

Delivery Phase Sustainability Management Plan

PLR1SOM-GLR-ALL-PM-PLN-000015

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Definitions and Acronyms

Terms	Meaning
BAU	Business As Usual
CERT	Carbon and Energy Reporting Tool
CRA	Climate Risk Assessment
DDR	Detailed Design Review
DSMP	Delivery Phase Sustainability Management Plan
EPD	Environmental Product Declaration
ETS	Electronic Ticketing System
GHG	Greenhouse gas
GRCLR	Great River City Light Rail
IC	Independent Certifier
IMS	Integrated Management System
Interface Contractor	Any relevant Rail Transport Agency, RMS (and its contractors), the Infrastructure Contractor, the Remediation Contractor, the Enabling Works Contractor, the RTR Contractor, and the ETS Contractor
IS	Infrastructure Sustainability
ISCA	Infrastructure Sustainability Council of Australia
JSEA	Job Safety and Environmental Analysis
LCA	Life Cycle Assessment
LRV	Light Rail Vehicle
O&M	Operation & Maintenance
PDMI	Plan-Do-Measure-Improve
PDR	Preliminary Design Review
PLR	Parramatta Light Rail
RMS	Roads and Maritime Service
RTR	Robin Thomas Reserve
RVTM	Requirements Verification Traceability Matrix
SaM Facility	Stabling and Maintenance Facility
SDG	Sustainable Design Guidelines v4.0
SDR	System Definition Review
SMT	Senior Management Team
SOM	Supply, Operate and Maintain

Terms	Meaning
TERM	TfNSW Enterprise Risk Management
TfNSW	Transport for New South Wales, the Principal

1 Introduction

Parramatta Light Rail (PLR) is a dual-track, light rail project aimed at meeting the growing public transportation needs in the Greater Parramatta region. Stage 1 of the PLR project includes the construction and operation of a 12 kilometre light rail service from Westmead to Carlingford via Parramatta CBD and Camellia. The PLR Stage 1 alignment is shown in Figure 1.



Figure 1: PLR Stage 1 Alignment

As shown in Figure 2, Transport for New South Wales (TfNSW) has divided the delivery for PLR Stage 1 works into seven packages, including the Supply, Operate and Maintain (SOM) Contract.

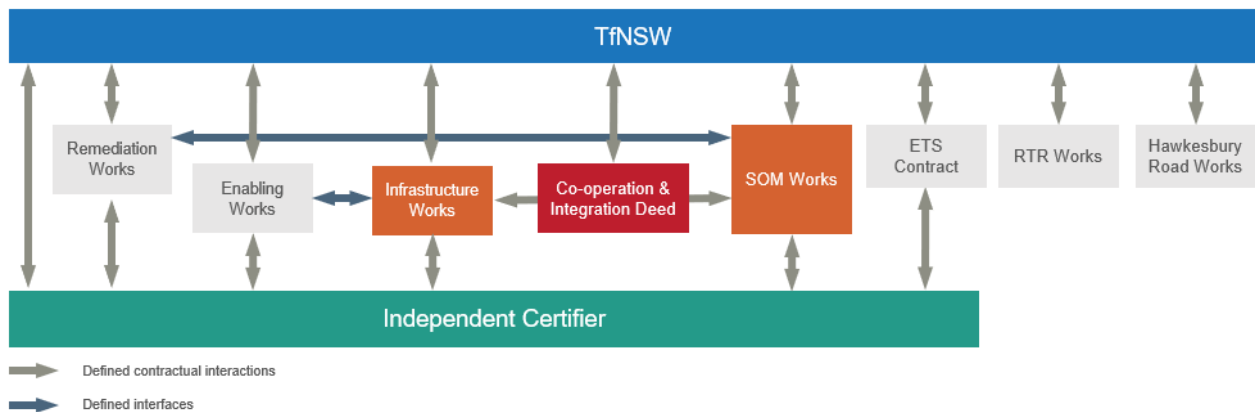


Figure 2: Project Contractual Interfaces

The SOM Contract defines any relevant Rail Transport Agency, RMS (and its contractors), the Infrastructure Contractor, Remediation Contractor, Enabling Works Contractor, RTR Contractor and ETS Contractor as Interface Contractors. As the SOM Contractor, Great River City Light Rail (GRCLR) will proactively coordinate and integrate the SOM Contractor’s Activities with those activities carried out by the Infrastructure Contractor and the Interface Contractors.

The SOM Contractor's Activities involve all things or tasks that GRCLR may be required to do (as the SOM Contractor) to comply with our obligations under the Deed. This includes:

- Delivery Activities;
- Light Rail Vehicle (LRV) Procurement Activities;
- Operation and Maintenance (O&M) Activities;
- Anything required under the Co-operation and Integration Deed;
- Anything required under the Contract Independent Certifier Deed; and
- Anything incidental or ancillary to the obligations listed above.

Figure 3 further details these activities. The main obligations and activities required under the Co-operation and Integration Deed and the Contract Independent Certifier Deed are set out in Sections 1.1 and 1.2 below.

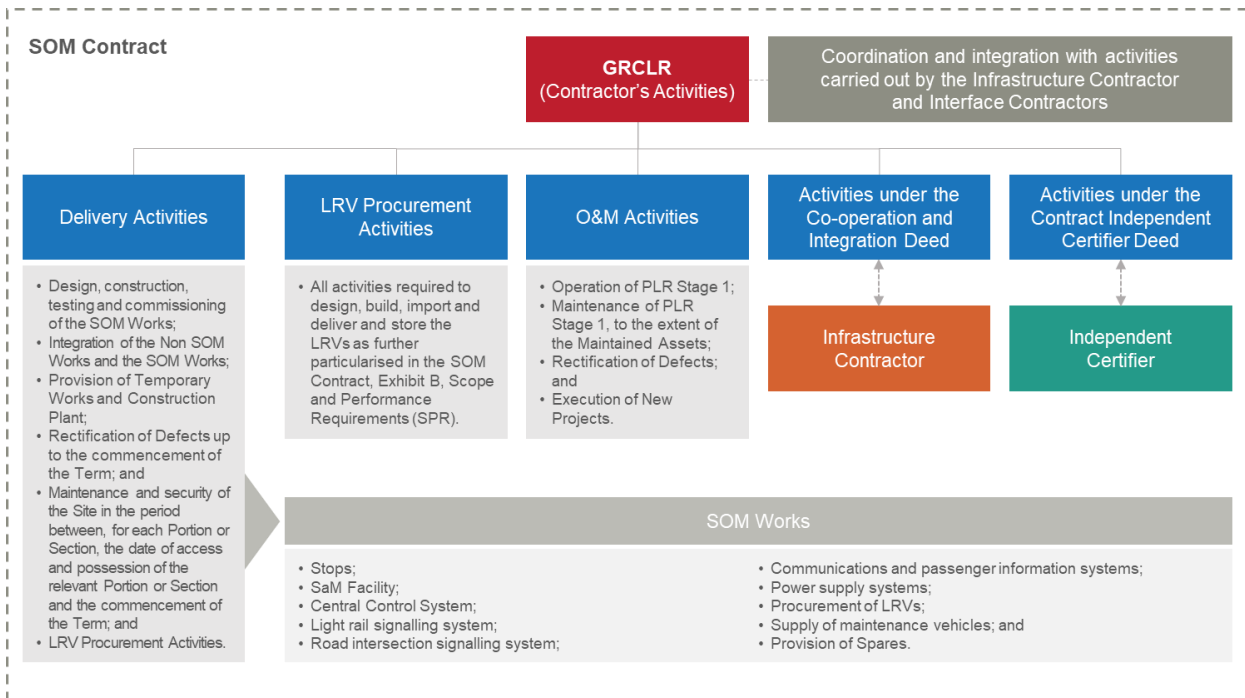


Figure 3: SOM Contractor’s Activities for PLR Stage 1

1.1 Co-operation and Integration Deed

The Co-operation and Integration Deed sets out how GRCLR and the Infrastructure Contractor will cooperate with each other and TfNSW in relation to the delivery of PLR Stage 1. For the purposes of the Co-operation and Integration Deed, Primary Deeds means the Infrastructure Contract and the SOM Contract.

