



**U.S. SMOKE & FIRE**  
**PROTECTING THE PEOPLE®**

## Smoke Curtain Installation Guide

### Models

SD60

SD60GS

SD240GS

## INSTALLATION GUIDE

### Included:

- Step by step instructions to install a U.S. Smoke & Fire smoke curtain.
- List of essential tools needed by the installer (Not supplied by U.S. Smoke & Fire)
- Identification of standard equipment needed from installer (Not supplied by U.S. Smoke & Fire)
- Best techniques and practices on how to install smoke curtains.
- Reminder to use proper safety equipment.

### Caution:

Though this hardware is fabricated to be strong and durable and to deploy in emergency situations, it can be damaged, particularly the curtain fabric.

Please take great care not to accidentally cut or damage the fabric.

Damage to the hardware could cause it to malfunction.

Please handle equipment with care during transport and installation.

Note: Each smoke curtain differs depending on job/ model/function. Slight differences in installation hardware do exist. For any questions please call US Smoke & Fire-(888)917-8777.



- GCP keys are located inside the panel and strapped to the GCP case as shown above left.
- Please remove the keys when unpacking your shipment and locate in a safe place until commissioning of system.

## INSTALLATION POWERTOOLS

Not supplied by U.S.S.F. - Contractor to provide.



Drill and impact driver



Grinder



Hammer drill



Rivet gun or manual rivet tool



Unibit drill bit



Metal drill bits (metric)



Hammer drill bits (metric)

# INSTALLATION MEASUREMENT TOOLS

Not supplied by U.S.S.F. - Contractor to provide.



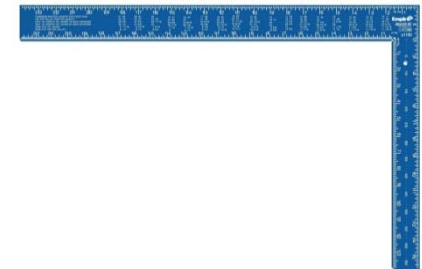
Rafter square



Laser level



Level



L-square



Tape measure



Chalk line



Torpedo level

## INSTALLATION HAND TOOLS

Not supplied by U.S.S.F. - Contractor to provide.



Metric wrench set preferably with ratchet capabilities



Thru-hole ratchet set



Steel drilling hammer



Hammer



Pry bar



Screw driver set



Wire stripper

# UNISTRUT INSTALLATION HARDWARE

Not supplied by U.S.S.F. - Contractor to provide.



Channel nut



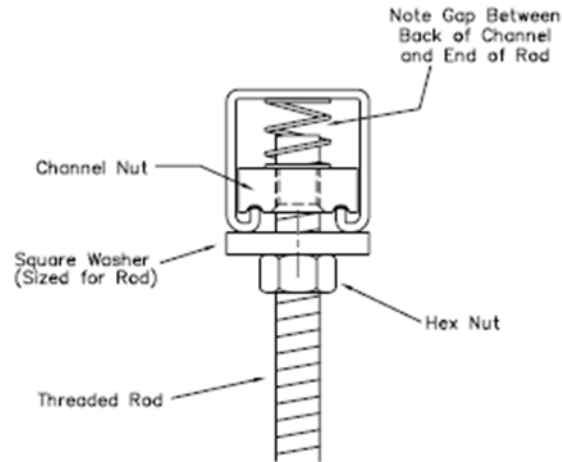
Bolt



Nut



3/8" Threaded rod

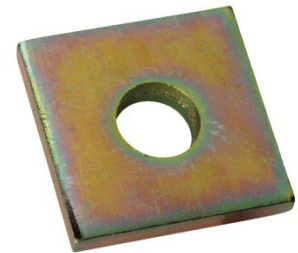


Example of Unistrut fittings.

Note: Channel nut does not require spring though the spring nut is helpful.



