STRATCO HILAND® TRAY

BUILDING PRODUCT INFORMATION SHEET—CLASS 1

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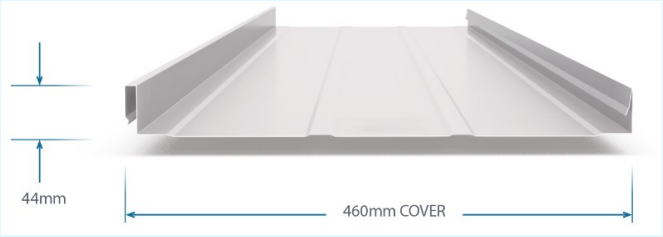
PRODUCT: **Stratco Hiland® Tray Roofing and Wall Cladding**



DESCRIPTION

Hiland® Tray is a proprietary 460mm wide tray roofing and wall cladding system, that does not require a supporting substrate in most applications and is secret fixed or 'snap locked' to roof purlins and wall girts using a concealed clip system.
The profile is available with the option of swages within the tray pan, or no swages for a more traditional look. The Hiland® Tray profile has a rib height of 44mm which provides greater water carrying capacity as well as strength for snow loading applications in alpine regions.
Hiland® Tray is manufactured at a Stratco facility and delivered to site.

PLACE OF MANUFACTURE

New Zealand

DESIGN CONSIDERATIONS

- Roof pitch minimum 3°
- Effective cover 460mm
- Rib height 44mm
- Specify material and coating to suit building location/environment
- COLORSTEEL®, including Matte, and ColorCote standard range of colours - availability and minimum quantities may apply
- Purlin spacing not to exceed maximum spans as per Hiland® Tray span tables
- For roof pitches less than 10°, it is recommended that internal purlin centres are reduced—see span tables for further information. Self support underlay will also require additional support under 10°
- Allow for thermal movement of product using Stratco's Hiland® Tray design detail drawings to meet NZ Building Code, E2/AS1 and NZ Metal Roofing Manufacturers Code of Practice. Ridge, valley, eave, change of pitch, head barge, and top apron design details should only be used in corresponding option versions. ie. All Option 1 or all Option 2—Refer Stratco design details: www.stratco.co.nz/nz/roofing/nz-roofing-and-walling/hiland-tray/
- Oil canning (wave or ripple) in the pan of Hiland® Tray occurs through thermal movement and is inherent in most wide, flat steel roofing and wall cladding products. This is visual only and does not affect the performance of the product
- To assist with minimising canning and reducing noise associated with thermal movement, during the manufacturing process, a 40mm x 10mm foam tape is applied lengthways to the centre of the underside of Hiland® Tray .
- Swaged or non-swaged pan options (swaged helps reduce canning effect)
- Hiland Tray wall cladding to use drainage cavity batten
- Additional support may be required in Extra High and Specific Engineered Design Wind Zones. It is also required when using aluminium Hiland® Tray. Contact Stratco for further information.
- Ensure compatibility when using Hiland® Tray roofing/wall cladding with other metal products such as copper to prevent accelerated corrosion

MATERIAL COMPOSITION & COATINGS

The boundaries of different corrosion zones are difficult to define because many factors determine the corrosivity of a particular location. It is important to choose the appropriate materials for the location to ensure they meet the minimum durability requirements of the NZ Building Code and satisfy customer expectations.

Zinc/alum coated steel substrate conforms with AS 1397:2011.

Pre-painted metals available provide solutions for different environments including various metals, metallic coatings, paint systems and paint thickness. The paint coatings are manufactured in accordance with AS/NZS 2728:2013.

For project specific environment zone product selection contact Stratco for further information.

BUILDING CODE COMPLIANCE

The product will, if used in accordance with Stratco's installation and maintenance requirements, assist with meeting the following provisions of the building code:

- **Clause B1 Structure**: B1.3.1, B1.3.2, B1.3.3 (b, c, f, g, h, j), B1.3.4
  Span tables are based on a maximum overall building height of ten metres and a 500 year design return period for strength limit state wind load assessment. Roofing spans specified are suitable for snow loading up to 2kPa in accordance with the New Zealand Metal Roof and Wall Cladding Code of Practice.

NZS 3604 WIND ZONES

Roofing: Spans are limited based on foot traffic incidental to maintenance.
Note: For roof pitches less than 10°, it is recommended that internal purlin centres are reduced to 450mm and end/double to 300mm. Self support underlay will also require additional support.

Aluminium Hiland® Tray — plywood substrate is required when using 0.90mm BMT aluminium in place of 0.55 steel roofing. Concealed fixing clips to be stainless steel fixed to plywood at 400mm centres.

