GROWspan™
greenhouse structures

GrowSpan™
Round Premium Vent High Tunnel

Photo may show a different but similar model.

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STK#	DIMENSIONS
106417	26' W x 12' H x 48' L
106418	26' W x 12' H x 72' L
106419	26' W x 12' H x 96' L

WARNING: Cancer and Reproductive Toxicity - P65Warnings.ca.gov

Revision date: 05.28.19

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READ THIS DOCUMENT BEFORE YOU BEGIN

Thank you for purchasing this GrowSpan™ high tunnel. When properly assembled and maintained, this product will provide years of reliable service. These instructions include helpful hints and important information needed to safely assemble and properly maintain the high tunnel. Please read these instructions ***before*** you begin.

If you have any questions during the assembly, contact Customer Service for assistance.

SAFETY PRECAUTIONS

- Wear eye protection.
- Wear head protection.
- Wear gloves when handling metal tubes.
- Use a portable GFCI (Ground Fault Circuit Interrupter) when working with power tools and cords.
- Do not climb on the high tunnel or framing during or after construction.
- Do not occupy the high tunnel during high winds, tornadoes, or hurricanes.
- Provide adequate ventilation if the structure is enclosed.
- Do not store hazardous materials in the high tunnel.
- Provide proper ingress and egress to prevent entrapment.

ANCHORING INSTRUCTIONS

Prior to assembling this high tunnel, please read the *MUST READ* document included with the shipment.

⚠ **WARNING:** The anchor assembly is an integral part of the high tunnel construction. Improper anchoring may cause high tunnel instability and failure of the structure. Failing to anchor the high tunnel properly *will void the manufacturer's warranty* and may cause serious injury and damage.

LOCATION

Choosing the proper location is an important step before you begin to assemble the structure.

The following suggestions and precautions will help you determine whether your selected location is the best location.

- Never erect the structure under power lines.
- Identify whether underground cables and pipes are present *before* preparing the site or anchoring the structure.
- Location should be away from structures that could cause snow to drift on or around the building.
- Do not position the high tunnel where large loads such as snow and ice, large tree branches, or other overhead obstacles could fall.

SITE

After choosing a location, proper preparation of the site is essential. Follow the information below.

- *A level site is required*. The site must be level to properly and safely erect and anchor the structure.
- For sites that are not concrete or gravel, placing wood blocks or other suitable supports under each rafter leg helps prevent the pipes from sinking or working into the site. Does not apply to frames with ground posts.
- Drainage: Water draining off the structure and from areas surrounding the site should drain away from the site to prevent damage to the site, the structure, and contents of the structure.

⚠ **WARNING:** The individuals assembling this structure are responsible for designing and furnishing all temporary bracing, shoring and support needed during the assembly process. For safety reasons, those who are not familiar with recognized construction methods and techniques must seek the help of a qualified contractor.

ASSEMBLY PROCEDURE

Following the instructions as presented will help ensure the proper assembly of your high tunnel. Failing to follow these steps may result in an improperly assembled and anchored high tunnel and will void all warranty and protection the owner is entitled.

The steps outlining the assembly process are as follows:

1. Verify that all parts are included in the shipment. Notify Customer Service for questions or concerns.
2. Read these instructions, the Must Read document, and all additional documentation included with the shipment ***before*** you begin assembling the high tunnel.
3. Gather the tools, bracing, ladders (and lifts), and assistance needed to assemble the high tunnel.
4. Check the weather ***before*** you install the roof cover and any panels (if equipped). Do not install covers or panels on a windy or stormy day.
5. Re-evaluate the location and site based on the information and precautions presented in the documentation included with the shipment.
6. Prepare the site (if applicable).
7. Assemble the frame components in the order they are presented in these instructions.
8. Assemble the frame including the struts (if equipped).
9. Consult the MUST READ document and properly anchor the assembled frame.
10. Install, tighten, and secure the end panel and main cover (if equipped). This applies to fabric covers that stretch over the frame assembly. Your shelter may include roof panels or side panels or both.
11. Read the Care and Maintenance information at the end of these instructions.
12. Complete and return all warranty information as instructed.

LIST OF WORDS AND PHRASES

Before you begin, it is important to become familiar with the words and phrases used in this instruction manual.

These words and phrases are common to most GrowSpan™ shelters and identify the different parts of the shelter. (Some are used in this document. Others may not apply to this particular shelter.) These terms describe the shipped parts and can also be found on the materials list/spec sheets included with the shipment. To aid in the assembly, read through the following definitions before you begin to assemble your shelter.

- **Conduit:** An assembly of pipes used to secure the main cover and end panels (if equipped). Purlins and some strut assemblies also consist of connected pipes to form a conduit. Each pipe joint of a conduit assembly is secured with a self-tapping Tek screw.
- **Coupler or Fitting:** A part of the frame assembly where legs, purlins and rafter pipes are inserted and secured. In most instances, 3-way and 4-way couplers are used. In some larger applications, couplers are used to secure the joints of the different rafter sections during the assembly of the rafters. Some shelters do not use couplers.
- **Foot or Rafter Foot:** The part attached to and found at the base of the rafter or leg of the shelter. Depending on the shelter, the foot is an optional purchase. Some shelters do not offer an optional foot. Some use 1-way connectors or ground posts.
- **Must Read Document:** This document includes building and shelter anchoring instructions, steps for end wall reinforcement, safety precautions, and notices and warnings. The Must Read document is sent with all shelters and buildings. If you did not receive a Must Read document, contact Customer Service to request one.
- **On-Center:** Term used to describe a measurement taken from the vertical center of the rafter or frame member to the vertical center of another.
- **Purlin:** The pipe assembly that runs perpendicular to the rafters or framework that supports the main cover. Purlins are found on the sides and roof areas of the assembled frame, are evenly spaced, and typically run from the front to the back of the shelter.
- **Plain or Straight Pipe:** A term used to describe a pipe that has the same diameter or width throughout its entire length.
- **Strut:** A strut is usually a length of pipe with two flattened ends and is used for diagonal bracing of the shelter frame. A strut is typically secured to the frame work by special brackets and bolts.
- **Swaged End or Swaged Pipe:** The term “swaged" refers to the tapered end of the pipe or tube. Swaged ends of a pipe can be inserted into couplers and the straight ends of other pipes.
- **Tek Screw:** A self-tapping fastener used to secure pipe joints and to fasten brackets to rafters.

REQUIRED TOOLS

The following list identifies the main tools needed to assemble the shelter. Additional tools and supports may be needed depending on the structure, location, and application.

- Tape measure or measuring device
- Fine point marker to mark the location on tubing
- Variable speed drill and impact driver (cordless with extra batteries works best)
- Wrench, ratchet and socket (recommended)
- Scissors
- Ropes long enough to reach over the frame
- Hammers and gloves
- Metal file
- Duct tape (supplied by customer)
- Box cutter or utility knife
- Ladders, work platforms, and other machinery for lifting designed to work safely at the height of the frame

UNPACK AND IDENTIFY PARTS

The following steps will ensure that you have all the necessary parts before you begin to assemble the shelter frame.

1. Unpack the contents of the shipment and place where you can easily inventory the parts. Refer to the Bill of Materials/Spec Sheets.
2. Verify that all parts listed on the Bill of Materials/Spec Sheets are present. If anything is missing or you have questions, consult the Pictorial Parts Guide and all diagrams for clarification, or contact Customer Service.

   NOTE: At this time, you do not need to open the plastic bags containing smaller parts such as fasteners or washers (if equipped).

SPECIAL NOTE: Baseboards for Frame

These instructions describe installing a baseboard (recommended) at ground level along each side of the frame. The baseboard runs from the front to the back of the frame.

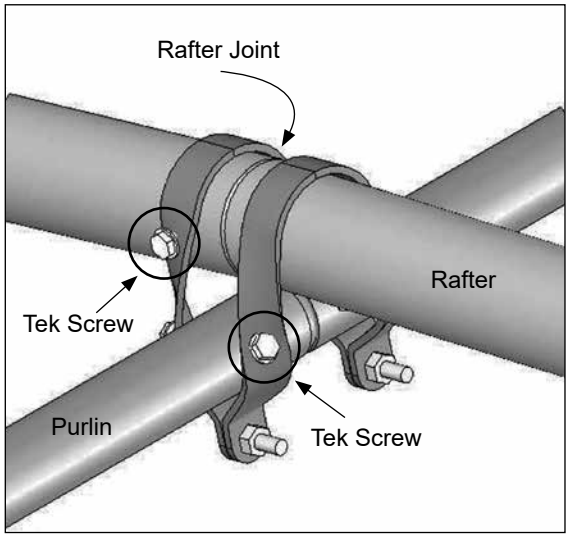
This baseboard is *not included* with the shipment and must be supplied by the customer. Treated or recycled plastic lumber works for a baseboard.

The baseboard, when installed properly, helps prevent the ground posts from sinking into the ground when anchored. Depending on the building, it also provides a surface to attach struts or other building components.

Consult these instructions, or contact Customer Service for additional information regarding baseboards.

FRAME ASSEMBLY NOTE

During the assembly of the frame, install a Tek screw through each clamp into the rafter and through each clamp into the purlin.



Position all Tek screws so they will not touch the cover material once it is installed.

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The following graphics and photos will help you identify the different parts. (Some parts are not shown.)

FA4482B
Tek Screw

CC6212 &
CC6213
Fabric Clips

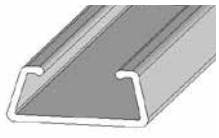
103544
Mounting Plate

102856
End Clamp

104211
Double Poly Latch

106554
Aluminum Channel

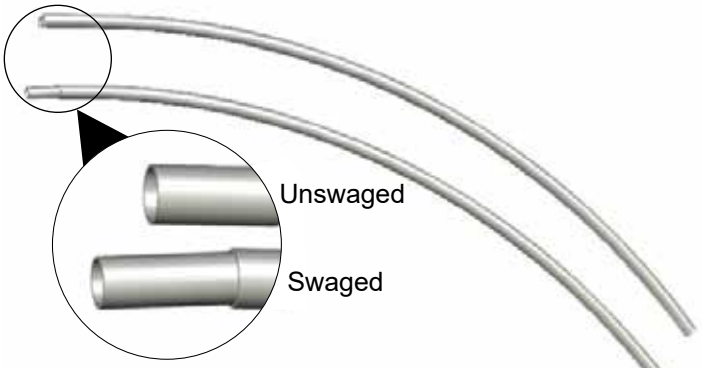
102569
Bearing



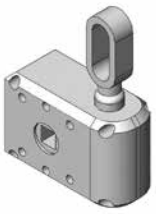
102197
Single Poly Latch
U-Channel

102717
Gearbox
Drive

102675
Ground Post



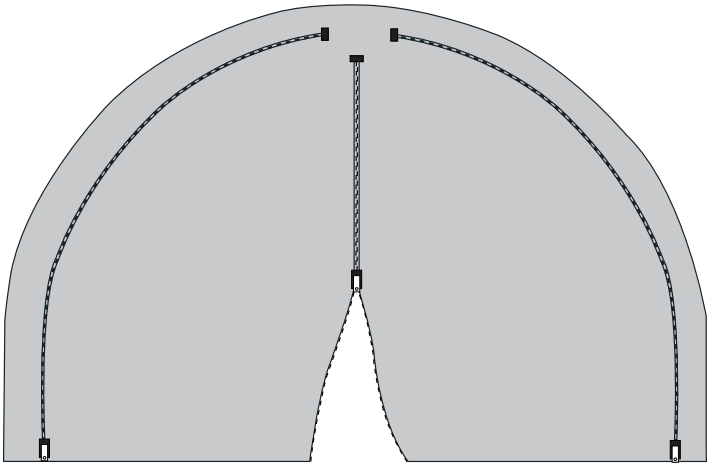
Swaged and Unswaged Rafter Sections
(not all pieces are shown)