1.1.1 Co-operation and Integration

GRCLR acknowledges that the Infrastructure Contractor’s Activities interface with the SOM Contractor's Activities. A high level of cooperation, coordination and collaboration must be

achieved to ensure the Infrastructure Works and SOM Works are fully integrated with each other, and to ensure that they each comply with their respective obligations to TfNSW under the Infrastructure Contract and the SOM Contract (as applicable).

We acknowledge that we will be executing work on parts of the Site adjacent to the Interface Contractors, and that failure to cooperate with each other and to properly integrate work may adversely impact on or delay PLR Stage 1.

1.1.2 Design

The Primary Deeds and Management Requirements (as defined in the Infrastructure Deed) specify a process for the development of the Design Documentation that involves GRCLR reviewing and commenting on the Design Documentation prepared by the Infrastructure Contractor, together with participation in design interface meetings.

Under the SOM Contract, at the relevant Design Stage, GRCLR is entitled to specify the SOM Design Criteria in response to Design Documentation (as that term is defined in the Infrastructure Contract) prepared by the Infrastructure Contractor. If GRCLR provides that information to the Infrastructure Contractor within the time specified in Clause 5.9(j) and (k) of the SOM Contract, the Infrastructure Contractor is obliged to comply with the SOM Design Criteria and incorporate into the Infrastructure Works.

This process is detailed in the Systems Engineering, Assurance and Design Management Plan.

1.1.3 Reciprocal Obligations

GRCLR must comply with our reciprocal obligations under Clause 2.13 of each Primary Deed. This includes:

- Working directly with the other Contractor in preparing any asset management information required under their respective contracts;
- Closely cooperating with the other Contractor in relation to community and stakeholder liaison issues; and
- Using best endeavours to resolve any problems, and working closely and iteratively, with the other Contractor and the Principal to achieve a solution to any interface issues.

1.1.4 Meetings

As detailed in the Interface Management Plan, GRCLR will attend and participate in the Project Interface Meetings and the Design, Systems Integration and Assurance Interface Meetings in a frank and cooperative manner.

1.2 Contract Independent Certifier Deed

Schedule 1 of the Contract Independent Certifier Deed sets out the Services that the Independent Certifier (IC) are responsible for providing as part of the Project.

1.2.1 Co-operation and Assistance

Under Section 8 of the Contract Independent Certifier Deed, GRCLR has a responsibility to cooperate with and reasonably assist the IC, and act honestly and fairly to enable the IC to perform the Services.

Subject to any Law or duty of confidentiality, and without limiting any other clause in the Contract Independent Certifier Deed, GRCLR must:

- Provide the IC with any information reasonably necessary to enable them to perform the Services; and
- Provide the IC with any such information within the time required by Contract Independent Certifier Deed or any relevant Contracts.

1.2.2 Information Provided to the IC

GRCLR has a responsibility to ensure that all information provided to the IC is accurate and true.

Where GRCLR is required to comment on Design Documentation, we agree to provide all comments in a format reasonably required by the IC, which as a minimum must contain:

- A unique reference number;
- A description of the Design Documentation; and
- The reasons for the non-compliance.

The author of any such comments (or appropriate personnel) must be made available to meet with the IC to clarify any comments.

1.2.3 Access

GRCLR must:

- Give access to the IC to such places that we control and which may be reasonably necessary to enable the IC to perform the Services; and
- Within a reasonable time of request by the IC, allow the IC access to any records held or systems maintained by us or our subcontractors or sub-consultants in relation to the works to which the Services relate, and which are reasonably necessary to enable the IC to perform the Services.

The IC must (within a reasonable time of any request) give GRCLR access to and copies of any records, reports, advice or other documents received, prepared, or generated by or for the IC in the course of performing the Services. The IC must also comply with the reasonable requirements of GRCLR when accessing any place under our control, including in relation to safety.

1.2.4 Copies of Notices and Documents

Under the Contract Independent Certifier Deed, all notices and documents provided by the IC to one Principal Party must be copied to the Other Party, and notices and documents provided by a Principal Party to the Independent Certifier must be provided by the Independent Certifier to the Other Party. For the purposes of the Contract Independent Certifier Deed, the Principal Party means TfNSW and GRCLR.

2 Scope

2.1 Purpose

This Delivery Phase Sustainability Management Plan (DSMP) describes how GRCLR will comply with the sustainability management requirements of the SOM Contract and the sustainability related Conditions of Approval, Revised Mitigation Measures and Environmental Performance Outcomes during the Delivery Phase of PLR Stage 1, including design and construction.

These sustainability requirements are listed in the Sustainability Requirements Matrix (Appendix B), and detailed in the following Deed documents:

- Exhibit A (*Management Requirements*), Management Requirements, Section 11 (*Sustainability Management*), dated 12 December 2018;
- Exhibit A (*Management Requirements*), Annexure 2 (*Project Plan Requirements*), Section 3.2.3 (*Delivery Phase Sustainability Management Plan*), dated 12 December 2018;
- Exhibit A (*Management Requirements*), Annexure 13 (*Reporting Requirements*), Section 3.2.3 (*Delivery Phase Sustainability Management Plan*), dated 12 December 2018;
- Exhibit B (*SPR*), Scope and Performance Requirements, Section 7.12 (*Sustainability Requirements*), dated 12 December 2018;
- Exhibit B (*SPR*), Appendix D (*Sustainability Requirements*), dated 12 December 2018; and
- Exhibit B (*SPR*) Appendix L (*LRV Performance and Data Characteristics*), dated 12 December 2018;

In addition, GRCLR is aware of the sustainability-related requirements of the Infrastructure Contract, and will comply/support, as required, including:

- Exhibit B (*SPR*) Appendix N (*Infrastructure SPR*), dated 12 December 2018; and
- Exhibit B (*SPR*) Appendix O (*Infrastructure SPR – Sustainability Requirements*), dated 12 December 2018.

2.2 Objectives

The objective of this DSMP is to provide the platform and outline the processes to:

- Drive sustainability through the design and construction elements of the SOM Deed;
- Ensure GRCLR meets and exceeds, where practicable, the requirements of the SOM Deed;
- Set the sustainability targets that will achieve sustainability outcomes and assist with Infrastructure Sustainability (IS) rating credit delivery;
- Develop the management processes for the implementation of sustainability targets;
- Integrate sustainability throughout design and construction of the SOM Deed;
- Identify and manage sustainability risk and opportunities;
- Capture the information and outcomes required to deliver the 'Design' and 'As Built' rating score certified by the Infrastructure Sustainability Council Australia (ISCA); and
- Assess, review and communicate sustainability performance and outcomes of initiatives.

2.3 Quality Assurance and Integration of Sustainability Management

This DSMP forms part of GRCLR's Integrated Management System (IMS). It is a quality assurance document prepared in accordance with AS/NZS ISO 9001:2016. The IMS integrates all SOM systems and processes, including sustainability management, required for the execution and delivery of the SOM Contractor's Activities. Further details are included in the Quality Management Plan.

GRCLR's quality and planning process is based on the application of the Plan-Do-Measure-Improve (PDMI) cycle for all aspects of the SOM Contractor's Activities, as shown in Figure 4. The quality and planning process ensures that this DSMP, and sustainability information developed through the IS Rating process, are used as a basis for decision-making and accountability at all relevant levels. It

integrates the process for managing sustainability into the overall governance, strategy and planning, management, reporting processes and culture.

