



Mandurah Estuary Bridge Duplication (MEBD) Project Annual Sustainability Report 2024/2025

Prepared by Georgiou Group

This annual report covers the period from 1/07/2024 to 30/06/2025. This is the third annual report to be prepared for the project. Previous annual sustainability reports include 2023-2024 and 2021-2022.

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Disclaimer

All information was true and accurate at date of publication. Data is subject to change pending audits, verifications, and reviews.

Acronyms & Abbreviations

Abbreviation	Full Form
ACH	Aboriginal Cultural Heritage
ACROD	Australian Council for Rehabilitation of Disabled
AECOM	Architecture, Engineering, Construction, Operations, and Management
AS/NZS	Australian/New Zealand Standard
ASS	Acid Sulfate Soils
ASSMP	Acid Sulfate Soils Management Plan
AIAG	Access and Inclusion Advisory Group
AHA	Aboriginal Heritage Act
BAU	Business As Usual
BG&E	Bruechle Gilchrist & Evans
BRG	Bindjareb Reference Group
CABE	UK Commission for Architecture and the Built Environment
CAT	Cultural Awareness Training
CCS	Cultural Context Study
CCTV	Closed Circuit Television
CPTED	Crime Prevention Through Environmental Design
CPS	Clearing Permit System
CRC	Crushed Recycled Concrete
CRG	Construction Reference Group
CSEMP	Community and Stakeholder Engagement Management Plan
CoM	City of Mandurah
DBCA	Department of Biodiversity, Conservation and Attractions
DFES	Department of Fire and Emergency Services
DOA	Delegation of Authority
DCCEEW	Department of Climate Change, Energy, the Environment and Water
DOH	Department of Health
DOT	Department of Transport
DPLH	Department of Planning, Lands and Heritage
DWER	Department of Water and Environmental Regulation
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EPA	Environmental Protection Authority of Western Australia
EPBC	Environment Protection and Biodiversity Conservation Act 1999
EPD	Environmental Product Declaration
FMP	Fauna Management Plan
GHG	Greenhouse Gas
GPT	Gross Pollutant Trap
GRI	Global Reporting Initiative
ha	Hectare(s)
IAP2	International Association for Public Participation
IFC	Issue For Construction

Abbreviation	Full Form
ILUA	Indigenous Land Use Agreement
IPS	Independent Piling Services
IS	Infrastructure Sustainability
ISAP	Infrastructure Sustainability Accredited Professional
ISC	Infrastructure Sustainability Council
ISO	International Organization for Standardization
kL	Kilolitre
km	Kilometre(s)
KPI	Key Performance Indicator
LCA	Lifecycle Assessment
LED	Light Emitting Diode
LPG	Liquefied Petroleum Gas
LTIFR	Lost Time Injury Frequency Rate
m	Metre(s)
MEHG	Mandurah Environment and Heritage Group
MEBD	Mandurah Estuary Bridge Duplication
MJ	Megajoule: a unit of energy equivalent to 1 million Joules.
MMO	Marine Mammal Observations
GJ	Gigajoule: unit of energy which is equivalent to 1 billion Joules
NAIDOC	National Aboriginal and Islanders Day Observance Committee
NEPM	National Environment Protection Measures
NGA	National Greenhouse Accounts
NSHA	Noongar Standard Heritage Agreement
OGA	Office of Government Architects
PRS	Peel Region Scheme
PTA	Perth Transport Authority
RAP	Reclaimed Asphalt Pavement
REC	Renewable Energy Certificate
RIWI	Rights in Water and Irrigation Act
RtR	Roads to Reuse
SDG	Sustainable Development Goals
SMP	Sustainability Management Plan
SLC	Sustainability Leadership Committee
SWALSC	Southwest Aboriginal Land & Sea Council
tCO ₂ e	Tonnes of carbon dioxide equivalent
TAFE	Technical and Further Education
TEC	Threatened Ecological Community
TGA	Tonkin Gap Alliance
UN	United Nations
VMS	Variable Message Sign
WA	Western Australia
WSUD	Water Sensitive Urban Design
WWTP	Waste Water Treatment Plant

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1 About this Report

1.1 Purpose

This report has been prepared for the Mandurah Estuary Bridge Duplication (MEBD) Project (the Project). It has been compiled by Georgiou Group on behalf of Main Roads Western Australia (Main Roads). The report is provided as a companion document to the Main Roads Annual Sustainability Report and will ultimately be integrated into the Main Roads Annual Report. Its content has been developed in line with the Global Reporting Initiative (GRI) principles and summarises the Project's sustainability initiatives, along with its potential environmental, social, and economic impacts. Material topics presented in this report were identified through a materiality assessment process consistent with the Infrastructure Sustainability Council's (ISC) Version 2.1 Design and As Built Rating framework.

1.2 Sustainability Statement

Originally constructed in the 1980s, the Mandurah Estuary Bridge was designed with future duplication in mind. With the current population growth in Perth, Mandurah, Peel and the South West, the amount of traffic currently using the bridge is causing congestion. More than 33,000 vehicles currently use the existing Mandurah Estuary Bridge daily.

The Project involves the construction of a second, two-lane bridge with a provision to add a future third lane to deliver the ultimate design of a six-lane bridge. The Project also enhances the location as a recreational area, delivering an accessible fishing platform, yarning circles on both eastern and western foreshores and an improved accessible shared path network and carpark.

The Project is targeting an Infrastructure Sustainability (IS) Rating for both the design and construction phases. Achieving this rating will demonstrate the economic, social and environmental benefits realised during construction and continuing through to long-term operation and maintenance.

"The new Mandurah Estuary Bridge will mean less time stuck in traffic, safer journeys, and quicker trips for thousands of locals each day. It's a project that will bridge communities quicker and make getting around Mandurah and the Peel Region easier now, and into the future. We thank all stakeholders for their collaboration, which has enabled the project team to optimise the program, achieve milestones, and remain on track for the early 2026 completion. Local suppliers have eagerly contributed, strengthening community involvement. Despite additional scope awarded nearly a year after commencement, delivery remains on schedule. Through design and construction efficiencies, we have reduced material impacts by 50% and implemented key stakeholder initiatives, ensuring the project meets expectations while minimising environmental footprint.

Paul Buckie, Construction Manager

1.3 Sustainability Summary

Protect, enhance and integrate the existing uses of the Estuary 'place'

The project is improving the Estuary area by:

- Delivering accessible facilities including a new fishing platform, ACROD parking and better path connections.
- Upgrading playgrounds and educational areas that support the natural environment.
- Adding public art and seating co-designed with the Bindjareb Noongar community.

How success is measured:

- Community surveys show at least 75% believe the area has improved.
- New accessible facilities, upgrades and artwork completed with Noongar input.

Protect and enhance local environmental features

We are supporting the Estuary's natural environment by:

- Installing signs that explain local wildlife, wetlands and cultural significance.
- Sharing dolphin monitoring data to support local research.
- Using only local native plants in landscaping.

How success is measured:

- Signs installed that clearly explain environmental values.
- Monitoring data provided on time.
- All landscaping plants confirmed as local native species.

Improve accessibility, capacity, connectivity and safety

The project is making travel safer and more reliable by:

- Improving peak-hour traffic flow and reducing crashes.
- Providing safer pedestrian and cycling access, including to nearby bus stops.
- Strengthening links between the Estuary and surrounding neighbourhoods.

How success is measured:

- Morning peak travel speeds increase by at least 10%.
- Crash numbers reduce.
- Access review confirms improved connections.

Maximise business and employment opportunities

The project is supporting local jobs and businesses by:

- Increasing local spending on materials and services within 50 km.
- Awarding work to Aboriginal businesses.
- Helping new local suppliers participate in the tender process.

How success is measured:

- Local and Aboriginal businesses receive project work.
- New local businesses submit successful tenders.
- Minimum local-spend targets are achieved.

Deliver a durable, resilient, low-maintenance bridge

We are building a long-lasting bridge that delivers value by:

- Designing for reduced maintenance needs and future climate resilience.
- Using motion-sensor lighting to cut energy use and protect wildlife.
- Re-using materials and incorporating stakeholder feedback.

How success is measured:

- Maintenance-reduction and climate-resilience features built in.
- Motion-sensor lighting installed.
- Material re-use targets achieved and stakeholder feedback reflected.

Deliver a high-quality, socially and environmentally sustainable outcome

The project is embedding sustainability by:

- Targeting an ISC ISv2.1 Design and As Built Silver Rating.
- Reducing waste, conserving resources and managing environmental impacts.
- Supporting Aboriginal participation, gender diversity and worker wellbeing.

How success is measured:

- ISC Silver rating achieved.
- Reductions in material, energy and water use, and high landfill diversion.
- Environmental limits met, with strong Aboriginal, female and wellbeing outcomes.

Figure 1 Sustainability objectives and target performance summary

2 Project Overview

2.1 Project Introduction

The Mandurah Estuary Bridge Duplication is delivering a major safety and efficiency upgrade to one of the region's busiest transport links. A new two-lane bridge is being built on the south side of the existing structure (Figure 2), which will allow traffic to flow in dual lanes in both directions. This upgrade will ease current congestion caused by growing traffic volumes and provide a more reliable connection between southern Mandurah and Bunbury.

The project also includes fully connected shared footpaths, giving pedestrian and cyclists safer, more direct links to local roads and nearby public transport. A new accessible fishing platform, upgraded car park and improved path connections are being built to enhance recreational opportunities for the community.

Project Objectives:

- Reduce congestion and improve travel times;
- Improve accessibility and connectivity of road networks;
- Improve freight productivity;
- Improve road safety for all road users; and
- Improve connectivity and safety for pedestrians, cyclists, and other users.

Beyond transport benefits, the project is boosting the local economy through local employment, Aboriginal participation, and opportunities for local businesses.

Construction began in late 2023, and the new bridge is scheduled to open in early 2026.

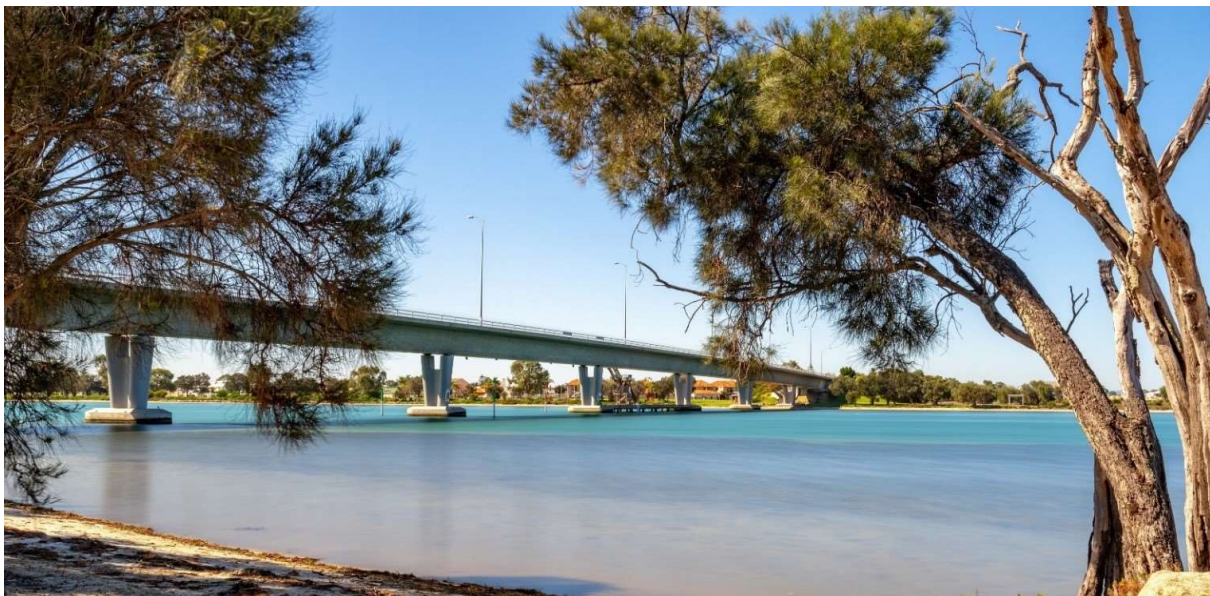


Figure 2 Existing Mandurah Estuary Bridge

2.2 Locality and Scope

The Project is located across the suburbs of Dudley Park, Halls Head and Erskine, along Mandurah Road, situated between Leslie Street and Old Coast Road. This thoroughfare is used to travel within Dudley Park, Halls Head and Falcon, and passing from the south through to the northern suburbs of Mandurah and Perth. Mandurah Road links Mandjoogoordap Drive to the old Lake Clifton Road,

which also serves as a major arterial network for oversize and over mass vehicles, which use the existing bridge to access Rockingham and Henderson ports.

Local stakeholders have been considered throughout project development to ensure final design delivers shared outcomes, and that construction activities do not disrupt businesses or residential operations. Community and stakeholder engagement has been a vital component of planning and delivery. Key Project stakeholders include the City of Mandurah, Main Roads, and Perth Transport Authority (PTA). A full list of stakeholders engaged can be found in Appendix 1.

The Project is within the Peel Region. Main Roads is the Asset Owner. The Project area is zoned as Primary Regional Roads within the Peel Region Scheme (PRS) – the basis for land use planning throughout the Peel Region. Foreshore reserves are zoned as 'Regional Open Space' in the PRS and the adjacent land to the Project area is zoned as 'Urban' (Figure 3).

Works being completed as part of the Project include:

- Design and construction of Bridge No. 1910 on the Highway for southbound traffic over the Estuary including Design and construction of modifications to existing Bridge No. 1085 on the Highway to be converted for use by northbound traffic over the Estuary.
- Design and construction of a new fishing platform.
- Design and construction of noise walls, retaining structures and walls.
- Design and construction of all connections, modifications and improvements necessary to connecting roads including access roads and intersections.
- Design and construction of road safety barriers.
- Design and construction of screen walls for privacy and headlight glare.
- Resurfacing of existing pavements where lane markings change, including resurfacing of the existing Bridge No. 1085 (northbound Highway over the Estuary).
- Provision of road reserve and other permanent fencing.
- Upgrade of existing parking area for fishing platform users at the eastern foreshore of the Estuary, including provision of sealed parking bays and access road from Waterside Drive.
- Provision of shared paths and footpaths including connections to the existing network. Replacement of existing paths where required.
- Design, installation, modification and upgrading of lighting.

An overview of major works and temporary construction are outlined in Figure 3, including the new fishing platform, the construction site compound and casting bed.

2.3 Project Map

Please refer to Figure 3 overleaf for a map of the Project.

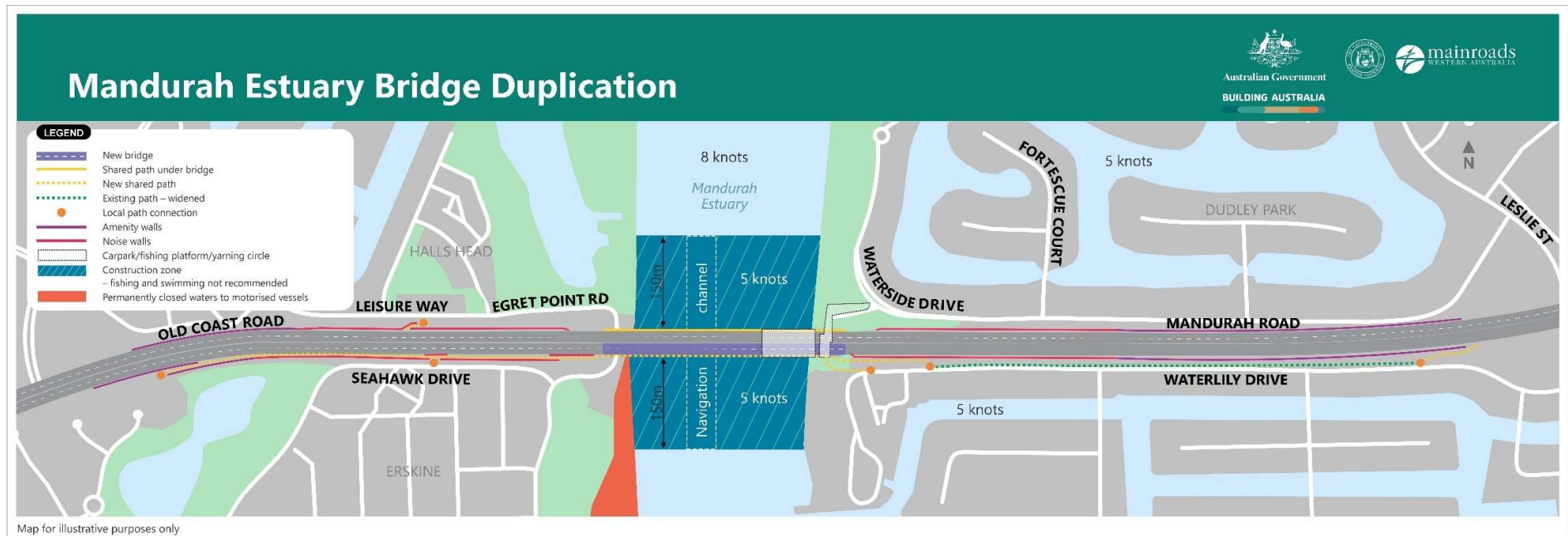


Figure 3 Project Map April 2025

2.4 Value and Funding

The \$148.8 million Project is jointly funded by the Australian (\$68 million) and Western Australian Governments (\$80.8 million).

2.5 Delivery Contractor

The Project is being delivered on behalf of Main Roads by local contractor Georgiou Group.

2.6 Project Timeline

Key Project milestones have been outlined in Figure 4 below. These include design and construction milestones, IS Rating milestones, and ongoing public reporting.

MANDURAH ESTUARY BRIDGE DUPLICATION (MEBD) PROJECT TIMELINE

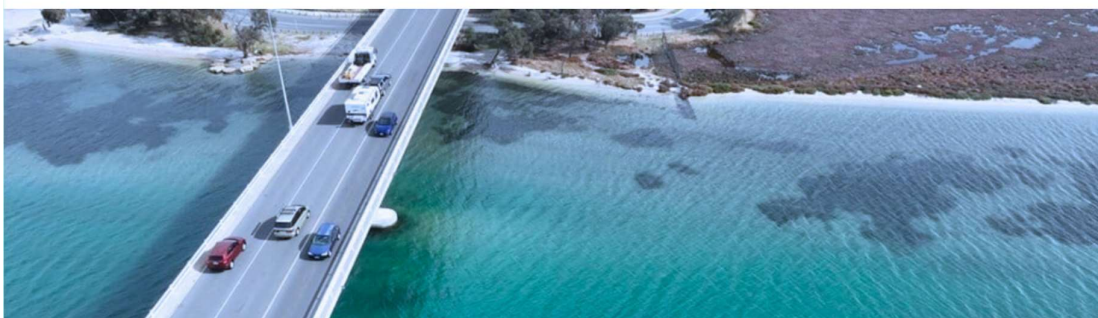


Figure 4 Project Timeline Infographic

3 Governance

3.1 Approach to Sustainability

The Project is seeking an ISC IS V2.1 Design and As Built 'Silver' Rating. This means we are embedding a high level of sustainable practice into all aspects of design and construction, based on industry-leading standards. These Ratings aim for optimal environmental, social and economic outcomes within the design and delivery of the Project, including the integration of processes and procedures to achieve outcomes on the Project within the following categories:

- Leadership and Management.
- Sustainable Procurement.
- Resilience.
- Options Assessment.
- Energy and Carbon.
- Environmental Impacts.
- Resource Efficiency and Management.
- Water.
- Stakeholder Engagement.
- Legacy.
- Heritage.
- Workforce Sustainability.

The Project is currently in the As Built phase and is awaiting the IS V2.1 Design Rating verification (Figure 4).

A Sustainability Management Plan (SMP) was implemented to outline how Georgiou will achieve all contractual deliverables and environmental, social and economic outcomes during design and construction phases. The Project's governance structure involves integrating sustainability within all disciplines on the Project and assigning personnel responsible for delivering sustainable outcomes within each discipline rather than sustainability being delivered isolated to the Project. The Project has a dedicated Sustainability Manager who is also an Infrastructure Sustainability Accredited Professional (ISAP) and reports directly to the Project Manager. The Project's key discipline leads form a Sustainability Leadership Committee (SLC), meeting monthly throughout design and construction phases to discuss sustainability progress, challenges and opportunities.

