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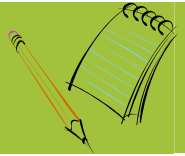


In this issue we have articles on:

- Schedule 1 Building Act 2004 – Feedback from Seminar's
- Compatibility of Materials
- Durability
- Roof Projections – Fire Rating
- Quiz on articles in this newsletter

For any enquiries regarding this news sheet, please contact Simon Tonkin on **(03) 211 1777**

## EDITORIAL



All our thoughts will be with the people of Christchurch following the devastating earthquake in February.

It is amazing to see the scenes of buildings collapsing and the way that all people want to help with whatever assistance they can provide.

No doubt this will be a long recovery process for Christchurch and our thoughts will be with the people of Christchurch and Canterbury that have suffered.

Editor  
Simon Tonkin

## SCHEDULE 1 BUILDING ACT 2004 FEEDBACK FROM SEMINAR



Seminars were undertaken in the Council chambers on 24 January and 2 February 2011 to explain the latest changes to Schedule 1 – Exempt Building Work.

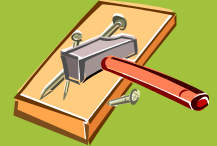
These seminar's were attended by 80 people.

Comments received back include:

- Important to advise clients to retain a paper trail for any exempted building work.
- Owner's need to be better informed.
- New able to make informed decisions.
- I am now able to assess what building work does not require a building consent but will advise my clients to obtain a building consent for the paper trail.



## COMPATIBILITY OF MATERIALS



Materials used in the construction of a building need to be compatible with each other and not cause undue issues such as corrosion.

New Zealand Building Code clause E2 external moisture under the acceptable solution has tables for material selection, compatibility of materials in contact and compatibility of materials subject to run off.

These tables are reproduced below, along with all the acceptable solution clauses referenced by the tables.

Acceptable Solution E2/AS1

EXTERNAL MOISTURE

Material		Exposure	Durability	
			15 yrs	50 yrs
<b>Aluminium, copper, lead, zinc, stainless steel</b>		Hidden	✓	✓
		Exposed to weather	✓	✓
		Sheltered	✓	✓
<b>Aluminium-zinc coated steel AZ150 uncoated, or coated to NZS 4217</b>		Hidden	✓	✓ (2)
		Exposed to weather	✓ (1)	✓ (4)
		Sheltered	✓ (3)	✓ (6)
<b>Aluminium-zinc: AZ150 factory-coated to AS/NZS 2728</b>		Hidden	✓	✓
		Type 4 Exposed to weather	✓	✓ (4)
		Type 5	✓	✓ (3)
		Type 6	✓	✓ (1)
		Type 4 Sheltered	✓ (3)	✓ (6)
		Type 5	✓ (1)	✓ (5)
		Type 6	✓	✓ (3)
<b>Bituminous material, uPVC</b>		Hidden	✓	✓
		Exposed to weather	✓	✗
		Sheltered	✓	✓
<b>Butyl rubber</b>		Hidden	✓	✓
		Exposed to weather	✓	✗
		Sheltered	✓	✗
<b>Galvanized steel Z450 uncoated, or coated to NZS 4217</b>		Hidden	✓	✓ (4)
		Exposed to weather	✓ (3)	✓ (6)
		Sheltered	✓ (5)	✓ (6)
<b>Galvanized steel: Z275 factory-coated to AS/NZS 2728</b>		Hidden	✓	✓
		Type 4 Exposed to weather	✓ (1)	✓ (6)
		Type 5	✓	✓ (4)
		Type 6	✓	✓ (1)
		Type 4 Sheltered	✓ (3)	✓ (6)
		Type 5	✓ (1)	✓ (6)
		Type 6	✓	✓ (4)
<b>Amend 2 Jul 2005</b>		<b>FIXINGS:</b>	*Hidden	✓
<b>Amend 2 Jul 2005</b>		<b>Aluminium, bronze, monel and stainless steel (Types 304 and 316)</b>	Exposed to weather	✓
			Sheltered	✓
		<b>FIXINGS:</b>	Hidden	✓ (2)
		<b>Hot-dipped galvanized steel to AS/NZS 4680</b>	Exposed to weather	✓ (2)
			Sheltered	✓ (4)
		<b>Screws to AS 3566: Part 2</b>	Class 3 Hidden	✓ (2)
			Class 4	✓
			Class 3 Exposed to weather	✓ (2)
			Class 4	✓ (4)
			Class 3 Sheltered	✓ (4)
			Class 4	✓ (2)
<b>Amend 2 Jul 2005</b>		<b>LEGEND:</b>	✓ Suitable for durability requirement in all NZS 3604 exposure zones, including sea-spray zones	
			✗ Not suitable for durability requirement	
			✓ (no.) Conditionally suitable – refer relevant acceptable zone number	
			* Includes fixings protected by putty and an exterior paint system of primer undercoat and two top coats of paint.	
<b>Amend 2 Jul 2005</b>		<b>Acceptable zones as per NZS 3604:</b>	(1) Zones 1, 2, 3 and 4	(3) Zones 2, 3 and 4
			(2) Zones 1, 2 and 3	(4) Zones 2 and 3
			(5) Zones 3 and 4	(6) Zone 3
<b>Amend 2 Jul 2005</b>		<b>Note:</b>	Durability may be improved by regular washing of sheltered materials. The term "sheltered" is as defined in NZS 3604, Figure 4.2. The term "hidden" is defined as concealed behind another element that would need to be removed to allow monitoring of performance or maintenance. A hidden flashing may be exposed to H <sub>2</sub> S in geothermal areas, but not to salt spray in coastal zones. If exposed to salt spray, it is classified as "sheltered".	

Amend 2 Jul 2005

Amend 2 Jul 2005

Amend 2 Jul 2005

Amend 2 Jul 2005

Amend 2 Jul 2005

**Table 21: Compatibility of materials in contact**

This table shall be read in conjunction with Table 20 and Table 22

Refer relevant *cladding* and *flashings* paragraphs for material and coating specifications.

