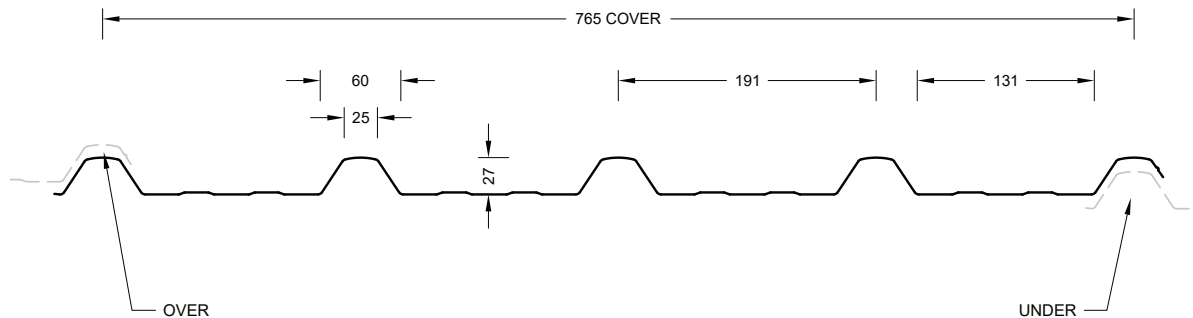


## PRODUCT TECHNICAL STATEMENT



Offering a bold modern look, Hi Five® allows you to maximise roofing and cladding efficiencies in your building designs. Supporting wide purlin spacing and performing well on low pitch roofs. It can additionally be crimp curved, offering unique architectural design possibilities. Also available in Audio-Perf®.

### SHEET TOLERANCES

**Cover:** ± 5mm – Sheet length: +10mm, -0mm (steel)

**Cover:** +10mm, -15mm – Sheet length: +0mm, -15mm (aluminium)

### RECOMMENDED PRODUCT/DESIGN USE

- **Minimum Pitch:** 3 degrees
- **Cover (mm):** 765mm
- **Applications:** Residential/ Industrial/ Commercial Roofing and Wall Cladding
- **Materials:** Specified coating and material based on environmental conditions in accordance with E2/AS1. Available in metallic coated and pre-painted steel in 0.40mm, 0.55mm – Aluminium 0.90mm BMT (base material thickness) Matching translucent sheeting is available in G.R.P. (fibreglass)
- **Material Thickness:** Steel 0.40mm, 0.55mm – Aluminium 0.90mm
- **Colours:** Available in pre-painted ColorCote® ZinaCore™, MagnaFlow™ and MagnaFlow® COLORSTEEL® MAXAM™, Altimate®, UniCote® LUX Refer to [www.colorcote.co.nz](http://www.colorcote.co.nz), [www.colorsteel.co.nz](http://www.colorsteel.co.nz), [www.unicote.com.au](http://www.unicote.com.au)
- **Durability:** All material selections must be compatible with the prevailing environmental conditions and adjacent materials. Areas not naturally exposed to rain will require scheduled maintenance.

### ENVIRONMENTAL PRODUCT DECLARATION

Dimond Roofing® has been implementing green building principles across the industry for several years now and has developed a fully realised environmental sustainability pathway to reach our goal of reducing our carbon emissions by 30% by 2030. Dimond Roofing® has met the criteria for “Level A” certification for the Global GreenTag™ GreenRate™ ecolabel and as part of Dimond’s Toitū carbonreduce® accreditation, essential Scope 1 & 2 emissions, are being measured as well as voluntarily measuring Scope 3 emissions.

Dimond Roofing® profiles are accredited with Eco Choice Aotearoa when manufactured from COLORSTEEL®. All manufacturing sites have been Audited by NZ Steel.

Dimond Roofing® recycle all steel scrap waste and offcuts which can then be remelted down and reused in other steel-based products. At the end of its useful life as a roofing profile can be recycled back by remelted down.

