

Building Practice Note EE-04: Alterations to existing Class 1 buildings

This Practice Note provides guidance on the energy efficiency requirements for alterations to an existing Class 1 building and compliance with the Building Act 1993, the Building Regulations 2018 and the National Construction Code 2019.

The content below provides guidance on:

- Compliance requirements for alterations to existing buildings
- Alterations and extensions to existing buildings
- Using NatHERS software to assess a proposed alteration to an existing dwelling
- Applying Elemental Provisions to a proposed alteration to an existing building
- Relocated and prefabricated homes



For guidance on the energy efficiency requirements for new residential buildings, refer to [Building Practice Note EE-03: New Residential Buildings](#).

Abbreviations & Definitions

The abbreviations and definitions set out below are for guidance only. They are not intended to vary those set out in the Building Act 1993 (Act), the Building Regulations 2018 (Regulations) or the National Construction Code 2019 (NCC).

- **Act** – Building Act 1993
- **BAB** – Building Appeals Board
- **BCA** – Building Code of Australia 2019 Volume Two
- **DtS** – Deemed-to-Satisfy
- **NatHERS** – Nationwide House Energy Rating Scheme
- **NCC** – National Construction Code 2019
- **PCA** – Plumbing Code of Australia 2019
- **RBS** – Relevant Building Surveyor
- **Regulations** – Building Regulations 2018

Compliance requirements for alterations to existing buildings

Alterations and extensions to Class 1 and Class 10a buildings must comply with the Regulations, which incorporate the NCC. The Regulations modify the NCC in some situations, and regulation 233 has specific provisions relative to alterations and extensions. Therefore, subject to the extent of the work, there are generally two options to consider for compliance:

- compliance with the provisions of the NCC, and
- partial compliance as permitted within the Regulations.

Compliance with the NCC means satisfying performance requirements P2.6.1 and P2.6.2 for the alteration or extension, and for the existing building, where triggered.

Regulation 233 of the Regulations gives the RBS discretionary powers to consider partial compliance. This allows for alteration work, which may not reasonably be able to satisfy performance requirements P2.6.1 and P2.6.2, to achieve an acceptable compliance outcome.

Alterations and extensions to existing buildings

Alterations to an existing building

Regulation 233 has specific provisions in regard to meeting the NCC compliance and where consent to partial compliance may be considered. These requirements are based on volume for alterations and floor area for additions. Application of partial compliance is summarised in Table 1 and Table 2 below.

Volume alteration	Application & Limitations	Consent to partial compliance
Less than 50% of existing building, including work done in the past 3 years	<ul style="list-style-type: none"> New building work only must comply with the Regulations - reg 233(1) & (2) 	Available
50% of existing building or greater, including work done in the past 3 years	<ul style="list-style-type: none"> New building work and existing building must comply with the Regulations - reg 233(1) & (2) Existing building may be considered in partial compliance determination - reg 233(3) Limitations on partial compliance remain present for new additions - see Table 2 	Available

Table 1: Application of Regulations and availability of partial compliance for alterations to existing buildings

Floor area addition	Application & Limitations	Consent to partial compliance
Less than 25% of existing building	<ul style="list-style-type: none"> New building work only must comply with the Regulations - reg 233(6) New building work and existing building may be considered in partial compliance determination 	Available
Extension greater than 25% of the existing building (or the lesser of 25% or 1000m ²)	<ul style="list-style-type: none"> New building work only must comply with the Regulations - reg 233(3) & (6) Applies to the extension component of building work only Existing parts of the building may still be subject to partial compliance determination - see Table 1 	Not available

Table 2: Application of Regulations and availability of partial compliance for additions to existing buildings

Calculation of volume

There is no specific requirement for how to calculate the volume for the purpose of regulation 233, therefore the RBS can use a level of professional judgement and their own discretion to apply the most appropriate method for the particular circumstances.

