

Use a Bathroom Scale to Weigh Honey Bee Colonies

Allen Hayes

When I tell other beekeepers that my scale hive gained 6 pounds today, the first thing they want to know is, "Where can I get a scale?" I always suggest farm sales, auctions and my favorite, flea markets. But finding a suitable scale can be difficult and many beekeepers who would like one have to do without. But now by purchasing a cheap bathroom scale any moderately skilled woodworker will be able to construct the scale base described here and have a valuable beekeeping resource.

There is no better way to determine when a honey flow has begun, peaked and ended than to place a colony on a scale and record its weight daily. A three pound drop in weight in one day is pretty strong evidence that the colony swarmed. The weights should be recorded at the same time every day preferably at dusk because that is when all of the foragers are home and the hive should be at its heaviest weight for the day. Recording this data then comparing it from year to year sometimes reveals very interesting results.

Probably the best scale to weigh bees with is the old beam type platform scale used by farms and feed stores. New versions of these are available but are expensive. Old ones can be hard to find but whether new or old, all of them are quite heavy. This makes them difficult to move, store and place in your apiary. In spite of their drawbacks these are very good as many of them record weights to as little as $\frac{1}{4}$ pound. In searching for an alternative to the scarce and heavy platform scale, I ran across this idea in an old text. While it is not perfect I believe it to be a reasonable substitution. I have used one of these for two seasons with acceptable results.

