



## MARKING GUIDELINES

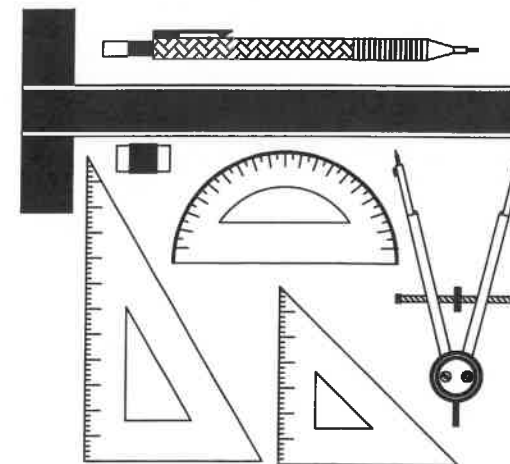
NATIONAL SENIOR CERTIFICATE EXAMINATION

2023

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	
TOTAL				200	

CHECKED BY

Please paste the barcode label here.

### 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 must be **assumed** in **good proportion**.
11. Your drawings should comply with SANS 10143.

EXAMINATION NUMBER

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

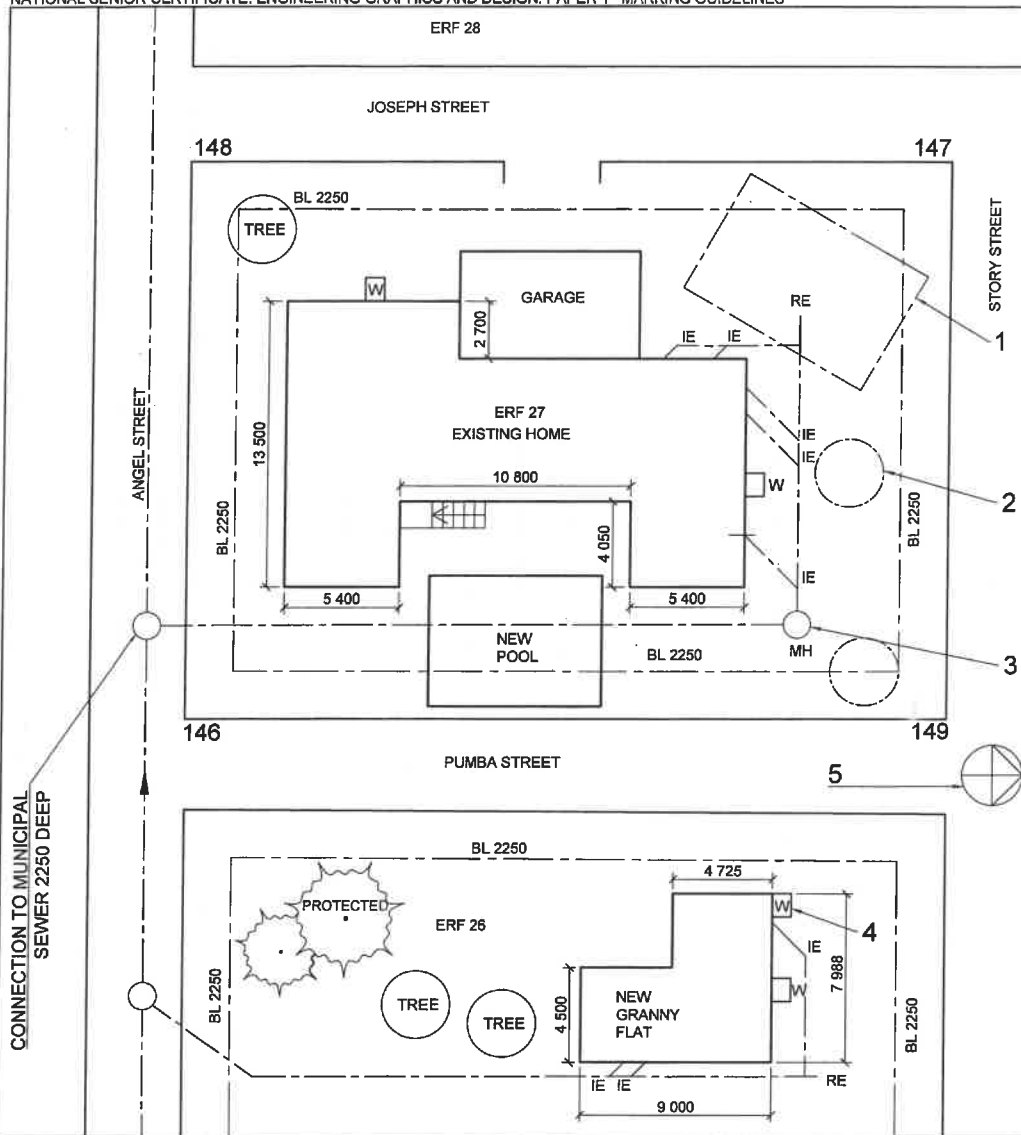


FIGURE A

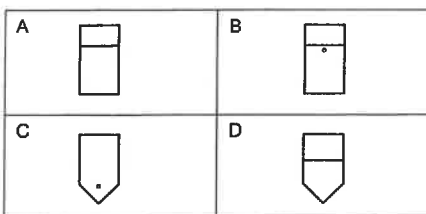
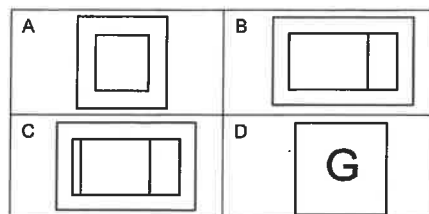


FIGURE B



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 Which corner beacon height is the highest on ERF 27? A. 147 B. 146 C. 148 D. 149	D	1
1.2 How many Rodding Eyes are there on ERF 27? A. 1 B. 2 C. 3 D. 4	A	1
1.3 How far is the building line from the boundary line on ERF 27? A. 2000 B. 2250 C. 1250 D. 2520	B	1
1.4 How many new additions are indicated on the site plan? A. 1 B. 3 C. 2 D. unknown	C	1
1.5 What is the feature at 3 called? A. Maintenance hole B. Mandatory hole C. Manhole D. Inspection chamber	C	1
1.6 Which street lies west of ERF 27? A. Angel Street B. Joseph Street C. Story Street D. Pumba Street	B	1
1.7 If you walked up the stairs, in which direction would you be walking? A. north B. south C. west D. east	B	1
1.8 What is the depth of the connection to the municipal sewer, in metres? A. 2250 m B. 225 m C. 2,25 m D. 22,5 m	C	1
1.9 What does the feature at 1 represent? A. Work to be removed B. Removed tree C. Removed fence D. Build outbuilding	A	1
