

Constructing, erecting and monitoring Pine Marten Den Boxes

Background

Den boxes are used to provide artificial breeding sites for pine martens, in areas where there is an absence of natural tree cavities. They have proved to be a very successful conservation tool in Scotland, with many boxes occupied year after year.

Martens use den boxes to:

- Raise young in spring/summer
- Shelter from bad weather
- Rest in during the day
- Stay safe from predation (foxes) above ground level.

We use them as:

- Temporary substitute for natural den/rest sites
- Monitoring tool for pine marten populations.

The key features of the VWT den box design are:

- Den chamber size is similar to natural den sites
- Good thermal insulation from the use of thick timber and boarding
- Reduced convection heat losses by having entrances at bottom and having a snug fitting lid
- Double “chimney” entrances give den chamber no external corners and so no rain penetration, increases insulation for the central chamber and gives animals a choice of entrance (mimicking many natural tree cavities).



These instructions and display materials were funded by a Biodiversity Grant from the Irish Environmental Network (IEN) and were first distributed at the Biodiversity Day at Rinvile Park Sunday 25th May 2014 organised by the People and Nature Project of Galway County Council.

Materials

The plywood used for the front, back and lid is 18mm exterior WBP (water and boil proof) grade. The timber, however, still needs to be painted and exposed edges need particular attention. Marine grade plywood would be better but is extremely expensive. The sides (both inner and outer) are cut from what is sold as 200mm x 25mm rough sawn timber, although the actual thickness of the timber may vary slightly and allowance for this should be made. The timber we use tends to be closer to 23mm thick. The timber for the battens on the underside of the lid can be cut as a pair from a single piece of c100mm wide softwood. The battens for the side should be cut to match these battens. These lid battens are generally cut from larger timber to suit the requirements. The exact dimensions are not critical as long as the fit is good. It might be necessary to make the lid panel slightly larger (or smaller) to suit the size of battens available.

All our softwood is CCA pressure treated (e.g. “Tanalith” or “Tanalised”), which gives a life expectancy of c30 years. In previous years the timber we used was treated using Tanalith ‘C’, but this is no longer available to the domestic user. The timber that is available is Tanalith ‘E’, which has undergone treatment using modern, environmentally friendly active ingredients and, although the timber may not last as long, it is a safer product to use and there are no reports of any undesirable chemicals leaching, which was a concern with the Tanalith ‘C’ timber. Another advantage is that a surface colouring compound can be added during treatment and it is possible to buy pre-coloured timber. We have used the dark brown colour on other types of boxes and find it helps disguise them ‘on the tree’.

Construction

A diagram showing the various components that make up a box is given at the end of this document, along with sketches to help with construction, and step by step instructions.

The boxes are fixed together using good quality galvanised screws. Screws do not suffer from the problems of ‘nail creep’ caused by expansion and contraction, which can cause the parts of nailed boxes to separate, letting the weather in. It is possible that ribbed nails delivered from a nail gun would be as effective as screws but we have not tried this.

Finishing

If CCA treated, the softwood needs no other treatment, but the plywood should be given two or three coats of exterior wood coating. Use the low odour water-based varieties that are designed for garden furniture, sheds, fences etc. Pay particular attention to exposed plywood edges and the lid, which will have to contend with slow draining water (and hopefully marten scats!). When dry, we suggest that each box has a unique number painted on the front. In the Timber Leaves guidelines, a piece of edging timber made of cedar is added to the box edges to provide additional weatherproofing.

Erecting

We fit these boxes on trees at a height of c4m, out of the way of ground-based predators and inquisitive people. Once a tree has been selected, two wooden battens (25mm x 50mm CCA treated softwood) should be nailed vertically to the horizontal battens on the rear of the box. These should be spaced so that they just keep the horizontal battens off the trunk. The length of these is unimportant as long as they reach between the horizontal battens.

The boxes are heavy (c.13kg or c.29lbs) and we strongly recommend the use of a simple rope strap and pulley arrangement so that a person on the ground can haul the box to the correct height. Using a ladder, a second person can then complete the fixing. Three loops of wire line are wrapped horizontally around the tree and box (fitting them under the protruding top batten) and then knotted off. We use best quality steel-stranded, plastic-coated washing line. Pulling downwards on the top of the box will cause it to jam firmly against the trunk.

