STAPLE

GAUTENG PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

JUNE EXAMINATION
GRADE 12
2024

ENGINEERING GRAPHICS AND DESIGN

PAPER 1

ENGINEERING GRAPHICS & DESIGN P1

C2771E

MARKS:100

TIME: 3 hours

X05

This question paper consists of 6 pages.

INSTRUCTIONS AND INFORMATION

1. The 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 must be re-stapled in numerical sequence and handed in irrespective of whether the question was attempted or not.
8. Time management is essential in order to complete all the questions.
9. Print your name and class 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		

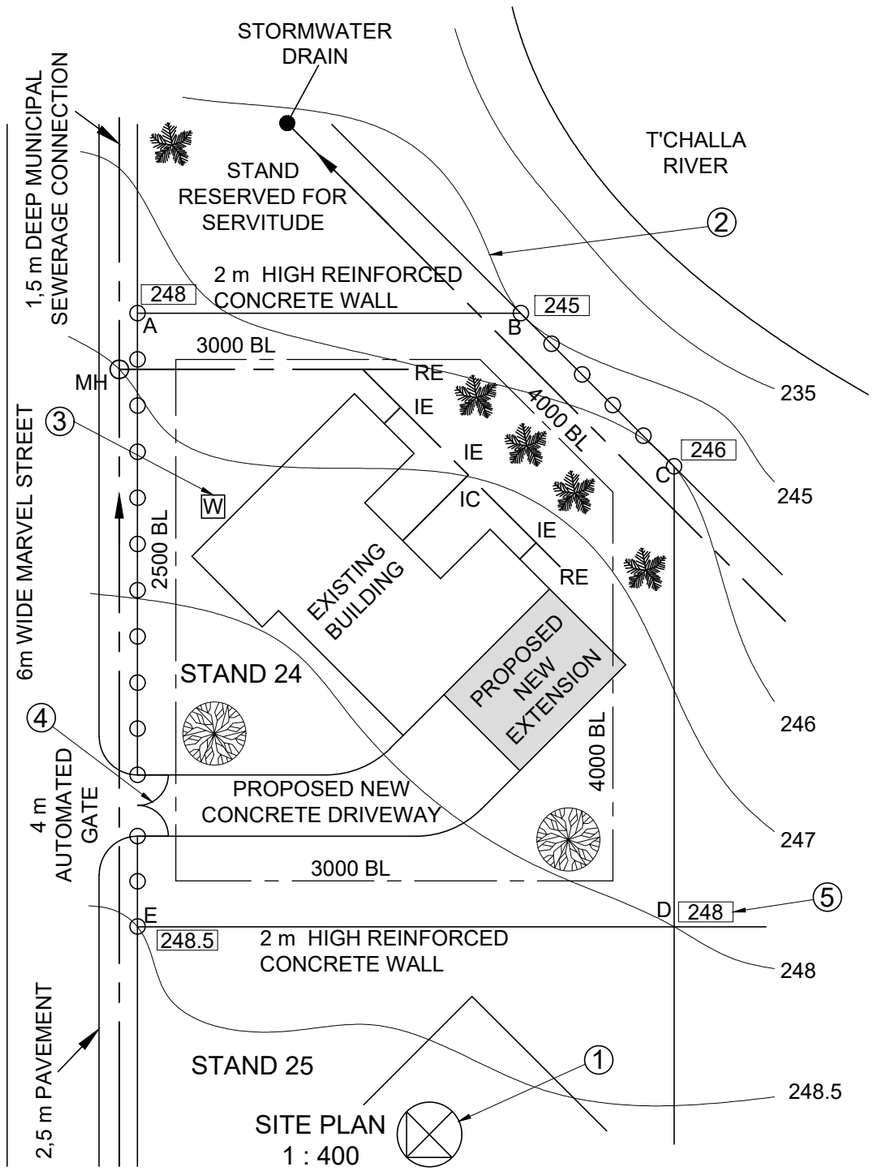
FINAL CONVERTED MARK	CHECKED BY
100	

COMPLETE THE FOLLOWING
NAME AND SURNAME
NAME AND SURNAME
CLASS AND TEACHER
CLASS AND TEACHER

DO NOT FOLD THE QUESTION PAPER IN HALF

LAND SURVEYOR'S CERTIFICATE OF THE BOUNDARY LENGTHS OF STAND NO. 24 SURVEYED ON 08-02-2023	
BOUNDARY LENGTHS IN MILLIMETRES	
AB	25000
BC	14142
CD	30000
DE	35000
EA	40000

SYMBOL LEGEND	
	PALM TREE
	DECIDUOUS TREE
	2 m HIGH ELECTRIC FENCE



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 22:
In the space below, draw, in neat freehand, the elevation and plan of the *SANS 10143* graphical symbol for a wall-mounted URINAL.

