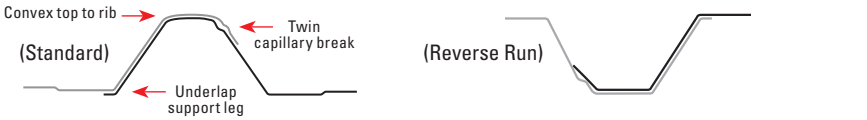
MAXISPAN®

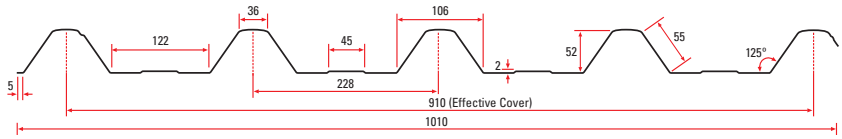
PROFILE TECHNICAL SUMMARY

(All dimensions are nominal and in mm.)

Maxispan lap

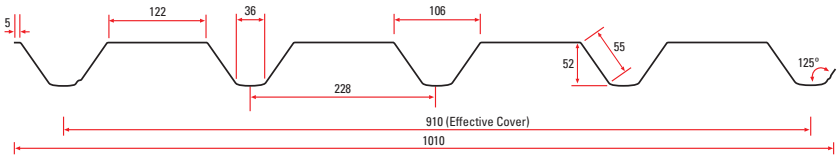


Maxispan (Roofing and Wall Cladding)
Dimensioned Drawing of Maxispan

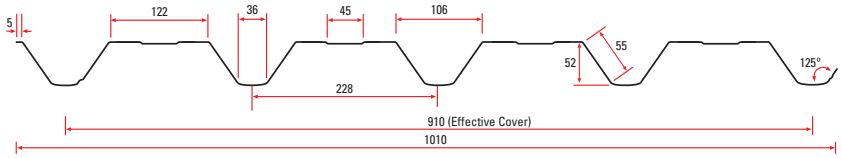


Maxispan Reverse Run (Optional but not standard)
Dimensioned Drawings of Maxispan Reverse Run
(For wall cladding only)

Option A - Without swage



Option B - With swage
With reverse run profiles it is recomended to use .55 mm BMT Steel or .90mm BMT Aluminium to minimise deflection



For wall cladding on industrial and commercial buildings it is often more appropriate to use a medium height profile such as Multirib.

Minimum Pitch

The minimum roof pitch for Maxispan is 3 degrees (approx 1:20). Any variation from the above should be referred to Roofing Industries.

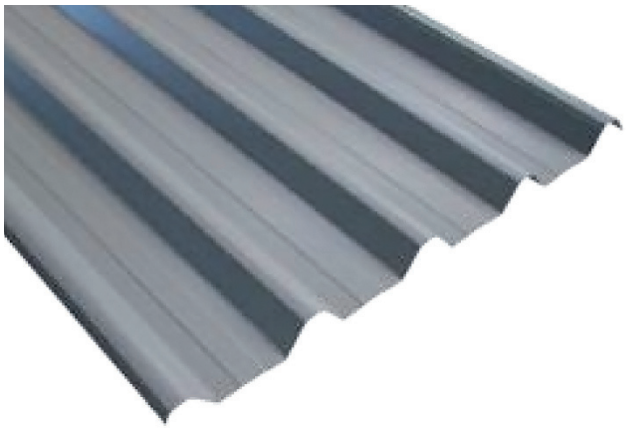
When a combination of sheets provide a run of in excess of 40 metres and up to 60 metres the roof pitch should be increased by 1 degree. Longer lengths require specific design.

When rainfall intensity exceeds 100mm/hour the minimum pitches need to be increased by a further 1 degree for every 10 metres of run over 40 metres.

The building design pitch may need to be higher to take into account any cumulative deflections of the frame, purlin and roof sheeting or penetrations.

With curved roofing the roof cladding must not terminate at a pitch lower than permitted above.