By way of guidance, the volume of alterations may be determined by the sum of the building spaces above the sub-floor. The building spaces are defined by:

- the enclosing external walls; and
- the roof space and roof structure; and
- the area covered by verandahs and other roofed structures forming part of the building.

Areas below the sub-floor framing may not need to be included except where these areas contain rooms, garages, etc. that are enclosed by walls, floor and roof/ceiling.

Example 1: Calculation of volume for an alteration that includes an extension

An opening is being incorporated into a wall to form a new room or increase the size of a room. The roof structure remains unaltered and it is the only work completed in the past three years. Figure 1 shows the building used in this example.

The volume of the alteration is: the area of the two rooms x the height of the rooms:

$$3.3 (W) \times 5.7 (L) \times 3 (H) = 56.43\text{m}^3$$

The volume of the extension is: the area of the extension x the height of the room:

$$3.3 (W) \times 2.1 (L) \times 3 (H) = 20.79 \text{ m}^3$$

The existing home's volume is:

$$7.3 (W) \times 9.3 (L) \times 3 (H) = 203.67 \text{ m}^3$$

The alteration as a percentage can now be determined as: $100 \times 56.43/203.67 = 28\%$

Example 2: Calculation of volume for a minor alteration

A window or door is being altered in an external wall. The volume calculation will only apply to the portion of wall being altered:

Volume = the width of the wall x the height of the wall x the length of the wall affected.

This method of calculating volume does not apply when calculating volume for the purpose of a NatHERS software rating.

