

External Assessment 2021

# HOUSING AND DESIGN

HDS315118

|                   |    |
|-------------------|----|
| Pages             | 16 |
| Questions         | 4  |
| Information Sheet | 1  |
| Answer Booklets   | 3  |

**Reading time:** 15 minutes – you may begin writing during this time

**Suggested working time:** 2 hours

## Instructions

- There are **two (2)** sections to this exam paper.
  - **Section A** – answer **one (1)** question on the supplied **Answer Sheet A**.
  - **Section B** – answer **one (1)** question on the supplied **Answer Sheet B**.
- All answers must be written in **English**.
- You **must** make sure your answers address:
  - Criterion 3 analyse and apply features and principles which contribute to environmental sustainability within design decisions.
  - Criterion 4 apply architectural design principles relating to functional use of space.

| Marker use |                |
|------------|----------------|
| C3         | A+ to z rating |
| C4         | A+ to z rating |

# Guide to Exam Structure

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|              |          | Questions available | How many questions to answer | Suggested working time       | Marks available   |
|--------------|----------|---------------------|------------------------------|------------------------------|---|
| Section      | <b>A</b> | 2                   | 1                            | 60 minutes                   | All criteria are assessed using extended ratings of A+ to z |
| Section      | <b>B</b> | 2                   | 1                            | 60 minutes                   |   |
| <b>Total</b> |          | <b>4</b>            | <b>2</b>                     | <b>120 minutes (2 hours)</b> |   |

# Section A

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- Answer **one (1)** question.
  - Answer on the A3 answer sheet labelled **Section A**.
  - This section assesses **Criterion 3**.
- 

## Question 1

Kuluni has just stayed at the Cloudy Bay house (South Bruny Island) designed by renowned Australian architect Richard Leplastrier with David Travalia. Kuluni is keen to build a similar house like this on her west facing ocean view property on Kangaroo Island (South Australia). She likes the clever design as it is simple, small in layout and, importantly, shields the occupant from the wind. The views can be enjoyed or closed with sliding fibre cement panels over windows and other openings to provide a secure outdoor/indoor space. More importantly the panels can be opened and closed according to the wind direction. She also enjoyed the experience of living in a house where the living and sleeping was separated from the bathroom and workplace/studio. She liked being in touch with seasonal changes and fresh air. The house is timber framed with fibre cement and timber boards.

However, Kuluni wants to live in her new house most of the time, whereas the 1996 Cloudy Bay house was built as a shack, to be lived in for short holiday periods. Kuluni wants your passive design advice on adapting the Cloudy Bay house to her site on Kangaroo Island.

Kangaroo Island is on a similar latitude to Bendigo, Victoria which is shown on the Housing and Design Information Sheet 2020 - 2022, under Sun Angles.

### Aim

To provide design advice on how to inhabit the site with Kuluni's design needs as above.

### Response

Use the A3 answer sheet provided for **Section A, Q1. Cool Temperate** for your response. You may use both sides of the answer sheet.

1. Draw an outline of the external house plan on the site to show the best orientation for the location. Justify the orientation strategy with concise annotations.
2. Draw and annotate the method you propose to generate and store power, as well as the means to collect and store water.
3. With the orientation established, draw over the faint drawings, to show what changes you recommend making to the house design and the possible material/construction to ensure thermal comfort. You may also want to change windows and doors where appropriate and explain with concise annotations.

**Question 1 continues**

Question 1 continued

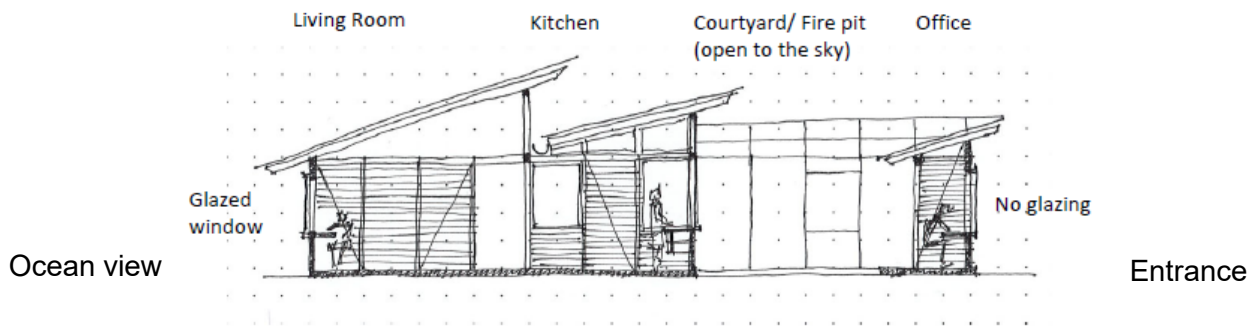


Figure 1: Cloudy Bay house section (not to scale)

