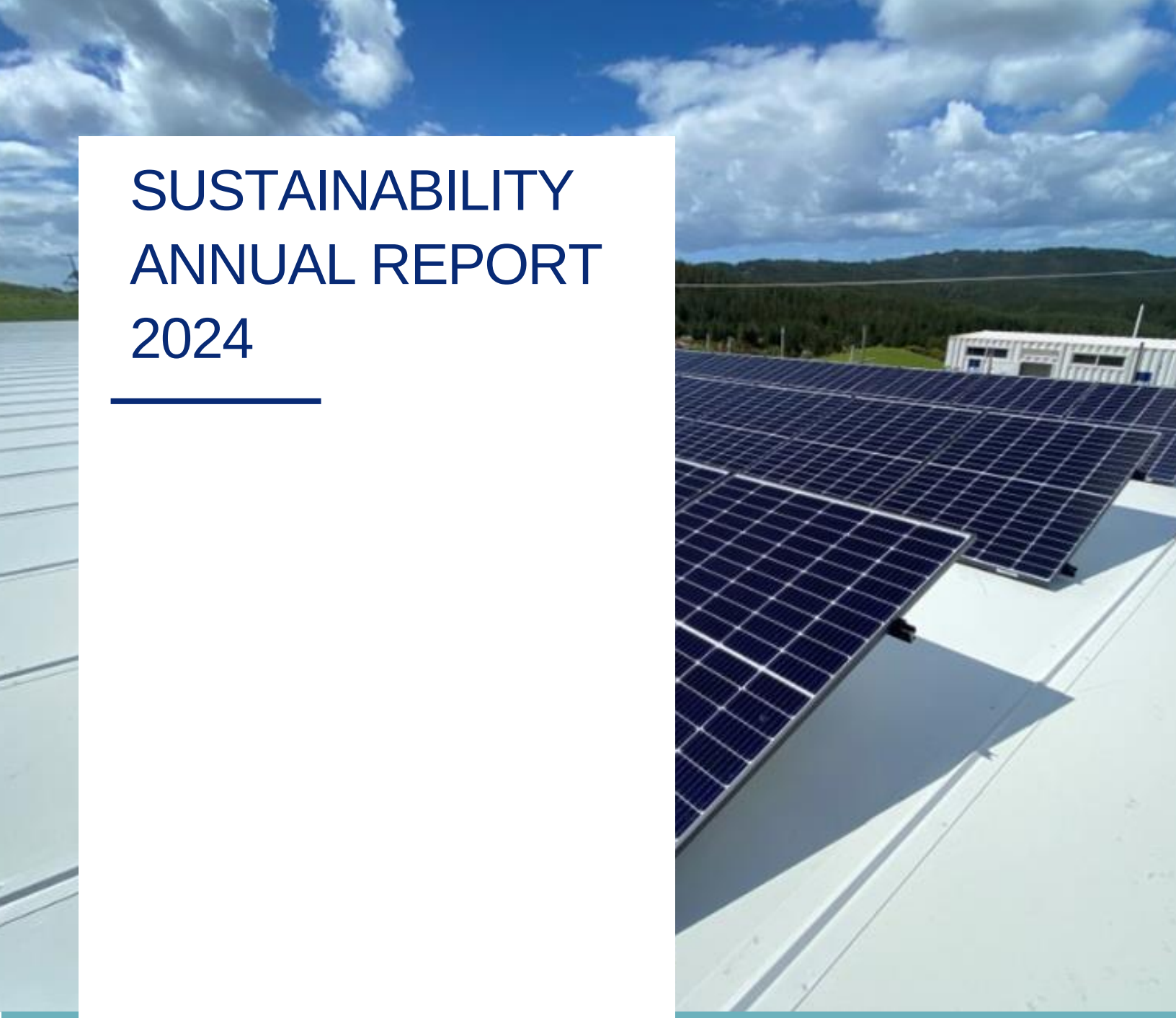


SUSTAINABILITY ANNUAL REPORT 2024

July 2024

O Mahurangi Penlink

O MAHURANGI

Contents

Introduction

Project background

O Mahurangi - Penlink will be a new seven-kilometer highway between Whangaparāoa Road and State Highway 1. The highway will create a more resilient network and get people where they need to be faster, whether by vehicle, walking or on a bike. Ultimately, offering a more carbon friendly travel option for Aucklanders. However, it involves significant costs to build, primarily due to energy, material, and water required for construction. Main works construction commenced October 2023.

