



Sunbow
Greenhouses

Instructions for:

Preparing your site | Setting ground stakes

Assembling your hoops | Put hoops into ground stakes | Attach purlins

Install baseframe and hip boards | Build endwalls | Attach wiggle wire track

Install endwall covering | Install main covering | Assemble side roll ups (optional)

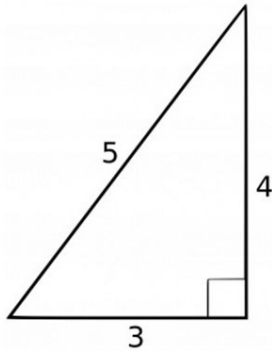
1) Preparing your site

You want to begin with a level, weed free site.

The flatter your site is when you begin, the easier the rest of the build will be. If your site is not flat you will have to compensate by adjusting the

height your ground stakes rise above grade.

Which is not a big deal. Moist greenhouses do not start out on a perfectly flat area.



2) Use the 3-4-5 method to establish square corners.

1. Set your baseline string

Decide which wall will be your reference line (usually the longest side or the one parallel to a property line).

Stretch a tight stringline between two stakes.

This is your “4 side” or your “3 side” – doesn’t matter which, just pick one.

2. Mark 4 units on the baseline

From the corner stake along that baseline string, measure 4 feet (or 4 of whatever units you’re using)

Put a mark on the string or a temporary nail/stake on the ground at that point.

(Now you’ve got the first leg of your triangle.)

3. Run the second string for the other wall

From the same corner stake, run a second string out roughly where you think the next wall should go (roughly 90°, but you don’t have to be perfect yet).

This is going to become your “3 side.”

4. Mark 3 units on the second string

From the corner stake along this second string, measure 3 feet out.

Put a mark or a small stake at that point.

Now you’ve got two marks:

One 4 ft out on the baseline string.

One 3 ft out on the second string.

5. Adjust until the diagonal is 5

Measure the distance between those two marks (from the 3 ft mark to the 4 ft mark).

Move/rotate the second stringline until that distance is exactly 5 feet.

Once the distance between those two marks is 5, you know the angle at the corner stake is a true 90°.

At that point:

Your baseline string is one wall.

Your second string is the other wall.

And the corner between them is square.

Scaling it up (for better accuracy)

The bigger the triangle, the more accurate your layout will be. Common construction sizes:

6-8-10 (just 3-4-5 doubled)

9-12-15 (tripled)

Same idea:

Measure 8 ft on the baseline

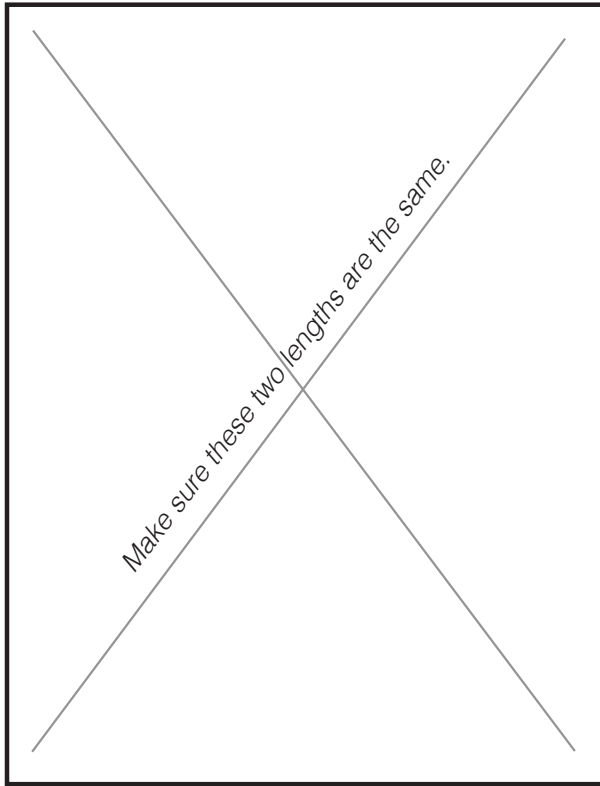
6 ft on the second line

Adjust until the diagonal between those marks is 10 ft



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You can double check the “squareness” of your outline by measuring to see that you have the same distance from corner to corner.



