Royal Commission of Inquiry into Building Failure Caused by the Canterbury Earthquakes

Standards Council – Submission (A): Overview

Contents **Page**

Appendix

For the purpose of this submission, the glossary terms given in **Appendix A** have been used.

1. Executive summary

About the Standards Council's submissions

The Standards Council wishes to respond to both the Commission's general invitation to interested persons to make submissions on issues that arise under the terms of reference, and to the more specific matters notified in its Statement Notice of Issues.

The Council has decided to present its submissions in two parts (reserving the opportunity to make further submissions at a later point if necessary).

Submission A – General information about the Standards Council

Submission B – Detailed submissions on the Notice of Issues with particular emphasis on Issue 3.

Background on the Standards Council

As the governing body of Standards New Zealand, the Standards Council guides Standards development and standardisation across a range of sectors. Its work is critical to providing a safe and sustainable environment for New Zealanders.

This organisation's genesis followed the 1931 magnitude 7.8 Hawke's Bay earthquake. The Standards Council was formed to ensure that as far as possible future such events did not result in the same devastation and loss of life.

The Standards Council operates as an autonomous Crown entity under the Standards Act 1988 and the Crown Entities Act 2004.

As the governing body of Standards New Zealand, the Standards Council guides New Zealand Standards development and standardisation across a range of sectors. The majority of New Zealand Standards are developed in partnership with Standards Australia. As New Zealand's representative for the International Organisation for Standardisation (ISO) and the International Electrotechnical Commission (IEC), Standards New Zealand ensures that New Zealand has a voice in the international Standards community.

New Zealand's Standards are very robust, and are often regarded as international Standards in themselves.

Standards New Zealand, the operating arm of the Standards Council, has approximately 50 staff, but draws on a volunteer base of more than 2000 technical experts put forward by industry, community, and government organisations.

New Zealand Standards are developed by expert committees using a consensus-based process that includes public input.

There are approximately 650 building and construction-related New Zealand Standards. All Standards are voluntary except where cited or referenced in legislation and are then given a different status. Some of these New Zealand Standards are empowered by the Building Act 2004 and the Building Code.

New Zealand Standards and earthquakes

The timeline of New Zealand Standards determining earthquake loading shows that the process is evolutionary. Progressively over the past 75 years these New Zealand Standards have been improved and revised as knowledge about earthquakes, and how to design buildings to resist them, has improved. The last revision was in 2004.

Issues and concerns about the New Zealand Standards-setting process

The funding model for the Standards Council has evolved over time.

Annual government funding contributions for the Council's 'public good' Standard setting functions were gradually phased out over the 1990s and replaced with a requirement for the Council to operate on a commercial (that is, self-funded) basis.

Two key issues facing the Standards Council

The Standards Council has been in existence for nearly 80 years as an independent Government agency set up precisely to develop Standards, yet:

- **It is self-funded**
  The Standards Council is self-funded and receives no annual Parliamentary appropriation for even a proportion of its operating costs. That is, Standards New Zealand is entirely funded through agreements for service with stakeholders contracting for the development, amendment or revision; and through the sale of Standards.

  No central funding is received by the Standards Council to maintain its operations or develop 'public good' New Zealand Standards, although this mandate is central to its legislated role.

- **It has no clear mandate**:
  Compounding this funding challenge, successive Governments since the Standards Council became self-funded have not articulated a clear commitment to the Standards Council as the prime source of Standards development expertise and capability in New Zealand.

The impact of these two issues:

Over time a lack of political or government commitment and adequate funding has led to:

- Confusion by stakeholders about the status of Standards and other documents supporting the New Zealand Building Code (for example if a New Zealand Standard must be used, could be used, or if used would provide a means of demonstrating compliance).

- Modifications by the regulator (Department of Building and Housing) of the requirements contained in a New Zealand Standard through referencing in New Zealand Building Code compliance documents. This requires users to review and corroborate the requirements in multiple documents to achieve compliance. Such an approach is risky and more complex than it needs to be.