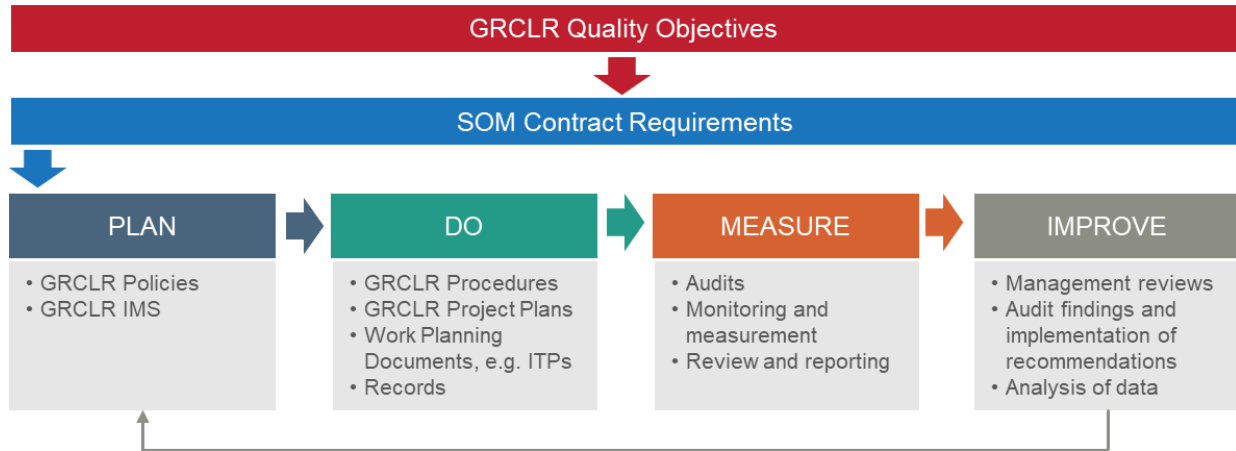


Figure 4: GRCLR Quality Management Approach – PDMI Cycle

2.4 Ongoing Development

The DSMP will be developed, amended and updated in line with the requirements set out in the SOM Contract, Exhibit A, Annexure 2, Section 2(d). The DSMP will be updated annually until the Date of Readiness for First Passenger Service and where reasonably requested or required by the Principal’s Representative or any Authority in accordance with Section 2(a). Refer to the Contract Management Plan for further details relating to this process.

A suite of sustainability-related documents (including Sustainability Requirements Matrix, Sustainability Dashboard, Sustainability Opportunities Register and Climate Risk Assessment) are ‘live’ documents, and will be utilised and updated on a regular basis.

A separate Operations Phase Sustainability Management Plan will be developed prior to the commencement of operations, in accordance with the Deed.

3 Policy Statements

Table 1 identifies the policy statements that relate to the DSMP.

Table 1: Related Policy Statements

Policy statements relating to this Plan	
1	GRCLR Environment and Sustainability Policy
2	GRCLR Risk Policy
3	GRCLR Quality Policy
4	TfNSW Parramatta Light Rail Environment and Sustainability Policy

The GRCLR Environment and Sustainability Policy and TfNSW Parramatta Light Rail Environment and Sustainability Policy are included in Appendix A.

4 Interaction with Other Plans

This DSMP interfaces directly with a number of Project Plans. Table 2 illustrates these interfaces by identifying the Project Plans from which the DSMP receives inputs, and the Project Plans where the outputs from the DSMP contribute to the development and implementation of the plan. This process, and a matrix detailing how the full suite of Project Plans interface, are included in the Contract Management Plan.

Table 2: Cross Reference Table

Sustainability Management Plan	Input from	Output to
General Plans		
Contract Management Plan	●	
Quality Management Plan	●	
Systems Engineering, Assurance and Design Management Plan	●	●
Digital Engineering Execution Plan		
Communication and Engagement Plan	●	●
Safety Management Plan		
Incident Management Plan		
Transport Integration Plan		
Workplace Relations Management Plan		
ICT & Software Systems Management Plan		
Delivery Phase Plans		
Construction Management Plan	●	●
Construction Environmental Management Plan	●	●
Interface Management Plan	●	
Construction Traffic and Transport Management Plan		
Utility Service Management Plan		
Property Management Plan		
Operational Integration Plan		
Operational Readiness Plan		
Testing and Commissioning Plan		●
Delivery Phase Workforce Development Plan	●	●
Operations Phase Plans		
Operations Management Plan		●
Business Continuity Plan		
Operations Environmental Management Plan		●
Operations Phase Sustainability Management Plan		●
Revenue Protection Plan		
Asset Management Plan		●
Annual Works Plan (Maintenance Plan)		●
Transition-Out Management Plan		
Operations Phase Workforce Development Plan		●

5 Reference List

Table 3 lists key legislation, authority approvals, standards, codes, programs, agreements and proposed agreements, drawings and reports that are applicable to the DSMP.

Table 3: Reference List

Reference documents
AS ISO 31000:2018 – Risk Management – Principles and guidelines
ISCA - Infrastructure Sustainability Rating Tool v1.2 - Technical Manual - Design & As Built (and supporting resources)
ISO 20400:2017 - Sustainable procurement - Guidelines
ISO 14025:2006 - Environmental labels and declarations - Type III environmental declarations
Office of Environment and Sustainability - NSW Government Resource Efficiency Policy (2019)
TfNSW - Carbon Estimate and Reporting Tool (CERT) Manual - 7TP-SD-100/2.0
TfNSW - Climate Risk Assessment Guidelines - 9TP-SD-081/3.0
TfNSW - Enterprise Risk Management (TERM) Standard (30-ST-164)
TfNSW - Sustainable Design Guidelines Version 4.0 (and supporting resources)

6 Project Sustainability Requirements

6.1 PLR SOM Contract Requirements – Management / Project Plan Requirements

Table 4 identifies where the DSMP addresses the Project Plan requirements in the SOM Contract, Exhibit A (*Management Requirements*), Annexure 2 (*Project Plan Requirements*). The full list of sustainability-related requirements from the SOM Deed and the Conditions of Approval, Revised Mitigation Measures and Environmental Performance Outcomes is included in the Sustainability Requirements Matrix (Appendix B).

Table 4: Compliance Table (*Project Plan Requirements*)

Project Plan Requirements	Cross reference to where this Plan meets those requirements	Cross reference to associated reference documents
(a) The Contractor must develop, maintain and implement a Delivery Phase Sustainability Management Plan which identifies how Contractor will comply with the sustainability requirements of the Deed.	This Plan	
(b) The Delivery Phase Sustainability Management Plan must, as a minimum, address and detail:	-	

Project Plan Requirements	Cross reference to where this Plan meets those requirements	Cross reference to associated reference documents
(i) the sustainability management team structure, including key personnel authority and roles of key personnel, lines of responsibility and communication, minimum skill levels of each role and interfaces with the overall project organisation structure;	Sections 7.1 and 7.2	
(ii) how the Contractor will interface and integrate with the Infrastructure Contractor and Interface Contractors for sustainability in alignment with the Interface Management Plan;	Section 7.4	Interface Management Plan
(iii) a sustainability policy statement and strategies for adaptation to climate change, resource management (including energy, water and waste), social sustainability and sustainable procurement;	Section 3 and Appendix A	
(iv) how the Contractor will achieve the IS Rating Scheme requirements described in the Management Requirements;	Section 9 and this Plan	
(v) the sustainability awareness programs that the Contractor will develop and maintain continual improvement for sustainable behaviour across the Contractor's workforce (including subcontractors);	Sections 7.3 and 12.4	
(vi) demonstrate how the Contractor will provide training to High Impact Suppliers as described in the ISCA rating tool;	Section 12.4	
(vii) the process for identifying and procuring suitable products with low life cycle environmental and social impacts under in the section of the plan that describes sustainable procurement management;	Sections 12 and 13	
(viii) describe the process for identifying and procuring suitable products with low life cycle environmental and social impacts in the Delivery Phase Sustainability Management Plan;	Sections 12 and 13	

