Bobcat Pro
High Tunnel Kit
Construction Manual

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Materials Included
Refer to the separate parts list for details.

Assembly and Care Kit Includes
- Ground post driver
- 5/16" magnetic nut driver
- 3/8" drill bit
- Mason line
- Line level
- Poly repair tape

Additional Tools Needed
- Cordless drill or impact driver
- Deep drive socket or nut driver
- Circular or reciprocating saw
- Sledgehammer
- Shovel
- 4' level
- Utility knife
- Clamps
- Permanent markers
- Tall step ladder
- Tape measure
- (2) 100'-long tape measures

List of Suggested Lumber Items (not included in kit)

Base Boards (for both sides)
• (8) 2 x 6 x 12' **OR** (8) 2 x 4 x 12'

End Walls (quantities listed for one end wall)
• (2) 2 x 4 x 12'
• (8) 2 x 4 x 8'

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ASSEMBLY INSTRUCTIONS

STEP 1: LAYING OUT YOUR HIGH TUNNEL AND INSTALLING GROUND POSTS

Important! *The site location must be relatively flat so the finished tunnel will be level. If working on slightly uneven ground, start by installing the ground posts to a depth of 24" in the lowest corner. The other posts may be driven in deeper, to a depth that ensures the top of the ground posts are level across the whole structure. The following directions are for building the Bobcat on level ground.*

1.1 Install the first 4' corner ground post by inserting the post driver into the top of the post and hammering it into the ground to a depth of 24" using a sledgehammer (see figure 2). Use a level to make sure the ground post is plumb.
Note: *The top of the ground post will have pre-drilled holes which should face inward toward the greenhouse, for attaching the bows.*

1.2 Install the second corner ground post on the same side of the tunnel, 48' from the first. This will now mark one full side of your tunnel.
Note: *The dimensions given are on center, so the measurements are to be made from the center of each post.*

1.3 Find the third corner ground post location by running a tape measure 16' from the second post and a second tape measure 50' 7" on a diagonal from the first post (see figure 1). Where the measuring tapes intersect place the third post, but do not drive it into the ground yet because you may need to adjust its position slightly.

1.4 To position the fourth corner ground post, run a tape measure 16' from the first post and a second tape measure 50' 7" on a diagonal from the second post (see figure 1). Where the measuring tapes intersect place the fourth post, but again, do not drive it into the ground because you may need to adjust its position.

1.5 Compare the measurement from each post to Figure 1 and adjust the location of corner posts 3 and 4 so the measurements are within 1" of the correct diagonal measurements of 50' 7". Once the tunnel is square, drive corner posts 3 and 4 into the ground.

1.6 After the four corner posts are set, level, and plumb, you are ready to install the remaining ground posts at 4' intervals apart on center.

1.7 Using the mason line and a line level (see figure 3), run a string between corner posts 1 and 2 so it is in-line with the predrilled holes (see figure 4), and pull it taut. Using your 100'-long tape measure, measure and mark the locations of each ground post on the string lines.

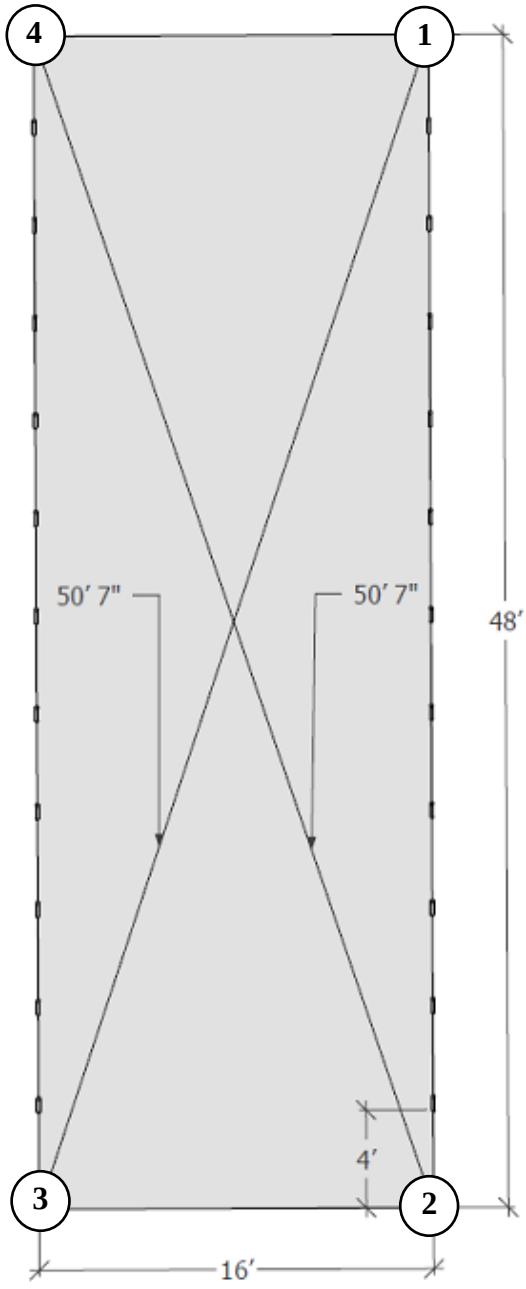


Figure 1: Diagonal measurements.

