WG-XTR

U.S. Patent No. 12,031,327
U.S. Patent No. 12,584,311

Extruded Aluminum Walkable Ceiling Suspension System

Installation Instructions

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PART 1 - STORAGE AND HANDLING

1. After receiving materials, transfer material immediately to a safe, dry, climate-controlled place where it will not be damaged during storage.
    a. Do not store Gordon, Inc. product or components outdoors.
    b. Store Crates and / or Cartons flat in a dry location away from activity.
    c. Do not store near corrosive material such as acids, salt, fertilizer, etc.
    d. All materials should be protected during site storage to prevent damage to the finished work from other trades.
    e. Store materials inside a well-insulated area, away from concrete and masonry and protected from the weather, moisture, soiling, abrasion, extreme temperatures and humidity.
    f. Protect the strippable protective covering on metal panels from exposure to sunlight, heat, and high humidity.
    g. Store product in Gordon's unopened packaging until installation of product.
    h. Prevent contact with material that may cause discoloration, staining, or corrosion.
    i. Store in flat, fully supported position.
    j. Store to prevent twisting, bending, abrasion, scratching, and denting.
    k. Do not drop or stand containers on edges or corners.
    l. Gordon, Inc. components and systems are not packaged to receive the load of any other material stored or stacked upon it. Therefore, DO NOT DOUBLE STACK OR STORE OTHER MATERIAL on top of the packages or crates.
2. Inspect all material prior to installation. Do not install any substandard or unacceptable material. Gordon, Inc. will not be responsible for the cost of repair or removal, or costs resulting from removal of rejected material, or the installation of replacement material.
3. Allow a minimum of 48 hours for the product to adjust to internal room temperature and humidity conditions before installing the product.
4. Material should be cleaned thoroughly prior to installation.

PART 2 - INSTALLATION

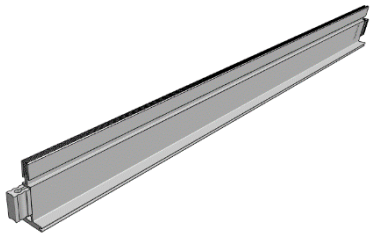
The WG-XTR Walkable Ceiling System by Gordon, Inc. is a modular ceiling suspension system created to sufficiently support service personnel traffic in the plenum area as well as the loads created by Automated Material Handling Systems (AMHS) and Fan Filter Units (FFUs). It is a stick-built, non-progressive system designed for field assembly. Every intersection can accommodate a sprinkler penetration and the unique design of the tee allows for simple snap-on of additional hangers, if necessary. (For more information on Cleanroom Ceiling Systems contact a Gordon, Inc. service representative. 800-747-8954).

2.01 - APPLICABLE CODES AND STANDARDS FOR INSTALLATION

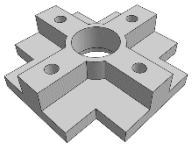
1. Project Specifications
2. Architect approved Shop Drawings
3. American Society for Testing and Materials (ASTM)
    - ASTM C635
    - ASTM C636
4. National and Local Building Codes

2.02 FACTORY SUPPLIED COMPONENTS

- The Tee Assembly
  - The WG-XTR Tee Assembly is comprised of one (1) WG-XTR Tee and two (2) WG-XTR Tee Inserts. Standard sizes are for 48” x 48” modules.
    - The WG-XTR Tees are very unique and designed to support high loads along with being versatile enough to allow multiple suspension options. The Tees are 3.8” tall and 2.0” wide. The top groove is made to receive ¼-20 bolts up to 7/8” long. The hollow web provides the cavity for inserting connectors at the end of each tee.
    - The WG-XTR Tee Inserts are factory pressed into the hollow web of the WG-XTR Tees and provide the interconnection method to assemble the Tees to the intersection components. The Tee Inserts are fabricated of high strength aluminum extrusions.



