an extraction unit for the kitchen of a restaurant. The unit consists of a transition piece (A), a cylindrical pipe (B) and a conical funnel (C).

Given:

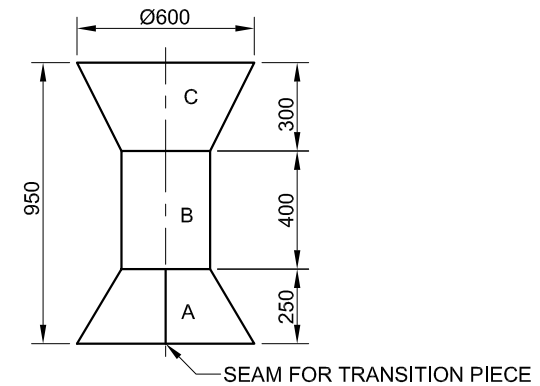
- The front view and top view of the extraction unit
- Centre point (D) as the reference point on the drawing sheet

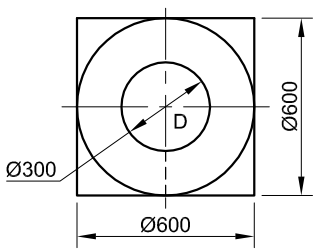
Instructions:

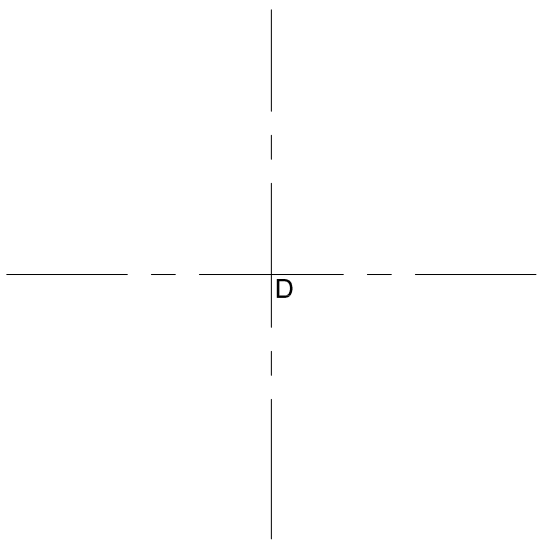
2.1 Draw, to scale 1 : 10, the given views of the extraction unit using point (D) as the reference point.
2.2 Develop the surface of the transition piece (A).
2.3 Develop the surface of the cylindrical pipe (B).
2.4 Develop the surface of the conical funnel (C).

- Show ALL necessary construction and calculations.

[37]





