

# 4311MR MDS PROFILED METAL ROOFING

## 1 GENERAL

This section relates to the supply and fixing of **Metal Design Solutions** Euro Roof profiled metal roofing complete with associated accessories and components.

It includes:

- Zinc Euro Roof profiles
- Copper Euro Roof profiles
- Aluminium & pre-coated aluminium Euro Roof profiles
- Galvanised steel & pre-coated steel Euro Roof profiles

### 1.1 RELATED WORK

Refer to 4161T THERMAKRAFT UNDERLAYS, FOILS & DPC for underlay

### 1.2 ABBREVIATIONS AND DEFINITIONS

Refer to the general section 1232 INTERPRETATION & DEFINITIONS for abbreviations and definitions used throughout the specification.

The following abbreviations apply specifically to this section:

BMT	Base metal thickness
LBP	Licensed Building Practitioner
NZMRM	New Zealand Metal Roofing Manufacturers Inc

### Documents

### 1.3 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

<a href="#">NZBC B2/AS1</a>	Durability
<a href="#">NZBC E2/AS1</a>	External Moisture
<a href="#">NZBC G12/AS1</a>	Water Supplies
<a href="#">AS/NZS 1170.2</a>	Structural design actions - Wind actions
AS 1397	Continuous hot-dip metallic coated steel sheet and strip - Coatings of zinc and zinc alloyed with aluminium and magnesium
AS 1566	Copper & copper alloys, rolled flat products
<a href="#">AS/NZS 1604.3</a>	Specification for preservative treatment Part 3: Plywood
<a href="#">AS/NZS 1734</a>	Aluminium & aluminium alloys - flat sheets, coiled sheet and plate
<a href="#">AS/NZS 2269.0</a>	Plywood - structural
<a href="#">NZS 2295</a>	Pliable permeable building underlays
<a href="#">AS/NZS 2728</a>	Prefinished / prepainted sheet metal products for interior / exterior building applications
<a href="#">NZS 3604</a>	Timber-framed buildings
ISO 9223	Corrosion of metals and alloys - Corrosivity of atmosphere - Classification determination and estimation
BS EN 988	Zinc & zinc alloys, specification for rolled flat products for building
<a href="#">NZMRM CoP</a>	NZ Metal Roof and Wall Cladding Code of Practice

### 1.4 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer's and supplier's documents relating to this part of the work:

Metal Design Solutions details

[BRANZ Appraisal 524](#) - Cavibat cavity battens

[BRANZ Appraisal 979](#) - Roof ventilation products

Manufacturer/supplier contact details

Company: Metal Design Solutions Limited

Web: [www.mds.net.nz](http://www.mds.net.nz)

Email: [info@mds.net.nz](mailto:info@mds.net.nz)

Telephone: 09 640 0009

### Warranties

## 1.5 WARRANTY - MANUFACTURER/SUPPLIER

Provide a material manufacturer/supplier warranty:

- ~ years for failure of coating adhesion
- ~ years for weatherproofing by material penetration

- Provide this warranty on the manufacturer/supplier standard form (if not available then use the standard form in the general section 1237WA WARRANTY AGREEMENT)
- Commence the warranty from the date of practical completion of the contract works.

Refer to the general section 1237 WARRANTIES for additional requirements.

## 1.6 WARRANTY - INSTALLER/APPLICATOR

Provide an installer/applicator warranty:

- 5 years for workmanship

- Provide this warranty on the installer/applicator standard form (if not available then use the standard form in the general section 1237WA WARRANTY AGREEMENT)
- Commence the warranty from the date of practical completion of the contract works.

Refer to the general section 1237 WARRANTIES for additional requirements.

### Requirements

## 1.7 QUALIFICATIONS WORKERS - MANUFACTURER / SUPPLIER REQUIREMENTS

Workers to be trained by and work under the direct supervision of a Licensed Foreman, approved by Metal Design Solutions Limited. Refer to 1270 CONSTRUCTION for additional requirements relating to qualifications.

## 1.8 NO SUBSTITUTIONS

Substitutions are not permitted to any of the Metal Design Solutions systems, or associated components and products listed in this section.

