



basic education
Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

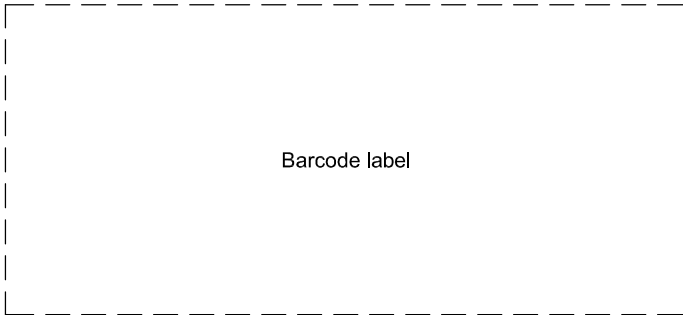
**SENIOR CERTIFICATE EXAMINATIONS/
NATIONAL SENIOR CERTIFICATE EXAMINATIONS**

ENGINEERING GRAPHICS AND DESIGN P1
2021

MARKS: 100

TIME: 3 hours

This question paper consists of 6 pages.



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	CHECKED BY
100	

COMPLETE THE FOLLOWING:
CENTRE NUMBER
CENTRE NUMBER
EXAMINATION NUMBER
EXAMINATION NUMBER

SYMBOL LEGEND:

1. DECIDUOUS TREES
2. SHRUBBERY
3. SEALED GARDEN LIGHTS
4. STORMWATER PIPE AND DRAIN



4 x 10 W



ANSWER 20

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



REVISION	DATE	DESCRIPTION
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PRINTED BY: INK-ON (PTY) LTD	DATE OF PRINT: 2020-12-28
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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
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DATE:
2020-11-18

DRAWN:
SHEILA

CHECKED:
CRISPIN

SCALE:
1 : 300

REFERENCE CODE:
SPDR-2020

B A S C - E D U C A T I O N

QUESTION 1: ANALYTICAL

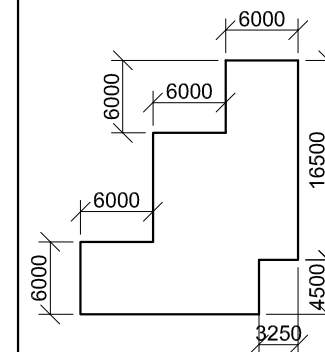
Given:

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]

ANSWER 18
Show ALL calculations.



EXISTING HOUSE

ANSWER 19
Show ALL calculations.

