



Dimond Roofing, A Division Of Fletcher Steel Limited, NZBN 9429037626563

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Place Of Manufacture

Aotearoa New Zealand

Technical Manual

<https://www.dimond.co.nz/downloads>

Product Description

1.1. Description

Dimond Rainwater Disposal Systems are intended to collect and channel water that runs off a roof. It is intended that the metal gutters be placed at the perimeter of the building, and not in an internal situation. Use of the products is subject to the limitations listed below

1.2. Product Variations (Thickness, Shape, And General Product Variables)

Material	Grade	Thickness mm	Metal Coating	Prepaint Finish Available	Relevant Standard
Steel	G 250/300	0.55 BMT	Zinc/Aluminium/ Magnesium	Yes	AS 1397
Aluminium (plain)	5052 5005	0.9 BMT	N/A	Yes	AS 1734
Stainless Steel	445M2/304	0.55	N/A	No	AS1449
Copper	122A	0.55	N/A	No	AS2738

N/A - Not available

1.3. Coating & Classes

Manufactured Using Different Paint Coatings Available From Pacific Coilcoaters Or New Zealand Steel Depending On The Durability Required For The Environment The Roof Or Wall Will Be Installed In, In Accordance With AS/NZS 2728. For More Information Refer To Table 2.1C Of The Dimond Technical Manual.

Refer To Environmental Literature Available From Pacific Coilcoaters Or New Zealand Steel Or Contact Dimond® Roofing On 0800 766 377.

Scope of Use

2.1 Recommend for use where:

Attention to the following details is required to ensure the expected system performance is achieved.

- The selection of the type and grade of gutter and bracket material and fasteners must be based on the life expectancy required and the severity of the external and internal environments. Refer Sections 2.1.1.2, 2.1.1.3, 2.1.1.4, 2.2.3.
- Site storage that keeps the product dry and protected from damage.

- Product handling that prevents surface damage.
- Correct installation of the brackets and gutter and snow straps.
- Allowance for thermal expansion and contraction. Refer Section 2.1.3.4
- Sufficient fall to permit complete surface water drainage, allowing the gutter to completely dry out and not hold water.
- Control of allowable contact with dissimilar materials. Refer Section 2.1.3.3.
- Awareness and implementation of maintenance requirements, particularly for surfaces not washed by natural rainfall. Refer Section 2.1.1.3)

2.2 Intended product use

Dimond Rainwater goods are intended to only be used on roof or wall constructions as the building envelop on either commercial or residential new or rebuild projects.

2.3 Limitations on use

Reference to sections below of the Dimond Technical Manual is required to ensure the expected system performance is achieved;

Dimond Technical Manual	Section Number
Rainwater Performance	3.1
Rainwater Components	3.2
Installation Information	3.3
Rainwater Durability, Warranty, Maintenance	3.4

Compliance with the NZ Building Code

3.1 Compliance statement

Reference information available from Pacific Coilcoaters and New Zealand 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 Rainwater 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 5years.

3.2 Applicable NZBC clauses

Past history of use of rainwater system products in New Zealand and information available from Pacific Coilcoaters and New Zealand Steel indicate that provided the system design, use and maintenance is in line with the guidelines contained in the current Dimond Roofing technical literature and standards referenced therein, Dimond® Roofing long run metal roofing & wall cladding systems can be expected to meet the following performance criteria outlined in New Zealand Building Code;

- **B2 Durability: Performance clauses B2.3.1(c):** Dimond Rainwater systems conforms to AS/NZS 2728 as stated in NZMRM code of practice section 17.4.
- **C3 Fire affecting areas beyond the fire source: Buildings C3.4(a):** Testing has been carried out material suppliers in accordance with the relevant standards stated in C3.4(a).
- **E1 Surface Water: Performance E1.3.3 (a), (b) and (d):** Is suitable for installation in accordance with Acceptable Solution E2/AS1, NZMRM code of practice, RANZ installation guides and Dimond installation Details/Technical Manual. Installation details provided by other parties such as architects and engineers may also be suitable.
- **F2 Hazardous building materials: Performance F2.3.1:** The quantities solid particles emitted by Dimond Rainwater systems, shall not give rise to harmful concentrations at the surface of the material where the material is exposed, or in the atmosphere.

