

MONKEYTOE EBOOK 10

BRIDGING
THE GAP
BRIDGES,
STAIRS &
CUSTOM
ACCESS

Monkeytoe

EVERYTHING BETTER

A NOTE FROM OUR DIRECTOR

We here at Monkeytoe have big ambitions. Not least among them is solving the access solutions of today and tomorrow – and that’s where our bridges, stairs, and custom access designs are leading the pack.

They’re enabling businesses, councils, and industry clients to go further and deeper, accessing the places that had previously been underutilised. Our aluminium structures thrive in harsh coastal conditions; our spans go longer than steel. Our stairs reach new heights.

That’s why we’re pursuing solutions that make it possible to boldly go without limitations – to access the inaccessible, to get into spaces that were previously closed off, and to design solutions that are innovative and inventive in a way that sets the pace for the industries we’re a part of.

Our vision is for a world without limitations – where nothing is inaccessible. We’re working to make that happen.

Read on to discover how Monkeytoe is working to create better access solutions for any situation.



Tim Prestidge
DIRECTOR OF MONKEYTOE

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At the cornerstone of our work is access: the bridges, stairs, walkways, and custom designed solutions that don't just get you from A to B, but also stand the test of time, look great, perform better and are developed to meet your unique needs.

Exploring solutions

It's no wonder that we love to explore. We've got some incredible places around us, and it's a privilege and a pleasure to be able to experience them across the generations.

We've spoken previously about driving our solutions to make life easier for our clients; it's spurred on the likes of the XBEAM, our market-leading aluminium products and world-class service, and our custom design process.

At the cornerstone of our work is access: the bridges, stairs, walkways, and custom designed solutions that don't just get you from A to B, but also stand the test of time, look great, perform better and are developed to meet your unique needs.

That's what this ebook is about.

First of all, let's set up some working definitions. When we talk about bridges, we mean an access solution that only has support at each end. And throughout this ebook, we aren't going to be talking about bridges in the sense of roading, either; we're thinking about foot traffic in industry, warehousing, architecture, or construction.

If the access solution looks like a bridge but is supported throughout the length – suspended from above or by members to the ground below – then we call that a walkway.

Bridges and walkways can take many forms, however. We consider our solution for Mairangi Bay (which we'll explore later) to be a bridge, even though it has stairs. In any case, the section on stairs is where we look at how we divide big vertical distances into smaller ones and how they help get you access when you need it.

A bridge is a surprising engineering challenge. You can't simply drop a beam from point A to point B and call it a day; achieving the right balance of span, strength, member size and weight, performance, and aesthetics is no mean feat. That's why we're always looking for solutions that don't just help us meet these criteria, but also help us push the limits of what was previously thought possible.

Achieving the span

This remains the #1 challenge in bridge construction. The further the span, the harder it is to deliver the performance you need.

Designing an effective bridge means relying on an exceptional understanding of the materials and technology you have to work with, and a foundational knowledge of how forces are transferred through different members. Bridges made of sticks or straw or brick will need very different designs, and each will have maximum span limits after which point it's not feasible to use those materials.

A small footprint

With any bridge or architectural design, a bigger structure means more materials. A heavy, bulky bridge – such as one made of steel – needs a lot more support in the form of big concrete columns. Alternatively, for a suspension-style bridge, that translates to significant strain on the structure of your building – and potentially more than can be safely loaded.

Again, there's good reason we've focussed on aluminium solutions. The combination of high quality aluminium and our truss design means our bridges can be installed where other options can't, and with fewer installation and maintenance costs.

We use marine-grade high tensile aluminium in our designs because it's easy to work with, has a low weight but high strength, and so can go further and longer than alternatives like steel. We've also developed our bridges using aluminium beams and extrusions which allows us to achieve some exceptional spans without compromising on strength or performance.

Weather with you

Whether for a public, recreational, or private application, a bridge has to withstand the elements. A timber bridge has a lifespan of about twenty years, and even then it will require vigilant maintenance. Steel is considerably more durable, but even then it's notoriously prone to corrosion, especially in a wet environment.

If you've read our first ebook, then you know why aluminium is considered the metal of kings. It's exceptionally durable, corrosion resistant (even in water or coastal settings), and any scratches immediately oxidise and seal themselves off. Bridges aren't necessarily easy access (or easily accessed for maintenance), so you need a high quality product that lasts – that's why our solutions are aluminium, not steel (and definitely not timber!).

