

Building A Patio Bench

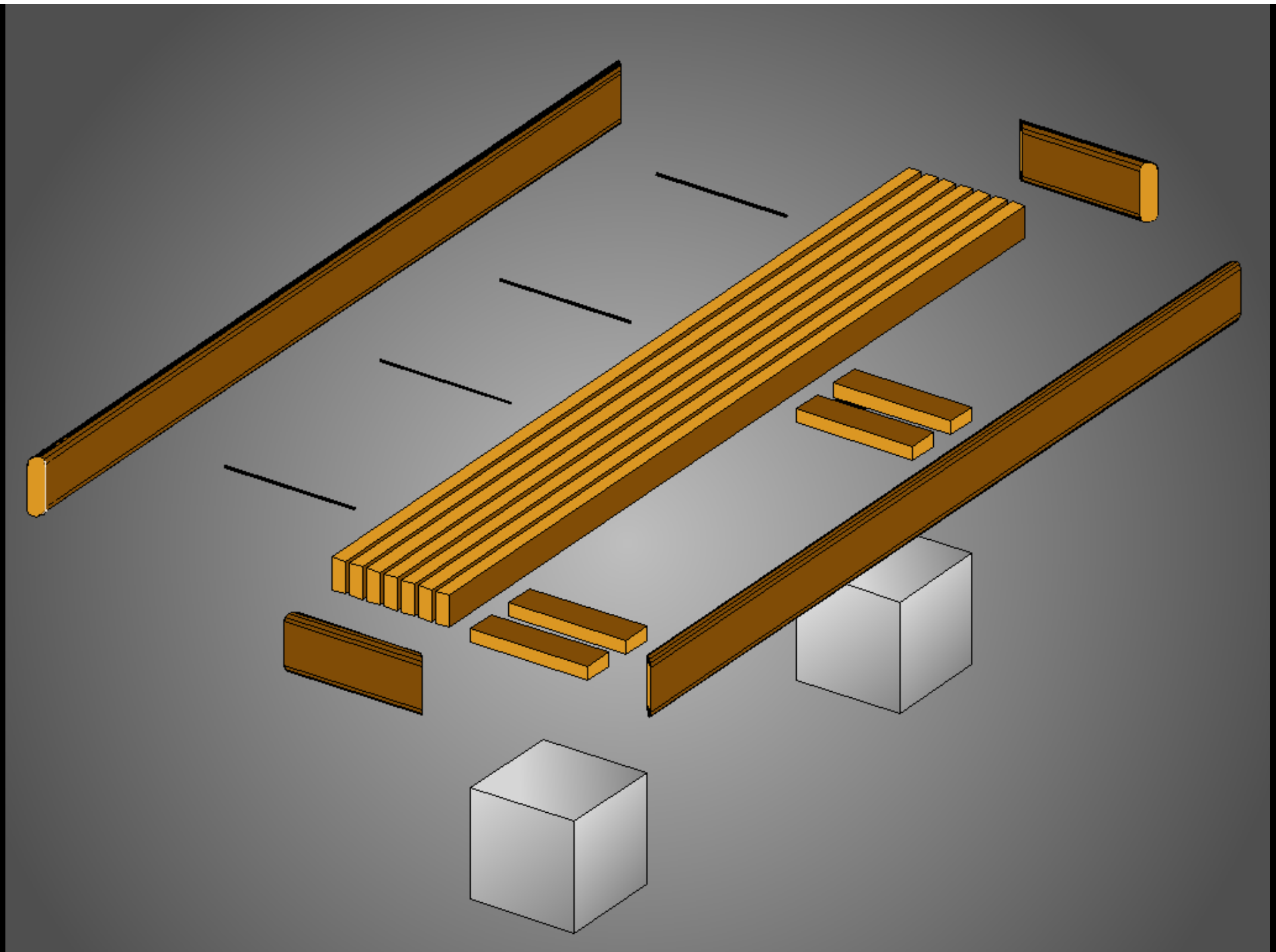
*(This page still under construction)
(Best viewed at 1200 pixel horizontal resolution, or greater)*

The finished bench looks like this. I wanted it to have a fairly massive appearance to fit into the decor of my large patio. The base blocks are 1 cubic foot of concrete, each. The finished weight of each bench is about 300 pounds. Two people can move them around with some effort, but they aren't likely to be carted off to someone else's place .