Side laps of curved sheets must be sealed to any areas below the minimum pitches permitted above.



Branches: • Whangarei • Auckland • Pukekohe (Franklin Metal Folding & Roofing Ltd) • Hamilton • Taupo • Palmerston North • Wellington • Christchurch

- Manufactured custom cut to length subject to transport and site limitations.
- As sheet lengths increase higher transportation costs may be applicable.
- Sheet lengths in excess of 28 metres require specialised transportation. Refer to Roofing Industries.
- Maximum recommended sheet lengths for **Aluminium** is 10-12 metres for dark coloured and 12-15 metres for plain and light coloured. Refer to Roof Expansions Provisions of this summary.

Information Table

Substrate Material	Steel		Aluminium	
Thickness	**.40mm BMT**	**.55mm BMT**	**.70mm BMT**	**.90mm BMT**
Aprox weight per lineal metre for Zincalume based material (kg/lm)	4.05	5.48	2.39	3.07
Purlin Spacings -General	Refer to separate section.		Refer to separate section.	
Unsupported Overhang (mm)[1]	250	450	250	350
Drape Curved Roof -min Radius (m)	N/R[2]	90	N/R[2]	90
Purlin Spacings for Curved Roofs -Intermediate (mm)	N/R[2]	2400	N/R[2]	2400
-End (mm)	N/R[2]	1600	N/R[2]	1600
Precurved Roof -min Radius (mm)	N/A[3]	N/A[3]	N/A[3]	N/A[3]
-Recommended Minimum Radius (mm)	N/A[3]	N/A[3]	N/A[3]	N/A[3]

[1] Not suitable for roof access without additional support) [2] N/R - Not recommended [3]N/A - Not Available

This technical data sheet is for steel and aluminium based substrates. Maxispan can also be manufactured in other metals such as Copper or Titanium Zinc. Refer to Roofing Industries.

Specification

Refer to our Full Specification on Masterspec, our website, and our Selection Guide.

Building Design / Performance Criteria / Product Selection

During the design of buildings, it is necessary for the designer to take into account a number of issues to ensure that the most appropriate roofing and cladding product is chosen.

Whilst aesthetics and product availability do play a part, the chosen profile must meet certain performance criteria. These are centred around the profile's ability to shed water from the roof and the ability of the product to span purlin and girt spacings and meet design criteria. The minimum pitch for this profile is outlined elsewhere within this literature.

In terms of purlin spans and girt spacing it is necessary to follow due process.

If a building is being designed and constructed in full accordance with E2/AS1 and roofing and cladding products as covered by that document are chosen, then it is necessary for the design spans and fixing methodology to comply with those of E2/AS1. However E2/AS1 states that the use of the manufacturers information may provide a more optimum spacing of fixings, and this is recommended by Roofing Industries.

Further where a building is outside of the scope of E2/AS1 and the building or parts thereof are of specific design then it is necessary for the roofing and cladding to be suitable for the design and vice versa.

Loadings referred to in Roofing Industries graphs are the result of testing to a serviceability limit state which is more conservative than an ultimate limit state as quoted by some manufacturers.

Our Design Graphs are presented in a form to allow the designer to select suitable products and purlin spacings.

For most roof installations the purlin spacings will be limited by the trafficable limitations of the profile or the structural design. It is then necessary for the designer to calculate the design wind load for the roofing and cladding in accordance with generally acceptable practice, by reference to AS/NZS 1170.2: 2011, and/or NZS 3604: 2011 as appropriate. For a fuller explanation of this refer to the NZ Metal Roof and Wall Cladding Code of Practice. This result should be referenced to the Wind Load Span Design Graphs.

The purlin spacings should be limited to the lower of the trafficable limitations and design wind load with the capacity of the structure being greater than the design load for the application. However for roofs that are not able to be walked on and for wall cladding applications, the trafficable limitations may be exceeded providing the design wind loading criteria is met. However this should be done with caution as it may require considerable extra secondary fasteners within the laps.

