



CLL RAPs Technology - Rammed Aggregate Piers

CLL
SERVICE & SOLUTIONS

Clients benefit from this depth and breadth of services in key areas

PROVEN TRACK RECORD

Rely on our established reputation backed by a track record of successful projects.

From intricate piling assignments to complex infrastructure developments, our expertise has consistently delivered quality results, earning the trust of our clients.

INNOVATION AND TECHNOLOGY

Stay ahead in the industry with our commitment to innovation and technology. Our company embraces cutting-edge advancements, ensuring that your projects benefit from the latest methodologies, materials, and equipment, leading to increased efficiency and project success.

VERSATILE EXPERTISE

CLL offer a comprehensive suite of services beyond piling and ground stabilisation, as our company excels in a wide range of civil construction disciplines.

Whether it's foundation work, structural engineering, or infrastructure development, we offer a one-stop solution for all your civil construction needs.

COST-EFFECTIVE SOLUTIONS

By consolidating various civil construction services under one roof, our clients experience streamlined project management, reducing the need for multiple contractors. This not only enhances overall project efficiency but also leads to potential cost savings.

AT CLL, we extend our footprint across New Zealand, operating seamlessly through specialised divisions strategically established in key regions such as Northland, Tauranga and Christchurch with our head office based in Auckland. Our centralised approach from Auckland allows us to efficiently coordinate and manage projects throughout the country, ensuring a consistent and high-quality service delivery.

ADAPTABILITY TO PROJECT SCALE

With over 200+ employees, whether you're undertaking a small-scale project or a large-scale development, our team is equipped to adapt to the unique requirements of each endeavour. Enjoy the flexibility and scalability of our services to match the specific needs of your civil construction projects.

CLIENT-CENTRIC APPROACH

Experience personalized service with our client-centric approach. We prioritize open communication, collaboration, and a thorough understanding of your project goals, ensuring that our solutions are tailored to meet your expectations and contribute to the overall success of your endeavours.

SERVICES & SOLUTIONS



CLL GROUP (CLL) is a well-established construction company specializing in piling, ground improvements, slip stabilization, ground anchors, retaining walls, civil structures, drainage, and contaminated site remediation. With extensive experience across these disciplines, CLL has built a strong reputation as a reliable and innovative industry leader.

At CLL, we pride ourselves on being at the forefront of ground improvement and piling techniques, leveraging advanced European technologies that set us apart. These cutting-edge systems allow us to tackle complex challenges efficiently, often eliminating provisional tags from tenders and streamlining project delivery. Our collaborative approach ensures that we work closely with your design consultants to develop cost-effective, fit-for-purpose solutions for in-ground challenges.

As part of our commitment to strong partnerships, we offer our expertise and time at no cost—providing indicative pricing and tailored recommendations to help achieve project goals efficiently.

CLL employs 250+ professionals, including engineers, project managers, estimators, machine operators, tradesmen, and skilled labourers. Our workforce includes specialist piling crews and industrial rope access teams, as well as tradesmen such as carpenters, mechanics, and formwork specialists.

OUR EXPERTISE

Geotechnical & Civil Engineering Solutions

- Piling solutions (Olivier Piling, CFA, Bored, Driven, Sheet Piling)
- Retaining and stabilization systems
- Ground anchors and soil nailing
- Deep foundation and ground improvement techniques

Critical Slip Rehabilitation & Drainage

- Earthworks and slope stabilisation
- Cross road drainage and culvert installation
- Swale and water diversion systems
- Manhole and bored drain installations

Specialized Construction Services

- Bridge and structure foundations
- Marine piling and coastal protection
- Infrastructure resilience solutions
- Sustainable construction initiatives



WHY CHOOSE CLL?

- **Industry Leadership:** Cutting-edge European piling and ground improvement technologies.
- **Experience & Expertise:** Decades of experience in delivering large-scale infrastructure projects.
- **Innovative Methods:** Leaders in advanced piling and geotechnical stabilization.
- **Sustainability Focus:** Commitment to environmentally friendly construction practices.
- **Safety & Quality Assurance:** Adherence to the highest industry standards.
- **Project Delivery Excellence:** Proven track record of delivering projects on time and within budget.

