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Visit the **Maestro Acoustical Shell** web page at wengercorp.com for more information.

- Note:** Please read and understand these instructions before using or setting up.
- Note:** Review all of the Installation Drawings and Reference Drawings.
- Note:** It is recommended that three or more people work together during the assembly.
- Note:** If you need additional information, contact Wenger Corporation using the information below.

Important User Information

General

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In no event will Wenger Corporation be liable for technical or editorial omissions made herein, nor for direct, indirect, special, incidental, or consequential damages resulting from the use or defect of these instructions. The manufacturer reserves the right to change this product at any time.

The information in this document is not intended to cover all possible conditions and situations that might occur. The end user must exercise caution and common sense when assembling or installing Wenger Corporation products. If any questions or problems arise, call the Wenger Corporation at (800) 4WENGER (493-6437) or +1-507-455-4100 worldwide.

Manufacturer

The Maestro® Acoustical Ceiling is manufactured by:

Wenger Corporation
555 Park Drive
Owatonna, MN 55060
(800) 4WENGER (493-6437) • +1 (507) 455-4100
wengercorp.com

Intended Use

- The ceiling is intended for indoor use only and is not intended for outdoor use.
- Never expose the ceiling components to wind, humidity, or wet conditions.
- This product is intended to be assembled only as described in these instructions.

Installation

- The ceiling installation and use must comply with local regulations and codes.
- All personnel (including all temporary workers) installing or maintaining the ceiling must read and understand these and other related installation instructions.

Warranty

This product is guaranteed free of defects in materials and workmanship for two full years from date of shipment. A full warranty statement is available upon request.

Safety Precautions

Throughout this document you may find cautions and warnings which are defined as follows:

- **WARNING:** Failure to follow the instruction could result in serious injury or damage to property.
- **CAUTION:** Failure to follow the instruction could result in minor injury or damage to property.

Read all of these safety instructions before using the equipment.

⚠ WARNING	⚠ WARNING	⚠ WARNING
<i>Make sure that anyone working with the Maestro Acoustical Ceiling has read and understands these instructions.</i>	<i>Failure to comply with Warnings and Cautions in this document can result in damage to property or serious injury.</i>	<i>Always observe and comply with the Warnings and Cautions posted on the system equipment.</i>

Before Installation

Note: The weight of each ceiling assembly is calculated and does not include the weight of the rigging or rigging hardware.

Note: Unless specifically agreed by Wenger Corporation, all rigging and rigging hardware is furnished by the general contractor or facility owner.

⚠ WARNING	⚠ WARNING	⚠ CAUTION
<i>Make sure that all rigging and rigging hardware is capable of lifting the calculated weight of the ceiling assemblies.</i>	<i>Personnel must always wear a safety harness when working above the floor surface.</i>	<i>Components can be heavy or difficult to handle and may require three or more people working together to lift or assemble.</i>

1. Read and understand the entire ceiling installation section before starting the installation.
2. Make sure that all personnel installing (including any temporary workers) are trained and understand the installation procedure.
3. Review all installation drawings and reference drawings. Save these drawings for future reference.
4. Make sure that all items on the shipment packing list are present.

⚠ CAUTION
<i>To avoid damage to surfaces:</i> <ul style="list-style-type: none">• <i>Always wear gloves during assembly and installation.</i>• <i>Lay any finished surfaces onto the cardboard and foam packaging to help protect from damage.</i>• <i>During assembly, dropped hardware can roll under other components and cause damage to finished surfaces.</i>

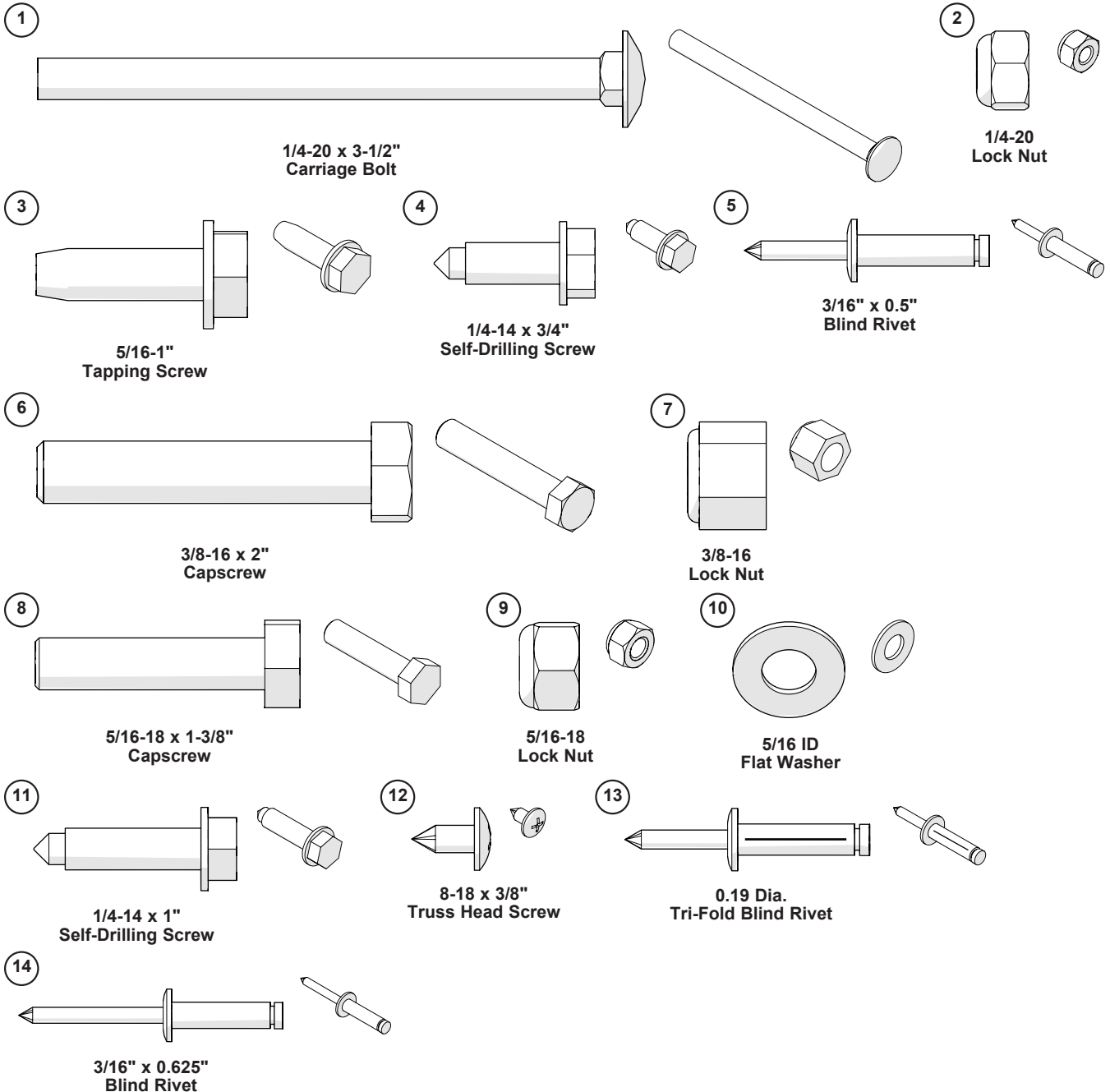
Required Tools

The following tools are required for assembly.

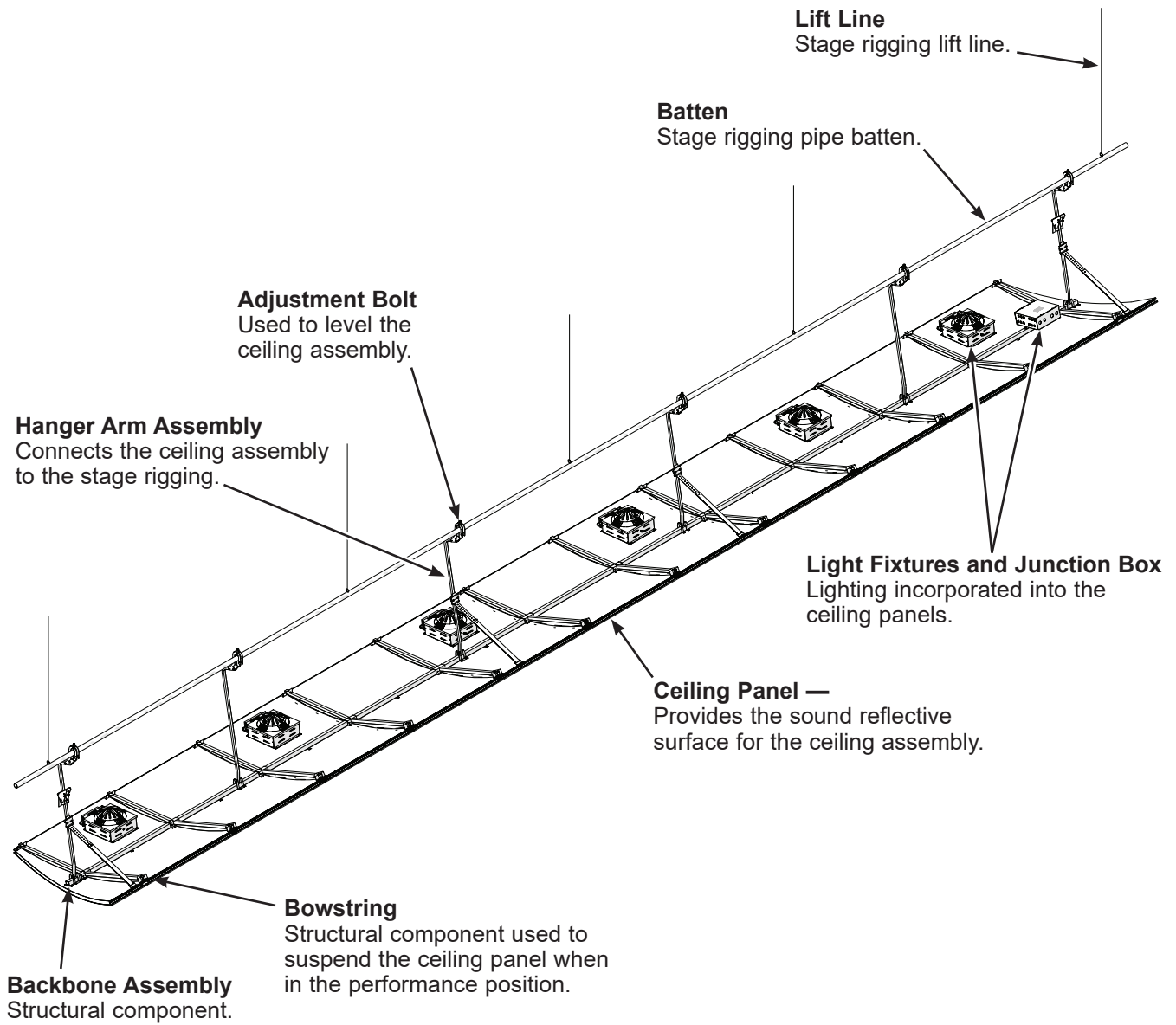
- Chalk line
- Tape measure
- Pencil
- Box cutter
- Cordless drill
- 3/8", 1/2" and 9/16" sockets
- 9/32" and 13/64" drill bits
- 13/64" drill stop (included)
- Rivet gun
- Metal bladed saw
- Box level

Fasteners

The fasteners shown below are contained in various Maestro hardware kits. Any fasteners remaining when an the installation is complete can be discarded.



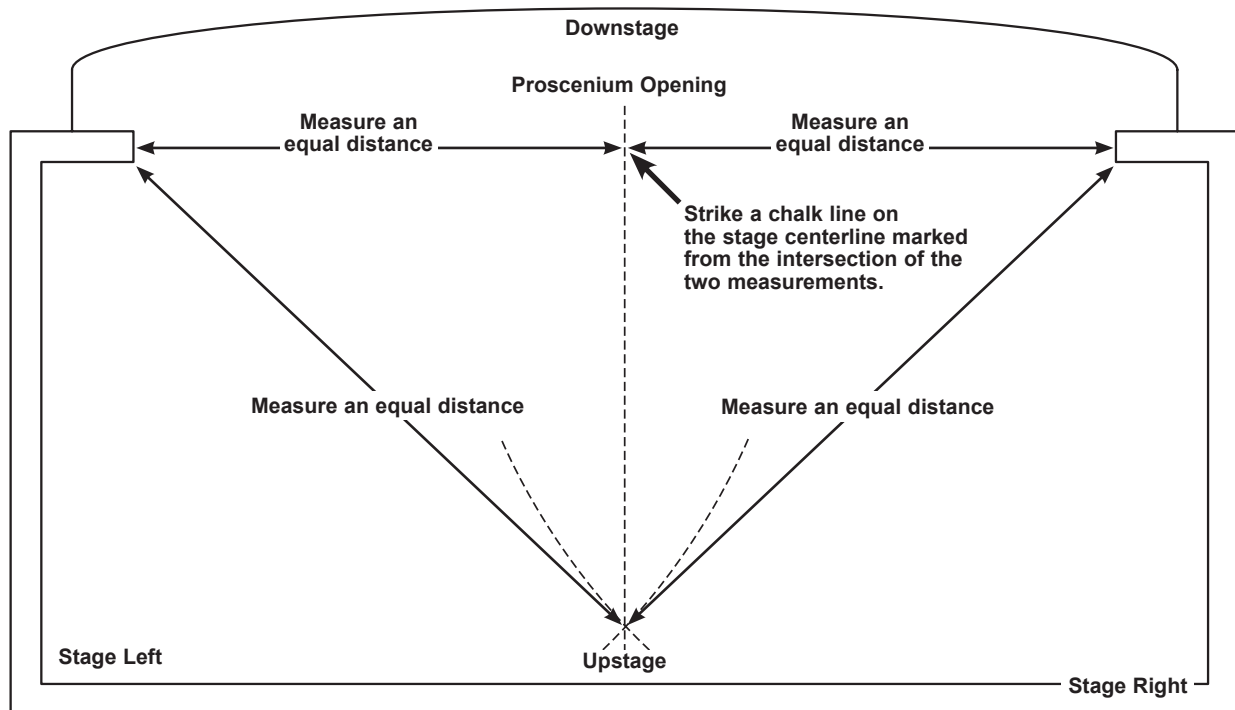
Ceiling Assembly Description



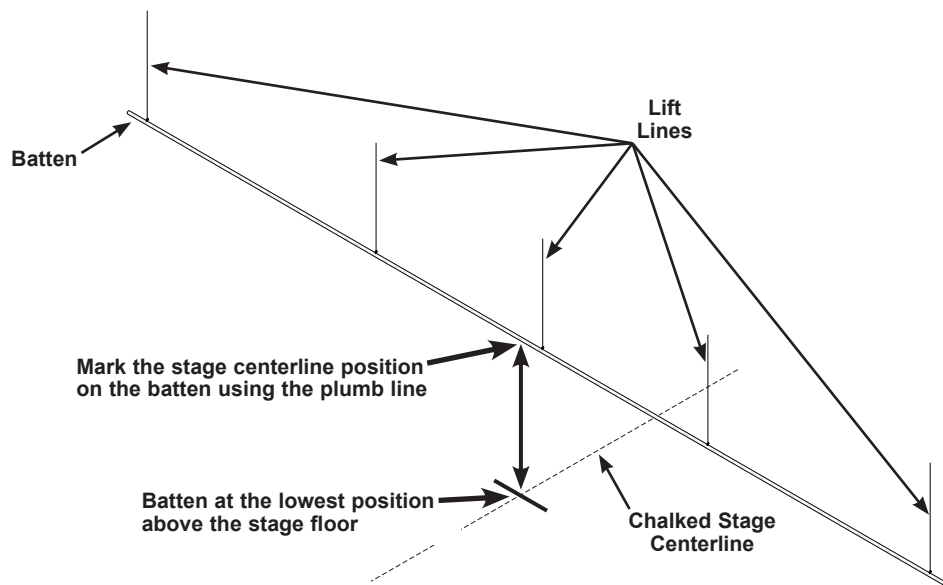
Ceiling Installation

Mark the Stage Area

1. Mark the centerline of the stage as follows. Refer to the illustration below.
 - a. Make sure that the line sets are in the correct position.
 - b. Mark the mid point downstage between the two sides of the proscenium.
 - c. Measure an equal distance from the two sides of the proscenium and mark the mid point upstage.
 - d. Snap a chalk line between the mid points marked upstage and downstage.



