BUILDING PRODUCT INFORMATION

Five Rib

Five Rib is a light, strong and contemporary style producing distinctive design solutions for both commercial and domestic uses.

AUTHORISED SUPPLIER
COLORSTEEL
New Zealand Steel

FREEMAN ROOFING

freemanroofing.co.nz

FREEMAN ROOFING FIVE RIB

Our Five Rib profile is an ideal solution for a wide range of applications, including roofing, cladding, fencing, and decorative projects. The distinctive trapezoidal profile of these panels provides excellent strength and durability, as well as a unique and appealing visual aesthetic.

When specifying Freeman Roofing Corrugate into design plans, always cite this product as: *'Freeman Roofing Five Rib'*. This will ensure that the product used on the project is compliant and accurately manufactured using genuine NZ Made Colorsteel®.

SUMMARY OF DESIGN CONSIDERATIONS

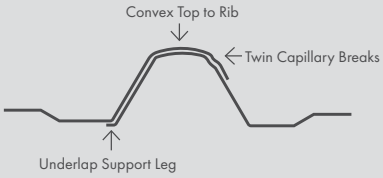
- Ensure a minimum roof pitch of 3°.
- Select appropriate material coating based on building location/environment.
- Choose from COLORSTEEL® standard colour ranges, including Matte and Altimate (availability and minimum quantities may apply).
- Use unpainted metallic-coated steel.
- Follow Freeman Roofing guidelines to meet the NZ Building Code, E2/AS1, and NZ Metal Roofing Manufacturers Code of Practice.
- Account for thermal expansion, especially in darker shades. Consider expansion joints at maximum lengths of 24 metres (lighter colours) and 16 metres (darker colours).
- Adhere to Freeman Roofing Five Rib span tables for purlin spacing to avoid exceeding maximum spans.
- For wall cladding, direct fixing is vertical, use drainage cavity batten for horizontal fixing.
- Exercise caution for compatibility when combining Freeman Roofing Five Rib with other metals like copper to prevent rapid corrosion.
- Choose an adequate cover based on the thickness (BMT) of the sheets.

PROFILE TECHNICAL SUMMARY

FIVE RIB LAP

All profile dimensions are nominal and in mm

Standard



FIVE RIB

Roofing and Wall Cladding

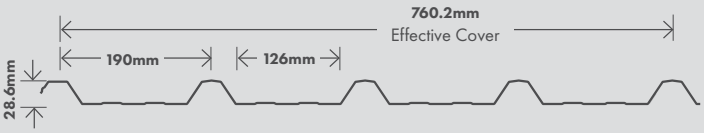
Dimensioned Drawing of Five Rib

Queenstown Profile **(+-2mm)**

Manufactured in Queenstown

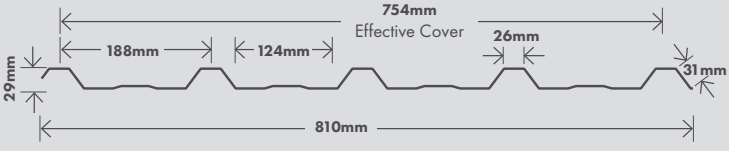
Double Swage Profile **(+-2mm)**

Manufactured in Timaru, Ashburton, Wānaka, Dunedin, Nelson, Blenheim and Tauranga

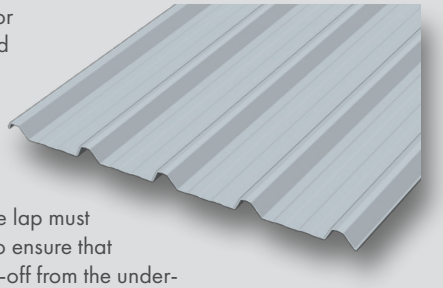


Single Swage Profile **(+-2mm)**

Manufactured in Wellington and Whangārei



MINIMUM PITCH



The minimum roof pitch for Five Rib is 3 degrees, and if end lapped, the pitch should be 10 degrees to ensure proper water drainage. If end-lapping of roof sheets cannot be avoided, both ends of the lap must be continuously sealed to ensure that neither condensation run-off from the under-surface nor rainwater run-off enters the lap.

