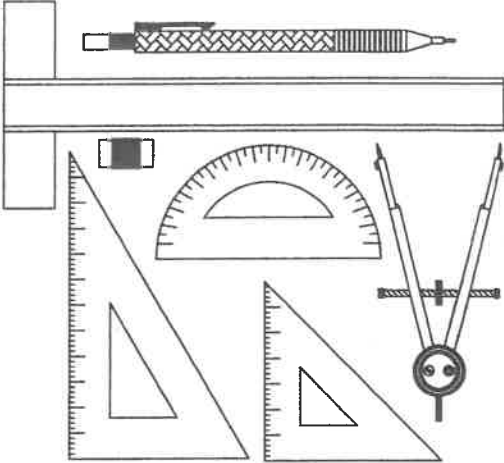




**NATIONAL SENIOR CERTIFICATE EXAMINATION**  
**MAY 2025**

**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	SOLID GEOMETRY			40	
3	TWO-POINT PERSPECTIVE			40	
4	CIVIL DRAWING			100	
	<b>TOTAL</b>			<b>200</b>	

**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 restapled in numerical order, even questions that have not been answered.
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.
12. All measurements are in millimetres (mm) unless otherwise indicated.

PLEASE PASTE THE  
BARCODED LABEL  
HERE

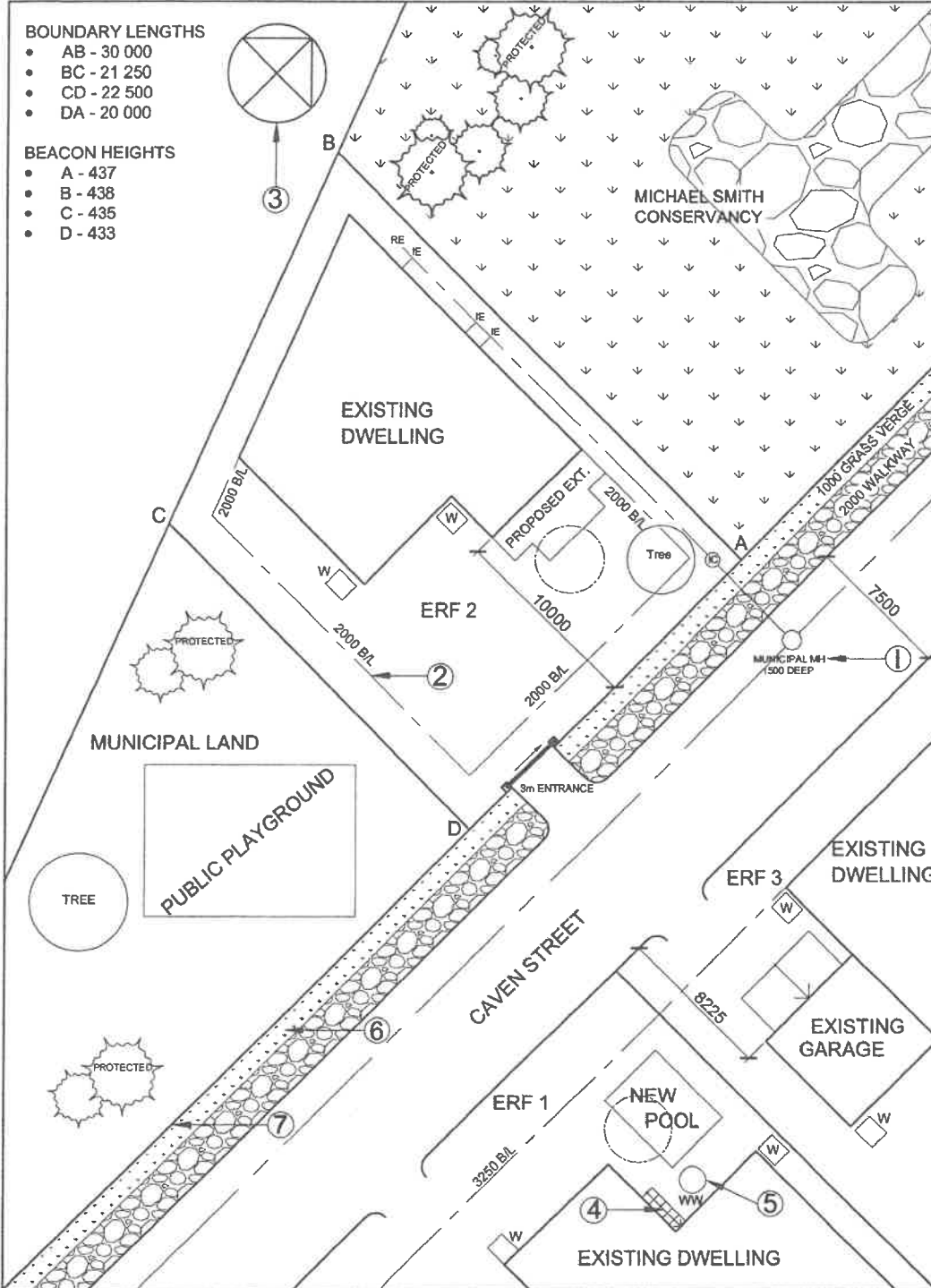
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N12EGAD-1-E

