MASTER BUILDERS
AUSTRALIA

19 October 2021

Mr Neil Savery
Chief Executive Officer
Australian Building Codes Board
224 Bunda St
Canberra ACT 2600

Dear Mr Savery

Thank you for the opportunity to make comment on the *NCC 2022 Public Comment Draft (stage 2)*.

In its submission, Master Builders Australia (Master Builders) has focused its response on residential energy efficiency and condensation management changes.

Master Builders supports the long-term objective of net-zero ready in the building and construction industry but only on the basis that risks are quantified and mitigated. In consideration of that position, we have significant concerns with the ABCB work.

To this end, we note the COAG Energy Ministers Trajectory for Low Energy Buildings Report made initial policy recommendations to government that was broadly supported by industry with a more flexible model for increases between 6.5 to 7 Star NatHERS equivalent ratings across climate zones than the 7-star average developed by the ABCB for the 2022 NCC update.

Regarding the *NCC 2022 Public Comment draft (Stage 2)*, energy efficiency and condensation management proposals, Master Builders is of the strong view that the work undertaken has not sufficiently addressed and mitigated associated risks and problems with the proposed changes. These relate to the points below that need to be managed concurrently with the introduction of Code changes to ensure an effective and workable shift in energy stringency for new housing construction and to facilitate cultural change within the building industry.

As a consequence, we urge the ABCB to delay the introduction of any changes, or if not a delay, at least a transition, with any changes not to come into effect, at the very earliest, until NCC 2025.

Risks and Problems

Matters (risk and problems) for further consideration:

- Condensation risk requires more research, evaluation and development of education tools to be clear on the defect risk emerging from existing energy stringency requirements, to ensure any changes introduced to Australia are fit for purpose and are understood by consumers and the supply chain.

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- Cost implications and impacts that outweigh societal benefits were identified in the Consultation Regulation Impact Statement (CRIS). The current policy should be reviewed as noted by the COAG Energy Council trajectory for Low Energy Buildings report that identified if improvements were not found to be cost effective in 2022, they should be reconsidered again in NCC 2025. In regard to the outcomes of the CRIS:
    - A reconsidered proposal for 2025 might be based on the COAG energy council trajectory report that did not recommend a 7 star average for all climate zones, instead it proposed a 6.5 and 7 star range across climate zones, including cool climate zones (6,7 and 8).
    - CRIS findings are conservative without condensation risks being assessed in this CRIS.
- To raise stringency from 6 to 7 stars with NatHERS and simultaneously update climate files within the backend of NatHERS has the potential to create huge problems and costs for industry. An example of the impact of this is:
    - If a project home builder has upgraded their design suite to meet 7-stars today, this may not be sufficient to meet the 7-star threshold tomorrow, because overnight the settings in backend of NatHERS have been modified. This is a challenge when using a 'black box' threshold tool for policy and in turn influence technical regulation of building work. When the backend changes within NatHERS there should be a regulation transition period of at least 12 Months for industry to catch up.
    - Master Builders is not opposed to climate file updates within NatHERS. However, these changes need to be widely communicated to industry when they will effect regulatory thresholds.
- Preparation time to enable capacity for the sector to change/roll-out design and business models. In particular, this applies to volume builders that will need sufficient time for the market to shift, to adapt and implement design change.
- Supply chain adaptability and supply chain capacity will be difficult to bring about in an already constrained environment that is experiencing for the next 12 months unprecedented product supply delays. For example, four months for timber framing and roof trusses.
- The need for time to develop and deliver education for the sector and regulators before changes take effect.
- Better interaction between development and building approval stages where design obligations, such as NatHERS or alternative energy efficient design requirements are required at development approval stage.
- Zoning needs, including the development of a block rating tool to assist consumers to better understand how the urban block geometry, orientation, street frontage access and size impacts energy efficient housing. For example:
    - A long north-south oriented boundary will perform better than an East-West oriented boundary in the ACT.

Master Builders is mindful of the good work across government and industry to improve the quality of building and construction in response to the Shergold-Weir *Building Confidence* report and seeks to reflect on the concerns raised in this report. We do not want to see a situation where the will to tick a policy box undermines development of good technical and regulatory requirements for energy efficiency.

To this end, the COAG Energy Council Trajectory for Low Energy Buildings report acknowledges that the Shergold Weir Building Confidence Report found that jurisdictions and industry bodies have been facing growing challenges in ensuring effective compliance with, and enforcement of, the NCC. In particular, the report noted these challenges were attributed to a lack of training, mandatory accreditation and auditing/compliance checking by regulators and that the NCC itself was also considered to be excessive in its complexity.

Delay/Transition Period

To enable time for risks and problems with the drafting of code changes to be managed effectively, Master Builders strongly urges there be a delay, or if not at least a transition

with any changes not to come into effect, at the very earliest, until NCC 2025.

This is necessary to resolve outstanding issues and deliver a more workable and effective NCC and associated regulatory response from states and territories.

MBA submission to ABCB Consultation

Master Builders has completed the ABCB submission process and responded with numerous suggestions to improve the drafting of the proposed technical requirements. The key issues responded to in the submission relate to the following:

- The objective and functional statements require more clarity, with simpler explanation of what these require to make the code more workable for practitioners. For example, remove references to greenhouse gas emissions and refer only to managing energy consumption which is what building methods are designed to achieve. Reducing greenhouse gas emissions is a higher order policy objective that is not needed in the technical code.
- Provisions for electric vehicle charging, renewable energy generation and storage ready buildings would benefit from further policy work to support development of accessible technical provisions that provide industry with clearly justified and specified building requirements.
- Poor drafting, convoluted compliance pathways and open-ended language will make the proposed draft difficult to apply in practice. Master Builders has therefore provided numerous suggestions for improving the drafting.
- There are some outstanding questions in relation to the following building fabric requirements that need to be clarified, including:
    - There is confusion about shading for walls of multi-level dwellings. Are the ground floor walls considered unshaded? Or do you use the eave/gutter from the upper level roof?
    - There is no allowance for EPS or other insulated wall claddings (the same wall batts are required for a 6mm FC cladding vs a 75mm foam EPS cladding)
- Concessions need to be considered for dwelling ratings that are disadvantaged by block orientation, for example:
    - Blocks on the Southern side of a road will be disadvantaged because they have the garage facing north and the living areas facing south. This is terrible passive design and can lose 1-2 stars, but clients do not have a choice because of the way blocks of land are developed.

- Class 2 units that face West or South, or those on the ground floor above a carpark, have significantly lower star ratings than the others. If they already have ceiling fans, maximum insulation, high performance glazing, how else are they supposed to get to 6 stars? This could result in every unit having completely separate requirements. Logistical nightmare.

MBA is concerned about the way the national technical building compliance code is being used to lead the policy implementation for emissions reduction outcomes.

This change is altering the intent of the code, from being a minimum standard for building regulation, to a best practice tool for the built environment. In doing so, it is making the code more complex, unworkable and difficult to regulate. The NCC is the wrong tool for the job and downstream legislation does not capture the right participants at the right time in the building regulation process to deliver the policy intention. A balance within the regulatory elements needs to be found, to ensure policy creep is not driving best practice standards into a minimum standard construction regulatory code and compromising the NCC functionality.

Master Builders believes that for the ABCB to address the issues raised would require significant policy work, research, and redrafting (minimum of 12 Months) as well as a second round of public comment. As such a delay is warranted until at least NCC 2025.

Attached is a copy of Master Builders response to the ABCB consultation template that accompanies this letter, which together constitute Master Builders full response to public consultation on the *NCC 2022 Public Comment Draft (stage 2).*

Yours sincerely

Denita Wawn
Chief Executive Officer

Cc: ABCB Board

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NCC Public Comment Draft (Stage 2)
Response Sheet

This response sheet is to be used for submitting responses to the National Construction Code (NCC) 2022 Public Comment Draft.

Response Sheet

Your details

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Organisation: Master Builders Australia

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Response(s) - Energy efficiency

Energy efficiency - Volume 1

NCC Volume(s): ☒ One ☐ Two ☐ Three ☐ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: Introduction to this Part

Recommended change to draft:

Please consider:

1. deleting this introduction or
2. editing and reworking to explain how code helps reduce energy use.

This Part is intended to manage ~~reduce greenhouse gas emissions from~~ energy use of buildings. It addresses ~~greenhouse gas emissions that occur as result of the~~ how the building uses energy…(How does it do this?)…, and through the source of the energy used.

Comment/reason for change:

Are buildings creating greenhouse gas emissions? or is the energy source utilised to operate the buildings creating greenhouse gas emissions?

Master Builders believe that the reduction of greenhouse gas emissions is too high-level concept and impractical for a technical regulation standard. The current introduction makes it

sound like buildings themselves are creating greenhouse gas emissions, when it is the energy source used that creates the emissions. Because of this, the focus should be on managing energy use within buildings, not greenhouse gasses – MBA agrees that greenhouse gas emissions should be the overarching policy concept, but this should not be in the main body of the code (It could be referred to in the guide if necessary).

It confuses the reader of the document as greenhouse gas emissions are not directly regulated as part of building regulation around the country.

What about the jurisdictions (Tasmania and the ACT) that are not producing any greenhouse gasses? Or buildings that are operating off grid, does this section not apply to them?

MBA does not support the inclusion of this introduction in it's current format; it adds no value to regulation and is excess noise for the reader. MBA would recommend that it is put into the guide, if used at all.

NCC Volume(s): ☒ One ☒ Two ☐ Three ☐ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: J1O1, H6O1, H6F1 & J1F1

Recommended change to draft:

Review the objectives to consider their application within a regulatory context.

Comment/reason for change:

Currently, the Objectives and Functional Statements appear to simply reflect the high-level policy intent outlined in the Trajectory for low energy buildings. Master Builders does not consider this appropriate and would like to see the policy contextualised for the regulation of buildings.

NCC Volume(s): ☒ One ☐ Two ☐ Three ☐ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: J1O1

Recommended change to draft:

Include a reference to buildings.

Comment/reason for change:

Master Builders is concerned that the objective for this part does not refer to buildings – which is what the code regulates. Whilst it might be OK to speak broadly within policy forums. As implementing the policy into a technical regulation code the regulated element should clearly be articulated (buildings).