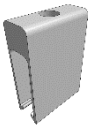
- The Hub
  - The WG-XTR Hub is a die cast zinc component that is designed to nest the Tee Assemblies at each intersection. The Hub has four threaded holes for connecting the Tee Assemblies. The Hub also has a central opening that allows for either overhead suspension or the installation of penetrating sprinklers.



- The Central Hanger
  - The Central Hanger is a die cast zinc component that is designed to suspend the Hubs to which all of the Tee Assemblies are connected. The Central Hanger is inserted through the central opening of the Hub and supports the Hub from underneath. The Central Hanger has a 3/8-16 threaded hole at its core to accommodate the connection of the 3/8-16 Starter Rod.



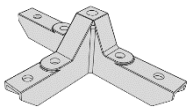
- The Snap-On Hanger
  - The Snap-On Hangers are utilized in locations where a sprinkler penetrates the Hub or in locations where additional support must be added directly onto a Tee. The Snap-On Hangers have a 3/8-16 threaded hole to accommodate the connection of the 3/8-16 Starter Rod.



- The Starter Rod & Turnbuckle Assembly
  - The Starter Rod is uniquely threaded with 3/8-16 RH threads on one end and ½-13 LH threads on the other end. The 3/8-16 end will thread into the Central Hanger or the Snap-On Hangers. The ½-13 end will thread into the factory supplied Turnbuckle.
  - The Turnbuckle provides adjustments to the suspension and accommodates leveling of the system. The Turnbuckles are ½-13 as required by the maximum loading to be supported by the Ceiling System. The Assembly includes a 3/8” Jam Nut.

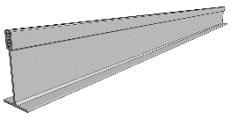


- WG4WAYHD, WG3WAYHD, WGCNRHD Connectors
  - These Connectors are die cast zinc components designed to be fastened to the ¼-20 screwslot along the top of the WG-XTR Tee.



These Connectors are primarily utilized when connecting field cut Tees to a perimeter Tee, or connecting Secondary Cross Tees to the WG-XTR Tees.

- The Secondary Cross Tee
  - The Secondary Cross Tee is required when a 2x4 light fixture is utilized. The Ceiling Grid is constructed on a 48" x 48" layout. The Secondary Cross Tee is a non-AMHS load bearing Tee designed to simply support the weight of the FFUs, Lights, and Service Personnel traffic. It is connected to the WG-XTR Tees with a WG4WAYHD or WG3WAYHD Connector.



- WG-XTR Bolts
  - The WG-XTR Tee Assemblies are connected to the WG-XTR Hub with Grade 5, 5/16-18 x 2 1/4" long Hex Head Bolts. These Bolts are supplied with 5/16" washers. No substitutions are allowed since it could compromise the strength of the assembly.



- ¼-20 Bolts
  - The ¼-20 Bolts are used to secure the WG3WAYHD, WG4WAYHD, and WGCNRHD Connectors to the ¼-20 screwslot on the top of the WG-XTR Tee.



2.03 SPECIAL TOOLS REQUIRED

- Screw gun
  - #2 Phillips Screwdriver bit for tightening ¼-20 bolts
  - ½" Wrench / Socket for tightening 5/16-18 hex bolts
- Laser Leveling and alignment tool
- Chop Saw / Band Saw with carbide-tipped, fine-tooth, metal cutting blade to cut aluminum extrusions.
- Wax stick or similar lubricant

2.04 INSTALLATION OF WG-XTR CEILING SYSTEM

Prior to installation:

Step 1:

Suspend the ½-13 threaded rods from the structure above. Be sure to check the location and length of the threaded rods before and after suspending them. Use Shop Drawings to locate the exact hanging locations. A laser or other suitable leveling tool should be used to ensure a consistently level finished product.