3.1.1 Sustainability Vision and Objectives

The Project's sustainability approach is based on the Sustainability Vision and Objectives established by Main Roads in the Planning Phase. The Project Vision is essentially an aspiration of the sustainability achievements. The Project Sustainability Vision is for:

"Connected, accessible and quality bridge and fishing platform that delivers a positive legacy by embracing local culture, improving habitat and amenity, and enhancing sense of place."

The Project's Sustainability Objectives are:

- Protect, enhance and integrate the existing uses of the Estuary 'place'.

- Protect and enhance the local environmental features.
- Improve accessibility, capacity, connectivity and safety for all users.
- Maximise business and employment opportunities for local communities.
- Deliver a high-quality outcome that is socially and environmentally sustainable and responds to the context and character of the area.
- Deliver a durable, resilient, low maintenance bridge that delivers value for money across all project phases.

The Project's Sustainability Objectives are designed to reflect the most important environmental, social and economic outcomes to be delivered during design, construction and operational phases of the Project. The Objectives are supported by several targets (Section 3.3) the team will work towards, to integrate the best environmental, social and economic outcomes for stakeholders aligned with their most important aspects (Section 3.2).

3.1.2 Sustainability Policy

Georgiou's Corporate Sustainability Policy commits the organisation to promoting a culture of sustainability across all operations and minimising environmental and social impacts by:

- Integrating sustainability initiatives throughout the business;
- Maintaining ethical responsibility in Project management, procurement and employment;
- Setting sustainable objectives and targets annually;
- Engaging with local communities;
- Supporting a diverse, engaged, motivated and competent workforce;
- Facilitating the sharing of ideas, knowledge and innovation that provide sustainable benefits;
- Maintaining health and safety of workforce, community and environment; and
- Delivering sustainable profits without compromising social, legal or contractual obligations.

A copy of the Sustainability Policy is provided in Appendix 2.

3.2 Material Sustainability Issues

The materiality process is a critical part of establishment, identifying the most important (material) sustainability issues to tailor the IS Rating tool to the Project.

A materiality assessment was completed during the Planning Rating and utilised as the basis of the assessment process in the delivery phase, to incorporate the substantial engagement activities and workshops completed during this stage. The preliminary sustainability workshop involved Main Roads, local government and key stakeholders including Office of the Government Architect, City of Mandurah, Department of Transport Maritime, Peel-Harvey Catchment Council and Peel Development Council. Input was sought on what were considered to be the priority issues, and this was internally reviewed by the Planning Phase Project team for applicability prior to implementation.

The Project's material issues were reviewed and updated after Contract Award by a multidisciplinary representation from the MEBD Project team including the Sustainability Manager (Georgiou), Environmental Manager (Georgiou), Aboriginal Engagement Officer (Georgiou), Commercial Manager (Georgiou), Quality Manager (Georgiou), Structures Lead (Georgiou), Designer – Structures (BG&E), Designer – Civils (BG&E), Senior Project Manager (Georgiou), Sustainability Lead (BG&E), Project Manager (Main Roads), Community Manager (Georgiou), HSE Senior Advisor (Georgiou), Electrical Design Lead (BEST Consultants), Urban and Landscape Design Architect (Landscape Planners), Project Director (Main Roads), Pavements Lead (Georgiou), Design Interface Manager (Georgiou). This ensured the material issues were an accurate representation of the Project's most important issues. The following issues were identified as the most important in terms of significance

of impacts and importance to stakeholders:

- Stakeholder Engagement.
- Local Business / Job Opportunities.
- Urban and Landscape Design, Recreational Use, and Accessibility and Connectivity.
- Benthic Habitats.
- Culture, History and Heritage.
- Resilience and Climate.
- Noise and Vibration.
- Water Quality and Wetlands.

These guide the environmental, social and economic outcomes the delivery team focuses on. They are discussed further within this Report.

3.3 Sustainability Targets

Sustainability targets have been developed for achievement over the design, construction and operational phases of the Project (Table 1).

These targets were developed following review and identification of the above listed material issues (Section 3.3), and engagement with internal multidisciplinary stakeholders and external Project stakeholders. External stakeholders were engaged to review and provide input into the finalisation of the Project's sustainability objectives and targets through an in-person workshop and mapping exercise. Stakeholders engaged included the City of Mandurah, Department of Transport Maritime, Peel-Harvey Catchment Council, Bindjareb Traditional Owners, Mandurah Environment and Heritage Group, Estuary Guardians, FishAbility, the City of Mandurah Access and Inclusion Group, and the Department of Water and Environmental Regulation. The final targets were reviewed and approved by the Georgiou Senior Project Manager and Main Roads Project Manager.

Targets are published on the Project Website for the Project Planning, Design, Construction and Operation Phases. Performance of each of these targets is reported annually within the Project Annual Sustainability Reports.

Table 1 Project Sustainability Objectives and Targets

Sustainability Objectives	Targets	Phase	Delivery Personnel Responsible	June 2025 Status* Update
Protect, enhance and integrate the existing uses of the Estuary 'place'.	Enhance the existing recreational facilities and connected path network within the Project area for all-abilities users, by: • implementing a new accessible fishing platform and associated fishing facilities; • new accessible car park with six Australian Council for Rehabilitation of Disabled (ACROD) parking bays; and • enhanced shared path network. Demonstrated through survey that 75 per cent of responders are satisfied the quality of place has been improved.	Design & Construction	Stakeholder Manager	On track; all design actions complete and opportunities implemented in final design. Pending survey responses.
	Improve existing recreational facilities through upgraded playground and educational facilities, promoting the local environment.	Design & Construction	Sustainability Manager	On track; concept finalised, to be constructed.
	Incorporate at least three pieces of public art into the Project incorporating themes that reflect the history, Aboriginal heritage, and/or environment of the local Mandurah Estuary area. Consult and incorporate input from Local Bindjareb Noongar people into all artwork reflecting Aboriginal culture. Create an additional seating node and collaborate with the Local Bindjareb Noongar people to enhance appreciation of the area.	Design	Indigenous Engagement Officer	Complete; Bindjareb reference group has been involved in the artwork development process. Three public art pieces are being coordinated by the Project.
Protect and enhance the local environmental features.	Provide permanent interpretative elements regarding the heritage and environmental value of the area, recognising Dolphins of the Peel-Harvey Estuary, the Ramsar Wetland status and migratory birds, to enhance environmental awareness and appreciation.	Design & Construction	Sustainability Manager & Indigenous Engagement Officer	On track; elements have been implemented in final design. Content is being developed by the Project in consultation with local stakeholders.
	Provide Marine Mammal Observer (MMO) monitoring data from the construction phase to Dr Krista Nicholson from Murdoch University.	Construction	Environmental Manager	Complete; all MMO data has been shared with Dr Krista Nicholson.

Sustainability Objectives	Targets	Phase	Delivery Personnel Responsible	June 2025 Status* Update
Improve accessibility, capacity, connectivity, and safety for all users.	All plant species used for landscaping are indigenous species (endemics).	Design & Construction	Design Manager	On track; endemic species have been included in final design.
	Increase eastbound morning peak hour median speed by 10% compared to pre-construction traffic conditions.	Design & Construction	Project Manager	On track; incorporated into final design, pending monitoring outcomes.
	Reduce crash frequency (rear and side swipes) within Project area compared to pre-construction crash statistics.	Design & Construction	Project Manager	On track; incorporated into final design, pending monitoring outcomes.
	Undertake a permeability assessment and achieve an improved Link and Place (Jones & Boujenko, 2009) score, Movement and Place score or similar methodology, including facilitating safe path access to bus stop ID 27635 on the south side of Mandurah Road.	Design	Design Manager	Complete; a Permeability assessment was completed by the Project's landscape architect indicating an improvement in link and place score as a result of final design.
Maximise business and employment opportunities for local communities.	At least 3.5% Project spend on materials sourced within 50km radius of the Project.	Design & Construction	Commercial Manager	On track; to date the Project has spent 5% on materials sourced locally.
	At least 3.5% of contract value is awarded to registered Aboriginal businesses during construction phase.	Design & Construction	Indigenous Engagement Officer	On track; to date the Project has spent greater than 5% on Aboriginal businesses.
	Provide two local businesses within 50km radius of the Project who have not completed Main Roads works, ability to competitively tender, understand specifications and quality requirements, and successfully submit bid for works on the Project.	Design & Construction	Commercial Manager	On track; the Project team has engaged two local businesses who have not previously been involved in a Main Roads project. The Project team has also engaged a local Aboriginal business.
	At least 7% of Project value spend on businesses within a 50km radius of the Project.	Design & Construction	Commercial Manager	On track; to date the Project has spend 9% on local businesses.
	Keep navigational channel open for at least 95% of the construction Project program.	Design & Construction	Construction Manager	On track; no closures have been carried out or planned to date.

Sustainability Objectives	Targets	Phase	Delivery Personnel Responsible	June 2025 Status* Update
Deliver a durable, resilient, low maintenance bridge that delivers value for money across all project phases.	Implement at least three opportunities to reduce maintenance compared to the existing Mandurah Estuary Bridge.	Design & Operation	Design Manager	Complete; opportunities have been implemented into final design to reduce maintenance including no scuppers and integrated drainage system on the new bridge.
	Identify and treat high climate and natural hazard risks and priority shocks and stresses within permanent design, to deliver a more resilient asset and associated infrastructure.	Design, Construction & Operation	Sustainability Manager	On track; risk assessment completed and treatment actions implemented in final design. Pending ongoing treatment actions in construction and handover to operators for ongoing management.
	Design and install motion sensor lighting on the fishing platform and car park to reduce energy and emissions and light impacts to sensitive receptors.	Design & Operation	Design Manager	Complete; Incorporated into final design.
	Greater than 75% of all stakeholders are satisfied that their input has influenced positive outcomes on the Project.	Design & Construction	Stakeholder Manager	On track; 75% of stakeholder surveyed at the end of the design (October 2024) phase were satisfied their input influenced positive outcomes on the Project. Ongoing engagement activities and second survey at the end of the construction phase remaining.
	Beneficially re-use at least two resource outputs on the Project.	Design & Construction	Construction Manager	Complete; multiple opportunities have been implemented in design and construction planning, including the reuse of imported material for preloading activities, and the reuse of casting bed concrete within final alignment.

Sustainability Objectives	Targets	Phase	Delivery Personnel Responsible	June 2025 Status* Update
Deliver a high-quality outcome that is socially and environmentally sustainable and responds to the context and character of the area.	Achieve an ISC IS V2.1 Design and As Built Silver Rating.	Design & Construction	Sustainability Manager	On track; monthly performance is positively tracking towards achieving the Silver Rating.
	Implement opportunities to optimise the use of materials on the Project and achieve a reduction in the environmental impacts of materials across design, construction and operational life of the asset, by a minimum of 10 per cent.	Design, Construction & Operation	Sustainability Manager	On track; a Life Cycle Assessment (LCA) was completed at the end of the design phase, and found the Project has reduced the environmental impacts of materials from the ISC Verified Base Case by 50%.
	Implement opportunities to reduce energy use and emissions across design, construction and operational life of the asset, by a minimum of 10 per cent.	Design, Construction & Operation	Sustainability Manager	Behind; a Life Cycle Assessment (LCA) was completed at the end of the design phase, and found the Project has reduced the energy use from the ISC Verified Base Case by 5%.
	Implement opportunities to reduce water usage across design, construction and operational life of the asset, by a minimum of 10 per cent.	Design, Construction & Operation	Sustainability Manager	Not achieved; a Life Cycle Assessment (LCA) was completed at the end of the design phase, and found the Project has reduced the energy use from the ISC Verified Base Case by 1%. Based on the scope of works remaining the Project will be unable to implement further opportunities to meet this reduction target.
	At least >85% of treated ASS is diverted from landfill (including >50% onsite reuse) in line with the DWER approved ASSMP.	Design & Construction	Construction Manager & Section Leads	On track; all excavated ASS to date has been treated and reused on site.

Sustainability Objectives	Targets	Phase	Delivery Personnel Responsible	June 2025 Status* Update
	At least >85% of clean/inert material excavated is diverted from landfill (including >50% onsite reuse of clean/inert excavation spoil).	Design & Construction	Construction Manager & Section Leads	On track; to date all site won material has been reused on site.
	At least >60% office resource outputs are diverted from landfill.	Construction	Construction Manager & Section Leads	Not achieved; 32% of all office waste has been diverted from landfill, despite rectification actions being implemented.
	At least >70% all other inert resource outputs are diverted from landfill.	Construction	Construction Manager & Section Leads	On track; 99% of all inert outputs have been recycled and diverted from landfill.
	Greater than 70% of all water used for construction purposes is recycled water.	Construction	Construction Manager & Section Leads	On track; 68% of all water used to date has been recycled water.
	Minimise light pollution and impacts to sensitive receptors, demonstrated through no more than two horizontal lux level over the Project boundary and two per cent upward light ratio (excluding decorative lighting).	Design	Design Manager	Complete; an assessment and report was completed by the Project's lighting designer confirming this target has been achieved.
	Minimise impacts of noise emissions to nearby receptors as a result of the Project, by ensuring all mitigation measures specified in the EMP are implemented and no recurring unresolved exceedances of noise goals.	Construction	Environmental Manager	On track; ongoing management of noise during construction as per the Environmental Management Plan.
	Minimise impacts to nearby receptors as a result of vibration generated by construction activities associated with the Project, by ensuring all mitigation measures specified in the EMP are implemented, and no recurring unresolved exceedances of vibration goals.	Construction	Environmental Manager	On track; ongoing management of vibration during construction as per the Environmental Management Plan.
	Achieve at least 10 per cent of total work hours undertaken by local Aboriginal persons.	Construction	Indigenous Engagement Officer	On track; to date greater than 10% of total work hours have been undertaken by Aboriginal persons.

Sustainability Objectives	Targets	Phase	Delivery Personnel Responsible	June 2025 Status* Update
	Achieve at least 10 per cent of women in the workforce.	Construction	Project Manager	On track; approximately 10% of the workforce is made up of women.
	Improve wellbeing for all employees on the Project through a Health and Wellbeing Plan, demonstrated by achieving >80% positive score in the team sentiment survey.	Construction	Project Manager	On track; A Health and Wellbeing Management Plan has been rolled out including initiatives. A greater than 80% positive score has been achieved in each team sentiment survey to date.

**Status is reported as follows:*

Complete: all actions complete and target achieved.

On track: based on findings to date, the target appears to be on track for achievement by Project Completion.

Behind: target does not appear achievable based on findings to date.

Not achieved: target unable to be achieved.

3.4 United Nations Sustainable Development Goals

The UN SDGs are an internationally agreed set of sustainability targets developed by the UN in 2015 as part of the 2030 Agenda for Sustainable Development. The 17 SDGs recognise that ending poverty and other deprivations must go hand-in-hand with strategies that improve health and education, reduce inequality, and spur economic growth – all while tackling climate change and working to preserve our oceans and forests.

These 17 sustainability goals are being embedded into government policies and reporting frameworks globally, including the ISC IS Rating scheme. As is the nature of sustainability, the SDGs are correlated, and work within one goal may support the performance of another.

The Project's sustainability approach contributes to the performance outcomes of many of the SDGs. Whilst the sub-targets of the SDGs are not directly aligned to the Project performance areas, many of the Project sustainability targets contribute indirectly to the outcomes pursued by the SDGs. A high-level overview of the Project's contribution to these global sustainability targets is captured in Table 2 below.

Table 2 SDGs and Project contributions

SDGs	SDG Goal	Project performance contributing to the SDGs
 1 NO POVERTY	End Poverty in all its forms everywhere.	The Project is unlikely to impact poverty in the context of the sustainability targets and indicators for this SDG.
 2 ZERO HUNGER	End hunger, achieve food security and improved nutrition and promote sustainable agriculture.	The Project scope is not aligned to the contribution of this goal.
 3 GOOD HEALTH AND WELL-BEING	Ensure healthy lives and promote well-being for all at all ages.	Greater than 80% of all employees have reported an improvement in health and wellbeing in the team sentiment survey. Monitoring of post-construction crash statistics is required to confirm if the Project design has reduced the risk of collisions along Mandurah Road. Achievement of an improved Link and Place score demonstrates positive contribution to the development of safe transport networks and wellbeing of all users.
 4 QUALITY EDUCATION	Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.	The Project is unlikely to impact education in the context of the sustainability targets and indicators for this SDG.
 5 GENDER EQUALITY	Achieve gender equality and empower all women and girls.	A minimum 10% workforce representing women has been achieved to date.

SDGs	SDG Goal	Project performance contributing to the SDGs
6 CLEAN WATER AND SANITATION 	Ensure availability and sustainable management of water and sanitation for all.	Greater than 70% of all water used has been sourced from a sustainable water source.
7 AFFORDABLE AND CLEAN ENERGY 	Ensure access to affordable, reliable, sustainable and modern energy for all.	The Project is unlikely to impact access to affordable and clean energy and enhancing energy efficiency, aligned to the sub-targets of this SDG.
8 DECENT WORK AND ECONOMIC GROWTH 	Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all.	To date 9% of total contract value has been spent on local sustainable economic growth, full businesses within 50km of the Project. 5% of contract value has been awarded to date to registered Aboriginal businesses.
9 INDUSTRY, INNOVATION AND INFRASTRUCTURE 	Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation.	A Climate, Natural Hazards and Resilience Risk Assessment was completed in design and risks treated within design and construction. A Resource Efficiency Management Plan and associated resource efficiency targets were implemented in design. 91% of the Project's resource efficiency targets are complete and/or on track. The Project has also contributed through research and implementation of innovation initiatives surrounding lighting, precast concrete structures and recycled water solutions on the Project. The Project can be considered as negatively contributing to this SDG, due to the avoidance of water usage target being behind.
10 REDUCED INEQUALITIES 	Reduce inequality within and among countries.	100% of on-site full-time employees receive diversity and inclusion training.
11 SUSTAINABLE CITIES AND COMMUNITIES 	Make cities and human settlements inclusive, safe, resilient and sustainable.	Through delivery of the Project Works, the Project is facilitating access to safe, accessible and sustainable transport systems for all road users. The Project sustainability targets include improving connectivity and accessibility for all-abilities users. Through the resilience risk assessment process implemented on the Project, the Project is identifying potential shocks and stresses, vulnerable communities and suitable treatment opportunities to be integrated.
12 RESPONSIBLE CONSUMPTION AND PRODUCTION 	Ensure sustainable consumption and production patterns.	The Project contributes to the targets within this SDG through the implementation of the Resource Efficiency Management Plan and the efficient management of all resources. 91% of the Project's resource output targets are complete and/or on track. Georgiou continue to work with the supply chain to implement innovative solutions and reuse existing materials in lieu of sourcing virgin materials. Packages with opportunities to identify sustainable

SDGs	SDG Goal	Project performance contributing to the SDGs
		material alternative are discussed early on for action and subcontractors are asked within vendor evaluations to put forward opportunities to maximise the use of recycled material, recycle waste materials and implement innovative alternatives. The Project is also responsible for maintaining human rights in the supply chain by mitigating the risk of modern slavery in the Project's procurement supply chain. This risk has been mitigated by having the following controls: all subcontract agreements have a clause in support of modern slavery laws for overseas suppliers; validation of modern slavery documentation by Georgiou Commercial Manager; and implementation of Georgiou's Code of Conduct. The Project can be considered as negatively contributing to this SDG, due to the office waste diversion from landfill target being reported as 'Behind'.
13 CLIMATE ACTION 	Take urgent action to combat climate change and its impacts.	The Project team successfully completed the target to identify and treat high climate and natural hazard risks within permanent design, to deliver a more resilient asset and associated infrastructure. 63% of all Inherent Risks identified had treatment options implemented and risks mitigated to a lower Residual Risk level. The Project can be considered as negatively contributing to this SDG, due to the emissions' footprint reduction target being behind.
14 LIFE BELOW WATER 	Conserve and sustainably use the oceans, seas and marine resources for sustainable development.	The Project scope is not aligned to the contribution of this goal.
15 LIFE ON LAND 	Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss.	The Project scope is not aligned to the contribution of this goal.
16 PEACE, JUSTICE AND STRONG INSTITUTIONS 	Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels.	The Project scope is not aligned to the contribution of this goal.
17 PARTNERSHIPS FOR THE GOALS 	Strengthen the means of implementation and revitalize the Global Partnership for Sustainable Development.	Indirect contribution through the alignment of the global sustainability goals with the Project's sustainability outcomes.

