

# Greenhouse cutting list

Some of the lengths of timber were too long to machine in my workshop and I took the decision to use the wood as it came. As the timber was not consistently sized nor perfectly square it was necessary to do some working round. I have been as accurate as I can with the measurements, but the dimensions given are for guidance only.

All planed all round air-dried oak.

## GREENHOUSE

|              |        |       |      |      |     |
|--------------|--------|-------|------|------|-----|
| Sills        | 100x50 | 2 off | 3220 | 2off | 700 |
| Corner posts | 75x75  | 4 off | 1070 |      |     |
| Wall plates  | 75x75  | 2 off | 3300 |      |     |

## SIDE FRAMES

|                      |       |       |      |  |  |
|----------------------|-------|-------|------|--|--|
| Top and bottom rails | 50x25 | 4 off | 3010 |  |  |
| Side rails           | 50x25 | 4 off | 940  |  |  |
| Intermediate posts   | 50x50 | 10off | 940  |  |  |

## REAR FRAME

|                     |       |      |      |      |      |      |      |
|---------------------|-------|------|------|------|------|------|------|
| Top, bottom & sides | 50x25 | 1off | 2200 | 1off | 1600 | 3off | 1000 |
| Intermediate posts  | 50x50 | 2off | 1300 |      |      |      |      |

|                    |        |        |      |  |  |
|--------------------|--------|--------|------|--|--|
| Rafters            | 100x50 | 14 off | 1620 |  |  |
| Tie beams          | 100x50 | 3 off  | 1600 |  |  |
| King Posts         | 150x50 | 3 off  | 650  |  |  |
| King post cover    | 150x15 | 2off   | 400  |  |  |
| Ridge board        | 150x40 | 1off   | 3180 |  |  |
| Weather board      | 150x30 | 1off   | 3180 |  |  |
| Eave boards        | 80x25  | 2off   | 3100 |  |  |
| Wall plate fillets | 50x25  | 1off   | 3000 |  |  |

## ROOF LIGHT FRAME

|                     |        |      |     |      |     |
|---------------------|--------|------|-----|------|-----|
| Top cross member    | 100x50 | 2off | 500 |      |     |
| Bottom cross member | 75x75  | 2off | 500 |      |     |
| Roof lights         | 75x50  | 4off | 600 |      |     |
|                     | 75x50  | 2off | 500 |      |     |
|                     | 50x15  | 2off | 500 |      |     |
| Weather bar         | 115x15 | 2off | 600 |      |     |
| Weather bar         | 50x50  | 2off | 600 |      |     |
| Windows             | 75x50  | 4off | 910 | 4off | 480 |

## DOOR FRAME

|            |        |      |      |  |  |
|------------|--------|------|------|--|--|
| Door posts | 100x75 | 2off | 2000 |  |  |
| Head       | 100x75 | 1off | 1030 |  |  |
| Drip head  | 80x25  | 1off | 1030 |  |  |

## DOOR

|                   |        |       |      |  |  |
|-------------------|--------|-------|------|--|--|
| Stiles            | 100x50 | 2off  | 1940 |  |  |
| Top cross rail    | 100x50 | 1off  | 850  |  |  |
| Middle cross rail | 150x50 | 1off  | 850  |  |  |
| Bottom cross rail | 70x25  | 1off  | 850  |  |  |
| Cladding          | 75x25  | 12off | 610  |  |  |

I used 55 metres of glazing bead of varying dimensions; the largest being 25x20.

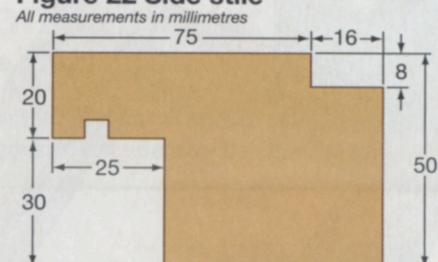
# PROJECT

## Roof lights

The opening for the roof light should be 450mm wide by 500mm long, there is a 25mm overlap to the sides, a 16mm overlap at the top and a 50mm overlap at the bottom, hence the light measures 562mm by 496mm (hw) allowing 4mm clearance.

