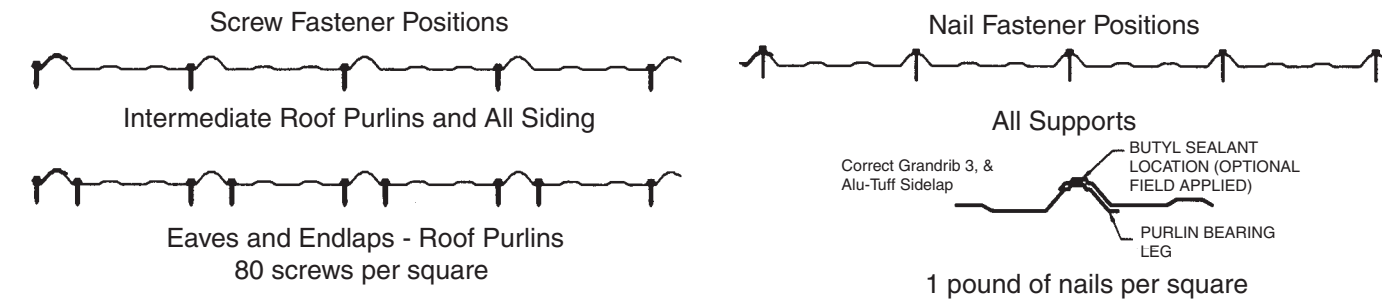
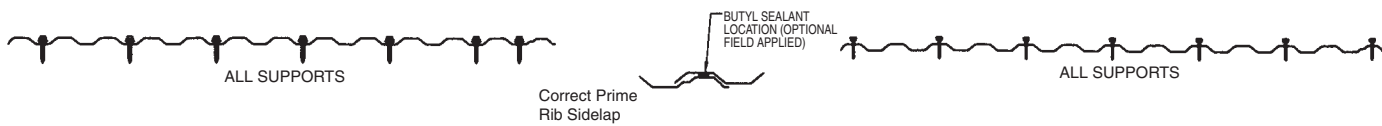


FABRAL RECOMMENDED FASTENER POSITIONS FOR STEEL ROOFING AND SIDING PANELS

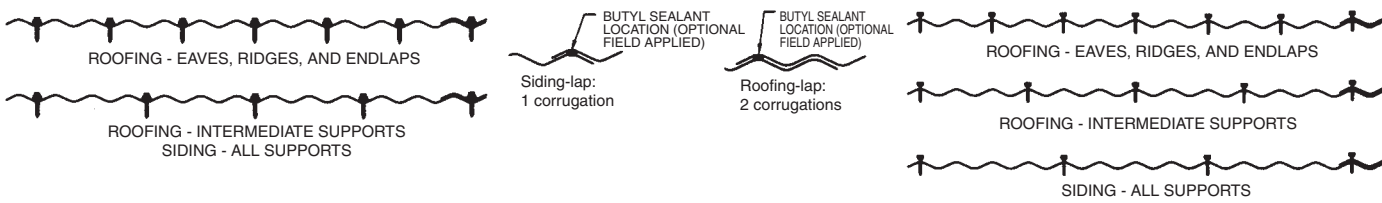
**Grandrib 3® & Alu-Tuff
All 3/4" High Steel Panels**