2. Place the battens or lift lines at the lowest position and mark the stage centerline position on the batten.



Ceiling Installation (continued)

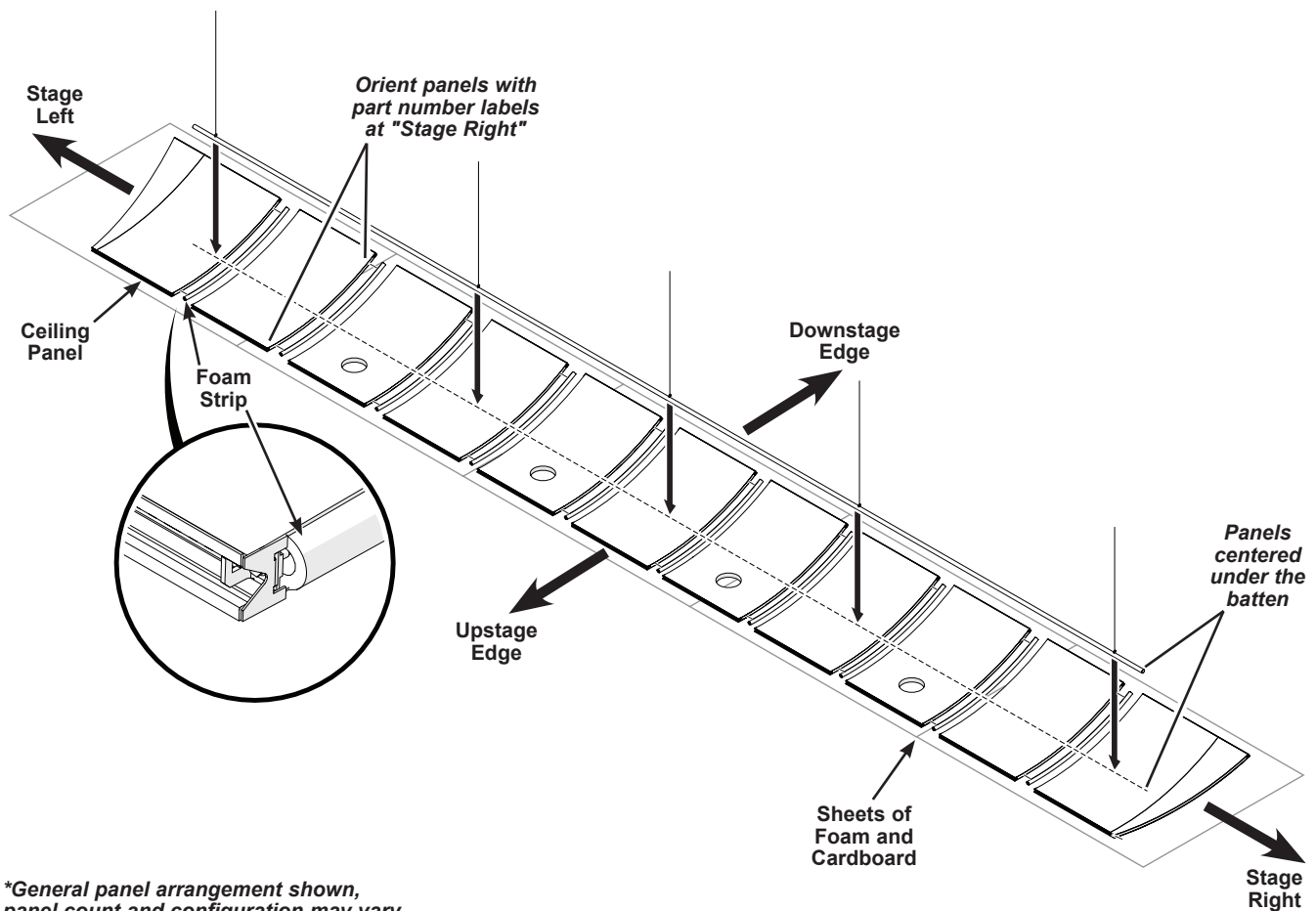


Always refer to the installation drawings for the location and arrangement of ceiling panels.

Arrange Ceiling Panels

Refer to the installation drawings for panel placement.

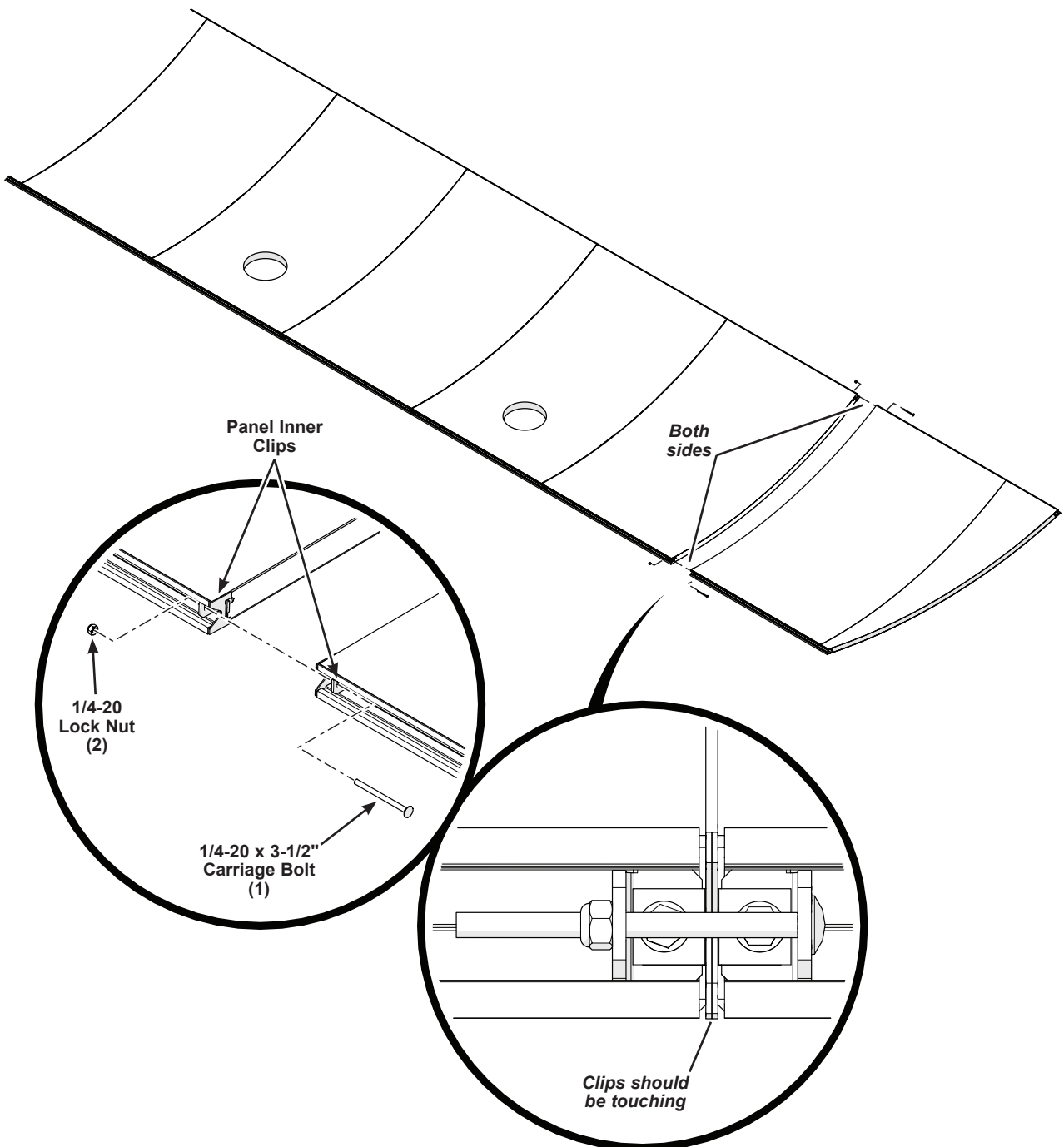
1. Sweep the floor around the assembly area and place sheets of foam and cardboard that shipped with the tower onto the floor surface to protect the panel surfaces.
2. According to the installation drawings, place the ceiling panels with the finished surface facing down onto the packaging materials and remove the tape holding any protective paper to the face of the panels. Orient the panels so the part number labels are at "Stage Right".
3. Where two panels join together, insert a foam strip into the recess of one of the two panels.
 - a. Trim the foam strip length if necessary.
 - b. Make sure that the foam strip is fully seated into the recess.



Ceiling Installation (continued)

Assemble Ceiling Panels

1. Connect all adjoining panels together.
 - a. Slide the panels together and align the edges.
 - b. Connect the two panel inner clips together using a 1/4-20 x 3-1/2" carriage bolt (1) and 1/4-20 lock nut (2). Tighten until just snug.
 - c. Repeat to connect the panels on the other side.



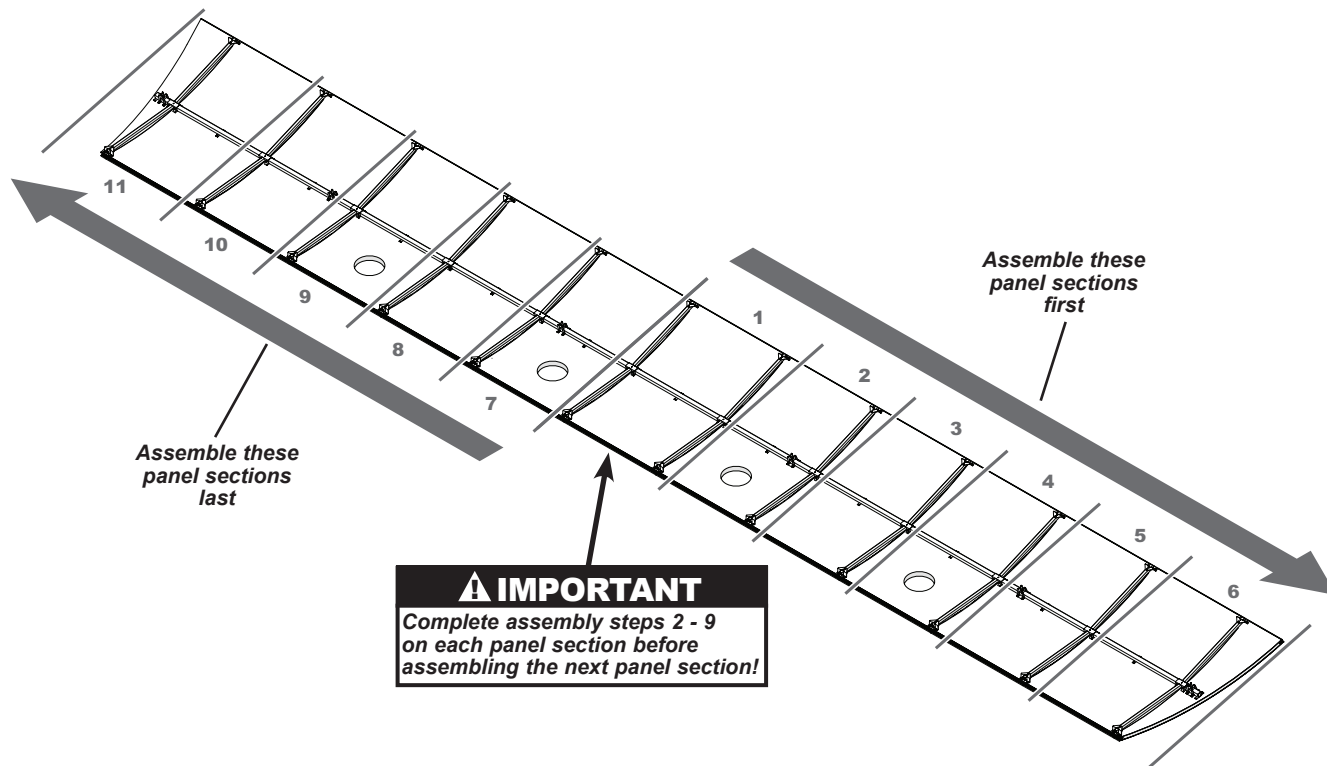
Ceiling Installation (continued)



Perform the following assembly steps 2 - 9 on a per panel basis in the order shown below.
Each individual panel section must be assembled before moving on to the next panel section.

Assemble Ceiling Panels (continued)

For steps 2 - 9, start at the panel section closest to the middle and work outward to the end. Then repeat on the other side.