4 Economic

Table 3 Summary of Economic Metrics

ECONOMIC METRICS	UNIT	TOTAL THIS PERIOD	TOTAL FOR PROJECT
Funding Received	\$	73,310,328.30	95,692,223.09
Aboriginal Business Spend	\$	3,352,451.09	3,899,175.99
Aboriginal Businesses	#	6	7
Disability Enterprises	#	0	0
Suppliers Engaged	#	49	301
Buy Local Spend	\$	4,704,978.18	6,700,23.31
Length of Principal Shared Path (Addition/Refurbished)	km	0	0

Table 4 Economic target performance summary

ECONOMIC TARGETS	UNIT	TARGET	ACTUAL
At least 7% spend on local businesses within 50km of the Project (of total contract value).	%	7	11.1
At least 3.5% Project spend on materials sourced within 50km radius of the Project.	%	3.5	5.9
At least 3.5% of contract value is awarded to registered Aboriginal businesses during construction phase	%	3.5	7.2

4.1 Economic Context

The Project is located within the Peel Region, considered part of the Southwest Region of Western Australia. Due to its location and capital value, the Project has the opportunity to contribute to business capability and capacity building in the local Mandurah and Peel Region. Local business and job opportunities were recognised as a material issue on the Project, and targets were established to see this realised during design and construction (refer Table 4).

The new bridge will decrease congestion, improve the safety of commuters and reduce commute time by an estimated three (3) minutes for residents and businesses servicing the areas to the north and south of the estuary. The ability to increase the flow of traffic would make the southern area of the estuary more attractive for residents and business to establish in the areas of Falcon, Halls Head and Dawesville.

Land uses immediately adjacent to the Project include the Mandurah Estuary, residential areas, public recreational areas including food trucks, and environmental reserves. All stakeholders are listed in Appendix 4. Construction works have not involved any closures of the navigational channel or closures to Mandurah Road.

Recently considered one of the fastest growing regional areas in Australia, the population in the Mandurah area has significantly increased and the areas south of Mandurah namely Erskine, Falcon, Halls Head and Dawesville have developed into large residential areas. This has created the need for the additional bridge to accommodate the increased traffic flow. The current number of vehicles travelling over the existing bridge is more than 35,000 vehicles per day with a predicted number of vehicles rising to more than 50,000 vehicles per day by 2041. There is currently no passenger rail

system south of Mandurah and residents and businesses are solely reliant on the two roads that link north and south of the estuary outlet.

The dependence on labour and suppliers located in Perth, which is about 70 kilometres away, is one of the obstacles of a project in Mandurah. When materials and equipment need to be transported to the site on a regular basis, this distance leads to higher transportation costs and associated carbon emissions. Furthermore, sourcing locally is a key sustainability objective, but it presents challenges when specialised subcontractors are required. The Project team has awarded locally where feasible and collaborated with local businesses to support capacity building and allow smaller packages of works to be awarded locally.

4.2 Economic Aspects Management

The Project team complies with the procurement management plan where specific tasks and responsibilities lie with specific persons involved with the procurement aspect for the Project. The Commercial Manager on the Project ensures that all persons comply with their responsibilities and undertake their tasks as per the procurement management plan framework and detail for the responsible person and task. Weekly meetings were held with all stakeholders involved in the procurement process detailing progress of procuring items, tasks undertaken by responsible persons and conformance of the procedure to purchase/engage subcontractor as per the procurement plan. Procurement management is to comply with the Sustainable Procurement requirements within ISC ISV2.1. Management measures are incorporated in the Procurement Plan and SMP.

A company delegation of authority (DOA) was implemented on the Project to ensure the Project complies with the company's governance measures which, as a check, also ensures any malpractice or fraudulent activity and that the company's interest regarding the procurement is maintained.

4.2.1 Challenges

A project's continual challenge (particularly on a design and construct project) is to get the design finalised as soon as possible to accurately establish a scope of work suitable to lock in prices or, alternatively, negotiate fixed prices for the duration of the project if possible. The Project was able to establish an 85% design relatively early in the delivery phase and ensure that subcontract packages were awarded timeously.

The ability to offer alternative products with a more sustainable purpose (e.g. green steel) generally had cost implications, and in some instances specialist resourcing was required. The Project however opted where the financial impact was not excessive to procure the more sustainable product where possible (e.g. costs surcharge for the use of low carbon / 'green' concrete). Unfortunately, where the economic impact was too great, the Project was limited to implement alternative products.

The use of local materials was also limited in the sense that certain local materials were more expensive than non-local materials or that the local material did not comply with the required standards to use. This was a challenge as the Project also had a target to procure materials locally and engage suppliers and subcontractors locally.

The use of local trade workers was also limited and where possible (albeit with a surcharge to some of the non-local trade workers) local trade workers were employed where possible.

Careful planning also had to be undertaken when ordering of certain products to limit the number of deliveries as much as possible to reduce transport costs, fuel use and emissions.

4.2.2 Modern Slavery

Georgiou remains committed to identifying and mitigating any risks associated with modern

slavery practices in our supply chains and operations. We continue to strive for sustainable growth through responsible business practices and require the same of our subcontractors and suppliers through our network of partners delivering our projects throughout Western Australia and beyond. Georgiou completes an annual Modern Slavery Statement under the *Modern Slavery Act 2018*, to detail the strategies in place within Georgiou to continue the identification and prevention of any potential modern slavery activities. Actions implemented by the MEBD Project to identify, assess and mitigate the risks of modern slavery include:

- All subcontract agreements have a clause about Modern Slavery laws for action of overseas suppliers.
- Third party review from the Georgiou Commercial Manager (WA) of our suppliers' documentation to ensure these are appropriate and remedied as required.
- Implementation of Georgiou's Code of Conduct. This applies to all Georgiou employees, subcontractors, suppliers and consultants. All parties are expected to act consistently with fundamental Georgiou values, ethical behaviour and accountability and transparency in our conduct, with protections against conflicts of interest and bribery in our business and supply chain.

4.2.3 Local Business and Job Opportunities

One of the main areas of economic focus for the client and Project partners is maximising local company involvement and job possibilities in Mandurah and the wider Peel Region. As part of the contractual agreement between Georgiou and Main Roads a sustainable procurement goal was established for this Project, which was a local spend of 7% of the total spend on local business within the Project. By sourcing materials, services, and labour locally, the Project has supported local capacity building, reduced transport-related emissions and promoted quicker, more responsive supply chains. This approach supports job creation in the Peel-Harvey region and follows sustainable buying practices by lowering the Project's overall carbon footprint and building long-term partnerships within the community.

Currently, the Project employs approximately 90 staff that are either directly employed by Georgiou or as subcontractors. The Project is expected to employ more than 350 people over the duration of the construction period, with a large proportion of persons employed coming from the local area or a local business.

As of the end of May, 44% of the total workforce, which includes both white-collar and blue-collar roles, lives within the Peel-Harvey region. This shows strong local engagement and a connection to regional employment priorities. The remaining 56% of the workforce commutes from the greater Perth metropolitan area to the Mandurah Estuary Bridge Project. This distribution highlights the Project's role in creating local jobs while also showing the ongoing need for the broader Perth labour market to fulfill specialized skill and capacity requirements. Continued efforts to improve skills and involve the local workforce may help increase the number of workers based in the area over time.

4.2.4 Climate and Resilience

During early design phase a Resilience Plan was prepared, building on the work done during the Planning phase and where necessary, inclusive of updates specific to design, construction and operation. This Plan involved an analysis of shocks and stresses, an analysis of interdependent infrastructure and services (including their condition and criticality), a review of climate change risks, assessment and treatments, and how treatment options will be implemented. A multidisciplinary review was completed at the commencement of Project delivery phase including key internal stakeholders from design and construction, further informed by external stakeholder engagement.

The analysis of shocks and stresses identified opportunities for the new assets to contribute to the resilience of the wider Peel Region and to identify treatment options to manage impacts to critical interdependent assets and services connected to the new MEBD bridge. A number of external stakeholders were involved in assessing resilience shocks and stresses in the design phase. Engagement was undertaken with active transport groups (Department of Transport and WestCycle), environment and community groups (Mandurah Estuary Heritage Group, Estuary Guardians, Dr Krista Nicholson), the City of Mandurah (including community development representatives and local emergency management), emergency services and Main Roads.

This process identified the following priority shocks and stresses for the Project:

- Anti-social behaviour/vandalism. Design has minimised the amount of under-bridge parking so this area is not hidden from passive surveillance. Provision for CCTV to be installed in the future has been incorporated into final design. Project Landscaping Design also incorporates CPTED principles.
- Inadequate urban planning - pollution / contamination impact on natural assets if inadequate drainage design/Water Sensitive Urban Design (WSUD) measures adopted. Main risks to manage are from concrete and diesel spill during construction. Pollution risk is managed through controls within the Environmental Management Plan. WSUD measures incorporated into Project Drainage Design (refer to Section 5.2.1) and treatment measures implemented to treat stormwater within the network including Gross Pollutant Traps (GPTs).
- Lack of transport accessibility. Project has included a new shared path to the bus stop on southwest side of bridge, which reduces walking distance and can make public transport a more attractive option. The path on the new bridge is wider than existing bridge. Additional space will be more attractive to people walking, biking and on e-mobility devices. This also improves maintenance access.
- Failure of critical infrastructure due to major incident or accident e.g. Gas main incident, traffic accident – resulting in delays and detours. Risk has been reduced by excluding services from the bridge - gas main is no longer accommodated in the bridge structure. The new bridge is also considered to provide options for diversions and partial closures as necessary.
- Failure of critical infrastructure due to major incident or accident e.g. Gas main incident, traffic accident – pollution / contamination impact on natural assets (including fauna and flora). New bridge does not have scuppers (drainage outlets to the river) as the old bridge has, meaning that all water (and potential spill) passes through the drainage system to basins, swales and bioretention. There are some opportunities to transfer water from the existing to the new bridge via expansion joints, thus reducing volume of water to the river compared with current arrangement

Climate and natural hazard risks were also assessed by the Project and controls implemented into final design. Climate change projections and local data was assessed by a suitably qualified professional, prior to a multidisciplinary assessment of risks relevant to 2030 and 2090 climate projections. Representative Concentration Pathway (RCP) 8.5 was adopted for projections, in line with current industry practice. The risk assessment process for the Project was designed to conform to AS5334-2013 Climate change adaptation for settlements and infrastructure – a risk-based approach and drew extensively on AS/NZS ISO31000-2009 Risk management – principles and guidelines. Much like resilience risks, engagement was undertaken during the Design phase with stakeholders including Government representatives (Local and State) and a selection providers and community stakeholders to inform the risk assessment.

Further to this, as part of the Project, BG&E has undertaken a waterways analysis for duplication of

the Mandurah Estuary Bridge. To account for climate change and uncertainties in design and model inputs, the waterways assessment also included sensitivity analysis by varying flows, sea levels and possible changes to design in sub-structure. The scenarios included:

- Increase in sea level by 0.9m (in line with projected increase).
- Increase in design flows by 25%.

The report summarises the impact on the design velocity and scour depth as a result of each scenario. Based on the waterways modelling (including the sensitivity analysis), structural design inputs and the increased factors for the water levels and surface velocity have been adopted for the bridge structural design to cater for climate change in the bridge design.

Through the planning and subsequent design stages of the Project, the Project has mitigated 63% of the Inherent Risks to an appropriate Residual Risk level. There are further aims in the future stages of the Project (construction and operations) to increase this number to further mitigate Inherent climate and natural hazard risks.

4.2.5 Sustainable Transport, Accessibility

The wider area is a popular destination for fishers including the Fishability program, assisting children and adults requiring support to experience the joy of fishing with assistance. The existing platform is only accessible through stairs and through consultation in the previous phase, the new platform is designed to be fully accessible through the new carpark planned off Waterlily Drive. The new carpark will also be constructed with nine ACROD parking bays.

Georgiou has met multiple times with the City of Mandurah Access and Inclusion Advisory Group (AIAG) to discuss permanent design and understand opportunities to adapt the fishing platform and associated infrastructure and make these areas more accessible. Further opportunities implemented in permanent design include the provision of additional ACROD bays, bicycle racks provided at new carpark, and the design of the fish cleaning station at an accessible height.

4.2.6 Sustainable Transport, Connectivity

The main objective of the new duplication bridge is to improve the connectivity between Mandurah and the areas south of Mandurah. By not destroying the existing bridge and building an entirely new bridge, the addition of a duplicate bridge with a design life of 100 years will contribute to the sustainability of the route between the north and south. Design has allowed for future provision of additional assets including an additional lane and additional infrastructure (CCTV).

Construction of the new bridge and associated works will increase pedestrian and cyclist connectivity through new connections being constructed as part of permanent works. New connections include:

- connection of Waterlily Drive to the new shared path on the bridge.
- connection of western shared path to existing shared path near Abbotswood Lake.
- connection of shared path on western side to Seahawk Drive.

These new connections facilitate access to the new fishing platform and carpark, improved connectivity to public transport, and improve north south access across the Highway.

4.3 Economic Outcomes

The key economic outcomes from the construction of the Project can be briefly summarised as:

- Local spend in the area will be increased by employing local staff and businesses.
- A minimum 3.5% (of total contract value). This target is currently has been exceeded please refer to Table 4 above.

- Reduce congestion and improve travel times by an estimated three (3) minutes, expected to increase productivity.
- Improve freight productivity.
- Improve safety, accessibility and connectivity of roads and pedestrian and cyclist areas. This may increase the interest of families and businesses to join the area.
- Increase development and further business opportunities that accompany population growth.

4.4 Economic Case Study, working with Aboriginal businesses

Working with local, emerging Aboriginal businesses is at the forefront of procurement activities on the Project. Not only does this support Aboriginal families and community but also brings opportunity to increase the local area's economic performance. Georgiou understands the importance of supporting Aboriginal businesses through the procurement of goods and/or services as required by the Project. We aim to assist in the continual development of Aboriginal businesses to expand their service/supply chain value proposition to ensure a sustainable enterprise is developed once the Project has concluded. Not only does this positively impact those involved within businesses but it extends to the wider communities and future generations. The project has a target of 3.5% of spend to be with Aboriginal businesses and as of July 2025, we have spent approximately \$7.3 million which equates to 9.3% of spend.

So far within the lifespan of the Project, Georgiou has held their own Indigenous Business Open House in January 2024 which hosted 10 Aboriginal businesses (Figure 5). This Open House was held during early stages of design prior to majority of the procurement packages going out and gives businesses opportunity to speak directly to the Project Design team, Engineers, Supervision and Management around upcoming packages. From this forum, two businesses are actively being engaged with, regarding the electrical and concrete precast packages.



Figure 5 Georgiou Project Manager, Georgiou Design Manager and Uncle George Walley (Bindjareb Elder & Traditional Owner)

Georgiou has also become involved with the Waalitj Hub – a subdivision of the Waalitj Foundation who provide support to Aboriginal and/or Torres Strait Islander people wanting to start, grow or sustain their business. The Project presented at the Hub's Mandjoogoordap Business Builders in May 2024 (Figure 6), in which we were able to provide details on the business, Project itself, the packages in which business could price and a run through of our simplified procurement process.



Figure 6 Georgiou Waalitj Hub Presentation, Business Builders, Mandjoogoordap

From the success of the Open House and engagement through Waalitj Hub in the region, we were able to award a majority of the Electrical works on the project to an emerging local, Aboriginal business, Mallee Karlip (refer to Section 4.5). Not only are they a local business but they strive to employ local Aboriginal people, whether they be already trade qualified, or are looking for an Apprenticeship.

Furthermore, Georgiou have engaged Winjan Aboriginal Corporation to complete all Heritage requirements relating to the Section 18 approvals for Place ID 32696 Djilba. This contributed over 1200 hours of employment for local Traditional Owners on the Project and injecting spend directly back into the Bindjareb community.

Finally, the Project has engaged Miranda (Mandy) Davis, an emerging local Aboriginal artist to oversee and complete a series of artworks across the Project. One being a community project Mural (Koorliny Mandjoogoordap – Coming Together in Mandurah) that now sits on Leisure Way to the Egret Point bus stop (refer to Figure 7) and we look forward to Aunty Mandy returning to the Project in the next few months to complete artworks on the land based piers. This engagement also facilitated working hours for artists (refer to Figure 8) and so far, approximately \$40,000 in payments to an up-and-coming artist.



Figure 7 Koorliny Mandjoogoordap – Coming Together in Mandurah



Figure 8 Alan Davis, Bindjareb Artist

4.5 Economic Case Study, Local Business Capacity Building

As part of our commitment to support local industry, the Project engaged a local electrical company (Figure 9) from Rockingham in August 2024 as their first project with Main Roads. This was an important step for the business as it gave them a chance to expand their skills and take part in a major infrastructure development in their region. Georgiou worked closely with the team to ensure a smooth onboarding process and contract execution in June 2025, and provided guidance and mentorship on the expectations and standards for Main Road projects.

Mallee Karlip General Manager Jay Collard, provided the following feedback to the Project team:

"As we are entering the final quarter stage of the electrical works on the project, I would like to take this opportunity to thank Georgiou for the opportunity provided to Mallee Karlip to undertake the electrical and feature lighting works. At the time of tender and negotiation not only was it the biggest but also the first project undertaken by Mallee Karlip for Main Roads as client. Georgiou further entrusted Mallee Karlip to successfully negotiate a large variation to the works being the installation of the feature lighting to both bridges.

The Georgiou team on the Mandurah Estuary Bridge Project have assisted and guided the Mallee Karlip team throughout the progression of works including early payment for materials off site, and advice and guidance on certain tasks that were unfamiliar to Mallee Karlip and included but not limited to sustainability, quality, administration, management processes and document control. The team at Mallee Karlip would like to express their sincere gratitude to Georgiou for the guidance and support provided throughout the duration of this project, and we look forward to the opportunity to work together on future projects."

Through this partnership Georgiou helped the local company understand and implement essential Main Roads processes. This included quality assurance, procurement compliance, and project documentation. Regular workshops and one-on-one support built their confidence and skills in meeting government requirements. This support not only helped them successfully complete their project tasks but also prepared them to seek future government infrastructure work. This created lasting economic benefits and enhanced capacity for the local community.



Figure 9 Project Manager, Section Manager and Marlee Karlip Engineers

The Georgiou Project team also engaged locally owned and operated company Independent Piling Services (IPS) to complete the installation of the fishing platform pile casings. With their previous works being predominantly private work in the commercial space, Georgiou worked with IPS to further develop their quality management system to a ISO9001 compliant standard. This improvement of their quality management system and the records of the works completed on the Project is being utilised as the basis of their submission to the certifying bodies for ISO9001 accreditation. Once completed, this will enable them to secure future works for Main Roads projects.

Georgiou also engaged IPS to provide the support barges for the form, reinforcement and pour of the marine substructure for the bridge (refer to Figure 10). Whilst their existing lifting capabilities were not sufficient for the works, through planning, collaboration and commitment between parties, IPS procured a 16t Hiab that could be fitted to one of their existing barges to provide the lifting capacity to complete the works scope successfully. This barge setup proved to be a versatile setup in lieu of a larger barge setup traditionally utilised, that proved to be very suitable to the works with significant benefits. From this collaboration, IPS have increased their capabilities to provide a versatile solution for future marine projects.



