

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.

SCIRT memento book

Story: SCIRT Memento Book

Theme: Design

A PDF version of the memento book created for those who contributed to the SCIRT programme.

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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SCIART

Rebuilding Infrastructure

Programme funded by



New Zealand Government



HOW THE SCIRT JOURNEY BEGAN...

Following the devastating earthquakes of 2010 and 2011, the Stronger Christchurch Infrastructure Rebuild Team (SCIRT) was created to rebuild Christchurch's damaged underground pipes, bridges, roads and retaining walls.

The amount of damage needing to be repaired was immense, and the need urgent. More than 30 per cent of the city's 1700km of underground wastewater pipes were damaged; 80 per cent of the central city's old clay pipes needed to be replaced; and many homes were without a functioning sewerage system.

Repair crews faced new and unexpected challenges. The earthquakes had moved the land up, down and sideways, and altered the ground conditions, increasing the water table around the city and making excavations prone to collapse.

The need to rebuild stronger, more resilient infrastructure presented opportunities for innovation, and new ways of working.

Throughout, SCIRT was always conscious of the recovering community where residents and businesses were dealing with their own issues.

Despite the enormous disruption to their daily lives caused by seemingly endless roadworks and traffic diversions, SCIRT is deeply grateful to the people of Christchurch for their patience and support. The SCIRT programme could not have been achieved without it.

SCIRT was made possible through the dedication and commitment of thousands of people who helped get Christchurch's civil infrastructure back on its feet.

Being part of that enormous, challenging task is something everyone involved can be very proud of.

More than **700 projects** spread over five and a half years.

The **\$2.2 billion SCIRT** rebuild programme was the **largest and most challenging** undertaking of its kind in New Zealand's history.

What we're here for:

“Creating resilient infrastructure that gives people security and confidence in the future of Christchurch”

ONE TEAM THAT CAME TOGETHER TO OVERCOME IMMENSE CHALLENGES AND DELIVER FOR CHRISTCHURCH



From the outset it was clear that the response to the earthquakes of 2010/11 in Christchurch was going to be both challenging and exciting. We were stepping into an environment of uncertainty and unknowns. It was clear that we needed to approach the task of getting the critical infrastructure back in operation with urgency but with due consideration to the future.

To do this we needed to bring together many people from a diverse range of organisations and to do it quickly. We needed to forge a team committed to a common noble purpose, a team enabled and empowered to step up and have a go within a clear framework of systems and procedures.

The results that have been achieved by the SCIRT team clearly demonstrate that we have succeeded, and as we did we have kept the focus on the people that make up the communities of Christchurch. In over 30 years in the construction industry I have not worked with such a focused, bold and yet humble team.

Thank you for letting me be a part of what you have achieved.

Duncan Gibb
SCIRT Executive General Manager
2011 - 2014

The most important legacy for any organisation or enterprise is how we remember it and I like to think that SCIRT will be remembered first and foremost for being about people, our people and the people of Christchurch we were doing it all for.

I'm proud of how hard we worked to keep the earthquake affected community informed and to take their unique needs into account at every stage of our work. I'm proud of how we delivered our \$2.2 billion rebuild programme within five and a half short years to enable the wider recovery effort and give the people of Christchurch confidence and security in their future.

And I'm especially proud and humbled by how designers, constructors and everyone else came together, from far and wide, putting aside their differences and rivalries, to work together as one team to achieve such outstanding outcomes for this city.

As a native Cantabrian I shall be forever deeply grateful to you all for that.

Ian Campbell
SCIRT Executive General Manager
2015 - 2017



Signing of the SCIRT Alliance Agreement

On 22 September 2011, eight organisations came together to commit to rebuilding Christchurch's horizontal infrastructure.

SCIRT BOARD MEMBERS REFLECT ON WHAT MAKES THEM PROUD



ONNO MULDER

SCIRT CHAIRMAN
CITY CARE

We have given people confidence again in the infrastructure and services and the knowledge that should such an event ever occur again, we will have a system that is better able to stand up to the devastating earthquakes.

I am really proud that due to SCIRT's relentless focus on safety, we have changed the industry for the better; the industry is now far more proactive in their approach to keeping people safe.

I think the uniqueness of the Alliance has enabled us to better adapt to the changing needs of the community over the five year rebuild period. It is not often that an entire industry of contractors, consultants and clients come together to deal with a common need to overcome a major natural disaster.

Onno Mulder SCIRT Chairman
City Care



COS BRUYN

OWNER NZ

Being involved in the setup and ongoing operation of SCIRT has certainly been one of my career highlights. It's been great to see how Central and Local Government agencies, together with private enterprise can work together so effectively to make a collective difference.

I am especially proud of our achievements out in the field – we have systematically gone about our job with a minimum of fuss, getting critical infrastructure working again.

We have made an outstanding contribution to the Canterbury rebuild and the overall health and well-being of the community, something we should all be proud of.

Cos Bruyn
Owner New Zealand



GRAHAM DARLOW

FLETCHER
BUILDING LIMITED

It's hard to image the chaos after the big earthquake in February 2011 and the imperative to get the city back on its feet. In my 40 years in engineering construction I've never seen a massive project set up so quickly and efficiently.

Much of the success was built on SCIRT's great people and the maturity of the participants who had forged New Zealand's well-established alliancing culture. We were very lucky to have NZTA, Christchurch City Council and CERA so ready to establish the funding arrangement and empower SCIRT to do the right thing.

Graham Darlow
Fletcher Building Limited



TONY GALLAGHER

FULTON HOGAN

One of the less recognised, but significant accomplishments was SCIRT's ability to organise and get going quickly from a standing start.

With no existing EQ manual to follow, SCIRT organised itself, formed a plan, challenged the norms, communicated with the public and collaborated with the construction industry to make things happen quickly in service of the people of Christchurch.

There are many achievements that the SCIRT team can rightly be proud of, but for me our actions, such as this example, are our hallmark.

Tony Gallagher
Fulton Hogan



JIM HARLAND

NZ TRANSPORT
AGENCY

I joined the SCIRT Board in early 2013. What impressed me from day one is how everyone has been focused and committed on what is good for Christchurch, then the Alliance and finally their home company. This has come through in the early morning site visits, breakfast meet and greets and through Ian Campbell's reports to the Board. For many of the SCIRT teams they have achieved this while having to deal with challenges with their own homes and neighbourhoods.

I am most proud of the commitment to make Christchurch stronger, the focus on health and safety and commitment to improve leadership in the construction industry. This has been recognised by the greater Christchurch community which has given consistently high satisfaction ratings to SCIRT's communications.

A job well done and all the best for the future.

Jim Harland
NZ Transport Agency



JOHN MACKIE

CHRISTCHURCH
CITY COUNCIL

SCIRT has been an outstanding example of what can be achieved when a dedicated team of talented people are brought together to work collaboratively to achieve a common purpose, with passion and commitment.

What impressed the most about SCIRT when I first came to Christchurch in 2012 was the energy within the team, generated through a combination of great leadership, empowered people, clear process and leading edge technology.

This led to innovations such as the rapid pipeline damage assessment tool, known as PDAT, which give us the ability to quickly prioritise the wastewater repair programme from hundreds of kilometres of CCTV footage.

Congratulations to the entire SCIRT team, it has been an honour and a privilege to serve on the Board.

John Mackie
Christchurch City Council



ROGER MCRAE

MCCONNELL DOWELL
CONSTRUCTORS LTD

When I look back on what makes me most proud of SCIRT, it is the way we, as Contractors, so quickly cast aside our individual corporate shackles in the pursuit of our noble purpose or what we were here for.

What is best for the people of Christchurch has been the glue that has guided our decision making throughout the challenges of the past five years.

I look back on what the whole SCIRT team has achieved, and the collaborative way we have done this, with a sense of real pride and accomplishment.

Roger McRae
McConnell Dowell Constructors Ltd



ROB ROUSE

DEPARTMENT OF THE
PRIME MINISTER
AND CABINET

Looking back at SCIRT's achievements, I continue to be impressed with the agility, flexibility and resilience of the team.

The sheer scale of work meant that design standards have changed as the SCIRT programme progressed and work was rescoped to ensure the best results for the City and Government.

It has been amazing to see how the SCIRT team embraced the changing demands and ran with them, in an often challenging environment. They strived to minimise disruption to residents, keep our communities up to speed with projects, and five years on, remain as professional, enthusiastic and committed to complete the programme as ever.

