NZ METAL ROOFING MANUFACTURERS INC.

INSTALLATION GUIDE

METAL LONGRUN ROOFING AND CLADDING

VERSION 1.0 MAY 2022

INSTALLATION GUIDE

PURPOSE OF USE

Installation information is consistent with the NZMRM Code of Practice version 3.0 and correct as of May 2022.

Refer NZMRM Code of Practice for additional information.

Metal roof and wall cladding should be installed as explained in this section to comply with the NZBC and to satisfy manufacturers' warranties.

Installers need to check that they are using the most up-to-date version of the Guide before they start construction.

This Installation guide has been created for all members of the New Zealand Metal Roofing Manufactures Association (NZMRM) only.

This Installation guide is applicable to profiles manufactured by NZMRM members only.

This installation guide satisfies the New Zealand Building Code compliance requirements regarding Installation of metal roofing and cladding.

PRE- INSTALLATION

The roofing contractor or supervisor must inspect a set of consented drawings and specifications for fixing the cladding, before starting to install metal roof or wall cladding. Any decisions departing from it should be agreed on and written confirmation signed before work begins.

Where specific details are not drawn, the roofer and the main contractor should agree on the execution of these details before commencement.

The roofing contractor is required to have safety provisions in place that satisfy the Health and Safety at Work Act 2015 before work is commenced.

The supporting structure should be inspected; the purlins and girts should be checked to see they are in a true plane (NZS3604 HB 1.3 Tolerance) and securely fixed, all trimming completed for penetrations, and any work by other trades is completed.

Where roof and wall cladding intersect with other materials, the sequencing of work and responsibilities for weatherproofing must be agreed with the main contractor prior to installation.

PRODUCT SELECTION

The profile must be suitable for the strength requirements of the building, and appropriate for the minimum pitch, and the material selected must be suitable for the environment and be compatible with adjacent building materials.

As paint formulations from different suppliers may have different performance characteristics, it is important that cladding and accessories are supplied from the same manufacturer as differing weathering characteristics may result in visible variance in appearance.

Aluminium requires special installation details to achieve durability.

FASTENER SELECTION

All cladding fasteners must be compatible with the material, suitable for the environment and a durability equivalent to that of the cladding material. All exposed fasteners must have a minimum durability of Class 4.

Only aluminium or stainless steel screws and washers should be used on pre-painted aluminium roof and wall cladding. Stainless steel fasteners must not be allowed to come into contact with the cladding and should be installed through oversize holes.

MEASURING

Measuring should take place once sufficient structure is in place to enable accurate measurement of lengths required. It is beneficial to make more than one measurement of any run to identify discrepancies and avoid errors.

ORDERING

Cladding materials should be ordered with enough time to allow for manufacture and transport. Profile, thickness, colour, grade, and any requirements for labelling of bundles positions on structure, should all be clearly identified.

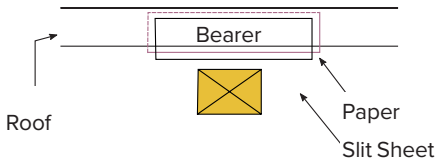
TRANSPORTATION

Load safety and protection is primarily the driver's responsibility.

Short sheets are nominally supplied on top of longer ones, which should have end and edge protection to avoid cut-end damage to the sheets below them. Dunnage should be evenly spaced in vertical alignment. Bundles must be placed and secured to protect against damage from other materials.

For sheets that are exposed on the underside in situ, such as for unlined wall cladding applications, or have double-sided or fleece-lined coatings, protection must be given to prevent the transportation of dunnage from damaging the bottom sheet. This is normally achieved by the application of a short slip sheet with paper overlay.

SLIP SHEET WITH PAPER OVERLAY



On longer distances, extra protection or packaging may be required to protect the material from fretting during transport.

For longer lengths, when a long boom is required for off-loading, a suitable boom should accompany the load unless otherwise arranged.

ACCEPTING DELIVERY

Check the delivery to make sure you have the right product, delivered in prime condition. Ensure all components needed to complete the installation, including fasteners and accessories, are onsite before commencing installation.

The person receiving the roof is responsible for identifying a safe and convenient landing point for the load, in association with the main contractor. The mobile or truck mounted crane operator has the duty of declining any loading instruction which he deems unsafe.

Bundles or packs of roof cladding must remain banded when being lifted by a crane.

They must be placed adjacent to the portal frame and not mid-span on the purlins. Bundles must be placed so that their weight is spread over the entire area of the roof and should be positioned with the laps in the direction of laying.

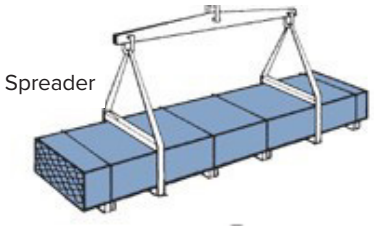
Workers receiving a bundle of roof cladding on the roof must have sufficient mobility to avoid the load, and use tag lines to control the swinging of the load while it is out of reach.

Packs must be securely fixed to the structure, and part-packs must be re-fixed at the end of every day.

