

# METALWORKS™ Linear – Synchro™

## Assembly and Installation Instructions

### 1. GENERAL

#### 1.1 Product Description

MetalWorks™ Linear – Synchro™ is a metal ceiling and wall system that utilizes linear planks that are available in 96" lengths and nominal 2", 4", 6", 9", 11", and 13" widths with a no-reveal design from plank to plank. The Linear planks are made of 0.028" thick, 24-gauge electrogalvanized steel. Their post-production, powder-coated finish is available in White, Silver Grey, Gun Metal Grey, Tech Black, Effects™ Wood Look finishes, and a wide range of custom colors and finishes. Perforated options with a plain border and acoustical fleece backing are available.

The Main Beam Carrier 2 (MBC2, Item 7277) used to suspend the planks is non-directional and has hanging features at 2-1/4" increments. All plank sizes can be installed on the same carrier system which allows for design and installation flexibility (*Fig 1*).

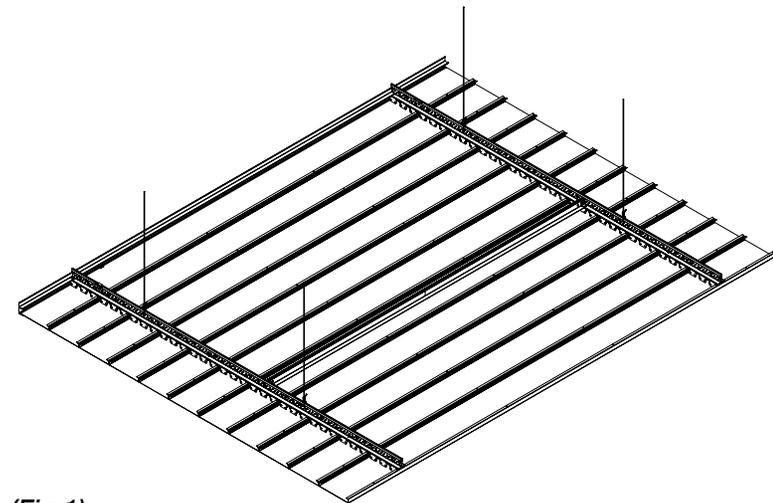
#### 1.2 Storage and Handling

The ceiling planks should be stored in a dry interior location and shall remain in cartons prior to installation to avoid damage. The cartons shall be stored in a flat, horizontal position. The planks should not be removed from the carton until the suspension system is installed. Proper care should be taken when handling the planks to avoid damage and soiling. It is recommended to hold the planks in the vertical orientation to avoid possibly bending the plank. White cotton or latex gloves are recommended for handling. It is recommended that two installers handle the 96" planks.

#### 1.3 Site Conditions

Areas to receive ceilings shall be free of construction dust and debris. MetalWorks Linear – Synchro planks should only be installed in closed and acclimatized buildings. This product is not intended for exterior purposes. Interior systems cannot be used where standing water is present or where moisture will come in direct contact with the ceiling.

METALWORKS™ LINEAR – SYNCHRO™ WIDTHS	
Nominal Plank Width (Inches)	Module Width (Inches)
2"	2.25"
4"	4.50"
6"	6.75"
9"	9.00"
11"	11.25"
13"	13.50"



(Fig 1)

## 1.4 Fire Performance

MetalWorks™ Linear – Synchro™ planks 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 production engineer, NFPA 13, and their local code officials for guidance on the proper installation techniques where fire detection or suppression systems are present.

Cutouts in the center of the plank are created by first drilling or punching a hole near the center and then cutting in a spiral pattern to the finished size and shape. Exercise caution during this procedure as the hand will be near the cut edge of the plank. This procedure can be followed for cutting in can lights. Sprinkler cutouts can be made with a hole saw and the appropriate metal blade.

## 1.5 Safety Considerations

This product arrives in a crate. Please plan for safe handling. MetalWorks Linear – Synchro planks require two people to install safely.

Edges of metal parts can be sharp. Handle metal carefully to avoid injury. Always wear safety glasses and cut-resistant gloves when handling or cutting metal.

When cutting planks, exposed raw edges of metal can be a safety hazard. The end cap is designed to give a finished edge appearance, however, deburring/sanding might be required based on the quality of the cut for proper fit. Cutting tools should be appropriate for steel. See specific cutting guidance in Section 5.0. Improper cutting equipment could damage or dent the metal planks.

## 1.6 Warranty

The MetalWorks Linear – Synchro system has been tested based on the installation method described in this document. Warranty will be voided if you do not follow these instructions and guidelines.

## 1.7 HVAC Design and Operation & Temperature and Humidity Control

Proper design for both supply air and return air, maintenance of the HVAC filters, and building interior space are essential to minimize soiling. Before starting the HVAC system, make sure supply air is properly filtered and the building interior is free of construction dust. Interior systems cannot be used where standing water is present or where moisture will come in direct contact with the ceiling.

## 1.8 Cleaning

An abrasive or strong chemical detergent should not be used. (A mild detergent diluted in warm water, applied with a soft cloth, rinsed, and wiped off with a chamois will maintain the planks in good condition.) Oily or stubborn stains, if not removed by washing, can be wiped with products like Fantastik®, but care is necessary to avoid affecting the gloss level of the paint finish.

## 2. DESIGN CONSIDERATIONS

### 2.1 Ceiling Plank Layout

**2.1.1** The ceiling plank layout should have perimeter planks equal in width on opposite ends. These cut perimeter planks should be more than 50% of their original width. See Section 5.0 for cutting instructions. If the plank is less than 50% of the original width, divide the room dimension by the nominal width of the plank (4", 6", 9", 11" or 13"). Determine the remainder, add one full plank width, and divide by two to determine the width of the border plank.

Example: 6" nominal plank width; room dimension is 10' 4". Divide 10' 4" by 6" = 20 full sections with 4" remainder. Add 4" to 6" = 10" divided by 2 = 5" border plank with 19 full rows of planks. This will create the best visual and easiest installation.

Perimeter consideration for 2" planks: full-size 2" wide planks should not be used as a perimeter plank. Cut 4" planks to create your perimeter solution for installations using 2" planks.

**2.1.2** Planks varying in widths can be installed in the same ceiling to create a striated visual.

**2.1.3** The following chart shows how many hooks each plank needs in order to be installed:

Plank Size	Number of Hooks Needed
2" Plank	1
4" Plank	2
6" Plank	3
9" Plank	4
11" Plank	5
13" Plank	6

## 2.2 Plenum

Since MetalWorks™ Linear – Synchro™ planks are installed from below, they require minimal clearance above the suspension system. The planks do not need to travel into the plenum space during installation or removal.

**NOTE:** Light fixtures and air handling systems require more space and will usually determine the minimum plenum height for the installation.

## 2.3 Accessibility

See Section 6 for more information on how to create access areas.

## 2.4 Exterior Applications

See section 11 of these instructions for exterior application installations.

## 2.5 Sloped Applications

It is not recommended to install any MetalWorks Linear – Synchro planks in a sloped application at this time.

## 2.6 Curved and Wall Installations

It is not recommended to install any MetalWorks Linear – Synchro planks in a curved or wall application at this time.

2.7 For optimum visual design, backlighting planks is not recommended.

## 3. SUSPENSION SYSTEM INSTALLATION

### 3.1 Perimeter Molding

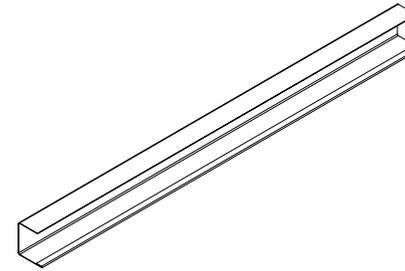
Install the Carrier Molding (Item 5574) on the perimeter walls (*Fig 2*). Molding should be secured to the wall every 16 to 24 inches. The bottom of the molding will be the finish height of the linear planks. The top flange of the Carrier Molding will slide between the two components of the Main Beam Carrier 2 (MBC2).