- Limited ability to rapidly initiate projects to amend, review, reconfirm or withdraw New Zealand Standards addressing matters of 'public good' as events

occur. For example, NZS 1170.5 *Earthquake actions* was published to 2004 to incorporate changes in earthquake loading values, yet these changes into NZS 3604:2011 *Timber-framed buildings* were not incorporated until 2011.

- Some documents developed for a specific purpose are used in ways not considered by the developers, for example NZS 1170.5:2004 sets the earthquake loading levels for retaining walls.

- Potential barriers for stakeholders to access requirements, as some documents in the building controls framework are free, while New Zealand Standards are on a cost reimbursement basis because of the user pays funding model driving Standards development.

- The voluntary, non-remunerated committee structure of technical experts provides a considerable risk to our not being able to access the necessary range of experts. While this is a funding issue, it is also a consequence of not having a sufficient national profile that would motivate experts to participate.

- Potential perception of 'committee capture' where the committee consensus does not align with the funders interests. The perception of committee capture can also be alleged where some stakeholders' have limited time and funding to participate in the process.

- Divergence of views among experts. Typically a Standard would not be promulgated in such circumstances. However, if there is a contract for service to deliver a Standard, this puts Standards New Zealand is a difficult position as it is bound to meet its contractual responsibilities.

2. About the Standards Council's submissions

The Standards Council has provided a key role in supporting the regulatory environment for building and construction since 1935. It is the body that approves and promulgates the New Zealand Standards that are used in the building controls framework, using the expertise of its operating arm Standards New Zealand and the voluntary input of large numbers of experts. The Council also has an overview of the Standard-setting process, both in New Zealand and internationally, and thus a unique perspective on the questions underlying the Royal Commission's terms of reference to inquire into the adequacy of the current legal and best-practice requirements for the design, construction, and maintenance of buildings in central business districts in New Zealand.

The Council has been able to directly assist the Royal Commission in a number of areas:

- provision of access to New Zealand Standards for Royal Commission researchers and commissioned experts

- provision of a glossary of appropriate building standards terms (see **Appendix A**)

- assistance to other stakeholders in the preparation of their submissions (for example IPENZ).

The Standards Council wishes to respond both to the Royal Commission's general invitation to interested persons to make submissions on issues that arise under the terms of reference, and to the more specific matters notified in its Notice of Issues.

The Council has decided to present its submissions in two parts (reserving the opportunity to make further submissions at a later point if necessary).

This first document contains an overview of the Council's history, its approach to the setting of Standards, and the background to the role of Standards in the building controls framework. The intention is to provide material which the Royal Commission can draw on, in a general sense, in its inquiry into the framework of legal and best-practice requirements.

The Council will also make more detailed submissions, in a separate document, on the Notice of Issues with particular emphasis on Issue Three. As agreed with Counsel assisting the Royal Commission, it will lodge those submissions within the time frame specified by the Royal Commission for the third hearing, which is concerned primarily with section 122 of the Building Act.

The Council intends to make further submissions, with particular emphasis on the forward-looking matters identified in the Notice of Issues, at a later stage or as requested by the Royal Commission.

3. Background on the Standards Council

As the governing body of Standards New Zealand, the Standards Council guides Standards development and standardisation across a range of sectors.

Its work enhances New Zealand's economy, productivity, and international competitiveness.

It is also critical to providing a safe and sustainable environment for New Zealanders.

Its history – founded on the debris of the 1931 Hawke's Bay quake

This organisation's genesis followed the 1931 magnitude 7.8 Hawke's Bay earthquake.

The following is a frightening description of what happened during the Hawke's Bay earthquake, from the government's TeAra.govt.nz -The Encyclopaedia of New Zealand website:

'As buildings began to disintegrate, many people fled outdoors into a lethal rain of chunks from ornate facades, parapets and cornices. Buildings swayed violently, and their walls bulged and collapsed into the streets in avalanches of brick and masonry that crushed vehicles and people.

Roofs caved in on buildings that had large open internal areas, such as churches, libraries and theatres. In some buildings the internal floors pulled free of the swaying walls, collapsing inward in a jumble of girders, wood and plaster.'