UNLOADING

Set out a flat area and supporting dunnage to ensure sheets will not be damaged by site debris. Sheets should be covered with a waterproof cover when stored more than a day on site

When unloading by crane, ensure the lifting boom has a spreader bar and that tightening strops do not damage sheet laps. Slings or strops should be nylon with sleeves to prevent fraying or cutting and damaging slings. Single slings and chains should not be used to lift packs of cladding.



SLING WITH SPREADER BAR

When unloading by hand, lift each sheet off the stack without sliding over under sheets, as that may cause damage to the paint.

WET STORAGE DAMAGE

Close stacked sheets may deteriorate quickly if water enters the pack. This happens because the metal exposed to moisture without air forms bulky, unstable, and loosely adherent, hygroscopic compounds.

When wet sheets are delivered or they get wet in storage, they must be used immediately or dried. Sheets can be dried by filleting sheets or cross stacking them on a slope to allow water to drain and air to circulate between the sheets.

Only use a dry, well-ventilated environment for long term storage.

Failure to follow these handling and storage precautions could result in spoiling the surface appearance of the products and severely reducing their service life. On galvanised material this will appear as a white corrosion product (white rust); on Aluminium/Zinc steel the corrosion shows up black. On pre-painted steel, the result of wet storage damage could be a bubbling of the paint surface. Damage resulting from such failure invalidates the warranty.

The extent and severity of wet storage stain is usually proportional to the length of time the sheeting has been wet. In the case of superficial attack, exposure to the atmosphere and careful cleaning will sufficiently reduce surface imperfections, but heavier deposits can damage the sheets enough that they require replacement.

Where it is likely that the roof or wall cladding will be stored on site for more than one week before installation, the contractor (or person responsible for doing ordering material) should consider including waterproof packaging from the manufacturer in the order.

SITE SAFETY

Installation of roofs presents many hazards including laceration, electrocution, puncture, and falling from a height. Prudent Personal protective equipment (PPE) and installation practices must be employed, and the guidelines of Worksafe: Working at Height in New Zealand must be followed.

Refer NZMRM Code of Practice.

HANDLING

Don't handle any roofing products roughly or carelessly; roofing products perform best when handled correctly.

Don't drag or slide new sheets over other sheets or rough surfaces.

All equipment and materials taken on to the roof should be clean and care taken to prevent damaging the surface.

WALKING ON ROOFS

It must not be assumed that it is safe or permissible to stand on any roof structure or roof cladding.

The manufacturer of the roof sheeting must provide technical literature stating the point load limitations of the profile. The information must indicate the positions on the sheet where persons may safely walk or stand without causing damage or, alternatively, indicate the necessity to provide temporary walkways.

For roofs tested in accordance with NZMRM testing standards refer NZMRM Code of Practice.

- Restricted Access roof will withstand a 100 kg point load applied to the rib or over two pans,
- Unrestricted Access roof will withstand a 100 kg point load to a single rib at mid span.

It must be taken into account that a worker laden with tools may weigh more than 100 kg, and impact loads can also contribute to exceeding this limit.

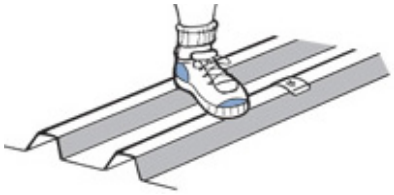
When access to the roof is necessary after construction, it is best practice to in the pan of the profile when walking up the

WALKING IN THE PAN

If ribs are too close together, so workers cannot place their feet in the pan, their weight must be spread evenly over at least two ribs when walking up the roof.

SPREADING WEIGHT OVER TWO RIBS

Translucent sheeting must not be walked on unless it is designed specifically for that purpose.



FOOTWEAR

Anyone walking on the roof should wear flat rubber-soled footwear to prevent marking.

Put an old mat or piece of carpet at the base of the ladder so that shoes can be cleaned before going up on the roof, or dirty shoes should be removed and replaced at base of the ladder.

Care should be taken walking on roofs as they may be slippery at times.

STRIPPABLE FILMS

Strippable film is a clear pressure sensitive polyethylene plastic film that is applied to some roofing products to assist in protecting the surface from damage and scratching during forming, transportation, handling, storage, and erection.

Strippable film is designed to provide some protection to the product before and during installation on the building. It is not designed to protect against corrosion, humidity, or chemicals.

To be removed as soon as exposed to sunlight and must not be left on the product more than a few hours.

Once removed from the sheet for installation, strippable film must be collected and removed from the site.

STORING PRODUCT WITH STRIPPABLE FILM

Product with film applied must be stored at temperatures of less than 50°C and out of direct sunlight to avoid prolonged UV exposure.

The product needs to be kept dry to prevent moisture ingress between the film and the painted surface. In the long term moisture ingress may cause issues to the painted surface; and in the shorter term cause the film adhesive to whiten and breakdown, leaving residue on the painted surface when the film is removed.

DOUBLE LAPPING

Sheets should not be laid with a double lap, as this can cause accelerated corrosion in the lap area. If the remaining area of a roof or wall section to be covered is less than a standard sheet width, the sheet should be cut lengthwise to fit the gap.

