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NATIONAL
SENIOR CERTIFICATE

GRADE 12



ENGINEERING GRAPHICS AND DESIGN P1

SEPTEMBER 2019

PREPARATORY EXAMINATION

MARKS: 200

TIME: 3 hours

This question paper consists of 6 pages.

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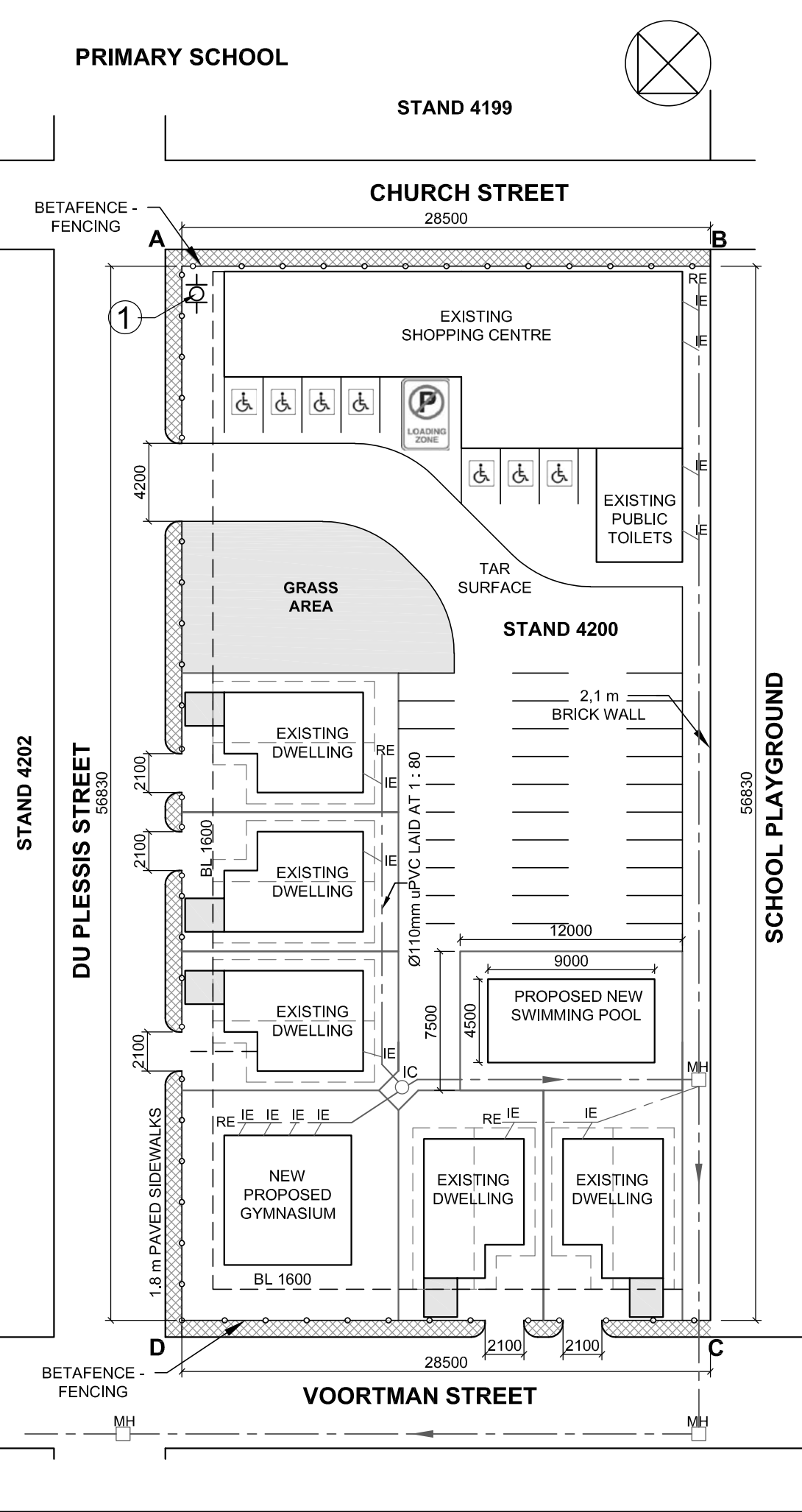
INSTRUCTIONS AND INFORMATION

1. The question paper consists of FOUR questions.
2. Answer ALL the questions.
3. All drawings must be drawn to scale 1 : 1, unless otherwise stated.
4. The questions must be answered on the answer sheets provided.
5. All the answers sheets must be re-stapled in numerical sequence and handed in irrespective of whether the question was attempted or not.
6. Careful 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 estimated in good proportion.
10. ALL drawings are in first angle orthographic projection, unless stated otherwise.