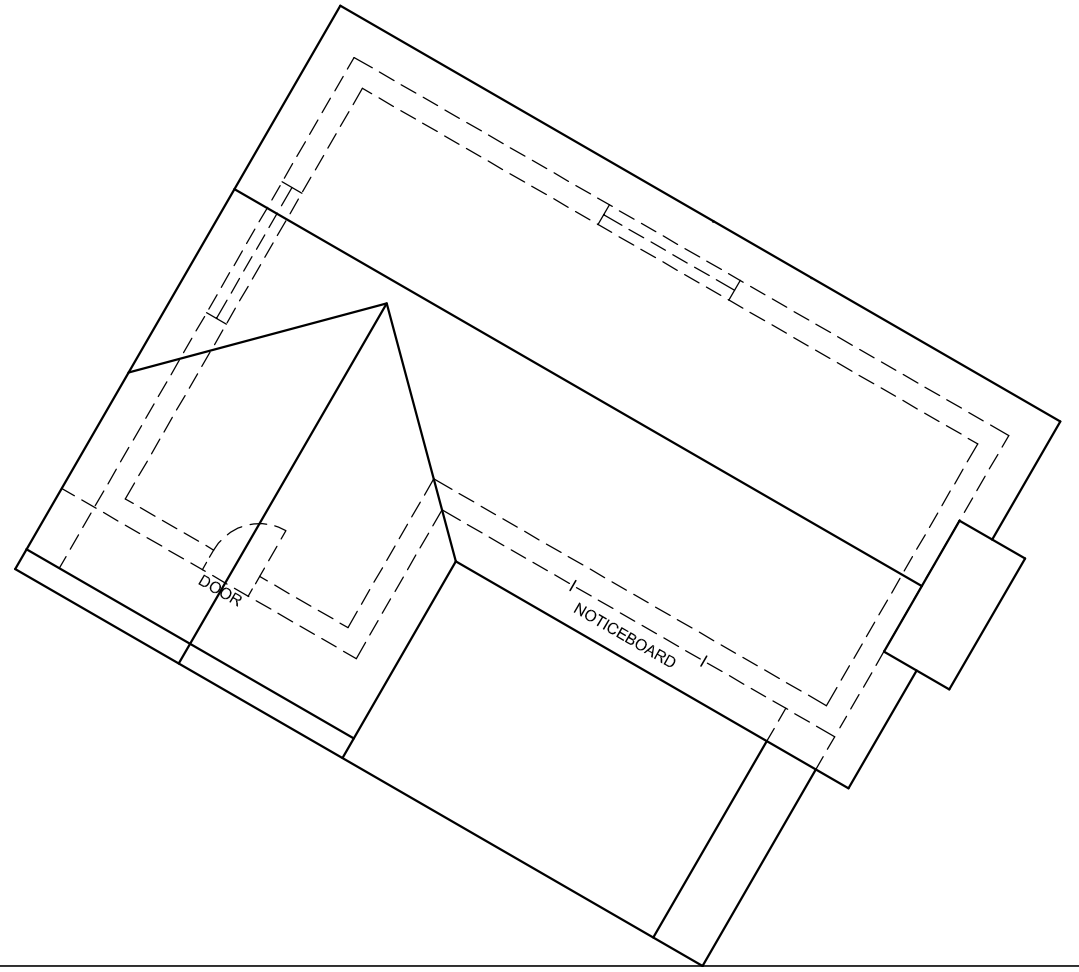


ASSESSMENT CRITERIA				
1. GIVEN	8			
2. TRUE LENGHTS	4			
3. DEVELOPMENT A	14			
4. DEVELOPMENT B	4			
5. DEVELOPMENT C	7			
TOTAL	**37**			

EXAMINATION NUMBER

EXAMINATION NUMBER 3

STAPLE



QUESTION 3: PERSPECTIVE

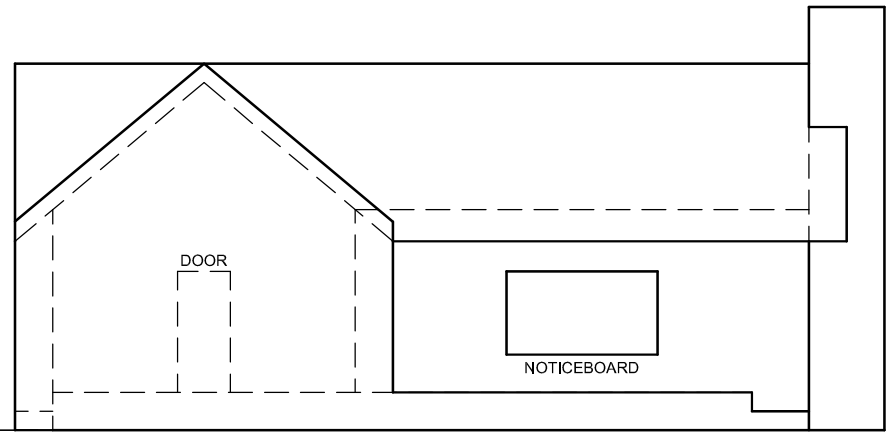
Given:
Three views of a clubhouse and the information needed to draw a two-point perspective drawing
PP - Picture plane
HL - Horizon line
GL - Ground line
SP - Station point

Instructions:
Complete the perspective drawing.

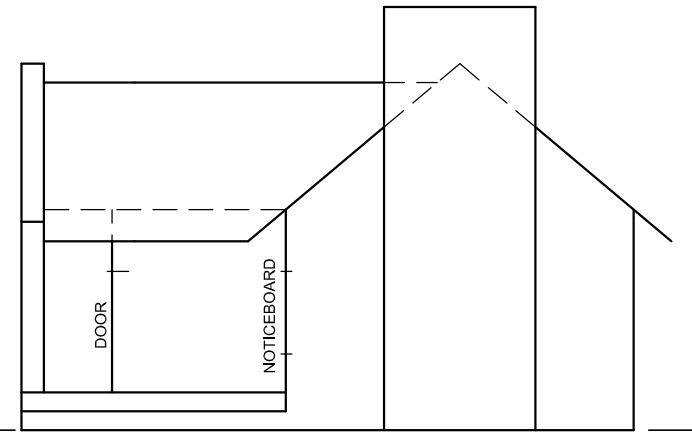
- Align the drawing sheet with the horizon line (HL).
- Locate and label the vanishing points.
- Show ALL necessary construction.
- NO hidden detail is required. **[36]**