REVISION	DATE	DESCRIPTION
2	2023-06-22	ADD A NEW DRIVEWAY
1	2023-06-11	ADD A LEGEND

SPIDER ARCHITECTS
11 WEB STREET
NEW YORK
www.spidey.com
011 842 1565

PRINTED BY:	DATE OF PRINT:
HAWKEYE PRINTS	2024-04-25

DRAWING TITLE:
SITE PLAN

PROJECT:
PROPOSED NEW EXTENSION
FOR T. STARK
MARVEL STREET
CENTRAL CITY
2055

PROJECT NUMBER:	DRAWING NUMBER:
EGD2024P1-GDE	ACAD/DR/24-01

DATE:	DRAWN:	DATE:	CHECKED:
2024-02-01	DANVERS	2024-03-11	PARKER

REFERENCE CODE:	SCALE:
08 - EGD235 - 678	1 : 400

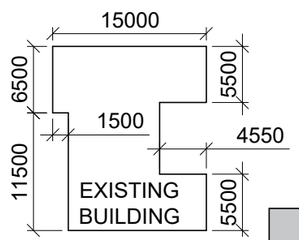
QUESTION 1: ANALYTICAL (CIVIL)

Given:
The site plan of an existing building with a proposed new extension, a title panel and a table of questions. The drawing has not been 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 scale is indicated for the site plan?		1	
2	In which city can the architectural company be found?		1	
3	Name the company that printed the site plan?		1	
4	Who is the client?		1	
5	What is the project number?		1	
6	What is the first revision?		1	
7	What does the symbol at 1 indicate?		1	
8	What is the width of Marvel Street in metres?		1	
9	Name the feature at 2.		1	
10	Which corner is the lowest corner on STAND 24?		1	
11	What does the abbreviation *IC* stand for?		1	
12	How many palm trees are on STAND 24?		1	
13	Name the feature at 3.		1	
14	What do the arcs at 4 indicate?		1	
15	What does the dimension at 5 indicate?		1	
16	With regards to the building regulations, why would the proposed new extension NOT be accepted?		1	
17	What natural feature is south of STAND 24?		1	
18	What does the arrow on the municipal sewer line indicate?		2	
19	Why can nothing be built on the STAND next to boundary AB?		2	
20	In the space below (ANSWER 20), determine the perimeter of stand 24 in metres.		3	
21	In the space below (ANSWER 21), determine the total area of the existing building in square meters.		3	
22	In the space in the title panel (ANSWER 22), draw, in neat freehand, the elevation and plan of the *SANS 10143* graphical symbol for a wall-mounted URINAL.		3	
		TOTAL	30	

ANSWER 20:
SHOW ALL CALCULATIONS.



ANSWER 21:
SHOW ALL CALCULATIONS.

NAME AND SURNAME
CLASS
2

QUESTION 2: SOLID GEOMETRY

Given:

- The front view of a right regular hexagonal prism and a right regular pentagonal pyramid.
- An auxiliary view for the front view of the prism.
- The top view of the pyramid, as well as the axis and an auxiliary view of the prism.
- Cutting plane C-C.

Specifications:

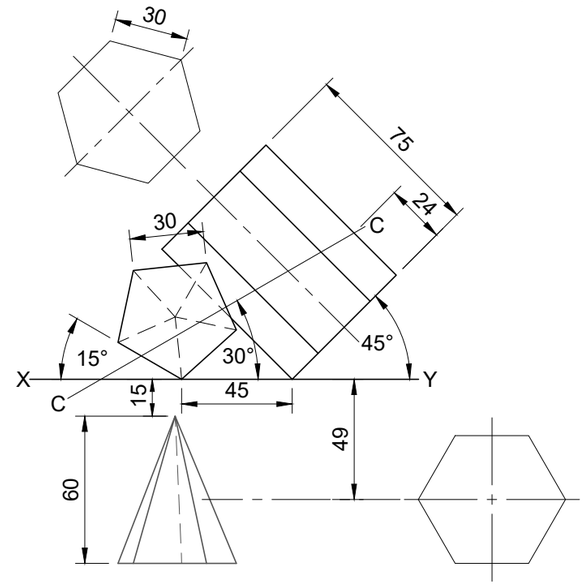
- The two solids do NOT touch.
- Both solids are cut by cutting plane C-C.