3) Setting ground stakes

Ground stakes are what anchor your greenhouse to the earth. They can be driven into the ground or they can be cast into concrete like a fence post. Setting in concrete is recommended.

Either way you install them, the most important thing is to have all of your ground stakes on **both sides completely level with each other**. It is far more important that they are all level with each other across the top, than how much they are sticking out of the ground. Because your site is not going to be lazer level, there will be differences in how far they actually stick up.

Set the 4 corners outside to outside.

Set all othe others on center.

It is also important to keep them plumb and level when setting them. If they lean to one side or towards the interior of the greenhouse it will affect how your hoops fit into them and will result in wonky looking hoop.



4) Assembling your Quonset hoops

Greenhouse width:

12'- (2) 10.5' hoop sections. **The painted end goes into the ground stake.

16'- (2.5) 10.5' hoops sections. ** The swaged or male end of the full length hoops sections go into the 5' section which is at the top of the completed hoop.

20'- (3) 10.5' hoop sections.

24'- (4) 10.5' hoop sections.

Begin putting your hoops together on the flattest possible area you have. Lay the sections out and put the male ends into the female ends. At each joint drive a Tek screw into the metal to secure

the joint. After screwing them all together, screw a Tek screw 12" from the bottom ends of the hoops. This screw is only used to be a temporary stopper, so you can only slide the hoop into the ground stake 12".

Also note the our Quonset style hoops will be 1-3 feet wider than the actual width of your greenhouse. When you install them you will compress them down the the correct width.

***ALWAYS BE MINDFUL ABOUT WHICH WAY YOUR SCREW HEADS WILL BE FACING. YOU DO NOT WANT THEM TO BE ABLE TO SNAG OR RUB THE PLASTIC. Make sure you screw from the bottom or side not from the top.**

5) Put hoops into ground stakes

This part is pretty straight forward. It helps to have two people. Put one end of the hoop into the ground stake until the stopper screw catches on the top of the ground stake. Your hoops by design are a bit wider than how far apart you have set your ground stakes. Push the other end of the hoops in and it will compress as you put the second end into the ground stake. Finally drill a hole through the ground stake and hoop. It needs to be parallel with the length of your greenhouse. Then use a 2" carriage bolt to fasten the hoops and ground stake together. Repeat on the other side. Finish the other hoops this same way.



This image shows how a hoop fits into the ground stake. and also previews how the base frame attaches to the ground stake

6) Attaching Purlins

Start with center purlin on **TOP** of the hoops, this creates a peak and helps with draining rain off. You will use the 1 3/8" x 10'6" poles provided. Start at one end and secure the 1st pole with an end Tee (swaged end facing toward the other end of the greenhouse). Your next pole will slide onto the swaged end and secured with a Tek screw in that connection point. Everywhere a hoop and a purlin intersect use a purlin clamp to fasten those two components together. **Be very mindful that your hoops are not leaning one way or the other as you make your way down the greenhouse attaching your ridge pole. It is very helpful to have someone standing out a ways off the side, looking at your hoops and telling you if they need to be pushed or pulled to get them straight up and down.** Once you get to the end measure the distance from your last full sized piece of pipe and cut it to the length needed to finish. Attach the End Tee and now you are ready for the side purlins.

Side purlins go on the **BOTTOM** side of the hoops. Other than that the install process is the same.

How high you run your side purlins depends a bit on where you plan to put your hip board. It is recommended to split the distance between the hip board and the ridge pole. This is true if you are doing one purlin on each side or two (two on each side and a total of five are installed on our 24' wide units).



How a purlin clamp connects the hoops to the purlins



How an end tee connects the end of the purlin into the end hoop



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7) Install baseframe and hip boards

Your base frame goes all the way around the bottom of your greenhouse. It is there to add strength and keep pests out. It needs to be level all the way around. If the earth below it is not level and there are gaps below the bottom of the frame then use gravel to fill in those areas to “seal” it up.