Aluminium is also endlessly recyclable, which means a lower environmental impact across its long lifetime.

BRIDGE

MAIRANGI BAY

01.1

Welcome to beautiful Mairangi Bay on Auckland's much sought-after North Shore. When the soil had eroded away from the existing access from the heavy concrete stair, Auckland Council rightly deemed the stair unsafe for public use.



Monkeytoe were brought in to help. Rather than try to fix what was there – which would have been a costly patchwork fix – we were brought in to bridge the gap with a stair bridge solution. You might look at this and think it's stairs, but we consider it a stepped bridge since it reaches across the entire span – like a bridge – rather than having supports through the structure as a stair or impractical ramped walkway might.

This Crow's Nest Rise Walkway reached 12 metres with a -20 degree incline, and now provides a perfectly safe and corrosion-free access solution that will handle the coastal conditions better than steel or timber, ensuring that visitors to Mairangi Bay will have safe access for years to come.



BRIDGE
NGA PUNA WAI

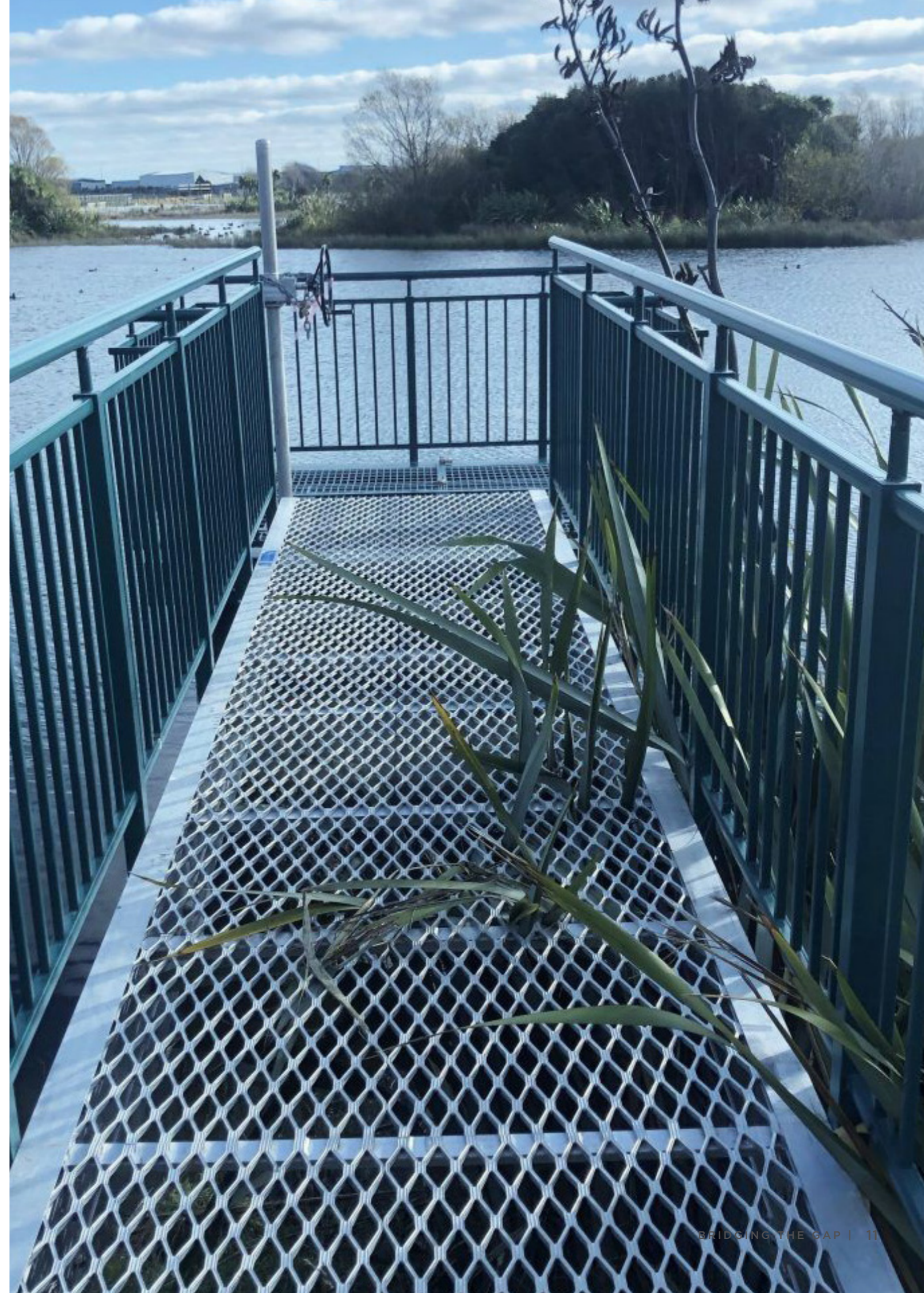
01.2

Nga Puna Wai is Christchurch City Council's premier community sporting facility. Located in the South Island of New Zealand, the facility boasts an athletics track and field, rugby league fields and hockey pitches as well as 12 acrylic outdoor courts.

The Council required a lightweight, corrosion resistant solution that would give the Nga Puna Wai Lake and loop walk the viewing platform it deserved - one that would work in with the stunning natural environment, last more than a lifetime, and provide easy access for all.

lifespans would have shortened considerably in the marine environment. So we approached the situation with an innovation mindset and developed an aluminium viewing platform based on one of our existing structures.

We worked with the Christchurch City Council to develop a simple bridge solution that spanned around five metres. Steel simply wouldn't have been an option here, as the



BRIDGE

DEVONPORT NAVY BASE

01.3

With a span of around 14m to cross, we knew the fit-out would be a challenge too. We chose aluminium for the bridge rather than steel; as a lighter material, we trusted that we could safely work on the existing wharf and crawl out an lightweight aluminium structure.

The home of New Zealand's Royal Navy, Devonport is a picturesque seaside village near Auckland's city centre. The Navy Base had built a new dolphin – a standalone structure that extends above the water line – for tying off boats, and needed an easy access solution that would reach from the wharf to the dolphin.