Step 2:

Measure and locate the positions of the WG3WAYHD Connectors on the Perimeter Main Tees and then attach them using four (4) of the ¼-20 bolts. Next attach the Starter Rod & Turnbuckle Assembly to the WG3WAYHD Connectors (48" O.C.). Ensure that the Starter

Rod is fully threaded into the casting prior to tightening the Jam Nut. Make sure that the Starter Rod is inserted 2/3rd inside the Turnbuckle and that the Turnbuckles align with the all-threaded rods pre-suspended along the perimeter. See Figure A.



Figure A: *Installing Perimeter Main Tees*

Suspend the Perimeter Main Tee from the suspended rods by threading the suspended rods into the Turnbuckles. Adjust the suspension height by rotating the Turnbuckle as required. A laser or other suitable leveling tool should be used to ensure a consistently level finished product. Continue suspending perimeter extrusions around walls and columns, if any, until complete.

On some projects, an optional Closure Wall Angle, typical of the Gordon, Inc. WA-2 is utilized. If called for, the Closure Wall Angle will be installed before the Perimeter Tees are suspended. Ensure Closure Wall Angle is properly leveled for ceiling height per approved Submittal Drawing, then attach lengths of Closure Wall Angle to walls using appropriate fasteners for your type of existing wall. The outside flange of the Perimeter Main Tees is suspended below the flange of the Closure Angle. Use the Turnbuckles on the Perimeter Main Tees to draw the Main Tee flange up tightly to the flange of the Closure Angle. See Figure B.

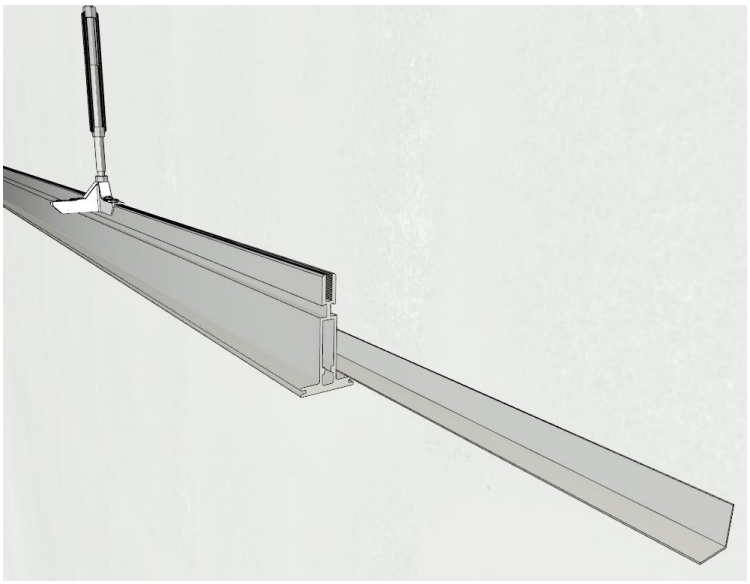


Figure B: *WA2 Perimeter Closure Angle Installation*

Cuts at corners can be made with any power miter saw with a non-ferrous, carbide-tipped blade. Special cuts on Cross and Main Tees may be made in the same manner.

Step 3:

Once the perimeters are completely installed, begin installing the Starter Rod & Turnbuckle Assemblies on the remaining threaded rod drops. Thread the open end of the ½" Turnbuckle onto the end of the suspension rods above. Make sure that the Starter Rod is inserted 2/3rd inside the Turnbuckle.

Step 4:

Assembly of the WG-XTR System can be completed overhead or on a table. The table assembly is referred to as constructing "ladders". Ladders can be constructed in multiple sizes, depending on preference. Ladders can be 4' wide by 8' long or 12' long, or 8' wide by 8' long. The following instructions describe table assembly of 4' x 12' ladders.