Base Frames can be built with several different materials. 2x6 material is the most common.

Once you have decided which material to use, Set a level string line down each side of the greenhouse then attach the base frame to the outside of the ground stakes with a large carriage bolt (long enough to go through the base frame, hoop and ground stake).

Hip boards are installed anywhere from 3’-6’ from the ground. They run the length of the greenhouse on the long side only.

*** if you are not doing side roll ups then your hip board can go on the inside of the hoops, like the other purlins. * If you are planning on or may be planning on side roll ups then install the hip board on the exterior of the hoops. The hip board is where you will attach the length wise wiggle wire tracks. If you are not doing side roll ups then the track goes along the base frame. More about that to come.**

Use a level string line as a guide when bolting the hip board to the hoops, just as you did with the base frame.



In the above installation side roll ups are going to be installed. Notice the wiggle wire track is on the hip board. This sets the maximum height your side can roll up to.

If you are not doing side roll ups then that wiggle wire track would be installed on the base frame like the image below.



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8) Building End Walls

There are many ways to build endwalls, a simple google search will show you many. This is how we do ours.

First determine the size of your doors and any ventilation system that will go on the end walls. And draw out a simple sketch of how this will look.

Begin the building by running a string level from each side of the endwall hoop. This will establish where to locate the bottom of the two posts (usually 4"x4") you are going to put up to the hoop. We recommend putting the posts in concrete. These posts will act as supports, but also as the outside of your door frame on at least one end, a door on each end is quite handy. If you want a 4' wide door then set the posts an inch wider so you will have room for hinges.

To attach the top of your posts to the end hoops notch the top of the posts so that the hoops fit into it. (See Bottom right image)

The next thing is to attach any cross supports you have planned to install. If you have vents and fans to install frame those out next. Wait to install the actual doors until your end wall plastic is completed.



This is an example of a plywood baseframe and simple endwall with a standard screen door.

9) Attach wiggle wire track

Wiggle wire track and wire is what attaches your covering to your frame. The track is installed first. It goes around the entire base of the greenhouse.

***IF YOU ARE DOING SIDE ROLL UPS THEN IT GOES ON THE HIP BOARD AND NOT THE BASE FRAME.** Either way it does go along the bottom of the end walls.

It also goes over the top of the two end hoops. On the very top. It will flex to bend over the curve. All tracks are attached with Tek screws.

The track also needs to go around your doors and any vents. **We supply enough track and wire to go around two 36" doors.** If you have extra vents or large doors then you may need to purchase a few more sections of wiggle wire and track. Also if you want any extra wiggle wire on the endwalls then that will need to be purchased as well.



The wiggle wire track will bend right over the top of the end hoops.



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10) Install endwall covering

It is very important to install the endwall cover first! For two reasons. When it goes in first the main cover will go over the top of that and act as a flashing to keep rain out. Also if you try to do the main covering first, it creates a wind tunnel once its been draped over but not yet attached. The chances of even a tiny wind catching your big plastic and turning it into a giant sail are very high.

In your kit there will be two rolls of plastic.

Endwall plastic will be between 9'x25' and 14'x50'. The other rolls will be much wider and that is your main covering.

Unroll your endwall plastic and cut it in half.

Now you have the two pieces you will need for the two endwalls. Next take one of the 6.5' pieces of wiggle wire and cut it into 6"-8" sections. These will be used to tack down your end wall plastic on the top of your end hoops.

