STAPLE

basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

## 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.

**SENIOR CERTIFICATE EXAMINATIONS**

# ENGINEERING GRAPHICS AND DESIGN P1

**2018**

**MARKS: 100**

**TIME: 3 hours**

**This question paper consists of 6 pages.**

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| QUESTION | MARKS OBTAINED | | | ½ | SIGN | MODERATED | | | ½ | SIGN | RE-MARKING | | | ½ | SIGN |
| 1 | | | | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | | | | |
| 4 | | | | | | | | | | | | | | | |
| TOTAL | | | | | | | | | | | | | | | |
| | 2 | 0 | 0 | | | 2 | 0 | 0 | | | 2 | 0 | 0 | | |

| FINAL CONVERTED MARK | CHECKED BY |
|---|---|
| 100 | |

Barcode label

| COMPLETE THE FOLLOWING: |
|---|
| CENTRE NUMBER |
| |
| CENTRE NUMBER |
| EXAMINATION NUMBER |
| |
| EXAMINATION NUMBER |

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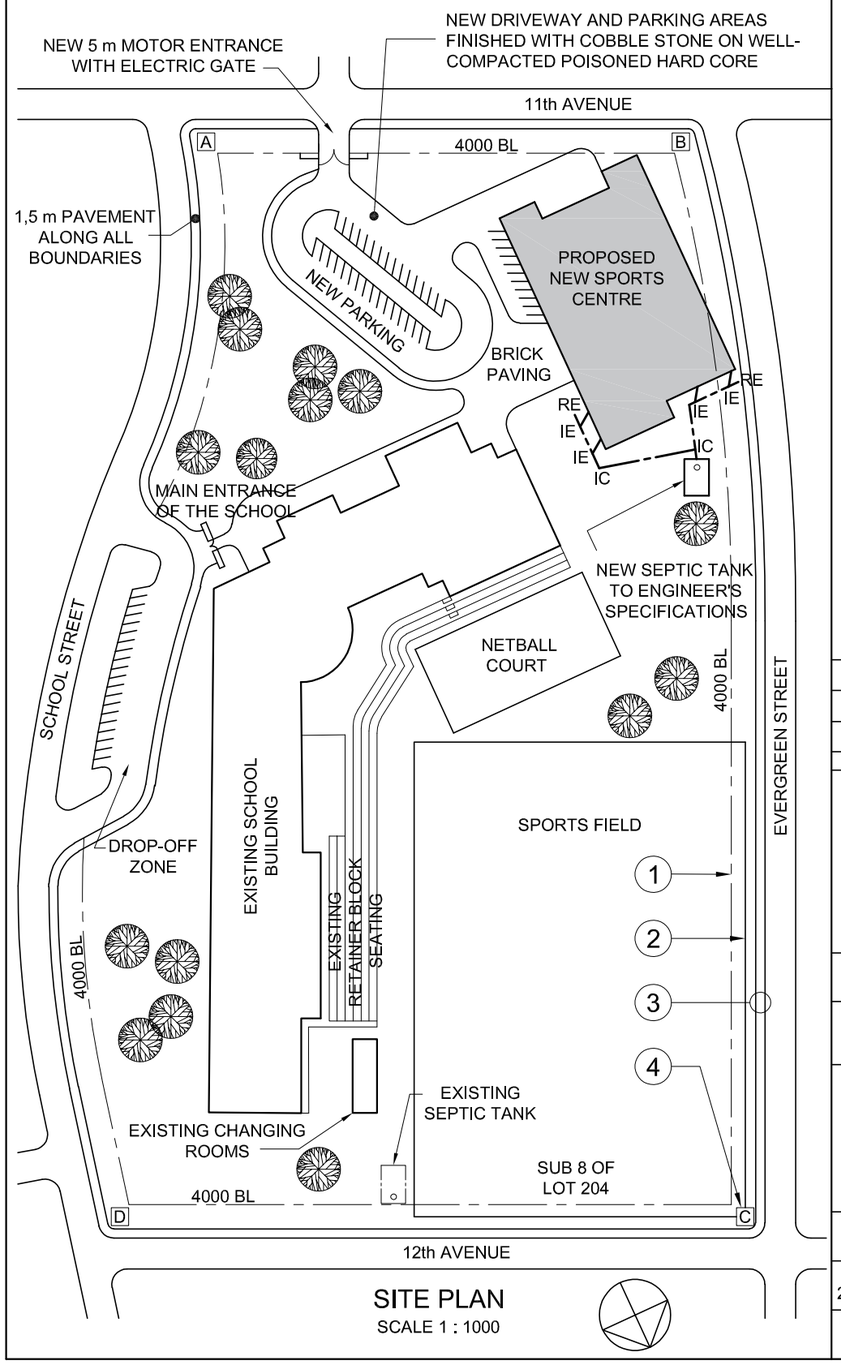
| LAND SURVEYOR CERTIFICATE OF THE BOUNDARY LENGTHS AND CORNER HEIGHTS OF SUB 8 OF LOT 204, SURVEYED ON 15-03-1985 | |
|---|---|
| BOUNDARY LENGTHS IN MILLIMETRES | CORNER HEIGHT IN METRES |
| AB = 85331 | A = 287,45 |
| BC = 180896 | B = 285,34 |
| CD = 105651 | C = 285,82 |
| DA = 181903 | D = 287,66 |