Inspecting

Disturbing pine martens and their dens in Ireland requires a licence from the National Parks and Wildlife Service. We recommend checking for signs of occupancy of boxes by pine martens by looking for the presence of marten scats on the box lid from a distance of at least 20m. This avoids the need for a licence and, done quietly and infrequently (maximum twice per year), should avoid disturbance that might lead a pine marten to desert the box.

The main indicator that a box may be in use is the presence of marten scats on the box lid. Scats may also be present at the base of the tree. It is often possible to hear noises coming from within the box.

Maintenance

The box should require only basic maintenance. Check the attaching line to make sure that the tree is not growing into it. Just moving it slightly every few years might be enough to prevent this happening. The box will also require repainting every three years or so. Installing one of these boxes represents a considerable investment of money, time and effort, so it makes sense to maximise their life by proper care. Unfortunately there may not be a time of the year when pine martens can be guaranteed to not be in residence. However, September and October are probably the safest months to repaint, again using a low odour coating. Check for occupants first. It might be easiest to lower the box to the ground for painting.

Suggestions for choosing sites to install the VWT marten den box

The den boxes are likely to produce greatest benefits, in terms of improved habitat quality for pine martens, if they are installed in large, undisturbed, prey-rich woodlands where natural den sites such as tree cavities are scarce or absent. Commercially managed woodland, or unmanaged woodland dominated by trees of less than 100 years old, is likely to be suitable provided there is adequate prey and freedom from excessive disturbance or risk of persecution. Extensive, diverse woodlands and/or woodlands with good habitat links to other woodland are preferable to small, monocultural and/or isolated woodlands.

Within suitable woodland, trees for attaching boxes should be selected carefully to minimise the risk of interference or disturbance. For example, choose trees out of sight of public roads or footpaths and away from areas targeted for woodland management or harvesting in the near future. Boxes sited in areas of woodland that is diverse (in terms of structure, topography or species composition) may be more attractive to pine martens than those in monotonous areas.

Finally, when choosing a site for a box, bear in mind the future requirement to view the lid of the box through binoculars to check for signs of marten scats.

