GENERAL PERFORMANCE STATEMENT

(a) Description:

Dimond long run roofing and wall cladding systems are available in a variety of sheeting materials together with the appropriate fasteners, underlay, supporting netting and perimeter and penetration flashings. Table 2.1A summarises the sheeting material options available.

Please also refer to the Dimond Colour Chart for the full range of available colours in each of the paint coating types. Other materials and thickness may be available upon enquiry.

Table 2.1A Sheeting Material Options

Material	Grade	Thickness (mm)	Metal Coating Available	Prepaint Finish Standards	Relevant
Steel	G550	0.40 or 0.55 BMT	Zinc[1] or Zinc/Aluminium[2] or Zinc/Aluminium/Magnese[4]	Yes	AS1397
	G250/300[3]	0.40 or 0.55 BMT		Yes	
Aluminium (plain or embossed)	5052	0.70 or 0.90 BMT	N/A	Yes	AS1734
	5251	0.70 or 0.90 BMT	N/A	Yes	
Stainless Steel 316	304	0.70	N/A	No	AS1449
	445m[2]	0.70	N/A	No	
Copper	110A	0.55 to 0.70	N/A	No	AS2738
	122A	0.55 to 0.70	N/A	No	
Zinc	Z1	0.70	N/A	No	EN988
GRP	Duraclad®	1.7	N/A	Yes	-

1.Galvsteel™ 2.Zincalume® 3.For some machine-curved products only 4. ZAM BMT. Base Metal Thickness

(b) Scope Of Use:

Dimond long run metal roofing and wall cladding systems are intended for use in constructing the building envelope for commercial buildings and residential buildings subject to the limitations listed below.

(c) Requirements:

Attention to the following details is required to ensure the expected system performance is achieved.	Reference
• The selection of the type and grade of sheeting material and fasteners must be based on the life expectancy required and the severity of the external and internal environments.	2.1.1.2 2.1.1.3 2.1.1.4 2.2.3
• Correct choice of breather type or vapour barrier underlay to suit the building environment.	2.1.3.5
• Site storage that keeps product dry and protected from damage.	
• Sheeting handling that prevents surface damage.	
• Avoidance of excessive spans or insufficient fasteners for the expected loads.	2.1.3.1 2.1.4
• Correct placement and flashing of penetrations through the roof.	
• Correct layout and installation of the sheeting, underlay and netting.	
• Allowance for thermal expansion and contraction.	2.1.3.4
• Sufficient roof pitch to permit complete surface water drainage.	2.1.4
• Control of allowable contact with dissimilar materials.	2.1.3.3
• Awareness and implementation of maintenance requirements, particularly for surfaces not washed by natural rainfall.	2.1.1.3
• Correct choice of material for collection of drinking water from a Zincalume® or colour finished roof is required.	2.2.1.4

Continued on next page...

(d) NZBC Compliance:

Test information available from Pacific Coilcoaters and BHP NZ Steel, and past history of use of long run metal roofing and cladding products in New Zealand indicate that, provided the product use and maintenance is in line with the guidelines contained in the current literature referenced, Dimond long run metal roofing & wall cladding systems can be expected to meet the performance criteria in clause B2 and E2 of the New Zealand Building Code, for a period of not less than 15 years.

(e) Use Outside the Stated Guidelines:

If the need arises to use Dimond long run roofing & cladding outside the limitations and procedures given in this or other referenced literature, or if any doubt exists on product handling or use, written approval for use must be obtained from Dimond before the project commences.

ENVIRONMENT

AS/NZS 2728: 1997, (Australia/New Zealand Standard – Prefinished / Prepainted Sheet Metal Products for Interior / Exterior Building Applications – Performance Requirements), classifies the atmospheric environment into 7 categories and provides a guide to the selection of prefinished products in these categories.

In Table 2.1B and 2.1C overleaf we have created a guide showing which categories the more common roofing and cladding materials and coatings can be used in. Only 6 of the 7 categories defined by the standard are covered, as the 7th one, Tropical, is not relevant in New Zealand.

For further classification information please refer to AS/NZS 2728:1997

Table 2.1B Atmospheric Classification Definition

Mild	Sheltered areas that are far inland (very few in NZ).
Moderate	Areas that are protected from marine influence. Are inland areas other than those that are far inland.
Industrial	Industrial areas that are inland.
Marine	Large parts of NZ including areas 100m – 400m from the shoreline in sheltered areas (inner harbour and estuaries) and more than 1 km from breaking surf shoreline. Can extend up to 30kms inland depending on topography and prevailing winds.
Severe Marine	Areas that range from 100m to 1km from a breaking surf shoreline. In high wind areas the distance inland will increase. It also includes areas that are less than 100m (but can extend up to 400m depending on prevailing winds) from the shoreline in sheltered areas.
Very Severe Marine	In areas up to and including 100m from breaking surf. Will extend inland 400m or more where strong prevailing winds exist.
Industrial & Geothermal	Areas of high corrosion including chemical plants and geothermal areas.
Severe Chemical Environments (additional to AS/NZS 2728)	Unusually harsh conditions due to moisture generation and/or chemical usage or storage (e.g. cool stores, animal shelters, fertiliser storage). Will require specific material selection for sheeting, fasteners and netting. Contact Dimond for advice.

Table 2.1C Environment Categories and Suitable Sheeting and Fastener Materials

Atmospheric Conditions	Substrates	Prefinished Paint Coating Types	Branded Sheeting Products	Recommended Screw Fastener Material**	Washer Material
Mild Moderate Industrial Marine	Zinc Coated Steel	-	Galvsteel™	Class 4, minimum	Galvanised
	Zinc/Aluminium Coated Steel (150g/m²) Zinc/Aluminium/Magnesium (MagnaFlow™ & MagnaFlow™ X)	-	Zincalume®	Class 4, minimum	Zincalume®
		Polyester, Acrylic	ColorCote® ZinaCore™ MagnaFlow™ COLOURSTEEL® ENDURA®	Class 4, minimum	Post Painted Steel
		PVF²	ColorCote® ZinaCore™ X & MagnaFlow™ X	Class 4, minimum	Post Painted Steel
	Aluminium	-	Plain or embossed finish	304 Stainless Steel or Alum. **	Aluminium
		Polyester, Acrylic	ColorCote® AlumiGard™	304 Stainless Steel or Alum. **	Post Painted Aluminium
		PVF²	ColorCote® AlumiGard™ X	304 Stainless Steel or Alum. **	Post Painted Aluminium
	Stainless Steel	-	-	304 Stainless Steel	304 Stainless Steel
	Copper	-	-	304 Stainless Steel or Bronze	-
	Glass Reinforced Polyester (GRP)	Gel Coat	Duraclad®, Webglass	304 Stainless Steel or Alum.	Weatherlok (UV Stabilised PEA)
Severe Marine	Zinc/Aluminium coated Steel (200g/m²)	Polyester	COLOURSTEEL® MAXX®*	Class 4, minimum	Post Painted Steel
	Zinc/Aluminium coated Steel (150g/m²) Zinc/Aluminium/Magnesium	PVF²	ColorCote® ZinaCore™ X* & MagnaFlow™ X	Class 4, minimum	Post Painted Steel
	Aluminium	-	Plain or Embossed	304 Stainless Steel or Alum. **	Aluminium
		Polyester, Acrylic	ColorCote® AlumiGard™	304 Stainless Steel or Alum. **	Post Painted Aluminium
		PVF²	ColorCote® AlumiGard™ X	304 Stainless Steel or Alum. **	Post Painted Aluminium
	Stainless Steel	-	-	304 Stainless Steel	304 Stainless Steel
	Copper	-	-	304 Stainless Steel or Bronze	-
	Glass Reinforced Polyester (GRP)	Gel Coat	Duraclad®, Webglass	304 Stainless Steel or Alum.	Weatherlok (UV Stabilised PEA)
Very Severe Marine Industrial Geothermal	Zinc/Aluminium coated Steel (200g/m²)	Polyester	COLOURSTEEL® MAXX®*	Class 5, minimum	Post Painted Steel
	Zinc/Aluminium/Magnesium	PVF²	ColorCote® MagnaFlow™ X	Class 5, minimum	Post Painted Steel
	Aluminium	-	Plain or Embossed	304 Stainless Steel or Alum. **	Aluminium
		Polyester, Acrylic	ColorCote® AlumiGard™	304 Stainless Steel or Alum. **	Post Painted Aluminium
		PVF²	ColorCote® AlumiGard™ X	304 Stainless Steel or Alum. **	Post Painted Aluminium
	Stainless Steel	-	-	316 Stainless Steel	Stainless Steel
	Copper	-	-	316 Stainless Steel or Bronze	-
	Glass Reinforced Polyester (GRP)	Gel Coat	Duraclad®, Webglass	316 Stainless Steel or Alum.	Weatherlok (UV Stabilised PEA)
Severe Chemical	Glass Reinforced Polyester (GRP)	Gel Coat	Duraclad®, Webglass (Consult Dimond)	Consult Dimond	Weatherlok (UV Stabilised PEA)

*Use of coil on cut edge protection lacquer may be required. Alum.= Aluminium Alutites for timber only.
** Stainless steel fasteners must be installed with clearance and separation to avoid contact with Aluminium.

WARRANTY

Warranties for commercial applications are issued on a job by job basis. It is imperative that care is taken during the planning process to choose the roofing, wall cladding, guttering and fastener system that will provide the life expectancy in the environment in which it will be installed, as incorrect selection could result in no warranty being available. Any warranty is not Dimond's responsibility and will be subject to the coil suppliers conditions. The site may affect the warranty term and/or product suitability so it is vital that the customer supplies accurate site information and that the designer is fully aware of the suitability of products specified.

To assist you in determining the system that will best meet your warranty expectations Dimond have in place a Warranty Inquiry Service. Your design decisions on product type, material thickness, profile, paint coating type and colour, along with site details including address, distance from sea and degree of exposure will be required to enable us to provide a warranty. To access the service, please contact Dimond on 0800 DIMOND.

All warranties will carry a required maintenance clause, which must be complied with to ensure the warranty remains valid. Often aspects of design such as roof shape and roof pitch can influence the maintenance requirements. Due consideration of these factors during the design process is wise.

As a general guide, provided the materials are correctly selected and installed from Table 2.1C for the environment and coil on cut edge protection lacquer used if required by the coil coater, and building design does not impact on durability, it is reasonable to expect the following warranty periods will be available for your roofing and wall cladding. Please note that no warranty is available for Galvsteel material regardless of which environmental category it is used in.

Paint products from different suppliers should not be mixed on the same job. This applies when the roofing is from one material supplier and the flashings from a different material supplier. No warranty would be available on either material.

Warranties only apply to roofing and cladding and guttering situations and not when used as fences, shower liners or planter boxes.

Guideline Warranty Periods

Steel substrate with appropriate paint coating:

- Commercial roofs:
  15 years to perforation of substrate and fastener strength retention.
  15 years to paint coating peeling, flaking or excessive fade.
- Residential roofs (dependent on environment):
  Up to a maximum 30 years to perforation of substrate and fastener strength retention.
  Up to a maximum 20 years to paint coating peeling, flaking or excessive fade.

Aluminium (unpainted):

- Commercial and residential roofs:
  15 years to perforation of substrate.

Aluminium substrate with appropriate paint coating:

- Commercial roofs:
  15 years to perforation of substrate and fastener strength retention.
  15 years to paint coating peeling, flaking or excessive fade.
- Residential roofs:
  30 years up to and including Severe Marine Environments, and 20 years in Very Severe Marine Environments, to perforation of substrate and fastener strength retention.
  15 to 20 years dependent on environment to paint coating peeling, flaking or excessive fade.

Duraclad®

- Commercial and residential roofs and walls:
  20 years to fibre show through or perforation of sheet.

Routine Maintenance

Washing

All metal surfaces must be kept clean for best durability. Warranty conditions require regular washing either by natural rainwater or by manual washing and scrubbing with a soft bristle brush.

The frequency of washing must be sufficient to prevent build up of debris, dirt or salt deposits and will vary depending on location and degree of protection from rainfall.

As a general guide the following frequencies can be used as a starting point.

Environment	Washing Frequency
Moderate / Marine	Every 6-12 months
Severe Marine	Every 3-6 months
Very Severe Marine	Every 3 months

The need to wash can be reduced by building design that avoids the creation of metal roof or wall surfaces that are sheltered from natural rainfall.

- Unwashed areas such as the exposed underside of roofing in soffits are not warranted, but can be specified as double sided paint surfaces to offer better durability to exposed roof undersides. Minimum coil quantities apply. Regular washing of these areas are still required. However they are not covered by the material warranty.

Overpainting

Once new or older pre-finished roofs are overpainted, the original material warranty becomes null and void, due to uncontrolled conditions and workmanship of the roof.

Substrate in Good Condition

Clean the surface and overpaint with 2 coats of an acrylic roof paint system, following the paint manufacturer's instructions.

If the roof or wall cladding has had less than 2 years exposure to weathering, the acrylic paint manufacturer should be consulted for advice on pretreatment of surface to ensure adequate adhesion.

Substrate Requires Refurbishment

Clean the surface and coat any surface corrosion with a suitable conversion treatment and primer, then overpaint with 2 coats of an acrylic roof paint system, following the paint manufacturer's instructions. Check and replace any fasteners exhibiting advanced corrosion.

Rubbing

Hard rubbing on the unpainted Zincalume® surface can cause black marks if the clear coating is worn through. If rubbing is unavoidable we recommend it be kept to a minimum to avoid the wear through of the protective clear coating.

LIFE CYCLE COSTING AND MAINTENANCE OPTIONS

The selection of the most appropriate roofing and wall cladding material to meet cost-performance requirements within a chosen time period should be made with the assistance of Life Cycle Costing comparisons.

Input for these comparisons requires:

- Environment type
- Expected useful life for each material / maintenance option
- Type of regular maintenance (if any) and associated cost
- Material types of sheeting and fastener, and their durability
- Material and installation costs
- Discount rate (%) to convert costs to present value

The following Tables 2.1D, E, F, G provide a guideline comparison for general cases. The Tables are based on:

1. Environment descriptions as defined in Section 2.1.1.2, specific chemical exposure has not been included in the Life Cycle Analysis.
2. Market rates for the sheeting and fastener materials detailed and for installation labour. These rates have been converted to relative costs based on the initial installed cost of unpainted Zincalume®.
3. A choice of three different maintenance options identified on the Tables by the following key:

   R: Replacement Option – No maintenance other than regular washing to keep surface clean. Sheeting and fasteners replaced once the sheeting has reached an advanced state of deterioration, but before perforation and leakage occurs.

   F: Refurbish Option – No maintenance other than regular washing to keep surface clean until surface deterioration is at a point where refurbishment will add to the life of the sheeting rather than leave for later replacement.

   A: Acceptable Appearance Option – Regular washing to keep surface clean, and repainting of the surface to maintain a good standard of acceptable appearance, where this is important (e.g. high visibility walls). Once painted, repainting is required every 8 years.

4. In some cases the F and A maintenance options will eventually include sheeting and fastener replacement. The number of replacements expected in any case is shown on the Tables with shading to the following key.

   No replacement of sheeting and fasteners

   One replacement of sheeting and fasteners

   Two replacements of sheeting and fasteners

5. The relative costs are given as initial installed cost at 0 years (with lowest cost option assigned the relative value of 1.0) and then as the present value of future maintenance costs required to deliver a sheeting life of 20, 30, 40 or 50 years. Present value has been calculated at a discount rate of 10%.
6. The combination of steel and aluminium is based on material with similar load span capability. No account has been taken of extra maintenance that may be required to repair foot traffic damage (which in some case may be higher for aluminium than steel).
7. The costs used for Duraclad® do not include the extra support framing that may be required for this material in comparison with steel or aluminium. Depending on use (e.g. wall cladding versus roofing) this difference may not be significant.

Table 2.1D Relative Life Cycle Costs – Moderate Environment

Roofing/Cladding Options			Relative Life Cycle Cost for Period				
Material		Maintenance					
Sheeting	Fastener		0 Years	20 Years	30 Years	40 Years	50 Years
Zincalume®	Class 3	R	1.00	1.00	1.00	1.09	1.09
Post-painted Zincalume®	Class 3	F	1.32	1.32	1.369	1.43	1.46
		A	1.32	1.54	1.58	1.59	1.62
COLOURSTEEL® ENDURA® or ColorCote® ZinaCore™	Class 3	R	1.21	1.21	1.21	1.27	1.27
		F	1.21	1.21	1.21	1.24	1.25
		A	1.21	1.28	1.32	1.34	1.35
ColorCote® ZinaCore™ X	Class 4	R	1.46	1.46	1.46	1.46	1.50
		F	1.46	1.46	1.46	1.47	1.48
		A	1.46	1.46	1.50	1.53	1.54

Table 2.1E Relative Life Cycle Costs – Industrial / Marine

Roofing/Cladding Options			Relative Life Cycle Cost for Period				
Material		Maintenance					
Sheeting	Fastener		0 Years	20 Years	30 Years	40 Years	50 Years
Zincalume®	Class 3	R	1.00	1.00	1.24	1.24	1.27
Post-painted Zincalume®	Class 3	F	1.32	1.44	1.48	1.50	1.55
		A	1.32	1.54	1.58	1.60	1.65
COLOURSTEEL® ENDURA® or ColorCote® ZinaCore™	Class 3	R	1.21	1.21	1.21	1.31	1.31
		F	1.21	1.21	1.25	1.26	1.27
		A	1.21	1.28	1.32	1.34	1.35
ColorCote® ZinaCore™ X	Class 4	R	1.46	1.46	1.46	1.46	1.53
		F	1.46	1.46	1.46	1.48	1.47
		A	1.46	1.46	1.50	1.53	1.54
COLOURSTEEL® MAXX®	Class 4	R	1.54	1.54	1.74	1.74	1.74
		F	1.54	1.79	1.90	1.95	1.99
Aluminium (unpainted)	304 S/S	R	1.56	1.56	1.56	1.56	1.56
Duraclad®	304 S/S	R	1.52	1.52	1.52	1.59	1.59
		F	1.52	1.52	1.63	1.68	1.72

Table 2.1F Relative Life Cycle Costs – Severe Marine Environment

Roofing/Cladding Options			Relative Life Cycle Cost for Period				
Material		Maintenance					
Sheeting	Fastener		0 Years	20 Years	30 Years	40 Years	50 Years
COLOURSTEEL® ENDURA® or ColorCote® ZinaCore™	Class 4	R	1.23	1.67	1.67	1.77	1.77
		F	1.23	1.42	1.64	1.66	1.67
ColorCote® ZinaCore™ X	Class 4	R	1.46	1.46	1.76	1.76	1.81
		F	1.46	1.57	1.57	1.75	1.77
		A	1.46	1.58	1.64	1.83	1.84
COLOURSTEEL® MAXX®	304 S/S	R	1.54	1.54	1.86	1.86	1.91
		F	1.54	1.91	2.17	2.22	2.27
Aluminium (Unpainted)	304 S/S	R	1.56	1.56	1.56	1.75	1.75
ColorCote® AlumiGard™ X	304 S/S	R	2.158	2.15	2.15	2.15	2.25
		F	2.15	2.15	2.15	2.18	2.24
		A	2.15	2.23	2.26	2.28	2.29
Duraclad®	304 S/S	R	1.52	1.52	1.52	1.59	1.59
		F	1.52	1.52	1.63	1.68	1.72

Table 2.1G Relative Life Cycle Costs – Very Severe Marine Environment

Roofing/Cladding Options			Relative Life Cycle Cost for Period				
Material		Maintenance					
Sheeting	Fastener		0 Years	20 Years	30 Years	40 Years	50 Years
COLOURSTEEL® MAXX®	Class 4	R	1.54	2.06	2.06	2.18	2.18
		F	1.54	1.91	2.23	2.29	2.34
Aluminium (Unpainted)	304 S/S	R	1.56	1.56	1.87	1.87	1.92
ColorCote® AlumiGard™ X	304 S/S	R	2.15	2.15	2.15	2.41	2.41
		F	2.15	2.27	2.30	2.46	2.47
Duraclad®	304 S/S	R	1.52	1.52	1.52	1.59	1.59
		F	1.52	1.52	1.63	1.68	1.72

DIMOND RECOMMENDED INSTALLERS NATIONWIDE

Current as at February 2014

City	Company name	Contact name	Phone number	Postal address	Website	Email Address
Auckland	RoofingSmith: Bass Corp Ltd T/a Active Roofing	Warren Green	0800 764 844 021 719 468	5A Wookey Lane Kumeu, Auckland 0810	roofingsmiths.co.nz	duncan@roofingsmithschristchurch.co.nz
Auckland	Fyfe Plumbing and Roofing Ltd	Matthew Dunne	09 445 1451 09 520 2279	level 1, 78 Coates Ave, Orakei	fyfeplumbing.co.nz	admin@fyfeplumbing.co.nz
Auckland	Kiwi Roofing	Paul Connell	09 263 9988	PO Box 76-584, Manukau	kiwiroofing.co.nz	tenders@kiwiroofing.co.nz
Auckland	Paton Roofing Services	Phil Gilmore	09 838 7905	5 Amokura St, Henderson	patonroofing.co.nz	damon@patonroofing.co.nz
Auckland	Reel Roofing	Rob Wells	09 577 4411	PO Box 230074 Botany, AKL	reelroofing.co.nz	rob@reelroofing.co.nz
Auckland	Quix Commercial	Dave Henderson	09 579 9065	PO Box 11161 Ellerslie, AKL	PO Box 35499, Browns Bay, AKL	Dave.henderson@quixnz.com
Auckland/ Hamilton	Project Unite	Rena Schuster	07 849 1700 021 368 960	PO Box 20112, Te Rapa, Hamilton 3241	projectunite.co.nz	rena@projectunite.co.nz
Hamilton	Geoff Pickford Roofing	Geoff Pickford	07 856 6804 021 597 216	PO Box 4465, Hamilton East, Hamilton	111 Kent Street, Frankton	geoff@gaproofing.co.nz
Hamilton	Roofing Specialists	Peter Fluhler	07 849 4160	PO Box 4465, Hamilton East 3247	roofingspecialists.co.nz	peter@roofingspecialists. co.nz
Hamilton	Nathan Taranaki Construction Ltd T/A Watertight Construction	Shae Jones	07 846 7244 027 6088 500	PO Box 10-117, Te Rapa	wtcroofing.co.nz	shae@wtcroofing.co.nz
Bay of Plenty	Roof Bay Of Islands Ltd	Stefan Dawson Rick Harper	09 407 9288		roofbayofislands.co.nz	info@roofbayofislands.co.nz
Rotorua	RoofingSmith: Amalgamated Roofing Ltd	Donald Trott	07 345 8588	24 Scott Street Rotorua, 3010	roofingsmiths.co.nz	trotty@amalgamatedroofing.co.nz
Tauranga	Harkin Roofing BOP Ltd	Brad Harkin	07 575 2027	PO Box 4019, Mt Maunganui	harkinroofing.co.nz	office@harkinroofing.co.nz
Tauranga	Roofing the Bay Ltd	Neville Johns	07 572 0920 021 767 448	P.O Box 14205, Tauranga Mail Centre. Tauranga	roofingthebay.co.nz	neville@rtb.co.nz
Tauranga	TH Commercial Roofing Ltd	Terry Hunt	07 579 9400	PO Box 9074, Tauranga 3142	thcroofing.co.nz	admin@thcroofing.co.nz
Hawke's Bay	Martin Roofing	Roger Martin	06 879 8252	PO Box 2131, Stortford Lodge	martinroofing.co.nz	roger@martinroofing.co.nz
Hawke's Bay	Amalgamated Roofing, Hawkes Bay	Jeff Moulder	06 870 7301	PO Box 2551, Stortford Lodge, Hastings	amalgamatedroofing.co.nz	jeff.amalga@xtra.co.nz
Hawke's Bay	Turfrey	Brad Turfrey	0800 182 182	PO Box 529, Waipukurau, 4242	turfrey.co.nz	brad@turfrey.co.nz
New Plymouth	RoofingSmith: Central Roofing Co Ltd	Duncan Corlett	0800 2766 348	23 Katere Rd New Plymouth 4312	roofingsmiths.co.nz	duncan@centralroofing.co.nz
New Plymouth	Farnsworth Roofing Ltd	Geoff Farnsworth	06 758 1445	PO Box 7058, New Plymouth	farnsworthroofing.co.nz	office@ farnsworthroofing.co.nz
New Plymouth	Millwards Roofing	Gerard Wells	06 758 5663	PO Box 406	millwardsroofing.co.nz	enquiries@ millwardsroofing.co.nz

City	Company name	Contact name	Phone number	Postal address	Website	Email Address
New Plymouth	Roofing Taranaki Ltd	Grant Stewart	06 758 5663	PO Box 3352, Fitzroy	roofingtaranaki.co.nz	roofingtki@xtra.co.nz
Manawatu	Turfrey	Rich Hutchinson	0800 182 182	597 Tremaine Ave, Palmerston North	Turfrey.co.nz	rich@turfrey.co.nz
Wellington	Turfrey	Rich Hutchinson	0800 182 182	22 Cashew Street, Grenada North	Turfrey.co.nz	rich@turfrey.co.nz
Wellington	Aquaheat Industries	Tim Meulenbroeks	04 232 5179	PO Box 51-031, Tawa	aquaheat.co.nz/classic_metal	wellington@aquaheat.co.nz
Wellington	Premier Roofing Ltd	Craig Lawn	04 473 1552	PO Box 2227		
Wellington	Tararua Roofing Ltd	Wayne Miscall	04 569 3074	PO Box 44-046, Lower Hutt		tararua@wilprop.co.nz
Tasman - Marlborough	RoofingSmith: Roofingsmiths Nelson Ltd	John/Sandi Hawke	027 447 0087	2/76 Gladstone Road Richmond 7020	roofingsmiths.co.nz	john@roofsmithsnn.nz
Christchurch	RoofingSmith: Central Roofing Co Ltd (Summerset)	Duncan Corlett	03 349 7218 027 449 2011	13 Parkhouse Rd Wigram, Christchurch 8042	roofingsmiths.co.nz	duncan@centralroofing.co.nz
Christchurch	RoofingSmith: CS Roofing Canterbury Ltd	Nathan Maxwell	03 338 0400 021 221 5931		roofingsmiths.co.nz	nathan@csroofingcanterbury.co.nz
Christchurch	Graham Hill Roofing Ltd	Graham Hill Mark Tinning	03 343 1030	PO Box 36-133, Merivale		mark@ghroofing.co.nz
Christchurch	Newfield Roofing Ltd	Barry Newfield	03 335 0077	PO Box 12062, Beckenham	newfieldroofing.co.nz	barry@newfieldroofing. co.nz
Christchurch	Wayman Roofing Services Ltd	Paul Wayman	03 338 0877	PO Box 9354	waymanroofing.co.nz	sales@waymanroofing. co.nz
Timaru	RoofingSmith: Menzies Group Ltd		03 684 8440	6 High St Timaru	roofingsmiths.co.nz	admin.menzies@xtra.co.nz
Wanaka	RoofingSmith: About Roofing Group Ltd	Dave Strudwick	03 443 2794 021 766 307	PO Box 154, Wanaka 9343	roofingsmiths.co.nz	wanaka@roofingsmiths.co.nz
Queenstown	RoofingSmith: CS Roofing Queenstown Ltd	Keith Ivey	03 442 2202 021 311 800	160 Glenda Drive Frankton, Queenstown 9371	roofingsmiths.co.nz	Keith@csroofingqueenstown.co.nz
Dunedin	RoofingSmith: CS Roofing (Otago) Ltd T	Craig Maley	03 479 0658 027 480 6566	10B Strathallan Street South Dunedin, Dunedin 9012	roofingsmiths.co.nz	craig@csroofingotago.co.nz
Invercargill	CS Roofing Southland Ltd	Keith Ivey	03 218 4394 021 311 800	24 Ettrick Street, Invercargill	csroofingsouthland.co.nz	keith@csroofingsouthland.co.nz
Southland	RoofingSmith: Paisley & King Roofing Ltd	Brendan Paisley Steve King	03 236 0209	84 Albert St Winton 9720	roofingsmiths.co.nz	paisley.roofers@xtra.co.nz

PROFILE SPAN AND CURVATURE - QUICK GUIDE TABLE 2.1H

This table is a quick reference guide on span and curvature limitations for all Dimond roofing and wall cladding profiles. For detailed Serviceability and Ultimate Limit State design, please refer to Section 2.1.4 – Specific Design by Profile Performance.

Basis to the tables:

Roofing – the spans are for roofs with restricted access or where the serviceability wind load does not exceed 1.2kPa. A restricted access roof is where there is occasional foot traffic, that is educated to walk on the purlin lines, in the profile pans, or carefully across two profile ribs. Walkways will be installed where regular traffic is expected and "Restricted Access" signs placed at access points.

Walls – spans are limited by acceptable appearance or an serviceability wind load of 1.0kPa.

Roofing fasteners – average of 4 screw fasteners per sheet per purlin. Based on Hex-head screws without washers. The number of fasteners can be reduced by specific design (refer to Section 2.1.4 – Specific Profile Performance).

Drape curve – radii are limited by acceptable roof appearance, refer to Section 2.4.2.

Crimp and roll curve – radii are limited by machine capabilities.

Overhang – for restricted access roofs. The unsupported area is not intended to be used as an access way.

Product		Thickness BMT	Maximum Span				Minimum radius for drape curve	Minimum radius for crimp or roll curve	Maximum overhang unsupported
			Restricted Access Roofing		Walls				
			End Span	Internal	End Span	Internal			
		(mm)	(m)	(m)	(m)	(m)	(m)	(mm)	(mm)
Steelspan 900 Min pitch 3°	Steel (G550)	0.55	2.9	4.3	3.3	5.0	120	N/A	450
		0.75+	4.0	6.0	N/A	N/A	120	N/A	600
	Aluminium H36	0.7+	1.6	2.5	1.7	2.6	N/R	N/A	250
		0.9	2.5	3.8	2.6	3.9	120	N/A	350
	Duraclad®	1.7	1.0	1.5	1.3	1.9	30	N/A	250
Topspan® Min pitch 3°	Steel (G550)	0.4+	2.0	3.0	2.3	3.5	N/A	N/A	250
		0.55	2.9	4.3	3.3	5.0	120	N/A	450
		0.75+	4.0	6.0	N/A	N/A	120	N/A	600
	Aluminium H36	0.7+	1.6	2.5	1.7	2.6	N/R	N/A	250
		0.9	2.5	3.8	2.6	3.9	120	N/A	350
	Duraclad®	1.7	1.0	1.5	1.3	1.9	30	N/A	250
DP955® Min pitch 3°	Steel (G550)	0.4	1.6	2.4	2.0	3.0	N/R	N/A	250
		0.55	2.7	4.0	2.9	4.3	70	N/A	350
BB900 Min pitch 3°	Steel (G550)	0.40	1.5	2.2	1.9	2.9	N/R	N/A	250
		0.55	2.3	3.4	2.7	4.1	90	N/A	350
		0.75	2.7	4.0	N/A	N/A	90	N/A	500
	Aluminium H36	0.7	1.1	1.7	1.6	2.4	N/R	N/A	200
		0.9	1.9	2.8	2.8	3.7	90	N/A	300
	Duraclad®	1.7	0.8	1.2	1.4	2.1	24	N/A	200
LT7 and LT5 Min pitch 3°	Steel (G550)	0.4	1.2	1.8	1.6	2.4	80	900	250
		0.55	1.9	2.9	2.3	3.4	50	400	350
	Aluminium H36	0.7	0.9	1.3	1.2	1.8	80	N/A	200
		0.9	1.5	2.3	1.9	2.9	50	400	300
	Duraclad®	1.7	0.8	1.2	1.3	2.0	24	N/A	200

Note: N/A = not available, N/R = not recommended, * = Roll curve only.
+ = Available only on request, subject to minimum order quantities. Check availability with Dimond
Refer to section 2.1.4: Specific Design by Profile for a manufacturing locality guide for each profile.

