



basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

NATIONAL
SENIOR CERTIFICATE

GRADE 12

ENGINEERING GRAPHICS AND DESIGN P1

FEBRUARY/MARCH 2015

MARKS: 100

TIME: 3 hours

This question paper consists of 6 pages.

INSTRUCTIONS AND INFORMATION

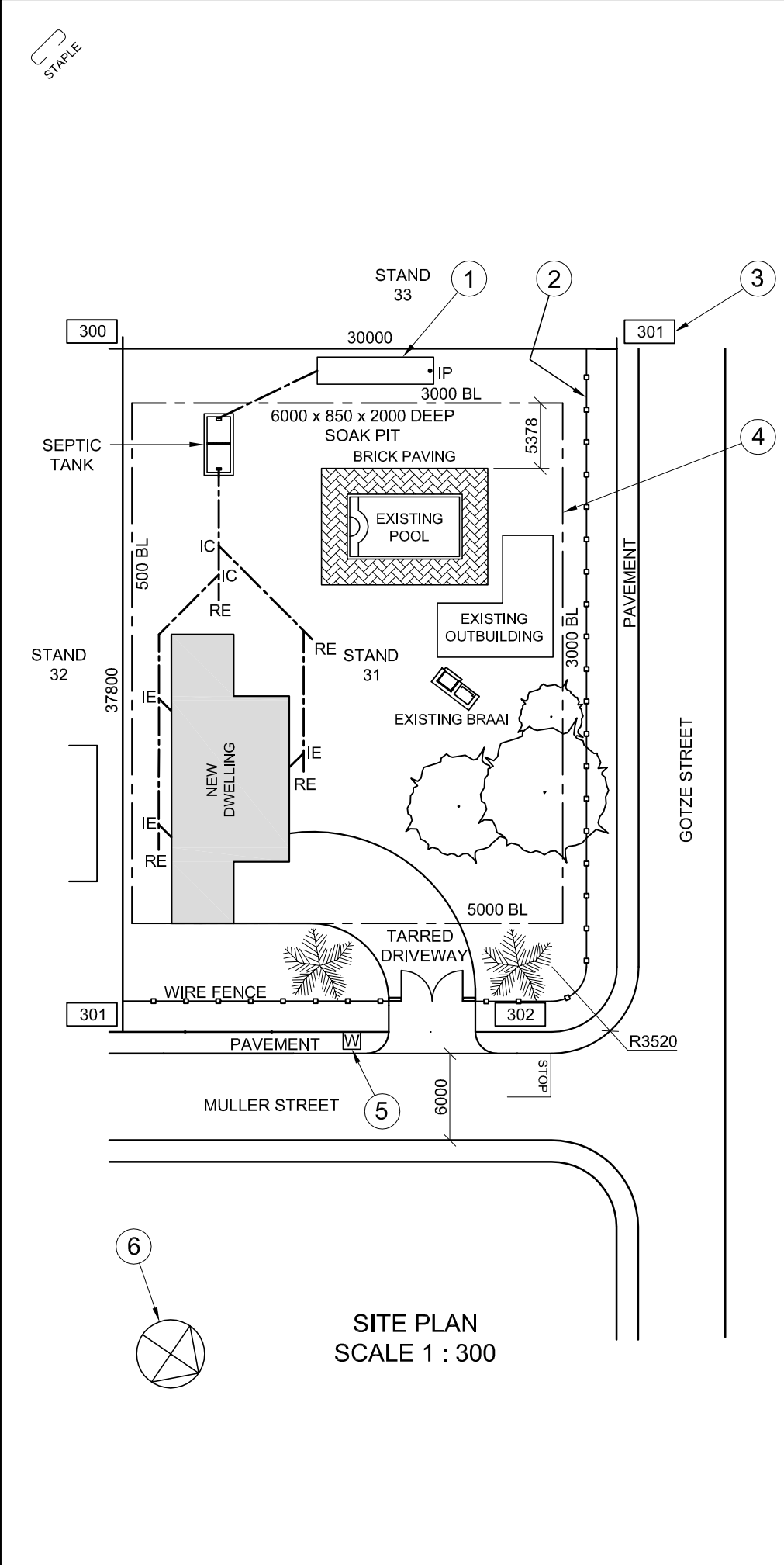
1. This question paper consists of FOUR questions.
2. Answer ALL the questions.
3. ALL drawings are in first-angle orthographic projection, unless otherwise stated.
4. ALL drawings must be completed using instruments, unless otherwise stated.
5. ALL answers must be drawn accurately and neatly.
6. ALL the questions must be answered on the QUESTION PAPER as instructed.
7. ALL the pages must be re-stapled in numerical sequence, irrespective of whether the question was attempted.
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			½	SIGN	MODERATED			½
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	