FOR OFFICIAL USE ONLY									
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FINAL CONVERTED MARK	CHECKED BY
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COMPLETE THE FOLLOWING:	
NAME	
NAME	
EXAMINATION CENTRE	
EXAMINATION CENTRE	



LAND SURVEYOR'S CERTIFICATE OF THE SIDE LENGTHS AND CORNER HEIGHTS ON STAND 4200 SURVEYED ON 2018-12-20	
LENGTHS IN MILLIMETRES	CORNER HEIGHTS IN METRES
AB = 28500	A = 1200
BC = 56830	B = 1200
CD = 28500	C = 1201
DA = 56830	D = 1201

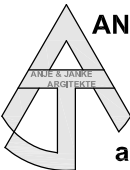
NOTE:
Contractors must verify all dimensions and levels on site before commencing work. Architects to be notified immediately of any discrepancies.

ARCHITECT'S SIGNATURE

CLIENT'S SIGNATURE

ANSWER 16
In the space provided below, draw, in neat freehand, the top view of the SANS 10143 convention for a **block / stall type urinal**

Blank space for drawing the top view of the SANS 10143 convention for a block / stall type urinal.

1	2019-01-09	New gymnasium over the building line	
REVISION	DATE	DESCRIPTION	
<div><div>ANJE & JANKE ARCHITECTS 103 Lyme Street St Francis 082 893 9154 a.j. architects@gmail.com</div></div>			
PRINTED BY IMPACT		DATE OF PRINT 2019-01-31	
DRAWING TITLE SITE PLAN			
PROJECT PROPOSED NEW GYMNASIUM AND SWIMMING POOL FOR MR. W. HALLAT ON STAND 4200, DU PLESSIS STREET, KIRKWOOD			
PROJECT NUMBER 09-2019		DRAWING NUMBER A012019	
DATE 2018-12-31	DRAWN KEAGON	CHECKED DWANE	SCALE 1 : 300
REFERENCE CODE SITE- 4200-19			

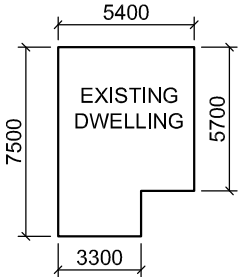
QUESTION 1: ANALYTICAL (CIVIL)

Given:
The site plan for existing dwellings with new proposed buildings, 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 and title panel. **[28]**

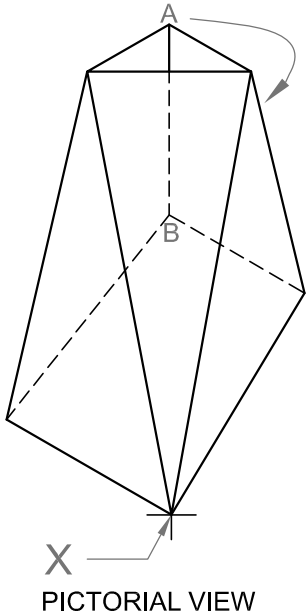
QUESTIONS		ANSWERS		
1	What is the reference code of the drawing?	1		
2	How many existing dwellings are indicated on the site plan?	1		
3	How many loading zones are indicated on the site plan?	1		
4	Which company was responsible for setting up the site plan?	1		
5	Who is the owner of stand 4200?	1		
6	What is stand 4198 used for?	1		
7	What is the total fall (slope) of stand 4200 in meters to the south eastern boundary of the stand?	2		
8	What does the abbreviation IC stand for?	1		
9	What does the abbreviation BL stand for?	1		
10	How many inspection eyes are needed for the new proposed building?	2		
11	Name the feature that is indicated by arrow 1 .	1		
12	What colour should be used to indicate the sewer line at the new proposed gymnasuim ?	2		
13	Has the proposed revision been made on the drawing? Motivate your answer.	2		
14	In the space below (ANSWER 14), determine the total length of the BETAFENCE-fence in metres .	4		
15	In the provided space below (ANSWER 15), determine the total area of one of the existing dwellings in square meters .	4		
16	In the provided space in the title panel (ANSWER 16), draw in neat freehand, the graphical symbol of the top view of the given block / stall type urinal according to SANS 10143.	3		
		TOTAAL	28	

ANSWER 14
Show ALL calculations.



ANSWER 15
Show ALL calculations.

