

When the HydroSana conditioner arrives, remove it from the packaging.

We start the installation by assembling the battery pak.
Remove the screws and top.



Next insert the batteries.

The negative or minus end of the batteries should touch the spring inside the battery tube.



With both batteries inserted, we close the battery pak up by replacing the top and the screws.



Now we connect the red and black wires.

The black wire goes on the negative end (the end with the led)

The red wire goes on the positive end



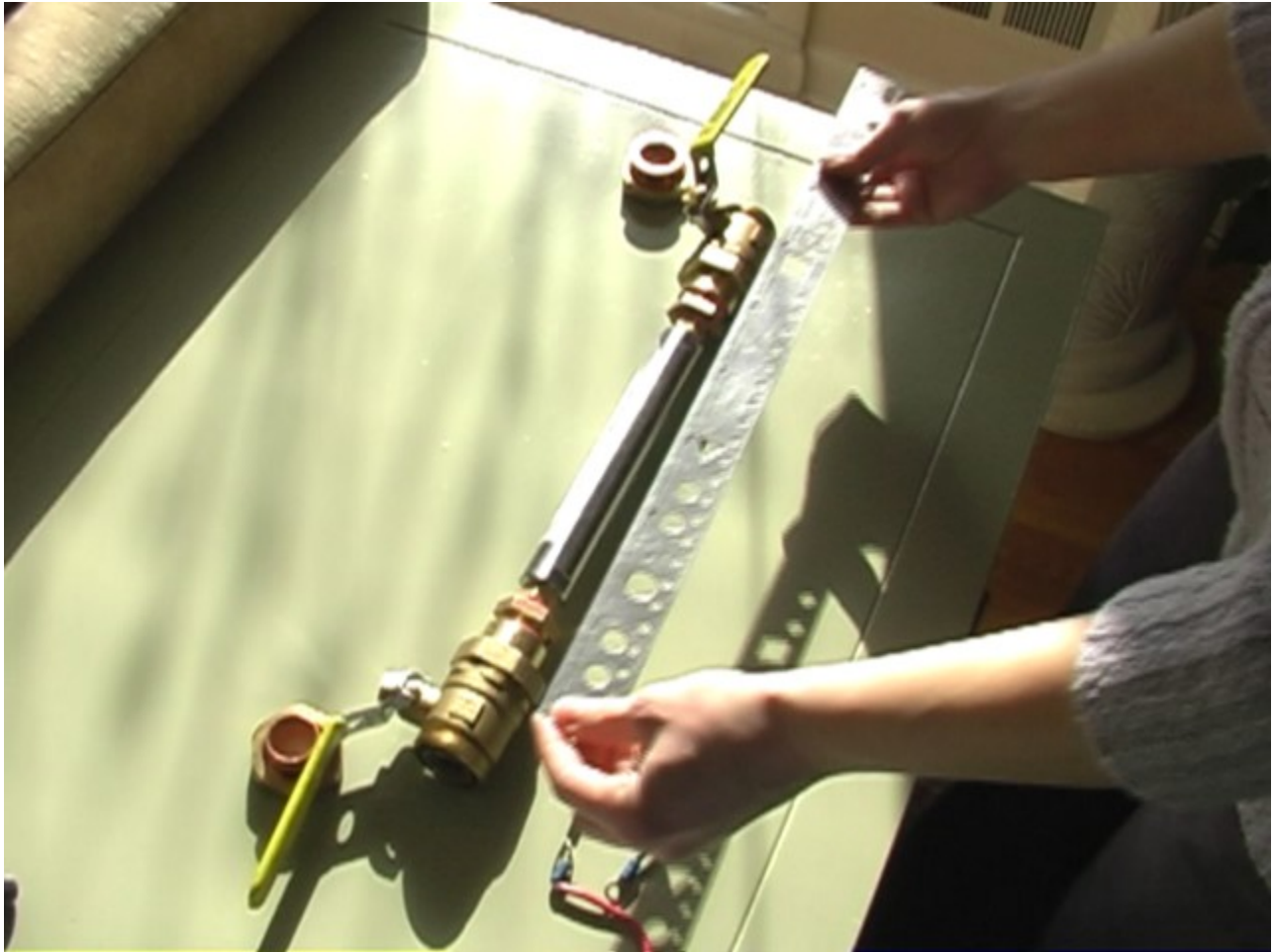
***** Next scene

Now we remove the outer ends of the conditioner.

Unscrewing the nuts allows the nut and copper flange to be removed.

Remove the black rubber "o ring" inside the shutoff valve and keep it aside.

With both ends removed, we measure the conditioner and valves to determine how much pipe to cut from the house water pipes.



***** Next Scene

Now we remove the valves from the conditioner so we can access the "o rings" on the inside.

Using non-drying Plumber's Grease, we liberally grease the "o ring" grooves on each end of the valve.



When the grooves have been filled with grease, we press the "o rings" into the groove and grease them with the excess that squeezes out.

Once the "o rings" have been greased, we are ready to prepare the pipe.