EXAMINATION NUMBER	
EXAMINATION NUMBER	2

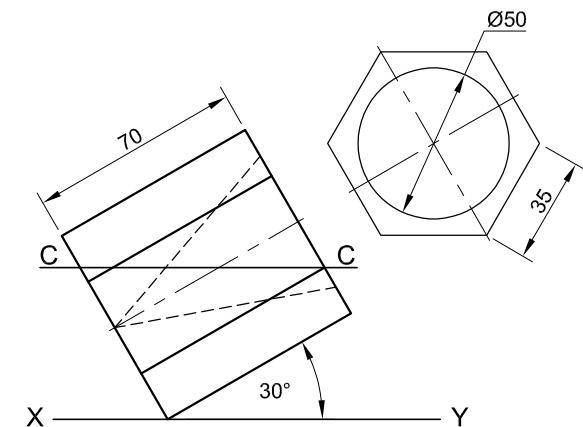


QUESTION 2: SOLID GEOMETRY

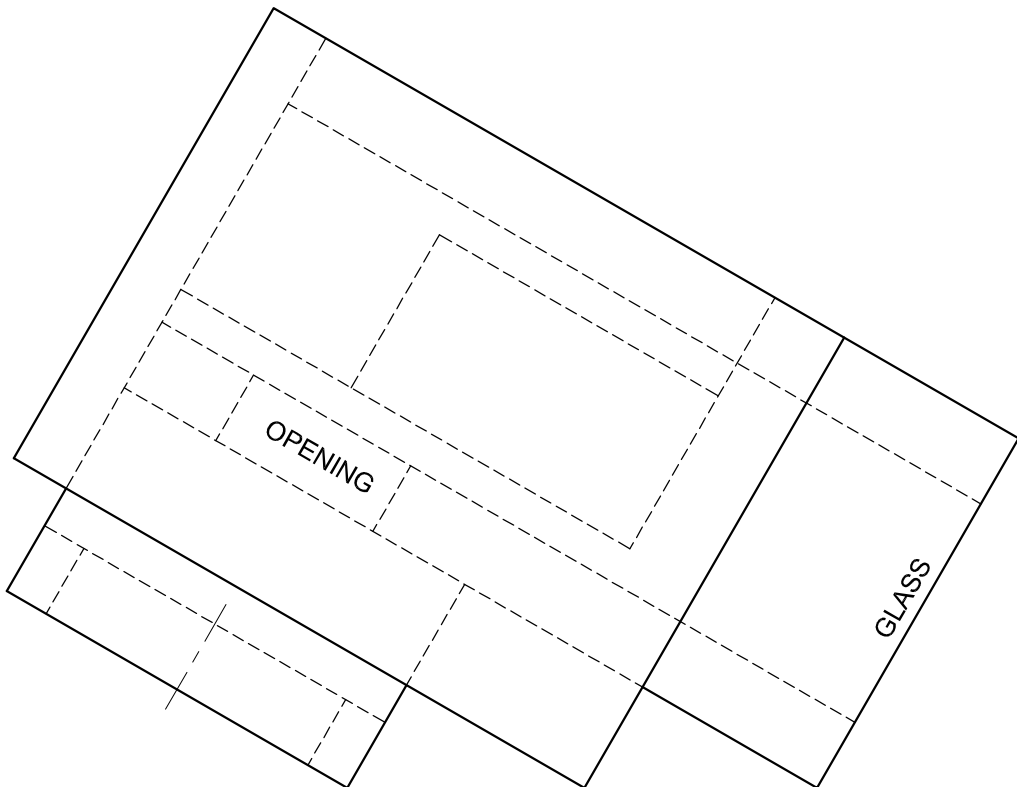
- Given:
- The front view of a right regular hexagonal prism with a right conical hole
 - An auxiliary view
 - Horizontal cutting plane C-C

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

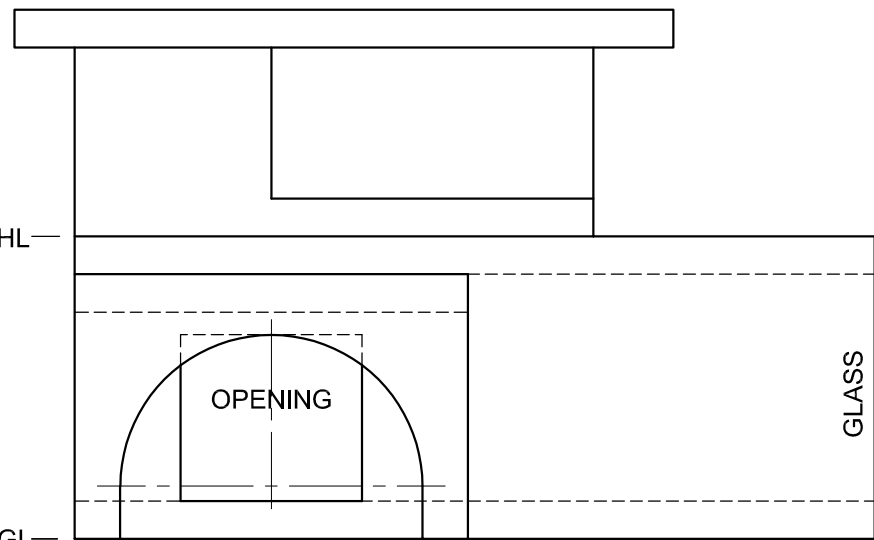
- Instructions:**
Complete the perspective drawing.
- Align the drawing sheet with the ground line (GL).
 - Determine and label the vanishing points.
 - Show ALL construction.
 - Show ALL visible internal detail as seen through the opening and the glass.
 - NO hidden detail is required.
- [39]