NCC Volume(s): ☐ One ☒ Two ☐ Three ☐ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: H601

Recommended change to draft:
The Objective of *Part H6 Energy efficiency* is to - ~~reduce greenhouse gas emissions.use energy efficiently in order to~~

(a) ~~reduce~~ manage energy consumption: and
(b) ~~reduce greenhouse gas emissions: and~~
(c) ~~improve occupant health and amenity~~: and
(d) ~~improve~~ manage ~~the resilience of a building to extreme weather and blackouts~~

Comment/reason for change:

1. The lead in sentence should clearly state what the "objective" is for - Part H6 Energy efficiency.
2. The addition of "~~use energy efficiently in order to"~~ adds no value to the objective as it is currently drafted.
3. Is the objective to reduce or manage energy consumption? MBA understands that on a societal scale the policy may be to reduce energy consumption in new homes compared with older/existing homes. However, as the technical regulation (NCC) is only applied to new building work, the objective should reflect the management of energy consumption rather than the reduction of energy use. This comment is also relevant to (b) as the act of constructing a new dwelling that will use energy will increase greenhouse gas emissions unless powered by renewable energy.
4. Master Builders believe that the reduction of greenhouse gas emissions is a high-level policy concept that does not directly relate to the codified technical regulation and the reference to greenhouse gas emissions is impractical for a technical regulation standard. For these reasons we think it should be removed from the main body of the code (it could be useful in the guide).
5. Improve occupant health – how will a building improve occupant health? The fact that a person is provided shelter with a building will improve occupant health, is the office of the ABCB going add "improve occupant health" to every objective within the NCC?
6. Improve occupant health – It is important to note that the development of the Energy efficiency provisions has completely ignored the occupant health risks posed by moisture and in turn indoor air quality and therefore is in direct conflict with the objective.
7. Improve occupant health – Master builders does not support this statement within the objectives as it is false in the current context.
8. Whilst "improve the resilience of a building to extreme weather and blackouts" is an admirable objective Master Builders does not this H6O1 is the correct place for it. On a individual building level a black out will not use any energy at all and on a network level will reduce energy use.

Other comments

- It should also be noted that efficient energy use in new development/building-work will not translate into a net reduction in energy use as it will be a new building requiring more energy than was previously required before the construction of the building.

NCC Volume(s): ☒ One ☐ Two ☐ Three ☐ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: J1F1

Recommended change to draft:

Split the functional statement into its primary elements.

Comment/reason for change:

MBA believes that the code requires more than one functional statement.

1. Envelope efficiency (fabric)
2. Domestic services efficiency

MBA believes that the separation between the performance of the building envelope and the services would allow for clearer consideration of the regulated elements.

This would—

1. help create a clear regulatory threshold for thermal performance of the building envelope and
2. allow a wholistic assessment regarding how thermal performance of the building envelope interacted with moisture and indoor air quality.

NCC Volume(s): ☒ One ☐ Two ☐ Three ☐ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: J1P1

Recommended change to draft:

Consider splitting this into a minimum of 2 performance requirements.

e.g.

1. A building~~, including its services,~~ must have features that facilitate the efficient use of energy appropriate…

2. ~~A~~ building~~, including its~~ services~~,~~ must have features that facilitate the efficient use of energy appropriate…

Comment/reason for change:

Please consider splitting this performance requirement into:

1. Envelope efficiency (fabric)
2. Domestic services efficiency

NCC Volume(s): ☐ One ☒ Two ☐ Three ☐ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: J1P3

Recommended change to draft:

Clarification of the performance requirement

Comment/reason for change:

What is the energy value of a -

1. 3-star ducted heat pump, rated under the 2019 GEMS determination for heating all spaces that are provided with heating?
2. 3-star ducted heat pump, rated under the 2019 GEMS determination, cooling all spaces that are provided with cooling?
3. 5-star instantaneous gas water heater, rated under the 2017 GEMS determination, providing all domestic hot water?

4. lighting power density of 4 W/m2 serving all spaces that are provided with lighting?

Is there a secondary calculation required to determine these values? If so, why not state calculation/formula here, rather than making the reader undertake a secondary step to understand what is required?

If there is not a calculation required to determine the energy values of these items, why not state what the regulated value is?

Currently this performance requirement is meaningless and unquantified.

NCC Volume(s): ☒ One ☐ Two ☐ Three ☐ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: J1P4

Recommended change to draft:

Click here to enter text.

Comment/reason for change:

Whilst Master Builders understands the intention, we believe that if governments are going to jump straight into regulation (for renewable energy and electric vehicle charging) rather than other policy levers, there needs to be a technical trajectory approach to facilitate a well communicated transition strategy that provides timely signals to industry prior to regulatory implementation.

Our concerns are mainly focused on the transition strategy for electric vehicles (transport) and their associated infrastructure requirements (Charging) into buildings.

This is a cross over between carbon reduction strategies for transport and buildings

Whilst the Trajectory for Low Energy Buildings policy has EVs as a target, the target is essentially EV 'ready' bundled with renewable energy generation and storage.

Master Builders is not aware of any work undertaken by the ABCB to scope/specify what infrastructure is needed to facilitate EVs into buildings (building materials, safety and electrical infrastructure as examples). This would be a key piece of work to determine what the stages of 'EV ready' are allowing industry an opportunity to move faster than regulation. I believe that energy ministers, building ministers and industry would expect this technical work early.

We are aware that work has been done on:

- EV impact analysis
- EV Risk Assessment
- Preliminary Impact Assessment - Installation of PV Panels on Class 1 & 7b Buildings
- Distributed Energy Resources (DER) in the NCC
- PIA – Section J solar

Whilst these documents are all accepted, they do not align in their views regarding risk, which would point to further being required in this space prior to implementation.

Further to this, any scoping undertaken in these papers is high level and give no practical consideration to technical implementation or scoping. This means that no work has been done to technically scope/specify and cost full implementation regarding EVs, renewable energy generation and storage. Therefore, it is difficult to understand the technical elements and their costs to figure out which parts of the system would be cost effective future proofing as well as making sure the code was not inhibiting future implementation.

And the integration with buildings should include information to facilitate the trajectories targets.

This process requires proper risk analysis regarding all related code provisions for life safety.

Master Builders believes that the Office of the ABCB should be making sure the code addresses the potential risks so there is no impediment to future uptake of EVs.

Once developed it requires seamless integration with other code requirements.

Master Builders notes that currently petrol stations are not located in basement carparks due to the risk. Whilst we acknowledge that the risk is different for EV's this still requires substantial investigation rather than moving straight to community testing.

Master Builders notes that the Trajectory for Low Energy Buildings provides the policy for this work, we believe that the Office of the ABCB has not appropriately unpacked or explored the technical scope of full implementation and therefore does not have a clear understanding of the elements required.

Master Builders notes that government policy makers, the ABCB board and energy/building minister are reliant on the Office of the ABCB to flesh out the broad non-technical policy into a detailed technical package. Master Builders does not believe this work has been undertaken in this instance and therefore the Office of the ABCB has proposed regulatory solutions prior to undertaking the full technical analysis or attempting any other solution prior to codifying regulatory requirements.

This detailed work would make it easy to understand where future proofing the NCC and in turn buildings should start and stop regarding the trajectory – This is a major criticism of this work and means that a cost benefit analysis is the only measure and does not give industry any meaningful signals for the future, which makes it impossible for industry to move ahead of regulation and is poor policy implementation.

Master Builders does not support policy signalling in the form of regulation and believe this is a poor governance practice.

Master Builders believe as the NCC is a regulatory code the future proofing focus of the ABCB and the NCC should be on making sure that the technical regulation within the code

does not inhibit the uptake of these technologies. This will require full scoping of what is required for full implementation of EVs, renewable energy generation and storage.

NCC Volume(s): ☒ One ☐ Two ☐ Three ☐ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: J1P4

Recommended change to draft:

A building must have features that facilitate future incorporation of renewable energy and electric vehicle charging equipment.

Comment/reason for change:

The policy is for EVs, renewable energy generation and storage ready buildings.

NCC Volume(s): ☒ One ☐ Two ☐ Three ☐ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: J1V4

Recommended change to draft:

Click here to enter text.

Comment/reason for change:

Master Builders is concerned that the proposed amendments to this verification method

Mean that the VM no longer clearly aligns with the requirements of J1P1 for building envelope sealing against air leakage.

J1P1

A building, including its services, must have features that facilitate the efficient use of energy appropriate to—

…(e) the sealing of the building envelope against air leakage.

The proposed changes to the VM

introduce a DtS style requirement for mechanical ventilation for SOU's in class 2 or 4 parts of buildings that have a verified building sealing of 5 air changes per hour at 50 Pa reference pressure or less.

Master Builders would like the proposed verification method amended with the ventilation requirement removed and the acceptable scoped thresholds (upper and lower) included for the use of the building sealing VM. This bolt-on requirement for ventilation is clearly demonstrating the limitations/thresoleds of blower door testing for NCC compliance.

Rather than backdoor introduction of ventilation requirement for well-sealed buildings due to the requirements of J1P1 for the sealing of the building envelope against air leakage.

Master Builders would suggest that there is consideration to how the code will address building sealings upper and lower regulatory thresholds and the cross over between sealing requirements and ventilation requirements.

NCC Volume(s): ☒ One ☐ Two ☐ Three ☐ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: J1D1(1)

Recommended change to draft:

Please consider changes below.

(1) Where a Deemed-to-Satisfy Solution is proposed, Performance Requirements J1 P1 to J1 P4 are satisfied by complying with-

(a) J2D2 Application of Section J: and

~~(a)~~ (b) J3D2 to J3D15 for Elemental provisions for a Class 2 building and a Class 4 part; and

~~(b)~~ (c) J4D2 to J4D7 for Building fabric; and

~~(c)~~ (d) J5D2 to J5D8 for Building sealing; and

~~(d)~~ (e) J6D2 to J6D13 for Air-conditioning and ventilation; and

~~(e)~~ (f) J7D2 to J7D9 for Artificial lighting and power; and

~~(f)~~ (g) J8D2 to J8D4 for Heated water supply and swimming pool and spa pool plant; and

~~(g)~~ (h) J9D2 to J9D5 for Energy monitoring and on-site distrib-uted energy resources.

Comment/reason for change:

(1) Nomenclature was out.

(2) Specify what the elements considered are as well as the clause numbers for ease of understanding.

NCC Volume(s): ☒ One ☐ Two ☐ Three ☐ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: J1P1(1)

Recommended change to draft:

(1) Performance Requirement J1P1 for energy use is satisfied by complying with-

Comment/reason for change:

The reader should be able to read in the text what the performance requirement is for i.e. Energy Use.