The designer should always take into account in areas of heavy roof traffic, snow loadings, or where the roofing supports such items as air conditioning units, purlin spacing should be reduced accordingly. Consideration also needs to be given to limitations of purlin spacings for any translucent sheeting.

Reference should be made to the notes in the graphs.

It is our recommendation that for commercial and industrial roofing applications that .55mm BMT steel or .90mm BMT Aluminium is used as it has more resilience to damage particularly by other trades.

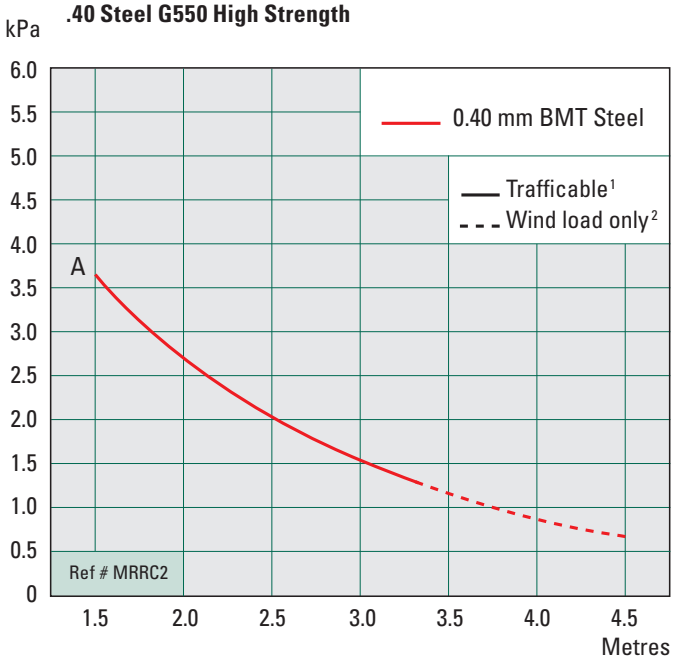
Underlay as per the project specifications should be used.

With an aluminium substrate steel netting should not be used where it may be in contact (either directly or through underlay degradation) with the aluminium roofing or cladding. Alternative material such as polypropylene strapping should be used where support is required, or the cladding separated from the underlay by a high density polystyrene batten or Thermakraft 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 the above cases self supporting paper should be used, including when support is required.

WIND & CONCENTRATED LOAD SPAN DESIGN GRAPH

Roofing - Steel Based Material

.40 Steel G550 High Strength



- Intermediate span in metres.
- End spans to be a maximum of 2/3 of this span.

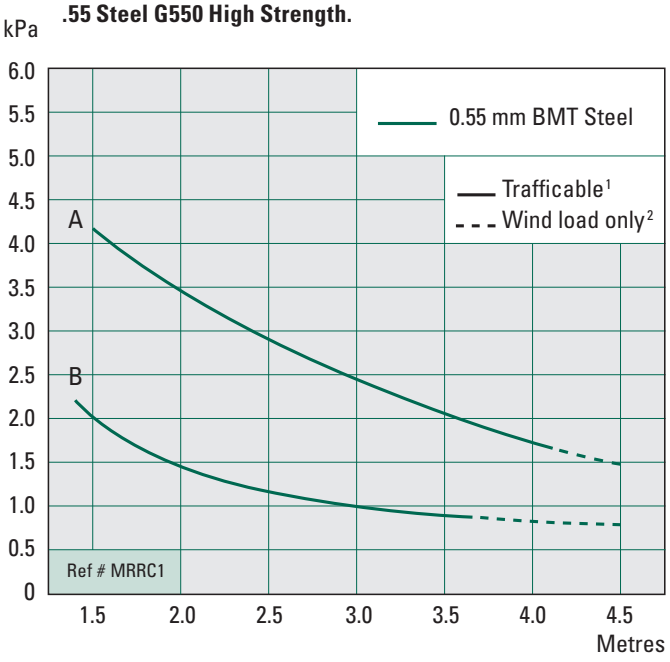
1) The solid line represents where walking is permitted within 300 mm of the purlin line or in the pan of the profile. Therefore for a normal roof, providing wind load requirements are met, purlin spans are limited to:

Maximum Spans	0.40 mm BMT
Intermediate	3.3 metres
End	2.2 metres
Type 2B *"Restricted Access"* Classification	

2) The broken line represents untrafficable roof areas and relates to wind loading only with Type 3 Classification.