Figure 10 Project marine barge used by IPS

5 Environmental

Table 5 Summary of Environmental Metrics

ENVIRONMENTAL METRIC	UNIT	TOTAL THIS PERIOD	TOTAL FOR PROJECT
Vegetation Cleared	ha	0.54	5.56
Vegetation Retained (due to design)	ha	0.00	0.00
Revegetation/rehabilitation Undertaken	ha	0.00	0.00
Number of Significant Trees Cleared	#	31.00	510.00
Number of Significant Trees Retained (due to design)	#	8.00	35.00
Water Consumption	kL	14179.92	23,197.16*
Non-Potable Water Consumption	kL	12028.15	15,840.95
Potable Water Consumption	kL	2,151.77	7356.21*
Scope 1 Greenhouse Gas emissions	t CO ₂ -e	852.00	1,429.00*
Scope 2 Greenhouse Gas emissions	t CO ₂ -e	17.00	21.00
Energy Consumption	MJ	12.30	20.50
Renewable Energy Consumption	MJ	0.11	0.11
Imported Virgin Materials (Used Onsite)	t	56,534.46	118,737.19
Recycled Materials (Used Onsite)	t	0.00	1,083.20
Reused Materials (Used Onsite)	t	50,385.48	59,400.48
RTR Crushed Recycled Concrete	t	0.00	0.00
Recycled Crumb Rubber	t	0.00	0.00
Reclaimed Asphalt Pavement	t	0.00	0.00
Recycled Plastic	t	0.00	0.00
Food Organics Garden Organics	t	0.00	0.00
Fly Ash	t	0.00	0.00
Recycled Glass	t	0.00	0.00
Waste Sent to Landfill	t	20.52	31.42
Waste Diverted from Landfill	t	89.99	106.04

*Please note the totals for 23-24 FY data have been updated, due to additional data added to the previous reporting period.

5.1 Environmental Context

The Project is situated in an area with important environmental and social value. The Project area covers 20.5ha, out of which 6.51ha supports planted vegetation. There are two Threatened Ecological Communities (TECs) adjacent to the Project area (Appendix 3), and 2.27ha of the Project area sits within the Mandurah Estuary. To complete the construction of the new bridge including seven new piers and two reclamation pads, a total of 0.1050ha of benthic vegetation (seagrass) has been cleared on the project. The remaining Project area includes land covered by roads, tracks, paths and bare areas. A summary of environmental performance and aspects for the Project is detailed in Table 5.

The Project intersects with Djilba (Place ID 32696), an Aboriginal Heritage Site (see Section 6.2.5 for further information regarding the Project's consultation process with the Bindjareb Reference Group). A Section 18 consent under the Aboriginal Heritage Act 1972 was granted on 7 October 2022.

The Mandurah Estuary forms part of the Peel-Yalgorup Wetland System, a Ramsar Wetland of

International Importance. The Peel-Yalgorup system is used by tens of thousands of waterbirds, including large numbers of migrant shorebirds from the northern hemisphere. Impacts to the wetland have been considered in design, construction and operation, refer to Section 5.2.1 for more information. According to the findings of the biological survey, terrestrial areas within the Project area are not likely to support migratory species outside of transient visits due to a lack of suitable habitat.

The Peel-Harvey Estuary is occupied year-round by a resident community of approximately 90 Indo-Pacific bottlenose dolphins (Figure 11). During all offshore piling works on MEBD, a trained Marine Mammal Observer (MMO) is present to ensure that no significant marine fauna are present within 50m of piling works. We also have soft-start procedures to avoid harm to marine life during activities with high noise levels. The soft start procedure allows mobile fauna to avoid areas of predicted high underwater noise and reduces the likelihood of startle responses in fauna that could cause injury.



Figure 11 On site photograph of 'Nikki and Nai'a', local bottlenose dolphins within the Mandurah Estuary

Following stakeholder feedback, Georgiou engaged dolphin researcher Dr Krista Nicholson (Murdoch University) and Estuary Guardians volunteer Robyn Bickell, to discuss controls employed by the Project during piling works, and to deliver informal educational toolboxes to the Project team on site. These toolboxes provided an overview of the dolphin population and emphasised the importance of mitigating potential impacts. A second session was held for the substructure workforce during offshore piling works, pictured below (Figure 12).



Figure 12 Dolphin Educational Toolbox with external, local presenter Robyn Bickell

Two TECs sit directly adjacent to the Project area, including the Samphire Cove Nature Reserve. The Project works do not directly impact these areas. Wetlands are present immediately northwest and southeast of the Project area, and include two Class A Nature Reserves:

- Samphire Cove (Reserve No. R45089), approximately 40 metres north. The area is known for its bird life and presence of the Subtropical and Temperate Coastal Saltmarsh TEC.
- Creery Wetland Reserve (Reserve No. R46661) approximately 350 metres southeast.

5.1.1 Challenges

Throughout the second half of 2024 and into early 2025, the Project encountered several environmental challenges, particularly during the winter months when sediment control and stormwater management became critical focus areas. The team implemented proactive measures to protect local ecosystems and minimise environmental harm in line with the EMP and Georgiou Environmental Policy. The following highlights events and the subsequent actions taken to address them accordingly:

- One key challenge arose during the removal of reclamation pads on both the western and eastern sides of the bridge. These works caused sediment displacement into the estuary, an impact that was assessed as unavoidable by both internal environmental advisors and relevant environmental authorities. To minimise the effects on water quality, several mitigation measures were implemented, including:
 - Daily water quality testing and review by an environmental delegate to ensure turbidity levels remained within range.
 - Use of silt curtains to contain sediment to immediate area surrounding reclamation pads.
 - Halting of works immediately when sediment plumes were observed to allow this material to settle to avoid further movement.
- In September 2024, intense rainfall led to the overflow of Abbotsford Lake. This triggered run off water which carried sediment and vegetation in its path along Egret Road and into the estuary. Upon investigation it was found that the southern discharge point from Abbotsford Lake had become blocked, with the other main outlet point being situated adjoining Project footprint (Egret Point). Historically, overflow streams pooled within a drainage swale adjoining Egret Point and sleeted across this road and into the estuary. The Project (under the direction of local government) released this water that had been pooling within the Project across Egret Point (Adjoining Abbotsford Lake) and causing residential properties to be at risk of water damage into the estuary. This caused a localised plume within the estuary. The plume was seen to clear up within hours. However, the Project acted immediately to reduce any impacts. This included the installation of a silt curtain at the point of discharge to reduce further material dispense into the estuary, additional coir logs being installed to direct water in a favourable direction as to not cause further scouring and water quality monitoring to continue as scheduled. Learning from this event, during wetter months expected in 2025, the Project has plans to embed the following measures to mitigate potential effects from similar events occurring:
 - Strategically placed eco-friendly coir logs installed in the drainage swale to filter and slow material caught up in any potential overflow water.
 - Regular monitoring of Lake Abbotsford Lake to forecast any flooding to prepare accordingly.
 - The expected flow path has been cleared to prevent debris transport.

The Project's office waste diversion target has also been a challenge for the duration of design and construction to date. The volume of waste being recycled from the offices is minor in comparison to the volume of waste being disposed of to landfill. The Project team have introduced additional recycling methods in the office including Food and Garden Organics (FOGO) and have coordinated

educational initiatives with the workforce to encourage waste minimisation. To date 67% of all office waste has been sent to landfill, and despite efforts to improve this, the Project team's forecast to the end of the Project anticipates this will not meet the target >60% diversion rate.

Two of the Project lifecycle reduction targets have also been a challenge to achieve and reported as behind (refer to Sustainability Targets). The Project has a target to reduce energy use and emissions across the design, construction and operational phase by a minimum of 10% (measured through emissions). Despite efforts to identify and implement opportunities such as connecting the site offices to mains power instead of diesel generators and installing motion sensor lighting for fishing platform and carpark to reduce emissions, the opportunities implemented did not reduce the overall footprint by the targeted 10%. Identifying feasible opportunities for the operational phase was challenging, which makes up the majority of the footprint. Further information is in Section 5.2.4. Due to the scope of works being delivered, the Project team was unable to implement significant water reduction opportunities. A number of opportunities were implemented (refer to Section 5.2.2) however considering the magnitude of the volume required for delivery, the opportunities made little impact.

5.2 Environmental Management

An Environmental Impact Assessment (EIA) was completed by Main Roads in 2022 to assess activities associated with the Project and the potential impacts upon the environment. A Project specific Environmental Management Plan (EMP) was developed by Georgiou to manage all potential impacts outlined in the EIA. The Project was not referred to the Environmental Protection Authority of Western Australia (EPA) due to the findings of the EIA that there will be no significant impacts to low impacts to the surrounding environment. The EIA also determined that the Project is unlikely to impact on Matters of National Environmental Significance and thus was not referred under the EPBC Act. All legislative and regulative requirements are listed in Table 6. Environmental permits and approvals are summarised in Table 7.

AECOM was commissioned to undertake the biological survey by Main Roads. The objective of the biological survey was to delineate key flora, vegetation, fauna and wetland values of the survey area to inform the environmental assessment and approval process. AECOM completed a detailed flora and vegetation assessment in September 2021 and a basic fauna and targeted black cockatoo survey in November 2021. Areas of native vegetation were traversed on foot and subjected to detailed surveys including flora sampling and opportunistic recordings. No threatened flora listed under the EPBC Act or Biodiversity Conservation Act 2016 were identified. No weeds listed as Declared Pests or as a Weed of National Environmental Significance were recorded. Further information is captured in Appendix 3 and Appendix 4.

The EMP sets out how environmental aspects are to be managed, and is written in accordance with Georgiou's health, safety and environment management system which is third party certified to AS/NZS ISO 14001. A risk management approach is used to determine the severity and likelihood of an activity's impact on the environment and to prioritise its significance.

Throughout the past year, the Project has continued to follow a range of targeted environmental protection and conservation initiatives. These include scheduled environmental audits, including fauna management and water quality management plans, to ensure compliance and continuous improvement on the Project. A comprehensive environmental monitoring program has been maintained, incorporating soil moisture probe readings, Acid Sulfate Soil (ASS) inspections, routine water quality testing, and marine mammal observation and protection protocols. These measures help identify and mitigate potential impacts on identified ecosystems both on land and in adjacent

marine environments. All initiatives are aligned with Georgiou's Environmental Management Plan (EMP) and overarching environmental policy, which were established prior to Project commencement. This structured approach ensures that environmental values are protected and enhanced throughout the Project lifecycle.

Table 6 Summary of Project Compliance Requirements

Legislation/Other Requirement	How will the Project comply with the requirement
Main Roads Environmental Policy	The EMP in its entirety
<i>Contaminated Sites Act 2003 (WA)</i>	Hydrocarbon and Chemical Management Sub Plan
<i>Environment Protection and Biodiversity Conservation Act 1999 (C)</i>	The EMP implements processes to minimise impact on the Environment
<i>Environmental Protection Act 1986 (WA)</i>	The EMP implements processes to minimise impact on the Environment
Environmental Protection Regulations 1987 (WA)	The EMP implements processes to minimise impact on the Environment
Environmental Protection (Unauthorised Discharges) Regulations 2004 (WA)	Waste Management Environmental Sub Plan
<i>Heritage Act 2018</i>	Culture & Heritage Management Environmental Sub Plan
<i>Biodiversity Conservation Act 2016</i>	Flora & Fauna Management Environmental Sub Plan
<i>Biosecurity and Agriculture Management Act 2008 (WA)</i>	Flora & Fauna Management Environmental Sub Plan
Environmental Protection (Clearing of Native Vegetation) Regulations 2004 (WA)	Adherence to the clearing permit (CPS 818/15)
<i>Rights in Water and Irrigation Act 1914 (RIWI Act) (WA)</i>	Water Management Environmental Sub Plan
Environmental Protection (Controlled Waste) Regulations 2004 (WA)	Waste Management Environmental Sub Plan
Environmental Protection (Noise) Regulations 1997 (WA)	Noise & Vibration Management Environmental Sub Plan
<i>Waterways Conservation Act 1976</i>	Water Management Sub Plan

Table 7 Environmental Allowances, Approvals and Permits

ENVIRONMENTAL ALLOWANCE TYPE	UNIT	PROJECT ALLOWANCE
Section 18 consent for Place ID 32696 (Djilba), in accordance with the Aboriginal Heritage Act 1972.	N/A	- Invites in writing, giving 60 days' notice for two representatives of the Gnaala Karla Booja Indigenous Land Use Agreement Group to be present during all ground disturbance works on the Land where it intersects with Aboriginal site ID 32696 (Djilba). - Georgiou is to aid Main Roads in written reporting as per Section 18 consent and SWTC requirements.
Clearing Permit Allowance (CPS818/15)	ha	Maximum impact to benthic vegetation of 0.12 ha.
Licence to Take Water	kL	46,000kL annually
Licence to Dredge and/or Reclaim (in accordance with Section 46 of		4,328m³ clean fill material to be deposited for reclamation. 143m³ material to be dredged.

ENVIRONMENTAL ALLOWANCE TYPE	UNIT	PROJECT ALLOWANCE
the Waterways Conservation Act 1976).		- Water quality monitoring undertaken and no visible floating oil, grease, scum, litter or objectionable material as a result of dredging works. - All reclamation works are to proceed within an enclosed silt curtain.

5.2.1 Receiving Water Management

A section of the Project area sits within the Mandurah Estuary, which forms part of the Peel-Yalgorup Wetland System, a Ramsar Wetland of International Importance. Project construction activities are not expected to significantly impact other environmental values of the Peel-Yalgorup wetland system because:

- disturbance of the bed of the Estuary for the permanent works will be limited to temporary and permanent piling works, and for pile caps an area no greater than the area of the pile cap plus 2.0m buffer. Works impacting on the bed of the Estuary beyond these limits will require consent from the Department of Water and Environmental Regulation.
- all reclamation works on the Project are to be done in accordance with a Department of Water and Environmental Regulation issued 'License to Dredge and/or Reclaim'.
- all dewatering activities and their impacts were localised and confined to a short duration and are now complete.
- the piers (and their construction) will not cause any significant alteration in flow regimes or velocities and, therefore, will not alter overall sediment deposition and erosion regimes of the Mandurah Channel.
- no riparian vegetation or significant fauna and/or flora species have been recorded as inhabiting the Project area.

Water quality and sediment monitoring will continue to be conducted during, and after completion on the Project to identify any deterioration in aquatic habitat that may adversely impact the environmental values of the Peel-Yalgorup Ramsar Site.

The Project has considered the indirect impacts on the Estuary, Peel-Yalgorup site, and adjacent Wetlands as part of design development. The key environmental requirements governing the drainage design are the principles of WSUD, namely:

- to prevent scour, erosion and sediment transport.
- to maintain the existing flow regimes and water balance of the site as much as possible.
- to avoid adverse impacts on the environment.
- The following were implemented in permanent design, which see an improvement to current conditions:
 - riparian vegetation included in Urban and Landscape Design Plan.
 - bioretention basins to treat drainage water from the bridge before it enters the Estuary. The bioretention basins are expected to provide the required filtration to remove pollutants from stormwater.
 - all runoff to be treated prior to entering the Estuary and/or surrounding waterways.

5.2.2 Water Usage

The Project is targeting a reduction in at least 10% of all water used over design, construction, and

operational life of the asset. Opportunities have been implemented to reduce water use and use sustainable water sources during the construction phase, including the use of recycled waste water and using recycled water to wash the noise walls prior to applying the anti graffiti coating. Georgiou has partnered with the City of Mandurah to utilise the recycled waste water from the Halls Head Waste Water Treatment Plant (WWTP) for construction purposes. Usage to date is captured in Table 8 and further information on this initiative in Section 5.4.

Table 8 Water Metrics

WATER METRICS	TOTAL THIS PERIOD		TOTAL FOR PROJECT	
	kL	%	kL	%
Potable Water				
Standpipe / Scheme Water Purchased	2,151.77	15.2	7356.21*	31.7
Non-Potable Water				
Bore Water	0	0	0	0
Surface Water	0	0	0	0
Recycled / Reused	12,028.15	84.8	15840.95	68.3
Total Water Used	14,179.92	100.0	23197.16	100.0

*Please note this total has been updated due to additional data added to the previous period 01 Jul 23 – 30 Jun 24.

5.2.3 Vegetation Management

5.2.3.1 Benthic Habitat

Following a biological survey and benthic habitat assessment undertaken within and in the vicinity of the Project area, the only native vegetation recorded within the impact area is a seagrass community located within the Estuary; *Ruppia megacarpa*. Epibenthos and other fauna species was found to be lacking in the survey area and this was attributed to the presence of coarse sediments and strong influence of currents through the channel. The survey also noted bare sediment dominated the substrate which prevented the establishment of attaching sessile organisms.

A total of 0.050ha of native vegetation in the form of benthic vegetation (seagrass) has been cleared during construction works. This species was noted in the survey to be a rapid coloniser with an abundance that can vary greatly over time. Impacts from the shading created from the bridge is expected to reduce 0.12 ha of the seagrass community area. This is not expected to have a significant impact on the benthic vegetation within the Mandurah Estuary.

5.2.3.2 Clearing

As part of the upgrade to Mandurah Road and associated drainage works, retaining walls, noise walls and paths, planted vegetation will be cleared.

The Project has prioritised minimising the clearing of vegetation through careful planning in both design and construction phases. Trees identified for retention have been clearly marked and actively monitored on site to support their long-term survival. This approach contributes to the goal of maximising urban tree canopy cover.

All vegetation clearing activities are carried out in full compliance with the Environmental Protection (Clearing of Native Vegetation) Regulations 2004 (WA) and in accordance with Clearing Permit CPS 818/15.

Where practicable, cleared vegetation is either reused or recycled, with all weed-free native vegetation chipped and stockpiled for use in site rehabilitation.

5.2.3.3 *Revegetation/ Rehabilitation*

An Urban and Landscape Design Framework and Urban and Landscape Design have been developed for the Project, setting out the urban and landscape design and revegetation plans for the Project area to commence in 2026. The associated design plans have been reviewed by Main Roads and the City of Mandurah. The Plan has also been independently reviewed aligned with the Principles of Design Review developed by the UK Commission for Architecture and the Built Environment (CABE).

No revegetation has taken place on the Project to date. The Project's plans for revegetation includes the reinstatement of all damaged areas which will be carried out under the direction of a suitably qualified environmental consultant engaged by Georgiou. Reinstatement works will involve all tasks required or recommended by the consultant and relevant Authorities in order to ensure that the damaged areas are restored to pre-existing condition as soon as possible.

5.2.3.4 *Dieback*

The risk of dieback is low within the Project area. No records of dieback occurrence were found within the area on the Natural Resource Management WA (NRM) Dieback mapping tool. The Project area was considered 'Dieback Uninterpretable' within the EIA, as the site has been subjected to widespread historical clearing followed by soft landscaping with mostly non-proteaceous species and grasses. Standard hygiene practices are employed on the Project by Georgiou to ensure all imported materials are dieback free. To date, no dieback has been found on site.

5.2.4 **Carbon Emissions and Energy**

Georgiou have investigated and implemented opportunities to reduce energy and emissions over the design, construction and operational phases of the Project. Energy usage on the Project to date inclusive of the design and construction phase is detailed in Table 9. Investigation into the asset's energy and emissions footprint concludes the following as the largest sources of emissions:

- Scope 3 emissions during the operation phase, associated with road users of the asset.
- Scope 1 emissions during construction phase, associated with construction activities.
- Scope 2 emissions during the operation phase, associated with lighting and roadside cabinets.

Refer to Figure 13 for visual representation of the Project's energy and emissions footprint.

This informed the opportunity assessment process and as the Project cannot have a direct impact on the Scope 3 emissions, Scope 1 and 2 emissions were the focus of investigations. Georgiou are responsible for reducing a minimum of 10% of all energy and emissions over the design, construction and operational life of the asset. This was measured using an LCA and compared to a Base Case (verified by a third-party verifier through the IS Rating process). An 8.5% reduction of construction phase emissions was modelled however the overall emissions footprint model did not meet the targeted 10%. The initiatives implemented by the Project included the following with associated emissions reduction:

- Connect site offices to mains power instead of diesel generators.
 - Construction emissions reduction: 28tCO₂e.
- Reduced clearing footprint from 7.34 to 6.63ha.
 - Emissions reduction: 148tCO₂e.
- Install motion sensor lighting for fishing platform and carpark.
 - Emissions reduction: 345tCO₂e over 50 years operation.

