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GRADE 12

ENGINEERING GRAPHICS AND DESIGN P1

SEPTEMBER 2022

PREPARATORY EXAMINATION

MARKS: 200

TIME: 3 hours

This question paper consists of 6 pages.

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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. ALL drawings are in first angle orthographic projection, unless stated otherwise.
5. ALL drawings must be prepared using pencil and instruments, unless otherwise stated.
6. All answers must be drawn accurately and neatly.
7. The questions must be answered on the question paper, as instructed.
8. All the answer sheets must be re-stapled in numerical sequence and handed in irrespective of whether the question was attempted or not.
9. Time management is essential in order to complete all the questions.
10. Print your name in the block provided on every ANSWER SHEET.
11. Any details or dimensions not given, must be assumed in good proportion.

FOR OFFICIAL USE ONLY

					MODERATED MARK
1					
2					
3					
4					
TOTAL					
2 0 0					2 0 0

**FINAL CONVERTED
MARK**

CHECKED BY

100

COMPLETE THE FOLLOWING:

NAME

NAME

EXAMINATION CENTRE

EXAMINATION CENTRE

DIMENSION LAYOUT OF THE STAFF PARKING AREA

Overall width: 31300
 Overall depth: 4400
 Left side extension: 5200
 Bottom-left extension: 3800
 Bottom-right extension: 2700
 Internal vertical dimensions: 3200 and 3000
 Central area: STAFF PARKING AREA

LAND SURVEYOR'S CERTIFICATE OF THE SIDE LENGTHS AND CORNER HEIGHTS OF STAND 121 SURVEYED ON 2021-11-16	
LENGTHS IN MILLIMETRES	CORNER HEIGHTS IN METRES
AB = 42200	A = 342,5
BC = 93500	B = 345,1
CD = 42200	C = 345,8
AD = 93500	D = 341,9

CLIENT'S SIGNATURE

MLANDWA ARCHITECTS
21 SEDIDI STREET
ALEXANDRIA
082 222 7888
mmlandwa.architect@hotmail.com

PROJECT:
PROPOSED NEW DEVELOPMENT
FOR MRS DLAYEDWA
STAND 121, Cnr. VOORTREKKER &
KROG STREET ALEXANDRIA

PROJECT NUMBER: 02-2022		DRAWING NUMBER: DEL011-2021	
DATE: 2021-11-21	DRAWN: RONNIE	CHECKED: DLABA	SCALE: 1 : 300
REFERENCE CODE: SITE- 121A-22		DRAWING NO.: 1 OF 6	

Complete the table below by neatly answering the questions which refer to the accompanying drawing and title block. **[29]**

QUESTIONS		ANSWERS		
1	Who is the architect of the development on STAND 121?		1	
2	Who is the owner of the development?		1	
3	What is the reference code?		1	
4	What is the width of the pavement in meters?		1	
5	The existing workshop is drawn with hidden lines. What does the hidden lines mean to the contractor?		2	
6	Name the feature at 1.		1	
7	How many sliding gates need to be installed?		1	
8	What type of fence must be used between the new proposed dwellings?		1	
9	In what colour should the new proposed dwellings be indicated on the site plan?		1	
10	How many parking bays for disabled are there for the visitors?		1	
11	How many inspection chambers must be installed at the new proposed dwellings?		1	
12	Name the type of material that must be used as a ground cover under the trees, around the parking area.		1	
13	With reference to the north point, on which side of the shopping centre is the staff parking area?		2	
14	Determine the total length (indicated with an X) of the shopping centre, in meter.		2	
15	The existing house is already fenced with a palisade fence. Determine, in the space below (ANSWER 15) how many meters of palisade fence need to be purchased to fence the two new dwellings. The Kerkhof street side already has betafence and do not need palisade.		3	
16	In the space provided below (ANSWER 16), determine the total area of the staff parking area , in square meters. See dimension layout of staff parking.		5	
17	In the space in the title panel (ANSWER 17), draw in neat freehand, the front and top view of the SANS 10143 graphical symbol for a BATH.		4	

ANSWER 15 Show ALL calculations.	ANSWER 16 Show ALL calculations.	TOTAL	29
		NAME	
		NAME	

QUESTION 2: SOLID GEOMETRY

Given:

- The front view and top view of a square prism with a cylindrical hole.
- Starting point **X**, the centre point of the cylindrical hole.