**EXAMINATION NUMBER**

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**QUESTION 1**  
CIVIL ANALYTICAL

STUDY THE ADJACENT DRAWINGS AND ANSWER THE QUESTIONS THAT FOLLOW.  
INDICATE THE LETTER CORRESPONDING TO YOUR ANSWER IN THE BLOCK PROVIDED

1.1 What is the width of Caven Street in millimetres? A. 1000 B. 2500 C. 2000 D. 7500	1
1.2 How many inspection eyes are shown on ERF 2? A. 1 B. 2 C. 3 D. 4	1
1.3 What does the abbreviation 'MH', at 1, stand for? A. Manhole B. Meter Housing C. Main Hole D. Main House	1
1.4 What is the line at 2 called? A. Sewer Line B. Boundary Line C. Contour Line D. Building Line	1
1.5 What does the symbol at 3 indicate? A. North Arrow B. True North C. Compass D. North Point	1
1.6 Refer to arrow at 4. What does the arrow on the structure represent? A. Ascend Direction B. Ramp C. Stairs D. Descend Direction	1
1.7 What symbol does the arrow at 5 represent? A. Electricity Meter B. Hotwater Cylinder C. Water-storage Tank D. Water Meter	1
1.8 How many trees on this drawing must be removed? A. 14 B. 2 C. 4 D. 7	1
1.9 What is the depth of the municipal manhole in metres? A. 7,5 m B. 1500 m C. 1,5 m D. 7500 m	1
1.10 How many inspection chambers are shown on this drawing? A. 1 B. 2 C. 3 D. 4	1
1.11 What ground cover is represented at 6? A. Tiles B. Tar C. Cobble Stone D. Grass	1
1.12 How many new features and structures are shown on this drawing? A. 1 B. 2 C. 3 D. 4	1
1.13 Which corner of ERF 2 is the highest? A. A B. B C. C D. D	1
1.14 What is the line at 7 called? A. Sewer Line B. Contour Line C. Boundary Line D. Building Line	1
1.15 In what unit of measurement are the dimensions of the corner beacon heights given? A. Millimetres B. Metres C. Centimetres D. Decimetres	1
1.16 How close, in metres, to the municipal land can a new building be built? A. 2 m B. 3,25 m C. 10 m D. 20 m	1
1.17 In what direction would a car travel, if it reversed out of the existing garage, on ERF 3? A. North B. South C. East D. West	1
1.18 What is the distance between the existing dwellings on ERF 2 and ERF 3, in metres? A. 23,75 m B. 24,75 m C. 21,50 m D. 20,50 m	1
1.19 If the entire ERF 2 was fenced, excluding the entrance, how many metres of fencing is required? A. 102,75 m B. 105,75 m C. 90,75 m D. 93,75 m	1
1.20 What is the area of ERF 2? A. 581,25 m <sup>2</sup> B. 475 m <sup>2</sup> C. 525 m <sup>2</sup> D. 609,38 m <sup>2</sup>	1

20 MARKS

EXAMINATION NUMBER

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ANSWER SHEET 1

**QUESTION 2**

**SOLID  
GEOMETRY**

**Given:**

- The front view and auxiliary view of a SQUARE PRISM with an EQUILATERAL TRIANGULAR PYRAMIDAL hole, inclined 30° to the horizontal plane.
- Cutting plane S-S.

