Installation of Xalon X8000 RF Shielded Ceiling Panels

X8000 Panel

A drop down or suspended RF shielded ceiling system is composed of a commercial metal ceiling grid with 15/16” grid type (non-metallic grid systems will not work) and Xalon RF Shielded ceiling panels, that are placed into the grid. Two standard sizes that are available: 2’ x 2’ and 2’ x 4’. Light fixtures with metallic housings (RF shielded) can also be used in the drop ceilings or LED light strips attached to the bottom of the ceiling grid or LED light fixtures that take the place of the ceiling grid member. RF shielded air vents are also required and are available.

Xalon RF shielded ceiling tiles are designed to be inserted into a commercial grade, metal, suspended ceiling grid with 15/16” grid tees, that has been electrically grounded and all joints RF sealed using beryllium copper fingerstock with electrically conductive pressure sensitive adhesive (ECPSA) or RF gasketing and Xalon FS electrically conductive silicone RTV caulking (recommended), as needed to seal RF leaks.

If the walls are RF shielded, install all the wall RF shielding layer(s) first, leaving the inner wall RF shield layer exposed, before installing the ceiling grid. This might be at the bottom of the grid wall molding or above, depending on the fire code.

Ideally, the ceiling grid perimeter wall molding will be attached directly in contact with the inner RF shielded wall layer (typically sheet metal, foil, or metalized fabric). If, due to fire code the 2nd layer of sheetrock must be installed, you will have to bring the wall shielding back down to the grid wall molding, on the inside of the 2nd layer of sheetrock. This can be done with ECPSA foil tape or 26-gauge galvanized steel flashing, or a combination of the two.

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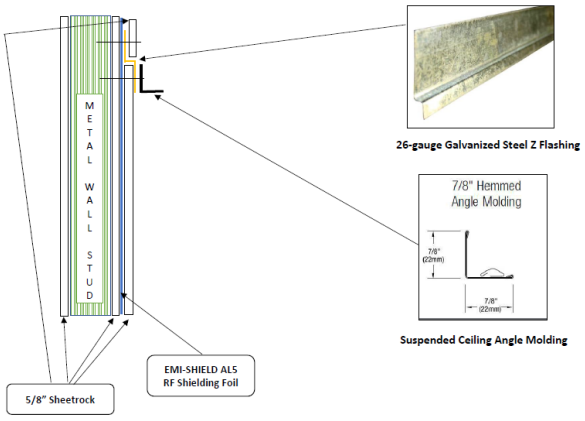
Connecting Suspended Ceiling Grid to Foil Shielded Wall



Larger drawing at the bottom of this document.

BEFORE INSTALLING CEILING GRID SYSTEM

Your need to make sure that every metal wall stud and metal ceiling or floor stud is connected electrically to earth ground. You might have to make more than one connection from the metallic grid to a good ground. Verify that all metal wall studs are earth grounded by continuity checking them using an ohmmeter or multi-meter. The suspended ceiling grid grounding is typically through the grounded metal wall studs (recommended) and metal ceiling studs (this is not typical or recommended). Even if the walls are not RF shielded, it is a good idea to make sure all the metal wall studs are grounded. The Xalon RF Shielding System relies on multi-point grounding to maximize the RF shielding performance. For non-metallic framing, designated grounding wires will have to be added, from the metal ceiling grid to earth ground (this is not common).

INSTALLATION OF THE MAIN BEAMS & CROSS TEES

Most contractors already know how to install a suspended ceiling system. We typically use Armstrong suspended ceiling grid system components.

If you do need instructions, please use the Armstrong installation instructions. https://www.armstrongceilings.com/residential/en-us/project-ideas-and-installation/drop-ceiling-installation.html

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RECOMMENDED SUSPENDED CEILING GRID SYSTEMS

ACP Classic X Clip

Armstrong Prelude ML (preferred)

Armstrong Prelude XL (preferred)

Armstrong Prelude XM (preferred)

CertainTeed Classic Aluminum Capped Stab System

CertainTeed Classic Environmental Stab System

Only the portion facing into the room is coated or painted

For retrofit of acoustic panels to RF shielded panels, most existing, commercial grade, metal ceiling grid systems can be made to work.