Up to 260 people are reported to have died in this earthquake.

The then government decided that New Zealand needed an effective set of building codes, and the work of this organisation was founded the following year.

Preventing devastation and loss of life

Standards New Zealand was formed to ensure as far as possible future such events did not result in the same devastation and loss of life.

In fact, Standards New Zealand developed its first earthquake New Zealand Standard in its first year. There are now more than 650 building-related New Zealand Standards.

Many of these New Zealand Standards provide guidance for designers and builders on how to comply with the Building Code – all benefit industry and New Zealand communities.

Here in New Zealand we owe a lot to those people who had the foresight to think about the need for Standards.

About the Standards Council

The Standards Council is an autonomous Crown Entity, which operates under the Standards Act 1988. Both the Council and its operating arm, Standards New Zealand, are Crown owned, but operate autonomously and without Crown direction (subject to the limited power of direction under section 104 of the Crown Entities Act 2004 in relation to matters of government policy).

As the governing body of Standards New Zealand, the Standards Council guides standardisation across a range of sectors.

The Standards Act 1988 charges the Standards Council with developing, promoting, and facilitating the use of Standards and standardisation to help deliver social and economic benefits, including increased productivity, enhanced market access for producers, innovation, and improved consumer safety.

The primary function of the Standards Council is to develop New Zealand Standards and promote and encourage the use of Standards in New Zealand (Standards Act 1988, section 10(1)). Without limiting the generality of that function, the Council prepares draft Standards (through Standards New Zealand and its activities) and then approves and promulgates them; and examines international Standards and then adopts and promulgates them (section 10(2)).

4. How does the Standards Council interact internationally?

The majority of New Zealand Standards are developed in partnership with Standards Australia.

As New Zealand's representative for the International Organisation for Standardisation (ISO) and the International Electrotechnical Commission (IEC), Standards New Zealand ensures that New Zealand has a voice in the international Standards community.

New Zealand's Standards are very robust, and are often regarded as international Standards in themselves.

As New Zealand's representative body of a wider standardisation community, it has a close working relationship with other national Standards bodies, including Australia and internationally including the International Organization of Standardisation (ISO).

As such, the Standards Council holds knowledge on processes used by these other standards organisations and their interaction with New Zealand.

The Standards development process has evolved from requirements of the Standards Act 1988 and elements of the ISO/IEC Directives. The process aligns with International best practice for standardisation as set out in the World Trade Office Technical Barrier to Trade Agreement (Annex 3) that describes principles on probity, transparency, building consensus, ensuring the opportunity for all stakeholder interests to participate in the process, and robustness for Standards development.

International and New Zealand Standards are instruments for codifying and considering the collective knowledge of the wider stakeholders. Each expert is able to share the knowledge and research base from their sector and the organisation they represent.

5. What is Standards New Zealand?

Standards New Zealand is the operating arm of the Standards Council. Its services include:

- providing a leadership role in facilitating the development of New Zealand Standards and Standards solutions
- publishing, marketing, and selling New Zealand Standards, both in hard copy and as PDF files
- providing free 'technical barriers to trade' (TBT) advisory services for importers and exporters
- providing a leadership role in Standards development internationally.

Standards New Zealand is set up to deliver professional services (particularly in the area of project management), and as a sales operation for New Zealand Standards and standardisation documents.

Standards New Zealand has approximately 50 staff, but draws on a volunteer base of technical experts put forward by industry, community, and government organisations.

This volunteer support includes more than 2000 New Zealanders who volunteer their time and expertise in kind to make up the committees that develop Standards solutions.

6. How are Standards developed in New Zealand?

What is a New Zealand Standard?

The Standards development model of drawing together collective wisdom and codifying an agreed research base has been in place for nearly 80 years.

New Zealand Standards are published documents setting out agreed practice.

New Zealand Standards are developed by expert committees using a consensus-based process that includes public input.

New Zealand Standards are used by a range of organisations to:

- enhance their products and services
- improve safety and quality

- meet industry good practice
- support trade into existing and new markets.

