

# **Support assembly instructions**

This document contains diagrams to aid assembly of a rhizobox support structure. This support is designed to hold rhizoboxes (see file 'Rhizobox assembly instructions') at a 45° angle with the glass surface of the rhizoboxes facing downwards. This means that the roots mostly grow against the glass surface so are visible and can be imaged. The support is constructed from slotted angle and slotted flat bars that are fastened using nuts and bolts. Parts and example sources are shown in Table 1. The length of bars needed are shown in Table 2, equipment needed in Table 3 and instructions for assembly are shown in figures 1-14. Before starting it is advisable to read the whole of this document.

## **Safety**

This document suggests the use of power tools, hand tools and adhesives. Follow all safety instructions which is provided or appropriate for any equipment used. Appropriate personal protective equipment should be used at all times such as gloves, eye protection etc. Work with tools should only be carried out by competent persons. Tools and materials can become hot when cut or filed and should be left to cool before handling.

Some of the components in this document are heavy. These components should be handled carefully and following manual handling guidelines. Further to this glass can be damaged and contain sharp edges. Glass should be handled with care using gloves and any broken glass should be disposed of appropriately.

Any work which uses tools or requires lifting is best carried out with two or more people.

**Table 1**

Part	Description	Example part source, country
Slotted angle bar	L-shaped profile, slotted to join	<a href="#">Racking Man, UK</a>
Slotted flat bar	Flat profile, slotted to join	<a href="#">Racking Man, UK</a>
Nuts and bolts	To fit slotted bar holes (likely M8)	<a href="#">Racking Man, UK</a>
Bracket	Plain for holes to be drilled or to fit where needed	<a href="#">Aluminium Warehouse, UK</a>
Trays	To fit rhizoboxes e.g. 110x55x4cm & 60x60x7cm	<a href="#">LBS horticulture, UK</a>
Polystyrene	To fit between rhizoboxes e.g. 120x60x6cm	<a href="#">Custompac, UK</a>
Anti slip mesh	Waterproof/ water resistant	<a href="#">Rugs and Stuff, UK</a>

**Table 2**

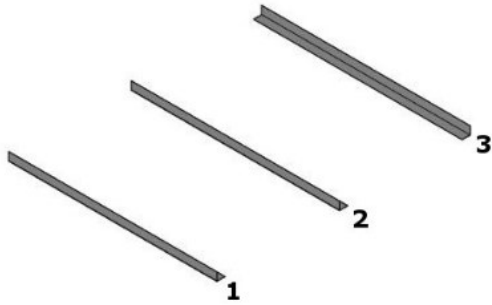
Bar number	Length (cm)
1, 2, 3	102
4, 5	60
6, 7	64
8, 9, 10	99
11, 12, 13	140
14, 15, 19, 20, 21, 22, 23	124
16, 17, 18	75
24, 25, 26*	59
27, 28, 29*	54

All bars are angled except \* which are flat.

**Table 3**

Equipment	Description
Spirit level	To assist in assembling pieces at correct angles
Carpenters angle	To assist in assembling 90° angled pieces
Metal saw + blade/s	Hacksaw suitable to cut 1.7mm thick steel
Measuring tape	To assist assembling pieces of correct lengths
Spanner/ ratchet	To fit bolts and nuts (likely M8 & 6)
Metal file	Round, approx. 5mm diameter

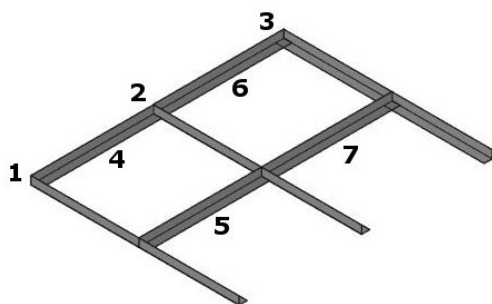
# 1



Bars 1-23 are slotted angle bars. This can be bought in the correct lengths or cut to size using a saw.



