

Gothic High Tunnel Assembly Guide

Roberts Ranch and Gardens
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How-To videos can be viewed on our Youtube channel

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Backyard High tunnels®

Designed by Growers for Growers

We designed our high tunnels with the needs of the grower and the plants in mind, as well as the problems created by extreme weather conditions. Our high tunnels have consistently held in strong winds (75+ mph) and heavy snow loads. We are confident that you will have the same results if you build your high tunnel according to our instructions. Each step requires as much precision as possible. Be exact with your measurements and in joining the purlins to the ribs. Be sure to have plenty of help when you pull the canopy. Feel free to call with questions at 435-562-6014. We have included pictures to help you understand how to construct your high tunnel. We also reference YouTube videos for additional help. If you find that these instructions do not exactly correlate with the video, it is because as time goes by we find alternative ways to do things that we prefer. However, either method will work well for you.



We recommend Eliot Coleman's books on Winter Harvest and Organic Gardening. He is a master at growing in unheated high tunnels and the information he shares will help you be a successful grower.

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Materials Provided: (If accessories were ordered, there will be more materials provided)

- 4' galvanized steel posts
- 10' bent rib pipes
- 10'6" purlin pipes
- 10'6' roll up bar pipes
- T-end clamps with nuts and bolts
- Cross Connectors
- End caps
- U-channel
- plastic for canopy and end walls
- wiggle wire
- plastic tape
- #14 1 1/2" self tapping screws
- #14 1" self tapping screws
- Metal to Wood screws
- Fabric clips
- Post pounder
- Hand cranks
- Wind rope
- Short eye screws (for wind rope installation)
- Long eye screws (for wind rope installation)

Tools Needed:

- 1-2 measuring tapes (25'-100', depending on size of the high tunnel)
- 2 hand levels – one approximately 4', one approximately 18"
- skill saw
- drill
- hammer
- sledge hammer (both a long handle and short handle, if possible)
- pencil or marker
- wooden stakes
- sawzall or hacksaw
- string
- staple gun
- staples
- 4-5 long ropes
- 3-4 ladders
- 3-5 saw horses, depending on length of high tunnel
- hex-head drill bit for #14 3" self tapping screws
- hex-head drill bit for 1" metal-to-wood screws
- phillips head screw bit
- duct tape
- power cords
- nail gun
- nails
- air compressor
- garden rake (optional)

Materials to Purchase (see Shopping List for detailed information):

- pressure-treated wood
- pine 2x4x8
- pine 2x4x10
- pine 2x4x12
- pine 1x4x8
- 3" grabber screws
- 1 5/8" grabber screws
- screen door and screen for vents
- stakes
- pine 1x4x10
- pine 1x4x12
- furring strips
- metal straps
- mend plates

Terminology

The terms **high tunnel** and **hoophouse** describe the same structure. They are interchangeable. Though our business name is Roberts Ranch Hoophouses, we often use the name high tunnel to describe our product, as in these instructions.

The term **pipe** refers to galvanized steel pipe which may be straight or cut and bent into different lengths and shapes.

The term **arch** refers to the entire arc including posts, bent and straight rib sections and the peak piece.

The term **rib** refers to half of an arch. Ribs come up from both sides and meet at the peak.

Purlin refers to straight pipe used to hold arches together.

Roll up bar refer to 3/4" EMT conduit pipe used to roll up the side walls.

Roll up board and **wiggle board** are interchangeable. It is the board the **U-channel** and **wiggle wire** are attached to, the **plastic** attaches to, the **roll up bar** rolls up to, and the **wind rope** attaches to.

You will find our engineered high tunnel plans for the width you are building in a separate email attachment. Length can vary without the need to change the basic plan. The end wall construction plans are recommended, but there is flexibility in the design. The vent can be framed above the door if preferred. Cover the vent with screening mesh and keep the plastic to seal it off in winter, or create a vent cover.

Part I: Selecting Location and Setting Base Frame

When selecting the ground for high tunnels, it is best to look for areas that receive a maximum amount of sunlight at all times during the day, especially in the winter months. If possible, orient the ends on an east/west axis. This will aid in increasing the amount of sunlight and heat available to plants. The ground should be as level as possible. If soil is mostly clay it may be necessary to create a slight slope to one side or to the back to allow for drainage.

It is best to clear plenty of space for construction. Limit the amount of possible obstructions both under the future high tunnel and in a 10-foot perimeter. While this may seem tedious, the construction of the high tunnel will be easier if there is more than enough room to work with long, awkward pieces of metal and wood.