Table continued overleaf

Product		Thickness BMT (mm)	Maximum Span				Minimum radius for drape curve (m)	Minimum radius for crimp or roll curve (mm)	Maximum overhang unsupported (mm)
			Restricted Access Roofing		Walls				
			End Span (m)	Internal (m)	End Span (m)	Internal (m)			
V-Rib Min pitch 4°	Steel (G550)	0.40	1.2	1.8	1.9	2.9	20	400	200
		0.55	1.7	2.5	2.3	3.5	16	400	300
	Aluminium H36	0.7	0.9	1.3	1.6	2.4	20	N/A	150
		0.9	1.4	2.1	1.9	2.9	16	N/A	250
	Duraclad®	1.7	0.8	1.2	1.2	1.8	20	N/A	150
Styleline/Hi Five Min pitch 3°	Steel (G550)	0.4	1.0	1.6	1.5	2.2	80	900	200
		0.55	1.5	2.2	2.0	3.0	40	400	250
	Aluminium H36	0.7	0.8	1.2	1.1	1.6	80	N/A	100
		0.9	1.1	1.7	1.7	2.6	40	400	200
	Duraclad®	1.7	0.7	1.1	1.0	1.5	12	N/A	100
Veedek™ Min pitch 3°	Steel (G550)	0.4	1.0	1.6	1.5	2.2	N/R	N/A	200
		0.55	1.5	2.2	2.0	3.0	N/R	N/A	250
	Aluminium H36	0.7	0.8	1.2	1.1	1.6	N/R	N/A	100
		0.9	1.1	1.7	1.7	2.6	N/R	N/A	200
	Duraclad®	1.7	0.7	1.1	1.0	1.5	N/R	N/A	100
Six Rib Min pitch 4°	Steel (G550)	0.4	1.0	1.5	1.2	1.8	80	N/A	250
		0.55	1.5	2.2	1.6	2.4	40	N/A	250
Solar-Rib® Min pitch 3°	Steel (G550)	0.55	1.3	1.9	1.5	2.3	90	N/A	50
	Aluminium H36	0.90	0.8	1.2	1.0	1.5	90	N/A	50
Corrugate Min pitch 8°	Steel (G550)	0.4	0.8	1.2	1.0	1.5	12	450*	100
		0.55	1.0	1.5	1.2	1.9	10	450*	150
	Aluminium H36	0.7	0.5	0.8	0.8	1.2	12	450*	75
		0.9	0.8	1.2	1.2	1.8	10	450*	150
	Duraclad®	1.7	0.6	0.9	0.9	1.4	8	N/A	100
Dimondek® 630** Min pitch 3°	Steel (G550)	0.48	2.2	3.3	N/A	N/A	250	N/A	150
		0.55	2.4	3.6	N/A	N/A	250	N/A	250
Dimondek® 400** Min pitch 3°	Steel (G300)	0.55	1.1	1.6	1.2	1.8	70	N/A	250
		0.75	1.5	2.2	1.3	1.9	70	N/A	300
	Aluminium H36	0.9	0.9	1.3	0.9	1.4	70	N/A	200
	Copper 1/2 Hard	0.55	0.9	1.4	1.0	1.5	70	N/A	200
Dimondek® 300** Min pitch 3°	Steel (G300)	0.55	1.3	2.0	1.2	1.9	N/R	N/A	250
		0.75	1.5	2.3	1.5	2.3	N/R	N/A	350
	Aluminium H36	0.9	1.1	1.6	1.0	1.5	N/R	N/A	200
	Copper 1/2 Hard	0.55	1.1	1.8	1.1	1.7	N/R	N/A	200
Heritage Tray™ Min pitch 3°	Steel (G300)	0.55	0.5	0.5	0.5	0.5	N/A	N/A	0
	Aluminium H36	0.90	0.5	0.5	0.5	0.5	N/A	N/A	0
Eurotray® Lite Min pitch 8° Needs ply substrate	Steel (G300)	0.55	0.4	0.4	0.4	0.4	N/A	N/A	0
Eurotray® Angle Seam Min pitch 5° Needs ply substrate	Steel (G300)	0.55	0.4	0.4	0.4	0.4	40	N/A	0
	Aluminium H36	0.7	0.4	0.4	0.4	0.4	70	N/A	0
	Copper 1/2 Hard	0.7	0.4	0.4	0.4	0.4	40	N/A	0
	Zinc	0.7	0.4	0.4	0.4	0.4	40	N/A	0
Eurotray® Double Standing Seam Min pitch 3° Needs ply substrate	Steel (G300)	0.55	0.4	0.4	0.4	0.4	40	N/A	0
	Aluminium H36	0.7	0.4	0.4	0.4	0.4	70	N/A	0
	Copper 1/2 Hard	0.7	0.4	0.4	0.4	0.4	40	N/A	0
	Zinc	0.7	0.4	0.4	0.4	0.4	40	N/A	0
Eurotray® Roll Cap & Roll Seam Min pitch 5° Needs ply substrate	Steel (G300)	0.55	0.4	0.4	0.4	0.4	N/A	N/A	0
	Aluminium H36	0.7	0.4	0.4	0.4	0.4	N/A	N/A	0
	Copper 1/2 Hard	0.7	0.4	0.4	0.4	0.4	N/A	N/A	0
	Zinc	0.7	0.4	0.4	0.4	0.4	N/A	N/A	0
Audioperf® Ceiling only	Steel (G550)	Refer to full section 2.1.4.22							
Euro-Panel® Wall cladding only Needs ply substrate	Zinc	0.7	N/R	N/R	500	500	N/R	N/R	N/R
	Copper 1/2 Hard	0.7	N/R	N/R	500	500	N/R	N/R	N/R
Super Six Min pitch 3°	Duraclad®	1.7	1	1.2	1.4	1.7	28	N/A	250
Dimondclad Rib 20 & 50 Wall cladding only	Steel (G550)	0.4	N/R	N/R	0.9	1.4	N/R	N/A	100
	Aluminium H36	0.7	N/R	N/R	0.9	1.4	N/R	N/A	75
		0.9	N/R	N/R	0.9	1.4	N/R	N/A	100
Baby Corrugate Wall cladding only	Steel (G550)	0.4	N/R	N/R	0.4	0.6	N/R	N/A	75
		0.55	N/R	N/R	0.4	0.8	N/R	N/A	75
Fineline Wall cladding only	Steel (G550)	0.55	N/R	N/R	0.3	0.3	N/R	N/A	N/R
	Aluminium H36	0.9	N/R	N/R	0.3	0.3	N/R	N/A	N/R

Note: N/A = not available, N/R = not recommended, * = Roll curve only.
+ = Available only on request, subject to minimum order quantities. Check availability with Dimond
Refer to section 2.1.4: Specific Design by Profile for a manufacturing locality guide for each profile.
**Ultimate loads apply to the Dimondek range

ROOF PROFILE FLOW CAPACITY

Theoretical calculation has shown that apart from Corrugate and V-Rib, all other Dimond roofing profiles are capable of accommodating the water from the most intense downpours (200mm/hr), even where total roof runs (ridge to gutter) reach 200m.

The lower rib, multi channel profiles Corrugate and V-Rib, have the following capacity restrictions for the total run of roof.

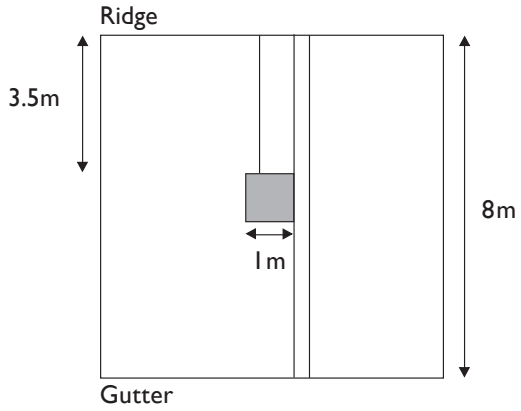
	Max Channel length (m)	Channel width (mm)
Corrugate	25	76
V-rib	80	101.6

(These are the recommended maximum lengths (from ridge to gutter) of the water channels to avoid side lap leakage.)

Where water flows are interrupted (e.g. penetrations, or where water is accumulated and deposited from an upper roof onto a lower roof), care must be taken to calculate the total length of channel within the catchment area that will be diverted to one roofing channel. This calculated length must then be added to the length of channel (ridge to gutter) the water will be diverted into. The total length must not exceed the calculated capacity (maximum channel length) of the profile used. Where it is anticipated that the profile capacity will be exceeded (thereby causing a risk of water flowing under the side flashing), steps must be taken to divert the water flow to a greater number of channels, or select a profile that can better handle the anticipated water flow.

When using all other Dimond profiles, please contact Dimond if the anticipated catchment area (channel length) exceeds 200m.

E.g. where a penetration interrupts the water flow on Dimond Corrugate



Width of penetration.	1m
Divided by the width of a Corrugate channel.	76mm
	1 ÷ .076mm =13.15 channels
Take half this number as only 1/2 the catchment area will be diverted into the channel beside the penetration.	7 channels
Multiplied by the run of roof from ridge to the back of the penetration.	7 x 3.5m = 25.5m
Add the length of one full channel (ridge to gutter), as this channel will carry the water collected from behind the penetration to the gutter.	+ 8
	= 33.5m

As the total amount of channel behind the penetration plus one channel from ridge to gutter exceeds the recommended maximum length of Corrugate channel, the water behind the penetration will need to be diverted into more than one channel to avoid the possibility of side lap leakage, or an alternative profile chosen.

DISSIMILAR MATERIALS

Corrosion from dissimilar materials usage may have two origins:

- Contact between different metals, producing a galvanic cell which causes the more active metal to corrode.
- Water run-off from particular materials on to a metal, causing corrosion.
- Surface oxide, relative surface areas, water purity and environmental factors can influence the outcome, so the consequences may not relate strictly to the well-publicised Galvanic Series.
- Table 2.1I shows which metals and materials can be used together in a roof and/or gutter installation and which should be avoided.

If dissimilar metal usage cannot be avoided then contact and/or water run-off must be avoided by insulating surfaces. Separation by rubber seal or coating the surfaces and maintaining the coating as an effective barrier for the life of the roof will be required. For further important information refer to the MRM code of practice at www.metalroofing.org.nz.

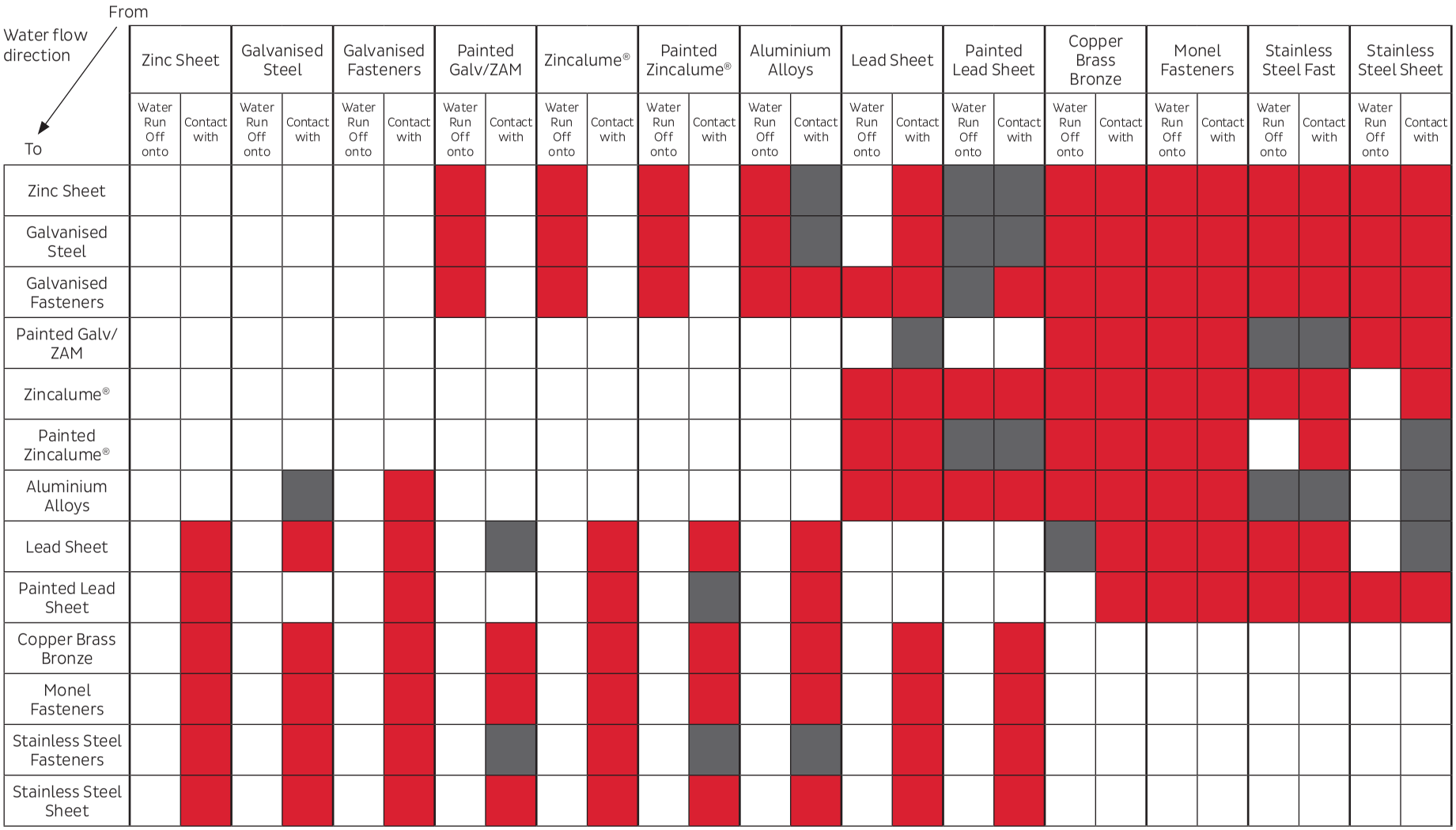
Contact with non-metal materials and water run-off from them can also cause corrosion problems. Well-known examples are:

- Inert catchment – where water running from a non-zinc surface onto unpainted galvanised steel can cause rapid consumption of galvanising. The guilty surfaces include glass, plastic including GRP sheeting, painted or unpainted Zincalume®, painted galvanised steel, concrete tiles and butyl rubber. (The effect is often seen on the unpainted interior surface of galvanised gutters where rust spots will appear at each water drip point).
- Timber – particularly copper treated including treated timber walkways. Any contact with wet timber should be avoided.
- Lime cement and concrete.
- Wet insulation.
- Soot or sulphur.
- Carbon (lead pencil or some black sealing washers), which causes Zincalume® to corrode.
- Galvanised netting must not be used directly under aluminium roofing. Where the galvanised netting has not been correctly isolated and has made or can make contact with the underside of the aluminium roof, pitting of the aluminium will occur. Either avoid using galvanised netting or isolate contact with an inert strip such as Dimond purlin protection strip or install over a vented drainage mat. Building paper cannot be relied upon as an inert strip, especially in severe marine environments.
- When stainless steel fasteners are used through aluminium roofs an oversize clearance hole around the fixing and a profiled metal washer with an EPDM seal must be used. If the fastener is not isolated from the roofing, any moisture, especially salt laden air, creates a corrosive cell between the stainless steel and the aluminium which results in rapid corrosion of the aluminium. Alternatively aluminium fasteners can be used (with an oversize clearance hole around the fixing and a profiled metal washer with an EPDM seal) into non-copper treated timber in place of stainless steel fasteners.
- Clouts or staples must not be allowed to make contact with aluminium roofs.

Table 2.1I Dissimilar Metals Guide – Overleaf

Table 2.11 Dissimilar Metals Guide

Example – Zincalume®: to check the compatibility of Zincalume® with other material, locate Zincalume® along the top (horizontal axis) and check the water run-off and contact columns for compatibility with other materials. This indicates, for example, that water run-off from Zincalume® onto unpainted galvanised steel must be avoided, but that direct contact between Zincalume® and galvanised steel is acceptable.



THERMAL MOVEMENT

The theoretical expansion and contraction movement of long run roofing and cladding sheets due to temperature change of the material can be calculated and then an appropriate fastening method specified.

Only thermal movement along the sheet length need be considered, as thermal movement across the sheet is accommodated by the profile shape.

DESIGN GUIDELINE

(a) Determine The Thermal Expansion Coefficient

Select the appropriate thermal expansion coefficient from the Table 2.1J:

Table 2.1J Thermal Expansion Coefficients

Sheet Material	Thermal Expansion Coefficient $\propto$ (mm/m°C)
Steel	0.012
Aluminium	0.023
Copper	0.017
GRP*	0.029

(* GRP refers to glass reinforced polyester material used to manufacture the Dimond Duraclad, Durolite and Maxilite products.)

(b) Determine The Expected Temperature Range

The temperature extremes (from nighttime winter to daytime summer) that the sheet material is expected to attain need to be assessed.

Use the Table 2.1K as a general rule to select the likely maximum and minimum temperatures.

These tabulated values may not be reached in less severe environments (e.g. North Island coastal) but may be exceeded in special circumstances (e.g. sheltered valley Central Otago).

Table 2.1K Guide To Surface Temperatures

Roof Type	Surface Appearance	Guideline Temperature Extremes °C			
		Uninsulated Roof		Insulated Roof	
		Max	Min	Max	Min
Steel or Aluminium	Unpainted	50	-10	60	-15
Steel or Aluminium	Light Colour	50	-10	60	-15
Steel or Aluminium	Dark Colour	65	-10	80	-15
Copper	Unpainted	65	-10	80	-15
Duraclad® (GRP)*	Light Colour	50	-10	60	-15
Duraclad® (GRP)*	Dark Colour	60	-10	70	-15
Natural Lighting (GRP)*	Clear or Tint	45	-10	-	-

(*GRP refers to glass reinforced polyester material used to manufacture the Dimond Duraclad, Durolite and Maxilite products.)

(c) Calculate The Theoretical Thermal Movement

Theoretical Thermal Movement (mm) = $\propto$ x ΔT x L

Where $\propto$ = thermal expansion coefficient, mm/m°C

ΔT = (max temp) – (min temp) = expected temperature range, °C

L = roof sheet length, m

Example – Light colour, insulated, steel roof, sheet length 12m

Theoretical Thermal Movement = 0.012 x (60-(-15))x12 = 10.8mm

(d) Specify The Appropriate Fixing Method

The theoretical thermal movement must be accommodated by the method used to fix the roof sheeting to the roof structure. Low rib sheet profiles are less rigid and are therefore able to bow slightly between purlin lines and accommodate more movement than the more rigid, high rib profiles.

Select the appropriate fixing method from Table 2.1L.

Table 2.1L Fixing Methods To Accommodate Thermal Movement

	Theoretical Thermal Movement (MM)			
Fixing Method	HIGH RIB BB900, LT7, SS900, Topspan®, DP955®, Solar-Rib®	LOW RIB Corrugate, Veedek™, Styleline, V-Rib, Hi Five, Six Rib	Decking	
			DD400 DD300	DD630
1. Solid Fix Screw fasteners without oversize holes, profile washers may not be necessary (reference Section 2.1.4)*	Up to 10mm	Up to 13mm	-	-
2. Oversize Holes, One End Top 2/3 of sheet length: screw fasteners without oversize holes, profile washers may not be necessary (refer Section 2.1.4)* Bottom 1/3 of sheet length: screw fasteners with 10mm ø oversize holes, and profile washers with 36mm ø EPDM seals	10 - 15mm	13 - 20mm		
3. Oversize Holes, Both Ends Top 1/4 of the sheet length: screw fasteners with 10mm ø holes and profile washers with 36mm ø EPDM seals. Middle 1/2 of sheet length: screw fasteners without oversize holes, profile washers ma not be necessary (refer Section 2.1.4)* Bottom 1/4 of the sheet length: screw fasteners with 10mm ø holes, and profile washers with 36mm ø EPDM seals.	15 - 20mm	20 - 26mm		
4. Clip Fastening of Decking/Eurotray®	-	-	Up to 30mm	**Up to 80mm

**Consideration must be given to sheet clearances between the building structure to achieve this max amount of movement. Any Natural Lighting sheets need to match this special design. Call 0800 ROOFSPEC to discuss.
*Note that Duraclad (GRP) sheets require a minimum pre-drilled hole diameter of 2mm greater than the screw diameter, and require washers (refer Section 2.1.4).

(e) Extra Long Roof Runs

Proposed lengths of sheeting that give theoretical thermal movement outside the scope of Table 2.1L will require the sheets to be in two or more separate lengths. The joining of these lengths must accommodate the thermal movement and therefore should be specified to the requirements for a Step Joint – refer specific detail drawings in Section 2.1.4.

(f) Horizontal Cladding

Avoid end laps and use a butt joint with a top hat flashing joiner. Consideration for thermal expansion movement on wall cladding should be made on wall runs above 8m. This may involve the use of a butt joint top hat flashing.

CONDENSATION

Condensation forms on the inside surface of metal roofing and wall cladding when warm, moist air inside the building contacts the colder metal surface.

The amount of condensation that forms depends on the relative humidity of the air, the air temperature and the metal surface temperature.

To minimise the effects of condensation through design choice, the following must be considered:

(a) Roofing Underlay

Specify a breather type underlay complying with NZS 2295 under metal roofing to absorb condensation that drips from the underside of the roofing. Roofing underlay should also always be used to cover roof space insulation. Breather-type underlays should be selected from the options in Table 2.1M.

Table 2.1M Breather-Type Underlays

Performance Required	Bitumac 710	Thermakraft 213	Bitumac 750	Framegard G3
Suitable as roofing underlay	No	Yes	Yes	No
Suitable as wall wrap	Yes	Yes	Yes	Yes
Requires netting or strapping for support	No (used on walls only)	Yes (over 1200mm span only)	Yes	No (used on walls only)
Can be unsupported on spans up to 1200mm	No	No	Yes	No
Fire retardant lining to NZBC Clause C3 requirements	No	No	No	Yes
Suitable for wet, wind, exposed situations	No	Yes	Yes	No

(b) Vapour Barrier

A material that is to a large degree impermeable to water vapour (foil or plastic covered, reinforced paper) can be used under insulation to restrict the amount of moist air reaching the cold metal surface (refer Section 2.4.3).

To achieve an effective vapour barrier all laps must be taped. Refer 2.4.3.1.3.

Vapour barriers should not be relied upon to achieve a total elimination of water contacting the metal surface.

The effectiveness of the vapour barrier to prevent condensation is determined by how effectively the vapour barrier surface temperature is kept above the moist air dew point by the use of insulation.

Continued on next page...

(c) Ventilation

Airflow to remove moist air from the building or roof space must be considered in cold climates and in buildings where moisture is generated within the building space. Consider specifying either natural draft open ridge or Ampelair ventilation (refer Section 2.4.4), or forced air ventilation using powered fans.

Ridge ventilators are partly open to the weather to allow sufficient airflow and may allow rain droplets to enter the building in high wind conditions.

Where there is no internal ventilation within the roof space there must be ventilation between the roof and the underlay.

This may mean leaving the ridge or eave filler strips out to allow air movement.

In enclosed applications such as swimming pool covers with internal ceilings or processing plant buildings with ceilings, that may create a build-up of moisture or pollutants, there must be adequate ventilation to minimise any corrosion risk on the ceiling or roof underside.

To minimise the corrosion risk, this may include allowing for frequent air changes by installing suitable fan and air extraction systems and/or specifying Duraclad®.

(d) Roofing and Cladding Material

The metal roofing and cladding material must be chosen to have sufficient resistance on the inside surface to degradation by exposure to the level of condensation expected.

In harsh industrial environments the durability of the internal surface may dictate the material used.

FLASHING DESIGN

General (2.1.3.6.1)

When considering the flashings for your job be aware that our range of standard flashings (see Section 2.2.4) are a small sample of what is possible. Below is a summary of the issues and the limitations that should be considered when detailing specific flashing shapes.

The material used will be:

Table 2.1N

	Thickness (mm)	Grade
Steel	0.55mm	G300
Aluminium	0.9mm	5052/5251 - H34

Copper and stainless steel are available upon request. Please contact Dimond on 0800 DIMOND (0800 346 663) to check availability.

The girth of the flashing will be limited in one direction to 1219mm maximum (coil width). Where one dimension is 1219mm or less, the recommended maximum length (the other dimension) is 6m. Lengths longer than 6m should be avoided, as thermal expansion issues will be accentuated with flashings.

Where flashing shapes are complex or bulky, it is recommended the maximum lengths be kept to 3m to assist with handling and installation of the product.

As the flashing shapes are created by mechanical folding there are certain limitations relating to the angle of the folds and the distance between two folds that need to be considered. The tightness that the material can be folded back on itself will also limit the options. The limitations will vary depending on material type including whether the material is painted. To confirm that your specific detail can be manufactured, please consult with Dimond on 0800 DIMOND during the planning stage.

Flashings running across sheet profiles must be finished to minimise the gap created over profile pans or troughs. This is achieved by notching the front downturn of the flashing over the sheet profile ribs, or on the Corrugate Profile a soft edge to the flashing can be used (refer Section 2.2.4.3). Notching should be specified as “flashing to be notched on site”.

When Duraclad is the selected roof or wall material, aluminium flashings are normally recommended. In some chemical environments a check on the suitability of aluminium should be made.

Other things to consider in the design and installation of flashings:

- flashings must shed moisture to the outside of the building;
- flashings must not retain moisture (all flashing surfaces must maintain a minimum 3º fall);
- all flashing surfaces to be no wider than 300mm in one plane unless strengthening ribs are incorporated or there is additional support underneath;
- the cover provided shall be sufficient to ensure wind driven moisture does not enter the building (see Table 2.1.O). Flashings may be used either with or without compressible foam strip. When installed correctly the foam strip will restrict air flow and carriage of water under the flashing.
- where several 6m lengths of flashings are lapped end to end and joined by rivets and sealant, consideration must be given to accommodating thermal expansion if the assembled length exceeds 18m for steel or 12m for aluminium.
- details showing flashing placement for steps in long runs of roofing are shown in the detail drawings for each profile

Change of Pitch (2.1.3.6.2)

Where there is a change of pitch in the roof, there are two options to create a watertight junction between the roofs.

A – include an apron flashing.

B – run the upper roof over the lower roof.

Option A is recommended and relies on flashing cover widths as shown in Table 2.1.O. This option must be used where the profile of the upper roof is different to the lower roof.

Option B while aesthetically more appealing relies on care being taken to align upper and lower sheets. However, there are certain limits which must be understood. This option is only suitable where the change in pitch is less than 20º and the lower roof can extend up under the upper roof by at least 150mm. Care will be required to avoid contact between the upper and lower sheet to ensure scratching does not occur. Movement of the top sheet through thermal expansion will also need to be considered. Maintenance is critical to remove any build-up of debris between the sheets and avoid unseen corrosion.

Whichever option is chosen, the top end of the lower sheet must be stop ended.

Fixings (2.1.3.6.3)

As the flashings are usually located at the perimeter of the structure, they are often subjected to the highest wind pressures. Accordingly the fixing patterns used must adequately accommodate the expected wind loads.
Where a flashing covers the roof or wall cladding, the primary fastening must penetrate through to the support structure (purlin or girt). The location of the fasteners used to secure the roof will be suitable to fasten the flashing.

Where thermal expansion is being accommodated at the ridge, primary fastenings should not be used to hold the flashing. Other options such as clips will be required.

Where the flashing covers a barge or parapet in low and medium wind zones, the fastener should be spaced at no more than 1m centres along the vertical face. In high wind zones and above (over 45m/sec), the maximum spacing should not exceed 500mm.

Where secondary fastenings (a fixing that secures the flashing to roof sheet only) are used to fasten the laps and provide additional hold down (side lap stitching), stitching screws are recommended. If aluminium rivets are used, the minimum diameter shall be 4.8mm.

Penetrations (2.1.3.6.4)

When designing penetrations it is critical to understand the issues that exist when a hole is cut in the roof sheeting. Where holes exceed 200mm in either direction the structure will need to be strengthened to ensure structural integrity is maintained and fixing points for the flashing are provided. Consideration must also be given to the additional weight that may be applied to the roof structure through the placement of plant (air conditioning units) on the roof.

It is also necessary to consider the effect the penetration will have on the flow of water down the roof. In instances where large penetrations are installed, the water from several pans may be channelled into one pan beside the penetration. If the flow capacity of the pan is exceeded, flooding of the side lap may occur, or water may dam back up the sheet and flood over the back flashing positioned above the penetration.

Please consider the potential catchment area and subsequent flow rate and where necessary direct water across several pans to ensure water flow does not create a leakage issue. See Section 2.1.3.2 for the flow capacity of each profile.

Continued on next page...

Table 2.1.O Effective Minimum Cover of Flashing Over Roof Sheet (mm)

Flashing Type	Min. Flashing Cover Dimension over Roof or Cladding (mm)	
	Low, medium or high wind zones where roof pitch is 10° or greater	For all pitches in very high wind zones and above, and for all wind zones where roof pitch is less than 10°
Ridge - transverse over roofing	130	200
Barge - parallel with ribs - parallel with corrugate - vertically down smooth face sheet - vertically down profiled face sheet	 1 rib 2 corrugations 50 75	 2 ribs 3 corrugations 75 100
Apron - transverse over roofing - parallel with ribs - parallel with corrugate - vertically up smooth face sheet - vertically up profiled face sheet	 130 1 rib 2 corrugations 50+ hem or 75 75+ hem or 100	 200 2 ribs 3 corrugations 75+ hem or 100 100+ hem or 125
Parapet - vertically down smooth face sheet - vertically down profiled face sheet	 50 75	 75 100

Notes:

Dimension excludes any soft edge or turn down to roofing.

Wall cladding must finish within 25mm above any apron flashing to allow clearance and avoid dirt building up.

In high wind areas a profiled foam seal can be used under the ridge or apron flashing, over the roofing, to create a pressure differential chamber to avoid moisture being driven in. The foam seal should be placed adjacent to the stop end at the head of the sheet.

All roof and wall cladding profiles are to be stop ended at the top end of the sheet on all pitches.

The cover dimensions given above are the cover over the roof or wall cladding not the leg length of the flashing.

On profiles other than Corrugate where cover over 2 ribs is required, flashings must cover at least one rib plus the trimmed side of the sheet turned up to the full height of the rib.

REFLECTANCE VALUES

Light Reflectance Values (LRV) refers to the total quantity of visible light that when illuminated by a light source is reflected by a surface. LRV runs on a scale from 0% (absolute black) to 100% (perfectly reflective white). However the amount of reflectivity will vary depending on the angle of incidence of the light onto the cladding surface and this must be taken into consideration in using these values.

NB: Slight variations in values may occur between different batches of product due to manufacturing tolerances.

COLOURSTEEL® Range (2.1.3.7.1)

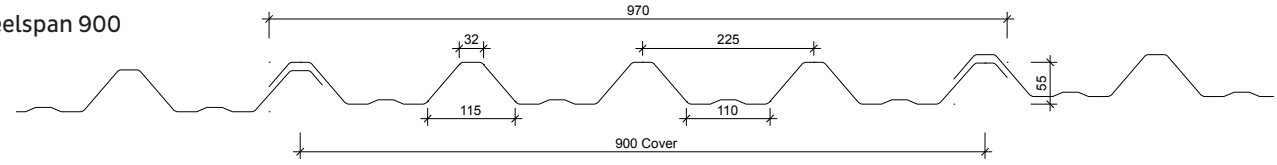
COLOURSTEEL® Colour	LRV %	COLOURSTEEL® Colour	LRV %
Cloud	74	Mist Green	25
Desert Sand	49	New Denim Blue	11
Ebony	5	Permanent Green	11
FlaxPod	7	Pioneer Red	13
Grey Friars	10	Sandstone Grey	27
Gull Grey	51	Scoria	10
Ironsand	8	Slate	9
Karaka	8	Thunder Grey	12
Lichen	27	Titania	68
Lignite	11	Windsor Grey	7

ColorCote® Range (2.1.3.7.2)

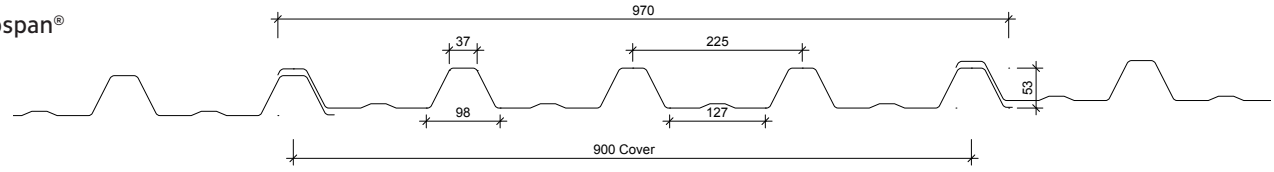
ColorCote® Colour	LRV %	ColorCote® Colour	LRV %
Black	5.32	Pacific White	49.90
Bone White	57.41	Pebble	32.80
Desert Sand	45.73	Permanent Green	10.66
Forest Fern	14.41	Pioneer Red	16.02
Grey Flannel	20.18	Poppy	27.87
Grey Friars	10.81	Rivergum	18.13
Gull Grey	46.98	Sandstone Grey	25.39
Ironsand	9.55	Scoria	11.66
Karaka	8.24	Seabird	12.19
Lancewood	7.80	Slate	9.53
Lazerite Blue	13.46	Slate Blue	9.05
Lichen	24.78	Smokey	29.28
Lignite	10.03	Smooth Cream	65.12
Metallic Gunmetal	No LRV	Storm Blue	12.46
Metallic Silver	No LRV	Terracotta	25.20
Mist Green	24.36	Threadbow White	78.61
Mudstone	16.08	Thunder Grey	13.14
New Denim Blue	12.02	Titania	65.92
Nimbus	22.68	Weathered Copper	11.65
Off White	67.63	Windsor Grey	10.61
Pacific Cloud	51.78		

DIMOND STEELSPAN 900 AND TOPSPAN® PROFILE PERFORMANCE

Steelspan 900



Topspan®



Cover (mm)	900
Sheet width (mm)	970
Minimum Pitch	3° (approx. 1:20)

All dimensions given are nominal

Sheet Tolerances

Sheet width: ±5mm

Sheet width for aluminium +0, -15. If sheet cover widths are critical, advise Dimond at time of order.

Sheet length: +10mm, −0mm. For horizontal wall cladding where notified at time of order of intended use, tighter tolerances can be achieved +3mm, −0mm.

Material Options Profile	Steel			Aluminium*		Duraclad®
	Topspan®	Both	Both	Both	Both	Both
Thickness (BMT) mm	0.4*	0.55	0.75*	0.7	0.9	1.7 (total thickness)
Nominal weight/lineal metre (kg/m)	4.12	5.55	7.47	2.31	2.96	2.70
Drape curved roof - min. radius (m)	n/r	120	120	n/r	120	30
Purlin spacings for drape curved roof (m) (1)	n/r	2.4	2.4	n/r	2.4	1.5
Machine crimp curved - roof min. radius (mm)	n/a	n/a	n/a	n/a	n/a	n/a
Unsupported overhang (2) (mm)	250	450	600	250	350	250

*Available only on request, subject to minimum order quantities. Check availability with Dimond.

(1) 0.4mm BMT not recommended for internal ceiling applications.
(2) Recommended maximum purlin spacing at minimum radius.
(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 at:	Hamilton – Steelspan 900 Christchurch – Topspan®
Manufacturing location for Duraclad®:	Auckland
Sheet lengths:	Steelspan 900 and Topspan® are custom run to order.

Where long sheets are used consideration must be given to:

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

STEELSPAN 900 AND TOPSPAN® 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 or Wall	
G550 Steel 0.40mm* Topspan® only	End Span	1200	1300	1500	1800	2000	2200	2300
	Internal Span	1800	2000	2200	2700	3000	3300	3500
	Serviceability	3.4	2.7	2.6	2.0	1.6	1.5	1.3
G550 Steel 0.55mm	End Span		2000	2300	2400	2900	3300	3400
	Internal Span		3000	3500	3600	4300	5000	5100
	Serviceability		2.3	1.8	1.7	1.3	1.0	0.9
G550 Steel 0.75mm*	End Span		2800	2900	3400	4000	4100	4300
	Internal Span		4200	4400	5200	6000	6200	6600
	Serviceability		2.3	2.2	1.8	1.5	1.3	1.1
5052, H36* Aluminium 0.70mm	End Span		1100	1200	1400	1600	1700	
	Internal Span		1700	1800	2100	2500	2600	
	Serviceability		2.6	2.4	2.0	1.6	1.4	
5052,H36 Aluminium 0.90mm	End Span		1700	1800	2100	2500	2600	
	Internal Span		2600	2700	3200	3800	3900	
	Serviceability		2.2	2.0	1.5	1.2	1.0	
Duraclad® 1.7mm (note 4)	End Span				900	1000	1100	1300
	Internal Span					1500	1600	1900
	Serviceability Ultimate	N/R	N/R			- 4.4	- 3.6	- 2.4

*Available only on request, subject to minimum order quantities. Check availability with Dimond.

Notes

1. In any category, spans above the maximum shown should not be used. Category 1 and 2 maximum spans are based on static point load testing as a guide, and further limited by practical experience of roof performance under dynamic foot traffic loads. Category 3 maximum spans are limited as a guide to achieving satisfactory appearance for wall cladding.
2. Loads given are based on 4 screw fasteners/sheet/purlin.
3. Loads given are limited to a maximum of 4.5 kPa. If design requirements exceed this limit, contact Dimond for specific advice.
4. 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.
5. N/R = not recommended.
6. End span capacities given in this table are based on the end span being 2/3 of the internal span.
7. **Design Criteria for Limit State Capacities**

   a) Serviceability Limit State
   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.

   b) Ultimate Limit State
   No pull through of fixings or fastener withdrawal resulting in sheet detachment due to wind up-lift (outward) loads.
8. **System Design**
   The span capacity of Steelspan 900 and Topspan® are determined from the Steelspan 900 and Topspan® Limit State Load/Span Capacity Chart using the section of the chart appropriate to the grade and type of material, and to the category of serviceability selected from the three categories below. Serviceability loads have been derived by test to the NZMRM testing procedures. To obtain an ultimate limit state load we recommend factoring the serviceability load up by 1.4 in-line with NZMRM guidelines. The capacities given do not apply for cyclonic wind conditions.

