Plywood Shelves

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Needing some shelves for storage, I shopped around a bit and was surprised by the asking prices. So I decided to make my own. If you cost your time realistically, it probably isn't cheaper to make your own, but I like wood working. Also I could make them to the exact sizes required, rather than having to make do with standard sizes. Here is how I went about it:

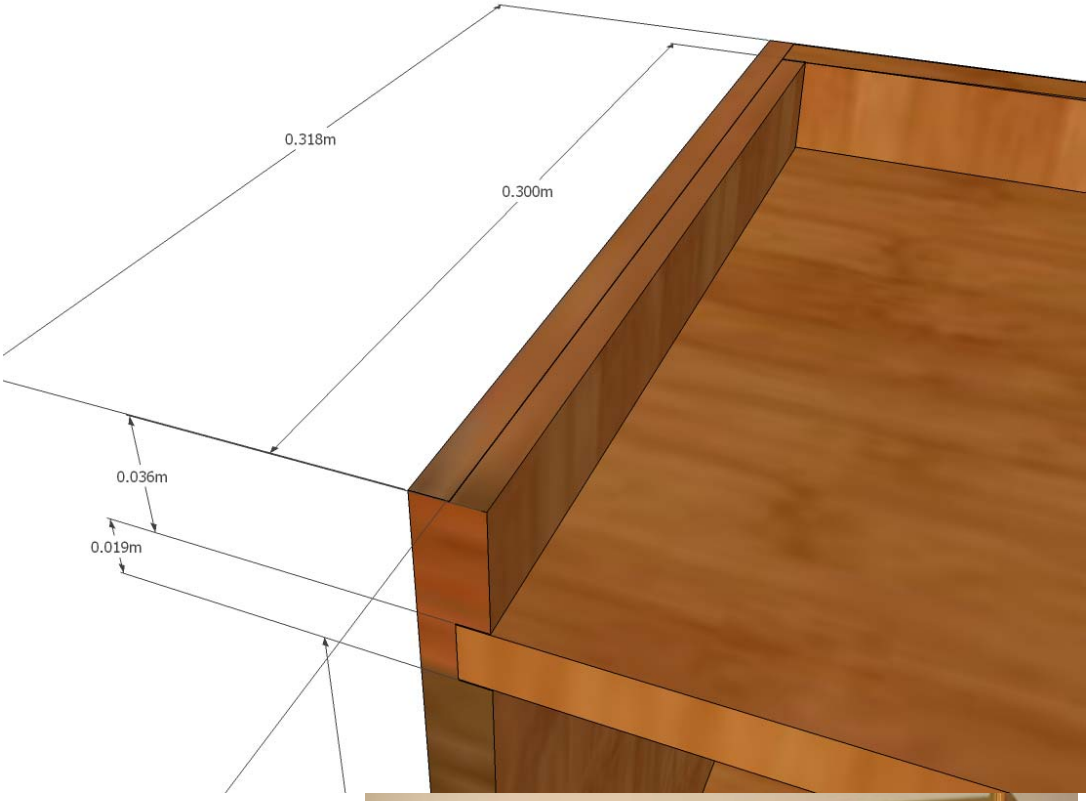
I used **Google Sketchup** to model a bookcase. The design I used is very simple, so I didn't need to use **Sketchup**, but I wanted to practice using the program with something simple. Making a 3D model is quick and easy and you can then add colours and textures to get an idea of what it will look like before you build it. The basic version of **Sketchup** is free and can be downloaded from www.google.com

This is a view of the 3D model for a basic bookcase drawn in Sketchup, with dimensions.

Bearing in mind the use (storage in the cellar or workshop), this is not "Fine Furniture". The joinery is simple – the shelves are rebated into slots in the sides and the back is rebated into the sides. The shelves are glued and screwed to the sides, and the back is glued and screwed to the sides and the shelves as well. Screws inserted from the back into the shelves in the middle support the shelves, preventing sagging. The back prevents the whole unit from racking sideways, making it very strong.