Rob Rouse
Department of the Prime Minister and Cabinet

Wastewater pump stations rebuilt or repaired

80



Retaining Walls repaired or rebuilt:

171



Storm Water pipes repaired:

58 km



Fresh Water pipes repaired:

100 km



Fresh Water pump stations or reservoirs repaired or rebuilt:

27



WHAT WE ACHIEVED

Storm Water pump stations repaired or rebuilt:

7



Number of Work Notices delivered:

1,750,000



Roads repaired:

1,300,000 m²



Bridges and culverts repaired or rebuilt:

144

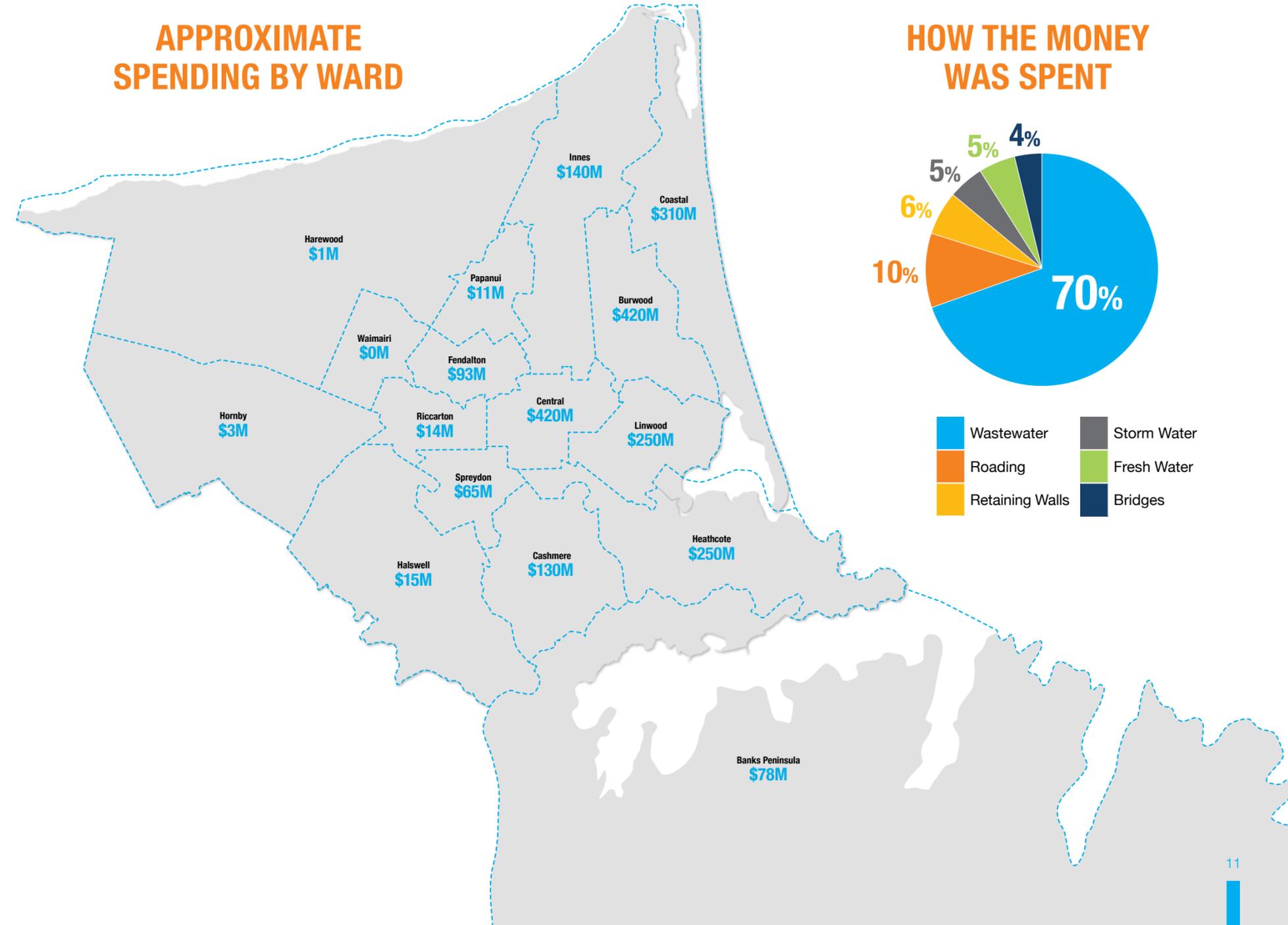


Wastewater pipes repaired:

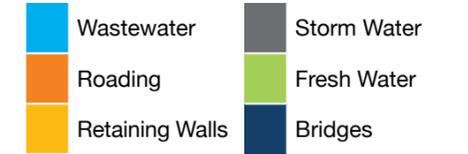
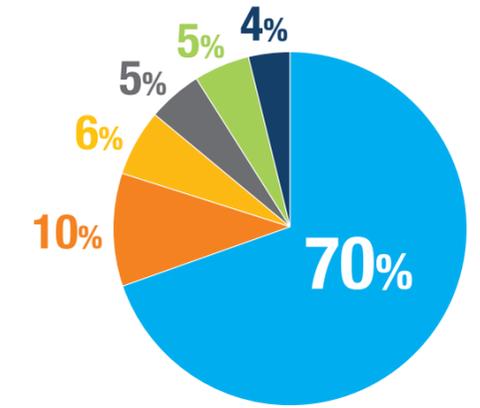
630 km