MAXIMUM SPANS FOR NZS 3604 WIND ZONES

Wind Zone	Roofing		Wall Cladding	
	End/Double	Internal	End/Double	Internal
Low/Medium	600	900	1500	1500
High	600	900	1500	1500
Very High	600	900	1200	1200
Extra High	600	900	1200	1200

SLS Low wind zone = 0.68kPa, Medium wind zone = 0.93kPa, High wind zone = 1.32kPa, Very high wind zone = 1.72kPa, Extra high wind zone = 2.09kPa
ULS Low wind zone = 0.98kPa, Medium wind zone = 1.32kPa, High wind zone = 1.88kPa, Very high wind zone = 2.44kPa, Extra high wind zone = 2.96kPa

SED WIND ZONES

MAXIMUM LOAD kPa

BMT	Span Type	Limit State	SPAN (mm)					
			450	600	900	1200	1500	1800
0.55mm	End/Double	Serviceability	5.23	3.78	3.14	2.57	2.08	1.68
		Strength	6.54	4.73	3.92	3.21	2.60	2.10
	Internal	Serviceability	5.23	3.78	3.14	2.57	2.08	1.68
		Strength	7.15	5.17	4.29	3.51	2.85	2.30

FASTENER REQUIREMENTS

Purlin or frame material	Clip Material	Roof	Wall (18 - 25mm cavity batten)	Secondary Fasteners	
				Aluminium Rivets	Screws
		Steel Sheeting	Steel Sheeting	Steel sheeting	Steel sheeting
Timber	Galvanised	Class 4 Type 17 10g x 30mm #2 SQ drive Wafer Head	Class 4 Type 17 10g x 65mm #2 SQ drive Wafer Head	Residential - Blind AS5-3 x 4mm minimum Bulb-tite	Class 4 Type 17 12-11x40 Roofing Screw with neoprene washer Class 4 12-14x20 Tek Roofing Screw with neoprene washer
Steel	Galvanised	Class 4 10g x 16mm #2 SQ drive Wafer Head	Class 4 10g x 40mm #2 SQ drive Wafer Head		
Plywood Substrate	Galvanised	Class 4 Type 17 10g x 30mm #2 SQ drive Wafer Head			
Timber	Stainless Steel	Aluminium Sheeting	Aluminium Sheeting	Aluminium sheeting	Aluminium sheeting
		SS304 Self Tapping 8g x 45mm #2 SQ drive Wafer Head	SS304 Self Tapping 8g x 75mm #2 SQ drive Wafer Head	Residential - Blind AS5-3 x 4mm minimum Bulb-tite	Alutite Type A 11x35 Roofing Screw SS304 Steel Tek 14 x 25 Roofing Screw
Plywood Substrate	Stainless Steel	SS304 Self Tapping 8g x 25mm #2 SQ drive Wafer Head			

- **Clause B2 Durability**: B2.3.1 (b)

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

- **Clause C Fire:** C3.5, C3.6, C3.7

  Colorsteel and Colorcote products are rated as a Group 1-S material when tested in accordance with ISO 5660:2002 part 2

- **Clause E1—Surface Water:** E1.3.2

  The wide tray and deep trough of Hiland® Tray gives it exceptional water carrying capacity compared to corrugate and trapezoidal profiles

Capacity Calculation in accordance with Metal Roofing Code of Practice calculators

Minimum Pitch 3^0, rainfall intensity 150 mm/hr		
Maximum Run	109 m	
Catchment area of spreader	181 m^2	10 m run, 2 holes in spreader
Catchment behind penetration	81 m^2	10m run, discharging each side of penetration

- **Clause E2 External Moisture:** E2.3.1, E2.3.2, E2.3.7

  The versatility of Hiland® Tray lends itself to a wide range of details for any application.

  Standard design details can be accessed from the web:

  www.stratco.co.nz/nz/roofing/nz-roofing-and-walling/hiland-tray/

  Alternative details may comply with solutions for trough sections found in E2/AS1, or comply with the 4 “D’s” Deflection, Draining, Drying and Durability.

- **Clause E3—Internal moisture:** E3.3.1

  When used with an absorbent, permeable underlay, complying with NZS 2295 2006, Hiland Tray will contribute to compliance with NZBC E3.3.1. Ceiling spaces of sarked roofs, skillion roofs, barrel curved roofs, flat roofs and roofs over moisture laden environments must have provision for adequate ventilation.

- **Clause F2 Hazardous building materials:** F2.3.1

  Hiland® Tray manufactured from Colorsteel, Colorcote or pre-painted aluminium will meet the performance requirement of F 2.3.1.

- **Clause G12 Water Supplies:** G12.3.2

  Colorsteel and Colorcote tested in accordance with AS/NZS 4020:2005 passed the requirements for products in contact with drinking water.