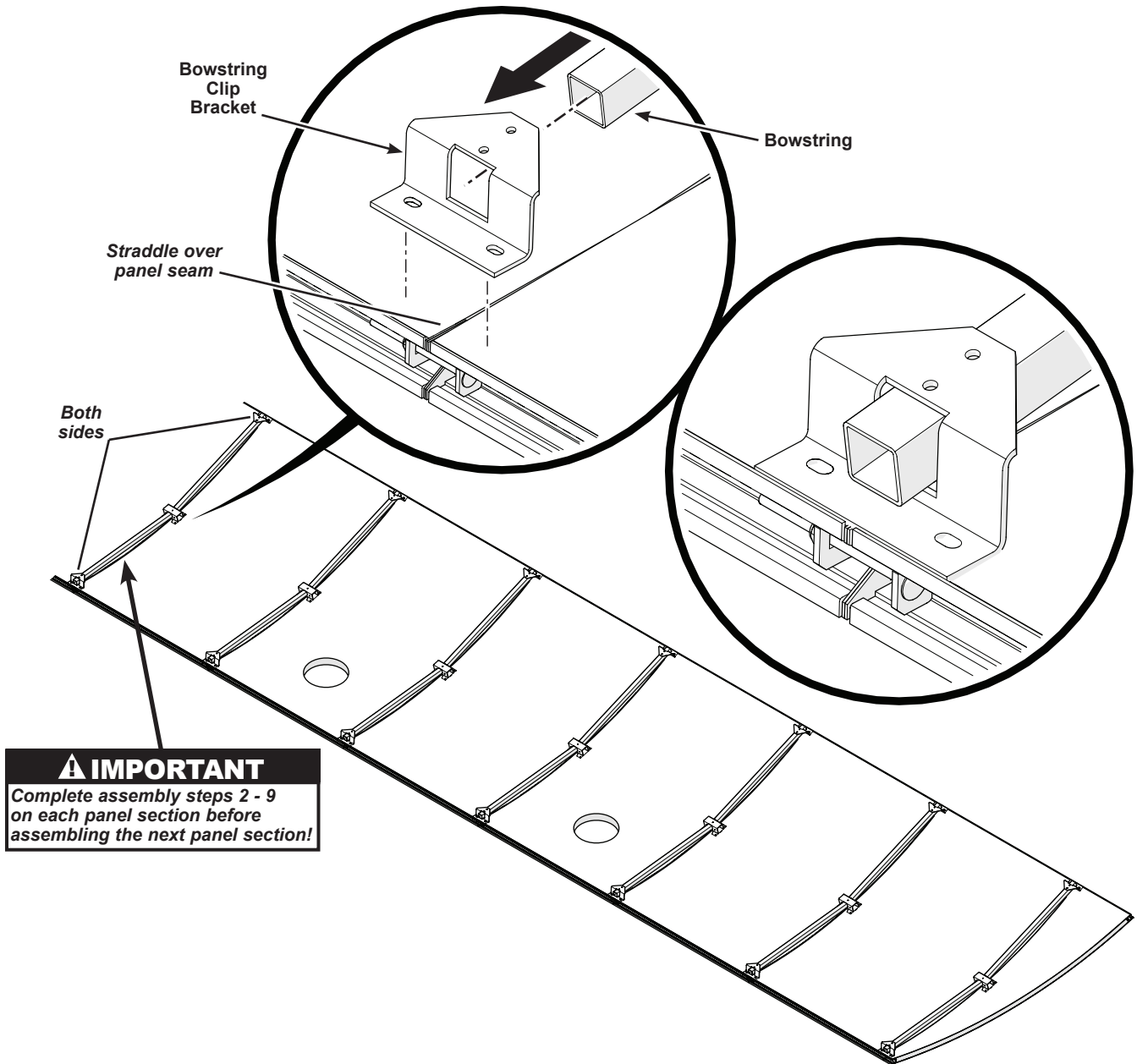


*General panel arrangement shown, actual panel count and configuration may vary.

Ceiling Installation (continued)

Assemble Ceiling Panels (continued)

- Slide one bowstring clip bracket onto both ends of a bowstring and straddle over both ends of the panel seam as shown.



Ceiling Installation (continued)

Assemble Ceiling Panels (continued)

3. Attach the middle of the bowstring to the panel.
 - a. At all four hole locations, use a 13/64" bit to drill a pilot hole through the bowstring hole locations and upper panel surface only.

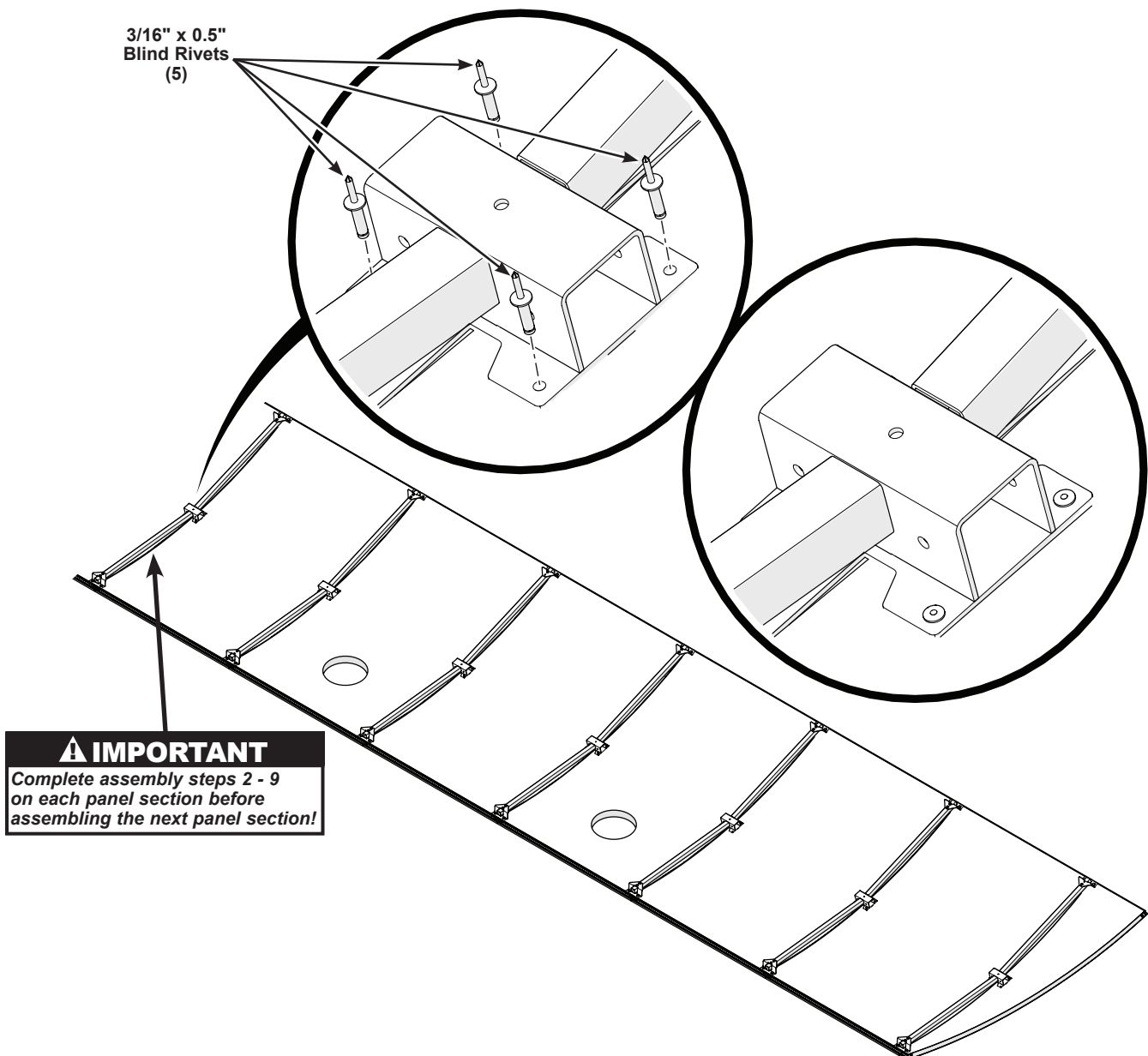
Use the included 13/64" drill stop to prevent drilling into the lower panel surface.

CAUTION

**Drill through the upper panel surface only.
Do not drill into the lower panel surface.**

Clean away any shavings from drilling.

- b. Attach the brackets to the bowstring using four 3/16" x 0.5" blind rivets (5).



Ceiling Installation (continued)

Assemble Ceiling Panels (continued)

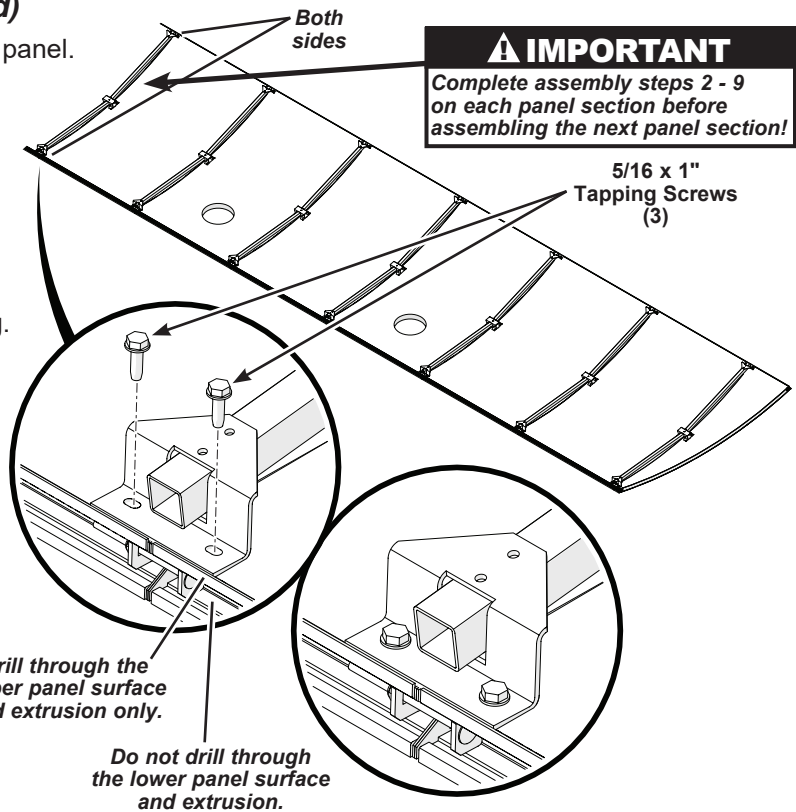
4. Attach both bowstring clip brackets to the panel.

- a. With both brackets in position, use a 9/32" bit to drill a pilot hole through the upper panel surface and extrusion only into each bracket hole location. **Do not drill through the lower panel surface and extrusion on the other side.** Clean away any shavings from drilling.

CAUTION
Drill through the upper panel surface and extrusion only. Do not drill through the lower panel surface and extrusion on the other side.

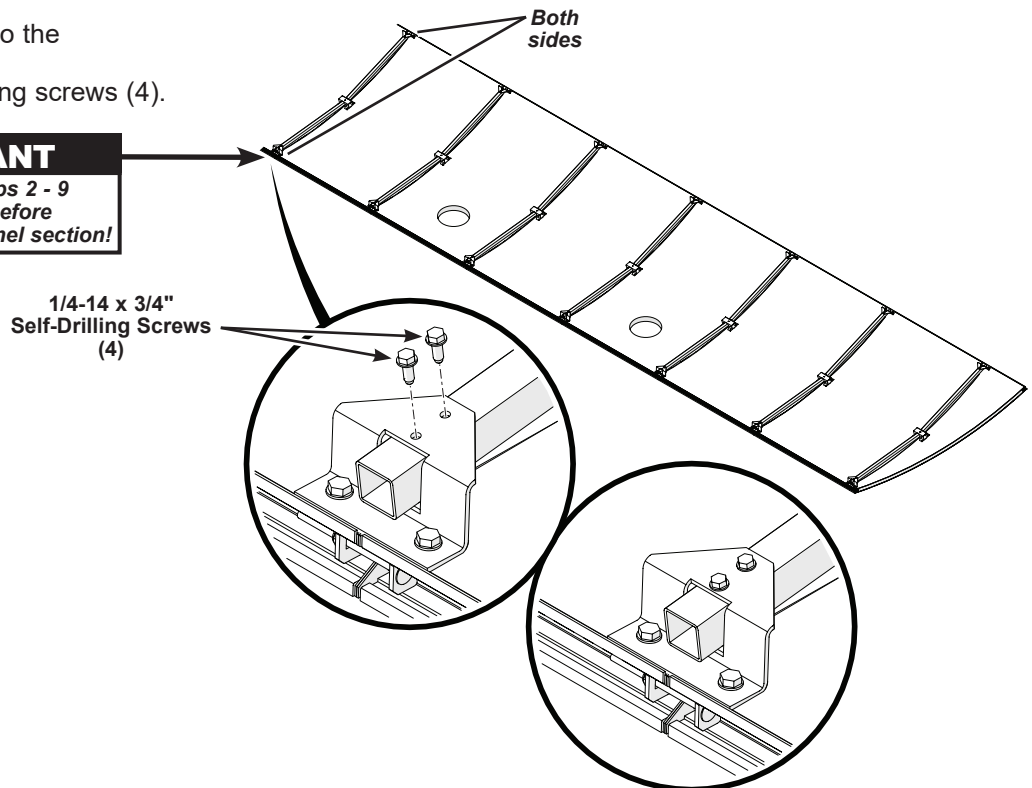
- b. Attach both brackets to the panel using two 5/16 x 1" tapping screws (3).

CAUTION
Do not over tighten the screws, damage to the panels could result.



5. Attach both brackets to the bowstring using two 1/4-14 x 3/4" self-drilling screws (4).

IMPORTANT
Complete assembly steps 2 - 9 on each panel section before assembling the next panel section!



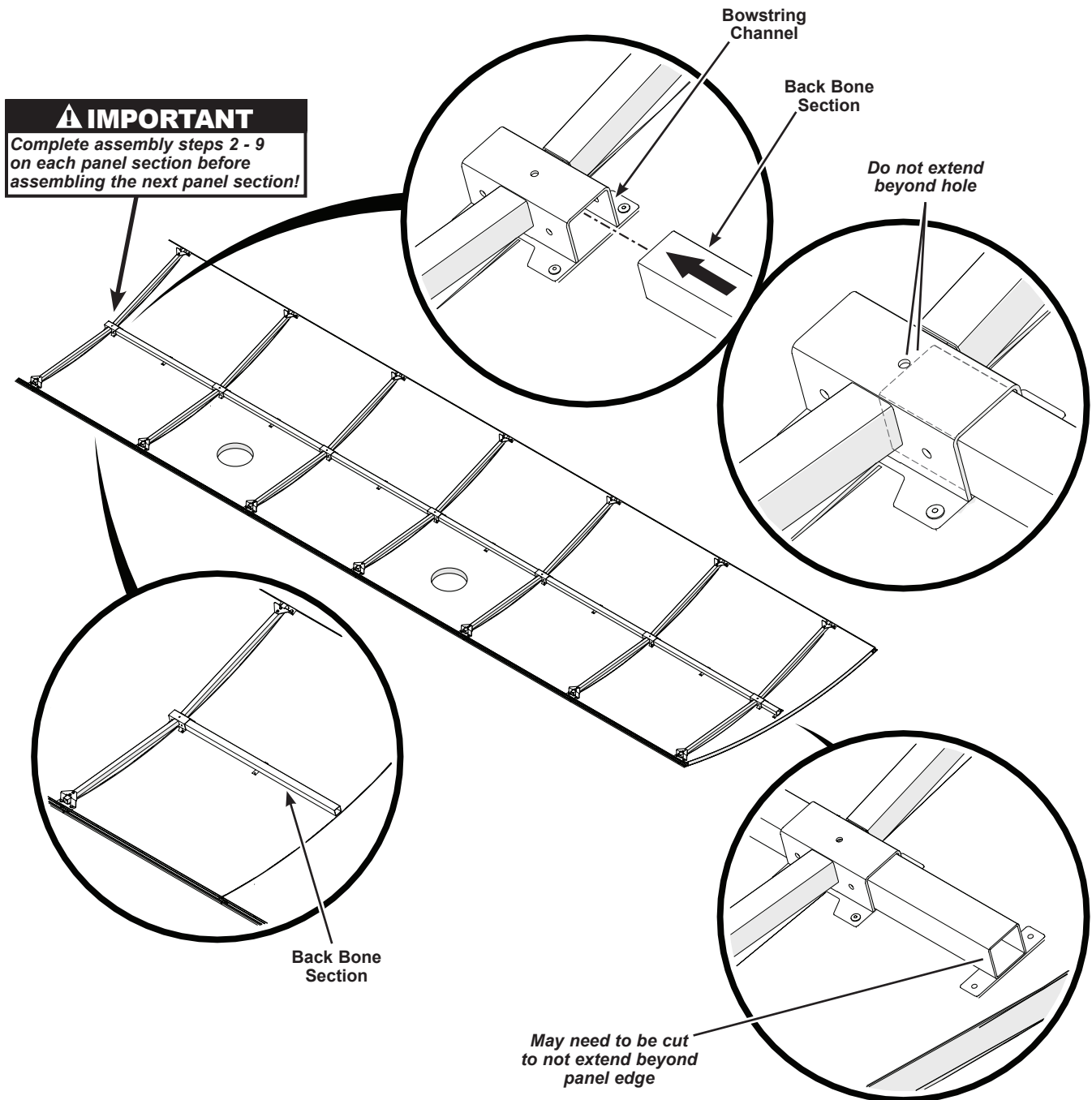
Ceiling Installation (continued)

Assemble Ceiling Panels (continued)

6. Add back bone sections by sliding one end into the open channel of the bowstring as shown.

For proper spacing, do not allow the back bone section to extend beyond the hole in the top of the bowstring channel.