SITE PLAN
SCALE 1 : 1000

NOTES:
1. Contractors must verify all dimensions and levels on site before commencing work. Architects to be notified immediately of any discrepancies.
2. All civil work must be signed off by a qualified engineer.
3. All new finishes to match existing finishes.
4. Existing 2,3 m high steel palisade security fence must remain.

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 DOUBLE SINK UNIT.

| REVISION | DATE | DESCRIPTION |
|---|---|---|
| | | |
| | | |
| A | 6 OCTOBER | VOEG HEKKE BY |

KLA ARCHITECTS
9 MAIN ROAD
QUEENSTOWN
☎ 083 792 2092
kla@hotmail.com

| PRINTED BY | DATE OF PRINT |
|---|---|
| TRUE PRINT | 2017-10-17 |

DRAWING TITLE
SITE PLAN

PROJECT
PROPOSED NEW SPORTS CENTRE AND PARKING FOR JUNIPER HIGH SCHOOL, SUB 8 OF LOT 204, 38 SCHOOL STREET, GLENDOWER.

| PROJECT NUMBER | DRAWING NUMBER |
|---|---|
| KLA/NFJ/-2018 | TH 17-05-NM/J |

| DATE | DRAWN | CHECKED | SCALE |
|---|---|---|---|
| 2017-04-13 | BENNY | SOPHIE | 1 : 1000 |

REFERENCE CODE
Q1P1-J2018

**QUESTION 1: ANALYTICAL (CIVIL)**

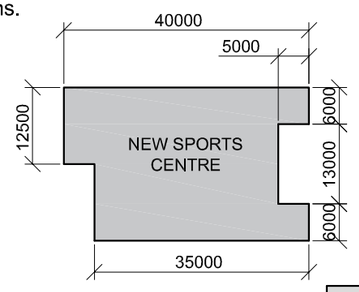
**Given:**
The site plan of an existing school with a proposed new sports centre and parking, a title panel and a table of questions. The drawing has not been prepared to the indicated scale.

**Instructions:**
Complete the table below by neatly answering the questions, which refer to the accompanying drawing and title panel. **[30]**