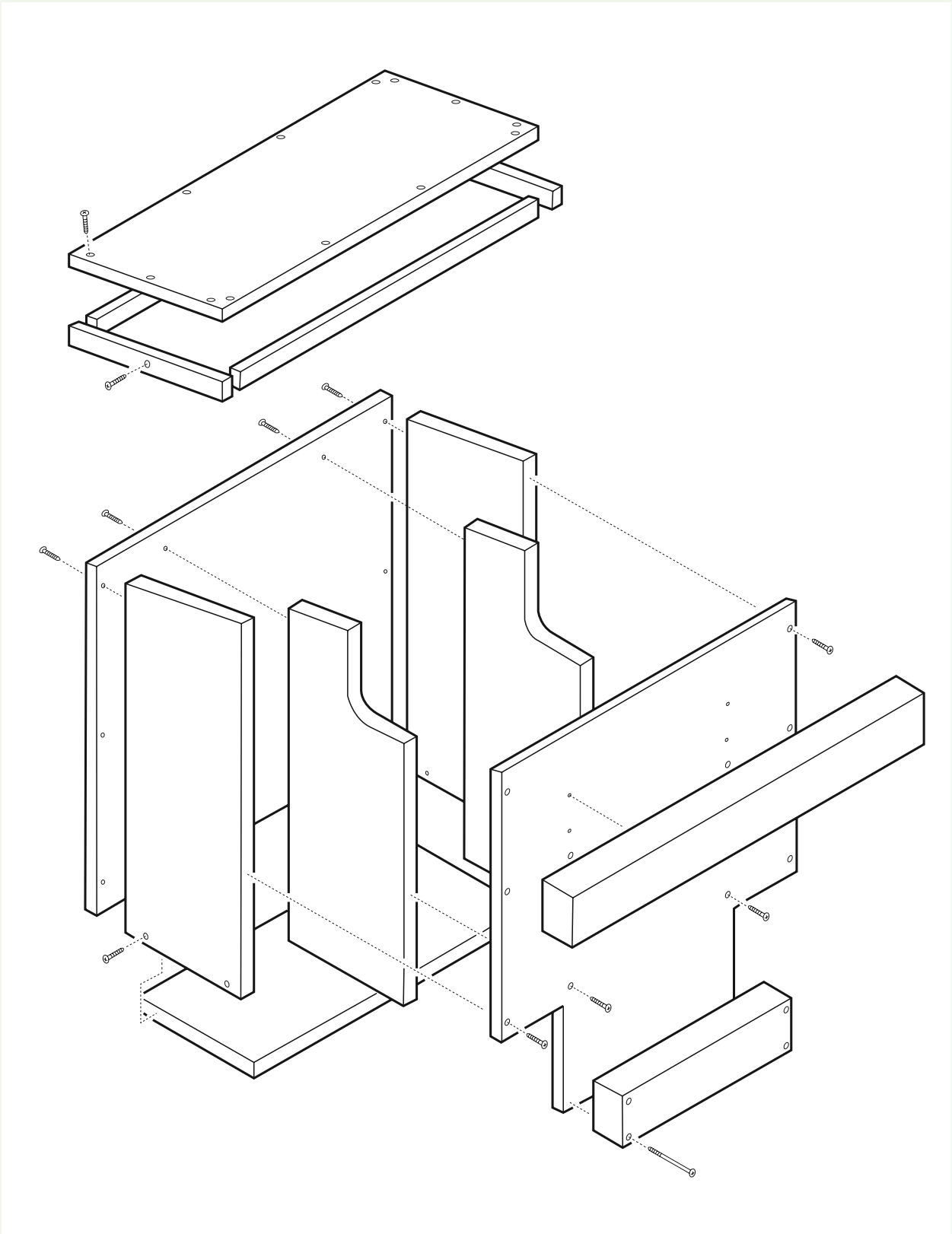


Den box © Nick Upton

Roof/Lid

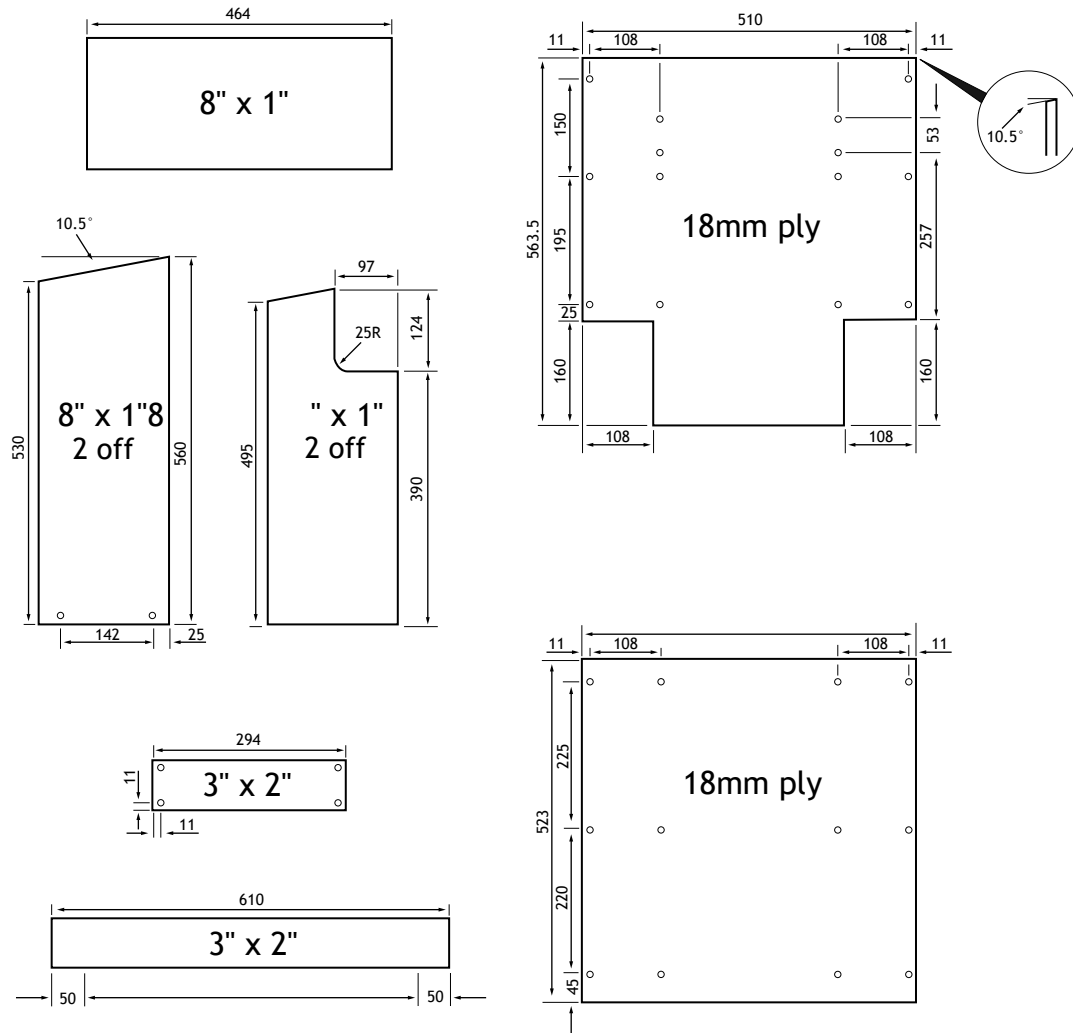
Our first boxes had a sloping lid to allow water to drain, but this made lid construction more difficult. We now use a flat lid, because tree trunks are rarely vertical and inevitably the roof will slope to some extent. We recommend the use of a piece of bitumastic roofing felt (of the type used on garden sheds - cut to fit and tacked on) to help with waterproofing. If this modification is used it should be achieved by increasing the height of the front to match the back, with appropriate adjustments to the softwood sides and partitions. The lid itself will need to be slightly shorter from back to front. We have also used a natural slate on some boxes, which is also suitable, but possibly not as readily available, or as cheap, as the felt option.