Relevant Standards

- NZBC - E2/AS1 - External Moisture/building performance
- NZMRM Cop - NZ Metal Roof and Wall Cladding Code of Practice
- AS/NZS 2728:2013 - Prefinished/prepainted sheet metal products for interior/exterior building applications - Performance requirements
- AS/NZS 1530.3:1999 - Methods for fire testing on building materials, components, and structures. Simultaneous determination of ignitability, flame propagation, heat, and smoke release
- AS/NZS 4020:2018 - Testing product for use with drinking water
- ISO 5660-1:2015 - Reaction to fire tests - Heat release. Smoke production and mass loss rate. Part 1
- ISO9223:2012 - Corrosion of metals and alloys - Corrosivity of atmospheres - Classification, determination, and estimation

Durability & Maintenance Requirements

4.1 Environments

Manufactured from coated steel produced by New Zealand Steel at Glenbrook from Ironsand mined off North Island’s West coast and Zinalume® coated. COLOURSTEEL® is factory painted at New Zealand Steel, Glenbrook or if its ColorCote® its painted at Pacific Coilcoaters Penrose.

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

Dimond Technical Manual	Section Number
Environments	2.1.1.2

4.2 Durability & Maintenance guidelines,

Reference should be made to Section 2.1.1.2 Environments, to ensure the correct material for the environment is chosen.

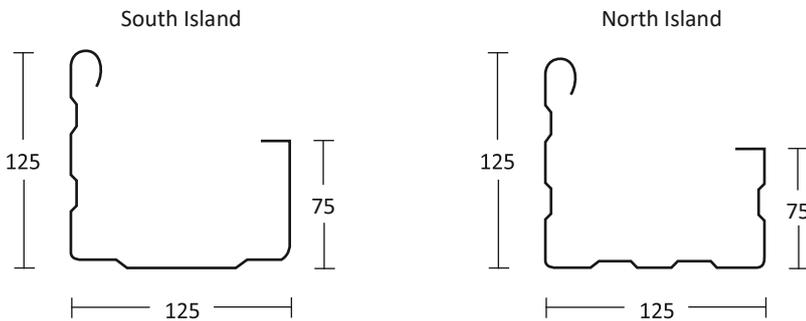
Coated brackets should be considered for use in severe and very severe marine environments. In snowfall areas refer to section 3.1.4.9

Dimond rainwater disposal systems require at least the following maintenance as a minimum to ensure the guaranteed performance is achieved. Additional regular maintenance can extend the useful life of the products. We define “regular” as often as is needed to avoid dirt build up on the gutter surface.

1. Keep surfaces clean and free from continuous contact with moisture and debris. The use of a proprietary leaf build-up protection system does not remove the need for regular gutter cleaning to remove any accumulated dirt and debris build-up on the roof or gutter.
2. Ensure that areas that are not washed by rainfall are cleaned regularly with water spray and/or if necessary, by scrubbing with a soft nylon brush. This includes the foot of the internal brackets.
3. At the first sign of corrosion, the affected areas should be cleaned down, spot primed and then repainted to an appropriate paint manufacturer’s recommendation.
4. Some fading of the surface coating will occur over time, making repainting necessary to retain aesthetic value.

Design

BOX 125



Effective cross sectional area (with 15mm free board)	7500mm ²
Flow capacity	112 litres/min
Minimum recommended fall	1:500 = 2mm in 1m
Minimum downpipe	Circular 70mm

All dimensions given are nominal.

Rectangular m in. cross sectional area of 4125mm², smallest dimension at least 50mm.

Catchment area per downpipe based on the above flow capacity is given in Table 3.1G. Use Table 3.1B (Section 3.1.4) to determine the Rainfall Intensity to be used.

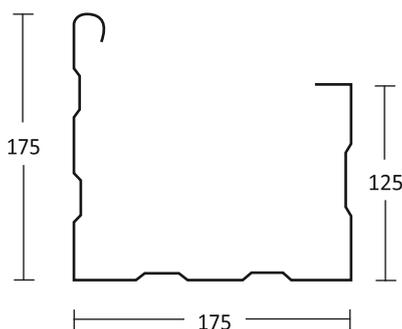
Table 3.1G

Rainfall Intensity, I (mm/hr)	40	50	60	70	80	90	100	120	140	160	180	200
Catchment Area per downpipe A _c (m ²)	168	134	111	96	84	75	67	56	48	42	37	33