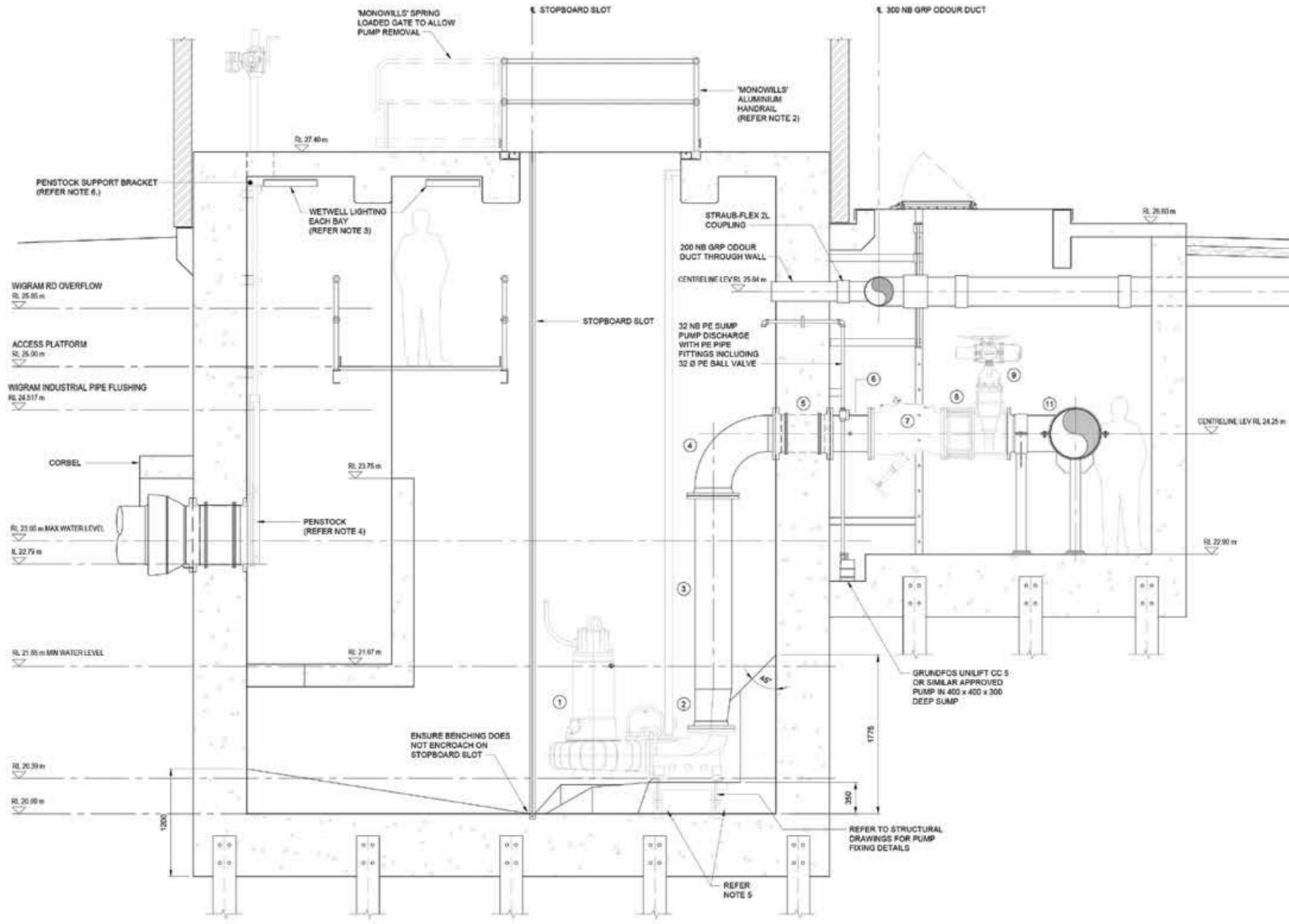


APPROXIMATE SPENDING BY WARD



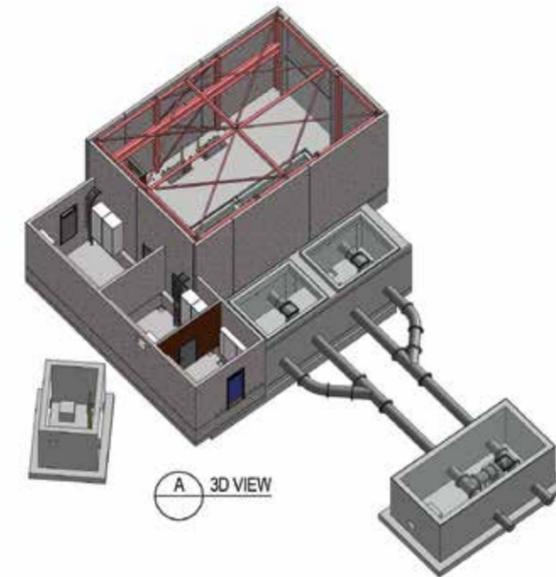
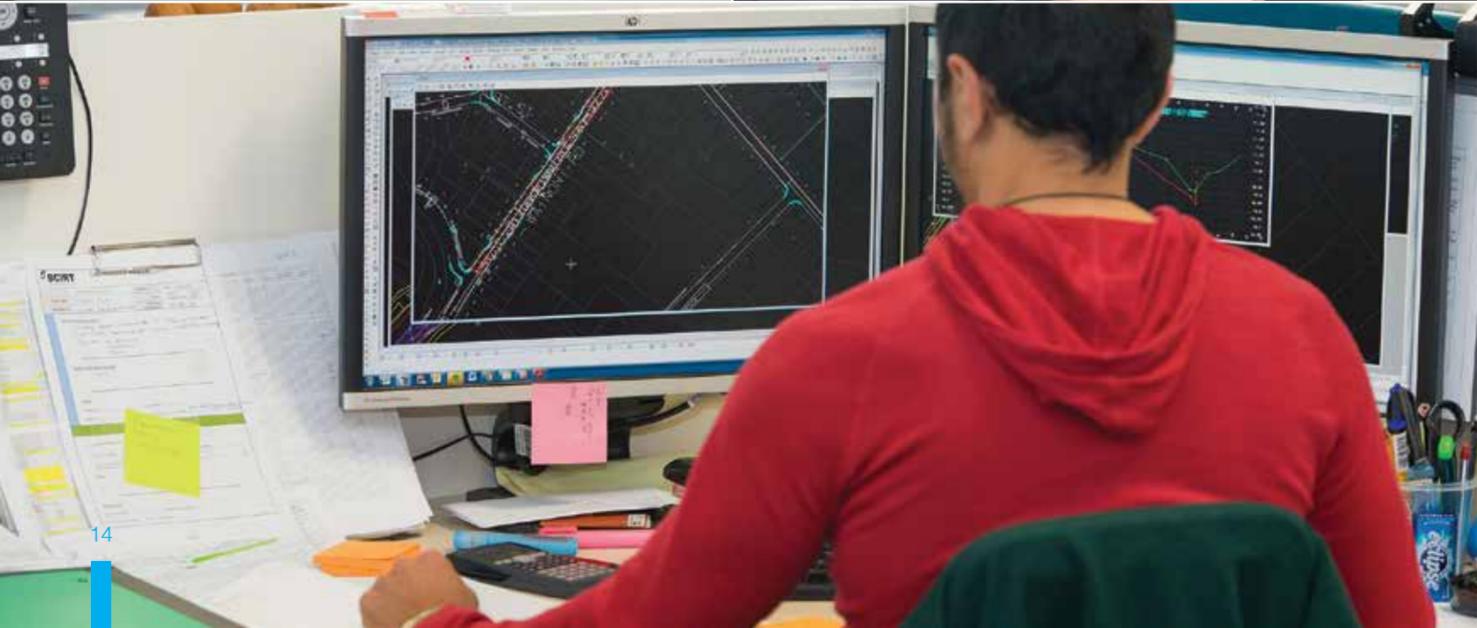
HOW THE MONEY WAS SPENT



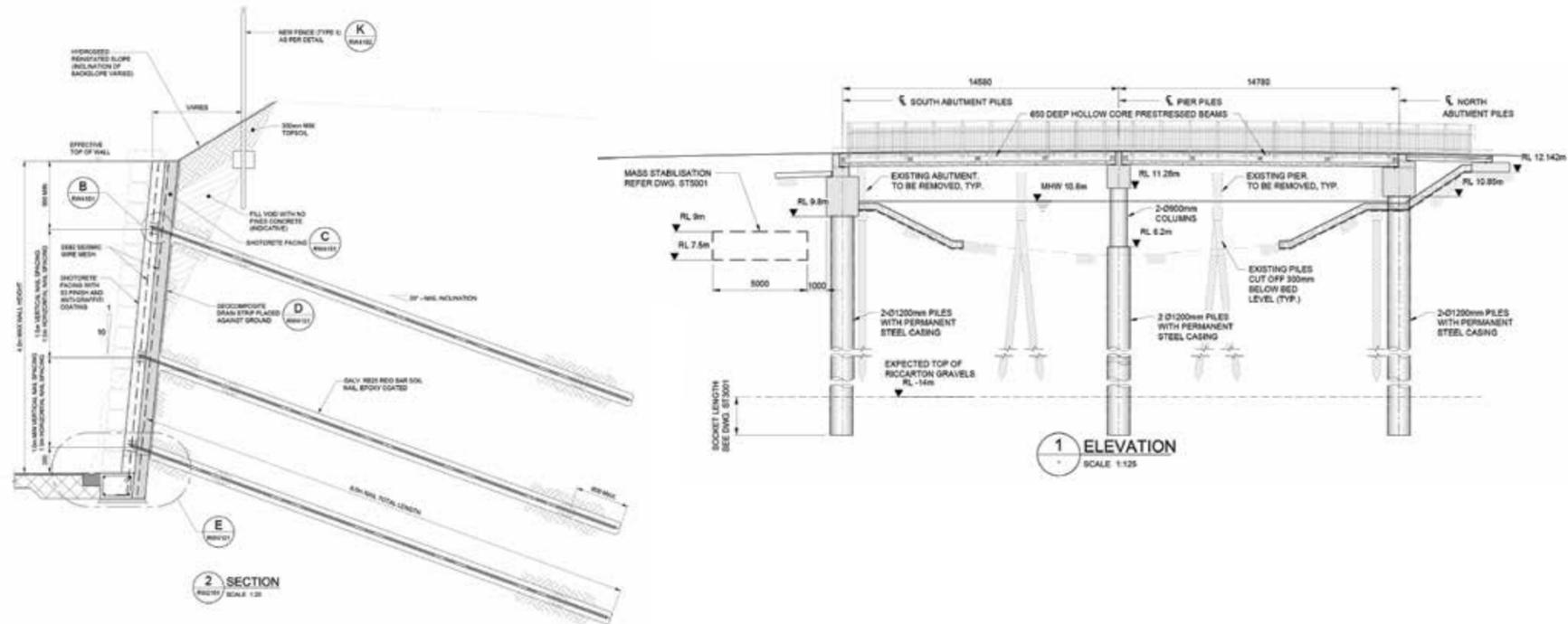


Design

1 SECTION
ME1001 SCALE 1:25



More than 26,000 drawings of everything from a balustrade to the most intricate inner working of a vacuum station.