Place four (4) WG-XTR Hubs face down on a protected surface, 48" apart. Place a WG-XTR Tee Assembly face down between each Hub so that the holes in the WG-XTR Tee Inserts align with the threaded holes on the Hubs. Tighten a Grade 5, 5/16 Hex Head Bolt into each hole to secure the Tee Assembly to the Hub. **The bolt must be assembled with the provided washer. Failure to use the supplied washer will compromise the integrity of the System.** The bolt must be tightened using a torque measuring tool. The torque to apply must be 15-17 ft-lbs. See Figure C.

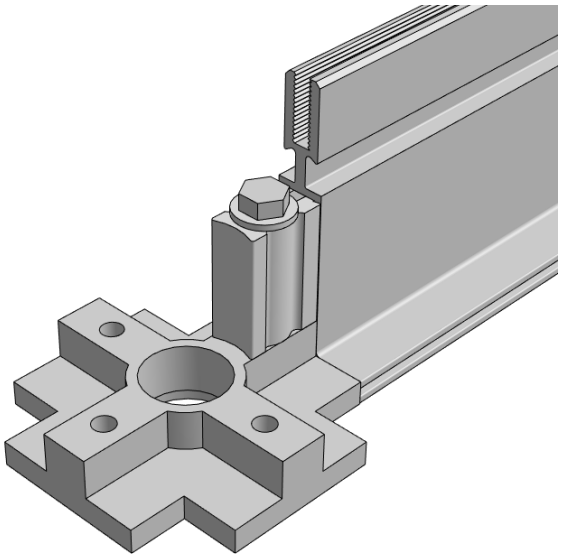


Figure C: *WG-XTR Tee Assembly Connection to Hub*

One side of the ladder will be formed after this step is completed. Repeat the previous step to create the second side of the ladder. See Figure D.



Figure D: *WG-XTR 12' Side Rail Ladder Assembly*

Once complete, the cross members can be attached. Using the same WG-XTR Tee Assemblies as before, connect the Hubs of each side of the ladder using the same process to attach the previous Tee Assemblies to the Hubs. All bolts with washers are to be tightened to 15-17 ft-lbs. The 4' x 12' ladder assembly will look as shown in Figure E below. Remove the paper release sheet from the gasket on the ends of the Tees exposing the adhesive. Press the gasket down onto the flange of the Hub, making certain that the intersecting gaskets touch.
Continue building ladders.

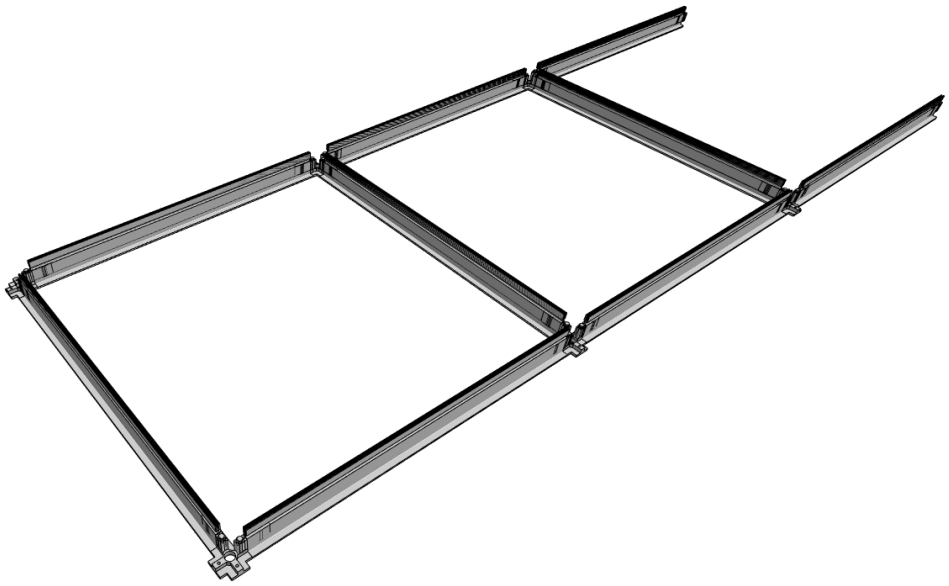


Figure E: *WG-XTR Ladder Assembly (4' x 12')*

Step 5:

After the Starter Rod & Turnbuckle Assemblies have been installed above, raise the ladders into place so that the tip of the Starter Rods penetrates approximately 1" through the central hole in the Hubs. See Figure F.

