

# FORMATIONS® with Integrated Lighting

## Assembly and Installation Instructions

### 1. DESCRIPTION

**1.1** Formations® with Integrated Lighting Kit is a perimeter trim and suspension system designed to create ready-to-assemble full panel installations for “ceiling clouds with integrated lighting” in four different sizes: 6' x 8', 8' x 8', 8' x 10' and 10' x 10'. Formations are designed to work with Armstrong Optima®, Ultima® and Calla™ ceiling panels in Tegular edges for 9/16" and 15/16" suspension systems. All suspension systems and trim components are cut to length and all necessary accessories are included in the package. The kit is made up of Prelude®, Suprafine® or Interlude® suspension components and is trimmed with inverted Axiom® Vector® trim.

**1.1.2** Included in the Kit are:

- Axiom® Vector® Trim, with factory-cut end details to form a cloud to the required size
- Suspension system main beams and corresponding suspension system components cut-to-length to accommodate the installation of 24" x 24" full-size panels and a 4" light opening.
- Aircraft cable, cut to 10' length, in the amount required for the installation
- StrongBack™ Carrying Channel, cut-to-length to accommodate installation of the aircraft cable, 24" from the vertical face of the Axiom trim
- Axiom splices to join together sections of Axiom trim
- Axiom Connector Clips to join suspension system components to the Axiom trim
- Axiom component diagram to properly position perimeter trim sections
- STAC Clips to secure the suspension system cross tees where they intersect the lighting fixture.

**NOTE:** Pop-rivets, screws, and hardware required for attachment to the structure are not included. **Ceiling panels, lighting, and controls are ordered separately.**

Kits contain all of the components required to construct and hang a complete cloud except for the ceiling panels, lighting, and controls.

**1.1.3** Most building codes require non-structural building components to be restrained. Armstrong also recommends restraint in accordance with local building code requirements. Please consult with the building code professional having jurisdiction over the project to determine appropriate restraint requirements for this installation. Restraints are not included in this kit.

**Please note:** The Philips LEDalite TruGroove light fixture is attached to the main beams and has been seismically tested as a component of the Armstrong Formations ceiling cloud, so the light does not have to be independently supported.

**1.1.4** Formations, as with other architectural features located in the ceiling plane, may obstruct or skew the existing or planned fire sprinkler water distribution pattern, or possibly delay the activation of the fire sprinkler or fire detection system. Designers and installers are advised to consult a fire protection engineer, NFPA 13, and their local codes for guidance on the proper installation techniques where fire detection or suppression systems are present.

**CAUTION:** Ceiling panels used in Formations Acoustical Clouds must be limited to no more than 1.25 lbs/SF. Use of panels weighing more than this stated limit could result in failure of suspension system components.

## 2. INSTALLATION

**IMPORTANT NOTE:** The Axiom® Vector® trim is to be installed with the trim inverted as shown in detail in (Fig 1).

## 3. PRE-ASSEMBLY

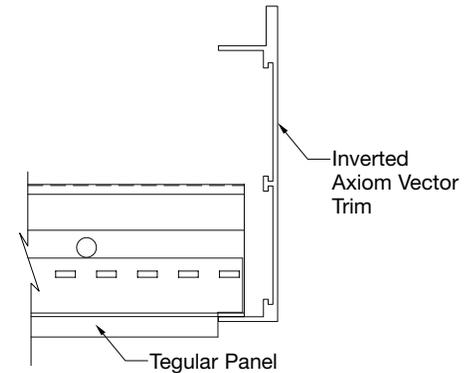
- 3.1** Study the layout drawing for the cloud and verify that kit contents are complete. Call 800-840-8521 to request replacements for missing components.
- 3.2** Review the location of the StrongBack™ Carrying Channels. They will be located on either side of the 4" linear light opening as a mean to support the side of the cloud. These StrongBack mains are located 4' on center (note that in some instances, this pattern will result in two StrongBack Carrying Channels being positioned 2' from one another at the center of the cloud).