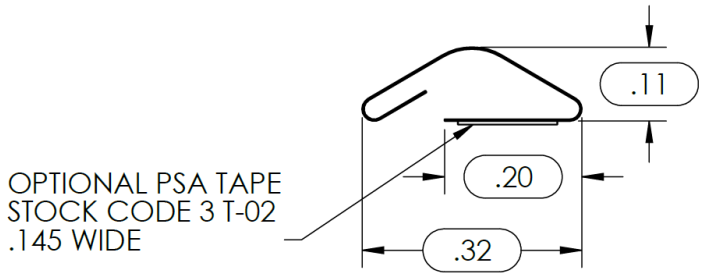
INSTALLATION OF BERYLLIUM COPPER FINGERSTOCK

Skin contact with Xalon FS or beryllium copper fingerstock may cause irritation in some sensitive individuals with an allergic dermal response. Please wear TPE, neoprene, or nitrile gloves to avoid this.

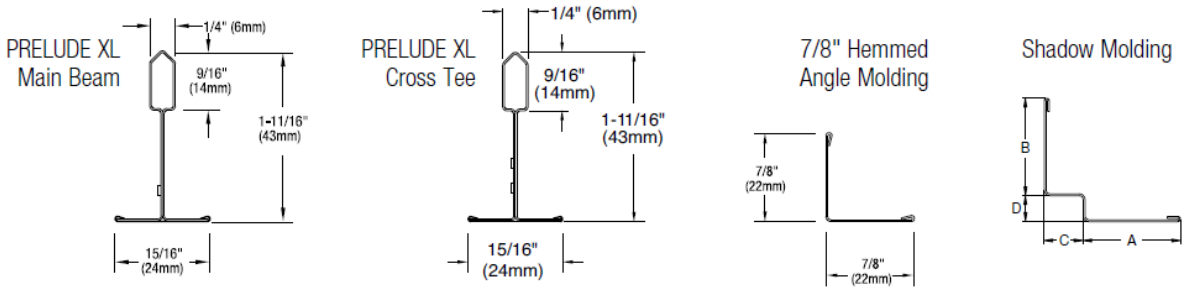
For ready to install main beams, now is a good time to install the beryllium copper fingerstock pieces on to the main beams. It is much easier to work on a table then overhead. Thoroughly clean the top side of the main beam tee. Remove the release tape from the fingerstock and install the fingerstock, with the tape side towards the outer folded over edge or hem (see drawings below), making sure it is lying flat in the

horizontal tee portion. Press down firmly on the fingerstock, along the length of the fingerstock to assure good adhesion of the fingerstock on to the main beam. Fill in both sides of the main beam with fingerstock by butt jointing the fingerstock, along the entire length of the main beam. Cut off any extra fingerstock at the end or precut the last fingerstock near the end with good quality shears. Then install the main beams as you normally would.

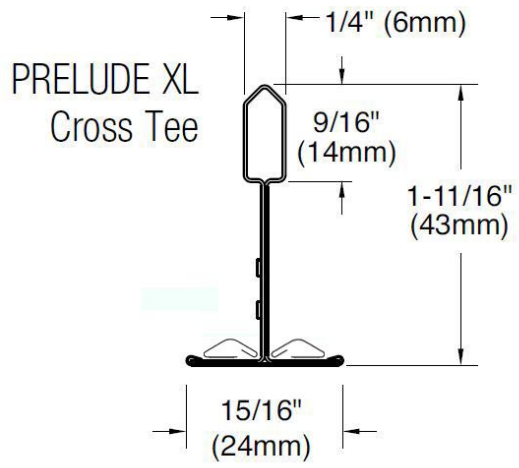
For the cross tees, follow the same procedure as the main beams. But do not install the cross tees to the wall angle molding at this time. All the other cross tees can be installed.