PP

HL



GL



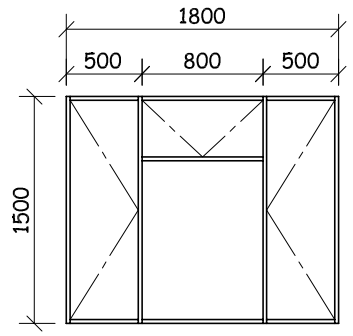
SP

ASSESSMENT CRITERIA				
1. CONSTRUCTION + VPs	7			
2. ROOF	$8\frac{1}{2}$			
3. WALLS + WINDOW	$15\frac{1}{2}$			
4. CHIMNEY	5			
TOTAL	**36**			

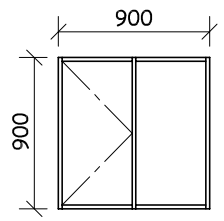
EXAMINATION NUMBER

EXAMINATION NUMBER 4

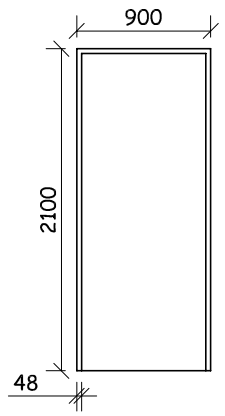
DOOR AND WINDOW SCHEDULE



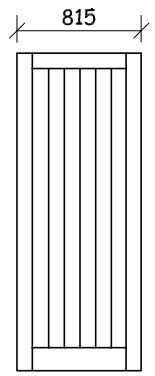
WINDOW
W1518
MERANTI
GLASS
3 mm CLEAR GLASS



