

Lessons learned from one of New Zealand's most challenging civil engineering projects: rebuilding the earthquake damaged pipes, roads, bridges and retaining walls in the city of Christchurch 2011 - 2016.

Catalyst for life-saving change in safety

Story: Health and Safety

Theme: Programme Management

A document which describes SCIRT's approach to ensuring zero harm during its five and a half year programme of work.

This document has been provided as an example of a tool that might be useful for other organisations undertaking complex disaster recovery or infrastructure rebuild programmes.

For more information about this document, visit www.scirtlearninglegacy.org.nz

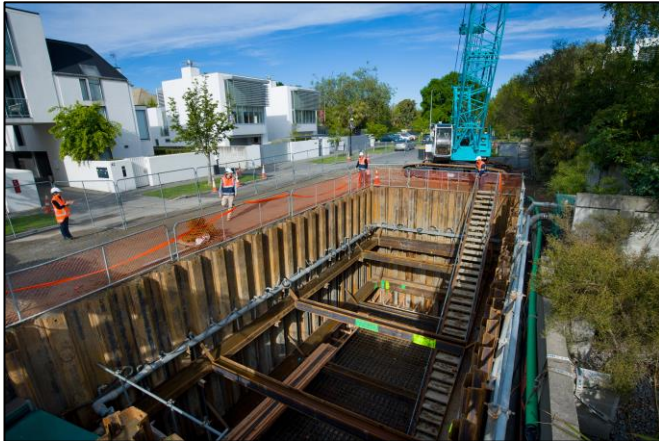


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Catalyst for life-saving change in safety

Fears of fatalities and life-changing injuries powered the urgent need for a workplace safety overhaul as the Christchurch rebuild gathered momentum.



Dig deep: An excavation for a new underground pump station in Chester Street East in Christchurch's central business district.

Business as usual (BAU) incident rates for New Zealand indicated several people could die each year during the post-earthquake programme of works.

Based on WorkSafe data over the past six years, the fatality rate within the construction industry in New Zealand peaked at nine in 2012.

In unison, government, business and unions sought speedy solutions to defy the BAU odds.

SCIRT management joined a meeting of construction industry minds that resulted in the formation of the Canterbury Rebuild Safety Charter.

All roads lead to 'zero harm'

A chorus of "raise the bar" and "zero harm" set the scene for a safety charter. The message was clear: "Make sure everyone who works in construction in Canterbury goes home safe and healthy every night."

More than 340 organisations – from small companies to large construction firms and from government organisations to non-governmental organisations – signed up.

To achieve that safety vision, the charter highlighted 10 commitments to focus on:

1. Leadership
2. Worker engagement, participation and representation
3. Reporting
4. Upstream and downstream duties
5. Critical risks
6. Managing site safety risks
7. Site induction
8. Training
9. Impairment
10. Health and well-being

The charter would offer guidance to help reshape the safety landscape and create better workplaces across the Christchurch rebuild. For those involved in the programme of work, it was a great thing to get on board.

Matter of record

SCIRT Board member Graham Darlow recalled that when work started on the city's rebuild, "there were predictions the construction industry's poor safety record meant one to two workers could die each year".

And there were fears that many more would suffer life-changing injuries and illnesses.

For Darlow and fellow board members, "that prospect was unacceptable".

"Fortunately, there were many people involved in the rebuild from business and government who also wanted to make sure those injury predictions didn't come true.

“We had a mandate to make health and safety a priority”

— Graham Darlow, SCIRT board member

We had a mandate to make health and safety a priority,” he said.

An era of change swept across the industry, prompting the creation of a fresh framework for health and safety. Innovative intervention and aspirational steps propelled the pursuit of higher standards. Policy and best practice were redefined as SCIRT helped power the shift, driving the construction industry to reset the health and safety benchmark.

Endorsed by SCIRT funders – the government, the Christchurch City Council and the New Zealand Transport Agency, along with the five contractor Delivery Teams, which initially were operating under similar but varying standards – the safety revolution was under way.

Do the right thing

A game-changing agreement to work together on unified standards signalled a new chapter in safety management and health and well-being guidelines.

An individual's right to feel and be safe at work was paramount.

At SCIRT, ensuring a safe, healthy and harm-free worksite was at the forefront of the organisational culture. Intentionality in words and actions was vital to establishing that high-level strategy.

However, everyone also had to share the responsibility for creating that environment.

The “rights” of the individual to “choose” his or her level of safety had to be put aside in favour of the greater good. Without multilateral agreement, standards would fall and injuries would rise. With SCIRT, the opportunity

was there to redefine and realign safety standards across the sector.