Unistrut



Square washer



Unistrut angle



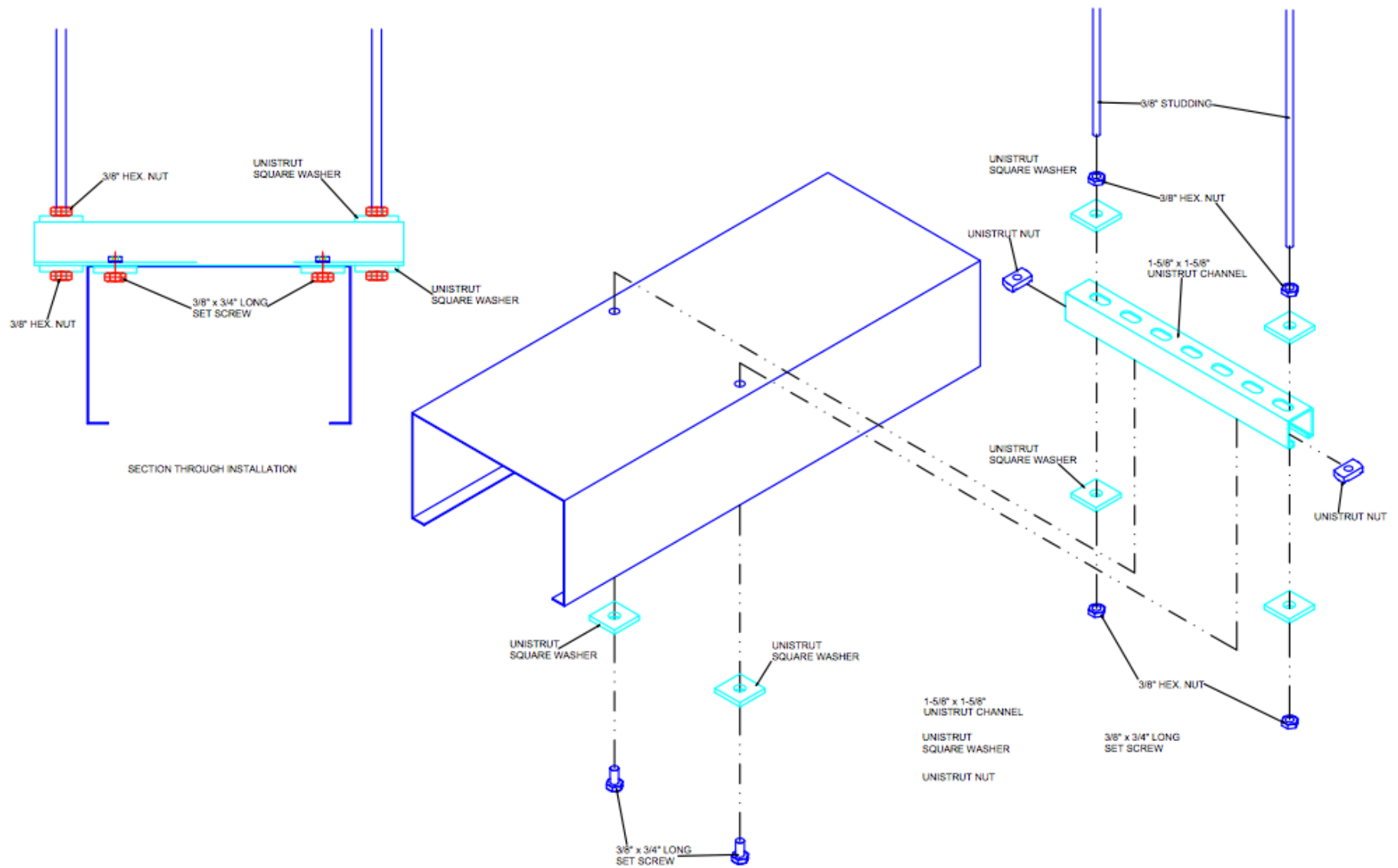
Threaded rod coupler



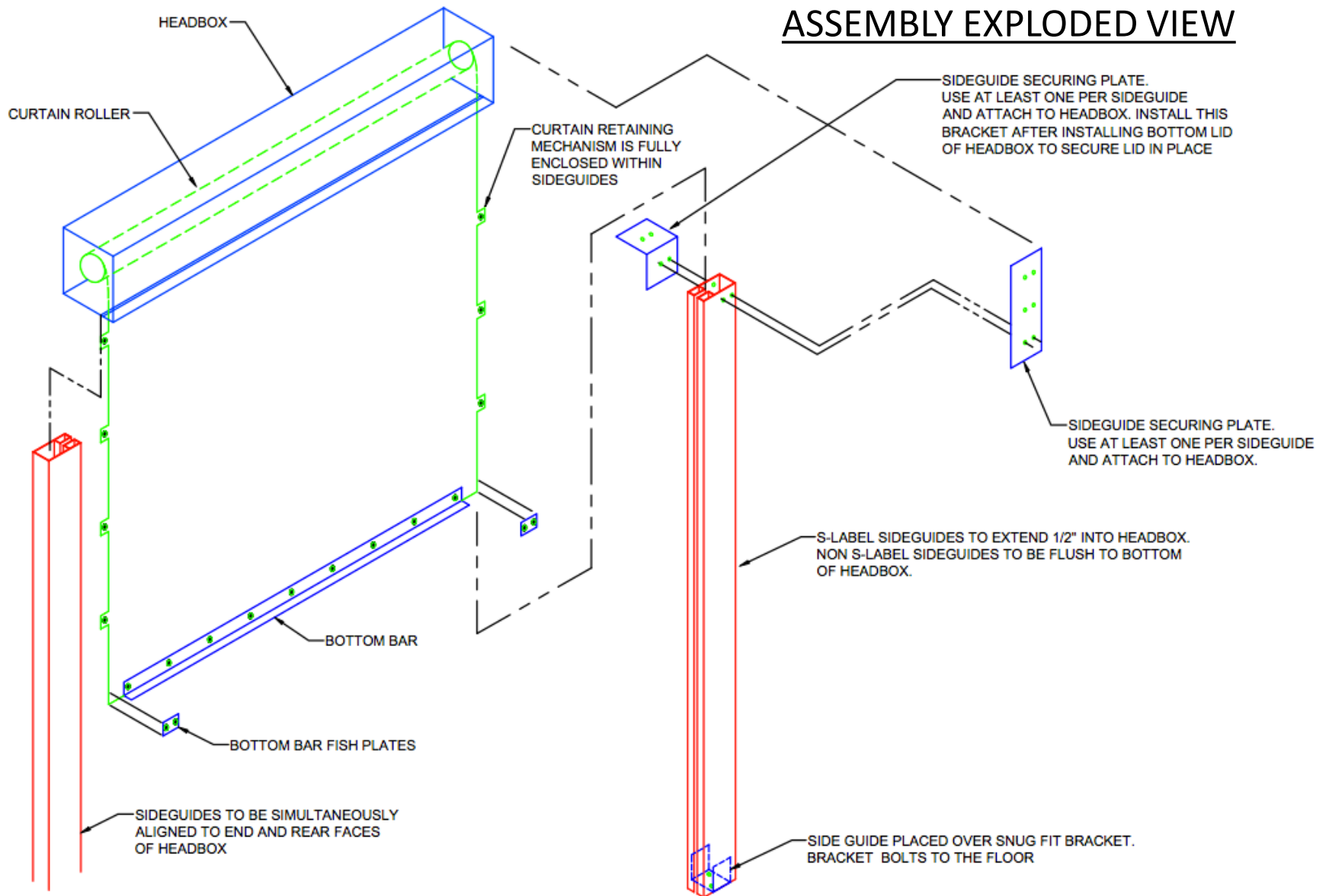
Drop-in anchor

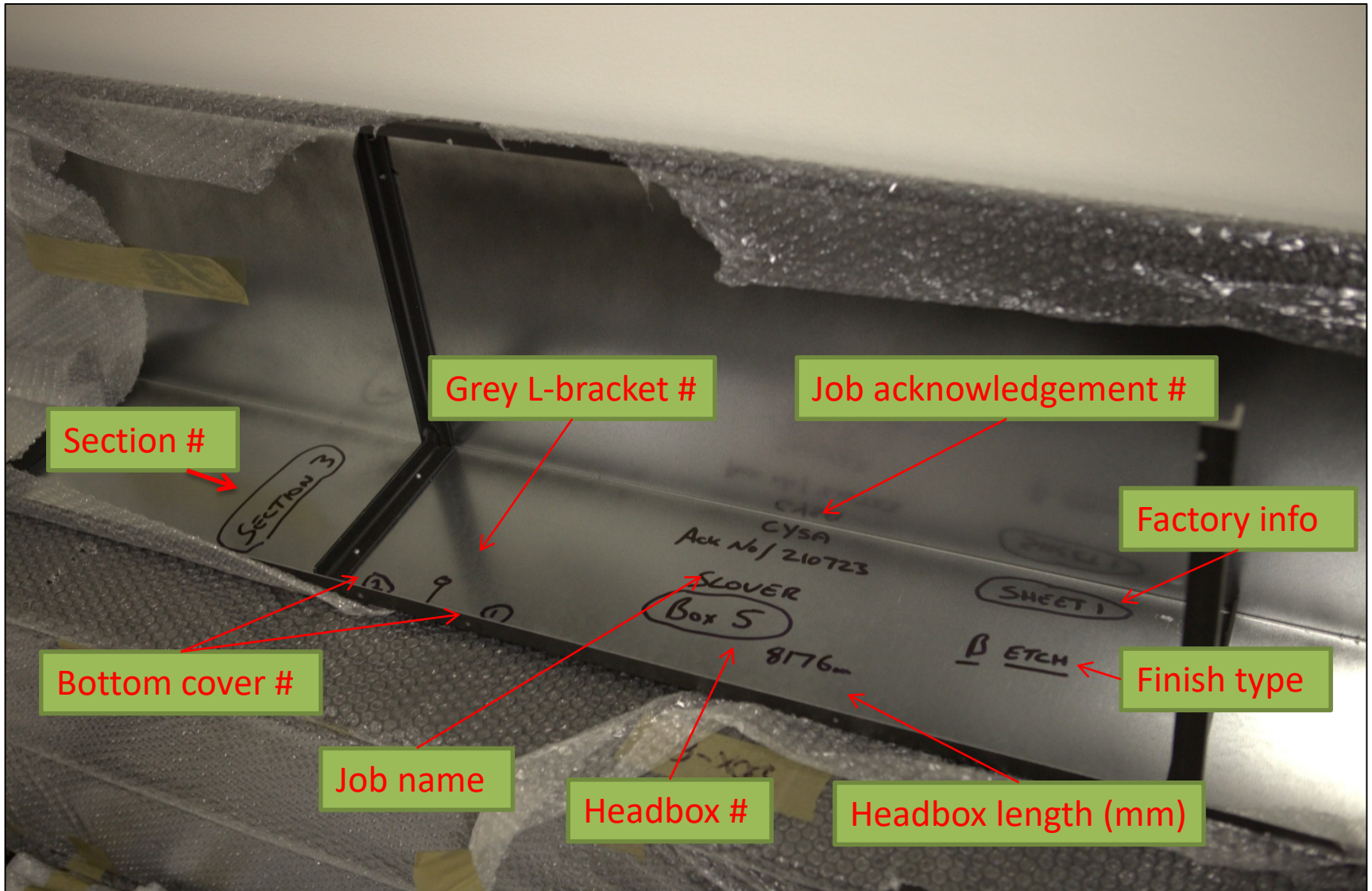


## UNISTRUT EXPLODED VIEW









**NOTE:** Headbox and headbox sections will have all relevant information scribed inside.

## COMPONENTS PROVIDED BY U.S.S.F.



Group Control Panel  
(GCP)