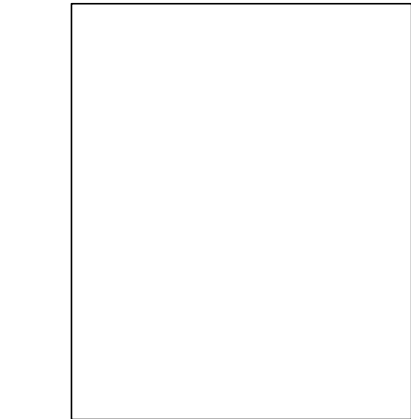


NOTE:
Contractors must verify all dimensions and levels on site before commencing work.
Architects to be notified immediately of any discrepancies.

ARCHITECT'S SIGNATURE

CLIENT'S SIGNATURE

ANSWER 20
In the space provided below, draw, in neat freehand, the front view and top view of the SANS 10143 graphical symbol for a DOUBLE SINK.



3		
2	2014-12-07	Include a soak pit
1	2014-11-09	Change driveway
REVISION	DATE	DESCRIPTION

TONY KROOS & ASSOCIATES

ARCHITECTS

1 BAYERN DRIVE

13 - 16 MUNICH GARDENS

NEW GERMANY

PINETOWN

07 913 13 130

tonykroos@bundes.com

PRINTED BY	DATE OF PRINT
FUSSBAL PRINTERS	2015-02-12

DRAWING TITLE
SITE PLAN

PROJECT

PROPOSED DWELLING FOR MR RIBERY ON STAND 31, CNR MULLER STREET AND GOTZE STREET.

PROJECT NUMBER CHLW-2013		DRAWING NUMBER BM 3113	
DATE 2015-01-28	DRAWN ARJEN	CHECKED ROB	SCALE 1 : 300

REFERENCE CODE
1VG2014



QUESTION 1: ANALYTICAL (CIVIL)

Given:

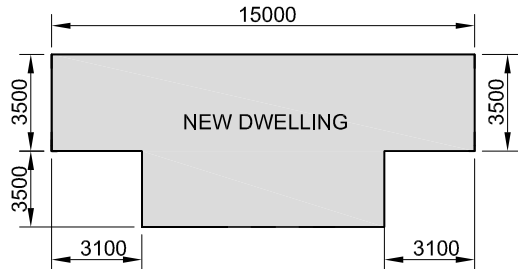
The site plan for a proposed new dwelling, a title panel and a table of questions. The drawing has not been prepared to the indicated scale.

Instructions:

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

QUESTIONS		ANSWERS	
1	What is the reference code for the drawing?	1	
2	What was the second revision?	1	
3	What scale is indicated for the drawing?	1	
4	How many inspection chambers are there on the sewer line?	1	
5	What finish is used around the pool?	1	
6	What new development is proposed on the site?	1	
7	In what colour would new glass be presented on a drawing?	1	
8	In what colour would new concrete be presented on a drawing?	1	
9	What is the depth of the feature at 1?	1	
10	Name the feature at 2.	1	
11	What does the number at 3 indicate?	1	
12	What does the line at 4 indicate?	1	
13	Name the feature at 5.	1	
14	Name the feature at 6.	1	
15	Which elevation of the new dwelling faces Gotze Street?	2	
16	What is the distance from the swimming pool to the south-western boundary line in metres?	2	
17	What is the length of the boundary facing stand 32 in metres?	2	
18	In the space below, determine the perimeter of the new dwelling in metres.	3	
19	In the space below, determine the total building area of stand 31 in square metres.	3	
20	In the space provided in the title panel, draw, in neat freehand, the front view and top view of the SANS 10143 graphical symbol for a DOUBLE SINK.	4	
		TOTAL 30	

ANSWER 18
Show ALL calculations.