Back bone sections at the ends may need to be cut to not extend past the panel edge.



Ceiling Installation (continued)

Assemble Ceiling Panels (continued)

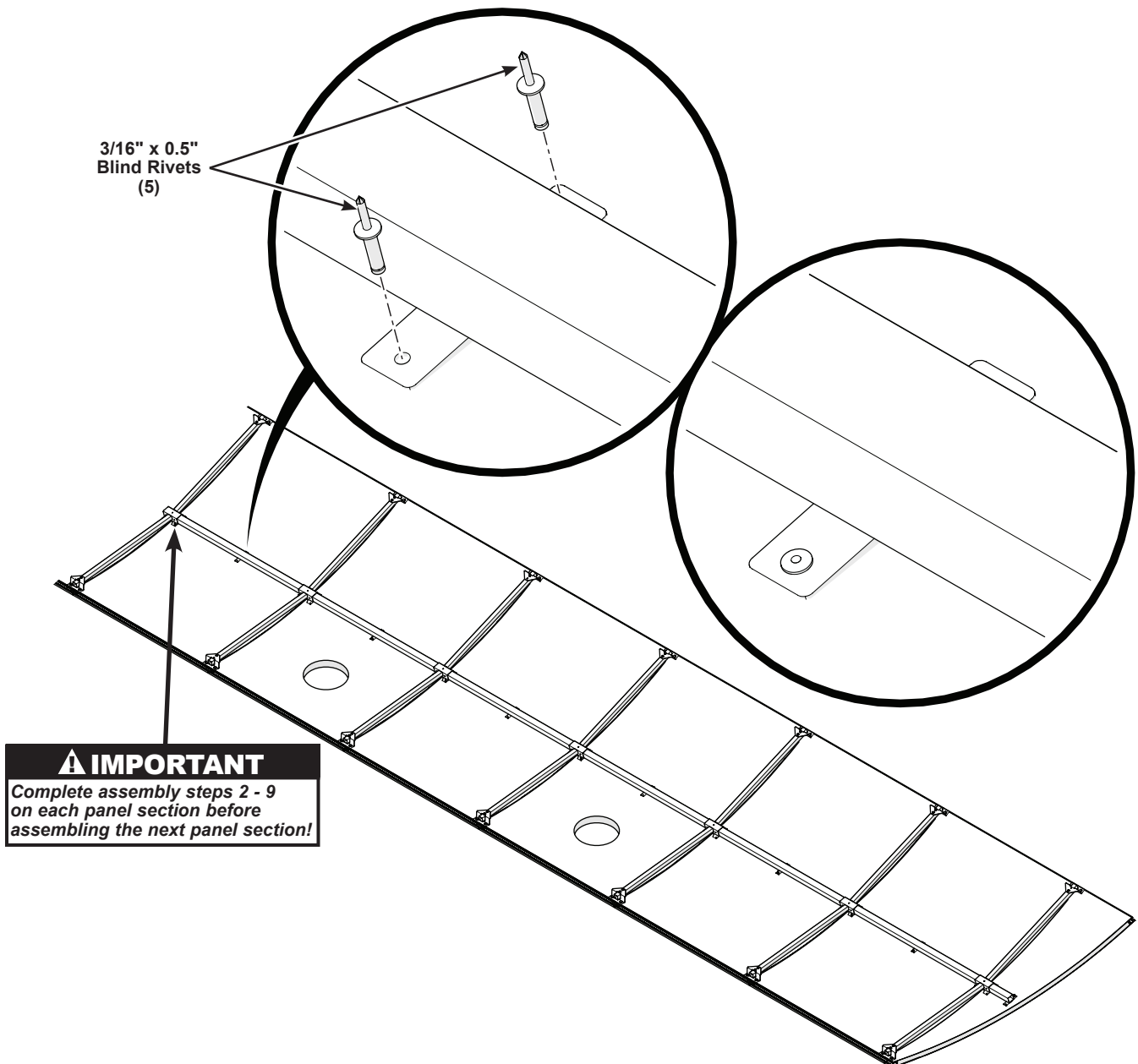
7. Attach the backbone section to the panel.
 - a. Use a 13/64" bit to drill a pilot hole through the backbone hole locations and upper panel surface only. Use the included 13/64" drill stop to prevent drilling into the lower panel surface.

CAUTION

**Drill through the upper panel surface only.
Do not drill into the lower panel surface.**

Clean away any shavings from drilling.

- b. Attach the backbone to the panel using two 3/16" x 0.5" blind rivets (5).



Ceiling Installation (continued)

Assemble Ceiling Panels (continued)

8. Attach the hanger arm bracket to the backbone.
Refer to the installation drawings for hanger arm locations.
 - a. Slide a hanger arm pivot plate under the backbone and fit two hanger arm pivot brackets over the backbone and onto the pivot plate as shown.
 - b. At all four hole locations, use a 13/64" bit to drill a pilot hole through the bracket and plate hole locations and upper panel surface only.

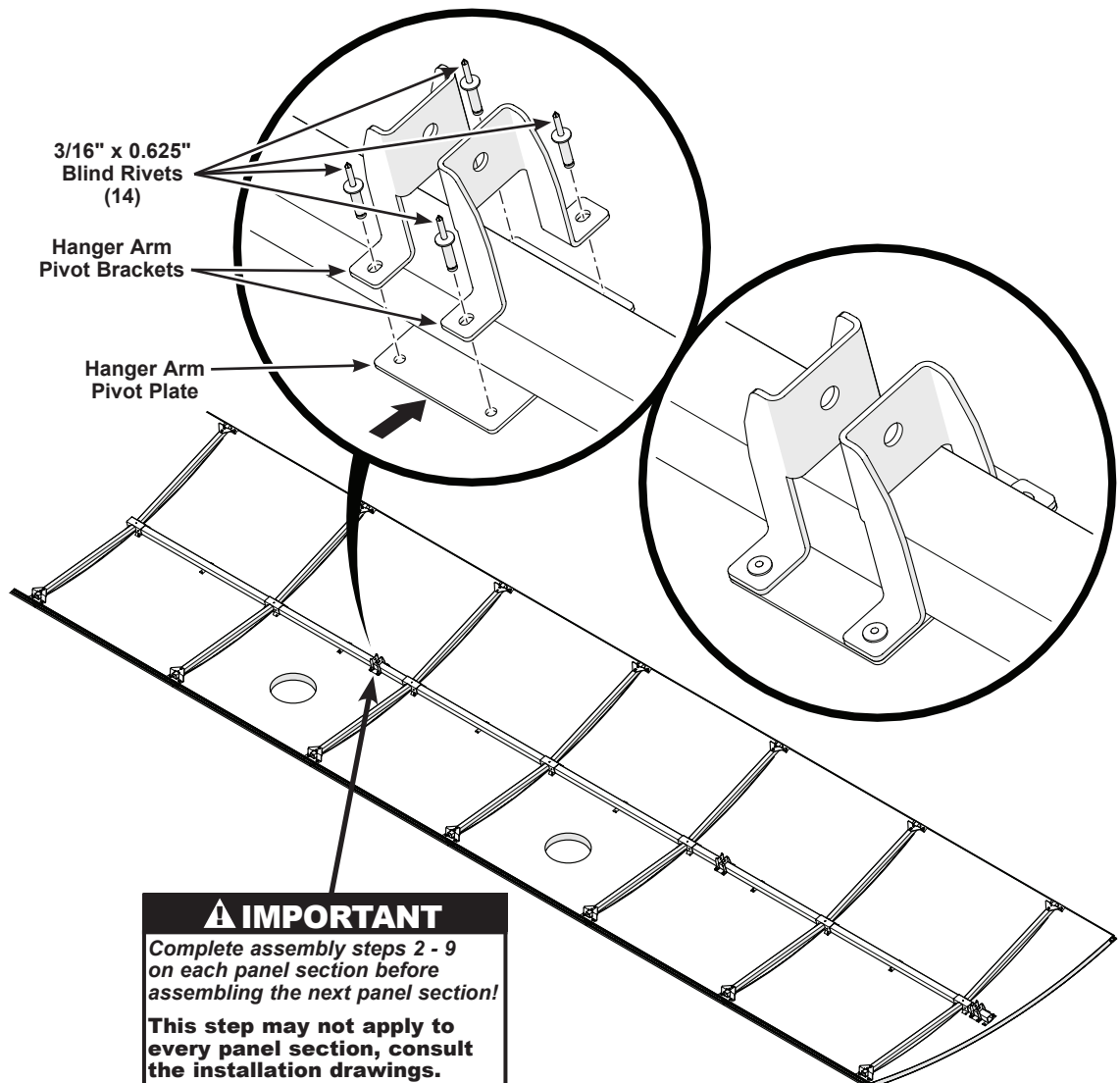
Use the included 13/64" drill stop to prevent drilling into the lower panel surface.

CAUTION

**Drill through the upper panel surface only.
Do not drill into the lower panel surface.**

Clean away any shavings from drilling.

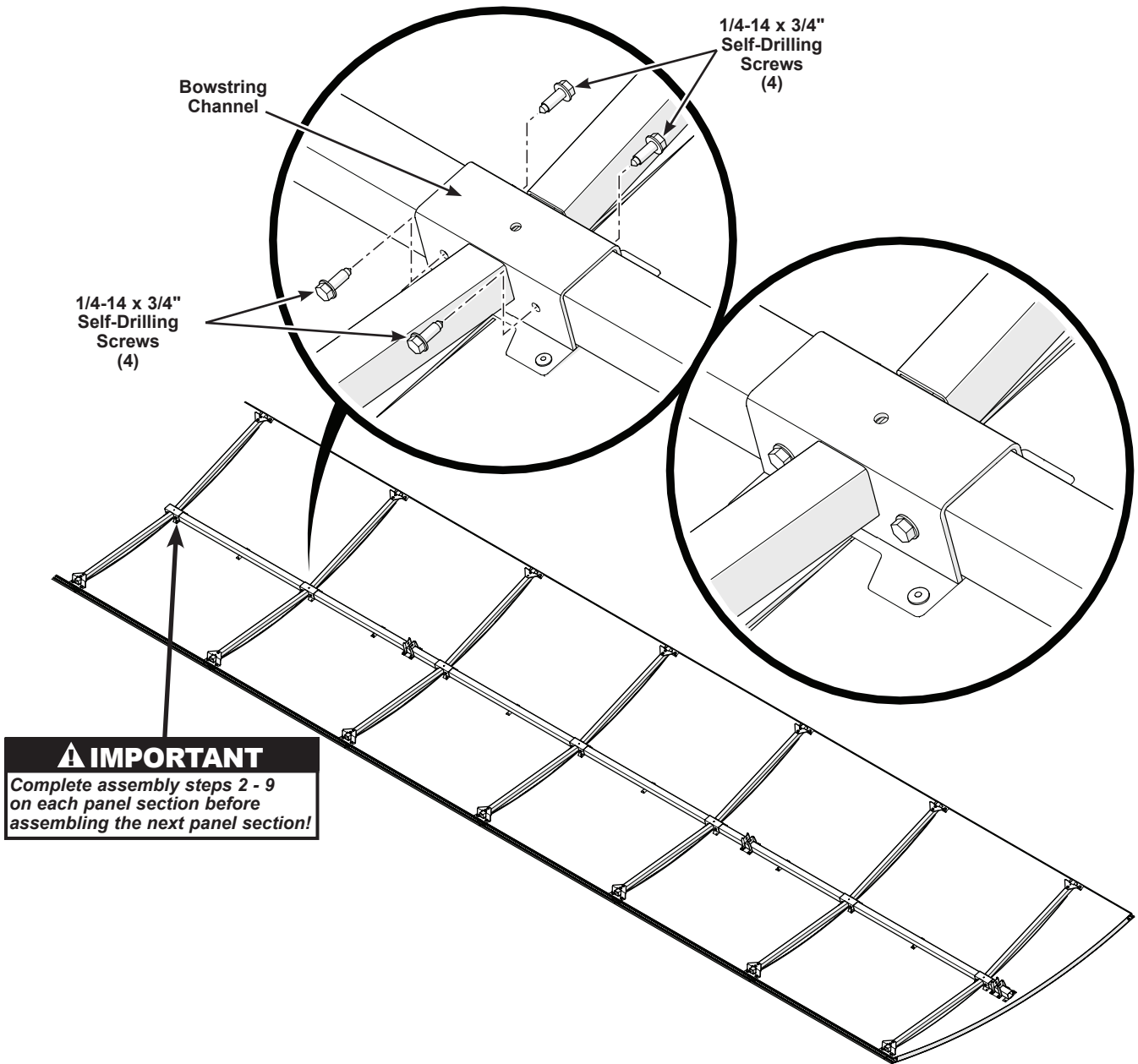
- c. Fit two hanger arm pivot brackets over the backbone and onto the pivot plate as shown.
- d. Attach the brackets and pivot plate to the panel using four 3/16" x 0.625" blind rivets (14).



Ceiling Installation (continued)

Assemble Ceiling Panels (continued)

9. Attach the backbone sections to the bowstring using four 1/4-14 x 3/4" self-drilling screws (4) in each bowstring channel.



▲ IMPORTANT

Complete assembly steps 2 - 9 on each panel section before assembling the next panel section!

