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EASTERN CAPE EDUCATION DEPARTMENT
OOS-KAAP ONDERWYSDEPARTEMENT

NATIONAL
SENIOR CERTIFICATE

GRADE 12

ENGINEERING GRAPHICS AND DESIGN P1

SEPTEMBER 2016

PREPARATORY EXAMINATION

MARKS: 200

TIME: 3 hours

This question paper consists of 6 pages.

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* G R D S E *

INSTRUCTIONS AND INFORMATION

1. The question paper consists of FOUR questions.
2. Answer ALL the questions.
3. All drawings must be drawn to scale 1 : 1, unless otherwise stated.
4. The questions must be answered on the answer sheets provided.
5. All the answers sheets must be re-stapled in numerical sequence and handed in irrespective of whether the question was attempted or not.
6. Careful time management is essential in order to complete all the questions.
7. Print your name in the block provided on every ANSWER SHEET.
8. All answers must be drawn accurately and neatly.
9. Any details or dimensions not given must be estimated in good proportion.
10. ALL drawings are in first angle orthographic projection, unless stated otherwise.

FOR OFFICIAL USE ONLY									
								MODERATED MARK	
1									
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3									
4									
TOTAL									
	2	0	0						

FINAL CONVERTED MARK	CHECKED BY
100	

COMPLETE THE FOLLOWING:	
NAME	
NAME	
EXAMINATION CENTRE	
EXAMINATION CENTRE	

Please turn over **1**

STAPLE

LAND SURVEYOR'S CERTIFICATE OF THE
SIDE LENGTHS AND CORNER HEIGHTS
ON ERF 132.
SURVEYED ON 2016-08-05

LENGTHS IN MILLIMETERS	CORNER HEIGHTS IN METERS
AB = 38500	A = 1372
BC = 25000	B = 1372,5
CD = 38500	C = 1371,25
DA = 25000	D = 1372,1

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 19

In the space provided below, draw, in neat freehand, the top view of the SANS 10143 convention for a GREASE TRAP.

ANSWER 20

In the space provided below, draw, in neat freehand, the front view and top view of the SANS 10143 convention for a WALLMOUNTED URINAL.

A	2016-08-12	CORRECT GREASE TRAP SYMBOL	
REVISION	DATE	DESCRIPTION	
PRINTED BY	DATE OF PRINT		
PRINT ALL CC	2016-08-15		
DRAWING TITLE			
SITE PLAN			
PROJECT			
PROPOSED NEW ROOM FOR MR A. RHADEBE ON ERF 132 13 KIPLING DRIVE, ABERDEEN.			
PROJECT NUMBER		DRAWING NUMBER	
ECDBE1-2016		10810	
DATE	DRAWN	CHECKED	SCALE
2016-08-10	FREDDIE	KRUGER	1 : 300
REFERENCE CODE			
QU1-2016			

QUESTION 1: ANALYTICAL (CIVIL)

Given:
The site plan for an existing house with a proposed new room, 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.

QUESTIONS		ANSWERS		
1	What is the drawing number?		1	
2	Who prepared the drawing?		1	
3	Which company printed the site plan?		1	
4	How many revisions were done to the site plan?		1	
5	How many people must sign the drawing?		1	
6	What feature is partially visible on the erf to the south east of ERF 132?		2	
7	What is the length of boundary line DA in meters?		1	
8	What does the abbreviation IC stand for?		1	
9	What does the abbreviation RE stand for?		1	
10	What does the abbreviation MH stand for?		1	
11	How many inspection eyes are indicated on the drawing?		1	
12	What feature is indicated by arrow A?		1	
13	What feature is indicated by arrow B?		1	
14	What colour is used on the siteplan for all proposed work?		1	
15	What colour is used in elevations for new concrete?		1	
16	The feature indicated by arrow C is a drainage pipe. Draw the correct line type for a drainage pipe in the block to the right.		1	
17	In the space provided below, determine the perimeter of erf 132 in meters.		3	
18	In the space provided below, determine the total area of the existing garage and proposed new room in square meters.		3	
19	In the space provided in the title panel, draw, in neat freehand, the top view of the SABS 10143 convention for a GREASE TRAP.		3	
20	In the space provided in the title panel, draw, in neat freehand, the front view and top view of the SABS 10143 convention for a WALL MOUNTED URINAL.		4	
TOTAL		30		

ANSWER 17

Show ALL calculations.

