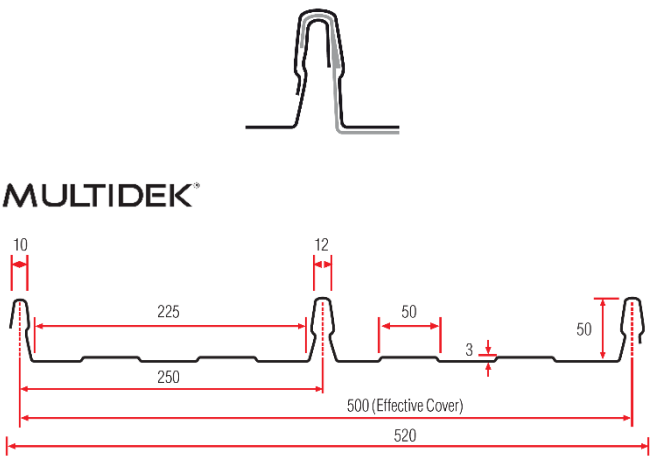
PRODUCT TECHNICAL STATEMENT

MULTIDEK®

Multidek® hidden fixed clip.

Multidek® Side Lap



All dimensions are nominal, in mm. Sheet cover width tolerance +/-5mm.

DESCRIPTION

Multidek® is a bold European inspired roofing and wall cladding profile incorporating a 50mm rib height with wide pans, attached to purlins using a concealed clip fastening system.

With wide pans, Multidek® provides excellent water carrying capacity, and being hidden fixed it minimises water leakage concerns at fastening points.

As a 500mm cover profile, installation cost savings and economy can be expected.

Manufactured from high strength material and supplied in a wide range of substrates and surface finishes, Multidek® equally complements commercial, residential and industrial projects.

FEATURES

- Concealed (hidden) fixed clips minimise fasteners through the profile and lower the risk of leaks.
- Steep 50mm deep ribs provide strength and aesthetics.
- Excellent water carrying capacity from 250mm wide pans.
- With a wide 500mm cover profile, Multidek® provides economy as a hidden fixed decking solution.
- European inspired profile design, supported by wind and concentrated load/span data and recommended fixing methods derived from load testing using industry test-rig apparatus in accordance with the NZ Metal Roofing Manufacturers (MRM) test procedure.
- Suitable for commercial, residential and industrial roofing and wall cladding applications.
- Matching accessories are available including natural lighting, flashings, fasteners, underlays and EZI-FLO™ guttering and downpipe systems.

Manufacturing Location: Auckland (suited to North Island applications only)

MINIMUM PITCH

The minimum roof pitch for Multidek® is 3 degrees (approx. 1:20).

Designers should consider increasing the roof pitch above minimum to consider the cumulative effect of deflections from framing, purlins and roof sheeting or penetrations, and potential for building movement over time.

For curved roofing, the roof cladding must not terminate at a pitch lower than permitted above. Side laps of curved sheets must be sealed on any areas below the minimum pitch permitted above.

An eaves gutter flashing is recommended where Multidek® is used below 10 degrees pitch, and as required by E2/AS1 and the MRM Roof and Wall Cladding Code of Practice (MRM COP).

SHEET LENGTHS

Custom-made cut to length sheets can be manufactured to 40 metres in length, subject to transport and site limitations. As sheet lengths increase higher transportation costs may be applicable, and sheet lengths over 28 metres require specialised transportation.

For aluminium substrate, maximum recommended sheet lengths are 18 metres for dark colours and 24 metres for plain and light colours. Refer to the Thermal Movement Provisions section.

Contact Roofing Industries for specific project advice regarding sheet lengths and transport requirements.

COATINGS

Selecting the right substrate is dependent on the environment in which the project is situated. Multidek® is available in the following Pacific Coilcoaters and New Zealand Steel materials, along with the full range of ColorCote® and COLORSTEEL® colours.