STEP 1 – Set Base Frame – see videos *Baseplate #1* and *Baseplate #2*

Take **pressure-treated 2x4s** and line them up end to end until you reach the desired length for the sides of the high tunnel. If **pressure-treated 2x4s** were purchased according to the accompanying **shopping list**, no cutting will be necessary.

- Center **mend plates** over each joint.
- Connect the ends of the **pressure-treated 2x4s** together by pounding the **mend plates** into the joined 2x4s. A hand sledge hammer works well.
- Turn the complete length of 2x4 over and attach **mend plates** to the joints on the opposite side.

It is easier to pound in mend plates if 2x4s are on a solid flat surface. When turning over the long lengths of wood to hammer in the mending plates on the unfinished side, be careful not to bend at the joints and skew off the **mend plates**.

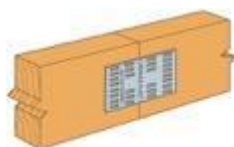


Figure 1 – Mend Plate Attachment

- Use **pressure-treated 2x4s** to create front and back base frame in the same manner described above.
- Join together base frame with two **3” grabber screws** at each corner.

If the **shopping list** is followed, there will be exactly enough pieces for the base frame without having to make any cuts. Some lengths may require a combination of 8’, 10’, or 12’

pressure-treated 2x4s, per the **shopping list**. Attach front and back base frame to the ends of the side base frame. The inside dimension will be the exact length of high tunnel. The width will be a bit narrower than what is prescribed.



STEP 2 – Square Frame –

- Mark all **4’ galvanized steel posts** at 12”.
- Drill a **3” grabber screw** into each corner of the base frame exactly in the middle of the board.
- Tie a **string** from one screw to the other along each length of the high tunnel base-frame.

Pull the **String** as tight as possible as it will help ensure that the wood is straight as the frame is squared and that the base frame is as level as possible.



The objective in this method of leveling is to achieve a 1" gap around the perimeter between the base frame and the **string** with the ends of the base frame being perfectly level with respect to the highest corner.

Choose a side that will run parallel with a wall, path, property line, or house. Position the high tunnel along that line. In the picture below, the end wall is lined up with the fence.

- Use **post pounder** to pound **4' galvanized steel posts** into the ground until 12" mark is 18" inches above the top of the frame. **Begin** by pounding posts **into the corners** along the side that is parallel with a wall, path, property line, or house. *see video - post installation*



- With a long **Measuring Tape**, measure from the inside of one corner to the inside of the diagonal corner. Repeat on remaining two corners, shifting the frame as necessary until both measurements are within 1/8" of each other.



- With the **post pounder**, drive **4' galvanized steel posts** into the remaining two corners of the frame until the 12" mark is 18" inches above the top of the frame. These will be driven further into place once the frame is level. Use stakes to adjust the base frame until the string sits the same distance above the frame all the way around.

- Mark the length of the base frame at 4' increments starting from the corner posts already driven into the ground . These marks determine where the remaining posts are driven.

STEP 3 - Level Frame and Set Posts – see post installation

Use the long level for this step. Use wood, stones, soil, or whatever is handy to hold the frame level. Some places may need to be dug out. Because our high tunnels aren't designed to be permanent structures, the plot does not need to be perfectly level and may have a gentle gradient. Due to this flexibility, it is only crucial that the ends of the high tunnel are perfectly level with some room for deviation in the sides.



- Identify the highest corner at one end of the high tunnel.
- Bring the other side of the high tunnel level with the highest corner on that end. If necessary, **stakes** can be pounded into the ground along the baseframe and screwed into the frame to maintain level.
- Repeat on the remaining end.
- Finish driving **4' galvanized steel posts** in until the 12" mark lines up with the bottom of the frame.



- Secure base frame to the corner posts using two **3” self tapping screws** and **washers** for each post. Attach the base frame along the side (length) and not from the front (end wall).

The objective in this method of leveling is to achieve a 1” gap around the perimeter between the base frame and the **string** with the ends of the base frame being perfectly level with respect to the highest corner.

- Drive the remaining **4’ galvanized steel posts** into the ground at each 4’ interval until the 12” mark aligns with the **string**. As posts are pounded in, use a small **level** to periodically check that each post is plumb and as close to the frame as possible.



