

SBA Technical Data Sheet Number 06 - The Smith Hive

Details of dimensions and construction for the DIY Beekeeper. Illustrations reproduced, and text modified, from Advisory Leaflet 445 - "The Smith Hive", Published 1960, Reprinted October 1966. © Crown copyright; reproduced by permission of the controller of HMSO.

NOTE

1. The design and dimensions of the Smith Single-walled hive are given in full in the specification issued by the British Standards Institution (British Standard 1300: 1960). The dimensions given here follow closely the recommendations of the designer, Mr. W. Smith of Innerleithen, Peeblesshire, and given in the Standard Specification.

2. The information given here has been copied and summarised from the Ministry of Agriculture, Fisheries and Food Advisory leaflet 445 - The Smith Hive, Published 1960, Reprinted October 1966.

3. Almost all measurements are Imperial. They have not been converted to Metric equivalents as the original designs were specified in Imperial measurements. Anyone who wants to work in Metric equivalents may, of course, carry out the conversion for their own use.

Equipment

Tools - hand (power tools optional)

Consumables

- Timber - Any softwoods are suitable provided the timber is well seasoned, sound, and free from large knots and rot.
- Wood Preservative - Colourless and odourless types, free from insecticide, are suitable. Cedar requires no preservative.
- Nails - assorted sizes
- Non-rusting metal sheet or other waterproof material (such as tar-felt) for covering the roof
- Metal Runners - these support the ends of the frames and are obtainable in the correct size from bee appliance dealers. One pair is required for each brood box or super
- Queen Excluder - these are inserted between the brood box and honey supers, and are available, to Smith specification, from appliance dealers. Zinc excluders will require framing around the edges and also across the centre to stop them from sagging. Wire ones are supplied framed.

Method of Preparation

All wood should be cut and planed to size before trial fitting together. It may be advisable to pre-drill nail holes depending on the timber being used, if it is inclined to split. Exterior grade glue, though not absolutely essential, may be used to strengthen joints if desired. Preservative should be allowed to dry thoroughly before bees are introduced to the hive.

Method of Construction - General Principles

This single-walled hive is almost unique to Scottish beekeeping. It is broadly similar in concept to the British National hive, but with the construction simplified to eliminate the complicated construction of the end walls of the National. This has been accomplished largely through the use of British Standard frames with short lugs instead of the long lugged frames used in the National. The short lugs are supported on a rebate cut in the thickness of the end wall, and therefore each box is made up from only four pieces of wood.

The hive consists of a floor with an entrance block, one or more deep (brood) boxes, a crownboard, and a roof. Supers or section racks may be used for the storage of honey. All boxes are designed to take British Standard frames with short (3/4") lugs (i.e. 15 1/2" top bars). Push-on metal spacers are not suitable and therefore Hoffman self spacing frames, or screw eye spacers, should be used. The box will just hold twelve Hoffman frames. However they will be very tight and the recommendation is to use eleven frames plus a spaced dummy board.

The section rack, which fits flush onto the unit below it, is designed to take 24 sections 4 1/2" square. The roof is designed to provide a 1 1/4" ventilated, bee-tight air space above the crownboard. The floor is designed to be reversible, to provide a full width entrance 7/8" deep on one side or 3/8" deep on the other. It should be supported clear of the ground on bricks, or some other type of stand.

The hive design is such that the bee-space is above the frames at the top of the box, not below them. In fact the deep and shallow boxes are made 3/8" deeper than the frames they contain; this gives a 1/4" bee space above and a 1/8" space below. It is important to use well seasoned timber so that these sizes are not altered by subsequent shrinkage of the wood.

Method of Construction - Details

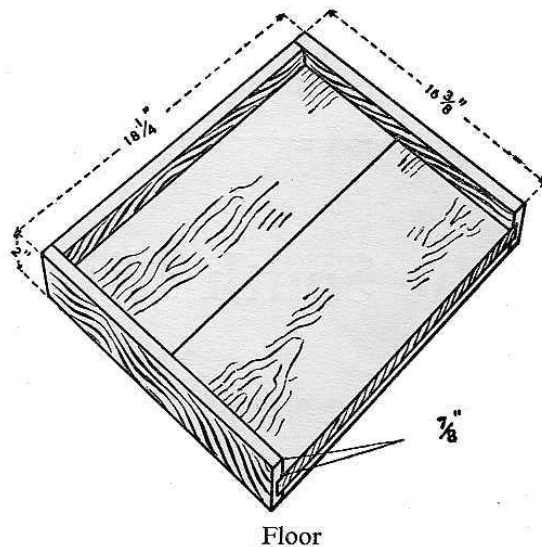
The separate parts of the hive are described in the following sections - each is illustrated, and there are accompanying notes for each part as well.

