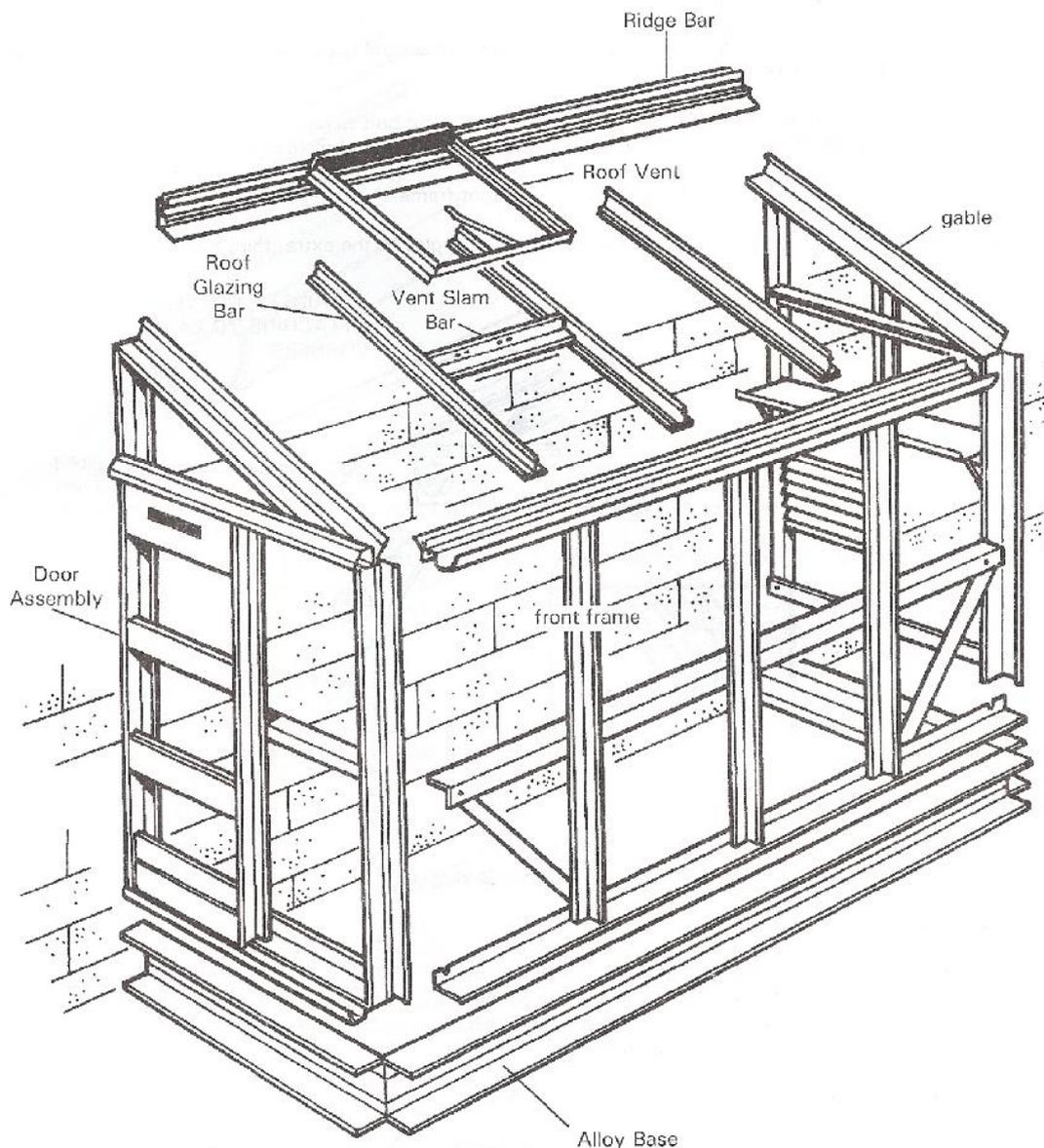




INSTRUCTIONS & ILLUSTRATIONS FOR THE
4'5" WIDE KENSINGTON LEAN-TO



ELITE GREENHOUSES LTD

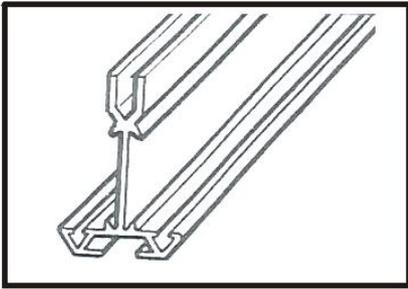
BENT SPUR ROAD, KEARSLEY, BOLTON BL4 8PD

TEL: 01204 791488 FAX: 01204 862412

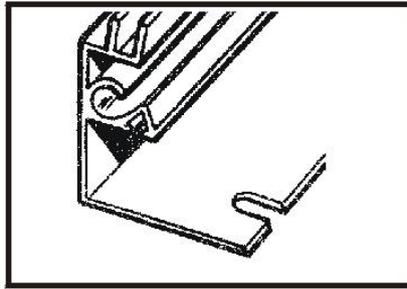
enquiries@elite-greenhouses.co.uk

www.elite-greenhouses.co.uk

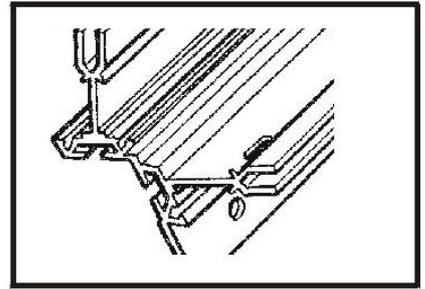
COMPONENT DRAWINGS (NOT TO SCALE)



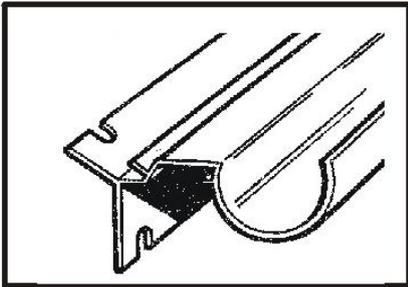
GLAZING BARS



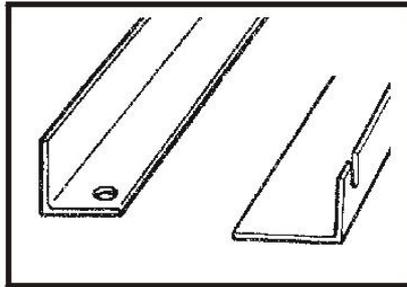
LEAN-TO RIDGE



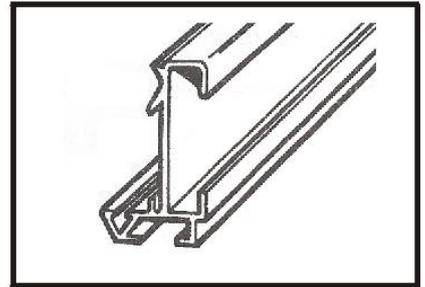
CORNER BAR



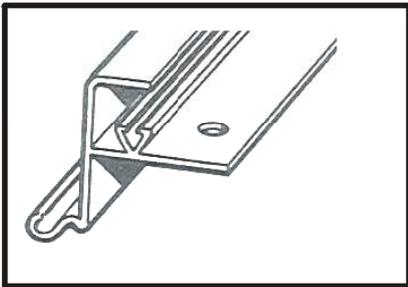
EAVES BAR/GUTTER



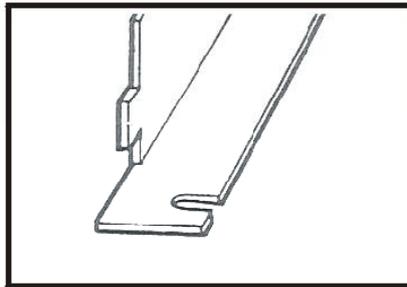
BRACING ANGLE & HORIZONTAL BRACE



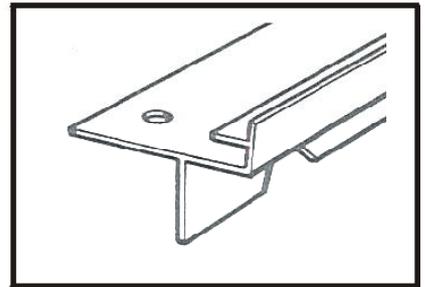
WALL BAR & DOUBLE DOOR POST



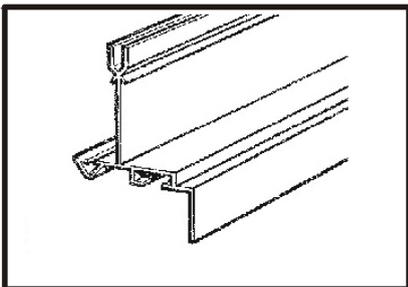
VENT TOP RAIL



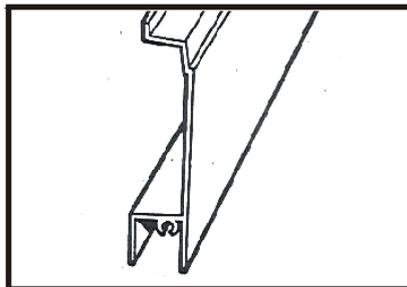
VENT SLAM BAR



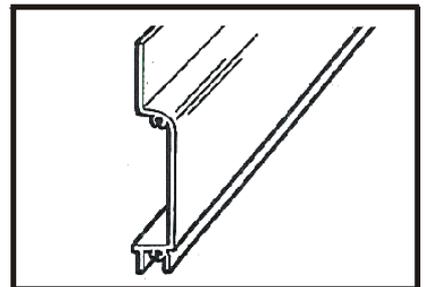
VENT BOTTOM RAIL



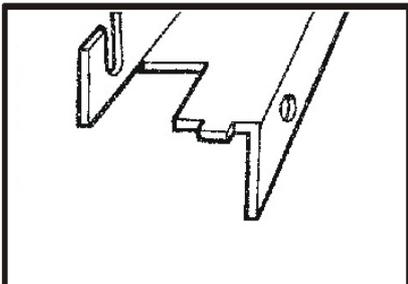
VENT SIDE RAIL



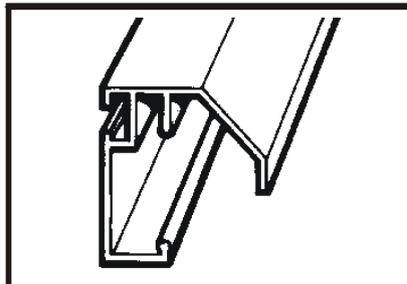
DOOR INFIL PANEL



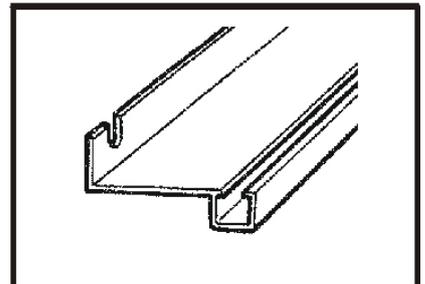
DOOR TOP/BOTTOM PANEL



DOOR TRACK SUPPORT

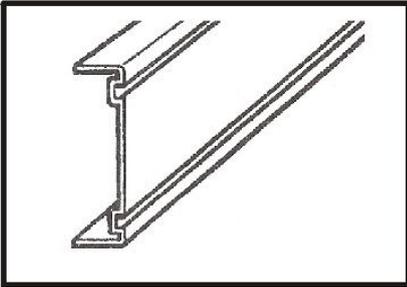


TOPDOOR TRACK

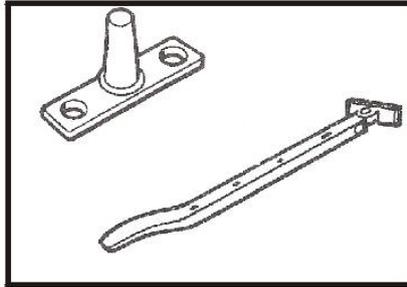


BOTTOM CILL

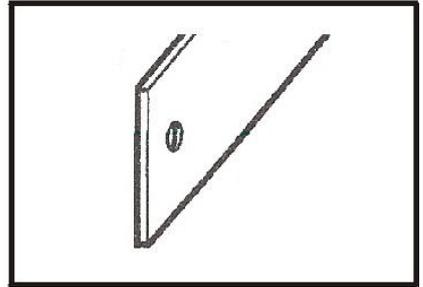
FITTINGS WITHIN THE KIT (NOT TO SCALE)



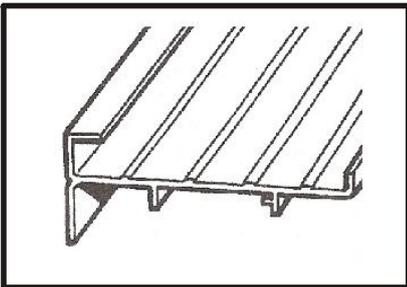
BASE (ALLOY)



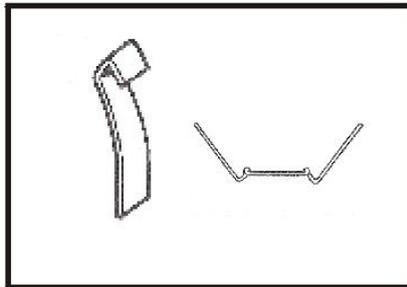
CASEMENT STAY + PINS



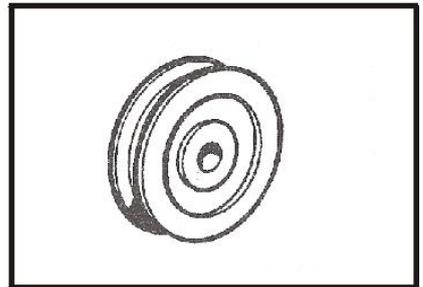
FLAT BAR



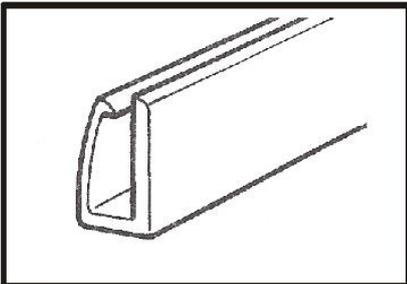
SHELF



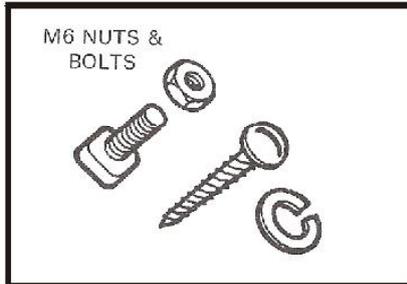
OVERLAP CLIP & WIRE CLIP



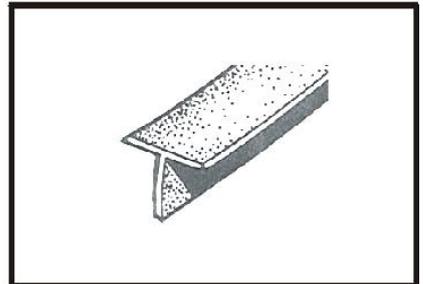
DOOR WHEEL



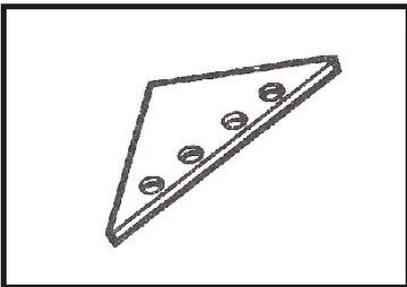
BLACK DOOR SKID



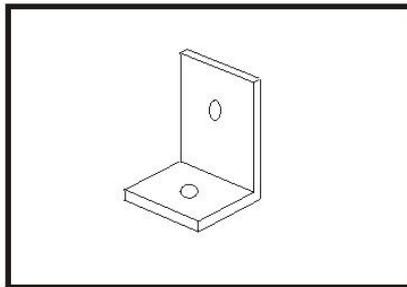
**M6 NUTS & BOLTS
SELF TAPPING SCREWS
SPRING WASHER**



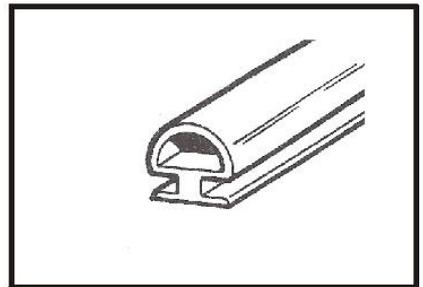
DRAUGHT EXCLUDER



EAVE GUSSET PLATES



ANGLE BRACKET



NEOPRENE BEADING



RAWLPLUGS & WOOD SCREW



SINGLE DOOR CATCH



BEWARE!

