

## PART A: DESIGN

## 2

## Design preliminaries

## 2.1 Product selection

When you design steel cladding into your building you have a wide range of profiles from which to choose. Whilst roofing and walling obviously have to keep out the weather, they also have significant effects on the looks, cost and durability of a building.

If you are unsure about any product feature, visit [www.lysaght.com](http://www.lysaght.com), call our information line or seek advice from the relevant specialists.

Other factors that affect selection are treated in Chapters 2 to 6.

**Walls**

The design of walling from a steel perspective is fairly straightforward. Once you have made the aesthetic decision of which profile to use, the main considerations are the support spacings (Section 2.3), fixing details (Chapter 3) and the details of flashing (Chapter 11).

**Roofs**

There are many factors in designing roofs including:

- the shape: is the roof to be 'flat' or pitched or curved?
- the supporting structure and support spacing;
- the wind forces that the roof must sustain;
- the pitch which affects the looks, the profile's ability to efficiently carry rain to the gutters, and fixing details;
- thermal expansion of long sheets (Chapter 10);
- the attributes of other materials used in the roof design.

This book doesn't attempt to cover the structural design details of supports or aesthetics: there are many other texts and Australian Standards that cover them.

This chapter gives tables of recommended support spacings, and the maximum roof length for pitch and rainfall intensity for steel roofing products.

The appropriate design will depend on your particular needs and circumstances. You should get advice from the relevant specialists where required.

## 2.2 Materials and finishes

Our most widely used cladding profiles are listed in Tables 2.12.1 and 2.13.1. They are available in COLORBOND® prepainted steel, or in unpainted ZINCALUME® aluminium/zinc alloy-coated steel.

COLORBOND® pre-painted steel has either a aluminium/zinc alloy-coated steel or stainless steel base metal, with a range of organic coatings to cope with exposure to a range of environments.

- COLORBOND® is prepainted steel for exterior roofing and walling. It is the most widely used.
- COLORBOND® METALLIC is prepainted steel for superior aesthetic qualities displaying a metallic sheen.
- COLORBOND® ULTRA is prepainted steel for severe coastal or industrial environments (generally within about 100 to 200 metres of the source).
- COLORBOND® STAINLESS is prepainted stainless steel for very severe coastal or industrial environments (generally within about 100 metres of the source). It is subject to availability and long lead times.

Check with your local BlueScope Lysaght office for availability of profiles, materials, finishes, colours, accessories; and for suitability of the product.

Tables 2.12.1 and 2.13.1 list general information for profile selection. Refer to our publications on specific products for detailed specifications. There are also publications on ZINCALUME® steel and COLORBOND® prepainted steel from our information line (Page 1).

**Typical material specifications**

- ZINCALUME® aluminium/zinc alloy-coated steel complying with AS 1397:2001. Minimum yield strengths are G550 (550MPa), or G300 (300MPa) depending on profile. Minimum coating mass is AZ150 (150g/m<sup>2</sup>)
- COLORBOND® is a pre-painted steel. The painting complies with AS/NZS 2728 and the steel base is an aluminium/zinc alloy-coated steel complying with AS 1397:2001. Minimum yield strengths are G550 (550MPa), or G300 (300MPa) depending on profile. Minimum coating mass is AZ150 (150g/m<sup>2</sup>)
- COLORBOND® Ultra is a pre-painted steel. The painting complies with AS/NZS 2728 and the steel base is an

aluminium/zinc alloy-coated steel complying with AS 1397:2001. Minimum yield strengths are G550 (550MPa), or G300 (300MPa) depending on profile. Minimum coating mass is AZ200 (200g/m<sup>2</sup>)

- COLORBOND® Stainless is a pre-painted steel. The painting complies with AS/NZS 2728 and the steel base is a stainless steel complying with AISI/ASTM Type 430; UNS No. S43000.

## 2.3 Support spacings

The maximum recommended support spacings are shown in Tables 2.13.1 and 2.14.1. They are based on data in accordance with AS 1562.1:1992 Design and installation of sheet roof and wall cladding: Metal, and AS 4040.1:1992 Methods of testing sheet roof and wall cladding—Resistance to concentrated loads.

The spacings in the tables are recommended to produce adequate performance of claddings under concentrated loading (incidental for maintenance).

For support spacings in wind conditions, refer to our publications on specific products for wind pressure data.

