Work Space Set-up

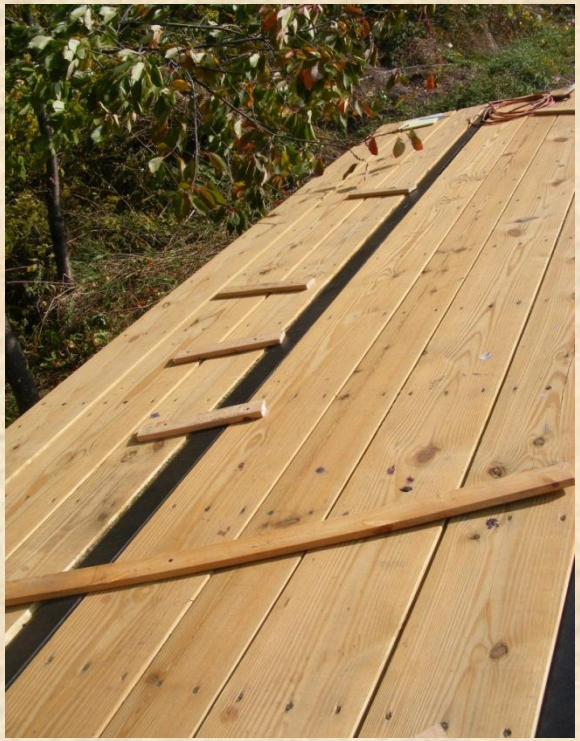
Affix pipe bender to end of working surface

Slats will level the pipe during bending and help minimize twisting of the bow.

Make the slat height equal the distance from your work surface to the bottom of the pipe when it is in the bender.

Lay the wooden slats out every 4-5’ in an arc.

Adjust slat placement and fasten down while bending practice bow.



Pipe Bending

Preparing the Pipe

Materials: Pipe bender, 1 $^{3}/_{8}$" top rail, marker, spare pipe end, large flat working space, wooden slats

Every pipe has a tapered, or *swedged* end. This end **always** goes into the bender first.

A hoop is never bent uniformly. Because of leverage differences, the two ends of a bow often have different arc angles.

It is fairly easy to make a consistent end angle between bows, but it is difficult to make both ends of a bow have the same arc angle.

That is why the swedged end **always** goes into the bender first.

Mark both ends of the pipe at 13".

Note: It is helpful to buy a few extra lengths of pipe. The first few you bend will be inconsistent. *Use the extras to develop good, consistent technique before making bows that you want to keep.*

Pipe Bending

Step 1: Insert swedged end into bender clamp ring. The 13” mark should be at far edge of clamp.

Step 2: Bend the pipe by walking it backwards. Bring it flat to the bender, keeping the pipe level. It shouldn’t touch the end closest to you. Do not over-bend.

Pipe Bending

Step 3: Walk the pipe back to your starting position.

Step 4: Slide the pipe 6-9” further into the bender. Keep the pipe level when sliding.

Step 5: Repeat Steps 2-5. **Consistency is key.** Try to slide the same distance and bend to the same degree each time.

Caution: It is easy to rotate the pipe in your hands when bending and sliding. Try very hard to not roll your wrists and the pipe. Rolling the pipe will result in a hoop that has a corkscrew twist bent into it.

Helpful Tip:

More slides, which will cause smaller bends, will yield greater angle uniformity in the bow.

Helpful Tip:

Push the pipe away from the bender to take pressure off the clamp ring, then slide.

Pipe Bending

Pipe Bending

Step 6: Bending will become difficult as you get toward the end of the pipe (last 4-5'). Insert swedged end of spare pipe into bow to increase your leverage.

Step 7: On the last bend, insert until 18-24" are left to be bent. The goal is to have the 13" mark end up just outside the front of the bender after bending. **Do not bend past the 13" mark.**

Step 8: Slightly over-bend end of pipe by bringing the whole length flat to the bender. This will ensure that the portion going into the ground post is straight.

Pipe Bending

When sliding, push the pipe away from you to relieve pressure on the clamp ring. Try to not roll the pipe while sliding.

Insert a spare length of pipe to help maintain leverage toward the end.

