basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

NATIONAL SENIOR CERTIFICATE

GRADE 12

ENGINEERING GRAPHICS AND DESIGN P1

FEBRUARY/MARCH 2011

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 stated otherwise.
4. ALL drawings must be drawn to scale 1 : 1, unless stated otherwise.
5. ALL the questions must be answered on the QUESTION PAPER as instructed.
6. ALL the pages must be restapled in numerical sequence, irrespective of whether the question was attempted.
7. Time management is essential in order to complete all the questions.
8. Print your examination number in the block provided on every page.
9. Any details or dimensions not given, must be assumed in good proportion.
10. ALL answers must be drawn accurately and neatly.

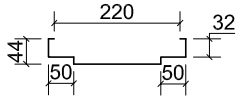
FOR OFFICIAL USE ONLY										
QUESTION	MARKS OBTAINED			½	SIGN	MODERATED			½	SIGN	
1											
2											
3											
4											
TOTAL											
	2	0	0			2	0	0			

FINAL CONVERTED MARK	CHECKED BY
___ 100	

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

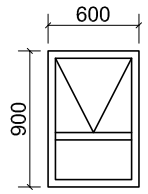
DOOR AND WINDOW SCHEDULE

DOOR FRAME
STANDARD, EXTERNAL,
MILD STEEL

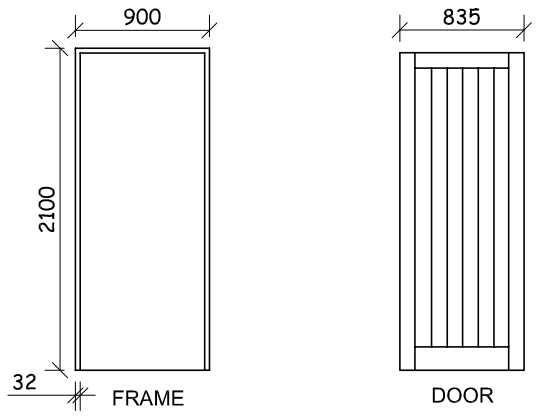


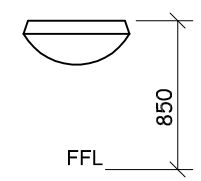
FRAME PROFILE

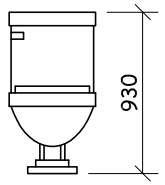
WINDOW
STANDARD W0609
TIMBER FRAME

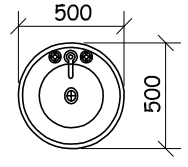


DOOR
H/W FRAMED, LEDGED
AND BATTENED

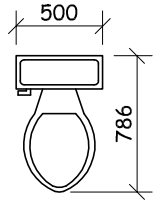






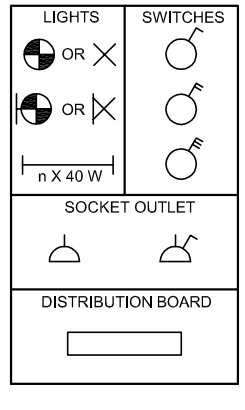


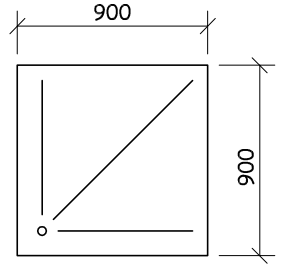
WASH BASIN



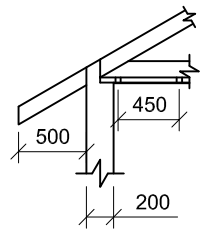
TOILET

ELECTRICAL SYMBOLS





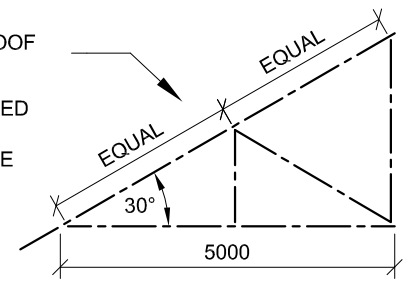
SHOWER



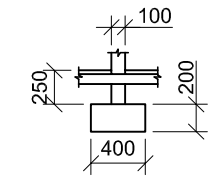
INCOMPLETE ROOF TRUSS,
WALL AND CEILING DETAIL