For longer runs, specific design is required to determine the necessary roof pitch. In cases where rainfall intensity exceeds 100mm/hour, the minimum pitches must be increased by a further 1 degree for every 10 meters of run over 40 meters to prevent water build-up on the roof. The building design pitch may need to be higher to account for any cumulative deflections of the frame, purlin, and roof sheeting or penetrations.

COMPOSITION OF MATERIALS AND FINISHES

Defining the boundaries of distinct corrosion zones proves challenging due to the numerous factors influencing the corrosiveness of specific sites. Selecting suitable materials for each location is crucial, ensuring they align with the NZ Building Code's durability standards and fulfil customer anticipations.

Zinc/aluminium-coated steel adheres to AS 1397:2011 standards.

Available pre-painted metals offer diverse environmental solutions encompassing multiple metals, metallic coatings, paint systems, and varying paint thicknesses. These paint coatings are manufactured in line with AS/NZS 2728:2013 regulations.

For project-specific environmental zone product selection, please contact Freeman Roofing for further details.

INFORMATION TABLE

Substrate Material	Colorsteel®		Aluminium	
Thickness (BMT)	**.40mm**	**.55mm**	**.70mm**	**.90mm**
Approx weight per lineal metre for Zincalume based material (kg/lm)	3.2	4.27	1.84	2.37
Purlin Spacings - General	Separate section.		Separate section.	
Unsupported Overhang (mm)[1]	200	250	150	200
Drape Curved Roof min Radius (mm)	80	40	80	40
Purlin Spacings for Curved Roofs				
- Intermediate (mm)	1200	1450	1200	1450
- End (mm)	800	1000	800	1000
Precurved Roof				
- min Radius (mm)	N/R[2]	300	N/A	N/A
- Recommended Minimum Radius (mm)	N/R[2]	400	N/A	N/A

[1]Not suitable for roof access without additional support
[2]N/R - Not recommended [3]N/A - Not Available

This technical data sheet is for Colorsteel® and aluminium based substrates. Depending on the nature and capability of the machine, most if not all of these materials can be roll formed in to our Five Rib profile: Colorsteel®, Aluminium, Zincalume®, Galvsteel®, Dridex®. Unfortunately some machines cannot roll form Aluminium or Galvsteel. Please check with your local Freeman Roofing branch before ordering.

BUILDING DESIGN/PERFORMANCE CRITERIA/PRODUCT SELECTION

During the design of buildings, it is necessary for the designer to take into account a number of issues to ensure that the most appropriate roofing and cladding product is chosen.

Whilst aesthetics and product availability do play a part, the chosen profile must meet certain performance criteria. These are centred around the profile's ability to shed water from the roof and the ability of the product to span purlin and girt spacings and meet design criteria. The minimum pitch for this profile is outlined elsewhere within this literature.

In terms of purlin spans and girt spacing it is necessary to follow due process.

If a building is being designed and constructed in full accordance with E2/AS1 and roofing and cladding products as covered by that document are chosen, then it is necessary for the design spans and fixing methodology to comply with those of E2/AS1. However E2/AS1 states that the use of the manufacturers information may provide a more optimum spacing of fixings, and this is recommended by Freeman Roofing.

Further where a building is outside of the scope of E2/AS1 and the building or parts thereof are of specific design then it is necessary for the roofing and cladding to be suitable for the design and vice versa.

Loadings referred to in Freeman Roofing graphs are the result of testing to a serviceability limit state which is more conservative than an ultimate limit state as quoted by some manufacturers.

Our Design Graphs are presented in a form to allow the designer to select suitable products and purlin spacings.