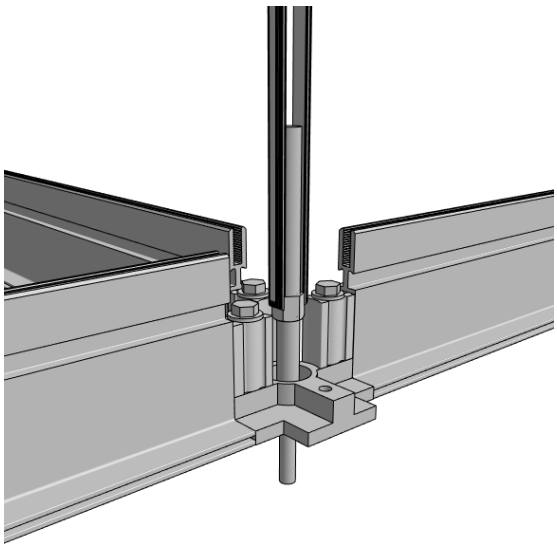


Figure F: *Suspending WG-XTR Ladders*

Thread a Central Hanger onto the end of each Starter Rod until it reaches full engagement. See Figure G.

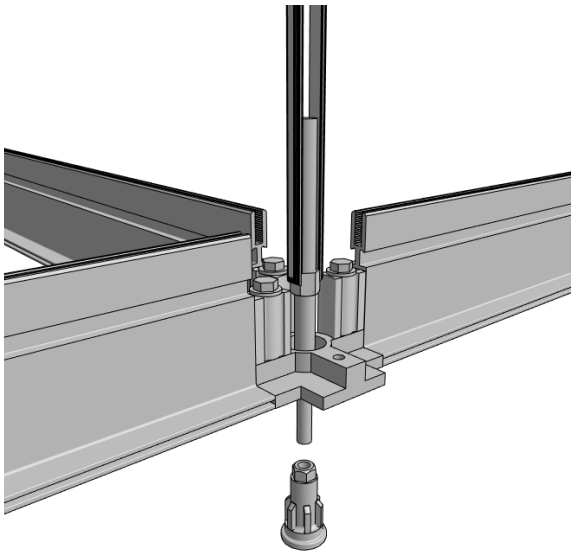


Figure G: *Installing the Central Hanger*

After all of the Central Hangers have been installed, the ladder can be lowered to rest on the Central Hangers. Adjust the suspension height using the Turnbuckle as required.

Step 6:

Once all of the ladders are in place, they can be bridged by positioning a Tee Assembly between them. The Tee Assemblies shall be connected to the ladders using the same procedure described in Step 4. See Figure H.

