

Design and Construction of Open-mesh Floors (OMF`s) (by M.W. Shaw, Anglesey Beekeepers` Association)

Introduction

I think it is safe to assume that, like Varroa itself, open-mesh floors (OMF`s) are here to stay and will become standard beekeeping equipment at some time in the future. Any future developments in the treatment of Varroa (including the possibility of tolerant strains of bee) are unlikely to make OMF`s redundant. We have been using OMF`s since 1996; first of all on just a few hives and with the catch-tray firmly in place during the winter. Now we have OMF`s on all hives, including nucs. Catch-trays are only normally in place when monitoring natural mortality or to assess the effectiveness of treatment. The only exceptions are nucs in winter and during the hiving of swarms (to prevent them getting under the floor by mistake). The bees seem to be exceptionally healthy and productive under the conditions that OMF`s provide and, even if Varroa were to become extinct tomorrow, I would not dream of returning to solid floors.

Essential Design Features of OMF`s

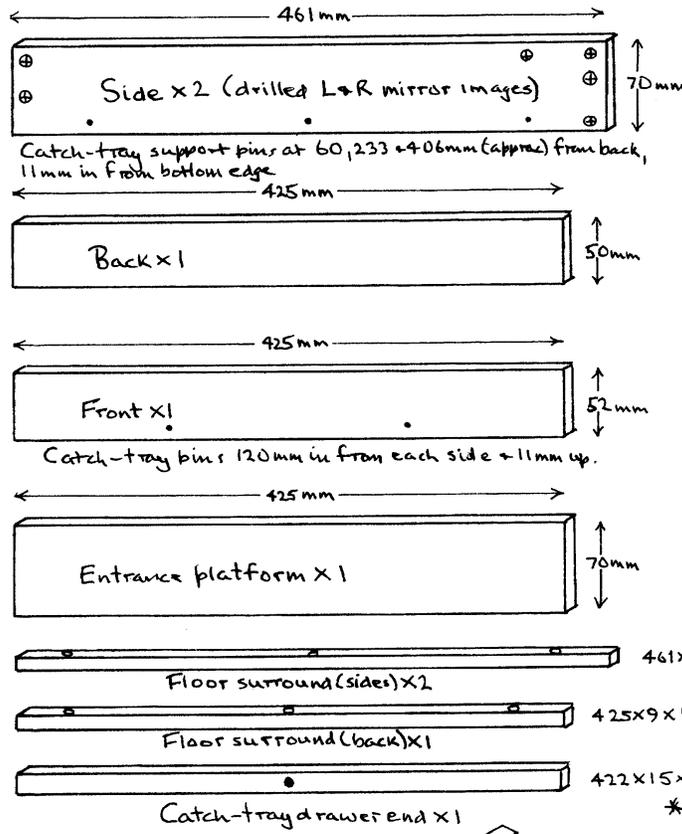
- 1) An OMF should have a minimum of horizontal surfaces below the mesh and no crevices or seams where hive debris and moisture can collect to encourage wax moth or rot the floor. Hence the use of pins (galvenised nails with the head cut off) on which to slide the catch-tray – no runners or ledges.
- 2) There should be a minimum of 2" (50mm) between the mesh and the upper surface of the catch-tray. Experiments have shown that this gap is safely beyond the distance at which live Varroa mites are able to sense the passage of bees overhead and try to move towards them.

Desirable Features of OMF`s

- 1) The increase in ventilation due to the mesh makes it possible to reduce the height of the floor (surround) to give an approximation of normal bee-space at the bottom of the hive. Standard solid floors have a height of 22-23mm but, with a mesh floor, it is possible – and I think desirable – to reduce this to about 9mm. The reduction in height virtually eliminates brace comb (comb extensions) on the bottom bars of the frames immediately above the floor. This means that boxes and frames can be re-positioned, eg. during swarm control, without the need to shake bees and trim the combs. Also, with a 9mm depth, combs are never braced to the mesh, as sometimes happens on deeper designs, and the bees seem to have no inclination to propolise the mesh.
- 2) The solid platform at the entrance (the doorstep) to the OMF serves three purposes; firstly, it strengthens the floor and makes it more rigid so it can be safely strapped for hive movement; secondly, it provides a nice firm place for guard bees to stand; and thirdly, it enables incoming bees to step climb directly from a solid surface onto the frames, without walking on the mesh, and may therefore reduce the loss of pollen-balls.
- 3) It seems to be unnecessarily harsh on the bees to place an OMF on the traditional double rail type of hive stand – although I have seen it done. The use of 9-12mm sacrificial feet on the floor (they can be replaced when they start to rot) and placing this on a solid surface gives adequate bottom ventilation in all seasons. We use a 2ft x 2ft concrete slab standing on two 9" concrete blocks, which acts as a very secure, durable hive stand. Helmut Horn (the originator of mesh floors – BeeCraft 1990) found that colonies on OMF`s (at ground level) consume about 15% more stores over the winter – but that was in Germany where there are much colder winters. Excessive ventilation with OMF`s on rails or other stands which are open at the bottom would tend to increase food requirements.
- 4) The seam between the floor surround and the base (with the mesh sandwiched between them) is very vulnerable to water penetration and should be sealed with some form of mastic – I have found glazing silicone to be entirely suitable. This will greatly reduce the tendency for rot to start at this joint and also reduce corrosion of the mesh.
- 5) The use of corrugated polypropylene (`Corrux`) sheet (thickness 6mm) to make the catch-tray is a great improvement over the original painted plywood. It does not warp and the thymol that falls through the mesh when treating with `Apiguard` has no effect on the polypropylene whereas on painted surfaces it acts as a paint stripper. The only downside is that earwigs take refuge in the corrugations and think they have gone to heaven – but it is not a problem.