### 3.2 Hanger Wires

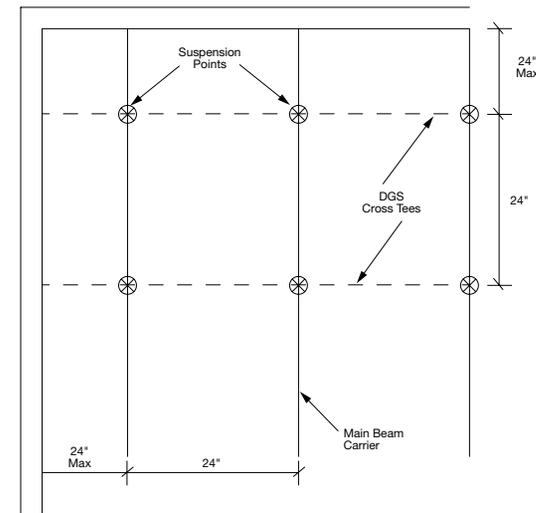
Secure hanger wires to the structure above to support the MBC2. Wire spacing for MBC2s should be within 24" of the perimeter wall and then 48" O.C.

### 3.3 Main Beam Carriers

**3.3.1** The MBC2s will be installed 24" O.C. perpendicular to the desired plank length direction. The first and last carrier must be installed within 24" of the perimeter wall (*Fig 3*). Every plank needs at least two connection points, so two MBC2s may be needed at the perimeters depending on the length of the plank.



(Fig 2)



(Fig 3)

**3.3.2** MBC2s are non-directional. Carriers splice together with the Superlock™ end detail just like standard drywall grid main beams.

### 3.3.3 Main Beam Carrier 2 Installation

**3.3.3.1** MBC2s can be installed in one of two ways:

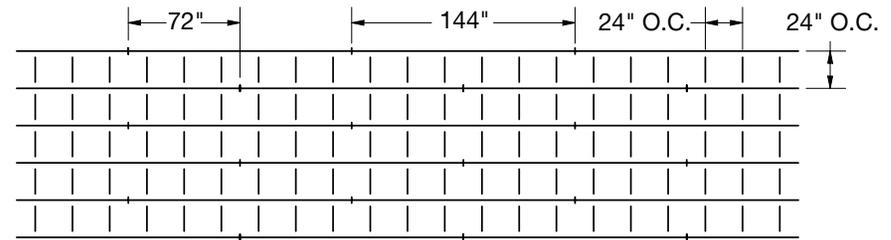
- 1) Alternating the splice locations row to row
- 2) Having all the splice locations line up

#### 3.3.3.2 Alternating Splice Locations Row to Row

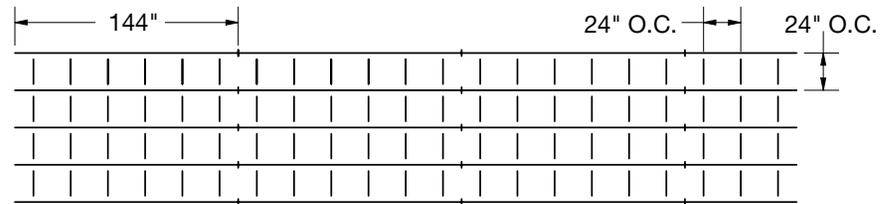
**IMPORTANT NOTE:** MBC2s can only be cut at 72" for the hooks and rout holes to properly line up (*Fig 4*). Any other measurement could cause misalignment and unsatisfactory visuals or the inability to install the planks.

#### 3.3.3.3 Splice Locations Line Up

All carriers can butt up against the wall with a factory end and install full MBC2s until the opposite wall is reached (*Fig 5*). When cuts are needed, it is paramount to cut all carriers at the same location to ensure the hooks and rout holes will stay aligned.



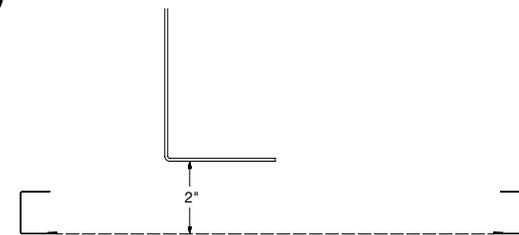
(Fig 4)



(Fig 5)

### 3.4 Prebending Hanger Wires

Stretch a string line or set a laser at the bottom of the molding from one side to the other along a row of hanger wires. Bend the wires 2" above the string or laser (*Fig 6*).



(Fig 6)

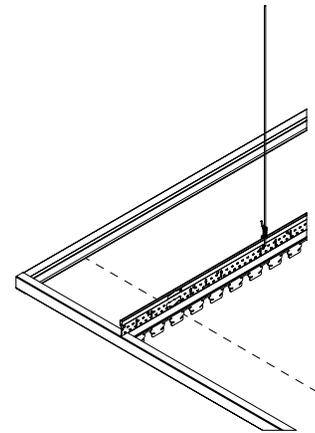
### 3.5 Squaring and Cutting the Main Beam Carrier 2

**3.5.1** Stretch a string line or set a laser from one side of the room to the other at the bottom of the molding (string/laser perpendicular to the carrier). The line should be out from the "end" wall by the calculated width of the first plank. Refer to Section 2.1.1 for width of border planks.

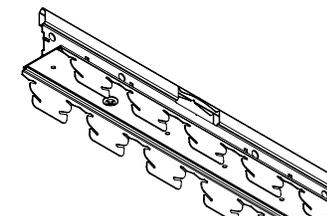
**3.5.2** Measure from this line to the wall. Cut the first MBC2 in each row so the desired hook lines up with the line (*Fig 7*). Add a sharp point screw in the second hole from the end on the underside of the carrier if you cut the factory screw off (*Fig 8*).

**IMPORTANT NOTE:** Make sure each MBC2 is cut at the same exact location to ensure that the hooks and rout holes will stay aligned. Any other measurement could cause misalignment and unsatisfactory visuals or the inability to install the planks. Check the carrier's alignment by lining up the laser and the same hook on each carrier.

**3.5.3** The suspension system must be leveled to within 1/4" in 10' and must be square to within 1/16" within each 2' x 2' grid module. Installation on suspension systems that do not meet this tolerance will produce unacceptable plank alignment.



(Fig 7)

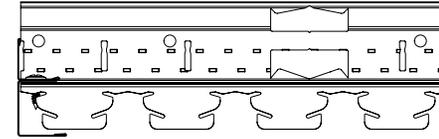


(Fig 8)

### 3.6 Main Beam Carrier 2 Attachment

**3.6.1** The bottom flange of the Angle Molding will slide in between the two components of the Main Beam Carrier 2. Once each MBC2 is aligned with the guide string explained in section 3.5, fasten them to the perimeter molding with a framing screw or a pop rivet (*Fig 9*).

**3.6.2** Complete the run of MBC2 to the other end of the installation space.



(Fig 9)

### 3.7 Drywall Cross Tees

The first row of 2' drywall cross tees (XL8926) should be within 24" of the perimeter wall and then 24" O.C., creating 2' x 2' grid modules.

## 4. SYNCHRO PLANK INSTALLATION

### 4.1 Starting Perimeter Row

**4.1.1** Measure from the wall to the string in several places and determine the exact width of the first row of planks.

**4.1.2** Mark the plank and cut to width. Either side of the plank can be cut off. See Section 5.0 for cutting recommendations.

