

LESSONS LEARNED
CHRISTCHURCH
EXPERT
EARTHQUAKE
ENGINEERING PANEL

LEGACY DOCUMENT 5

THE CANTERBURY EARTHQUAKES

ENGINEERING JOURNEY



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THE LEGACY PROJECT :: THE CANTERBURY EARTHQUAKES ENGINEERING JOURNEY

This document forms part of the set of information referred to as the 'Legacy Toolbox Package'. This set of documents was prepared by engineers from the Christchurch Earthquake Expert Engineering Panel and the Engineering Advisory Group. Review and input have also been provided by Engineering New Zealand, GCCRS (now NZCRS) and representatives from the Legal, Insurer and Homeowner Advisory Groups.

1. OVERVIEW

Engineers faced a number of challenges in assessing damage and preparing repair and rebuild specifications following the Canterbury Earthquake Sequence (CES). In the first instance these involved uncertainty about the nature and impact of damage to houses that had a common cause, but came in a range of forms, such as liquefaction on houses and the development of appropriate technical solutions. Considerable engineering effort was also applied to landslide and rockfall risk and its mitigation in the Port Hills.

Coming to terms with the requirements of residential insurance contracts with a "when new", or "as new" repair standard, some aspects of which were untested by Courts here and overseas, presented an additional challenge.

Homeowners were facing similar issues, including the need to find and engage an engineer for the first time. They often found themselves having to navigate more than one engineering assessment and repair recommendation. These assessments often differed as a result of different briefs and consequently their differing findings were typically not easy for any of the parties involved to reconcile.

This document summarises some of the key aspects of this 'journey', and explores the following themes:

- Keeping engineers informed
- The importance of relevant technical guidance and information
- The regulatory context
- The insurance context
- Navigating the legal uncertainties
- The view through the homeowner lens
- The Public Inquiry into Toka Tū Ake EQC
- The Greater Christchurch Claims Resolution Service
- Canterbury Earthquake Insurance Tribunal

The purpose of this summary is to provide insights to inform future residential recoveries from all natural hazard events, and any occasion where there is an insurance claim that requires Engineering New Zealand

professionals to be part of the claim assessment and recommend repairs– not to look back on the Canterbury earthquake recovery process.

2. KEEPING ENGINEERS INFORMED

One of the key challenges for the engineering profession after the CES was keeping engineers and others involved in the recovery informed and up to date about the nature and scope of the damage to buildings and the ground. Further updates were required as appropriate technical solutions were developed and refined.

From the early days following the Darfield Earthquake in September 2010, Technical Clearinghouses were run by the University of Canterbury in association with the New Zealand Society for Earthquake Engineering (NZSEE).

Initially held on an almost daily basis, these in-person fora were led in the early stages by the research community. They then settled into an approximately fortnightly pattern throughout 2011, with more of a focus on informing practitioners on the new and evolving technical methods and regulatory arrangements for repairs and reconstruction.

The Technical Clearinghouses were subsequently facilitated as a collaboration between the Canterbury branch of the Structural Engineering Society, NZSEE, and New Zealand Geotechnical Society (NZGS).

The high demand for engineering inputs led to many engineers from other regions and from overseas becoming involved. The Technical Clearinghouses enabled those coming into the area to quickly obtain an understanding of both the wider situation and specific solutions.

These continued until 2016 on a less regular basis, with the final meetings being held in 2018. In total, more than 55 Technical Clearinghouse meetings were held. They were well supported by the engineering community and made a significant contribution to the adoption of common approaches by the majority of engineers.

The Technical Clearinghouse mechanism was used to good effect following the Kaikōura Earthquake in 2016, and more recently following Cyclone Gabrielle for Hawke’s Bay engineers.

3. THE IMPORTANCE OF RELEVANT TECHNICAL GUIDANCE

One early challenge for all parties was understanding what levels of damage triggered the difference between houses to be rebuilt as opposed to repaired. Where new foundations or full rebuilds were considered necessary, the form that suitable foundations should take in areas significantly affected by liquefaction needed to be established.