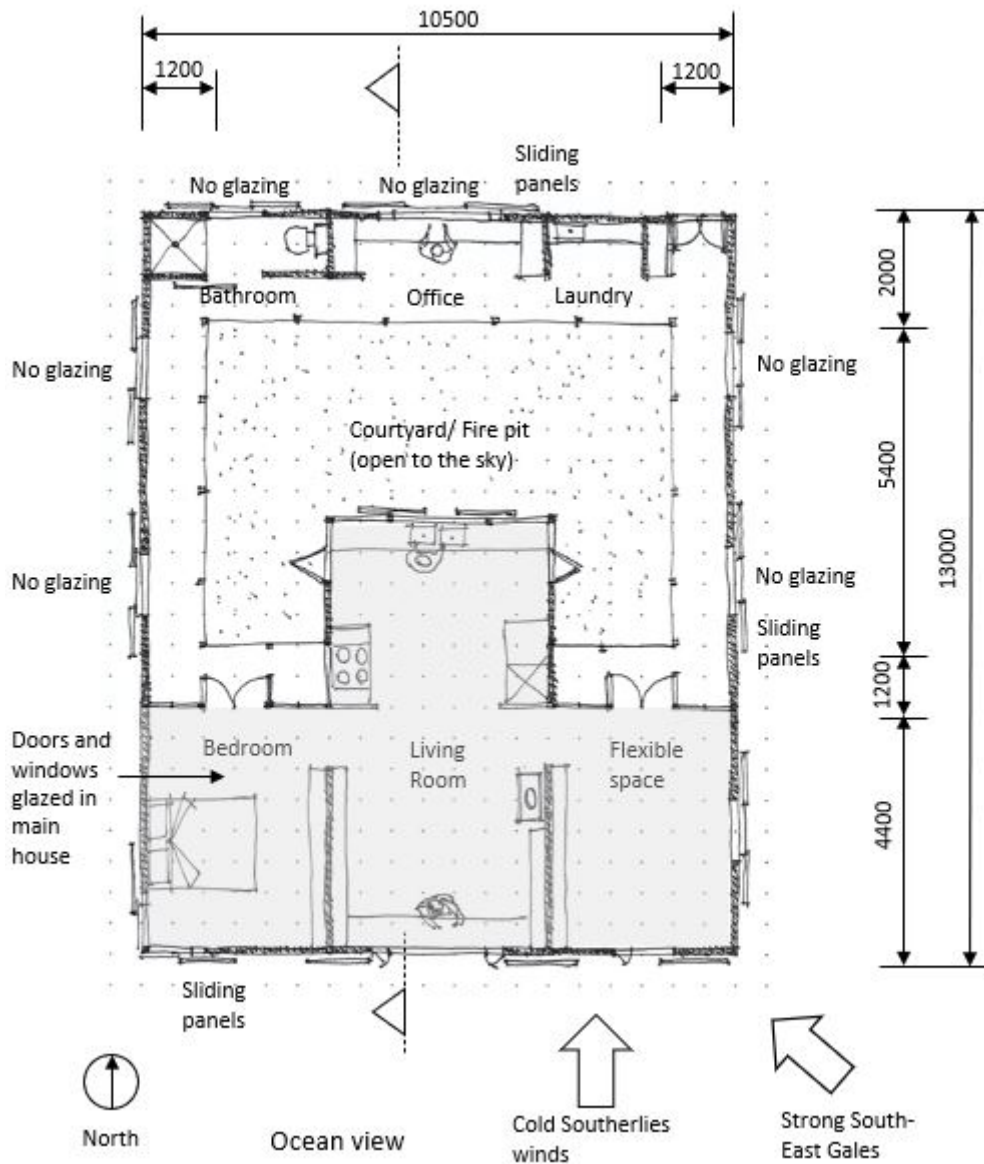
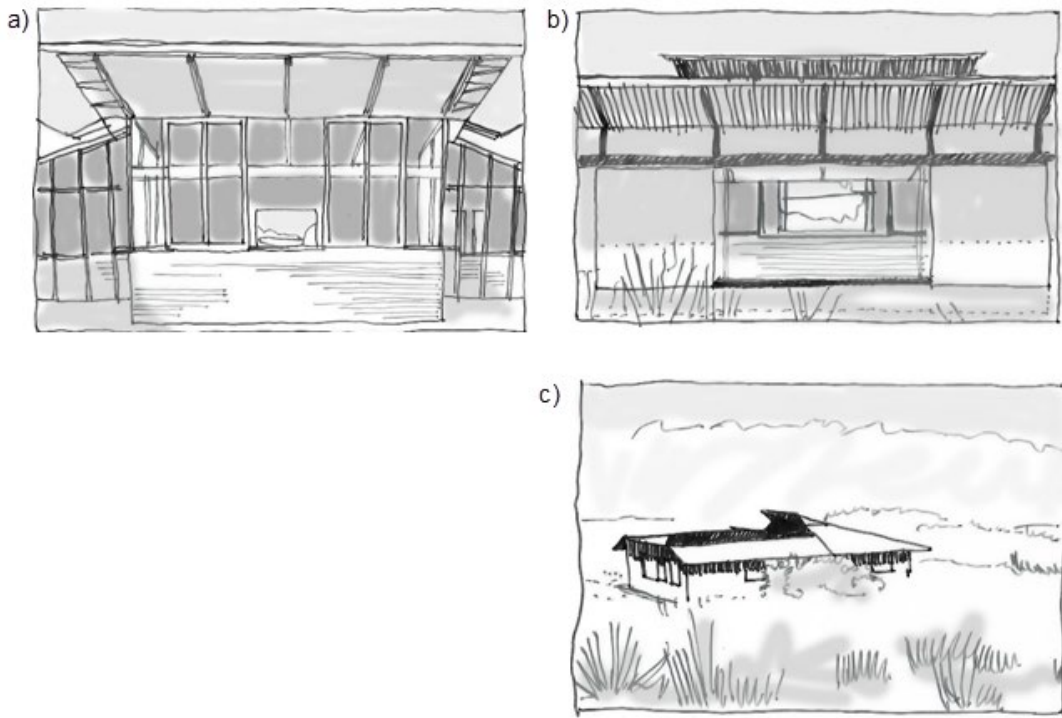


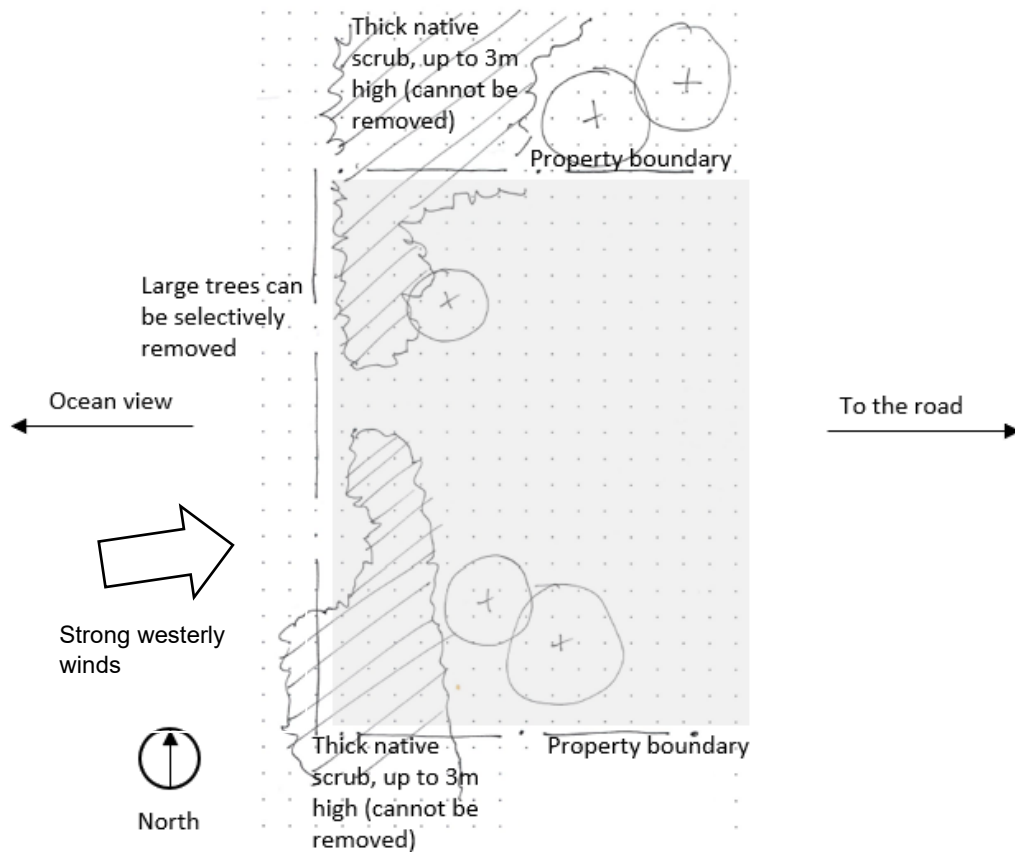
Figure 2: Cloudy Bay house plan (not to scale)

Question 1 continued



**Figure 3:** Cloudy Bay house a) looking at the kitchen from the indoor courtyard; b) sea view can be seen from the front elevation when panels open, through the kitchen window to the living window; c) house nestled into the landscape with sliding panels closed.