   Serviceability Requirements
   While these categories are given for design guidance to meet the serviceability limit state criteria, foot traffic point load damage may still occur if there is careless placement of these point loads.

Service Category	Description
1. Unrestricted-access roof	Expect regular foot traffic to access the roof for maintenance work and able to walk anywhere on the roof. No congregation of foot traffic expected.
2. Restricted-access roof	Expect occasional foot traffic educated to walk only on the purlin lines, in the profile pans, or carefully across two profile ribs. Walkways installed where regular traffic is expected, and “Restricted Access” signs placed at access points.
3. Non-access roof or wall	Walls or roofs where no foot traffic access is possible or permitted. If necessary, “No Roof Access” signs used.

9. **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.

Fastener Design

Steelspan 900 and Topspan® should be screw fixed to either timber or steel purlins. The use of the appropriate length of 14g roofing screw will ensure failure by screw pull out will not occur under loads within the scope of the Limit State Load / Roofing Span Capacity Chart.

Purlin Type	Screw Fastener			
	Roofing Rib		Wall Clading Pan	
	Screw Length* (mm)	Designation	Screw Length* (mm)	Designation
Timber	100	T17 - 14 - 10 x 100	50	Roofzip M6 x 50 HG-Z4
Steel	95	Tek - 14 - 10 x 95	20	Tek - 12 - 14 x 20

*If sarking or insulation is used over the purlins or for wall cladding fixing onto a cavity batten, into the stud, the screw length will need to be increased.

For screw size range and fastener / washer assembly refer Section 2.2.3.1.

The Limit State Load / Span Capacity Chart is based on 4 screw fasteners/sheet/purlin without the use of load spreading washers (except for 0.4mm steel, 0.7mm aluminium and Duraclad® material, which must be fitted with profiled metal washers and 36mm EPDM seals).

Profiled metal washers are recommended for use:

1. On end spans, or large internal spans where the Ultimate Limit State distributed load is limiting. Contact Dimond for specific advice in these design cases.
2. When required to enable the fixing system to accommodate the thermal movement of long sheets – see Section 2.1.3.4 Thermal Movement.
3. Wherever the designer wishes to ensure the risk of fastener over-tightening will not cause dishing of the crest of the profile rib.

Use in serviceability categories (1) or (2) can allow the reduction of fasteners to 2 screw fasteners/sheet/purlin by using 2 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 Steelspan 900 has a maximum end span of 2900mm and a maximum internal span of 4300mm. The following distributed load capacities apply.

	4 fasteners/sheet	2 fasteners/sheet
End Span	2900mm	2900mm
Internal Span	4300mm	4300mm
Serviceability	1.3 kPa	0.6 kPa

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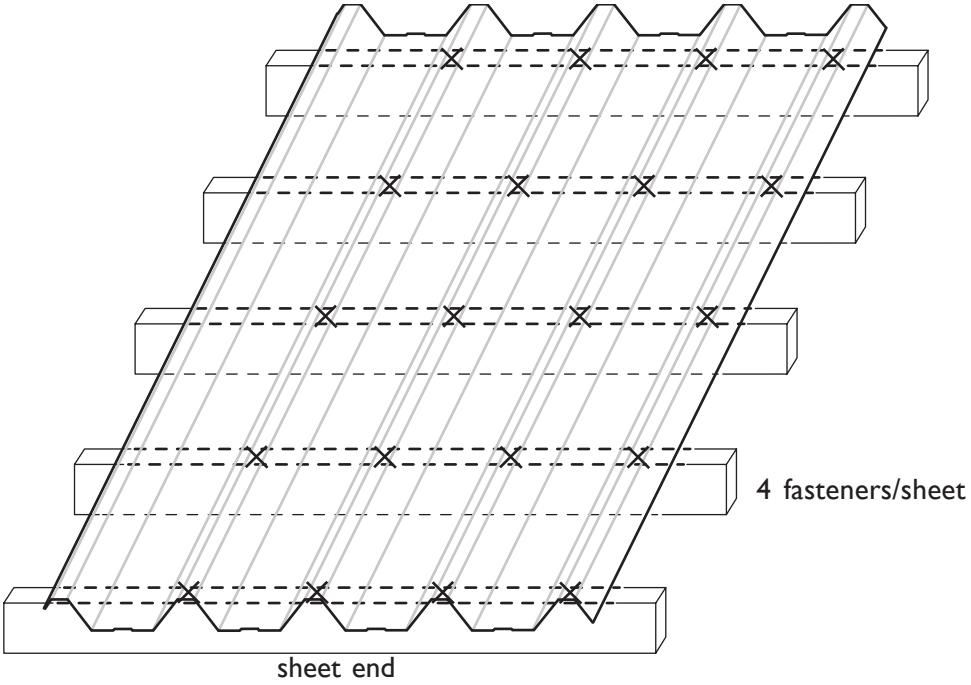
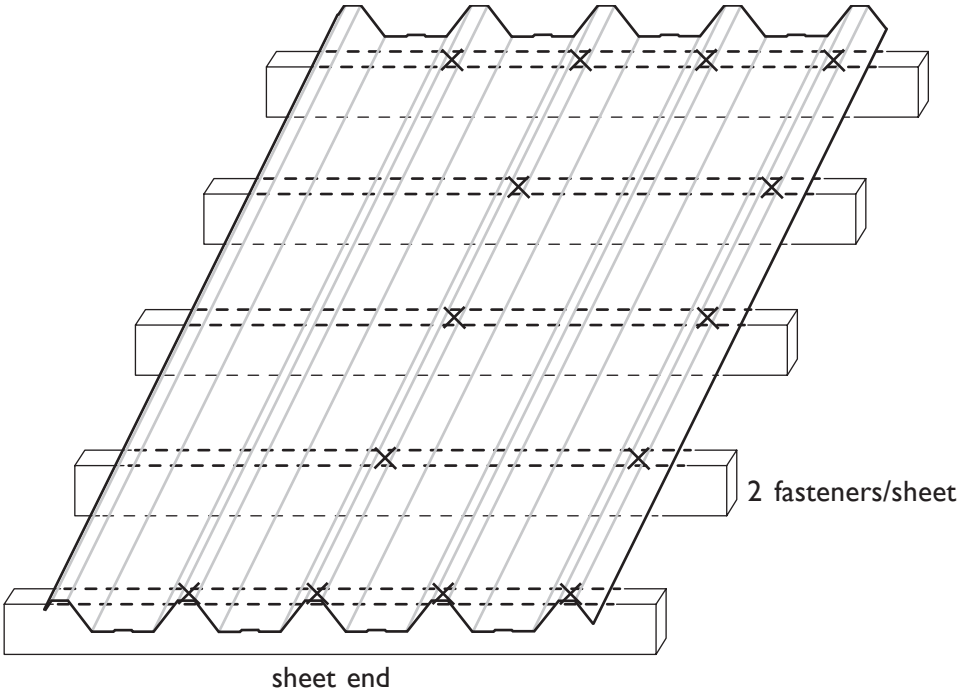
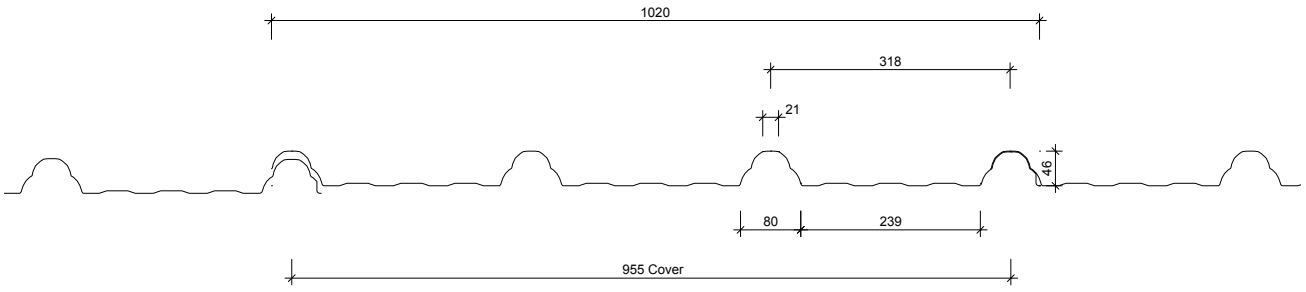
DIMOND STEELSPAN 900 AND TOPSPAN®
FASTENER LAYOUT OPTIONS





DIMOND DP955® PROFILE PERFORMANCE



Cover (mm)	955
Sheet width (mm)	1020
Minimum Pitch	3° (approx. 1:20)

All dimensions given are nominal

Sheet Tolerances

Sheet width: ±5mm

Sheet length: +10mm, –0mm. For horizontal wall cladding where notified at time of order of intended use, tighter tolerances can be achieved +3mm, –0mm.

Material Options Profile	Steel	
Thickness (BMT) mm	0.4	0.55
Nominal weight/lineal metre (kg/m)	4.12	5.55
Drape curved roof - min. radius (m)	n/r	70
Purlin spacings for drape curved roof (m)(1)	n/r	2.7
Machine crimp curved - roof min. radius (mm)	n/a	n/a
Unsupported overhang (2)(mm)	250	350

(1) Recommended maximum purlin spacing at minimum radius
(2) Based on 1.1kN point load support, but not intended for roof access.
n/r – not recommended
n/a – not available

Notes:

1. Where purlin spacings for roofing exceed 1.5m for 0.4mm or 2m for 0.55mm, the sidelap must be fastened in accordance with Section 2.3.2
2. When notching flashings around the DP955® rib, use straight cuts rather than follow the curve rib shape

Roll-forming facility at: Auckland and Christchurch

Sheet lengths: DP955® is custom run to order.

Where long sheets are used consideration must be given to:

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

Refer Section 2.1.3.4.

DP955® 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 or Wall	
G550 Steel 0.40mm	End Span			800	1100	1300	1600	1800	2000
	Internal Span			1400	1700	2000	2400	2700	3000
	Serviceability			2.3	1.9	1.6	1.3	1.1	1.0
G550 Steel 0.55mm	End Span	1600	1800	2000	2200	2400	2700	2900	
	Internal Span	2400	2700	3000	3300	3600	4000	4300	
	Serviceability	2.0	1.8	1.6	1.4	1.3	1.2	1.1	

Notes

1. In any category, spans above the maximum shown should not be used. Category 1 and 2 maximum spans are based on static point load testing as a guide, and further limited by practical experience of roof performance under dynamic foot traffic loads. Category 3 maximum spans are limited as a guide to achieving satisfactory appearance for wall cladding.
2. Loads given are based on 3 screw fasteners/sheet/purlin with load spreading washers.
3. Loads given are limited to a maximum of 4.5 kPa. If design requirements exceed this limit, contact Dimond for specific advice.
4. End span capacities given in this table are based on the end span being $^{2}/_{3}$ of the internal span.
5. **Design Criteria for Limit State Capacities**

   a) Serviceability Limit State
   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.
6. **System Design**
   Serviceability loads have been derived by test to the NZMRM testing procedures. To obtain an ultimate limit state load we recommend factoring the serviceability load up by 1.4 in-line with NZMRM guidelines. The capacities given do not apply for cyclone wind conditions.

   Serviceability Requirements
   While these categories are given for design guidance to meet the serviceability limit state criteria, foot traffic point load damage may still occur if there is careless placement of these point loads.

Service Category	Description
1. Unrestricted-access roof	Expect regular foot traffic to access the roof for maintenance work and able to walk anywhere on the roof. No congregation of foot traffic expected.
2. Restricted-access roof	Expect occasional foot traffic educated to walk only on the purlin lines, in the profile pans, or carefully across two profile ribs. Walkways installed where regular traffic is expected, and “Restricted Access” signs placed at access points.
3. Non-access roof or wall	Walls or roofs where no foot traffic access is possible or permitted. If necessary, “No Roof Access” signs used.

7. **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.

Fastener Design

DP955® should be screw fixed to either timber or steel purlins. The use of the appropriate length of 12g or 14g screw will ensure failure by screw pull out will not occur under loads within the scope of the Limit State Load / Span Capacity Chart.

Purlin Type	Screw Fastener			
	Roofing Rib		Wall Cladding Pan	
	Screw Length* (mm)	Designation	Screw Length* (mm)	Designation
Timber	100	T17 - 14 - 10 x 100	50	Roofzip M6 x 50 HG-Z4
Steel	75	Tek - 14 - 14 x 75	20	Tek - 12 - 14 x 20

*If sarking or insulation is used over the purlins or for wall cladding fixed onto a cavity batten, into the stud, the screw length will need to be increased.

For screw size range and fastener / washer assembly refer Section 2.2.3.1.

The Limit State Load / Span Capacity Chart is based on 3 screw fasteners/sheet/purlin with the use of load spreading washers and 36mm dia EPDM seals.

Profiled metal washers are recommended for use:

1. On end spans, or large internal spans where the Ultimate Limit State distributed load is limiting. Contact Dimond for specific advice in these design cases.
2. When required to enable the fixing system to accommodate the thermal movement of long sheets – see Section 2.1.3.4 Thermal Movement.
3. Wherever the designer wishes to ensure the risk of fastener over-tightening will not cause dishing of the crest of the profile rib.

Where screws are used without load spreading washers, the profile's load span ability is reduced by 60%.

Long spans above 1.5m for 0.4mm and 2.0m for 0.55mm 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 DP955® has a maximum end span of 2700mm and a maximum internal span of 4000mm. The following distributed load capacities apply.

	3 fasteners/sheet
End Span	2700mm
Internal Span	4000mm
Serviceability	1.2 kPa

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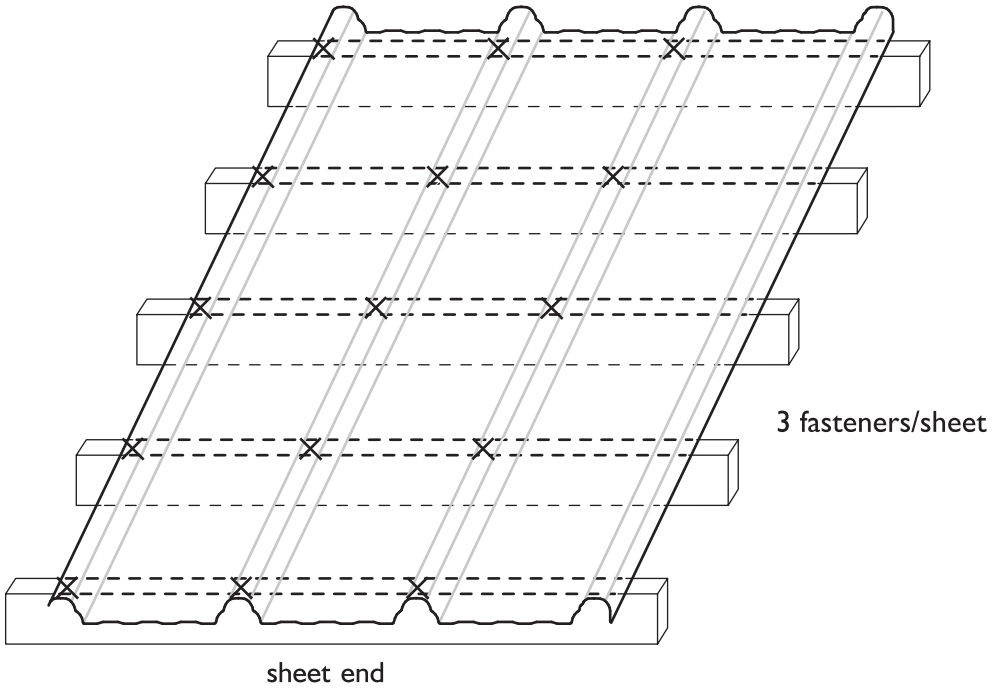
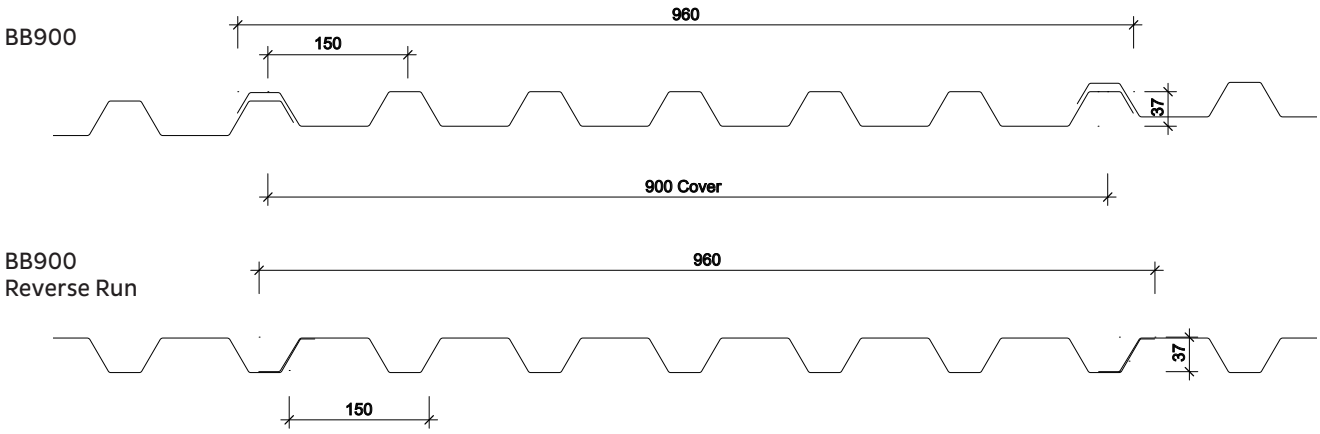
DIMOND DP955®
FASTENER LAYOUT OPTIONS



DIMOND BROWNBUILT 900 (BB900) PROFILE PERFORMANCE



BB900 Reverse Run Profile (for wall cladding only). Lapped sheet shown dotted.

Cover (mm)	900
Sheet width (mm)	960
Minimum Pitch	3° (approx. 1:20)

All dimensions given are nominal

Sheet Tolerances

Sheet width: ±5mm

Sheet width for aluminium +0, -15. If sheet cover widths are critical, advise Dimond at time of order.

Sheet length: +10mm, –0mm. For wall cladding where notified at time of order of intended use, tighter tolerances can be achieved +3mm, –0mm.

Material Options Profile	Steel			Aluminium		Stainless Steel	Duraclad®
Thickness (BMT) mm	0.4	0.55	0.75	0.7	0.9	0.55	1.7 (total thickness)
Nominal weight/lineal metre (kg/m)	4.12	5.55	7.47	2.31	2.96	5.36	2.90
Drape curved roof - min. radius (m)	n/r	90	90	n/r	90	n/r	24
Purlin spacings for drape curved roof (m)(1)	n/r	2.4	2.4	n/r	2.4	n/r	1.2
Machine crimp curved - roof min. radius (mm)	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Unsupported overhang (2)(mm)	250	350	450	200	300	350	200

(1) Recommended maximum purlin spacing at minimum radius
(2) Based on 1.1kN point load support, but not intended for roof access.
n/r – not recommended
n/a – not available

Roll-forming facility at: Auckland

Manufacturing location for Duraclad®: Auckland

Sheet lengths: BB900 is custom run to order.

Where long sheets are used consideration must be given to:

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

Refer Section 2.1.3.4.

BROWNBUILT 900 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 or Wall		
G550 Steel 0.40mm	End Span		800	1100	1300	1500	1500	1700	1900
	Internal Span		1200	1600	1900	2200	2300	2600	2900
	Serviceability		4.0	3.3	2.6	2.0	1.8	1.6	1.2
G550 Steel 0.55mm	End Span		1600	1700	2000	2300	2400	2500	2700
	Internal Span		2400	2500	3000	3400	3500	3800	4100
	Serviceability		3.7	3.5	2.7	2.0	1.9	1.7	1.5
G550 Steel 0.75mm	End Span		2000	2100	2400	2700	2800	3000	
	Internal Span		3000	3200	3600	4000	4200	4600	
	Serviceability		4.0	3.8	3.1	2.3	2.0	1.3	
5052 H36 Aluminium 0.70mm	End Span		900		900	1100	1200	1400	1600
	Internal Span		1300		1400	1700	1800	2100	2400
	Serviceability		3.1		2.8	2.2	2.0	1.5	1.2
5052 H36 Aluminium 0.90mm	End Span		1300	1400	1600	1900	1900	2200	2800
	Internal Span		2000	2100	2400	2800	2900	3300	3700
	Serviceability		3.8	3.6	2.8	2.1	2.0	1.5	1.2
Duraclad® 1.7mm (Note 4)	End Span				600	800	900	1100	1400
	Internal Span				900	1200	1300	1700	2100
	Serviceability Ultimate	N/R	N/R		- 4.5	- 4.5	- 4.5	- 3.2	- 2.0

Notes

1. In any category, spans above the maximum shown should not be used. Category 1 and 2 maximum spans are based on static point load testing as a guide, and further limited by practical experience of roof performance under dynamic foot traffic loads. Category 3 maximum spans are limited as a guide to achieving satisfactory appearance for wall cladding.
2. Loads given are based on 6 screw fasteners/sheet/purlin.
3. Loads given are limited to a maximum of 4.0 kPa. If design requirements exceed this limit, contact Dimond for specific advice.
4. 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.
5. N/R = not recommended.
6. End span capacities given in this table are based on the end span being $^{2}/_{3}$ of the internal span.
7. **Design Criteria for Limit State Capacities**

   a) Serviceability Limit State
   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.

   b) Ultimate Limit State
   No pull through of fixings or fastener withdrawal resulting in sheet detachment due to wind up-lift (outward) loads.
8. **System Design**
   The span capacity of Brownbuilt 900 is determined from the Brownbuilt 900 Limit State Load/Span Capacity Chart using the section of the chart appropriate to the grade and type of material, and to the category of serviceability selected from the three categories below. Serviceability loads have been derived by test to the NZMRM testing procedures. To obtain an ultimate limit state load we recommend factoring the serviceability load up by 1.4 in-line with NZMRM guidelines. The capacities given do not apply for cyclonic wind conditions.

   Serviceability Requirements
   While these categories are given for design guidance to meet the serviceability limit state criteria, foot traffic point load damage may still occur if there is careless placement of these point loads.

Service Category	Description
1. Unrestricted-access roof	Expect regular foot traffic to access the roof for maintenance work and able to walk anywhere on the roof. No congregation of foot traffic expected.
2. Restricted-access roof	Expect occasional foot traffic educated to walk only on the purlin lines, in the profile pans, or carefully across two profile ribs. Walkways installed where regular traffic is expected, and “Restricted Access” signs placed at access points.
3. Non-access roof or wall	Walls or roofs where no foot traffic access is possible or permitted. If necessary, “No Roof Access” signs used.
9. **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.

Fastener Design

Brownbuilt 900 should be screw fixed to either timber or steel purlins. The use of the appropriate length of 12g or 14g screw will ensure failure by screw pull out will not occur under loads within the scope of the Limit State Load / Span Capacity Chart.

Purlin Type	Screw Fastener			
	Roofing Rib		Wall Cladding Pan Fix	
	Screw Length* (mm)	Designation	Screw Length* (mm)	Designation
Timber	75	T17 - 14 - 10 x 75	50	Roofzip M6 x 50 HG-Z4
Steel	65	Tek - 14 - 10 x 65 Tek - 12 - 14 x 68	20	Tek - 12 - 14 x 20

*If sarking or insulation is used over the purlins or for wall cladding fixed onto a cavity batten, into the stud, the screw length will need to be increased.

For screw size range and fastener / washer assembly refer Section 2.2.3.1.

The Limit State Load / Span Capacity Chart is based on 6 screw fasteners/sheet/purlin without the use of load spreading washers (except for Duraclad® material, which must be fitted with profiled metal washers and 36mm EPDM seals.

Profiled metal washers are recommended for use:

1. On end spans, or large internal spans where the Ultimate Limit State distributed load is limiting. Contact Dimond for specific advice in these design cases.
2. When required to enable the fixing system to accommodate the thermal movement of long sheets – see Section 2.1.3.4 Thermal Movement.
3. Wherever the designer wishes to ensure the risk of fastener over-tightening will not cause dishing of the crest of the profile rib.

Use in serviceability categories (1) or (2) can allow the reduction of fasteners to 3 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 Brownbuilt 900 has a maximum end span of 2400mm and a maximum internal span of 3400mm. The following distributed load capacities apply.

	6 fasteners/sheet	3 fasteners/sheet
End Span	2300mm	2300mm
Internal Span	3400mm	3400mm
Serviceability	2.0 kPa	1.0 kPa

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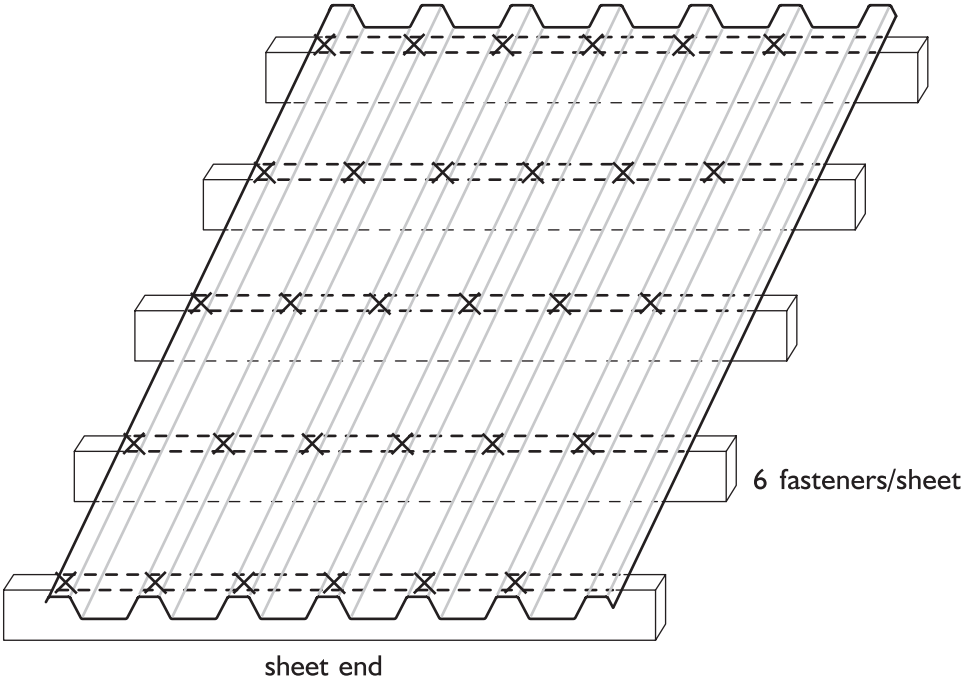
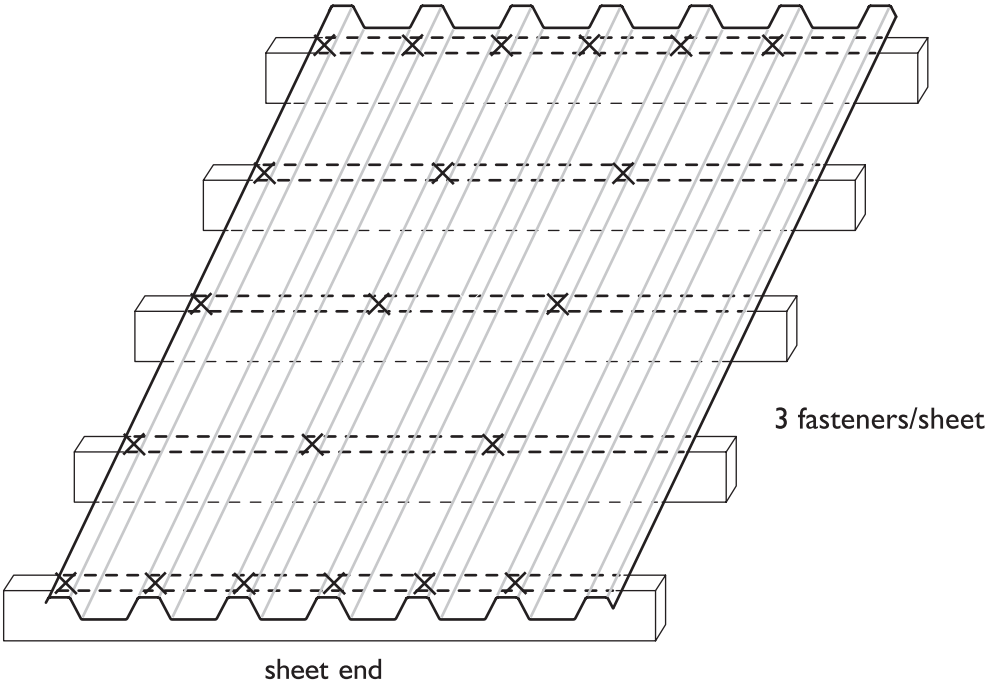
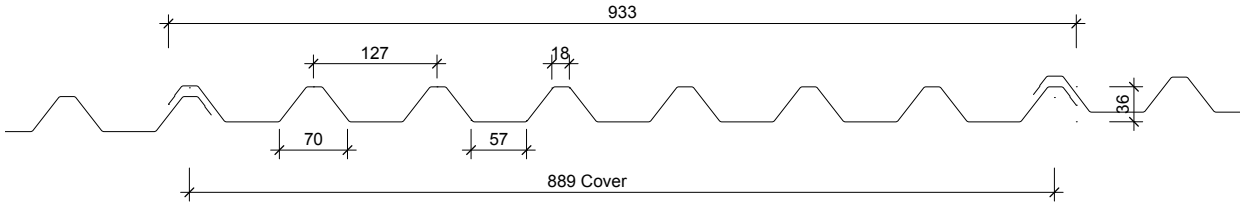
DIMOND BROWNBUILT 900
FASTENER LAYOUT OPTIONS



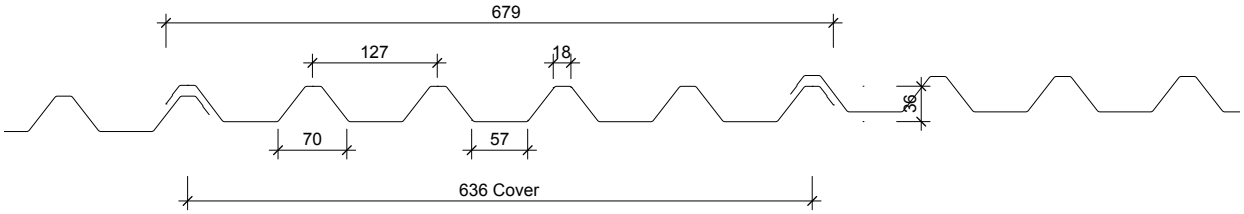


DIMOND LT7 & LT5 PROFILE INFORMATION

LT7



LT5



	LT7	LT5
Cover (mm)	889	635
Sheet width (mm)	933 (Wellington) 942 (Invercargill)	725
Minimum Pitch	3° (approx. 1:20)	

All dimensions given are nominal

Sheet Tolerances

Sheet width: ‡5mm
Sheet width for aluminium +0, -15mm. If sheet cover widths are critical, advise Dimond Roofing at time of order.
Sheet length: +10, - 0mm. For horizontal wall cladding where notified at time of order of intended use, tighter tolerances can be achieved +3, -0.

Material Options	Steel		Aluminium		Steel		Aluminium	
	LT5		LT5		LT7		LT7	
Thickness (BMT) mm	0.40	0.55	0.70	0.90	0.40	0.55	0.70	0.90
Nominal weight/lineal metre (kg/m)	3.17	4.27	1.78	2.28	4.12	5.55	2.31	2.96
Drape curved roof - min. radius (m)	80	50	80	50	80	50	80	50
Purlin spacing's for drape curved roof (m)(1)	1.4	2.2	1.4	2.2	1.4	2.2	1.4	2.2
**Machine curved - roof min. radius (mm)	n/a	n/a	n/a	n/a	900	400	n/a	400
Unsupported overhang (2)(mm)	250	350	200	300	250	350	200	300

(1) Recommended maximum purlin spacing's at minimum radius.
(2) Based on 1.1kN point load support, but not intended for roof access.
n/a not available

Roll-forming facilities at: Wellington and Invercargill

** Crimp Curving facility at: Wellington

Sheet lengths: LT7 and LT5 are custom run to order. Where long sheets are used, consideration must be given to:

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

LT7 - LT5 LIMIT STATE LOAD/SPAN CAPACITY CHART

(span in mm, distributed serviceability and ultmate loads in kPa)

Serviceability Category

		Unrestricted-Access Roof	Restricted-Access Roof			Non-Access Roof or Wall		
G550 Steel 0.40mm	End Span (mm)	800	900	1000	1200	1300	1500	1800
	Internal Span (mm)	1200	1300	1500	1800	1900	2300	2700
	Serviceability	2.5	2.2	2.1	1.7	1.6	1.1	0.8
G550 Steel 0.55mm	End Span (mm)	1300	1400	1700	1900	2000	2300	2500
	Internal Span (mm)	2000	2100	2500	2900	3000	3400	3800
	Serviceability	2.2	2.1	1.8	1.5	1.4	1.2	1.1
5052, H36 Aluminium 0.70mm	End Span (mm)				900	900	1100	1400
	Internal Span (mm)				1300	1400	1700	2100
	Serviceability				1.7	1.6	1.3	0.9
5052, H36 Aluminium 0.90mm	End Span (mm)	1100	1100	1300	1500	1600	1900	2100
	Internal Span (mm)	1600	1700	2000	2300	2400	2800	3200
	Serviceability	2.3	2.3	2.1	1.7	1.6	1.2	0.9
Duraclad® 1.7mm (Note 4)	End Span (mm)			600	800	900	1100	1400
	Internal Span (mm)			900	1200	1300	1700	2100
	Ultimate			4.5	4.5	4.5	2.7	1.7

Notes

1. In any category, spans above the maximum shown should not be used. Category 1 and 2 maximum spans are based on static point load testing as a guide, and further limited by practical experience of roof performance under dynamic foot traffic loads. Category 3 maximum spans are limited as a guide to achieving satisfactory appearance for wall cladding.
2. Loads given are based on 4 screw fasteners/sheet/purlin.
3. Loads given are limited to a maximum of 3.5kPa. If design requirements exceed this limit, Contact Dimond Roofing for specific advice.
4. Duraclad®
   - Serviceability Limit State Load are not applicable to Duraclad® material, as it does not experience permanent deformation
   - System must include Safety Mesh it intended for use as a Restricted-Access roof. Refer Section 2.2.1.8
5. N/R = not recommended
6. End span capacities given in this table are based on the end span being 2/3 of the internal span.
7. **Design Criteria for Limit State Capacities**

   a) Serviceability Limit State
   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.

   b) Ultimate Limit State
   No pull through of fixings or fasteners withdrawal resulting in sheet detachment due to wind up-lift (outward) loads.
8. **System Design**
   The span capacity of LT7/5 is determined from the LT7/5 Limit State Load/Capacity Chart using the section of the chart appropriate to grade and type of material, and to the category of serviceability selected from the three categories below. Serviceability loads have been derived by test to the NZMRM testing procedures. To obtain an ultimate limit state load we recommend factoring the serviceability load up by 1.4 in-line with NZMRM guidelines. The capacities given do not apply for cyclone wind conditions.