ANSWER 18

Show ALL calculations.

NAME

NAME

2

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Please turn over



b

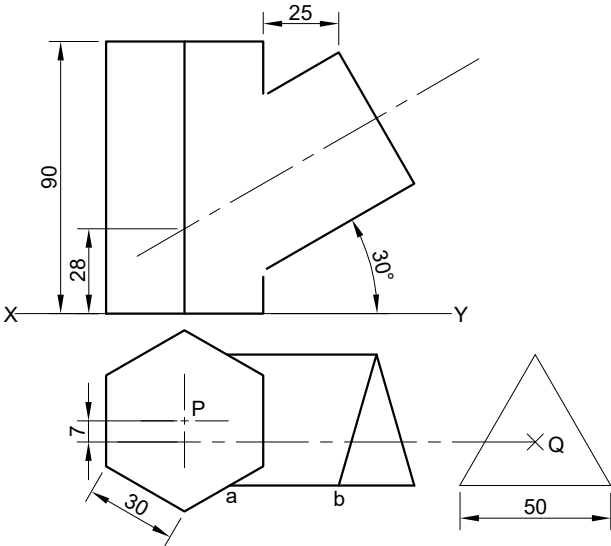
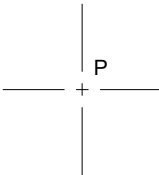
QUESTION 2: INTERPENETRATION AND DEVELOPMENT

Given:
The incomplete front view and the top view of a hexagonal main pipe and equilateral triangular branch pipe. The auxiliary view of the branch pipe with center point Q. The center point P for the top view of the hexagon and the ground line XY. A right angle labeled B as the start for the development.

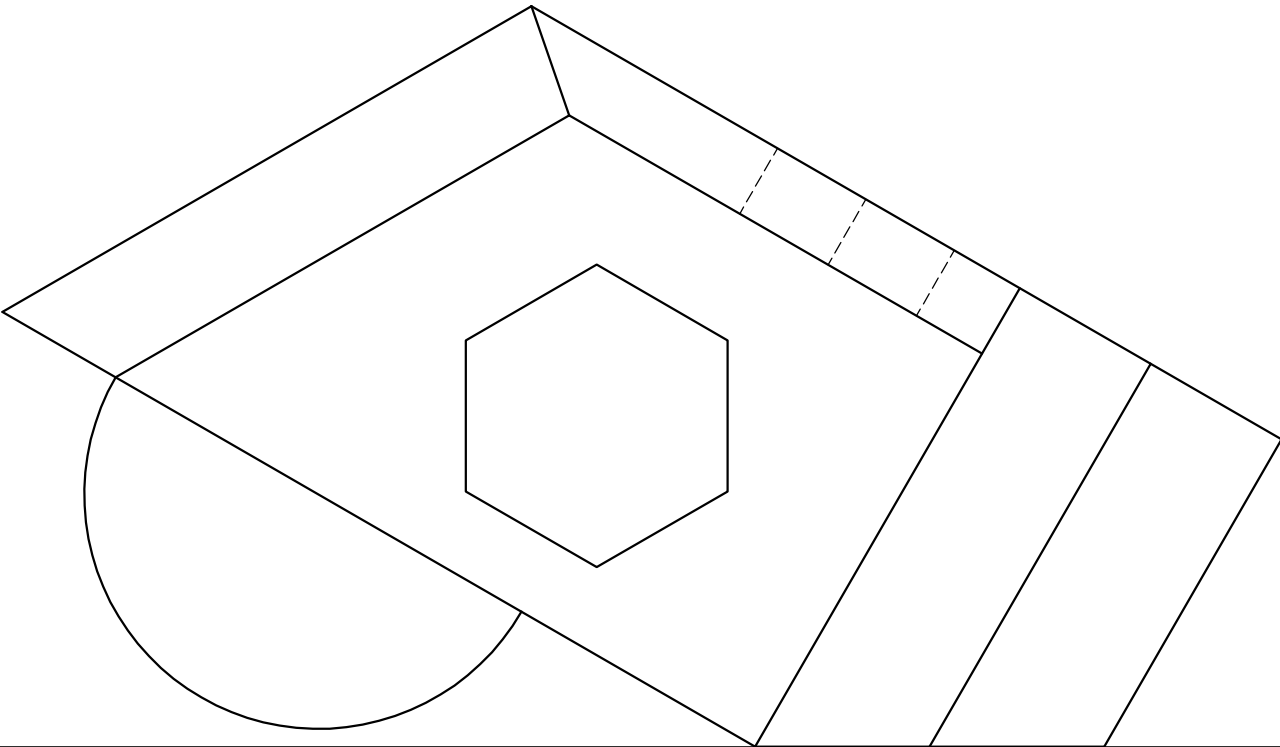
- Instructions:**
Draw, to scale 1 : 1, the following views of the two interpentraint pipes:
- 2.1 The top view
 - 2.2 The complete front view clearly showing the interpenetration between the two parts
 - 2.3 Develop the surface of the branch pipe and make AB the seam.

