

# PROJECT MANAGEMENT PLAN

Sustainability Management Plan

Sydney Metro West – Western Tunnelling Package

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## DOCUMENT CONTROL

The current document version number and date of revision are shown in the document footer. All changes made to the Management Plan during its implementation on a live project are to be recorded in the amendment tables below.

### Revision history

Revision	Date	Description of changes	Prepared by	Approved by
A	25/05/2022	Issue to Sydney Metro for review	LS	HY
B	28/07/2022	SM Comments addressed	LS	HY
C	18/08/2022	SM Reporting Template Updated	LS	HY
D	11/05/2023	Annual Update	GV	SM
E	28/05/2024	Annual Update	TS	SM/HY
F	04/07/2024	SM Comments addressed on Rev E	TS	SM/HY
G	13/11/2025	Annual Update	NZ	SM/HY

### Terms and Definitions

The following terms, abbreviations and definitions are used in this plan.

Term	Definition
ASR	Annual Sustainability Report
CCIAR	Climate Change Impact Assessment Report
CEMF	Construction Environmental Management Framework
CERT	Carbon Estimation and Reporting Tool
CTP	Central Tunnelling Package
DJV	Design Joint Venture
ECM	Environmental Control Map
EIS	Environmental Impact Statement
EMS	Environmental Management System
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i>
EPA	Environmental Protection Authority
EPD	Environmental Product Declarations
ER	Environmental Representative
ESCP	Erosion and Sediment Control Plans
ESR	Environmental Site Representative

Term	Definition
ETP	Eastern Tunnelling Package
EWMS	Environmental Work Method Statement
FSC	Forest Stewardship Council
GGIR	Greenhouse Gas Inventory Report
GLC	Gamuda Australia – Laing O’Rourke Consortium
GS	General Specifications
IS Rating	Infrastructure Sustainability Rating
ISC	Infrastructure Sustainability Council
ITR	Inspection Test Report
LCA	Life Cycle Assessment
MCoA	Ministers’ Condition of Approval
MRG	Management Review Group
MSDR	Monthly Sustainability Data Report
MSF	Maintenance and Stabling Facility
NEPM	National Environment Protection (Ambient Air Quality) Measure
NGER	National Greenhouse and Energy Reporting
OCCS	Overarching Community Communications Strategy
PEFC	Programme for the Endorsement of Forest Certification
PM	Project Manager
POEO Act	Protection of the Environment Operations Act 1997 (NSW)
(the) Project	Sydney Metro West Western Tunnelling Package
PS	Particular Specifications
QSR	Quarterly Sustainability Report
RAATM	Requirements Analysis, Allocation and Traceability Matrix
REMM	Revised Environmental Mitigation Measures
SMP	Sustainability Management Plan
SMW	Sydney Metro West
SOP	Sydney Olympic Park
SSI	State Significant Infrastructure
TBM	Tunnel Boring Machine
TfNSW	Transport for NSW
UK IAQM	United Kingdom's Institute of Air Quality Management
WTP	Western Tunnelling Package

# 1. GENERAL

## 1.1 Project Description

Sydney Metro is Australia’s biggest public transport project, with the vision “to transform Sydney with a world-class metro.” In 2024, Sydney will have 31 metro stations and more than 66 kilometres of new metro rail, revolutionising the way Australia’s biggest city travels. By the end of the decade, the network will be expanded to include 46 stations and more than 113 kilometres of world-class metro for Sydney.

Sydney Metro West (SMW) is a new 24-kilometre metro line with stations confirmed at Westmead, Parramatta, Sydney Olympic Park, North Strathfield, Burwood North, Five Dock, The Bays, Pyrmont Street and Hunter Street in the Sydney CBD.

On completion in 2030, SMW will support a growing city and deliver world-class metro services to more communities. This new underground railway will connect Greater Parramatta and the Sydney CBD.

This once-in-a-century infrastructure investment will transform Sydney for generations to come, doubling rail capacity between the two CBDs, linking new communities to rail services, and supporting employment growth and housing supply. SMW is expected to create about 10,000 direct and 70,000 indirect jobs during construction.

The new 24-kilometre SMW tunnel and excavation works for 10 new stations will be delivered in three contracts—the Western Tunnelling Package (WTP), the Central Tunnelling Package (CTP) and the Eastern Tunnelling Package (ETP).

The Gamuda Australia and Laing O’Rourke Consortium (GLC) is in the process of delivering the SMW WTP (hereafter referred to as the Project), which includes:

- Westmead Station box excavation, including temporary support, stub tunnels, partially mined station cavern and crossover cavern including permanent lining and support
- Parramatta Station, including excavation of station box and associated support
- Clyde Maintenance and Stabling Facility (MSF), including permanent dive structure, portal, spur running tunnels, spur tunnel junction cavern, bulk earthworks, civil structures, utilities corridor, road crossing and creek diversion
- Rosehill Services Facility, including shaft excavation, permanent lining and lateral support
- A precast segment manufacturing facility at Eastern Creek
- Demolition and site clearance works
- Tunnelling between Sydney Olympic Park (SOP) and Westmead.

Noting that the Western Tunnelling Package project scope being limited to mostly excavation and tunnelling works, and not including traditional carbon footprint high impact works, such as mechanical and electrical works, the sustainability management of the project will be especially focused on energy savings in construction and embodied carbon in our material selection.

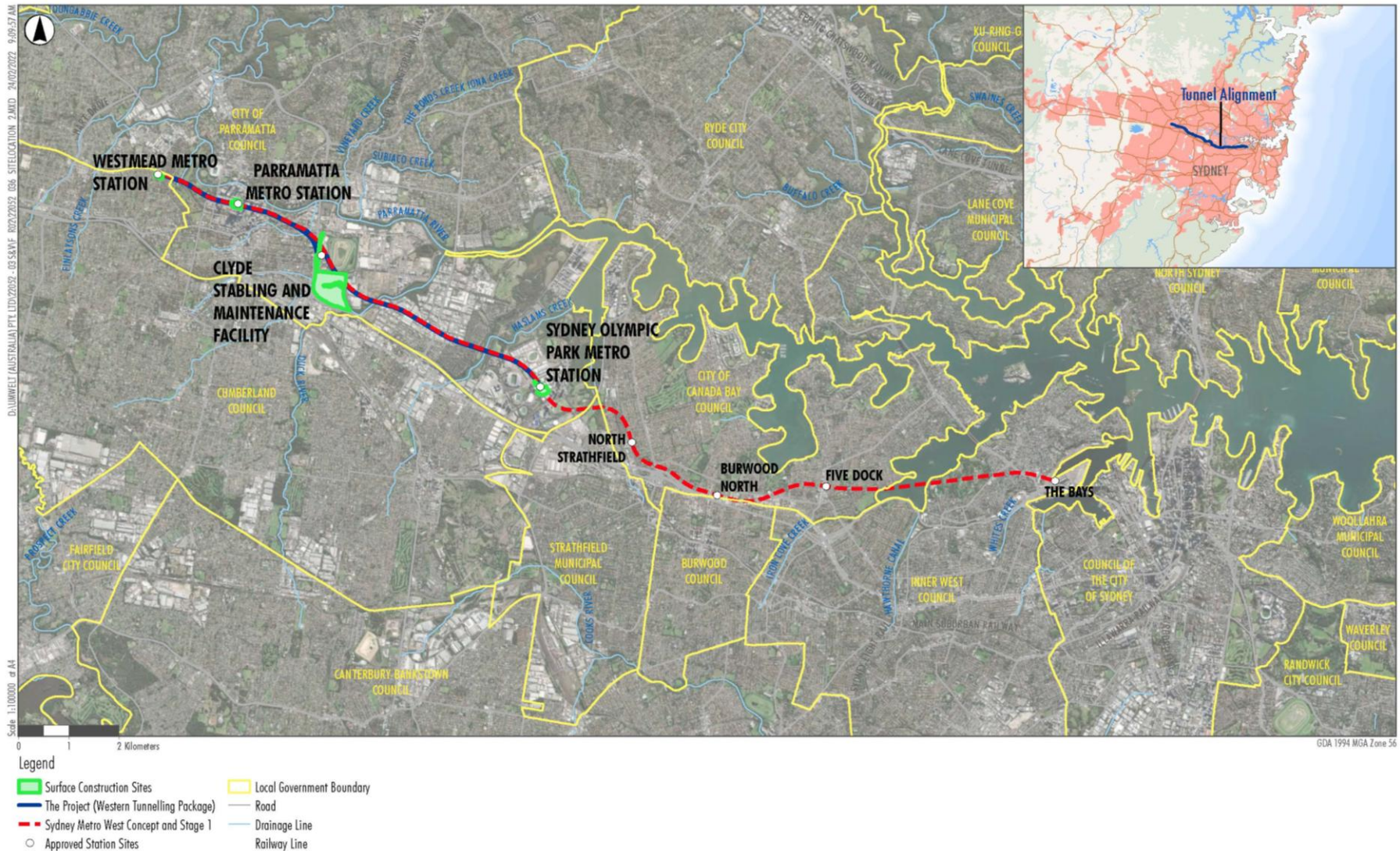


Figure 1: SMW WTP Project Map



## 1.2 Project Requirements

### 1.2.1 Contract requirements

This Sustainability Management Plan (SMP) has been developed to satisfy the contractual requirements listed in the following section of the General Specification (GS):

- Section 5.1.1 General
- Section 5.1.2 Project Plan Submission and Update
- Section 5.1.7 Sustainability Management Plan

Appendix A provides the GS compliance matrix.

### 1.2.2 Project sustainability compliance obligations

Key sustainability compliance obligations for the Project are derived from the following contractual documents:

- GS and Particular Specifications (PS)
- Returnable Schedule 3.5B Sustainability
- Construction Environmental Management Framework (CEMF)
- Planning Approval – Minister’s Conditions of Approval (MCoA)
- Infrastructure Sustainability Council’s (ISC) Infrastructure Sustainability (IS) Rating Tool v1.2 requirements
- Sydney Metro Sustainability Framework
- Sydney Metro West Sustainability Plan

## 1.3 Purpose of the Sustainability Management Plan (SMP)

This SMP has been prepared in accordance with MCoA C6. The purpose of this SMP and the associated sub-plans is to:

- Describe how GLC will comply with the requirements for sustainability management detailed within the MCoA, REMMs and the CEMF.
- Describe how GLC will minimise environmental risks and achieve Project environmental outcomes.
- This SMP will be the primary tool to bring Sydney Metro and legislative requirements together throughout project delivery.

This SMP has been prepared in accordance with:

- SSI 10038 MCoA, dated 11<sup>th</sup> March 2021 including:
  - The Sydney Metro West – Environmental Impact Statement, dated 15<sup>th</sup> April 2020
  - The Sydney Metro West – Amendment Report, dated 20<sup>th</sup> November 2020
  - The Sydney Metro West – Submissions Report, dated 20<sup>th</sup> November 2020
- Sydney Metro Construction Environmental Management Framework v4.0 (TfNSW, 2020)
- Sydney Metro West Overarching Community Communications Strategy (OCCS)
- Community Communications Strategy and Business Management Plan

- Relevant environmental legislative requirements
- Sydney Metro Sustainability Framework
- GLC Sustainability and Innovation Policy
- All other requirements of the contract.

This SMP specifies the sustainability requirements that the Project must meet to enhance sustainability performance. Consistent with the Project Sustainability Policy, the intended outcomes of the SMP include:

- Enhancement of sustainability performance
- Fulfilment of compliance obligations
- Achievement of sustainability objectives.

## 2 RESPONSIBILITIES AND AUTHORITIES

### 2.1 Key Personnel

GLC’s initial Project Environment and Sustainability Team and their interface with the project team and lines of communication with Sydney Metro are shown in the organisational chart in Figure 2.

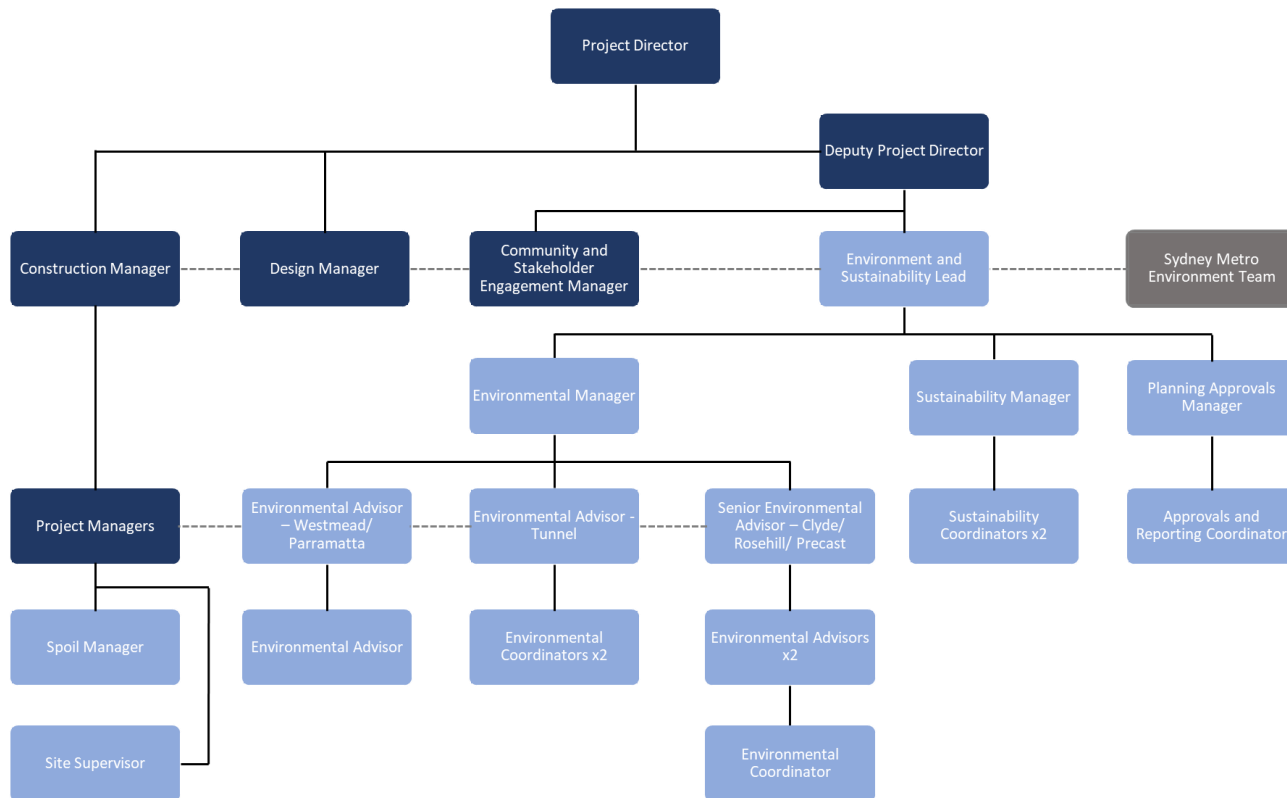


Figure 2: Initial GLC Environment and Sustainability team

GLC has determined and made provision for the resources required to establish, implement, maintain, and continuously improve our sustainability management system for the works.

The Sustainability Manager holds primary responsibility for sustainability performance during design and delivery of the Project. The Environment and Sustainability Lead champions sustainability across the project and representing sustainability at the senior management level.

The Sustainability Team assists in delivering contractual requirements, including the Infrastructure Sustainability (IS) Rating requirements. Reporting to the Sustainability Manager, the team comprises of a Sustainability Advisor and a Sustainability Coordinator providing sufficient resourcing to ensure that sustainability requirements remain embedded in the design and monthly reports developed for monitoring and performance.

Key responsibilities of the Environment and Sustainability Team are detailed in Table 1, Table 2 and Table 3. Roles and responsibilities of other teams in relation to sustainability are outlined in Table 4.

