

Timber Framing Concessions for Class 2 and 3 Buildings

Purpose

This guidance document will explain the:

- background to the concessions in Clause 3.10 and 4.3 in Specification C1.1 of the National Construction Code (NCC), Building Code of Australia (BCA), Volume One; and
- related compliance requirements and the operation of Section C of the BCA; and
- observations made by the VBA about practitioners applying these parts of the BCA; and
- the VBA's approach to enforcement activity where it considers non-compliance has occurred.

Background

Clauses 3.10 and 4.3 of Specification C1.1 were introduced in the BCA 1990 Amendment No 07 (Timber Framing Concessions). The purpose was to allow '3 storey walk up' type apartment buildings to be constructed using timber framing. As the BCA was not performance-based until BCA 1996, the use of timber was prohibited because there were prescriptive requirements for concrete or masonry and for external walls to be non-combustible in Type A and B construction.

The inclusion of the Timber Framing Concessions followed a submission by the National Association of Forest Industries (NAFI). The submission included results from a series of research projects that investigated fire performance when timber framing was used in prototype wall systems intended for use in Class 2 buildings. The research compared masonry construction with other models using timber framed construction. The submission recommended that timber framed construction be allowed for Class 2 buildings up to three storeys in height, subject to specific measures being implemented. These measures related to fire-rated construction, automatic smoke alarm system requirements and lightweight construction. The submission was put forward on the basis that all other requirements of the BCA were still required to be met, including that the external walls of the building would otherwise be non-combustible.

The Australian Building Codes Board (ABCB) released an Advisory Note in July 2019, explaining the intent of the concession and how it was to allow the use of elements containing timber framing or non-combustible materials such as steel beams, lintels or columns, where concrete, masonry and non-combustible materials was otherwise required. The Advisory note clarified that the Timber Framing Concessions were never intended to allow combustible components, including external wall cladding, to form part of the external wall system.

Following the Advisory Note, an out of cycle amendment to the BCA 2019 was developed to refine the wording of Clauses 3.10 and 4.3 of the BCA to further clarify the concessions for buildings of Type A and B construction and more clearly reflect their intended purpose. On the 1 July 2020, BCA 2019 Amendment 1 was adopted in Victoria. Where the Timber Framing Concession was misinterpreted and applied in a manner inconsistent with the intent of the BCA provisions allowing for use of the concession, the VBA considers that the construction is not compliant with the Deemed-to-Satisfy (DtS) requirements of the BCA.

Compliance Requirements

Class 2 and 3 Building Concessions

If the DtS Provisions are being used to determine compliance for a Class 2 or 3 building of Type A or B construction, Clauses 3.10 or 4.3 can be applied, which will allow the use of timber framing and non-combustible materials as part of external walls. Application of the concessions do not remove other critical compliance requirements in Section C, including the requirements for fire-resisting construction, non-combustible cladding, vertical separation of openings and lightweight construction.

Diagrams showing the acceptable use of the Timber Framing Concession to a range of scenarios have been included at the end of this document.

Type A Construction

The concession in Clause 3.10 of Specification C1.1 of the BCA can apply to a Class 2 or 3 building of Type A construction with a rise in storeys of not more than three, where the building is constructed using timber framing, non-combustible material, or a combination. In order to attract the concession, there are preconditions that must be met, including that any insulation in the cavity of a wall required to have an FRL is non-combustible, and the building is fitted with an automatic smoke alarm system complying with Specification E2.2a of the BCA.

The concession can also be applied to a Class 2 or 3 building with a rise in storeys of not more than four, where the top three storeys can attract the concession. In order to apply the concession in this scenario, there are certain preconditions that must be met. The lowest storey must be:

- (a) used solely for the purpose of parking motor vehicles or for some other ancillary purpose; and
- (b) constructed of concrete or masonry, including the floor between it and the Class 2 or 3 part above; and
- (c) separated from the storey above it by an FRL of 90/90/90, with only specific penetrations permitted.