In all cases, cladding is fixed to a support of 1.0mm minimum base metal thickness (BMT) and minimum yield stress of G550. If you want to use metal battens thinner than 1.0mm, seek advice from our information line.

## 2.4 Maximum lengths of roofing

The valleys (or pans) of roofing have to carry water to the gutters. If in heavy rain, the valleys overflow, water can flow into the roof through the side-laps and flashings.

Factors affecting waterproof and drainage capacity of the laps of a profile include:

- the width and depth of the valleys or pans;
- the pitch of the roof—rain flows faster on a steeper pitch;
- rainfall intensity for the geographical area;
- the length of the roof from ridge to gutter; and
- penetrations that cause nearby valleys to carry extra rain diverted from valleys obstructed by the penetration (Figure 2.14.1).

The maximum recommended roof lengths for drainage for each profile are given in Table 2.14.1 at the end of this chapter.

## 2.5 Low roof pitches

Unless there is adequate positive fall in a roof, there is danger of ponding, which can lead to a reduced service life, particularly in coastal areas.

At low slopes, say around 1 in 50 (1°) slope, all roof supports must be in the one plane because slight variations can result in zero or negative fall. This may occur even after completion of the building as the result of settlement, timber warping or shrinking, or extra loadings (like air conditioners).

Minimum recommended roof slopes are listed in Table 2.12.1. As a guide, wherever possible, you should design for a minimum slope of 1 in 30 (2°). Roof slopes lower than the recommended minimum may be available subject to enquiry and will be dependent upon the roof application and building details. Lower roof slopes may require additional provisions to be adhered to. Please call your nearest service centre for advice.

## 2.6 Wind forces on roofs

Winds create considerable forces on both the topside and the underside of roof cladding, and you must consider these forces in the design and fixing of any roof. The forces are:

- **inward forces** tending to collapse the roof cladding inwards, caused by wind acting directly on the windward side; and
- **outward forces** tending to lift the roof cladding from its framing, and the entire roof structure from the rest of the building. Outward forces can be caused both by uplift from negative wind pressures, outside the building; and by positive wind pressure inside the building.

Generally the greatest wind forces imposed on roofs are due to the outward forces. Because the dead weight of roofing materials is relatively small, the outward forces must be resisted by the roof fasteners.

It is very important that the battens and roof framing are adequately fixed to the rafters and walls, and that under extreme conditions the wall framing is anchored to the footings. Special anchoring provisions may apply in cyclonic areas. Specialist advice should be sought in these circumstances.

## 2.7 Codes and performance tests

AS 1562.1:1992 specifies the design and installation of sheet metal roof and wall cladding. Our roofing profiles satisfy all the requirements of this standard, including the ability of the roof to resist outward forces and concentrated loads. The testing is performed according to AS 4040.

Metal roofing products must comply with the performance specifications, and be checked by stringent tests, in accordance with the standard. Such tests have been carried out on all our claddings and the results have been used in the preparation of the fixing and installation recommendations in this manual.

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### 2.8 Environmental conditions

Coated steel products can be damaged by some environmental conditions including industrial, agricultural, marine, intensive animal farming, swimming pools or other aggressive conditions.

If any of our products are to be used in these conditions, or unusually corrosive environments, seek advice from our information line (Page 1).

Keep the product dry and clear of the ground. If stacked or bundled product becomes wet for extended periods, separate it, wipe it with a clean cloth and stack it to dry thoroughly.

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### 2.9 Metal and timber compatibility

Contact with, or runoff from, some materials can damage coated steel products. Buildings can also be susceptible to condensation on inside surfaces.

The materials include certain metals, treated timbers and chemicals.

- Don't allow any contact of coated steel products with incompatible materials. (Table 2.9.1)
- Don't allow discharge of rainwater from incompatible materials onto coated steel products. (Table 2.9.1)
- Ensure that supporting members are compatible with the coated steel products or, alternatively, appropriately coated.

If there are doubts about the compatibility of other products being used, seek advice from our information line.

Incompatible materials include:

- lead
- copper
- monel metal
- bare steel
- stainless steel (except with COLORBOND® stainless cladding)
- carbon (in pencils and some rubbers)
- green or some chemically-treated timber (like CCA or tanalith treatments)

- materials subject to cycles of dryness and wetness or which have excessive moisture content (such as improperly-seasoned timber)
- wet and dry concrete
- soils
- vegetable matter
- cleaning agents (e.g. brick cleaning)
- any material which will inhibit normal exposure to the atmosphere

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### 2.10 Transportation

Because our roofing and walling is manufactured by continuous processes, sheet lengths can be supplied up to the limits of transport regulations, which vary from state to state.