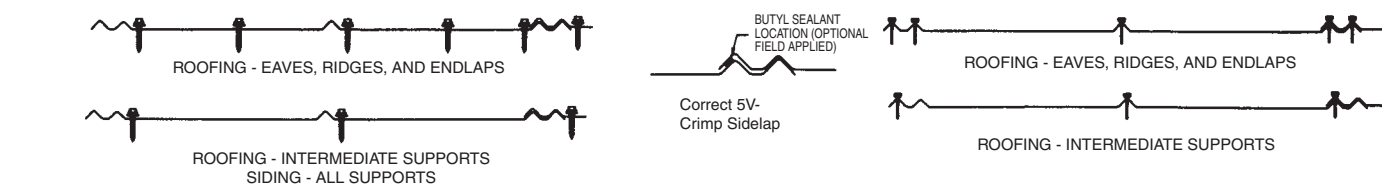
Prime Rib®



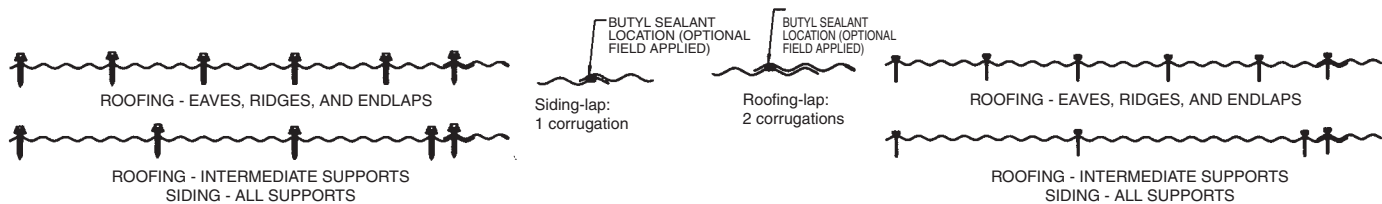
2 1/2" Corrugated



**5V-Crimp
(Requires Solid Deck)**

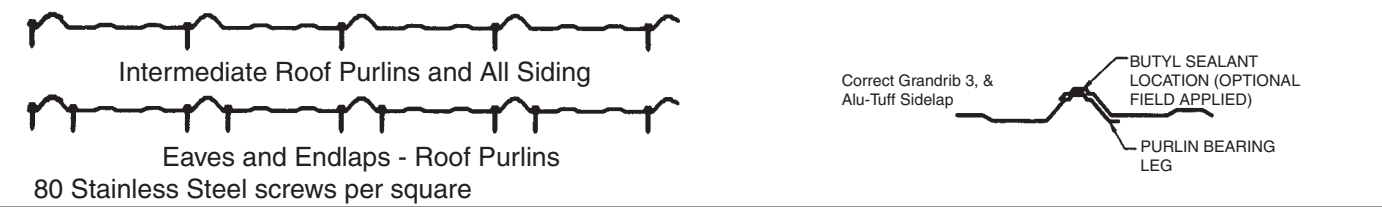


1 1/4" Corrugated



FABRAL RECOMMENDED FASTENER POSITIONS FOR ALUMINUM ROOFING AND SIDING PANELS

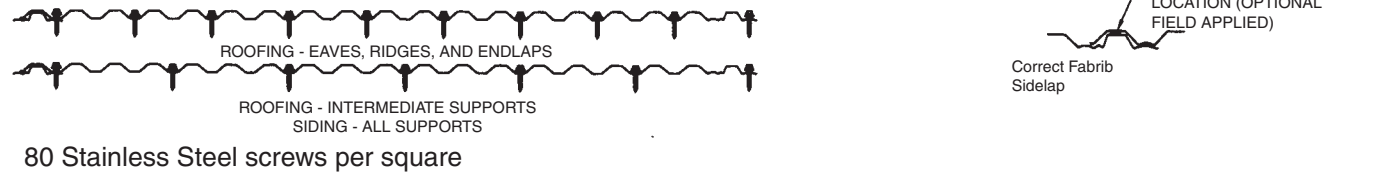
**Grandrib 3®
Alu-Tuff**



Strongrib®



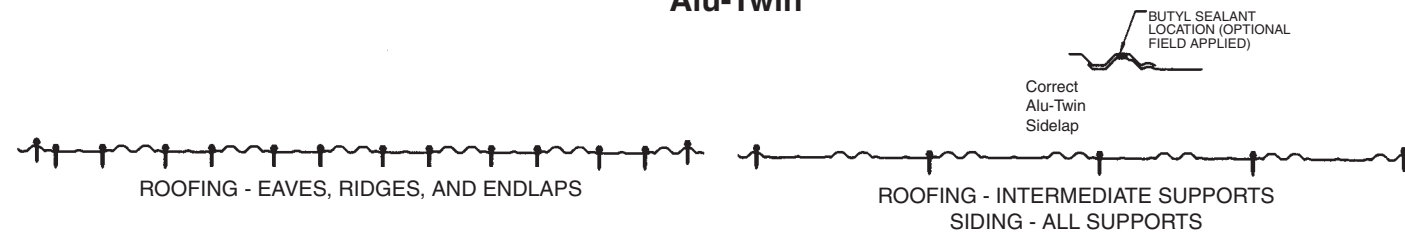
Fabrib®



2 1/2" Corrugated



Alu-Twin



Nails are Not Recommended because of thermal movement of aluminum



For the complete line of available accessories, refer to Fabral's Blue Book, F107, "Standard Details for Post-Frame and Residential Structures"