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Figure 2: Ground post driver.



Figure 3: Mason line and line level.



Figure 4: Level ground posts and mason line.

1.8 Drive each post 24" deep into the ground in the same manner as the corner posts, using a level to make sure each post is plumb. Be sure the posts are 4' on center as you go.

1.9 Repeat steps 1.7 and 1.8 for the other side of the high tunnel.

STEP 2: BOW ASSEMBLY

We recommend pre-assembling all your bows prior to installing them into the ground posts. Be sure to use a flat surface so the bows do not curve.

2.1 Each bow assembly will consist of two half-bows and a ridge connector. Insert the swaged (tapered) end of each half-bow into the ridge connector (see figure 5) and secure them together using two 1" Tek screws (see figure 6).
Note: *Tek screws are designed with a tip that drills through metal, eliminating the need for pre-drilling holes.*

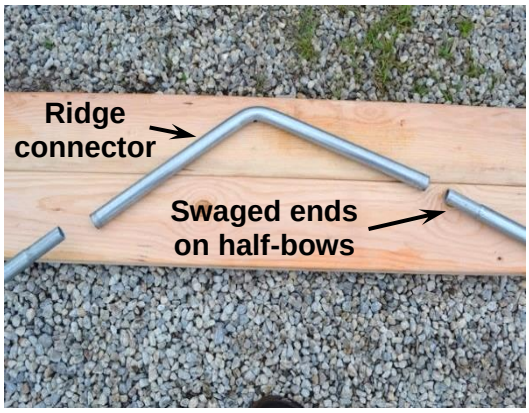


Figure 5: Bow assembly.

2.2 Prepare the first end wall bow for installation by slipping four brace bands onto each side of the bow before inserting it into the ground posts (see figure 7). These brace bands will be used later to secure the end wall framing to the bow.

2.3 Insert the end wall bow into the first set of ground posts and secure in place using the pre-drilled holes and the two ½" carriage bolts and hex nuts provided (see figure 8). Tighten the carriage bolt so that the square part below the head sinks into the ground post and the head sits flush (see figure 9).
Note: *The head of the carriage bolt should be positioned on the exterior of the tunnel, with the hex nut facing inward.*



Figure 6: Tek screws securing bow assembly.

2.4 Install the second bow in the same manner as you did the first but slip one brace band (two if installing truss supports) onto each side before inserting the bow into the ground posts. These brace bands will be used later to secure the wind bracing.
Note: *The extra brace bands can be attached later, but it is easier to slip them onto the bows now rather than to pry them open to fit over the bow pipes once they are set into the ground posts.*

2.5 Continue installing the assembled bows into the ground posts, slipping one brace band onto each side if installing truss supports. Use the pre-drilled holes and the two ½" carriage bolts to secure the bows.

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2.6 Install the last two bows as you did with the first two, ensuring the correct number of brace bands are attached to each.



Figure 7: Brace band on end bow for wind bracing, trusses, and framing.



Figure 8: Carriage bolt and hex nut.



Figure 9: Carriage bolt properly installed.

STEP 3: RIDGE PURLIN INSTALLATION

3.1 Begin by attaching the non-swaged end of a purlin to the underside of one of the bows that make up an end wall. Secure it to each bow peak using a 4" carriage bolt and hex nut (see figure 10). Be sure the carriage bolt head is facing up to avoid damaging the poly roof.
Note: *You can also cover the carriage bolt head with a small square of duct tape for added protection.*

3.2 Insert the next purlin onto the swaged end of the first and secure it to each bow as you did previously.

3.3 Continue to install each of the ridge purlins to the bows until you reach the other end wall.
Note: *The last purlin will be slightly shorter than the others and will not have a swaged end.*



Figure 10: Ridge purlin secured to the bow peak.

STEP 4: TRUSS SUPPORT INSTALLATION (OPTIONAL)

This tool Truss Support Kit is optional but necessary for tunnels installed in areas that experience snow fall. Adding a set of trusses allows the roof to support significantly more weight by distributing the vertical load; plus, the trusses can be used to secure crop trellising.

4.1 Attach both ends of the horizontal truss to each interior bow using the brace bands and a 1½" carriage bolt and hex nut (see figure 11).
Note: *Do not tighten the bolts yet, in case the truss needs to be adjusted.*



Figure 11: Brace band securing trusses to Bobcat frame.



Figure 12: Finished truss installation.

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4.2 Level the horizontal truss and tighten the hex nut to secure it in place.
Note: *The ends of the trusses should sit approximately 50" from the peak of the bow (see figure 12).*

STEP 5: WIND BRACE INSTALLATION

5.1 Using the brace bands that you previously slipped onto the bows, attach the wind brace to the end wall bow approximately 36" above the top of the ground post (approximately 60" above the ground) with a 1½" carriage bolt and hex nut (see figure 13).
Note: *Use the third brace band from the top to attach one end of the wind brace to the end wall bow.*

5.2 Secure the other end of the wind brace just above the ground post with the previously placed brace band and a 1½" carriage bolt and hex nut.
Note: *The head of the carriage bolt should be positioned on the exterior of the tunnel.*



Figure 13: Wind brace attached 36" above the top of the ground post.

