MINISTRY OF BUSINESS,
INNOVATION & EMPLOYMENT
HĪKINA WHAKATUTUKI

Acceptable Solutions and Verification Methods

For New Zealand Building Code Clause **B2 Durability**

B2
BUILDING CODE

Status of Verification Methods and Acceptable Solutions

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Defined words (italicised in the text) and classified uses are explained in Clauses A1 and A2 of the Building Code and in the Definitions at the start of this document.

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Document Status

The most recent version of this document (Amendment 10), as detailed in the Document History, is approved by the Chief Executive of the Ministry of Business, Innovation and Employment. It is effective from 30 November 2018 and supersedes all previous versions of this document.

The previous version of this document (Amendment 9) will cease to have effect on 31 March 2019.

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Amendment 10	Effective 30 November 2018	p. 5 Contents p. 7 References	p. 15F B2/AS1 3.6 p. 23 Index
Note: Page numbers relate to the document at the time of Amendment and may not match page numbers in current document.			

2B

New Zealand Building Code Clause B2 Durability

This Clause is extracted from the New Zealand Building Code contained in the First Schedule of the Building Regulations 1992 and amended by the Building Regulations 1997.

FIRST SCHEDULE–*continued*

Clause B2–DURABILITY

Provisions	Limits on application
OBJECTIVE **B2.1** The objective of this provision is to ensure that a *building* will throughout its life continue to satisfy the other objectives of this code.	
FUNCTIONAL REQUIREMENT **B2.2** *Building* materials, components and construction methods shall be sufficiently durable to ensure that the *building*, without reconstruction or major renovation, satisfies the other functional requirements of this code throughout the life of the *building*.	
PERFORMANCE **B2.3.1** *Building elements* must, with only normal maintenance, continue to satisfy the performance requirements of this code for the lesser of the *specified intended life* of the *building*, if stated, or: (a) The life of the building, being not less than 50 years, if: (i) Those *building elements* (including floors, walls, and fixings) provide structural stability to the building, or (ii) Those *building elements* are difficult to access or replace, or (iii) Failure of those *building elements* to comply with the *building code* would go undetected during both normal use and maintenance of the *building*. (b) 15 years if: (i) Those *building elements* (including the *building* envelope, exposed plumbing in the subfloor space, and in-built chimneys and flues) are moderately difficult to access or replace, or	Performance B2.3.1 applies from the time of issue of the applicable *code compliance certificate*. *Building elements* are not required to satisfy a durability performance which exceeds the *specified intended life* of the *building*.

FIRST SCHEDULE–*continued*

Provisions	Limits on application
(ii) Failure of those *building* elements to comply with the *building code* would go undetected during normal use of the *building*, but would be easily detected during normal maintenance.	
(c) 5 years if:	
(i) The *building elements* (including services, linings, renewable protective coatings, and *fixtures*) are easy to access and replace, and	
(ii) Failure of those *building elements* to comply with the *building code* would be easily detected during normal use of the *building*.	
B2.3.2 Individual *building elements* which are components of a *building* system and are difficult to access or replace must either:	
(a) All have the same durability, or	
(b) Be installed in a manner that permits the replacement of *building elements* of lesser durability without removing *building elements* that have greater durability and are not specifically designed for removal and replacement.	

Contents

References

For the purposes of New Zealand Building Code (NZBC) compliance, the Standards and documents referenced in this Verification Method and Acceptable Solution (primary reference documents) must be the editions, along with their specific amendments, listed below. Where these primary reference documents refer to other Standards or documents (secondary reference documents), which in turn may also refer to other Standards or documents, and so on (lower-order reference documents), then the version in effect at the date of publication of this Verification Method and Acceptable Solution must be used.

Amend 7 Apr 2011

Amend 6 Sep 2010

Standards New Zealand

		Where Quoted
NZS 3101:-	Concrete structures standard	
Part 1: 2006	The design of concrete structures *Amend: 1, 2*	AS1 3.1.1
SNZ TS 3404: 2018	Durability requirements for steel structures and components	AS1 3.6
NZS 3602:-		
Part 1: 2003	Timber and wood-based products for use in building	AS1 3.2.1, 3.2.2
NZS 3604: 2011	Timber framed buildings	AS1 3.2.3
NZS 3640: 2003	Chemical Preservation of round and sawn timber *Amend: 1, 2, 3, 4, 5*	AS1 3.2.1, 3.2.2.1, 3.2.3
NZS 4223:	Glazing in buildings	
Part 2: 2016	Insulating glass units	AS1 3.5
NZS 4251:-	Solid plastering	
Part 1: 2007	Cement plaster for walls, ceilings and soffits	AS1 3.3.1
NZS 4297: 1998	Engineering design for earth buildings	AS1 3.4.1
NZS 4299: 1998	Earth buildings not requiring specific design *Amend: 1*	AS1 3.4.1

Amend 10 Nov 2018

Amend 7 Apr 2011

Amend 5 Apr 2004

Amend 3 Jul 2001

Amends 2 and 8

Amends 7 and 8

Amend 9 Jan 2017

Amend 6 Sep 2010

Amend 2 Dec 2000

Amend 5 Apr 2004

Amend 5 Apr 2004

Definitions

Amend 6 Sep 2010

This is an abbreviated list of definitions for words or terms particularly relevant to this Acceptable Solution and Verification Method. The definitions for any other italicised words may be found in the New Zealand Building Code Handbook. Amend 8 Feb 2014

Adequate ***Adequate*** to achieve the objectives of the *building code*.