TESTING & SUPPORTING EVIDENCE

NZ Metal Roofing Manufacturers Association Inc. (NZMRM Code of Practice) www.metalroofing.org.nz/cop

NZ Steel www.colorsteel.co.nz/resources/downloads-and-brochures/

Pacific Coilcoaters www.colorcote.co.nz/technical-information/

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

The Wind Capacity Tables are based on testing in accordance with AS1562.1-1992 and AS4040.0, 1 & 2-1992. Span tables have been developed by determining wind pressures in accordance with AS4055-2006 for domestic applications and AS/NZS 1170.2:2002 for all other applications.

INSTALLATION

Packs of Hiland® Tray sheeting should always be kept dry and stored above ground level on site. If the sheets have become wet, they should be separated, wiped and placed in the open to dry.

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

Cut pre-painted steel material by shear only — use nibblers or hand shears. Friction blades and high-speed saw blades must not be used on metal cladding. These blades will damage both the metallic coating and the pre-painted steel surface by creating excessive heat, and generate hot swarf that will get embedded into the coating surface.

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

Hiland® Tray sheets are laid lapped to sit neatly on the preceding roof sheet. To assist with minimising canning and reducing noise associated with thermal movement, a 10mm foam tape is added centrally lengthways to the centre of Hiland® Tray. Avoid 'stretching' the width of the sheet when installing, as this can allow wind and rain to enter.

Edge fixing is mandatory for strength/spanning capability. Use self drilling screws as per fastener table to secure the standing seam to edge clips (i.e. to all clips along edges of sheet layouts) using two fixing screws (square drive recommended) per clip. Clips located at every sheet overlap and sheet edges at each timber support.

When walking on Hiland® Roofing, walk over the purlins to avoid damage to the sheeting. Wear flat rubber soled shoes and walk flat footed in the pans only. Walking on end spans is restricted explicitly to over the end span purlins with no access allowed directly on end spans due to potential sheet damage.

Allow for thermal movement of product using Stratco Hiland® Tray design detail drawings to minimise canning. Ridge, Valley, Eave, Head Barge, Change of Pitch and Top Apron details should only be used in corresponding option versions. ie. All Option 1 or all Option 2.

Eaves flashings must be installed where roof pitch is ≤ 10° and/or soffit width is ≤ 100mm or wind zones are either Very High, Extra High or Specific Engineer Design.

On roofing, at the end of the sheets, the pans should be turned up at crest of the roof and down at the gutter end using a turn up/down tool. Wall cladding is to be turned up on the top of the sheet on vertical wall cladding.

Cavity batten is required to be used under Hiland® Tray wall cladding. If cavity batten is used over the roof purlins the screw length will need to be increased by at least the cavity batten thickness.

Aluminium Hiland® Tray — plywood substrate is required when using 0.90mm aluminium in place of 0.55mm steel roofing for Hiland® Tray. This must be a minimum CpD Grade plywood treated H3.2 with a minimum thickness of 15mm and a maximum 18% moisture content. A drainage mat underlay is also required. Fixing clips are to be stainless steel fixed at 400mm centres. Contact Stratco for further installation information.

Flashings are to be installed using multi piece under and top flashings with minimal visible fixings as detailed using Stratco design details to comply with NZ Building Code, E2/AS1 and/or NZMRM Code of Practice. All flashing turn downs into the pan of Hiland® Tray sheeting are to be notched around the rib to provide maximum weather tightness. Alternative flashing details may be used providing they comply with NZ Building Code, E2/AS1 where applicable and/or NZMRM Code of Practice. Refer www.stratco.co.nz/nz/roofing/nz-roofing-and-walling/hiland-tray/

MAINTENANCE

All roofing and cladding products are subject to the cumulative effects of weather, dust and other deposits so the performance and durability of Hiland® Tray roofing and wall cladding over time depends on its correct maintenance. For roofing, normal rain washing will remove most accumulated atmospheric contaminants from the top side of roofs.

Wall cladding requires manual washing every 3 to 12 months (depending on the local environment and paint system), to prevent build up of dirt, debris or other material that is not otherwise removed by rain washing.

Areas that do not receive adequate rain washing (known as unwashed areas) require more extensive manual washing. These areas include soffits, wall cladding under eaves, undersides of gutters, fascias, sheltered areas of garage doors, unwashed roof areas, and other high risk areas like around flues, under television aerials and solar panels or in sites prone to mould, lichen, bird droppings or debris.

Roofing and cladding products should be manually washed by either water and a sponge or a soft nylon-bristled brush or by water blasting at pressures of no more than 20MPa. Never use abrasive or solvent based cleaners such as turps, petrol or kerosene.

WEIGHTS & TOLERANCES

Weight		0.55 BMT	0.90 Aluminium
Kg/lineal metre	Painted	2.75	1.48
Kg/square metre	Painted	6.05	3.21

Tolerances: Sheet width +/- 2mm Sheet length +/-5mm

SECTION 26 OF THE BUILDING ACT

Hiland® Tray roofing and wall cladding products are not subject to any warnings or bans under Section 26 of the Building Act 2004.