1. Floor
2. Brood Chamber and Shallow Super
3. Crownboard
4. Roof
5. Section Rack

Constructional Details

1 Floor

- external dimensions 18 1/4" wide and 16 3/8" from front to back
- floorboards 3/4" thick timber, tongued and grooved or lapped joints, 17 1/4" long and any convenient widths to make up to 16 3/8"
- timbers grooved 1/4" deep into side rails 16 3/8" long, 2" deep and 3/4" thick
- the grooves 3/4" wide in each side rail are 3/8" from one edge and 7/8" from the other edge
- back closed with two strips, one 16 3/4" x 7/8" x 7/8" for the deep side and 16 3/4" x 7/8" x 3/8" for the shallow side, are nailed on at opposite ends
- The entrance block is only used when the floor has its deeper side uppermost.
- It is a fraction under 7/8" square cross section and 16 5/8" long, with a 5" x



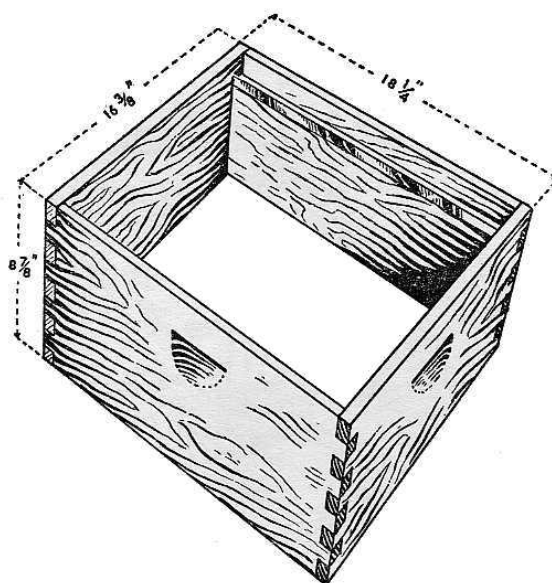
5/16" central cut-away on one face. This allows it to be used to either regulate the entrance to 5" wide, or to close off the entrance completely.

- Drive a staple into the inner face of the side rail on each side at the front of the floor, 7/8" in from the front and leaving about 1/4" of the staple projecting. This will prevent the block being accidentally pushed into the hive and out of reach.

Fit the floorboards into the grooves of the side rails. Nail in from the outside of the side rails. Nail on the back strips, one on each side and at opposite ends, with nails in at both ends.

2 Brood Chamber and Shallow Super

- external dimensions are 16 3/8" from front to back, 18 1/4" wide and 8 7/8" deep
- Constructed from four pieces of 7/8" thick timber
- lock-jointed or halved at the corners, and nailed both ways
- internal dimensions are 16 1/2" long and 14 5/8" wide
- end (longer) walls rebated at the top 1/2" wide into the thickness from the inner face, and 7/8" deep
- metal runners are fixed to project 1/4" above the rebate; this gives a bee space of 1/4" above the frame lugs and top bars
- 'D'-shaped finger grips are cut centrally into all four walls 3 1/2" long and 1/2" deep, located 2 1/2" below the top edge



Brood chamber

Cut all timber to side and cut the finger grips in the outer faces. Form the box by nailing (and glueing also if desired) at the four corners.

Shallow Super

Construction of the shallow super is identical to the Brood Box. Only the dimensions are different:

- depth is 5 7/8"
- runners may be omitted, in which case the rebates should be cut 5/8" deep rather than 7/8" deep

Bee Space

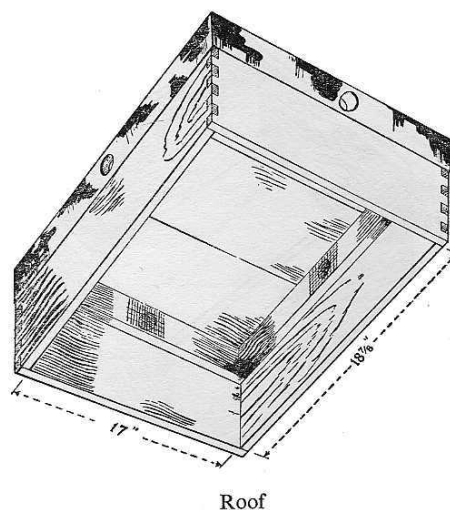
The dimensions given here are such that the deep and shallow boxes when finished 3/8" deeper than their frames. This results in a 1/4" bee space above the frames and a 1/8" space below. It is important however to use well seasoned timber, so that when the hive is assembled the bee space between boxes is not reduced as a result of further shrinkage in the widths of the boards.