For most roof installations the purlin spacings will be limited by the trafficable limitations of the profile or the structural design. It is then necessary for the designer to calculate the design wind load for the roofing and cladding in accordance with generally acceptable practice, by reference to AS/NZS 1170.2: 2011, and/or NZS 3604: 2011 as appropriate. For a fuller explanation of this refer to the NZ Metal Roof and Wall Cladding Code of Practice. This result should be referenced to the Wind Load Span Design Graphs.

The purlin spacings should be limited to the lower of the trafficable limitations and design wind load with the capacity of the structure being greater than the design load for the application. However for roofs that are not able to be walked on and for wall cladding applications, the trafficable limitations may be exceeded providing the design wind loading criteria is met. However this should be done with caution as it may require considerable extra secondary fasteners within the laps.

The designer should always take into account in areas of heavy roof traffic, snow loadings, or where the roofing supports such items as air conditioning units, purlin spacing should be reduced accordingly. Consideration also needs to be given to limitations of purlin spacings for any translucent sheeting.

Reference should be made to the notes in the graphs. It is our recommendation that for commercial and industrial roofing applications that .55mm BMT Colorsteel® or .90mm BMT Aluminium is used as it has more resilience to damage particularly by other trades.

Underlay as per the project specifications should be used. With an aluminium substrate steel netting should not be used where it may be in contact (either directly or through underlay degradation) with the aluminium roofing or cladding. Alternative material such as polypropylene strapping should be used where support is required, or the cladding separated from the underlay by a high density polystyrene batten or Thermakraft Drainage Matt or similar, and the use of an aluminium gutter flashing. This is also applicable to coated metal and zinc roofing in severe marine applications. In all the above cases self supporting paper should be used, including when support is required.

ROOF EXPANSION PROVISIONS

Fix with recommended fasteners and systems from the Primary Fixing Chart and additionally allow for the following where applicable.

Colorsteel® Based Material

NZ Metal Roof and Wall Cladding Code of Practice Compliance				
Sheet Lengths	**Up to 15 metres**	**>15-18 metres**	**>18-25 metres**	**>25-30 metres**
Zincalume and light colours	No special provision	No special provision	Solid fix from the ridge down 12 metres and oversize holes should be used for the remainder of the sheet with approved load spreading profile washers, and a 36mm EPDM or approved 25mm Aluminium embossed washer	Solid fix from the ridge down 12 metres & oversize holes should be used for the remainder of the sheet with approved load spreading profile washers, and a 36mm EPDM or approved 25mm Aluminium embossed washer used for the entire sheet
Dark Colours	No special provision	Solid fix from the ridge down 12 metres and oversize holes should be used for the remainder of the sheet with approved load spreading profile washers, and a 36mm EPDM washer or approved 25mm Aluminium embossed washers		Not recommended

Aluminium

Sheet Lengths	**Up to 10 metres**	**10-12 metres**	**12-15 metres**	**>15 metres**
Plain Aluminium & lighter colours in Favourable Installations (Refer NZMRM C.O.P. Section 4.1.6)	Fix using oversize holes with screws and approved load spreading profile Ali washers, and 36mm EPDM washers			Not recommended
Dark Coloured Aluminium in Favourable Installations (Refer NZMRM C.O.P. Section 4.1.6)	Fix using oversize holes with screws and approved load spreading profile Ali washers, and 36mm EPDM washers		Not recommended	
Plain Aluminium & lighter colours in Unfavourable Installations (Refer NZMRM C.O.P. Section 4.1.6)	Fix using oversize holes with screws and approved load spreading profile Ali washers, and 30mm EPDM washers		Not recommended	
Dark Coloured Aluminium in Unfavourable Installations (Refer NZMRM C.O.P. Section 4.1.6)	Fix using oversize holes with screws and approved load spreading profile Ali washers, and 30mm EPDM washers	Not recommended		

For sheet lengths in excess of the above a step joint or other special provision for expansion is required. When using load spreading profile washers or 25mm Aluminium embossed washers for roofing fix ridging, roof flashings etc. using a 25mm Aluminium embossed washer and appropriate screw.

