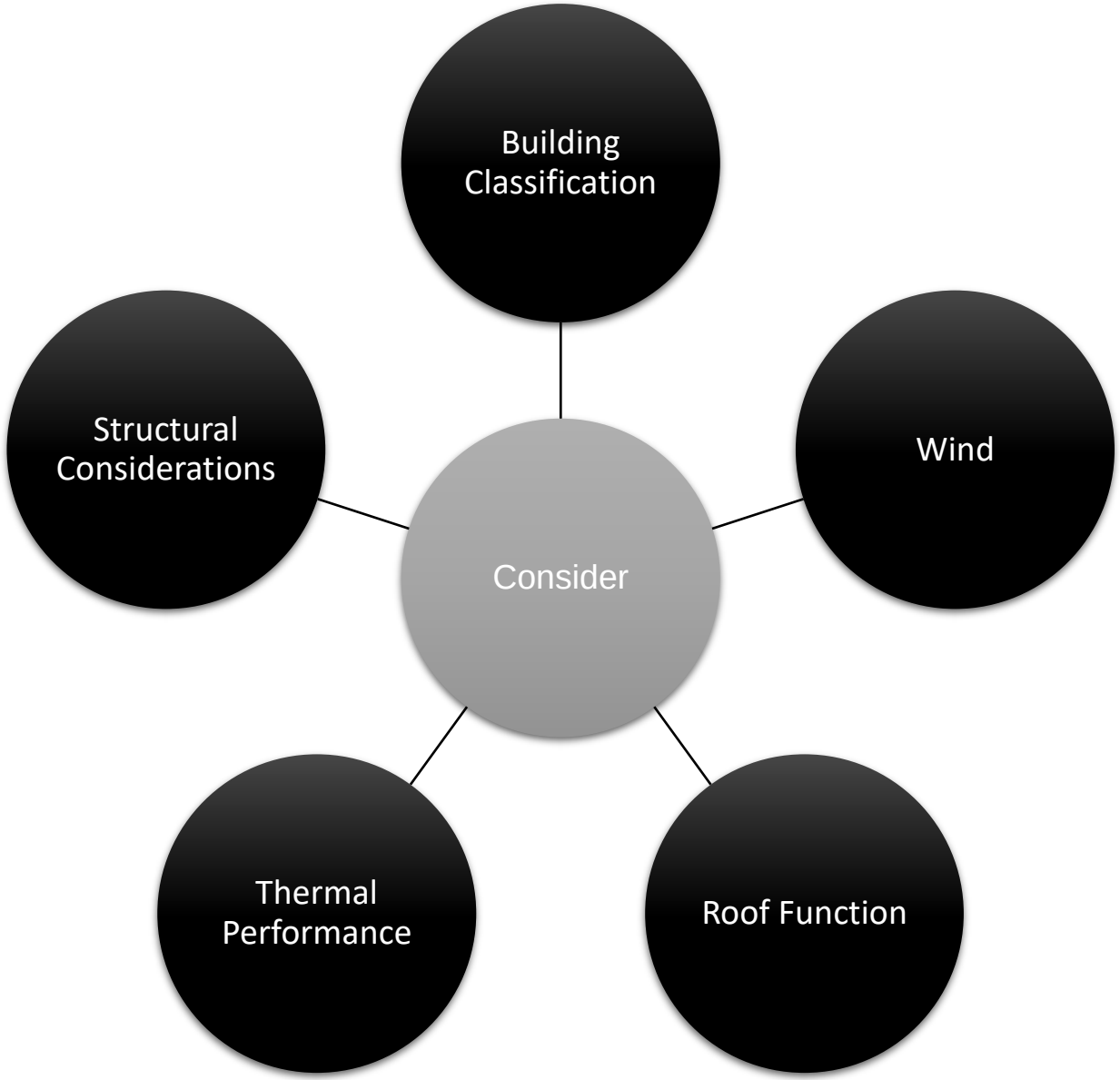
Commercial Roofing Selection Process

and Lapping System Options

BONDOR® meTecno® PIR

General Issues for Consideration



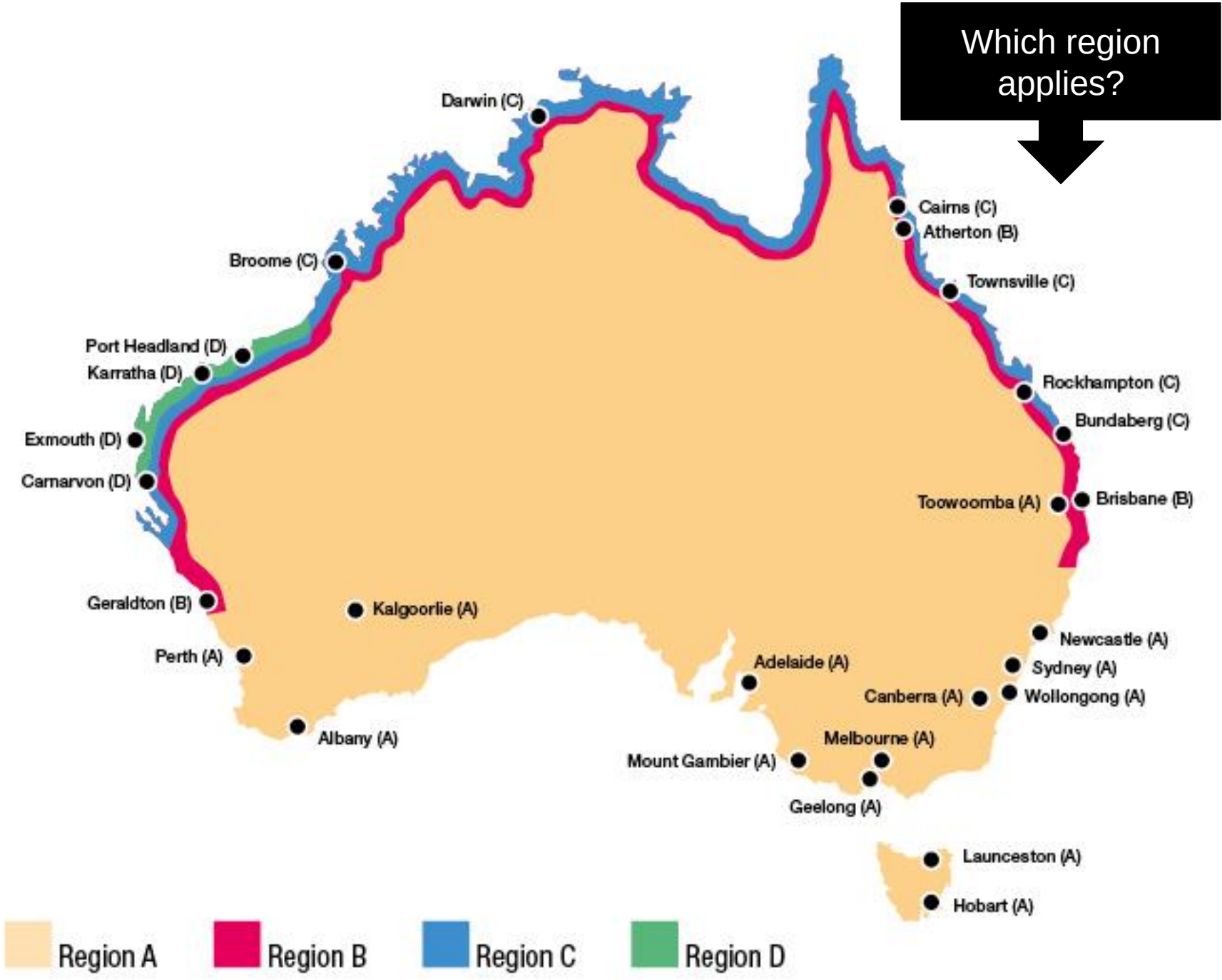
Building Classification

The Building Class will influence technical requirements needed for each project type. It influences things structural, fire resistance, access and egress, services and equipment, and certain aspects of health and amenity