Baluster A post providing the support for the top and bottom rails of a barrier.

Balustrade The infill parts of a barrier (typically between floor and top rail). Amend 4 Apr 2004

Building has the meaning given to it by sections 8 and 9 of the *Building Act 2004*. Amend 6 Sep 2010

Building Code means the regulations made under section 400 of the *Building Act 2004*. Amend 4 Apr 2004

Building element Any structural and non-structural component or assembly incorporated into or associated with a *building*. Included are *fixtures*, services, *drains*, permanent mechanical installations for access, glazing, partitions, ceilings and temporary supports.

Cladding The exterior weather-resistant surface of a *building*. Amend 4 Apr 2004

Code compliance certificate means a certificate issued by a *building consent authority* under section 95 of the *Building Act 2004*. Amend 5 Apr 2004, Amend 6 Sep 2010

Damp-proof course (DPC) A narrow strip (generally up to 300 mm wide) of *durable vapour barrier* placed between *building elements* to prevent the passage of moisture from one element to another.

Damp-proof membrane (DPM) A sheet material, coating or vapour barrier, having a low water vapour transmission, and used to prevent water and water vapour movement through concrete in contact with the ground. (Also known as a concrete underlay.)

Durable Resistant to wear and decay. Amend 4 Apr 2004

External wall Any exterior face of a *building* within 30° of vertical, consisting of *primary* and/or *secondary elements* intended to provide protection against the outdoor environment, but which may also contain *unprotected areas*. Amend 4 Apr 2004

Fixture An article intended to remain permanently attached to and form part of a *building*.

Flue The passage through which the products of combustion are conveyed to the outside.

Handrail A rail to provide support to, or assist with the movement of a *person*. Amend 4 Apr 2004

Hazardous Creating an unreasonable risk to people of bodily injury or deterioration of health.

Intended use in relation to a *building*,

(a) includes any or all of the following:

(i) any reasonably foreseeable occasional use that is not incompatible with the *intended use*:

(ii) normal maintenance:

(iii) activities undertaken in response to *fire* or any other reasonably foreseeable emergency; but

(b) does not include any other maintenance and repairs or rebuilding. Amend 6 Sep 2010

Person includes the Crown, a corporation sole, and also a body of *persons*, whether corporate or unincorporated.

Primary element A *building element* providing the basic load bearing capacity to the structure, and which if affected by *fire* may initiate instability or premature structural collapse.

Secondary element A *building element* not providing load bearing capacity to the structure and if affected by *fire*, instability or collapse of the *building* structure will not occur. Amend 4 Apr 2004

Amend 6 Sep 2010

Specified intended life has the meaning given to it by section 113(3) of the Building Act 2004.

Section 113(3) states:

> "(3) In subsection (2), **specified intended life**, in relation to a building, means the period of time, as stated in an application for a building consent or in the consent itself, for which the building is proposed to be used for its intended use."

Unprotected area in relation to an *external wall* of a *building*, means any part of the *external wall* which is not *fire* rated or has less than the required *FRR*.

COMMENT:
Unprotected area includes non-*fire* rated windows, doors, or other openings, and non-*fire* rated *external wall construction*.

Vapour barrier Sheet material or coating having a low water-vapour transmission, and used to minimise water-vapour penetration in *buildings*. (*Vapour barriers* are sometimes referred to as *damp-proof membranes*.)

Amend 4 Apr 2004

Water heater A device for heating water.

Verification Method B2/VM1

1.0 Durability Evaluation

1.0.1 Verification that the durability of a *building element* complies with the NZBC B2.3.1 and B2.3.2 will be by proof of performance and shall take into account the expected in-service exposure conditions by one or more of the following:

a) In-service history,

b) Laboratory testing,

c) Comparable performance of similar *building elements*.

1.1 In-service history

1.1.1 Verification of durability based on in-service history of a *building element*, including materials, components and systems shall take into account but not be limited to:

a) Length of service,

b) Environment of use,

c) Intensity of use,

d) Any reaction with adjacent materials,

e) Limitations in performance,

f) Degree of degradation, and

g) Changes in formulation.