Oversize holes should be 3mm greater diameter than the screw or as per the Primary Fixing Chart for stainless steel screws. For further information on the fixing of Five Rib refer to E2/AS1 of the NZ Building Code and NZ Metal Roof and Wall Cladding Code of Practice, www.metalroofing.org.nz. These publications along with the foregoing technical data should form the basis of the design and installation of metal roofing and cladding

Also refer to our suite of detail drawings, and to NZ Steel Ltd and Pacific Coilcoaters literature.

ADHERENCE TO BUILDING CODE STANDARDS

When employed in alignment with Freeman Roofing's installation and maintenance advice, Freeman Roofing Five Rib will aid in fulfilling the subsequent stipulations of the New Zealand building code.

B1 STRUCTURE:

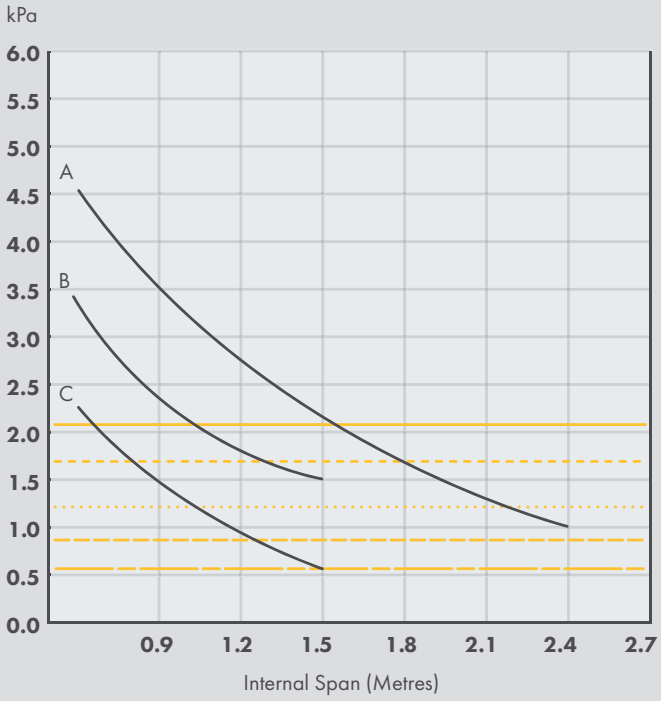
B1.3.1, B1.3.2, B1.3.3 (b, c, f, g, h, j), B1.3.4

The span tables align with AS/NZS 1170.2:2002 standards. They are established using a maximum building height of ten meters and a 500-year design return period for wind load assessment under the strength limit state.

WIND & CONCENTRATED LOAD SPAN DESIGN GRAPH (APPLICABLE TO ROOF AND WALL CLADDING)