| | QUESTIONS | ANSWERS | | | |
|---|---|---|---|---|---|
| 1 | What scale is indicated for the drawing? | | 1 | | |
| 2 | What was Benny responsible for? | | 1 | | |
| 3 | What is the complete number of the LOT? | | 1 | | |
| 4 | How many revisions have been made to the drawing? | | 1 | | |
| 5 | What does the abbreviation *IC* stand for? | | 1 | | |
| 6 | How many trees are on the LOT? | | 1 | | |
| 7 | What security feature surrounds the LOT? | | 1 | | |
| 8 | What finish must be applied to the new driveway? | | 1 | | |
| 9 | What sewerage system is proposed for the new sports centre? | | 1 | | |
| 10 | Off which street is the main entrance of the school? | | 1 | | |
| 11 | What does the line at 1 indicate? | | 1 | | |
| 12 | What does the line at 2 indicate? | | 1 | | |
| 13 | What do the two lines in the circle at 3 indicate? | | 1 | | |
| 14 | What does the letter in the box at 4 represent? | | 1 | | |
| 15 | Which elevation of the proposed new sports centre faces the main entrance of the school? | | 2 | | |
| 16 | What is the length of the north eastern boundary in metres? | | 2 | | |
| 17 | With reference to the building regulations, why would this proposed site plan not be approved? | | 2 | | |
| 18 | In the space below (ANSWER 18), determine the perimeter of the proposed new sports centre in metres. | | 3 | | |
| 19 | In the space below (ANSWER 19), determine the total area of the proposed new sports centre in square metres. | | 3 | | |
| 20 | In the space provided in the title panel (ANSWER 20), draw, in neat freehand, the top view of the *SANS 10143* graphical symbol for a DOUBLE SINK UNIT. | | 4 | | |
| | | **TOTAL** | **30** | | |

ANSWER 18: Show ALL calculations.

ANSWER 19: Show ALL calculations.




| EXAMINATION NUMBER | |
|---|---|
| | |
| EXAMINATION NUMBER | 2 |

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## QUESTION 2: SOLID GEOMETRY

**Given:**

- The incomplete front view and the top view of a hollow open-ended right square prism that has been shaped to fit around a hollow open-ended right regular hexagonal prism. The axes of both hollow prisms lie in a common vertical plane.
- An auxiliary view of the square prism

**Instructions:**

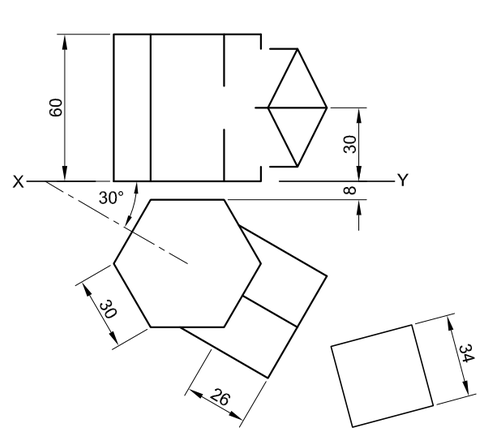
Draw, to scale 1 : 1, the following:

2.1 The given top view

2.2 The complete front view, clearly showing the curve of interpenetration

2.3 The complete right view, clearly showing the curve of interpenetration

- Planning is essential.
- Show ALL hidden detail.
- Show ALL construction. **[37]**




| ASSESSMENT CRITERIA | | | | | | |
|---|---|---|---|---|---|---|
| 1 | TOP VIEW | 7 | | | | |
| 2 | FRONT VIEW | 14 $\frac{1}{2}$ | | | | |
| 3 | RIGHT VIEW | 15 $\frac{1}{2}$ | | | | |
| PENALTIES (-) | | | | | | |
| | **TOTAL** | **37** | | | | |

