DIVISION OF FarmTek Growers supply

GROWspan™ greenhouse structures

GrowSpan™ Round Pro Greenhouses and Systems

Photo may show a different but similar model.

STK#	DIMENSIONS
104861	38' W x 15' H x 40' L
104862	38' W x 15' H x 48' L
104863	38' W x 15' H x 72' L
104864	38' W x 15' H x 96' L

Revision date: 01.03.19

GROWspan™
greenhouse structures

YOU MUST READ THIS DOCUMENT BEFORE YOU BEGIN TO ASSEMBLE THE SHELTER.

Thank you for purchasing this Solar Star™ greenhouse. 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 greenhouse. Please read these instructions ***before*** you begin.

If you have any questions during the assembly, contact Customer Service at 1-800-245-9881 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 greenhouse or framing during or after construction.
- Do not occupy the greenhouse during high winds, tornadoes, or hurricanes.
- Provide adequate ventilation if the structure is enclosed.
- Do not store hazardous materials in the greenhouse.
- Provide proper ingress and egress to prevent entrapment.

ANCHORING INSTRUCTIONS

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

⚠ **WARNING:** The anchor assembly is an integral part of the greenhouse construction. Improper anchoring may cause greenhouse instability and failure of the structure. Failing to anchor the greenhouse 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 greenhouse where large loads such as snow and ice, large tree branches, or other overhead obstacles could fall.
- *Always check local building codes before you begin.*

SITE

After choosing a location, proper preparation of the site is essential. The following site characteristics will help ensure the integrity of the structure.

- *A level site is required*. The site must be level to properly and safely erect and anchor the structure.
- If the site is not level, use footings to provide a secure base to assemble the structure. Pre-cast concrete blocks, pressure-treated wood posts, or poured footings are all acceptable when properly used. (Some shelters use ground posts or rafter feet.)
- 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.*

DOUBLE-LAYER FILM INSTALLATION

Greenhouses equipped with a double-layer film include a layer that is Infra Red (IR) Retention film.

IMPORTANT! ***During cover installation, the IR film must be installed first! Examine the film and install it according to the instructions printed on the film.***

ASSEMBLY PROCEDURE

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

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 greenhouse.
3. Gather the tools, bracing, ladders (and lifts), and assistance needed to assemble the greenhouse.
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 the end wall framing. (End walls are optional items for some shelter types.)
11. Install, tighten, and secure the end wall end panels and doors.
12. Install, tighten (if applicable), or secure the main cover.
13. Read the care and maintenance information at the end of these instructions.
14. Complete and return all warranty documents 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.

- **Band Clamp:** Clamp used to connect the end wall framing to the rafter pipe. In some cases, band clamps are also used to connect diagonal struts to the assembled frame.
- **Clip or Fabric Clip:** A short, half-section piece of conduit (cut lengthwise) used to secure the end panel cover to the leg or rafter assembly. The clip or fabric clip is typically fastened in place using self tapping Tek screw.
- **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 to prevent separation. Some conduit assemblies are used to secure larger end panels and main covers. These conduits typically consist of sections of PVC tubing glued at the joints.
- **Cross Connector:** Any one of the metal brackets used to "connect" or secure a purlin to a rafter. Cross-connectors are typically pictured on the Pictorial Parts Guide page or in the Quick Start section (if present).
- **End Panel:** Fabric or material used to cover the end wall assemblies. End wall assemblies are optional for many shelters.
- **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
- Marker to mark locations on the pipes
- Variable speed drill and impact driver (cordless with extra batteries works best)
- Metal-cutting saw
- Wrenches and impact socket set, or an adjustable wrench
- Scissors, utility knife, or tin snips
- Hammers and gloves
- Adjustable pliers and self-locking pliers
- Ladders, work platforms, and other machinery for lifting designed to work safely at the height of the building
- Rope/cable for temporary rafter bracing during frame assembly

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).

QUICK START GUIDE

For a quick overview of the building and its components, consult the information and diagrams in the Quick Start section near the back of these instructions.

SPECIAL NOTE: Baseboards for Frame

These instructions recommend installing a baseboard under the mounting feet along each side of the frame. The baseboard runs from the front to the back of the building.

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.

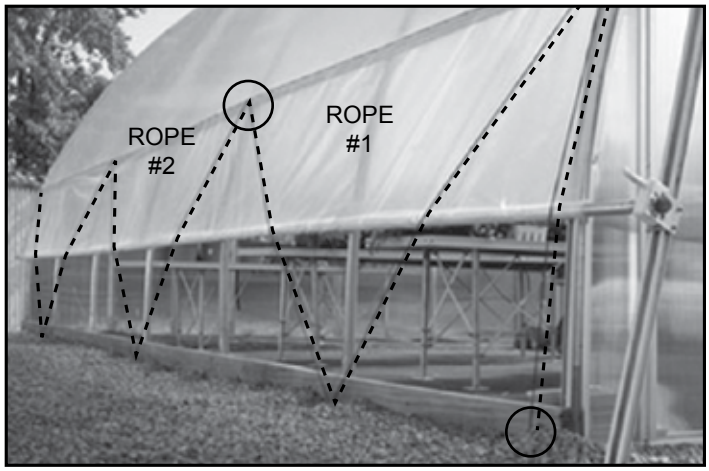
The baseboard, when installed properly, helps prevent the shelter from sinking into the ground when anchored. Baseboards also provide a surface to attach rafter feet or other building components.

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

ANTI-BILLOW ROPE INSTALLATION

TO PREVENT DAMAGE AND POSSIBLE INJURY, INSTALL THE ANTI-BILLOW ROPES IN SHORT LENGTHS ALONG EACH SIDE OF THE FRAME.

DO NOT INSTALL AS A SINGLE LENGTH TIED AT EACH END OF THE BUILDING. DOING SO WILL RESULT IN A LOOSE SIDE PANEL IF THE SINGLE ROPE BREAKS DURING STRONG WINDS.



Dotted line represents the anti-billow rope. The circles identify the ends of ROPE #1.

GROWspan™
greenhouse structures

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


FA4482B
Tek Screw


CC6212
Fabric Clip


103544
Mounting Plate

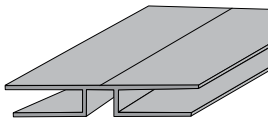

102569
Bearing

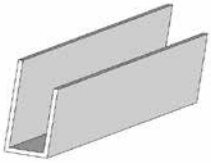

102717
Gearbox Drive

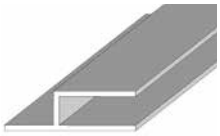

QH1070
Pipe Strap

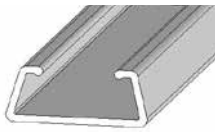

102546
Cross Connector

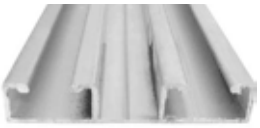

102570
Aluminum
Channel


Aluminum 8'
H-Channel Profile


104213
Aluminum
U-Channel Profile

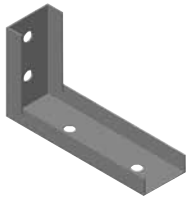

104548
End Cap Profile
Doors/Fans/Vents

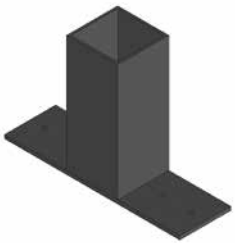

102197
Aluminum
U-Channel

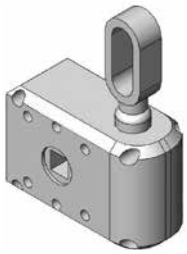

104211
Double Poly Latch


AS1083
3/16" Cable Thimble


AS1003
3/16" Cable Clamp

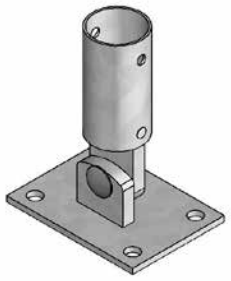

QH1330
Angle Bracket


104624
Square Tube Fitting


103496
Gearbox

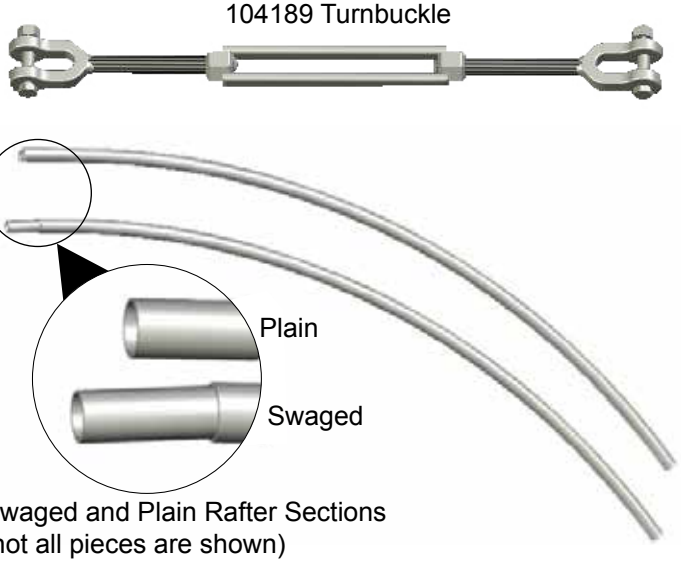

104074
Square-to-Round
Tube Connect
Bracket


103856
Band Clamp


104302
Pipe Fitting w/Plate


102921B & FA4484B
Neo-bonded
Washers and Long
Tek Screws

104189 Turnbuckle



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

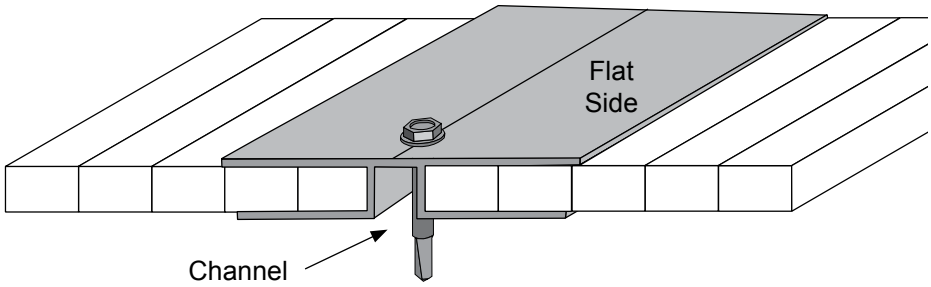

102198
U-Channel Spring

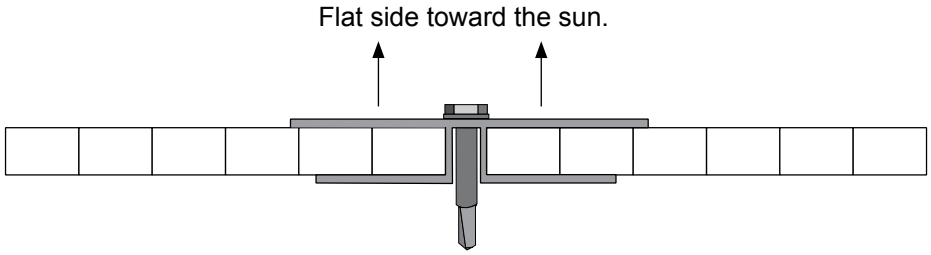
H-CHANNEL INSTALLATION INSTRUCTIONS

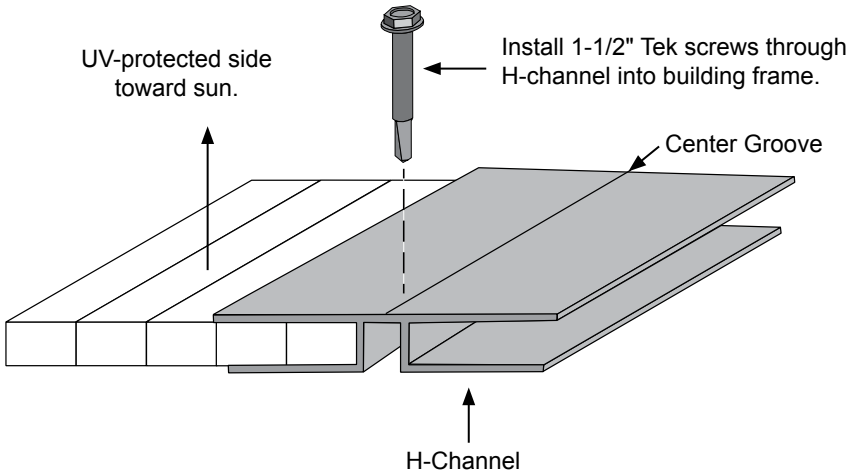
The new H-channel design requires installation of the flat side facing out with channel side toward the building. Some diagrams and photos in this document show installation of *original* H-channel with channel side facing out. Design of new H-channel *does not allow* channel-side out installation.

Use the diagrams on this page to install H-channel with flat side facing out.

ATTENTION: Use only 1-1/2" Tek screws to attach H-channel to building frame. ***Do not use shorter screws. They will not hold. Do not use washers on Tek screws when installing H-channel.***







ATTENTION: Install all twin-wall poly carbonate panels with UV-protected side toward the sun.

GrowSpan™ Round Pro Greenhouses and Systems

OVERVIEW

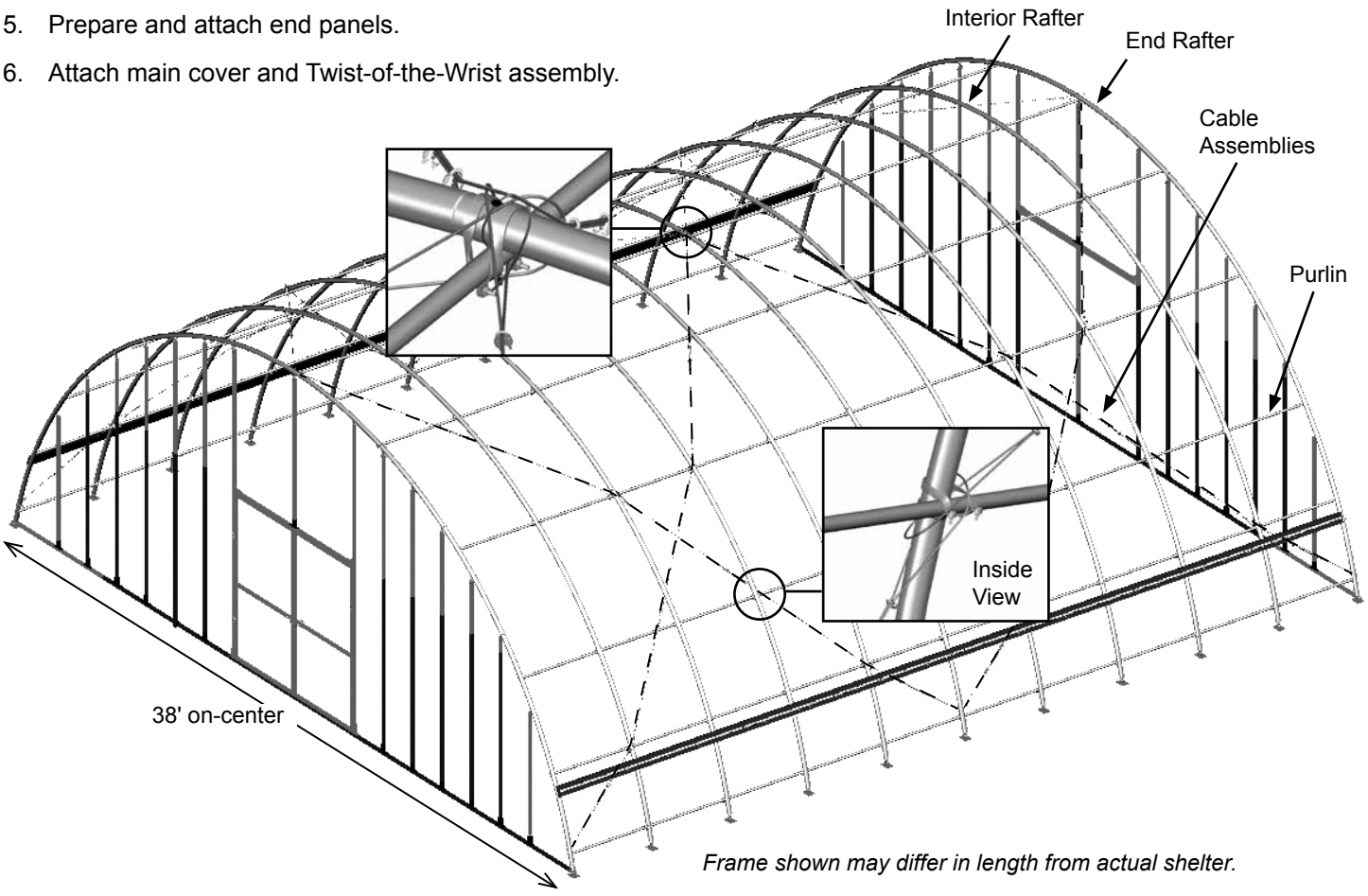
This section describes assembling your Round Pro Greenhouse. For details of each assembly procedure, consult the Quick Start Guide and the individual sections of these instructions. See illustration below to identify main parts of shelter.

1. Layout the site and identify the required parts for each assembly procedure.
2. Assemble all rafters.
3. Assemble and anchor the frame.
4. Cut, assemble, and install all cables.
5. Prepare and attach end panels.
6. Attach main cover and Twist-of-the-Wrist assembly.

The instructions that follow describe assembling all rafters and then constructing the frame. Depending on the number of individuals assisting with the construction, it may be best and more efficient to have someone assemble the rafters and others assemble the frame as rafters are completed.

Other factors to consider during the assembly, especially for buildings longer than 60', include:

- Amount of working area
- Available lifts and work platforms
- Number of assistants



Frame shown may differ in length from actual shelter.

LAY OUT THE BUILDING SITE

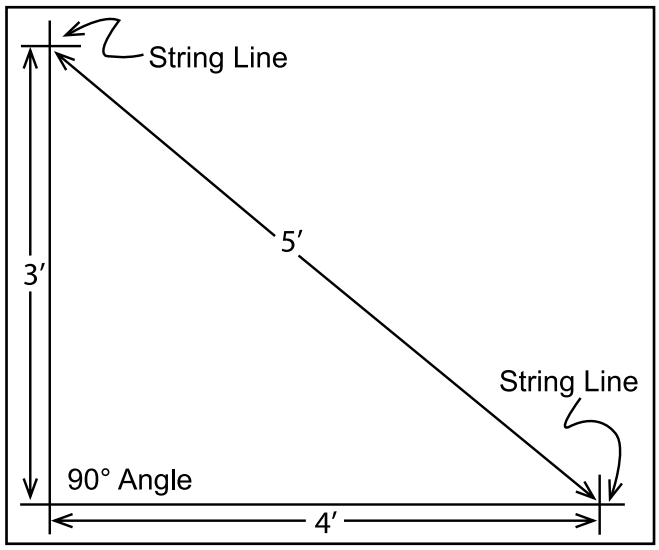
After the site is prepared, identify the location of the shelter corners helps to square the frame after it is assembled.

Taking these steps ***before*** assembling the shelter saves time and ensures that the structure is positioned as desired. The following procedure is a suggested method. Its use depends on the size of the shelter, shelter application, the footings, and the method used to anchor the shelter.

SQUARE THE SITE

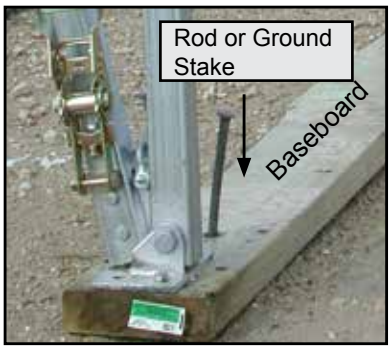
1. Identify a corner where a building rafter will be positioned, drive in a stake, and string a line the exact width of the building and stake in place. (Width of the rafter is measured from center-to-center of the rafter legs.)
2. String a line at least as long as the building from the first stake at 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.



3. After squaring the position of the building and placing a stake at all corners, string a line between the stakes to mark the base of the building.
4. Next, paint or mark a line on the ground using the strings between the stakes as guides.

NOTE: Setting *customer-supplied baseboards* on the site in the correct positions is another way to prepare for the frame assembly.



Actual rafter is not shown.

NOTE: If a baseboard is used, drill holes through the board at evenly-spaced intervals along the length of the board. Drive a rod through each hole and into the site to prevent the boards from shifting and to maintain the on-center width of the building.

The baseboards can be "pinned" in place using rods driven into the site through evenly-spaced holes drilled in the baseboard. This prevents the baseboards from shifting during assembly.

Building width is measured on-center.

5. After marking the outline of the building, continue with the rafter assembly instructions.

Space below is reserved for customer notes.

ASSEMBLE THE GREENHOUSE COMPONENTS

NOTE: *Assistance is required to assemble the shelter.*

END RAFTER ASSEMBLY (2)

Gather the parts:

- Rafter pipe (#37R23S1D)
- Rafter pipe (#38R23S1) & rafter pipe (#38R23P2)
- Pipe strap (#QH1070) & band clamp (#103856)
- Rafter foot (#104302) & Tek screws (#FA4482B)
- FAG363B 3/8" x 3" bolt and FALB04B 3/8" nut

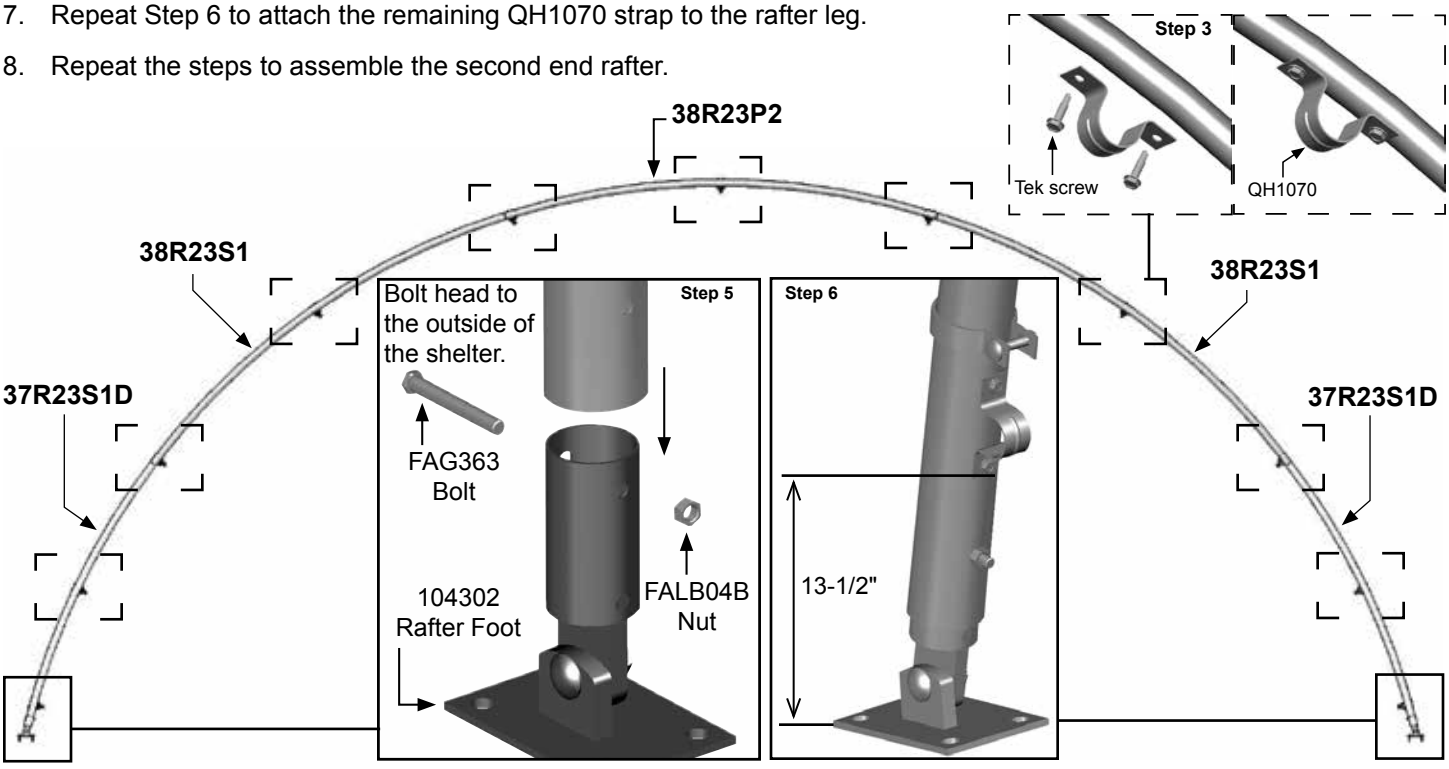
ATTENTION: After assembling the end rafters, set the two (2) identical rafters aside in an accessible place. One rafter is used at each end of the frame during the assembly.

