

Property Council New Zealand

Submission on

Building Code update 2021 and operating protocols

28 May 2021

For more information and further queries, please contact

Natalia Tropicova
natalia@propertynz.co.nz
021863015

28 May 2021

Ministry of Business Innovation and Employment
Building Performance and Engineering Team
Building System Performance
PO Box 1473
Wellington 6140
Email: buildingfeedback@mbie.govt.nz

Building Code update 2021 and operating protocols

1. Recommendations Summary

1.1. Property Council New Zealand (“Property Council”) welcomes an opportunity to provide feedback on the [Building Code update 2021](#). While we support the intention of the Ministry of Business Innovation and Employment (“MBIE”) to ensure buildings are more energy efficient, there are parts of the update that require clarification and further refinement to ensure the Building Code Update 2021 serves its purpose of making homes and buildings warmer, drier and healthier, with less impact on the environment.

1.2. We recommend the following:

Overall approach to the Building Code Update 2021:

- Align with the 2020 Building for Climate Change recommendations;

Proposal 1: Energy Efficiency for housing and small buildings:

- Provide further details around proposed costs and options;
- Adopt a ‘kWh/m²/yr’ metric to measure energy efficiency;
- Provide more clarity around transitional arrangements and adopt a minimum of two-year timeframe for proposed changes to come into effect;

Proposal 2: Energy Efficiency for large buildings:

- Provide further details around proposed construction costs and options;

Proposal 3: Energy Efficiency for heating, ventilation and air conditioning systems in commercial buildings:

- Adopt a method of complying with the Building Code with clear indication of whether it is mandatory or a guidance;

Proposal 4: Natural light for higher density housing:

- Prioritise other significant issues (e.g. leaky buildings; cold damp conditions) over the ‘nice-to-have’ proposals (e.g. increased natural light);

Other factors to improve building efficiency:

- Refine the Building Code update 2021 taking into consideration other factors that contribute to an overall building efficiency:
 - Condensation risks
 - Risk of overheating
 - Other cost-effective means:
 - ❖ improving airtightness;

- ❖ improving heating system to increase effects of insulation;
- ❖ setting up mechanical ventilation to remove foul, moist or warm air; and
- ❖ addressing an underlying issue of thermal bridges through the insulation.

Additional comments on the Building Code update 2021:

- Align the Building Code update 2021 with the Healthy Homes Guarantee Act 2017;
- Refine the Building Code update 2021 to ensure different requirements of insulation levels for different types of buildings;
- Prioritise solutions around other significant issues (e.g. leaky buildings; cold damp conditions) over the ‘nice-to-have’ proposals (e.g. increased natural light);

Building Code operating protocols:

- Add ‘alignment with the Building for Climate Change recommendations’ as a criterion to the proposed operating protocols.

2. Introduction

- 2.1. Property Council’s purpose is; “Together, shaping cities where communities thrive”. We believe in the creation and retention of well-designed, functional and sustainable built environments which contribute to New Zealand’s overall prosperity. We support policies that provide a framework to enhance economic growth, development, liveability and growing communities.
- 2.2. Property is currently New Zealand’s largest industry with a direct contribution to GDP of \$29.8 billion (13 per cent). The property sector is a foundation of New Zealand’s economy and caters for growth by developing, building and owning all types of property.
- 2.3. Property Council is the leading not-for-profit advocate for New Zealand’s largest industry – property. Connecting people from throughout the country and across all property disciplines is what makes our organisation unique. We connect over 10,000 property professionals, championing the interests of over 600 member companies who have a collective \$50 billion investment in New Zealand property.
- 2.4. This submission provides Property Council’s feedback on the [Building Code update 2021: Consultation Document](#) (“Consultation Document 1”) and the [Building Code operating protocols: Consultation Document](#) (“Consultation Document 2”). Comments and recommendations are provided on those issues that are relevant to Property Council and its members.