STEP 6: BASEBOARD INSTALLATION

6.1 Secure each of the ground posts using two-hole pipe straps and 1" Woodmate screws (see figure 14).

6.2 Install a 1" Tek screw through the center of the two-hole pipe strap to prevent the baseboard from shifting (see figure 14).

6.3 On the end bows, drill a 3/8" hole, using the drill bit provided, through the baseboard and ground post, to bolt the baseboard onto the ground post with a 4" carriage bolt (see figure 15).

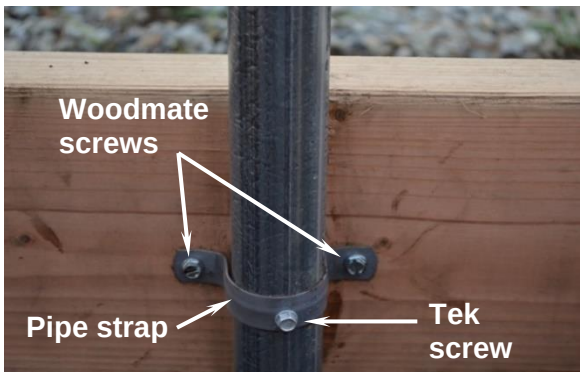


Figure 14: Attaching the baseboard to the bows.

STEP 7: DESIGNING YOUR END WALLS

The end walls of your Bobcat tunnel can take on many forms, according to your preferences.

Popular options include constructing a wood frame from locally sourced 2 x 4 lumber or purchasing a Steel End Wall Kit.

The following drawings show a couple common end wall framing configurations from which you can choose. Rough dimensions are given for openings you will need to frame any door, fan vent, or gable shutter you choose to add. You will want to know the exact dimensions of the door and other features you plan to add so you can build your frame accordingly.

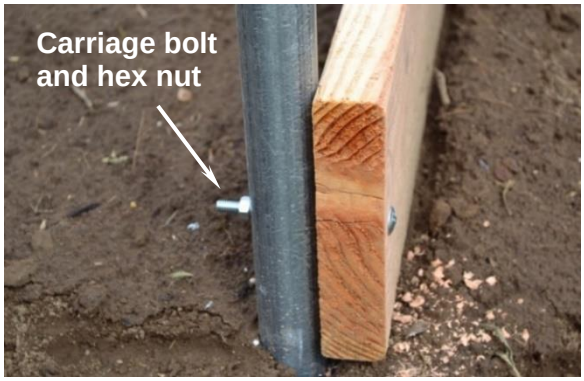
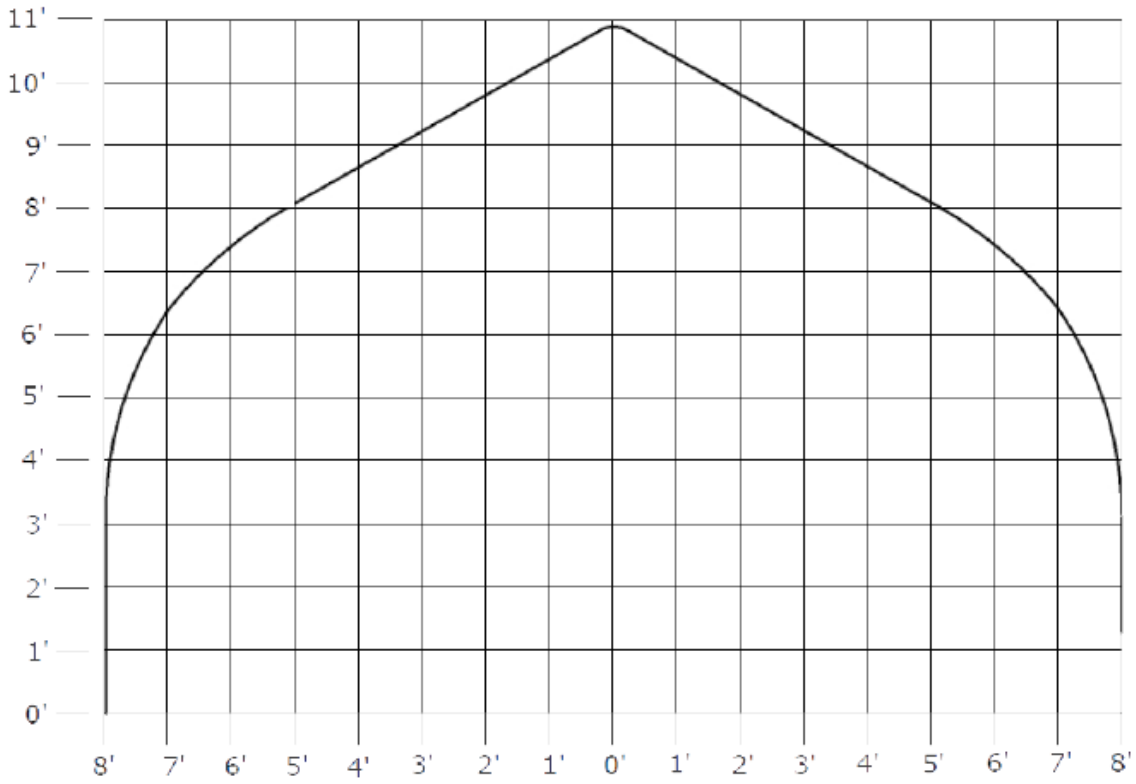


