

Adopting a Health and Safety Framework for the Assessment and Remediation of Earthquake Prone Buildings

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Introduction

He Whakatauki: He Korowai Whakaruruhau

“He korowai āta raranga
He korowai whakaruruhau
Mō tātou katoa”

This *whakatauki* (proverb) features prominently in the Independent Taskforce’s Report on Workplace Health and Safety.¹ The korowai (cloak) was woven by Robin Hill who explained that:²

This korowai is made of pheasant feathers, both male and female birds, which speaks to me of the inclusion of all people. The taniko (woven border) is designed with a family in mind. The marriage of two people and their respective families join to make one pattern. Although people belong together in society we are all individuals so there are individual bundles of feathers throughout the korowai body.

The image, symbolism and cultural significance of the *korowai* embodies and embraces the requirements for best practice regarding workplace health and safety. The Independent Taskforce considered that “urgent sustainable step-change in harm prevention activity and a dramatic improvement in outcomes” are required to improve New Zealand’s poor health and safety performance.³

It considered that all of its identified pre-requisites need to be in place for a high-functioning workplace health and safety regulatory system, including: (a) good workable law; (b) an effective primary regulatory agency; (c) strong visible leadership; (d) a robust level of capacity and capability; (e) genuine and effective worker participation; (f) incentives that are effective levers for good practice; (g) high quality data; and (h) a national culture that is more risk aware.⁴

Much has been written about the lessons to be learned from the Canterbury earthquakes. More than eight years after the first earthquake of 4 September 2010, it is timely, if not overdue, to reflect on whether the fatalities which resulted from the catastrophic collapse of the CTV and PGC buildings and other multiple building failures would be avoided or mitigated under the new workplace health and safety regime.

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¹ Independent Taskforce *The Report of the Independent Taskforce on Workplace Health and Safety: He Korowai Whakaruruhau* (Executive Report) (Independent Task Force reporting to the Minister of Labour, April 2013).

² Ibid.

³ At 3.

⁴ Ibid.

To appreciate the context behind the recent changes to health and safety in New Zealand, it is necessary, as a minimum, to have regard to the following materials: the Royal Commission on the Pike River Coal Mine Tragedy⁵, the Canterbury Earthquakes Royal Commission⁶, the Report of the Independent Taskforce⁷, WorkSafe New Zealand's Position Statement on Dealing with Earthquake Related Hazards⁸, Ministry of Business, Innovation and Employment's (MBIE) Investigation into the Performance of Statistics House in the 14 November 2016 Kaikōura Earthquake,⁹ the sentencing decision of *WorkSafe New Zealand v Rangiora Carpets Limited*¹⁰ and recent changes to the regulatory regime for managing earthquake prone buildings (the EPB Regime).

The key question for this paper is whether the revised and updated EPB Regime will prevent loss of life as occurred as a result of the CTV and PGC building failures and would have occurred in Statistics House but for the fortuitous timing of the Kaikōura earthquake.

First, the failures that led to the Pike River Coal Mining tragedy and the collapse of the CTV building will be compared to identify whether there have been any common features. Secondly, the Report of the Independent Taskforce will be reviewed. Thirdly, the recently updated EPB Regime will be reviewed. Finally, an assessment will be made as to the effectiveness of the EPB Regime as it currently operates and some suggestions will be made for addressing EPB issues from a health and safety perspective.

The Pike River Coal Mine Tragedy

The Pike River coal mine tragedy has come to symbolise the systemic failure of health and safety in New Zealand. On Friday, 19 November 2010, at 3.45pm, there was an explosion in the mine. Twenty-nine men died underground immediately after the explosion or shortly afterwards, either from the impact of the explosion or from the toxic atmosphere. Two workers, who were located in a stone drift, and removed from the workings of the mine, managed to escape.¹¹ Over the next nine days, the mine exploded three more times before it was sealed. No workers were rescued, and no bodies have been recovered.¹²

According to the Royal Commission on the Pike River Coal Mine tragedy, the cause of the 19 November explosion was the ignition of a substantial volume of methane gas.¹³ While it

⁵ Royal Commission on the Pike River Coal Mine Tragedy *Royal Commission on the Pike River Coal Mine Tragedy: Te Komihana a te Karauna mo te Parekura Ana Waro o te Awa o Pike* (Royal Commission on the Pike River Coal Mine Tragedy, October 2012).