ROOF NOTE
37 x 740 IBR SHEETS LAID
ON 75 x 50 PURLINS @
1250 C/C ON 114 x 38 ROOF
TRUSSES

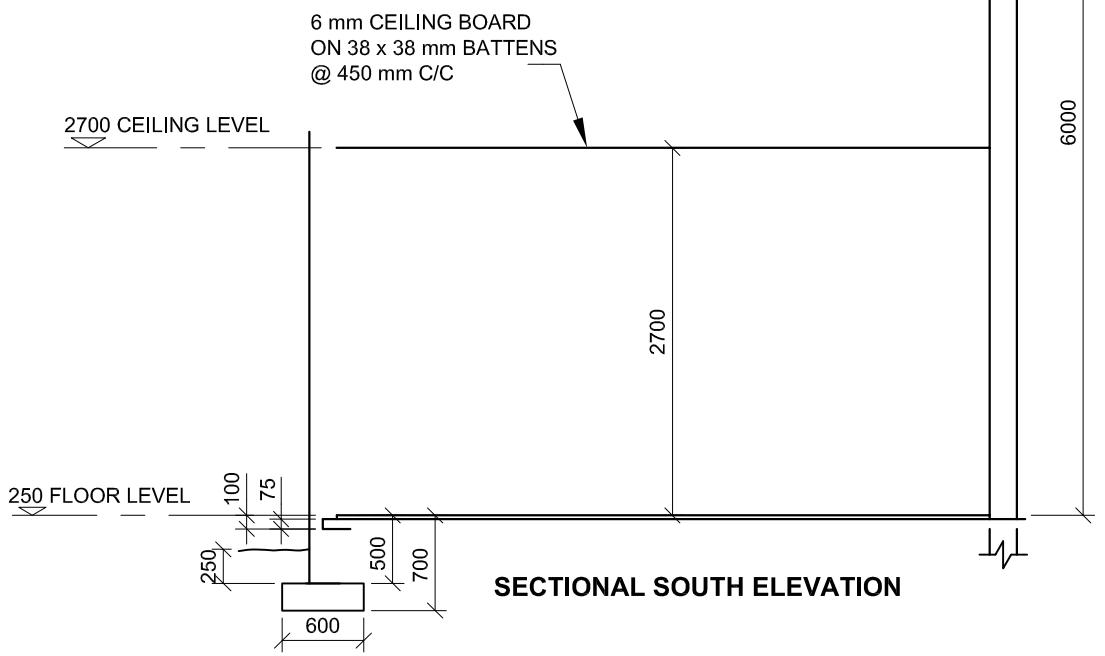
114 x 38 mm GANG-NAILED
ROOF TRUSS ON A
114 x 38 mm WALL PLATE