NCC Volume(s): ☒ One ☒ Two ☐ Three ☐ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: J2D2(1)(a)

Recommended change to draft:

(a) Parts J4 Building Fabric and J5 Building Sealing for ~~reducing the heating loads or cooling loads of a~~ Class 2 to 9 buildings, other than the sole-occupancy units of a Class 2 building or a Class 4 part of a building~~, Parts J4 and J5~~: and

Comment/reason for change:

These provisions do not reduce the heating or cooling loads they provide a regulatory threshold for compliance regarding building fabric and building sealing. Please consider removing extraneous language.

It may be good to include this language into the guide.

NCC Volume(s): ☒ One ☐ Two ☐ Three ☐ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: J2D2(1)(b)

Recommended change to draft:

(b) Part J6 for air-conditioning and ventilation, ~~Part J6~~; and

Comment/reason for change:

MBA would prefer to see the part that requires compliance first.

NCC Volume(s): ☒ One ☐ Two ☐ Three ☐ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: J2D2(1)(c)

Recommended change to draft:

Part J7 for artificial lighting and power, ~~Part J7~~;

Comment/reason for change:

MBA would prefer to see the part that requires compliance first.

NCC Volume(s): ☒ One ☐ Two ☐ Three ☐ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: J2D2(1)(d)

Recommended change to draft:

Part J8 for heated water supply and swimming pool and spa pool plant, ~~Part J8~~

Comment/reason for change:

MBA would prefer to see the part that requires compliance first.

NCC Volume(s): ☒ One ☐ Two ☐ Three ☐ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: J2D2(1)(e)

Recommended change to draft:

Part J9 for energy monitoring and distributed energy resources, ~~Part J9~~.

Comment/reason for change:

Click here to enter text.

NCC Volume(s): ☒ One ☐ Two ☐ Three ☐ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: J2D2(2)

Recommended change to draft:

(2) Performance Requirement J1P2 for Building fabric of sole-occupancy units of a Class 2 building or Class 4 part is satisfied by complying with-

Comment/reason for change:

The reader should be able to read in the text what the performance requirement is for i.e. for Building fabric of sole-occupancy units of a Class 2 building or Class 4 part. As opposed to having to click on a hyperlink to understand the sentence.

NCC Volume(s): ☒ One ☒ Two ☐ Three ☐ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: J2D2(2)(a)

Recommended change to draft:

(a) for ~~reducing~~ the regulation of heating loads or cooling loads ~~of sole-occupancy units of a Class 2 building or Class 4 part of a building~~ using house energy rating software~~,~~ and J3D3 to J3D6 as applicable: or

Comment/reason for change:

1. These provisions do not reduce the heating or cooling loads they provide a regulatory threshold for compliance regarding building fabric including requirements for heating and cooling load limits, fans and thermal breaks. The only way heating and cooling limits have been reduced may be in the context of the code, which is irrelevant to the reader once a new code is applied.

Please consider removing extraneous language and clarifying the regulatory focus.

2. remove "~~of sole-occupancy units of a Class 2 building or Class 4 part of a building"~~ as this should be clarified in the lead in sentence (2).

3. looking at the definition of *house energy rating software* in the context of the clause:

How does a builder know what "house energy rating software" is accredited under the Nationwide House Energy Rating Scheme for compliance with this requirement? This creates a step away from the primary technical regulation document (NCC) to ascertain compliance. As well as introducing a compliance requirement that has nothing to do with building work. Builders who are regulated against these provisions are not trained to assess the validity of software accreditation and nor should they be expected to validate NatHERS assessments.

4. The definition of *House energy rating software* introduces an administrative requirement via a definition. Master Builders is apposed to this style of drafting or this kind of requirement within a technical regulation code, as it is not a technical requirement of building work. This is NOT the role of the NCC and should be delt with in State and Territory legislation/regulation.

5. Also as the House energy rating software is applied to SOU's in class 2 and 4 parts; is it appropriate that it is defined as *house energy rating software.*

NCC Volume(s): ☒ One ☐ Two ☐ Three ☐ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: J2D2(2)(b)

Recommended change to draft:

for ~~reducing~~ the regulation of heating loads or cooling loads of sole-occupancy units of a Class 2 building or Class 4 part of a building by improving the thermal performance of the building fabric-

Comment/reason for change:

1. These provisions do not reduce the heating or cooling loads they provide a regulatory threshold for compliance regarding general thermal construction, fans, roofs, walls, glazing and floors. The only way heating and cooling limits have been reduced may be in the context of the code, which is irrelevant to the reader once a new code(new baseline) is applied.

Please consider removing extraneous language and clarifying the regulatory focus.

NCC Volume(s): ☒ One ☐ Two ☐ Three ☐ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: J3D1, J4D1, J5D1, J6D1, J7D1, J8D1, J9D1

Recommended change to draft:

Review draft

Comment/reason for change:

Master Builders questions the need to repeat/mirror the requirements of J2D1 in Parts 3,4,5,6,7 and 8.

It does not add any value to specific parts.

NCC Volume(s): ☒ One ☐ Two ☐ Three ☐ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: J2D2(2)(b)(i)

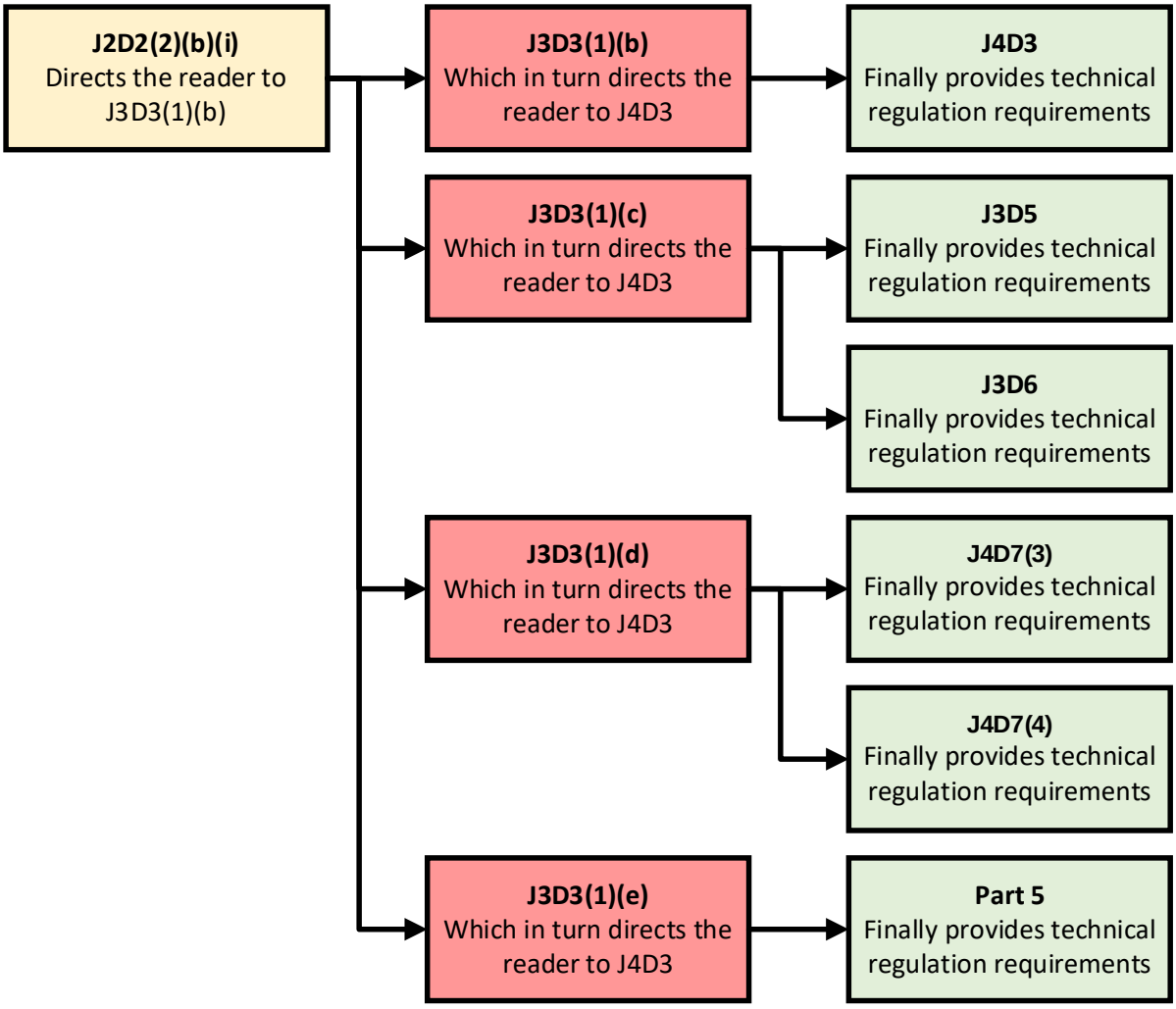
Recommended change to draft:

(i) for general thermal construction, ~~J3D3(1)(b) to J3D3(1)(e):~~ J4D3, J3D5, J3D6, J4D7(3), J4D7(4) and Part J5:

Comment/reason for change:
MBA does not support the current structure of this clause.

As drafted, this requirement is a regulatory treasure hunt, it is indirect and unnecessarily complex regulatory drafting! Every extra step the reader must take, is an opportunity for failure.

As an example: J2D2(2)(b)(i) refers the reader to J3D3(1)(b) which in turn refers the reader to J4D3 which contains requirements, this is a 3 step process to reach the requirements. The second step should be eliminated.



NCC Volume(s): ☒ One ☐ Two ☐ Three ☐ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: J5D7 heading

Recommended change to draft:

~~J~~JJ5D7

Comment/reason for change:

MBA is sure that the Office of ABCB don't want to delete the "J" as it is key to the clauses location within the code.

NCC Volume(s): ☒ One ☐ Two ☐ Three ☐ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: J3D6

Recommended change to draft:

Redraft the clause.

See notes below on suggested structure.

Comment/reason for change:

What kind of a wall *must have a thermal break*? Any wall? The type of wall that this clause is attempting to regulate requires specification at the start.

Master Builders are concerned with the quality of drafting of section J. The drafting is consistently confusing and difficult to understand. The structure of the regulatory drafting is important. The regulated items must be specified clearly and then the requirements that apply to the regulated item should follow.

If you are referring to an "external wall with a metal frame" please state that in the lead in. It is important to nominate the regulated item explicitly and up front.

e.g.

1. External wall
2. Metal frame
3. No wall lining or wall lining direct fixed
4. Lightweight clad
5. Thermal break between frame and cladding is required
6. R- value of the thermal break is R0.2.