Steel Substrate

Base Metal Thickness (BMT): 0.55mm

- ColorCote® ZinaCore™
- ColorCote® MagnaFlow™
- COLORSTEEL® Maxam®

Aluminium Substrate

Base Metal Thickness (BMT): 0.90mm

- ColorCote® AlumiGard™
- COLORSTEEL® Altimate®

Refer to Pacific Coil Coaters and New Zealand Steel literature for environmental zones, coating systems and warranty information.

Material is subject to availability and materials such as copper, titanium zinc, etc. may have longer lead times. Contact Roofing Industries for specific advice.

Multidek® is not suitable for use with absorbent self-adhesive fleece to the underside.

INFORMATION TABLE

Substrate Material	Steel*	Aluminium
Base Metal Thickness, BMT (mm)	0.55	0.90
Weight per lineal metre (kg/m)	3.35	1.85
Maximum Sheet Overhang[1] (mm)	250	200
Drape Curved Roof Minimum Radius (m)	70	70
Purlin Spacings for Drape Curved Roofs		
Maximum Intermediate Spans (mm)	1450	900
Maximum End Spans (mm)	1100	600

*Based on 150g/m² alloy coating

All weights are approximate

[1]From last fixing line to sheet end: Not suitable for roof access without additional support.

Multidek® is supplied with strippable film.

Pre-curved roofing options are not available for Multidek®.

FIRE TESTING

Refer to Pacific Coil Coaters and New Zealand Steel bulletins for fire testing of ColorCote® and COLORSTEEL® products, which can be supplied on request.

SPECIFICATION

Refer to Roofing Industries full specification statements on Masterspec and/or Smartspec, www.roof.co.nz and our Selection Guide.

SOLAR INSTALLATIONS

Rib fixed solar panels can be used with Multidek®. These are required to be specifically designed and installed to solar manufacturers recommendations.

For further information, refer to the MRM COP, Pacific Coil Coaters and New Zealand Steel bulletins for the use of solar installations with ColorCote® and COLORSTEEL® products.

BUILDING DESIGN / PERFORMANCE CRITERIA / PRODUCT SELECTION

During the design phase, it is necessary for the designer to consider a number of factors when specifying Multidek®:

- Material type and finish
- Roof pitch
- Sheet lengths
- Wind loadings
- Load span performance (Refer to the Load Span Graphs section)
- Reference to Roofing Industries detail drawings
- Purlin and nogg/girt spacing

Underlay as per the project specifications should be used to meet NZS 2295 and/or AS/NZS 4200 standards, in accordance with the underlay manufacturers recommendations. Where the roof pitch is 10 degrees and above, self-supporting underlay is recommended (without any support) and purlin spacings must be limited to a maximum of 1.2m centres for vertically run underlay and 1.05m centres for horizontally run underlay. Where the roof pitch is less than 10 degrees, underlay must be fully supported with a corrosion resistant material.

For buildings designed in accordance with E2/AS1 and cladding products covered by that document are chosen, the design spans are required to comply with E2/AS1. However, where a building is outside of the scope of E2/AS1, the building and parts thereof require specific design by a suitably qualified structural engineer and the roofing and cladding design spans (purlin and nogg/girt spacing) are required to be suitable for that design.

Whilst aesthetics and product availability do play a part, the chosen profile must meet certain performance criteria. These are centred around the ability of the product to span between purlin and nogg/girt spacings and meet the design criteria. Where cladding rib set-out is critical, contact Roofing Industries to discuss.

Multidek® is a concealed clip fastening system with lugs on the clip which engage with the rib of the profile to resist wind uplift loads. To engage effectively, the lugs are wider than the throat of the rib, and they may cause some degree of permanent distortion locally to the sides of the rib during installation as the sheet is pushed over the clip. This is unavoidable and will become less apparent with ageing. Refer to Section 12.3 of the MRM COP and the Ministry of Business, Innovation and Employment (MBIE) Guide to Tolerances, Materials and Workmanship, 2015.