NAME	
NAME	2



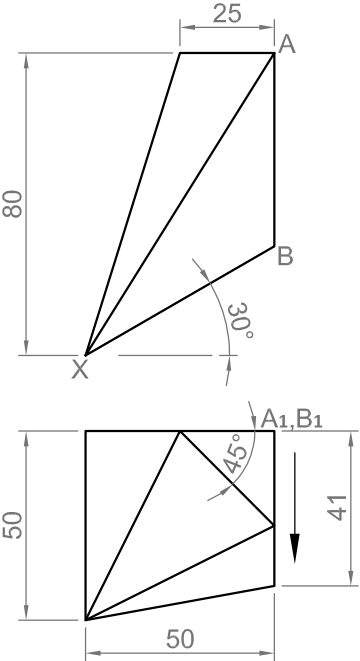
QUESTION 2: TRANSITION PIECE AND DEVELOPMENT

- Given:**
- The front view and top view of a portion of a duct showing an irregular square-to-triangle transition piece.
 - The pictorial view of the transition piece for clarity.
 - Starting position **X** for the front view.
 - Starting position of seam **AB** for the development of the transition piece.

- Instructions:**
Draw to scale 1 : 1, the following views of the transition piece:
- 2.1 The given front view (start at point **X**).
 - 2.2 The given top view.
 - 2.3 The left view.
 - 2.4 The surface development in the direction of the arrow as shown in the top view, with **AB** as the seam.

- Note:**
- Show ALL hidden detail and folding lines.
 - Show ALL necessary construction lines.

[31]

