Tuff Span™ Insulated Composite Panels (Wall & Roof)

Installation Guide

Introduction & Disclaimer

This guide is for installing Tuff Span™ Composite Insulated Composite Panels (ICP) manufactured by Enduro Composites, Inc on both wall and roofs. With proper installation and good building design, the corrosion-resistant panel system, having glass-fiber-reinforced plastic (FRP) sheeting, delivers long term, reliable service for building owners.

Panel installers should read this guide before receiving Tuff Span ICP panels on the job site. Details shown in Field Construction Drawings for the current project take precedence over similar information in this guide. It is the sole responsibility of the panel installer and engineer of record to ensure specified air and weather tightness for the building and installation. All safety procedures, including adequate fall protection, are the responsibility of the panel installer.

This guide may not cover all conditions for your current project. For additional assistance or clarification, please contact:

Enduro Composites, Inc.
16602 Central Green Blvd.
Houston, Texas 77032

Tel: 713-358-4000
sales@endurocomposites.com

Product Overview

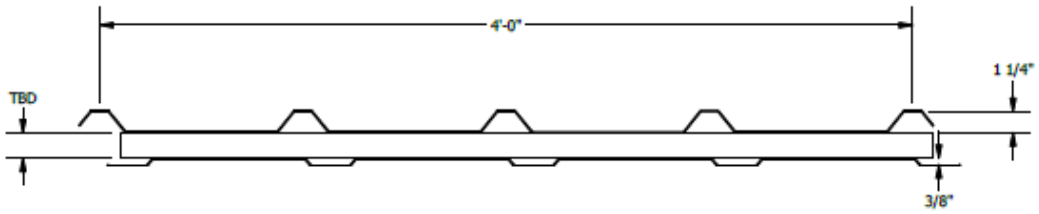
Tuff Span ICP panels are single component units that offer air and weather tightness, thermal, structural, fire, and durability performance for industrial buildings with tough chemical or continually wet operating conditions. As one-piece units, the insulated composite panels dramatically reduce installation cost and valuable time over field-assembled, insulated systems. The corrosion-resistant panels, with glass-fiber-reinforced plastic (FRP) exterior and interior, deliver longer service and significantly lower, life-cycle cost over metal panel systems.

Standard Tuff Span ICP panels are offered in 2" and 3" insulation thickness with nominal insulating R-Value of 13 and 20, respectively. For different panel thicknesses or insulating values, please contact us. The nominal 48" wide panels feature low profile ribs and are offered in lengths up to 16'0". Standard colors are gray exterior with white interior with an additional wide range of colors available for architectural considerations. The panel exterior has embossed finish, and its interior liner has smooth finish. To complete the system, accessories including fasteners, sealants, and corrosion resistant FRP flashings are available from Enduro Composites.

System Features

1. Single component panels provide exterior weather barrier, corrosion protection, insulating core and interior vapor barrier.
2. Polyisocyanurate foam core provides long-term insulating value.
3. Lightweight, single unit panels are easy to install.
4. Wide range of colors are available for architectural considerations.
5. Panels are offered in varying lengths up to 16'0".
6. Accessories including FRP flashings, sealants, and stainless steels fasteners provide a complete system.
7. Tuff Span FRP exterior and interior sheeting ensure long-term, reliable performance and significant life-cycle cost savings.

Panel End View



Receiving Materials

Enduro Composites takes extra care with packaging and loading at its factory to prevent shipping damage. Upon receiving shipment, the receiver is responsible to:

1. Check material quantities, dimensions, color, etc. against the shipping document.
2. Inspect materials for any transit damage, etc.
3. Document any material shortage or panel damage on the bill of lading and have it signed by the driver. Within 15 days of material receipt, provide Enduro written confirmation that all materials have been received.
4. Make any damage claim to the carrier immediately.

Enduro Composites is not responsible for damage which may occur during transportation, delivery, storage, or on-site handling and is not responsible for filing of such claims.