Show ALL hidden detail and fold lines.
AB is the seam of the branch pipe. **[32]**

X-----Y



ASSESSMENT CRITERIA					
1	CONSTRUCTION + CENTRE LINES + TOP VIEW	8			
2	FRONT VIEW	12			
3	DEVELOPMENT	12			
PENALTIES (-)					
TOTAL		32			
NAME					
NAME					3



QUESTION 3: PERSPECTIVE

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

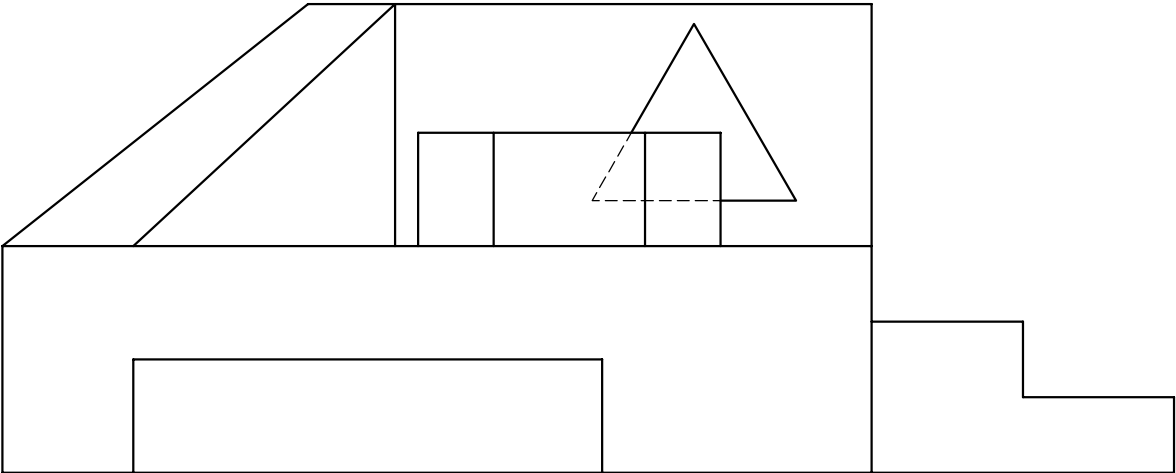
- Instructions:**
Complete the perspective drawing.
- Align the drawing sheet with the ground line (GL).
 - Determine and label the vanishing points.
 - Show ALL necessary construction.
 - Show the wall thickness at the openings.
 - NO hidden detail is required.
- [40]

