





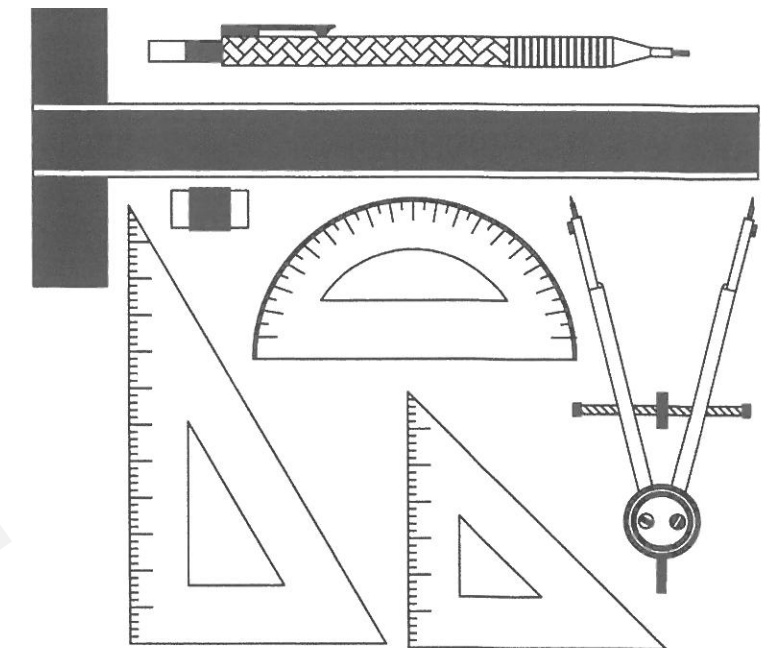
NATIONAL SENIOR CERTIFICATE EXAMINATION

2017

ENGINEERING GRAPHICS AND DESIGN

PAPER 1

MARKS: 200
TIME: 3 HOURS



FOR OFFICIAL USE ONLY

QUESTION	SECTION	MARK	MODERATED	MAXIMUM	CODE
1	CIVIL ANALYTICAL			20	
2	INTERPENETRATION & DEVELOPMENT			40	
3	TWO-POINT PERSPECTIVE			40	
4	CIVIL DRAWING			100	
SYMBOL	TOTAL			200	
				100	

FINAL CONVERTED MARK

100

CHECKED BY

PLEASE READ THE FOLLOWING INSTRUCTIONS CAREFULLY

1. This question paper consists of **6 pages** including the cover page and **4 questions**.
2. **All** questions must be answered.
3. Unless specified otherwise, all questions are in **First-angle Orthographic Projection**.
4. Unless specified otherwise, all questions are to be completed to a **scale of 1:1**.
5. **All** answer sheets must be re-stapled in numerical order, even questions that are not attempted/blank.
6. All **construction work** must be shown.
7. Print your **examination number** neatly on each page.
8. Use only the **answer sheets** provided.
9. Your drawings should reflect **neatness** and **accuracy**.
10. All dimensions or detail not given may be **assumed** in **good proportion**.
11. Your drawings should comply with SANS 10143.

EXAMINATION NUMBER

SMITH, ZULU & CO ARCHITECTS

"designing the future"