103496
Gear Box

102548
Cross Connector

102198
U-Channel Spring



Zippered End Panel

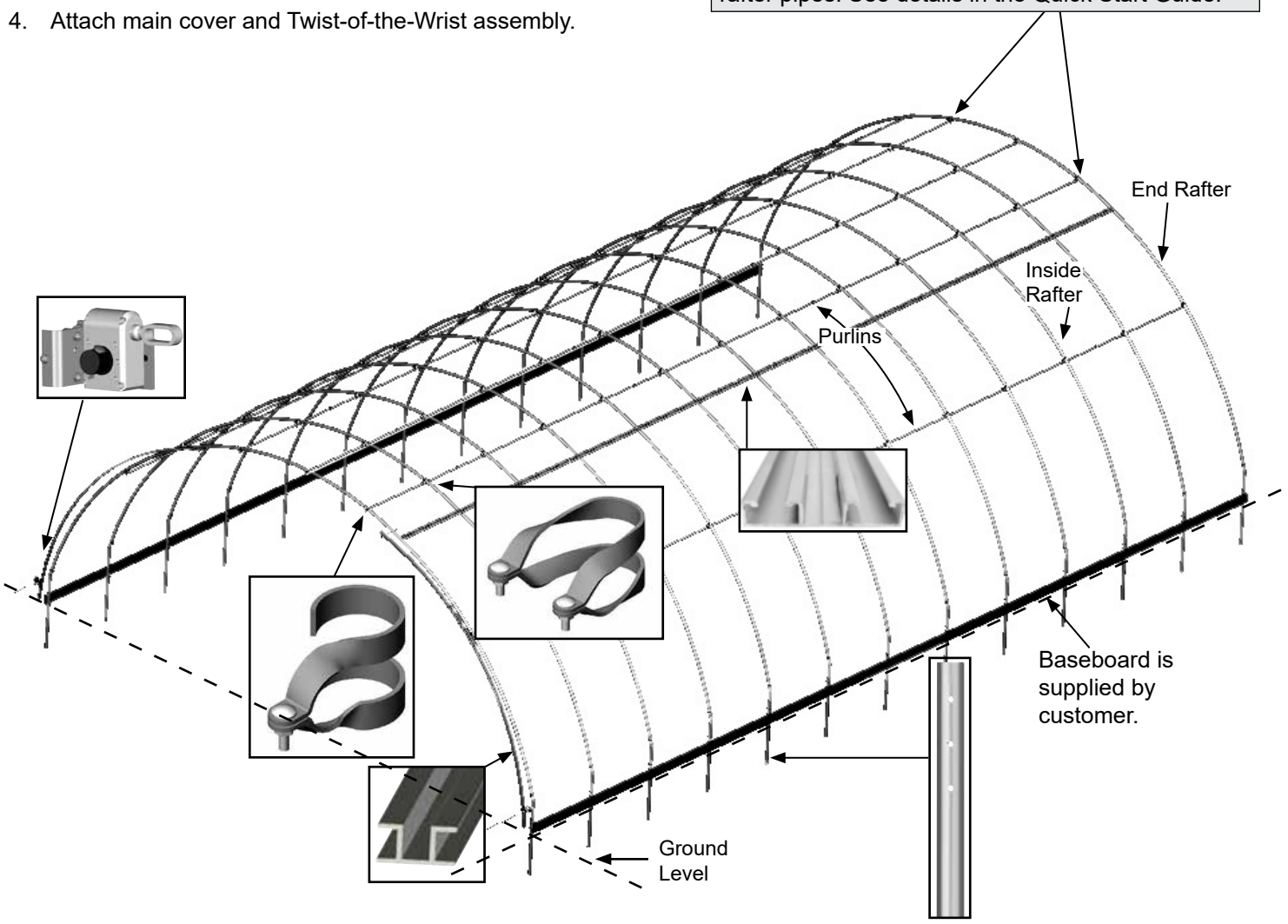
ROUND PREMIUM VENT HIGH TUNNELS

OVERVIEW

This section describes how to assemble your high tunnel shelter. See illustration below to identify main parts of high tunnel.

1. Locate the required parts for each assembly procedure.
2. Assemble the rafters and frame, and square the frame.
3. Prepare and attach end panels.
4. Attach main cover and Twist-of-the-Wrist assembly.

ATTENTION: Position purlins evenly during the frame assembly. Use the rafter pipe joints as guides when installing the end clamps, cross connectors, and purlins. Saddle all purlins (except the top, center purlin) in the joint created by the separate rafter pipes. See details in the Quick Start Guide.



LAY OUT THE BUILDING SITE

Taking these steps ***before*** assembling the shelter saves time and ensures that the structure is positioned as desired.

Drive ground posts to the proper depth. Width and length of the shelter is measured from the center of one ground post to the center of the remaining ground post. See the Quick Start Diagrams near the end of this instruction manual.

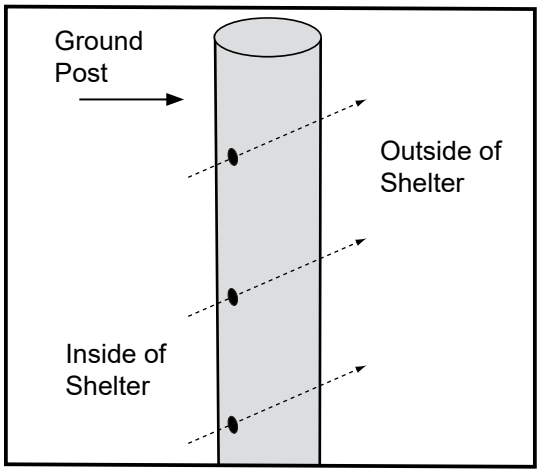
SQUARE THE SITE

Gather the Parts:

- Ground posts
- Ground post couplers
- 5/16" x 2-1/2" machine bolts
- 5/16" nuts

1. Identify a corner where a ground post will be positioned and drive the first ground post into the ground.

   NOTE: Insert the ground post driver into the top of the ground post to protect the post and drive the post into the ground. *The top of the post will be one (1) foot above the finished grade when properly driven.*



   ATTENTION: Position the pre-drilled holes facing to the inside/outside of the shelter so they can be aligned with the bolt holes in the rafter legs.

   To align the bolt holes in the ground posts with those in the rafter *after driving the ground posts,* insert a tapered rod or pry bar into a ground post bolt hole and turn the post using the rod or pry bar.

2. After the first corner ground post is in place, string a line the width of the building (center-to-center) and drive the second ground post into the ground just enough to hold it in place.

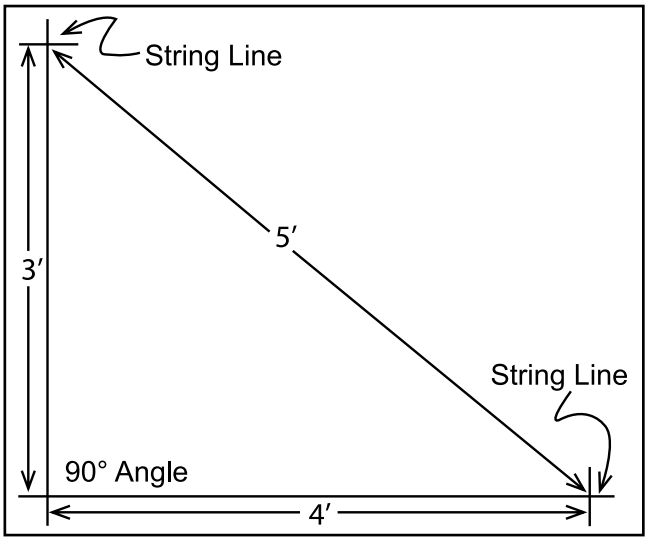
3. Use a transit or line level to drive the second corner post to the same depth as the first ground post.

4. String a line at least as long as the building from the first stake at 90°.

   NOTE: A transit can be used to ensure an accurate 90° angle, or the 3-4-5 rule can be used. Refer to diagram. Using multiples of 3-4-5 such as 6-8-10 or 12-16-20 helps to maintain an accurate 90° angle.

5. After squaring the position of the building, measure the length and drive the next corner ground post.

6. Repeat the same step for the last corner post.



   NOTE: The distance measured diagonally between corner posts must be equal for the building to be square.

7. Check all dimensions (and adjust if needed) before driving the remaining posts to the required height.

8. After all corner posts are accurately installed, tie a string line between the tops of the corner ground posts on the same side of the shelter. The string is used to identify the tops of all remaining ground posts. The string must remain tight and level.

9. Use a tape measure to mark the 48" on-center locations of the remaining ground posts.

10. Drive the remaining ground posts into the ground at the required 48" on-center dimension and to the height identified by the string.

    NOTE: Verify that the holes in the ground posts are in the proper position and that each post is plumb and driven to the correct depth.

    The lower holes in the ground post are used to secure the optional baseboards.

11. Continue with the **Rafter Assembly** steps that follow.

ASSEMBLING THE ROUND STYLE HIGH TUNNEL FRAME COMPONENTS

NOTE: Assistance is required to assemble the high tunnel frame.

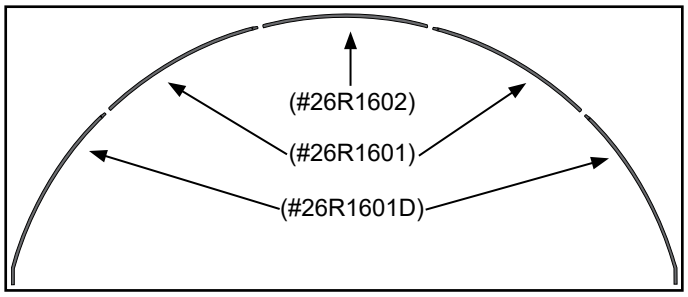
RAFTER ASSEMBLY

Gather the parts:

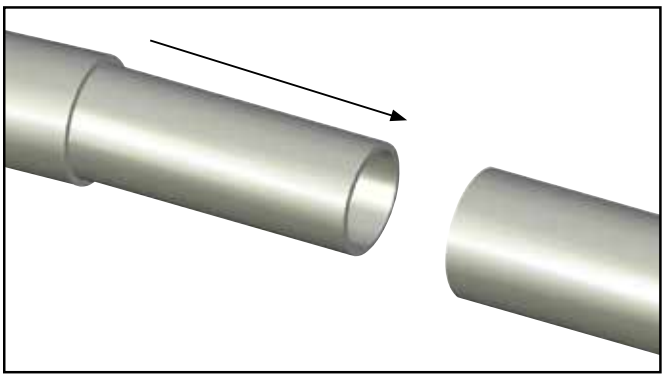
- Rafter pipe (#26R1601D)
- Rafter pipe (#26R1601)
- Rafter pipe (#26R1602)
- End clamps (102856)
- Tek screws
- Nut Setter (3/8" x 2-9/16" magnetic)

Rafter Assembly Procedure
Each rafter assembly consists of five (5) rafter sections: one (1) curved rafter pipe (for the top), four (4) side pipes that connect to the upper center pipe. The lower two (2) pipes are drilled.

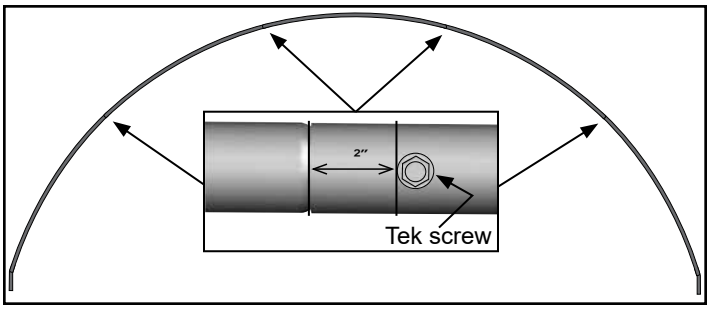
1. Select the five (5) pipes needed to assemble a rafter and arrange these on a flat surface as shown below for assembly.