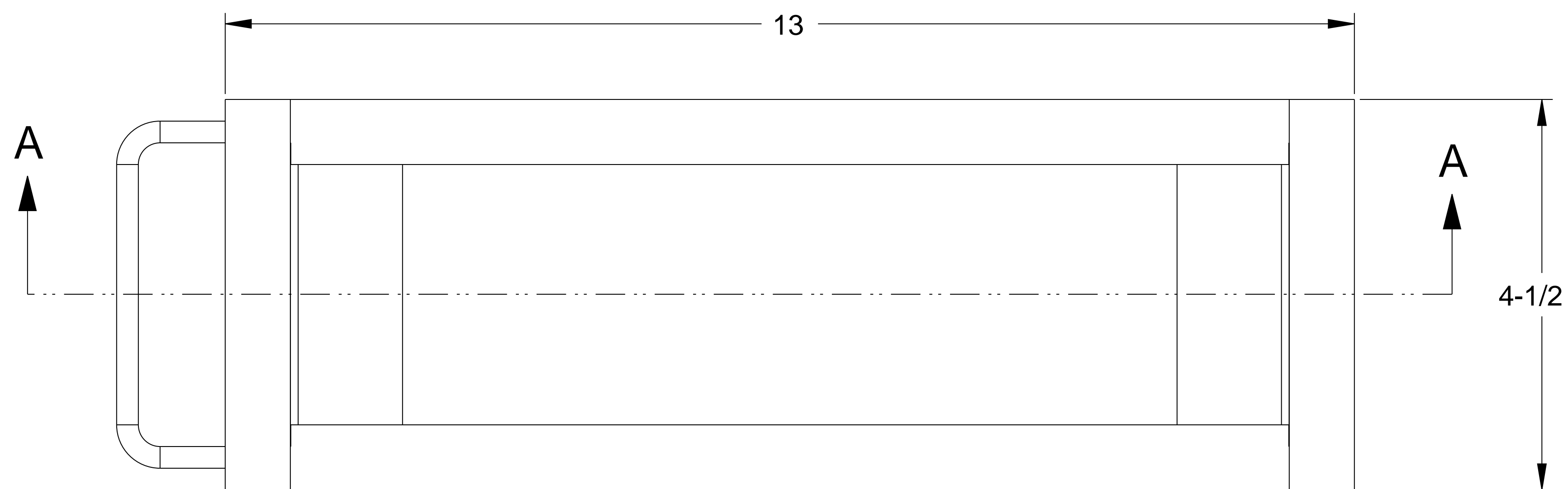
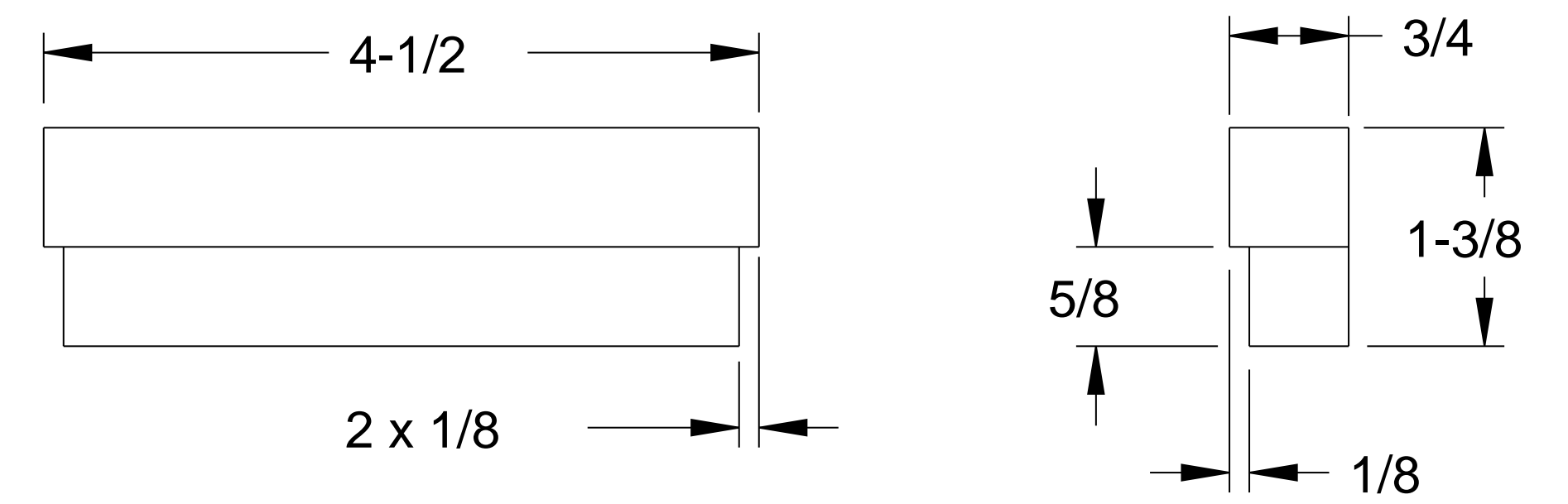
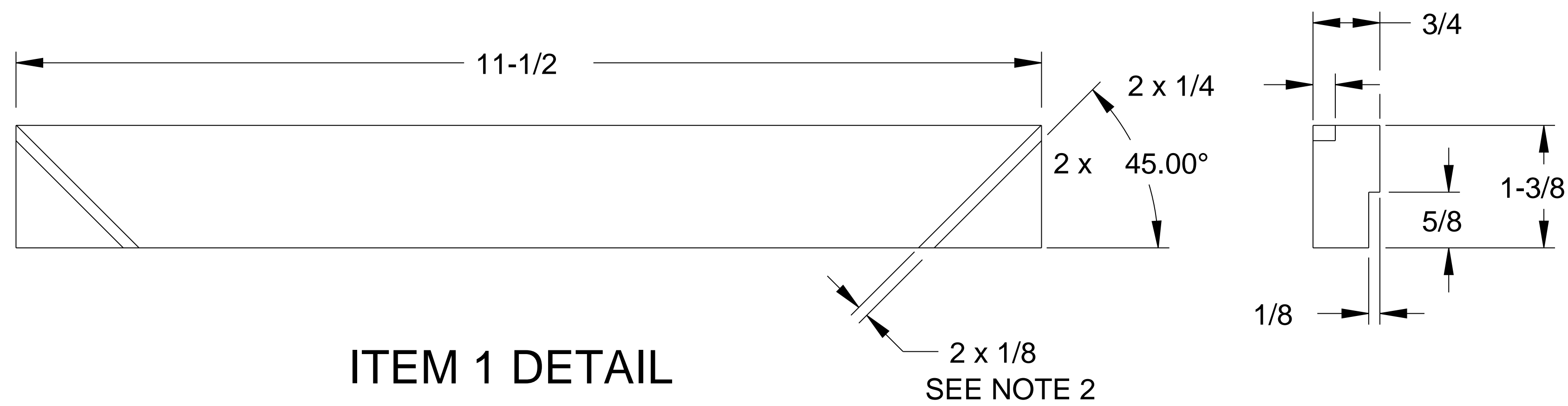
You may find the periscope to be the most difficult component to build. The good news here is that you only need to make one. You can build several bases and move the periscope from one to another. That way you can track the progress of multiple colonies in your apiary. The scale you choose should be able to record a difference of about $\frac{1}{2}$ pound though you may have to estimate the value if the indicator is between one pound marks. You need to buy a spring type bathroom scale, not a digital one. They can be found at discount stores for under \$10.00. Don't let getting the mirrors cut to size scare you. I purchased one 12" square mirror tile from a home store and cut several out of it. A hardware store or glass shop can cut these for you if cutting glass isn't your thing. I suggest getting this done first then cut the slots in the periscope to fit the mirrors. In addition to the materials listed on the drawings you will need an assortment of different size nails and/or screws to hold everything together. The scale needs to be secured to the base to keep it in place. I put four small blocks of wood on

each of the sides and screwed them to the base. If you make these blocks too thick they will interfere with the scale's operation. Blocks that measure $\frac{3}{4}$ " thick should work fine. Once you have the wooden components completed either brush on two coats of paint or exterior polyurethane to protect them from the elements.