PP

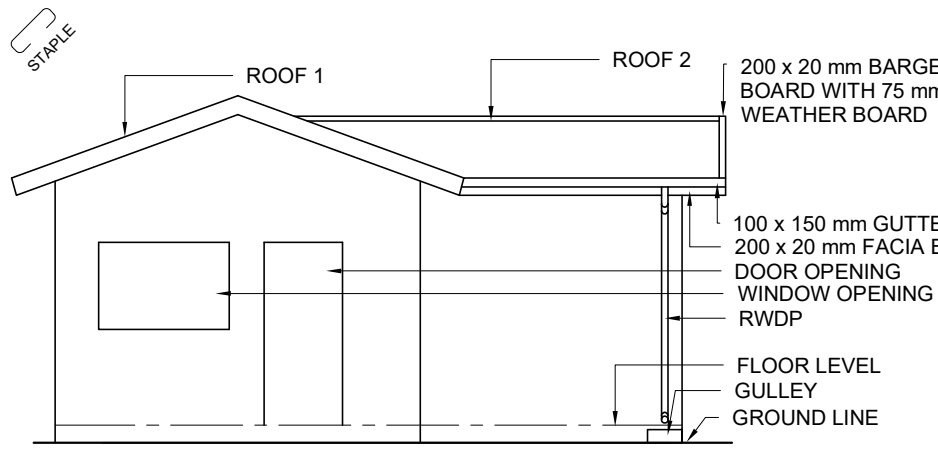
HL

HL

GL



ASSESSMENT CRITERIA					
1	CONSTRUCTION + VPs	7			
2	STAIRS + BASE	12			
3	WALLS + HEXAGON	14			
4	SEMI-CIRCLE	7			
TOTAL		40			
NAME					
NAME					4



STAPLE

ROOF 1

ROOF 2

200 x 20 mm BARGE BOARD WITH 75 mm WEATHER BOARD

100 x 150 mm GUTTER

200 x 20 mm FACIA BOARD

DOOR OPENING

WINDOW OPENING

RWDP

FLOOR LEVEL

GULLY

GROUND LINE

INCOMPLETE SOUTH EAST ELEVATION

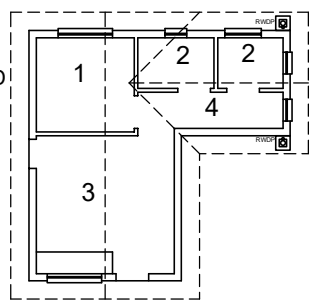
FLOOR FINISHES

1 BEDROOM: CARPET

2 BATHROOM: TILE

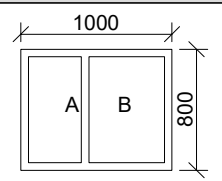
3 OPEN PLAN AREA: TILE

4 PASSAGE: TILE

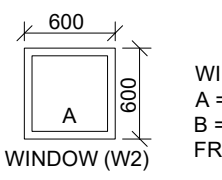


ROOM DESIGNATIONS

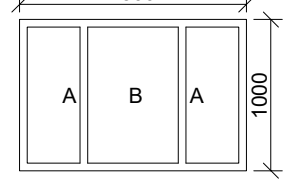
DOOR AND WINDOW SCHEDULE



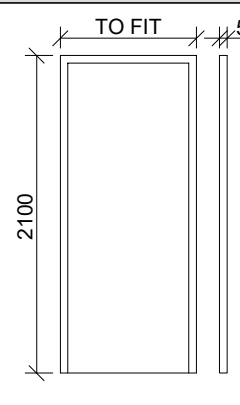
WINDOW (W1)



WINDOW (W2)



WINDOW (W3)



DOOR FRAME AND DOOR (D1)

NOTE: 175 x 20 mm FIBRE CEMENT SILL UNDER ALL WINDOWS

WINDOW NOTES

A = OPENING SIDE

B = FIXED PANE

FRAMES 40 mm

FEATURES

D1 DOOR

W1 WINDOW

W2 WINDOW

W3 WINDOW

FIXTURES

WC TOILET

WB WASH BASIN

SH SHOWER

S SINK

ELECTRICAL FITTINGS

1. LIGHT SWITCH - SINGLE-POLE

2. LIGHT SWITCH - DOUBLE-POLE

3. FLUORESCENT LIGHT 2 x 40 W

4. CEILING LIGHT

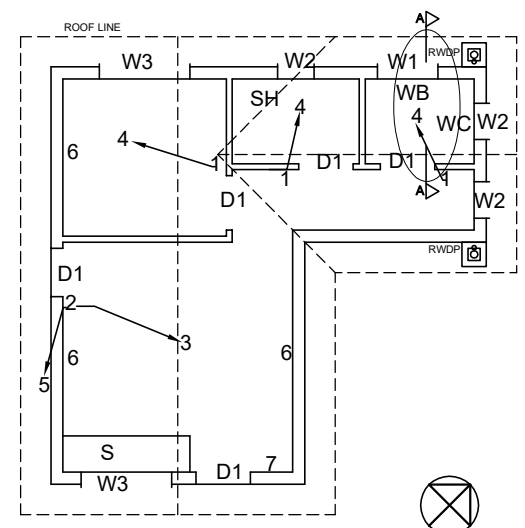
5. WALL MOUNTED LIGHT

6. SWITCHED SOCKET OUTLET

7. DISTRIBUTION BOARD

NOTE:

THE ARROWS ON THE FLOOR PLAN SHOW THE LIGHT CONNECTION TO THE SWITCH.



