



basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

SENIOR CERTIFICATE EXAMINATIONS/ NATIONAL SENIOR CERTIFICATE EXAMINATIONS

ENGINEERING GRAPHICS AND DESIGN P1

2021

MARKS: 100

TIME: 3 hours

This question paper consists of 6 pages.

Barcode label



INSTRUCTIONS AND INFORMATION

1. This question paper consists of FOUR questions.
2. Answer ALL the questions.
3. ALL drawings are in first-angle orthographic projection, unless otherwise stated.
4. ALL drawings must be prepared using pencil and instruments, unless otherwise stated.
5. ALL answers must be drawn accurately and neatly.
6. ALL the questions must be answered on the QUESTION PAPER, as instructed.
7. ALL the pages, irrespective of whether the question was attempted or not, must be re-stapled in numerical sequence in the TOP LEFT-HAND CORNER ONLY.
8. Time management is essential in order to complete all the questions.
9. Print your examination number in the block provided on every page.
10. Any details or dimensions not given must be assumed in good proportion.

FOR OFFICIAL USE ONLY															
QUESTION	MARKS OBTAINED			$\frac{1}{2}$	SIGN	MODERATED			$\frac{1}{2}$	SIGN	RE-MARKING			$\frac{1}{2}$	SIGN
1															
2															
3															
4															
TOTAL															
	2	0	0			2	0	0			2	0	0		

FINAL CONVERTED MARK

100

CHECKED BY

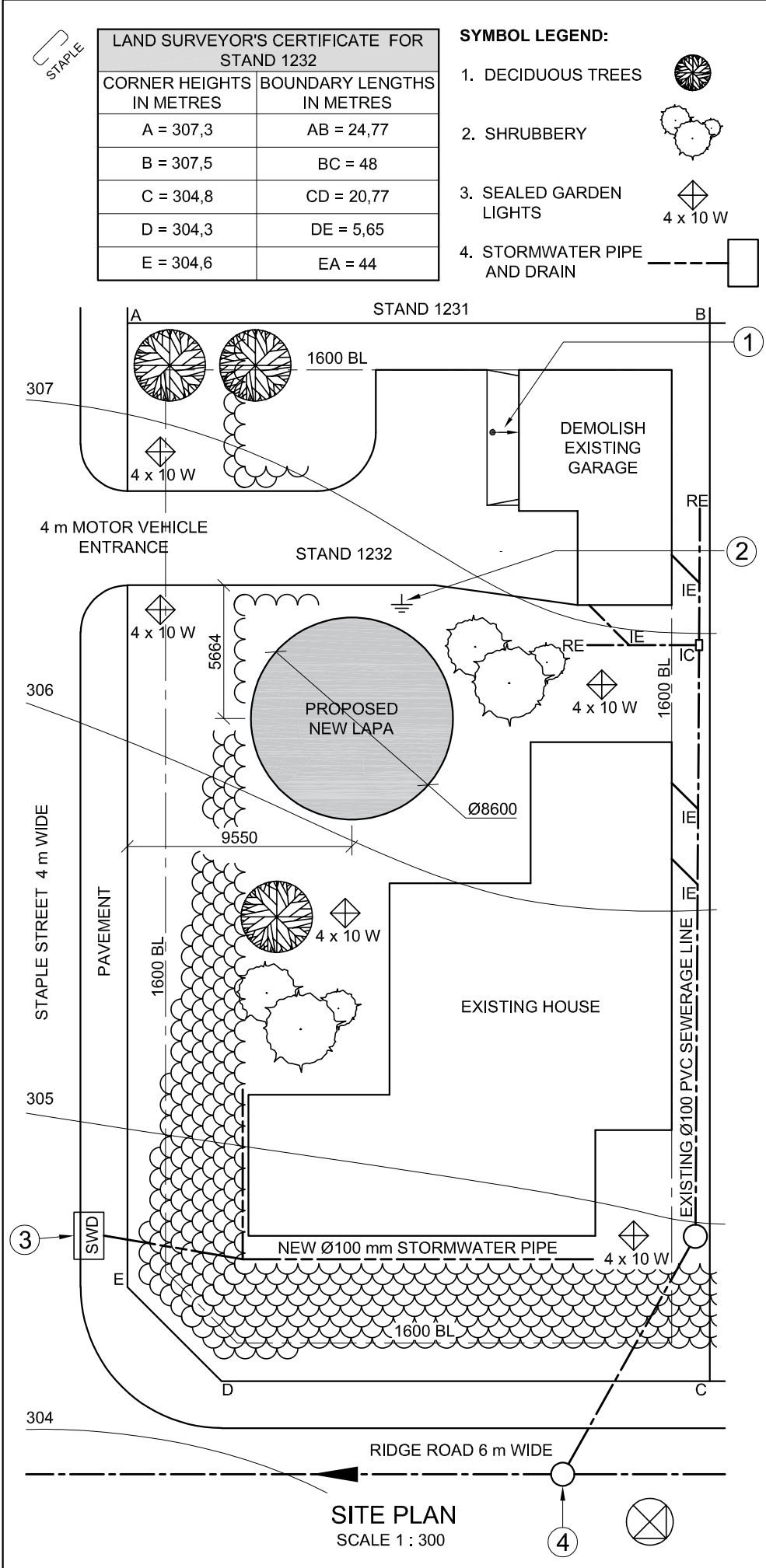
COMPLETE THE FOLLOWING:

CENTRE NUMBER

CENTRE NUMBER

EXAMINATION NUMBER

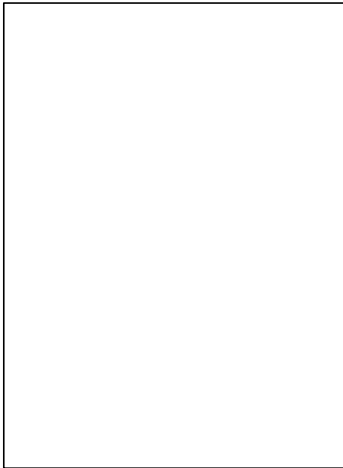
EXAMINATION NUMBER



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 20
In the space below, draw, in neat freehand, the top view of the *SANS 10143* graphical symbol for a GREASE TRAP.



3		
2	2020-11-18	ADD STORMWATER PIPE AND DRAIN
1	2020-11-17	REMOVE GARAGE
REVISION	DATE	DESCRIPTION
DRULOFF ARCHITECTS 69 WALTHER ROAD WILDERNESS www.druloffarch.co.za 043 445 0883		
PRINTED BY: INK-ON (PTY) LTD		DATE OF PRINT: 2020-12-28
DRAWING TITLE: SITE PLAN		
PROJECT: PROPOSED NEW LAPA FOR PETER PARKER ON STAND 1232, 4 STAPLE STREET, PLETTENBERG BAY, 4091		
PROJECT NUMBER: CRY-2020		DRAWING NUMBER: 8225
DATE: 2020-11-18	DRAWN: SHEILA	CHECKED: CRISPIN
REFERENCE CODE: SPDR-2020		SCALE: 1 : 300

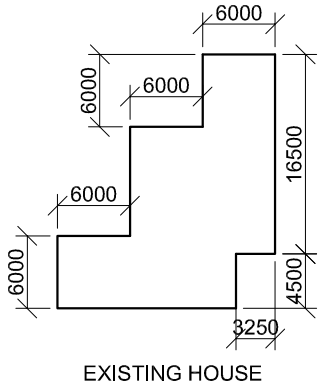
QUESTION 1: ANALYTICAL

Given:
The site plan of an existing house with a proposed new lapa, a title panel and a table of questions. The drawing is not presented 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. **[30]**