Similarly, when replacing a roof without removing existing flashings, for example apron or chimney flashings behind cladding, the area of the retained flashing should be reduced by cutting back to the minimum practically achievable.

If a roof sheet lap requires extra protection, for instance when over the apex of a barrel curved roof where pitch is less than the minimum stipulated for the product, laps should be sealed rather than double-lapped. Lap tape is preferred over gunned sealant for this purpose, as it is less likely to become displaced while positioning the sheet.

The line and first sheet then become locators for quick placing and aligning of subsequent sheets. However, periodic checks should be made during installation of each roof area, by measuring across the width of the fastened sheeting, at the top and again at the bottom of the sheet run. If the building is not square, then tapered flashing is required. Fanning or stretching of the sheet is not permitted to allow for building that is not square.

MARKING AND CUTTING

Black lead pencils must never be used for marking aluminium/zinc unpainted or pre-painted steel products. The carbon in the pencil promotes corrosion which will etch the surface of the material, leaving a permanent mark. Use a pencil of any colour other than black, a marker pen, or crayon.

Cut pre-painted steel material with care to avoid marring the high-quality finish. Cut by shear only — use nibblers or hand shears.

Friction blades and high-speed saw blades must not be used on metal cladding. These blades will damage both the metallic coating and the pre-painted steel surface by creating excessive heat, and generate large amounts of hot swarf which will get embedded into the coating surface

All debris must be swept off the job at the end of each day. Prevention of swarf damage is far easier than its cure.

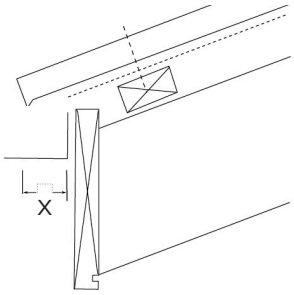
Refer NZMRM Code of Practice.

OVERHANG

The length of the overhang of sheeting into a gutter or spouting depends on the pitch of the roof and the site exposure to wind and rain.

The minimum overhang for roof cladding with a pitch between 10° and 35° is 50 mm, and 40 mm is regarded as suitable for a roof above 35°. When the ends of the ribs are baffled by a spouting and the pitch is below 10°, the overhang should be increased to 60mm minimum.

When the ends of the ribs are not baffled by a spouting and the pitch is below 10°, the overhang should be increased to 70mm to avoid blow-back.



MINIMUM OVERHANG

X = 50 mm @ 10–35°
X= 40 mm @ >35°
X= 60 mm @ <10° and where ends of ribs baffled by gutter
X = 70 mm @ <10° and where ends of ribs not baffled by gutter

Underlay must not overhang the gutter line by more than 20 mm, or if eaves flashings are used, terminate on the upper side of the flashing.

- Apply two beads of sealant close to each edge of the joint.
- Align pieces together and fasten with rivets at 50 mm centres.

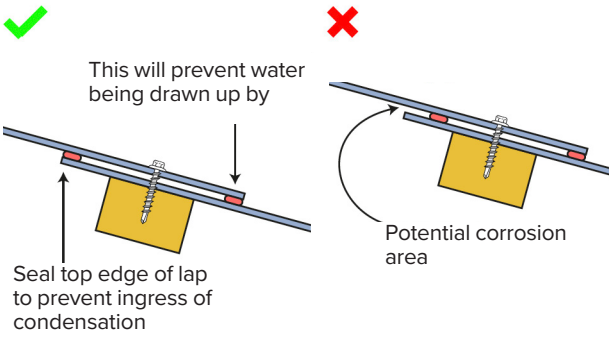
SEALING AND JOINING

- Soldering cannot be used on aluminium-zinc materials; use only neutral cure silicone rubber or MS polymer sealants.
- Pre-align the pieces to be joined and pre-drill if possible.
- Thoroughly clean off surplus sealant and swarf using a dry, lint-free cloth or plastic scraper.

SEALING END LAPS

End laps in profiled metal roofing should be avoided where possible. When unavoidable, the end lap of should be sealed with a double bead of sealant as in the illustration below. Alternatively, self- adhesive closed cell tape can be used in the same position.

SEALED END LAP



SIDE LAPS

Side laps should be fitted evenly and snugly without excessive gaps or tension. Sheets exhibiting edge wave should be reported to the supplier immediately. Where a sheet width exceeds the distance to the next architectural feature, it should be slit to width; not given multiple overlaps to decrease its effective cover width.

FASTENERS

The durability of fasteners should equal or exceed that of the material being fastened, and the fastener metal or coating must be compatible with the cladding material if in contact. Fasteners used pre-painted steel products should be factory colour matched before installation.

NAILS

Spiral shanked hot dip galvanised nails may be used to fasten roof, but the NZMRM Code of Practice recommends using screws rather than nails.

NAIL PULL-OUT.

Driven Fasteners can back out over time.

SCREWS

Screw fasteners should be long enough to give adequate penetration into the supporting structure. Generally, 30mm minimum embedment is required for screws into timber or three threads engagement for screws into steel.

