CODE ADVISORY PANEL

MEETING REPORT FROM 23 SEPTEMBER 2020

A meeting of Code Advisory Panel was held on 23 September 2020 in Wellington and was attended by the following representatives of MBIE and the CAP:

MBIE

- Mike Kerr, Chief Engineer (Chair)
- Dave Robson, Manager Building Performance and Engineering
- Devin Glennie, Code Advisory Panel Secretariat
- Jenni Tipler, Manager Engineering
- Richard London, Manager Building Performance
- Katie Symons, Principal Advisor Engineering
- Jonna Morris, Personal Assistant to Dave Robson
- Reza E. Sedgh, Senior Structural Engineer (Observer)
- Rolf Westerhuis, Building Performance Senior Advisor (Observer)

CAP members

- Bruce Curtain, NZIA
- Peter Laurenson, Auckland Council
- Ian McCauley, Tasman Council
- Mark Jones, BRANZ
- Johnny Calley, Calley Homes
- Ross Roberts, NZGS
- Michael James, SFPE
- Patrick Cummuskey, NZSEE
- Simon Davis, Fire and Emergency NZ
- Cory Long, BOINZ
- Tania Williams, Engineering NZ

PRESENTATIONS FROM THIS MEETING

Annual update forward calendar

Overview

Dave Robson provided an overview of the current and future work programme for the Building Code.

Annual update calendar

Building Code updates are now scheduled on an annual basis. This includes two key dates for each year:

- April – Consultation period/time – time to think about changes and provide feedback
- November – publishing/implementation – time to enact changes in operations

Consequently, the transition period will be defaulted to 12 months and extendable in 12 month increments

In principle, this calendar will apply to all types of changes (Regulations, Acceptable Solutions and Verification Methods, guidance, information, etc). MBIE still have the ability to undertake urgent updates, but only for immediate safety risks.

Forward work programme

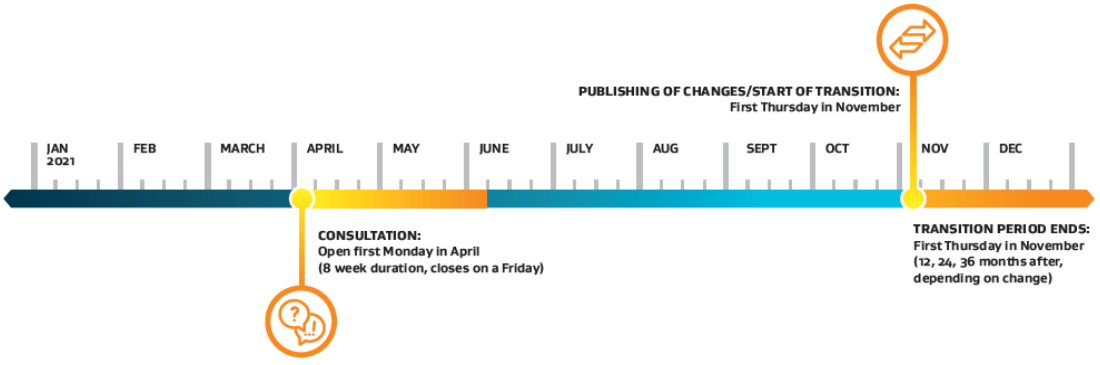
The work programme in progress for years 2021-2024 is attached as slides at the end.

The biggest piece of work proposed for revision in 2021 are amendments to H1 Energy Efficiency Acceptable Solutions and Verification Methods. Other significant pieces of work in the future include the revisions to the National Seismic Hazard Model and a revision to NZS 3604 Timber framed buildings. MBIE is currently working to get our future work programme finalised and made public before the next public consultation cycle.

HD8 and Building for Climate Change as strategic priorities

The strategic priorities for updating the Building Code continue to housing densification (through the High Density 8 code clauses) and Building for Climate Change. As immediate priorities, regulation changes are required for:

- G6 Airborne and Impact Sound.
- H1 Energy Efficiency



Schedule 1 exemptions

Overview

Reza E. Sedgh provided an update on new exemptions provided in Schedule 1 of the Building Act. From Monday 31 August, these exemptions increase the building work that does not require a building consent.