For Multidek®, a visible waviness or undulations known as canning may be present in the pans. These are considered to be an architectural feature of the profile. Normally, structural integrity is not affected by canning. However, structural integrity must be reviewed if the distortion results from an extreme external influence.

Since many factors are involved outside of our control, Roofing Industries cannot realistically assure the total elimination of undulation in the pan. Low gloss paint coatings are also available which assist in minimising the visual apparentness of any undulations and must be specified at time of coil ordering. Refer also to the Canning Section.

For aluminium substrate, marine grade powder coated steel clips must be used, with all fasteners isolated from sheeting to avoid dissimilar metal contact. Steel netting cannot be used where it may be in contact (either directly or through underlay degradation) with the aluminium roofing or cladding. Alternative materials such as plastic strapping are to be used where support is required, or the cladding separated from the underlay by a high-density plastic batten, drainage matt or similar, and the use of an aluminium gutter flashing. This is also applicable to coated metal and zinc roofing in severe marine applications. In all cases self-supporting paper should be used, including when support is required. Refer to section 14.19 of the MRM COP.

Green (or wet) timber contracts as it dries, resulting in shrinkage. Only install into timber when the moisture content is 18% or less (i.e. the maximum moisture content as specified in NZS 3604 and the MRM COP). Multidek® must be isolated when laid directly on timber battens, plywood or other incompatible materials using a suitable isolator in-between.

All fixings and fasteners are to be of an approved type, compatible with all materials, the environment and must meet the requirements of the NZ Building Code. Refer to E2/AS1, and the MRM COP. Installation is to be in accordance with the MRM COP and manufacturers literature.

Multidek® is an alternative solution to E2/AS1 and is to be designed and installed to manufacturer's recommendations.

PURLIN/GIRT SPACING LIMITATIONS AND RECOMMENDATIONS

E2/AS1 states that a specific design may produce a more optimum spacing for fixing than as presented in this document. For Multidek® this is particularly applicable, and the manufacturer's information should be used. Manufacturers' recommendations for maximum spacings are as determined by testing carried out to methodology in the MRM COP.

For most roof installations purlin spacings will be determined by the trafficable or wind load criteria whichever is the lower limiting factor. However, for roofs that are not able to be walked on (non-trafficable) and for wall cladding applications, these limitations may be exceeded providing the design wind loading criteria is met.

The designer should consider reducing purlin spacings accordingly in areas of heavy roof traffic, snow loadings or where the roofing supports plant items such as air conditioning units. For curved roofing limitations, refer to the Information Table.

For wall cladding on buildings within the scope of NZS 3604 using cavity construction, a maximum batten spacing of 800mm is recommended to balance aesthetics and practicality. However, the Uniform Load Span Graphs must also be checked for the given Wind Zone and nogg/girt spacing. For buildings outside the scope of NZS 3604 (unlined warehouses, sheds etc.), refer to the Uniform Load Span Graphs section.

Multidek® sheets must be fixed into **all** purlins and girts (and all noggs/top/bottom plates for timber/steel framing).

WIND LOADINGS

Firstly, it is necessary for the designer to calculate the design wind load for the roofing and cladding following accepted practice, by reference to AS/NZS 1170, NZS 3604 and/or the NASH Light Steel Framed Buildings standard as appropriate. For further explanation, refer to the MRM COP.

The wind uplift and suction forces on Multidek® roofing and cladding are transferred through to the building via the concealed clips and fasteners into the structure. The performance criteria are the number of concealed clips/fasteners per square metre, which can be varied by the spacing of purlins and/or noggs/girts.

SNOW LOADINGS

When the possibility of snow exists, it is necessary for the designer to allow for the complexities of imposed snow loads including snowdrift due to wind. Snow loads for a project can vary by region and altitude, refer to the MRM COP for snow loads and the snow loadings map.

Design can be achieved by increasing the strength of the structure and/or minimising the buildup of snow (commonly increasing the roof pitch to allow ease of snow shedding). Snow loads are treated as uniformly distributed loads, similar to wind loads.