Instructions:

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

2.1 The given front view
2.2 A sectional top view
2.3 A sectional left view
2.4 The true shape of the cut surfaces of both solids

- Planning is essential.
- Show ALL hidden detail.
- Show ALL construction. **[38]**



ASSESSMENT CRITERIA				
1	FRONT VIEW + AUX	10		
2	SECTIONAL TOP VIEW	10 ½		
3	SECTIONAL LEFT VIEW	10 ½		
4	TRUE SHAPES	7		
	TOTAL	38		

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QUESTION 3: PERSPECTIVE

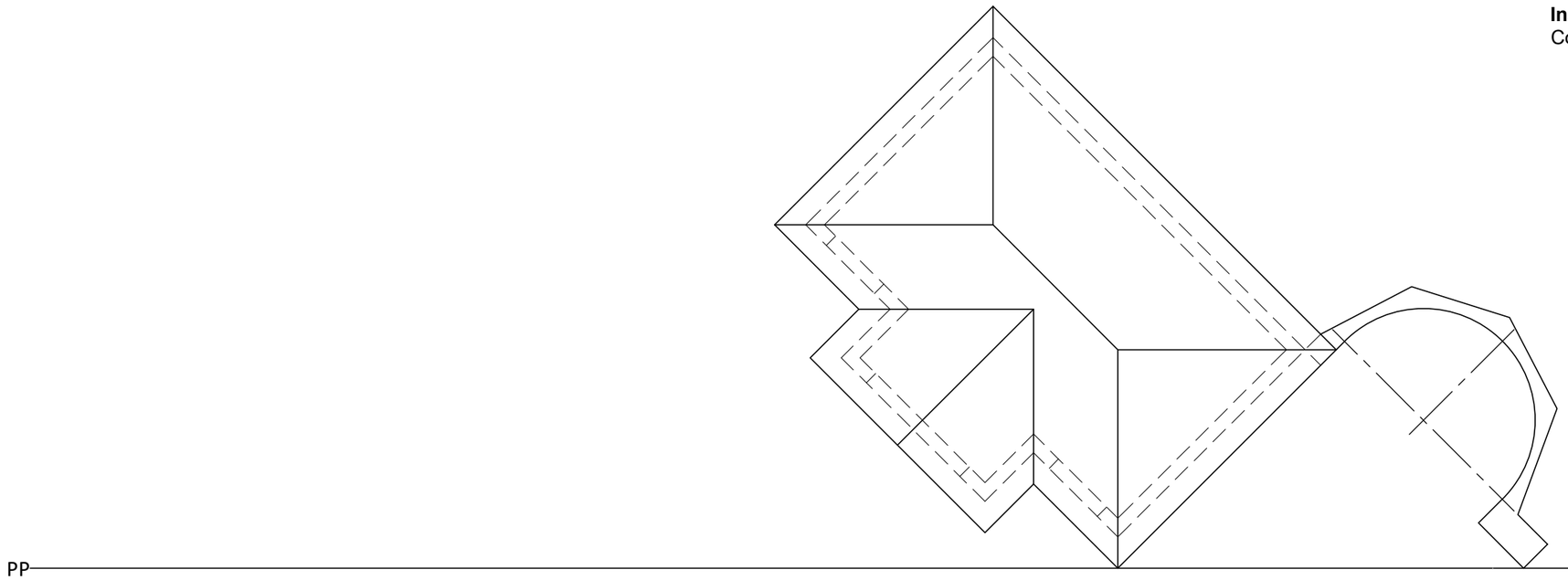
Given:
Two views of a house and the information needed to draw a two-point perspective drawing.

- 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 construction.
- Show the depth at the door and the window.
- No hidden or internal detail is required.