***** Next Scene

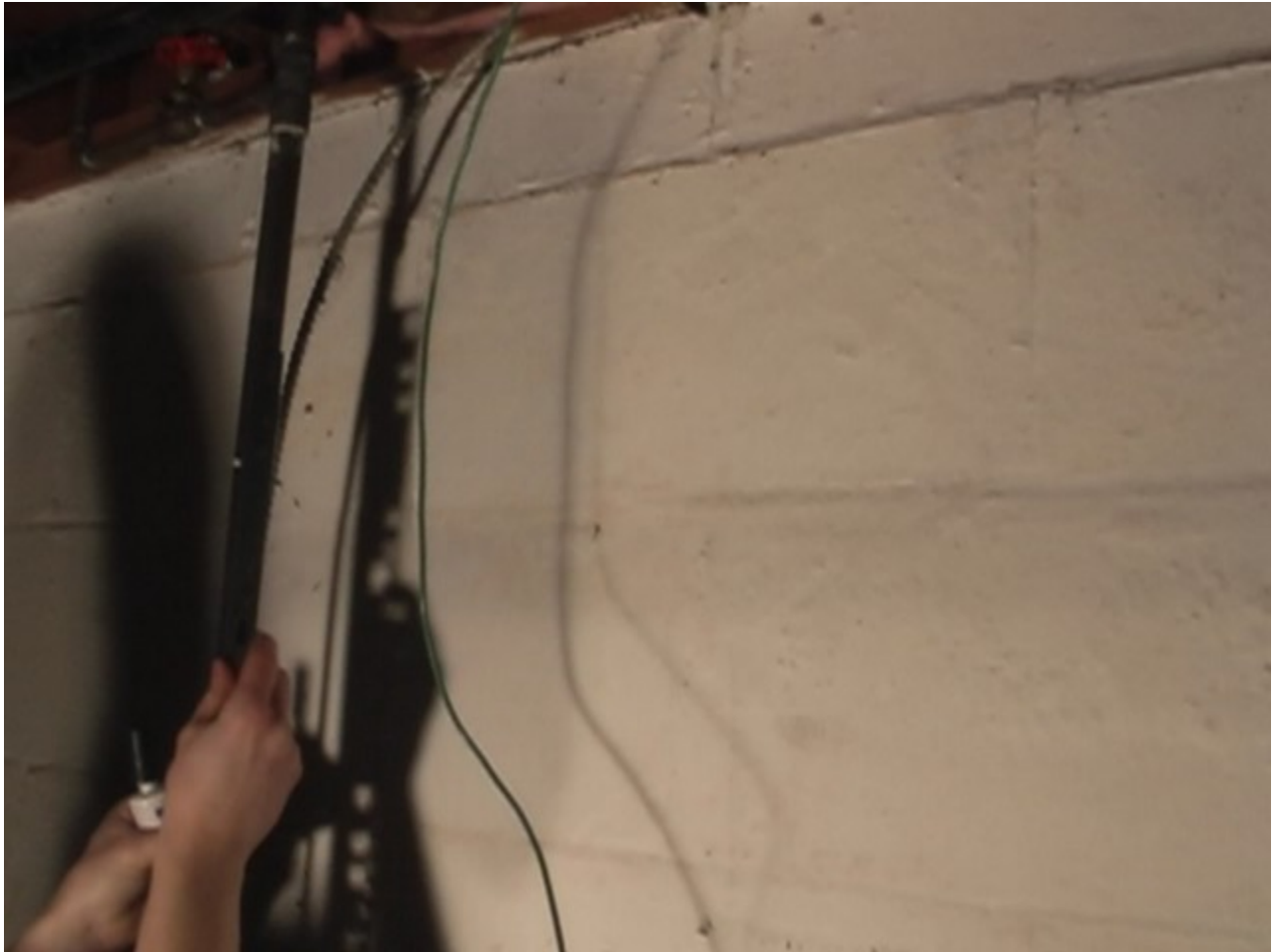
Looking at the water pipes, we see existing ground wires wrapped around the pipe.

We detach the green wire and unwrap it from the pipe.

Now we remove the wire holding the shielded ground to the pipe.

That gives us clear access to the pipe and installation of the conditioner.

Mark the conditioner length we previously measured on the pipe.



***** Next Scene

Before we can cut the pipe we need to shut the water off

Starting with the inlet valve before the water meter

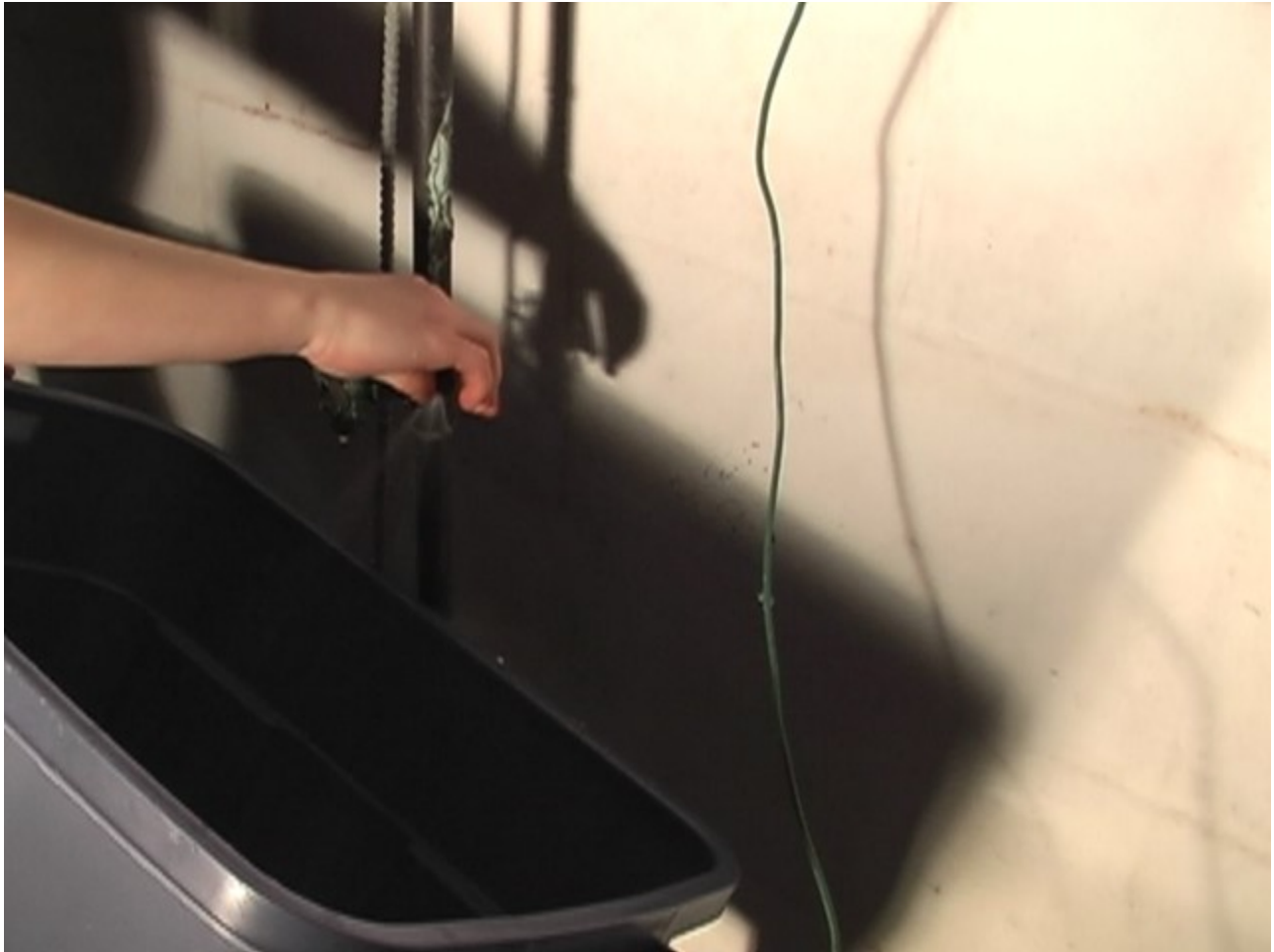
Next the valve after the water meter

This valve has a bleeder on it.



