



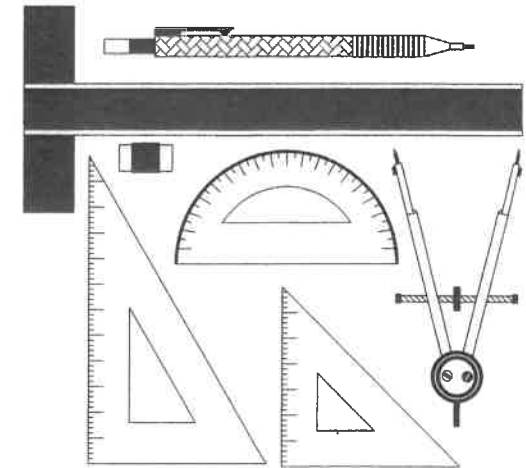
NATIONAL SENIOR CERTIFICATE EXAMINATION

MAY 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	

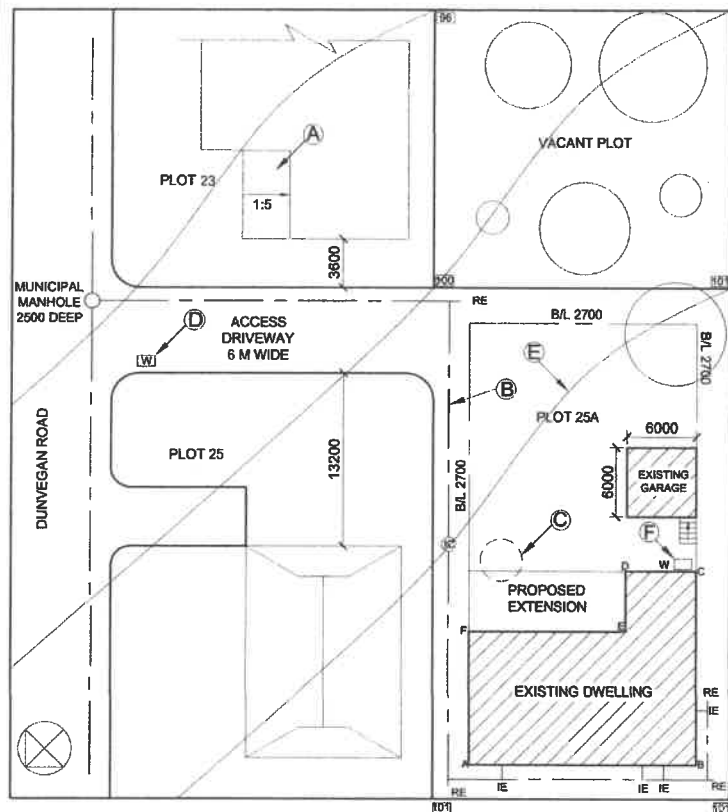
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PLEASE READ THE FOLLOWING INSTRUCTIONS CAREFULLY

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.

EXAMINATION NUMBER

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PLEASE NOTE: THIS SITE PLAN IS NOT DRAWN TO SCALE

STUDY THE ABOVE DRAWING AND ANSWER THE QUESTIONS THAT FOLLOW.

Choose the correct answer and print the correct **LETTER** in the **ANSWER BLOCK**.

1.1 In what units are the corner heights given on this site plan?

A	CENTIMETRES	B	MILLIMETRES	C	METRES	D	UNKNOWN
---	-------------	---	-------------	---	--------	---	---------

1.2 What does feature A in plot 23 represent?

A	RAMP	B	DRIVEWAY	C	STAIRS	D	PORCH
---	------	---	----------	---	--------	---	-------

1.3 What does the line at B represent?

A	STORMWATER LINE	B	BOUNDARY LINE	C	BUILDING LINE	D	SEWER LINE
---	-----------------	---	---------------	---	---------------	---	------------

1.4 In which direction would you be walking, if you walked up the stairs?

A	NORTHWEST	B	SOUTHEAST	C	NORTHEAST	D	SOUTHWEST
---	-----------	---	-----------	---	-----------	---	-----------

1.5 What does the feature at C represent?

A	TREE TO BE PLANTED	B	TREE TO BE REMOVED	C	HOT WATER CYLINDER	D	SPRINKLER
---	--------------------	---	--------------------	---	--------------------	---	-----------

1.6 What does the symbol at D represent?

A	ELECTRICAL BOX	B	WATER METER	C	WATER STORAGE TANK	D	ELECTRICITY METER
---	----------------	---	-------------	---	--------------------	---	-------------------