3. Overall approach to the Building Code Update 2021

- 3.1. Property Council welcomes an opportunity to provide feedback on the Building Code Update 2021. However, we are concerned with an overarching approach the MBIE has taken when updating the Building Code.
- 3.2. For future purposes please note that consultation materials do not allow for easy addition of image-based material, nor do they allow for any extra general commentary outside of prescriptive questions. This stifles opportunities for submitters to raise other pertinent and potentially innovative content.
- 3.3. Our main concern is around misalignment of the proposed changes in the Building Code update 2021 with the [2020 Building for Climate Change recommendations](#). For example, the Building for Climate Change 2020 consultation document proposed that the new measures for operational efficiency would be implemented in a series of steps for new buildings (Figure 1 below). However, Step 1 (all

new buildings must report against operational efficiency requirements at consent and code compliance stages) was not included in the Building Code update 2021.

Step 1	Step 2	Step 3	Step 4
Operational Efficiency Requirements Launched	Initial Operational Efficiency Requirements come into force	Intermediate Operational Efficiency Requirements come into force	Final Operational Efficiency Requirements come into force
All new buildings must report against operational efficiency requirements at consent and code compliance stages.	All new buildings must meet initial operational efficiency requirements at consent and code compliance stages.	All new buildings must meet intermediate operational efficiency requirements at consent and code compliance stages.	All new buildings must meet final operational efficiency requirements at consent and code compliance stages.
	Public sector buildings must meet intermediate operational efficiency requirements at consent and code compliance stages.	Public sector buildings must meet final operational efficiency requirements at consent and code compliance stages.	

Figure 1. Operational Efficiency Framework. Sourced from MBIE¹

- 3.4. Further to this, use the Energy Performance Index (kWh/m²/yr) does not appear in the Building Code Update 2021, while being the core premise of the Building for Climate Change 2020.
- 3.5. We are concerned that the MBIE does not seem to be following its own recommendations. Therefore, we recommend refining the Building Code update 2021 to ensure it aligns with the 2020 Building for Climate Change recommendations. This will help ensure consistency of recommendations and delivery of better outcomes of the overarching Building System reform.
- 3.6. Sections below outline our recommendations to ensure the Building Code update 2021 serves its purpose.

4. Proposal 1: Energy Efficiency for housing and small buildings

Question 1-1: Proposed options and costs

- 4.1. We support MBIE’s overarching intention of higher level energy efficiency for housing and small buildings. However, there are a number of things within the proposal that require further consideration and refinement.
- 4.2. The costs and benefits section in Consultation Document 1 provides a summary of ongoing annual energy savings and associated upfront construction investment cost for all options that have been considered (Figure 2 below). The balance between the costs relative to the benefits does not seem to be right. In particular, it is concerning that the cost estimations of slight increases in efficiency result in significant cost outlay, especially given a flow-on effect it will have on affordability.

¹ Retrieved from <https://www.mbie.govt.nz/dmsdocument/11793-transforming-operational-efficiency>

4.3. While some methodology is provided (e.g. classification of new climate zones, insulation levels for different building elements), it is not entirely clear how these costs were calculated and how the MBIE arrived at these three options.

Options	Climate zone					
	1					6
Option 1. Halfway to international standards						
Ongoing annual energy savings	N/A ⁽²⁾	12%	21%	22%	21%	27%
Upfront construction investment cost	N/A ⁽²⁾	0.4%	1.9%	2.8%	2.3%	3.7%
		(\$1,760)	(\$8,400)	(\$11,300)	(\$10,700)	(\$15,300)
Option 2. Comparable to international standards						
Ongoing annual energy savings	36%	41%	50%	49%	57%	58%
Upfront construction investment cost	3.2%	3.9%	4.3%	4.4%	4.6%	5.8%
	(\$14,700)	(\$16,800)	(\$18,700)	(\$18,200)	(\$21,400)	(\$24,200)
Option 3. Going further than international standards						
Ongoing annual energy savings	46%	51%	64%	64%	64%	68%
Upfront construction investment cost	4.1%	4.7%	5.8%	7.0%	10.4%	12.1%
	(\$18,900)	(\$20,500)	(\$25,100)	(\$28,700)	(\$48,200)	(\$50,100)

Figure 2. Heating and cooling energy savings and the associated investment in new buildings. Sourced from MBIE

4.4. Transparency is key when it comes to making informed decisions. Therefore, we recommend the MBIE provide further details around how they arrived at these costs and three options.