VWT plan of the components of a den box

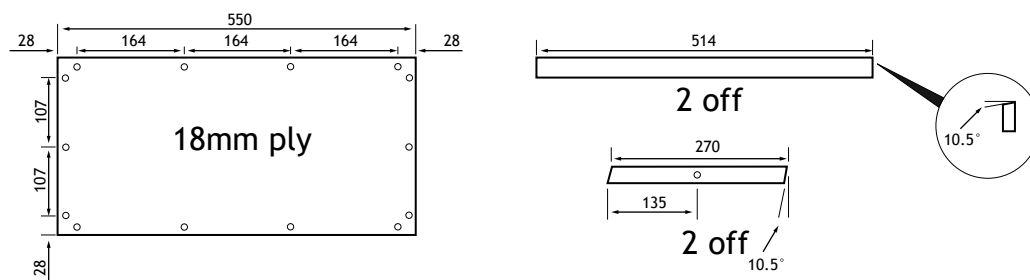


Details of the components of a den box (note these refer to a sloping lid)

Box parts



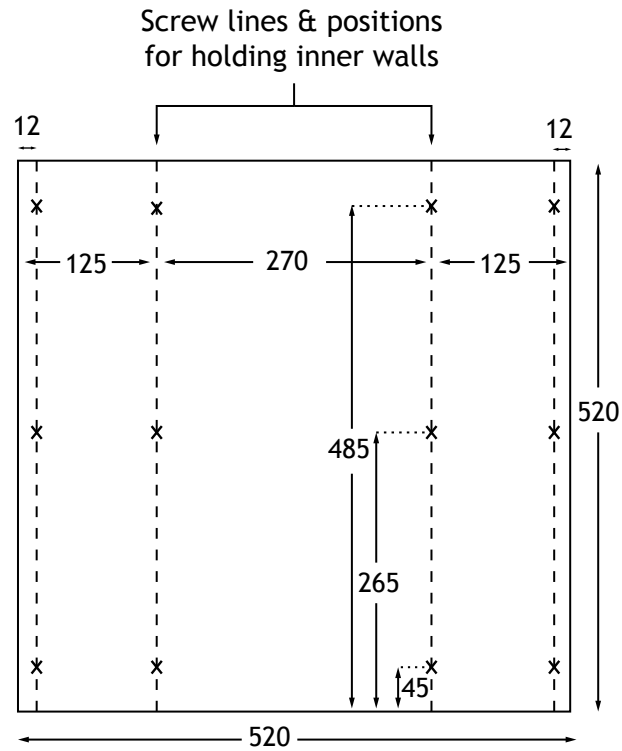
Lid parts



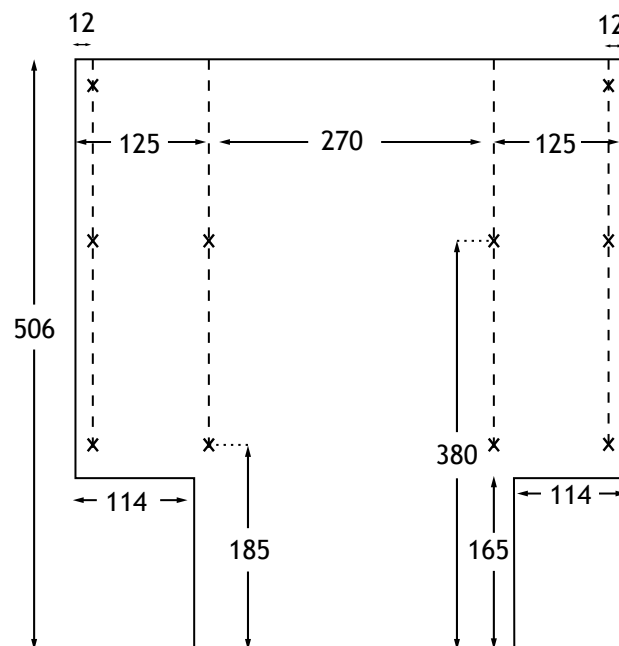
All dimensions in mm
Countersink fixing holes

Timber Leaves guidelines

Front

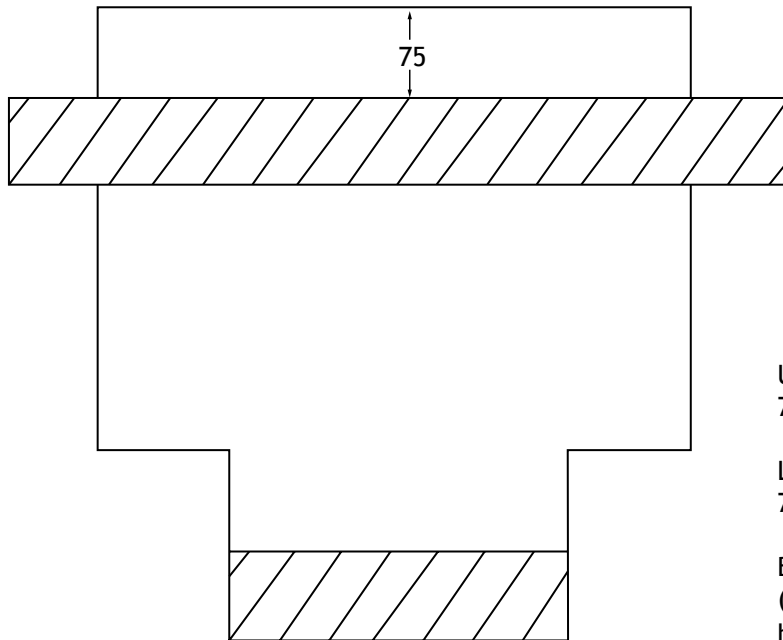


Back (mounting battens not shown)



Timber Leaves guidelines

Back (with mounting battens shown)



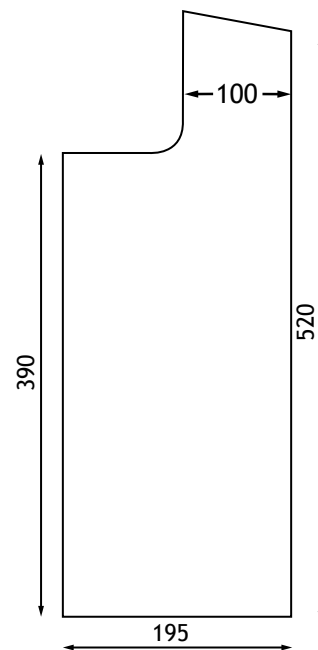
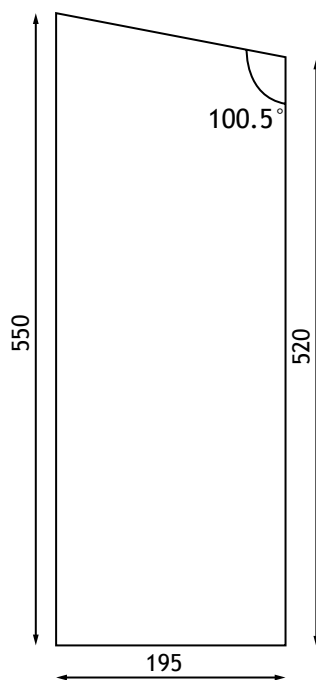
Upper batten dimensions
75mm x 660mm x 45mm