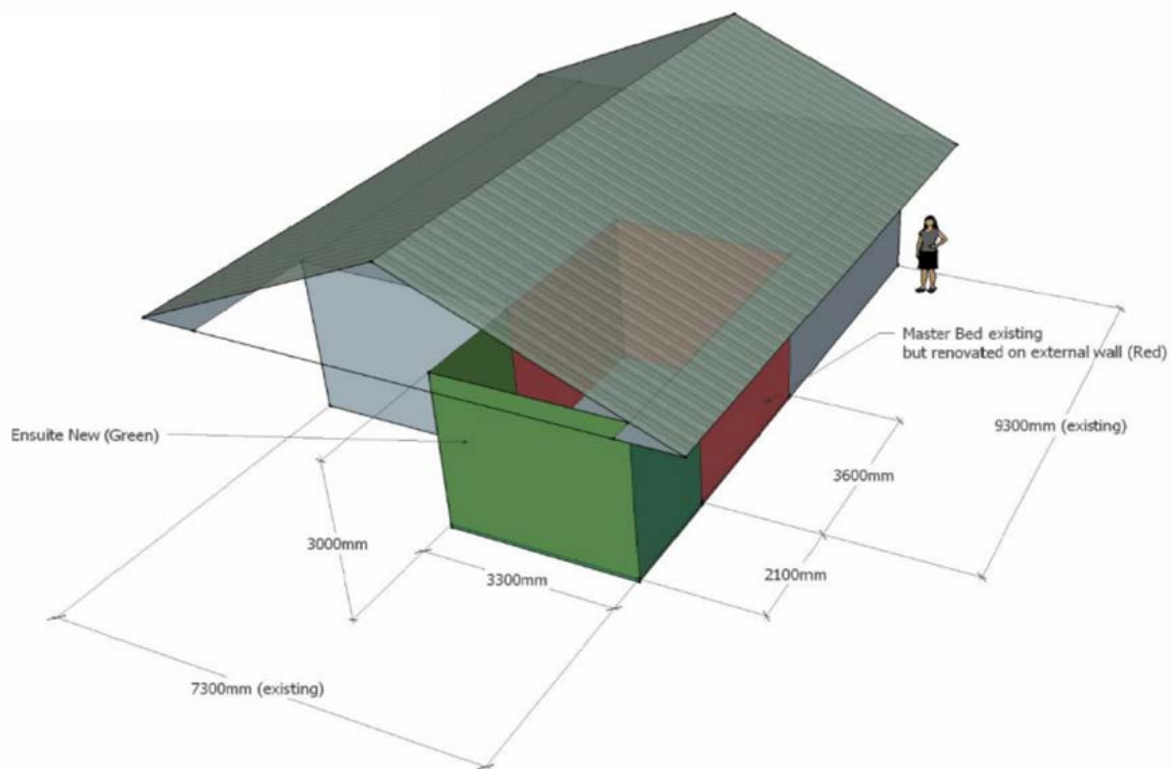


Figure 1: Building dimensions used in Example 1 volume calculations

Extensions to an existing building

An extension to an existing building must comply with the Regulations. The RBS can consider partial compliance to an extension under regulation 233(6), if the floor area of the extension is not greater than the lesser of:

- 25% of the floor area of the existing building, and
- 1000m².

The requirement for full compliance, when the extension exceeds the thresholds in regulation 233(6), only applies to the extension. Partial compliance determinations may still be used for the existing building, where appropriate.



For further information on exemptions from compliance with the Regulations, refer to [Building Practice Note BP-12: Exemptions from compliance with Regulations.](#)

Consent to partial compliance of building work

Regulation 233(3) provides the RBS with discretionary power to consent to partial compliance with sub-regulations (1) or (2). When determining whether to consent to partial compliance under regulation 233(3), the RBS must take the following into account:

- the structural adequacy of the building, and
- the requirements necessary to make reasonable provision for:
 - the amenity of the building and the safety and health of people using the building, and
 - avoiding the spread of fire to or from any adjoining building.

The discretion to allow partial compliance applies to both the building work associated with the alteration (except any extensions for which partial compliance is excluded under regulation 233(6)), and the requirement to bring the remainder of the building into compliance. In granting partial compliance, the RBS should require the highest level of compliance, unless it can't be reasonably achieved.

The RBS must ensure that any consent to partial compliance under 233(3) is in the form of Form 18 and is recorded on the building permit.

An application to the BAB can also be made under section 160 of the Act to allow for partial compliance with the Regulations.

What is reasonable?

When deciding whether to consent to partial compliance under regulation 233, the RBS should consider whether full compliance would be reasonable in a particular instance. Consideration should be given to:

- the objectives under section 4 of the Act, in particular -
 - safety and health
 - amenity
 - cost effective construction and maintenance
 - facilitating environmentally and energy efficient buildings,
- the energy efficiency objectives and functional statements of the NCC,
- the overall energy efficiency performance, including whether improved outcomes are achieved for the existing building (i.e. the existing building will not have a reduced energy efficiency performance based on the consent to partial compliance).

The RBS should apply professional judgement to the specific matter being assessed. In some instances, the RBS will need to seek the advice of other suitably qualified practitioners or industry experts in determining the acceptability or otherwise of partial compliance.

The energy efficiency provisions have been developed on a basis of efficient use of energy and long-term cost effectiveness for the building owner. Therefore, it would be reasonable to consider those factors when determining whether to consent to partial compliance with the energy efficiency provisions.

Example 3: Consideration for partial compliance

Alteration of an existing dwelling triggers full compliance with the NCC as it exceeds 50% volume limitation despite additional measures being implemented, such as insulating the ceiling space, installing dampeners for building sealing, shading western facing glazing, etc. A proposal for partial compliance is put forward based on the cost associated with dismantling and rebuilding the external wall to add insulation.

Using NatHERS software to assess a proposed alteration to an existing dwelling

The use of NatHERS software to assess alterations and extensions to existing dwellings is considered a DtS solution under the BCA, where the whole building (i.e. existing and alteration) is brought into compliance with the 6-star requirement. For information about this solution refer to Practice Note EE-03. New Residential Buildings.

NatHERS software can typically only assess a building as a whole. Therefore, it may not be possible to simply assess the extension or alteration of a building using NatHERS under a DtS solution.

In cases where the existing dwelling does not have a house energy rating it may be more practical to use the DtS elemental provisions than NatHERS software.

