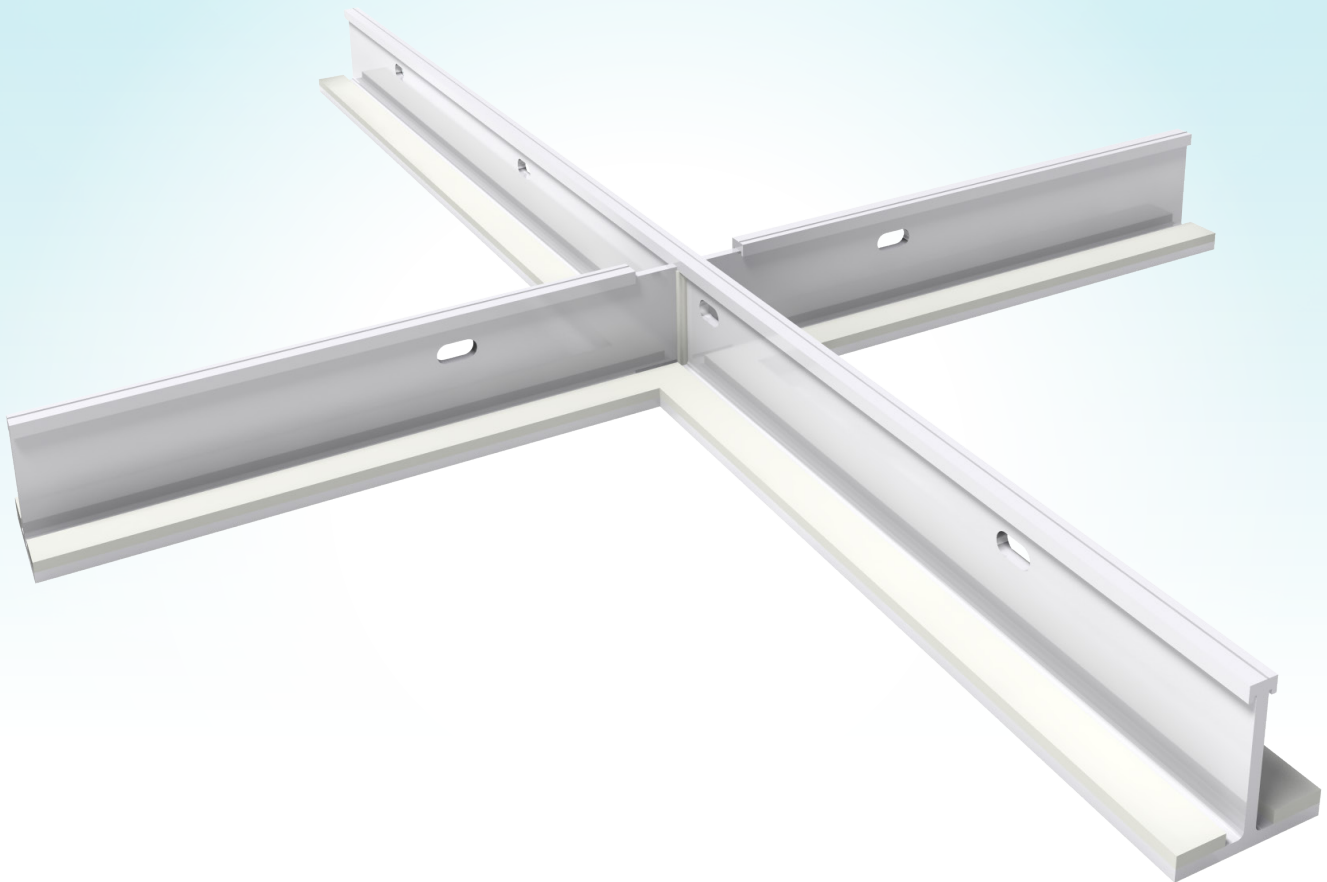




# Apex

## Cleanroom Ceiling System



**INSTALLATION + SERVICE MANUAL**

**v001 – Issue Date: 06/13/22**

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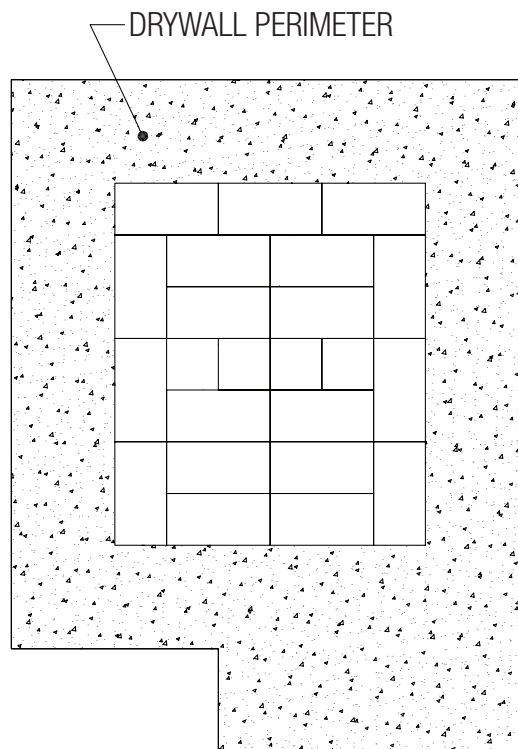
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**NOTE:** These instructions are for Perimeter Drywall Applications only. Contact your local Sales Representative for other installations.

## Before You Start

- Inspect all cartons and boxes for flaws and shipping damage
  - If anything is discovered to be damaged, contact the shipping company and file a freight claim.
- Review Keystone project specific submittals to ensure booms have been located in the correct locations (recommended to measure and chalk outline of ceiling system on floor).
- If drywall perimeter is being installed prior to the ceiling system, ensure that the opening is cut to the correct dimensions (as per the submittal), and is square on all corners.
- Ensure all tools (as listed on the following page) are on site and ready for use.