Table 1: Environment and Sustainability Lead

Environment and Sustainability Lead	
Authority	<ul style="list-style-type: none"> <li>● Liaise directly with ISC and Sydney Metro to facilitate positive sustainability outcomes.</li> <li>● Sustainability representative on the Senior Leadership Team, and responsible for providing feedback, proactive updates to senior management of sustainability initiatives and progress.</li> <li>● Authorised to stop work in the event of potential environmental harm.</li> <li>● Resolve major issues which cannot be resolved by the Environmental Manager and the project team.</li> <li>● Liaise directly with the Environment Representative and Acoustic Advisor as appropriate to facilitate any environmental management requirements, including those identified within the Planning Approvals.</li> </ul>
Responsibility	<ul style="list-style-type: none"> <li>● Monitor, measure, and evaluate the Project’s sustainability performance in order to support the continuous improvement of the GLC’s performance, systems and practice.</li> <li>● Represent and advocate sustainable outcomes within the industry on behalf of the Project.</li> <li>● Promote and drive the implementation of the Sustainability Policy, specifically within the Senior Management team to ensure sustainability is incorporated into project decisions and all management team members are aware of sustainability requirements</li> <li>● Oversee the process of achieving a compliant ISC Design and As-built rating.</li> <li>● Provide adequate resources to meet environmental objectives</li> <li>● Primary contact on environmental and sustainability matters to Sydney Metro, the Acoustic Advisor, and Environmental Representative.</li> <li>● Provide environmental support to the project team</li> <li>● Coordinate internal audits</li> <li>● Report to management on environmental performance and breaches</li> </ul>
Lines of Communication	<ul style="list-style-type: none"> <li>● Reports to Deputy Project Director</li> </ul>
Minimum skill level	<ul style="list-style-type: none"> <li>● Must have tertiary qualifications in environmental engineering / science along with relevant experience working in environmental management roles in Australia.</li> <li>● Infrastructure Sustainability Accredited Professional preferred.</li> <li>● Must complete corporate and project induction covering environmental responsibilities and Gamuda’s environmental management system.</li> </ul>

Table 2: Sustainability Manager

Sustainability Manager	
Authority	<ul style="list-style-type: none"> <li>• Authorised to endorse documentation for sustainability management approvals before submission to Sydney Metro</li> </ul>
Responsibility	<ul style="list-style-type: none"> <li>• Holds central responsibility for managing sustainability across the Project</li> <li>• Ensures that the SMP is effectively established, implemented and maintained at the project level</li> <li>• Ensures compliance with all relevant statutes, regulations, rules, procedures, standards and policies</li> <li>• Provide specialist sustainability advice to all functional managers, particularly Design, Procurement, Commercial and Construction, to ensure sustainability obligations are integrated across all Project delivery functions</li> <li>• Promote sustainability in design by facilitating opportunities workshops</li> <li>• Interface with, and report to, key Project stakeholders in relation to sustainability issues, including Sydney Metro and ISC</li> <li>• Participation in environment, sustainability, design, construction and commercial meetings as required.</li> <li>• Implement and deliver sustainability outcomes consistent with sustainability requirements, including IS rating requirements</li> <li>• Report on compliance and against sustainability requirements</li> <li>• Establish Program and project controls and reporting systems across the works for performance monitoring against desired targets</li> <li>• Demonstrate continuous improvement of management systems based on senior management reviews</li> <li>• Manage a team of sustainability personnel and specialist consultants to ensure all contract requirements are met.</li> </ul>
Lines of Communication	<ul style="list-style-type: none"> <li>• Reports to the Environment and Sustainability Lead</li> <li>• Reports to the Project Systems Manager on the performance of the system and improvement opportunities.</li> <li>• Liaises with Sydney Metro on sustainability issues, including non-conformances (incidents or deviations from the SMP)</li> <li>• Liaises with the Environmental Manager on environmental and sustainability matters.</li> </ul>
Minimum skill level	<ul style="list-style-type: none"> <li>• Tertiary qualification in environmental science, engineering or equivalent</li> <li>• Minimum 10 years' experience post qualification in major projects, with extensive experience in the preparation and implementation of sustainability management plans and IS rating</li> <li>• Infrastructure Sustainability Accredited Professional that has submitted an IS Rating to a minimum Leading standard</li> <li>• Must complete corporate and project induction covering sustainability requirements and Gamuda's Sustainability and Innovation Policy.</li> </ul>

Table 3: Sustainability Advisor and Coordinator

Sustainability Advisor/Coordinator	
Authority	<ul style="list-style-type: none"> <li>● Authorised to undertake onsite inspections</li> <li>● Intervene where a sustainability incident has occurred or is likely to occur</li> </ul>
Responsibility	<ul style="list-style-type: none"> <li>● Delivery of toolbox / prestart presentation (or other specific training) to inform work crews of the requirements documented in the SMP</li> <li>● Perform regular on-site liaison and inspections</li> <li>● Provide sustainability advice and assistance to construction personnel</li> <li>● Manage implementation of SMP and sub-plans</li> <li>● Respond to sustainability non-conformances</li> <li>● Manage and administer sustainability ratings</li> <li>● Responsible for assisting the Sustainability manager deliver the IS rating process and is a Project ISAP</li> <li>● Liaise with wider team (including design, construction, stakeholder and community and contracts) to integrate sustainability requirements across the works</li> <li>● Collect and manage evidence to meet sustainability requirements</li> <li>● Manage submission of evidence to demonstrate compliance with sustainability requirements</li> <li>● Collect and manage data associated with emissions, materials, waste and water on site</li> <li>● Conduct sustainability audits as necessary</li> </ul>
Lines of Communication	<ul style="list-style-type: none"> <li>● Reports to Sustainability Manager</li> </ul>
Minimum skill level	<ul style="list-style-type: none"> <li>● Must have tertiary qualifications in environmental planning/science</li> <li>● Infrastructure Sustainability Accredited Professional preferred.</li> <li>● Experience in the delivery of IS Ratings preferred.</li> <li>● Must complete corporate and project induction covering sustainability requirements and the Project Sustainability and Innovation Policy.</li> </ul>

Responsibility and Authorities for other key roles are included in Table 4 below.

Table 4: Other key roles

Role	Key Responsibilities and Authorities
Project Director	<ul style="list-style-type: none"> <li>● Promote and work in accordance with the WTP Sustainability Policy, holding overall responsibility for the successful implementation of the sustainability strategy including environment, social and economic aspects.</li> <li>● Project Director reports to the Steering Committee</li> <li>● Construction Manager reports to the Project Director</li> <li>● Ensures project responsibilities/authorities are defined/communicated</li> <li>● Accountable for implementation of the SMP and Sub-plans</li> <li>● Provides adequate resources to meet environmental objectives</li> </ul>

Role	Key Responsibilities and Authorities
	<ul style="list-style-type: none"> <li>● Appoints/nominates and provides support for the Environment and Sustainability Lead</li> <li>● Approves the SMP</li> <li>● Reports to Steering Committee on the performance of the system and environmental breaches</li> <li>● Reports sustainability incidents to the client / authorities as required</li> <li>● Authorise expenditure on sustainability issues within limits of authority</li> <li>● Resolve major issues which cannot be resolved by the Deputy PD</li> <li>● Must complete corporate and project induction covering sustainability requirements and the Project Sustainability and Innovation Policy.</li> </ul>
Deputy Project Director	<ul style="list-style-type: none"> <li>● Ensures that the SMP is effectively implemented and maintained</li> <li>● Takes action to resolve sustainability non-conformances and incidents</li> <li>● Ensure that internal audits of the system are conducted</li> <li>● Review audit corrective actions and take action as necessary to ensure timely close out of issues</li> <li>● Reports to senior management on the performance of the system and sustainability non-compliances</li> <li>● Ensures suppliers and subcontractors comply with requirements</li> <li>● Resolve major issues which cannot be resolved by the Environment and Sustainability Lead</li> <li>● Must complete corporate and project induction covering sustainability requirements and the Project Sustainability and Innovation Policy.</li> </ul>
Construction Manager	<ul style="list-style-type: none"> <li>● Manage construction works in accordance with the Planning Approval and obligations</li> <li>● Ensures compliance with this plan, Sub-plans, and sustainability requirements</li> <li>● Support and integrate sustainability initiatives and tracking</li> <li>● Work collaboratively with sustainability teams to improve sustainability outcomes</li> <li>● Engage with the Sustainability Manager to ensure sustainability requirements are embedded in construction plans, solutions, and processes</li> <li>● Ensure selected subcontractors meet package sustainability requirements</li> <li>● Ensure subcontractors achieve sustainability objectives in delivery and direct or oversee corrective actions where appropriate</li> </ul>
Design Manager	<ul style="list-style-type: none"> <li>● Ensure design development is in accordance with the Planning Approval and obligations</li> <li>● Provide input into further assessment as required</li> <li>● Support and integrate sustainability initiatives and tracking</li> <li>● Ensure the design complies with relevant IS requirements.</li> <li>● Ensure that sustainability performance and knowledge is communicated at senior management team meetings</li> <li>● Ensure that sustainability obligations are met across all projects</li> </ul>

Role	Key Responsibilities and Authorities
	<ul style="list-style-type: none"> <li>Consult with the sustainability team on sustainability matters or opportunities as they arise during project development</li> <li>Champion the sustainability program objectives.</li> </ul>
Stakeholder and Community Engagement Manager	<ul style="list-style-type: none"> <li>Manages key stakeholder relationships, including in relation to any visual amenity impacts throughout construction</li> <li>Provision of strategic advice to the leadership team</li> <li>Identify and mitigate reputational risks, including any relating to construction impacts</li> <li>Accountable for crisis and incident communications</li> </ul>
Site Supervisor / Site Foreman	<ul style="list-style-type: none"> <li>Ensuring relevant plans, procedures, objectives, and targets are explained to personnel and a record of understating is obtained prior to personnel starting the activity work</li> <li>Conducting works to ensure sustainability objectives are achieved</li> <li>Taking preventative action to eliminate all sustainability non-compliances as advised by the Sustainability Manager</li> <li>Provide resources for the implementation of corrective actions for non-conformances resulting from investigations, incidents, hazards, injuries and near misses</li> <li>Complying with any responsibilities as assigned in project environmental documentation and associated procedures</li> <li>Disseminating sustainability requirements during site induction and pre-start meetings</li> <li>Responsible for checking that sustainability performance monitors remain effective, through maintenance, and that field personnel are provided with appropriate training</li> <li>Stop work immediately if an unacceptable impact on project's sustainability outcome is likely to occur.</li> </ul>
Utilities Coordination Manager	<ul style="list-style-type: none"> <li>Manage and coordinate the utility work for the duration of the Project delivery in accordance with MCoA D102</li> <li>Interact with the Environment and Sustainability Team, and Communications Team as required</li> <li>Responsible for the identification of utilities, services and other infrastructure potentially affected by construction works affecting them and determine requirements for access to, diversion protection and / or support.</li> </ul>
Operational Environment Manager	<ul style="list-style-type: none"> <li>Maintain and manage the overall environmental performance of the project</li> <li>Ensures relevant licences, approvals and permits are obtained.</li> <li>Ensures compliance with all relevant statutes, regulations, rules, procedures, standards and policies</li> <li>Manage environmental team</li> </ul>
Spoil Manager	<ul style="list-style-type: none"> <li>Ensures that the spoil management measures outlined in the Spoil Management Plan are effectively implemented and maintained</li> <li>Ensures compliance with all relevant statutes, regulations, rules, procedures, standards, and policies of the Spoil Management Plan</li> </ul>

Role	Key Responsibilities and Authorities
	<ul style="list-style-type: none"> <li>Ensures that environmental records and files are collected and maintained</li> <li>Ensures that spoil being transported offsite is tracked in accordance with the Spoil Management Plan</li> <li>Regularly monitor the management of spoil in accordance with the Spoil Management Plan.</li> </ul>
Quality Manager	<ul style="list-style-type: none"> <li>Maintain and manage document certification</li> <li>Interact with the Environment and Sustainability Team, and Communications Team as required</li> </ul>
Human Resources Manager	<ul style="list-style-type: none"> <li>Incorporate sustainability requirements into the workforce engagement strategy.</li> <li>Incorporate sustainability requirements into the workforce education requirements</li> </ul>

## 2.2 Specialist Consultants

Several specialist consultants support GLC with expert advice and assistance to develop and implement the SMP and Sub-plans. Proposed consultants include those outlined in Table 5. If required, GLC will seek advice from additional expert consultants during the delivery of the works.

Table 5: Specialist consultants

Sustainability Aspect	Consultant	Area of advice, as required
Contamination	Design JV Epic Environmental	Detailed Site Investigations Remediation Action Plans Validation Reports
Resource use modelling	Arcadis	Production of resource use models in line with the IS Rating requirements
EPA Accredited Auditor	Geosyntec	Auditing in accordance with the <i>Contaminated Land Management Act 1997 (CLM Act)</i>
Noise and Vibration	SLR Consulting	Noise and Vibration Management
Archaeology	GML Umwelt	Aboriginal and non-Aboriginal Archaeology
Built Heritage	GML Umwelt	Heritage Management
Ecology	Design JV Umwelt	Flora and Fauna Management

## 2.3 Sydney Metro

Transport for NSW (TfNSW) is the Proponent under the *Environmental Planning and Assessment Act 1979 (EP&A Act)* with ultimate responsibility for compliance with the Planning Approval. As specialised delivery office, Sydney Metro is the NSW Government agency tasked with delivering a high-capacity, high-frequency metro network across the Greater Sydney region. Its role is to plan,

build, operate and optimise metro services and create vibrant and attractive precincts and places, contributing to an integrated public transport network that focuses on customer and community outcomes.

Sydney Metro is an outcome-oriented organisation. Sydney Metro commits to providing easy, safe and reliable turn-up-and-go metro services and deliver these customer-centric outcomes in a socially, financially and environmentally responsible way.

### 3 PROJECT OBJECTIVES AND TARGETS

Key sustainability objectives and targets for the Project are set out in Table 6.

Table 6: Sustainability GS + PS Requirements of the Project

Policy Commitment	Objective	Target	GLC Bid back/ stretch target	Performance Indicators	Where Addressed	Environmental	Social	Economic	Relevant IS Rating Credits	Strategy Document
	ISC IS Rating Tool v1.2. Scores for both 'Design' and 'As-Built'.	75+	85+	Verified IS Ratings.	Section 9.1	✓	✓	✓	Entire Rating	Sustainability Management Plan
Govern for sustainability by implementing robust and tailored systems	Develop, implement, and maintain governance structures, processes and systems that ensure integration of all sustainability considerations, initiatives and reporting.	Preparation and implementation of a SMP	N/A	Preparation and implementation of a SMP.	This Plan.	✓	✓	✓	Man-1 to Man-7	
Promote best practice to facilitate a shift from mitigating environmental impacts towards enhancing environmental outcomes.	Reduce greenhouse gas emissions from the project baseline greenhouse gas footprint	20%	25%	TfNSW's Carbon Estimation and Reporting Tool (CERT) Report or an alternative system to be agreed.	Section 7.2	✓		✓	Ene-1	
Minimise whole of life asset impact by prioritising low- impact materials, energy and water sources Identify and implement realistic sustainability targets and performance indicators in	Scope 1 and Scope 2 emissions, as defined in National Greenhouse and Energy Reporting (NGER), are offset by purchasing approved offsets or renewable energy	25%	30%	TfNSW's CERT Report or an alternative system to be agreed.	Section 7.2.1	✓	✓		Ene-1	



Policy Commitment	Objective	Target	GLC Bid back/ stretch target	Performance Indicators	Where Addressed	Environmental	Social	Economic	Relevant IS Rating Credits	Strategy Document
<p>support of the UN Sustainable Development Goals.</p> <p>Integrate social, economic, and environmental aspects into business decision making, including planning, procurement, design, and delivery.</p> <p>Manage our activities ethically and maintain our commitment to modern slavery</p> <p>Transparently measure and report our sustainability performance to drive continuous improvement.</p> <p>Deliver sustainable and inclusive growth while satisfying our ethical, legal, and contractual obligations.</p>	Overall reduction in water use compared to a base case footprint	10%	-	Water Consumption Data	Section 7.1	✓		✓	Wat-1	<p>Sustainability Management Plan, Water Reuse Strategy &amp; Water Balance Study</p>
	Maximum volume of water from the potable water main will be used in the Tunnelling Contractor's Activities.	463,177kL or less	-	Water Consumption Data	Section 7.1	✓		✓	Wat-1	
	Replace potable water with non-potable water sources	33%	40%	Water Consumption Data	Section 7.1	✓		✓	Wat-2	
	Minimum volume of water from sources other than the potable water main will be used in the Tunnelling Contractor's Activities.	290,353kL	-	Water Consumption Data	Section 7.1	✓		✓	Wat-2	
	Reuse concrete production operation water into concrete production at onsite or offsite batching plants for all concrete used	A portion of total water consumption	-	Water Consumption of Precast Yard	Section 7.1	✓		✓	Wat-2	
	Reduce Portland cement content through replacement by supplementary cementitious materials such as fly ash or slag.	35% (average)	-	Environmental Product Declarations (EPD), Design Drawings, mix design reviews, ITPs, materials monthly data tracking and reporting	Section 9.3	✓			Mat-1	
Require suppliers and subcontractors, within their own supply chains, to maximise local content and investigate opportunities to reduce resource consumption (including the feasibility of renewables), minimise waste or divert from landfill, and reduce the									Sustainability Management Plan	

Policy Commitment	Objective	Target	GLC Bid back/ stretch target	Performance Indicators	Where Addressed	Environmental	Social	Economic	Relevant IS Rating Credits	Strategy Document
embodied carbon of high materiality construction materials such as concrete, steel and asphalt.	Maximum cementitious material carbon footprint for tunnel segment concrete mix	270kg CO <sub>2</sub> -e / m <sup>3</sup>	-	EPD, Design Drawings	Section 9.3	✓			Mat-1	
	Demonstrate a reduction in materials lifecycle impacts	15%	-	IS Materials calculator or an alternative system to be agreed.	Section 9.5	✓		✓	Mat-1	
	At least one other recycled material (excluding steel, spoil, and concrete constituents) is used	1	5	Inspection Testing Record (ITR) Compiling of information to substantiate claims e.g., pictures, emails, invoices etc.	Section 9.3	✓			Mat-1	
	All timber products used in the Project Works and Temporary Works are from: re-used timber, post-consumer recycled timber, Forest Stewardship Council (FSC) or Programme for the Endorsement of Forest Certification (PEFC) certified timber sources.	100%	-	Inspection Testing Record (ITR) Materials Compliance Register	Section 9.3	✓			Mat-1	
	Inert and non-hazardous C&D waste, excluding spoil, is recycled or beneficially reused	95%	-	Waste Receipts	Waste Management Plan	✓	✓		Was-2	Waste Management Plan & Spoil Management Plan