UNIFORM & CONCENTRATED LOAD SPAN GRAPHS

Loadings referred to in Roofing Industries Multidek® graphs are the result of testing to serviceability (SLS) and ultimate (ULS) limit states in accordance with MRM test procedures and using MRM test apparatus, covering both roofing and cladding applications. Refer to the MRM COP for fixing classification types.

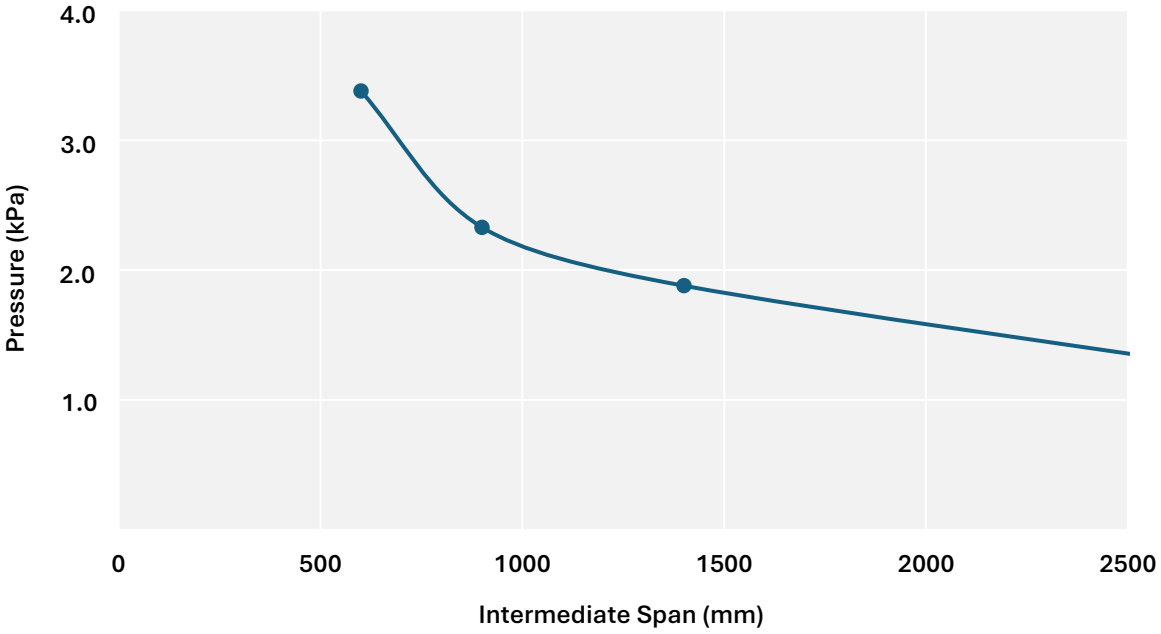
The Design Graphs are presented in a form to allow the designer/engineer to select suitable products and maximum purlin spacings, outlining guidance for Multidek® fixing requirements for buildings within the scope of NZS 3604 and the NASH Light Steel Framed Buildings standard, up to Extra High Wind Zones. Refer also to the notes in the graphs.

SED Wind Zones require specific design by a suitably qualified structural engineer. Fixing types, embedment, pullout, etc. need to be checked with the fastener manufacturer to ensure design loads are met.

ROOFING AND WALLING APPLICATIONS – UNIFORM & CONCENTRATED LOAD SPAN GRAPHS

Steel-based Material G550 High Strength

Multidek® x 0.55mm Serviceability / Ultimate Limit States (SLS/ULS)



Notes:

- End spans to be a maximum of 2/3 of intermediate spans.
- The above graph can be used for both SLS and ULS, as testing showed there is little difference between SLS and ULS failure mechanisms for the Multidek® concealed fixed clip profile.
- The above load span graph and maximum foot traffic spans below are applicable to steel-based substrates. For other substrates, contact Roofing Industries.
- Higher loads may be achieved by the use of additional fixings through the top of the profile rib into the concealed clips. Contact Roofing Industries for specific advice.