WINDOW
W99
MERANTI
GLASS
3 mm CLEAR GLASS

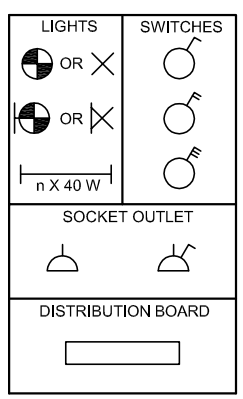


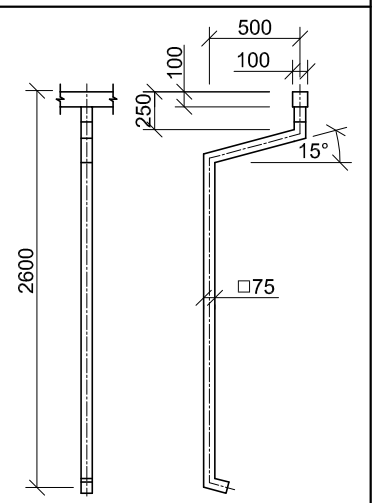
DOOR FRAME
76 x 44 mm MERANTI



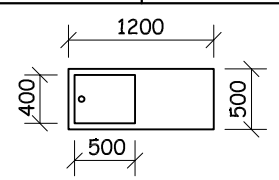
DOOR
EXTERIOR MERANTI

ELECTRICAL SYMBOLS

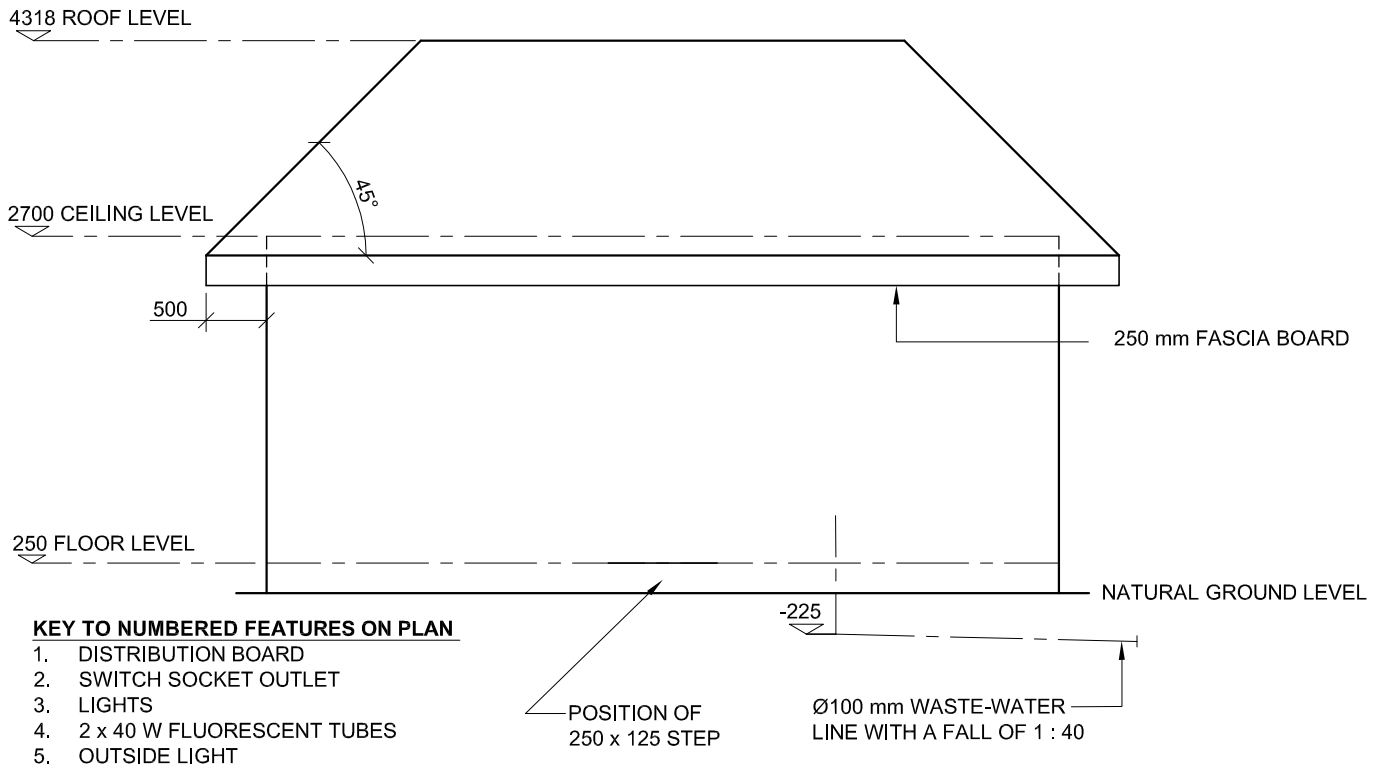




GUTTER AND RAINWATER
DOWNPIPE DETAIL



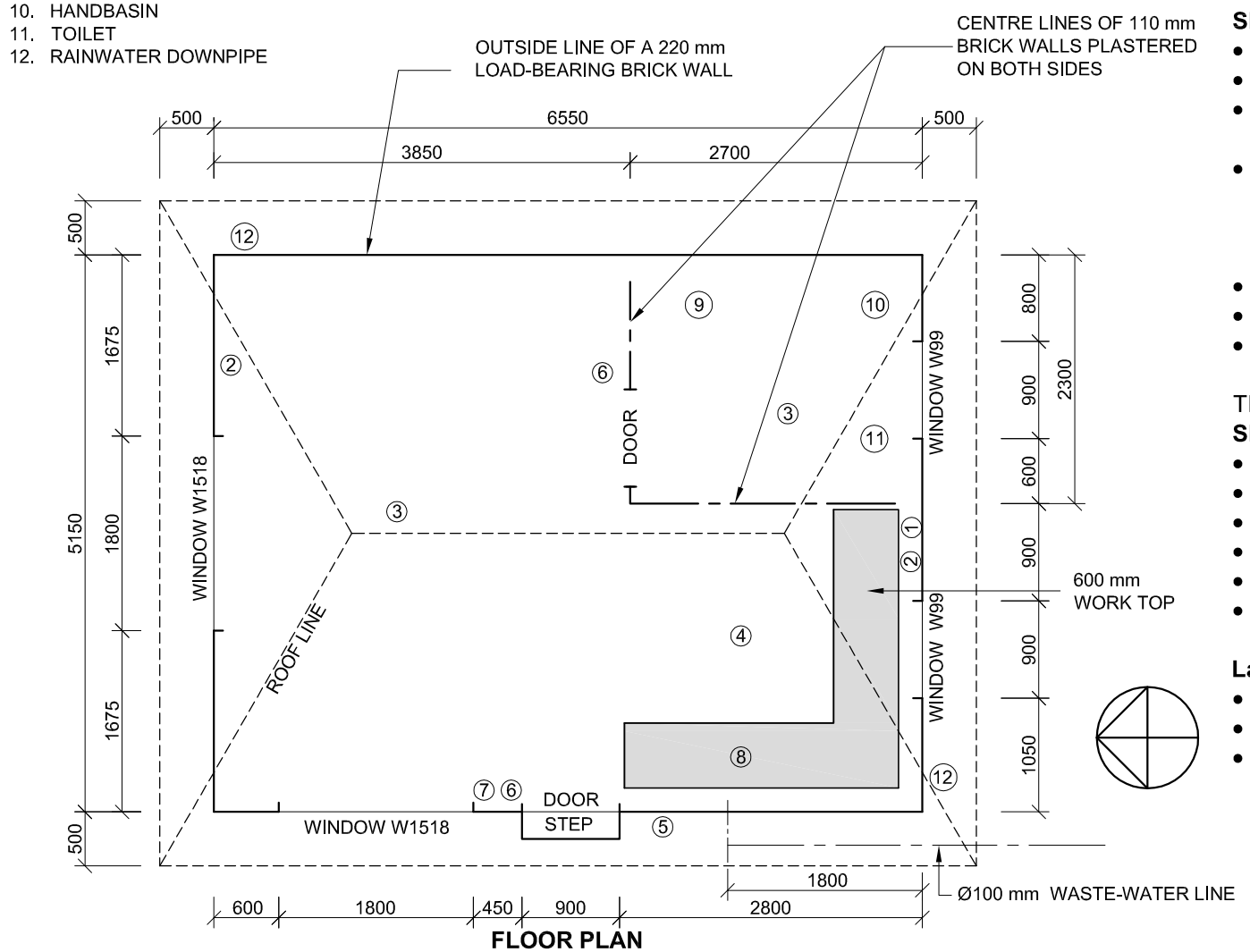
SINK DETAIL



WEST ELEVATION

KEY TO NUMBERED FEATURES ON PLAN

1. DISTRIBUTION BOARD
2. SWITCH SOCKET OUTLET
3. LIGHTS
4. 2 x 40 W FLUORESCENT TUBES
5. OUTSIDE LIGHT
6. ONE-POLE LIGHT SWITCH
7. TWO-POLE LIGHT SWITCH
8. SINK
9. SHOWER
10. HANDBASIN
11. TOILET
12. RAINWATER DOWNPIPE



FLOOR PLAN

QUESTION 4: CIVIL DRAWING

Given:

- The incomplete west elevation of a new **granny flat** showing the outlines of the walls and roof, as well as the position of the kitchen's waste-water disposal system
- The incomplete floor plan of the new **granny flat** showing the outside lines of the exterior walls, the centre lines of the interior walls, the position of all the features, relevant notes and dimensions
- A door and window schedule
- A table of electrical symbols
- A detailed drawing of the gutter and the rainwater downpipe
- A detailed drawing of the sink

Instructions:

- Answer this question on page 6.
- Draw, to scale 1 : 50 and the given specifications:
  4.1 The complete floor plan
  4.2 The complete west elevation
- ALL drawings must comply with the guidelines contained in the *SABS 0143.*

SPECIFICATIONS:

THE FLOOR PLAN

Show the following features on the drawing:

- ALL the walls with hatching detail
- The doors, step and windows
- The conventions of ALL the bathroom fixtures as indicated with numbers on the incomplete floor plan
- ALL the electrical features as indicated with numbers on the incomplete floor plan. The light in the living area and the fluorescent tubes in the kitchen must be connected to the two-pole light switch.
- The work top and the sink detail
- The waste-water disposal system for the kitchen
- The roof line

THE WEST ELEVATION

Show the following features on the drawing:

- The outlines of the walls and roof
- The door, step and window
- The finished floor level
- The gutter
- Rainwater downpipes
- The waste-water disposal system for the kitchen

Label the following:

- The floor plan, including the scale
- The west elevation
- Using the correct abbreviations, label the following features on the correct view: finished floor level, sink, the fall of the waste-water line, inspection eye, bathroom designation and floor finish (ceramic tiles). **[97]**

STAPLE

ASSESSMENT CRITERIA				
WEST ELEVATION				
	POSSIBLE	OBTAINED	SIGN	MODERATE
1. ROOF + FASCIA	5			
2. GUTTER + RWDP	6			
3. WALLS + FFL	$3\frac{1}{2}$			
4. WINDOWS + DOOR + STEP	$13\frac{1}{2}$			
5. WASTE-WATER	2			
6. LABELS	4			
SUBTOTAL	**34**			
FLOOR PLAN				
1. ROOF	$4\frac{1}{2}$			
2. WALLS	$6\frac{1}{2}$			
3. WINDOW + DOOR + STEP	16			
4. KITCHEN + BATHROOM	$11\frac{1}{2}$			
5. ELECTRIC	12			
6. WASTE-WATER	2			
7. HATCHING	$4\frac{1}{2}$			
8. LABELS	6			
SUBTOTAL	**63**			
TOTAL	**97**			

EXAMINATION NUMBER	
EXAMINATION NUMBER	6