PARTS LIST

			6 x 4	8 x 4	10 x 4	12 x 4
1	50ø glazing beading		1	1	0	0
2	100ø glazing beading		2	2	3	3
3	Eave gusset plate		2	2	2	2
4	Black draught excluder		2	2	2	2
5	Top door panel	Taped together and marked door	1	1	1	1
6	Bottom door panel		1	1	1	1
7	Door infill panels		3	3	3	3
8	Door track support		1	1	1	1
9	Ridge	Taped together in extension box	1	1	1	1
10	Gutter/Eave		1	1	1	1
11	Front cill		1	1	1	1
12	Heavy angle brace		1	1	1	1
13	Rear end cill	Taped together and marked end	1	1	1	1
14	Rear end glazing bar		1	1	1	1
15	Rear end horizontal bracing angle		1	1	1	1
16	Rear end wall bar		1	1	1	1
17	Door end cill	Taped together and marked end	1	1	1	1
18	Door end glazing bar		1	1	1	1
19	Door end horizontal bracing angle		1	1	1	1
20	Door end wall bar		1	1	1	1
21	Door glazing bars ó marked door		2	2	2	2
22	Front glazing bars ó marked front		2	3	4	5
23	Corner bars ó taped in two packs		4	4	4	4
24	Short bracing angles marked door end		1	1	1	1
25	4ø shelf		1	1	1	1
26	6ø shelf		0	0	0	0
27	Vent (in packs)		1	1	1	1
28	Louvre (in packs)		1	1	1	1
29	Door track		1	1	1	1
30	Roof glazing bars		2	3	4	5
31	Roof strengthening bars		0	0	0	0
32	Roof flat bars		0	0	0	0

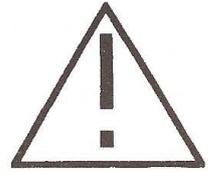
33. The following items can be found in the bag of fittings or additional packages. Skeleton gun, tube of silicon, rolls of foam seal, anchor brackets, stainless steel screws, plastic plugs, M10 nuts and bolts, stainless steel clips, wire clip, overlap clips, casement stays, stay pins, M4 pins, nuts and bolts, door catch, short and long self tapping screws, spring washers, door skids, door wheels and fittings.

34. Glass

For both toughened glass and horticultural glass, please refer to the relevant glass plans towards the rear of this booklet. * If your building is longer than 6øö, the extra bars for the roof and front are in the longer box which contains the gutter, ridge and cills e.g. A 10 x 4 would have an extra 2 roof bars and front bars in the longer box.

HELPFUL HINTS

- Please do take your time during construction and be sure to read all instructions carefully.
- Ensure that your base is level and square and built to the precise measurements indicated of the base section of this booklet.
- Base must be 90° to the wall it leans on.
- Do not alter the dimensions or shape of any component unless indicated to do so.



- This plan covers the entire range of 4ø wide lean-to models and their options including door positions (front, gable end or double front), louvre location, shelf construction and vent construction.

It is therefore possible that you may have remaining components on the completion of construction. The reason for this would be because one option has been chosen in preference to another.

This detailed assembly instruction booklet will explain the construction procedures you require to correctly install your particular structure.

- For the purpose of coloured models:
 1. There may be some jig holes in some bars, these holes play no part in the assembly but assist in the painting process.
 2. Extra care must be taken in assembly of all coloured models so as not to scratch the paint and hence affect the appearance of the structure.

SAFETY

- When using electrical equipment outside always use a circuit breaker.
- Do not attempt to construct frame or glazing of lean-to in high winds.
- Glass is fragile, so safety gloves and eye protection should be worn when glazing any part of the structure.
- Please remember that if lean-to is to be situated over an entrance to a house or dwelling, 4mm safety glass must be used to eave level. Horticultural glass is unacceptable in this situation.
- Do not place structure in vulnerable situation. Children should not play near glass greenhouses.
- Failure to observe these rules could result in personal injury or property damage.

REQUIRED TOOLS

1. M10 spanner
2. Heavy duty flat screwdriver
3. Pair of pliers
4. Electric drill/circuit breaker
5. Masonry bit
6. Hacksaw
7. Sharp cutting tool
8. Metal file

CONSTRUCTION OF FRAMEWORK AND WORK PROCEDURE

The structure should be completed from start to finish in the following order

1. Base preparation
2. Construction of frame assemblies
3. Joining of sub-assemblies to make full size frame
4. Securing structure to the base and wall
5. Glazing
6. Finishing off

Each of the above procedures is detailed at the appropriate stages of this booklet.

BASE SIZE AND PREPARATION (for brick/concrete bases only)

Kensington 4ø model	Length (Dimension B)	Width (Dimension A)	ç Square	External ridge height
6 x 4 model	1.960m	1.297m	2.3503m	2.200m
8 x 4 model	2.578m	1.297m	2.8859m	2.200m
10 x 4 model	3.196m	1.297m	3.4492m	2.200m
12 x 4 model	3.814m	1.297m	4.0285m	2.200m

NB. If you have a corner location, i.e. one end missing ó all base lengths reduced by 10mm. (**You will need to timber plinth screwed to the side wall to enable the two corner bars to attach effectively**). All bases of any material must be level and square and built to exact outside measurements.

CONSTRUCTION OF THE FRAMEWORK ASSEMBLIES

The building is divided into a number of different frame assemblies.

1. Right hand gable end frame
2. Shelf installation
3. Left hand gable end frame
4. Front frame assembly
5. Roof frame assembly
6. Door assembly
7. Roof vent assembly
8. General assembly of greenhouse unit.
9. Construction and installation of louvre

The installation procedure should follow the above format and it is recommended that you complete each one fully before moving onto the next frame.

For the purpose of this booklet, we have used an 8 x 4 lean-to as the basis for construction. If you have purchased another size, the principles of the job are identical.

All bases, of any material must be level and square and built of the exact outside measurements

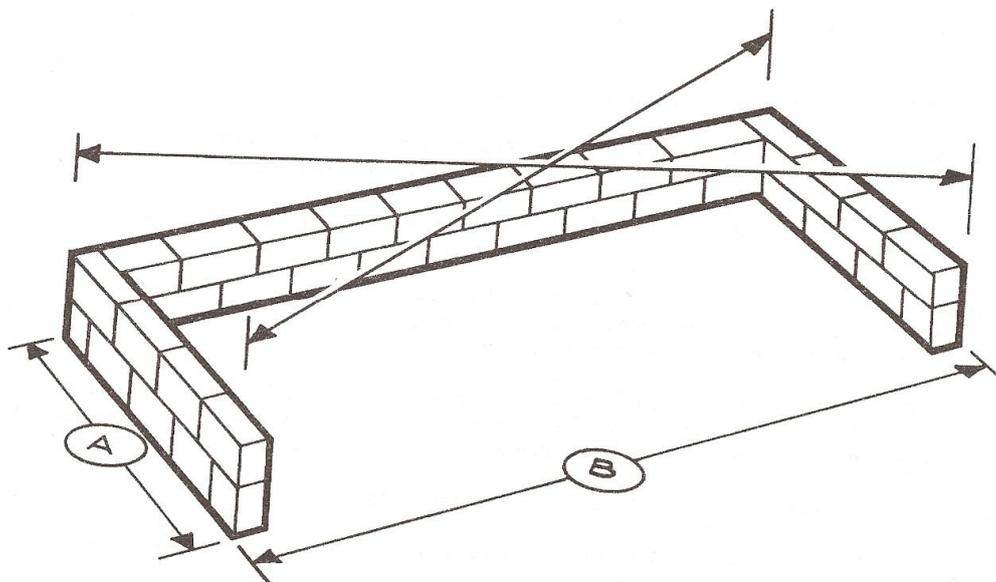
If you are putting a concrete footing down it is wise to dig a trench around the perimeter removing all top soil, insert some hard-core (broken brick etc) into the trench and back fill with concrete. You can now begin to lay the required course of brick, remembering to insert a damp-proof strip one or two course above ground level.

ELITE GREENHOUSES BASE DIMENSIONS

For brick, Block, Concrete or Timber

The dimensions given on the previous page must be used to locate the position of your lean-to greenhouse brick base.

If a brick, concrete or timber base is to be laid, construct it as shown ensuring that dimensions A & B are not **exceeded** as these are the precise outside measurements enabling the cill to overhang the edges. ENSURE that the base is square by measuring across the corners, only when equal is it square. Check the level using a builder's spirit level.



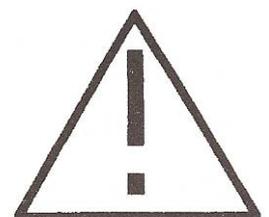
If you have a patio floor you can lay the bricks directly on top of the flags provided they have a proper foundation. If you don't have hardstanding underneath you may need to lift the outer flags and insert some firmer material such as aggregate before laying the bricks.

Please proceed along the following format.

Before commencing the detailed frame assemblies, you must decide which gable is going to be the door end, and which is to be fixed end (**Key point**). For the purposes of this plan, we have made the left hand gable the door end, but it can just as easily be the right hand end, so please read the instructions with the alternative in mind (**Key point**).

If you have bought an alloy base to go with the house, start with this

1. Lay the three base sections on level ground in a rectangle with the bolt channels facing inward and the flanges facing outwards, remembering to put the **wider** of the two flanges towards the floor. **(Key point)**.
2. Slide a bolt into each end of the bolt channels in each section (i.e four bolts to each). **IMPORTANT: If you plan to erect the greenhouse on a patio or flagged area, you need to insert some extra bolts in the lower channels. See 13 below.**
3. Attach an angle stake to the first corner by pushing the bolts through the holes in the stake and securing with a nut. You do not need to fasten them tightly at this stage.
4. Repeat this with the other corner.
5. Ensure that the frame is square by measuring from corner to corner. Only when the diagonals are equal is the frame square. Tighten all the nuts **(Key point)**.
6. Get someone to help you carry the base frame to place where you want the greenhouse to be situated.
7. a) If you are erecting on soil, mark where the corners will be and follow points 8 to 11 below.
b) If you are putting on a patio or flagged area, jump to point 11*
8. Lift the base frame clear of the site and dig a hole at each corner, sufficient in depth to take the angle stakes.
9. Re-position the base in the desired position, ensure that it is still square by checking the diagonals again and then that it is level using a spirit level. When you are sure that both are correct give the nuts a final tightening
10. Skip the next points and go to greenhouse assembly.
N.B. It is advisable to concrete the corner stakes after you have erected the greenhouse. If you do it before and are slightly out of square you cannot make any adjustments **(Key point)**.
11. *You must ensure that your patio is level. If it is not, you must level it up first or the greenhouse will not be level and will not glaze properly.
12. Cut off the surplus portions of the angle stakes level with the bottom of the base.
13. These are the number of extra bolts you need to insert into the bottom channel of each side and end, as mentioned in point 2 above.
14. Check that the base is still square by measuring the diagonals again and level by using a spirit level.
15. Space the bolts in the sides and ends at equal distance and place the brackets on them, securing them with a nut.
16. Do not anchor down at this stage **(Key point)**



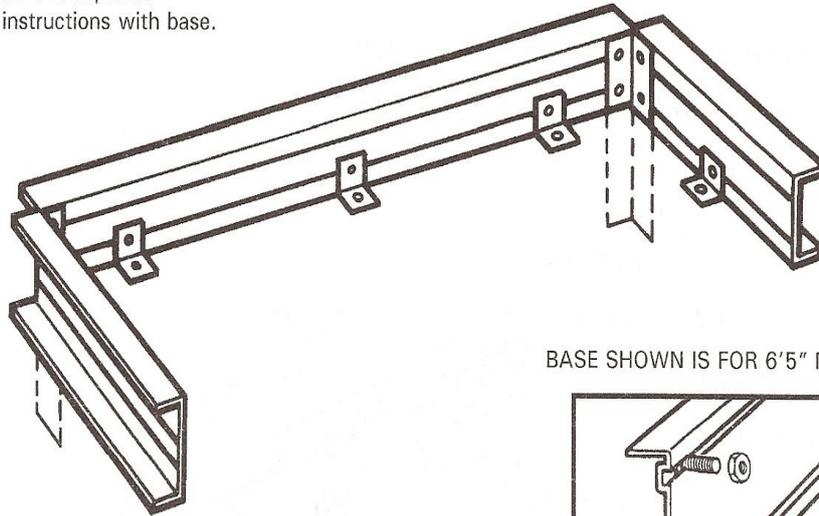
**BEWARE OF
SHARP EDGES!**

Do not over tighten nuts as the bolts could snap.

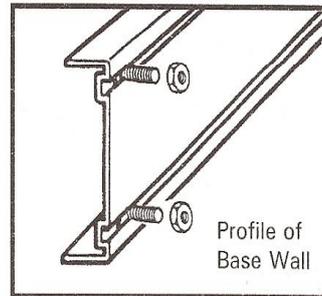
ALLOY BASE ASSEMBLY

Alloy base (when fitted to concrete or patio floor)

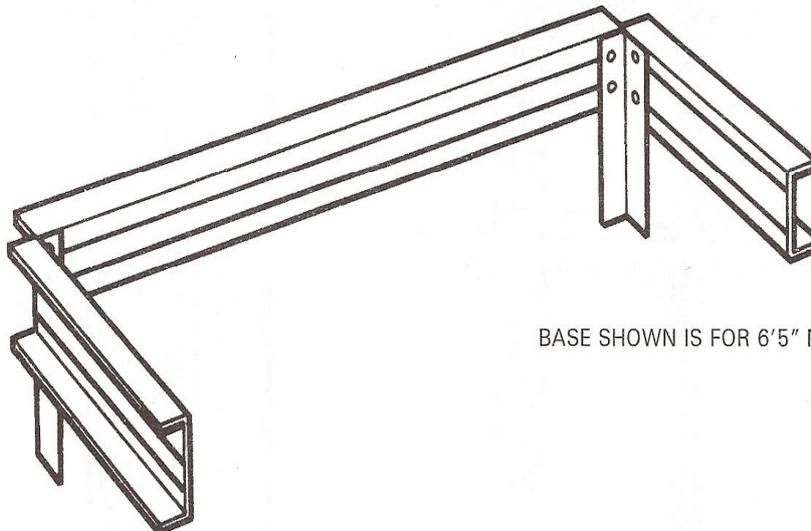
For brick base see page 5.
If you have purchased a steel
base, please see separate
sheet for instructions with base.



BASE SHOWN IS FOR 6'5" MODEL



Alloy base (when fitted to soil floor).



BASE SHOWN IS FOR 6'5" MODEL

Having assembled the base,
proceed to the greenhouse
construction.

N.B. The wider of the two small flanges goes towards the floor.

RIGHT HAND GABLE END FRAME

Please note that for the purpose of this plan, we have made the right hand gable end rear end (i.e. not the door end), but it could just as easily be the left hand gable end. So please read this section and the left hand gable end section with the alternative in mind.

