

## INSTALLATION GUIDE TO JG INNOVATIONS – INTERIOR STEEL SOFFIT SYSTEMS

**Forward** – Our custom interior soffit systems have been designed to conceal any type, size or combination of Fire Sprinkler Systems, Plumbing, Hydronic Piping, HVAC, Electrical or Cable/IT Wiring. There are presently four types of interior steel soffit offered; Architectural, Aesthetic, Commercial, and Security Grade, which should accommodate most project needs. Our Architectural, Aesthetic, and Commercial soffit systems are typically installed where aesthetics are the primary concern. Examples include buildings of residential/commercial/educational occupancy such as Nursing Homes, Hospitals, Hotels, Apartment Buildings, K-12 Educational Facilities, Universities, Greek Housing and Dormitories. On the other hand, our security soffit system is designed for Psychiatric Wards, Prisons, Jails, Detention Centers, Institutions and other facilities where security is the pressing need. There are minimal differences between our Architectural/Aesthetic/Commercial/Security Soffit systems. Our Architectural, Aesthetic and Commercial lines utilize slip couplings for proper fastening of seams and are typically comprised of light to medium duty material; whereas our Security soffit system is manufactured in a heavier gauge material and requires riveted joints where seams occur.

The different installation procedures for these two systems are identified within the text of this guide. As fire sprinkler piping system installations generally entail more complete and specific concerns, restrictions, and details (specific sprinkler head locations, etc.), this guide will address the installation of our interior steel soffit systems as it is intended to accommodate fire sprinkler systems.

**Handling and Storage** – Reasonable care must be exercised in handling our steel soffit systems and accessories. Take caution to not drop the shield or any objects on the shield itself in order to minimize dents and damages. It is strongly recommended that our interior steel soffit systems and fittings should not be stored in a manner which compresses the components or would distort their shape.

**Recommended Tools** – One of the keys to a fast, smooth, and efficient installation of our interior steel soffit systems are having the proper tools to work with. Ideally, these tools would include:

1. Aviation Shears/Snips may be used for cutting material in lighter gauges, such as our 24 Gauge material. A hand seamer or hand break also assists with custom fabrications. For cutting material to length, notching and cutting holes for sprinkler heads or other devices in heavier gauges, a plasma cutter is typically sufficient. Other useful tools include a die grinder, industrial grade jigsaw or hand held saber saw/metal cutter.
2. If more than a few dozen outlet holes are required, a carbide tipped hole saw is recommended. This tool expedites hole cutting and increases accuracy. When using this tool, you will also need a power drill with a higher RPM and at least a 1/2" chuck. Standard hole saw sizes for sprinkler head cut-outs are between 2" and 2 3/4"
3. When encountering concrete structures a rotary hammer drill is essential for anchoring the cover clips. Typically, 3/16" x 8" length SDS carbide tipped hammer drill bits work well.

4. High speed rotary drill is required for drilling rivet holes and in cut ends, cutting sprinkler head holes, etc.

Additional suggested tools include:

- An 8" x 12" steel frame square
- A combination square (for measuring angles)
- Medium size rubber mallet or dead blow type hammer
- Pry bar/Nail puller (for reaching behind the cover to spread shield cover clips and other fittings)
- 25' tape measure
- Cordless drill for anchoring fasteners in drywall and drilling pop rivet holes
- Caulk gun

Required Accessories:

- Pop rivets (1/8" diameter x 1/4" length) of matching material/finish
- Substrate appropriate anchors/fasteners
- Commercial Grade (Sonneborn® NP-1) or Institutional Grade (Sonneborn® Ultra) Sealant
- Safety glasses and leather belts

**Assembly** – The following order of steps is recommended when installing fire sprinkler systems in conjunction with any of our interior steel soffits.