The new exemptions

- Single-storey detached buildings
- Ground-mounted solar array panels
- Carports up to 40 m^2
- Ground floor awnings up to 30 m^2
- Ground floor verandas and porches up to 30 m^2
- Flexible water storage bladders
- Permanent outdoor fireplaces and ovens
- Small pipe-supporting structures
- Short-span (small) bridges
- Single-storey pole sheds and hay barns in rural zones

The new exemptions increase the size of a single-storey detached building that can be constructed without a consent. Kitchen and bathroom facilities are not included in the exemption. All other normal provisions still apply – considerations such as smoke alarms, disposal of stormwater, location of existing services, district planning and the building code still need to be addressed.

Key aspects of the new exemptions

- Licenced Building Practitioners will now have their own suite of exemptions that only they can undertake
- Some building work must be carried out or have the design and construction supervised by a Licensed Building Practitioner
- Some exemptions do not require a professional by law, however some homeowners may want to enlist a Licensed Building Practitioner to help carry out the work
- There will be no changes to the standard processes – the Building Code will still need to be followed, and resource consents may still need to be applied for.

Key factors considered when assessing the risk for new exemptions

- Physical Loads on the Land (site location)
- Building Features (use, geometry, material, …)
- Expected Impact of failure
- Professional Involvement in the Process (Design and/or Construction)
- Past Failures

In formulating the new exemptions, evidence of past failures in the exemptions was not found. The goal was to provide exemptions for structures with a similar level of risk as importance level 1 buildings. A 30 m^2 sleepout is not an importance level 1 building but the only difference for this building type is the fire risk. MBIE is working on guidance to support the exemptions to reduce the risk of non-compliance including step-by-step instruction on how to construct a sleepout/garage to comply with the Building Code.

Advice

After the presentation, the Code Advisory Panel provided the following advice:

- It is likely not to be a building failures but actually breaches of other regulations (Resource Management Act). Compliance with city and district plans will also be an issue (including geotech, daylight or stormwater connections). Items outside of the structure aspect may need some guidelines. The BCAs may see an increase in complaints from neighbours.
- MBIE will need to work hard to identify the education gap for homeowners and non-professionals.
- MBIE need to continue the monitor how the exemptions have landed and capture lessons learned. The 30 m^2 exemption is the main concern.
- Implementation of the exemptions needs to be assisted by the LBP board and CPEng and not just Councils.

Building for Climate Change

Overview

Callum Thorpe, MBIE Principal Advisor, presented on the Building for Climate Change programme of work being undertaken. It was launched on 3 July 2020 and involves both climate change mitigation and adaptation.

Why now

Passing of the Climate Change Response (Zero Carbon) Amendment Act 2019 means New Zealand has a target of net zero emissions by 2050. An Emissions Reduction Plan will be released at the end of 2021 and a National Adaptation Plan in mid-2022. An Emissions Reduction Plan sets out how the government will meet the interim carbon budgets and building and construction is one of the five key sectors. Building and construction is a driver of emissions in other areas. Minimising carbon in building products will flow onto other areas (energy for production).

The National Adaptation Plan to be developed in the next two years setting out work to meet climate change risks.

Frameworks for consultation

In spring 2020, two frameworks were released by MBIE for public consultation. These were:

- **Embodied carbon framework** – Sets out the MBIE thinking about how to reduce embodied carbon – first through reporting and then setting a cap on embodied carbon. This is an important issue as the building sector is a large driver of emissions in the products it consumes and is an important part of the plan to reduce emissions from manufacturing. This also looks at waste reduction and how to incentivise circular economy.
- **Operational efficiency** – Sets cap on the efficiency of buildings (including energy and water use) and defines indoor environmental quality. Reducing the energy used in buildings will have an impact on emissions through reduced electricity use and reduced fossil fuel use. Reduced water use will reduce emissions through reduced supply and infrastructure.