   Serviceability Requirements
   While these categories are given for design guidance to meet the serviceability limit state criteria, foot traffic point load damage may still occur if there is careless placement of these point loads.

Service Category	Description
1. Unrestricted-access roof	Expected regular foot traffic to access the roof for maintenance work and able to walk anywhere on the roof. No congregation of foot traffic expected.
2. Restricted-access roof	Expect occasional foot traffic educated to walk only on the purlin lines, in the profile pan. Walkways installed where regular traffic is expected, and “Restricted Access” signs placed at access point.
1. Non-access roof or wall	Walls or roofs where no foot traffic access is possible or permitted. If necessary, “No Roof Access” signs used.

7. **Wind Pressure Guide**
   As a guide for no-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.

LT7/5 Design

LT7/5 should be screw fixed to either timber or steel purlins. The use of the appropriate length of 12g or 14g screw will ensure failure by screw pull out will not occur under loads within the scope of the Limited State Load/Span Capacity Chart.

LT7/5 Fastener Designation

Fixing Requirement				
Purlin or frame material	Roof		Wall (over vented cavity batten, 18 - 25mm thick)	
	Base material		Base material	
	Steel	Aluminium	Steel	Aluminium
Timber	Type 17 14g x 75 Timbertite	14 x 65mm Alutite	Type 17 12g x 50mm Timbertite	14g x 55mm Alutite
Steel	Tek 12g x 68 x or 14g x 65	n/a	M6 x 50 roofzip	n/a

*If sarking or insulation is used over the purlins or for wall cladding fixing onto cavity a batten, into a stud, the screw length will need to be increased.

For screw size range and fastener/washer assembly refer to Section 2.2.3.1

The Limited State Load/Span Capacity Chart for LT7 is based on 4 screw fasteners/sheet/purlin without the use of load spreading washers. For LT5 Load /span capacity chart is based on 3 screw fasteners/sheet/purlin without the use of load spreading washers.

Profile metal washers are recommended for use:

1. On end spans, or large internal spans where Ultimate Limit State distribution load is limiting. Contact Dimond Roofing for specific advice in these cases.
2. When required to enable the fixing system to accommodate the thermal movement of long sheets – See Section 2.1.3.4 Thermal Movement.
3. Whenever the designer wishes to ensure the risk of fastener over-tightening will not cause dishing in the crest of the profile rib.

Use in serviceability categories (1) and (2) can allow the reduction of fasteners to 3 screw fasteners/sheet/purlin. If this is done, the distributed load capacities given in the chart should be reduced using a multiplying factor of 0.75.

Long spans may require specification and use of side lap stitching screws – Section 2.3.2 C Installation

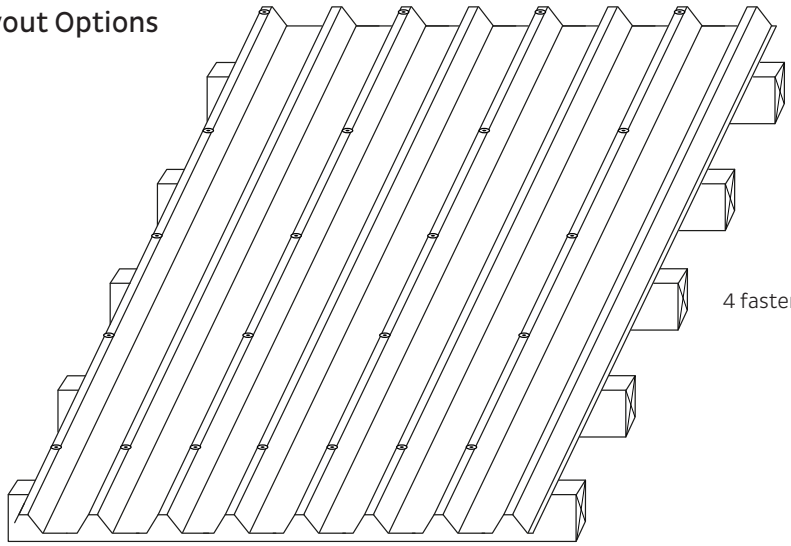
Information: Layout and Fastenings.

Design Examples

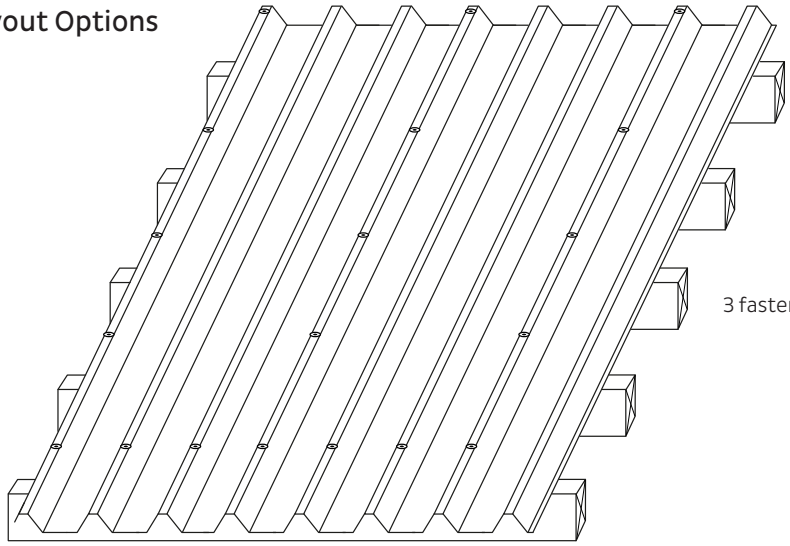
Restricted access roof, 0.55mm G550 steel LT7 has a maximum end span of 1900mm and a maximum internal span of 2900mm. The following distributed load capacities apply.

	4 fasteners/sheet	3 fasteners/sheet
End Span	1900mm	1900mm
Internal Span	2900mm	2900mm
Serviceability	1.5kPa	1.1kPa

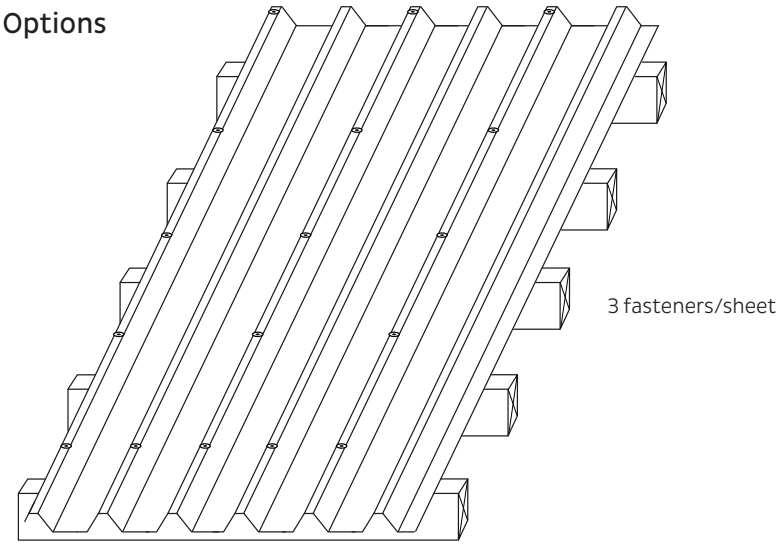
LT7 Fastener Layout Options



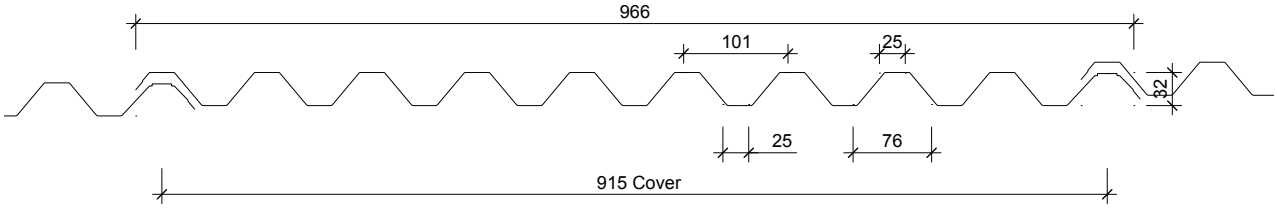
LT7 Fastener Layout Options



LT5 Fastener Layout Options



DIMOND V-RIB PROFILE PERFORMANCE



Cover (mm)	915
Sheet width (mm)	966
Minimum Pitch	4° (approx. 1:15)

All dimensions given are nominal

Sheet Tolerances

Sheet width: ±5mm

Sheet width for aluminium +0, -15. If sheet cover widths are critical, advise Dimond at time of order.

Sheet length: +10mm, −0mm. For horizontal wall cladding where notified at time of order of intended use, tighter tolerances can be achieved +3mm, −0mm.

Material Options Profile	Steel		Aluminium		Duraclad®
Thickness (BMT) mm	0.4	0.55	0.7	0.9	1.7 (total thickness)
Nominal weight/lineal metre (kg/m)	4.12	5.55	2.31	2.96	2.70
Drape curved roof - min. radius (m)	20	16	20	16	20
Purlin spacings for drape curved roof (m)(1)	1.3	1.6	1.3	1.6	1.2
Machine crimp curved - roof min. radius (mm)	400	400	n/a	n/a	n/a
Unsupported overhang (2)(mm)	200	300	150	250	150

(1) Recommended maximum purlin spacing at minimum radius
(2) Based on 1.1kN point load support, but not intended for roof access.
n/a – not available

Roll-forming & crimp curving facility at: Christchurch

Manufacturing location for Duraclad®: Auckland

Sheet lengths: V-Rib is custom run to order.

Where long sheets are used consideration must be given to:

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

Refer Section 2.1.3.4.

V-RIB 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 or Wall		
G550 Steel 0.40mm	End Span	800	800	900	1100	1200	1400	1700	1900
	Internal Span	1100	1200	1400	1700	1800	2100	2500	2900
	Serviceability	3.5	3.4	3.2	2.6	2.4	1.9	1.4	1.0
G550 Steel 0.55mm	End Span	1100	1100	1300	1600	1700	2000	2300	2700
	Internal Span	1600	1700	2000	2400	2500	3000	3500	4000
	Serviceability	3.2	3.1	2.7	2.2	2.0	1.4	1.0	0.8
5052 H36 Aluminium 0.70mm	End Span				800	900	1100	1400	1600
	Internal Span				1200	1300	1700	2100	2400
	Serviceability				2.5	2.4	1.4	1.3	1.0
5052 H36 Aluminium 0.90mm	End Span	900	1000	1100	1300	1400	1700	1900	2300
	Internal Span	1400	1500	1700	2000	2100	2500	2900	3400
	Serviceability	2.8	2.7	2.5	2.1	1.9	1.4	1.0	0.7
Duraclad® 1.7mm (Note 4)	End Span				700	800	1100	1200	
	Internal Span				1100	1200	1500	1800	
	Serviceability Ultimate				- 4.5	- 3.8	- 1.7	- 1.3	

Notes

1. In any category, spans above the maximum shown should not be used. Category 1 and 2 maximum spans are based on static point load testing as a guide, and further limited by practical experience of roof performance under dynamic foot traffic loads. Category 3 maximum spans are limited as a guide to achieving satisfactory appearance for wall cladding.
2. Loads given are based on 5 screw fasteners/sheet/purlin.
3. Loads given are limited to a maximum of 4.5 kPa. If design requirements exceed this limit, contact Dimond for specific advice.
4. 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.
5. N/R = not recommended.
6. End span capacities given in this table are based on the end span being 2/3 of the internal span.
7. **Design Criteria for Limit State Capacities**

   a) Serviceability Limit State
   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.

   b) Ultimate Limit State
   No pull through of fixings or fastener withdrawal resulting in sheet detachment due to wind up-lift (outward) loads.
8. **System Design**
   The span capacity of V-Rib is determined from the V-Rib Limit State Load/Span Capacity Chart using the section of the chart appropriate to the grade and type of material, and to the category of serviceability selected from the three categories below. Serviceability loads have been derived by test to the NZMRM testing procedures. To obtain an ultimate limit state load we recommend factoring the serviceability load up by 1.4 in-line with NZMRM guidelines.

   The capacities given do not apply for cyclonic wind conditions.

   Serviceability Requirements
   While these categories are given for design guidance to meet the serviceability limit state criteria, foot traffic point load damage may still occur if there is careless placement of these point loads.

Service Category	Description
1. Unrestricted-access roof	Expect regular foot traffic to access the roof for maintenance work and able to walk anywhere on the roof. No congregation of foot traffic expected.
2. Restricted-access roof	Expect occasional foot traffic educated to walk only on the purlin lines, in the profile pans, or carefully across two profile ribs. Walkways installed where regular traffic is expected, and “Restricted Access” signs placed at access points.
3. Non-access roof or wall	Walls or roofs where no foot traffic access is possible or permitted. If necessary, “No Roof Access” signs used.

9. **Wind Pressure Guide**
   As a guide for no-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.

Fastener Design

V-Rib should be screw fixed to either timber or steel purlins. The use of the appropriate length of 12g or 14g screw will ensure failure by screw pull out will not occur under loads within the scope of the Limit State Load / Span Capacity Chart.

Purlin Type	Screw Fastener			
	Roofing Rib		Wall Cladding Pan	
	Screw Length* (mm)	Designation	Screw Length* (mm)	Designation
Timber	65	T17 - 14 - 10 x 65 T17 - 12 - 11 x 65 Roofzip M6 x 50 HG-Z4	50	Roofzip M6 x 50 HG-Z4
Steel	55	Tek - 12 - 14 x 55	20	Tek - 12 - 14 x 20

*If sarking or insulation is used over the purlins or for wall cladding fixing onto a cavity batten, into the stud, the screw length will need to be increased.

For screw size range and fastener / washer assembly refer Section 2.2.3.1.

The Limit State Load / Span Capacity Chart is based on 5 screw fasteners/sheet/purlin without the use of load spreading washers (except for Duraclad® material, which must be fitted with profiled metal washers and 36mm EPDM seals).

Profiled metal washers are recommended for use:

1. On end spans, or large internal spans where the Ultimate Limit State distributed load is limiting. Contact Dimond for specific advice in these design cases.
2. When required to enable the fixing system to accommodate the thermal movement of long sheets – see Section 2.1.3.4 Thermal Movement.
3. Wherever the designer wishes to ensure the risk of fastener over-tightening will not cause dishing of the crest of the profile rib.

Use in serviceability categories (1) or (2) can allow the reduction of fasteners to 3 screw fasteners/sheet/purlin.
If this is done, the distributed load capacities given in the chart should be reduced using a multiplying factor of 0.6.

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 V-Rib has a maximum end span of 1600mm and a maximum internal span of 2400mm. The following distributed load capacities apply.

	5 fasteners/sheet	3 fasteners/sheet
End Span	1600mm	1700mm
Internal Span	2400mm	2400mm
Serviceability	2.2 kPa	1.3 kPa

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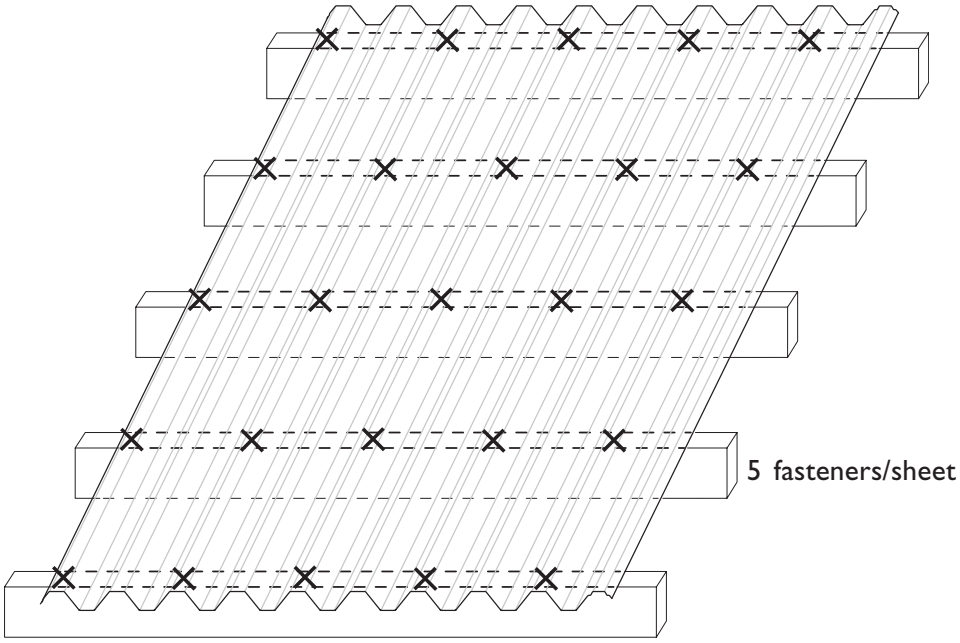
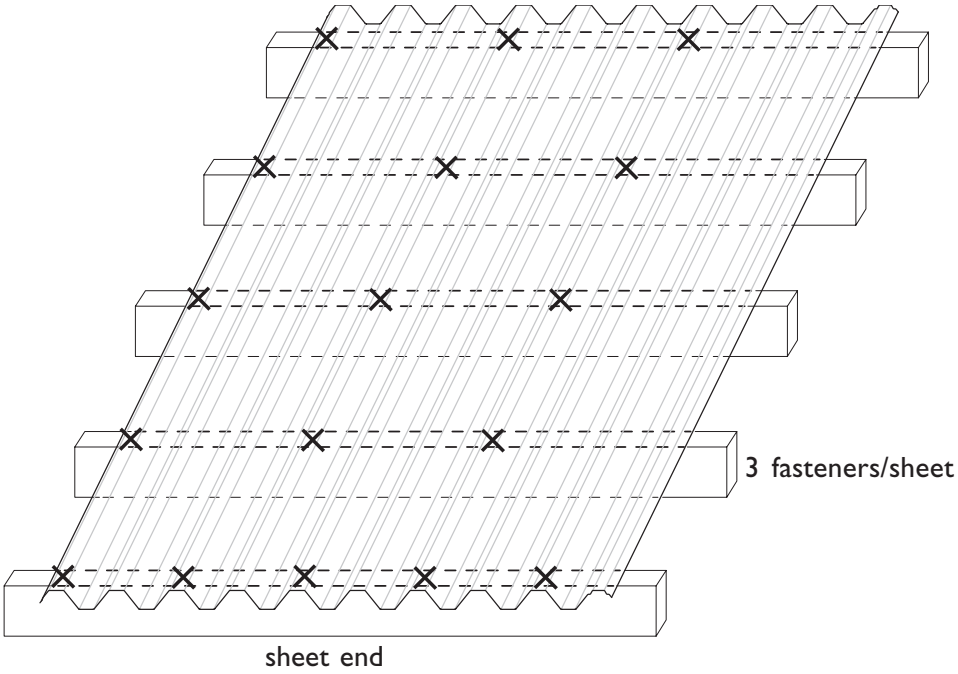
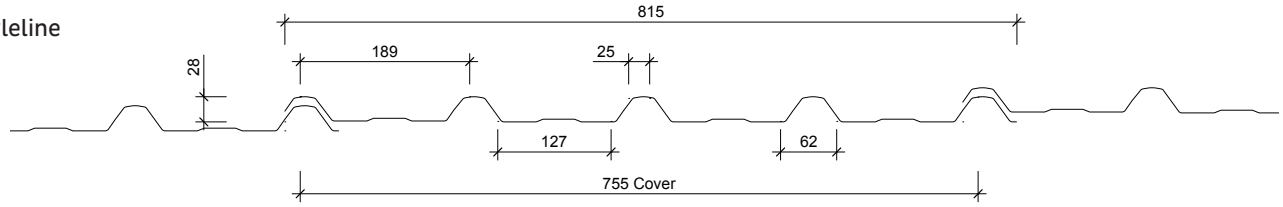
DIMOND V-RIB
FASTENER LAYOUT OPTIONS



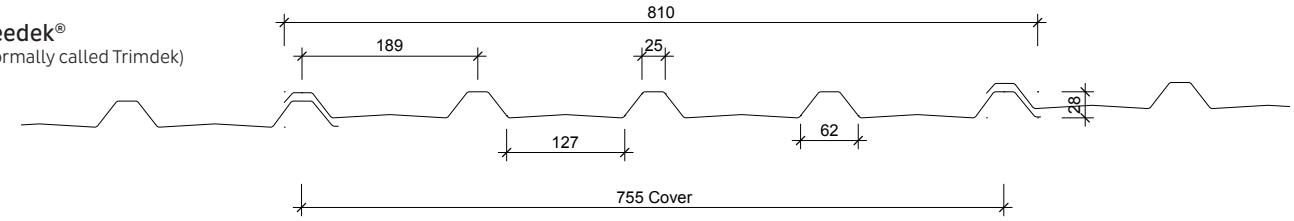


DIMOND STYLELINE, HI FIVE AND VEEDEK® PROFILE PERFORMANCE

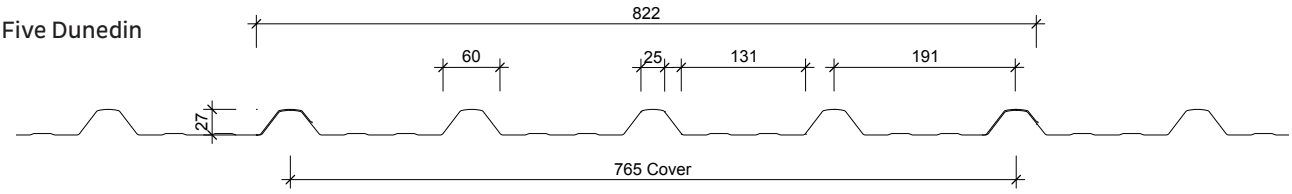
Styleline



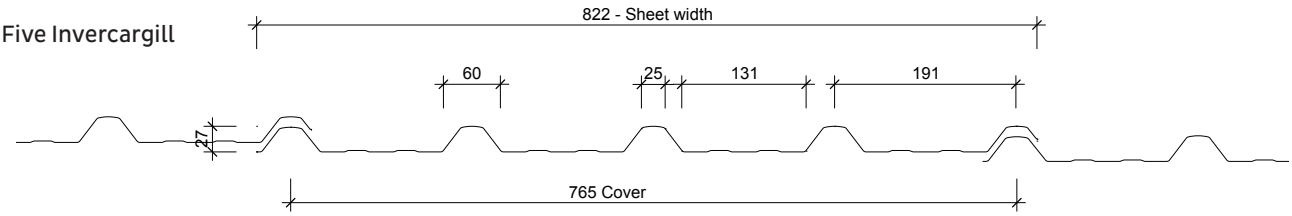
Veedek®
(Formally called Trimdek)



Hi Five Dunedin



Hi Five Invercargill



Cover (mm)	755
Sheet width (mm)	810
Minimum Pitch	3° (approx. 1:20)

All dimensions given are nominal

Sheet Tolerances

Sheet width: ±5mm

Sheet width for aluminium +0, -15. If sheet cover widths are critical, advise Dimond at time of order.

Sheet length: +10mm, −0mm. For horizontal wall cladding where notified at time of order of intended use, tighter tolerances can be achieved +3mm, −0mm.

Material Options Profile	Steel		Aluminium		Duraclad®
Thickness (BMT) mm	0.4	0.55	0.7	0.9	1.7 (total thickness)
Nominal weight/lineal metre (kg/m)	3.17	4.27	1.78	2.28	2.2
Drape curved roof - min. radius (m)	80	40	80	40	12
Purlin spacings for drape curved roof (m) (1)	1.2	1.4	1.2	1.4	1.1
Machine crimp curved - roof min. radius (mm)	450**	400	n/a	400	n/a
Unsupported overhang (2)	200	250	100	200	100

*Please note: only Styleline is suitable for drape curving or crimp curving
**Hi Five only

(1) Recommended maximum purlin spacing at minimum radius
(2) Based on 1.1kN point load support, but not intended for roof access.
n/a – not available

Roll-forming facilities for Styleline at:	Auckland, Hamilton, Christchurch, Wellington, Whangrei
Roll-forming facilities for Hi Five at:	Invercargill, Dunedin
Curving for Hi Five at:	Invercargill
Roll-forming facilities for Veedek® at:	Auckland, Hamilton, Wellington, Christchurch,
Manufacturing location for Duraclad®:	Auckland
Sheet lengths:	Styleline, Hi Five and Veedek® are custom run to order.

Where long sheets are used consideration must be given to:

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

STYLELINE, HI FIVE AND VEEDEK® 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 or Wall		
G550 Steel 0.40mm	End Span			600	800	1000	1100	1300	1600
	Internal Span			900	1200	1600	1700	2000	2400
	Serviceability			3.5	2.7	1.8	1.6	1.2	0.9
G550 Steel 0.55mm	End Span	800	1000	1100	1300	1500	1500	1700	2000
	Internal Span	1200	1500	1600	1900	2200	2300	2600	3000
	Serviceability	4.0	3.3	3.0	2.5	2.0	1.8	1.5	1.1
5052 H36 Aluminium 0.70mm	End Span				600	800	900	1100	1300
	Internal Span				900	1200	1300	1600	1900
	Serviceability				2.4	1.9	1.8	1.2	0.8
5052 H36 Aluminium 0.90mm	End Span		800	900	1000	1100	1200	1500	1700
	Internal Span		1200	1300	1500	1700	1800	2200	2600
	Serviceability		2.8	2.7	2.2	1.7	1.6	1.4	1.1
Duraclad® 1.7mm (Note 4)	End Span					700	800	1000	1200
	Internal Span					1100	1200	1500	1800
	Serviceability Ultimate	N/R	N/R			- 4.5	- 4.4	- 2.6	- 1.6

Notes

1. In any category, spans above the maximum shown should not be used. Category 1 and 2 maximum spans are based on static point load testing as a guide, and further limited by practical experience of roof performance under dynamic foot traffic loads. Category 3 maximum spans are limited as a guide to achieving satisfactory appearance for wall cladding.
2. Loads given are based on 4 screw fasteners/sheet/purlin.
3. Loads given are limited to a maximum of 4.5 kPa. If design requirements exceed this limit, contact Dimond for specific advice.
4. 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.
5. N/R = not recommended.
6. End span capacities given in this table are based on the end span being 2/3 of the internal span.
7. **Design Criteria for Limit State Capacities**

   a) Serviceability Limit State
   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.

   b) Ultimate Limit State
   No pull through of fixings or fastener withdrawal resulting in sheet detachment due to wind up-lift (outward) loads.
8. **System Design**
   The span capacity of Styleline, Hi Five and Veedek® are determined from the Styleline, Hi Five and Veedek® Limit State Load/Span Capacity Chart using the section of the chart appropriate to the grade and type of material, and to the category of serviceability selected from the three categories below. Serviceability loads have been derived by test to the NZMRM testing procedures. To obtain an ultimate limit state load we recommend factoring the serviceability load up by 1.4 in-line with NZMRM guidelines.

   The capacities given do not apply for cyclone wind conditions.

   Serviceability Requirements
   While these categories are given for design guidance to meet the serviceability limit state criteria, foot traffic point load damage may still occur if there is careless placement of these point loads.

Service Category	Description
1. Unrestricted-access roof	Expect regular foot traffic to access the roof for maintenance work and able to walk anywhere on the roof. No congregation of foot traffic expected.
2. Restricted-access roof	Expect occasional foot traffic educated to walk only on the purlin lines, in the profile pans, or carefully across two profile ribs. Walkways installed where regular traffic is expected, and “Restricted Access” signs placed at access points.
3. Non-access roof or wall	Walls or roofs where no foot traffic access is possible or permitted. If necessary, “No Roof Access” signs used.

9. **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.

Fastener Design

Styleline, Hi Five and Veedek® should be screw fixed to either timber or steel purlins. The use of the appropriate length of 12g screw will ensure failure by screw pull out will not occur under loads within the scope of the Limit State Load / Roofing Span Capacity Chart.

<table>
<tr><th>Purlin Type</th><th colspan="4">Screw Fastener</th></tr>
<tr><th rowspan="2"></th><th colspan="2">Roofing Rib</th><th colspan="2">Wall Cladding Pan</th></tr>
<tr><th>Screw Length* (mm)</th><th>Designation</th><th>Screw Length* (mm)</th><th>Designation</th></tr>
<tr><td>Timber with steel based sheet</td><td>65</td><td>T17 - 12 - 10 x 65 Roofzip M6 x 65 HG-Z4</td><td>Non cavity 35
Cavity 50</td><td>Roofzip M6 x 50 HG-Z4</td></tr>
<tr><td>Timber with aluminium based sheet</td><td>73</td><td>14g x 73mm Alutite with 12mmØ clearance hole and an aluminium profiled washer and 36Ø EPDM seal</td><td>Non cavity 35
Cavity 55</td><td>12g x 35mm or 14g x 55mm Alutite with 12mmØ clearance hole and an aluminium round washer and seal</td></tr>
<tr><td>Steel</td><td>45</td><td>Tek - 12 - 14 x 45</td><td>20</td><td>Tek - 12 - 14 x 20</td></tr>
</table>

*If sarking or insulation is used over the purlins or for wall cladding fixing onto a cavity batten, into the stud, the screw length will need to be increased.

For screw size range and fastener / washer assembly refer Section 2.2.3.1.

The Limit State Load / Span Capacity Chart is based on 4 screw fasteners/sheet/purlin without the use of load spreading washers (except for Duraclad® material, which must be fitted with profiled metal washers and 36mm EPDM seals).

Profiled metal washers are recommended for use:

1. On end spans, or large internal spans where the Ultimate Limit State distributed load is limiting. Contact Dimond for specific advice in these design cases.
2. When required to enable the fixing system to accommodate the thermal movement of long sheets – see Section 2.1.3.4 Thermal Movement.
3. Wherever the designer wishes to ensure the risk of fastener over-tightening will not cause dishing of the crest of the profile rib.

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.

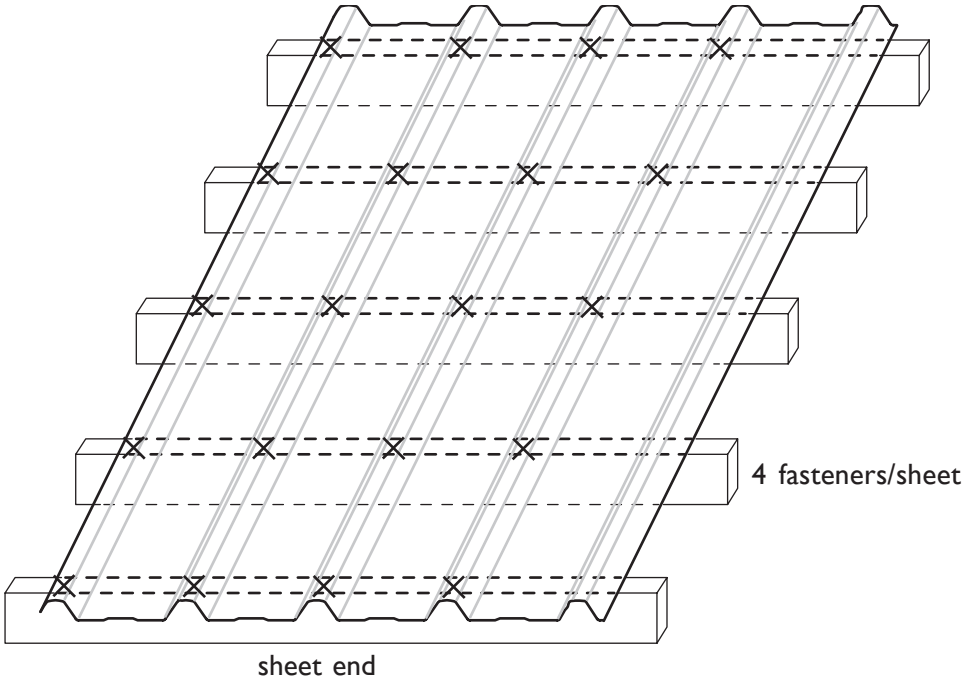
Long spans may require the specification and use of side lap stitching screws – see Section 2.3.2C Installation Information: Layout and Fastening.

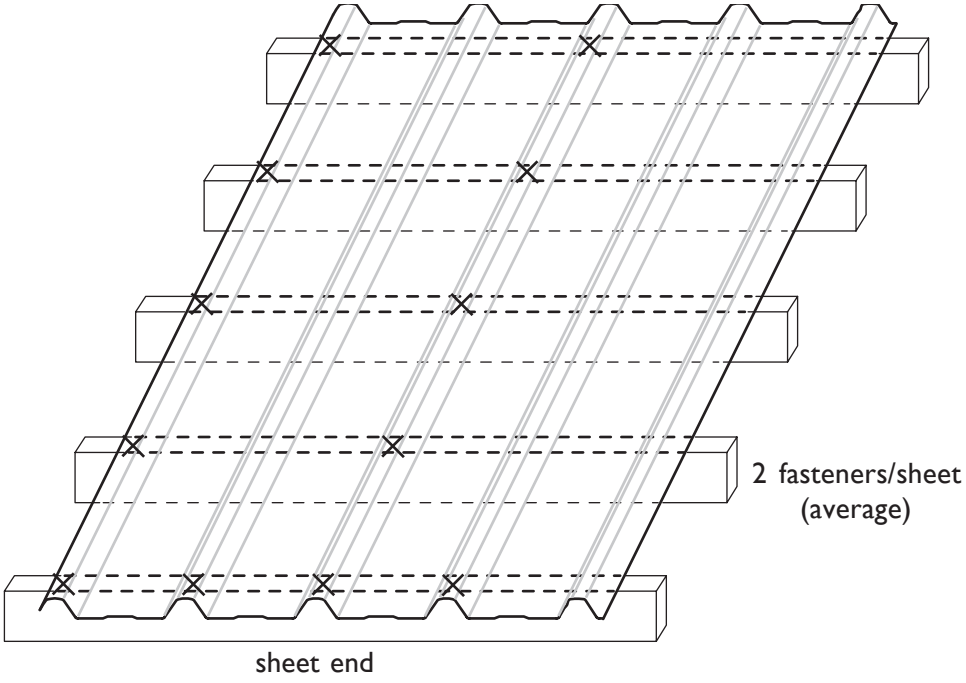
Design Example

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

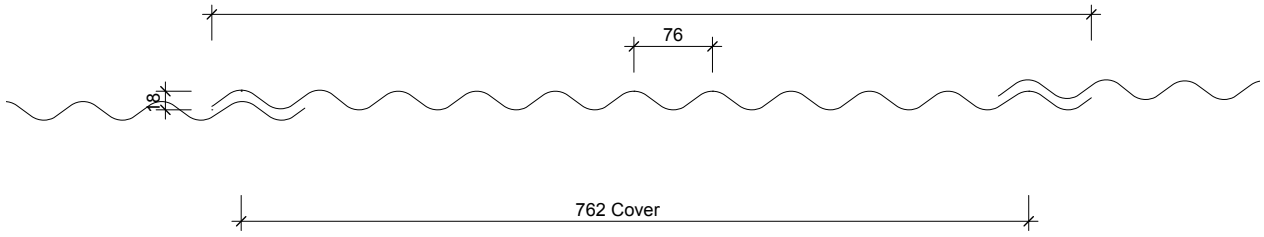
	4 fasteners/sheet	2 fasteners/sheet
End Span	1500mm	1500mm
Internal Span	2200mm	2200mm
Serviceability	2.0 kPa	1.0 kPa

DIMOND STYLELINE, HI FIVE AND VEEDEK®
FASTENER LAYOUT OPTIONS





DIMOND CORRUGATE PROFILE PERFORMANCE



Cover (mm)	762
Sheet width (mm)	810
Minimum Pitch	8° (approx. 1:7)

All dimensions given are nominal

Sheet Tolerances

Sheet width: ±5mm

Sheet width for aluminium +0, -15. If sheet cover widths are critical, advise Dimond at time of order.