What is the Standards Council's role in developing Standards?

The Standards Council's role is to facilitate and manage the Standards development process described in figure 1, using internationally recognised best practice. This has been guided by the directives from the International Organisation for Standardisation, the International Electrotechnical Commission and the Standards Act 1988.

The Standards Council markets and distributes published New Zealand Standards.

How is a Standard developed?

The national role of the Standards Council provides the basis to facilitate and manage an efficient and effective Standards development process.

The process for initiating the development of a New Zealand Standard, or amending or revising an existing New Zealand Standard, requires the following:

1. Agreement by the sector to the use and value of a New Zealand Standard

2. Funding to enable Standards New Zealand to recover costs.

The Standards Council operates an efficient and robust process for the development of New Zealand Standards given the resources afforded to it. The Standards Council proactively engages with key sector organisations to determine areas needing New Zealand Standards development activity and to gauge the priority in these areas.

Once the content for the Standard is written, a draft is made available on the Standards Council's website for anybody to comment on. Comments submitted during the public comment period are reviewed by the committee and if necessary the Standard is modified.

More information on the Standards development process and the benefits of involvement are outlined in the document Standards development committees (see **Appendix B**).

A summary of the Standards development process is shown in Figure 1.

Figure 1 – Standards development process

New Zealand Standards are agreed on a 'consensus basis'.

The development of consensus through Standards committee processes is a powerful means to achieve the following.

- **Preventing capture of the process**. The building of consensus involves the establishment of clear and robust rules for the operation of committees and prevents the approval of requirements by any one organisation.
- **Creating buy-in and support by a wide range of stakeholder groups** This is done through early engagement and inclusion in the requirements setting process.

- **Providing a forum for thought leaders to test research with wider interest groups** and enable early disclosure of further research requirements.

Once a New Zealand Standard has been published, the maintenance and review of New Zealand Standards is a function of agreement by stakeholders and funding to initiate a review. International Standards practices, such as those used by ISO, ensure reviews are carried out at least 5-yearly for all Standards.

When developing a Standard, what does the committee look at?

The committee will be focused on changes that bring value for the users and wider New Zealand community, which might include:

- making the development, manufacturing and supply of products and services more efficient, safer and cleaner
- providing governments with a technical base for health, safety and environmental legislation, and conformity assessment
- safeguarding consumers, and users in general, of products and services
- sharing technological advances and good management practice
- disseminating innovation
- making life simpler by providing solutions to common problems
- facilitating trade between countries and making it fairer.

To do this, the committee will draw on knowledge from a range of stakeholder organisations and from the public through a comment process. Input is regularly gathered from local and international experts as well as experience with the Standard.

Once a New Zealand Standard is developed, is its use compulsory?

All New Zealand Standards are developed as voluntary consensus-based documents. New Zealand Standards are used by a range of people and organisations to enhance their products and services, improve safety and quality, meet industry good practice, and/or support trade into existing and new markets.

Examples include *NZS 8690:2003 Water safety signage, NZS 4102:2011 Safety in the house(A guide to reducing injuries through home design, building, and maintenance), AS/NZS 1102 Graphical symbols for electrotechnical documentation, AS/NZS ISO 31000:2009 Risk management – Principles and guidelines.*

However they can be given a different status by regulators and Government agencies.

New Zealand Standards can become enforceable when empowered in legislation including regulations or in a legal contract by the relevant agency/organisation.

For instance, building and construction design New Zealand Standards become compulsory when ‘cited’ or ‘referenced’ by the Department of Building and Housing as part of the New Zealand Building Code.

Similarly, health Standards can be empowered by the Ministry of Health in funder contracts with service providers, safety Standards by the Department of Labour, and Standard model bylaws by local authorities.