Do not place other assembled interior rafters from the next procedure on the end rafter pile.

Assemble End Rafters

1. Connect the pipes as shown below. Each rafter assembly consists of five (5) pipes: 2 (#37R23S1D), 2 (#38R23S1), and 1 (#38R23P2). Each #37R23S1D pipe includes *one drilled hole near the bottom* used to connect the rafter foot.
2. With the rafter pipes assembled on the ground, secure each pipe joint using one self-tapping Tek screw (FA4482). Position screws so they will not interfere with the cover once it is installed.
3. Attach all (QH1070) brackets to the rafter using two (2) Tek screws for each strap. Attach the brackets to the underside of the rafter in the locations shown below and on the Front Profile diagram in the Quick Start section at the back of these instructions. The QH1070 straps should remain loose; do not fully tighten *at this time*.

   NOTE: Do not attach the lower QH1070 straps, these straps will be installed later in the instructions.
4. Move to the end of each rafter leg and slide one (1) 103856 band clamp onto each leg.
5. Attach a rafter foot to each leg of the rafter using a 3/8" x 3" bolt and 3/8" nut. Position the bolt head to the outside of the rafter to prevent cover damage when it is installed.
6. With both rafter feet secured, measure 13-1/2" from the bottom of one rafter foot and mark a line on the inside of the rafter. Position the bottom of one QH1070 bracket on the line and secure it to the rafter. Strap should remain loose.
7. Repeat Step 6 to attach the remaining QH1070 strap to the rafter leg.
8. Repeat the steps to assemble the second end rafter.



INTERIOR RAFTER ASSEMBLIES

Gather the parts:

- Rafter pipe (#37R23S1D)
- Rafter pipe (#38R23S1)
- Rafter pipe (#38R23P2)
- Rafter foot (#104302)
- Tek screws (#FA4482B)
- FAG363B 3/8" x 3" bolt and FALB04B 3/8" nut

Assemble Interior Rafters With Attached Ratchets

1. Connect the pipes as shown below. Each rafter assembly consists of five (5) pipes: 2 (#37R23S1D), 2 (#38R23S1), and 1 (#38R23P2). Each #37R23S1D pipe includes *one drilled hole near the bottom* used to connect the rafter foot.
2. With the rafter pipes assembled on the ground, secure each pipe joint using one self-tapping Tek screw (FA4482). Position screws so they will not interfere with the cover once it is installed.
3. Attach a rafter foot to each leg of the rafter using a 3/8" x 3" bolt and 3/8" nut. Position the bolt head to the outside of the rafter to prevent cover damage when it is installed.

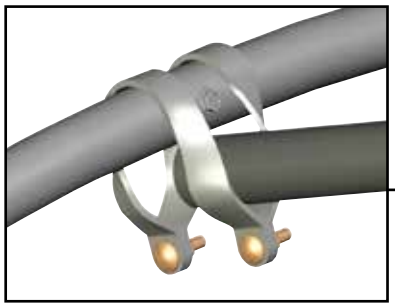
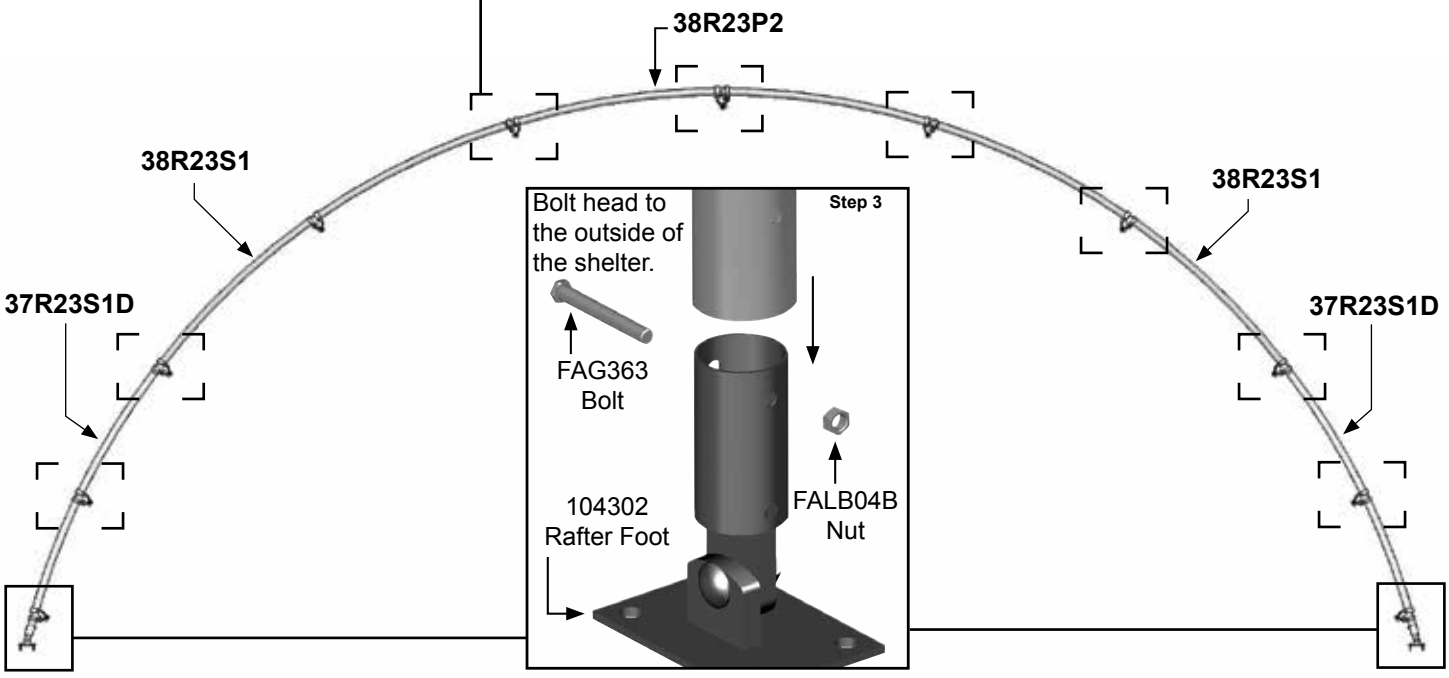


Diagram shows position of the cross connector. *Cross connectors are installed during the frame assembly.*



FRAME ASSEMBLY

Gather the parts:

- All rafter assemblies
- Purlin pipe 1.315" x 75" swaged (131S075)
- Purlin pipe 1.315" x XX" plain (131P0XX)

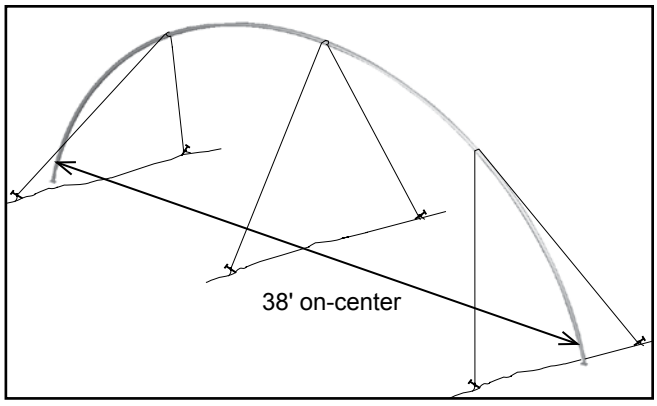
NOTE: The XX" represents the remaining length required to reach the end of the shelter. Consult the spec sheet and Side Profile diagram (Quick Start) for part identification.

Frame Assembly Procedure

After all rafters are constructed and placed in an orderly fashion for frame assembly, proceed with standing the first end rafter. Forklifts and personnel booms are recommended for lifting and setting the rafters. Consult a construction professional if you are not familiar with construction techniques and erecting similar structures.

ATTENTION: Use the proper lifts. Rafter assemblies are heavy and awkward to handle.

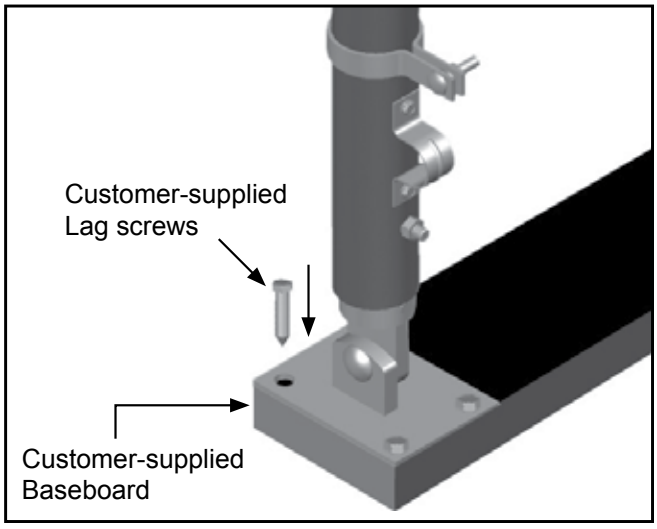
1. Stand the first end rafter and secure it using rope, cable, or some other form of temporary bracing to hold the rafter in position. Use a level (or other leveling device) to plumb the end rafter.



NOTE: Plumbing the end rafter at this stage assists in placing the remaining rafters.

2. Position rafters to maintain width at 38' on-center.

3. Secure the rafter feet to the site (or customer-supplied baseboards) to prevent the rafter from shifting.



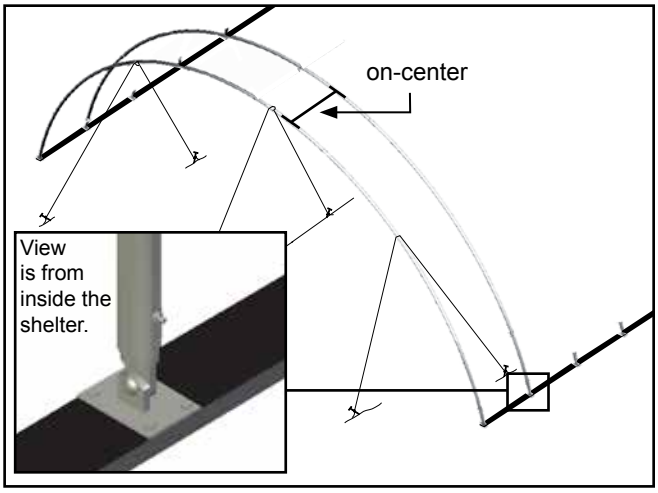
NOTE: The use of a baseboard beneath the feet of the rafters is strongly recommended. The feet then can be secured to the baseboard using the customer-supplied lag screws or other appropriate fasteners.

If used, baseboards should be "pinned" in place to prevent them from moving during assembly. *Anchoring the rafter feet to customer-supplied baseboards is not a substitute for anchoring the frame to the site*.

Consult the MUST READ documentation that shipped with the building for anchoring instructions.

Baseboards can be treated wood or recycled plastic lumber. Contact Customer Service at 1.800.245.9881 for additional information.

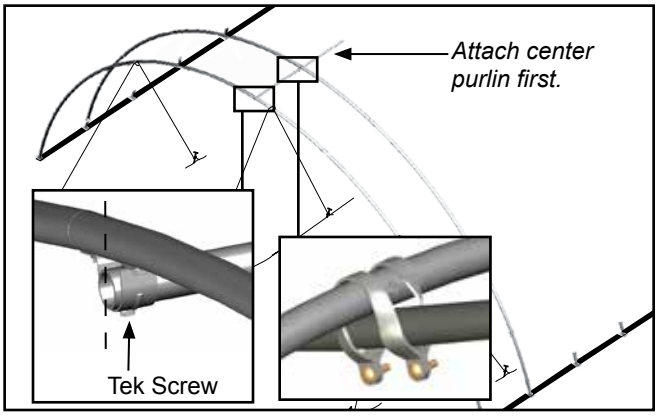
4. With the first end rafter standing, plumb, properly secured, and width on-center, set the first interior rafter in place.



FRAME ASSEMBLY (CONTINUED)

5. Place a cross connector at the top of the inside rafter, align it with the QH1070 pipe strap attached to the end rafter in the same location, and insert the *plain end* of the purlin pipe (131S075) through the connector and through the *pipe clamp at the top of the end rafter*.

6. Verify that both rafters are plumb and properly spaced (center-to-center).



All cross-connectors will align with the QH1070 pipe straps attached to the end rafters when properly installed.

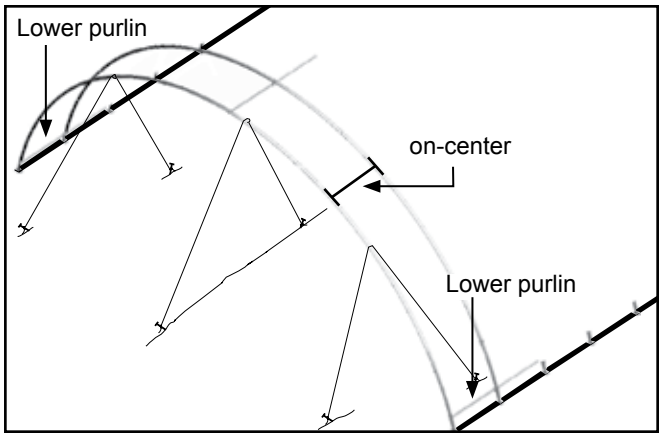
7. Verify that the purlin does not extend beyond the end rafter and tighten the cross connector at the *top of the interior rafter.* (See dashed line in insert above.)

8. Return to and tighten the QH1070 pipe strap at the top of the end rafter to secure the purlin.

   NOTE: To prevent cover damage, do not allow the purlin to extend beyond the edge of the end rafter. See dashed line in previous diagram for details.

9. Secure the purlin to the QH1070 strap by driving a Tek screw through the strap and into the purlin pipe. See the arrow in the insert of the previous diagram.

10. With the first section of the top, center purlin in position, move to the bottom of the rafter, verify that the rafter spacing between the end rafter and the first interior rafter is on-center, and install the first section of purlin pipe at this location. *Verify that rafters are plumb.*



11. Move to the other side of the rafter and repeat Step 10.

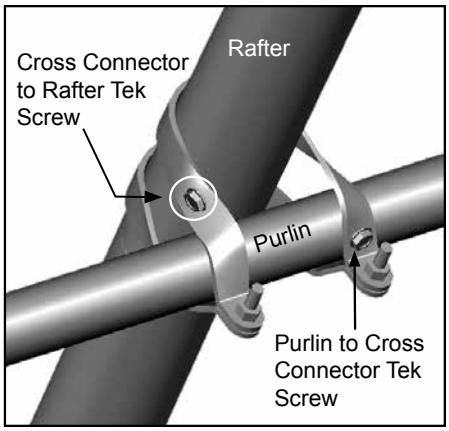
12. Install the first pipe section of remaining purlins. (There are eleven (11) purlins between each rafter.) Consult the Frame Diagram shown earlier in these instructions for purlin location.

    ATTENTION: To prevent cover damage, DO NOT allow the purlin pipes to extend beyond the end rafter. *To protect the cover, tape all rafter joints with duct tape.*

13. Verify that purlins are running parallel with each other.

14. Return to *each purlin and cross connector* and secure the cross connector to the rafter and the purlin to the cross connector. See the example diagram below.

Position Tek screws so they will not contact the cover once it is installed.

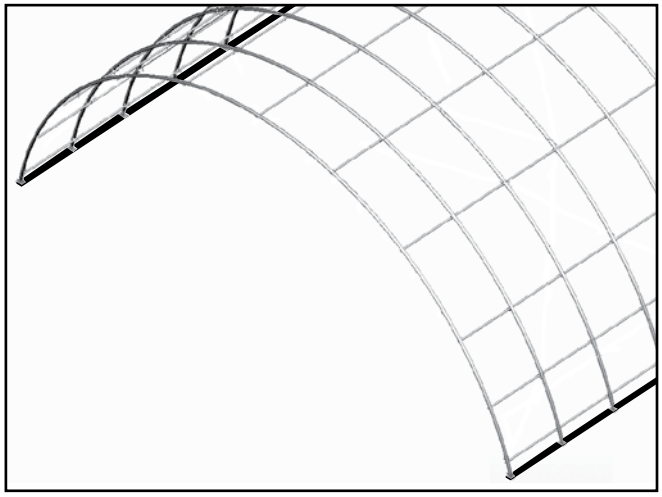


15. Repeat the steps to set and secure the remaining interior rafters for the length of the building.

    IMPORTANT: During assembly, consult the Side Profile Diagram in the Quick Start section to determine the positions of the interior rafters that include ratchets and those that do not.

16. Finish each purlin run using a plain pipe positioned between the last interior rafter and the final end rafter to complete the assembly.

17. With all rafters in place, continue with the cable assembly procedures.

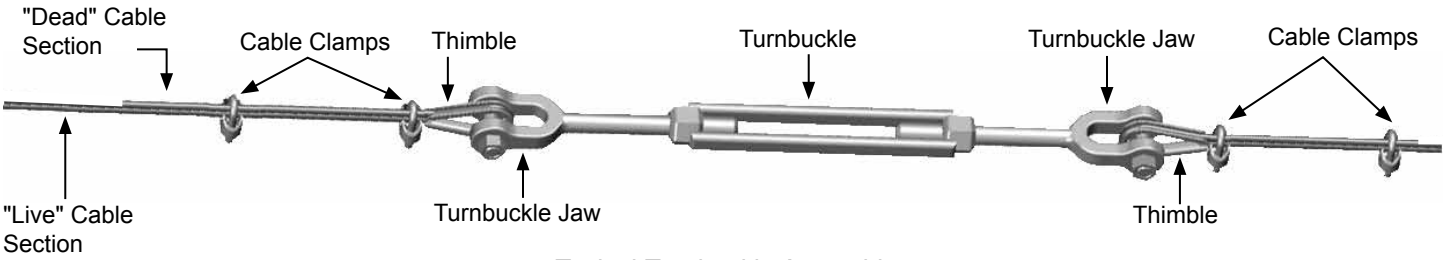


CABLE ASSEMBLY

Cable assemblies provide diagonal bracing for the building. Each cable assembly includes the following items:

- Cable (2 cables cut to length)
- Turnbuckle (1)
- Cable thimbles (4)
- Cable clamps (4)

ATTENTION: Consult the diagram on the next page to identify cable assemblies and cable locations.



Typical Turnbuckle Assembly

NOTE: For each cable assembly, four (4) additional cable clamps are used to attach the cable assembly to the frame. In addition, Cable C assemblies require an additional cable thimble at each lower end to complete the connection to the band clamp attached to the rafter leg. See Side Profile Diagrams. Consult the Cable Diagram on the following page and the Side Profile Diagram in the Quick Start section for clarification and cable locations.

Cable Assembly Procedure

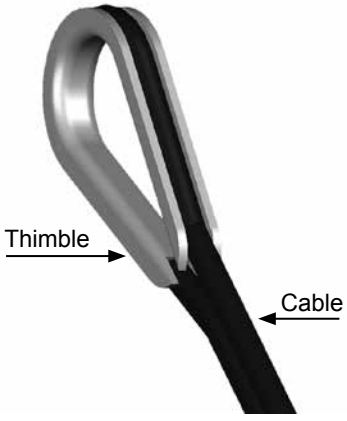
1. Using the Side Profile Diagram in the Quick Start section (and others) as guides, measure the distance needed on the frame and cut the cable to the proper length for each assembly. Remember to account for the turnbuckle and the cable length needed to attach the thimbles at each end. (Extra cable has been sent for the cabling.) Make a single assembly *before* making them all. This allows a check to be sure the correct length has been cut. Make the necessary length adjustments as needed before making additional assemblies. *Always measure before cutting the cable.*

   ATTENTION: One (1) turnbuckle and two (2) cables are used for each cable assembly type. For best results and the least cable waste, use the diagram on the following page and measure the distance required for a specific cable. Additional cable length is needed to anchor the cable to the frame and to attach the cable sections to the turnbuckle.

   Measure and cut the follow assemblies as needed:

   Cable Assembly A: 16 cable lengths; 8 turnbuckles
   Cable Assembly B: 16 cable lengths; 8 turnbuckles
   Cable Assembly C: 16 cable lengths; 8 turnbuckles

2. Place one cable thimble approximately twelve inches (12") from the end of a cable section and wrap the cable around the thimble as shown in the figure to the right.