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			

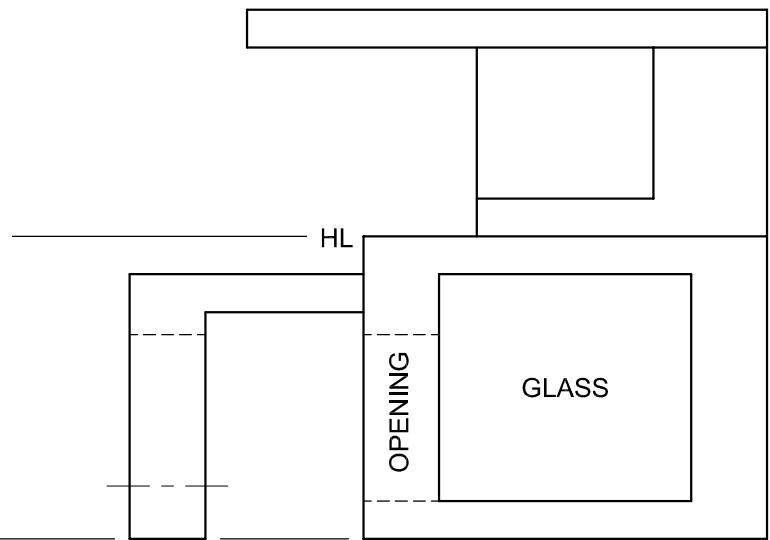
PP

HL

GL



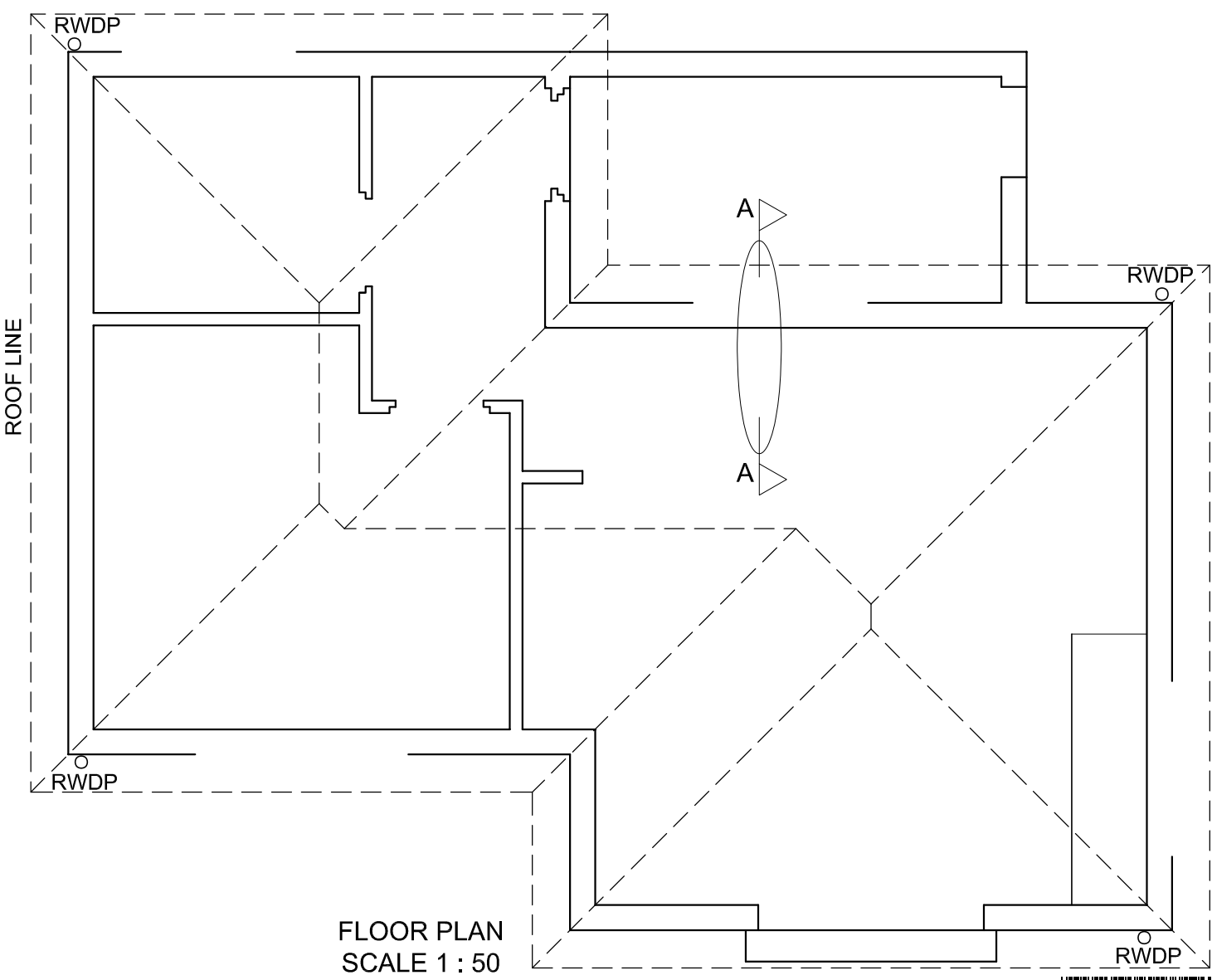
SP



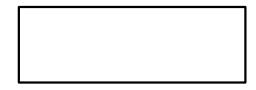
EXAMINATION NUMBER	
EXAMINATION NUMBER	
4	



GL



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 1/2			
4	HATCHING	3			
5	LABELS	4			
SUBTOTAL		36 1/2			
NORTH ELEVATION					
1	ROOF + RWDP	11 1/2			
2	WALLS + STEP + FFL	4			
3	DOOR + WINDOW	8			
4	LABELS	1			
SUBTOTAL		24 1/2			
DETAILED SECTION					
1	ROOF DETAIL	14 1/2			
2	SLAB + WALL + WINDOW	11 1/2			
3	HATCHING	6 1/2			
4	LABELS	1 1/2			
SUBTOTAL		34			
TOTAL		95			
PENALTIES (-)					
GRAND TOTAL					
EXAMINATION NUMBER					
EXAMINATION NUMBER					6



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ENGINEERING GRAPHICS AND DESIGN P1

2021

MARKING GUIDELINES

MARKS: 100

These marking guidelines consist of 7 pages.