For these frameworks, MBIE have learned from experience overseas such as in the UK and in Vancouver. New Zealand might be at the front of the curve of embodied carbon but catching up on operational carbon and MBIE are careful to create solutions that work for New Zealand.

Work is underway to look at how the Building Code will accommodate climate change. This will include emissions reduction as well as the adaptation of building.

Advice

After the presentation, the Code Advisory Panel provided the following advice:

- Considerations are required for the existing building stock versus new buildings
- Role of education will be important and will require a change in culture. Building Consent Authorities and Territorial Authorities would not currently have the level of expertise to critique building consent applications.
- This will require a huge step change in culture (even before design, it starts with owners). Behaviour change is similar to the Low Damage Seismic Design project and non-structural elements. As much effort is needed to explain why this is important versus the how.
- It will always be a struggle to get owners to pay more upfront if there is not a long term benefit.
- There needs to be behaviour change on where buildings can go due to the nature of our geology.
- We will not be able to make decisions until we have an accurate carbon accounting system
- Some considerations need to look at the design life (50 years versus 100 years for foundations)

Standards

Overview

Jenni Tipler provided an update on work to revise standards and forward-thinking on standards are being addressed for the Building Code. This work ties into the long work programme for HD8 to streamline the Acceptable Solutions and Verification Methods especially around building typologies up to 3 storeys.

Current standards under revision

- NZS 3604 – Timber framed buildings
- NZS 3404 – Steel structures
- NZS 4512/4514 – Fire and smoke alarms – This standard was revised in response to a government petition. Existing fire alarm standards do not require any means of notification for those who are hearing impaired.
- NZS 4510 – Fire hydrants
- NZS 4211 – Performance of windows

How Building Performance is managing standards

The plethora of standards has become unmanageable under the current system. MBIE is undertaking work to address this.

- **Internal categorisation** – Identify standards that are most important for maintaining the Building Code.
- **Performance settings** – Being clear on where the performance settings lie and limit the standard to the technical aspects required to implement the policy settings
- **Improving the user experience** – Provide clean citations of the standard within the Building Code and clear modifications to the standards where required.

Advice

As part of this update, the Code Advisory Panel provided the following feedback and advice:

- There are benefits of an education piece around the use of standards for the Building Code and the use of standards used in specifications. The Building Code only goes to a certain level of depth.
- It is very difficult for Building Consent Authorities to maintain competency with revisions to standards.
- Providing a forward work programme publically for standards revisions may help gain others to support the workload and contribute to a long term goal.
- Identifying the most important standards in the building may require assistance from outside of MBIE and would benefit from input from the Code Advisory Panel.

Interpreting adequate – H1 Energy Efficiency

Overview

Richard London presented on work being undertaken by MBIE to revise thermal insulation values in the H1 Energy Efficiency Acceptable Solution and Verification Methods. This topic was discussed at a separate sub-group meeting of permanent and co-opted members of the CAP on 31 August 2020. These changes support the Building for Climate Change initiatives and will be consulted on in April 2021 for the November 2021 Annual Building Code Update. To support this, the CAP members were asked to provide advice on the programme of work and the interpretation of 'adequate thermal resistance' found within the H1 Code Clause for the Acceptable Solution and Verification Methods.

Proposed amendments in 2021

The proposed amendments will include new climate zones, and thermal insulation values for residential and non-residential buildings. Climate zones are used to determine the relative level of performance expected across different areas of New Zealand. The current performance settings only consider 3 zones (with the south island being only 1 zone). The proposal for consultation will include 6 different climate zones which are spread across both islands.

The current performance settings in H1 for thermal insulation are well behind international practice. Longer term regulation change (at Code Clause level) is being planned, but the initial changes will focus on Acceptable Solutions and Verification Methods – which is where the performance settings are quantified.

The R-Values are currently contained within cited standards in H1. The work proposed for the next year will provide the thermal insulation values within the Acceptable Solutions and Verification Methods.