In areas of heavy roof traffic, snow loadings or where the roofing supports such items as air conditioning units, purlin spacing should be reduced accordingly.

.55 Steel G550 High Strength.



- Intermediate span in metres.
- End spans to be a maximum of 2/3 of this span.

1) The solid line represents where walking is permitted within 300 mm of the purlin line or in the pan of the profile. Therefore for a normal roof, providing wind load requirements are met, purlin spans are limited to:

Maximum Spans	0.55 mm BMT
Intermediate	4.2 metres
End	2.8 metres
Type 2B *"Restricted Access"* Classification	

2) The broken line represents untrafficable roof areas and relates to wind loading only with Type 3 Classification.

In areas of heavy roof traffic, snow loadings or where the roofing supports such items as air conditioning units, purlin spacing should be reduced accordingly.

For Type A "Unrestricted Access" Classification, refer to Purlin Spacing Limitations and Recommendations.
Classification Types are from the NZ Metal Roof and Wall Cladding Code of Practice.
Testing confirms that .70mm Aluminium has similar results to .40mm Steel and that .90mm Aluminium has similar results to .55 Steel and is adjusted for practical application.

Primary Fixing Methods

Roofing Application

A - Fixed every purlin, every rib with approved screws & neos, load spreading profiled metal washers and EPDM washers.

B - Fixed every purlin at the laps and to the centre rib with approved screws & neos, load spreading profiled metal washers and EPDM washers. Every purlin and periphery of roof to be fixed every rib.

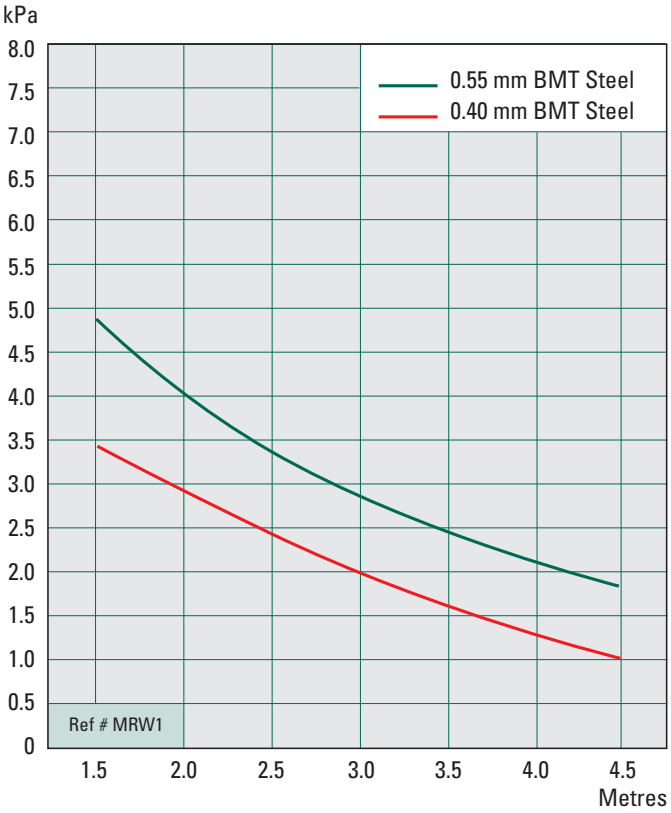
Other fixing patterns and systems may be used ,however these will alter the design load. Where purlin spacings are closer than the maximum above it may not be necessary to fix every rib every purlin. Refer to Roofing Industries.

