Department of
Building and Housing
Te Tari Kaupapa Whare

Amendment 7, effective 4 April 2011, to the Compliance Document for Clause B2 Durability of the New Zealand Building Code.

Section	**Old B2**	**April 2011 Erratum to B2**
Title pages	Remove title page and document history	Replace with new title page and document history
Contents	Remove pages 5–6	Replace with new pages 5–6
References	Remove pages 7–8	Replace with new pages 7–8
B2/AS1	Remove pages 15–16	Replace with new pages 15, 15A–15F, 16

Compliance Document for New Zealand Building Code Clause B2 Durability

Prepared by the Department of Building and Housing

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Status of Compliance Documents

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Users should make themselves familiar with the preface to the New Zealand Building Code Handbook, which describes the status of Compliance Documents and explains alternative methods of achieving compliance.

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 Compliance Document.

B2: Document History

	Date	Alterations	
First published	July 1992		
Amendment 1	September 1993	p. 3, Table 1	
Second Edition	28 February 1998	Document revised – second edition issued	
Amendment 2	1 December 2000	p. ii, Document History p. v, Contents p. vi, References	p. 5, 3.2.2, 3.3, 3.4 p. 9, Index
Amendment 3	1 July 2001	p. 2, Document History, Status p. 7, References	p. 8, 5.0.1
Amendment 4	1 April 2004	p. 2, Document History p. 7, References pp. 9–10, Definitions	p. 15, 3.2.1 Comment pp. 17–22 Table 1 p. 23 Index
Amendment 5	1 April 2004	p. 7, References p. 9, Definitions	p. 15, 3.2.1, 3.2.2, 3.2.3
Amendment 5 regarding timber treatment is subject to a transitional provision.			
Reprinted incorporating Amendments 3, 4 and 5	April 2004		
Amendment 6	Published 30 June 2010 Effective from 30 September 2010	p. 2, Document History, Status p. 5, Contents p. 7, References	pp. 9–10, Definitions pp. 13–15, B2/AS1 1.1, 3.1.1, 3.2.1, 3.2.2
Reprinted incorporating Amendment 6	Published 30 June 2010 Effective 30 September 2010		
Amendment 7	Effective 4 April 2011 Supercedes Amendment 6 version 30 July 2011	p. 2, Document History, Status p. 5, Contents	p. 7, References pp. 15–15F, 3.2.1, 3.2.2, 3.2.3

Notes:
- B2/AS1 Amendment 7 version is effective from 4 April 2011.
- Up to 30 June 2011, B2/AS1 Amendment 6 version may also be used.
- From 1 July 2011, only B2/AS1 Amendment 7 version applies, and supersedes all previous versions of the document.

Note: Page numbers relate to the document at the time of Amendment and may not match page numbers in current document.

Document Status

The most recent version of this document, as detailed in the Document History, is approved by the Chief Executive of the Department of Building and Housing.

People using this Compliance Document should check for amendments on a regular basis. The Department of Building and Housing may amend any part of any Compliance Document at any time. Up-to-date versions of Compliance Documents are available from www.dbh.govt.nz

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.

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Amend 6 Sep 2010

		Where Quoted
Standards New Zealand		
NZS 3101:-	Concrete structures standard	
Part 1: 2006	The design of concrete structures *Amend: 1, 2*	AS1 3.1.1
NZS 3602:-		
Part 1: 2003	Timber and wood-based products for use in building	AS1 3.2.1, 3.2.2
NZS 3604: 1999	Timber framed buildings *Amend: 1*	AS1 3.2.3
NZS 3640: 2003	Chemical Preservation of round and sawn timber *Amend: 1, 2, 3 and 4*	AS1 3.2.1, 3.2.3
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

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Amend 3 Jul 2001

Amend 2 Dec 2000

Amend 5 Apr 2004

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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

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

a) Part 1 of NZS 3602 for listed species, excluding radiata pine and Douglas fir solid timber

b) NZS 3640 and Part 1 of NZS 3602 for radiata pine and Douglas fir solid timber, with the amendments set out in Paragraphs 3.2.2 and 3.2.3

c) NZS 3604, with reference to NZS 3602 (and NZS 3640) as amended in Paragraph 3.2.1 b).