LEGEND

EXISTING SERVICES

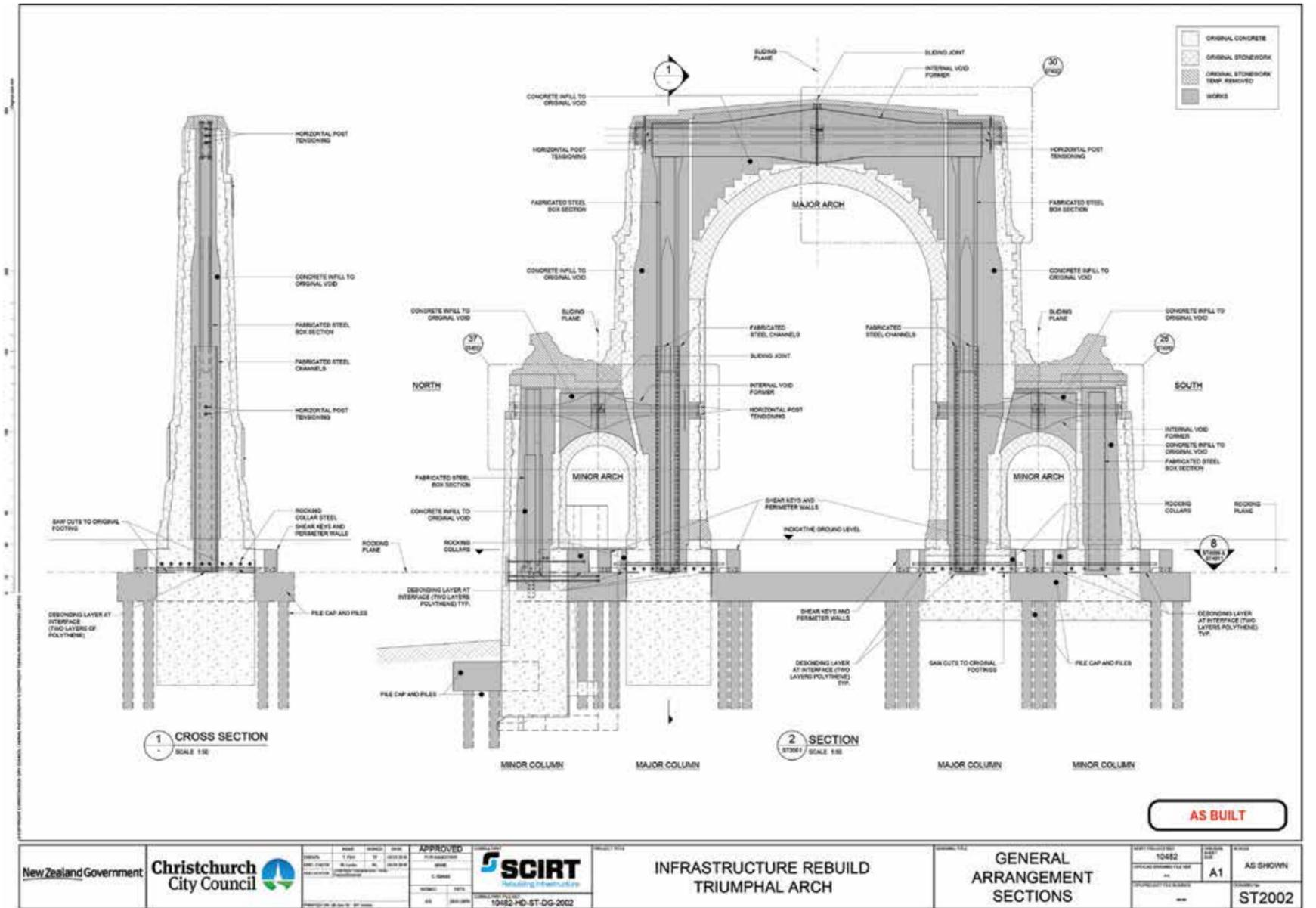
- WASTEWATER
- WASTEWATER (PRESSURE)
- WASTEWATER (PREV. ABANDONED)
- WATER MAIN
- WATER MAIN (PREV. ABANDONED)
- STORMWATER
- STORMWATER (PREV. ABANDONED)
- POWER/3A HIGH VOLTAGE MAINLINE
- TELEPHONE
- FIBRE OPTIC NETWORK
- GAS
- POWER POLE
- WATER SERVICE VALVES
- FIRE HYDRANT
- MANHOLES
- SINGLE TAMP (SIL. DOUBLE TAMP (SIL.))
- MANHOLE D.

WASTEWATER DESIGN

- WASTEWATER
- WASTEWATER (PRESSURE)
- WASTEWATER (SINK)
- WASTEWATER LINE TO BE ABANDONED
- MANHOLE, VENTED MANHOLE

LONG SECTION VIEW

- WASTEWATER EXISTING
- WASTEWATER DESIGN
- EXISTING SURFACE
- DESIGN SURFACE



New Zealand Government | Christchurch City Council | **SCIRT** | INFRASTRUCTURE REBUILD TRIUMPHAL ARCH | GENERAL ARRANGEMENT SECTIONS | 10452 | A1 | AS SHOWN | ST2002