Sheet length: +10mm, –0mm. For horizontal wall cladding where notified at time of order of intended use, tighter tolerances can be achieved +3mm, –0mm.

Material Options Profile	Steel		Aluminium		Duraclad®
Thickness (BMT) mm	0.4	0.55	0.7	0.9	1.7 (total thickness)
Nominal weight/lineal metre (kg/m)	3.17	4.27	1.78	2.28	2.21
Drape curved roof - min. radius (m)	12	10	12	10	8
Purlin spacings for drape curved roof (m)(1)	800	1100	800	1100	900
Machine crimp curved - roof min. radius (mm)	450	450	450	450	n/a
Unsupported overhang (2)(mm)	100	150	75	150	100

(1) Recommended maximum purlin spacing at minimum radius
(2) Based on 1.1kN point load support, but not intended for roof access.
n/a – not available

Roll-forming facilities at:	Whangarei, Auckland, Hamilton, Wellington, Christchurch, Dunedin, Invercargill
Roll-curving facilities at:	Hamilton, Christchurch, Dunedin, Invercargill
Manufacturing location for Duraclad®:	Auckland
Sheet lengths:	Corrugate is custom run to order.

Where long sheets are used consideration must be given to:

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

CORRUGATE 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 or Wall		
G550 Steel 0.40mm	End Span			400	500	700	800	900	1000	
	Internal Span			600	800	1000	1200	1400	1500	
	Serviceability			4.0	3.2	2.5	2.0	1.6	1.4	
G550 Steel 0.55mm	End Span		600	600	700	900	1000	1100	1300	1200
	Internal Span		900	1000	1100	1300	1500	1600	1800	1900
	Serviceability		4.4	4.0	3.7	3.2	2.8	2.6	2.2	2.0
5052 H36 Aluminium 0.70mm	End Span						500	600	800	1000
	Internal Span						800	900	1200	1500
	Serviceability						1.4	1.3	1.1	0.8
5052 H36 Aluminium 0.90mm	End Span		500			600	800	900	1000	1200
	Internal Span		800			900	1200	1300	1500	1800
	Serviceability		3.5			3.2	2.2	2.0	1.7	1.3
Duraclad® 1.7mm (Note 4)	End Span						600	700	800	900
	Internal Span						900	1000	1200	1400
	Serviceability Ultimate	N/R	N/R				- 4.5	- 4.1	- 2.3	- 1.6

Notes

1. In any category, spans above the maximum shown should not be used. Category 1 and 2 maximum spans are based on static point load testing as a guide, and further limited by practical experience of roof performance under dynamic foot traffic loads. Category 3 maximum spans are limited as a guide to achieving satisfactory appearance for wall cladding.
2. Loads given are based on 5 screw fasteners/sheet/purlin.
3. Loads given are limited to a maximum of 4.5 kPa. If design requirements exceed this limit, contact Dimond for specific advice.
4. 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.
5. N/R = not recommended.
6. End span capacities given in this table are based on the end span being 2/3 of the internal span.
7. **Design Criteria for Limit State Capacities**

   a) Serviceability Limit State
   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.

   b) Ultimate Limit State
   No pull through of fixings or fastener withdrawal resulting in sheet detachment due to wind up-lift (outward) loads.
8. **System Design**
   The span capacity of Corrugate is determined from the Corrugate Limit State Load/Span Capacity Chart using the section of the chart appropriate to the grade and type of material, and to the category of serviceability selected from the three categories below. Serviceability loads have been derived by test to the NZMRM testing procedures. To obtain an ultimate limit state load we recommend factoring the serviceability load up by 1.4 in-line with NZMRM guidelines.

   The capacities given do not apply for cyclone wind conditions.

   Serviceability Requirements
   While these categories are given for design guidance to meet the serviceability limit state criteria, foot traffic point load damage may still occur if there is careless placement of these point loads.

Service Category	Description
1. Unrestricted-access roof	Expect regular foot traffic to access the roof for maintenance work and able to walk anywhere on the roof. No congregation of foot traffic expected.
2. Restricted-access roof	Expect occasional foot traffic educated to walk only on the purlin lines, in the profile pans, or carefully across two profile ribs. Walkways installed where regular traffic is expected, and “Restricted Access” signs placed at access points.
3. Non-access roof or wall	Walls or roofs where no foot traffic access is possible or permitted. If necessary, “No Roof Access” signs used.
9. **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.

Fastener Design

Corrugate should be screw fixed to either timber or steel purlins. The use of the appropriate length of 12g screw, or when fixing aluminium roof or wall cladding to timber, the use of a 12g or 14g Alutite, on both a non cavity and cavity system will ensure failure by screw pull out will not occur under loads within the scope of the Limit State Load / Span Capacity Chart.

Corrugate Fastener Designation

Purlin or frame material	Roof - rib fixed		Wall - pan fixed		
	Steel based sheet	Aluminium based sheet	Steel based sheet		Aluminium based sheet
Timber	T17 x 12 - 11 x 50 M6 x 50 HG-Z4 Roofzip	14g x 55mm Alutite with a 12mm dia. clearance hole, alum. profiled washer & 36mm dia EPDM seal	Non cavity	M6 x 50mm HG-Z4 Roofzip	12g x 35mm Alutite
			Cavity	M6 x 50mm HG-Z4 Roofzip	14g x 55mm Alutite
Steel up to 1.5mm thick	M6 x 50 HG-Z4 Roofzip or Tek 12g - 14 x 35 Class 4	Stainless steel grade 304 14g x 50mm with a 12mm dia clearance hole, alum. profiled washer & 36mm dia EPDM seal	Non cavity	Tek 12g - 14 x 20 Class 4	Stainless steel grade 304 14g x 20mm with a 15mm dia bonded washer, through an 10mm dia. clearance hole
			Cavity	Tek 12g - 14 x 35 Class 4	Stainless steel grade 304 14g x 50mm with a 15mm dia bonded washer, through an 10mm dia. clearance hole
Steel 1.5mm to 4.5mm thick	Tek 12g - 14 x 35 Class 4	Stainless steel grade 304 14g x 50mm with a 12mm dia clearance hole, alum. profiled washer & 36mm dia EPDM seal	Non cavity	Tek 12g - 14 x 20 Class 4	Stainless steel grade 304 14g x 20mm with a 15mm dia bonded washer, through an 10mm dia. clearance hole
			Cavity	Tek 12g - 14 x 35 Class 4	Stainless steel grade 304 14g x 50mm with a 15mm dia bonded washer, through an 10mm dia. clearance hole

*If sarking or insulation is used over the purlins or for wall cladding fixing onto a cavity batten, into the stud, the screw length will need to be increased.

For screw size range and fastener / washer assembly refer Section 2.2.3.1.

The Limit State Load / Span Capacity Chart is based on 5 screw fasteners/sheet/purlin without the use of load spreading washers (except for Duraclad® material, which must be fitted with profiled metal washers and 36mm EPDM seals).

Profiled metal washers are recommended for use:

1. On end spans, or large internal spans where the Ultimate Limit State distributed load is limiting. Contact Dimond for specific advice in these design cases.
2. When required to enable the fixing system to accommodate the thermal movement of long sheets – see Section 2.1.3.4 Thermal Movement.
3. Wherever the designer wishes to ensure the risk of fastener over-tightening will not cause dishing of the crest of the profile rib.

Use in serviceability categories (1) or (2) can allow the reduction of fasteners to 3 screw fasteners/sheet/purlin.
If this is done, the distributed load capacities given in the chart should be reduced using a multiplying factor of 0.6.

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 Corrugate has a maximum end span of 1000mm and a maximum internal span of 1500mm. The following distributed load capacities apply.

	5 fasteners/sheet	3 fasteners/sheet
End Span	1000mm	1000mm
Internal Span	1500mm	1500mm
Serviceability	2.8 kPa	1.7 kPa

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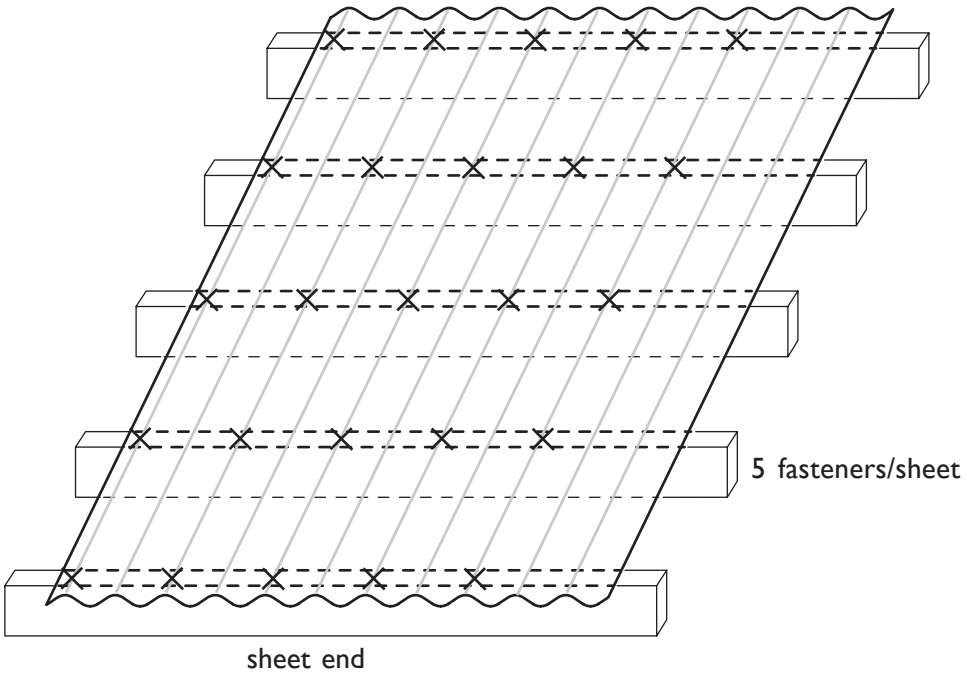
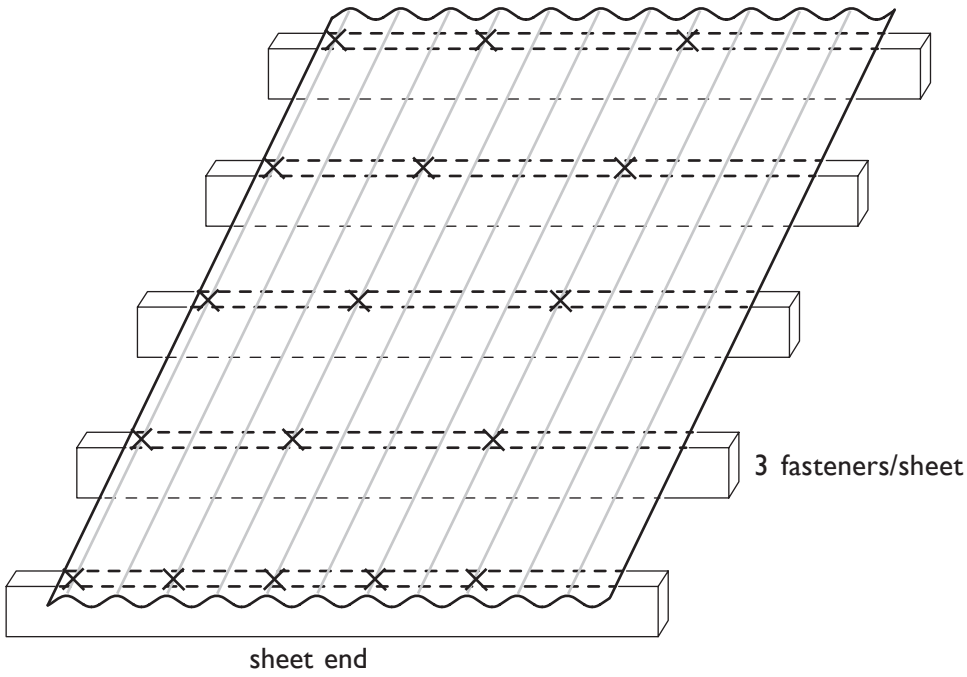
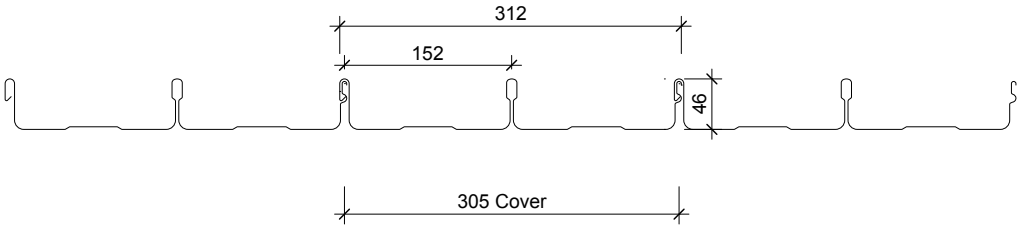
DIMOND CORRUGATE
FASTENER LAYOUT OPTIONS





DIMONDEK® 300 PROFILE PERFORMANCE



Cover (mm)	305
Sheet width (mm)	310
Minimum Pitch	3° (approx. 1:20)

All dimensions given are nominal

Sheet Tolerances

Sheet width: ±5mm

Sheet length: +10mm, −0mm. For horizontal wall cladding where notified at time of order of intended use, tighter tolerances can be achieved +3mm, −0mm.

Material Options Profile	Steel		Aluminium	Copper
Thickness (BMT) mm	0.55	0.75	0.9	0.55
Nominal weight/lineal metre (kg/m)	2.31	3.12	1.24	2.50
Drape curved roof - min. radius (m)	n/r	n/r	n/r	n/r
Purlin spacings for drape curved roof (m)(1)	n/r	n/r	n/r	n/r
Machine crimp curved - roof min. radius (mm)	n/a	n/a	n/a	n/a
Unsupported overhang (2)(mm)	250	350	200	200

*Dimondek 300 is available in Copper ex Auckland only, subject to coil availability.

(1) Recommended maximum purlin spacing at minimum radius
(2) Based on 1.1kN point load support, but not intended for roof access.
n/r – not recommended
n/a – not available

Roll-forming facilities for Dimondek® 300 at: Hamilton

Sheet lengths: Dimondek® 300 is custom run to order.

Where long sheets are used consideration must be given to:

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

Refer Section 2.1.3.4.

DIMONDEK® 300 LIMIT STATE LOAD / SPAN CAPACITY CHART

(span in mm, distributed ultimate loads in kPa)

Serviceability Category

		Unrestricted-Access Roof		Restricted-Access Roof			Non-Access Roof or Wall	
G300 Steel 0.55mm	End Span		900	1000	1100	1300	1400	1600
	Internal Span		1400	1500	1700	2000	2100	2400
	Ultimate[5]		2.2	2.2	2.2	1.9	1.7	1.3
G300 Steel 0.75mm	End Span		1100	1100	1300	1500	1600	1900
	Internal Span		1600	1700	2000	2300	2400	2800
	Ultimate[5]		2.2	2.2	2.2	2.1	1.9	1.2
5052 H36 Aluminium 0.90mm	End Span		800		900	1100	800	1700
	Internal Span		1100	1200	1400	1600	1700	2000
	Ultimate[5]		2.2	2.2	2.1	1.9	1.8	1.3
½ hard Copper 0.55mm	End Span		600		800	1100	1200	1500
	Internal Span		1100	1300	1500	1800	1900	2200
	Ultimate[5]		2.2	2.2	2.2	1.9	1.7	1.2

*Subject to availability

Notes

1. In any category, spans above the maximum shown should not be used. Category 1 and 2 maximum spans are based on static point load testing as a guide, and further limited by practical experience of roof performance under dynamic foot traffic loads. Category 3 maximum spans are limited as a guide to achieving satisfactory appearance for wall cladding.
2. Loads given are based on clip fastening every rib at every purlin.
3. Loads given are limited to a maximum of 2.2 kPa U.L.S. If design requirements exceed this limit, the push on Dimond wind clamps can be installed to double the wind uplift load.
4. N/R = not recommended.
5. For the purposes of serviceability design, the serviceability limit, limited by permanent rib deformation, occurs essentially at the same load as ultimate failure which is the point of disengagement of the roof with the clip.
6. End span capacities given in this table are based on the end span being $^{2}/_{3}$ of the internal span.
7. **Design Criteria for Limit State Capacities**

   a) Serviceability Limit State
   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.

   b) Ultimate Limit State
   No pull through of fixings or fastener withdrawal resulting in sheet detachment due to wind up-lift (outward) loads.
8. **System Design**
   The span capacity of Dimondek 300 is determined from the Dimondek 300 Limit State Load/Span Capacity Chart using the section of the chart appropriate to the grade and type of material, and to the category of serviceability selected from the three categories below. It is recommended that to obtain a dependable design strength capacity for the ultimate limit state, a reduction factor of Ø = 0.8 is applied.
   The capacities given do not apply for cyclonic wind conditions.
9. **Serviceability Requirements**
   While these categories are given for design guidance to meet the serviceability limit state criteria, foot traffic point load damage may still occur if there is careless placement of these point loads.

Service Category	Description
1. Unrestricted-access roof	Expect regular foot traffic to access the roof for maintenance work and able to walk anywhere on the roof. No congregation of foot traffic expected.
2. Restricted-access roof	Expect occasional foot traffic educated to walk only on the purlin lines, in the profile pans, or carefully across two profile ribs. Walkways installed where regular traffic is expected, and “Restricted Access” signs placed at access points.
3. Non-access roof or wall	Walls or roofs where no foot traffic access is possible or permitted. If necessary, “No Roof Access” signs used.

10. **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.

Fastener Design

Dimondek® 300 is clip-fastened to either timber or steel purlins. The use of the appropriate type and length of fastener for clip fixing will ensure failure by fastener pull out will not occur under loads within the scope of the Limit State Load / Span Capacity Chart.

Purlin Type	Clip Fastener
Timber	10g x 45mm timbertite wafer head screw or T17 M4x75mm pan head for fixing through Cavibats and 17.5mm thick ply
Steel	10g x 16mm wafer head screw

*If sarking or insulation is used over the purlins or for wall cladding fixing onto a cavity batten, into the stud, the screw length will need to be increased.

For screw size range refer Section 2.2.3.1.

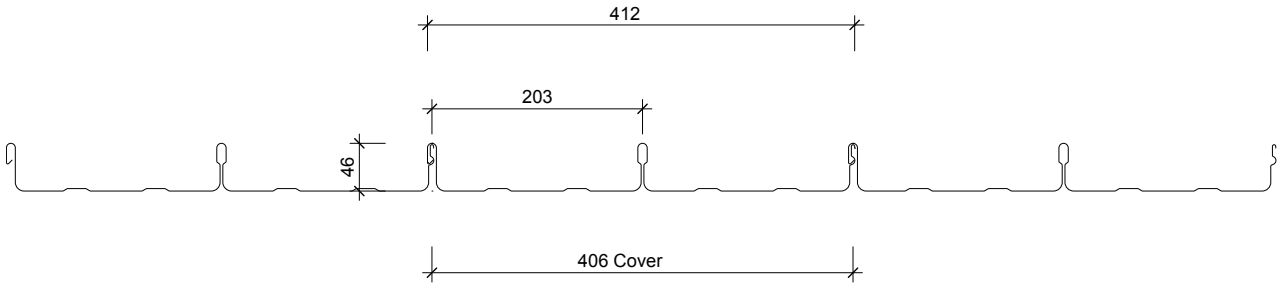
The Limit State Load / Span Capacity Chart is based on every rib being clip fastened to every purlin or girt.

Design Example

Restricted access roof, 0.55mm G300 steel Dimondek® 300 has a maximum end span of 1300mm and a maximum internal span of 2000mm. The following distributed load capacities apply.

End Span	1300mm
Internal Span	2000mm
Ultimate	1.9 kPa

DIMONDEK® 400 PROFILE PERFORMANCE



Cover (mm)	406
Sheet width (mm)	412
Minimum Pitch	3° (approx. 1:20)

All dimensions given are nominal

Sheet Tolerances

Sheet width: ±5mm

Sheet length: +10mm, –0mm. For horizontal wall cladding where notified at time of order of intended use, tighter tolerances can be achieved +3mm, –0mm.

Material Options	Steel		Aluminium	Copper*
Thickness (BMT) mm	0.55	0.75	0.9	0.55
Nominal weight/lineal metre (kg/m)	2.77	3.73	1.48	2.99
Drape curved roof - min. radius (m)**	70	70	70	70
Purlin spacings for drape curved roof (m)(1)	1200	1500	900	1000
Machine crimp curved - roof min. radius (mm)	n/a	n/a	n/a	n/a
Unsupported overhang (2)(mm)	250	300	200	200

*Dimondek 400 is available in Copper ex Auckland only, subject to coil availability.
**To achieve a high level of appearance on the completed roof, it is important that the purlin layout alignment is laid within the tolerances as stated in Section 2.4.2.3.1.

(1) Recommended maximum purlin spacing at minimum radius
(2) Based on 1.1kN point load support, but not intended for roof access.
n/a – not available

Roll-forming facilities for Dimondek® 400 at: Auckland, Hamilton, Wellington, Christchurch, and a mobile machine based in Hamilton which can be moved to site as required.

Sheet lengths: Dimondek® 400 is custom run to order.

Where long sheets are used consideration must be given to:

- Special transportation licences for sheet lengths over 25m
- Site access for special lifting equipment
- Fixing techniques to accommodate thermal expansion. Refer Section 2.1.3.4.
- Possibility of manufacturing sheets on site – sheet lengths up to 100m long are possible when rolled on site.

Call 0800 400 222 to discuss.

DIMONDEK® 400 LIMIT STATE LOAD / SPAN CAPACITY CHART

(span in mm, distributed ultimate loads in kPa)

Serviceability Category

		Unrestricted-Access Roof		Restricted-Access Roof			Non-Access Roof or Wall	
G300 Steel 0.55mm	End Span	600	800		900	1100	1100	1400
	Internal Span	900	1200		1300	1600	1700	2100
	Ultimate[5]	2.0	1.7		1.6	1.4	1.3	1.0
G300 Steel 0.75mm	End Span	800	1000	1100	1300	1500	1500	
	Internal Span	1200	1500	1600	1900	2200	2300	
	Ultimate[5]	2.0	1.8	1.7	1.5	1.3	1.2	
5052 H36 Aluminium 0.90mm	End Span	400	600		700	900	900	1100
	Internal Span	600	900		1000	1300	1400	1700
	Ultimate[5]	2.7	2.1		1.9	1.5	1.4	1.0
½ hard Copper 0.55mm	End Span		700		700	900	1000	1300
	Internal Span		1000		1100	1400	1500	1900
	Ultimate[5]		2.1		1.9	1.5	1.4	1.0

*Subject to availability

Notes

1. In any category, spans above the maximum shown should not be used. Category 1 and 2 maximum spans are based on static point load testing as a guide, and further limited by practical experience of roof performance under dynamic foot traffic loads. Category 3 maximum spans are limited as a guide to achieving satisfactory appearance for wall cladding.
2. Loads given are based on clip fastening every rib at every purlin.
3. If design requirements exceed the loads given above, the push on Dimond wind clamps can be installed to double the wind uplift load.
4. N/R = not recommended.
5. For the purposes of serviceability design, the serviceability limit, limited by permanent rib deformation, occurs essentially at the same load as ultimate failure which is the point of disengagement of the roof with the clip.
6. End span capacities given in this table are based on the end span being 2/3 of the internal span.
7. **Design Criteria for Limit State Capacities**

   a) Serviceability Limit State
   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.

   b) Ultimate Limit State
   No pull through of fixings or fastener withdrawal resulting in sheet detachment due to wind up-lift (outward) loads.
8. **System Design**
   The span capacity of Dimondek 400 is determined from the Dimondek 400 Limit State Load/Span Capacity Chart using the section of the chart appropriate to the grade and type of material, and to the category of serviceability selected from the three categories below. It is recommended that to obtain a dependable design strength capacity for the ultimate limit state, a reduction factor of Ø = 0.8 is applied.
   The capacities given do not apply for cyclonic wind conditions.

   Serviceability Requirements
   While these categories are given for design guidance to meet the serviceability limit state criteria, foot traffic point load damage may still occur if there is careless placement of these point loads.

Service Category	Description
1. Unrestricted-access roof	Expect regular foot traffic to access the roof for maintenance work and able to walk anywhere on the roof. No congregation of foot traffic expected.
2. Restricted-access roof	Expect occasional foot traffic educated to walk only on the purlin lines, in the profile pans, or carefully across two profile ribs. Walkways installed where regular traffic is expected, and "Restricted Access" signs placed at access points.
3. Non-access roof or wall	Walls or roofs where no foot traffic access is possible or permitted. If necessary, "No Roof Access" signs used.
9. **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.

Fastener Design

Dimondek® 400 is clip-fastened to either timber or steel purlins. The use of the appropriate type and length of fastener for clip fixing will ensure failure by fastener pull out will not occur under loads within the scope of the Limit State Load / Span Capacity Chart.

Purlin Type	Clip Fastener
Timber	10g x 45mm timbertite wafer head screw or T17 M4x75mm pan head for fixing through Cavibats and 17.5mm thick ply
Steel	10g x 16mm wafer head screw

*If sarking or insulation is used over the purlins or for wall cladding fixing onto a cavity batten, into the stud, the screw length will need to be increased.

For screw size range refer Section 2.2.3.1.

Underslung Fixing

- When using Dimondek® 400 as an underslung roof, the ribs are required to be fixed under the steel structure, using a Dimond stainless steel tee bolt and stainless steel clip with neo's on every rib.
- There should be 1 row of clips on each structural member, each alternating side of the flange to avoid the Dimondek® 400 falling off the structural steel.
- It is important to pre drill a 5mm diameter hole, through the centre of each rib of Dimondek® 400, within 10mm of the edge of the structural steel member.
- For roofing lengths over 18m, an allowance for thermal expansion must be made.
- From the underside the tee bolt is then passed through the hole in the Dimondek® 400, a neo seal fitted, then the clip is secured against and on top of the flange of the structural steel, before a neo seal washer and lock nut are tightened down, to compress the seals and hold the clip in place.

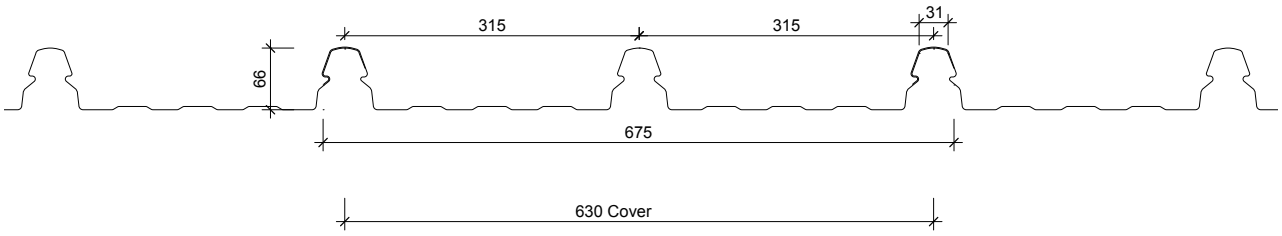
The Limit State Load / Span Capacity Chart is based on every rib being clip fastened to every purlin.

Design Example

Restricted access roof, 0.55mm G300 steel Dimondek® 400 has a maximum end span of 1100mm and a maximum internal span of 1600mm. The following distributed load capacities apply.

End Span	1100mm
Internal Span	1600mm
Ultimate	1.4 kPa

DIMONDEK® 630 PROFILE PERFORMANCE



Cover (mm)	630
Sheet width (mm)	675
Minimum Pitch	3° (approx. 1:20)

All dimensions given are nominal

Sheet Tolerances

Sheet width: ±5mm

Sheet length: +10mm, –0mm.

Material Options	Steel	
Thickness (BMT) mm	0.48	0.55
Nominal weight/lineal metre (kg/m)	3.85	4.22
Drape curved roof - min. radius (m)*	250	250
Purlin spacings for drape curved roof (m)(1)	2400	3300
Machine crimp curved - roof min. radius (mm)	n/a	n/a
Unsupported overhang (2)(mm)	150	250

*To achieve a high level of appearance on the completed roof, it is important that the purlin layout alignment is laid within the tolerances as stated in Section 2.4.2.3.1.

(1) Recommended maximum purlin spacing at minimum radius
(2) Based on 1.1kN point load support, but not intended for roof access.
n/a – not available

Roll-forming facilities at: Mobile machine based in Hamilton, and can be moved to site when required.

Sheet lengths: Dimondek® 630 is custom run to order.

Where long sheets are used consideration must be given to:

- Special transportation licences for sheet lengths over 25m
- Site access for special lifting equipment
- Fixing techniques to accommodate thermal expansion. Refer Section 2.1.3.4.
- Possibility of manufacturing sheets on site, sheets length up to 100m long are possible, when rolled on site.

Call 0800 DIMOND to discuss.

DIMONDEK® 630 LIMIT STATE LOAD / SPAN CAPACITY CHART

(span in mm, distributed ultimate loads in kPa)

Serviceability Category

		Unrestricted-Access Roof				Restricted-Access Roof			Non-Access Roof or Wall
G550 Steel 0.48mm	End Span			1400	1600	1800	2000	2200	2400
	Internal Span			2100	2400	2700	3000	3300	3600
	Ultimate[5]			2.6	2.3	2.0	1.8	1.7	1.4
G550 Steel 0.55mm	End Span	1500	1700	2000	2200	2400	2600	2800	See Note 4
	Internal Span	2300	2600	3000	3300	3600	3900	4200	
	Ultimate[5]	2.6	2.3	1.9	1.8	1.6	1.4	1.2	

Notes

1. In any category, spans above the maximum shown should not be used. Category 1 and 2 maximum spans are based on static point load testing as a guide, and further limited by practical experience of roof performance under dynamic foot traffic loads. Category 3 maximum spans are limited as a guide to achieving satisfactory appearance for wall cladding.
2. Loads given are based on clip fastening every rib at every purlin.
3. Loads given are limited to a maximum of 2.6 kPa. If design requirements exceed this limit, contact Dimond for specific advice.
4. Spans beyond 3.6m are not recommended.
5. For the purposes of serviceability design, the serviceability limit, limited by permanent rib deformation, occurs essentially at the same load as ultimate failure which is the point of disengagement of the roof with the clip.
6. End span capacities given in this table are based on the end span being $^{2}/_{3}$ of the internal span.
7. **Design Criteria for Limit State Capacities**

   a) Serviceability Limit State
   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.

   b) Ultimate Limit State
   No pull through of fixings or fastener withdrawal resulting in sheet detachment due to wind up-lift (outward) loads.
8. **System Design**
   The span capacity of Dimondek 630 is determined from the Dimondek 630 Limit State Load/Span Capacity Chart using the section of the chart appropriate to the grade and type of material, and to the category of serviceability selected from the three categories below. It is recommended that to obtain a dependable design strength capacity for the ultimate limit state, a reduction factor of Ø = 0.8 is applied.
   The capacities given do not apply for cyclonic wind conditions.

   Serviceability Requirements
   While these categories are given for design guidance to meet the serviceability limit state criteria, foot traffic point load damage may still occur if there is careless placement of these point loads.

Service Category	Description
1. Unrestricted-access roof	Expect regular foot traffic to access the roof for maintenance work and able to walk anywhere on the roof. No congregation of foot traffic expected.
2. Restricted-access roof	Expect occasional foot traffic educated to walk only on the purlin lines, in the profile pans, or carefully across two profile ribs. Walkways installed where regular traffic is expected, and “Restricted Access” signs placed at access points.
3. Non-access roof or wall	Walls or roofs where no foot traffic access is possible or permitted. If necessary, “No Roof Access” signs used.
9. **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.

Fastener Design

Dimondek® 630 is clip-fastened to either timber or steel purlins. The use of the appropriate type and length of fastener for clip fixing will ensure failure by fastener pull out will not occur under loads within the scope of the Limit State Load / Span Capacity Chart.

Purlin Type	Clip Fastener
Timber	Roofzip M6 x 50 HG-Z4
Steel	12g x 30mm hex head tek screw

*If sarking or insulation is used over the purlins or for wall cladding fixing onto a cavity batten, into the stud, the screw length will need to be increased.

The Dimondek® 630 perimeter clip must always be used over the first rib and clip on the first laid sheet.

For screw size range refer Section 2.2.3.1.

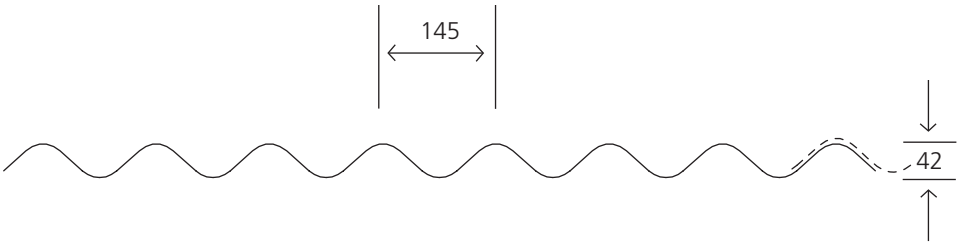
The Limit State Load / Span Capacity Chart is based on every rib being clip fastened to every purlin or girt.

Design Example

Restricted access roof, 0.55mm G550 steel Dimondek® 630 has a maximum end span of 2800mm and a maximum internal span of 4200mm. The following distributed load capacities apply.