Handling Panel Bundles by Forklift

1. Use forklift with widely spaced forks (minimum 60") placed under the center of the bundle. Do not over engage forks.
2. Use of foam blocks on the mast can help prevent fork damage to adjacent bundles and soften contact with the fork truck's mast.
3. Protect the surface of fiberglass (FRP) materials from cuts, scratches, gouges, abrasions, and impacts.
4. Incorrect handling can damage the foam core and/or FRP face sheets.

Handling Panel Bundles by Crane

1. Use nylon straps positioned at two points (minimum) along the length of bundle. Do not use wire straps for lifting of panels.
2. Wood spreaders should be used and located at the top and bottom of the bundles at strap positions to protect edges of panels.
3. Extreme caution should be taken to avoid bumping and snatching of bundles when lifting.
4. Protect the surface of fiberglass (FRP) materials from cuts, scratches, gouges, abrasions, and impacts.

Storage of Panels

1. Panels should be inspected upon delivery for presence of moisture. If water is present in the bundle (at any time), open the bundle, separate the panels, and dry the materials.
2. Store bundled panels off the ground high enough to allow air circulation under the bundle and to be above standing water. Elevate one end of the bundle for water drainage.
3. Prevent rain, snow and ice from entering bundle by covering with a tarp or shelter. Avoid moisture between bundled panels, by providing air circulation between draped edges of tarp and ground.
4. If conditions do not permit immediate installation, extra care should be taken to protect panels while nested in bundles against trapped moisture, which can cause permanent watermarks.
5. Avoid outdoor storing for longer than 30 days. If panels cannot be installed promptly, they should be stored under a temporary shelter with the plastic removed from the top and sides of the bundles.

6. Limit stacked bundles to a maximum of two high. Sufficient support shall be provided to keep objects straight and without bowing so that warping does not occur.
7. If panels are to be installed promptly, bundles should be placed as close as possible to their applicable building areas.
8. Panels in opened bundles should be covered by a plastic sheet or tarp at the end of the workday.

Storage of Flashings & Accessories

9. Care should be taken during unloading and storage to prevent damage to small items, i.e., trims fasteners, clips, sealants, etc.
10. Cover all pallet crates or boxes to protect materials from weather but allow for ventilation to prevent condensation.
11. Sufficient support shall be provided to keep objects straight and without bowing so that warping does not occur.
12. Temperature sensitive items such as butyl tapes and sealants should be stored under controlled conditions to maintain suitable application properties. All adhesives such as silicone caulk, anchor adhesive, shall be stored according to the manufacturer's recommended guidelines.

Handling Panels

1. When moving a panel, turn it on its edge and provide support at each end. To avoid excessive bending, which can damage a panel core, individual panels should not be moved in flat position.
2. Use planking when moving loads across panels. Do not overload or use panels for storage platforms.
3. Protect panels from surface cuts, impacts, and abrasions.
4. Avoid interference and extreme bending when covering corners and uneven surfaces. *FRP materials cannot be reshaped by use of external force such as hammering or extreme bending.*

Cleaning & Maintenance of Panels

1. Clean panels with soap and water first. If this does not work, some solvents can be used to clean spills or stains on Tuff Span. However, use solvents sparingly and only if absolutely necessary. *Some solvents like acetone may remove the acrylic polymer surface coating on coated materials.*

2. Minor damage to panel units or flashing that results in exposed glass fibers should be resin coated. Materials suffering damage other than minor damage may require replacement.

Field Cutting of Panels

1. All saw blades must be high quality carbide tipped or diamond tipped (has a gritted appearance). Standard high speed steel bits are not to be used for cutting FRP.
2. For small penetrations, a Dremel type router may be used to cut each face of the panel, and a serrated bread knife may be used to cut the foam core.