ANSWERS		
1	DRAW/PREPARE SITE PLAN	1
2	INK-ON (PTY) LTD	1
3	2020-11-18	1
4	1 : 300	1
5	www.druloffarch.co.za	1
6	6000	1
7	STAPLE STREET	1
8	5	1
9	METRES (m) and MILLIMETRES (mm)	2
10	DASH LINE/HIDDEN DETAIL	1
11	INCLINE/UP	1
12	EARTH/LIGHTNING CONDUCTOR	1
13	STORMWATER DRAIN	1
14	MH	1
15	BLUE	1
16	SOUTH EAST	2
17	3 or 3 : 48	2
18	See below	3
19		4
20		3
TOTAL		30

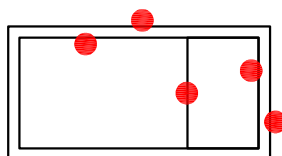
ANSWER 18
Show ALL calculations.
APPLYING CORRECT FORMULE ✓

$$\begin{aligned}
 &= 24,77 + 48 + 20,77 \\
 &\quad + 5,65 + 44 \\
 &= 143,19 \quad \checkmark \quad \text{m} \quad \checkmark
 \end{aligned}$$

ANSWER 19
Show ALL calculations.
APPLYING CORRECT FORMULE ✓✓

$$\begin{aligned}
 &= (6 \times 6) + (10,5 \times 12) + (8,75 \times 4,5) + \\
 &\quad (6 \times 6) \\
 &= 237,38 \quad \checkmark \text{m}^2 \quad \checkmark
 \end{aligned}$$