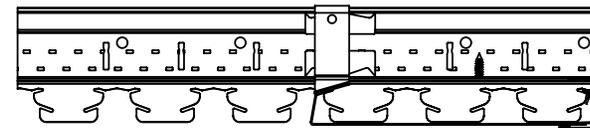
**4.1.3** Slide the cut edge of the plank into the perimeter carrier molding. The opposite factory hook edge of the plank will fit into the top notch of the carrier (*Fig 10*).

**4.1.4** The Synchro Cut Plank Bracket (SCPB, Item 7237S3) must be used to secure planks to the carrier system when one of the plank's factory engagement edges has been removed. The function of the clip is to keep the remaining factory edge of a cut plank engaged with the carrier, while the cut edge is supported by the carrier molding.

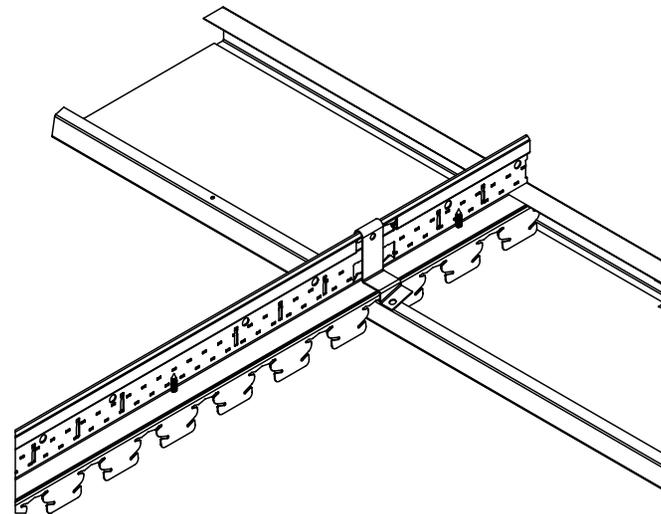
The SCPB is intended to replace the use of visible pop rivets into the bottom flange of the carrier molding.

To install the SCPB:

- 1) Cut and install the planks as described starting in Section 4.1.1.
- 2) Install the SCPB before installing the second row of planks.
- 3) Place the SCPB over the bulb of the grid and align it so it rests on the flange of the plank.
- 4) Attach the SCPB to the carrier with one #8 – 1/2" framing screw through the top hole in the SCPB.
- 5) Attach the SCPB to the plank with one #8 – 1/2" framing screw through the lower hole in the SCPB (*Fig 11*).



(Fig 10)



(Fig 11)

**4.1.5** Insert Pressure Spring Clips (Item 8161) and/or pop rivets into the plank to secure it to the molding (**Fig 12**). Frequency of the pressure springs or pop rivets is as necessary, but typically 24" O.C.

## 4.2 Plank Splices

When 2", 4", and 6" planks do not reach across the space in one piece, use a splice plate to join and align adjacent planks. Install planks so the factory ends are at the splice location and assure the joint is tight. Install the splice by sliding it into the end of the first installed plank. Once the adjacent plank is installed, slide the splice so it is split evenly between the two planks (**Fig 13**).

**NOTE:** Splice plates can be installed and fit under an MBC2 if a splice happens to be near a carrier.

The 9", 11", and 13" wide planks have factory upturns on the short ends and are spliced differently. Install planks so that the factory ends are tight and use vise grip clamps to temporarily hold them together. Insert sheet metal framing screws through the plank upturns. This requires a clear plenum to work with a drill motor above the plank. Two screws are required at each splice (**Fig 14**).

## 4.3 Field Plank Installation

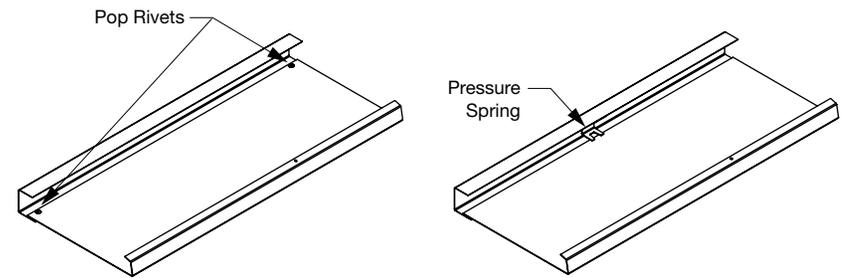
**4.3.1** Install the second row of planks by inserting the closer flange in the top hook on the carrier and swing the further flange up while pushing it into the top hook until it snaps in the carrier. Repeat these steps to continue installing rows of planks across the space (**Fig 15**). It is recommended that two installers handle the 96" planks. When you get near the opposite perimeter, make sure to leave enough room for access to the carrier molding as this will be necessary for the last perimeter row.

**4.3.2** It is recommended that the plank splices are staggered for optimal visual.

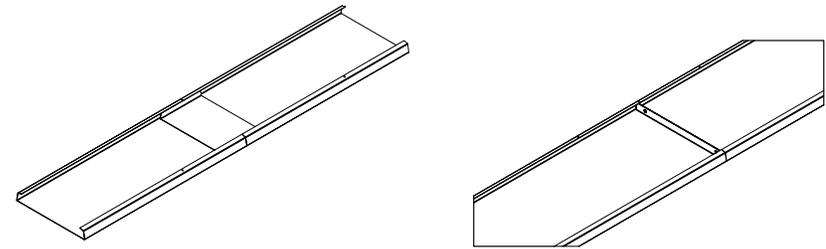
**4.3.3** Each plank must have two attachment points. Additional MBC2s may be necessary (depending on the layout) to achieve this.

## 4.4 Last Perimeter Row

**4.4.1** The approximate width of the perimeter planks will be based off the layout calculations in Section 2.1. Take the measurement as shown in (**Fig 16**) to confirm the plank width and cut the planks based on recommendations in Section 5.0.

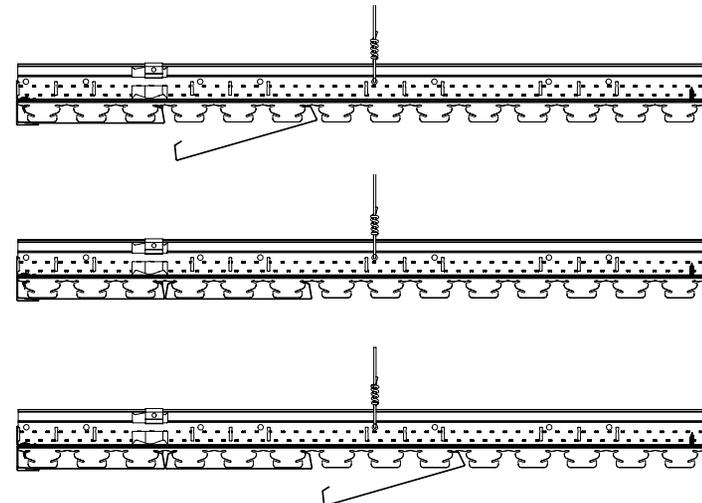


(Fig 12)

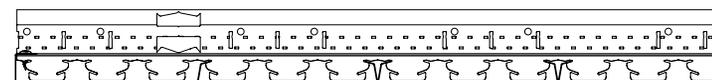


(Fig 13)

(Fig 14)



(Fig 15)



(Fig 16)

**4.4.2** The cut perimeter planks will be securely installed by utilizing the Spreader Hold Down (Item 7113). Screw the Spreader Hold Down to the inside of the Carrier Molding with a sharp-point framing screw. It is recommended to install two Spreader Hold Downs per 24" grid module.

**4.4.3 NOTE:** All field planks should be installed prior to installing the final cut perimeter planks.

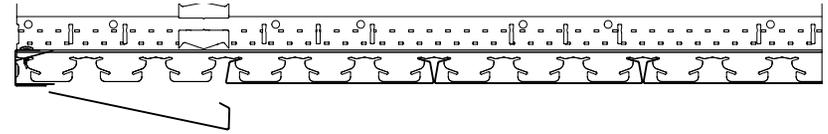
**4.4.4** Once the Spreader Hold Downs are installed, slide the cut edge of the perimeter plank in between the bottom flange of the Carrier Molding and the bottom edge of the Spreader Hold Downs (*Fig 17*).