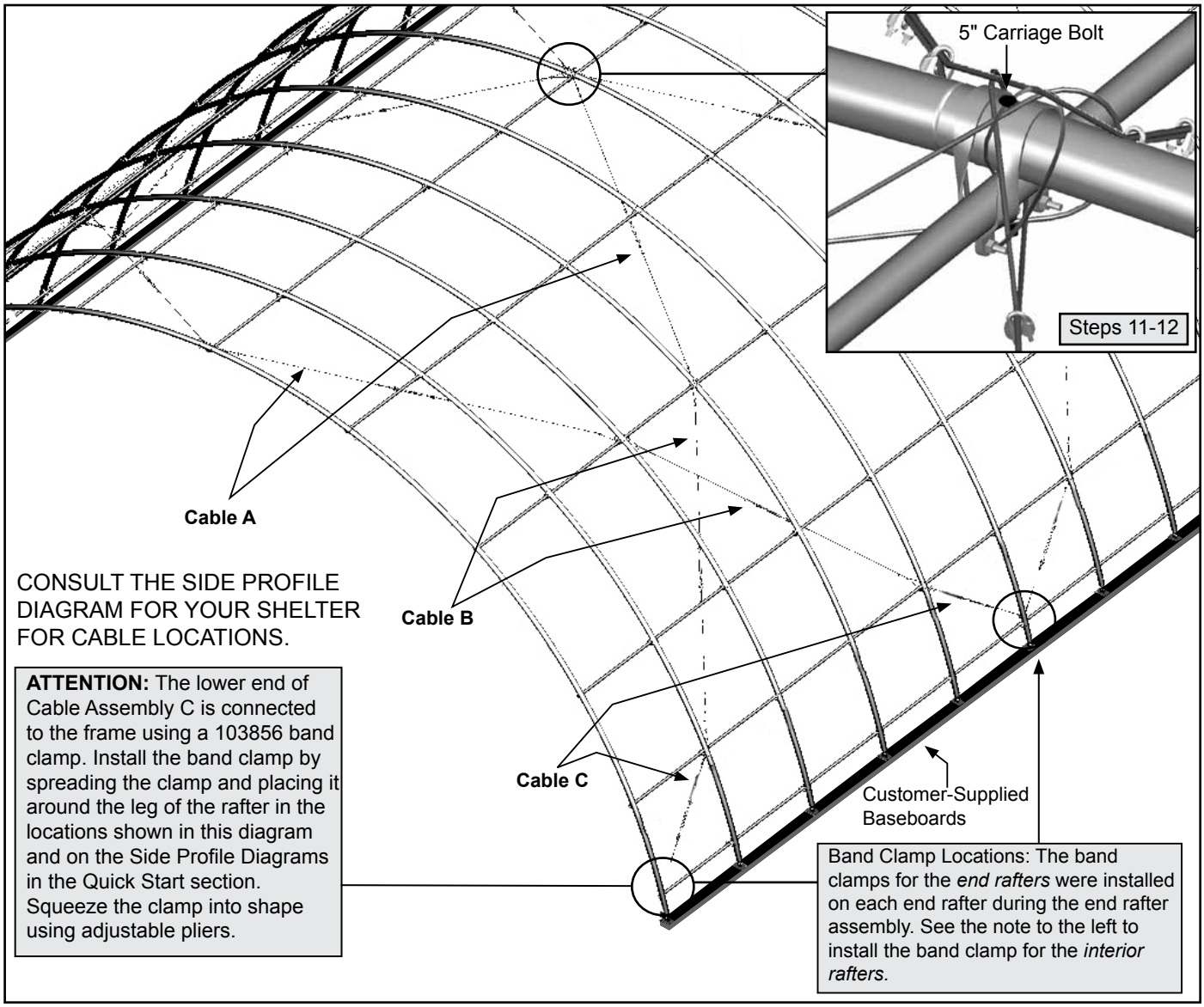
3. Grasp both sections of the cable near the thimble and position one cable clamp one inch away from the thimble as shown above.

   NOTE: Position the clamp on the cable with its U-bolt portion over the short/"dead" cable section.

4. With the saddle portion of the cable clamp in position on the "live" cable section, thread the nuts onto the U-bolt section of the clamp and tighten slightly to maintain the position of the clamp on the cable.

CABLE ASSEMBLY (CONTINUED)

5. Install a second cable clamp on the cable six to eight (6"-8") inches from the first clamp and tighten both clamps.
6. Remove the bolt from the jaw of the turnbuckle and position the cable end with the thimble into the turnbuckle jaw.
7. Insert the bolt through the turnbuckle jaw and the cable thimble, thread the nut onto the bolt, and tighten to secure the cable to the turnbuckle.
8. Repeat Steps 2-7 for the remaining length of cable for this assembly.
9. Open the turnbuckle to its longest position and set the assembly aside.
10. Repeat the above procedure for all remaining assemblies. Length of upper cables may differ from the side cables. *Always measure length on the frame before cutting the cables.*
11. With all cables assembled, move to the top of the sixth (6th) rafter and drill a 5/16" hole down through the rafter and top, center purlin. This is the rafter-purlin connection where the ends of the upper cables are wrapped and secured. See the insert in the diagram below for Steps 11 and 12.
12. Insert the 5/16" x 5" carriage bolt (FAH325B) down through the 5/16" hole, add a 5/16" nut, and tighten.
13. Attach the cables to the assembled frame. See the diagrams below and in the Quick Start section of these instructions for details and cable locations. The cable assembly length and positions are the same for the other side and end of the frame. *Verify that the turnbuckles are fully extended before attaching the cables to the anchored frame.*



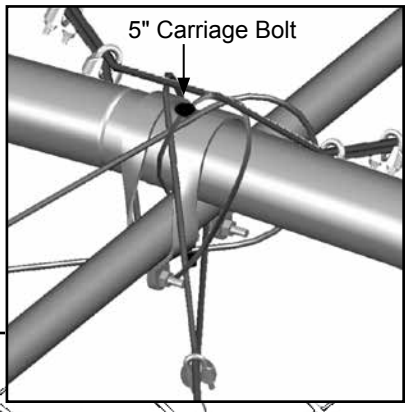
CABLE PLACEMENT

The diagram and inserts below identify the placement and proper way to attach the cable assemblies to the building.

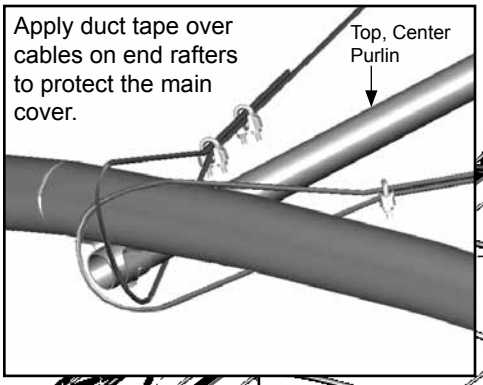
Do not tighten the cables until the frame is properly and securely anchored to the site as described in the Must Read document.

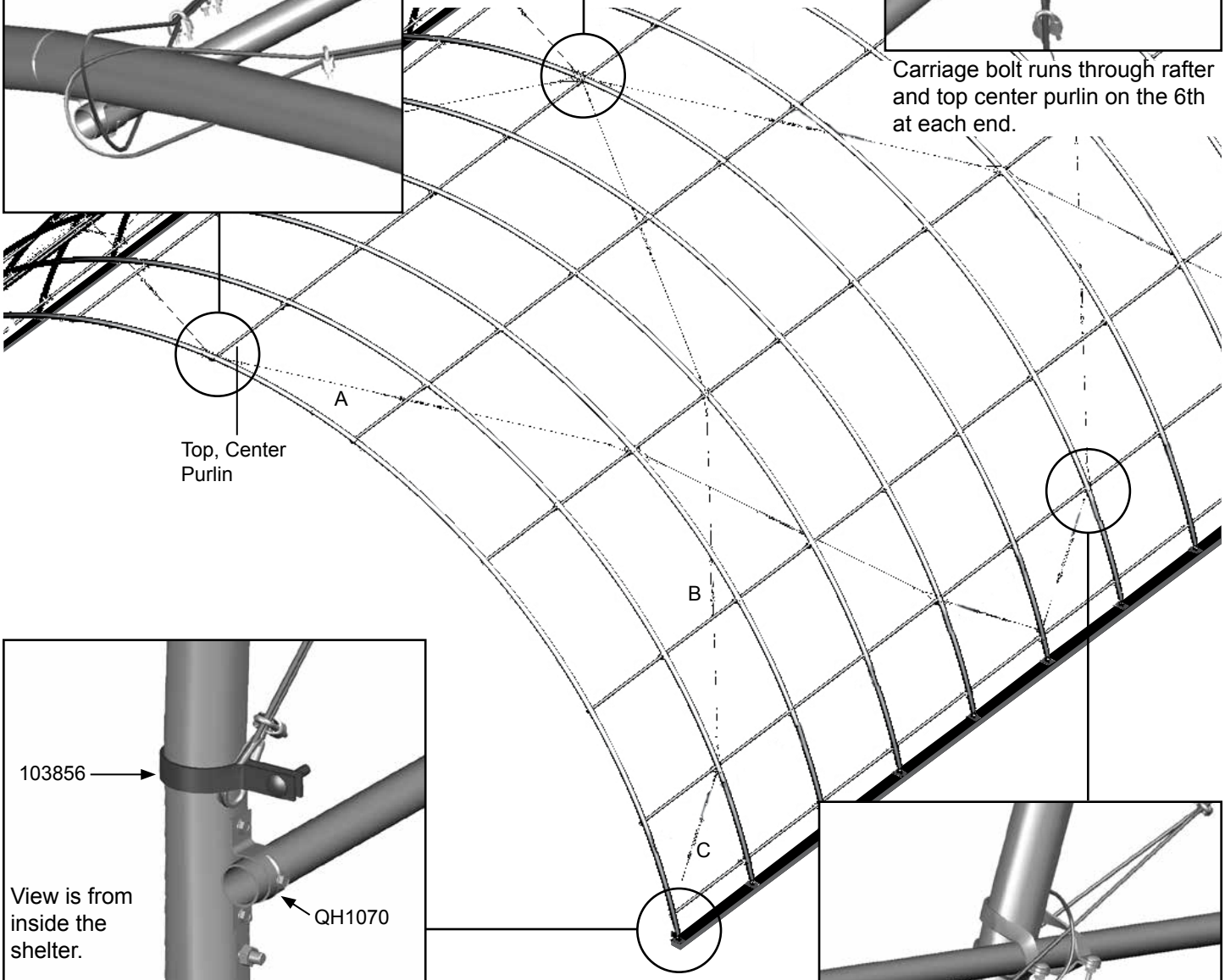
ATTENTION: Install a carriage bolt in this location at both ends of the shelter.

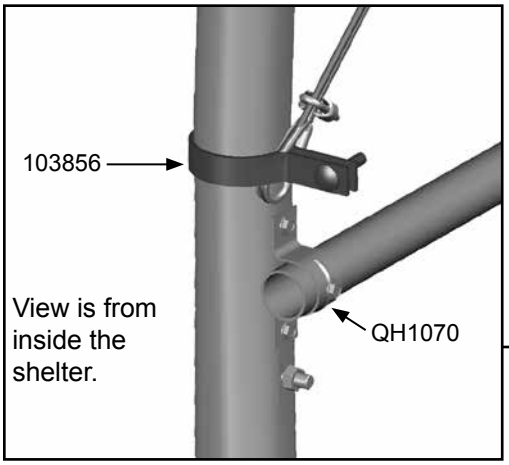
Drill through the rafter and purlin to install the bolt.



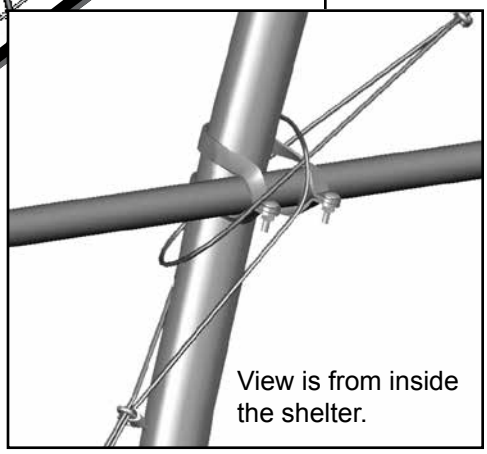
Carriage bolt runs through rafter and top center purlin on the 6th at each end.







Attach the band clamp (103856) above the lowest pipe strap (QH1070) on the end rafters only. Once the cable is attached and the clamp is tightened, secure the clamp to the rafter using a Tek screw.

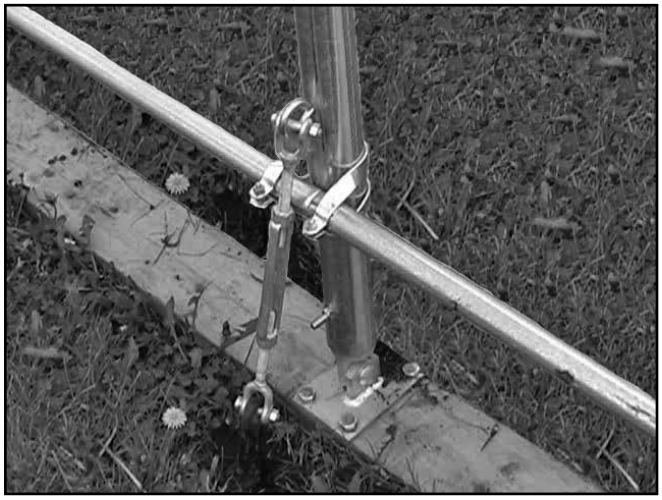


NOTE: The positions of the cable assemblies are identical for the opposite side and the remaining end of the building that are not shown. *Consult the Side Profile Diagram in the Quick Start section for rafter spacing and cable locations*.

ANCHOR THE SHELTER

After installing all cable assemblies, anchor the frame. Once the frame is anchored properly, continue with these instructions.

WARNING: Securing the rafter mounting feet to baseboards set on the site is not a substitute for properly anchoring the shelter. You must anchor the shelter as described in the MUST READ document.



FAILING TO PROPERLY ANCHOR THE SHELTER WILL RESULT IN DAMAGE TO THE SHELTER AND MAY CAUSE PERSONAL INJURY.

READ THE MUST READ DOCUMENT TO PROPERLY ANCHOR THE SHELTER.

TIGHTEN THE CABLING

The positions of the cable assemblies are identical for the opposite side and the remaining end of the building that are not shown in the previous diagram. For cable locations for your building, consult the Quick Start section (back).

1. After attaching all cable assemblies to the building frame, verify that each band clamp is tight and secured to the rafter leg using a Tek screw.
2. Return to the first set of turnbuckles and tighten the cables.

   NOTE: Tighten the cables in each section evenly so that the frame remains plumb.
3. After one set of cables is tightened, move to another set and repeat the steps to tighten those cables.
4. Repeat this process until all cables are tight.
5. Complete the final frame check that follows.

FINAL FRAME CHECK

1. Return to the frame connections and verify that all bolts are tight.
2. Verify that each purlin splice is secured with a Tek screw.
3. Verify that each purlin is secured to the cross connector and that each cross connector is secured to the rafter pipe.
4. Inspect the frame for any sharp areas that could damage the cover. If found, reposition components or tape with layers of duct tape.
5. Verify that all bolts are positioned with the heads to the outside of the frame. Tape the bolts, rafter joints, and cable connections *before* installing the cover.
6. Continue by installing the end walls.

Space below is reserved for customer notes.

END WALL INSTALLATION

The steps to install the end walls for the greenhouse include the following:

1. Install end wall framing. (See the diagrams in the Quick Start section at the back of these instructions. Read the installing accessories note below.)
2. Prepare polycarbonate end panels and attach.
3. Assemble doors and attach.

INSTALL END WALL FRAMING (Front and Back)

Site variations and different methods for anchoring the greenhouse may require slight changes to be made to these instructions. *It is the responsibility of the owner/ builder to adapt these instructions as needed to adjust for these and other differences.*

A NOTE ABOUT INSTALLING THE END WALL FRAMING FOR OPTIONAL HEATERS, VENT FANS, AND MOTORIZED SHUTTERS (if equipped):

Optional accessories such as heaters, vent fans and motorized shutter units are typically installed or attached to the end walls of this greenhouse. Additional horizontal framing (included) is installed *between* the vertical end wall frame tubes to mount these accessories. The spacing shown for the end wall supports on the end frame diagrams may be too narrow for the installation of some larger accessories.

Diagrams do not show framing for the accessories.

When framing the end wall, consult the installation instructions for the accessories (if equipped), or measure the width of the accessory to accurately space and position the end frame tubes. Consult the panel installation diagrams in the Quick Start section to *identify the verticals that can be moved*.

MOVE ONLY THE VERTICAL SUPPORTS LABELED AS NC (NON-CRITICAL). See Quick Start diagrams.

Before installing any greenhouse accessory, adhere to the following:

- Consult the end frame diagrams before installing the accessory horizontal framing.
- Move only those verticals labeled as NC (NON-CRITICAL) on the end frame diagrams when deciding where to install the additional horizontal framing for accessories.
- Consult the diagrams in the Quick Start section showing the polycarbonate panel locations and the locations of the aluminum trim and profile before repositioning any end wall vertical.
- DO NOT REPOSITION THE END WALL VERTICALS USED AT THE SEAM OF TWO (2) POLYCARBONATE PANELS.
- Always consult the installation guides that shipped with the accessory for additional precautions, recommendations, and safety requirements.
- Before installing any electrical accessory, consult a professional electrician for precautions and additional assistance.
- For gas heaters, a professional, qualified service technician must install the unit.

Complete these steps to install the accessory framing:

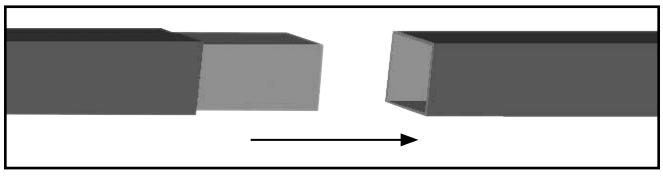
1. Based on the installation requirements and precautions of the accessory, choose a location in the end wall to mount the accessory, and cut a 1.5" x 1.5" frame tube to the required length for framing.
2. Attach these horizontal frame tubes between the vertical frame tubes of the end wall (at the required height determined by the installation instructions included with that accessory) using QH1330 brackets.

INSTALL THE FRONT END WALL FRAME

Refer to the end frame diagrams (Quick Start section). The materials and parts needed to assemble the end wall frame include:

- Square tube (#102897)
- Angle brackets (#QH1330) & band clamp (#103856)
- Square tube fitting (#104624)
- Square-to-round tube connect bracket (#104074)
- Carriage bolt (#FAH320) and nut (#FALB32B)
- Tek screws (#FA4482B)

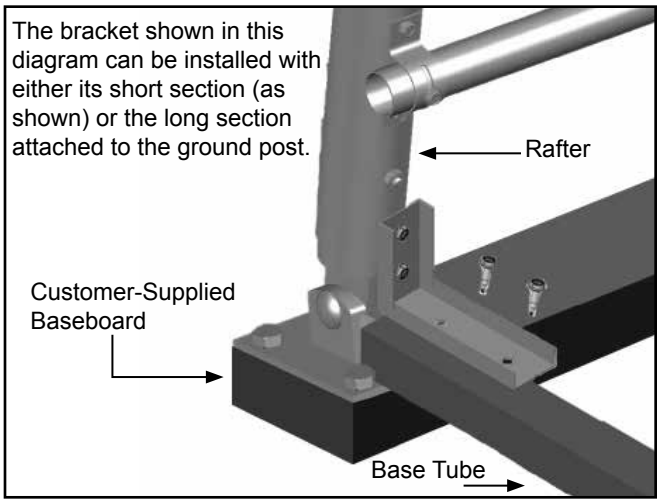
1. Locate the square metal tubing for the base tube of the end wall. The base tube consists of 99" swaged tubes and one (1) short section cut from a length of square pipe. See Quick Start section for clarification.
2. Insert the swaged ends of the tubing into the plain ends to connect the pieces, measure, and cut to length.



3. Position this assembled base tube on the ground between the legs of the end rafter at the front of the greenhouse and anchor it in place. This base tube will be directly below and in line with the end rafter.

END WALL INSTALLATION (continued)

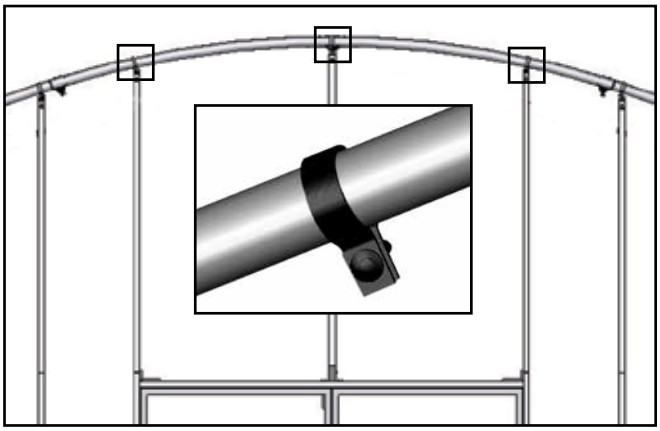
4. Secure the base tube between the legs of the end rafter using an angle bracket and Tek screws.



5. On the base tube surface facing the inside of the greenhouse, install a short Tek screw at each joint and then locate and mark the center of the base tube.

6. Consult the End frame diagram (Quick Start section) and mark the rough opening for the width of the double door assembly.

7. Place the band clamps on the end rafter above the door as shown below. **DO NOT TIGHTEN THE BOLTS AT THIS TIME.**



IMPORTANT: Actual number of band clamps may differ from example shown. Consult end frame diagrams in Quick Start section for details.

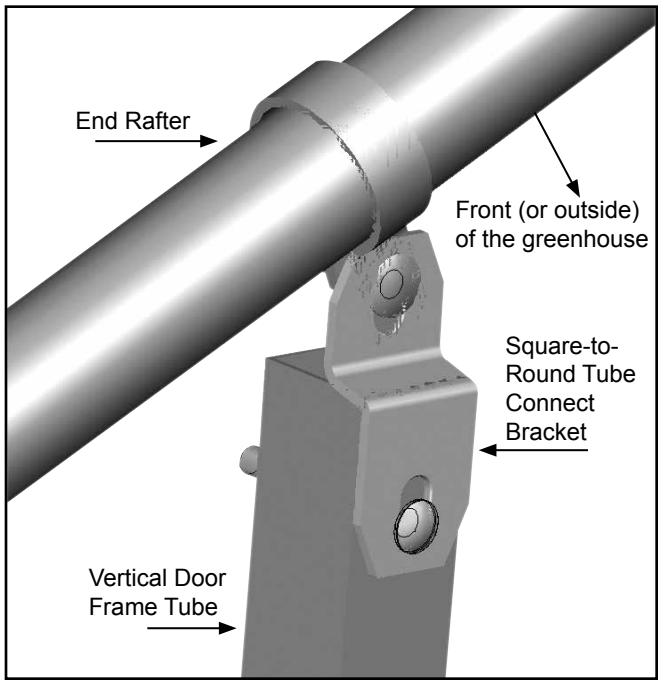
8. Select the tubing for the two vertical frame supports for the sides of the double door. Each support includes:

   - Square tubing (#102897 swaged end): For the longer vertical frame members, shorter sections of tube may need to be cut and added.
   - One (1) square-to-round tube bracket (#104074)

9. Measure the distance *between the top of the base tube and band clamp (Step 7)* to determine the length of the first vertical section of the door frame tube.

10. Choose one square tube (#102897), insert the swaged end of the long tube into the plain end of another tube and tap with a hammer to properly seat the tubes at the joint.

11. On this assembled frame member, mark the length determined in Step 9 (above) and *subtract the amount needed to account for the square-to-round tube connect bracket*, which is attached to the top of the frame tube. See the diagram that follows.



12. Select a square-to-round tube connect bracket and attach the bracket to one end of the vertical frame member. Use a 5/16" drill bit to drill a hole through the tube and attach the bracket to the tube using a nut and carriage bolt.

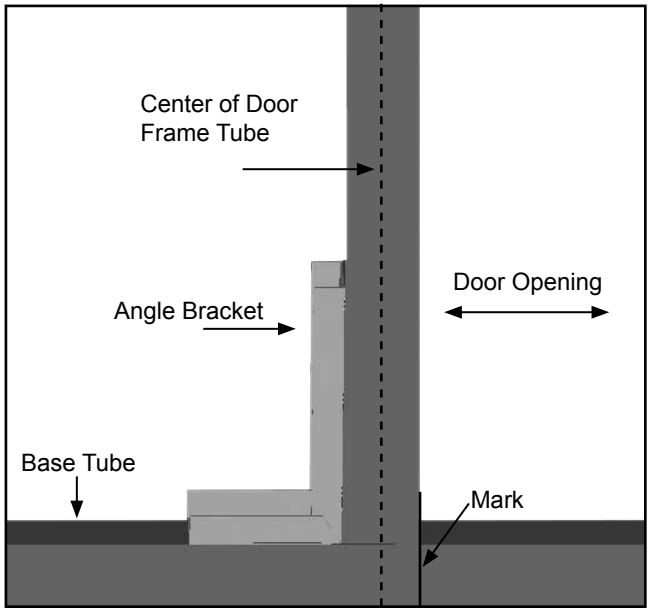
13. Repeat Steps 9-12 for the remaining vertical frame member for the door.

