



# PEDESTRIAN, CYCLING BRIDGES & ACCESS STRUCTURES

Monkeytoe

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# PEDESTRIAN, CYCLING BRIDGES & STRUCTURES ACCESS

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**IN THIS EBOOK WE DISCUSS HOW  
MONKEYTOE UTILISES ALUMINIUM IN  
ACCESS STRUCTURES AND SOLUTIONS.**

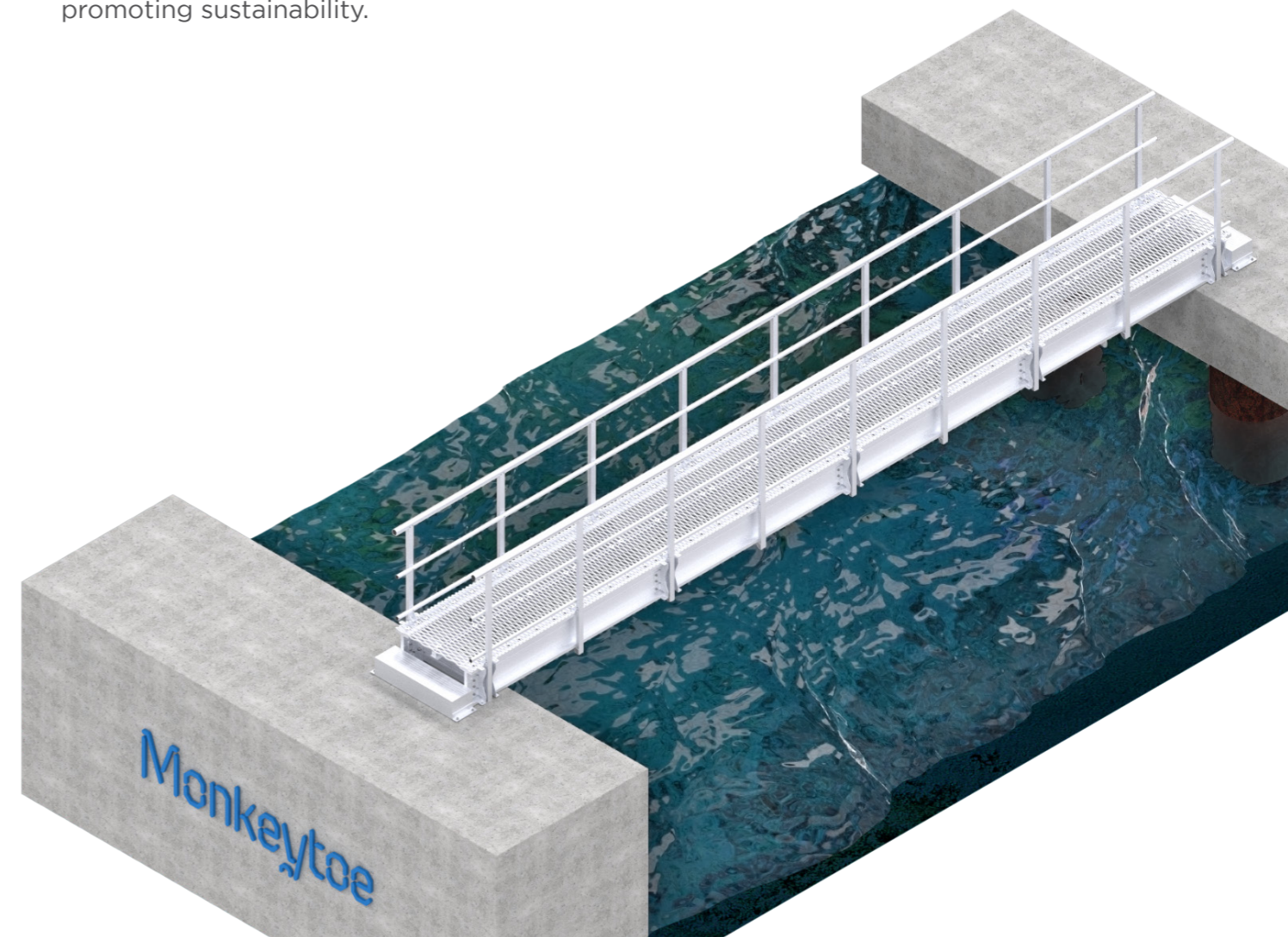
## WHY ALUMINIUM?

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01

Have you ever crossed a pedestrian bridge over a beautiful body of water or walked on an access structure that leads to a stunning location? These structures not only serve a practical purpose but can also add beauty to outdoor spaces. Aluminium is quickly becoming the material of choice for these types of structures and for good reason.