⁶ Canterbury Earthquake Royal Commission *Final Report: Te Komihana Ruwhenua o Waitaha* (Canterbury Earthquake Royal Commission, November 2012).

⁷ Above n 1.

⁸ WorkSafe New Zealand "Position Statement on Dealing with Earthquake Related Hazards: Information for employers and owners of workplace buildings - Position Statement" (November 2016) WorkSafe New Zealand < www.WorkSafe.govt.nz >.

⁹ Ministry of Business, Innovation and Employment "Investigation into the Performance of Statistics House in the 14 November 2016 Kaikōura Earthquake" (MBIE, March 2017).

¹⁰ *WorkSafe New Zealand v Rangiora Carpets Limited* [2017] NZDC 22587.

¹¹ Royal Commission on the Pike River Coal Mine Tragedy, above n 4, at 12.

¹² *Ibid.*

¹³ Royal Commission on the Pike River Coal Mine Tragedy, above n 4, at 23.

remains unclear exactly how such large quantities of methane gas accumulated and the identity of the ignition source, it seems highly likely that the accident and subsequent loss of life would have been prevented if proper health and safety processes had been followed.

According to the Royal Commission, the underlying causes of the tragedy included that:¹⁴ (1) it could fairly be described as a *process safety accident*, comprising an escape of methane gas, followed by an explosion. It occurred at a time when production was prioritised at the expense of health and safety; (2) at the time of the tragedy, the legal framework for health and safety in underground mining was deficient; (3) in the years leading up to the time of the accident, the oversight provided by the health and safety regulator was inadequate; (4) the search and rescue operations were compromised due to a lack of advance planning; and (5) the families of the miners would have benefitted from improved communication during the search, rescue and recovery phases.

There were multiple process failures, as outlined below:

A management culture which saw management of methane gas as “*more a nuisance and daily operational consideration than a significant problem or barrier to operations*”.¹⁵

The investigation of incident reports was haphazard. For example, in October 2010, a backlog of outstanding investigations was simply written off.¹⁶

A key health and safety requirement for underground mining is to effectively manage methane gas levels. One component of effective methane management is proper implementation of a ventilation management system. For Pike River, the ventilation management plan was deficient. For example, no one had dedicated responsibility for ventilation management.¹⁷

The ventilation shaft was relied on by Pike River as a second means of escape. In April 2010, a Department of Labour (DoL) inspector advised the company that the ventilation shaft was not a suitable means of egress. However, the DoL took no further action before the explosion occurred. This was because the DoL assumed that Pike River was a ‘best practice’ employer when this was not the case. These failures, and others, occurred due to DoL’s failure to resource and support the dwindling mining inspectorate.¹⁸

Placing the main fan underground was a ‘major error’ because the decision was not subject to an adequate assessment of risk, the main fan was not ‘explosion protected’ and it was not operational after the explosion.¹⁹

The backup fan, which was located at the top of the ventilation shaft, failed to start, as planned, after the explosion.²⁰

¹⁴ At 15.

¹⁵ At 18.

¹⁶ At 19.

¹⁷ Ibid.

¹⁸ At 23.

¹⁹ Ibid.

²⁰ Ibid.

Monitoring methane levels is an essential part of effective methane management. The Royal Commission found that the sensors were either not operational or were unreliable.²¹

Under mining regulations, electrical equipment must be located in a restricted zone to prevent the possibility of equipment igniting an explosion. The Pike River restricted zone was fixed without any risk assessment and only after equipment had already been installed.²²

The premature commencement of hydro mining resulted in high methane gas readings. As a result of these readings, hydro mining should have ceased.²³

Overall the Royal Commission stated that:²⁴

New Zealand has a poor overall health and safety record compared with other advanced countries. In relation to underground coal mining, New Zealand has had a tragedy every generation or so, after the lessons of previous tragedies have been forgotten. This time the lessons must be remembered. Legislative, structural and attitudinal change is needed if future tragedies are to be avoided. Government, industry and workers need to work together. That would be the best way to show respect for the 29 men who never returned home on 19 November 2010, and for their loved ones who continue to suffer.