## 4. ATTACH HANGING CABLES TO STRUCTURE

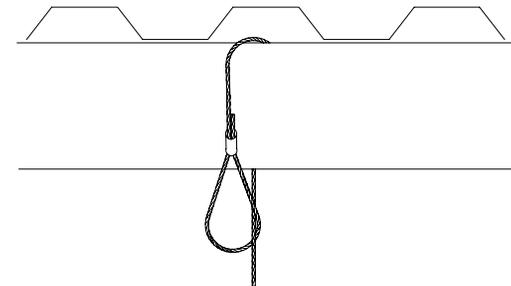
- 4.1** Hanging cables (item AC1210) are located along the length of the structural main beam suspension systems starting 2' from the edges of the cloud and then 4' on centers (note that in some instances, this pattern will result in two hanging cables being positioned 2' from one another at the center of the cloud).
- 4.2** Hardware for the attachment of the cable to the building structure is not provided. Cables are fitted with a loop at one end that is to be cinched to mounting hardware appropriate for the surface to which it is attached. Select hardware that will be capable of supporting a minimum of 200 pounds (Fig 2).

## 5. HANGING MAIN BEAMS

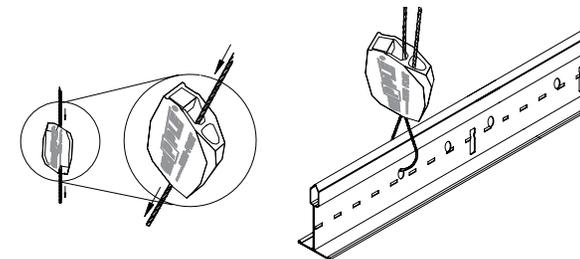
- 5.1** Attach the suspension system main beams to hanging cables using the adjustable "Quick Loop" connectors (item ACHC) provided with the kit. Insert the cable through one end of the connector and then through the appropriate hanger wire hole on the suspension system main beam. Slide the cable back through the "Quick Loop" connector and adjust to the correct elevation. Follow the instructions provided with the connectors if it becomes necessary to release the cable from the connector (Fig 3).



(Fig 1)



(Fig 2)



(Fig 3)

**5.2** Attach Axiom Clips (item AXCCLT) to each end of the main beams by positioning as shown in the drawing. The top of the clip should touch the bottom of the bulb of the suspension system and the end of the main beam should contact the thumbnail stop on the clip. Secure each clip with two pop-rivets or #8 sheet metal screws (note that pop-rivets are preferred over screws because they will not interfere with the placement of the ceiling panels) *(Fig 4)*.

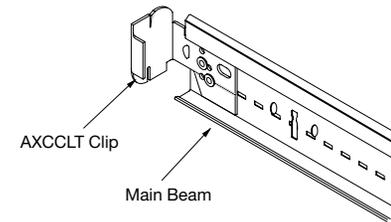
**NOTE FOR INSTALLING MAIN BEAMS:** Hang only the mains supported by cables. The remaining mains/tees & support bar cannot be installed yet, as they need the two pieces of Axiom installed perpendicular to the mains for support until final assembly. Layout the tee locations on the Axiom and install only the two pieces that attach to the mains. (Two people are needed to hold the mains until both Axioms are installed) now install the remaining mains by twisting in the clips to the Axiom. They will be temporary supported by the Axiom until tees and support bar are installed.

Once your cloud looks like the drawing in *(Fig 5)*, you will need to install the two non-supporting main beams. See drawings for locations.