We open the bleeder to drain the water from the pipes

Catch the water in a tub or container instead of letting it run onto the floor



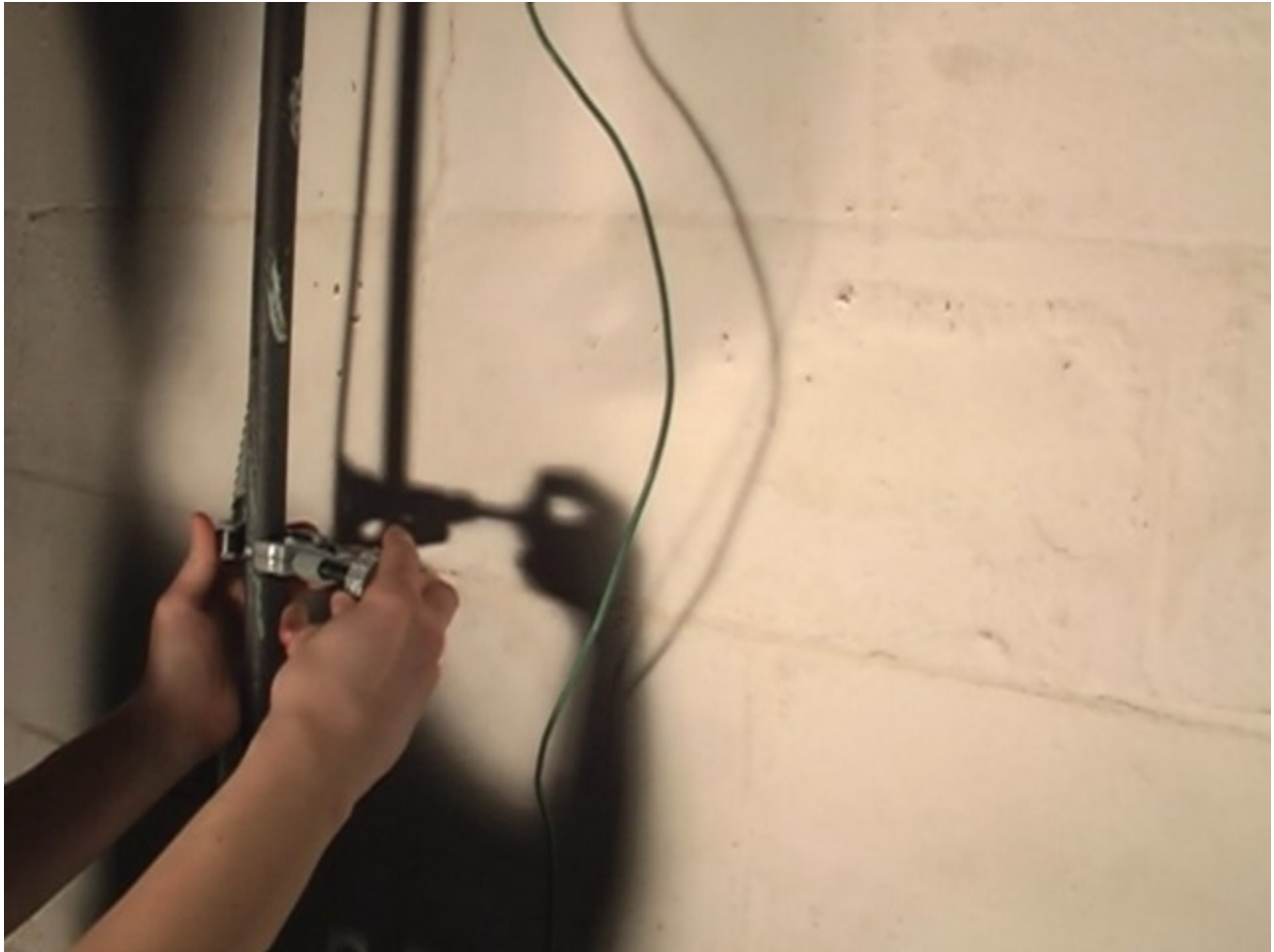
***** Next Scene

With the water out of the pipe, we use a tubing cutter to cut the pipe

A tubing cutter has a sharp wheel that contacts the pipe



Place the cutter on the pipe and tighten the cutting wheel



Now rotate the cutter around the pipe.

With each revolution, tighten the cutting wheel.