NCC Volume(s): ☒ One ☐ Two ☐ Three ☐ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: J3D7 and Table(s) a - o

Recommended change to draft:

Delete the current clause, redraft, consider breaking the clause up into several clauses.

Clearly scope what is “in” and what is “out” of this clauses scope.

Revise the communication structure of the requirements to clearly communicate what the minimum requirement is.

Do not include compliance requirements within notes to tables. For this style of technical compliance tables should be for information that forms part of a primary requirement – the table itself should not contain separate requirements.

Comment/reason for change:

This clause is hard to understand. The scope of the clause is impossible to determine.

What is the minimum standard? This will create massive confusion for designers, builders and certifiers.

What is this clause attempting to regulate? In its attempt to regulate all things roofing it is highly confusing.

There are several elements being addressed in a single clause:

1. Minimum R-Value
2. Reflective insulation
    a. Installation requirements,
    b. product requirements and
    c. cross reference (in accordance with F8D5) – which is not clear and exempts the requirements for a BAL FZ
3. Solar absorptance
4. Ventilation
5. Space that are nor permitted to have insulation
6. Under roof R-Values
7. Adjustment factors
8. Thermal Bridging for steel roofs
9. Calculation requirements (in a secondary source) – referenced document AS/NZS 4859.2
10. Adjustment factors for thermal bridging
11. Calculation requirements (within notes see table J3D7t as an example)
12. Directional heat flow
13. Thermal break options (1, 2 & 3)
14. Vapour permeability.

Overly complex due to the clause trying to regulate 14 elements (sometimes compounded) in a single clause.

Starting the first clause with “subject to” makes it sound like it should not be the first clause.

The tables introduce several compliance elements:

- Reflective insulation
- Solar absorptance
- Ventilation – with a regulatory threshold of its own.
- Under roof R-Values
- Etc.

Master Builders does not support the application of auxiliary requirements for ventilation within the table notes. Notes are not the place for requirements all requirements should be within a clause structure first and then within a table format second.

MBA does not support the use of the “X” within the table, where combination is not permitted.

Master Builders strongly opposes the use of this clause in its current format.

NCC Volume(s): ☒ One ☐ Two ☐ Three ☐ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: J3D7(1)

Recommended change to draft:

Clearly scope the clause

Comment/reason for change:

This clause refers to tables that address 3 different roof types:

1. Flat concrete roof
2. Pitched roof with flat ceiling
3. Timber-framed flat, skillion or cathedral roof

These roof types should be addresses in the lead-in to the clause.

Also, J3D7(f) is fabulous in comparison! Clear and easy to understand.

NCC Volume(s): ☒ One ☐ Two ☐ Three ☐ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: J3D7 and Table(s) J3D7a, J3D7d, J3D7g, J3D7j, J3D7m, J3D7p - Flat concrete roof — minimum R-Value for insulation.

Recommended change to draft:

MBA requests that the office of the ABCB redraft these tables in a format that is easy to understand and clearly states the minimum requirements. The range of choice just provides an opportunity for licensees and enforcers in the technical regulation chain to get confused. The reader should not need to roll a dice to figure out if they are going to get eaten by the regulatory dragon. Technical regulation is not the main game, good building are.

Comment/reason for change:

What is a flat roof?

Is a flat roof absolutely flat?

Have office of the ABCB assessed the moisture risk for this type of construction (Reflective insulation under-roof)?

MBA are concerned regarding the complex nature of the drafting – e.g. Climate Zone 7 & 8 have a Solar absorbance choice of 7 ranges. This seems excessive for regulation.

NCC Volume(s): ☒ One ☐ Two ☐ Three ☐ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: J3D7(3)

Recommended change to draft:

Review the clause regarding the use of reflective insulation.

Comment/reason for change:

Master Builders are concerned with the specification of reflective insulation due to the relationship with condensation risk.

Also we note that the clause is a little schizophrenic in its structure.

(3) *Reflective insulation* installed to comply with (1) must—

(a) be downward facing; and (installation)

(b) have an emissivity of not more than 0.05; and (product requirement)

(c) be adjacent to a roof space— (installation)

(i) of not less than 20 mm; and (installation)

(ii) in accordance with F8D5. (unclear cross reference)

This clause is about ventilation of rood spaces, is F8D5 an appropriate cross reference? If so, what exactly is the point of the cross reference? It is not clear the link between these requirements.

NCC Volume(s): ☒ One ☐ Two ☐ Three ☐ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: J3D7(4)

Recommended change to draft:

This clause needs to be reconsidered and possibly redrafted.

Where~~, for operational or safety reasons associated with exhaust fans, flues or recessed downlights~~, the area of ceiling insulation required ~~to be added~~ is reduced, the loss of insulation must be compensated for ~~by increasing the material R-Value of the remainder of the ceiling insulation~~ in accordance with Table J3D7s.

Comment/reason for change:

Are the looking to regulate the reason that people have reduced the insulated area? Or are you simply looking to regulate the compensation factor where insulation area has been reduced?

If you have clearly specified where insulation must be added then this clause is an exemption to that requirement.

See suggest change above.

NCC Volume(s): ☒ One ☐ Two ☐ Three ☐ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: J3D7(5)

Recommended change to draft:

Please consider redrafting this clause.

Comment/reason for change:

This subclause and its associated tables are terrible!

Is J3D7 about insulation or thermal bridging? It is desultory in its drafting.

One option in the table is to directly address the thermal bridge the other options compensate for the thermal bridge with insulation. Master Builders would suggest that this subclause is either about:

1. Insulation (as compensation for the thermal bridge) and included in J3D7 or
2. thermal bridging and located outside of J3D7.

Once the ABB has figured out how they want to address this clause, it should be redrafted for clarity.

NCC Volume(s): ☒ One ☐ Two ☐ Three ☐ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: J3D8

Recommended change to draft:

MBA's recommended changes are:

1. Make the heading more specific
2. Rewrite the clause making it a true DtS clause.

Comment/reason for change:

This clause needs to be targeted better, currently it is a jumble of specific performance requirements for R Values and solar absorbance that cannot be applied by builders (who are regulated against these requirements).

The clause is not a DtS that gives the reader any clue how to achieve compliance (or the intended policy outcome) with total R-values or solar absorbance requirements. This clause is probably a good Performance Requirements for external wall R-values and solar absorbance requirements, that in turn could use a good DtS clause or clauses to accompany it.

A good DtS clause would reflect all the current DtS options for external walls currently addressed within the code for class 2 and 4. It would consider items such as:

- DtS structural materials
- DtS cladding materials
- Etc.

What does this clause hope to achieve?

Does this clause address every requirement for an external wall of a sole-occupancy unit of a Class 2 building or a Class 4 part as reflected in the title? Give the clause a better name that tells the reader what the clause is about! The clause needs to be renamed.

Who are these provisions aimed at?

MBA would suggest they are aimed at smaller class 2 developments, that don't want to go down a route of full-blown energy assessment. Because of this

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NCC Volume(s): ☒ One ☐ Two ☐ Three ☐ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: J3D11 & J3D12

Recommended change to draft:

Rename the clauses

Comment/reason for change:

What is the building outcome of these clauses?

How are the ABCB expecting the clause will be implemented and by which regulated party?

Winter/summer glazing means nothing to a builder (I also suspect regulators and building surveyors may be the same).

Are the ABCB suggesting that glazing within a building is changed for winter and summer?

If this clause is about specifying minimum winter/summer performance of window expressly state that.

Currently these clauses appears to be performance-based and does not reflect a good prescriptive DtS clause that informs the reader what is OK or what is not ok. These may be good performance requirements for winter/summer performance of windows. However, it required a good prescriptive DtS clause to go with it(it may only need to be a single clause if it was prescriptive).

MBA supports the use of the tables in this clause as it is tabulated information (not requirements).

NCC Volume(s): ☒ One ☐ Two ☐ Three ☐ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: J3D13

Recommended change to draft:

Redraft (b)

(b)(ii) if adjustable, is readily operated either manually, mechanically, or electronically ~~by the building occupants.~~ from within the SOU.

Comment/reason for change:

This is one of the best drafted cluses within this section.

However, (b) requires some tweaking.

(b) addresses external shading devices/products (shutters, blinds, vertical or horizontal building screens with blades, battens or slats)

(b)(i) is a product performance statement that will require evidence of suitability for the product used – Is solar radiation addressed by manufacturers of these devices/products?

(b)(ii) This clause is applied to design and construction, it is too late by the time the occupant gets to it.

MBA would prefer to see specified prescriptive options within the DtS. This clause is mostly there.

NCC Volume(s): ☒ One ☐ Two ☐ Three ☐ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: J3D9

Recommended change to draft:

Click here to enter text.

Comment/reason for change:

This clause gives a builder no information they can understand and should not be regulated against builders.

NCC Volume(s): ☒ One ☐ Two ☐ Three ☐ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: J3D10

Recommended change to draft:

Please consider

Comment/reason for change:

Have the ABCB considered the knock-on effects of specifying a waffle slab? E.g. Weather/waterproofing/rising damp?

MBA would strongly suggest that these need to be considered before specifying this product.

Master Builders see a need for integration of energy efficiency provisions and a consolidation of DtS requirements.

NCC Volume(s): ☒ One ☐ Two ☐ Three ☐ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: J3D14 (1)

Recommended change to draft:

(1) The modelled net annual energy usage of the dedicated services…

Comment/reason for change:

It should be explicitly stated that this is a "model" for regulatory purposes, not actual net energy use. Otherwise, it will create confusion when lawyers and good-natured consumers read this clause - A regulatory performance based NCC creates enough confusion.

Please consider clearly stating that this is a model.

NCC Volume(s): ☒ One ☐ Two ☐ Three ☐ Housing Prov. ☐ Livable Housing

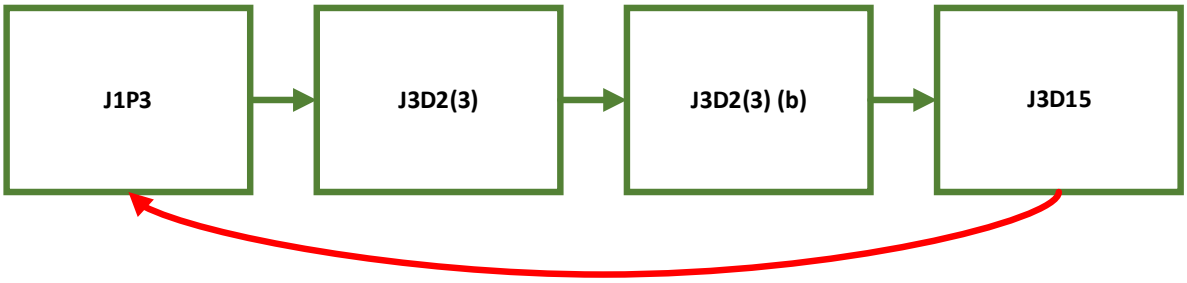
Clause/Figure/Table: J3D15

Recommended change to draft:

Please consider redrafting to remove the circular nature of the drafting.