1.7 What is the line at E called?

A	CONTOUR LINE	B	SLOPE LINE	C	BUILDING LINE	D	SEWER LINE
---	--------------	---	------------	---	---------------	---	------------

DECALA ARCHITECTS

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APPROVED BY:

JOE S

REFERENCE:

BU2022/02

PROPOSED EXTENSION FOR
MS SITA HIRALAL
DUNVEGAN ROAD
PLOT 25A
MOUNT EDGECOMBE

DATE: 14 APRIL 2022

SHIRALAL

SIGNED: MS S HIRALAL

LAND SURVEYOR'S CERTIFICATE
DWELLING SIDE LENGTHS

AB = 17700, BC = 15000,

CD = 5400, DE = 4500,

EF = 12300, FA = 10500

QUESTION 1CIVIL
ANALYTICAL

1.8 What does the symbol at F represent?

A	WASTE TANK	B	ELECTRICAL BOX	C	WATER STORAGE TANK	D	ELECTRICITY METER
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1.9 Where is plot 25A situated?

A	SELBOURNE	B	GLEN ANIL	C	LA LUCIA	D	MOUNT EDGECOMBE
---	-----------	---	-----------	---	----------	---	-----------------

1.10 How far, in metres, is the building line from the boundary line in plot 25A?

A	2,7 m	B	2 700 m	C	2 400 m	D	2,4 m
---	-------	---	---------	---	---------	---	-------

1.11 What is the perimeter, in metres, of the dwelling on plot 25A after the proposed extension has been completed?

A	65,4 m	B	65 400 m	C	9,6 m	D	9 600 m
---	--------	---	----------	---	-------	---	---------

1.12 What is the depth of the municipal manhole in metres?

A	2 500	B	2 700	C	2,7	D	2,5
---	-------	---	-------	---	-----	---	-----

1.13 How many rodding eyes are there in the drawing?

A	4	B	3	C	2	D	1
---	---	---	---	---	---	---	---

1.14 What is the distance between the 2 dwellings on plots 23 and 25?

A	16,8 m	B	22,8 m	C	16 800 m	D	22 800 m
---	--------	---	--------	---	----------	---	----------

1.15 What does the abbreviation IC stand for?

A	INSPECTION CHANNEL	B	INSPECTION CLOSET	C	INSPECTION CHAMBER	D	INSPECTION CONNECTION
---	--------------------	---	-------------------	---	--------------------	---	-----------------------

1.16 What is the architect's web address?

A	peter@decala.co.za	B	admin@decala.co.za	C	www.decala.co.za	D	www.decalaarchitects.co.za
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1.17 In the space below, determine the area of the existing dwelling in metres squared (m²). Round your answer to 2 decimal places.Answer:

1.18 In the space below, draw, in NEAT freehand, the PLAN VIEW and ELEVATION VIEW of the SANS 10143 convention for a bath.

PLAN VIEW	ELEVATION VIEW

20 MARKS**EXAMINATION NUMBER****ANSWER SHEET 1**

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QUESTION 2

INTERPENETRATION
& DEVELOPMENT

The figures below show the INCOMPLETE Front View and a COMPLETE Top View of a SQUARE PIPE penetrated by a PENTAGONAL DUCT. Auxiliary views of the pentagonal duct are also shown.

Draw the following:

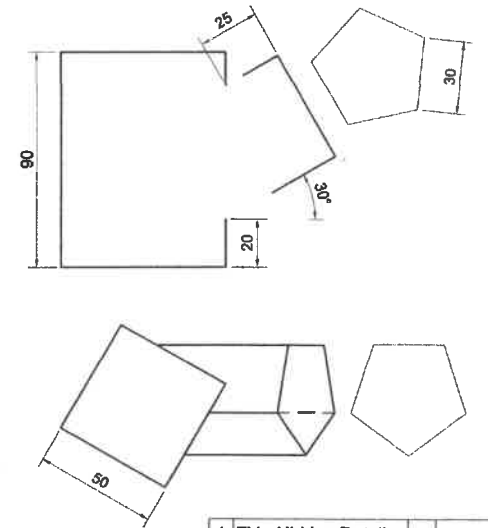
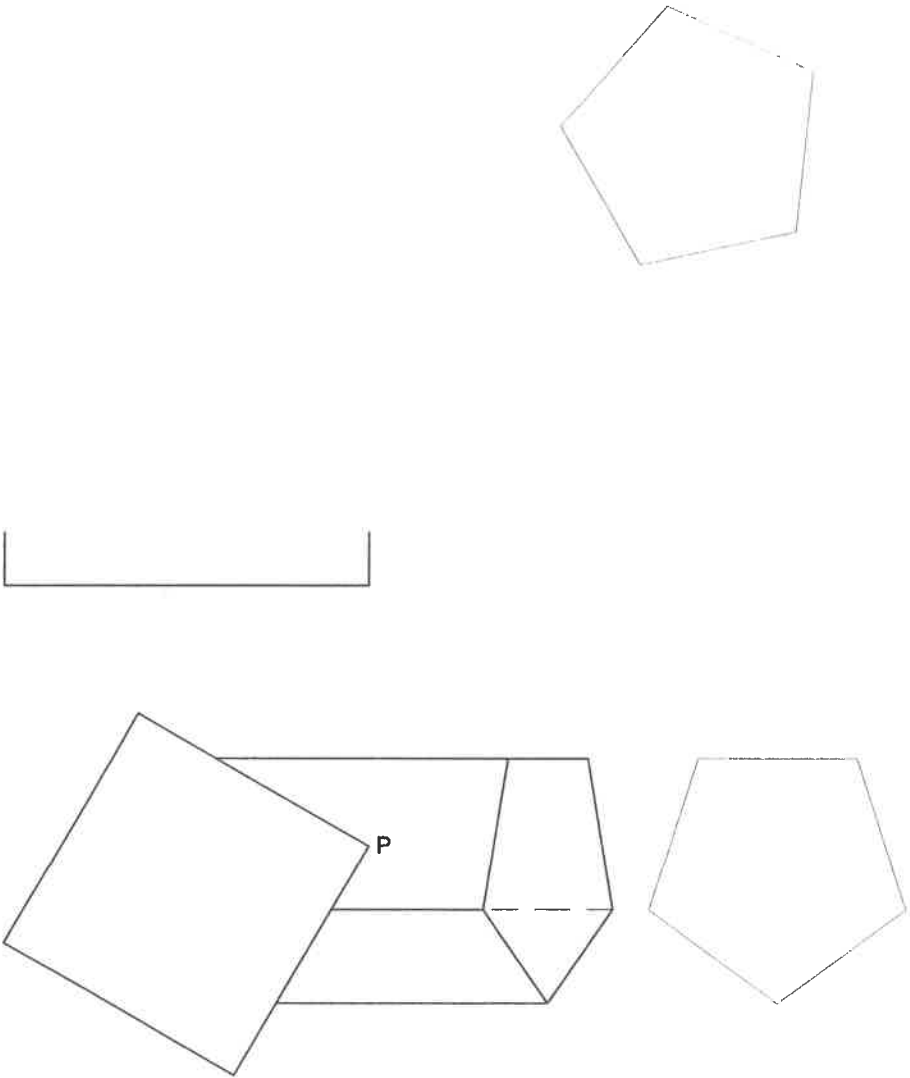
- 2.1 the complete FRONT view, clearly showing the curve of interpenetration. Show all hidden detail.
- 2.2 the development of the square pipe clearly showing the hole. Show only two faces. Use point P as a reference.

Show all construction.

ASSESSMENT CRITERIA

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

- draw the given incomplete Front View 2
- complete the Front View 26
- show necessary construction 3
- develop the square pipe 9



1	FV - Hidden Detail	10
2	FV - Points	7
3	FV - Lines	11
4	Construction	3
5	Development	9

40 MARKS

EXAMINATION NUMBER

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ANSWER SHEET 2

QUESTION 3

**TWO-POINT
PERSPECTIVE**

The figures show the two views of a house with a garage. Draw a neat two-point perspective view of this dwelling.

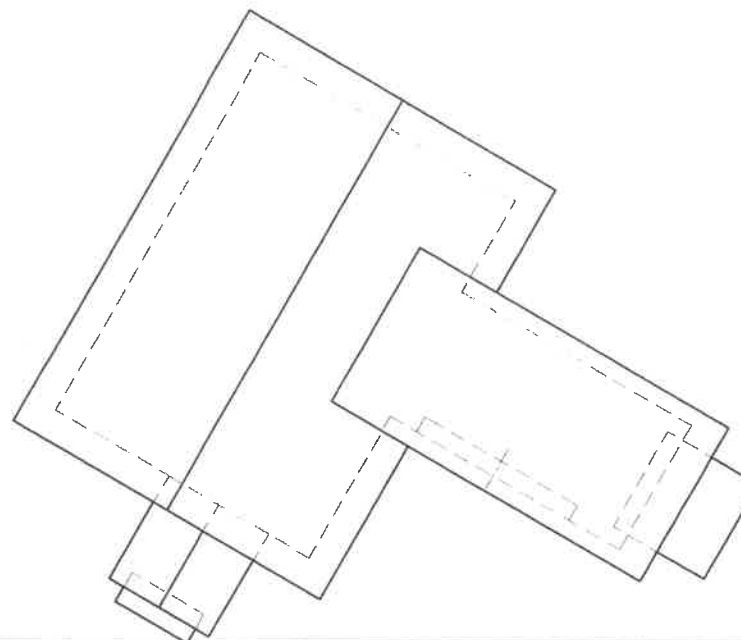
PP - Picture Plane
HL - Horizon Line
GL - Ground Line
SP - Station Point