Type B Construction

The concession in Clause 4.3 of Specification C1.1 of the BCA can apply to a Class 2 or 3 building of Type B construction, with a rise in storeys of not more than two where the building is constructed using timber framing, non-combustible material, or a combination. To attract the concession, there are preconditions that must be met, including that any insulation in the cavity of a wall required to have an FRL is non-combustible, and that the building is fitted with an automatic smoke alarm system complying with Specification E2.2a of the BCA.

The concession can also be applied to a Class 2 or 3 building with a rise in storeys not more than two, where the top storey can attract the concession. In order to apply the concession in this scenario, there are certain preconditions that must be met. This includes that the lowest storey must be:

- (a) used solely for the purpose of parking motor vehicles or some other ancillary purpose; and
- (b) constructed of concrete or masonry, including the floor between it and the Class 2 or 3 part above; and
- (c) separated from the storey above by an FRL of 90/90/90, with only specific penetrations permitted.

Non-combustible Insulation

In order to apply the Timber Framing Concession, any insulation installed in the cavity of a wall required to have a FRL must be non-combustible. In order to confirm this, evidence of suitability must be provided. To demonstrate that the proposed insulation is non-combustible, the BCA requires that the material is subject to AS 1530.1 and not deemed combustible, or the material may be deemed non-combustible by Clause C1.9(e) of the BCA.

Fire-resisting Construction

The DtS provisions of Clause C1.1 and Specification C1.1 requires loadbearing and non-loadbearing parts of external walls to achieve the required FRL, depending on the distance the building element is from a fire- source feature.

The DtS provisions of Clause 2.2 in Specification C1.1 require that if a part of a building required to have an FRL is dependent upon vertical or lateral support from another part of the building to maintain its FRL, the supporting part must have the same FRL.

Where the DtS provisions require a building element to have an FRL, evidence of suitability must be provided when assessing the proposed design. Clause A5.4 requires that this must be determined in accordance with Schedule 5.

Schedule 5 sets out the procedures for determining the FRL of building elements and lists several methods that may be used to meet the Schedule. Where the building element is an external wall system (a wall system incorporating multiple components including an external cladding element), the applicable method is outlined in Clause 2(b) and (c).

Under Clause 2(b), a building element can be accepted as achieving the FRL, if it is identical with a prototype that has been submitted to the Standard Fire Test (as described in AS 1530.4), or an equivalent or more severe test. The FRL achieved by the prototype must be confirmed in a report from an Accredited Testing Laboratory (ATL). The report needs to describe the method and conditions of the test and the form of construction of the tested prototype in full, and certify that the application of restraint to the prototype complied with the Standard Fire Test.

Under Clause 2(c), a building element is allowed to differ from the tested prototype but only in a minor degree and only if the FRL of the differing building element has been confirmed in a report from an ATL as being capable of achieving the FRL despite the minor departure. The confirmation test report must describe the materials, construction and conditions of restraint which are necessary to achieve the FRL.

In order to comply with the requirements of Clause A5.4 and Schedule 5, the external wall system, including junctions between other elements and penetrations in the wall, must have been tested to AS 1530.4 and be identical with the prototype, or differ in only a minor degree where this is confirmed as sufficient in a report from an ATL.

Vertical Separation of Openings in External Walls

The DtS Provisions of Clause C2.6 apply to some buildings of Type A construction and require openings in external walls to be separated by spandrels, curtain/panel walls or horizontal construction that meet specified requirements. Where a building has a sprinkler system (other than FPAA systems) complying with Specification E1.5, these requirements do not apply.

For the purpose of Clause C2.6, a part of an external wall of a building that does not have an FRL of 60/60/60 or greater is considered an opening. There are often scenarios where non-loadbearing parts of external walls would not achieve an FRL of 60/60/60.

Under Clause 2.6, spandrels, curtain/panel walls or horizontal construction used to separate openings must be non-combustible and achieve an FRL of 60/60/60.

Lightweight Construction

In a cladding context, lightweight construction is defined in the BCA as construction which incorporates or comprises sheet or board material, plaster, render, sprayed application, or other material similarly susceptible to damage by impact, pressure or abrasion.