KL-700HS is available in extra long lengths via an on-site mobile rollformer. This service is available nationally, subject to enquiry.

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### 2.11 Paint and COLORBOND® finishes

COLORBOND® finishes can be damaged by some handling, installation or maintenance activities. If damage occurs to the COLORBOND® pre-painted finish, refer to Technical Bulletin TB-2, published by BlueScope Steel.

Replacement of severely damaged COLORBOND steel should consider that the replacement sheet may not match perfectly due to the possible long term fading of the installed sheets exposed to weathering.

You may overpaint whole roofs and paint accessories to match specific colours. The overpaint guidelines are also discussed in Technical Bulletin TB-2.

**Table 2.9.1**

Acceptability of drainage from upper surface onto a lower metal surface and direct contact

**COMPATIBILITY OF DIRECT CONTACT BETWEEN METALS OR ALLOYS**

| ROOF DRAINAGE SYSTEM COMPONENTS & ANY CLADDING MATERIAL | ACCESSORIES OR FASTENER OR (UPPER SURFACE) |                                |      |  |                      |                 |                  |                                       |      |  |
|---|--|--------------------------------|------|--|----------------------|-----------------|------------------|---------------------------------------|------|--|
|   | ZINCALUME®                                 | GALVANISED (ZINC COATED STEEL) | ZINC | COLORBOND® COLORBOND® ULTRA, COLORBOND® METALLIC | COLORBOND® STAINLESS | STAINLESS STEEL | ALUMINIUM ALLOYS | COPPER & COPPER ALLOYS <sup>(1)</sup> | LEAD |  |
| ZINCALUME®  | YES  | YES                            | YES  | YES  | NO                   | NO              | YES              | NO                                    | NO   |  |
| GALVANISED (ZINC COATED STEEL)                          | YES  | YES                            | YES  | YES  | NO                   | NO              | YES              | NO                                    | NO   |  |
| ZINC  | YES  | YES                            | YES  | YES  | NO                   | NO              | YES              | NO                                    | NO   |  |
| COLORBOND® COLORBOND® ULTRA, COLORBOND® METALLIC        | YES  | YES                            | YES  | YES  | NO                   | NO              | YES              | NO                                    | NO   |  |
| COLORBOND® STAINLESS                                    | NO   | NO                             | NO   | NO   | YES                  | YES             | NO               | NO                                    | NO   |  |
| STAINLESS STEEL   | NO   | NO                             | NO   | NO   | YES                  | YES             | NO               | NO                                    | NO   |  |
| ALUMINIUM ALLOYS  | YES  | YES                            | YES  | YES  | NO                   | NO              | YES              | NO                                    | NO   |  |
| COPPER & COPPER ALLOYS <sup>(1)</sup>                   | NO   | NO                             | NO   | NO   | NO                   | NO              | NO               | YES                                   | NO   |  |
| LEAD  | NO   | NO                             | NO   | NO   | NO                   | NO              | NO               | YES                                   | YES  |  |