ANSWER 19
Show ALL calculations.

EXAMINATION NUMBER
EXAMINATION NUMBER
2

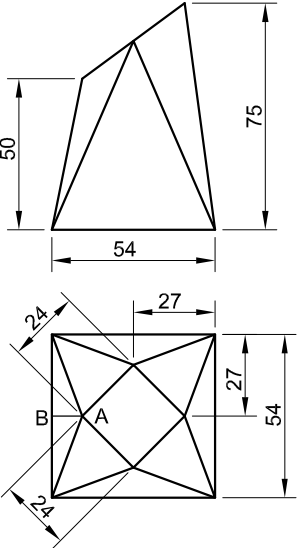


QUESTION 2: TRANSITION PIECE

Given:
The front view and the top view of a square-to-irregular four-sided transition piece.

- Instructions:**
Draw, to scale 1 : 1, the following views of the transition piece:
- 2.1 The given top view
 - 2.2 The given front view
 - 2.3 The development of the transition piece

NOTE:
AB is the seam. [36]



ASSESSMENT CRITERIA					
1	FRONT AND TOP VIEW	11			
2	TL CONSTRUCTION	8			
3	DEVELOPMENT	17			
PENALTIES (-)					
TOTAL		36			
EXAMINATION NUMBER					
EXAMINATION NUMBER					3