Here is some more detail of the finished bench. The seat is planked with 2X4's on edge, and skirted with 5/4" X 6" deck planking. All lumber is treated, and finished with an outdoor deck stain

(Behr brand). Spaces between the planks allow rainwater to run off, and the wider skirt gives it a heavier look, as well as concealing the end grain of the planks and the hardware used to hold everything together. Mitre joints to join the skirt at the corners gives a bit more refined appearance. The deck planking has a rounded nose on each edge, and the round part is left just proud of the seat surface.



An exploded view of the parts used in assembling the bench. The threaded rods are inserted in countersunk holes in the planking. A detailed view of the blocks and the embedded anchor brackets is shown below.



Here, the 1/4" threaded rod is visible, extending out one side. The gaps are created by inserting a stack of galvanized flat washers over the threaded rod between each of the planks. The holes for each of the four threaded rods are counterbored to conceal the nuts and washers on the outside planks. Put a washer and nut on one end of each rod, and insert it into the predrilled countersunk hole. Leave the rod longer than necessary, and when everything is all tightened up, cut off the excess with a

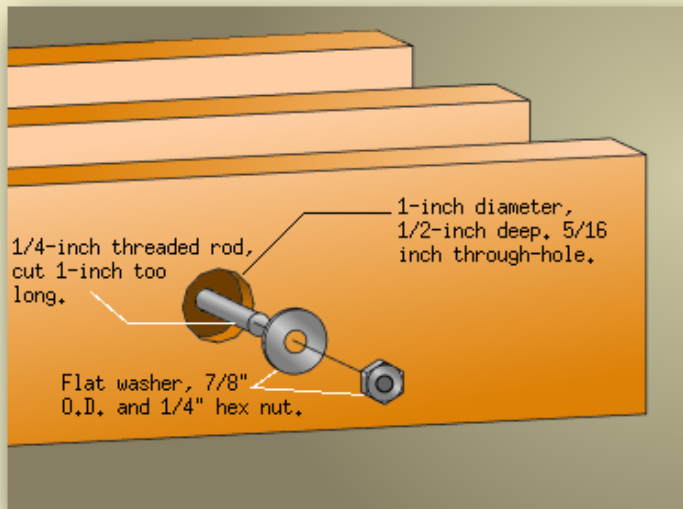
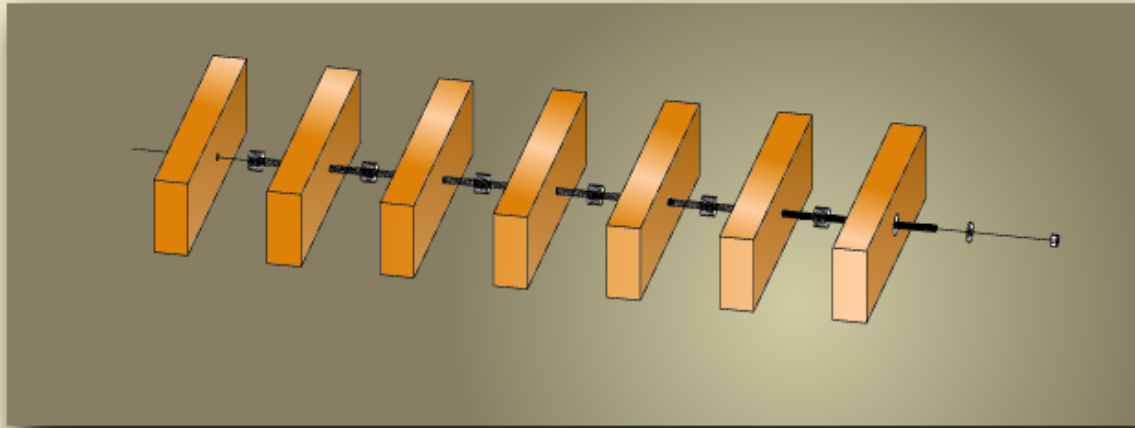
hacksaw or a ferrous metal cutting blade in a circular saw. Don't worry too much about small nicks on the side on the planking, as it will be concealed by the skirting. I used 6' segments of threaded 1/4"X20TPI rod, cut into 4 pieces. The locations for the holes was chosen to create a uniform spacing between the cross-pieces underneath the planks, and between the cross-pieces and the ends of the bench. Use a framing square to keep the ends of the planks square and evenly lined up across the ends.



