



Province of the
EASTERN CAPE
DEPARTMENT OF EDUCATION

**NATIONAL
SENIOR CERTIFICATE**

GRADE 12

ENGINEERING GRAPHICS AND DESIGN P1

SEPTEMBER 2022

PREPARATORY EXAMINATION

MARKS: 200

TIME: 3 hours

This question paper consists of 6 pages.

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INSTRUCTIONS AND INFORMATION

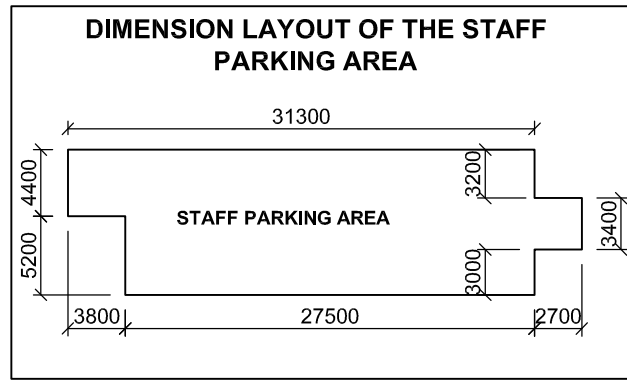
1. The question paper consists of FOUR questions.
2. Answer ALL the questions.
3. All drawings must be drawn to scale 1 : 1, unless otherwise stated.
4. ALL drawings are in first angle orthographic projection, unless stated otherwise.
5. ALL drawings must be prepared using pencil and instruments, unless otherwise stated.
6. All answers must be drawn accurately and neatly.
7. The questions must be answered on the question paper, as instructed.
8. All the answer sheets must be re-stapled in numerical sequence and handed in irrespective of whether the question was attempted or not.
9. Time management is essential in order to complete all the questions.
10. Print your name in the block provided on every ANSWER SHEET.
11. Any details or dimensions not given, must be assumed in good proportion.

| FOR OFFICIAL USE ONLY | | | | |
|-----------------------|----------|----------|----------|----------------|
| | | | | MODERATED MARK |
| 1 | | | | |
| 2 | | | | |
| 3 | | | | |
| 4 | | | | |
| TOTAL | | | | |
| | 2 | 0 | 0 | 2 0 0 |

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

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

| SYMBOL LEGEND | | |
|---------------|--|---------------------|
| 1 | | 13 mm CRUSHED STONE |
| 2 | | PALISADE FENCING |
| 3 | | BETA FENCING |
| 4 | | INDIGENOUS TREE |
| 5 | | PALM TREE |



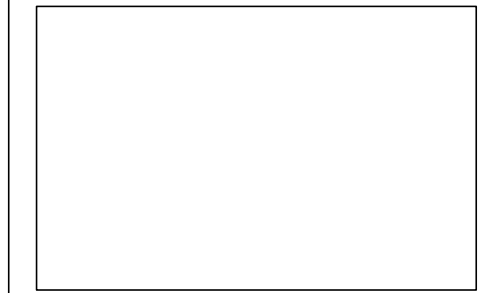
LAND SURVEYOR'S CERTIFICATE OF THE SIDE LENGTHS AND CORNER HEIGHTS OF STAND 121 SURVEYED ON 2021-11-16

| LENGTHS IN MILLIMETRES | CORNER HEIGHTS IN METRES |
|------------------------|--------------------------|
| AB = 42200 | A = 342,5 |
| BC = 93500 | B = 345,1 |
| CD = 42200 | C = 345,8 |
| AD = 93500 | D = 341,9 |

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

ARCHITECT'S SIGNATURE
CLIENT'S SIGNATURE

ANSWER 17
In the space below, draw, in neat freehand, the front and top view of the SANS 10143 graphical symbol for a BATH.



| REVISION | DATE | DESCRIPTION |
|----------|------------|---------------------------------|
| 2 | 2022-01-24 | Add all street names |
| 1 | 2022-01-19 | Indicate disabled parking areas |

MLANDWA ARCHITECTS
21 SEDIDI STREET
ALEXANDRIA
082 222 7888
mlandwa.architect@hotmail.com

PRINTED BY: **LUDIDI PRINTERS** DATE OF PRINT: **2022-02-14**

DRAWING TITLE:
SITE PLAN

PROJECT:
PROPOSED NEW DEVELOPMENT FOR MRS DLAYEDWA STAND 121, Cnr. VOORTREKKER & KROG STREET ALEXANDRIA

| | | | |
|---|---------------------------------------|--------------------------|--------------------------|
| PROJECT NUMBER: 02-2022 | DRAWING NUMBER: DEL011-2021 | | |
| DATE: 2021-11-21 | DRAWN: RONNIE | CHECKED: DLABA | SCALE: 1 : 300 |
| REFERENCE CODE: SITE- 121A-22 | DRAWING NO.: 1 OF 6 | | |