Comment/reason for change:

- The circular reference to back to J1P3 is problematic, as this is the performance requirement that is satisfied with the DtS clause J3D2(3)(b), references J3D15, that refers the reader back to the very performance requirement the DtS is supposed to satisfy.



When industry requested a whole of house tool, we were not looking for another complication to the discombobulated energy efficiency requirements. Industry was looking for a simplification of the compliance process with a tool. Unfortunately this has become another bolt-on requirement which will contribute to the confusion of industry.

NCC Volume(s): ☒ One ☐ Two ☐ Three ☐ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: J9D4

Recommended change to draft:

Please delete

1. J9D4 (e)
2. J9D4 (3)
3. J9D4 (4)

Comment/reason for change:

1. class 3 to 9 buildings do not have the same restrictive issues as class 2 buildings when it comes to retrofitting.
2. There is no reason to have this requirement. Master Builders is unaware of any issues regarding installation of cabling post occupation.
3. Labelling this space is unnecessary.

The implementation of high-cost electrical infrastructure such as distribution boards makes sense.

The installation of charging control systems is more questionable as technology is likely to change and buildings may have to replace the charging control systems as the technology advances.

The future cost saving is not clear for these provisions.

Also, there does not seem to have been any considerations for changes to the main switchboard and submains to facilitate the distribution boards in carparks in or servicing Class 2 buildings.

Also, what impact on the grid is estimated with largescale uptake of electric vehicles and does this clash with the objectives and function statements for Section J.

Energy Efficiency - Volume 2

NCC Volume(s): ☐ One ☒ Two ☐ Three ☐ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: Introduction to this Part

Recommended change to draft:

Consider deletion of introduction

This Part is intended to ~~reduce greenhouse gas emissions from~~ manage energy use in buildings. It addresses ~~greenhouse gas emissions that occur~~ energy use as a result of ~~the~~ how the building is designed and constructed~~, its energy use related to design and construction factors:~~ and the source of the energy used.

Comment/reason for change:

Are buildings creating greenhouse gas emissions? Or is the energy source utilised to operate the buildings creating greenhouse gas emissions?

Master Builders believe that the reduction of greenhouse gas emissions is too high level concept for this introduction and impractical for a technical regulation standard. It also makes it sound like buildings themselves are creating greenhouse gas emissions, when it is the energy source used that creates the emissions. Because of this, the focus should be on managing energy use within buildings, not greenhouse gases – MBA agrees that greenhouse gas emissions should be the overarching policy concept but this should not be in the main body of the code (It could be referred to in the guide if necessary).

What about the jurisdictions (Tasmania and the ACT) that are not producing any greenhouse gases? Or buildings that are not on the grid? Does this section not apply to them?

MBA does not support the inclusion of this introduction in its current format; it adds no value to regulation and is excess noise for the reader. MBA would recommend that it is put into the guide, if used at all.

NCC Volume(s): ☐ One ☒ Two ☐ Three ☐ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: H6O1

Recommended change to draft:

Include a reference to buildings

Comment/reason for change:

Master Builders is concerned that the objective for this part does not refer to buildings – which is what the code regulates. Whilst it might be OK to speak broadly within policy forums, once in a technical regulation code the regulated element should clearly be articulated (buildings).

NCC Volume(s): ☐ One ☒ Two ☐ Three ☐ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: H601

Recommended change to draft:
The Objective of *Part H6 Energy efficiency* is to - ~~reduce greenhouse gas emissions.use energy efficiently in order to~~
(a) ~~reduce~~ manage energy consumption: ~~and~~
(b) ~~reduce greenhouse gas emissions: and~~
(c) ~~improve occupant health and amenity: and~~
(d) ~~improve~~ manage ~~the resilience of a building to extreme weather and blackouts~~

Comment/reason for change:

1. The lead in sentence should clearly state what the "objective" is for - Part H6 Energy efficiency.
2. The addition of "~~use energy efficiently in order to"~~ adds no value to the objective as it is currently drafted.
3. Is the objective to reduce or manage energy consumption? MBA understands that on a societal scale the policy may be to reduce energy consumption in new homes compared with older/existing homes. However, as the technical regulation (NCC) is only applied to new building work, the objective should reflect the management of energy consumption rather than the reduction of energy use. This comment is also relevant to (b) as the act of constructing a new dwelling that will use energy will increase greenhouse gas emissions unless powered by renewable energy.
4. Improve occupant health – how will a building improve occupant health? The fact that a person is provided shelter with a building will improve occupant health, is the office of the ABCB going add this to every objective within the NCC?
5. Improve occupant health – It is important to note that the development of the Energy efficiency provisions has completely ignored the occupant health risks posed by moisture and in turn indoor air quality.
6. Improve occupant health – Master builders does not support this statement within the objectives as it is false in the current context.
7. Whilst "improve the resilience of a building to extreme weather and blackouts" is an admirable objective Master Builders does not think this H6O1 is the correct place for it. On a building level a black out will not use any energy at all and on a network level, will reduce energy use.
8. Resilience needs further policy work to define what exactly meant by "resilience of a building to extreme weather and blackouts". Without this policy work it is impossible to develop technical regulation that will address the policy intention.
9. Master Builders is also concerned that the concept of resilience is so broad that to implement it in a national code may not meet the individual requirement of each state and territory.

Other comments

- To use energy efficiently in new development/building work will not translate into a net reduction in energy use.

NCC Volume(s): ☐ One ☒ Two ☐ Three ☐ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: H6F1

Recommended change to draft:

Split the functional statement into its primary elements.

Comment/reason for change:

MBA believes that the code requires more than one functional statement.

1. Envelope efficiency
2. Domestic services efficiency

MBA believes that the separation between the performance of the building envelope and the services would allow for clearer consideration of the regulated elements, especially in relation to the building envolope.

This would—

1. help create a clear regulatory threshold for thermal performance of the building envelope and
2. allow a wholistic assessment regarding how thermal performance of the building envelope interacted with moisture and indoor air quality.
3. Dictate spec

NCC Volume(s): ☐ One ☒ Two ☐ Three ☐ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: H6P1

Recommended change to draft:

Click here to enter text.

Comment/reason for change:

This performance requirement is misleading as it suggests the only way to comply is via Specification 44. H6D1 & H6D2 then suggest otherwise.

ABCB need to consider re drafting this performance requirement as Specification 44 is not the only pathway to comply with H6P1

NCC Volume(s): ☐ One ☒ Two ☐ Three ☐ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: H6P1(3)

Recommended change to draft:

Redraft clause to accurately describe the

…not exceed the thermal energy load limit as calculated in Specification 44.

Comment/reason for change:

Specification 44 does not specify a thermal energy load limit. The text currently reads like you can find the thermal energy load limit in specification 44…alas, you cannot without performing a calculation.

NCC Volume(s): ☐ One ☒ Two ☐ Three ☐ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: H6P2

Recommended change to draft:

Please consider clarification of this clause. It requires a better definition of *energy value*.

However, MBA would strongly recommend that the structure of this performance requirement be revised and changed.

Comment/reason for change:

1. How do you determine energy value to understand/regulate this performance requirements?
2. How do you determine the energy value of a building?
3. How do you reconcile the energy value of a building vs 70% of the building's energy value?

NCC Volume(s): ☐ One ☒ Two ☐ Three ☐ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: H6P2

Recommended change to draft:

Clarification of the performance requirement

Comment/reason for change:

What is the energy value of a -

1. 3-star ducted heat pump, rated under the 2019 GEMS determination for heating all spaces that are provided with heating?
2. 3-star ducted heat pump, rated under the 2019 GEMS determination, cooling all spaces that are provided with cooling?
3. 5-star instantaneous gas water heater, rated under the 2017 GEMS determination, providing all domestic hot water?
4. lighting power density of 4 W/m2 serving all spaces that are provided with lighting?

Is there a secondary calculation required to determine these values? If so, why not state calculation/formula here, rather than making the reader undertake a secondary step to understand what is required?

If there is <u>not a calculation required</u> to determine the energy values of these items, why not state what the regulated value is?

Currently this performance requirement is meaningless and unquantifiable.

NCC Volume(s): ☐ One ☒ Two ☐ Three ☐ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: H6P2

Recommended change to draft:
The *energy value* of the *domestic services must not exceed 70% of* the *energy value* ~~with~~ of -

(a) XXX kw/h ~~a 3-star ducted heat pump rated under the 2019 GEMS determination, heating all spaces that are provided with heating~~ for a heating unit that is heating all spaces: and

(b) XXX kw/h ~~a 3-star ducted heat pump, rated under the 2019 GEMS determination, for cooling all spaces that are provided with cooling~~ for a cooling unit that is cooling all spaces: and

(c) XXX kw/h ~~a 5-star instantaneous gas water heater, rated under the 2017 GEMS determination providing all domestic hot water~~, for a domestic hot water unit: and

(d) a lighting power density of 4 W/m2 serving all spaces that are provided with lighting.

Comment/reason for change:

Setting a kw/h value will make it easier for the user of the NCC, rather than the user needing to search other documents.

NCC Volume(s): ☐ One ☒ Two ☐ Three ☐ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: H6P2

Recommended change to draft:

Include a definition for domestic services.

Comment/reason for change:

1. There is no definition for the defined term "*domestic services"* in the draft.
2. As this is a key part of the Energy Efficiency provisions, it is difficult to understand:
    a. how this clause will be regulated and
    b. the implications to the design and in turn, the construction of buildings.

NCC Volume(s): ☐ One ☒ Two ☐ Three ☐ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: H6P2(a), (b), (c) and (d)

Recommended change to draft:

Review clause considering the comments below.