Technical challenges

Through the CAP sub-group meeting, a number of technical challenges were identified for this work. This included:

1. **Climate zone for the Bay of Plenty and Tauranga** – this may require some additional consideration
2. **Other parts of the Building Code** – consideration is required for other parts of the Code including internal moisture, ventilation, overheating, thermal bridging, and air tightness. Air tightness will need to be offset by ventilation to suppress condensation. If this is step 1 in changes, these other areas also need to be looked at now or in the immediate future.
3. **Slab edge detailing and thermally broken glazing** – it was unclear if it was the architect who was responsible for detailing or if the builder responsible for these items and it lead to frequent issues.
4. **Availability of products –** triple glazing may not be achievable now. There are supply issues and limited procurement options for triple glazing. Discussions need to occur with manufacturers/suppliers to identify what products are readily available.

Advice from the sub-group and CAP meeting

- **Qualitative performance in the Building Code** – MBIE should be clear on the relationship between the changes in the Acceptable Solution and Verification Method and the mandatory requirements of the Building Code. If the performance settings are qualitative in the Building Code and performance settings are set in the AS and VM, this may require additional guidance to ensure alternative solution approaches maintain the same minimum settings. There was additional discussion that MBIE could move away from R-values and towards a single performance measure for energy efficiency.

Interpreting adequate – H1 Energy Efficiency Continued

- **New climate zones** – Increasing the number of climate zones was welcomed. Consideration should be made where the proposed new climate zones cover a large area (e.g. Tauranga and the Central Plato) as there are large climate variations within one zone. There are additional considerations for the microclimate such as a building facing the sun or in the shade.
- **Climate zone rating system** – The new climate zones would benefit of a rating system so that people can tell the difference in the outcomes and what they mean. An example discussed was with wind loadings. If, for instance, someone in climate zone 5 uses the values from climate zone 6, what would the difference in performance be? There is too often confusion to the public that the building code minimum represents a high-performing house. Presenting the requirements as 'good', 'better', 'best' (minimum versus medium or high performing) may help to educate the public. The Building Code minimum should be seen as the "good" option.
- **Costs** – Increased costs of construction will decrease overtime and MBIE should be very optimistic about this. The market will adapt. However, a balanced approach still needs to be considered as there isn't the scale of manufacturing in New Zealand. The approach needs to be ambitious within a timeframe that the sector can meet. The costs should look at things like fuel poverty and whether the poorest family in New Zealand could actually afford to heat a home in Invercargill to 20°C. However, this also needs to consider housing affordability.
- **Benefits** – Benefits of the changes are not just about cost savings or heating savings but there are also positive co-benefits, such as health. If MBIE are proposing to make significant changes, this can be supported by these other consequential co-benefits. Lowered construction costs can create burdens on the other areas of society including the health sector.
- **Timeline for implementation** – There was support for MBIE to implement the changes as fast as possible. There is lag in the system as it will take years for existing stock to get up to speed. MBIE should consider being bolder for new buildings to compensate for this lag. Considering climate change and to rise to the zero carbon by 2050, it needs to be pretty ambitious. The proposed amendment is not a change in how to comply but just the performance setting. It was suggested that the highest requirements could be fully implemented in 3-5 years or even sooner for a small step. Homestar has already helped people understand the ways to construct higher performing houses.
- **Roadmap for future changes** – The values decided today will enshrine performance for decades through the existing building stock. Future and long-term thinking needs to consider climate change forecasting. If this is presented in stages, a roadmap needs to be clearly set out and presented where we are going in 2021 to where we are going in the future (ie signalling step changes in performance settings to the industry, and when they will be implemented for them to gear up) and what work might be undertaken to retrofit existing homes. H1 changes need to be clearly communicated as it relates to the Building for Climate Change programme. Long term strategy likely needs to include carbon targets or other performance measures.
- **Education is key** – Education programmes are key to bringing people along the journey. It was estimated that only a half or third of designers will be ready by the time the change comes in and the rest may wait to be called out as non-compliance. An avenue to target for education would be the number of people ready to comply on day one.

Keeping pace with technology

Overview

Devin Glennie presented to the Code Advisory Panel on what needs to be considered when new technologies create new risks. Instead of addressing each new item as it appears, MBIE are looking to develop long term strategy around how to deal with new technologies and their introduction into the Code. The key questions posed to the Code Advisory Panel were:

- Is the Building Code nimble enough to account for technological change?
- What does a nimble code look like?