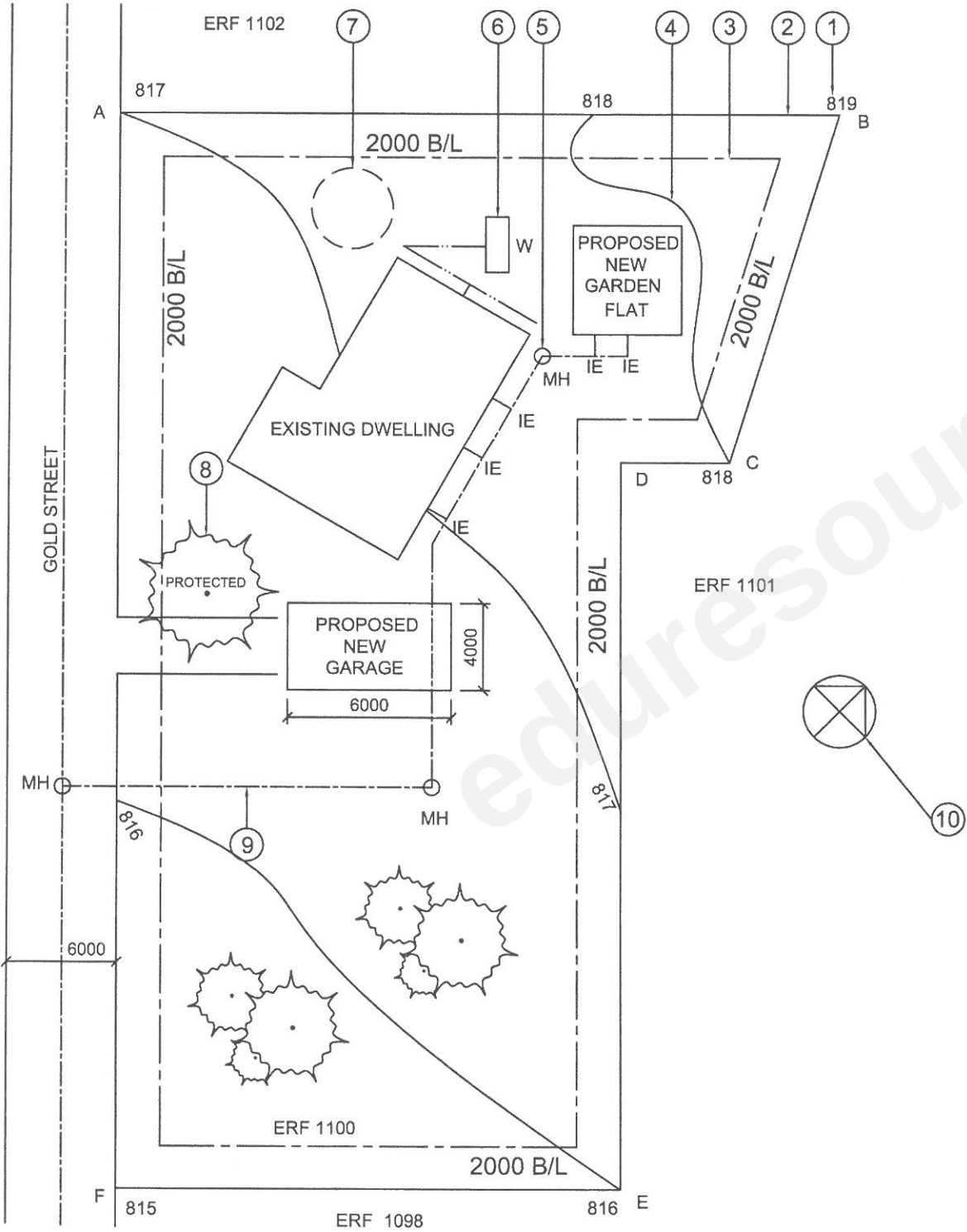
P.O.BOX 1683
GEORGE
6530

TEL: (044) 7612233
FAX: (044) 7612234
CELL: 0837612233

www.smithzulu.co.za
office@smithzulu.co.za
info@smithzulu.co.za

23 COPPER STREET
GEORGE
6529

PROPOSED ADDITION FOR A.B. VILLIERS GOLD STREET ERF 1100 GEORGE SOUTH	DRAWN BY:	PATRICK LOUW	DATE:	12 FEBRUARY 2017	LAND SURVEYOR'S CERTIFICATE SIDE LENGTHS AB = 33000, BC = 16700 CD = 5000, DE = 36000 EF = 22000, FA = 42000
	CHECKED BY:	T.B. ZULU	AB VILLIERS		
	APPROVED BY:	H.V. SMITH			
	REFERENCE:	1002/VILLIERS	SIGNED:	MR A.B. VILLIERS	



CIVIL
ANALYTICAL

STUDY THE ADJACENT DRAWING AND INFORMATION AND ANSWER THE QUESTIONS THAT FOLLOW:

1.1 What type of civil drawing is shown?		1
1.2 What elevation faces the Gold Street?		1
1.3 Who checked the drawing?		1
1.4 In which town is the architect's office located?		1
1.5 On what erf number will the proposed additions be erected?		1
1.6 What is the feature at 1 called?		1
1.7 What is the feature at 2 called?		1
1.8 What is the feature at 3 called?		1
1.9 What is the feature at 4 called?		1
1.10 What is the feature at 5 called?		1
1.11 What is the feature at 6 called?		1
1.12 What is the feature at 7 called?		1
1.13 What is the feature at 8 called?		1
1.14 What is the feature at 9 called?		1
1.15 Which direction would you face when reversing out of the garage?		1
1.16 How many metres would Mr Villiers walk if he walked the boundary?		1
1.17 By how many metres is the highest corner above the lowest?		1
1.18 What is the closest Mr Villiers is allowed to build to Gold Street?		1
1.19 In the space below, determine the area of the proposed new garage in m ²	Answer:	