Drape Curved Roofing

It is recommended that the first two purlins at each end of the sheet in drape curving situations, should be fixed using profile metal washers and EPDM washers to every crest, when any alternative fixing method is used.

Wall Cladding - Steel Based Material

Combined Graph, .40 and .55 Steel High Stength



Testing and classification type
All roofing and cladding has been tested in accordance with the NZMRM test procedure.
Classification Types are from the NZ Metal Roof and Wall Cladding Code of Practice.

- Intermediate span in metres.
- End spans to be a maximum of 2/3 of this span.
- Type 3 Classification.

Other fixing patterns may be used, however these will alter the design load.

Note: For wall cladding on industrial and commercial buildings it is often more appropriate to use a medium height profile such as Maxispan™.

Testing confirms that .70mm Aluminium has similar results to .40mm Steel and that .90mm Aluminium has similar results to .55mm Steel and is adjusted for practical application.

Primary Fixing Methods

Fixed in the pan adjacent to every rib every girt, with approved 12 gauge screws & neos. At the laps the fixing is to be adjacent to the lap rib.

PURLIN/GIRT SPACING LIMITATIONS AND RECOMMENDATIONS

(Dimensions in metres)

E2/AS1 states that a specific design may produce a more optimum spacing for fixing than as presented in this document. For profiles such as Maxispan that is particularly applicable and as such the manufacturers information should be used.

Manufacturers recommendations for maximum spacings in accordance with NZ Metal Roof and Wall Cladding Code of Practice

		Steel Based Material			Aluminium H36	
		.40mm BMT		.55mm BMT	.70mm BMT	.90mm BMT
Restricted Access Roof (Type 2B) (Where walking is permitted within 300mm of the purlin line or in the pan of the profile)	Intermediate	3.300	For wind design loads for steel based materials refer to graphs or Summary Chart.	4.200	2.400 (1.3kPa)*	3.800 (1.6kPa)*
	End	2.200		2.800	1.600 (2.3kPa)*	2.500 (2.5kPa)*
Unrestricted Access Roof (Type 2A) (Where walking is permitted anywhere on the roof cladding)	Intermediate	1.500		3.000	1.200 (3.6kPa)*	2.400 (2.4kPa)*
	End	1.000		2.000	0.800 (4.0kPa)*	1.600 (3.4kPa)*
Non Accessible Roof and Wall Cladding (Type 3)	Intermediate	3.600		4.500	2.400 (1.3kPa)*	3.800 (1.6kPa)*
	End	2.400		3.000	1.600 (2.3kPa)*	2.500 (2.5kPa)*

*Wind design load for Aluminium using Primary Fixing Method A. See Summary Charts for steel

Classification Types are from the NZ Metal Roof and Wall Cladding Code of Practice and do not allow for any congregation of foot traffic.
Purlin spacing limitations to be read in conjunction with Wind Load Span Design Graphs and Charts.
In areas of heavy traffic purlin spacing should be reduced accordingly.
For curved roofing refer to Information Table.
When roof pitch is 8 Degrees or higher and self supporting paper is preferred to be used (without any support) purlin spacings must be limited to a maximum of 1.200 mtr centres for vertically run underlay and 1.150 mtr centres for horizontally run underlay. This is particularly relevant with aluminium and /or severe marine environments for the reasons designated under Building Design/Performance Criteria/Product Selection part of this document.

Snow Loads

When the possibility of snow exists it is necessary to allow for the extra imposed snow loads by increasing the strength of the structure, and/or minimising the build up of snow, and this is generally achieved by increasing the roof pitch by allowing easier shedding of the snow or otherwise as the designer determines.

The objective is to simplify rather complex loading patterns while remaining adequately cautious. The design loads should take account of drifting snow due to wind,but wind loads are not required to be combined with snow loads.