### Compliance information

## 1.9 INFORMATION REQUIRED FOR CODE COMPLIANCE

Provide the following compliance documentation:

- Manufacturer's, importer's or distributors warranty
- Installer's warranty
- Producer Statement PS3- Construction from the installer
- Other information required by the BCA in the Building Consent Approval documents.

### Performance - Wind (design by contractor)

## 1.10 DESIGN PARAMETERS WIND - DESIGN BY CONTRACTOR

Design the installation to the manufacturer's requirements and as appropriate for the project wind design stated in the general section 1220 PROJECT.

### Performance

## 1.11 FIXINGS, WIND

Design and use the fixings / fixing pattern appropriate for the design loads of this site; refer to general section 1220 PROJECT for details of wind zone and [NZMRM CoP](#). and to **Metal Design Solutions** requirements for the selected profile.

Allow for specific loadings at corners and the periphery of the roof, where localised pressure factors apply. Fixing pattern to also take into account fixing method and purlin spacings.

## 1.12 CO-ORDINATE

Co-ordinate to ensure substrate and preparatory work is complete and other work programmed in the order required for access and completion of the roof. Ensure that all necessary members are positioned so that flashings can be fastened at both edges through the roof profile or cladding to the primary structure.

## 1.13 PERFORMANCE

Install roofing materials in accordance with the [NZMRM CoP](#), and **Metal Design Solutions** requirements for the selected profile, to form a weather-tight performance for the completed roofing system, including all penetrations through the roof and junctions with walls and parapets.

## 1.14 DRINKING WATER

Roofing for collecting potable water to [NZBC G12/AS1](#).

## 2 PRODUCTS

## Materials

- 2.1 GALVANIZED STEEL, UNPAINTED  
Formability steel sheet, G300 flashings and roll forming of profiles, coated to AS 1397.
- 2.2 HOT-DIPPED ALUMINIUM/ZINC COATED STEEL, UNPAINTED  
Formability steel sheet, G300 flashings and roll forming of profiles, coated to AS 1397.
- 2.3 PRE-FINISHED HOT-DIPPED ALUMINIUM/ZINC COATED STEEL  
Formability steel sheet, G300 flashings and roll forming of profiles, coated to AS 1397.
- 2.4 PRE-FINISHED HOT-DIPPED ALUMINIUM/ZINC/MAGNESIUM COATED STEEL  
Formability steel sheet, G300 flashings and roll forming of profiles, coated to AS 1397.
- 2.5 ALUMINIUM  
Aluminium to [AS/NZS 1734](#). Aluminium alloy series 5005 or 5052 marine grade. H34 or H36 temper to suit application.
- 2.6 PRE-FINISHED ALUMINIUM  
Aluminium to [AS/NZS 1734](#). Aluminium alloy series 5005 or 5052 marine grade. H34 or H36 temper to suit application, coated to [AS/NZS 2728](#).
- 2.7 COPPER  
Copper to AS 1566, half-hardened commercial finished with a minimum 0.55mm BMT.
- 2.8 ZINC / TITANIUM ZINC  
Coil to BS EN 988 with a minimum 0.70mm BMT with back face coating.

## Fixings

- 2.9 FASTENERS GENERALLY  
Fixings and fasteners are to be compatible with all materials, the environment and meeting the requirements of the NZ Building Code. Installation is to be in accordance with [NZBC E2/AS1](#) and/or the [NZMRM CoP](#) and Metal Design Solutions requirements.
- 2.10 FIXING CLIPS - STAINLESS STEEL  
Stainless Steel fixing clips to [NZBC E2/AS1](#), clause 8.4.9, to suit the material, profile and location as required by Metal Design Solutions Technical Information. Fix to plywood underlay with 2No timber with 30mm x 10 gauge countersunk stainless steel screws to [NZBC E2/AS1](#), 8.4.9.  
  
Fix clips at no more than 500mm spacing through plywood with selected fasteners. For high and very high wind load areas clip spacing may require to be reduced, refer to SELECTIONS for details.
- 2.11 FIXING CLIPS - COPPER  
Copper fixing clips to [NZBC E2/AS1](#), clause 8.4.9, to suit the material, profile and location as required by Metal Design Solutions Technical Information. Fix to plywood underlay with 2No timber with 30mm x 10 gauge countersunk stainless steel screws to [NZBC E2/AS1](#), 8.4.9.  
  