From the main box you require:

1. Set of corner bars marked **RIGHT END CORNER BARS**
2. Set of glazing bars, angle and cill marked **END**

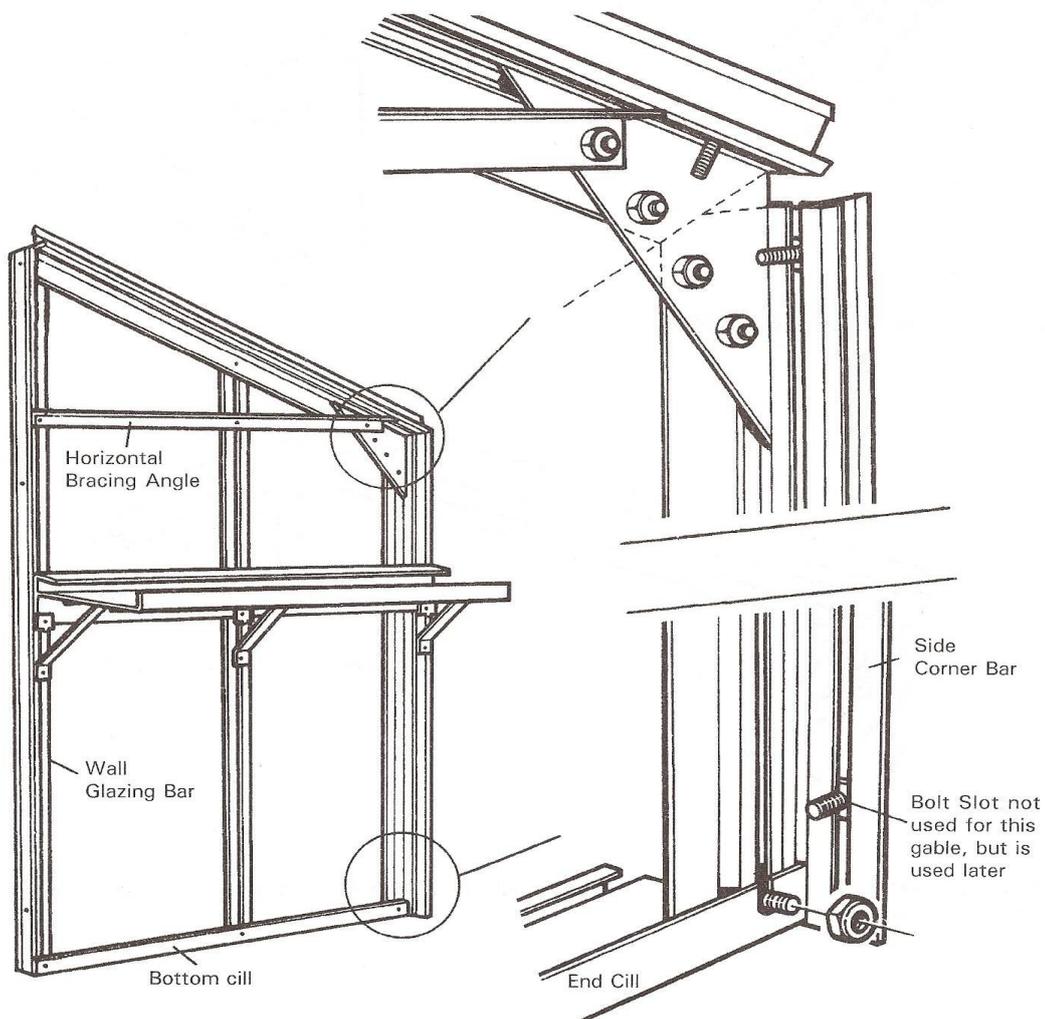
This contains:

- 1) Wall bar
- 2) Door cill
- 3) 1 Glazing bar
- 4) Horizontal bracing angle

From the bag of assorted fittings and fitting within the box, you will require

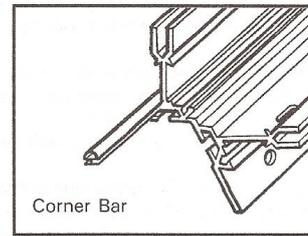
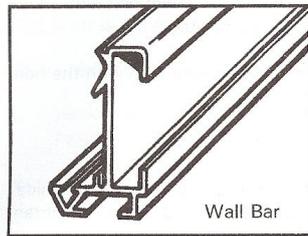
- 1) One eave gusset plate
- 2) Nuts and bolts
- 3) Coil of glazing bead

N.B. See front of booklet for component diagram key.



PROCEDURE

1. Split the tape holding the corner bars together and also the tape holding the glazing bar, angle and cill. Slide glazing beading along the beading channel of the two outer grooves of the corner bars, (as seen in diagram below).



The use of pliers is recommended for the beading process.

When threading the glazing beading along the bars, there is a tendency for it to stretch and later contract. It is therefore advisable to have the beading protruding approx. 25mm at each end of each bar which can then be pushed back at either end if necessary.

Before assembly, you must ensure that the beading is flush with the ends of the bar. It may be necessary to trim the beading to size.

2. The longer of the other bars is the wall bar and has only one groove for glazing bead, while the glazing bar has two grooves for glazing bead. Slide glazing bead in to these channels in the same way as for the corner bars.
3. The corner bars now need to be distinguished between a roof corner bar and a side corner bar.
 - a) The roof corner bar is 1308mm long and has 3 holes in the flange, and is mitred at both ends.
 - b) The side corner bars is 1795mm long and has 1 hole in the flange, and is mitred at one end only.

Having determined which corner bar is the roof and side, you must now establish which way round they go for assembly purposes.

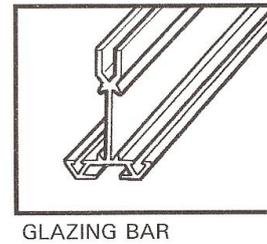
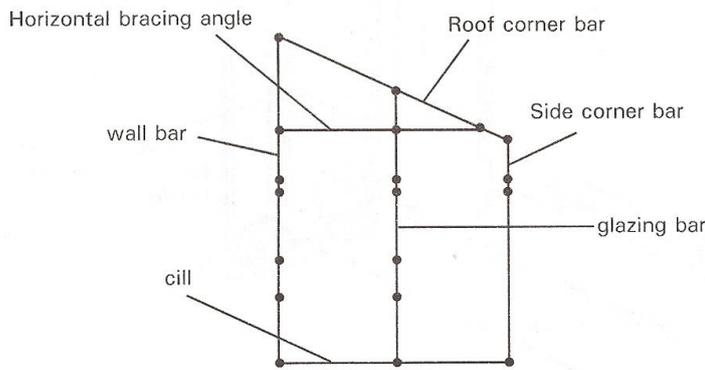
- c) Side corner bar

The end that is mitred and with only one hole in the flange near to the mitre is the top of the bar. The bolt slots are to be on the inside for assembly purposes.

- d) Roof corner bar

There is a mitre at both ends 3 holes in the flange. The smallest of the two mitres is to be the top of the bar i.e. it is to be placed nearest to the ridge. The other end with the most severe mitre will go to the eave to marry up with the side corner bar.

4. Lay out the component parts on the ground with the bolt slots uppermost in the positions shown below. Ensure that the wall bar is laid on the ground in a way so that the beaded section of the bar is on the inside for glazing purposes.
5. Now you must add the nuts and bolts to the bars. The diagram below illustrates the bolt configuration for the rear end gable. Where a Dot appears below, a bolt with a finger tip tightened nut should be slid along the bolt slot of the bar. In the case of the corner bars, the bolt should be slid along the lower bolt slot which faces up, and not the bolt facing sideways. In to the bolt slot facing sideways on each corner bars, slide 2 bolts ó 1 top and 1 bottom put a nut on and finger tip tighten, these will be used later in the general assembly.



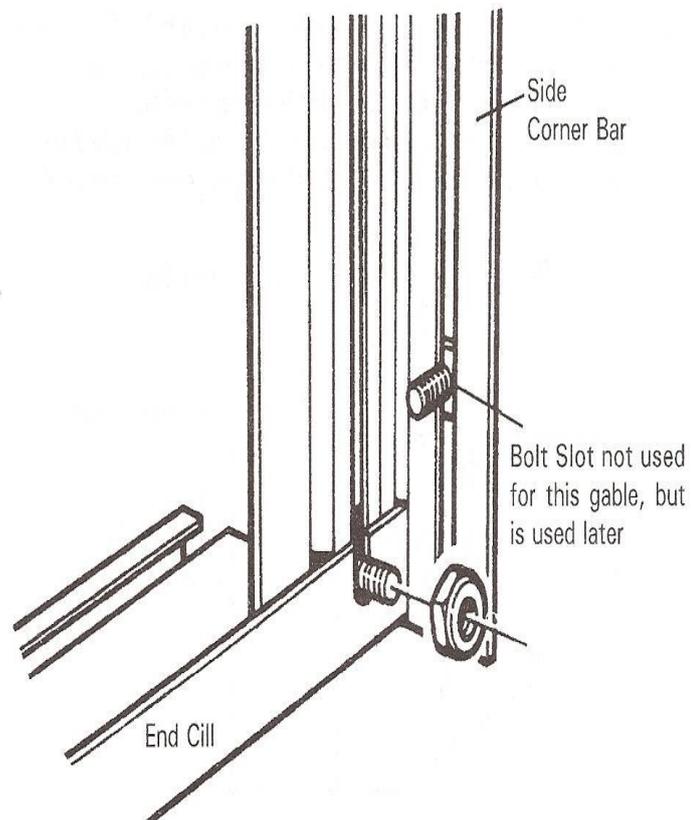
6. Starting with the side corner bar put the eave gusset plate over the top bolt in the bolt slot utilising the bottom hole in the plate. Slide the plate left or right until the next hole i.e. 2nd from the bottom in the gusset plate lines up with the hole in the flange of the side corner bar. Put nuts in and finger tip tighten.
7. Next using the bolt previously inserted in to the bottom of the roof corner bar in the lower bolt slot, place the gusset plate over utilising the top hole in the plate. Do not put a nut on at this stage.
8. Slide the gusset plate left or right until the last hole not used (i.e. 2nd hole from top) lines up with the hole in the flange of the roof corner bar. Put a nut on the bolt and finger tip tighten. The diagram of the gusset plate will assist in the construction
9. Attach the bottom cill to the side corner bar using the previously inserted bolt in the bolt slot of the side corner bar. Slide the bolt downwards and into the slot on the cill. Put the nut back on and finger tip tighten (see diagram for more detailed description of this assembly).
10. Next attach the wall bar and glazing bar and glazing bar to the cill (having first threaded the glazing bead in to the channels of both bars). Starting with the wall bar, using the bottom bolt previously inserted into the wall bar, offer the wall bar to the slotted hole in the bottom left side of the cill. Move the bolt downwards and into the slotted hole. Put the nut back on and finger tip tighten.
11. The glazing bar can now be attached to the cill on the same way as the wall bar.
12. Both the glazing bar and wall bar can now be fitted the flange in the roof corner bars. Insert the bolt at the top of the wall bar and glazing bar in to the holes in the flange of the roof corner bar. Put a nut on both bolts and finger tip tighten.
13. Next the horizontal bracing angle can be fitted. The angle can be fitted either upwards or downwards. Place one end to the top bolt of the gusset plate (the one unoccupied by a nut). Put a nut on and finger tip tighten. Now utilising the highest bolts previously inserted into the wall bar and glazing bar, slide these bolts up or down so that they are in line with the horizontal bracing angle and insert them through the holes in the horizontal bracing angle. Put nuts back on and finger tip tighten.
 NB. The extra hole in the middle of the horizontal bracing angle simply means that the bar is not handed, i.e. it can go at either end of the structure.
14. This gable end is almost complete. Before tightening all nuts, you must ensure the following.
 - a) The corner joint behind the eave gusset plate is tight, i.e. Corner bars are touching behind the gusset plate.

- b) The glazing bar is pushed right up to the roof corner bar
- c) The glazing bar is pushed right down to the angle of the cill
- d) The horizontal bracing angle is on the top bolt of the eave gusset plate and that it is parallel to the cill.

15. Tighten all the nuts. Take care not to over tighten

16. You can now fit the shelf

17. The louvre is an independent frame and is better fitted to this gable when the house is assembled, prior to glazing.



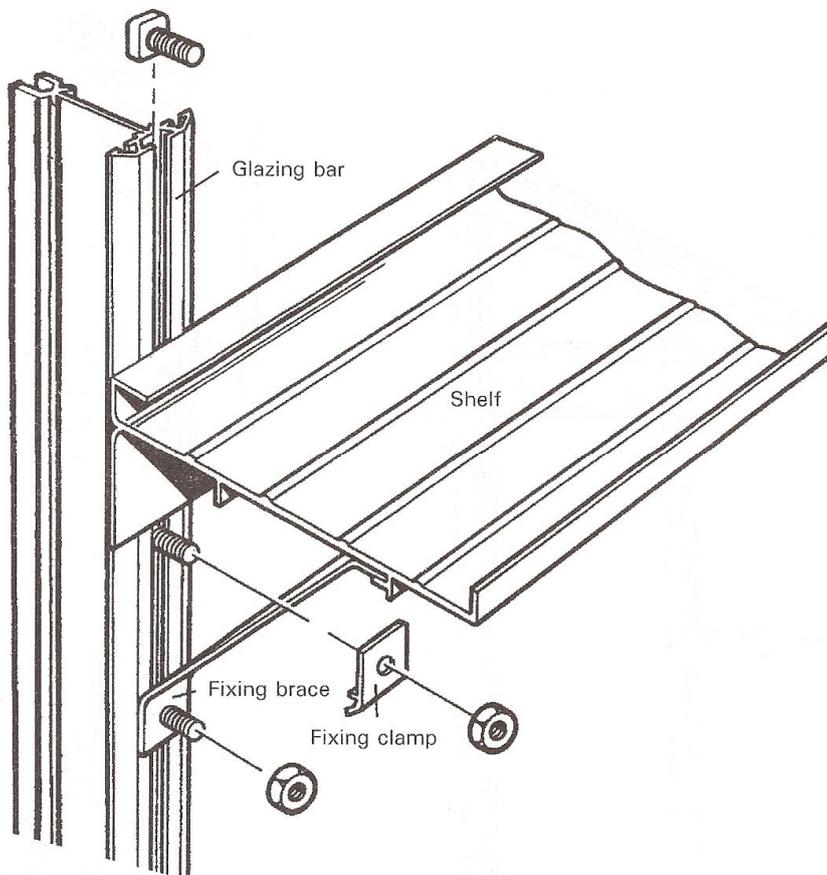
SHELF INSTALLATION

The next addition to the rear end (non-door end) is the aluminium shelf. The following diagram and text give the details of its installation.

The shelf is to be fitted to the rear end of the unit.

This is done by utilising the previously inserted nuts and bolts in the glazing bar, wall bar and side corner bar.

1. Attach the fixing braces on to all 3 bars using the lower of the unoccupied nuts and bolts at the desired height. (Ensure that all braces are fixed at the same height.)
2. The shelf rests on the upper of the unoccupied bolts (nuts now not required) which is held in place using the fixing clamps as seen in the diagram. Again, ensure that the fixing clamps are fixed at the same height.
3. The shelf is further supported by the insertion of the fixing brace in to the protruding lip of the underside of the shelf as seen on the diagram.
4. Ensure that all nuts are tight. Do not over tighten
5. Shelf installation is now complete.



LEFT HAND GABLE END FRAME

Please note that for the purpose of this plan, we have made the left hand gable, the door end, but it could just as easily be the right hand gable end. So please read this section and the preceding one with the alternative in mind.