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.

3.2.2 Amendments to NZS 3602 for Paragraph 3.2.1 b) above.

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.

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

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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.

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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.

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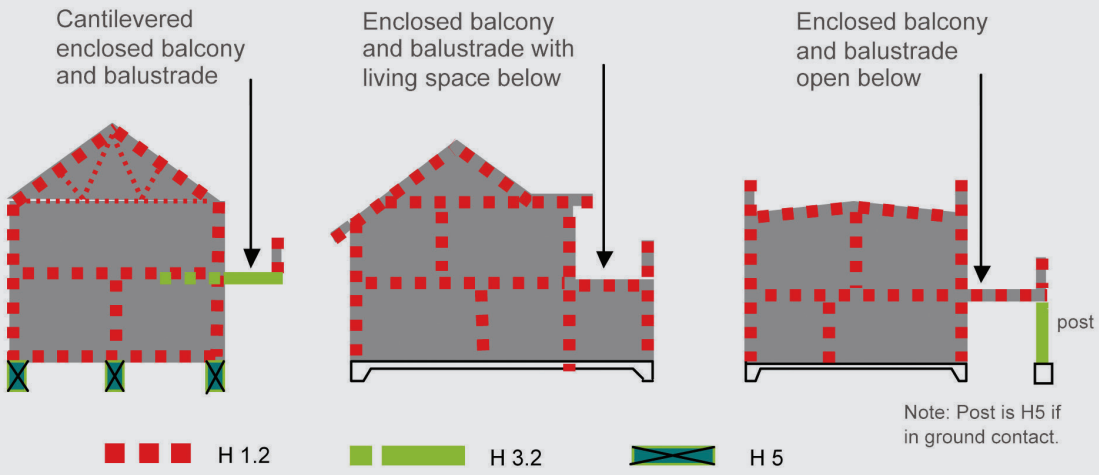
COMMENT:
Summary of requirements for radiata pine and Douglas fir framing for B2/AS1



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.

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3.2.2.3 Amendments 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.

COMMENT:
For Paragraph 3.2.1 a) above, sections 109 and 110 of NZS 3602 remain unaltered.

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3.2.3 Amendments to NZS 3640 for 3.2.1 b) above.

3.2.3.1 The following treatments listed in NZS 3640 shall not be used as framing preservative: Bis-(tri-n-butyltin) oxide (TBTO), Bis-(tri-n-butyltin) naphthenate (TBTN), and Iodo propynyl butyl carbamate (IPBC).

3.2.3.2 Table 4.4 – remove H1.2 from the hazard classes column in the Copper napthenate (CuN) line.

COMMENT:
Including H1.2 hazard class for CuN is inconsistent with H1.2 preservatives listed in Table 6.1.

3.2.3.2 Table 5.2 – Colour coding for timber to be used as framing shall be replaced with the following Table:

Table 5.2 **Colour coding for timber to be used as framing**

Hazard class	Preservative	Colour (1)
H1.2	Boron	Pink(2)
H3.1	Propiconazole + tebuconazole/permetherin	No added colour(3) or green (4)

Note –

(1) These colours shall not be used for any preservative types/hazard classes other than specified.

(2) Colour – Red 112 (red) or Red 122 (pink).

(3) H3.1 framing shall be branded repetitively along the length at 1500 mm centres maximum on its face or edge.

(4) If coloured green, the colour is to be distinctly different (Colour Green 368) from the green of the H3.2 preservative treatment – *see C Table 5.2 (a)* below.

3.2.3.3 Table 6.1 – Minimum preservative retention in the H1.1, H1.2 analysis zone (sawn timber), shall be replaced with the following table:

Table 6.1 **Minimum preservative retention in the H1.2 analysis zone (sawn timber)**

Preservative type	Component	Retention %m/m oven Dry weight of wood
		H1.2
Waterborne preservatives		
Boron compounds –		
Softwoods x-sect	H_3BO_3	0.40(1)

Note:

(1) This cross-section retention is required whether the material is sampled wet, where the timber is intended to be air dried, or on the dry timber

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3.2.3.4 Note (1) of Table 6.2 shall be deleted and replaced with the following:

(1) Boron compounds are approved for H3.1 only for timber boards for fascia, cladding, joinery, cavity battens and other timber components less than 30 mm thick and only when an oil alkyd, modified acrylic or modified latest grey pigmented coating is applied to all timber surfaces, after treatment and before dispatch from the treatment plant.