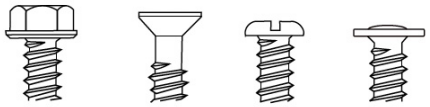
Refer to roofing manufacturers for recommendation.

FASTENERS SHOULD BE:

- A minimum of Class 4 for Severe Environments, Class 5 for Very Severe Environments;
- Manufactured and coated with materials compatible with the material being fastened;
- Fitted with low carbon, non-conducting sealing washers;
- Profiled washers should have an EPDM sealing washer

SCREW TYPES:

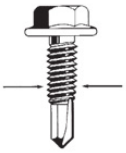
SCREW HEADS:



SCREW THREAD TYPES

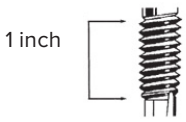
Gauge	Nominal Shank Diameters mm
6	2.5
8	3
10	3.5
12	4.1
14	4.8

SCREW GAUGE



THREADS PER INCH (TPI).

Screw fasteners are identified by their length, gauge pitch (threads per inch) and their drill point. The drill point may be type 17 for driving into timber or drill point for driving into steel. Reduced diameter drill points, which can be used for either function, are also available.



CLIP FASTENERS

Secret-fixed roofs will be attached to the primary structure by a proprietary clip that is screwed or nailed to the purlins. These profiles offer the advantages of fewer penetrations through the cladding, and thermal expansion is unimpeded.

Clip and bracket fasteners can be purpose made to provide the same attributes to most flashings.

RIVETS

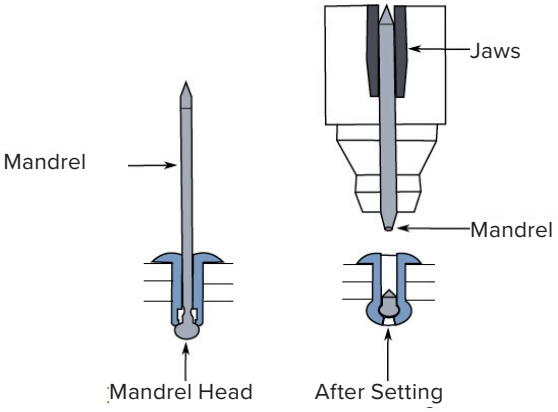
Rivets should have a minimum diameter of 4 mm.

Use aluminium rivets for galvanised sheets and aluminium/zinc-coated steel products; monel rivets are incompatible with aluminium and zinc products.

Sealed rivets are preferred over unsealed rivets, as they do not require adding sealant on the face to achieve weatherproofing.

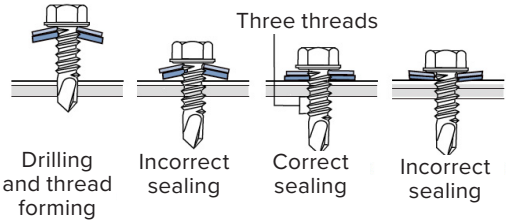
RIVET SETTING

Blind rivets are placed through a pre-drilled hole then are set by rivet tool withdrawing the mandrel. This expands the rivet pin, clamping the material between the rivet pin and the rivet head. The pin eventually snaps free.



FASTENER INSTALLATION

The correct depth setting on a screw gun is provided either by the depth gauge or by a clutch torque adjustment, and an adjustment should be made every time a different screw or material thickness is to be drilled. Resilient washers under fastener heads will only seal properly with the right adjustment.



Experienced operators can, in most instances, drive screws correctly by using a variable speed screw gun; however, a depth set gun will give more consistent results.

Type 17 screws driven into timber will 'part' the fibres rather than cutting them which provides a self-locking action against withdrawal. Screws driven completely through timber will, therefore, not have the same pull-out resistance as screws with embedded tips.

Impact drivers and poorly fitting nut drivers can both damage the protective coating on the screw head which will affect durability. It is the roofer's responsibility to ensure the method of installing screws does not cause damage.

Screw points, method of driving, and thread design all have an impact on pull-out capacity; so in critical situations, the specific screw and method of installation must be specified.

FASTENER SPACING

Fasteners should be of grade and type suitable for the application, installed at spacings required by design loads and manufacturer's recommendations. All purlin must be fixed to.

On buildings constructed to NZS 3604, a consistent fixing pattern should be used on all fastener rows; for other buildings, higher fastener density may be required around the periphery. All purlins must be fastened to so that they each contribute to resisting uplift loads.

Flashing should be fastened at a point between 25mm and 50mm from the edge of the flashing and the maximum primary fastener spacing should be 600 mm. When this is not possible because there is no structure member provided, they should be fixed at a maximum 200 mm centres.

Rivets on flashings should be placed at 50 mm centres.

Refer NZMRM Code of Practice.

FASTENER PLACEMENT

Roof fasteners should be placed at the crest of the profile. Wall cladding fasteners can be placed at the crest or the pan. Pan fixing of wall cladding is more popular as the screw lines are less visible.

