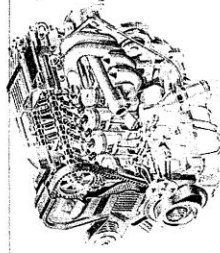
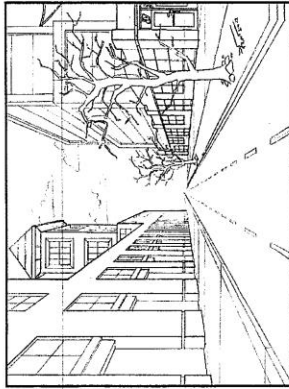
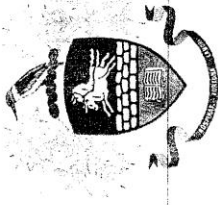


# HILLCREST HIGH SCHOOL ENGINEERING GRAPHICS AND DESIGN EXAM NOVEMBER EXAM



GRADE 12  
2020  
PAPER 1

**TIME: 3 hours**  
**Examiner: Mrs Tonkin**

**MARKS: 200**  
**Moderator: Mr Victor**

**NB: READ THE INTRUCTIONS**

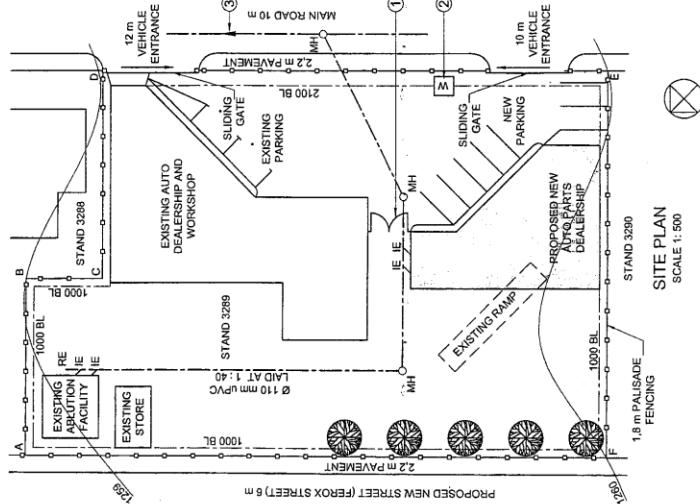
1. This paper consists of **6 pages** including the cover page and **4 questions**.
2. Answer **ALL** questions.
3. Take note of the mark allocation in each question.
4. The questions must be answered on the answer sheets provided.
5. All the answer sheets must be **re-stapled in NUMERICAL** sequence and handed in irrespective of whether the question was attempted or not.
6. Time management is essential in order to complete all the questions.
7. Print your Name in the block provided on **EVERY** answer sheet.
8. All answers must be drawn accurately and neatly.
9. Any details or dimensions not given must be assumed in good proportion.

QUESTION	SECTION	MARK	MODERATE	MAXIMUM
1	CIVIL ANALYTICAL			28
2	INTERPENETRATION			37
3	PERSPECTIVE			40
4	CIVIL DRAWING			95
<b>TOTAL</b>				<b>200</b>
<b>SYMBOL</b>				<b>100</b>

NAME: \_\_\_\_\_  
TEACHER: \_\_\_\_\_

**LAND SURVEYORS CERTIFICATE OF THE BOUNDARY LENGTHS OF STAND 3288, SURVEYED ON 2017/08/31**

BOUNDARY LENGTHS IN MILLIMETRES		CORNER HEIGHTS IN METRES	
AB = 22500	A = 1259		
BC = 8650	B = 1259		
CD = 26680	C = 1259		
DE = 69050	D = 1259		
EF = 49190	E = 1260		
FA = 74900	F = 1260		



**SITE PLAN**  
SCALE 1:500

**NOTE:**  
Contractors must verify all dimensions and levels on site before commencing work. Architects to be notified immediately of any discrepancies.

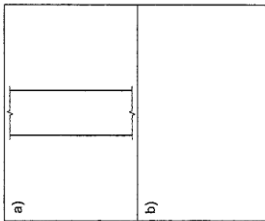
ARCHITECT'S SIGNATURE: .....

CLIENT'S SIGNATURE: .....