Storage and Installation Instructions

FABRAL

**METAL ROOFING AND SIDING
ALUMINUM AND GALVANIZED STEEL**

(Plain and Painted)

**IMPORTANT
PROPER STORAGE**

When moisture remains in contact with Galvanized, Galvalume or Aluminum panels in the absence of freely circulating air, white, black, or dark gray corrosion products begin to form. Moisture can get between stacked panels either through capillary action or atmospheric humidity (if the temperature of the panels is below the dew point temperature of the surrounding air, condensation will form between the panels). If moisture becomes entrapped between the sheets, this condition can result in water stains or white rust, which can affect the service life of the metal and will detract from its appearance. If the metal panels will not be installed immediately, store them in a well-ventilated, dry area to minimize exposure to moisture. Cut the steel shipping bands and use wood blocking to elevate the panels at least 1 foot off the ground in an inclined position. This will allow circulation of air between the panels and provide positive drainage. If outdoor storage cannot be avoided, protect the metal with a breathable canvas or waterproof paper cover. Leave the bottom of the cover loose to allow air circulation between the sheets. **Do NOT use plastic, which causes sweating or condensation.**



Headquarters:

Lancaster PA Plant:
(800)477-2741
Fax: (800)283-4289

Other Manufacturing Facilities:

Gridley IL Plant:
(800)451-3974
Fax: (800)289-3383

Tifton GA Plant:
(800)339-8311
Fax: (800)380-4784

Marshfield WI Plant:
(800)528-0878
Fax: (715)387-2424

Cedar City UT Plant:
(800)432-2725
Fax: (800)632-2725

Spokane WA Plant:
(800)456-9124
Fax: (509)535-3939

Salem OR Plant:
(800)477-8028
Fax: (503)393-5813

St. Joseph MN Plant:
(800)873-3440
Fax: (320)363-0553

Grapevine TX Plant:
(800)477-9066
Fax: (817)488-0446

Jackson GA Plant:
(800)884-4484
Fax: (800)765-4484

Idabel OK Plant:
(800)926-8509
Fax: (800)289-6007

INSTALLATION INSTRUCTIONS FOR METAL PANELS

Building Design and Construction

In order to ensure the anticipated performance and longevity, protect metal panels from potentially corrosive situations and materials. When treated lumber will be in direct contact with metal panels or flashings please note the following: Galvanized steel is compatible with the CCA (Chromated Copper Arsenate) pressure-treated lumber that was predominantly used before 2004, but not with the older Penta-treated lumber or the new ACQ (Alkaline Copper Quaternary), CA (Copper Azole), or CBA (Copper Boron Azole) pressure-treated lumber. Stainless steel or other specially treated fasteners should be used into these non-compatible pressure treated lumbers. Micronized Copper Quaternary (MCQ) is a new pressure treatment this is only slightly more corrosive than untreated lumber. This treatment does not require a barrier with either steel or aluminum panels and does not require special fasteners. Aluminum must be separated from contact with all treated wood since the soluble copper in the preservative is corrosive to aluminum. Likewise, dissimilar metals also require a protective barrier between them to prevent galvanic corrosion. Request FABRAL Technical Bulletins #803, 106, and 107 for more information on treated lumber and dissimilar metals.

Plastic, builders' felt, bituminous paint, caulking, or gasket material may be used to separate panels from treated wood and dissimilar metals. When using aluminum panels in direct contact with steel, use a separator as described above and fasten with Stainless Steel screws.