The recommendations of the Royal Commission included: (1) to improve New Zealand's poor record in health and safety, a new Crown agent focussing solely on health and safety should be established;²⁵ (2) an effective regulatory framework for underground coal mining should be established urgently;²⁶ (3) regulators need to collaborate to ensure that health and safety is considered as early as possible and before permits are issued;²⁷ (4) the statutory responsibilities of directors for health and safety in the workplace should be reviewed to better reflect their governance responsibilities;²⁸ (5) directors should rigorously review and monitor the organisation's compliance with health and safety law and best practice²⁹; (6) the health and safety regulator should issue an approved code of practice to guide managers on health and safety risks, drawing on both their legal responsibilities and best practice. In the meantime, managers should consult the best practice guidance available;³⁰ and (7) worker participation in health and safety in underground coal mines should be improved through legislative and administrative changes.³¹

In other words, the Royal Commission advocated strongly for a significant mind shift regarding workplace health and safety. The elements required to deliver such a change include (1) a clear and coherent regulatory framework, (2) leadership provided by central government, (3)

²¹ At 20.

²² Ibid.

²³ Ibid.

²⁴ At 35.

²⁵ At 36.

²⁶ Ibid.

²⁷ At 37.

²⁸ Ibid.

²⁹ Ibid.

³⁰ At 38.

³¹ Ibid.

identification of health and safety risks at an early stage, (4) ongoing monitoring of those risks, (5) effective management of health and safety risks by mine management, (6) effective review of the management of health and safety risks by governance entities and (7) active worker participation regarding health and safety risks.

In other words, the *korowai whakaruruhau* requires a cloak which is carefully woven if workers and others are to be protected at work. The Pike River coal mine tragedy was a process failure. If proper processes had been followed, then the accident and the explosion and the loss of life could have been avoided.

The Royal Commission referred to 17 previous coal mining accidents, most of which resulted in loss of life.³² In total, since 1879, more than 200 miners have lost their lives in New Zealand coal mine tragedies. The recurrence of such tragedies was evidence of recurring themes including:³³ (a) an insufficient regulatory framework; (b) the health and safety regulator not properly conducting inspections or ensuring legislative compliance; (c) operators not identifying and managing hazards, including inadequate ventilation and gas management systems; (d) operators not providing miners with the proper training, equipment and oversight; and (e) miners not following safe practices.

In other words, a common theme of the previous 17 coal mining accidents is that there was no carefully woven cloak which would have protected coal miners at work in New Zealand. This context provides a useful framework for assessing the consequences of the collapse and total failure of the CTV building on 22 February 2011 from a health and safety perspective.

The CTV Building

On 22 February 2011, just three months after the Pike River coal mine tragedy, a 6.3 magnitude earthquake, with an epicentre less than 10 kilometres from the Christchurch CBD, struck at 12.51pm. It followed an earthquake of magnitude 7.1 which occurred on 4 September 2010 and a large number of powerful aftershocks. The shaking was particularly destructive due to the shallowness of the fault line and its proximity to the CBD.³⁴

Ground motions caused by the February earthquake were extremely high. For example, vertical accelerations were measured at 2.2g and horizontal accelerations near the epicentre were measured at 1.7g. These accelerations meant that the earthquake is seen as a one in 2,500-year event.³⁵ Buildings in New Zealand are not built to withstand shaking of this intensity although they are meant to preserve life.

One hundred and fifteen people were killed when the CTV building collapsed in the February earthquake. Profiles of these people are featured in the Royal Commission's report.³⁶ The

³² At 258 to 261.

³³ At 261.

³⁴ Ministry for Culture and Heritage "Christchurch earthquake kills 185" (April 2017) <<https://nzhistory.govt.nz/>>

³⁵ Canterbury Earthquake Royal Commission (Vol 1), above n 5, at 34.

³⁶ Ibid (Vol 6), at 5-37.

victims' places of work included Kings Education Language School, The Clinic medical centre, the Toyama College of Foreign Languages, CTV and Relationship Services.

The Royal Commission found that the collapse of the CTV building would have occurred within 10-20 seconds of the commencement of the February earthquake.³⁷ The collapse was sudden and catastrophic. After a period of twisting and shaking, all of the floors dropped vertically due to major weaknesses in the beam column joints and columns. This was described by eye witnesses as a 'pancake' effect. The north wall complex was left standing, the floors had become separated from it. The south sheer wall collapsed inwards on top of the floors which was probably the last part of the collapse sequence. Both the north and the south walls failed to perform their intended role.³⁸

The two key failures of the designer were: (1) to properly consider low tracking through the beam column joint zones. This failure led to joint zones which "*were easy to construct but lacked ductility and were brittle in character*"; and (2) failing to ensure that there were adequate connections between the floors and the north wall complex.³⁹ Retrofit works also failed due to their lack of ductility.