Paragraphs 2.2 c), 4.2.4, 4.4, 4.5.2 a), 8.2.4, 8.4.11 a) and c), 8.4.11, 1 b), 9.6.7 a) and 9.8.5

	Aluminium, anodised or mill-finish	Aluminium, coated <sup>(1)</sup>	Butyl rubber & EPDM	CCA-treated timber <sup>(2)</sup>	Cedar	Cement plaster (uncoated)	Ceramic tiles (cement grout)	Clay bricks (cement mortar)	Concrete old (unpainted)	Concrete green (unpainted)	Copper/brass	Glass	Glazed roof tiles	Lead (including lead-edged) unpainted	Plastics	Stainless steel	Steel, galvanised coil-coated	Steel, galvanized (unpainted)	Zinc	Zinc/aluminium coated <sup>(1)</sup>	Zinc/aluminium, (unpainted)	
Aluminium, anodised or mill-finish	✓	✓	✓	X	✓	X	X	X	✓	X	X	✓	✓	X	✓	B	✓	✓	✓	✓	✓	
Aluminium, coated <sup>(1)</sup>	✓	✓	✓	B	✓	X	X	X	✓	X	X	✓	✓	B	✓	B	✓	✓	✓	✓	✓	
Butyl rubber & EPDM	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
CCA-treated timber <sup>(2)</sup>	X	B	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	B	X	X	B	X	
Cedar	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	X	✓	X
Cement plaster (uncoated)	X	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	X
Ceramic tiles (cement grout)	X	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X
Clay bricks (cement mortar)	X	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X
Concrete old (unpainted)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Concrete green (unpainted)	X	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	✓	✓	X	X	X	X	X	X
Copper/brass	X	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	B	✓	B	X	X	X	X	X	X
Glass	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Glazed roof tiles	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Lead (including lead-edged) unpainted	X	B	✓	✓	✓	X	✓	✓	✓	X	B	✓	✓	✓	✓	B	B	B	B	B	B	X
Plastics	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Stainless steel	B	B	✓	✓	✓	✓	✓	✓	✓	✓	B	✓	✓	B	✓	✓	B	X	X	B	B	
Steel, galvanised coil-coated	✓	✓	✓	B	✓	✓	✓	✓	✓	X	X	✓	✓	B	✓	B	✓	✓	✓	✓	✓	
Steel, galvanized (unpainted)	✓	✓	✓	X	X	✓	✓	✓	✓	X	X	✓	✓	B	✓	X	✓	✓	✓	✓	✓	
Zinc	✓	✓	✓	X	X	✓	✓	✓	✓	X	X	✓	✓	B	✓	X	✓	✓	✓	✓	✓	
Zinc/aluminium, coated <sup>(1)</sup>	✓	✓	✓	B	✓	✓	✓	✓	✓	X	X	✓	✓	B	✓	B	✓	✓	✓	✓	✓	
Zinc/aluminium (unpainted)	✓	✓	✓	X	X	X	X	X	✓	X	X	✓	✓	X	✓	B	✓	✓	✓	✓	✓	

**LEGEND:**

✓ Materials satisfactory in contact.

X Contact between materials is not permitted. Minimum gap of 5 mm is required to prevent moisture bridging.

B Avoid contact in sea-spray zone or corrosion zone 1.

**NOTES:**

(1) Coated – includes factory-painted, coil-coated and powder-coated.

(2) Includes copper azole and copper quaternary salts.

Amend 2  
Jul 2005

**Table 22: Compatibility of materials subject to run-off**

This table shall be read in conjunction with Table 20 and Table 21.  
Refer relevant cladding and flashings paragraphs for material and coating specifications.  
Paragraphs 2.2 c), 4.2.4, 4.4, 4.5.2 a), 8.2.4, 8.4.11 a) and c), and 9.8.5

Material that water flows onto	Aluminium, anodised or mill-finish	Aluminium, coated <sup>(1)</sup>	Butyl rubber & EPDM	CCA-treated timber <sup>(2)</sup>	Cedar	Cement plaster (uncoated)	Ceramic tiles (cement grout)	Clay bricks (cement mortar)	Concrete old (unpainted)	Concrete green (unpainted)	Copper/brass	Glass	Glazed roof tiles	Lead (including lead-edged) unpainted	Plastics	Stainless steel	Steel, galvanised coil-coated	Steel, galvanised (unpainted)	Zinc	Zinc/aluminium coated <sup>(1)</sup>	Zinc/aluminium, (unpainted)
Aluminium, anodised or mill-finish	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Aluminium, coated <sup>(1)</sup>	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Butyl rubber & EPDM	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
CCA-treated timber <sup>(2)</sup>	X	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	X	X	X	X
Cedar	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Cement plaster (uncoated)	X	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	A	✓	X	✓	✓	✓	✓	✓	✓	✓
Ceramic tiles (cement grout)	X	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	A	✓	✓	✓	✓	✓	✓	✓	✓	✓
Clay bricks (cement mortar)	X	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	A	✓	✓	✓	✓	✓	✓	✓	✓	✓
Concrete old (unpainted)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	A	✓	✓	✓	✓	✓	✓	✓	✓	✓
Concrete green (unpainted)	X	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	A	✓	X	✓	✓	X	X	X	X	X
Copper/brass	X	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	X	X	X	X
Glass	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Glazed roof tiles	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Lead (including lead-edged) unpainted	X	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X
Plastics	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Stainless steel	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Steel, galvanised coil-coated	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Steel, galvanised (unpainted)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Zinc	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Zinc/aluminium coated <sup>(1)</sup>	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	X
Zinc/aluminium, (unpainted)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	X

**LEGEND:**

- ✓ Materials satisfactory with water run-off as indicated.
- X Water run-off is not permitted as indicated.
- A Etching or staining of glass may occur with run-off.

**NOTES:**

- (1) Coated – Includes factory-painted, coil-coated and powder-coated.
- (2) Includes copper azole and copper quaternary salts.

Amend 2  
Jul 2005

## 2.2 Materials

Materials used to construct the building envelope shall be:

- a. in accordance with the durability requirements of NZBC B2,
- b. suitable for their end use, location and environment as shown in Table 20, and
- c. compatible with adjoining materials as shown in Table 21 and 22.

Table 20,  
21 and 22

### 4.2.2 Environment

Flashing materials shall be selected according to the relevant exposure conditions as defined in either:

- a) NZS 3604 Clause 4.2, or
- b) AS/NZS 2728.

Flashings shall be selected from Table 20 to minimise corrosion.