1.2 Laboratory testing

1.2.1 Verification of durability based on successful performance in a laboratory test shall be accompanied by an assessment of the tests performed, their relevance to field and service conditions, and in particular:

a) Types of degradation mechanisms likely to be induced by testing,

b) The degradation mechanisms likely in service,

c) Details of methods of assessment,

d) Variability of results, and

e) The relevance of the test to the *building element* under study.

1.3 Similar materials

1.3.1 For the purposes of evaluation, a *building element* may be considered as similar to another *building element* with proven performance, if both are subject to the same controls for composition and overall performance. Examples of such controls are Approved Documents or Standards. Where such a direct comparison is not possible, the *building element* shall be independently assessed to determine the degree of similarity.

1.3.2 Assessment shall take into account but not be limited to:

a) Product composition,

b) Method and quality assurance of manufacture,

c) Degradation mechanisms,

d) Local environment,

e) Conditions of use,

f) Required maintenance, and

g) Performance in use.

COMMENT:

Environment

1. To be acceptable, any opinion in support of the assessed durability for a *building element* shall clearly identify the conditions of use and the environment under which that durability will be achieved. If the *building element* can be reasonably expected to be used in circumstances which will reduce the durability, any limitations in use shall be clearly identified and evaluated.

2. Circumstances which need to be considered include, but are not limited to:

   a) Maintenance required to achieve the required durability (e.g. painting, cleaning, replacing high wear items such as washers),

   b) Installation details of the total system (e.g. fixings, flashings, jointing materials),

   c) Compatibility with other materials (e.g. galvanic corrosion, plasticiser migration),

d) Locality or macroclimatic effects (e.g. coastal or thermal areas, wet or damp ground conditions),

e) Microclimatic effects (e.g. sheltered areas on *buildings* such as eaves),

f) External environment influences (e.g. local industrial operations such as fertiliser works), and

g) Internal environment (e.g. swimming pools, chemical processing areas, sauna rooms).

Acceptable Solution B2/AS1

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 Acceptable Solutions and Verification Methods

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

COMMENT:
It is not practicable within the Acceptable Solutions and Verification Methods 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 application in the Acceptable Solution or Verification Method, durability shall be verified by B2/VM1.

Amends 6 and 8

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 non-specific or unquantified terms do not form part of the Acceptable Solution. Non-specific

Amend 6 Sep 2010

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.

Amend 6 Sep 2010

3.2 Timber and wood-based building products

3.2.1 The following Standards form an *Acceptable Solution* for B2/AS1 meeting the durability requirements of timber and wood-based *building elements*,

a) NZS 3602 Part 1 as modified by Paragraph 3.2.2.

b) NZS 3640 as modified by Paragraph 3.2.3.

c) NZS 3604, with reference to NZS 3602 (and NZS 3640), as modified by Paragraph 3.2.1 a) and b) above.

Amend 8 Feb 2014

COMMENT:
The use of different timbers or timber treatments to those referred to in NZS 3602 are outside the scope of this *Acceptable Solution*. Where the use of a different timber or timber treatment is proposed, it shall be separately assessed for compliance with 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.

Amend 8 Feb 2014

3.2.2 Modification to NZS 3602

3.2.2.1 Level of treatment references to radiata pine and Douglas fir solid timber in Table 1 categories 'C', 'D' and 'E' and Table 2 category 'B' shall be replaced by Tables 1A and 2A below. Table 1A and Table 2A are to be read with NZS 3602 sections 108 to 111 inclusive, with the amendments in Paragraph 3.2.2.3 below.

Amend 8 Feb 2014

Other references to radiata pine, Douglas fir solid timber and engineered wood products in NZS 3602, including Table 1 categories 'A', & 'B'; Table 2 category 'A'; and Table 3 are unaltered.

Amend 7 Apr 2011

Laminated veneer lumber (LVL) treated using LOSP borne azoles as specified for H3.1 in NZS 3640 Table 6.2 satisfies the minimum treatment requirement of H 1.2.

Amend 8 Feb 2014

Table 1A **Requirements for radiata pine and Douglas fir solid timber to achieve a (minimum) 50 year durability performance**

Ref No.	Wood-based building components	Species or type	Level of treatment (2) to NZS 3640
C – Members protected from the weather but exposed to ground atmosphere (see section 108 of NZS 3602)			
1C.1	Jackstuds, subfloor braces, bearers, wall plates, floor joists to the subfloor, blocking, subfloor wall studs, wailings and battens, wall studs and nogs, diagonal boards	Radiata pine Douglas fir	H1.2
1C.3	Interior flooring, suspended ground floors	Radiata pine Douglas fir	H1.2

NOTE

(2) Throughout Table 1A, timber treated to a higher level than the minimum satisfies the minimum requirements