- A minimum of two (2) people will be required to install this system.

### Typical Perimeter Drywall Application



## Required Tools/Parts

To be supplied by contractor

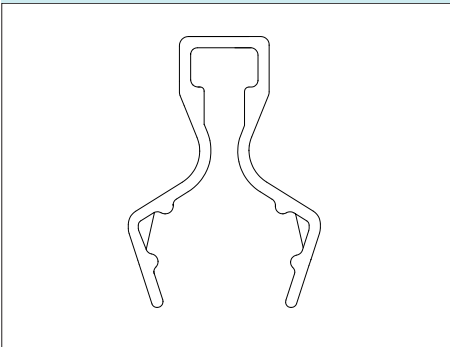
- (2+) 8ft ladders or scaffolding
- Laser level
- Cordless drill/impact
- #8 self-tapping screws (1/2" maximum length)
- Screwdriver bit(s) to suit self-tapping screws
- Damp Cloth(s) (for cleaning)
- Utility Knife
- Chalk Line
- Pliers with wire cutter
- Tape Measure
- Clamps/Locking Plier
- Pre-stressed 12 ga. Suspension wire (or approved alternative) with necessary equipment to hang wire

## Keystone Supplied

- Job specific submittal drawing showing all sizes and dimensions of ceiling sections and panels
- Ceiling sections (refer to job submittal drawing for quantity and sizes)
- Access panel clips – patent pending (Part Number 026002-002) (**Figure 1**)
- 1/8" x 1/2" (t x w) white gasket tape – For backside of tees (Part Number 042373-002) (**Figure 2**)
- 1/32" x 3/4" (t x w) white gasket tape – For between ceiling sections (Part Number 042373-004) (**Figure 3**)