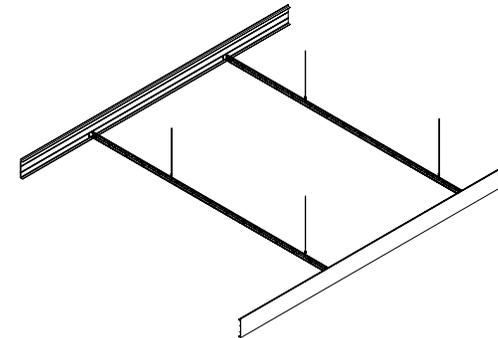
## 6. INSTALL TEES

**6.1** Install 2' cross tees between the main beams located 2' apart per shop drawing.

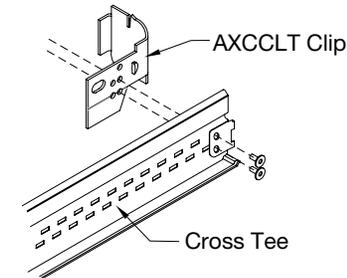
**6.2** Cut away the end detail on the cross tees that will engage the Axiom® trim. Attach Axiom Cross Tee Clips (item AXCCLT) to each end of each cross tee by positioning as shown in the drawing. The top of the clip should touch the bottom of the bulb of the suspension system and the end of the main beam should contact the thumbnail stop on the clip. Secure each clip with two pop-rivets or #8 sheet metal screws (note that pop-rivets are preferred over screws because they will not interfere with the placement of the ceiling panels) *(Fig 6 and 7)*.



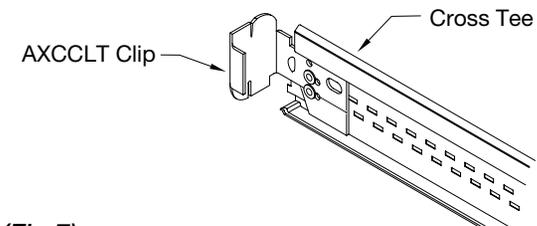
*(Fig 4)*



*(Fig 5)*

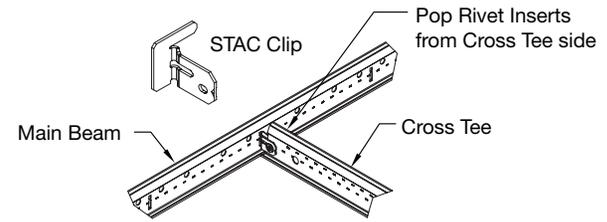


*(Fig 6)*



*(Fig 7)*

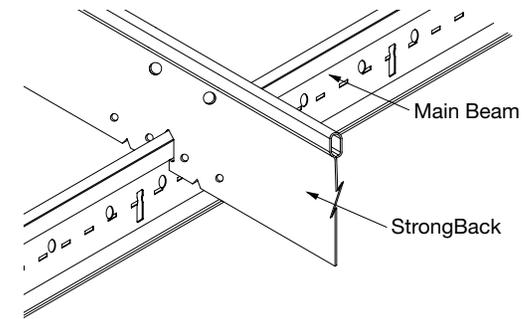
**6.3** Install STAC clips (as shown below) onto the cross tees that intersect with the two main beams located in the center of the Formations cloud. (These main beams create the 4" opening for the lighting fixture). The STAC clips hold the cross tees in their correct position (*Fig 8*).



(Fig 8)

## 7. INSTALL STRONGBACK CHANNELS

**7.1** The StrongBack Hanging Channel are best installed from above, as opposed to slid the suspension system main beam through the notches in the StrongBack. On the StrongBack Hanging Channel, bend the tab on one side of the notch out of the way. After the main beam is installed, the tab on StrongBack should be bent back into position under the bulb of the main beam (*Fig 9 and 10*).



(Fig 9)

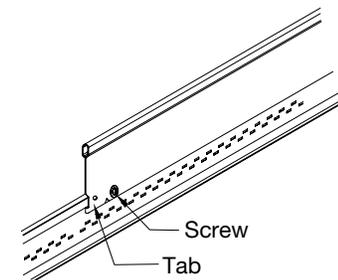
## 8. INSTALL FINAL AXIOM® TRIM

**8.1** Connect sections of Axiom trim with splice plates as required. The supplied assembly drawing will show the correct quantity and location for splice plates. Corner splices must be bent to 90° before assembly (*Fig 11*).