It only takes a few revolutions to cut the pipe



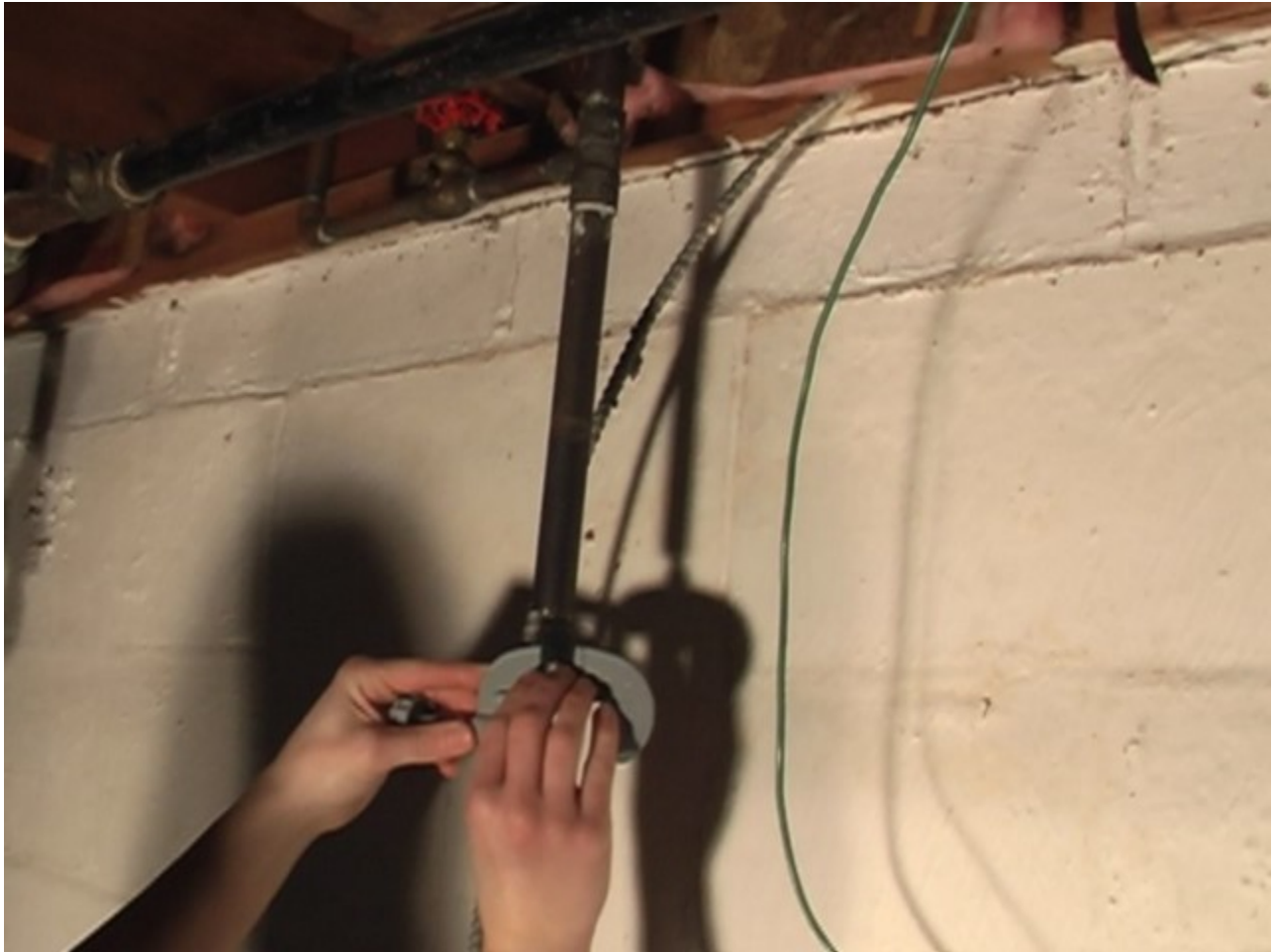
With both ends cut we measure the piece we are removing

If it is a lot short, we need to make an additional cut

Normally, once a pipe has been cut, one end or the other has movement that can accommodate inaccuracies in measurement or cutting.

When we cut a pipe, the wheel creates an inward lip or what is called a "burr".

The tubing cutter has a deburrer on it. We insert it into the pipe end we just cut and turn it one or two revolutions to remove the burr.



Now we use a pipe cleaning tool to clean the ends. Push it onto the pipe and twist it to clean the oxidation and dirt from the pipe

We are finished when the copper is bright and shiny

Do this to both ends



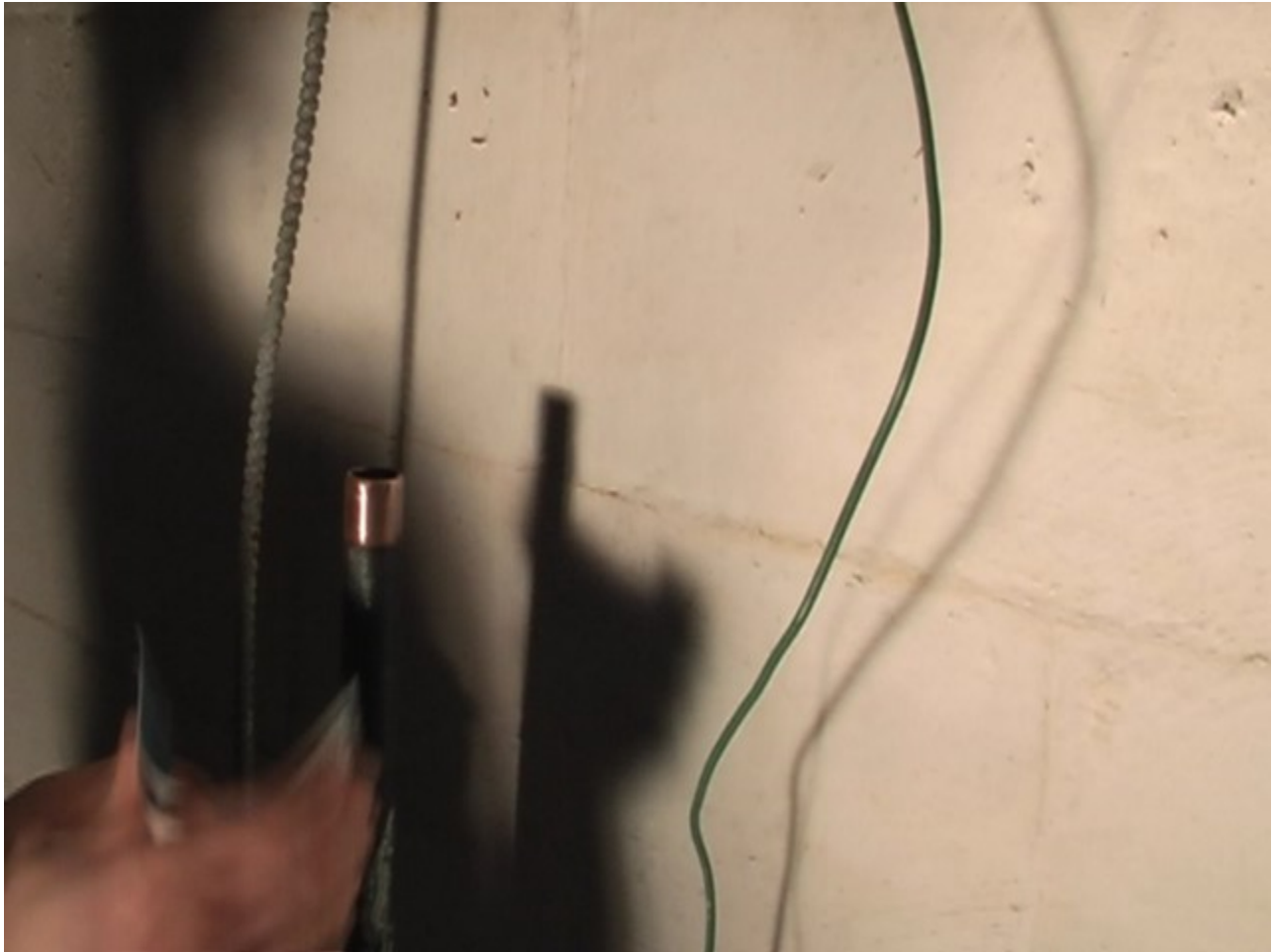
Now using the wire brush we clean the inside on the flanges we are going to solder onto the pipe ends