14. With the square-to-round tube connect bracket attached to the top of each vertical door frame tube, use the bolt in the band clamp to attach the bracket to the band clamp. DO NOT TIGHTEN AT THIS TIME.

    NOTE: The heads of the bolts for each clamp are to the outside (or front/back) of the greenhouse. At this point, the two vertical door frame members should be loosely attached to the end rafter assembly.

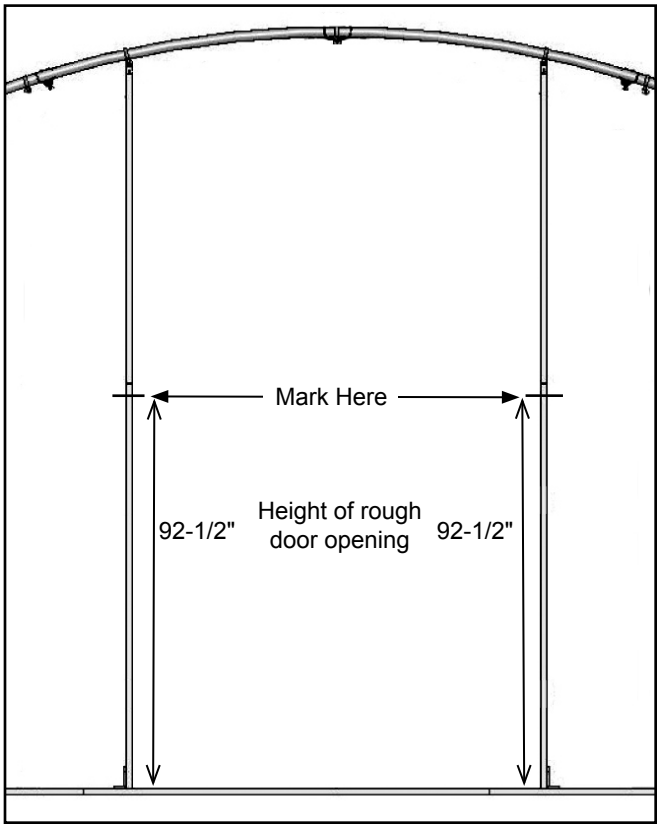
INSTALL THE END WALL FRAME (continued)

15. Using the marks on the base tube for the rough opening for the door, attach the bottom of each vertical frame member to the base tube using an angle bracket. Consult the end frame diagram.



16. With the vertical door frame tubes attached at the bottom and loose at the top, measure each frame member to locate the height of the rough door opening and mark the location on the inside of the door frame.

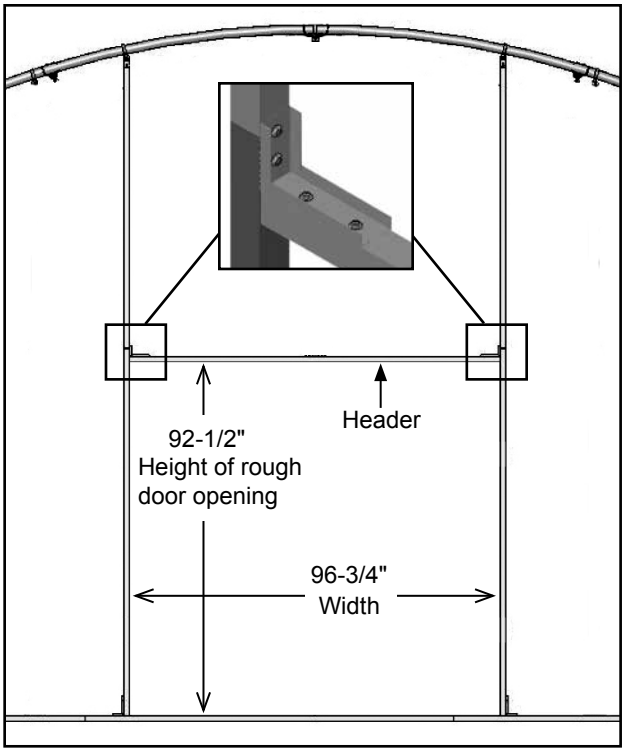
    Consult the End Frame diagrams in the Quick Start section located at the back of these instructions.



17. Using a level (or other means), verify that one vertical door frame tube is plumb and tighten the band clamp bolt to lock the first door frame member in place.

18. Choose the square tube for the door frame header and cut the swaged end to the proper length for the width of the rough door opening.

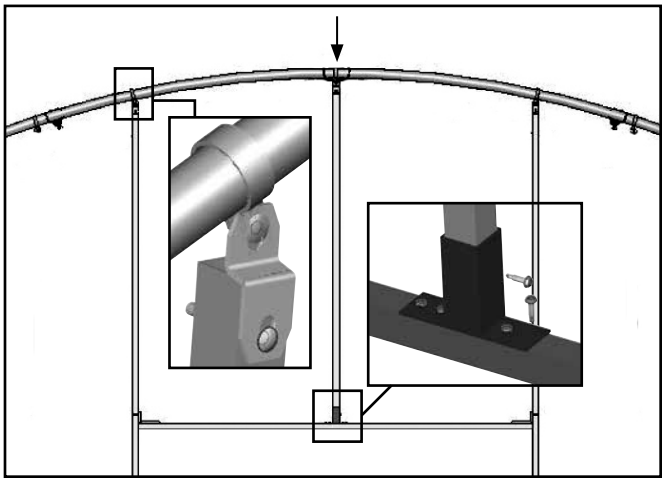
19. Using two angle brackets, attach the header tube to the end wall assembly between the vertical door frame tubes as shown.



    Inside dimensions are shown. Diagrams may show a different frame used for illustration purposes only.

20. Verify that both door frame verticals are plumb and recheck the width of the rough door opening at the top and bottom. Adjust if needed.

21. Cut the metal tube for the short, end wall support (positioned between the header and the end rafter) and attach as shown in the following diagram.



INSTALL THE END WALL FRAME (continued)

22. Use the end frame diagram to determine the number of remaining vertical end frame supports and place one band clamp on the end rafter for each of the remaining vertical supports. Use the diagram for the location of these clamps.

23. Using the end frame diagrams (Quick Start section), measure and mark (on the base tube) the locations of the remaining vertical end wall supports.

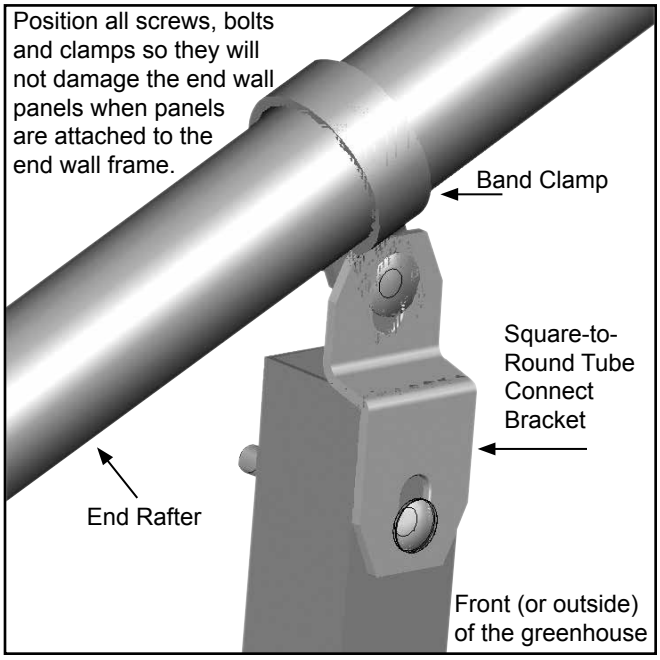
24. Choose the parts for each remaining vertical support for the end wall framing. Each vertical support consists of the following parts:

    - Square tube: Longer verticals may require an additional shorter length cut from a longer tube.
    - One (1) square tube fitting (#104624) to attach the support to the base tube of the end wall assembly.
    - One (1) square-to-round tube connect bracket (#104074) to attach the tubing to the band clamp on the end rafter.

25. Use the steps presented earlier in these instructions and the end frame diagrams to measure and cut each section of square tubing for the remaining vertical frame members.

    ATTENTION: Remember to subtract the amount needed to account for the square-to-round tube connect bracket that will be attached to the top of each remaining frame member.

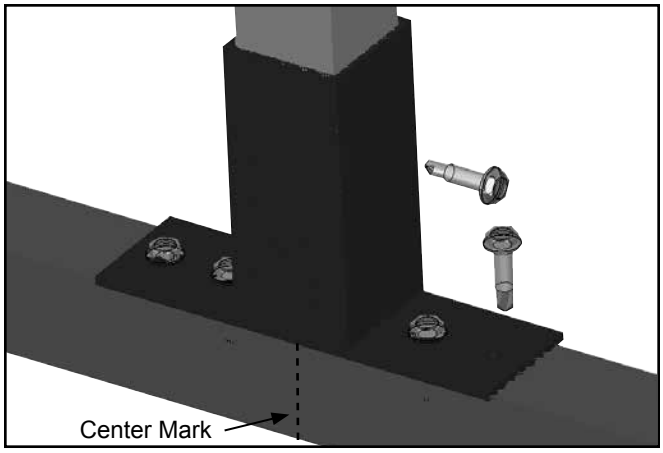
26. Choose a square-to-round tube connect bracket and attach the bracket to one end of the vertical frame member. Use a 5/16" drill bit to drill a hole through the tube and attach the bracket to the tube using a nut and carriage bolt.



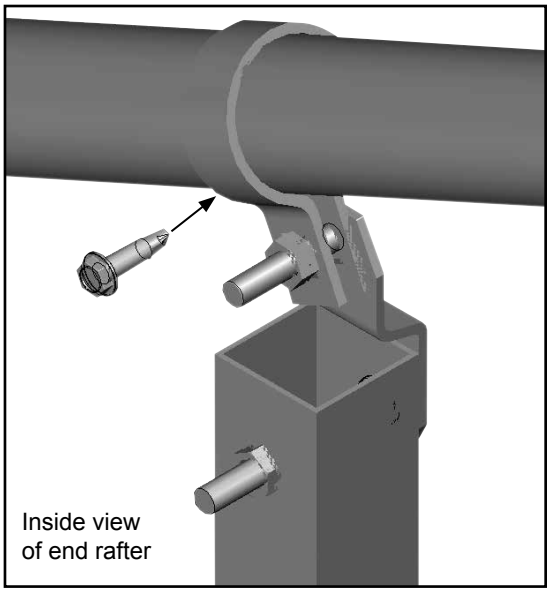
27. With the square-to-round tube connect bracket attached to the top of the frame member, place a square tube fitting on the bottom of the frame member.

28. Align the center of the assembled frame member with the center mark on the base tube and attach the top of the frame member to the band clamp on the rafter. *Do not tighten*.

29. Verify that the vertical end wall frame member is plumb and use the short Tek screws to secure the square tube fitting to the base tube.



30. Tighten the top band clamp and *install a short Tek screw through the clamp and into the rafter.*



31. Repeat the procedure as needed to assemble and install the remaining vertical end wall supports.

32. Return to the bottom of each frame member and install a short Tek screw through the backside of each tube fitting to secure the end frame support to the tube fitting.

33. Once each end wall is assembled, return to each band clamp and pipe splice of each base tube and verify that a Tek screw is installed. Install a Tek screw if needed.

INSTALL THE END WALL FRAME (continued)

INSTALL BACK END WALL FRAME (NO DOOR)

End wall framing for back of greenhouse is assembled in the same way as front end wall.

If back wall includes an optional double door kit (additional purchase required), repeat Front End Wall Installation procedure.

CONSULT QUICK START SECTION FOR ADDITIONAL FRAMING INFORMATION.

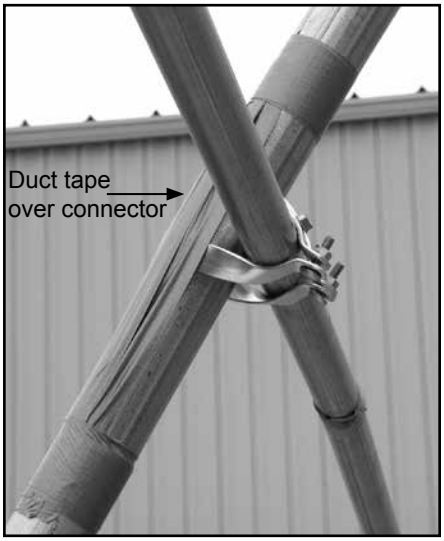
If the back end wall *does not include* an optional double door kit, install vertical frame members as shown below.

1. Join and cut the tubes to the required length and attach to the end wall framing.
2. Attach the frame support at the top and bottom as previously described.
3. Continue with installing the end panels.

TAPE SHARP EDGES AND CONNECTORS

After the frame is assembled, check the frame for sharp edges that could damage the cover or end panel, and file these smooth or tape over them using the supplied duct tape.

In addition, return to the rafters and apply tape over each connector to better protect the cover film when it is installed. The following photo shows one way to apply the tape.



Rafter and frame shown above may differ from actual frame. Photo is used to illustrate how to apply tape.

END PANEL INSTALLATION

After end wall framing is installed, attach polycarbonate panels to end wall framing. Steps that follow describe one way to complete panel installation.

Materials and parts needed to install end panels include:

- Polycarbonate panels and white vent tape
- Aluminum U-Channel profile (#104213)
- Aluminum 8' H-Channel profile
- Tek screws (#FA4484B)
- Neo-bonded, galvanized washers (#102921B)

Read the following information before starting:

- U-Channel profile (104213) is used to finish sides and top edges of polycarbonate panels.
- H-Channel profile is used to join two (2) separate polycarbonate panels at the seam.
- FA4484B Tek screws and galvanized washers are used to secure aluminum channel and panels to end wall frame.
- Install polycarbonate panels with UV-protected side to the outside. Mark side with a marker if needed after removing protective film.

  ATTENTION: Do not store polycarbonate panels in direct sunlight! Allowing film to remain intact and in direct sunlight will make film difficult if not impossible to remove. *Remove protective film from panels before installation.*
- During preparation, rest panel edges on cardboard or other material to protect them from dirt and damage.
- Seal panel bottom with white vent tape.
- Consult polycarbonate panels (Quick Start section) for location and lengths of each panel. Diagrams are located near back of these instructions.

ATTENTION: Position panels as shown on panel diagrams. Using a panel in an incorrect position may affect placement of subsequent panels. In addition, the amount of aluminum profile used between panels and to finish panel edges may not be adequate if additional seams are created. Begin at the *door end* of the building.

NOTE: Install all accessories (fans, vents, heaters, etc.) after installing all polycarbonate sheets.

Secure all polycarbonate panels as shown in the diagrams and photos below, unless otherwise noted.

Use a Tek screw and washer to secure panel to end wall frame. Do not crush panel when installing screws.

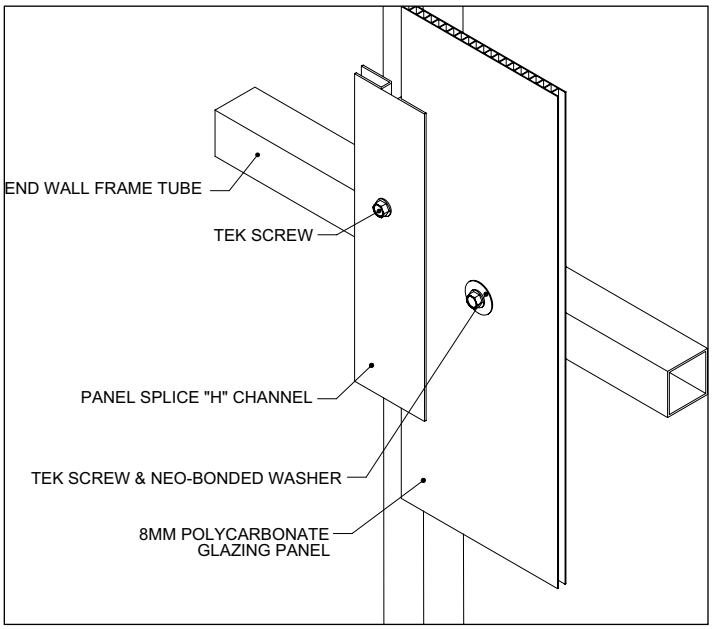
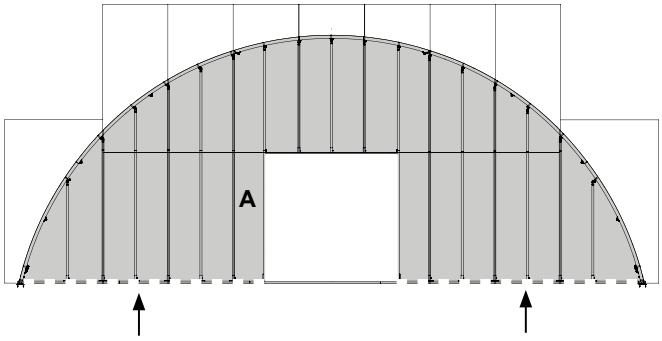


Diagram shows basic panel installation and fasteners used to secure polycarbonate panels. *Install H-channel with flat side out.*

END PANEL INSTALLATION (continued)

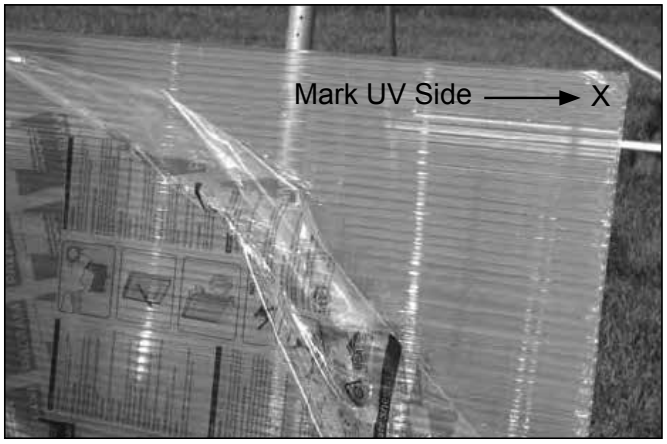
Complete the following general steps to install end wall panels.

1. Consult panel location diagrams, select one 4' x 8' polycarbonate panel, begin at the edge of double door opening, and work to the outside edge of end wall. See **Panel A** in diagram below for first panel.



Dashed line and small arrows (above) show where to install the white vent tape. *Install tape along this bottom edge only.*

2. Measure area and cut panel to size. Review panel layout diagrams in Quick Start section. *Remember to account for H-channel dimensions between panels.*

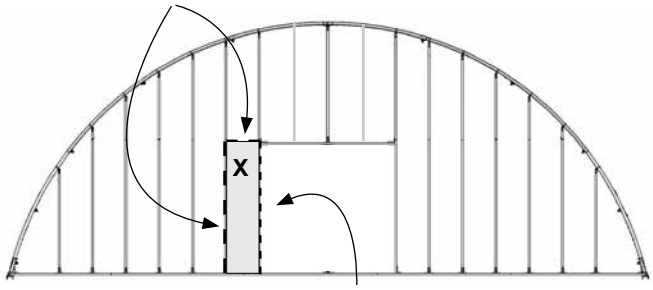


3. Remove protective film and mark UV-protected surface.

4. Apply vent tape to bottom of panel and attach 104213 profile to panel edge adjacent to door as shown on Polycarbonate Panels diagram in Quick Start section.

5. Place panel in position, attach it to end wall framing using FA4484B Tek screws and 102921B washers.

H-channel here – outer edge and top of panel.

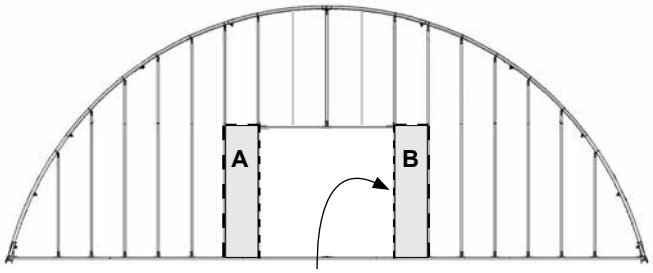


104213 U-profile here along door edge.

NOTE: When preparing any panel for installation and attaching aluminum profile, remember to account for areas where different sections of profile intersect so profile is cut to proper length and installed to achieve the desired finished appearance.

Space screws evenly **at 16"** on-center when securing panels. DO NOT USE WASHERS WHEN SECURING H-CHANNEL TO END WALL FRAMING.

6. Use remainder of 4' x 8' side panel (A) adjacent to door to cover same area along remaining side of door (B).

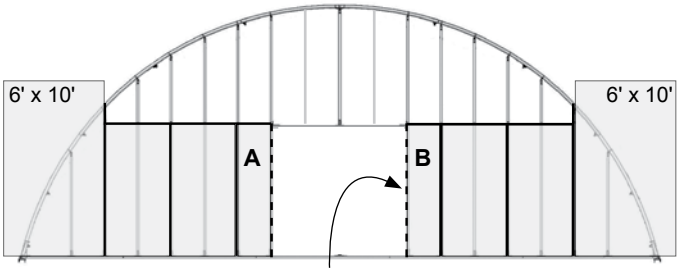


104213 U-profile here along door edge.

ATTENTION: Prepare panel as previously described. ***Only the bottom edge of all lower panels is covered with vent tape.***

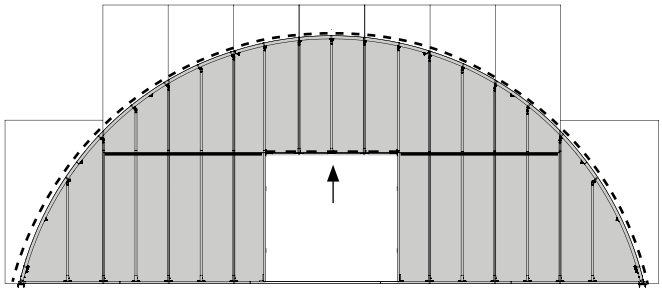
END PANEL INSTALLATION (continued)

7. Continue to prepare and install panels and aluminum profile in the locations shown on end panel diagrams (Quick Start section) to complete lower row of panels.



104213 U-profile here along door edge.

8. Prepare and install upper panels. Cut upper edge of panel to correct length using rafter profile as a guide. ***Do not apply vent tape of any upper panel edge.***



Attach 104213 U-profile to bottom of panels above door.