D – Members protected from the weather but with a risk of moisture penetration conducive to decay (see section 109 of NZS 3602)			
Roof members (in or associated with)			
1D.1	Sarking and framing not protected from solar driven moisture through absorbent cladding materials(8)	Radiata pine Douglas fir	H1.2
1D.2	Enclosed flat roof framing and associated roof members	Radiata pine Douglas fir	H1.2
1D.3	Enclosed skillion roof framing and associated roof members	Radiata pine Douglas fir	H1.2
1D.4	Valley boards and boards supporting flashings or box gutters and flashings to roof penetrations and upstands to roof decks (10)	Radiata pine Douglas fir	H1.2
Wall members (in or associated with)			
1D.5	Framing and other members within or beneath a parapet	Radiata pine Douglas fir	H1.2
1D.6	Framing, and other members within enclosed decks or balconies	Radiata pine Douglas fir	H1.2
1D.7	Cantilevered enclosed deck joists and associated framing including joist trimmers, nogs, and blocking(5)	Radiata pine Douglas fir	H3.2
1D.8	Framing and other members supporting enclosed decks (including enclosed cantilevered decks) or balconies	Radiata pine Douglas fir	H1.2
1D.10	Battens used behind cladding to form a cavity	Radiata pine Douglas fir	H3.1
1D.14	All other exterior wall framing and other members including exterior and boundary joist (9) (11)	Radiata pine Douglas fir(14)	H1.2

NOTE

(5) H3.2 refers to preservative treatments outlined in NZS 3640.

(8) Timber shakes and shingles, and similar absorbent claddings, absorb moisture that can be driven in frame cavities by evaporation. Unless the cavities are adequately drained and ventilate, continuing condensation caused by solar driven transfer increases the moisture content in the cavities and timber framing requiring a higher level of timber treatment to resist decay.

(9) Such as joists, lintels, wall plate and double top plates, studs, together with parapets, enclosed balustrades, boxed columns and chimneys

(10) Any metal flashing shall be separated from the treated timber with building paper.

(11) Exposed ends of joists shall be protected by a boundary joist.

Amend 7
Apr 2011

Table 1A (continued) **Requirements for radiata pine and Douglas fir solid timber to achieve a (minimum) 50 year durability performance**

Ref No.	Wood-based building components	Species or type	Level of treatment (2) to NZS 3640
E – Members not exposed to weather or ground atmosphere and in dry conditions (see section 110 of NZS 3602)			
1E.1	All roof trusses, including gable end trusses, roof framing, ceiling and eaves framing, purlins and battens	Radiata pine Douglas fir(14)	H1.2
1E.2	All midfloor framing including boundary joists, ceiling framing, ceiling battens, and double top plates	Radiata pine Douglas fir(14)	H1.2
1E.3	Wall framing and roof framing (including trusses) protected from the weather, in unlined and unoccupied farm buildings and outbuildings except those not allowed in 110.2(f) of NZS 3602	Radiata pine Douglas fir	None
1E.5	Internal walls	Radiata pine Douglas fir(14)	H1.2
1E.7	Interior flooring	Pinus species Douglas fir(14)	H1.2

NOTE

(14) Exceptions to the levels of treatment for Douglas fir are provided in Paragraph 3.2.2.2 of this *Acceptable Solution* B2/AS1.

Table 2A **Requirements for radiata pine and Douglas fir solid timber to achieve a 15-year durability performance**

Ref No.	Wood-based building components	Species or type	Level of treatment(2)
B – Members protected from the weather and dampness (see section 111 of NZS 3602)			
2B.1	Non-load bearing interior wall framing	Radiata pine Douglas fir(9)	H1.2
2B.2	Stair treads, risers and handrails	Radiata pine Douglas fir(9)	None

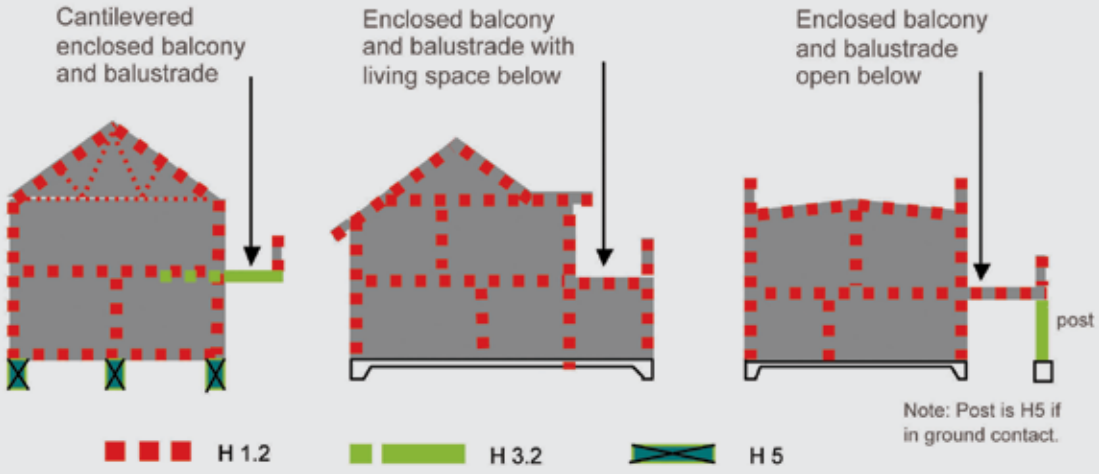
NOTE

(2) Throughout Table 2A, timber treated to a higher level than the minimum satisfies the minimum requirements

(9) Exceptions to the levels of treatment for Douglas fir are provided in Paragraph 3.2.2.2 of this *Acceptable Solution* B2/AS1.