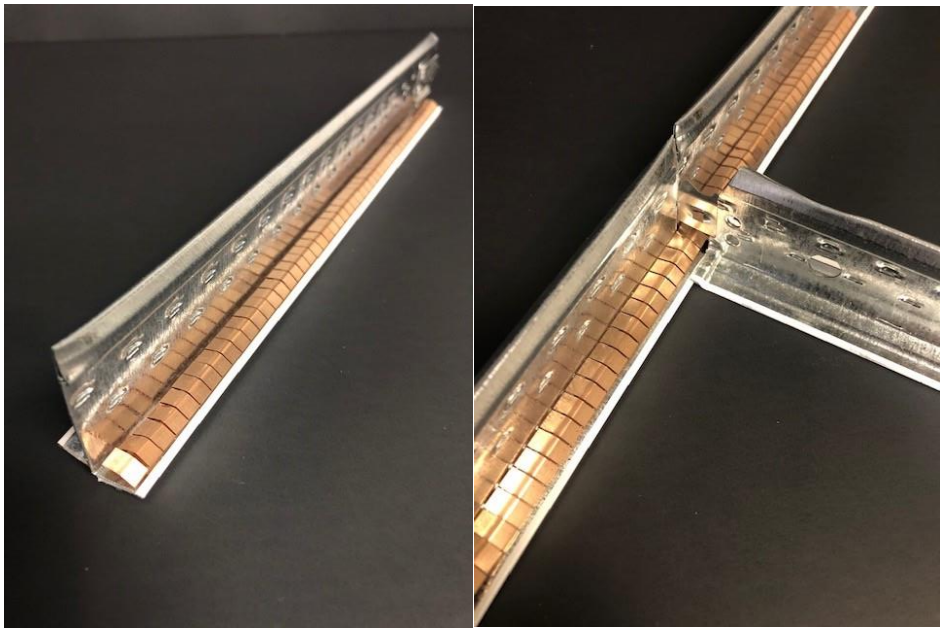
Profile view of fingerstock



Profile view of ceiling grid components



Profile view of fingerstock installed (both sides) of main beam & cross tee

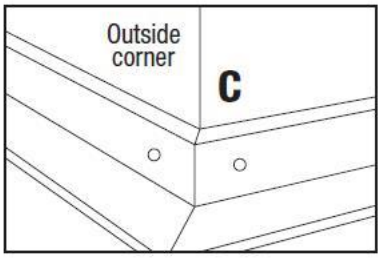


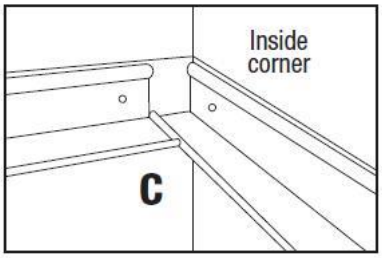
Pictures of fingerstock installed on a main beam

INSTALLING WALL MOLDING ANGLES

For the wall molding, fully install it all, without the fingerstock attached. You will want to check electric continuity (resistance) between a known earth ground and each piece of

the molding. The inside and outside corners will have to be miter cut, typically at 45°. After all the angle molding is installed, install the fingerstock, like you did for the main beams and cross tees.

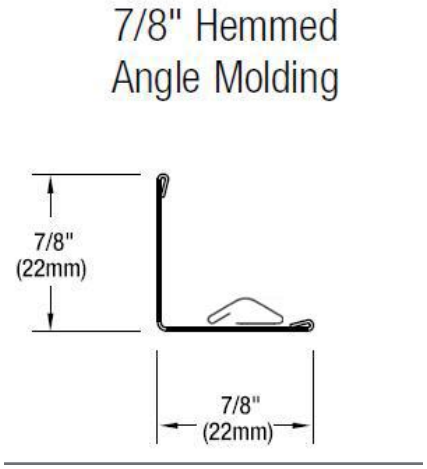




Correctly Miter Cut Outside Corner Incorrectly Done Inside Corner

For RF shielded walls, you must maintain the shielding integrity of the wall system you are attaching or anchoring through. Metal screws going through the ceiling grid perimeter angle moulding, throught the RF shield layer, through the sheetrock or plywood and anchoring into the grounded metal wall stud is recommended. Due to the many different shielded wall systems, it will be left to the installer. Usually with a combination of flashing and foil tape with electrically conductive adhesive.