1. Piping and sprinkler layout (not covered in this guide) and steel soffit system covers, fittings and clip planning. For large projects (1,000ft or more), a complete mock-up installation is strongly recommended as a cross check
2. Pipe hanger and our interior soffit system shield clip placement and anchoring
3. Piping installation
4. Piping system testing (not covered in this guide)
5. Interior steel soffit covers, fitting fabrication and installation
6. Finishing

**STEP 1: Planning** – Our Architectural/Aesthetics/Commercial/Security soffit systems are prefabricated, custom-fitted interior soffit systems; therefore soffit dimensions and locations must be determined prior to installation. The soffit dimensions and locations are the sole responsibility of the pipe/utility installer as soffit dimensions and locations are entirely dependent on the pipe/utility installation. Soffit dimensions can be derived from both the size of the pipe/utility and its centerline in conjunction with the wall and/or ceiling. All soffit dimensions and locations must be clearly indicated on the pipe/utility shop drawings prior to soffit installation. In doing so, any deviance from the pipe/utility installer shop drawings by the pipe/utility installer or the soffit installer can then be easily tracked.

The pipe hangers and cover system installation must be cross-checked for system compatibility (i.e. pipe location and clip locations as required by Steps 2, 3, and 5). The underlying support system for our

interior steel soffit system’s installation must fulfill the individual support requirements of both the pipe and the shield. (Pipe support and support spacing must be in accordance with piping manufacturer’s guidelines where applicable). Soffit material support spacing must be in accordance with the maximum allowable spacing between supports as specified herein. (See Step 2.2)

**STEP 2: Hangers and Clips** – IMPORTANT: A chalk line should be employed to assure all hangers and clips are installed in a straight line. When employing the L-Shield centerline, distance of the pipe hanger from the wall is critical for fitting piping within the shield.

**2.1 Hangers** – Pipe hangers must be of a design compatible with the dimensional constraints of the steel soffit material used. When using an L-Design shield, the pipe should be anchored firmly (minimum 200# pullout) to the wall within 2 feet of any sprinkler outlet.

**2.2 Clips** – Each of our two classic soffit material designs (L-Shield and U-Shield) entails the use of shield clips for soffit material support. To ensure proper attachment of the steel soffit material, alignment of clips must be perpendicular to the pipe run and should be flat against the mounting surface before anchoring. The clip is designed as a snap-on positioning and structural support for the cover and certain fittings. These clips should be installed to observe the following spacing maximums between cover supports. In areas with inconsistent substrates, clip placement will be dependent upon “high” and “low” spots as illustrated in Section 5.5 of this installation guide.

**Suggested Spacing of Shield Clips along each Edge**

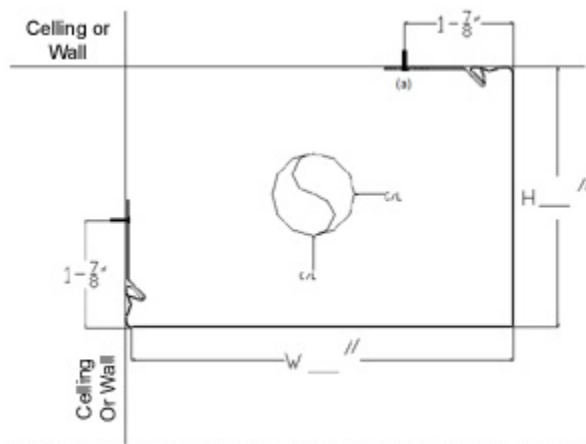
Shield Type	Commercial/Other Installations	Institutional Installations
L-Shield	10 Clips per 10’ Section	10 Clips per 10’Section
U-Shield	10 Clips per 10’ Section	10 Clips per 10’Section

The clip should be located such as that the tip of its catch point will rest in the bottom of the cover catch point once assembled to minimize lineal distortion to the soffit material. Proper clip placement is best attained through the use of chalk lines.