7. What is the Standards Council's role in developing building related Standards?

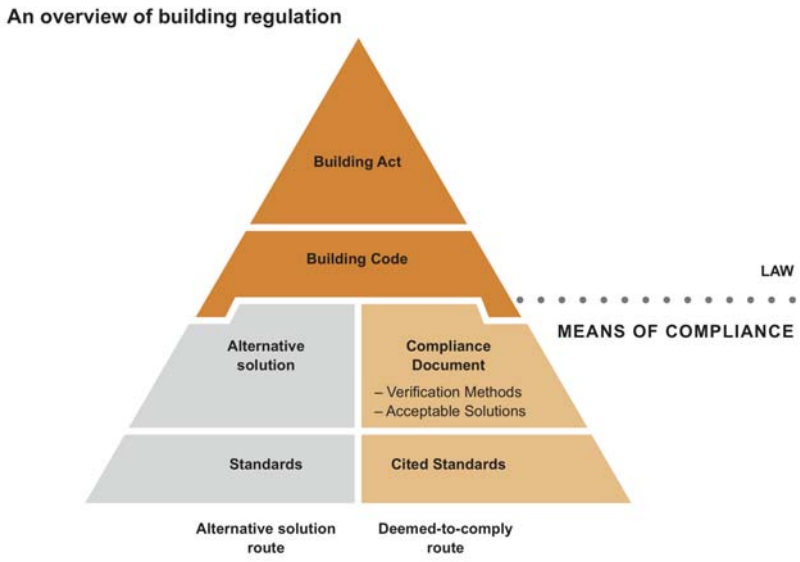
There are approximately 650 building and construction-related New Zealand Standards. Some of these New Zealand Standards are empowered by the Building Act and the Building Code.

New Zealand Standards are one form of standardisation that has been used to codify requirements for the building controls framework.

They are robustly developed by drawing on the input of regulators, industry, and the wider community. However, Standards do need to be maintained and reviewed frequently to remain up-to-date and fit for purpose for the legal requirements, and to reflect contemporary knowledge and adequate requirements.

Standards have an important place in the building controls framework for considering research and knowledge, and codifying this into agreed requirements and practices. These Standards can then support the regulator to set legal requirements and to continue to support the sector to codify lessons from research and major events such as earthquakes.

An overview of the link between New Zealand building Standards and building legislation can be found on the Department of Building and Housing website, and is summarised in Figure 2 (provided by the Department of Building and Housing).



(from DBH website)

Figure 2 – New Zealand building controls framework

How are New Zealand Standards used in the building controls framework?

Once a New Zealand Standard has been promulgated or revised, it is up to the regulator to determine whether it is suitable to be used in the building controls framework, and if so how it is to be cited.

The Building Act 2004 expressly contemplates the use of New Zealand Standards in the framework. The purpose of the Act (section 3) includes reference to 'the setting of performance standards for buildings'. Among the principles to be applied in the performance of functions, and the exercise of powers, under the Act is:

> 'the importance of standards of building design and construction in achieving compliance with the building code' (section 4(2)(f)).

The Act provides for a range of instruments through which New Zealand Standards can be cited or incorporated by reference for the purpose of code compliance: in particular, compliance documents (made by the Chief Executive under section 22) and acceptable solutions or verification methods (prescribed by regulations made under section 401(1)(a)). A New Zealand Standard may be cited in any of these types of instruments, or incorporated by reference into the instrument using the provisions in sections 405 to 413 of the Act.

Section 23 of the Standards Act 1988 specifies the manner in which a New Zealand Standard may be cited in a legislative instrument. Citation could include the entire Standard or parts of it. An instrument may also cite the Standard subject to certain modifications.

What happens when a New Zealand Standard needs to be revised?

Modification or replacement of a New Zealand Standard that has been incorporated by reference is a matter in the first instance for the Standards Council exercising its powers under section 10(2) of the Standards Act. Under section 10(4), the Council must obtain the approval of the Minister of Housing before amending, revising, revoking, or replacing a Standard that has been cited in an Act or regulation (including acceptable solutions or verification methods prescribed under section 401 of the Building Act). The amendment does not, however, take effect until new regulations have been made, or a new compliance document is issued, under section 406(c).

8. How do New Zealand Standards address earthquakes?

How do New Zealand Standards for earthquake loadings and design draw on international best current thinking?