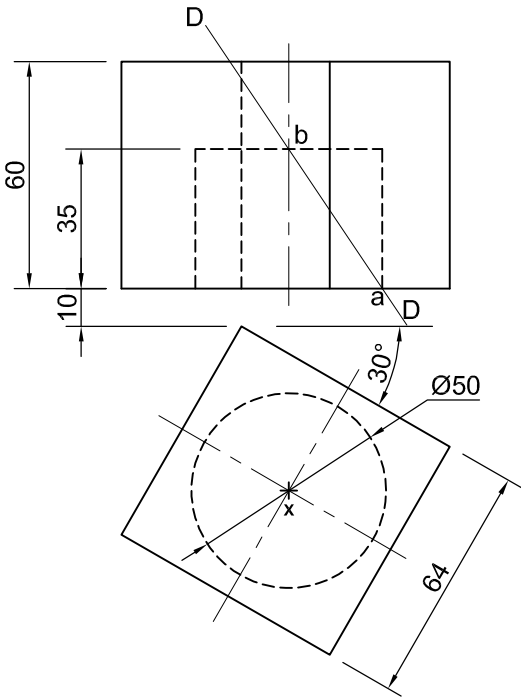
Instructions:

Draw to scale 1 : 1, the following views:

- 2.1 The top view.
- 2.2 The front view with the cutting line (Draw the cutting line through points **a** and **b**.
- 2.3 The sectional right view on cutting plane D-D
- 2.4 The true shape of the cutting area.

- Show ALL centre lines and hidden detail.
- Show ALL necessary construction lines.

[31]



+
X

ASSESSMENT CRITERIA					
1	TOP VIEW	4 ¹ / ₂			
2	FRONT VIEW	6			
3	SECTIONAL RIGHT VIEW	12			
4	TRUE SHAPE	8 ¹ / ₂			
PENALTIES (-)					
TOTAL		31			

NAME	
NAME	3

QUESTION 3: PERSPECTIVE

Given:

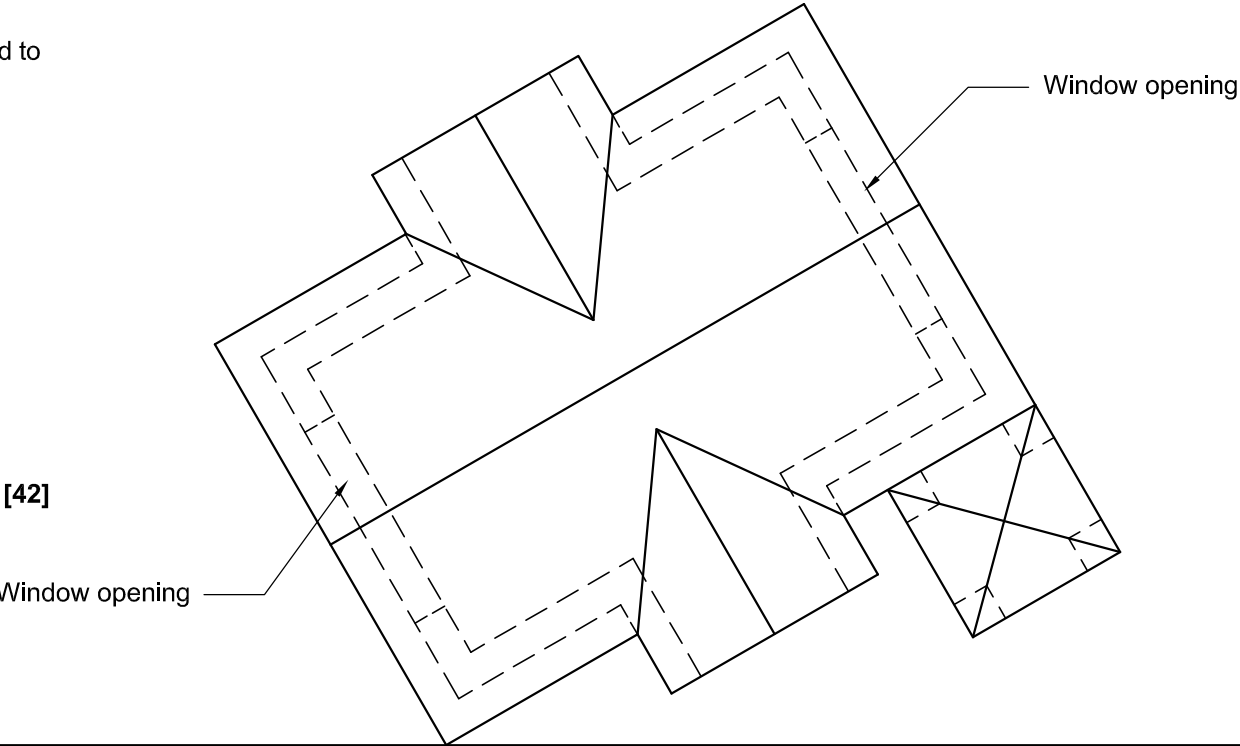
- Two views of a small chapel and the information needed to draw a two-point perspective drawing.