The secondary challenge was to enable repairs and rebuilds to be undertaken as consistently as possible. This had great significance to homeowners; a key question often was *“why is my house only being repaired when the one next door and the house over the back fence are to be rebuilt?”*.

Recognising the immense challenge for engineers and the affected territorial authorities in dealing with the ‘new’ phenomenon of the damage caused by liquefaction, especially different categories of land damage, the Earthquake Commission (now referred to as Toka Tū Ake EQC) established the Engineering

Advisory Group in October 2010 to prepare guidance derived from the research information it had commissioned.

The value of the Engineering Advisory Group was endorsed by the Canterbury Earthquakes Royal Commission of Inquiry. Similar leadership groups were established following the Kaikōura Earthquake in Wellington and Cyclone Gabrielle in Hawke's Bay.

The Engineering Advisory Group was transitioned to the Department of Building and Housing, which then became the Ministry of Business Innovation and Employment (MBIE). The first version of *Repairing and rebuilding houses affected by the Canterbury earthquakes* was released in December 2010, before being extensively updated in 2011 and again in 2012 to reflect the greater and cumulative impacts of the February 2011 earthquake. The document became known as the MBIE Residential Guidance and was extended in 2014 to encompass multi-unit buildings. Further support for practitioners was provided in the form of Q&As, with a total of 63 Q&As issued between 2013 and 2018.

The creation of the Canterbury Geotechnical Database to enable geotechnical and structural engineers to access geotechnical data shared by other engineers and their clients was a key means of sharing information critical to the recovery. The pooling and active sharing of geotechnical data facilitated a greater understanding of the distribution, variability and behaviour of the soils across the affected areas, and informed decisions in relation to repairs and rebuilding of residential and commercial buildings.

The database was subsequently extended to become the New Zealand Geotechnical Database, and makes geotechnical information available to engineering companies, local and central Government officials, scientific and academic institutions, and insurers.

4. THE REGULATORY CONTEXT

The lack of specific provisions in the Building Act for repairs from natural disaster damage led to the need to provide appropriate guidance for engineers, insurers and Building Consent Authorities. The MBIE Residential Guidance is regarded as having been a valuable point of reference for this purpose and was accepted as such by the Courts. The MBIE Residential Guidance was endorsed by the Christchurch, Selwyn and Waimakariri councils, who confirmed that if the guidance was followed, they would issue a Building Consent for the repair work. This led to the guidance being referred to as providing 'acceptable alternative solutions'.

The most relevant clauses in the Building Act were section 17 *All building work must comply with Building Code*, section 42A *Building work for which building consent is not required under Schedule 1*, and section 112 *Alterations to existing buildings*. Section 17 contains the caveat *to the extent required by the Building Act*, which in part points to section 112. In essence this section requires that the repaired structure overall shall perform no worse in future events than it did prior to the repairs being undertaken.

Understanding the interaction between these sections of the Building Act required considerable effort on the part of engineers recommending repairs to houses with minor to moderate damage.

For many repair options, determining what comprised new 'building work' was a challenge, particularly for older houses with varying levels of pre-existing static settlement due to Christchurch's soft ground, foundation earthquake damage, and a range of possible treatment options.

While the focus of the MBIE Guidance was on the regulatory aspects of technical solutions, it emerged that some in the insurance and damage assessment field were using the Guidance inappropriately as providing the principal basis for settling claims, rather than letting this process be led by the relevant provisions of the specific insurance contract. This was a significant issue that complicated the settling of many claims and potentially undermined the value of the guidance for many homeowners.

5. THE INSURANCE CONTEXT

While most residential insurance policies were new replacement based, a number contained different wording in key areas. A key area of contention was in relation to the interpretation of the repair standard engineers were to design to: 'when new' vs 'as when new'. The impact of the difference in meaning between these was often significant in terms of the potential scope of repairs for older houses with minor to moderate damage, particularly when the house had been extended and/or renovated.