The Royal Commission found that these design defects were compounded by construction defects in that the builder failed to roughen the interface between the ends of the precast beams and the concrete in the columns.⁴⁰

The Royal Commission made a number of critical findings including that:

Mr Harding, who carried out the structural design of the building, was acting beyond his competence and did not seek assistance from his employer, Alan M Reay Consulting Engineer (ARCE). Specifically, Mr Harding was inexperienced in the use of the ETABS computer programme and that he had never designed a multi-storey building.⁴¹

Dr Reay failed to properly supervise Mr Harding's work and failed to implement a system for reviewing the design either by himself or by someone else who was qualified to carry out a review.⁴²

In the process of applying for a building permit around July and August 1986, a building consent officer, Mr Tapper, identified that there were design flaws in the structural drawings. These included the connections of the floors to the north wall complex. However, in September 1986, Dr Reay became involved in the process for issuing consent and it seems likely the Christchurch City Council (CCC) accepted that Mr Tapper's concerns lacked foundation. As a result, the CCC issued a building permit when it ought not to have done so.⁴³

³⁷ Ibid (Vol 6) at 307.

³⁸ Ibid.

³⁹ Ibid.

⁴⁰ Ibid.

⁴¹ Ibid at 302.

⁴² Ibid.

⁴³ Ibid at 303.

The defects in design were compounded by construction defects. The two main defects in construction works were that (1) there was no or insufficient roughening of construction joints between precast and in situ concrete and (2) a number of reinforcing bars in the precast beams were bent backwards instead of being embedded into the north wall complex as the design had intended.

These construction defects may not have been identified or addressed as a result of inadequate construction monitoring by both ARCE and the CCC.⁴⁴

In 1990, retrofitting works were carried out. This involved the insertion of drag bars between levels four to six in the north wall complex. When the drag bars were inserted, no building permit was obtained. Although the installation of the drag bars met relevant standards, overall, the connections between the floors and the north wall complex remained non-compliant for seismic actions in the east-west direction.⁴⁵

On 7 September 2010, when three CCC building officers carried out an inspection, there was no engineer present. Notwithstanding this omission, the officers decided that an existing green placard signalling that the building was safe to occupy was confirmed.⁴⁶

There were many opportunities to identify and address the defective design issues. If this had occurred, it is possible that at least some of the lives lost on 22 February 2011 could have been saved. From a health and safety perspective, the risk of catastrophic collapse in a major earthquake was not identified. The failure to identify the risks of use and occupancy of the CTV building meant that those risks could not be eliminated or minimised.

Once again, the protective cloak was not woven with sufficient care to protect people who had the misfortune to be in the CTV during the February earthquake. The process flaws between the design of the building and the earthquake in February 2011 echo the failings in the Pike River coal mine tragedy. The catastrophic collapse of the CTV building could also be described as a *process safety accident*.

The Report of the Independent Taskforce

The Taskforce identified that New Zealand's performance in workplace health and safety is poor by international standards. Although there were issues with the quality of the data, the Taskforce was extremely concerned at health and safety in this country. Each year, around 200,000 claims are made to ACC. While the majority of these claims are for medical fee expenses, in 2010, ACC accepted about 26,000 substantive entitlement claims for work-related harm.⁴⁷

The Taskforce concluded that there was no single factor responsible for the poor performance. Instead, the Taskforce identified:⁴⁸

⁴⁴ Ibid.

⁴⁵ Ibid at 304.

⁴⁶ Ibid at 305.

⁴⁷ Independent Task Force, above n1 at 12.

⁴⁸ Independent Task Force, above n1 (Executive Report) at 10.

Significant weaknesses across the full range of workplace health and safety system components, coupled with the absence of a single strong element or set of elements to drive major improvements or to raise expectations. The fundamental issue is systemic.

While the Taskforce identified problems with (1) confusing regulation, (2) a weak regulator, (3) poor worker engagement and (4) inadequate leadership, the Taskforce carefully considered New Zealand's risk-tolerant culture and stated:⁴⁹

Our national culture includes a high level of tolerance for risk, and negative perceptions of health and safety. Kiwi stoicism, deference to authority, laid-back complacency and suspicion of red tape all affect behaviour from the board room to the shop floor. If recognition and support for health and safety are low or intermittent, workplaces are liable to develop, accept and defend low standards, dangerous practices and inadequate systems.