SCHEMATIC DRAWING OF THE ROOF TRUSS



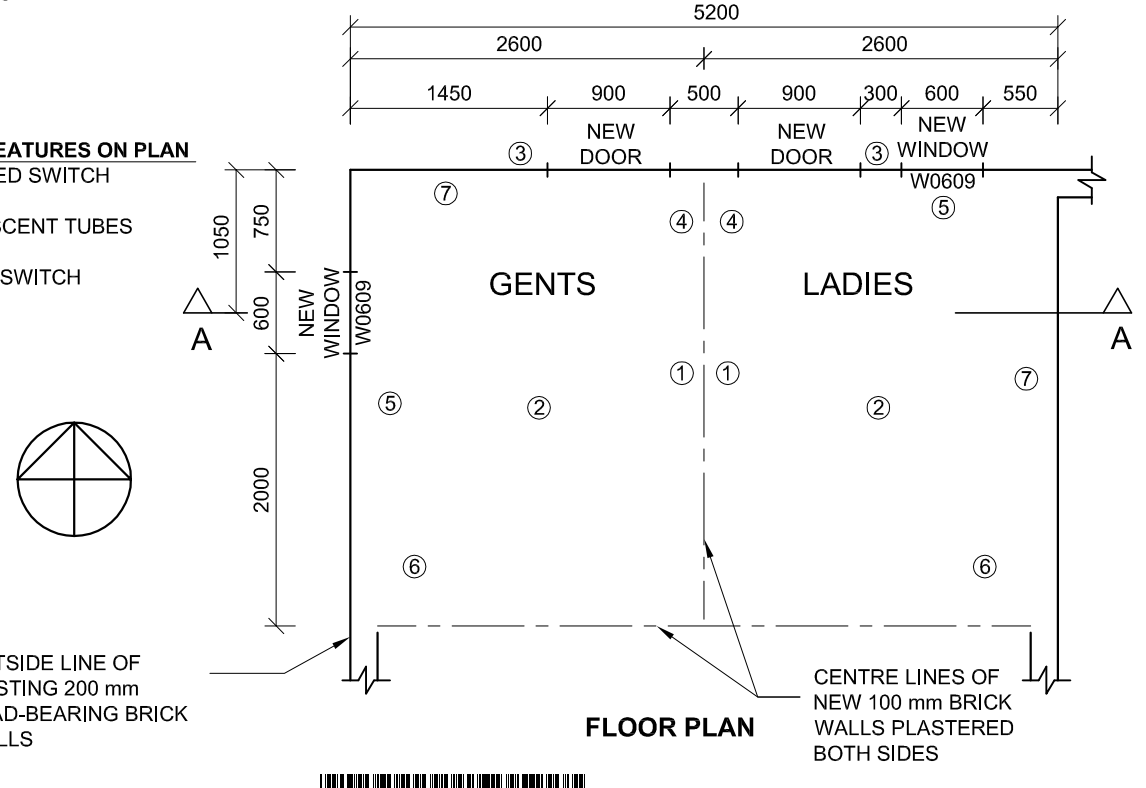
INCOMPLETE
FOUNDATION DETAIL
FOR THE NEW
INTERIOR WALLS



SECTIONAL SOUTH ELEVATION

INCOMPLETE LOAD-BEARING
FOUNDATION DETAIL

KEY TO NUMBERED FEATURES ON PLAN
1. DOUBLE INSULATED SWITCH SOCKET OUTLET
2. 2 x 40 W FLUORESCENT TUBES
3. OUTSIDE LIGHTS
4. TWO-POLE LIGHT SWITCH
5. TOILET
6. SHOWER
7. WASH BASIN



FLOOR PLAN

QUESTION 4: CIVIL DRAWING

Given:

- The incomplete sectional south elevation of a part of an previous extention to a clubhouse showing the outside line of the existing outer wall, the incomplete load-bearing foundation detail, the ceiling level and an existing 200 mm load-bearing wall
- The incomplete floor plan of proposed new **ladies and gents change rooms,** that will be developed inside the given part of the previous extention, showing the outside lines of the exterior walls, the centre lines of the new interior walls, the position of all the fixtures and features, relevant notes and dimensions
- A door and window schedule
- The fixtures for the change rooms
- A table of electrical symbols
- The incomplete roof truss, wall and ceiling detail
- A schematic drawing of the roof truss, drawn to a different scale
- The incomplete foundation detail for the new interior walls

Instructions:

- Answer this question on page 6.
- Draw, to scale 1 : 50 and to the given specifications, the following views of the proposed new **ladies and gents change rooms:**
  - **4.1 The complete floor plan**
  - **4.2 The complete sectional south elevation** on cutting plane A-A
- ALL drawings must comply with the guidelines contained in the *SABS 0143.*

SPECIFICATIONS:

THE FLOOR PLAN

Show the following features on the drawing:

- ALL the walls with hatching detail
- ALL the doors and windows
- The conventions of ALL the fixtures as indicated with the numbers
- ALL the electrical features as indicated with the numbers. Each change room's outside light and florescent tubes must be connected to the two-pole light switch.
- The cutting plane A-A

THE SECTIONAL SOUTH ELEVATION

Show the following features on the drawing:

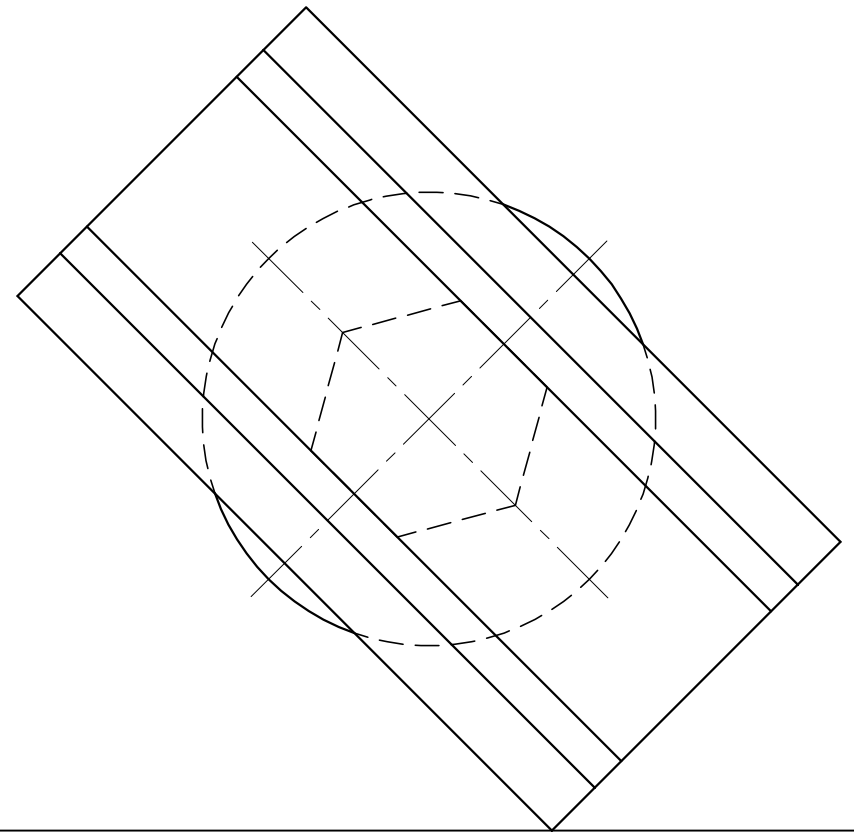
- The complete foundation, floor, wall, window, ceiling and roof detail. The window must have two lintels.
- The doors and window to the north of cutting plane A-A
- The conventions of the fixtures to the north of cutting plane A-A
- ALL hatching detail

Label the following:

- The floor plan, including the scale
- The sectional south elevation
- The change rooms and floor finish (ceramic tiles)

