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basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

**SENIOR CERTIFICATE EXAMINATIONS/
NATIONAL SENIOR CERTIFICATE EXAMINATIONS**

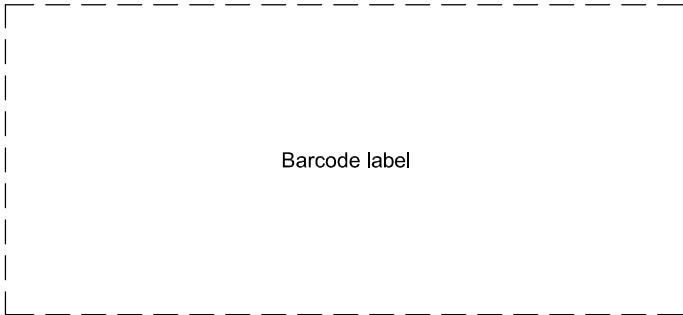
ENGINEERING GRAPHICS AND DESIGN P1

2021

MARKS: 100

TIME: 3 hours

This question paper consists of 6 pages.



Barcode label



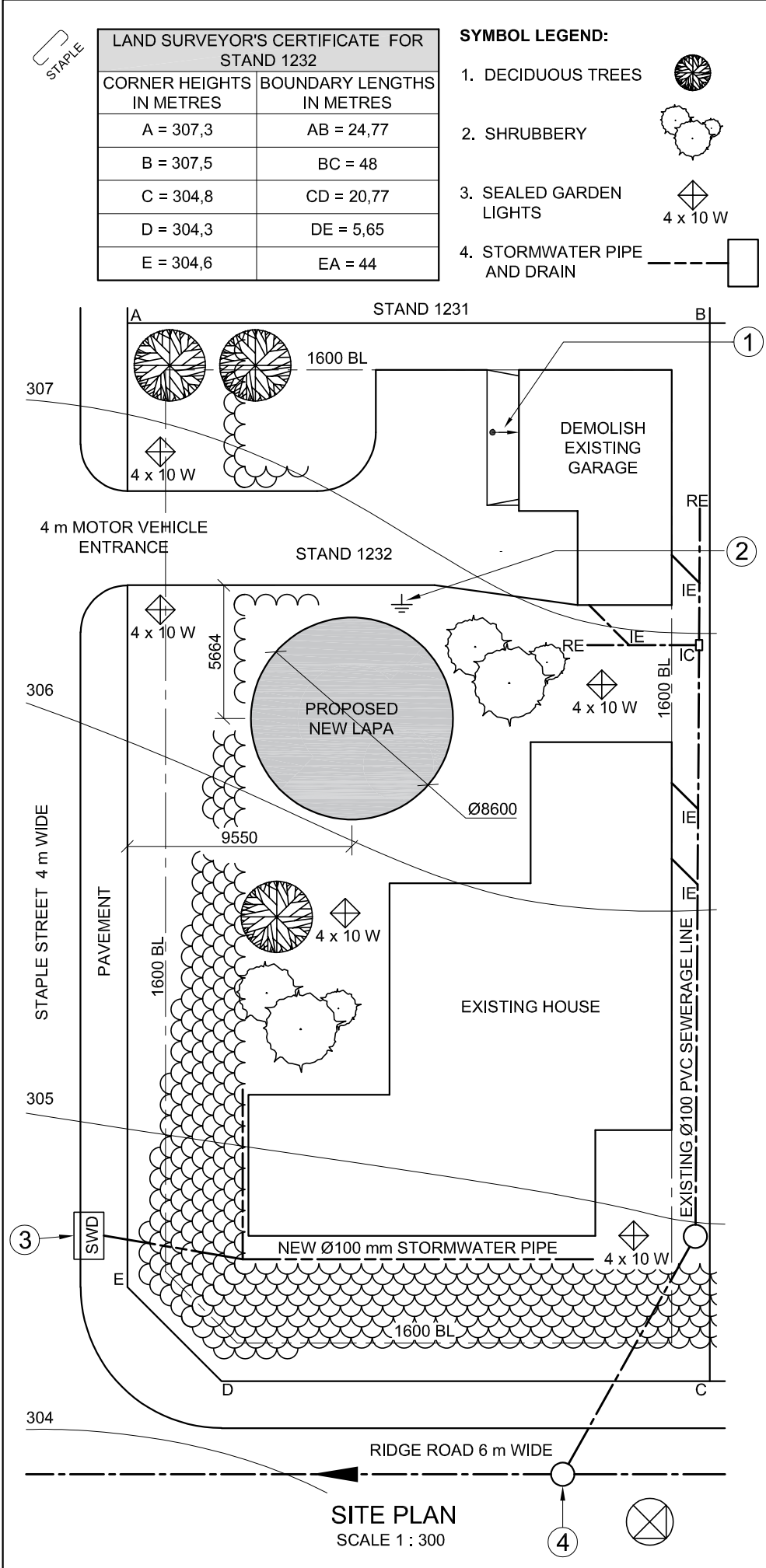
INSTRUCTIONS AND INFORMATION

- 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 prepared using pencil and 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, irrespective of whether the question was attempted or not, must be re-stapled in numerical sequence in the TOP LEFT-HAND CORNER ONLY.
- 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			$\frac{1}{2}$	SIGN	MODERATED			$\frac{1}{2}$	SIGN	RE-MARKING			$\frac{1}{2}$	SIGN
1															
2															
3															
4															
TOTAL															
	2	0	0			2	0	0			2	0	0		

FINAL CONVERTED MARK	CHECKED BY
100	

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

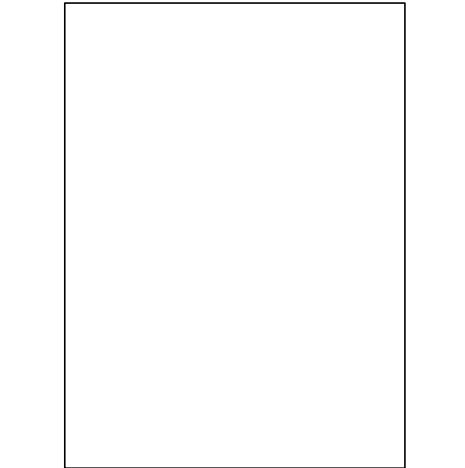


NOTE:
Contractors must verify all dimensions and levels on site before commencing work. Architects to be notified immediately of any discrepancies.

ARCHITECT'S SIGNATURE:

CLIENT'S SIGNATURE:

ANSWER 20
In the space below, draw, in neat freehand, the top view of the SANS 10143 graphical symbol for a GREASE TRAP.



3		
2	2020-11-18	ADD STORMWATER PIPE AND DRAIN
1	2020-11-17	REMOVE GARAGE
REVISION	DATE	DESCRIPTION
DRULOFF ARCHITECTS 69 WALTHER ROAD WILDERNESS www.druloffarch.co.za 043 445 0883		
PRINTED BY: INK-ON (PTY) LTD		DATE OF PRINT: 2020-12-28
DRAWING TITLE: SITE PLAN		
PROJECT: PROPOSED NEW LAPA FOR PETER PARKER ON STAND 1232, 4 STAPLE STREET, PLETTENBERG BAY, 4091		