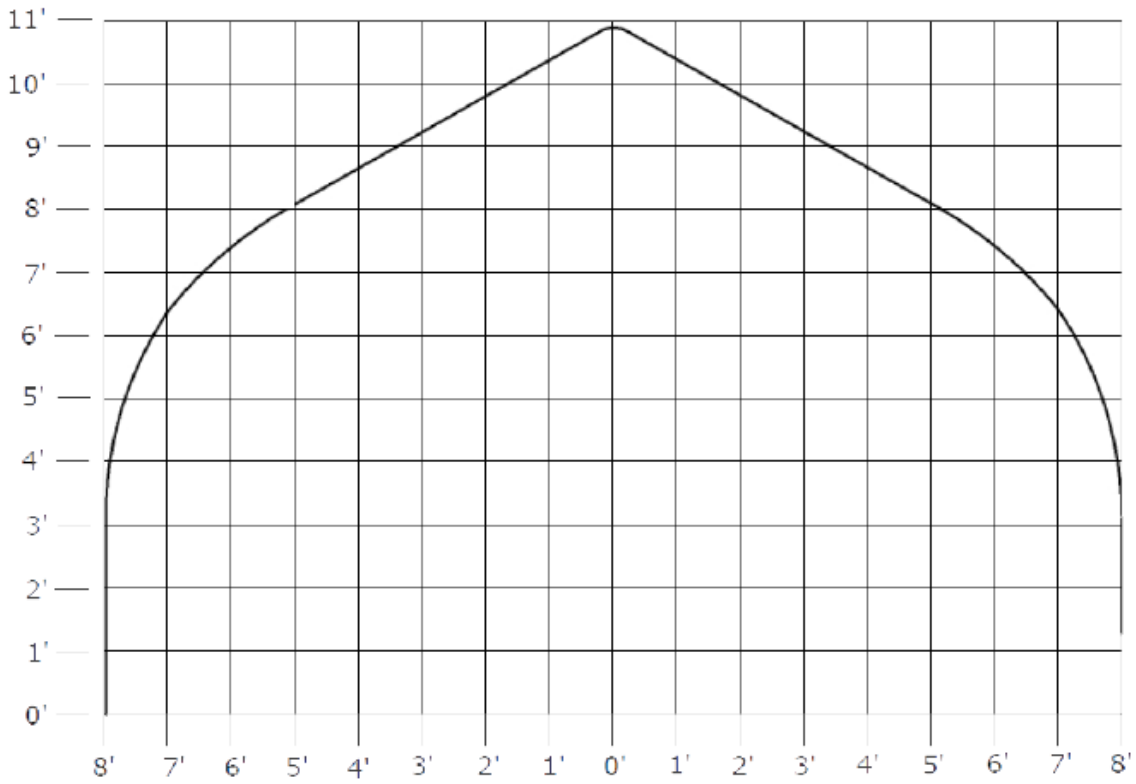
Figure 15: Attaching baseboard to the end wall.

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Option 1. Design Your Own.
You can use these scaled end wall grids to plan and sketch your Bobcat end walls.

16’ Wide Bobcat Tunnel: 1 square = 1 square foot





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Option 2. Figures 16 & 17 show configurations that leave openings for a door, as well as the 20" exhaust shutter fan and 24" motorized power shutter that are included with the Automatic Ventilation Kit for the Bobcat Pro. Use your door's outer dimensions to determine how large the door frame opening will need to be. The dimensions shown below are for the optional Sliding Door Kit, which comes with one door.