Fertilizer, lime, acids, feeds, manure, soils, and many other compounds also cause corrosion in metal panels. Contact between metal panels and any potentially corrosive materials should be prevented.

Porous insulation materials may absorb and retain moisture, and should not be used in direct contact with metal panels. Use a vapor barrier such as polyethylene plastic or 30-lb felt to prevent moisture from contacting both the insulation and the metal panel.

FABRAL's translucent panels are intended for siding applications only due to the safety hazard they can cause when used for roofing. In all situations, foot traffic should be avoided on translucent panels. Translucent panels used in roofing applications will break down in a short time and cause staining and premature corrosion of the metal panels below. If used on roofs, apply butyl caulking to separate the fiberglass panels from the metal. Translucent panels should be cleaned and sealed regularly, as recommended by the translucent panel manufacturer.

Purlins, Girts and Roof Deck

The substructure to which the metal panels are fastened must be properly spaced and sufficiently thick to provide a roof or wall system able to meet required design loads.

A 2" nominal lumber thickness provides the maximum pullout values for both screws and nails when the fasteners penetrate a minimum of 1" into the wood. Because 1" thick nominal lumber and solid decking are thinner, they provide somewhat lower pullout values. When using purlins, FABRAL recommends a maximum spacing of 24" on-center (note that 5V requires solid decking). Pullout values decrease if the fasteners protrude completely through the purlins. Kiln-dried softwood is recommended for purlins or decking (pine, fir, hemlock, and spruce). Hardwoods are difficult to fasten into without splitting and contain tannic acids that are corrosive to metal

panels. Green (non-kill-dried) lumber may warp, twist, and shrink as the wood seasons fully, causing waviness in the panels as well as loosening and leaking of the fasteners.

Solid decking is highly recommended for all residential applications. When using solid decking or sheathing, always use 30-lb felt or Roofguard underlayment and plan on using closer fastener spacing and larger diameter #14 screws. (Refer to the tables on page 31 of FABRAL's F-107 Standard Detail Book for additional information).

On re-roofing projects where the condition of the old decking is in question, or where existing shingles will be left in place, new 2x4 purlins should be fastened through the decking and into the rafters. This will provide a solid framework for attaching the metal panels. For more detailed information on Re-roofing applications, consult FABRAL Technical Bulletin #721, Re-Roofing With Metal. Load tables are available for all FABRAL panels; contact FABRAL for additional information.

Roofing

Panel sidelaps should face away from wind driven rain or away from the primary viewing angle. To accomplish this, begin by installing the first sheet square with the eave and gable at the downwind end of the roof, farthest away from the source of prevailing winds or away from the primary viewing location.

In applications requiring a panel endlap, please refer to the detailed instructions in this booklet. For best results, lap panels as shown and install in the indicated sequence. **All endlaps require sealant. When weather-tightness is critical, use sealant tape in all sidelaps.**

To provide a drip edge, allow an overhang of 1 to 2 inches at the eave. At the gable edge, use a gable or sidewall flashing. This will keep weather out, prevent lifting in high winds, and provide a neat, finished appearance. The trim and roofing sheet should be fastened every 12 to 24 inches along the gable edge. Do not step on panel ribs or on trim pieces to prevent kinking.

Roof Pitch

The metal roofing panels shown in this manual require a minimum slope of 2½" per foot to ensure proper drainage. Refer to the rain-carrying table in this booklet for the maximum allowable panel length per slope that will provide adequate drainage. For longer slopes and lower roof pitches, contact FABRAL for other suitable profiles.

Bending and Bowing

Aluminum roofing and siding sheets are rollformed from hardened, tempered metal for maximum strength. If a sheet must be bent parallel to the ribs, a gentle 90-degree bend is the maximum recommended. Metal should not be re-bent once it has been formed, nor should it be folded back on itself. When a metal roofing sheet must be installed on a curved roof, screws should be installed at every overlapping rib at the sheet ends to resist the natural tendency of the metal to spring back. The standard fastening pattern is permitted over the rest of the sheet. When installing the metal panels shown in this booklet over a curved arch, the minimum radius of the arch is 18' for aluminum panels and 24' for steel panels. Use sealant tape or butyl caulking at all sidelaps and endlaps.

