

## NATIONAL SENIOR CERTIFICATE EXAMINATION

2017

## **ENGINEERING GRAPHICS AND DESIGN**

### PAPER 1

MARKS:

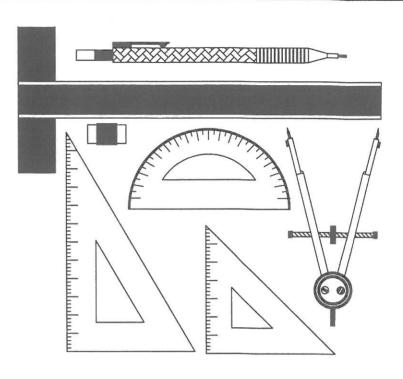
200

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.
- 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.



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				
SYMBOL	TOTAL			200				
				100				

FINAL CONVERTED MARK	CHECKED BY
100	

EXAMINATION NUMBER								

QUESTION 1

CIVIL **ANALYTICAL** 

## SMITH, ZULU & Co ARCHITECTS

"designing the future"

P.O.BOX 1683 GEORGE 6530

TEL: (044) 7612233 FAX: (044) 7612234

CELL: 0837612233

www.smithzulu.co.za office@smithzulu.co.za 23 COPPER STREET

info@smithzulu.co.za

**GEORGE** 6529

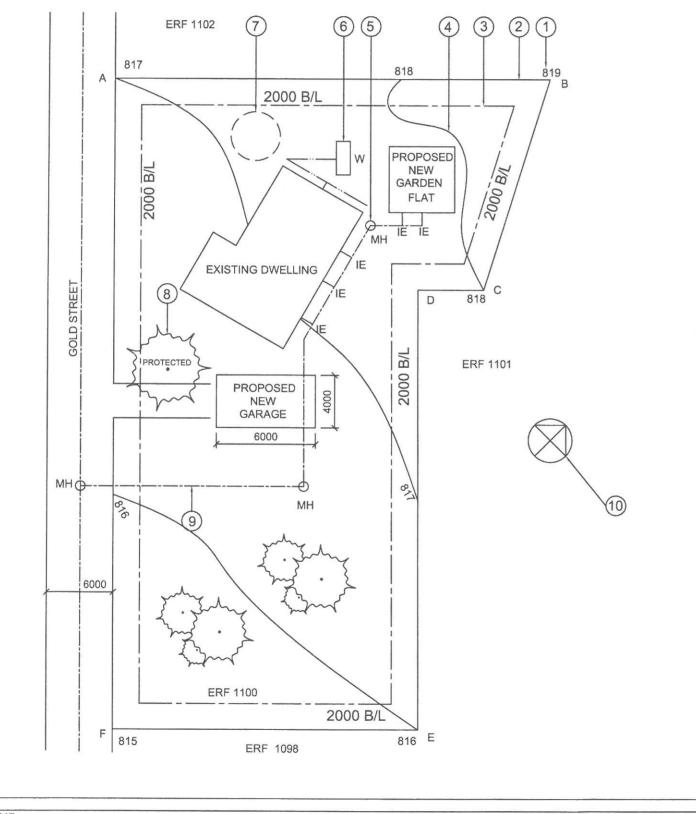
PROPOSED ADDITION FOR A.B. VILLIERS GOLD STREET ERF 1100 **GEORGE SOUTH** 

DRAWN BY: CHECKED BY:

APPROVED BY: H.V. SMITH REFERENCE: 1002/VILLIEF 1002/VILLIERS

PATRICK LOUW DATE: 12 FEBRUARY 2017
T.B. ZULU DR 10110670 ab MLLIERS SIGNED: MR A.B. VILLIERS

LAND SURVEYOR'S CERTIFICATE
SIDE LENGTHS
AB = 33000, BC = 16700 CD = 5000, DE = 36000 EF = 22000, FA = 42000



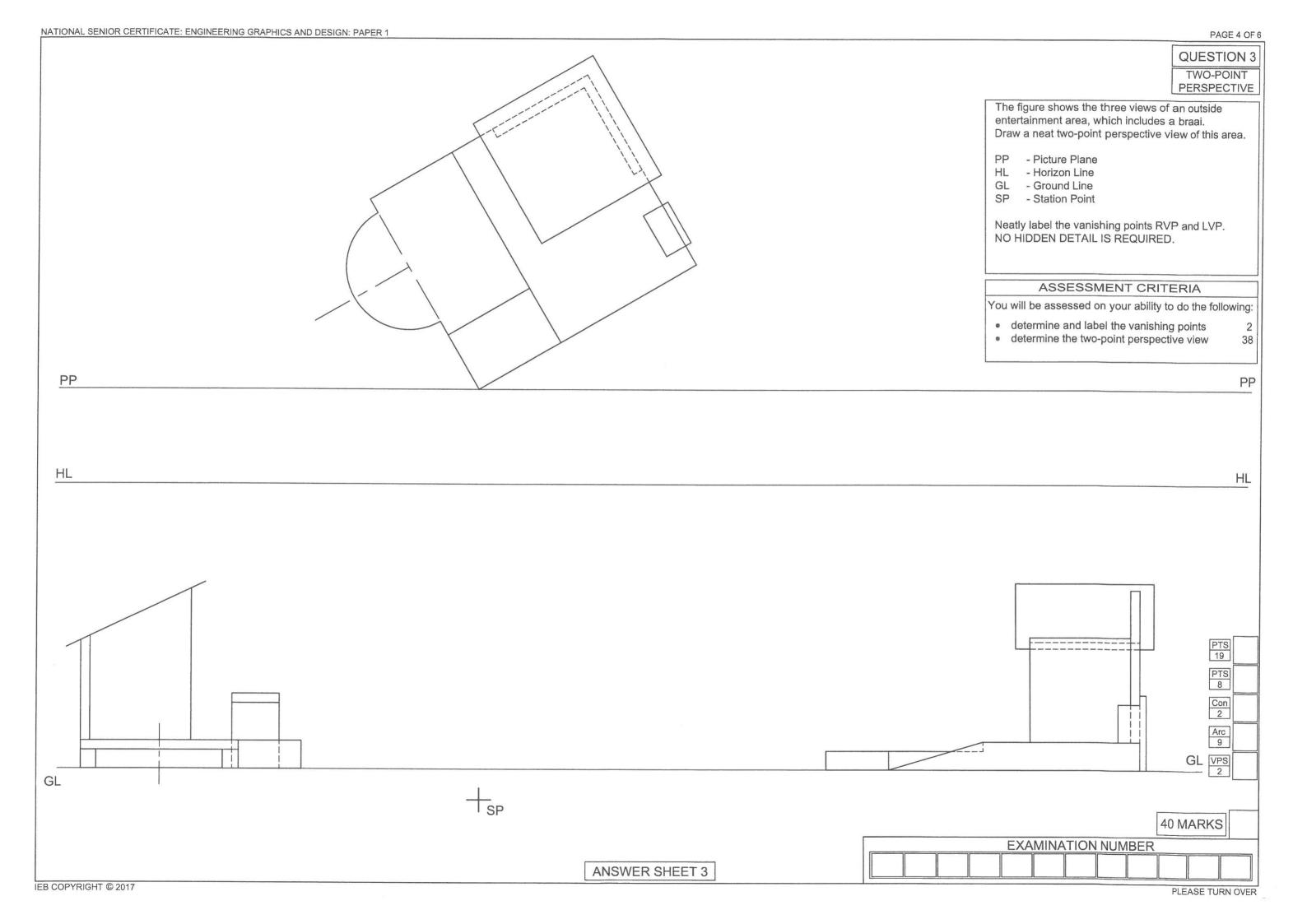
STUDY THE ADJACENT DRAWING AND INFORMATION AND ANSWER THE QUESTIONS THAT FOLI	LOW:
1.1 What type of civil drawing is shown?	1
1.2 What elevation faces the Gold Street?	1
1.3 Who checked the drawing?	1
1.4 In which town is the architect's office located?	1
1.5 On what erf number will the proposed additions be erected?	1
1.6 What is the feature at 1 called?	1
1.7 What is the feature at 2 called?	1
1.8 What is the feature at 3 called?	1
1.9 What is the feature at 4 called?	1
1.10 What is the feature at 5 called?	1
1.11 What is the feature at 6 called?	1
1.12 What is the feature at 7 called?	1
1.13 What is the feature at 8 called?	1
1.14 What is the feature at 9 called?	1
1.15 Which direction would you face when reversing out of the garage?	1
1.16 How many metres would Mr Villiers walk if he walked the boundary?	1
1.17 By how many metres is the highest corner above the lowest?	1
1.18 What is the closest Mr Villiers is allowed to build to Gold Street?	1
1.19 In the space below, determine the area of the proposed new garage in m?  Answer:	2
•	