Table 20

#### COMMENT:

The exposure zone in which a building is located can affect the durability of flashings.

AS/NZS 2728 lists atmospheric classes derived from ISO 9223 for Australia and New Zealand.

Exposure zones are defined in Clause 4.2 of NZS 3604, based on the likely exposure to wind-driven sea-salt or geothermal gases.

### 4.2.3 Specific conditions of use

Flashing materials shall be selected according to the specific conditions of their use.

Flashings shall be selected from Table 20 to minimise the effects of sheltered corrosion.

Table 20

#### COMMENT:

The specific location of a material on a building can substantially affect the durability of that material.

In particular, many metals can undergo accelerated corrosion if they are exposed to wind-driven sea-salt in sheltered locations, where they are not exposed to being washed by rainwater.

### 4.2.4 Surrounding materials

Metals which are in contact in locations where they will become wet, or where water can flow over metals or certain plastics onto another metal, shall be selected in accordance with Table 21 and Table 22.

Uncoated metals shall not be used where carbon deposits or chemical contaminants may accumulate.

Table 21  
and 22

#### COMMENT:

Undesirable effects can occur when some materials are in contact with each other. Examples are corrosion of metals, stress cracking of plastics and staining of glass. Carbon deposits such as soot will cause accelerated corrosion of damp uncoated metal.

### 4.3 Acceptable flashing materials

Table 20 shall be used to assess suitability of flashing materials for the required durability.

Table 20

#### COMMENT:

Additional guidance on flashing materials can be found in the New Zealand Metal Roof and Wall Cladding Code of Practice.

#### 4.3.1 uPVC flashings

uPVC flashings shall be a minimum of 0.75 mm thick.

uPVC flashings shall comply with the requirements of the following Clauses of AS/NZS 4256: Part 2:

- a) Clause 9.2 Impact resistance,
- b) Clause 9.3 Tensile strength, and
- c) Clause 9.4 Colourfastness and impact resistance following ultraviolet light exposure.

Where uPVC flashings are exposed to the weather, they shall also comply with Section 8 of AS/NZS 4256: Part 2.

uPVC flashings shall have a finish colour with a reflectance of 40% or more, as outlined in Paragraph 2.4.

#### COMMENT:

Manufacturers of uPVC flashings which have a proven performance in use may be able to show compliance with NZBC B2 Durability as detailed in B2/VM1.

#### 4.3.3 Galvanized steel flashings

Galvanized steel flashings shall have a BMT of 0.55 mm minimum for flashings generally, and a BMT of 0.4 mm minimum for roll-formed roll-top ridge flashings, with galvanizing of:

- a) Hot-dipped zinc coated Z450 to AS 1397, or
- b) Hot-dipped zinc coated Z275 for pre-painted roofing with a factory-applied finish complying with AS/NZS 2728 Type 4 or better.

Table 20

#### 4.3.4 Aluminium-zinc coated steel flashings

Aluminium-zinc coated steel flashings shall only be used in accordance with Table 20.

Aluminium-zinc coated steel flashings shall have:

- a) 0.55 mm minimum BMT of steel for flashings generally and 0.4 mm BMT of steel for roll-formed roll-top ridge flashings, and
- b) Aluminium-zinc coating of AZ150 to AS 1397, with a factory-applied finish complying with AS/NZS 2728 Type 4 or better.

Table 20

#### 4.3.8 Zinc sheet flashings

Zinc sheet flashings shall only be used in accordance with Table 20.

Zinc sheet flashings shall be:

- a) A minimum thickness of 0.7 mm, and
- b) In compliance with BS EN 988.

Table 20

#### 4.3.9 Butyl rubber and EPDM flashings

Butyl rubber flashings shall only be used in accordance with Table 20.

Butyl rubber and EPDM flashings shall be a minimum thickness of 1.0mm, and shall comply with the following parts of Table 1 in ASTM D6134:

- a) Tensile strength,
- b) Elongation,
- c) Water absorption,
- d) Water vapour permeance, and
- e) Heat aging followed by:
  - i) tensile strength
  - ii) elongation.

Table 20

#### 4.3.10 Bituminous flashings

Bituminous flashings shall only be used in accordance with Table 20.

Flashings made from bitumen-impregnated material shall:

- a) Comply with AS/NZS 2904, and
- b) Be used only in fully concealed applications.

Table 20

#### 4.4 Fixings

Fixings of metal flashings shall comply with Table 20 to Table 22.

Exposed flashings such as barge and ridge flashings are to be fixed along both edges.

Table 20,  
21 and 22

#### COMMENT:

Fixings that penetrate flashings should be avoided where possible, particularly for horizontal flashings.

#### 4.5.2 Metal flashing joints

Where metal flashings require to be joined, the method shall be as shown in Figure 6. Joints of metal flashings shall have the following features:

- a) Rivets used for joining and sealing laps shall be spaced at a maximum of 50 mm centres, and be:
  - i) compatible with the flashing material as per Table 21 and Table 22, and
  - ii) sealed against moisture, or
  - iii) of a sealing type,
- b) Expansion joints shall be provided for joined flashings with a combined length exceeding:
  - i) 12 metres for light coloured steel and stainless steel. 8 metres for dark coloured steel,
  - ii) 8 metres for copper,
  - iii) 8 metres for aluminium.
- c) Where both ends of a flashing are constrained, allowance shall be made for expansion,
- d) Where necessary, expansion joints shall be formed as shown in Figure 6, with:
  - i) minimum 200 mm laps, and
  - ii) sliding clips at both sides of the lap,
- e) When using uncoated galvanized steel, zinc, stainless steel or copper flashings, joints shall be riveted and soldered as described in the New Zealand Metal Roof and Wall Cladding Code of Practice,

Table 21  
and 22

- f) When using uncoated or coated lead flashings, maximum continuous lengths should be 1300 mm for 17 kg or 1500 mm for 20 kg lead. Where the pitch of the flashing is greater than 15° at the join, the lap at the join shall be 100 mm minimum. Where the pitch of the flashing is 15° or less at the join, the lap at the join shall be 200 mm minimum and the flashing underneath the lap shall have a hook at the edge,
- g) Lap joints on other metal flashings shall be sealed using a neutral cure silicone sealant in conjunction with mechanical fasteners. The sealant shall comply with:
  - i) Type F, Class 20LM or 25LM of ISO 11600, or
  - ii) low modulus Type II Class A of Federal Specification TT-S-00230C.