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.
- NO hidden detail is required.



[42]

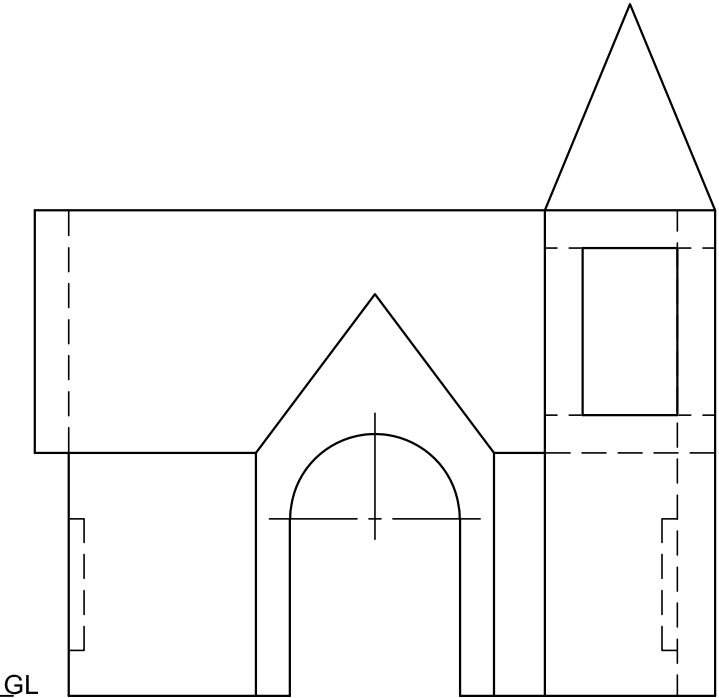
Window opening

Window opening

ASSESSMENT CRITERIA					
1	CONSTRUCTION + VP's	5			
2	WALLS + WINDOW	11			
3	ROOF	7 ¹ / ₂			
4	TOWER	14			
5	ARCH + CONSTRUCTION	4 ¹ / ₂			
PENALTIES (-)					
TOTAL		42			

PP

HL



GL

+

SP

NAME

NAME

4

QUESTION 4: CIVIL DRAWING

Given:

- The incomplete west elevation of a **new house**, showing the walls, windows and door openings, the braai area, the roof and labels.
- The incomplete floor plan showing the walls, step, position of the doors, windows, fixtures and the electrical layout.
- A schematic diagram of the roof truss and roof notes.
- The incomplete foundation and external wall with dimensions.
- Room designations as well as floor finishes.
- A door and window schedule
- A table of sanitary fixtures
- A table of roof components
- A table of electrical symbols
- A table of rainwater items
- The incomplete floor plan and ground line of a **new house**, drawn to scale 1 : 50, and the incomplete foundation and a break line for the for the detailed section, drawn to scale 1 : 20, on page 6.

Instructions:

Answer this question on page 6.

4.1 Use the given incomplete floor plan, to draw, in first-angle orthographic projection 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 sanitary fixtures as indicated by the abbreviations
- ALL electrical fittings as indicated by the numbers
- The complete roof line
- ALL hatching detail

4.1.2 THE COMPLETE WEST ELEVATION

Show the following features on the drawing:

- The outside walls, braai, slidingdoor,step and window detail.
- The roof detail, including the fascia boards, ridge cover, gutters, rainwater down-pipe and gully.
- The finished floor level.