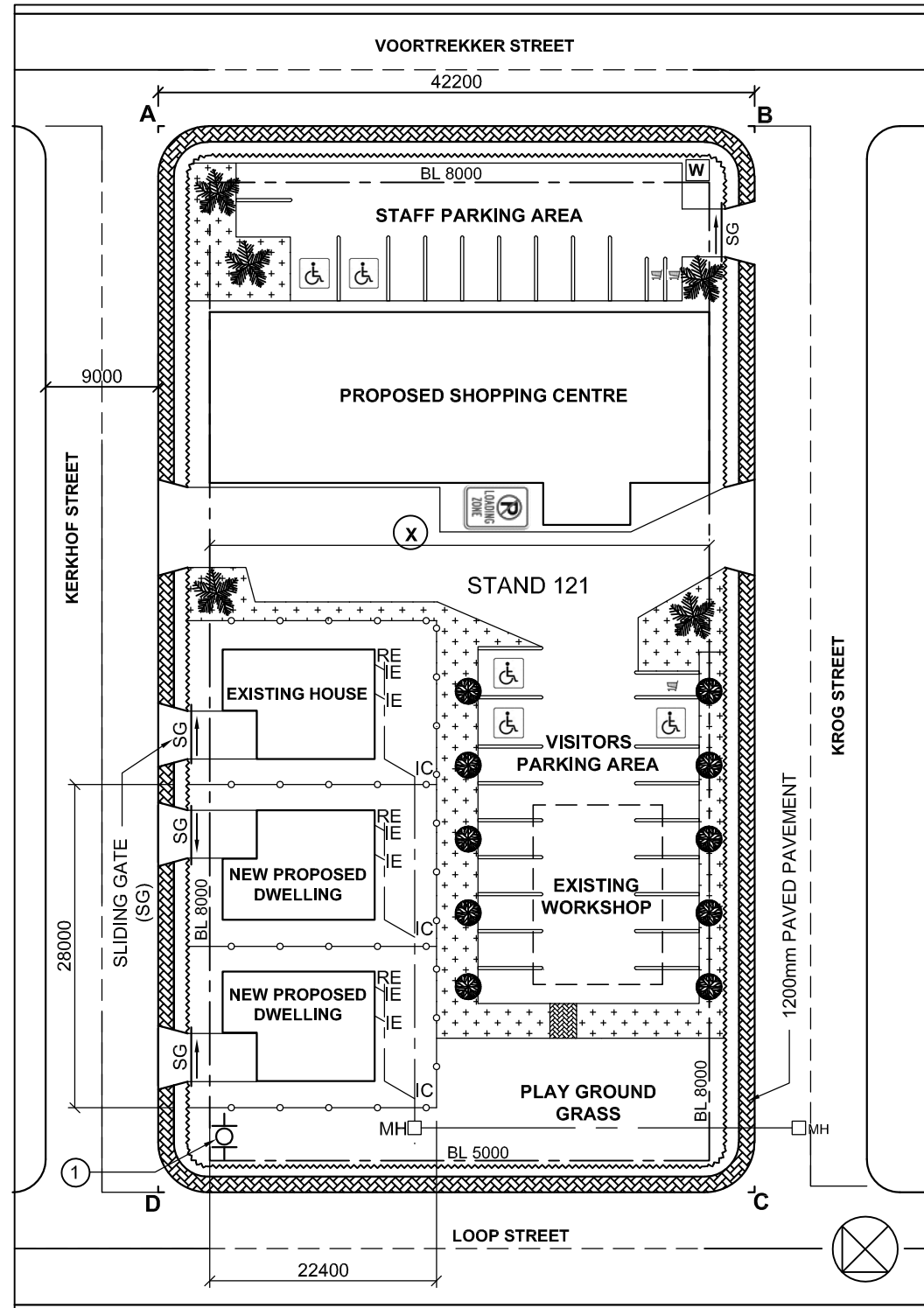
QUESTION 1: ANALYTICAL (CIVIL)

Given:
The site plan of a new development with new dwellings, shopping centre, parking areas, a title block 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 block. [29]