Fix clips at no more than 500mm spacing through plywood with selected fasteners. For high and very high wind load areas clip spacing may require to be reduced, refer to SELECTIONS for details.
- 2.12 FIXING SCREWS  
To AS 3566. Screws appropriate to the roofing material and the supporting structure, as required by Metal Design Solutions and with a Class 4 or 5 durability and not less than the material being fixed. Screws into timber to penetrate by minimum 30mm. Refer to SELECTIONS.
- 2.13 RIVETS - ALUMINIUM  
Generally use sealed aluminium rivets, minimum diameter 4mm.
- 2.14 RIVETS - COPPER  
For copper roofing use solid copper rivets with minimum diameter 4mm.
- 2.15 RIVETS - STAINLESS STEEL  
For titanium zinc roofing use 304 solid stainless steel rivets with minimum diameter 4mm.

## Components

- 2.16 FLASHINGS GENERALLY  
To [NZBC E2/AS1](#), 4.0, **Flashings**. Formable grade 0.55mm BMT for galvanized, aluminium/zinc, aluminium/zinc/magnesium - coated and pre-painted steel, 0.90mm BMT for aluminium (or 0.7mm for small aluminium flashings) 0.5mm BMT for Copper & 0.7mm BMT for Titanium Zinc to the same standards as the profiled sheets, notched where across profile or provided with a soft edge.

## 2.17 FLASHINGS TO VERGE, RIDGE AND HIP

To [NZBC E2/AS1, 4.0](#), **Flashings**. Flashings, under flashings and continuous flashing clip/cleats supplied by Metal Design Solutions to match or to suit the roofing profile and material.

## 2.18 BOOT FLASHINGS

Generally to [NZBC E2/AS1, 8.4.17 Roof penetrations](#) (note; [NZBC E2/AS1, Figure 54 Soaker flashing for pipe penetration](#), has an error, use as guide only).

EPDM proprietary pipe flashing laid on 45° bias to roofing, with over-flashing (soaker flashing) if required.

A boot flashing should be positioned so that it dams a roofing pan no more than 50%, if this cannot be avoided use an over-flashing back to the ridge and fix the boot flashing to that.

### Accessories

## 2.19 PLYWOOD SUBSTRATE

Plywood to be thickness 15mm minimum and complying with [AS/NZS 2269.0](#), minimum CD Grade, H3.2 with waterbourne CCA treatment to [AS/NZS 1604.3](#) and kiln dried after treatment and be equilibrium moisture content (EMC) of 18% or less, when the cladding is installed. Install with C quality face, filled and sanded on upper face.

## 2.20 UNDERLAY

Refer to 4161T THERMAKRAFT UNDERLAYS, FOILS & DPC.

## 2.21 CAVIBAT EXTERIOR CAVITY BATTENS

Cavibat 45x18mm extruded fluted polypropylene cavity batten system. Refer to [BRANZ Appraisal 524](#).

## 2.22 CASTELLATED EXTERIOR CAVITY BATTENS

Radiata Pine H3.2 castellated and bevelled 45x20mm cavity batten. Refer to 3821 TIMBER FRAMING.

## 2.23 VENTED FASCIA BEAD

VENT ventilated roof batten, VB20 40mm wide x 20mm deep extruded polypropylene ventilated roof batten. Refer to [Branz Appraisal 979](#).

## 2.24 WIRE NETTING AND SAFETY MESH

Refer to 4161 UNDERLAYS, FOIL AND DPC.

## 2.25 SEALANT

Neutral curing MS sealant or polymer sealant as required by Metal design Solutions and used as directed.

## 2.26 LAP SEALING TAPE

Closed cell self adhesive nitrile tape.

## 3 EXECUTION

### Conditions

## 3.1 DELIVERY, STORAGE & HANDLING OF PRODUCTS

Refer to 1270 CONSTRUCTION for requirements relating to delivery, storage and handling of products.

Store on a level firm base clear of the ground, with packs well ventilated and completely protected from weather and damage. Do not allow moisture to build up between sheets. If sheet packs become wet, fillet or cross stack to allow air circulation and drying between sheets.