N.B. The pullover design values established by testing for pan fixing are more than twice those for crest fixing.

FASTENER SEATING

Fasteners should be seated snugly to give a good seal, without distorting the roofing profile. Any "pigtails" created by the drilling process must be removed before seating the screw.

FASTENER ALLOWANCE FOR EXPANSION

All roofing and cladding are subject to expansion and contraction due to temperature extremes. This is particularly evident with darker colours and long spans.

Refer to manufacture technical sheet for profile.

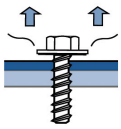
Screws fitted with profiled washers to allow for thermal expansion must be installed centrally through a 9 mm diameter pre-drilled hole in the roof sheeting.

MODES OF FASTENER FAILURE

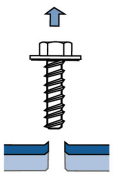
On most pierce fixed roofs, mode of failure is likely to be pull-over. Where profiled load spreading washers are required to eliminate this, it is important that the specified washer is used. When fastening to light gauge steel purlins, thread strip out may be the lower failure point.

The pull-out failure point is very dependent on drill point, thread shape, and pitch; it is essential in such cases to use a correctly specified fastener.

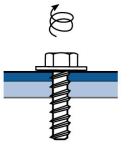
PULL OVER



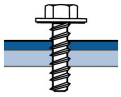
PULL OUT



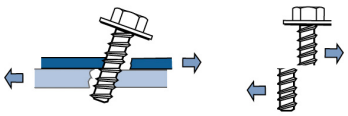
THREAD STRIP OUT



BACK OUT



FASTENER SHEARING



STOP-ENDS

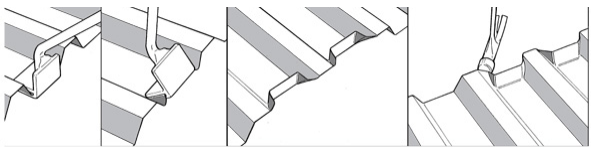
Stop-ends are required at the upper end of all sheets, on horizontal metal wall cladding and at the lower edge of penetrations.

Stop-ends for trapezoidal profiles are known as 'pull-up'.

Stop-ending tools should be in good condition so that they do not mark the coating. This is particularly important when using pre-painted material.

Stop ending can cause distortion of the pan adjacent to the turn-up, which can cause contact and mark the turndown of the cover flashing onto the pan of the cladding. This can be avoided by technique and experiment, often standing in the pan adjacent to the end being stopped will prevent the pan from becoming convex at this point.

PULL- UP STOPENDS



A 'pull-up' stop-end is not cut back but pulled up to the maximum allowable height without tearing the metal. No extra material allowance is required for a 'pull-up' stop-end.

TO CREATE PULL-UP STOPENDS:

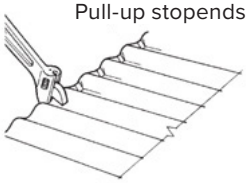
1. Place stopend tool centrally in the pan.
2. Lift up steadily until the end is vertical.
3. Remove tool.

CORRUGATE STOP-ENDS

Stop-ends for corrugate should be pulled up to the full height of the profile, and on low pitches at exposed sites, additional weathering may be provided by the use of filler blocks.

Refer NZMRM Code of Practice.

Pull-up stopends



TURNDOWNS (DRIP FORMING OR DRIP EDGING)

All roof cladding with a pitch of less than 8° must be provided with turn-downs after the roof is fixed, using special tools to ensure water flows directly into the gutter.

As corrugated profiles cannot be satisfactorily turned down, it is not permissible to terminate this profile below 8°. However for acceptable corrugated profiles where the crease height is greater than 21 mm; used below 8° and cannot be provided with a turn-down, an eave flashing is required at the gutter line.

Refer NZMRM Code of Practice.

PROFILE TURNDOWN

Providing a profile with a downturn will provide a positive drip edge and minimise the amount of sediment build-up at the gutter line.

Distortion should be avoided because it causes ponding and the collection of dirt, which in turn causes corrosion.

SOFT EDGING AND FLASHING

The periphery of all roof planes should be sealed with a flashing.

Longitudinal flashings must cover one or two crests according to requirements. There should be a gap between the downturn and the adjacent rib to prevent capillary action and to allow for pressure equalisation. Both vertical and horizontal faces of the flashing should be fastened to other cladding or preferably, through the cladding to the structure.

Transverse flashings may be notched over the ribs of the profile, or for lower trapezoidal profiles or corrugate they can be fitted with a soft edging which is dressed into the pan of the profile. All soft edging must be colour matched to the roof before installation.

Soft edging can be solid aluminium, solidly backed, or perforated to allow ventilation. The leading edge of transverse flashings must be through fastened to the primary structure, not riveted to the cladding.

ROOF CLADDING DAMAGE

Excessive downforce on a rib or corrugate crest can cause a compression fold, or “ding” in the apex of the crest.

Most roofs designed to Restricted Access criteria may incur some damage during installation or by subsequent traffic. If this is unacceptable, roofs should be designed to Unrestricted Access criteria and roof access and usage by other trades must be strongly managed and supervised.