Policy Commitment	Objective	Target	GLC Bid back/ stretch target	Performance Indicators	Where Addressed	Environmental	Social	Economic	Relevant IS Rating Credits	Strategy Document
	Office waste is recycled or alternatively beneficially reused	60%	-	Waste Receipts	Waste Management Plan	✓	✓		Was-2	
	Reusable spoil is beneficially reused	100%	-	Waste Receipts	Spoil Management Plan		✓		Was-2	
	No major pollution incidents	0	-	Audit Reports	CEMP	✓	✓	✓	Dis-1	CEMP
	Undertake multidisciplinary sustainability initiatives workshops during detailed design process.	5	-	Design Reports Meeting Minutes	This SMP	✓	✓	✓	Entire Rating	Sustainability Management Plan
Encourage innovation within our delivery teams and supply chain.  Stimulate innovation through procurement to enhance whole-of-life environmental, social, and economic outcomes and reward exemplary performance within our supply chain.	Investigate and implement innovations directly on the Project and within the supply chain.	10 ISC innovation points	-	Verified ISC Rating	IS Design and As-Built Submission	✓	✓	✓	Inn-	Sustainability and Innovation Policy
Collaborate with our customer, stakeholders, and communities to provide resilient operational outcomes.	Implement community benefit initiatives which will provide tangible benefits to local community groups within the period of completion of the Tunnelling Contractors' Activities.	10	-	Number of community benefit programs implemented	Appendix D		✓		Hea-1	Sustainability and Innovation Policy
	Implement "legacy" community benefit initiatives which will	10	-	Number of community benefit	Appendix D		✓		Hea-1	

Policy Commitment	Objective	Target	GLC Bid back/ stretch target	Performance Indicators	Where Addressed	Environmental	Social	Economic	Relevant IS Rating Credits	Strategy Document
	provide tangible benefits to local community groups within the period of completion of the Tunnelling Contractors' Activities.			programs implemented						
Educate our people, subcontractors, and supply chain to ensure they are fully aware of and committed to the implementation of sustainable practices. Source sustainably, including prioritising Aboriginal and Torres Strait Islander peoples and business, local suppliers, and social procurement initiatives	Engagement of social enterprises or social benefit organisations in the supply chain	5	10	Number of social enterprises engaged	Appendix D		✓		Pro-1	Social Procurement Policy
Uphold ethical practices, comply with the Modern Slavery Act (2018), and consider human rights and labour practices in alignment with ISO 20400: Sustainable Procurement Guidelines. Manage our activities ethically and maintain our commitment to modern slavery	Compliance with all relevant NSW and Australian modern slavery legislation;	Suppliers sourcing materials from a country of interest undergo the Modern Slavery Assessment	-	Number of suppliers sourcing materials from countries of interest and the outcomes of the Modern Slavery Assessment	Section 13		✓	✓	N/A	
Source sustainably, including prioritising Aboriginal and Torres Strait Islander peoples and	Minimum project-spend (minus exclusions) must be dedicated to Aboriginal participation in accordance with the Aboriginal	1.5%	3%	Social Procurement Reporting	Section 6		✓		Pro-1	

Policy Commitment	Objective	Target	GLC Bid back/ stretch target	Performance Indicators	Where Addressed	Environmental	Social	Economic	Relevant IS Rating Credits	Strategy Document
<p>business, local suppliers, and social procurement initiatives</p> <p>Require suppliers and subcontractors, within their own supply chains, to engage Aboriginal and Torres Strait Islander peoples and businesses.</p> <p>Embrace diversity as business as usual</p>	Participation in Construction (APiC) Policy (NSW).									
<p>Future proofing our assets by identifying and mitigating climate change risks</p>	<p>The Project will develop all necessary adaptation measures that comprehensively address risks classified as “extreme”, “high” and “medium” during the Design Life of the Project Works using AS/NZS ISO 31000:2009 Risk management – Principles and guidelines.</p>	<p>Adaptation measures for all extreme, high and medium risks</p>	-	<p>Inspection Test Records (ITRs)</p>	<p>Section 9.2</p>		✓		<p>Cli-1</p>	<p>Climate Change Risk Assessment</p>

## 4 POLICY

### 4.1 Project Sustainability and Innovation Policy

GLC has prepared a Project Sustainability and Innovation Policy (Appendix B) which aligns with the Sydney Metro Environment & Sustainability Policy. It is displayed at prominent locations on the Project, including the main office at 60 Station Street and construction sites along the alignment. The Policy is communicated to site personnel during induction and training and made accessible to Sydney Metro. All personnel associated with the Project, including subcontractors, must comply with the spirit and intent of the Policy.

### 4.2 Project Social Procurement Policy

GLC has prepared a Project Social Procurement Policy that guides the strategic objectives of the project and its supply chain. The Social Procurement Policy:

- Guides the continued development and implementation of processes and procedures that will be used to provide environmental and social improvement
- Guides the selection of subcontractors
- Aids in ensuring ethical sourcing of labour and materials
- Aids in ensuring human rights impacts and risks are identified in the supply chain both within and Australia and for offshore procurement.

Refer to Appendix C for the full policy. All personnel associated with the project, including subcontractors, must comply with the spirit and intent of the policy.

### 4.3 Sydney Metro Environment and Sustainability statement of commitment

Sydney Metro has prepared an Environment and Sustainability statement of commitment that is being used to guide the Project to deliver great services, places and transport infrastructure for Sydney metros customers while protecting the environment, contributing to economic prosperity and delivering social benefits to the communities in which we work.

Therefore, the Project remains committed to:

- Minimising our impacts and leaving a positive environmental and social legacy
- Delivering a resilient asset and service for our customers
- Collaborating with stakeholders to innovate and drive sustainable outcomes and
- Embed sustainability into our activities.

Refer to Appendix J for Sydney Metro's statement of commitment. All personnel associated with the Project, including subcontractors, must comply with the spirit and intent of the statement.

## 5 SUSTAINABLE DESIGN

### 5.1 Permanent Works

Integrating sustainability in design is critical to the success of sustainability on the Project. The Design Phase was undertaken by GHD and SMEC [the Design Joint Venture (DJV)].

GLC and the DJV have a collaborative Sustainability in Design process that ensures design compliance with project sustainability requirements, identifies potential optimisations and drives innovation. The three-stage Sustainability in Design process, which commenced in the conceptual stages of design, is detailed in Figure 3.



Figure 3: Sustainability in Design Process

GLC shall produce Sustainability Design Reports at Stage 2 and Stage 3 of design in line with the Particular Specification 3.4.7 (g). Other activities involved in GLC and the DJV's sustainable design process include:

- Life Cycle Assessment, energy modelling and water balance assessments
- Opportunity analysis of potential sustainability initiatives and considerations (refer to Section 9)
- Attendance of the sustainability team at design meetings to generate ideas and facilitate discussion around sustainability
- Documenting initiatives in design reports
- Reviewing design documentation

- Reviewing design, procurement, and construction delivery programmes.

The Project tracks design-phase compliance against the Project Contract Requirements in the Requirements Verification and Traceability Matrix (RVTM). The RVTM maps all contract requirements/ clauses against responses and evidence that show compliance. The Project's Sustainability deed requirements for the General Specification and Particular Specification can also be found in this document.

The RVTM process ensures that prior to release, the design packages include all sustainability requirements relevant to that package of works. All sustainability requirements are detailed in the respective design and delivery assurance frameworks.

## 5.2 Temporary Works

The importance of integrating sustainability into design extends to Temporary Works. Depending on the site and scope of work, various temporary components are required to enable the delivery of the project.

To ensure the Temporary Works aspects are captured and more sustainable alternatives are implemented where possible, GLC have developed a process to enable designers and construction teams to minimise impacts and contribute to project targets and requirements relating to sustainability. The process has been broken up into three stages, see Appendix I – Temporary Works Sustainability Design Process, and is summarised below:

### 1. Temporary Works Design Brief

- The construction team determine need for temporary works and prescribe scope. The sustainability team attend design meetings and highlight sustainability opportunities and ensure that these are added into the initial design brief.

### 2. 30% Design

- The 30% design is developed considering the sustainability opportunities in the temporary works design brief and additional resources provided by the sustainability team, including guidance on material selection and substitution.

### 3. 100% Design

- The sustainability team review designs and identify any opportunities for improvement. Final drawings include notes on materials and specifications to guide construction team. Initiatives implemented are tracked and recorded by the sustainability team.

## 5.3 Design for Sustainable Operation

The Project is an enabling package of Sydney Metro West with the scope of works outlined in Section 1.1. All station fit out, rail installation, and permanent utilities are excluded from the Project scope. Therefore, the only operational considerations apply to the Unwin Street upgrades, including pavement maintenance and street lighting.

Opportunities to reduce resource use in operations include:

- The 23 street lights on Unwin Street use 28W LED lights which have lower energy demand compared to traditional halogen lights.

## 6 SUSTAINABLE PROCUREMENT

Sustainable procurement operates under the Social Procurement Policy, provided in Appendix C. The Sustainability Team works closely with the Procurement Team to incorporate all sustainability conditions, opportunities, and forward commitments in the procurement management system to ensure subcontracts and suppliers meet minimum requirements, generate opportunities, and address Project challenges through innovation.

The Sustainability Team is involved in high impact package reviews prior to release to the market. They also review returned packages and ensure all social procurement requirements are adhered to, including supplier and subcontractor management throughout the duration of the works.

Procurement on the Project complies with ISO 20400:2017 Sustainable Procurement – Guidance. GLC operates under a sustainable procurement framework that balances economic, environmental, and social considerations in the procurement process. The sustainable procurement framework helps to identify and support a selection of sustainable products and services, educate our supply chain on sustainability requirements and targets, and develop a process that draws together the knowledge and technical advances our supply chain can offer to improve sustainable outcomes and solve challenges.

GLC built several sustainability measures into the procurement process, including:

- Identifying key high impact packages in the procurement schedule
- Requiring suppliers and subcontractors to align with the sustainability expectations and requirements of GLC and Sydney Metro
- Integrating a sustainability section into all request for tender packages and scope of work documents
- Ensuring all tenderers complete and submit the tender questionnaire and that each submission includes adequate responses to all sustainability items
- Ensuring qualified representatives are involved in tender evaluations and any tender meetings with potential tenderers where sustainability has been identified as a requirement
- Mandating the provision of sustainability performance data by suppliers on a monthly basis during the delivery of contracted works
- Undertaking audits where required to ensure continuous improvement
- Considering sustainability principles in making procurement decisions through Multi-Criteria Assessments (MCA).
- Publicly stating our sustainable procurement commitments on WTP Project website.

### 6.1 Evaluation of Subcontractors

As part of the evaluation of subcontractor tender responses, all Subcontractors are requested to:

- Provide a Sustainability Policy (noting that a sustainability policy includes environmental, social, and economic aspects), or commit to operating in accordance with GLC's sustainability management system.
- Provide evidence of environmental, health and safety, quality management systems and policies and previous experience.
- Respond to a range of high materiality non-cost questions as part of the *Project Tender Questionnaire* (High Impact Subcontractors Suppliers) and provide appropriate evidence to demonstrate compliance.

- Commit to the minimum requirements stipulated in the *Subcontractor Pack*, including the *Project Environment and Sustainability Requirements* sub-pack which outlines the relevant aspects of environment and sustainability from the PS and GS, and all management requirements for sustainability. This document forms part of the scope of work to be delivered by the supplier.
- High impact Subcontractors and Suppliers will then be assessed for suitability using a combination of financial and non-financial scoring criteria (including sustainability and innovation) and the total non-price component shall be no less than 20%.

During pre-award and pre-start meetings, there will be discussion of the sustainability aspects of the tendered scope of works and surety gained on the tenderer's ability to deliver that work. Sustainability reporting and requirements form part of executed subcontracts.

## 6.2 Monitoring of Subcontractors Sustainability Performance

Subcontractor performance is monitored throughout the duration of each contract. Successes are celebrated and lessons learned are shared. When poor performance is identified, GLC formally raises issues with the Subcontractor and/or Supplier and work together to remedy the situation.

### 6.2.1 Monitoring Processes

Subcontractor performance is continuously evaluated through examination of data associated with each package's deliverables. Following data collection and analysis (Section 12.2), subcontractor data is compared to expected values (such as from the Project's design model), data from similar packages, and data from different times within the same package.

Data discrepancies trigger the performance management procedures listed in 6.2.2.

### 6.2.2 Subcontractor Performance Management Procedures

Should performance trigger points be crossed, the Project's subcontractor performance management process will be implemented. This includes the following steps:

1. Detailed analysis of subcontractor performance data (including past performance),
2. Request for data clarification and update including desktop audits,
3. Confirmation of any poor performance, if applicable,
4. Liaison with relevant subcontractor personnel to discuss any performance issues and/or non-conformance (NCR) indicated in the collected data,
5. Rectification of NCR, and
6. Continued detailed monitoring of subcontractor for following three months.

## 7 SUSTAINABLE CONSTRUCTION

### 7.1 Water Management

GLC is committed to optimal water management and to implementing initiatives to reduce water consumption and replace potable water on the Project.

Reused and captured water is prioritised over potable water at all sites where suitable quality and quantity is available. The supply of reused water will be dependent on rainfall, groundwater inflow, construction activities, and availability of storage at each site. Water reuse initiatives are further detailed in the Project Water Reuse Strategy.

#### 7.1.1 Minimise Water Demand

As a priority, GLC is investigating and implementing opportunities to reduce potable water consumption. Initiatives include:

- Site offices are fitted with water efficient controls, fixtures, and fittings such as water efficient taps, toilets, laundries, and urinals.
- Polymers and soil binding solutions are prioritised over potable water for dust suppression where possible.
- Hardstands are installed as soon as possible to reduce exposed areas.
- Water efficient misting systems are used in truck loading areas.

#### 7.1.2 Rainwater Harvest

Where reasonable and feasible, temporary site accommodation is fitted with rainwater harvesting tanks to capture and reuse rainwater falling to the roof catchments. Reuse options are assessed during the procurement and logistics planning phase of site establishment (for example, use in wash down, toilets, laundering, or dust suppression).

#### 7.1.3 Stormwater Collection

Where stormwater is captured in the sediment basin at the Eastern Creek site, it is reused wherever possible for civil construction activities such as dust suppression and compaction.

#### 7.1.4 Groundwater Management

Groundwater is collected and treated through onsite water treatment plants at sites such as Westmead and Parramatta. Treated groundwater is reused for ancillary site purposes such as dust suppression, cleaning, laundering, toilet flushing.

TBM operations use of treated groundwater through the innovative GLC/ Herrenknecht recycled waterline. Careful consideration of water quality requirements has been made to ensure that TBM operations are not adversely affected by treated water. Monitored data from the associated water treatment plant is recorded.

#### 7.1.5 Water Monitoring and Data Collection

All water consumption on site is tracked through manual water cart loads or metering. Where possible, smart metering is installed to provide real time information about water consumption and

reuse. Smart meters have been installed on all water treatment plants to track the reuse of treated groundwater across the Project. A summary of the water monitoring points and mechanisms of data collection is provided below in Table 7 below:

Table 7: Construction water data collection

Site	Location / Activity	Water Type	Water Source / Provider	Data Type
Project-wide	Road Sweepers	Potable & Non-potable	PM & Galea	Subcontractor Report
	Road Sweepers	Potable	Superboom	Subcontractor Report
	Road Sweepers	Potable & Non-potable	Ward Civil	Subcontractor Report
Westmead	Alexandra Ave	Potable	Municipal Grid	Meter
	Hassall St	Potable	Municipal Grid	Meter
	Bailey St	Potable	Municipal Grid	Meter
	Water Treatment Plant	Non-potable	WTP	WTP Dashboard
Parramatta	Across Site Office	Potable	Municipal Grid	Meter
	Water Treatment Plant	Non-potable	WTP	WTP Dashboard
	George St	Potable	Municipal Grid	Meter
Clyde Dive	Across Unwin St	Potable	Municipal Grid	Meter
Clyde MSF East	Across Wentworth St	Potable	Municipal Grid	Meter
Clyde MSF West	Along Unwin St (MSF Gate 9)	Potable	Municipal Grid	Meter
Rosehill	Site Office Car Park	Potable	Municipal Grid	Meter
TBM/WTP (Rosehill)	Water Treatment Plant	Non-potable	WTP	WTP Dashboard
Pre-cast Yard	Site Entrance	Potable	Municipal Grid	Meter
	Wedge Pit	Non-potable	Wedge Pit	WTP Dashboard
Sydney Olympic Park	Site Entrance	Potable	Municipal Grid	Meter
Veolia Office Building	Unwin St	Potable	Municipal Grid	Meter

### 7.1.6 Construction water consumption estimates

The Project has a Water Reuse Strategy and Water Balance Study that is publicly available on the Project's website. The study includes high-level estimates of potable and non-potable water use that is expected to be consumed through construction activities (Table 8). Actual construction data

will be managed throughout the duration of the Project through monthly reporting (Section 12.2.3) and the IS As-Built Rating.