Motor Control Circuits  
(MCCs)



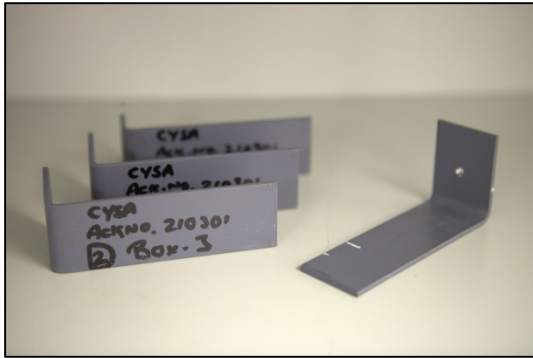
Individual Override Interface  
(IOI) (optional)



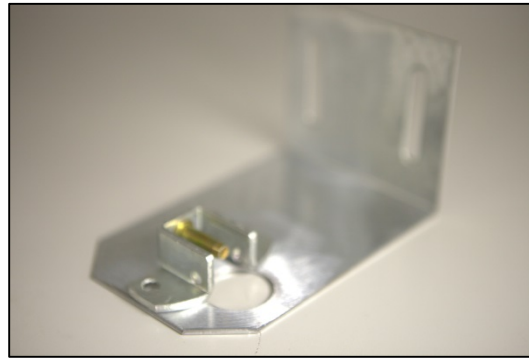
12V Battery  
(2 per GCP)



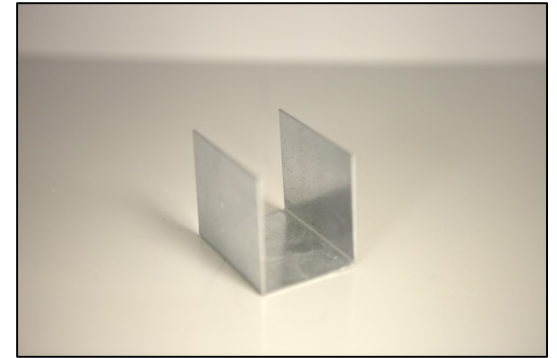
Curtain Up Buttons  
(optional)



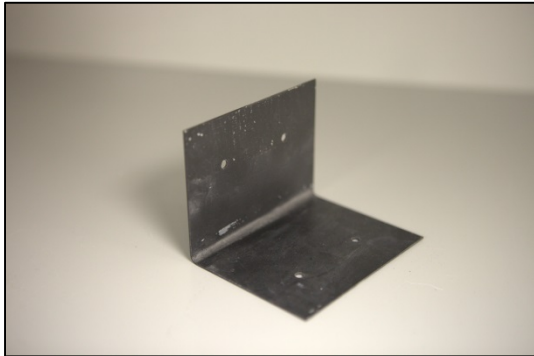
L-brackets



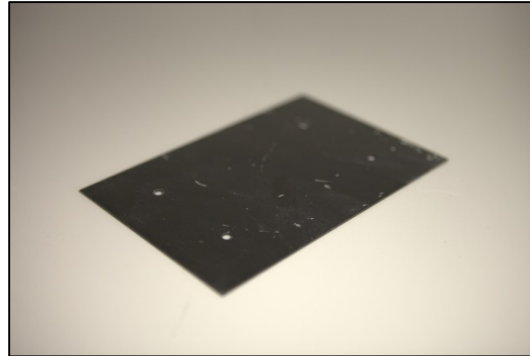
Roller bracket



Snug fit brackets



Auxiliary rail L-bracket



Auxiliary rail flat plate



5/32" or 11/64" Rivets



1/2" connectors  
\*not included



1/4" Concrete drive-pin Anchor  
\*not included

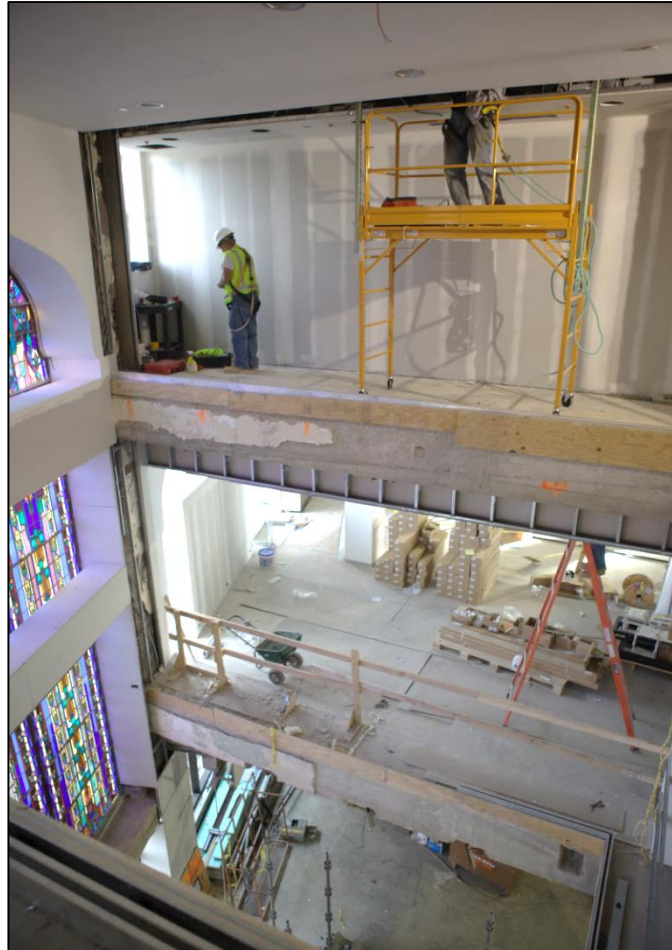


1/2" self tapping screw  
\*not included





The curtains, auxiliary rails and headboxes should be treated with great care. In most cases, the headbox will be primed and ready for paint after the installation. In other cases, it will be powder coated. In either case, it is important to be delicate with the handling and transporting of this hardware. Improper handling could result in a malfunctioning unit. It's a good idea to keep packing materials, such as the bubble wrap, wrapped around all parts so that the installer can insure minimal scratching or damage to the units. In most cases the curtain roll should be kept out of the way and in a safe location so as to not get damaged until it's ready to be installed.