PROJECT NUMBER: CRY-2020		DRAWING NUMBER: 8225
DATE: 2020-11-18	DRAWN: SHEILA	CHECKED: CRISPIN
REFERENCE CODE: SPDR-2020		SCALE: 1 : 300

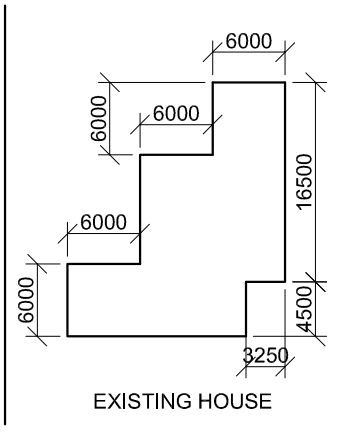
QUESTION 1: ANALYTICAL

Given:
The site plan of an existing house with a proposed new lapa, a title panel and a table of questions. The drawing is not presented to the indicated scale.

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

QUESTIONS		ANSWERS		
1	What was Sheila responsible for?	1		
2	Who printed the drawing?	1		
3	What is the date of the second revision?	1		
4	What scale is indicated for the drawing?	1		
5	What is the web address of the architectural firm?	1		
6	How wide is Ridge Road in millimetres?	1		
7	In which street is the main access to STAND 1232?	1		
8	How many sealed garden lights are shown on STAND 1232?	1		
9	In which two metric units are the dimensions on the site plan indicated?	2		
10	How should the garage have been presented to show that it has to be demolished?	1		
11	What does the arrow at 1 indicate?	1		
12	Name the symbol at 2.	1		
13	What does the abbreviation SWD at 3 stand for?	1		
14	What is the abbreviation for the sewerage feature at 4?	1		
15	What colour could be used to indicate new steel work on elevations?	1		
16	Which elevation of the existing house faces Staple Street?	2		
17	What is the fall of STAND 1232 from corner A to corner D in metres?	2		
18	In the space below (ANSWER 18), determine the perimeter of STAND 1232 in metres.	3		
19	In the space below (ANSWER 19), determine the total area of the existing house in square metres. Round off the answer to TWO decimal places.	4		
20	In the space in the title panel (ANSWER 20), draw, in neat freehand, the top view of the SANS 10143 graphical symbol for a GREASE TRAP.	3		
TOTAL		30		