For non-shielded walls, fasten the wall angles securely to the wall at all points. Screw them firmly to grounded metal wall studs, using clear zinc coated drip point screws. Use clear zinc coated screws for wood studs. Use screw anchors or other masonry fasteners on brick or masonry walls.



Profile view of fingerstock installed in the angle molding

SUSPENSION WIRES FOR MAIN TEES

Install your suspension wires as you would normally for a commercial installation. You may need these suspension wires later, if you find portions of the ceiling grid are not tied to earth ground.

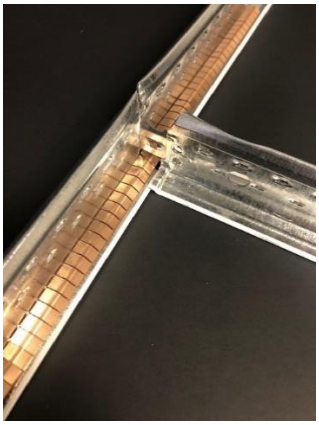
Be sure the suspension wires are securely fastened

INSTALLING BORDER CROSS TEES TO WALL ANGLE MOLDING

Border cross tees are installed between the wall angle and the outer main beams.

If you have not already installed the fingerstock on to the main beams and wall angle molding, apply the fingerstock now.

Install the cross tees in to the main beams, as you normally would. The cross tees may or may not have the fingerstock already installed. The fingerstock installed on the main beams and angle moldings, should not be affected.



Installed cross tee connection to main beam

BEFORE INSTALLING CEILING PANELS

Your need to make sure that every grid component is connected electrically to earth or electric ground. You might have to make more than one connection from the metallic grid to get a good ground. Verify that all ceiling grid components are grounded by continuity checking them using an ohmmeter or multi-meter. Your resistance reading needs to be less than 5 ohms, the lower the better.

Use Xalon FS electrically conductive silicone caulking to cover up all joints or gaps on the top side of the inverted T channel, Tees, expansion joints, and angle molding. Typical areas are; where the cross tees tie into the main beams, cross tees tie into the angle molding and where you have tee joints. From the top of the ceiling grid, apply Xalon FS from the inward side of the fingerstock working inwards at angle molding and main beam joints. For cross tee to main beam connection, along the edge of the cross tee to main beam or angle molding intersection. Let the Xalon FS set up for 24 hours before installing the ceiling panels.

Cross Tee to Main Beam Intersection

Xalon FS

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CUTTING THE XALON RF SHIELDED CEILING PANELS

The standard Xalon X8000 2’ x 2’ and 2’x 4’ RF shielded panels are all precut at the factory, so they are ready to install in the ceiling grid.

First. cut the aluminum RF shielding panel to size. Measure twice and cut once. We recommend metal nibblers or metal shear; a saber saw with a fine-tooth blade will also work. Sand down any rough edges.

The aluminum shielding panel will be cut ½” wider and ½” longer than the ceiling grid opening. If the ceiling opening has non-parallel edges, adjust your panel cut to compensate.

Verify the panel was cut correctly by placing in into the ceiling grid, in its intended location. See how to cut a round hole in the panel below.

If you going with the bare aluminum panel look, just install the panels in the ceiling grid.

If you want a different look, the panels can be painted, FRP added to the interior face or other flat material added to the interior face.

If you are going to paint them, follow the paint manufacturer’s directions for spraying paint on to aluminum. Paint the entire interior face with the desired color of paint.