When it comes to pedestrian/cycling bridges and public access structures, aluminium is an excellent choice for those looking to minimize maintenance costs. Steel and wooden structures require regular maintenance to prevent corrosion and rot, respectively. In contrast, aluminium requires little to no maintenance, resulting in lower lifecycle costs. Aluminium for these applications offers unparalleled durability and versatility, reducing construction time and costs, enhancing safety, and promoting sustainability.



## APPEARANCE & DESIGN

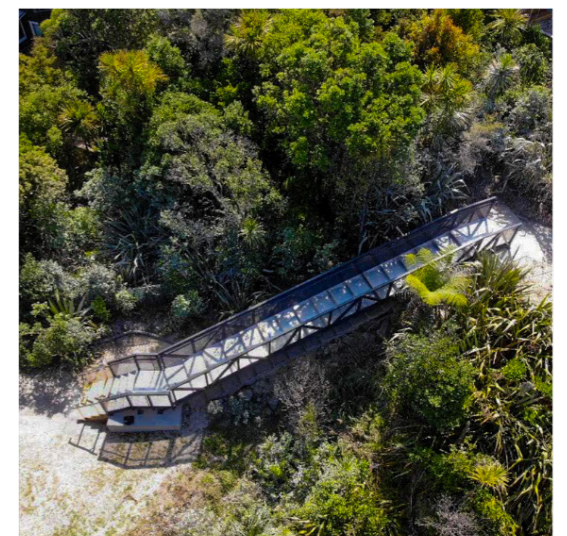
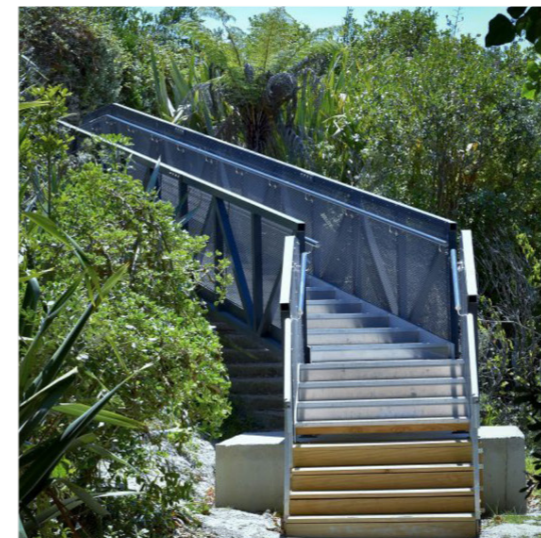
02

Aluminium bridges and access structures for pedestrians have a clear advantage in terms of their versatility. They can be customized to fit the specific needs and aesthetic preferences of the project. For instance, aluminium bridges can be left with a natural finish or coated with long-lasting paint or powder-coating to enhance their visual appeal. This feature allows them to easily blend in with their surroundings while providing a strong and durable structure, even in harsh marine environments.

To further enhance the visual appeal of aluminium pedestrian bridges, they can be designed with timber rails and sidings, as showcased in the Opotiki and Graylees projects. This combination of materials not only creates a unique and aesthetically pleasing design but also provides a safe and reliable pedestrian crossing. The timber accents can blend in seamlessly with natural surroundings, making the bridge a visually pleasing addition to the environment. The decking systems can likewise be selected from a range of aluminium, composite wood/recycled plastic or natural timber options.

### ALUMINIUM IS A VERSATILE MATERIAL THAT OFFERS MANY BENEFITS FOR PEDESTRIAN BRIDGES AND ACCESS STRUCTURES.

First and foremost, aluminium is lightweight, which makes it easy to transport and quick to install and reduces foundation requirements. This can be a major advantage in remote locations or in areas where heavy machinery cannot be used. For example, for the Graylees bridge project this bridge was transported to its final location via helicopter minimizing onsite works at a remote location. For other applications, modules are designed for rapid onsite assembly without any welding or resurfacing issues that are common with coated wood and steel structures using the DFMA methodology which Monkeytoe are familiar with.



## LIFECYCLE COST & DURABILITY

03

### WHEN IT COMES TO PEDESTRIAN BRIDGES, ALUMINIUM IS AN EXCELLENT CHOICE FOR THOSE LOOKING TO MINIMISE MAINTENANCE COSTS.

Steel and wooden bridges require regular maintenance to prevent corrosion and rot, respectively. In contrast, aluminium bridges require little to no maintenance, resulting in lower lifecycle costs.

Let's look at two pedestrian bridges on the St. Lawrence River to show the contrast between steel and aluminium. The first one, made of aluminium, was built 18 years ago in Verdun on the Island of Montreal. The second bridge, made of steel and concrete, was installed in Longueuil on the south shore in 1988. Despite facing the same climate and being designed for the same weight capacity, the steel bridge has needed regular maintenance, costing over \$1M NZD in the last decade [1].