20 MARKS

EXAMINATION NUMBER

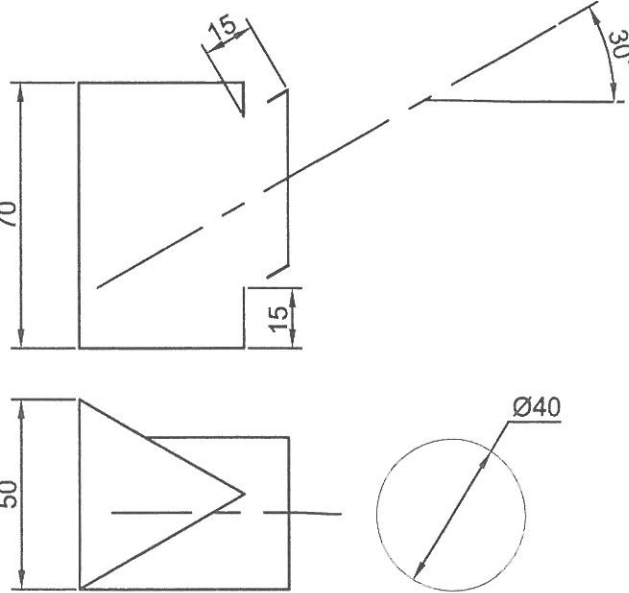
INTERPENETRATION
& DEVELOPMENT

The figure below shows the INCOMPLETE Front View and the Top View of an **EQUILATERAL TRIANGULAR DUCT** penetrated by an **CIRCULAR PIPE** drawn in First-angle Orthographic Projection. The auxiliary view of the circular pipe is also shown in the Top View.

- Draw the following:
- 2.1 the complete FRONT view clearly showing the curve of interpenetration. Show all hidden detail.
 - 2.2 the complete TOP view.
 - 2.3 the development of the two surfaces of the triangular duct that are being penetrated, clearly showing the curve of interpenetration. Show all construction.

ASSESSMENT CRITERIA

You will be assessed on your ability to do the following:	
• draw the given views	5
• complete the front view	17
• show necessary construction	3
• develop and label the triangular duct	15



GIV	5
FV	17
CON	3
DEV	15

40 MARKS

EXAMINATION NUMBER

TWO-POINT
PERSPECTIVE

The figure shows the three views of an outside entertainment area, which includes a braai. Draw a neat two-point perspective view of this area.

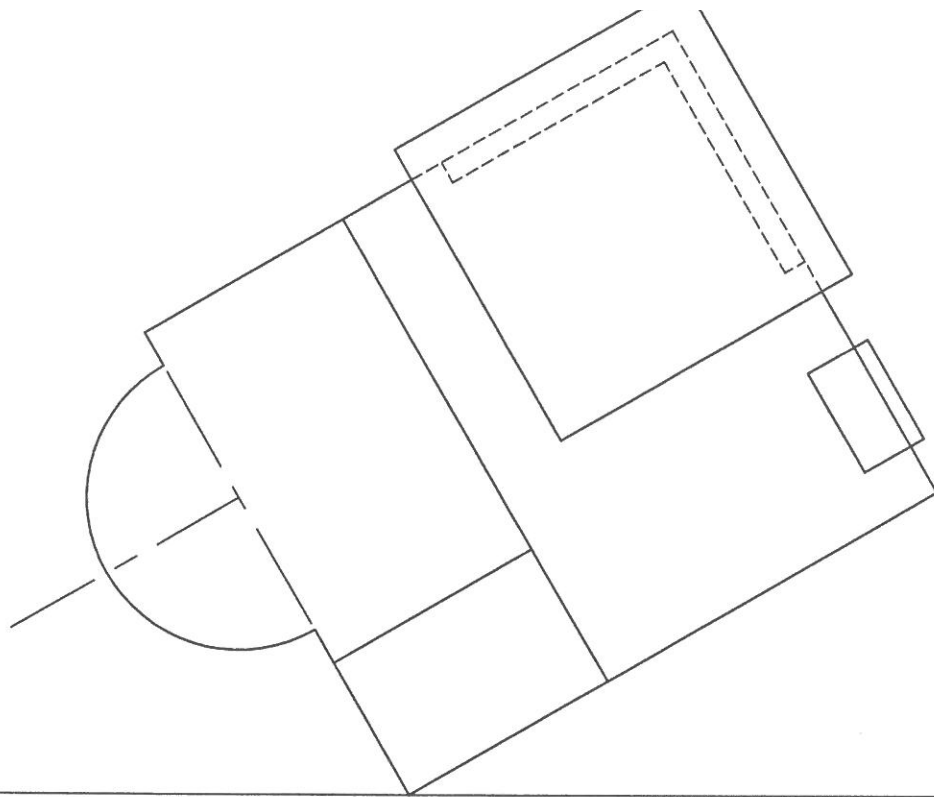
- PP - Picture Plane
HL - Horizon Line
GL - Ground Line
SP - Station Point