Safety first: if your are working near a floor opening or ledge, be sure to use a harness and lifeline. Scaffolding will also help maintain the installer's balance compared to a ladder. Use proper PPE per OSHA regulations (hardhat, gloves, goggles) and in order to avoid injury. These boxes are heavy and have sharp corners that can cut skin. Goggles will protect your eyes from possible falling debris while installing.

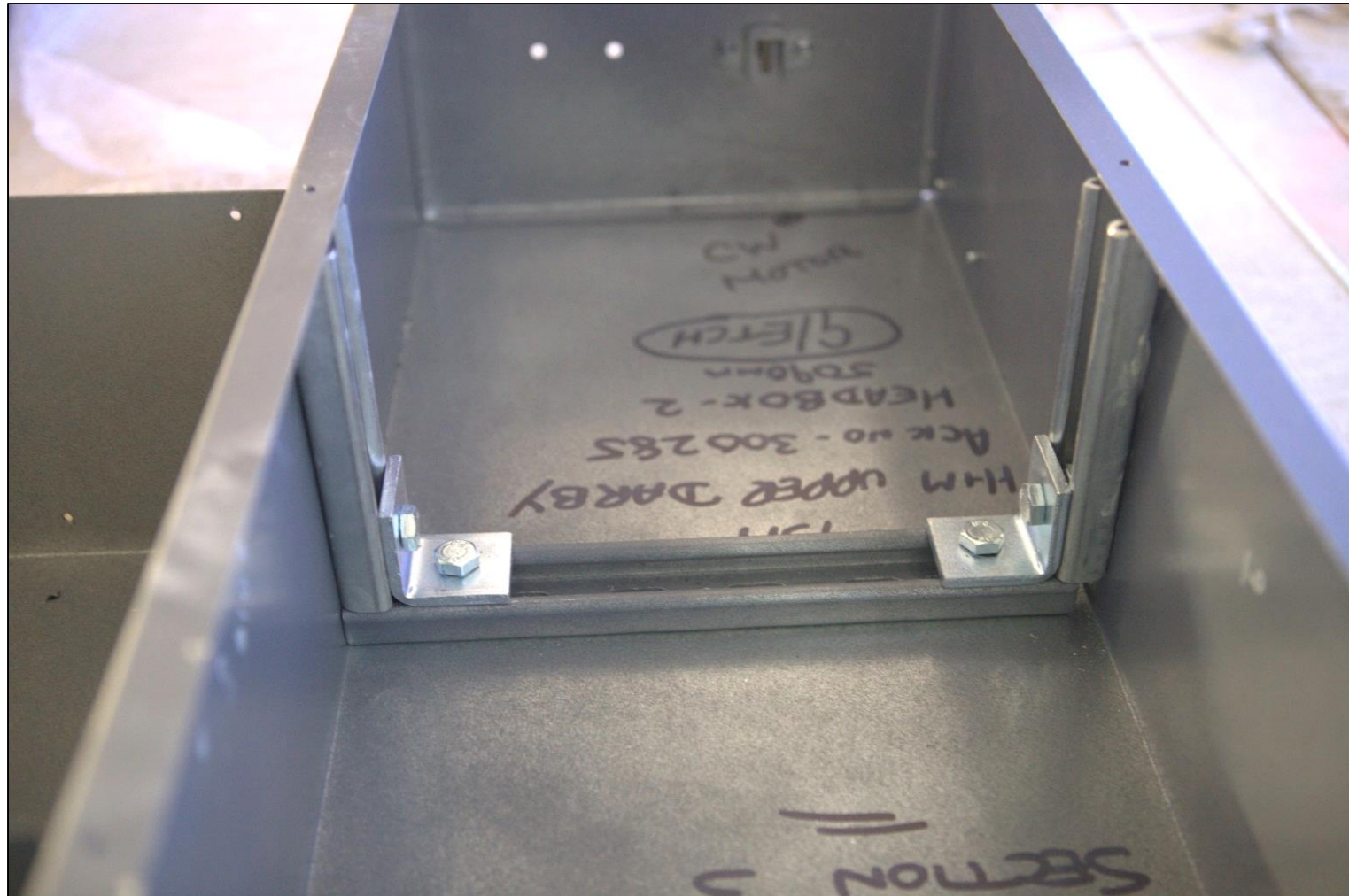


Once headboxes and hardware arrive at the job site, separate headboxes and labeled accessories into groups. Separate all hardware and take inventory to ensure correct count. The headboxes are manufactured in 8 foot sections. Layout the headboxes into correct position as labeled inside the headbox but do not fasten with rivets just yet. Verify all measurements at installation locations before any holes are drilled or any parts are fastened together.





Once hardware is accounted and inventoried, start by putting together the inner brackets. This will make it easier to install into the headboxes.\* Not all headbox's have these inner brackets-The manufacturer will decide per project if inner brackets are needed depending on weight and functionality. of the unit. Please call USSF with any questions-(888)917-8777. Skip to pg. 17.



Install the internal brackets into place within the headboxes according to the marked locations shown inside the headbox. Make sure to not install the brackets too close to the walls causing pressure on the sides of the headbox. If the headbox opening is too wide, then the opening in the neck will be too wide, causing a potential problem when the bottom bar retracts. These need to be tightened into place so they will not fall out while hanging the headbox. They can be adjusted once the headbox is installed.

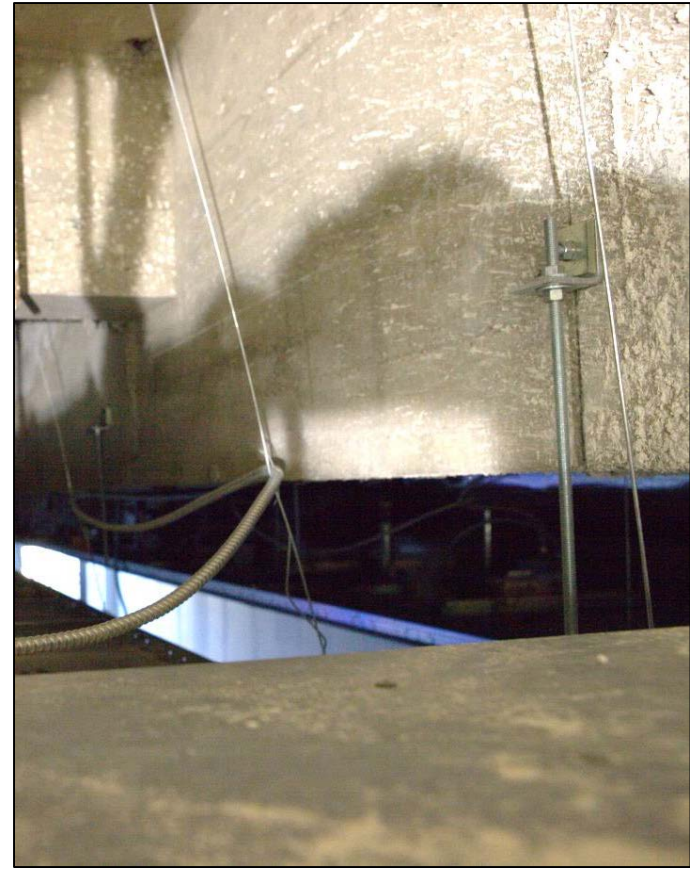
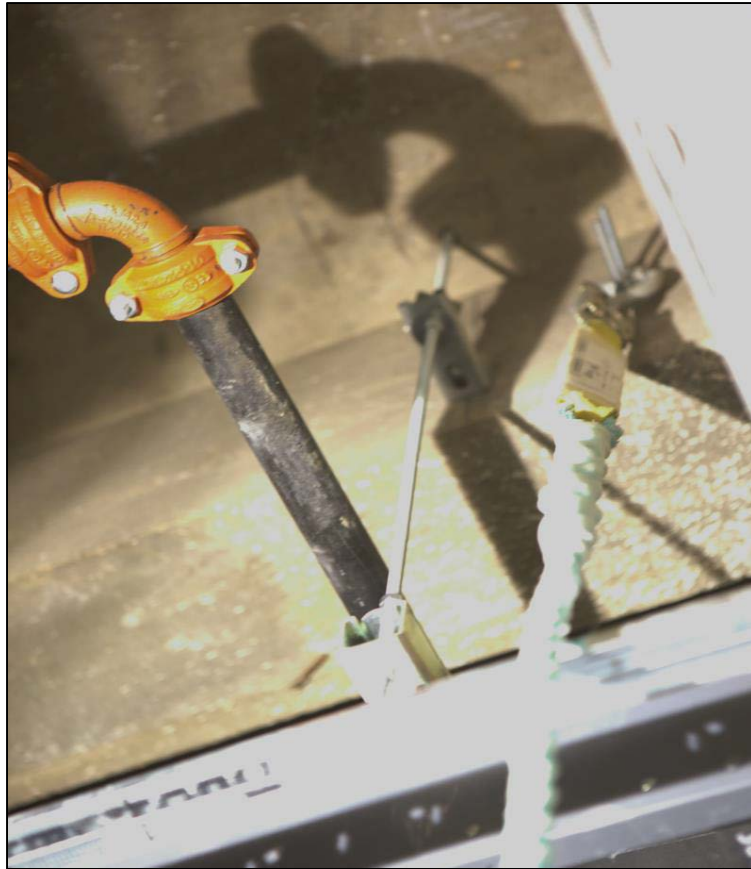