Fastening of Panels to Structure

1. Use of proper equipment is critical to installation. To drill pilot holes for Type A and B stainless steel screws use a 0-1000 RPM Variable Speed Drill and Carbide-Tipped Bit. *Impact or higher speed drills should not be used.* Refer to the Drill Bit Selection Chart for correct bit size. To install stainless steel fasteners, use a 0-1000 RPM Variable Speed, Screw Gun equipped with clutch and depth sensing nose piece.
    a. Drill Bit Selection Chart

Structural Fastener	Beam Thickness	Drill Bit Size
#14 Type B	.065-.085"	#8 (.199")
	.085-.115"	#7 (.201") or 13/64
	.115-.375"	#1 (.228") or 7/32
	.375-.500"	#1 (.228") or 7/32
#14 Type A	.021-.026"	1/8 (.125")
	.027-.050"	3/16 (.187")
	.051-.075"	#8 (.199") or 13/64
	Wood	5/32"
	FRP	#22 (.157") or 11/64

2. For Type A and B stainless steel screws, drill pilot holes through panels and into structural supports straight at very slow speed. High-speed drilling can harden inside of holes, making it difficult for fastener threads to bite and cause thread rolling. Excessive speed can cause drill bits to burn-up faster than normal. Applying a lubricant to drill bits can extend service life.
3. Fasten panels to supports at correct spacing with fasteners and washers per Field Construction Drawings. *Standard is one on each side of every high rib or 6" C-C. One fastener adjacent to right side of high rib or 12" C-C may be satisfactory for installations with low wind pressures and if noted on Field Construction Drawings.* Drive all screws at 500 rpm or less. While installed, screws must be kept straight. Excessive speed may cause thread rolling or shearing the fastener. To avoid excessive speed and heat build-up, "trigger" the motor (vary the speed). Tighten screws until sealing washer extrudes slightly beyond the metal washer as shown below. Do not over tighten screws as this can damage the fastener or panel.
4. If thread rolling occurs, 1) apply a lubricant to screws, 2) make sure appropriate equipment is being used and these instructions are followed. Tapping the hole with a heat-treated Type B carbon screw with similar threads may be needed.

Correct Fastener Installation
Visual Inspection

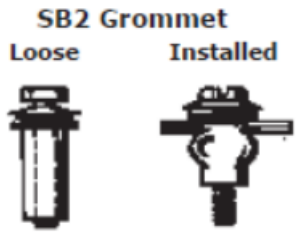
Correct Tightness! Note slight circle of sealant extrusion.

Too Tight! Metal backing of washer starts to turn up.

Too Loose! Sealant is not compressed to form seal.

Panel Side Lap Fastening

1. Mark and drill 3/8” diameter pilot holes for SB2 Grommet fasteners at spacing per Fastener and Sealant Guide.
2. Before inserting the SB2, draw adjacent panels together to prevent premature spreading of the fastener.
3. Using an adjustable torque driver at slow speed, install SB2 fastener. Tighten until the grommet washer extrudes out slightly beyond the metal washer.