2. Slide the swaged portion of each rafter pipe into the plain end of the pipe as shown.



3. With the main rafter pipes seated at each joint and the rafter positioned on a flat surface, secure each joint with a single self-tapping Tek screw. Position Tek screw approximately 2" from pipe joint.



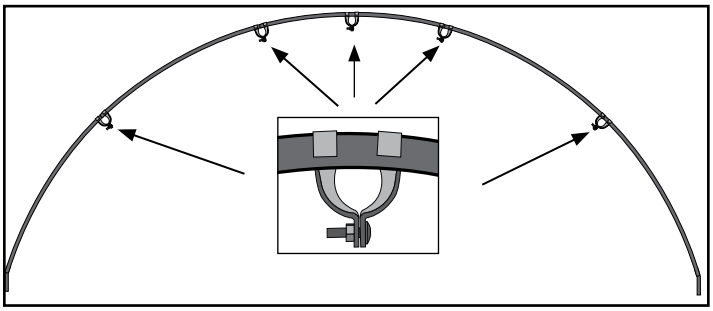
ATTENTION: Install the screws so they will not touch the cover once it is installed. This is typically on the backside of the rafter, which will be the surface visible from the *inside* of the high tunnel once the frame is assembled. Drive screw into the inner rafter pipe.

4. Assemble rafters as described and continue with the additional steps to complete the assembly of the two (2) end rafters.

END RAFTER ASSEMBLY

In addition to the steps in the previous procedure, complete the following steps *for the two (2) end rafters only*.

1. Take one of the assembled rafters and place it on a flat surface.
2. Slide five (5) end clamps (102856) onto the rafter in the locations noted below. (Do not secure the clamps to the rafter at this time. These clamps will be repositioned during the frame assembly when the purlins are added.)



NOTE: Position all clamps as shown. Use a piece of duct tape (if desired) to keep each clamp from sliding when the rafter is lifted into position.

View of the end rafter and clamps as shown from the outside when the frame is assembled.

3. Repeat the same procedure for the final end rafter.
4. Continue with the **Frame Assembly** instructions that follow.

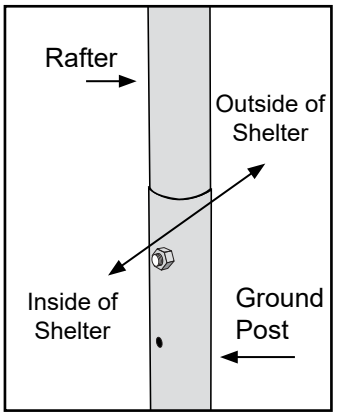
FRAME ASSEMBLY

Gather the parts:

- All Rafter Assemblies
- Pipe 1.315" x 75" swaged (#131S075)
- Pipe 1.315" x 73.5" plain (#131P0735)
- 5/16" x 2-1/2" machine bolts (#FAG336B)
- 5/16" Nuts (#FALB02B)
- Lifts, ladders, and assistants

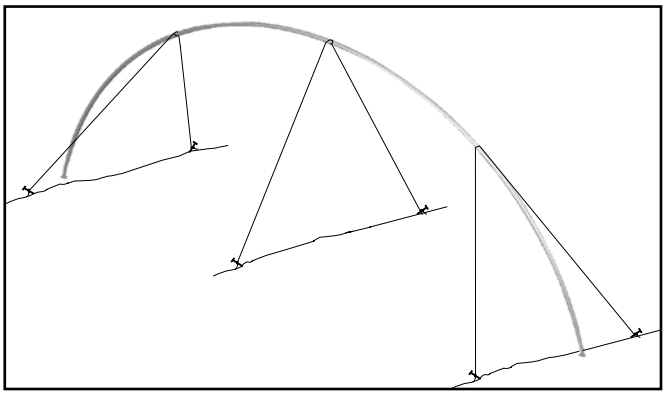
Frame Assembly Procedure

1. Using the proper lifts and with assistance, carefully stand the first end rafter—one with end clamps—and place the leg pipes into the first set of ground posts.



IMPORTANT: Brace the first rafter in position as needed to keep it from moving. Bracing is removed *after* additional rafters are installed and secured to the other rafters.

2. Secure the leg pipes to the ground posts using the 5/16" x 2-1/2" machine bolts and nuts.

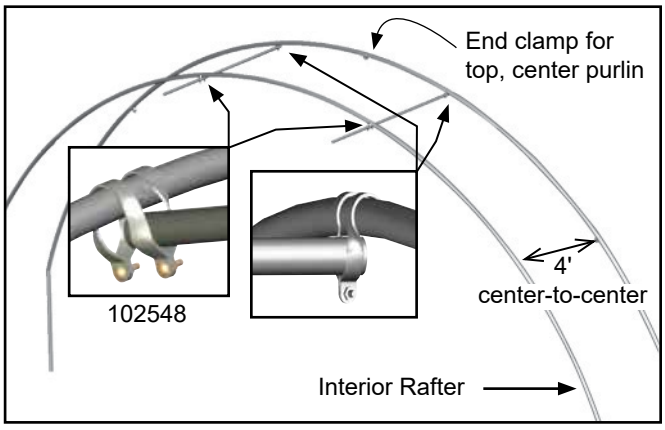


3. Verify rafter is plumb and brace it in place using cables, ropes, or dimensional lumber. Leave bracing in place until additional rafters and purlins are installed.

   NOTE: Rafter above is used to illustrate bracing. Actual rafter may differ in design or width or both.

4. Place an interior rafter–one without clamps—into the next set of ground posts. Secure the leg pipes to the ground posts as previously described.

5. Position one (1) cross connector (102548) near the top of the interior rafter assembly.



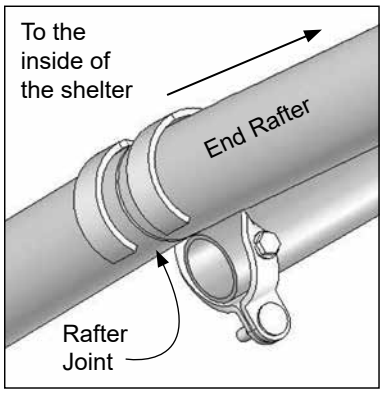
6. With assistance, take one (1) swaged 75" purlin sections (#131S075) and insert the plain end through an end clamp on the end rafter. Next, insert the tapered end through a cross connectors near the top of the interior (or second) rafter as shown above.

   Saddle the purlin pipe in the joint where the rafter pipes are connected to keep purlins aligned during assembly.

7. Repeat the previous step to install a second purlin section. See the above diagram for details.

8. Verify that both rafters are plumb and properly spaced (4' on center).

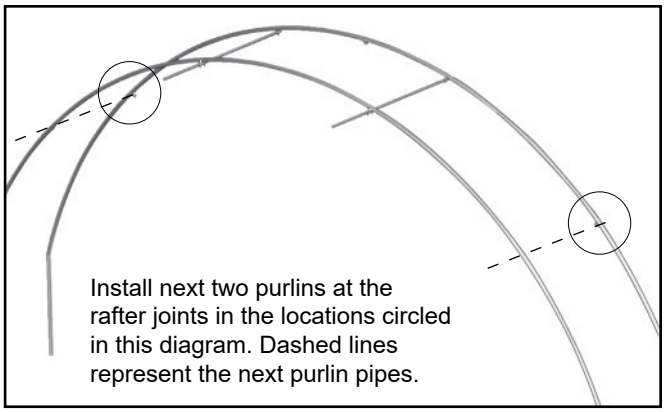
9. Tighten the 102548 cross connectors on the interior rafter and tighten the end clamps installed at the end rafter to secure the first sections of purlin pipe.



NOTE: Do not allow the plain end of any purlin to extend beyond the end of the end rafter. Align with the center of the rafter for best results and to prevent cover damage.

FRAME ASSEMBLY (continued)

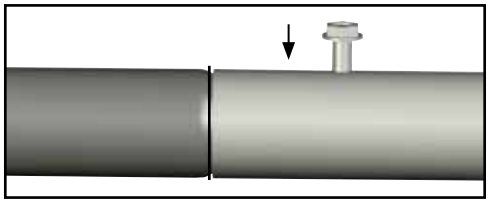
10. Move to *the last two rafter joints* and install the first section (#131S075) of those purlins. Verify the rafter spacing is 4' on-center, and tighten the end clamps and cross connectors. ***Do not install the top, center purlin until the entire frame is assembled.***



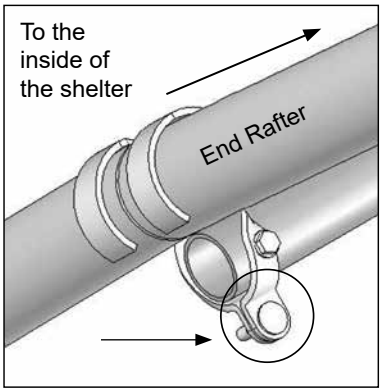
NOTE: Each purlin assembly consists of 1.315" x 75" (#131S075) swaged pipes (quantity is determined by shelter length) and one (1) 1.315" x 73.5" (#131P0735) plain pipe to end each purlin run.

Consult the Side Profile diagram in the Quick Start section for your building for additional details.

11. Continue adding rafters and purlin pipe until the frame is assembled. ***Secure each purlin splice using a Tek screw. See diagram that follows.***



12. Finish each purlin run using the plain, pipe (#131P0735), and use the final end rafter to complete the assembly. If the last end rafter is plumb and the purlin run extends beyond the end of the rafter, cut the last section of purlin pipe to the required length.



Position the bolt side of the end clamps toward the inside of the shelter—the same side as the purlin.

NOTE: Typically purlin pipes *do not* require cutting. *Verify that you have the correct plain pipes before you decide to cut any pipe to complete the purlin runs.*

To prevent cover damage, do not allow the plain end of any purlin to extend beyond the end of the end rafter. Align with the center of the end rafter for best results.

If the purlin is too short to fit into the rafter end clamps without pulling the end rafter out of plumb, first verify you have the correct pipe. If so, loosen a purlin splice and slide the pipes apart. At least half of the tapered end must remain inside the adjacent pipe. Drive the Tek screw back into the pipe to secure the purlin joint.

13. Once all rafters are set and the four (4) lower purlins are in place and secured, return to each pipe splice of each purlin run and verify that a Tek screw secures each joint. Install a Tek screw (if needed).

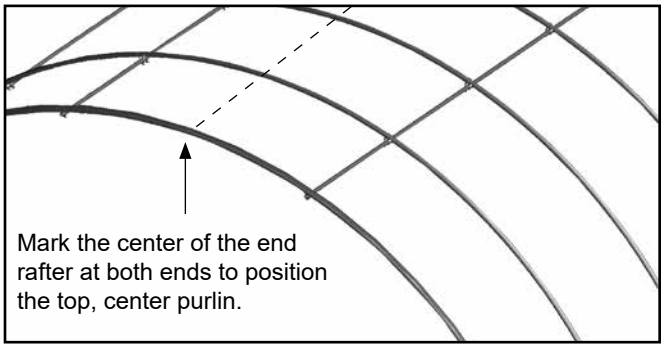
14. Continue by installing the top, center purlin.

INSTALL TOP, CENTER PURLIN

Complete the following steps:

1. Move to one end of the assembled frame, find the center of the end rafter, and mark the top, center location on the outside face of the end rafter.

2. Move to the other end of the frame and repeat the step to find the top, center of that end rafter.

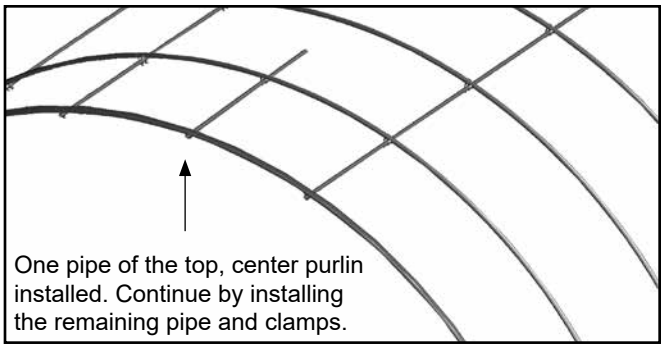


3. To keep the top purlin parallel with the lower purlins, take a chalk line, stretch it between the two marks, and snap it to mark the position of the top purlin.