## Installation Instructions

**Figure 1: Access Panel Clips**



**Figure 2: 1/8" x 1/2" White Gasket Tape**



**Figure 3: 1/32" x 3/4" White Gasket Tape**

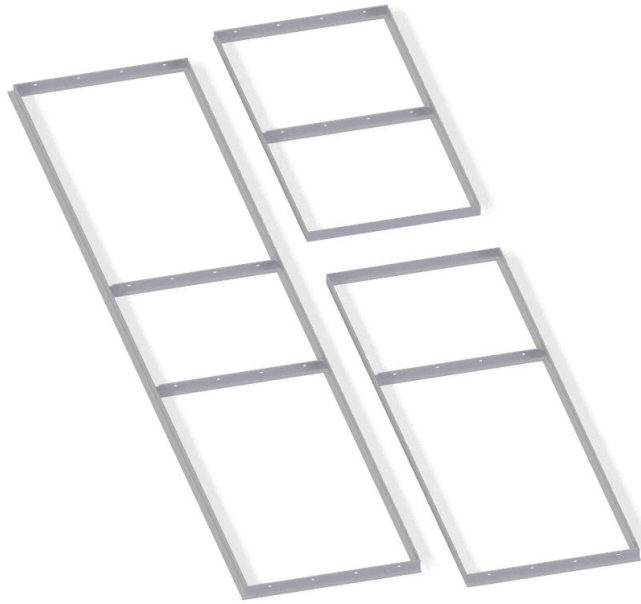


**Step 1:** Snap chalk line on ground to mark locations and sizes of ceiling module outline.

**Step 2:** Unpack ceiling sections and lay them out on the floor (**Figure 4**) as per the job specific submittal package.

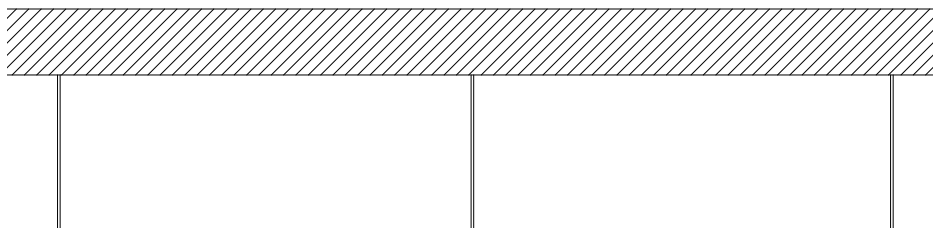
**NOTE:** Ensure floor surface is clean and free of debris that could damage the ceiling's finish.

**Figure 4. Ceiling Sections**



**Step 3:** Attach lengths of pre-stressed 12 ga. suspension wire to the slab or structural steel (**Figure 5**) above the ceiling according to ASTM C636, or local building codes (as applicable).

**Figure 5. Suspension Wire Attached to Structure**



**Step 4:** Check to ensure that the perimeter drywall (if installed) and other equipment are installed at the correct heights using laser level.

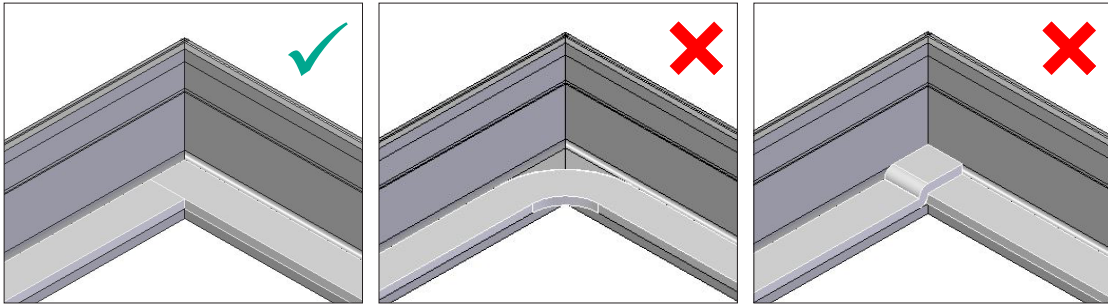
**Step 5:** Extend hanger wires 6" below the ceiling plane and snip to length as required.