It's WAY

EASIER to thread the planking over the rods like this, as opposed to laying the planks down in their ultimate orientation and pushing the rods through the holes horizontally. I can't believe I couldn't have figured that out intuitively. Notice the stacks of washers all lined up ready to drop over the threaded rods. It is surprising how much time it takes to count out all of these little things both at assembly time and in the hardware store. All of the lumber should be cut to size and stained before assembly. Once the planks are assembled onto the threaded rods, the last washer and nuts are tightened up, into the countersunk holes. Adjust the tension on the nuts so that the bench top is uniformly wide down its full length.

This design uses seven planks, each spaced about 3/8" from the neighbouring plank using stacks of 6 flatwashers. I chose to use flat washers because I wanted the round surface that would shed water, and to avoid having to cut and drill a lot of small pieces. I used galvanized washers to prevent rust, and also to help deter rotting of the adjacent lumber.



Some details of the fastening system used to hold the planking together. The fasteners are completely concealed by the skirt. Holes are countersunk to prevent interference with the skirts at final assembly time.



To cast the concrete base-blocks, I made a simple mold out of 1/2" sheathing and 2X4's. My project required a total of 8 blocks, so I cast

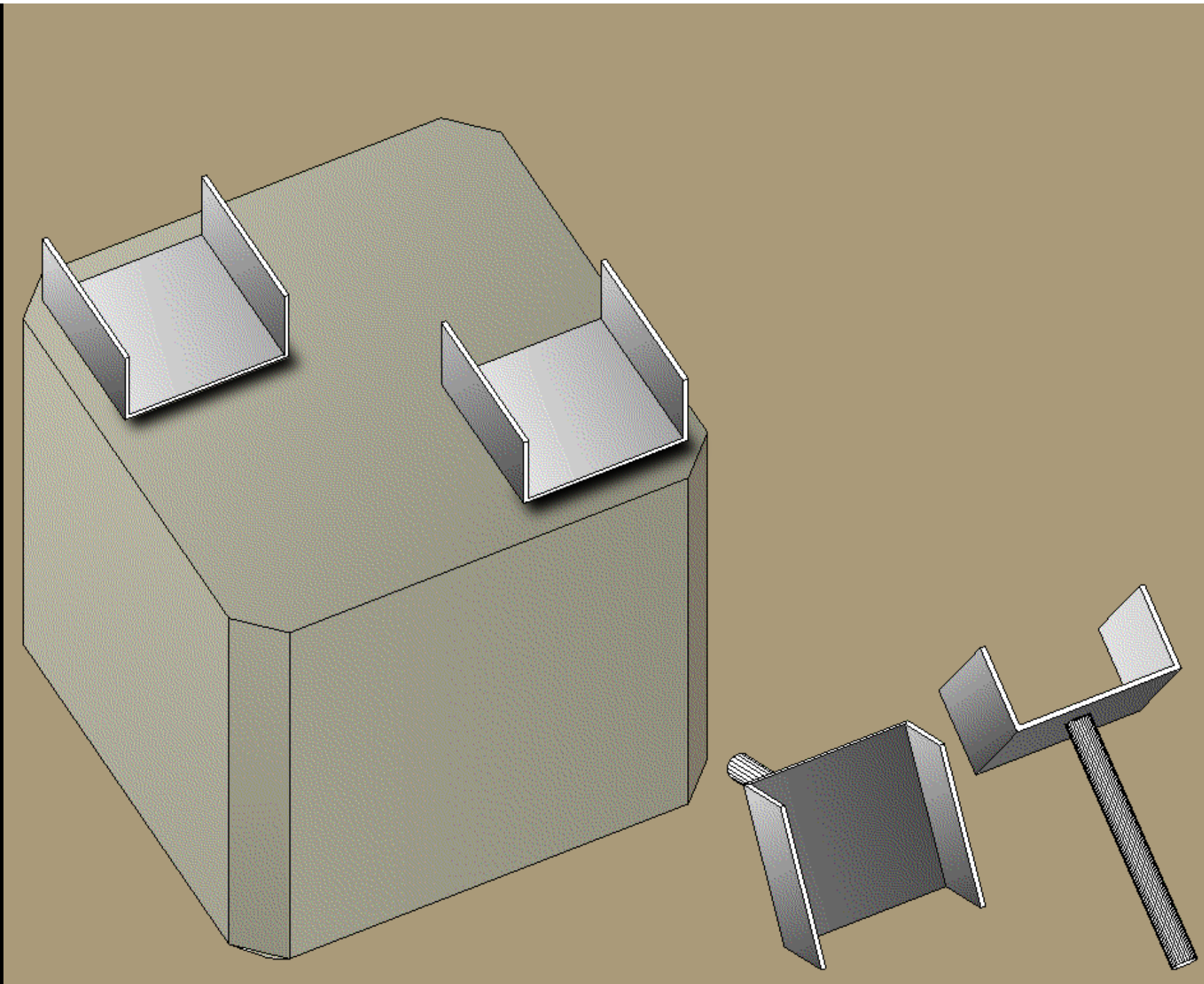
them in 2 batches of 4. The blocks were to have beveled edges and corners to refine the appearance a little, and to help prevent the sharp edges from getting chipped. The bevels were ripped from a 2X4, and fastened to the plywood with drywall screws. Disassembly and reassembly was fairly easy to do by removing screws as necessary with a cordless drill/driver. Some thought had to be put into where to put screws so they were accessible after the mold was filled with concrete.