The below pie-chart (Figure 13) summarizes the makeup of the biggest contributors to the final design's carbon footprint in terms of energy.

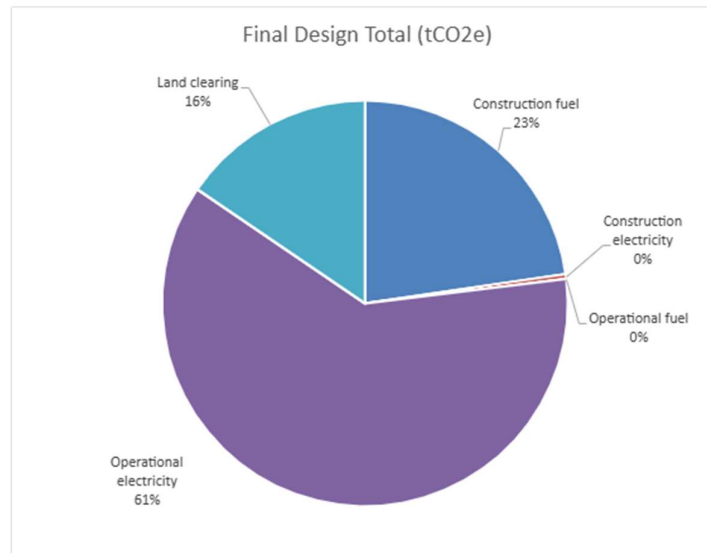


Figure 13 Breakdown of Energy in the Final Design

Additionally, an opportunity to reduce the Project's construction environmental footprint was found which involved connecting the Project to Synergy's Greenpower program. According to Synergy, Greenpower investments go towards the purchase of renewable energy certificates (RECs) from Australia's national accreditation program. 'Green energy purchased by Synergy is fed into the electricity grid where it mixes with energy produced from non-renewable sources; before being supplied to (customers). How much is green, depends on how many RECs are purchased'. This will generate a saving of 23.86 tonnes of CO₂e.

Table 9 Energy Metrics

ENERGY USED ONSITE	TOTAL THIS PERIOD				TOTAL FOR PROJECT			
	LITRES	KWH	GHG (t CO ₂ -e)	GJ	LITRES	KWH	GHG (t CO ₂ -e)	GJ
Unleaded (on-road)	721.1	N/A	2	25	731.3	N/A	2	25
Unleaded (off-road)	6059.9	N/A	14	207	6059.9	N/A	14	207
Diesel Used (on-road and off-road)	307449.7	N/A	834	11867	519296.1*	N/A	1410	20045
Liquefied Petroleum Gas (LPG)	0	N/A	0	0	0	N/A	0	0
Biodiesel	0	N/A	0	0	0	N/A	0	0
Hydrogen	0	N/A	0	0	0	N/A	0	0
Oil	850.3	N/A	2	33	1224.5	N/A	3	47
Grease	76.5	N/A	0	3	88.1	N/A	0	3
Electricity consumption (Grid)	N/A	32711.0	17	118	N/A	40566.8	21	146
Renewable Energy (Grid)	N/A	31322.5	0	0	N/A	32011.6	0	0
Renewable Energy (Generated Onsite)	N/A	0	0	0	N/A	0	0	0
Total	315157.5	64033.5	869	12253	527399.9	72568.4	1450	20473

GHG Emissions have been calculated using the latest [National Greenhouse Accounts Factors](#)

*This has been updated with the addition of litres missing from the previous period.

5.2.5 Materials and Recycling

A Resource Efficiency Management Plan (REMP) has been developed for the Project, detailing how Georgiou will manage and deliver resource efficiency outcomes. The delivery of resource efficiency outcomes is focused on the following objectives:

- Deliver a high-quality outcome that is socially and environmentally sustainable and responds to the context and character of the area.
- Deliver a durable, resilient, low maintenance bridge that delivers value for money across all Project phases.

Resource input and output targets have been established to achieve these objectives, please refer to the Project's output targets in the table below. The REMP includes an action plan to achieve these targets during the design, construction and operations phases of the Project. All resource inputs used to date on the Project are summarised in Table 5.

Table 10 Resource Output Targets and Performance

Target	Performance (%)
>85% clean/inert excavation spoil diverted from landfill (including >50% onsite reuse)	100.00
>85% reuse of all cleared vegetation material	100.00
>75% of the imported Perth Sand (preload material) to be re-used on site	100.00
>70% all other inert outputs diverted from landfill	99.98

All resource efficiency opportunities and the management of inputs and outputs on the Project are considered in the order of the waste hierarchy. The waste hierarchy is a widely accepted decision-making tool set out within the Waste Authority's Waste Avoidance and Resource Recovery Strategy 2030, ranking waste management options in order of their general environmental desirability. The hierarchy is applied in several processes used on the Project to review management actions of resource outputs and consider opportunities to manage material a step higher on the hierarchy.

All materials selected for use on the Project are considered aligned with the Project objectives and targets. Materials must also meet the requirements of the Project Scope of Works and Technical Criteria, Main Roads Specifications, Design Reports, operator specific conditions, and relevant industry standards. All materials used in permanent design elements are approved by Main Roads prior to implementation. The Project's resource efficiency targets have been considered throughout the Project design phase, and several opportunities were implemented through collaboration of the design team, construction team, proponent and operators. Opportunities include the re-use of steel formwork, using half parapets instead of full parapets, and using a pre-cast tub technique for installation of pile caps.

Through the Project's purchasing power, the Project can ultimately support the industry's paradigm shift from a linear flow of materials to a circular flowing economy. This is achieved through the indication that resource efficiency is an important factor for subcontract packages, and the investigation of resource efficiency opportunities in RFP stage of supply and subcontract packages. This is also achieved through the application of the waste hierarchy in resource management. Sustainable procurement practices have been adopted, with numerous construction materials sourced from suppliers providing Environmental Product Declarations (EPDs). Products from Bestbar, Fremantle Steel, Metal West, and WA Premix have either been utilised or assessed during the design phase to support lower embodied carbon and improve material transparency.

One of the Project’s input targets is to reduce the Project’s materials’ environmental footprint by at least 10%, measured utilising a Life Cycle Assessment (LCA) and compared to the Project’s Base Case. The figure below shows opportunities implemented to improve the materials’ life cycle impact of the Project. The three biggest savings in terms of tonnes of CO2 equivalent included the reduced bridge girder geometry (saving a total of 300 tonnes CO2-e), the L walls that were swapped with limestone walls (saving a total of 391 tonnes CO2-e) and the combination of retaining walls with noise walls (saving a total of 109 tonnes CO2-e).

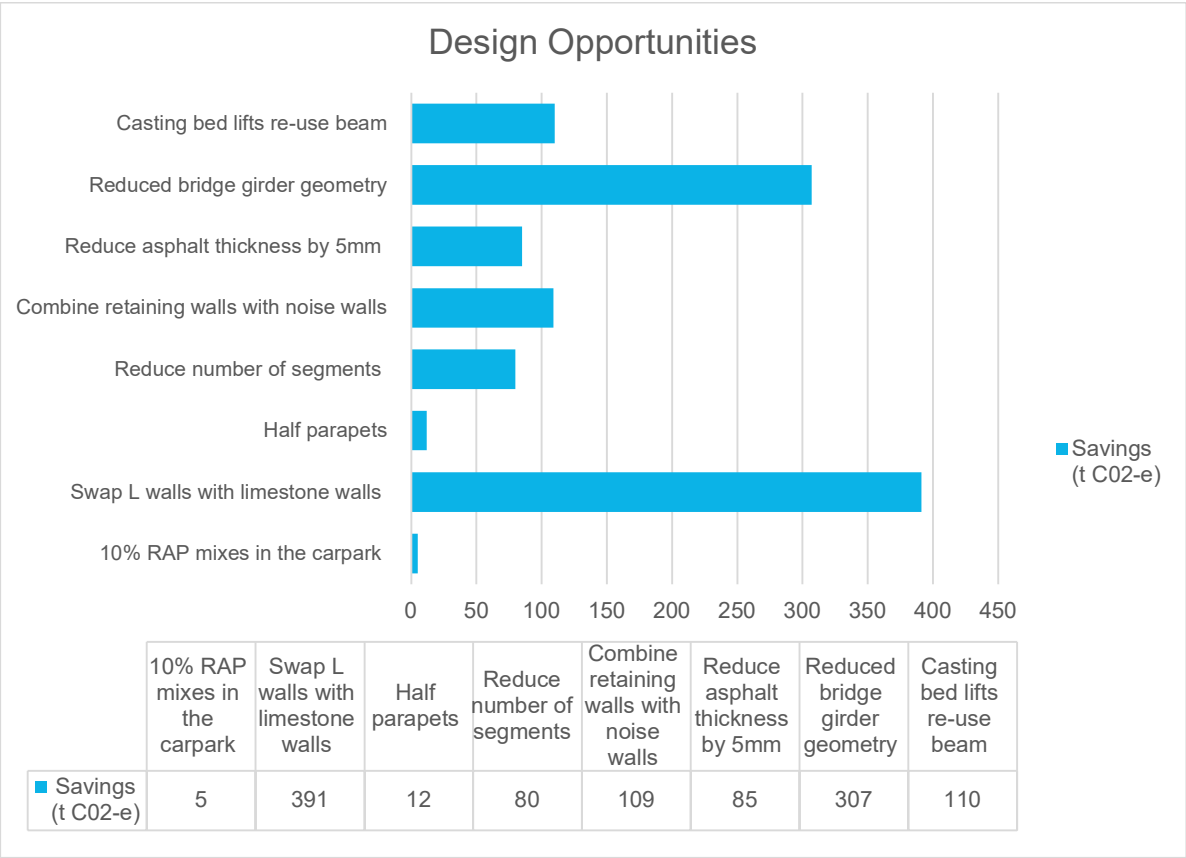


Figure 14 Opportunities implemented to reduce the Project's materials environmental footprint, from the Project base case

As a result of all design and construction optimisations realised by the design and construction team, the Project team reduced the materials’ life cycle impacts by a total of 50% from the Base Case. This reduction is measured using ‘IS EnviroPoints v2.0’.

When considering the environmental impact of materials through the emissions footprint, the Project achieved a 44% reduction from the base case. This is a total saving of 17,463 tonnes CO2 emissions realised.

5.2.6 Noise and Vibration

Noise and Vibration are recognised as high priority issues on the Project (Section 3.2). Construction will involve piling works expected to generate noise and vibration. Sensitive receptors are less than 10m from the piling works when considering the waterway as a sensitive receptor. The management of noise and vibration associated with the marine environment is managed in line with the Project’s approved Fauna Management Plan (FMP).

A MMO was present at all times during piling works (incl sheet-piling), to ensure that significant

marine fauna and dolphins were not present within the pile-driving areas during the construction of the piers. All piling activities cease if a dolphin comes within 50m of the activity and will not recommence until the dolphin has moved more than 200m away or has not been observed for at least 20 minutes. All other controls to mitigate impacts to marine fauna are listed in the Project FMP. Following stakeholder feedback the Project consulted with local expert Dr Krista Nicholson to review the controls in place and review the MMO training.

Residents are located on average within 50m of the Project works, with some locations being less than 10m for a limited scope of works expected to generate lower-level noise; clearing, retaining walls, noise walls and/or tie ins. As part of regular practice, the Project offered property precondition surveys to properties within close proximity of the works. Noise and vibration monitoring is established 24/7 with the use of SiteHive monitors at five locations within the Project area, including the four quadrants and casting bed to enable the Project to monitor and respond to real-time noise and vibration levels. Alerts are programmed within these monitors to notify the construction team and environmental advisor where noise and/or vibration levels are reaching near the threshold limits set by the Project in collaboration with supplier knowledge and experience, and in the event these limits are exceeded. The recipients then investigate all exceedances and record nearby activities taking place.

An Out of Hours Management Plan is prepared monthly and issued to the City of Mandurah and Main Roads for approval, demonstrating how noise and vibration emanating from construction works will be managed during out of hours (that being outside the hours of 7am to 7pm Monday to Saturday, excluding public holidays).

5.2.7 Air Quality

Air quality impacts are only anticipated to occur during the initial movement of material for preloading activities and the re-use of this material within final alignment. These are not anticipated to exceed the air quality limits aligned with the National Environment Protection Measures (NEPM). The Project has established 24/7 air quality monitoring at five locations within the Project area, to enable the construction team to monitor and respond to real-time air quality levels.

An Air Quality Assessment was conducted by AECOM in the Project Proposal (2022) and concluded that there would be a negligible or minor changes to the air environment surrounding the Project area during the operational life of the asset.

5.2.8 Light Spill

Construction of the Project will involve nightworks which require temporary lighting. Light receptors are within 10m of nightworks when considering the waterway as a sensitive receptor. Regular inspections are conducted during night works to ensure temporary lighting is positioned appropriately away from sensitive receptors.

Light pollution has been considered in the development of the permanent lighting design. During the design process light locations have been modified to coordinate with the adjustment in road alignment and ensure compliance is maintained. This includes repositioning lights within the foreshore carpark, further away from the waterline. Light poles have been positioned in order to achieve no more than 2 horizontal lux level over the Project boundary and 2% upward light ratio (excluding decorative lighting).

The sensitive receptors to the Project were identified by Georgiou early on in design development. As a result, the design and procurement of luminaires considered approaches to limit impacts and a specific type of luminaire was selected for the fishing platform and carpark lighting, to reduce light

impacts to wildlife. Additional measures developed during the design process include the introduction of motion control lighting to the fishing platform and carpark to reduce the duration of light and thereby assist in minimising the ongoing impact. For further information refer to Section 5.5.

5.2.9 Contamination

Investigations in the Planning Phase have determined there is low risk of contamination on site. The EIA denotes there are no previous known land use activities on or adjacent to the proposed activities with the potential to create contamination. There are no known contaminated sites within the Project Area and its vicinity.

5.2.10 Acid Sulfate Soils

Department of Water and Environmental Regulation (DWER) Acid Sulfate Soil (ASS) Risk Mapping (Swan Coastal Plain) has been reviewed and identifies that most of the site is categorised as having a moderate to high risk of ASS occurring within 3m of the natural soil surface. This is consistent with the findings of the Preliminary EIA. An ASS Management Plan (ASSMP) has been developed for the Project which sets out all controls, monitoring and reporting requirements during construction. The ASSMP has been approved by Main Roads and submitted to DWER prior to ASS being knowingly disturbed on the Project.

To date, one instance of ASS material has been identified on the Project. In July 2024, ASS was discovered in the South East quadrant of the site. Upon detection, the team responded in accordance with the Project's ASSMP, which included stockpiling, lime treatment, and the reuse of the material on site.

5.3 Environmental Outcomes

An Environmental Impact Assessment (EIA) was conducted in November 2022 by a Main Roads Environmental Officer, before project commencement. This EIA identified several key environmental focus areas for the Project. These included the protection of Aboriginal heritage values, the management of Acid Sulphate Soils (ASS), and the mitigation procedures in place during construction activities that may disturb estuary sediments, particularly during pier construction, which could expose ASS and degrade water quality. Other priority areas included the potential impact on benthic vegetation (seagrass) within the Peel-Yalgorup wetland system, which is a designated Ramsar site. The removal of trees with diameters suitable for Black Cockatoo breeding (noting that none investigated contained hollows) and low-quality foraging habitat for both the Carnaby's and Forest Red-tailed Black Cockatoos were also addressed. In addition, piling activities within the Mandurah Estuary raised concerns about noise and vibration impacts on sensitive terrestrial and aquatic receptors, including local residents and bottlenose dolphins. These environmental priorities were incorporated into the Project's Environmental Management Plan (EMP), which includes measurable objectives, implementation schedules, and clearly defined roles and responsibilities to ensure compliance and continual improvement where possible.

A wide range of environmental protection and enhancement initiatives have been implemented throughout the Project and are summarised in Section 5.2 of this report. These include the use of maintained silt curtains, installation of biodegradable coir logs for erosion control, water quality testing, and marine mammal observation measures.

5.4 Environmental Case Study, Use of recycled wastewater for construction purposes from the Halls Head Waste Water Treatment Plant (WWTP)

During the design phase, the construction team forecast the total water required for all construction activities including earthworks. The construction team then assessed the most sustainable supply options to meet water demand, and opportunities to reduce the overall demand itself. Alternative water supply options were investigated for earthworks activities, including the use of recycled waste water from the Halls Head Waste Water Treatment Plant (WWTP). Through collaboration with the City of Mandurah, Georgiou has implemented the use of recycled waste water sourced from the WWTP for construction activities.

Earthworks on the Project involves over 45,000 tonnes of material used for preloading activities ahead of the super structure incremental launch and movement of this material into the final alignment across the Project area. Approximately 46,000 kL is forecast for all earthworks activities over the two-year construction period ahead, followed by a small amount required in 2026 for closing out the Project. This solution has been pursued since December 2023, through consultation with the DWER and approval of the City of Mandurah and Department of Health (DoH). Approval was received in February 2024 and since then, approximately 15,841kL of recycled water has been utilised (Table 8). Since implementation of this initiative, additional construction activities have been identified to use this alternative recycled waste water. An estimated 88,000kL of water used for construction activities will utilise recycled water.

The City of Mandurah has worked with Georgiou to coordinate approvals and management conditions with the DoH. The use of this recycled water is to be operated with the Recycled Water Quality Management Plan, the Guidelines for the Non-potable Uses of Recycled Water in Western Australia, and the conditions set out in the approval by DoH.

To enable the use of this waste water for construction purposes, additional infrastructure was required at the Halls Head WWTP. Georgiou has agreed to build the required infrastructure and build this to become ongoing infrastructure for use by the City of Mandurah beyond the Project works. This infrastructure will be finalised by Georgiou upon Project completion and handed over to the City for long-term use.

5.5 Environmental Case Study 2, Lighting the Fishing Platform and Carpark

The MEBD Project adjoins with the Mandurah Estuary, which makes up part of the Peel-Yalgorup Wetland System, a RAMSAR Wetland of International Importance. The Peel-Yalgorup system is used by tens of thousands of waterbirds, including large numbers of migrant shorebirds from the northern hemisphere. The Peel-Harvey Estuary is occupied year-round by a resident community of approximately 90 Indo-Pacific bottlenose dolphins. The Project Works are also located directly adjacent to two Threatened Ecological Communities (TEC). This vegetation is protected and acknowledged as habitat for migratory shore birds.

During tender phase, the Project identified these sensitive receptors and investigated opportunities to consider in design to mitigate potential impacts. The Project's Lighting Designer identified an opportunity to implement a luminaire which can mitigate impacts to these sensitive receptors greater than the Business-as-Usual (BaU) luminaires. The Project team worked with the lighting supplier, HI Lighting, to implement during construction.

Light pollution, caused by excessive or misdirected artificial light, can have detrimental effects on wildlife. Animals perceive light differently from humans, and artificial light can disrupt critical behaviour and cause physiological changes in wildlife. For migratory species, the impact of artificial light may compromise an animal's ability to undertake long-distance migrations integral to its life cycle (DCCEEW 2023, National Light Pollution Guidelines for Wildlife). Light pollution impacts to wildlife in the context of the Project, can be considered as upward light pollution, reflective light into the waterway, and light pollution into the adjacent habitat.

All lighting on the fishing platform and carpark is designed to include the 'Wild-light' luminaire, which has an adjustable brightness level and colour temperature. This luminaire:

- Enables adaptive lighting of streets, paths and open spaces.
- Is controlled with smart lighting and built-in motion sensors.
- Is dark sky compliant.
- Offers adjustable light spectrums, minimising the impact on wildlife, whilst providing safe lighting for humans.

The lighting manufacturer (WE-EF) have recently completed a pilot study to explore the lighting technology and its sensitivity on wildlife, read more [here](#).

As noted above, this system features motion sensors, which allow the lighting to meet safety and wayfinding needs, whilst also reducing the ongoing light pollution within the area when there are no users within the vicinity. Operational settings for the luminaires are included in the Lighting Design Report and will be managed by the Asset Operator. Please refer to the example in Figure 15 from the lighting manufacturer.