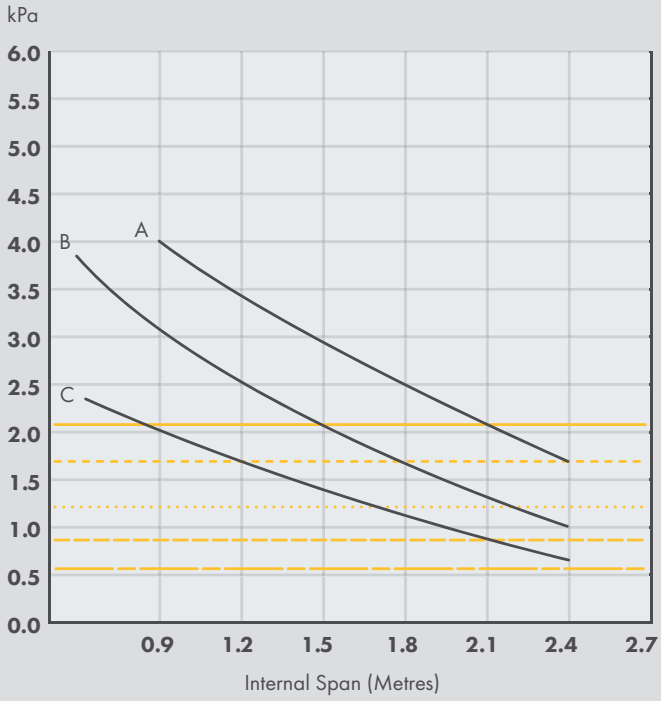
Roofing - Steel Based Material

.40 Steel G550 High Strength



Key	Wind Zone	Load
	Extra High	2.09kPa
	Very High	1.72kPa
	High	1.32kPa
	Medium	0.93kPa
	Low	0.6kPa

.55 Steel G550 High Strength



Key	Wind Zone	Load
	Extra High	2.09kPa
	Very High	1.72kPa
	High	1.32kPa
	Medium	0.93kPa
	Low	0.6kPa

- Intermediate span in metres.
- A, B, and C represent alternative primary fixing methods

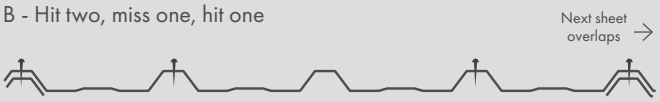
Testing confirms that .70mm Aluminium has similar results to .40mm Colorsteel® and that .90mm Aluminium has similar results to .55mm Colorsteel® and is adjusted for practical application. Aluminium requires load spreading profile washers and EPDM's at all time.

ADHERENCE TO BUILDING CODE STANDARDS CONT.

FIVE RIB FIXING PATTERNS

A - Hit all

B - Hit two, miss one, hit one



C - Hit one, miss one

B2 DURABILITY:

B2.3.1 (b)

Durability in accordance with Table 20 E2/AS1		
Product	**Rain Washed Roofs**	**Walls and Unwashed Areas**
Colorsteel Endura / Colorcote Zinacore	B, C, D	B, C
Colorsteel Maxx / Colorcote Magnaflow	B, C, D, E	B, C, D
Colorsteel Altimate / Colorcote Alumiguard	B, C, D, E	B, C, D, E

Key	E2/AS1 references atmospheric zones B,C,D,E. Determined, by wind-driven sea-spray. B: Low / C: Medium / D: High / E: Severe marine, such as breaking surf beaches.

C FIRE:

C3.5, C3.6, C3.7

Freeman Roofing products made from Colorsteel® are rated as group 1-S materials when tested in accordance with ISO 5660:2002 part 2. For more information, please refer to: Colorsteel product technical statements v2022.1. **https://www.colorsteel.co.nz/resources/downloads-and-brochures/**

E1 – SURFACE WATER:

E1.3.2

Freeman Roofing Five Rib carrying capacity.

Capacity Calculation in accordance with Metal Roofing Code of Practice calculators

Minimum Pitch 3°, rainfall intensity 150 mm/hr		
Maximum Run	119.5m	
Catchment area of spreader	83m²	20m run, 2 holes in spreader
Catchment behind penetration	38m²	20m run, discharging each side of penetration

E2 EXTERNAL MOISTURE:

E2.3.1, E2.3.2, E2.3.7

Freeman Roofing Five Rib will match a wide range of details for most applications. Standard design details for Freeman Roofing Five Rib can be found on our website.
https://www.freemanroofing.co.nz/roofing-styles/free-span/

Other options can conform to the trapezoidal roofing solutions outlined in E2/AS1.

E3 INTERNAL MOISTURE:

E3.3.1

When utilised alongside a porous and permeable underlay that meets the standards of NZS 2295:2006, the utilisation of Freeman Roofing Five Rib aids in satisfying the requirements of NZBC E3.3.1. Adequate ventilation provisions are necessary for ceiling spaces in sarked roofs, skillion roofs, barrel curved roofs, flat roofs, and roofs in moisture-prone environments.

F2 HAZARDOUS BUILDING MATERIALS:

F2.3.1

Freeman Roofing Five Rib manufactured from Zincalume® Colorsteel® or pre-painted Aluminium such as Altimate® will meet the performance requirement of F 2.3.1.