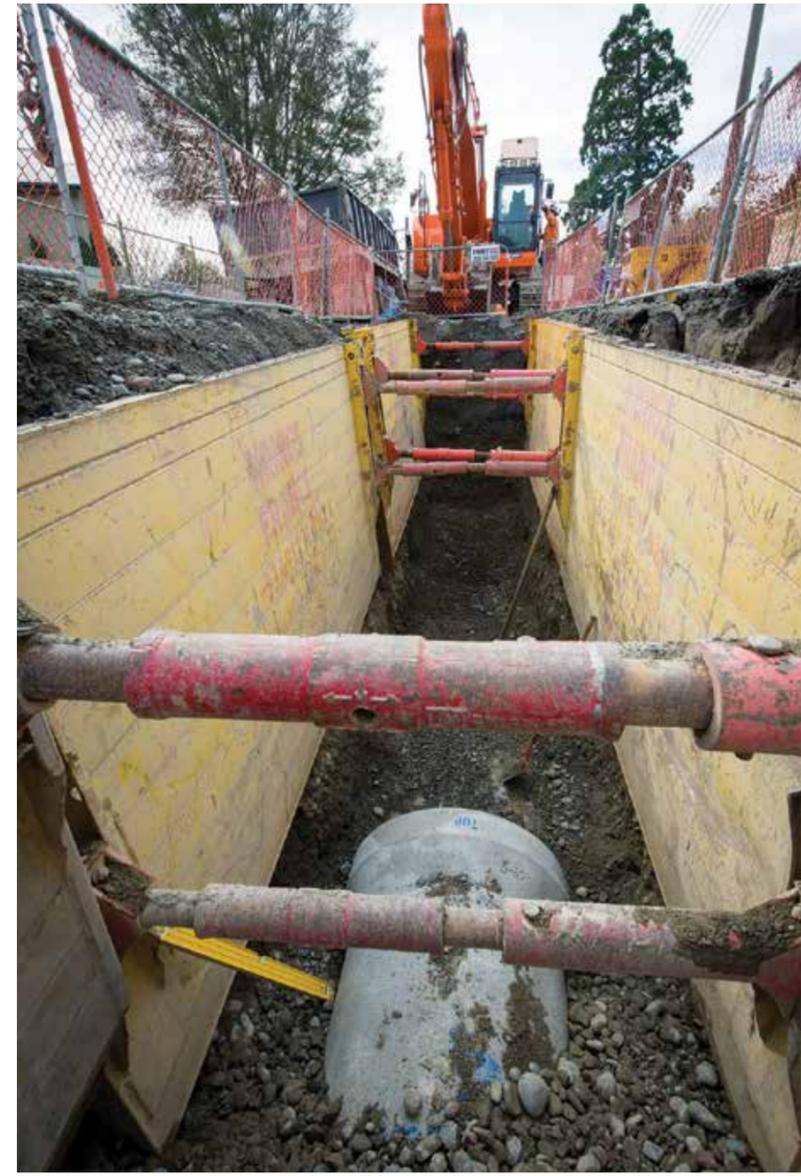
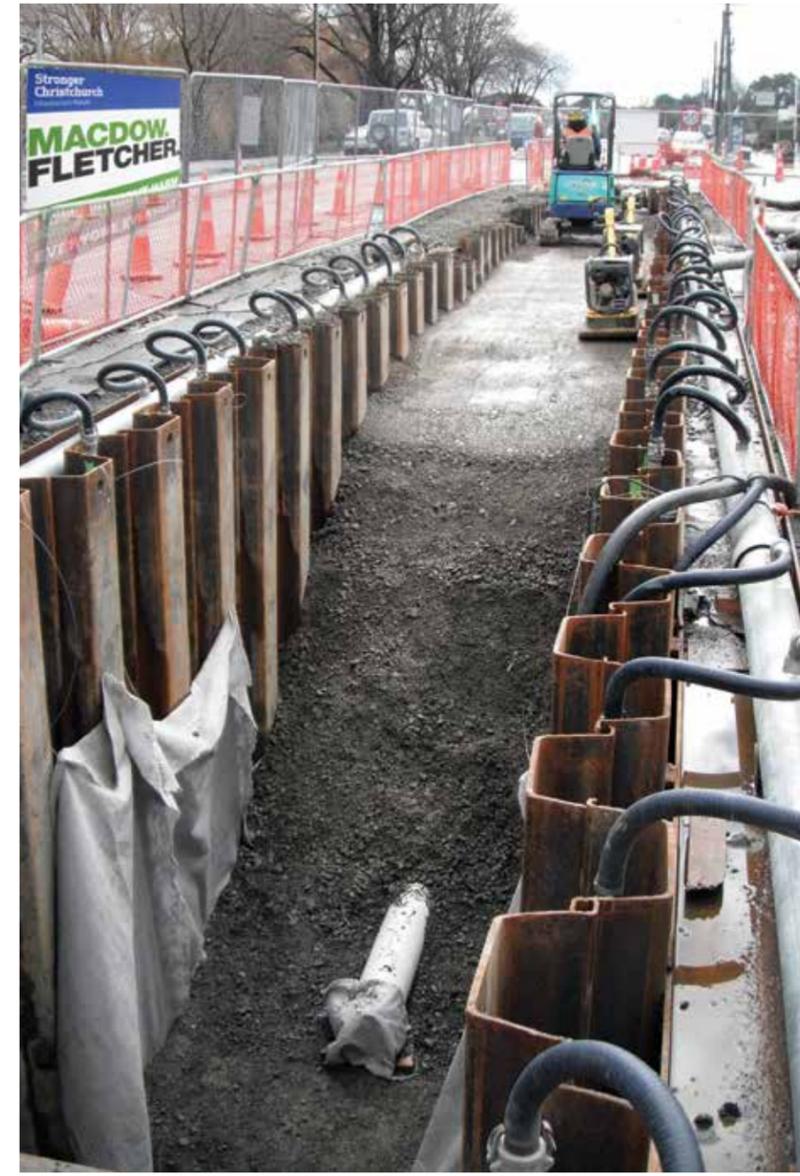
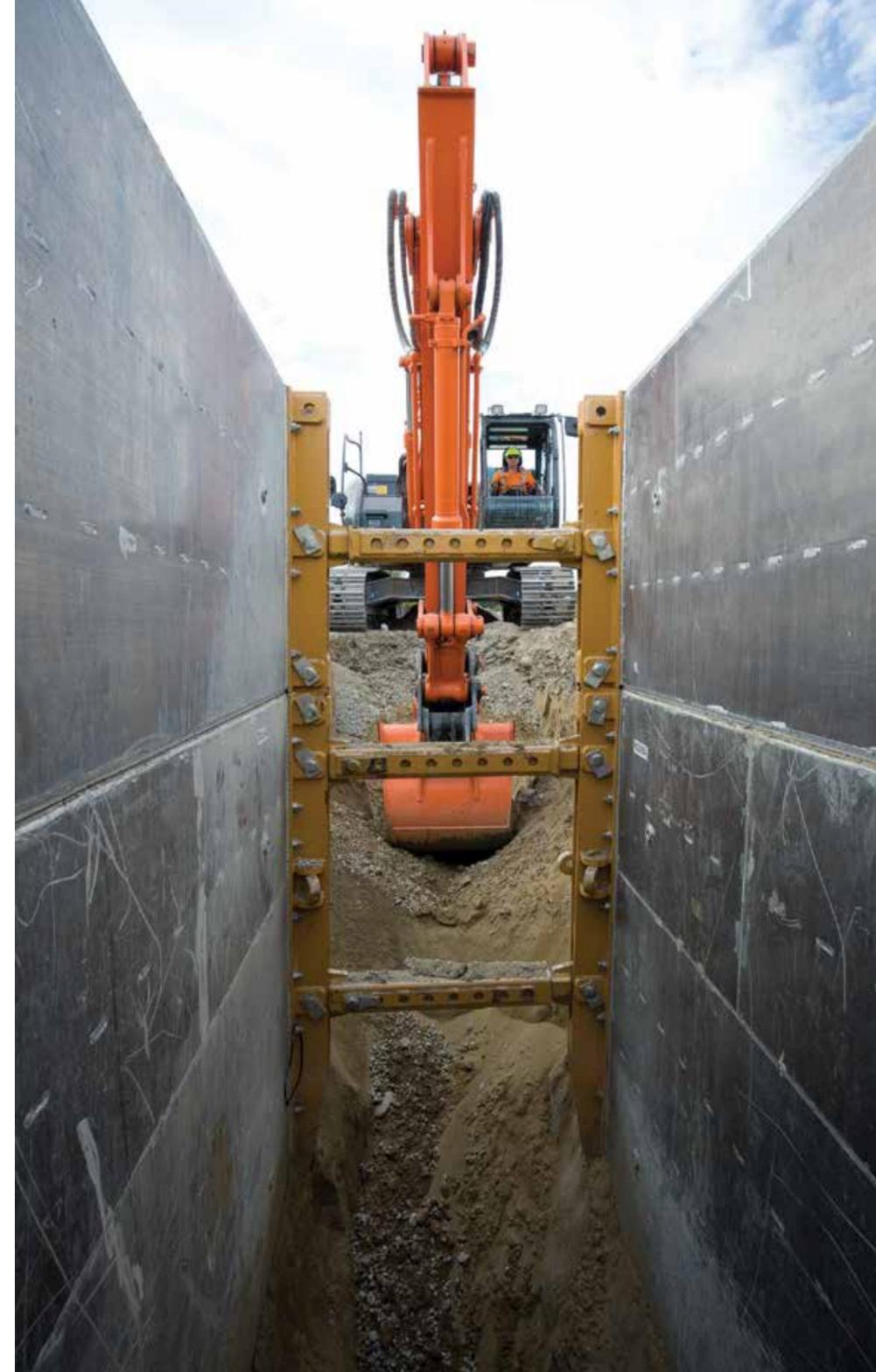
Underground Pipes











We installed New Zealand's largest vacuum wastewater system in Aranui.



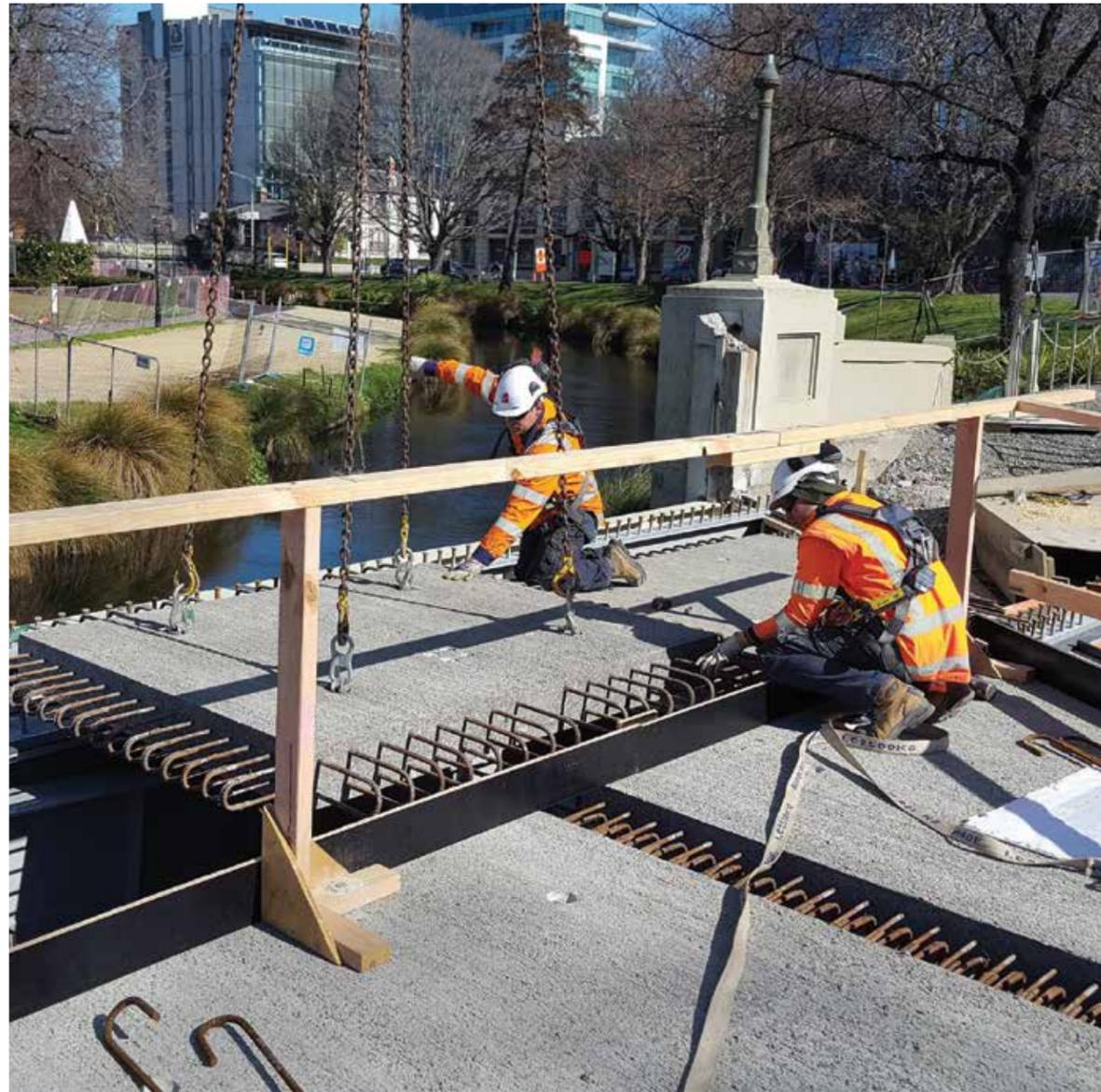


Most of Christchurch's wastewater pump stations were repaired or entirely rebuilt.