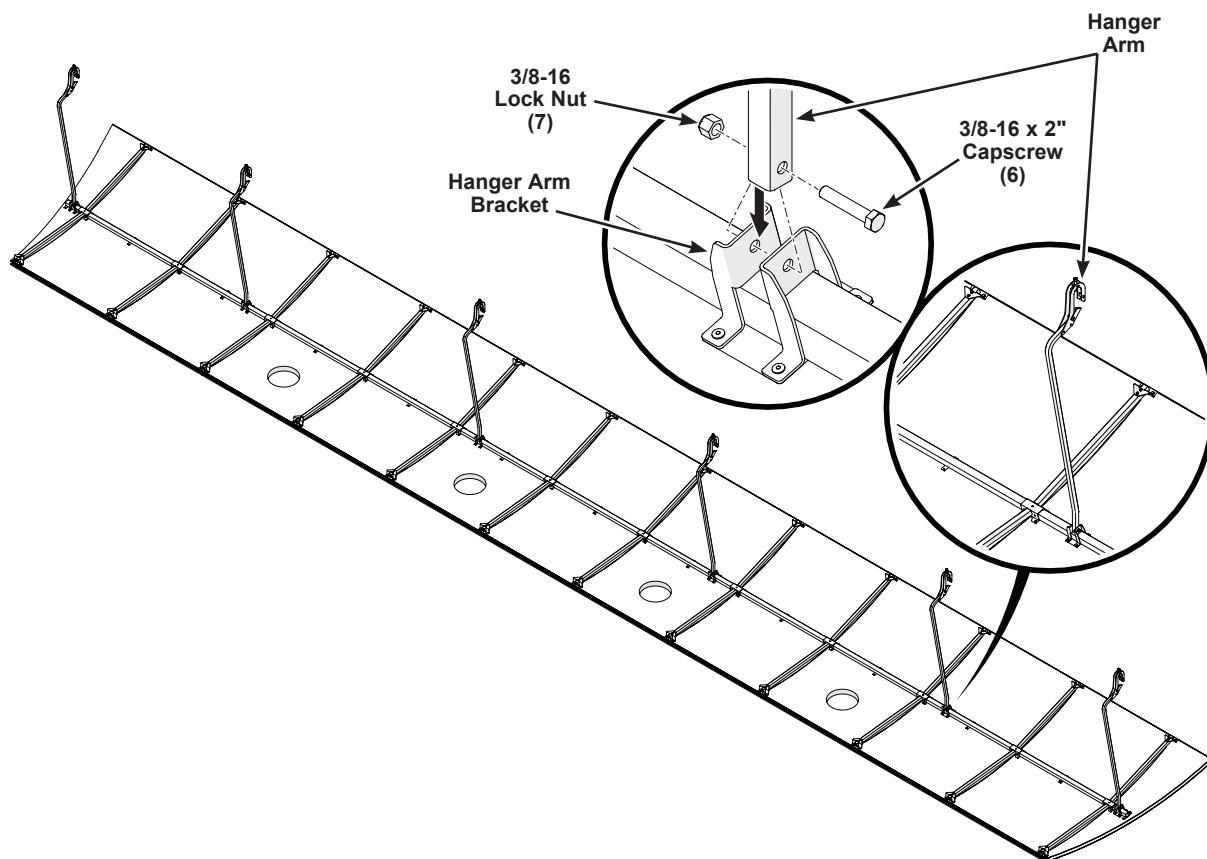


Assembly steps 2 - 9 must be complete on all panel sections before proceeding.

Ceiling Installation (continued)

Attach Ceiling Assembly to Batten

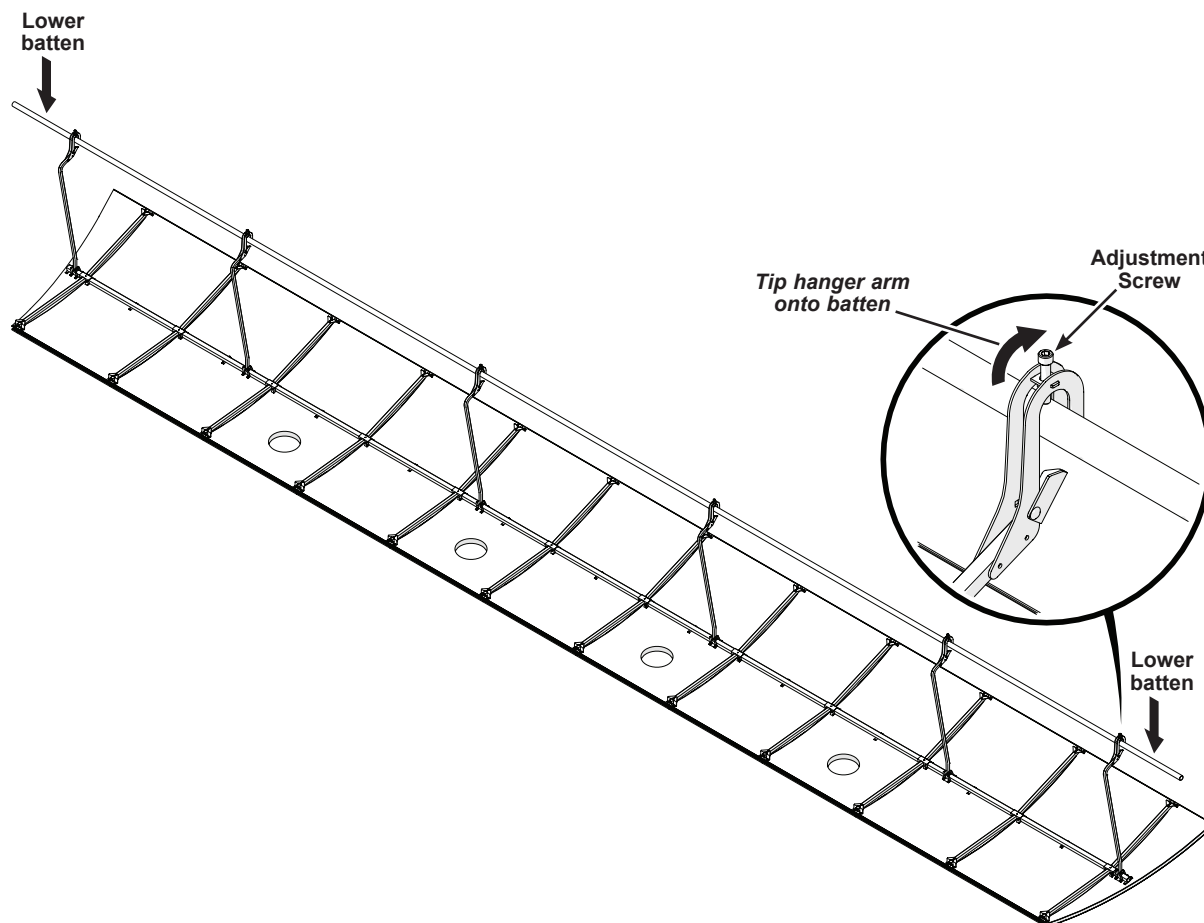
1. Attach one hanger arm to each hanger arm bracket using one 3/8-16 x 2" capscrew (6) and 3/8-16 lock nut (7) as shown.



Ceiling Installation (continued)

Attach Ceiling Assembly to Batten (continued)

2. Lower the batten to just below the hanger arms.
3. Tip each hanger arm bracket onto the batten.
Turn the adjustment screw as necessary.



Ceiling Installation (continued)

Fly The Ceiling Assembly

⚠ WARNING

Only qualified personnel who are familiar with rigging systems should set up the rigging, add weights to the arbor, or fly the ceiling panels.

⚠ WARNING

Make sure that all rigging and rigging hardware is capable of lifting the ceiling panel component calculated weight plus a reasonable margin of safety. Always comply with local codes and regulations.

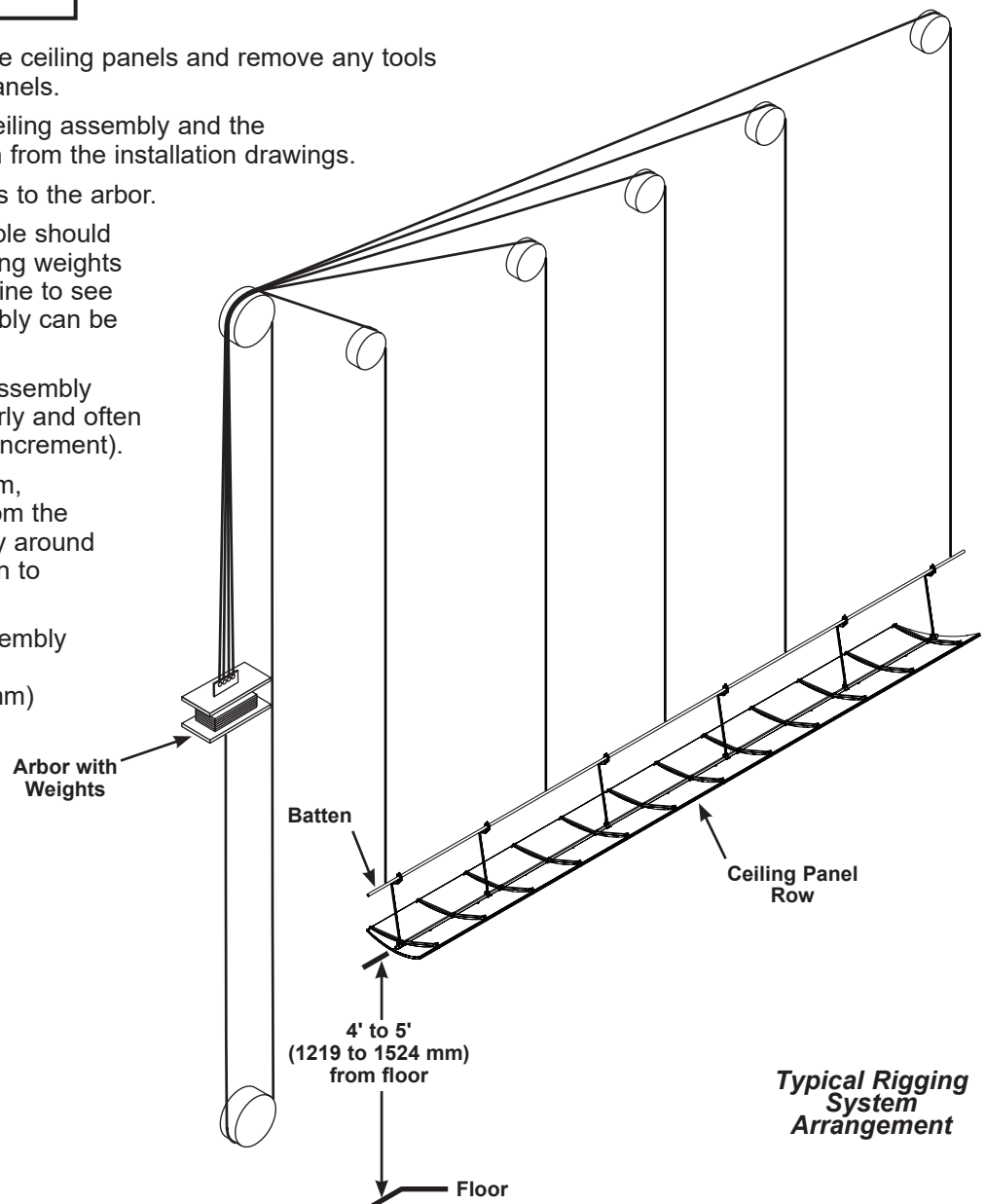
⚠ WARNING

Make sure all fasteners are tight before adding any weight to the arbor.

⚠ WARNING

Never climb on the ceiling panels.

1. Clean all debris from the ceiling panels and remove any tools resting on the ceiling panels.
2. Get the weight of the ceiling assembly and the arbor weight calculation from the installation drawings.
3. Start adding the weights to the arbor.
 - a. Three or more people should work together, adding weights and tending to the line to see if the ceiling assembly can be lifted from the floor.
 - b. Check the ceiling assembly counter balance early and often (after adding each increment).
4. Using the rigging system, lift the ceiling panels from the stage surface and apply around 100 lb (45 kg) of tension to each lead-set cable.
5. Keeping the ceiling assembly horizontal, lift it 4' to 5' (1219 to 1524 mm) from the floor.

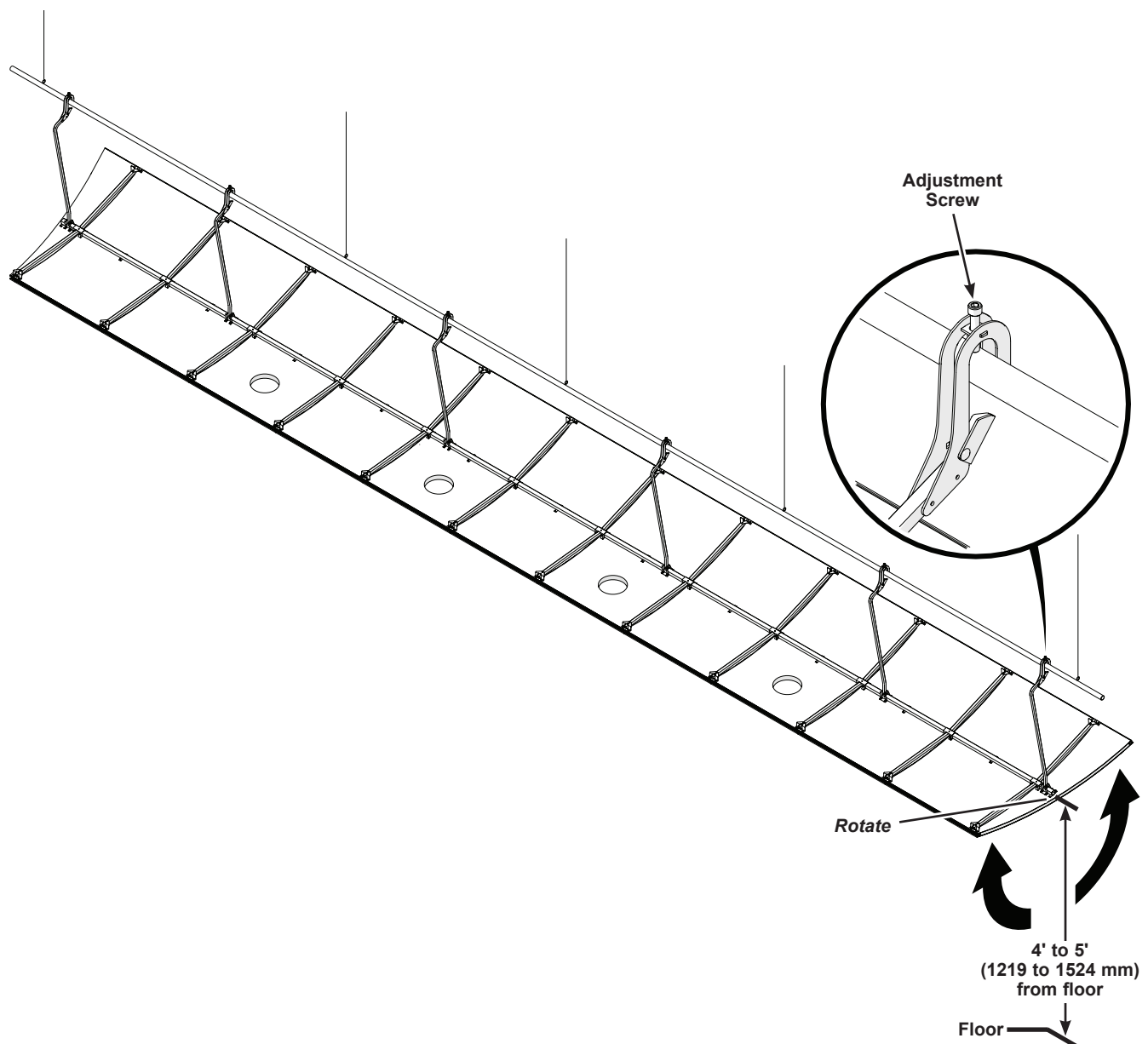


Typical Rigging System Arrangement

Ceiling Installation (continued)

Level the Ceiling Assembly

1. Position the ceiling panel row 4' to 5' (1219 to 1524 mm) from the floor surface.
2. With a box level, check the along the length of the ceiling panel row and make sure that it is straight and level.
 - a. Turn the adjustment screw on the hanger arms to correct any non-straight or out-of-level conditions.
 - b. Rotate the ceiling assembly as little as possible when making adjustments.
3. With one person standing and observing at the end of the ceiling panel row:
 - a. Rotate the ceiling panel row until the bottom surface faces downstage.
 - b. Then, rotate the ceiling panel row until the bottom surface faces upstage.
 - c. Any ceiling panel row bowing in either vertical position indicates that further leveling is required.
4. **Make sure that all fasteners are tight.**



Ceiling Installation (continued)

Set the Performance Angle

Refer to the installation drawings for ceiling strap locations.