INCOMPLETE FLOOR PLAN

ROOF NOTES:

ROOF PITCH 20° WITH 200 x 20 mm FACIA BOARD ON SIDES

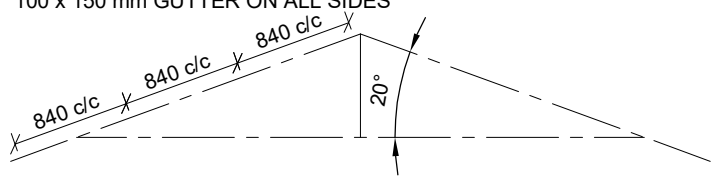
200 x 20 mm BARGE BOARDS AND 75 mm WEATHER BOARD ON EAVES

ROOF COVER 15 mm FIBRE CEMENT SHEET ON 75 x 50 mm PURLINS @ 920 mm c/c

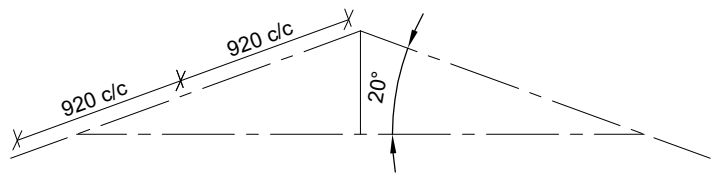
114 x 38 mm ROOF TRUSS ON 114 x 38 mm WALL PLATES

9 mm CEILING BOARD ON 38 x 38 mm BRANDERING STRIPS @ 440 mm c/c

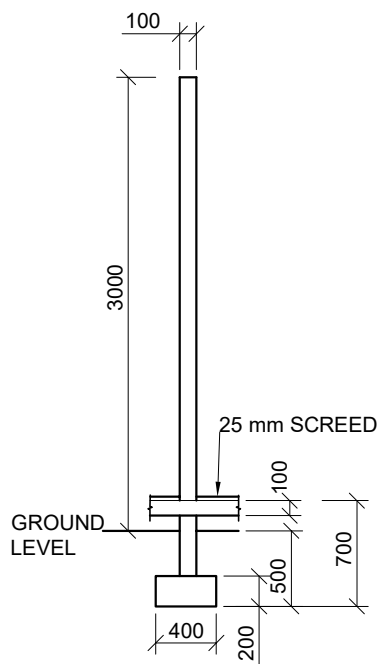
100 x 150 mm GUTTER ON ALL SIDES



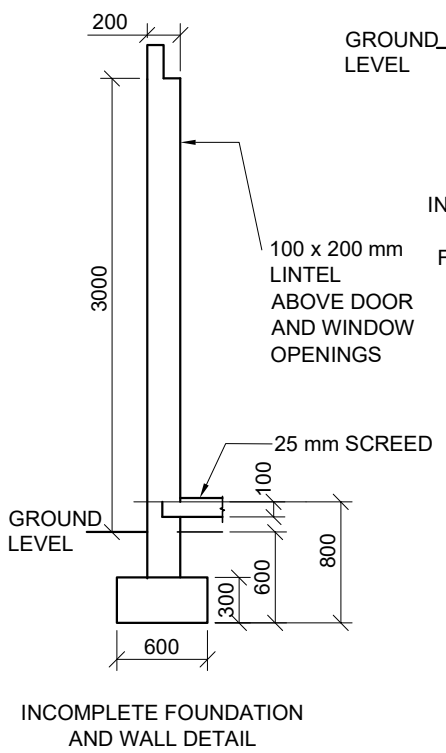
SCHEMATIC DIAGRAM OF ROOF 1 TRUSS



SCHEMATIC DIAGRAM OF ROOF 2 TRUSS

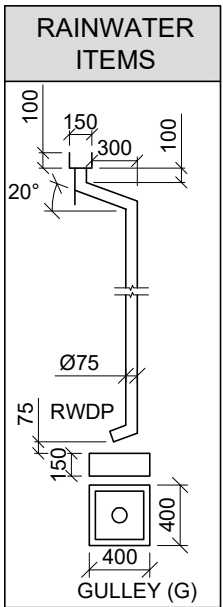


INCOMPLETE NON LOAD BEARING WALL AND FOUNDATION DETAILS



INCOMPLETE FOUNDATION AND WALL DETAIL

RAINWATER ITEMS

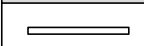
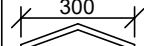