Naturally, they needed a structure that could handle marine conditions. But they also needed the structure to safely slide up and down according to the tides; one end of the bridge couldn't be fixed.

We developed a bridge with a hinge fitting at both ends so that it could safely move with tidal action. Because it wasn't for a public space, we could go further using a narrower bridge with finer extrusions – one that would only need to support one or two people at a time, and so could be scaled to better suit their needs.

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Because we've developed all our solutions to be modular, they're lighter than steel, and they don't require hot works, we're able to work with spaces where others simply can't reach. They also mean less interruption to business, which saves you time and money.

While steel and concrete stairs have had their fair share of attention in the past, aluminium access stairs are rightly claiming their place as the ideal for service staircases where durability and strength are vital.

From standard designs to custom applications

Because we manufacture our aluminium stairs in-house, we have the opportunity to provide prefabricated stairs that fit the bill, or push out the boat and design a custom solution that meets your exact needs. We're flexible in set-up, and with our modular design it's incredibly easy to work around and with any requirement.

Lightweight and easy to install

We've developed our fixing methods to be as easy as possible. Combined with impressive span potential and aluminium's high strength-to-weight ratio, Monkeytoe stairs are ideal for rooftop applications including platform stairs, pipe bridges, or step overs as part of roof walkway systems.

We often pair our stairs with our premium aluminium handrails or contemporary balustrades for a smart and safe solution.

Durability when you need it

We love our high tensile marine-grade aluminium. Its non-corrosive quality makes it perfect for a no-maintenance access solution in coastal conditions and doesn't require costly protective coatings. If your stair is out of the way or in a difficult location, then knowing it'll perform well for decades to come saves maintenance stress.

Working into existing spaces

Because we've developed all our solutions to be modular, they're lighter than steel, and they don't require hot works, we're able to work with spaces where others simply can't reach. They also mean less interruption to business, which saves you time and money.

The modular design in particular means can prefabricate parts offsite and easily lift them into place when they arrive, quickly building our platforms and stairs in places where it simply wouldn't have been possible or practical with a steel (or similar) solution.