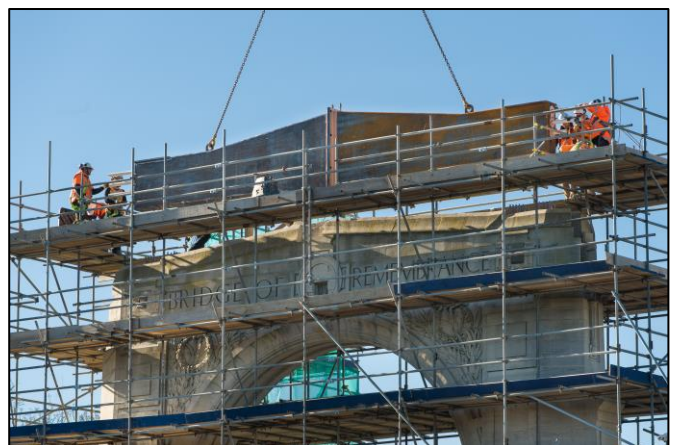
Exceed the standards

Encouraged and supported by the SCIRT Board and senior management, along with health and safety champions, team members committed to the numerous strategies and goals to lift standards both locally and throughout the construction industry.

Everyone had to undertake the transition. It became a collaborative journey as leaders and work crews quickly took the same path.

A desire for high-level worksite responsibility began to morph into a sector-wide standard reality. Safety had to be in-built. A visible and proactive commitment to health and safety had to be established to expand and sustain the new culture. Actions, attitudes and awareness would beget controls, consistency and confidence.

With the construction industry on board and an innovative culture in place, SCIRT focused on developing the numerous health and safety initiatives that would change the industry mindset for the better. Supported by innovative leadership, objectives and targets were set to ensure safety was not compromised. SCIRT committed to providing the best resources – both material and financial – to achieve those targets.



Sling and lift: A steel beam is hoisted into place at the top of the Memorial Arch in central Christchurch.



Got your back: A “spotter” guides an excavator operator as the road surface is scraped in Petrie Street, Richmond.

Make a commitment

As SCIRT safety, quality and environment manager David Hanham pointed out, to achieve those goals “there must be leadership from everyone, and the whole team must take personal responsibility for the safety of everyone involved in the programme of work”.

“In order to reach the ideal ‘interdependent’ safety culture, most people and companies need to transition from a compliance/management-led culture, through personal commitment, to a culture of ‘looking after each other’,” Hanham said.

“SCIRT recognised the importance of aligning values, objectives and actions, and believed from the start that all accidents were preventable.

“Safety is literally a choice, and leadership influences that choice.”

Actions had to go well beyond the “think before you act” mindset in order to achieve more efficient and effective outcomes. Rather than a push or pull approach to workers, motivation was the key to improved safety.

A great deal of time and effort went into influencing a change in industry mindset and shifting workers’ perception of responsibility for safety.

Take the initiative

Wanting to cover the breadth and depth of health and safety issues, SCIRT launched a remarkable range of initiatives, including:

- **A safety culture evolution**

“Zero harm” was a key objective in the SCIRT Alliance Agreement and recognised as a core mindset/value. It placed the health and safety of the community and workers above all else. SCIRT ensured workers were empowered to speak out about any concerns and trained in safety methodology. It led by example, while complying with legislation and regulations. SCIRT Delivery Teams worked collectively to raise standards across the industry and reported, recorded, investigated and learnt from any incidents and injuries. SCIRT also identified risks and developed and implemented appropriate controls and practices.

- **Critical risks programme**

SCIRT focused on what it considered to be the eight critical risks for the horizontal infrastructure rebuild programme, developing training programmes and information in support of improvements. SCIRT targeted service strikes, traffic management and public interface, lifting operations, confined spaces, working at height and depth, powered plant and tools, mobile plant and people interface, and trenches and excavations. For each critical risk, it created a “toolbox” guide to health and safety improvements.

- **A training programme**

A SCIRT Training Centre, in partnership with industry training organisation InfraTrain, offered national qualifications and targeted on-the-job safety and skill-focused improvement. It also introduced workplace tutors to train, mentor and assess and Technical Industry Advisory groups, and lifted role competencies and training resources for the industry.

“... the whole team must take personal responsibility for the safety of everyone ...”

— David Hanham, SCIRT SQE manager



Easy to spot: A “spotter”, wearing personal protective equipment (PPE), looks out for underground services.

- **Frontline leadership development**

Frontline leaders were trained to define and deliver a safe working environment and lead by example.

External safety mentors guided worksite leaders in their development.

- **Key performance indicators (KPIs) affecting work share**

SCIRT used key performance indicators (KPIs) to drive safety behaviours. Higher KPIs contributed to a larger share of the work being assigned to a Delivery Team.

- **A drug and alcohol policy**

SCIRT was committed to creating a drug and alcohol-free workplace. It provided a drug and alcohol programme supported by educational material and specialist training; pre-employment testing; post-accident/incident testing and random testing.