ANSWER 20



● FREEHAND

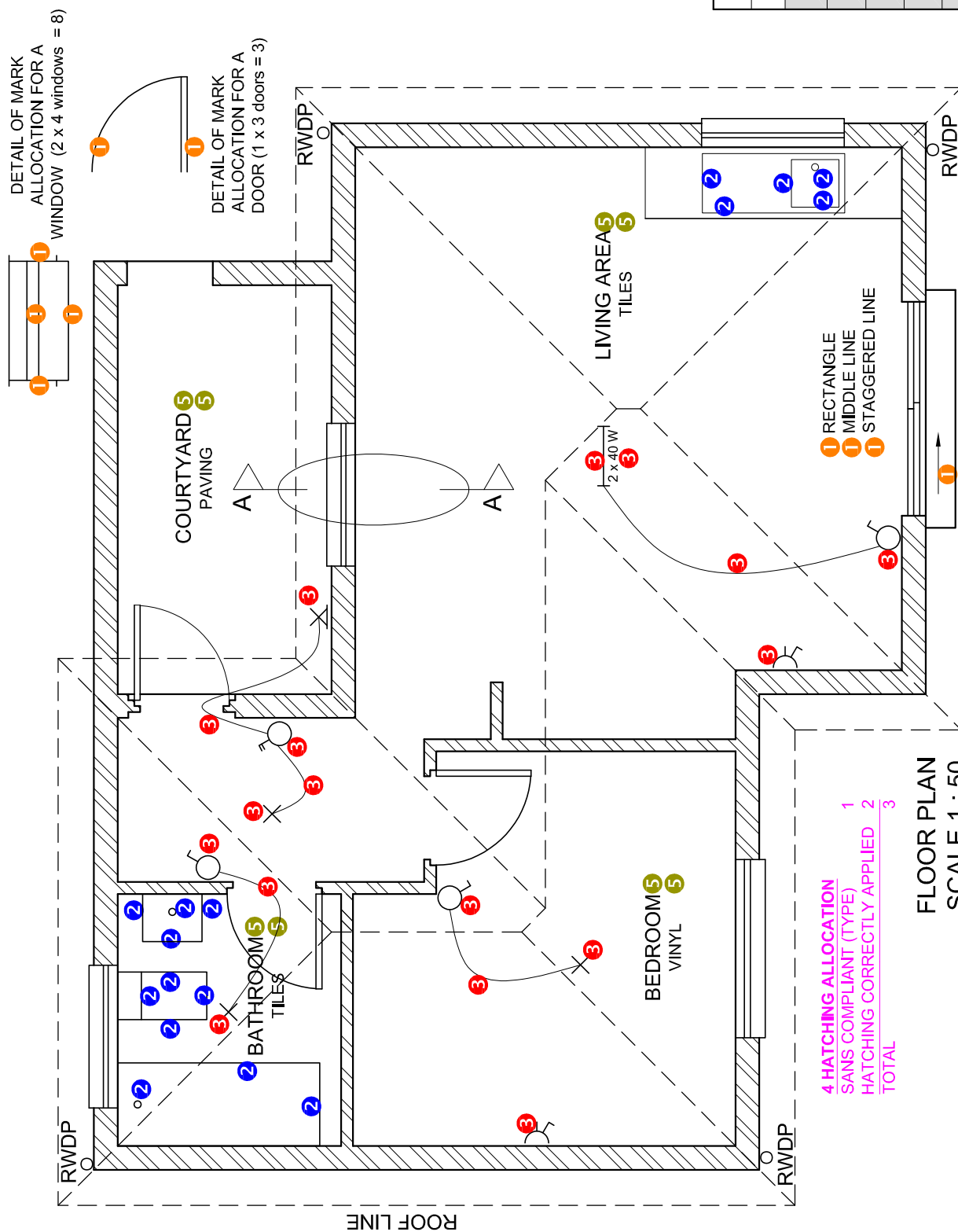
PAPER 1 QUESTION 1
GRADE 12
2021
MARKING GUIDELINES



ASSESSMENT CRITERIA	
1	AUXILIARY VIEW
2	FRONT VIEW
3	SECTIONAL TOP VIEW
4	RIGHT VIEW
TOTAL 36	

ASSESSMENT CRITERIA		
1	CONSTRUCTION	6
2	LOWER SECTION	15
3	UPPER SECTION	6
4	ROOF	4 $\frac{1}{2}$
5	ARC	7 $\frac{1}{2}$
TOTAL		39