CASE STUDY

STAIRS VITACO

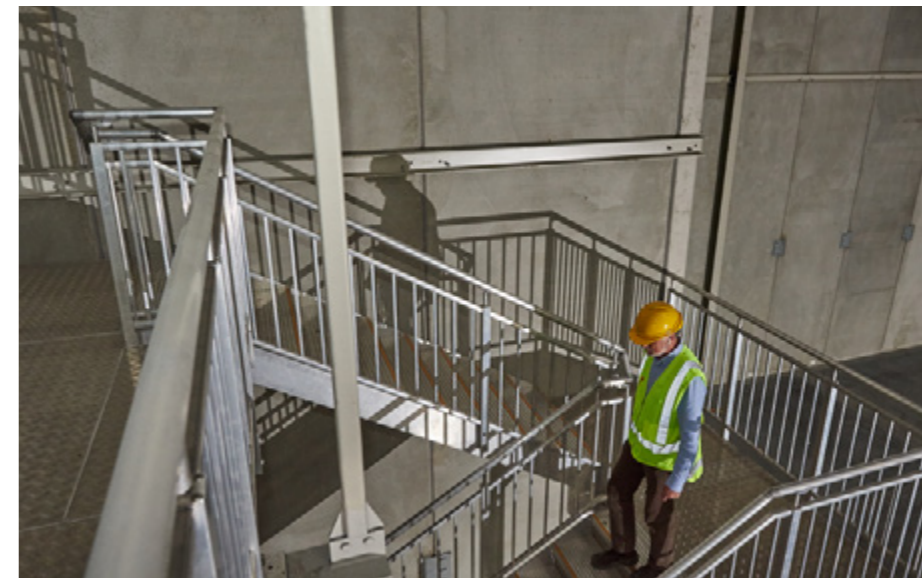
02.1

Vitaco's requirement for a 70m long elevated walkway was quickly understood by **Monkeytoe** and we were given 3D designs to review. Monkeytoe's engineers worked closely with our architects and engineers to produce a final design.

Vitaco is one of Australasia's biggest developers, manufacturers, and marketers of world-class nutrition products. So of course, when they needed world-class aluminium structures for their buildings, they came to Monkeytoe. We were tasked with creating a main entrance solution for staff to access their new warehouse. Our solution? A suspended walkway running some 60m (in bridged sections) across the length of the building, and a standout custom tower stair four flights tall.

Vitaco's requirement for a 70m long elevated walkway was quickly understood by Monkeytoe and we were given 3D designs to review. Monkeytoe's engineers worked closely with our architects and engineers to produce a final design. We've been kept well informed throughout the project and the result is an impressive looking walkway, which is rock solid, a critical factor as it's 7m above the warehouse floor and used by 50 staff everyday.

Simon Stockdale,
Senior Project Manager at Vitaco



STAIRS
CORDIS HOTEL

02.2

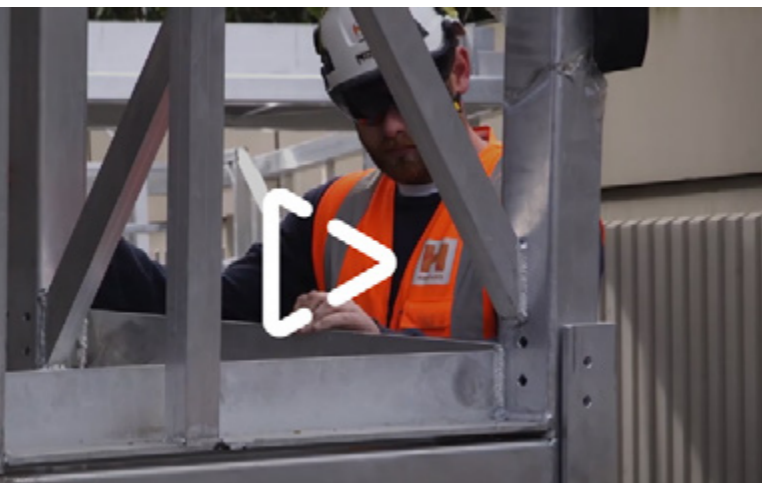
This five-star hotel in Auckland needed a five-star solution for their staggering 17-storey extension across a two-year, 280 room project that includes full kitchen service and a conference rooms.

But in modifying their existing building, the project required that the existing fire egress be closed off - necessitating a temporary fire egress stair. Our first solution was relatively straightforward: we developed a 26m modular stair, prefabricated it offsite and then installed it in less than four days.

“The problem that we had was the existing egress stair was chosen as the new building interface,”

“The solution was the Monkeytoe access system on the outside of the building which kept the occupants of the live hotel. It gave them the ability to use that stair while we removed the existing egress down the side of the building.”