Ø75













RWDP

GULLY (G)

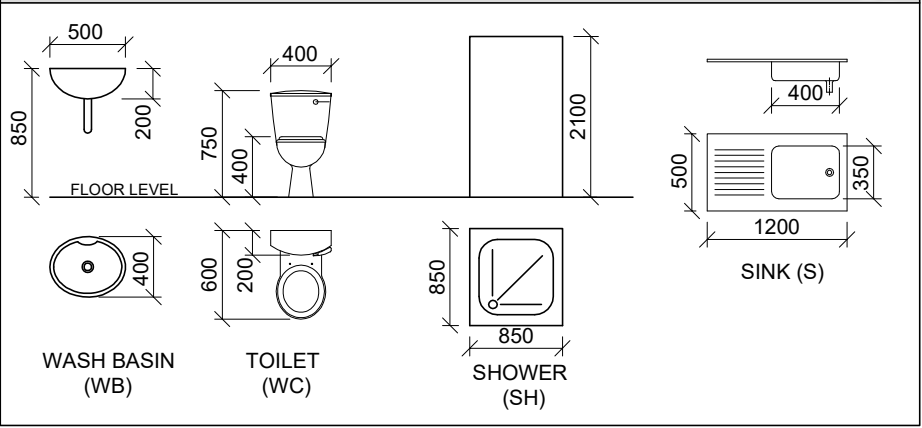
ROOF COMPONENTS

	200 x 20 mm FASCIA BOARD
	ROOF CAP
	75 x 50 mm PURLINS

ELECTRICAL SYMBOLS

SANITARY FIXTURES



WASH BASIN (WB)

TOILET (WC)

SHOWER (SH)

SINK (S)

QUESTION 4: CIVIL DRAWING

Given:

- The incomplete south east elevation of a bachelors flat, showing the walls, the window, the door opening, the roof and notes
- The incomplete floor plan showing the walls, position of the doors, windows, fixtures and electrical layout
- Roof notes with schematic diagrams of two roof trusses
- The incomplete foundation and wall detail
- Room designations and floor finish
- A door and window schedule
- A table of sanitary fixtures
- A table of electrical symbols
- A table of rainwater items
- The floor plan of the **proposed bachelors flat**, 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 bachelors flat**:

4.1.1 **THE COMPLETE FLOOR PLAN**

Add the following features to the drawing:

- ALL doors and windows
- ALL fixtures as indicated by abbreviations
- ALL electrical fittings as indicated by numbers
- ALL hatching detail

4.1.2 **THE SOUTH EAST ELEVATION**

Show the following features on the drawing:

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

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

Show the following features on the drawing:

- The complete foundation, external wall with window and internal wall with door detail
- The roof detail, including the fascia board and gutter
- ALL features to the right of the section
- ALL hatching detail. ONLY the substructure hatching may be drawn in neat freehand
- Start at the given starting point

Label the following:

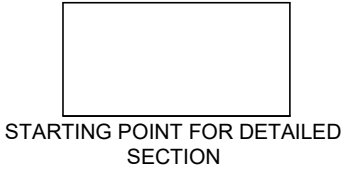
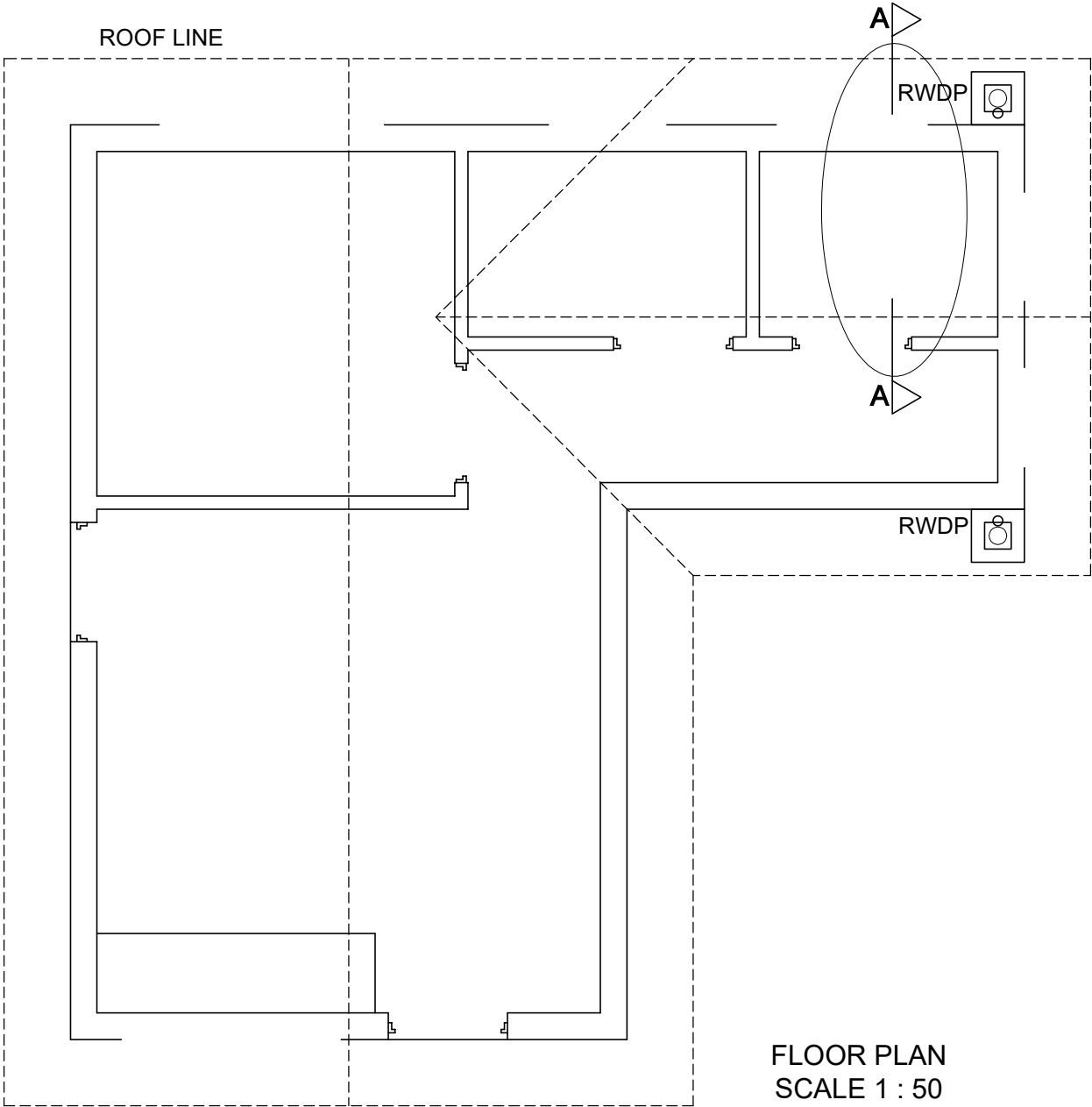
- The south east elevation including the scale
- The room designations and floor finishes
- Using the correct abbreviations, label the following features in the correct view: ground level; finished floor level and damp proof course

NOTE:

ALL drawings must comply with the **guidelines** and **graphical symbols** contained in the **SANS 10143**. [98]



GL



SECTION A-A
SCALE 1 : 20

PENALTIES		
1	INCORRECT OVERALL SCALE	
2	INCORRECT POSITIONING OF VIEWS	
3	NON-ALIGNMENT OF VIEWS	
TOTAL PENALTIES (-)		

ASSESSMENT CRITERIA					
FLOOR PLAN					
1	DOORS + WINDOWS	17			
2	ELECTRICAL	9			
3	FIXTURES	7			
4	HATCHING	4			
5	LABELS	5			
SUBTOTAL		42			
SOUTH EAST ELEVATION					
1	ROOF	6 1/2			
2	WALLS + RWDP + FFL + GULLEY	4			
3	DOOR + WINDOW	4			
4	LABELS	1 1/2			
SUBTOTAL		16			
DETAILED SECTION					
1	ROOF DETAIL	13			
2	FOUNDATIONS + WALLS + SLAB	8			
3	DOOR + GULLEY RWDP + GUTTER + SILL + WINDOW + WC	8			
4	HATCHING	9			
5	LABELS	2			
SUBTOTAL		40			
TOTAL		98			
PENALTIES (-)					
FINAL TOTAL					
NAME					
NAME					6