LET'S WORK TOGETHER

We welcome opportunities to collaborate on upcoming projects. Get in touch to discuss how CLL can bring value to your project by contacting the person who gave you this brochure or via our branches located on the last page of this document.



RAMMED AGGREGATE PIERS (RAPs)

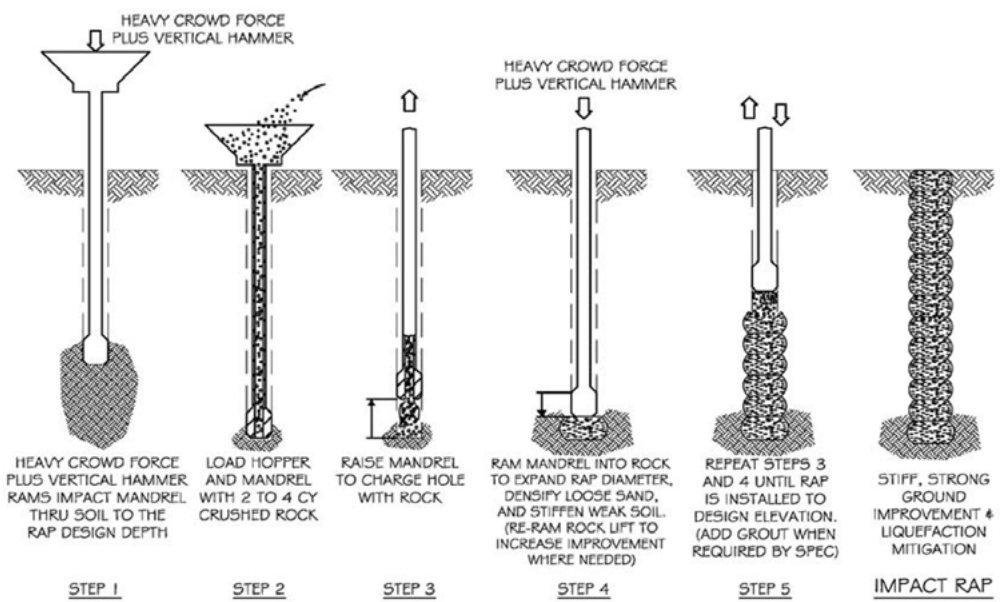
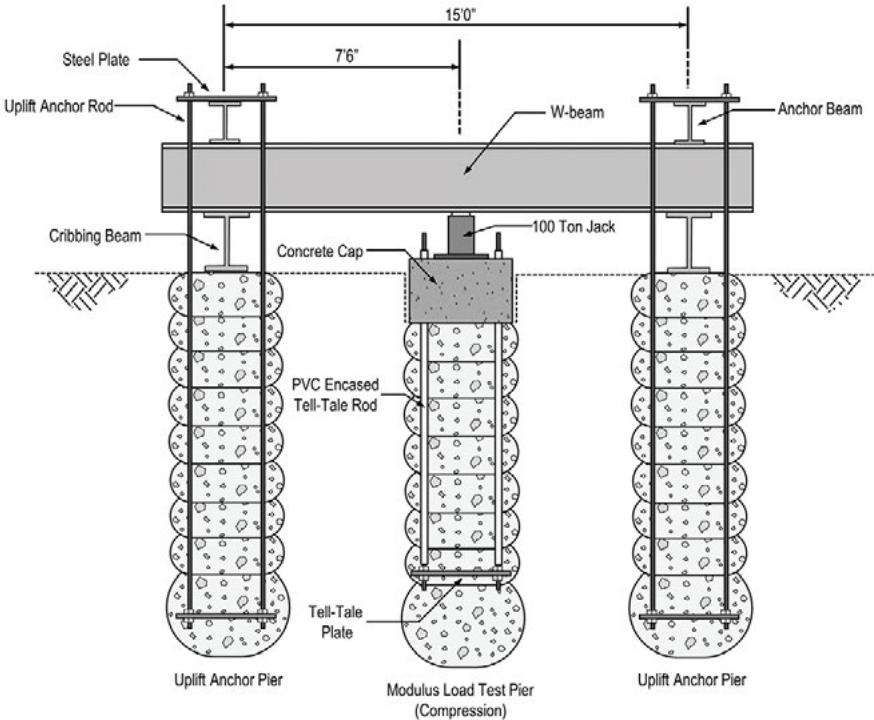
A Rammed Aggregate Pier (RAP) is a foundation system that uses no concrete and removes no spoil. RAPs are stiff, compacted stone inclusions that reinforce and densify the ground, along with providing a drainage path.