Comment/reason for change:

1. The way this clause reads is; if systems other than –
    a. "a 3-star ducted heat pump, rated under the 2019 GEMS determination, heating all spaces that are provided with heating" and
    b. " a 3-star ducted heat pump, rated under the 2019 GEMS determination, cooling all spaces that are provided with cooling and
    c. domestic hot water system other than "a 5-star instantaneous gas water heater, rated under the 2017 GEMS determination, providing all domestic hot water" and
    d. "a lighting power density of 4 W/m2 serving all spaces that are provided with lighting".
2. A buildings domestic services can exceed 70% of the energy value if you use products other than a, b, c and d.
3. Is this the intention?

NCC Volume(s): ☐ One ☒ Two ☐ Three ☐ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: H6P2/Schedule 1

Recommended change to draft:

Click here to enter text.

Comment/reason for change:

The defined term *energy value* is inaccessible to the parties (builders, building surveyors) who will be regulated against it.

The current definition reads like a combination of economic and legal waffle and is meaningless to the people who will be implementing the technical regulation or be regulated against the technical regulation (performance requirement).

> ***Energy value: The net cost to society including, but not limited to, costs to the building user, the environment and energy networks***

How is the reader supposed to use a defined term that in turn requires definition and further refinement?

How does the reader determine costs to -

1. the building user?
2. the environment?
3. energy networks?

How does the reader determine the net cost to society when the definition is **not limited to the factors within the definition**?

What metric is the *energy value* measured in? As an example, how does the reader reconcile 4 W/m^2 against the unknown metric of “energy value”?

Is the *energy value* an absolute value or is it an estimate? This is a point MBA has raised numerous times in the BCC and development of these provisions.

This is a regulatory code and must be practical, clearly defined and measuable to regulators and licenced parties.

NCC Volume(s): ☐ One ☒ Two ☐ Three ☐ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: H6V3

Recommended change to draft:

Master Builders recommend 2 changes to the draft:

1. Scope part 1 of the VM to acknowledge the upper (10m3/hr.m2 at 50 Pa) and lower (5 m3/hr.m2 at 50 Pa) thresholds for compliance.
2. Delete proposed part 2 and 3, or move the ventilation requirements included in the VM to the ventilation part of the code.

(1) Compliance with H6P1(f) is verified when a building envelope is sealed at an air permeability of not more than 10 m3/hr.m2 at 50 Pa reference pressure when tested in accordance with AS/NZS ISO 9972 Method 1.

~~(2) Where an air change rate of not more than 5 air changes per hour at 50 Pa reference pressure is achieved-~~

~~(a) the building must be provided with a mechanical ventilation system that-~~

~~(i) can be manually turned off: and~~

~~(ii) provides outdoor air, either-~~

~~(A) continuously: or~~

~~(B) intermittently. where the system has controls that enable operation for not less than 25 percent of each 4 hour segment: and~~

~~(iii) provides a flow rate not less than that achieved with the following formula: 0 = (0.05 xA + 3.5 x (N + 1))/ P~~

~~(A) 0= the required air flow rate (Lis): and~~

~~(8) A= the total floor area of the building (m2): and~~

~~(C) N= the number of bedrooms in the building: and~~

~~(D) P = the fraction of time within each four hour segment that the system is operational: and~~

~~H6V3~~

~~(b) any space with a solid-fuel burning combustion appliance must be ventilated with permanent openings directly to outside with a free area of not less than half of the cross-sectional area of the appliance's flue: and~~

~~(c) any space with a gas fuelled combustion appliance must be ventilated in accordance with-~~

~~(i) clause 6.4 of AS/NZS 5601.1: and~~

~~(ii) clause 6.4.5 of AS/NZS 5601.1.~~

~~(3) For the purposes of (2)(c), the volume of the space is considered to be O m□for determining ventilation requirements.~~

Comment/reason for change:

Master Builders is concerned that the proposed amendments to this verification method mean that the VM no longer clearly aligns with the requirements of H6P1(f) for building envelope sealing against air leakage. However, MBA also notes this PR has been proposed for deletion. So the VM may not align with any performance requirement.

The proposed changes to the VM introduce DtS style requirement for mechanical ventilation for buildings that have a verified building sealing of 5 air changes per hour at 50 Pa reference pressure or less.

Master Builders would like the proposed verification method amended with the ventilation requirement removed and the acceptable scoped thresholds (upper and lower) included for the use of the building sealing VM. This bolt-on requirement for ventilation is clearly demonstrating:

1. the limitations of blower door testing for NCC compliance
2. The need to separate the elements of building envelope performance, when addressing energy efficiency
3. The need for integration of the energy efficiency requirements throughout the code to prevent regulator impediments to sustainable construction. Rather than just bolting DtS style requirements onto VM's.

Master Builders would be interested to understand the evidence used to develop the new part 2 and 3 of the verification method.

NCC Volume(s): ☐ One ☒ Two ☐ Three ☐ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: H6D2(1)(a)(i)

Recommended change to draft:

Clarification required for the subclause

Comment/reason for change:

Does the reference to specification 42 include the requirements S42C3?

NCC Volume(s): ☐ One ☒ Two ☐ Three ☐ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: H6V3(1)

Recommended change to draft:

Delete H6V3 as this verification method aligns with as H6P1(f) which is proposed to be deleted.

Comment/reason for change:

This verification method no longer aligns with a performance requirement.

NCC Volume(s): ☐ One ☒ Two ☐ Three ☐ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: H6D1(1)

Recommended change to draft:

(1) Where a Deemed-to-Satisfy Solution is proposed Performance Requirements H6P1 and H6P2 are satisfied by complying with H6D2; ~~and~~

Comment/reason for change:

Having “and” after the semicolon implies that clause (2) is required also. MBA suggests that the “and” is removed.

NCC Volume(s): ☐ One ☒ Two ☐ Three ☐ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: H6D2(a)(ii)

Recommended change to draft:

(ii) ~~Section 13 of~~ the ABCB Housing Provisions, clauses-

Comment/reason for change:

The lead-in suggests the whole of section 13 is required for compliance.

NCC Volume(s): ☐ One ☒ Two ☐ Three ☐ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: H6D2(a)(ii)(A)

Recommended change to draft:

(A) 13.2.2, for ~~building fabric~~ thermal insulation product and installation requirements; and

Comment/reason for change:

These changes allow the reader to understand that the reference contains:

1. Product requirements
2. Installation requirements

NCC Volume(s): ☐ One ☒ Two ☐ Three ☐ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: H6D2(2)

Recommended change to draft:

The drafting of this clause requires redrafting

Comment/reason for change:

The drafting of this clause requires redrafting

The intent of clause H6D2(2) is not to consider clause c in isolation so having the prefix or after clause a, b and c is considered incorrect

Complying with Parts 13.6 and 13.7 does not satisfy H6P2

MBA does not support the reference to Part B of the NCC Vol 3 – Plumbing Code of Australia as it has no relevance to H6P2.

NCC Volume(s): ☐ One ☒ Two ☐ Three ☐ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: Guidance

Recommended change to draft:

Include flow chart that maps out compliance pathways.

Comment/reason for change:

MBA notes that there has been a flow chart that maps out compliance with the performance requirements in the past. We strongly encourage the inclusion of an updated flow chart.

NCC Volume(s): ☐ One ☒ Two ☐ Three ☐ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: H6D2(1)(a)(ii)(B)

Recommended change to draft:

13.2.3(6) and 13.2.5(5), for thermal breaks in roofs and external walls; and

Comment/reason for change:

It allows the reader to have a general understand the scope of the clause without having to go to the actual clause.

NCC Volume(s): ☐ One ☒ Two ☐ Three ☐ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: H6D2(1)(a)(ii)(D) complying with Section 13 of the A8C8 Housing Provisions

Recommended change to draft:

(D) 13.2.6(3) for steel framed floor insulation; and

…

(F) 13.2.6(4), for concrete slab-on-ground floor edge insulation; and

Comment/reason for change:

Subclause D reads like it is only addresses slab edge insulation rather than steel framed floor insulation also. MBA recommends separation into separate clauses that clearly state the purpose and the element for regulation.

NCC Volume(s): ☐ One ☒ Two ☐ Three ☐ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: H6D2(1)

Recommended change to draft:

…the thermal performance of the building is satisfied by complying with either (a) or (b)…

Comment/reason for change:

The lead-in sentence for (1) should spell out how to comply with (1). i.e. There are two ways you can comply NatHERS + ACP or ACP.

This is important because there are 2 separate pathways that are currently presented as a single option.

NCC Volume(s): ☐ One ☒ Two ☐ Three ☐ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: H6D2(1)(a)(i)

Recommended change to draft:

Include house energy rating software (NatHERS)

Comment/reason for change:

This is the NatHERS pathway – state it clearly!

It is ridiculous that the reader must look at specification 42 to understand what this compliance what this subclause says.

NCC Volume(s): ☐ One ☒ Two ☐ Three ☐ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: H6D2(2)

Recommended change to draft:

complying with ~~Section 13 of~~ the ~~following parts of the~~ ABCB Housing Provisions -

Comment/reason for change:

This currently reads as compliance with the whole of section 13 is required.

NCC Volume(s): ☐ One ☒ Two ☐ Three ☐ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: H6D2(1)(b)(ii)

Recommended change to draft:

(ii) Part 13.3, for the external windows(?) and shading; and

Comment/reason for change:

This clause if difficult to read as drafters seem to have forgotten to put a word in.

NCC Volume(s): ☐ One ☒ Two ☐ Three ☐ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: H6D2

Recommended change to draft:

Click here to enter text.

Comment/reason for change:

Please consider separating H6D2 into two separate application clauses. As the issues addressed within (1) and (2) are totally different. Tangling them together into 1 application clause is confusing.

NCC Volume(s): ☐ One ☒ Two ☐ Three ☐ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: H6D2(2)(b)

Recommended change to draft:

complying with Parts 13.6 Whole-of-home energy usage and 13.7 Services of the ABCB Housing Provisions:

Comment/reason for change:

Please consider stating what the referenced clauses address so the reader can understand the application without having to look in other places.

NCC Volume(s): ☐ One ☒ Two ☐ Three ☐ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: H6D2(2)(c)

Recommended change to draft:

Please review clause.

Comment/reason for change:

Is H6P2 really satisfied by compliance with this clause?

Specification 42

NCC Volume(s): ☐ One ☒ Two ☐ Three ☐ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: Specification 42

Recommended change to draft:

Click here to enter text.

Comment/reason for change:

General Comments

Spec 42 is overly complex

(1)

It contains regulatory thresholds

NCC Volume(s): ☐ One ☒ Two ☐ Three ☐ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: Specification 42(1)

Recommended change to draft:

A building must achieve an energy rating, including the separate heating and cooling load limits, using~~.....,~~ of greater than or equal to-

Comment/reason for change:

Appear to be words missing.

