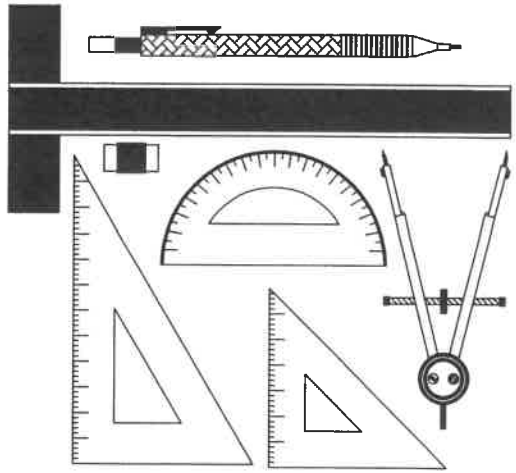
ieb
assessment matters



NATIONAL SENIOR CERTIFICATE EXAMINATION
SUPPLEMENTARY PAPER
2019

ENGINEERING GRAPHICS AND DESIGN

PAPER 1

MARKS: 200
TIME: 3 HOURS

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 millimeters (mm) unless otherwise indicated.

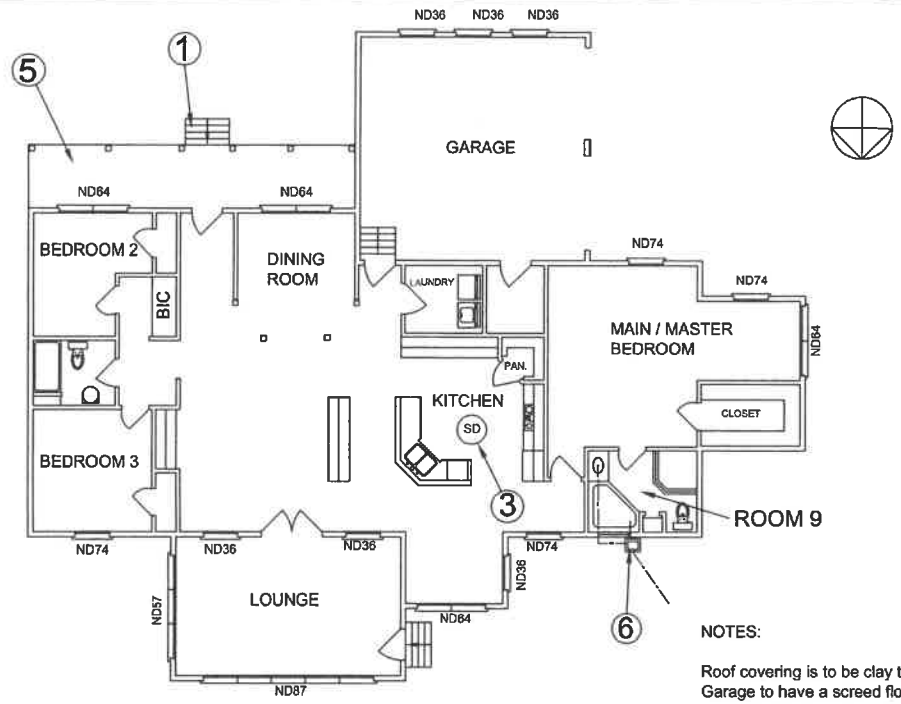
FOR OFFICIAL USE ONLY					
QUESTION	SECTION	MARK	MODERATED	MAXIMUM	CODE
1	CIVIL ANALYTICAL			20	
2	INTERPENETRATION			40	
3	TWO-POINT PERSPECTIVE			40	
4	CIVIL DRAWING			100	
SYMBOL	TOTAL			200	
				100	