From the main box you will require:

1. Set of corner bars marked LEFT HAND END CORNER BARS

2. Set of glazing bars, angle and cill marked END

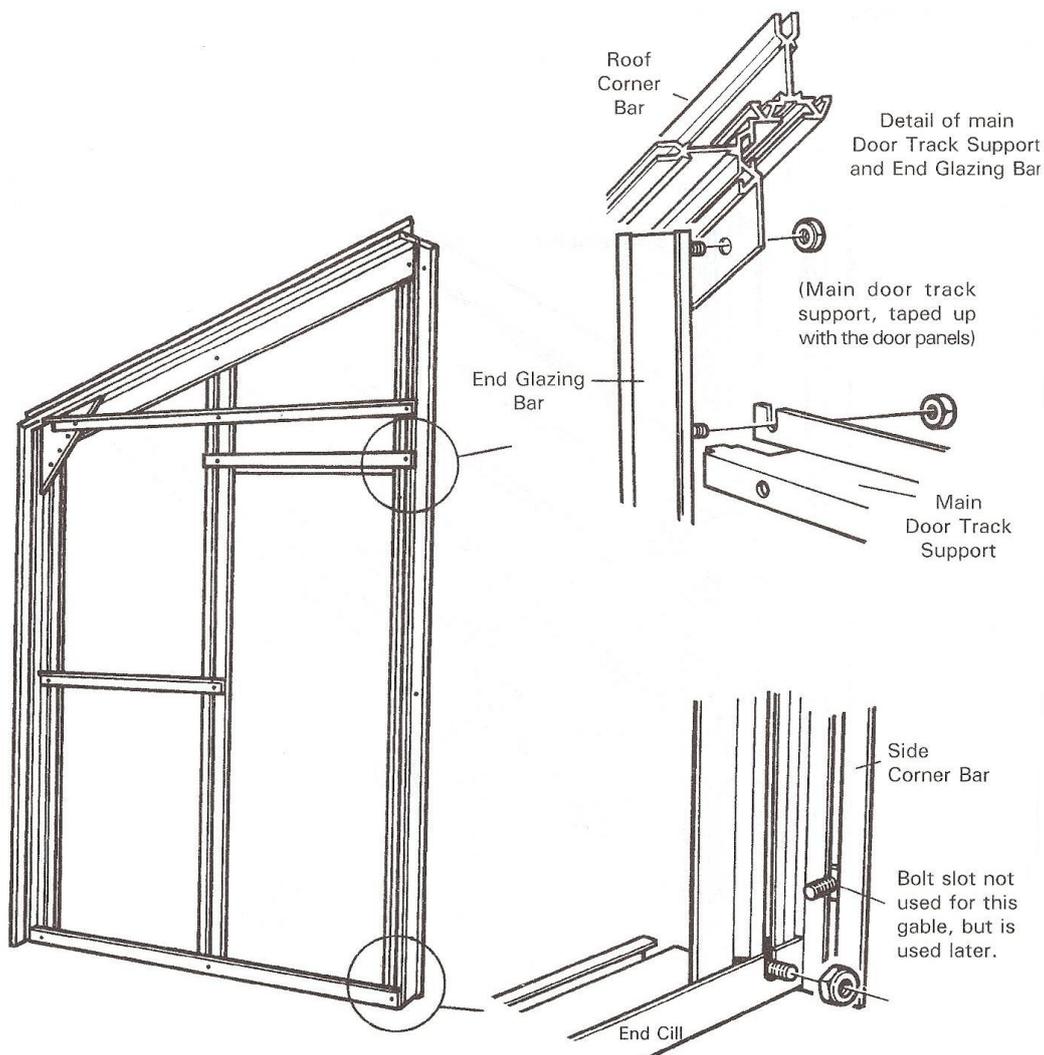
This contains

- 1) Wall bar
- 2) Door cill
- 3) 1 Glazing bar
- 4) 1 Horizontal bracing angle

3. Set of angles marked DOOR END

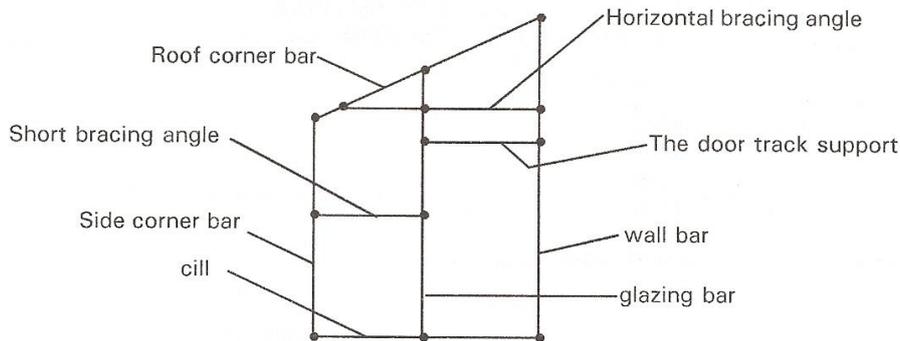
From the bag of assorted fittings and fittings within the box, you will require:

- 1) One eave gusset plate
- 2) Nuts and bolts
- 3) Coil of glazing bead



PROCEDURE

1. The initial construction of this gable is identical to the right hand gable except for the changes listed below. Door end does not consist of louvre or shelf. The diagram below shows the bolt configuration for the door end (Again a Dot indicates a bolt)



NB. If your door is on the front, see the bolt configuration drawing below. On the door end there is a short bracing angle to be fitted. This can be found in the main box marked DOOR END.

2. This bar, like the horizontal bracing angle, can be fixed either upwards or downwards (for aesthetic reasons we suggest that you attach it the same way as horizontal bracing angle). Using the previously inserted bolts, attach the short bracing angle to the unit as shown (exact distances are not required). Put nut on and finger tip tighten.

3. The door track support (taped together with components marked DOOR) looks similar to a $\text{Z}\emptyset$ bar (see component diagram at beginning of booklet). The door track support is fitted to glazing bar and wall bar utilising the two remaining unoccupied nuts and bolts. This bar is to be fitted just below the horizontal bracing angle. **The end slotted holes must face upward like a letter 'U' (key point -see diagram on previous page).**

4. Tighten all nuts remembering not to over tighten.

The door track support may need altering slightly in the construction, so finger tip tight will be sufficient at this stage.

NB Do not fit the door track at this stage ó this will be done later in General Assembly.

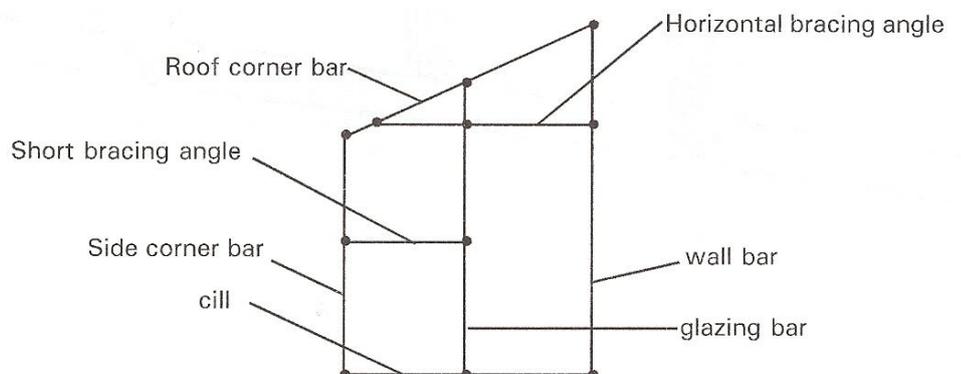
FOR THE PURPOSE OF SINGLE DOOR BEING ON THE FRONT

If the position of your door is to be front (i.e. Not on either gable end), then the bolt configuration on the gables will be different than previously stated. In that case follow the procedure below for the initial construction of gable ends.

If the right hand gable end is to house the shelf and louvre, then the bolt configuration is the same as indicated for the right and end in this booklet.

The bolt configuration of the left hand end will now be as shown below.

If you choose the left hand end to house the shelf and louvre then the bolt configurations indicated above are simply swapped.



FRONT FRAME ASSEMBLY

From the main box and subsidiary extension packages you will require:

Taped together in one bundle marked (FRONT (the ridge is also in this pack).

1 Eave/gutter bar

1 Cill

1 Heavy angle brace

1 Pack of glazing bars marked FRONT

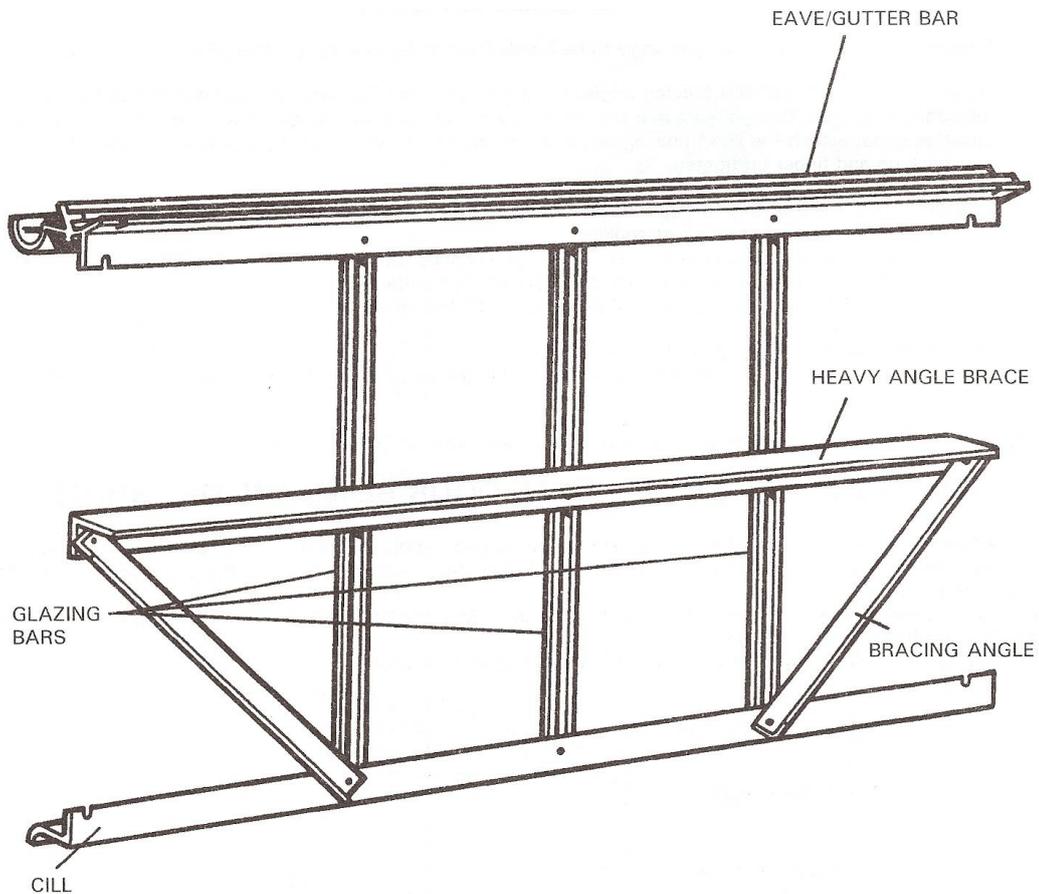
i) if unit is 6ø long = 2 bars

ii) 8ø long = 3 bars

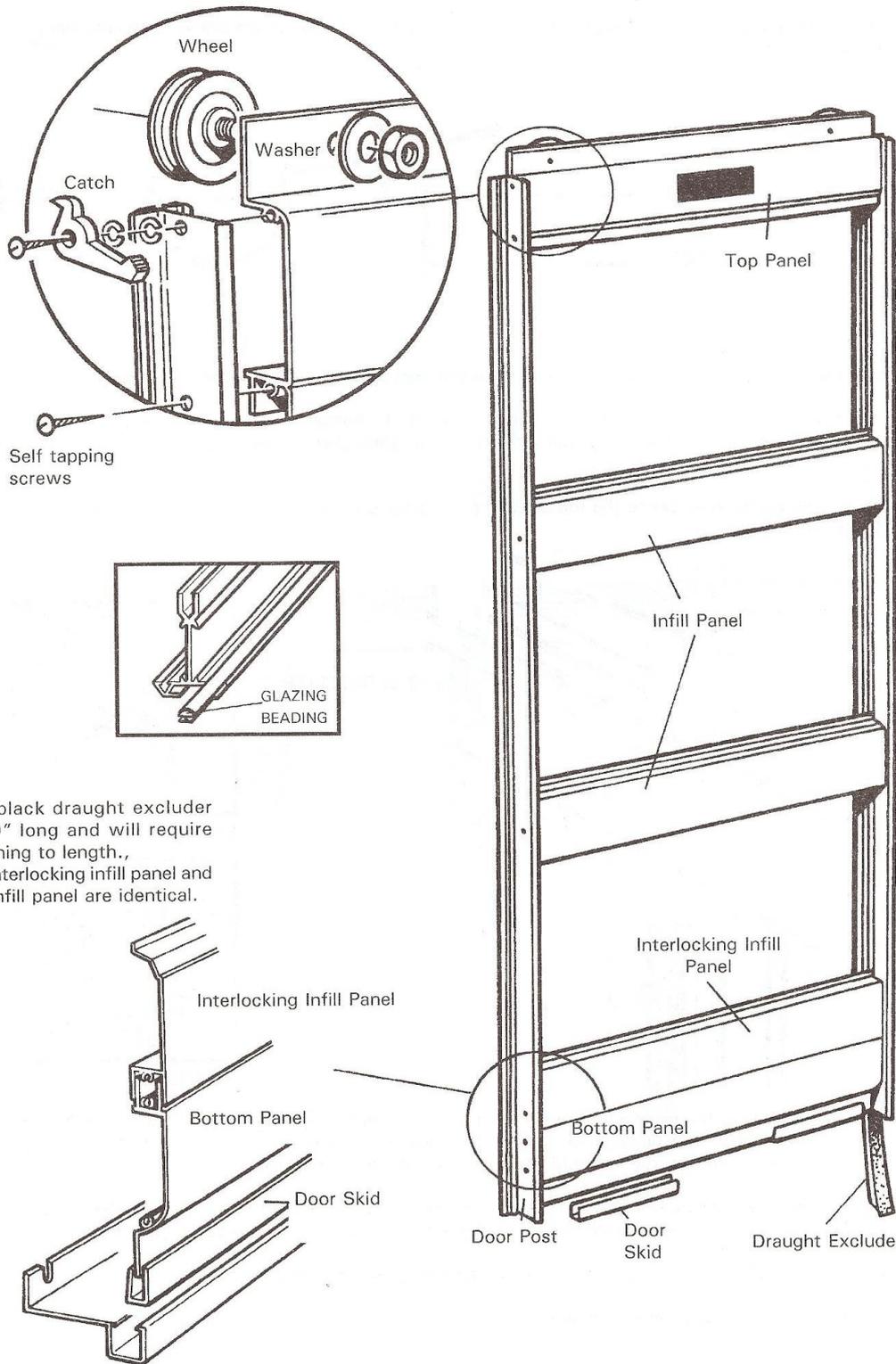
iii) 10ø long = 4 bars

iv) 12ø long = 5 bars

Bracing angles taped together with glazing bars above.



DOOR FRAME



The black draught excluder is 69" long and will require trimming to length., the interlocking infill panel and the infill panel are identical.

DOOR FRAME ASSEMBLY

Components consist of:

2 door glazing bars

3 infill panels

2 top and bottom door panel

From the main bag of fittings you require

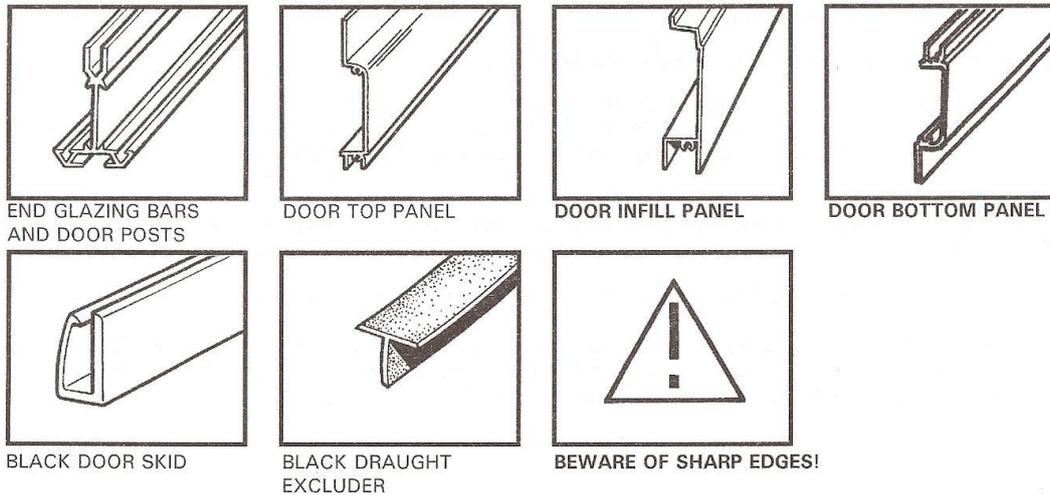
2 door wheels

2 clip on nylon door skids

2 lengths of black rubber draught excluder

Door catch, self tapping screws and spring washers.

