Weathertightness risk matrix

Supporting information for building consent application

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TIMARU DISTRICT COUNCIL
Te Kaunihera ā-Rohe o Te Tihi o Maru

Project location:

Description of work:

Establishing the risk

A risk assessment of the proposed design shall be carried out, using a building envelope risk matrix. This allows the risks related to various features to be aggregated, resulting in a risk score for the design.
Figure 1 shows the process that shall be followed in order to assess the risk.

FIGURE 1	**How to assess risk** (paragraph 3.1)
Applicant checklist	**Item**
☐	**Step One:** Detailed drawings. 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.
☐	**Step Two:** Assess each external face against risk factors. Assess the drawings for each external face to determine the risk score for each risk factor. These are: • Wind zone • Number of storeys • Roof/wall intersection design • Eaves width • Envelope complexity • Deck design (Table 1)
☐	**Step Three:** Complete the building envelope risk matrix table. Complete the "Building envelope risk matrix" (Table 2) for each face of the building. Note : It is possible for different elevations to have different risk scores.
☐	**Step Four:** Determine suitable cladding. To determine what cladding types are recommended with the risk score for each face. (Table 3) 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).

Wall claddings - the following wall cladding systems are covered in the Acceptable Solution (E2/AS1)			
a) Masonry Veneer	Paragraph 9.2	e) Profiled Metal Wall Claddings	Paragraph 9.6
b) Stucco	Paragraph 9.3	f) Fibre Cement Sheet	Paragraph 9.7
c) Timber Weatherboards	Paragraph 9.4	g) Plywood Sheet	Paragraph 9.8
d) Fibre Cement Weatherboards	Paragraph 9.5	h) EIFS	Paragraph 9.9
Other wall claddings are beyond the scope of the Acceptable Solution.			

Definitions of risk

Table 1 sets out the definitions of risk levels relating to the location and design features of the building.

TABLE 1	**Definitions of risk** (paragraph 3.1.1, figure 1)	
A. Wind zone	Low risk	Low wind zone as described by NZS 3604
	Medium risk	Medium wind zone as described by NZS 3604
	High risk	High wind zone as described by NZS 3604
	Very high risk	Very high wind zone as described by NZS 3604
B. Number of storeys	Low risk	One storey
	Medium risk	Two storeys in part
	High risk	Two storeys
	Very high risk	More than two storeys
C. Roof / wall intersection design	Low risk	Roof-to-wall intersection fully protected (eg hip and gable roof with eaves)
	Medium risk	Roof-to-wall intersection partly exposed (eg hip and gable roof with no eaves)
	High risk	Roof-to-wall intersection fully exposed (eg parapets, enclosed balustrades or eaves at greater than 90º to vertical with soffit lining)
	Very high risk	Roof elements finishing within the boundaries formed by the exterior walls (eg lower ends of aprons, chimneys, dormers etc)
D. Eaves width (1) (2)	Low risk	Greater than 600mm for single storey
	Medium risk	451-600mm for single storey, or over 600mm for two storey
	High risk	101-450mm for single storey, or 451-600mm for two storey, or greater than 600mm above two storey
	Very high risk	0-100mm for single storey, or 0-450mm for two storey, or less than 600mm above two storey
E. Envelope complexity	Low risk	Simple rectangular, L, T or boomerang shape, with single cladding type
	Medium risk	More complex, angular or curved shapes (eg Y or arrowhead) with no more than two cladding types
	High risk	Complex, angular or curved shapes (eg Y or arrowhead) with multiple cladding types
	Very high risk	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 (3)	Low risk	None, timber slat deck or porch at ground level
	Medium risk	Fully covered in plan by roof, or timber slat deck attached at first or second floor level
	High risk	Enclosed deck exposed in plan or cantilevered at first floor level
	Very high risk	Enclosed deck exposed in plan or cantilevered at second floor level or above

Notes:

(1) Eaves width measured horizontally from external face of wall cladding to outer edge of overhang, including gutters and fascias.

(2) Balustrades and parapets count as 0mm eaves.

(3) The term deck includes balconies, as described in the Definitions.

The risk score

Table 2 sets out the risk matrix that shall be used to define the risk score for a building within the scope of the Acceptable Solution. A risk score is calculated for each elevation of the building. Claddings are then selected from Table 3 according to the risk scores, or the highest risk score may be used for all walls.