(Images sourced from <https://www.ozetecture.org/cloudy-bay>)



**Figure 4:** Kuluni's site on Kangaroo Island (not to scale).

OR

Section A continues

## Section A continued

### Question 2

Dominic has just stayed at the Cloudy Bay house (South Bruny Island, Tasmania) designed by renowned Australian architect Richard Leplastrier with David Travalia. Dominic is keen to build a similar plan on his urban block in Townsville (North Queensland). He likes the clever design as it is simple, small in layout and, importantly provides good levels of privacy as well as control of window and door openings for cooling breezes. He also enjoyed the experience of living in a house where the living and sleeping was separated from the bathroom and workplace/studio as he liked the idea of mostly living on the veranda, around an internal courtyard. The house is timber framed with fibre cement and timber boards.

Dominic understands there are significant climatic differences between Townsville and Bruny Island. However, he wants your advice how to adapt the Cloudy Bay house to his site.

#### Aim

To provide design advice on how to inhabit the site with Dominic's design needs as above.

#### Response

Use the A3 answer sheet provided for **Section A, Q2. Hot Humid** for your response. You may use both sides of the answer sheet.

1. Draw an outline of the external house plan on the site to show the best orientation for the location. Justify the orientation strategy with concise annotations.
2. Draw and annotate the method you propose to generate and store power, cool the house, and the means to collect and store water for the garden and washing.
3. With the orientation established, draw over the faint drawings, to show what changes you recommend making to the house design and the possible material/construction to ensure thermal comfort. You may also want to change windows and doors where appropriate and explain with concise annotations.

Question 2 continued

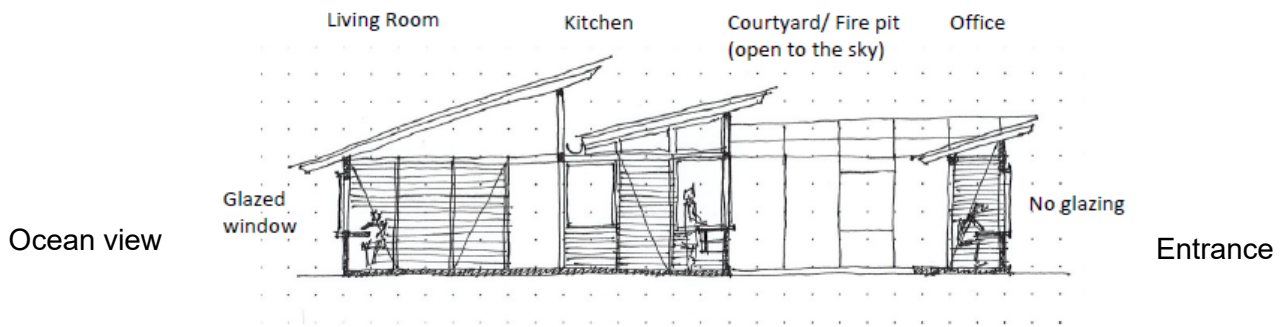


Figure 5: Cloudy Bay house section (not to scale)