The DtS provisions of Clause C1.8 and Specification C1.8 require lightweight construction used in wall systems required to have an FRL to be subject to specific tests to ensure its integrity is preserved in a fire. This is largely due to lightweight construction being more susceptible to damage than other forms of fire protection.

The DtS provisions of Clause 3.4 of Specification C1.8 require that an external wall of lightweight construction must be subject to four tests and fulfil certain criteria.

Clause 3.4(a) requires the material tests in Clause 5(a) and the criteria in Clause 6(a) to be satisfied. These Clauses require the material to be tested in accordance with the standards adopted by reference in the BCA. Where a material is being used that is adopted by reference in the BCA, there needs to be appropriate evidence of suitability to confirm that lightweight construction meets the requirements of Specification C1.8. Expanded polystyrene cladding (EPS), aluminium composite panels (ACP) and other types of wall cladding systems do not have standards adopted by the BCA, therefore a Performance Solution would need to be developed as use of these products is outside the scope of the DtS Provisions.

Other Requirements

There are no DtS Provisions in the BCA to meet Performance Requirement FP1.4 for the weatherproofing of an external wall. In all circumstances for a Class 2 or 3 building, a Performance Solution must be developed to confirm how Performance Requirement FP1.4 has been satisfied.

Some specific materials or cladding products commonly used in external wall construction are not the subject of DtS structural provisions. Where a product or material, such as expanded polystyrene or aluminium composite panels do not have standards adopted by reference in the BCA, a Performance Solution must be developed to confirm how Performance Requirements BP1.1 and BP1.2 have been satisfied.

VBA Audit Observations

In the audits undertaken by the VBA surrounding the use of the Timber Framing Concessions, several failures in the application of the concession and wider compliance requirements of the BCA have been identified.

The concessions in Clause 3.10 or 4.3 can only be applied to Class 2 or 3 buildings. The VBA has observed the concessions being applied to buildings that include other classifications, including Class 6 parts. This can only occur where the design is supported by a documented Performance Solution.

If applying the concessions in Clause 3.10 or 4.3 to situations that include another storey used for the purpose of parking motor vehicles, there are preconditions that must be met surrounding the use and construction of the lowest storey. The VBA has observed the concession being applied outside of these preconditions, including in situations where the lowest storey is used for mixed purposes.

The VBA has also observed the concession being applied without any reference in approved documents to the insulation product to be used in walls required to have an FRL and in particular, without any evidence of suitability to confirm the insulation will be non-combustible.

Where external wall systems or spandrels are required to have an FRL, the element must have been tested to AS 1530.4 and be identical with the prototype, or differ in only a minor degree as confirmed in a report from an ATL. The VBA has observed situations where approved documentation has no information about the product to be used for the wall system with generic references to 'EPS cladding' or 'Foam cladding' being approved. There are also many instances where there is no evidence of suitability in accordance with Clause A5.4, Schedule 5 and AS 1530.4 to confirm external wall systems and spandrels have the required FRL and are consistent with the tested prototype.

In many instances, the Timber Framing Concessions have been applied in addition to multiple other Performance Solutions relating to fire Performance Requirements, with no consideration given as to how the Performance Solutions and the use of the concession impact on the fire safety of the building as a whole. Where a combination of Performance Solutions and DtS Solutions are used, Clause A2.4 of the BCA prescribes the mandatory method that must be followed.

Cladding rectification

It is important that the correct intent and application of the BCA is applied to any decision by a municipal building surveyor regarding the danger to life or property and whether enforcement action should be considered in relation to buildings with identified combustible cladding.