ATTENTION: Review roof panel installation steps to determine how to finish joint between end panels and roof cladding. ***Cut panels as installed, or after all are installed (if weather and wind conditions allow).***

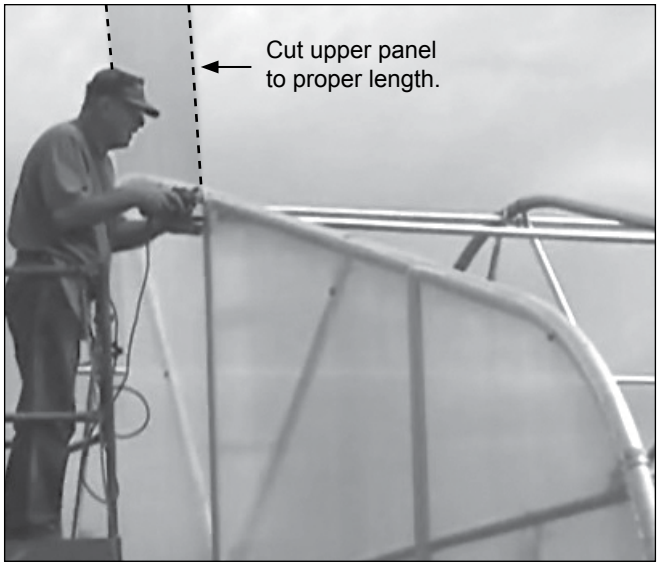
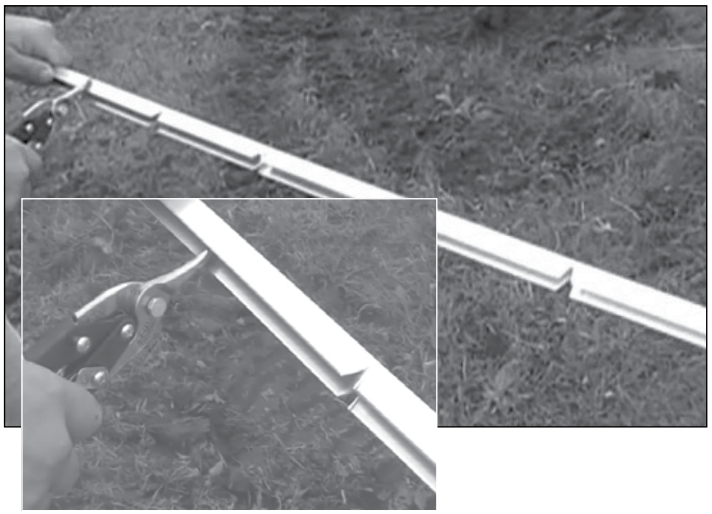


Photo shows removal of panel using a power tool equipped with a round cutting bit. (Greenhouse shown is used for illustration only. It is of a different model.)

9. After cutting panels, attach 104213 profile to upper (or outer) edge of all panels. ***See dashed line in diagram under previous step for profile location.***

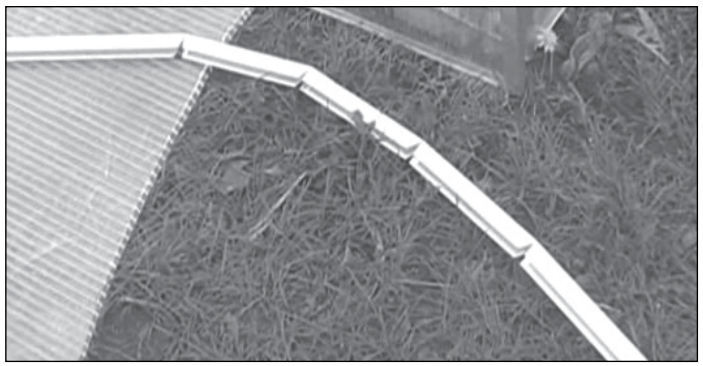
   NOTE: To bend U-profile (104213), prepare as shown:

   a. Cut angled notches from profile to allow bending.



   b. Distance between notches is determined by degree of bend.

   c. Bend U-channel profile at notches before installing.



10. Repeat procedures to install panels for remaining end wall. ***Review Quick Start diagrams for layout.***
11. Continue with **Double Door Assembly** procedures.

DOUBLE DOOR ASSEMBLY

The materials and parts needed to assemble the doors include:

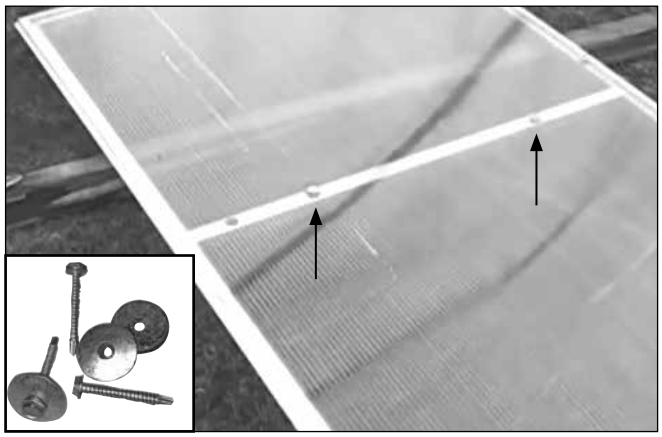
- 102923 door frames
- 4' x 8' polycarbonate panels
- Door hinges and latch hardware
- Aluminum U-Channel profile (#104213)
- End cap profile (#104548)
- Tek screws (FA4484B)
- Neo-bonded galvanized washers (#102921B)

ASSEMBLE AND ATTACH DOORS

NOTE: Install panels with UV-protected side to the outside.

1. Locate door frame (102923), assemble, and place on a flat surface.
2. Select one 4' x 8' panel and cut length to **91-3/4"**. This is 1/4" shorter than door frame.

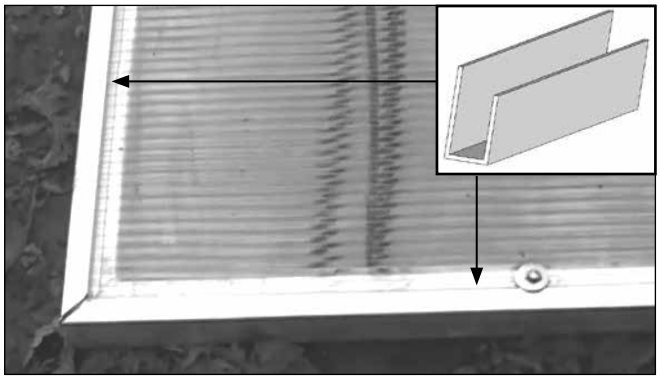
   NOTE: Trimming panel length as instructed keeps panel flush with door frame edge once the 104213 profile is installed. Panel width does not require cutting.
3. Place panel on door frame ***with UV-protected side to the outside.***
4. Use Tek screws (FA4484B) and neo-bonded washers (102921B) to attach panel to *horizontal cross tube of door frame*.



   NOTE: Attach panel in the locations shown above to hold panel in place while the 104213 profile is installed around perimeter of panel.

5. Measure, cut and install U-channel profile (104213) to all edges of the panel.

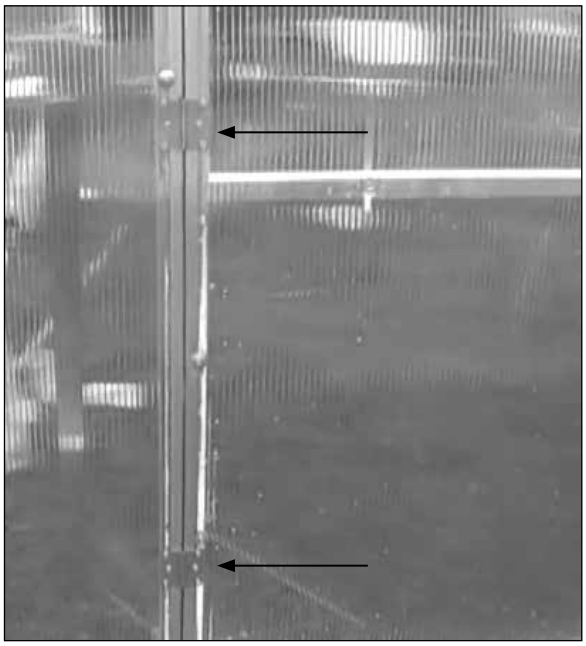
   Photo shows panel attached to the outside of the door frame and finished with U-channel. Corners are cut at 45° angles.



   To keep panel and profile in place, Tek screws and neo-bonded washers are installed so screw drills through longer edge of U-profile (underside of panel) and washer overlaps shorter edge of U-profile (top) as shown above.
6. Repeat steps to attach panel and to install profile to remaining door frame.
7. After assembling both doors, evenly space three (3) hinges along door frame of each door. Attach hinges to assembled doors using FA4484B Tek screws.

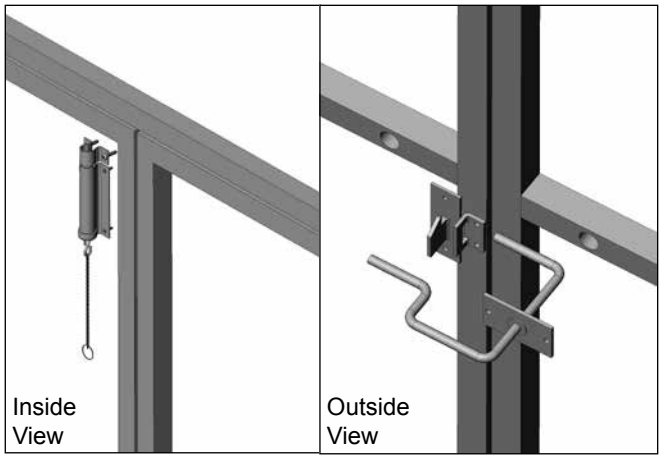
DOUBLE DOOR ASSEMBLY (continued)

8. Next, with assistance, lift door and attach to end wall frame using the long Tek screws.



Locations of door hinges may vary.

9. Install 6" chain bolt to upper part of the inside of one door and main latch assembly to other door.

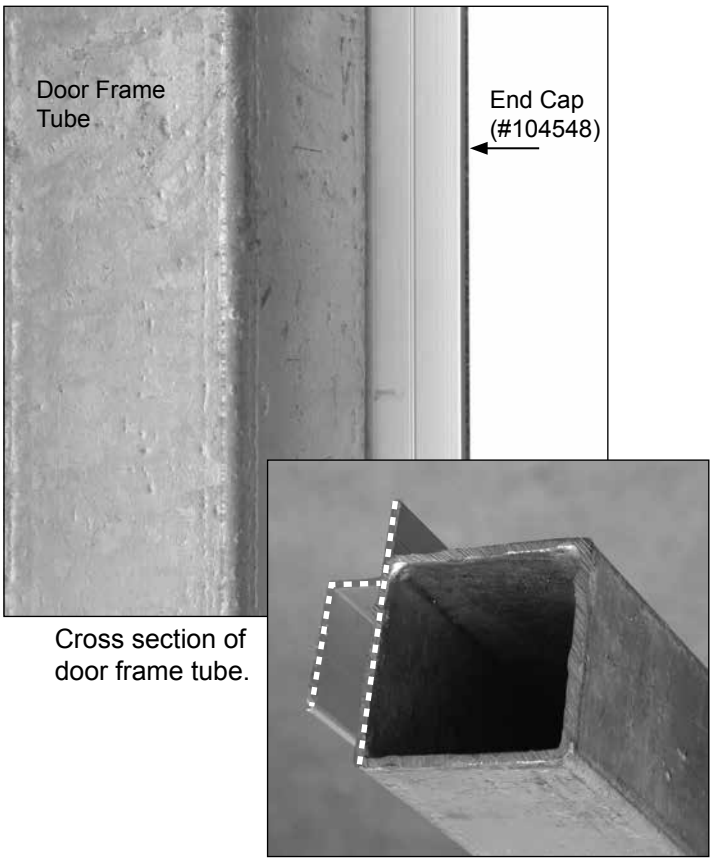


10. At top and sides of end wall door frame opening on the inside, attach end cap and allow it to extend below and into door frame opening.

    ATTENTION: This profile acts as a door stop, which prevents undo stress on hinges. Consult photos and info in right column.

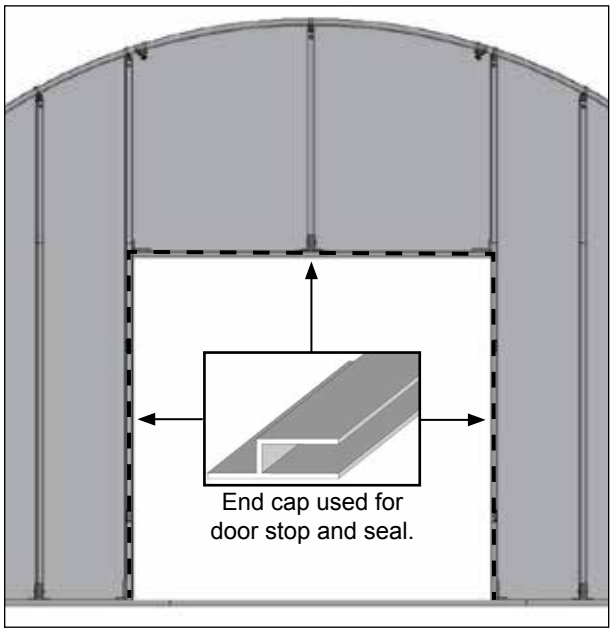
a. Photo shows end cap as attached to door frame tube. View shows assembly from the outside.

b. Cross section shows the end cap (dashed line) attached to the inside/back of the door frame.



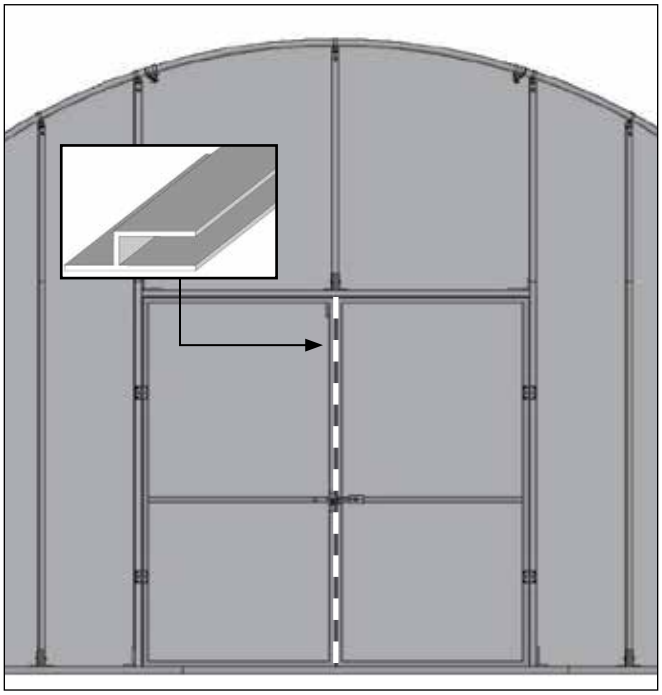
Cross section of door frame tube.

c. Dashed line identifies where to attach end cap profile. End cap extends beyond the frame members and into rough opening to stop door and to help seal gap between door and frame.



DOUBLE DOOR ASSEMBLY (continued)

11. Next, install another section of end cap on the *inside frame of the door that includes the chain latch.*



NOTE: This length of end cap will act as a stop for the remaining door of the double door when both doors are closed.

12. Check operation of the latches and doors.
13. Continue with **Main Cover Installation** procedure.

MAIN COVER INSTALLATION

After the end panels and doors are installed, install the main covers. The steps to install the cover include:

1. Attach poly latch U-Channel along the greenhouse sides and tops of the greenhouse *end rafters*.
2. Pull one cover film over the frame and attach to the end rafters.
3. Stretch and attach the first cover to the sides.
4. Install the Inflation Fan kit.
5. Attach a second cover layer to the frame.
6. Test the operation of the Inflation fan kit.
7. Install roll-up side kits and test.

INSTALL POLY LATCH U-CHANNEL

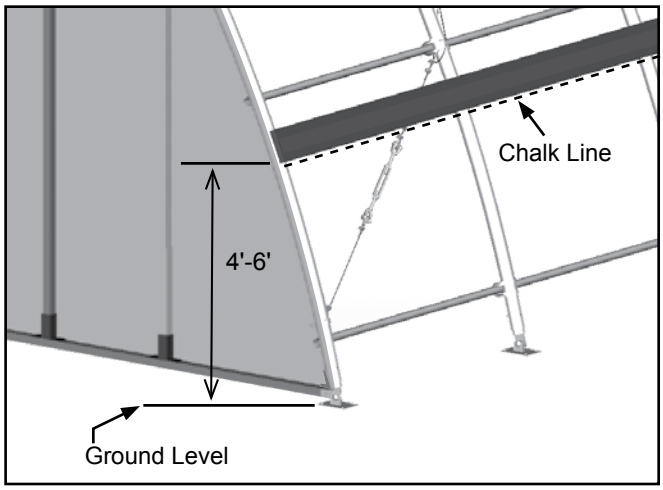
The double poly latch U-Channel (#104211) is attached to each side of the frame and runs from the front to the back of the shelter. The position of this U-Channel identifies the highest "open" position of the roll-up side panels. Tek screws are used to secure the U-Channel to each rafter and to secure 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 Channel (#104211): Sides
- Tek screws (#FA4482B)

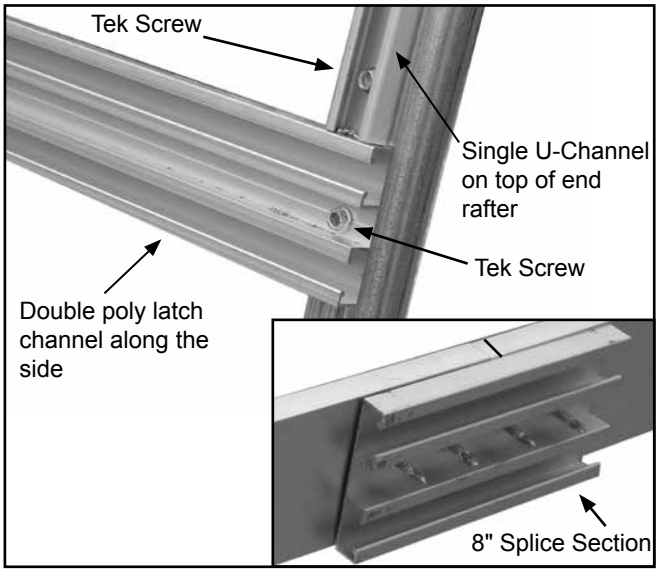
1. Measure the desired height (4'-6') to identify the top of the roll-up side and mark the location on the end rafter.



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 double poly latch channel.

INSTALL POLY LATCH U-CHANNEL (continued)

4. To begin, *cut one 8′ section* of double poly latch channel to 6' and attach the 6' section to the rafters using Tek screws. Attach the poly latch channel flush with the outside edge of the end rafter. Use the chalk line as a guide to position the poly latch channel.



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

5. The insert shows how to splice the joint between two sections of double poly latch 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 poly latch channel from the outside of the frame and into the 8" splice section.

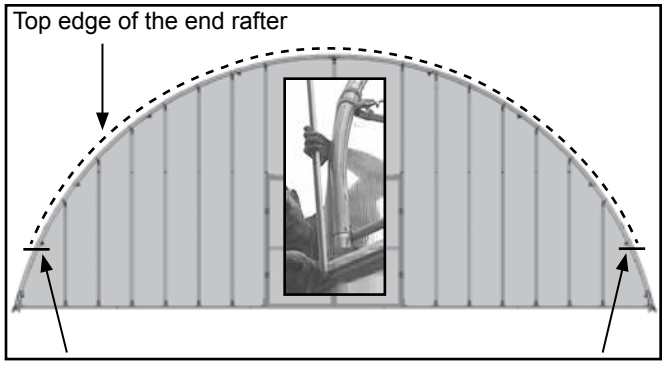
   Double poly latch is attached along the sides of the shelter only. Single poly latch is attached to the top of each end rafter.

6. 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 channel.*

7. Repeat these steps to secure the double poly latch channel to the other side of the frame.

8. After attaching the double poly latch to the sides of the frame, measure *between the two runs of double poly latch channel at one end rafter* to determine the length of the single U-Channel. See the dashed line below.



Location of the side runs of double poly latch channel. Insert may show a different model, same procedure.

9. 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.

   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.

10. Repeat the steps to install the single U-Channel at the remaining end of the frame.

11. Continue with the installation of the main cover.

INSTALL MAIN COVER

Gather the parts:

- Main covers and inflation fan kit
- U-Channel spring (#102198)
- Ropes long enough to reach over the frame (provided by customer)
- Box cutter or utility knife

Assembly Procedure
After the poly latch U-channel is attached to the frame, unpack the main cover and pull 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.

Consult the Spec Sheets for cover identification. The greenhouse is equipped with double-layer main cover and an inflation fan kit. One cover is pulled into position and anchored to the frame, then the inflation kit is installed, and finally the last main cover is attached.

INSTALL MAIN COVER (continued)

The steps that follow describe one way to complete this process.

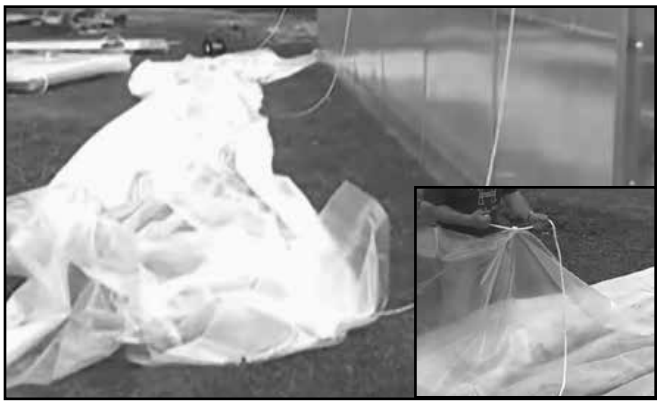
ATTENTION: Install the IR film cover first! Examine the IR film and install with the correct side facing in the direction indicated on the film.

1. Take the cover film and position it along the base of one side of the greenhouse.

NOTE: *Unfold the cover and locate the leading edge The frame shown in the photos that follow differs from actual frame. Procedure is the same.*

Photo shows the cover film in position to pull over the greenhouse.

2. Along the edge, make small holes in the cover at evenly spaced intervals and tie rope or straps to the cover.



NOTE: The ropes or straps must be long enough to reach over the top of the building to the other side. Long buildings require additional ropes to prevent tearing the main cover when it is pulled into place.

Keep the holes, used to attach the rope or straps, near the edge of the material and below where the cover will be secured to the U-channel.

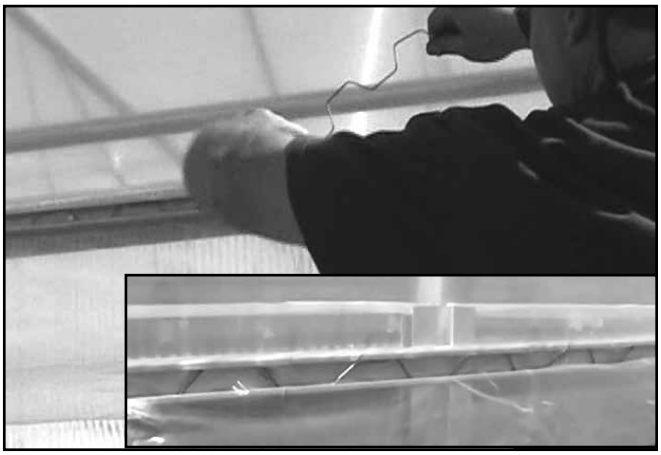
3. After tying the ropes to the main cover, throw the ropes over the top of the greenhouse and pull the covers into place.

Use ropes to pull cover over the greenhouse and onto the frame. ADDITIONAL ASSISTANCE IS REQUIRED.

Center cover side-to-side and end-to-end.

IMPORTANT: To prevent damage to the main cover during installation, additional personnel and lifts may be needed. ***Verify that you have installed the IR film according to the markings shown on the film.***

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.