Building Class	NCC Description Summary	Example
Class 1a	A single dwelling	House
Class 1b	A boarding house, guest house, hostel or the like	Hostel less than 12 people
Class 2	A building containing 2 or more sole-occupancy units each being a separate dwelling	Multi residential
Class 3	A residential building, other than a building of Class 1 or 2, which is a common place of long tremor transient living for a number of unrelated persons	Hostel greater than 12 people
Class 4	A dwelling in building that is Class 5,6,7,8 or 9 if it is the only dwelling in the building.	Sole dwelling in Class 5-9 building
Class 5	An office building used for professional or commercial purposes, excluding buildings of Class 6, 7, 8 or 9.	Office
Class 6	A shop or other building for the sale of goods by retail or the supply of services direct to the public	Shop
Class 7a	A building which is– a carpark	Carpark
Class 7b	A building which is for storage, or display of goods or produce for sale by wholesale.	Warehouse
Class 8	A laboratory, or a building, in which handicraft or process for the production assembling, altering, repairing, packing, finishing, or cleaning of goods or products is carried on for trade, sale or gain.	
Class 9a	A building of a public nature healthcare building	Hospital
Class 9b	A building of a public nature assembly building	School
Class 9c	A building of a public nature aged care	Nursing home
Class 10 a	A non-habitable building or structure being a private garage, carport, shed or the like	Garage
Class 10 b	A non-habitable building or structure being a fence, mast, antenna, retaining or free-standing wall, swimming pool or the like	Fence
Class 10 c	A private bushfire shelter	Bushfire Shelter

Wind Class

The project location and exposure to the elements will have a major influence on structural & external cladding requirements



Roof Function

- Water Carrying Capacity influenced by local rainfall intensity
- Underside finish – what's the client's expectation?
- Roof run length
- Desired roof pitch
- Are roof laps or joints required
- Pierced, fixed or concealed fixed sheeting
- Durability and sheeting stiffness determines deflection and possible water ponding
- Roof penetration locations can cause issues with diverted water flow

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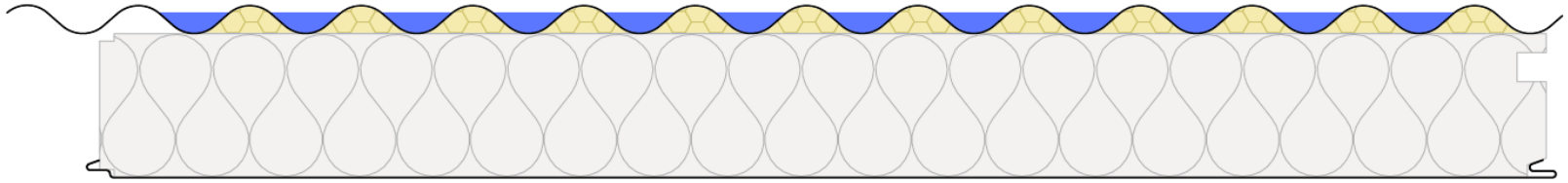
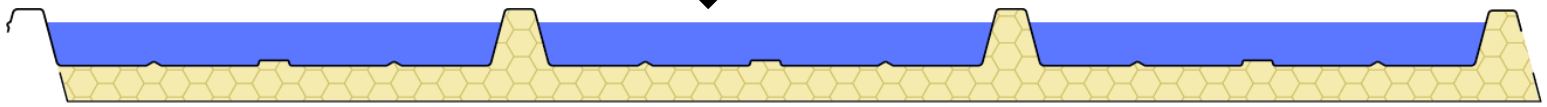
Low ribs & narrow trays = less water capacity



Higher ribs & wider trays = greater water capacity



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- Underside finish
- Roof run length
- Desired roof pitch
- Fire/sprinkler implications
- Internal fit out
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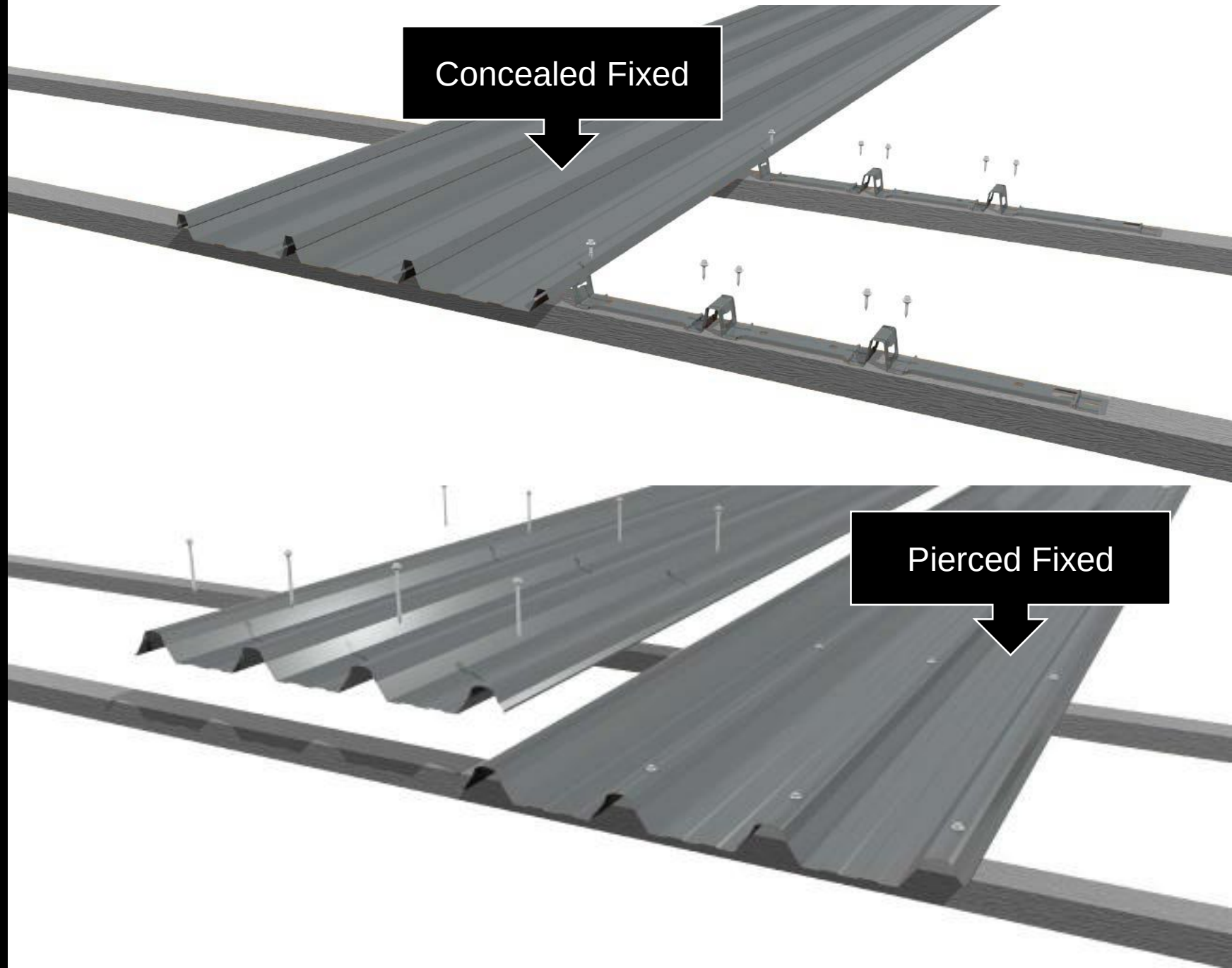