Where the NatHERS software is used to assess compliance when only part of the building needs to achieve a 6-star rating it may be necessary to consider under a consent to partial compliance, or a Performance Solution demonstrating compliance as required under BCA clause A2.2.

Performance Solution

When considering the use of NatHERS software for developing a Performance Solution for alterations, careful consideration must be given to how the part of the building will comply with the BCA.

Any Performance Solution must clearly document and demonstrate how it either directly addresses the performance requirement or is equivalent to the DtS provisions. For example, a Performance Solution can be developed for an extension greater than 25% of the floor area of the existing building to demonstrate that it is equivalent to the DtS provisions.



It is important to note that the process to obtain consent to partial compliance is separate to the process of a Performance Solution.

Consent to partial compliance

If NatHERS software is used to assess an alteration to an existing dwelling that has not previously been assessed using NatHERS software or if a previous assessment was done using superseded NatHERS software, then it will be necessary to provide two energy ratings to the RBS. The ratings should be conducted using the same version of the software and by the same assessor to ensure consistency in assessment. The ratings required are:

- **An initial house energy rating for the existing building** as constructed (if it is not going to be altered) to determine what star rating it currently achieves. Table 3 provides a checklist of documentation required to conduct the rating. Further details and information may be requested by the assessor conducting the rating.
- **A second house energy rating for the whole building design** incorporating the proposed building work is necessary to show that the proposed design would meet the minimum required overall star rating calculated using the approach set out in Table 4.

If the application for partial compliance relates to a reduction in the required overall star rating, further justification would be needed to demonstrate to the RBS that the reduction is reasonable in the proposed circumstances

Where partial compliance under regulation 233 is approved, it is important that the plans reflect the approved conditions. This is to ensure that the construction requirements, which need to be implemented to achieve the required star rating of the new work and existing building, are clearly defined.

Type of Documentation	Supplied (Yes / No)
• Energy Efficiency specifications (if separate to drawings)	
• Floorplans	
• Elevations	
• Section drawings	
• Site plan / context plan(s)	
• Electrical (incl. fans and downlights)	
• Drawing details	
• Window system descriptions	
• Window schedule – existing including sizes and new	
• Insulation details	

Table 3: Standard documentation required for rating an existing dwelling

Required overall star rating - application of the formula

The formula in Table 4 can be used to determine the overall star rating for a dwelling where there is consent to partial compliance.

The formula may be used where a new extension of less than 25% floor area is required to have a star rating of 6 and the existing building is not proposed to be altered. The formula allows for a reduced star rating for the whole building but demonstrates a net improvement in the dwelling's energy efficiency performance. Table 4 shows examples of the application of the formula.

The formula is not a DtS or Performance Solution under the BCA. However, it may be incorporated into part of a Performance Solution if justified and documented correctly to address the Performance Requirement P2.6.1, or be shown to be at least equivalent to DtS requirement.



For further information on Performance Solutions, refer to [Building Practice Note PS-01: Documentation and Assessment – Performance Solution](#).

The volumes referred to in the formula relate to the volume of conditioned or rated space in the NatHERS software, including those volumes affected by the proposed building work, not the volume of building calculation for the purposes of regulation 233.

The volume of new work is the volume of the spaces where the proposed works are to be undertaken. For example, if installing an ensuite to a master bedroom, including re-lining internal walls and new windows throughout, the volume of the work would include the ensuite and master bedroom spaces.