(1) MONEL - COPPER/NICKEL ALLOY  
 (2) FOR FURTHER GUIDANCE REFER TO AS/NZS 3500.3: 2003

**ACCEPTATIBILITY OF DRAINAGE FROM AN UPPER SURFACE TO A LOWER METAL SURFACE**

| LOWER ROOF DRAINAGE SYSTEM MATERIAL              | UPPER CLADDING OR ROOF DRAINAGE SYSTEM MATERIAL |                                |      |  |                      |                 |                  |                                       |      |                                    |
|--|---|--------------------------------|------|--|----------------------|-----------------|------------------|---------------------------------------|------|------------------------------------|
|  | ZINCALUME®                                      | GALVANISED (ZINC COATED STEEL) | ZINC | COLORBOND® COLORBOND® ULTRA, COLORBOND® METALLIC | COLORBOND® STAINLESS | STAINLESS STEEL | ALUMINIUM ALLOYS | COPPER & COPPER ALLOYS <sup>(1)</sup> | LEAD | GLAZED ROOF TILES, GLASS & PLASTIC |
| ZINCALUME®                                       | YES   | YES                            | YES  | YES  | YES                  | YES             | YES              | NO                                    | NO   | YES                                |
| GALVANISED (ZINC COATED STEEL)                   | NO  | YES                            | YES  | NO   | NO                   | NO              | NO               | NO                                    | YES  | NO                                 |
| ZINC   | NO  | YES                            | YES  | NO   | NO                   | NO              | NO               | NO                                    | YES  | NO                                 |
| COLORBOND® COLORBOND ULTRA®, COLORBOND METALLIC® | YES   | YES                            | YES  | YES  | YES                  | YES             | YES              | NO                                    | NO   | YES                                |
| COLORBOND® STAINLESS STEEL                       | YES   | YES                            | YES  | YES  | YES                  | YES             | YES              | YES                                   | YES  | YES                                |
| STAINLESS STEEL                                  | YES   | YES                            | YES  | YES  | YES                  | YES             | YES              | YES                                   | YES  | YES                                |
| ALUMINIUM ALLOYS                                 | YES   | YES                            | YES  | YES  | YES                  | YES             | YES              | NO                                    | NO   | YES                                |
| COPPER & COPPER ALLOYS <sup>(1)</sup>            | YES   | YES                            | YES  | YES  | YES                  | YES             | YES              | YES                                   | YES  | YES                                |
| LEAD   | YES   | YES                            | YES  | YES  | YES                  | YES             | YES              | YES                                   | YES  | YES                                |

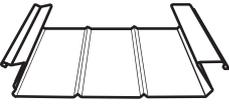
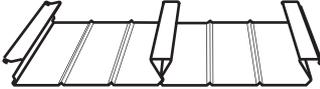
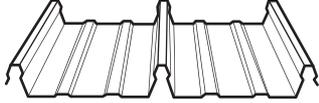
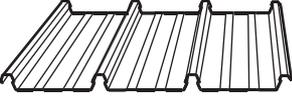
(1) MONEL - COPPER/NICKEL ALLOY  
 (2) FOR FURTHER GUIDANCE REFER TO AS/NZS 3500.3: 2003