| EXAMINATION NUMBER | |
|---|---|
| | |
| EXAMINATION NUMBER | 3 |

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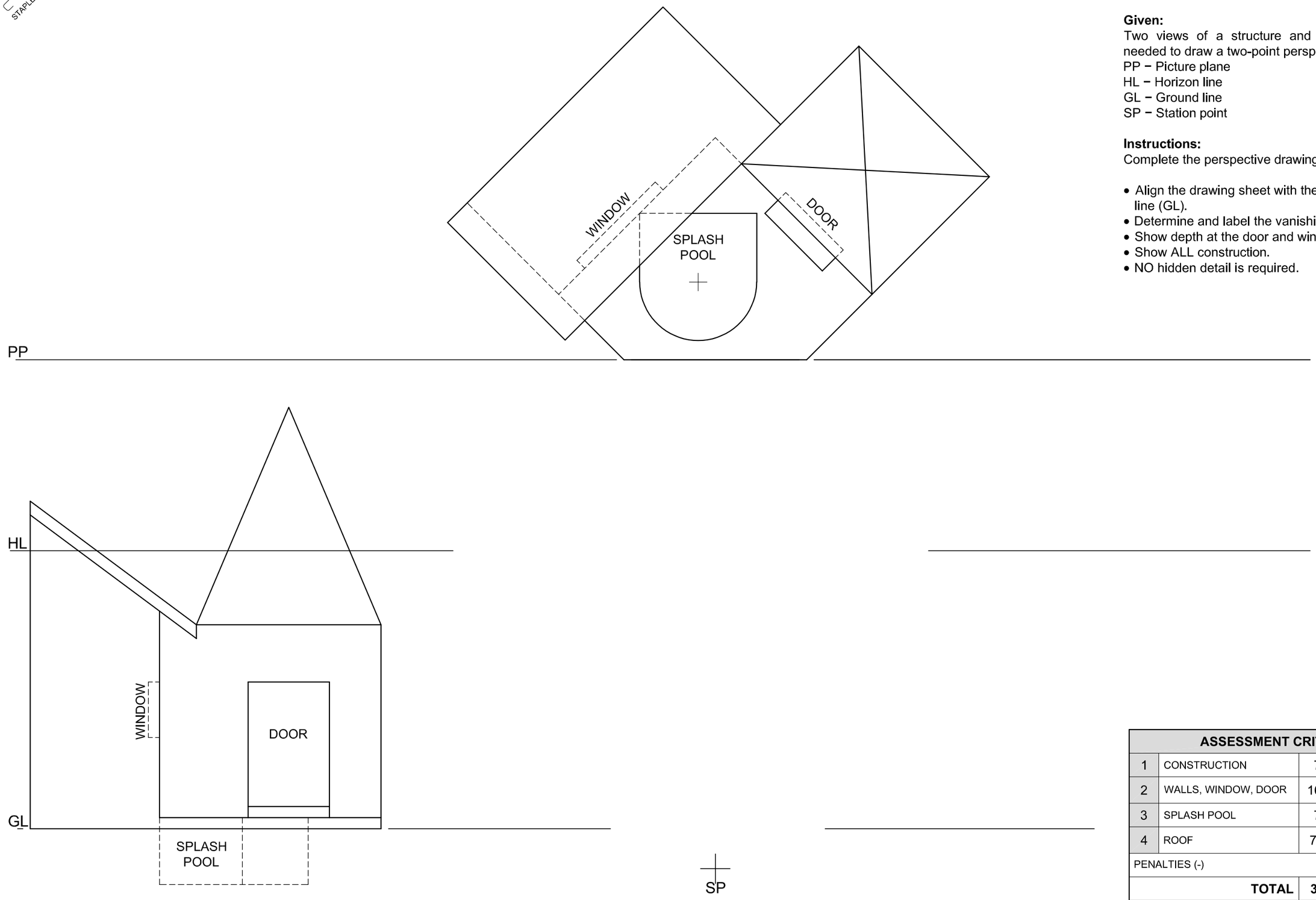


**QUESTION 3: PERSPECTIVE**

**Given:**
Two views of a structure 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 depth at the door and window.
- Show ALL construction.
- NO hidden detail is required. **[38]**

| ASSESSMENT CRITERIA | | | | | | |
|---|---|---|---|---|---|---|
| 1 | CONSTRUCTION | 7 | | | | |
| 2 | WALLS, WINDOW, DOOR | 16 ½ | | | | |
| 3 | SPLASH POOL | 7 | | | | |
| 4 | ROOF | 7 ½ | | | | |
| PENALTIES (-) | | | | | | |
| | **TOTAL** | **38** | | | | |