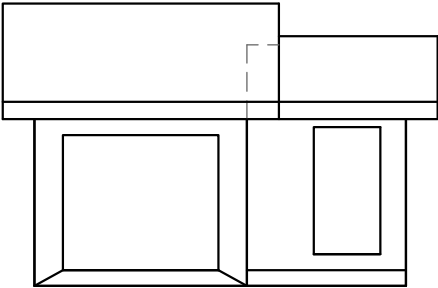


A

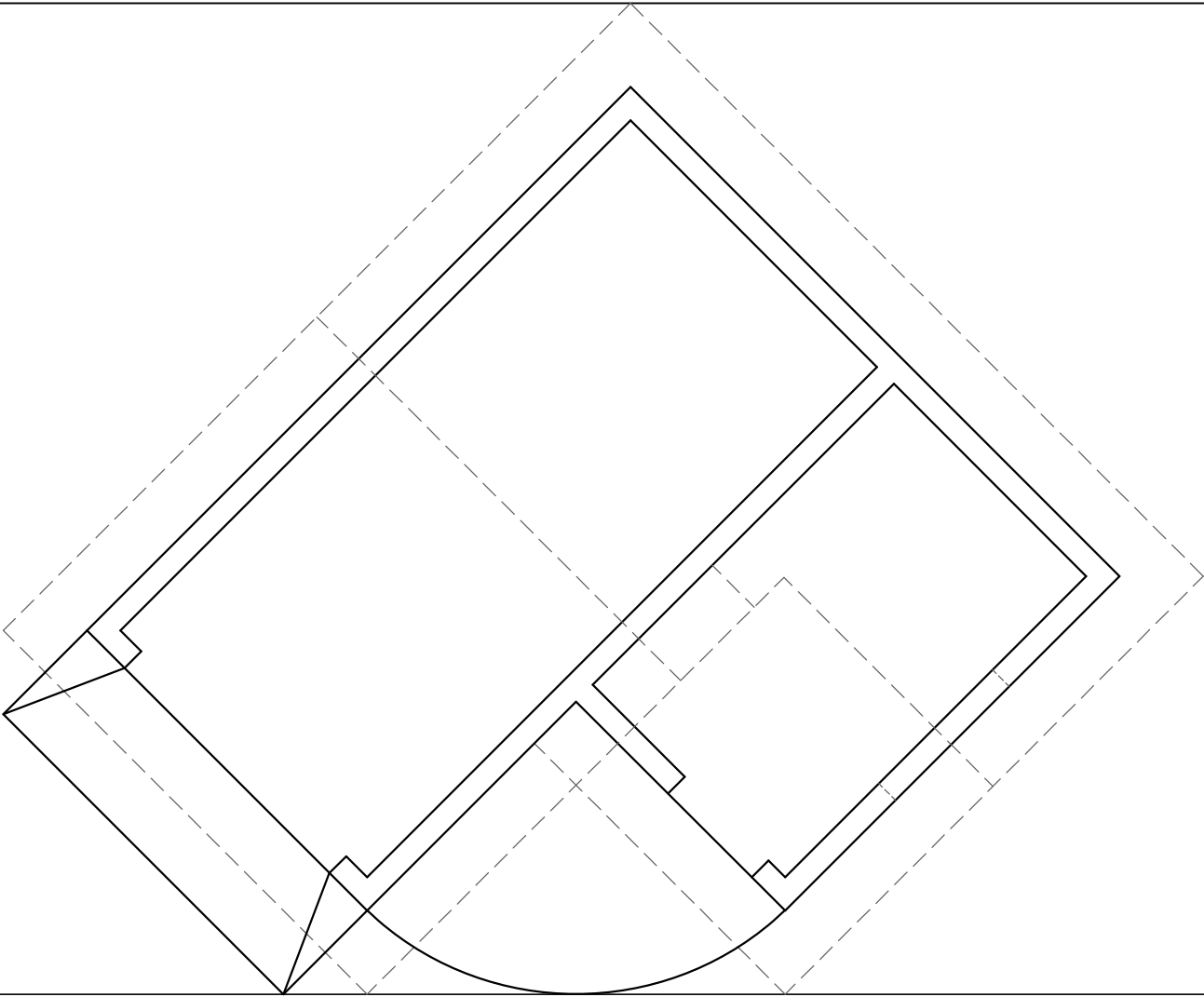
B

ASSESSMENT CRITERIA					
1	FRONT VIEW	4			
2	TOP VIEW	5			
3	LEFT VIEW	6			
4	CONSTRUCTIONS	3			
5	DEVELOPMENT	13			
PENALTIES (-)					
TOTAL		31			

NAME	
NAME	3



AUXILIARY VIEW



PP

PP

HL

GL

HL

GL

SP

QUESTION 3: PERSPECTIVE

Given:

- Views of a garage and washroom and the information needed to draw a two-point perspective drawing.
- An auxiliary view.

PP – Picture plane
HL – Horizon line
GL – Ground line
SP – Station point

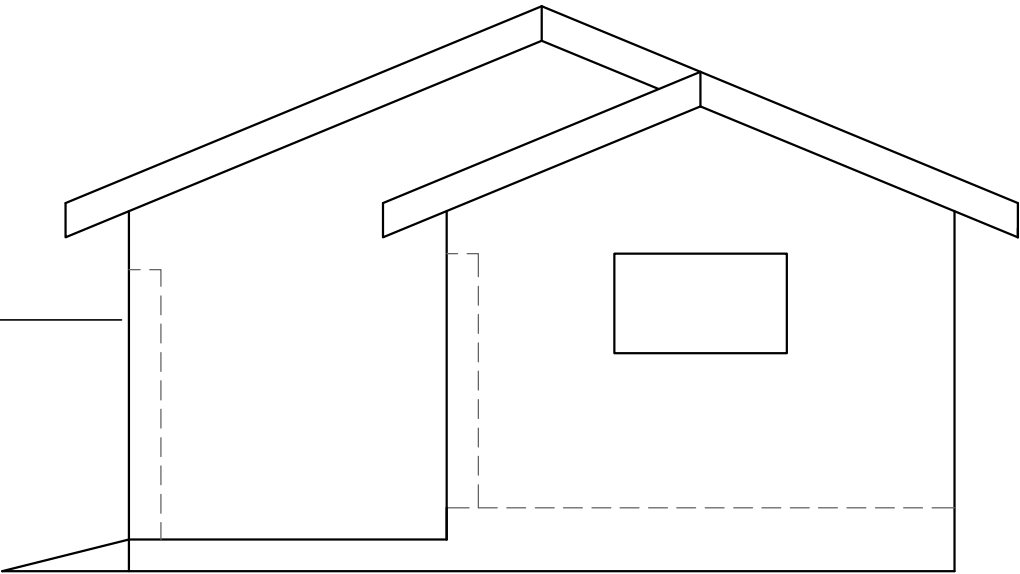
Instructions:

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.

[41]

ASSESSMENT CRITERIA				
1	CONSTRUCTION AND VPs	6		
2	ROOF	14		
3	WALLS	5		
4	DOORS AND WINDOW	9 ¹ / ₂		
5	CIRCLE AND RAMP	6 ¹ / ₂		
TOTAL		41		



NAME

NAME

4

QUESTION 4: CIVIL DRAWING

Given:

- The incomplete south view of a **cottage**, showing the walls, the windows, the door opening, the roof and notes.
- The incomplete floor plan showing the roof line, walls, position of the doors, windows, fixtures and electrical layout.
- A schematic diagram of a roof truss and roof notes
- The incomplete foundation and wall detail
- Room designations and floor finishes
- A door and window schedule
- A table of sanitary fixtures
- A table of roof components
- A table of electrical symbols
- A table of rainwater items
- The floor plan of the **cottage**, 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 Use the given incomplete floor plan to draw, in first-angle orthographic projection and to **scale 1 : 50**, the following views of the **cottage**:

4.1.1 THE COMPLETE FLOOR PLAN

Add the following features to the drawing:

- ALL doors and windows
- ALL sanitary fixtures as indicated by abbreviations
- ALL electrical fittings as indicated by the numbers
- ALL hatching detail

4.1.2 THE COMPLETE SOUTH VIEW

Show the following features on the drawing:

- The outside walls, steps and window detail
- The roof detail, including the roof cap, barge boards, fascia boards, gutter and rain- water down pipes
- The finished floor level

- 4.2 In the space provided on page 6, using the incomplete foundation and break line, 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 complete detail of the foundation, external wall with window detail, shower wall and relevant sanitary fixtures.
- The roof detail, including the barge board, fascia board, gutter and rain water down-pipe
- ALL hatching detail. ONLY the substructure hatching may be drawn in neat freehand.

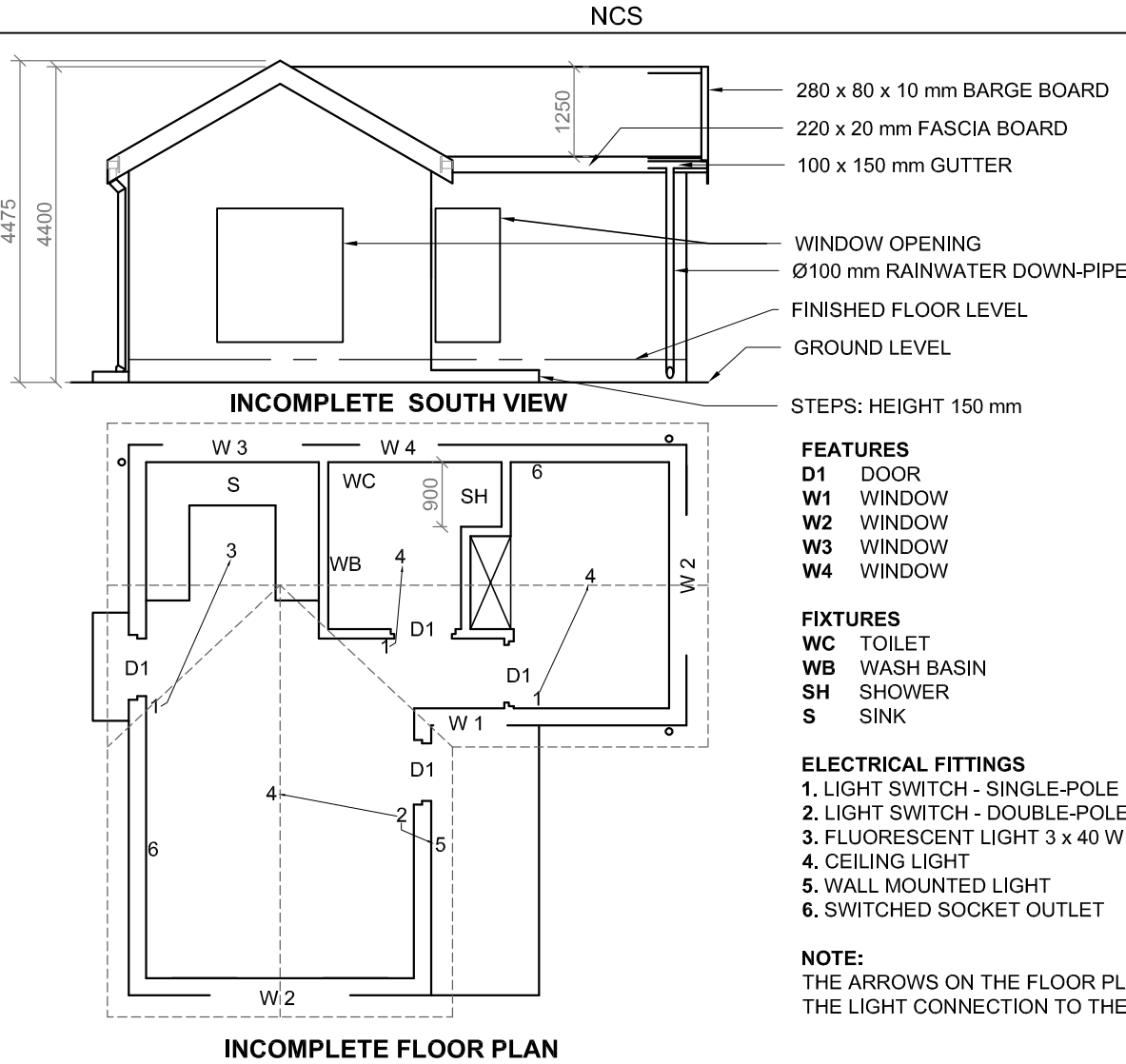
Label the following:

- The south elevation
- The room designations and floor finishes.
- Ground level, finished floor level and damp proof course (Use the correct abbreviations and show them on ALL the relevant views)

NOTE:

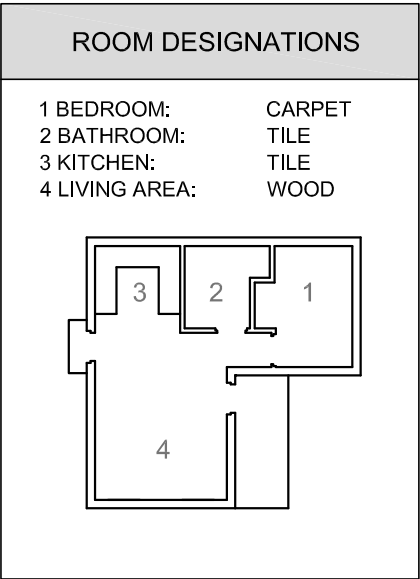
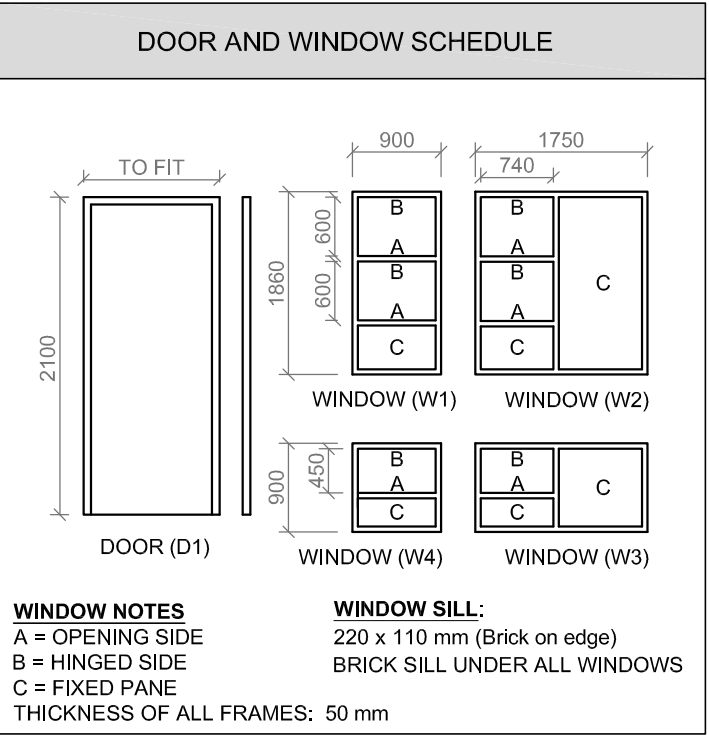
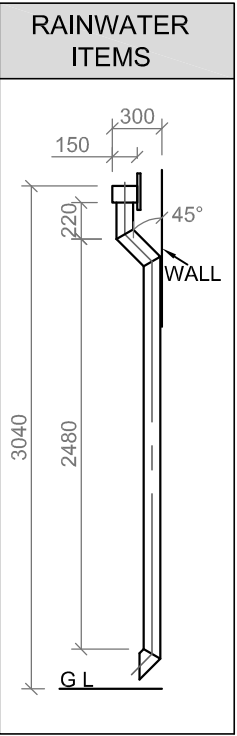
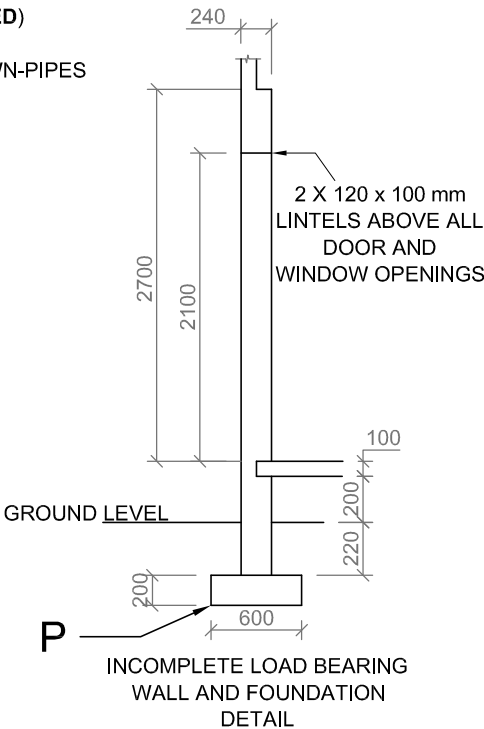
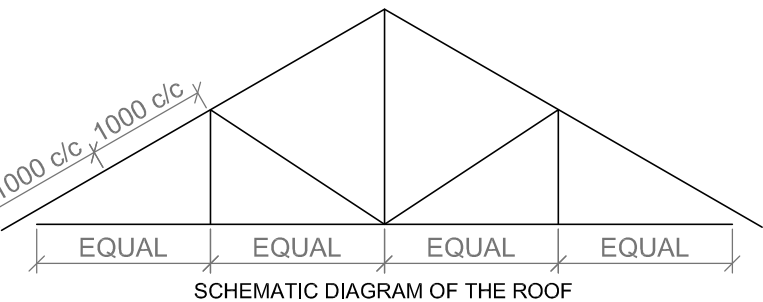
ALL drawings must comply with the **guidelines** and **graphical symbols** as contained in the *SANS 10143*.