2.12 Specifications - roofing

Table 2.12.1

Specifications of roofing & walling profiles

Maximum recommended spacing of supports  
ROOFS WALLS

|   | BMT<br>mm | Mass <sup>1</sup><br>kg/m <sup>2</sup> | Width<br>overall<br>approx.<br>mm | Cover<br>width<br>mm | Rib<br>depth<br>mm | Roof pitch<br>minimum <sup>2</sup><br>degrees | Eaves Overhang <sup>3</sup> |           |                |                        |                      |              |           |                |                     |
|---|-----------|--|-----------------------------------|----------------------|--------------------|---|-----------------------------|-----------|----------------|------------------------|----------------------|--------------|-----------|----------------|---------------------|
|   |           |  |                                   |                      |                    |   | Single<br>mm                | End<br>mm | Internal<br>mm | Unstiff-<br>ened<br>mm | Stiff-<br>ened<br>mm | Single<br>mm | End<br>mm | Internal<br>mm | Over-<br>hang<br>mm |
| <br>CUSTOM ORB <sup>4</sup>      | 0.42      | 4.3                                    | 838                               | 762                  | 16                 | 5° (1 in 12)                                  | 700                         | 900       | 1200           | 200                    | 300                  | 1800         | 2500      | 2700           | 200                 |
|   | 0.48      | 4.9                                    | 838                               | 762                  | 16                 | 5° (1 in 12)                                  | 800                         | 1300      | 1700           | 250                    | 350                  | 1800         | 2700      | 2700           | 250                 |
| <br>CUSTOM BLUE ORB <sup>4</sup> | 0.60      | 6.1                                    | 838                               | 762                  | 17                 | 5° (1 in 12)                                  | 1600                        | 1600      | 1800           | 200                    | 300                  | 2400         | 3000      | 3300           | 200                 |
|   | 0.80      | 8.0                                    | 838                               | 762                  | 17                 | 5° (1 in 12)                                  | 1800                        | 1800      | 2600           | 400                    | 600                  | 2400         | 3200      | 3600           | 400                 |
| <br>FLATDEK <sup>5</sup>         | 0.42      | 6.0                                    | 272                               | 250                  | 45                 | 2° (1 in 30)                                  | 2000                        | 2600      | 3000           | -                      | -                    | -            | -         | -              | -                   |
| <br>FLATDEK II <sup>5</sup>      | 0.42      | 5.2                                    | 642                               | 620                  | 45                 | 2° (1 in 30)                                  | 2400                        | 2800      | 3200           | -                      | -                    | -            | -         | -              | -                   |
| <br>INTEGRITY 820                | 0.42      | 4.6                                    | 895                               | 820                  | 48                 | 2° (1 in 30)                                  | 2100                        | 2300      | 2800           | 150                    | 300                  | 2600         | 3400      | 3600           | 150                 |
|   | 0.48      | 5.2                                    | 895                               | 820                  | 48                 | 1° (1 in 50)                                  | 2500                        | 2550      | 3050           | 200                    | 350                  | 2700         | 3600      | 3600           | 200                 |
| <br>KLIP-LOK 406                | 0.48      | 5.6                                    | 432                               | 406                  | 41                 | 1° (1 in 50)                                  | 1500                        | 1800      | 2100           | 200                    | 600                  | -            | -         | -              | -                   |
| <br>KLIP-LOK 700 HI-STRENGTH   | 0.42      | 4.7                                    | 710                               | 700                  | 43                 | 2° (1 in 30)                                  | 1650                        | 1750      | 2200           | 150                    | 450                  | 2600         | 3200      | 3850           | 150                 |
|   | 0.48      | 5.3                                    | 710                               | 700                  | 43                 | 1° (1 in 50)                                  | 2050                        | 2350      | 2800           | 200                    | 500                  | 3000         | 3450      | 3900           | 200                 |
|   | 0.60      | 6.6                                    | 710                               | 700                  | 43                 | 1° (1 in 50)                                  | 2350                        | 3000      | 3600           | 250                    | 550                  | 3300         | 3600      | 3900           | 250                 |
| <br>KLIP-LOK CLASSIC 700       | 0.42      | 4.7                                    | 729                               | 700                  | 41                 | 2° (1 in 30)                                  | -                           | 1800      | 2200           | 200                    | 500                  | -            | 2150      | 3250           | 300                 |
|   | 0.48      | 5.3                                    | 729                               | 700                  | 41                 | 1° (1 in 50)                                  | -                           | 2100      | 3050           | 250                    | 600                  | -            | 2500      | 3550           | 400                 |
| <br>LONGLINE 305 (not tapered) | 0.70      | 9.7                                    | 310                               | 305                  | 48                 | 1° (1 in 50)                                  | 1800                        | 2000      | 2500           | 150                    | 450                  | -            | 2700      | 2700           | 450                 |
| <br>SPANDEK <sup>6</sup>       | 0.42      | 4.7                                    | 754                               | 700                  | 24                 | 3° (1 in 20) <sup>7</sup>                     | 1300                        | 1800      | 2400           | 300                    | 600                  | 2500         | 3000      | 3300           | 300                 |
|   | 0.48      | 5.3                                    | 754                               | 700                  | 24                 | 3° (1 in 20) <sup>7</sup>                     | 2000                        | 2200      | 3000           | 400                    | 700                  | 3000         | 3000      | 3300           | 400                 |
| <br>SPANRIB                    | 0.42      | 4.6                                    | 895                               | 820                  | 48                 | 2° (1 in 30)                                  | 2100                        | 2300      | 2800           | 150                    | 300                  | 2600         | 3400      | 3600           | 150                 |
|   | 0.48      | 5.2                                    | 895                               | 820                  | 48                 | 1° (1 in 50)                                  | 2500                        | 2550      | 3050           | 200                    | 350                  | 2700         | 3600      | 3600           | 200                 |
| <br>TRIMDEK                    | 0.42      | 4.3                                    | 816                               | 762                  | 29                 | 2° (1 in 30)                                  | 1100                        | 1300      | 1900           | 150                    | 300                  | 2400         | 3000      | 3000           | 150                 |
|   | 0.48      | 4.9                                    | 816                               | 762                  | 29                 | 2° (1 in 30)                                  | 1600                        | 1850      | 2600           | 200                    | 350                  | 2700         | 3000      | 3000           | 200                 |

<sup>1</sup> Masses are for unpainted ZINCALUME steel.

<sup>2</sup> See Section 2.5.

<sup>3</sup> See Section 10.6 for explanation of 'stiffened'.