[38]



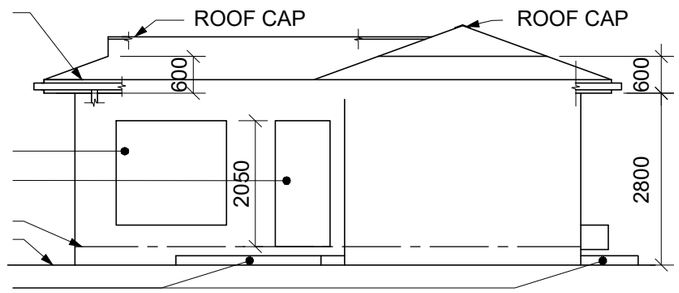
ASSESSMENT CRITERIA				
1	CONSTRUCTION	6		
2	WALLS, DOOR + WINDOW	20		
3	ROOF	6		
4	ARCH WALL	6		
	TOTAL	38		

NAME AND SURNAME
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150 x 100 mm GUTTER ON
220 x 20 mm FASCIA BOARD
WITH Ø100 RWDP THAT
STOPS 50 mm ABOVE THE
GROUND LEVEL

WINDOW OPENING
DOOR OPENING

FINISHED FLOOR LEVEL
GROUND LEVEL
150 mm HIGH CONCRETE
PORCH AND STEP



INCOMPLETE WEST ELEVATION

FEATURES

D	DOOR
W1	WINDOW
W2	WINDOW

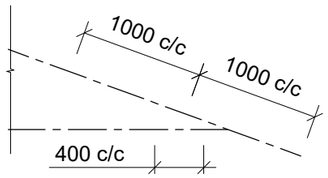
FIXTURES

WC	TOILET
WB	WASH BASIN
SH	SHOWER
S	SINGLE SINK
WT	WASH TUB

ELECTRICAL FITTINGS

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

NOTE:
THE ARROW SHOWS THE LIGHT CONNECTION TO THE SWITCH



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

ROOF NOTES:
ROOF PITCH 20°

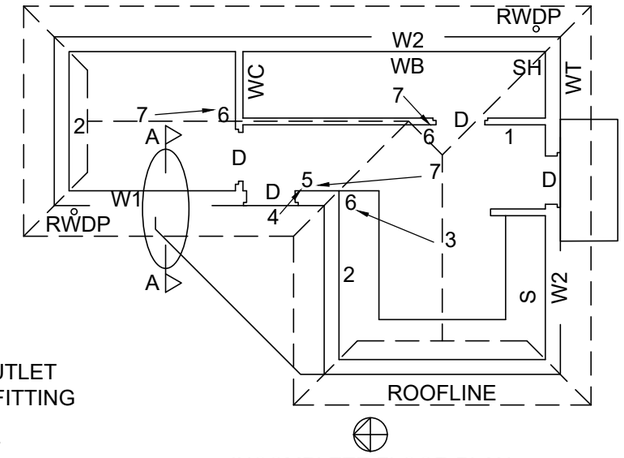
114 x 40 mm ROOF TRUSSES ON
114 X 40 mm WALL PLATES

500 mm ROOF OVERHANG TO END OF ROOF TRUSS

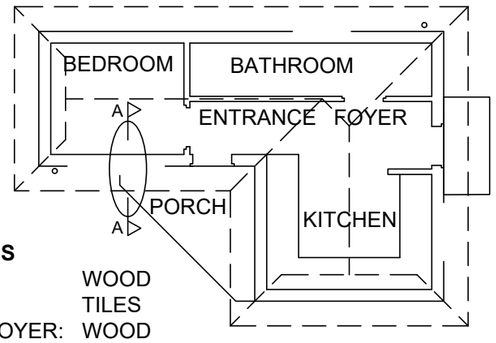
20 mm IBR ROOF SHEETING ON
80 x 50 mm PURLINS @1000 mm c/c