After the paint has dried, scotch-brite and wipe off with microfiber towel the ½” or wider perimeter of the exterior face of the aluminum shielding panel. Then using the ½” wide copper foil tape with electrically conductive adhesive (PN: ST1.4CU-1/2x180-1s), start on the painted side and place the copper tape ¼” on to the painted surface, using the panel edge as a center line, go across the full length or width on the panel. Apply pressure and smooth the copper tape down with your finger. Then, wrap the remaining ¼” of copper tape on to the unpainted back side of the panel. Apply pressure and smooth the copper tape down with your finger on the back side.

Do one edge at a time, until all 4 sides are done. The copper tape can overlap at the corners. This is easily done by placing the panel on a table and letting the panel edge you are working on hang over the table edge.

When you are finished the painted side should have a ¼" copper tape border around it. The completed panel can now be installed in the ceiling.

For up to a 1/8" thick FRP panel, you will want to cut the FRP panel the same size, then attach the FRP panel to the aluminum panel with adhesive.

Spray the aluminum shielding panel interior face and the FRP back side using 3M™ 94 ET ™ clear spray adhesive. 3M 94 ET spray adhesive stock number, 62-4870-4930-6 does not have a zero VOC (VOC < 20%), so you might have to spray them outside.

When the adhesive has dried, follow the same procedure as for the painted panels (above) and apply a ¼" copper tape border around the panel. The FRP faced panel can now be installed in the ceiling.

Other materials, besides paint and FRP can be used, but the electrically conductive copper tape must stick to it.

If you have an interior corner on the panel, you can apply ¼" strips of the copper tape on to the interior corner (the copper tape pieces can overlap each other), before you perimeter tape the panel with the ½" copper tape.

CUTTING A HOLE IN THE XALON RF SHIELDED CEILING PANELS

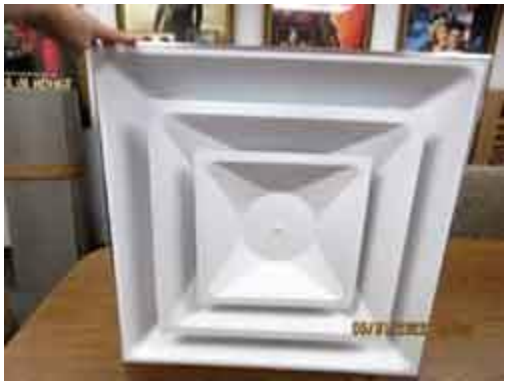
To cut a round hole in the aluminum ceiling panel with a fine-toothed hole saw. The hole saw must be over ½" deep. If you are painting the panel, you will want to cut the holes in the aluminum panel, before you paint it.

Place the X8000 panel over a garbage can, or on a couple 2x4s, so the metal filings from the hole saw, going through the aluminum panel, drop out the bottom.

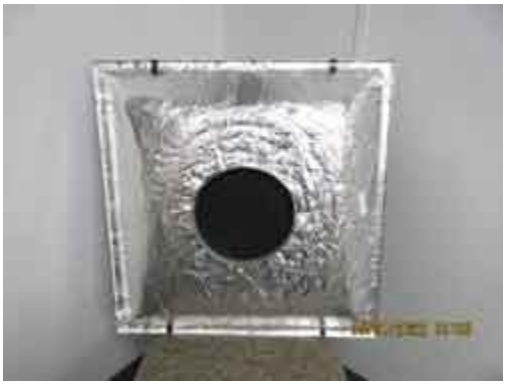
Clean up the aluminum hole with a round metal file, if needed.

INSTALL AIR VENTS

For air vents and return air vents, we recommend metal 2’ x 2’ air vents with metal backing or metal housing and metal reducer.