Wall Panel Installation

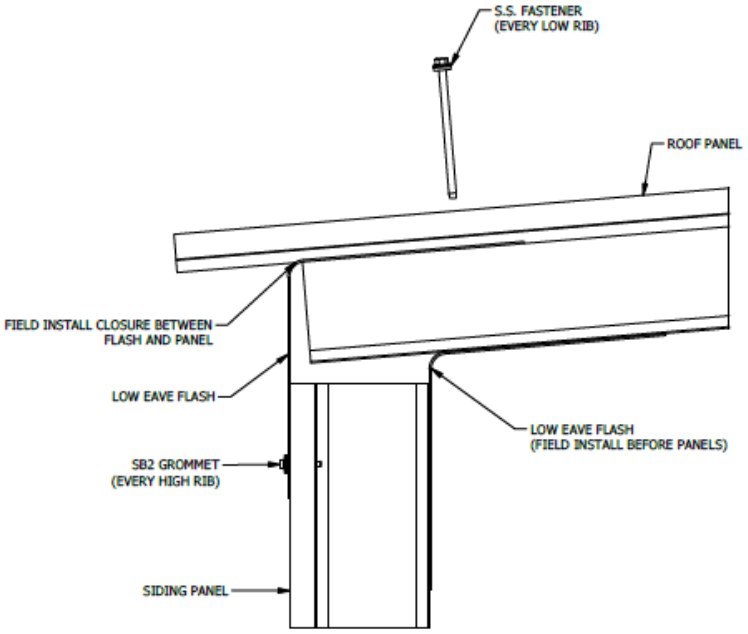
1. Structural Alignment.
   a. Review structural drawings prior to installation
   b. to verify structural members are in correct location. For end lap conditions, a 90° angle shall be installed to top of girt/purlin flush with the outer edge. This will allow weathertightness of the interior of top panel once EPDM closure strip is installed between interior panel and added angle. If Enduro Tuff Span 8F6 girts are utilized additional angle is not required.
   c. Installer must examine alignment of structural members before installation of wall panels. Walls must be square, and panel support members must be in the same plane, flat and free of obstructions such as weld marks, bolts or screw heads.
2. Install base angle support and associated drip flashings per Field Construction Drawings or Wall Details.
3. Install inside corner trim and associated structural supports per drawings or details. To avoid fastener head interfering with panel, tack inside corner trim with 1 fastener per girt Proper fastening of panels on both sides of corner will secure flashing in place permanently.
4. Install interior portion only of two piece framed opening trims per drawings or details.
5. Install butyl tape sealant or caulk on right side of inside corner trim. Other vertical trim or framed openings shall be caulked prior to installation of panels.
6. Install butyl sealant tape or caulk on vertical leg of interior framed opening trims to provide proper weather and vapor seals at all framed opening locations.
7. Install starter panel typically starting from left to right with edge of insulation flush with outer corner of inside corner trim.
8. Lift starter panel into place and press firmly into structure to seat panel into sealant placed on the trims.
9. Verify panel is vertical using a level placed on leading (non-cut) edge.
10. Install fasteners per Field Construction Drawings and fastener installation recommendations found on page 5.
12. On previously installed panel, install ¼" bead of caulk on exposed rib of liner panel.
13. Lift next panel into position and fully engage with installed panel so insulation touches. Verify panel is vertical using a level placed on leading edge and install fasteners as required.
14. Install side lap grommets per Field Construction Drawings and panel sidelap fastening installation recommendations found on page 6.
15. Repeat step 13 until wall elevation is completed.
16. Repeat process for other wall elevations.
17. End wall (rake wall) panels must be field cut to match slope of roof.
18. Once all walls are sheeted, install exterior corner trims, and exterior framed opening trims as required. Follow fastening information on drawings.