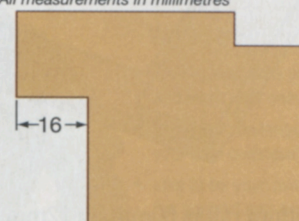
**1** Machine the stiles and the top rails, **Figs 22 and 23**; the only difference is the overlap. At the top of each stile rebate for the overlap and cut the tenon, **Fig 24**. The bottom of each stile is cut as shown in **Fig 25**. The top rail tenon is cut as **Fig 26**.

**Figure 22 Side stile**



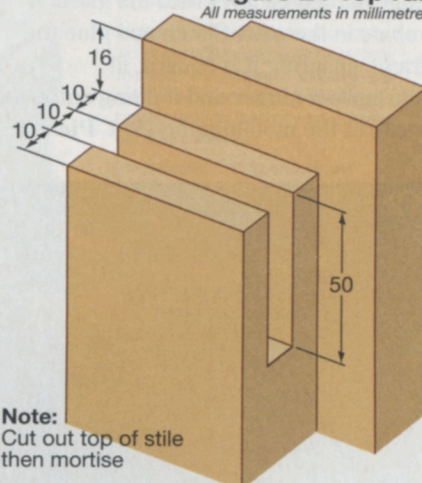
**Figure 23 Top rail**

All measurements in millimetres



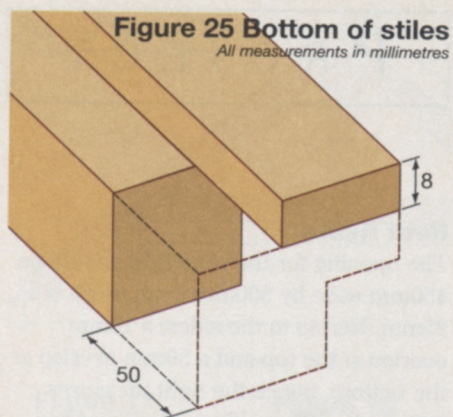
**Figure 24 Top rail**

All measurements in millimetres

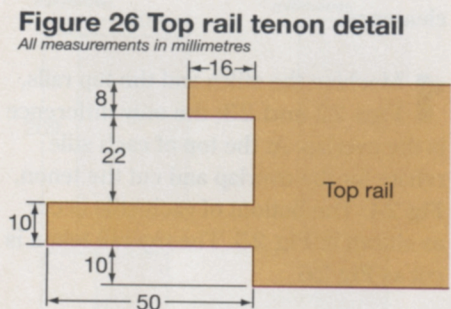


**Note:**  
Cut out top of stile  
then mortise

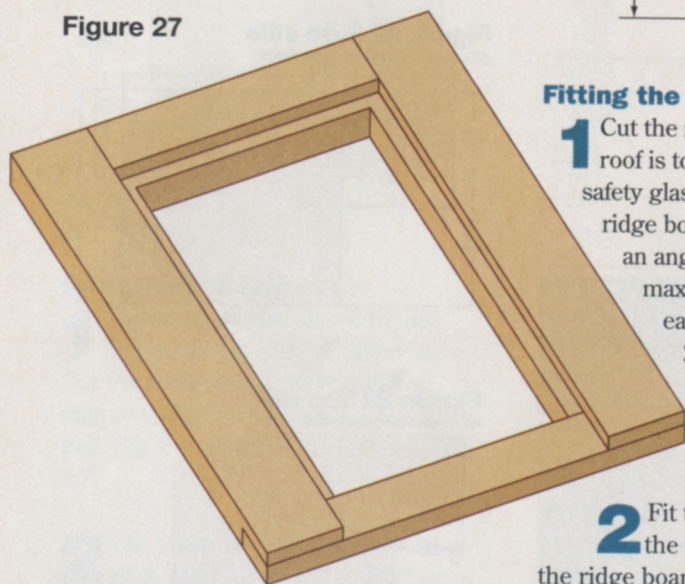




**Figure 25 Bottom of stiles**  
All measurements in millimetres



**Figure 26 Top rail tenon detail**  
All measurements in millimetres

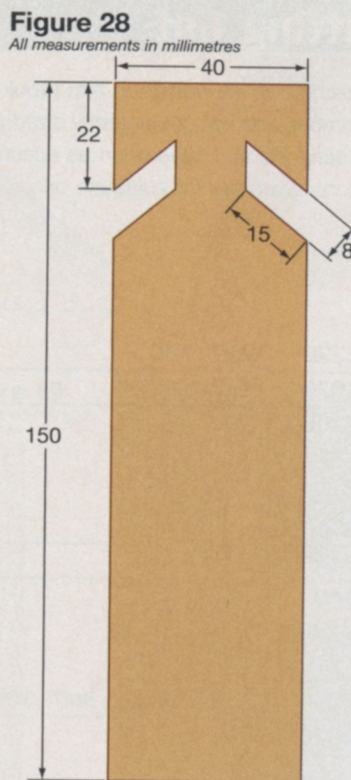


**Figure 27**

**2** The bottom rail is 50mm by 12mm, it is glued in place under the stile projections as **Fig 27**; when fitted the top edge should be level with the glass rebate in the stile. Clamp and glue the frame ensuring it is square, fit stormproof hinges and if fitting automatic vents fit the mounting bracket. **Pic 12**.



**12**



**Figure 28**  
All measurements in millimetres

#### Fitting the roof

**1** Cut the ridge board to length. The roof is to have 6.5mm laminated safety glass which will slot into the ridge board so it is necessary to cut an angled slot 10mm wide and a maximum of 15mm deep on each side of the board, **Fig 28**. Fit the three roof trusses in place and temporarily fit cross braces to hold in position.