4.5. Property Council believes that there are inadequacies in all these options outlined the Consultation Document 1. We strongly encourage the MBIE to take into account the following factors when making their final decision on a preferred option:

- Acknowledgement that there will need to be significant change from the industry and adaptation for New Zealand conditions will have to be accompanied by extremely robust construction methods if they are to match international standards;
- There needs to be adequate time for upskilling the work force and materials testing and certification. The process of material certification and testing needs to be streamlined to allow more materials with proven performance internationally to be used in New Zealand. It is even more critical given the current environment of material shortages (due to COVID and other reasons) and the lack of competition in the local market (which is already a major driver of construction costs).

Question 1-4: Measuring energy efficiency

4.6. The Building Code update 2021 requires to achieve a Building Performance Index (“BPI”) of 1.55. We are concerned with the proposal as BPI is unnecessarily complex and not the most suitable metric to measure building efficiency (when compared to international best practice). ‘kWh/m2/yr’ metric is being the core premise of the Building for Climate Change 2020. However, it does not appear in the Building Code Update 2021. Further to this, an alternative metric of ‘kWh/m2/yr’ (as noted in section

3 above) is a common tool that is used around the world to measure energy efficiency. Therefore, we recommend the MBIE adopt a ‘kWh/m²/yr’ metric instead of using the BPI to measure energy efficiency.

Question 1-6: Timeframes

- 4.7. Provision of clear timelines and guidelines helps making sure that compliance takes place and planning goes smoothly. There must be regular, clear communication from the Government regarding all aspects of the changes and the timeframes in which they are to occur. However, the Building Code Update 2021 does not provide clear guidance and timeframes, like it did in the 2020 update (Figure 3 below).

	Before 25 June 2020 (the proposed effective date)	From 25 June 2020 (effective date) to 25 October 2020 (cessation date)
Existing Acceptable Solutions and Verification Methods,	If used, will be treated as complying with the Building Code	If used, will be treated as complying with the Building Code
Amended or new Acceptable Solutions and Verification Methods	Not yet published	If used, will be treated as complying with the Building Code

Figure 3. Transitional arrangements within the Building Code Update 2020. Sourced from MBIE

- 4.8. Given the above, we recommend the MBIE provide more clarity around transitional arrangements. We also recommend adoption of at least a two-year timeframe for proposed changes to come into effect. This will give enough time for projects to adapt to any changes once the preferred option is adopted. It is also a necessary timeframe when overlaid with the timing of the Building for Climate Change proposals (see para 3.2).

5. Proposal 2: Energy efficiency for large buildings

Question 2-1

- 5.1. The MBIE considers three options to increase the minimum thermal insulation against the status quo. However, it is unclear what the status quo is (i.e. the current operational efficiency). Therefore, it is unclear how the MBIE arrived at these options and what these options are set to achieve (given that the status quo is unknown) (Figure 4 below). Further clarification is required.
- 5.2. Moreover, increases in construction costs for the proposed options are significant. For example, under Option 3, increases in construction costs for a 5 storey office building in Auckland will be 3.9% (\$87/m²) to achieve 25 per cent reduction in energy use, while increases in construction costs for the same type of building and same level of reduction in energy use in Queenstown will be 14 per cent (\$280/m²). It is not clear how the MBIE arrived at these costs and whether these costs are justified in relation to benefits (i.e. energy efficiency).
- 5.3. As noted earlier in the submission, we support the MBIE’s intention of reducing energy use. However, it is unclear what the margin is between the proposed three options, and how these reductions in energy use are going to be achieved.