End Span	2800mm
Internal Span	4200mm
Ultimate	1.2 kPa

DIMOND SUPER SIX PROFILE PERFORMANCE



Cover (mm)	1007
Sheet width (mm)	1097
Minimum Pitch	3° (approx. 1:20)

All dimensions given are nominal

Sheet Tolerances

Sheet width: ±5mm

Sheet length: +10mm, −0mm. For horizontal wall cladding where notified at time of order of intended use, tighter tolerances can be achieved +3mm, −0mm.

Material Options	Duraclad®
Thickness (BMT) mm	1.7
Nominal weight/lineal metre (kg/m)	2.7
Drape curved roof - min. radius (m)	28
Purlin spacings for drape curved roof (m) (1)	1.2
Machine crimp curved - roof min. radius (mm)	n/a
Unsupported overhang (2)	250

(1) Recommended maximum purlin spacing at minimum radius
(2) Based on 1.1kN point load support, but not intended for roof access.
n/a – not available

Manufacturing location for Duraclad®: Auckland

Sheet lengths: Super Six is custom run to order.

Where long sheets are used consideration must be given to:

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

Refer Section 2.1.3.4.

SUPER SIX LIMIT STATE LOAD / SPAN CAPACITY CHART

(span in mm, distributed serviceability and ultimate loads in kPa)

Serviceability Category

		Unrestricted-Access Roof	Restricted-Access Roof		Non-Access Roof or Wall		
Duraclad® 1.7mm (Note 4)	End Span		800	1000	1100	1400	1700
	Serviceability & Ultimate	N/R	N/A 4.5	N/A 4.5	N/A 4.5	N/A 3.8	N/A 2.6
	Internal Span		900	1200	1300	1700	2100
	Serviceability & Ultimate	N/R	N/A 4.5	N/A 4.5	N/A 4.5	N/A 3.2	N/A 1.7

Notes

1. In any category, spans above the maximum shown should not be used. Category 1 and 2 maximum spans are based on static point load testing as a guide, and further limited by practical experience of roof performance under dynamic foot traffic loads. Category 3 maximum spans are limited as a guide to achieving satisfactory appearance for wall cladding.
2. Loads given are based on 4 screw fasteners/sheet/purlin.
3. Loads given are limited to a maximum of 4.5 kPa. If design requirements exceed this limit, contact Dimond for specific advice.
4. 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.
5. N/R = not recommended.
6. **Design Criteria for Limit State Capacities**

   a) Serviceability Limit State
   Super Six is supplied only in Duraclad® material. Serviceability criteria of permanent distortion that would cause unacceptable appearance, side lap leakage or water ponding do not apply.

   b) Ultimate Limit State
   No pull through of fixings or fastener withdrawal resulting in sheet detachment due to wind up-lift loads, or cracking at the purlin line due to inward wind loads.
7. **System Design**
   The span capacity of Super Six is determined from the Super Six Limit State Load/Span Capacity Chart using the section of the chart appropriate to the grade and type of material, and to the category of serviceability required for foot traffic application.
   It is recommended that to obtain a dependable design strength capacity for the ultimate limit state, a reduction factor of Ø = 0.75 is applied.
   The capacities given do not apply for cyclonic wind conditions.

   Serviceability Requirements
   While these categories are given for design guidance to meet the serviceability limit state criteria, foot traffic point load damage may still occur if there is careless placement of these point loads.

Service Category	Description
1. Unrestricted-access roof	Expect regular foot traffic to access the roof for maintenance work and able to walk anywhere on the roof. No congregation of foot traffic expected.
2. Restricted-access roof	Expect occasional foot traffic educated to walk only on the purlin lines, in the profile pans, or carefully across two profile ribs. Walkways installed where regular traffic is expected, and “Restricted Access” signs placed at access points.
3. Non-access roof or wall	Walls or roofs where no foot traffic access is possible or permitted. If necessary, “No Roof Access” signs used.
8. **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.

Fastener Design

Super Six should be screw fixed to either timber or steel purlins. The use of the appropriate length of 12g or 14g screw will ensure failure by screw pull out will not occur under loads within the scope of the Limit State Load / Roofing Span Capacity Chart.

Purlin Type	Screw Fastener			
	Roofing Rib		Wall Cladding Pan	
	Screw Length* (mm)	Designation	Screw Length* (mm)	Designation
Timber	75	T17 - 14 - 10 x 75	50	Roofzip M6 x 50mm
Steel	65	Tek - 12 - 14 x 68 Tek - 14 - 10 x 65	20	Tek - 12 - 14 x 20

*If sarking or insulation is used over the purlins, the screw length will need to be increased.

For screw size range and fastener / washer assembly refer Section 2.2.3.1.

The Limit State Load / Span Capacity Chart is based on 4 screw fasteners/sheet/purlin using load spreading washers that are either profiled metal washers and 36mm EPDM seals.

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, Duraclad® Super Six has a maximum end span of 1000mm and a maximum internal span of 1200mm. The following distributed load capacities apply.

	4 fasteners/sheet
End Span	1000mm
Internal Span	1200mm
Ultimate	4.5 kPa

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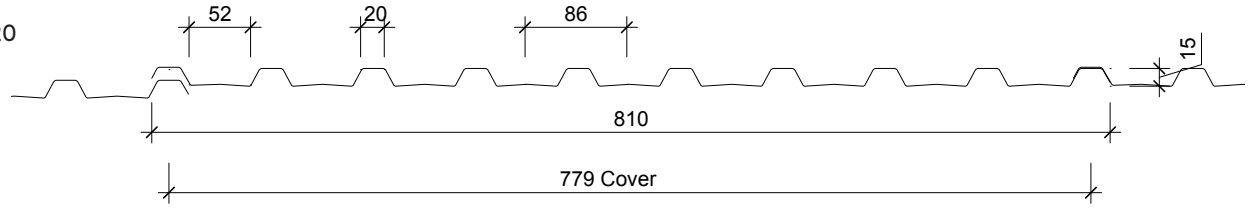
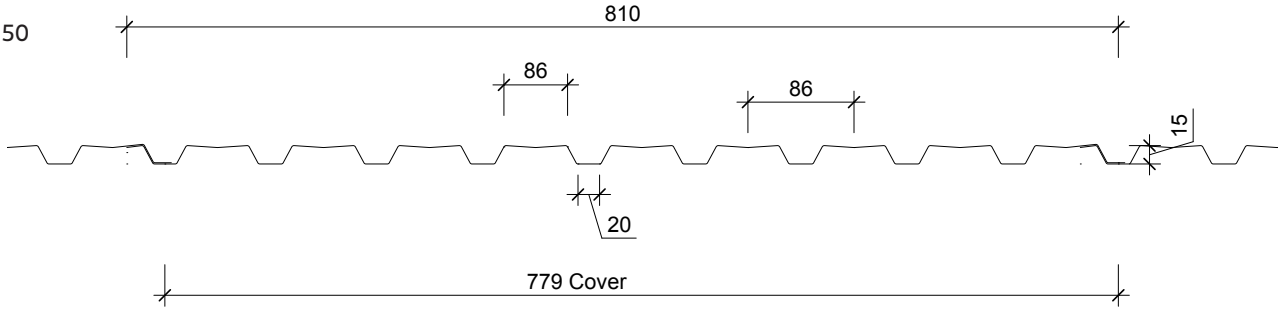
DIMONDCLAD RIB 20 & RIB 50 PROFILE PERFORMANCE

Rib 20



Rib 50



Cover (mm)	779
Sheet width (mm)	810
Minimum Pitch	Wall cladding only

All dimensions given are nominal

Sheet Tolerances

Sheet width: ±5mm

Sheet length: +10mm, −0mm. For horizontal wall cladding where notified at time of order of intended use, tighter tolerances can be achieved +3mm, −0mm.

Material Options	Steel	Aluminium	
Thickness (BMT) mm	0.4	0.7	0.9
Nominal weight/lineal metre (kg/m)	3.17	1.78	2.28
Unsupported overhang (1) (mm)	100	75	100

(1) Not intended to support point loads.

Roll-forming facility at: Hamilton

Sheet lengths: Dimondclad Rib 20 and Rib 50 are custom run to order.

Where long sheets are used consideration must be given to:

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

Refer Section 2.1.3.4.

DIMONDCLAD – DETAILED CLADDING DESIGN

Design Criteria for Limit State Capacities.

a) Serviceability Limit State

No deflection or permanent distortion that would cause unacceptable appearance or side lap leakage due to inward or outward wind loads.

b) Ultimate Limit State

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 Dimondclad Rib 20 and Dimondclad Rib 50 is determined by the serviceability requirement for acceptable appearance and should not exceed 1400mm.

The ultimate windload should not exceed 3 kPa.

The Dimondclad Rib 20 and Dimondclad Rib 50 profiles are not intended for use as roofing products, and must not be used in situations where foot traffic point loads can be applied.

Fastener Design

Dimondclad Rib 20 and Dimondclad Rib 50 should be screw fixed over cavity battens to either timber or steel framing where a high level of appearance is required. Nail fixing to timber may be used in an interior situation not exposed to the weather. The use of the appropriate length of 12g screw will ensure failure by fastener pull out will not occur under the load limitation given.

Framing	Fastener Length (mm)	
	Wall Cladding Pan Fixed - Over Vented Cavity Battens	
	Screw Length* (mm)	Designation
Timber	50	Roofzip M6 x 50mm
Steel	20	Tek - 12 - 14 x 20

*If sarking or insulation is used over the framing, screw length will need to be increased.

For screw size range and fastener / washer assembly refer Section 2.2.3.1.

The Span Capability and Sheet Appearance is based on fasteners at 260mm maximum spacing across the sheet without the use of load spreading washers.

Spans greater than 800mm will require the specification and use of side lap stitching fasteners – see Section 2.3.2C Installation Information: Layout and Fastening, for fastener type.

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.

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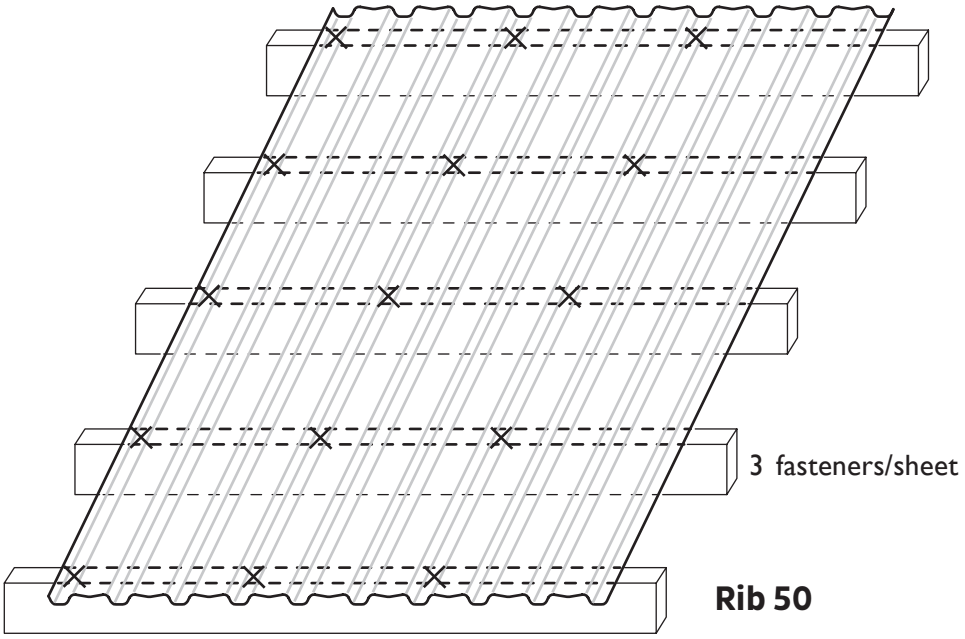
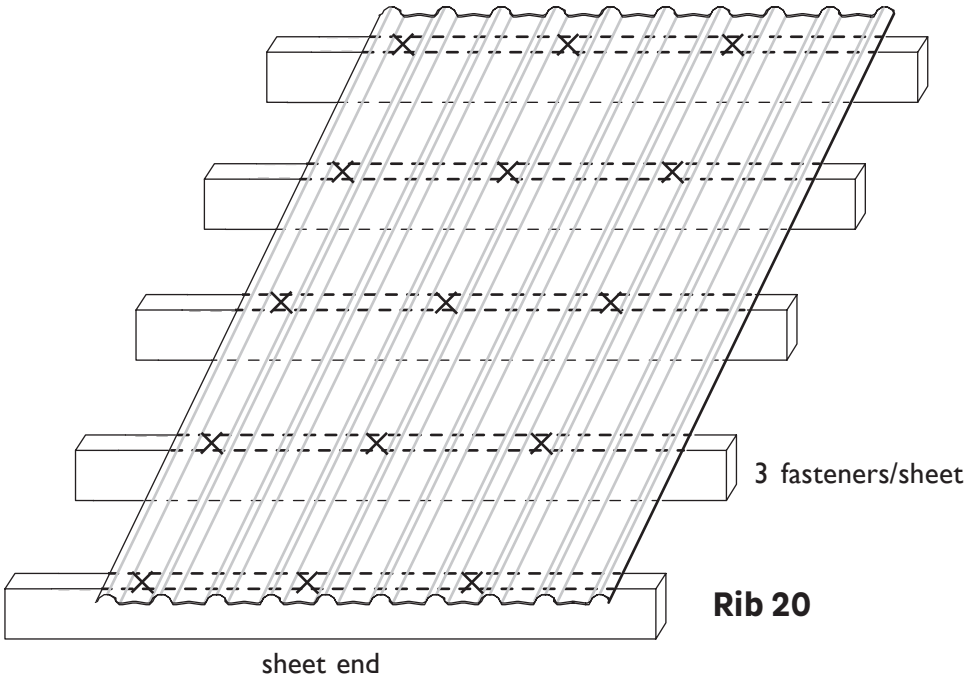
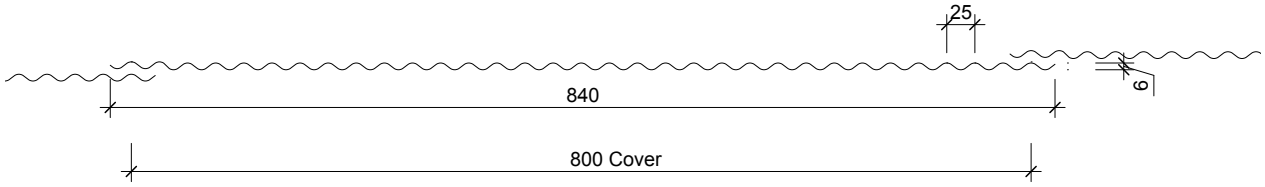
DIMONDCLAD
FASTENER LAYOUT OPTIONS





DIMOND BABY CORRUGATE PROFILE PERFORMANCE



	Northern Region	Central Region	Southern Region
Cover (mm)	815	840	*
Sheet width (mm)	835	890	
Minimum Pitch	Wall cladding only		

All dimensions given are nominal
*Check with Dimond South Island supplying branch

Sheet Tolerances

Sheet width: ±5mm

Sheet length: +10mm, −0mm. Where notified at time of order its intended use will be for horizontal wall cladding, tighter tolerances can be achieved +3mm, −0mm.

Material Options	Steel	
Thickness (BMT) mm	0.4	0.55
Nominal weight/lineal metre (kg/m)	3.17	4.27
Unsupported overhang (1)	75	75

(1) Not intended to support point loads.

Baby Corrugate is available ex Auckland or Palmerston North. For South Island please check with your local branch.

Sheet lengths: Baby Corrugate is available in lengths up to 6m long.

BABY CORRUGATE – DETAILED CLADDING DESIGN

Design Criteria for Limit State Capacities

a) Serviceability Limit State

No deflection or permanent distortion that would cause unacceptable appearance or side lap leakage due to inward or outward wind loads.

b) Ultimate Limit State

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 Baby Corrugate is determined by the serviceability requirement for acceptable appearance and should not exceed 600mm.

The ultimate windload should not exceed 3 kPa.

The Baby Corrugate profiles are not intended for use as roofing products, and must not be used in situations where foot traffic point loads can be applied.

Fastener Design

Baby Corrugate should be screw fixed to either timber or steel framing.

For Timber

Buildex Ripple Zip M4.8 x 25 provides a tidy fixing detail with a unique head design that seals without a washer and screws to fit down into corrugations.

For Steel

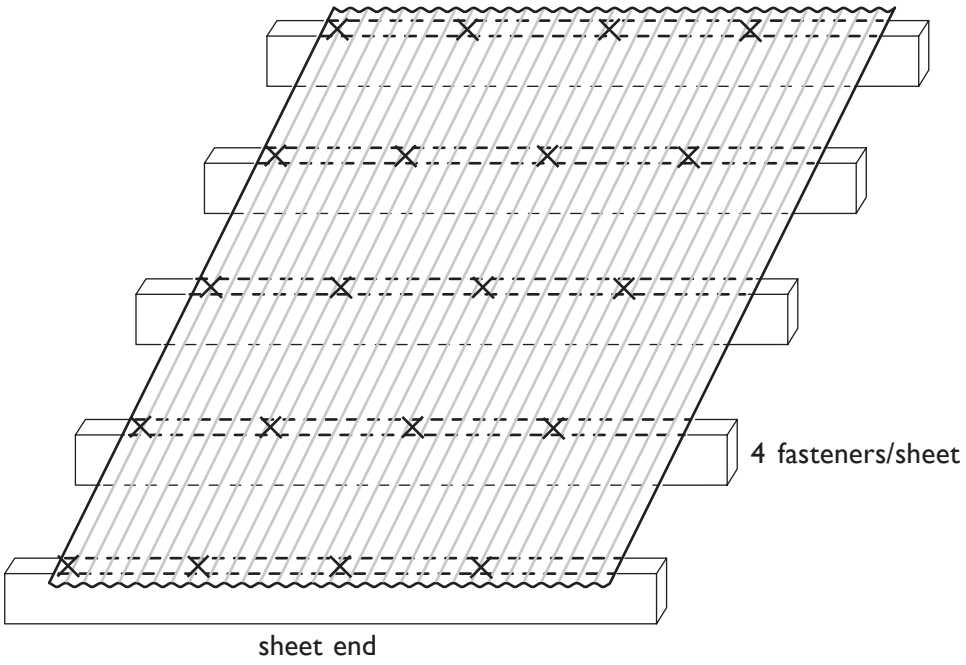
Buildex Ripple Zip M4.8 x 25 provides a unique head design that seals without a washer and does not deform the sheeting. If sarking or insulation is used over the framing Ripple Zips can't be used, as they are not long enough and a 12g screw of appropriate length will be required.

For screw size range and fastener / washer assembly refer section 2.2.3.1.

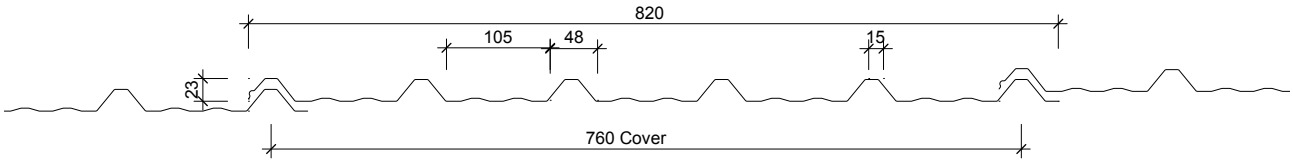
The Span Capability and Sheet Appearance is based on fasteners at 200mm maximum spacing across the sheet without the use of load spreading washers.

Spans greater than 800mm will require the specification and use of side lap stitching fasteners – see Section 2.3.2C Installation Information: Layout and Fastening, for fastener type.

DIMOND BABY CORRUGATE
FASTENER LAYOUT OPTIONS



DIMOND SIX RIB PROFILE INFORMATION



Cover (mm)	760
Sheet width (mm)	820
Minimum Pitch	4° (approx. 1:20)

All dimensions given are nominal

Sheet Tolerances

Sheet width: ‡5mm
Sheet width for aluminium +0, -15mm. If sheet cover widths are critical, advise Dimond Roofing at time of order.
Sheet length: +10, - 0mm. For horizontal wall cladding where notified at time of order of intended use, tighter tolerances can be achieved +3, -0.

Material Options	Steel	
Thickness (BMT) mm	0.40	0.55
Nominal weight/lineal metre (kg/m)	3.17	4.27
Drape curved roof - min. radius (m)	80	40
Purlin spacing's for drape curved roof (m)(1)	1.2	1.4
Machine curved - roof min. radius (mm)	n/a	n/a
Unsupported overhang (2)(mm)	250	250

(1) Recommended maximum purlin spacing's at minimum radius.
(2) Based on 1.1kN point load support, but not intended for roof access.
n/a not available

Roll-forming facilities at: Invercargill

Sheet lengths: Six Rib is custom run to order. Where long sheets are used, consideration must be given to:

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

SIX-RIB LIMIT STATE LOAD/SPAN CAPACITY CHART

(span in mm, distributed serviceability and ultmate loads in kPa)

Serviceability Category

		Unrestricted-Access Roof	Restricted-Access Roof			Non-Access Roof or Wall
G550 Steel 0.40mm	End Span (mm)	600	700	800	1000	1200
	Internal Span (mm)	900	1000	1200	1500	1800
	Serviceability	4.5	3.9	3.1	2.3	2.0
G550 Steel 0.55mm	End Span (mm)	1000	1100	1250	1500	1600
	Internal Span (mm)	1500	1700	900	2200	2400
	Serviceability	3.0	2.5	2.0	1.5	1.3

Notes

1. In any category, spans above the maximum shown should not be used. Category 1 and 2 maximum spans are based on static point load testing as a guide, and further limited by practical experience of roof performance under dynamic foot traffic loads. Category 3 maximum spans are limited as a guide to achieving satisfactory appearance for wall cladding.
2. Loads given are based on 5 screw fasteners/sheet/purlin.
3. Loads given are limited to a maximum of 4.5kPa. If design requirements exceed this limit, Contact Dimond Roofing for specific advice.
4. End span capacities given in this table are based on the end span being 2/3 of the internal span.
5. **Design Criteria for Limit State Capacities**

   a) Serviceability Limit State
   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.

   b) Ultimate Limit State
   No pull through of fixings or fasteners withdrawal resulting in sheet detachment due to wind up-lift (outward) loads.
6. **System Design**
   The span capacity of Six Rib is determined from the Six Rib Limit State Load/Capacity Chart using the section of the chart appropriate to grade and type of material, and to the category of serviceability selected from the three categories below. Serviceability loads have been derived by test to the NZMRM testing procedures. To obtain an ultimate limit state load we recommend factoring the serviceability load up by 1.4 in-line with NZMRM guidelines. The capacities given do not apply for cyclone wind conditions.

   Serviceability Requirements
   While these categories are given for design guidance to meet the serviceability limit state criteria, foot traffic point load damage may still occur if there is careless placement of these point loads.

Service Category	Description
1. Unrestricted-access roof	Expected regular foot traffic to access the roof for maintenance work and able to walk anywhere on the roof. No congregation of foot traffic expected.
2. Restricted-access roof	Expect occasional foot traffic educated to walk only on the purlin lines, in the profile pan. Walkways installed where regular traffic is expected, and “Restricted Access” signs placed at access point.
1. Non-access roof or wall	Walls or roofs where no foot traffic access is possible or permitted. If necessary, “No Roof Access” signs used.
7. **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.

Six Rib Design

Fasteners that are used to secure Six Rib down as a roof cladding must penetrate into the purlin a minimum of 30mm for timber and 6mm for steel purlins. For wall cladding the fasteners must be long enough to pass through the substrate, cavity batten and into the solid framing by 30mm for timber and 6mm for steel.

Fixing Requirements		
Purlin or frame material	Roof	Wall (over vented cavity batten, 18 - 25mm thick) Pan fixed
Timber	12g x 65mm Type 17 Timbertite with neo	12g x 50mm Type 17 Timbertite complete with neo
Steel	12g x 35mm Steeltite	12g x 50mm Steeltite complete with neo

For screw size range and fastener/washer assembly refer to Section 2.2.3.1

The Limited State Load/Span Capacity Chart is on 5 screw fasteners/sheet/purlin without the use of load spreading.

Profiled metal washers are recommended for use;

1. On end spans, or large internal spans where the Ultimate Limit State distributed load is limiting. Contact Dimond Roofing for specific advice in these design cases.
2. When required to enable the fixing system to accommodate the thermal movement of long sheets – see Section2.1.3.4 Thermal Movement

3. Whenever the designer wishes to ensure the risk of fastener over-tightening will not cause dishing of the crest of the profile rib.

Use in serviceability categories (1) or (2) can allow the reduction of fasteners to an average of 3 screw fasteners/sheet/purlin. If this is done, the distributed load capacities given in the chart should be reduced using a multiplying factor of 0.6.

Long spans may require specification and use of side lap stitching screws – Section 2.3.2 C Installation

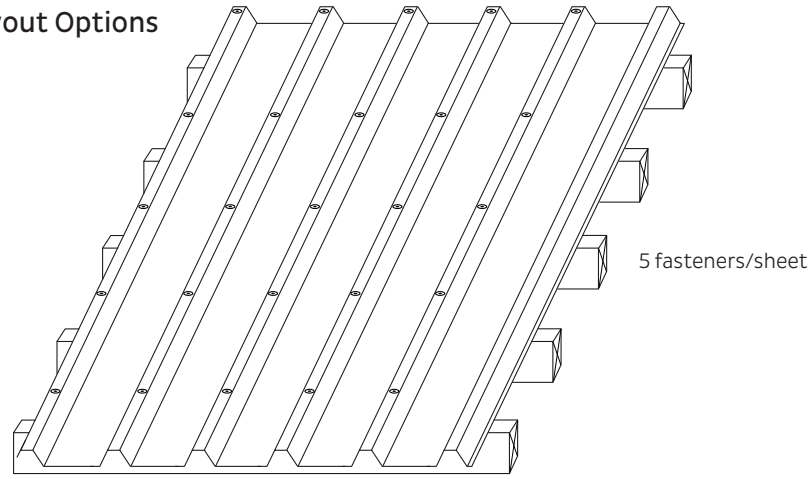
Information: Layout and Fastenings.

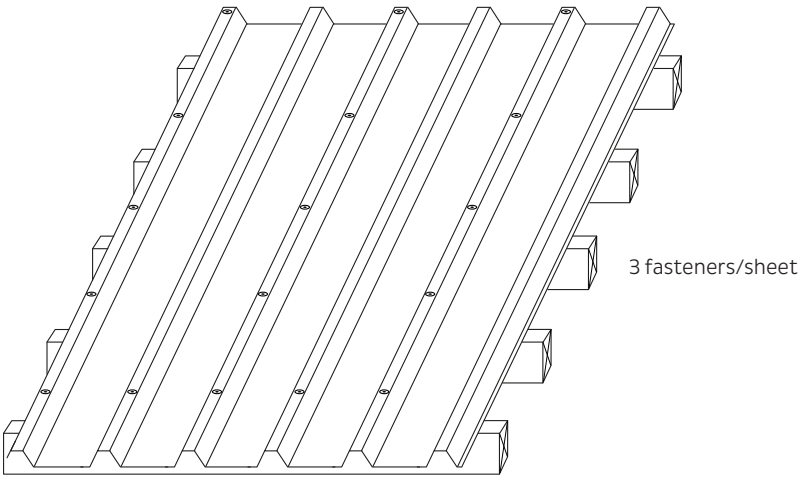
Design Examples

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

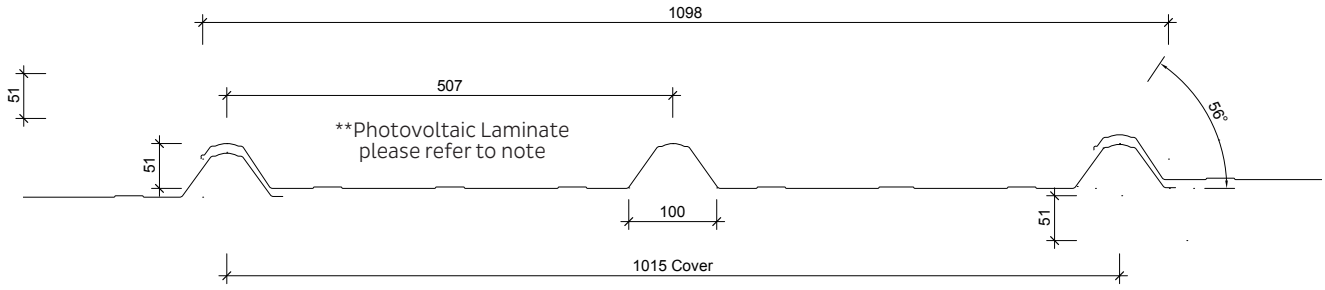
	5 fasteners/sheet	3 fasteners/sheet
End Span	1500mm	1500mm
Internal Span	2200mm	2200mm
Serviceability	1.5kPa	0.9kPa

Six Rib Fastener Layout Options





DIMOND SOLAR-RIB® PROFILE INFORMATION



Cover (mm)	1015
Sheet width (mm)	1098
Minimum Pitch	3° (approx. 1:20)

All dimensions given are nominal

Sheet Tolerances

Sheet width: ‡5mm
Sheet width for aluminium +0, -15mm. If sheet cover widths are critical, advise Dimond Roofing at time of order.
Sheet length: +10, - 0mm. For horizontal wall cladding where notified at time of order of intended use, tighter tolerances can be achieved +3, -0.

Material Options	Steel	Aluminium
Thickness (BMT) mm	0.55	0.90
Nominal weight/lineal metre (kg/m)	5.55	2.96
Drape curved roof - min. radius (m)	90	90
Purlin spacing's for drape curved roof (m)(1)	1.500	1.500
Machine curved - roof min. radius (mm)	n/a	n/a
Unsupported overhang (2)(mm)	50	50

(1) Recommended maximum purlin spacing's at minimum radius.
(2) Based on 1.1kN point load support, but not intended for roof access.
n/a not available

Roll-forming facilities at: Auckland and Invercargill

Sheet lengths: Solar-Rib® is custom run to order. Where long sheets are used, consideration must be given to:

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

THIS PRODUCT MUST BE INSTALLED BY A CERTIFIED & APPROVED ROOFINGSMITH

**NOTE
Photovoltaic laminates (PVL's) can be installed on to this profile at an additional cost when the cladding is completed and other trade have finished or it can be installed at a later date.
Laminates are 348mm wide and available in 5.910mm and 2.585mm lengths. Lead time of 16 weeks
Laminates cannot be installed on raking sections of roofs
Consult with Dimond Roofing 0800 Dimond (0800 346 663) for further information

SOLAR-RIB® LIMIT STATE LOAD/SPAN CAPACITY CHART

(span in mm, distributed serviceability and ultmate loads in kPa)

Serviceability Category

		Unrestricted-Access Roof	Restricted-Access Roof		Non-Access Roof or Wall	
G550 Steel 0.55mm	End Span (mm)	700	1000	1300	1500	1700
	Internal Span (mm)	1000	1500	1900(x)	2300(x)	2300(y)
	Serviceability	2.5	1.7	1.7	1.2	1.2
5052, H34 Aluminium 0.90mm	End Span (mm)		700	800	1000	1300
	Internal Span (mm)		1000	1200	1500	1900(x)
	Serviceability		2.3	1.7	1.5	1.0

Notes

1. In any category, spans above the maximum shown should not be used. Category 2 maximum spans are based on static point load testing as a guide, and further limited by practical experience of roof performance under dynamic foot traffic loads. Category 3 maximum spans are limited as a guide to achieving satisfactory appearance for wall cladding.
2. Loads given are based on 2 screw fasteners/sheet/purlin (x) = one stitching screw between mid-span purlins, (y) = two stitching screws per mid-span purlin.
3. Loads given are limited to a maximum of 2.5kPa. If design requirements exceed this limit, Contact Dimond Roofing for specific advice.
4. N/R = not recommended
5. End span capacities given in this table are based on the end span being 2/3 of the internal span.
6. **Design Criteria for Limit State Capacities**

   a) Serviceability Limit State
   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.

   b) Ultimate Limit State
   No pull through of fixings or fasteners withdrawal resulting in sheet detachment due to wind up-lift (outward) loads.
7. **System Design**
   The span capacity of Solar-Rib® is determined from the Solar-Rib® Limit State Load/Capacity Chart using the section of the chart appropriate to grade and type of material, and to the category of serviceability selected from the three categories below. Serviceability loads have been derived by test to the NZMRM testing procedures. To obtain an ultimate limit state load we recommend factoring the serviceability load up by 1.4 in-line with NZMRM guidelines. The capacities given do not apply for cyclone wind conditions.

   Serviceability Requirements
   While these categories are given for design guidance to meet the serviceability limit state criteria, foot traffic point load damage may still occur if there is careless placement of these point loads.

Service Category	Description
1. Unrestricted-access roof	Expected regular foot traffic to access the roof for maintenance work and able to walk anywhere on the roof. No congregation of foot traffic expected.
2. Restricted-access roof	Expect occasional foot traffic educated to walk only on the purlin lines, in the profile pan. Walkways installed where regular traffic is expected, and “Restricted Access” signs placed at access point.
3. Non-access roof or wall	Walls or roofs where no foot traffic access is possible or permitted. If necessary, “No Roof Access” signs used.

8. **Wind Pressure Guide**
   As a guide for no-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.

Solar-Rib® Design

Fasteners that are used to secure Solar-Rib® down as a roof cladding must penetrate into the purlin a minimum of 30mm for timber and 6mm for steel purlins. For wall cladding the fasteners must be long enough to pass through the substrate, cavity batten and into the solid framing by 30mm for timber and 6mm for steel.

Fixing Requirements				
Purlin or frame material	Roof		Wall (over vented cavity batten, 18 - 25mm thick) Pan fixed	
	Base material		Base material	
	Steel (1,2,3,4)	Aluminium (1,2,3,4)	Steel	Aluminium
Timber	14g x 100mm Type 17 Timbertite with 36mm EPDM washer and load spreading washer	Type 17 304 Grade stainless steel 14g x 90mm Timbertite with 36mm EPDM and load spreading washer	14g x 50mm Type 17 Timbertite complete with neo	14g x 55mm Alutite with a clearance hole an complete with bonded washer
Steel	14g x 90mm Steeltite with 36mm EPDM washer and load spreading washer	14g x 90mm Steeltite with 36mm EPDM washer and load spreading washer	14g x 50mm Steeltite complete with neo	Stainless steel grade 304 - 12g x 50mm Steeltite with hole and complete with bonded washer

1. A 30mm bonded (BRA) washer may be used in low and medium wind zones and when the sheet length is less than 7m. Periphery and valley lines must still have a load spreading washers used.
2. When using bonded washers remove the neo from the fastener prior to installing.
3. Were photo-voltaic laminates are to be used an extra row of purlins is required 600mm down from the ridge line and up from the bottom purlin.
4. When using Load Spreading Washers a 12mm (clearance) hole is to be drilled for the 36mm diameter EPDM seal.

