



WEATHERTIGHTNESS RISK FACTORS CHOOSING YOUR CLADDING

Establishing The Risk

A risk assessment allows the risks related to various features to be aggregated, resulting in a risk score for the design. Figure 1 from E2/AS1 "How to access risk" shows the process to be followed. Table 1 from E2/AS1 "Definitions of risk" sets out the definitions to risk levels relating to the location and design features of the building.

How to Assess Risk

Figure 1 from E2/AS1:

<p>Step One: Obtain detailed drawings</p>	<p>Suitably detailed drawings are required to assess weathertightness risk. This documentation may include a site plan, floor plans, elevations, details of junctions and penetrations, and the presence of features like decks and pergolas.</p>
<p>Step Two: Assess each external face against risk factors (refer to Table 1)</p>	<p>Assess the drawings for each external face to determine the risk score for each risk factor. The factors are:</p> <ul style="list-style-type: none"> • Wind zone • Number of storeys • Roof/wall intersection design • Eaves width • Envelope complexity • Deck design
<p>Step Three: Complete the "Building envelope risk matrix"</p>	<p>Complete the "Building envelope risk matrix" (Table 2) for each face of the building. It is possible for different elevations to have different risk scores.</p>
<p>Step Four: Determine suitable cladding</p>	<p>Consult Table 3 to determine what cladding types are recommended with the risk score for each face. The cladding selected must be appropriate for the score on that face, but can be beyond the minimum required (ie, cladding suitable for a higher score can be used).</p>

Definitions of Risk

Table 1 from E2/AS1:

Risk Factor	Risk	Detail
A: Wind Zone	Low	Low wind zone as described by NZS 3604
	Medium	Medium wind zone as described by NZS 3604
	High	High wind zone as described by NZS 3604
	Very High	Very high wind zone as described by NZS 3604
B: Number of Storeys	Low	One storey
	Medium	Two storeys in part
	High	Two storeys
	Very High	More than two storeys
C: Roof/Wall intersection design	Low	Roof-to-wall intersection fully protected (eg, hip and gable roof with eaves).
	Medium	Roof-to-wall intersection partly exposed (eg, hip and gable roof with no eaves).
	High	Roof-to-wall intersection fully exposed (eg, parapets or eaves at greater than 90° to vertical with soffit lining).
	Very High	Roof elements finishing within the boundaries formed by the exterior walls (eg, lower ends of aprons, chimneys etc).
D: Eaves width ⁽¹⁾	Low	Greater than 600mm at first floor level.
	Medium	450-600mm at first floor, or over 600mm at second floor level.
	High	100-450mm at first floor, or 450-600mm at second floor level.
	Very High	0-100mm at first floor, or 100-450mm at second floor level, or 450-600mm at third floor level. ⁽²⁾
E: Envelope Complexity	Low	Simple rectangular, L, T or boomerang shape, with single cladding type.
	Medium	More complex, angular or curved shapes (eg, Y or arrowhead) with single cladding type.
	High	Complex, angular or curved shapes (eg, Y or arrowhead) shapes with multiple cladding types.
	Very High	As for high risk, but with junctions not covered in C or F of this table (eg, box windows, pergolas, multi-storey re-entrant shapes etc).
F: Deck Design	Low	None, timber slat deck or porch at ground level.
	Medium	Fully covered in plan by roof, or timber slat deck attached at first or second floor level.
	High	Enclosed deck exposed in plan or cantilevered at first floor level.
	Very High	Enclosed deck exposed in plan or cantilevered at second floor level or above.

NOTES

1. Eaves width measured from external face of wall cladding to outer edge of overhang, including gutters and fascias.
2. Balustrades and parapets count as 0mm eaves.

Risk Score

Table 2 "Building envelope risk matrix" sets out the risk matrix that shall be used to define the risk score. A risk score is calculated for each elevation of the building. Claddings are then selected from Table 3 "Suitable wall claddings" according to the risk scores, or the highest risk score may be used for all walls.

Building Envelope Risk Matrix

Table 2 from E2/AS1:

Risk Factor	Risk Severity								subtotals for each risk factor
	low	score	medium	score	high	score	very high	score	
Wind Zone (per NZS 3604)	0		0		1		2		
Number of storeys	0		1		2		4		
Roof/wall intersection design	0		1		3		5		
Eaves width	0		1		2		5		
Envelope complexity	0		1		3		6		
Deck design	0		2		4		6		
Total risk score:									

(Enter the appropriate risk severity score for each risk factor in the score columns. Transfer these figures across to the right-hand column. Finally, add up the figures in the right-hand column to get the total risk score).

Design for Snow & Wind

	Altitude	Wind Speed
Albury	230m	0.9 kPa
	250m	1.0 kPa
	300m	1.1 kPa
Fairlie	310m	1.15 kPa
	350m	1.3 kPa
Kimbell / Haldon	390m	1.4 kPa
	450m	1.5 kPa
Twizel	480m	1.6 kPa
	550m	1.7 kPa
	600m	1.9 kPa
	650m	2.0 kPa
Tekapo / Mt Cook	720m	2.1 kPa
	750m	2.2 kPa
	800m	2.3 kPa
	850m	2.5 kPa
	900m	2.7 kPa
	950m	2.9 kPa
	1000m	3.2 kPa

Specific Engineering Design (SED)

SED

SED

SED

SED

SED

SED

SED

SED

SED

Qualifications

The Acceptable Solution requires that the installer of the roof and wall claddings listed below must be approved by the manufacturer or a New Zealand agent.

Material:

- Masonry tile roof cladding
- Pressed metal tile roofing
- Profiled metal roof cladding
- Butyl rubber and EPDM membrane cladding
- Masonry veneer
- Solid plaster / stucco
- Profiled metal wall cladding
- Flush-metal wall cladding
- Flush-finished cladding (fibre cement sheet)
- EIFS cladding systems

Suitable Wall Claddings

Table 3 from E2/AS1:

Suitable Wall Claddings ⁽¹⁾		
Risk Score	Direct fixed to framing	Over 20mm minimum drained cavity
0 - 6	a) Timber weatherboards – all types b) Fibre cement weatherboards c) Vertical profiled metal ⁽³⁾ – corrugated and symmetrical trapezoidal only d) Fibre cement sheet ⁽⁴⁾ e) Plywood sheet f) EIFS	a) Masonry veneer ⁽²⁾ b) Stucco c) Horizontal profiled metal ⁽³⁾ – corrugated and trapezoidal only
7 – 12	a) Bevel-back weatherboards b) Vertical board and batten c) Vertical profiled metal ⁽³⁾ – corrugated only	a) Masonry veneer ⁽²⁾ b) Stucco c) Horizontal profiled metal d) Rusticated weatherboards e) Fibre cement weatherboards f) Fibre cement sheet g) Plywood sheet h) EIFS
13 – 20	a) Vertical profiled metal ⁽³⁾ – corrugated only	a) to h) as above i) Bevel-back weatherboards
Over 20	a) Redesign the building to achieve a lower score, or b) Specific design: <ul style="list-style-type: none"> • The design may need changing to reduce the risk • The territorial authority or building certifier will require more comprehensive details and documentation providing evidence of weathertightness. • The territorial authority, building certifier, designer or owner may require more inspections. • A third party audit of design by a weathertightness expert may be required. 	

NOTES:

1. The wall claddings in this table **are limited to** those covered in the Acceptable Solution.
2. Traditional masonry veneer as per SNZ HB 4236, with minimum 40 mm cavity.
3. Refer to Figure 38 of E2/AS1 for profiles.
4. Except stucco over a fibre cement backing.