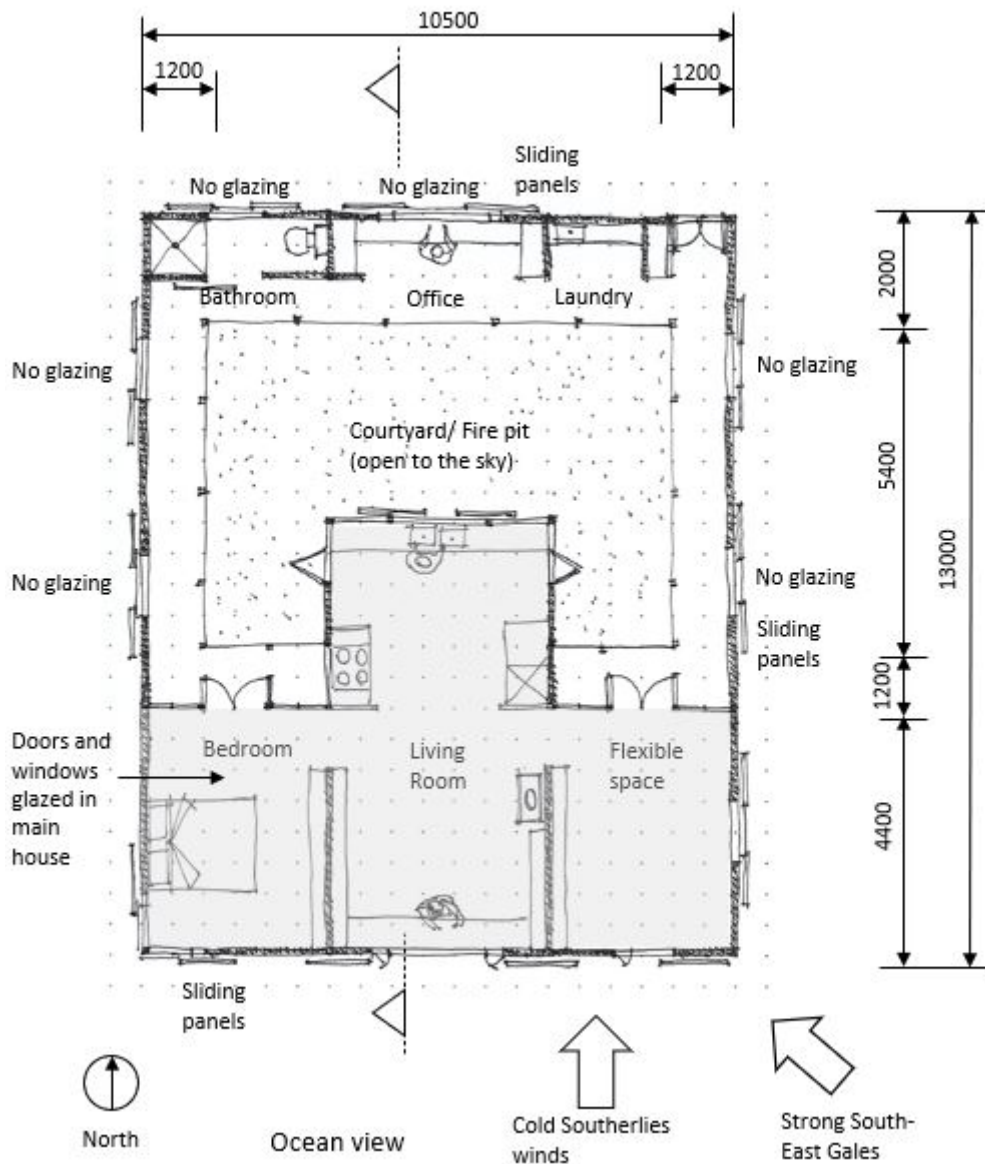
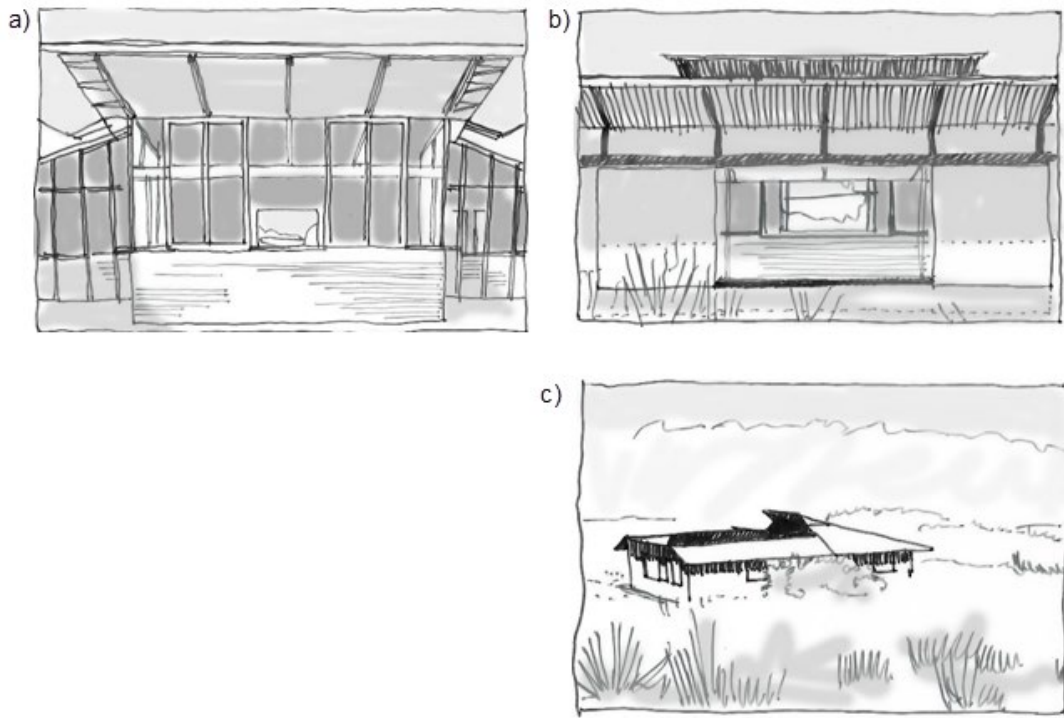


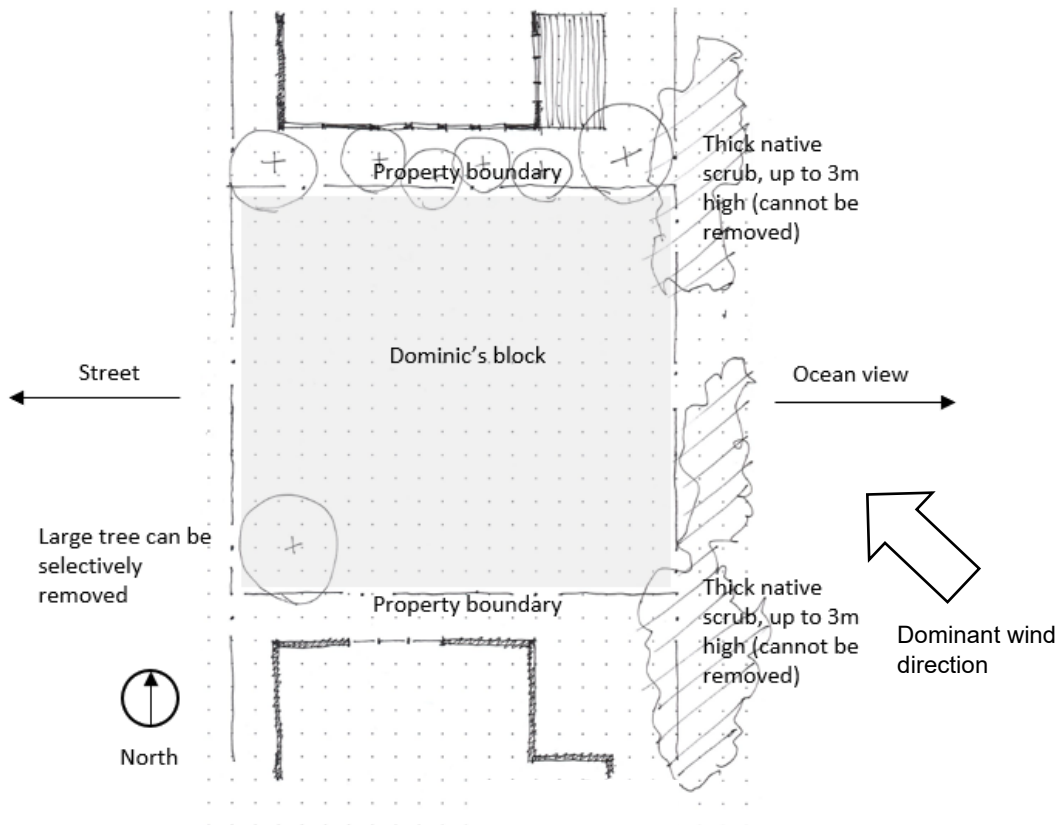
Figure 6: Cloudy Bay house plan (not to scale).

Question 2 continued



**Figure 7:** Cloudy Bay house a) looking at the kitchen from the indoor courtyard; b) sea view can be seen from the front elevation when panels open, through the kitchen window to the living window; c) house nestled into the landscape with sliding panels closed.