**Step 6:** Ensure that the tees are clean by wiping them down with a damp cloth.

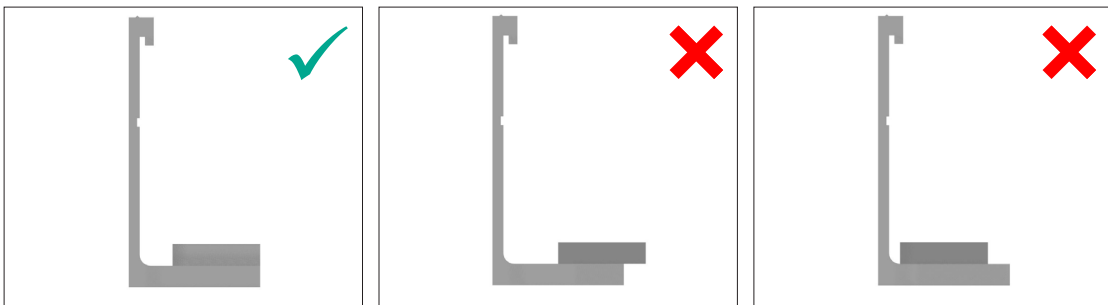
**Step 7:** Apply gasket to the backside (horizontal edge) of the tees (part number 042373-002). The gasket is supplied in 50ft rolls – measure and cut the gasket, as required.

**NOTE:** Gasket should be installed as close to the edge of the tee as possible – do not extend past the lip of the tee. At corners, gasket should be cut so that the edge of one side is aligned with the edge of the perpendicular tee – do not bend gasket around at corners, or overlap pieces. Do not stretch gasket as it is being applied; this will cause it to pull away from the grid over time. Reference **Figure 6** and **7** below for proper and improper installation.

**Figure 6. Gasket Installation Isometric View**



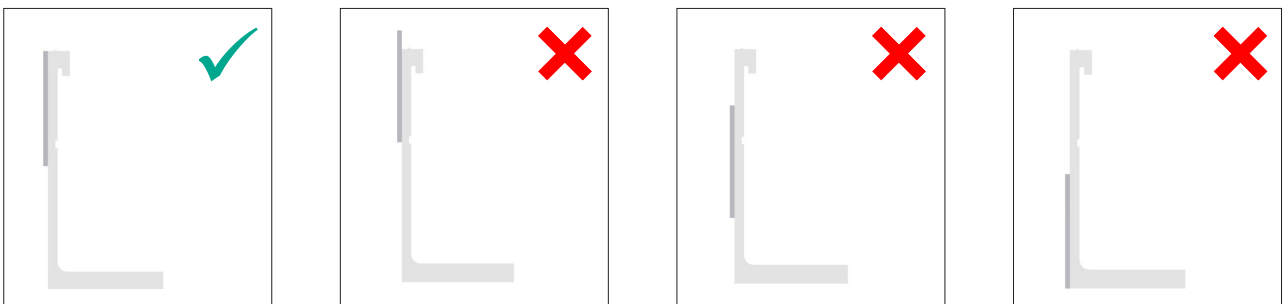
**Figure 7. Gasket Installation Cross Section**



**Step 8:** Apply gasket (part Number 042373-004 ) to one outside (vertical) surface of the half tee where two modules meet. The gasket is supplied in 50ft rolls – measure and cut the gasket as required.

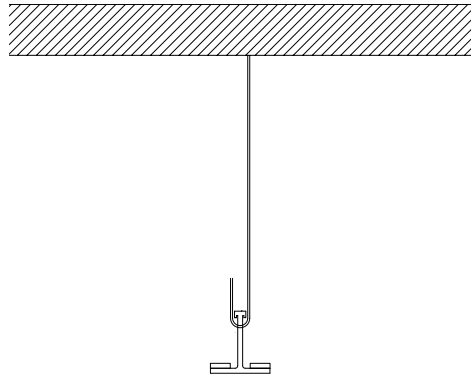
**NOTE:** Gasket should be installed as close to the top of the tee as possible – do not extend past the lip of the tee. Ensure that only one half tee has the gasket applied. Do not stretch gasket as it is being applied; this will cause it to pull away from the grid over time. Reference **Figure 8** for further details.

**Figure 8. Half Tee Field Joint**



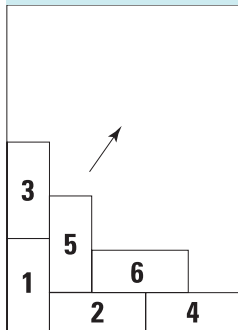
**Step 9:** Raise the first section, temporarily supporting it using hanger wire. Do not twist the wires at this stage; bend in loose, 180 degree loops (**Figure 9**) allowing leveling of the ceiling system once all sections are in place.