Roof Panel Installation

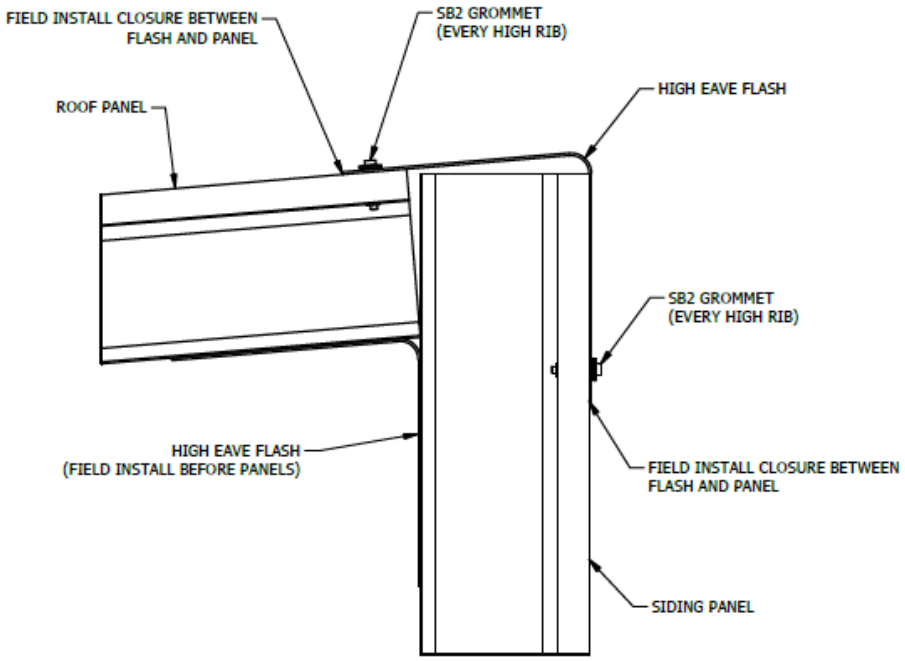
1. Structural Alignment.
   a. Review structural drawings prior to installation to verify structural members are in correct location. For end lap conditions, a 90° angle shall be installed to top of girt/purlin flush with the outer edge. This will allow weathertightness of the interior of top panel once EPDM closure strip is installed between interior panel and added angle.
   b. Installer must check alignment of structural supports before panel installation. Panel support members must be in the same plane, flat and free of obstructions such as weld marks, bolts or screw heads.
   c. Each panel end must have 3" minimum bearing on supports. For bearing less than 3", additional support angles will be needed.
2. Prior to installation of panels, install interior roof flashings. Tack fasteners to avoid panel interference with low ribs. Securement of the panels will secure the interior flashing in place permanently.
3. First panel alignment and fastening procedure:
   d. Apply continuous bead of butyl sealant to lower purlin and along roof rake, where panel is in contact with interior flashing or structural support.
   e. Starting from female side of the panel, the outer edge of the panel should be flush with the outside face of the wall panel.
   f. The first row of panels start at the eave of roof and must be laid true to line using a laser or string with square. The starter panel should be through fastened into the rake angle and purlins.
4. Panel Side Laps:
   a. After starter panel is set, ensure all panel ends are seated into butyl beads applied to the structure and panel ends are fully supported by structure, purlin or support angle.
   b. After placement of overlapping panel, install lap fasteners to overlapping rib.
5. Apply continuous butyl sealant to exterior panel side lap and end lap joints.
6. Set panel next in place, maintain alignment with installed panel and rake angle.
7. Securely holding the panel in place, secure with fasteners per Field Construction Drawings and fastener installation recommendations found on page 5.
8. For additional row of panels, the interior panel and insulation will need to be cut 6" to create an end lap. See section "Field Cutbacks of Panels for End Laps".
9. The first panel on left side should be installed even with first row so side laps are exactly matching. Securely holding the panel in place, drive self-drilling through-fasteners as required.
10. Repeat steps as necessary to complete roof installation. Apply through fasteners and washers as required.