Take the first piece of plastic and unfold it enough to get to a single ply. Next find the center, mark it with a marker or tape. Take the center of your plastic to the center(top) of the hoop. Using your mark/tape tack the center of the plastic into the wiggle track with a short piece of wire. The

goal here is to get the center of the plastic to the center of the hoop. Unfurl the plastic to the ground. Next attach each corner at the bottom. The goal here is to get the plastic temporarily stretched out to the widest it will be. Thus ensuring your plastic will cover the entire end wall. ***ALWAYS LEAVE ONE END OF YOUR WIGGLE WIRES NOT IN THE TRACK. SO YOU CAN EASILY REMOVE THE LITTLE PIECE.**

After you have it tacked up, you then have to go around and install more "tackers" in the hoop tracks and along the bottom. As you work your way around you will need to remove the little pieces and tighten the plastic in a fashion that removes rolls and bubbles in the plastic. Take your time here and really get it pulled out evenly. Once you have it where you want it then go ahead and insert the last little ends of wires you left out of the track for access. You can install the full pieces of wire along the endwall base, but leave just the little pieces holding the plastic on the top of the hoops because your main covering is also going into that same track. The last thing is to trim off the excess plastic, leaving 2" all the way around. Then repeat on the other side and your endwall plastic is installed.



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11) Install Main Covering

The big plastic is installed by pulling it over the hoops, from one side to the other. Begin by unrolling the plastic down the length of your greenhouse. Starting at one end, unfurl a small section of the plastic enough to expose it to a single layer. Then roll and fold that single layer into a softball size bunch. Next tie a cloth rope to the bundle. Make sure your rope is long enough to be thrown over to the other side of the greenhouse. This rope will be used to pull the plastic over. You will want a rope attached every 20', all the way down to the other end. With bundles and ropes at each end as well. Once you have your ropes all thrown over to the other side and with as many people helping as possible begging to pull the cover over your hoops. Using a ladder from the inside to help push the plastic over any purlins or hoops the plastic may get stuck on. Work quickly, but do not tug very hard if the plastic gets stuck. Instead get inside and push it up and over any things that are causing resistance.

With your plastic all the way over work as quickly as possible to temporarily “tack” down the plastic to your track. Remember you are going to be going back and undoing these “tacks” to stretch the plastic out. Your goal here is to get it pulled

out as much as possible and then “tacked” down in enough places to keep the cover down should a gust of wind come.

The more people you have helping pull the plastic tight the better. You will want to start at one end, attach the plastic into the end hoop track (always keeping an end of the wire exposed so you can grab it and undo it if needed). As you work your way down the greenhouse, be mindful to keep your plastic squared up to the frame and only undo enough of the “tacks” needed to pull the rolls and creases out of that section. You want to be pulling the plastic towards the other end of the greenhouse and down towards the baseframe at the same time. Remember you are trying to stretch the plastic over the frame as snugly as possible. If you start to see creases or rolls in the plastic, then take the time to undo enough wiggle wire to correct the problem. On a big greenhouse this process could take a couple hours or more depending on how many people are helping. Really take your time with this process.



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12) Assemble side roll ups (optional)

Now that the plastic is on you are ready to install the side roll ups. Your plastic is snugly attached all the way down your hip board and the bottom of the plastic is laying on the ground, flattening the wind.

First attach the 1 3/8" pipes along the length of the greenhouse with 6" of overhang on each side. If your greenhouse is 40' long then the total length of your roll up pipe should be 41'. With the pipe layed out and screwed together (just like you did with the purlins), place the pipe on top of the plastic. Then fold the plastic over the pipe and use the clips to attach the plastic to the pipe. Cut away any excess plastic, leaving a couple inches to spare.

Next decide which end of your greenhouse you want the hand cranks to be and install the handles onto the roll up pipe. You will also need to put the "guide" pipe into the handle. This is the pipe that the handle rolls up and down. You drive it into the ground or attach it to the frame of the greenhouse.



These clips are what attach the plastic to the pipe that rolls up.



Completed side roll ups. Rolling up nice and straight.

Instruction manual disclaimer

Please read all instructions before beginning installation. These guidelines are provided in good faith to help prevent any problems caused by errors in installation. Oregon Greenhouse, LLC shall not be held responsible for installation actions taken or not taken. There are many details of installation that are assumed to be general construction knowledge, which

are not included in these instructions. These installation guidelines are intended to be strictly recommendations and are not to serve as a step-by-step, fail-safe installation checklist. Oregon Greenhouse, LLC does not accept any responsibility for job failure resulting from or associated with improper site environmental conditions and installation failure.



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