As snow loads are uniformly distributed loads they are similar to wind loads.

Snow loadings are not required to be taken into account for the North Island of New Zealand north of a line drawn from Opotiki to Turangi and New Plymouth.

However for other areas snow loadings may need to be taken into account dependent on the area and altitude of the proposed project. A fuller reference including a map and chart is available from the NZ Metal Roofing Roof and Wall Cladding Code of Practice Section 3.5.

SUMMARY CHART FOR ROOFING SPANS IN STEEL

Incorporating Wind and Concentrated Load Span Design Graphs, Primary Fixing Methods and Foot Traffic

.40mm BMT Steel

Purlin Spacing (mtrs)		WIND DESIGN LOADINGS - kPa's Fixing Method A		Foot Traffic
Intermediate	End	Int.	End	
1.5	1.0	3.6	4.2	Fully trafficable
1.75	1.16	3.0	4.0	Restricted Access Walk within 300mm of Purlins or in pan of roof
2.00	1.33	2.7	3.8	
2.25	1.5	2.25	3.6	
2.5	1.66	2.0	3.3	
2.75	1.83	1.75	2.9	
3.0	2.0	1.5	2.7	
3.3	2.2	1.3	2.3	
3.5	2.33	1.15	2.2	Non Accessible
3.6	2.4	1.1	2.1	
3.75	2.5	1.0	2.0	
4.0	2.67	0.8	1.8	
4.25	2.83	0.75	1.6	
4.5	3.0	0.7	1.5	

.55mm BMT Steel

Purlin Spacing (mtrs)		WIND DESIGN LOADINGS - kPa's Fixing Method A		Foot Traffic
Intermediate	End	Int.	End	
1.5	1.0	4.1	4.7	Fully trafficable
1.75	1.16	3.75	4.5	
2.00	1.33	3.45	4.3	
2.25	1.5	3.25	4.1	
2.5	1.66	2.9	3.7	
2.75	1.83	2.7	3.6	
3.0	2.0	2.45	3.45	
3.25	2.16	2.25	3.3	Restricted Access Walk within 300mm of Purlins or in pan of roof
3.5	2.33	2.05	3.0	
3.75	2.5	1.8	2.9	
4.0	2.67	1.7	2.7	
4.2	2.8	1.6	2.55	
4.5	3.0	1.5	2.45	Non Accessible

For wall cladding refer to Wall Cladding Graph. When fixed in accordance with the Primary Fixing Method loadings will always be higher than the above roofing charts.

Foot traffic classifications do not allow for any congregation of foot traffic.

PRIMARY FIXING CHART

Roofing - Crest fixed (To be read in conjunction with Roof Expansion Provisions and Load Span Design Graph)

	Wood Purlins	Steel Purlins or girts up to 1.5mm	Steel Purlins or girts 1.5-4.5mm	Steel Purlins or girts 4.5-12mm	Washers (When required)
Steel Based Material	14-10x100 Class 4 Type 17 Woodteks with neos with Maxispan load spreading profile washers & 36mm EPDM	14-20x90 Class 4 Steelteks with neos with Maxispan load spreading profile washers & 36 mm EPDM	14-20x90 Class 4 Steelteks with neos with Maxispan load spreading profile washers & 36 mm EPDM	14-20x90 Class 4 Steelteks with neos with Maxispan load spreading profile washers & 36 mm EPDM. Predrill for screws	Maxispan load spreading profile Steel and 36mm EPDM
Aluminium Based Material	Stainless steel grade 316, 14-10x100 Type 17 with neos through a 10mm dia. clearance hole with Maxispan load spreading profile 1.2mm Ali washer & 36mm EPDM	Stainless steel grade 304, 14-14x90 Steelteks and bonded washer through a 10mm dia. clearance hole with Maxispan load spreading profile 1.2mm Ali washer & 36mm EPDM	Stainless steel grade 304, 14-14x90 Steelteks and bonded washer through a 10mm dia. clearance hole with Maxispan load spreading profile 1.2mm Ali washer & 36mm EPDM	Fabco stainless steel grade 304, 14-14x90 Type B screw and bonded washer through a 10mm dia. clearance hole with Maxispan load spreading profile 1.2mm Ali washer & 36mm EPDM	Maxispan load spreading profile 1.20mm Ali and 36mm EPDM