In comparison, the aluminium bridge has not required any maintenance. Aluminium has a history of being used for long lasting challenging applications with little or no maintenance. Some examples are the Arvida bridge (72 years) and the San Gioacchino Church roof and Shaftesbury Memorial Fountain which have been in service for more than 100 years.



Life Cycle Cost Assessment of 30 m Pedestrian Bridge

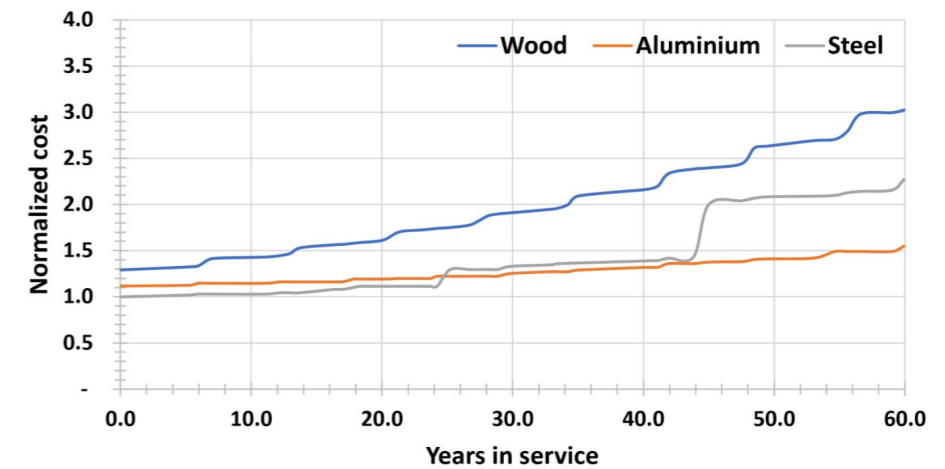


Figure 5: Life Cycle Cost Assessment of 30m Wood, Aluminium and Steel Pedestrian Bridge [2]

## SUSTAINABILITY

04

### ALUMINIUM IS A UNIQUE METAL WITH NUMEROUS ADVANTAGES FOR THE CIRCULAR ECONOMY



### AROUND 75%

of all aluminium ever produced is still in use today. It can be recycled multiple times without losing its mechanical, physical, or chemical properties.

### ONLY 5%

of the energy needed to produce virgin aluminium is needed for Recycling it, making it an excellent choice for achieving NZ's sustainability goals.

Monkeytoe also has the advantage of flexible supply and can supply specific projects with aluminium sourced from NZ smelted aluminium, some of the lowest carbon aluminium in the world while providing local benefit.

## THE MONKEYTOE SOLUTION

05

### AS LEADERS IN ALUMINIUM STRUCTURAL DESIGN, OUR EXPERIENCED PROFESSIONALS HAVE THE EXPERTISE AND KNOWLEDGE REQUIRED TO DELIVER CUSTOMISED SOLUTIONS TAILORED TO YOUR SPECIFIC NEEDS AND REQUIREMENTS

As leaders in aluminium structural design, our experienced professionals have the expertise and knowledge required to deliver customised solutions tailored to your specific needs and requirements. Choosing Monkeytoe for your aluminium bridge or access project has a multitude of benefits. One of the most significant advantages is our ability to provide a comprehensive service.



DESIGN



ENGINEERING



SUPPLY SOLUTION

Starting from the initial consultation all the way through to fabrication and installation. Our complete design, engineering and supply solutions means that we can oversee the entire process from start to finish\*.



## IN CONCLUSION

Aluminium is an excellent choice for pedestrian bridges and access structures. Its durability, resistance to corrosion, and minimal maintenance requirements make it a cost-effective option for those looking to minimize lifecycle costs, maximize sustainability and reduce installation impacts.

Aluminium structures provide safe and durable solutions for outdoor spaces. With the ability to be customized and coated for aesthetic purposes, aluminium structures are a smart choice for those looking to add functionality and beauty to their outdoor spaces.



\*At Monkeytoe, we understand that successful project outcomes rely on collaborative efforts from various experts. We partner with your geotechnical site engineers and foundation providers to facilitate foundation design and installation. Our team specializes in designing, engineering, and fabricating the structure while working closely with the client's environmental impact mitigation, civil works, hydrology, and foundation specialists to deliver a comprehensive, tailored solution.

#### References

1. Alex de la Chevrotiere, P.E., and Martin Hartlieb Aluminum's advantages for bridges. 2020.

2. Radlbeck, C., E. Dienes, and D. Kostea, Sustainability of aluminium in buildings. Structural engineering international, 2004. 14(3): p. 221-224.



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