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

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.

5. The rope can remain in place to temporarily secure the cover. Remove the ropes as the covers are secured to the greenhouse.

INSTALL MAIN COVER (continued)

6. As the spring is install 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 greenhouse.

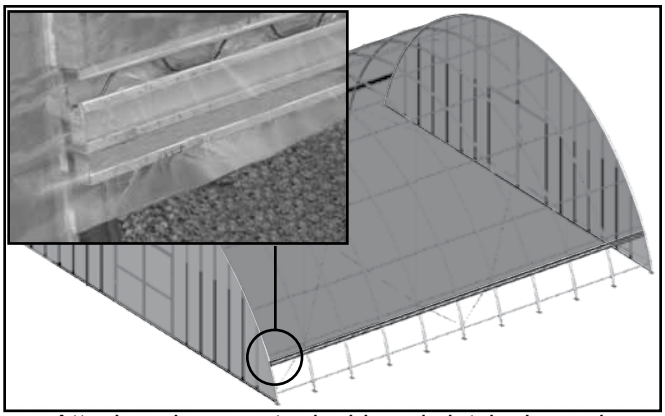
   NOTE: The cover material is cut longer/wider than is required to cover the greenhouse. For easier anchoring, allow approximately 10" to extend past the edge of the end rafter as the cover is anchored into place.

7. Stretch the cover to the other end of the building and repeat the steps to secure the main 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.

8. After the cover is stretched end-to-end and secured using the wire spring and single U-channel, 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 poly latch channel and work toward the other. *Use the upper channel of the poly latch channel to secure the main cover.*



Attach main cover to double poly latch channel.

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

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

10. Once the first cover is stretched and secure, install the inflation fan kit in the desired location and according to the instructions sent with the kit.

    Install the Inflation Fan Kit *before* installing the second main cover. Consult the instructions included with the Inflation Fan Kit to install the kit. Actual components may differ from example shown.

11. After installing the inflation fan kit, repeat the steps to install the film for the second main cover.

    NOTE: When installing the second cover film, use the same upper channel used for the first cover film, and a second run of spring, which is installed on top of the first U-channel spring already in the channel.

12. With the second cover film layer installed, test the operation of the inflation fan kit.

    IMPORTANT: If trimming the excess cover material at the ends and sides, DO NOT remove too much of the excess material.

    Some excess main cover material (the material that extends beyond the end rafters and sides) should remain in place to more easily re-stretch the film if needed.

13. Continue by installing the roll-up side panels.

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. Install roll-up panels.
2. Assemble the roll-up side conduit.
3. Attach the roll-up conduit to the bottom of the roll-up sides.
4. Assemble the Twist-of-the-Wrist assembly and attach it to the frame and the roll-up side.
5. Install the Anti-Billow Rope system.
6. Test the operation of the roll-up side.

INSTALL ROLL-UP PANELS

To this point, the main cover should be secured to the greenhouse and the roll-up side panels should be positioned along the sides at the base of the frame.

1. Unfold one roll-up panel and evenly stretch the roll-up panel out along the side of the greenhouse and center it from end-to-end.
2. Using the double poly latch channel and the wire spring, secure the top edge of the film in the *lower channel*.

Photo are used for illustration purposes only. Frame shown may differ from actual frame.

3. With the top edge secured, spread the free end of the panel out so that it hangs evenly from the secured edge.

4. Continue with the Install the **Roll-up Side Assemblies** procedure.

ASSEMBLE THE ROLL-UP SIDE CONDUIT

Gather the Parts:

- Pipe 1.315" x 75" swaged 17 GA (#131S0075)
- Pipe 1.315" x XX" plain 17 GA (#131P0XX)
- Tek screws (#FA4482B)

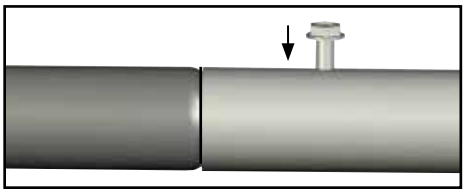
The roll-up side conduit assembly is attached to the bottom of the roll-up side cover material. This assembly runs the length of the frame and serves as the center pipe that the roll-up cover wraps around when it is opened to ventilate the shelter. *This conduit is identical to the purlins that were assembled and attached to the frame.*

NOTE: The number of pipes used in the roll-up conduit assembly varies with the length of the greenhouse.

Roll-up conduit assemblies consist of multiple sections of swaged 1.315" pipe at 75" in length (part #131S075) and one (1) additional plain 1.315" pipe at a shorter length (part #131P0XX) determined by the greenhouse, where XX represents the remaining length required to complete the roll-up conduit assembly and to reach the end of the greenhouse.

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

1. Locate all sections of pipe needed to assemble the cover conduit.
2. Insert the swaged end of each pipe into the plain end of another pipe until the conduit is assembled.
3. Secure each pipe joint with a Tek screw.



4. Place the assembled conduit at the base of the side where the end of the main cover is located.

   NOTE: Apply duct tape over Tek screws to prevent damage to main cover.

5. Repeat the steps to assemble the remaining cover conduit.
6. Continue with the procedure that follows to attach the conduit to the main cover.

ATTACH CONDUIT TO THE ROLL-UP SIDES

Gather the parts:

- Assembled conduits
- Fabric clips #CC6212 (Divide quantity in half.)
- Tek screws (#FA4482B)

To this point, the main cover layers are secured to the greenhouse and the roll-up portion along both sides are secured to and hanging down from the poly latch double U-channel.

1. Unfold the remaining portion of the roll-up sides (if needed) and evenly stretch it out on the ground along the frame.
2. *Working from the inside the frame*, roll the assembled cover conduit onto the edge of the roll-up side panel.
3. Verify that the side panel and conduit are evenly positioned and tuck the panel edge under the conduit and begin to turn the conduit in a clockwise direction.

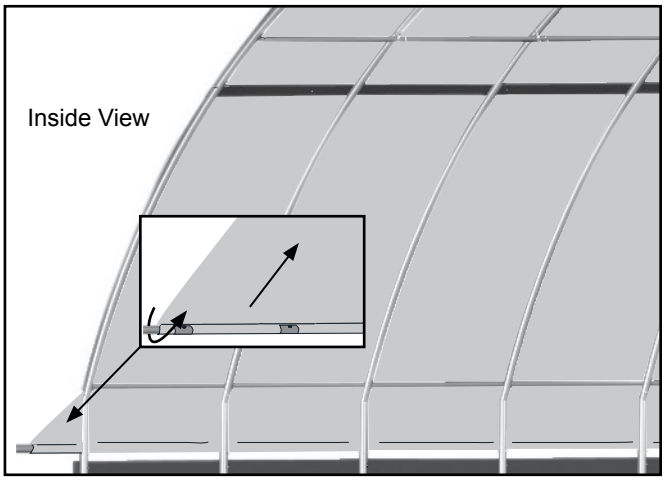


Diagram may show a different model and is used for illustration purposes only.

NOTE: If the conduit begins to turn inside the side panel material and is unable to roll up the side evenly, secure the side panel material to the conduit with Tek screws and fabric clips evenly spaced along the conduit.

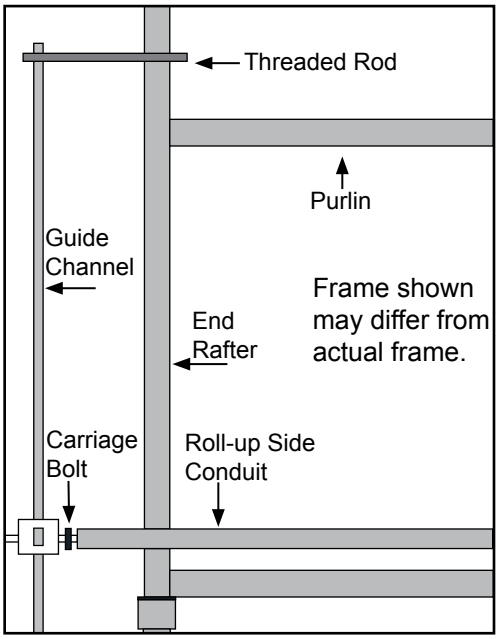
4. Continue to roll the conduit until the excess side panel material is wound around the conduit.
5. Repeat these steps for the other side of the shelter.
6. With the excess side panel material rolled up on the conduit assemblies, continue with the **Twist-of-the-Wrist Assembly** procedure.

TWIST-OF-THE-WRIST ASSEMBLY

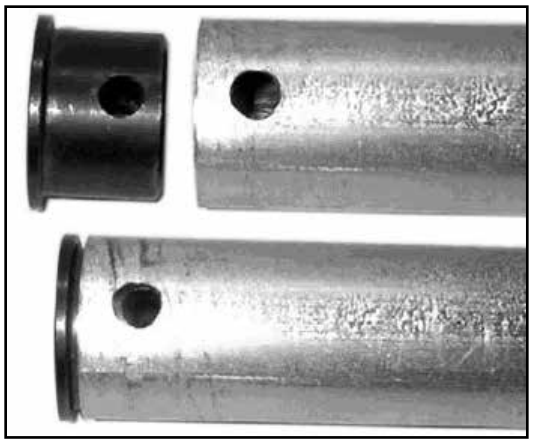
Gather the parts:

- Aluminum channel
- Drive handle
- Gearbox and gearbox drive
- Mounting plate
- Bearing and threaded rod
- 3/8" nuts and washers

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

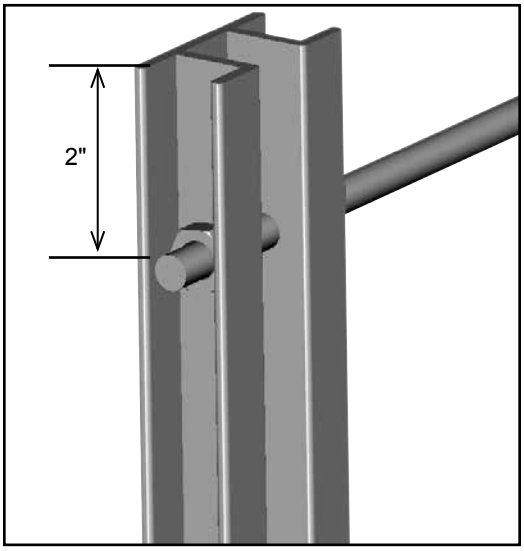


1. Drill a 5/16" hole through the cover conduit 1/2" from the end of the conduit.
2. Insert a tubing adapter into the conduit and align the holes of the adapter with the drilled holes in the conduit.



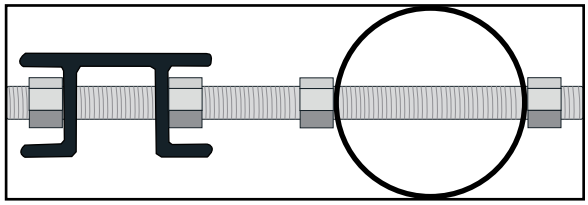
TWIST-OF-THE-WRIST ASSEMBLY (continued)

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



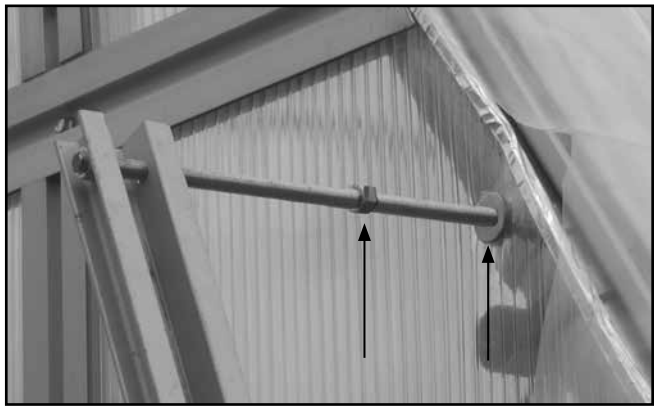
4. With lower end of the channel approximately 4" off the ground, position the channel along the rafter at the end of the building where the Twist-of-the-Wrist assembly will be located.

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.



Top View

NOTE: Install a flat washer between the nut and the end panel.

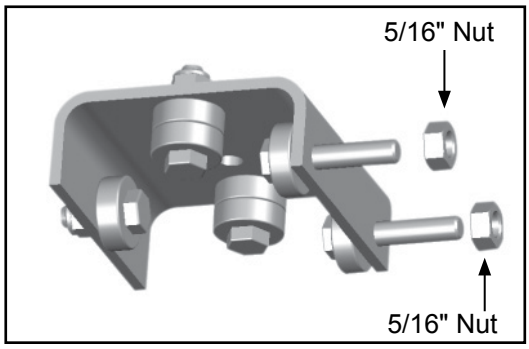


6. Select the bearing bracket and attach the bearings as needed. (In some instances, the bearings may come already attached.) Assemble as follows:

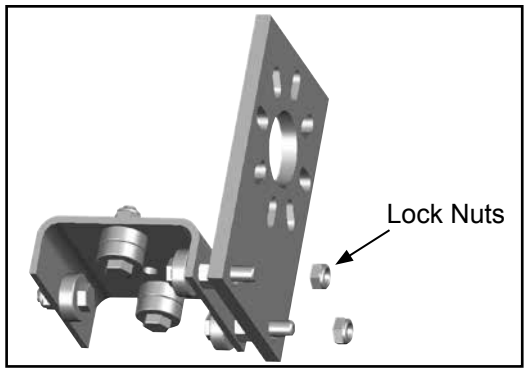
   NOTE: Single bearings are attached to the sides of the bracket and double bearings to the middle portion of the bracket. Use 1/4" hex bolts and locknuts as needed. Install a flat washer on both sides of each bearing to insure proper operation of bearings and the assembly.

7. 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.

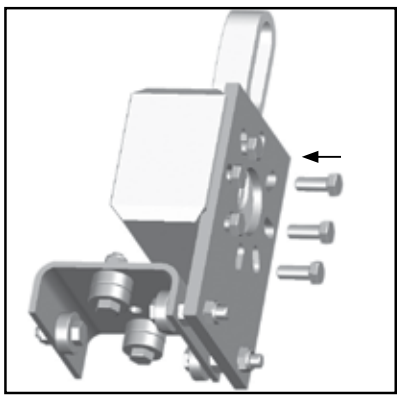
8. For the spacers on the long bolts, insert a 5/16" nut over each bolt. *These nuts are used as spacers only.*



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

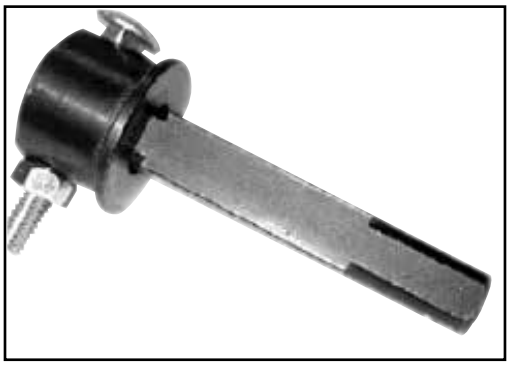


10. Attach the Twist-of-the-Wrist gearbox to the mounting plate using hex head bolts.

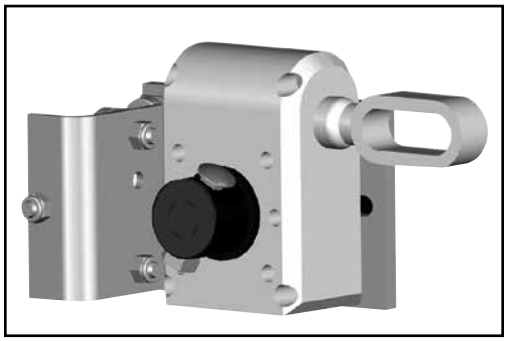


TWIST-OF-THE-WRIST ASSEMBLY (continued)

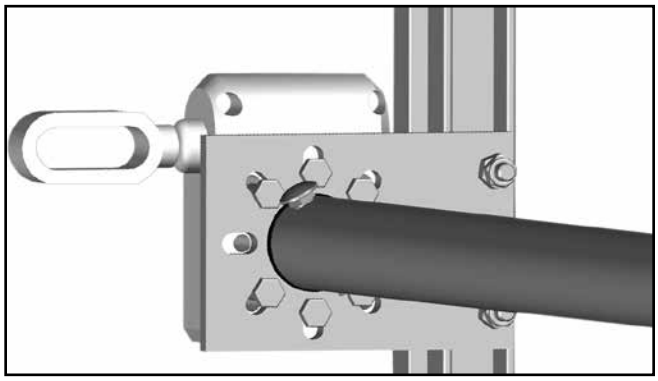
11. Using a carriage bolt, attach the square shaft to a tubing adapter.



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

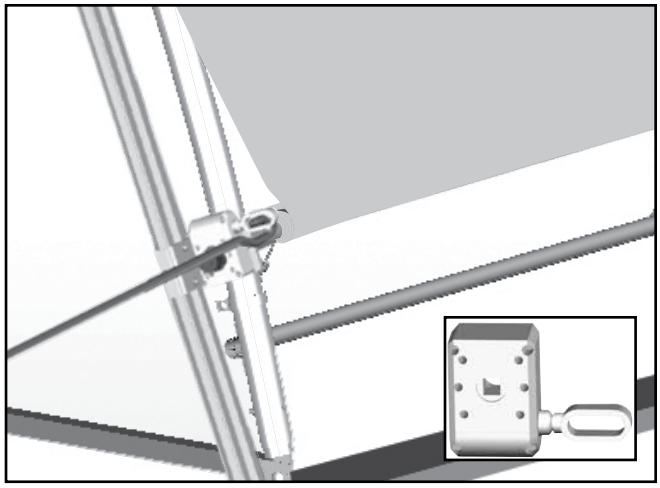


13. Slide the Twist-of-the-Wrist assembly onto the aluminum channel from the ground end. (This is the free end of the channel.)



14. Finish rolling the cover conduit in a clockwise motion up to the Twist-of-the-Wrist assembly.

15. Attach the rolled conduit to the square shaft of the assembly by inserting a carriage bolt through the hole in the conduit and tubing adapter. Tighten the nut.



16. Attach the crank handle to the Twist-of-the-Wrist assembly.

17. Test the operation of the Twist-of-the-Wrist assembly and repeat the steps for the remaining 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:

- Eyebolts (FA2061)
- Anti-Billow rope
- Nut (FALB01B) and Washer (FAME50B)

INSTALL ANTI-BILLOW ROPES IN SHORT SECTIONS ALONG EACH SIDE OF THE FRAME. DO NOT INSTALL AS A SINGLE ROPE. Complete the following steps:

ATTENTION: The procedure that follows is applicable when the frame was constructed using wood boards under each rafter foot, or if baseboards were installed. If the shelter was constructed on concrete footings, a concrete slab, or on bare ground, alternative steps must be taken by the owner during the following procedure to anchor the lower ends of the anti-billow ropes. *Additional parts may be required and must be supplied by the customer.*

1. Using the Twist-of-the-Wrist assembly, roll up the sidewall so that it is a few inches above the ground.
2. Drill a 3/8" hole into the wood baseboard at the base of the end rafter where the Twist-of-the-Wrist assembly is located, insert an eyebolt through the hole, and secure the eyebolt with a nut and washer.

INSTALL ANTI-BILLOW ROPES (continued)

ATTENTION: If no wood baseboard is present as required, additional steps must be take to anchor the lower portion of the anti-billow ropes. (Contact Customer Service at 1-800-245-9881 to purchase additional parts if needed.)

3. Move up the same end rafter and drill a 3/8" hole through the poly latch U-Channel and rafter leg, insert an eyebolt through the hole, and secure the eyebolt with a nut (FALB01B) and washer (FAME50B).

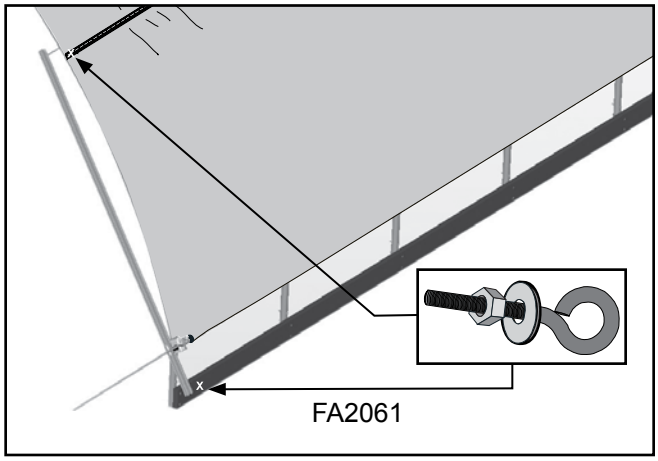
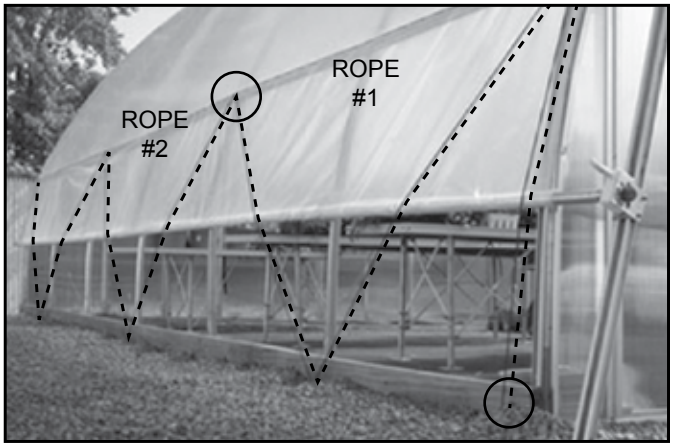


Diagram may show a different frame used for illustration purposes only.

NOTE: If the poly latch U-Channel was attached to a ribbon board (as suggested), the eyebolt can be mounted through the poly latch channel and ribbon board.

4. Attach the remaining eyebolts using the diagram below as a pattern guide.

5. Once all eyebolts are installed in the proper locations, install the anti-billow rope ***in short lengths along each side***. Thread the free end of the rope through the end rafter eyebolts and the eyebolts at two to three interior rafters.



Dotted line represents the anti-billow rope. The circles identify the ends of ROPE #1.

6. Cut the rope and tie one end to the eyebolt.

7. Pull the rope tight and tie the remaining end to secure.

8. Repeat the steps to install another section of anti-billow rope. Continue this pattern until all ropes are tied along one side and repeat the steps to install the anti-billow ropes for the remaining side.

NOTE: The number of individual ropes along any one side depends on the length of the building, rafter spacing, and the length of the rope sections.

9. Check the roll-up side operation. Adjust rope tension as needed.

10. 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 cover or covers to see that these are tight and in proper repair. Tighten and adjust the tension as needed to prevent damage and wear.
- Check the cable turnbuckles and cable clamps to see that these remain tight. Tighten as needed.
- Check connections and all fasteners to verify that they remain tight and in good condition.
- Check the polycarbonate panels to verify that these are secure and in good repair. Verify that nothing is touching the panels that may cause damage.
- Do not climb or stand on the greenhouse at anytime.
- Remove debris and objects that can accumulate on the greenhouse. 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 shelter to verify that nothing is touching the cover that could cause damage.
- If the shelter is dismantled and moved, inspect all parts and connections before using.
- Depending on the contents, construction of the shelter, shelter materials, and shelter location, the potential for condensation exists. GrowSpan™ offers several items that can be used to alleviate a condensation condition. Please contact a GrowSpan™ representative for additional information.
- For replacement or missing parts, call 1-800-245-9881 for assistance.