Additional care and fasteners must be provided when securing the top and bottom purlins on an arched rafter building to prevent the curved panels from pulling the purlins loose from the rafters. Ring-shank pole barn nails, heavy wood screws, lag screws, or bolts are often used for attaching these purlins.

Siding

Siding should be installed using the standard fastening and overlap patterns to ensure optimum performance. For strong, neat corners use hemmed corner flashings. **Do not run siding sheets all the way to the ground. Instead, provide a protective base of concrete, masonry, treated wood, or similar material and terminate the siding sheets 6" above grade.**

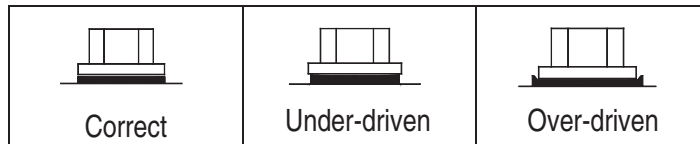
If siding sheets are installed horizontally, use sealant tape or butyl caulking at the vertical laps to ensure weather-tight joints. Install panels from the bottom up so that water is directed away from, and not into, the lap joints.

Fastening

FABRAL can supply either screws or nails for fastening into dimension lumber. Always use screws with solid sheathing. Screws for use with steel panels are galvanized and then coated with an organic polymer for optimum corrosion resistance. For best results with aluminum panels, use #300 series stainless steel screws.

The FabrOseal® galvanized ring-shank nail, with its premium long-life silicone rubber gasket, assures a lasting seal and is the best nail available for steel panels when screws are not the method being used by the installer.

The correct way to fasten steel panels with nails is to drive the nail through the top of the rib so the washer is compressed securely against the metal. Nail placement must be in the ribs for roofing applications to minimize the potential for roof leaks. Over-driving the nail can split the washer and dimple the metal, causing leaks.



Wood screws with combination metal and neoprene washers should be installed in the flat area of the panel adjacent to the ribs, and tightened such that the washer is compressed as illustrated above. This will ensure a lasting, leak-proof seal. **Remove any metal filings created by the drilling action of the screws or predrilling of the holes to avoid rust staining on the panel surface.** Refer to the fastening schedules in this booklet for the correct fastener locations.

Flashing and Trim

Always begin flashing installation from the bottom and work up, so that upper flashings are lapped on top of lower flashings. This will prevent moisture from leaking under the flashings and into the structure. **Endlap flashings a minimum of 6" and seal the lap joints with butyl sealant. Extend flashings 4-6" beyond the building, cut along the bend lines, apply sealant, and fold the side flaps in and the top flaps down to cap off the ends. Secure with pop-rivets or stitch screws.**

Some roof conditions, such as valleys, may require a longer endlap and/or a larger flashing to properly drain moisture from the roof. Factors that influence flashing size, shape, and endlap requirements include roof pitch, roof geometry, slope length, and climatic factors (such as heavy snowfall or rainfall).

Whenever possible, begin trim installation at the downwind end of the roof, farthest away from the source of prevailing winds, to allow flashing laps to face away from wind-driven rain. Refer to the details in this book for the proper location of fasteners and sealants.

The flashings and trims shown in this book are standard parts. Custom trims are available to meet your specific design needs. If you

need a special trim, please furnish a drawing of the desired shape, including dimensions and angles, to your Fabral dealer to obtain pricing and availability. Refer to the SMACNA Architectural Sheet Metal Manual for additional information about detailing and installing flashings.

Safety

Always work safely when installing metal products and use extreme caution on the roof at all times. Wear gloves and safety glasses to reduce the risk of injury, and use hearing protection when operating power tools. Always be sure that ladders are safely positioned and properly secured. Safety harnesses or other special equipment may be required; be sure to Consult OSHA guidelines for compliance with all safety requirements.