While it appears that with this set up the hive may teeter when placed on the small scale, it is actually quite stable since the weight is balanced. I haven't had a hive fall over after two seasons of using this set up. But just to be sure, I use two ratchet straps around the hive from the underside of the bottom board to the top of the outer cover to hold things together should it topple over. The sun's UV radiation deteriorates the fabric of the straps and after just one season they become too weak to use again. Since the entire weight of the colony must be supported by the center of the bottom board most screened bottom boards available today won't work. Instead I use the old solid type bottom board and for Varroa Mite control I use a screen insert. The "Beltsville type" screen insert that I use isn't shown in the photographs.

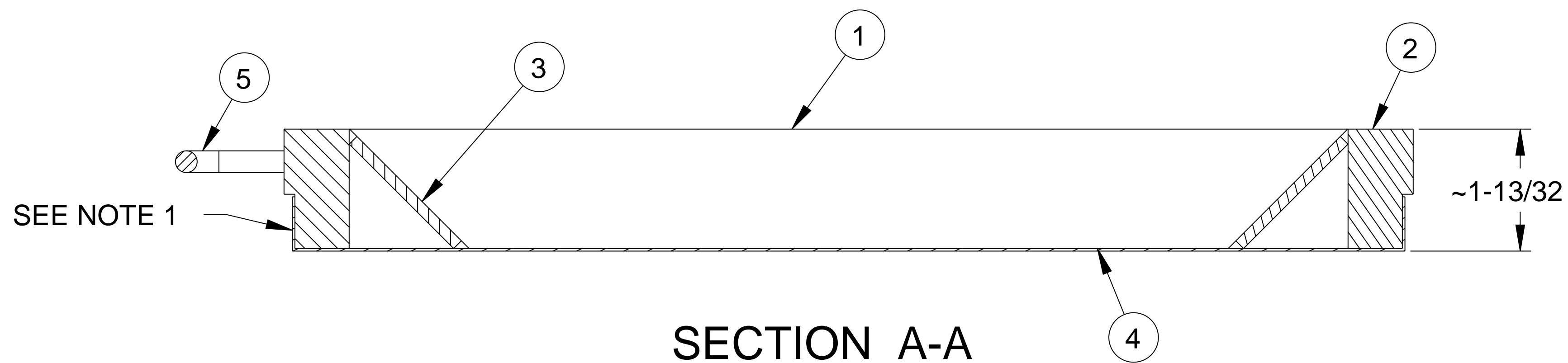
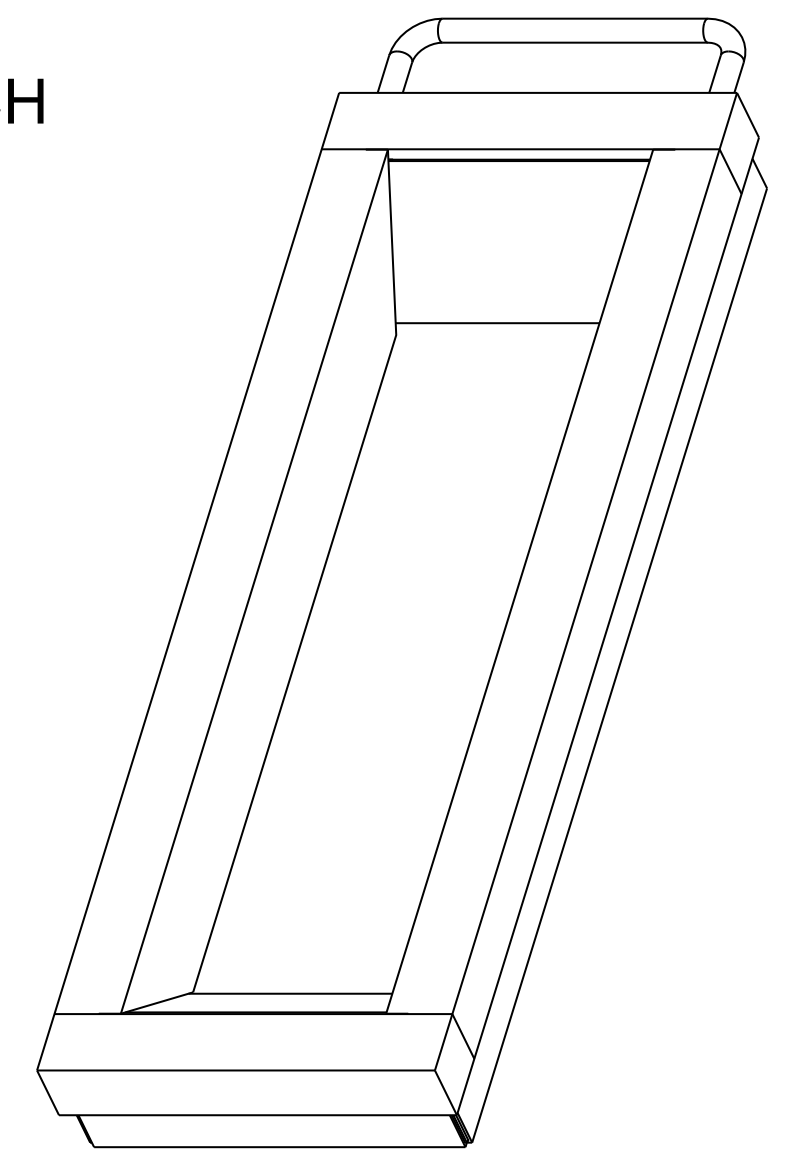
To set up your hive scale place the base on the ground or concrete blocks and make sure the base is level. Then place the bathroom scale upside down with the display over the hole in the base. Make sure the periscope is visible from the back of the colony not the front. Next place your colony on the scale and record the weight. Slide the periscope out until the scale indicator is visible then slide it back in for safe storage. Since there are two mirrors you can read the weights directly without seeing a mirror image. As you add or remove supers or other equipment accurately record the weight and either add or subtract that value from the daily weight. Remember you are only interested in the daily change in weight, be it increase or decrease, not the total weight of the colony. I have found it best to use a flashlight to take the daily readings. Then about dusk every evening visit your scale hive and see what your bees have been doing all day. I am sure you will enjoy what you learn from weighing your bees.