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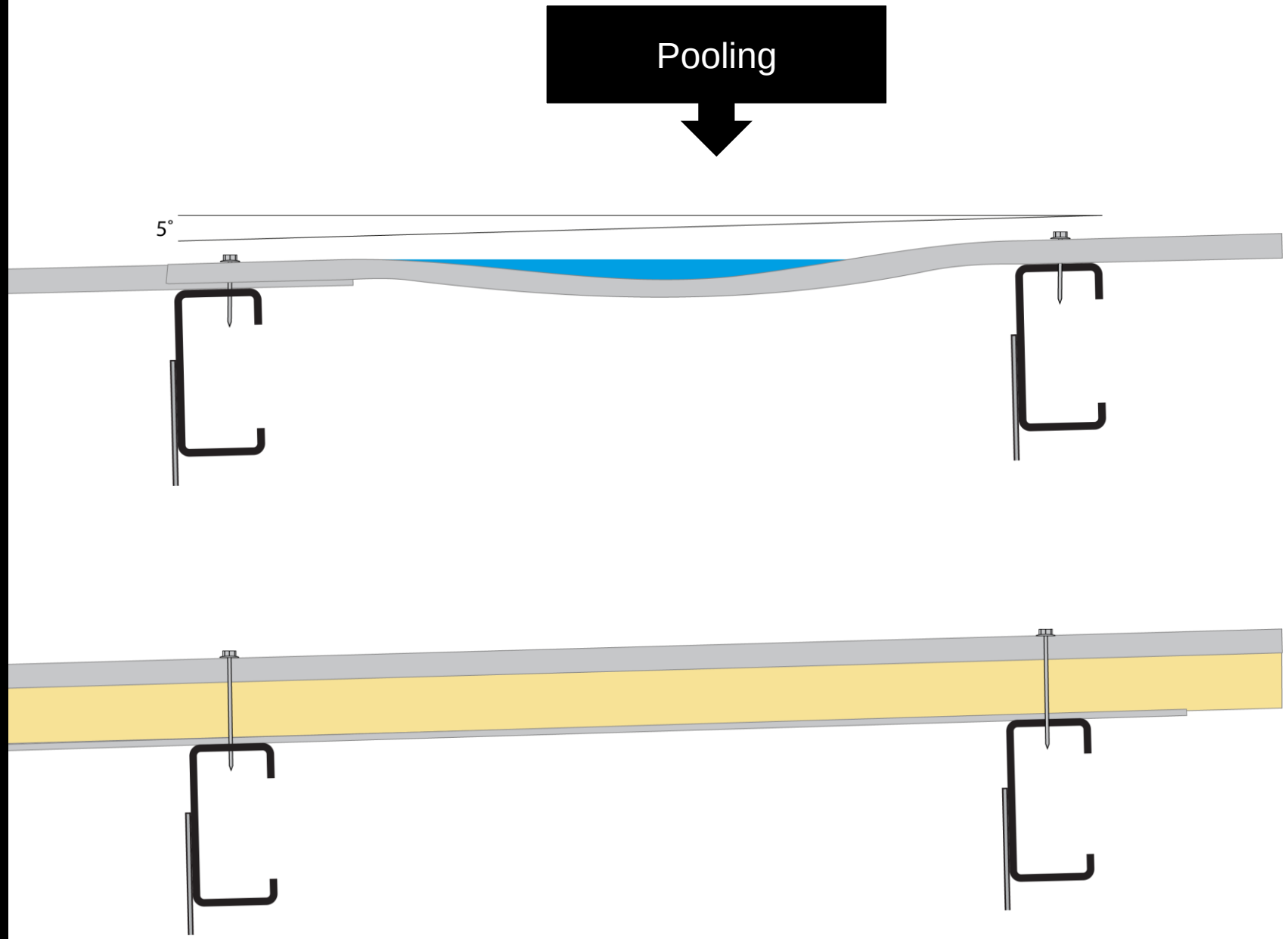