QUESTIONS		ANSWERS		
1	What was Sheila responsible for?	1		
2	Who printed the drawing?	1		
3	What is the date of the second revision?	1		
4	What scale is indicated for the drawing?	1		
5	What is the web address of the architectural firm?	1		
6	How wide is Ridge Road in millimetres?	1		
7	In which street is the main access to STAND 1232?	1		
8	How many sealed garden lights are shown on STAND 1232?	1		
9	In which two metric units are the dimensions on the site plan indicated?	2		
10	How should the garage have been presented to show that it has to be demolished?	1		
11	What does the arrow at 1 indicate?	1		
12	Name the symbol at 2.	1		
13	What does the abbreviation <i>SWD</i> at 3 stand for?	1		
14	What is the abbreviation for the sewerage feature at 4?	1		
15	What colour could be used to indicate new steel work on elevations?	1		
16	Which elevation of the existing house faces Staple Street?	2		
17	What is the fall of STAND 1232 from corner A to corner D in metres?	2		
18	In the space below (ANSWER 18), determine the perimeter of STAND 1232 in metres.		3	
19	In the space below (ANSWER 19), determine the total area of the existing house in square metres. Round off the answer to TWO decimal places.		4	
20	In the space in the title panel (ANSWER 20), draw, in neat freehand, the top view of the <i>SANS 10143</i> graphical symbol for a GREASE TRAP.		3	
TOTAL		30		

ANSWER 18
Show ALL calculations.



ANSWER 19
Show ALL calculations.

EXAMINATION NUMBER
EXAMINATION NUMBER



QUESTION 2: SOLID GEOMETRY

Given:

- The front view of a right regular hexagonal prism with a right conical hole
- An auxiliary view
- Horizontal cutting plane C-C

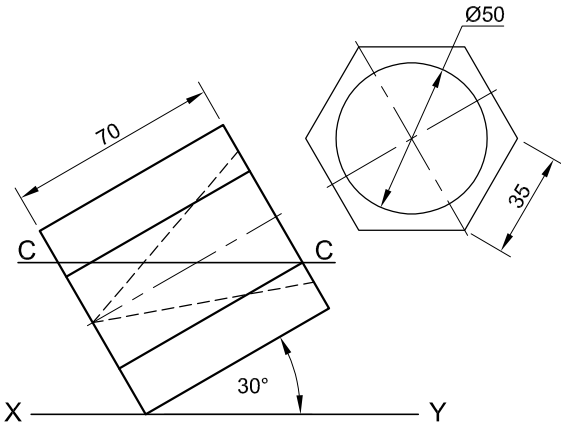
Instructions:

Draw, to scale 1 : 1, the following views of the solid:

- 2.1 The given front view
- 2.2 A sectional top view
- 2.3 The right view

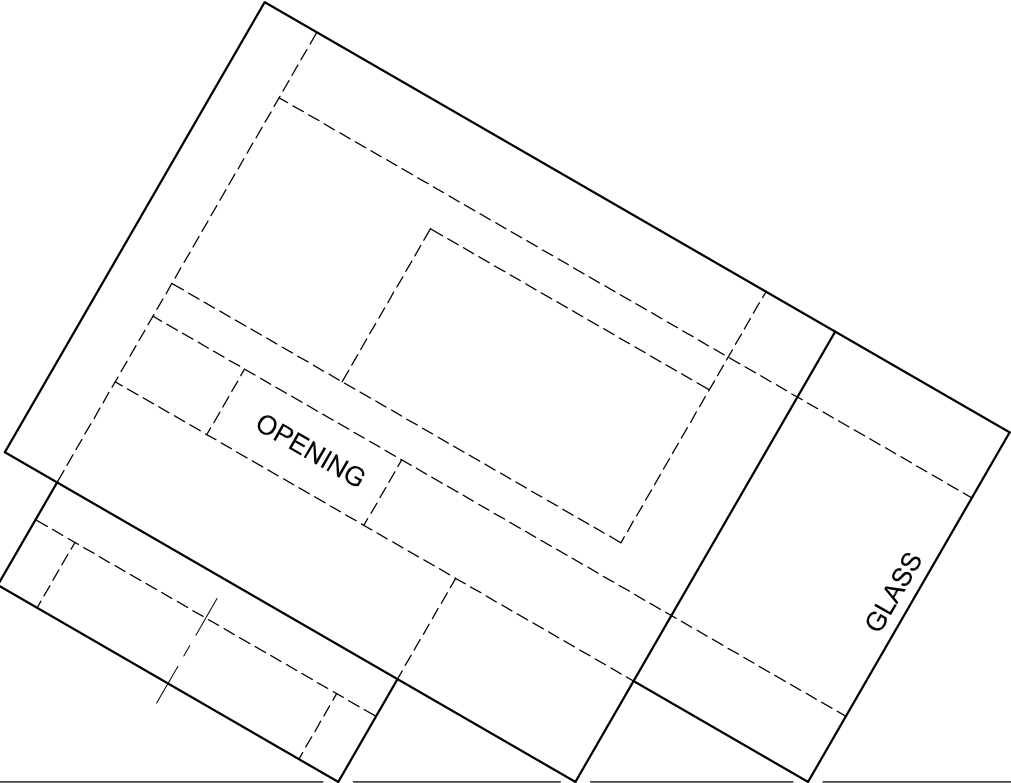
- Planning is essential.
- Show ALL hidden detail.
- Show ALL construction.