These comments certainly ring true if we reflect on the mining activities documented by the Pike River Royal Commission or the processes involved in the design and construction of the CTV building.

The Chair of the Taskforce considered that to address these cultural challenges would:⁵⁰

...require strong top-down and bottom-up leadership. It will also require a fundamental change to the prevailing 'she'll be right' culture in New Zealand. She most clearly is not all right. Businesses, workers, unions, industry organisations and the Government all have vital and shared roles to play in achieving this vision.

Wally Noble became a paraplegic in a workplace accident on a construction site when he fell 6.5 metres through a hole in the roof and landed on the penthouse below. He suffered serious injuries, including breaking his spine which resulted in him becoming a paraplegic and being confined to a wheelchair. He reflected that his accident could have been avoided and stated:⁵¹ "we have a responsibility to change the safety culture in the workplace. We need to inspire everyone at work to have the courage to speak up when things don't seem right."

Other submitters echoed these concerns around culture, leading the Taskforce to conclude that:⁵²

New Zealand's national culture includes a high level of tolerance for risk, and negative perceptions of health and safety. There appear to be a number of prevailing values and norms that are at odds with a safety-conscious, harm-preventive and compliance-based workplace health and safety system. 'It's only minor', 'it won't happen to me' and 'it's all part of the work we do' are some phrases that aptly capture this.

⁴⁹ At 12.

⁵⁰ Ibid (Full Report) at 5.

⁵¹ At 14-16.

⁵² At 31.

The Taskforce records the views of a company director regarding the connection between cultural change and strong leadership:⁵³

How do you create the right culture? “A commitment has to come from the top. It needs to be led primarily by the chief executive but the board directors must support and challenge the CEO too. “There needs to be greater awareness – and the Pike River tragedy has raised people’s awareness – and an acceptance of the importance of health and safety.

The Taskforce agreed and emphasised the critical nature of effective leadership:⁵⁴

One of the most important components of the workplace health and safety system is leadership – from the Government, government agencies, industry bodies, pan-industry bodies, professional associations, employers, managers, people in governance roles, unions, community based organisations, the medical profession, other professions, health and safety representatives and, of course, workers.

First and foremost, leadership needs to be strongly demonstrated from the top. The Government should provide strong leadership and act as an exemplar of good workplace health and safety practice.

These statements about creating and maintaining a safety culture in the workplace go to the heart of recent reforms in this area. To achieve a cultural shift requires a number of features to be present, including clear and effective regulation, a visible and strong regulator, effective management and governance structures, strong leadership (both top-down and bottom-up), a common vision for workplace safety, shared ownership of safety issues and effective processes to ensure worker participation.

To achieve real change, all key elements must be present along with a “broad-based step-change in approach and a seismic shift in attitude.”⁵⁵

The Taskforce made a number of recommendations and many of these have already been implemented. We now have much stronger health and safety legislation in the form of the Health and Safety at Work Act 2015 (HSWA). The HSWA contains specific provisions relating to: the primary duty of care of a Person Carrying out a Business or Undertaking (PCBU);⁵⁶ the due diligence duties of directors;⁵⁷ worker participation, including the roles of health and safety representatives and health and safety committees;⁵⁸ and overlapping duties where there is more than one PCBU present in a workplace.⁵⁹ Additionally, there is now a suite of at least 10 health and safety regulations which have been promulgated under the HSWA since 2015. There is a

⁵³ At 76.

⁵⁴ At 77.

⁵⁵ At 4.

⁵⁶ Health and Safety at Work Act 2015, sections 17 and 36.

⁵⁷ Section 44.

⁵⁸ Sections 58-67.

⁵⁹ Sections 32-34.

dedicated regulator (WorkSafe New Zealand) with strengthened powers of enforcement. Prosecutions under the HSWA are currently making their way through the courts. WorkSafe is providing leadership by making available to businesses guidance documents, fact sheets, position statements and other relevant information.⁶⁰

Central government deserves credit for implementing these initiatives. WorkSafe has a visible presence and continues to develop a large body of information and guidance to enable PCBUs, directors, workers, HSRs and Health and Safety Committees to contribute more effectively to workplace health and safety. In general terms, the *korowai* is increasingly becoming a *korowai whakaruruhau*.