FINAL CONVERTED MARK	CHECKED BY
100	

EXAMINATION NUMBER

QUESTION 1

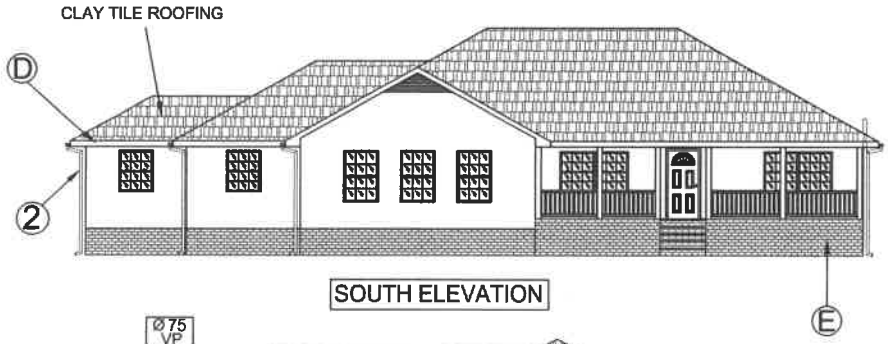
CIVIL ANALYTICAL



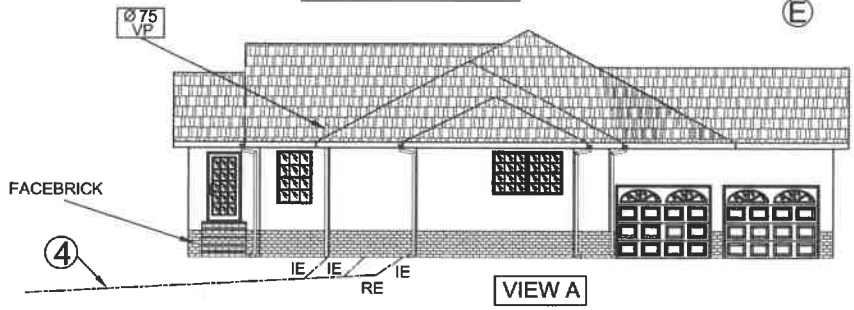
FLOOR PLAN

NOTES:

Roof covering is to be clay tiles.
Garage to have a screed floor finish.
Exterior walls to have a plaster and paint finish above the face brick plinth.
Interior walls to be standard clay brick.



SOUTH ELEVATION



VIEW A

STUDY THE ADJACENT DRAWING AND ANSWER THE QUESTIONS THAT FOLLOW:

1.1 What elevation is VIEW A?		1
1.2 What would be the room designation of ROOM 9?		1
1.3 What type of tiles cover the roof?		1
1.4 How many inspection eyes are indicated?		1
1.5 What does the abbreviation "BIC" stand for?		1
1.6 What type of floor finish should the garage have?		1
1.7 What is the feature at 1 called?		1
1.8 What is the feature at 2 called? (No abbreviations)		1
1.9 What is the feature at 3 called? (No abbreviations)		1
1.10 What is the feature at 4 called?		1
1.11 What is the name of the area indicated by 5?		1
1.12 What is the feature at 6 called?		1
1.13 How many ND74 windows are used?		1
1.14 What is the diameter of the ventilation pipe?		1
1.15 In which direction would a car move if it were driving into the garage?		1
1.16 What does the abbreviation "RE" stand for?		1
1.17 Name the board that the gutters attach to. (Indicated at D)		1
1.18 What material is the plinth (indicated by E) made from?		1

1.19 In the space below, draw, in NEAT freehand, the PLAN VIEW and ELEVATION VIEW of the SANS convention for a wall-mounted urinal. 2

PLAN VIEW	ELEVATION VIEW

20 MARKS

ANSWER SHEET 1

EXAMINATION NUMBER

QUESTION 2

INTERPENETRATION

The figure below shows the COMPLETE Front View and an INCOMPLETE Top View of a **CIRCULAR PIPE** lying on the ground and penetrated by an equilateral **TRIANGULAR DUCT**, drawn in First-angle Orthographic Projection. The Auxiliary Views of the triangular duct have also been drawn.

Draw the following:

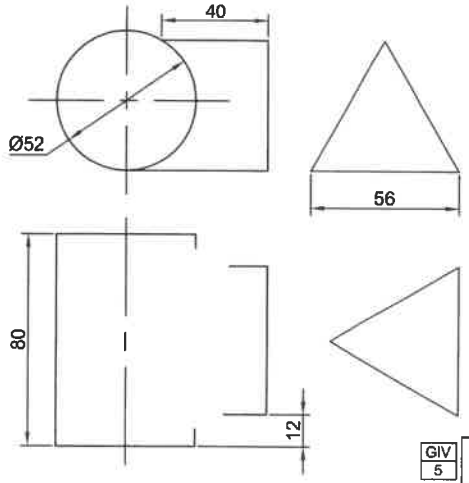
2.1 the given Front View,

2.2 the complete Top View clearly showing the curve of interpenetration. Show all hidden detail,

2.3 the surface development of the triangular duct showing the curve of interpenetration.

Show all construction.