For screw size range and fastener/washer assembly refer to Section 2.2.3.1

The Limited State Load/Span Capacity Chart is on 2 screw fasteners/sheet/purlin with the use of load spreading

Long spans may require specification and use of side lap stitching screws – Section 2.3.2 C Installation

Information: Layout and Fastenings.

Design Examples

Restricted access roof, 0.55mm G550 steel Solar-Rib® has a maximum end span of 1300mm and a maximum internal span of 1900mm. The following distributed load capacities apply.

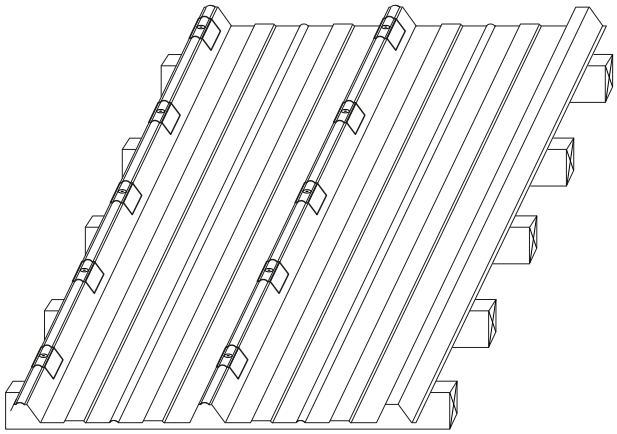
	2 fasteners/sheet
End Span	1300mm
Internal Span	1900mm
Serviceability	1.7kPa

Solar-Rib® Fastener Layout Options

2 fasteners per sheet with 36mm EPDMs and load spreading washers.

Drill 12mm holes to accommodate the EPDM.

High wind zones and above, and all wind zones for sheets longer than 7m.



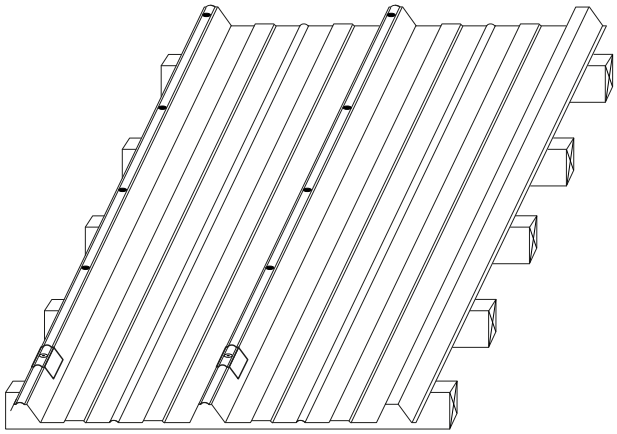
Sheet end

Solar-Rib® Fastener Layout Options

2 fasteners per sheet with 36mm EPDMs and load spreading washers at the sheet end and 30mm bonded (BRA) washer on the remaining.

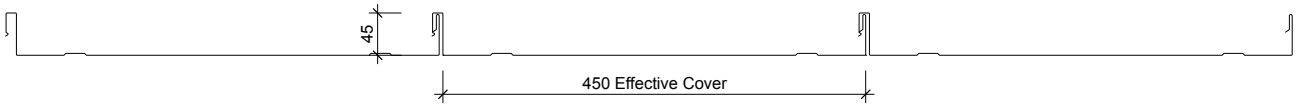
Drill 12mm holes to accommodate the EPDM.

Low and medium wind zones and when sheet length is less than 7m.



Sheet end

DIMOND HERITAGE TRAY™ PROFILE INFORMATION



**Photovoltaic Laminate please refer to note

Cover (mm)	450
Sheet width (mm)	465
Minimum Pitch	3° (approx. 1:20)

All dimensions given are nominal

Sheet Tolerances

Sheet width: ‡5mm
Sheet width for aluminium +0, -15mm. If sheet cover widths are critical, advise Dimond Roofing at time of order.
Sheet length: +10, - 0mm. For horizontal wall cladding where notified at time of order of intended use, tighter tolerances can be achieved +3, -0.

Material Options	Steel	Aluminium
Thickness (BMT) mm	0.55	0.90
Nominal weight/lineal metre (kg/m)	2.77	1.48
Drape curved roof - min. radius (m)	n/a	n/a
Substrate required	No	No
Machine curved - roof min. radius (mm)	No	No
Drip edge flashing required see detail R-005-02	Yes	Yes

**Please contact your Dimond Roofing 0800 Dimond (0800 346 663) for availability.

Roll-forming facilities at: Auckland, Christchurch and Invercargill

Curving facilities: n/a

Sheet lengths: Heritage Tray™ is custom run to order. Where long sheets are used, consideration must be given to:

- Special transportation licences
- Should be run on-site
- Site access for special lifting equipment
- Fixing techniques to accommodate thermal expansion

THIS PRODUCT MUST BE INSTALLED BY A CERTIFIED & APPROVED ROOFINGSMITH

**NOTE
Photovoltaic laminates (PVL's) can be installed on to this profile at an additional cost when the cladding is completed and other trade have finished or it can be installed at a later date.
Laminates are 348mm wide and available in 5.910mm and 2.585mm lengths. Lead time of 16 weeks
Laminates cannot be installed on raking sections of roofs
Consult with Dimond Roofing 0800 Dimond (0800 346 663) for further information

HERITAGE TRAY™ LIMIT STATE LOAD/SPAN CAPACITY CHART

(span in mm, distributed ultimate load in kPa)

Serviceability Category

		Unrestricted-Access Roof		Wall	
		Fix clip to every purlin	Fix clip to every second purlin	Fix clip to every purlin	Fix clip to every second purlin
G300 Steel 0.55mm	End Span (mm)	500	500	600	600
	Internal Span (mm)	500	500	800	800
	Ultimate (kPa)	4.7	3.9	3.5	3.1
5052, H34 Aluminium 0.90mm	End Span (mm)	500	500	600	600
	Internal Span (mm)	500	500	800	800
	Ultimate (kPa)	2.8	2.2	2.0	1.8

Notes

1. Category 1 maximum spans are based on static point load testing as a guide, and further limited by practical experience of roof performance under dynamic foot traffic loads. Category 3 maximum spans are limited as a guide to achieving satisfactory appearance for wall cladding.Loads given are based on 4 screw fasteners/sheet/purlin.
2. Loads given are based on 1 clip per purlin, and alternative (second) purlin clipping, i.e. hit 1, miss 1. Clips are required to be fitted to all end and valley purlins, under any situation.
3. Loads given are limited to a maximum of 4.7kPa. If design requirements exceed this limit, Contact Dimond Roofing for specific advice.N/R = not recommended.
4. End span capacities given in this table are based on the end span being the same as the internal span.
5. **Design Criteria for Limit State Capacities**

   a) Ultimate Limit State
   No pull through of fixings or fasteners withdrawal resulting in sheet detachment due to wind up-lift (outward) loads.
6. **System Design**
   The span capacity of Heritage Tray™ is determined from the Heritage Tray™ Limit State Load/Capacity Chart using the section of the chart appropriate to grade and type of material, and to the category of serviceability selected from the two categories below. It is recommended that to obtain a dependable design strength capacity for the ultimate limit state, a reduction factor of Ø = 0.8 is applied.

   The capacities given do not apply for cyclone wind conditions.

   Serviceability Requirements
   While these categories are given for design guidance to meet the serviceability limit state criteria, foot traffic point load damage may still occur if there is careless placement of these point loads.

Service Category	Description
1. Unrestricted-access roof	Expected regular foot traffic to access the roof for maintenance work and able to walk anywhere on the roof. No congregation of foot traffic expected.
7. **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.

Heritage Tray™ Design

Fasteners that are used to secure Heritage Tray clip down as a roof cladding must penetrate into the purlin a minimum of 30mm for timber and 6mm for steel purlins. For wall cladding the clip fasteners must be long enough to pass through the substrate, cavity batten and into the main frame by 30mm for timber and 6mm for steel.

Galvanised Clip Fixing Requirement 2 fixings per clip				
Purlin or frame material	Roof		Wall (over vented cavity batten, 18 - 25mm thick)	
	Base material		Base material	
	Steel	Aluminium	Steel	Aluminium
Timber	Class 4 10g x 45mm wafer head	Class 4 10g x 45mm wafer head	Class 4 10g x 65mm wafer head	Class 4 10g x 45mm wafer head
Steel	Class 4 10g x 25mm #2sq/drive wingtec	Stainless steel 10g x 25mm #2sq/drive wingtec	Class 4 10g x 40mm #2sq/drive wingtec	Stainless steel 10g x 25mm #2sq/drive wingtec

Design

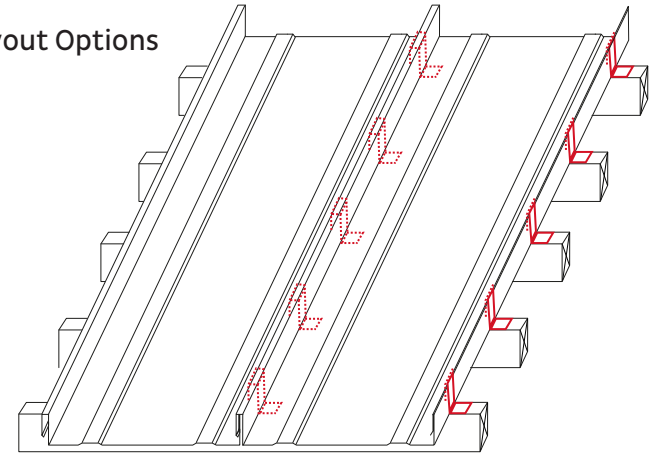
Clip fasteners must be fixed closer together on the periphery edges of all roofs in areas of High to Extra High Wind Zones.

Unlike profiled metal cladding, the point load imposed on a fully supported cladding is supported by the substrate underneath.

Minimum pitch for Eurotray® Double Standing Seam is 5 degrees.

Heritage Tray™ Fastener Layout Options

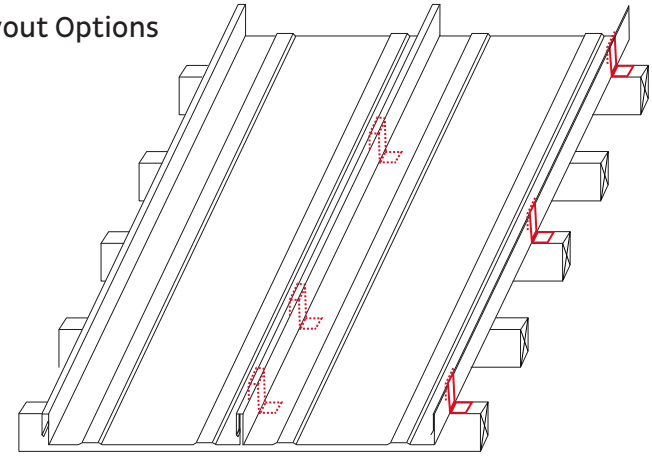
Fix all clipping
500mm purlin centres
Very high/Extra High



Sheet end

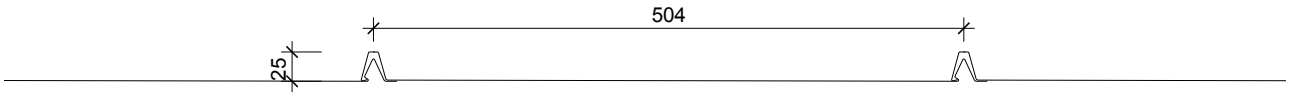
Heritage Tray™ Fastener Layout Options

Alternate clipping
500mm purlin centres
Low - High Zones



Sheet end

DIMOND EUROTRAY® LITE PROFILE INFORMATION



**Photovoltaic Laminate please refer to note

Cover (mm)	504mm (FIXED)
Sheet width (mm)	528mm
Minimum Pitch	8° (approx. 1:7)

All dimensions given are nominal

Sheet Tolerances

Sheet width: ‡5mm
Sheet width for aluminium +0, -15mm. If sheet cover widths are critical, advise Dimond Roofing at time of order.
Sheet length: +10, - 0mm. For horizontal wall cladding where notified at time of order of intended use, tighter tolerances can be achieved +3, -0.

Material Options	Steel
Thickness (BMT) mm	0.55
Nominal weight/lineal metre (kg/m)	2.77
Drape curved roof - min. radius (m)	n/a
Substrate required	Yes
Machine curved - roof min. radius (mm)	n/a
Drip edge flashing recommended CAD detail R-002-02	Yes

Roll-forming facilities at: Christchurch

Curving facilities: n/a

Sheet lengths: Eurotray® is custom run to order. Where long sheets are used, consideration must be given to:

- Special transportation licences
- Should be run on-site
- Site access for special lifting equipment
- Fixing techniques to accommodate thermal expansion

THIS PRODUCT MUST BE INSTALLED BY A CERTIFIED & APPROVED ROOFINGSMITH

**NOTE
Photovoltaic laminates (PVL's) can be installed on to this profile at an additional cost when the cladding is completed and other trades have finished or it can be installed at a later date.
Laminates are 348mm wide and available in 5.910mm and 2.585mm lengths. Lead time of 16 weeks
Laminates cannot be installed on raking sections of roofs
Consult with Dimond Roofing 0800 Dimond (0800 346 663) for further information

Eurotray® Lite Design

Eurotray® Lite roof cladding must always be installed over a plywood (12mm minimum) substrate with a moisture content of less than 18% and made wind tight, with purlin supports underneath at 600mm centres in low to high wind zones and 400mm centres for very high and extra high wind zones. 8 gauge x 40mm countersunk stainless steel screws at 150mm centres around the panel edged and 200mm centres on the intermediate supports. The fasteners should be no closer than 10mm to the edge.

A 3mm expansion gap be should be provided between the sheets. All joints should be staggered and taped over before placing underlay, Dimond Roofing recommend the use of vented type underlay such as tyvek metal or Covertek 407 with drainage mat. This allows added air-flow between the underside of the tray and substrate, it also helps to reduce oil-canning in the tray.

Fasteners that are used to secure Eurotray® down as a roof cladding must penetrate through the substrate and into the purlin a minimum of 30mm for timber and 6mm for steel purlins. For wall cladding the fasteners must be long enough to pass through the substrate, cavity batten and into the main frame by 30mm for timber and 6mm for steel.

Fixing Requirement		
Purlin or frame material	Roof (standard 12mm Substrate)	Wall Standard 12mm substrate over vented cavity batten (18-25mm thick)
	Base material	Base material
	Steel only	Steel only
Timber	Class 4 10g x 45mm wafer head	Class 4 10g x 45mm wafer head
Steel	Class 4 - 10g x 40mm #2sq/drive wingtec	Class 4 - 10g x 60mm #2sq/drive wingtec

Design

Fasteners must be fixed closer together on the periphery edges of all roofs in areas of High to Extra High Wind Zones.

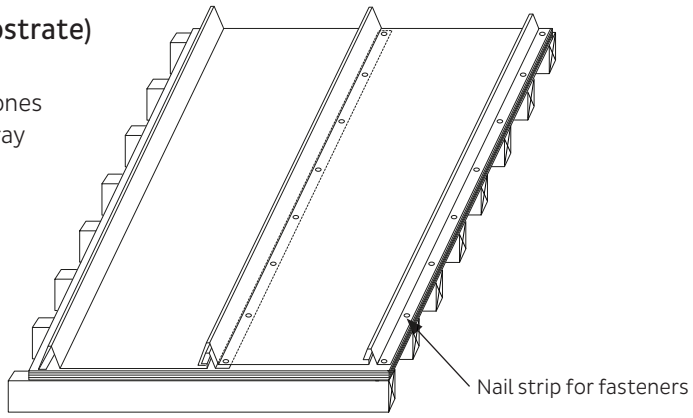
Unlike profiled metal cladding, the point load imposed on a fully supported cladding is supported by the substrate underneath.

Clip fixing table	
Wind Zone	Purlin Centre (mm)
Low to High	600
Very High to Extra High	400

Minimum pitch for Eurotray® Lite is 8 degrees.

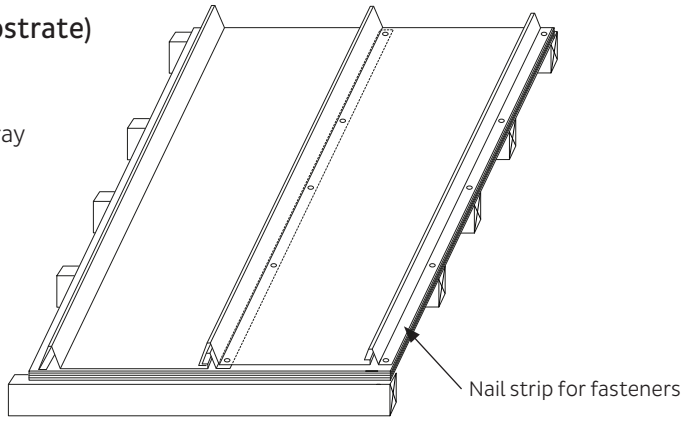
Eurotray® Lite (over substrate)

400mm purlin centres
Very high/Extra High Wind Zones
Nail strip formed as part of tray

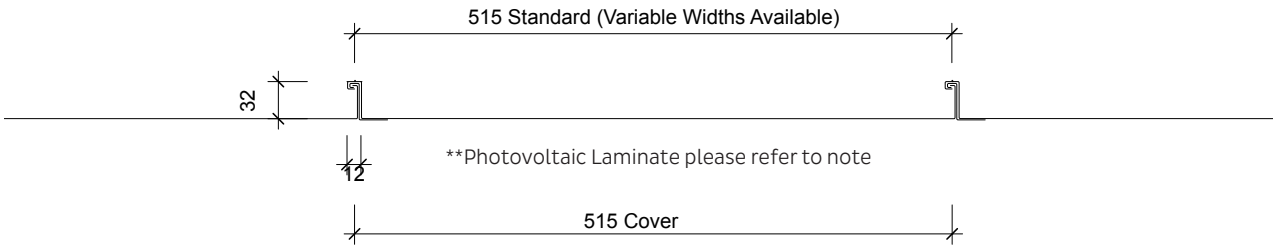


Eurotray® Lite (over substrate)

600mm purlin centres
Low - High Wind Zones
Nail strip formed as part of tray



DIMOND EUROTRAY® ANGLE SEAM PROFILE INFORMATION



Roll-forming facility	AKL	CHC	INV
Cover (mm)	525	517	525
Sheet width (mm)	523	515	523
Minimum Pitch	5° (approx. 1:11)		

Note for Copper and Zinc reduce widths by 10mm

Sheet Tolerances

Sheet width: ‡5mm
Sheet width for aluminium +0, -15mm. If sheet cover widths are critical, advise Dimond Roofing at time of order.
Sheet length: +10, - 0mm. For horizontal wall cladding where notified at time of order of intended use, tighter tolerances can be achieved +3, -0.

Material Options	Steel	Aluminium	**Copper	**Zinc
Thickness (BMT) mm	0.55	0.70	0.70	0.70
Nominal weight/lineal metre (kg/m)	2.77	1.19	3.84	3.06
Drape curved roof - min. radius (m)	40	70	40	40
Substrate required	Yes	Yes	Yes	Yes
Machine curved - roof min. radius (mm)	2500	600	600	600
Drip edge flashing required CAD detail R-004-02	Yes	Yes	Yes	Yes

**Please contact your Dimond Roofing 0800 Dimond (0800 346 663) for availability.

Roll-forming facilities at: Auckland, Christchurch and Invercargill

Curving facilities: Machine is transportable
For curving restraints check with the local roofingsmith.

Sheet lengths: Eurotray® is custom run to order. Where long sheets are used, consideration must be given to:

- Special transportation licences
- Should be run on-site
- Site access for special lifting equipment
- Fixing techniques to accommodate thermal expansion

THIS PRODUCT MUST BE INSTALLED BY A CERTIFIED & APPROVED ROOFINGSMITH

**NOTE
Photovoltaic laminates (PVL's) can be installed on to this profile at an additional cost when the cladding is completed and other trade have finished or it can be installed at a later date.
Laminates are 348mm wide and available in 5.910mm and 2.585mm lengths. Lead time of 16 weeks
Laminates cannot be installed on raking sections of roofs
Consult with Dimond Roofing 0800 Dimond (0800 346 663) for further information

Eurotray® Angle Seam Design

Eurotray® Angle Seam roof cladding must always be installed over a plywood (12mm minimum) substrate with a moisture content of less than 18% and made wind tight, with purlin supports underneath at 600mm centres in low to high wind zones and 400mm centres for very high and extra high wind zones. 8g x 40mm countersunk stainless steel screws at 150mm centres around the panel edged and 200mm centres on the intermediate supports. The fasteners should be no closer than 10mm to the edge when using Zinc avoid contact with Bituminous paper underlays and use Covertek 403.

Dimond Roofing

A 3mm expansion gap should be provided between the sheets. All joints should be staggered and taped over before placing underlay, Dimond Roofing recommend the use of vented type underlay. This allows added air-flow between the underside of the tray and substrate, it also helps to reduce oil-canning in the tray.

Fasteners that are used to secure Eurotray® down as a roof cladding must penetrate through the substrate and into the purlin a minimum of 30mm for timber and 6mm for steel purlins. For wall cladding the fasteners must be long enough to pass through the substrate, cavity batten and into the main frame by 30mm for timber and 6mm for steel.

Clip Fixing Requirement - 2 fixings per clip per purlin								
Purlin or frame material	Roof (standard 12mm Substrate)				Wall (over vented cavity batten, 18 - 25mm thick)			
	Base material				Base material			
	Steel	Aluminium	Copper	Zinc	Steel	Aluminium	Copper	Zinc
Timber	Stainless steel grade 304 - 8g x 50mm c/sunk	Stainless steel grade 304 - 8g x 50mm c/sunk	Stainless steel grade 304 - 8g x 50mm c/sunk	Stainless steel grade 304 - 8g x 50mm c/sunk	Stainless steel grade 304 - 8g x 65mm c/sunk	Stainless steel grade 304 - 8g x 65mm c/sunk	Stainless steel grade 304 - 8g x 65mm c/sunk	Stainless steel grade 304 - 8g x 65mm c/sunk
Steel	Stainless steel grade 304 - 8g x 30mm c/sunk	Stainless steel grade 304 - 8g x 30mm c/sunk	Stainless steel grade 304 - 8g x 30mm c/sunk	Stainless steel grade 304 - 8g x 30mm c/sunk	Stainless steel grade 304 - 8g x 40mm c/sunk	Stainless steel grade 304 - 8g x 40mm c/sunk	Stainless steel grade 304 - 8g x 40mm c/sunk	Stainless steel grade 304 - 8g x 40mm c/sunk

Design

Fasteners must be fixed closer together on the periphery edges of all roofs in areas of High to Extra High Wind Zones.

Unlike profiled metal cladding, the point load imposed on a fully supported cladding is supported by the substrate underneath.

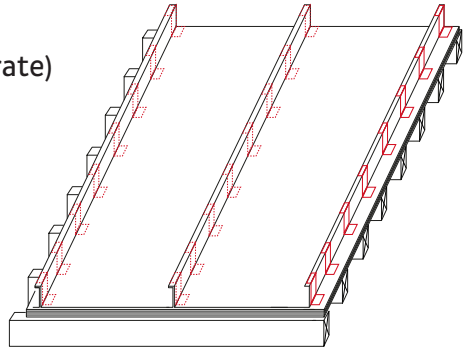
Clip fixing table	
Wind Zone	Purlin Centre (mm)
Low to High	600
Very High to Extra High	400

Minimum pitch for Eurotray® Angle Seam is 5 degrees.

NOTE
Flashing and jointing details when using Copper or Zinc materials are required to be solder, silicone sealants are not to be used on these materials avoid contact between zinc and Bituminous underlay. Recommend Covertek 403.

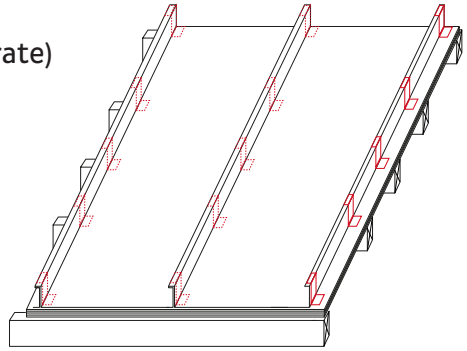
Eurotray® Angle Seam (over substrate)

400mm purlin centres
Very high/Extra High Wind Zones

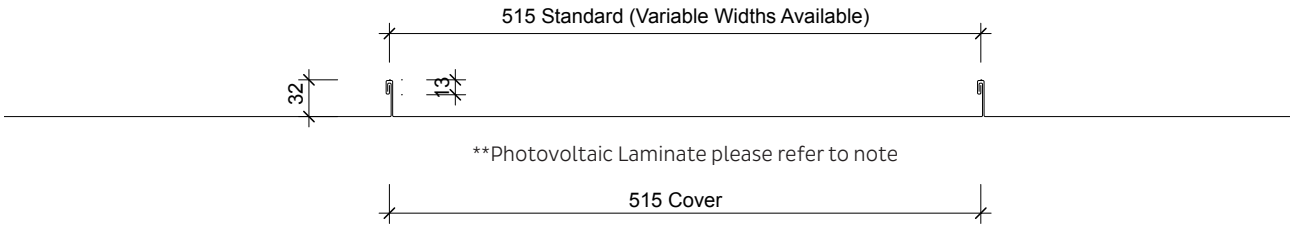


Eurotray® Angle Seam (over substrate)

600mm purlin centres
Low - High Wind Zones



DIMOND EUROTRAY® DOUBLE STANDING SEAM PROFILE INFORMATION



Roll-forming facility	AKL	CHC	INV
Cover (mm)	526	520	525
Sheet width (mm)	523	517	523
Minimum Pitch	3° (approx. 1:20)		

Note for Copper and Zinc reduce widths by 10mm

Sheet Tolerances

Sheet width: ‡5mm
Sheet width for aluminium +0, -15mm. If sheet cover widths are critical, advise Dimond Roofing at time of order.
Sheet length: +10, - 0mm. For horizontal wall cladding where notified at time of order of intended use, tighter tolerances can be achieved +3, -0.

Material Options	Steel	Aluminium	**Copper	**Zinc
Thickness (BMT) mm	0.55	0.70	0.70	0.70
Nominal weight/lineal metre (kg/m)	2.77	1.19	3.84	3.06
Drape curved roof - min. radius (m)	40	70	40	40
Substrate required	Yes	Yes	Yes	Yes
Machine curved - roof min. radius (mm)	2500	600	600	600
Drip edge flashing required CAD detail R-003-02	Yes	Yes	Yes	Yes

**Please contact your Dimond Roofing 0800 Dimond (0800 346 663) for availability.

Roll-forming facilities at: Auckland, Christchurch and Invercargill

Curving facilities: Machine is transportable
For curving restraints check with the local roofingsmith.

Sheet lengths: Eurotray® is custom run to order. Where long sheets are used, consideration must be given to:

- Special transportation licences
- Should be run on-site
- Site access for special lifting equipment
- Fixing techniques to accommodate thermal expansion

THIS PRODUCT MUST BE INSTALLED BY A CERTIFIED & APPROVED ROOFINGSMITH

**NOTE
Photovoltaic laminates (PVL's) can be installed on to this profile at an additional cost when the cladding is completed and other trade have finished or it can be installed at a later date.
Laminates are 348mm wide and available in 5.910mm and 2.585mm lengths. Lead time of 16 weeks
Laminates cannot be installed on raking sections of roofs
Consult with Dimond Roofing 0800 Dimond (0800 346 663) for further information

Eurotray® Double Standing Seam Design

Eurotray® Double Standing Seam roof cladding must always be installed over a plywood (12mm minimum) substrate with a moisture content of less than 18% and made wind tight, with purlin supports underneath at 600mm centres in low to high wind zones and 400mm centres for very high and extra high wind zones. 8g x 40mm countersunk stainless steel screws at 150mm centres around the panel edged and 200mm centres on the intermediate supports. The fasteners should be no closer than 10mm to the edge.

A 3mm expansion gap should be provided between the sheets. All joints should be staggered and taped over before placing underlay, Dimond Roofing recommend the use of vented type underlay such as tyvek metal or Covertek 407. Avoid Bituminous underlays in contact with Zinc. This allows added air-flow between the underside of the tray and substrate, it also helps to reduce oil-canning in the tray.

Fasteners that are used to secure Eurotray® down as a roof cladding must penetrate through the substrate and into the purlin a minimum of 30mm for timber and 6mm for steel purlins. For wall cladding the fasteners must be long enough to pass through the substrate, cavity batten and into the main frame by 30mm for timber and 6mm for steel.

Clip Fixing Requirement - 2 fixings per purlin								
Purlin or frame material	Roof (standard 12mm Substrate)				Wall (over vented cavity batten, 18 - 25mm thick)			
	Base material				Base material			
	Steel	Aluminium	Copper	Zinc	Steel	Aluminium	Copper	Zinc
Timber	Stainless steel grade 304 - 8g x 50mm c/sunk	Stainless steel grade 304 - 8g x 50mm c/sunk	Stainless steel grade 304 - 8g x 50mm c/sunk	Stainless steel grade 304 - 8g x 50mm c/sunk	Stainless steel grade 304 - 8g x 65mm c/sunk	Stainless steel grade 304 - 8g x 65mm c/sunk	Stainless steel grade 304 - 8g x 65mm c/sunk	Stainless steel grade 304 - 8g x 65mm c/sunk
Steel	Stainless steel grade 304 - 8g x 30mm c/sunk	Stainless steel grade 304 - 8g x 30mm c/sunk	Stainless steel grade 304 - 8g x 30mm c/sunk	Stainless steel grade 304 - 8g x 30mm c/sunk	Stainless steel grade 304 - 8g x 40mm c/sunk	Stainless steel grade 304 - 8g x 40mm c/sunk	Stainless steel grade 304 - 8g x 40mm c/sunk	Stainless steel grade 304 - 8g x 40mm c/sunk

Design

Fasteners must be fixed closer together on the periphery edges of all roofs in areas of High to Extra High Wind Zones.

Unlike profiled metal cladding, the point load imposed on a fully supported cladding is supported by the substrate underneath.

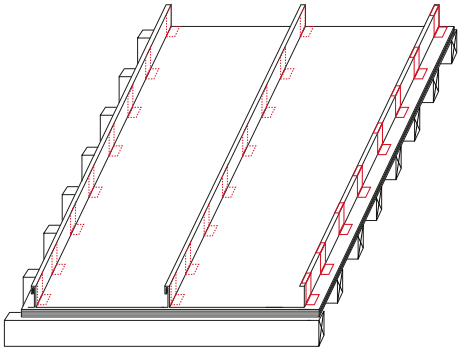
Clip fixing table	
Wind Zone	Purlin Centre (mm)
Low to High	600
Very High to Extra High	400

Minimum pitch for Eurotray® Double Standing Seam is 3 degrees.

NOTE
Flashing and jointing details when using Copper or Zinc materials are required to be solder, silicone sealants are not to be used on these materials.

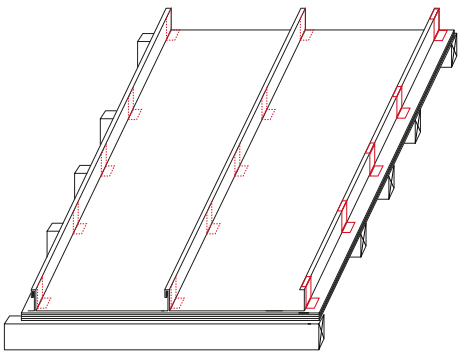
Eurotray® Double Standing Seam (over substrate)

400mm purlin centres
Very high/Extra High Wind Zones

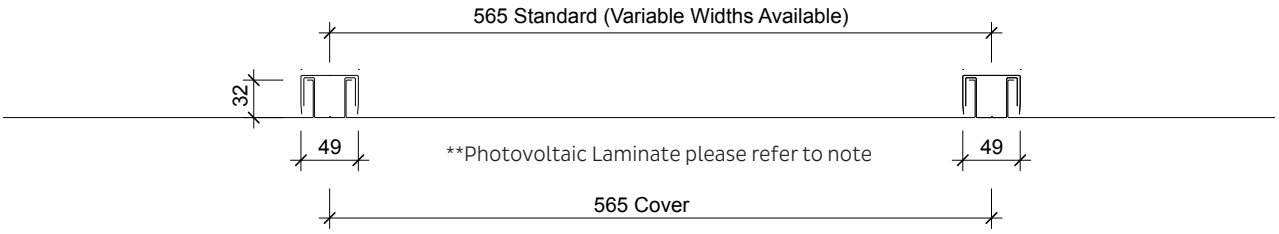


Eurotray® Double Standing Seam (over substrate)

600mm purlin centres
Low - High Wind Zones



DIMOND EUROTRAY® ROLL CAP PROFILE INFORMATION



Roll-forming facility	AKL	CHC	INV
Cover (mm)	575	565	579
Sheet width (mm)	540	530	544
Minimum Pitch	5° (approx. 1:11)		

Note for Copper and Zinc reduce widths by 10mm

Sheet Tolerances

Sheet width: ‡5mm
Sheet width for aluminium +0, -15mm. If sheet cover widths are critical, advise Dimond Roofing at time of order.
Sheet length: +10, - 0mm. For horizontal wall cladding where notified at time of order of intended use, tighter tolerances can be achieved +3, -0.

Material Options	Steel	Aluminium
Thickness (BMT) mm	0.55	0.70
Nominal weight/lineal metre (kg/m)	2.77	1.19
Drape curved roof - min. radius (m)	n/a	n/a
Substrate required	Yes	Yes
Machine curved - roof min. radius (mm)	n/a	n/a
Drip edge flashing required see detail R-005-02	Yes	Yes

Roll-forming facilities at: Auckland, Christchurch and Invercargill

Curving facilities: Machine is transportable
For curving restraints check with the local roofingsmith.

Sheet lengths: Eurotray® is custom run to order. Where long sheets are used, consideration must be given to:

- Special transportation licences
- Should be run on-site
- Site access for special lifting equipment
- Fixing techniques to accommodate thermal expansion

THIS PRODUCT MUST BE INSTALLED BY A CERTIFIED & APPROVED ROOFINGSMITH

**NOTE
Photovoltaic laminates (PVL's) can be installed on to this profile at an additional cost when the cladding is completed and other trade have finished or it can be installed at a later date.
Laminates are 348mm wide and available in 5.910mm and 2.585mm lengths. Lead time of 16 weeks
Laminates cannot be installed on raking sections of roofs
Consult with Dimond Roofing 0800 Dimond (0800 346 663) for further information

Eurotray® Roll Cap Design

Eurotray® Roll Cap roof cladding must always be installed over a plywood (12mm minimum) substrate with a moisture content of less than 18% and made wind tight, with purlin supports underneath at 600mm centres in low to high wind zones and 400mm centres for very high and extra high wind zones. 8g x 40mm countersunk stainless steel screws at 150mm centres around the panel edged and 200mm centres on the intermediate supports. The fasteners should be no closer than 10mm to the

edge.