# 2

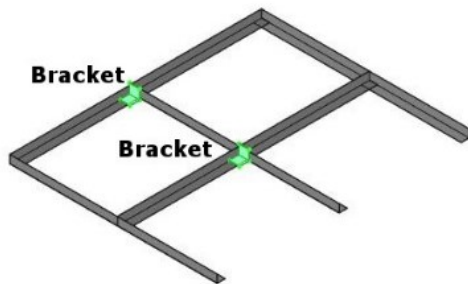


Bars 4-7 are at 90° to bars 1-3.

Bars should be cut precisely and assembled at exact angles. A spirit level and carpenter's square/angle measurer should be used and will minimise misaligned holes and bars.

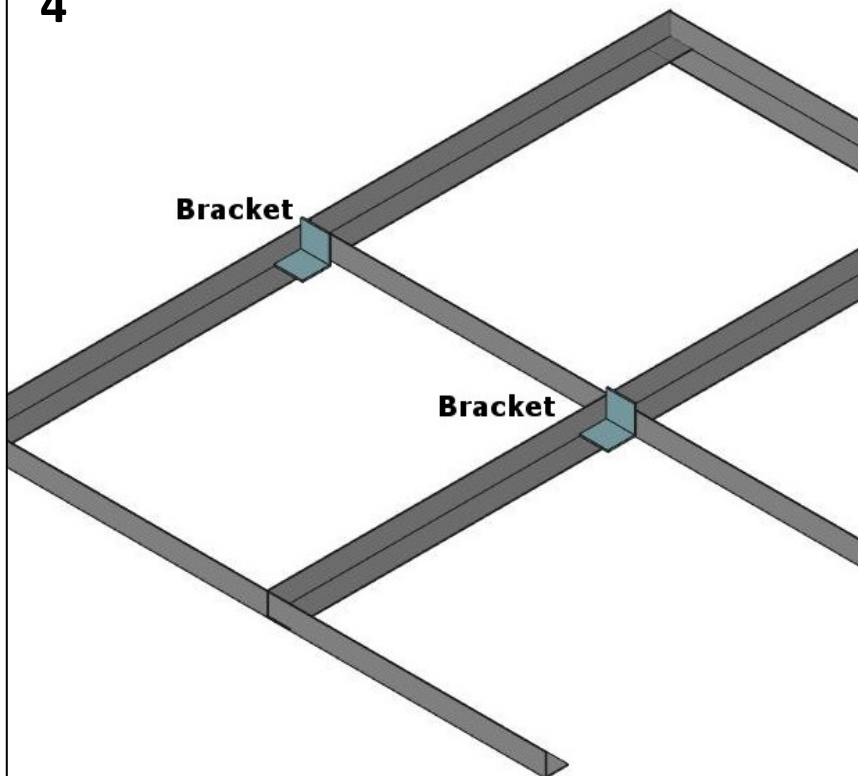
Bars 5 & 7 should be placed 72.5cm along bars 1-3.

3

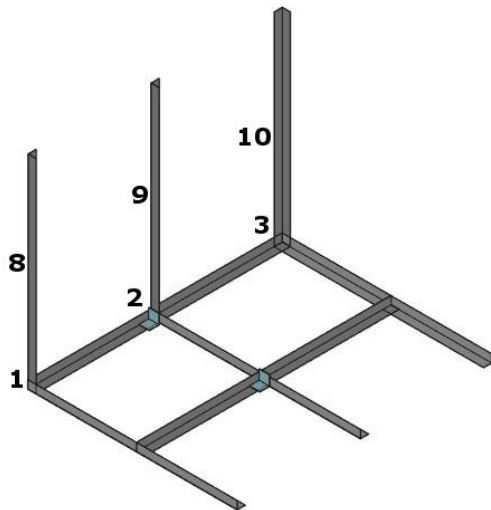


Bars 4 & 5 require a bracket to connect to bar 2. This is best done where custom holes can be made in a plain bracket to ensure the holes align. If this is not possible a bracket with holes should be selected to fit.