- Secure the frame to each post with two **3” self tapping screws** and **washers**. Drive screws from outside of base frame into wood then into post. Space screws 2” apart vertically.
- Remove stakes.

The importance of pounding in the posts as plumb as possible cannot be overstated. Additionally, the alignment of the posts with each other is critical. These factors will affect the overall integrity and alignment of the rest of the high tunnel. Depending on the type of soil, it may be extremely difficult to drive the posts a complete 30” into the ground. If such is the case, posts will need to be cemented into the ground,



taking care not to bump or throw off the alignment of the frame in the process.

Once each post is pounded in and secured to the frame, it is possible that the tops of the posts will be somewhat deformed due to tough soil conditions. With a **sawzall**, cut off the minimum amount from each pipe so that they are all the same height. We recommend cutting them all to 1' above the top of the base frame.

Part II: Setting Ribs and Purlins

Ribs are the bent galvanized pipes that come together at the peak creating the shape of the high tunnel. Purlins run the length of the high tunnel and secure the arches together; they serve as the backbone of the high tunnel. There is one center purlin on every high tunnel. Larger high tunnels have more purlins added to increase stability.



Tools Needed:

- pencil or marker
- measuring tape
- drill
- hex-head drill bit for #14 1" self tapping Screws
- sawzall or hacksaw
- 1-2 ladders

Materials Needed:

- straight purlin pipes
- bent rib pipes
- peak purlin pieces
- T-end clamps
- nuts and bolts
- Cross connectors
- #14 1" self tapping Screws

STEP 1 - Assembling Arches

Bent pipes are packaged and shipped to facilitate assembly into ribs. It is easiest if **bent pipes** are kept in strapping until ready for assembly. **Bent pipes** should be bundled with each other and the **straight pitch pipes** should be bundled with each other. Each arch contains 4 pipes: 2 bent pipes that connect to the base frame posts; and 2 straight pipes that connect to the peak piece.

Put the **arches** together on flat ground. Beveled ends of the **bent pipe** head down. They will slide into the posts. Screw in the joints with a **1" self tapping screw**. Make sure screws face the inside of the structure.

- Slide the beveled end of the **arches** (the bottom) into the **4' galvanized steel posts**. Continue building the arches and installing them. When this step is finished, you will have a complete arch in the base frame posts for the entire length of the structure.
- About 2" down from the top of the **posts**, screw the arches into the **4' galvanized steel posts** using a **1" self tapping screw**. Be sure to screw them together on the inside of the rib so the screw head won't tear the plastic cover.



STEP 1 – Assembling Purlins *see video “purlin assembly and installation”*

- Take the **purlin pipes** and lay them out inside the high tunnel. Connect the joints together until there are two purlins that extend beyond the length of the high tunnel. Cut off the swedged end. Both ends must be open.
- Screw purlins together with **1” self tapping screws**. Ensure all screws are screwed in on the same side of the purlin for the full length.
- Cut **purlin pipes** 1” shorter than the length between the two end arches so the purlin pipe is 2” shorter than the inside distance between the first and last arch.
- Place **purlin pipes** next to the side base frame. The **purlin pipes** should sit 1” shorter than the arch posts on each end.
- Using the **4’ galvanized steel posts** as a guide, mark the purlins at 4’ increments. A marker works well on the pipes
- Put the third purlin or **peak purlin** together by placing two flattened pieces on each end. We call these pinched purlins. Cut an inner piece of pipe so the entire purlin is the same length as the other purlins. The flat pieces need to correspond to one another. Screw together with **1” self tapping screws**. Mark this purlin at 4’ increments as well. Purlin pipes are now ready for installation.



STEP 3 – Attaching Purlins to Ribs

It is helpful to have people hold the pipes in place until enough **cross connectors** can be attached to hold the pipe up. If assembled correctly, the marks made on the purlins should align with the joints of the ribs.

- Lift the **purlin pipes** up to the rib joint and ensure that the **1” self tapping screws** on the **purlin pipes** are facing down towards the inside of the high tunnel to avoid the plastic canopy catching on the screw heads.
- With **two 1 5/8” cross connectors and two bolts** attach the purlins to the arches at the joint between the straight and bent pipe pieces of the arch. The marks on the purlins should cross the joint.
- Attach the ends of the **side purlins** to the endwall arches with **T-end clamps**. Slide the **purlin pipes** into the **T-end clamps** until the **purlin pipe** touches the bolt in the **T-end clamp**. Tighten **Nut**. Then using **1” self tapping screw**, fasten long part of **T-end clamp** to purlin pipe from the underside of clamp. Screw right through the **T-end clamp** and into the purlin about an inch away from the bolt.
- The **Peak purlin** is built a little differently. It is secured to the endwalls with band clamps instead of T-end clamps. The first and last section of the peak purlin needs to have pinched ends with a drilled hole. Place **band clamp** over **end arch**. Slide **Peak purlin** into band clamp and fasten with nut and bolt.