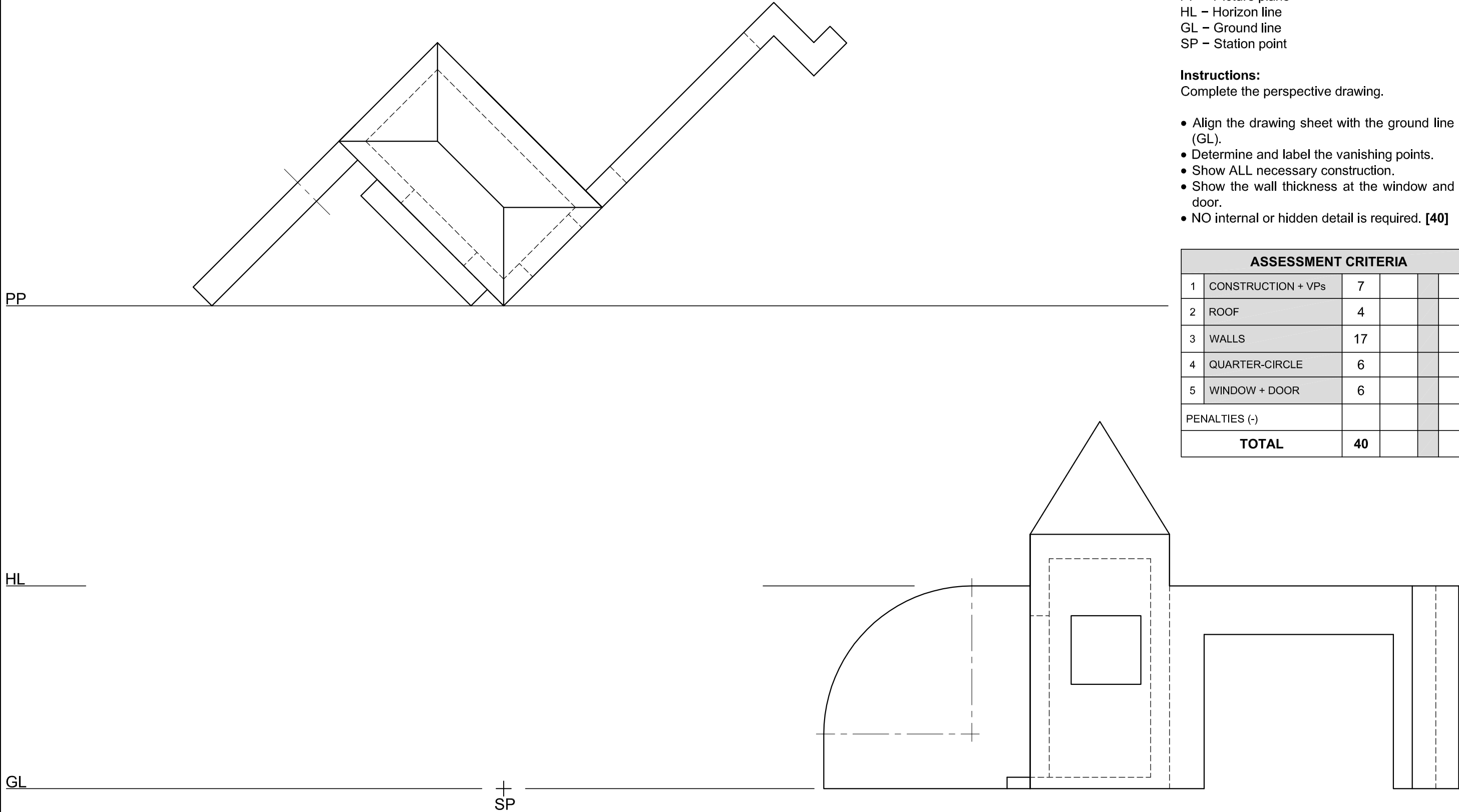
QUESTION 3: PERSPECTIVE

Given:
Two views of an entrance with a control point 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.

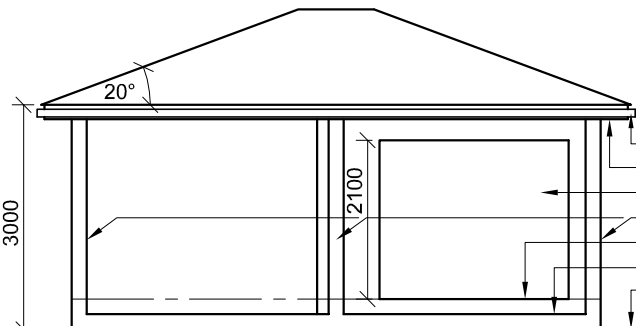
- Align the drawing sheet with the ground line (GL).
- Determine and label the vanishing points.
- Show ALL necessary construction.
- Show the wall thickness at the window and door.
- NO internal or hidden detail is required. **[40]**

ASSESSMENT CRITERIA					
1	CONSTRUCTION + VPs	7			
2	ROOF	4			
3	WALLS	17			
4	QUARTER-CIRCLE	6			
5	WINDOW + DOOR	6			
PENALTIES (-)					
TOTAL		40			



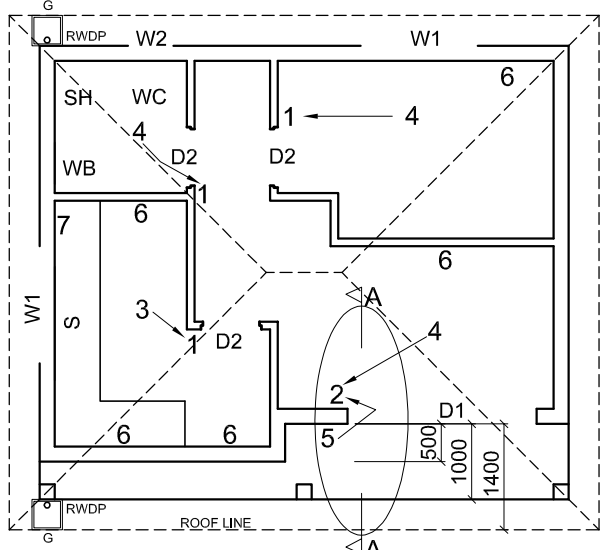
EXAMINATION NUMBER	
EXAMINATION NUMBER	4





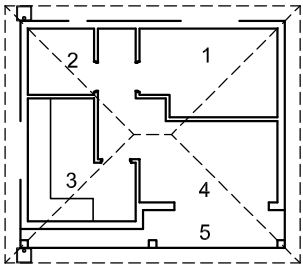
100 x 150 GUTTER
200 x 20 FASCIA BOARD
SLIDING DOOR OPENING
VERANDAH PILLARS
FLOOR LEVEL
VERANDAH LEVEL
GROUND LEVEL