| QUESTIONS | | ANSWERS | |
|-----------|--|---------|--|
| 1 | Who is the architect of the development on STAND 121? | 1 | |
| 2 | Who is the owner of the development? | 1 | |
| 3 | What is the reference code? | 1 | |
| 4 | What is the width of the pavement in meters? | 1 | |
| 5 | The existing workshop is drawn with hidden lines. What does the hidden lines mean to the contractor? | 2 | |
| 6 | Name the feature at 1. | 1 | |
| 7 | How many sliding gates need to be installed? | 1 | |
| 8 | What type of fence must be used between the new proposed dwellings? | 1 | |
| 9 | In what colour should the new proposed dwellings be indicated on the site plan? | 1 | |
| 10 | How many parking bays for disabled are there for the visitors? | 1 | |
| 11 | How many inspection chambers must be installed at the new proposed dwellings? | 1 | |
| 12 | Name the type of material that must be used as a ground cover under the trees, around the parking area. | 1 | |
| 13 | With reference to the north point, on which side of the shopping centre is the staff parking area? | 2 | |
| 14 | Determine the total length (indicated with an X) of the shopping centre, in meter. | 2 | |
| 15 | The existing house is already fenced with a palisade fence. Determine, in the space below (Answer 15) how many meters of palisade fence need to be purchased to fence the two new dwellings. The Kerkhof street side already has betafence and do not need palisade. | 3 | |
| 16 | In the space provided below (ANSWER 16), determine the total area of the staff parking area , in square meters. See dimension layout of staff parking. | 5 | |
| 17 | In the space in the title panel (ANSWER 17), draw in neat freehand, the front and top view of the SANS 10143 graphical symbol for a BATH. | 4 | |

| | | | |
|--|--|--------------|-----------|
| ANSWER 15 Show ALL calculations. | ANSWER 16 Show ALL calculations. | TOTAL | 29 |
| | | NAME | |
| | | NAME | 2 |



QUESTION 2: SOLID GEOMETRY

Given:

- The front view and top view of a square prism with a cylindrical hole.
- Starting point **X**, the centre point of the cylindrical hole.

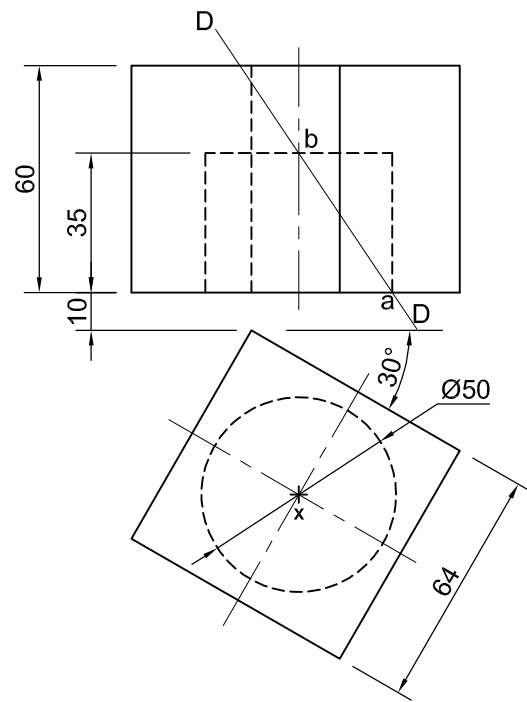
Instructions:

Draw to scale 1 : 1, the following views:

- 2.1 The top view.
- 2.2 The front view with the cutting line (Draw the cutting line through points **a** and **b**.)
- 2.3 The sectional right view on cutting plane D-D
- 2.4 The true shape of the cutting area.

- Show ALL centre lines and hidden detail.
- Show ALL necessary construction lines.

[31]



+
X

| ASSESSMENT CRITERIA | | | | |
|---------------------|----------------------|-----------|--|--|
| 1 | TOP VIEW | 4 ½ | | |
| 2 | FRONT VIEW | 6 | | |
| 3 | SECTIONAL RIGHT VIEW | 12 | | |
| 4 | TRUE SHAPE | 8 ½ | | |
| PENALTIES (-) | | | | |
| TOTAL | | 31 | | |

| | |
|-------------|----------|
| NAME | |
| | |
| NAME | |
| | 3 |

QUESTION 3: PERSPECTIVE

Given:

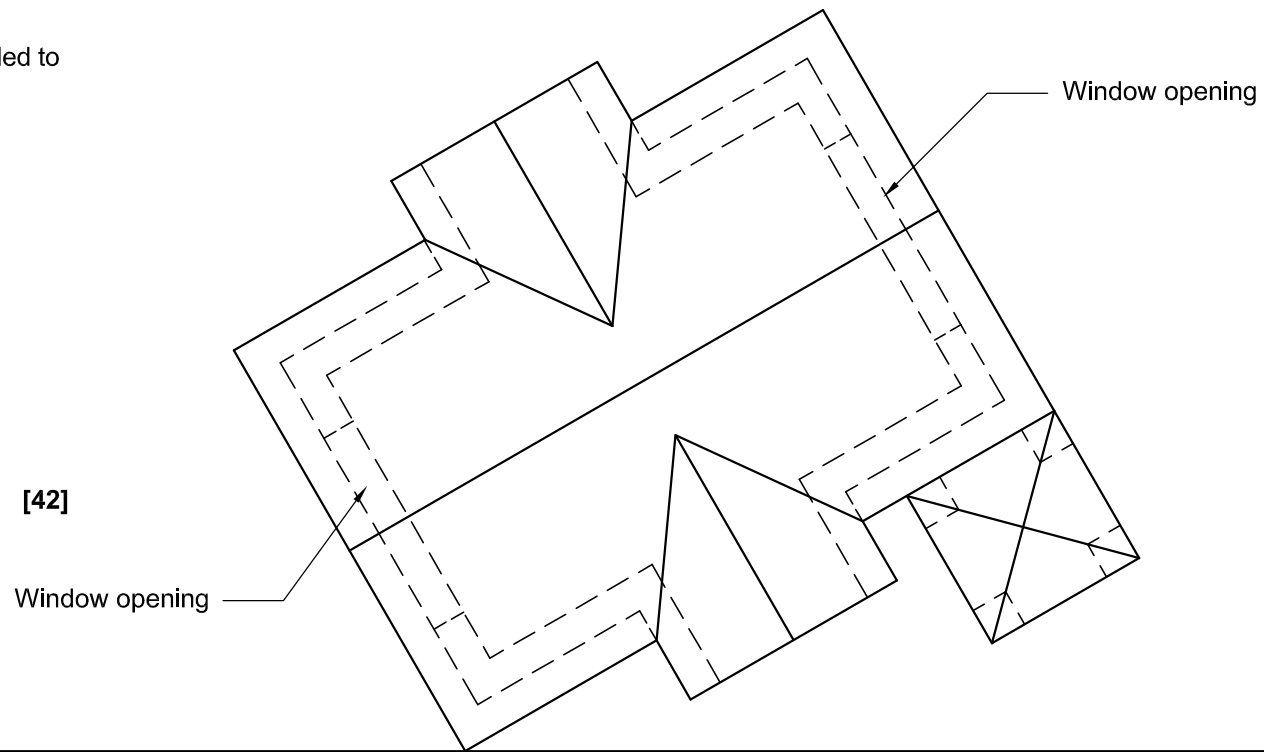
- Two views of a small chapel and the information needed to draw a two-point perspective drawing.

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

Instructions:

Complete the perspective drawing.

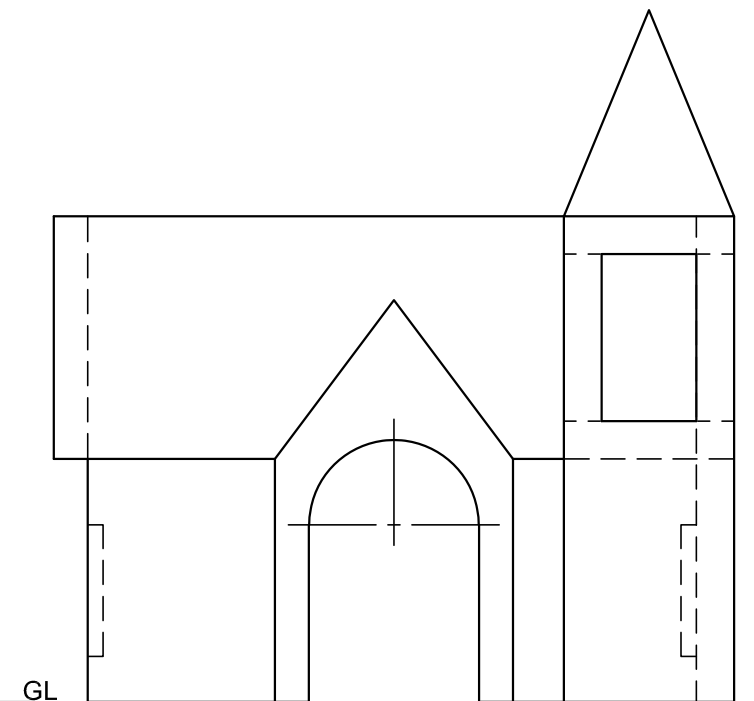
- Align the drawing sheet with the ground line (GL).
- Determine and label the vanishing points.
- Show ALL necessary construction.
- NO hidden detail is required.



| ASSESSMENT CRITERIA | | | | |
|---------------------|---------------------|-----------|--|--|
| 1 | CONSTRUCTION + VP's | 5 | | |
| 2 | WALLS + WINDOW | 11 | | |
| 3 | ROOF | 7 1/2 | | |
| 4 | TOWER | 14 | | |
| 5 | ARCH + CONSTRUCTION | 4 1/2 | | |
| PENALTIES (-) | | | | |
| TOTAL | | 42 | | |

PP

HL



+

SP

| | |
|------|--|
| NAME | |
| | |
| NAME | |
| 4 | |

QUESTION 4: CIVIL DRAWING

Given:

- The incomplete west elevation of a **new house**, showing the walls, windows and door openings, the braai area, the roof and labels.
- The incomplete floor plan showing the walls, step, position of the doors, windows, fixtures and the electrical layout.
- A schematic diagram of the roof truss and roof notes.
- The incomplete foundation and external wall with dimensions.
- Room designations as well as 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 incomplete floor plan and ground line of a **new house**, drawn to scale 1 : 50, and the incomplete foundation and a break line for the for 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 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 sanitary fixtures as indicated by the abbreviations
- ALL electrical fittings as indicated by the numbers
- The complete roof line
- ALL hatching detail

4.1.2 THE COMPLETE WEST ELEVATION

Show the following features on the drawing:

- The outside walls, braai, slidingdoor,step and window detail.
- The roof detail, including the fascia boards, ridge cover, gutters, rainwater down-pipe and gully.
- The finished floor level.

4.2 Using the given foundation and break line 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:

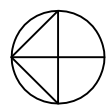
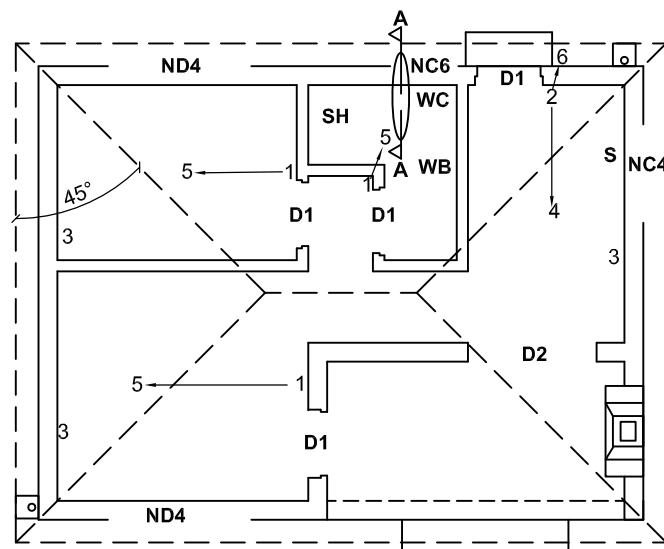
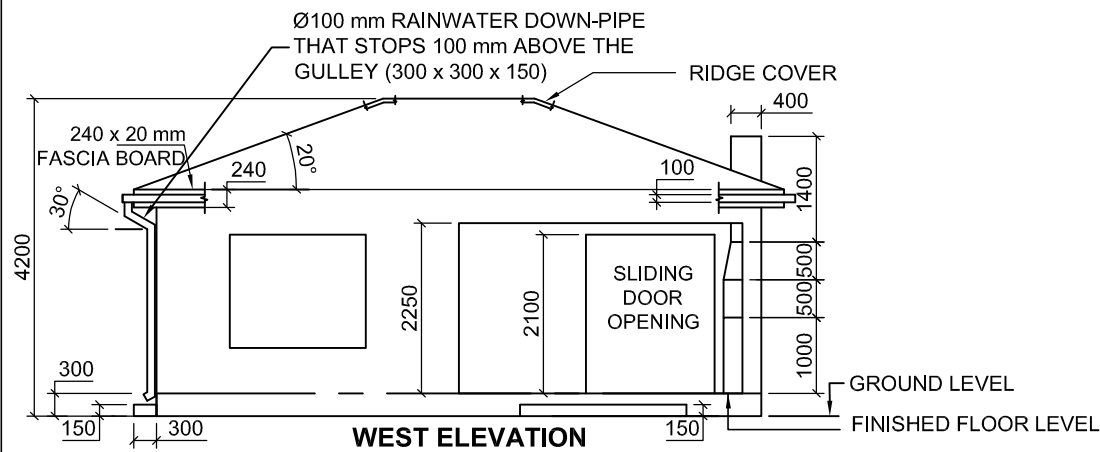
- The complete foundation, external wall, lintel and window detail.
- The shower to the north of the cutting plane **A-A**
- The roof detail, including the fascia board and gutter.
- ALL hatching detail. **ONLY** the substructure hatching may be drawn in neat freehand.

Label the following:

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

NOTE:

ALL drawings must comply with the **guidelines** and **graphical symbols** as contained in the **SANS 10143**. [98]



**FLOOR PLAN
SCALE 1 : 50**

ROOF NOTES:

20° ROOF PITCH.

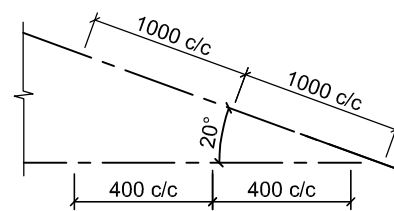
114 x 38 mm ROOF TRUSSES ON
114 x 38 mm WALL PLATES.

300 mm ROOF OVERHANG TO THE END OF THE ROOF TRUSS

ROOF COVER: 20 mm FIBRE CEMENT ROOF SHEETING
ON 75 x 50 mm PURLINS @ 1000 mm c/c.