Space below is reserved for customer notes.

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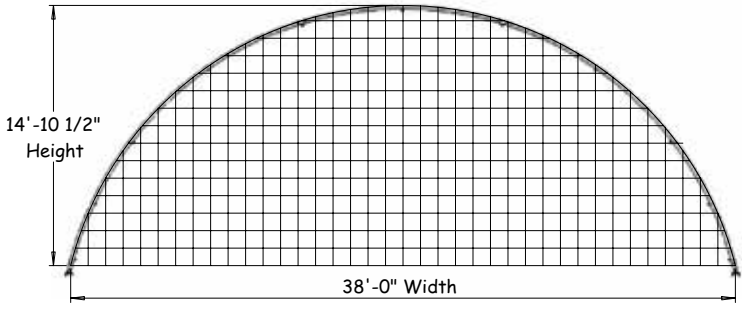
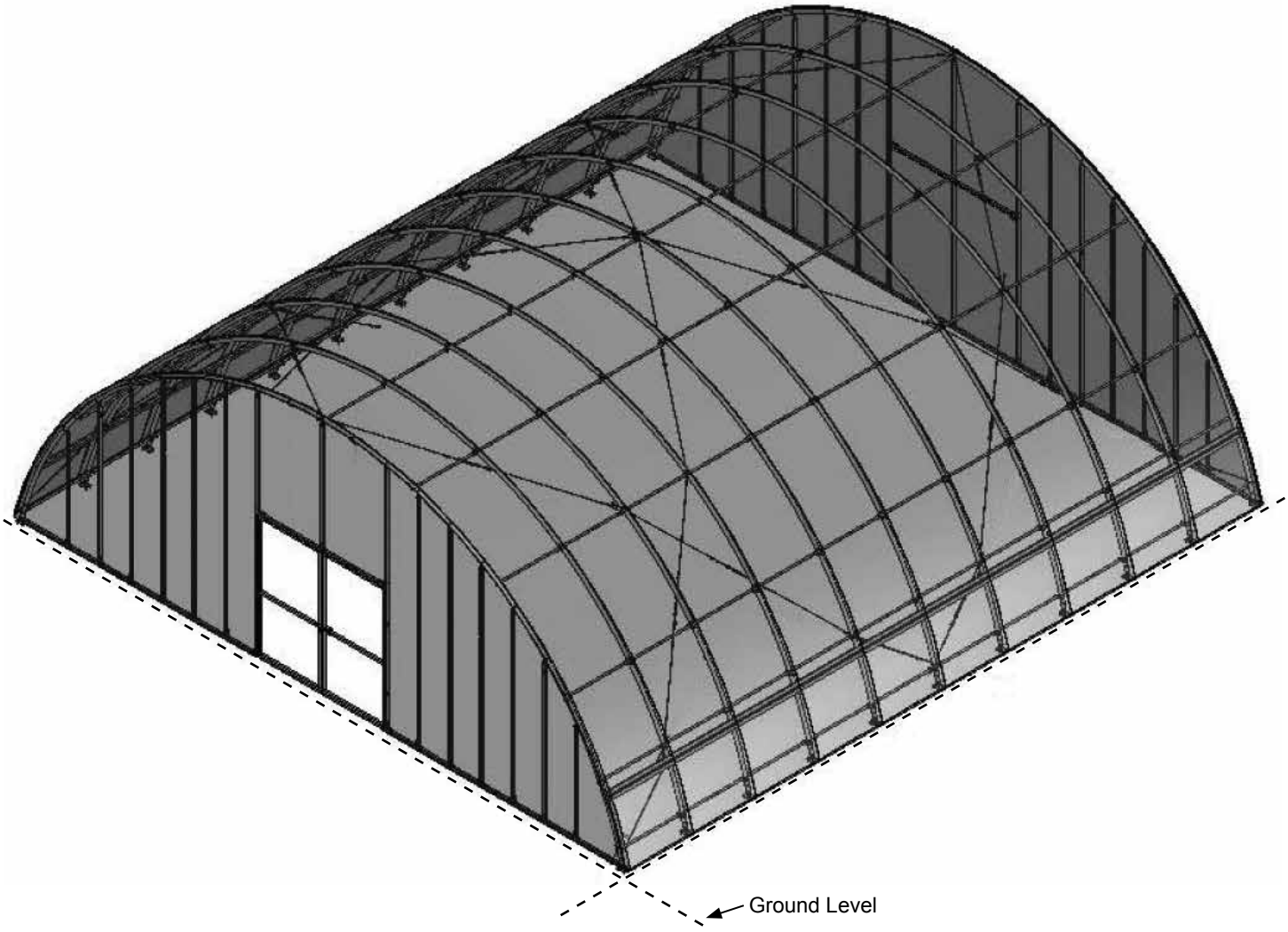
GROWspan™
greenhouse structures

QUICK START GUIDE

38' Round Pro Greenhouse

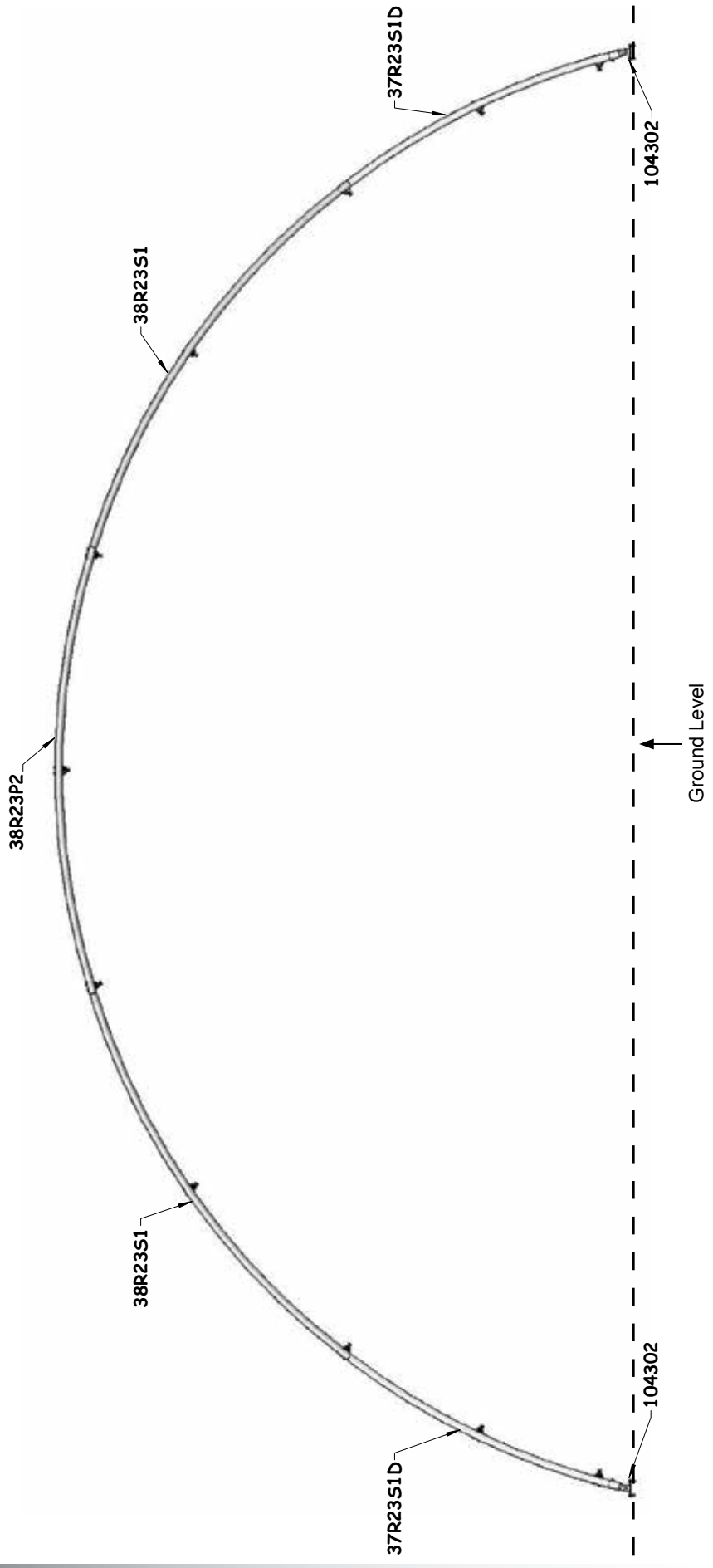


FRONT
Grid Represents 12" Squares

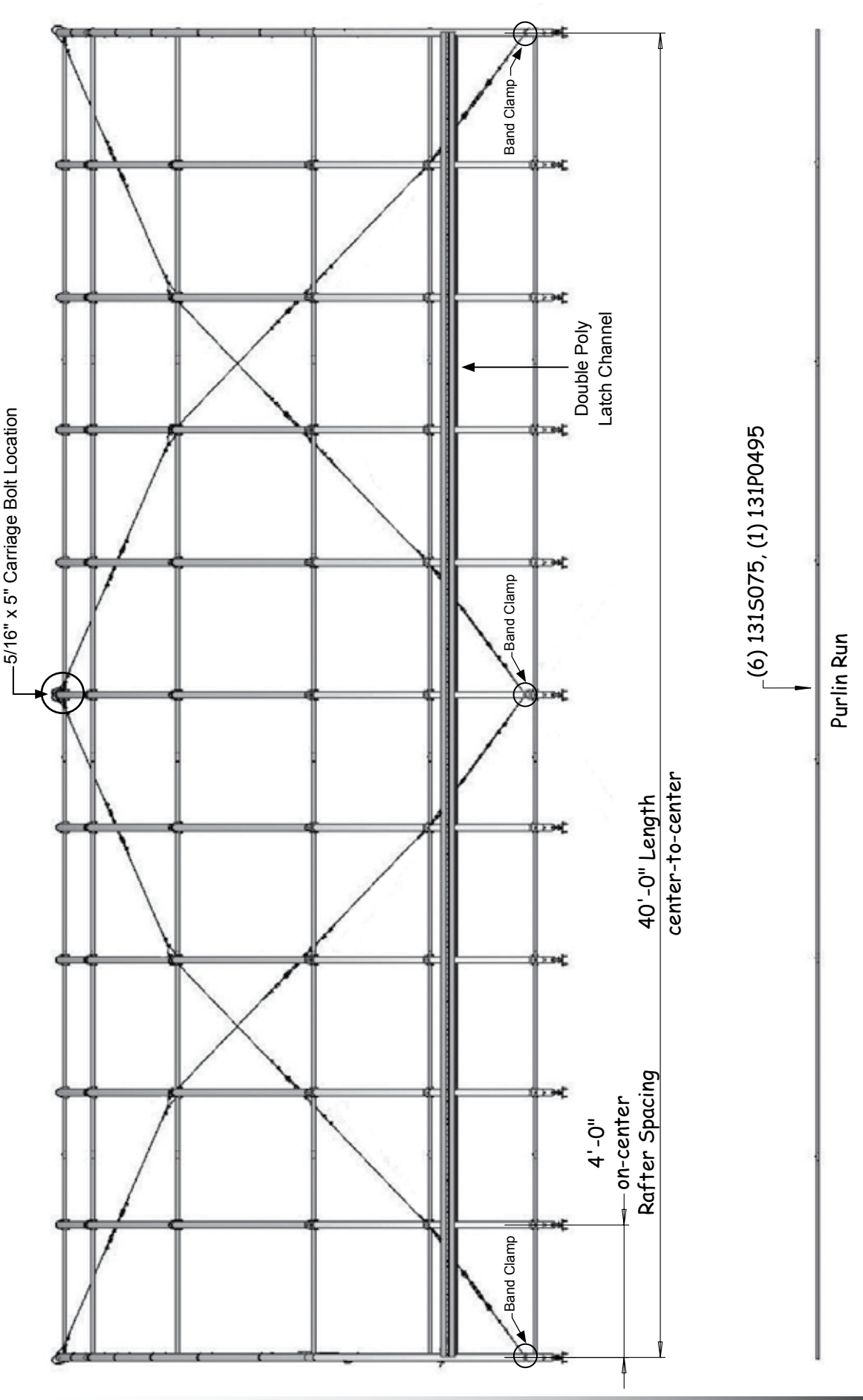


Frame shown may differ in length from actual frame.