**ANSWER 19**

In the space below, draw, in neat freehand and according to the SANS 10143:

- a) FACE BRICK hatching
- b) The graphical symbol for a GULLY



REVISION	DATE	DESCRIPTION

**FRESH DESIGNS**  
51 Munnik Street  
Brey  
010 810 631  
fd.architect@gmail.com

PRINTED BY: .....

L-PRINT .....

DATE OF PRINT: 2018-05-21

DRAWING TITLE: **SITE PLAN**

**PROJECT:**  
PROPOSED NEW AUTO PARTS DEALERSHIP FOR REGROW HOLDINGS ON STAND 3289, MAIN ROAD, PORT ELIZABETH.

**PROJECT NUMBER:** FDDBS-2018

**DRAWING NUMBER:** 1 OF 7

**DATE:** 2018-04-05

**DRAWN:** MP

**CHECKER:** CJC

**SCALE:** 1:500

**REFERENCE CODE:** C1P1-2018

**QUESTION 1: ANALYTICAL (CIVIL)**

**Given:**  
The site plan of an existing auto dealership and workshop with a proposed new auto parts dealership, a title panel and a table of questions. The drawing has not been prepared to the indicated scale.

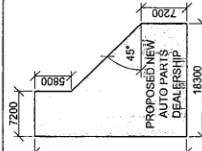
**Instructions:**  
Complete the table below by neatly answering the questions, which refer to the accompanying drawing, title panel and civil content.

**QUESTIONS**

1	What is the title of the drawing?	1/4
2	On what date was the drawing prepared?	1/4
3	What scale is indicated for the drawing?	1/4
4	What is the name of the proposed new street?	1/4
5	How many existing buildings are there on STAND 3289?	1
6	How many parking bays are shown?	1
7	What does the abbreviation RE stand for?	1
8	How wide are the pavements in millimetres?	1
9	What do the two arcs at 1 indicate?	1
10	Name the feature at 2.	1
11	How many manholes are shown?	1
12	What type of fencing surrounds STAND 3289?	1
13	What feature is shown on STAND 3288?	1
14	What is the number of the STAND south west of STAND 3289?	2
15	Why is the existing ramp shown with broken lines?	1
16	What does the arrow on the line at 3 indicate?	1
17	What is the fall of the sewer line?	1
18	In what colour could new concrete be indicated on a layout drawing?	1
19	In the space in the title panel (ANSWER 19), draw, in neat freehand and according to the SANS 10143 a) FACE BRICK hatching, and b) the graphical symbol for a GULLY.	4
20	In the space below (ANSWER 20), determine the total length of the fence in metres.	4
21	In the space below (ANSWER 21), determine the total area of the proposed new auto parts building in square metres. Round off the answer to THREE decimal places.	3
<b>TOTAL</b>		<b>28</b>

**ANSWERS**

<b>ANSWER 20</b>	Show ALL calculations.
<b>ANSWER 21</b>	Show ALL calculations.



**QUESTION 2: INTERPENETRATION AND DEVELOPMENT**

**Given:**

- The top view and incomplete front view of a right regular hexagonal prism that has been shaped to fit over an equilateral triangular prism. The axes of both solids lie in a common vertical plane.
- An auxiliary view of the triangular prism

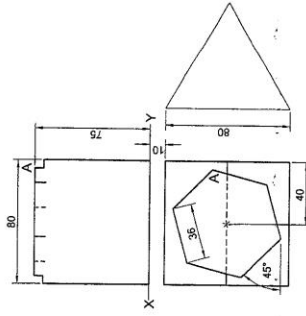
**Instructions:**

Draw, to scale 1 : 1, the following views of the TWO solids:

- 2.1 The given top view
- 2.2 The right view
- 2.3 The complete front view, clearly showing the curve of interpenetration
- 2.4 The development of the surface of the hexagonal prism. Make edge 'A' the seam.

- Planning is essential.
- Show ALL hidden detail.
- Show ALL construction.