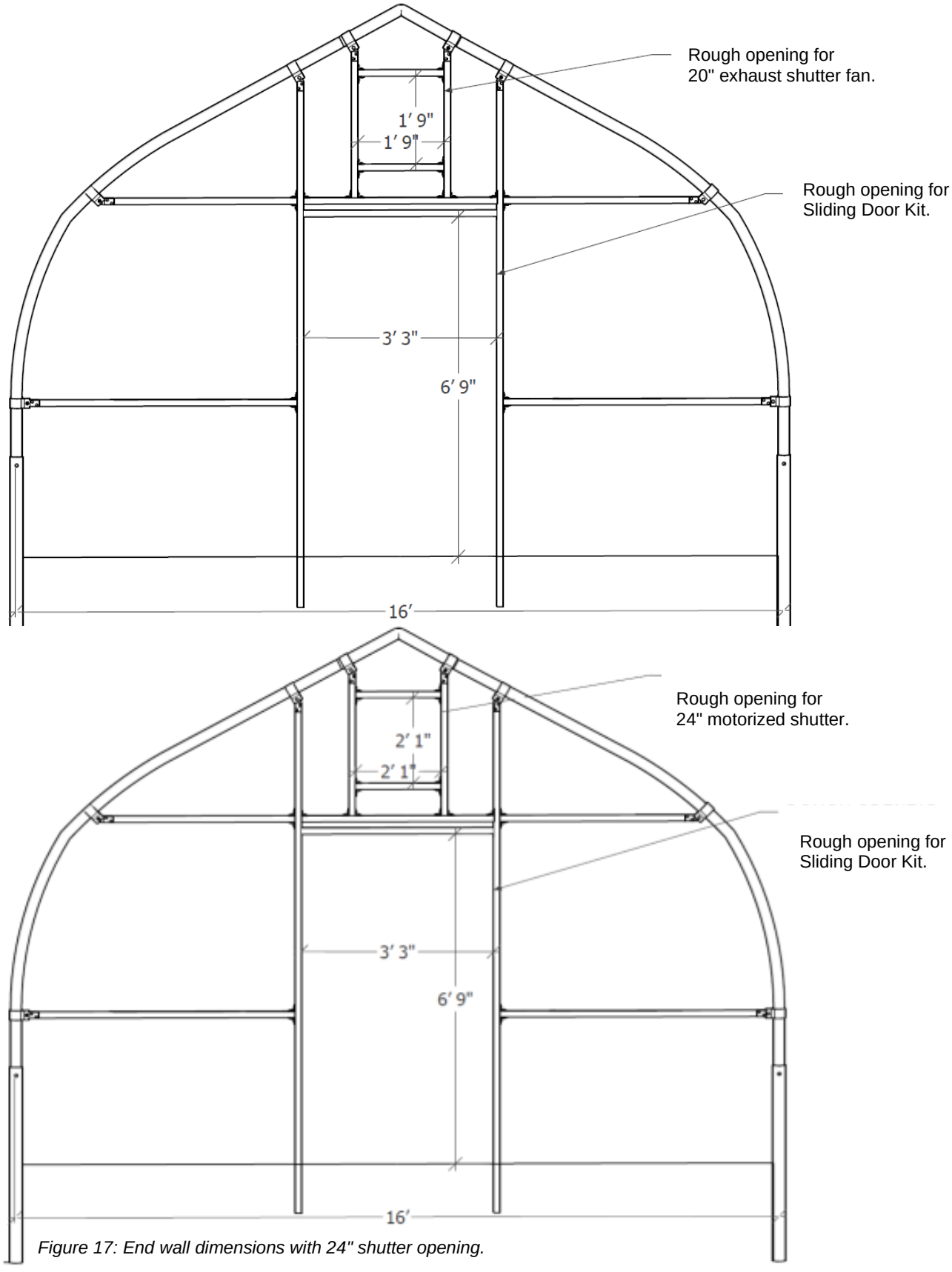


Figure 17: End wall dimensions with 24" shutter opening.

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STEP 8: FRAMING WOODEN END WALLS

Note: *Refer to the additional Steel End Wall Kit instructions if you intend to install the optional steel end walls.*



Figure 18: Connecting a 2 x 4 to the frame with an end wall bracket and brace band.

8.1 Start by digging two holes in the ground at the approximate location of the vertical studs that will sit on either side of your door.

8.2 Attach an end wall bracket to one end of the two 2 x 4 x 12' studs using 1½" Woodmate screws (see figure 18).

8.3 Use the end wall brackets to loosely attach these two vertical studs to the end wall bows using the top brace band you previously installed, 1½" carriage bolts, and hex nuts (see figure 18). These will form the sides of your door frame, so space them slightly wider than the door you intend to install. Once the studs are plumb, tighten the bolts and pack soil around the bases to hold in place.
Note: *The end wall brackets are offset, so the outside of the end wall should be flush with the exterior of the tunnel.*



Figure 19: Securing horizontal stud to door frame.

8.4 Cut a length of 2 x 4 for the top of the door frame using a circular or reciprocating saw with a wood blade.

8.5 Install the top of the door frame between the two vertical studs by drilling two 2½" wood screws through the vertical studs and into the end of the horizontal stud on each side (see figure 19).
Note: *Be sure the top door frame is level and set at a height so the bottom of the door rests about 1" above ground level.*

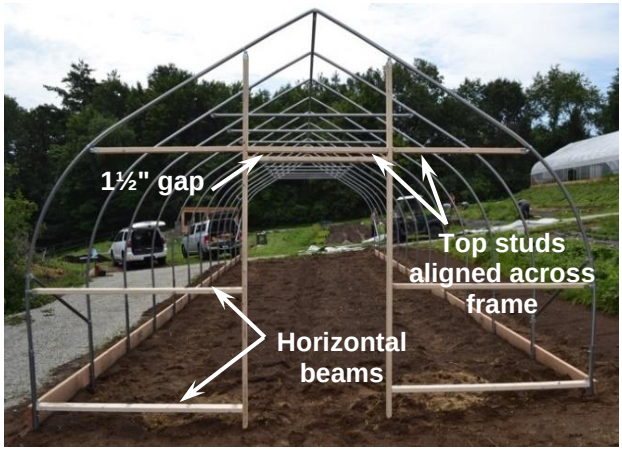


Figure 20: Stud placement for end wall framing.