VBA Position in Disciplinary Action

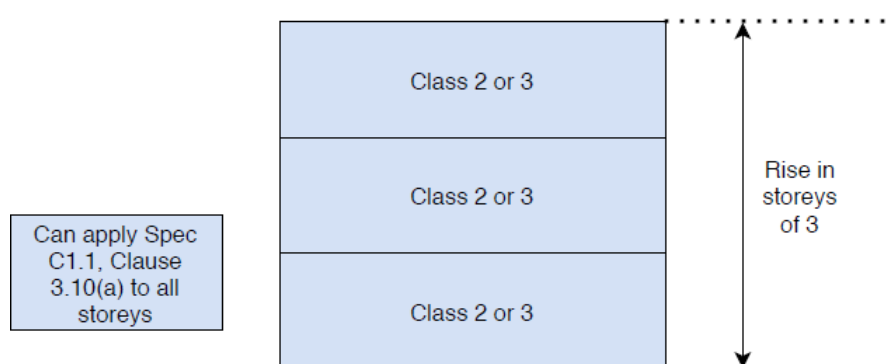
The VBA notes that the ABCB stated intent of the Timber Framing Concessions always was to allow for timber framing only and that the relevant provisions of the BCA never permitted combustible cladding to be installed on the external walls of buildings in the absence of a Performance Solution. It is acknowledged that the concessions before the release of the ABCB Advisory Note and BCA 2019 Amendment 1 may have been misapplied by some (in a manner that was not consistent with its intent).

Although a case by case assessment still applies, the VBA will adopt the following general position to a practitioner's application of Clause 3.10 and 4.3 if the decision was made prior to release of the ABCB Advisory Note on 1 July 2019. The BCA needs to be read in a holistic manner. In rare cases where building practitioners have misapplied the concessions, but all the preconditions applying to the concessions were satisfied with appropriate evidence, and there are no other compliance issues, the VBA's general position, from the date of this practice note, is that it will not take disciplinary action against a practitioner solely on their misapplication of the concessions.