1. Place the two side door glazing bars on a level surface two feet apart with the bolt slots facing **downwards**. The top of each side piece has two screw holes in it, the bottom has three. Insert the glazing beading into the inside of both bars. (**Key point**).
2. Place the top, bottom and two infill panels in position as shown by the position of the screw holes in the side pieces of the panels. The top panel has the greenhouse name on it. The bottom panel has the edge for the door skids to fit on. The lower infill panel locks on to the bottom panel.
3. Fix the door together by screwing through the door side pieces into the screw eyes in the door panels using the self tapping screws. **DO NOT** fix the top left hand side screw yet (unless you are fitting a double door). The screws will go in more easily and without danger of trying to go crooked if you can out a small amount of grease on the panel before assembling the doors. Alternatively, you could insert the screws into the screw eyes of the door panels before assembling the doors; this would have the effect of pre-self tapping the panels prior to assembly making assembly easier.
4. Fix the top left hand side with the one-and-a-half inch screw provided (if the door is on the right hand gable, it is the top tight hand that has the 1 ½"). Put the screw through the door catch so that the serrated part is facing outwards and upwards. Next slip two spring washers on to the screw, and then fix the screw through the side of the door and into the top panel (**Key point**).
5. Make sure all the angles are square and tighten all screws.
6. Fix each door wheel into position by pushing the bolt provided through the centre of the wheel and then through the hole in the top door panel from underneath (i.e. from the inside of the door). Put the washer over the bolt and secure with the nut provided, tightening until there is no movement on the bolt. The nuts are lock-nuts and are harder to put on than normal nuts in general assembly so a 2nd spanner or pliers to prevent rotation of the bolt would help. The wheels have a protruding collar on one side. This collar goes against the inside edge of the top door panel (**Key point**). Failure to do this would prevent the wheel from rotating freely
7. Slip the nylon door skids on each end of the bottom panel.
8. Turn the door over and insert the black rubber draught excluders in the groove (bolt slot) in each side piece of the door. Push up to the top of the door and trim off surplus at the bottom. With a pair of pliers squeeze the groove together at the bottom so that the rubber will not slip down when the door is in its upright position.
9. Do not fit the door at this stage, see later page for this detail.



DOUBLE DOOR FRAME ASSEMBLY

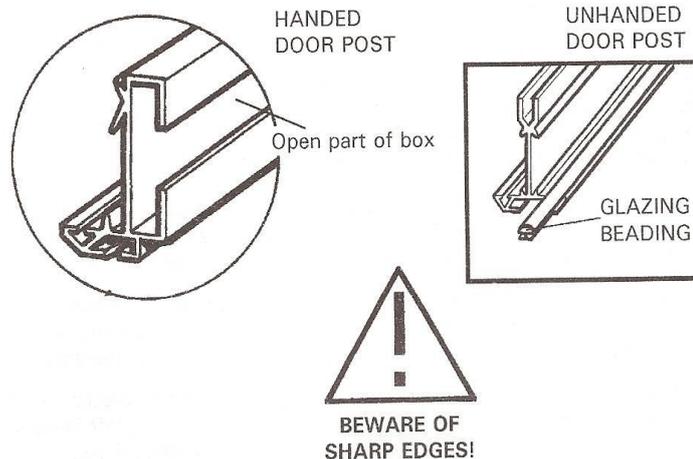
Procedure for assembly of one of the doors, 2nd door procedure is the same except handed/unhanded door position is reversed.

Each door component consists of:

- 2 door glazing bars 1 = handed, 1 = unhanded
- 3 infill panels
- 2 top and bottom door panels

From the main bag of fittings you require

- 2 door wheels
- 2 clip on nylon door skids
- 1 length of black rubber draught excluder
- Door catch, self tapping screws and spring washers.



1. Place the two side bars on a level surface roughly 240 apart with the bolt slots facing downwards. The top of each side piece has two screw holes in it, the bottom has three (**Key point**).
2. Looking at the handed door posts in profile with the 2 holes at the top (3 holes at the bottom) the open box part of the section goes to the outside i.e. on right hand door, handed door post is fitted on the left, on left hand door, handed door post is fitted to the right (when viewed from the outside).
3. Place the top, bottom and 3 infill panels in position as shown by the position of the screw holes in the side pieces and the panels. The top panel has the greenhouse name on it. The bottom panel has the edge for the door skids to fit on. The lower infill panel locks on to the bottom panel.
4. Fix the door together by screwing through the door side pieces into the holes provided in the edge of the panels with the No.8 half-inch self tapping screws. The screws will go in more easily and without danger of trying to go crooked if you put a small amount of grease on the screw before assembling the doors. Alternatively, you could insert the screws into the screw eyes of the door panels before assembling the door; this would have the effect of pre self-tapping the panels prior to assembly, making assembly easier.

5. Make sure all the angles are square and tighten all screws

6. Fix each door wheel into position by pushing the bolt provided through the centre of the wheel and then through the hole in the top door panel from underneath (i.e. from the inside of the door). Put the washer over the bolt and secure with the nut provided, tightening until there is no movement on the bolt. The nuts are lock-nuts and are harder to put on than the normal nuts in general assembly. The wheels have a protruding collar on one side. This collar goes against the inside edge of the top door panel (**Key point**). Failure to do this would prevent the wheel from rotating freely

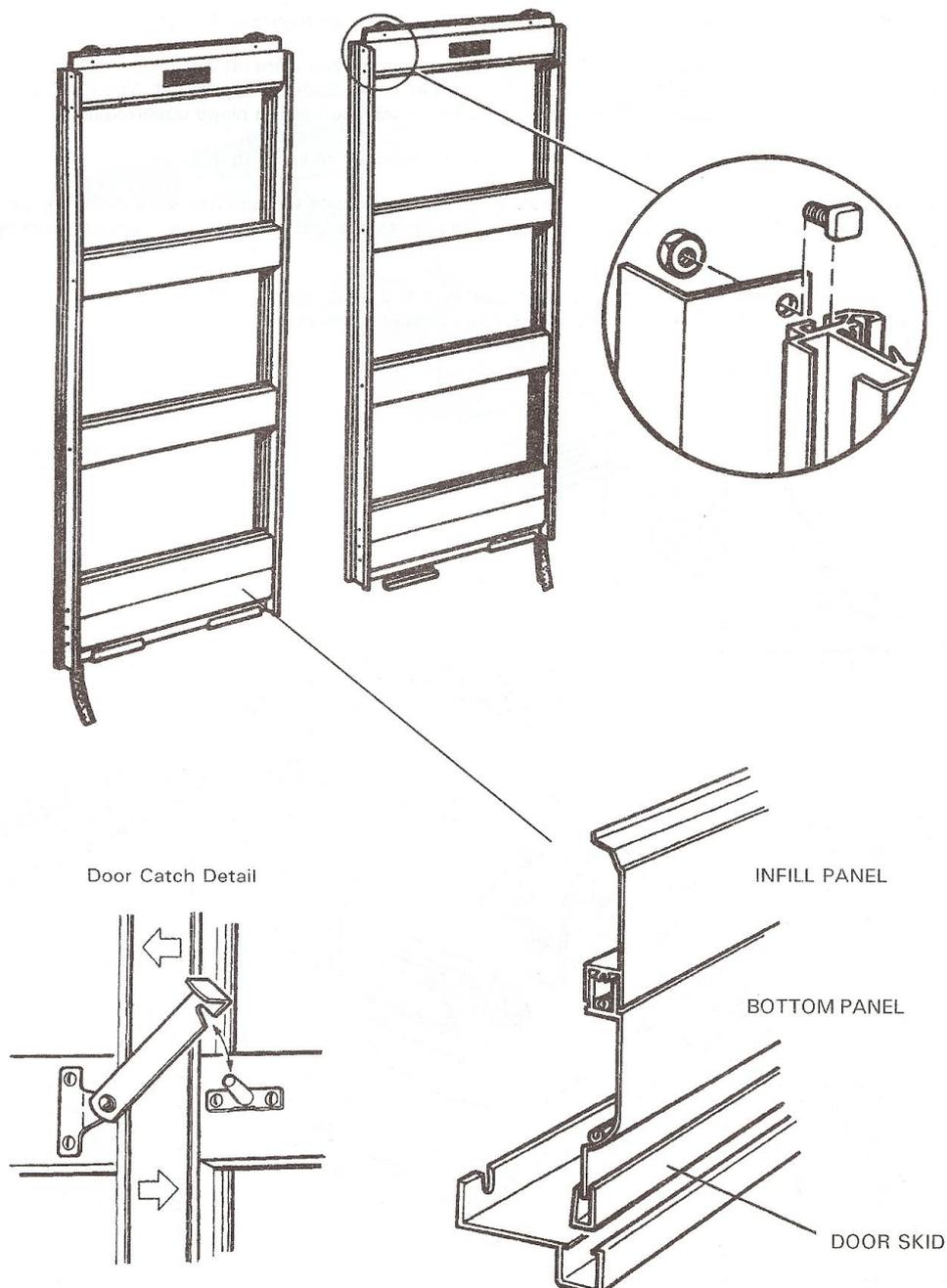
7. Slip the nylon door skids on each end of the bottom panel.

8. Turn the door over and insert one of the black rubber draught excluders in the groove (bolt slot) in the left hand of the door i.e. the unhandled bar. Push up to the top of the door and trim off surplus at the bottom. With a pair of pliers squeeze the groove together at the bottom so that the rubber will not slip down when the door is in its upright position.

9. Do exactly the same with the right hand door. The draught excluder is inserted into the unhandled door post.

10. Do not fit the doors to the front at this stage; wait until the structure is fully assembled prior to glazing.

11. The double door catch is fitted to the door panels as



illustrated. You will need to drill four 5mm holes in the relevant door panels and attach the catch and keep, utilising the small nuts and bolts provided. Position the keep so that the catch fits snugly and the doors close tightly.

12. Having assembled both doors you need to attach a piece of alloy to the rear of right hand door. Insert bolts into bolt slot of the left hand upright of the right hand door, attach the angle and put on and tighten the nuts. As illustrated.

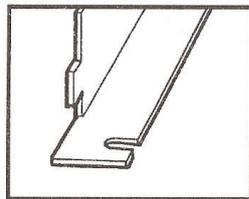
ROOF VENT ASSEMBLY

The roof vent pack has 5 pieces of aluminium: and from the main box of fittings you require 6Ø of glazing beading, 4 nuts and bolts, 2 casement stay pins, 1 casement stay and 6 M4 stainless steel nuts and bolts.

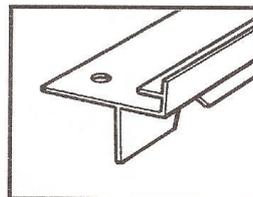
Procedure

1. Identify the slam bar and attach the 2 stay pins to the outer side of the angles using the M4 stainless steel nuts and bolts. Do not fit the slam bar at this stage, This will be fitted when the roof is installed to the greenhouse.
2. Lay the 4 edge pieces of the vent on a level surface as though you were on the inside of the event (with the bolt slots of the side bars uppermost and the ∇ Ø slots of the bottom rail uppermost. The top rail is arranged in such a way that the squared off end is to the bottom and the hooked hinge uppermost).
3. Slide the glazing beading into the slots in the side and top rails and trim to suit.
4. Insert a bolt into each end of the side rail bolt slots, put these bolts through the holes in the top and bottom rails, add nuts and lightly tighten. Check that all joints are secure and that the vent is square, and then tighten up the nuts.
5. Fit the casement stay using the M4 stainless steel nuts and bolts, putting the bolts through the holes in the saddle of the stay and through the 2 elongated holes in the bottom rail. Hold the nuts in place and tighten the bolts with a screwdriver.

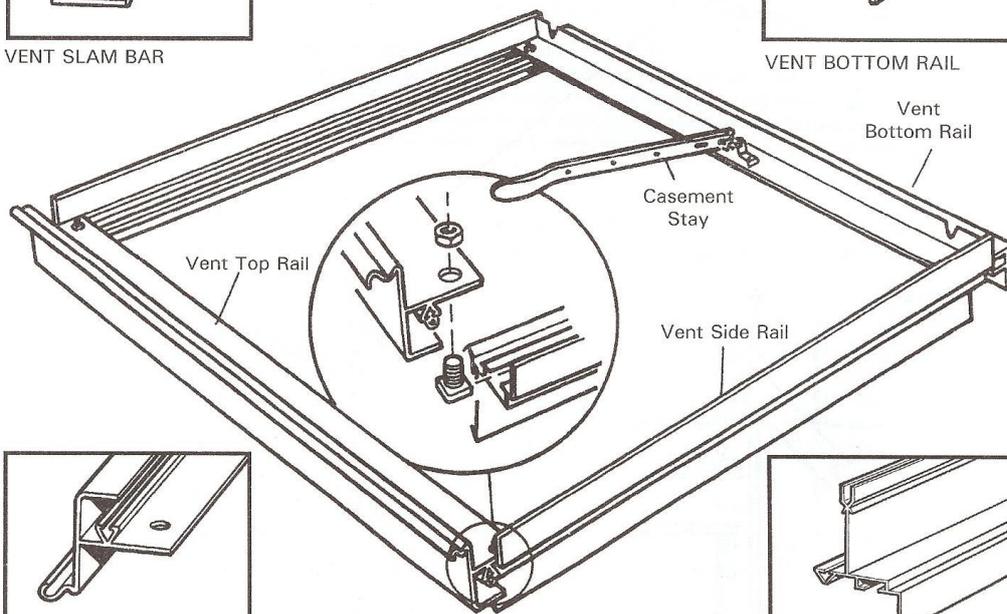
Do the same with the other vents.