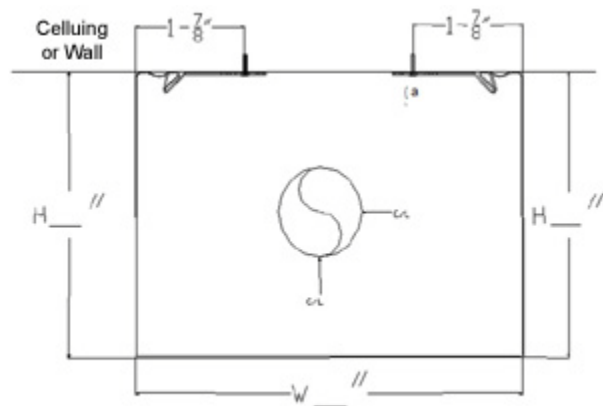
Please note: Chalk lines for clip fastener placement should ordinarily be snapped  $1\text{-}\frac{7}{8}$ " less than the exterior dimensions of soffit faces. For example:

- L-Shield soffit with dimensions of  $6$ "h (down from the ceiling) x  $4$ "w (out from the wall) will require a chalk line on the wall  $4\text{-}\frac{1}{8}$ " down from the ceiling and a chalk line on the ceiling  $2\text{-}\frac{1}{8}$ " out from the wall.
- U-Shield soffit with dimensions of  $6$ "h (down from ceiling) x  $6$ "w (width between sides) x  $6$ "h (back up to ceiling) will be dependent on the centerline of the pipe/utility to be covered. Once the centerline of the pipe/utility has been established, measure out for the chalk lines on both sides of the centerline  $1\text{-}\frac{1}{8}$ " [ $3$ " (half the width) minus  $1\text{-}\frac{7}{8}$ "].

### L-Shield



### U-Shield



For commercial installations and applications in which drywall or plaster comprise the cover mounting surface, ZIP-ITS or hollow wall anchors can be used. After hollow wall anchors are in place, the shield clips can be fastened with # 10 x  $1\frac{1}{4}$ " sheet metal screws that have a # 2 Phillips pan head.

When installing the L-shield, it is functional to use an  $8$ " x  $12$ " steel frame square as a template. Once you determine the proper position of the shield clip from the wall or ceiling, use the square to measure the distance from wall/ceiling juncture to the location of the pre-drilled anchor hole in the clip. Then simply drill holes in the steel frame square to serve as your template for drilling anchor holes. Check your work by using a level to assure the vertical side is plumb when assembled. If not, the inside corners and T-intersections cannot be made to be square, resulting in large and unsightly gaps.

All coupling joints should be supported within twelve (12) inches by a clip and each separate shield fitting should be likewise supported. Anchoring for shield clips must be of sufficient strength to hold the shield firmly against the mounting surface when the shield is snapped into the clips, in addition to withstanding a minimum pullout of 200 pounds. Individual back to top side and bottom clips for both L-shield and U-Shield profile should have lineal offset (alternating). Shield clips may be anchored in concrete structures using  $1\text{-}\frac{1}{4}$ " or  $1\text{-}\frac{1}{2}$ " Tap-Con screws or expansion shields.

**STEP 3:** Installing the Piping System – After all required hangers and clips have been properly anchored, the piping system is assembled according to the piping manufacturer’s recommendations.

IMPORTANT: Please check Fire Sprinkler System assembly prior to proceeding with installation to assure pipe position is compatible with your steel soffit system cover dimensions. This is the Pipe/Utility Installer responsibility; due to the various fittings used, JG Innovations Inc. cannot assume any liability for compounding errors.

**STEP 4:** Piping System Testing – Testing of the piping system is not covered in this guide.

IMPORTANT: Fire Sprinkler Piping System must be pressure tested prior to installing our steel soffit material and fittings.

**STEP 5: Laying Out, Fabricating and Assembling our Interior Steel Soffit Material and Fittings** – The primary difference between installation of our Architectural/Aesthetic/Commercial steel soffit systems and our Security soffit system primarily lies in the means of joining the cover sections.

Our Architectural/Aesthetic/Commercial steel soffit materials are readily joined via an internal slip coupling. The coupling easily slips into one end and is pinched in place by a hand seamer (refer to Recommended Tools section of this Installation Guide), thus forming a male end to be slipped into the next section. In situations where the substrate(s) are distorted and uneven, simply use 1/8” pop rivets as needed to hold corner sections square and pull seams together.