NCC Volume(s): ☐ One ☒ Two ☐ Three ☐ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: Specification 42 Heading

Recommended change to draft:

Requirements for using House energy rating software

Comment/reason for change:

Using House energy rating software is not a great heading.

This clause sets out regulatory thresholds (6, 6.5 and 7 star) for compliance when using house energy rating software.

It also has exemptions to the thresholds, heating and cooling load requirements as well as energy use requirements.

It needs a better heading.

NCC Volume(s): ☐ One ☒ Two ☐ Three ☐ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: Specification 42 Scope

Recommended change to draft:

This Specification sets out requirements for using house energy rating software for compliance with…

Comment/reason for change:

What are the expected outcomes of Spec 42 requirements? This scope needs to clearly articulate what Spec 42 is for.

Currently, the scope reads like the reader is going to be presented with the requirements for the technical use of housing energy rating software tools. Rather than the technical threshold requirements for regulatory compliance.

NCC Volume(s): ☐ One ☒ Two ☐ Three ☐ Housing Prov. ☐ Livable Housing

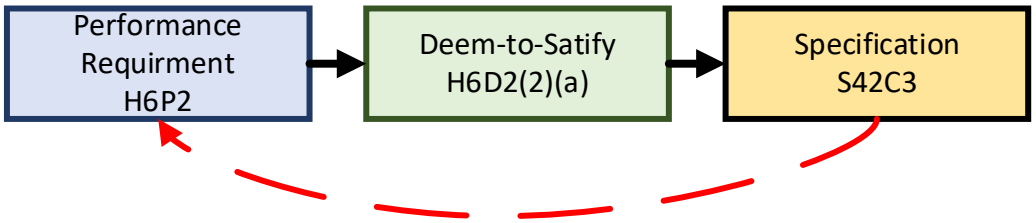
Clause/Figure/Table: S42C3

Recommended change to draft:

(1) …a minimum whole-of-home rating of ~~not less than~~ equal to or greater than H6P2…
(2) Consider comments below regarding clarity.

Comment/reason for change:

- Current drafting is negative (double negative ☹), overly complex and confusing.
- What is net equivalent energy usage? This term has appeared and has not been explained in the regulatory pathway. How is the reader supposed to understand what is meant by this term?
- How do you undertake a whole-of-home rating?
- The performance requirement H6P2 is difficult to understand and is not clear on the process to determine equivalence - see specific comment on H6P2 for further information.
- The circular reference to back to H6P2 is problematic, as this is the performance requirement that is satisfied with the DtS clause H6D2(2)(a), which references the specification S42C3, that refers the reader back to the very performance requirement the DtS is supposed to satisfy. This drafting concept is entertaining ☺, but NOT supported.



- Does this DtS provision really require a 3 stage processes for compliance?
  1. undertake a whole-of-home rating on proposed dwelling (process 1)
  2. undertake H6P2 process (2)
  3. Compare process 1 to process 2, to make sure process 1 is **not less than** process 2(process 3).
  4. This seems to be a Verification Method, for a performance solution rather than a DtS.

5. What does the evidence within complaint approval look like? Have the ABCB done this to show building surveyors what they will be required to have

---

Housing Provisions

NCC Volume(s): ☐ One x Two ☐ Three ☐ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: 10.8.1.(2)

Recommended change to draft:

(a) in climate zones 4 and 5, 0.143 µg/N.s (AS4200 class 3 or 4 vapour permeance): and

(b) in climate zones 6, 7 and 8, 1.14 µg/N .s. (AS4200 class 4 vapour permeance)

Comment/reason for change:

Please consider including the vapour classification as this minimises confusion and means it is not necessary to refer to AS4200 in many cases. This also assists in people understanding what "yg/N.s" actually relates to. When purchasing these materials the classification is the main item labelled (not permeability µg/N.s).

NCC Volume(s): ☐ One x Two ☐ Three ☐ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: 10.8.1.(2)

Recommended change to draft:

MBA shares others concerns regarding potential weatherproofing issues with pliable building membranes, sarking-type materials or insulation layers that are vapour permeable and also liquid water permeable. We urge the Office of the ABCB to address building envelope issues holistically with a view to incorporate/consolidate requirements.

NCC Volume(s): ☐ One ☐ Two ☐ Three ☒ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: 10.8.1(4) suggested inclusion

Recommended change to draft:

10.8.1(4) Pliable building membranes must have a flammability index not greater than 5 in accordance with Part 3.7.1.2

Comment/reason for change:

This consolidates the requirements for PBMs.

NCC Volume(s): ☐ One ☐ Two ☐ Three ☒ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: 10.8.2

Recommended change to draft:

Specify minimum exhaust system requirements including duct size etc.

Comment/reason for change:

Provides industry prescriptive parameters for compliance. Currently this clause a performance statement regarding exhaust systems performance.

NCC Volume(s): ☐ One ☐ Two ☐ Three ☐ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: Table 10.8.2

Recommended change to draft:

Other alternatives need to be offered such as lower-level relief grilles

Comment/reason for change:

The current requirements to undercut a door is too limiting consumers/designer choice. It should not require a performance solution for make up air.

NCC Volume(s): ☐ One ☐ Two ☐ Three ☒ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: Table 10.8.2

Recommended change to draft:

1. Change the heading to column 1 to read “Required exhaust air flow rate”

Comment/reason for change:

Creates a definitive alignment with 10.8.2(1)

NCC Volume(s): ☐ One x Two ☐ Three ☐ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: Table 10.8.2: Make-up air requirements

Recommended change to draft:

Exclusion for cavity sliding doors

Comment/reason for change:

Due to the nature of cavity sliders, creating large gaps at the bottoms of doors is problematic. The natural "gappiness" of cavity sliders would likely be sufficient for make up air pathways.

NCC Volume(s): ☐ One ☐ Two ☐ Three ☒ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: 10.8.3

Recommended change to draft:

Provide additional information on how this is can be achieved where the roof space is reduced at the permitter walls when a truss roof system all the pitching line is approx. 125 mm whilst primary insulation layer (Ceiling Batts) used in in the ceiling are generally 150 – 300 thick

Comment/reason for change:

The requirement contradicts practical application

NCC Volume(s): ☐ One ☐ Two ☐ Three ☒ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: 10.8.3

Recommended change to draft:

This part of the housing provision requires redrafting as it is unclear and will be misunderstood by industry and resulting to noncompliance.

Comment/reason for change:

Scopes ways to improve compliance, particularly that many homes are constructed without eaves

---

NCC Volume(s): ☐ One ☐ Two ☐ Three ☒ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: Table 10.8.3

Recommended change to draft:

The Table notes should include some practical solutions. ABCB should not continue to set benchmarks for compliance without offering industry pragmatic solutions

Comment/reason for change:

Scopes ways to improve compliance, particurarly that many homes are constructed without eaves

---

NCC Volume(s): ☐ One ☐ Two ☐ Three ☒ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: 10.8.3(2)

Recommended change to draft:

Incorporate an Explanatory Note that makes it clear that whilst compliance with 10.8.3 is not required to be complied with for a roof subject to BAL FZ requirements, it is likely that these buildings may incur condensation problems

Comment/reason for change:

It needs to be clear that condensation may occur. Consumers and Industry need to be informed that buildings in BAL FZ are susceptible to condensation

---

NCC Volume(s): ☐ One ☐ Two ☐ Three ☒ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: 10.8.3(1)

Recommended change to draft:

(1) In climate zones 6, 7 and 8, a roof must have a ventilated roof space that -

Comment/reason for change:

Please consider adding ventilated into this clause, as this is what is being asked for.

NCC Volume(s): ☐ One x Two ☐ Three ☐ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: 10.8.3

Recommended change to draft:

Explanatory note regarding "roof spaces": The roof space needs to allow for insulation deflection and sag of any insulation or sarking like materials above with the minimum gap (10.8.3 (b)) maintained.

Comment/reason for change:

Ventilated roof space is a new requirement, so it is important that the intent is clearly understood. Variation from drawings to "as constructed" can result in a ventilation path which is closed by deflection of materials, unless specifically allowed for.

NCC Volume(s): ☐ One x Two ☐ Three ☐ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: 10.8.3 (1) (b)

Recommended change to draft:

No recommended change – As MBA do not have sufficient information to make a recommendation.

Comment/reason for change:

MBA are concerned that rooves under 5 degrees are recognised as a very high condensation risk when constructed in accordance with the NCC.

NCC Volume(s): ☐ One ☐ Two ☐ Three ☒ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: 10.8.3 (c) (ii)

Recommended change to draft:

10.8.3 (1) In climate zones 6, 7 and 8, a roof must have a roof space that

(c) (ii) located immediately underneath the sarking of a ~~tiled~~ roof where the sarking has a vapour permeance of not less than 1.14 µg/N.s.

Comment/reason for change:

Both tile and metal clad roofs benefit from the use of vapour permeable sarking to manage condensation risk in cold climates. As written, clause 10.8.3 (1) (c) (ii) only requires tiled roofs to be sarked with a vapour permeable sarking which effectively allows metal roofs to use any sarking-type material (including a vapour barrier). If this were permitted, sarking of a metal roof over the battens with a vapour barrier could result in the sarking in contact with the roof cladding allowing it to reach dew point and closure of ridge and fascia ventilation pathways. This would effectively increase condensation risk in cold climates.

NCC Volume(s): ☐ One ☒ Two ☐ Three ☒ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: 13.6.2(1)

Recommended change to draft:

The ~~net equivalent~~ estimated energy usage of a building calculated in…

Comment/reason for change:

1. The term “net equivalent” has no meaning in the regulatory context and is confusing.

The important part of this clause is the requirement to undertake a calculation to determine compliance by not exceed the stated threshold.

Keep the language simple, this will allow regulators and regulated parties understand what is required of them.

2. NOTE – clause 13.6.2(1)(b)(ii) and Table 13.6.2b- the "energy factors" for "allowance" can vary by a factor of close to 2 for the same climate zone, in adjacent jurisdictions (as one example from Tennant Ck NT to Mt Isa QLD there is a 1:2 ratio in allowable energy).This is very hard to understand without explanation.

NCC Volume(s): ☐ One ☐ Two ☐ Three ☒ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: 13.2.3(1)

Recommended change to draft:

~~Roof~~ Ceiling insulation must achieve the minimum R-Value

Comment/reason for change:

Roof insulation is in reference to insulation of a roof. MBA does not believe that this was the intention of the drafter.