220 x 20 mm FASCIA BOARDS WITH
150 X 100 mm GUTTERS ON ALL SIDES

10 mm CEILING BOARDS ON 40 x 40 mm BRANDERING STRIPS @ 400 mm c/c



INCOMPLETE FLOOR PLAN



ROOM DESIGNATIONS

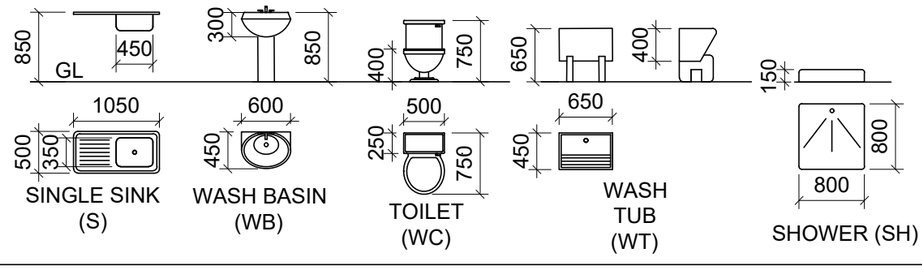
FLOOR FINISHES

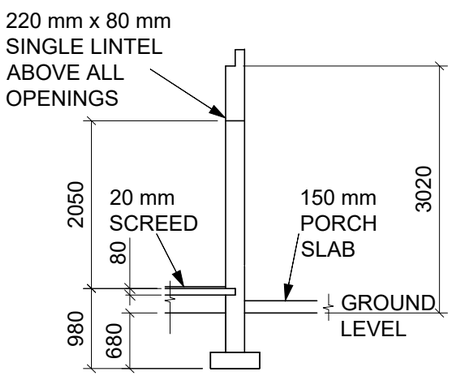
1. BEDROOM:	WOOD
2. BATHROOM:	TILES
3. ENTRANCE FOYER:	WOOD
4. KITCHEN:	WOOD
5. PORCH:	SLATE

ROOF COMPONENTS	
500	ROOF CAP
	FASCIA BOARD 220 x 20
	GUTTER 150 x 100

ELECTRICAL SYMBOLS	
W	n x 40W

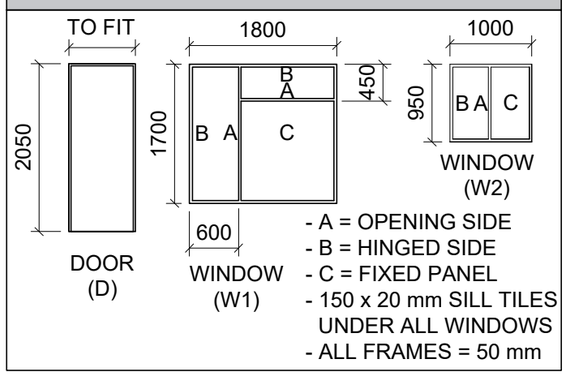
FIXTURES





INCOMPLETE FOUNDATION AND EXTERNAL WALL DETAIL

DOOR AND WINDOW SCHEDULE



QUESTION 4 - CIVIL DRAWING

Given:

- The incomplete west elevation of a house showing the walls, the window and door openings, the porch, the step and wash tub, the roof and labels
- An incomplete floor plan, showing the walls, the position of the windows, doors and fixtures, the electrical layout and the complete roof line
- An incomplete schematic diagram of a roof truss at cutting plane A-A and roof notes
- Room designations and floor finishes
- A table of roof components and a table of electrical symbols
- A table of fixtures
- An incomplete foundation and external wall detail
- A door and window schedule
- The incomplete floor plan, drawn to scale 1 : 50, and the incomplete foundation and break lines of the 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 house:

4.1.1 **THE COMPLETE FLOOR PLAN**
Add the following features to the drawing:

- All doors, windows and the roof lines
- The fixtures as indicated by the abbreviations
- ALL electrical fittings as indicated by the numbers
- ALL hatching detail

4.1.2 **THE COMPLETE WEST ELEVATION**
Add the following features to the drawing:

- The outside walls, door and window detail
- The porch, step and wash tub detail
- The roof detail, including the roof cap, the rainwater down-pipe, gutters and fascia boards
- The finished floor level

4.2 Using the incomplete foundation and break lines on page 6, draw to scale 1 : 20, **A 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 complete foundation and external wall detail
- The window and the porch detail
- The roof detail, including the fascia board and the gutter
- The door frame, and the rest of porch to the right (south) of cutting plane A-A
- Do NOT show the roof to the right (south) of cutting plane A-A
- ALL hatching detail. ONLY the substructure hatching may be drawn in neat freehand