(Images sourced from <https://www.ozetecture.org/cloudy-bay>)



**Figure 8:** Dominic's site in Townsville, Queensland (not to scale).

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# Section B

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- Answer **one (1)** question.
  - Answer on the A3 answer sheet labelled **Section B**.
  - This section assesses **Criterion 4**.
- 

## Question 3

Dot and Alex would like to adapt an old farm shed on their property to re-use as their first home. The old farm shed is made-up of two structures joined. The first structure is old and built with stone walls (maximum interior height 3000mm) and large timber beams and columns. The second structure is joined to the old shed (maximum interior height 4500mm) and was built thirty years ago. It is steel framed and clad with corrugated iron sheets.

The couple want your advice on how best to meet their needs, for:

- a kitchen
- dining space with seating for six
- area to lounge with their friends or family with seating for six
- a queen-sized bed
- a washing machine and laundry sink
- a walk-in shower, toilet and vanity basin
- storage.

They want to re-use the farm shed walls, structure and roof to reduce the overall cost. A builder has provided an initial quote to glaze the existing openings, line the walls with insulation and provide services for a bathroom and kitchen to be fitted by the couple. There is just enough money that they can place one more window into one of the existing walls. The new window opening can be a maximum of 1000 wide, and 1000 high. As the couple are constrained with openings and floor area they want the spaces to feel as light and airy as possible.

### Aim

To assist Dot and Alex with the layout of their new home within the existing footprint and structure of the old farm shed.

### Response

Use the A3 answer sheet provided for **Section B** to respond.

1. Draw a plan at a scale of 1:50 to best show the location of different spaces and furniture. Justify the design strategies used and explain how they satisfy the couple's wishes.
2. Draw additional an sketch or sketches, roughly to scale to demonstrate how the spatial arrangement may work and the strategies used to incorporate space, light, and privacy.

Question 3 continued

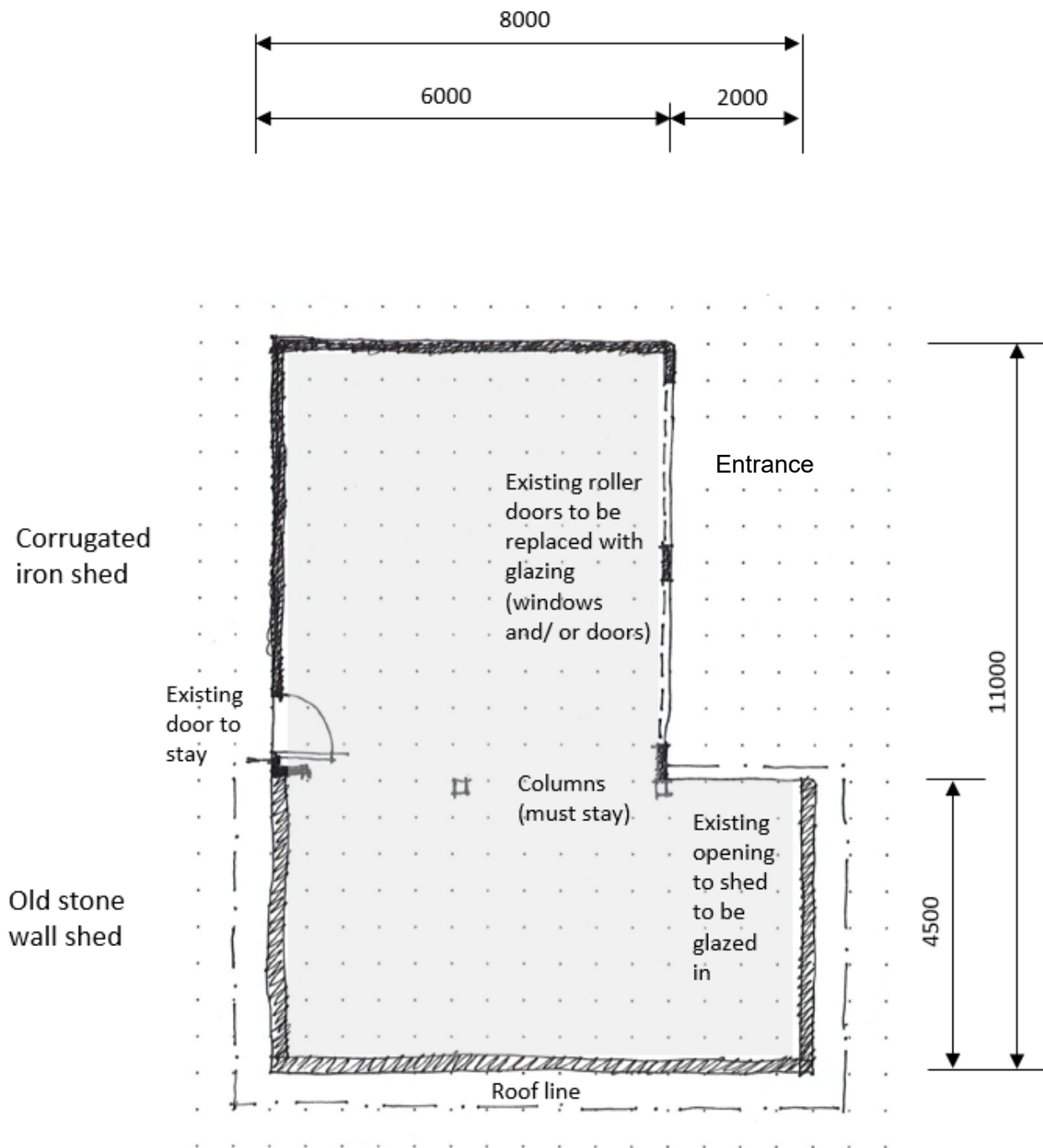


Figure 9: Dot and Alex's existing farm shed plan (not to scale).

OR

## Section B continued

### Question 4

Fred's new home requires some alterations before he and his family can move in. Fred likes to cook and entertain, and the kitchen needs to be designed for his use of a wheelchair. He and his partner want a functioning kitchen and dining space for their needs which includes two children, aged five and seven.

The kitchen and dining space brief, includes:

- two bowl sink
- dishwasher
- induction cooktop, electric stove and microwave
- refrigerator and freezer
- a method of storing pots, pans, bowls, crockery, and dry food stuffs
- rubbish and recycling waste
- a six-seater dining table
- the ability to supervise the children doing their homework and participating in cooking.

#### Aim

To assist Fred with the new layout of his kitchen and dining space for the existing room nominated.

#### Response

Use the A3 answer sheet provided for **Section B** to respond.