Here is a view of the inside of the mold.

Getting the angles on the bevels is a bit tricky, especially where the third piece mates with the other two at the bottom corners. Not



shown in this photo are the 6" square pieces of 3/4" melamine particle board that were used to make the hollows that will be filled with the exposed aggregate detail. They were screwed to two opposing inside faces of each block mold. Although I used about 6 or 8 degrees of draft on the edges of the squares, they were still very difficult to extract from the solidified concrete blocks. If I were to repeat the process, I would either bevel them with a draft angle of 15 or so degrees, and/or apply a coat of some kind of mold-release to the edges of the exposed particle board. I chose the melamine particle board because I wanted something that would be easy to release from the cured concrete, and I didn't want to apply any substance that might prevent the exposed aggregate infill from adhering.

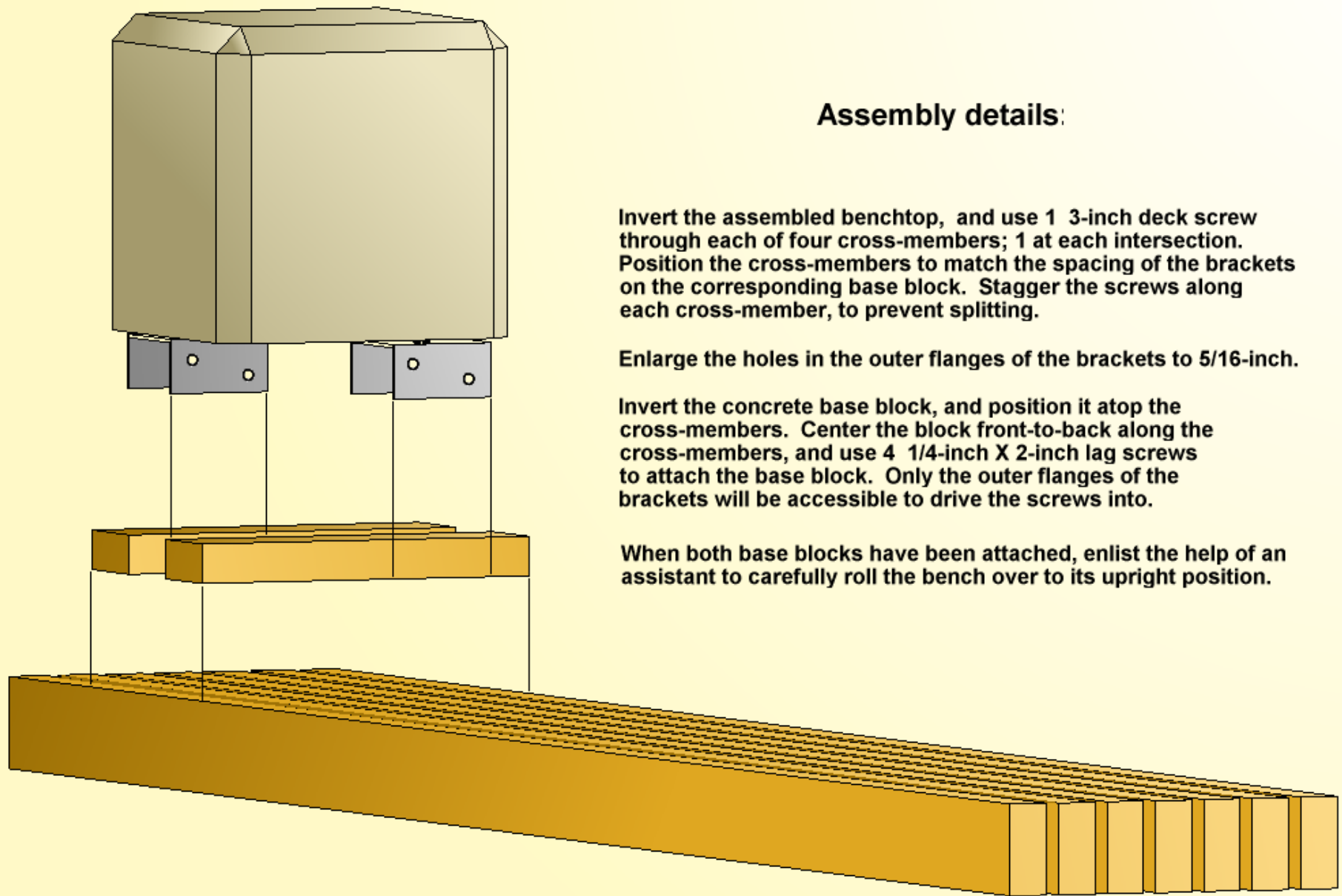


This is a block extracted from the mold, and layed on its side. The 6" square indentation will be filled with exposed aggregate, to match the exposed aggregate of the existing patio. Almost invsible in these photos are the galvanized steel anchor brackets that were cast into the tops of the blocks, and which will later be used to attach the wooden bench top to the concrete blocks. The brackets are the shape of U-channels, wide enough and deep enough to hold a 2X4 on edge. There are two of them in each block at opposite corners, with the channels running parallel to each other. The channels will accept the horizontal cross braces that are attached to the bottoms of the seat planking. The minor bits of flash at the edges and corners is easily cleaned up with a hammer.