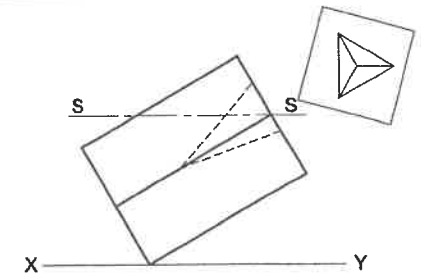
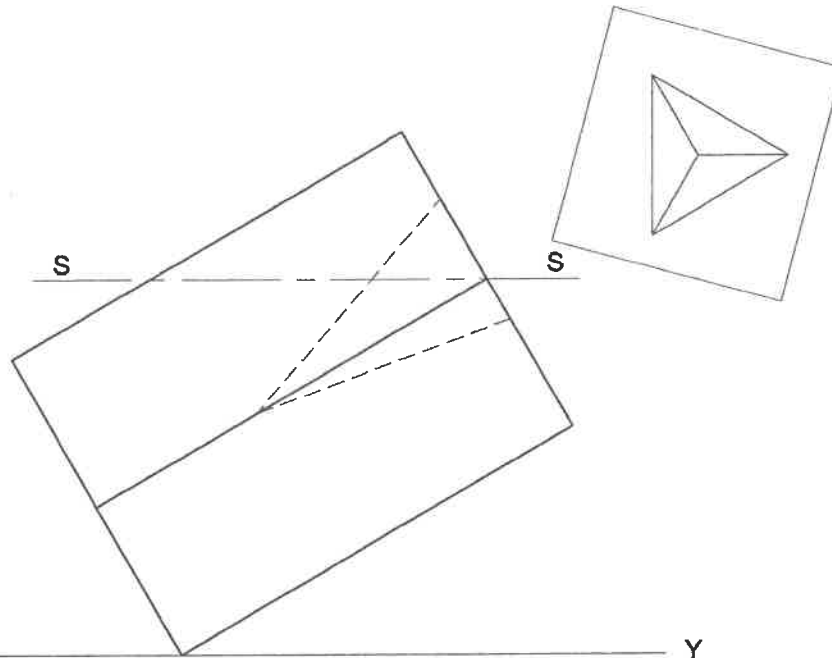
**Instruction:**

- Using the given front view and auxiliary view, project a SECTIONAL TOP VIEW on cutting plane S-S. Show the hidden detail of the pyramidal hole ONLY. The top view is 25 mm from the X-Y line (vertical plane).
- Project a RIGHT VIEW. Do not show hidden detail. Do not section the RIGHT VIEW.

Show all construction.

**ASSESSMENT CRITERIA**

- You will be assessed on your ability to do the following:
- |   |    |
|---|----|
| • draw a sectional Top View                 | 22 |
| • show hidden detail for the pyramidal hole | 3  |
| • hatch the sectioned surface               | 1  |
| • draw the Right View                       | 13 |
| • show construction                         | 1  |



This is a schematic diagram of the Front View and Auxiliary View of the solid.  
**DO NOT DRAW** on this diagram

TV	22
H/D	3
HATCH	1
RV	13
CON	1

**40 MARKS**

**EXAMINATION NUMBER**

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**ANSWER SHEET 2**



**QUESTION 4**

**CIVIL DRAWING**

Answer this question on ANSWER SHEET 4 (page 6). All drawings must comply with SANS 10143.

**The following are given:**

- Window detail
- Roof detail
- Door detail
- Roof Truss detail
- Incomplete foundation detail
- An incomplete schematic east elevation with
  - ▶ window position, ground level, floor and ceiling levels
  - ▶ steps and ramp position
- An incomplete floor plan of a **SURGERY** with
  - ▶ window and door positions
  - ▶ steps and ramp position
  - ▶ plumbing fixture position
  - ▶ cutting plane AA

Draw the following on Answer Sheet 4 using a scale of 1:50:

- 1) The complete FLOOR PLAN
- 2) The SECTIONAL SOUTH ELEVATION on the indicated cutting plane
- 3) The complete EAST ELEVATION

**FLOOR PLAN INSTRUCTIONS**

- Hatch all walls
- Insert the details for the C22 window near the entrance door. The window does not have a window sill. DO NOT insert the other windows
- Insert the door details at the entrance
- Draw the two steps
- Complete the ramp
- Insert the electrical detail
- Insert the plumbing fixture as indicated by the abbreviation. Use appropriate measurements