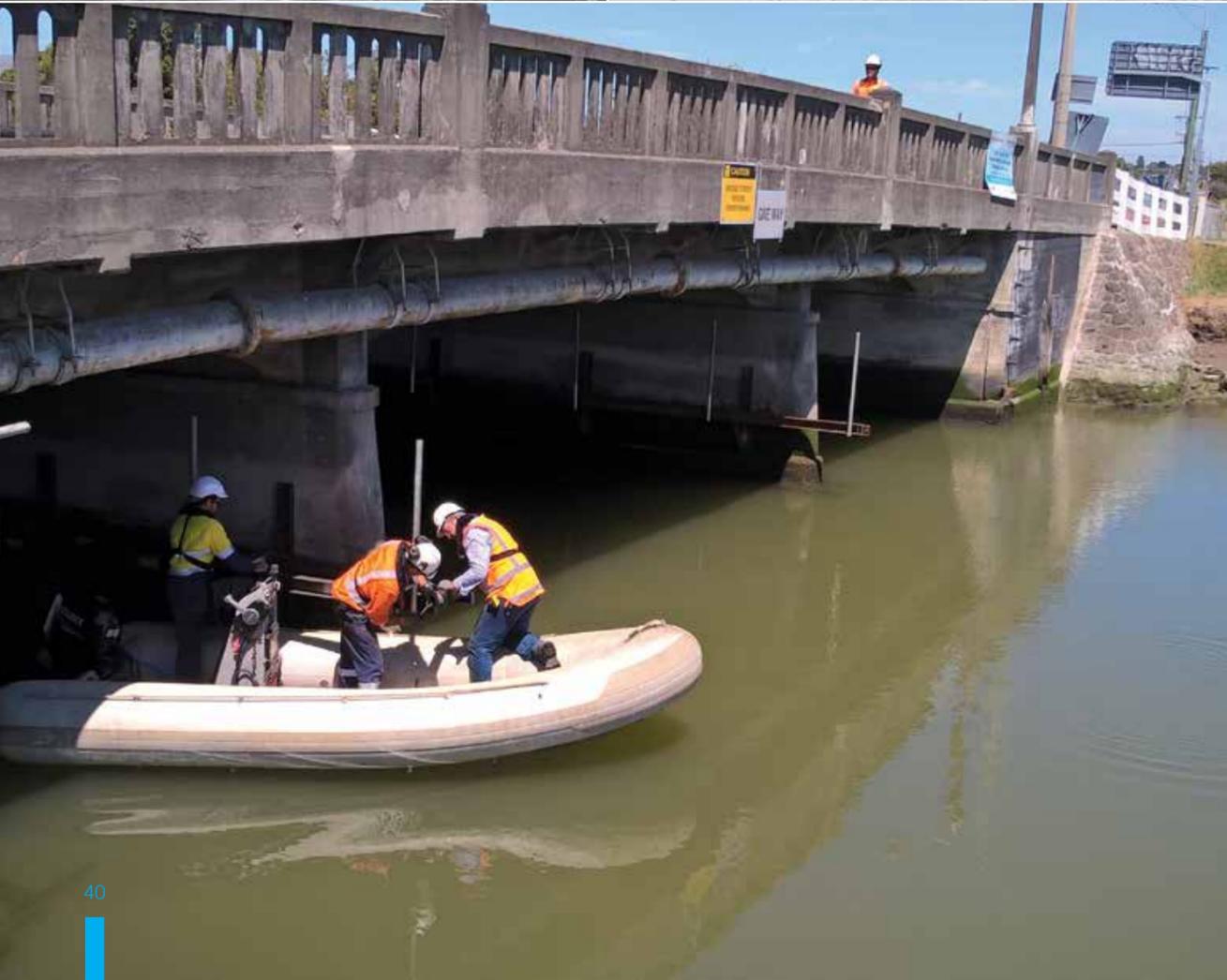


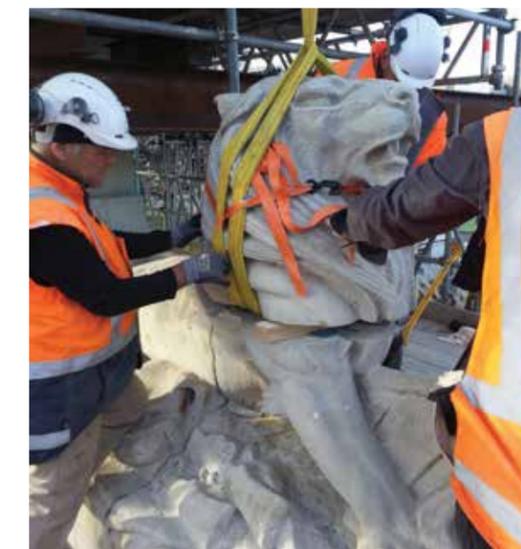
Bridges





In Christchurch, you are never far from a bridge.







From restoring heritage bridges from the 1860s to sleek modern new designs, two thirds of the city's bridges and culverts were repaired or rebuilt.





Retaining Walls





Some of our most physically challenging and creative work was on retaining walls.





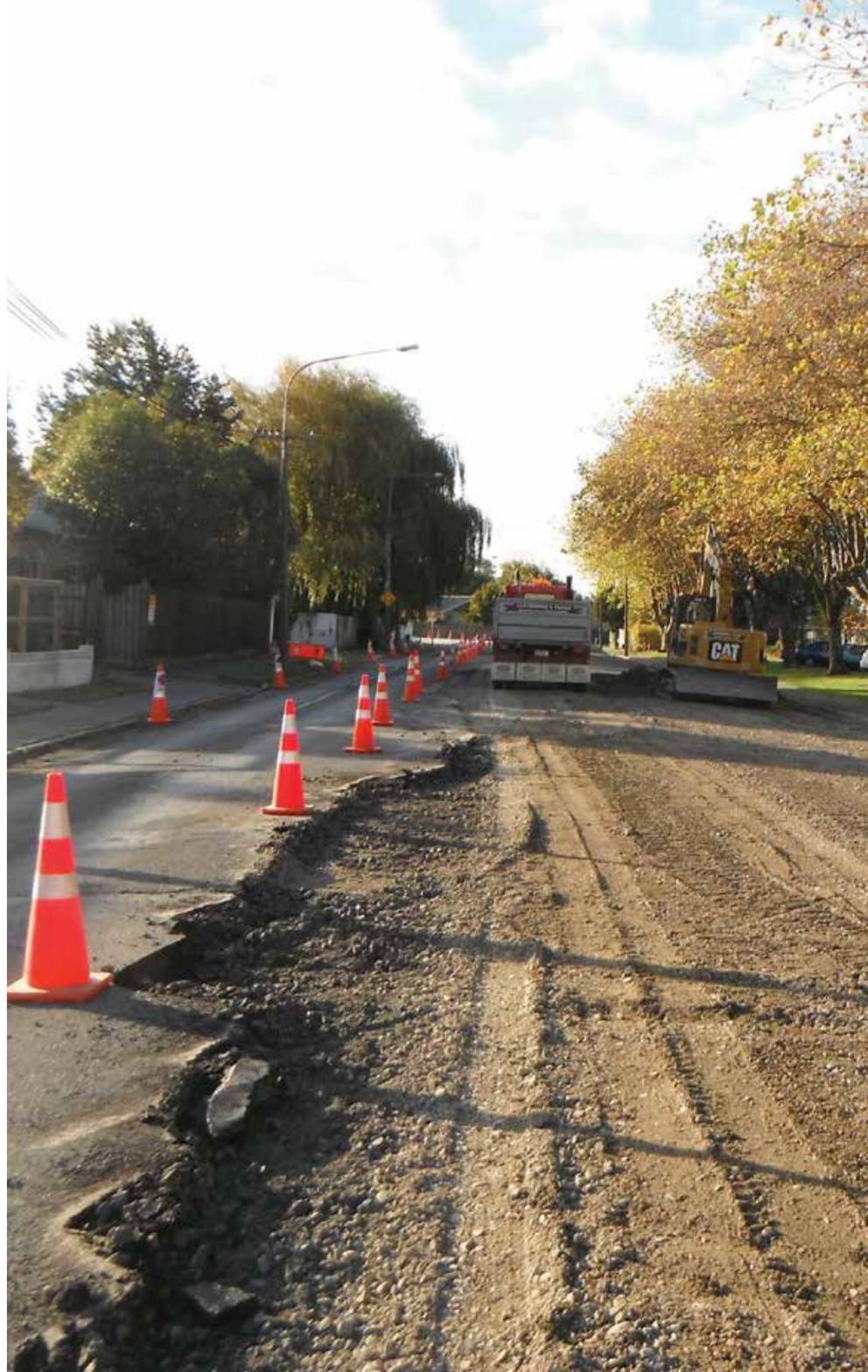




Roading









We repaired
1,300,000 m²
of Christchurch
roads.