EXAMINATION NUMBER

EXAMINATION NUMBER 4

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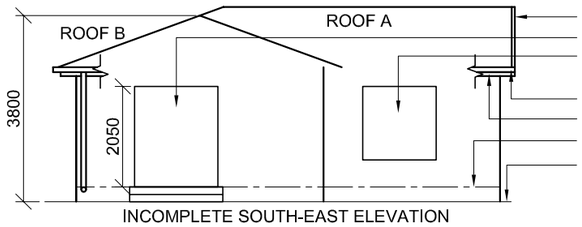
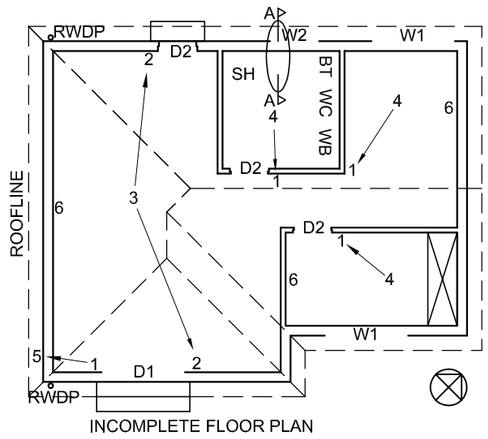
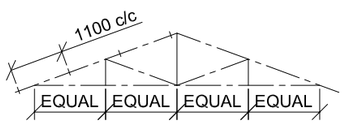


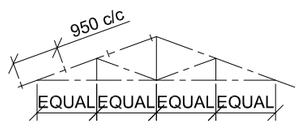

INCOMPLETE SOUTH-EAST ELEVATION




INCOMPLETE FLOOR PLAN




SCHEMATIC DIAGRAM OF ROOF 'A'




SCHEMATIC DIAGRAM OF ROOF 'B'

**ROOF NOTES:**
20° ROOF PITCH

114 x 38 mm ROOF TRUSSES ON
114 x 38 mm WALL PLATES

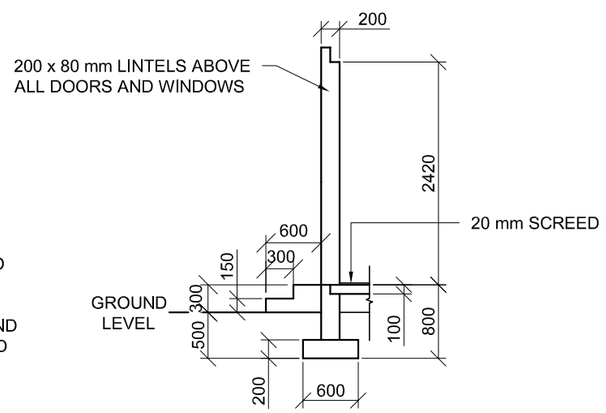
300 mm ROOF OVERHANG TO END OF ROOF TRUSSES

10 mm FIBRE CEMENT ROOF SHEETING ON 75 x 50 mm PURLINS SPACED ACCORDING TO SCHEMATIC DIAGRAMS

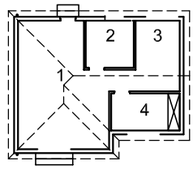
200 x 20 mm FASCIA BOARD ON ALL SIDES AND 300 x 75 mm BARGE BOARDS ON THE GABLED END, 20 mm PAST THE GUTTER

150 x 100 mm GUTTERS WITH Ø75 RWDP ON ALL SIDES

10 mm CEILING BOARDS ON 38 x 38 mm BRANDERING STRIPS @ 450 c/c




INCOMPLETE FOUNDATION AND EXTERNAL WALL DETAIL




ROOM DESIGNATIONS

**FEATURES**

| | |
|---|---|
| **D1** | SLIDING DOOR |
| **D2** | DOOR |
| **W1** AND **W2** | WINDOWS |

**FIXTURES**

| | |
|---|---|
| **WC** | TOILET |
| **WB** | WASH BASIN |
| **BT** | BIDET |
| **SH** | SHOWER |

**FLOOR FINISHES**

| | | |
|---|---|---|
| 1 | LIVING AREA | CARPET |
| 2 | BATHROOM | TILE |
| 3 | HOBBY ROOM | TILE |
| 4 | BEDROOM | CARPET |