It is necessary to consider whether, from a health and safety perspective, the new regime for EPBs provide adequate protection for PCBUs, managers, directors and workers against risks associated with unsafe structures.

The New Regime for Earthquake Prone Buildings

The Canterbury Earthquakes Royal Commission (CERC) noted that, under the system that operated at the time of the Canterbury earthquakes, it was left to each territorial authority to set its own policy for identifying and managing earthquake prone buildings and for reviewing its policy every five years.⁶¹ MBIE, as building regulator, produced guidance to assist local authorities to determine how it would manage its existing building stock.

MBIE considered that local authorities would implement policies that struck a balance between earthquake risks and other factors, taking into account economic and social considerations and the community interest in preserving heritage buildings.⁶² MBIE suggested that policies adopted by territorial authorities could adopt an active or passive approach.

Under an active approach for managing EPBs, territorial authorities identify all of the high risk buildings within its district and serve notice on the owners, requiring them, at their cost and within a specific timeframe, to provide more detailed seismic assessments and/or improve the performance of their buildings as appropriate.⁶³

Under a passive approach, a territorial authority waits for a building owner to apply for building consent where alterations to existing buildings are proposed. A territorial authority then requires seismic works to be completed as part of the alterations to the building.⁶⁴

The CERC found that, while all 67 territorial authorities had policies for managing EPBs, 43 had active policies, 12 had passive policies and 12 had hybrid policies containing active and passive elements.⁶⁵ Unsurprisingly, the CERC recommended that, while territorial authorities

⁶⁰ <www.worksafe.govt.nz>.

⁶¹ Building Act 2004, ss 131-132.

⁶² Department of Building and Housing. (2005). *Earthquake-Prone Building Provisions of the Building Act 2004: Policy Guidance for Territorial Authorities*. Wellington, New Zealand.

⁶³ Canterbury Earthquakes Royal Commission, above n 5 (Vol 4) at 200.

⁶⁴ Ibid.

⁶⁵ At 201.

should be permitted to set discretionary EPB policies, MBIE should provide further guidance on the factors to be considered, including the nature of a community's building stock, the expected economic impact, the numbers of passers-by for some buildings, levels of occupancy, and potential impact on key infrastructure in a time of disaster.⁶⁶

The new regime came into force on 1 July 2017 and has five key features: (1) Building (Earthquake-prone Buildings) Amendment Act 2016. This Act contains important provisions. It requires territorial authorities to adopt an active approach to identifying and managing EPBs and sets timeframes of between 2.5 and 15 years for building owners to improve the performance of EPBs. It also requires seismic upgrades to be completed when building owners carry out substantial alterations but does not define what constitutes a 'substantial alteration'. The Amendment Act commenced on 1 July 2017; (2) Building (Specified Systems, Change the Use, and Earthquake-prone Buildings) Regulations 2005; (3) an EPB methodology was released by MBIE in July 2017. The EPB methodology provides guidance to territorial authorities tasked with identifying EPBs; (4) Engineering Assessment Guidelines were finalised in August 2017. They provide guidance for initial seismic assessments (ISAs) and detailed seismic assessments (DSAs); and (5) a national EPB register.

Comment

There are some inherent weaknesses in the current regime for assessing EPBs. While there is a more consistent national approach, implementation of the policy is left to territorial authorities who are all able to adopt different approaches, have differing levels of institutional expertise, differing capabilities, and differing resources. These variations are compounded by the fact that neither the building regulator nor the health and safety regulator provide any independent oversight.

A further factor is that older buildings may comply with building standards at the time of construction but may, nonetheless, be brittle and struggle to withstand the force of a powerful earthquake.

For example, the PGC Building collapsed following the February earthquake, killing 18 people, after both the east and west walls failed. The PGC building was built in 1966. It complied with the building standards of that time. However, a number of features of the design meant that the PGC building could not lawfully be constructed under the current Building Code and associated standards.⁶⁷

Following seismic works carried out in the 1990s, an engineer estimated the building's strength to be approximately 50 per cent of seismic design loading in the relevant standard.⁶⁸ The CTV building was assessed at between 40-55 per cent NBS. Yet, both of these buildings contained a number of design and construction flaws which rendered them susceptible to total building failure in the event of a major earthquake. Because they were originally compliant with

⁶⁶ At 211.

⁶⁷ Canterbury Earthquakes Royal Commission, above n 5, (Vol 2) at 41.