For more information on the use of hive scales, data recording and how your scale hive data can become part of a national network visit honeybeenet.gsfc.nasa.gov.



NOTES:

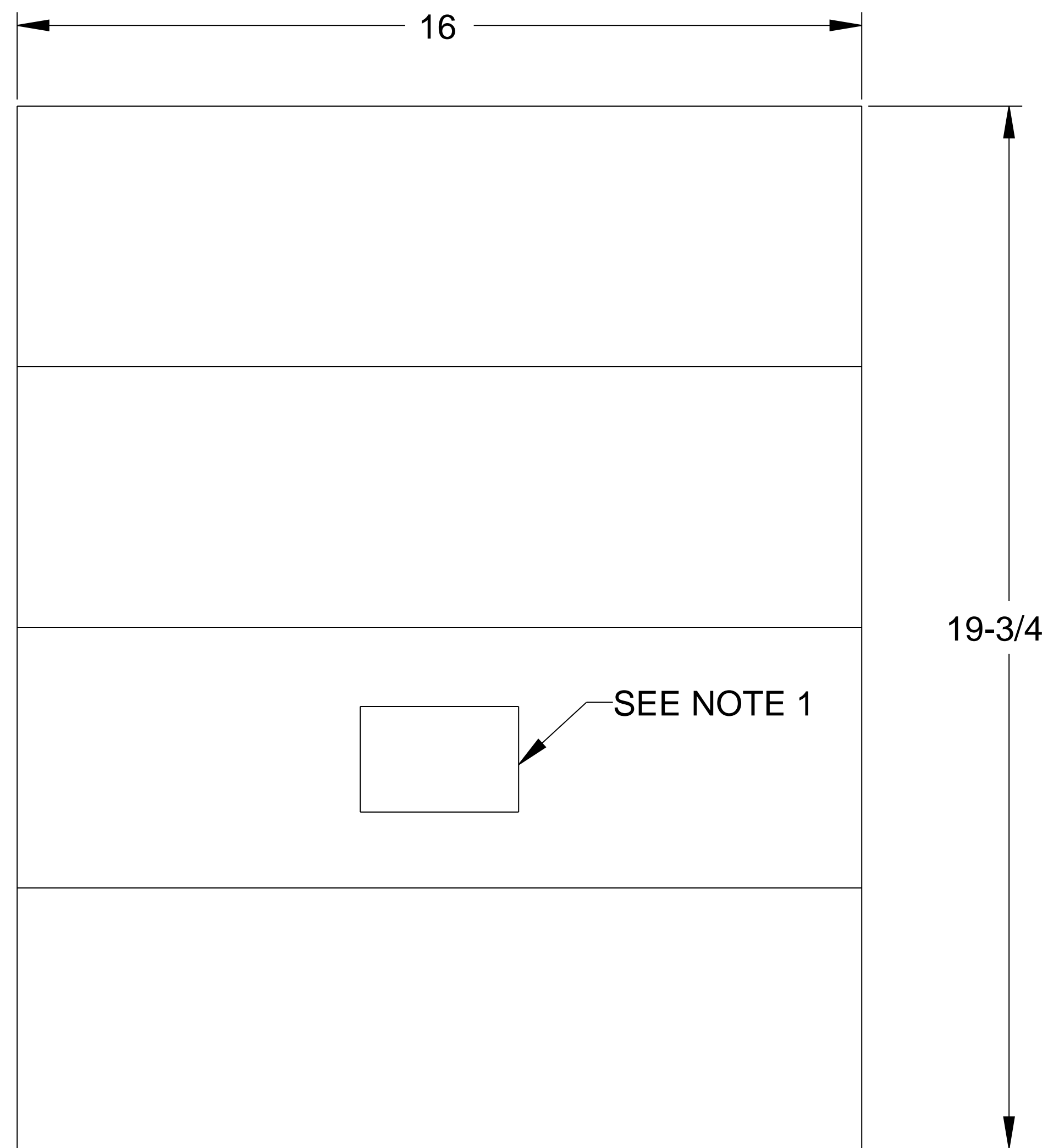
1. USE FLAT HEAD WOOD SCREWS TO ATTACH ITEM 4 FOR ACCESS TO ITEM 3.
2. CUT TO FIT MIRRORS.
3. ALL DIMENSIONS ARE IN INCHES.