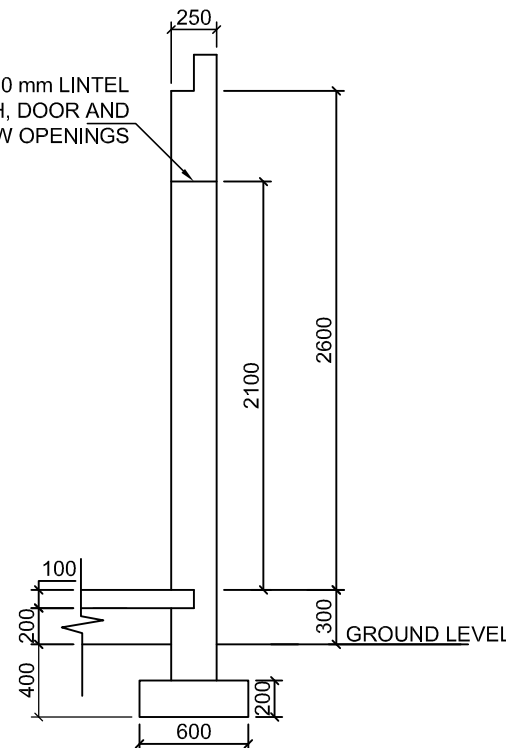
240 x 20 mm FASCIA BOARD WITH 150 X 100 mm GUTTERS ON ALL
SIDES AND A Ø100 mm RAINWATER DOWN-PIPE

10 mm CEILING BOARD ON 38 x 38 mm BRANDING @ 400 mm c/c.

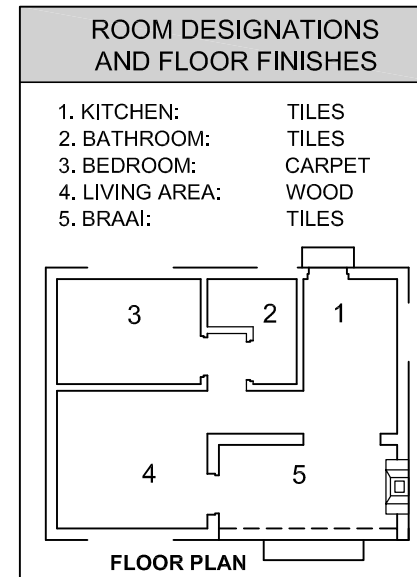
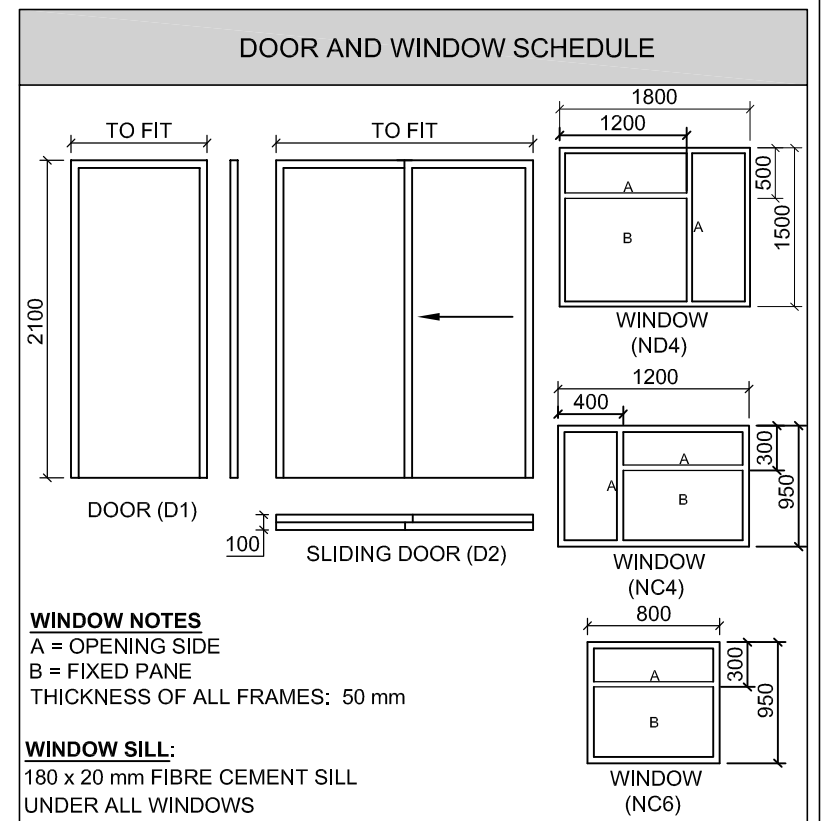
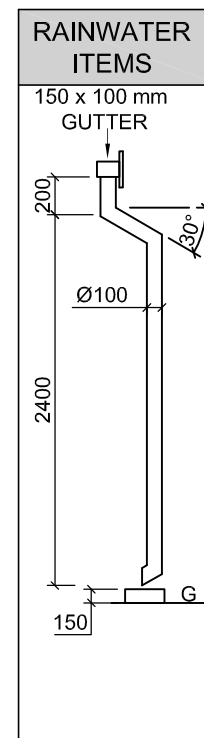