The potential inconsistencies in approach and coverage between Toka Tū Ake EQC and private insurers was also an issue when claims that were initially assessed by Toka Tū Ake EQC to be under the Toka Tū Ake EQC 'cap' of \$100,000 plus GST per event were then found to be overcap (often after the floor levels were measured) and passed to the private insurers. Interface issues also arose due to land damage being covered by Toka Tū Ake EQC but not by the private insurers.

Another challenge for all parties related to interpreting and assessing the impact on the amenity of houses as another component of damage and loss. Floors being out of level was the dominant issue in this context, in addition to the subtler visual aspects resulting from building movement. Physical change in itself was not enough to constitute 'damage' for insurance purposes - the change also needed to materially impair the value or usefulness of the element. This proved to be quite subjective in many cases (although the damage 'thresholds' in the MBIE Residential Guidance helped engineers navigate this).

This process was not helped by some engineers going beyond their professional role and providing their interpretation of insurance contracts and making 'in my opinion' statements that were not backed up by forensic evidence. This led to the spectrum of views where some engineers essentially considered that all damaged foundations should be replaced (which sometimes led to full rebuilds), whereas others taking the view that such damage was all pre-existing.

The fundamental question that engineers needed to determine when looking at the dwelling in the post-earthquake state was whether the damage was "more than likely" attributable to the earthquake (and in some cases which earthquake) - either directly or by exacerbation of pre-existing damage. This task was even more challenging for engineers seeing the building for the first time towards the end of the 2010s and early 2020s, often with previously attempted repairs. The interpretation of damage and causative factors required forensic engineering knowledge and experience. Conveying the findings clearly in written reports required well-developed report writing skills.

6. NAVIGATING THE LEGAL UNCERTAINTIES

Some disputes between homeowners and insurers (both Toka Tū Ake EQC and private insurers) involved court proceedings. In May 2012 the High Court established the High Court Earthquake List to manage the litigation arising out of the Canterbury earthquakes as swiftly as the Courts' resources permitted. Over 1,300 cases were filed in the earthquake list in its first decade of existence. While some cases went

through to court-determined outcomes, the majority were settled between the parties before being heard before judges, with no information being made public on the positions being taken or the associated details. Settlement was often achieved at mediation or a judicial settlement conference. This required the engineers involved to be skilled at articulating their position clearly and persuasively, while resisting advocating for their clients or becoming entrenched or biased. Unhelpfully, the published court judgements were relatively few and far between in the early to middle stages of the recovery, and so matters of relevant technical and regulatory precedent were few. Insurers ran surprisingly few test cases, despite the Earthquake List protocol anticipating these would be helpful.

Judgments that were subsequently published on the meaning of loss, damage, exacerbation of damage, multiple events, the repair standards, and what was required to meet those standards provided baseline points of reference that could be used to resolve disputes from those publication dates onwards.

The Canterbury Earthquakes Insurance Tribunal Act 2019 established the Canterbury Earthquakes Insurance Tribunal in June 2019. Decisions by the Tribunal were also written up comprehensively and made available soon after decisions were reached.

As insurance contract wording has changed since the earthquakes and continues to change (for example the “as new” repair standard is now uncommon) some aspects of the previous judgements may no longer be directly relevant to future events. However, the more generic findings are still relevant to more recent and future disasters, so we should not lose the lessons learnt.

It is clear, that having key technical and regulatory points of principle being subject to legal test with published outcomes early in a recovery phase would provide a much clearer path forward to reduce foreseeable disputes that relate to insurance contract interpretation. It is also clear that strong relationships and communication between the engineering and legal professions post disaster can help affected communities.

7. THE VIEW THROUGH THE HOMEOWNER LENS

Throughout the residential recovery process, homeowners have seen findings in assessments from engineers engaged by them that in many cases differed significantly from those engaged by insurers. In some cases there were three or four different engineers involved with varying views and opinions and this severely delayed settlement of the claims. These contrasting findings, and the polarity and lack of convergence of the subsequent discussions, significantly undermined the perception of engineers as independent professionals and the robustness of engineering solutions. This had a wider and negative impact on how the engineering profession was viewed, particularly in Canterbury.