ECONOMY OPEN-MESH (VARROA) FLOOR

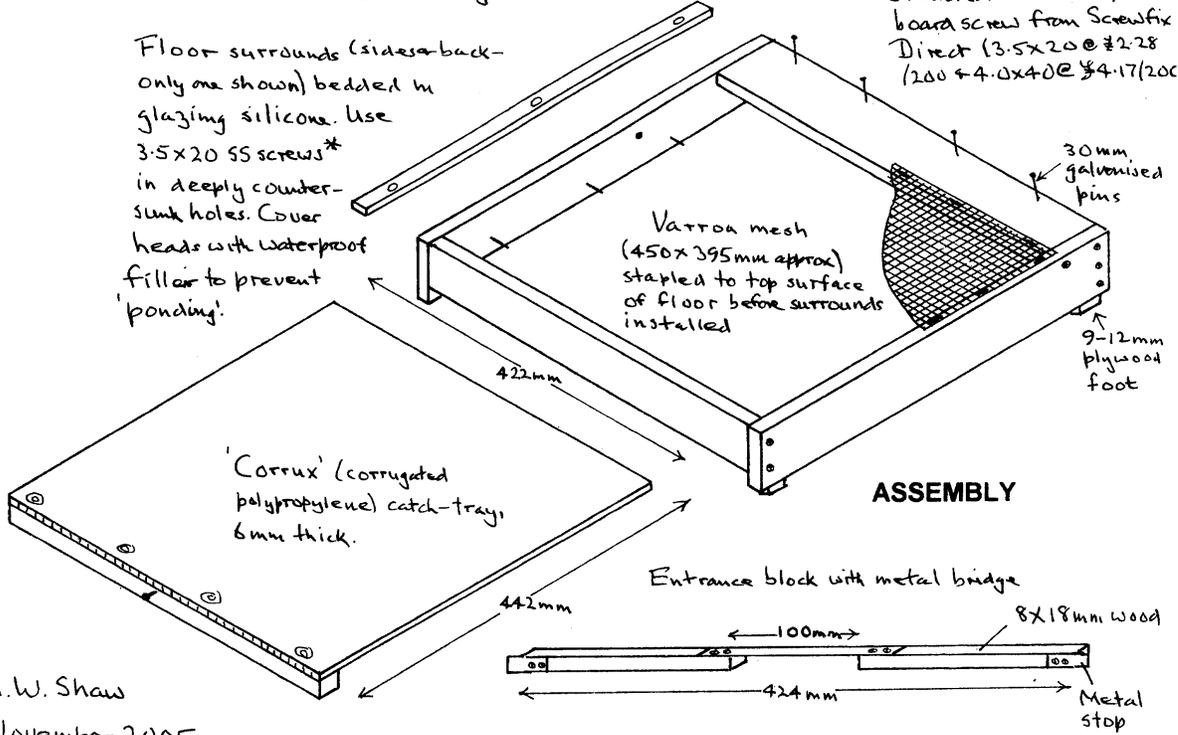
PART CUTTING LIST
(Sizes in mm)



All parts cut from 18mm PAR softwood (need to adjust sizes if thickness different)
Floor depth (70mm) comes nicely out of standard 6" box (144mm)
Joints secured using 4.0 x 4.0 stainless steel chipboard screws* in 4mm countersunk holes + good waterproof glue, eg. 'Cascamitie'

* Stainless steel chipboard screw from Screwfix Direct (3.5 x 20 @ £2.28 / 200 + 4.0 x 4.0 @ \$4.17/200)

Floor surrounds (sides+back- only one shown) bedded in glazing silicone. Use 3.5 x 20 SS screws* in deeply countersunk holes. Cover heads with waterproof filler to prevent 'ponding'!



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