[37]



EDGE 'A' IS THE SEAM

ASSESSMENT CRITERIA		7 1/2		
1	TOP VIEW			
2	RIGHT VIEW	5		
3	FRONT VIEW	13		
4	DEVELOPMENT	11 1/2		
PENALTIES (-)				
TOTAL		37		

3

Please turn over

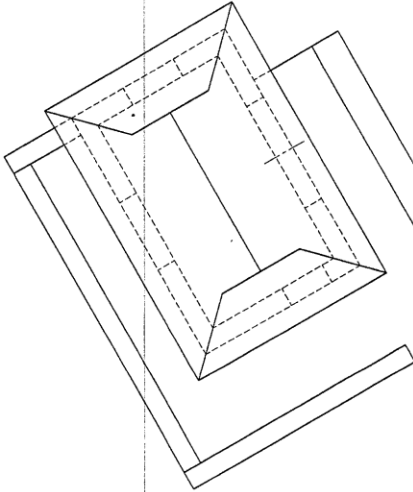
**QUESTION 3: PERSPECTIVE**

**Given:**

Three views of a shelter with a viewing deck and the information needed to draw a two-point perspective drawing  
 PP – Picture plane  
 HL – Horizon line  
 GL – Ground line  
 SP – Station point

**Instructions:**

- Complete the perspective drawing.
- Align the drawing sheet with the ground line (GL).
- Determine and label the vanishing points.
- Show ALL necessary construction.
- NO hidden detail is required. [40]

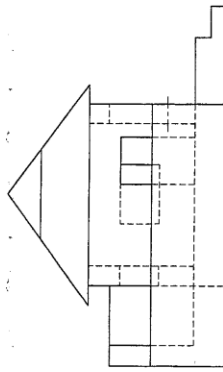
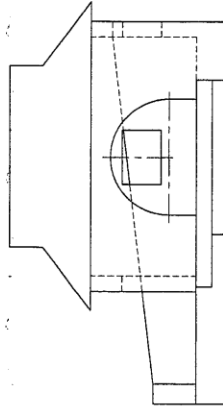


PP

PP

HL

HL



GL

SP

ASSESSMENT CRITERIA			
1	CONSTRUCTION + VPs	7	
2	WALLS + DOORS	22	
3	ROOF	5	
4	CIRCULAR ARC	6	
TOTAL		40	

4

Please turn over

### QUESTION 4: CIVIL DRAWING

**Given:**

- The incomplete west elevation of a new house, showing the walls, the door and window openings, the roof and notes
- The incomplete floor plan showing the walls, positions of the doors, windows, fixtures and the electrical layout
- A schematic diagram of a roof truss and roof notes
- Room designations and floor finishes
- The incomplete foundation and external wall detail
- A table of roof components
- A table of electrical symbols
- A door and window schedule
- A table of fixtures
- The incomplete floor plan of the new house, drawn to scale 1 : 50, and the incomplete foundation of the detailed section, drawn to scale 1 : 20, on page 6

**Instructions:**

Answer this question on page 6.

4.1 Using the given incomplete floor plan, draw, in first-angle orthographic projection and to scale 1 : 50, the following views of the new house:

4.1.1 **THE COMPLETE FLOOR PLAN**

- Add the following features to the drawing:
  - ALL doors and windows
  - The fixtures as indicated by the abbreviations
  - ALL electrical fittings as indicated by the numbers
  - ALL hatching detail

4.1.2 **THE COMPLETE WEST ELEVATION**

- Show the following features on the drawing:
  - The outside walls, door and window detail
  - The roof detail, including the barge boards, fascia boards, gutters and rainwater down-pipe
  - The finished floor level

4.2 Using the incomplete foundation on page 6, draw, to scale 1 : 20, a **DETAILED SECTION** on cutting plane A-A of the area in the ellipse shown on the incomplete floor plan.

Show the following features on the drawing:

- The foundation and external wall detail
- The door detail
- The roof detail, including the fascia board and gutter
- The sink
- ALL hatching detail. ONLY the substructure hatching may be drawn in neat freehand.