ITEM	QTY.	SIZE	DESCRIPTION
1	2	1" x 1-3/8" x 11-1/2"	WOOD
2	2	1" x 1-3/8" x 4-1/2"	WOOD
3	2	1/8" x 1-5/8" x 3-1/2"	MIRROR
4	1	0.030" X 5-1/2" x 14"	ALUM. FLASHING
5	1	3-1/4"	PULL

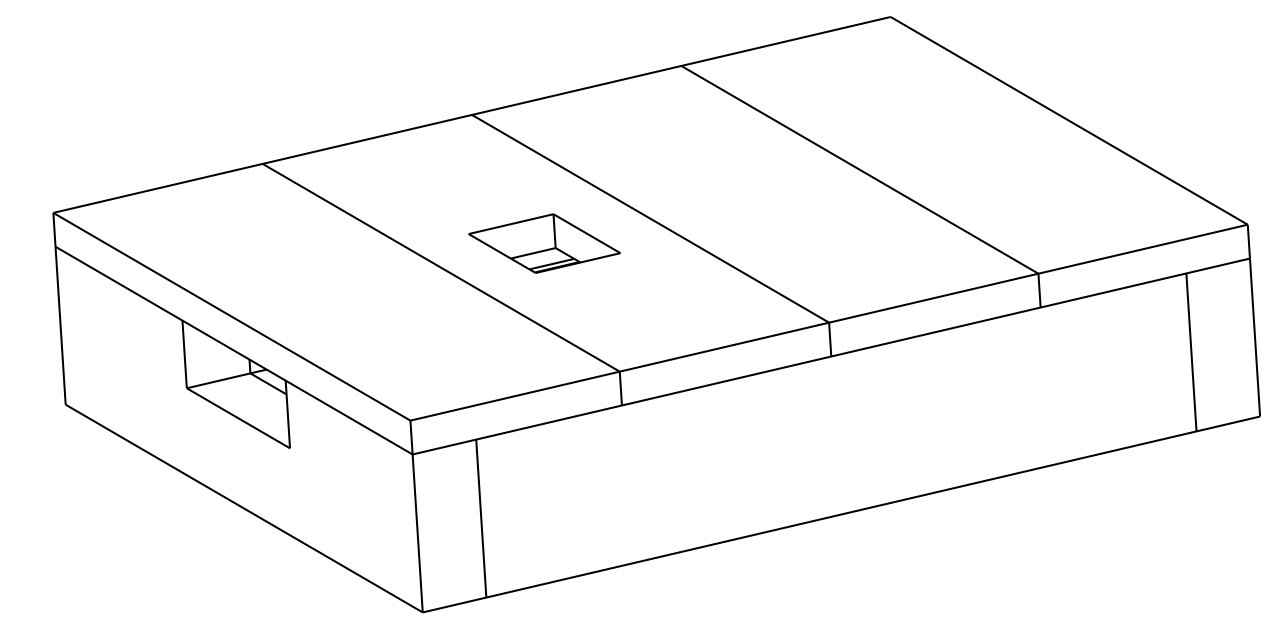
PERISCOPE

ALLEN HAYES



NOTES:

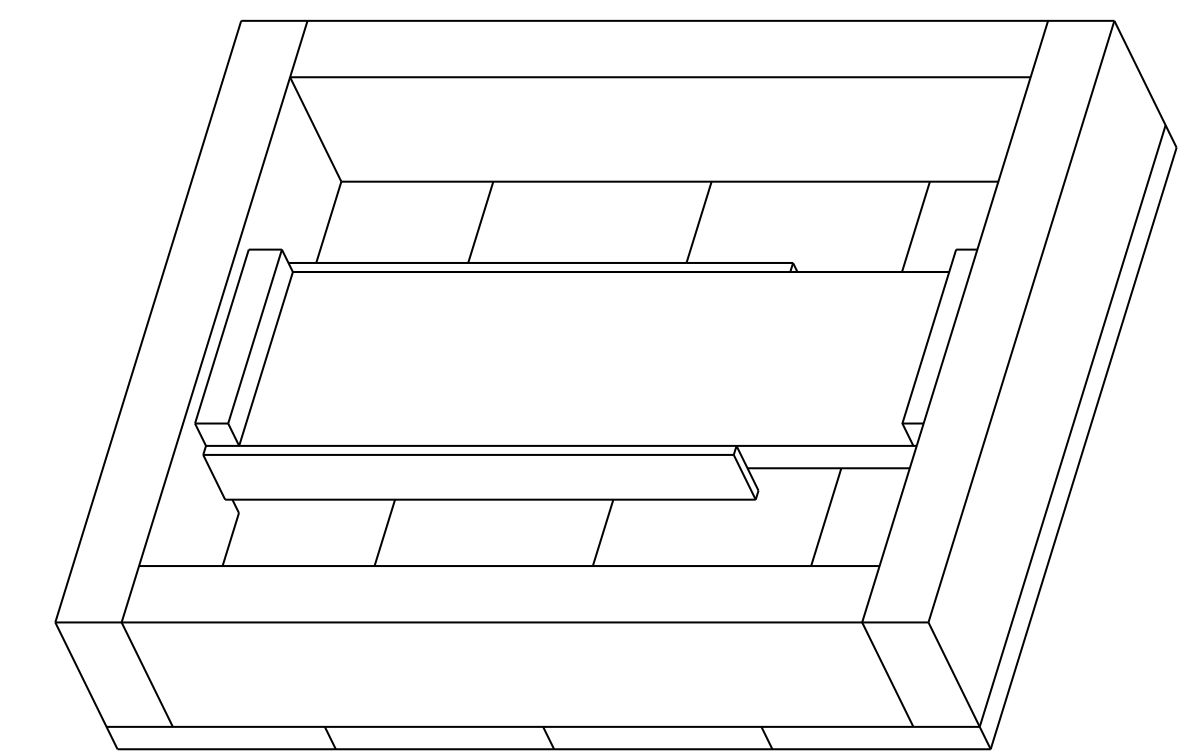
1. OPENING SIZE, SHAPE AND LOCATION WILL VARY, WITH SCALE BEING USED.
2. SUBSTITUTE TOUNGE AND GROOVE MATERIAL OR 3/4" PLYWOOD
3. NAIL OR SCREW COMPONENTS TOGETHER AS SHOWN.
4. CUT NOTCH IN ONE ITEM 1 ONLY.
5. ALL DIMENSIONS ARE IN INCHES.