**Figure 9. Temporary Hanger Wire Support**

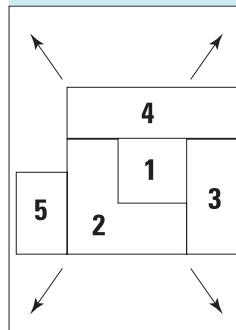


**NOTE:** It is recommended to start working at one corner of the room moving diagonally towards the opposite corner (diagonal start - **Figure 10**), alternatively starting at the center of the room and working outwards (central start - **Figure 11**), these methods allow for the contractor to trim or shim the drywall if they are not perfectly square. Do not start by installing the perimeter first (perimeter start - **Figure 12**); no ceiling modifications are possible in this configuration.

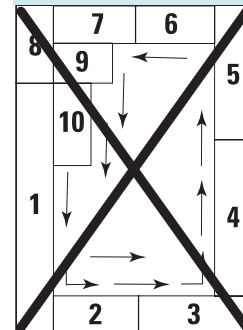
**Figure 10:  
Diagonal Start**



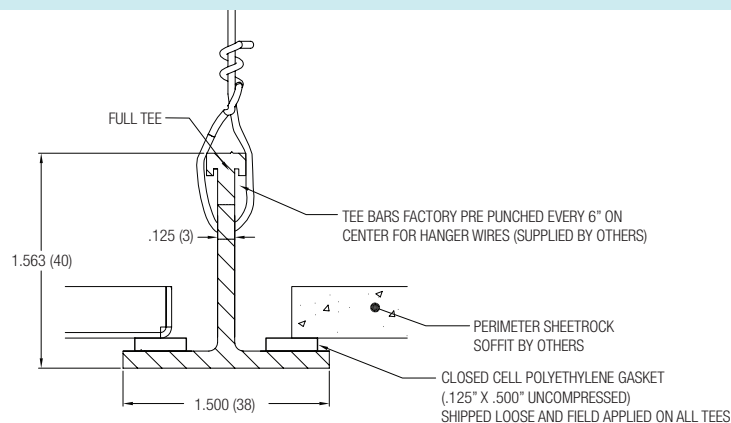
**Figure 11:  
Central Start**



**Figure 12:  
Perimeter Start**

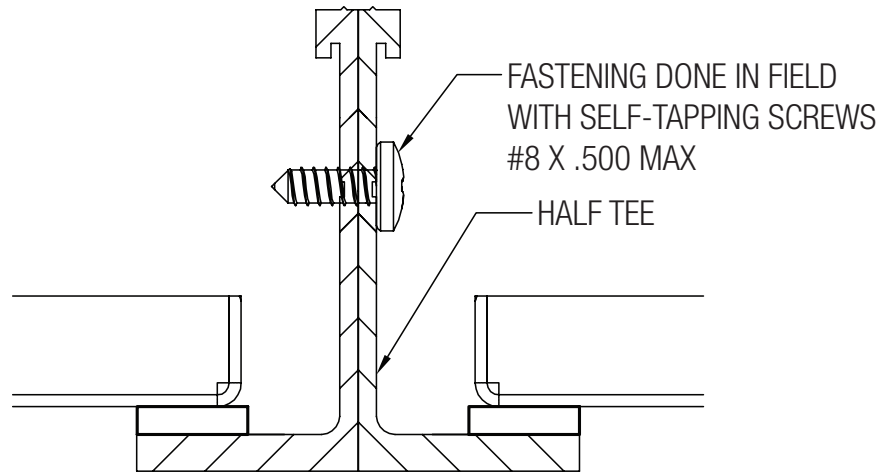


**Figure 13. Perimeter Installation Detail**



**Step 10:** Raise adjacent section, temporarily supporting with hanger wire, similar to Step 9. Clamp sections together and fasten together using self-tapping screws (**Figure 14**). Bottom of tees should be flush and level prior to screwing together.