G12 WATER SUPPLIES:

G12.3.2

Rainwater collected from roofs clad with steel and pre-painted steel products [including Colorsteel®], will comply with the provisions of NZBC G 1 2.3.1, provided the water is not contaminated from other sources (MRM Code of Practise 12.7).

TESTING & SUPPORTIVE EVIDENCE

Supporting evidence provided where requested will apply to the product supplied for the specific project.

Technical documentation and testing evidence pertaining to Colorsteel® and Altimate® can be found here: **https://www.colorsteel.co.nz/resources/downloads-and-brochures/**

Freeman Roofing Five Rib wind capacity and span tables reflect testing undertaken by the New Zealand Metal Roofing Manufacturers Association. Documentation can be obtained by contacting Freeman Roofing.

INSTALLATION ADVICE

- Store Freeman Roofing Five Rib sheets above ground level in a dry place. If they get wet, separate, wipe, and let them dry.
- Avoid using black lead pencils on aluminium/zinc or steel; they cause corrosion. Use non-black pencils, marker pens, or crayons.
- Cut pre-painted steel with shears, not friction blades or high-speed saws, which can damage the coating and create heat and swarf.
- Clear debris daily, as it's easier to prevent swarf damage.
- Install sheets with lapping, not stretching, to prevent weather penetration.
- Crest fix roofing with specified fasteners through every rib. Use load-spreading washers when needed; pan fixing is for walls.
- For wide spans, use self-drilling stitching screws for a weatherproof seal.
- Turn up/down pans on roofing and ends on wall cladding. Use foam seals when necessary.
- Install eaves flashings for low pitch or narrow soffits and in high-wind zones.
- Walk on roofing over purlins, wear flat rubber-soled shoes, and use crawl boards for carports/verandas.
- Use cavity battens under wall cladding, adjusting screw length as needed.
- Install flashings as specified for weather tightness.

MAINTENANCE

All roofing and cladding materials are affected by the combined influences of weather, dust, and various deposits. Therefore, the long-term performance and resilience of Freeman Roofing Five Rib roofing and wall cladding rely on proper upkeep. In the case of roofing, the natural action of rain will generally cleanse most gathered environmental particles from the upper surface.

On the other hand, wall cladding necessitates manual cleaning every 3 to 12 months (depending on the local surroundings and paint system) to prevent the accumulation of dirt, debris, or other substances that rain alone can't remove. Regions that lack sufficient rain cleaning (unwashed areas) demand more thorough manual cleaning. These areas encompass soffits, wall cladding beneath eaves, undersides of gutters, fascia's, protected sections of garage doors, unwashed roof segments, and other zones at greater risk, such as around flues, beneath television aerials and solar panels, or in locales prone to mould, lichen, bird droppings, or debris.

Maintenance of roofing and cladding materials should be cleaned manually using either water and a sponge or a gentle nylon-bristled brush. Water blasting can be employed, but the pressure must not exceed 20MPa. Avoid using harsh or solvent-based cleaners like turps, petrol, or kerosene.

Additional information pertaining to New Zealand Steel's maintenance advice for its products can be found here: **https://www.colorsteel.co.nz/assets/Brochures/Maintenance_Recommendations_Brochure_v4.pdf**.

STATEMENT IN REGARD TO SECTION 26 OF THE BUILDING ACT

Freeman Roofing Five Rib roofing and wall cladding products are not subject to any warnings or bans under Section 26 of the Building Act.

MANUFACTURING BRANCHES

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Manufactured custom cut to length subject to transport and site limitations.

Sheet lengths in excess of 28 metres require specialised transportation.

As sheet lengths increase higher transportation costs may be applicable.

Maximum recommended sheet lengths for aluminium is 10-12 metres for dark coloured and 12-15 metres for plain and light coloured. Refer to Roof Expansions Provisions of this summary.

FREEMAN ROOFING

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