Amend 7 Apr 2011

COMMENT:
Summary of requirements for radiata pine and Douglas fir framing for B2/AS1



3.2.2.2 Exceptions for the use of untreated Douglas fir

Preservative-free (untreated) solid Douglas fir framing may be used for roof members protected from the weather, floor members protected from the weather and not exposed to ground atmosphere, and for internal and external wall framing protected from the weather provided that the *building* meets **all** of the following requirements:

a) is a stand alone, single household unit of no more than two storeys (as defined in NZS 3604) and designed and constructed to NZS 3604, and

b) is situated in wind zones no greater than High as defined in NZS 3604, and

c) has an envelope complexity of no greater than medium risk and a deck design no greater than low risk as defined by the risk matrix in E2/AS1, and

d) has drained and vented cavities complying with E2/AS1 behind all claddings, and

e) uses roof and wall cladding systems and details conforming with Acceptable Solution E2/AS1, and

f) has a risk matrix score of no more than 6 on any external wall face as defined in E2/AS1, and

g) has a simple pitched roof incorporating hips, valleys, gables, or mono pitches, all draining directly to external gutters; but excluding internal or secret gutters, concealed gutters behind fascias, or any roof element finishing within the boundaries formed by exterior walls (eg, the lower ends of aprons, chimneys, dormers, clerestories, box windows, etc), and

h) has a roof slope of not less than 10°, and

i) if it has a skillion roof, then the roofing material shall be corrugated iron or concrete, metal or clay tiles to ensure adequate ventilation, and

j) has eaves 450 mm wide or greater for single storey houses, and eaves 600 mm or greater for two storey houses.

COMMENT:
This Paragraph 3.2.2.2 provides an option for those who do not want to use chemically treated timber in their home. In the case of commercial or other building categories, the use of untreated Douglas fir to comply with the *Building Code* is outside the scope of this *Acceptable Solution* and needs to be considered on a case-by-case basis.

Amend 7 Apr 2011

Amend 7 Apr 2011

Amend 8
Feb 2014

3.2.2.3 Modifications to to NZS 3602 sections 109, and 110

Table 1A and Table 2A are to be read with NZS 3602 sections 109 and 110 including amendments below.

109.2 (a) (iii) Delete and replace with:
Members supporting enclosed cantilevered decks having increased risk of failure due to there being single points of support.

109.2 (b) Delete and replace with:
Timber framed elements exposed to exterior weather conditions on both faces such as parapets and balustrades, or exterior boxed beams columns or chimneys.

109 (c) (vi) Delete

109 (c) (vii) Delete and replace with:
Framing and other members in exterior walls including boundary joists.

Figure 1 Delete

Figure 2 Delete

Figure 3 Delete

110.2 (b) Delete

110.2 (c) Delete and replace with:
Internal walls

110.3.1 Delete and replace with:
Floor coverings in 'wet areas' such as laundries, bathrooms, kitchens and toilets shall be as set out in E3/AS1. Where maintenance of an impervious coating cannot be assured in wet areas, plywood flooring treated to minimum H3, or solid pinus species or Douglas fir flooring treated to minimum H1.2, shall be used.

Amend 7
Apr 2011

Amend 8
Feb 2014

3.2.3 Amendments to NZS 3640.

3.2.3.1 Delete comment C3.1 and replace with the following as normative text:

3.1.1 NZBC clause B2.3.1 refers to minimum durability requirements for building elements. Timber used for structural purposes is required to be durable in-service for the life of the building, being not less than 50 years unless the building has a specified intended life. This is applicable to hazard classes H1.2, H3.2, H4, H5, and H6. Structural timber refers to timber that has been graded to characteristic strength and stiffness properties.

The minimum requirement for a H1.2 treatment for timber framing is to provide protection in-service but the preservative treatment is not designed for extended exposure to elevated moisture content.

Timber used for non-structural purposes, such as H1.1 and H3.1 is required to be durable in-service for a minimum of 5 years and 15 years respectively.

3.2.3.2 Delete clause 6.3.1.1 and replace with:

6.3.1.1 Complete sapwood penetration shall be achieved.

Amends 7 and 8

Amends 7 and 8

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.

Amend 2 Dec 2000

3.5 Insulating Glass Units

3.5.1 NZS 4223.2 is an Acceptable Solution for meeting the durability requirements of insulating glass units, within its scope.