Next we use the sanding cloth to further clean the pipe ends



When the ends have been cleaned, we light the torch



Do this by opening the knob slowly until you hear the gas escaping

Light the gas then open or close the knob until there is a blue flame that comes to a point



Now we use the torch to heat the pipe ends.

This boils away any moisture.

While the pipe is still hot, we paint on Plumber's Flux. This is a paste that makes the solder stick to the copper when we solder it



Now put the valve nut on the pipe with the threads facing the cut end of the pipe

Next, push the valve flange onto the pipe

Now we heat the pipe and the flange to accept solder

We want the pipe and flange to be hot enough to melt the solder when it is touched to the metal

We do not use the flame to melt the solder.

Unclean joints, wet joints and solder melted by the flame instead of the metal are the cause of most soldering failures

The flanges have a ring of solder inside them

When we see that solder running out it is time for use to add solder around the joint



Amazingly, the solder will wick upward fairly quickly

A lot of people think they have to solder from the top down to let gravity draw the solder down.

That the solder wicks up is counter intuitive

When we can see the solder coming out the top of the flange, we are finished



While the solder is still molten, we can use a cotton rag and wipe away the excess solder from the joint.

Looking at the top of the flange, we must be sure that no solder sticks to the top surface. If there is water or solder, we wipe it off.

Now we do the top.

Place the threaded nut on first the tape it up, out of the way so we can solder

Heat and flux the pipe end then push the flange onto the pipe

Now heat the pipe and the flange until solder melts when touched to the pipe.

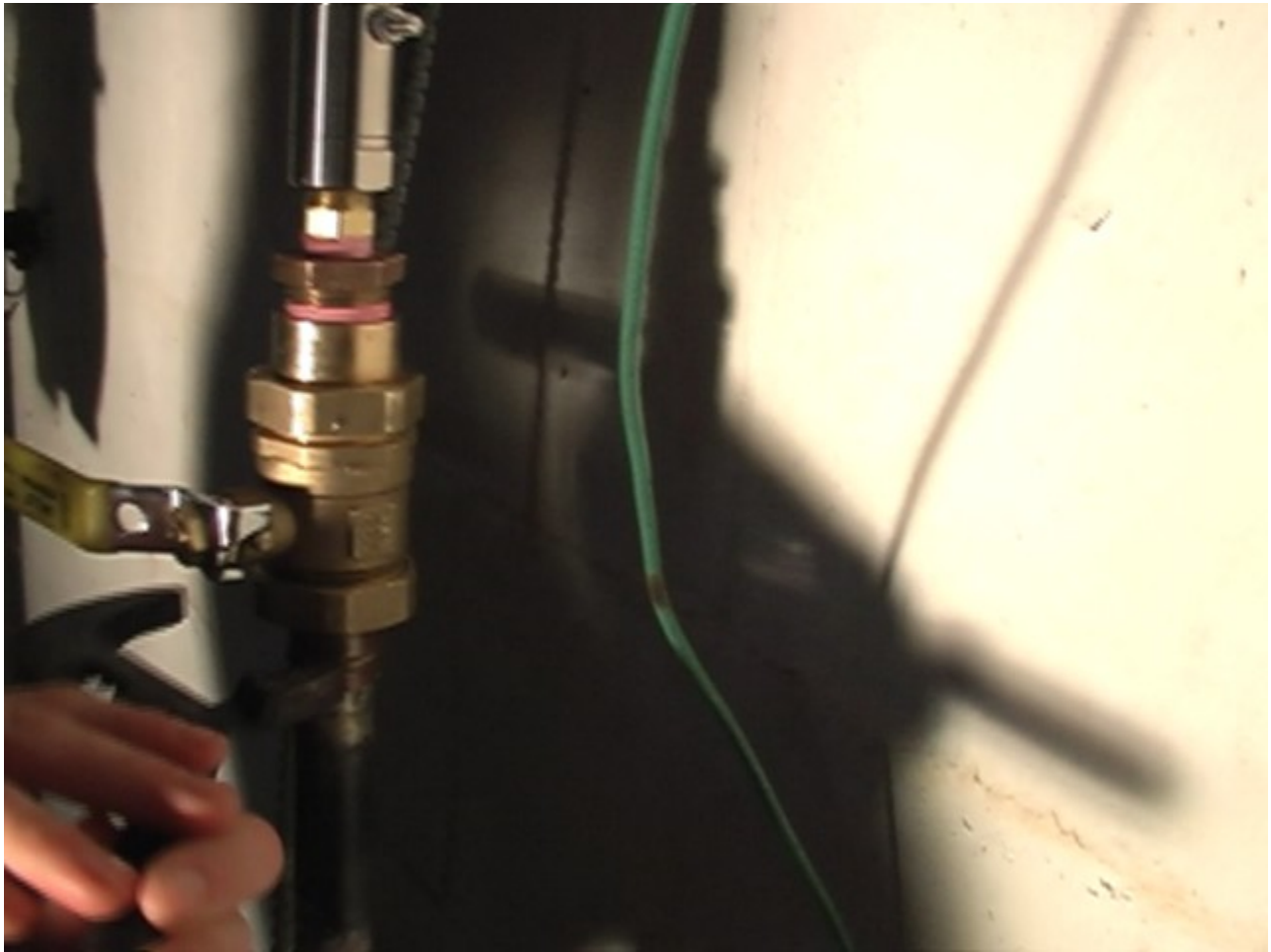
It is much easier to solder with the help of gravity.