Part III: Framing End Walls

Tools Needed:

- hammer
- drill
- 18” Level

- pencil or marker
- phillips head drill bit or star bit
- skill saw or hand saw
- saw horses
- nail gun and compressor (optional)

Materials Needed:

- pine 2x4x10s
- pine 2x4x8s
- 2-4 ladders
- metal straps
- duct tape
- 3" grabber screws or #16 penny nails (recommended)
- 1 1/2" grabbers screws
- #14 3" self tapping screws

STEP 1 - Choosing a Plan

This kit comes with an end wall framing diagram which you will find at the end of these instructions. Use this one or create an original. Some customers opt for variations to accommodate bay doors or additional storm doors.

The plan provided is for one storm door framed in the center. It can be framed off center if preferred. Be prudent in cutting framing pieces so as to limit waste.

STEP 2 - Framing End Walls and Door *see video 20' wide Roberts Ranch Gothic Hoophouse timelapse. And "End Wall Framing tips for Roberts Ranch DIY Hoophouse Kit Installation"*

- Mark the base frame where the vertical 2x4's will go.



- Place the appropriate length 2x4 on the mark at the bottom and scribe a line at the top where the 2x4 is plumb.
- Cut on the scribed line.
- Attach the wood framing to the metal **ribs** using **metal straps** and **1 ¼" grabber screws**.



Secure as tightly as possible. When attaching with the metal straps, be sure to start on the outside and then wrap to the inside, keeping the outside screws as flush as possible. Keep all outside materials as flush as possible. Use duct tape to cover screws and metal straps on the outside.

Notice that the screws are not flush with the board. Always start on the outside, keeping the screws flush with the board, then come to the inside, angling the screws to tighten the straps. This step is done **before** the U-channel is attached to the rib.

- Frame in cross bars.

- Mark the rough opening for the door according to the directions provided on door box.
- Add a 4' piece of pressure treated wood to the inside of the base frame where the door will be located. This will create a double plating at the door opening.
- Frame in the rough opening of the door. Turn the 2x4s used to frame the door sideways so they face each other and are perpendicular to the base frame, as shown in picture. Keep the outside edge flush. 2x4s are only turned this direction to frame in the door. All other 2x4 pieces sit flush with base frame.

A rough opening for the door is being created with the 2x4's turned sideways so there will be more to attach the door to making the doorway more stable. The double plate base frame gives something to which the bottom of the 2x4 can be attached. Keep in mind when base plate is marked.



- Frame in the header according to manufacturer's rough opening dimensions.

Circulation vents are framed in at the top centered over the door and covered with screening instead of plastic. If desired, this is the best time to put in the venting.



Figure 10 – High tunnel with framing finished. Note opening for a bay door and storm door.

STEP 3 - Attaching End Walls to Grounded Posts

These posts will give the ends support and firmly attach them to the ground. Pick two studs in front and two in back that are equal distance from the center.

- Pound in the remaining four **4' galvanized steel posts** along the inside of the studs. Ensure posts remain plumb as they are driven in.
- Use two **3" self tapping screws** for each post to secure it to the end frame. Attach from the outside of the high tunnel, drilling through the frame first then into the post.



It is recommended that screws be countersunk into the wood or covered with duct tape to prevent wear and tear on the plastic.

Part IV: Attaching Roll-Up Board and U-channel

see video "[Roll up board Instructions for Roberts Ranch Hoophouse DIY Kits](#)"

The wiggle board is the point in which the canopy is attached along the length of the high tunnel. It is also referred to as the Roll-Up Board. All the plastic below the Roll-Up Board is attached to a **roll-up bar**. The placement of this board can vary between the purlin and the base plate. Most roll-up boards are about 2 ½ to 3 ½ feet from the ground.