Table 8: Construction water consumption

Site	Activity - Duration (weeks)	Activity	Predicted Potable (kL)	Predicted Non-Potable (kL)	Total Non-potable Replacement
<b>Clyde MSF</b>	Earthworks-89	Concrete works	133	-	Total potable: 5016kL Total Non-potable: 20,074kL <b>Total replacement 80 %</b>
	Street Sweeper-118	Earthworks fill- to achieve moisture content	-	3,200	
	Wheel Wash-113	Street Sweepers	-	705	
		Dust suppression	-	14,109	
	General Site works-133	Machine washdown/wheel wash as required	-	1,130	
		Site offices	4,883	930	
<b>Clyde Dive</b>		Tunnelling- cooling, roadheader mist, washdown	-	50,528	Total potable: 7,532kL Total Non-potable: 57,863kL <b>Total replacement 88%</b>
	Site office-122	Tunnelling- drill rigs / Bolters and shotcrete rigs	1,240	-	
	Dive Piling- 13				
	Dive excavation-26	Dust suppression during dive excavation works	-	702	
	Roadheader-94	Street Sweeping	-	676	
	Overall site work-135	Washdown of plant and site wide dust suppression	-	5,011	
		Site offices	6,292	946	
<b>Rosehill</b>	Site establishment-2	Street sweeping	-	811	Total potable: 12,737kL Total Non-potable: 12,670kL <b>Total replacement 50%</b>
	Diaphragm wall (east)-13	Machine washdown	-	1,621	
	Eastern	Dust suppression	-	9,103	
	Excavation-38	Site offices	10,028	1,135	
	Diaphragm wall (west)- 9				
Western	Bentonite for diaphragm wall	2,709	-		
	Excavation- 37				
	Overall Site work-162				
<b>Westmead</b>	Site establishment-36	Piling and Grouting	540	-	Total potable: 29,051kL Total Non-potable: 6,638kL <b>Total replacement 19%</b>
	Rippable ground excavation- 21	Street sweeping	-	945	
	Hard rock excavation- 4	Machine washdown	-	1,574	
		Dust Suppression	-	3,017	
	Overall site work -157	Installing Piles	21,000		
		Site office	7,511	1,102	
<b>Parramatta</b>	Site establishment-24	Piling and Grouting	5,708	-	Total potable: 14,308kL
	Diaphragm wall-48	Street sweeping	-	832	
		Machine washdown	-	1,664	

Site	Activity - Duration (weeks)	Activity	Predicted Potable (kL)	Predicted Non-Potable (kL)	Total Non-potable Replacement
	Soft Ground Excavation-26	Dust Suppression	-	3,120	Total Non-potable: 6,781kL <b>Total replacement 32%</b>
	Hard ground excavation-43				
	Overall site work-166	Site office	8,600	1,165	
<b>Precast Yard</b>	Construction of facility- 35	Batch plant into concrete	18,268	5,457	Total potable: 34,756kL Total Non-potable: 28,479kL <b>Total replacement 45%</b>
		Machine washdown	-	17,254	
	Production of segments-96	Machine washdown at batch plant	-	4,793	
		Curing chamber vaporiser	9,586	-	
	Overall Site works-139	Site Office	6,902	975	
<b>TBM(Rosehill)</b>	TBM1 Rosehill to SOP- 248	Minimum Flow	55,714	55,714	Total potable: 141,281kL Total Non-potable: 75,595kL <b>Total replacement- 35%</b>
		General cleaning	3,482	3,482	
	TBM2 Rosehill to SOP- 248	TBM Cooling circuit	11,032	-	
		Grout (batching plant, flushing, washdown)	71,053	3,134	
	TBM 1 Rosehill to Westmead- 238	Horizontal conveyor dust suppression	-	8,843	
	TBM 2- Rosehill to Westmead-241	Surface general washdown	-	4,422	
<b>Total</b>		All Sites and activities	244,681	208,100	<b>Total predicted non-potable replacement- 46%</b>

## 7.2 Carbon and Energy

Carbon and energy management is a priority for GLC, including opportunities to reduce energy demand and substitute for lower-impact energy sources. This includes the investigation of more energy efficient options, optimised construction scope, and the use of renewable energy. This contributes to GLC's commitment to offsetting at least 30% of the Project's Scope 1 and Scope 2 emissions, with a stretch target of 100%.

GLC shall undertake a feasibility study in the design phase to assess the opportunities, costs and benefits of renewable energy technologies in both temporary and permanent works and for use during construction.

Initiatives to reduce carbon emissions and meet the Projects carbon reduction targets are:

- Renewable energy installation at Rosehill and MSF West to power site facilities
- Solar powered lighting used onsite where practicable or feasible
- Hybrid pool vehicles

- Supply of grid electricity through an Australian Government accredited renewable energy supplier
- Design optimisations that reduce plant and equipment usage

**Error! Reference source not found.** presents the Project’s carbon and energy performance against contractual requirements outlined in the GS Section 5.1.7(b). , This includes an estimation of Scope 1, Scope 2, Scope 3, and total carbon emissions and ‘Carbon Emission Targets’ incorporating direct and indirect emissions associated with electricity and fuel consumption, on-site process emissions, and materials-related emissions. Initial estimates were compiled at tender. Table 8 and Table 9 has now been updated with data presented in the latest version of the Design Stage 3 Sustainability report – see Section 3.2. Actual data is being compiled by the Sustainability Team via monthly reporting (Section 12.2.3) and project performance against contractual requirements will be updated per the IS As-Built Rating.

*Table 9: Design stage 3 energy estimations for Scope 1, Scope 2, Scope 3 emissions – Percentage reduction*

		Target	ISC Models	SMCT	Remarks
Energy	GHG Emission Reduction (Scope 1 and 2)	25%	* 46%	59%	*BAU Assumptions Sydney Metro West, 25% of all Scope 1 and Scope 2 emissions is considered BAU and is applied to the Base Case total emission.
	Emission Offset (Scope 1 and 2)	30%	57%	57%	The use of GreenPower has been counted towards offsets
Material	Embodied Carbon Reduction (Scope 3)	15%	25%	*27%	*Calculated
	SCM Replacement	35%	48%	48%	
Overall	GHG Emission Reduction (Scope 1,2 and 3)	25%	39%	39%	

*Table 10: Design stage 3 energy estimations for Scope 1, Scope 2, Scope 3 emissions - Absolute reduction*

		Target	ISC Models	SMCT	Remarks
Energy	GHG Emission Reduction (Scope 1 and 2)	25%	*41,173 tCO <sub>2</sub> eq	70,964 tCO <sub>2</sub> eq	*BAU Assumptions Sydney Metro West, 25% of all Scope 1 and Scope 2 emissions is considered BAU and is

		Target	ISC Models	SMCT	Remarks
					applied to the Base Case total emission.
	Emission Offset (Scope 1 and 2)	30%	68,703 tCO <sub>2</sub> eq	68,881 tCO <sub>2</sub> eq	The use of GreenPower has been counted towards offsets
Material	Embodied Carbon Reduction (Scope 3)	15%	53, 252 tCO <sub>2</sub> eq	* 54,351 tCO <sub>2</sub> eq	*Calculated
	SCM Replacement	35%	48%	48%	
Overall	GHG Emission Reduction (Scope 1,2 and 3)	25%	94,425 tCO <sub>2</sub> eq	125,315 tCO <sub>2</sub> eq	

## 7.2.1 Energy and Carbon Monitoring and Data Collection

Energy and carbon monitoring data is collected from sources including: direct and metered data from re-fuelling equipment, metered data from sub-contractor equipment, invoiced data from subcontractors and suppliers. These data will be collated and cross-referenced for accuracy prior to use in project reporting and as evidence in the Project’s IS Rating submissions.

### 7.2.1.1 Scope 1 (Liquid Fuels)

Data relating to the consumption of liquid fuels (i.e. mineral diesel, bio-diesel, and petrol) and natural gas across the Project is collected from several sources. Liquid fuel data is sourced from; sub-contractor reports, fuel card databases, direct refuelling (either through self-performed refuelling or through a subcontractor), and derived data, if necessary.

Natural gas is used only at the Project Eastern Creek Pre-cast Yard, with data directly provided by the site’s natural gas supplier.

### 7.2.1.2 Scope 2 (Electricity)

Data relating to purchase and consumption of electricity is sourced from two principal points; invoice (inclusive of related meter reads and electricity type) for municipal grid electricity and dashboard reads for electricity generated on-site. These data are collated into three categories:

- Grid Electricity,
- Off-site renewables (i.e. GreenPower), and
- On-site generation.

## 7.3 Sustainable Materials

GLC is committed to reducing the Project's carbon footprint and enhancing the sustainability performance associated with construction materials.

Where possible, specific materials will be certified or accredited or procured from suppliers that are certified / accredited to a relevant product stewardship organisation or can demonstrate certified application of environmental sustainability within their organisation such as certified management systems.

GLC manages its impacts associated with Construction materials and how it is applied in a systematic manner and determine its applicability to the Project. Additionally, the Project's activities, products, and services that the Project can control or influence will also continue to be considered from a life cycle perspective.

Contractual requirements for materials selection are summarised below in Table 13.

Table 11: Contractual requirements for materials

Condition Type	Condition Reference	Description
Particular Specs	3.4.4.3 (a)	The Tunnelling Contractor must identify and implement material selection strategies to minimise the embodied carbon and lifecycle impacts of waste and materials associated with the Tunnelling Contractor's Activities.
Particular Specs	3.4.4.3 (b)	The Tunnelling Contractor must undertake life-cycle assessments in accordance with ISO 14044 to assist in selection of the most appropriate low-impact materials for the Tunnelling Contractor's Activities.
Particular Specs	3.4.4.3 (c)	The Tunnelling Contractor must ensure that the life-cycle assessments described in Item (b) above are undertaken before the completion of Design Stage 2, and the results of the life cycle assessments are included in its Design Documentation for Design Stage 2.
Particular Specs	3.4.4.3 (d)	The Tunnelling Contractor must demonstrate that it has achieved a minimum 15% reduction in the environmental footprint of the materials used for the Tunnelling Contractor's Activities, compared to a business-as-usual case, using: (i) a methodology agreed with the Principal's Representative; or (ii) the materials calculator included in the Infrastructure Sustainability Council IS Rating Scheme v1.2.
Particular Specs	3.4.4.3 (e)	The Tunnelling Contractor must reduce materials use through materials avoidance and reduction strategies and minimise construction materials volumes through design refinement, construction planning and construction methods.
Particular Specs	3.4.4.2 (f)	The Tunnelling Contractor must minimise embodied carbon and lifecycle impacts by using, where practicable: (i) blended cement that contains supplementary

Condition Type	Condition Reference	Description
		<p>cementitious materials, such as fly ash and ground granulated blast furnace slag;</p> <p>(ii) low carbon concrete including geopolymer concrete where feasible;</p> <p>(iii) aggregate containing recovered products such as glass, plastic and concrete;</p> <p>(iv) recycled steel, including in concrete reinforcing; and</p> <p>(v) spoil generated on-site.</p>
Particular Specs	3.4.4.2 (h)	The Tunnelling Contractor must use recycled and recyclable materials where possible, without compromise to the structural integrity, longevity and visual quality of materials and structures.
Particular Specs	3.4.4.2 (i)	The Tunnelling Contractor must use reusable formwork where practicable.
Particular Specs	3.4.4.2 (j)	<p>The Tunnelling Contractor must source the materials for the Project Works and Temporary Works in accordance with the following requirements:</p> <p>(i) concrete must be sourced from members of:            A. Cement Concrete &amp; Aggregates Australia; or            B. a "similar" association or organisation by agreement with the Principal's Representative;</p> <p>(ii) steel must be sourced from suppliers that:            A. are certified under the Australian Certification Authority for Reinforcing and Structural Steels (ACRS); or            B. a "demonstrated equivalent" association or organisation, where agreed by the Principal's Representative;</p> <p>(iii) steel must be sourced from steelmakers with an ISO 14001:2015 Environmental management certified Environmental Management System;</p> <p>(iv) fabricated steel products must be in accordance with AS 5131:2016 Structural steelwork – Fabrication and erection and certified through the National Structural Steelwork Compliance Scheme; and</p> <p>(v) polyvinyl chloride must be compliant with the Green Building Council of Australia (GBCA) Best Practice Guidelines for polyvinyl-chloride (PVC) in the built environment.</p>
Particular Specs	3.4.4.3 k)	<p>All timber products for the Project Works and Temporary Works must be sourced from either:</p> <p>(i) re-used timber;</p> <p>(ii) post-consumer recycled timber;</p> <p>(iii) Forest Stewardship Council (FSC) certified timber sourced within Australia; or</p> <p>(iv) Programme for the Endorsement of Forest Certification (PEFC) certified timber sourced within Australia.</p>
Particular Specs	3.4.4.4 a)	The Tunnelling Contractor must use low volatile organic compounds (VOC) paints, finishes, sealants and adhesives and zero or low formaldehyde emission composite wood

Condition Type	Condition Reference	Description
		products (as defined in the Green Star Design and As Built Sydney Metro Rating Tool) for the Tunnelling Contractor's Activities.
Particular Specs	3.4.4.4 b)	All surface coatings used by the Tunnelling Contractor must comply with the Australian Paint Approval Scheme (APAS) volatile organic compounds limits.
General Specs	2.8.9 (a)	In addition to steel, spoil, and concrete constituents the Tunnelling Contractor must utilise at least five of the below recycled material streams during construction: (i) recycled aggregates (e.g., glass sand) for piling pads, drainage, and bedding materials; (ii) alternative road surfacing for new council roads or temporary on-site roads; (iii) Close the Loops' Tonerplas – asphalt additive made from soft plastics and toner powder; (iv) Downer's Reconophalt – made from soft plastics, glass, and toner; (v) recycled PE pipes in utilities applications; (vi) recycled plastic and timber for hoarding, walkways, decking, bollards, and fencing (temporary & permanent); (vii) Liaising with current associated projects nearing project completion to identify any opportunities to reuse temporary site facilities such as sheds, tanks, containers, fencing or hoarding; or (viii) an alternative as agreed with the Principal.
General Spec	2.8.2 (d)	In achieving the “design” rating, the Tunnelling Contractor must, as a minimum, achieve the following levels using the ISC IS rating tool version 1.2 < <a href="https://www.iscouncil.org">https://www.iscouncil.org</a> >: (i) Level 2.67 for credit Ene-1 'Energy and carbon monitoring and reduction' demonstrating a greenhouse gas emissions reduction of 25% below a base case footprint; (ii) Level 1 for credit Ene-2 'Use of renewable energy' to fully investigate opportunities for use of renewable energy; (iii) Level 2 for credit Wat-1 'Water use monitoring and reduction', demonstrating a reduction in water use of 10% compared to a base case footprint; (iv) Level 1.2 for credit Wat-2 'Replace potable water', demonstrating that at least 40% of water used is from non-potable sources; (v) Level 2 for credit Mat-1 'Materials lifecycle impact measurement and reduction', demonstrating a 15% reduction in materials lifecycle impacts compared to a base case footprint; (vi) Level 2 for credit Pro-1 'Commitment to sustainable procurement'; and (vii) Level 3 for credit Pro-2 'Identification of suppliers'.
General Spec	2.8.2 (f)	In achieving the “as built” rating, the Tunnelling Contractor must, as a minimum, achieve the following levels using the ISC IS Rating Scheme version 1.2:

Condition Type	Condition Reference	Description
		(i) Level 2.67 for credit Ene-1 'Energy and carbon monitoring and reduction' demonstrating a greenhouse gas emissions reduction of 25% below a base case footprint; (ii) Level 1 for credit Ene-2 'Use of renewable energy' to fully investigate opportunities for use of renewable energy; (iii) Level 2 for credit Wat-1 'Water use monitoring and reduction', demonstrating a reduction in water use of 10% compared to a base case footprint; (iv) Level 1.2 for credit Wat-2 'Replace potable water', demonstrating that at least 40% of water used is from non-potable sources; (v) Level 2 for credit Mat-1 'Materials lifecycle impact measurement and reduction', demonstrating a 15% reduction in materials lifecycle impacts compared to a base case footprint; (vi) Level 2 for credit Pro-1 'Commitment to sustainable procurement'; (vii) Level 3 for credit Pro-2 'Identification of suppliers'; (viii) Level 3 for credit Pro-3 'Supplier evaluation and contract award'; and (ix) Level 2 for credit Pro-4 "Managing supplier performance".
IS v1.2	Mat-1, L1	Monitoring and modelling of materials lifecycle impacts is undertaken using the Materials Calculator (or other suitable Lifecycle Assessment technique) across the infrastructure lifecycle
IS v1.2	Mat-1, L1 (Must statement)	The materials environmental impact have been monitored and modelled
IS v1.2	Mat-1, L1 (Must statement)	For the As-Built rating, monitoring has been undertaken during construction
IS v1.2	Mat-1, L1 (Must statement)	Modelling of energy use and GHG emissions has been undertaken for the operation phase based on the as-built infrastructure to give a total footprint across the infrastructure lifecycle.
IS v1.2	Mat-1, L1 (Must statement)	Documentation is in the form of a completed copy of the Materials Calculator, dated and signed as a true record by the 'engineer of record' or other suitably qualified professional
IS v1.2	Mat-1, Scaled	Monitoring and modelling demonstrates a reduction in materials lifecycle impacts compared to a base case footprint. For every reduction up to 30% for Level 3, fractions of Levels may be achieved on a sliding scale.
IS v1.2	Mat-1, Scaled (Must statement)	The verified Base Case must be used for all relevant credits in the Assessment.