ENVIRONMENT

Stratco has Toitu Enviromark Gold Certification plus, as approved partners with New Zealand Steel, Stratco are licensed to use the Eco Choice Aotearoa Label for products formed in Colorsteel®, Zincalume® and Galvsteel® as made by New Zealand Steel Ltd. Refer Eco Choice Aotearoa

Stratco sites recycle their steel and aluminium scrap/offcuts. Steel and aluminium are infinitely recyclable so at the end of its useful life they can be recycled and remelted for use in other steel/aluminium products.

Appendix

As reference, this appendix contains the full descriptions of all building performance clauses listed in this document.

B1 Structure

B1.3.1

Buildings, *building elements* and *sitework* shall have a low probability of rupturing, becoming unstable, losing equilibrium, or collapsing during *construction* or *alteration* and throughout their lives.

B1.3.2

Buildings, *building elements* and *sitework* shall have a low probability of causing loss of amenity through undue deformation, vibratory response, degradation, or other physical characteristics throughout their lives, or during *construction* or *alteration* when the *building* is in use.

B1.3.3

Account shall be taken of all physical conditions likely to affect the stability of *buildings*, *building elements* and *sitework*, including:

(b) imposed gravity loads arising from use

(c) temperature

(f) earthquake

(g) snow

(h) wind

(j) Impact

B1.3.4

Due allowances shall be made for:

1. the consequences of failure,
2. the intended use of the *building*,
3. effects of uncertainties resulting from *construction* activities, or the sequence in which *construction* activities occur,
4. variation in the properties of materials and the characteristics of the site, and
5. accuracy limitations inherent in the methods used to predict the stability of *buildings*

B2 Durability

B2.3.1

Building elements must, with only normal maintenance, continue to satisfy the performance requirements of this code for the lesser of the *specified intended life* of the *building*, if stated, or:

(b) 15 years if:

i. those *building elements* (including the *building* envelope, exposed plumbing in the subfloor space, and in-built chimneys and flues) are moderately difficult to access or replace, or

ii. failure of those *building elements* to comply with the *building code* would go undetected during normal use of the *building*, but would be easily detected during normal maintenance.

C3 Fire affecting areas beyond the fire source

C3.5

Buildings must be designed and constructed so that *fire* does not spread more than 3.5 m vertically from the *fire source* over the external cladding of multi-level *buildings*.

C3.6

Buildings must be designed and constructed so that in the event of *fire* in the *building* the received radiation at the *relevant boundary* of the property does not exceed 30 kW/m^2 and at a distance of 1 m beyond the *relevant boundary* of the property does not exceed 16 kW/m^2.

Appendix

C3.7

External walls of *buildings* that are located closer than 1 m to the *relevant boundary* of the property on which the *building* stands must either:

a) be constructed from materials which are not *combustible building materials*, or

b) for *buildings* in importance levels 3 and 4, be constructed from materials that, when subjected to a radiant flux of 30 kW/m^2, do not ignite for 30 minutes, or

c) for *buildings* in Importance Levels 1 and 2, be constructed from materials that, when subjected to a radiant flux of 30 kW/m^2, do not ignite for 15 minutes.

E1 Internal moisture

E1.3.2

Surface water, resulting from an event having a 2% probability of occurring annually, shall not enter *buildings*.

Performance E1.3.2 shall apply only to *housing*, *communal residential* and *communal non-residential buildings*.

E2 External moisture

E2.3.1

Roofs must shed precipitated moisture. In locations subject to snowfalls, roofs must also shed melted snow.

E2.3.2

Roofs and exterior walls must prevent the penetration of water that could cause undue dampness, damage to *building elements*, or both.

E2.3.7

Building elements must be constructed in a way that makes due allowance for the following:

a. the consequences of failure:
b. the effects of uncertainties resulting from *construction* or from the sequence in which different aspects of *construction* occur:
c. variation in the properties of materials and in the characteristics of the site.

E3 Internal moisture

E3.3.1

An *adequate* combination of *thermal resistance*, ventilation, and space temperature must be provided to all *habitable spaces*, bathrooms, laundries, and other spaces where moisture may be generated or may accumulate.

Performance E3.3.1 does not apply to *communal non-residential*, *commercial*, *industrial*, *outbuildings*, or *ancillary buildings*.

F2 Hazardous building materials

F2.3.1

The quantities of gas, liquid, radiation or solid particles emitted by materials used in the *construction* of *buildings*, shall not give rise to harmful concentrations at the surface of the material where the material is exposed, or in the a®osphere of any space.

G12 Water Supplies

G12.3.2

A potable *water supply system* must be—

1. protected from contamination; and
2. installed in a manner that avoids the likelihood of contamination within the system and the water main; and
3. installed using components that will not contaminate the water.