3 Crownboard

- materials recommended are knot free well seasoned softwood at least 3/8" thick, with rebated or tongued and grooved joints; or resin bonded plywood at least 5mm thick
- dimensions 18 1/4" x 16 3/8"
- framed with 7/8" x 3/8" softwood strips on the upper side only
- two holes 1 3/16" x 3" (the ends shaped to receive a Porter bee-escape) are cut in the board
- the long sides of the holes parallel to the short sides of the crownboard
- one hole situated centrally and the other midway between the centre and the edge of the crownboard

4 Roof

- internal dimensions are 18 7/8" x 17"
- side walls not less than 1/2" thick
- top boards not less than 3/8" thick
- depth inside is 5 3/4"
- corners lock jointed and nailed both ways
- if halved corners are used, the timber for the sides should be at least 5/8" thick
- roof is covered with non rusting sheet metal or other waterproof material which extends at least 1 1/2" down the sides
- four strips of wood measuring 1 1/4" x 3/4" cross-section are fixed around the top inside to give a head space of 1 1/4" above the crownboard
- ventilation holes 3/4" in diameter are bored centrally through the sides of the roof and the spacing strips, and backed on the inside with perforated zinc or rustproof mesh

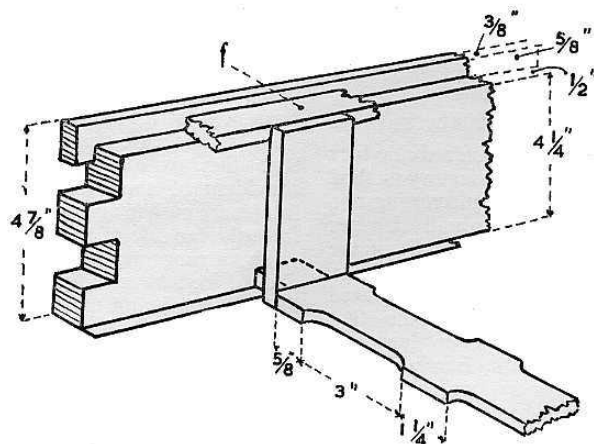


Assemble the four sides of the roof , taking care to nail the corners in both directions, then fit the top boards, nailing them through onto the side boards along all four sides. Next fit the four strips to provide the head space, then cover with waterproof cover (metal or tarred felt) before completing the ventilation holes.

5 Section Rack

- section rack is designed to take eight section carriers each holding three 4 1/2" x 4 1/2" sections
- carriers interspaced with 1/8" wooden dividers, and rest on thin metal strips nailed along the bottom edge of front and back walls
- walls of 7/8" thick wood
- outside dimensions 18 1/4" wide x 16 3/8" from back to front, depth 4 7/8"
- top of finger grips 2" below top edges
- top inside edges of end (longer) walls are rebated 1/2" wide and 5/8" deep to take a loose fillet 16 1/2" x 3/4" x 3/4" (these fillets centralise the section carriers in the rack - see diagram)
- a 3/4" strip of tin plate projecting 3/8" inside is nailed along the bottom edge of each end (long) wall - see diagram
- section carrier consists of two end bars and a bottom bar only

- bottom bar 1/4" thick, 1 15/16" wide and 14 1/2" long; it is reduced in width to 1" for 7/8" at each end to form a lug - see diagram
- the length between the shoulders of the lugs (i.e. the the inside distance between the end-bars when these are in position) is 12 3/4"
- the bottom bars have three bee-ways cut into each side to coincide with the bee-ways in the sections
- each bee-way is 3" long and 1/4" deep, spaced 1 1/4" apart and 5/8" in from the shoulders - see diagram
- the two end bars for each carrier are each 4 1/2" x 1 15/16" x 1/2"
- they are grooved 1" wide and 1/4" deep at one end to fit over the lugs of the bottom bar, which project 3/8" to rest on the metal strips
- dividers are made of 1/8" wood, 14 1/2" long and 4 5/8" deep
- the dividers each have three bee-ways cut into the top and bottom edges to coincide with the bee-ways in the sections
- bee-ways are 3" long, 1 1/4" apart and 1 1/2" from the ends
- bee-ways are cut 3/8" deep into the top edge and 5/8" deep into the bottom edge
- top corners of the dividers are rebated 1/2" deep and 1/2" wide



Details of section rack and section carrier

A Simpler Alternative for a Section Rack

A shallow super may be used for sections, held in the hanging section frames (14" x 5 1/2") sold by bee appliance dealers, so long as the lugs are reduced to 3/4" long.

Health and Safety Information

The following hazards are identified:

1 Danger or personal injury from:

1. Hand tools
2. Power tools
3. Hammer and nails

Precautions:

1. Protective overall and gloves
2. Goggles

DISCLAIMER: - Great care has been taken in the preparation of this technical sheet to ensure accuracy but the Scottish Beekeepers' Association cannot accept liability or responsibility. Beekeepers must therefore use the information at their own discretion and risk.

Acknowledgements

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