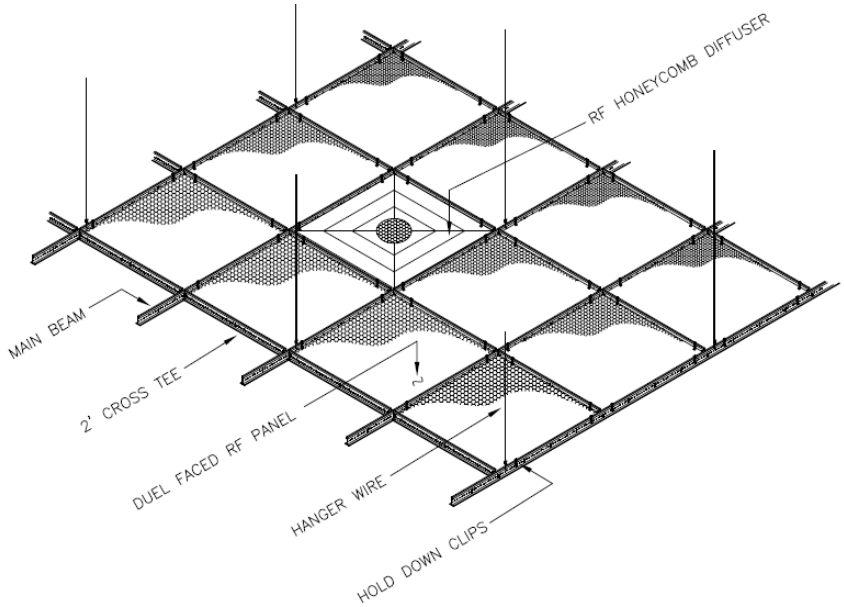


2' x 2' RF Shielded Diffuser - Bottom



RF Shielded Air Vent Diffuser - Top

We recommend RF shielded honeycomb waveguide air vents for 60 dB and higher shielding effectiveness requirements. You can use full panel honeycomb panels or honeycomb with diffusers.

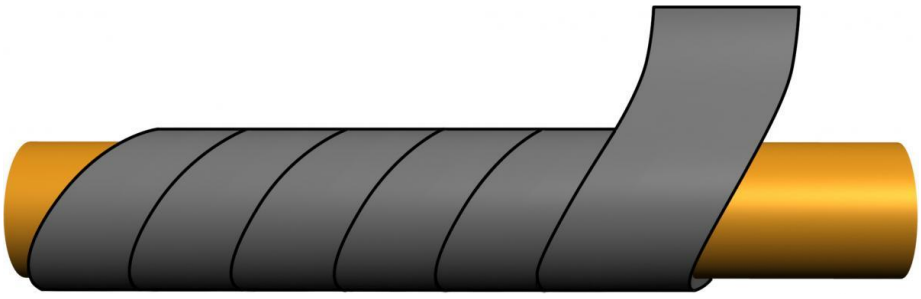


Honeycomb Waveguide Air Vents

For penetrations, like fire sprinkler penetrations, the hole you cut in the X8000T needs to be RF shielded, above the panel. You will need to get above the panels to radial tape, using electrically conductive pressure sensitive adhesive (ECPSA) foil tape, the metal pipe to the top of the RF panel. We recommend the Xalon ST5 aluminum tape for sealing the metal sprinkler pipe to the top of the X8000T panel.

If the pipe is not metal, you will need to spiral wrap EC foil tape around the pipe from the top of the panel, to least 6 times the diameter of the pipe. Then radial tape from your now taped pipe to the top of the RF panel.

Example: The pipe penetration is 2” in diameter, from the top of the RF panel, you will spiral wrap ECPSA foil tape up to a height of 12”, then radial tape from the top of Xalon RF panel to the newly tape pipe penetration.



Wrapping Pipe with ECPSA Foil Tape

INSTALL LIGHTS

For recessed lighting, you can use 2’x2’ or 2’x4’ drop-in troffer lighting fixtures, which are specially RF shielded and designed for this purpose, we currently do not sell these or have a source for them. We recommend 24 VDC LED strip or LED COB lighting, that attaches to the bottom of the ceiling grid.