**2** Fit the ridge board ensuring the bottom edge of the slot in the ridge board is level with the rebate in the rafters, **Pic 13**. The trusses are screwed to the ridge board and to the wall plate, **Pic 14**.

**3** Fit the opening light frames by screwing through the top cross member into the ridge board, **Pic 15**. Finally fit the four remaining rafters screwing each to the ridge board.



**13**

Always ensure the glass rebate on each rafter is level with the bottom edge of the slot in the ridge board. Screw the rafters to the wall plate then glue and clamp the eave boards in place, the top edge of the eave boards must be level with the rebate in the rafters, **Pics 16 and 17**.

**4** Cut a length of fillet at 40 degrees to fill the gap between the top of the wall plate and the bottom of the eaves board.



**14**



**15**



**16**



**17**



# PROJECT

18



19



## Door frame

**1** Measure the height and width of the door frame. Cut a 50mm by 25mm rebate for the door. Mortise and tenon the posts to the head.

**2** Cut mortises in the posts to fit the tenons in the short sill pieces. Cover the bottom of the posts with Extramite to act as a waterproofing.

**3** Fix the posts to the brickwork with 135mm frame fixers and glue and screw the head of the door frame to the cross beam of the roof truss; the door frame is flush with the roof truss.

Figure 29



Figure 30 Window moulding

All measurements in millimetres

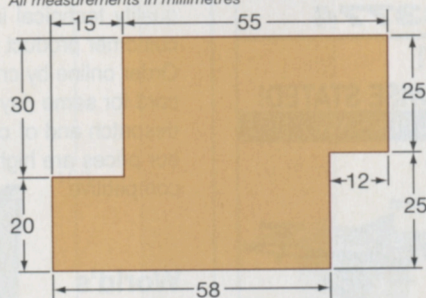


Figure 32 Plan of window stile

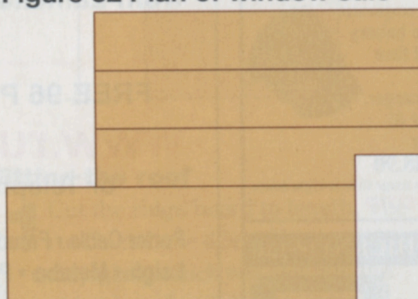


Figure 31 Mortise detail

All measurements in millimetres

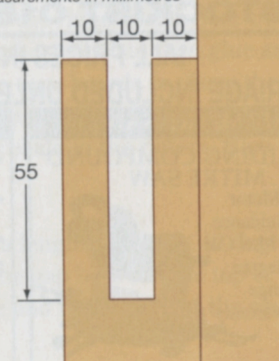
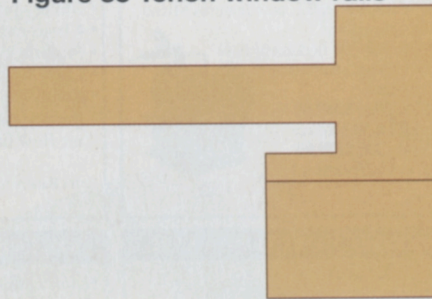