Take measurements of the area where the headbox is to be installed. Refer to plans/shop drawings and find the curtain drop line. From one end of the headbox, mark points 2'0" then 4'0" O.C. thereafter. When finished, you will have marked points two feet from one end the headbox and four feet apart running the entire length of the drop line (small deviations are allowable if mechanical or other obstructions pass overhead). Make sure the markings do not exceed more than 4'0" from one end of the headbox to the other end. From those points using a laser level mark, transfer measurements onto the ceiling for the threaded rod mounting locations.



Depending on the surface the headbox is being attached to, the installer must find the best approach as to how to secure it to the ceiling. In some cases, it will be a flat surface (slab or beam), but sometimes the surface will be more challenging. The picture above shows threaded rods anchored to a concrete ceiling beam.





In other cases, the installer needs to install unistrut angles onto the sides of the structure (as shown above) and/or beam clamps to a steel beam. When installing to the side of the structure, this can be done by drilling in and installing threaded anchors into the concrete beam's side. Then, using a 90 degree angle, another threaded rod can be attached, dropping down towards the headbox. Depending on the width between each pair of rods, a unistrut channel may need to be attached to the top of the headbox and to the rods coming off the ceiling for a proper fit.



After measurements have been made, use a drafter's square to draw perpendicular lines along the back of the headbox so that each pair of holes for the unistruts are aligned every four feet along the length of the headbox. These holes should line up to the measurement of the threaded rods of the ceiling. The recommended method of installation is to install unistruts directly atop the headbox 4'0" O.C. with threaded rods on both ends of the unistrut channel. This allows flexibility to adjust the headbox up and down to varying field conditions.





Determine where the motor wire will need to exit the headbox. Each curtain roller will either be marked with “C” for clockwise or “AC” anti-clockwise. The direction indicates which way the curtain rolls up. The curtain roller tubes have sleeved motor wires coming out of one end. Be sure not to let the wires twist, especially near the tubular motor where the wire has an extra coating on it. Using a unibit, drill a 1/2” to 5/8” hole where a connector can be inserted. This is where the motor wires will pass through the headbox with flex metal conduit. It’s a good idea to have them exit the headbox in the direction of the GCP.





FIG. 1

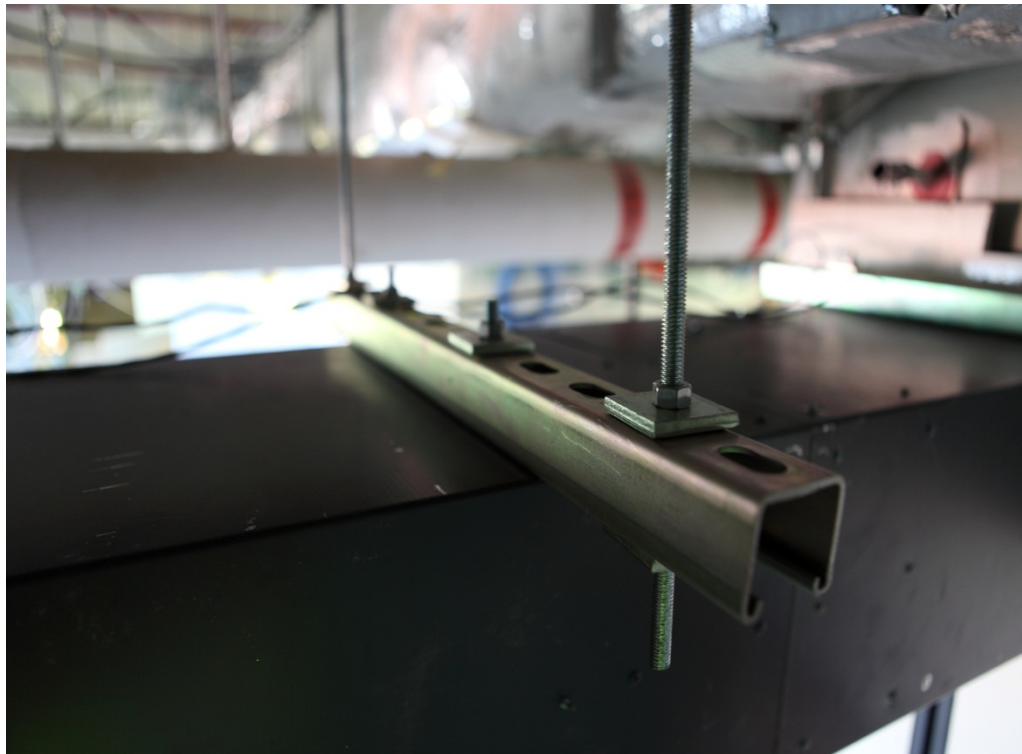


FIG. 2

**Please follow instructions on this page if installing headbox to unistrut channels (recommended).**

Install the unistrut channels atop of the headbox using washers, nuts, and bolts as shown above in Fig. 1 starting 2'0" from one end of the headbox and 4'0" O.C. afterwards aligning with the threaded rods already mounted to structure. Make sure no unistrut is spaced more than 4'0" apart from one end of the headbox to the other end. Once the unistruts are installed atop headbox, lift the headbox up in sections or combined sections to the threaded rods that have already been installed to structure @ 4'0" O.C. Make sure not to screw too tightly the unistruts to the threaded rods until the headbox is completely level. Once it is determined that the headbox is level and at the correct height, the washers, nuts and bolts can be tightly fastened (shown in Fig. 2)



**Please follow instructions on this page if installing threaded rods through headbox (skip if using unistruts atop headbox).** Once the headbox location measurements are finished and the threaded rods are installed, the headbox can be riveted together. A battery-powered pop rivet gun is recommended for easier installation of the rivets. The rivet holes for attaching the headbox sections can be tight. By adjusting the box sections, the rivets may be slipped into place. If needed, the hole can be drilled wider, but be advised not to open it too wide that the rivet won't function properly. Once riveted together, flip the box over so top faces up and find the center point. Measure out 2'0" in each direction from the center point. From these points, continue to measure 4'0" out repeatedly until you reach the ends of the headbox's length. This should be identical to the locations of where the threaded rods were mounted to structure.