4.2 Using the given foundation and break line 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:

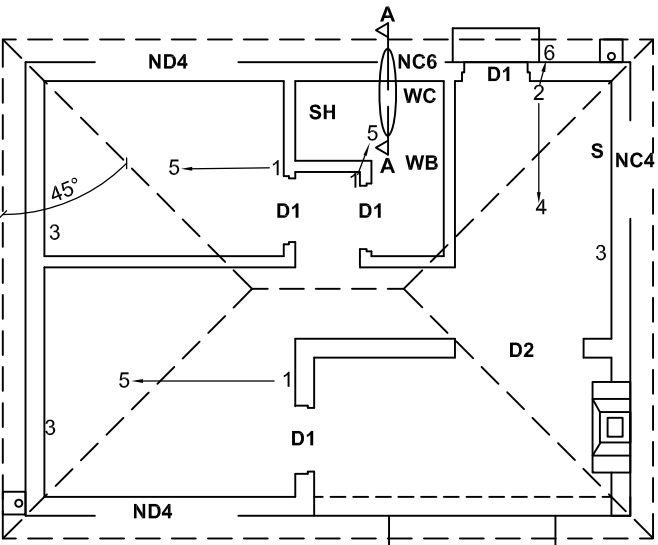
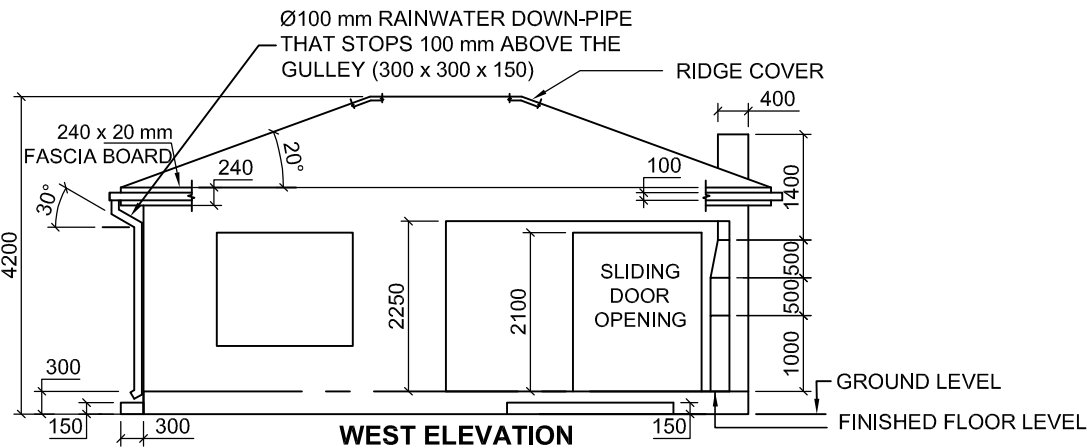
- The complete foundation, external wall, lintel and window detail.
- The shower to the north of the cutting plane **A-A**
- The roof detail, including the fascia board and gutter.
- ALL hatching detail. ONLY the substructure hatching may be drawn in neat freehand.

Label the following:

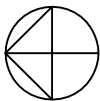
- The west elevation
- The room designations and floor finishes.
- Ground level, finished floor level and damp proof course (use the correct abbreviations and show it on ALL the relevant views)

NOTE:

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



FLOOR PLAN
SCALE 1 : 50



ROOF NOTES:

20° ROOF PITCH.

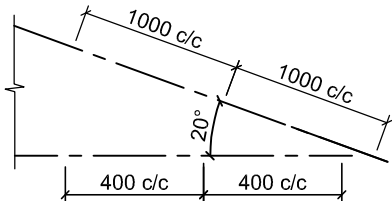
114 x 38 mm ROOF TRUSSES ON
114 x 38 mm WALL PLATES.

300 mm ROOF OVERHANG TO THE END OF THE ROOF TRUSS

ROOF COVER: 20 mm FIBRE CEMENT ROOF SHEETING
ON 75 x 50 mm PURLINS @ 1000 mm c/c.

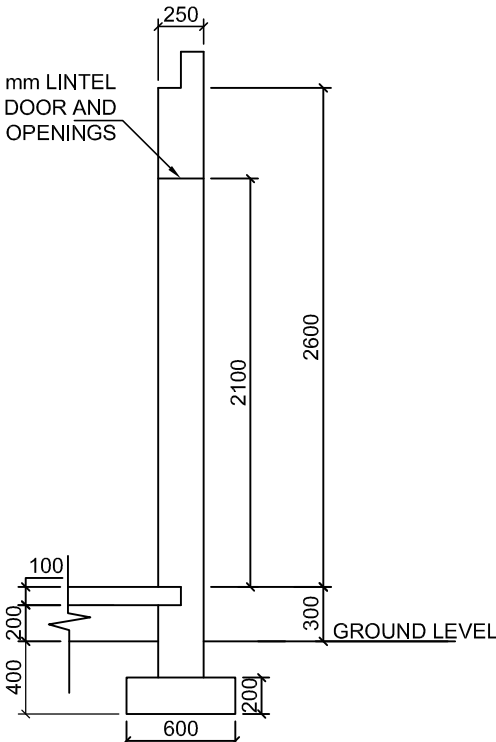
240 x 20 mm FASCIA BOARD WITH 150 X 100 mm GUTTERS ON ALL
SIDES AND A Ø100 mm RAINWATER DOWN-PIPE

10 mm CEILING BOARD ON 38 x 38 mm BRANDING @ 400 mm c/c.

