

# Conowingo Models



## Bush's Mill

*In O scale*



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Thank you for purchasing this kit!

Supplied are the basic directions. For more tips and some additional instructions, please see [conowingomodels.com](http://conowingomodels.com). We have a General Instructions guide and any revisions to these instructions on the Instructions page.

I did not include places to add details. Depending on what you decide to do with this mill, you'll hopefully figure out where and when to deviate from the instructions.

Be careful when you remove the pieces from the sheets because some pieces are brittle. I've tried to protect the more brittle pieces by making some wider and some have extra laser cuts around them, but by no means is this a guarantee.

### PAINTING

With this particular kit, I think it may be more beneficial to do a majority of your painting/staining after the sub-assemblies are constructed.

In this particular kit there is bracing as part of the construction. In the event that you feel you need more bracing, please read ahead and make sure that it will not cause clearance issues. Also, one thought that people often overlook is that additional bracing can be made from the leftover pieces of the basswood sheets. Unless the bracing will be visible, there is no reason to use strip wood for that bracing.

Some parts will need temporary bracing in order to be painted/stained. I tried two different things.

For the first, apply a quick-drying stain to one side, let it sit for five minutes, (it will start to warp) then use clamps and flat wood (I used 2x4 scraps) (or some good weights) to flatten the wood. This technique will cause some discoloration. Allow it to set up for 24 hours before removing the clamps. If you remove the clamps early it will warp. If you're staining both sides (recommended), repeat.

The second technique requires you to apply clamps to flat wood that has been placed across the structure. Paint/stain and let set up. This should allow you to do parts of both sides. Allow it to set up for 24 hours, then move the clamps and flat wood to prevent warping and repeat painting/staining.

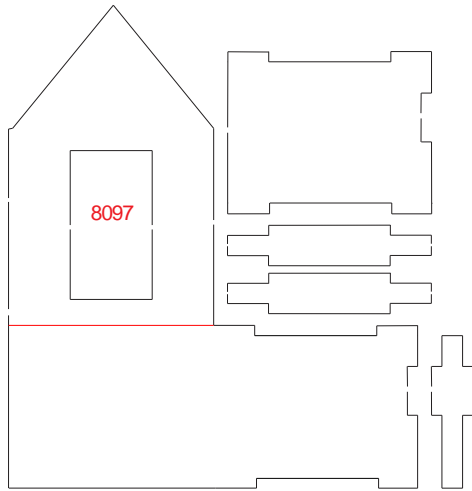
### PAINTING/STAINING

Painting/staining is the best place to start.

1. I would recommend painting/staining the basswood external pieces the same color as the stripwood. This is so that any imperfections/ expansion/contraction of the stripwood on your external layer won't show through.
2. The inside pieces should be painted/stained as well. I've included a floor and make this recommendation because the windows are big and a mill wouldn't have curtains. Therefore, the inside would be somewhat visible from the outside.
3. The 2X8 stripwood and 1/16 stripwood should most likely be stained in variations of color. Don't make it all the same unless your building is brand new.

4. The sluices and sluiceways should also be stained.

### HEAD WALL

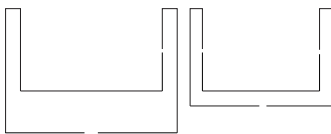


The head wall is an area where you may want to consider reworking so that it is the reservoir wall with a cut in it for the sluice. This presents its' own set of challenges, which is why I didn't include it in the production version of this kit. Food for thought.

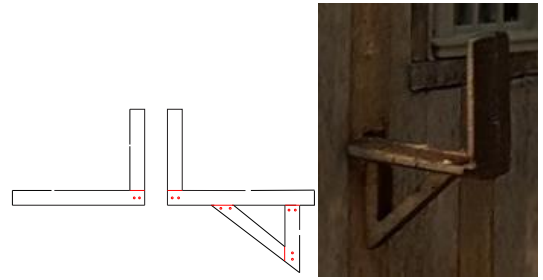
1. Locate the external building wall with the head wall attached. There are four pieces that attach to it.
2. They can be glued together in any order. However, I suggest the top and bottom pieces first, the larger piece next and the end piece can be added last. Ensure it is nice and square.
3. If you are going to use stripwood on the outside of the building, it is recommended that you stain/paint the upper portion of the building a grey color so gaps in the stripwood don't show.