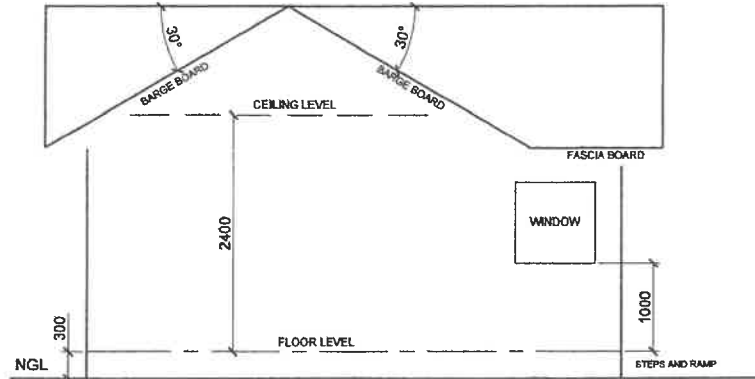
**SECTIONAL SOUTH ELEVATION INSTRUCTIONS**

- Draw the complete SECTIONAL SOUTH ELEVATION showing the section as per the indicated cutting plane
- Draw the internal walls and built-in-cupboard
- Complete the foundation details
  - ▶ insert all floor slab details
  - ▶ use 200 mm compacted hardcore filling
- Draw the sectional window, using the given frame detail
  - ▶ use ONE 250 mm x 75 mm concrete lintel above the window
- Draw the folding door. DO NOT DRAW THE ENTRANCE DOOR.
- Roof details:
  - ▶ draw the roof truss using 114 mm x 38 mm rafters and ONE 100 mm x 75 mm truss plate at the bottom of the king post
  - ▶ use FOUR 75 mm x 38 mm purlins spaced appropriately
  - ▶ use TWO 125 mm x 38 mm wall plates
  - ▶ use TWO 38 mm x 38 mm ceiling battens. Show both in the dispensary
  - ▶ use corrugated metal sheeting for the roof and a 30° pitch
  - ▶ use 9 mm gypsum ceiling boards
- Show all hatching detail
- Label the ground level
- Label the damp-proof course at the floor slab and window
- Label the complete SOUTH ELEVATION

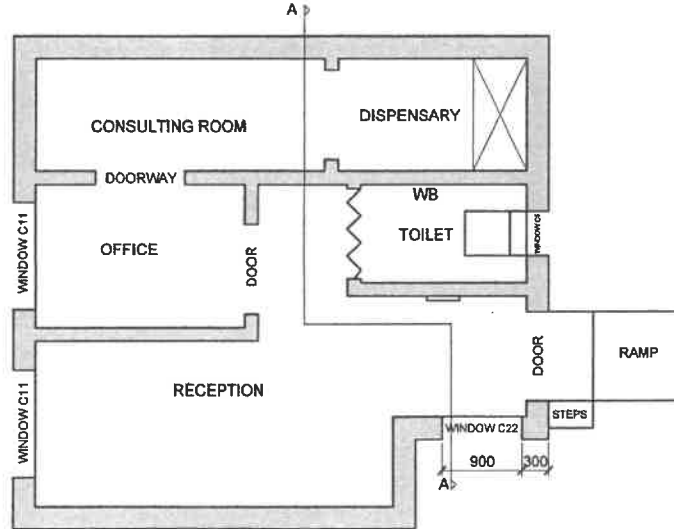
**EAST ELEVATION INSTRUCTIONS**

- Draw the complete EAST ELEVATION
- Draw the walls and roof
- Draw the barge boards and fascia board
- Draw the C22 window
- Show the steps and ramp
- Draw and label the floor level
- Label the elevation

[100]