Figure 33 Tenon window rails



For the end window, make a sub-frame from 50 x 25mm with two 50mm square posts fitted vertically to fit in the gap at the end of the greenhouse **Fig 29**; set it back 25mm from the front edge of the corner posts. Fit further pieces of 50 x 25mm to complete the sub-frame; to increase the rigidity of the structure fit bracing pieces to each corner as **Pic 18**. Fit 50 x 25mm pieces to the openings each side of the door, again set them back 25mm from the front edge and fit corner bracing pieces. **Pic 19**.

## Making the opening windows

Measure the window openings and cut timber to length. Machine the stiles and the top rails as in **Fig 30**, at the end of each stile, rebate for the overlap, and cut the tenon as in **Figs 31 and 32**. The top and bottom rail tenons are cut as in **Fig 33**. Clamp and glue the frame ensuring it is square, fit stormproof hinges

## The door

Thickness the stiles and top and middle rails and cut stiles to length. Cut the three cross rails. Now rebate the stiles and one long edge of the top rail and two edges of the middle rail, **Fig 34**.

Figure 34

All measurements in millimetres

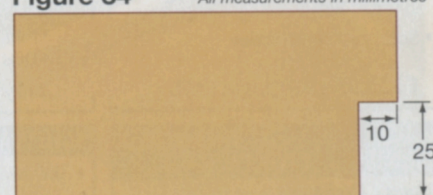
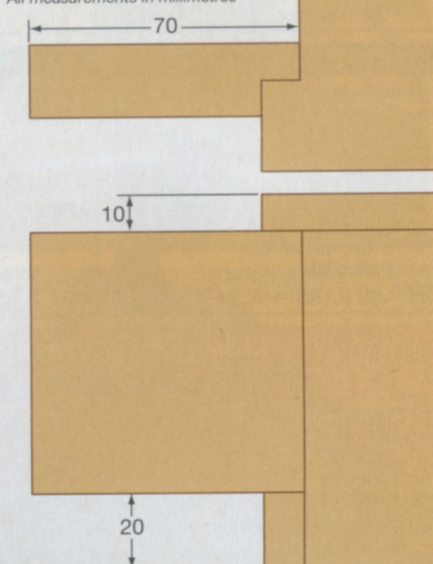
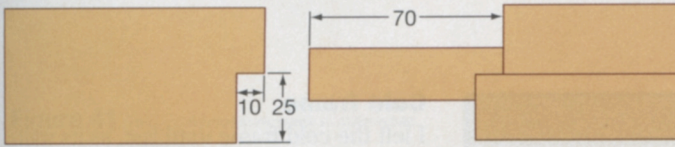