### 7.3.1 Materials Compliance Process

To ensure the Project's installed materials are compliant with requirements outlined in Section 7.3 above, GLC will implement and utilise a Material Compliance Process. Prior to materials being ordered, a compliance review is conducted with input from all relevant disciplines; construction teams, design and engineering, Quality, Health and Safety, and Sustainability. Function representatives must sign for compliance with their respective contract clauses. For example, E&S representatives will ensure compliance with materials environmental and sustainability-related requirements.

Over time, a register of compliant materials will become available, enhancing ongoing decision making. This process aims to drive best-for-project outcomes through compliance with contractual clauses as well as driving cross-disciplinary discussions, providing a process to expedite discussions regarding conflicting priorities, outcomes, or requirements.

### 7.3.2 Materials Monitoring and Data Collection

Robust data collection and collation processes are paramount on the Project to ensure accurate cost and contract administration, accurate sustainability reporting, and for use in the Project's IS Rating submissions. Data collection and associated registers cover materials including, but not limited to:

- Concrete and Grout (including SCM rates),
- Steel,
- Aggregates,
- Asphalt, and
- Water Treatment Plant Chemicals and Inputs.

Inputs are from regular sustainability reporting from subcontractors and suppliers, monthly payment claims (as cross-referencing and assurance), and project summary data provided by suppliers at the completion of their packages.

## 7.4 Waste Management and Recycling

Every effort is made to ensure that waste material is seen as a resource and is beneficially reused, either on-site within the Project boundary or off-site including on other projects. Where direct beneficial reuse is not possible, the Project's waste contractors will make every effort to recycle any waste materials for future beneficial use.

The Waste Reuse Principles adopted are:

- Identifying materials for a reuse purpose
- Segregating materials at the source of generation to facilitate reuse, and store or reuse those items, either on-site or off-site
- Re-useable formwork where practicable
- Compostable erosion and sediment control measures will be used where possible
- Recycled and recyclable materials will be used where possible, without compromise to the structural integrity, longevity and visual quality of materials and structure.

### 7.4.1 Waste Recycling Measures

Recycling is a process involving the collection and separation of waste materials, which are transformed into useable products. The principles adopted for the Project are:

- Erect signage to encourage the reuse and recycling of recovered waste material
- Identify materials for a recycling purpose
- Where practical, construction recycling facilities will be provided within the Site
- Sort materials into components/material streams to facilitate recycling.
- Separation of materials may occur off-site by specialised licensed waste handling contractors
- A waste contractor with access to a sophisticated materials reclamation facility is contracted to manage (including sorting and recycling) and remove waste from site
- Implement packaging take-back initiatives with sub-contractors & suppliers.
- GLC will recycle or beneficially reuse 60% of office waste through:
  - Ensuring that the onboarding process includes opportunities to maximise office recycling
  - Training of all office cleaning staff to ensure waste segregation processes are clearly understood and effective
  - Having no individual under-desk bins
- Clearly signed and strategically placed recycling bins with informative recycling posters in communal kitchen and rest areas
- Conducting regular office waste audits to identify problematic waste streams
  - Publicly displayed waste performance reporting to promote site-specific accountability.
- Regular engagement of site staff and contractors including education and awareness through Toolbox Talks

### 7.4.2 Contamination Management

Where contamination on the Project has the potential to pose a risk to human or ecological receptors, a Remediation Action Plan will be prepared in accordance with the Contaminated Land Management Act (NSW). Remediation options are evaluated using a sustainability hierarchy to promote beneficial reuse opportunities. The hierarchy includes the assessment of at least one indicator from each of the sustainability dimensions – environmental, social and economic from the ‘Framework for Assessing the Sustainability of Soil and Groundwater Remediation’ (SuRF 2009), as described in Table 10.

Table 12: Sustainability indicators from the 'Framework for Assessing the (SuRF 2009)

Environmental	Social	Economic
<ul style="list-style-type: none"> <li>● Impacts on air (including climate change);</li> <li>● Impacts on soil;</li> <li>● Impacts on water;</li> <li>● Impacts on ecology;</li> <li>● Use of natural resources and generation of wastes;</li> <li>● Intrusiveness</li> </ul>	<ul style="list-style-type: none"> <li>● Impacts on human health and safety;</li> <li>● Ethical and equity considerations;</li> <li>● Impacts on neighbourhoods or regions;</li> <li>● Community involvement and satisfaction;</li> </ul>	<ul style="list-style-type: none"> <li>● Direct economic costs and benefits;</li> <li>● Indirect economic costs and benefits;</li> <li>● Employment and capital gain;</li> <li>● Gearing; Life-span and ‘project risks’;</li> <li>● Project flexibility</li> </ul>

Environmental	Social	Economic
	<ul style="list-style-type: none"><li>• Compliance with policy objectives and strategies;</li><li>• Uncertainty and evidence.</li></ul>	

### 7.4.3 Waste Monitoring and Data Collection

Waste data is collected as part of construction phase through several sources. Principal amongst these will be monthly reporting from Project waste contractors. This includes Construction and Demolition (C&D) waste, some spoil, and office wastes. These data are provided according to segregated waste quantities.

Additional data relating to on-site wastes (particularly those re-used on site), site-won materials, and in-project spoil movements are provided by Site personnel in the form of registers and vehicle dockets.

Waste to destination audits are conducted every 6 months in line with *Was-1 Waste Management* ISC credit requirements to ensure project waste data collection and requirements are being met.

## 8 SUSTAINABILITY AWARENESS

### 8.1 Training and Education

Through the facilitation of Project training forums, such as the Project Induction, Toolbox Talks and Pre-Start Meetings, GLC ensures that all project personnel are aware of issues including, but not limited to, the following:

- Project sustainability policy and minimum expectations in relation to resource consumption and optimisation
- Project sustainability requirements as they relate to the applicable scope
- reporting requirements and deliverable timeframes
- avenues for raising innovations or opportunities for innovation
- Project successes and lessons learned

#### 8.1.1 High Impact Suppliers

During project start-up, a multidisciplinary team from GLC shall identify High Impact Suppliers and packages within the procurement schedule. The workshop is an informal meeting of senior leaders to consider which procurement packages could have a significant impact, provide significant opportunities, or pose significant risks to GLC's performance. The team identified high impact packages based on the criteria. The team consists of representatives from the following disciplines:

- Environment and Sustainability
- Construction
- Human Resources
- Aboriginal Participation
- Design

- Logistics
- Safety.

## 8.2 Project Website

The WTP webpage includes the below documentation which is required to be publicly displayed per the ISC v1.2 manual and as requested by Sydney Metro (this documentation will also be available on the GLC and Sydney Metro Project website):

- GLC Sustainability and Innovation Policy
- GLC Social Procurement Policy
- Sydney Metro West Sustainability Plan (SM)
- Sydney Metro Environment, Sustainability Statement of Commitment
- Annual Public Reports.

## 8.3 Knowledge Sharing

Effective and ongoing sustainability knowledge sharing is critical to ensuring that sustainability knowledge from diverse sources (including from the Project team, Sydney Metro, the supply chain and parent organisations, organisations involved in the design and delivery, and wider industry) is captured, disseminated, built upon, and applied.

The Sustainability team initiate and attend meetings and facilitate sustainability forums both internally and externally to share knowledge and enhance project sustainability outcomes. Key disciplines for knowledge sharing include:

- Design Management
- Social Procurement
- Construction Planning
- Material selection

A knowledge sharing process has been developed to facilitate the sharing of sustainability knowledge. This includes best practice initiatives, lessons learned, process and progress, and the approach to delivering Project sustainability objectives, targets, and policy commitments.

## 8.4 Decision Making

GLC have a decision-making framework that uses Multi Criteria Assessment (MCA) to guide decisions on the Project. The MCA is a quantitative analysis using a triple bottom line framework to ensure a wide range of value-adding elements are assessed in making decisions. The criteria and weightings can be controlled and managed by WTP. The decision-making process (outlined in Appendix H) includes the following key steps:

- Issue Identification
- Consultation
- Scoping
- Evaluation and Assessment.

The implementation of the MCA provides the rationale for adopted opportunities as well as options which were abandoned due to projected unfavourable outcomes.

## 9 SUSTAINABILITY INITIATIVES

GLC is delivering sustainability initiatives to support the Project's objectives and targets (Table 6). Design-stage initiatives are identified in the Project Design Opportunities and Initiatives Register. Initiatives are prioritised for implementation based on material impact and material initiatives are included in LCA modelling (Section 9.3) to support the *Mat-1 Materials lifecycle impact measurement and reduction* credit of the IS Rating.

Table 11 summarises initiatives identified in the Design Stage 3 Sustainability Report. Further initiatives will be identified, assessed, and implemented where reasonable and feasible during the construction phase and detailed in the IS As-Built Rating submission.

Table 13: Initiatives that will improve sustainability outcomes on WTP

Initiative No. from Initiatives Register	Site	Initiative Description	Business As Usual	Benefits
S12	Rosehill D-wall	<p>Design of full-length D-wall structure for the box in lieu of contiguous bored piles and interior skin walls. The d-wall includes permanent external diaphragm walls designed by DJV for a 120-year design life.</p> <p>Regarding sustainability, the diaphragm walls at full depth with no temporary support are considered more efficient than installing temporary support followed by permanent support (cast in situ walls). This reduces the excavation profile, avoiding additional spoil volume generation and groundwater needing treatment and discharge. Additionally, the initiative can be considered a low-carbon initiative as it will significantly decrease the concrete and steel reinforcement usage on the structure component.</p>	Contiguous piles + interior skin walls (installed by follow-on contractor) as per the ECI Design	<p>Initiative Benefits:</p> <ul style="list-style-type: none"> <li>• Reduced earthworks and spoil generation</li> <li>• Reduced groundwater inflows and resulting treatment</li> <li>• Reduced steel and concrete consumption</li> <li>• Improved construction methodology</li> </ul> <p>Emissions savings resulting from material reductions:</p> <ul style="list-style-type: none"> <li>• <b>4,552 tCO<sub>2</sub>e – Scope 3</b></li> </ul>
S28	Parramatta D-wall	<p>Design of full-length D-wall structure for the box in lieu of secant bored piles. The d-wall includes permanent external diaphragm walls designed by DJV for a 120-year design life.</p> <p>The sustainability saving from this initiative is found in the diaphragm walls full depth with no temporary support is considered more efficient than installing temporary support followed by the permanent support (cast in situ walls) as it reduces excavation profile, avoiding additional spoil volume generation and groundwater needing to be treated and discharged. Additionally, the initiative can be considered a low-carbon initiative</p>	Secant bored piles + interior skin walls (installed by follow-on contractor) as per the ECI Design	<p>Initiative Benefits:</p> <ul style="list-style-type: none"> <li>• Reduced earthworks and spoil generation</li> <li>• Reduced groundwater inflows and resulting treatment</li> <li>• Reduced steel and concrete consumption</li> <li>• Improved construction methodology</li> </ul> <p>Emissions savings resulting from material reductions:</p> <ul style="list-style-type: none"> <li>• <b>2,558 tCO<sub>2</sub>e – Scope 3</b></li> </ul>

Initiative No. from Initiatives Register	Site	Initiative Description	Business As Usual	Benefits
		as it significantly decrease the concrete and steel reinforcement usage on the structure component.		
S08	Clyde MSF	<p>A three-span overbridge is proposed where the relocated Unwin Street, a publicly accessible road with a shared user path, crosses over the tracks and access roads of the MSF. This is in lieu of an underpass.</p> <p>The change from an underpass to an overbridge significantly reduces the material required for construction, excavation quantities, and associated truck movements for spoil transport. This also minimises contaminated spoil known to be present onsite and the need for remediation and transportation.</p> <p>In addition, for the previously designed underpass, a Pumping Station was required to manage the risk of flooding and any likely run-off during rainfall events. The Pumping Station is now removed.</p> <p>The underpass option would also have required additional safety operational lighting requirements compared to an overbridge. Removing the underpass has contributed to substantial energy savings for this design package.</p> <p>This initiative has substantial constructability benefits by reducing the requirement to excavate and construct supporting infrastructure.</p>	Underpass below rail as per the ECI Design	<p>Initiative Benefits:</p> <ul style="list-style-type: none"> <li>Improved constructability resulting in reduced fuel consumption</li> <li>Reduced spoil and potential remediation</li> <li>Reduced energy consumption of the pumping station and lighting</li> <li>Reduced steel and concrete use</li> </ul> <p>Emissions savings resulting from material reductions and an improved construction methodology:</p> <ul style="list-style-type: none"> <li><b>345 tCO<sub>2</sub>e – Scope 1</b></li> <li><b>2,255 tCO<sub>2</sub>e – Scope 3</b></li> </ul>
S254	Clyde MSF	Reduction in length of the Water Conveyance Structure (WCS). Originally, the WCS structures extended to the length of the boundary.	Water conveyance structure length per Tender Design	<p>Initiative Benefits:</p> <ul style="list-style-type: none"> <li>Improved constructability resulting in reduced fuel consumption</li> </ul>

Initiative No. from Initiatives Register	Site	Initiative Description	Business As Usual	Benefits
		<p>Implementing this initiative reduced the structure length by 40 meters, creating a new bridge.</p> <p>The initiative results in material savings, including a reduced volume of concrete and steel required to build the WCS and a reduced construction program resulting in energy savings. Additionally, less spoil material is required to be excavated and transported off-site, minimising waste management practices, which include potential reuse/recycling and/or appropriate disposal.</p>		<ul style="list-style-type: none"> <li>Reduced spoil and potential contamination/remediation</li> <li>Reduced steel and concrete consumption</li> </ul> <p>Emissions savings resulting from material reductions and an improved construction methodology:</p> <ul style="list-style-type: none"> <li><b>361 tCO2e – Scope 1</b></li> <li><b>1347 tCO2e – Scope 3</b></li> </ul>
S249	Clyde MSF - M4 Retaining Wall	<p>The design of the M4 retaining wall, which is being constructed to facilitate future excavation of the Sydney Water mains, has been reduced in length from the original scope.</p> <p>The initial design submission of the M4 retaining wall (as per tender design) projected a 300m length embankment structure. At current Design Stage 3, the M4 retaining wall is 240m long due to optimisations resulting from sustainability in design reviews. The length reduction has resulted in reduced steel and concrete use required for the structure.</p>	Original wall length per Sydney Water DN1200 Case 181691PW 70% Detailed Design (300 m)	<p>Initiative Benefits:</p> <ul style="list-style-type: none"> <li>Reduced steel and concrete consumption</li> </ul> <p>Emissions savings resulting from material reductions:</p> <ul style="list-style-type: none"> <li><b>65 tCO2e – Scope 3</b></li> </ul>
S02	Tunnels - Tunnel Rings	<p>This initiative involves adopting the universal ring arrangement within the running tunnels 6+0 in lieu of 6+1.</p> <p>The design reduction of rings substantially minimise material per ring as well as shorten ring erection time. The initiative also enables a more efficient stacking, handling, and transport of the segments from tunnelling works, contributing to</p>	TBM Tunnel rings thickness as per EC1 design (6+1 ring)	<p>Initiative Benefits:</p> <ul style="list-style-type: none"> <li>Reduced consumption of steel fibres and concrete per ring</li> <li>More efficient erection time, stacking and transport of rings resulting in reduced energy consumption</li> </ul>