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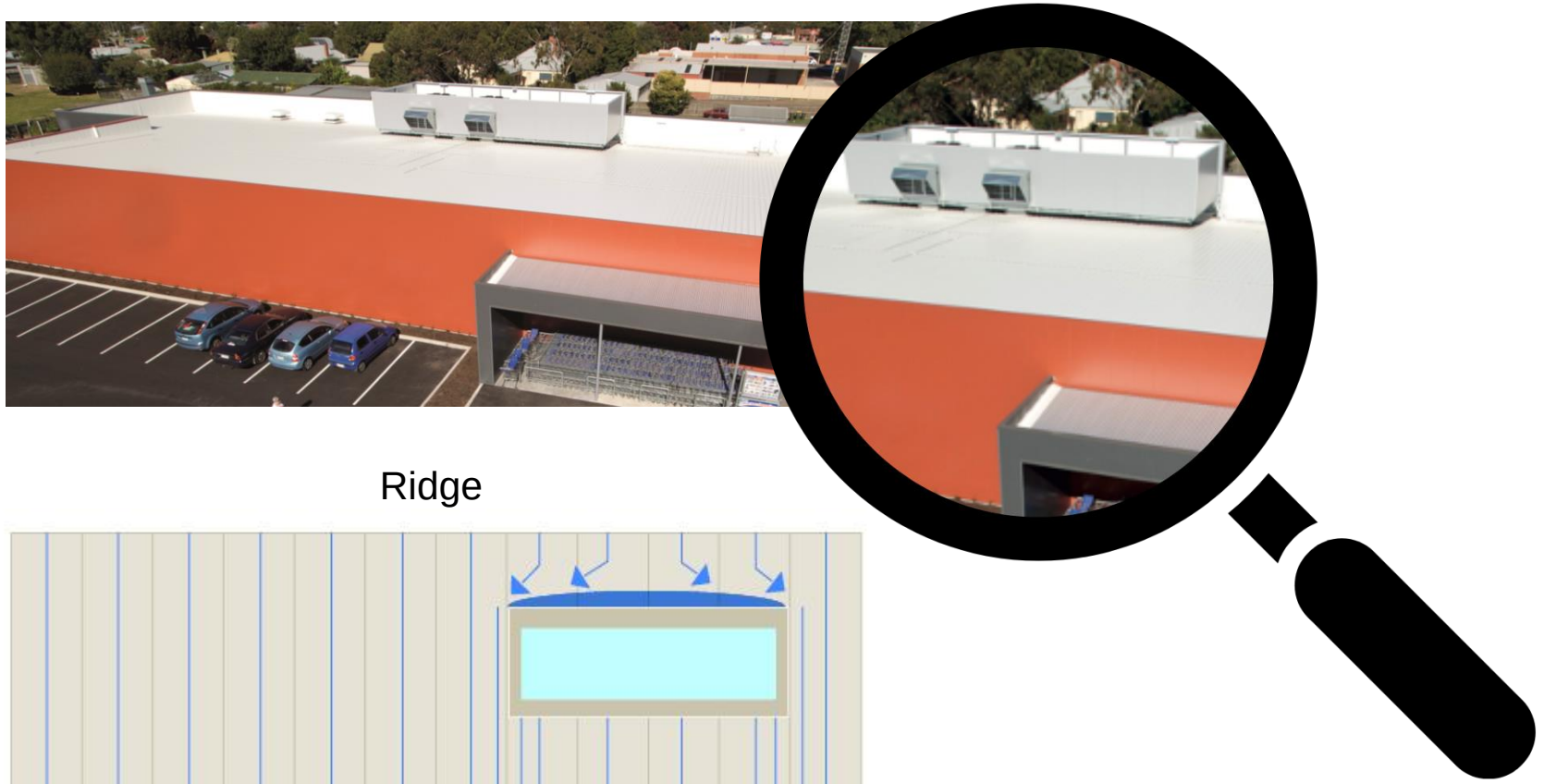
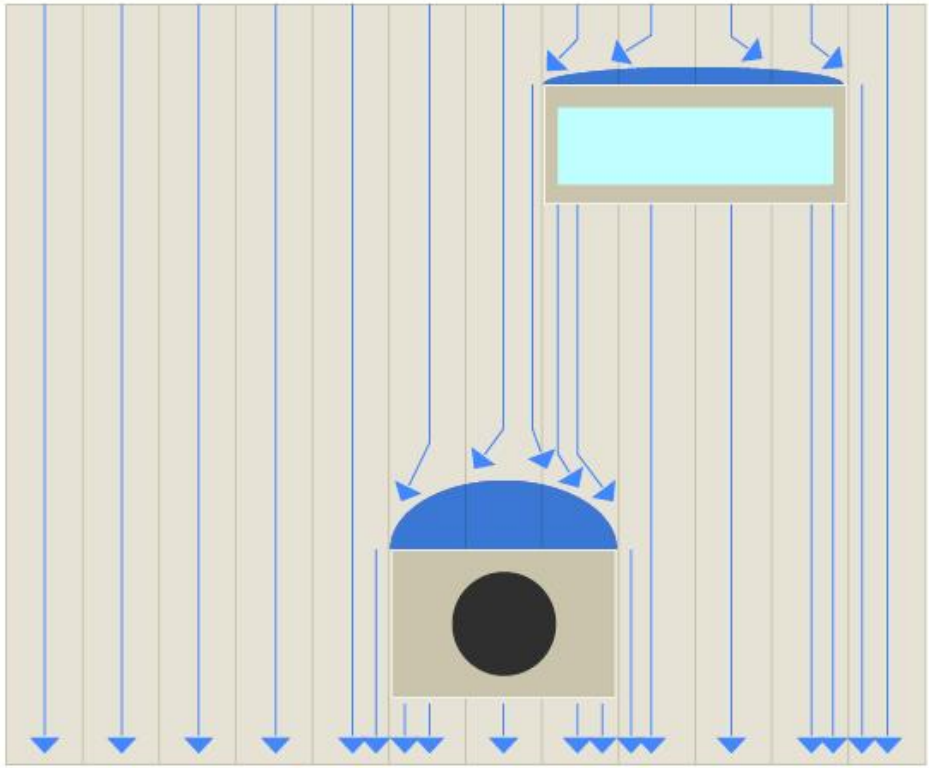