Figure 35 Top rail

All measurements in millimetres

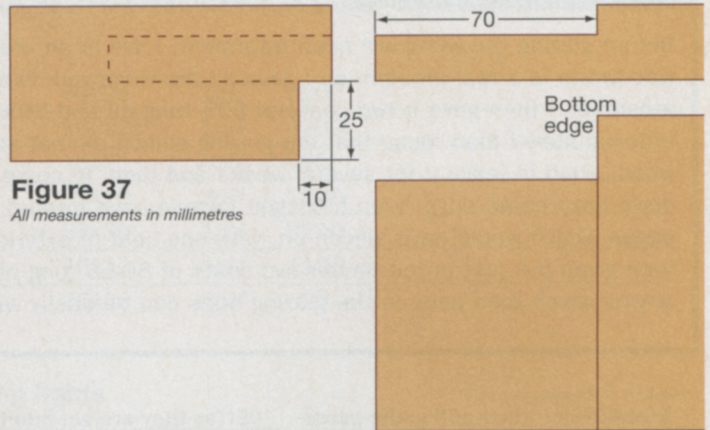






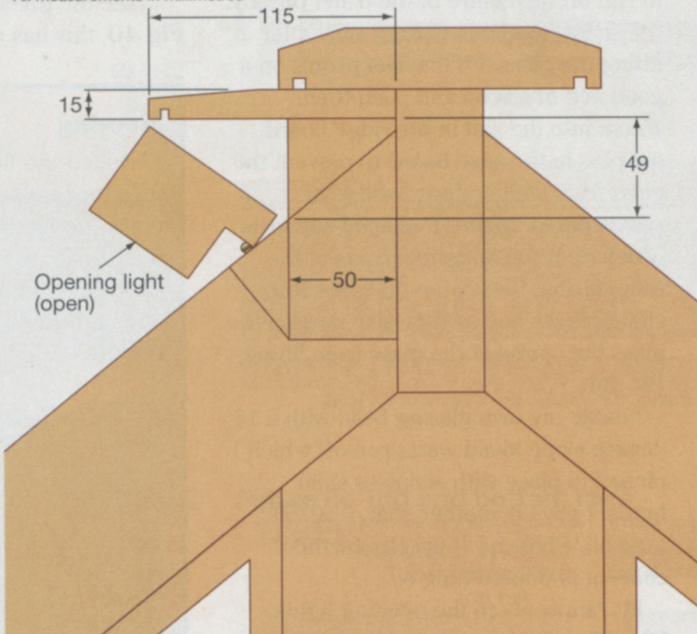
**Figure 36 Middle rail**  
All measurements in millimetres

Mortise the stiles (make the top of the middle rail level with the window sills) and make corresponding tenons in the rails, **Figs 35 and 36**. The bottom rail is set back to accommodate the panelling, **Fig 37**. Next, assemble the door ensure it is square and there is no twist. The cladding is rebated by 10mm to a depth of 12.5mm so that they overlap. Fit the panelling and door using three 100mm brass or stainless steel hinges. Add the lock.



**Figure 37**  
All measurements in millimetres

**Figure 38 Opening light weatherboard**  
All measurements in millimetres



## Windows

Fit the fillets to the roof light frames as in **Fig 13** and **Pic 20**, and then fit the opening lights. To stop water raining in under the top of the roof lights make a board which projects over the roof light, **Fig 38**. This projection is a bit of a compromise as, to make the light completely waterproof, the board would project so far that the light would no longer open. So, open the light to its



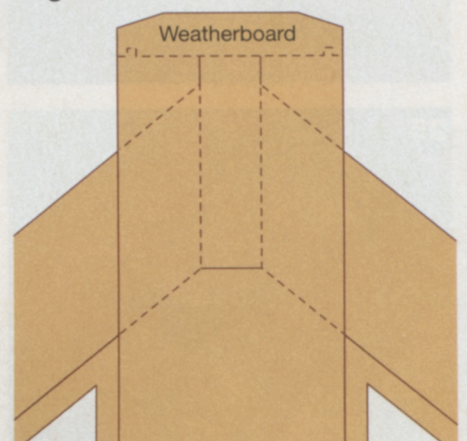
maximum, and make the board just clear it. I put a piece of draught excluder strip along the top edge of the frame and this has kept the water out. However, if this were to be a conservatory roof, I would have made a much closer fitting cover which cantilevered from the roof light.

Make and fit a weatherboard onto the top of the ridge board as **Fig 39** and **Pic 21**. Make and fit panels to the king posts to cover the end of the ridge board and fit a board over the door frame to act as a drip board, **Pic 22**.

Fit glazing bead around the inside edges of the openings in the end roof trusses.