ANSWER 18
Show ALL calculations.



ANSWER 19
Show ALL calculations.

EXAMINATION NUMBER
EXAMINATION NUMBER



QUESTION 2: SOLID GEOMETRY

Given:

- The front view of a right regular hexagonal prism with a right conical hole
- An auxiliary view
- Horizontal cutting plane C-C

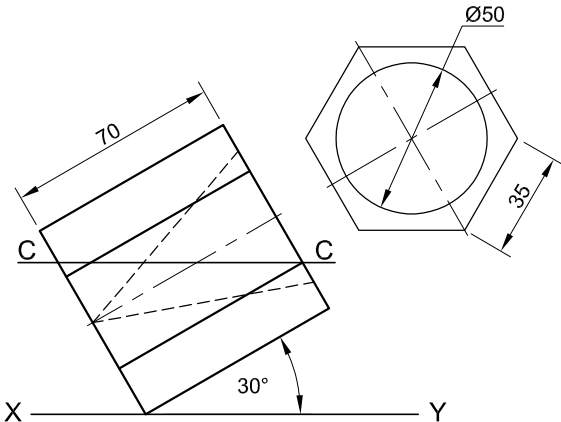
Instructions:

Draw, to scale 1 : 1, the following views of the solid:

- 2.1 The given front view
- 2.2 A sectional top view
- 2.3 The right view

- Planning is essential.
- Show ALL hidden detail.
- Show ALL construction.

[36]



ASSESSMENT CRITERIA					
1	AUXILIARY VIEW	2			
2	FRONT VIEW	5			
3	SECTIONAL TOP VIEW	16			
4	RIGHT VIEW	13			
PENALTIES (-)					
TOTAL		36			
EXAMINATION NUMBER					
EXAMINATION NUMBER					3





HL

GL

SP

Given:

PP – Picture plane

HL - Horizon line

GL – Ground line

SP – Station point

Complete the perspective drawing.

- Align the drawing sheet with the ground line (GL).
- Determine and label the vanishing points.
- Show ALL construction.
- Show ALL visible internal detail as seen through the opening and the glass.
- NO hidden detail is required. **[39]**

ASSESSMENT CRITERIA					
1	CONSTRUCTION	6			
2	LOWER SECTION	15			
3	UPPER SECTION	6			
4	ROOF	4 $\frac{1}{2}$			
5	ARC	7 $\frac{1}{2}$			
PENALTIES (-)					
TOTAL		39			

OPENING

GLASS

EXAMINATION NUMBER

EXAMINATION NUMBER

4

ROOF CAP
RIDGE COVER
150 x 100 mm GUTTER ON 250 x 20 mm FASCIA BOARD WITH Ø100 mm RWDP THAT STOPS 50 mm ABOVE THE GROUND LEVEL
WINDOW OPENING
FINISHED FLOOR LEVEL
GROUND LEVEL
SLIDING DOOR OPENING 250 x 150 mm STEP

INCOMPLETE NORTH ELEVATION

ROOM AND AREA DESIGNATIONS

FLOOR FINISHES
1 BEDROOM: VINYL
2 BATHROOM: TILE
3 LIVING AREA: TILE
4 COURTYARD: PAVING

INCOMPLETE FLOOR PLAN

FEATURES
D1 SLIDING DOOR
D2 DOOR
W1 WINDOW
W2 WINDOW
W3 WINDOW

FIXTURES
WC TOILET
WB WASH BASIN
B BATH
S SINK

ELECTRICAL FITTINGS
1. ONE-WAY SWITCH - SINGLE-POLE
2. ONE-WAY SWITCH - DOUBLE-POLE
3. FLUORESCENT LIGHT 2 x 40 W
4. CEILING LIGHT
5. WALL MOUNTED LIGHT
6. SWITCHED SOCKET OUTLET

NOTE:
THE ARROW SHOWS THE LIGHT CONNECTION TO THE SWITCH.