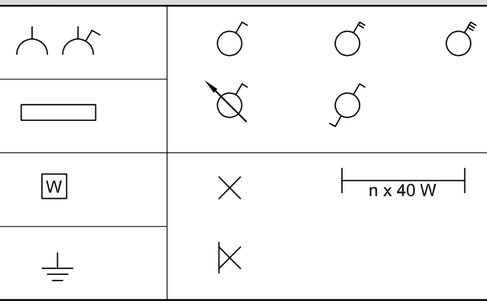
**ELECTRICAL FITTINGS**
1. ONE-WAY SWITCH - SINGLE POLE
2. TWO-WAY SWITCH - SINGLE POLE
3. FLUORESCENT LIGHT 2 x 40 W
4. CEILING LIGHT
5. WALL-MOUNTED LIGHT
6. SWITCHED SOCKET OUTLET

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

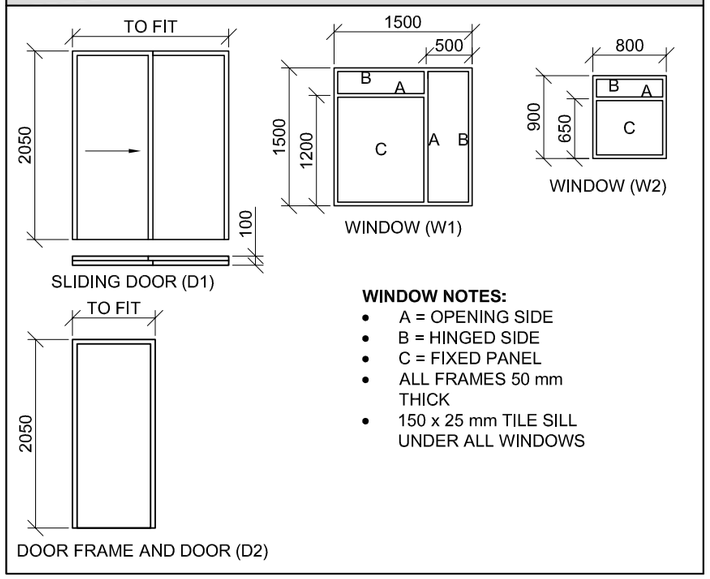
## ROOF COMPONENTS

| | |
|---|---|
| | 300 x 75 mm BARGE BOARD |
| | 200 x 20 mm FASCIA BOARD |
| 300 | ROOF CAP |

## ELECTRICAL SYMBOLS

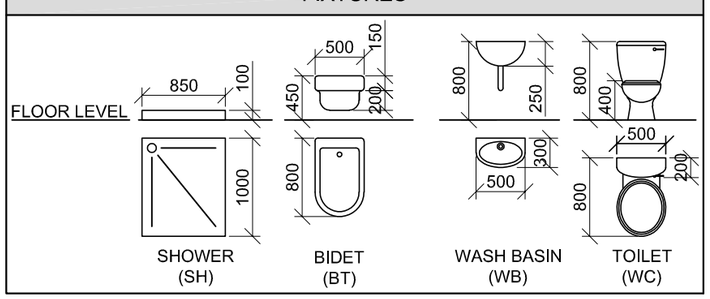



## DOOR AND WINDOW SCHEDULE




**WINDOW NOTES:**
- A = OPENING SIDE
- B = HINGED SIDE
- C = FIXED PANEL
- ALL FRAMES 50 mm THICK
- 150 x 25 mm TILE SILL UNDER ALL WINDOWS

## FIXTURES




## QUESTION 4: CIVIL DRAWING

**Given:**
- The incomplete south east elevation of a **new house**, showing the walls, the sliding door and window openings, the roof and notes
- The incomplete floor plan showing the walls, positions of steps, doors, windows, fixtures and the electrical layout
- Schematic diagrams of the roof trusses and roof notes
- The incomplete foundation and external wall detail
- Room designations and floor finishes
- 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 and the breakline 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
- ALL fixtures as indicated by the abbreviations
- ALL electrical fittings as indicated by the numbers
- ALL hatching detail

4.1.2 **THE COMPLETE SOUTH-EAST ELEVATION**
**Show the following features on the drawing:**
- The outside walls, sliding door, steps and window detail
- The roof detail, including the fascia boards, gutters, barge board, roof cap and rainwater downpipe
- The finished floor level

4.2 Using the incomplete foundation and breakline 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 complete foundation and external wall detail
- The window detail
- The roof detail, including the fascia board, gutter and barge board
- The bidet
- ALL hatching detail. ONLY the substructure hatching may be drawn in neat freehand.