The Standards development committees include technical experts from a range of stakeholder groups. Our process enables a forum for these individuals who may be involved in wider international research programmes and organisations, to raise knowledge and information that can be considered for the New Zealand context.

In addition to this, the Standards Council is an active member of the international Standardisation community. As the national member for the International Organization for Standardization (ISO), the Standards Council is the channel for New Zealand technical experts to access the ISO committees where discussions involve experts from throughout the world.

ISO Standards often set the underlying philosophy or premise for domestic Standards, as this enables international consistency and can assist in minimising technical barriers to trade. For example, AS/NZS ISO 31000:2009 *Risk management – Principles and guidelines* for the approach to risk management, or ISO 2394:1998 *General principles on reliability of structures* which was used to guide the development of the current Australian and New Zealand loading Standards.

Since 1991 the Standards Council has had a memorandum of understanding with the National Standards body of Australia, Standards Australia. Australasian knowledge and research has been drawn on, as seen in the Standards Australia-led development of the current loading Standards AS/NZS 1170 *Structural design actions*, which includes the New Zealand Part 5 for New Zealand seismic actions.

Are there New Zealand Standards that relate specifically to earthquakes?

Seismic consideration is an important aspect of all New Zealand building design Standards.

The loading Standards which include seismic considerations, particularly *NZS 1170 Part 5:2004 Structural design actions – Earthquake actions – New Zealand* assist in defining the loads for buildings.

What is NZS 1170 Part 5:2004?

NZS 1170 Part 5:2004 *Structural design actions – Earthquake actions – New Zealand* is a Standard that has two core functions:

- to provide methods for structural engineers to determine earthquake loading levels and specifications
- to determine the seismic design loads for specific areas of New Zealand.

NZS 1170.5:2004 was developed from an extensive and robust process involving the contributions and consensus building of many individuals and organisations. The process used is described in **Appendix C**.

How does NZS 1170 Part 5:2004 apply to New Zealand buildings and homes?

Design Standards for construction materials such as timber, steel, concrete and earth-building are developed in alignment with loading Standards to guide design tolerances.

How often has NZS 1170 Part 5:2004 been reviewed and revised?

The attached timeline (see **Appendix D**) of New Zealand Standards relating to determining earthquake loading shows that the process is evolutionary. Progressively over the past 75 years these New Zealand Standards have been improved and revised as knowledge about earthquakes, and how to design buildings to resist them, has improved. The last revision was in 2004.

Standards New Zealand technical committees draw on international, regional and national Standards, recent earthquake learnings, new technologies and practices as part of the development process.

What are the early indications about the intensity of the 22 February 2011 Christchuch earthquake, relative to Standards?

The following information has been received by the Standards Council:

1. The IPENZ's overview notes that:

'Earthquake records show that some buildings may have experienced shaking more than two times more intense than a new building would be currently designed for …'

2. The Department of Building and Housing notes that:

'….*early indications are that the earth shaking was probably much more violent than designed for in New Zealand's Building Code, with vertical shaking that was both extreme and unusual.'*

'The Building Code standards are based on the kind of shaking expected to happen about every 500 years, and experts are saying that the shaking that occurred in Christchurch's central business district may have been as much as three times greater than this.'

What is the most widely used New Zealand building Standard?

NZS 3604 Timber-framed buildings is the foremost building Standard in New Zealand for residential buildings. The majority of new and existing residential buildings in our country are of timber construction and 93% have components of NZS 3604 in their design and construction.

For further information on NZS3604, please refer to the Standards New Zealand website.

As a critical New Zealand Standard as part of the building controls framework, NZS 3604 applies primarily to residential buildings, which are outside of the terms of reference for the Royal Commission.

9. Issues and concerns about the New Zealand Standards-setting process

The Standards Council's operating processes are consistent with the current policy settings in the Standards Act 1988. However, this policy setting does not readily enable the regular maintenance and review of important Standards, particularly those of public good with a wide base of stakeholder interest.

The funding model for the Standards Council has evolved over time.

Annual government funding contributions for the Council's 'public good' Standard setting functions were gradually phased out over the 1990s and replaced with a requirement for the Council to operate on a commercial (that is, a self-funded) basis.