Homeowners’ lack of financial resources to engage engineers, the lack of engineering resource and the lack of an early mechanism to enable an interface between homeowners, and the technical community, contributed to these adverse perceptions. In many cases homeowners’ engineers were arranged and funded by “no win, no fee” litigation funders who, while providing important access to justice, had a financial interest in the resultant dispute and litigation. A related issue was the lack of any specific mechanism to monitor how the technical guidance was being used by the various parties and their engineers, and different engineers working to different briefs.

It is acknowledged that the collective process uncertainty for homeowners had a significantly adverse effect on the wellbeing of many as they went through the claims process.

8. THE PUBLIC INQUIRY INTO TOKA TŪ AKE EQC

The Public Inquiry into Toka Tū Ake EQC was established in November 2018 to examine the role and work of the Commission following the Canterbury Earthquakes, and to learn lessons that can be applied to how it operates in the future.

The Inquiry's report released in March 2020 acknowledged that Toka Tū Ake EQC staff had done the best they could in difficult circumstances, even if New Zealanders didn't always see it that way. However, it also found that Toka Tū Ake EQC was poorly prepared, was rapidly overwhelmed, and as a result the public bore the burden of those shortcomings.

The report noted that some people expressed concern that EQC assessments, or engineering reports commissioned by EQC, were not independent or impartial.

The report also highlighted that thorough and consistent assessments would be assisted by a clear definition of natural disaster damage, along with checklists and better quality assurance mechanisms.

Following the *lessons learned* from the Inquiry, Toka Tu Ake EQC implemented a more customer led approach which aided in successful dispute resolution.

9. THE GREATER CHRISTCHURCH CLAIMS RESOLUTION SERVICE

The Greater Christchurch Claims Resolution Service (GCCRS) was established in 2018. This enabled a more specific focus on homeowners and their need for resolution to insurance claim disputes in order to enable them to be able to move on with their lives.

GCCRS widened the previous work of the Residential Advisory Service (RAS) which had provided primarily legal advice with only limited technical advice. In addition to an internal dispute resolution service, including mediation and determinations, GCCRS provided free general legal, engineering and wellbeing support to homeowners to help them get their claims resolved. GCCRS did not provide or fund homeowners' legal or engineering services in disputed cases.

The GCCRS was structured to have input from advisory groups including the Legal Advisory Group, Homeowner Advisory Group, Wellbeing Advisory Group, and the Engineering Advisory Group. There was also an overarching Advisory Committee that included the Chairs of the above Groups. Operationally, the GCCRS was supported by the Christchurch Earthquake Expert Engineering Panel to provide specialist advice on specific cases, established and managed by Engineering New Zealand.

This Panel was established in December 2018 and comprised 18 structural and geotechnical engineers from Christchurch and other parts of New Zealand, whose independence was accepted by both homeowners and insurers. Due to demand, membership of the Panel was expanded in July 2019 to add another 7 engineers. The Panel provided initial appraisals, peer reviews, reinstatement recommendations, and facilitation between expert engineers, as well as being available for appointment as technical expert and facilitators for the Tribunal. Through a combination of their technical knowledge and empathetic approach through their written reports, the Panel engineers were able to convey to homeowners the likely cause of damage and the extent to which the earthquakes contributed. This was instrumental in achieving the closure of many long-standing unresolved claims.

One of the first things that Engineering New Zealand produced in support of the Panel was a letter of engagement which clarified the responsibilities and duties of an independent engineer engaged to undertake residential damage assessments. The letter included reference to the key insurance reinstatement requirements applicable to the property. Recommended standard headings for damage and reinstatement reports were also included. The letter of engagement was developed with input from the GCCRS Homeowner Advisory Group and proved a critical process improvement step that helped reduce the volume of disputes through the parties' engineers working to the same or similar briefs.

The work of GCCRS has enabled closure of over 3,000 claims that were subject to long-standing disputes, in addition to efficiently handling new claims that were enabled by subsequent legal actions. Of these, input from the Engineering Panel has led to the resolution of more than 420 previously disputed claims. The significant value of the work of the Engineering Panel to the community was recognised by the Panel receiving the Engineering New Zealand President's Gold Award in 2022.