Part of the Community







10 AUG 2015

FLAT 3,
400 PAGES ROAD,

ARAWU.

12th, AUGUST 2015.

To whom it concerns,

Over the past few weeks, as you informed us, we have experienced your company installing the new waste water pressure main.

Between activities away from home I have plenty of time to read the paper etc, on fine days on my patio and to watch the mammoth task being undertaken by your company deserves nothing but the greatest admiration and highest respect for the men and women on the job through heat, cold, rain and sleet the progress has continued at a steady rate. I am a bus user and though the bus stops change they have never been too far from my door. Access has always been clear along footpaths and there

2

have always been generous road crossing areas. Whenever I have had a query your staff have always been pleasant and polite.

The depth of the trench dug, pipes and sheet pile and filling in has shown me the enormity of the operation and how well it has been coordinated.

The sun had hardly risen this morning when this journey resumed for another day, sadly though the progress has passed my place, no longer the rattle of cups and saucers and vibrations but also no longer the laughter and conversations that added another dimension to recent days past.

The parade of activity has passed me by now but the experience has given me a valuable insight and respect for the people who are contributing so much to the city's new future.

Many thanks,
Selwyn Cassar

Brickbats and Bouquets

I have to respectfully ask but WTF is going on with the Ferrymead bridge approaches?? The progress is GLACIAL. Half the time there isn't anyone there to ask "whats going on"? or even say "Hurry the f*ck up" to. Its like they got so far (which was slow enough) and now just couldn't be arsed finishing the job. Put a bomb under these muppets will you. Its beyond a joke. They might as well take down the ROADWORKS sign and replace it with a THERE, THAT'LL DO IT sign....

Kamala Hayman
3 mins · 🗨️
Totally freaked out to see our road was going to close for ten weeks = a disaster for my disabled mum. But SCIRT responded to my email in the blink of an eye and are sorting. Awesome customer service

I'm not sure how to translate this better, than simply - F*#% YOU.

probably don't get many thank you's but THANK YOU 😊 Doing an amazing job,



: Caller wanted to thank City Care (SCIRT) for finishing the road on her part of Hills Rd. Her house no longer vibrates and the road is a smooth beautiful black.



To everyone at McConnell Dowell Creative Construction Company.
Thank-you for the great BBQ that you invited us to. The children, families and teachers really enjoyed your kind hospitality.
Kind Regards, Kidsfirst Woodley Street.



Dear Matt, Aude
Thank you for coming to talk to us today.
From all of the children and teachers at Gbbalkids.



"The SCIRT model has provided a cost-effective option by combining the efforts of planners, designers, contractors and asset owners to deliver an end-to-end solution based on actual need and what is affordable. The relationships between key stakeholders help to drive success. All parties share the risk in an appropriate way and poor performance is penalised."
Fulton Hogan NZ chief executive Robert Jones.

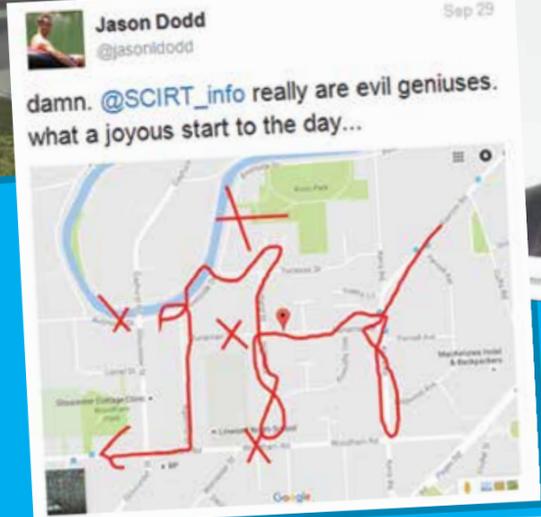
Congratulation to everyone involved in rebuilding this city, from the sewers and roads, to exciting new rebuilds.

Congratulations to all the SCIRT and Downer team who have been working on the project. It is brilliant and such an improvement to the area. Thanks to all the workmen whom I found, at all times, to be professional, friendly and considerate. I walked past the site regularly during construction and at all times felt safe and respected. Many thanks to all concerned including the managers who have developed this exemplary culture of behaviour.

Hi there, I apologise for the lateness of this email but I wish to make a point of how incredibly helpful one of the guys were on the roading team (I believe his name was Dave?) outside Te Waka Unua School recently. Without fail he was there morning and afternoon to stop traffic and help our children cross the road safely. His friendly manner made the inconvenience of the works easier to deal with. So, I just want to say thank you to him and that as a parent I appreciated him taking the time to help our children cross the road.

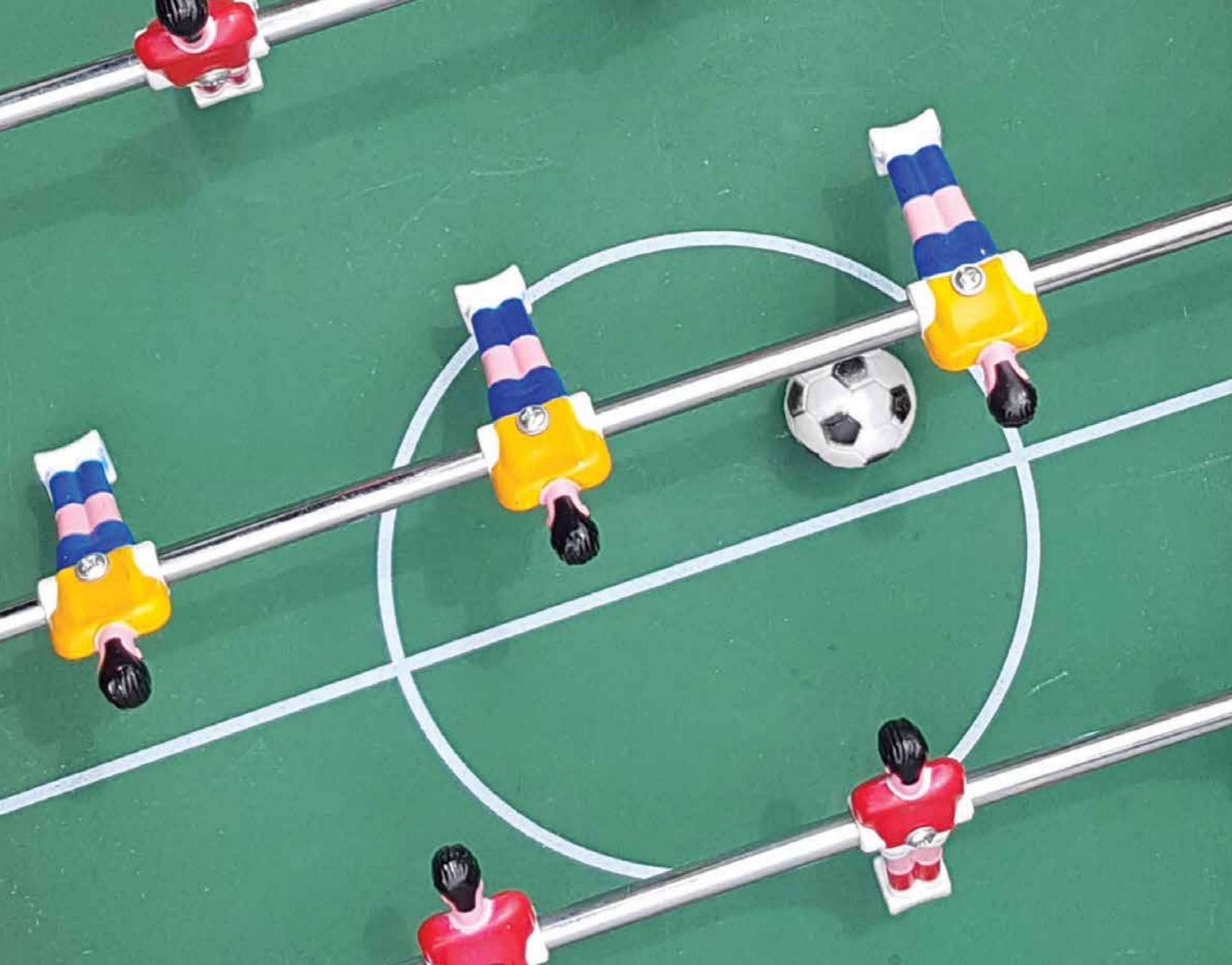


THE PRESS
SCIRT could be re-formed without central government - Townsend
Canterbury Employers' Chamber of Commerce chief executive Peter Townsend said it would be a mistake to shut down SCIRT at the end of the year.