VENT SLAM BAR



VENT BOTTOM RAIL



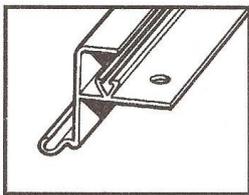
Inside View

Vent Bottom Rail

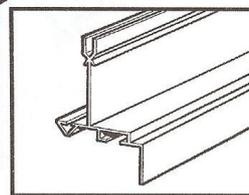
Casement Stay

Vent Top Rail

Vent Side Rail

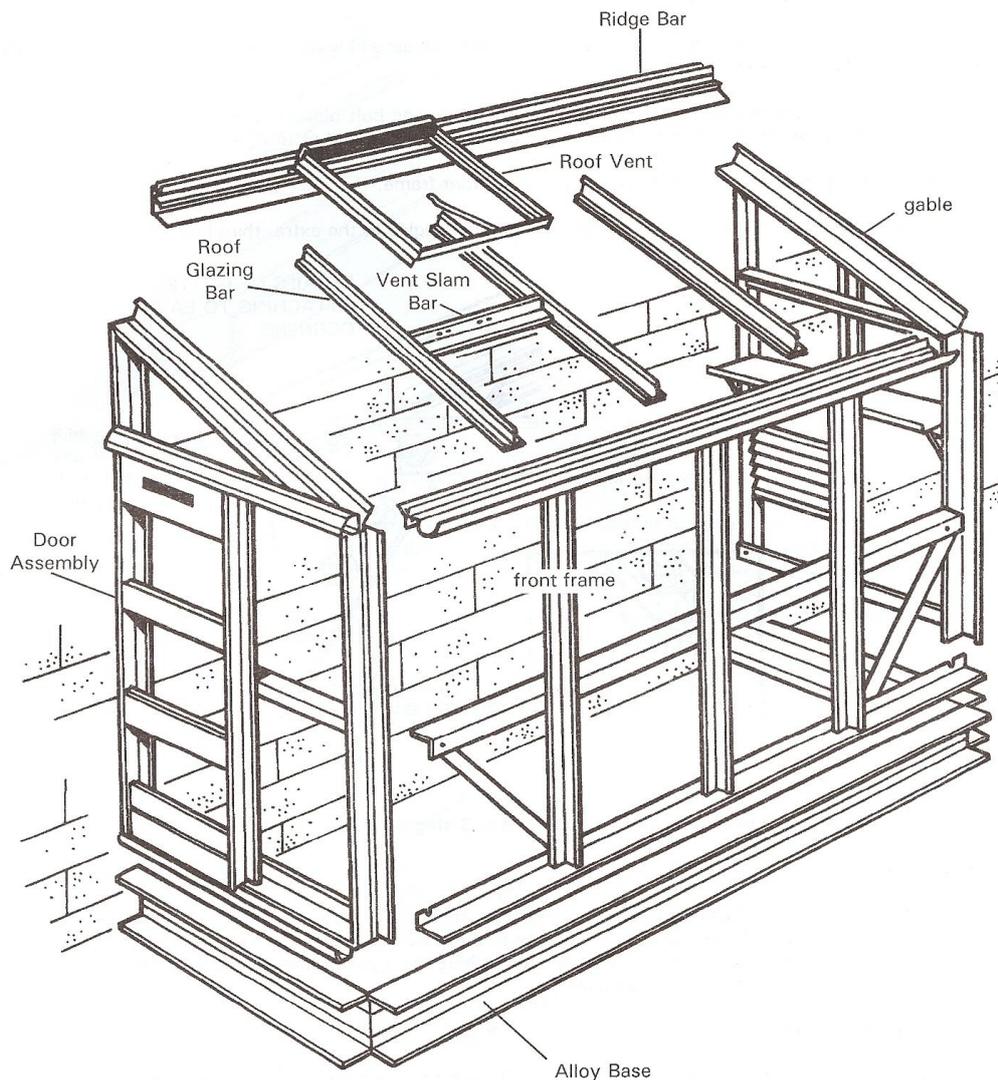


VENT TOP RAIL



VENT SIDE RAIL

GENERAL ASSEMBLY OF GREENHOUSE UNIT



A Attach right and left hand gables to front frame

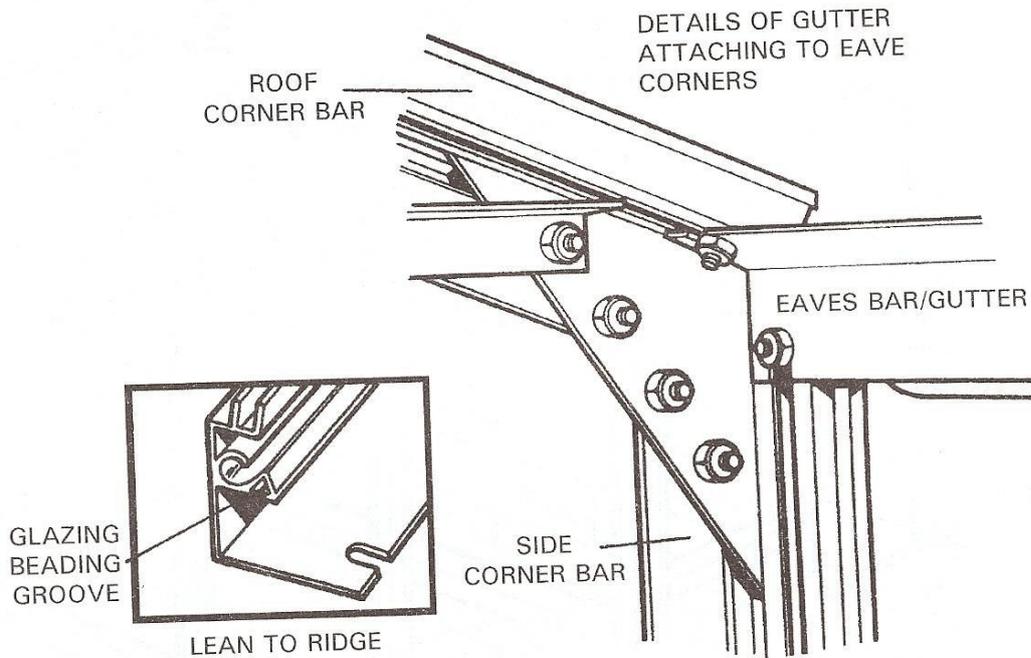
1. Stand the right hand end frame and the front up so that they meet at the right front corner. Push the gutter/eave bar into the small gap between the roof and side corner bars so that the slotted holes at the end of the eave flanges line up with the bolt slot in the corner bar. The gutter is **OUTSIDE** the end frame and the two flanges that form the angle of the roof and side are **INSIDE** and tight up against the bolt slots of the roof and side corner bars (**Key point**).

The extra bolts inserted into the corner bar during gable end assembly can now be slid into the slots in the eave bar to secure the corner.

2. The bottom cill attaches to the inside of the corner bar. The bolt placed in the bolt slot of the corner bar during gable end assembly will slide down into the slotted hole at the end of the cill.

3. Do the same operation with the left hand gable and front frame.

4. Next, attach the horizontal front angle and two diagonal angles to the extra; third bolt inserted in the side corner bars.



B The next step is to put the roof on and this is done in 3 stages

1 Attaching the ridge

Firstly insert the glazing beading into the $\nabla\emptyset$ groove, then in the same way the gutter slotted into the corner bars so too does the ridge. Slot the ridge on to the corner bar, ensuring that the flat side of the ridge is facing the wall. The bolts inserted in the roof corner bars at original frame assembly can now be slide into the slots at the end of the ridge. **(Key point)**

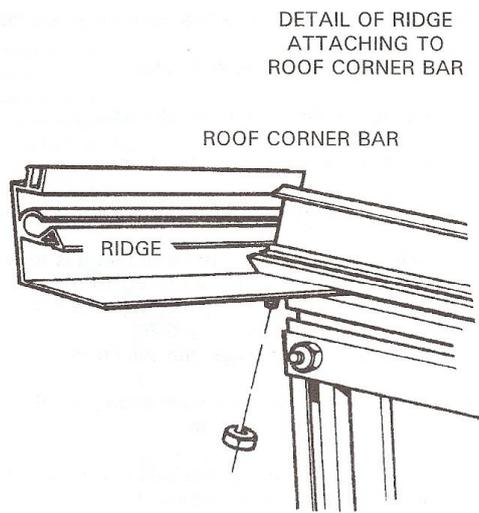
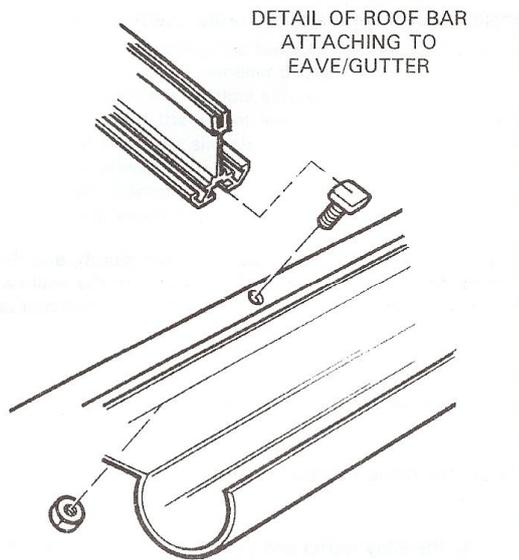
2 Securing the roof bars

A Firstly thread the glazing bead into the grooves of each roof glazing bar, as previously described in an earlier section.

B Slide one bolt into one roof glazing bar and place it through the hole in the flange of the gutter/eave bar as seen in the diagram. Add a nut and finger tip tighten.

C From the top of the glazing bar slide a bolt into the bolt slot. This will be used to secure the glazing bar to the hole in the flange of the ridge.

D From the top of the glazing bars which are either side of the position of the roof vent, slide a bolt along the bolt slot to about half way down. Put a nut on and finger tip tighten. This will be used to secure the roof vent described later.

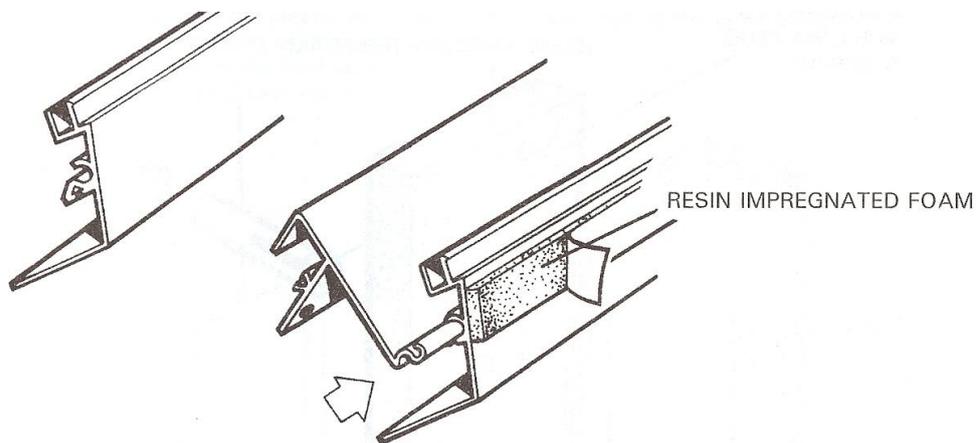


3 Sliding the vent into position

The hinge is a groove $\text{C}\emptyset$ joint, the female $\text{C}\emptyset$ is an integral part of the ridge, the male $\text{C}\emptyset$ being a part of the event top rail. (**Key point**) You must identify correctly these two sections.

Then slide the vent on to the ridge from one end. With the vent in the open position, push the event along the ridge until it covers the middle section (if your greenhouse is more than 3 panes long you must decide which section the vent is to be situated in). The two side rails of the event will overlap the outside edges of the middle two roof bars.

To prevent the event moving left/right during operation, insert a bead of silicone into the hinge part of the ridge at the end of the vent top rail.



The vent slam can now be fitted to the roof bars just underneath the bottom rail of the vent. The ends of the slam bar are cut out to go round the profile of the roof glazing bar. Secure the slam bar with the two bolts that were inserted when you fitted the bottom of the roof bars to the eave.

The slam bars in an unequal angle and it attaches to the roof with the longer part of the angle pointing skywards, i.e. toward the bottom rail of the vent, and the shorter part of the angle pointing to the gutter, i.e. the outside corner of the angle is facing inside the structure (**Key point**).

The frame assemblies and final unit shape are now complete, but there are three further steps to take:

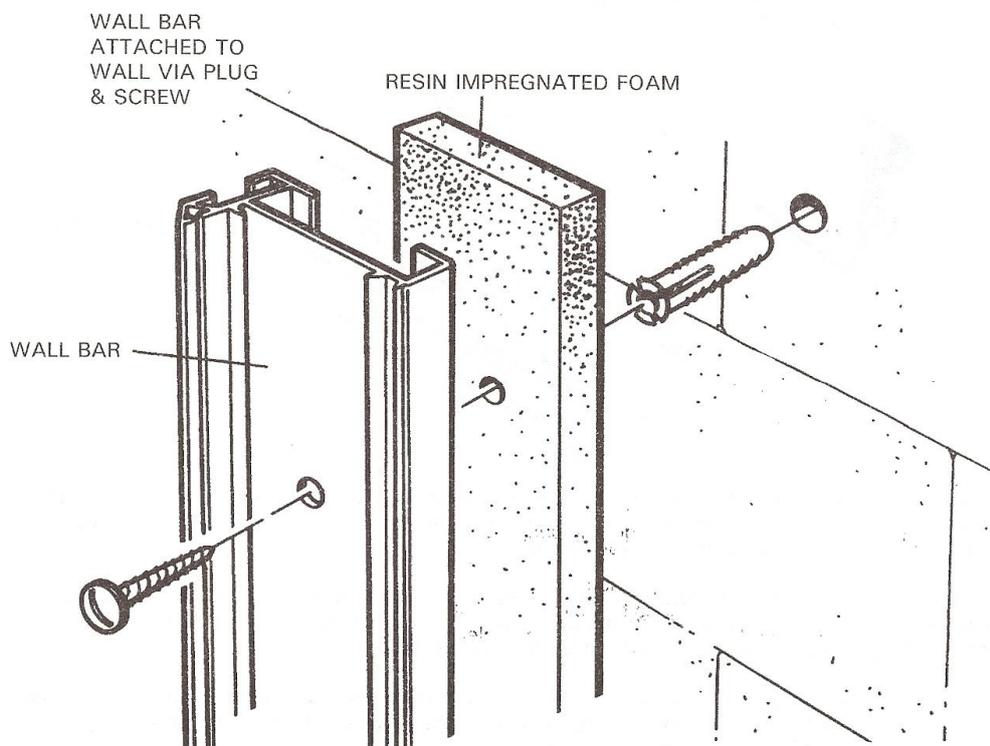
1. **Securing to the wall and base**
2. **Fitting the door track and the door**
3. **Glazing the completed structure**

SECURING TO THE WALL AND BASE

1. Offer the structure to the wall that it is to abut, ensuring that the verticles (wall bars) are plumb, and that the building is square and at 90° to the wall (**Key point**). Mark the wall through the holes in the wall bar and ridge. Then remove the structure to another location and drill through into the wall at the pre-marked locations with a masonry drill. Insert the plastic plugs into the holes.
2. The coil of paper-back resin impregnated foam rubber can now be stuck on to the wall side of the ridge and wall bars (**Key point**).
3. Offer the structure to the wall again and screw through the holes into the pre-located plastic plugs in the wall with the screws provided.

If your wall is not plumb, it may require packing between the alloy frame and wall.

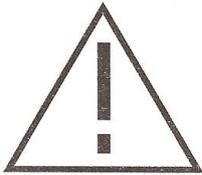
4. Having successfully anchored the structure to the wall you can now secure it to its base. You must ensure that the structure is square and level and that your wall is plumb and the base (alloy or brick) is set at 90°C to the wall it abuts (**Key point**).



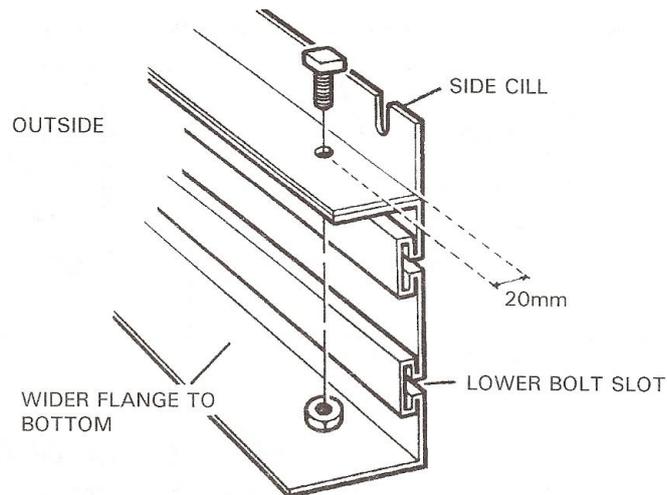
A. Alloy base

Having assembled the base as previously described earlier in the booklet, place the greenhouse on top of the upper base flange, i.e. smaller of the two flanges, position the greenhouse so that the back vertical edge of the cill is level with the vertical side of the base. Because our base is assembled by using bolt slots, it is not too difficult to adjust the overall length and width of the base by loosening the nuts holding the corners and moving the wall of the base slightly in or out to line up the precise position of the greenhouse. Having arrived at this position you need to drill through the cill and the upper flange of the base. Between each vertical glazing bar, drill 7mm holes, 20mm in from the corner of the cill/angle, put the holes in the cill in the centre between the vertical glazing bars, insert a bolt from the top and put a nut on from the underside, tighten all nuts (**Key point**).

B. Brick base



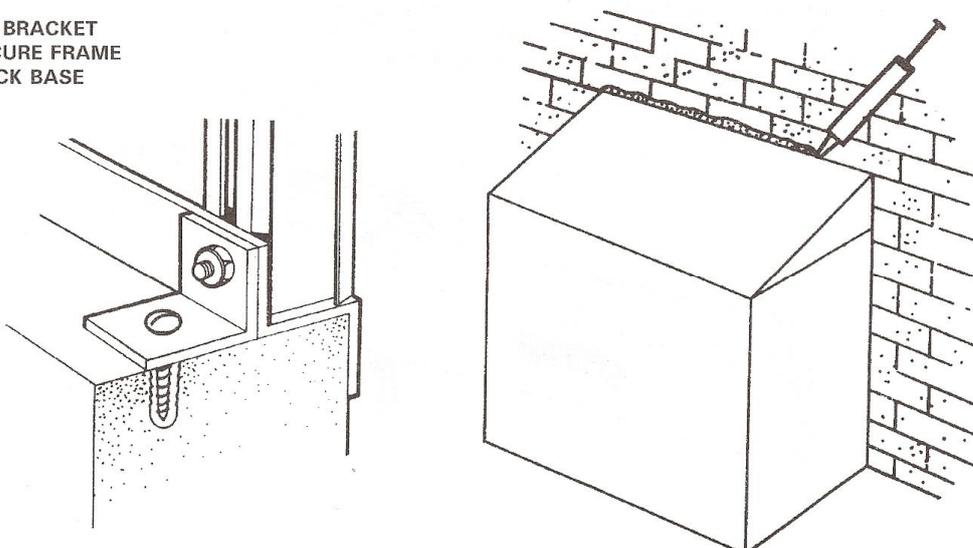
DANGER PLEASE USE
EXTREME CARE WHEN
USING AN ELECTRIC
DRILL



There are a number of small angle brackets in the pack of fittings; these are to be bolted onto the upright glazing bars at the point where the cills are attached to them. Before bolting them to the frame, first mark the brickwork where the holes are to be drilled. Drill the holes with a masonry bit and insert the plastic plug. Secure the small angle to the uprights and screw through the hole in the angle into the plug as illustrated.