Tools Needed:

- drill
- hammer
- sawzall or hacksaw
- washers

Materials Needed:

- mend plates
- U-channel
- pine 1x4x12's
- #14 1-1/2" self tapping Screws
- #14 1" self tapping Screws
- metal-to-wood screws

STEP 1 – Create Roll-Up Board

- Mend together lengths of **1x4s** in the same manner as previously done with the **pressure-treated 2x4s** to create the base frame. The length of the **Pine 1x4s** needs to be from outside of end rib to outside of end rib. It can extend beyond at this point and then be trimmed with a **sawzall** later.
- Lay Roll-Up Board along base plate against ribs and mark the Roll-Up Board every 4' using the posts as a guide.

- Make a mark on every rib where the board is to be installed. recommended.

Be extra cautious in handling the long, full length boards as the **pine 1x4x12s** can easily crack and break at this point.

STEP 2 - Mount Roll-Up Board on Ribs – see video “Roll up board instructions for Roberts Ranch Hoophouses DIY kits.

This step usually takes a team of 4 or more to do if high tunnel is 40’ or longer. One good method is to set **1 ½” self tapping screws** in the ribs where the board is to be mounted. **Self tapping screws** should be drilled in just enough to provide a shelf for the board to rest on. They will be removed once the board is fastened.



- Attach the **roll-up board** to the outside of the rib cage, between 2’-4’ from the base frame, depending on amount of ventilation desired.
- Use **1-1/2” self tapping screws** and **washers** to fasten the **pine 1x4s** to the ribs, using three screws for each rib as shown.

Place the first two screws far enough apart to mount the **U-channel** down the middle between the screws. When attaching the board, it is best to drill the first screw in only partially, then drill the second screw in all the way. Go back and drill the first screw in all the way. This method helps prevent cracking the board.



STEP 3 – Mount U-channel

- Attach the **u-channel** to the **roll-up board** using **metal-to-wood screws**.

Keep the **u-channel** level, butting them up end to end and in the center of the **roll-up board**. Space screws 1 foot apart. Be sure to drive a **1-1/2” self tapping screw** through the **u-channel** and into every **rib**.



- Attach **u-channel** to end ribs using **1” self tapping screws**. It is important to use **metal to wood screws on the roll up board and self tapping screws on the steel arches**. Note: This picture is of a quonset style - the process is the same for the Gothic.

Be sure to stay on top of the **rib** as you move across and over the **rib** with the **u-channel**. Keep each segment flush against its adjoining segments.

- Cut **u-channel** at **roll-up board** and continue below the **roll-up board** to the base of the wooden base frame.
- Pre-drill a hole through **u-channel** at the base frame.
- Use **3” grabber screws** at the bottom to fasten into the wood.



Part V Attaching Plastic *see video Instructions on pulling canopy plastic for a Roberts Ranch Hoophouse DIY Kit*

The plastic is shipped in two rolls, one for the canopy and the other for **BOTH** ends. **canopy** and **end-wall** rolls will be marked. The end-wall plastic will arrive in one long piece that will need to be folded in half and cut. BE SURE plastic is cut in the right direction. It needs to be 2' wider and 2' taller than the end wall. If you roll out the end-wall plastic completely and fold it in half lengthwise, the midpoint created should be the cutting point, but double check.

When dealing with plastic at any step, be sure that there is little to **NO WIND**. Any wind at all may cause the plastic to catch on sharp objects and tear, or take off like a parachute.

Tools Needed:

- staple gun
- exacto-knife or scissors
- 4-5 long ropes
- drill
- hex-head drill bit for #14 1" self tapping screws
- 1-2 Ladders
- hammer (*Optional*)

Materials Needed:

- plastic
- wiggle wire
- roll up bars
- plastic tape
- #14 1" self tapping screws
- 3/8" staples
- fabric clips
- saw horses (*Optional*)

STEP 1 – Cut and Attach Plastic to End Walls

With plenty of helping hands and maybe a few large clamps, attach the end walls first. The canopy will need to be replaced sooner, so for ease of canopy replacement, attach the canopy after end-wall plastic.

- Roll out the **end-wall** plastic sheeting and cut it in half. Be sure plastic is cut so as to maintain the width for the base of the high tunnel. Stretch each piece over the ends of high tunnel, making it as tight as possible and eliminating bubbles and wrinkles.
- Secure the plastic to the **u-channel** on the arch using the **wiggle wire**. Begin at the center and work down the sides maintaining a very taut sheet. Stretch plastic over **roll-up board** and continue in **u-channel** below the **roll-up board** all the way to the baseframe.
- As plastic is fastened into the **arch**, follow along the outside face with the plastic held even on both sides and level to the ground tacking the plastic into the 2x4 framing pieces and the wooden base frame using a **staple gun**.