Wall Cladding - Pan fixed

	Wood Purlins	Steel Purlins or girts up to 1.5mm	Steel Purlins or girts 1.5-4.5mm	Steel Purlins or girts 4.5-12mm	Washers (When required)
Steel Based Material Direct fixed	12-11x40 Class 4 Type 17 Woodteks with neos	12-14x20 Class 4 Steelteks with neos	12-14x20 Class 4 Steelteks with neos	12-24x32 Class 4 Steelteks Series 500 with neos	
Steel Based Material 20mm Cavity	12-11x50 Class 4 Type 17 Woodteks or Roofzips with neos	12-14x45 Class 4 Steelteks with neos or 12x50 Roofzips with neos	12-14x45 Class 4 Steelteks with neos	12-24x50 Class 4 Steelteks Series 500 with neos	
Aluminium Based Material Direct Fixed	12-11x35 Alutite with bonded washer	Stainless steel grade 304, 14-14x25 Steelteks and bonded washer through a 10mm diameter clearance hole with 19mm bonded Ali washer	Stainless steel grade 304, 14-14x25 Steelteks and bonded washer through a 10mm diameter clearance hole with 19mm bonded Ali washer	Fabco stainless steel grade 304, 4-14x20 Type B screw and bonded washer through a 10mm diameter clearance hole with 19mm bonded Ali washer	19mm bonded Ali washer
Aluminium Based Material 20mm Cavity	12-14x55 Alutite with bonded washer	Stainless steel grade 304, 14-14x70 Steelteks and bonded washer through a 10mm diameter clearance hole with 19mm bonded Ali washer	Stainless steel grade 304, 14-14x70 Steelteks and bonded washer through a 10mm diameter clearance hole with 19mm bonded Ali washer	Fabco stainless steel grade 304, 14-14x70 Type B screw and bonded washer through a 10mm diameter clearance hole with 19mm bonded Ali washer	19mm bonded Ali washer

Note: All primary fasteners to have a minimum embedment into structural timber of 30mm. Adjust fastener length for both timber and steel fixings when necessary for battens etc. When using load spreading profile washers or 25mm Aluminium embossed washers for roofing fix ridging, roof flashings etc. using a 25mm Aluminium embossed washer and appropriate screw. In some applications when purlin spacings are not at their maximum and sheet lengths are not excessive, load spreading profile washers may not be needed. Refer to Roofing Industries.

Secondary Fasteners (To be used in accordance with the NZ Metal Roof and Wall Cladding Code of Practice.)

These should be:

- Aluminium Blind Rivets AS5-3 x 4mm minimum (Residential)
- Aluminium Blind Rivets AS 6-3 x 4.8mm minimum (Commercial)
- Aluminium Bulb-tite Rivets
- 12-11x35 Alutites
- 12-11x25 Class 4 Type 17 Woodteks (Steel based material only)

ROOF EXPANSION PROVISIONS

Fix with recommended fasteners and systems from the Primary Fixing Chart and additionally allow for the following where applicable.