Neatly label the vanishing points RVP and LVP.
NO HIDDEN DETAIL IS REQUIRED.

ASSESSMENT CRITERIA

You will be assessed on your ability to do the following:

- | | |
|--|----|
| • determine and label the vanishing points | 2 |
| • determine the two-point perspective view | 38 |



PP

PP

HL

HL

GL

GL

SP

PTS
19

PTS
8

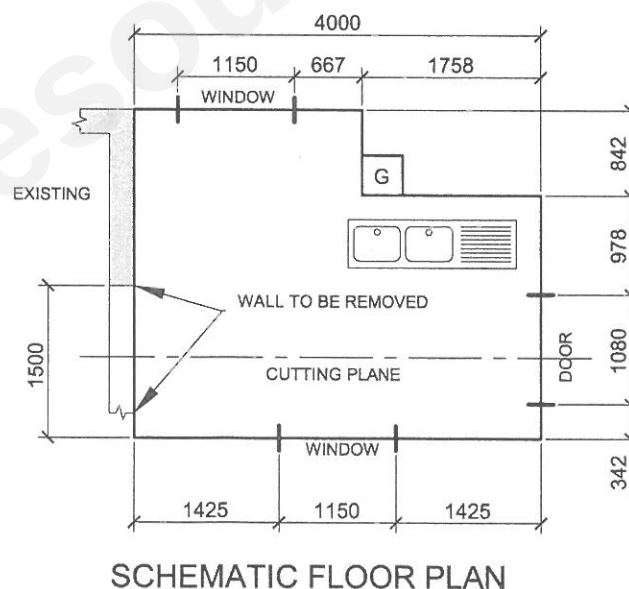