**Figure 39 Weatherboard**





# PROJECT

## GLAZING AND FINISHING

Before glazing the wood will need treatment, I live in an area where woodworm is a real problem so I gave all the woodwork two coats of wood preserver. I then gave it two coats of 50% tung oil and 50% white spirit. Unfortunately I then found that the glazing silicon did not stick to the treated wood. I had to leave it for several weeks and then, in some places, plane down the treated edge. With hindsight I would have treated the glazing edges, which would have silicon on, with one coat of exterior varnish and then given the rest of the timber two coats of 50-50 tung oil/ white spirit, any oil which then gets on the glazing edge can be easily wiped off.

Measure for glass and make paper templates for the glass in the roof trusses. For the windows deduct 3mm from the height and width to allow a fitting tolerance. For the roof glass deduct 3mm from the width but they need to have 15mm added to their length



as they are set into the ridge board. I had a 25mm curve cut into the bottom edge of the roof glass which is a traditional feature to help the rainwater to run off the centre of the panel **pic 23**.

Use low modulus glazing silicon for fitting the glass. Fit the roof panels on a good bed of silicon and push them 15mm into the slot in the ridge board, put pins in the eave board to prevent the glass from sliding down whilst the silicon cures. Make 'T' shaped supports which fit at the bottom corners of the roof glazing, these stop the glass from sliding down and as they also overlap the glass they prevent the glass from lifting, **Pic 24**.

I made my own glazing bead with a 15 degree slope to aid water run-off which I pinned in place with stainless steel brads. I gave it another coat of 50/50 tung oil/white spirit the two further coats of undiluted tung oil.

Fit Autovents to the opening lights, **Pic 25**.

## Cold frame

I left the cold frame until last, as its wall was very useful to stand on whilst glazing the greenhouse.

I had intended to use acrylic for the cold frame glazing but, although it would be the safest option, it is less rigid and a lot more expensive than glass, so I chose to use laminated safety glass, which is aesthetically more pleasing, but has made the lights rather heavy (a mixed blessing).

Because I did not want a glass edge at the front, as with the roof lights, and rebating the 30mm frames to take glazing would weaken it too much I took the decision to take a chance and permanently fix the glass in the frames.

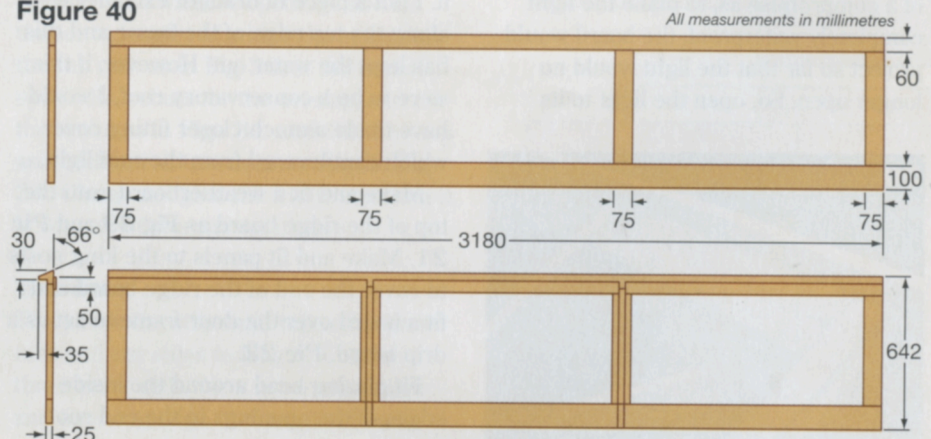
Make the frame section as shown in **Fig 40**, this has mortise and tenon

## Flooring

I levelled the floor with sharp sand (two tonnes) before laying Pavaset block paving, this has the advantage that it has no nibs attached allowing very close fitting block work to reduce the chance of weed growth, **Pic 26**.