**SCHEMATIC DIAGRAM OF THE
ROOF TRUSS FOR ROOF**

1 X 250 x 100 mm LINTEL
ABOVE ALL ARCH, DOOR AND
WINDOW OPENINGS

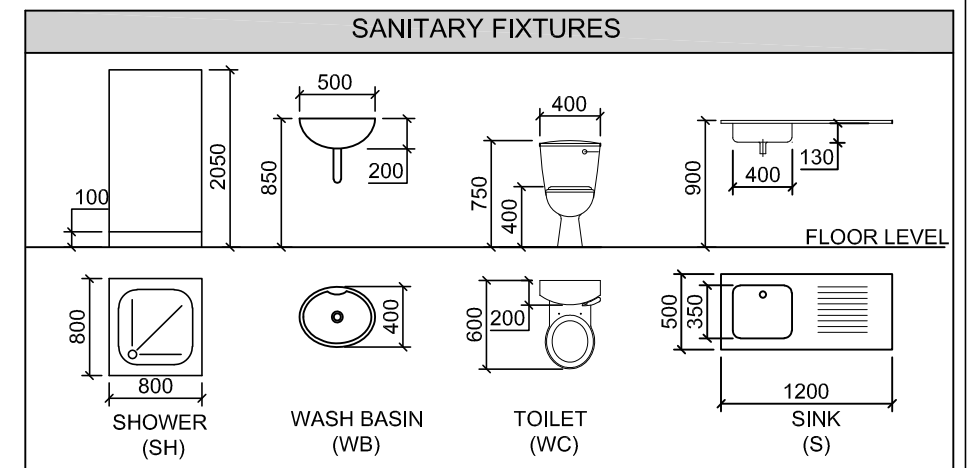


**DIMENSION GUIDE:
INCOMPLETE FOUNDATION AND
EXTERNAL WALL DETAIL**



| ROOF COMPONENTS | |
|-----------------|--------------------------|
| | 240 x 20 mm FASCIA BOARD |
| | ROOF CAP AND RIDGE COVER |
| | 150 x 100 GUTTER |

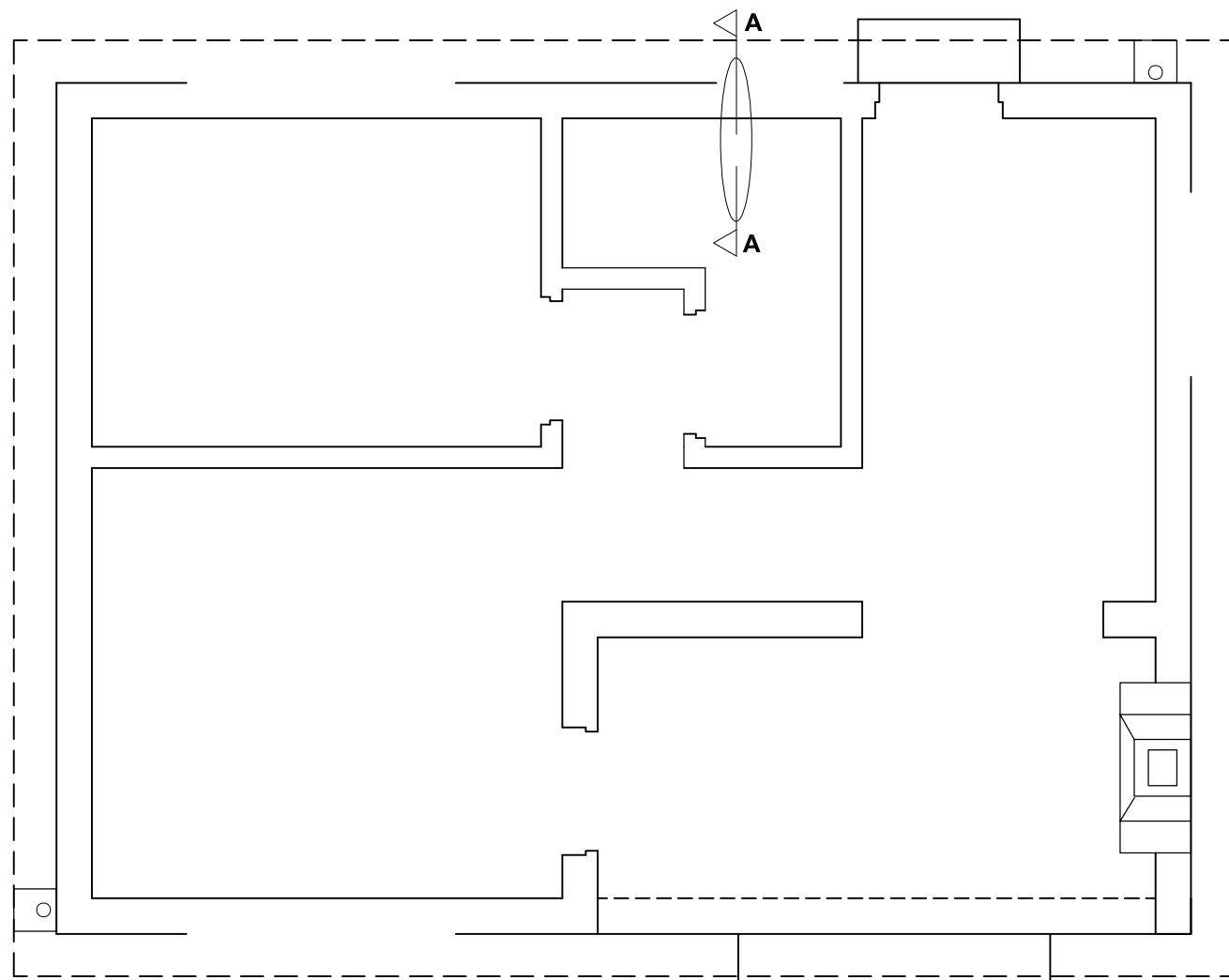
| ELECTRICAL SYMBOLS | |
|--------------------|--|
| | |
| | |
| | |
| | |