INCOMPLETE SOUTH-WEST ELEVATION



INCOMPLETE FLOOR PLAN

ROOM DESIGNATIONS



FLOOR FINISHES

1 BEDROOM:	CARPET
2 BATHROOM:	TILE
3 KITCHEN:	TILE
4 LOUNGE:	TILE
5 VERANDAH:	GRANO

FEATURES

D1 SLIDING DOOR
D2 INTERNAL DOOR
W1 WINDOW
W2 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 ARROW SHOWS THE LIGHT CONNECTION TO THE SWITCH.

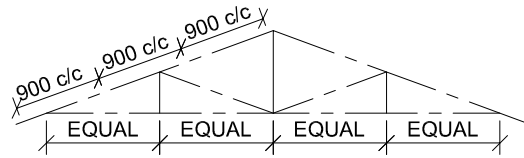
ROOF NOTES:
ROOF PITCH 20° WITH 200 x 20 mm FACIA BOARD ON ALL SIDES

ROOF COVER 15 mm FIBRE CEMENT SHEET ON 75 x 50 mm PURLINS @ 900 mm c/c

115 x 38 mm ROOF TRUSS ON 115 x 38 mm WALL PLATES

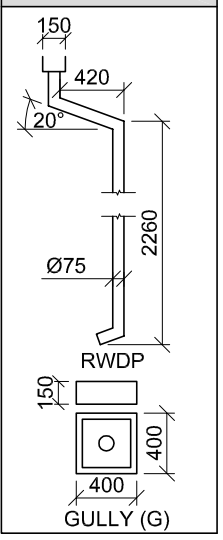
9 mm CEILING BOARD ON 38 x 38 mm BRANDING STRIPS @ 600 mm c/c

100 x 150 mm GUTTER ON ALL SIDES



SCHEMATIC DIAGRAM OF A ROOF TRUSS

RAINWATER ITEMS

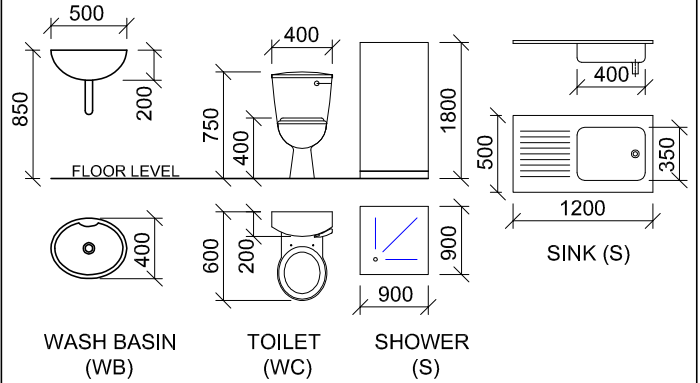


ROOF COMPONENTS

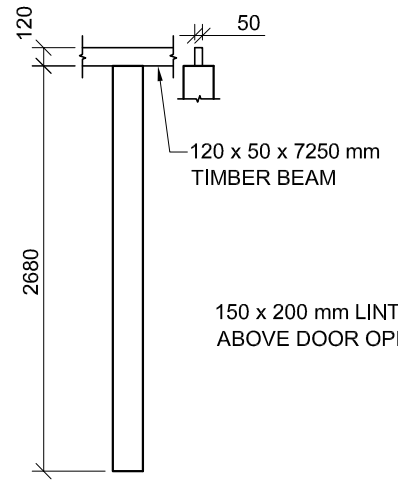
	200 x 20 mm FASCIA BOARD
	120 x 50 x 7250 mm TIMBER BEAM
	75 x 50 mm PURLINS