**Please follow instructions on this page if installing threaded rods through headbox (skip if using unistruts atop headbox).** Lift the headbox up in sections or combined sections to the threaded rods. Starting on one side, lift the box, inserting the rods into the pre-drilled holes. Once the rods comes through the box, insert a square washer and a nut, leave it loose and do not tighten. Move on to the next set of rods until you reach the other end of the headbox section. Once all the rods have been inserted, you may push the box up to the appropriate height on each end. Secure the box with the nuts and washers on both ends first. Next the nuts & washers in the center of the headbox can be tightened.



Use a long level to check the headbox position lengthwise and make all necessary adjustments. Make sure the bottom face of the headbox (drop height) matches the dimension shown on the shop drawings. The auxiliary rails once mounted will fit inside the headbox approximately  $1/2''$  to  $3/4''$ . Then using the torpedo level, check the headbox widthwise, making sure that the all corners on the bottom face of the box are parallel to the floor. Since the curtains deploy via gravity, it is important to make sure the headbox is level. If the headbox is tilted, the curtain may not drop or retract properly. Adjust all inner brackets and tighten into place. Be sure not to let inner brackets widen the headbox opening. This could be a potential problem for the bottom bar slipping in later.



Once the headbox is up and leveled, its time to insert the smoke curtain rollers – see next page for roller component descriptions. These rollers are compromised of smoke curtain fabric wrapped around a steel tube with tubular motors in its core. These motors can be damaged so please handle with care when mounting the rollers. Connect the roller end without the motor wires to its mounting bracket. The roller end without the motor wires slides out an additional few inches making it easier to mount onto mounting bracket first. Before mounting other end of roller, fish the motor wire through the O-ring hole of the mounting bracket and pull it through carefully. Then carefully push the roller up and onto its mounting bracket. Once installed insert the split pins through the holes in the mounting bracket. These will keep the roller in place. Use a flathead screwdriver to open the ends of the split pins so the pins do not fall out.

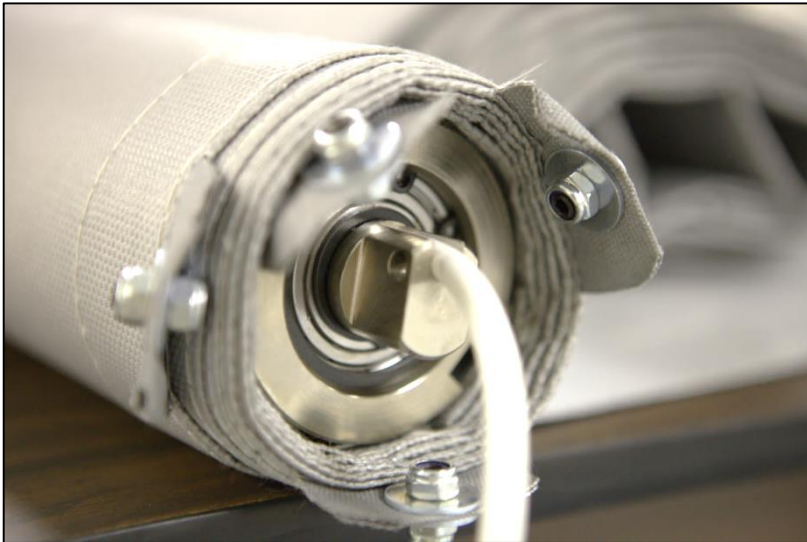




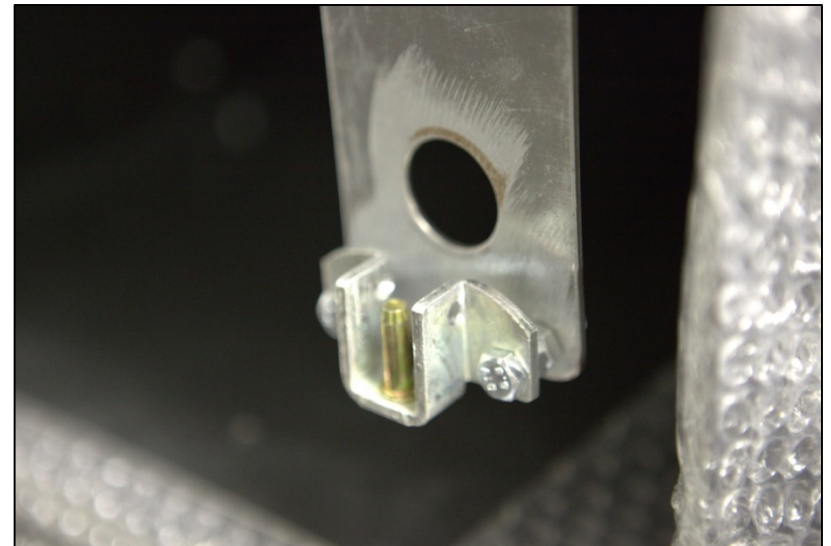
Non-motor wire side of roller axel slides out.



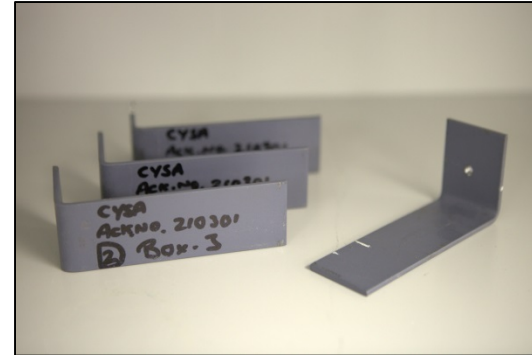
Split pin



Motor side of roller bar. Do not twist or cut. Multiple motor wires need to be the same length for the signals to travel in sync.



Roller support bracket with mounting pin.



L-brackets

Now that the rollers are installed make sure that they can turn without resistance. Turn the rollers by hand making sure the rollers turn smoothly.

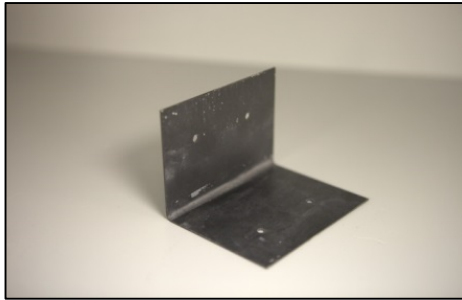
Install all the remaining inner brackets assembled earlier as well as all the grey L-shaped brackets (shown above). These grey brackets are all numbered and labeled on the headbox and on the bracket itself. Keep these in order as they only fit into the labeled locations. It's a good idea to screw in a primed headbox screw into the bracket before fastening it to the headbox so it can be pre-threaded and easier to put into place. The pre-drilled holes in the L-bracket can be tight so expect to strip a screw or two. If you use a drill bit to open holes in the L-brackets, make sure not to make the hole too big or the screw will not catch and it will render the bracket useless.