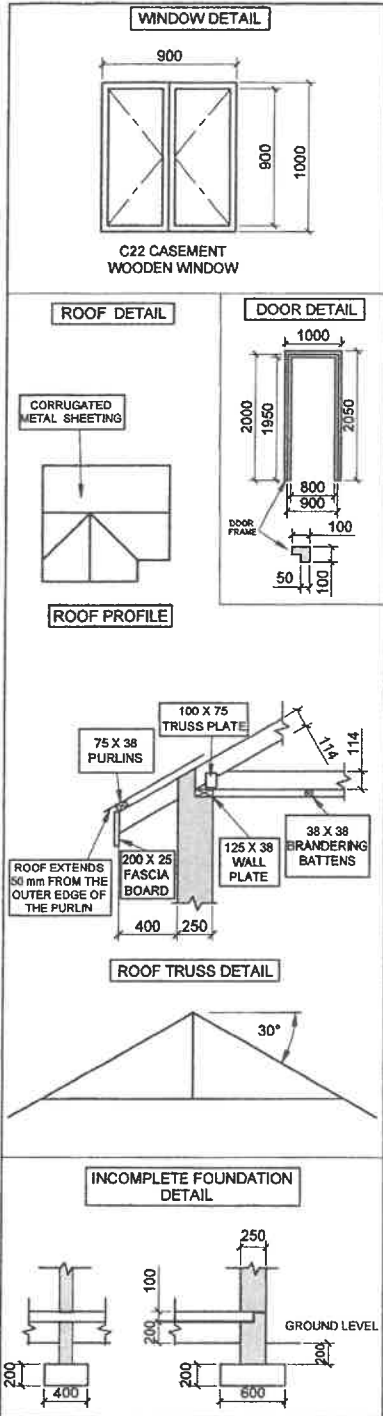
SCHEMATIC EAST ELEVATION



FLOOR PLAN SCALE 1:50

**NOTES:**

- Place a wash-basin as indicated.
- Insert the following electrical detail:
  - ▶ a two-tube, 30 watt fluorescent light in the consulting room
  - ▶ a single-pole, light switch for the fluorescent light on the west wall of the office near the doorway
  - ▶ a socket outlet on the west wall of the toilet in between the door and wash-basin.
- The ramp leads onto a landing which is the same height as the finished floor level. The ramp has a gradient of 1:10.
- The finished floor level is in line with the top of the ramp landing.
- The two steps have a tread of 150 mm and riser of 150 mm.
- The built-in-cupboard on the north wall is 2250 mm high.
- The windows do not have window sills.
- The barge boards are 250 mm X 38 mm.



**QUESTION 4**

CIVIL  
DRAWING

**Assessment Criteria**

**Sectional Elevation**

1 Ceiling Battens	2	
2 Wall Plates	2	
3 Ceiling Board	1	
4 Truss Plate	1	
5 Roof Truss	5	
6 Purlins	4	
7 Roof	1	
8 Sectioned Walls	4	
9 Sectioned Window	5	
10 Floor & Foundation	7	
11 DPC & NGL Labels	3	
12 Hatching	12	
13 Internal Wall & BIC	2	
14 Folding Door	3	
15 Fascia Boards	2	
16 Label	1	

**Subtotal** 55

**East Elevation**

17 Walls	3	
18 NGL, Steps & Ramp	5	
19 Roof	4	
20 Fascia Board	1	
21 Barge Boards	2	
22 FFL	2	
23 Label + Window	5	

**Subtotal** 22

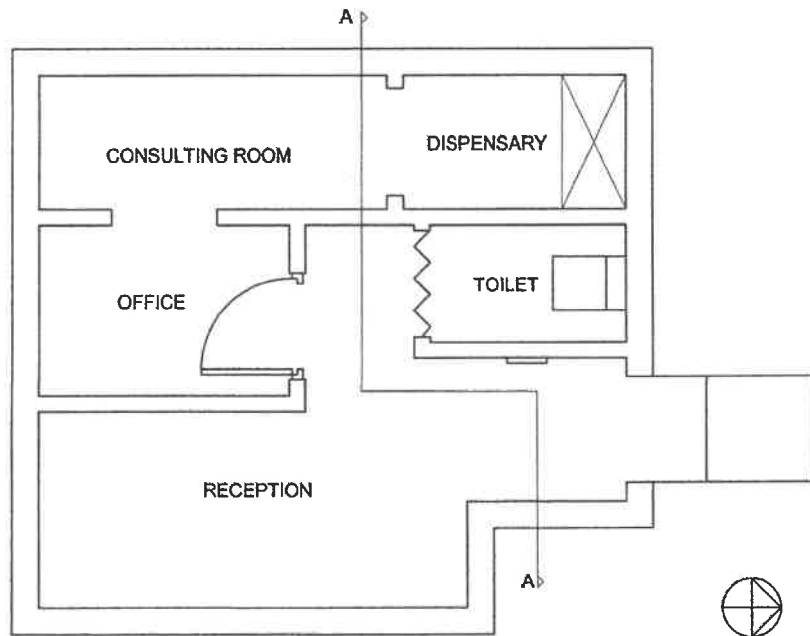
**Floor Plan**

24 Hatching	7	
25 Window	2	
26 Door	4	
27 Ramp	2	
28 Steps	3	
29 Electrical	4	
30 Plumbing Fixture	1	

**Subtotal** 23

**TOTAL** 100

NGL



FLOOR PLAN  
SCALE 1:50

EXAMINATION NUMBER

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ANSWER SHEET 4