Wall Details

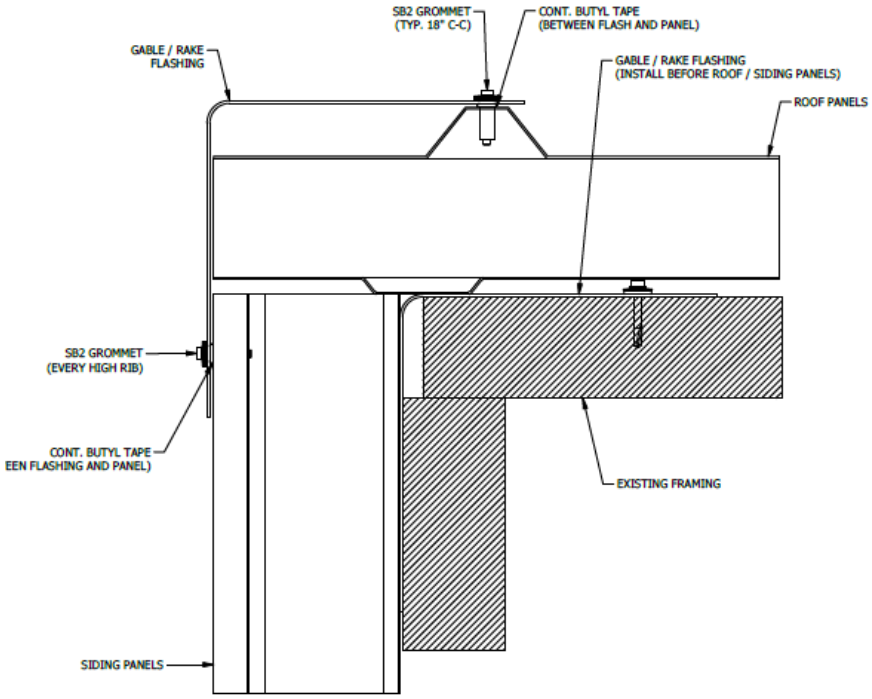
Low Eave Detail



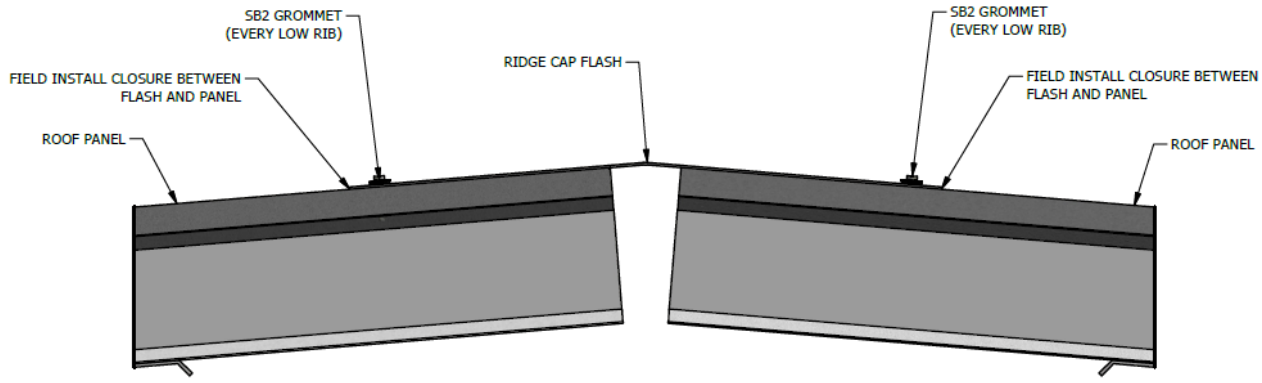
High Eave Detail



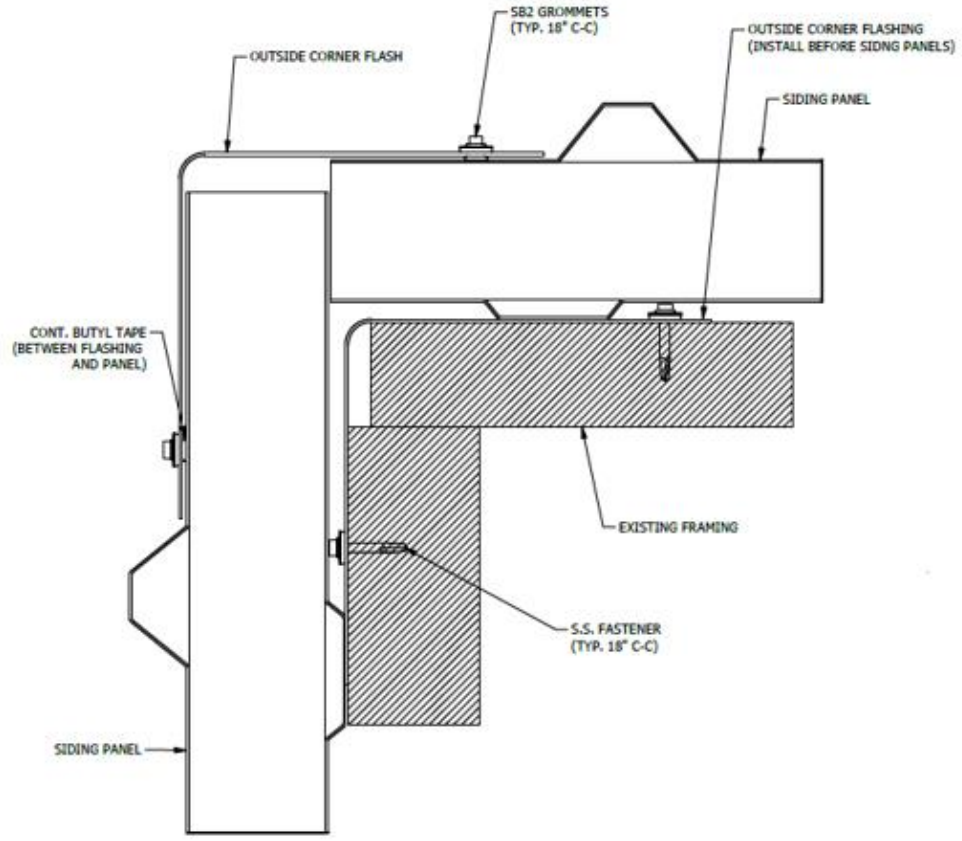