Weak Soils are displaced with columns of aggregate, which are compacted in place using a vibrating steel tamper. This process densifies the matrix soils between the piers. The result is a stiffened mass of soil that provides increased bearing capacity and eliminates, or controls load induced, or liquefaction induced settlement.

The process is carried out with state-of-the-art variable moment leader mounted hammers, manufactured in Germany. The force is applied vertically rather than horizontally, as in the case of Stone Columns with the double benefit of producing a very stiff aggregate column without damaging adjacent structures and services.



RAPs UPLIFT ELEMENT



RAPs KEY FACTS

- Densify loose sands, provide stiff element in the ground, increase the shear modulus of the ground, provide a path for pore water pressure to dissipate during an event. Provide lateral confinement.
- Most cost-effective solution on the market for liquefaction mitigation
- Most cost-effective solution on the market for mitigation of load induced settlement
- Very fast construction
- Generally suitable for improving soils which are not weaker than 20-30kPa. Where soils are weaker than required, RAPs may be grouted.
- Individual RAPs can support up to 450kN ULS compression of uplift loads, depending on the founding soils.
- Vibratory technique is vertical opposed to lateral which creates a significantly stiff column of aggregate without effects on adjacent structures
- No spoil generated





Key Project Information & Client Reference Sheets

CLL has successfully delivered projects for government agencies, local councils, and private sector clients across New Zealand. Our portfolio includes major infrastructure projects, slip remediation, and specialized piling solutions that have improved the resilience of transport networks and essential infrastructure.

We are able to provide you with our up-to-date presentations, demonstrating our cutting edge technologies and case studies should you require, and you can visit our LinkedIn page and website for more visual content, or at your request we can provide you with links to these.



PROJECT INFORMATION SHEET

TE KAHA STADIUM

LOCATION

CHRISTCHURCH CBD

CLIENT

BESIX WATPAC

START & FINISH DATES

AUGUST 2022 - MARCH 2023

VALUE

\$7M

PROJECT OVERVIEW

Our client required a ground improvement solution for the Te Kaha Stadium project in Christchurch, seeking enhanced soil density and load capacity for the proposed arena structure.

In November 2021, CLL partnered with Tonkin & Taylor, to secure a design and build contract for this project. Following an extensive design phase and site trials, we were selected for the project and commenced operations in August 2022.

The project involved enhancing soil density through the incorporation of our innovative *Geopier Rammed Aggregate Piers (RAPs). Using multiple advanced fixed mast rigs, we compacted 20,400m³ of aggregate to depths of up to 12m, significantly improving the ground density and load capacity.

The successful completion of this project resulted in a return engagement for additional RAPs in May 2023 and established a strong foundation for potential future collaborations.



PROJECT INFORMATION SHEET

WAIPIPI WIND FARM

LOCATION

WAVERLEY, TARANAKI

CLIENT

HIGGINS

START & FINISH DATES

AUGUST 2019 - SEPTEMBER 2020

VALUE

\$8M

PROJECT OVERVIEW

Our client required comprehensive ground improvements for 26 wind turbine sites situated in Waverley, located 80km south of Taranaki. The project demanded the installation of Geopier Rammed Aggregate Piers (RAPs) across an expansive area, with the challenge of remote execution and difficult terrain.

We successfully undertook the complex task of implementing ground improvements across the wind turbine sites. Spanning 97,700 lineal meters, our team utilised five fixed mast rigs, diligently working to install 11,365 Geopier Rammed Aggregate Piers (RAPs) at depths reaching up to 15 meters. This project marked the largest Geopier RAP undertaking ever accomplished in New Zealand.

