

# NATIONAL SENIOR CERTIFICATE EXAMINATION

2015

# **ENGINEERING GRAPHICS AND DESIGN**

PAPER 1

MARKS:

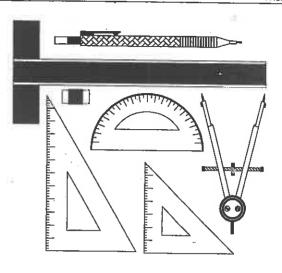
200

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 re-stapled in numerical order, even questions that are not attempted/blank.
- All construction work must be shown.
- 7. Print your examination number neatly on each page.
- 8. Use only the drawing sheets provided.
- Your drawings should reflect neatness and accuracy.
- 10. All dimensions or detail not given may be assumed in good proportion.



FOR OFFICIAL USE ONLY					
QUESTION	SECTION	MARK	MARK MODERATED		CODE
1	CIVIL ANALYTICAL			20	
2	INTERPENETRATION			39	
3	TWO-POINT PERSPECTIVE			41	-
4	CIVIL DRAWING			100	
SYMBOL	TOTAL			200	_
				100	

FINAL CONVERTED MARK	CHECKED BY
100	

	FIGARINATION		_ <u></u>
	EXAMINATION	<u>LNUMBER</u>	
1 1 1			
			- [ ]

QUESTION 1
CIVIL
ANALYTICAL

	ERF 334		
	3000 B/L	839 B	v
E	RF 336		×
837	`\ <i>J</i> ' i	PROPOSED DOGO RE	ERF 436
PROTEA STREET	EXISTING DWELLING	Marie and market	- <b>4</b>
EET	2500	IE IE	-3
MUNICIPAL SEWER 2 m deep	SOAKPI	PROPOSED NEW GARDEN FLAT	
	2000 B/I 2000 B/I 23000 ERF 338	~ / \-	C [836]
		SITE PLAN SCALE 1:2000	

1.1 What type of civil drawing is shown by the adjacent drawing?	-
1.2 Which elevation of the dwelling faces Protea Street?	
1.3 What colour must the proposed new buildings be in this drawing?	
1.4 How many inspection eyes are there on this property?	
1.5 Which of the labelled corners is the highest on this property?	
1.6 On which property are the proposed building additions?	
1.7 What is the feature at 1 called? (No abbreviations)	
1.8 What is the feature at 2 called? (No abbreviations)	
1.9 What is the feature at 3 called? (No abbreviations)	
1.10 What is the feature at 4 called?	
1.11 What is the feature at 5 called?	
1.12 What is the feature at 6 called?	
1.13 What is indicated by the dashed lines at feature 7?	
I.14 If the owners wanted to construct a brick wall along the Protea Street boundary, how close could this wall be to the street?	
1.15 Would the given drawing be accepted by the town engineer as it is?	
Give a reason for your answer in 1.15:	
.16 What is the depth of the municipal sewer connection?	
.17 In the space below determine the area of the existing dwelling in m <sup>2</sup> .	
The second secon	

ANSWER SHEET 1

20 MARKS

**EXAMINATION NUMBER** 

QUESTION 2

INTERPENETRATION

The figure below shows the INCOMPLETE Front View and an INCOMPLETE Top View of a CIRCULAR PIPE penetrated by a SQUARE DUCT. An auxiliary view of the square duct is also given.

## 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 surface development of the square duct A.

Show all construction.

### ASSESSMENT CRITERIA

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

- draw the complete front view
- draw the complete top view
- show necessary centre lines and construction
- draw the surface development