1. Attach a ceiling stay clamp and ceiling stay bracket halfway up on the hanger arm using two 5/16-18 x 1-3/8" capscrews (8), 5/16-18 lock nuts (9) and 5/16 ID Flat Washers (10) as shown.
2. Directly across, attach a ceiling stay panel bracket halfway to the edge of the panel as shown.
 - a. Use a 9/32" bit to drill a pilot hole through the upper panel surface and extrusion only into each bracket hole location.
Do not drill through the lower panel surface and extrusion on the other side.
Clean away any shavings from drilling.

CAUTION

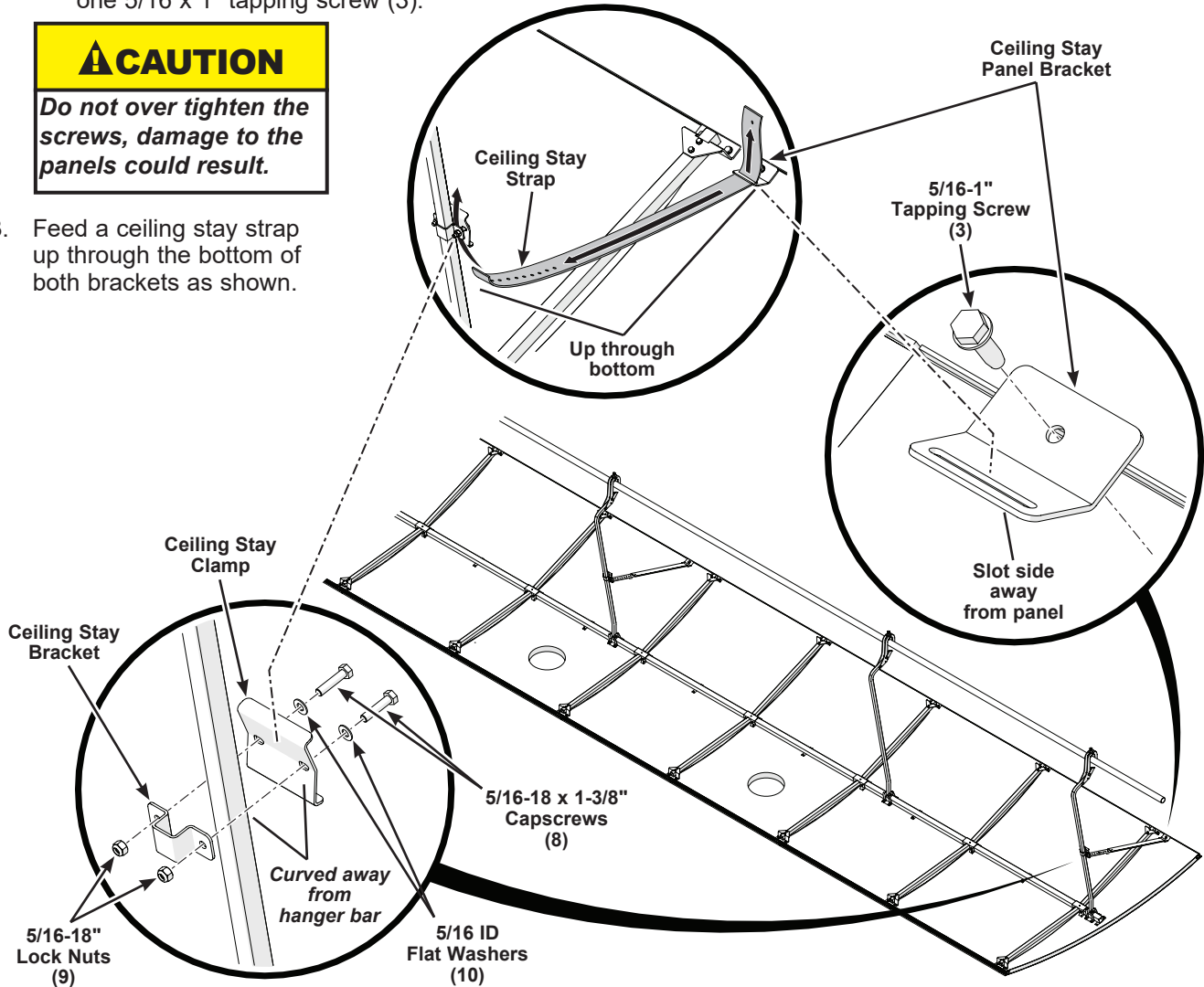
**Drill through the upper panel surface and extrusion only.
Do not drill through the lower panel surface and extrusion
on the other side.**

- b. Attach the bracket to the panel using one 5/16 x 1" tapping screw (3).

CAUTION

**Do not over tighten the
screws, damage to the
panels could result.**

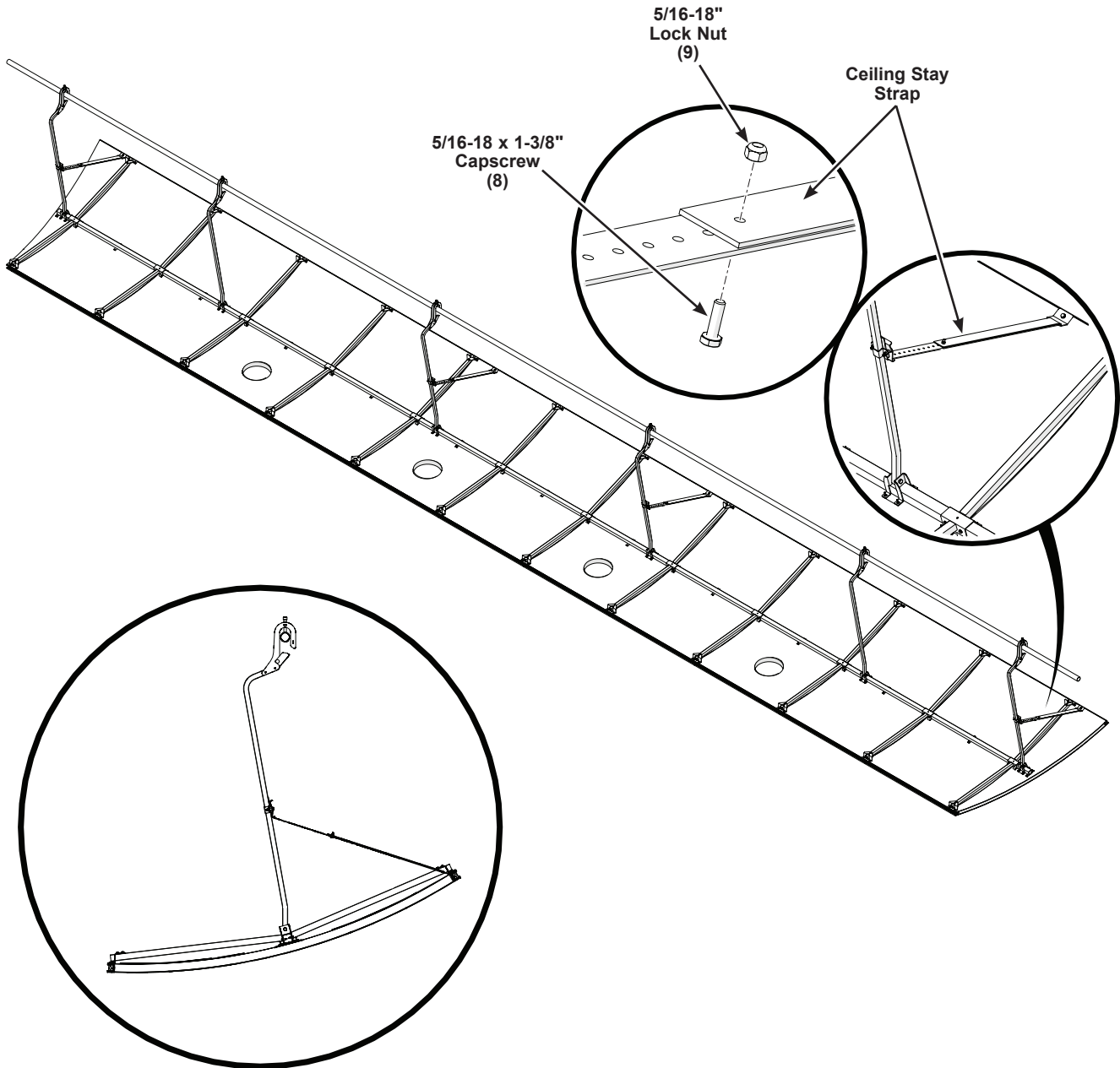
3. Feed a ceiling stay strap up through the bottom of both brackets as shown.



Ceiling Installation (continued)

Set the Performance Angle (continued)

4. Tilt the ceiling panel row to the appropriate performance angle and secure that position using the holes in the ceiling stay straps using 5/16-18 x 1-3/8" capscrew (8) and one 5/16-18 lock nut (9) in each.



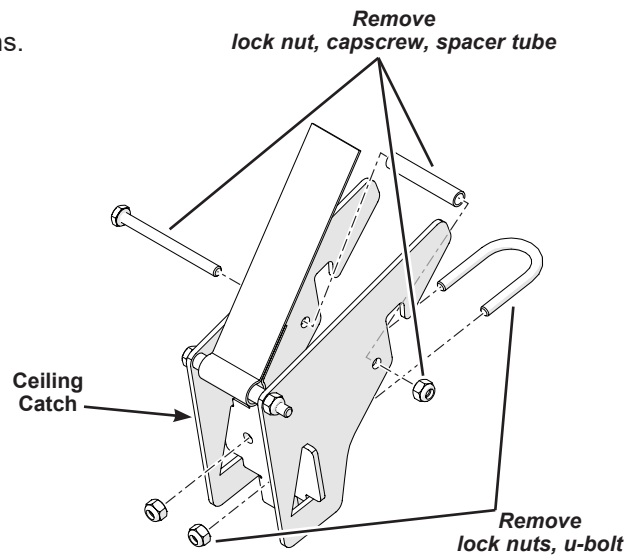
Performance Angle Set

Ceiling Installation (continued)

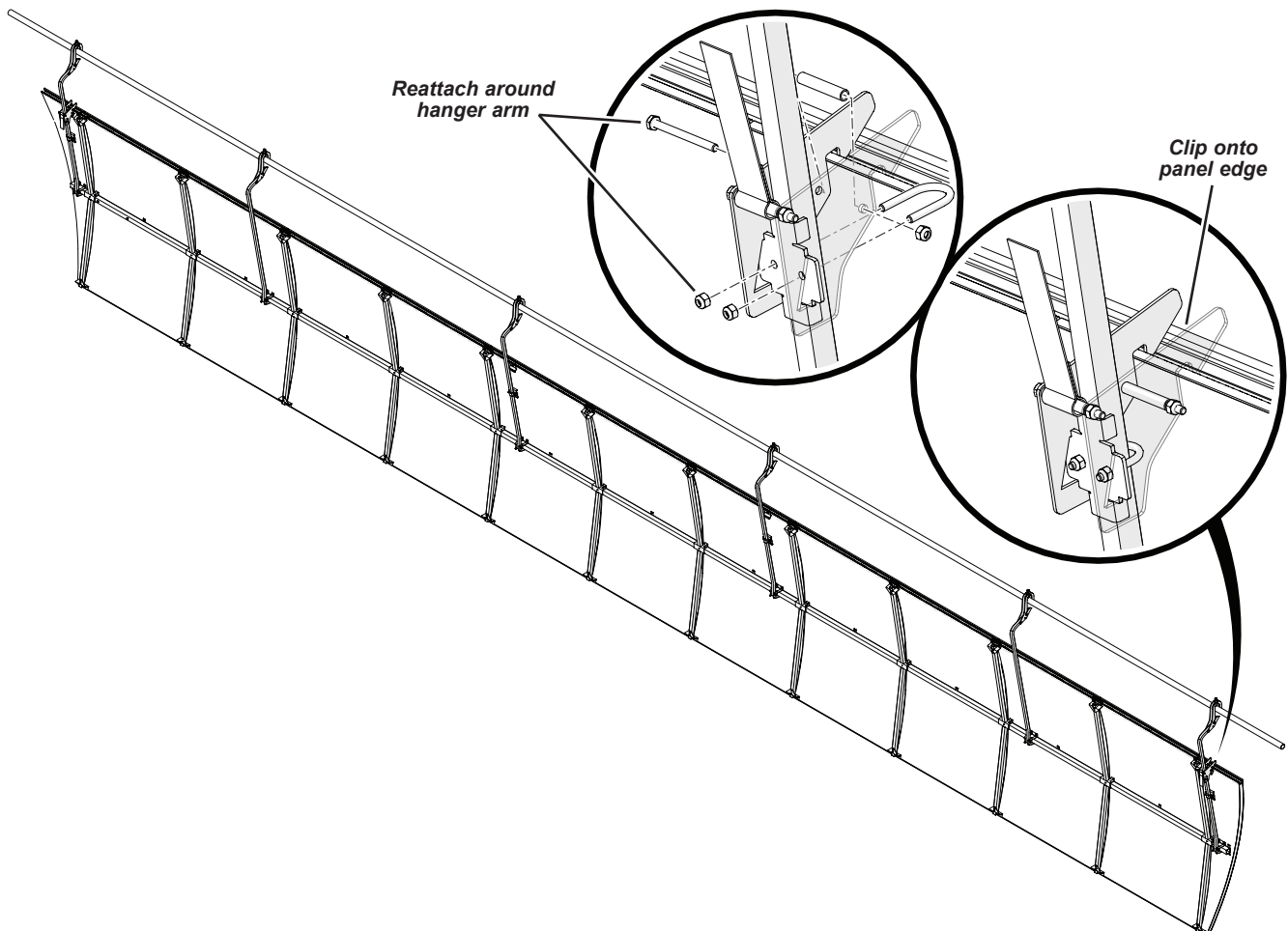
Install the Ceiling Catch

Refer to the installation drawings for ceiling catch locations.