**Label the following:**
- The south-east elevation
- The room designations and floor finishes
- Ground level, finished floor level, damp-proof course and built-in cupboard (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.* **[95]**



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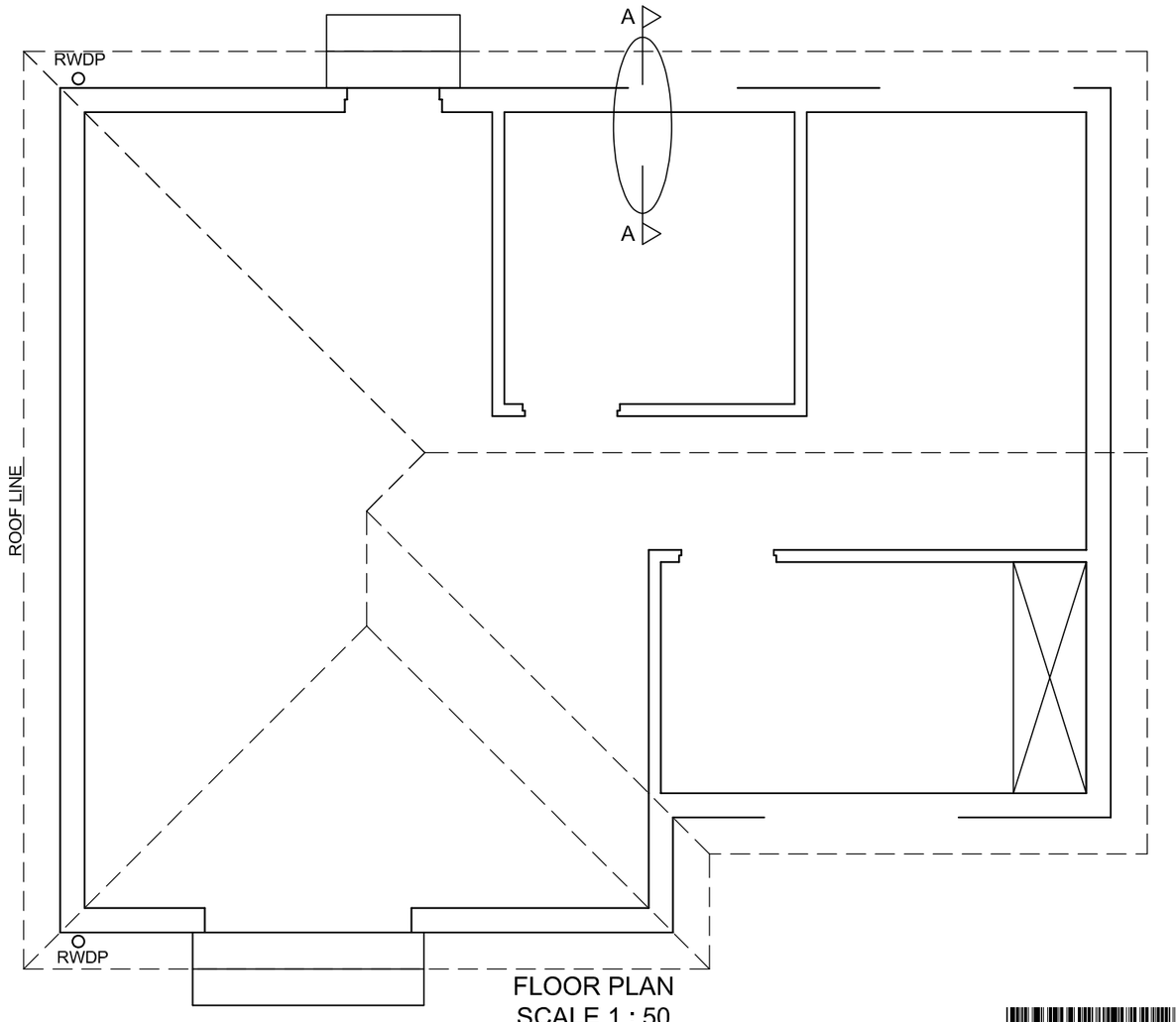
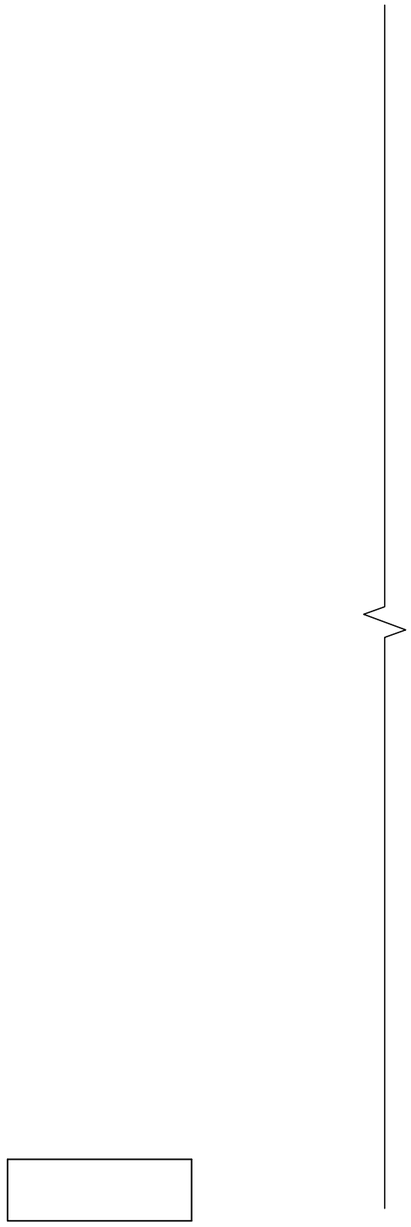