PART A

Part A

By
Cen
3

Con
14

Dev
11

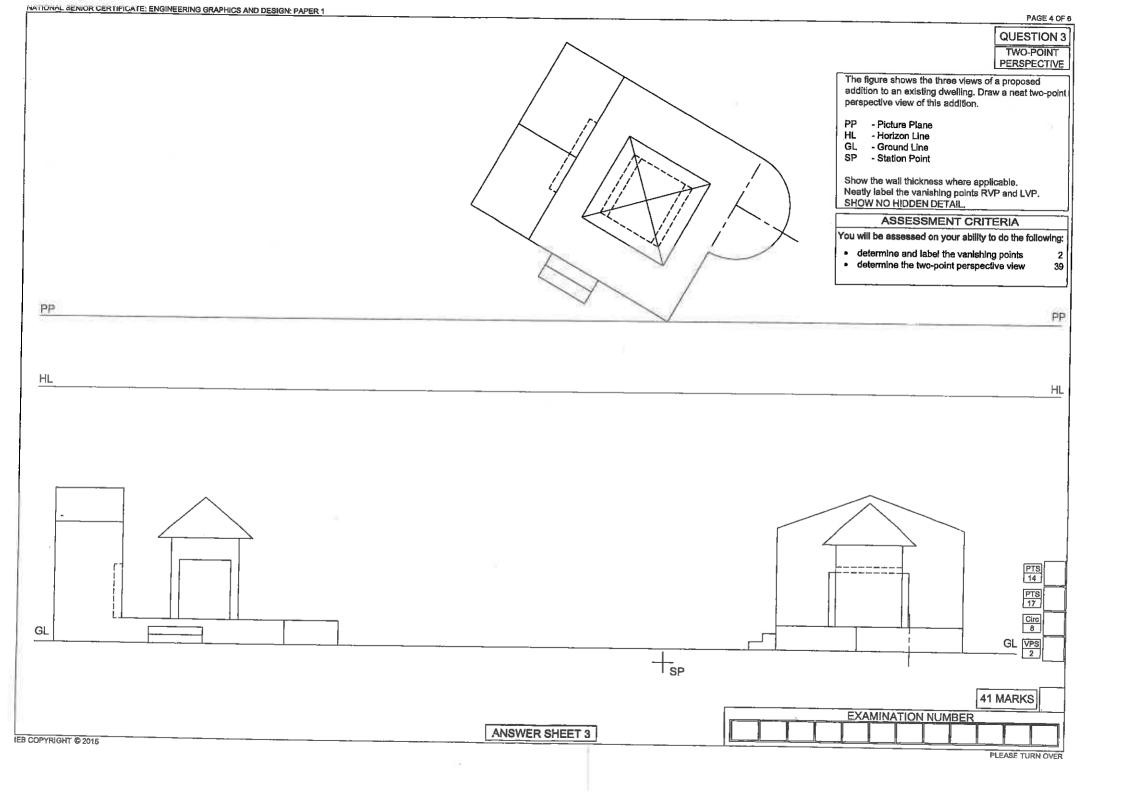
**EXAMINATION NUMBER** 

ANSWER SHEET 2

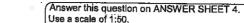
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PLEASE TURN OVER

39 MARKS



QUESTION 4 CIVIL DRAWING



All drawings must comply with SANS: 10143.

#### The following is given:

- An incomplete schematic floor plan of an ABLUTION BLOCK
  - window and door positions
  - > perimeter dimensions and cutting plane A-A
  - plumbing fixtures and an external sewerage line
- An incomplete schematic elevation
  - window position, ceiling height, ground level and floor level
- Window detail, door and door frame detail
- Incomplete foundation detail
- Roof detail, including purlin, batten and truss detail

#### Draw the following:

- 1) the complete floor plan
- the complete sectional elevation, including the rest of the elevation that is not sectioned.

### **FLOOR PLAN INSTRUCTIONS**

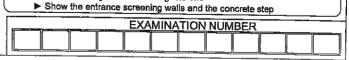
- Hatch all the external and internal walls
- Insert all window and EXTERNAL door details and label the cutting plane
- Draw the gully one brick course thick
- Label the floor plan and print the scale
- Insert the following electrical detail in the men's side of the ablution only:
  - A TWO, 40 watt fluorescent tube light fitting in the centre of the ablution
  - ► A single wall mounted light outside the external door
  - ► One TWO pole switch for these two lights
- Insert the SANS plumbing symbols in the men's ablution for the following:
  - A water closet (toilet), wall-mounted urinal and two wash basins
  - ▶ Piping showing the toilet and urinal linking to the external sewerage line
  - Piping showing the 2 basins linking to the gully and from the gully to the external sewerage line