Multidek® x 0.55mm Maximum Foot Traffic Spans (mm)

Classification Type (MRM COP)	Intermediate Spans	End Spans
Unrestricted Traffic	1800	1200
Restricted Traffic	2500	1600
Non-Trafficable	2500	1600

ROOFING AND WALLING APPLICATIONS – PRIMARY FIXING METHODS

Multidek® G550 High Strength Steel

Fix 1 x Multidek® clip per sheet per support, using 2 approved wafer head screws positioned through the outermost holes of the clip (nearest each upstand as shown).

Multidek® hidden fixed clip.

Notes:

- For drape curved roofing, the purlins at each end of the sheet should be double clipped, with the balance of the roof fixed as above.

PRIMARY FIXING CHART

Roofing

	Timber Purlins	Steel Purlins up to 1.5mm	Steel Purlins 1.5mm-4.5mm
Steel-based Material	Zincalume Multidek® clips with 2 x 10-12x45 Class 5 wafer head square drive Timber screws per clip	Zincalume Multidek® clips with 2 x 10-16x16 Class 5 wafer head square drive Steel screws per clip	Zincalume Multidek® clips with 2 x 10-16x30 Class 5 wafer head square drive Steel screws per clip (pre-drilled if necessary)
Aluminium-based Material	Powder coated* Zincalume Multidek® clips with 2 x 10-12x45 Class 5 wafer head square drive Timber screws per clip	Powder coated* Zincalume Multidek® clips with 2 x 10-16x16 Class 5 wafer head square drive Steel screws per clip	Powder coated* Zincalume Multidek® clips with 2 x 10-16x30 Class 5 wafer head square drive Steel screws per clip (pre-drilled if necessary)

***** For aluminium substrate, marine grade powder coated steel clips must be used, with all fasteners isolated from sheeting to avoid dissimilar metal contact.

Wall Cladding

	Timber Noggs	Steel Girts up to 1.5mm	Steel Girts 1.5mm-4.5mm
Steel-based Material Direct Fixed	Zincalume Multidek® clips with 2 x 10-12x45 Class 5 wafer head square drive Timber screws per clip	Zincalume Multidek® clips with 2 x 10-16x16 Class 5 wafer head square drive Steel screws per clip	Zincalume Multidek® clips with 2 x 10-16x30 Class 5 wafer head square drive Steel screws per clip (pre-drilled if necessary)
Steel-based Material 20mm Cavity	Zincalume Multidek® clips with 2 x 10-12x45 Class 5 wafer head square drive Timber screws per clip	Zincalume Multidek® clips with 2 x 10-16x30 Class 5 wafer head square drive Steel screws per clip	Zincalume Multidek® clips with 2 x 10-16x30 Class 5 wafer head square drive Steel screws per clip (pre-drilled if necessary)
Aluminium-based Material Direct Fixed	Powder coated* Zincalume Multidek® clips with 2 x 10-12x45 Class 5 wafer head square drive Timber screws per clip	Powder coated* Zincalume Multidek® clips with 2 x 10-16x16 Class 5 wafer head square drive Steel screws per clip	Powder coated* Zincalume Multidek® clips with 2 x 10-16x30 Class 5 wafer head square drive Steel screws per clip (pre-drilled if necessary)
Aluminium-based Material 20mm Cavity	Powder coated* Zincalume Multidek® clips with 2 x 10-12x45 Class 5 wafer head square drive Timber screws per clip	Powder coated* Zincalume Multidek® clips with 2 x 10-16x30 Class 5 wafer head square drive Steel screws per clip	Powder coated* Zincalume Multidek® clips with 2 x 10-16x30 Class 5 wafer head square drive Steel screws per clip (pre-drilled if necessary)

***** For aluminium substrate, marine grade powder coated steel clips must be used, with all fasteners isolated from sheeting to avoid dissimilar metal contact.