<sup>4</sup> With 5 fasteners per sheet, per support

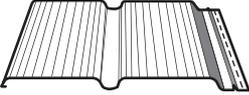
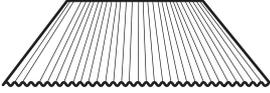
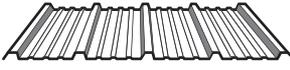
<sup>5</sup> FLATDEK & FLATDEK II are Home Improvement profiles. Please refer to the brochures for more installation details..

<sup>6</sup> With 4 fasteners per sheet, per support

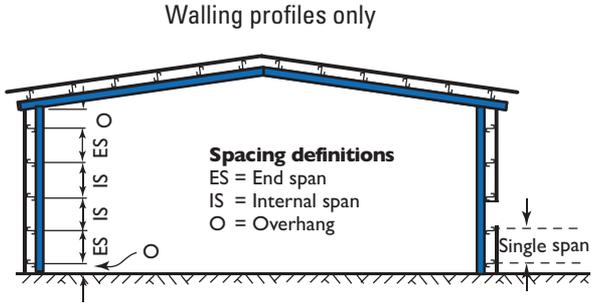
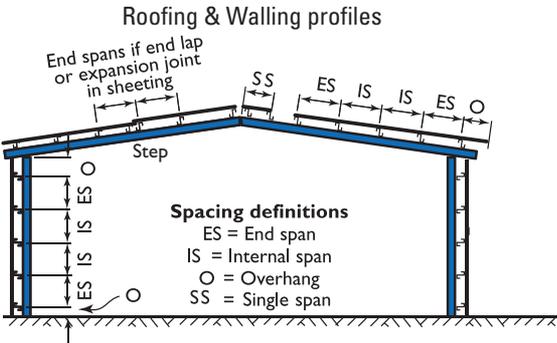
<sup>7</sup> Slope of 2° (1 in 30) is available subject to enquiry. Please refer to Section 2.5.

2.13 Specifications - walling

**Table 2.13.1**  
Specifications of profiles for walling only

|   | BMT<br>mm | Mass <sup>1</sup><br>kg/m <sup>2</sup> | Width<br>overall<br>approx.<br>mm | Cover<br>width<br>mm | Rib<br>depth<br>mm | Maximum recommended<br>spacing of wall supports |           |                |                |
|---|-----------|--|-----------------------------------|----------------------|--------------------|---|-----------|----------------|----------------|
|   |           |  |                                   |                      |                    | Single<br>mm                                    | End<br>mm | Internal<br>mm | Overhang<br>mm |
| <br>EASY-CLAD              | 0.42      | 4.5                                    | 330                               | 300                  | 19                 | -   | 1500      | 1500           | 100            |
| <br>MINI ORB <sup>7</sup>  | 0.42      | 4.0                                    | 841                               | 820                  | 6                  | 1200  | 1500      | 1500           | 100            |
|   | 0.48      | 4.5                                    | 841                               | 820                  | 6                  | 1500  | 1500      | 1500           | 125            |
| <br>MULTICLAD              | 0.35      | 3.3                                    | 880                               | 840                  | 12                 | 1400  | 1800      | 1800           | 150            |
|   | 0.42      | 3.9                                    | 880                               | 840                  | 12                 | 1700  | 1800      | 1800           | 150            |
| <br>PANELRIB <sup>6</sup>  | 0.35      | 3.2                                    | 915                               | 850                  | 4                  | 1100  | 1200      | 1200           | 150            |
|   | 0.42      | 3.7                                    | 915                               | 850                  | 4                  | 1200  | 1200      | 1200           | 150            |
| <br>TRIMWALL <sup>4</sup> | 0.35      | 3.6                                    | 816                               | 762                  | 29                 | 2100  | 2900      | 3000           | 150            |
| <br>WALLCLAD             | 0.35      | 3.6                                    | 838                               | 762                  | 16                 | 2100  | 2400      | 2400           | 150            |
| <br>WEATHERBOARD         | 0.42      | 4.1                                    | 272                               | 260                  | 12                 | -   | 1000      | 1000           | n/a            |