Initiative No. from Initiatives Register	Site	Initiative Description	Business As Usual	Benefits
		energy savings by reducing fuel and power consumption.		Emissions savings resulting from material reductions: <ul style="list-style-type: none"> <li>• <b>2,267 tCO2e – Scope 3</b></li> </ul>
S120	Clyde MSF - Rip rap for scour protection	<p>Rip rap solution is used for scour protection for the water conveyance structures in lieu of a Concrete slab.</p> <p>This initiative involves slope protection for the bridges that have been constructed as part of the WCS. The ECI design proposed a concrete base for the bridges, however, due to a construction methodology change, the design has progressed to a rip rap base. Rip rap is a layer of loose rock strategically placed to dissipate the force of water and prevent erosion from water action.</p> <p>Utilising rip rap instead of concrete reduces the material intensity of the scour protection, providing material reductions as well as promoting the use of recycled material usage (e.g., rock) from onsite sources. The need for transporting the material for re-use or appropriate disposal is reduced if onsite materials are re-used, resulting in energy savings in terms of fuel consumption/ potential carbon emissions.</p>	A reinforced concrete slab as per Tender Design	<p>Initiative Benefits:</p> <ul style="list-style-type: none"> <li>• Reduced concrete consumption</li> <li>• Potential reductions in material transport if onsite materials are utilised</li> </ul> <p>Emissions savings resulting from material reductions:</p> <ul style="list-style-type: none"> <li>• <b>2,267 tCO2e – Scope 3</b></li> </ul>
S01/S03	Tunnels - Reduction of Ferrules	As noted in initiative No.6 above, adopting the TBM tunnel ring arrangement of 6+0 rings in lieu of 6+1 has resulted in substantial material reductions, including minimising the number of ferrules. Material reductions have been implemented for the circumferential and	TBM Tunnel rings ferrules per ECI design	<p>Initiative Benefits:</p> <ul style="list-style-type: none"> <li>• Improved constructability resulting in reduced electricity consumption</li> <li>• Reduced steel and concrete consumption</li> </ul>

Initiative No. from Initiatives Register	Site	Initiative Description	Business As Usual	Benefits
		<p>longitudinal ferrules used to connect segments to segments and rings to rings, respectively.</p> <p>The design reduction of rings substantially minimises material use from ferrules, guide rods and gaskets (reduction of 1 of each per ring), as well as shorten ring erection time.</p>		<p>Emissions savings resulting from material reductions and an improved construction methodology:</p> <ul style="list-style-type: none"> <li>• <b>151 tCO2e – Scope 2</b></li> <li>• <b>297 tCO2e – Scope 3</b></li> </ul>
S237	Westmead - Pile Length Optimisation	<p>The pile length for the Westmead Station Box temporary retention system compared to Tender Design has been optimised. The pile length has been reduced in comparison to the tender design.</p> <p>Comparing the detailed design to the tender design submission, the piling length has been shortened to typical short piles in concrete terms - 12 piles of 15-20 metres each. This provided a carbon reduction as the initiative promotes concrete and steel usage savings as well as minimises construction programs, meaning less fuel consumption by onsite equipment.</p>	Piles at original longer length as per ECI Design.	<p>Initiative Benefits:</p> <ul style="list-style-type: none"> <li>• Improved constructability resulting in reduced fuel consumption</li> <li>• Reduced steel and concrete use</li> </ul> <p>Emissions savings resulting from material reductions and an improved construction methodology:</p> <ul style="list-style-type: none"> <li>• <b>12 tCO2e – Scope 1</b></li> <li>• <b>181 tCO2e – Scope 3</b></li> </ul>
S55	Clyde Dive - Soldier Piles Permanent Wall	<p>Use of soldier piles to act as a permanent wall instead of providing another skin wall in front, as suggested by ECI Design.</p> <p>This initiative has incorporated the use of soldier piles and shotcrete to act as a permanent wall within the dive section underneath the portal structure, avoiding a permanent cast in-situ concrete wall. Soldier piles were used for both the temporary works and part of the permanent wall.</p> <p>This initiative provides substantial material reductions, and formwork usage has also been eliminated from the project footprint, representing</p>	Soldier piles and skin wall as detailed in ECI Design	<p>Initiative Benefits:</p> <ul style="list-style-type: none"> <li>• Improved constructability resulting in reduced fuel consumption</li> <li>• Reduced material waste</li> <li>• Reduced steel and concrete use</li> </ul> <p>Emissions savings resulting from material reductions:</p> <ul style="list-style-type: none"> <li>• <b>1,678 tCO2e – Scope 3</b></li> </ul>

Initiative No. from Initiatives Register	Site	Initiative Description	Business As Usual	Benefits
		not only a material reduction but waste elimination from associated temporary works for the cast in-situ wall.		
S58	Clyde Dive - Elimination of Tension Piles	<p>Extension of the soldier piles and thickening of the base slab to omit the need for tension piles for the Clyde Dive and Portal Structure</p> <p>An extended soldier piles and thickened base slabs have been implemented to avoid the need for tension piles. As such, all tension piles have been removed from the design and replaced by longer piles (approximately 3-5m long). Base slab thickness has been increased by approximately 200mm, resulting in materials savings for the design footprint, including steel and concrete reductions.</p> <p>Production of spoil material was also be avoided, and therefore the requirement to transport material for re-use or appropriate disposal, resulting in energy savings in terms of fuel consumption/ potential carbon emissions.</p>	Tension piles as per ECI design.	<p>Initiative Benefits:</p> <ul style="list-style-type: none"> <li>Reduced spoil waste and associated transportation, resulting in reduced fuel consumption</li> <li>Reduced steel and concrete consumption</li> </ul> <p>Emissions savings resulting from material reductions and an improved construction methodology:</p> <ul style="list-style-type: none"> <li><b>146 tCO<sub>2</sub>e – Scope 1</b></li> <li><b>1,569 tCO<sub>2</sub>e – Scope 3</b></li> </ul>
S72	Clyde Dive Structure Optimisation	<p>The Clyde Dive structure has been shifted 60m south, resulting in a reduction in the length of the overall structure and the removal of struts from the design. As a result, the length of the spur tunnel has increased; however, concrete struts are reduced from 8m to 4m. This results in a substantial reduction in material use.</p> <p>The reduced length of the structure provided a carbon reduction as the initiative promotes concrete and steel usage savings as well as</p>	Clyde Dive structure dimension per ECI Design	<p>Initiative Benefits:</p> <ul style="list-style-type: none"> <li>Reduced steel and concrete consumption</li> <li>Improved constructability resulting in reduced fuel consumption</li> </ul> <p>Emissions savings resulting from material reductions and an improved construction methodology:</p> <ul style="list-style-type: none"> <li><b>346 tCO<sub>2</sub>e – Scope 1</b></li> </ul>

Initiative No. from Initiatives Register	Site	Initiative Description	Business As Usual	Benefits
		minimises construction program, meaning less fuel consumption by onsite equipment.		<ul style="list-style-type: none"> <li>786 tCO<sub>2</sub>e – Scope 3</li> </ul>
S09B	Junction Caverns	The overall length of the Clyde Spur Tunnel Junction STJ3 cavern is reduced by 11.2m (RT01) and 8.4m (RT02) by reducing the minimum rock pillar width between the Spur Tunnel and the Mainline Running Tunnel and reducing all headwall thicknesses as part of design development.	Longer Caverns and Thicker headwalls - per ECI Design	<p>Initiative Benefits:</p> <ul style="list-style-type: none"> <li>Reduced steel and concrete consumption</li> <li>Improved constructability resulting in reduced electricity consumption</li> </ul> <p>Emissions savings resulting from material reductions and an improved construction methodology:</p> <ul style="list-style-type: none"> <li>215 tCO<sub>2</sub>e – Scope 2</li> <li>584 tCO<sub>2</sub>e – Scope 3</li> </ul>
S158	Junction Caverns	The original over excavation of 144m <sup>3</sup> would have required backfilling of 20 MPa. Tailored approach to TBM relaunch reducing the over excavation at Clyde STJ01 by 144m <sup>3</sup>	Original over excavation as indicated on CAD drawings provided by NOMA.	<p>Initiative Benefits:</p> <ul style="list-style-type: none"> <li>Reduced steel and concrete consumption</li> <li>Improved constructability resulting in reduced electricity consumption</li> </ul> <p>Emissions savings resulting from material reductions and an improved construction methodology:</p> <ul style="list-style-type: none"> <li>47 tCO<sub>2</sub>e – Scope 2</li> <li>36 tCO<sub>2</sub>e – Scope 3</li> </ul>
S16/S153	Westmead	Reduction of thickness of Westmead headwalls from 3500mm to 2500mm and reduction of thickness of crossover cavern wall from 800mm to 600mm.	Thicker headwalls - per ECI Design	<p>Initiative Benefits:</p> <ul style="list-style-type: none"> <li>Reduced steel and concrete use</li> </ul> <p>Emissions savings resulting from material reductions:</p>

Initiative No. from Initiatives Register	Site	Initiative Description	Business As Usual	Benefits
				<ul style="list-style-type: none"> <li>• <b>172 tCO2e – Scope 3</b></li> </ul>
S149	Clyde Dive	This initiative allows the project to shorten spur tunnels lining program by 2 months. Limited information is currently available regarding the machine to be used for erection of the precast permanent lining, as well as to establish accurate quantities for the Base Case assumption (Cast in-situ permanent lining). As such the calculations is based on a machine with similar power to Tunnel Boring Machine precast segment erectors, with an increase of energy demand (electricity) for the Base Case proportional to a lengthening of program by 2 months. The machine details are not fully known at time of the IS Design Submission, these assumptions are to be reviewed for As-built submission.	Permanent lining for spur tunnels (road header mined tunnels) cast in-situ, per ECI Design	Initiative Benefits: <ul style="list-style-type: none"> <li>• Improved constructability resulting in reduced electricity consumption</li> </ul> Emissions savings resulting from improved construction methodology: <ul style="list-style-type: none"> <li>• <b>26 tCO2e – Scope 2</b></li> </ul>
S255	Spur Tunnel	Backfilling of Spur tunnels traditionally uses cast-in-situ concrete (mass fill) of 32 MPa. The use of foam concrete as an alternative saw the reduction of absolute concrete usage.	32Mpa mass concrete.	Initiative Benefits: <ul style="list-style-type: none"> <li>• Reduction of absolute mass concrete.</li> </ul> Emissions savings resulting from material reductions: <ul style="list-style-type: none"> <li>• <b>943 tCO2e – Scope 3</b></li> </ul>
S256	Spur Tunnel	Removal of pilot tunnel from design by introducing a short mass concrete pillar. The 124m long pilot tunnel at interface between Clyde Dive portal and the Spur tunnels were to be backfilled with mass concrete.	Pilot tunnel to be mined and backfilled before spur tunnels were connected to Clyde dive portal.	Initiative Benefits: <ul style="list-style-type: none"> <li>• Reduction of absolute concrete use and efficiency of construction methodology</li> </ul> Emissions savings resulting from material reductions:

Initiative No. from Initiatives Register	Site	Initiative Description	Business As Usual	Benefits
				<ul style="list-style-type: none"><li>656 tCO<sub>2</sub>e – Scope 3</li></ul>

## 9.1 Infrastructure Sustainability Rating

The IS Rating scheme is developed and administered by the Infrastructure Sustainability Council (ISC) as a tool to evaluate sustainability across design, construction, and operation of infrastructure. It aims to:

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

The scheme comprises the IS rating tool, rating process, and ISC education and training programs, including the IS Accredited Professional (ISAP) program.

Sydney Metro West - Western Tunnelling Package will achieve an IS rating of ‘Leading’ for design (end of planning and design) and as-built (end of construction). While a ‘Leading’ rating requires a minimum score of 75 points, the Project is committed to achievement of a minimum score of 85 points (including 10 points allocated to innovation) per the contractual bid-back. GLC has developed an IS Rating pathway with consideration to:

- Contract requirements, design documentation, technical and functional requirements to understand the sustainability considerations within the Project scope
- ISC Technical Manual (v1.2) and the Project’s Materiality Assessment which prioritise credits that the team has high confidence of achieving with minimal risk.

The Project scorecard and weightings assessment have been made available and transmitted to Sydney Metro - SMWSTWTP-GLO-TX-002319. GLC manages the delivery of the IS Rating, including the status and risk of each credit, via excel trackers.

Table 14: ISC v1.2 overview (ISC, 2018)

Theme	Category	Description
Management and governance	Management systems	Management systems aim to ensure consistent and efficient activities within an organisation, project, or asset management.
	Procurement and purchasing	Goods and services should be procured in a manner that optimises economic, social, and environmental outcomes.
	Climate change adaptation	Infrastructure needs to be designed, constructed, and operated to cope with projected hotter, drier and stormier climatic conditions, with higher sea levels.
Using resources	Energy and carbon	Energy and carbon monitoring and reduction, and the use of renewable energy.
	Water	Conserving water and managing runoff and wastewater to prevent pollution.

Theme	Category	Description
	Materials	Ensuring that materials such as aggregates, concrete, steel, oil and wood are responsibly sourced, and used efficiently.
Emissions, pollution and waste	Discharges to air, land and water	Concerned with pollution to waterways, noise and vibration, air pollution, and light pollution.
	Land	Ensuring that the land used is not of high environmental or social value.
	Waste	Construction should avoid the generation of waste, manage waste as a resource, and ensure that waste treatment, disposal, recovery and re-use is undertaken in a sound manner.
Ecology	Ecology (potential scope out)	Considers local ecosystems (soil, water, air, biomass and wildlife).
People and place	Community health, wellbeing and safety	This relates to the concept of liability, and that community wellbeing is considered in the construction of infrastructure.
	Heritage	This encompasses the conservation of Indigenous, historic and natural heritage in a local area.
	Stakeholder participation	Refers to the processes and mechanisms that enable stakeholders who have a direct or indirect interest in infrastructure development to be part of decision-making.
	Urban and landscape design (potential scope out)	Concerned with the arrangement, appearance and function of infrastructure within an area.
Innovation	Innovation	Innovation is the creation of more effective infrastructure, processes, services, technologies or ideas.

## 9.2 Climate Change Risk Assessment

GLC is undertaking a climate change risk assessment in accordance with the TfNSW Climate Risk Assessment Guidelines (SD-081) and the *Cli-1 Climate change risk assessment* and *Cli-2 Adaptation measures* credits of the IS Rating. A Climate Risk Assessment Report has been prepared and submitted to Sydney Metro and the risk assessments used as an input to inform the design development.

GLC ensured that the climate change projections and guidance used to underpin the climate change risk assessments were the most recent available and were consistent with industry best practice. GLC ensured that the climate change report included:

- documents to all project specific amendments to the climate change risk framework,
- demonstration of how risk adaptation measures, including baseline risk adaptation measures, have been and will be implemented to reduce risk levels – optimal scale and timing.

In the Design Documentation, the Project identifies and describes climate change adaptations where the Works have been designed to be resilient to the effects of climate change during each Design Stage. GLC shall implement design mitigations for all climate change risks classified as “extreme”, “high”, and “medium”, such that all residual risks are classified as “low”.

### 9.3 Whole of Life Impact and Life Cycle Assessment Methodology

Life Cycle Assessment (LCA) is an internationally standardised analytical framework for identifying and quantifying the impact of resource use and emissions (e.g. greenhouse gases) of a system. LCAs assess environmental impacts associated with all the stages of a product's life from raw material extraction through materials processing, manufacture, distribution, use, repair and maintenance, and disposal or recycling i.e. “cradle to grave”. The impacts that are “banked” at each stage are referred to as “embodied” impacts.

LCAs use established ‘inventories’ of impacts across a range of environmental impacts which are then normalised for a geographic region. The output of the assessment is expressed in ‘eco-points’ for the v1.2 IS Rating.

The Project is required to prepare the LCA prior the completion of Design Stage 2 (PS 3.4.4.3 (b)) and to update the LCA at Design Stage 3 (GS 5.1.7 (b)) and As Built. The LCA is prepared using the Sydney Metro Carbon Tool.

Design-phase LCA results are presented in Section 7.2 in this plan.

## 10 BIODIVERSITY

The Project shall minimise vegetation clearance, particularly native vegetation, in accordance with the general principles for biodiversity management which are included in the WTP Flora and Fauna Management Plan.

Key initiatives to minimise the impact and enhance biodiversity might include:

- Minimising vegetation removal wherever practical
- Prioritising removal of non-native vegetation over native vegetation
- Installation of a BioBasin to manage operational water quality
- Review of construction methodology to remove occurrence of instream works where practical.

## 11 COMMUNITY BENEFITS

GLC is developing 20 initiatives under the Community Benefits Initiatives Plan. The Project will deliver at least 10 community benefit initiatives which target identified community needs which provide demonstrable and tangible benefits to the local community groups during the period of construction period, and a further 10 which provide benefit to the broader local community beyond the construction period to leave a lasting legacy, as per Section 2.8.7 of the General Specifications.

Table 14 below is a non-exhaustive list of the community initiatives which are being investigated for potential implementation on the Project.

For the Community Benefits Implementation Plan, see Appendix D. The results of opportunity investigations and the delivered initiatives are reported in Quarterly Sustainability Reports (Section 12.2.2).

Table 15: Community Benefit Initiatives to be investigated

Initiative	Potential partners	Priority outcome(s)
Monetary and time donations to the Supertee program to support children at Westmead Children’s Hospital	Supertee	Priority E – Thriving children and families. Priority G – Improve the health and wellbeing of communities.
Monetary donations or completing maintenance works to a new shelter	Parramatta Women’s Shelter	Priority D – Build inclusive communities. Priority E – Thriving children and families.
Installing planter boxes in the church parking lot to activate the space for events	Uniting Church	Priority D – Build inclusive communities. Priority H – Having a safe and affordable place to live.
Participating in the Meals Plus Program and contributing to a food and clothes drive	Parramatta Mission	Priority D – Build inclusive communities. Priority G – Improve the health and wellbeing of communities. Priority H – Having a safe and affordable place to live.
Completing maintenance and refurbishment work to the Parramatta Gaol to activate the space for community events	Deerubbin Local Aboriginal Land Council	Priority B – Improve community character or surroundings. Priority F – Empowering Aboriginal communities.
Providing funding for the installation of an LED sign	Westmead Public School	Priority I – Providing educational foundations and best start in life for young children.
Monetary and time donations to coordinate and deliver a “Plant a Tree Day” event at Westmead Public School	Westmead Public School	Priority E – Thriving children and families. Priority I – Providing educational foundations and best start in life for young children.
Donating to the community pantry	Cumberland Community Pantry	Priority D – Build inclusive communities. Priority G – Improve the health and wellbeing of communities.