3.5.2 Modifications to NZS 4223.2

Delete clause 5.3.

Replace with

"5.3 Marking

Insulating glass units shall be permanently and clearly marked. As a minimum, marking shall include the following:

(a) The name or registered trademark of the manufacturer or supplier;

(b) The date of manufacture (use the year as the minimum), and

(c) Complies with NZS 4223.2:2016.

Marking shall be visible after the IGU has been installed, and must be legible and durable for the life of the unit.

Amend 9 Jan 2017

NOTE -

(1) Etching and permanent laser marking are acceptable means for marking insulating glass units. Externally affixed adhesive labels are not acceptable.

(2) Additional marking may be used by the manufacturer."

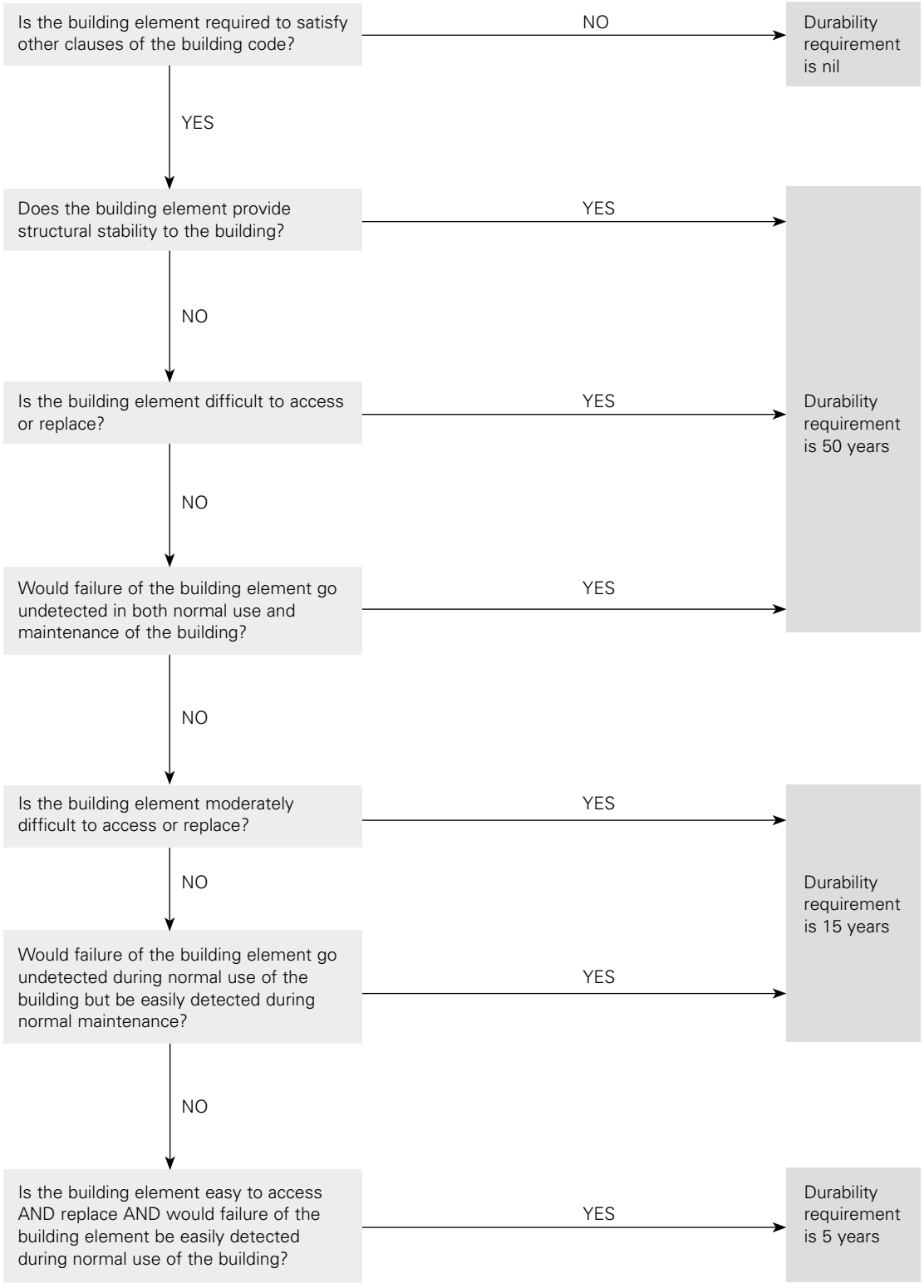
Amend 9 Jan 2017

3.6 Steel

3.6.1 SNZ TS 3404: SNZ TS 3404 is an Acceptable Solution for meeting the durability requirements of steel *building elements* within its scope.