Project Plan Requirements	Cross reference to where this Plan meets those requirements	Cross reference to associated reference documents
(ix) sustainability initiatives to be implemented during the performance of Contractor's Activities to meet the requirements and sustainability targets in the SPR;	This Plan Appendices B – D	
(x) how sustainability requirements and opportunities will be identified and addressed during construction activities;	Section 11	
(xi) the processes and activities for tracking the identification and implementation of sustainability initiatives;	Section 8 Appendices B – D	
(xii) the processes and methodologies for embedding sustainability initiatives into the Contractor's Activities;	Sections 7.3 and 8	
(xiii) the processes and methodologies for assurance, monitoring, auditing, corrective action, continuous improvement and reporting on sustainability performance;	Section 17	Quality Management Plan Audit Schedule
(xiv) the processes and procedures for undertaking climate change risk assessments, including nominating gateways requiring a climate change risk review, and the identification and implementation of climate change adaptation measures;	Section 13 Appendix E	
(xv) an outline of the systems that will be used to support sustainability management and their alignment with ISO14001:2015;	Section 8	
(xvi) an environmental performance declaration for LRVs in accordance with ISO14025:2006; and	Section 13	
(xvii) interfaces with other Project Plans.	Table 2 and this table	Contract Management Plan
(c) The Delivery Phase Sustainability Management Plan must also include the following separate sections covering:	-	
(i) climate change risk assessment and adaptation;	Section 13 Appendix D	
(ii) energy and carbon management; and	Section 16	

Project Plan Requirements	Cross reference to where this Plan meets those requirements	Cross reference to associated reference documents
(iii) infrastructure sustainability rating management.	Section 9	
(d) The climate change risk assessment and adaptation section of the Delivery Phase Sustainability Management Plan must address and detail:	-	
(i) project specific climate change related risks;	Section 13 Appendix E	
(ii) adaptation actions to be implemented to mitigate extreme and high level change risks and manage medium level climate change risks on the project;	Section 13 Appendix E	
(iii) the methodology used (including modelling and risk assessment), in accordance with the guidance and requirements <i>TfNSW Climate Risk Assessment Guidelines 2016</i> and the <i>Infrastructure Sustainability Council of Australia IS Rating Tool Technical Manual v 1.2 - climate change category</i> ;	Section 13 Appendix E	
(iv) the review and update process of the Climate Change Risk Assessment and Adaptation Plan; and	Section 13 Appendix E	
(v) the integration with the Contractor's RMIS	Section 13 Appendix E	Risk Management Plan
(e) The energy and carbon management section of the Delivery Phase Sustainability Management Plan must address and detail:	-	
(i) an "Energy and Carbon Inventory" covering at least Scope 1 Emissions, Scope Emissions 2 and land clearing across the infrastructure lifecycle in accordance with the requirements of TfNSW's Carbon Estimate and Reporting Tool (CERT). It must include both permanent SOM Works and Temporary Works;	Section 16	

Project Plan Requirements	Cross reference to where this Plan meets those requirements	Cross reference to associated reference documents
(ii) a carbon emission estimate determined using a carbon footprint assessment undertaken in accordance with ISO14064. The footprint must incorporate direct and indirect emissions associated with electricity and fuel consumption, on-site process emissions and embodied emissions for all concrete and steel used in delivery and operational activities. The carbon foot printing model to be used must be described;	Section 16	
(iii) a description of the overall approach to the identification of opportunities to reduce carbon emissions, energy use and embodied lifecycle impacts of the Contractor's Activities;	Section 16	
(iv) low carbon strategies and initiatives that will be implemented to minimise the carbon emissions associated with the Delivery Activities; and	Section 16	
(v) energy efficiency strategies and initiatives that will be implemented to minimise overall energy consumption.	Section 16	
(f) the infrastructure sustainability rating management section of the Delivery Phase Sustainability Management Plan must be developed in consultation with and to the standard required by the Infrastructure Sustainability Council of Australia.	Section 9	Communication and Engagement Plan

6.2 Sustainability Objectives and Targets

Table 5 identifies Sustainability Objectives and Targets defined in the SOM Contract, Exhibit B – Sustainability.

Table 5: Sustainability Objectives and Targets

Relevant Target	Objective	Minimum Target (SOM Deed)	Aspirational Target
Sustainability Rating	IS Design, As-built and Operations Rating	70/110	80+/110
Climate Change	Identify all necessary adaption measures that comprehensively address climate change risks during asset life in accordance with ISO31000.	Implement Measures to mitigate all climate change risks classified as “Extreme” and “High” and a minimum of 25% of risks classified as medium “Medium”	-
Emissions Reduction	Reductions in greenhouse gas emissions compared to a base case footprint, including scope 1, scope 2 and land clearing emissions	15% Reduction in Greenhouse Gas emissions during construction, AND Offset a minimum of 25% of total electricity use during construction	>15%
Water Reduction	Reduction in total water use compared to a base case footprint	15% Water Reduction	>15%
Water Substitution	Water use from non-potable sources, from reclaimed or recycled waste water or harvested water	50% replacement of potable water	>50%
Environmental Labelling	Material or products have an ISCA approved environmental label	3-9% Environmentally Labelled Products	9%
Material Lifecycle Impact Measurement and Reduction	Monitoring and modelling of materials lifecycle impacts is undertaken using the Materials Calculator and a reduction is demonstrated compared to a base case footprint across the infrastructure lifecycle.	15% Reduction in life cycle impacts	>15%

Relevant Target	Objective	Minimum Target (SOM Deed)	Aspirational Target
Quantity of Waste to be Recycled	Percentage of spoil waste diverted from landfill for recycling or reuse	100%	-
	Percentage of inert or non-hazardous waste diverted from landfill for recycling or reuse	90%	>90%
	Percentage of paper and cardboard / co-mingled office waste diverted from landfill for recycling or reuse	60%	>60%
Procurement	IS v1.2 Credit Pro-1	Level 2	Level 3
	IS v1.2 Credit Pro-2	Level 3	Level 3
	IS v1.2 Credit Pro-3	Level 3	Level 3
	IS v1.2 Credit Pro-4	Level 2	Level 3

7 Organisation Structure, Responsibilities, Culture and Collaboration

7.1 Organisation Structure

GRCLR’s Organisation Structure for the Delivery Phase is shown in Figure 5. The Senior Management Team (SMT) are shown in the blue boxes (including the Project Director). The Environment & Sustainability Manager is indicated by the green dashed box.

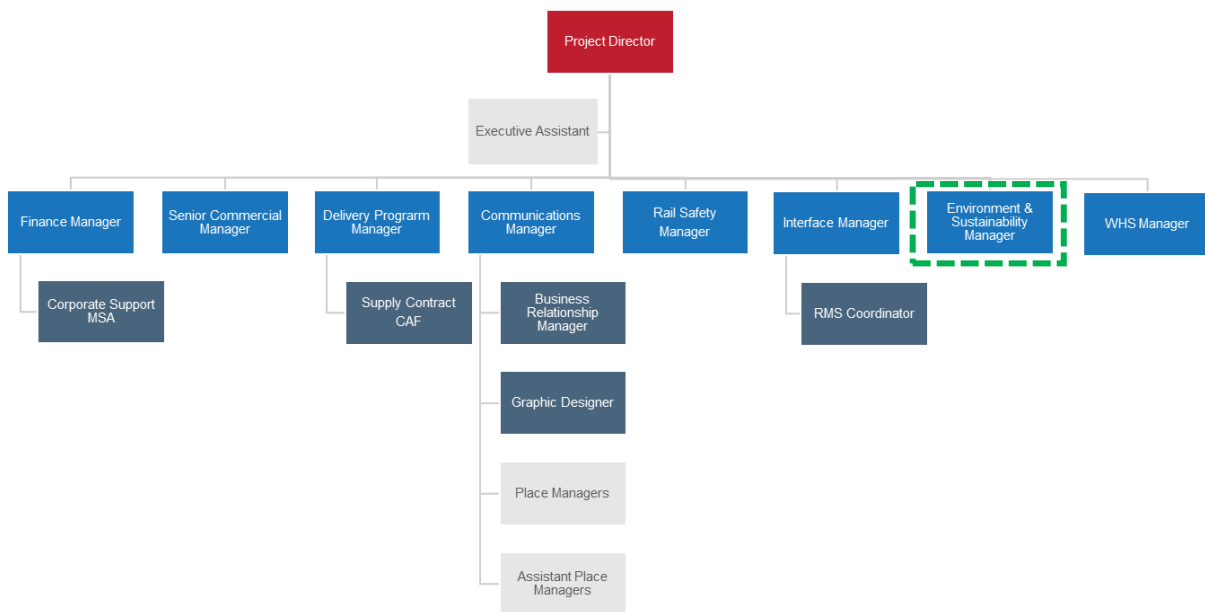


Figure 5: GRCLR Delivery Phase Organisation Structure

7.2 Roles and Responsibilities

The entire GRCLR Project Team has responsibilities in relation to sustainability. In summary:

- GRCLR’s Project Director is accountable for the sustainability outcomes across the SOM Contract. The Project Director also provides the leadership and sets the sustainability culture and expectations for the Contract.
- GRCLR’s SMT is responsible to ensure that sustainability expectations are set across their teams and functions, and that adequate resources are allocated to ensure requirements can be met.
- GRCLR’s Environment and Sustainability Manager is responsible for managing the development and implementation of the strategies, plans, initiatives and tasks to realise the sustainability requirements across the Contract. The Environment and Sustainability Manager sits on the SMT and influences key strategic decisions.
- The entire GRCLR Project Team (including sub-contractors) is empowered to identify sustainability opportunities and risks across the SOM Contract.

Key sustainability management related responsibilities and skills for key roles are presented in Table 5. Further details are included in the Contract Management Plan.

Table 5: GRCLR Roles and Key Responsibilities Related to Sustainability Management

Role	Key Responsibilities	Qualifications or equivalent experience
Project Director/ General Manager	<ul style="list-style-type: none"> ■ Ensure adequate resources, both human and systems are in place to achieve sustainability requirements; ■ Provide sustainability leadership and ensures that sustainability is driven across the business; ■ Authorise expenditure of Project resources for sustainability initiatives; and ■ Maintain oversight of the DSMP and propose amendments as required. 	<ul style="list-style-type: none"> ■ +15 years' experience in commercial management on projects similar to PLR Stage 1; ■ Hold a recognised qualification relevant to the position and the Contractor's Activities; and ■ Hold professional accreditations in commercial and/or business management.
Sustainability Manager	<ul style="list-style-type: none"> ■ Be responsible for and have the authority to develop and implement the sustainability requirements in accordance with the requirements of the Deed and the DSMP; ■ Provide strategic direction; ■ Interface with TfNSW, ISCA, Infrastructure Contractor, GRCLR SMT; ■ Provide oversight / guidance of ISCA process; ■ Provide oversight and review of reporting; 	<ul style="list-style-type: none"> ■ Possess a recognised qualification relevant to sustainability management and have recent relevant experience in sustainability management on projects similar to the SOM Works; ■ Have at least 5 years' sustainability management experience in similar roles such as management of sustainability in design, construction and operation of infrastructure; and ■ Be an IS Accredited Professional.
Sustainability Officer/s	<ul style="list-style-type: none"> ■ Support the embedding of sustainability requirements through design & construction; ■ Support collection of evidence for each ISCA credit; ■ Facilitate inputs to and maintenance of relevant live documents (e.g. Sustainability Opportunities Register, Sustainability Requirements Register, ISCA Tracker and Sustainability Dashboard); and 	<ul style="list-style-type: none"> ■ Relevant experience and qualifications; and ■ Have IS experience and be an IS Accredited Professional (preferred). <p>NOTE: this role will be fulfilled by multiple people across the GRCLR team, including CAF's Environment & Sustainability / Health & Safety Lead,</p>

Role	Key Responsibilities	Qualifications or equivalent experience
	<ul style="list-style-type: none"> Provide inputs to monthly and annual reporting. 	Laing O'Rourke's Sustainability Advisor and WSP's Sustainability Advisor
SMT (within their areas of responsibility)	<ul style="list-style-type: none"> Endorse and advocate the sustainability management process throughout the organisation in relation to all SOM Contractor's Activities; and Ensure appropriate processes and systems are in place to realise sustainability requirements. 	<ul style="list-style-type: none"> +15 years' experience in relevant discipline on projects similar to PLR Stage 1; and Hold a recognised qualification relevant to the position and the Contractor's Activities.
Discipline Leads	<ul style="list-style-type: none"> Ensure sustainability requirements related to their discipline are understood and realised; and Review sustainability opportunities, and provide guidance on whether to accept or dismiss or seek additional information. 	<ul style="list-style-type: none"> Relevant experience and qualifications.
Other Project personnel, including subcontractors	<ul style="list-style-type: none"> Realise sustainability requirements related to their scope and responsibilities; and Identify sustainability opportunities. 	<ul style="list-style-type: none"> Relevant experience and qualifications.

7.3 Creating a Positive Sustainability Culture

GRCLR will instil a positive sustainability culture by embedding sustainability management at all levels of the organisation. Key mechanisms that will assist with this process include:

- Sustainability training and awareness to GRCLR staff, contractors and suppliers, commencing with inductions;
- GRCLR Sustainability Working Group (meeting fortnightly during early design);
- Sustainability updates at relevant project meetings;
- Tools and processes to embed sustainability through design and construction, as outlined in Sections 0 and 11; and
- Reporting on sustainability outcomes, risks and opportunities in line with the monthly and annual reporting requirements, as outlined in Section 17.

7.4 External Collaboration

In addition to the internal collaboration described above, GRCLR will collaborate with key external stakeholders, including TfNSW, ISCA, Infrastructure Contractor and other Interface Contractors in alignment with the Deed, the IS Rating Agreement, the Contract Management Plan, the Communication and Engagement Plan and the Interface Management Plan.

The ISCA Tracker (Appendix C), in conjunction with the ISCA Technical Manual v1.2, provides a means of identifying and tracking the sustainability-related stakeholder participation and engagement activities, and the means to achieve the target scores for Sta-1 to Sta-4.

During early design, meetings will be held on a fortnightly basis with TfNSW, and on an ad hoc basis with the Infrastructure Contractor and other Interface Contractors.

8 Sustainability Requirements

8.1 Overview

The sustainability requirements in the SOM Deed incorporate:

- Principles of the TfNSW PLR Stage 1 Sustainability Strategy;
- ISCA Design & As-Built v1.2 guidance and requirements; and
- A suite of TfNSW tools, guidelines and requirements, including Sustainable Design Guidelines v4.0 (SDG), Carbon and Energy Reporting Tool (CERT), Climate Risk Assessment (CRA) Guidelines and TfNSW Enterprise Risk Management (TERM) Standard, among others.

There are overlaps and linkages between these elements, as shown in Figure 6. For example, a number of TfNSW tools and guidelines align with and support the requirements of various ISCA credits.

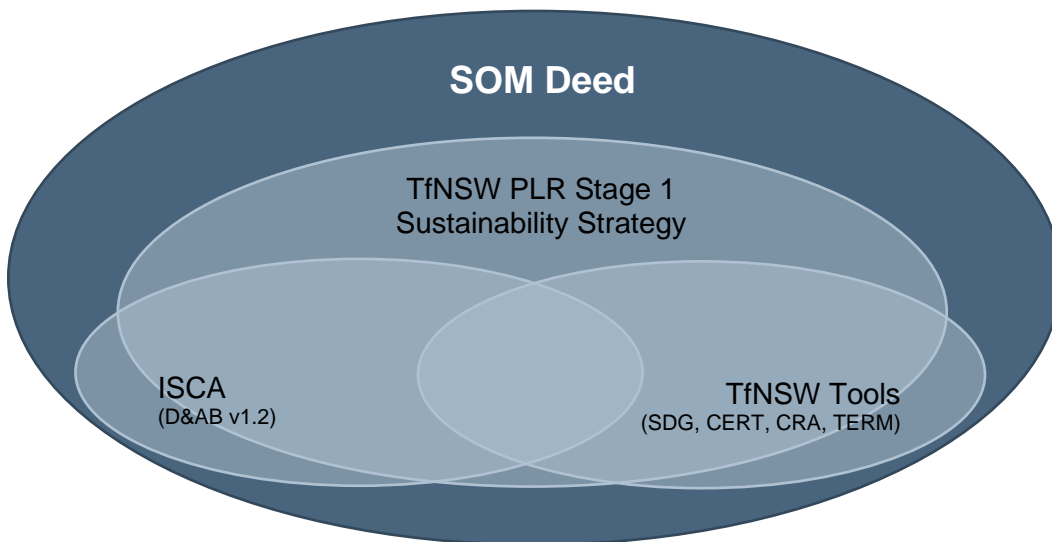


Figure 6: Linkages between sustainability requirements in SOM Deed and supporting documents and resources

8.2 Governance and Technical Requirements

Broadly speaking, there are three main types of sustainability requirement:

- Governance / contract-wide requirements;
- Technical – prescriptive requirements; and
- Technical – non-prescriptive requirements.

