
Repairable low damage seismic design buildings concept

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ABSTRACT

Insurers face a degree of uncertainty when pricing a building risk for earthquake coverage as they do not know if a new building is going to end up being a constructive total loss following a significant earthquake event.

This uncertainty will apply to any new building even if it is of a low damage seismic design.

Insurers reflect this uncertainty in their premium pricing.

Would we ever get lower insurance rates with future low damage seismic designs?

The message we are getting is this would likely only be achieved if "Certainty of Repair" is built into future Low Damage Seismic Designs. Can we do this?

Today's Earthquake Insurance Market.

Insurance for commercial buildings and apartment complexes is now expensive and particularly so in Wellington. Insurance availability is a concern, and this could reduce the appetite for developers constructing new buildings in the capital.

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This uncertainty will apply to any new building even if it is of a low damage seismic design.

Insurers reflect this uncertainty in their premium pricing.

It's important to know that the insurance contract pays for damage "Any Damage" even if the building can still be used.

More Certainty that the building will be Repairable.

Insurers have had negative experiences following the damage to many new buildings in Wellington from the Kaikoura earthquake in 2016. Many of these buildings were understood to be more resilient with favourable NBS ratings but many of them became constructive total losses as they were not able to be repaired.

Reinsurers internationally have not forgotten this.

Would we ever get lower insurance rates with future low damage designs?

The message we are getting is that this would likely only be achieved if "Certainty of Repair" is built into future Low Damage Seismic Designs.

In Wellington we currently have a number of new buildings that appear to be of a robust seismic design, using extensive steel superstructure, viscous dampers and base isolation technologies.

We so far have not had an earthquake event big enough to really test these new buildings.

If they did suffer damage in a moderately large earthquake event, insurers do not know what could fail and what it would take to repair (cost & time) any damaged structural and non-structural elements.

Current building designs may require significant deconstruction of the buildings components to be able to repair major structural components such as a fractured shear wall, damaged steel support beams, columns and foundation supports.

The Repairable Building Design Challenge.

Could engineers design a low damage building with the primary objective that it will be repairable?

Could modular replaceable elements be used that can be removed and replaced without significant deconstruction of the building?

We could see replaceable structure sections can be quickly fabricated in another part of the country and installed on site.

Speed of repair is essential as insurers cover the loss of rental income if the building is not habitable during its repair and this is taken into account on the viability of undertaking any repairs or just writing-off the building.

Detailed Information to Insurers about the Buildings Low Damage Design and Repairability.

There will be a need for engineering technical information to prove that the building has been designed as repairable. This information will be very technical, but insurers will require it, and they will have people that will understand it.

In addition, there will be benefits from insurers receiving expected annual loss (EAL) values for the building as a whole but also translated into what individual components would be likely damaged and what it would cost to repair. These cost estimates would be updated by the professional valuers QS team at the same time as the insurance replacement valuation is updated annually.

Insurers internal modelling would calculate the premium with greater certainty.

This information will help insurers make informed decisions that would lead to lower risk pricing by removing much of the constructive total loss uncertainty.

The Reinsurance Market

The reinsurance market drives the pricing for earthquake cover in New Zealand as insurers transfer most of their earthquake risk to Natural Catastrophe Reinsurance markets. In recent years this pricing has increased significantly for Wellington.

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Right now, the reinsurance market has softened but not so much for earthquake coverage in Wellington.

Insurers purchase an annual reinsurance programme that will cover all there risks they insure for an amount above an agreed limit (net retention). Currently reinsurers will want to know what the number and value of risks that are located in the insurer's portfolio of risks in Wellington. This reinsurance programme includes all building risks (some good and some not so good) in the insurer portfolio and one price is applied.

With a repairable low damage building concept, we are aiming to create a new class of building that reinsurers will rate separately from all other buildings.

Initially these risks will be placed individually (facultatively as we call it) with specific reinsurers who are interested in making a difference and we know of a number that are keen to be involved.

As the stock of repairable low damage buildings increases, reinsurance costs will hopefully decrease, and these cost reductions will benefit the building's owner over time.

Future Availability of Earthquake Insurance

These new repairable low damage buildings could be a good investment if earthquake insurance was to become less available. We are probably only one significant earthquake event away from not being able to purchase earthquake insurance like we can currently.

Summary

The Insurance Council has been tasked by its Board to find workable solutions to insurance availability. This idea of Repairable Low Damage Seismic Designs from our Commercial Property Insurers Group may just work so we need your help. We know it's not going to happen overnight.

I meet with a number of engineers involved with the new Repairable Low Damage Seismic Design methodology at the University of Canterbury late last year and I got to understand what they were wanting to achieve, and this is great, but from an insurance perspective this does need to go further to have a positive effect on the cost and future availability of earthquake insurance in New Zealand.

We feel that earthquake engineers should be interested in this, and it may lower insurance premiums sufficiently to promote new growth in construction activity in New Zealand and particularly Wellington.

We also think this could be a world first and could benefit markets like California and Japan where current earthquake insurance is too expensive for many building owners.

Could New Zealand be a pioneer of Repairable Low Damage Design Buildings?

We are very keen to receive your comments.