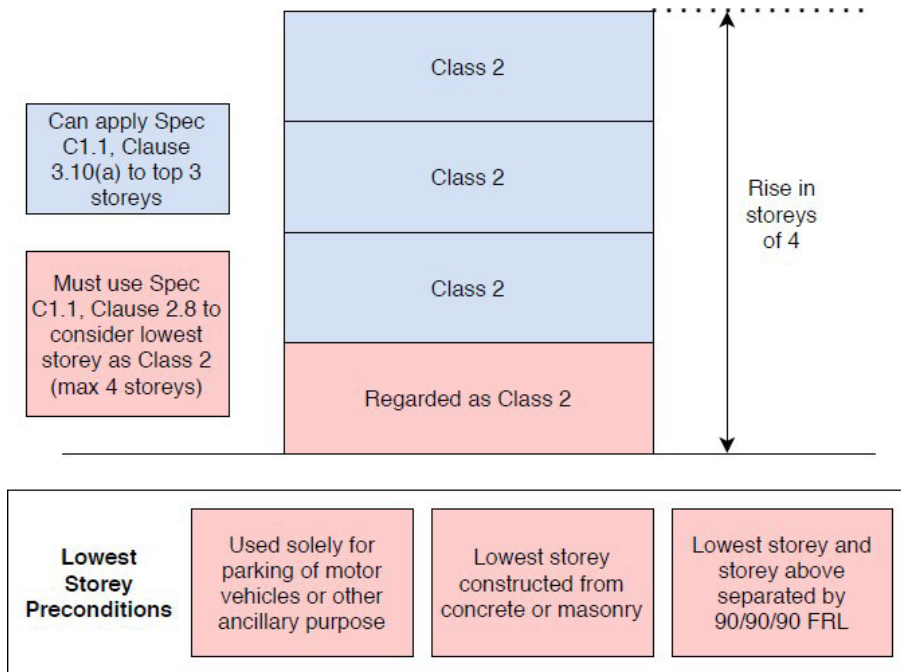
Diagrams

Type A Construction

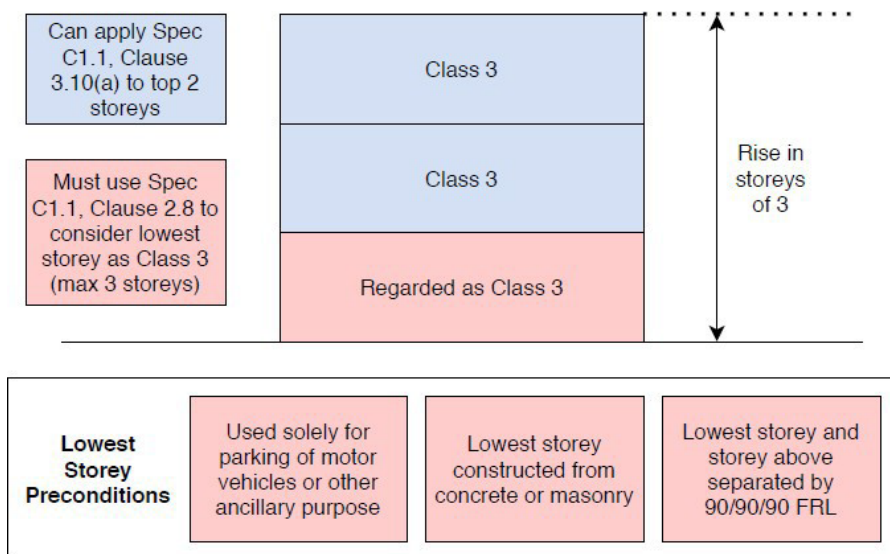
Application of Clause 3.10(a) to a Class 2 or 3 Building



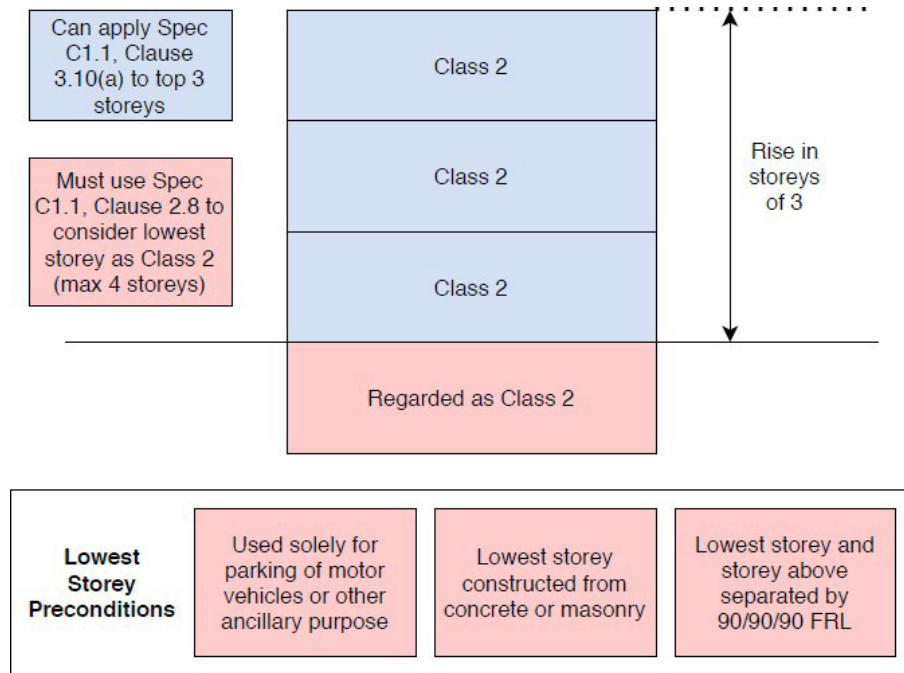
Application of Clause 3.10(a) and (b) to a Class 2 Building with Carparking



Application of Clause 3.10(a) and (b) to a Class 3 Building with Carparking

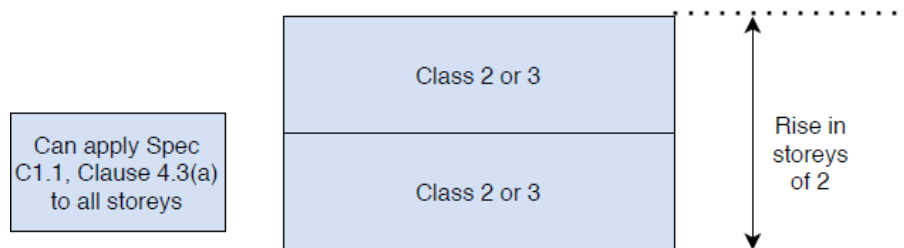


Application of Clause 3.10(a) and (b) to a Class 2 Building with Basement Carparking

