

# Presentation to the Royal Commission

## 14 March

### New and Alternative Technologies



Department of  
Building and Housing  
*Te Tari Kaupapa Whare*



# Outline of the presentation

- Context
- History of innovation
- Current framework and how it supports innovation
- Perceived obstacles to innovation
- What we are doing to address perceived obstacles to innovation
- Other work



## Seismic Events to date and building performance

- The ground shaking generated by the 22 February earthquake was amongst the highest ever experienced in an urban environment
- The severity of the earthquake exceeded the expectations of the building design standards
- Most buildings designed and built after 1995 have performed acceptably in the Canterbury Earthquake sequence
- Buildings that have been well designed, well detailed and well constructed have performed well irrespective of date built



# The Building Act 2004

- Purpose inter alia to
  - regulate the building work and set performance standards for buildings
  - ensure that people can use buildings safely and
  - buildings have attributes that contribute to peoples' health and wellbeing
  - Section 3 (a) and (b)
- One of the principles of the Act is the importance of allowing for **continuing innovation** in methods of building design and construction
- As well as durability and the importance of standards of design and building and construction in achieving compliance with the Building Code
  - Section 4 (f) (c) (g)



## History of Innovation

- New Zealand has a long history of innovation in earthquake engineering with for example:
  - Base isolators
  - Reinforced concrete
  - Multi-storey wooden buildings
- We have learned from others' experience and have ensured that this is incorporated in building performance expectations and construction methods



## Current regulatory framework allows for innovation

- The Building code is performance and outcome based
- There are checks and balances to ensure safe innovation
- While the Issues raised by other submitters can be addressed without significant changes to the regulatory framework
- The Department recognises that the experience of trying to get innovation into use has met obstacles
- We are looking at how we can address these perceived obstacles
- There is a need for greater sector leadership and skills enhancement



## Perceived obstacles to Innovation

- Risk averse behaviour by some Building Consent Authorities
- Lack of understanding of the system and particularly the performance based Building Code
- Many are still focussed on compliance documents including NZ Standards when there are alternatives
- Not all Standards are readily accessible
- Lack of available skilled resources to test, apply and peer review application of innovation
- Lack of training across the sector in all roles design, engineering to construction, and building officials
- Insufficient research in innovation and the associated implementation
- Lack of infrastructure to test products and innovation



## Checks and Balances to ensure safe innovation

- As a minimum all Building work must comply with the Code
- Building Consent establishes compliance with the Code
- Process for compliance documents
  - Testing and research, solutions and methods are robustly tested and researched before being included in Compliance documents
  - The Department consults widely before issuing a Compliance document
- Product certification is available to provide assurance across both product and approach to usage
- Determinations is a route to assurance of an innovation





## Attributes of Safer Innovation

- The Department has no role in endorsing specific products or building systems
- The Department has set up a product certification scheme but is not the decision maker
- Successful innovation requires more than a good idea, Needs:
  - to be implementable
  - take up by the sector
  - to be supported by robust evidence of compliance with the Code and that it's a lasting solution
- Safe innovation is possible without changes to the Code or regulation



## Relevant Regulatory Framework

- The Building Code is performance based
- Solutions that comply with the Code are in Compliance documents but these are not mandatory
- Apart from Compliance documents, alternatives are NZ and other National Standards, industry documents and “Alternative solutions”
- A Building Consent Authority must accept as compliant for building consent a design that follows a Compliance document
- Where an Alternative solution is used the designer has to show how the design complies with the Code to secure a consent



## How to determine performance

- Three possible routes
  1. Verification methods sets out the process of doing the design through an approved methodology and is a compliance document
  2. Acceptable solution is a prescriptive compliance document
  3. Alternative solution is a description produced by the designer of how the Code requirements are to be met
- Do not have to use or cite NZ Standards to be successful in getting Consent or showing compliance



## Successful Innovation – some examples

- Victoria University Rankine Brown building seismic retrofit
- Nelson Marlborough Institute of Technology building – PRESSS and laminated veneer lumber
- Wellington BNZ building – long span precast hollow core floors
- Use of super plasticiser in concrete
- Base isolation – a range of techniques



## Regular work

- As part of our normal work programme the Code and compliance documents are constantly kept in review
- The Government has just approved extensive changes to the fire provisions of the Code
- The Department has started a review of the Code clause for structure to make requirements clearer and more specific
- This will ensure that explicit policy decisions are made about the performance expectations in event of an earthquake and other events
- Noting that there is nothing stopping construction above the Code minima



## Improvements to the Code System

- Clarify the structure clause B1 and the associated verification methods
- Improve the quality and accessibility of information to reduce dispute between designers, builders and BCAs
- Industry role critical role in developing good practice guidelines
- Develop an alternative pathway for the assessment of innovative approaches



## Work underway to address perceived obstacles

- Proposing to move to a risk based consenting model through the Building Act No 3
  - This would entail assessing each project for risk and applying the appropriate level of quality assurance and peer review.
- Progressing Design Features reports (recommended by the Expert Panel) which detail how innovation deals with risk to structure both through design, construction and Code Compliance
- Potential to move to Centres of Expertise in Consenting for particular types of construction
- Continuing work with BCAs to be assured of a level of competence through accreditation



## continued

- Completing and promulgating more acceptable solutions
- Capturing knowledge from across BCAs of new building innovations alternative solutions and incorporate in acceptable solutions
- Building better understanding of the Code Performance requirements and the role of Compliance documents across the Sector
- Improve electronic access to information supporting the Code
- Working with the Sector to build capability both in initial training and also in continuing professional development
- Occupational regulation review considering the issues of competence registration and discipline





## Research

- Committed to learning from the assessments of what worked in the performance of buildings in the Canterbury sequence of earthquakes
- Working with the Natural Hazards Platform to encourage the investment in appropriate research and its application
- Will encourage additional funding where appropriate