1. Draw a plan at a scale of 1:50 to best show the location and key requirements of kitchen joinery, appliances, furniture and fittings, as well as a dining space. Justify and identify critical dimensions, features and their location to make for an effective and usable kitchen for Fred and his family.
2. Draw a few additional sketches around the plan to illustrate in greater detail the critical heights or allowances for Fred to be able to use his new kitchen to cook and entertain.

Question 4 continued

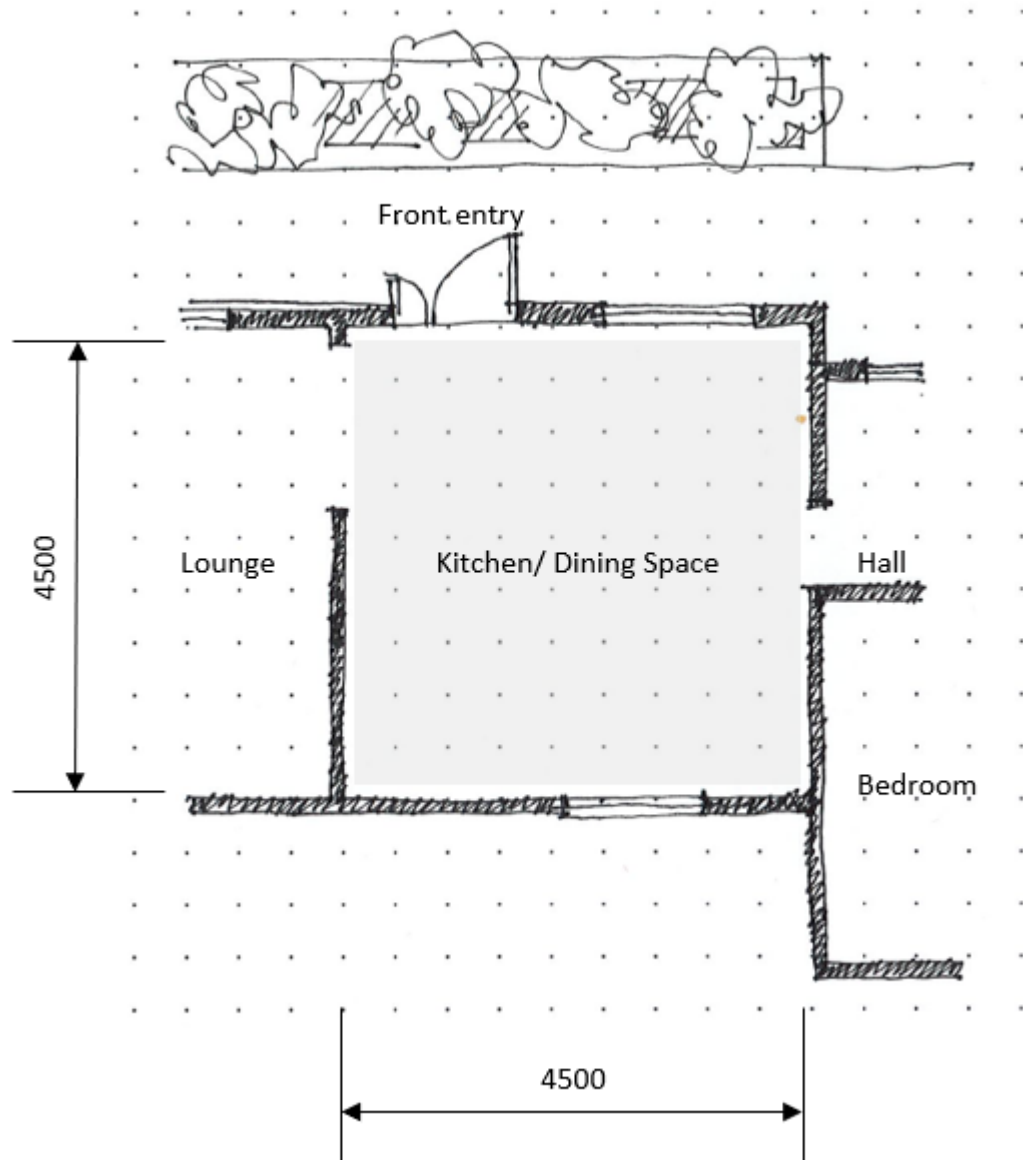


Figure 10: A plan of Fred's new home (not to scale).