Amend 10 Nov 2018

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



Note:
Building elements shall not be required to satisfy a durability performance which exceeds the *specified intended life* of the *building*

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
Acoustic elements		Covered by or integral with structural elements or bracing panels	✓		
		Behind non-structural *claddings* or linings	✓		
		Surface mounted		✓	
Balustrade	(Refer to safety barrier)				
Battens (Cavity battens for wall	Battens	Where wall *cladding* durability requirement is 15 years		✓	
cladding systems) *(See note at top of table)*		Where wall *cladding* provides bracing	✓		
Bracing Elements		All – includes the bracing element and fixings	✓		
Building wraps (See also wind barriers)	Roof underlay	Access requires removal of roof tiles or structural elements	✓		
(See note at top of table)		Where roof *cladding* durability requirement is 15 years		✓	
	Wall underlay	Where wall *cladding* durability requirement is not less than 50 years (e.g. providing bracing, or where the *cladding* is very durable e.g. brick veneer)	✓		
		Where wall *cladding* durability requirement is 15 years		✓	
	Wind barriers	Providing bracing (i.e. rigid wind barriers)	✓		
		Not providing bracing (non-rigid wind barriers)		✓	
Cladding	Roof	Structural	✓		
(including jointing systems)		Non-structural		✓	
	Wall	Structural including bracing elements	✓		
		Non-structural		✓	
Curtain walling	Frames and fixings	All *buildings*	✓		
	Gaskets, glazing or panelling and beads			✓	
	Internal hardware				✓
Damp-proof course (DPC)	*DPCs* under timber members	Under structural framing	✓		
		Under non-structural framing		✓	
Damp-proof membranes (DPM) *(See note at top of table)*	Damp-proofing generally	*DPMs* under concrete floor slabs	✓		

Amend 4
Apr 2004

Table 1: Durability Requirements of Nominated Building Elements (cont'd)

Building Element	Component	Situation/Function	Not less than 50 years	Not less than 15 years	Not less than 5 years
Damp-proof membranes (DPM) (Continued)	Damp-proofing generally	*DPMs* applied to the top of concrete slabs		✓	
		DPMs behind retaining walls used for landscaping		✓	
		DPMs designed for ready access and replacement		✓	
		DPM behind tiles	Same durability as the tile covering it		
	Water-proofing of basements	Tanking, except those designed for ready access	✓		
		Tanking designed for ready access		✓	
Decking (timber)	Decking	Structural (e.g. bracing diaphragm)	✓		
		Non-structural strip decking		✓	
	Sub-floor structure	All	✓		
Demountable Partitions	Partition including frame, fixings, and linings	All			✓
Doors (including frame)	Non fire rated doors	Internal			✓
		External		✓	
		Furniture and hardware			✓
	Fire rated doors	Internal		✓	
		External		✓	
		Furniture and hardware			✓
Electrical work *(See note at top of table)*	Wiring	Buried in or under concrete slabs or behind structural linings without ducts	✓		
		Concealed behind linings or in complex ducts or conduit, or surface mounted in conduit		✓	
		Wires in easy to access ducts			✓
	Fittings	Concealed and moderately difficult to access or replace	✓		
		Surface mounted			✓
	Ducting or conduit	Difficult to access or replace	✓		
		Moderately difficult to access or replace		✓	
Fire rated walls		Structural walls including bracing elements	✓		
		All others		✓	
Fixings	Nails and screws	Used to fix structural or difficult to replace *building elements*	✓		
		Under water-proof membranes	✓		
		Under roofing membranes	✓		
		Used to fix non-structural or moderately difficult to replace *building elements*		✓	
	Bolts	Used to fix structural or difficult to access or replace *building elements* including structural elements of decks and barriers	✓		

Amend 4
Apr 2004

Table 1: Durability Requirements of Nominated Building Elements (cont'd)

Building Element	Component	Situation/Function	Not less than 50 years	Not less than 15 years	Not less than 5 years
Fixings (Continued)	Bolts	Used to fix non-structural or moderately difficult to replace *building elements*		✓	
	Brick ties and fixings	All	✓		
	Proprietary fixings	Used to fix structural or difficult to replace *building elements*	✓		
		Used to fix non-structural or moderately difficult to replace *building elements*		✓	
	Adhesives	Used to fix structural or difficult to replace *building elements*	✓		
		Used to fix non-structural or moderately difficult to replace *building elements*		✓	
	Face fixings	Used to fix accessories, door furniture and hardware			✓
Flashings *(See note at top of table)*	Roof, wall or window	All flashings to roof *cladding*, *flues* and other roof penetrations		✓	
		Requires the removal of *cladding* 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 *cladding* to be replaced		✓	
		Requires the removal of the *cladding* to be replaced	✓		
Flooring – sheet or strip *(See note at top of table)*		Floor bracing diaphragm	✓		
		Flooring laid under bottom plates	✓		
		Flooring laid between bottom plates		✓	
Floor coverings		Protective or acoustic coverings			✓
Flue systems	All *flue* systems	Those built into the floor, wall, ceiling or roof		✓	
		Those exposed to view or penetrating the floor, wall, ceiling or roof through a sleeve			✓
Framing	(refer to wall framing or to roof framing as appropriate)				
Guttering and downpipes *(See note at top of table)*		Gutters or downpipes incorporated within the structure (e.g. down-pipes cast into a column or boxed in behind *claddings*), or secret gutters (e.g. hidden verge or valley gutters)	✓		
		Internal or valley gutters, fascia gutters or built-in downpipes		✓	
		External gutters and downpipes			✓
Heating Appliances	Solid fuel	Freestanding			✓
		Inbuilt		✓	
	Gas	Freestanding			✓
		Inbuilt		✓	
	Electric	Permanently wired			✓