1. Unpackage the ceiling catch assemblies.
 - a. Remove the lock nut, capscrew and spacer tube and set them aside.
 - b. Remove the two lock nuts from the u-bolt and set them aside.



2. Position the ceiling catch assembly onto the hanger arm to be able to catch the panel edge.
3. Attach the ceiling catch to the hanger arm with the u-bolt and two lock nuts.
4. Repeat for the remaining ceiling catches.

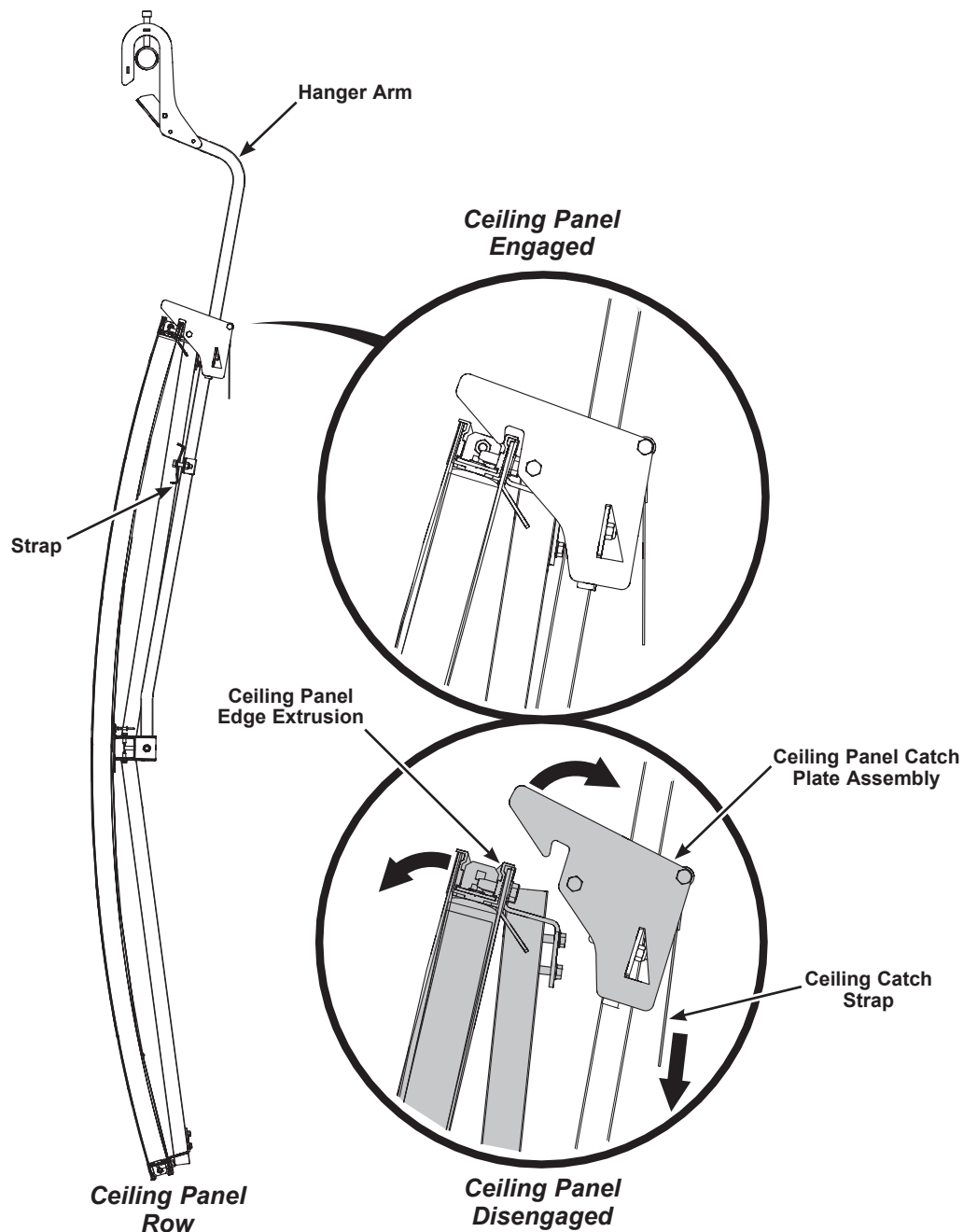


Ceiling Installation (continued)

Engage the Ceiling Catch

Ceiling panels are either stored in a vertical storage position or placed into a horizontal performance position. Two or more people should work together to set ceiling panel positions.

- **Performance Position** — Pull the ceiling catch strap downward to disengage the ceiling panel catch plate assembly from the ceiling panel edge extrusion. The ceiling panel row is rotated until the ceiling stay strap is tight (performance angle) and is lifted to a position above the stage.
- **Storage Position** — The ceiling panel row is rotated vertically until the ceiling panel edge extrusion is engaged with the ceiling panel catch.



Light Fixture Installation



This procedure details installing the Lieto™ LED Light Fixture.
If installing other light fixtures, contact Wenger.

Inspection

Before installing, inspect the light fixtures for any signs of damage.
If any damages are present, immediately contact Wenger.

Lieto LED Light Fixture Installation

Install the light fixtures into the pre-cut ceiling panel holes.
Refer to the installation drawings for locations.

⚠ WARNING

A licensed electrician must perform the electrical installation.
Branch circuits that connect to ceiling panel lights must always be designed by an electrical engineer and comply with electrical codes and user requirements.
All electrical sources must be permanently wired and comply with local electrical codes.
Each ceiling panel light must connect to a grounded, three-wire receptacle that connects to a fused circuit breaker.

1. Insert the light fixture into the pre-cut ceiling panel light mounting hole.
2. Attach the light assembly to the ceiling panel.
 - a. Use a 13/64" bit to drill a pilot hole through the upper panel surface only.
Use the included 13/64" drill stop to prevent drilling into the lower panel surface.

⚠ CAUTION

Drill through the upper panel surface only.
Do not drill into the lower panel surface.

Clean away any shavings from drilling.

- b. Attach the light to the panel using four 0.19 dia tri-fold blind rivets (13).

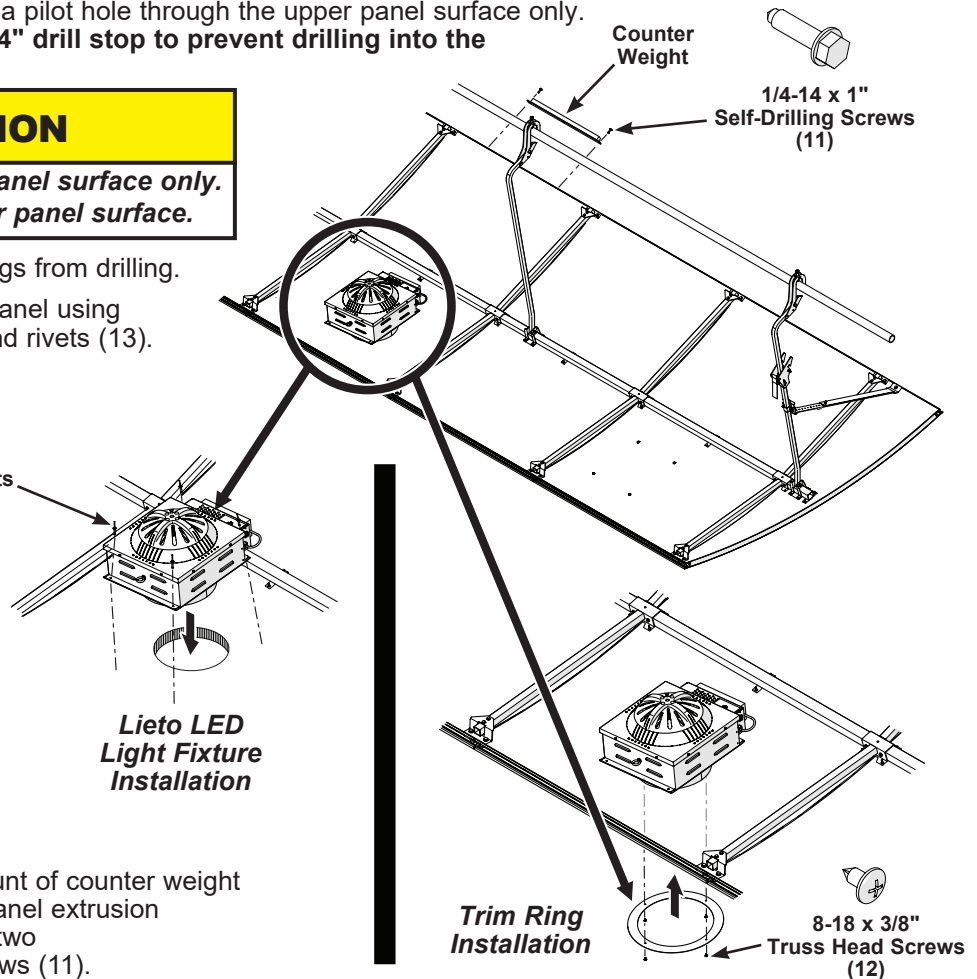


3. Attach a trim ring to the bottom side of the panel using four 8-18 x 3/8" truss head screws (12).

⚠ CAUTION

Do not over tighten the screws, damage to the panels could result.

4. Attach an appropriate amount of counter weight to balance the row to the panel extrusion on the opposite side using two 1/4-14 x 1" self-drilling screws (11).



Light Fixture Installation (continued)

Lieto LED Light Fixture Electrical Connection

1. Ensure the light fixture power source is compliant with local electrical codes.
2. Connect the PowerCON and RJ-45 or XLR DMX cables to the corresponding ports on the first light fixture control box.
3. Connect the PowerCON and RJ-45 or XLR DMX cable to the next light fixture in the row.

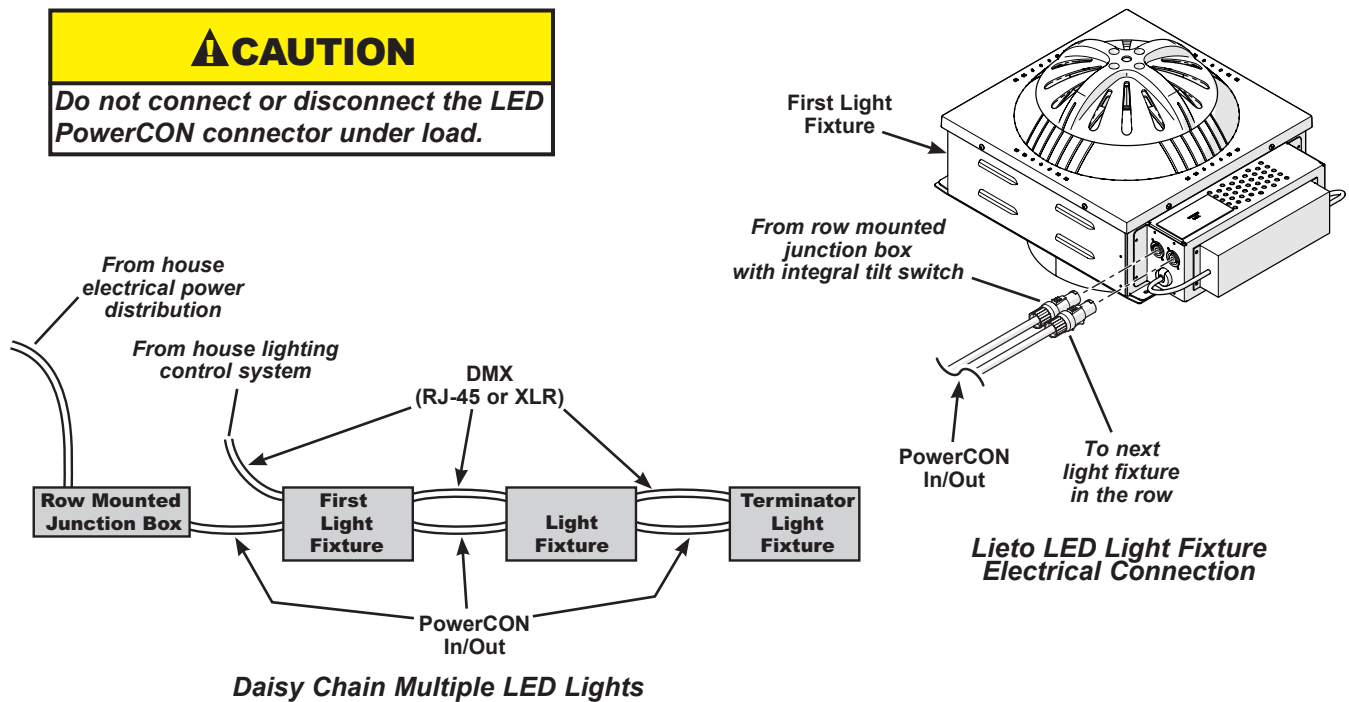
Note: Ensure the supply voltage meets the Lieto LED light fixture requirements before securing connections. The Lieto light fixture requires non-dimmed mains power in the range of 100-240VAC 50/60Hz.

4. Power up the light fixture to ensure proper connections.

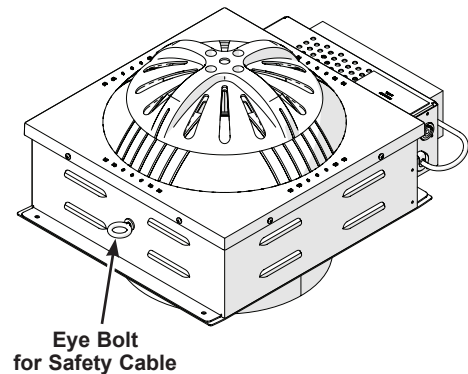
For troubleshooting, refer to the Lieto LED Light Fixture Owner's Manual 188A559.

CAUTION

Do not connect or disconnect the LED PowerCON connector under load.



5. Insert the safety cable through the eye bolt on the light box assembly, then secure the other end of the safety cable to the truss assembly or other substantial connection point such as a bowstring. Minimize the slack in the safety cable where possible.