**4.4.5** Once the entire cut edge of the perimeter plank is under the Spreader Hold Down, lift the remaining plank flange up and engage it in the top notch of the carrier (*Fig 18*).

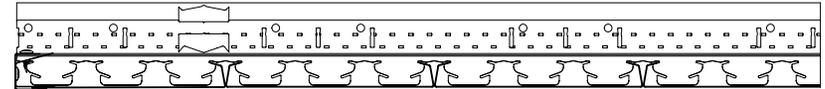
**4.4.6** It is recommended to install the perimeter planks so the splices occur under a carrier (*Fig 19*).

#### 4.5 Optional Plank End Caps

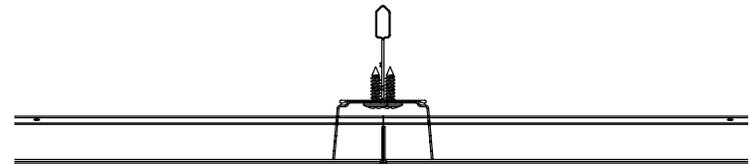
Plank end caps can be used when the plank end is not covered by molding. This may occur at a ceiling penetration or custom perimeter treatment, such as a floating installation. The plank end must be cut square and clean. Press the cap into the plank until it is flush with the end (*Fig 20*).



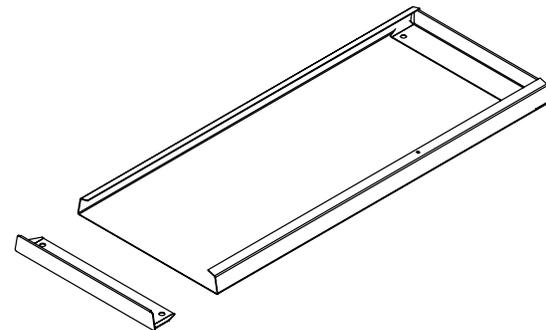
(Fig 17)



(Fig 18)



(Fig 19)



(Fig 20)

## 5. FIELD CUTTING INSTRUCTIONS

5.1 Use the following tools to make cuts in the field:

- Circular Saw: recommended field cutting method for cross cuts and rips. Use a 7-1/4" metal cutting blade for thin-walled material, such as Admiral™ (Item 62736) or equal.
- Compound Miter Saw: recommended field cutting method for cross cuts for planks up to 9" in width. Use a 12" metal cutting blade for thin-walled material, such as the Diablo D1296L or equal. **NOTE:** Cuts are best achieved with the plank face up and when started at the corner of the plank.
- Band Saw: Field cutting method for cross cuts. Use a non-ferrous metal cutting blade for thin-walled material.
- Nibbler: Field cutting method for rip cuts. Use a nibbler such as Hilti SPN 6-A22 or equal.
- Tin Snips: Field cutting method for cross cuts.
- Hole Saw: Field cutting method for use in can light or sprinkler locations.

### 5.2 Safety

**CAUTION:** Cut edges of metal parts can be extremely sharp. Handle metal carefully to avoid injury. Always wear safety glasses, a safety shield, and gloves when working with metal.

5.3 Make sure plank is supported on a clean surface when making cuts to minimize the risk of blemishes or scratches.

5.4 Make sure plank is properly held down with clamps to minimize movement while cutting.

5.5 It may be necessary to deburr the edge for proper fit and safety if a clean cut is not achieved.

5.6 Cutouts in the center of the plank are created by first drilling or punching a hole near the center and then cutting in a spiral pattern to the finished size and shape. Exercise caution during this procedure as the hand will be near the cut edge of the plank. This procedure can be followed for cutting in can lights. Sprinkler cutouts can be made with a hole saw with appropriate metal blade.

### 5.7 Made-to-Order Planks

Made-to-order planks that eliminate the need for field modification of standard planks are available. Contact ASQuote@armstrongceilings.com for more information.

## 6. ACCESS PLANKS

6.1 Access planks must be installed in a 2' x 2' or 4' x 4' grid opening. Maximum access plank size is dependent on the size of the plank installed in the space but must fit within a 4' x 4' grid opening. Follow the chart below for the recommended access plank size based on the plank width. Plan the size and location carefully to ensure that all above-ceiling equipment requiring service is reachable.

**NOTE:** An access plank larger than 2' x 2' will require grid modification. Please plan accordingly. Additional hanger wires surrounding the access plank may be required.

2' X 2' ACCESS PLANK			
Plank Size	Access Plank Size	Number of Planks Needed	Main Beam Carrier 2 Length
2" Plank	20" x 22-1/2"	10	22-1/2"
4" Plank	20" x 22-1/2"	5	22-1/2"
6" Plank	20" x 20-1/4"	3	20-1/4"
9" Plank	20" x 18"	2	18"
11" Plank	20" x 22-1/2"	2	22-1/2"
13" Plank	20" x 13-1/2"	1	13-1/2"

4' X 4' ACCESS PLANK			
Plank Size	Access Plank Size	Number of Planks Needed	Main Beam Carrier 2 Length
2" Plank	44" x 45"	20	45"
4" Plank	44" x 45"	10	45"
6" Plank	44" x 47-1/4"	7	47-1/4"
9" Plank	44" x 45"	5	45"
11" Plank	44" x 45"	4	45"
13" Plank	44" x 40-1/2"	3	40-1/2"

## 6.2 Access Plank Construction

**6.2.1** Cut planks to 20" or 44" in length depending on the size of the access plank. Keep one of the ends as the factory finished end if possible.

**6.2.2** Cut two MBC2s to specified length in chart on previous page, making sure not to cut a hook in half; all hooks must be full-size hooks.

**6.2.3** Install the first cut plank to the cut MBC2s making sure that they will line up with the planks in the field of the ceiling.

**6.2.4** Space the cut MBC2s 12" O.C. or 30" O.C. apart with 4" O.C. or 7" O.C. (respectively) of exposed ends of the cut plank on either side.

**6.2.5** Fasten a Synchro Cut Plank Bracket (SCPB, Item 7237S3) on each cut plank to the cut carrier following the instructions in Section 4.1.4. This will secure the cut plank to the carrier.

**6.2.6** Install the remaining cut planks to the cut carriers, fastening an SCPB on each cut plank and carrier connection.

**6.2.7** Once all cut planks are installed, fasten two pieces of scrap grid to the MBC2s to act as support pieces to strengthen the access plank. For best results, arrange the grid pieces to form the shape of a triangle.

**6.2.8** Cut two pieces of cold-rolled channel to 30" or 54" (depending on the size of your access plank) and connect them to the top of the cut MBC2s with the Up-Tight Clip (Item UTC), making sure to space the cold-rolled channel evenly across the carrier. Fasten at least two screws through the UTC into the cold-rolled channel to secure the connection. **NOTE:** Insert a screw through the bulb of the grid on either side of the UTC to ensure it does not slide.

**6.2.9** The access plank is now ready to be integrated into the system (*Fig 21*). Install the access plank as you would a normal acoustical ceiling tile, with the bottom of the cold-rolled channel resting on the top of the neighboring carriers. **NOTE:** Due to the size and possible weight of the access plank, it is recommended to have two people remove and reinstall the access plank.