Lift each sheet carefully, do not drag or distort and avoid contact with damaging substances, including cement. Long lengths of roofing should be lifted onto the roof using an approved load spreading beam. Protect edges and surface finishes from damage, keep under cover and remove as the product is being installed. Use soft, flat sole shoes when fixing and for all other work on the roof. Walk along the purlin line whenever possible.

## 3.2 ROUTINE MATTERS

Refer to 1250 TEMPORARY WORKS & SERVICES for protection requirements.

Refer to 1270 CONSTRUCTION for requirements relating to defective or damaged work, removal of protection and cleaning.

## 3.3 INSPECTION - STRUCTURE

Inspect the roof framing and supporting structure to ensure that it is complete, with sufficient fixing points for roofing, fully braced and confirm it is of the required standard ready for roofing works, if applicable, and roofing and free from any misalignments or protrusions that could damage the roofing.

If using Eurospan roofing profile (non-vented), ensure purlins have upper edges arrised in accordance with MDS Euro Roof details.

#### 3.4 FRAMING TIMBER MOISTURE

When continuous metal cladding etc runs along a long continuous timber member and is directly fixed to it, the timbers equilibrium moisture content (EMC) to be 18% or less. For flashings in this situation (sometimes called transverse flashings) the framing EMC to be maximum 16%, and preferably as low as 12%. Transverse flashings can be temporarily tacked in place and final fixing done when moisture content is acceptable.

##### **Preparation - generally**

#### 3.5 SEPARATION

Isolate dissimilar materials (metals and non-metals) in close proximity as necessary by painting the surfaces or fitting separator strips of compatible materials. Place isolators between metals and treated timber and cement based materials. Do not use lead sheet or copper in contact with or allow water run-off onto galvanized or aluminium/zinc & aluminium/zinc/magnesium coated steel.

#### 3.6 INSTALL VENTED BATTEN

Install vented batten VB20 to top of fascia on accordance with Metal Design Solutions details for vented for vented fascia.

#### 3.7 LAY PLYWOOD SUBSTRATE

Lay with the face grain at right angles to the supports, filled and sanded face up, with staggered joints (brick bond) with all edges of the sheets fully supported and to be continuous over at least two spans. Ensure sheets are correctly aligned, square, and in the same plane.

Allow a 3mm gap between square edged sheets, and fix at 150mm centres on all edges, 200mm centres elsewhere with stainless steel countersunk No.10 x 50mm screws into timber substrate in accordance with plywood manufacturer and Metal Design Solutions requirements.

#### 3.8 INSTALL STARTER FLASHING

Install continuous starter flashing along the base of plywood substrate at the gutter line, prior to installation fit a narrow strip of underlay between plywood and starter flashing for separation. Where roof pitch is 5° pitch or less, rebate starter flashing into plywood.

#### 3.9 FIX UNDERLAY OVER PLYWOOD SUBSTRATE

Refer to 4161 UNDERLAYS, FOIL AND DPC

Lay and lap roofing underlay to [NZBC E2/AS1.8.1.5 Roof Underlays](#) and to manufacturer's requirements. Make good any damage to underlay before or during fixing of cladding before fixing continues.

##### **Preparation - Eurospan profile**

#### 3.10 FIX UNDERLAY

Refer to 4161 UNDERLAYS, FOIL AND DPC.

#### 3.11 INSTALL CAVITY BATTENS / CAVIBAT

Install either two 45x18mm Cavibat battens or two H3.2 castellated & bevelled timber battens, as selected, over roofing underlay along length of each purlin using specified non-structural fixings at 400mm centres.

#### 3.12 INSTALL STARTER FLASHING

Install continuous starter flashing at the gutter line, prior to installation fit a narrow strip of underlay between purlin or cavity batten and starter flashing for separation.

##### **Installation - generally**

#### 3.13 STANDARDS AND TOLERANCES

Refer to the general section 1270 CONSTRUCTION for general requirements.

#### 3.14 SET-OUT

Carefully set out with consideration of the position of side laps to take account of the prevailing wind and line of sight. Ensure all sheets are square and oversailing the gutter true to line. Check during fixing to eliminate creep or spread.