NOTE: For buildings longer than a typical chalk line, find the center of an interior rafter and snap the chalk line using that mark and the mark on the end rafter. Repeat as needed to mark all rafters.

INSTALL TOP, CENTER PURLIN (continued)

4. Use the steps of the previous procedure to install the top, center purlin.



One pipe of the top, center purlin installed. Continue by installing the remaining pipe and clamps.

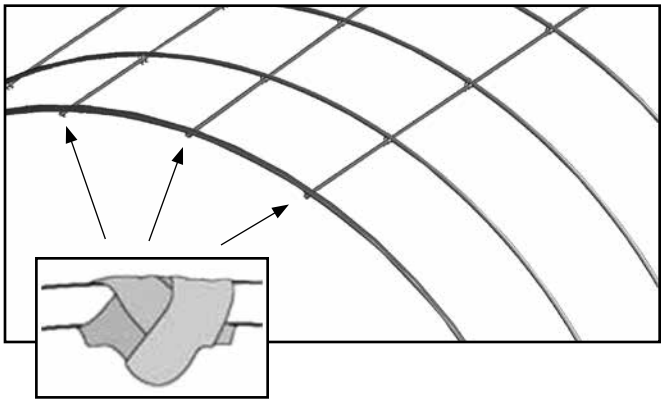
5. Continue with the next procedure.

FINISH ROUGH EDGES

Gather the parts:

- Duct tape (supplied by customer)
- Metal file

1. Check for any sharp edges on the frame and file them smooth so they will not cut the cover.
2. Apply two layers of heavy duct tape on all pipe connections and clamps that may contact the cover.



ANCHOR THE ASSEMBLED FRAME

At this point, anchor the high tunnel frame. Consult the MUST READ document for anchoring information and suggestions. Please call customer service at 1-800-245-9881 for additional anchoring information.

CAUTION: The anchor assembly is an integral part of the high tunnel construction. Improper anchoring may cause instability and failure of the structure to perform as designed. Failing to anchor the shelter properly will void the manufacturer's warranty and may cause serious injury and damage.

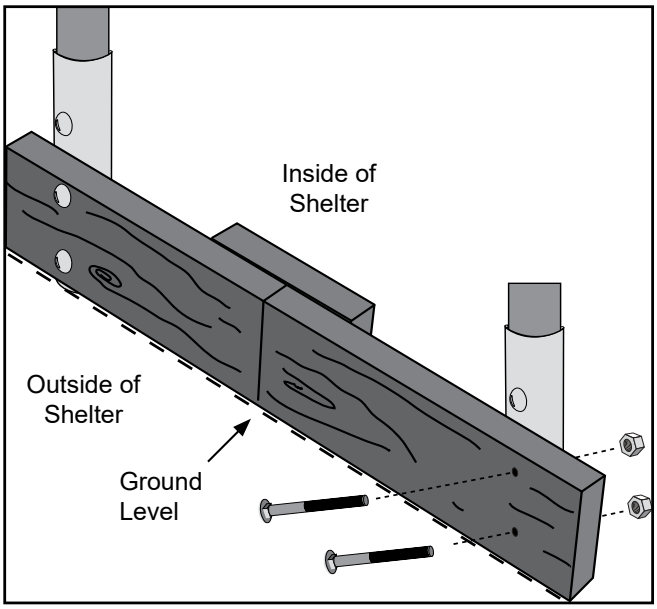
BASEBOARD INSTALLATION (RECOMMENDED)

Gather the parts:

- Treated or recycled plastic lumber (supplied by customer).
- 1/4" x 4" Carriage Bolts and 1/4" Nuts

NOTE: The following procedure describes one way to install the recommended baseboards. The size and type of the baseboard you choose may require the use of alternative steps. When properly installed, baseboards run the length of the frame.

On the outside of the frame, attach the first baseboard to the ground posts using the 1/4" x 4" carriage bolts (FAH009B) and nuts (FALB01B). Continue adding baseboards to complete the first run. Splices are made between posts as shown. Use a short section of baseboard to secure separate baseboards at a splice.



NOTE: The boards should be at ground level or slightly into grade to prevent the shelter from sinking and to create a seal along the bottom. After installing the baseboards, continue with these instructions.

This baseboard is *not included* with the shipment and must be supplied by the customer. Treated or recycled plastic lumber works well for a baseboard.

The baseboard, when installed properly, helps prevent the ground posts from sinking into the ground when anchored. Depending on the building, it also provides a surface to attach struts or other building components.

ATTACH END PANELS

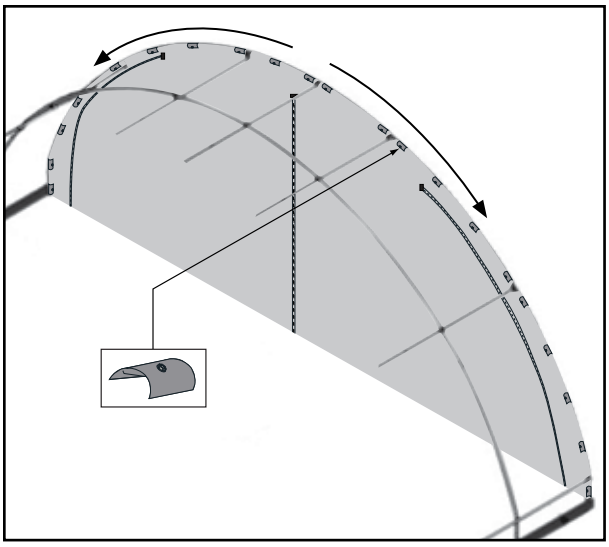
CAUTION: To prevent damage, do not install end panels on a windy day.

Gather the parts:

- End Panels 3-Zip (Zippered)
- Fabric Clips #CC6213 (Divide quantity in half.)
- Measuring Tape
- Scissors

Assembly Procedure:

1. Spread an end panel out on the ground at the desired end of the frame and center the end panel as needed.
2. With the proper lift (or ladders) positioned inside the frame, pull the end panel up and over the top of the end rafter.
3. Secure the end panel to the backside of the end rafter at the top, center position using a fabric clip and Tek screw.
4. Moving outward in both directions, continue attaching fabric clips to secure the end panel to the rafter. Evenly space the fabric clips and work toward the ground.
5. Verify that the end panel is in the desired position and repeat the steps to secure the other end panel to the frame using the remaining half of the fabric clips.



NOTE: The end panels may be shipped as untrimmed rectangular pieces. If so, use scissors to trim the excess end panel material from inside the frame after attaching the panels to the end rafters.

MAIN COVER INSTALLATION

After installing the end panels, install the main cover. The steps to install the main cover include:

1. Attach double poly latch U-Channel along the high tunnel frame sides and single U-Channel along the tops of the high tunnel end rafters between the two runs of double U-Channel.
2. Pull main cover over the frame.
3. Attach the main cover to the end rafters using the poly latch springs and the single U-Channel.
4. Stretch and attach main cover to the sides of the frame.
5. Install roll-up side kits and anti-billow ropes, and test the operation of the twist-of-the-wrist assembly.

INSTALL POLY LATCH U-CHANNEL

The double poly latch U-Channel (#104211) is attached to each side of the frame and runs from the front to the back of the shelter. The position of this U-Channel identifies the highest point of the roll-up side when it is in the "open" position. Tek screws are used to secure the U-Channel to each rafter and to secure the splice where two separate U-Channel sections meet between two rafters.

The single poly latch U-Channel (#102197) is attached to the top of each end rafter using Tek screws. This U-Channel is used to secure the center portion of the main cover that is not part of the roll-up sides. (This is the section of the main cover that runs down the middle of the frame at the top stretched between the two runs of double poly latch U-Channel.) During installation, the single poly latch U-Channel will bend with the curve of the end rafter as it is attached.

Gather the parts:

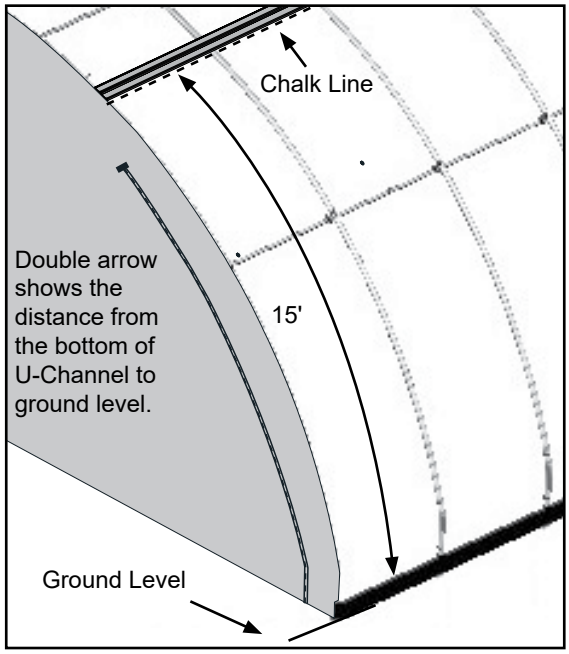
- Aluminum single U-Channel (#102197): End Rafters
- Double poly latch U-Channel (#104211): Sides
- Tek screws (#FA4482B)

ATTENTION: *The maximum distance from the finished grade to the bottom of the double poly latch U-Channel is fifteen feet (15').*

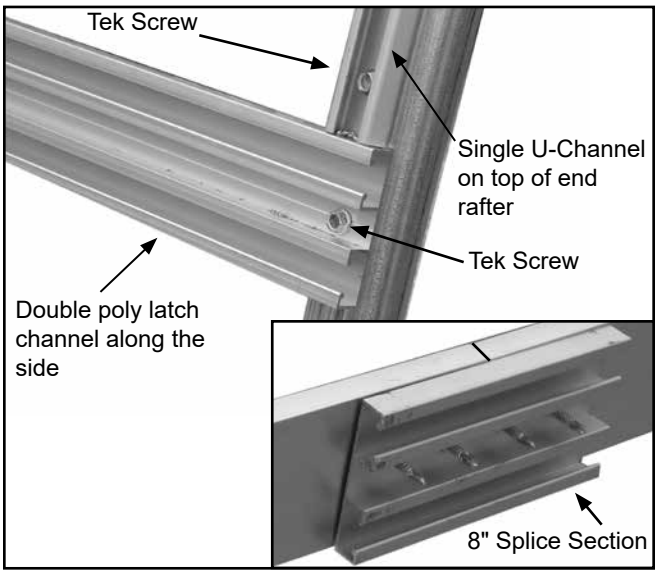
Consult the diagrams in the next section for clarification.

INSTALL POLY LATCH U-CHANNELS (CONTINUED)

1. Measure the desired height (15' maximum) to identify the top of the roll-up side and mark the location on the end rafter.



2. Move to the other end of the frame and repeat Step 1.
3. Stretch a chalk line between the marks and snap to mark the location of the U-Channel.
4. To begin, *cut one 8' section* of double U-channel to 6' and attach the 6' section to the rafters using Tek screws. Attach the poly latch U-channel flush with the outside edge of the end rafter. Use the chalk line as a guide to position the U-Channel.



NOTE: Cut the remaining 2' section into 8" pieces to use to splice the longer double U-channel sections together.

The insert shows how to splice the joint between two sections of double poly latch U-Channel. Use Tek screws and an 8" section of double poly latch channel and place the channel on the back of the poly latch (or to the inside of the frame). Install Tek screws through the double U-Channel from the outside of the frame and into the 8" splice section as shown in the previous diagram.

Double poly latch is attached along the sides of the shelter only. Single poly latch is attached to the top of each end rafter.

5. Continue by attaching the 8' double poly latch sections to the rafters and work toward the other end of the frame. Cut the last 8' section of double poly latch to the required length so that it is flush with the outside edge of the end rafter.