Solder around the joint and it will flow downward.

We can see the solder when we look from the bottom.

Now we are ready to insert the conditioner.

Making sure not to lose an "o ring", we put the conditioner in place and screw on the nuts



When there is metal-to-metal contact we are done.

This is much less tightening that might be imagined.

The "o ring" gets squeezed a few thousandths of an inch to make the seal.

Tighten all 4 nuts

Close the bleeder on the 2nd valve by tightening it.

Do not over tighten

Now we are ready to turn the water on

Start with the valve on the outside of the meter then move the the next one.

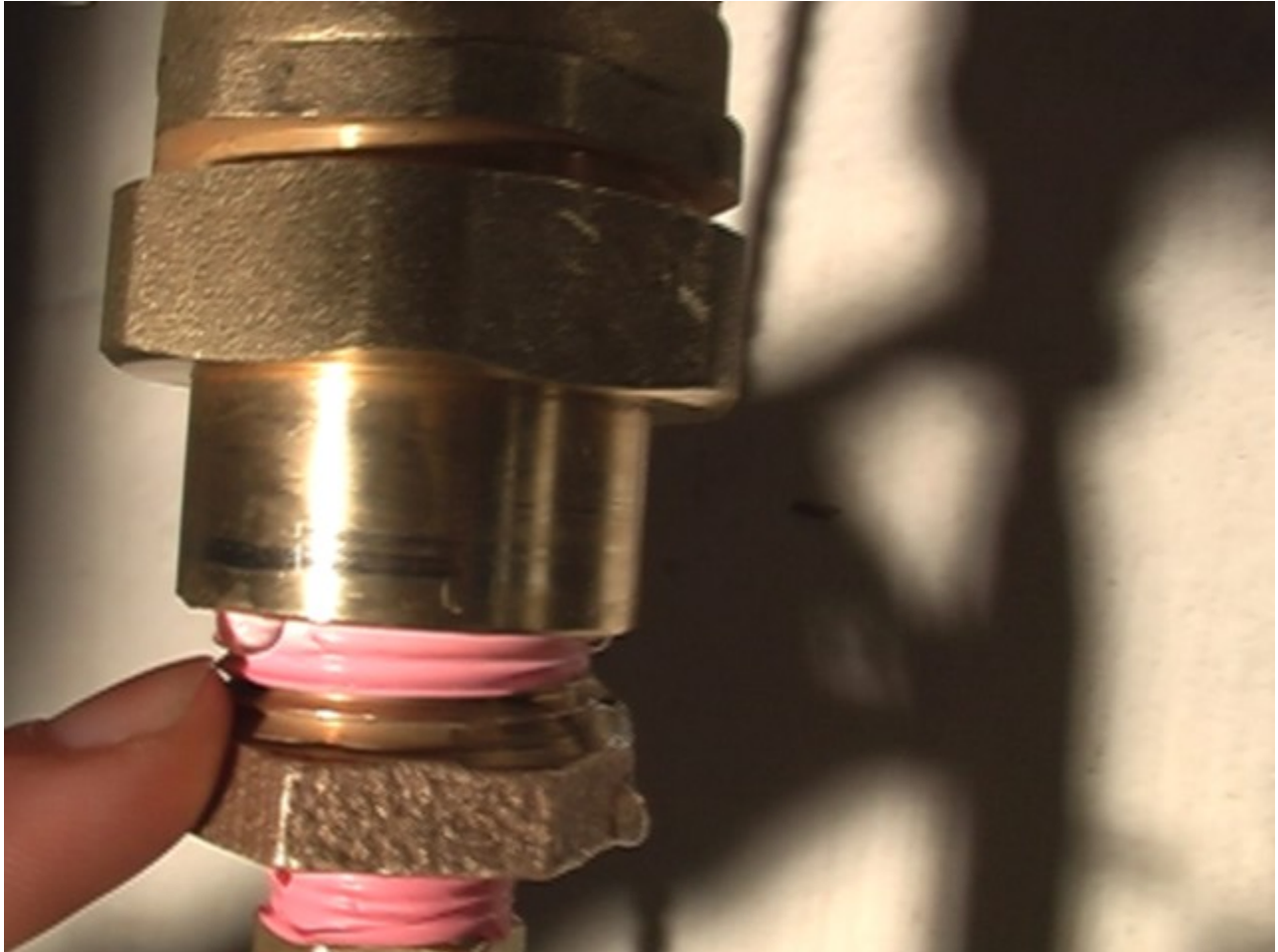
Watch for leaks

Now turn on the valve at the bottom of the conditioner

Watch for leaks

Now the top valve gets opened

We can see that we have two leaks

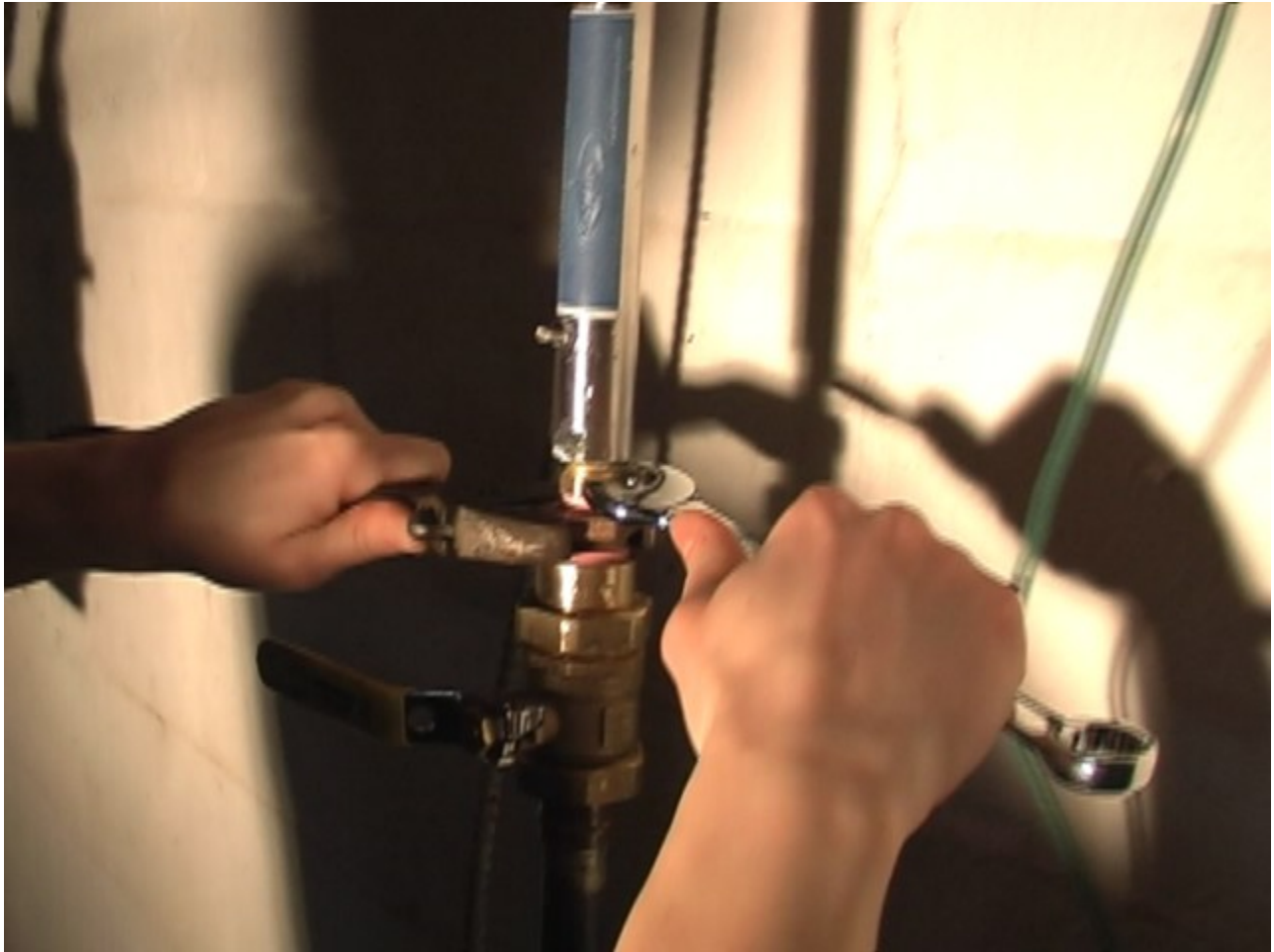


We fix this by first turning off the valves

Then loosening the inside nut of the top valve

It isn't necessary to fully unscrew it, just be sure it is loose

Now, using a wrench to hold the conditioner, we tighten the joints to stop the leaks