NOTE:
ALL substructure hatching may be drawn in freehand **[97]**

STAPLE



PP

HL

GL

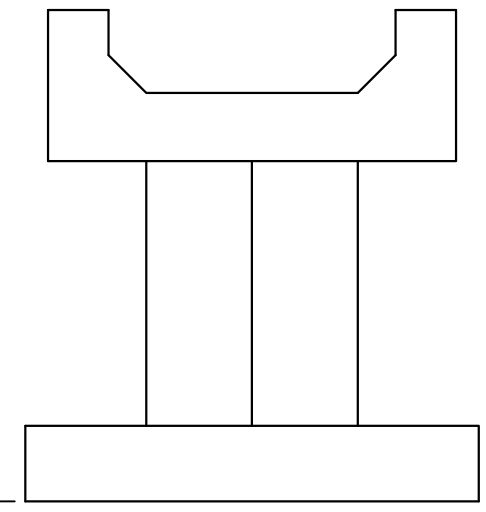
SP

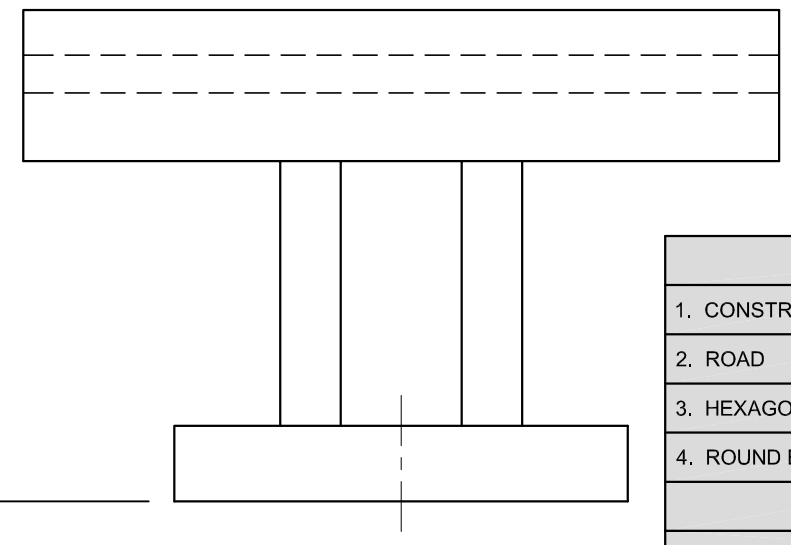
QUESTION 3: PERSPECTIVE

Given:
Three views of a single-pillar bridge 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 horizon line (HL).
- Locate and label the vanishing points.
- Show ALL necessary construction.
- NO hidden detail is required. **[36]**





ASSESSMENT CRITERIA				
1. CONSTRUCTION + VPs	7			
2. ROAD	10			
3. HEXAGONAL PILLAR	6			
4. ROUND BASE	13			
TOTAL	**36**			
EXAMINATION NUMBER				
EXAMINATION NUMBER				4

STAPLE

QUESTION 2: INTERPENETRATION AND DEVELOPMENT

Given:

- The incomplete front view and top view of a connecting piece for a ventilation system. The connecting piece consists of a hexagonal pipe (A) and a cylindrical branch pipe (B) that lie in a common vertical plane
- Centre point D as the reference point on the drawing sheet

Instructions:

2.1 Draw, to scale 1 : 1, the following views of the connecting piece:

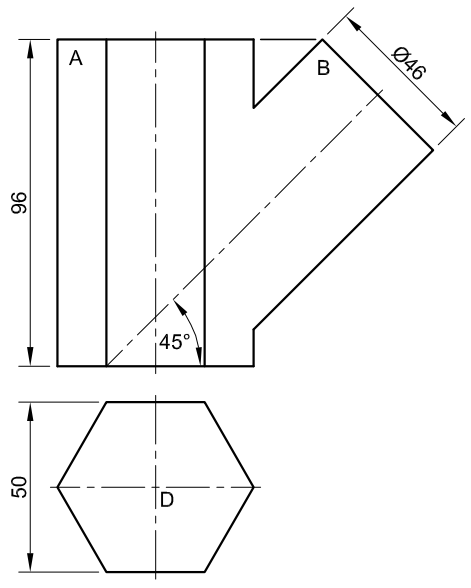
2.1.1 The complete top view using point D as the reference point