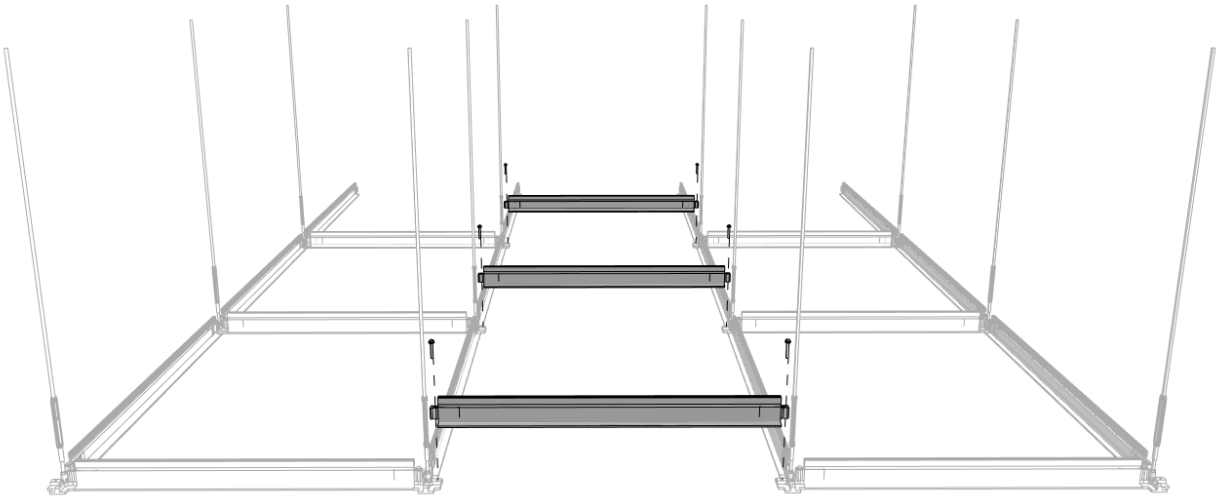


Figure H: *Installing the Remaining Tee Assemblies between Ladders*

Step 7:

After all the standard Assemblies are installed, field cut the Tee Assemblies that are to be installed between the Perimeter Tee and the first ladder. IMPORTANT: When cutting a Tee, leave 1/4" of gasket overhanging this cut. To install the field cut Tee Assembly, first secure the end with the Tee Insert to the Hub on the adjacent ladder. Next insert the opposite end of the Tee (the field cutting should have removed some if not all of the Tee Insert on this end) into the WG3WAYHD Connector at the Perimeter Tee and secure them using the 1/4"-20 bolts.

Remove the paper release sheet from the gasket on the ends of the Tees exposing the adhesive. Press the gasket down onto the flange of the Hub making certain that the intersecting gaskets touch. Properly installed, the cut end of one gasket will compress against the side of the intersecting gasket to create an air-tight seal under compression. Repeat until all Tees are in place.

Step 8:

Check the entire Ceiling Grid System once all the Tees have been installed and level to within 0.10" overall or to 0.06" in any 10' length. Minor adjustments can be done by adjusting the Turnbuckles. You may now proceed to module installations (Lights, FFUs, etc.) if any and laying in the blank walkable tiles.

Step 9:

In locations where sprinklers are penetrating the Hub, the Snap-On Hangers will be used. If this is the case, the Central Hanger cannot be utilized. Position two (2) Snap-On Hangers, one (1) on each end of the two (2) adjacent Tees. See Figure I.