4

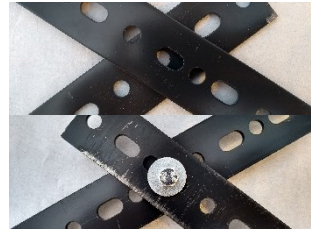


5

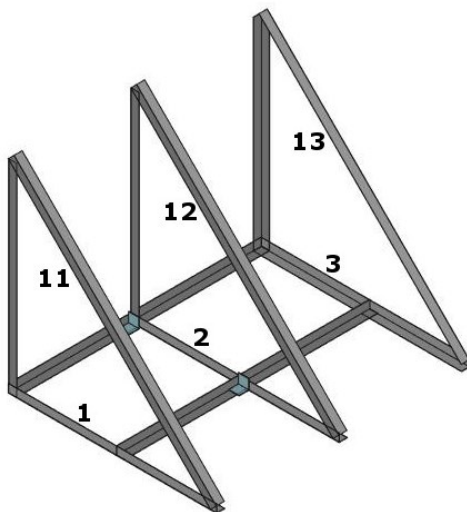


Bars 8-10 are at 90° to bars 1-3.

Occasionally holes may not be aligned. In these cases a smaller diameter of bolt can be used and supported with washers and/or the hole/s can be extended with a metal file.

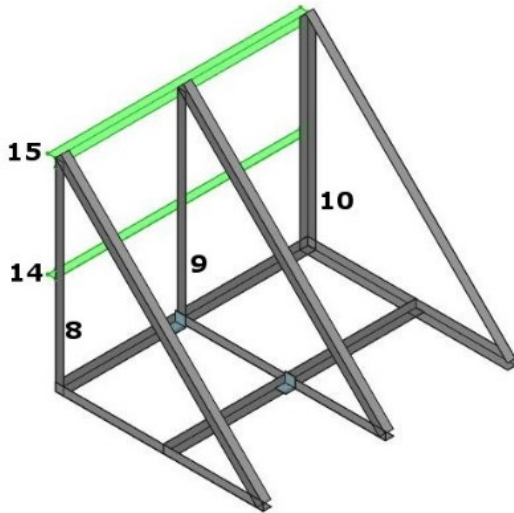


6



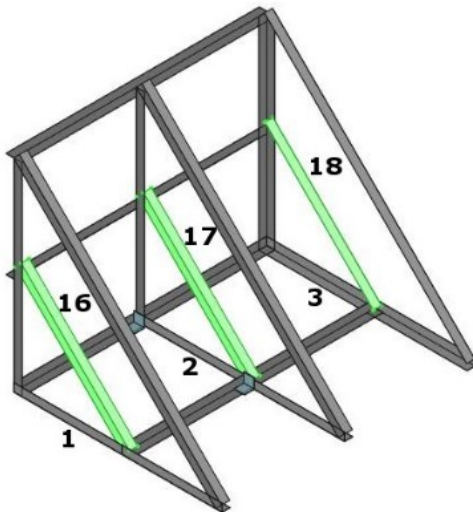
Bars 11-13 are at 45° to bars 1-3. It is important that these bars are parallel and aligned with each other because they are in contact with the rhizoboxes.

7



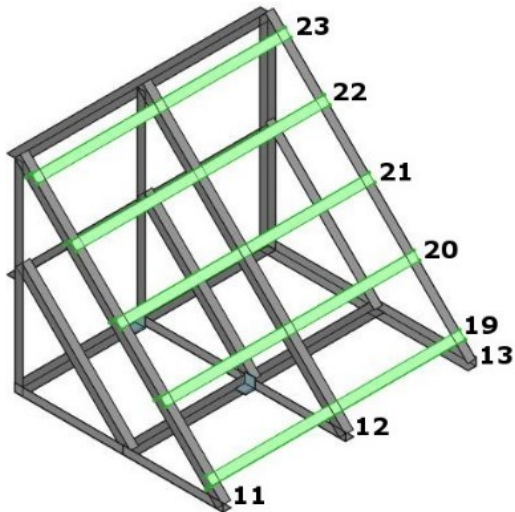
Bars 14 & 15 are at  $90^\circ$  to bars 8-10. Bar 15 should be positioned at the top and bar 14 at the middle of bars 8-10.

8



Bars 16-18 are at  $45^\circ$  to bars 1-3 although this is not important and these bars are only secondary support. Priority can be given to aligning holes rather than bar angle.