A 3mm expansion gap should be provided between the sheets. All joints should be staggered and taped over before placing underlay, Dimond Roofing recommend the use of vented type underlay such as Tyvek metal or Covertek 403 with drainage mat. This allows added air-flow between the underside of the tray and substrate, it also helps to reduce oil-canning in the tray.

Fasteners that are used to secure Eurotray® down as a roof cladding must penetrate through the substrate and into the purlin a minimum of 30mm for timber and 6mm for steel purlins. For wall cladding the fasteners must be long enough to pass through the substrate, cavity batten and into the main frame by 30mm for timber and 6mm for steel.

Clip Fixing Requirement - 1 fixing per clip per purlin								
Purlin or frame material	Roof (standard 12mm Substrate)				Wall (over vented cavity batten, 18 - 25mm thick)			
	Base material				Base material			
	Steel	Aluminium	Copper	Zinc	Steel	Aluminium	Copper	Zinc
Timber	Type 17 class 4 12 x 50mm timbertite	Type 17 class 4 12 x 50mm timbertite	N/A	N/A	Type 17 class 4 12 x 65mm timbertite	Type 17 class 4 12 x 65mm timbertite	N/A	N/A
Steel	Class 4 12 x 45mm steeltite	Class 4 12 x 45mm steeltite	N/A	N/A	Class 4 12 x 45mm steeltite	Class 4 12 x 45mm steeltite	N/A	N/A

Design

Fasteners must be fixed closer together on the periphery edges of all roofs in areas of High to Extra High Wind Zones.

Unlike profiled metal cladding, the point load imposed on a fully supported cladding is supported by the substrate underneath.

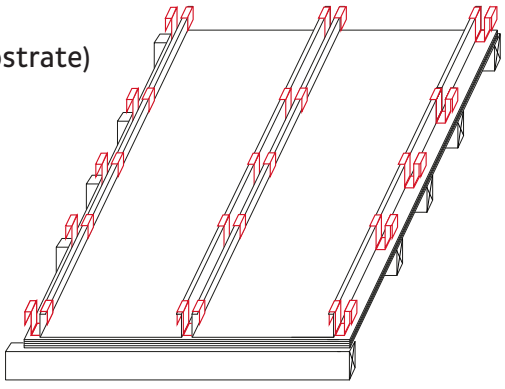
Clip fixing table	
Wind Zone	Purlin Centre (mm)
Low to High	600
Very High to Extra High	400

Minimum pitch for Eurotray® Roll Cap is 5 degrees.

NOTE
Flashing and jointing details when using Copper or Zinc materials are required to be solder, silicone sealants are not to be used on these materials.

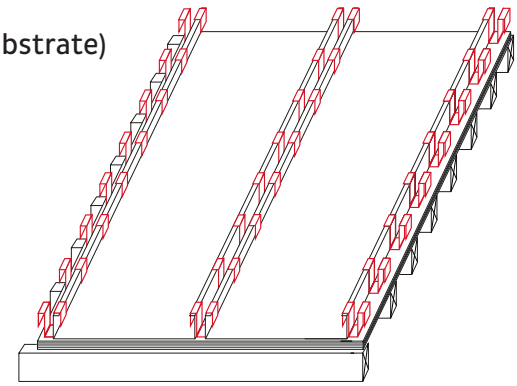
Eurotray® Roll Cap (over substrate)

600mm purlin centres
Low - High Wind Zones

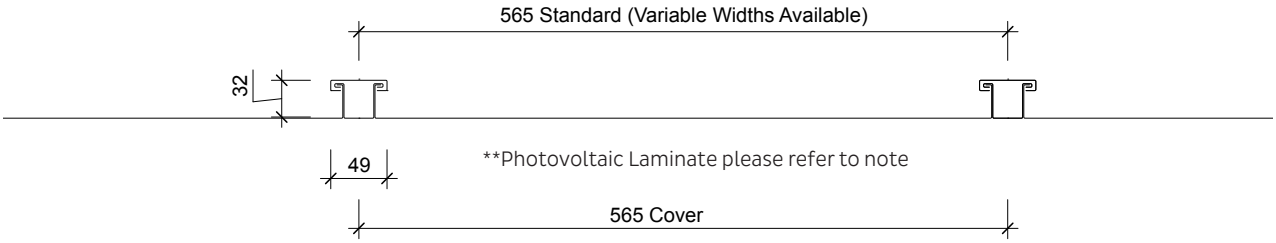


Eurotray® Roll Cap (over substrate)

400mm purlin centres
Very high/Extra High Wind Zones



DIMOND EUROTRAY® ROLL SEAM PROFILE INFORMATION



Roll-forming facility	AKL	CHC	INV
Cover (mm)	575	565	579
Sheet width (mm)	540	530	544
Minimum Pitch	5° (approx. 1:11)		

Note for Copper and Zinc reduce widths by 10mm

Sheet Tolerances

Sheet width: ‡5mm
Sheet width for aluminium +0, -15mm. If sheet cover widths are critical, advise Dimond Roofing at time of order.
Sheet length: +10, - 0mm. For horizontal wall cladding where notified at time of order of intended use, tighter tolerances can be achieved +3, -0.

Material Options	Steel	Aluminium	**Copper	**Zinc
Thickness (BMT) mm	0.55	0.70	0.70	0.70
Nominal weight/lineal metre (kg/m)	2.77	1.19	3.84	3.06
Drape curved roof - min. radius (m)	40	70	40	40
Substrate required	Yes	Yes	Yes	Yes
Machine curved - roof min. radius (mm)	2500	600	600	600
Drip edge flashing required see detail R-005-02	Yes	Yes	Yes	Yes

**Please contact your Dimond Roofing 0800 Dimond (0800 346 663) for availability.

Roll-forming facilities at: Auckland, Christchurch and Invercargill

Curving facilities: Machine is transportable
For curving restraints check with the local roofingsmith.

Sheet lengths: Eurotray® is custom run to order. Where long sheets are used, consideration must be given to:

- Special transportation licences
- Should be run on-site
- Site access for special lifting equipment
- Fixing techniques to accommodate thermal expansion

THIS PRODUCT MUST BE INSTALLED BY A CERTIFIED & APPROVED ROOFINGSMITH

**NOTE
Photovoltaic laminates (PVL's) can be installed on to this profile at an additional cost when the cladding is completed and other trade have finished or it can be installed at a later date.
Laminates are 348mm wide and available in 5.910mm and 2.585mm lengths. Lead time of 16 weeks
Laminates cannot be installed on raking sections of roofs
Consult with Dimond Roofing 0800 Dimond (0800 346 663) for further information

Eurotray® Roll Seam Design

Eurotray® Roll Seam roof cladding must always be installed over a plywood (12mm minimum) substrate with a moisture content of less than 18% and made wind tight, with purlin supports underneath at 600mm centres in low to high wind zones and 400mm centres for very high and extra high wind zones. 8g x 40mm countersunk stainless steel screws at 150mm centres around the panel edged and 200mm centres on the intermediate supports. The fasteners should be no closer than 10mm to the edge.

Dimond Roofing

A 3mm expansion gap should be provided between the sheets. All joints should be staggered and taped over before placing underlay, Dimond Roofing recommend the use of vented type underlay. This allows added air-flow between the underside of the tray and substrate, it also helps to reduce oil-canning in the tray.

Fasteners that are used to secure Eurotray® down as a roof cladding must penetrate through the substrate and into the purlin a minimum of 30mm for timber and 6mm for steel purlins. For wall cladding the fasteners must be long enough to pass through the substrate, cavity batten and into the main frame by 30mm for timber and 6mm for steel.

Clip Fixing Requirement - 2 fixings per clip per purlin								
Purlin or frame material	Roof (standard 12mm Substrate)				Wall (over vented cavity batten, 18 - 25mm thick)			
	Base material				Base material			
	Steel	Aluminium	Copper	Zinc	Steel	Aluminium	Copper	Zinc
Timber	Type 17 class 4 12 x 50mm timbertite	Type 17 class 4 12 x 50mm timbertite	Type 17 Stainless steel grade 304 12 x 50mm	Type 17 class 4 12 x 50mm timbertite	Type 17 class 4 12 x 65mm timbertite	Type 17 class 4 12 x 65mm timbertite	Stainless steel grade 304 class 4 12 x 65mm timbertite	Type 17 class 4 12 x 65mm timbertite
Steel	Class 4 12 x 25mm steeltite	Class 4 12 x 25mm steeltite	Class 4 12 x 25mm steeltite	Class 4 12 x 25mm steeltite	Class 4 12 x 45mm steeltite	Class 4 12 x 45mm steeltite	Stainless steel grade 304 class 4 12 x 45mm steeltite	Class 4 12 x 45mm steeltite

Design

Fasteners must be fixed closer together on the periphery edges of all roofs in areas of High to Extra High Wind Zones.

Unlike profiled metal cladding, the point load imposed on a fully supported cladding is supported by the substrate underneath.

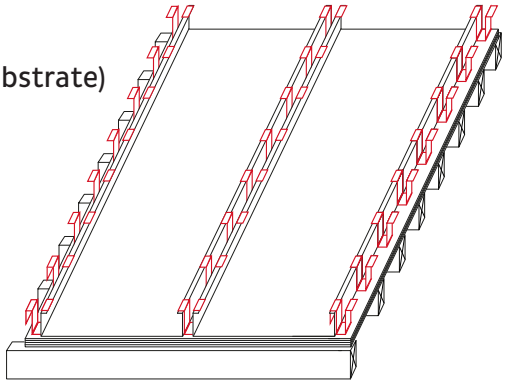
Clip fixing table	
Wind Zone	Purlin Centre (mm)
Low to High	600
Very High to Extra High	400

Minimum pitch for Eurotray® Double Standing Seam is 5 degrees.

NOTE
Flashing and jointing details when using Copper or Zinc materials are required to be solder, silicone sealants are not to be used on these materials.

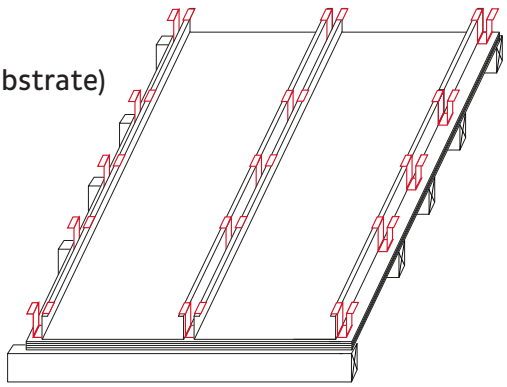
Eurotray® Roll Seam (over substrate)

400mm purlin centres
Very high/Extra High Wind Zones



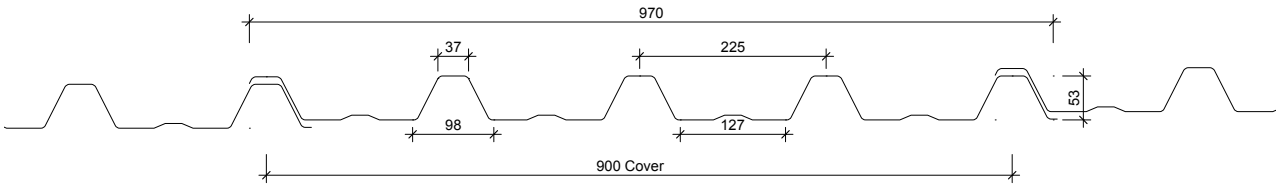
Eurotray® Roll Seam (over substrate)

600mm purlin centres
Low - High Wind Zones



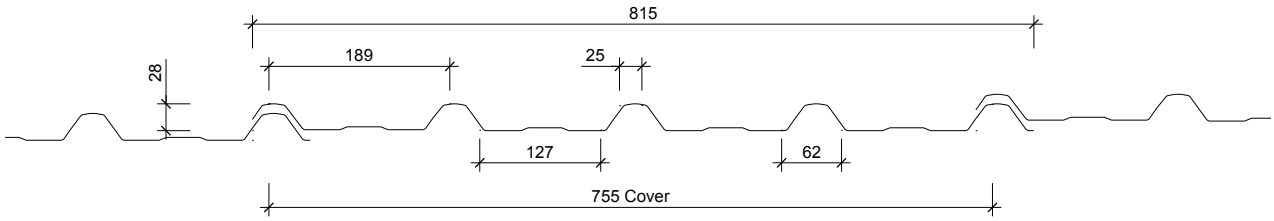
DIMOND AUDIOPERF® PROFILE INFORMATION

Steel Span & Top Span



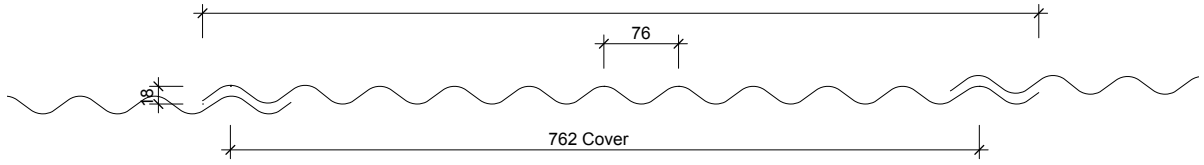
Cover (mm)	900
Sheet width (mm)	970

Hi Five, Styleline, Veedek®



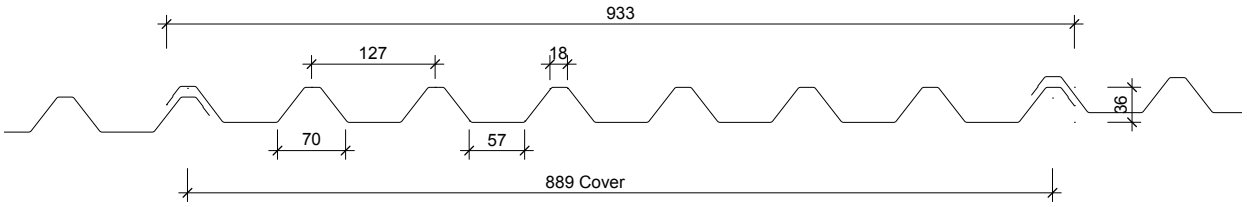
Cover (mm)	755
Sheet width (mm)	810

Image of Corrugate



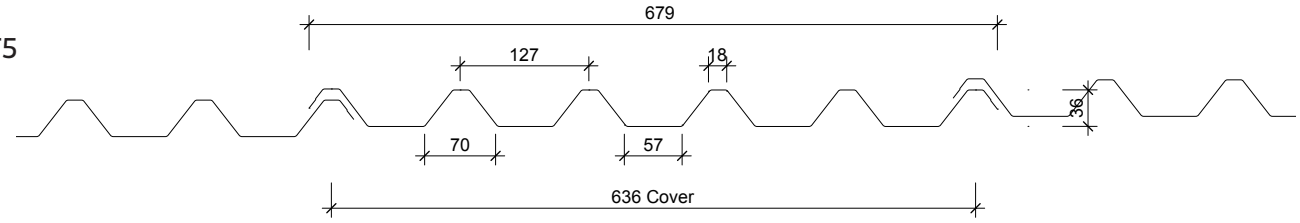
Cover (mm)	762
Sheet width (mm)	851

LT7



Cover (mm)	762
Sheet width (mm)	851

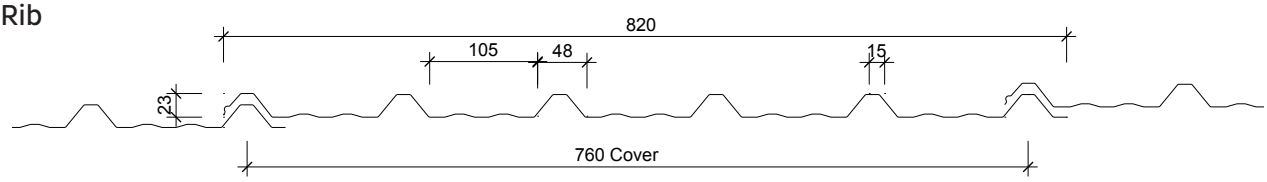
LT5



Cover (mm)	635
Sheet width (mm)	725

Dimond Roofing

Six Rib



Cover (mm)	760
Sheet width (mm)	851

Sheet Tolerances

Sheet width: ‡5mm

Sheet width for aluminium +0, -15mm. If sheet cover widths are critical, advise Dimond Roofing at time of order.
Sheet length: +10, - 0mm. For horizontal wall cladding where notified at time of order of intended use, tighter tolerances can be achieved +3, -0.

	Audioperf® Specifications Maximum allowable spans for direct fixed ceiling applications (mm)					
Material Options	Corrugate	6 Rib	Hi Five	V-Rib	LT7 & 5	Steel/Top Span
**0.55mm (G300)	1.3	1.35	1.5	1.6	1.6	1.7
0.70mm Aluminium	1.3	1.35	1.5	1.6	1.6	1.7
0.90mm Aluminium	1.5	1.65	1.7	1.8	1.8	2.0

**Indicates AZ150 Coated Steel, Pre-painted material and for internal (dry location) use.

Roll-forming facilities at: Auckland, Hamilton, Wellington, Christchurch and Invercargill (LT5 is Wellington and Invercargill)

Curving facility at: Contact Dimond Roofing.

Sheet lengths: Audioperf® is custom run to order. Where long sheets are used, consideration must be given to:

- Special transportation licences for sheet lengths over 16m
- Site access for special lifting equipment

Audioperf®

Audioperf® is a perforated ceiling system for commercial applications and is manufactured from perforated metal of aluminium and roll-formed into a wide range of profiles.

Developed for large and medium scale building applications, and particularly large span ceiling applications. Audioperf® gives strong clean lines and bold symmetry with modern forms it is used to create dynamic shadows and can be integrated with bespoke flashings to create negative details and installation points for sprinklers, light units etc.

Profiles

Audioperf® is available in the following profiles:

- Steel Span or Top Span
- LT7 & LT5
- V-Rib
- High Five
- Six Rib
- Corrugate

Material Thicknesses

- 0.55mm AZ150 Coated Steel
- 0.55mm MagnaFlow™
- 0.70mm AlumiGard™
- 0.90mm AlumiGard™

As the product is intended primarily as an internal ceiling material other uses should be considered carefully on an individual basis in consultation with Dimond Roofing, typical examples are:

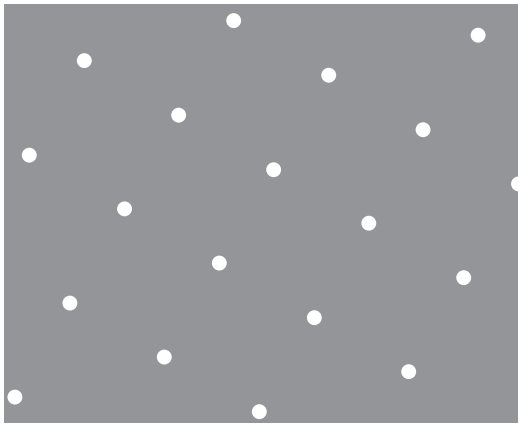
- External use such as veranda ceiling, decorative panels or back lit applications as wall cladding
- Curved or Bull-nose applications
- Internal wall cladding or areas exposed to physical contact or vandalism

Perforations

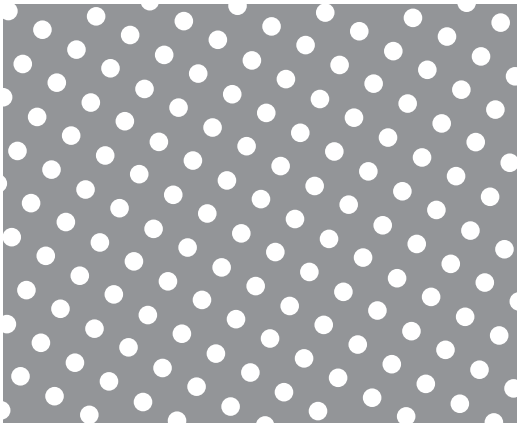
Perforations are available in four holes sizes and array pitches giving open areas of 7% to 60%. Examples are shown below:

Note: for acoustic performance, AP143 is recommended

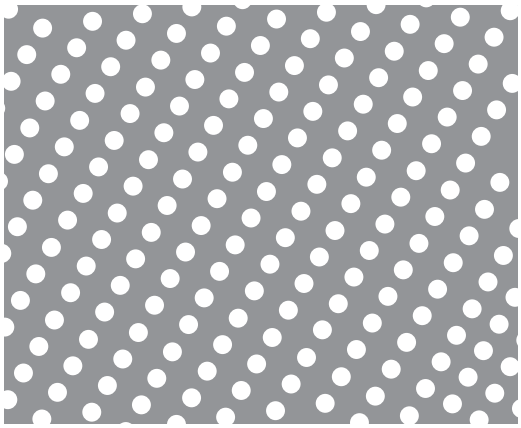
AP119 - 2.5mm at 15mm centres 7% open area



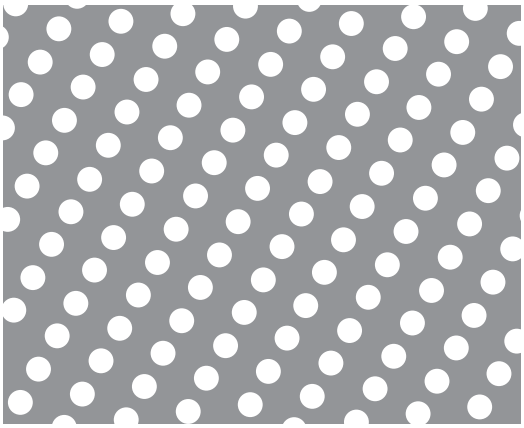
AP143 - 3.2mm at 6.5mm centres 23% open area



AP129 - 3.2mm at 5mm centres 32% open area



AP165 - 4mm at 5mm centres 58% open area



Span Data

The table on the front page cover, the installation onto metal battens using the material thickness, condition and perforation pattern specified. Note the span data assumes self-weight only and penetrations, inserts of other items should have loads reacted directly against structural members rather than imposed via the Audioperf®. For small items (less than 3kg) where no more than 2 items exist on the same sheet these should be located near to battens (to avoid sag) and battens spans should be reduced by 20%.

Curved Ceilings

Sheets may be rolled over their width or sprung curved/ machine curved over their length, for corrugated profile the following should be maintained:

Width Curved	1 metre radius
Sprung curved	10 metre radius
Machine curved	2 metre radius

Acoustic Performance

Testing of the ceiling system is to ASTM C423 and ASTM E1414. Independent laboratory testing of insulation materials can give an NRC value of up to 1.0 testing of a typical complete system has shown the following NRC values:

- CSR-AP143 corrugate direct fixed with 25mm insulation = NRC 0.55
- CSR-AP143 corrugate direct fixed with 50mm insulation = NRC 0.70
- CSR-AP143 corrugate direct fixed with 75mm insulation = NRC 0.70
  (NRC) Noise Reduction Coefficient

Fire Performance

The system when installed on metal purlins or battens complies with the New Zealand Building Code C/AS1 and has been specifically tested to AS1530.3 and meets the following:

Ignitability Index (Range 0-20)	0
Spread of Flame (Range 0-10)	0
Heat Evolved Index (Range 0-10)	0
Smoke Developed Index (Range 0-10)	3

Durability

All materials selected and supplied by Dimond Roofing are warranted for internal use only, to exceed the requirements of clause B.2.3 (1) of the first schedule to the Building Regulations 1992 for 15 years durability, providing the materials selected are suited to the environment and designed, detailed, and fixed and maintained in compliance with Dimond Roofing instructions, the Roofing Code of Practice and good trade practice.

Lengths

Audioperf® is made to custom long run lengths. Where these exceed 16 metres, they may require special transport and handling facilities. For lengths over 24m, special Land Transport Safety Authority permission should be sought at design stage.

Flashings

Standard flashings are available for each profile. Attention is drawn to use of matching flashing material in contact with the Audioperf®. In addition, curved flashings are available to suit curved or sprung ceilings.

Fixing

Fasteners for internal use shall be 12g x 20mm steel or timbertite and be pan fixed.

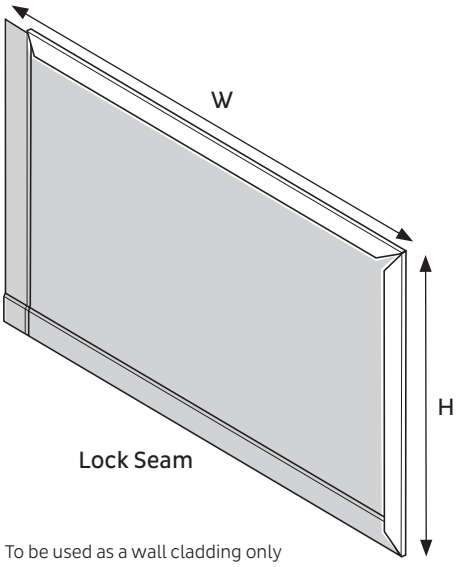
Maintenance

No specific maintenance is required for internal use than an annual removal of dust with a mild detergent.

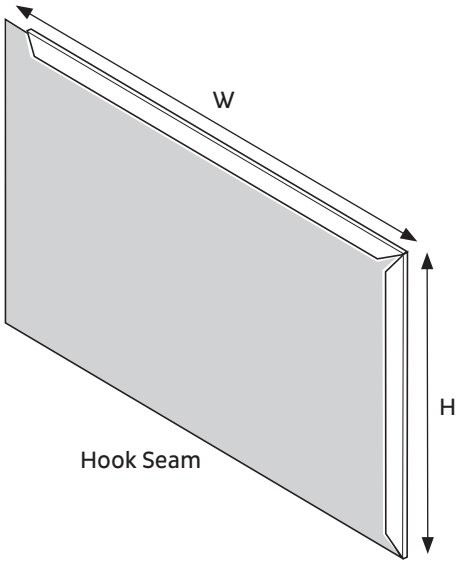
Avoid the product being prolonged contact with debris that could hold moisture
Regularly hose down and clean any areas showing accumulation of dirt salt other contaminants. Always use a non-abrasive brush. For moderate environments this should be carried out at least annually.
Avoid contact with, or discharge from dissimilar metals.

Failure to observe these guidelines may result in voiding the warranty and affect the durability of the product.

DIMOND EURO-PANEL® PROFILE INFORMATION



To be used as a wall cladding only



Panel Tolerances

Cover (mm) H = 600 x W = 1125
Panel length ‡ 5mm
Panel Height ‡ 5mm

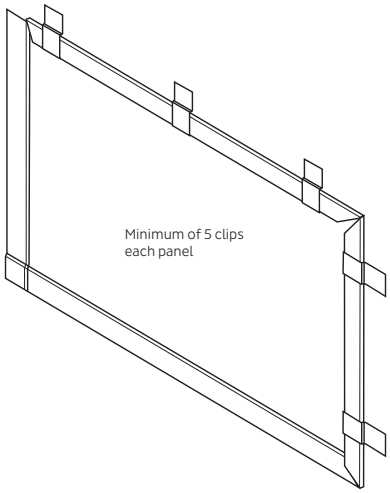
Dimensions given are nominal

Material Options	Copper	Zinc
Thickness (BMT) mm	0.7	0.7
Nominal weight/lineal metre (kg/m)	6.78	3.02

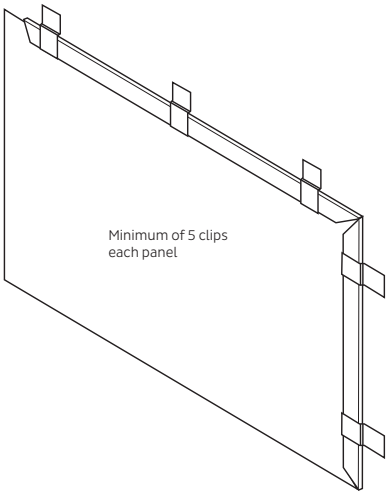
Euro-Panel® Fastener Designation

Over cavity batten, with a 12mm plywood substrate (18-25mm thick)		
Framing material	Copper	Zinc
Timber	Type 17 Stainless steel grade 304 8g x 20mm c/sunk or 2.5mm x 25mm grade 304 stainless steel annular grooved nails	Type 17 Stainless steel grade 304 8g x 20mm c/sunk or 2.5mm x 25mm grade 304 stainless steel annular grooved nails
Fixing Clips	The maximum clip fixing centre is 500mm, with clip spacing's from the corners no greater than 65mm	
Lock Seam Width	Standard seam width is 30mm, but can be made to 40mm	

Euro-Panel® Lock Seam (swages around two edges)



Euro-Panel® Hook Seam



THIS PRODUCT MUST BE INSTALLED BY A CERTIFIED & APPROVED ROOFINGSMITH

EURO-PANEL® LIMIT STATE LOAD/SPAN CAPACITY CHART

(span in mm, distributed ultimate load in kPa)

Serviceability Category Wall

	Fixings per Panel	Fixings per Clip	Ultimate (kPa)
Zinc 0.70mm	5	2	2.65
Copper 0.70mm	5	2	4.15

NOTES

1. Loads given are limited to a maximum of 4.15kPa. If design requirements exceed this limit, Contact Dimond Roofing for specific advice.
2. **Design Criteria for Limit State Capacities**
   a) **Ultimate Limited State**
   No pull through of fixings or fasteners withdrawal resulting in sheet detachment due to wind up-lift (outward) loads
3. **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.

Euro-Panel® Design

Euro-Panel® wall cladding must always be installed over a plywood (12mm minimum) substrate with a moisture content of less than 18% and made wind tight, with purlin supports underneath at 600mm centres in low to high wind zones and 400mm centres for very high and extra high wind zones. Avoid contact between Zinc and Bitumous papers. Use covertek 403.

8g x 40mm countersunk stainless steel screws at 150mm centres around the panel edged and 200mm centres on the intermediate supports. The fasteners should be no closer than 10mm to the edge.

A 3mm expansion gap should be provided between the sheets. All joints should be staggered and taped over before placing underlay.

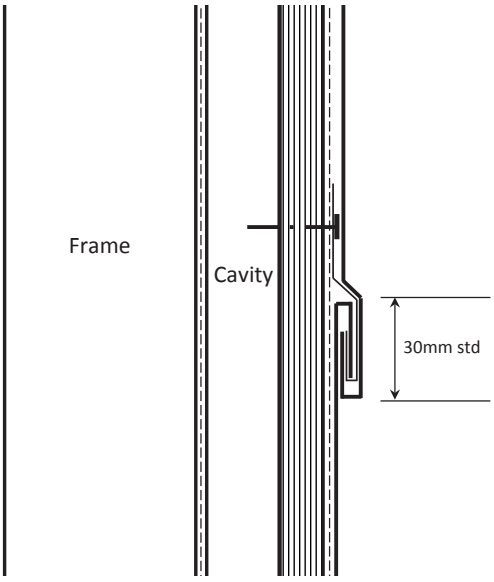
Euro-Panel® can have varying length panels up to 1125mm for Lock seam but can be longer for Hook Seam panels please contact the local Dimond Roofing branch for further information.

Euro-Panel® can be laid in pattern or randomly depending on the required finish. Most often the panel will be installed in a brick-block pattern.

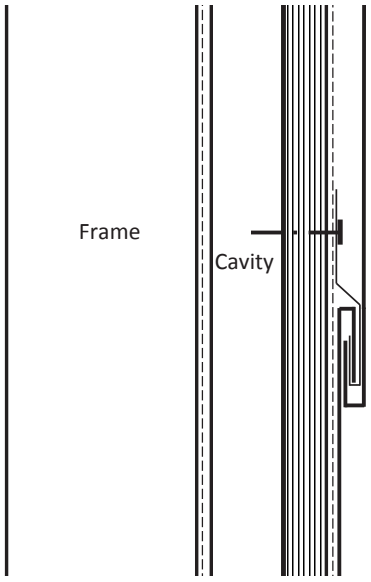
The height of the panel must remain the same for each row or course. Concealed 'stainless steel' or copper clips connect the Euro-Panel® to the substrate, and the seam width of the Lock Seam panel can be adjusted if required.

Types of Panel

Euro-Panel® Lock Seam



Euro-Panel® Hook Seam

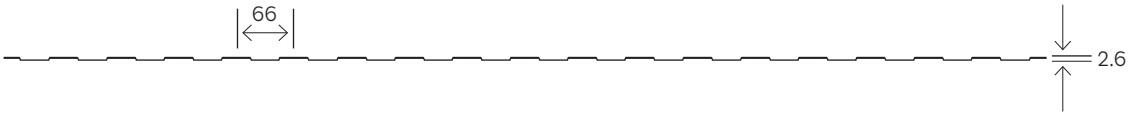


Production facility at: Invercargill

NOTES

Coated steel based materials are not recommended for these profiles, due to the high likelihood of scratching, which could lead to corrosive issues at a later date. Flashing and jointing details when using Copper or Zinc materials are required to be solder, silicone sealants are not to be used on these materials.

DIMOND FINELINE PROFILE PERFORMANCE



Cover (mm)	885	1147
Sheet width (mm)	940	1200
Minimum Pitch	Wall cladding only	

All dimensions given are nominal

Sheet Tolerances

Sheet width: ±5mm

Sheet length: +10mm, –0mm. For horizontal wall cladding where notified at time of order of intended use, tighter tolerances can be achieved +3mm, –0mm.

Material Options	Steel	Aluminium
Thickness (BMT) mm	0.55	0.9
Nominal weight/lineal metre (kg/m)	4.27	2.28
Unsupported overhang (mm)	nil	nil

Roll-forming facility at: Auckland

Sheet lengths: Fineline is custom run to order in sheet lengths up to 6 metres long.

FINELINE – DETAILED CLADDING DESIGN

Design Criteria for Limit State Capacities.

a) Serviceability Limit State

No deflection or permanent distortion that would cause unacceptable appearance or side lap leakage due to inward or outward wind loads.

b) Ultimate Limit State

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 Fineline is determined by the serviceability requirement for acceptable appearance and should not exceed 300mm.

The ultimate windload should not exceed 3 kPa.

The Fineline profiles are not intended for use as roofing products, and must not be used in situations where foot traffic point loads can be applied.

Fastener Design

Fineline should be screw fixed to either timber or steel framing, or may be nail fixed to timber if not used in an exterior situation exposed to the weather. The use of the appropriate length of 12g screw will ensure failure by fastener pull out will not occur under the load limitation given.

Framing	Fastener Length (mm)	
	Wall Cladding Pan	
	Screw Length* (mm)	Designation
Timber	50	Roofzip M6 x 50mm
Steel	20	Tek - 12 - 14 x 20

*If sarking or insulation is used over the framing, screw length will need to be increased.

For screw size range and fastener / washer assembly refer Section 2.2.3.1.

The Span Capability and Sheet Appearance is based on fasteners at 200mm maximum spacing across the sheet without the use of load spreading washers.