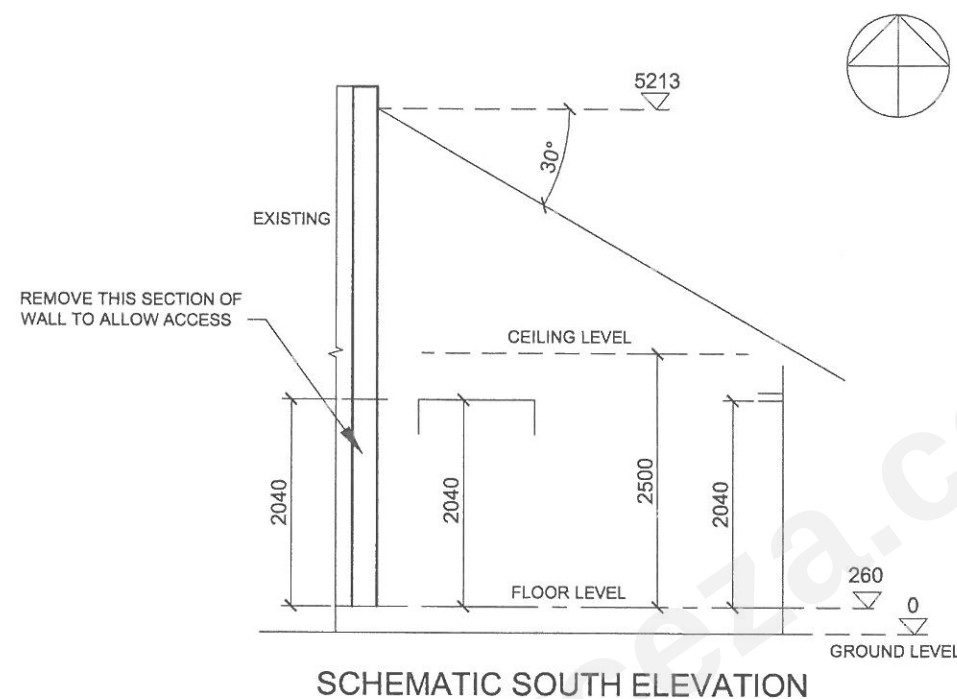
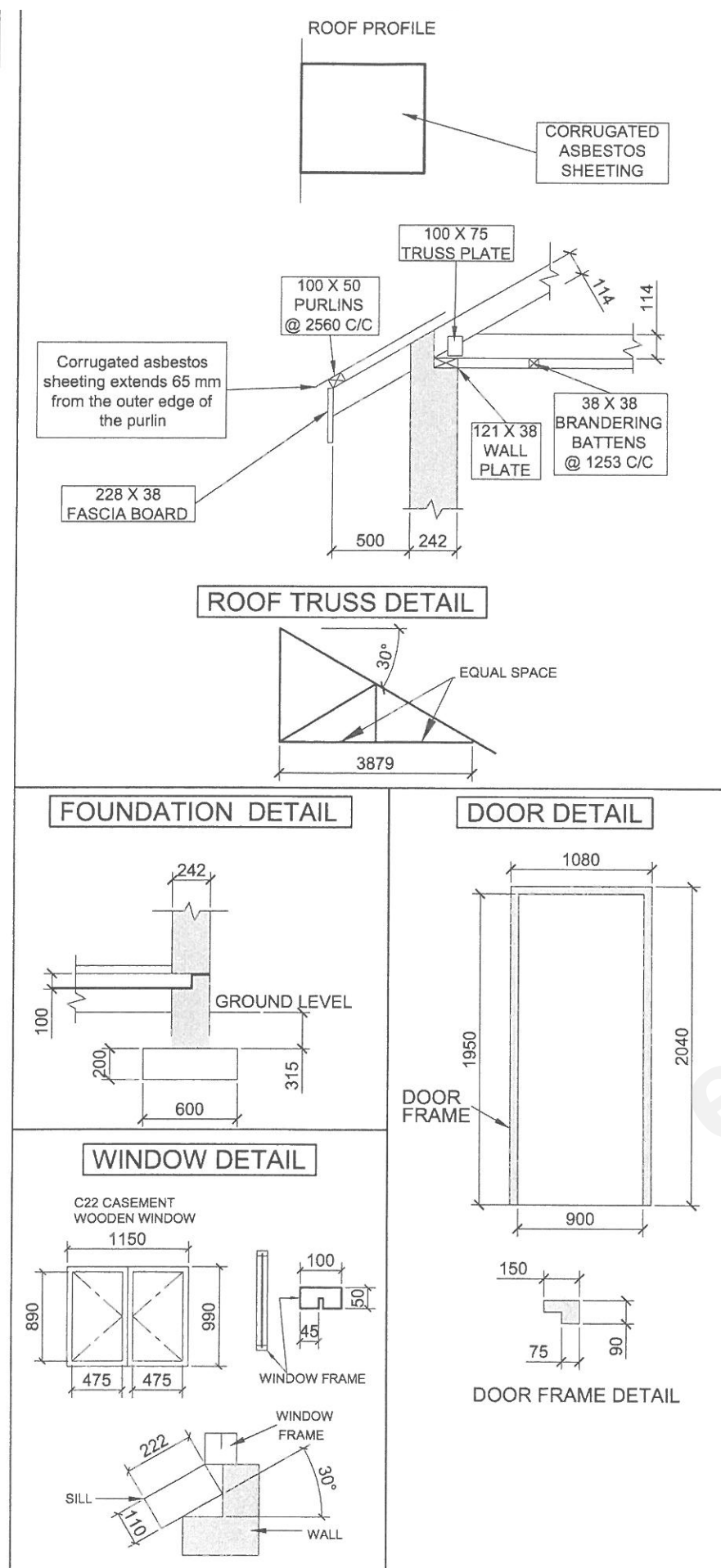
Con
2

Arc
9

VPS
2

40 MARKS

EXAMINATION NUMBER



NOTES:
 Gully is 400 x 400, brick course thick and 2 bricks high.
 All windows are C22.
 The floor must be tiled.
 Place the double sink so that the top surface is 900mm from the floor.
 The double sink dimensions are 1660 long, 535 wide and 300 deep.