Material options including thickness and grade	Steel	0.55mm G300	
	Aluminium	0.90mm H34	
	Copper	0.55mm 1/2 hard	
	Stainless steel	refer Dimond	
Roll-forming facility	Auckland, Christchurch		
	(Note: all Dimond branches can fold gutter shapes with swages patterns to be confirmed at time of order) (1)		
Gutter bracket material and thickness	Internal	Galvanised	1.15mm
	External	Hot dipped galvanised	3mm x 32mm
		Aluminium	5mm x 30mm
		Brass	3mm x 30mm
		Stainless steel	3mm x 30mm
Recommended maximum spacings	9 00mm spacing		
	(refer section 3.1.4.7 for recommended spacings where snow fall is possible).		
Bracket Centres	Aluminium 450mm Internal - 600mm External		
Recommended fixings	Screw fastenings to suit substrate.		

(1) Internal brackets are not recommended with folded gutter without a 4mm diameter aluminium rivet fixing through the gutter and bracket.

BOX 175



All dimensions given are nominal.

Effective cross sectional area (with 15mm free board)	19,250mm ²	
Flow capacity	363 litres/min	
Minimum recommended fall	1:500	= 2mm in 1m
Minimum downpipe	Circular	115mm
	Rectangular	m in. cross sectional area of 10,600mm ²

Catchment area per downpipe based on the above flow capacity is given in Table 3.1H. Use Table 3.1B (Section 3.1.4) to determine the Rainfall Intensity to be used.

Table 3.1H

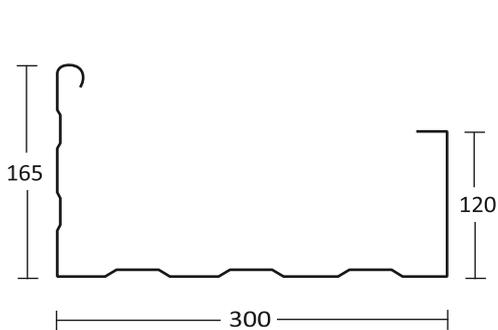
Rainfall Intensity, I (mm/hr)	40	50	60	70	80	90	100	120	140	160	180	200
Catchment Area per downpipe A_c (m ²)	545	435	360	310	270	240	220	180	155	135	120	110

Material options including thickness and grade	Steel	0.55mm G300	
	Aluminium	0.90mm H34 offered in folded shape only	
	Stainless steel	refer Dimond	
Roll-forming facility	Hamilton		
		(Note: all Dimond branches can fold gutter shapes with swages patterns to be confirmed at time of order) (2)	
Gutter bracket material and thickness	Internal (1)	Galvsteel	1.55mm
	External	Hot dipped galvanised	5mm x 30mm
		Aluminium	7mm x 30mm
		Stainless steel	5mm x 30mm
Recommended maximum spacings	900mm	(refer section 3.1.4.7 for recommended spacings where snow fall is possible).	
		Aluminium: 600mm	

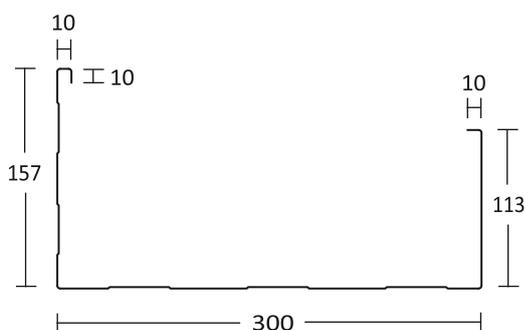
Recommended fixings Bolts or screw fastenings to be compatible with substrate and bracket material

- (1) Internal brackets are not recommended for use in areas that are subject to snow fall and/or wind above medium velocity (as determined by NZS 3604).
- (2) Internal brackets are not recommended with folded gutter without a 4mm diameter aluminium rivet fixing through the gutter and bracket, it is better to use external brackets.

BOX 300



Roll formed shape



Folded shape (based on strip girth (g) of 600mm)

All dimensions given are nominal.

Effective cross sectional area (with 15mm free board) 33,550mm² or 29,400mm² (g = 600mm)

Flow capacity 727 litres/min or 616 litres/min

Minimum recommended fall	1:500	= 2mm in 1m
Minimum downpipe	Circular	150mm
	Rectangular	m in. cross sectional area of 18,500mm ²

Catchment area per downpipe based on the above flow capacity is given in Table 3.1 I. Use Table 3.1B (Section 3.1.4) to determine the Rainfall Intensity to be used.