### NEW ZEALAND BUILDING CODE COMPLIANCE

When used in accordance with Dimond Roofing installation and maintenance requirements, facilitate with meeting the following provisions of the NZBC:

- **B1 Structure:** Performance clauses B1.3.1, B1.3.2, B1.3.3 (a) (b) (c) (g) (h), B1.3.4 (b) and (d)
- **B2 Durability:** Performance clauses B2.3.1(b) and (c)
- **C3 Fire affecting areas beyond the fire source:** Performance clauses C3.4(a) and C3.9
- **E2 External moisture:** Performance clauses E2.3.1 and E2.3.2
- **F2 Hazardous building materials:** Performance clause F2.3.1
- **G12 Water Supplies:** Performance clauses G12.3.1 and G12.3.2

To comply with the performance clauses of NZBC E2 all cladding to be installed in accordance with:

- Acceptable Solutions NZS E2/AS1 or an Acceptable Alternative Solution
- MZ Metal Roofing Manufacturers Code of Practice
- Dimond Roofing Specification; details available on [www.dimond.co.nz](http://www.dimond.co.nz)

Dimond Roofing is not subject to any warning or ban under section 26 of the Building Act 2004.

## MAINTENANCE

In general, NZ metal roofing materials exposed to rain washing can be expected to comply with NZBC B2 without manual washing, or replacement of protective finishes.

Areas not directly exposed to rain, such as soffits, wall cladding under eaves, the undersides of gutters, fascia's, and sheltered areas like garage doors, will require scheduled maintenance.

Refer to ColorCote® Minimum Maintenance Schedule and COLORSTEEL® Maintenance Recommendations Brochure.

## MATERIAL CLADDING TESTING AND PERFORMANCE

All cladding testing is carried out in accordance with the NZMRM Code of Practice – Testing and MRM Standards.

| Material Options                            | Steel |      |      | Aluminium H36 | Duraclad® (GRP) |
|---------------------------------------------|-------|------|------|---------------|-----------------|
| Thickness (BMT) mm                          | 0.40  | 0.55 | 0.75 | 0.90          | 1.7             |
| Nominal Weight/lineal metre (kg/m)          | 3.17  | 4.27 | N/A  | 2.28          | 3.0             |
| Drape curved – min. radius (m)              | 80    | 40   | N/A  | 40            | 12              |
| (1) Purlin spacings for drape curving (m)   | 1.2   | 1.4  | N/A  | 1.4           | 1.1             |
| (2) Machine crimp curved – min. radius (mm) | 450   | 400  | N/A  | 400           | N/A             |
| (3) Unsupported Overhang (mm)               | 200   | 250  | N/A  | 100           | 100             |

- (1) Recommended maximum purlin spacings at minimum radius  
 (2) N/A  
 (3) Based on 1.1kN point load support, but not intended for roof access  
 N/R – Not recommended  
 N/A – Not available.

Roll-forming facility location: Invercargill  
 Crimp curving facility location: Invercargill  
 Manufacturing location for DuraClad®: Auckland  
 Sheet lengths: Hi Five® is custom run to order.

Where long sheets are used consideration must be given to:

- Special transportation licences for sheets over 25m
- Site access for special lifting equipment
- Fixing techniques to accommodate thermal expansion.

## DIMOND HI FIVE® LIMIT STATE LOAD / SPAN CAPACITY CHART

(span in mm, distributed serviceability loads in kPa)