1.10 What does the feature at 2 represent? A. Plant a tree B. Remove a tree C. Pothole D. Firepit	B	1
1.11 What is the feature at 4 called? A. Water tank B. Electricity meter C. Waste pit D. Wash basin	B	1
1.12 What is the scale of the drawing? A. 1:150 B. 1:200 C. 1:500 D. 1:250	D	1
1.13 What determines the size of the plan when it is drawn on paper? A. height B. width C. type D. scale	D	1
1.14 If the scale was 1:500, what would the lowest corner beacon height be on ERF 27? A. 1,46 B. 146 C. 73 D. 292	B	1
1.15 Why is the position of the new pool, on ERF 27, not suitable? A. Close to the stairs B. Over a sewer line C. Close to the street D. Blocks the view	B	1
1.16 What does the symbol at 5 indicate? A. street continues B. slope of street C. one-way street D. north point	D	1
1.17 Refer to Figure A. Which image is the correct SANS 10143 symbol for the plan view of a water-closet? A. A B. B C. C D. D	A	1
1.18 Refer to Figure B. Which image is the SANS 10143 symbol for a gully? A. A B. B C. C D. D	A	1
1.19 In the space below, determine the area of the NEW GRANNY FLAT in metres squared. Round off the answer to TWO decimal places.		2

$$((4500 \times 9000) + (3488 \times 4725)) / 1000 = 56.9808$$

Answer: 56.98 m<sup>2</sup>

20 MARKS

EXAMINATION NUMBER

ANSWER SHEET 1

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

PLEASE TURN OVER

**QUESTION 2**

**INTERPENETRATION  
& DEVELOPMENT**

**Given:**

- The INCOMPLETE Front View, complete Top View and Right View of a right regular HEXAGONAL prism penetrated by a horizontal CYLINDRICAL pipe.
- Auxiliary views of the cylinder.