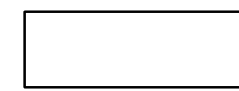
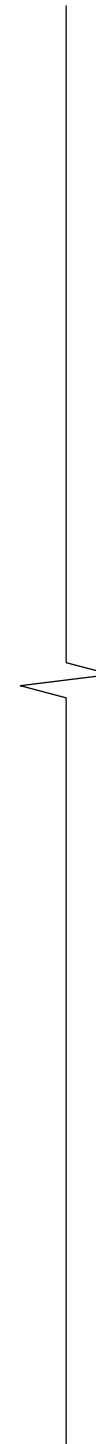
| ROOF DETAIL: MARK ALLOCATION | | | | | | | |
|------------------------------|----------------------|-------|--|---|---------------|-----------|--|
| A | ROOF ANGLE | 1/2 | | F | CEILING BOARD | 1/2 | |
| B | ROOF SHEET | 1 | | G | WALL PLATE | 1 | |
| C | ROOF TRUSS | 3 | | H | FACIA BOARD | 1 | |
| D | PURLIN + SPACING | 1 1/2 | | I | GUTTER | 1 | |
| E | BRANDERING + SPACING | 1 1/2 | | | | | |
| TOTAL | | | | | | 11 | |

| PENALTIES | | |
|----------------------------|------------------------|--|
| 1 | INCORRECT SCALE | |
| 2 | NON-ALIGNMENT OF VIEWS | |
| 3 | INCORRECT LETTERING | |
| TOTAL PENALTIES (-) | | |

| ASSESSMENT CRITERIA | | | | |
|---------------------|---|-----------|--|--|
| FLOOR PLAN | | | | |
| 1 | DOORS + WINDOWS | 14 | | |
| 2 | ELECTRICAL + ROOF LINES | 11 | | |
| 3 | FIXTURES | 7 | | |
| 4 | HATCHING | 3 | | |
| 5 | LABELS | 5 | | |
| SUBTOTAL | | 40 | | |
| NORTH ELEVATION | | | | |
| 1 | ROOF + GUTTER + RWDP + GULLEY FACIA BOARD + RIDGE COVER | 10 | | |
| 2 | WALLS + PORCH + BRAAI + FFL | 9 1/2 | | |
| 3 | DOOR + WINDOW | 7 1/2 | | |
| 4 | LABELS | 1 | | |
| SUBTOTAL | | 28 | | |
| DETAILED SECTION | | | | |
| 1 | ROOF DETAIL | 11 | | |
| 2 | FOUNDATIONS + WALLS + FLOOR | 6 1/2 | | |
| 3 | WINDOW + SHOWER | 5 | | |
| 4 | HATCHING | 6 | | |
| 5 | LABELS | 1 1/2 | | |
| SUBTOTAL | | 30 | | |
| TOTAL | | 98 | | |
| PENALTIES (-) | | | | |
| GRAND TOTAL | | | | |



FLOOR PLAN
SCALE 1 : 50



DETAILED SECTION A-A
SCALE 1 : 20

| | |
|-------------|--|
| NAME | |
| | |
| NAME | |
| 6 | |