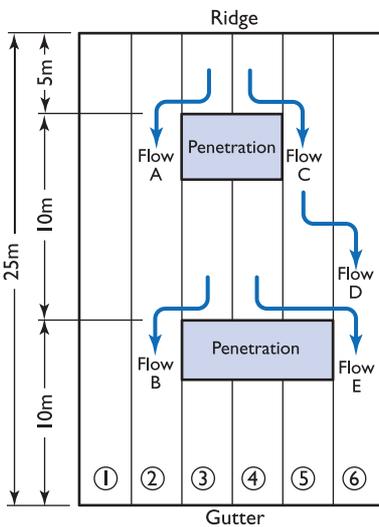
<sup>1</sup> Masses are for unpainted ZINCALUME steel.  
<sup>4</sup> With 5 fasteners per sheet, per support  
<sup>6</sup> With 4 fasteners per sheet, per support  
<sup>7</sup> With 6 fasteners per sheet, per support



2.14 Maximum roof lengths for drainage

Table 2.14.1

Maximum roof lengths for drainage measured from ridge to gutter (m) Penetrations alter the flow of water on a roof. Thus, for design, you need to use an effective roof length (Figure 2.14.1).



| Valley | Effective length  |
|--------|---|
| 1      | 25m (Base length)   |
| 2      | Base length + A + B<br>= 25 + 5 + 10 = 40m  |
| 6      | Base length + C + D + E<br>= 25 + 5 + 15 + 10 = 55m<br>(Worst case used for design) |

Figure 2.14.1

Example of calculating effective roof lengths where penetrations alter the flow of water on a roof.

NOTE: A suitably qualified engineer is recommended for calculating/checking roof design and flow design.