TABLE 2	**Building envelope risk matrix** (paragraph 3.1.2, figure 1)

Elevation or wall									
Risk factor	**Low**	**Score**	**Medium**	**Score**	**High**	**Score**	**Very high**	**Score**	**Subtotal for each risk factor**
Wind zone (per NZS 3604)	0		0		1		2		0
Number of storeys	0		1		2		4		0
Roof / wall intersection design	0		1		3		5		0
Eaves width	0		1		2		5		0
Envelope complexity	0		1		3		6		0
Deck design	0		2		4		6		0
[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.]								**Total risk score:**	0

Elevation or wall									
Risk factor	**Low**	**Score**	**Medium**	**Score**	**High**	**Score**	**Very high**	**Score**	**Subtotal for each risk factor**
Wind zone (per NZS 3604)	0		0		1		2		0
Number of storeys	0		1		2		4		0
Roof / wall intersection design	0		1		3		5		0
Eaves width	0		1		2		5		0
Envelope complexity	0		1		3		6		0
Deck design	0		2		4		6		0
[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.]								**Total risk score:**	0

Elevation or wall									
Risk factor	**Low**	**Score**	**Medium**	**Score**	**High**	**Score**	**Very high**	**Score**	**Subtotal for each risk factor**
Wind zone (per NZS 3604)	0		0		1		2		0
Number of storeys	0		1		2		4		0
Roof / wall intersection design	0		1		3		5		0
Eaves width	0		1		2		5		0
Envelope complexity	0		1		3		6		0
Deck design	0		2		4		6		0
[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.]								**Total risk score:**	0

Elevation or wall									
Risk factor	**Low**	**Score**	**Medium**	**Score**	**High**	**Score**	**Very high**	**Score**	**Subtotal for each risk factor**
Wind zone (per NZS 3604)	0		0		1		2		0
Number of storeys	0		1		2		4		0
Roof / wall intersection design	0		1		3		5		0
Eaves width	0		1		2		5		0
Envelope complexity	0		1		3		6		0
Deck design	0		2		4		6		0
[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.]								**Total risk score:**	0

TABLE 3	**Suitable wall claddings** (paragraphs 3.1.2, 3.4.1.1, 3.4.2.1, 3.4.2.2, 3.4.3.2, 9.1.1, 9.4.1.2, 9.4.1.3, 9.6, figure 1 (E2/AS1))	
Risk score	**Suitable wall claddings**	
	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 (3) d) Fibre cement sheet (4) (Jointed finish) e) Plywood sheet	a) Masonry veneer (2) b) Stucco c) Horizontal profiled metal (3) - corrugated and trapezoidal only d) Fibre cement – flush-finished e) EIFS
7 - 12	a) Bevel-back weatherboards b) Vertical timber board and batten c) Vertical profiled metal (3) - corrugated only(3)(6)	a) Masonry veneer (2) b) Stucco c) Horizontal profiled metal - corrugated and trapezoidal only d) Rusticated weatherboards e) Fibre cement weatherboards f) Fibre cement sheet – flush and jointed finish g) Plywood sheet a) EIFS
13-20	a) Vertical profiled metal - corrugated only (3) (6)	a) Masonry veneer (2) b) Stucco c) Horizontal profiled metal - corrugated and trapezoidal only d) Rusticated weatherboards e) Fibre cement weatherboards f) Fibre cement sheet – flush and jointed finish g) Plywood sheet h) EIFS i) Bevel-back weatherboards
Over 20	a) Redesign the building to achieve a lower score, or b) Specific design – The design may need changing to reduce the risk – The building consent authority may require more comprehensive details and documentation providing evidence of weathertightness – The building consent authority, designer or owner may require more inspections – A third party audit of the design may be required.	

Notes:

1) The wall claddings in this table are limited to those covered in this Acceptable Solution.
2) Traditional masonry veneer as per SNZ HB 4236, with minimum 40mm cavity.
3) Refer Figure 38 for profiles.
4) Except stucco over a fibre cement backing.
5) Claddings in Extra High wind zones require rigid underlays
6) Direct fix vertical corrugated steel is included as cavity construction.