NCC Volume(s): ☐ One ☐ Two ☐ Three ☒ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: Table 13.2.3a – Table Notes

Recommended change to draft:

Within the table there is a column labelled “Roof ventilation”. Within this column the options are either vented or standard. Vented is described/defined and standard is anything other than vented.

MBA would recommend that this terminology is changed to vented and non-vented as this seems to be the intension.

Comment/reason for change:

Without this clarification it may be possible to have—

1. two wind-driven roof ventilator per 50 m2 of respective ceiling area or
2. one powered roof ventilator per 200 m2 of respective ceiling area

and not strictly meet the considerations required for “Vented”. This requires the addition of a minimum ventilation requirement – which should not be in the notes of the table.

For noting: MBA has had feedback in relation to whether a non-ventilated roof should be compliant in cooler climates. This needs to be investigated for the regulatory context.

NCC Volume(s): ☐ One ☐ Two ☐ Three ☒ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: Clause 13.2.3(1)

Recommended change to draft:

Expand clause 13.2.3(1) to provide a structure for exemptions from the minimum R-Value for ceiling insulation for the variables addressed in the table 13.2.3a—

1. roof ventilation,

2. reflective insulation with certain R-value.
3. Solar absorptance

Comment/reason for change:

The minimum regulatory threshold for technical regulation should start with:

1. the most stringent minimum requirement based on the worst-case scenario, and
2. then provide exemptions to that requirement where the scenario is better than worst-case.

In this instance, there are several complex variables that need to be accounted for and the code should clearly structure the requirements for ease of policy implementation and regulation.

NCC Volume(s): ☐ One ☐ Two ☐ Three ☒ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: Table 13.2.3a

Recommended change to draft:

Break up the tables into several different tables reducing the complexity within the tables – transfer the complex variables into the clause structure of Clause 13.2.3(1) – as suggested above.

Comment/reason for change:

MBA generally supports a table format for the minimum requirements for ceiling insulation within the housing provisions.

However, in this instance MBA do not. This table is too complex and should be split into several tables stating clearly/plainly/simply the minimum insulation requirements for the scenarios addressed in the table.

This table currently states the minimum requirements and exemptions from the minimum for—

1. roof ventilation,
2. reflective insulation (condensation trap☹) with certain R-value.
3. Solar absorptance

MBA would like to see this single table broken up into separate parts.

Note: many of the tables 13.2.3 (a) onwards have words missing and appear half-completed.

NCC Volume(s): ☐ One x Two ☐ Three ☐ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: tables 13.2.5 (k) - (o)

Recommended change to draft:

Review of parameters for wall insulation.

Comment/reason for change:

The stringency for wall insulation DECREASES from climate zone 6 through to climate zone 7 and 8. Many systems are allowed in climate zone 8 (alpine) with R1.5 wall insulation. This anomaly is difficult to understand and requires review or explanation.

NCC Volume(s): ☐ One ☐ Two ☐ Three ☒ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: 13.2.6

Recommended change to draft:

There needs to be more scope in the requirements or “explanatory information”

Comment/reason for change:

When in slab heating is in place to a class 1 and there is an attached garage.

There is no clarity on how or where the perimeter insulation is required

The slab edge insulation is required to the slab where it meets the ground to the outside permitter of the edge beam as per Fig 13.2.6. This therefore allows warmth from the slab heating to leak into the unconditioned garage slab.

This is easy to understand if there is not attached garage.

Given the dwelling is adjoining an attached garage which is an unconditioned space it seems that there would be minimal benefit to provide slab edge insulation to the garage as it will cause further problems for the abutment of driveways and garages on boundaries.

Having something in the Explanatory information will be beneficial for industry.

Response(s) - Condensation

Condensation - Volume 1

Master Builders does not support the current condensation provisions. These provisions must align with the energy efficiency provisions and be developed addressing the same scope.

Master Builders notes that appropriate research and modelling into the issue has not taken place. Limited work has been undertaken to scope of the risk in Australia (different geographical locations) and the risk within buildings in medium to high-risk locations.

Geographical risk analysis must align with the 69 NatHERS Climate Zones across Australia that is used to develop energy efficiency policy. Considering the difference between internal and external environments.

Hygrothermal analysis of buildings in medium to high-risk geographical locations also needs to be undertaken to understand the risks in current DtS construction methods as well as widely used methods as recorded by CSIRO.

For these reasons Master Builders does not support these provisions.

NCC Volume(s): ☒ One ☐ Two ☐ Three ☐ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: F8O1

Recommended change to draft:

No suggested change

Comment/reason for change:

Master Builders is concerned that due to increased building sealing, as a part of energy efficiency regulation there is a problem with condensation within buildings. This issue is well understood by building scientist all over the world and should have been managed in the early 2000s.

NCC Volume(s): ☒ One ☐ Two ☐ Three ☐ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: F8F1

Recommended change to draft:

A building is to be ~~constructed~~ designed to avoid the likelihood of excessive internal moisture accumulating within the building structure.

Comment/reason for change:

The management of this issue need to happen and be regulated during the design phase.

NCC Volume(s): ☒ One ☐ Two ☐ Three ☐ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: F8V1(a)

Recommended change to draft:

(1) Compliance with Performance Requirement F8P1 is verified for an external wall assembly when it is determined by modelling of the design that a mould index of greater than 3, ~~as defined by Section 6 of AIRAH DA07~~, does not occur on interior, exterior or interstitial surfaces of the modelled components of the building fabric, from the 5th year after construction onwards.

(3) mould index of greater than 3 as defined by Section 6 of AIRAH DA07

Comment/reason for change:

By modelling of the design and the modelled - To make it clear that compliance with this verification method is determined from modelling of the design, not surveying the building after the 5th year post construction.

Some construction systems which may be analysed with wet construction materials which have not been protected from rain will have high initial moisture content (double the equilibrium moisture content at 80%RH) in the systems as per AIRAH DA07. These construction systems which contain materials that absorb water such as timber & timber boards can easily lead to a mould growth index exceeding 3 in the first few years of simulation then settle back down to zero or near zero. These systems have high drying potential and could be considered good systems but fail the verification.

NCC Volume(s): ☐ One ☒ Two ☐ Three ☐ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: F8D3(2)

Recommended change to draft:

…pliable building membranes, sarking-type materials, or insulation layers…

Comment/reason for change:

This is a classic example of the desperate need to review and consolidate the NCC by incorporating energy efficiency and moisture requirements directly into DtS provisions. The fact that this clause needs to use 3 names for the same building element is shameful and confusion to the general user of this document.

Condensation - Volume 2

Master Builders does not support the current condensation provisions. These provisions must align with the energy efficiency provisions and be developed addressing the same scope.

Master Builders notes that appropriate research and modelling into the issue has not taken place. Limited work has been undertaken to scope of the risk in Australia (different geographical locations) and the risk within buildings in medium to high-risk locations.

Geographical risk analysis must align with the 69 NatHERS Climate Zones across Australia that is used to develop energy efficiency policy. Considering the difference between internal and external environments.

Hygrothermal analysis of buildings in medium to high-risk geographical locations also needs to be undertaken to understand the risks in current DtS construction methods as well as widely used methods as recorded by CSIRO.

For these reasons Master Builders does not support these provisions.

NCC Volume(s): ☐ One ☒ Two ☐ Three ☐ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: H4O7 Condensation and water vapour management

Recommended change to draft:

~~The Objective is to reduce the likelihood of condensation or water vapour build-up causing illness, injury or loss of amenity for building occupants.~~

The Objective of this Part is to safeguard occupants from illness or loss of amenity because of excessive internal moisture.

Comment/reason for change:

This objective is clearer – MBA cannot see a reason to have 2 separate objectives between volume 1 and volume 2.

NCC Volume(s): ☐ One ☒ Two ☐ Three ☐ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: H4V5(a)

Recommended change to draft:

(1) Compliance with Performance Requirement F8P1 is verified for an external wall assembly when it is determined by modelling of the design that a mould index of greater than 3, ~~as defined by Section 6 of AIRAH DA07~~, does not occur on interior, exterior or interstitial surfaces of the modelled components of the building fabric, from the 5th year after construction onwards.

(4) mould index of greater than 3 as defined by Section 6 of AIRAH DA07

Comment/reason for change:

Including by modelling of the design and the modelled - To make it clear that compliance with this verification method is determined from modelling of the design, not surveying the building after the 5th year post construction.

Some construction systems which may be analysed with wet construction materials which have not been protected from rain will have high initial moisture content (double the equilibrium moisture content at 80%RH) in the systems as per AIRAH DA07. These construction systems which contain materials that absorb water such as timber & timber boards can easily lead to a mould growth index exceeding 3 in the first few years of simulation then settle back down to zero or near zero. These systems have high drying potential and could be considered good systems but fail the verification.

Schedule 1 Definitions

NCC Volume(s): ☒ One ☒ Two ☐ Three ☐ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: House energy rating software

Recommended change to draft:

(1) For the purposes of Volume One, means software accredited under the Nationwide House Energy Rating Scheme (NatHERS) and its associated NatHERS Certificate.

~~(2) For the purposes of Volume Two-~~

~~(a) applied to H6V2-software accredited or previously accredited under the Nationwide House Energy Rating Scheme (NatHERS), its associated NatHERS Certificate and the additional functionality provided in non-regulatory mode; and~~

~~(b) applied to H6D3-software accredited under the Nationwide House Energy Rating Scheme (NatHERS) and its associated NatHERS Certificate.~~

Comment/reason for change:

Delete (2)(a) as there is no reference to the defined term in H6V2.

Delete (2)(b) as H6D3 does not exist.

This definition introduces administrative requirements into the NCC by stealth.

The definition of *House energy rating software* introduces an administrative requirement via a definition. Master Builders is opposed to this style of drafting or this kind of requirement within a technical regulation code, as it is not a technical requirement of building work. This is NOT the role of the NCC and should be delt with in State and Territory legislation/regulation.

NCC Volume(s): ☐ One ☒ Two ☐ Three ☐ Housing Prov. ☐ Livable Housing

Clause/Figure/Table: Schedule 1

Recommended change to draft:

Membrane: A barrier impervious to liquid water ~~moisture~~.

Comment/reason for change:

The changes above to the definition of membrane are suitable for application to waterproofing and weatherproofing membranes.

The use of the word **moisture** can incorporate water vapor which needs to be able to move freely. The purpose of a membrane is to restrict liquid water movement in both wet area and external walls – not vapour.

This definition may need to be revisited in the future considering the complexities with these types of products.