A small ding in a sheet will not normally cause any structural problems and may be aesthetically acceptable, however deeper dings can cause cracking of the sheet and lead to leaks.

To restore a damaged rib load capability to the original levels all damage must be repaired with a cap flashing.

For aesthetic reasons, any damage may be unacceptable. However, if the roof cladding is not visible, ribs can be repaired by using a sealed and riveted saddle cap.

SEALED AND RIVETED SADDLE

It is technically acceptable to have two dings or creases on one sheet within one purlin spacing, providing two adjacent ribs are not damaged. Any greater level of damage requires the sheets to be replaced, and the person who causes the damage must report it and be responsible for its repair.

WATER PONDING

Ponding will create a prolonged time of wetness and increased build-up of debris. Ponding will detract from a coated steel product’s life and will invalidate the product warranty.

The installation of penetrations must be done in such a way that they do not cause ponding.

On low pitched roofs, careless or excessive foot traffic may cause rib damage and localised ponding. This can be minimised by installing temporary protection in critical areas, such as entry points, where the roof is accessed by other trades, or there is a step-down in the roof. It is the main contractor’s responsibility to ensure that other trades do not damage the roof.

It is recommended to design to Unrestricted Access-criteria or better if roofs are highly visible or need to be regularly accessed by maintenance personnel.

Refer NZMRM Code of Practice.

CORRECTLY INSTALLED GUTTERS

Gutters must be installed with adequate fall to ensure all water is transported to appropriately located downpipes. The installation and downpipe construction should allow the gutter to drain completely. Regular gutter cleaning and maintenance is required to remove leaves and other debris that may restrict water flow to downpipes.

A gutter protection system (or any other product) that entraps debris or water between itself and any steel product surfaces, restricting coated steel’s ability to dry, is not recommended and is an exclusion in the product warranty.

INCORRECTLY INSTALLED GUTTER PROTECTION SYSTEM

SWARF DAMAGE

Swarf is the term given to the metal debris arising from cutting or piercing operations when using friction saws, drills, or other tools on roofing and cladding products. In this context, swarf may also include any other discarded steel objects such as rivet shanks, nails, screws, and nuts which may come into contact with cladding products.

Steel swarf particles left on the surface will corrode and cause rust stains which will detract from the finished appearance of a project. These stains are often mistaken for early deterioration of the roofing and cladding itself.

PREVENTING SWARF DAMAGE

CUTTING:

- Cut only by shear; power shears or hand snips produce the least amount of debris.
- Power nibblers give a clean cut but generate debris which if left is prone to corrosion.
- Do not use metal friction blades or reciprocating saws which produce fine hot particles which can embed deeply into the coating surface and corrode rapidly.
- If metal grinding is taking place near the surface of an installed or uninstalled roof, careful masking of nearby coated steel surfaces must be executed.

CLEAN-UP:

- Swarf should be swept or hosed from the job progressively and certainly no less than at the end of each day. Swarf that has become stuck must be removed carefully, avoiding action which is likely to remove or change the appearance of the paint or metal coatings.
- When sweeping or hosing into a gutter, clean out the gutter before leaving the job to prevent premature corrosion. On completion of the job, give a final wash or sweep down.

SEVERE OR EXTENSIVE SWARF STAINING

If the coating is severely damaged by swarf corrosion, the area should be painted or replaced. The whole visible area should be repaired, as air drying paints weather more rapidly and in a different manner to pre-painted roofing and cladding products. If swarf particles are painted over, rust bleed-through is likely to occur

SUPERVISING OTHER TRADES

A common cause of swarf complaints arises because other trades have used grinding equipment in the vicinity of a newly completed roof. Wind carried swarf can contaminate large areas some distance from the cutting site. Main contractors should be aware of the likelihood of such damage, and project planning should include scheduling of all cutting or grinding work to be completed before laying the roof cladding.

COLOUR MATCHING PAINT

Colour match paint is designed for matching accessories to the pre-painted material; it is not designed for repairing marks or blemishes. The term touch-up paint should never be used. Fasteners and accessories requiring colour matching should be painted before installation and ideally away from the roof or wall cladding

Air-dried paints used to disguise marks weather at a rate different from that of pre-painted material, sometimes dramatically so, and will often become more apparent than the mark they are intended to disguise. Minor scratches are best left alone, and they will not affect the performance of the pre-painted product due to the self-healing qualities of the primer and metallic coating. They become less evident as the coating weathers.

Minor scratches may be described as scratches that do not extend to the metallic coating, are less than 3 mm in width, and are not visually noticeable from a distance of 3 m. This characterisation will, however, vary with the concentration of the scratches, and the visibility of the area affected.

Extensive coating damage to any pre-painted steel product can only be rectified by replacement or repainting of the affected sheets.

VISUAL IMPACT OF MISMATCHED PAINT

FIELD PAINTING

Profiled metal roofing and wall cladding are readily paintable using good quality primers and water-based acrylic topcoats. Metallic coated roofs can be painted immediately after installation; however, dirt, grease, and any loose materials must be cleaned off, so the surface is clean and dry before applying the first coat.