Xalon X9000 RF Shielded Ceiling
Gloss White 2’ x 2’ FRP Panels with LED Linear Lighting

DISCLAIMER

Check national, state, and local codes before starting any project. Follow all safety precautions. Information in this document has been furnished by the National Retail Hardware Association (NRHA) and associated contributors. Every effort has been made to ensure accuracy and safety. Neither R. A. Mayes Company, Xalon RF Shielding Systems, NRHA, any contributor nor the retailer can be held responsible for damages or injuries resulting from the use of the information in this document.

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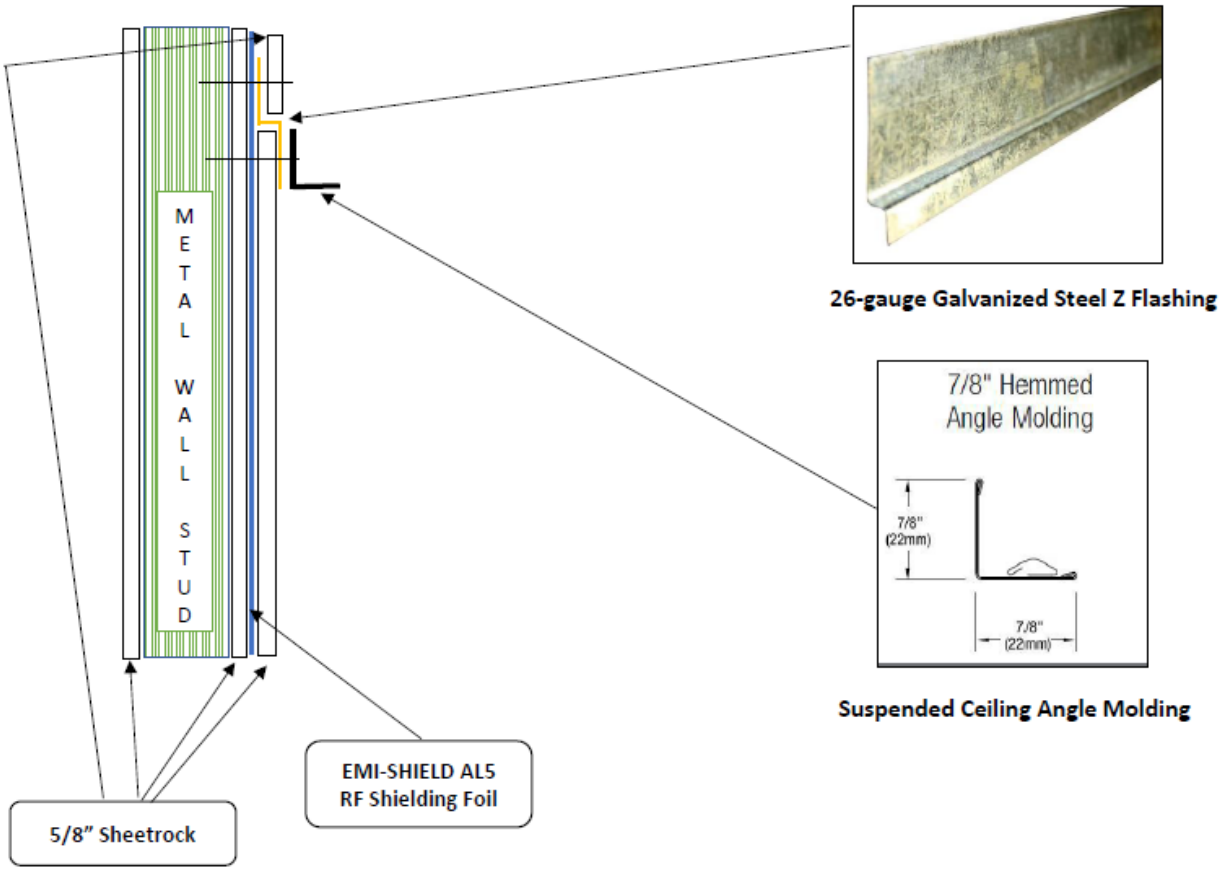
Connecting Suspended Ceiling Grid to Foil Shielded Wall



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