- 5.4. We are concerned that developers might end up spending, for example, 25 per cent on a building to get just a 10 per cent reduction in energy use. It does not seem to be practicable and cost-effective. It will also have a flow-on effect on affordability of the final product. It is concerning given the Government’s overarching intention of increasing affordable housing provision.
- 5.5. Given the above, we recommend the MBIE provide more clarity around their methodology for identifying these three options (particularly around construction costs).

Building type	Climate zone					
	1	2	3	4	5	6
Option 1. 10% reduction in energy use for heating and cooling – Increases in construction costs⁽¹⁾						
Office – A 5 storey mid-rise office building	0.4% (\$8/m ²)	2.0% (\$39/m ²)	2.4% (\$48/m ²)	4.3% (\$87/m ²)	5.3% (\$120/m ²)	6.8% (\$140/m ²)
Retail – A single storey big box retail store with a large footprint	1.7% (\$26/m ²)	3.3% (\$45/m ²)	3.6% (\$50/m ²)	5.3% (\$75/m ²)	6.2% (\$97/m ²)	7.5% (\$110/m ²)
School – A single storey school with group classrooms	0.9% (\$30/m ²)	2.8% (\$82/m ²)	3.4% (\$98/m ²)	5.7% (\$170/m ²)	8.1% (\$230/m ²)	8.7% (\$250/m ²)
Healthcare – A 3 storey low-rise building with clinics occupied 24/7	0.3% (\$15/m ²)	1.0% (\$41/m ²)	1.2% (\$48/m ²)	1.9% (\$81/m ²)	2.5% (\$110/m ²)	3.0% (\$120/m ²)
Option 2. 20% reduction in energy use for heating and cooling – Increases in construction costs⁽¹⁾						
Office – A 5 storey mid-rise office building	2.1% (\$48/m ²)	2.4% (\$49/m ²)	4.3% (\$87/m ²)	7.1% (\$140/m ²)	6.3% (\$140/m ²)	8.2% (\$160/m ²)
Retail – A single storey big box retail store with a large footprint	3.3% (\$50/m ²)	3.9% (\$54/m ²)	5.5% (\$76/m ²)	14% (\$200/m ²)	13% (\$200/m ²)	15% (\$220/m ²)
School – A single storey school with group classrooms	2.9% (\$98/m ²)	3.5% (\$100/m ²)	5.7% (\$170/m ²)	11% (\$330/m ²)	12% (\$330/m ²)	13% (\$370/m ²)
Healthcare – A 3 storey low-rise building with clinics occupied 24/7	1.1% (\$48/m ²)	1.2% (\$50/m ²)	2.0% (\$81/m ²)	3.9% (\$160/m ²)	3.6% (\$160/m ²)	4.5% (\$180/m ²)
Option 3. 25% reduction in energy use for heating and cooling – Increases in construction costs⁽¹⁾						
Office – A 5 storey mid-rise office building	3.9% (\$87/m ²)	6.1% (\$120/m ²)	7.7% (\$160/m ²)	7.7% (\$160/m ²)	11% (\$260/m ²)	14% (\$280/m ²)
Retail – A single storey big box retail store with a large footprint	5.0% (\$76/m ²)	7.1% (\$98/m ²)	15% (\$210/m ²)	15% (\$210/m ²)	20% (\$320/m ²)	27% (\$380/m ²)
School – A single storey school with group classrooms	4.9% (\$170/m ²)	7.8% (\$230/m ²)	12% (\$350/m ²)	12% (\$350/m ²)	20% (\$560/m ²)	21% (\$630/m ²)
Healthcare – A 3 storey low-rise building with clinics occupied 24/7	1.8% (\$81/m ²)	2.7% (\$110/m ²)	4.3% (\$170/m ²)	4.1% (\$170/m ²)	6.1% (\$27/m ²)	7.7% (\$310/m ²)

Figure 4. Increases in construction costs for the proposed options for different building types. Sourced from MBIE

6. Proposal 3: Energy efficiency for heating, ventilation and air conditioning systems in commercial buildings

Question 3-1

- 6.1. We find the proposal to issue a new verification method confusing and inconsistent. The existing guidance to assist with demonstrating compliance with clause H 1.3.6 of the Building Code is not mandatory for people to use or for building consent authorities to accept. However, the proposal is to adopt a simplified verification method. We recommend the MBIE adopt a method of complying

with the Building Code with a clear indication of whether it is mandatory or a guidance. (note: to ensure compliance it is sensible to make it mandatory).