ASSESSMENT CRITERIA	
You will be assessed on your ability to do the following:	
• draw the given Front View	5
• draw the complete Top View	19
• draw the surface development	14
• show necessary construction	2



GIV 5	
TV 19	
DEV 14	
CON 2	
40 MARKS	

EXAMINATION NUMBER

ANSWER SHEET 2

QUESTION 3

TWO-POINT PERSPECTIVE

The figure shows the three views of an outside courtyard area with an L-shaped fish pond. Draw a neat two-point perspective view of this area.

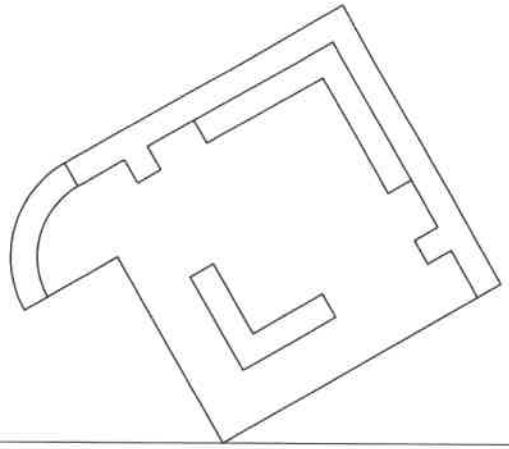
PP - Picture Plane
HL - Horizon Line
GL - Ground Line
SP - Station Point

Show the wall thickness where applicable.
Determine and 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