For example



As a passerby enters the area, Wild-Light switches the colour temperature to 3000 K to enhance safety and way-finding.

Figure 15 Example of motion sensor lighting in effect

6 Social

Table 10 Summary of Social Metrics

SOCIAL METRIC	UNIT	TOTAL FOR THIS PERIOD	TOTAL FOR THE PROJECT
Stakeholders engaged	#	130.0	957.0
Stakeholder enquiries received	#	108.0	281.0
Total Size of Project Workforce	#	93.0	274.0
Women in Workforce	%	8.1*	10.0*
Aboriginal Participation in Workforce	%	13.8	13.7
Lost Time Injury Frequency Rate (LTIFR)	#	10.4	10.4
Hours of Training Undertaken [^]	hrs	191.0	191.0
Development Employees and Apprentices on the Project	#	0.0	3.0

[^]training hours represent online and on-site inductions only.

*based on averages.

6.1 Social Context

The Project is surrounded predominantly by residential areas. One quadrant has been identified as a well-established neighbourhood, and the other three quadrants relatively new with development still ongoing. Regular and ongoing stakeholder engagement with residents from all four quadrants is a priority for the Project, followed by recreational user groups of the surrounds including the Estuary. This extends to special interest and environmental groups relating to the estuary and wetlands. Engagement with the local government authority is another identified key stakeholder priority. These priorities and others are outlined in the Community and Stakeholder Engagement Management Plan (CSEMP) specifically developed for the Project during the planning phase.

A summary of social aspects is provided in Table 10.

The Project is located in the City of Mandurah, Western Australia, a rapidly growing regional centre known for its scenic waterways and vibrant community. In September 2021, the State Government announced the MEBD Project to improve safety and traffic flow while providing better connections to the Peel region.

The current bridge supports 33,000 vehicles a day, and in the five years leading up to 2022 experienced 145 crashes. The duplicate bridge is a critical infrastructure project aimed at easing traffic congestion and improving safety for all road users, increasing accessibility and connectivity of road networks, and improving connectivity and safety for pedestrians, cyclists, and other users.

According to 2021 Census data, Mandurah has a population of more than 107,000 residents, with approximately 3% indicating they are Aboriginal. Sixty-eight per cent of the population were born in Australia followed by England (10.8%) and then New Zealand (3.5%). Nearly 88% use only the English language at home.

The primary stakeholders for this Project include:

- State and Federal Government as project owners and funding project delivery.
- State Government agencies, e.g. Main Roads, Department of Transport WA, Peel Development Commission, PTA.
- Local Government, i.e. City of Mandurah.
- Aboriginal stakeholders, e.g. Winjan Aboriginal Corporation, Bindjareb Reference Group

- Residents and property owners: Individuals living in proximity to the bridge.
 - Environmental Groups: Organisations focused on protecting the local estuarine environment, e.g., Mandurah Environment and Heritage Group (MEHG), Estuary Guardians, Peel Harvey Catchment Council.
 - Emergency Services, e.g., St John, Department of Fire and Emergency Services (DFES), WA Police.
 - Estuary recreational and business groups, e.g., Fishability, Mandurah Boat Hire, Sea West Cruises, Boating WA.
 - Community and special interest groups, e.g., Access and Inclusion Advisory Group, Peel Chamber of Commerce and Industry.
 - Tourists and Visitors: Individuals visiting Mandurah for recreation and tourism, Visit Mandurah.
- A full list of stakeholders is included in Appendix 1.

6.2 Social Aspects Management

6.2.1 Community and Stakeholder Engagement

The overarching objectives of community and stakeholder engagement for the Project are to provide consistent, clear, and honest information to stakeholders and develop and maintain relationships with key stakeholders and impacted community members.

The Project engages with the community to manage complaints, concerns, and issues in a fair and timely manner via the Main Roads Customer Information Centre CONNECT platform, in addition to monthly letterbox drops, emails, social media and face-to-face meetings. Regular weekly meetings with the construction team are held to develop strategies to minimise impacts during the construction phase.

Additionally, the Project team creates a positive perception of the Project, Main Roads, and Georgiou within the community, and provides opportunities for community involvement during the design and construction phases to achieve both short and long-term benefits for the community.

We develop interesting and accurate information that help our stakeholders get to know the Project team, and understand the Project including why decisions are made. Our lines of communication are open, and we remain transparent by sharing outcomes and the rationale for decisions with our stakeholders and the community.

We have adopted a proactive approach that ensures stakeholders, and the community are informed about potential issues or events in advance, and there are no surprises. We are also proactive in understanding how the construction may impact their needs and work with them to reach a solution.

We consider opportunities for the community to be involved, and listed negotiables in Section 1.4 of the Community and Stakeholder Engagement Management Plan. We will continue to work with the Project Team during the delivery phase to seek further opportunities for the community to be involved.

The success of these objectives is evaluated on an ongoing basis and will be until the end of the Project. Methods used will include surveys, questionnaire forms at the Open Houses and other community events, and feedback sought through other channels. If feedback/results indicate that objectives are not being met, corrective actions will be implemented in conjunction with Main Roads.



Figure 16 Community consultation at Halls Head Central in November 2024

6.2.2 IAP2

Our engagement program is being delivered in line with the principles and core values of the International Association for Public Participation (IAP2). The Community and Stakeholder and Engagement Manager is accredited to deliver IAP2 compliant engagement, ensuring our approach remains transparent, inclusive, and responsive throughout delivery..

We continue to engage with a broad range of stakeholders, including nearby residents, environmental organisations, and local user groups. Updates, resources, and project information remain accessible via the dedicated Project page on the Main Roads website.

Stakeholders have the opportunity to influence some negotiables of the Project including design elements of the fishing platform, environmental offset opportunities and locations, community engagement tools and methods, shared use path connections to public transport facilities, and input into innovations and legacy ideas. They can also contribute to urban and landscape design elements, industry collaboration opportunities, ideas to mitigate construction impacts, noise wall colours, and the extents of noise mitigation.

However, certain elements are non-negotiable and cannot be influenced by the community and key stakeholders, such as the bridge design, pier and span location, funding allocation, safety standards in road design, general road corridor, nautical navigational requirements, construction methodology and sourcing of materials, inclusion of a universally accessible fishing platform, environmental assessment levels and the need to protect certain flora and fauna communities.

Our engagement approach remains ongoing and adaptive. We will continue to listen, share updates, and work collaboratively with stakeholders to ensure the Project delivers meaningful community outcomes.

6.2.3 Community Satisfaction and Amenity

The key community concerns were compiled in early 2024 based on the key issues identified within

the Planning Phase, Community and Stakeholder Engagement Management Plan, early engagement activities with key stakeholders, and the initial Open House community event in December 2023. These events enabled the development of a clear understanding of the community priority issues and overall concerns. The high priority issues were reviewed and updated, in consultation with other key stakeholders including the City of Mandurah and Department of Transport Maritime. These issues continue to be reviewed and updated accordingly following ongoing consultation. Refer to Table 11 below for breakdown of concerns and actions undertaken by the Project to address community concerns and drive Project outcomes.

Table 11 High priority issues, actions and outcomes

Priority Issue(s)	Project Actions	Outcomes
Heritage and Cultural Significance	Hold three (3) yearly reference group meetings to obtain feedback and guidance on matters of culture and heritage relating to Project area, including presenting design for comment, reviewing artwork, interpretive elements, and seating node installations.	Continued communication to inform and address stakeholder as design progresses.
Noise walls	Escalated to Main Roads Steering Committee and Minister Saffioti office for consideration.	Additional amenity walls were added to the Project scope in November 2024, satisfying the request from residents for further sound / noise protection. The amenity walls will be constructed within the Project timeframe.
Vegetation clearing	Further explanation was provided in email responses and phones calls. An extra letterbox drops also went out to explain the clearing. A commitment was made to provide more detailed information in Project communications. Fact sheets will be provided to summarise any further clearing if required. Any further clearing will have information provided early on.	Continued communication to inform and address stakeholder and community concerns as they arise. Additional clearing requirements were communicated to the community prior to the announcement of amenity walls. Communications were also issued 4 weeks in advance of clearing works for the amenity walls to address and ease any community concerns.
Dust Mitigation	Further explanation was provided in email responses and phone calls. A fact sheet explaining dust has been created to share with residents. An extra water cart was employed on the Project. Gluon was applied to affected areas, when possible, with a focus on the SE and NE east areas. (Waterlily Drive and Waterside Drive). 24/7 call line (Main Roads) for enquiries/complaints and active engagement with affected residents. Open House event in March to inform community of construction activities and mitigation measures.	Continued communication to inform and address stakeholder and community concerns as they arise. Continued commitment to ensure dust mitigation measures are implemented; included as part of the out of hours management plan submitted to and approved by City of Mandurah.
Noise Mitigation	We have been very clear in our communications that the works will create noise during day hours. Baselines were undertaken to understand the noise before we started the works so we could compare. We will have noise monitors on site. 24/7 call line (Main Roads) for enquiries/complaints and active engagement with affected residents.	Continued communication to inform and address stakeholder and community concerns as they arise. Continued commitment to ensure noise mitigation measures are implemented; included as part of the out of hours management plan

Priority Issue(s)	Project Actions	Outcomes
Fishing platform design	Open House events to inform community of construction activities and mitigation measures. The Access and Inclusion Group is involved in the 15% and 85% design stages. We took on board all their suggestions and feedback, and where we could, we incorporated it into design.	submitted to and approved by City of Mandurah. Some changes to design were identified in the 100% impacting accessibility. Continued consultation has been undertaken and the group are satisfied with the results. The group will be invited to an opening event at the new fishing platform once completed in early 2026.
Path Connections	Open House event to inform community of design and attain their feedback. We listened to their feedback and the current design reflects their feedback on final design. The team has committed to looking for opportunities to provide temp access during construction, however it doesn't seem possible yet. Waterlily Drive residents however want the path bike access from their street to Mandurah Rd permanently removed. With this in mind, we have opened an expression of interest for an active travel working group to work with community and stakeholders to assess opportunities and overcome issues.	Continued communication to inform and address stakeholder groups as design progresses. Following resident concerns, the Project working with the City of Mandurah was able to revise design for access paths in line with the amenity walls to remove access from Mandurah Road to Waterside Drive. Access from Mandurah Road to Waterlily Drive was brought closer to the Leslie Street intersection. This location was preferred by DoT, CoM, and WestCycle, providing cyclists with the additional opportunity to exit Mandurah Road and join the shared path that leads to the new bridge underpass.
Urban and Landscape Design (including artwork)	15%, 85% and 100% is reviewed by Main Roads, the City of Mandurah, the Office of Government Architects (OGA), and other stakeholders. The Landscape Architect consults with the Bindjareb Reference Group for input in the themes and revegetation strategy.	Continued communication to inform and address stakeholder groups as design progresses.
Environment (including estuary protection)	15% and 85% designs sent for comment. Consult with Dr Krista Nicholson on the controls implemented during construction activities, to manage potential impacts to marine fauna. Facilitate permanent educational signage.	Continued communication to inform and address stakeholder groups as design progresses.
Estuary and Vessel Management	15% and 85% designs sent for comment.	Continued communication to inform and address stakeholder groups as design progresses. A reduced speed limit of 5 knots within 150m of construction area was implemented in early 2025 to ensure worker and marine equipment safety.

6.2.3.1 Community Enquiries and Complaints

All stakeholder information, contacts with the community, queries, complaints, meetings, presentations, site visits, feedback, and public events are recorded in Main Roads' corporate customer relationship system, CONNECT.

During working hours, the Project aims to acknowledge all complaints within 24 hours and respond within 10 working days. All details are entered into CONNECT. Main Roads are provided with a weekly report on enquiries received.

All telephone queries and complaints are directed to the Main Roads Customer Information Centre (CIC) via 138 138. If the CIC cannot answer the query, the call will be transferred to the Community and Stakeholder Engagement Manager during working hours or, if not urgent, raised as a CONNECT case.

If the matter is urgent after hours, the call will be transferred to the after-hours Duty Manager phone. This will be a dedicated 1800 number for the CIC or Main Roads to contact a project representative, and it will be guaranteed to be answered. This number will be established from 30 days after the deed until three months after practical completion of Separable Portion 2.

In this reporting period 108 queries were received with the most frequently asked questions relating to:

- Noise from project works.
- Community engagement requests.
- Vegetation removal and plans for revegetation.
- Damage to neighbouring properties.
- Air quality concerns.

6.2.4 Challenges

The Project encountered several significant challenges related to key community and environmental priorities, particularly concerning noise walls and Project location.

Community engagement efforts were often influenced by unresolved concerns about the length and scope of the proposed noise walls. Despite sharing broader project updates, feedback from community information sessions and stakeholder meetings consistently centred on whether noise mitigation measures would be extended to meet resident expectations. The delay in confirming a final decision on this matter impacted community sentiment and overall perceptions of the Project.

Following the final decision, a clear communication plan was implemented, including targeted updates to affected residents on the additional noise wall (amenity walls) scope and additional clearing required to construct the amenity walls. Communications continue in relation to the construction of the amenity walls and impacts to residents from these works.

The Project's location also presented ongoing challenges. Situated in close proximity to residential areas, the Mandurah Estuary, and the sensitive Ramsar-listed wetlands, the construction program has required stringent environmental controls and careful planning to mitigate potential ecological impacts. Balancing the delivery of critical infrastructure with the preservation of surrounding natural and community assets has remained a central and complex focus throughout the Project lifecycle.

Continued refinement of construction methods and scheduling will be considered to minimise environmental impact near the estuary and wetlands, supported by ongoing ecological monitoring.

6.2.5 Culture, History and Heritage

6.2.5.1 *Heritage assessment*

An ethnographic assessment was undertaken for the Project in 2022. The assessment was undertaken in accordance with the Noongar Standard Heritage Agreement (NSHA) and was undertaken in collaboration with South West Aboriginal Land & Sea Council (SWALSC) and with participation of

seven Gnaala Karla Boodja Indigenous Land Use Agreement (ILUA) group representatives. The assessment confirmed the significance of Djilba (Aboriginal Cultural Heritage [ACH] Registered Place ID 32696). It is an area of importance to the Bindjareb people and is a sacred Waugal site, camping ground, fishing and hunting place, food and medicine resource, recreational area, gathering place and a place along a traditional Noongar Walk trail.

Djilba includes approximately 12.9ha of the Mandurah Estuary and its embankments. Prior to work getting underway, Section 18 approval was obtained in October 2023 (under the requirements of the Aboriginal Heritage Act 1972 [AHA]). While there are additional sites of cultural significance sitting outside of the Project area, there are no other significant sites within the Project footprint.



Figure 17 Intersection of the Project with Djilba

6.2.5.2 Heritage engagement and considerations

The Project team meets with a Bindjareb Reference Group (comprising of 8 Bindjareb Elders as voted in by the Winjan Aboriginal Corporation board) at a minimum of 3 times a year. The BRG was established to provide a forum for nominated representatives from the Bindjareb community to share knowledge and information, provide advice and input into the Project, address concerns and enhance the outcomes of the Project. BRG discussions include:

- Preferences for artwork design and selection of artists.
- Landscaping selection.
- Follow up of recommendations included in the heritage assessment, such as renaming of the bridge.
- Cultural awareness training.
- Ongoing heritage monitors during construction activities.
- Business and employment opportunities.

Following the initial heritage assessment, a Cultural Context and Interpretation Strategy (CCIS) was prepared in December 2022, to:

- Reveal the history of the site through thematically driven stories drawn from the cultural context study (part of the CCIS).
- Provide a clear series of interpretative strategies to guide the Project procurement and delivery phases.

- Provide a plan locating potential locations for integration of strategies into the design and landscape.

The CCIS started with the preparation of a Cultural Context Study (CCS) which sets out the environment or situation that is relevant to the beliefs, values, and practices of the culture under study. The CCS provides understanding of the intangible values that relate to a site that may not necessarily have a recognised cultural heritage significance but contribute to a broader understanding of connection that the place has to Noongar boodja (country). Once the CCS was supported by the BRG, it was followed by the preparation of an Interpretation Strategy report, that identifies the most significant themes and stories about a place and the strategies most suited to exploring them. A series of Interpretation Strategies were identified to maintain heritage values within the development approach and design. The Project has made considerations for the below design additions outlined in Table 12 in consultation with the BRG, to maintain the heritage assets/values of the area. In addition to the BRG, the Project has also implemented a CRG to go through detailed design plans (15%, 85% and 100% reviews of landscaping, artwork, bridge design and urban design). All decision-making of heritage design strategies during design and construction is addressed through the CRG.

Table 12 CCIS Strategies and Project outcomes

Strategy (CCIS)	Project Actions
Design Response	Creating a place welcoming to the Bindjareb people to continue to use this area is at the forefront of design development. Permanent design has been developed in consultation with the BRG, including technical consultants and asset managers being present at BRGs to attain input. Final design includes the following heritage initiatives: • Bindjareb painted mural. • Heritage trail information / signage - to be placed around the Project area with stories from Bindjareb Elders regarding the area. • Seating node (Yarning Circle) on Eastern and Western Foreshore. • Theming of the noise walls. • Pier artwork, requested by the BRG.
Landscape design	The Project's Urban and Landscape Design has been prepared in consultation with the BRG. The Project's Landscape Architect has presented key concepts to the BRG for input. Heritage interpretation within landscape design is informed by the CCIS. Urban and landscape design includes the following: • Bindjareb painted mural • Theming of the noise walls - Bindjareb Elders • Heritage trail information / signage - to be placed around the Project with stories from Bindjareb Elders regarding the area • Seating node (Yarning Circle) on Eastern and Western Foreshore • Pier artwork, requested by the BRG
Landscaping & Revegetation	The Project's Landscape Architect has been present at multiple BRG and CRG meetings. This has included presenting the proposed plant species. The species list was then sent to the BRG for review and input. The BRG also requested for the common plant names to be added into species documentation, this was actioned within the Landscaping and Revegetation Plan.
Public Art & Community Art	All public art has been coordinated with the BRG (<i>Her-1f [No.1, p1]</i>). Representatives of the BRG have been involved in the selection of artists for public art, including attending Artist workshops with representatives of Georgiou, Main Roads and the City of Mandurah. Final artwork themes with input from the BRG include: • Bindjareb painted mural

Strategy (CCIS)	Project Actions
Lighting	• Theming of the noise walls - Bindjareb Elders (still being developed). • Pier artwork, requested by the BRG Feature lighting has been discussed with the BRG. As the Project has developed another public art piece in consultation with the BRG (Pier Artworks), we have moved away from lighting as a form of art. However, there will be lighting from the bridge to highlight the artwork on the piers.
Signage and wayfinding	All wayfinding and signage within the Project site is coordinated with the BRG. The BRG are responsible for providing naming, wording and guiding the Project on suitable final locations.
Nomenclature	The Project has pursued the opportunity to re-name the new bridge as per the recommendations of the CCIS and BRG consultation. Unfortunately, this initiative was not realised.
Ephemeral	Final design has been developed in consultation with the BRG and CRG, to ensure it encourages the use of the place for local Bindjareb people. The inclusion of two new seating nodes will provide new locations for future events during the operational phase of the asset.

6.2.5.3 *Heritage management during construction*

The Project has engaged Winjan Aboriginal Corporation to oversee the heritage monitoring requirements for all works within Djilba. All ground disturbance works on the Land that intersects Djilba is to have representatives of the Bindjareb people on site as heritage monitors. Monitors are arranged based on construction program.

A Culture and Heritage Sub-Plan of the EMP has been implemented on the Project with mitigation measures and procedures, including an unexpected finds procedure. Implementation of the unexpected finds procedure is monitored as part of regular Environmental Daily Hazard Inspections and no unexpected finds have been recorded on the Project to date.

Cultural Awareness Training (CAT) is mandated for all long-term Project employees and is delivered by a Bindjareb Elder (Uncle George Walley) with local knowledge of the area. Long-term employees are considered Project employees who have worked on the Project full-time for over 3 months. The Training provides an overview of the Aboriginal history of the area on which the Project is based. It has been specifically created for Georgiou and for the Project.