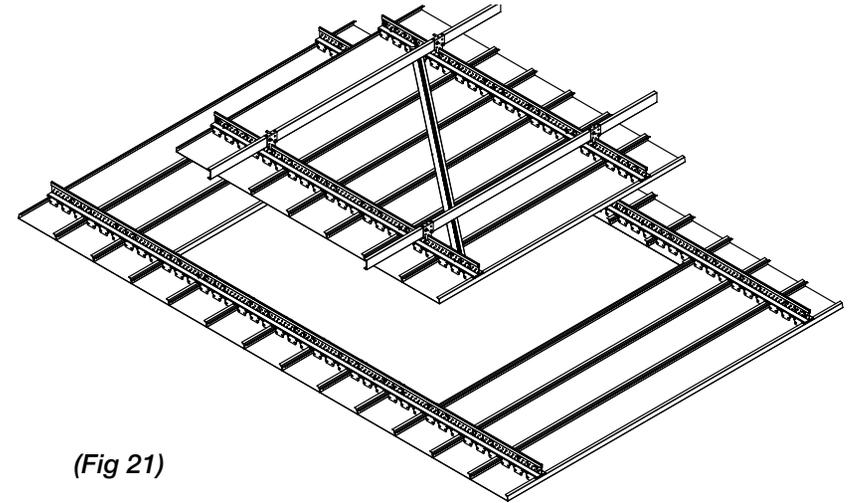
## 6.3 Custom-Sized Access Planks

**6.3.1** A custom-sized access plank can be created in the field if so desired if it fits within the prescribed grid size opening.

**6.3.2** It is recommended to keep the 20" or 44" length described above, but the width of the access plank can be adjusted, or the "Number of Planks Needed" as shown in the charts.

**6.3.3** Once the width has been selected, cut the MBC2s so there are enough full-size hooks to house the number of planks needed.

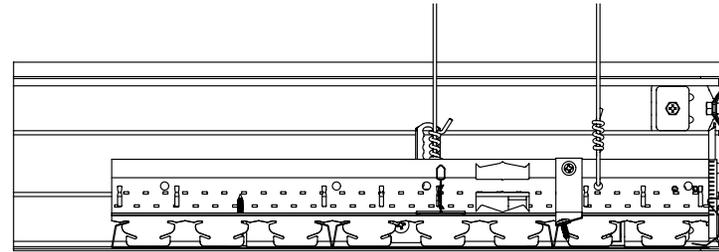
**6.3.4** Follow the same instructions listed in Section 6.2 to construct the access plank.



(Fig 21)

## 7. FLOATING TRIM / DISCONTINUOUS CEILINGS

For a cloud or discontinuous installation, the MetalWorks™ Linear – Synchro™ system can be capped with Axiom® trim (*Fig 22*). The offset from the plank face to the carrier flange is about 1-1/32". The Adjustable Trim Clip (Item 7239) must be used to accommodate this drop to rest the cut planks on the Axiom flange. This clip takes the place of AXTBC clips and can adjust to within 1/8" increments to hold the trim at different heights relative to the carrier flange. Refer to the Axiom Classic installation instructions for detailed trim, clip, and support wire installation instructions.

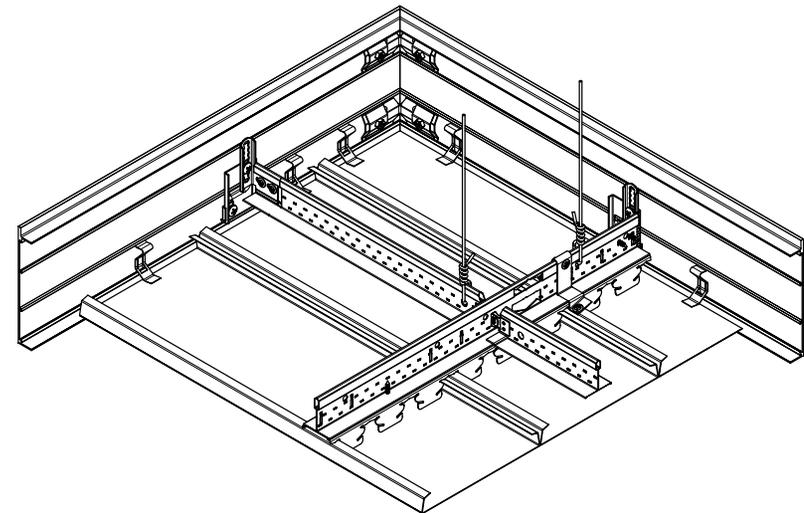


## 8. MEP INTEGRATION

**8.1** Mechanical fixtures such as diffusers, speakers, and sprinklers should be installed into the plenum area before installing the MetalWorks Linear - Synchro system. Fixture weight or housing must not be supported by the planks. Any integrated MEP fixtures must be independently supported.

Penetrations through linear metal planks are made using typical metal working equipment. Hole saws work well for sprinklers. Tin snips can be used for larger openings. All penetrations should be fitted with escutcheons that conceal the cut plank edges.

**8.2** See the supplemental installation instructions for MetalWorks Linear – Synchro Lighting Integration. The installation of this ceiling system and the integrated lighting solution will require coordination between the ceiling contractor and the electrical contractor. MetalWorks Linear – Synchro planks with the integration is a progressive installation, meaning the lights and the planks must be installed at the same time. The general contractor should work with the electrical contractor and ceiling contractor to clearly assign responsibilities.



(Fig 22)

## 9. SEISMIC INSTALLATION

MetalWorks Linear – Synchro has been engineered and tested for applications in all seismic areas based on the following installation procedures.

The following installation guidelines should be used in areas where anticipated seismic activity will be moderate to severe (IBC Seismic Design Categories C, D, E, and F). Consult the local building code department to ensure compliance with their unique requirements.

## 9.1 Seismic Suspension System

The following requirements are in addition to the installation instructions listed in this guide, ASTM E580, and the Armstrong® Seismic Ceiling Installation Guide requirement for a ceiling system.

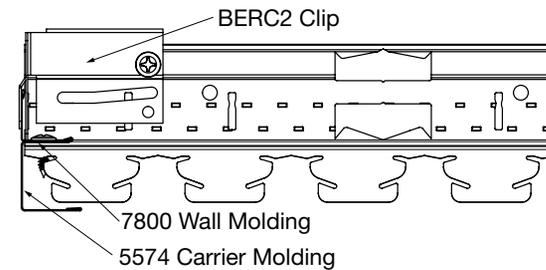
Layout of the grid system is the same regardless of the linear plank selected. MetalWorks™ Linear – Synchro™ has only been tested for a flat installation in IBC Seismic Categories (C, D, E, and F).

## 9.2 Seismic Components

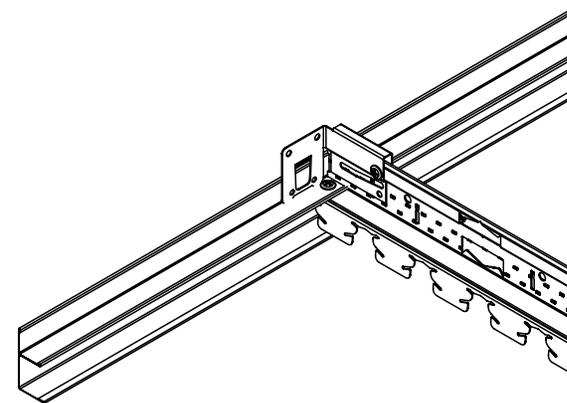
- 12' Main Beam Carrier 2 (Item 7277)
- 2' Drywall Grid Cross Tee (Item XL8926)
- BERC2 Clip (Item BERC2)
- 7/8" Wall Angle Molding (Item 7800)
- Carrier Molding (Item 5574)
- Pressure Spring Clips (Item 8161)
- Synchro Cut Plank Bracket (SCPB, Item 7237S3)

## 9.3 Suspension System General Requirements

- Install Wall Molding (Item 7800) on top of Carrier Molding (Item 5574) (*Fig 23*).
- Main Beam Carrier 2 must be installed 24" O.C., perpendicular to the desired plank length direction.
- The first and last Main Beam Carrier 2 must be installed within 24" of the perimeter wall.
- Install 2' DGS Cross Tee (Item XL8926) at 24" O.C. with the first tee no more than 24" from the wall.
- Install BERC2 Clips over all grid connections to the wall (*Fig 24*). Two screws must fasten the BERC2 Clip to the wall.
- Main Beam Carrier 2 and cross tees must be mechanically attached to the molding on two adjacent walls.
- The opposite unattached walls must have 3/4" clearance.
- Perimeter wires must be installed to support all MBC2s and cross tees within 8" of the wall.
- All continuous ceilings over 1,000 SF will require compression posts per ASTM E580.