Do Not walk on panels until all the fasteners are installed. Metal roofing panels are slippery when wet, dusty, frosty, or oily -- Do Not attempt to walk on a metal roof under these conditions. Wear soft-soled shoes to improve traction and to minimize damage to the paint finish. Always be aware of your position on the roof relative to any roof openings, roof edges, co-workers, and penetrations. Installing metal panels or flashings on a windy day can be dangerous and should be avoided if possible.

Cutting Aluminum Panels

To make a cut parallel to the ribs, score the panel deeply with a sharp utility knife and bend back-and-forth along the score, breaking the metal off cleanly. For cuts across the ribs, use straight-cut snips, electric or pneumatic shears, a portable profile shear, or an electric nibbler. Some installers prefer using a circular saw with a metal cutting blade (a fine-tooth hardwood blade, or a standard combination blade reversed in the saw works also). Light oil or soap on the blade will make cutting easier.

Cutting and Drilling Steel Panels

Steel panels may be cut with metal snips, electric or pneumatic shears, a portable profile shear, or an electric nibbler. Some installers prefer using a circular saw to cut metal panels. **Do Not** use self-consuming abrasive blades because of the following: 1. Abrasive blades burn the paint and galvanizing at the cut edge, leaving edges that are jagged and unsightly and rust more quickly 2. Abrasive blades produce hot metal filings that embed in the paint and cause rust marks on the face of the panel 3. All saw cut panels must be turned face down and cut in a location down-wind and well away from the building and other panels to avoid embedment of metal filings on other panels 4. All saw cut panels must be thoroughly wiped to ensure the removal of all metal filings. If saw cutting cannot be avoided, select a carbide-tipped blade specially designed for cutting light-gage ferrous metal panels. These blades are now available at many home centers and lumber yards. Pre-drilling wall panels gives uniform alignment of screw rows. Be sure to remove drill filings to avoid rust marks from the filings.

Building Maintenance

A metal roof should be inspected annually and cleaned as necessary to maintain its beauty and performance. Any debris or residue, including leaves, twigs, and dust should be cleaned off promptly to prevent moisture entrapment against the metal, which may lead to finish deterioration or premature corrosion. Flashings may need to be re-sealed periodically in order to maintain optimum weathertightness.

ALLOWABLE PANEL LENGTHS (ft.) ALONG THE SLOPE FOR 4" RAINFALL PER HOUR

Panel Name	Minimum Slope	Roof Slope						
		2:12	2 1/2:12	3:12	3 1/2:12	4:12	5:12	6:12
Alu-Tuff	2 1/2:12	N/A	58	61	64	67	73	78
Grandrib 3	2 1/2:12	N/A	58	61	64	67	73	78
Prime Rib	2 1/2:12	N/A	39	41	43	45	49	53
5V	2 1/2:12	N/A	43	45	47	49	54	58
2½" Corrugated	2 1/2:12	N/A	28	29	31	32	35	38
1¼" Corrugated	2 1/2:12	N/A	16	16	17	18	20	21
Alutwin	2 1/2:12	N/A	37	39	41	43	46	50
Fabrib	2 1/2:12	N/A	32	34	36	38	41	44
Strongrib	2 1/2:12	N/A	56	59	62	65	70	76

Notes For Rain-Carrying Tables

1. All values based on a 1-hour duration storm of 4"/hr. intensity.
2. Values represent the point at which the panel ribs will flood.
3. Size and frequency of penetrations can greatly reduce the amount of water removed from a roof.
4. All panel endlaps must be caulked.
5. When weather-tightness is critical, use sealant tape in all sidelaps.

1. Apply 3/32" x 1" butyl endlap sealant on bottom panel just below centerline of purlin (see endlap diagram for location) on panel #1.
2. Apply sidelap sealant on panel #1 and connect to endlap sealant.
3. Place panel #2 so it overlaps panel #1 12" as shown. Install screws per endlap fastening pattern.
4. Apply sidelap sealant on panel #2 to connect to sidelap sealant of panel #1.
5. Place panel #3 over sidelap of #1 and #2.
6. Apply endlap sealant on panel #3.
7. Apply sidelap sealant on panel #3 and connect with endlap sealant.
8. Place panel #4 over endlap of panel #3. Install screws per endlap pattern.
9. Repeat sequence for entire roof.