[100]



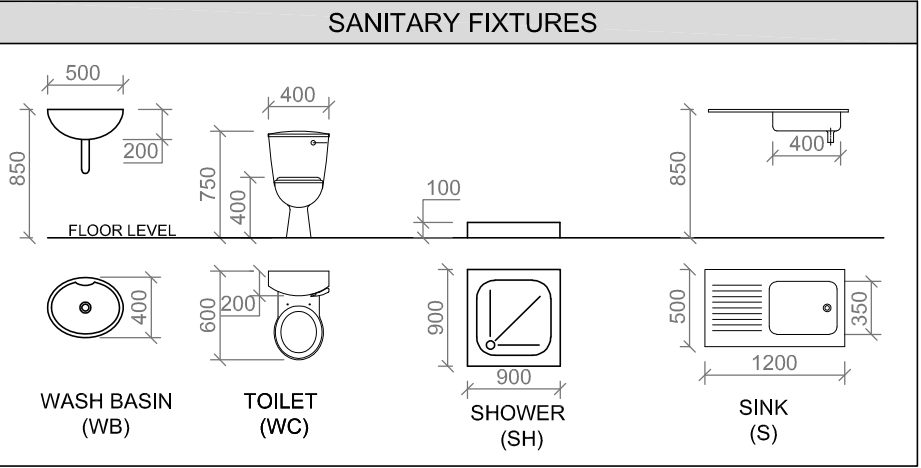
ROOF NOTES:

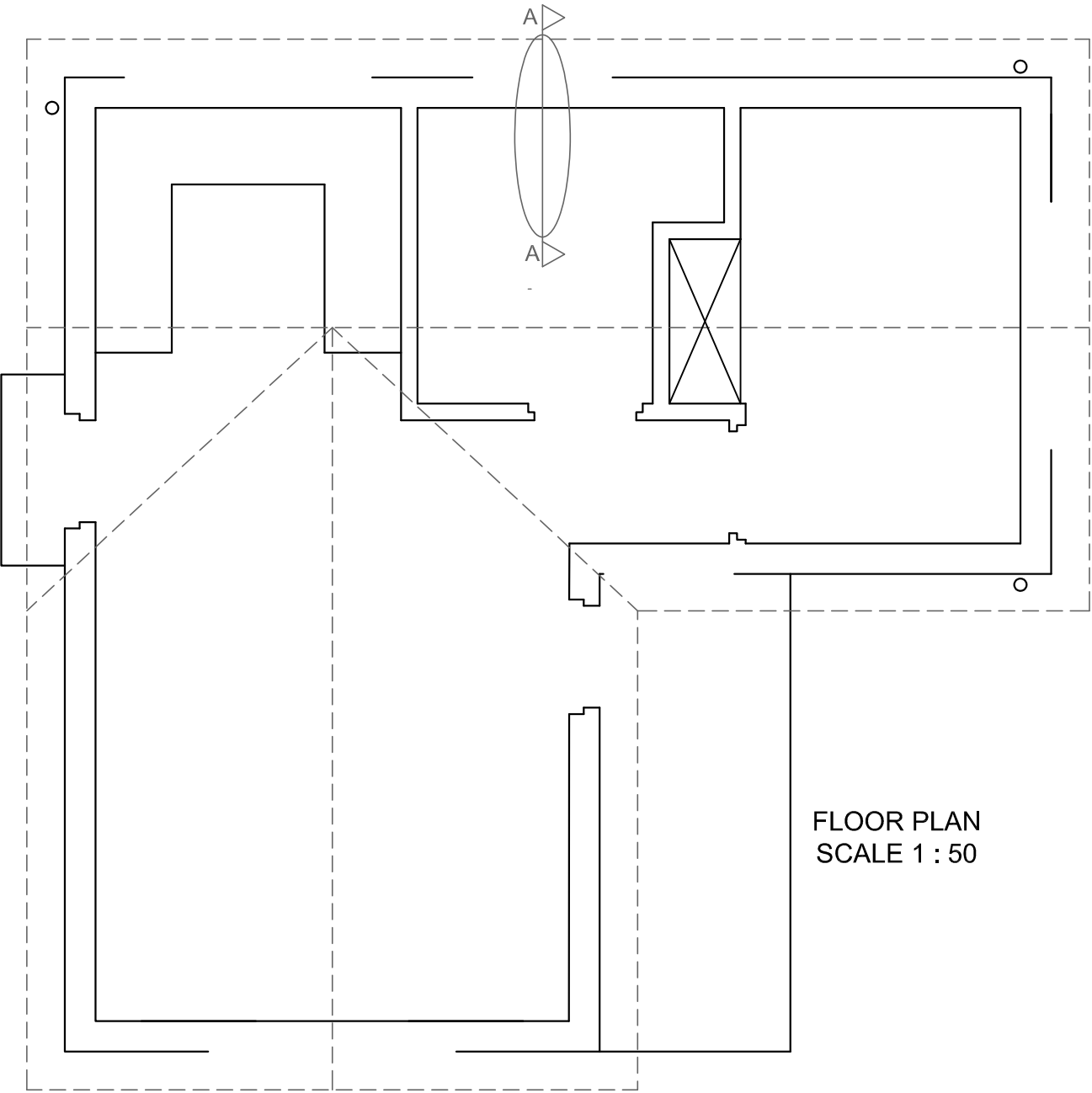
- 30° ROOF PITCH
- 114 x 38 mm ROOF TRUSSES ON 114 x 38 mm WALL PLATES
- ROOF COVER: 20 mm IBR SHEETING ON 75 x 50 mm PURLINS @ 1000 mm c/c
- 280 x 80 x 10 mm BARGE BOARD ON GABLE ENDS AND OVERHANG IS IN LINE WITH THE GUTTERS. TOTAL OVERHANG IS 300 mm (**GUTTERS INCLUDED**)
- 220 x 20 mm FASCIA BOARD ON ALL SIDES
- 150 x 100 mm GUTTERS ON ALL SIDES WITH Ø100 mm RAINWATER DOWN-PIPES
- ROOF CAPS MUST BE MOUNTED ON THE ROOF PITCH.
- 9 mm CEILING BOARD ON 38 x 38 mm BRANDERING @ 400 mm c/c



ROOF COMPONENTS	
	220 x 20 mm FASCIA BOARD
	ROOF CAP
	75 x 50 mm PURLIN
	280 x 80 x 10 mm BARGE BOARD

ELECTRICAL SYMBOLS	





FLOOR PLAN
SCALE 1 : 50



P

DETAILED SECTION A-A
SCALE 1 : 20

6. ROOF DETAIL: MARK ALLOCATION			
6.1	ROOF ANGLE	$\frac{1}{2}$	
6.2	ROOF SHEET	1	
6.3	ROOF TRUSS	2	
6.4	PURLIN + SPACING	2	
6.5	BARGE BOARD	1	
6.6	BRANDERNG + SPACING	2	
6.7	CEILING BOARD	$\frac{1}{2}$	
6.8	WALL PLATE	$\frac{1}{2}$	
6.9	FASCIA BOARD	$\frac{1}{2}$	
6.10	GUTTER	1	
TOTAL		11	

PENALTIES		
1	INCORRECT OVERALL SCALE	
2	INCORRECT POSITIONING OF VIEWS	
3	NON-ALIGNMENT OF VIEWS	
TOTAL PENALTIES (-)		

ASSESSMENT CRITERIA				
FLOOR PLAN				
1	DOORS AND WINDOWS	15		
2	ELECTRICAL	8		
3	FIXTURES	7		
4	HATCHING	3		
5	LABELS	4		
SUBTOTAL		37		
SOUTH VIEW				
1	ROOF, GUTTER, RWDP, FASCIA AND BARGE BOARD	11		
2	WALLS AND STEPS	4		
3	DOORS AND WINDOWS	$11\frac{1}{2}$		
4	LABELS	$1\frac{1}{2}$		
SUBTOTAL		28		
DETAILED SECTION				
1	RWDP	4		
2	FOUNDATIONS, WALLS AND SLAB	8		
3	WINDOW, SHOWER AND LINTELS	5		
4	HATCHING	$5\frac{1}{2}$		
5	LABELS	$1\frac{1}{2}$		
6	ROOF DETAIL	11		
SUBTOTAL		35		
TOTAL		100		
PENALTIES (-)				
FINAL TOTAL				

NAME	
NAME	6