Nick Wright,
Site Manager, Hawkins Construction



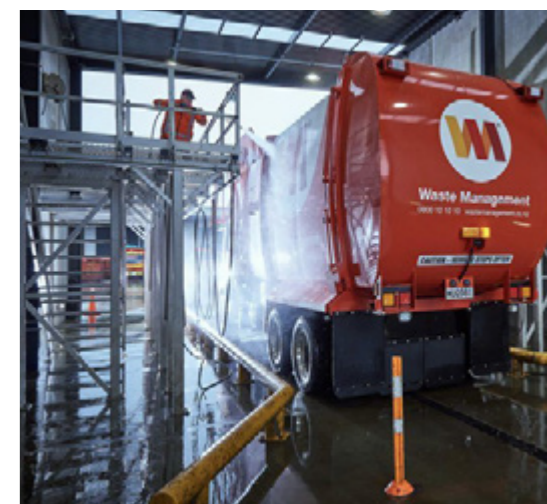
“By using Monkeytoe, it was an off-site prefabrication process that allowed us to build and prepare the rooms and openings while it was built off-site. Rather than preparing the opening, removing all the scaffold and then rebuilding everything modularly, it was all prefabricated and brought in to us as soon as we were ready.”

Custom Access opens you up to a host of options combining bridges, stairs, walkways, and platforms to get more out of your space and more back from your hardware.

Many of our clients come to us for a custom access solution, simply because no two sites are alike. You might need to get to a location that's been impractical to reach with a steel solution, or to take better advantage of a space and get smarter use of your facilities.

Whether you need an off-the-shelf solution, have a difficult space to reach, or need bespoke designs generated, our ability to find and tailor solutions to client specification is what's gotten us head and shoulders above others in the industry.

Our custom design process is the peak of our in-house processes, encompassing everything from consultation to installation. Let's dive right into some projects where we've worked our magic for clients.



CUSTOM ACCESS SOLUTION MARAETAI DAM POWER STATION

03.1

Once every three years, engineers have to look into and replace packing within expansion joints in the penstocks that control water flow to the turbines.

It's no small feat. The Maraetai Dam sees around 340 cubic metres of water flow through the ten penstocks every second. With this much surging water to control, ensuring the inspection goes off seamlessly is paramount for the safety of the engineers.

It's a high-risk job. Historically, Maraetai Dam engineers would set up scaffolding and complete the works at height – and above water. But working with temporary solutions can be tricky and prone to insecurities. For a major maintenance activity (called “Class 3” in the industry), Maraetai needed something better.

When Maraetai and Mercury Energy approached us at Monkeytoe, we jumped at the chance to help. We'd previously done smaller works with them, largely around access, and done our best to integrate into their existing processes, procedures, and structures to minimise disruption and help them get the solutions that would best suit their needs.

Nick Marshall is a Production Engineer in the Hydro Generation Group, who looks after Whakamaru and Maraetai power stations.

He was impressed by our ability to provide Maraetai with a solution that'll see them get easy access for years to come. The high-risk work of setting up scaffolding to look into the replacement of packing within the expansion joints on the penstocks is now far easier and safer with their custom Monkeytoe ladder and platform access solution. We've helped cut risks for them, and provided them with a fixed, safe, and permanent solution.

“What I love about this solution is that it removes the necessity of erecting scaffolding on a temporary basis, and enables us a permanent access method to do inspections and perform maintenance on those expansion joints,” says Nick.

The aluminium-based structure also won't need any ongoing maintenance like a steel access would require in such water-prone conditions.

They came to us with a problem, and we were able to work with them to provide the ideal solution.

“Originally, we'd had a pretty standard design that we'd looked into a few years back conceptually,

says Nick. “Monkeytoe looked at that, then came out to site and did their own assessment of the problem and took their own measurements. They came back with a much sleeker and more practical design as well. Very easy to work with.”

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CUSTOM ACCESS SOLUTION LYTTLETON PORT

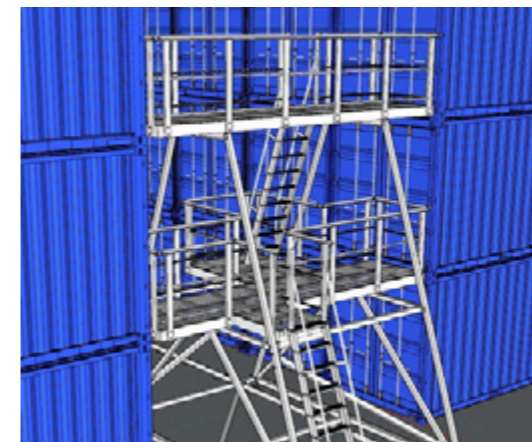
03.2

Lyttleton Port's Head of Engineering, Projects and Asset Management, Alistair Boyce looks after the development of new infrastructure and the maintenance of existing assets – so he was pretty invested in a new access solution that would enable them to handle an additional 70,000 containers that would be heading their way thanks to a new contract.