INCOMPLETE SCHEMATIC DIAGRAM OF A ROOF TRUSS AT CUTTING PLANE A-A

ROOF NOTES:
30° ROOF PITCH
115 x 40 mm ROOF TRUSSES ON 115 x 40 mm WALL PLATES
300 mm ROOF OVERHANG TO END OF ROOF TRUSS
20 mm FIBRE CEMENT ROOF SHEET ON 75 x 50 mm PURLINS @ 800 mm c/c
250 x 20 mm FASCIA BOARDS WITH 150 x 100 mm GUTTERS ON ALL SIDES
10 mm CEILING BOARD ON 40 x 40 mm BRANDING STRIPS @ 400 mm c/c

INCOMPLETE FOUNDATION AND EXTERNAL WALL DETAIL

DOOR AND WINDOW SCHEDULE

DOOR	WINDOW
SLIDING DOOR (D1)	WINDOW (W1)
DOOR (D2)	WINDOW (W2)
	WINDOW (W3)

WINDOW NOTES:
• A = OPENING SIDE
• B = FIXED PANEL
• ALL FRAMES 50 mm THICK
• 150 x 20 mm FIBRE CEMENT SILL UNDER ALL WINDOWS

ROOF COMPONENTS		ELECTRICAL SYMBOLS	
	250 x 20 mm FASCIA BOARD		
	150 x 100 mm GUTTER		
	75 x 50 mm PURLINS		
	ROOF CAP AND RIDGE COVER		

RAINWATER ITEMS

RAINWATER ITEMS

FIXTURES

FIXTURES

QUESTION 4: CIVIL DRAWING

- Given:**
- The incomplete north elevation of a **new house**, showing the walls, the window opening, the sliding door opening, the roof and labels
 - The incomplete floor plan showing the walls, positions of the doors, windows, fixtures and electrical layout
 - An incomplete schematic diagram of a roof truss at cutting plane A-A and roof notes
 - The incomplete foundation and external wall detail
 - Room and area designations and floor finishes
 - A door and window schedule
 - A table of roof components
 - A table of electrical symbols
 - A table of rainwater items
 - A table of fixtures
 - The incomplete floor plan and ground level of the **new house**, drawn to scale 1 : 50, and the incomplete foundation and break lines of a detailed section, drawn to scale 1 : 20, on page 6

- Instructions:**
Answer this question on page 6.
- 4.1 Using the given incomplete floor plan and ground level, draw, to scale 1 : 50, the following views of the **new house**:
- 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 COMPLETE NORTH ELEVATION**
Show the following features on the drawing:
- The outside walls, step, window and sliding door detail
 - The roof detail, including the fascia boards, gutters and rainwater down-pipes
 - The finished floor level
- 4.2 Using the incomplete foundation, draw, to scale 1 : 20 and between the break lines, the **DETAILED SECTION** on cutting plane A-A of the area in the ellipse shown on the incomplete floor plan.
- Show the following features on the drawing:**
- The paving, complete foundation, external wall and window detail
 - The courtyard wall to the east of cutting plane A-A
 - The roof detail, including all roof and rainwater items to the east of cutting plane A-A
 - ALL hatching detail. ONLY the substructure hatching may be drawn in neat freehand.