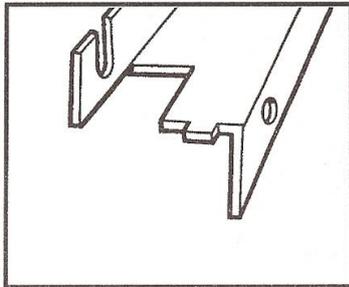
The structure is now ready for the final sealant. There is a tube of silicon and a skeleton gun in the pack which you can now use to seal between the wall bars and ridge and the brick wall.

ANGLE BRACKET
TO SECURE FRAME
TO BRICK BASE

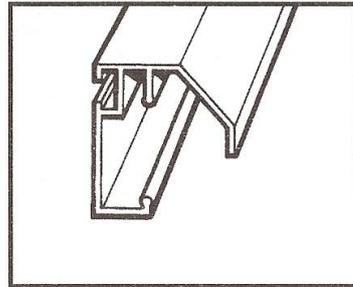


FITTING THE DOOR TRACK

1. The door track has a continuous bolt channel in the flat section of the bar. Slide 3 bolts into the bolt channel and line up with the 3 holes in the previously inserted door track support. (See door end gable assembly section of this booklet).
2. Loosely add the nuts and slide the door track left or right so that it covers the area of the door in the open and closed position



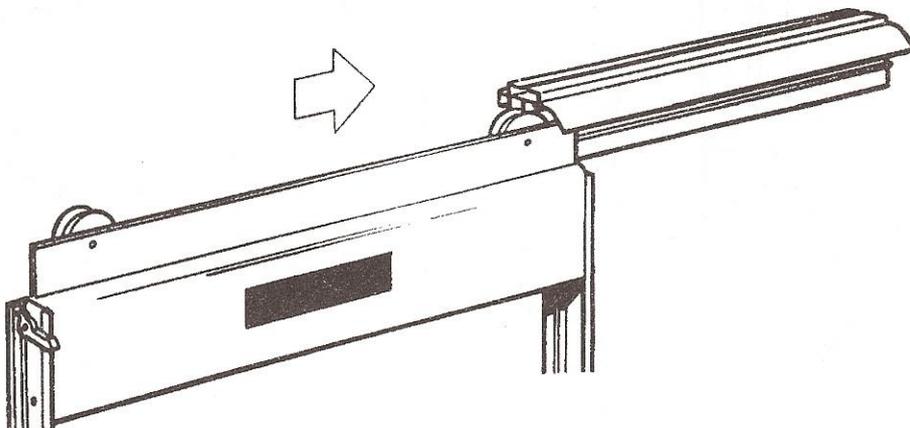
DOOR TRACK SUPPORT



TOP DOOR TRACK

FITTING THE DOOR

- a. Hold the door frame assembly in front of the door opening, to the left if your right hand gable is the door end, to the right if your left hand gable is the door end.
- b. Align the door wheels with the guides in the door end.
- c. Set the first door wheel into the track with the bottom of the door inside the cill section
- d. Slowly push the door towards the wall bar, making sure the nylon door skid remains in the bottom cill guide.
- e. Continue moving the door towards the wall making sure the second wheel correctly enters the top door track. When the black rubber door butts up the glazing bar, carefully ease the door past the bar by moving it inwards to allow the door to move past.
- f. Make sure the nylon guide remains in the door guide at the bottom
- g. The door can now be adjusted slightly up or down to afford proper unhindered movement by loosening the bolts, holding the door track support and moving it up and down.
- h. Attach a flat bar bracket (approx 80mm long with 2 holes of different size and found in the fittings bag) to the unsupported end of the door track using the bolt channel at the back. When you are happy that the door is moving correctly, slide the flat bar along the door track until the smaller hole of the flat bar meets the self tapping screw groove in the roof corner bar. Insert a self tapping screw and secure.



This will prevent the door track from any sagging when the door is in the open position.

INSTALLATION OF SINGLE FRONT DOOR

1. Firstly you must decide which bay the door opening is to be.
2. Having decided where the door is positioned, install the door track support at the door opening bay utilising the unoccupied bolts in the glazing bars. Fit the door track support approximately 10 below the gutter but for this application the bar goes in the opposite way i.e. outer uø slot facing down.
3. Attach the door track in the same way as outlined in the door end section of this booklet using the bolt channel at the back of the door track.
4. Slacken off the nuts on the door track support and move the door track as high as possible so that the door track is touching the underside of the gutter.
5. The small flat bar support fits to the bolt channel at the back of the door track approximately 25mm from the end and can be self taped onto a corner bar or glazing bar at a slight angle. This will support the door track when the doors are in the open position.
6. Door track is now fitted and ready for the addition of the door.
7. Before fitting the door you must cut away the horizontal bracing angle using a hacksaw and metal file, to afford access through the door opening.
8. Fit the door in the same manner as previously described in this booklet
9. Single front door installation is now complete.

INSTALLATION OF DOUBLE FRONT DOOR

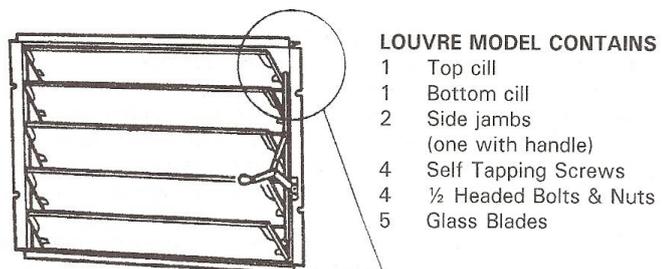
1. You must first establish which two bays the doors are to be fitted over.
2. Having established this, remove the middle glazing bar which would have been positioned between the doors. Fit the main door track support in the same way as for a single front door.
3. Offer the door track to the door track support directly under the gutter.
4. Fit 2 small flat bar supports to the bar left and right of the door track and self tap into the corner bar (or glazing bars), similar to single door fitting above. Remember the flat bars will be at a slight angle when fitted.

5. The door track is now fitted and ready for the addition of the doors.
6. Before fitting the door you must cut away the horizontal bracing angle using a hacksaw and metal file, to afford access through the door opening.
7. Fit the door in the same manner as previously described in this booklet. For the double door, fit the left hand door from the left hand side and the right hand door from the right hand side.
8. The installation of the double door is now complete.

5 BLADE LOUVRE

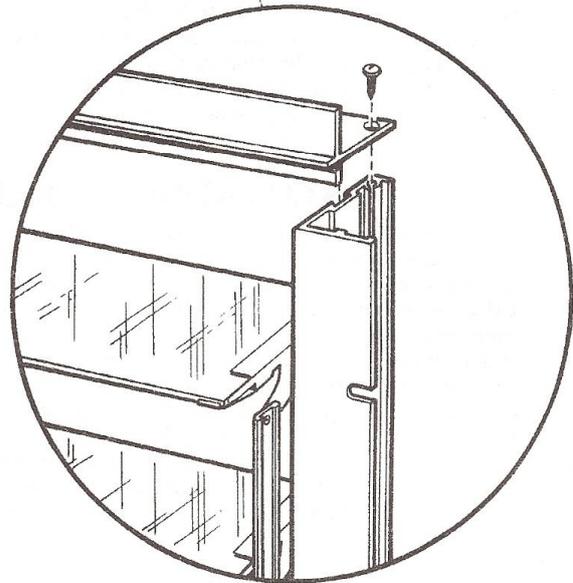
Procedure

1. Place top cill into position on side jamb of louvre and secure with self tapping screws.
2. Do same on the other top corner
3. Do same with bottom cill
4. Please note that the handle is on the right hand side, the above diagrams are viewed from the middle
5. To fit the louvre to the side, utilise the extra bolts you inserted during side frame assembly. Insert a glass pane at the bottom, bolt the louvre to the framework and slide it down so that the bottom cill of the louvre frame is touching the pane of glass. With the louvre in the open position, insert the 5 glass blades from the inside. Insert the upper pane above the louvre.



LOUVRE MODEL CONTAINS

- 1 Top cill
- 1 Bottom cill
- 2 Side jambs
(one with handle)
- 4 Self Tapping Screws
- 4 ½ Headed Bolts & Nuts
- 5 Glass Blades



INSTALLATION OF 5 BLADE LOUVRE TO THE STRUCTURE

The louvre can be installed to either the fixed gable end or front assembly. This position might not be variable depending upon your door position

1. The louvre must be fitted after the unit has been fully assembled and anchored to the wall and base, and prior to glazing.

2. The louvre is fitted to the wall bar and glazing bar of the fixed gable end utilising the 4 unoccupied bolts previously inserted into the bolt slots of the glazing bars concerned during original assembly.
3. The louvre is fitted from the inside of the structure with the angle jambs fitting around the glazing bar. N.B. The handle is on the inside of the greenhouse and the right hand side as viewed from inside the structure.
4. To determine the height, install a pane of glass under the louvre (glass size dependant upon style of glass and desired louvre height- see relevant glazing plan
5. Offer the louvre frame to the bolts; add the nuts and finger tip tighten
6. Slide the completed framework to the top of the pane of glass so that the bottom cill of the louvre rests on the glass.
7. Tighten all nuts
8. Louvre frame installation is now complete.

GLAZING THE STRUCTURE

Having anchored the structure to the wall and its base, observing the earlier comments about levels, square etc, you can commence glazing.

If you are out on any of the 4 key points i.e.

1. Plumb wall
2. Level base
3. Square base
4. Base set at 90° to wall

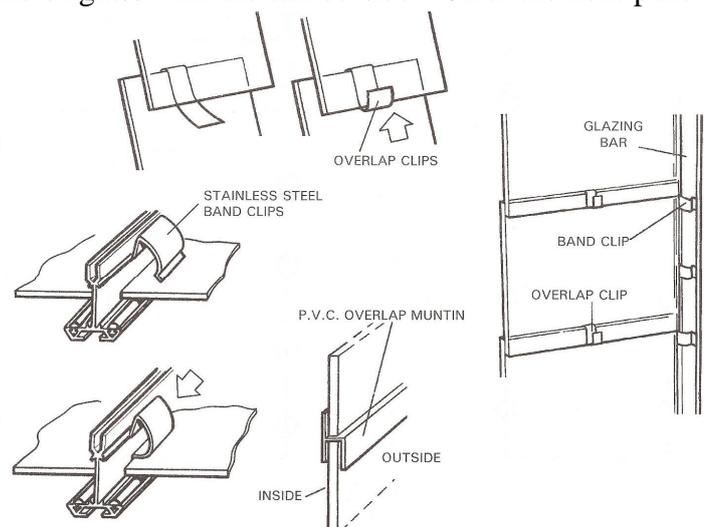
Then you will have difficulty in glazing. So please be sure before starting this section of construction

1. Horticultural glass

Each section has a number of panes; please refer to the chart on the next page for the specific sizes and quantities.

With each section start with the bottom pane of glass (**Key point**) insert, 2 stainless steel band clips approx 6ö (150mm) from the bottom, and 2 more approx ¾ö (20mm) from the top.

Put one overlap clip on to the top of the pane of glass with the tail outside. Offer the next pane of glass to the glazing bars resting the glass on to the two upper clips. Exert some pressure onto the upper pane of glass with one hand and bend the overlap upwards to form a hook with the other hand. Insert 4 more stainless steel clips as outlined above. Do the same with the next pane of glass and throughout the rest of the glazing. N.B. the vent slam bar can be adjusted up/down to afford proper opening and closing and to



ensure that the glass panes under the vent fit correctly.

2. Toughened Glass

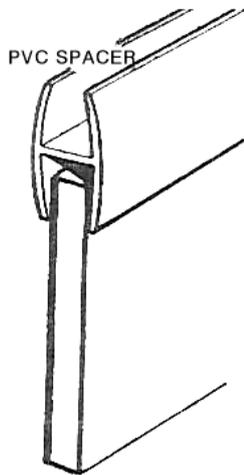
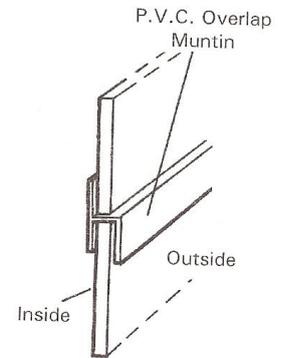
Key Point – if you have ordered PVC bar capping, please consult the separate capping installation sheet before glazing as the clips might differ for each glazing method

The toughened glass option is in single sheets, apart from the shapes.

The glass fits in the same way as the horticultural but there are no overlaps, use 8 stainless steel clips per large pane of glass.

Where you have 2 pieces of glass butt jointing together, you use the PVC muntin as indicated.

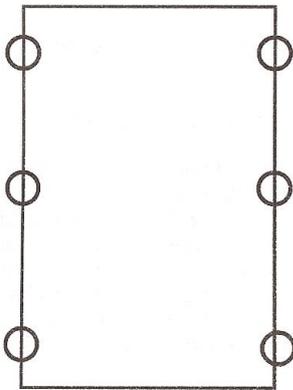
N.B There are a small number of stainless steel wire clips which you use immediately behind the door i.e. the section of glass that the door opens on to. This applies to both the horticultural and toughened glass options.



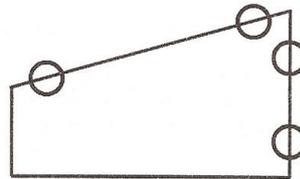
The glass to fit along the front (under the gutter) is required to be longer than the glass supplied. To overcome this, you will find a number of PVC spacer bars inside the packet of glass delivered (full sheet toughened glass only). This spacer must be fitted to the top of the front pane before the glass is installed to the front assembly. Please see diagram below

CLIP CONFIGURATION FOR TOUGHENED GLASS

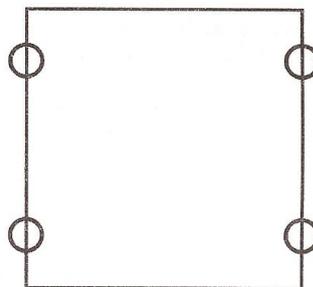
For panes of glass not exceeding 1100mm long



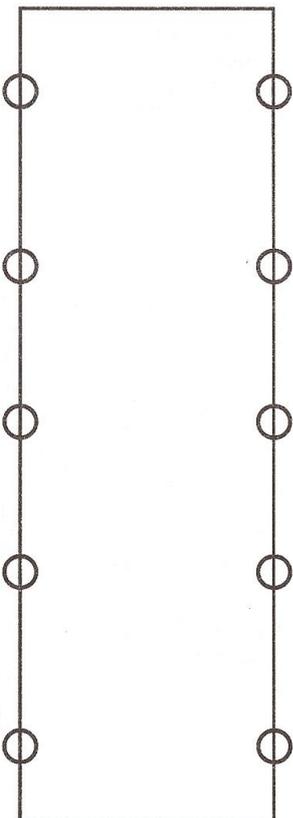
For shapes, stainless steel clips should be arranged as seen below
(in all the following diagrams, a circle indicates a clip)



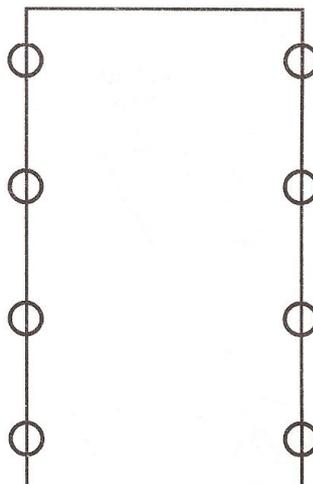
For panes of glass not exceeding 750mm long