8.6 Cut and attach another horizontal 2 x 4 stud of the same size just above the door frame stud so there is a 1½" gap between the two (see figure 20). This will be used for additional support and for mounting the optional sliding door track.

8.7 Install two horizontal studs on either side of the door frame so they are in-line with the last horizontal stud you placed (see figure 20). This is especially important if you are installing the track for This tool Sliding Door Kit. Secure them to the door frame with two 2½" wood screws, and then to the end wall bow as you did with the vertical posts using end wall brackets and brace bands. You will have to insert the screws at a 45º angle to keep the studs in-line with the one above the door frame.
Note: *You will first need to measure the distance between the door frame and the bow before cutting each horizontal stud to fit.*

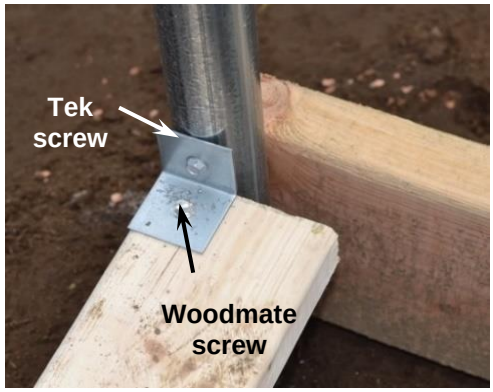


Figure 21: Securing bottom 2 x 4 to end wall frame.

8.8 Install another set of horizontal studs approximately halfway up the door frame, and another towards the bottom (see figure 20). Each bottom horizontal stud must be attached using a 1½" angle bracket, a 1" Woodmate screw for securing it to the 2 x 4, and a 1" Tek screw for securing it to the end wall bow (see figure 21). Level each horizontal stud before securing in place.
Note: *If you are installing This tool Sliding Door Kit, be sure to install the middle horizontal beam at a comfortable handle height. The Z-catch for the sliding door is installed on the middle horizontal beam to catch the lever handle from the sliding door, securing it in the closed position.*

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STEP 9: INSTALLING DOUBLE WIRE LOCK CHANNEL FOR ROLL-UP SIDES

9.1 Mark all four end wall bows approximately 30" above the ground post. This marks the location of the bottom of your double wire lock channel.

9.2 Attach a T-plate to each end wall bow using four 1" Tek screws for each plate. The second screw holes from the bottom on the T-plates should line up with the 30" marks you made on the end wall bows (see figure 22).

9.3 Cut one of the double wire lock channels to 6' and slide the heads of two 1" hex head bolts into the grooves on the back (see figure 23).

9.5 Secure the 6' channel to the T-plate using one of the hex bolts in the groove on the back and a hex nut (see figure 24). ***Note:*** *Do not cover the four screws securing the T-plate to the end wall. A single wire channel lock will be installed there* (see figure 25).

9.6 Secure the rest of the channel to the bows by sliding 1" hex bolts into the groove on the back and attaching them to each bow with two-hole pipe straps and hex nuts (see figure 26).

9.7 Attach 12' sections of channel together using the connector plate and four Tek screws (see figures 27 and 28) to form a continuous channel that runs the length of the tunnel.

9.8 When you reach the end, you will have to cut the final piece to the correct length. Mark where to cut so the four Tek screws on the T-plate remain exposed just like the first T-plate (see figure 25).

9.9 The final step is installing two ¾" Tek screws through the double wire lock channel on every bow to secure it in place (see figure 29).

9.10 Repeat the same steps for the other side of the tunnel.



Figure 22: Marks the bottom of the double wire lock channel.


Figure 23: Hex bolts installed in the back side of the channel.


Figure 24: Back view of channel secured to T-plate.


Figure 25: Front view of channel secured to T-plate.


Figure 26: Securing channel to the bow with a 2-hole pipe strap.


Figure 27: Front view of connector plate installed.


Figure 28: Back view of connector plate installed.


Figure 29: Channel secured to bow with Tek screws.

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STEP 10: INSTALLING SINGLE WIRE LOCK AND POLY FOR END WALLS

10.1 Install the first piece of single wire lock channel at the bow peak using a 1" Tek screw. The channel should be attached in the center, with each half bent to follow the curve of the bow (see figure 30). Secure every 12" using 1" Tek screws. Continue adding channel to both sides of the bow until you reach the baseboard, then cut to size.



Figure 30: Channel attached to bow peak.

10.2 To attach channel to the wooden end wall framing, you will first pre-drill pilot holes in the channel every 12" using a 7/32" bit. Use these holes to install the channel to the wood around doors, peak vents, and on vertical and horizontal framing with 1½" Woodmate screws. The ends should be flush with the next channel (see figure 31).
Note: *Unlike Tek screws, Woodmate screws do not self-drill through metal, so pilot holes are required.*



Figure 31: Channel installed on end wall framing.

10.3 Cut the 17’ X 32’ piece of woven poly in half to give you two 17’ X 15' 6” pieces to use as end walls. This will be enough to cover the end wall with some excess.