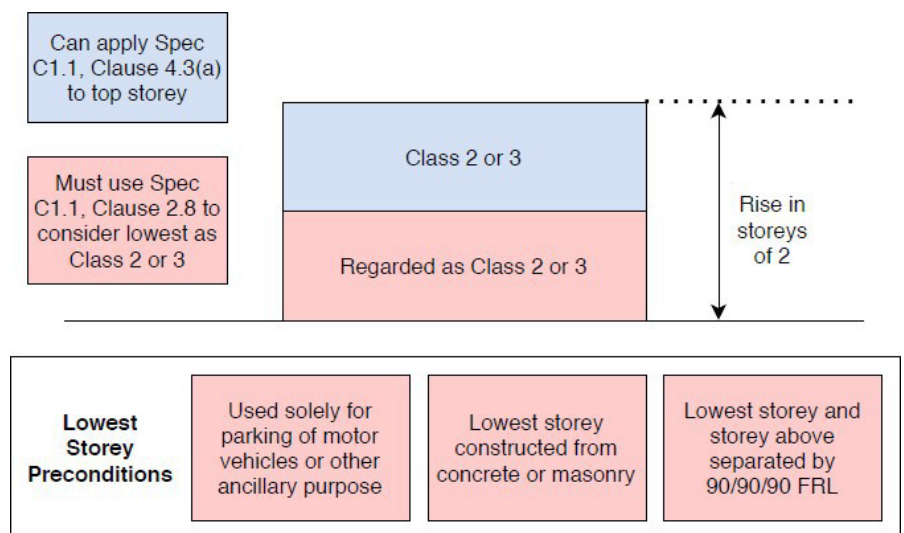


Type B Construction

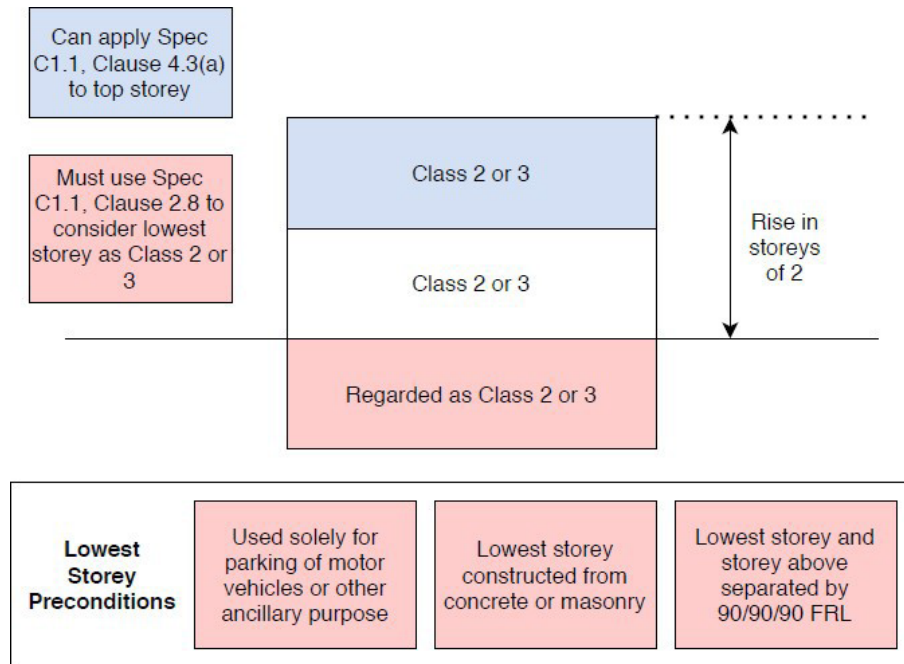
Application of Clause 4.3(a) to a Class 2 or 3 Building



Application of Clause 4.3(a) and (b) to a Class 2 or 3 Building with Carparking



Application of Clause 4.3(a) and (b) to a Class 2 or 3 Building with Basement Carparking

**Want to know more?**

If you have any questions about this information, please contact the VBA.

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