7. Proposal 4: Natural light for higher-density housing

Question 4-1

7.1. The MBIE recommends introducing new compliance pathways for daylight that provide more appropriate solutions for apartments and higher density building types.

7.2. We believe that insufficient light is not high priority from a building occupant’s perspective. Other issues, such as leaky buildings, and cold damp conditions are more significant and require consideration.² Therefore, we recommend the MBIE prioritise those issues.

8. Other factors to improve building efficiency

8.1. Insulation is a great way to keep the home warm while keeping heating costs down. However, other factors contributing to the energy efficiency should also be considered. Therefore, we recommend the MBIE refine the Building Code update 2021 taking these additional factors into consideration. Sections below provide further details.

Condensation risks

8.2. Increasing insulation levels saves energy use by preventing heat gains throughout the system. However, in some instances, condensation may still form. For example, if the insulation is porous, the water vapour can still go through the insulation resulting in condensation on the cold surface of the pipe, regardless of the insulation thickness.

8.3. Condensation causes damage to interior paintwork, the inside surface of wall linings, floor coverings, curtains, and furnishings (Figure 5 below). It results in increased heating costs as additional energy is required to convert condensation back into vapour which is taken up by the air as the temperature rises. It also presents a health hazard. Therefore, actions should be taken to mitigate these risks (e.g. using composite aluminium/timber frames, timber, uPVC or fibreglass frames; using vapor retarder for porous insulation, specifying window frames with built-in passive ventilation).

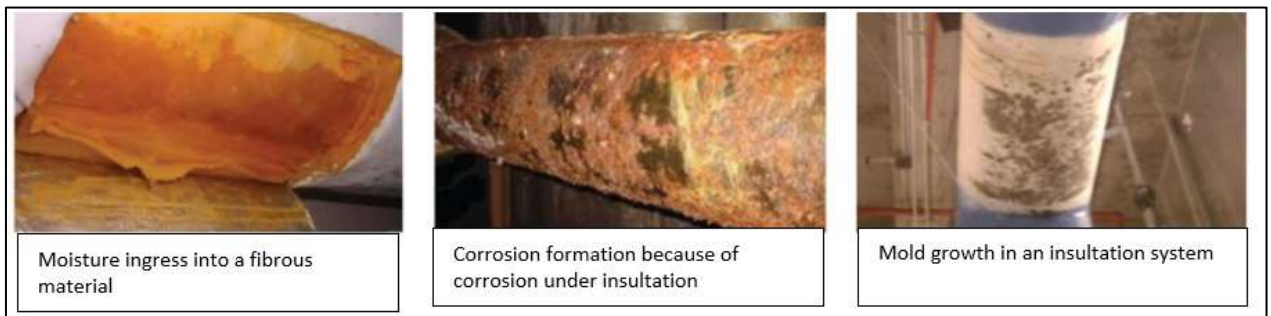


Figure 5. Effects of condensation to the insulation. Sourced from Insultation Outlook³

² Housing documentary reveals shocking state of New Zealand apartment blocks. (2021, April, 11). *Newshub*. Retrieved from <https://www.newshub.co.nz/home/new-zealand/2021/04/housing-documentary-reveals-shocking-state-of-new-zealand-apartment-blocks.html>

³ Condensation Control: Why the Proper Insulation Choices Will Keep You Out of the Rain (2018). Retrieved from <https://insulation.org/io/articles/condensation-control-why-the-proper-insulation-choices-will-keep-you-out-of-the-rain/>