Gable/Rake Detail



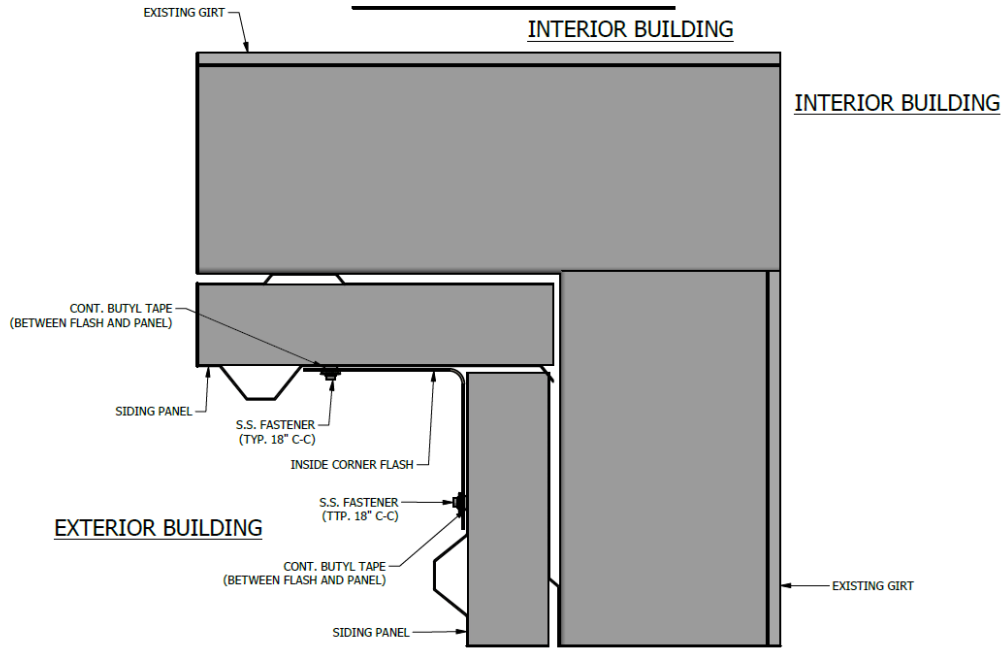
Ridge Cap Detail



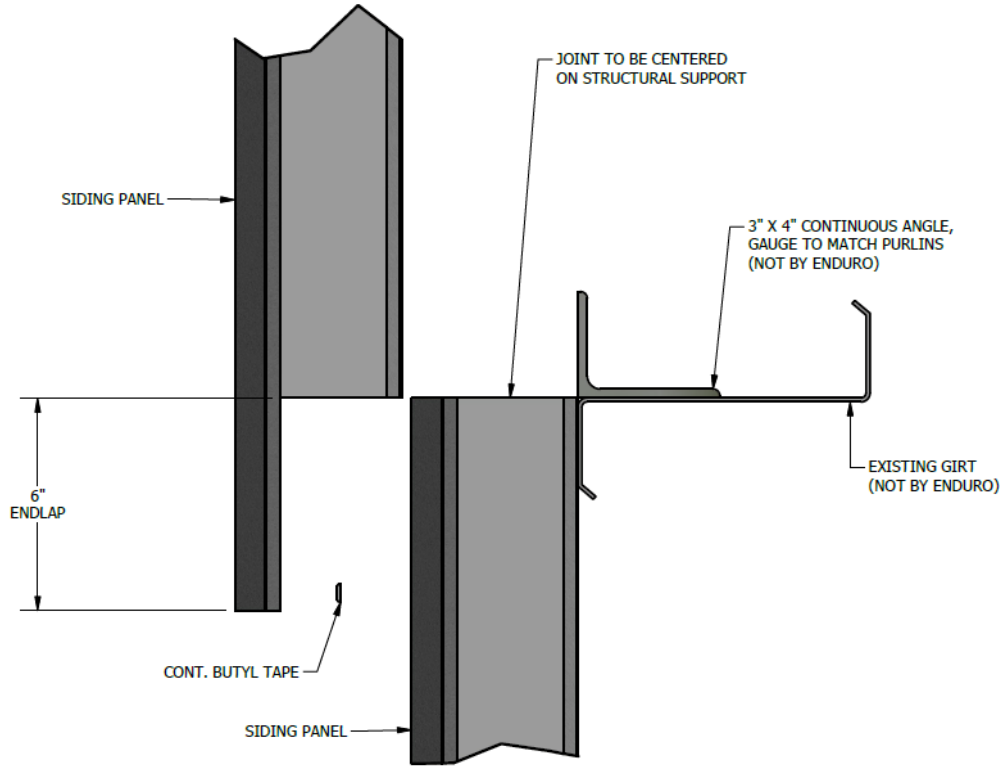
Outside Corner Detail



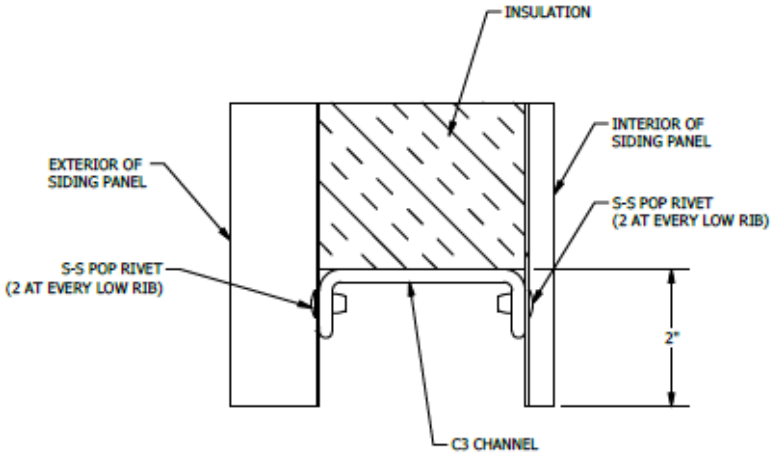