Considerations

This presentation contained examples of how MBIE has addressed previous technologies such as:

- Drained cavities to address leaky buildings which prompted a change to Building Act and updates to the Acceptable Solutions
- Cross-laminated timber and lithium ion batteries and which were previously discussed in meetings of the panel in March 2019 and February 2020.
- Requirements for accessible pay counters in G5 Internal Environments which would require a regulation change to address.

To limit failures, there is a minimum amount of testing and research require before a new system or product into a building. It is often difficult to consider how something might fail and the failures might be in unexpected areas of the code.

In the past, the road testing for new products has come through standards development as well as adoption into the Acceptable Solution and Verification Methods. Some manufacturers prefer MBIE to develop the solutions which may sit at the bottom of a long to-do list. This means that products generally only get attention when there is a critical mass of suppliers irrespective of how good it is.

Advice

On this topic, the Code Advisory Panel provided the following advice:

- The Building Code does not stop a designer from being innovative but a nimble code is only as effective as effective as the Alternative Solution process.
- The unintended consequences of new technologies are the biggest risk for promoting innovation in design. Analysis of an Alternative Solution needs to be robust and cover all the impacted clauses. Designs that fail may fail substantially. There could be benefits by having an education piece around how to comply when not using an Acceptable Solution or Verification Method.
- What is in the Building Code regulations should not contain underlying assumptions for a building and about especially around items that could change. The regulation stage is not nimble enough to address fundamental shifts in assumptions.
- There are other portions of the building system around risk and liabilities that may need support to allow more innovation. Acceptance of innovative solutions has liabilities that need to be addressed to allow people to experiment.

Life span of a building

Overview

Katie Symons presented to the Code Advisory Panel on the regulatory check-in points that are used to ensure compliance of building design and construction work. This ties into work being undertaken by MBIE through the Building for Climate Change work programme where MBIE is looking at how we design, build and operate buildings, which will need to consider the stages of a building's life cycle after construction. A Building Consent and a Code Compliance Certificate are key check-in points to ensure compliance of building design and construction work. There may be other check-in points required in the life cycle of a building. The key questions posed to the Code Advisory Panel were:

- What are the benefits and challenges of looking at the whole life of a building?
- How can these be addressed in the Building Code?

Considerations

Within the building regulatory system, there are several areas in the life cycle of a building identified where compliance could be checked:

- **Design that occurs after consent**: Detailed design of systems not captured in the consent information, or changes to the design that occur after consent is granted, that materially affect the performance of a building,
- **Commissioning**: Once the Code Compliance Certificate has been awarded, how are the many complex systems in a building put into operation, and explained to the end user?
- **Maintenance during use**: The maintenance required by the regulatory system is restricted to specified systems listed in the compliance schedule, which are primarily concerned with fire safety systems. Other aspects such as energy efficiency of building services, or degradation of other building components that may affect occupant's health, wellbeing and the ability to promote sustainable development in the building's use.
- **End-of-Life**: There is currently little regulation covering the demolition and disposal of buildings at the end of their lives. Environmental concerns over embodied carbon emissions and construction waste is driving more thinking towards a circular economy for building products and materials.

Advice

On this topic, the Code Advisory Panel provided the following advice:

- New leases for commercial buildings come with new fit-outs every few years. There are opportunities to provide check-ins at these stages. Some sort of trigger would have to be implemented to separate minor and major fit-outs. This could be based on the dollar amount or percentage of the upgrade. Some parts of the country do not have the same economic drivers for new fit-outs.
- There needs to be clear distinct goals between what performance level is required for new buildings versus the existing building stock. In general, the performance level for a new building should be higher than existing. The risk is that performance settings are pulled backed for new buildings to address concerns with existing buildings.
- Some buildings require specific functions are not easily adapted to a new use and are required to maintain their original function. Examples of this include Importance Level 3 and 4 Structures.
- A big hole in the New Zealand regulatory system is maintenance. Incentives are needed in order for people to prioritise maintenance of their existing buildings.
- NZBC Code Clause B2 Durability touches on these concepts and could be reviewed as it provides a different way of thinking.