Determine and label the vanishing points RVP and LVP
Show the wall thickness where applicable.
NO HIDDEN DETAIL IS REQUIRED.

ASSESSMENT CRITERIA

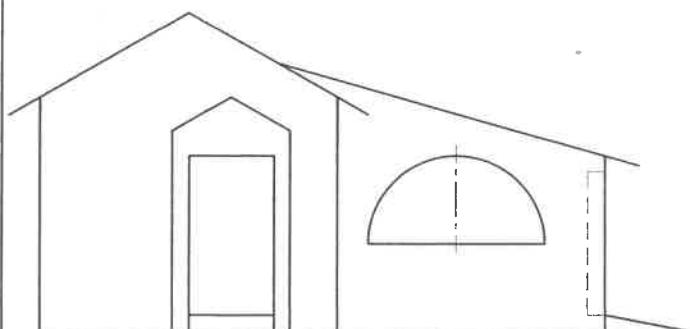
You will be assessed on your ability to do the following:

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



PP

HL



PTS	
27	
Con	
4	
Arc	
7	
VPS	
2	

GL

SP

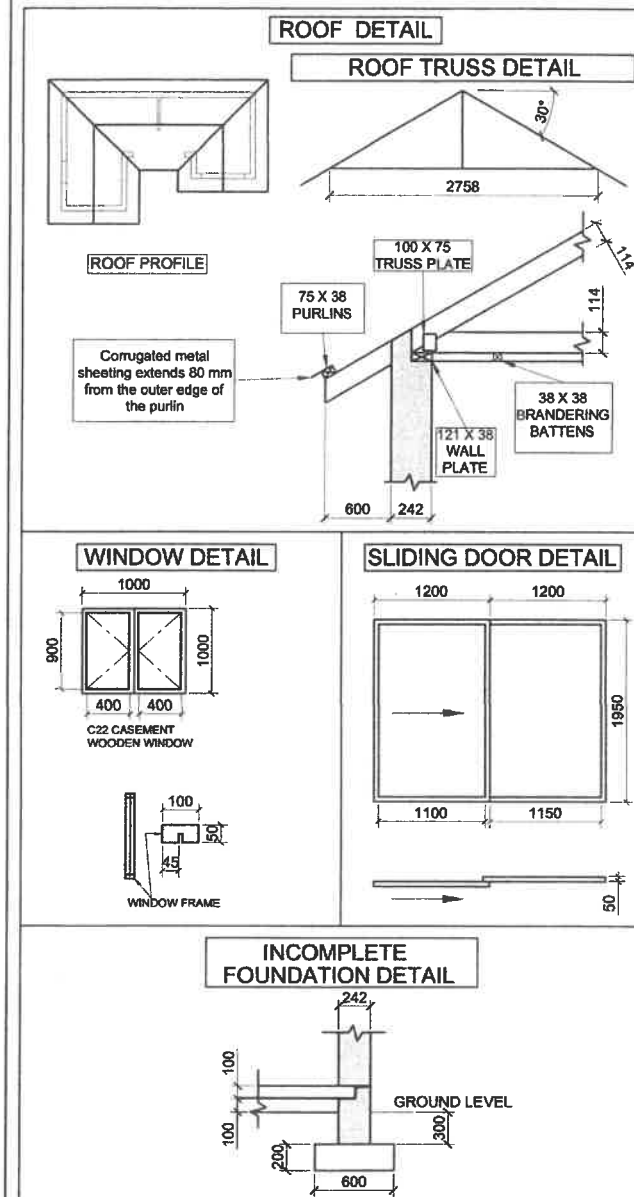
40 MARKS

EXAMINATION NUMBER

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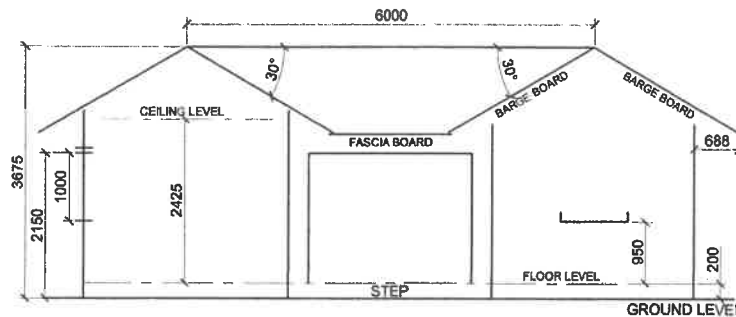
ANSWER SHEET 3