Table 6 shows a description, examples and associated actions for each type of sustainability requirement.

Table 6: Types of Sustainability Requirements

Type	Description	Examples	Actions
Governance (contract-wide)	Deed and ISCA requirements which apply across the entire contract and/or are addressed by governance systems and structures	<p>“Ensure that sustainability is embedded into the Design and delivery of the Contract” [Exhibit A, MR, 11(e)(ii)]</p> <p>“Use the ISCA IS Rating Scheme version 1.2 to achieve the minimum ratings specified for design, as-built and O&M Activities.” [Exhibit B (SPR), App D 1.1(d)]</p>	<ul style="list-style-type: none"> Establish the governance systems and structures required to meet requirements; and Track progress and compliance through the Sustainability Requirements Matrix (refer to Appendix B).
Technical – prescriptive	Deed and ISCA requirements are clearly defined parameters, and/or can be fulfilled by a single design or construction activity	<p>“Use asphalt and reclaimed asphalt pavement with a minimum recycled substitutions rate of 25% for asphalt and 100% for subbase” [Exhibit B (SPR), App D 1.3(a)(ix)]</p> <p>“Ensure all surface coatings comply with the Australian Paint Approval Scheme (APAS) Volatile Organise Compounds Limits” [Exhibit B (SPR), App D 1.4(a)(ii)]</p> <p>“Irrigate the SaM Facility landscape using 100% recycled or rain water” [Exhibit B (SPR), App D 1.6(a)(xi)]</p>	<ul style="list-style-type: none"> Assign each requirement to specific design and construction packages; Include requirements in basis of design, and through construction planning and execution; and Track progress and compliance through the Sustainability Requirements Matrix (refer to Appendix B).
Technical – non-prescriptive	Deed and ISCA requirements are not prescriptive, and/or cannot be fulfilled by a single design or construction activity	<p>“.. greenhouse gas emissions reduction of 15% below a base case footprint” [Exhibit B (SPR), App D 1.6(a)(v)]</p> <p>“Maximise the use of regenerative braking energy to the extent practicable” [Exhibit B (SPR), App D 1.6(a)(xvi)]</p> <p>“.. reduction in water use of 15% compared to a base case footprint” [Exhibit B (SPR), App D 1.7(a)(i)]</p>	<ul style="list-style-type: none"> Assign each requirement to specific design and construction packages; Include requirements in basis of design, and through construction planning and execution, however, additional support required (e.g. Sustainability in Design training; innovation workshops; opportunity register); Identify and assess opportunities to meet requirements; and Track progress and compliance through the Sustainability Requirements Matrix (refer to Appendix B).

8.3 Process

The process to ensure sustainability requirements are met across the delivery phase of the SOM Contract is demonstrated in Figure 7. These activities are captured and tracked in the Sustainability Requirements Matrix, a dynamic document which will be regularly reviewed and updated. An example of the Matrix is included in Appendix B.



Figure 7: Process to ensure sustainability requirements are met

8.4 Decision Making

Throughout the design and construction process critical decisions will be made and design changes implemented that will impact the sustainability outcome of the project. Implementing a well-developed decision-making framework is essential in ensuring designers consider the environmental, social and economic impacts of a change prior to implementation.

GRCLR has employed multi-criteria analysis to assess key decisions and design methodology changes. The multi criteria analysis is based on the following four categories:

- economic – covering capital, operational, program and indirect costs
- environmental – covering energy, water, materials, emissions, indoor environment and waste
- social – covering community outcomes, perception, social benefits and priority job seekers
- technical – covering design, performance, constructability, reliability and operation.

During the detailed design phase, key actions will be further identified, assessed and implemented:

- sustainability as an agenda item in all coordination meetings
- including sustainability targets and obligations in all relevant management plans to raise awareness
- inclusion of the sustainability team in design review process
- inclusion of sustainability in all relevant design packages
- ready access for the design team to the project specific multi-criteria analysis tool

A decision making framework outlining the GRCLR decision making process has been developed and included as Appendix H.

9 Infrastructure Sustainability (IS) Rating Management

9.1 Overview

The IS Rating Scheme is developed and administered by ISCA 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;
- Provide 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; and
- Build an organisation’s credentials and reputation in its approach to sustainability in infrastructure.

The IS Scheme is comprised of the IS Rating Tool, rating process, and ISCA education and training programs (including the IS Accredited Professional program).

9.2 Scope of IS Scheme

The themes and categories covered under the IS scheme are shown in Table 7.

Table 7: ISCA v1.2 Overview (ISCA, 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.

Theme	Category	Description
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.
	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	Considers local ecosystems (soil, water, air, biomass and wildlife).
People and place	Community Health, Well-being and Safety	This relates to the concept of livability, and that community well-being 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	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.

Source : https://www.isca.org.au/isv_12_overview

9.3 IS Rating Process

The key stages of the IS Rating process are shown in Figure 8.