**Figure 14. Fastened Adjacent Ceiling Sections**



**NOTE:** 12 in. recommended fastener spacing ensuring screws are placed within 6 in. of section edge.

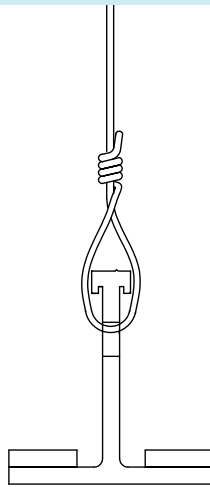
**Step 11:** Repeat Step 10 until all sections are hung/temporarily supported.

**Step 12:** Pull down the perimeter sections to tension the wires, and adjust the wire to minimize settling and movement of the grid once the diffusers, panels and lights are installed. Ensure that they are tight to the drywall (if installed), and/or at the correct height and there is no slack in the hanger wires. A sample perimeter installation detail is shown in **Figure 10**.

**Step 13:** Tighten hanger wire by twisting and securing per ASTM C636, or local building codes (as applicable).

**Step 14:** Adjust all sections, starting with the immediate adjacent sections, making the entire ceiling grid level and flush. Tightening hanger wires by twisting and securing per ASTM C636, after each module is properly tensioned (**Figure 15**).

**Figure 15. Tee Profile with Twisted Wire**

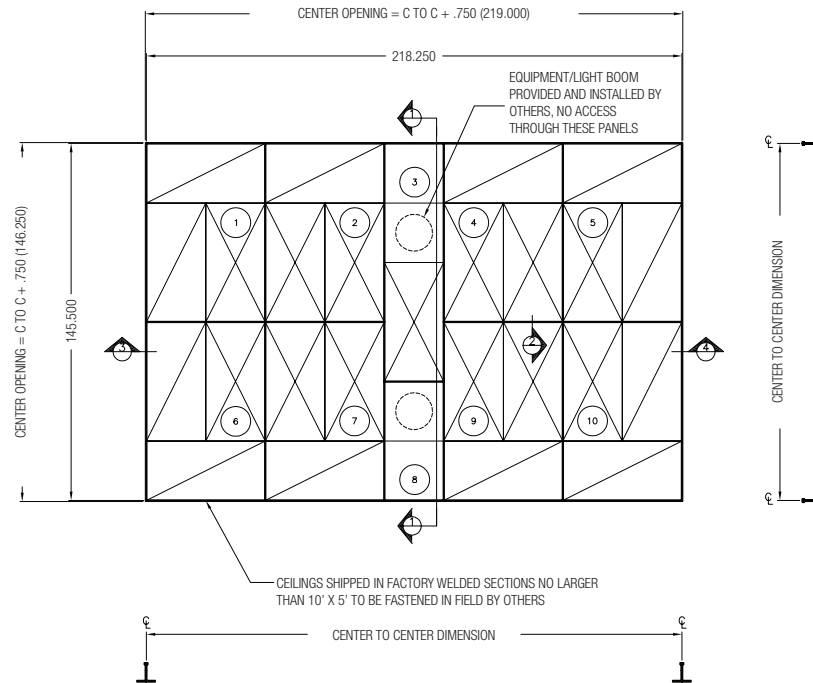




**Step 15:** Identify ceiling panels that require field cutting for equipment or light booms (panels will have dotted circles shown on submittal drawings, **Figure 16**). Refer to equipment/light manufacturer's instructions for size of hole, mark on the back of the ceiling panel, and cut accordingly.