#### SLUICE SUPPORTS

In researching this topic, I found more questions than answers. What I decided to do was include the supports for the sluices themselves and let you figure out how to support them.



1. Glue the support pieces together. I've included two types (4 of each total) for you to choose from. Pick and choose what you want.
2. Once dry, use the left over 2X8 stripwood or your own version thereof to build the appropriate supports for your sluiceway.



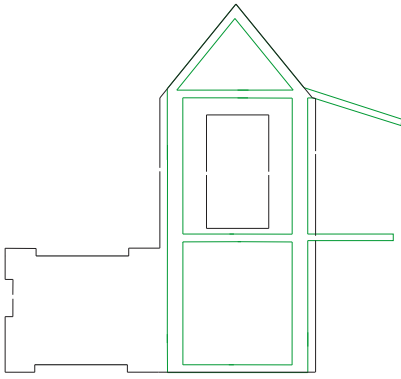
3. The above supports (2 each) can be glued together. Again, you may wish to clean up the laser burn. These are the supports that attach to the building.



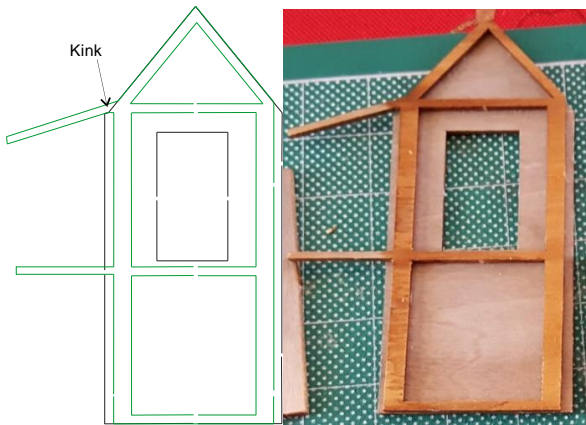
#### SLUICE

1. There are two sluice sections. They should be easy to fabricate should you require more for your use. There are three pieces to each.
2. Lay the bottom piece(s) flat.
3. Glue the sides to the long ends of the bottom piece(s). Ensure they are positioned so that the completed piece(s) form a U.
4. While the glue is still wet, locate the two pieces that form Hs, along with the rectangle with a small cut out in it. These control water flow. The two Hs are guides for the gate.
5. Before you glue these three pieces together, you have a decision to make. If your sluice is going to be shown with water flowing, you'll want to raise the gate. The guides belong on either side of the gate.
6. Glue the guides and gate into one end of the sluice. The guides should be squarely in the sluice with the bottoms of the Hs at the bottom. The gate should be positioned so that the bottom is no higher than the top of the sides of the sluice in a position of your choosing.
7. Paint/stain as appropriate including the sluice supports.

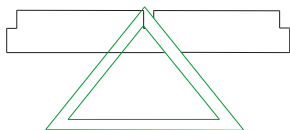
#### BUILDING FRAMEWORK



1. Locate the external building wall with the head wall on it. If you've already built the wall, you're good as long as it isn't wet and malleable. You'll also need two of the internal framing walls. You will also need to locate the opposite wall.
2. Starting with the head wall piece, glue on one of the internal framing walls (shown in green). Match up the roof ends, ensuring the frame piece is square. With the head wall on your left, the porch roof support needs to aim to the right. Set aside to dry.

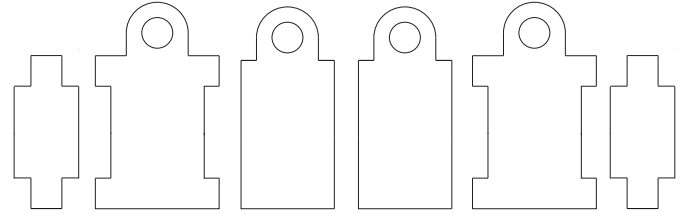


3. Position the opposite wall so that the roof is at the top, with the laser-cut cheater line on the table. There should also be a kinked roofline on the left. Glue the second internal framing piece to it so that the porch roof support is on the left. Again, ensure that you have matched up the roof ends and that the framing is square on the outside wall. Set aside to dry.