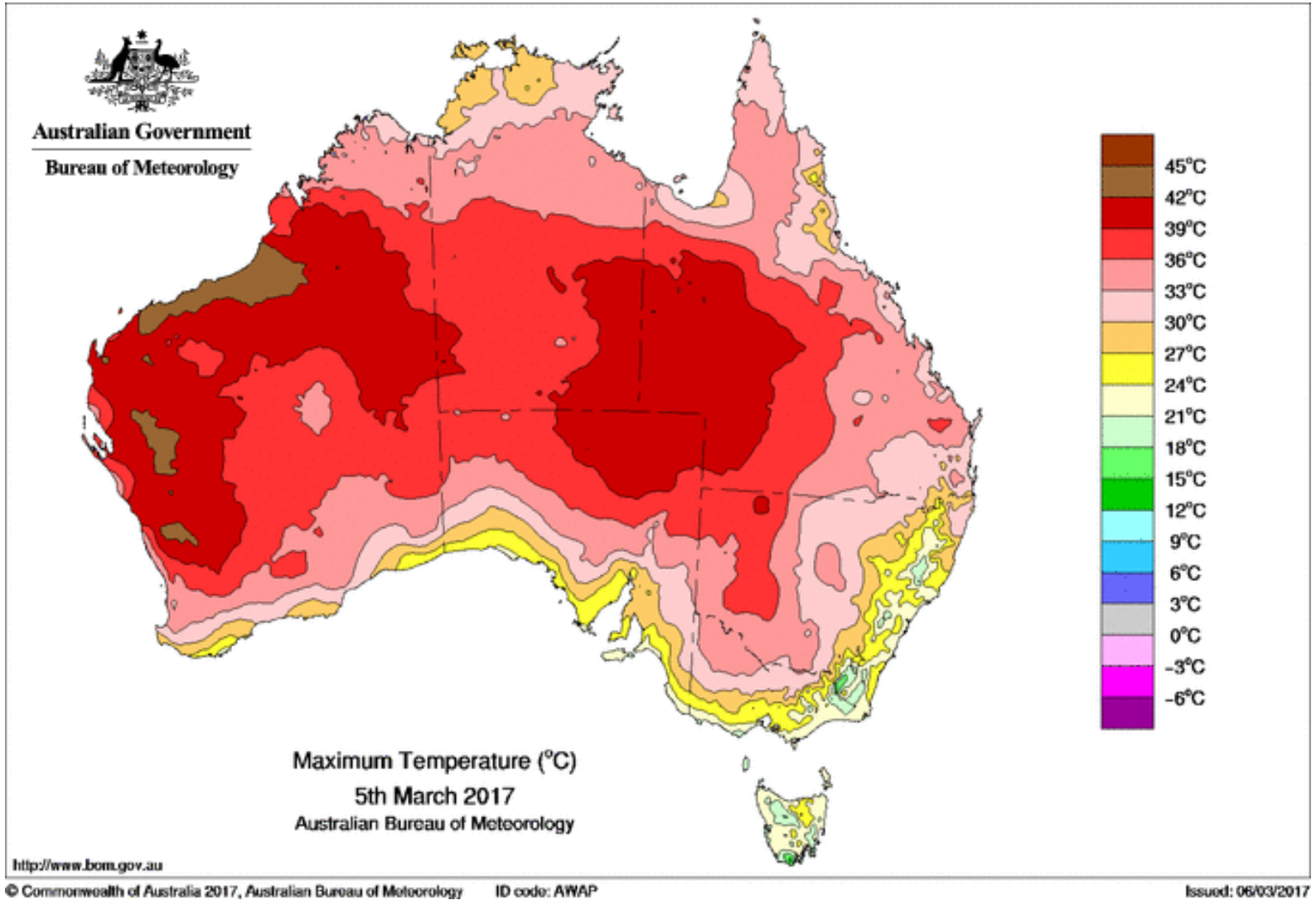
Ridge



Eave

Thermal Performance

- Building Class usually defines the minimum BCA thermal performance requirement
- Is the building to be air-conditioned?
- Is a suspended ceiling proposed or is the underside of the roof/panel exposed?
- Is some form of temperature control required outside BCA requirements (wineries, data storage, agricultural)?
- Is air leakage and optimising the building's energy efficiency a



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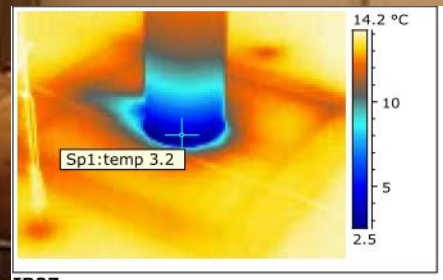
Temperature sensitive goods require specific solutions



IR27

DC 28

Comment: condensation on hydraulic cylinders

Recommendation: possibly lagging from ceiling to external roof. Cable entering electrical connections on solenoids should enter from underneath.

Structural Considerations

- Internal fixture layouts or roller door locations may influence column and rafter locations
- Are purlins or panel required to carry additional loads externally or internally (air conditioning, lighting tracks, etc.)
- Purlin design matched to structural steel placement and roof panel span performance priority?

Single skin sheeting or Panel

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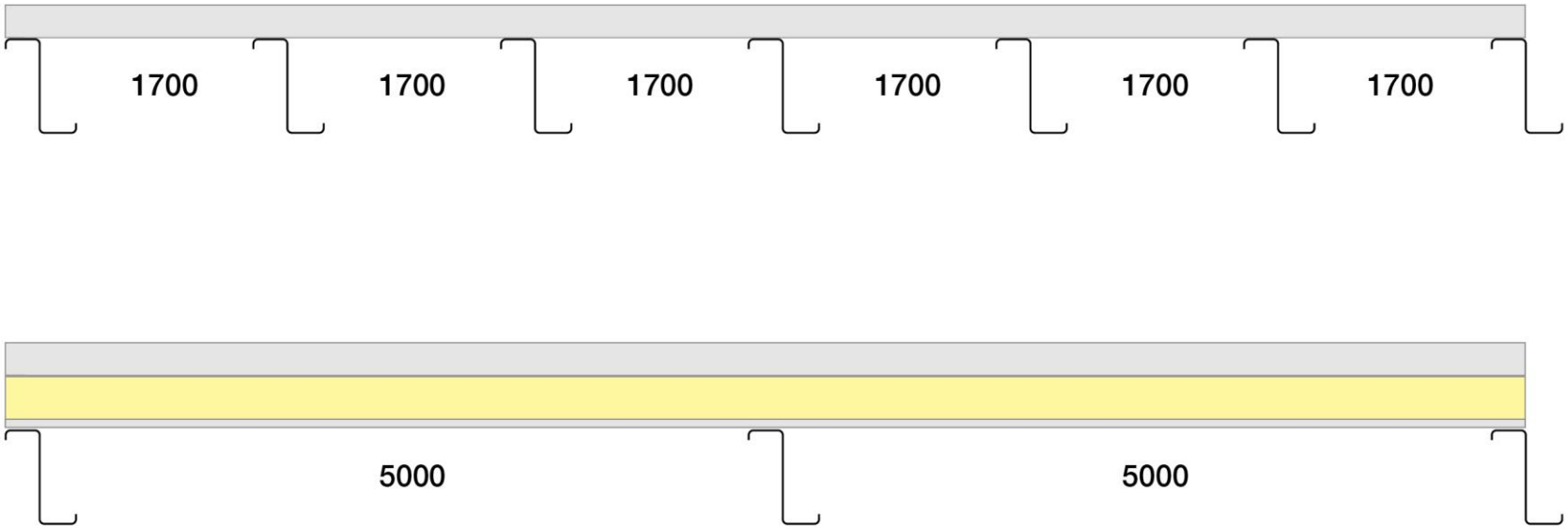
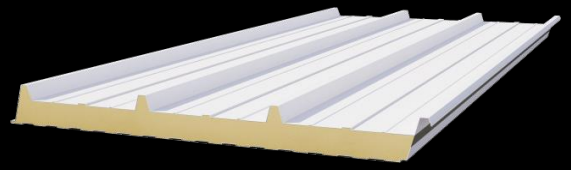
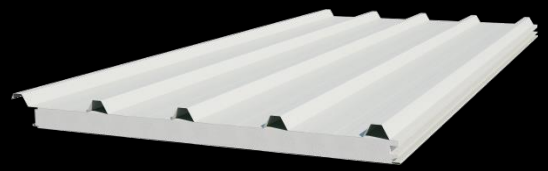
10,000mm Span



There is not one commercial roof solution for every building



metecnospan®



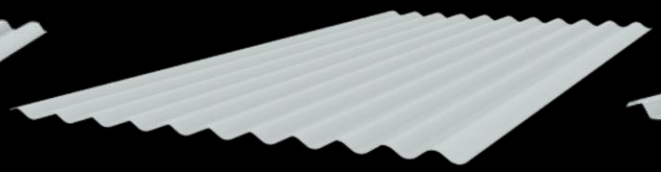
solarspan® by BONDOR

equideck® by BONDOR

purline®

Klip-Lok® 700 Classic

Spandek®



Corro - Orb®

Trimdek®

Roofing

CASE STUDY AND SOLUTIONS

End Lap Options

Roofing

CASE STUDY AND SOLUTIONS

- Old style lapping connections rely on sealant
- Poor frame alignment or poor workmanship mean trouble