**COMMENT:**

Further information may be found in the New Zealand Metal Roof and Wall Cladding Code of Practice.

**7.3.2 Ground floor level access**

Where provision for level access is required, this may be provided as shown in Figure 17B, with exterior paving or decking that complies with the access route requirements of D1/AS1.

Table 20

**COMMENT:**

The specific features of a building and its site can have a significant effect on the options available for providing level access at doors. These features include the provision of shelter, prevailing winds and ground levels. Where level access is required, it is highly recommended that the services of a designer experienced in this field be obtained.

**7.3.2.1 Concrete slab**

Where provision for level access is required from a concrete floor slab to exterior paving, this shall be as shown in Figure 17B with:

- a) A channel across the door opening, with:
  - i) the width to suit capacity in accordance with E1/AS1,
  - ii) a minimum depth of 150 mm,
  - iii) a maximum length of 2000 mm, and
  - iv) 1:200 minimum fall along length of channel towards a drainage outlet,
- b) Grating, in accordance with Table 20, over the channel, that:
  - i) is supported independently of the door frame,
  - ii) is removable to allow access for cleaning,
  - iii) is specifically designed to accommodate imposed loads,
  - iv) has gaps sized to prevent the wheels of wheel chairs or mobility aids entering or being trapped, and
  - v) has a continuous gap of 12 mm minimum from door frame and wall cladding, and
- c) Exterior paving that:
  - i) has a minimum fall of 1:40 away from the channel,

**COMMENT:**

The grating support must be specifically detailed to suit the condition of the building and site.

- ii) together with the surrounding paving and ground levels, complies with drainage requirements of E1/AS1.

## 8.0 Roof Claddings

Table 20

### 8.1.4 Fixings

Fixings shall be as specified in Paragraph 8.2 to Paragraph 8.5.

Fixings for roof claddings and flashings, where necessary, shall be selected from Table 20 to minimise corrosion.

#### COMMENT:

The use of stainless steel fixings is not recommended by steel manufacturers for use with coated steel, as they are considered to cause deterioration in severe marine and industrial environments.

## 8.2 Masonry Tiles

Table 20

### 8.2.4 Flashings and fixings

Materials for flashings, gutters and fixings shall be in accordance with Paragraph 4.0, and:

- a) Be selected from Table 20 to minimize corrosion, and
- b) Be compatible with mortar and bedding in accordance with Table 21 and Table 22.

## 8.3 Pressed Metal Tiles

Table 20

### 8.3.4 Metal substrate

#### 8.3.4.1 Choice of metal

The metal substrate shall be selected according to the exposure conditions as defined in:

- a) NZS 3604 Clause 4.2, or
- b) AS/NZS 2728.

The metal substrate shall be selected from Table 20 to minimise corrosion.

#### COMMENT:

The exposure zone in which a building is located can affect the durability of pressed metal tiles.

AS/NZS 2728 lists atmospheric classes derived from ISO 9223 for Australia and New Zealand.

Exposure zones are defined in Clause 4.2 of NZS 3604, based on the likely exposure to wind-driven sea-salt or geothermal gases.

### 8.4.11 Flashing requirements

Table 21  
and 22

The roofing shall be flashed at all boundaries, except at the discharge to a gutter.

- a) Soft edge to cover flashings shall comply with Paragraph 4.6. Refer to Figure 41 for example of use. Check the compatibility of the soft edge material against Table 21 and Table 22.
- b) Notched turn-downs to cover flashings shall comply with Paragraph 4.6. Refer to Figure 42 for example of use.
- c) Materials for flashings shall be compatible with the roof cladding material as per Table 21 and Table 22, and shall be in accordance with Paragraph 4.3.
- d) Provide expansion joints in accordance with Paragraph 4.5.2.

#### 8.4.11.1 Fixing flashings

- a) When fixing flashings to the structure, use screws as for roofing (see Paragraph 8.4.8).
- b) When fixing flashings to other flashings or to roofing use:
  - i) for galvanized steel, 4 mm diameter monel metal or stainless steel rivets, where compatible as per Table 21,
  - ii) for aluminium-zinc coated steel, 4 mm diameter aluminium rivets,
  - iii) for aluminium, 4 mm diameter aluminium rivets.

Table 21  
and 22

#### COMMENT:

The use of stainless steel fixings is not recommended by steel manufacturers for use with coated steel, as they are considered to cause deterioration in severe marine and industrial environments.

- c) Flashing joints, including expansion joints where required, shall be in accordance with Paragraph 4.5.2 and as shown in Figure 6.
- d) Where end-laps are required in flashings, form these as shown in Figure 6 and, before joining the two parts, apply an 8 mm diameter bead of neutral cure sealant complying with:
  - i) Type F, Class 20LM or 25LM of ISO 11600, or
  - ii) low modulus Type II Class A of Federal Specification TT-S-00230C.

### 9.6 Profiled Metal Wall Cladding

Table 20

#### 9.6.3 Materials

##### 9.6.3.1 Choice of metal

The metal cladding shall be selected according to the exposure conditions as defined in:

- a) NZS 3604 Clause 4.2, or
- b) AS/NZS 2728.

The metal cladding, flashings and fixings shall be selected from Table 20 according to the durability required for the specific application.

#### COMMENT:

The exposure zone in which a building is located can affect the durability of metal cladding.

AS/NZS 2728 lists atmospheric classes derived from ISO 9223 for Australia and New Zealand.

Exposure zones are defined in Clause 4.2 of NZS 3604, based on the likely exposure to wind-driven sea-salt or geothermal gases.

#### 9.6.6 Fixings

The cladding shall be screw-fixed through the troughs and battens, where applicable, into the framing. Fixings shall:

- a) Be minimum 12-gauge hexagonal head, self-drilling wood screws,
- b) Penetrate the framing by a minimum of 25 mm,
- c) Be hot-dipped galvanized, complying with AS 3566: Part 2, to at least Class 4,
- d) Be selected from Table 20 to minimize corrosion,
- e) Include neoprene (having a carbon black content of 15% or less by weight) or EPDM sealing washers as shown in Figure 39, and

Table 20

- f) Be used on the cladding at side laps and every second trough or, for trapezoidal where the rib centres exceed 150 mm, at side laps and every trough:
  - i) to framing, and
  - ii) at all external and internal corners.