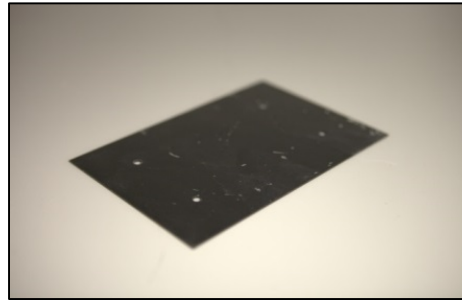


Now that the headbox is in position and the rollers and all brackets have been inserted, the bottom cover plates can be installed. First, carefully cut the tape wrapped around the rollers and pull the fabric down about a foot under the headbox. Be careful that the curtain doesn't unravel. Look for writing inside the headbox of where the bottom cover plates are to be mounted. Each bottom cover plate screw hole should line up to the grey L-shaped bracket holes previously installed. Using an impact driver, drill in the screws securing the bottom cover plates tightly into place. Once this is done, you are ready to install the auxiliary rails.

**\*SD60 model does not have auxiliary rails. Installer can skip to pg 35.**



Auxiliary Rail L-Bracket

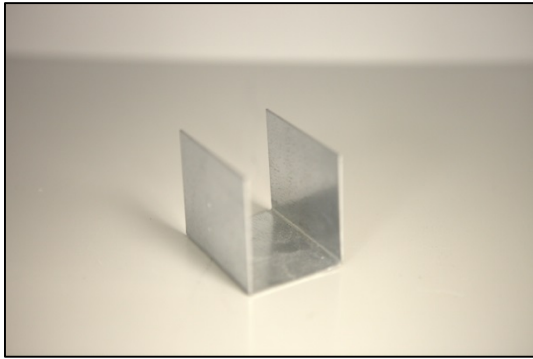


Auxiliary Rail Flat Plate

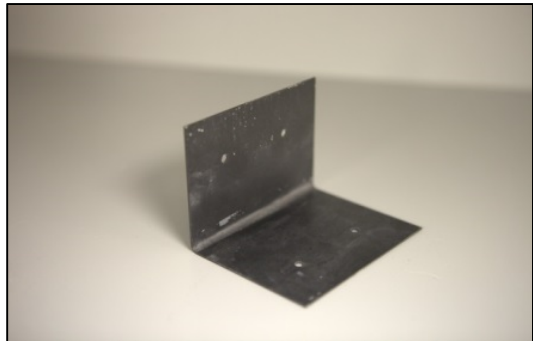


Note: Flat plate riveted to the auxiliary rail. Tapping screws used to attach to headbox neck.

Using the curtain drop line and floor measurements, find the location of where the auxiliary rails should be mounted. Remember to take into account where the finished drywall needs to be set. Auxiliary rails are generally face-flush to the surrounding walls in order to recess them for a better finished appearance. Once you have determined the location, rivet on one side the aux rail L-brackets (shown above) to the top of each rail (see sheet 8). It's a good idea to wedge open the rail channel so it doesn't bend closed while drilling the holes for the rivets. Afterwards rivet the flat plates to the top of each rail on the other side (see sheet 8). Make sure the flat plates do not extend more than 1-1/2" inside the headbox or it might damage the fabric. Fit the rail into place and level in all directions. Both auxiliary rails need to be completely vertical and lined up to the drop line.



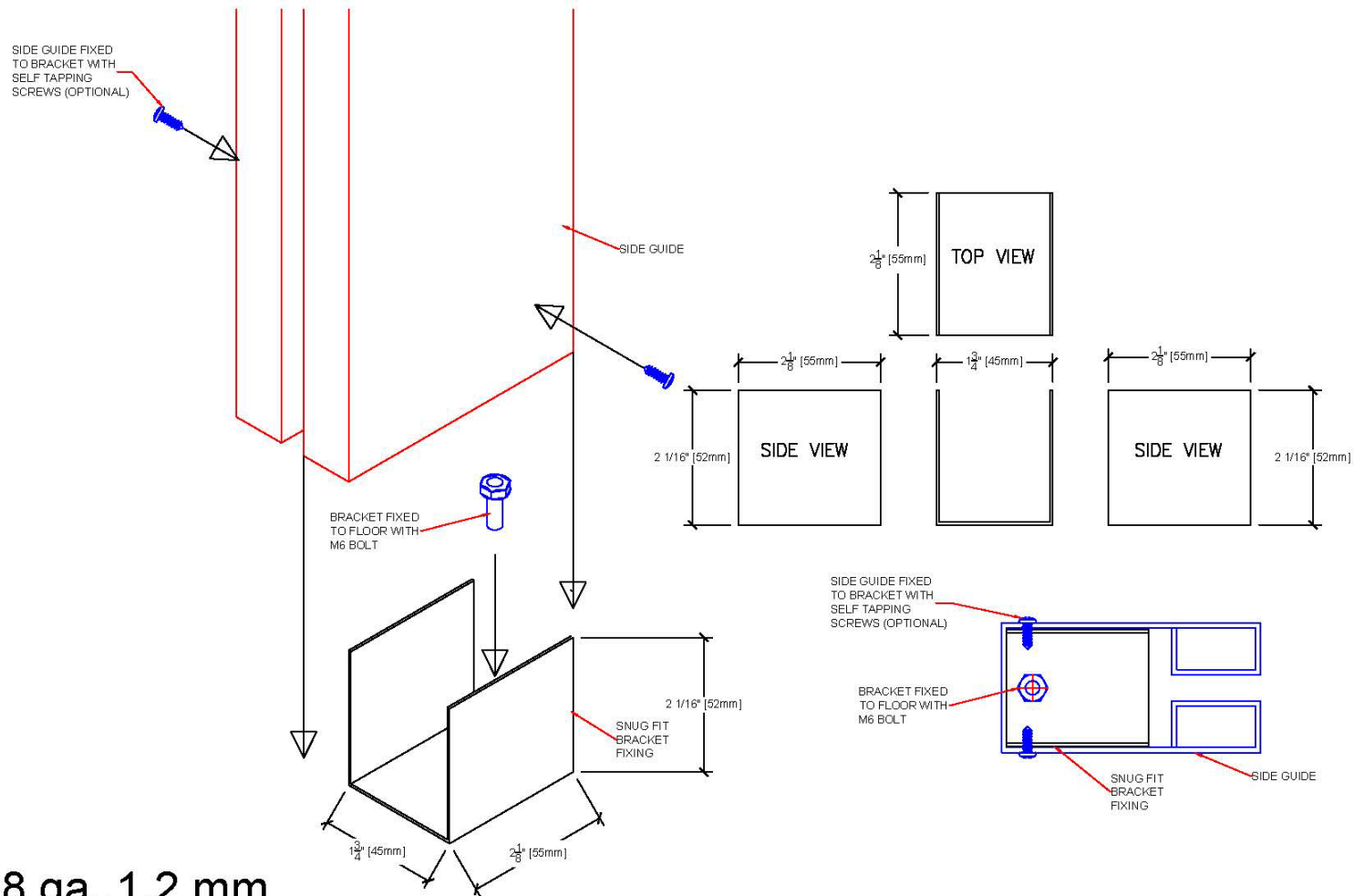
Auxiliary Rail Snugfit Bracket



Auxiliary Rail L-Bracket



The auxiliary rails should be mounted to floor by using the snug fit brackets provided. Secure screws/bolts through the snug fit brackets to the floor. Once the snugfit bracket is tightly secured to the floor, place the auxiliary rail over the snugfit bracket so that is flush with the floor . This bracket is designed to keep the side guide in place at the floor level as shown on the diagram on sheet 8. Auxiliary rail L-brackets can also be used by riveting to the bottom of the auxiliary rails and then anchoring to the floor as shown above. Wedge a spacer in the rail channel while drilling into the rails for the rivets so as to not bend the channel shut. If the channel does close up, the curtain will not drop properly.