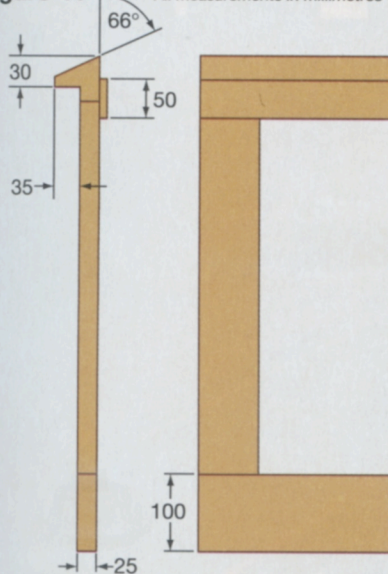


Figure 40





**Figure 41** All measurements in millimetres



Cold frame used fixed glazing with Extramite adhesive for the joints

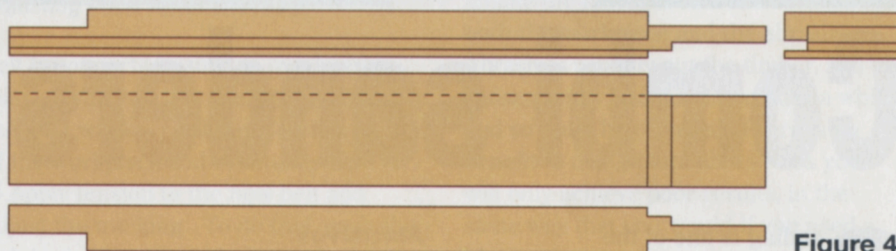
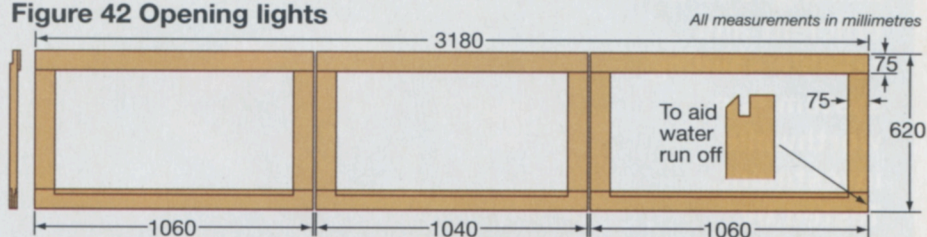
joints; a shallow 4mm channel is cut with a core box bit between the lights to aid water run off. Glue and pin rain bars above each opening and glue and screw the mounting bar to the underside at the top of the frame, **Fig 41**. I used silicon, but mortar would be more practical if there are large gaps, bed the frame; drill through the mounting bar into the greenhouse wall and used 100mm frame fixers to fix the top of the frame in place. Plug and screw the front of the frame to the wall.

## Cold frame cutting list

### COLD FRAME

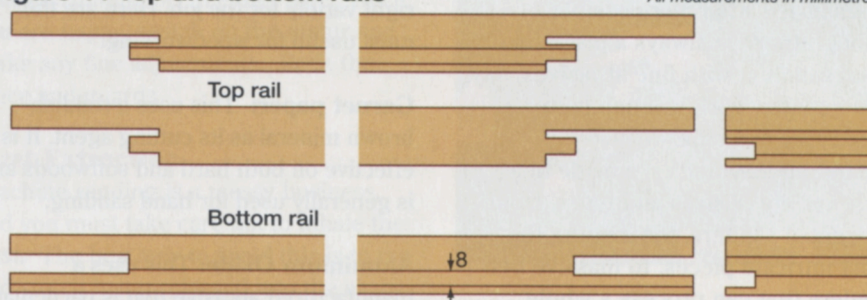
|                   |        |      |      |
|-------------------|--------|------|------|
| Frame top rail    | 60x25  | 1off | 3200 |
| Frame bottom rail | 100x25 | 1off | 3200 |
| Frame verticals   | 75x25  | 4off | 650  |
| Rain bar          | 50x10  | 3off | 1100 |
| Mounting bar      | 35x30  | 1off | 3200 |
| Opening lights    | 75x30  | 6off | 1100 |
| Opening lights    | 75x30  | 6off | 620  |

**Figure 42 Opening lights** All measurements in millimetres



**Figure 43**

**Figure 44 Top and bottom rails** All measurements in millimetres



The opening lights are made as **Figs 42-44**; the bottom glazed edge is angled to aid water run off. I used Extramite glue for the joints and bedded the glass directly with silicon. Use two 100mm brass hinges per light.

Give the cold frame two coats of 50/50 tung oil/white spirit and then the whole greenhouse should have three coats of undiluted tung oil.