Lower batten dimensions
75mm x 280mm x 45mm

Both battens screwed
(from inside) & glued in place
before assembly of box sides.

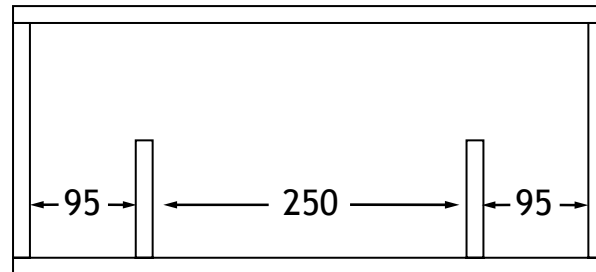
External

Internal

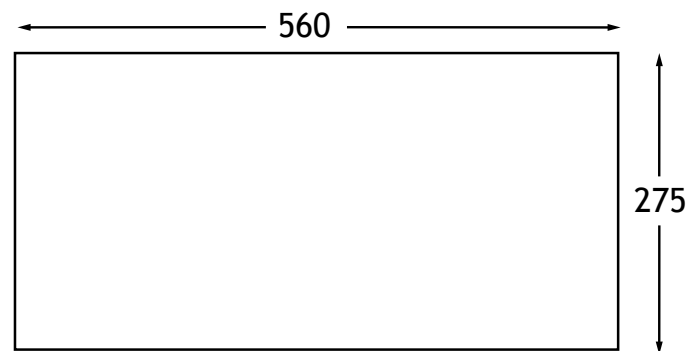


Timber Leaves guidelines

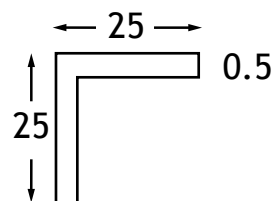
From above (without lid)



Lid



Cross section of cedar cover for all vertical edges



Construction



1. Screw the rear battens to the back panel from what will become the inside of the box.



2. Using the inside of the front panel as a template, mark out the positions of the side and inner walls.



3. Put the inner walls in position, ensuring they are flush with the top, so that the base will be recessed, when fitted.



4. Position the base, ensuring it is centred to accommodate the side walls.*



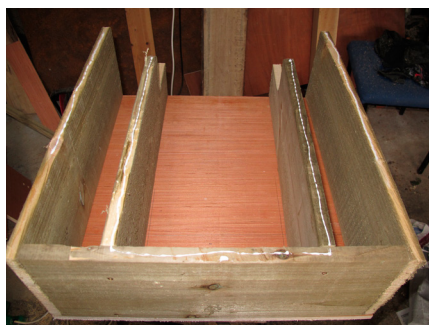
5. Screw the base to the inner walls, ensuring that it is well recessed to prevent rain driving in.



6. Position the side walls.



7. Screw the side walls to the base.



8. Run a line of wood glue along the edges of the walls and base that will be in contact with the back panel.



9. Position the back panel and fix firmly with screws.

* It might be prudent to leave cutting the base until this stage, so that any slight variations in the width of the box can be accommodated.



10. Turn the box over.



11. Run a line of wood glue along the edges of the walls and base.



12. Position the front panel and fix firmly with screws.



13. Finished box - front view - minus lid.



14. Finished box - rear view - minus lid.



15. Screw the rear batten to the underside of the lid.



16. Test fit this onto the box and scribe a line using a pencil to show the position of the front and sides of the box.



17. Fit the remaining battens, ensuring that the fit on the box is snug.*

* Again, it might be prudent to leave cutting the lid panel until this stage, so that any slight variations in the box size can be accommodated.