6.2.6 **Road Safety**

The Project is a crucial initiative aimed at improving the travel times between the northern and southern sides of Mandurah, as well as providing safer access for pedestrians and cyclists. This Project aims to significantly improve traffic flow and reduce the risk of rear end and side-impact collisions, which are prevalent in this area due to high traffic volumes. Recent statistics highlight the urgency of this Project, with 96 traffic incidents reported in the Lakelands Lake Clifton Area between 01/01/2018 and 31/12/2022, 71 of which being rear end collisions and 11 being sideswipe/same direction incidents.

Increasing traffic demand through this road, especially during morning and afternoon traffic peaks, highlights the requirement for robust controls and plans to ensure road safety. To date, the Project has implemented various traffic controls which range from a minor speed reduction, up to contraflowing of the traffic to facilitate minor road works and the Project's first traffic staging requirement. Planning for these works involved a detailed process for which a Road Traffic Manager

endorsed Traffic Control Plans are thoroughly reviewed by the Project Team, City of Mandurah and Main Roads. The main aim of the review process is to ensure the safety of the public during and after each traffic implementation.

Additional control such as pre-implementation and post-implementation audit by a non-affiliated third party has been implemented for major traffic implementation to ensure that works are conducted safely, and the final road alignment are safe for motorists. The condition of the traffic setup post implementation is monitored through daily site drives with emphasis on road conditions and existing temporary traffic setup.

6.2.7 Diversity and Inclusion

The Project is committed to promoting an inclusive working environment and addressing the disadvantage and inequality which may be experienced by different diversity groups. To address these disadvantages the Project has implemented a Project Wellbeing and Diversity and Inclusion Committee. The Committee has been meeting once a month since the start of the Project, to ensure actions are implemented to achieve the Project's targets and implement initiatives and events celebrating the diversity of the workforce.

The Project's targets are currently all on track:

- Minimum 5% of the workforce to be new employees with less than 5 years' experience in the construction industry.
- Celebrate at least 1 event celebrating diversity groups, such as Harmony week at least annually.
- Implement the flexible working arrangement policy.
- Achieve at least 10% of white-collar employees representing women in non-traditional roles.
- Provide training to female workforce for upskilling
- Fundraise for 1 event supporting not for profit organisation in Mandurah during life of Project.

Events held to celebrate diversity and inclusion in the last financial year include NAIDOC Week July 2024, Chinese New Year in February 2025, St Patrick's Day in March 2025, Reconciliation Week and Pride Month in June 2025.

Additionally, as part of the project's health and well-being management plan. The project has implemented several initiatives to improve the well-being of both the white-collar and blue collars on-site. The team participated in a health challenge with the goal being to increase the physical activity and promote improved nutrition of the workforce, contributing to positive physical and mental wellbeing. This ran over two months with a competitive nature promoting great results. The next initiative that was implemented was educational sessions during the pre-start meetings in the morning; this is centred around hot topics such as alcohol and drugs minimisation, healthy eating and proper sleeping patterns. This all contributed to the overall high sentiment score received by the workers on site in the quarterly surveys.



Figure 18 Dragons at Chinese New Year Celebrations on the Project

6.2.8 Workforce Safety

The Project has established a set of safety criteria against which it evaluates its safety performance. These criteria are not purely statistical but encompass various generic and site-specific objectives, including Health, Safety, Environment and Quality Management System Application, Communication, Workforce Consultation & Participation, Effective Risk Management, Training & Innovation, Health & Wellbeing, and Project Specific Objectives. Monthly assessments against these criteria determine compliance.

There's a notable focus on managing critical risks, with workshops held to review risks associated with high-risk activities. Despite these challenges, the Project has achieved key objectives, maintaining a record of no incidents during such activities. Audit schedules are based on Project requirements, and inspections are conducted periodically using Key Performance Indicators monitored by senior management for accountability.

The Project has implemented a safety culture program aimed at improving individual safety performance. This program emphasises specific safety behaviours expected from all Project personnel, including caring for colleagues, reporting hazards and incidents, individual accountability, and promptly addressing safety issues.

While safety remains paramount, the Project recognises the importance of creating a work environment where every worker feels valued and respected. This fosters a stronger safety culture, enhancing safety performance.

The Project has a strong focus on health and wellbeing and supports white and blue-collar workers through implementation of the Health and Wellbeing Management Plan. A Wellbeing Committee meets monthly to discuss actions to achieve wellbeing targets during delivery, including ongoing initiatives such as offsite group exercise sessions for both white and blue-collar workers, completing the Push up Challenge, and scheduling days off to support work-life balance and wellbeing. The Project holds regular toolbox sessions addressing critical issues such as men's health, mental health, and other culturally relevant topics. Additionally, industry professionals are engaged to conduct

information sessions on these important issues such as sleep and nutrition.

Statistically, the Project to date reports no lost time, moderate or high severity incidents with a total of five (5) work-related incidents documented, two (2) of which are report only incidents.

6.2.9 Legacy Commitments

During the design phase the Project team has considered 'legacy' opportunities aligned with the ISC definition for legacy. Interpretive elements about the area, birdlife and dolphin population, including promotion of the RAMSAR significance, was raised during engagement activities within the design phase. Recognising the environmental significance of the local area surrounding the Project, the Project is facilitating the implementation of interpretative elements recognising the dolphins of the Peel-Harvey Estuary, the RAMSAR status of the Peel-Harvey Estuary and migratory birds.

During stakeholder engagement in the planning phase, one priority issue was raised by stakeholders, to ensure implementation of seven ACROD parking bays as a legacy initiative for the community as part of the Project works. Since this priority issue was raised, the Project has expanded this to include nine ACROD parking bays in the new carpark being designed and constructed at the eastern foreshore. The Project team has ensured we have engaged with the Access and Inclusion Group during the design phase to understand and implement accessibility considerations in permanent design and implemented a number of considerations based on this engagement.

6.2.10 Urban and Landscape Design

The MEBD Project Urban and Landscape Design process commenced in the project development (planning) phase, where an Urban and Landscape Design Framework (ULDF) was developed. The purpose of the ULDF is to assist the planning and management of urban and landscape design related factors associated with the Project and to provide guidance for subsequent design and delivery stages. An Urban and Landscape Design (ULD) Report has been prepared to present the urban design within the Project, in accordance with the visions, principles and objectives outlined in the ULDF. This Report has been developed in conjunction with the 'Foreshore Urban and Landscape Design' and 'Landscaping and Revegetation Design' Reports, which form the Project's Urban and Landscape Design.

The ULD for the Project has been developed in response to, and supporting the vision, principles and objectives outlined within the ULDF. The Project ULD principles include:

- Identity: Enhance identity and sense of place to enrich community experience and understanding of the place.
- Connectivity & Wayfinding: Better connections and legible addition to existing networks and places for healthy, inclusive communities.
- Urban Integration: Integrate the infrastructure and provide benefits to a diversity of users.
- Resilience and Sustainability: Infrastructure is durable, enduring and resilient to support current and future generations.
- Amenity: High quality amenity delivered by well-designed, functional infrastructure for users of all abilities, contributing to successful, equitable and prosperous communities.
- Vibrancy: Ensure built places are vibrant places where people want to visit, experience or live around.
- Safety: People and Place. Safe environments are essential for strong, connected and liveable communities.
- Accessibility: Highly accessible and inclusive environments encourage positive activation and are vital to community well-being, inclusion and health.

Supporting objectives for each of these principles are outlined in the ULD Report. These ULD principles and objectives were developed to ensure that overall landscape and overall design vision is realised within the Project. The ULD principles and objectives are based on the overarching principles of Creating Places for People: An Urban Design Protocol for Australian Cities (2011) and SPP 7.0 Design WA Principles (DPLH).

The Project's ULD has been developed with a holistic design approach, carefully considering the existing Mandurah Estuary Bridge's, context, surrounding communities and recreational areas, to ensure that the ULDF vision has informed the project works. The following community benefits are anticipated through the ULD:

- The Project has created a positive legacy for the Mandurah Estuary and community with the development of a universally accessible fishing platform that enhances and provides amenity within the foreshore reserve, informed by the area's strong natural and cultural heritage.
- Amenity for surrounding communities has been provided within the Mandurah Estuary foreshore, with connectivity to foreshore pathways, enhancement and activation of foreshore areas below the new bridge.
- The Project has enhanced connectivity from surrounding communities across the estuary, for all types of commuters, cars, cyclists and pedestrians. In particular, providing connectivity for pedestrians and cyclists east and west, on the southern side of the bridge to access surrounding recreational and community areas of Erskine and Dudley Park. The Project also enhances the safety of pedestrian access to the bus stops on Mandurah Road.
- Visual quality of the projects integrated Public Art and urban aesthetics has been carefully considered during the design process to ensure that a specific sense of place is created for the project, informed by the Estuary and its context.

The Project's Urban and Landscape Design is reviewed by Main Roads, the City of Mandurah, and by an Independent Reviewer with over 18 years' experience as a Landscape Architect. Stakeholders were consulted as part of the Urban and Landscape Design process, leading to the following design changes and options considered to maximise amenity and urban and landscape design outcomes:

- Carpark Access Road.
- Carpark Accessible Bay Locations.
- Fish Cleaning Station.
- Egret Point Drive and Seahawk Drive Retaining Wall.
- Shared Path Rest Stop Location.
- Shared Path connection (Seahawk Drive).
- Pier Artwork.
- Western Foreshore Yarning Node.
- Samphire Revegetation.
- Stone Pitch Patterns.
- Western Universal Access to Beach.

6.3 Social Outcomes

The Project's key social outcomes are reflected in multiple Project sustainability objectives:

- Protect, enhance and integrate the existing uses of the Estuary 'place'.
- Improve accessibility, capacity, connectivity and safety for all users.
- Deliver a high-quality outcome that is socially and environmentally sustainable and responds to the context and character of the area.

In addition to these aspects, stakeholder engagement, management of culture and heritage, and workforce sustainability are key social priorities on the Project. As detailed in Section 6.2, the overarching objectives of community and stakeholder engagement for the Project are to provide consistent, clear, and honest information to stakeholders and develop and maintain relationships with key stakeholders and impacted community members.

6.4 Social Case Study, Dedicated Project Facebook Group

During the early design phase of the Mandurah Estuary Bridge Duplication Project, it became clear that the community was highly engaged online, often discussing the Project on multiple local Facebook pages. While this demonstrated strong interest, it also posed challenges for monitoring discussions and responding accurately to community concerns. Misinformation and speculation were common, and there was no central platform for updates or direct dialogue.

To address this, a dedicated Project Facebook Group, Mandurah Estuary Bridge Duplication Project, was launched as a dedicated platform to:

- Disseminate timely and accurate project updates.
- Address community queries and concerns directly.
- Serve as a reference point complementing other communication channels such as the Main Roads website, monthly Construction Updates, Fact Sheets, and Project Newsletters.

Since its inception, the Facebook Group has demonstrated significant growth and engagement:

- **Membership Growth** The group has grown to over 3,500 members, reflecting strong community interest and involvement. Apart from an initial advertising campaign to attract members in March 2024, growth of members and engagement reach has been organic.
- **Active Participation Members** regularly engage with posts, seeking updates and asking questions, which are promptly addressed by Project representatives.
- **Information Dissemination** The group effectively disseminates information about Project milestones, construction activities, and community events, ensuring transparency and keeping the public informed.
- **Positive Sentiment** The centralised communication has contributed to a reduction in speculative commentary on other platforms, fostering a more informed and positive community sentiment towards the Project.

6.4.1 Impact and Outcomes

The group now has 3,500+ members and continues to grow steadily.

An initial paid awareness campaign targeted local Mandurah residents, helping establish the group's presence and drive membership. Otherwise, growth of the group has been organic.

Engagement has significantly increased, with members regularly using the group to:

- Access accurate and timely Project updates.
- Ask questions and receive responses from Project representatives.
- Share their experiences and photos of the works in progress.

The group has played a proactive role in reducing misinformation and speculative commentary across other community platforms.

The Mandurah Estuary Bridge Duplication Project Facebook Group has proven to be an invaluable tool in enhancing community engagement, providing accurate information, and fostering positive sentiment towards the Project. Its strategic implementation and active management have ensured

that the community remains informed and involved throughout the Project's progression.

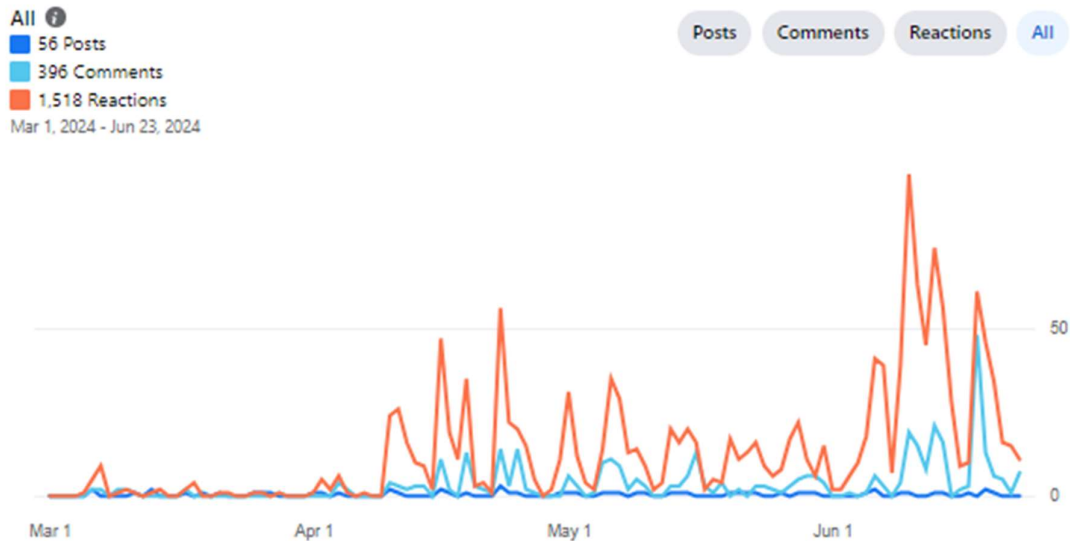


Figure 19 Total Facebook engagement since inception

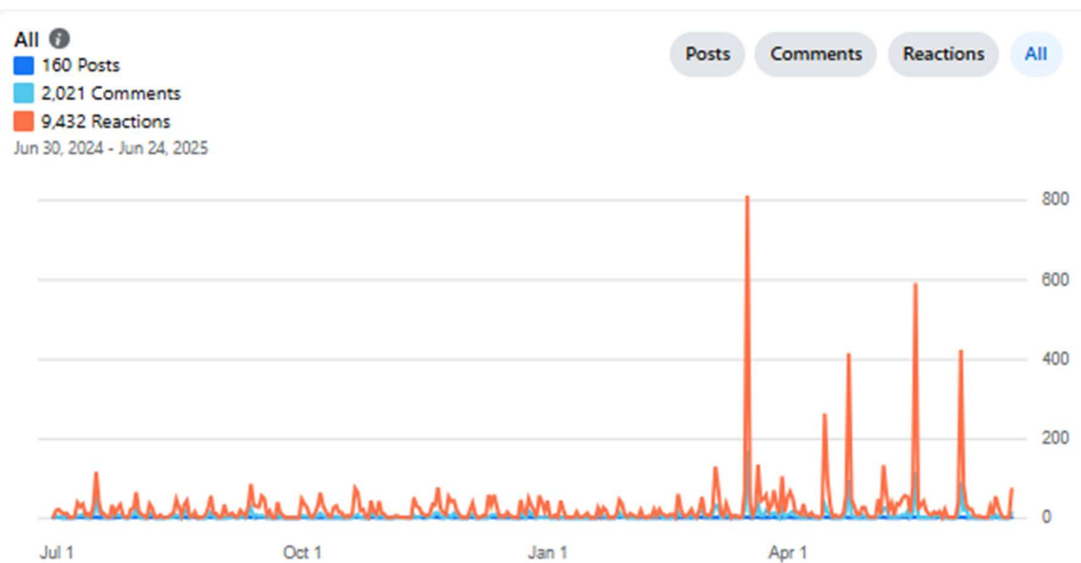


Figure 20 Total Facebook engagement July 2024 – June 2025



Figure 21 Facebook group demographics

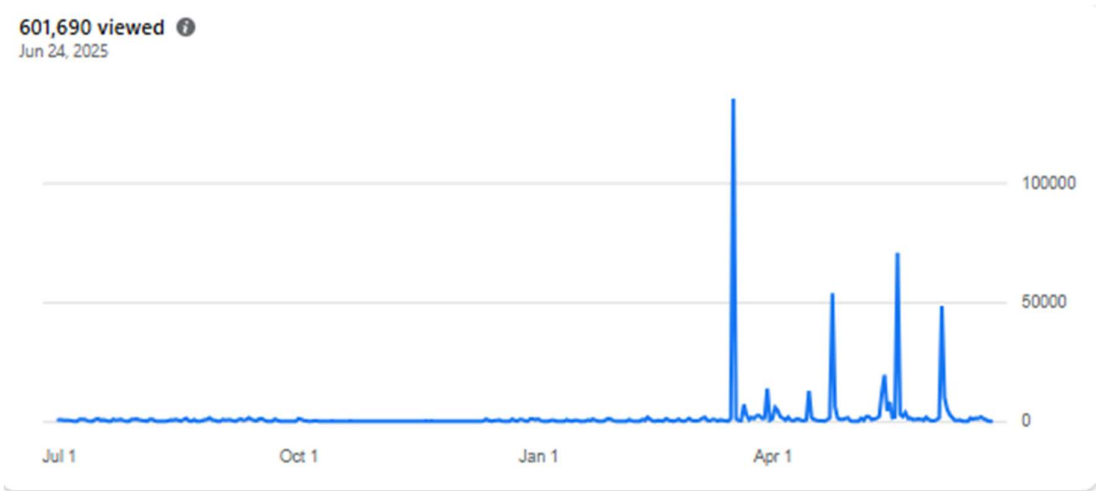


Figure 22 Facebook post views July 2024 – June 2025 – 601,690 people viewed the group

6.5 Social Case Study, Biophilic design elements

A Biophilic Design Memorandum was developed by the Project’s Landscape Architect, to demonstrate the biophilic design elements incorporated within the Project works and integrated the main attributes of biophilic design.

Biophilic design connects people and communities with nature, utilising visual, patterned, spatial or relationship connection to landscape, ecology or culture of a local area. This connection has been found to be beneficial for the wellbeing of peoples and communities. Biophilic design is more

traditionally applied to architectural design and the spaces created within its associated built form, however biophilic design principles can be applied to large infrastructure projects where good design will provide outcomes that connect to the landscape, community or local area.

The Project's main biophilic design elements are based on the following outcome areas:

- Natural Connections:
 - Direct; water, plants, animals, natural landscapes and ecosystems.
- Patterns of Nature:
 - Indirect; images of nature, natural colours, naturalistic shapes and forms.
- Place Relationships:
 - Space & place; prospect and refuge, mobility and wayfinding, cultural and ecological attachment to place.

These outcomes contain attributes that are both, direct experience of nature, indirect experience of nature, and experience of space and place, and are entwined across the three outcome areas. Refer to Figure 23 for a visual overview of the Patterns of Nature on the Project. Noise and amenity walls include 'birds of flight' integrated artwork, utilising colours from the Estuary edge reflected skyline (refer to ID '1'). Retaining walls include 'Samphire' patterns at ground level utilising earthier colours of the Estuary edge (refer to ID '2'). Tops of walls provide a sky line, with stencilled birds and colours from the Edge reflected skyline. Contrasting stone pitch areas utilising basalt and limestone, to create patterns mimicking the flow of water and ripple forms within the Estuary landscape (refer to ID '3'). Bifurcated bridge pier form reflecting a naturalistic supportive element (refer to ID '4').