With just five weeks on the clock until the containers arrived, Lyttleton Port reached out to us to talk about what we could do together. While they converted a pavement block into an area that could support a large proportion of refrigerated units, we worked hard to custom design and fabricate three mobile access structures – including one that could be pushed along the ground and throughout the shipping yard and enable their specialists' easy access to monitor and maintain this valuable stock.

The platforms needed to balance strength and flexibility, allowing users to walk up to the first and second levels and reach the stacked containers. We developed a profile that could be rolled along dedicated tracks, taking advantage of a triangular design that would have great structural support.

Check out the video to hear more from Alistair about how we were able to work together and create a novel solution with Lyttleton Port.



CUSTOM ACCESS SOLUTION OIL SEED PRODUCTS

03.3

Regular maintenance of equipment is a must at every plant, and can often pose complexities, especially when at height. So for the Oil Seed Products Plant, a permanent access system was ideal, and more cost-effective than erecting temporary structures for maintenance regularly.

The biggest challenge for us at Monkeytoe was that we couldn't mechanically connect to the massive silos - no welding or bolting was allowed, which meant our solution had to be lightweight, modular and designed around the silos.

We came up with a custom fixing method that would allow us to attach to the silos without compromising their integrity. Oil Seed Products created a collar that could safely slip around one tank neck. Our unique clamp that would give us the support we needed with no mechanical connection.

Would you believe that, for this project, there is only one spot that connects to the ground, and that's the ladder? It took some ingenuity, but we've developed an innovative solution for Oil Seed Products that will give them access for years to come.





CASE STUDY

CUSTOM ACCESS SOLUTION WASTE MANAGEMENT

03.4

Cleaning recycling and refuse waste trucks takes something a bit different from what your standard car wash can offer, so when Waste Management came to us for a solution, we did our bit by proposing a custom platform and stair structure that ticked all the boxes.

The challenge for this project was that we needed to design a system that their waste trucks could safely operate around. We'd initially envisioned a suspended walkway system, but once we investigated the site, we instead turned to strategically-mounted wall brackets that took best advantage of the available space.

Waste Management are now making the most of their aluminium stairs, aluminium handrails, and a HVAC plant platform, keeping their trucks and New Zealand - looking good.



TESTIMONIALS

Mairangi Bay - Bridge

“A major slip occurred on site in 2017. The surrounding land was unstable. We investigated and considered various engineering options, such as a palisade wall. However, since another slip is more than likely to occur at another location along the coastal walkway, we wanted an option to remove our assets if we close down the walkway. Monkeytoe provided a bridge option so we could span the slip site and work in more stable ground.

Monkeytoe were helpful with sharing design options in the initial stages of the investigations and continued to provide design/engineering input throughout the project. The structure has held up well, and provides access to a popular coastal network; the “bridge” option met our requirements and objectives.”