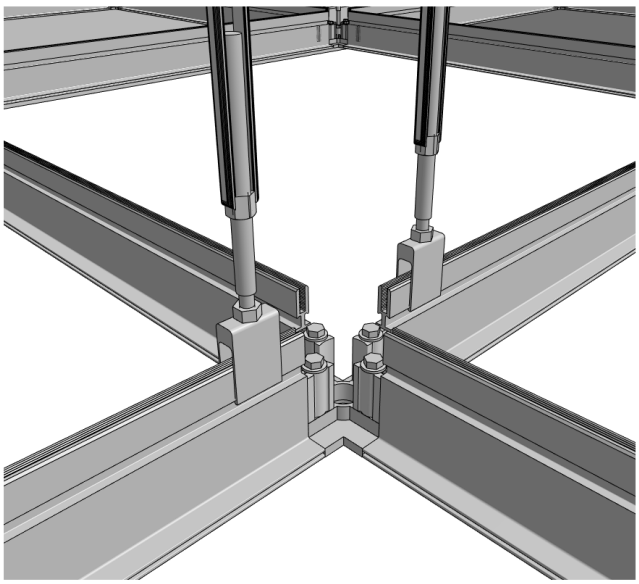


Figure I: *Snap-On Hangers at Sprinkler Penetration Location*

Take note that the Threaded Rod drops in these locations will need to be approximately 4 ½" shorter than the Threaded Rod Drops that are connected to the Central Hangers. The Snap-On Hangers can be installed while the ladder is being constructed or after the ladder has been installed. These components can be snapped on or slid on from the end of the Tee. The bottom lips of the Snap-On Hanger should positively engage the slots on along the side of the Tee. Thread the Starter Rod completely into the Snap-On Hanger until it bottoms out on the top of the Tee. The bottom of the Starter Rod must be contacting the top of the Tee. Tighten with a lock nut.

Step 10:

Sprinkler Installation

The FM Approved Sprinklers have been designed specifically for the WG-XTR System. Before installing the sprinklers, check that the Snap-On Hangers have been utilized as described in the previous step. The hole in the center of the Hub shall be free and ready to receive the Sprinkler. Ensure the Sprinkler Grommet is properly seated upon the machined edge of the stainless-steel Sprinkler pipe.

To install the Sprinkler, remove the plastic guard from the Sprinkler Head and carefully insert the Sprinkler Head through the hole in the Hub. Position the Sprinkler Bracket so that it is running above the Tees that do not have the Snap-On Hangers. See Figure J.

Using the two (2) each ¼-20 Machine Screws that are supplied with the Sprinkler, attach the Sprinkler to the Tee Assemblies by inserting the screws through the Sprinkler Bracket and into the Screwslot along the top of the Tee Assemblies. It is recommended to use a cordless screw gun to tighten the screws at a torque setting of no more than 50% of maximum for the tool.

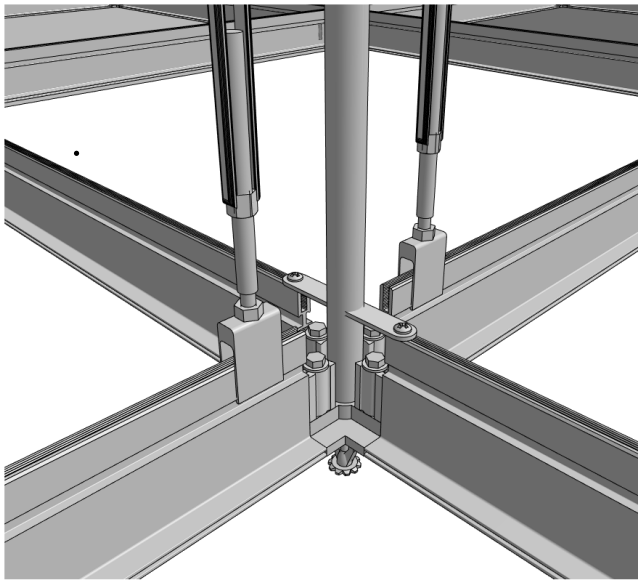


Figure J: *Sprinkler Installation*

Step 11:

Installation of Cross Tees for 2x4 Light Fixtures

The Secondary Cross Tees for 2x4 Light Fixtures are only used when an additional Tee is required to support a 2x4 light fixture. These Tees are designed to support the personnel loads as well as the loads of FFUs and light fixtures. They are not designed to support AMHS loads.

If light fixtures are being installed in adjacent modules, the WG4WAYHD will be used. If the light fixtures are separated by one or more modules with a 4x4 blank panel, then the WG3WAYHD will be used.

Position either the WG4WAY Connector or WG3WAY Connector in the center of the WG-XTR Tee Assemblies. Using four (4) each ¼-20 Machine Screws, attach the Connectors to the Tee Assemblies by inserting the screws through the Connectors and into the Screwslot along the top of the Tee Assemblies. It is recommended to use a cordless screw gun to tighten the screws at a torque setting of no more than 50% of maximum for the tool.

Insert the Secondary Cross Tee and secure to the two (2) Connectors using four (4) more ¼-20 Machine Screws. See Figure K.