**9.6.7 Flashings**

Flashings used with metal wall cladding shall be in accordance with Paragraph 4.0, and with the following requirements:

- a) Hooks and hems shall be as shown in Figure 5,
- b) Have joints formed with laps and sealant as shown in Figure 6,
- c) Where shown, sealant shall be neutral cure, complying with:
  - i) Type F, Class 20LM or 25LM of ISO 11600, or
  - ii) low modulus Type II Class A of Federal Specification TT-S-00230C,
- d) Under-flashings shall be fixed to framing at 600 mm maximum centres.
- e) Flashings shall be fixed together at junctions at 50 mm maximum centres or to cladding at 900 mm centres with:
  - i) for galvanized steel, 4 mm diameter monel metal or stainless steel rivets, where compatible as per Table 21, or
  - ii) for aluminium-zinc coated steel, 4 mm diameter aluminium rivets, or
  - iii) for aluminium, 4 mm diameter aluminium rivets.

Table 21  
and 22

**9.6.5 Profiles**

Profiles covered in this Acceptable Solution are:

- a) Corrugated – curved with a minimum crest height of 17.5 ±1 mm, and
- b) Trapezoidal – symmetrical with a minimum crest height of 19 mm.

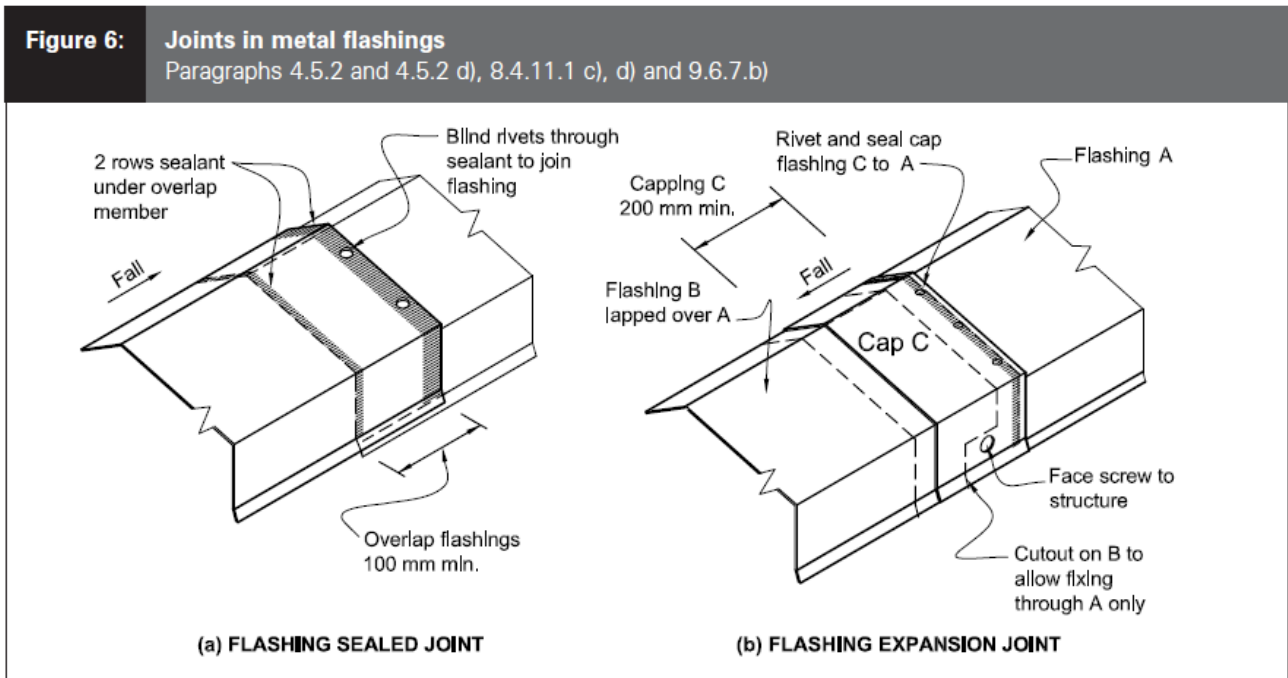
For details of these profiles, refer to Figure 38.

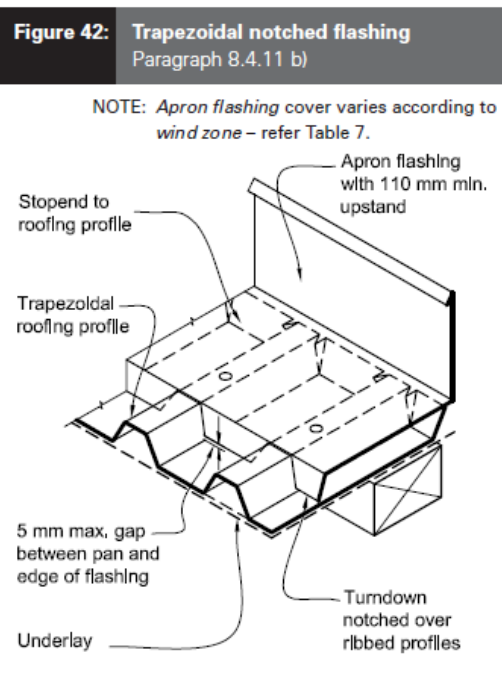
Table 21  
and 22

**9.8.5 Flashing material**

Flashings shall be selected in accordance with Table 20 to Table 22.

Table 20





## **E2 / AS1 – MAINTENANCE CRITERIA**

### **2.5 Maintenance**

Maintenance shall be carried out as necessary to achieve the required durability of materials, components and junctions.

The extent and nature of necessary maintenance is dependent on the:

- a) Type of cladding or components used,
- b) Position of cladding or components on the building,
- c) Geographical location of the building, and
- d) Specific site conditions.

#### **COMMENT:**

A deterioration in the appearance of the surface of a cladding does not necessarily relate to a deterioration in the weathertightness of the cladding.

#### **2.5.1 Regular maintenance**

Regular maintenance of a building will include:

- a) Washing exterior surfaces,
- b) Inspecting surfaces and junctions, and
- c) Repair or replacement of items when necessary, in order to preserve the weathertightness of the building.