As for our security soffits, prefabricated ends are designed to form male/female overlapping joints via the use of integral (factory installed) couplings. The joints are then locked together with steel pop rivets (1/8" diameter) using a hand held riveter (this must be done by the installer). Rivet holes (1/8" diameter) must be drilled through the two joined sections. For field efficiency, the use of a template and a high speed drill are suggested.

IMPORTANT: Holes must be spaced at 2" intervals around the cover perimeter at a distance no greater than 1" from the end of the female section.

**Sprinkler Outlets** – Outlet holes should be cut only after careful measuring to determine the precise location. Depending on the size of the escutcheon plate used, a 2"- 3" outlet hole is recommended in order to provide allowance for proper positioning.

#### 5.1

A carbide tipped hole saw is suggested for cutting outlet holes. When required, a sprinkler outlet adapter ring is provided by the installing contractor. The purpose of the sprinkler outlet adapter ring is to prevent any possible gaping between the sprinkler escutcheon and the steel soffit material. These rings are simply cut lengths of pipe (usually plastic) of a size that will slip over the outlet branch of your pipe tee along the full length of such outlets prior to installing the cover. This device is optional but should be considered mandatory for high security (prison) installations.

**Steel Interior Soffit Systems Installation – IMPORTANT:** Always wear safety glasses and leather gloves when conducting field fabrications and handling our soffit materials.

- 5.2 With the shield cut to the proper length (see Recommended Tools section of this Installation Guide) and positioned, it is simply pressed onto each clip until a definite “snap” is heard from each clip arm. This is best accomplished by attaching one side of the shield cover first, followed by the opposite side, and is best done by applying direct pressure only at clip locations. A large rubber mallet is helpful, particularly for the heavier gauges. Be sure to record the clip locations prior to attempting to snap the cover on. These records will also allow for easy removal.

Field cut ends and outlet holes must be touched up with a matching paint prior to installation to protect the cover against corrosion.

- 5.3 **Sprinkler Head Accommodations** – Our Steel Soffit Systems can accommodate most any type of sprinkler head, including those intended for institutional use.

- 5.4 **Soffit System Fittings and Closure Sections** – Field fabricated fittings can be readily made on demand in the field with the use of factory made wall flanges. Examples of such fittings include: L-Shield x U-Shield T- Intersections, U-Shield x U-Shield T- Intersections, L-Shield Inside Corners, etc. Using aviation shears/snips, a hand held saber saw/metal cutter, or an industrial grade jigsaw (refer to Recommended Tools section in this Installation Guide), a slot is cut in the cover section for pipe emergence. When performing this function, we suggest you use the bracket itself as a template to mark the outline of the slot to be cut. For heavier gauge material, it is helpful to cut a hole to form the bottom of the slot, then cut down to the hole with a die grinder, cutoff saw, or plasma cutter. The flange is then attached to the cover (with pop rivets) around the slot with the offset sections then being likewise attached to the flange, thus tightly tying the two cover sections together.

IMPORTANT - The flange should be attached to the first section only after the first section has been installed. In this manner it can be positioned tightly against the construction surfaces. The catch points of the cover section interfacing with the flange must be snipped to allow the overlapping cover to closely hug the flange.

When forming inside corners with the L-Shield cover you will note there are left and right hand flanges, depending on the direction it is being installed from. While you will generally be supplied with a few extra of each, it is a good idea to keep this fact in mind and try to balance your requirements accordingly.

The key benefits of such field made fittings are design flexibility and the elimination of precision cutting otherwise required to accurately position pre-fabricated fitting.

**Pre-Fabricated Fittings** – Certain fittings are joined with splice couplings in the same manner as the lineal sections. Rivets can be applied in order to pull the seams together smoothly. The end cap serves as its own coupling and simply slips into the end of a lineal section and is then either caulked or riveted in place. Unless otherwise specified, JG Innovations Inc., will assume field fabricated fittings will be utilized where possible.

