

Submission to

**Department of
Prime Minister and Cabinet**

on

**Strengthening the Resilience of
Aotearoa New Zealand's Critical
Infrastructure System**

8 August 2023



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National Security Group
Department of the Prime Minister and Cabinet
Level 8 Executive Wing
Parliament Buildings
WELLINGTON 6011

By email: infrastructureresilience@dpmc.govt.nz

Dear Madam/Sir

STRENGTHENING THE RESILIENCE OF AOTEAROA NEW ZEALAND'S CRITICAL INFRASTRUCTURE SYSTEM

Concrete New Zealand (NZ) represents a membership of more than 500 corporates and individuals who make a significant contribution to the New Zealand construction sector.

Concrete NZ speaks with a unified voice on behalf of the cement and concrete industry.

In line with this mandate Concrete NZ welcomes the opportunity to provide comments on the Department of Prime Minister and Cabinet's (DPMC) *Strengthening the Resilience of Aotearoa New Zealand's Critical Infrastructure System*.

Concrete NZ would welcome engagement with DPMC on any aspect of this submission.

Concrete plays an essential role in much of New Zealand's infrastructure and other construction, for many reasons, including the durability and longevity of the material, versatility of form when placed, cost-effectiveness, fire safety, thermal mass, and increasingly, its lower CO₂ emissions footprint.

All the more so, in light of the increasing threats to the resilience of critical infrastructure in New Zealand. Examples of the role of concrete in critical infrastructure include:

- Parliament buildings in Wellington – the Beehive
- The seawalls for the rebuild of SH1 between Blenheim and Kaikōura
- Electricity generation and distribution - e.g., hydroelectric schemes, foundations for wind turbines, power poles

- Three waters infrastructure
- Bridges and tunnels on the state highway network, and the rail network
- Airports, seaports, schools and hospitals generally
- Community facilities such as strong and durable sport stadiums, public swimming pools, sound-proof concert halls, and much more.

Concrete NZ is due shortly to release the New Zealand cement and concrete industry's net zero carbon roadmap. This sets out the pathways by which the concrete industry will continue to reduce emissions, and which in some cases will require government action to enable that outcome. Note that the Canadian government is now working actively with that country's cement and concrete industry to decarbonise.

The United Nations has acknowledged global cement and concrete industry decarbonisation. In June 2023 UN Secretary-General António Guterres addressed the Global Cement and Concrete Association on the topic, at its annual conference, held this year in Zurich, Switzerland. The point is that if the UN and the world at large are taking cement and concrete industry decarbonisation seriously, New Zealand should too.

We note the [discussion document](#) "builds on Rautaki Hanganga o Aotearoa, New Zealand's first Infrastructure Strategy, produced by Te Waihanga – New Zealand's Infrastructure Commission". This is a strong foundation for the present policy initiative.

Given Concrete NZ's focus in the context of the topic under discussion, we have structured our submission as follows:

- Comment on selected discussion document content
- Answers to selected discussion document questions

Concrete NZ would welcome further engagement on this important initiative for New Zealand.

COMMENT ON DISCUSSION DOCUMENT CONTENT

Concrete NZ comments below (*italics*) on selected passages from the discussion document text, in order of their presentation, noting the paragraph numbers restart part way through.

Para 10 (page 4), "Feedback on this paper will inform subsequent consultation in early 2024, exploring in more detail the options identified for enhancing infrastructure resilience to all hazards and threats."

Concrete NZ looks forward to engaging in this subsequent consultation.

Para 14 (page 5), “This discussion document is primarily aimed at critical infrastructure owners and operators, who would be directly affected by regulatory reforms to enhance the resilience of critical infrastructure.”

It should also be aimed at the people who design and build the critical infrastructure, including the people who supply the building and construction materials (also answered below).

Para 16 (page 5), “Your submission may respond to any or all of the issues we ask about. The Government is particularly interested in your views on: a) whether this document accurately identifies the issues with New Zealand’s current approach to regulating the critical infrastructure system, and b) where relevant, ideas for possible reforms that may help address these problems.”

At issue is a perception among many people and government agencies that concrete is an emissions-intensive building and construction material. The fact is that the CO₂ footprint of cement and concrete production has been decreasing for many years (by 15% between 2005 and 2018, inclusive, thinkstep 2020), and that the industry in New Zealand has a goal of net-zero carbon concrete by 2050 (refer to our forthcoming roadmap). We argue for a material-neutral approach to building and construction, including for critical infrastructure, and for accurate whole-of life calculation of embodied carbon in materials.

Para 4 (page 7), “Enhancing resilience can be in tension with these other objectives. Recognising this, the government is committed to working with critical infrastructure owners and operators and the general public to identify and deliver the ‘socially optimal’ level of resilience.”

A good example of searching for socially optimal solutions is in climate change adaptation. Nature-based solutions may be appropriate in many settings but not all settings. For example, there will be a role for sea walls in some locations.

Para 16 (page 12), “Resilience is not just about physical assets – it is a strategic capability. It requires organisations to have the right leadership and culture, networks and relationships, and organisational processes in place before an event, so that they can recover and thrive afterwards.”

In many cases, but not all cases. If infrastructure had been built properly in the first place, it would be more resilient. Resilience is also about the people who design, build and maintain the infrastructure, and the materials they use.

Para 17 (page 13), “Resilience is distinct from the ability to simply absorb shocks. Instead, resilience is both about absorbing shocks, but also having the capacity to adapt to those shocks and rapidly recover, even if that means providing services in a new way. That is, the most resilient organisation is not necessarily the one with the ‘hardest’ assets, but the one that can continue to deliver services to communities most consistently. An organisation that uses less robust assets that are easily replaceable may

be more resilient from a service delivery perspective than one that relies on highly engineered assets that take a long time to replace when they fail.”