Notes:

- Primary fixing requirements are for buildings within the scope of NZS 3604 for up to Extra High Wind Zones.
- Primary fasteners are to have a minimum 30mm embedment into structural timber purlins, battens or timber framing; or minimum 3 threads showing from the underside of steel purlins; adjusting fastener length where using non-structural battens, load spreading profile washers, etc. to account for the extra thickness of components.
- Where sheet lengths exceed 12m for Zincalume and light coloured steel-based material, and 8m for dark coloured steel-based material and aluminium-based material: fix ridging, roof/wall flashings, etc. with 25mm aluminium embossed washers and an appropriate screw fixing regime.
- Class 5 (Category 5) fasteners are to be used with steel-based material in all environments.
- To be read in conjunction with Thermal Movement Provisions, Load Span Graphs and Primary Fixing Methods.
- Secondary fasteners are to be used in accordance with the MRM COP.

FRAME TOLERANCE

It is important that the structure is suitable for the installation of metal roofing and wall cladding.

Particular attention should be paid to the squareness of the structure and alignment of the purlins, noggs/girts and framing, which is required to be within acceptable tolerance.

Prior to installation, the installer is to consider sheeting set out, for example to accommodate roof and wall penetrations, roof lights, windows and doors.

For timber framed construction, during installation the installer must check alignment of the framing using a string line or straight edge, particularly around penetrations to ensure the framing is plumb and true. Where sheets are cut, for example to accommodate corners and around penetrations, etc. they require packers to support the flashings. Multidek® laid directly onto framing or cavity battens requires alignment of the noggs/battens to be within +/- 5mm tolerance to mitigate batten creasing (tighter tolerance may be required for aesthetic finishes).

CANNING

Canning is the visible waviness or undulations in the flat areas of metal roof cladding, wall cladding or wide flat panel flashings. This phenomenon occurs due to differential stresses which build up in the material, and as these stresses are relieved, undulations form leading to the characteristic waviness associated with canning.

The apparentness of these undulations can be affected by several factors such as the angle of viewing, direction and clarity of the light, sheet length, colour, temperature and the thickness of the material; some degree of distortion is inevitable in thinner gauge materials.

In addition, the high gloss levels of brand-new sheets can highlight these undulations but with time natural weathering reduces reflectivity which in turn reduces the visible effect of canning.

The property/building owner, builder and specifier must be aware that these undulations can occur in the flat areas of profiles. Please note canning is aesthetic in nature only and in general does not pose any structural issue or affect the performance or material warranty of the cladding.

To following material factors can assist in reducing the apparentness of canning,

- Use of thicker gauge materials
- Inclusion of stiffening swages
- Limiting the width of flat elements

Attention to detail during installation is also key to reducing canning, and it is important to inspect the alignment of the structure, check sheeting for straightness prior to installing, and ensure sheeting is fastened to Roofing Industries recommendations and industry standards. Refer to the Handling, Storage and Installation section.

THERMAL MOVEMENT PROVISIONS

All metal roofing/cladding and flashings are subject to expansion and contraction caused by changes in temperature, and their design should allow for this movement. The energy produced should be absorbed without damage to the cladding, fixings or structure. Refer to www.roof.co.nz for recommendations for damage prevention and potential noise or waviness issues.

Noise resulting from thermal expansion and contraction of the Multidek® sheeting may be observed. This is a naturally occurring process and is normal to expect. Refer to Section 12.1.3 of the MRM COP and the MBIE Guide to Tolerances, Materials and Workmanship, 2015.

Where long length Multidek® sheets are used, thermal expansion/contraction must be considered. Aluminium is more sensitive to movement with temperature, with around twice the thermal movement of steel. Darker colours also expand/contract more than light colours.

Multidek® sheeting is fixed with the recommended concealed clip system and fasteners from the Primary Fixing Chart using the Primary Fixing Methods. The profile slides on the Multidek® clips to manage thermal movement.

Steel-Based Material

Maximum recommended sheet lengths are 24 metres for dark colours and up to 40 meters for plain and light colours. Sheet lengths over 28 metres require specialised transportation.