**NOTE:** Ensure the hole will be covered by the equipment escutcheon (cover plate).

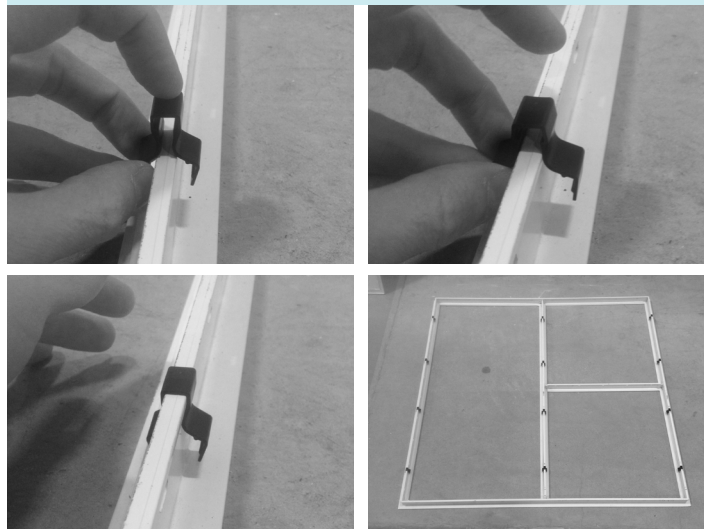
**Figure 16. Sample Ceiling Layout**



**Step 16:** Identify ceiling panel locations, denoted with a letter on the job specific submittal. Install ceiling access clips (Part Number 026002-002) along two opposite sides of where the panel will be installed. To install hold down clips, press the clips on the top of the tee until they snap in place (no tools required).

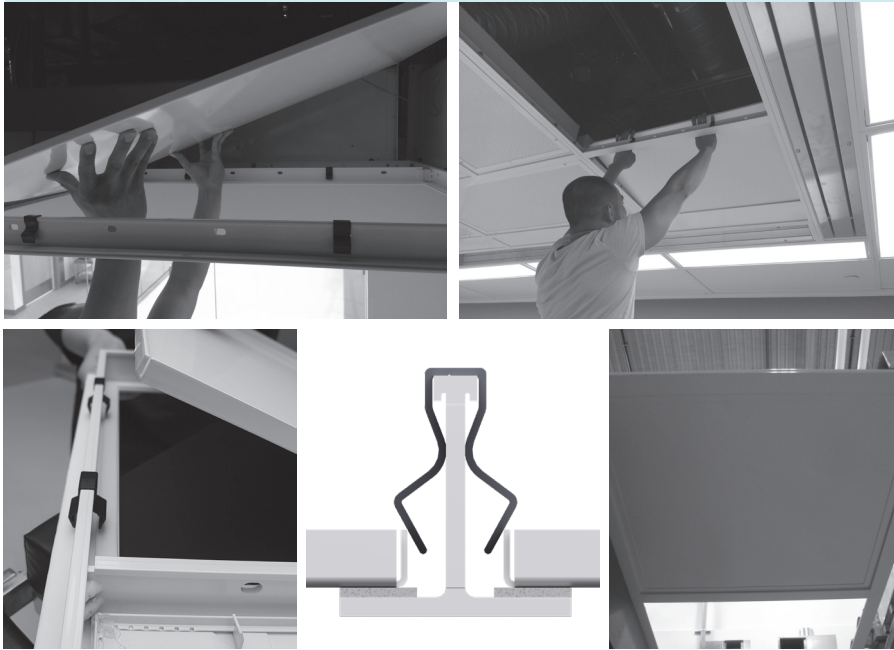
**NOTE:** Clips should be installed along the long side of the panels. For square panels, place clips along sides that are parallel to the long dimension of adjacent panels. The first clip should be installed 6" from the corner of the panel with the remaining clips spaced equally apart (12" in most cases). Refer to **Figure 17** for more details.

**Figure 17. Access Panel Clip Installation**



**Step 17:** Install ceiling panels in appropriate locations (refer to job specific submittal for locations). Maneuver panel through the grid opening so that the entire panel is above the tee surface. Place the panel at a 30 degree angle and push one edge of the panel against the ceiling access clips. Drop the panel to engage remaining ceiling access clips (**Figure 18**). For small panels, it may be necessary to push down on some edges to ensure all clips have been locked in place.

**Figure 18. Access Panel Installation**



**NOTE:** You may need to press the panel in place to ensure all ceiling access clips are engaged. Leave a large panel as the last panel installed. All ceiling panels should be installed prior to the installation of the booms and other equipment.

**NOTE:** To remove ceiling panels, push up on the face of the panel near any edge and remove the panel through the opening to access the ceiling above (**Figure 19**).

**Figure 19. Access Panel Removal**



**Step 18:** For diffuser installation, refer to the Keystone Diffuser Installation Manual.

For any questions or concerns with installation please contact [keysupport@keystonecleanair.com](mailto:keysupport@keystonecleanair.com) or call (470)-702-9560.





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