PAPER 1 QUESTION 3
GRADE 12
2021
MARKING GUIDELINES

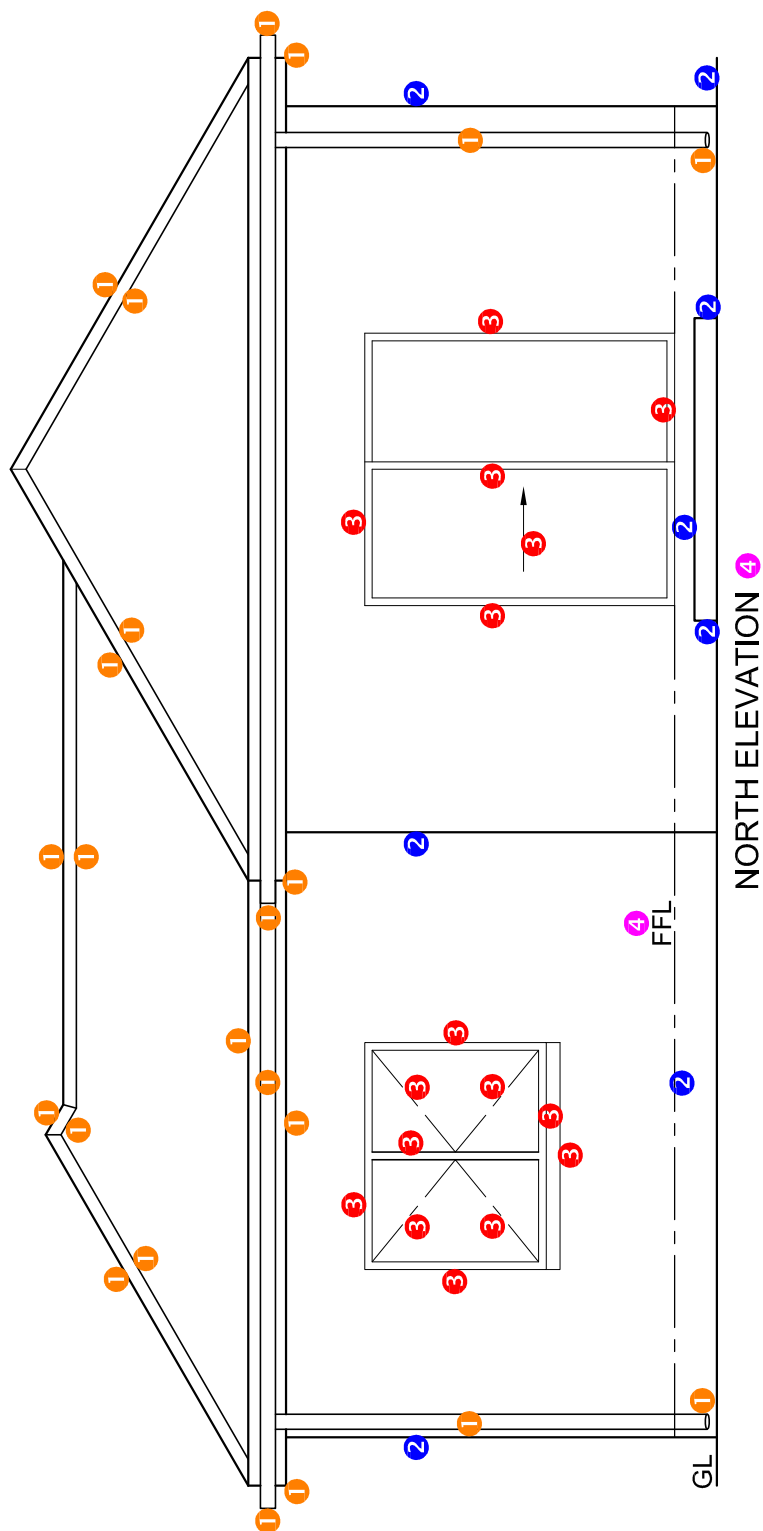


FLOOR PLAN		POSSIBLE
1	DOORS + WINDOWS	13
2	FIXTURES	8
3	ELECTRICAL	8 $\frac{1}{2}$
4	HATCHING	3
5	LABELS	4
SUBTOTAL		36 $\frac{1}{2}$