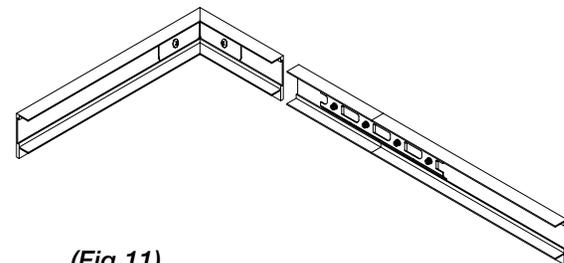
**8.2 DO NOT OVERTIGHTEN SETSCREWS.** Excessive torque will result in deformation of the trim that will show on the finished surface.

## 9. INSTALL RESTRAINT/SEISMIC BRACING

**9.1** Restraint for clouds installed on projects where anticipated seismic activity will be light (IBC seismic design categories A & B) can be accomplished by installing a pair of crossed cables 2' in from each edge of the assembly. These cables should attach to the support channels and be sloped no more than 45° from horizontal.



(Fig 10)



(Fig 11)

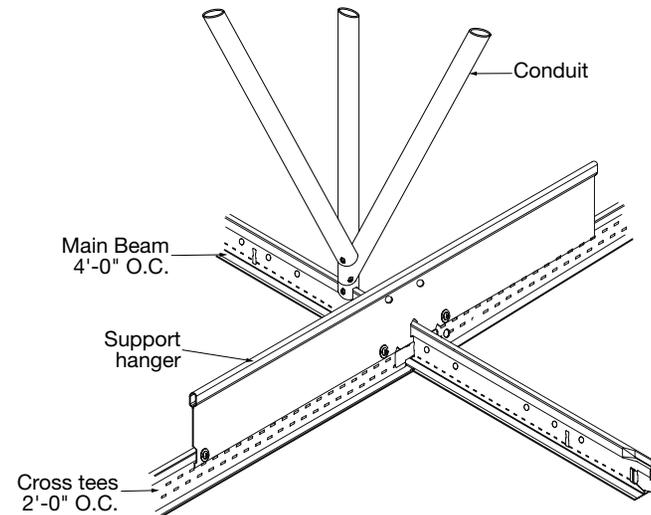
**9.2** In areas where anticipated seismic activity will be moderate to severe, the crossed cables should be replaced with a bracing system more appropriate for the forces that will be encountered.

**9.2.1** Testing conducted at the Structural Engineering Earthquake Simulation Laboratory, located at the State University of New York – Buffalo campus, produced satisfactory results with rigid bracing fabricated from 1/2" EMT conduit.

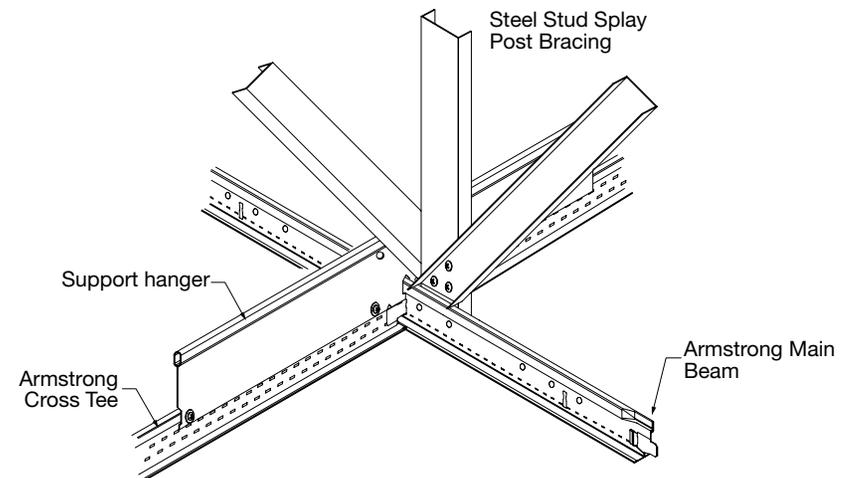
**9.2.2** The tested bracing system consisted of a vertical member extending from the support channel to the structure above near each corner of the cloud. These members were positioned at the main beam/support channel intersections closest to the corners of the assembly. Two additional members were fastened to the bottom of the vertical and extended to the structure at an angle not exceeding 45° from horizontal. These members were parallel to the sides of the cloud.