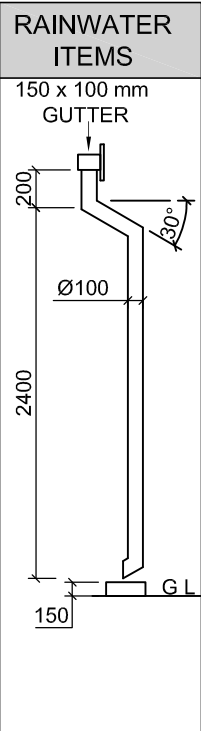


SCHEMATIC DIAGRAM OF THE
ROOF TRUSS FOR ROOF

1 X 250 x 100 mm LINTEL
ABOVE ALL ARCH, DOOR AND
WINDOW OPENINGS



DIMENSION GUIDE:
INCOMPLETE FOUNDATION AND
EXTERNAL WALL DETAIL



RAINWATER
ITEMS

DOOR AND WINDOW SCHEDULE			
TO FIT		TO FIT	1800 1200 500 1500
DOOR (D1)		SLIDING DOOR (D2)	WINDOW (ND4)
			1200 400 300 950
			WINDOW (NC4)
			800 300 950
			WINDOW (NC6)
WINDOW NOTES A = OPENING SIDE B = FIXED PANE THICKNESS OF ALL FRAMES: 50 mm			
WINDOW SILL: 180 x 20 mm FIBRE CEMENT SILL UNDER ALL WINDOWS			

ROOM DESIGNATIONS AND FLOOR FINISHES	
1. KITCHEN:	TILES
2. BATHROOM:	TILES
3. BEDROOM:	CARPET
4. LIVING AREA:	WOOD
5. BRAAI:	TILES
FLOOR PLAN	

ROOF COMPONENTS	
240 x 20 mm FASCIA BOARD	
300 ROOF CAP AND RIDGE COVER	
150 x 100 GUTTER	

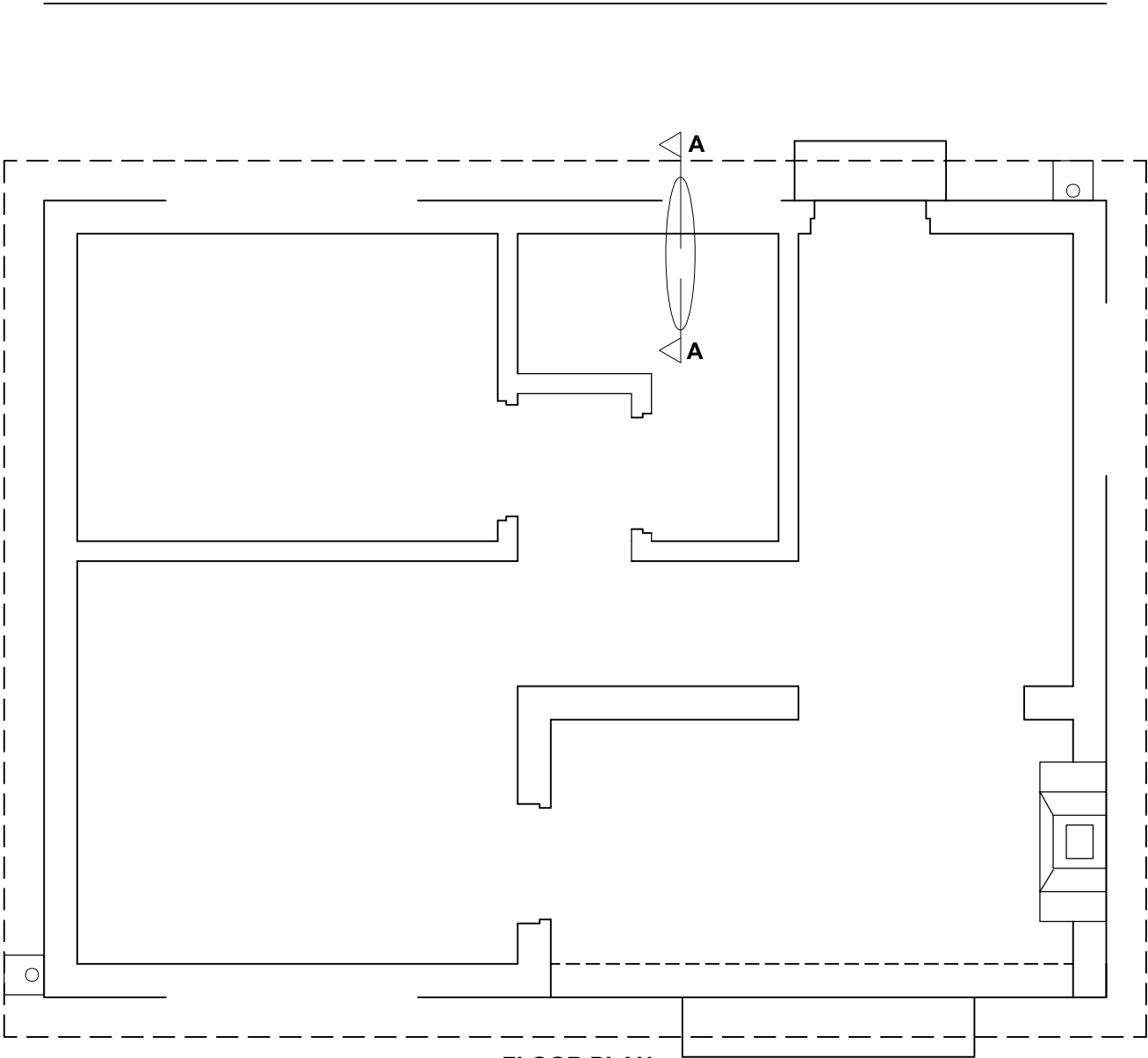
ELECTRICAL SYMBOLS	
ONE-WAY SWITCH - SINGLE-POLE	ONE-WAY SWITCH - DOUBLE-POLE
SWITCHED SOCKET OUTLET	FLUORESCENT LIGHT 1 x 40 W
CEILING LIGHT	WALL-MOUNTED LIGHT