Inside Corner Detail



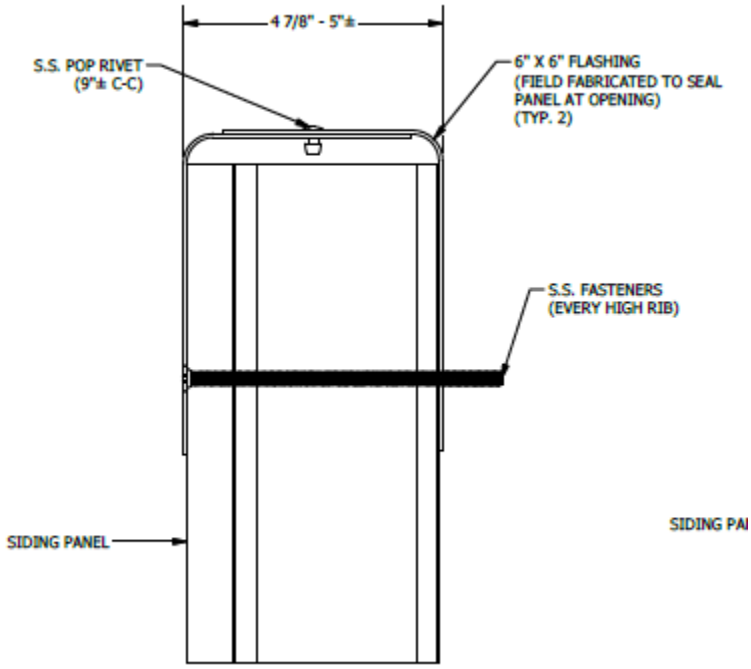
Siding End Lap Detail



Base Detail



Sill Detail at Framed Opening



Header Detail at Framed Opening