BUILDING PERFORMANCE

Business update – General topics

Introduced by:
Dave Robson
Manager Building Performance and Engineering

MINISTRY OF BUSINESS, INNOVATION & EMPLOYMENT
HĪKINA WHAKATUTUKI

New Zealand Government

Annual Updates

- Effective for this year, updates are now on an annual basis
- Simplified to two key dates/periods
  - April – consultation period/time – time to think about changes and provide feedback
  - November – publishing/implementation – time to enact changes in operations
- As such, the transition period will be standard 12 months, and extendable in 12 month increments
- In future , the principle will to have all types of change – regulation, compliance document, guidance, info etc. – follow this schedule
- MBIE still have the ability to undertake urgent updates, but only for immediate safety risks

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2020 updates

- proposed changes to Verification Methods and Acceptable Solutions will:
  - C1-C6 Protection from Fire – amend fire testing requirements for cladding so international fire test methods can be considered
  - E1 Surface Water – introduce a new Acceptable Solution for the design and installation of stormwater drainage systems
  - E3 Internal Moisture – increase clarity on provisions for kitchen and laundry overflows in densified housing
- These proposed amendments will support high density housing, make consenting easier and ensure buildings are safe, healthy and durable

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2021 updates

- B1 – Structure – Introducing a framework for best practise in Low Damage Seismic Design – not a Code minimum, but information helping designers to understand how to design better, and building owners to invest, in more resilient design.
- B1 – Structure – Finalising the geotechnical practice series/modules previously issued as draft in 2016. The first release covers modules 1-5 and incorporates best-practice design guidelines for liquefaction assessment, hazard assessment and ground improvement.
- H1 Energy Efficiency – increasing quantified minimums in Acceptable Solutions and Verification Methods (Thermal envelope and HVAC systems) as the first step in the Building for Climate Change Programme (and related changes in other clause areas)
- G7 Natural light – Modernising Acceptable Solutions and Verification Methods to take into account densified housing typologies
- Other minor changes to some compliance documents to optimise settings for densified housing typologies

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2022 updates

- G6 Airborne and impact sound– Reviewing and changing the regulatory framework for performance settings to manage noise transmitted to and between households – taking into account densified housing typologies. (TBC by Minister)
- C1-C6 Protection from Fire – Issuing a revised Verification method for Protection from Fire (second edition)
- B1 Structure –Phase 2 of the geotechnical practice series/modules covering module 6 for retaining walls
- Phase 2 of Building for Climate Change – (content to be confirmed, including changes in other related Code clause areas, for example G5 application and settings for max/min temperature)
- General updates to the E series (moisture clauses)

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2023 updates

- B1 Structure – Implementation of changes to B1 to support the revised National Seismic Hazard Model
- B1 Structure – Revisions to geotechnical verification methods which expand the compliance options for 3 storey buildings and create new options for buildings on hillsides
- G1 Personal Hygiene - Significant changes to refresh adequate provision of sanitary facilities
- E2- External moisture - A new version of the E2/AS – external moisture
- Other changes to be confirmed

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2024 (and beyond) updates

- Citation of significant Standards revisions…
  - 3604 (timber buildings up to 3 stories)
  - 4299 (concrete buildings up to 3 stories)
  - 3404 (steel structures)
  - 3101 (concrete structures).
- Other content to be advised

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Other priorities

- Strategic priorities are still HD8 and BfCC
- Looking to seek permission from the Minister post election to make regulation (Code level) changes to support these two priorities, over the next year or so.
- Going ahead with a revision of NZS 3604 that support general updates, and these two strategic areas
- Significant investment in NSHM revision
- Ongoing investment in technical advice from Engineering NZ member groups
- Long term investment in revision and sponsorship of Standards
- Aware the medium-density housing typology consents continue to grow, and that building uses are more complex. Our approach to building categorisation is not optimised for this – we need to fix it.

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