[36]



ASSESSMENT CRITERIA					
1	AUXILIARY VIEW	2			
2	FRONT VIEW	5			
3	SECTIONAL TOP VIEW	16			
4	RIGHT VIEW	13			
PENALTIES (-)					
TOTAL		36			
EXAMINATION NUMBER					
EXAMINATION NUMBER					3





QUESTION 3: PERSPECTIVE

Given:
Three views of a modern exhibition centre 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 construction.
- Show ALL visible internal detail as seen through the opening and the glass.
- NO hidden detail is required.

[39]

ASSESSMENT CRITERIA					
1	CONSTRUCTION	6			
2	LOWER SECTION	15			
3	UPPER SECTION	6			
4	ROOF	4 ¹ / ₂			
5	ARC	7 ¹ / ₂			
PENALTIES (-)					
TOTAL		39			

PP

HL

GL

SP

HL

OPENING

GLASS

EXAMINATION NUMBER	
EXAMINATION NUMBER	4

ROOF CAP
RIDGE COVER
150 x 100 mm GUTTER ON 250 x 20 mm FASCIA BOARD WITH Ø100 mm RWDP THAT STOPS 50 mm ABOVE THE GROUND LEVEL
WINDOW OPENING
FINISHED FLOOR LEVEL
GROUND LEVEL
SLIDING DOOR OPENING 250 x 150 mm STEP

INCOMPLETE NORTH ELEVATION

ROOM AND AREA DESIGNATIONS

FLOOR FINISHES
1 BEDROOM: VINYL
2 BATHROOM: TILE
3 LIVING AREA: TILE
4 COURTYARD: PAVING

INCOMPLETE FLOOR PLAN

FEATURES
D1 SLIDING DOOR
D2 DOOR
W1 WINDOW
W2 WINDOW
W3 WINDOW

FIXTURES
WC TOILET
WB WASH BASIN
B BATH
S SINK

ELECTRICAL FITTINGS
1. ONE-WAY SWITCH - SINGLE-POLE
2. ONE-WAY SWITCH - DOUBLE-POLE
3. FLUORESCENT LIGHT 2 x 40 W
4. CEILING LIGHT
5. WALL MOUNTED LIGHT
6. SWITCHED SOCKET OUTLET

NOTE:
THE ARROW SHOWS THE LIGHT CONNECTION TO THE SWITCH.

INCOMPLETE SCHEMATIC DIAGRAM OF A ROOF TRUSS AT CUTTING PLANE A-A

ROOF NOTES:
30° ROOF PITCH
115 x 40 mm ROOF TRUSSES ON 115 x 40 mm WALL PLATES
300 mm ROOF OVERHANG TO END OF ROOF TRUSS
20 mm FIBRE CEMENT ROOF SHEET ON 75 x 50 mm PURLINS @ 800 mm c/c
250 x 20 mm FASCIA BOARDS WITH 150 x 100 mm GUTTERS ON ALL SIDES
10 mm CEILING BOARD ON 40 x 40 mm BRANDING STRIPS @ 400 mm c/c