The final stages of the exposed aggregate finish on the decorative panel. At left, the aggregate has been seeded and pressed into the surface of the wet mortar. The center image shows the exposed aggregate after having been allowed to set, almost to the point of becoming dry, and then the top layer of cream has been carefully brushed away, clearly exposing the embedded pea gravel. The right image is of the final gentle washing of the nearly hardened surface.





Assembly details:

Invert the assembled benchtop, and use 1 3-inch deck screw through each of four cross-members; 1 at each intersection. Position the cross-members to match the spacing of the brackets on the corresponding base block. Stagger the screws along each cross-member, to prevent splitting.

Enlarge the holes in the outer flanges of the brackets to 5/16-inch.

Invert the concrete base block, and position it atop the cross-members. Center the block front-to-back along the cross-members, and use 4 1/4-inch X 2-inch lag screws to attach the base block. Only the outer flanges of the brackets will be accessible to drive the screws into.

When both base blocks have been attached, enlist the help of an assistant to carefully roll the bench over to its upright position.

Looking for a nice way to finish a patio to put your bench on? How about visiting my [Exposed Aggregate Do-It-Yourself](#) for all the details on finishing concrete in exposed aggregate.

Or, visit [Picnic Table Design 101](#) for some nice free plans to build the classic style picnic table.

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Some details of the construction of this bench design are not yet included in this document. I will be building more of these benches, and taking photos to flesh out more of the details. C'mon back for the final version Real Soon Now.

The author invites your comments and feedback. Please feel free to send e-mail at the address listed below.

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