This is not a complete treatment of the issue. On the above argument, people could, for example, be forced to live in make-shift temporary accommodation instead of houses, as a solution to the resilience challenge.

Para 29 (page 15), “Given that investments in resilience can generally occur at a lower cost than paying for repairs and recovery after an event, enhancing the critical infrastructure system’s resilience is likely to reduce the government’s and broader society’s fiscal exposure to disasters over time.”

Concrete NZ agrees, and suggests that building properly in the first place with resilient materials, e.g., concrete, would save ultimately on costs, over the life of the asset.

Para 40 (page 18), “We also have other vulnerabilities, including aging infrastructure (for example, much of New Zealand’s water infrastructure) and the use of outdated or relatively unsecure technologies by some operators.”

New Zealand has many proven and evolving technologies, and that includes concrete.

Para 44 (page 19), “Global efforts to mitigate the direct effects of climate change will also have significant implications for critical infrastructure operations and resilience. This includes, but is not limited to, changes in: how electricity is generated; how and when electricity is used (for example, as more consumer and commercial processes are electrified); what materials are used to build and maintain infrastructures; and pricing structures, which will need to better reflect the cost of greenhouse gas emissions.”

To note once more that concrete is becoming increasingly a lower-carbon building and construction material.

Para 61 (page 23), “For this reason, Te Waihangā and New Zealand’s National Adaptation Plan for climate change recommend taking a coordinated, systematic approach to building infrastructure resilience. This requires the focus to shift from the resilience of each distinct infrastructure asset, to how infrastructure assets and the networks between them can contribute to the resilience of the whole infrastructure system.”

May we add to the above a well-informed approach, based on the science and evidence.

ANSWERS TO QUESTIONS

The Government would like your views – page 10

DPMC questions	Concrete NZ response
Does more need to be done to improve the resilience of New Zealand’s critical infrastructure system?	The discussion document answers the question – yes.
Have you had direct experience of critical infrastructure failures, and if so, how has this affected you?	Waikanae and Waikato Expressways. Time and emissions wasted in traffic jams whilst repairs were underway.
How would you expect a resilient critical infrastructure system to perform during adverse events?	To not fail. Had East Coast plantation forestry been better managed, slash etc would not have destroyed bridges. A further example is the Kāpiti expressway (SH1).
Would you be willing to pay higher prices for a more resilient and reliable critical infrastructure system?	Where justified, yes. A good example is that on a whole-of-life basis, concrete pavements compare favourably than other forms of pavements because they need little or no maintenance over 40 years. Where they are suitable, concrete roads are a resilient roading solution. Find out more here .
The work programme’s objective is to enhance the resilience of New Zealand’s critical infrastructure system to all hazards and threats, with the intent of protecting New Zealand’s wellbeing, and supporting sustainable and inclusive economic growth. Do you agree with these objectives? If not, what changes would you propose?	We agree with the objectives. It is important to note that concrete is becoming progressively a lower-carbon building and construction material, including for critical infrastructure.
Do you agree with the proposed criteria for assessing reform options? If not, what changes would you propose?	Not answered.

The Government would like your views – page 22

DPMC questions	Concrete NZ response
The paper discussed four megatrends: i) climate change, ii) a more complex geopolitical and national security environment, iii) economic fragmentation, and iv) the advent and rapid uptake of new technologies. Do you think these pose significant threats to infrastructure resilience?	Megatrends also present opportunities, e.g., new technologies and innovation. Among solutions is lower-carbon concrete.

Are there additional megatrends that are also important that we haven't mentioned? If so, please provide details.	A significant megatrend is misinformation in relation to facts and evidence. An example is discussion on the relative CO ₂ footprints of different building and construction materials. There has been misrepresentation of the facts and evidence in this area, and Concrete NZ has a strong interest in setting the record straight.
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The Government would like your views - page 32

DPMC questions	Concrete NZ response
If you are a critical infrastructure owner or operator, what additional information do you think would best support you to improve your resilience?	Critical infrastructure operators will want to know about the resilience of the civil contracting industry, and the reliability/resilience of supply of lower-carbon building and construction materials, including aggregates and concrete
What do you think the government should do to enable greater information sharing with and between critical infrastructure owners and operators?	Not answered

The Government would like your views - page 39

DPMC questions	Concrete NZ response
Would you support the government being able to set, and enforce, minimum resilience standards across the entire infrastructure system?	Yes - to note that government does this indirectly at present via councils/network utility operators, using criteria in Standards such as loadings and material standards. Investing in these Standards to ensure they remain current and achieve required outcomes should be a focus
If so: <ul style="list-style-type: none"> • what type of standard would you support (e.g., requirement to adhere to a specific process or satisfy a set of principles)? • do you have a view on how potential minimum resilience standards could best complement existing approaches to risk management? 	Investment in the development or adoption of an international standard methodology (potentially through Standards NZ) to undertake consistent life-cycle assessments. This will complement investment in the design of Standards for New Zealand use.
Would you support the government investing in a model to assess the	Yes.

<p>significance of a critical infrastructure asset is, and using that as the basis for imposing more stringent resilience requirements?</p>	
<p>If so:</p> <ul style="list-style-type: none"> • what options would you like the government to consider for delivering on this objective? • what criteria would you use to determine a critical infrastructure asset's importance? 	<p>A comment – we ask if network utility operators (such as Chorus), and asset managers such as Waka Kotahi do this already.</p>

Concrete NZ thanks the Department of Prime Minister and Cabinet's (DPMC) for the opportunity to submit feedback on *Strengthening the Resilience of Aotearoa New Zealand's Critical Infrastructure System*.

Yours faithfully



Rob Gaimster
 CHIEF EXECUTIVE
 Concrete NZ