Table 3.1 I

Roll formed shape												
Rainfall Intensity, I (mm/hr)	40	50	60	70	80	90	100	120	140	160	180	200
Catchment Area per downpipe A _c (m ²)	1090	870	725	620	545	485	435	360	310	270	240	215
Folded shape (based on strip girth of 600mm)												
Rainfall Intensity, I (mm/hr)	40	50	60	70	80	90	100	120	140	160	180	200
Catchment Area per downpipe A _c (m ²)	922	738	615	527	461	410	369	307	264	231	205	184

Material options including thickness and grade	Steel	0.55mm G300
	Aluminium	0.90mm H34
	Copper	0.55mm 1/2 hard
	Stainless steel	refer Dimond

Roll-forming facility: Hamilton
 (Note: all Dimond branches can fold gutter shapes)

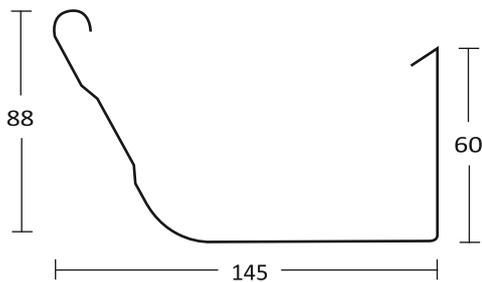
Dimensions may vary slightly from above. Check with your local Dimond branch.

Gutter bracket material thickness	External	Hot dipped galvanised	5mm x 50mm and
		Aluminium	6mm x 38mm
		Stainless steel	5mm x 40mm

Recommended maximum spacings: 600mm (refer section 3.1.4.7 for recommended spacings where snow fall is possible).

Recommended fixings: Bolts or screw fastenings to be compatible with substrate and bracket material.

DEEP QUAD



All dimensions given are nominal.

Effective cross sectional area (with 10mm free board)	5435mm ²
Flow capacity	75 litres/min
Minimum recommended fall	1:500 = 2mm in 1m
Minimum downpipe	Circular 60mm

Rectangular m in. cross sectional area of 2717mm², smallest dimension at least 50mm.

Catchment area per downpipe based on the above flow capacity is given in Table 3.1J. Use Table 3.1B (Section 3.1.4) to determine the Rainfall Intensity to be used.

Table 3.1J

Rainfall Intensity, I (mm/hr)	40	50	60	70	80	90	100	120	140	160	180	200
Catchment Area per downpipe A _c (m ²)	112	90	75	64	56	50	45	37	32	28	25	22

Material options including Steel 0.55mm G300 thickness and grade

Roll-forming facility Rotorua

Gutter bracket material Internal Aluminium 2.0mm and thickness

Recommended maximum spacings 9 00mm spacing

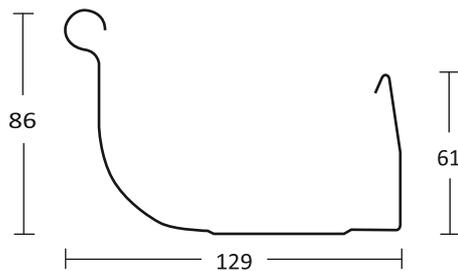
(refer section 3.1.4.7 for recommended spacings where snow fall is possible).

Recommended fixings Screw fastenings to be compatible substrate and bracket material.

Stop ends Zinc cast stop ends are available powder coated to match fascia colour.

*When using aluminium internal brackets the roofing may need to be 10mm longer into the gutter to accommodate correct roof overhang into gutter.

QUAD SI



All dimensions given are nominal.

Effective cross sectional area 5485mm²

(with 10mm free board)

Flow capacity 75 litres/min

Minimum recommended fall 1:500 = 2mm in 1m

Minimum downpipe Circular 60mm

Rectangular m in. cross sectional area of 2742mm², smallest dimension at least 50mm.

Catchment area per downpipe based on the above flow capacity is given in Table 3.1L. Use Table 3.1B (Section 3.1.4) to determine the Rainfall Intensity to be used.