QUESTION 4

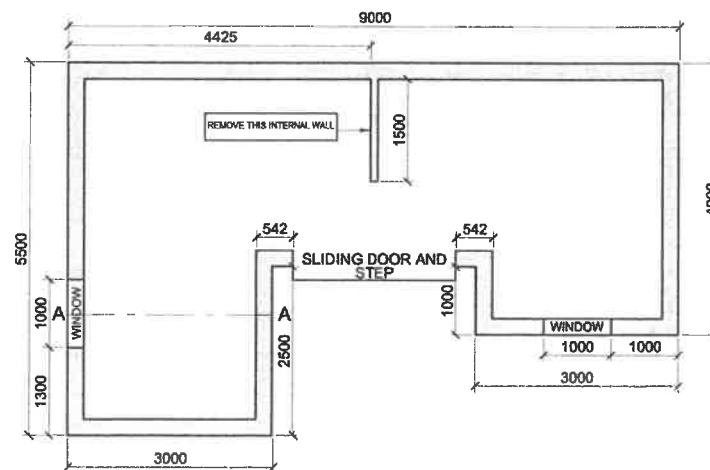
CIVIL
DRAWING

NOTES:

- Floor tiles should be used for the entire floor area.
- Brickwork must be carried out as indicated on the schematic drawing:
The internal wall must be removed.
- The step has a 200 mm riser and a 200 mm tread. The top of the step is the same height as the finished floor level.
- The windows do not have window sills.



SCHEMATIC NORTH ELEVATION



SCHEMATIC FLOOR PLAN

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

The following are given:

- Roof detail
- Window detail
- Sliding door detail
- Incomplete foundation detail
- Notes
- An incomplete schematic elevation with
 - ▶ door and window positions, ceiling, ground and floor levels
- An incomplete schematic floor plan of a **CLUBHOUSE** with
 - ▶ window and door positions
 - ▶ perimeter dimensions

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

- 1) The **complete FLOOR PLAN**
- 2) The **SECTIONAL NORTH ELEVATION** on the indicated cutting plane

FLOOR PLAN INSTRUCTIONS

- Draw the complete floor plan of the clubhouse.
- The following alterations must be made to the clubhouse:
 - ▶ Remove the internal wall as indicated.
- Draw and hatch all walls.
- Insert all window details.
- Insert the sliding door details.
- Draw the step.
- Label the floor plan and indicate the scale.
- Draw and label the cutting plane A-A.

SECTIONAL NORTH ELEVATION INSTRUCTIONS

- Draw the complete NORTH ELEVATION showing the section as per the indicated cutting plane and the rest of the exterior of the building.
- Draw the window detail of the C22 window.
- Show some roof detail for the corrugated metal sheeting.
- Draw the step.
- Complete the foundation details:
 - ▶ insert all floor slab details.
 - ▶ use 100 mm compacted hardcore filling.
- Label the ground level.
- Label the damp-proof course at the floor slab and window.
- Draw the section at the window:
 - ▶ use ONE 242 x 75 mm concrete lintel above the window.
 - ▶ show the window frame detail.
- Roof details:
 - ▶ draw the roof truss using 114 x 38 mm rafters and FOUR 100 x 75 mm truss plates.
 - ▶ use FOUR 75 x 38 mm purlins spaced appropriately.
 - ▶ use TWO 121 x 38 mm wall plates.
 - ▶ use TWO 38 x 38 mm ceiling battens spaced appropriately.
 - ▶ use corrugated metal sheeting for the roof and a 30° pitch.
 - ▶ use 9 mm gypsum ceiling boards.
- The fascia board is 200 mm wide.
- The barge board is 225 mm wide and 2 400 mm long.
- Draw the fascia and barge boards in the outside view of the North Elevation only.
- Label and draw the finished floor level.
- Show all hatching detail.
- Label the sectional NORTH ELEVATION.

**CIVIL
DRAWING**

Sectional North Elevation

Subtotal	73	
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Subtotal	27	
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[illegible]