

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.

Bill Perry Safety Award submission - Downer 2014 - CBD catchment

Story: Bill Perry Safety Awards

Theme: Programme Management

A document which outlines several of Downer's safety initiatives, developed when working in the Central Business District.

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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Bill Perry Nomination

CBD Catchment - Working around Services

Delivery Team:	DOWNER
Nominated by:	RUTH BULLEN
H+S Advisor:	DAVID MAUCOR
Contact Phone#:	
Project Team/ Sub-Contractors: TDM, Tasman & Hydrotech	11104 & 11061 CBD CATCHMENT SOUTH
Current Site Address:	Lismore and Wilson's Rd (behind AMI stadium)
Contact Person:	RUTH BULLEN, Project Manager
Contact Phone #:	

Introduction

The CBD catchment project has been leading the way in the Downer SCIRT Delivery Team for working around services, our number 1 critical risk. Key ingredients to their success have been:

- Improving processes. In particular they were the first to develop work plans and trial the 2 part permit to excavate system that all Downer teams use now.
- Implementing initiatives. With their sub contractors TDM and Tasman Civil, they trialled ideas that just make that bit of difference such as spray marking out the limits of the permit on the road, highlighting exposed services with dazzled pipe offcuts, considering the extents of permits to allow for hold points before working into a higher risk area, improving the way service locating is managed, ensuring goal posts were used for overhead services, running interactive toolboxes to engage the teams to think about safety and their part in keeping it safe.
- Tracking their performance. They developed the “Service Strike Crossed” ratio from January 2014, to motivate site crews and focus on great performance when working around services
- Sharing the lessons learnt. The investigations into the strikes made everyone involved review what had happened and challenge why. The last service strike was not marked on any service drawings or picked up in the locating process. This made the team reassess how they were managing this and change their approach

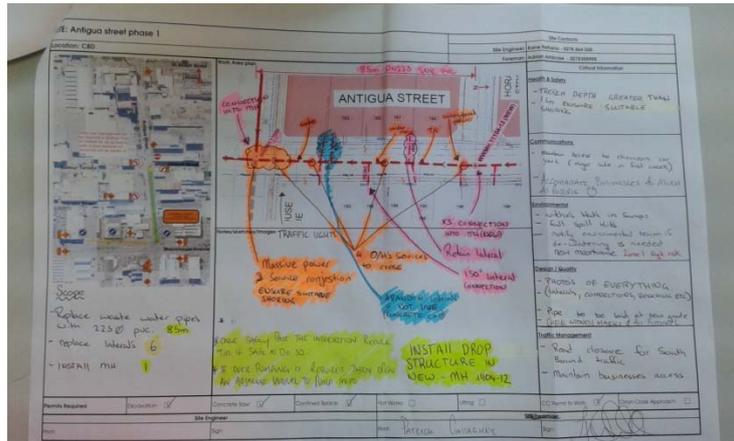
The efforts have paid off. The catchment has recorded 2 service strikes, and crossed 839 services, in the last 8 months of work in the service intensive CBD catchment. Another flow on effect has been the emergence of a culture of taking no risks or short cuts when working around services. **There is a real sense of ownership by all involved in the process of working around services not to strike anything, and the result has been increased productivity for the subcontractor.**

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1. Improving Processes

- **Work plans** – A3 work plans were developed for each section of work, outlining the work and key safety hazards. The plans were then discussed during a walk through weeks in advance of work with the supervisors and other stakeholders allowing any control measures needed to be organised. When starting the works it is used with the job start briefings and then displayed at the site access point. The team learnt to carry out some service location before the walk-throughs to help them visualise and consider the hazard of working around services. See VR:DNZ-SCT#0337



- **Two Part Excavation Permit** is used to control the process so that no “work” starts until all services have been positively identified; only then the second part of the permit is released to let the actual work start. The team took this further by limiting the area covered by the permit so that it created stop points for the crew to reassess and consider the new hazard or service they are approaching. Simple ideas like this and visual markers by spraying permit limits on the ground have lead to limited strikes. How the service drawings and work pack were presented have continually improved to make sure the right information is communicated, provided and understandable along with making sure all parties involved are there from the start of the process locating the services above ground. See VR:DNZ-SCT#0305



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- **Service location** – after the last service strike the team decided it needed to improve how it was controlling the service location part of the process and it was becoming common that we were finding services not shown on any drawings. This led to the team stepping up their game, in how they were managing the service locator operator in terms of what they were asking for, the supervisor and engineer being present during the mark out, checking and ensuring all methods of service location were being used, walking through the site and having a conversation at the end of the mark out to check all physical signs of services have been considered, all identification methods have been used, everything matches up with the service plans and are marked correctly. At this point the engineer is confident to sign the permit to allow the services to be positively identified. See VR:DNZ-SCT#0385
- **Improving Before U Dig** – on the back of the investigation into a strike with a Traffic light cable, the team along with Dave Bain, SCIRT IST, have improved the information available regarding these services to all future contractors in Christchurch.

Ultimately there has been a collective effort by the team to achieve the project goal of no service strikes through following the procedure for working around services and challenging ourselves on how we implement it.