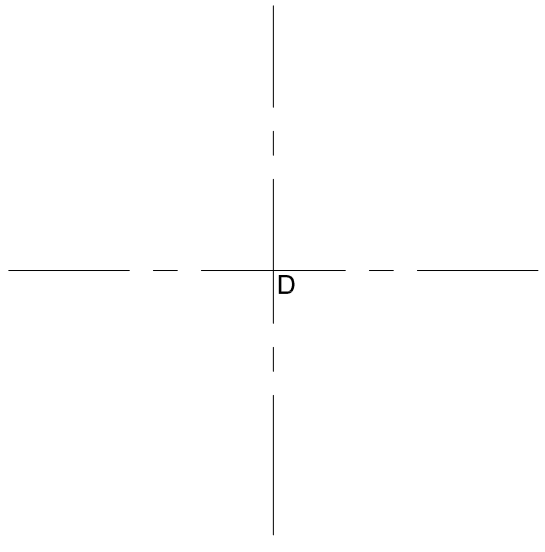
2.1.2 The complete front view clearly showing the curve of interpenetration

2.2 Develop the surface of the cylindrical branch pipe (B).

- Show ALL necessary construction and calculations.

[40]





ASSESSMENT CRITERIA				
1. GIVEN + CENTRE LINES	8			
2. AUX. CIRCLES	4			
3. PROJECTION	4			
4. INTERPENETRATION	$5\frac{1}{2}$			
5. TOP VIEW OF CYLINDER	7			
6. DEVELOPMENT	$11\frac{1}{2}$			
TOTAL	**40**			