Amend 4
Apr 2004

Table 1: Durability Requirements of Nominated Building Elements (cont'd)

Building Element	Component	Situation/Function	Not less than 50 years	Not less than 15 years	Not less than 5 years
Insulation	Sub-floor		✓		
	Walls		✓		
	Ceiling or roof	Skillion roof	✓		
		Accessible ceiling or roof space	✓		
Interior wall linings		Structural linings (e.g. bracing elements)	✓		
		Shower linings (excluding behind tiled showers)		✓	
		Linings behind tiled showers	Same durability as tile covering it		
		Easy to access and replace			✓
Lintels	Steel angle (brick veneer)	All situations	✓		
	Flat steel	All situations	✓		
Plumbing and piping	Piping and fittings	Cast into concrete	✓		
		Under slabs	✓		
		Installed in a masonry cavity and not ducted or provided with maintenance access	✓		
		Concealed behind wall linings or installed in maintenance ducting		✓	
		Surface mounted and easy to replace			✓
	Valves	Concealed or moderately difficult to replace		✓	
		Surface mounted and easy to replace			✓
	Fixtures				✓
	Outlets				✓
Protective Coatings		Paint systems that are difficult to access or replace	✓		
		Roofing membranes		✓	
		Paint systems that are easy to access and replace			✓
Roof framing including trusses, purlins, tile battens and bracing members			✓		
Roofing tile battens			✓		
Safety barrier (balustrade, baluster, and handrail)	Support posts, *handrails*		✓		
	Balusters			✓	
Septic tanks		Built into or under the structure of a *building*	✓		
		Easy to access units (e.g. in-ground but accessible)		✓	
		Effluent field		✓	

Amend 4
Apr 2004

Table 1: Durability Requirements of Nominated Building Elements (cont'd)

Building Element	Component	Situation/Function	Not less than 50 years	Not less than 15 years	Not less than 5 years
Stairs and ladders (for *balustrades* refer to safety barriers)	Stringers		✓		
	Treads	Difficult to replace	✓		
		Moderately difficult to replace		✓	
	Ladders including rungs			✓	
Tiling	Walls and floors (including showers)	Tiling in wet areas		✓	
	Walls and floors	Decorative finish only	No durability requirement under the *building code*		
Under-floor heating	Heating coils	Buried in concrete slabs	✓		
		Accessible coils		✓	
	Cables and fittings	Buried in concrete slabs	✓		
		Accessible cables and fittings		✓	
Vapour barriers		Behind structural elements or difficult to access and replace	✓		
		Behind non-structural internal linings		✓	
		High gloss paint finish			✓
Ventilation	Plant	All		✓	
	Ducting	Built-in ducting		✓	
		Easy to access and replace			✓
	Fittings				✓
Vermin proofing		Built into structure	✓		
		Moderately difficult to access or replace		✓	
		To drained ventilated cavity	Same durability as the *cladding* covering it		
Water heaters	Continuous flow heaters	Moderately difficult to access or replace (e.g. installed in cupboard)		✓	
		Easy to access or replace (e.g. on internal or *external wall*)			✓
	Storage water heaters	Moderately difficult to access or replace (e.g. installed in cupboard)		✓	
		Easy to access but moderately difficult to replace		✓	
Wall framing including dwangs or nogging	Timber or steel	Load-bearing framing	✓		
		Easy to access lined, non-load-bearing partitions		✓	
		Easy to access unlined, non-structural partitions or non-load-bearing demountable partitions			✓
	Structural Steel	All	✓		
Windows	Frame and interior reveals	Structural units	✓		
		External window/door joinery		✓	
		Internal window joinery			✓

Amend 4
Apr 2004

Table 1: Durability Requirements of Nominated Building Elements (cont'd)

Building Element	Component	Situation/Function	Not less than 50 years	Not less than 15 years	Not less than 5 years
Windows (Continued)	Gaskets, glazing and glazing beads	Moderately difficult to access or replace		✓	
	Hardware				✓

Amend 4 Apr 2004

Index B2/VM1 & AS1

All references to Verification Methods and Acceptable Solutions are preceded by **VM** or **AS** respectively.