The biophilic enhancements and elements within the Project have been assessed to demonstrate their net improvement to the Project's biophilic outcomes. The assessment was undertaken through a biophilic assessment workshop, and elements were assessed based on their quantum and quality of biophilic outcomes to demonstrate the net improvement of each element. Individual Project elements of each outcome area were identified for assessment to determine the net biophilic improvement for the Project. The memorandum inclusive of the assessment was also independently reviewed during the design phase. The result of the assessment demonstrates percentage increase in enhancement for each biophilic design outcome area:

- Natural Connections, 12.5% increase. Related Project elements include:
 - Western Foreshore Seating Node.
 - Eastern Foreshore Platform Landing Node.
 - Fishing Platform.
 - Revegetation.
 - Samphire Plantings.
 - Riparian Drainage Treatments.
- Patterns of Nature, 14.6% increase. Related Project elements include:
 - Noise and Amenity Wall Artwork.
 - Retaining Wall Artwork.
 - Piers.
 - Abutment Stone Pitch Patterns.
- Place and Relationships, 13.9% increase. Related Project elements include:
 - Rest Node Views.
 - Framed Views.
 - Shared Path Connectivity.

- Accessible Carpark and Fishing Platform.
- Wayfinding (noise walls on Mandurah Road).
- Wayfinding (Bindjareb pier artwork).
- Bindjareb Pier Artwork.
- Bindjareb Interpretative Signage.
- Ecological Interpretative Signage.
- Sculptures (fishing stories).

Based on the biophilic net improvement assessment, the Project demonstrates a net improvement and increase in biophilic enhancements.

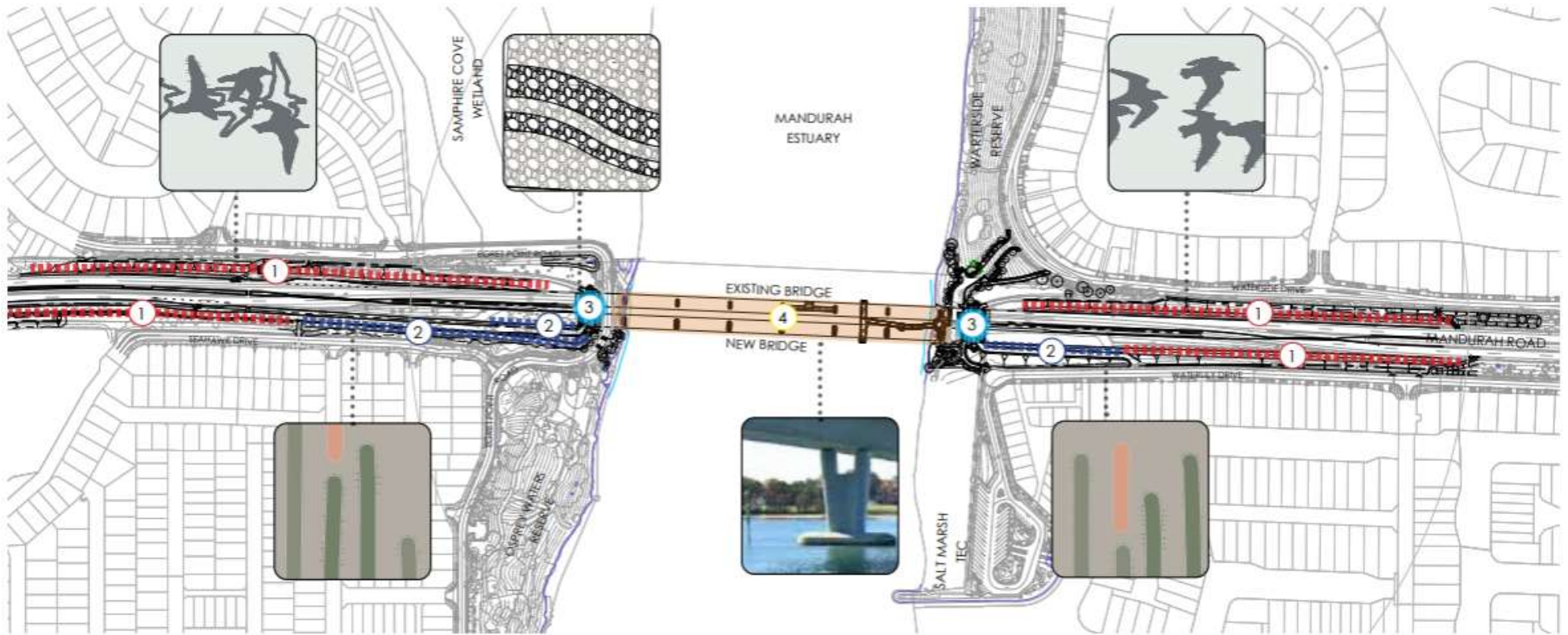


Figure 23 Patterns of Nature Locations on the Project

7 Glossary

A glossary of terms used throughout this document is detailed in Table 13.

Table 13 Glossary of Terms

Term	Description	Link to Further Information
Material; Materiality	Relevant topics are those that may reasonably be considered important for reflecting the organisation's economic, environmental, and social impacts, or influencing the decisions of stakeholders.	Global Reporting
National Greenhouse Accounts Factors	The National Greenhouse Accounts (NGA) Factors has been prepared by the Department of Industry, Science, Energy and Resources and is designed for use by companies and individuals to estimate greenhouse gas emissions. The NGA Factors is not published for the purposes of reporting under the <i>National Greenhouse and Energy Reporting Act 2007</i> (the NGER Act). While drawing on the National Greenhouse and Energy Reporting (Measurement) Determination 2008, the methods described in the NGA Factors have a general application to the estimation of a broader range of greenhouse emissions inventories.	Australian National Greenhouse Account Factors
Resource Input	Materials that are used to build the Project, such as steel, concrete, or timber.	N/A
Resource Output	Outputs traditionally known as 'waste'.	N/A
Scope 1 Emissions	Scope 1 greenhouse gas emissions are the emissions released to the atmosphere as a direct result of an activity, or series of activities at a facility level. Scope 1 emissions are sometimes referred to as direct emissions.	Clean Energy Regulator
Scope 2 Emissions	Scope 2 greenhouse gas emissions are the emissions released to the atmosphere from the indirect consumption of an energy commodity. Scope 2 emissions from one facility are part of the scope 1 emissions from another facility.	
Scope 3 Emissions	Scope 3 emissions are indirect greenhouse gas emissions other than scope 2 emissions that are generated in the wider economy. They occur as a consequence of the activities of a facility, but from sources not owned or controlled by that facility's business. Some examples are extraction and production of purchased materials, transportation of purchased fuels, use of sold products and services, and flying on a commercial airline by a person from another business.	
Sustainable Development Goals (SDGs)	The 2030 Agenda for Sustainable Development, adopted by all United Nations Member States in 2015, provides a shared blueprint for peace and prosperity for people and the planet, now and into the future. At its heart are the 17 Sustainable Development Goals (SDGs), which are an urgent call for action by all countries - developed and developing - in a global partnership.	United Nations Sustainable Development Goals 2030

8 Appendices

Appendix	Title
Appendix 1	List of Project Stakeholders
Appendix 2	Georgiou Sustainability Policy
Appendix 3	List of Protected Areas
Appendix 4	Protected/Conservation Significant Flora and Fauna Species and Habitat

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Appendix 1 – List of Project Stakeholders*Table 14 Project Stakeholders*

STAKEHOLDER GROUP	SPECIFIC STAKEHOLDERS	ENGAGEMENT TYPE
State Government	- Premier Hon. Roger Cook (MLA) - Minister for Transport, Hon. Rita Saffioti - Lisa Munday Dawesville (Lab) - Rhys Williams Mandurah (Lab) - Director General Transport, Peter Woronzow	- Inform and consult – all through Main Roads - Briefing notes - Site visits - Presentations - Information sheets
Federal Government	- Catherine King Minister for Infrastructure, Transport, Regional Development and Local Government - Andrew Hastie Member for Canning (Lib)	- Inform - Project updates - Site visits - Presentations - Information sheets
State Government agencies	- Office of Environmental Protection Authority - Public Transport Authority - Department of Aboriginal Affairs - Department of Transport, including Marine Safety Branch - Department of Biodiversity, Conservation and Attractions - Department of Planning, Lands and Heritage (DPLH) - Department of Water and Environmental Regulation (DWER) - Department of Fisheries - Tourism WA - Western Australian Planning Commission - Peel Development Commission - Department of Biodiversity, Conservation and Attractions	- Inform, consult, involve and collaborate - Meetings - Presentations - Site visits - Working group representation - Email/phone calls - Workshops - Construction update - Relevant notices
Local Government	- City of Mandurah - Management - Elected members (especially Coastal and East ward councillors) - Mayor - Rhys Williams (July 2024 – January 2025) - Caroline Knight (January 2025 – October 2025) - Caroline Knight (January 2025 – October 2025)	- Inform, consult, involve and collaborate - Construction update - Fortnightly Meetings - Emails/phone calls - Fact sheets - Complaints register - Site visits - Presentations - Project updates
Aboriginal stakeholders	- Winjan Aboriginal Corporation - Bindjareb Noongar representatives - Winjan Rangers - Gnaala Karla Booja	- Inform and involve - Working group - Construction update - Relevant notices - Emails/phone calls - Meeting

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STAKEHOLDER GROUP	SPECIFIC STAKEHOLDERS	ENGAGEMENT TYPE
		- Aboriginal monitoring - Site visits - Story-telling - Smoking ceremony
Environment Groups	- Peel Harvey Catchment Council - Friends of Samphire Cove - Conservation Council of WA - Peel Preservation Group - MEHG - Estuary Guardians - Birdlife - Birds Australia - The Nature Conservancy Australia	- Inform, consult and involve - Working groups - Meetings - Construction updates - Phone calls/emails - Site visit - Volunteering - Mammal observers - Open Houses
Emergency services	- St John WA - WA Police - DFES	- Inform and involve - Email/phone calls - Relevant notices
Utility service providers	- ATCO Gas - Telstra - Water Corporation - Western Power - Telcos/service providers	- Inform, consult, involve and collaborate - Emails/phone calls - Meetings - Relevant notices
Property owners/residents (within 100m)	- Tenants - Homeowners - Landowner - Waterside Residents Association - Mariners' Cove Residents' Association	- Inform, consult and involve - Meetings - Face to face - Phone calls/emails - Construction updates - Relevant notices - Working groups - Open Houses - Project updates - Fact sheets - Property condition surveys
Developers	Mirvac	- Inform and consult - Phone calls/emails - Meetings - Construction updates
Business	Local business	- Inform, consult and involve - Face to face - Meetings - Relevant notices - Construction updates
Estuary recreational and business groups	- Fishability Group - RecFishWest - Mandurah Licensed Fisherman's Assoc. - Boating WA	- Inform, consult and involve - Working groups - Meetings - Phone calls/emails

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STAKEHOLDER GROUP	SPECIFIC STAKEHOLDERS	ENGAGEMENT TYPE
	- Fishers with Disabilities Association - Mandurah offshore Fishing and Sailing Club - Blue Lighting Charters - Port Bouvard Charters - Mandurah over 55s Kayak Club - Mandurah Vikings Dragon Boat Club - Rowing WA - Mandurah Boat hire - Over 55 Sailors mental health group	- Construction updates - Relevant notices - Website - Open House
Community interest	Access and Inclusion Advisory Group (City of Mandurah)	- Meetings - Emails - Open House
Other Interest Groups	- Peel Chamber of Commerce and Industry - Mandurah and Peel Tourism Organisation - Mandurah Communities page - Facebook - Mandurah Notice Board - Facebook group - Our Dawesville Community - Facebook group - South West Community Notice Board - Facebook Group - Visit Mandurah - Mandurah Over 55 Cycle Club - School and TAFE groups	- Inform, consult and involve - Meetings - Phone calls/emails - Open House - Construction update - Fact sheets - Working groups - Website - Monitor online media
Cyclist groups	- WestCycle - Dept of Transport Network Planning - Local community groups	- Inform and involve - Meetings - Working groups - Phone calls/emails - Site visits - Signage and VMS
Community	- Residents in neighbouring suburbs - Wider community	- Inform and involve - Public displays - Open House - Construction update - Website - Project update
Motorists	General road users	- Inform and involve - Public displays - Open House - Construction update - Website - Project update - Signage and VMS

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Appendix 2 – Georgiou Sustainability Policy

COMPANY POLICY



SUSTAINABILITY

Georgiou is committed to achieving sustainable growth by managing its operations to maximise environmental, economic and social outcomes.

To achieve this commitment, Georgiou will:

- Be ethically responsible in managing project construction, materials procurement and companies engaged.
- Build long-term relationships with communities and stakeholders.
- Support the workforce in being diverse, engaged, motivated and competent.
- Engage with supply chain to achieve project sustainability objectives and targets.
- Value a culture based on leadership, inclusiveness and personal development.
- Facilitate the sharing of ideas, knowledge and innovation within the business and stakeholders.
- Implement risk and hazard management principles to maintain the health and safety of its people, the surrounding community and the environment.
- Create long-term sustainable outcomes for our clients aligned to their objectives.
- Deliver sustainable, profitable growth while satisfying social, legal and contractual obligations.

A stylized, handwritten signature in black ink, appearing to be "GG" or similar initials.

Gary Georgiou
Chief Executive Officer
Georgiou Group
September 2025



Appendix 3 – List of Protected Areas

The following table lists Protected Areas identified within the Project Area, by the Flora, Vegetation, Fauna and Black Cockatoo Assessment Report completed by AECOM in 2022 and the Georgiou EMP.

Table 15 Project Protected Areas

PROTECTED AREA	DETAILS	LOCALITY/ PROXIMITY	IMPACT
Environmental			
Peel-Yalgorup Wetland	Ramsar Wetland – Site 482 Internationally important wetlands under the Ramsar convention 1971	A section of the Project Area (2.27ha) lies within the wetland	Project construction activities are not expected to significantly impact environmental values of the Peel-Yalgorup wetland system because: - no areas of the wetland will be destroyed or substantially modified due to disturbances associated with the construction of Bridge 1910 piers being confined to a maximum area of 2m around each pier. 0.01050ha of benthic vegetation (seagrass) has been cleared for the reclamation pad construction. An additional 0.12 ha of benthic vegetation is expected to be lost due to shading from the bridge, which will reduce light penetration and limit seagrass photosynthesis. - all dewatering activities and their impacts will be localised and confined to a short duration. - the Project piers (and their construction) will not cause any significant alteration in flow regimes or velocities and, therefore, will not alter overall sediment deposition and erosion regimes of the Mandurah Channel. - no riparian vegetation or significant fauna and/or flora species have been recorded as inhabiting the Project area.
Sub-tropical and Temperate Coastal Saltmarsh	Threatened Ecological Community (Cth VU, WA P3) as per Western Australian Environmental Protection (Environmentally Sensitive Areas) Notice 2005	Adjacent to Project Area	No material impact expected on this area.
Samphire Cove	Class A Nature Reserve	Approximately 40m from the proposed works.	No material impact expected on this area.

PROTECTED AREA	DETAILS	LOCALITY/ PROXIMITY	IMPACT
Creery Wetland Reserve	Class A Nature Reserve	Approximately 350m from the proposed works.	No material impact expected on this area.
Heritage			
Djilba - Aboriginal Site (ID: 32696)	Registered Aboriginal Heritage Site	Inside Project Area	• Direct impacts of dust and vibration on the Project Area and surrounds are monitored continuously and managed as per the Environment Management Plan. • Invites in writing, giving 60 days' notice are sent to two representatives of the Gnaala Karla Booja Indigenous Land Use Agreement Group. This is so they can be present during all ground disturbance works on the Land where it impacts Djilba, if they desire. • Georgiou engages with a suitably qualified archaeologist to firstly identify and then be present during excavation of any areas with potential for buried material who then engage Aboriginal 'monitors' approved by the South West Aboriginal Land and Sea Council to be present during the excavation work in Djilba

Appendix 4 – Conservation Significant Flora and Fauna Species and Habitat

The following table lists conservation significant flora and fauna known to occur or likely to occur within the Project Area, as identified within the Flora, Vegetation, Fauna and Black Cockatoo Assessment Report completed by AECOM in 2022. General risks to fauna exist and as such are outlined in the Georgiou Fauna Management Plan.

Table 16 Conservation Significant Flora and Fauna

SPECIES	CONSERVATION SIGNIFICANCE CODE [^]		IMPACT
	FEDERAL	STATE	
Flora			
Fauna			
<i>Calidris canutus</i> (Red knot)	V, Mi, Ma	EN	Recorded within the Project Area during survey (Flora, Vegetation, Fauna and Black Cockatoo Assessment, 2022). No direct impacts expected or confirmed have occurred.
<i>Calyptorhynchus banksii naso</i> (Forest red-tailed black cockatoo)	V	VU	Foraging evidence recorded within the Project Area during survey (Flora, Vegetation, Fauna and Black Cockatoo Assessment, 2022). No direct impacts expected or confirmed have occurred.
<i>Calyptorhynchus latirostris</i> (Carnaby’s cockatoo)	E	EN	Recorded within the Project Area during survey (Flora, Vegetation, Fauna and Black Cockatoo Assessment, 2022). No direct impacts expected or confirmed have occurred.
<i>Numenius madagascariensis</i> (Eastern curlew)	CR, Mi	CE	Recorded within the Project Area during survey (Flora, Vegetation, Fauna and Black Cockatoo Assessment, 2022). No direct impacts expected or confirmed have occurred.
<i>Tursiops aduncus</i> (Indo-Pacific Bottlenose Dolphin)	DD	DD	Although not specifically marked as of State or Federal significance with regards to conservation. The Mandurah Estuary dolphin population are extremely significant to the local community. As such MMOs will be stationed at the construction site during marine piling to ensure work stops when dolphins are within 50m of piling equipment.
<i>Calidris ferruginea</i> (Curlew sandpiper)	CR, Mi, Ma	CE	Desktop assessment determined the species is likely to occur within the Project Area – suitable habitat present and multiple DBCA records in vicinity (Flora, Vegetation, Fauna and Black Cockatoo Assessment, 2022). No direct impacts expected or confirmed have occurred.
<i>Calidris tenuirostris</i> (Great Knot)	CR, Mi, Ma	CE	Desktop assessment determined the species is likely to occur within the Project Area – suitable habitat present and multiple DBCA records in vicinity (Flora, Vegetation, Fauna and Black Cockatoo Assessment, 2022).

SPECIES	CONSERVATION SIGNIFICANCE CODE ^		IMPACT
	FEDERAL	STATE	
			No direct impacts expected or confirmed have occurred.
<i>Calyptorhynchus baudinii</i> (Baudin's cockatoo)	E	EN	Desktop assessment determined the species is likely to occur within the Project Area – suitable habitat present and one nearby record (Flora, Vegetation, Fauna and Black Cockatoo Assessment, 2022). No direct impacts expected or confirmed have occurred.
<i>Falco peregrinus</i> (Peregrine Falcon)	-	OS	Desktop assessment determined the species is likely to occur within the Project Area – suitable habitat present and nearby records (Flora, Vegetation, Fauna and Black Cockatoo Assessment, 2022). No direct impacts expected or confirmed have occurred.
<i>Hydromys chrysogaster</i> (Rakali)	-	P4	Desktop assessment determined the species is likely to occur within the Project Area – suitable habitat present and recent DBCA records (Flora, Vegetation, Fauna and Black Cockatoo Assessment, 2022). No direct impacts expected or confirmed have occurred.
<i>Isodon fusciventer</i> (Quenda)	-	P4	Desktop assessment determined the species is likely to occur within the Project Area – suitable habitat present and recent DBCA records (Flora, Vegetation, Fauna and Black Cockatoo Assessment, 2022). No direct impacts expected or confirmed have occurred.
<i>Idiosoma sigillatum</i> (Shield-backed trapdoor spider)	-	P3	Desktop assessment determined the species is likely to occur within the Project Area – suitable habitat present and recent DBCA records (Flora, Vegetation, Fauna and Black Cockatoo Assessment, 2022). No direct impacts expected or confirmed have occurred.

^WA State Codes:

P3 – Poorly known species that do not appear to be under imminent threat

P4 – Rare, near threatened and other species in need of monitoring

CE – Critically endangered

EN – Endangered

VU – Vulnerable

OS – Other specially protected species

DD – Data deficient

Federal Codes:

Mi, Ma – Migratory

CR – Critically endangered

E – Endangered

V – Vulnerable

DD – Data deficient