9

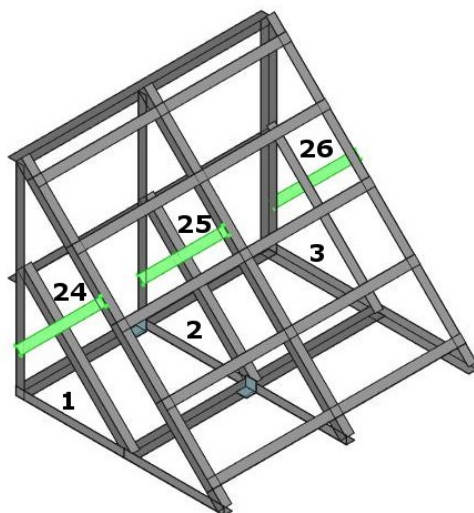


Bars 19-23 are at 90° to bars 11-13. These bars are in contact with rhizoboxes and so must be parallel, aligned and flat to ensure even support. These bars are cut at each end to fit around bars 1 & 3 and in the middle to fit around bar 2:



Bars 19-23 should be distributed equally along the length of bars 11-13.

10

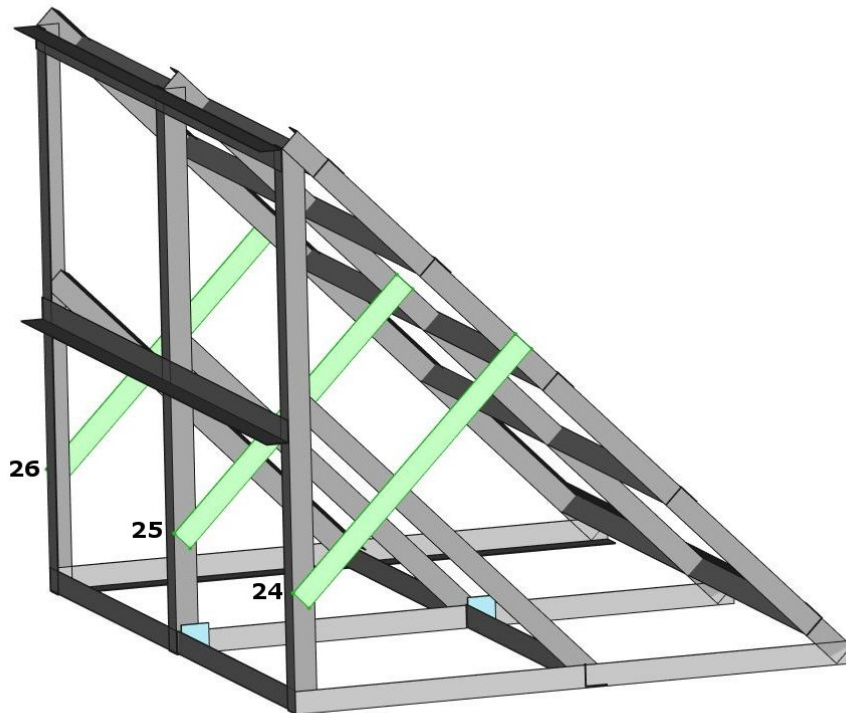


Bars 24-29 are slotted flat bars.

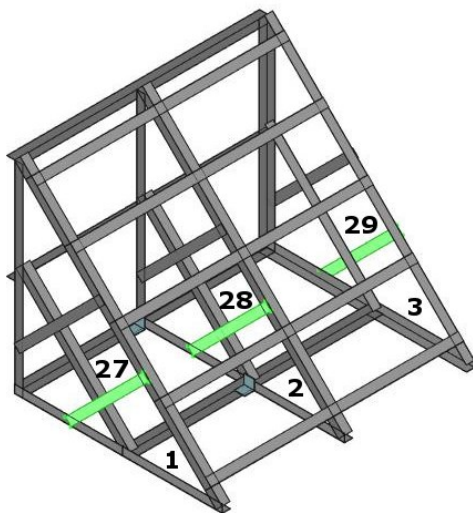


Bars 24-26 are at 45° to bars 1-3 although this is not important and these bars are only secondary support. Priority can be given to aligning holes rather than bar angle.