A finished bow

Hoop Installation

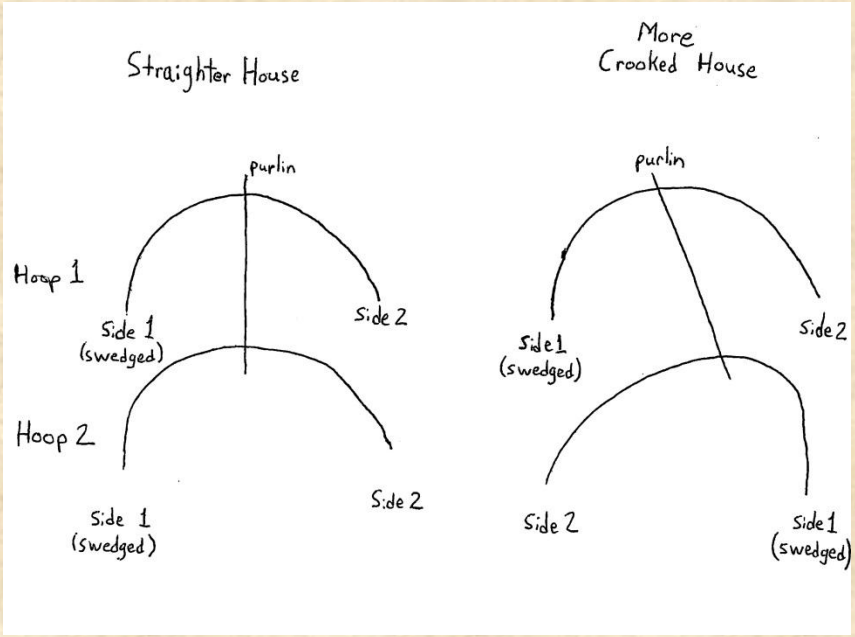
Materials: Bent hoops, drill, duct tape

Work from one end of the tunnel to the other

Always place the swedged end into ground post first

Always place the swedged end always on same side of the tunnel.
This will ensure that the same bend is on the same side of the house, which will improve tunnel consistency and alignment.

Remember: The bend in a single bow will be different from one side to the other. However, that difference will be present in each bow produced.



Hoop Installation

Step 1: Work swedged end of bow into ground post. Bow is fully inserted when 13” mark is at the top of the ground post.

Step 2: Insert loose end into the opposite ground post. You will likely need 2 people to very gently flex the bow. Stop at 13” mark.

Two teams insert two bows.

Swedged end at right.

Insert to 13” mark.

Hoop Installation
Trouble Shooting

It is likely that your house will not look even once all the hoops are installed.

Step 3: With both ends securely in ground posts, gently push/ pull on bows to try to lessen any inconsistencies.

- You won't be able to make big changes. Don't force the bows too much in trying.
- Purlin will also help straighten/align bows, and will allow you to bring bows back to vertical.

Step 3: Gently straighten bows. Hoops were bent inconsistently, which pulled the tunnel out of alignment. Purlin attached for demonstrative purposes.

Hoop Installation

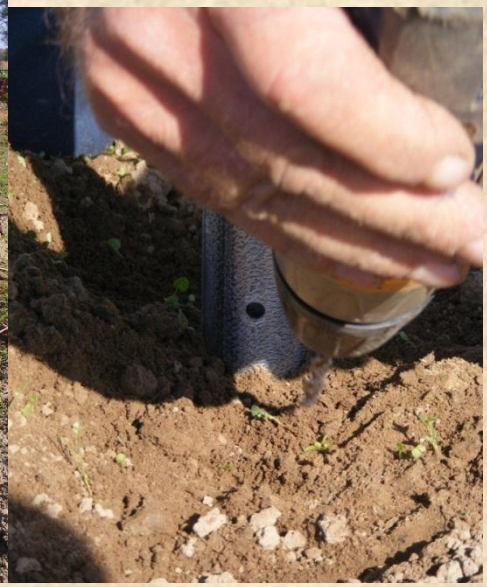
Step 4: Twist pipe ground pipe so that the hole faces straight out (perpendicular to length)

Step 5: Drill through bow– should pass cleanly through pre-drilled ground post holes

Step 6: Duct tape bow-post joint to prevent plastic wear

Step 4: Twist pipe. Note that bow is inserted almost perfectly to the 13” mark.

Step 5: Drill through bow, pass cleanly through pre-drilled ground post



Bolt Assembly

Materials: ¼” plastic tubing, clippers, bolts, washers, nuts, measuring tape, wrench

Step 1: Cut plastic tubing into 1 ¾” long pieces

Step 2: Slide onto bolt: plastic tubing (up to head), then washer then nut. Pushing bolt and tube into a drilled board may be helpful.

Step 3: Repeat until you have assembled 40 bolts.

Cutting plastic tubing

Left: Materials Right: Assembly

Bolt Attachment

Place one bolt in each ground post. Attach with head to the exterior. Secure with a second washer & nut. Tighten with wrench.