For more than two decades, the Standards Council has had an on-going engagement with the Government (as its owner) to clarify the responsibility of the Council for meeting commercial operating objectives and its wider statutory functions under the Standards Act 1988.

As the Standards Council became fully self-funded, receiving no annual Parliamentary appropriation for even a proportion of its operating costs, a lingering tension has remained.

More recently, the role and functions of the Standards Council were considered as part of a wider review of the national Standards and conformance infrastructure conducted by the Ministry of Economic Development[1].

The review, while suggesting that the infrastructure was 'fundamentally sound', included a recommendation that further work could be initiated around establishing a contestable fund for 'public good' activity including Standards development.

The Council's submission to the Ministry highlighted the on-going 'market failure' associated with its self-funded model and the limitation this model places on its ability to develop and maintain the national Standards catalogue.

A new piece of legislation[2], the Standards and Accreditation Bill (2008) has been introduced to Parliament in the wake of the review and is awaiting its first reading.

However, despite the Standards Council's representations to Government during the drafting process, this Bill does not address the Standards Council's funding model or any substantive aspects of its core functions.

Two key issues facing the Standards Council

The Standards Council has been in existence for nearly 80 years as an independent Government agency set up precisely to develop Standards, yet:

- **It is self-funded**
  From the 1990s, the Standards Council became self-funded and now receives no annual Parliamentary appropriation for even a proportion of its operating costs. That is, Standards New Zealand is entirely funded through agreements for service with stakeholders contracting for the development, amendment, or revision of Standards; and through the sale of Standards.

  No central funding is received by the Standards Council to maintain its operations or develop 'public good' New Zealand Standards, although this mandate is central to its legislated role.

- **It has no clear mandate**:
  Compounding this funding problem, successive Governments since the Standards Council became self-funded have not articulated a clear commitment to the Standards Council as the prime source of Standards development expertise and capability in New Zealand.

As a result, there are insufficient resources to provide 'public good' New Zealand Standard development in a timely way.

The impact of these two issues:

Over time a lack of political or government commitment and funding has led to:

- Confusion by stakeholders about the status of Standards and other documents supporting the New Zealand Building Code (for example if a New Zealand Standard must be used, could be used, or if used would provide a means of demonstrating compliance).

[1] http://www.med.govt.nz/upload/46688/cabinet-paper.pdf
[2] http://www.med.govt.nz/templates/MultipageDocumentTOC____2493.aspx

- Modifications by the regulator (Department of Building and Housing) of the requirements contained in a New Zealand Standard through referencing in New Zealand Building Code compliance documents. This requires users to review and corroborate the requirements in multiple documents to achieve compliance. Such an approach is risky and more complex than it needs to be.

- Limited ability to rapidly initiate projects to amend, review, reconfirm or withdraw New Zealand Standards addressing matters of 'public good' as events occur. For example, NZS 1170.5 *Earthquake actions* was published to 2004 to incorporate changes in earthquake loading values, yet these changes into NZS 3604:2011 *Timber-framed buildings* were not incorporated until 2011.

- Some documents developed for a specific purpose are used in ways not considered by the developers, for example NZS 1170.5:2004 sets the earthquake loading levels for retaining walls.

- Potential barriers for stakeholders to access requirements, as some documents in the building controls framework are free, while New Zealand Standards are on a cost reimbursement basis because of the user pays funding model driving Standards development.

- The voluntary, non-remunerated committee structure of technical experts provides a considerable risk to our not being able to access the necessary range of experts. While this is a funding issue, it is also a consequence of not having a national profile of sufficient standard that would motivate experts to participate.

- Potential perception of 'committee capture' where the committee consensus does not align with the funders interests. The perception of committee capture can also be alleged where some stakeholders' have limited time and funding to participate in the process.

- Divergence of views among experts. Typically a Standard would not be promulgated in such circumstances. However, if there is a contract for service to deliver a Standard, this puts Standards New Zealand is a difficult position as it is bound to meet its contractual responsibilities.