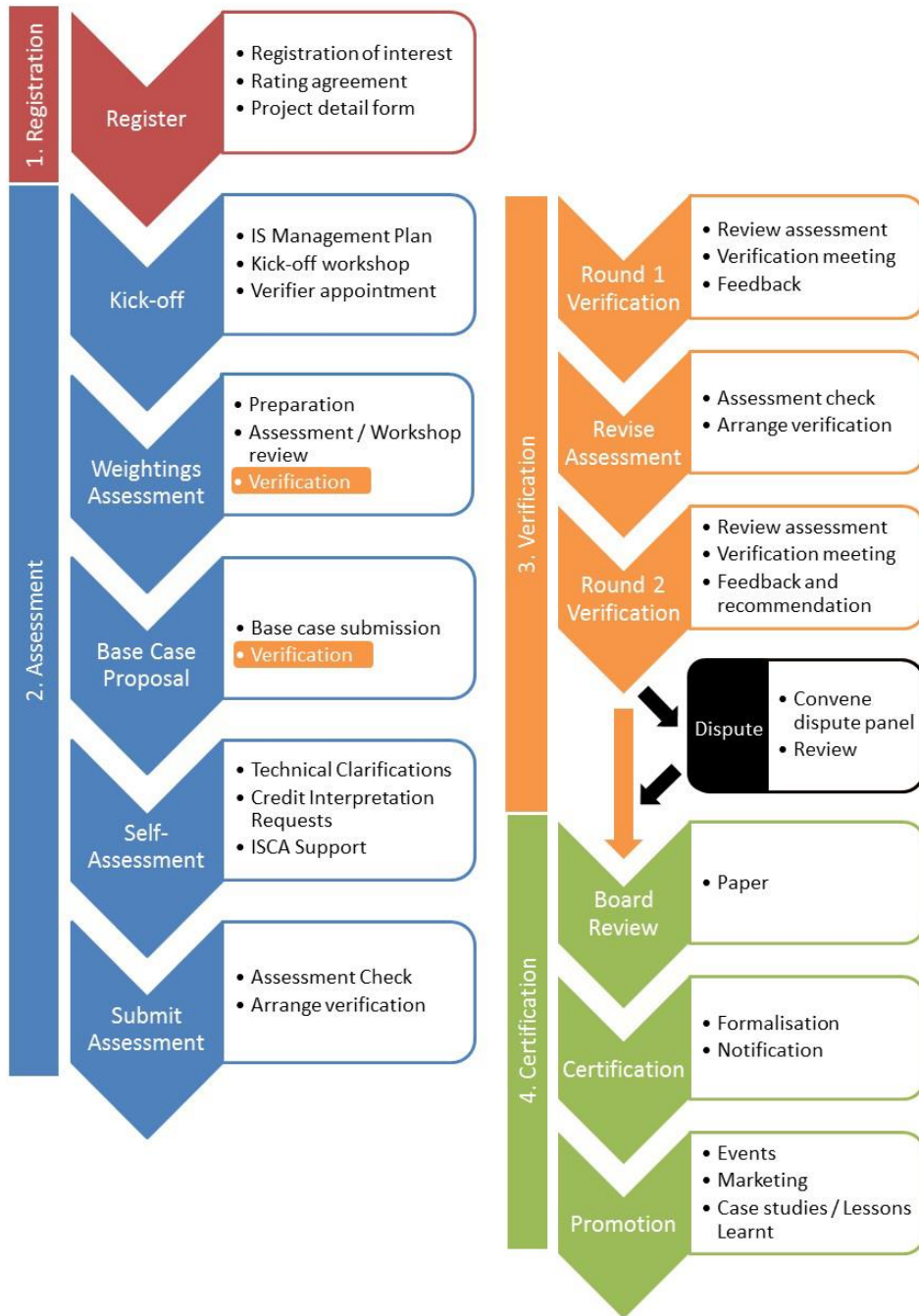


Figure 8: IS Rating Process (ISCA, 2018)

9.4 ISCA Resources

Table 8 outlines the ISCA resources that will be utilised through the execution of the Deed.

Table 8: ISCA resources

Resource	Description	Application
IS Technical Manual Version 1.2	Describes the aims, benchmark criteria, evidence criteria and additional guidance for each credit	Specifications for obtaining an IS rating.
IS Design Review Guide	Guidance to support the Technical Manual	Applied when completing Urb-1 in the Urban and Landscape Design category.
IS Materials Calculator	A calculator that evaluates environmental impacts associated with the use of materials	For use with Mat-1 in the Materials category.
IS Rating Tool Scorecard	Excel spreadsheet tool that facilitates self-assessment during the rating / scoring process	Calculation of IS score.
AGIC Climate Change Adaptation Guideline	Information on climate change risks and opportunities, and guidance to industry on developing adaptation measures	Supports the assessment of credits in the Climate Change Adaptation category.
Ecological Value Calculator	Part of the Green Star – Design and As Built rating tool (not developed by ISCA), this calculates total change in ecological value after construction compared to before	For use with Eco-1 in the Ecology category.

This DSMP has been developed in alignment with the Deed requirements and the IS Management Plan template developed by ISCA (Appendix F). Informal consultation with ISCA has informed the development of the DSMP.

9.5 Approach to meet ISCA score >70

GRCLR is required to achieve at least a certified 'Excellent' Design and As-Built rating with a minimum score of 70 under ISCA v1.2. GRCLR is also required to target an ISCA IS 'Leading' rating (i.e. IS score greater than 75).

The pathway to the minimum and target scores has been mapped, using the ISCA Tracker (Appendix C). A target level for each credit has been determined, based on the Deed requirements, project objectives and previous experience. Each level within each credit is assessed to determine the 'degree of confidence' (high-medium-low) of meeting the requirements of that level. This provides an overall understanding of the confidence of attaining the required scores, or rather, highlights the risk areas which require further attention. The ISCA Tracker is a 'live' document which will be updated regularly and reviewed at least monthly. The confidence level should be conservatively assessed (i.e. erring on the side of underestimating the confidence level rather than being over-confident). This then serves as a motivator for the broader project team to improve performance and realise the minimum / target score.

10 Sustainability in Design

10.1 Design Process Overview

The design will be undertaken in defined stages which allows the design to be progressively developed, refined, reviewed and endorsed by the project team, the Configuration Control Board and the Principal. In this way, GRCLR can ensure the proposed solutions fulfil all project requirements, including functionality, construction cost, coordination, interfaces, integration, construction methodology, commissioning and operability, as well as environmental and sustainability requirements.

The design will be finalised with the issue of approved for construction/issued for construction documentation.

The key design stages are shown in Figure 9, and outlined below. The design process is detailed in the Systems Engineering, Assurance and Design Management Plan (SEADMP). The SEADMP (Section 4.8.2) also notes that this DSMP (including the Sustainability Requirements Matrix) forms part of the design requirements, in addition to specific reference that the design will take into account climate change risks.

Design leads will ensure that the sustainability section in each design package includes tangible detail on sustainable design decisions, opportunities, initiatives and outcomes which have been considered and implemented for the design package. This is in addition to contract-wide sustainability progress which will be captured in the sustainability design package / report at SDR, PDR and DDR. Section 4 of the SEADMP notes the requirement



Figure 9: Key Stages in Design Process

10.2 Design Planning

The objective of design planning is to map out the strategies, tools, resources, methods, deliverables, and personnel that will be used to successfully complete the design development, including requirements from a sustainability perspective.

10.3 Design Initiation

The objective of design initiation is to ensure that:

- The head contract obligations are communicated and understood by design team members;
- The plan for design production is communicated and understood by the project team;
- The information on which the design will be based is understood by the team; and
- The requirement for interdisciplinary reviews to be held for each package is understood.

From a sustainability perspective, the Design Initiation stage involved an introductory 'Sustainability in Design' presentation to the core design team to communicate the requirements

and opportunities around design and procurement. A high-level matrix of sustainability requirements was developed and circulated to senior members of the project team, allocating responsibilities to various parties in GRCLR and summarising key activities required during the design process to achieve the targeted IS ratings for each category.

10.4 System Definition Review (SDR)

The objective of the SDR is to demonstrate that the system and interface specifications are complete, unambiguous and consistent with the requirements of the Contract, that the design outputs, strategy, and choices taken in earlier design stages are valid, and that the solution provides a best for project outcome. The design works are also progressed to enable procurement and construction planning to proceed and/or continue.

The SDR represents a very early stage of the design process (~30% design). The majority of the sustainability requirements will be developed and incorporated during the subsequent PDR and DDR phases.

Key sustainability-related activities undertaken during SDR include:

- ‘Sustainability in Design’ workshops with design discipline leads;
- Formation of the SOM Contract Sustainability Working Group (consisting of GRCLR, CAF, Laing O’Rourke and WSP), to align on delivery of sustainability requirements, share information, and identify collaboration opportunities;
- Liaison with Environment & Sustainability Manager with PLR Infrastructure Contractor to identify collaboration and information sharing opportunities;
- Development of the Sustainability Requirements Matrix (Appendix B);
- Development of the Sustainability Opportunities Register (Appendix D);
- Development of the Sustainability Dashboard, to capture progress against key sustainability requirements;
- Progress on the CRA, including Climate Risk Assessment Report (refer to Section 13); and
- Preliminary specialist studies related to key design decisions, including Energy Efficiency and Renewable Energy and Water Footprint for the SaM Facility.

Further details of the sustainability activities undertaken during the SDR stage are presented in the SDR Sustainability Design Package Report (Package 15).

10.5 Preliminary Design Review (PDR)

The objective of the PDR is to demonstrate that the integrated design for PLR Stage 1 will meet systems, legal, stakeholder and authority requirements.