**Draw the following:**

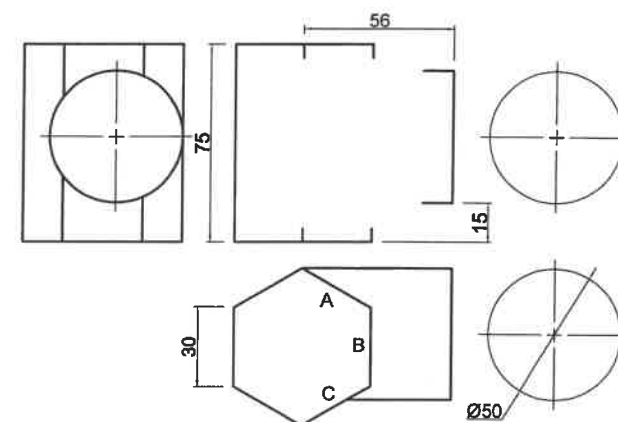
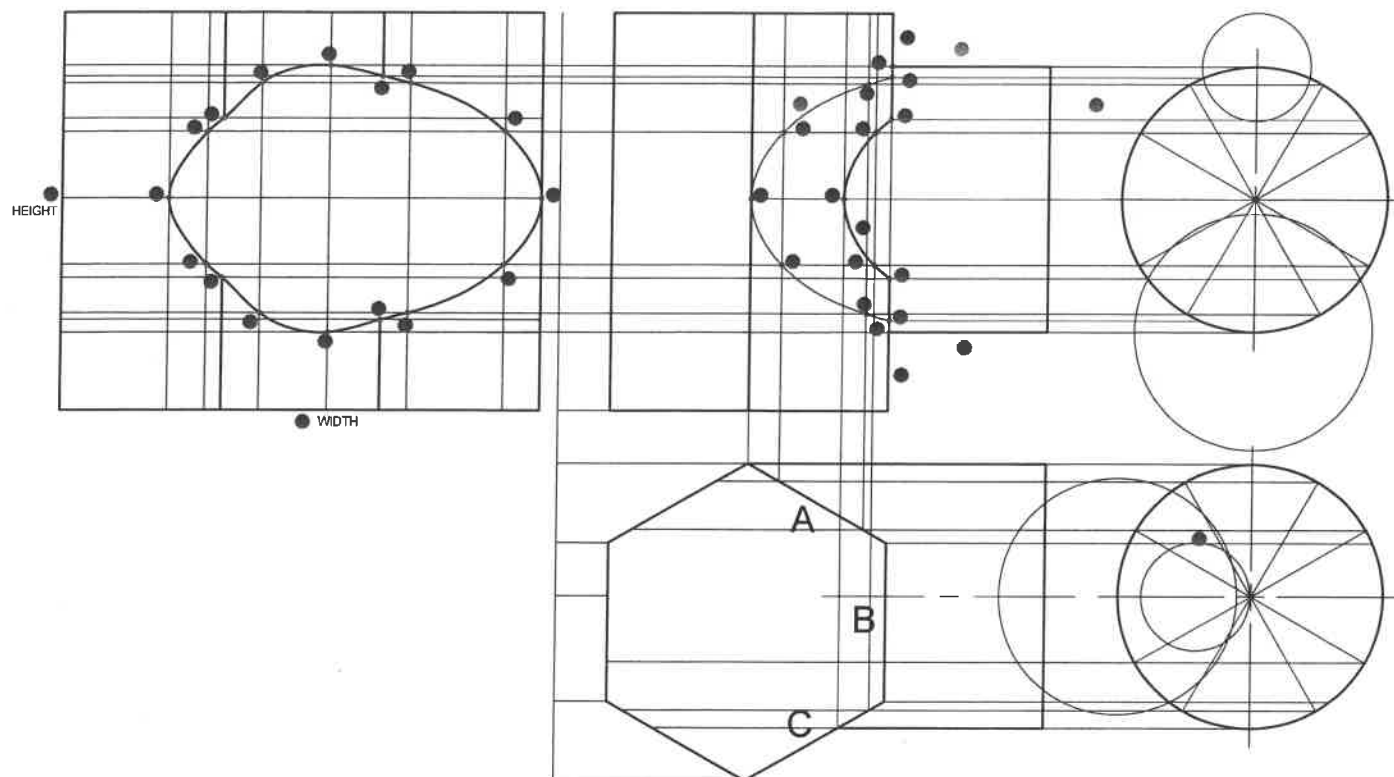
- the complete front view, clearly showing the curve of interpenetration,
- the surface development of the 3 rectangular panels of the hexagonal prism which shows the hole. The rectangular panels have been indicated by A, B & C below.

Show the hidden detail.  
Show all construction.  
Do not draw the right view.

**ASSESSMENT CRITERIA**

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

- |                               |    |
|-------------------------------|----|
| • draw the given              | 2  |
| • complete the Front View     | 18 |
| • show necessary construction | 2  |
| • draw the development        | 18 |



GIV	2	●
H/D	1	●
INT	14	●
SOL	3	●
CON	2	●
DEV	18	●

**40 MARKS**

**EXAMINATION NUMBER**

**ANSWER SHEET 2**

CIVIL  
DRAWING

## Sectional Elevation

Subtotal	59	
----------	----	--

18	Walls	11
19	Hatching	5
20	Window	2
21	Door	4
22	Step	2
23	Ramp	5
24	Built-in-Cupboard	1
25	Fixtures	4
26	Electrical	3
27	Labels	2
28	Cutting Plane	2

TOTAL	100	
-------	-----	--



ANSWER SHEET 4

EXAMINATION NUMBER

[illegible]