4 HATCHING ALLOCATION
SANS COMPLIANT (TYPE)
HATCHING CORRECTLY APPLIED 2
TOTAL 3

FLOOR PLAN
SCALE 1 : 50

PAPER 1 QUESTION 4
GRADE 12
2021
MARKING GUIDELINES



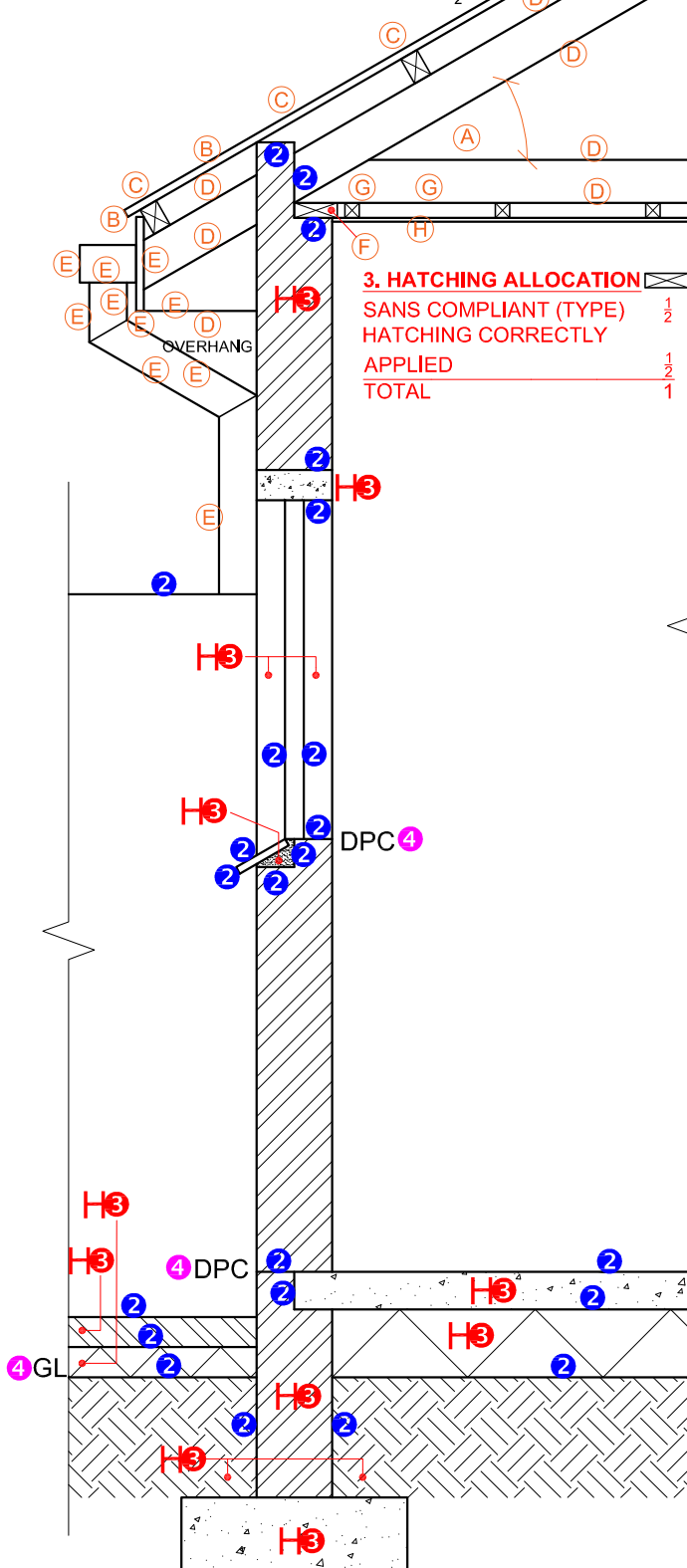
NORTH ELEVATION	
1	ROOF + RWDP
2	WALLS + STEP + FFL
3	DOOR + WINDOW
4	LABELS
SUBTOTAL	
	24 1/2

1. MARK ALLOCATION FOR ROOF

A: ROOF ANGLE	1
B: ROOF SHEET	1
C: PURLIN + SPACING	1 $\frac{1}{2}$
D: TRUSS + OVERHANG	3 $\frac{1}{2}$
E: FASCIA BOARD + GUTTER + RWDP	5
F: WALL PLATE	1
G: BRANDING + SPACING	1
H: CEILING BOARD	$\frac{1}{2}$
TOTAL	14 $\frac{1}{2}$