|                               | Peak rainfall intensity mm/hr | Roof slope   |              |              |              |                 |              | Peak rainfall intensity mm/hr |
|-------------------------------|-------------------------------|--------------|--------------|--------------|--------------|-----------------|--------------|-------------------------------|
|                               |                               | 1 in 50 (1°) | 1 in 30 (2°) | 1 in 20 (3°) | 1 in 12 (5°) | 1 in 7.5 (7.5°) | 1 in 6 (10°) |                               |
| CUSTOM ORB<br>CUSTOM BLUE ORB | 100                           |              |              |              | 29           | 34              | 38           | 100                           |
|                               | 150                           |              |              |              | 20           | 23              | 25           | 150                           |
|                               | 200                           |              |              |              | 15           | 17              | 19           | 200                           |
|                               | 250                           |              |              |              | 12           | 14              | 15           | 250                           |
|                               | 300                           |              |              |              | 10           | 11              | 13           | 300                           |
|                               | 400                           |              |              |              | 7            | 8               | 10           | 400                           |
| 500                           |                               |              |              | 6            | 7            | 8               | 500          |                               |
| INTEGRITY 820<br>SPANRIB      | 100                           |              | 410          | 480          | 598          | 713             | 820          | 100                           |
|                               | 150                           |              | 273          | 320          | 399          | 476             | 547          | 150                           |
|                               | 200                           |              | 205          | 240          | 299          | 357             | 410          | 200                           |
|                               | 250                           |              | 164          | 192          | 239          | 285             | 328          | 250                           |
|                               | 300                           |              | 137          | 160          | 199          | 238             | 273          | 300                           |
|                               | 400                           |              | 102          | 120          | 150          | 178             | 205          | 400                           |
| 500                           |                               | 82           | 96           | 120          | 143          | 164             | 500          |                               |
| KLIP-LOK 406                  | 100                           | 375          | 467          | 548          | 682          | 813             | 934          | 100                           |
|                               | 150                           | 250          | 311          | 365          | 454          | 542             | 623          | 150                           |
|                               | 200                           | 188          | 234          | 274          | 341          | 406             | 467          | 200                           |
|                               | 250                           | 150          | 187          | 219          | 273          | 325             | 374          | 250                           |
|                               | 300                           | 125          | 156          | 183          | 227          | 271             | 311          | 300                           |
|                               | 400                           | 94           | 117          | 137          | 170          | 203             | 234          | 400                           |
| 500                           | 75                            | 93           | 110          | 136          | 163          | 187             | 500          |                               |
| KLIP-LOK 700<br>HI-STRENGTH   | 100                           | 344          | 428          | 502          | 624          | 745             | 856          | 100                           |
|                               | 150                           | 229          | 285          | 334          | 416          | 496             | 571          | 150                           |
|                               | 200                           | 172          | 214          | 251          | 312          | 372             | 428          | 200                           |
|                               | 250                           | 137          | 171          | 201          | 250          | 298             | 342          | 250                           |
|                               | 300                           | 115          | 143          | 167          | 208          | 248             | 285          | 300                           |
|                               | 400                           | 86           | 107          | 125          | 156          | 186             | 214          | 400                           |
| 500                           | 69                            | 86           | 100          | 125          | 149          | 171             | 500          |                               |
| KLIP-LOK<br>CLASSIC 700       | 100                           | 247          | 308          | 361          | 449          | 536             | 616          | 100                           |
|                               | 150                           | 165          | 205          | 241          | 300          | 357             | 411          | 150                           |
|                               | 200                           | 124          | 154          | 181          | 225          | 268             | 308          | 200                           |
|                               | 250                           | 99           | 123          | 144          | 180          | 214             | 246          | 250                           |
|                               | 300                           | 82           | 103          | 120          | 150          | 179             | 205          | 300                           |
|                               | 400                           | 74           | 93           | 108          | 135          | 161             | 185          | 400                           |
| 500                           | 49                            | 62           | 72           | 90           | 107          | 123             | 500          |                               |
| LONGLINE 305<br>(not tapered) | 100                           | 219          | 273          | 320          | 398          | 475             | 546          | 100                           |
|                               | 150                           | 146          | 182          | 213          | 265          | 317             | 364          | 150                           |
|                               | 200                           | 110          | 136          | 160          | 199          | 237             | 273          | 200                           |
|                               | 250                           | 88           | 109          | 128          | 159          | 190             | 218          | 250                           |
|                               | 300                           | 73           | 91           | 107          | 133          | 158             | 182          | 300                           |
|                               | 400                           | 55           | 68           | 80           | 100          | 119             | 136          | 400                           |
| 500                           | 44                            | 55           | 64           | 80           | 95           | 109             | 500          |                               |
| SPANDEK                       | 100                           |              | 97           | 111          | 133          | 154             | 173          | 100                           |
|                               | 150                           |              | 65           | 74           | 89           | 103             | 115          | 150                           |
|                               | 200                           |              | 49           | 55           | 67           | 77              | 86           | 200                           |
|                               | 250                           |              | 39           | 44           | 53           | 62              | 69           | 250                           |
|                               | 300                           |              | 32           | 37           | 44           | 51              | 58           | 300                           |
|                               | 400                           |              | 24           | 28           | 33           | 39              | 43           | 400                           |
| 500                           |                               | 19           | 22           | 27           | 31           | 35              | 500          |                               |
| TRIMDEK                       | 100                           |              | 220          | 257          | 320          | 382             | 439          | 100                           |
|                               | 150                           |              | 146          | 172          | 214          | 255             | 293          | 150                           |
|                               | 200                           |              | 110          | 129          | 160          | 191             | 220          | 200                           |
|                               | 250                           |              | 88           | 103          | 128          | 153             | 176          | 250                           |
|                               | 300                           |              | 73           | 86           | 107          | 127             | 146          | 300                           |
|                               | 400                           |              | 55           | 64           | 80           | 96              | 110          | 400                           |
| 500                           |                               | 44           | 51           | 64           | 76           | 88              | 500          |                               |

- Some lengths in this table may exceed the maximum allowable transport length.
- Data are based on work of CSIRO and BlueScope Lysaght.
- For peak rainfall intensities in your locality, see Chapter 6.
- LYSAGHT FLATDEK and FLATDEK II are recommended for home improvement use only (carports/verandahs) where weathertightness is not of primary importance. Drainage figures are therefore not supplied.
- SPANDEK with slope of 2° (1 in 30) is available subject to enquiry. Please refer to Section 2.5.

## Date of Issue February, 2012

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This Guide has been prepared for a range of roofing and walling applications including water drainage systems, using products manufactured or supplied by BlueScope Lysaght.

The information in this booklet is suitable for use only in areas where a tropical cyclone is unlikely to occur as defined in AS/NZS 1170. 2:2002 Part 2: Structural Actions - Wind Actions (or if used outside Australia, to the equivalent standard).

Information on cyclonic performance may be found in our Cyclonic Area Design Manual which is available on-line at [www.lysaght.com](http://www.lysaght.com).

All erection and connection details to be made in accordance with the relevant standard connection details drawing contained in this Guide.

We recommend you get professional advice to ensure your particular needs are adequately met.

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Technical enquires: [steeldirect@bluescopesteel.com](mailto:steeldirect@bluescopesteel.com) or call 1800 641 417

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