(Fig 23)



(Fig 24)

## 9.4 Seismic Linear Plank – Field

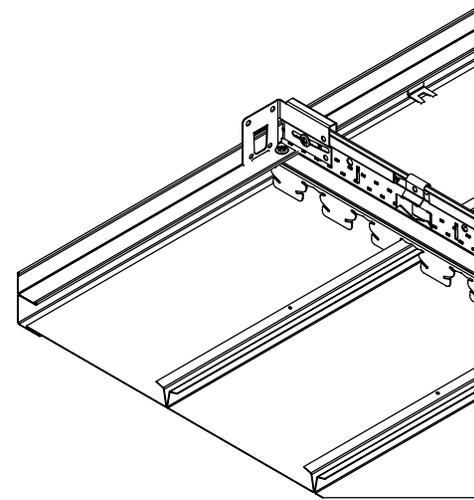
MetalWorks™ Linear – Synchro™ planks in the field require no additional considerations. Please follow the installation steps described in Sections 3.0 and 4.0 of this guide for general requirements.

## 9.5 Plank Interface with Wall Molding – Borders

- Planks cut to width along an attached wall require pop rivets 24" O.C. or the Synchro Cut Plank Bracket (SCPB, Item 7237S3) at every carrier to keep the planks fully engaged.
- The SCPB is a clip used in conjunction with wall molding to secure MetalWorks Linear – Synchro planks to the carrier system when one of the plank engagement edges has been removed. The function of the clip is intended to keep the remaining plank edge engaged with the carrier feature, while the other edge is supported and allowed to float on the wall molding flange.
- Perimeter consideration for 2" planks: full-size 2" wide planks should not be used as a perimeter plank. Cut 4" planks to create your perimeter solution for installations using 2" planks.
- Short ends of the planks along both the attached and unattached walls only require Pressure Springs (1 per 4", 6", and 9" plank, and 2 per 11" and 13" plank).
- The unattached long side of the planks will require additional Pressure Spring Clips to keep the planks engaged during a seismic occurrence (*Figs 25 & 26*).

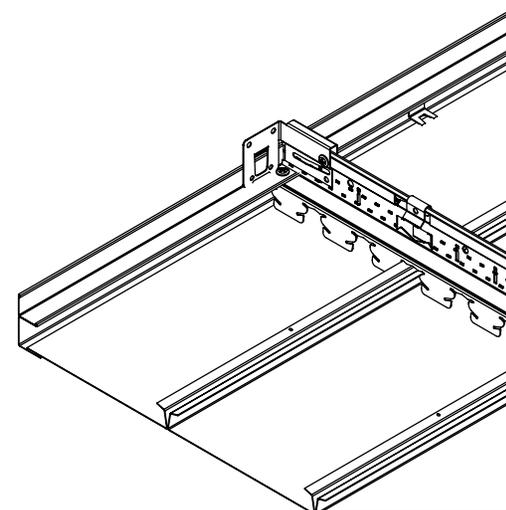
**9.6** Seismic testing conducted at the Structural Engineering Earthquake Simulation Laboratory, located at the State University of New York – Buffalo campus, produced satisfactory results with the guidelines listed above.

**9.7** Please contact Techline for a White Paper if positive connection from the plank to the carrier in seismic areas is required.



*Unattached wall, screw through BERC2 slot*

*(Fig 25)*



*Attached wall, screw through BERC2 and bulb of MBC2*

*(Fig 26)*

## 10. WALL INSTALLATIONS

**10.1** MetalWorks™ Linear – Synchro™ planks can be installed on the wall horizontally and vertically. The Main Beam Carrier 2 (MBC2) will be installed perpendicular to the desired plank length direction (**Fig 27**). The 2" planks are not able to be installed in wall applications.

### 10.2 A Square and Level Wall

The suspension system must be leveled to within 1/8" in 12' and must be square to within 1/16" within each 2' x 2' grid module. Installation on suspension systems that do not meet this tolerance will produce unacceptable plank alignment.

### 10.3 MBC2 Installation

**10.3.1** Install QSUTC to furring strips or 5/8" plywood, securing them with appropriate fasteners for the substrate to the structure (**Fig 28**). Spacing between clips along the MBC2 should not be more than 24". The first row of clips at the bottom should be elevated from the floor or kick plate by no more than 6". The last row of clips at the top should be within 6" from the existing ceiling.

When installing panels in the vertical orientation with MBC2s running horizontally, the MBC2s should be resting on top of the QSUTCs.

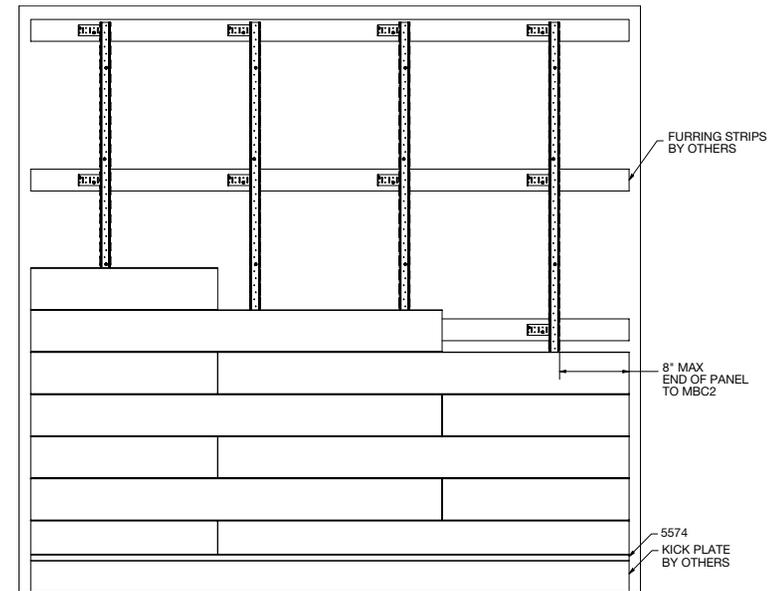
#### 10.3.2 Perimeter Molding

It is recommended to have a 6" - 8" kick plate installed along the floor to minimize the possible damage to planks installed at floor level.

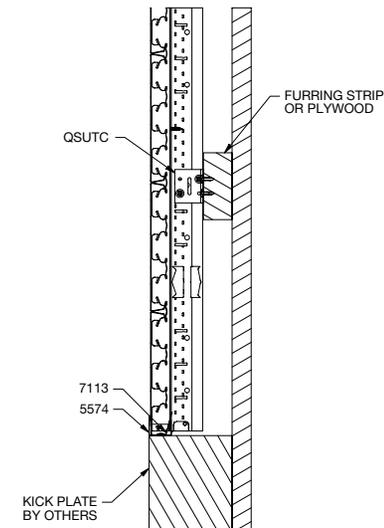
Install Carrier Molding (Item 5574) around the perimeter. Molding should be secured to the wall every 16 to 24 inches. The bottom of the molding will be the finish height of the linear planks. The top flange of the Carrier Molding will slide in between the two components of the Main Beam Carrier 2 (MBC2).