In early 2023, GCCRS became the New Zealand Claims Resolution Service (NZCRS), which was launched immediately following Cyclone Gabrielle. NZCRS has a wider remit to support homeowners across New Zealand in resolving issues with their residential insurance claims resulting from all natural disaster events, not just earthquakes. The standard form letters of engagement have now been updated for use in all natural disaster events.

10. THE CANTERBURY EARTHQUAKES INSURANCE TRIBUNAL

The Canterbury Earthquakes Insurance Tribunal Act 2019 established the Canterbury Earthquakes Insurance Tribunal in June 2019 as a response to the thousands of residential insurance claims from the 2010 and 2011 Canterbury earthquakes that remained unresolved.

Located in Christchurch, the Tribunal considers claims for physical loss or damage to residential buildings, property and land. Most applications are for technically and legally complex matters involving disputes about the primary insurance response to earthquake damage and/or increasingly, allegations of defective earthquake repair work. Further complexity is added by the prolonged timeframes homeowners have been in dispute with their insurers, leading to mistrust and difficult relationships between the parties. Claims can only be brought by homeowners who owned the damaged property at the time of the earthquakes. The Tribunal is not available for people who have inadvertently purchased an earthquake damaged property since.

The Tribunal regularly appoints experts to assist in resolving technical issues at facilitated conferences of experts and during hearings by answering questions and engaging with the parties' experts. The Christchurch Earthquake Expert Engineering Panel provides facilitation services and technical advice to the Tribunal on referral to Engineering New Zealand. The Tribunal's expert does not provide evidence but instead assists the Tribunal in testing the parties' expert evidence.

The Tribunal's decisions are published anonymously and can provide useful guidance for others resolving earthquake disputes. Further information on the Tribunal's rulings are included in the Legacy document 'Guidance to Engineers on Insurance Law'. They can also be found here: [CEIT decision finder | New Zealand Ministry of Justice](#).

As at June 2023, 148 claims have been lodged with the Tribunal, of which 41 have been referred to the panel for expert advice. The Natural Disaster Recovery Panel will continue to support the Tribunal in settling insurance claims.

11. SUMMARY: KEY POINTS FOR FUTURE EVENTS

Reflecting on the observations in the preceding theme-based sections, key points in relation to future natural hazard events can be summarised as follows:

1. The formation of locally focused Engineering Leadership Groups is considered the best mechanism to inform the work of engineers in regions significantly affected by natural disaster events, and to promote consistency of practice. These groups should be independent but be able to call on the wider industry (e.g. lawyers, Toka Tu Ake EQC) for input where needed;
2. The use of Technical Clearinghouses (a combination of in-person and online participation) is the best mechanism to keep engineers from within and beyond affected regions informed on impact information and the developing event-specific good practice;
3. The rapid development and circulation of technical guidance covering event-specific issues plays an important role in achieving consistent assessments and repair specifications, particularly how key Building Act provisions should be applied;
4. There is a need to have an interface between homeowner representatives, insurers and those providing oversight to the development and application of technical guidance from the early stages of recovery planning;
5. Where there is an insured disaster event that causes damage, there is an insurance (and Toka Tū Ake EQC) claim response. Clear instructions must always be received from the insured or insurer;
6. The importance of the letter of engagement for engineers being in a standard format which clarifies the responsibilities and duties of an engineer engaged to undertake residential damage assessments, including reference to the key insurance reinstatement requirements applicable to the property;
7. The need for engineers undertaking damage assessments to have specifically developed forensic investigation knowledge and reporting skills; and
8. Stronger communication between the legal and engineering professions to ensure greater clarity on common interpretations of key regulatory provisions and insurance contract clauses at the early stages of an event recovery (or as standing guidance) would greatly assist engineering practitioners working on residential claims.

The expansion of the Christchurch-focused GCCRS to become the New Zealand Claims Resolution Service, supported by a standing national engineering panel, is seen as a key means of identifying and addressing potential disputes early in the recovery process, hence keeping homeowner interests to the fore. This standing national engineering panel can support and provide service to the wider industry in a post disaster environment.