INCOMPLETE FOUNDATION AND EXTERNAL WALL DETAIL

80 x 200 mm LINTELS ABOVE ALL WINDOW OPENINGS
TOP OF COURTYARD WALL
80 mm BRICK PAVING
80 mm COMPACTED HARDCORE

DOOR AND WINDOW SCHEDULE	
SLIDING DOOR (D1)	DOOR (D2)
WINDOW NOTES: - A = OPENING SIDE - B = FIXED PANEL - ALL FRAMES 50 mm THICK 150 x 20 mm FIBRE CEMENT SILL UNDER ALL WINDOWS	
WINDOW (W1)	WINDOW (W2)
WINDOW (W3)	WINDOW (W4)

ROOF COMPONENTS	
	250 x 20 mm FASCIA BOARD
	150 x 100 mm GUTTER
	75 x 50 mm PURLINS
	ROOF CAP AND RIDGE COVER

ELECTRICAL SYMBOLS	

FIXTURES			
WASH BASIN (WB)	TOILET (WC)	BATH (B)	SINK (S)

RAINWATER ITEMS

QUESTION 4: CIVIL DRAWING

- Given:**
- The incomplete north elevation of a **new house**, showing the walls, the window opening, the sliding door opening, the roof and labels
 - The incomplete floor plan showing the walls, positions of the doors, windows, fixtures and electrical layout
 - An incomplete schematic diagram of a roof truss at cutting plane A-A and roof notes
 - The incomplete foundation and external wall detail
 - Room and area designations and floor finishes
 - A door and window schedule
 - A table of roof components
 - A table of electrical symbols
 - A table of rainwater items
 - A table of fixtures
 - The incomplete floor plan and ground level of the **new house**, drawn to scale 1 : 50, and the incomplete foundation and break lines of a 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 and ground level, draw, 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
 - ALL fixtures as indicated by abbreviations
 - ALL electrical fittings as indicated by numbers
 - ALL hatching detail
- 4.1.2 **THE COMPLETE NORTH ELEVATION**
Show the following features on the drawing:
- The outside walls, step, window and sliding door detail
 - The roof detail, including the fascia boards, gutters and rainwater down-pipes
 - The finished floor level
- 4.2 Using the incomplete foundation, draw, to scale 1 : 20 and between the break lines, the **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 paving, complete foundation, external wall and window detail
 - The courtyard wall to the east of cutting plane A-A
 - The roof detail, including all roof and rainwater items to the east of cutting plane A-A
 - ALL hatching detail. ONLY the substructure hatching may be drawn in neat freehand.

- Label the following:**
- The north elevation
 - The room designations and floor finishes
 - Ground level, finished floor level and damp-proof course (use the correct abbreviation and show it on ALL relevant views)

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

STAPLE

GL

ROOF LINE

RWDP

RWDP

RWDP

RWDP

FLOOR PLAN

SCALE 1 : 50

SECTION A-A

SCALE 1 : 20

MARK ALLOCATION FOR SECTION OF ROOF		FOR OFFICIAL USE ONLY			
A		INCORRECT SCALE(S) USED			
B		NON-ALIGNMENT OF VIEWS			
C		VIEW(S) ROTATED			
D		SECTION VIEWED INCORRECTLY			
E		INCORRECT LETTERING			
F					
G					
H					
TOTAL		TOTAL			

ASSESSMENT CRITERIA					
FLOOR PLAN					
		POSSIBLE	OBTAINED	SIGN	MODERATED
1	DOORS + WINDOWS	13			
2	FIXTURES	8			
3	ELECTRICAL	8 ½			
4	HATCHING	3			
5	LABELS	4			
SUBTOTAL		36 ½			
NORTH ELEVATION					
1	ROOF + RWDP	11 ½			
2	WALLS + STEP + FFL	4			
3	DOOR + WINDOW	8			
4	LABELS	1			
SUBTOTAL		24 ½			
DETAILED SECTION					
1	ROOF DETAIL	14 ½			
2	SLAB + WALL + WINDOW	11 ½			
3	HATCHING	6 ½			
4	LABELS	1 ½			
SUBTOTAL		34			
TOTAL		95			
PENALTIES (-)					
GRAND TOTAL					
EXAMINATION NUMBER					
EXAMINATION NUMBER					
					6