Table 3.1L

Rainfall Intensity, I (mm/hr)	40	50	60	70	80	90	100	120	140	160	180	200
Catchment Area per downpipe A _c (m ²)	112	90	75	64	56	50	45	37	32	28	25	22

Material options including Steel 0.55mm G300 thickness and grade

Roll-forming facility Christchurch

Gutter bracket material Internal Galvanised 1.15mm

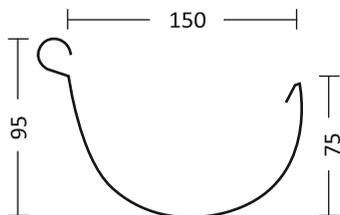
and thickness

Recommended maximum spacings 900mm spacing (refer section 3.1.4.7 for recommended spacings where snow fall is possible).

Recommended fixings Screw fastenings to be compatible with substrate and bracket material.

Stop ends Zinc cast stop ends are available powder coated to match fascia colour.

150 HALF ROUND



All dimensions given are nominal.

Effective cross sectional area (with 10mm free board) 6600mm²

Flow capacity 95 litres/min

Minimum recommended fall 1:500 = 2mm in 1m

Minimum downpipe Circular 80mm

Catchment area per downpipe based on the above flow capacity is given in Table 3.1M. Use Table 3.1B (Section 3.1.4) to determine the Rainfall Intensity to be used.

Table 3.1M

Rainfall Intensity, I (mm/hr)	40	50	60	70	80	90	100	120	140	160	180	200
Catchment Area per downpipe A _c (m ²)	142	114	95	81	71	63	57	47	40	36	32	28

Material options including Steel 0.55mm G300 thickness and grade

Roll-forming facility Christchurch & Invercargill
Note: only available in the South Island

Gutter bracket material External Aluminium 4mm x 30mm

and thickness

Recommended maximum spacings 900mm spacing
(refer section 3.1.4.7 for recommended spacings where snow fall is possible). Snow straps available.

Recommended fixings Screw fastenings to be compatible with substrate and bracket material avoiding dissimilar metal contact.

GUTTER BRACKETS IN SNOWFALL AREAS

When installing gutters in areas subjected to snow fall in New Zealand, the gutter bracket spacings must be reduced and snow straps installed to take the increased snow weight that may be experienced during periods of snow fall to avoid damage to the gutter system.

This is a guide to the snow fall regions. Please refer to the standard AS/NZS 1170.3 for full details, available for purchase from www.standards.co.nz

	Sub Alpine Snow Region	Height above sea level (m)	Region description
North Island	N1	400 to 1200	South of a line from Opotiki to Turangi and across to New Plymouth

South Island	N2	200 to 900	West of Southern Alps from Nelson to Milford Sound
	N3	150 to 900	Nelson East to Cheviot
	N4	0 to 900	East of Southern Alps Cheviot to Moeraki into Omarama
	N5	0 to 900	South of Moeraki around to Milford Sound

Note: Regions with a height above sea level great than shown above require specific design and are outside Dimond recommendations.

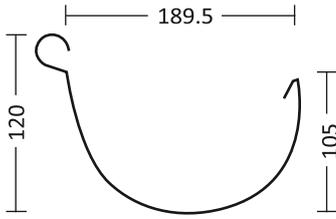
Dimond Gutter shape Type	Gutter Bracket	Maximum gutter bracket and snow strap spacing (mm) by Snow Region									
		N1		N2		N3		N4		N5	
		Gutter brackets	Snow straps	Gutter brackets	Snow straps	Gutter brackets	Snow straps	Gutter brackets	Snow straps	Gutter brackets	Snow straps
125 Quad	Internal	600	900	600	600	600	600	600	500	600	600
Deep Quad	Internal	600	900	600	600	600	600	600	500	600	600
Quad SI	Internal	600	900	600	600	600	600	600	500	600	600
Box 125	Internal	600	900	600	600	600	600	450	500	450	600
Box 125	External	900	900	600	600	600	600	450	500	600	600
Box 175	External	900	900	600	600	600	600	450	500	600	600
Box 300	External	600	900	600	600	600	600	450	500	600	600
150 Half Round	External	900	900	600	600	600	600	450	500	600	600
200 Half Round	External	900	900	600	600	600	600	450	500	600	600

Notes:

1. Based on an 8m maximum single roof run.
2. Situations where upper roofs allow snow to fall onto lower roofs are excluded and require specific design
3. Each Snow strap is fixed to roof and into purlins using 2x 12 gauge self drilling screws or M6 Roofzips
4. Each Snow strap is fixed to the gutter using 2x 4.8mm dia alum rivets minimum
5. Snow strap min sizing to be 0.55mm x 25mm
6. Formed snow straps are available for 125 Quad, 150 Half Round & 200 Half Round

February 2019

200 HALF ROUND



All dimensions given are nominal.