Allison Poulter @AllisonPoulter
Following
@marklincoln unaddressed mail 'is' Junk Mail. Except the leaflets that @SCIRT_info put in letterbox ;)

Every single person we dealt with, from start to finish on this project, was always friendly and helpful, answered all our questions and went out of their way to help the residents in our street feel safe & well informed.
Each day we got a big wave, a warm hello and a smile from the workers. They took extra care to ensure the residents were safe as they moved past the team of workers. The men moved our bins if the rubbish trucks couldn't get in, and often bought them back to our driveways once the trucks had finished. They always looked out for my children and helped them cross the roads safely when needed. They made a special effort to ensure we could retain access to our properties, and if they needed to close the access, we always got plenty of notice.
We all cheered the first day it rained in our street, as the water flowed down the gutters TO the drains - the first time it had in 5 years! I also loved the way they came round & watered the berms with the truck after the grass had been sown and fixed up the caution tape that had been blown around by the norwesters. Talk about awesome service. I don't know many businesses in Chch that would go that extra mile. They did a really great job from start to finish and now our street looks amazing!
Best of all, they were just the nicest bunch of guys you could have asked for, to work in our street. We are all truly grateful for the extra effort they went to for our residents.



SCIIRT Team at Work and Play







Thanks,
we couldn't have
done it without you.







**Insert your
photo here**

SCIRT WOULD LIKE TO THANK THE HUNDREDS OF SUB-CONTRACTORS AND SUPPLIERS WHO HELPED DELIVER THE SCIRT PROGRAMME, INCLUDING:

1 D Loader Limited	Bruce Buchanan Limited	Detection Services SI	Goleman Co Ltd	James Crow Ltd	Mico Pipelines t/a Crane Distribution	Pump Hire Ltd	Trademark Paving Ltd
3 Way Solutions	Buller Contracting Ltd	DHI Water & Environment Ltd	Gough Gough & Hamer Ltd	JFC	Mike Downs Contracting Ltd	Pure Technologies (Aus) Pty Ltd	Traffic Management NZ
Aardvark Concrete Services 2000 Ltd	C & A Cox Ltd	Donaldson Civil Ltd	Gough Power Systems	JMW Consultants AU Pty Ltd	Millennium Electrical Ltd	Quikshot Ltd	Traffic R Us Ltd
ACK Contractors Limited	Cancast Limited	Dormer Construction Ltd	Graeme Martin Contracting Ltd Also	John Fillmore Contracting Ltd	Moira Mallon Leadership Coach	Reline NZ Ltd	Traffic Systems Ltd
Acrow Ltd	Cardno NZ Ltd	Drain Inspection Services Ltd	Grounds & Services Ltd (GSL)	Johnston Drainage & Contracting Ltd	Mulford Holdings Ltd	RIB Software NZ Ltd	Trans Tasman Civil Limited
Action Engineering Ltd	Career Balance	Drainage & Roading NZ Ltd	H W Hendricks Sons & Daughter Ltd	Johnston Excavating & Drainage Ltd	MWH New Zealand Ltd	Rock Control	Treetech Specailists Treecare Ltd
Advanced Excavating	Carroll Civil Ltd	Drainman NZ LTD	Hadlee & Brunton Ltd	JPM Contracting Ltd	Naylor Love Construction Limited	Rock Hard Civil & Drainage	Tru-Line Civil Limited
Aecom Consulting	CB Civil & Drainage Ltd	Drains & Developments	Harker Ltd	K Drainage Ltd	Norfolk Electrical & Mechancal Ltd	Schick Construction	Underground Brown Ltd
Alchimie NZ Limited	CDS New Zealand Ltd	E Carson & Sons Limited	Higgins Contractors	Kerb Co Ltd	Nova Traffic Management Ltd	Scope Demolition Group Ltd	Upright Scaffolding Ltd
Allied Concrete Limited	Civil Solutionz NZ Ltd	e2environmental Ltd	Hirepool Christchurch	Kreisel Contracting (1988) Ltd	Opinions Market Research Ltd	Seipp Construction Limited	Utilities Infrastructure NZ Ltd
ARC Projects Limited	Clark Fortune McDonald & Associates	Earthtech Limited	Hiway Geotech	Lambe Construction Limited	Opus	Shayne Higgs Drainage Contract	Vac U Digga (NZ) Ltd
Arklow Contracting Limited	Clayton Drainage and Earthworks	Eastworx Ltd	HTC Specialised Tooling Ltd	Lawson Consulting 2008 Ltd	Orion New Zealand	Smith Crane & Construction	Vital Futures Ltd
Armadillo Holdings Ltd	Coffey Services NZ Ltd	Ecoflow Limited	Humes Pipeline Systems	Letton Kerb and Channel Ltd	Pacific Plumbing Services Ltd	South Island Shotcrete Ltd	Waterproofing Systems Ltd
Armatec Environmental Ltd	Commercial Vehicle Holdings Ltd	EDR Contracting Ltd	Hunter Civil Ltd	LQ Contracting	Paterson Pitts Group	Southern Cross Engineering Co Ltd	Westroads Ltd
Asphalt Contractors (M Newman)	Concrete Protection & Repair Ltd	Eliot Sinclair & Partners Ltd	Hydrotech Drainage & Plumbing Ltd	MacDonald Gray 2011 Ltd	Pattle Delamore Partners Ltd	Spartan South Limited	Whitestone Contracting Ltd
Aurecon	Concrete Solutions Ltd	Environment Canterbury	Hynds Pipe Systems Ltd	MacEwans Pumps	Paul Smith Earthmoving Ltd	Spiire NZ Ltd	Winstone Aggregates Limited
Barrs Ltd	Concrete Treatments NZ Ltd	Field Services	Ice Excavation Ltd	Mainland Pipelines Inspections Ltd	Peter Diver Plumbing & Drainage Ltd	Spraymarks Signs & Graphics	Wood and Partners
Beca Ltd	Connell Contractors Ltd	Ford Contracting Limited	ID Loader Ltd	March Construction Ltd	Pidgeon Contracting Limited	Springs Rd Quarry T/A CCL	Worthington Contracting
Benchmark Construction Ltd	Connetics Ltd	Frank PKS NZ Ltd	Immediate Media	Martin Civil Construction	Piletech New Zealand Ltd	Stark Bros Ltd	WT Partnership
Beta Cut Concrete Cutting Ltd	Core Infrastructure	Freyssinet New Zealand Ltd	Independent Traffic Control Ltd	Max Contracts Limited	Pipe Technologies Ltd	Steel and Tube	Xylem Water Solutions NZ Ltd
BG Contracting Ltd	Creative Spirit	G & T Construction Ltd	Innovative Technical Solutions	Maxwell Plumbing	Pipe Vision NZ Ltd	Stella Group	Yates Welding Services
BM Contracting Limited	Daniel Smith Industries Ltd	Gas Services & Plumbing	Intercivil Limited	McConchie Builders Ltd	Pipeline & Infrastructure Ltd	Sub Surface Drilling Ltd	
BondCM	Daveron Scaffolding Ltd	Geotechnics Ltd	Interflow (NZ) Limited	McMillan Drilling Civil Ltd	Pipeworks	Tasman Civil	Book designed by: Angela Guillemin
Bradford Building	Davie Lovell-Smith Ltd	GHD Limited	Intergroup Ltd	McMillan Water Wells Ltd	Porter Group	TDM Construction Ltd	Photos contributed by: Neil Macbeth and many others
Bromley Steel	DD Drainage Limited	Gillon and Maher Plumbing Ltd	Isaac Construction Co Ltd	Melray Electric Limited	Powell Fenwick Consultants Ltd	Texco Excavating Ltd	Printed by: Caxton
Brownlees Contracting Limited	Delta Utility Services Ltd	Goldfield Stone Ltd	Jacobs New Zealand Ltd	Men @ Work Ltd	ProjectMax	Timbco Harvesting Ltd	



Farewell, and thank you for a job well done.

The SCIRT Journey