**Wall Flanges** – Can also be used as closure flanges where the shield ends directly at the wall (these are identical to those used for field fabricated fittings).

IMPORTANT: In all cases, the flange fits on the inside of the cover and the catch points/groove must be clipped from the cover section at the interfacing with the flange.

**Trouble Shooting** – Each project you encounter will have its nuances. These may include:

**Asbestos Ceilings** – A wall mounted L-Bracket sized to accommodate the ceiling level catch point of your particular soffit is available for any installations needing to accommodate asbestos ceilings.

**Protrusions/Offsets** – In situations where the substrate has small protrusions and offsets, typically the soffit material is over sized and notched as needed. For larger offsets, custom offset elbows and corners may be ordered.

**Restricted Vertical Space** - Where space is limited, i.e. high doorways, it may be necessary to use a smaller cover than what may otherwise be optimal. When installing a fire sprinkler system with side wall heads, it may then require “sprinkler housings” to accommodate “drops” to the sidewall sprinkler device at its listed elevation.

5.5

**Excessively Wavy Construction Surfaces** - Using a chalk line, determine the “low points” of such surfaces and mount the clips at these points. If the clips were mounted in the high points, it may be impossible to snap the soffit material on. Caulk the “high” sections where gapping between the shield and substrate has occurred.

**Restricted Horizontal Lineal Space** - Snip off the catch points from the soffit material section that would normally interface with a coupling or wall flange. This precludes the need for “sliding” over the coupling.

There are many ways to enhance the physical appearance if you are having problems with ceiling or wall distortion and other special situations described above. Our

recommendations include:

- Small finishing nails can be used to hold shield ends square when butting shield up to a wall. After nail is in place, sealant can be applied. After sealant has cured, nail can be removed and corner is held in place. This is most commonly done in situations where clip placement is difficult or impossible.
- Wooden shims may be handy in situations where shield may need to be forced down from the ceiling surface or out from a wall to maintain a lineal and square appearance.
- Painters caulk can be utilized to fill in small openings in seam areas. Seams should not appear to be gapped or open; by utilizing this method, you are left with a smooth, paint-ready surface, free of blemishes or unsightly gapping.
- Two-part metal epoxy is useful in areas where pop rivets are unacceptable (high traffic areas that are visible to the public). After mixing epoxy, apply mixture to internal coupling and slide next section into place. When the soffit material is clipped in place, apply pressure to joint and wait approximately five minutes for epoxy to set. After it has cured, some sanding may be required to smooth out surface.

**5.6 Special Fabrications** – In order to provide an exact concealment solution tailored to each individual project needs, our interior steel soffit systems are entirely custom-fabricated and built to order. Therefore, it is the responsibility of the designer and/or the installer to determine precisely what those needs may be. Filling these needs often require special fabrications. In those instances, please submit drawings, complete with dimensions, to JG Innovations, Inc., via fax at 608-314-8712 or electronically to [sales@jgius.com](mailto:sales@jgius.com) for review, consultation, and pricing.

**STEP 6: Finishing** – Upon completion of the installation, all cover and structure surface interfacing should be caulked with the appropriate sealant (see Recommend Accessories notation in this Installation Guide).

As a final step, the soffit material should be cleaned using an ammonia based product, such as your common household window cleaner. Verify that all cut ends and scratches have been touched up with paint, particularly in corrosive areas, to avoid rust (not necessary for stainless covers). It is a good idea to use an aerosol paint applicator to touch up unfinished ends.

**For Assistance** – Call us toll free at 1-888-933-2248 to discuss your project's installation needs.

**In Summary** – Our Interior Steel Soffit Systems are custom fitted interior enclosure systems designed to provide a secure and durable, low-maintenance, streamlined solution for concealment of unsightly utilities.

However, as a custom-designed system, we strongly emphasize the contractor exercise extreme caution and conduct a thorough design analysis prior to ordering and installing our product. An initial mock up installation may be requested at the beginning of the utility installation in order to assure that our Interior Steel Soffit Systems are properly matched with your project's concealment needs.