Roofing

CASE STUDY AND SOLUTIONS

- Lap corrosion failure

Roofing

CASE STUDY AND SOLUTIONS

- Repair sleeve inserted to prolong roof life but the corrosion will continue
- View from above of repair sleeve

Roofing

CASE STUDY AND SOLUTIONS

- Mechanical barrier
- Roof turn-up process

Roofing

CASE STUDY AND SOLUTIONS

Three current lap options

1. Sheet to sheet contact
2. Expansion Step Joint
3. New hybrid systems allowing connection of a single purlin

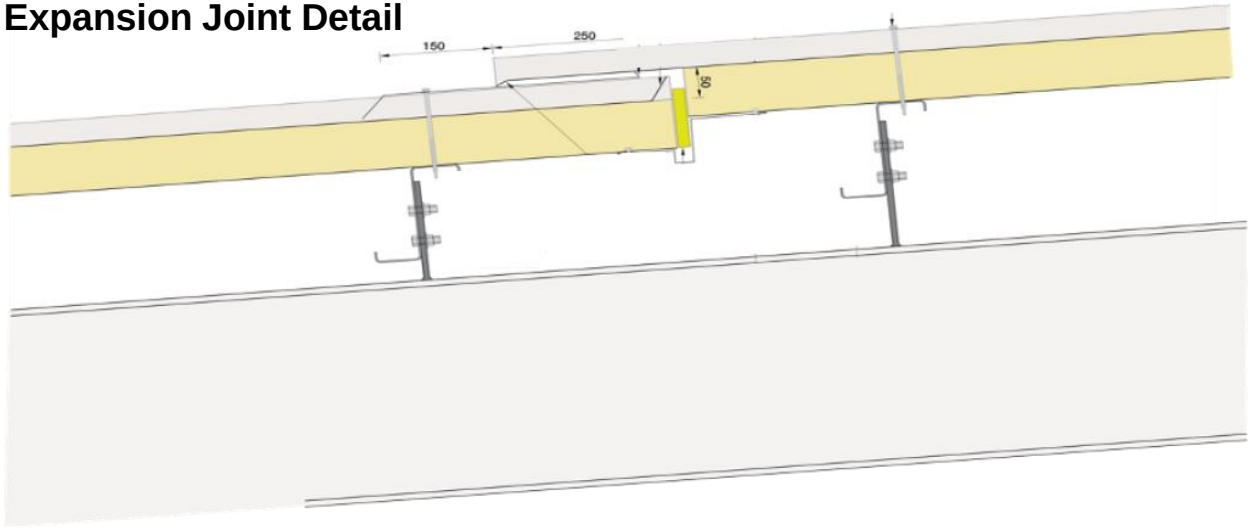
Roofing

CASE STUDY AND SOLUTIONS

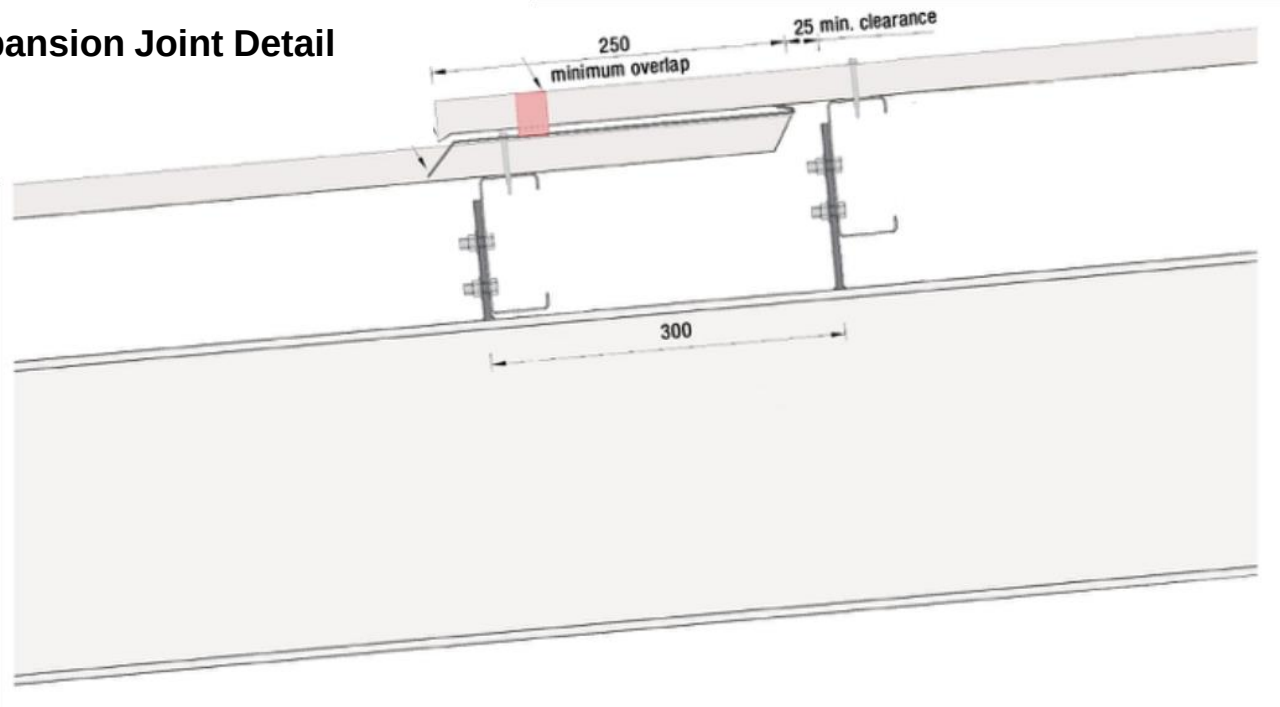
Expansion Step Joint

- Step joints require an additional purlin & longer purlin cleats to the upper roof run
- A baffle flashing is also required