10.4 Install the top-center of the poly film panel to the peak of the bow by securing it into the channel with the wire lock (see figure 32). Continue to install down both sides of the bow to the ground (see figure 33).
Note: *Keep the poly straight as you install, but do not pull tight. The wire lock will draw the poly into the channel, pulling it taut.*



Figure 32: Installing wire lock into channel.

10.5 Install the wire lock into the channels on the wooden end wall frame, working from the top down (see figure 34).
Note: *Secure the entire panel to the end wall before cutting out openings for the door and shutters.*

10.6 Once the poly end wall is installed, you can trim off the excess material, leaving about 1" extra around the bow and other openings and 12" along the bottom of the tunnel so you can bury it underground to create a seal (see figure 35).

10.7 Repeat these steps to finish the second end wall.



Figure 33: Lock wire installed on end wall bow.



Figure 34: Lock wire installed on vertical and horizontal framing.



Figure 35: Completed poly installation with excess material removed.

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STEP 11: INSTALLING THE INFLATION BLOWER

11.1 Attach the blower bracket to the second bow from the end wall using self-tapping Tek screws (see figure 36). ***Note:*** The blower should be installed approximately half-way up the curve of the bow.

11.2 Secure the blower motor to the bracket using the screws provided, so the drain hole is facing downward.

11.3 Once the first layer of poly film is installed over the motor, you will cut a small hole in the poly where it lines up with the opening in the blower motor.

11.4 Insert the mushroom-shaped deflector cap into the port on the motor so it captures the poly film and turn one quarter-turn to lock it in place (see figure 37). ***Note:*** *Be sure the hole you cut* in the poly lines up with the center of the open port.

11.5 The second layer of poly will be installed over the top of the deflector cap.



Figure 36: Bracket and blower motor mounted to the bow.



Figure 37: Blower installed in the first poly layer.

STEP 12: INSTALLING DOUBLE ROOF POLY FILM

Install the roof poly film when there is little to no wind, such as early morning. It is helpful to have three or more people and to place a ladder at each end of the tunnel.

12.1 Roll out the poly film and cut it so you have two pieces, each at least 50’ in length. This will be enough to cover the tunnel, with approximately 12" extra at either end (see figure 38). ***Note:*** *You will need approximately 10' of space next to the tunnel to roll out the poly*.

12.2 Spread out the poly film on the ground so that the two pieces are open and loose (see figure 38). You will install the first layer of poly film and lightly tack it in place before adding the second on top.

12.3 Use tennis balls loosely secured to ropes on two corners of the same side of the poly film so they will not slip (see figure 39).

12.4 Throw the ropes up and over the top of the tunnel and use them to slowly pull the poly evenly over the top to the other side of the frame (see figure 40). Be sure the poly film is straight and square with the frame.

12.5 Tack the first poly layer in place with short sections of wire lock so it will not shift while installing the second layer.



Figure 38: Roll out poly along tunnel.



Figure 39: Tennis ball wrapped in poly.

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Note: *<u>Do not</u> pull the poly too tight over the frame. There should be 4–18" of air space between the two poly layers when fully inflated for proper insulation.*

12.6 Finish installing the inflation blower as described in the previous step before adding the second layer of poly film.

12.7 Add the second layer of poly film over the first layer and install both layers into the single channel on one end wall using the wire lock, starting at the peak and working down to the double wire lock channel. Be sure not to pull the second layer too taut to maintain the proper air space between the two poly layers.
Note*: The wire lock channels can accommodate multiple layers of poly and wire lock, so you can stack them over the ones previously installed on the end wall bows.*

12.8 Once the poly film is secure to one end wall, pull it tight lengthwise and repeat step 12.7 on the opposite end wall.

12.9 Continue to install the poly into the double wire lock channel that runs the length of the tunnel, starting in the middle and working outward to the end walls on each side. Install wire in both the upper and lower channels (see figure 41).

12.10 When you are finished securing the poly into the channels, trim the excess plastic along the end walls.



Figure 40: Pulling poly over the tunnel frame.

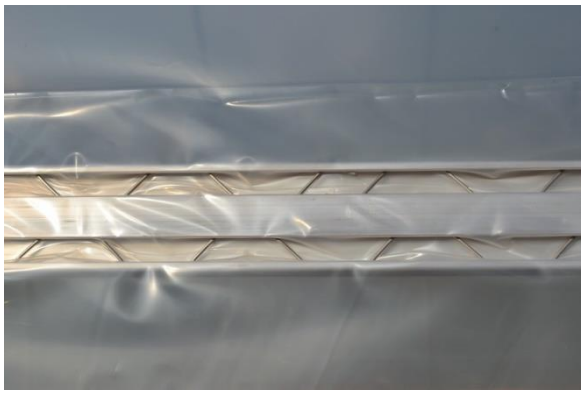


Figure 41: Wire lock installed in both side wall channels.

STEP 13: INSTALLING ROLL-UP SIDES

13.1 Measure 6" in from the outside edge of the baseboard and make a mark 2" up from the bottom edge. Do the same on the opposite end of the tunnel. These will be the locations of the first and last eyebolts.