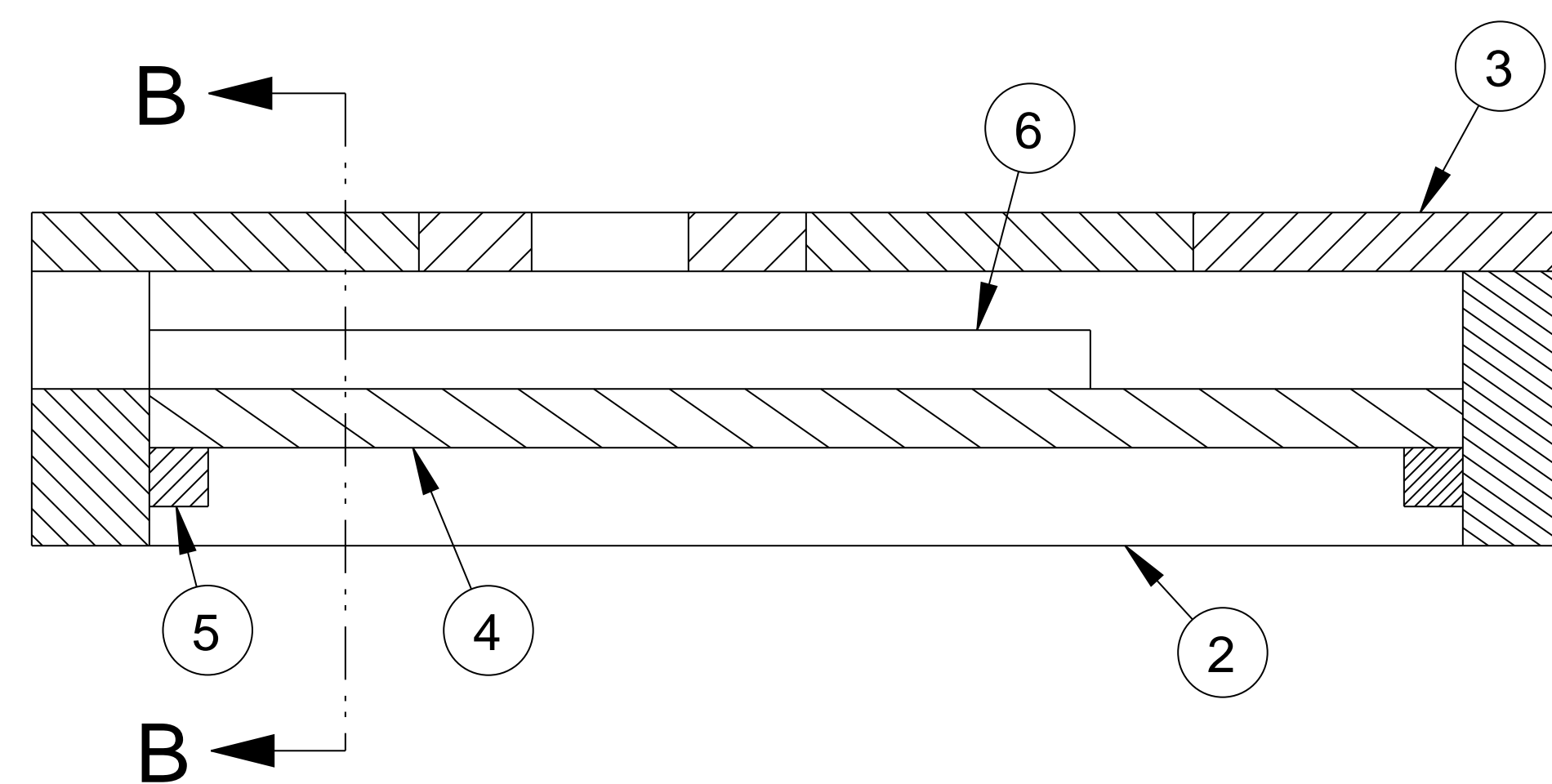
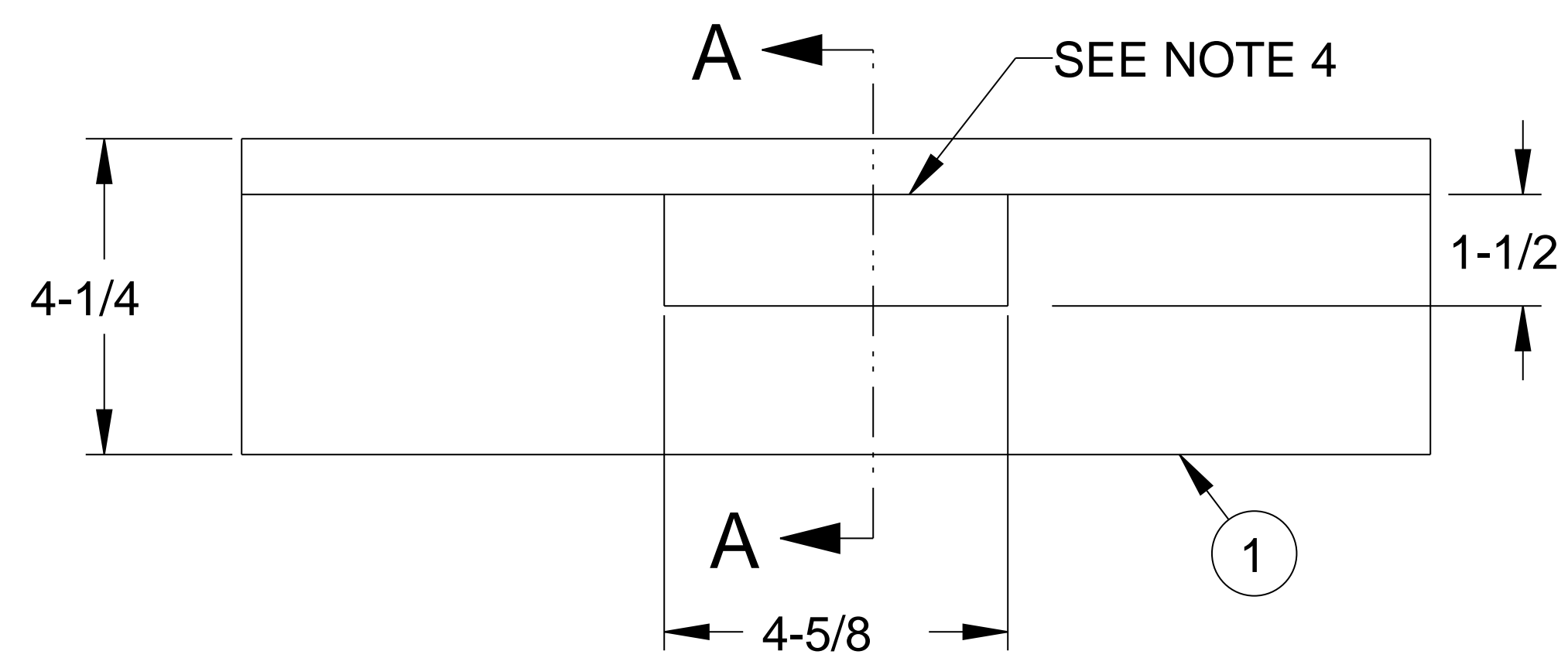
ISOMETRIC VIEW