Shutter-ply is low grade plywood intended for making concrete forms – shuttering. It is made locally from pine and is relatively cheap. It is available in standard sheets (2440 x 1220mm = 8ft by 4 ft) in 18mm thickness. A few months ago, it was on special at Builders Warehouse for R200- a sheet, but the normal price they charge is R230- a sheet. Shutter ply does have voids and overlapping plies, and the surface layers are not of a better quality as with normal ply woods – not "Fine Woodworking" material. For the price, it is very strong and economical, and is much better than chipboard for this purpose.

9mm plywood is adequate for the back. The pine plywood supplied by Builders Warehouse is better quality than the shutter ply, and somewhat more expensive at R300- a sheet. This view shows the joinery in more detail. If you look at the dimensions, you will notice that I used 18mm shutter-ply for the back for this design, as it was cheaper. The back is rather over-engineered and does make the unit unnecessarily heavy.



I made another two sets of shelves each 600mm wide and used 9mm ply for the backs. Even 6mm would have probably done the job for these narrower shelves. A picture of these appears below.

One of the advantages of buying from Builders Warehouse, is that they will cut up your plywood to your dimensions at no extra charge. The two that I have visited (Germiston and Centurion) have large wall mounted panel saws, operated by competent operators. All the dimensions I have specified to them have been met within a millimetre, and the boards are also square.

Bringing home a set of boards, cut to length and width is a lot easier than transporting sheets of plywood. Then you just need to cut the rebates and dadoes to suit the thickness of the plywood used. This can be done using a table saw, a radial arm saw, a router, a rebate or dado plane, or even a handsaw and chisel depending on what you have available. I used my radial arm saw.

For the first unit I used cross-head Phillips chipboard screws into predrilled holes to avoid splitting. I glued and screwed it together and then I varnished it using a stained varnish.

For the second and third units, I varnished the sides before cutting the rebates and dadoes. I also varnished the shelves and back before assembling them. The ends of the shelves that were glued into the dadoes were not varnished, so that the glue would stick. For these two units, I used square-socket chipboard screws with self drilling ends. I still predrilled the holes, but not to the full depth.

This is the first time I have seen the square-socket screws available locally, and I was impressed how much easier they are to use. The square head driver bits are sold next to the screws and are sized as #1, #2 or #3 for use with a drill/driver.

With the Phillips headed screws in the longer lengths – 40mm or above, the level of torque required to fully seat the screws in Pine is such that you have to push really hard to stop the screw bit from jumping out. This was with predrilled holes and using wax to lubricate the screws. (In hardwoods, with longer screws, the torque required is such that there is a risk of the screw heads twisting off, which can make a real mess of a job.)

With the square-socket screws, the effort to fully seat the screws was much less. I guess I only had to push about half as hard, and the bit only jumped out a few times. Highly recommended compared to Phillips (Star) screws!

The first unit of shelves is shown on the previous page. You can see the similarity to the Sketchup image. The next picture shows the square socket screws and bits on top of work in progress. This was the first time I used my small Bosch Li-Ion IXO driver. I used my cordless drill to pre-drill the holes and the IXO driver to insert the screws. The screws were 4.5 x 40 and 4.0 x 35 chipboard screws with square socket heads. The IXO coped adequately, managing about 50 screws before the battery low light came on. It did not have quite enough torque to fully seat the screws, but a final twist by hand did the job. It is not going to replace my cordless drill for bigger screws, but coped perfectly well given its size. Using both the cordless drill and the IXO meant that I did not have to keep swapping drills and screw driver bits, which saved time.

I made two more bookcases to the same design as the first one, but half the width (600mm). Material cost including varnish was about R700- for the two. In pine, varnished these sell for about R1100- ea at the local pine emporium. The #60½ block plane gives you some idea of the scale.

For the two smaller units, I had to do a little fettling because the ply wood does vary slightly in thickness, and the piece I used to size the dadoes was thinner than some of the shelves. The last picture shows the #60½ block plane and the side rebate plane I used to trim the shelves and dadoes to fit.
(You can see the lighter wood in the dadoes (slots) and the ends of the shelves, where there is no varnish.)