ATTENTION: *Use the remainder to finish the other run of double poly latch U-Channel.*

6. Repeat these steps to secure the double U-Channel to the other side of the frame.
7. After attaching the double poly latch to the sides of the frame, measure *between the two runs of double U-Channel at one end rafter* to determine the length of the single U-Channel. See the dashed line below.

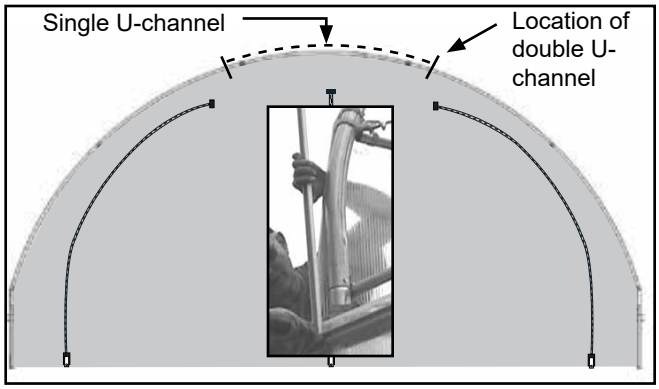


Diagram may not be to scale.

8. Cut the single poly latch U-Channel (if needed) and use Tek screws to attach the single U-channel to the top edge of the end rafter. Space screws every 16".

Insert above shows the installation of poly latch U-Channel on top of an end rafter. The poly latch U-Channel will bend with the curve of the rafter as it is attached. Dashed line shows where to install the single poly latch U-channel.

9. Repeat the steps to install the single U-Channel at the remaining end of the frame.
10. Continue with the installation of the main cover.

INSTALL MAIN COVER

Gather the parts:

- Main cover
- Ropes long enough to reach over the frame (provided by customer)
- U-Channel spring (102198)
- Box cutter or utility knife

After the poly latch U-Channel is attached to the frame, unpack the main cover and pull it into place. Ropes or straps are typically used to pull the main cover onto and over the frame.

WARNING: To prevent damage to the cover and to prevent serious personal injury, DO NOT attempt to install the main cover on windy or stormy days.

The following steps describe one way to install the main cover.

1. Unpack the main cover and position it at the base along one side of the frame.
2. Make small holes along the edge of the cover at evenly spaced intervals and tie rope to the cover. (The length of the cover determines the number of holes that are needed to attach the ropes.)

   NOTE: The ropes must be long enough to reach over the top of the building to the other side. Long buildings will require additional ropes to prevent tearing the main cover when it is pulled into place.
3. After tying the ropes to the main cover, throw the ropes over the top of the frame and pull the cover into place. Cover must be centered side-to-side and end-to-end.

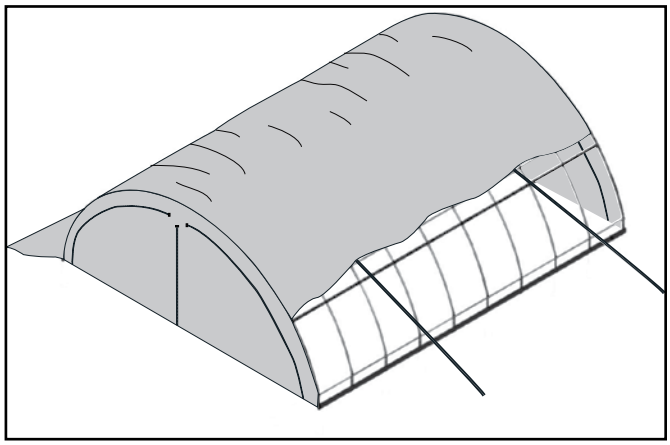


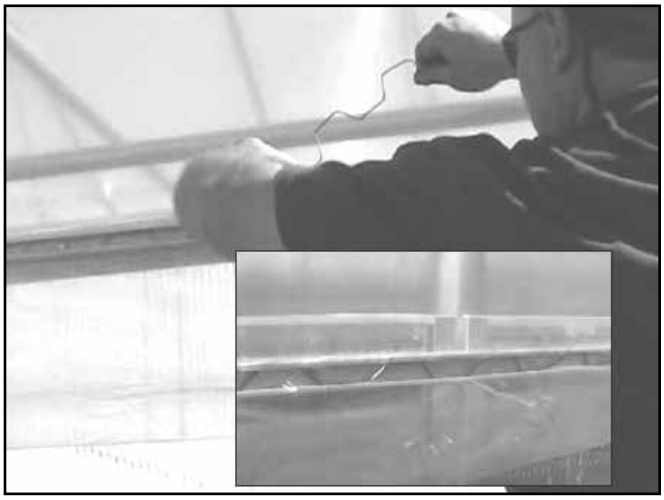
Diagram may show a different frame used for illustration purposes only.

IMPORTANT: To prevent damage to the main cover during installation, additional personnel and lifts may be needed.

4. Once the main cover is in place and centered on the frame, begin at the peak of one end rafter and install the wire spring into the U-Channel to secure the cover. Work the spring into the U-Channel until you reach the double U-Channel attached to each side of the frame.

   ATTENTION: Center the main cover front to back and side-to-side to ensure that enough cover material is present to lock into the U-Channel. Cover is longer than the frame. *The excess cover along each side is rolled up when the roll-up side assemblies are installed.*

   The rope can remain in place to temporarily secure the cover if needed. Remove the ropes as the cover is secured to the frame.



Photos show installing the spring into the U-Channel on the outside of a frame. The process is the same for the U-Channel attached to the top of the end rafters.

5. Continue adding the spring into the U-Channel at the top of the first end rafter. Ensure that an even amount of the cover is exposed and maintained along the edge of the frame as it is attached.

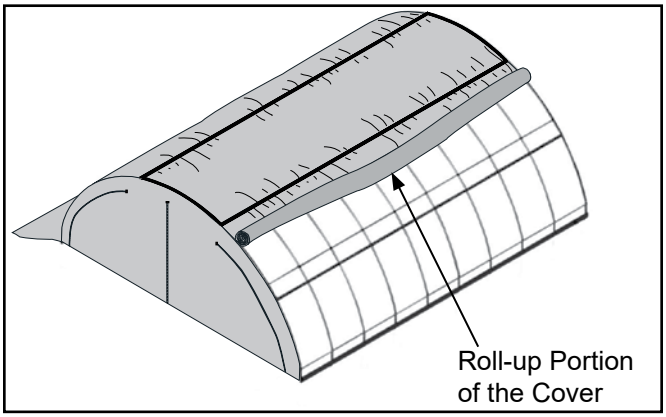
   NOTE: The cover material is cut longer/wider than is required to cover the frame. For easier anchoring, allow approximately 10" to extend past the edge of the end rafter as the cover is anchored in place.
6. Stretch the cover to the other end of the building and repeat the steps to secure the cover in the single U-Channel attached to the top of the remaining end rafter.

   NOTE: Pull the cover tight as the spring is inserted into the U-Channel.

INSTALL MAIN COVER (CONTINUED)

7. Move to one side of the frame and repeat the steps to anchor the main cover to the first side. Begin at one end of the double U-Channel and work toward the other. *Use the upper channel of the double U-Channel to secure the main cover.*

   NOTE: To access the U-Channel from the sides, roll the main cover up so that it is out of the way, as shown below. Reach over the rolled-up section and secure by installing the wire spring.



   NOTE: Maintain an even length along the side. The final stretching of the cover takes place when the last side is secured.

8. After securing the first side, move to the remaining side, pull the cover tight, and secure it in place as previously described.

9. With the main cover anchored in the *upper channel* of the double U-Channel along each side, return to each double U-Channel run and secure the main cover in the *lower channel of the double U-Channel*. *Both channels of each double U-Channel run are used to secure the main cover.*

10. Trim the length of the main cover.

    IMPORTANT: *DO NOT REMOVE TOO MUCH OF THE EXCESS COVER MATERIAL AT EACH END.* Allow approximately 6" of the cover to extend beyond each end rafter.

    Some excess main cover material–the material that extends beyond the end rafters–should remain in place. If the main cover needs stretched in the future, remove the spring from the U-Channel, grasp the excess material, pull the cover tight, and reinstall the spring.

    DO NOT TRIM THE SIDES. The excess material along the sides is rolled up in the roll-up side assembly.

11. Once the main cover is installed and secured in the U-Channel, continue with the **Install the Roll-Up Side Assemblies** procedure.

INSTALL THE ROLL-UP SIDE ASSEMBLIES

The instructions below describe how to install a single roll-up sidewall assembly for one side of the frame. The procedure is repeated for the remaining side. The procedures to install the roll-up side include the following:

1. Assemble the roll-up side conduit and attach the roll-up conduit to the bottom of the main cover.
2. Assemble the Twist-of-the-Wrist assembly and attach it to the frame and the roll-up side.
3. Install the Anti-Billow Rope system.
4. Test the operation of the roll-up side.

INSTALL THE ROLL-UP SIDE CONDUIT

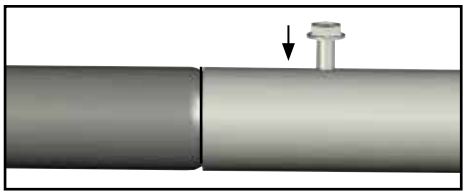
Gather the parts:

- Pipe 1.315" x 75" swaged 17 GA (#131S0075)
- Pipe 1.315" x 73.5" plain 17 GA (#131P0735)
- Pipe 1.315" x 27" swaged 17 GA (#131S027)
- Tek Screws

The roll-up side conduit assembly is attached to the bottom of the roll-up side cover material. This assembly runs the length of the frame and serves as the center pipe that the roll-up cover wraps around when it is rolled up. *This conduit is identical to the purlins that were assembled and attached to the frame and includes one additional 27" pipe.*

Complete these steps to assemble the roll-up side conduit.

1. Locate all sections of pipe needed to assemble one (1) roll-up cover conduit. See the pipe above.
2. Insert the swaged end of each pipe into the plain end of another pipe until the conduit is assembled. Finish the run with the 27" swaged pipe. *The assembled conduit will be longer than the shelter.*



3. Secure each pipe joint with a Tek screw.
4. Center the assembled conduit at the base of the side where the end of the main cover is located.

   NOTE: *An equal amount of the conduit should extend beyond each end rafter.*

5. Continue with the procedure that follows to attach each roll-up conduit to the main cover.

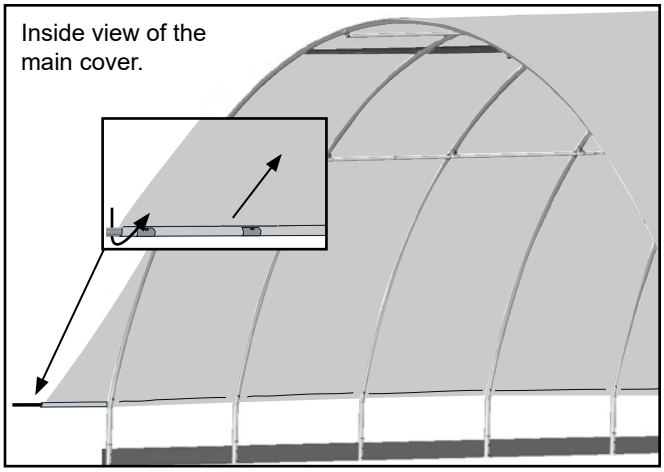
ATTACH CONDUIT TO MAIN COVER ROLL-UP SIDE

Gather the parts:

- Two (2) assembled conduits
- Fabric clips #CC6212 (Divide quantity in half.)
- Tek Screws

To this point, the main cover should be secured to the frame and the excess cover along both sides should be spread out along the side of the frame.

1. Unfold the remaining portion of the main cover (if needed) and evenly stretch it out on the ground along the frame.
2. Roll the assembled cover conduit onto the edge of the main cover.
3. Verify that the cover and conduit are evenly positioned and tuck the cover edge under the conduit and begin to turn the conduit.