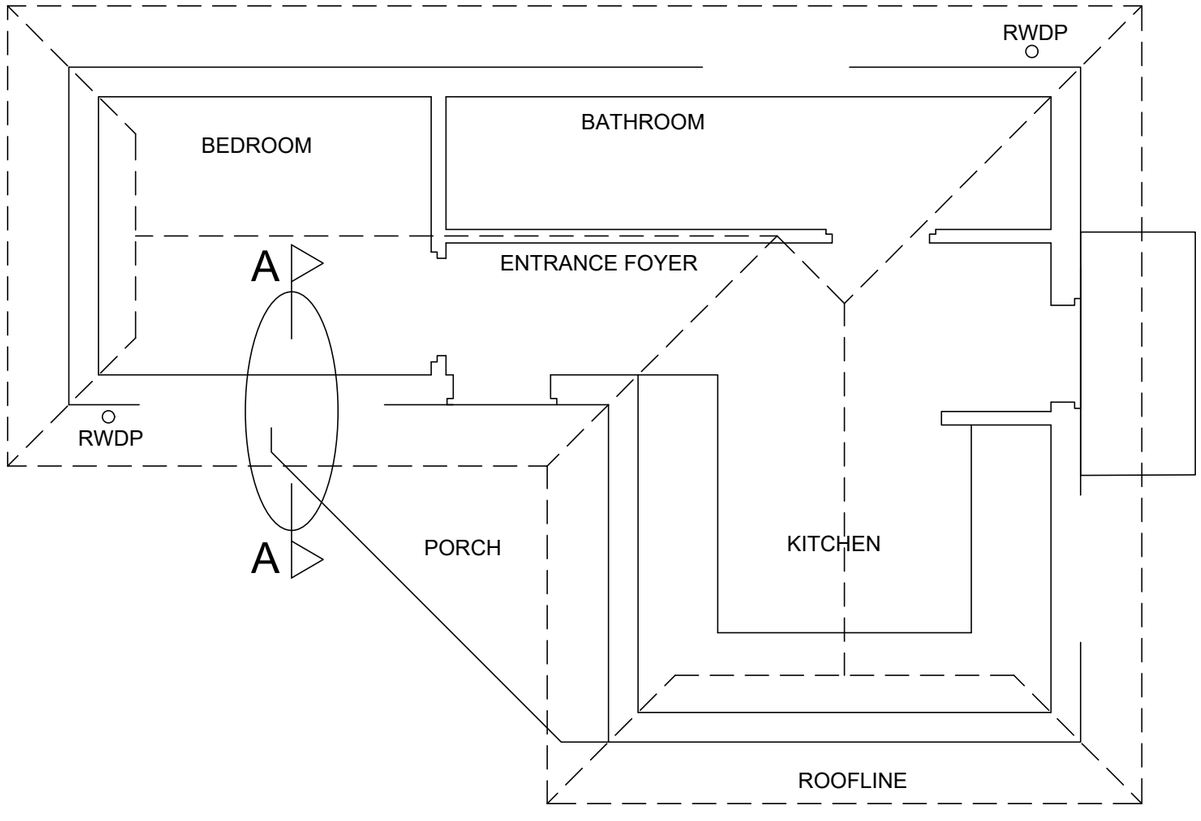
Label the following:

- The west elevation
- The floor finishes
- Ground level, finished floor level and the damp-proof course (use the correct abbreviations and show it on all relevant views)

NOTE:

- ALL drawing must comply with the **guidelines** and **graphical symbols** contained in the *SANS 10143*.
- No hidden detail is required. **[94]**

GL



FLOOR PLAN
SCALE 1 : 50

SECTION ON A-A
SCALE 1 : 20

ROOF DETAIL			
A	ROOF ANGLE	1	
B	ROOF COVER & PURLINS	2	
C	RAFTER AND TIE BEAM	3 ½	
D	FASCIA, GUTTER & RWDP	2	
E	BRANDERING, WALL PLATE & CEILING	2	
SUBTOTAL		10 ½	

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INCORRECT SCALE (-2)	
NON-ALIGNMENT OF VIEWS (-2)	
VIEWS ROTATED (-2)	
SECTION VIEWED INCORRECTLY(-2)	
INCORRECT LETTERING (-1)	
BREAK LINE (-1)	
TOTAL	

ASSESSMENT CRITERIA			
FLOOR PLAN			
		POSSIBLE	OBTAINED
1	DOORS + WINDOWS + ROOF LINE	15 ½	
2	FIXTURES	9	
3	ELECTRICAL	9	
4	HATCHING	3	
5	LABELS	2 ½	
SUBTOTAL		39	
WEST ELEVATION			
1	ROOF + RWDP	10	
2	WALLS + FFL + PORCH + WASH TROUGH	6 ½	
3	DOOR + WINDOW	7 ½	
4	LABELS	1	
SUBTOTAL		25	
DETAILED SECTION A-A			
1	ROOF DETAIL	10 ½	
2	FOUNDATION + WALL + DOOR + FIXTURE	9 ½	
3	WINDOW & DOOR	3	
4	HATCHING	6	
5	LABELS	1	
SUBTOTAL		30	
PENALTIES (-)			
TOTAL		94	
NAME AND SURNAME			
CLASS			

END