**ANSWER SHEET 1** 

20 MARKS

**EXAMINATION NUMBER** 

NATIONAL SENIOR CERTIFICATE: ENGINEERING GRAPHICS AND DESIGN: PAPER 1	PAGE 3 OF
	QUESTION
	INTERPENETRATIO  & DEVELOPMENT
	The figure below shows the INCOMPLETE Front View an the Top View of an <b>EQUILATERAL TRIANGULAR DUC</b> penetrated by an <b>CIRCULAR PIPE</b> drawn in First-angle Orthographic Projection. The auxiliary view of the circular pipe is also shown in the Top View.
	<ul> <li>Draw the following:</li> <li>2.1 the complete FRONT view clearly showing the curve of interpenetration. Show all hidden detail.</li> <li>2.2 the complete TOP view.</li> <li>2.3 the development of the two surfaces of the triangular duct that are being penetrated, clearly showing the curve of interpenetration.</li> <li>Show all construction.</li> </ul>
	ASSESSMENT CRITERIA  You will be assessed on your ability to do the following:  or draw the given views  complete the front view  show necessary construction  develop and label the triangular duct  15
	15
	95
	GIV 5
	FV 17
	DEV 15
	40 MARKS
	EXAMINATION NUMBER
	ANSWER SHEET 2
IEB COPYRIGHT © 2017	PI EASE TI IPN OVE



ROOF DETAIL

Corrugated asbestos

sheeting extends 65 mm from the outer edge of

the purlin

228 X 38 FASCIA BOARD

FOUNDATION DETAIL

600

WINDOW DETAIL

C22 CASEMENT

1150

475 475

WOODEN WINDOW

**GROUND LEVEL** 

315

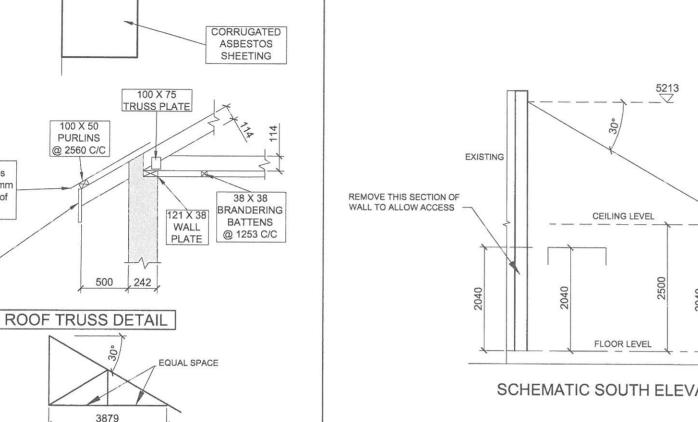
WINDOW

FRAME

DOOR

ROOF PROFILE

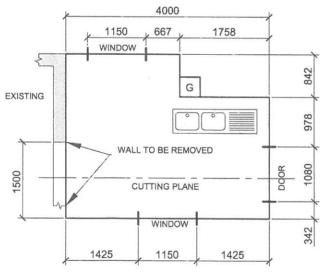
QUESTION 4 CIVIL DRAWING



DOOR DETAIL

900

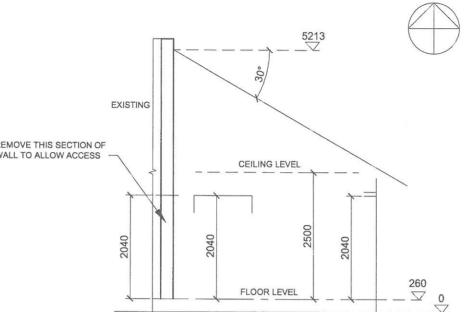
DOOR FRAME DETAIL



Gully is 400 x 400, brick course thick and 2 bricks high. All windows are C22.