| Serviceability Category                  |                       | Unrestricted-Access Roof |            | Restricted Access Roof |            |            | Non-Access Roof & Wall |            |            |
|------------------------------------------|-----------------------|--------------------------|------------|------------------------|------------|------------|------------------------|------------|------------|
| <b>G550 Steel<br/>0.40mm</b>             | End Span              |                          |            | 600                    | 800        | 1000       | 1100                   | 1300       | 1600       |
|                                          | Internal Span         |                          |            | 900                    | 1200       | 1600       | 1700                   | 2000       | 2400       |
|                                          | <b>Serviceability</b> |                          |            | <b>3.5</b>             | <b>2.7</b> | <b>1.8</b> | <b>1.6</b>             | <b>1.2</b> | <b>0.9</b> |
| <b>G550 Steel<br/>0.55mm</b>             | End Span              | 800                      | 1000       | 1100                   | 1300       | 1500       | 1500                   | 1700       | 2000       |
|                                          | Internal Span         | 1200                     | 1500       | 1600                   | 1900       | 2200       | 2300                   | 2600       | 3000       |
|                                          | <b>Serviceability</b> | <b>4.0</b>               | <b>3.3</b> | <b>3.0</b>             | <b>2.5</b> | <b>2.0</b> | <b>1.8</b>             | <b>1.5</b> | <b>1.1</b> |
| <b>5052 H36<br/>Aluminium<br/>0.70mm</b> | End Span              |                          |            |                        | 600        | 800        | 900                    | 1100       | 1300       |
|                                          | Internal Span         |                          |            |                        | 900        | 1200       | 1300                   | 1600       | 1900       |
|                                          | <b>Serviceability</b> |                          |            |                        | <b>2.4</b> | <b>1.9</b> | <b>1.8</b>             | <b>1.2</b> | <b>0.8</b> |
| <b>5052 H36<br/>Aluminium<br/>0.90mm</b> | End Span              |                          | 800        | 900                    | 1000       | 1100       | 1200                   | 1500       | 1700       |
|                                          | Internal Span         |                          | 1200       | 1300                   | 1500       | 1700       | 1800                   | 2200       | 2600       |
|                                          | <b>Serviceability</b> |                          | <b>2.8</b> | <b>2.7</b>             | <b>2.2</b> | <b>1.7</b> | <b>1.6</b>             | <b>1.4</b> | <b>1.1</b> |
| <b>Duraclad®<br/>1.7mm<br/>(Note 4)</b>  | End Span              |                          |            |                        |            | 700        | 800                    | 1000       | 1200       |
|                                          | Internal Span         |                          |            |                        |            | 1100       | 1200                   | 1500       | 1800       |
|                                          | <b>Serviceability</b> |                          |            |                        |            | –          | –                      | –          | –          |
|                                          | <b>Ultimate</b>       | <b>N/R</b>               | <b>N/R</b> |                        |            | <b>4.5</b> | <b>4.4</b>             | <b>2.6</b> | <b>1.6</b> |

### Notes:

- In Restricted Access Roof and Non-Access Roof & Wall applications, spans exceeding the maximum values shown should not be used. The maximum spans for Restricted Access Roofs are based on static point load testing as a guide and are further limited by practical experience of roof performance under dynamic foot traffic loads. For Non-Access Roof & Wall applications, the maximum spans are limited to ensure satisfactory appearance for wall cladding.
  - Loads given are based on 4 screw fasteners/sheet/purlin.
  - Loads given are limited to a maximum of 4.5 kPa. If design requirements exceed this limit, contact Dimond for specific advice.
  - Duraclad®**
    - Serviceability Limit State loads are not applicable to the Duraclad® material, as it does not experience permanent deformation.
    - System must include Safety Mesh if intended for use as a Restricted-Access roof. Refer Section 2.2.1.8.
  - N/R = not recommended.
  - End span capacities given in this table are based on the end span being 2/3 of the internal span.
  - Design Criteria for Limit State Capacities**
    - Serviceability Limit State (SLS Design)**  
No deflection or permanent distortion that would cause unacceptable appearance, side lap leakage or water ponding, due to foot traffic point loads, inward or outward wind loads or snow loads.
    - Ultimate Limit State (ULS Design)**  
No pull through of fixings or fastener withdrawal resulting in sheet detachment due to wind up-lift (outward) loads.
  - System Design**  
The span capacity of the roofing or cladding profile is determined from the Load Span Table, using the section of the chart appropriate to the grade and type of material, and the category of serviceability selected from the two categories above. Serviceability loads have been derived by testing according to NZMRM procedures. To obtain an ultimate limit state load, we recommend factoring the serviceability load by 1.4 in line with NZMRM guidelines.  
  