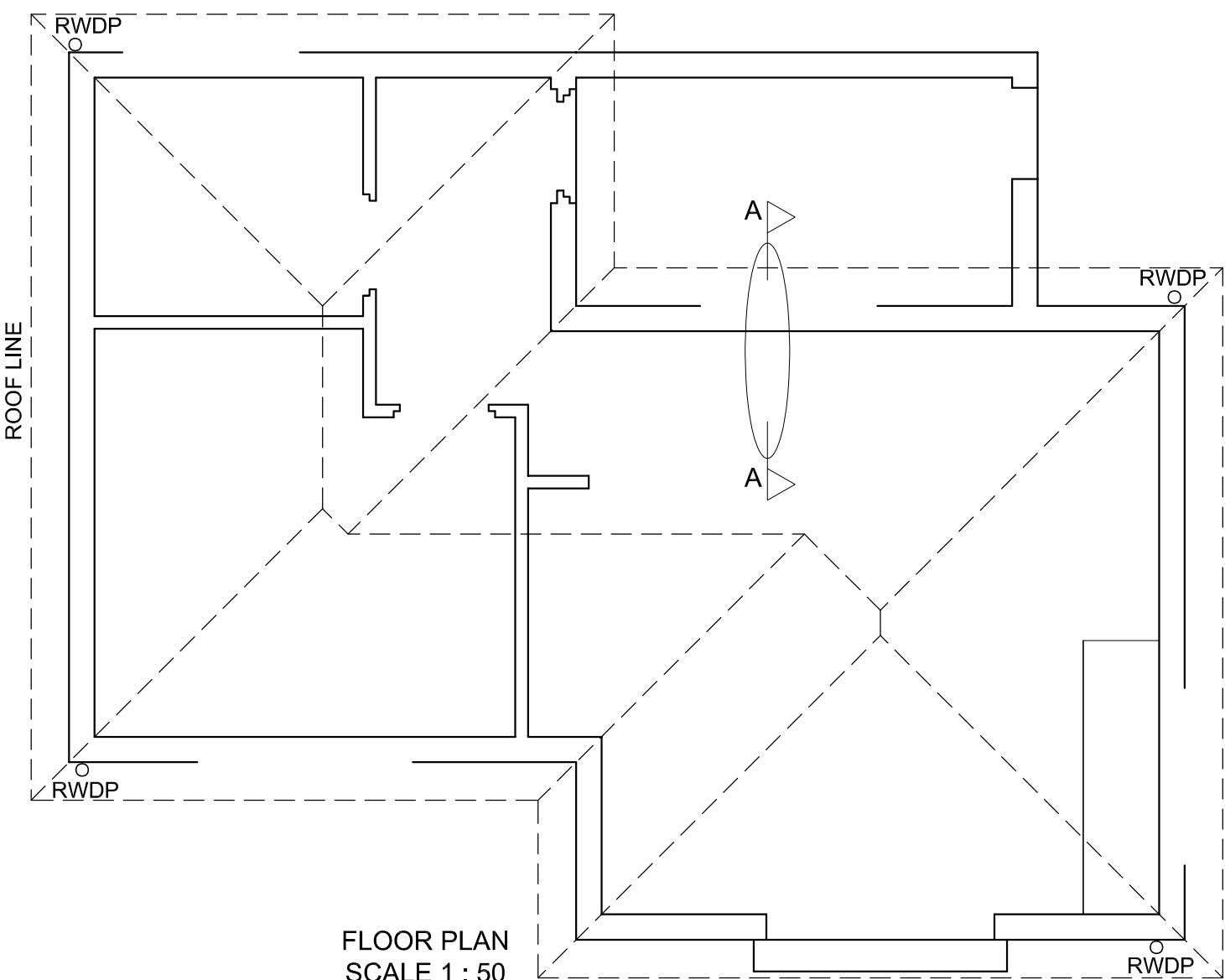
- Label the following:**
- The north elevation
 - The room designations and floor finishes
 - Ground level, finished floor level and damp-proof course (use the correct abbreviation and show it on ALL relevant views)

NOTE:
ALL drawings must comply with the **guidelines** and **graphical symbols** as contained in the **SANS 10143**. [95]

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GL



FLOOR PLAN
SCALE 1 : 50



SECTION A-A
SCALE 1 : 20

MARK ALLOCATION FOR SECTION OF ROOF		FOR OFFICIAL USE ONLY	
A		INCORRECT SCALE(S) USED	
B		NON-ALIGNMENT OF VIEWS	
C		VIEW(S) ROTATED	
D		SECTION VIEWED INCORRECTLY	
E		INCORRECT LETTERING	
F			
G			
H			
TOTAL		TOTAL	

ASSESSMENT CRITERIA					
FLOOR PLAN					
		POSSIBLE	OBTAINED	SIGN	MODERATED
1	DOORS + WINDOWS	13			
2	FIXTURES	8			
3	ELECTRICAL	8 1/2			
4	HATCHING	3			
5	LABELS	4			
SUBTOTAL		36 1/2			
NORTH ELEVATION					
1	ROOF + RWDP	11 1/2			
2	WALLS + STEP + FFL	4			
3	DOOR + WINDOW	8			
4	LABELS	1			
SUBTOTAL		24 1/2			
DETAILED SECTION					
1	ROOF DETAIL	14 1/2			
2	SLAB + WALL + WINDOW	11 1/2			
3	HATCHING	6 1/2			
4	LABELS	1 1/2			
SUBTOTAL		34			
TOTAL		95			
PENALTIES (-)					
GRAND TOTAL					
EXAMINATION NUMBER					
EXAMINATION NUMBER					6