Answer this question on ANSWER SHEET 4.
 Use a scale of 1:50.

The following is given:

- An incomplete schematic floor plan of a tiled LAUNDRY addition with
 - ▶ window and door positions
 - ▶ perimeter dimensions
- An incomplete schematic elevation with
 - ▶ door and window positions, ground and floor levels
- Incomplete foundation detail
- Roof and roof truss detail
- Window, window frame, window sill and door frame detail
- The existing wall to which the addition is attached

Draw the following:

- 1) The complete floor plan attaching your drawing to the given existing walls on answer sheet 4.
- 2) The SOUTH elevation showing the section as indicated by the cutting plane A-A.
- 3) The outside EAST elevation showing the laundry addition only.

FLOOR PLAN INSTRUCTIONS

- Draw and hatch all walls
- Indicate appropriately, the removed section of the existing wall
- Insert all window details and the door detail
- Draw the gully
- Label the floor plan and indicate the scale, room designation and floor finish
- Insert the following electrical detail:
 - ▶ A TWO, 40 watt fluorescent tube light in the middle of the room
 - ▶ one wall mounted light outside the door
 - ▶ one double pole light switch on the western wall for both the lights
 - ▶ one switched socket outlet on the northern wall under the window
- Insert the SANS plumbing symbol for the double sink unit
- Draw and label the cutting plane A-A

SECTIONAL SOUTH ELEVATION INSTRUCTIONS

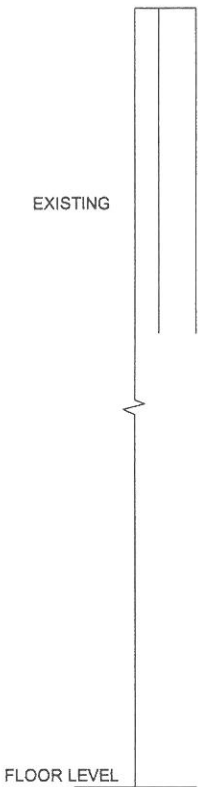
- Draw the complete south elevation showing the section as per the indicated cutting plane
- Show the removed section of the existing wall
- Show the outside C22 window
- Complete the foundation details
- Draw all floor slab details
 - ▶ use 10 mm screed and 150 mm compacted hardcore filling
- Label the ground level and damp-proof course
- Draw in the sectional door
 - ▶ use ONE, 242 x 75 concrete lintel above the door
- Roof details:
 - ▶ draw the roof truss using 114 x 38 rafters and 100 x 75 plates
 - ▶ use THREE, 100 x 50 purlins spaced at 2 560 centres
 - ▶ use ONE, 121 x 38 wall plate
 - ▶ use TWO, 38 x 38 battens spaced at 1 253 centres
 - ▶ use a 228 x 38 fascia board
 - ▶ use 9 mm gypsum ceiling boards
- Correctly position the SANS symbol for the double sink unit
- Show all hatching detail and label the Sectional South Elevation

EAST ELEVATION INSTRUCTIONS

- Draw the complete outside east elevation showing the laundry only
- Show some detail for the corrugated asbestos roof sheeting
- Indicate the Finished Floor Level and label the elevation

EXAMINATION NUMBER

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CIVIL
DRAWING

Assessment Criteria

Sectional South Elevation

1	Ceiling Battens	2	
2	Wall Plates	1	
3	Ceiling Board	1	
4	Truss Plates	5	
5	Roof Truss	6	
6	Purlins	3	
7	Roof	1	
8	Walls	5	
9	Door	4	
10	Floor & Foundation	4	
11	DPC & Labels	3	
12	Hatching	7	
13	Fascia Board	1	
14	Outside window	4	
15	Double Sink	3	

Subtotal	50	
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Floor Plan

16	Plumbing	5	
17	Walls	6	
18	Hatching	3	
19	Windows	4	
20	Door	4	
21	Electrical	6	
22	Labels	4	
23	Cutting Plane	2	

Subtotal	34	
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West Elevation

24	Walls & Gully	6	
25	Roof Detail	2	
26	Door	3	
27	Fascia Board	2	
28	Floor Finish Level	2	
29	Label	1	

Subtotal	16	
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TOTAL	100	
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100 MARKS

EXAMINATION NUMBER