Note: The capacities given do not apply for cyclone wind conditions.
- Serviceability Requirements**  
While these categories are provided for design guidance to meet the serviceability limit state criteria, foot traffic point load damage may still occur if point loads are placed carelessly.
- Service Category**  
Refer to MRMCOP 3.7.4 Roof Traffic. The designer must consider the degree and type of foot traffic expected on a roof. The following requirements are subjective standards and must be considered in line with customer expectations, building use, and type. More robust design than specified below (such as reducing purlin spacing or adding protection from mechanical action) is required for roofs that are regularly accessed, used as staging by subsequent trades, or areas adjacent to access points, particularly step-down access.
- Wind Pressure Guide**  
As a guide for non-specific design the following S.L.S. design loads in accordance with the MRM Roofing Code of Practice can be used for buildings less than 10m high, otherwise AS/NZS 1170.2 should be used Low wind zone = 0.68kPa, Medium wind zone = 0.93kPa, High wind zone = 1.32kPa, Very high wind zone = 1.72kPa and Extra high wind zone = 2.09kPa

## FASTENERS

The durability of the 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. Refer to NZS E2/AS1 table 20 for compatibility requirements.

The minimum embedment of 30mm is the requirement for screws fixing into timber and minimum of three threads to pass through steel. When fastening through cavity battens, thermal break materials etc ensure the length of the screw is increased to accommodate the extra material.

| Common Fastener Lengths* – Roof Cladding – Crest Fixed |                                                                                          |                                                          |                                                    |
|--------------------------------------------------------|------------------------------------------------------------------------------------------|----------------------------------------------------------|----------------------------------------------------|
| Cladding Material                                      | Timber Purlins (mm)                                                                      | Steel Purlins/Girts up to 2.5mm (minimum 3 threads) (mm) | (1,2) Load Spreading Washers (LSW) (When required) |
| <b>Steel</b>                                           | TT 12g x 65 with neo                                                                     | ST 12g x 55 with neo                                     | Steel with 30mm EPDM washer                        |
| <b>Aluminium</b>                                       | TT 12g x 73 Alutite with neo and LSW<br>TT 12g x 65 304 stainless steel with neo and LSW | ST 12g x 50 304 stainless steel with neo and LSW         | Aluminium with 30mm EPDM washer                    |

\*Class 5 fasteners are recommended with steel-based material

(1) – When Using LSW increase fastener length by 10mm

(2) – When using LSW pre-drill a 10mm oversized hole to accommodate the EPDM washer

| Common Fastener Lengths* – Wall Cladding – Pan Fixed |                                     |                                                   |
|------------------------------------------------------|-------------------------------------|---------------------------------------------------|
| Cladding Material                                    | Timber Dwangs/Nogs (mm)             | Steel Girts up to 2.5mm (mm)                      |
| <b>Steel</b><br>Direct fix                           | TT 12g x 40 with neo washer         | ST 12g x 20 with neo washer                       |
| <b>Steel</b><br>On 20mm (nom.)<br>Cavity Batten      | TT 12g x 55 with neo washer         | ST 12g x 35 with neo washer                       |
| <b>Aluminium</b><br>Direct fix                       | TT 14g x 35 Alutite with neo washer | **ST 12g x 25 304 stainless steel with neo washer |
| <b>Aluminium</b><br>On 20mm (nom.)<br>Cavity Batten  | TT 14g x 55 Alutite with neo washer | **ST 14g x 50 304 stainless steel with neo washer |

\*Class 5 fasteners are recommended with steel-based material

\*\*Stainless steel fasteners require to be separated from aluminium

Use in serviceability categories (1) or (2) can allow the reduction of fasteners to an average of 2 screw fasteners/sheet/purlin. If this is done, the distributed load capacities given in the chart should be reduced using a multiplying factor of 0.5.