4. Secure the cover material to the conduit using Tek screws and half of the fabric clips evenly spaced along the conduit.
5. Continue to roll the conduit until the excess cover material is wound around the conduit and the conduit rests along the ground posts (or baseboard if one was installed as suggested).
6. Repeat the steps for the remaining roll-up cover conduit.
7. With the excess cover material rolled up on the roll-up conduit, continue with the **Twist-of-the-Wrist Assembly** procedure.

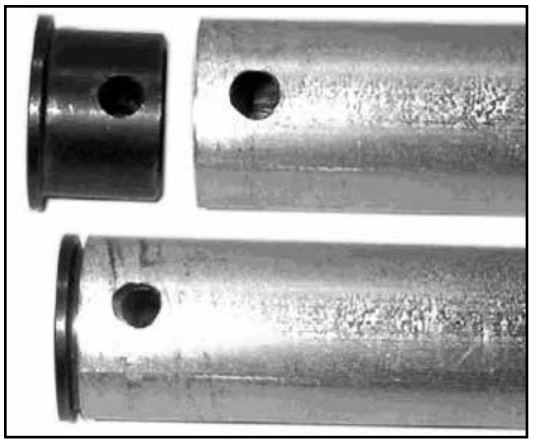
TWIST-OF-THE-WRIST ASSEMBLY

Gather the parts:

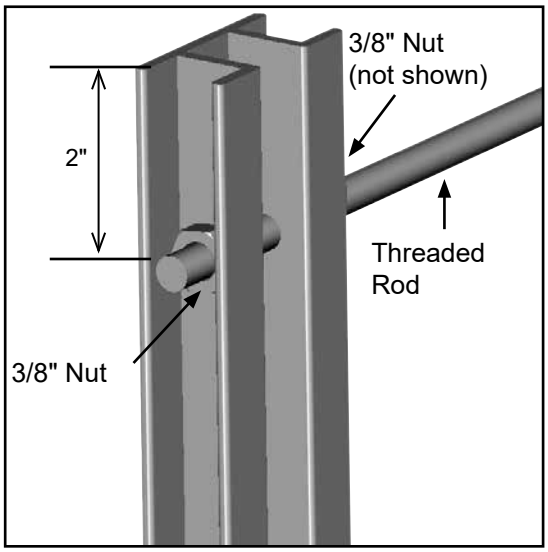
- Aluminum channel (106554)
- Drive handle (102480)
- Gearbox (103496) and gearbox drive (102717)
- Mounting plate (103544)
- Bearing (102569) and threaded rod (FAK26)
- 3/8" nuts and washers

The Twist-of-the-Wrist Assembly is designed to roll up a portion of the sides of the shelter. The following steps describe the installation of one assembly.

1. Drill a 5/16" hole through the cover conduit 1/2" from the end of the conduit.
2. Insert a tubing adapter into the conduit and align the holes of the adapter with the drilled holes in the conduit.



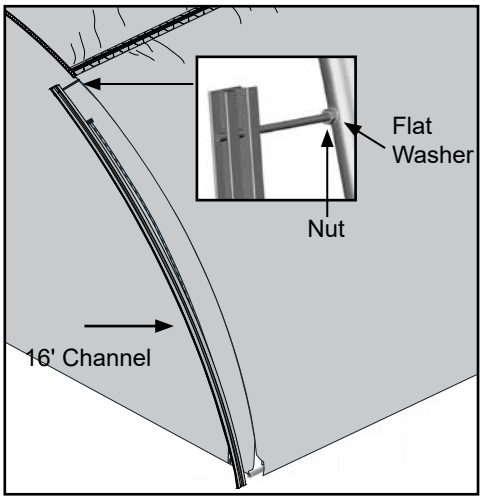
3. Select one aluminum channel and drill a 3/8" hole through the channel approximately 2" from the end and attach a threaded rod to the channel using a 3/8" nut on each side of the channel.



TWIST-OF-THE-WRIST ASSEMBLY (CONTINUED)

4. Position the channel along the rafter at the desired end of the building where the Twist-of-the-Wrist assembly will be located. Place the lower end of the channel an inch off the ground to allow free movement of the channel during the operation of the rollup cover.

5. Secure the upper end of the channel by drilling a 3/8" hole through the end rafter and attach as shown. The lower end of the channel will "float" and is not attached.



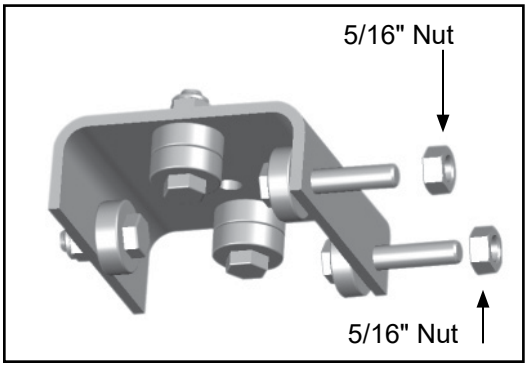
NOTE: Install a 3/8" flat washer between the 3/8" nut and the end panel.

6. Select the bearing bracket and attach the bearings as needed. (In some instances, the bearings may come already attached.) Assemble as follows if needed:

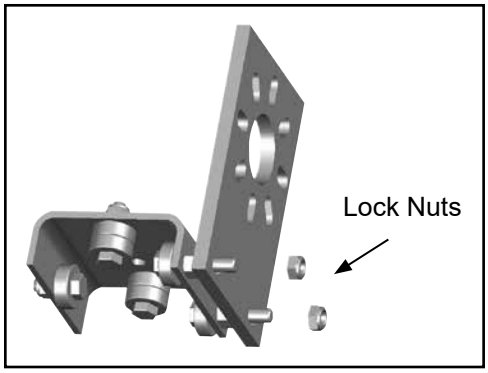
   Single bearings are attached to the sides of the bracket and double bearings to the middle portion of the bracket. Use 1/4" hex bolts and locknuts as needed. Install a flat washer on both sides of each bearing to insure proper operation of bearings and the assembly.

   Install the longer bolts with bearings on the side of the bracket that has the two holes. Install these *before* installing the double bearing assembles. See the figures below.

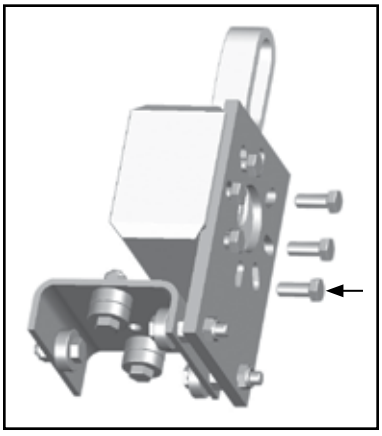
7. For the spacers on the long bolts, insert a 5/16" nut over each bolt. *These nuts are used as spacers only.*



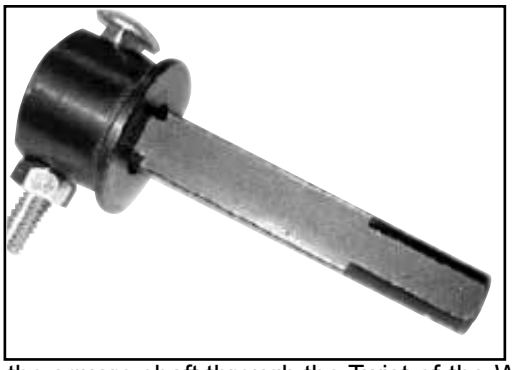
8. Slide the Twist-of-the-Wrist mounting plate over the long bolts and secure the plate with two lock nuts.



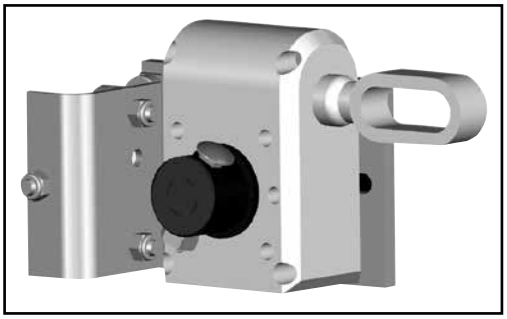
9. Attach the Twist-of-the-Wrist gearbox to the mounting plate using hex head bolts.



10. Using a 5/16" machine bolt and 5/16" nut, attach the square shaft to a tubing adapter. (Carriage bolt is shown for illustration. Use a 5/16" machine bolt.)

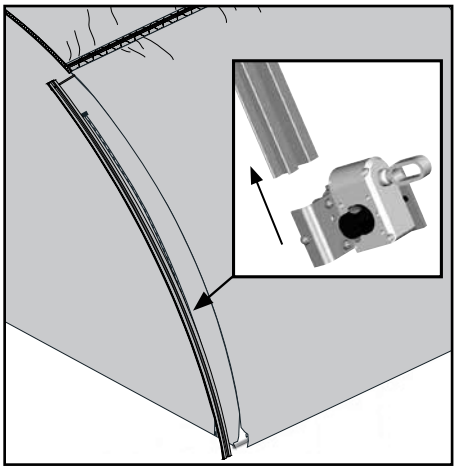


11. Slide the square shaft through the Twist-of-the-Wrist gearbox.



TWIST-OF-THE-WRIST ASSEMBLY (CONTINUED)

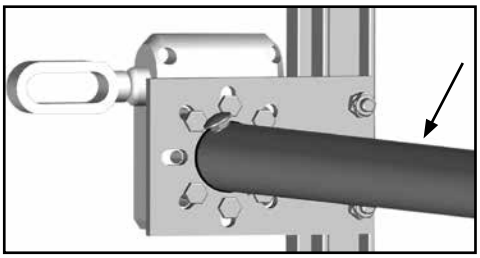
12. Slide the Twist-of-the-Wrist assembly onto the aluminum channel from the ground end. (This is the free end of the channel.)



13. Finish rolling the cover conduit until it reaches the Twist-of-the-Wrist assembly.

14. Attach the rolled conduit to the square shaft of the assembly by inserting a 5/16" machine bolt through the hole in the conduit and tubing adapter. Tighten the nut.

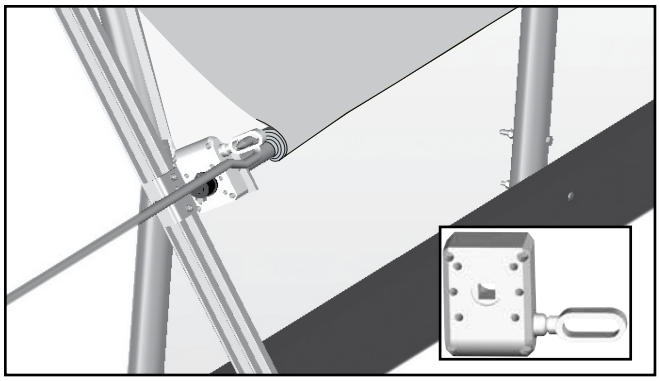
    NOTE: It may be necessary to trim the conduit and cover to the proper length so that it aligns with the gearbox. Adapt these instructions to your application.



Roll-Up Cover Conduit

(Cover is not shown.)

15. Attach the crank handle to the Twist-of-the-Wrist assembly. (Cover is not shown in the above diagram.)



16. Test the operation of the Twist-of-the-Wrist assembly.

    NOTE: If the cover rolls in the desired direction, but you want to turn the crank in the opposite direction for the same result, unbolt, reposition the gearbox, and remount it on the same side of the mounting bracket.

INSTALL ANTI-BILLOW ROPES

Gather the parts:

- 1/4" x 4" eyebolts
- Anti-billow rope
- 1/4" nuts and 1" fender washers

Anti-billow ropes secure the roll-up sides when they are in the down position. Complete the following steps to install the anti-billow ropes and connecting hardware.