Example 1 - Extension to an existing dwelling (existing dwelling has lesser rating)	Example 2 - Extension to an existing dwelling including compliant internal alteration work
$SRr = \frac{(Ve \times SRe) + (Vn \times SRn)}{(Ve + Vn)}$	$SRr = \frac{[(Ve - Vni) \times SRe] + [(Vn + Vni) \times SRn]}{(Ve + Vn)}$
<p>Where</p> <p>SRr = Overall star rating required</p> <p>SRe = Existing dwelling star rating</p> <p>SRn = New work dwelling star rating</p> <p>Ve = Existing unaltered volume</p> <p>Vn = New work volume for extension</p>	<p>Where</p> <p>SRr = Overall star rating required</p> <p>SRe = Existing unaltered dwelling star rating</p> <p>SRn = New work dwelling star rating</p> <p>Ve = Existing unaltered volume</p> <p>Vn = New work volume for extension</p> <p>Vni = New work volume for internal alteration</p>
<p>An example of application of the formula is as follows:</p> <p>Ve = 203.7 m³</p> <p>Vn = 20.8 m³</p> <p>SRe = 3.2 stars</p> <p>SRn = 6.0 stars</p>	<p>An example of application of formula is as follows:</p> <p>Ve = 203.7 m³</p> <p>Vn = 20.8 m³</p> <p>SRe = 2.0 stars</p> <p>SRn = 6.0 stars</p> <p>Vni = 35.6m³</p>
<p>The required overall star rating,</p> $SRr = \frac{(203.7 \times 3.2) + (20.8 \times 6.0)}{(203.7 + 20.8)}$ <p>SRr = 3.5 Star requirement</p>	<p>The required overall star rating,</p> $SRr = \frac{((203.7 - 35.6) \times 2.0) + ((20.8 + 35.6) \times 6.0)}{(203.7 + 20.8)}$ <p>SRr = 3.0 Star requirement</p>

Table 4: Using the formula to calculate the required overall star rating

Building fabric

Where a building is extended, the fabric of the extension should fully comply with the BCA. Partial compliance for the extension may be considered under regulation 233, subject to the restriction under regulation 233(6) (refer to Table 1 and Table 2).

Where the new work includes replacement of existing elements, such as roof cladding, wall cladding or wall lining, compliance with the BCA fabric provisions should be achieved. However, if these items only require minor repair work, then it may be unreasonable to require their removal, solely to install new insulation. For example, where access to the roof space is available, fully compliant ceiling insulation should be installed.

Where an existing building is extended, the glazing in the extension must comply with the BCA Part 3.12.2. Glazing compliance can be determined by using the DtS requirements or by using the ABCB's Glazing Calculator (refer to the ABCB website, www.abcb.gov.au).

External glazing

The glazing provisions are determined on the basis of the whole storey. This means that, for the purpose of determining the conductance and solar heat gain of the glazing to an extension or part of a storey, the glazing to the existing part of the storey also needs to be considered in the calculations.

In these instances, where compliance is required for part of a storey, it may be reasonable to determine compliance as part of a Performance Solution by applying the performance of the new glazing uniformly to the whole storey but only requiring complying glazing to the extension or new building work.

If all the existing glazing or other elements are being replaced, then those elements must comply with the current BCA provisions, subject to acceptance of partial compliance under regulation 233 of the Regulations.

Shading

Shading is integral to glazing performance. There may be site constraints or planning requirements that prevent external shading from being added to an existing building. In these circumstances, higher performance glazing elements may need to be used. However, this may be more costly.

It may therefore be reasonable to allow a reduced level of glazing performance, where such constraints on shading exist. This only applies to the existing building and not a proposed extension, where the extension exceeds the floor area limit set out in regulation 233(6).

Building sealing

An extension to an existing building should be sealed in accordance with BCA Part 3.12.3. If an existing room is extended, then the need for sealing may depend upon its condition. If the existing part is not sealed, for example having large areas of unsealed louvred glazing, there may be little benefit in sealing the new part of the building.

Where a new extension is proposed to an existing unsealed building, a practical approach may be to accommodate the different amounts of sealing in the new and existing parts of the building by installing sealed doors between the two parts. The final decision should be based on the relative size of the extension, the extent to which the existing part is unsealed and the extent to which sealing is practical and beneficial.