For panes of glass not exceeding 2000mm long



For panes of glass not exceeding 1500mm long

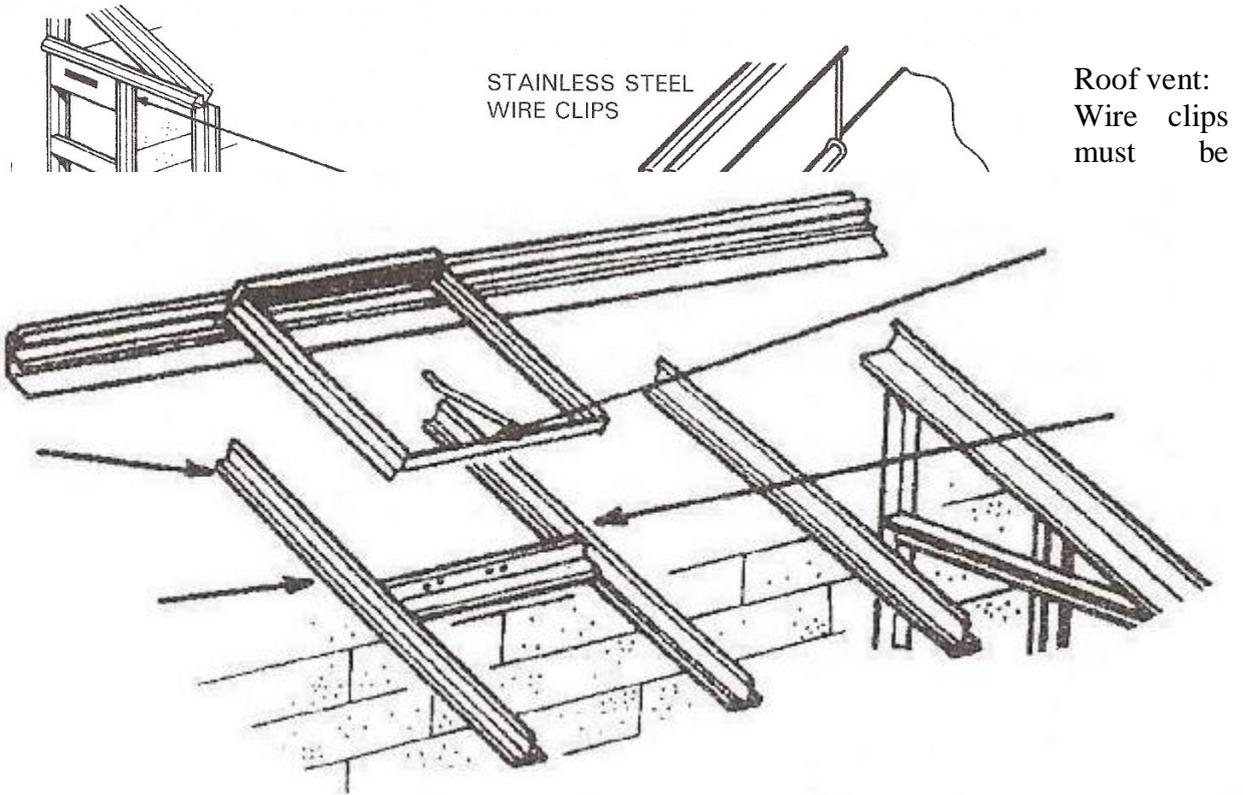


Wire clips
Wire clips are used to replace the stainless steel clips in the following situations.

Wire clips replace the stainless steel band clips completely if you are installing bar capping—see separate capping instruction sheet

Door:
Wire clips are to be used on the glass behind where the door slides. Wire clips

are only needed on the left hand side of these sheets of glass. See the diagram below.



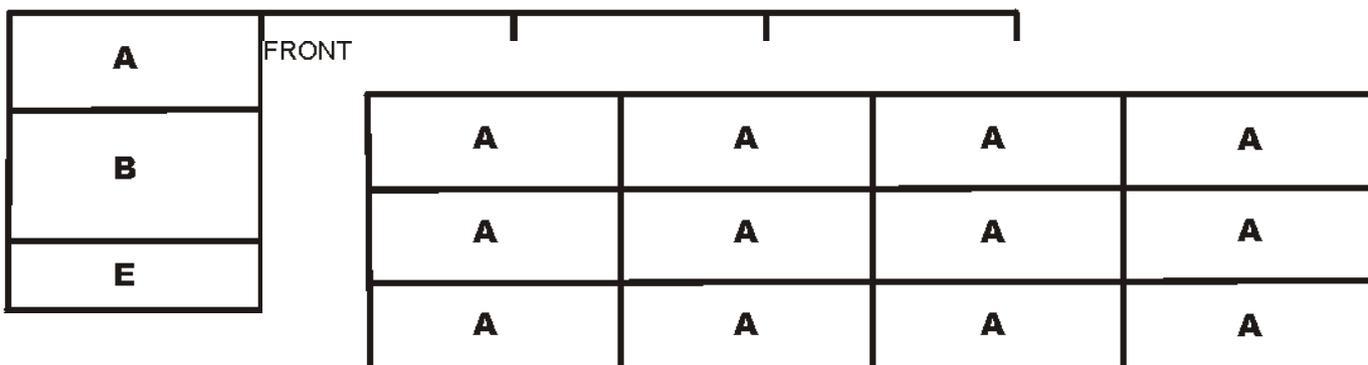
used on the panes of glass either side of the vent. The wire clips are only necessary on the sides of the glass nearest to the vent. This is because the vent side rails overlap the roof glazing bars. See diagram below.

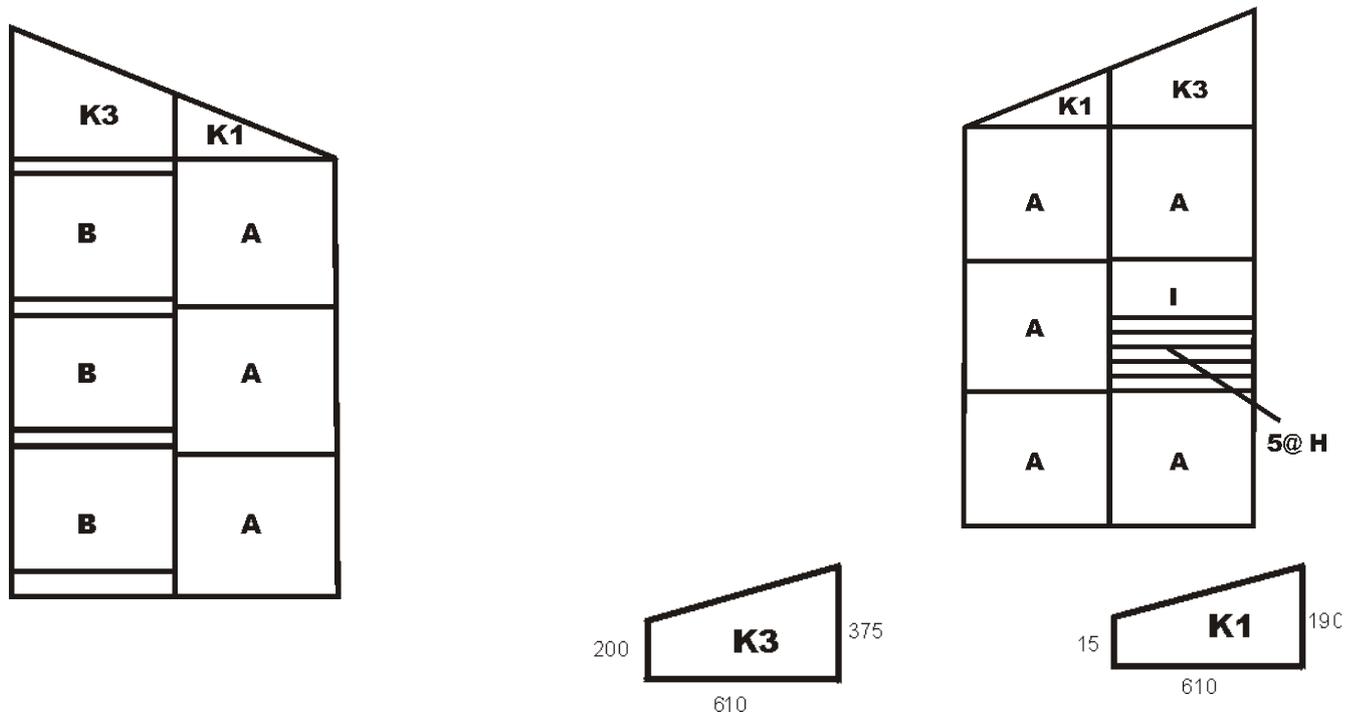
4' WIDE LT. HORTICULTURAL GLASS

If the position of the door is single front, swap a bay of A panes from the front with the door and B panes from the door end.

If the door is double front, replace two adjoining bays of A panes from the front with 6 B panes and replace missing glass in door end with 3 A panes.

ROOF





Ref size	A	B	E	H	K1	K3	J	I
6 x 4	20	6	2	5	2	2	1	1
8 x 4	24	7	3	5	2	2	1	1
10 x 4	28	8	4	5	2	2	1	1
12 x 4	32	9	5	5	2	2	1	1

3mm HORIZONTAL GLASS PLAN

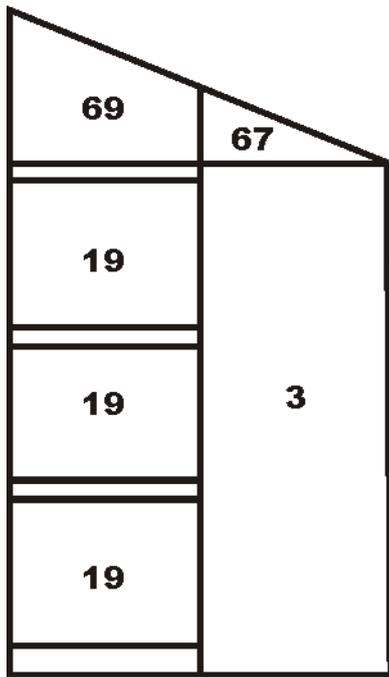
Rear end

If an extra louvre is added, replace an A from the required position with an I and 5-H

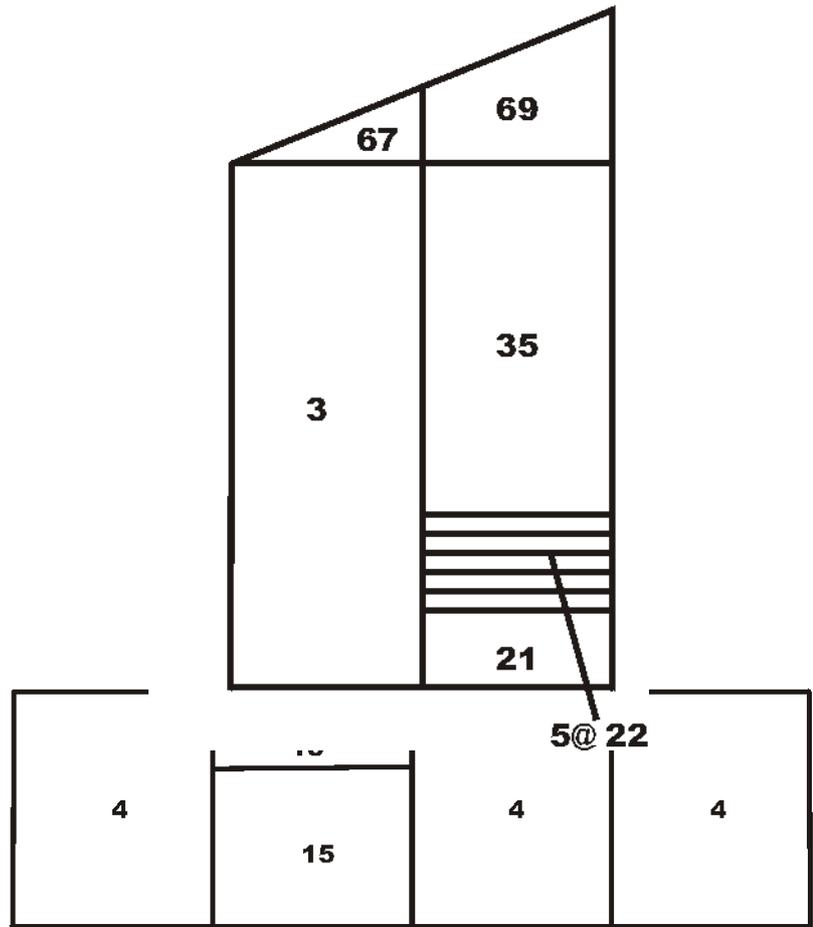
Code	Width (mm)	Length (mm)
A	610	610
B	610	457
E	610	305
H	573	100
I	610	140
J	610	280

4' WIDE LT. TOUGHENED GLASS PLAN REAR END

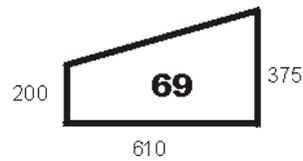
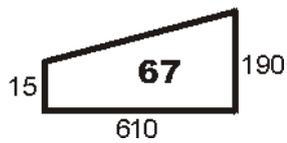
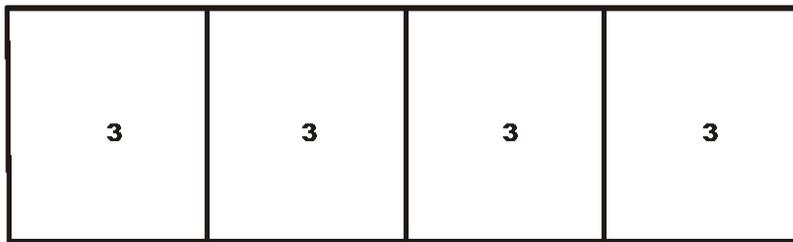
DOOR END & PARTITION



ROOF



SIDE



Ref Size	3	4	15	18	35	19	68	67	22
6 x 4	5	2	1	2	1	3	2	2	5
8 x 4	6	3	1	2	1	3	2	2	5
10 x 4	7	4	1	2	1	3	2	2	5
12 x 4	8	5	1	2	1	3	2	2	5

SCHEDULE: 4mm TOUGHENED GLASS

Code	Width (mm)	Length (mm)
3	610	1775
4	610	1322
15	610	725
18	610	610
35	610	1185
19	610	457
22	573	100
21	610	140

If you have an extra roof vent, you would need to replace a ref 4 with an 18 and a 15. If you have an extra louvre, replace an ref 3 with a ref 21 and 35 plus the louvre itself. You can alter the louvre height by reversing the glass panels above and below, but you must ensure you have glass above and below the louvre

Should the position of your door be front, replace 1-ref 3 with 3- ref 19 panes and the door. Should door be double front door, replace 2- panes ref 3 with 6- panes ref 19 and two doors.

FINISHING OFF

Now you have successfully completed the full installation of your lean-to greenhouse, there may be just a couple of things that require attention.

1. Ensure that you have neatly inserted silicone along the ridge and down the wall bars. Also at the point where
 - a) The ridge, roof corner bar and wall bar meet, there may be a gap at this junction which can be filled in with silicone from the inside and tidied up with a knife from the outside.
 - b) At the part where the corner bars and gutters meet, once again a gap can occur that may require filling. Unlike the ridge joint, this is best done by inserting the silicone from the outside.
2. To avoid seepage of water between the cill of the structure and the brick base, it is best to put a fillet of cement to cover any gaps that may be there. When the cement has set, to finish the job off properly, give the fillet a coat of specialised paint to act as a further water barrier.
3. Ensure that all nuts and bolts are tight and that glazing clips and overlap clips are pushed securely into place.
4. Check that the door runs correctly and is properly secured. The catch must be in the downward position when the door is moving and then rotated 1/8 turn upwards to lock the door in place.
5. Maintenance with an alloy greenhouse is minimal but ensure that the door top and bottom tracks are free from debris which will inhibit its movement. The louvre has a number of moving parts which may require lubrication once in every 6 months with lubricating fluid of some kind.
6. Replacing broken glass requires care and attention:

- a) Always wear protective gloves and eye protectors.
- b) Remove the broken pieces from the frame; you may need a screwdriver or a knife to remove some of the smaller bits.
- c) Do not attempt to remove a piece of glass still held in with clips, use a pair of pliers to remove the clip.
- d) If it is a lower pane of glass that needs to be replaced or removed, you must first remove the upper panes.

OPTIONAL EXTRAS

RAIN WATER KIT FOR GUTTERING