EXAMINATION NUMBER

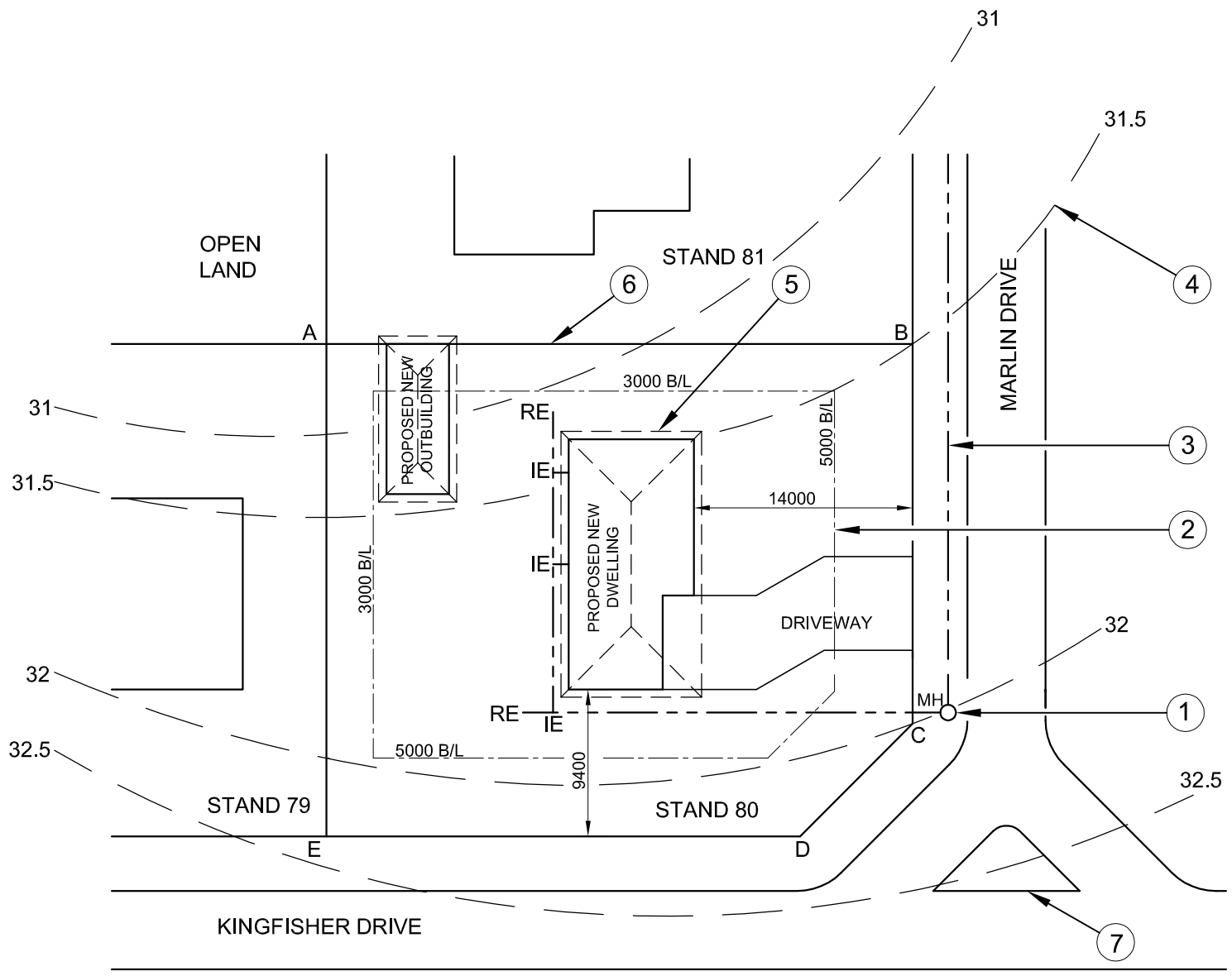
EXAMINATION NUMBER 3

STAPLE

THE SITE PLAN SHOWS STAND 80
SITUATED AT KAYSERS BEACH

SURVEYED ON 12-04-2010

LAND SURVEYOR'S CERTIFICATE
SIDE LENGTHS
AB = 37 806
BC = 24 200
CD = 10 615
DE = 30 300
EA = 31 706



SITE PLAN
SCALE 1 : 200

QUESTION 1: ANALYTICAL (CIVIL)

Given:
The site plan of a proposed new dwelling and outbuilding and a table of questions. The drawing is not to scale.

Instructions:
Complete the table below by neatly answering the questions, which all refer to the accompanying drawing. **[27]**

QUESTIONS		ANSWERS	
1	Why would the site plan for the proposed new dwelling and outbuilding not be approved by the municipality?		2
2	Which stand is to the west of stand 80?		1
3	How many complete stands are shown on the site plan?		1
4	What scale is indicated for the drawing?		1
5	On what date was the site surveyed?		1
6	In which residential area is the proposed dwelling situated?		1
7	From which street is the motor vehicle access to the site?		1
8	How many rodding eyes are shown on the site plan?		1
9	What is the distance, in metres, from the municipal boundary line on Marlin Drive to the propopsed new dwelling ?		1
10	What does the abbreviation IE stand for?		1
11	Name the feature at 1.		1
12	What does the line at 2 indicate?		1
13	What does the line at 3 indicate?		1
14	Name the feature at 4.		1
15	What does the line at 5 indicate?		1
16	What does the line at 6 indicate?		1
17	What does the complete feature at 7 indicate?		1
18	Determine, in metres, the difference in height between corner B and corner C of the stand.		1
19	The side of the new dwelling that faces Kingfisher Drive will be called the ____ elevation.		1
20	Determine the perimeter of the stand in metres. Show ALL calculations.		$2\frac{1}{2}$
21	Determine the total area of the stand in square meters. Show ALL calculations.		$4\frac{1}{2}$
	TOTAL		**27**

EXAMINATION NUMBER	
EXAMINATION NUMBER	2

STAPLE

ASSESSMENT CRITERIA				
SECTIONAL SOUTH ELEVATION				
	POSSIBLE	OBTAINED	SIGN	MODERATE
1. WALLS + HATCHING	16			
2. WINDOWS + DOORS	10			
3. FIXTURES	5			
4. ROOF + CEILING	15			
5. LABELS	1			
SUBTOTAL	**47**			
FLOOR PLAN				
1. WALLS + HATCHING	12			
2. WINDOWS + DOORS	9			
3. FEATURES	11			
4. ELECTRIC	10			
5. LABELS	6			
6. CUTTING PLANE A-A	2			
SUBTOTAL	**50**			
TOTAL	**97**			

EXAMINATION NUMBER	
EXAMINATION NUMBER	6