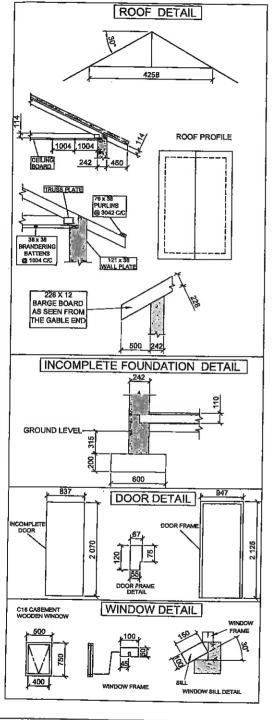
#### SECTIONAL ELEVATION INSTRUCTIONS

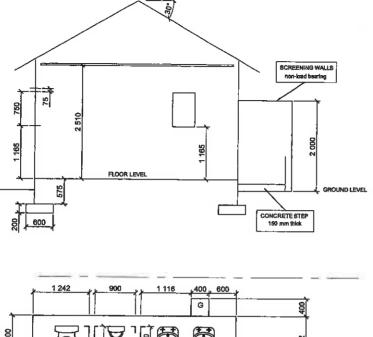
- Complete the foundation details
- Insert all floor slab details
  - ▶ use 10 mm screed
  - ▶ use 150 mm compacted hardcore filling
- Label the ground level, damp proof course and floor level
- Draw in the sectional window in the space indicated
  - ▶ use ONE, 242 x 75 concrete lintel above the window
  - ▶ use 150 x 100 quarry tile window sill
  - ▶ show the window frame detail and label the damp proof course
- Complete and draw the roof details showing the truss.

The whole roof structure uses the following:

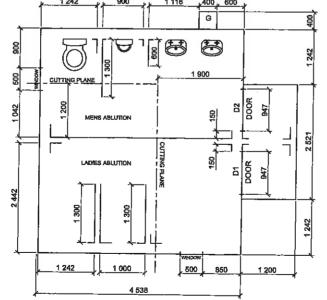
- ▶ 114 x 38 rafters and 100 x 100 truss plates for the truss
- ► FOUR 76 x 38 purlins spaced at 3 042 centres
- ► TWO, 121 x 38 wall plates
- ► THREE 38 x 38 ceiling battens spaced at 1004 centres
- ► Steel sheeting for the roof and a 30° pitch
- ▶ 9 mm Gypsum ceiling boards
- Complete all hatching detail and label the sectional elevation
- Show the visible plumbing using SANS symbols for the toilet and urinal
- Draw the rest of the elevation that is not sectioned
  - Show the barge board on the gable end







SCHEMATIC ELEVATION



SCHEMATIC FLOOR PLAN

NATIONAL SENIOR CERTIFICATE; ENGINEERING GRAPHICS AND DESIGN: PAPER 1	<u></u>				PAGE 6 OF
				[Q	UESTION
					CIVIL
					DRAWING
				Assessment	Critorio
				ASSESSITIETIL	Criteria
				Sectional El	evation
				1 Ceiling Battens	2
				2 Wall Plate	1
				3 Ceiling Board	1
				4 Truss Plates	3
				5 Roof Truss	4
				6 Purlins	3
				7 Roof	1
				8 Walls	4
				9 Sectional Window	5
				10 Floor & Foundation	4
				11 DPC / Labels	4
				12 External Window	3
				13 Hatching	9
				14 External Walls	6
				15 Barge Board	2
		_		16 Finished Floor Level	2
		SEWERAGE LINE		17 Plumbing	2
				Subtotal	56
				Floor Pla	an
					411
				18 Walls	9
				19 Doors	6
				20 Windows 21 Cutting Plane	4
				22 Labels	2
				23 Hatching	7
				24 Plumbing Fixtures	4
				25 External Plumbing	6
				26 Electrical	4
				Subtotal	44
				TOTAL	100
				100 M	ARKS
			EXAMINAT	ION NUMBER	
	ANSWER SHEET 4				
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