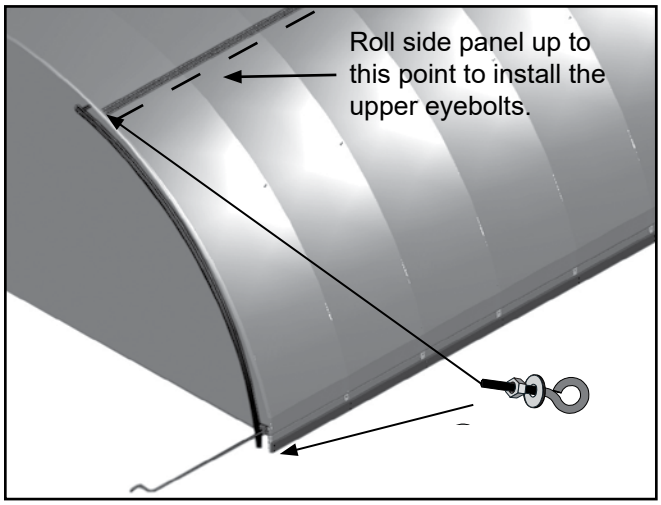
1. Using the Twist-of-the-Wrist assembly, roll the side panel up to the "open" position. (See the dashed line in the diagram below. Diagrams on this page show the cover in the "closed" position for clarity.)

   NOTE: If it is windy, temporarily secure the rolled cover to the rafters to keep the panel in place.

2. Install the first eyebolt through the wood baseboard at the base of the end rafter where the Twist-of-the-Wrist assembly is located and secure using a 1" washer and 1/4" nut.

   ATTENTION: Drill the 1/4" hole through the baseboard only. If no baseboard was installed, drill through the rafter and install the eyebolt through the rafter at ground level.

3. Move up the same end rafter and drill a 1/4" hole through the poly latch U-Channel just to the side the rafter (toward the inside of the frame).



4. Slide a 1" washer onto an eyebolt, insert the bolt into the hole, and secure the eyebolt using a 1/4" nut.

   NOTE: Do not drill through the rafter. Position the eyebolt just to the side of the rafter toward the inside of the frame. Diagram shows the cover in the "closed" position. Cover is rolled to the upper or "open" position (Step 1) during these steps.

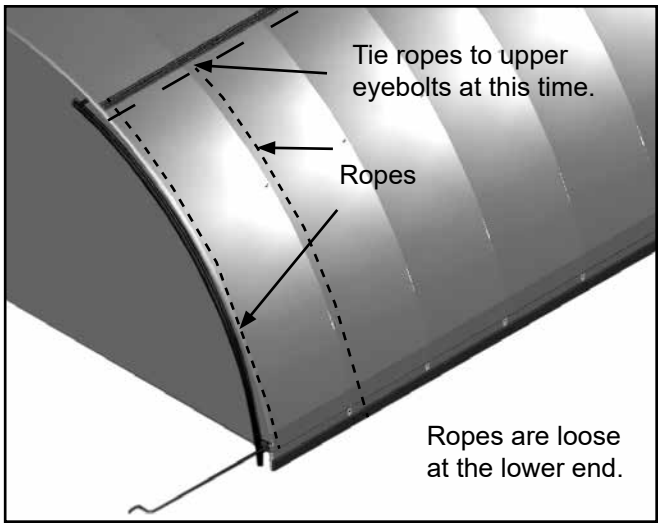
5. Repeat Steps 2–4 for all remaining rafters along the side of the frame.

6. Once all eyebolts are installed and secured in the proper locations, move to an end rafter, measure the distance between the eyebolts on that rafter, add 12" (for tying), and cut a piece of rope to that length.

   NOTE: Be sure to measure *between the eyebolts and over the rolled panel* to account for the diameter of the rolled panel. Do not cut the rope too short.

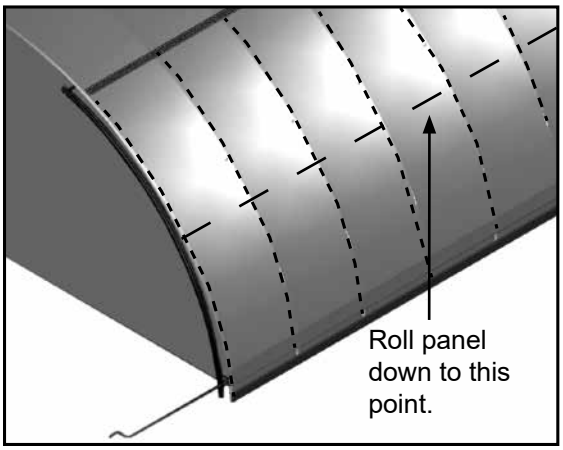
7. Once an accurate length is determined, cut a rope to that length for the remaining rafters along the side.

8. After all ropes for the side are cut to length, tie a rope to the *upper eyebolt on each rafter.*



NOTE: Do not tie the loose end of any rope to the lower eyebolts at this time.

9. With all ropes for the side tied to the upper eyebolts, lower the side panel to the "middle" position. (See the dashed line in the diagram below for proper location.)



NOTE: The diagram shows the cover in the "closed" position so the anti-billow rope pattern and locations are easier to see.

10. Take the loose end of one 3/16" black rope, thread it through the lower eyebolt (on the rafter the rope is attached to), pull the rope snug (but not too tight) to remove slack, and tie the rope to the lower eyebolt.
11. Repeat the steps to tie the remaining ropes to the lower eyebolts.

    NOTE: Do not overtighten the ropes. Doing so will prevent the roll-up side panel from properly rolling down to the "closed" position.
12. Once all ropes are in place, use the Twist-of-the-Wrist assembly to test the operation of the roll-up side.

    NOTE: If the panel does not roll down smoothly, loosen a few of the anti-billow ropes and test the operation of roll-up panel again.

    DO NOT REMOVE THE ROPES. The anti-billow ropes must remain in place to prevent injury and property damage during windy conditions.

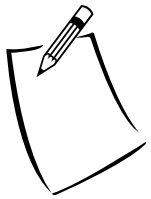
    Adjust the anti-billow ropes as needed to allow the side panels to roll up and down smoothly.
13. Repeat all of the above steps to install anti-billow ropes for the remaining roll-up side.
14. Read the shelter care and maintenance information that follows.

SHELTER CARE AND MAINTENANCE

Proper care and maintenance of the shelter is important. Check the following items periodically to properly maintain the shelter:

- Regularly check the main cover and panels (if equipped) to see that these remain tight and in proper repair.
- Check connections and all fasteners to verify that they remain tight.
- Do not climb or stand on the frame at anytime.
- Remove debris and objects that may accumulate on the cover. Use tools that will not damage the cover when removing debris.
- Remove snow to prevent excess accumulation. Use tools that will not damage the cover when removing snow.
- Check the contents of the high tunnel to verify that nothing is touching the cover or the side panels that could cause damage.
- Check the anchoring system to ensure that all components are tight and in good repair.
- Verify that the anti-billow ropes are tight and in good condition. Replace ropes as needed.
- If the shelter is moved, inspect all parts and connections before reassembling.
- For replacement or missing parts, call 1-800-245-9881 for assistance.

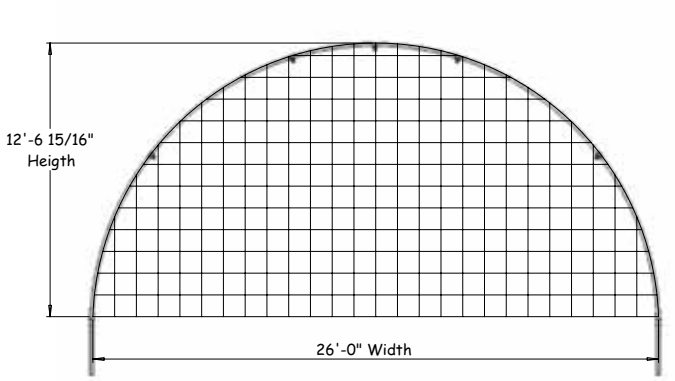
NOTE: With the exception of truss arch and engineered buildings, ClearSpan™ and GrowSpan™ shelters and greenhouses *do not* have any tested loading criteria.