**11**



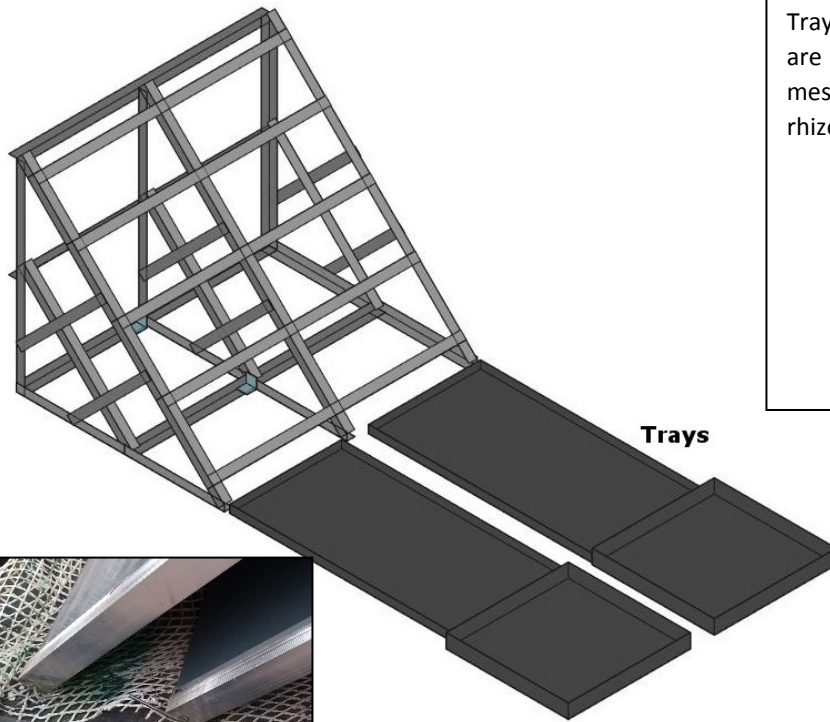
**12**



Bars 27-29 are at  $45^\circ$  to bars 1-3 although this is not important and these bars are only secondary support. Priority can be given to aligning holes rather than bar angle.



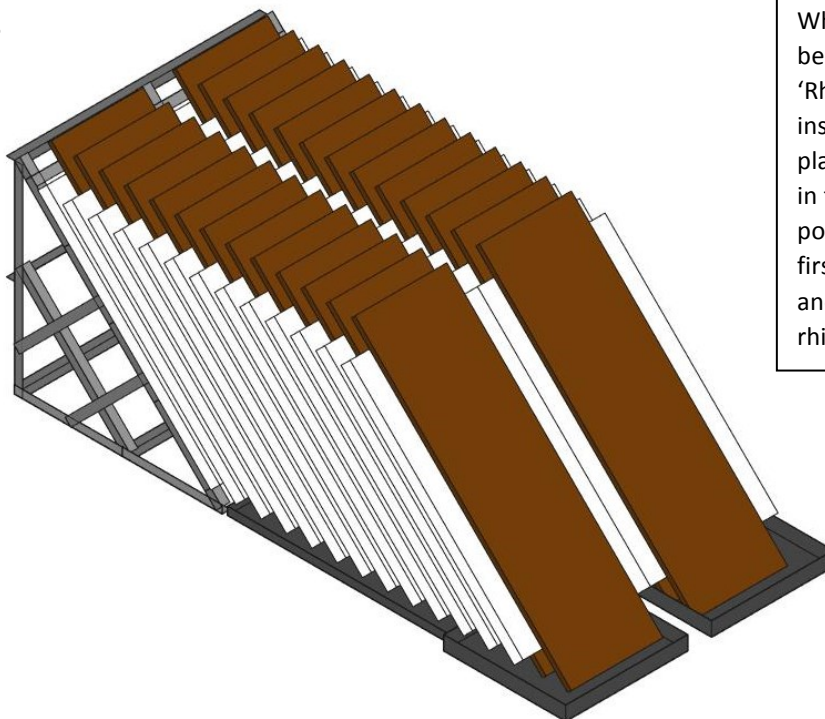
13



Trays hold rhizoboxes and are lined with anti-slip mesh to prevent the rhizoboxes from moving.



14



When rhizoboxes have been assembled (see file 'Rhizobox assembly instructions') they are placed against the support in the trays with a sheet of polystyrene between the first rhizobox and support and then between every rhizobox and the next.