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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.

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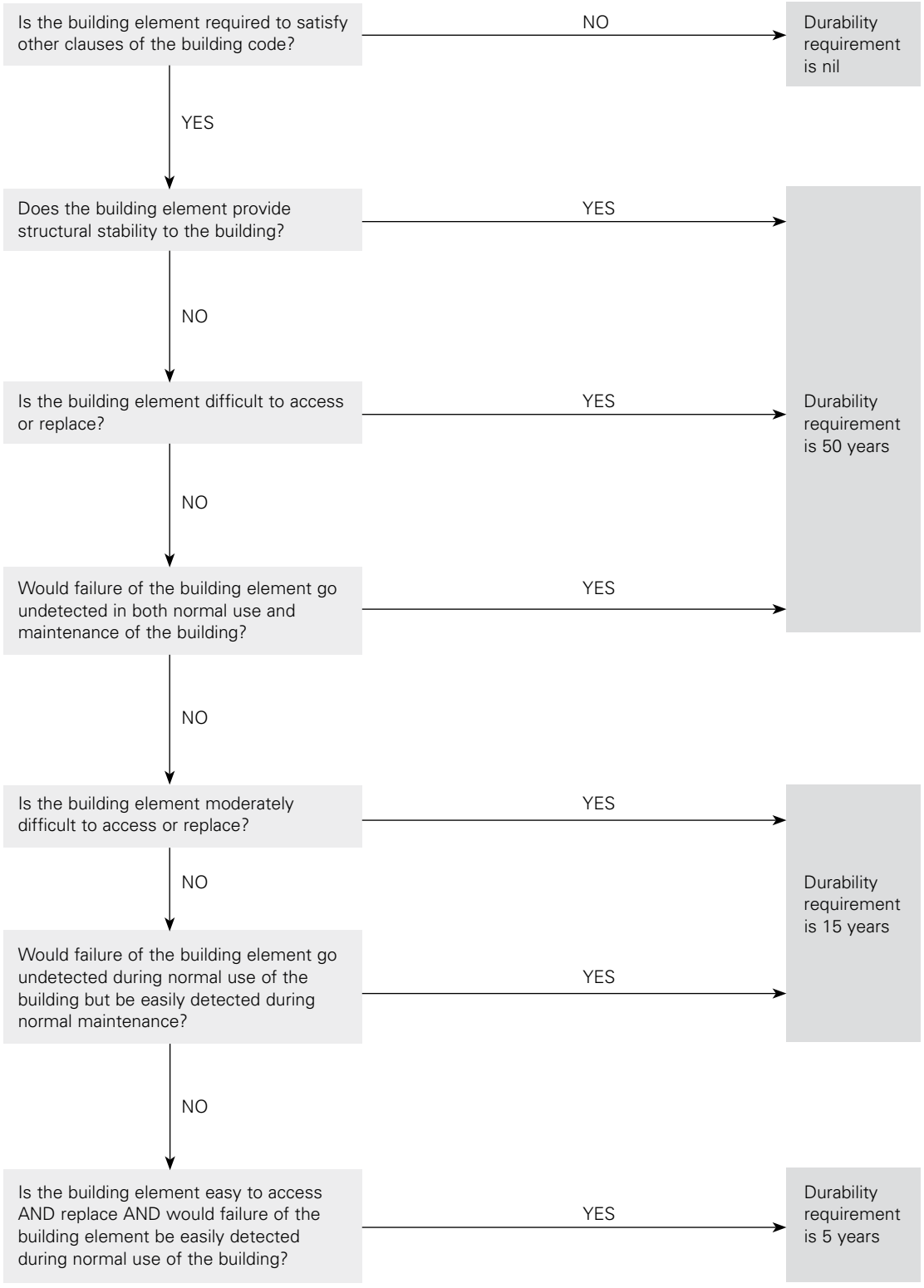
Figure 1: **Assessment of Durability Requirement**
Paragraph 1.2.2



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