ELECTRICAL SYMBOLS

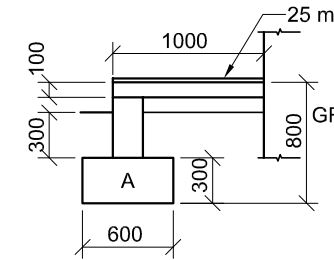
FIXTURES



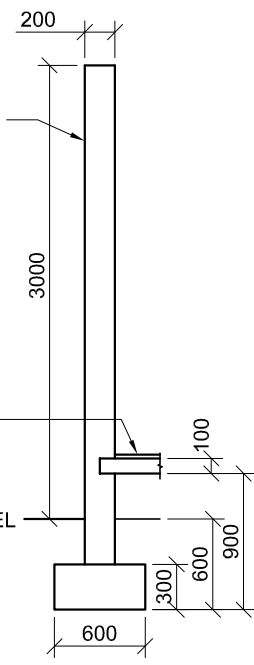
200 x 200 mm VERANDAH PILLAR AND BEAM DETAIL



INCOMPLETE FOUNDATION 'A' AND VERANDAH DETAIL



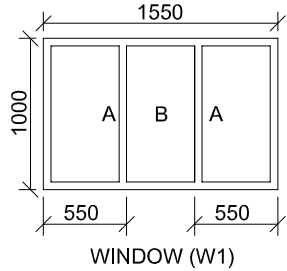
INCOMPLETE FOUNDATION AND EXTERNAL WALL DETAIL



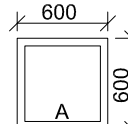
DOOR AND WINDOW SCHEDULE

TO FIT	TO FIT
OPENING PANEL	FIXED PANEL
2100	2100
100	50
SLIDING DOOR WITH FRAME (D1)	INTERNAL DOOR FRAME AND DOOR (D2)

WINDOW (W1)



WINDOW (W2)



WINDOW NOTE:
A = OPENING SIDE
B = FIXED PANEL

NOTE:
150 x 25 mm FIBRE CEMENT SILL UNDER ALL WINDOWS

QUESTION 4: CIVIL DRAWING

Given:

- The incomplete south-west elevation of a **new cottage**, showing the walls, the verandah pillars, the sliding door opening, the roof and notes
- The incomplete floor plan showing the walls, position of the verandah pillars, doors, windows, fixtures and electrical layout
- Roof notes with a schematic diagram of a roof truss
- Room designations and floor finish
- Verandah pillar and beam detail
- The incomplete foundation 'A' and verandah detail
- The incomplete foundation and external wall detail
- A door and window schedule
- A table of rainwater items
- A table of roof components
- A table of electrical symbols
- A table of fixtures
- The incomplete foundation 'A' and floor plan of the **new cottage**, 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 cottage**:

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-WEST ELEVATION**
Show the following features on the drawing:

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

4.2 Using the given incomplete foundation 'A', 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 'A' and verandah detail
- The complete foundation, external wall and sliding door detail
- The roof detail, including the fascia board and gutter
- ALL features of the verandah to the left of cutting plane A-A, including the rainwater down pipe and gully
- ALL hatching detail. **ONLY** the substructure hatching may be drawn in neat freehand.

Label the following:

- The south-west elevation
- The room designations and floor finishes
- Using the correct abbreviations, label the following features in the correct view: ground level and finished floor level.