#### **COMMENT:**

Washing by rain removes most accumulated atmospheric contaminants, but sheltered areas, such as walls directly below eaves, are protected from the direct effects of rain and require regular manual washing.

Some heavily textured surfaces will not be as effectively washed by rain as smoother surfaces, so will require more regular manual washing.

However, it is important that high pressure water is not directed at sensitive junctions such as window surrounds and other flashings. Great care must be taken to avoid water being driven past anti-capillary gaps and flashings into the wall cavities.



As the previous article on compatibility noted, all elements to comply with B2 durability, the acceptable solution and part of the table on fixings and flashings, is included for your reference.

### 1.0 Durability Applications

**1.0.1** This acceptable solution applies to materials and components required to satisfy the performances specified in other NZBC clauses.

#### Comment:

All *building* work shall comply with the NZBC. This means that *building elements*, both individually and as part of a system, shall meet all the performances required by the applicable NZBC clauses and shall continue to do so for the required durability period. In some cases, *building elements* (e.g. decorative coatings and trim) are not required to satisfy an NZBC performance criterion. Such *building elements* will then have no B2 durability requirement. However, where a *building element* serves two purposes, only one of which must satisfy the NZBC, it shall have the durability appropriate to its location and use. For example, a decorative finish applied to a *building element* required by the NZBC to have an impervious easily cleaned surface will need to satisfy the 5 year durability performance.

### 1.1 Compliance documents

**1.1.1** *Building elements*, including materials, components and systems, complying with a publication referenced in the Compliance Documents, satisfy B2 requirements only when the conditions of use stated in the publication and Compliance Documents prevail.

#### Comment:

It is not practicable within the Compliance Documents to cover all possible combinations, uses and conditions which may be applied to a *building element*. In special circumstances and where elements are called up but are used outside the scope of the Compliance Document application, durability shall be verified by B2/VM1.

### 1.2 Assessing required durability

**1.2.1** Evaluation of *building elements* shall be based on the following concepts:

- a) **Difficult to access or replace** – applies to *building elements* where access or replacement involves significant removal or alteration of other *building elements*. Examples are works involving the removal of masonry or concrete *construction*, or structural elements or repair of buried tanking membranes. A 50 year durability is required.
- b) **Moderately difficult to access or replace** – applies to *building elements* where access or replacement involves the removal or alteration of other *building elements*. Examples are the replacement of services reticulation in wall cavities and skillion roofs, or of plant and hotwater cylinders built into roof spaces without adequately sized access openings. A 15 year durability is required.
- c) **Easy to access and replace** – applies to *building elements* where access or replacement involves little alteration or removal of other *building elements*. Examples are linings, trim, light fittings, hotwater cylinder elements and door hardware, or where specific provision for removal has been made. A 5 year durability is required.

- d) **Failure to comply with the NZBC would go undetected during both normal use and maintenance of the building** – applies where the *building elements* are hidden from view with no provision for inspection access, and failure would not be apparent until significant damage had occurred to other *building elements*. Examples are building paper behind a masonry veneer cladding, and insulation in a skillion roof. A 50 year durability is required.
- e) **Failure to comply with the NZBC would go undetected during normal use of the building but would be easily detected during normal maintenance** – applies where normal maintenance will identify faults unlikely to be observed by *building* occupants until significant damage has occurred. Examples are degradation of exterior claddings on roofs and walls, sealant filled joints, flashings, services with specific provision for inspection access, chimneys and flues. A 15 year durability is required.
- f) **Failure to comply with the NZBC would be easily detected during normal use of the building** – applies where the failure is obvious to the *building* occupants. Examples are exposed *building elements* which are damaged or inoperative such as protective finishes, essential signs, sticking doors, slip resistant surfaces, stair treads and surface-run *building* services equipment. A 5 year durability is required.

1.2.2 Figure 1 provides a means of assessing the durability requirements for *building elements*.

### 1.3 Examples of durability requirements

1.3.1 Table 1 is an acceptable solution establishing durability requirements of nominated *building elements*.

## 2.0 Maintenance

### 2.1 Normal maintenance

2.1.1 Normal maintenance is that work generally recognised as necessary to achieve the expected durability for a given *building element*. The extent and nature of that maintenance will depend on the material, or system, its geographical location and position within the *building*, and can involve the replacement of components subject to accelerated wear.

2.1.2 It is the responsibility of the person specifying the *building element* to determine normal maintenance requirements. These may be based on the manufacturer's recommendations and may also include periodic inspections of elements not readily observable without a specific effort (e.g. access to roof or subfloor spaces).

2.1.3 Basic normal maintenance tasks shall include but not be limited to:

- a) Where applicable, following manufacturers' maintenance recommendations,
- b) Washing down surfaces, particularly exterior *building elements* subject to wind driven salt spray,
- c) Re-coating interior and exterior protective finishes,
- d) Replacing sealant, seals and gaskets in joints,
- e) Replacing valves, washers and similar high wear components in easily accessed service equipment and other *building elements*,
- f) Cleaning and replacing filters in *building* services systems,
- g) The regular servicing of boilers, cooling towers, lifts, escalators, emergency lighting and *fire* protection equipment, and
- h) The maintenance of signs for access, *escape routes*, emergency equipment and *hazardous* areas.

**Comment:**

Maintenance does not include such things as upgrading *building elements* to meet the demands of new technology or the increased environmental expectations of users.

**2.2 Scheduled maintenance**

**2.2.1** Scheduled maintenance comprises the inspection, maintenance and reporting procedures for *building elements* required to have a *compliance schedule* in terms of section 44 of the Building Act. By those procedures the *building elements* concerned are effectively deemed to have a durability of the life of the *building* because they are required to perform as designed at all times. The relevant maintenance procedures may include total replacement.

**3.0 Generic Materials****3.1 Concrete**

**3.1.1 NZS 3101:** Part 1 Section 3 is an acceptable solution for meeting the durability requirements of concrete building elements subject to the following modification: Provisions in this Standard that are in nonspecific or unquantified terms do not form part of the Acceptable Solution. Non-specific or unquantified terms include, but are not limited to, special studies, manufacturer's advice and references to methods that are appropriate, adequate, suitable, relevant, satisfactory, acceptable, applicable, or the like. Such provisions must be treated as the basis of an alternative solution proposal.