Overheating

- 8.4. There is also a risk of overheating, particularly with climate change. A number of studies found that the high levels of insulation may result in overheating unless a number of alterations including active cooling were implemented. In particular, it has been found that light weight, air tight dwellings with little access to cross ventilation (such as single aspect flats) may be at a particularly high level of risk of overheating.⁴

Other cost-effective means to consider

- 8.5. The Building Code update 2021 should also take into account other cost-effective means to ensure better building performance. This includes, but not limited to:
- improving airtightness;
 - improving heating system to increase effects of insulation;
 - setting up mechanical ventilation to remove foul, moist or warm air; and
 - addressing an underlying issue of thermal bridges through the insulation.

9. Additional comments

Alignment with the Healthy Homes Guarantee Act

- 9.1. In December 2017, the Government passed the Healthy Homes Guarantee Act 2017 which enables standards to be made to make rental homes warmer and drier. However, we are concerned that it is still entirely possible to build code compliant houses and apartments that are not legal to rent. Therefore, we recommend the MBIE refine the Building Code update 2021 to ensure it aligns with the Healthy Homes Guarantee Act.

Different building typologies

- 9.2. Different buildings require different levels of insulation. The Consultation Document 1 specifically points out that:

“Compared to housing and small buildings, larger buildings require more active cooling in summer to maintain comfortable indoor temperatures, while also still requiring heating in winter. As well, for larger buildings the relative importance of different building elements for controlling heat gains and losses greatly depends on the individual geometry and orientation of a building. For example, high-rise buildings have large external wall and window areas and are sensitive to the heat gains and losses through these elements. On the other hand, large single-storey retail stores require more consideration of the roof insulation.”

- 9.3. While the MBIE acknowledges different requirements for different buildings, that difference is not reflected in the Building Code update 2021 so apartment buildings and houses have the same insulation requirements. Therefore, we recommend the MBIE take this into consideration to ensure provision of right/appropriate level of insulation for different types of buildings.

⁴ The impact of regulations on overheating risk in dwellings (2016). Retrieved from <https://core.ac.uk/download/pdf/151208136.pdf>

10. Building Code operating protocols

Question 1

- 10.1. We support the proposed set of criteria for two operating protocols that are intended to provide transparency and certainty around the work MBIE does as the building and construction regulator. However, there is one missing criterion which we believe is key to ensure delivery of better outcomes of the overarching Building System reform and that is alignment with the 2020 Building for Climate Change recommendations that is key to ensuring consistency of recommendations.
- 10.2. Therefore, we recommend the MBIE include this criterion into the protocols.

11. Conclusion

- 11.1. We support the intention of the MBIE to ensure buildings are more energy efficient. However, there are parts of the update that require clarification and further refinement to ensure the Building Code update 2021 serves its purpose.
- 11.2. This includes refinement of the proposals to ensure its alignment with the Building for Climate Change recommendations (including proposed set of criteria for operating protocols) and the Healthy Homes Guarantee Act 2017; provision of further details around proposed options (including construction costs) for energy efficiency for large buildings, housing and small buildings; as well as adoption of a method of compliance with the Building Code with clear indication of whether it is mandatory.
- 11.3. We also recommend the MBIE refine the Building Code update 2021 taking into consideration other factors that contribute to building efficiency (e.g. condensation and overheating risks; other cost-effective means); different insulation requirements for different buildings as well as prioritisation of significant issues (e.g. leaking buildings) over their current proposal of increased natural light.
- 11.4. Property Council would like to thank the Ministry of Business Innovation and Employment for an opportunity to provide feedback on the Building Code Update 2021. **We also wish to be heard in support of our submission.**
- 11.5. For any further queries contact Natalia Tropotova, Senior Advocacy Advisor, via email: natalia@propertynz.co.nz or cell: 021863015.

Yours sincerely,



Chief Executive,
Property Council New Zealand