Tighten the top nut

Use the cotton rag to wipe off any water

Now open the 2 valves bottom first and watch for leaks

Seeing that the leaks have stopped, we attach the battery pak

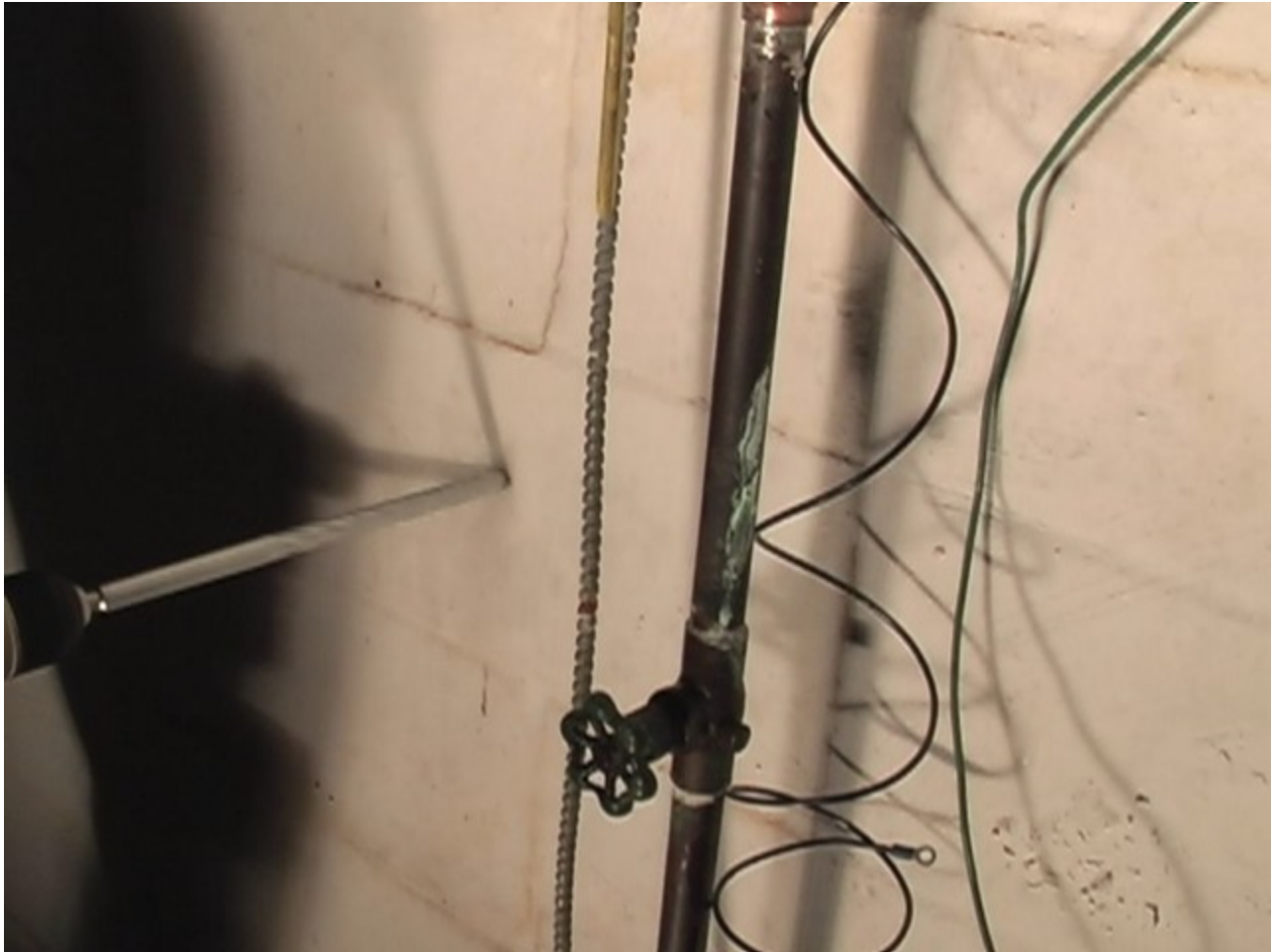


Connect the black ground wire and the black wire from the battery to the inlet end (bottom post) of the conditioner

Now connect the red wire to the top post

When these are tight, the led on the bottom of the battery pak should be lit

Seeing that it is we proceed on to the next step



Using a 5/8" masonry bit, we drill through the basement wall

These blocks are not the soft kind that are easy to drill, but are hard concrete blocks

It can take a few minutes to drill through a side

Do not force the drill too much.

Keep a steady pressure on it and the drill will do the cutting

When we are through the first side of the block we still have to drill through the outside

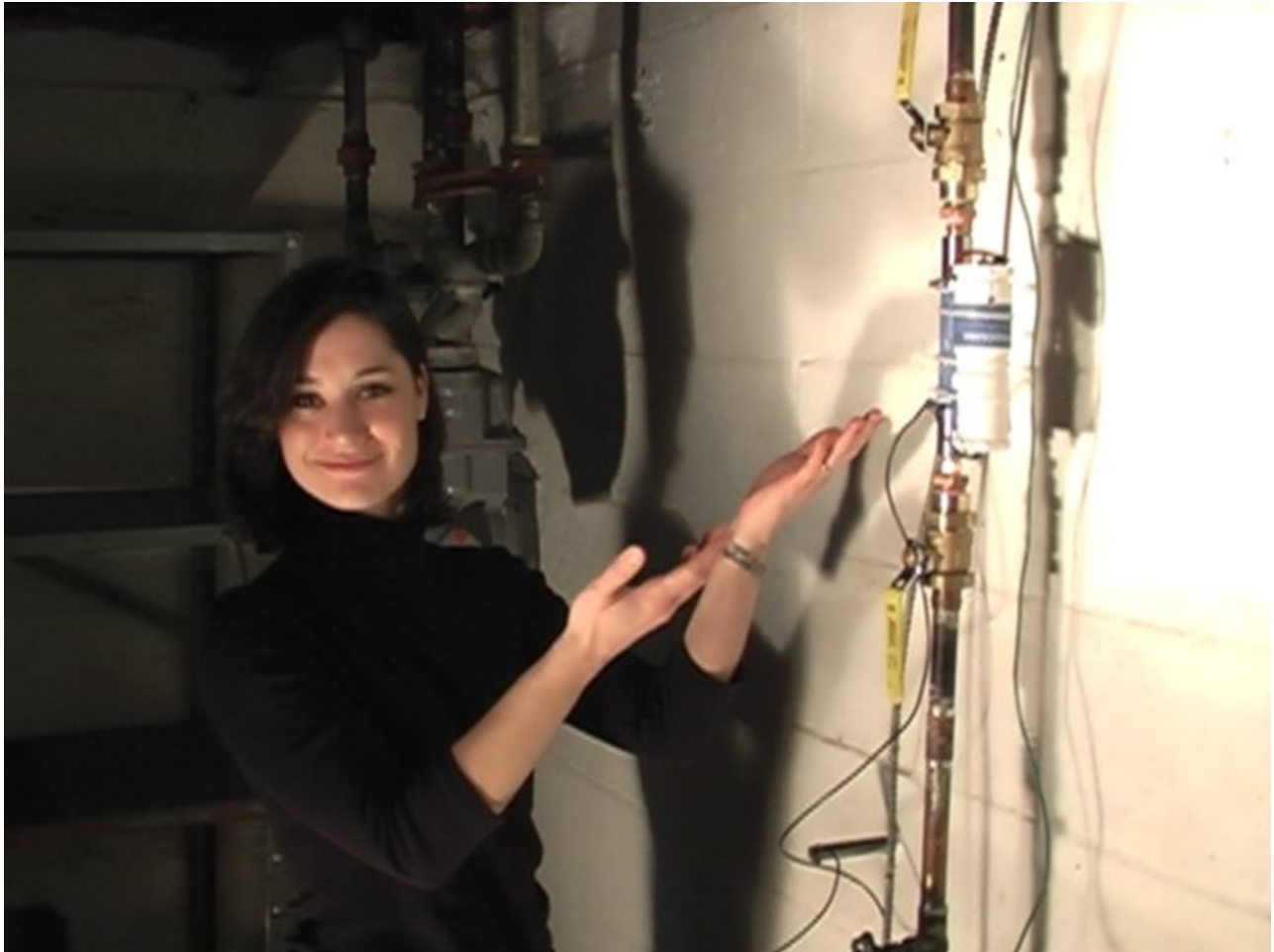
Now we are through both sides of the block



Next we use a hammer to drive the grounding rod into the earth on the outside of the wall

The hole we drilled is a tight fit but we should caulk around the hole to prevent leaking from the outside

Attach the black grounding wire to the rod and we are finished



The reason we don't ground to the cold water pipe is because of possible ground current

The electrical system in the house is grounded to the cold water pipe.

This is to "drain" off any current from faulty household appliances and also static electricity buildup

This creates "ground current". It often isn't confined to your house.

Your pipes connect to the main which connects to all your neighbors.

If any of them have a faulty appliance or excessive static, it can show up at your house.

If you notice the oxydation (discoloration) of your cold water pipe, that can also prevent a good contact with the ground.

The separate grounding rod guarantees a good ground without stray currents.