18 ga., 1.2 mm





It's a good idea to place drywall into position when setting auxiliary rails into place. As you can see, the drywall is flush with face of the rail. This will disguise the rails once the walls and rails have been painted.



Next step is to pull the fabric on all the rollers down simultaneously all the way to the floor.



Measure the length needed for the curtain to reach the floor. Keeping the curtains together use a chalk line to snap the line where the bottom bar should go. The curtains will have a line draw across the bottom, this is not the cut line, it is solely intended to function as a square indication tool, measure from that line on both curtains to achieve a proper horizontal cut. The bottom bar at full deployment should “rest” on the finished floor and all the curtains must be taut. If the curtains are loose during deployment, it will not function properly. Once the chalk line is snapped, attach the bottom bar sections. The bottom bar sections are staggered from one side of the curtain to the other creating a stronger connection. Once the bottom bar is installed, do not cut off the extra fabric until the curtain has been tested. Testing can be done by connecting the motors to the Motor control circuits (MCC) and the MCC’s to the Group Control Panel (GCP). **DO NOT CUT THE MOTOR WIRES AT ANY POINT DURING INSTALLATION.** Use the GCP to test the smoke curtain to see if it retracts correctly. Watch carefully to see that all curtains retract evenly. If one curtain is longer than the other, the bottom bar will not rest evenly to the bottom of the headbox and will need to be re-adjusted. Use caution as to not produce unnecessary holes in the fabric.



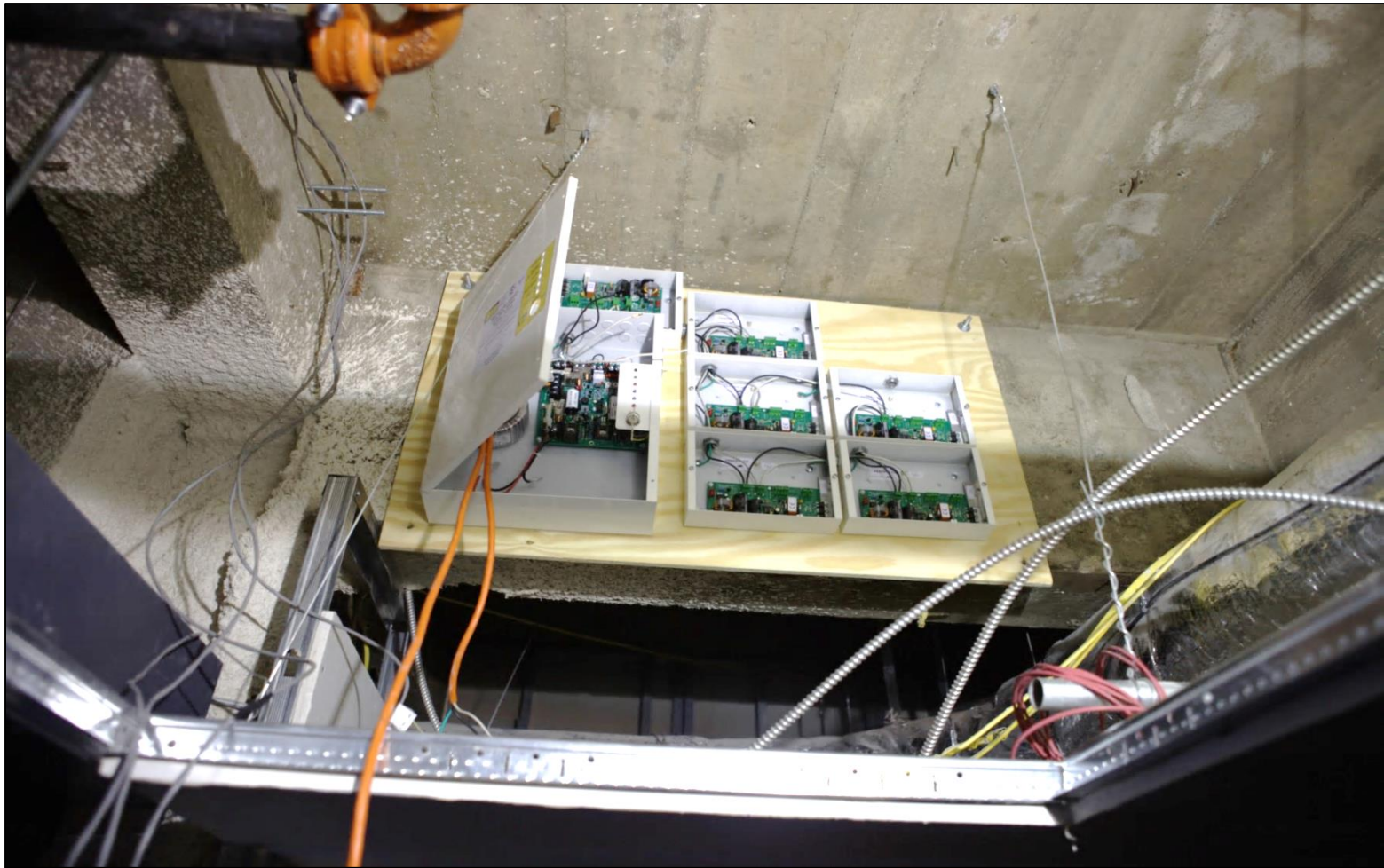


Once the curtain has been tested and the bottom bar rests flush on the finished floor when deployed, and lays flush against the bottom of the headbox when fully retracted, its time to cut the extra fabric from under the bottom bar. Use a box cutter to cut off excess fabric. Be careful not to damage the curtain fabric above the bottom bar.



Once the excess fabric has been cut, the smoke curtain is finished. All electrical wiring at this point should be placed under permanent power following the job-specific electrical wiring point-to-point wiring diagrams. All electrical terminations should be checked and tested for correct voltage. Once this has been done, the curtain can be tested using the test key switch at the GCP.





Best practice dictates keeping all of the control electronics together. Mounting the GCP and MCC's together helps keep everything organized and easily accessible in the case of a service call. Shown above is an example of the GCP and MCC's mounted above the finished ceiling right at an access panel. If this is not feasible, the GCP can be mounted in an electrical/mechanical room and the MCC's can be remote located as shown above without the GCP. In this case, the GCP can be no farther than 150 feet from the furthest MCC location for the low voltage wiring ring loop.

For questions or additional information, please contact U.S. Smoke & Fire.  
We can provide a WebEx meeting if needed:

**888-917-8777**

or

**[aeteam@ussmokeandfire.com](mailto:aeteam@ussmokeandfire.com)**