4. (Optional) Glue the last internal framing piece (It looks like the one in step 2. Illustrated here with a triangle) into the middle notch on the roof ridge

piece at a 90° angle. (Not like the illustration) You will need to support this so that the roof ridge is level and the internal framing piece is square and level. If you need assistance, you can glue small pieces of wood (provided they have a 90° angle on them) to each side of the ridge/frame intersection, ensuring that it doesn't protrude beyond the roof line.



#### WHEEL DERRICK

1. Locate the seven pieces that make up the wheel derrick as well as the axle. In the O scale version, there are THREE of the middle pieces, not two as shown.
2. Glue those three smaller pieces with the hole in them together. Use the axle to ensure proper alignment.
3. Glue the two larger pieces on either side of the first two. Again, use the axle to ensure proper alignment.
4. Attach the end pieces.
5. When dry, sand the round part so that it is even. This part would traditionally be a single piece of metal or perhaps a metal assembly. I'd recommend painting it black when the opportunity arises.
6. Add the stone paper. We'd recommend a single piece beginning and ending on the corner of the derrick nearest where the head wall and building meet. If this is your first time using the paper stone, this is a good place to practice because it's the smallest spot.

#### BUILDING ASSEMBLY

1. Gather the door-side piece and the center support assembly. Put some glue on the outside of the support on the porch side. You can do the same for the opposite side.



2. "Hook" the top porch support (of the center support assembly) over the top of the door-side piece and rotate so the bottom porch support slides neatly through the elongated hole on the door-side piece.
3. Take the wheel-side piece and glue it against the little pocket between the head wall piece and the support on it.
4. Put some glue on the two notches of the roof ridge piece.
5. Do the same for the door-side piece, ensuring the roof ridge piece fits neatly against the apex of the roof.



6. The remaining wall can now be glued into place, ensuring again that the roof ridge piece fits against the apex of the roof and that all the walls fit nicely together and are square.
7. Right now, you're thinking "I should put the roof on next, right?" Not this time. It'll make things complicated. I like to do things the simple way.



8. Using your best judgement, apply clamps where need be to hold the building together while the glue dries.

#### EXTERNAL FOUNDATION

Using the rock paper, you will now wrap your building. It is important to do this first, before you add your stripwood siding because you want the siding to overlap the stone foundation.

These directions assume that your mill will be displayed with the water wheel being the most visible part of the model. The object is to hide the seams from "public" view or at least put them in a spot where they are easily and plausibly covered up. I've included dimensions that worked for me. You may want to measure the building before you cut and determine what will work best for you.

1. Begin by covering the wheel derrick. This is to help you get used to working with the paper. You will need to do this twice.

Start with the head wall (building on your left), start the wall with the seam on the left. Wrap the wall around to where the wall meets the building. On the building cut it even with the laser cut guide line. Allow that line to continue until it wraps around the corner. Don't cut it off.

Glue that side of the wall down and apply pressure until it's dry.

Bend the paper to neatly cover the corner. You may consider gluing it, applying pressure again and letting

it dry, but that's a judgement call. Continue to allow it to be one piece.

Cover the front side of the wall and top, so the top edge meets the opposite side of the head wall. Letting judgement be your guide, determine whether you should cut the paper here or continue. Either way, it should be glued and pressure applied.

1. Use the laser cut guide lines to determine where to apply the paper as you continue to glue it down, apply pressure and let it dry. Don't forget to cut the hole for the axle.
2. Repeat until all four sides of the building are done. I cut the two remaining pieces separately, but in hindsight it wasn't necessary.

#### SIDING

Before proceeding, decide if you want to use all of the windows. In the pilot model, we figured it might be a hidden distillery so we didn't add all the windows.

Apply your favorite techniques for aging, etc. to your 2X8 stripwood, 1/16 stripwood and the three roof supports. If you don't have any, try any of the following techniques-

1. Cut grooves, knot holes, edges using a hobby knife into the wood.
2. Using a ponce wheel, apply nail holes to the ends if you desire.
3. Use a rough sanding block or steel brush to groove the wood.
4. Use india ink/alcohol solution, grey stain or grey paint
5. After step 4, apply a light coat of paint and remove with masking tape before it dries. Light sanding works as well.