- Cut out any plastic needed for doors. Repeat for remaining End-Wall.
- Trim off excess plastic with **Scissors** or **Exacto Knife**.
- Install storm door according to instruction



STEP 2 – Attach Canopy – See video titled “Instructions on pulling canopy plastic” Go to our playlist to view.

This step is the most hazardous. There must be **NO WIND** when installing the canopy. It is recommended that this step be carried out with a team of at least 6 people. It is also recommended that this step be read through completely before starting the process.



- Lay out and connect lengths of the ¾” conduit **pipes** by sliding connector sleeves in the ends and securing the joints with two 1” self tapping screws.
- Create two long pipes that are 10” longer than the total length of the high tunnel. These will form the **roll-up bars**. Cover the screws with **duct tape**.
- Once both **roll-up bars** are ready, open the plastic and roll it out on a smooth, soft surface, preferably grass if available. Do not completely unfold the plastic.
- Lay the **roll-up bars** along the middle of the length of the plastic. Center the **roll-up bars** length-wise on the plastic. Place the bar under the edge of the plastic until it wraps once around the **roll-up bar**.
- Clip with **fabric clips** about every 30”. If they are not tight screw them in.
- Once both bars are attached to the plastic, fold one side of the plastic under itself so the bars are together.
- Gather the plastic and walk over to the high tunnel. Set entire length on saw horses or or 2x4’s placed on an angle from ground to baseboard. See video.



The **roll-up bars** need to be on the outer edge of the saw horses and on top of the plastic. If using saw horses, the plastic needs to be draping over the edge of the saw horses on the side closest to the high tunnel.

- Tie the middle of long ropes between the fabric clips on the bar closest to the structure.
- Throw one side of the rope over the top of the high tunnel. This is the pulling end of the rope

Tie as many ropes as needed to lift the length of the canopy. All lengths require two ropes, while a 90 foot high tunnel requires 5 ropes. By tying the to the bar in the middle of the ropes, those in the **second** position (see below) can more easily help control the speed of the **roll-up bar** as it moves up and over the ribs. It also allows the extra rope length to temporarily secure the plastic to the structure by tying it around the base boards on both sides. This is extremely helpful when wind gusts could be possible.



This picture is of a quonset style hoop house ready for pulling plastic, the gothic is done the same way. Getting up over the peak of a gothic style does require a little more help from the inside. Use ladders and brooms to help the plastic over the peak if necessary.

STEP 3 – Pull Canopy

There are three basic positions for the next step. These are detailed below:

The **first** is lifting on the side of the plastic; this position will be guiding the plastic up over the roll up board and watching as it unfolds making sure that it does not catch on anything.

The **second** position is where the rope ends are; those in this position will be pulling slowly and in unison on the ropes to lift the plastic over the top of the high tunnel. Good voice commands are a necessary part of this step.

The **third** position consists of 1-2 people running the inside of the high tunnel with a rake or broom, gently lifting and shifting the plastic from the inside where it needs help.

Once all positions are ready, start pulling the plastic over the arch slowly and communicate so that the plastic isn't torn. It is very easy for the plastic to tear! All positions need to be watching out for any possible snags as the plastic is pulled into place. There are fold lines on the plastic that will visually help the team keep the plastic straight. Make sure both roll up bars are on the ground. A foot extra would be good as well.

- As soon as the plastic is over the ribs, ensure it is even on all sides. The roll up bar should extend 4-8" beyond the end of the high tunnel on one end and 2" beyond the high tunnel on the other end. The end that is 4-8" beyond the hightunnel is where the roll up handcrank will go.
- Begin securing the plastic to one end of the high tunnel using the **wiggle wire**. Start at the top middle of the end rib.
- Keep the plastic at a constant pressure with about 1' of plastic past each end **rib**.
- Secure remaining end, pulling tight and maintaining the same length of extra plastic past the rib. Teams of two work best; one pulls plastic while the other fastens the plastic into the **u-channel** using the **wiggle wire**. Pullers on the side may be needed as well.



- Finally, secure the sides of the plastic into the **roll-up board**, maintaining even pressure.