Effective cross sectional area (with 10mm free board)	14,200mm ²
Flow capacity	248 litres/min
Minimum recommended fall	1:500 = 2mm in 1m
Minimum downpipe	Circular 80mm
Maximum downpipe	Circular 150mm

Catchment area per downpipe based on the above flow capacity is given in Table 3.1M. Use Table 3.1B (Section 3.1.4) to determine the Rainfall Intensity to be used.

Table 3.1M

Rainfall Intensity, I (mm/hr)	40	50	60	70	80	90	100	120	140	160	180	200
Catchment Area per downpipe A _c (m ²)	371	297	247	212	185	165	148	124	106	93	83	74

Material options including Steel 0.55mm G300 thickness and grade
Copper 0.6mm Half hard

Manufacturing facility Christchurch & Invercargill

Note: only available in the South Island

Maximum length 4.2m

Gutter bracket material External *Stainless steel 3mm x 30mm

and thickness Powder coated in matching colour.

External Brass 2.5mm or 3.0mm x 50mm wide

(for use with copper gutter)

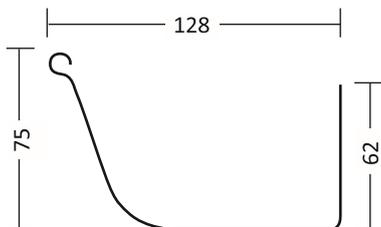
Recommended maximum spacings 900mm spacing

(refer section 3.1.4.7 for recommended spacings where snow fall is possible). Snow straps available.

Recommended fixings Screw fastenings to be compatible with substrate and bracket material avoiding dissimilar metal contact.

*Note: A PVC barrier tape must be placed between the inside of the bracket and the spouting.

125 QUAD



All dimensions given are nominal.

Effective cross sectional area (with 10mm free board)	5670mm ²
Flow capacity	79 litres/min

Minimum recommended fall	1:500	= 2mm in 1m
Minimum downpipe	Circular	80mm
	Rectangular	m in. cross sectional area of 2835mm ² , smallest dimension at least 50mm.

Catchment area per downpipe based on the above flow capacity is given in Table 3.1J. Use Table 3.1B (Section 3.1.4) to determine the Rainfall Intensity to be used.

Table 3.1J

Rainfall Intensity, I (mm/hr)	40	50	60	70	80	90	100	120	140	160	180	200
Catchment Area per downpipe A _c (m ²)	118	95	79	68	59	53	47	39	34	30	26	24

Material options including thickness and grade	Steel	0.55mm G300
	Aluminium	0.70mm H34
Manufacturing facility	Invercargill	
Gutter bracket material and thickness	Internal	Zincalume* 1.95mm Q2
	External	Galvanised steel 2.0mm Q4
Recommended maximum spacings	9 00mm spacing (refer section 3.1.4.7 for recommended spacings where snow fall is possible). Snow strap available.	
Recommended fixings	Screw fastenings to be compatible substrate and bracket material.	

Installation and Construction Instructions

Dimond rainwater disposal systems must be correctly selected, specified and installed if they are to meet their designed performance. Correct system selection and specification will be achieved by following the design guidelines in this manual.

Correct system installation (including components used and workmanship) will be achieved by specifying the use of a Dimond recommended installer.

Correct system performance will be endorsed by requesting a Dimond inspection and written report on completed work that has been carried out by a Dimond recommended installer.

For installation instructions please refer to the sections of Dimonds Technical Manual Installation Guide references below or the links provided;

Dimond Technical Manual Installation Guide Reference	Section Number
Handling and Storage	2.3.1
Installation	3.3
General Workmanship	2.3.4
Code of Practice	https://www.metalroofing.org.nz/cop/introduction

6.1 Warnings/Bans

Not subject to any warning or ban under section 26 of the Building Act 2004.

DISCLAIMER

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