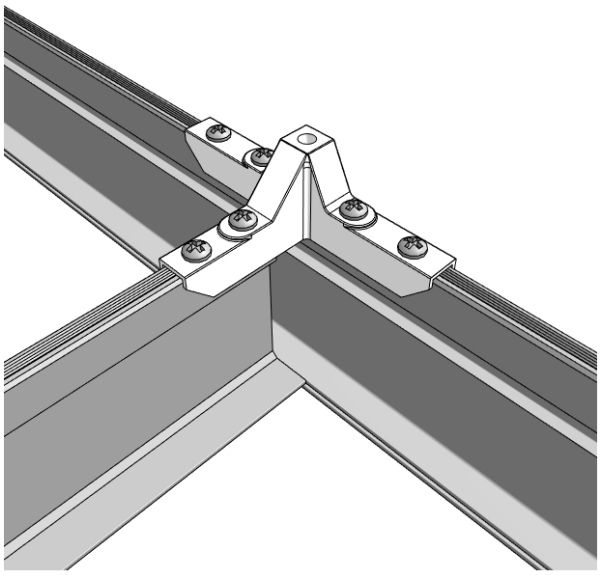


Figure K: *Adding Secondary Cross Tees to Support 2x4 Light Fixtures*

Remove the paper release sheet from the gasket on the ends of the Tees exposing the adhesive. Press the gasket down onto the flange of the Hub making certain that the intersecting gaskets touch. Properly installed, the cut end of one gasket will compress against the side of the intersecting gasket to create an air-tight seal under compression.

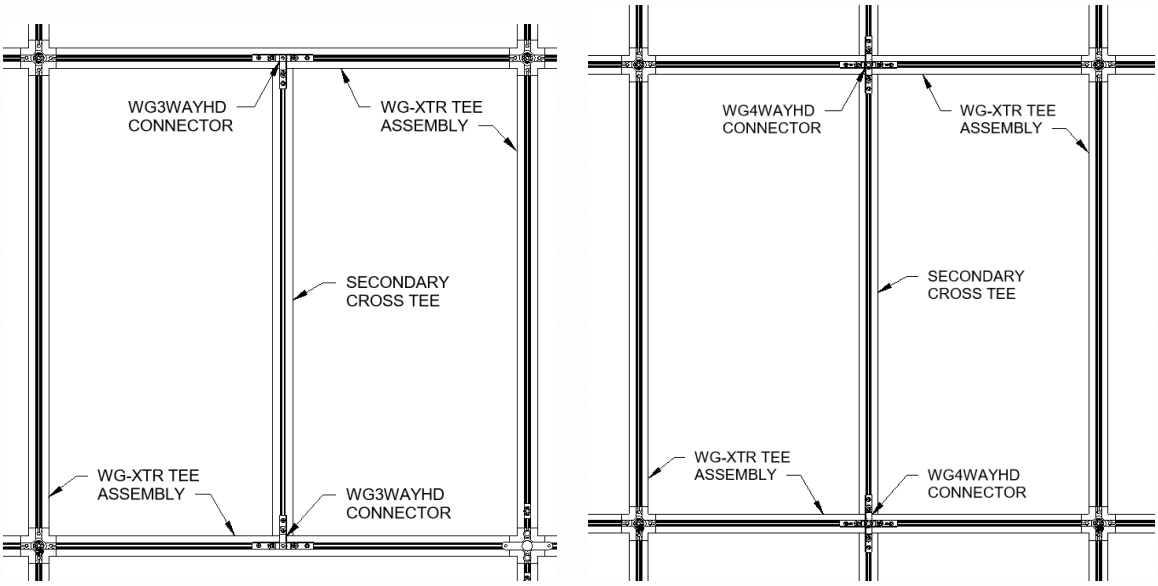


Figure L: *Mounting Secondary Cross Tees with WG3WAYHD and WG4WAYHD Connectors*

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