**3.2 Timber**

**3.2.1** Part 1 of NZS 3602: 2003 is an acceptable solution for meeting the durability requirements of timber *building elements*.

**Comment:**

The use of different timbers or timber treatments to those referred to in NZS 3602 may still comply with the *building code* in particular applications. Where the use of a different timber or timber treatment is proposed, this would be an alternative solution and evidence must be provided to the *building consent authority* that the intended use will meet the *building code*. For example, if imported hard-wood is to be used to surface a deck, evidence that the timber was durable for a minimum of 15 years in the expected exposure conditions is required.

**3.2.2** From 1 April 2004 to 31 March 2005 nothing in Paragraph 3.2.1 shall apply to the issue of *code compliance certificates*, but the previous acceptable solution Part 1 of NZS 3602: 1995 will continue to apply as an acceptable solution until 31 March 2005.

**3.2.3** NZS 3604 is an acceptable solution for meeting the durability requirements of *buildings* within its scope, except that any reference to NZS 3602 shall be read as having been amended in accordance with Paragraphs 3.2.1 and 3.2.2 above.

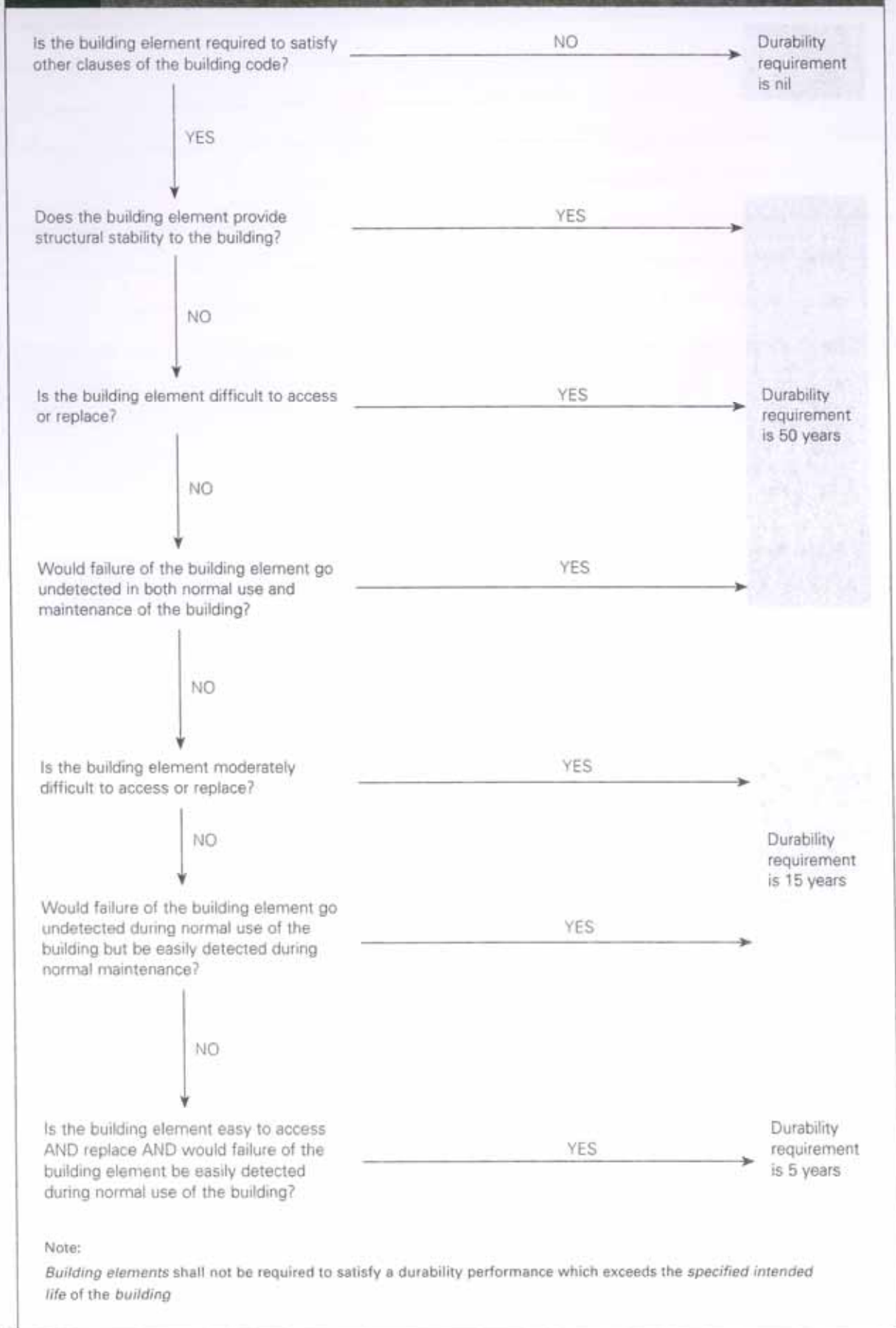
**3.3 Solid plastering**

**3.3.1** NZS 4251: Part 1 is an acceptable solution for meeting the durability requirements of cement plasters for walls, ceilings and soffits within its scope.

**3.4 Earth buildings**

**3.4.1** NZS 4297 and NZS 4299 are acceptable solutions for meeting the durability requirements of earth *buildings* within their scope.

**Figure 1: Assessment of Durability Requirement**  
Paragraph 1.2.2



**Table 1: Durability Requirements of Nominated Building Elements**

Note: Clause B2.3.2 requires that all hidden elements have at least the same durability as that of the element that covers it (i.e. must have the same expected life) which may be more than the requirement in clause B2.3.1. For example, the reason that a brick tie has a requirement of not less than 50 years in this table, instead of the 15 year requirement for *cladding*, is that the brick veneer that hides it has an expected durability of 50 years or more.