Our team functioned as a self-sufficient unit due to the remote location. We established a lay-down area, provided two full-time mechanics, and deployed a full-sized fuel tanker on-site. Negotiating the challenging eight-kilometre expanse from wind turbine 1 to wind turbine 30, which traversed iron sands, presented considerable challenges and placed substantial strain on equipment. Despite these adversities, our team exhibited unwavering dedication, ensuring the project's successful completion.



PROJECT INFORMATION SHEET

MCLAUGHLINS ROAD, WIRI

LOCATION

69 MCLAUGHLINS ROAD, WIRI, AUCKLAND

CLIENT

MACRENNIE COMMERCIAL CONSTRUCTION

START & FINISH DATES

APRIL 2023 - MAY 2023

VALUE

\$3.5M

DESCRIPTION OF WORKS

The client required ground improvement measures to support the development of agricultural warehousing facilities in Wiri, Auckland. The project faced escalating foundation costs, threatening to exceed the budget for the 10,000 square meter warehouse with high 40kpa floor loads. The initial contract was for a conventional steel job at \$11.8 million, but progress was hindered by these financial constraints.

CLL addressed this issue by proposing an optimised design to reduce costs. In collaboration with our Geotech partners at CMW Designers, we conducted a thorough analysis and additional Geotech input, leading to the recommendation of a ground improvement technique using Rigid Inclusions (RAPs). To support the redesign, we requested an additional \$50,000 for Cone Penetration Testing (CPT) and laboratory testing.

Following the redesign approval, we installed and comprehensively load-tested 1,970 RAPs, each 8 meters deep with diameters of 600mm. This redesign resulted in a remarkable cost saving of \$8 million for the client. Despite the redesign, we completed the project one month ahead of schedule.



PROJECT INFORMATION SHEET

NORTHERN QUARTER

LOCATION

68 WILLOW STREET, TAURANGA

CLIENT

WATTS & HUGHES

START & FINISH DATES

AUGUST 2023 - DECEMBER 2023

VALUE

\$2.6M

DESCRIPTION OF WORKS

The Northern Quarter Commercial Development sought to revitalise Tauranga's CBD by creating contemporary office and hospitality spaces, to foster a vibrant hub for residents, workers, and visitors. However, the site presented a major challenge with liquefiable soils overlying soft, compressible soils. Initially designed for a Stone Columns solution, it soon became clear that the required volume of stone columns was impossible.

CLL, in collaboration with our geotechnical subcontractors Geovert, identified Rammed Aggregate Piers (RAPs) as a feasible and cost-effective solution. Our team successfully installed 1,913 RAPs, each with a diameter of 600mm and depths ranging from 6.7m to 9.7m. To support increased loads under the structure's beams, 903 of these RAPs were grouted. This strategic approach ensured the project's success and delivered a robust foundation for the contemporary office space and hotel development.



NON-NEGOTIABLES



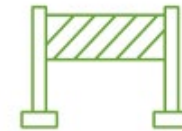
**NO LIFT IS TO BE DONE
WITHOUT A
LIFT PLAN IN PLACE**



**GEOTECH APPROVED
PILING PLATFORMS
MUST BE IN PLACE**



**NO MACHINE OR
VEHICLE MOVEMENT
WITHOUT A SPOTTER**



**ISOLATE PILING ZONE
USING SIGNAGE AND
BARRIERS**



**NEVER LEAVE OPEN
HOLES UNCOVERED**



**DO NOT BREAK GROUND
UNTIL PERMIT TO DIG
HAS BEEN ISSUED**



**NO CELL PHONE
USE WHILE DRIVING
OR OPERATING**

CORE VALUES



Integrity

We are straight forward and ethical.
We are astute and considerate.



Courage

We take personal responsibility.
We are confident in our ideals.



Selflessness

We put service and people first.
We respect and share
knowledge with each other.
We give others confidence
and promote growth.



Innovation

We are strive to think, feel and act -
rather than react.

We are innovative and
receptive to new ideas.



Respect

We have respect for ourselves,
each other, our clients,
the environment, and our
plant & equipment.





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