Air Movement

In climate zone 4, air movement provisions in BCA Part 3.12.4 require two openings in a room, or a breeze path through to another room. In the case of some extensions, it may not be possible to comply with these requirements – for example, where there is insufficient room for the two openings to be installed in the external wall and the existing building does not have complying breeze paths.

Services

New building work must comply with P2.6.2 for Services. However, BCA 3.12.5.0 does not apply to heated water supply systems in Victoria, as heated water supply systems are required to comply with the Plumbing Regulations 2018.

BCA clauses 3.12.5.1 to 3.12.5.3 set out the requirements for insulation of services, central heating water piping and heating and cooling ductwork. In all cases, insulation for service piping and ductwork must be provided.

It is important that the designer provides the RBS with sufficient details of piping and ductwork insulation to ensure that P2.6.2 compliance has been met.



For information on Hot Water Systems requirements in Victoria (the Victorian Variation), please refer to the PCA or [Plumbing Practice Note SH-01: Solar Heated Water](#).

Artificial Lighting

BCA clause 3.12.5.5 sets out the compliance requirements for artificial lighting. The alterations or extension should comply with the BCA artificial lighting provisions. It would be unreasonable to change existing light fittings unless the alterations include the complete re wiring of the building.

However, if the existing light fittings are to be replaced then compliance with the provisions is required. It is important that the designer provides the RBS sufficient details of electrical layout and fittings so that the RBS can ensure that P2.6.2 is complied with.

Performance solutions for alterations - installing rainwater tanks or solar hot water systems

In Victoria, a new Class 1 building must have a rainwater tank connected to all sanitary flushing systems, or a solar water heater system installed in accordance with the Plumbing Regulations 2018.

Where an alteration is proposed to an existing building, the RBS may consider the installation of a solar hot water system as part of a trade-off for partial compliance, or as part of a Performance Solution, if they are satisfied that the proposal meets Performance Requirements P2.6.1 or P2.6.2. However, a rainwater tank cannot be used as part of a Performance Solution to meet an energy efficiency saving requirement.

Standards in clause 11 of Schedule 2 of the Plumbing Regulations 2018 do not apply to alterations to an existing building.

Relocated and prefabricated homes

Relocated homes

An alteration is building work that relates to an existing building. An existing dwelling that is re-erected, moved from one allotment to another or relocated on the same allotment is considered an alteration to the dwelling exceeding the 50% volume trigger. This means that the RBS has discretion to allow partial compliance under regulation 233.

It is recognised that there are sometimes limited opportunities to improve the thermal performance of an existing building where it is being relocated in its original condition. However, wherever possible, compliance with the DtS provisions should be achieved.

This does not prevent the owner of the property using best practice principles. As a minimum, required levels of insulation should be installed to ceilings, walls and floor, if there is access to do so. Sealing of windows and doors should be undertaken and where windows are replaced, thermally efficient windows should be installed.

Prefabricated kit homes

Homes that are prefabricated in a factory, whether they are fully assembled or delivered to site as “flat pack” kits, are required to comply with the Regulations as they are a new dwelling. This also applies to transportable/demountable buildings (e.g. dongas, on-site cabins etc.). The design for this type of homes must be assessed using either NatHERS software to achieve a 6 star rating or above, or the elemental Dts provisions, or sufficient evidence provided that the design will meet the performance requirements of the BCA. These homes will also require the installation of either a solar hot water system or a rainwater tank. It is important to note that a separate house energy rating must be completed for every new orientation and other site conditions. This avoids incorrect use of a design in other orientations, which may reduce the star rating of the dwelling.

Related Documents

- Building Act 1993
- Building Regulations 2018
- Plumbing Regulations 2018
- National Construction Code 2019
- Building Practice Note BP-12: Exemptions from compliance with regulations
- Building Practice Note EE-02: Applying BCA energy efficiency measures to existing Class 2-9 buildings
- Building Practice Note EE-03: New Residential Buildings
- AS/NZS4859.1: Thermal insulation materials for buildings

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