Insulated Panel Expansion Joint Detail



Traditional Expansion Joint Detail



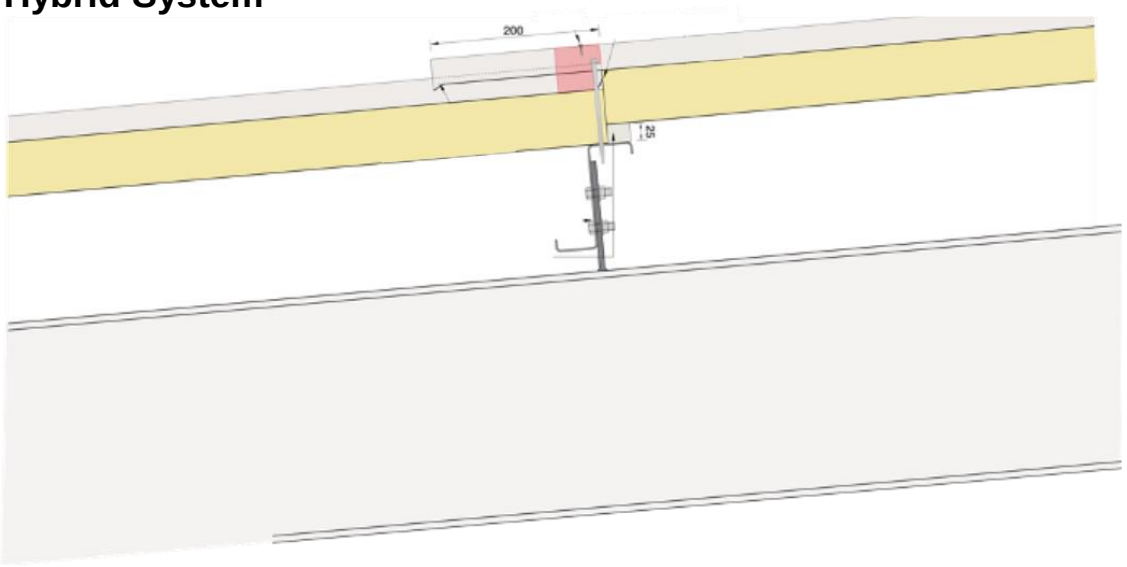
Roofing

CASE STUDY AND SOLUTIONS

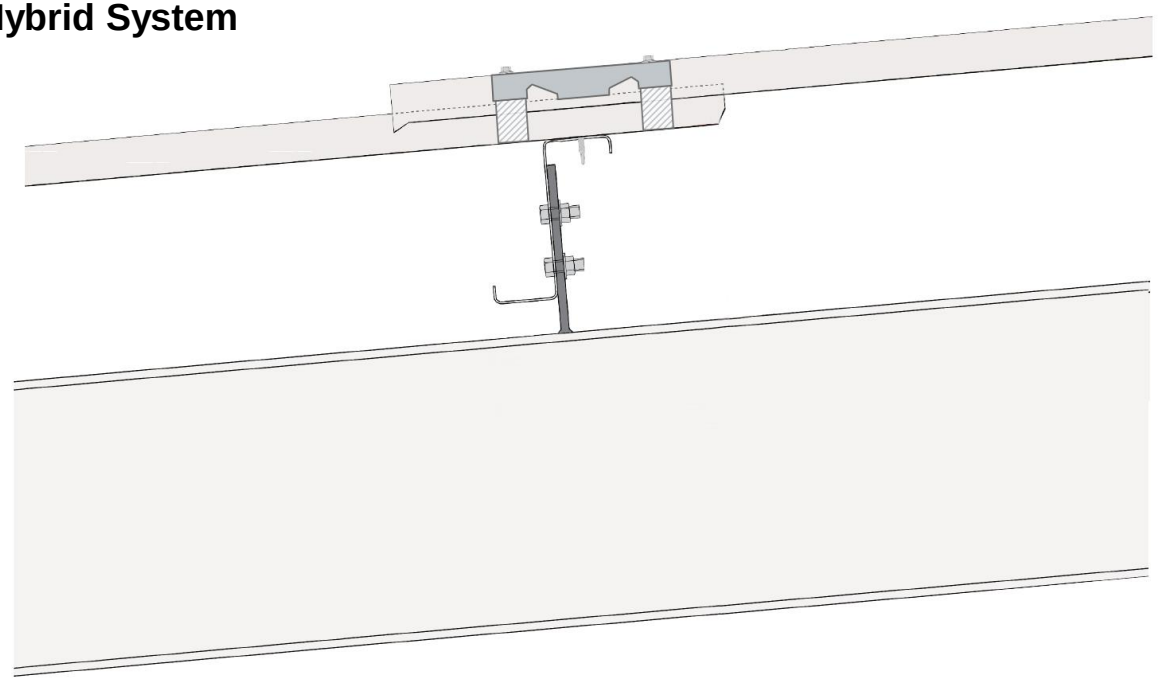
Hybrid lapping systems

Bondor SecureLap addresses all the major concerns associated with current end-lapping techniques for insulated panel roofing while still allowing connection over one purlin.