- **Utilities location and protection**

The identification and protection of utilities – particularly power and gas – located within the horizontal infrastructure rebuild zones were paramount for workers’ safety. First up, council plans were checked prior to site excavation. Next, cable detection tools and radar were utilised to locate services to 100 millimetres accuracy. Hydro-excavation then opened up the area and revealed services. SCIRT introduced hydro excavation and other survey technology and practices to combine civil engineering, geophysics, survey and

computer-aided drafting and geographic information systems (CAD/GIS), providing more accurate information on the location and condition of subsurface utilities. In turn, SCIRT created an accurate record for future reference.

- **Proactive traffic management**

Temporary traffic management (signs, cones, barriers and fences) helped keep road workers and road users safe. For each work site, SCIRT created a traffic management plan (TMP). These included multiple factors, such as nearby work sites, and any combined effects on smooth traffic flow; different vehicle types; pedestrians; visibility and weather conditions; approaching road conditions; materials placement and the impact of noise and vibration; signage, barriers and warning requirements; speed limits and alternate routes. SCIRT worked with road-controlling authorities to make the traffic management more user-friendly and effective in keeping workers, motorists and cyclists safe.

- **Personal protective equipment (PPE) standards**

The rebuild presented an opportunity to set high-level PPE standards in alignment with the Alliance Agreement objective of “zero harm”. SCIRT chose the highest standard in each area from each non-owner participant. It recognised the value in alignment and standards to protect crew members, opting to provide PPE for all site workers including subcontractors. Guidelines and safety inductions detailed the need for



Safety stop: A traffic management team member keeps the city streets safe.



Fenced in: A safety fence at a site in Coppell Place, Hoon Hay.

PPE on every SCIRT site. Mandatory PPE included long trousers and long sleeves to act as a barrier to the sun and hazardous material; hard hats to cushion the impact of stationary and moving hazards; steel cap boots to protect toes from crush injuries; high-visibility vests so workers around heavy machinery were easily seen; well-fitting safety gloves to protect hands from injuries, burns, harmful materials, and blistering; and safety goggles and glasses to protect eyes from hazardous liquids, grit and sand, sparks, protruding sticks and bars, fumes, and shrapnel from tools and activity such as excavation.

• **Site fencing and housekeeping**

Under the SCIRT programme, the public was isolated from the worksite with secured 1.8-metre fencing. Trench protection, such as benching, battering or shoring, was also utilised, along with edge protection to prevent falls. Crews were encouraged to keep sites tidy because tidy sites tended to be safe sites.

• **Awards to reward innovation**

Wanting to lift the level of safety in the Christchurch construction industry and honour the memory of a former board member, SCIRT introduced the Bill Perry Safety Award. The award recognised SCIRT teams that continually raised the bar on safety and safety awareness. The quarterly award highlighted that safety remained central to SCIRT's work.

Positive outcome

In response to the multiple initiatives, the outcomes were truly remarkable:

- 2.8 million hours without a lost time injury.

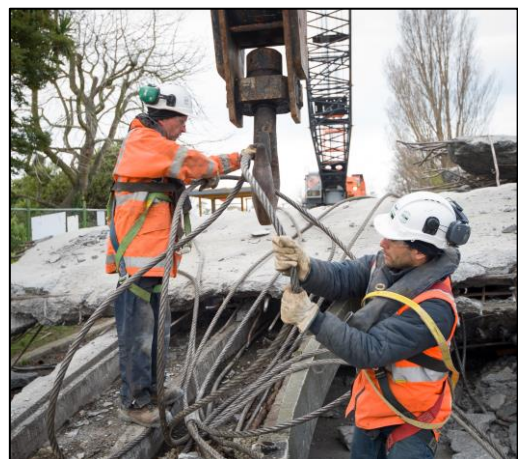
- A massive service strike reduction.
- Fifteen months without a regulatory notice.
- A total recordable injury frequency rate (TRIFR) of less than 10 per 1 million hours. and less than five by end of the programme.
- Initiatives, practices and processes adopted by other organisations.
- Innovations and improved safety work plans.
- A new BAU established.

Valuable lessons

In all, collective action supported by SCIRT values and goals ensured safety was an indicator of progress in improving processes across the organisation and the construction industry. SCIRT powered a combined commitment to health and safety excellence that united all workers. It championed the health and safety principle of zero harm.

For Hanham, the major lessons of SCIRT's health and safety innovations were:

- Intentionality in everything was vital – “mean safe, think safe, do safe”.
- People had to be taken along the safety journey.
- Working collaboratively delivered the best outcomes.
- Acknowledging that everyone had ideas to offer often paid major health and safety dividends.



Ready to lift: Team members at work on the Gayhurst Road Bridge in Dallington.