Building Element	Component	Situation/Function	Not less than 50 years	Not less than 15 years	Not less than 5 years
<b>Fixings</b> (Continued)	Bolts	Used to fix non-structural or moderately difficult to replace <i>building elements</i>		✓	
	Brick ties and fixings	All	✓		
	Proprietary fixings	Used to fix structural or difficult to replace <i>building elements</i>	✓		
		Used to fix non-structural or moderately difficult to replace <i>building elements</i>		✓	
	Adhesives	Used to fix structural or difficult to replace <i>building elements</i>	✓		
		Used to fix non-structural or moderately difficult to replace <i>building elements</i>		✓	
	Face fixings	Used to fix accessories, door furniture and hardware			✓
<b>Flashings</b> (See note at top of table)	Roof, wall or window	All flashings to roof <i>cladding</i> , <i>flues</i> and other roof penetrations		✓	
		Requires the removal of <i>cladding</i> above the roof to be replaced	✓		
		Hidden flashings such as behind brick veneer, stucco or spandrel panels	✓		
		Visible and does not require the removal of the <i>cladding</i> to be replaced		✓	
		Requires the removal of the <i>cladding</i> to be replaced	✓		

## ROOF PROJECTIONS – FIRE RATING



How close can you build a domestic dwelling to a boundary and not have to fire rate the wall?

Council inspectors have been seeing a number of plans where the distance from the dwelling to the closest boundary means that all or part of the wall is required to be fire rated under the acceptable solution C1 / AS1.

The situation generally comes about where the designer has stated they are using C1 / AS1 – control of external fire spread as their means of compliance.

The designer notes the wall is 1.0m away from the boundary to avoid any fire rating requirement but forgets about the soffit overhang.

The soffit overhang is noted in C1 / AS1 under clause 7.8.3 roof projections.

This clause is reproduced below.

**7.8.3** Where the external wall is required to have a FRR, the eaves projection shall be constructed with the same FRR as the external wall. Alternatively, the external wall shall be extended behind the eaves projection to the underside of the roof and the eaves need not be fire rated.

**7.8.4** Where the external wall is not required to have a FRR, roof eaves projecting from that wall need not be rated provided that no part of the eaves construction is closer than 650mm to the relevant boundary.

**7.8.5** Where the external wall, on its own, is not required to have a FRR, but roof eaves extend to within 650mm of the relevant boundary, the total eaves construction and the external wall from which they project shall have a FRR. For purpose groups SH and SR that FRR shall be 30 / 30 / 30. For other purpose groups the FRR shall be based on the S rating for the firecell protected by the external wall.

### **Comment:**

Eaves construction includes the gutter and spouting and any other projections from the eaves, although guttering and spouting need not be fire rated.

***Designers need to read the above clause in full including the comment. If the roof projection is within 650mm of the boundary, fire rating is required. The roof projection includes the spouting and gutter.***

## QUIZ ON ARTICLES IN THIS NEWS SHEET

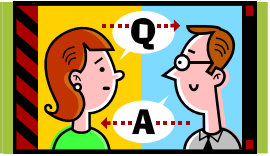


1. The table in which Building Code acceptable solution has examples of durability requirements for building elements is
  - a. B1
  - b. B2
  - c. E2
  
2. A slip resistant surface of a floor would require what durability under B2 / AS1?
  - a. 5 years
  - b. 10 years
  - c. 15 years
  
3. B2 / AS1 notes section 44 of the Building Act for scheduled maintenance of elements required to have a compliance schedule. Section 44 is from which Act?
  - a. Building Act 1991
  - b. Building Act 2004
  
4. If a building element is difficult to access or replace the durability requirement would be what under B2 / AS1?
  - a. 5 years
  - b. 15 years
  - c. 50 years
  
5. Brick veneer cladding is required to have what durability under B2 / AS1?
  - a. 5 years
  - b. 15 years
  - c. 50 years
  
6. The brick ties that support brick veneer cladding are required to have what durability under B2 / AS1?
  - a. 5 years
  - b. 15 years
  - c. 50 years
  
7. If a building element is not required to satisfy other clauses of the Building Code, what durability does it need under B2 / AS1?
  - a. Nil
  - b. 5 years
  - c. 15 years
  - d. 50 years

8. If a brick veneer clad building has a specified intended life at 15 years, what durability is required for the brick veneer cladding under B2 / AS1?
  - a. Nil
  - b. 5 years
  - c. 15 years
  - d. 50 years
  
9. An adhesive used to fix structural or difficult to replace building elements requires what durability under B2 / AS1?
  - a. 5 years
  - b. 15 years
  - c. 50 years
  
10. All flashings for a solid fuel burner flue require what durability under B2 / AS1?
  - a. 5 years
  - b. 15 years
  - c. 50 years
  
11. A flashing that requires the removal of the cladding to be replaced requires what durability under B2 / AS1?
  - a. 5 years
  - b. 15 years
  - c. 50 years
  
12. Compatibility of building materials is found in which Building Code acceptable solution?
  - a. B1 – structure
  - b. B2 – durability
  - c. E2 – external moisture
  
13. uPVC flashings shall have a minimum thickness of
  - a. 0.4mm
  - b. 0.55mm
  - c. 0.75mm
  
14. Zinc sheet flashings shall have a minimum thickness of
  - a. 0.4mm
  - b. 0.5mm
  - c. 0.7mm
  
15. For metal flashings expansion joints are to be provided every \_\_\_\_\_ metres for light coloured steel.
  - a. 6 metres
  - b. 8 metres
  - c. 12 metres
  
16. Copper flashings shall have expansion joists every
  - a. 6 metres
  - b. 8 metres
  - c. 12 metres

17. Where required, an expansion joint on metal flashings shall have a minimum lap of \_\_\_\_\_mm and sliding clips at both sides of the lap.
- 100mm
  - 200mm
  - 300mm
18. Exposure zones are found in which document?
- NZBC – B1 structure
  - NZS 3604
  - NZBC – B2 durability
19. Fixings for profiled metal wall cladding can be screws with \_\_\_\_\_ gauge hexagonal head.
- 8
  - 10
  - 12
20. Screws noted in 19 above must penetrate the framing by a minimum of \_\_\_\_\_mm.
- 10mm
  - 25mm
  - 45mm

## ANSWERS TO QUIZ



- |       |       |
|-------|-------|
| 1. b  | 11. c |
| 2. a  | 12. c |
| 3. a  | 13. c |
| 4. c  | 14. c |
| 5. c  | 15. c |
| 6. c  | 16. b |
| 7. a  | 17. b |
| 8. c  | 18. b |
| 9. c  | 19. c |
| 10. b | 20. b |