**9.2.3** In order to hide the bracing above the cloud, wire splay bracing can be replaced with rigid bracing. Rigid bracing only requires a post and two diagonals. This should be located at the suspension system intersection closest to each corner of the cloud and then not more than 12 feet in each direction. Depending on the height of the plenum, 1/2" EMT conduit can be used. The EMT ends are flattened and bent to facilitate attachment to the structure and the suspension system. Install the post first, and then connect the diagonals to the lower end of the strut just above the suspension system bulb.

**9.2.4** Restraint for a cloud is rigid diagonal bracing to the structure and since clouds are not attached to two walls, they must have restraints. In addition to building code requirements, there is a particular installation benefit for a contractor to restrain a ceiling that does not run wall-to-wall. A restrained ceiling is easier to keep straight and square. Some contractors will initially opt to skip this step in an attempt to save money. However, it is not advisable to do so because rework to fix alignment issues can add more labor costs than if the bracing would have been done at the onset. Typical restraint for a floating ceiling takes the form of rigid diagonal braces that extend from the suspension system members to the overhead structure. Sufficient restraint points must be used to meet the force values required by the code and to prevent movement in all directions. Additionally, the strength of the bracing members also must be matched to the anticipated applied forces.



(Fig 12)



(Fig 13)

**9.2.5** Rigid bracing at all four corners meets the requirements of Seismic Design Categories D, E, and F for clouds up to 200 SF as long as:

- The bracing is based on the cloud area, weight, and plenum depth
- The bracing is designed by the project engineer

Keep in mind that hanger placement is determined by the length of the cantilevered component. It is not a line of sight issue. Also, a cloud will require the same bracing and restraint with or without sprinklers.

### **9.3 Distance between a Cloud and Wall or Adjacent Cloud**

There is no minimum required as long as clouds are restrained to meet the Seismic Design Category.

## **10. INSTALL LIGHTING FIXTURE (BY OTHERS)**

**10.1** The Philips LEDalite TruGroove lighting fixture gets installed by a licensed electrical contractor. The lighting fixture is installed after the Formations cloud has been completely constructed. The lighting fixture installs from above the Formations cloud and attaches to the two center main beams using the UCB clip, provided with the light fixture.

**10.2** The electrical contractor will attach the side attachment brackets to the side of the TruGroove lighting fixture and fit it over top of one of the center suspension system main beams. The electrical contractor will secure each bracket to the suspension system main beam using sheet metal screws. The electrical contractor shall reference the TruGroove T-Grid installation instructions for exact installation requirements for the TruGroove light fixture.

**10.3** The Philips LEDalite TruGroove lighting fixture installed in the Formations™ cloud does not need to be independently restrained or supported. Testing was conducted at the Structural Engineering Earthquake Simulation Laboratory, located at the State University of New York – Buffalo campus where the lighting fixture was supported by the Armstrong Formations cloud and satisfactory results produced.

## **11. INSTALL CEILING PANELS**

**11.1** Clean and align Axiom® components and install ceiling panels to complete the assembly.

### **MORE INFORMATION**

For more information, or for an Armstrong Ceilings representative, call 1 877 276 7876.

For complete technical information, detail drawings, CAD design assistance, installation information, and many other technical services, call TechLine customer support at 1 877 276 7876 or FAX 1 800 572 TECH.

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