Picking a corner to start with, cut-to-fit and glue the stripwood into place vertically. Do not cover up the 1/16 stripwood you just put in. Trim around those pieces as necessary. One interesting technique I

found is that if some of the stripwood ends are rough, put them on the bottom and make your trim cut on the top. It adds character. Also, leave room for the sluice supports. If you want to adjust their locations, now is the time.

Don't throw away your scraps just yet!

6. Add the two sluice supports that attach to the building.

#### WINDOWS AND DOORS

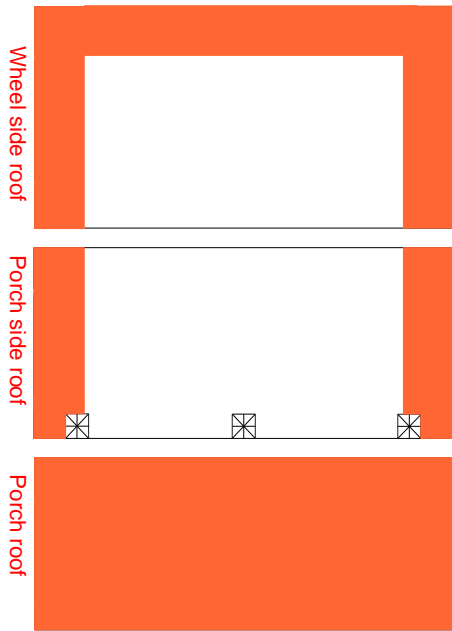
1. Cut out the windows and door from their sprues, taking note as to their location on the building.
2. Paint the windows and add acetate as appropriate.
3. When dry, glue them into place.

#### WATER WHEEL

1. Very, very carefully cut out the wheels with paddles attached. (Paddle wheel)
2. Glue the two paddle wheel halves together, ensuring they are uniform.
3. Paint/stain the paddles and the inside of the two wheel side pieces. Apply weights to keep them from warping.
4. When dry, glue the side wheel pieces to the paddle wheel with the engraved side out.
5. When the wheel assembly is fully dry, paint/stain the outside. Apply weights to keep the wheel from warping.
6. On the side that will face outward, cut out and install the nut, bolt, washers in the holes.

#### ROOFING

1. Paint/stain the three pieces on the scribe side as shown above. I used Hunterline Raw Umber. Or leave it alone if you want it au natural. You might want to sand the edges to remove any laser burn that may exist.



2. Glue on the porch side roof first. Ensure the scribe side is down and that the piece is centered side to side.
3. Glue on the wheel side roof next. This piece needs to butt against the porch side roof to form the ridge cap. Again, ensure the scribe side is down and centered side to side.
4. Lastly, the porch roof can be added. It should butt against the porch side roof, of course ensuring the scribe side is down and centered side to side.
5. Apply shingles. Be sure to put down the starter piece on both sides and shingle away! Finish up with the ridge cap. Don't use too little or too much!

#### PORCH ASSEMBLY

1. Glue the base piece to the lower three deck support pieces on the door side of the mill. It should slide on.
2. Run a piece of 1/16 stripwood across the underside of the deck to hold it flush.
3. Fit and glue into place 3/32 stripwood around the bottom of the deck.
4. Fit and glue into place three 1/8 stripwood roof supports at the corners and middle.

5. We've included a pre-cut piece of wood for the top. However, we found that a piece of 3/16 x 3/32 stripwood worked better.
6. Use some 3/32 stripwood to add desired trim at the top of the walls and to the porch.

#### FINAL ASSEMBLY

1. Install the sluice supports, followed by the sluice(s).
2. Slide the axle through the derrick, water wheel and into the mill. We recommend gluing the axle to the derrick, but not to the other two items.
3. Drill a hole and install the chimney as desired.



I hope you've enjoyed building this little model. Hopefully, if all goes well you will be seeing more models from me.

1. Please share your photos on our Facebook page!  
<https://www.facebook.com/ConowingoModels>

Once again, thank you for your purchase!

If there are any parts missing, please e-mail me what you need to complete the kit and I'll send it your way. Also suggestions for improvement are welcome.

See the Conowingo Models website  
[www.conowingomodels.com](http://www.conowingomodels.com)  
 for more exciting, funky buildings for your model railroad!

Many thanks to my family, Jeff Grove, Steve Milley and Mark Schreier for their support!