⁶⁸ At 24.

building regulation, and structural alterations did not trigger a reassessment of their critical structural weaknesses, the EPB regime under the 2004 Building Act was not engaged.

Following the Kaikōura earthquake, Statistics House, a six storey building located in the Centreport Harbour Quays business park, suffered a partial collapse of the first and second storeys.⁶⁹

The building was constructed in 2004 and 2005 when the Building Act 2004 was in force. Following the 2013 Seddon earthquake, the building owners engaged engineers to undertake a review against the recommendations of the Canterbury Earthquake Royal Commission. These seismic works had commenced but had not been concluded at the time of the Kaikōura earthquake.

According to MBIE, the building was unable to withstand the effect of the Kaikōura earthquake due to: (1) a highly flexible ductile frame which exacerbated the impact of the earthquake; (2) shortening of the pre-cast double-tee flooring units as a result of the spalling at the ends of the units; (3) amplification of ground shaking due to basin-edge effects in the Thorndon basin area; and (4) the long duration of the earthquake (about 120 seconds).⁷⁰

The concerning nature of this modern and presumably well designed and constructed building failing is that if the high end of our building stock presents life safety issues in a major earthquake, then where does it leave buildings constructed to a lower standard?

Another worrying consideration is that, while MBIE carried out a careful review of the building after it had partially failed, there does not appear to be any machinery for an independent panel of building experts to assess buildings when concerns have been raised by employers, workers and others, but before a building has failed to perform in a manner which would preserve life safety.

WorkSafe has a position statement on earthquake damaged buildings. There are two key 'takeouts' in the statement:⁷¹

In short, if you are doing what you're supposed to be doing under the Building Act, then we are not going to enforce to a higher standard in relation to your building's earthquake resilience under HSWA. If you're not doing what you should be doing under the Building Act, we expect the relevant local council to take action – not us.

If you're not doing what you're supposed to be doing under the Building Act and someone is seriously harmed following an earthquake you could face enforcement action under the HSWA.

On 4 October 2017, WorkSafe New Zealand successfully prosecuted a company for having an unsafe structure. In this case, the defendant, Rangiora Carpets Limited operated a business of supplying and installing floor coverings to domestic and retail markets, employing

⁶⁹ Ministry of Business, Innovation and Employment, above n 8, at 14.

⁷⁰ At 28.

⁷¹ WorkSafe New Zealand, above n 7.

approximately 16 staff. It operates out of a two-storey commercial building which includes a mezzanine area which is approximately 2.7 metres high and 74 metres wide.⁷²

The mezzanine was constructed without any building consent and, at the time of the accident, the mezzanine did not comply with the building code due to the lack of a balustrade. There was a false ceiling adjacent to the mezzanine.⁷³

The victim, in this case, while moving a box containing old paper work, pushed a box along the carpeted edge of the mezzanine. As she stood up, her foot slipped off the side of the mezzanine and she fell through the false ceiling to the floor approximately 2 ½ metres below.⁷⁴

According to the victim impact statement, she suffered a broken arm, broken right shoulder, broken right collarbone, fractures to the left side of her pelvis, and a laceration to her head. These injuries required her to spend eight days in hospital before being discharged and cared for by her husband who had to take time off work to look after her.⁷⁵

In its submissions for sentencing, WorkSafe noted that a proper hazard identification assessment would have picked up the risk created by the lack of a balustrade on the mezzanine floor and that addressing this risk would have been relatively easy and inexpensive.⁷⁶

The District Court ordered the defendant to pay \$20,000 in reparation to the victim, a total fine of \$157,500 and prosecution costs.⁷⁷

In media statement, WorkSafe General Manager Operations and Specialist Services, Brett Murray stated:⁷⁸

Falls from height always present a significant risk. Even a fall of less than three metres can result in serious injuries or death. Identifying the need for a barrier to protect workers on the mezzanine floor was imperative to avoiding this incident.

Under the current regime, health and safety issues relating to defective structures are treated as Building Act issues until something goes wrong. If something goes wrong, and harm occurs, then the issues become HSWA issues, capable of investigation and prosecution by WorkSafe. The effect of this approach is that WorkSafe is under no obligation to take any action until harm has actually been suffered. In other words, WorkSafe has no role in providing any sort of safety net regarding the hazards contained in defectively constructed buildings.