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

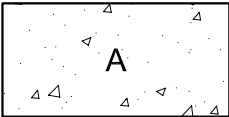
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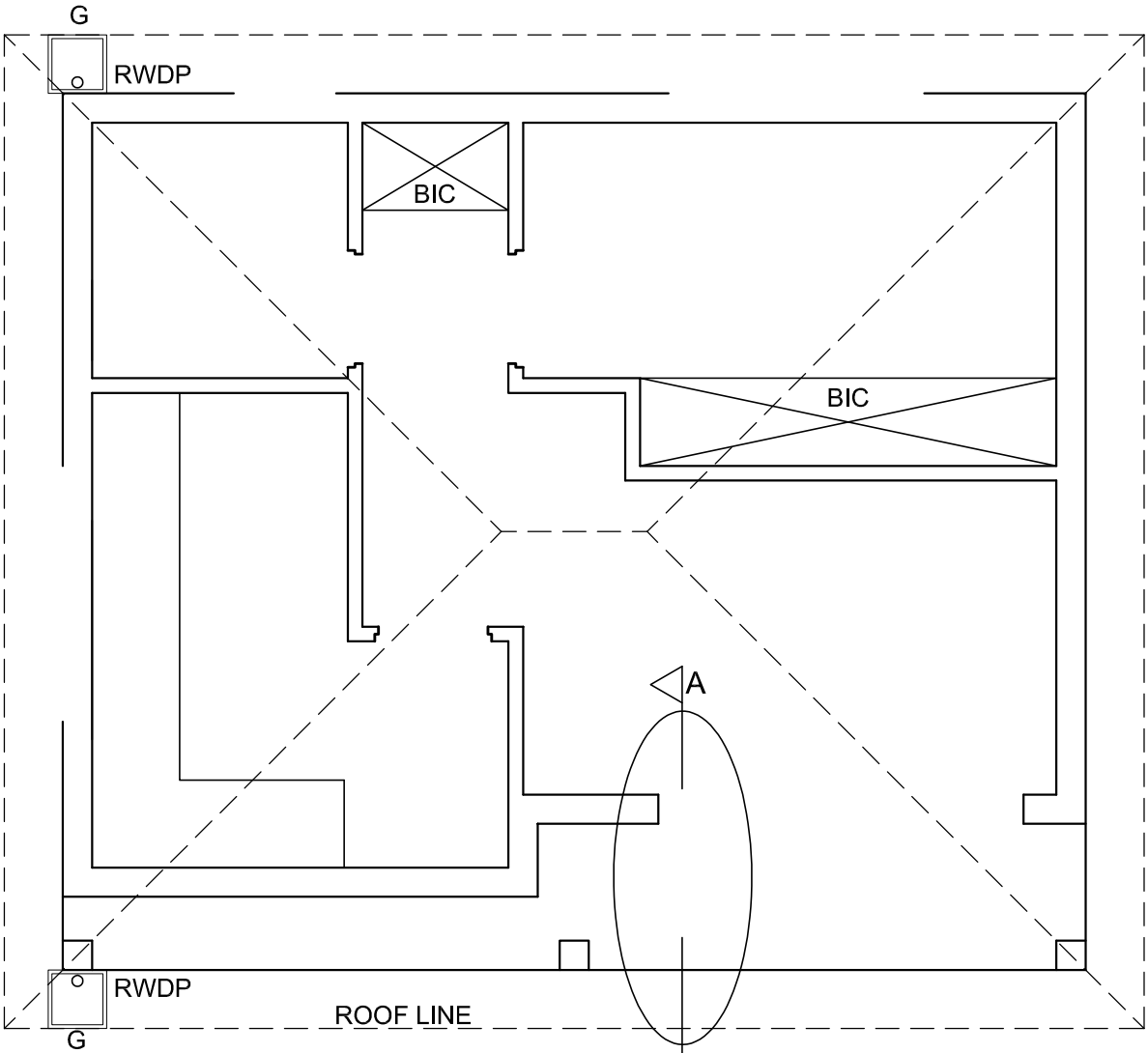
* BASIC - EDUCATION *

Please turn over

5



DETAILED SECTION
SCALE 1 : 20



FLOOR PLAN
SCALE 1 : 50



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

ASSESSMENT CRITERIA					
FLOOR PLAN					
		POSSIBLE	OBTAINED	SIGN	MODERATE
1	DOORS + WINDOWS	12			
2	ELECTRICAL	10			
3	FIXTURES	4			
4	HATCHING	4			
5	LABELS	5			
SUBTOTAL		35			
SOUTH-WEST ELEVATION					
1	ROOF	6½			
2	WALLS + RWDP + FFL + GULLY	9			
3	DOOR	3			
4	LABELS	1½			
SUBTOTAL		20			
DETAILED SECTION					
1	ROOF DETAIL	12			
2	FOUNDATIONS + WALLS + SLAB	11½			
3	DOOR + GULLY RWDP + GUTTER	9			
4	HATCHING	6½			
SUBTOTAL		39			
TOTAL		94			
TOTAL PENALTIES (-)					
FINAL TOTAL					
EXAMINATION NUMBER					
EXAMINATION NUMBER					6