FLOOR PLAN
SCALE 1 : 50



SECTION A - A
SCALE 1 : 20

| 1. MARK ALLOCATION FOR ROOF SECTION | |
|---|---|
| A (1) | |
| B (1) | |
| C (2) | |
| D (3) | |
| E (2) | |
| F (1) | |
| G (1) | |
| H (1) | |
| I (1) | |
| **TOTAL** | |

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

**ASSESSMENT CRITERIA**

**FLOOR PLAN**

| | | POSSIBLE | OBTAINED | SIGN | MODERATED |
|---|---|---|---|---|---|
| 1 | DOORS + WINDOWS | 11 | | | |
| 2 | FIXTURES | 7 | | | |
| 3 | ELECTRICAL | 10 ½ | | | |
| 4 | HATCHING | 4 | | | |
| 5 | LABELS | 4 ½ | | | |
| **SUBTOTAL** | | **37** | | | |

**SOUTH EAST ELEVATION**

| | | | | | |
|---|---|---|---|---|---|
| 1 | ROOF + RWDP | 9 ½ | | | |
| 2 | WALLS + FFL + STEPS | 4 ½ | | | |
| 3 | DOOR + WINDOW | 8 | | | |
| 4 | LABELS | 1 ½ | | | |
| **SUBTOTAL** | | **23 ½** | | | |

**DETAILED SECTION**

| | | | | | |
|---|---|---|---|---|---|
| 1 | ROOF DETAIL | 13 | | | |
| 2 | FOUNDATION + WALL + SLAB | 7 | | | |
| 3 | WINDOW + SILL | 3 ½ | | | |
| 4 | FIXTURES | 3 ½ | | | |
| 5 | HATCHING | 6 | | | |
| 6 | LABELS | 1 ½ | | | |
| **SUBTOTAL** | | **34 ½** | | | |
| **TOTAL** | | **95** | | | |
| PENALTIES (-) | | | | | |
| **GRAND TOTAL** | | | | | |

EXAMINATION NUMBER

EXAMINATION NUMBER 6

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