The best way to do this is to roll the **Roll-Up Bars** up a few rotations and use the weight of the bars as an **even** pressure. Don't pull down with uneven pressure or your roll up bars will not be straight. Remove any wrinkles or bubbles that may form in the plastic. It is best to work in teams of two or three for this step. Trim excess plastic around the roll up bars and up and over the end arches.



Part VI: Attaching Furring Strips, Roll Up Bars, and Hand Cranks

Tools Needed:

- drill
- skill saw
- saw horses
- marker or pen
- hex-head drill bit for #14 1" self tapping screws
- ladder(s)

Materials Needed:

- furring strips
- hand crank
- end cap
- #14 1" self tapping screws
- 1 5/8" grabber screws

STEP 1 – Attach Furring Strips

- Cut **Furring Strips** to the approximate lengths of the outside of the end frames.

- Attach the **Furring Strips** using 1 ½” **Grabber Screws**.

The cuts do not have to be exact, simply cover the staples used to attach the plastic. Be sure to attach **Furring Strips** to the base frame as well. Furring strips give more stability to the plastic wall, preventing wind damage.



Figure 12 – Furring Strips on End Walls

STEP 2 – Finish Roll-Up Bar see video Jiggly Greenhouse® MRUP300 Sidewall Ventilation Hand Crank Installation

- On the end of the roll bars that extend 2” beyond the hightunnel, attach an **End Cap**, and on the other end attach a **Hand Crank**. For help with the installation, watch the video demonstration.
- Drive a **5’ long ¾” conduit pipe** into the ground so the handcrank casing can ride up and down on the conduit as the sides are rolled up and down.



Tips on preventing wind damage: In high winds the high tunnel sides will be more stable with a bit of tension on the roll bar – especially for longer high tunnels. Just give the roll bar a couple of rolls so the side plastic has weight. When the roll bar is just sitting on the ground, the plastic is more easily whipped back and forth by high winds damaging the eye bolts that hold the windropes in place.

Part VII Installation of Wind Ropes

Because wind is one of the greatest threats, the use of wind ropes is essential. see - “The Importance of Windropes” and “[Vents, roll up bar, Wiggle Wire, and Wind Factor - Important Information](#)”

Materials Needed

- wind rope (provided)
- short eye screws
- long eye screws

Tools Needed

- drill and drill bits
- screw driver or socket that will turn they eye screw

Wind ropes is a system of alternating diagonal rope threaded through eye-screws from the wiggle board to the base frame. See video “Importance of Wind Ropes”.

Step 1 Attaching Eye Screws

- Attach a short eye screw to the wiggle board where it crosses the first rib, then attach a short eye screw to **every other** rib where it crosses the wiggle board for the length of the high tunnel. An additional short eye screw will also be attached to the last rib. Using a drill to create a starter hole is recommended
- Attach a long eye screw to the baseboard where the posts cross the baseboard and twist them in with a screw driver or drill and socket combination. This eye screw will have to be attached a little to the right or to the left of the post. They will also alternate along the length of the hoophouse with the short eye screws above on the wiggle board. There will be a long screw on both the first and last ribs.

Step 2 Threading the Windrope

- Thread the windrope through the short eye screw on the first rib and then down through the long eye screw on the same rib. Then go back up and through the small eye screw on the next rib, then down through the long eye screw on the next rib. Continue until you have threaded the rope through all the eye screws creating a zigzag pattern and ending with the rope going straight up and down on the first and last ribs. Tighten.



Your biggest enemies: Wind and Snowloads

*Although our High tunnels will withstand strong winds and heavy snow loads, they will experience wear and tear during severe weather events. It is important to repair, replace, and regularly maintain the high tunnel in order to ensure long life of the structure. **They will not hold more than 2' of snow on the top.** Clear snow from the sides in order to allow the snow to shed. In heavy storms, use a long rope with towels*

tied to the middle. Throw one end over the high tunnel and with a sea saw action, walk the length of the high tunnel clearing the snow from the top. Our high tunnels are engineered to withstand 30 psf and no more. Melting snow can become very heavy. Then with added snow in subsequent storms, it could easily exceed 30 psf on quonset style hoopouses. Gothics should not have this issue as they readily shed snow.

Always install windropes on roll up sides. If you live in an area of high winds, we highly recommend you anchor the corner posts and every 4th post with earth anchors. You can purchase them on Amazon. Look for anchors that are rated for 1100 lbs.

Your High tunnel is finished! The easy work is done! Enjoy seasons of fruits and veggies as you harvest year round from your own backyard.



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