Insulated Panel Hybrid System



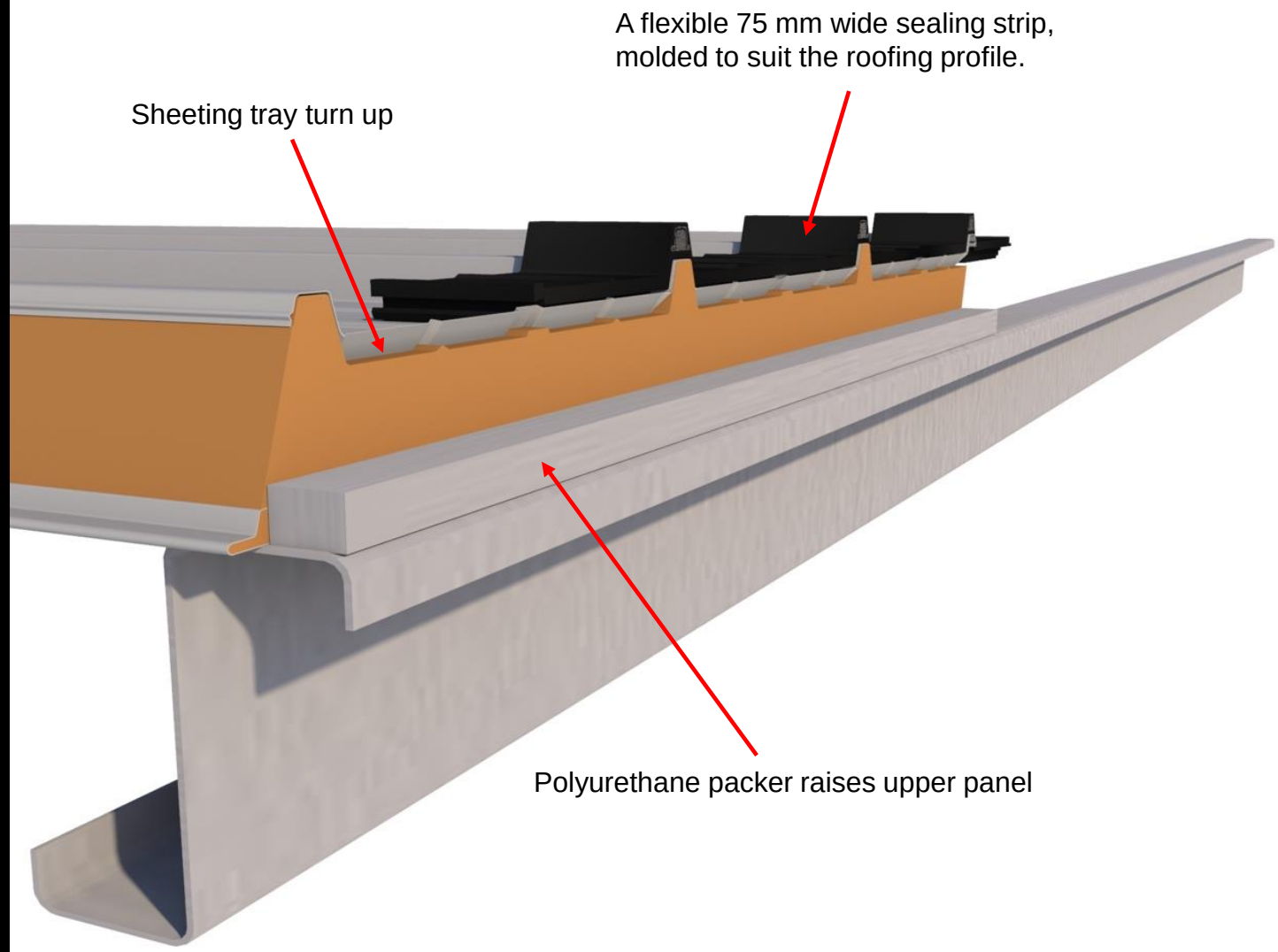
Single Skin Hybrid System



Roofing

CASE STUDY AND SOLUTIONS

securelap® by BONDOR



Roofing

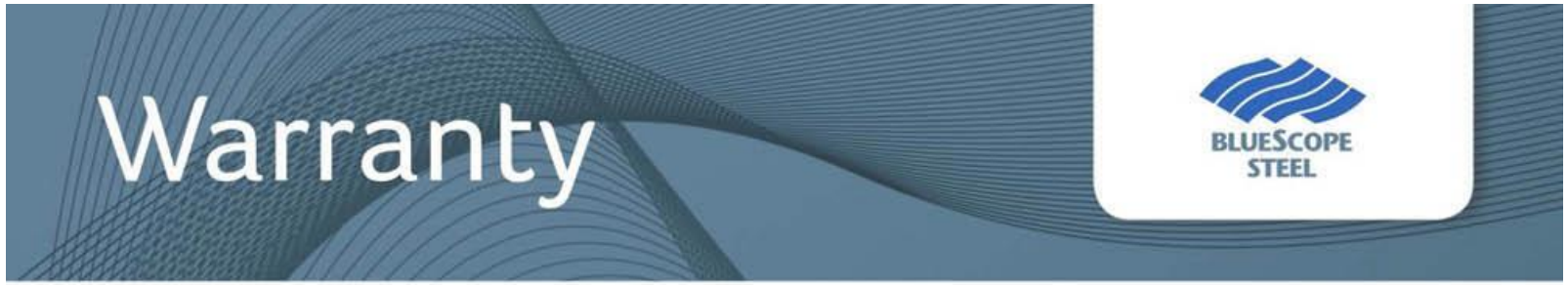
CSIRO Weather Test

AS/NZ 4046.9-2002
80kph wind driven rain simulation

Roofing

WARRANTY

- Both BlueScope Steel and Metecno, deliver a constant message
- Understand the risks associated with poor roof design
- Understand the warranty implications associated with premature corrosion failure
- Understand the options and choose wisely



B. injury to persons, damage to property, loss of income, profit or business, or any other indirect loss arising from or caused in any way by the defective End Product.

b. This Warranty does not cover corrosion to perforation, paint flaking or peeling, wholly or partly due to an event or cause beyond the reasonable control of BlueScope Steel, including without limitation each of the following:

i. defects attributed to faulty design, method of manufacture or installation of the End Product;

ii. mechanical, chemical or other damage sustained during transport, handling, storage, erection or subsequent to erection;

iii. attack from chemical or other agents (including sunscreen), fumes, liquids or solids other than direct rain or run-off falling onto the End Product;

iv. contact with soil, ash, fertilizer, moisture retaining substances, lead or copper and other dissimilar metals, chemical agents, liquid from copper flashings or copper pipes, green or wet timber, or treated timber. Refer to Corrosion Technical Bulletin CTB-12 *"Dissimilar Metals"* and CTB-13 *"Contact with Timber"*, which are available from www.bluescopesteel.com.au, for further information;

v. failure to prevent the panel insulation core from becoming wet due to internal or external moisture sources;

vi. failure to remove debris and/or allow free drainage of water (including condensation) from all surfaces of the End Product;

viii. corrosion arising within the lapped areas of end-lapped panels. Refer to Corrosion Technical Bulletin CTB-8 *"Building Applications"*, which is available from www.bluescopesteel.com.au, for further information;

ix. installations subject to severe industrial or unusually corrosive environments at any time in the future;

x. accidental or intentional damage by a person or animal;

xi. earthquakes, hurricanes, tornadoes, cyclones, gales, lightning, hail, fires, flood and other similarly extreme "acts of God".

c. This Warranty does not cover nor extend to, in respect of the exterior paint system, normal weathering which includes a natural reduction in paint gloss and a natural colour change of the paint finish.

d. This Warranty does not cover nor extend to, with regard to corrosion to perforation or paint flake and peel, the internal facing skin of the architectural panel.

e. This Warranty does not cover against aesthetic surface corrosion including paint blistering, white corrosion product or red rust on cut edges.

f. This Warranty does not cover against paint flake and peel arising from paint blistering, corrosion product or red rust.

Roofing

Summary

- Both systems provide water tight security without reliance on sealant or butyl tape
- Both are suitable for pitches as low as 2 ˚
- Both allow underside sheet turn up vital for water tight security
- Expansion joint can’t be substituted once steel design is completed.
- Sheet to sheet end-lapping should be avoided in commercial applications where ever possible

Expansion Joint

- Provide excellent thermal movement control
- Allow greater tolerance to purlin inconsistencies
- Allow full tray turn-up

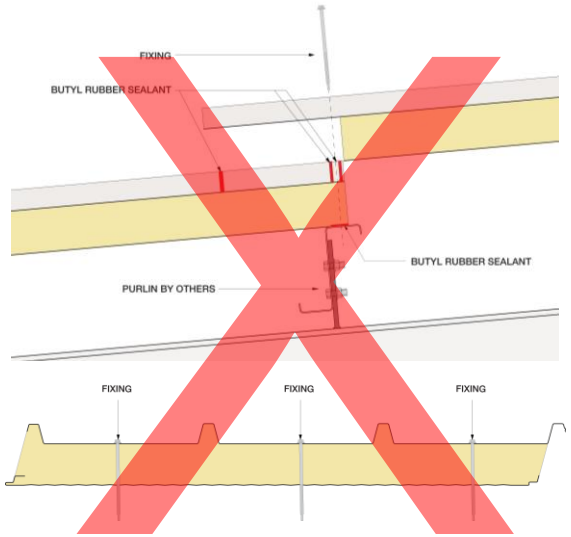
BUT

- Require additional purlins
- Require baffle flashings
- Require longer purlin cleats to facilitate step

securelap® by BONDOR

- Allows connection over one purlin
- Does not require any design or structural changes
- Can be substituted to any current end lapping application
- Supported by CSIRO testing and BlueScope Steel Experience

Sheet to Sheet End Lap



Conclusion

Building Types

Location

Thermal

Structural

Roof Functionality & Durability