In this case, the territorial authority could have issued the company with a Notice to Fix but did not do so.⁷⁹ The territorial authority was in a position of influence and control in that it

⁷² *WorkSafe New Zealand v Rangiora Carpets Limited* [2017] NZDC 22587 at [6].

⁷³ *Ibid.*

⁷⁴ At [9].

⁷⁵ At [10]-[11].

⁷⁶ At [25].

⁷⁷ At [59].

⁷⁸ WorkSafe “Risk Present in All Work Spaces” (5 October 2017) WorkSafe New Zealand: Mahi Hauora Aotearoa <www.worksafe.govt.nz>.

⁷⁹ Building Act 2004, ss 163-168.

could have prevented the harm which occurred. Under s 17 of the Building Act 2004, all building work must comply with the Building Code even if a building consent is not required. But the experience from the Canterbury earthquakes suggests that there is no regime for building inspections where consent is not required. Compliance is left in the hands of a building owner. Potentially, WorkSafe could also have prosecuted the territorial authority for failing to prevent harm by requiring the mezzanine to comply with the Building Code.

While, generally, WorkSafe is showing strong leadership in relation to health and safety issues, providing relevant information to employers and workers and becoming involved in initiatives that are likely to have a positive impact on New Zealand's poor health and safety record, in the area of defective, non-compliant and unsafe structures, there appear to be gaps in WorkSafe's role which means that the responsibility falls on employers and workers to identify and remediate hazards with insufficient support or involvement from territorial authorities, the building regulator and the health and safety regulator.

Conclusion

There are a number of concerns with the new EPB regime from a health and safety perspective: first, while the policy for managing EPBs is now contained in the Building Act, it appears that territorial authorities have different approaches for managing EPBs. This is demonstrated through the inconsistent use of the national EPB register; second, even if EPBs are identified, the timeframes for addressing critical structural weaknesses mean that most of the health and safety risks are borne by employers and workers; third, there appears to be no or ineffective oversight of territorial authorities' implementation of their EPB obligations under the Building Act; fourth, buildings which have an NBS rating of more than 34 per cent may, nonetheless, pose significant life-safety risks. These buildings are not identified by territorial authorities and there are no requirements for seismic works to be carried out; fifth, NBS assessments focus on primary structural elements but secondary elements such as in-ceiling building services may have no impact on NBS assessments; sixth, there appears to be no process designated for the moderation of conflicting assessments by engineers; seventh, there needs to be much greater clarity regarding the roles of WorkSafe, the Department of Building and Housing within MBIE, territorial authorities, employers and workers; eighth, there needs to be one agency who takes the lead and co-ordinates the implementation nationally of the implementation of all EPB programmes, including the national EPB register; and finally, there should be a database for capturing the institutional knowledge and expertise contained in engineering reports so that territorial authorities are not left to reinvent the wheel whenever a new catastrophe strikes.

In order to make the regime more responsive and coherent, I strongly recommend that an independent panel of engineers should play a role in: peer reviewing, on a random basis, ISAs and DSAs carried out for EPB purposes; carrying out ISAs in circumstances where an employer or a health and safety committee raises concerns which are not addressed by a building owner; and carrying out random audits of EPB programmes being implemented by territorial authorities.

Construction industry participants should be able to make protected disclosures on an anonymous basis without suffering any adverse consequences so that authorities and agencies can identify buildings which present real risks to life-safety. There should be increased

recognition that territorial authorities and MBIE have overlapping duties with regard to health and safety risks posed by unsafe structures. WorkSafe should play a much more active role in monitoring health and safety risks posed by unsafe structures, especially where structures have not been identified as being earthquake-prone.

The WorkSafe Position statement should be urgently reviewed in light of the conclusions of the Pike River Royal Commission, the Canterbury Earthquake Royal Commission and the Report of the Independent Taskforce.

Currently, there is no *korowai whakaruruhau* for unsafe structures. A plethora of risks for people in their workplaces relating to unsafe structures have not even been identified, let alone addressed. Our *korowai* must be woven with much greater care if we are to improve our poor performance in workplace health and safety in this area. There is an acute lack of both top-down and bottom-up leadership. The current EPB regime seems set to fail to prevent loss of life and serious harm to employers, employees and other occupiers of buildings.

The key elements for delivering a culture of workplace safety with regard to buildings and other structures are not present and an urgent change in approach is required. In the words of the Independent Taskforce, 'she most clearly is not alright'.