When installing panels in the vertical orientation with MBC2s running horizontally, cross tees may be needed on the top and bottom most MBC2s in order to attach Carrier Molding, if so desired.

**10.3.3** Install the MBC2 directly to the QSUTCs 24" O.C. The first and last MBC2 must be within 8" from the end to control plank twist. Every plank needs at least two connection points, so two MBC2s may be needed at the perimeters depending on the length of the plank.



(Fig 27)



(Fig 28)

### 10.3.4 Squaring and Cutting the MBC2

Stretch a string line or set a laser from one side of the room to the other at the bottom of the molding (string/laser perpendicular to the carrier). The line should be out from the "end" wall by the calculated width of the first plank. Refer to Section 2.1.1 for width of border planks.

Measure from this line to the wall. Cut the first MBC2 in each row so the desired hook lines up with the line. Add a sharp point screw in the second hole from the end on the underside of the carrier if the factory screw is cut off. Refer to section 3.5 for more information.

**IMPORTANT NOTE:** Make sure each MBC2 is cut at the same exact location to ensure that the hooks and rout holes will stay aligned. Any other measurement could cause misalignment and unsatisfactory visuals or the inability to install the planks. Check the carrier's alignment by lining up the laser to the same hook on each carrier.

The suspension system must be leveled to within 1/8" in 12' and must be square to within 1/16" within each 2' x 2' grid module. Installation on suspension systems that do not meet this tolerance will produce unacceptable plank alignment.

## 10.4 Synchro Plank Installation

### 10.4.1 Starting Perimeter Row

Measure from the wall to the string in several places and determine the exact width of the first row of planks.

Mark the plank and cut to width. Either side of the plank can be cut off. See Section 5.0 for cutting recommendations.

The cut perimeter planks will be securely installed by utilizing the Spreader Hold Down (Item 7113). Screw the Spreader Hold Down to the inside of the Carrier Molding with a sharp-point framing screw. It is recommended to install two Spreader Hold Downs per 24" grid module.

Once the Spreader Hold Downs are installed, slide the cut edge of the perimeter plank in between the bottom flange of the Carrier Molding and the bottom edge of the Spreader Hold Downs.

Once the entire cut edge of the perimeter plank is under the Spreader Hold Down, push the remaining plank flange in and engage it in the top notch of the carrier.

### 10.4.2 Plank Splices

The 4" and 6" planks use a splice plate to join and align adjacent planks. Install planks so the factory ends are at the same splice location and ensure the joint is tight. Splice plate installation will be blind because of proximity to the wall structure. NOTE: splice plates can be installed and fit under an MBC2 if a splice happens to be near a carrier.

The 9", 11", and 13" planks have factory upturns on the short ends and are spliced differently. Install planks so that the factory ends are tight and use vise grip clamps to temporarily hold them together. Insert sheet metal framing screws through the plank upturns. A pivot bit set might be required depending on the space between the plank and the wall. Two screws are required at each splice.

### 10.4.3 Install the field planks as described in section 4.3.

### 10.4.4 Last Perimeter Row

Follow the same instructions described in section 4.4, utilizing the Spreader Hold Down (item 7113). It is recommended to install the perimeter planks so the splices occur under a carrier.

**NOTE:** the tabs on the perimeter planks may need to be slightly bent up to help engage with the carrier.

**NOTE:** all field planks should be installed prior to installing the final cut perimeter planks.

## 10.5 Finishing Trim

If the installation is not wall-to-wall or covered by molding, use end caps on planks, but all other components may be in line of sight. Border trim finish to be completed by others.

## 10.6 Framing Out for Wall Feature

Please see the following recommendations if there is a need for a framed-out section in the wall for a design feature, such as a television or sign:

- Prior to installing the planks, measure the space needed for the design feature since there will need to be grid modification.
- Cut the MBC2s to the desired length, making sure to add a sharp point screw in the second hole from the end on the underside of the carrier if the factory screw is cut off.
- There should be a QSUTC within 6" of the end of the cut MBC2.
- Every plank needs at least two connection points, so additional MBC2s may be needed at the perimeters depending on the length of the plank.

### **Horizontal Plank Installations:**

- It is best to use full size planks on the top and bottom of the frame-out, but if that is not possible due to needed dimensions, Carrier Molding can be installed to hide the cut edge of the plank.
- Use end caps for the cut planks on the left and right of the frame-out.

### **Vertical Plank Installations:**

- It is best to use full size planks on the left and right of the frame-out, but if that is not possible due to needed dimensions, Carrier Molding can be installed to hide the cut edge of the plank.
- Install Synchro Cut Plank Bracket (SCPB, item 7237S3) on each cut plank on the top of the frame-out to prevent panels from sliding down. A pivot bit set or a flexible drill extension may be needed.
- Use end caps for the cut planks on the top and bottom of the frame-out.

## **11. EXTERIOR INSTALLATION**

MetalWorks Linear – Synchro planks, 2", 4", 6", 9", 11", and 13" widths (unperforated) are recommended for non-exposed exterior applications.

**11.1** Only these specific suspension system items and accessories should be used for wind uplift applications:

- Main Beam Carrier 2 (Item 7277)
- 2' DGS cross tee (XL8926G90)
- MetalWorks Linear Carrier Molding (Item 5574)
- 20AWG 3-5/8" CSJ Compression Posts (not sold by Armstrong World Industries)
- 16AWG CRC U Profile (not sold by Armstrong World Industries)
- BACG90 Clips
- XTAC (Cross Tee Adapter Clip)
- 2" Splice Plate (Item 8243W02)
- 4" Splice Plate (Item 8243W04)
- 6" Splice Plate (Item 8243W06)
- Pressure Spring (Item 8161)
- Spreader Hold Down (Item 7113)

**11.2** This section provides details for the proper application of these products in areas requiring resistance to wind uplift forces. The details and descriptions provided in this section depict the method used during independent testing conducted according to UL580 "Standard Test for Uplift Resistance of Roof Assemblies".

**11.2.1** Armstrong World Industries is not licensed to provide professional architecture or engineering design services. These drawings and descriptions show typical conditions in which the product depicted is installed. They are not a substitute for an architect's or engineer's plan and do not reflect the unique requirements of local building codes, laws, statutes, ordinances, rules, and regulations (legal requirements) that may be applicable for a particular installation.

Armstrong World Industries does not warrant and assumes no liability for the accuracy or completeness of the drawings for a particular installation or their fitness for a particular purpose. The user is advised to consult with a duly licensed architect or engineer in the locale of the installation to assure compliance with all legal requirements.

**11.2.2** Independent testing was successfully conducted to Class 30, 60, and 90 using 20AWG 3-5/8" CSJ Compression Posts with a 30" plenum. Plenum depths beyond 30" will require a structurally engineered configuration.

### **11.3 Installation of Suspension System**

**11.3.1** Install the 5574 Carrier Molding at the finish ceiling elevation.

**11.3.2** Attachment should be by metal fasteners of a type and size appropriate for the mounting surface. Fasteners should be evenly spaced along the length of the track and the maximum center spacing should not exceed 16".

**11.3.3** Cut Main Beam Carriers 2 (MBC2) to length as described in section 3.

**11.3.4** MBC2 need to be hung with #12-gauge galvanized steel wire at 2' O.C. to facilitate installation.

**11.3.5** Stretch a string from one side of the room to the other at the bottom of the molding (string perpendicular to DGS main beams).

See section 3.5. The string should be out from the end wall by the calculated width of the first plank.

**IMPORTANT NOTE:** Make sure each MBC2 is cut at the same exact location to ensure that the hooks and rout holes will stay aligned. Any other measurement could cause misalignment and unsatisfactory visuals or the inability to install the planks. Check the carrier's alignment by lining up the laser and the same hook on each carrier.

See Section 4 for border plank installation.