The O Mahurangi Alliance continue their commitment to extending the life of materials, optimising energy and water usage across the site, and striving for high diversion of waste from landfill. The project's sustainability performance is externally verified by the Infrastructure Sustainability Council (ISC). With O Mahurangi targeting an 'Excellent' rating.

Acknowledgement of Mana Whenua

Ngā Iwi Mana Whenua o Tāmaki Makaurau have been able to observe and interpret change within the environment in Tāmaki Makaurau over many generations. This wisdom has been built upon an additional 50,000 years of mātauranga (indigenous knowledge systems) passed down from ancestors. O Mahurangi is the first Auckland project to have iwi partners embedded into the project including on our Project Advisory Board (PAB). This partnership enables a Te Ao Māori lens across all aspects of the project. With Te Tiriti o Waitangi as a framework, NZ Transport Agency Waka Kotahi and the Alliance work with iwi partners to build strong, meaningful and enduring relationships that achieve mutually beneficial outcomes.

O Mahurangi – project name

This project has been gifted the name O Mahurangi which refers to Mahurangi who is an ancestress of Tainui waka and was a renowned tohunga (high priestess). Mahurangi gave karakia to the atua (gods) for guidance and protection of her people as they embarked on their journey from their ancient homelands of Hawaiki to Tāmaki, Aotearoa and the lands known today as Whangapāraoa.

Rangatira, Te Warena Taua gifted the name O Mahurangi to the project which runs from Whangaparāoa to Paeroaroa (Redvale). The name, in his words, is 'an ancient name belonging to the rohe (district or tribal boundary) of Ngāti Manuhiri, Te Kawerau ā Maki and Tainui whānui as the descendants of the eponymous ancestor Maki from whom the name Tā Maki comes'.

The project is framed by the rivers of Wēiti and Ōkura, the maunga Pukekauere, and the bay of Karepiro including Ōtaimaro and Te Ringa Kaha ā Manu – all of which speak to the history of the descendants of Maki and his people.

Project features

The project outcomes are expected to:

- Reduce congestion along Whangaparāoa Road, improving quality of life for residents and providing opportunities for economic activity. Increased capacity on existing networks will also enable planned growth in the region, including in Silverdale, Wainui and Dairy Flat.
- Improve accessibility and reduce travel time to and from the Whangaparāoa Peninsula to provide for business and residential growth on the Peninsula.
- Enhance community resilience, with more transport options for public transport, people on foot and on bikes to the Whangaparāoa Peninsula.

About the Infrastructure Sustainability (IS) Rating Scheme

NZ Transport Agency Waka Kotahi is committed to delivering good environmental and social outcomes as part of the design, construction and operation of our infrastructure projects. The IS rating scheme is a rating system for evaluating sustainability across the planning, design, construction and operational phases of infrastructure programs, projects, networks and assets in Australia and New Zealand. ISC evaluates the sustainability performance of the quadruple bottom line (Governance, Economic, Environmental and Social) of infrastructure development. The IS rating scheme aims to:

- Provide a common national language for sustainability in infrastructure.
- Provide a framework for consistent application and evaluation of sustainability in tendering processes.
- Help in scoping whole-of-life sustainability risks for projects and assets, enabling smarter solutions that reduce risks and costs.
- Foster efficiency and waste reduction, reducing costs.
- Foster innovation and continuous improvement in the sustainability outcomes from infrastructure.
- Build an organisation's credentials and reputation in its approach to sustainability outcomes.

There are four rating phases that the scheme can be applied to;

- Planning
- Design,
- As-built
- Operations

There are three rating levels that a project can achieve:

- Commended
- Excellent
- Leading

The O Mahurangi Alliance is contracted to deliver an 'Excellent' IS Rating for the Design and As-built phases, using v1.2 IS Technical Manual. Some credits from the v2.1 IS Technical Manual will also be used. A score of 50 to <75 is required for an Excellent rating level. Points are awarded for how an infrastructure project or asset performs across 15 categories.

O Mahurangi has completed its first submission for the design rating in April 2024 and is on track to achieving an excellence rating. A further submission will be undertaken, after receiving ISC verifier feedback, prior to confirmation of the rating level achieved.