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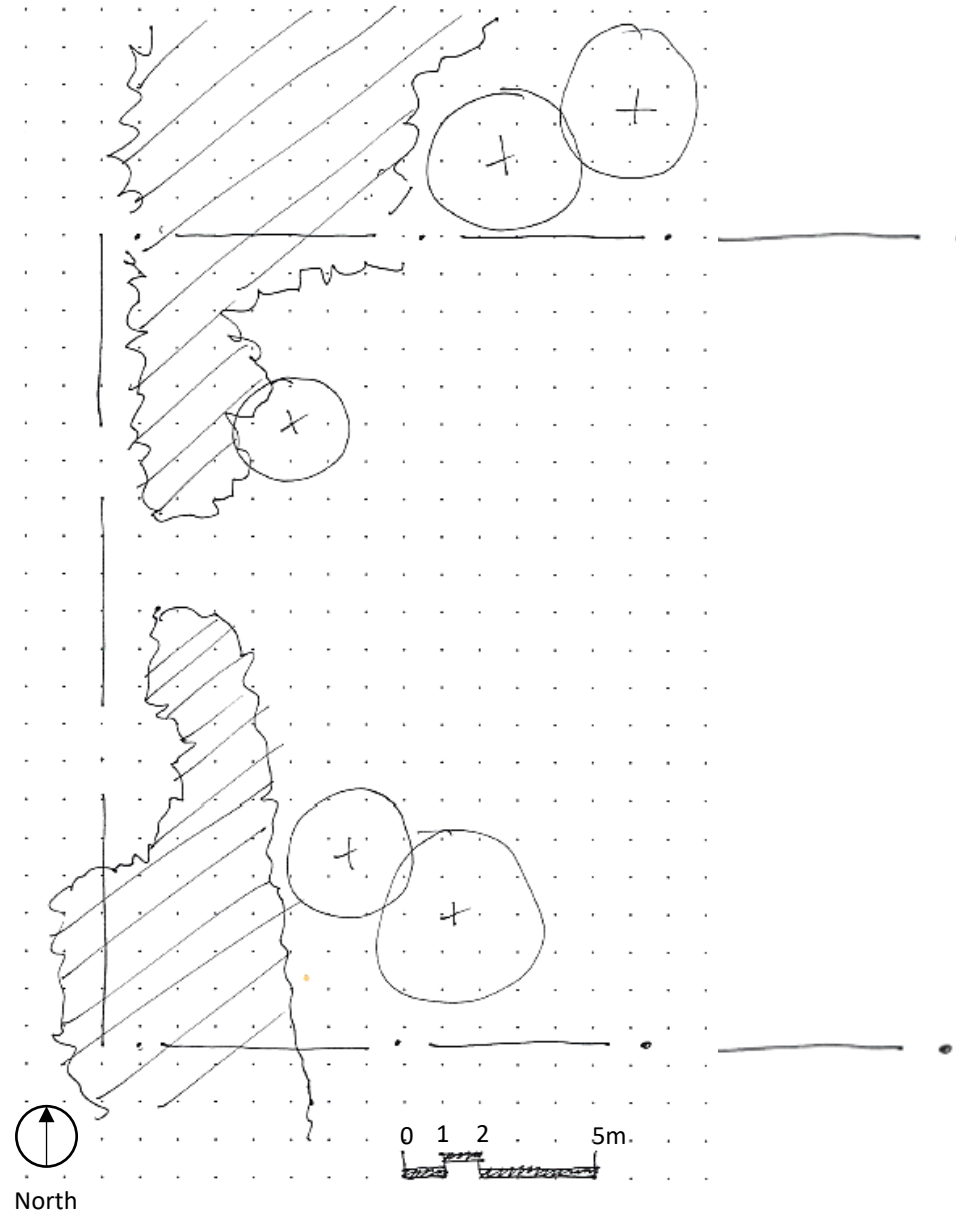
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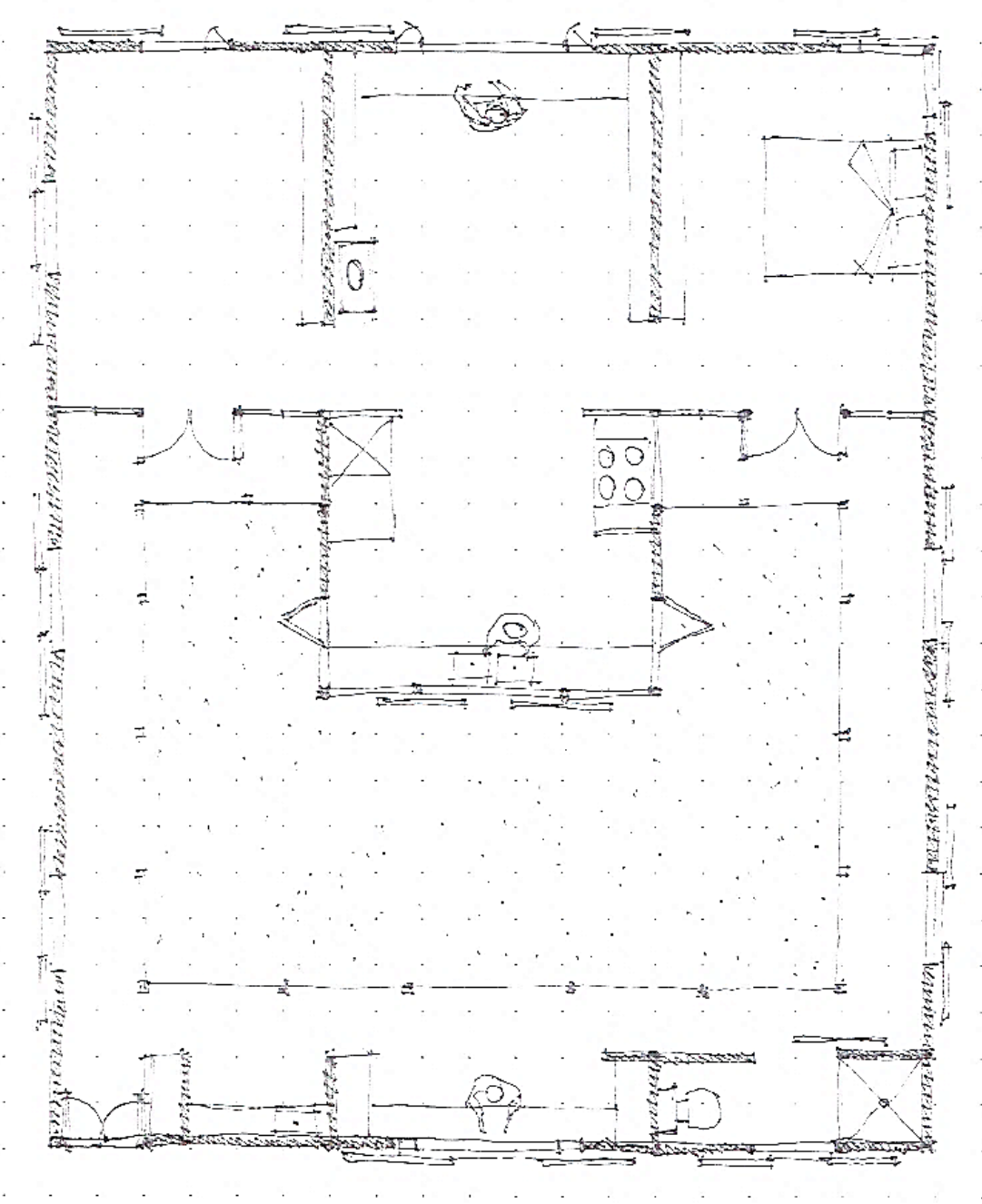
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Section **A** Answer Sheet

**Q1 Cool Temperate**





Kuluni's house plan (not to scale)