Initiative	Potential partners	Priority outcome(s)
Christmas Toy Drive, donation of warehouse equipment, and maintenance support for warehouse facilities	Turbans 4 Australia	Priority E – Thriving children and families.
Funding a promotional campaign for stores experiencing a reduction in business due to construction	Local shops in Parramatta	Priority A – Create a strong, resilient and diverse economy.
Coordination and delivery of interactive road safety activities at Westmead Public School as part of Road Safety Awareness Week	Westmead Public School	Priority E – Thriving children and families Priority G – Improve the health and wellbeing of communities. Priority I – Providing educational foundations and best start in life for young children
Monetary and time donations to provide food for sick children and their families	Ronald McDonald House Charities	Priority E – Thriving children and families Priority G – Improve the health and wellbeing of communities

## 12 MONITORING, AUDITING AND REPORTING

Key Project operations and activities which impact sustainability are regularly monitored and measured. This may include topic-specific sustainability monitoring, recording of information to track performance, monitoring operational controls and assessing conformance with objectives and targets. Additionally, formal reporting is undertaken to review Project performance in relation to sustainability requirements and, if necessary, actions are implemented to improve performance in required areas.

All sustainability issues, non-conformances, and actions that arise from monitoring are raised in Velocity EHS, the Project HSE digital management platform. These may include:

- Inspection outcomes that cannot be rectified immediately
- Incidents and associated corrective actions
- Internal audit observations/non-compliance
- Client audits or other notice of non-compliance
- Actions resulting from ER inspections
- Notices or action from regulatory authorities.
- Inspections, audits and monitoring are conducted in accordance with the Project Sustainability inspection, auditing and monitoring requirements matrix (Appendix F).

### 12.1 Sustainability Inspections

GLC’s Environmental and Sustainability Inspection Checklist (SMWSTWTP-GLO-1NL-EN-CHK-000003 – Environment and Sustainability Inspection) is used to monitor site sustainability performance. The inspection is completed by a member of the Environment and Sustainability team on a weekly basis.

Issues identified, and any associated actions raised and unable to be closed on the day, are captured in Velocity EHS, the Project HSE digital management platform.

### 12.2 Sustainability Reporting

Project sustainability reporting requirements, as required by the contract, are outlined in Table 15.

*Table 16: WTP Sustainability Reporting Requirements*

Sustainability Report	Frequency	Requirement
Annual Public Report	Annually	IS Rating Man-5 Level 3
Greenhouse Gas Inventory Report (GGIR)	Design Stage 1, Design Stage 3, annually thereafter and again prior to the Date of Construction Completion of the last Portion to reach Construction Completion	Particular Specification 3.4.7 (c) and (d)

Sustainability Report	Frequency	Requirement
Quarterly Sustainability Report	Quarterly (design and construction)	General Specification 5.2.4
Monthly Sustainability Data Report	Monthly (design and construction)	General Specification 5.2.2.8 (a) (xiii)
Monthly Project Progress Report	Monthly (design and construction)	General Specification 5.2.2.8 (a) (xiii)
Climate Change Impact Assessment Report (CCIAR)	Design Stage 1, Design Stage 2, Design Stage 3 and again prior to the Date of Construction Completion of the last Portion to reach Construction Completion	Particular Specification 3.4.7 (a) and (b)
Sustainability Design Report	Design Stage 2 and Design Stage 3	Particular Specification 3.4.7 (g)

The results of monitoring are reviewed by the Sustainability Manager (or Coordinator as delegated) to identify any opportunities for improved sustainability outcomes and potential non-compliances.

### 12.2.1 Annual Sustainability Performance Review

GLC reports on sustainability performance annually with a formal review to be held with GLC’s senior leadership and relevant Project stakeholders (see Table 16). GLC recognises the importance of engaging with stakeholders who are directly or indirectly impacted by the Project to ensure risks are reduced and performance is maximised.

The review details the overarching approach to sustainability, the systems that have been implemented on the Project to manage performance, the IS Rating pathway, progress made against contractual requirements and initiatives implemented to address social and environmental aspects. The review also detail progress against requirements and targets in relation to resource consumption and summarise initiatives that have been implemented to achieve reductions in these areas.

A summary of the sustainability performance of the Project for each year will be provided in the form of an Annual Public Report available on the project website (Section 8.2).

Table 16 lists and provides justification for the relevant stakeholders for the review of sustainability performance. Each stakeholder group was reviewed based on the purpose of the organisation, the involvement in the development and operation of the Project and the relevance of sustainability to their functioning. The impact of the asset was also reviewed as well as expertise available within the organisation to provide commentary on sustainability performance.

Table 17: Relevant Stakeholder Groups for Sustainability Performance Review

Stakeholder Group	Relevant to Performance Review	Justification
<b>Elected Representatives – State and Federal</b>	No	Consultation with government is undertaken via engagement with the Local Government Area Councils. The councils have specific departments that are responsible for sustainability and environment and are able to provide comment and considerations for the council and area as a whole rather than the individual member representative.
<b>Government agencies/entities</b>	As per below.	As per below.
<ul style="list-style-type: none"> <li>Sydney Metro</li> </ul>	Yes	Sydney Metro are the Client for the Project and engagement with the relevant representatives on sustainability performance is crucial to maximising the success of the Project.
<ul style="list-style-type: none"> <li>TfNSW (including Sydney Trains)</li> <li>Department of Planning and Environment (including Sydney Olympic Park Authority (SOPA))</li> </ul>	Yes	<p>TfNSW (including Sydney Trains) have been deemed a relevant stakeholder to review sustainability performance as the owner and operator of asset. TfNSW (including Sydney Trains) will be the operator and maintainer of the asset once construction of the Sydney Metro West line is complete. In addition, as an organisation they have boarder sustainability goals and plans and have specific departments that are responsible for sustainability.</p> <p>SOPA are responsible for the day-to-day management of all public places and will be directly impacted by the construction and operation of the Project and consider sustainability aspects in the Sydney Olympic Park area. As such, they are a relevant stakeholder for consultation. As SOPA is directly relevant to the sustainability performance of the Project and will be consulted, the Department of Planning and Environment will not be included.</p> <p>TfNSW and SOPA will be able to access the Project’s sustainability performance via the Annual Public Report.</p>
<ul style="list-style-type: none"> <li>NSW Health / Health Infrastructure</li> <li>Environment Protection Authority</li> </ul>	No	Whilst the remaining government agencies/entities have been identified as relevant stakeholder groups for the Project, collaboration with these organisations specifically on sustainability performance is not appropriate as the functioning of the organisations does not relate to sustainability or the operation of the asset.

Stakeholder Group	Relevant to Performance Review	Justification
<ul style="list-style-type: none"> <li>• Venues NSW</li> <li>• Schools Infrastructure</li> <li>• Infrastructure NSW</li> <li>• Office of Water</li> <li>• Greater Cities Commission</li> </ul>		
<b>Local Government</b> <ul style="list-style-type: none"> <li>• Cumberland City Council</li> <li>• City of Parramatta Council</li> </ul>	Yes	<p>Cumberland City Council and City of Parramatta Council are directly impacted by the construction and operation of the Project and sustainability performance is directly related to the organisations. In addition, the councils have departments that are involved with sustainability and as such will be included in the stakeholder review process. Councils will be able to access the Project's sustainability performance via the Annual Public Report.</p>
Commuters, residents, and businesses surrounding the Project sites	No	<p>Whilst the stakeholder groups will be impacted by the construction and operation of the Project, sustainability performance is not directly relevant and as such these groups will not be included in the review process.</p>
<b>Aboriginal Land Councils</b> <ul style="list-style-type: none"> <li>• Deerubbin Local Aboriginal Land Council</li> <li>• Metropolitan Local Aboriginal Land Council</li> </ul>	No	<p>Heritage is incorporated into sustainability, however, these groups will be directly consulted with by the environment team and heritage technical specialists to discuss all relevant heritage items and therefore will not be included in this review process.</p>
<b>Emergency services</b>		
<ul style="list-style-type: none"> <li>• Rural Fire Service (RFS)</li> <li>• State Emergency Services (SES)</li> </ul>	No	<p>The stakeholder group is not likely to be impacted by the construction of the Project and as such these groups will not be included in the review process.</p>
<ul style="list-style-type: none"> <li>• Police</li> </ul>	No	<p>Whilst the stakeholder groups will be impacted by the construction and operation of the Project, sustainability performance is not directly relevant and as such these groups will not be included in the review process.</p>
Places of worship	No	<p>Whilst the stakeholder groups will be impacted by the construction and operation of the Project,</p>

Stakeholder Group	Relevant to Performance Review	Justification
		sustainability performance is not directly relevant and as such these groups will not be included in the review process.
Heritage Stakeholders	No	Heritage is incorporated into sustainability, however, these groups will be directly consulted with by the environment team and heritage technical specialists to discuss all relevant heritage items and therefore will not be included in this review process.
Medical facilities	No	Whilst the stakeholder groups will be impacted by the construction and operation of the Project, sustainability performance is not directly relevant and as such these groups will not be included in the review process.
Educational facilities	No	Whilst the stakeholder groups will be impacted by the construction and operation of the Project, sustainability performance is not directly relevant and as such these groups will not be included in the review process.
Other educational institutions	No	Whilst the stakeholder groups will be impacted by the construction and operation of the Project, sustainability performance is not directly relevant and as such these groups will not be included in the review process.
Other road users, pedestrians, cyclists	No	Whilst the stakeholder groups will be impacted by the construction and operation of the Project, sustainability performance is not directly relevant and as such these groups will not be included in the review process.
<b>Utilities</b> <ul style="list-style-type: none"> <li>• Sydney Water</li> <li>• Endeavour Energy</li> </ul>	No	The stakeholder group is not likely to be impacted by the construction of the Project and as such these groups will not be included in the review process.

### 12.2.2 Quarterly Sustainability Reporting

GLC prepares a Quarterly Progress Report to be submitted to GLC Senior Leadership and Sydney Metro. The Report includes sustainability performance data and metrics (as described in Section 12.2.3 below), status of ongoing community benefits initiatives, and key achievements and milestones for that reporting period.

### 12.2.3 Monthly Reporting

Each month, subcontractors on the Project are required to submit monthly data to the GLC Sustainability Team summarising the parameters in Table 18 that are relevant to their scope. Subcontractor data is collated by the GLC Sustainability Team and submitted to Sydney Metro in the interdisciplinary Monthly Project Progress Report.

Table 18: Sustainability Performance Metrics

Performance Data	Data Source
Electricity consumption and generation, including any on-site renewable energy generation and any renewable energy sourced for the construction	Metering and bills
Quantity of greenhouse gas emissions associated with electricity consumption which have been offset, and method of offset	Metering and bills (GHG conversion achieved using latest NGERs approved Factors) Offset certificates.
Fuel consumption	Bills and Monthly payment claims from subcontractors
Volume of potable mains water consumed for the contractor's activities	Metering
Volume of non-potable water consumed for the contractor's activities, including details of the sources of non-potable water	Metering
Waste generation, recycling and disposal	Reports from Waste Contractors
The volume of spoil:	
<ul style="list-style-type: none"> <li>● Reused within site;</li> </ul>	Reports from Waste Contractors
<ul style="list-style-type: none"> <li>● Beneficially reused off-site or;</li> </ul>	Reports from Waste Contractors
<ul style="list-style-type: none"> <li>● Disposed offsite</li> </ul>	Reports from Waste Contractors
<ul style="list-style-type: none"> <li>● Destinations for spoil which has been beneficially reused off-site or disposed of off-site.</li> </ul>	Reports from Waste Contractors
Quantities of steel and concrete which have been used	Contractor reporting / procurement records
Volume weighted average percentage cementitious content in concrete used which has comprised of fly ash or slag	'Green Star' report from concrete supplier

## 12.3 Auditing

### 12.3.1 Independent Sustainability Audits

The project sustainability management system is audited by an Independent Sustainability Professional (ISP). As per the ISC criteria, sustainability performance shall be externally audited once during design, and then annually during construction. GLC is committed to completing quarterly sustainability external auditing to ensure performance is being managed effectively. Refer to Appendix F.

### 12.3.2 Internal audits

GLC undertake quarterly internal audits of sustainability performance which commenced with an initial internal audit dated within the three months of the commencement of construction.

The audit scope includes but is not limited to:

- Material environmental, social, and economic issues
- Sustainability training records
- Sustainability monitoring and inspection results.

Material issues are defined as those having a high material impact on the project and has been assessed in accordance with the verified IS Weighting Assessment Materiality Score. The audit schedule supports the IS credits *Man-3 Organisational Structure, and Roles and Responsibilities* and *Man-4 Inspection and Auditing*.

Auditing of the project environmental requirements is carried out in accordance with SMW WTP Environment and Sustainability Policy and *AS/NZS ISO 19011:2019 – Guidelines for Auditing Management Systems*. Audits are undertaken by suitably qualified personnel within the Project team or as engaged by GLC.

Actions arising from audits are developed in consultation with the personnel involved in the audit and the implementation is overseen by the Environment and Sustainability Lead.

## 12.4 Non-Conformance

Non-conformances identified from monitoring, inspections and audit are recorded in Velocity EHS and addressed by the Sustainability Manager.

All Non-conformances are reviewed to evaluate the need for action to prevent recurrence. Actions to review the non-conformances include:

- Understanding the nature of the nonconformity and the requirement it relates to
- Determining the causes of the nonconformity
- Determining if similar nonconformities exist, or could potentially occur
- Identify the need for corrective actions to ensure the compliance requirement is understood by the relevant project personnel and that the requirement is clearly documented. Corrective actions may include team communication such as alerts or toolbox talks, training, or review of this plan

- Review the effectiveness of any corrective action taken.

Corrective Actions arising from audits, inspections, non-conformances, or incidents are captured in Velocity EHS to prevent recurrence or manage ongoing environmental or sustainability risk. A summary of this information is documented in Quarterly Reports (refer Section 12.2.2).

## 13 MODERN SLAVERY

Modern Slavery on the Project is managed in accordance with the NSW and Australian Modern Slavery legislation as detailed in Sections 2.8.6 and 5.1.7 of the General Specification. The framework, outlined in Figure 3, ensures that when equipment, materials or labour are procured from a *country of interest* locations outside Australia, GLC procurement and commercial team members ensure that human rights impacts and risks are identified during the tender stage, and any mitigation measures are identified and implemented to ensure compliance. The process has been drawn from the best practice framework implemented at Laing O’Rourke’s Sydney Metro Central Station Project.

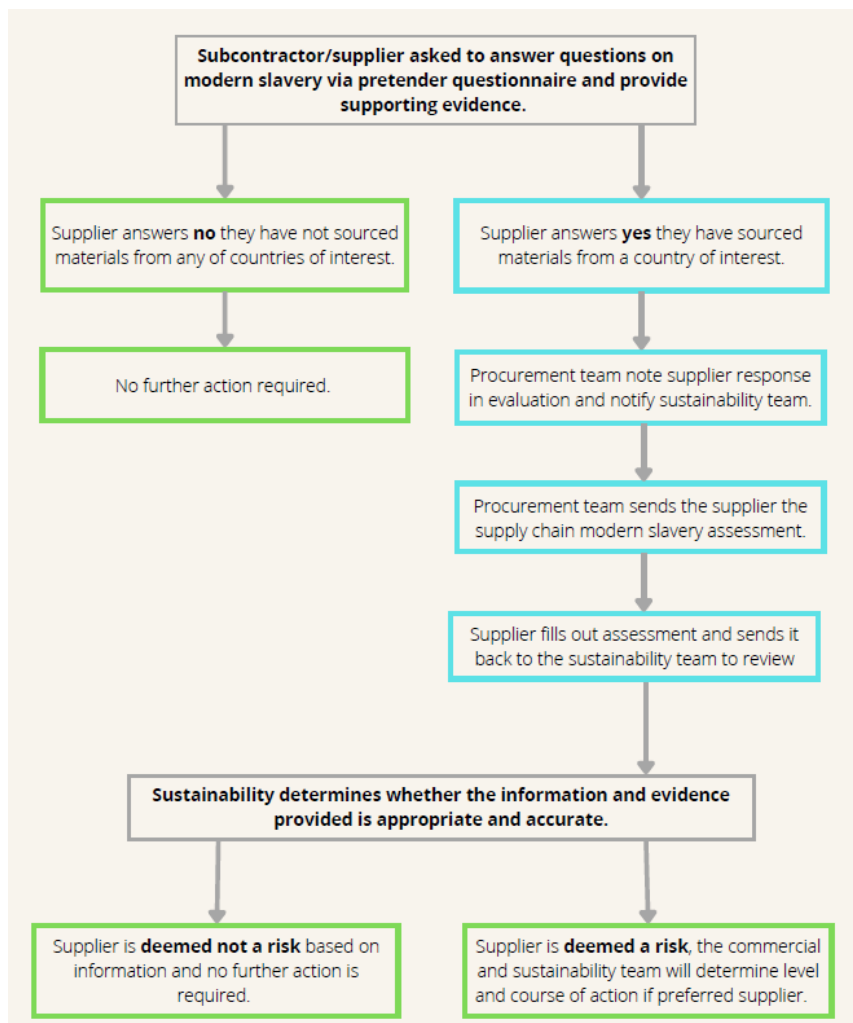


Figure 3 Modern Slavery Process Flow Chart

# A APPENDIX – SUSTAINABILITY REQUIREMENTS COMPLIANCE TABLE

The below compliance table maps the alignment of this Plan with the Project contractual requirements.