13.2 Drill a hole through the baseboard using a $^{3}/_{8}$" drill bit, to install an eyebolt. Secure the eyebolt in place with a flat washer and a $^{5}/_{16}$" hex nut on either side of the baseboard (see figures 42 and 43).
Note*: The eye should be perpendicular to the ground so the rope will slide through easily.*

13.3 Moving towards the other end of the tunnel, install another eyebolt in the same way at the base of every other bow. Each eyebolt should sit 2" up from the bottom of the base board and just off to the side of each bow. Continue until you reach the other end wall and install the last eyebolt in the location that you previously marked.



Figure 42: Eyebolt view from outside the tunnel.



Figure 43: Eyebolt installed from the inside.

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13.4 Assemble the roll-up side pipe by inserting the swaged ends into non-swaged ends of the 12' 3" pipe until it measures the length of the tunnel.

13.5 Lay the assembled roll-up side pipe on top of the eyebolts with one end extending 1" past the end of the tunnel to accommodate the roll-up gear box (see figure 44).
Note: *Be sure the end of the roll-up side pipe with a pre-drilled hole is on the end of the tunnel you wish to place the gear box operator.*



Figure 44: Pipe extending 1" beyond the outside edge.

13.6 Pull the poly film so it is taut down to the ground before attaching it to the roll-up side pipe. Be sure it is even all the way down the tunnel.

13.7 Attach the poly film to the roll-up side pipe resting on top of the eyebolts by pinning it down with the curtain cap provided (see figure 45) and attach it in place with ¾" Tek screws spaced every 12" (see figure 46). Use two Tek screws where the swaged tubes connect, one on either side of the junction, to secure it to the pipe.

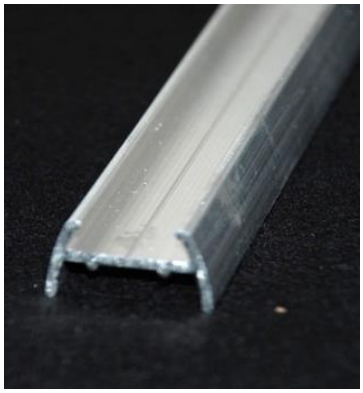


Figure 45: Curtain cap.



Figure 46: Tek screws securing curtain cap to the roll-up side pipe.

13.8 After the roll-up curtain cap is installed, trim off the excess poly, leaving 1" extra.

13.9 Install the rope hooks into the bottom of the double wire lock channel (see figure 47). Place the first rope hook on each end wall corner directly above the first eyebolt. The rest of the rope hooks should be placed near the bows located between each eyebolt. Secure the rope hooks in place with a Tek screw (not shown in photo).



Figure 47: Rope hooks for the top of the roll-up sides.

13.10 Feed the rope through the eye bolts (see figure 48) and then rope hooks, creating a “W” pattern, until you get to the other end of the tunnel. Pull the rope taut and tie it off on both ends.
Note: *This rope will be used to keep the roll-up side in place against the tunnel.*

13.11 Repeat these steps on the other side.



Figure 48: Eyebolts for the bottom of the roll-up sides.

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STEP 14: INSTALLING THE GEAR BOX OPERATORS

14.1 Drill a ¼" hole through the roll-up pipe approximately 1" from the end, so that it lines up with the pre-drilled hole in the adaptor.

14.2 Insert the adaptor into the end of the roll-up pipe and secure in place with the ¼" X 1¾" hex bolt and ¼" lock nut included.

14.3 Slide the square shaft on the adapter into the square port of the gear box, and secure in place with the ¼" flat washer and the ¼" X 1" hex bolt provided.

14.4 Slide the guide pipe into the gear box so that is sits snug between the guide wheels (see figure 49).

14.5 There is a predrilled 3/8" hole in the end wall bow at the appropriate height so the guide pipe can move along with the gear box when the side walls are rolled up and down. Insert the 3/8" X 6" eyebolt, and secure in place with a flat washer and 3/8" hex nut on both the inside and outside of the tunnel (see figure 50).
Note: *The eyebolt should extend approximately 3" out from the end wall bow.*

14.6 Drill a 5/16" hole approximately 1" from the top of the guide pipe and attach the chain to the inside using a 1¾" hex bolt and lock nut (see figure 50).

14.7 Hook the end of the chain over the eye bolt so the guide pipe can hang freely, allowing it to move with the gear box when in use (see figures 50 and 51).

14.8 Repeat these steps for the opposite roll-up side wall.

To operate the side walls, simply insert the hook on the end of the hand-crank into the loop on the gear box and use it to turn the gears back and forth (see figure 52).



Figure 49: Gearbox installed.



Figure 50: Hardware for mounting the guide pipe.



Figure 51: Gear box on the hanging guide pipe.



Figure 52: Operating the hand crank.

STEP 15: INSTALLING THE AUTOMATIC VENTILATION KIT

Please refer to the separate Automatic Ventilation Kit manual for detailed installation instructions.

Now that you have finished building your Bobcat tunnel, it's time to start growing!

For installation questions or customer support, call Rimol Greenhouse Systems at (603)629-9004.

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