IS Rating Scheme Themes

Management and Governance

- Management Systems
- Procurement and Purchasing
- Climate Change Adaptation

Using Resources

- Energy and Carbon
- Water
- Materials

Emissions, Pollution and Waste

- Discharges to Air, Land and Water
- Land
- Waste

Ecology

- Ecological value

People and Place

- Community Health, Wellbeing and Safety
- Heritage
- Stakeholder Participation
- Urban and Landscape Design

Innovation

- Innovation strategies and technologies

Our sustainability targets

The table below describes the resource efficiency targets and sustainability goals that have been proposed for the O Mahurangi Penlink project.
They align with industry best practice as suggested in two of the credits in the IS rating scheme and are also supporting the overall goal of the project to reduce carbon.

Resource Efficiency Topic	Target
Virgin and high carbon-intensity materials	>10% less embodied carbon in core structural materials used
Energy	>10% reduction in energy use across construction and operational phases
Recycled and alternative materials	>10% use of materials with recycled content
Waste	>60% diversion by volume of office waste >90% diversion by volume of clean spoil >100% diversion by volume of inert and non-hazardous waste from landfill
Water	>10% use of non-potable water

Base case

In order to track progress towards achieving the above targets and reductions required to meet the resource use related category of the IS Rating Scheme, a base case has been established. A base case is an estimate of the total amount of energy, water and materials expected to be used throughout the construction and operation of O Mahurangi. This estimate is established using business as usual assumptions and provides a number for actual resource use to be compared to. Once the design and any sustainability initiatives have been established, the base case can be compared to the design case to estimate proposed reductions. As construction commences and information regarding resource use is collected, actual resource use and progress towards reduction targets against the business-as-usual base case is able to be tracked.

O Mahurangi's base case has been established and forms part of the first round of the submission for the IS Design Rating. Tracking of water, energy and materials use has started with the commencement of main works in October 2023. Tracking resource use efficiency targets against targets will commence once base case modelling is verified.

Realised opportunities

Energy - Throughout construction O Mahurangi will use a lot of energy, comprised mainly of diesel. The Project has an aim to reduce energy use when compared to business as usual across the construction and operational phases by at least 10%.

Forrest Duff

Low topsoil depths and high green waste volumes lead to high predicted diesel use associated with the import of topsoil and disposal of green waste offsite. To avoid this, the project is reusing natural onsite soils and organic site won material for landscaping. This results in a significant reduction in diesel as well as improved ecological outcomes such as retention of the existing seed bank, and reduced green waste volumes.

Renewable energy

O Mahurangi is employing various energy efficient initiatives to reduce carbon associated with non-renewable energy. This includes;

- Hybrid, electric assisted and/or Tier 4 plant for bulk earthworks, along with Adblue (10-15% fuel saving)
- Electric buggies to reduce use of diesel vehicles on site
- Solar power generation at two site offices. The mains office currently runs power from solar panels to lights and EV charging stations

Optimised efficiency in construction methodologies

Multiple opportunities for more sustainable outcomes in construction methodology and design have been identified and implemented during construction. For example, the construction team worked with the design team to delete the need for a large soil buttress at ‘cut 14’. This was made possible through changes to the geometric design and favorable ground conditions. This buttress equated to 40,000m^3 of earthworks, with deletion of it reducing carbon associated with plant fuel use by approximately 144T CO2.

Materials – a lot of materials are required to produce the final O Mahurangi alignment. The project aims to reduce the amount of embodied carbon from optimising materials through reuse and innovation efforts.

CCS Candy and carbon factors

Carbon factors have been included within the cost estimating software for the project (CCS Candy). This allows the team to identify the carbon footprint associated with each material type proposed to be used, and track carbon for the project including departures and scope creep.

Weiti River Bridge

An extradosed bridge form was designed during tender instead of a cantilever box girder bridge which would have been business as usual. This provides significant carbon savings in materials such as concrete and steel, as it substantially shortens the bridge reducing the number of piers, reduces the deck volumes and reduces temporary staging requirements.

Water - it is expected that almost 80 million litres of water will be used for activities such as dust suppression, earthworks compaction and concrete curing during construction. The Project has a commitment to minimising the use of potable water where possible.