DETAILED SECTION

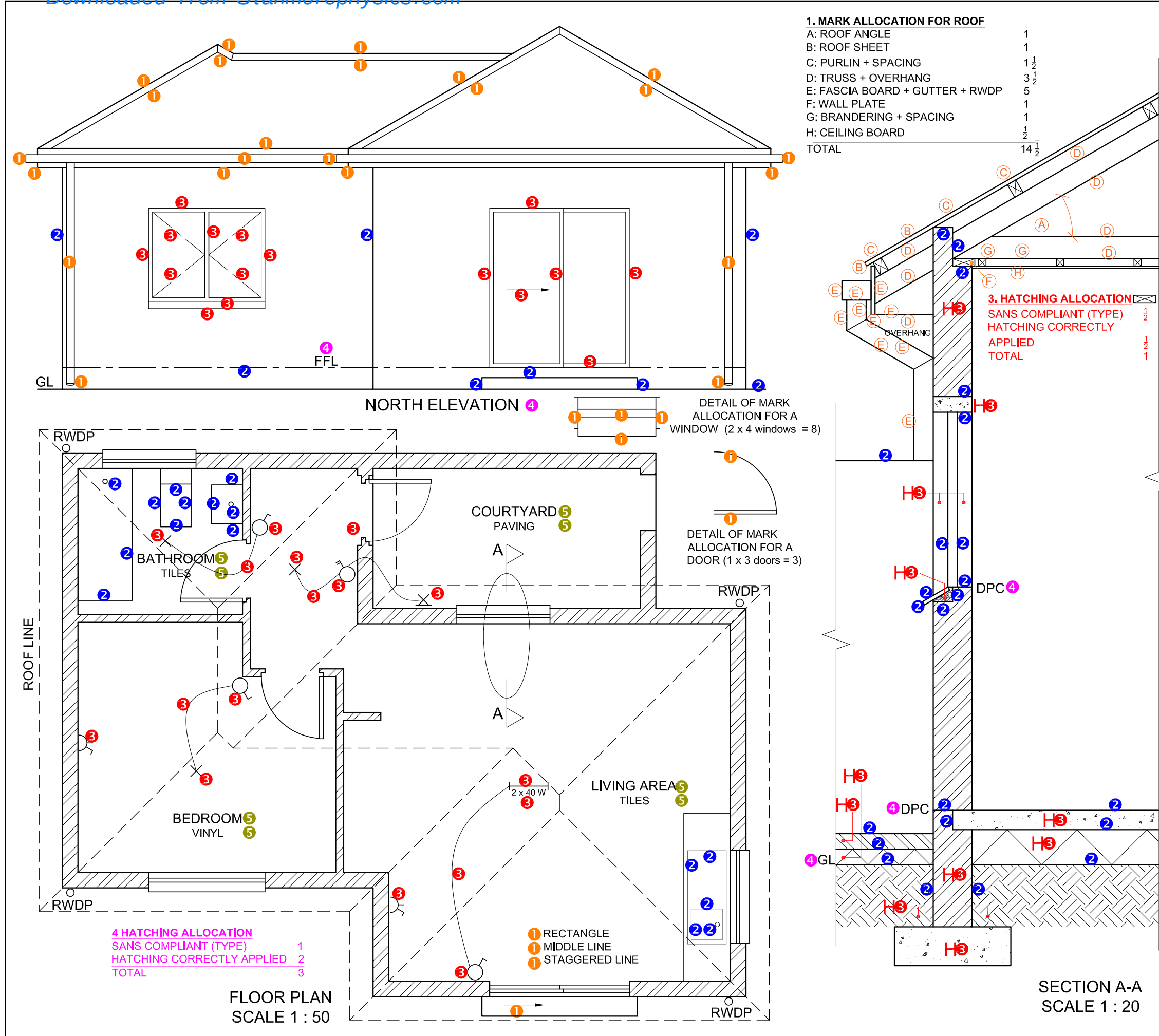
1	ROOF DETAIL	14 $\frac{1}{2}$
2	SLAB + WALL + WINDOW	11 $\frac{1}{2}$
3	HATCHING	6 $\frac{1}{2}$
4	LABELS	1 $\frac{1}{2}$
SUBTOTAL		34



3. HATCHING ALLOCATION	
SANS COMPLIANT (TYPE)	$\frac{1}{2}$
HATCHING CORRECTLY APPLIED	$\frac{1}{2}$
TOTAL	1

SECTION A-A
SCALE 1 : 20

PAPER 1 QUESTION 4
GRADE 12
2021
MARKING GUIDELINES



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		SC = 1 MARK PENALTY ON EITHER SIDE FOR THE LINES NOT TOUCHING THE BREAK LINES	
G			
H			
TOTAL		TOTAL	

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