Steel Based Material				
E2/AS1 Compliance				
Sheet Lengths	**Up to 8 metres**	**>8-12 metres**	**>12-18 metres**	**>18 metres**
	No special provision.	Lower 50 % of the roof should be fixed using oversize holes at fastening points with approved load spreading profile washer, and 36mm EPDM washers.		Not Applicable.
NZ Metal Roof and Wall Cladding Code of Practice Compliance				
Sheet Lengths	**Up to 15 metres**	**>15-18 metres**	**>18-25 metres**	**>25-30 metres**
Zincalume and light colours	No special provision.	No special provision	Solid fix from the ridge down 12 metres and oversize holes should be used for the remainder of the sheet with approved load spreading profile washers, and a 36mm EPDM or approved 25mm Aluminium embossed washer.	Solid fix from the ridge down 12 metres & oversize holes should be used for the remainder of the sheet with approved load spreading profile washers, and a 36mm EPDM or approved 25mm Aluminium embossed washer used for the entire sheet
Dark Colours	No special provision.	Solid fix from the ridge down 12 metres and oversize holes should be used for the remainder of the sheet with approved load spreading profile washers, and a 36mm EPDM washer or approved 25mm Aluminium embossed washers		Not recommended

For sheet lengths in excess of the above a step joint or other special provision for expansion is required. Refer to Roofing Industries.
When using load spreading profile washers or 25mm Aluminium embossed washers for roofing fix ridging, roof flashings etc. using a 25mm Aluminium embossed washer and appropriate screw.
Oversize holes should be 3mm greater diameter than the screw or as per the Primary Fixing Chart for stainless steel screws.
For further information on the fixing of Maxispan refer to E2/AS1 of the NZ Building Code and NZ Metal Roof and Wall Cladding Code of Practice, www.metalroofing.org.nz.
These publications along with the foregoing technical data should form the basis of the design and installation of metal roofing and cladding
Also refer to our suite of detail drawings, and to NZ Steel Ltd and Pacific Coilcoaters literature.

ROOF EXPANSION PROVISIONS

Fix with recommended fasteners and systems from the Primary Fixing Chart and additionally allow for the following where applicable.

<table>
<tr><td colspan="4">Aluminium</td><td></td></tr>
<tr><td>Sheet Lengths</td><td>Up to 10 metres</td><td>10-12 metres</td><td>12-15 metres</td><td>>15 metres</td></tr>
<tr><td colspan="4"></td><td></td></tr>
<tr><td>Plain Aluminium & lighter colours in Favourable Installations (Refer NZMRM C.O.P. Section 4.1.6)</td><td colspan="3">Fix using oversize holes with screws and approved load spreading profile Ali washers, and 36mm EPDM washers</td><td>Not recommended</td></tr>
<tr><td>Dark Coloured Aluminium in Favourable Installations (Refer NZMRM C.O.P. Section 4.1.6)</td><td colspan="2">Fix using oversize holes with screws and approved load spreading profile Ali washers, and 36mm EPDM washers</td><td colspan="2">Not recommended</td></tr>
<tr><td>Plain Aluminium & lighter colours in Unfavourable Installations (Refer NZMRM C.O.P. Section 4.1.6)</td><td colspan="2">Fix using oversize holes with screws and approved load spreading profile Ali washers, and 30mm EPDM washers</td><td colspan="2">Not recommended</td></tr>
<tr><td>Dark Coloured Aluminium in Unfavourable Installations (Refer NZMRM C.O.P. Section 4.1.6)</td><td>Fix using oversize holes with screws and approved load spreading profile Ali washers, and 30mm EPDM washers.</td><td colspan="3">Not recommended</td></tr>
</table>

For sheet lengths in excess of the above a step joint or other special provision for expansion is required. Refer to Roofing Industries.
When using load spreading profile washers or 25mm Aluminium embossed washers for roofing fix ridging, roof flashings etc. using a 25mm Aluminium embossed washer and appropriate screw.
Oversize holes should be 3mm greater diameter than the screw or as per the Primary Fixing Chart for stainless steel screws.
For further information on the fixing of Maxispan refer to E2/AS1 of the NZ Building Code and NZ Metal Roof and Wall Cladding Code of Practice, www.metalroofing.org.nz.
These publications along with the foregoing technical data should form the basis of the design and installation of metal roofing and cladding
Also refer to our suite of detail drawings, and to NZ Steel Ltd and Pacific Coilcoaters literature.