Non-potable water supply

O Mahurangi Penlink aims to source at least 63% of all water used for construction and operation from non-potable (water not of drinking quality) sources. During construction, it is estimated that 79.5% of water used will be from non-potable sources. This is in line with our target for ISC credit Wat-2 L2, and our client, NZTA's target of sourcing >10% non-potable water. To achieve these targets, the project has established a 380m deep groundwater bore to supply non-potable water for construction activities such as dust suppression. The project is on track to meet these targets.

Waste - construction and demolition waste contributes significantly to New Zealand's landfills. O Mahurangi aims to divert >60% of office waste, >90% of construction waste and 100% of spoil from landfill.

Waste Management

The project has a strong focus on waste minimisation and diversion from landfill, with a culture of reuse being embedded into the team. Digital platforms are being used to share materials such as pipes, cloth and aggregate available for reuse across the wider team. Further waste management initiatives have been established such as composting food scraps at site offices, alongside PVC, PE and soft plastic recycling as high-volume waste types.

Spoil and Fill Sites

Exploration of opportunities for new sites for spoil and surplice fill within the project extent is continuous.

Numerous locations within or adjacent to the project extent have been identified and confirmed for waste material, surplus fill and duff. These sites allow a total of 242,000m3 of material that would otherwise be sent off site to be retained on site. This reduces both volume of material sent to clean fill/management fill or landfill, in line with our target to divert 100% of spoil from landfill, and results in significant reductions in transport associated carbon. Approximately 16,690 truck movements (one way) would be required to transport this volume, equating to ~380T Co2.

Procurement - sustainable procurement is an important step in supporting sustainable outcomes across the project, within the community and for businesses.

O Mahurangi has made a commitment to incorporate sustainability in the engagement of subcontractors and suppliers. The project has undertaken a suppliers briefing to support potential subcontractors and suppliers and to communicate sustainability expectations to the wider industry.

The projects procurement process includes the evaluation of sustainability policies and objectives of potential suppliers.