Aluminium-based Material

Maximum recommended sheet lengths are 18 metres for dark colours and 24 metres for plain and light colours.

Where sheet lengths are in excess of those shown above, a step joint or other special provision for expansion is required. Contact Roofing Industries for guidance.

Ridging and Flashings

Where sheet lengths exceed 12 metres for Zincalume and light coloured steel-based material, and 8 metres for dark coloured steel-based material and aluminium-based material: fix ridging, roof/wall flashings, etc. with 25mm aluminium embossed washers and an appropriate screw fixing regime.

TRANSLUCENT ROOFING

Where natural lighting is a feature, translucent Multidek® is available as roof and wall lighting and can be supplied in either single or multi-skin forms. For further information, contact the following suppliers who manufacture a full range of fibreglass and polycarbonate products:

- Alsynite One alsynite.co.nz
- Ampelite New Zealand ampelite.co.nz

STRIPPABLE FILM

Multidek® is supplied with strippable film to give temporary protection from scratching etc. Strippable film should be removed from underlaps while laying and removed entirely before UV sets the adhesive, making it difficult to remove without leaving glue residue on the sheet. Traffic across sheets should be kept to a minimum, particularly with self-supporting products.

HANDLING, STORAGE AND INSTALLATION

The following points, although not exhaustive, provide practical guidance to product handling storage and installation -

- Read the pack label for important guidance and inspect packs for any damage.
- Store Multidek® packs and accessories on site using evenly spaced and supportive dunnage, clear of the ground and under cover, to keep dry.
- Product surface protected with strippable film is to be stored under cover, away from UV light.
- If packs become wet and the product is not used immediately, separate the sheets to allow air circulation and drying.
- Do not drag sheets across each other or across rough surfaces.
- Other trades should be made aware of this by the main contractor.
- Installation is to be undertaken by suitably qualified installers experienced in the type of work being carried out, in line with acceptable trade practice.
- Flashings should be notched over the ribs and all sheeting should be edge fixed.
- Refer to the Multidek® detail drawings at www.roof.co.nz

For further guidance, refer to Roofing Industries Handling and Storage Guide, E2/AS1, the MRM COP and MRM Metal Long Run Roofing and Cladding Installation Guide. Failure to install all products in accordance with industry requirements may void the warranty.

MAINTENANCE

Regular maintenance should be performed as necessary to remove dirt, salt and pollutants and extend the life of the roof cladding and accessories. Industry maintenance guides are available from www.roof.co.nz and should be considered to ensure warranty conditions are fulfilled.

BRANCHES

Branch	Address	Phone	Email
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Pukekohe	212 Manukau Road, Pukekohe, Auckland 2120	(09) 238 0050	franklin@roof.co.nz
Hamilton	63 Tasman Road, Avalon, Hamilton 3200	(07) 849 5115	waikato@roof.co.nz
Tauranga	80 Portside Drive, Mount Maunganui 3116	(07) 578 2650	tauranga@roof.co.nz
Taupō	1101 Rakaunui Road, Rotokawa 3378	(07) 376 7971	taupo@roof.co.nz
Hawke's Bay	5 Poporo Way, Longlands, Hastings 4175	(06) 281 2586	hawkesbay@roof.co.nz
New Plymouth	11 Oropuriri Road, Waiwhakaiho, New Plymouth 4312	(06) 758 3003	taranaki@roof.co.nz
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Blenheim	5 Kendrick Road, Riverlands 7274	(03) 934 5901	blenheim@roof.co.nz
Christchurch	12 William Lewis Drive, Sockburn, Christchurch 8042	(03) 339 2324	christchurch@roof.co.nz
Dunedin	33 Strathallan Street, South Dunedin, Dunedin 9012	(03) 455 4444	dunedin@roof.co.nz
Southern Lakes	3 Proctor Way, Cromwell 9310	(03) 928 6869	cromwell@roof.co.nz
Invercargill	133 Bill Richardson Drive, Avenal, Invercargill 9810	(03) 218 7663	invercargill@roof.co.nz

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