**Label the following:**

- The west elevation
- The room designations and floor finishes
- Ground level, finished floor level and damp-proof course (use the correct abbreviations and show it on ALL the relevant views)

**NOTE:**

ALL drawings must comply with the guidelines and graphical symbols as contained in the SANS 10143. [95]

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**DOOR AND WINDOW SCHEDULE**

**DOOR FRAME AND DOOR (D)**  
DOOR NOTE:  
TWO 75 x 100 mm LINTELS ABOVE THE DOOR

**WINDOW (W1)**  
WINDOW (W2)  
WINDOW (W3)

**WINDOW NOTES:**

- A = OPENING SIDE
- B = HINGED SIDE
- C = FIXED PANEL
- 150 x 20 mm FIBRE CEMENT SILL UNDER ALL WINDOWS

**ELECTRICAL SYMBOLS**

**ROOM DESIGNATIONS**

1 BATHROOM: TILE  
2 BEDROOM: CARPET  
3 LOUNGE: CARPET  
4 KITCHEN: TILE

**FLOOR FINISHES**

25 mm SCREED

**ROOF COMPONENTS**

- ROOF CAP
- 114 x 38 mm WALL PLATE
- 150 x 100 mm GUTTER

**INCOMPLETE WEST ELEVATION**

**INCOMPLETE FLOOR PLAN**

**ROOF NOTES:**

- 30° ROOF PITCH
- 114 x 38 mm ROOF TRUSS ON 114 x 38 mm WALL PLATES
- 500 mm ROOF OVERHANG TO END OF ROOF TRUSS
- 10 mm FIBRE CEMENT ROOF SHEETING ON 75 x 50 mm PURLINS @ 1000 mm oc
- 200 x 8 mm BARGE BOARD ON GABLE ENDS
- 250 x 9 mm FASCIA BOARD WITH 150 x 100 mm GUTTERS ON ALL SIDES
- 9 mm CEILING BOARD ON 38 x 38 mm BRANDERING STRIPS @ 400 mm oc

**SCHEMATIC DIAGRAM OF A ROOF TRUSS FOR ROOF B**

**FIXTURES**

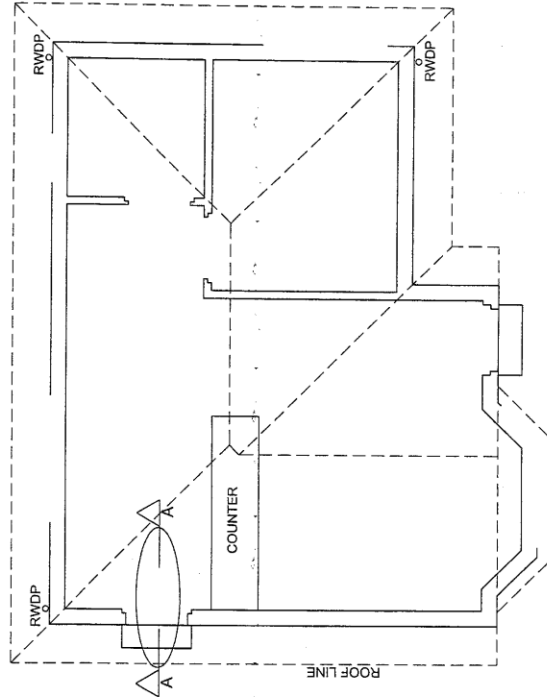
**TOILET (WC)**  
**WASHBASIN (WB)**  
**SINK (S)**  
**SHOWER (SH)**

**FLOOR LEVEL**

FOR OFFICIAL USE ONLY	
INCORRECT SCALE	
NON-ALIGNMENT OF VIEWS	
VIEWS(S) ROTATED	
SECTION VIEWED INCORRECTLY	
INCORRECT LETTERING	
TOTAL	

MARK ALLOCATION FOR ROOF SECTION										
A	B	C	D	E	F	G	H	I	J	

ASSESSMENT CRITERIA			
FLOOR PLAN			
	POSSIBLE	OBTAINED	MODERATED
1	DOORS + WINDOWS	13½	
2	ELECTRICAL	9½	
3	FEATURES	8½	
4	HATCHING	3	
5	LABELS	4	
SUBTOTAL		38½	
WEST ELEVATION			
1	ROOF + RWDP	12	
2	WALLS + FFL	6½	
3	DOOR + WINDOW	8	
4	LABELS	1½	
SUBTOTAL		28	
DETAILED SECTION			
1	ROOF DETAIL	11	
2	FOUNDATION + WALL + DOOR	9	
3	SINK	3	
4	HATCHING	4½	
5	LABELS	1	
SUBTOTAL		28½	
TOTAL		95	
PENALTIES (-)			
GRAND TOTAL			



FLOOR PLAN  
SCALE 1 : 50

DETAILED SECTION A-A  
SCALE 1 : 20