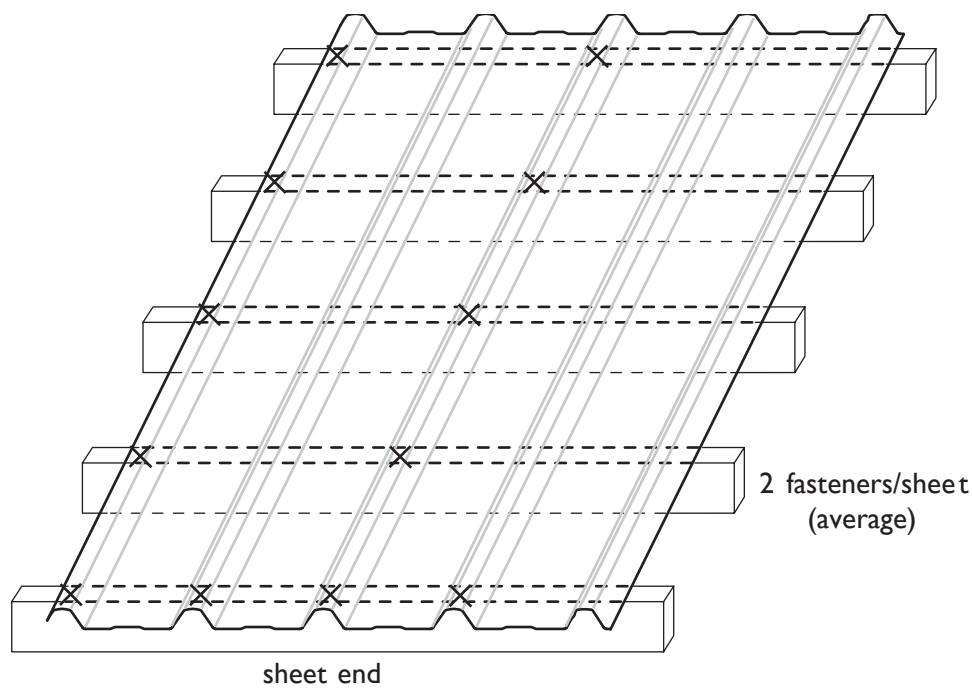
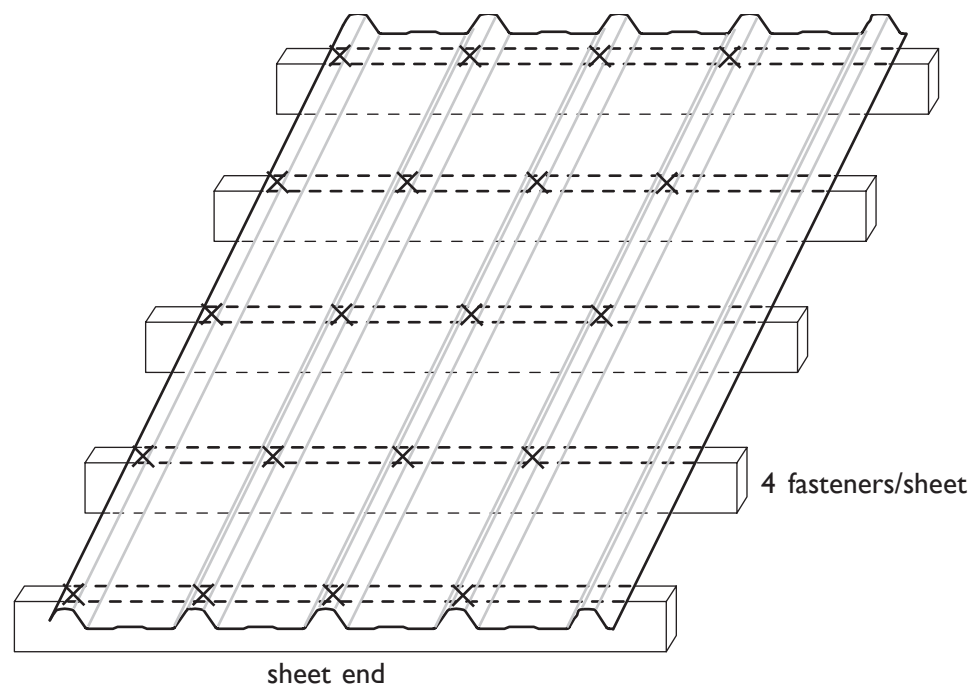
Long spans may require the specification and use of side lap stitching screws – see Section 2.3.2C Installation Information: Layout and Fastening.

## DESIGN EXAMPLE

Restricted access roof, 0.55mm G550 steel Hi Five® has a maximum end span of 1500mm and a maximum internal span of 2200mm. The following distributed load capacities apply.

|                       | 4 fasteners/sheet | 2 fasteners/sheet |
|-----------------------|-------------------|-------------------|
| <b>End Span</b>       | 1500mm            | 1500mm            |
| <b>Internal Span</b>  | 2200mm            | 2200mm            |
| <b>Serviceability</b> | 2.0 kPa           | 1.0 kPa           |

**DIMOND HI FIVE® FASTENER LAYOUT OPTIONS**



## DESIGN DETAILS

Design details covering residential & commercial roof & wall claddings are available at [www.dimond.co.nz](http://www.dimond.co.nz) in PDF, DWG & RVT files under each product section.