General Specification Requirements	Reference
(a) The Tunnelling Contractor must submit a Sustainability Management Plan to the Principal for Review in accordance with Table 3.	This document
(b) The Sustainability Management Plan must address and detail:	
(i) the relevant requirements of the Sydney Metro Environment and Sustainability Statement of Commitment and the Sydney Metro Sustainability Plan;	This table
(ii) a sustainability policy statement;	Section 4.1 and Appendix B
(iii) the sustainability management team structure, including:	Section 2
A. the Tunnelling Contractor’s personnel’s Authority and Roles of the Tunnelling Contractor’s Personnel	Section 2.1
B. lines of responsibility and communication	Section 2.1
C. minimum skill levels of each role; and	Section 2.1
D. interfaces with the overall Project organisation structure;	Section 2.2 and section 2.3
(iv) how sustainability initiatives will be identified and integrated into the design of the Project Works;	Section 9
(v) the carbon and energy mitigation measures as detailed in the environmental approval documentation that are applicable to the Project Works;	Section 7.2
(vi) the low carbon strategies and initiatives that will be implemented to minimise the carbon emissions	Section 7.2
(vii) the energy efficiency strategies and initiatives that will be implemented to minimise energy use;	Section 7.2
(viii) support innovative and cost-effective approaches to energy efficiency, low carbon / renewable energy sources and energy procurement;	Section 7.2
(ix) the strategies and initiatives that will be implemented to enhance the biodiversity;	Section 10
(x) the processes and methodologies for assurance, monitoring, auditing, corrective action, continuous improvement and reporting on sustainability performance;	Section 12
(xi) process for compliance record generation and management;	Section 5 and Section 12

General Specification Requirements	Reference
(xii) the processes and methodologies which will be used to achieve the required scores under rating systems identified in section 2.7.2;	
(xiii) the strategy and methodology for incorporating climate change adaption in designs in response to the climate change risks and baseline adaptation measures allocated to the Project Works;	Section 9.2
(xiv) the strategies and initiatives that will be implemented to minimise overall water use, maximise the availability and use of non-potable water sources;	Section 7.1
(xv) estimates of the quantity of potable water which will be consumed during construction;	Section 7.1
(xvi) estimates of the quantity of water from non-potable sources which will be consumed during construction;	Section 7.1
(xvii) the strategy to reduce material use throughout the Project lifecycle;	Section 7.3
(xviii) the strategies and initiatives that will be implemented to maximise the use of recycled materials;	Section 7.3 and Section 9
(xix) the strategies and initiatives to recycle and reuse materials onsite;	Section 7.3
(xx) the strategies and initiatives to prioritise the use of materials with a lower embodied impact;	Section 9
(xxi) estimates of the Portland cement reduction which will be achieved in concrete (averaged across all mixes), compared to a reference case;	Section 7.3
(xxii) the strategies and initiatives to prioritise the use of low volatile organic compound (VOC), low emission materials;	Section 7.3 and Section 9
(xxiii) the use of sustainably sourced and certified timber and wood products;	Section 7.3
(xxiv) the development of deconstruction plans to enable recycling and reuse at end-of-life;	Section 7.3
(xxv) estimates of fuel consumption;	Section 7.2
(xxvi) estimates of electricity consumption;	Section 7.2
(xxvii) Carbon emission targets that incorporates direct and indirect emissions associated with electricity and fuel consumption, on-site process emissions and embodied emissions for all main materials used;	Section 7.2
(xxviii) reporting of carbon and energy will be undertaken in accordance with the National Greenhouse and Energy Reporting Act 2007;	Section 7.2

General Specification Requirements	Reference
(xxix) the strategy and initiatives to influence subcontractors and materials suppliers to adopt sustainability objectives in their works and procurement;	Section 6
(xxx) a Sustainable Procurement Policy that must, as a minimum, include:	Section 4.2
A. the processes and procedures that will be used to provide environmental and social improvement;	Section 4.2
B. the responsibility of the Tunnelling Contractor’s Personnel with respect to the implementation of the policy	Section 4.2
C. compliance record generation and management;	Section 4.2
D. the processes and environmental and social criteria that will be used for the selection of Subcontractors;	Section 4.2
E. the processes that will be used to ensure ethical sourcing of labour and materials;	Section 4.2
F. local sourcing; and	Section 4.2
G. where equipment, materials or labour are procured from locations outside Australia, the processes that will be used to ensure human rights impacts and risks are identified and mitigated as well as processes to ensure compliance with modern slavery, and modern slavery reporting;	Section 4.2
(xxxii) the retention of records detailing the consideration of sustainability in the procurement of all materials; and	Section 6.2
(xxxii) a Community Benefits Implementation Plan that must, as a minimum, include:	Appendix D
A. community needs analysis and how this has been informed through input from the local community and stakeholders;	Appendix D
B. methodology for the development of community benefit initiatives and legacy community benefit initiatives to add value to the communities in which it is working;	Appendix D
C. how each initiative aligns with an identified outcome in the Project Community Benefit Plan;	Appendix D
D. how each initiative will be implemented;	Appendix D
E. a monitoring and evaluation methodology to demonstrate the outputs and tangible outcomes achieved, including key performance indicators	Appendix D
F. a verification process to confirm the outputs and outcomes; and	Appendix D

General Specification Requirements	Reference
G. a community benefit initiative impact register which would include details of initiatives submitted for review and approval by the Principal and the date approval is granted by the Principal to undertake the initiative	Appendix D

## B APPENDIX – PROJECT SUSTAINABILITY AND INNOVATION POLICY

# C APPENDIX – PROJECT SOCIAL PROCUREMENT POLICY

# D APPENDIX – COMMUNITY BENEFITS IMPLEMENTATION PLAN

# E APPENDIX – SYDNEY METRO SUSTAINABILITY REPORTING TEMPLATE

# F APPENDIX – PROJECT AUDIT SCHEDULE

# G APPENDIX – ISC SCORE PATHWAY

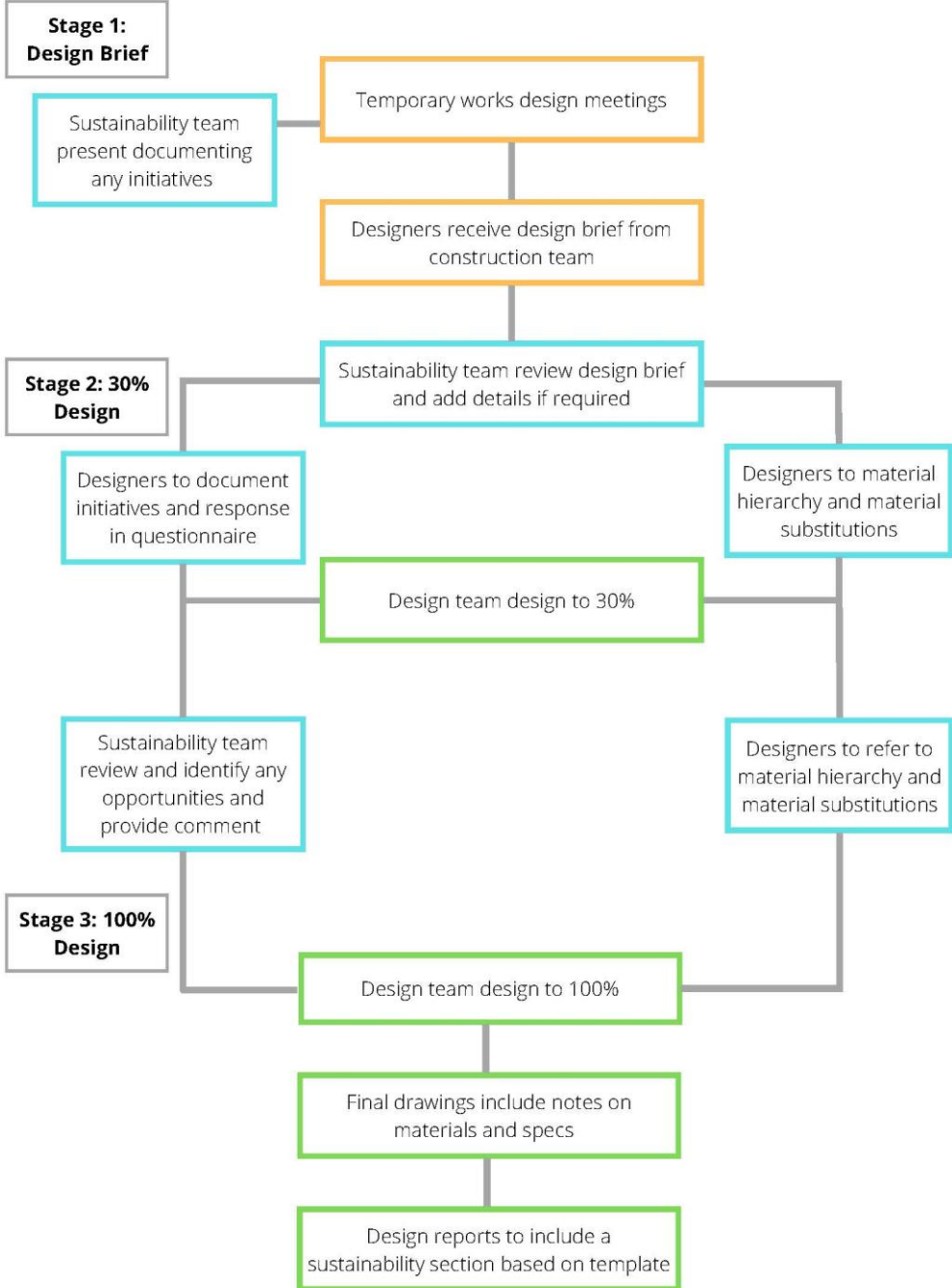
Credit	Name of credit	Materiality score	Score possible	No. levels	Target level	Target score
<b>Total</b>			<b>110pts</b>			<b>106pts</b>
Man-1	Sustainability management and commitment	2	0.97	3	3	0.97
Man-2	Risk and opportunity management	2	0.97	2	2	0.097
Man-3	Organisational structure, roles, and responsibilities	2	0.97	2	2	0.97
Man-4	Inspection and auditing	2	0.97	2	2	0.97
Man-5	Reporting and review	2	0.97	3	3	0.97
Man-6	Knowledge sharing	2	2.18	3	3	2.18
Man-7	Decision-making	2	3.15	3	3	3.15
Pro-1	Commitment to sustainable procurement	2	1.21	3	3	1.21
Pro-2	Identification of suppliers	2	1.21	3	3	1.21
Pro-3	Supplier evaluation and contract award	2	-	-	-	-
Pro-4	Managing supplier performance	2	-	-	-	-
Cli-1	Climate change risk assessment	4	4.84	3	3	4.84
Cli-2	Adaptation options	4	4.84	3	3	4.84
Ene-1	Energy and carbon monitoring and reduction	3	13.08	3	3	13.08
Ene-2	Renewable energy	3	2.18	3	2.82	2.05
Wat-1	Water use monitoring and reduction	1	4.36	3	2	2.91
Wat-2	Replace potable water	1	2.42	3	1.5	1.21
Mat-1	Materials footprint measurement and reduction	3	8.72	3	2.66	7.73
Mat-2	Environmentally labelled products and supply chains	2	-	-	-	-
Dis-1	Receiving water quality	2	2.30	3	3	2.30

Dis-2	Noise	4	4.60	3	3	4.60
Dis-3	Vibration	3	3.45	3	3	3.45
Dis-4	Air quality	3	3.45	3	3	3.45
Dis-5	Light pollution	2	0.97	1	1	0.97
Lan-1	Previous land use	2	2.42	3	3	2.42
Lan-2	Conservation of on-site resources	SO	-	3	0	-
Lan-3	Contamination and remediation	4	3.87	3	2	3.87
Lan-4	Flooding design	3	1.45	2	2	1.45
Was-1	Waste management	4	3.87	2	2	3.87
Was-2	Diversion from landfill	4	-	-	-	-
Was-3	Deconstruction/ Disassembly/ Adaptability	SO	-	-	-	-
Eco-1	Ecological value	SO	-	3	0	0
Eco-2	Habitat connectivity	SO	-	3	0	0
Hea-1	Community health and well-being	3	3.63	3	2	2.42
Hea-2	Crime prevention	3	3.63	2	2	3.63
Her-1	Heritage assessment and management	3	3.63	3	2	3.63
Her-2	Monitoring and management of heritage	3	-	-	-	-
Sta-1	Stakeholder engagement strategy	4	2.42	3	1	2.42
Sta-2	Level of engagement	4	2.42	3	1	2.42
Sta-3	Effective communication	4	2.42	2	2	2.42
Sta-4	Addressing community concerns	4	2.42	2	2	2.42
Urb-1	Urban design	2	SO	-	-	-
Urb-2	Implementation	2	SO	-	-	-
Inn-1	Innovation	2	10.00	10	10	10.00

## H APPENDIX – DECISION MAKING FRAMEWORK

# I APPENDIX – TEMPORARY WORKS SUSTAINABILITY DESIGN PROCESS

**Temporary Works Sustainability Design Process**



Appendix – Sydney Metro Environment and Sustainability Statement of Commitment



## Environment & Sustainability Statement of Commitment

Sydney Metro will deliver great services, places and transport infrastructure for our customers while protecting the environment, contributing to economic prosperity and delivering social benefits for the communities we serve. We have a duty to undertake our activities in the interest of the greater good, to move beyond compliance and be a genuine leader in both environmental management and sustainability.

Sydney Metro is committed to:

- Minimising our impacts and leaving a positive environmental and social legacy;
- Delivering a resilient asset and service for our customers;
- Collaborating with stakeholders to innovate and drive sustainable outcomes; and
- Embedding sustainability into our activities;

To deliver on these commitments Sydney Metro will:

### Leave an environmental and social legacy

- Protect the environment, prevent pollution and comply with legal and other requirements.
- Manage resources and waste efficiently, exploring opportunities to minimise waste, use recycled and low impact materials and reduce our environmental footprint.
- Promote a diverse and inclusive workforce and supply chain, build capability and capacity within industry, and increase Aboriginal participation.
- Responsibly minimise environmental and social risks in our supply chain.
- Create liveable places that are well integrated and promote active and sustainable transport.
- Conserve and enhance the natural environment and our built and cultural heritage.
- Work collaboratively with delivery partners to provide social benefits to the communities in which we work.

### Drive resilience

- Tackle climate change and contribute to the NSW Government target of net zero emissions.
- Deliver Sydney Metro assets and operations that are resilient to a changing climate, and work with stakeholders to proactively respond to emerging challenges and opportunities.
- Promote the greening of our cities to help combat the 'urban heat island' effect.

### Collaborate to deliver sustainable outcomes

- Align with and respond to Transport for NSW policy and other NSW Government priorities.
- Establish and maintain positive relationships with communities and stakeholders to harness local knowledge and maximise opportunities to add value across the project lifecycle.
- Collaborate and consult with Aboriginal stakeholders to understand how we can best respect and celebrate Aboriginal cultural values including Designing with Country.
- Provide industry leadership by setting benchmarks, encouraging innovation and driving continual improvement with our delivery partners.
- Increase environmental awareness amongst staff and customers to drive more sustainable behaviours.

### Embed sustainability

- Establish robust objectives and targets that are measurable and take into account whole-of-life considerations.
- Maintain an environmental management system that is integrated into our projects and continually improved to enhance environmental performance.
- Apply effective assurance processes to monitor environment and sustainability performance including ensuring accountability, incentivising beyond compliance behaviours and implementing corrective actions as required.
- Embed sustainability considerations into key project decisions across the project lifecycle.
- Provide appropriate training and resources to meet our obligations and commitments.
- Publicly report on sustainability performance.

**Peter Regan**  
Chief Executive, Sydney Metro

This Statement of Commitment supersedes previous versions of the Sydney Metro Environment & Sustainability Policy and aligns with the cluster wide TNSW Environment and Sustainability Policy which has been adopted by Sydney Metro. It applies to all people working for Sydney Metro.

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