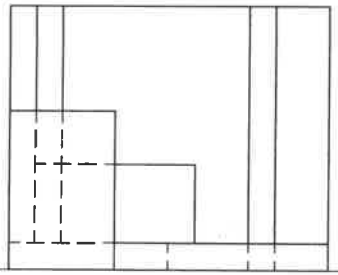


PP

PP

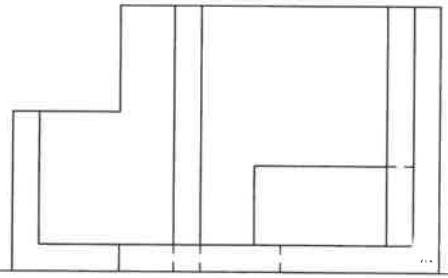
HL

HL



GL

SP



GL

PTS
27

Con
4

Arc
7

VPS
2

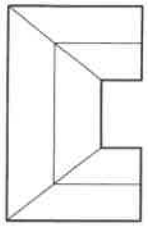
40 MARKS

EXAMINATION NUMBER

ANSWER SHEET 3

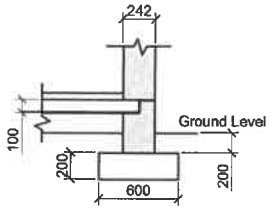
ROOF DETAIL

ROOF PROFILE

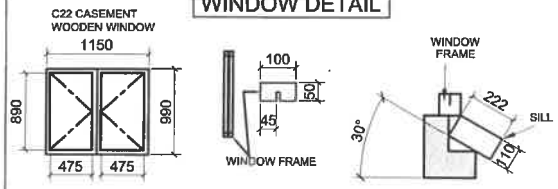


ROOF TRUSS DETAIL

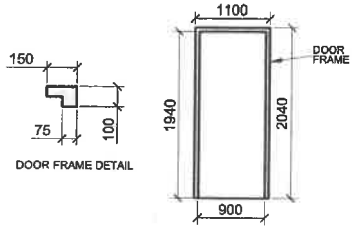
INCOMPLETE FOUNDATION DETAIL



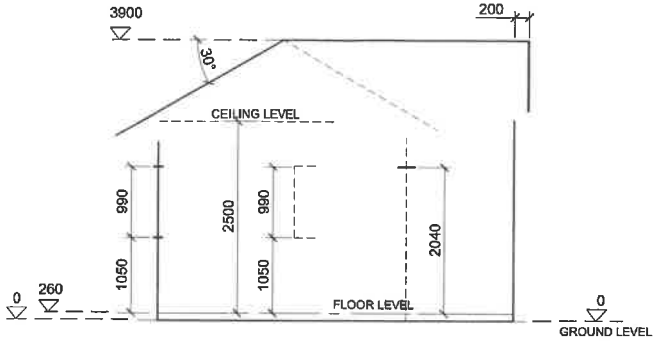
WINDOW DETAIL

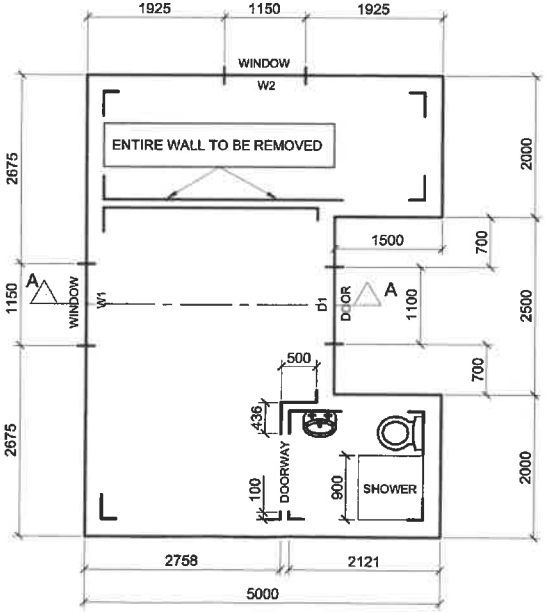


DOOR FRAME DETAIL



SCHEMATIC SOUTH ELEVATION





SCHEMATIC FLOOR PLAN

QUESTION 4

CIVIL DRAWING

Answer this question on ANSWER SHEET 4.
All drawings must comply with SANS 10143.

The following is given:

- An incomplete schematic floor plan of a tiled ***OUTBUILDING*** with
  - ► window and door positions
  - ► perimeter dimensions
- An incomplete schematic elevation with
  - ► door and window positions, ground and floor levels
- Door and door frame detail
- Incomplete foundation detail
- Roof detail
- Window, window frame and window sill detail

Draw the following on answer sheet 4 using a scale of 1:50 :

1) The **complete FLOOR PLAN**
2) The **SECTIONAL SOUTH ELEVATION** on cutting plane A-A.

FLOOR PLAN INSTRUCTIONS

- The following alterations must be indicated:
  - ► Show that the existing internal wall must be removed
- Draw and hatch all walls (only external walls are load bearing)
- Insert all window details
- Insert the door detail of the door
- Draw, according to the SANS convention, the water closet, wash basin and shower (position suitably)
- Insert the following electrical detail:
  - ►A TWO, 40 watt fluorescent tube light in the centre of room
  - ►a single wall-mounted light outside the door
  - ►a double wall-mounted light switch next to the door
  - ►one switched socket outlet on the **northern** wall
- Label the floor plan and the scale
- Indicate the room designation
- Draw and label the cutting plane

SECTIONAL SOUTH ELEVATION INSTRUCTIONS

- Draw the complete SOUTH ELEVATION showing the section as per the indicated cutting plane and the rest of the exterior of the building
- Show the window detail of window W2
- Complete the foundation details
- Insert 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 window with the same frame detail as the C22
  - ► use ONE 242 x 75 mm concrete lintel above the window
  - ► use 222 x 110 mm quarry tile windowsill
  - ► show the window frame detail
- Draw in the sectional door showing the door frame detail
  - ► use ONE 242 x 75 mm concrete lintel above the door
- Roof details
  - ► draw the roof truss using 114 x 38 rafters
  - ► use FOUR 100 x 100 mm truss plates
  - ► use FOUR 76 x 50 mm purlins spaced at 2 175 mm centres
  - ► use TWO 121 x 38 mm wall plates
  - ► use TWO 38 x 38 mm battens spaced at 1 005 mm centres
  - ► use corrugated asbestos sheeting for the roof and a 30° pitch
  - ► use 9 mm gypsum ceiling boards
- Show all hatching detail
- Label the sectional SOUTH ELEVATION

EXAMINATION NUMBER

QUESTION 4

CIVIL DRAWING

Assessment Criteria

Sectional Elevation

1	Ceiling Battens	2	
2	Wall Plates	2	
3	Ceiling Board	1	
4	Truss Plates	4	
5	Roof Truss	5	
6	Purlins	4	
7	Roof	4	
8	Walls	5	
9	Sectioned Window	6	
10	Sectioned Door	4	
11	Floor & Foundation	6	
12	DPC	2	
13	Hatching	11	
14	Outside window	4	
15	Fascia Board	4	
16	Labels	2	
Subtotal		66	

Floor Plan

17	Walls	7	
18	Hatching	5	
19	Windows	4	
20	Door	4	
21	Plumbing Fixtures	3	
22	Labels	3	
23	Cutting Plane	2	
24	Electrical	6	
Subtotal		34	
TOTAL		100	

100 MARKS

EXAMINATION NUMBER

ANSWER SHEET 4