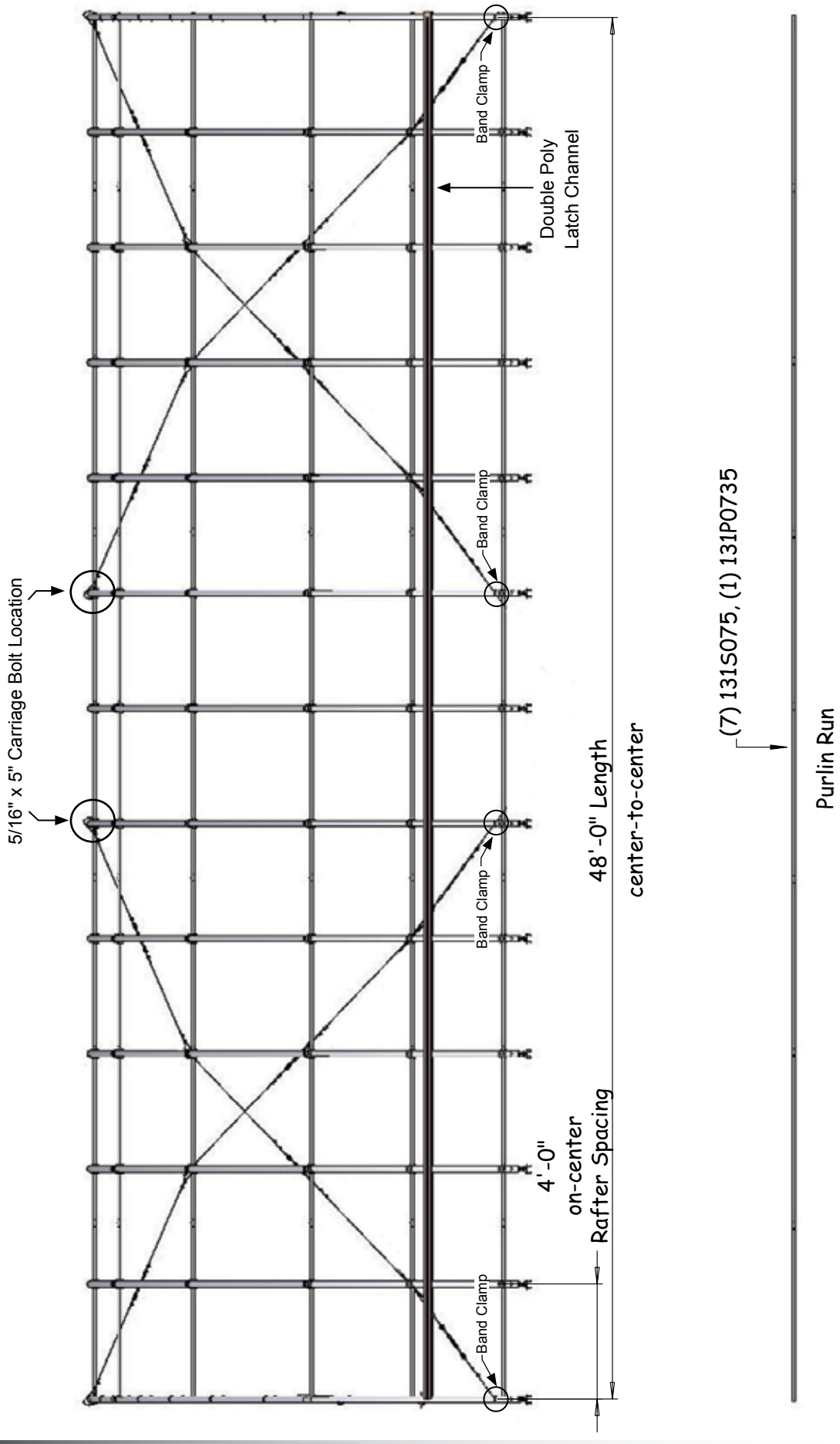
FRONT PROFILE



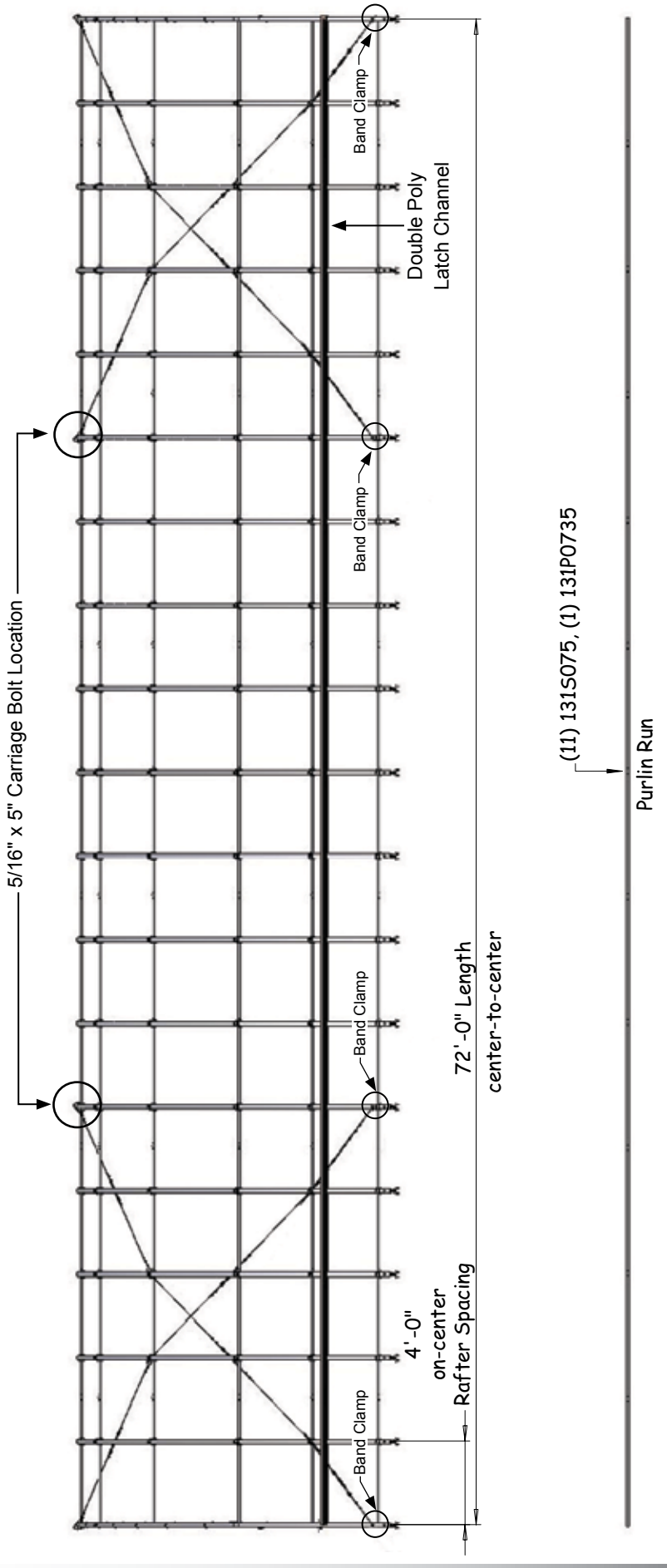
SIDE PROFILE - 104861



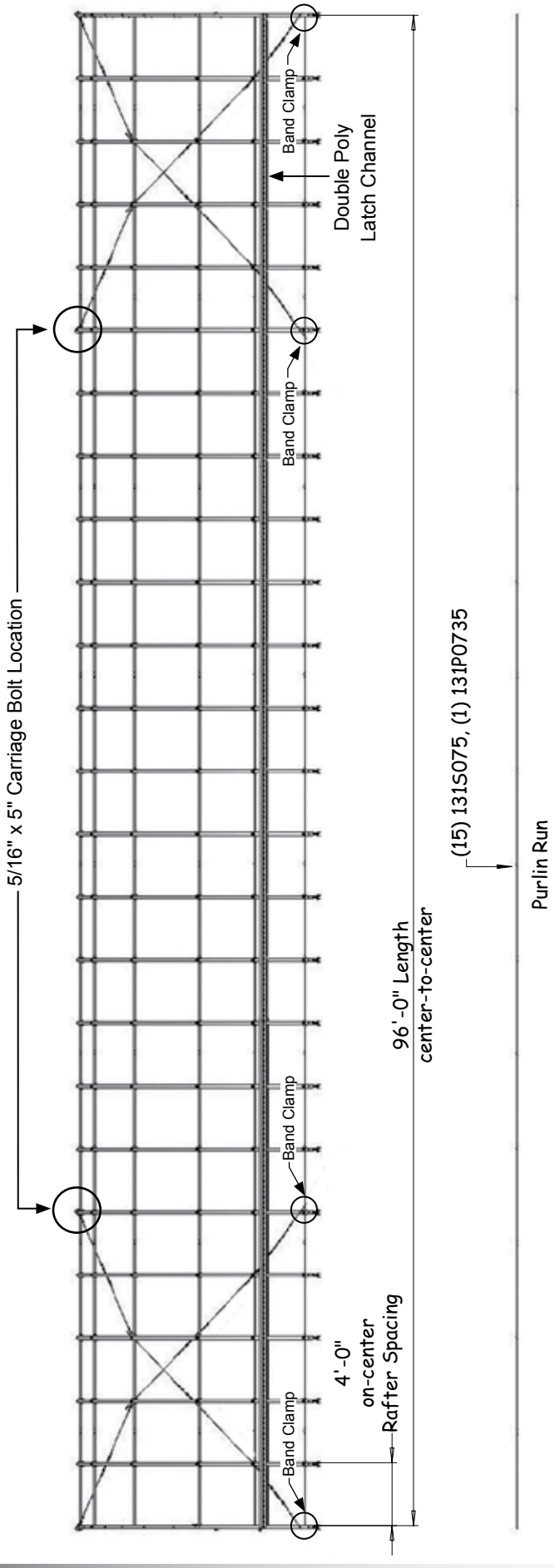
SIDE PROFILE - 104862



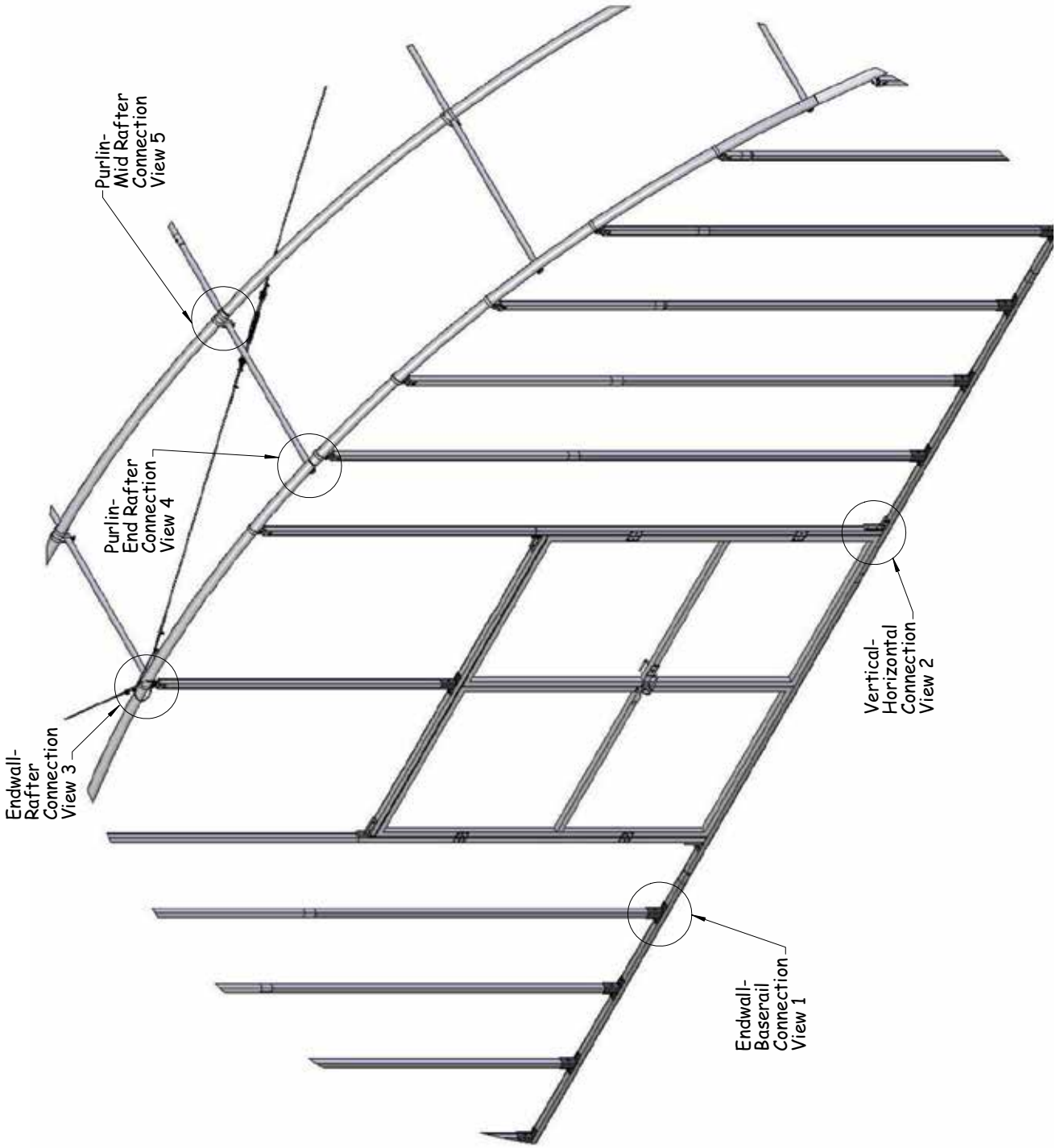
SIDE PROFILE - 104863



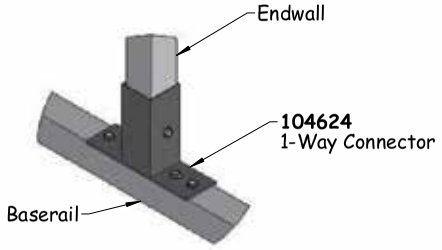
SIDE PROFILE - 104864



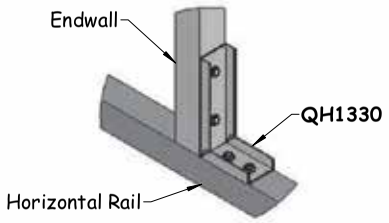
CONNECTIONS



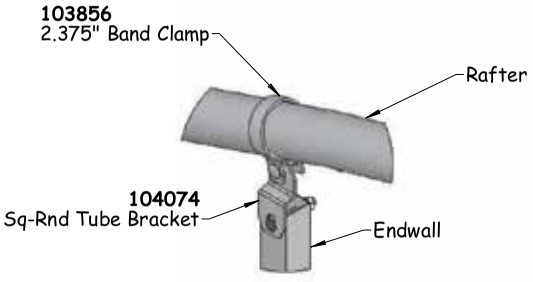
CONNECTION - DETAILS



View 1
Endwall- Baserail
Connection

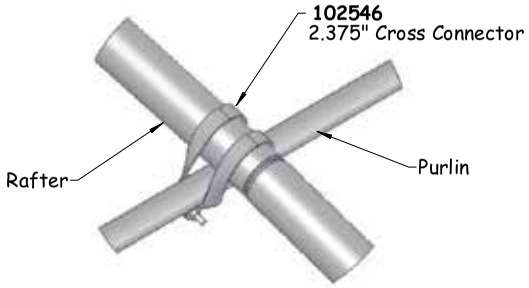


View 2
Vertical- Horizontal
Connection



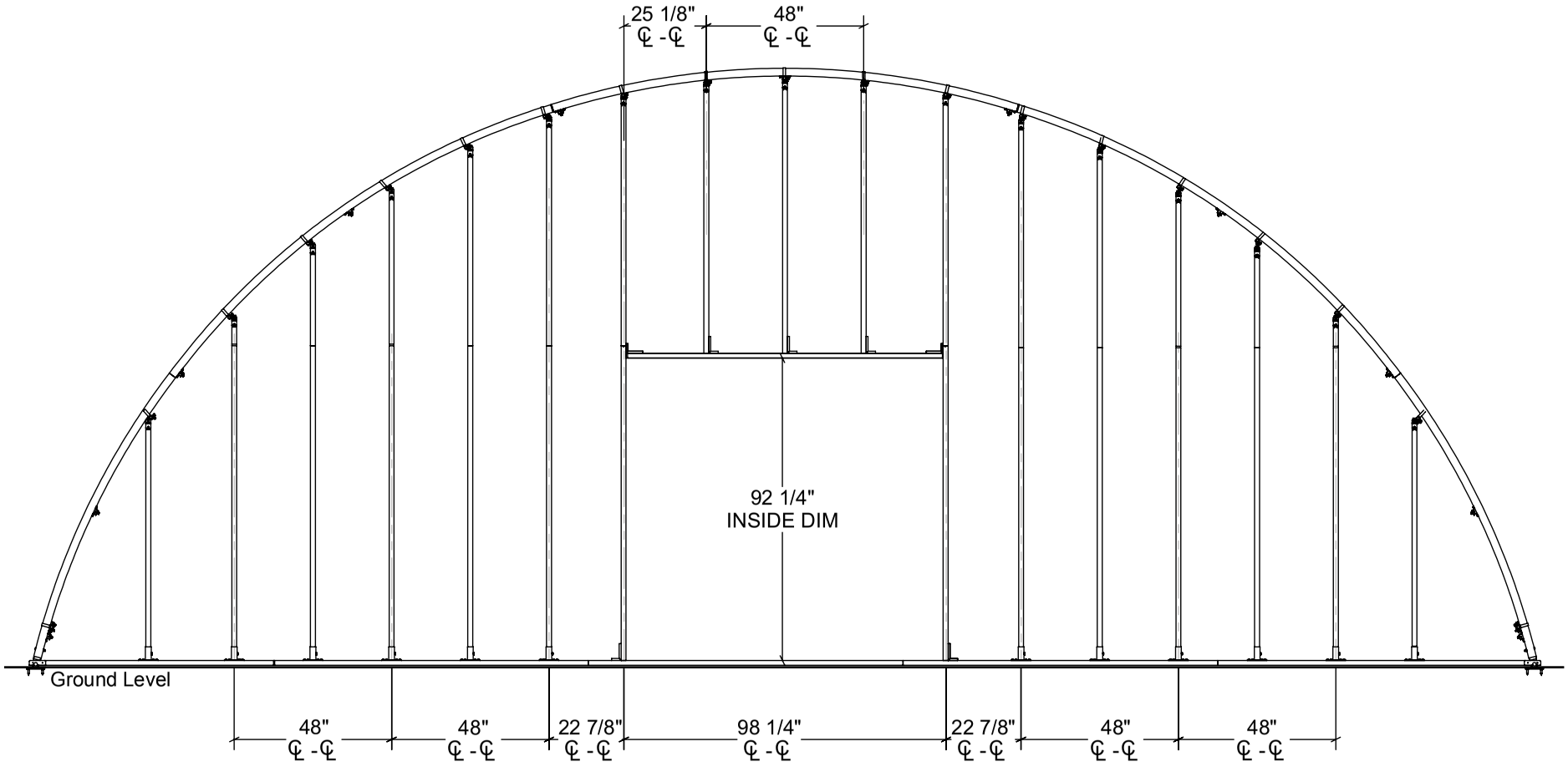
View 3
Rafter- Endwall
Connection

View 4
Purlin- End Rafter
Connection



View 5
Purlin- Mid Rafter
Connection

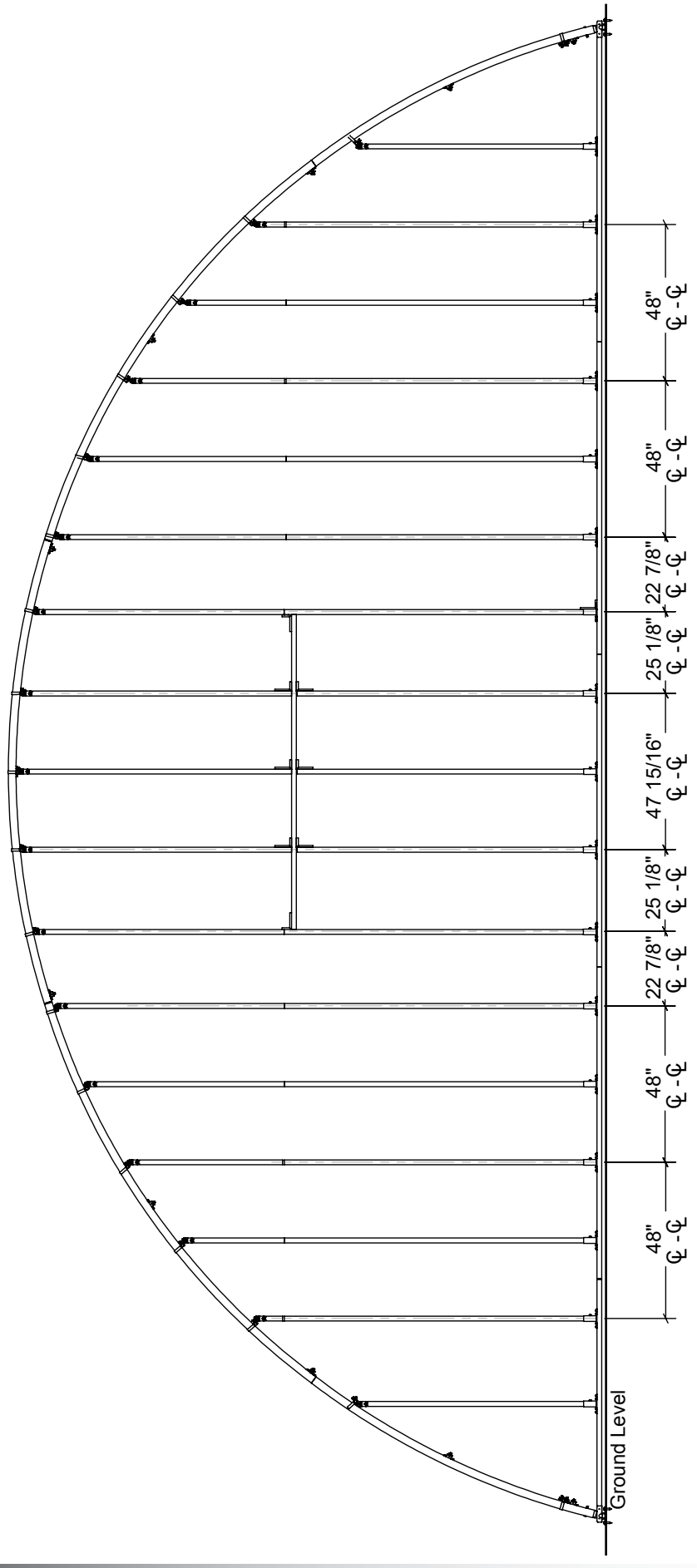
END FRAME DIAGRAM - FRONT VIEW



NOTE: COLUMNS NOT DIMENIONED HAVE A NON-CRITICAL PLACEMENT AND ARE USED FOR POLYCARBONATE SUPPORT.

ALL END FRAMING TUBES ARE FULL LENGTH OR CUT FROM 1 1/2" X 1 1/2" SQUARE TUBING.

END FRAME DIAGRAM - BACK VIEW



NOTE: COLUMNS NOT DIMENIONED HAVE A NON-CRITICAL PLACEMENT AND ARE USED FOR POLYCARBONATE SUPPORT.

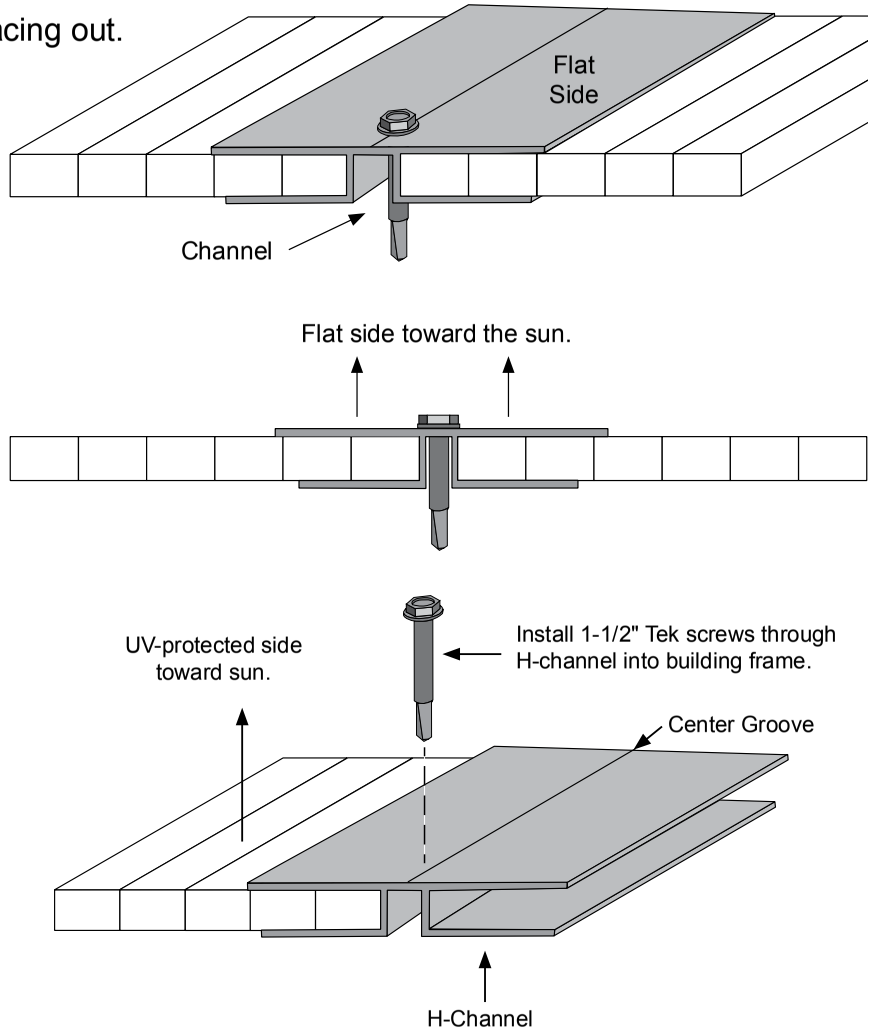
ALL END FRAMING TUBES ARE FULL LENGTH OR CUT FROM 1 1/2" X 1 1/2" SQUARE TUBING.

H-CHANNEL INSTALLATION INSTRUCTIONS

The new H-channel design requires installation of the flat side facing out with channel side toward the building. Some diagrams and photos in this document show installation of *original* H-channel with channel side facing out. Design of new H-channel *does not allow* channel-side out installation.

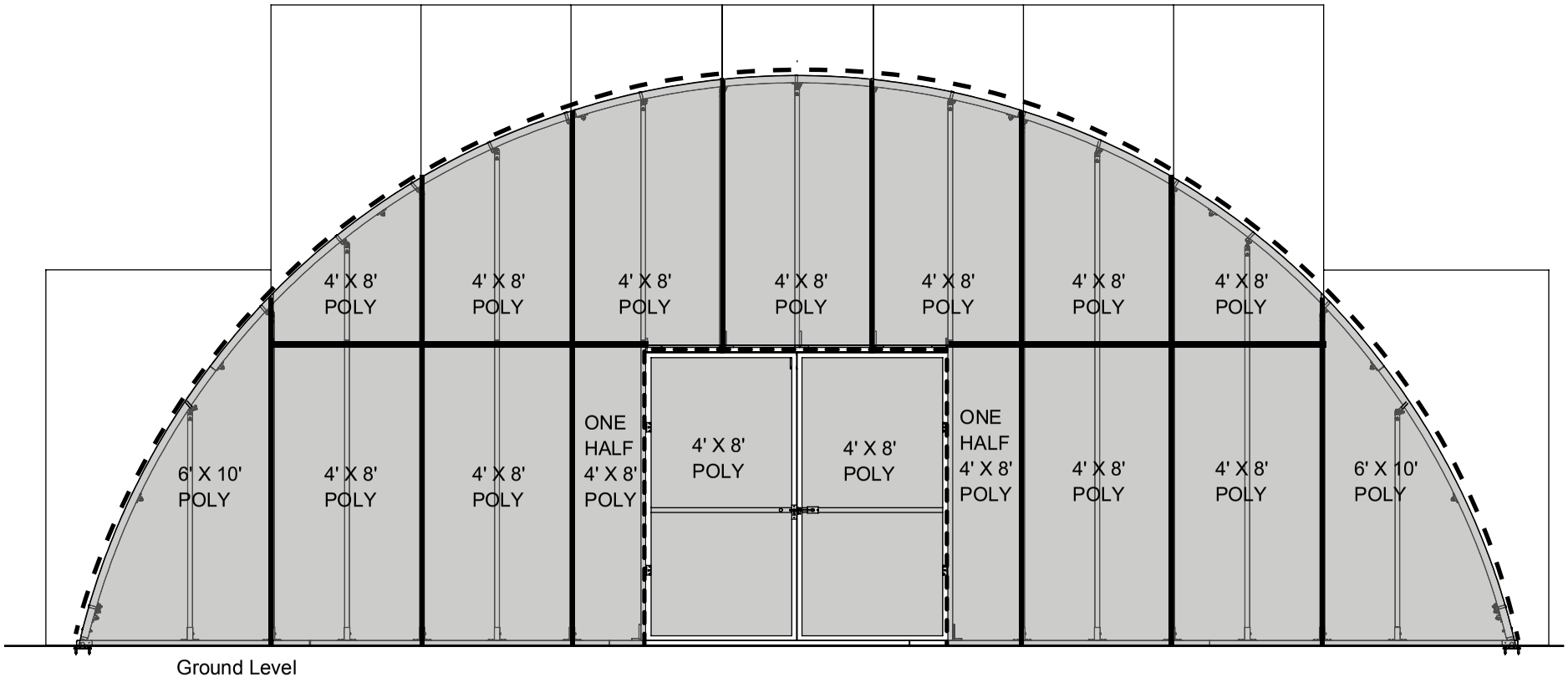
Use the diagrams on this page to install H-channel with flat side facing out.

ATTENTION: Use only 1-1/2" Tek screws to attach H-channel to building frame. ***Do not use shorter screws. They will not hold. Do not use washers on Tek screws when installing H-channel.***



ATTENTION: Install all twin-wall poly carbonate panels with UV-protected side toward the sun.

POLYCARBONATE PANELS - FRONT VIEW



NOTE: INSTALL UV-PROTECTED SIDE OF PANEL TO THE OUTSIDE.

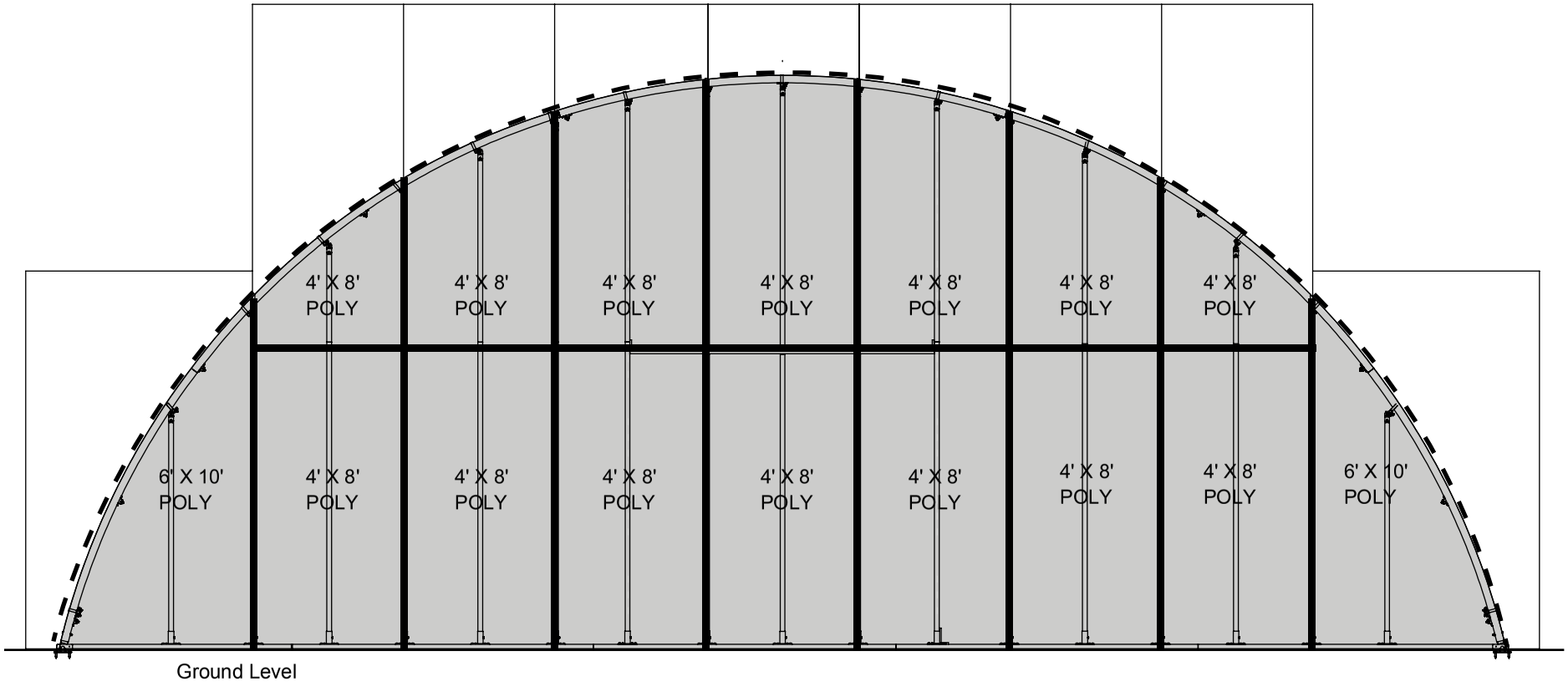
H-CHANNEL

U-CHANNEL

104213 U-Channel

8' H-Channel

POLYCARBONATE PANELS - BACK VIEW

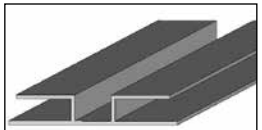


NOTE: INSTALL UV-PROTECTED SIDE OF PANEL TO THE OUTSIDE.

H-CHANNEL

U-CHANNEL PROFILE (104213)


104213 U-Channel


8' H-Channel

Space below is reserved for customer notes.