GROWspan™
greenhouse structures

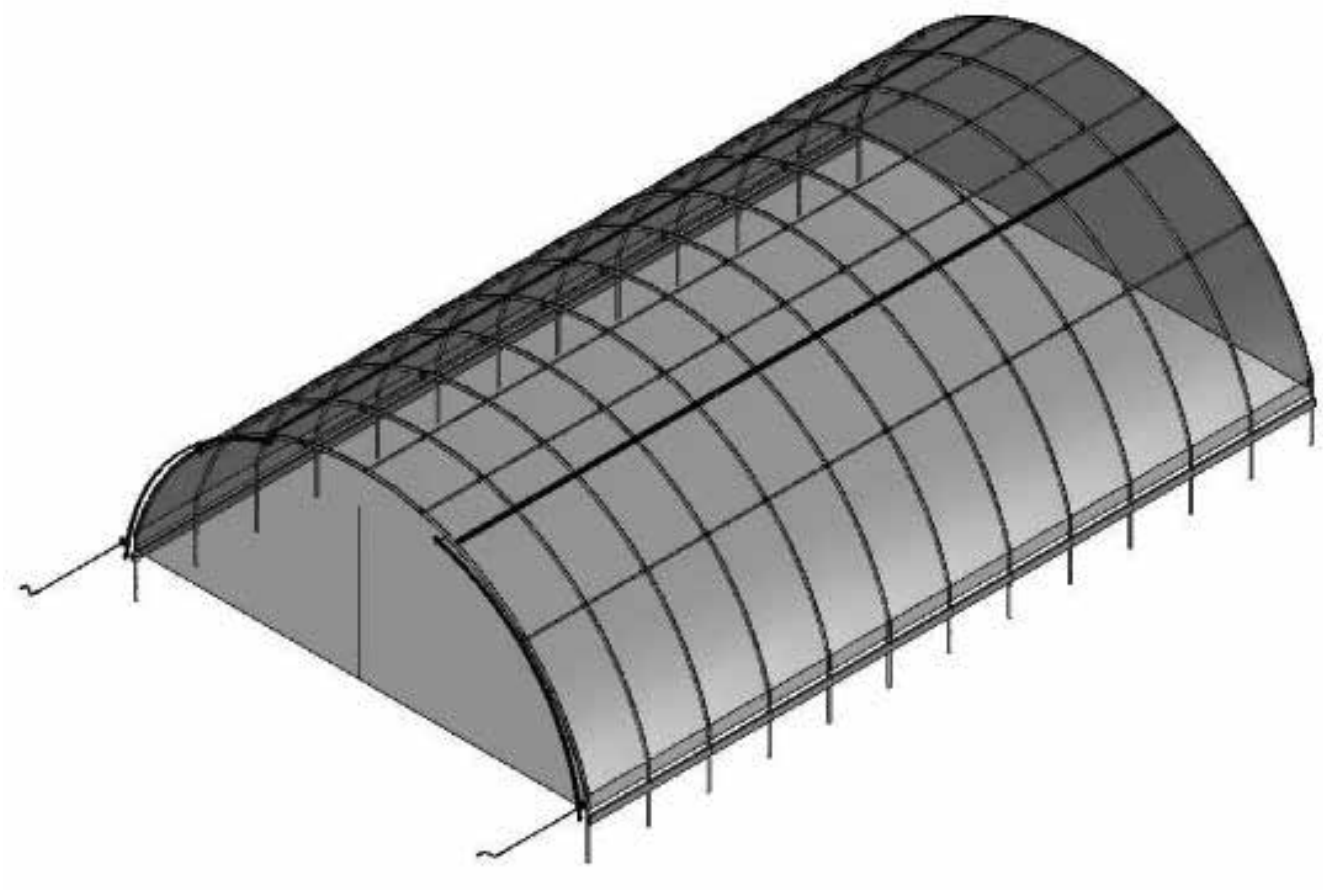
QUICK START GUIDE

Round Premium Vent High Tunnels



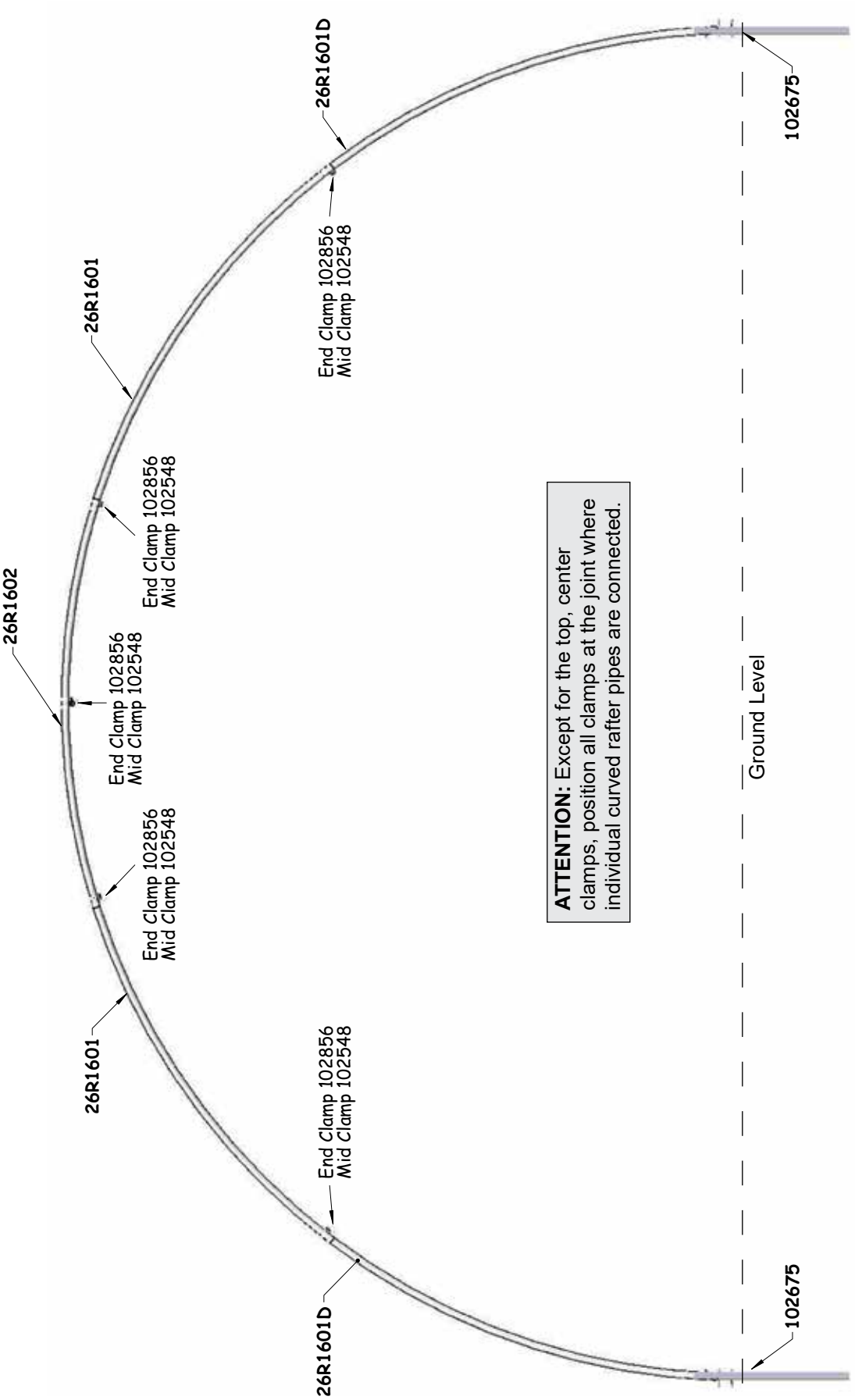
FRONT

Grid Represents 12" Squares

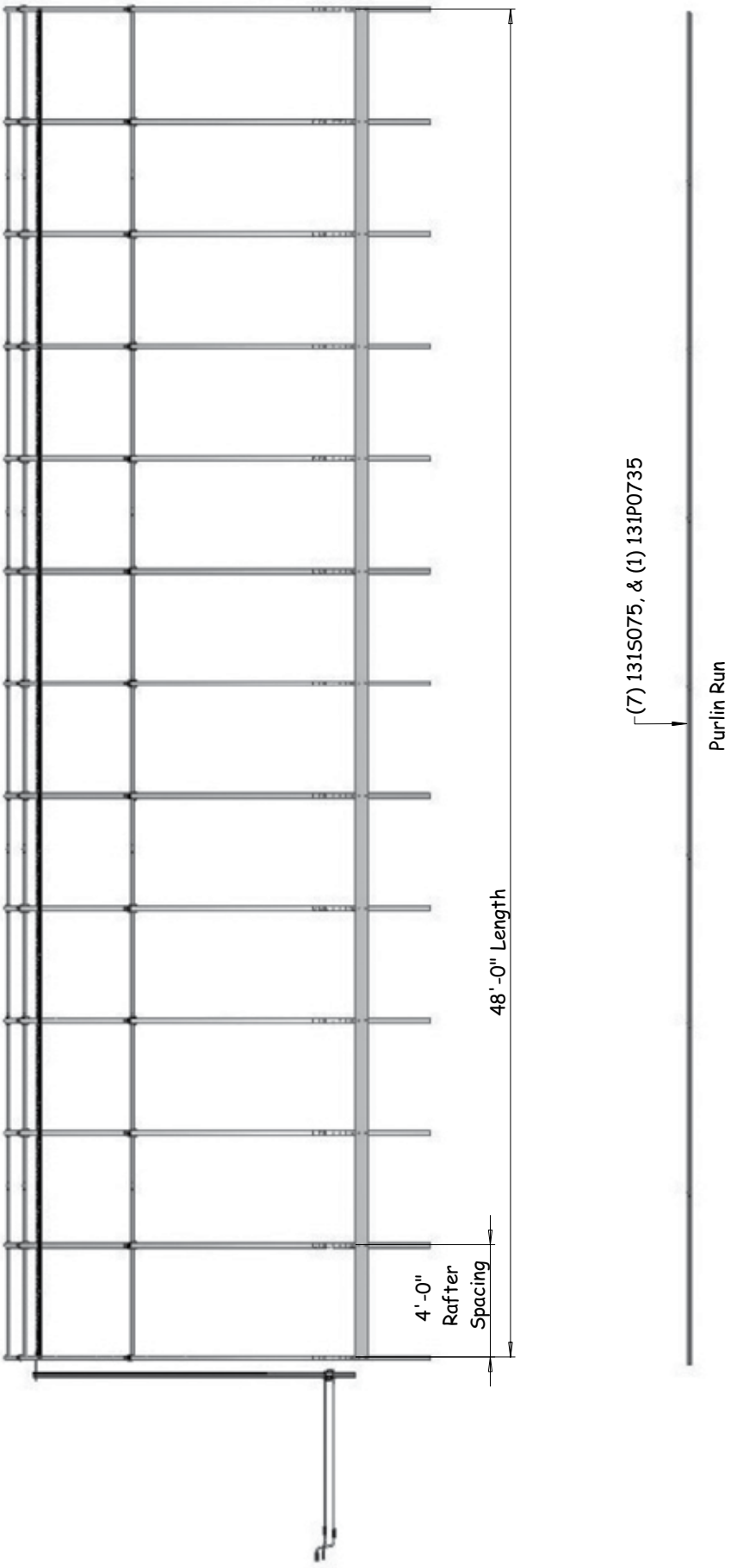


Frame shown may differ in length and rafter spacing from actual frame.

FRONT PROFILE



SIDE PROFILE - 106417



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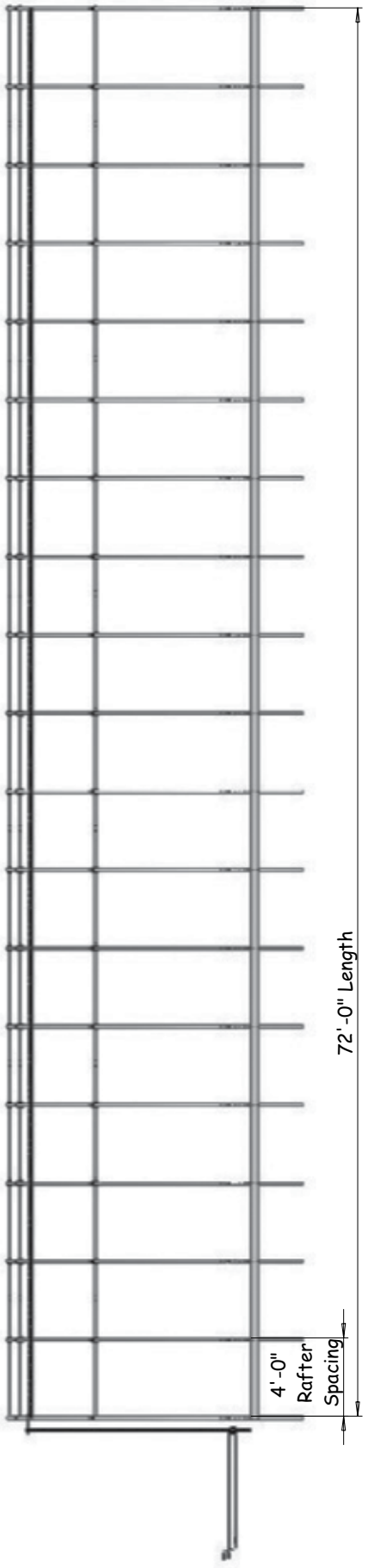
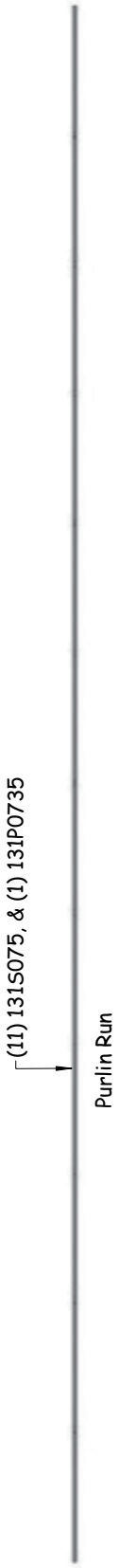
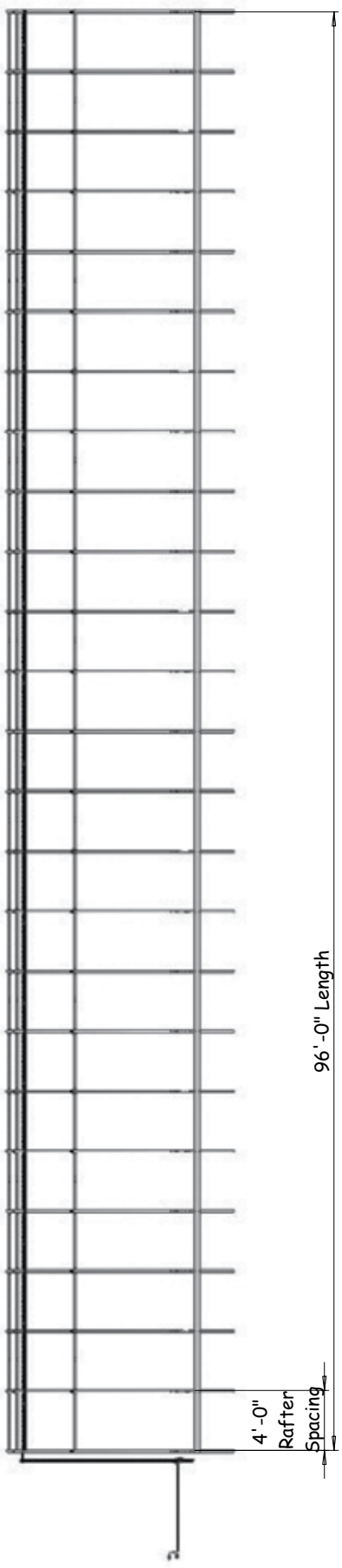




SIDE PROFILE - 106419



CONNECTIONS