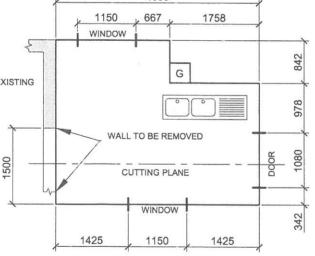
The floor must be tiled.

Place the double sink so that the top surface is 900mm from the floor. The double sink dimensions are 1660 long, 535 wide and 300 deep.



SCHEMATIC SOUTH ELEVATION

GROUND LEVEL



SCHEMATIC FLOOR PLAN

# The following is given:

Use a scale of 1:50.

- An incomplete schematic floor plan of a tiled LAUNDRY addition with
  - ▶ window and door positions
  - ▶ perimeter dimensions
- An incomplete schematic elevation with

Answer this question on ANSWER SHEET 4.

- b door and window positions, ground and floor levels
- Incomplete foundation detail
- Roof and roof truss detail
- Window, window frame, window sill and door frame detail
- The existing wall to which the addition is attached

#### Draw the following:

- 1) The complete floor plan attaching your drawing to the given existing walls on answer sheet 4.
- 2) The SOUTH elevation showing the section as indicated by the cutting
- 3) The outside EAST elevation showing the laundry addition only.

### FLOOR PLAN INSTRUCTIONS

- Draw and hatch all walls
- Indicate appropriately, the removed section of the existing wall
- Insert all window details and the door detail
- Draw the gully
- Label the floor plan and indicate the scale, room designation and floor
- Insert the following electrical detail:
  - ▶ A TWO, 40 watt fluorescent tube light in the middle of the room
  - ▶one wall mounted light outside the door
  - ▶one double pole light switch on the western wall for both the lights
  - ▶one switched socket outlet on the northern wall under the window
- Insert the SANS plumbing symbol for the double sink unit
- Draw and label the cutting plane A-A

### SECTIONAL SOUTH ELEVATION INSTRUCTIONS

- Draw the complete south elevation showing the section as per the indicated cutting plane
- Show the removed section of the existing wall
- Show the outside C22 window
- Complete the foundation details
- Draw 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 door
- ▶ use ONE, 242 x 75 concrete lintel above the door
- Roof details:
  - ▶ draw the roof truss using 114 x 38 rafters and 100 x 75 plates
  - ▶ use THREE, 100 x 50 purlins spaced at 2 560 centres
  - ▶ use ONE, 121 x 38 wall plate
  - ▶ use TWO, 38 x 38 battens spaced at 1 253 centres
  - ▶ use a 228 x 38 fascia board
- ▶ use 9 mm gypsum ceiling boards
- Correctly position the SANS symbol for the double sink unit
- Show all hatching detail and label the Sectional South Elevation

### EAST ELEVATION INSTRUCTIONS

- Draw the complete outside east elevation showing the laundry only
- Show some detail for the corrugated asbestos roof sheeting
- Indicate the Finished Floor Level and label the elevation

E	TANIMAX	ION NUMBE	ER	

NATIONAL SENIOR CERTIFICATE: ENGINEERING GRAPHICS AND DESIGN: PAPER 1 QUESTION 4 CIVIL DRAWING Assessment Criteria **EXISTING** FLOOR LEVEL Floor Plan 16 Plumbing 5 17 Walls 6 18 Hatching 3 19 Windows 4 20 Door 4 21 Electrical 6 22 Labels 4 EXISTING 23 Cutting Plane 2 Subtotal 34 West Elevation 24 Walls & Gully 6 25 Roof Detail 2 26 Door 3 27 Fascia Board 2 28 Floor Finish Level 2 29 Label Subtotal 16 TOTAL 100 100 MARKS EVANIALATION ALLIADED ANSWER SHEET 4 IEB COPYRIGHT © 2017

PAGE 6 OF 6

Sectional South Elevation						
	Ceiling Battens	2				
-	Wall Plates	1				
3	Ceiling Board	1				
4	Truss Plates	5				
5	Roof Truss	6				
6	Purlins	3				
7	Roof	1				
8	Walls	5				
9	Door	4				
10	Floor & Foundation	4				
11	DPC & Labels	3				
12	Hatching	7				
13	Fascia Board	1				
14	Outside window	4				
15	Double Sink	3				
Subtotal						

EXAMINATION NUMBER										
										-