SEE NOTE 2

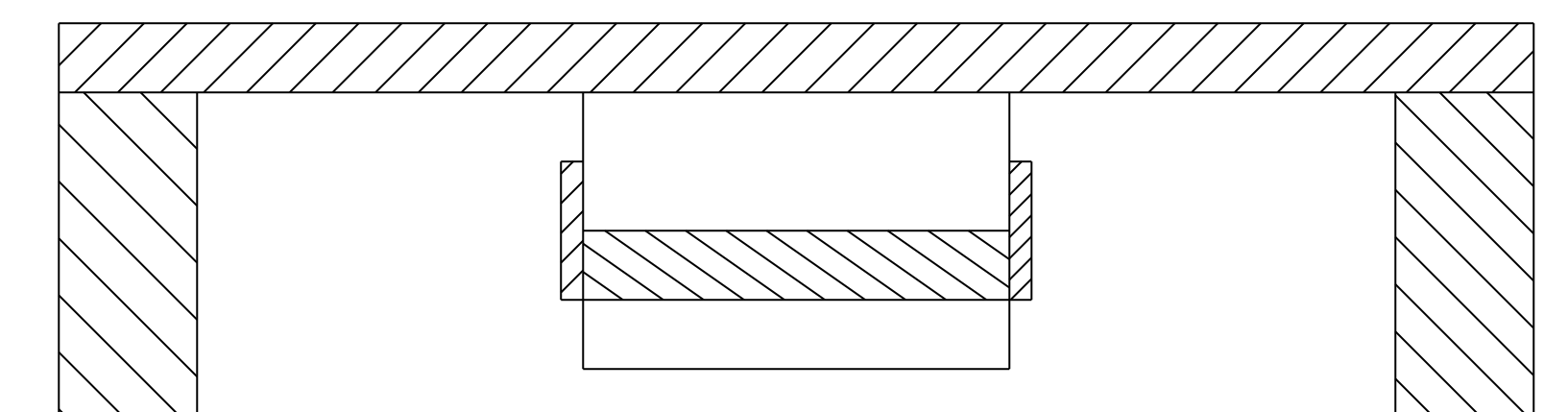
ITEM	QTY.	SIZE	DESCRIPTION
1	2	2" x 4" x 16"	WOOD
2	2	2" x 4" x 16-3/4"	WOOD
3	4	1" x 6" x 16"	WOOD
4	1	1" x 4-5/8" x 16-3/4"	WOOD
5	2	1" x 1" x 4-5/8"	WOOD
6	2	1/4" x 1-1/2" x 12"	WOOD



UNDERSIDE VIEW



SECTION A-A



SECTION B-B

HIVE SCALE BASE

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