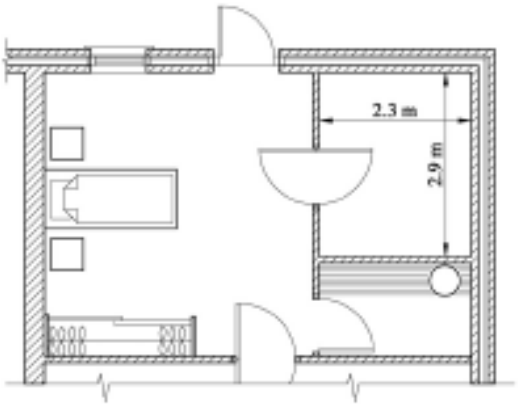
1. A triple-glazed bay window projects 1.5 metres from the external wall of a dwelling house, as shown in the accompanying sketch. The external wall is a 350 mm concrete block wall with an insulated cavity. The lean-to roof is an insulated slated roof and has a pitch of 30°. Insulated plasterboard is fixed to the underside of the rafters to form a sloped ceiling.

(a) To a scale of 1:5, draw a vertical section through the window, roof and front wall of the house. The section should show the typical construction details from 400 mm below the concrete lintels of the bay window, through the fixed frame of the window, wallplate and rafter to a level 400 mm above the abutment of the lean-to roof and the front wall of the house.

(b) Indicate on your drawing the design detailing that ensures moisture does not penetrate at the abutment of the roof and the wall of the house.

2. (a) Discuss in detail, using notes and freehand sketches, **two** functional requirements of a dwelling house designed for lifetime use. Refer in particular to the:

- main entrance **and**
- internal corridor layout.



(b) The layout of a bedroom and an adjoining bathroom, which is 2.3 m × 2.9 m, is shown in the accompanying drawing. The hot press is also shown.

Using notes and freehand sketches, show a preferred layout for the bathroom space to ensure that it is suitable for a person in a wheelchair. Indicate in your design sketches the location of the following:

window, shower area, toilet, wash hand basin and grab rails.

Include **three** typical dimensions.

(c) Discuss your preferred location for the bathroom items listed at **2**(b) above.

3. The drawing shows the elevation and plan of a semi-detached house with an adjoining storeroom. All external walls are of single leaf 215 mm hollow block construction and all roofs are slated. All internal walls are of solid block construction and the internal wall **A-A** is load-bearing. The storeroom wall **B-B** is south facing.
It has been decided to convert the storeroom in order to enlarge the living space.
In the conversion, you need to give consideration to:

- redesigning the ground floor layout to allow increased penetration of sunlight to the interior

and

- upgrading the thermal properties of the external walls.

(a) Show, using notes and freehand sketches, a revised design detailing for the dwelling house.

(b) For **each** of the above, discuss in detail the reasons for your proposed design choices.