#### 3.15 END LAPS

Install sheets in continuous lengths and do not form end laps except where specifically detailed.

#### 3.16 THERMAL MOVEMENT

Comply with [NZBC E2/AS1](#) clause 8.4.2 Allowance for expansion. Roof fixing and jointing to conform to Metal Design Solutions requirements for thermal movement. Provide sliding clips as to [NZMRM CoP](#) recommendations.

### 3.17 MARKING AND CUTTING

Use ink pen, chalk line or coloured pencil for marking roof sheets prior to cutting. Do not use lead pencil for marking aluminium/zinc or aluminium/zinc /magnesium coating products. Cut only by shearing tools and seal all sheared edges of pre-coated steel sheet with edge protection lacquer. Remove all cutting and drilling debris from the roof.

### 3.18 INSTALLATION OF PROFILED METAL ROOFING - GENERALLY

Install and fix in accordance with [NZBC E2/AS1](#), [NZMRM CoP](#) recommendations and to Metal Design Solutions Limited requirements and details for each selected profile and area of the roofing. Paint colour matched fixings and accessories before installation. Use only selected screws and clips, refer to SELECTIONS for details.

### 3.19 FIX SHEETS

Fix sheets in place using the fastening system required by Metal Design Solutions Limited for specified profiles, making due allowance for dynamic local wind pressures on the building and thermal movement in the sheet. Ensure adequate fixings installed at corners and roof periphery.

### 3.20 FORM SEAMS

Mechanically form and welt seal in-situ to required height and profile, using trade specific tools. Dress seams flat at gutters, hips and ridges.

### 3.21 STOP ENDS AND DOWNTURNS

Fold pan and seams down at the gutter line over starter flashing and fold pans up to form stop ends at hips and ridges in accordance with Metal Design Solutions Limited details. Form using the required tools.

### 3.22 INSTALL FLASHINGS

Flash roof junctions, to upstands, abutments and penetrations in accordance with [NZBC E2/AS1](#) requirements, Metal Design Solutions Limited requirements and as detailed. Where no detail is provided flash to [NZMRM CoP](#) recommendations.

Pre-form flashing shapes wherever possible. Cut neatly and precisely, notch, scribe, flute or dress down as required and fix using continuous clip / cleats, under-flashings, rivets and sealant to detail to form a weatherproof cover. For visible flashings, plan joints/junction to take account of the aesthetic requirements.

### 3.23 FLASHING PENETRATIONS

Flash all penetrations through the roof in accordance with [NZBC E2/AS1](#); clause 8.4.17 Roof Penetrations, Metal Design Solutions Limited requirements and as detailed to provide a weathertight seal. Fit pipe flashings with a proprietary collar flashing. Ensure that flashings are set to avoid any ponding of water.

### 3.24 USE OF SEALANTS

Select and use neutral curing MS sealant or polymer sealant only as recommended by Metal Design Solutions Ltd. Apply sealant in two narrow beads transversely across flashing intersections, close to the two edges. Avoid exposing sealant on outside surfaces.

Do not use sealant on Copper and Titanium Zinc material, these materials are required to be soldered to complete any joint.

## Completion & Commissioning

### 3.25 COMPLETION MATTERS

Refer to 1270 CONSTRUCTION for completion requirements and if required commissioning requirements.

## 4 SELECTIONS

For further details on selections go to [www.metaldesignsolutions.co.nz](http://www.metaldesignsolutions.co.nz). Substitutions are not permitted to the following, unless stated otherwise.

### Coating system

#### 4.1 COATING SYSTEM - EXPOSURE ZONE B-C (CAT 1-3)

Project Exposure Zone B-C to [NZS 3604](#), C 1-3 to ISO 9223.

Profile/location: ~

Base material: ~

Coating system: ~

Coating colour: ~

#### 4.2 COATING SYSTEM - EXPOSURE ZONE D (CAT 4)

Project Exposure Zone D to [NZS 3604](#), C 4 to ISO 9223.