## PUBLICATIONS

To achieve the product's full potential, it must be designed, installed, and maintained in accordance with Good Trade Practice. For more information, please refer to:

**NZS E2/AS1:** [www.building.govt.nz](http://www.building.govt.nz)

**NZMRM:** New Zealand Metal Roofing and Wall Cladding Code of Practice – [www.metalroofing.org.nz](http://www.metalroofing.org.nz)

**NZMRM:** Installation Guide – Metal Longrun Roofing and Cladding – [www.metalroofing.org.nz](http://www.metalroofing.org.nz)

**RANZ:** How to Guides – [www.ranz.co.nz](http://www.ranz.co.nz)

**Pacific Coil Coaters:** Choose the Right Roof  
[www.colorcote.co.nz](http://www.colorcote.co.nz)

**Pacific Coil Coaters:** Maintenance Schedule  
[www.colorcote.co.nz](http://www.colorcote.co.nz)

**Pacific Coil Coaters:** Environmental Product Declaration  
[www.colorcote.co.nz](http://www.colorcote.co.nz)

**New Zealand Steel:** Environmental Categories, Warranty & Product Maintenance Recommendations Brochure  
[www.colorsteel.co.nz](http://www.colorsteel.co.nz)

**New Zealand Steel:** Maintenance Recommendations Bulletin  
– [www.colorsteel.co.nz](http://www.colorsteel.co.nz)

**New Zealand Steel:** Installers Guide [www.colorsteel.co.nz](http://www.colorsteel.co.nz)

**UniCote LUX:** Performance – [www.unicote.com.au](http://www.unicote.com.au)

**UniCote LUX:** Technical & Warranty – [www.unicote.com.au](http://www.unicote.com.au)

**BRANZ:** Good Profiled Metal Roofing and Wall Cladding – [www.branz.co.nz](http://www.branz.co.nz)

**MBIE:** Guide to tolerances, materials and workmanship in new residential construction 2015 – [www.mbie.govt.nz](http://www.mbie.govt.nz)

## THERMAL NOISE

All profiled metal roofs and wall cladding can produce thermal noise from time to time. This occurs as the roof expands and contracts due to temperature changes, with darker colours potentially increasing the noise. The NZMRM Code of Practice addresses this issue.

According to the MBIE's 2015 "Guide to Tolerances, Materials, and Workmanship in New Residential Construction," noise from metal roofing's thermal expansion is considered normal and should be expected.

## OIL CANNING

Differential thermal movement between wide, flat surfaces and ribs or corners within a metal sheet can create a visual effect known as oil canning. This refers to the visible waviness or undulations in the flat sections of metal cladding, roofing, or walling. Oil canning is an inherent architectural characteristic of flat metal surfaces and is not indicative of any performance issues with the product.

It may occur during the forming and installation processes, as well as throughout the roof's lifecycle due to thermal expansion. The visibility of oil canning can vary depending on lighting conditions, sun angles, and the gloss level of the coating.

For more details, please refer to Section 12.4 of the New Zealand Metal Roof and Wall Cladding Code of Practice.

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## Dimond Roofing, NZBN 9429037626563

**Contacts:** Technical Advice 0800 766 377 • Sales and Supply 0800 346 663

**Website:** <https://www.dimond.co.nz/>

**Email Specification Team:** [roofspec@dimond.co.nz](mailto:roofspec@dimond.co.nz)

**Email Technical Team:** [rooftech@dimond.co.nz](mailto:rooftech@dimond.co.nz)

**Address:** 48 Victoria Street, Onehunga, Auckland 1061

**Place of Manufacture:** Aotearoa New Zealand



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## Contact us

**Dimond Roofing®**

Ph. 0800 Roofspect (0800 766 377)  
or 0800 DIMOND

[dimond.co.nz](https://dimond.co.nz)