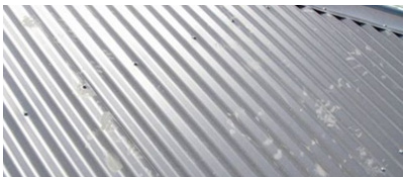
An effective method for painting metallic coated roofing is to apply a good quality galvanised iron primer and two water-based acrylic topcoats, following the manufacturer's recommendations.

Pre-painted products can be painted after exposure to weather. Normally, 6–12 months of exposure is required to achieve surface modification of the surface to allow the new coating to adhere.

Edge laps of unpainted metallic coated sheets steel do not require lap priming.

SUNSCREEN

Sunscreen containing titanium dioxide or zinc oxide can accelerate the degradation of organic materials including auto finishes and pre-painted cladding surfaces. This damage is irreparable, so prevention of its occurrence is the only defence. For more information contact the material supplier.



GUTTER INSTALLATION

Gutter or spouting blockages can cause flooding because of the build-up of debris. Regular inspection and maintenance must be carried out to ensure that gutters are free-draining, overflow outlets can also prevent damage.

The Installation Guide does not recommend permanent gutter leaf guards. Although they do prevent large pieces of debris from obstructing the outlets, they allow finer particles to collect on the sole of the guttering. Without regular maintenance, the prolonged wetting of the interface between any debris and the metal can lead to early corrosion of the roof or gutter. The decay of organic matter such as leaves can produce organic acids, which will also accelerate corrosion.

The build-up of matter on the upper surface of the leaf guard can also form a poultice, which increases the time of wetness and acidity and can accelerate corrosion of the roof sheet ends.

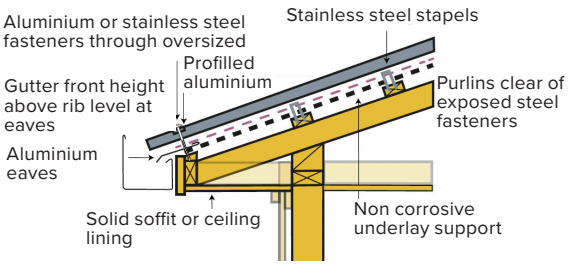
FIXING ALUMINIUM SHEETING

Aluminium is a naturally durable material with proven performance over a long period.

Most metals compatible with Galvanised and Aluminium/Zinc coatings are compatible with aluminium. However, to acquire the required fastener durability, use aluminium or stainless screws rather than painted steel screws.

Aluminium has approximately twice the thermal expansion of steel, therefore, expansion provisions must be executed Installers must adhere to coil manufacturers published data.

Being soft and frequently requiring oversize holes for expansion, aluminium is typically fastened with fasteners equipped with load spreading washers, as is reflected in published span tables. Installers must adhere to published fastening systems to meet design load/span expectations.



PAINTED ALUMINIUM

Painted aluminium products perform differently than uncoated aluminium as the paint coating affects reactions with the atmosphere, and reduces the aluminium surface area that can be sacrificed to defend against localised corrosion.

Pit corrosion can result from damage to the paint coating and exposure to corrosive substances. It is necessary to protect against wet contact with concrete, treated timber, steel, stainless steel, and butyl rubber.

RECOMMENDATIONS FOR FIXING ALUMINIUM

- The front edge of the spouting or gutter must be higher than the crest of the roofing profile.
- Eaves flashings of painted or unpainted aluminium must be used. Underlay should terminate on the top of the eaves flashing.
- When re-roofing with aluminium, the existing support members must be inspected to ensure all staples, wire netting, nails, or other materials likely to damage the aluminium have been removed.
- Galvanised netting or mesh must not be in contact with the underside of aluminium roofs. If present, it must be separated by a 5 mm barrier of inert non-absorbent, non-reactive material. Alternatively, self-supporting underlays may be used. Plastic strapping can be used for supporting underlays, stapled with stainless steel staples to the vertical face of the purlins.
- In a wet environment, aluminium must be separated from a corrosive surface such as concrete, butyl rubber, or CCA treated timber by using a 5 mm rigid strip of an inert non-absorbent material, an open woven geotextile layer, or PVC netting. Plastic coated steel netting is not recommended under aluminium sheeting.
- The design of the ceiling cavity must prevent the saturation of support members from internal or ground moisture. (See 10 Internal Moisture.)
- All screws should be fitted with a profiled or bonded washer. Fixing screws shall be aluminium or Grade 304 stainless steel. Stainless steel screws must be fitted centrally through pre-drilled oversized holes (9 mm) for roofing and walls, regardless of sheet length.
- For sheet lengths over 10 m, the capacity to allow for thermal expansion must be in accordance with the product Manufacturers Technical Literature.