Profile/location: ~

Base material: ~

Coating system: ~

Coating colour: ~

- 4.3 COATING SYSTEM - EXPOSURE ZONE E (CAT 5)  
Project Exposure Zone E to [NZBC E2/AS1](#), C 5 (C5I & C5M) to ISO 9223.  
Profile/location: ~  
Base material: ~  
Coating system: ~  
Coating colour: ~

**Material - Euro Roof profiles**

- 4.4 MDS EURO ROOF - ANGLE SEAM ROOFING  
Location: ~  
Material/BMT: ~  
Rib centres: ~mm  
Seam: ~mm (seam height) x 12mm  
Minimum pitch: 15°  
Clips: Concealed ~ clips  
Clip material: Stainless steel clips  
Clip fixing: 10 gauge x 30mm countersunk 304 stainless steel screws, 2No per clip.
- 4.5 MDS EURO ROOF - DOUBLE STANDING SEAM ROOFING  
Location: ~  
Material/BMT: ~  
Rib centres: ~mm  
Seam: 38mm (seam height) x 8mm  
Minimum pitch: 3°  
Clips: Concealed ~ clips  
Clip material: Stainless steel clips  
Clip fixing: 10 gauge x 30mm countersunk 304 stainless steel screws, 2No per clip.
- 4.6 MDS EURO ROOF - EUROSPAN ROOFING  
Material/BMT: 0.55mm Steel G300  
Rib centres: ~mm  
Seam: 45mm (seam height) x 9mm wide  
Minimum pitch: 3°  
Clips: Concealed clips  
Clip material: Stainless Steel Clips  
Clip fixing: ~
- 4.7 MDS EURO ROOF - NAIL STRIP ROOFING  
Material/BMT: ~  
Rib centres: ~mm  
Seam: ~mm (seam height) x 10mm wide  
Minimum pitch: 3°  
Fixing: 10 gauge x 30mm countersunk 304 stainless steel concealed screws
- 4.8 MDS EURO ROOF - ROLL CAP ROOFING  
Material/BMT: ~  
Rib centres: ~mm  
Seam: 32mm (seam height) x 50mm wide  
Minimum pitch: 5°  
Clips: Concealed ~ clips  
Clip material: Stainless steel  
Clip fixing: 10 gauge x 30mm countersunk 304 stainless steel screws, 2No per clip.
- 4.9 MDS EURO ROOF - ROLL SEAM ROOFING  
Material/BMT: ~  
Rib centres: ~mm  
Seam: 32mm (seam height) x 50mm wide  
Minimum pitch: 5°  
Clips: Concealed ~ clips  
Clip material: ~  
Clip fixing: 10 gauge x 30mm countersunk 304 stainless steel screws, 2No per clip.

#### 4.10 MDS EURO ROOF - SNAPLOCK ROOFING

Location:	~
Material/BMT:	~
Rib centres:	~mm
Seam:	~mm (seam height) x 10mm
Minimum pitch:	3°
Clips:	Concealed ~ clips
Clip material:	Stainless steel clips
Clip fixing:	10 gauge x 30mm countersunk 304 stainless steel screws, 2No per clip.

#### **Accessories**

#### 4.11 FLASHINGS - GENERALLY

Profile:	~
BMT/material:	~
Coating system:	To match roofing
Coating colour:	To match roofing
Options:	

#### 4.12 PLYWOOD SUBSTRATE

Location:	~
Brand/type:	CHH Woodproducts , Ecoply,
Thickness:	~mm
Grade:	CD
Stress Grade:	F8/F11
Treatment:	H3.2 CCA
Fixing:	~

#### 4.13 UNDERLAY

Location:	~
Note:	Refer to 4161T THERMAKRAFT UNDERLAYS, FOILS & DPC.

#### 4.14 CAVITY BATTENS - TIMBER

Location:	Under Eurospan for vented system
Type:	Pinus Radiata H3.2 Castellated and bevelled
Size:	45x20mm
Fixing:	~

#### 4.15 CAVIBAT EXTERIOR CAVITY BATTENS

Location:	Under Eurospan for vented system
Type:	Cavibat non-structural, extruded fluted polypropylene cavity batten
Size:	40mm x 18mm
Fixing:	~

#### 4.16 VENTED FASCIA BEAD

Location:	To top of fascia for vented fascia
Manufacturer:	VENT Passive Ventilation
Type:	VB20
Size:	40mm wide x 20mm deep