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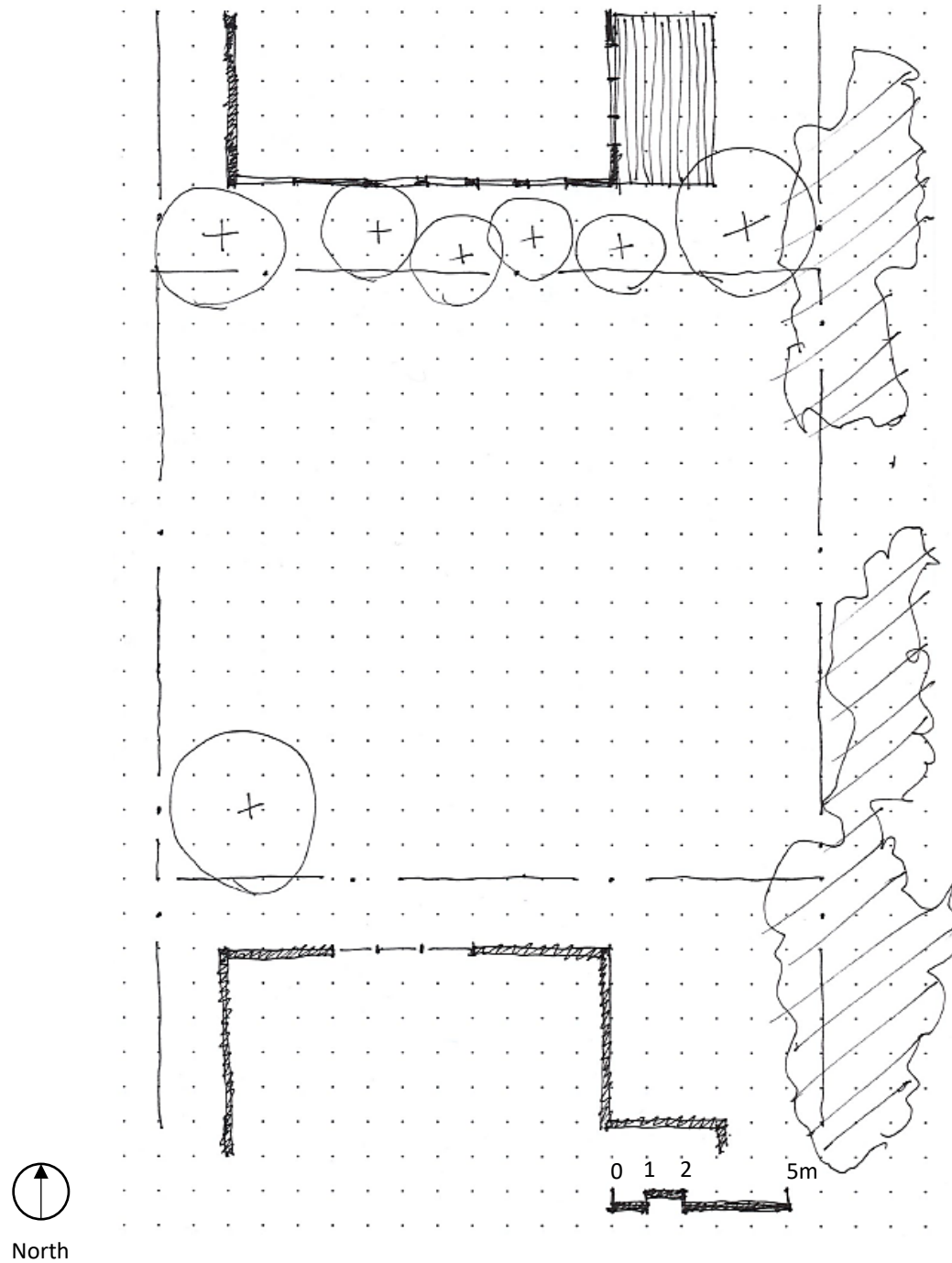
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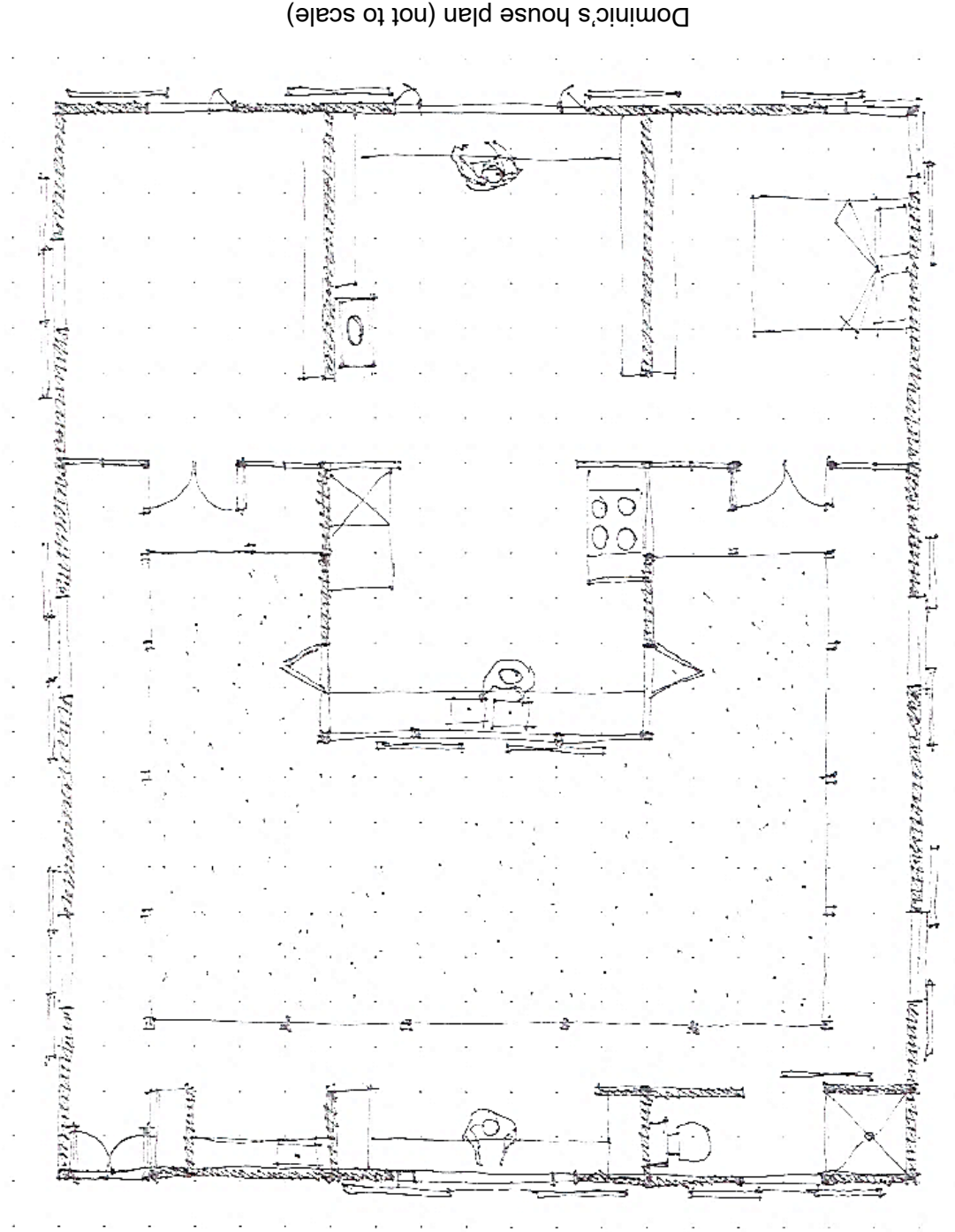
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Section **A** Answer Sheet

**Q2 Hot Humid**





Dominic's house plan (not to scale)

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## Section **B** Answer Sheet

Tick the appropriate box for the question you have chosen to answer:

**Question 3**

**Or**

**Question 4**