SANITARY FIXTURES			
SHOWER (SH)	WASH BASIN (WB)	TOILET (WC)	SINK (S)
800 2050 100	500 850 200	400 750 400	900 400 130
800 800	400 400	600 200	500 350 1200

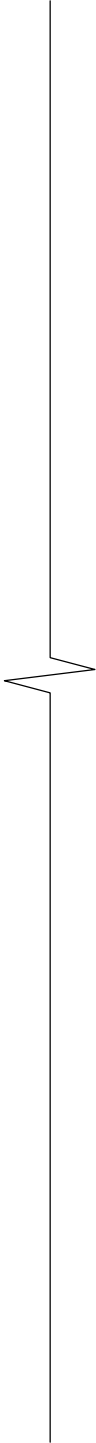
ROOF DETAIL: MARK ALLOCATION									
A	ROOF ANGLE	$\frac{1}{2}$		F	CEILING BOARD	$\frac{1}{2}$			
B	ROOF SHEET	1		G	WALL PLATE	1			
C	ROOF TRUSS	3		H	FACIA BOARD	1			
D	PURLIN + SPACING	$1\frac{1}{2}$		I	GUTTER	1			
E	BRANDERING + SPACING	$1\frac{1}{2}$							
TOTAL						11			

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

ASSESSMENT CRITERIA				
FLOOR PLAN				
1	DOORS + WINDOWS	14		
2	ELECTRICAL + ROOF LINES	11		
3	FIXTURES	7		
4	HATCHING	3		
5	LABELS	5		
SUBTOTAL		40		
NORTH ELEVATION				
1	ROOF + GUTTER + RWDP + GULLEY FACIA BOARD + RIDGE COVER	10		
2	WALLS + PORCH + BRAAI + FFL	$9\frac{1}{2}$		
3	DOOR + WINDOW	$7\frac{1}{2}$		
4	LABELS	1		
SUBTOTAL		28		
DETAILED SECTION				
1	ROOF DETAIL	11		
2	FOUNDATIONS + WALLS + FLOOR	$6\frac{1}{2}$		
3	WINDOW + SHOWER	5		
4	HATCHING	6		
5	LABELS	$1\frac{1}{2}$		
SUBTOTAL		30		
TOTAL		98		
PENALTIES (-)				
GRAND TOTAL				



FLOOR PLAN
SCALE 1 : 50



DETAILED SECTION A-A
SCALE 1 : 20

NAME	
NAME	6