**11.3.6** DGS cross tees must be installed adjacent to compression posts. See (Fig 33) for cross tee interface with compression posts. All single tee connections or cut cross tees must be reinforced with an XTAC.

**11.3.7** Attach the ends of the MBC2s to the Carrier Molding using #8 x 1/2" self-drilling screws.

#### 11.4 Installation of the Compression Posts

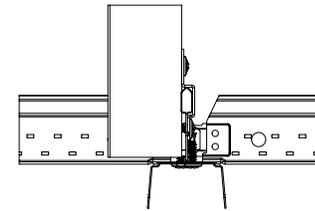
**11.4.1** Independent testing was successfully conducted to Class 30, 60, and 90 using 20AWG 3-5/8" CSJ Compression Posts with a 30" plenum. Plenum depths beyond 30" will require a structurally engineered configuration.

**11.4.2** Note that the bottom end of the posts should fit tight against the flange of the MBC2.

**11.4.3** The top end of the post is made by cutting through the flanges of the stud and folding over a short horizontal leg of approximately 3" to 5" add a screw to secure the folded stud. The top end of the post shall be attached to the structure by means of at least two metal fasteners of a type and size appropriate for the application.

<b>MetalWorks™ Linear – Synchro™ Exterior: Suspension System and Compression Post Spacing for UL Uplift Class Rating</b>		
<b>Class Rating</b>	<b>Carrier Spacing</b>	<b>Compression Post and Cross Tee Spacing</b>
<b>2" Planks</b>		
30 (45 PSF)	24" O.C.	24x
60 (75 PSF)	24" O.C.	24"
90 (105 PSF)	24" O.C.	24"
<b>4" Planks</b>		
30 (45 PSF)	24" O.C.	24"
60 (75 PSF)	24" O.C.	24"
90 (105 PSF)	24" O.C.	24"
<b>6" Planks</b>		
30 (45 PSF)	24" O.C.	24"
60 (75 PSF)	24" O.C.	24"
90 (105 PSF)	24" O.C.	24"
<b>9" Planks</b>		
30 (45 PSF)	24" O.C.	24"
60 (75 PSF)	24" O.C.	24"
90 (105 PSF)	24" O.C.	24"
<b>11" Planks</b>		
30 (45 PSF)	16" O.C.	24"
60 (75 PSF)	16" O.C.	24"
90 (105 PSF)	16" O.C.	24"
<b>13" Planks</b>		
30 (45 PSF)	16" O.C.	24"

**11.4.4** Attachment to the MBC2 shall be by means of the Armstrong® BACG90A clip. Begin by clamping the post and the BACG90A clip in position. Then use four #8 x 3/4" self-drilling sheet metal screws to fasten the post to the BACG90A clip. The top screws will fasten the strut to the clip and the bottom screws will fasten the strut and MBC2 to the clip (*Fig 29*).



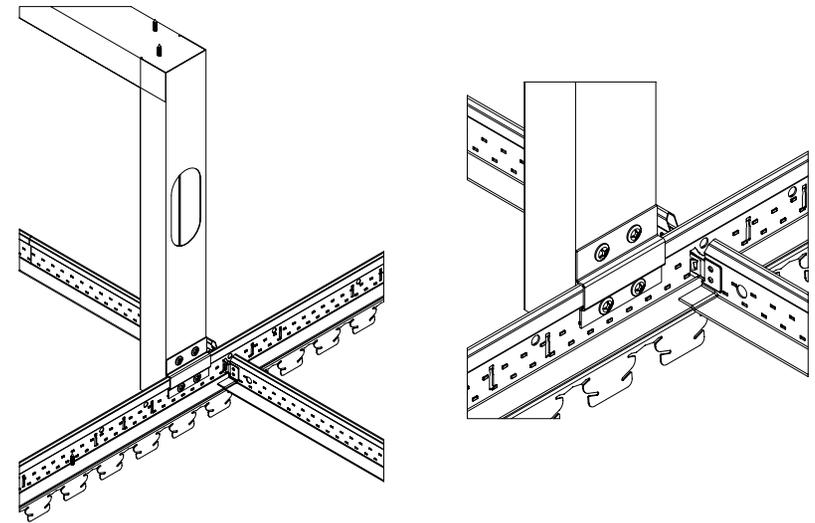
### 11.5 Installation of the Planks

Please refer to section 4 in this document for general information regarding the installation of MetalWorks™ Linear – Synchro™ planks and suspension system.

**11.5.1** Measure, cut, and install the first border plank as described in section 4.1. Install a Pressure Spring (Item 8161) every 12" along the border plank. Pop rivet the plank to the Carrier Molding 12" O.C. in between the carriers and within 3" of plank ends.

The end of the plank will fit into the Carrier Molding on the adjacent wall. One pressure spring is required on the end for all 2", 4", and 6" wide planks, two pressure springs are required on the short ends of each 9", 11", and 13" plank that rests on the wall molding.

**11.5.2** Continue installing rows of planks across the space. When you get near the opposite perimeter, make sure to leave enough room for access above the main carriers as this will be necessary for the last perimeter row.



(Fig 29)

### 11.6 Plank Joints

For 2", 4", and 6" planks:

- Splice locations must be centered between two MBC2s
- 16AWG CRC U Profile must be installed perpendicular to the DGS cross tees above all splice locations (Fig 34).
- Splice plates will be installed as normal

For 9", 11", and 13" planks:

- Splice locations must be directly under MBC2s (Fig 35).
- Screws through the plank upturns can be added as detailed in section 3.5.7 to secure the plank reveals.

### 11.7 Last Perimeter Row

- Refer to section 4.4 on how to install the last perimeter row utilizing the Spreader Hold Down (item 7113).
- **NOTE:** all field planks should be installed prior to installing the final cut perimeter planks.
- It is recommended to install the perimeter planks so the splices occur under a MBC2.
- Install Pressure Springs every 12" along the border of the plank.
- Pop rivet the plank to the Carrier Molding every 12" in between the Main Carriers and within 3" of plank ends.

Item #	Description	Included with Planks	Required for Install	Sold by the:	Pcs/Ctn
<b>MetalWorks™ Linear – Synchro™</b>					
8223W02	96 x 2 x 5/8" MetalWorks Linear – Synchro Plank	–	–	Ctn	16
8223W04	96 x 4 x 5/8" MetalWorks Linear – Synchro Plank	–	–	Ctn	12
8223W06	96 x 6 x 5/8" MetalWorks Linear – Synchro Plank	–	–	Ctn	8
8223W09	96 x 9 x 5/8" MetalWorks Linear – Synchro Plank	–	–	Ctn	6
8223W11	96 x 11 x 5/8" MetalWorks Linear – Synchro Plank	–	–	Ctn	4
8223W13	96 x 13 x 5/8" MetalWorks Linear – Synchro Plank	–	–	Ctn	4
<b>Suspension System Components</b>					
7277	12' Main Beam Carrier 2 (MBC2)	No	Yes	Ctn	10
XL8926	2' Drywall Grid Cross Tees	No	Yes	Ctn	36
5574	10' Carrier Molding	No	Yes	Ctn	10
7800	12' Angle Molding	No	Seismic	Ctn	30
<b>Accessories</b>					
Various	Splice Plates (see data page)	No	Based on design	Ctn	10
Various	End Caps (see data page)	No	Based on design	Ctn	10
8161	1" Pressure Spring	No	Based on design	Ctn	50
7237S3	Synchro Cut Plank Bracket (SCPB)	No	Based on design	Pail	25
7113	Spreader Hold Down	No	Based on design	Ctn	40
BERC2	2" Beam End Retaining Clip	No	Seismic	Ctn	200/50
UTC	Up-Tight Clip	No	Access Plank	Ctn	250
	Cold-Rolled Channel	No	Access Plank	Not sold by Armstrong	

## 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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