COMPLETION

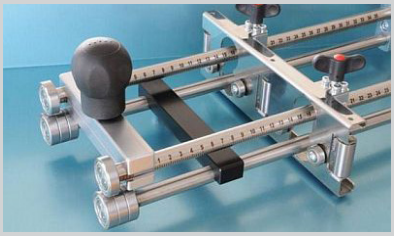
- The roofing contractor should notify the main contractor, architects or owner when he has completed the scheduled work. It is prudent if he records any damage to the sheets (or lack thereof) at this point, particularly if subsequent trades accessing the roof. Damage of any sort caused by other trades is not the responsibility of the roofer.
- All gutters, valleys, roof channels and the roof cladding should be left clean and free from debris on completion of the work, and any roofing related debris on site should be safely removed.

TOOLS OF THE TRADE

HAND SEAMERS

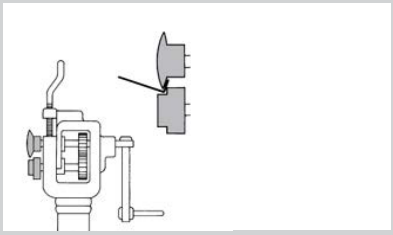
Hand Seamers are used to hand fold small flashings, by progressively working along the edge of a sheet.

ROLLER BENDER



This can be used for onsite manufacture of flashings.

HAND JENNY EDGER

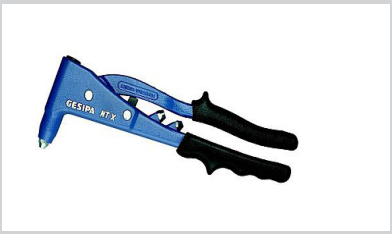


SEAMING PLIERS

Various shapes of seaming pliers may be required to execute complex sheet metal work, particularly with

Shears are normally purchased in left-hand and right-hand sets. Both may be required to cut through complex shapes. They may be solid or articulated

RIVET SETTER



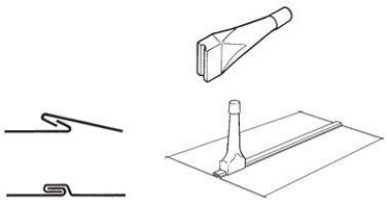
CRIMPING TOOLS

PORTABLE FOLDING MACHINE

TURN UP AND TURN DOWN TOOLS

NYLON FACED HAMMER.

JOINT SEALING BY HAND SEAMING.



All metal joints that are to be sealed should be mechanically joined. Seaming is one acceptable method of joining two pieces of metal.

The two pieces are folded so each hooks into the other and then they are locked together by the means of a hand seamer or groover.

The material allowance depends on the hook dimension, but it is usually 6 mm. That means the extra allowance for the is 18 mm, because there are four thicknesses of material.

This type of seam can be used on a flat surface or round surface.

NZMRM MEMBERS

NZMRM members listed below are correct at time of print. For full and updated contact details refer to www.metalroofing.org.nz

ASHBURTON LONG RUN IRON
5 McGregor Lane Ashburton 7700
T:03 3081850
www.longruniron.co.nz

ELLERYS ROOFING DIRECT LTD
250 Main South Road
Karoro
Telephone: 03 7686514

B J MOSS LTD
PO Box 1007
Gisborne
Telephone: 06 867 1219
www.bjmoss.co.nz

B R ROOFING & WALLING CO LTD
Ford Road
Onekawa, Napier
Telephone: 06 843 6968

CONTINUOUS NEW ZEALAND LTD
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Takanini, Auckland
Telephone 09 268 1555
www.continuous.co.nz

CONTOUR ROOFING NELSON LTD
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Telephone: 03 546 4260
www.contourroofing.co.nz

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PO Box 151 Pukekohe, Auckland
Telephone: 09 238 9249
www.franklinroofing.co.nz

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MARSHALL INDUSTRIES LTD
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Telephone: 03 218 2579
www.marshalls.co.nz

METAL ROOFING SYSTEMS LTD
PO Box 117 Takanini, Auckland 2245
Telephone: 09 268 8959
www.megamiroofing.co.nz

METALCRAFT ROOFING
PO Box 51286 Pakuranga, Auckland
Telephone: 09 274 0408
www.metalcraftgroup.co.nz

METAL DESIGN SOLUTIONS
PO Box 33 Drury, Auckland
Telephone: 09 294 9134
www.metaldesignsolutions.co.nz

ROSS ROOF GROUP
PO Box 72-062 Takanini, Auckland
Telephone: 09 299 9498
www.metrotile.com

QUIN ROOFING LTD
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Telephone: 06 3679480
www.quinbuildings.co.nz

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TARANAKI STEELFORMERS LTD
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DISCLAIMER:

The NZ Metal Roof and Wall Cladding Installation Guide is published by NZ Metal Roofing Manufacturers Inc. (NZMRM), to provide:

Acceptable Installation Guidelines for the handling and the fixing of metal roof and wall cladding and accessories.

This Installation Guide does not describe or dismiss alternative methods, which may need specific acceptance by the Building Consent Authorities.

It is published in accordance with current technology, materials, and building codes.

This Installation guide will be periodically updated to reflect changes in legislation and standards or improvements in technology and available materials.

The most current Installation Guide is available on the NZMRM website, www.metalroofing.org.nz.

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