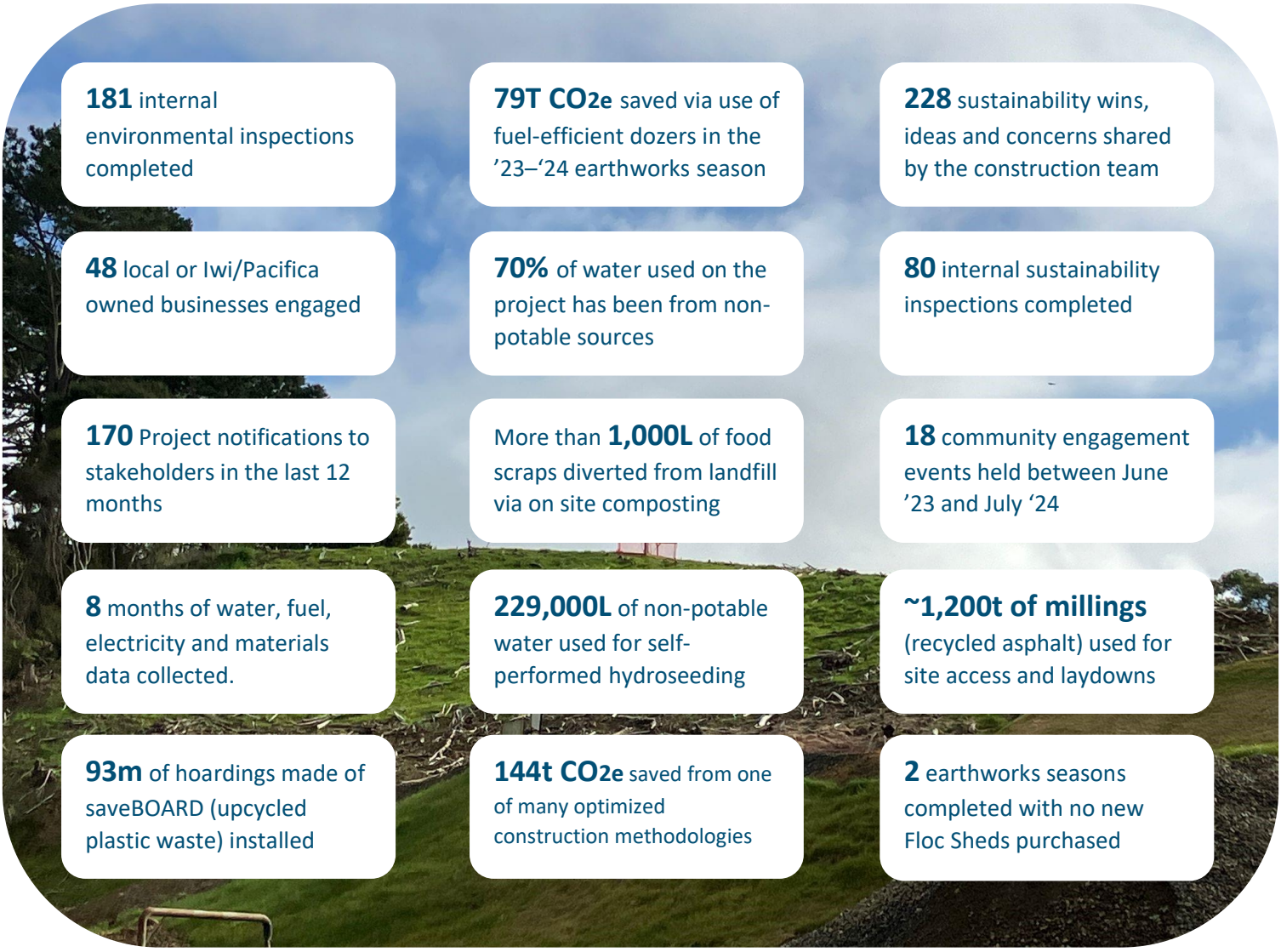
Where we are now

IS Rating design submission

The design rating and detailed design packages have recently been submitted for review, leading the project into the main phase of construction. The majority of potential carbon and resource efficiency savings have been implemented via the design process and management systems, ensuring that every potential carbon reduction has been considered and embedded if plausible from the start.

June ‘23 – July ‘4 in Numbers

Tracking of resource use efficiency data such as water, energy and materials has commenced.



Sustainability Wins, Ideas and Concerns shared by the Construction Team

On site sustainability culture is off to a great start with the Oct ’23 main works commencement. Below are a selection of examples of sustainability wins, ideas and concerns shared by the construction team to each other over the last 12 months. These have been shared via the projects WhatsApp Sustainability Group, a purpose made digital sharing mobile and desktop app, and via paper submission forms.

- Harvest of over 100 harakeke required to be cleared by kaitiaki, and gifting of harakeke to community groups to repurpose the taonga and avoid sending green waste to landfill.
- Topsoil stripping directly to finished batters to avoid double handling of topsoil.
- Use of approximately 1200 tonne of recycled asphalt (millings) for site access and lay downs instead of importing aggregate from quarries. This results in less carbon in materials and less carbon in transport of materials.
- Mulching and turfing bunds. Operators shared the wins of reusing mulch resulting from forest clearance on site for erosion control and use of existing grass to turf bunds. Stabilisation of bunds would usually be achieved via the application of geotextile cloth. This reuse of mulch and turf leads to the reduction of use of geotextile cloth, leading to a reduction in embodied carbon via materials use reduction, reduction in carbon associated with transport, and reduction in waste and turf and mulch does not need to be transported off site to landfill.
- Reuse of various materials on site, such as cloth and pipes and pile casings for temporary erosion and sediment control, geogrid and aggregate for site access, and timber.
- Identification of single use waste stream; paper towels across the site. Individual identified this concern of non-recyclable waste stream and proposed solutions such as avoidance of waste stream via hand dryers or reuse of paper towels for compost.

Next steps

O Mahurangi has now entered the main works phase of the project, this will be where we shift our focus to the as-built phase and the implementation of sustainability initiatives. This includes:

- Resource use (water, energy, materials) data collection and tracking performance against the base case once verified via the design rating
- Ongoing review, updating and enacting of sustainability commitments and sustainability policy, review and improvements to management plans (ISMP and REWMP).
- Continued identification and investigation of carbon and resource use reduction opportunities
- Ongoing engagement with the project team to support a sustainability focused site team
- Inclusion of sustainability factors within procurement processes
- Weekly sustainability site inspections and quarterly internal and external audits
- Implementation of innovative sustainability initiatives, such as Forrest Duff
- Ongoing stakeholder engagement
- Increased engagement with subcontractors and suppliers to identify opportunities for more sustainable outcomes and/or products and continue to commit to sustainable procurement.
- Engagement in forums to share knowledge such as lessons learnt with the wider industry.
- Improvements in the resource and waste efficiency/diversion areas.

Project contacts

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