Light Fixture Operation

Adjustment and Aiming

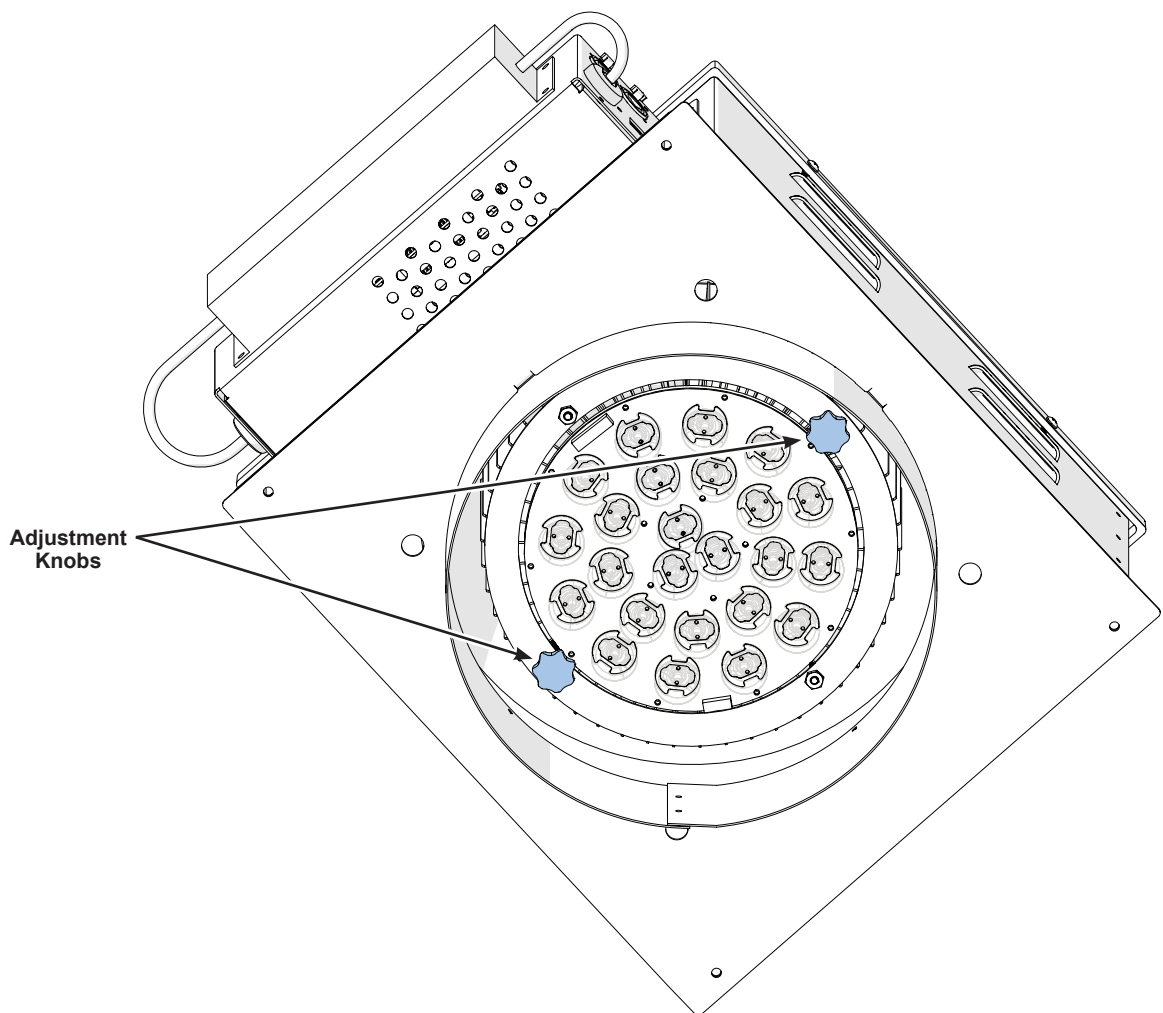
To adjust the angle and orientation of the LED array, use the adjustment knobs located in the underside of the light fixture.

1. Loosen the adjustment knobs to change the LED array angle and orientation.
2. Use the knobs, to orient the LED array to the desired angle.
3. Tighten the adjustment knobs to secure the LED array in the new position.

⚠ CAUTION

*Only tighten the adjustment knobs by hand.
Use of tooling could cause damage.*

For troubleshooting, refer to the Lieto LED Light Fixture Owner's Manual 188A559.

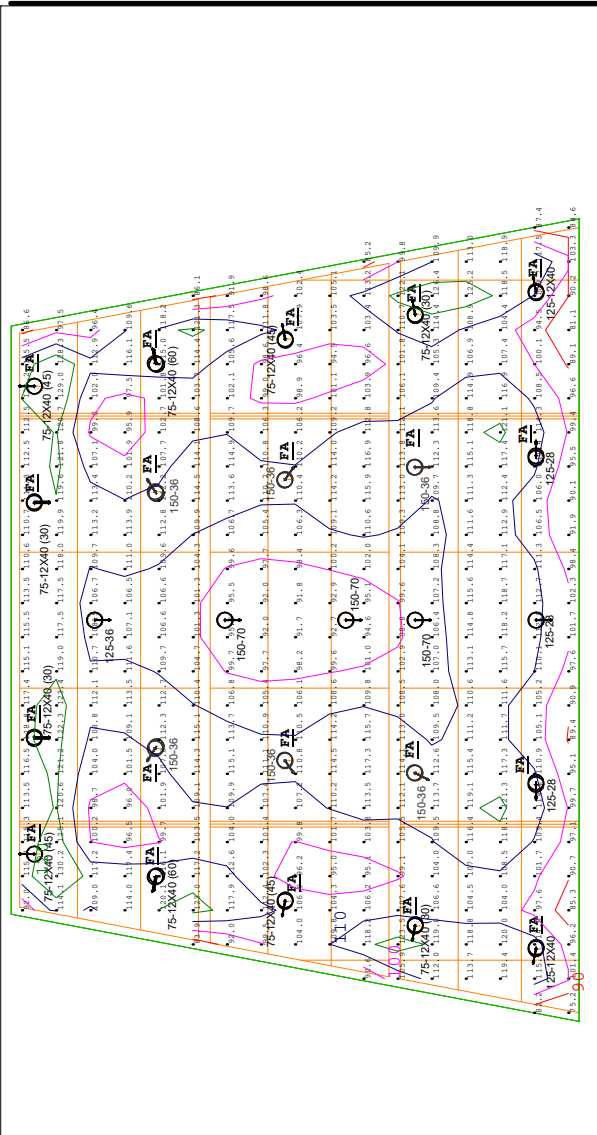


Light Fixture Operation (continued)

Photometrics

- NOTES:**
 1. ALL LIGHTS BELOW 75 WATTS NEED TO HAVE THE FIELD SET WATTAGE ADJUSTED TO MATCH THIS PHOTOMETRIC. (SEE TABLE)
 2. SEE NOTES ON PAGE 3 OF 3 TO AIM LIGHT FIXTURES.

Color	Value
Blue	60
Green	70
Yellow	80
Orange	90
Red	100
Purple	110
Pink	120
Light Blue	130
Light Green	140
Light Yellow	150
Light Orange	160



Qty	Tag	Description	LMF	Field Set Wattage
7	125-28	Wenger Part # LTO-125-28-30-RJ45-80-NL		0.900 125
2	125-36	LTA-125-36-30-RJ45-80-NL		0.900 125
6	150-70	LTO-150-70-30-RJ45-80-NL		0.900 130
5	125-12X40	LTO-125-12X40-30-RJ45-80-NL		0.900 125
4	75-12X40 (60)	LTO-75-12X40-30-RJ45-80-NL (60)		0.720 60
8	75-12X40 (80)	LTO-75-12X40-30-RJ45-80-NL (80)		0.900 80

CalcType	Units	Avg	Min	Avg/Min	Max/Min
Illuminance	Fc	107.74	130.2	75.2	1.43
					1.73



DESCRIPTION: PHOTOMETRIC
 PROJECT: ACCOUNT NAME
 CITY, STATE

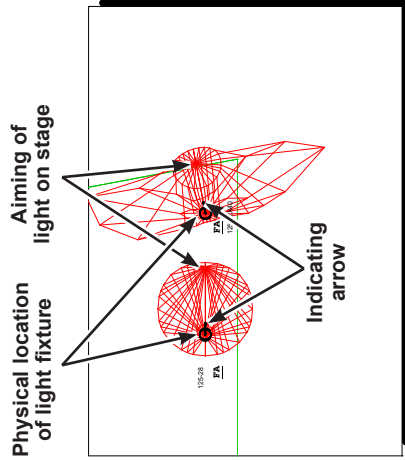
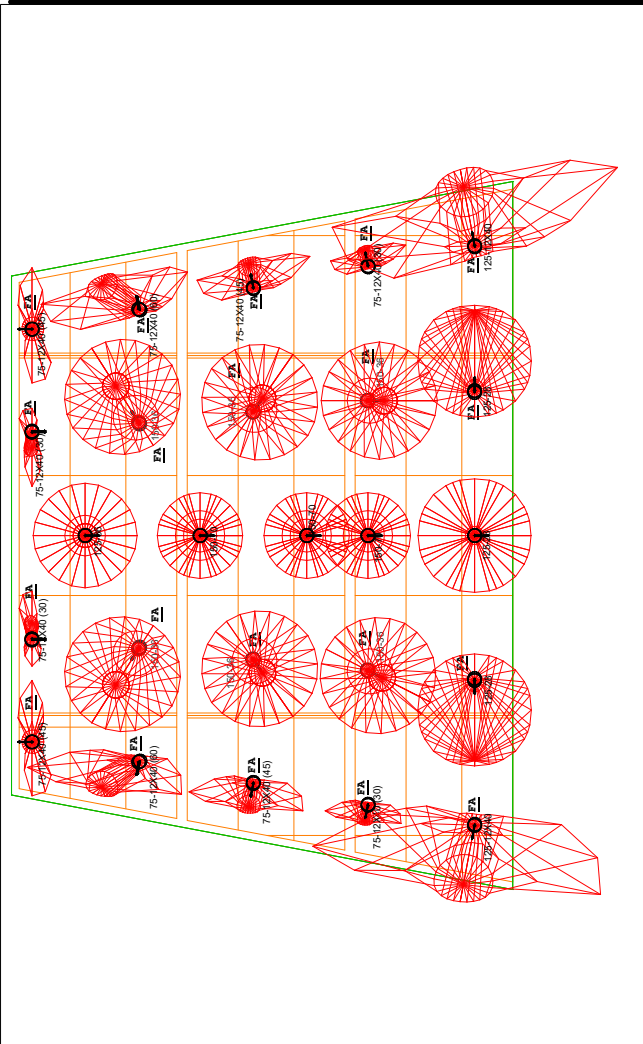
SIZE	DWG NO.	Page 1 of 3	REV
B	19PXXXXX_PM		1

NAME	DATE
DRAWN	CIB
CHECKED	-
WENGER ORDER NUMBER:	16XXXX

Light Fixture Operation (continued)

Photometrics (continued)

- NOTES:
1. LIGHT FIXTURES NOT INDICATED BY (FA) TO BE ADJUSTED PERPENDICULAR TO THE STAGE FLOOR.
 2. LIGHT FIXTURES INDICATED BY (FA) WILL REQUIRE FIELD ADJUSTMENT OF BEAM DIRECTION (TILT / AIM) TO ACHIEVE THE PHOTO-METRIC. ARROW INDICATES BEAM ADJUSTMENT DIRECTION.
 3. OBLONG EDGE (40) OF ASYMMETRIC LIGHTS (12X40) TO BE ALIGNED PARALLEL WITH TOWER WALLS TO AVOID DIRECT DOWN LIGHTING ON THE FACE OF THE TOWERS.

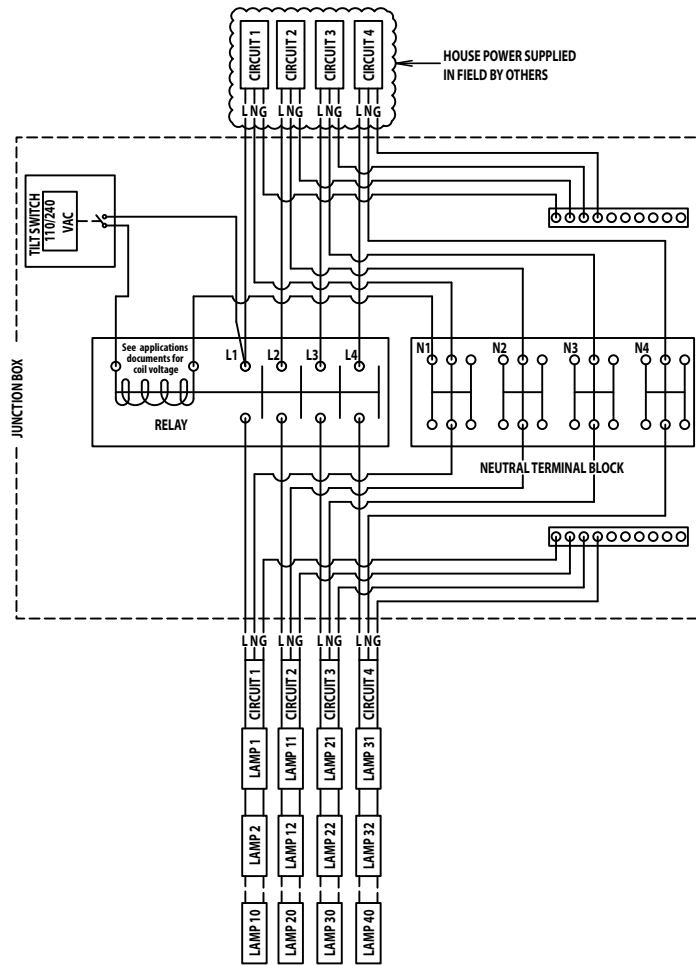


Wenger ORCLANCY	
DESCRIPTION:	PHOTOMETRIC
PROJECT:	ACCOUNT NAME CITY, STATE
SIZE	DWG NO. Page 3 of 3 REV
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NAME	DATE
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WENGER ORDER NUMBER:	16XXXX

Schematics

Lieto LED Light Fixture Electrical Schematic (Maestro® Acoustical Ceiling)



Decals, Numbers and Logos

1. Place a ceiling operation decal near each ceiling stay approximately 2" (51 mm) from the upstage edge.
2. Place a Warning decal near each ceiling stay approximately 2" (51 mm) from the upstage edge.
3. Place a light troubleshooting decal near each Lieto LED light fixture.

Final Inspection

1. Check the rigging.
 - a. Make sure that it operates smoothly and safely.
 - b. Determine if additional weights need to be added to any arbors to offset the additional weight of ceiling stays, lights, etc.
2. Make sure that all cable clamps are not missing any hardware.
3. Inspect all ceiling panels for surface finish damage.
Touch up as required.
4. Make sure that all wiring for lighting is tied away from the light canisters and that the wiring does not interfere with ceiling panel row rotation.
5. Discuss the preferred light focus with the general contractor or the site's lighting technician.