2. Developing Initiatives

- **Marvel** - a small and simple tool to implement but demonstrated the importance of protecting services and helps the spotter and excavator operator see where the service is when concentrating on excavating and working See VR:DNZ-SCT#0403



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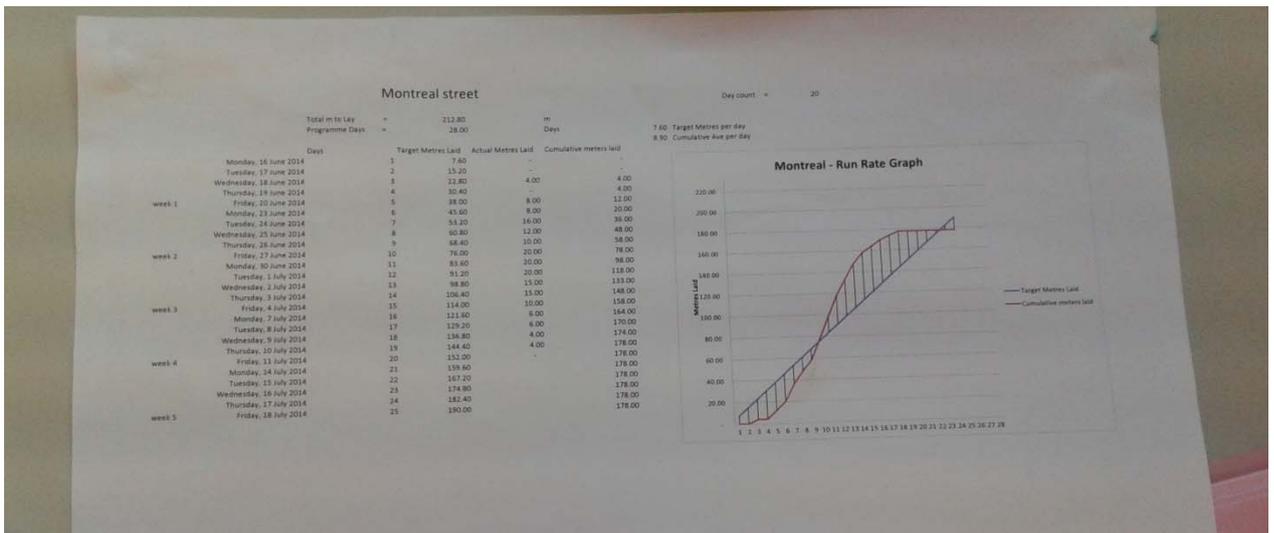
CBD Catchment - Working around Services

- **Interactive tool boxes** have been used to engage the workforce, encourage collaboration and sharing whilst focusing on safety in an alternative way to the standard tool box. Having practical stations needing participation from the team has added to the culture and approach to safety on the CBD projects. See VR:DNZ-SCT#0422



3. Tracking Performance

The **tracking tool** was developed to demonstrate the success of following the process and the results that are gained. Displaying it in a simple format and regularly updating how many services the crews are working around keeps the focus on what is being achieved and the critical risk of working around services at the forefront of people’s minds – it’s a conversation starter at the beginning of the week at the job start. Along with tracking tool sits the productivity graph. This simple “run rate graph” is discussed weekly with the **sub-contractor who is satisfied to observe that early planning, and efforts to avoid strikes, has improved his productivity.**



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Services crossed ratio - Linking it to quantity of services as well as days helped us promote to the crews the intensity of the hazard of services they were working around every day and why it is a critical risk. It also helped us appreciate the results we are achieving by having the right approach to how we follow our processes and the way we excavate



Services ratio

Work Plan

4. Sharing lessons learnt

The team on CBD have been keen to share and exchange with other SCIRT teams.

- **Incident investigation.** The SCIRT ZH Advisor was called upon to participate in the ICAM investigation following an unfortunate service strike. Also, the experience of the SCIRT tutors was called upon to help understand the root causes behind a Hi Potential Near Miss, when an electric service was not picked up by GPR and CAT & Genl. By involving SCIRT partners, this allowed to call upon their experience in dealing with other projects in Christchurch, and also for them to in turn become a vector of lessons learnt to other SCIRT teams. Lessons learnt from investigations have been shared throughout SCIRT as a Toolboxes and Alerts [See: VR:DNZ-SCT#0349](#)
- The CBD have recently organised a “**SCIRT show n’ tell**” on the Downer two part excavation permit and the way they use it. Safety Advisors from other DT’s and the IST, as well as sub contractors, attended and this allowed for a constructive discussion and exchange of information.
- On the back of the development of the Services crossed ratio, and after this was shared within SCIRT, the idea has been adopted as a **new Safety KPI**. In June the team hosted a “show n’ tell” for other Downer engineers to discuss the implementation of this tool on their respective projects.
- Over 7 initiatives have been shared through the monthly **SCIRT Safety Initiatives register**.
- The team have also **adopted great ideas** from other projects. In particular, they decided to carry out the interactive tool boxes brought from Downer South shore project. This was a success.