Julie Crabb, Principal Design Open Space at Auckland Council

Cordis Hotel - Stairs

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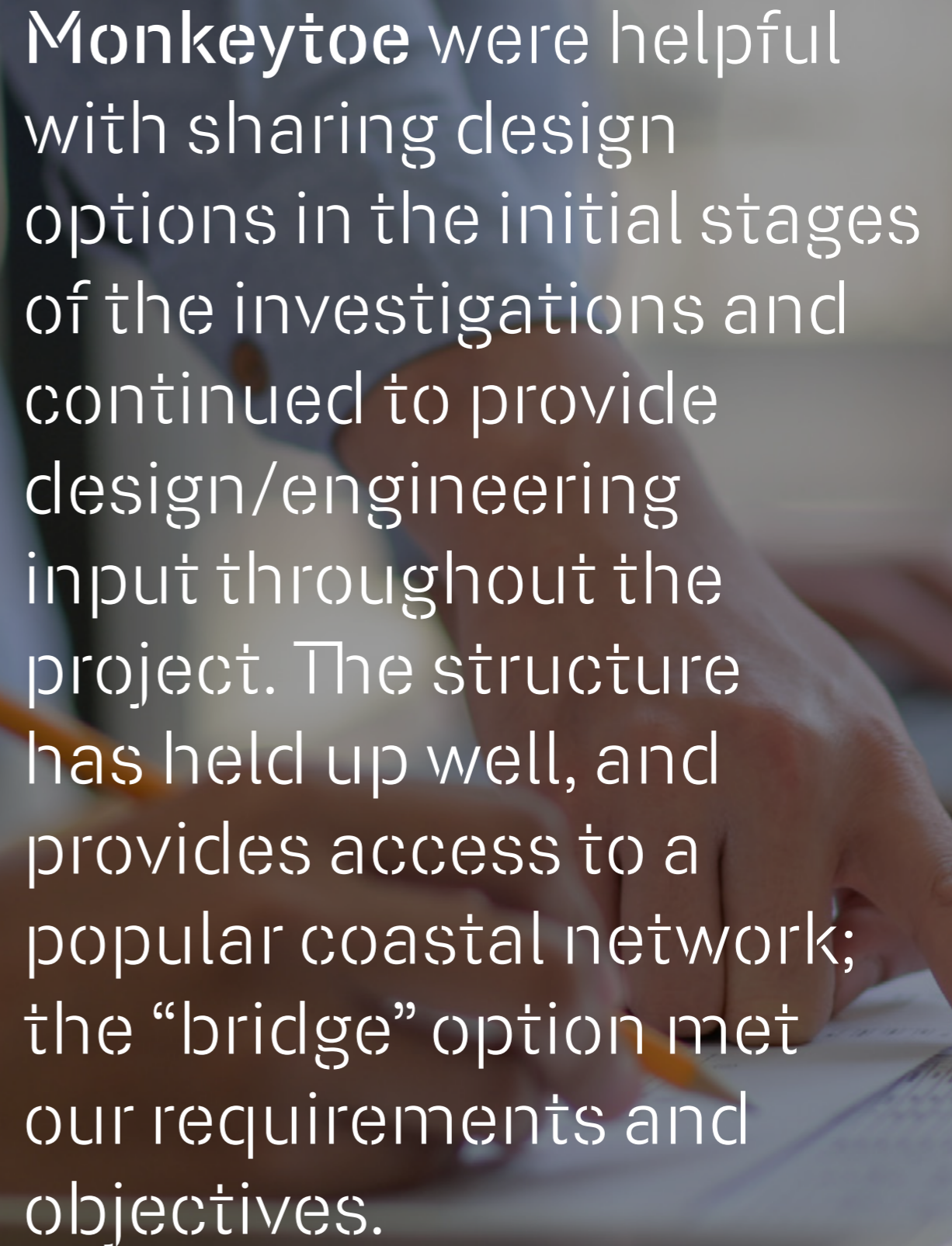
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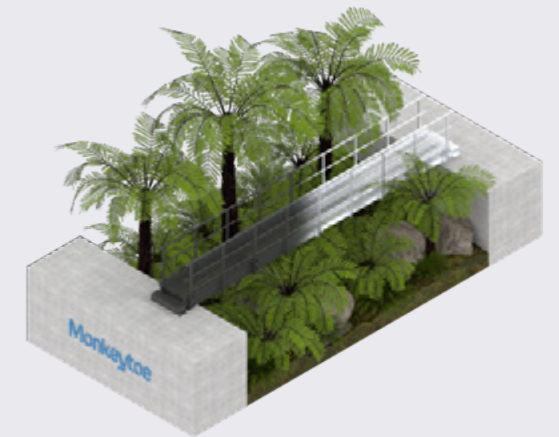
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BRIDGES

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STAIRS

Concrete and steel stairs are a thing of the past. Our aluminium-based stairs go further and last longer, whether you need an off-the-shelf design or something customised for your situation. Plus, thanks to the superb strength-to-weight ratio of aluminium, Monkeytoe stairs are ideal for rooftop applications including platform stairs, pipe bridges, or step overs as part of roof walkway systems. We also have a range of handrails, balustrades and acoustic treads for more comfort and style.



CUSTOM ACCESS

No two sites are alike, which means you'll need something designed to your needs. We can engineer any combinations of bridges, stairs, walkways and platforms to get more out of your space. Plus, thanks to our modular designs, we can work in and around existing hardware - getting you the solution you need faster and with less disruption to your business.





Monkeytoe

EVERYTHING BETTER