Key sustainability-related activities to be undertaken during PDR include:

- Ensure sustainability requirements are allocated to design packages/disciplines (refer to Section 8 and Appendix B):
 - Prescriptive requirements included in design specifications; and
 - Plan developed to ensure non-prescriptive requirements are managed and realised;
- Review and update Sustainability Requirements Matrix (Appendix B), and ensure sustainability requirements are included in and tracked through the GRCLR Requirements Verification and Traceability Matrix (RVTM);

- Undertake CRA workshop, develop CRA Report and ensure risks are mitigated through design, where practicable (refer to Section 13 and Appendix E);
- Develop base case calculations for energy/carbon, water and materials, and commence data collection (refer to Section 16);
- Produce estimates of operational electricity consumption;
- Further develop the photovoltaic study and the water study for the SaM Facility;
- Identify sustainability opportunities in the Sustainability Opportunities Register (Appendix D), and evaluate opportunities for inclusion in design;
- Collect evidence for ISCA credits; and
- Update ISCA Tracker and scorecard (Appendix C).

Details of these sustainability activities, progress and outcomes will be included in the relevant PDR design package reports.

10.6 Detailed Design Review (DDR)

The objective of the DDR is to ensure that the detailed design fully adheres to the engineering specification, and the requirements of the Contract. The Contractor must submit review design documentation of sufficient detail to ensure that the design that complies with the requirements of the SPR in Exhibit B of the SOM Deed, and can be constructed, manufactured and delivered.

Key sustainability-related activities to be undertaken during DDR include:

- Ensure sustainability requirements have been met in relevant design packages/disciplines (refer to Section 8 and Appendix B);
- Review and update Sustainability Requirements Matrix (Appendix B) and ensure sustainability requirements are tracked,
- Review and update CRA Report (including CRA workshop), and ensure risks have been mitigated through design, where practicable (refer to Section 13 and Appendix E);
- Produce estimates of operational electricity and water consumption;
- Demonstrate the required reductions in energy/carbon, water and materials against the base case;
- Identify sustainability opportunities in the Sustainability Opportunities Register (Appendix D), evaluate opportunities for inclusion in design, and confirm all design related opportunities have been closed out (accepted or dismissed);
- Collect evidence for ISCA credits; and
- Update ISCA Tracker and scorecard (Appendix C).

Details of these sustainability activities, progress and outcomes will be included in the relevant DDR design package reports.

11 Sustainability in Construction

Key sustainability-related activities to be undertaken during construction include:

- Ensure sustainability expectations and philosophy is included in site inductions;
- Ensure sustainability requirements are allocated to construction packages (refer to Section 8 and Appendix B):
 - prescriptive requirements included in work method statements and Job Safety and Environmental Analyses (JSEAs);
 - plan developed to ensure non-prescriptive requirements are managed and realised;
- Review and update Sustainability Requirements Matrix (Appendix B);
- Ensure Climate Change risks are being mitigated through construction;
- Ensure energy/carbon, water, materials and waste are monitored and tracked to quantify achievement of reduction targets;
- Ensure that all construction vehicles, plant and equipment are selected and operated for optimum energy efficiency;
- Identify sustainability opportunities in the Sustainability Opportunities Register (Appendix D), evaluate opportunities for inclusion in construction, and confirm all construction related opportunities have been closed out (accepted or dismissed);
- Collect evidence for ISCA credits; and
- Update ISCA Tracker and scorecard (Appendix C).

12 Sustainable Procurement Management

12.1 Overview

The IS Procurement and Purchasing category assesses the level of consideration afforded to economic, environmental and social elements and impacts associated with the identification, evaluation, selection and final procurement of goods and services.

The Project's commitment to sustainable procurement is demonstrated in the Sustainability Policy which is publicly available on the Project website. In developing, implementing and maintaining the procurement policy and processes associated with meeting the IS requirements, GRCLR will comply with the requirements of ISO 20400:2017. ISO 20400 defines sustainable procurement as 'procurement that has the most positive environmental, societal and economic impacts possible across the entire life cycle of and that strives to minimise adverse impacts'.

The Project will encourage a lasting positive supply chain legacy by influencing subcontractors and suppliers to consider and adopt more sustainable practices by:

- Committing to require environmental, social and economic aspects to be considered in the procurement process.
- Procuring products which possess recognised sustainability credentials, or third party certified eco-labels where available and feasible;
- Prioritising procurement from local businesses including contractors, subcontractors, voluntary sector organisations, consultants and suppliers as well as service providers and employment opportunities.

12.2 Supplier Identification, Evaluation and Contract Award

All suppliers and subcontractors tendering for work on the project will be issued a selection questionnaire or tender schedules requesting them to provide details of their sustainability policies, performance and management approach.

Completed questionnaires provided by subcontractors and suppliers will be evaluated by either the Sustainability Representative or Procurement team, with the resulting scores for these non-financial criteria contributing to at least 20% of the total tender score. The final scoring acts as a key factor in determining which subcontractor wins the tender.

For procurement packages with significant sustainability outcomes or risks, a member of the Sustainability Team may participate in a kick-off meeting organised by the delivery team to ensure the subcontractor/supplier is aware of their requirements.

12.3 Managing Supplier Performance

Supplier contracts considered to have a high materiality will have specific contract objectives and/or targets to address the risk or opportunity that they pose. Supplier performance against the targets and objectives will be monitored for the duration of the contract. This will involve performing brief audits of compliance with the sustainability requirements of the contract considered highest risk for the goods or services contracted.

Early identification of poor sustainability performance or non-compliance will ensure performance is actively managed before it impacts the Project. Similarly, positive performance will be identified and shared with the wider project team to promote sustainability opportunities.

Applicable material suppliers (e.g. concrete, quarry materials, waste) will be required to provide monthly reports detailing the requirements such as waste diversion, percentage of FSC timber supplied or percentage of Supplementary Cementitious Materials (SCM) used in concrete.

12.4 Sustainable Procurement for High Impact Suppliers

GRCLR will provide sustainability training to High Impact Suppliers defined as those suppliers with over 9% of materials / products of the SOM Works by value. GRCLR will follow the guidance provided in the IS Technical Manual and Compulsory Requirement 12 of TfNSW's SDG, which refers to materials / services that have known (or potentially) significant environmental, social or socio-economic impacts or opportunities. Under the SDG specific elements to consider include the level of spend, ability to influence, and corporate sustainability policy commitments.

GRCLR will identify High Impact Suppliers and undertake training outlined in the SDG to achieve Level P1 – Sustainability training for high impact suppliers. This training may include internal training (GRCLR-led seminars or workshops with relevant GRCLR and supplier staff) and external training, e.g. online modules, training through the Australian Supply Chain Sustainability School, and will be determined based on scope, supplier needs and schedule. Evidence will include documentation outlining the process adopted to identify High Impact Suppliers, and a summary of the type of training, date/s and suppliers involved.

13 Sustainability in LRV Design and Manufacture

Sustainability requirements related to the LRV design, manufacture and operations will be identified and implemented according to the process outlined in Section 8.3. The sustainable procurement process for the LRVs is described in Section 12. 'Social accountability' related to LRVs is described in Section 14.

An Environmental Product Declaration (EPD) for the LRVs will be developed in accordance with ISO 14025:2006, using the latest Product Category Rules for rolling stock as developed by The International EPD® System.

The key steps to develop an EPD under The International EPD® System are:

1. Perform a life cycle assessment (LCA) based on Product Category Rules;
2. Compile information in the EPD format;
3. Verification by an approved individual verifier or an accredited certification body; and
4. Registration and publication completed by the Secretariat.

In recent years, CAF has developed EPDs for heavy and light rail rolling stock across the world. This includes the Urbos 100 tram for the City of Zaragoza, which is very similar to the trams proposed for PLR. A copy of the Zaragoza Tram EPD is included in Appendix G.

The intent is to bring forward the development of the EPD for the LRVs (earlier than one year into operations, per the Deed) in order to meet the IS Mat-2 Level 2 requirement. This is under discussion with CAF to confirm this can be achieved. If not, ISCA approved environmental labels for other materials to be used across the SOM contract will be used to meet this requirement. This may include high-value, high-use materials such as concrete, steel and asphalt. These materials will be identified through a mapping process, where existing EPDs and product labels are mapped against the key materials to determine likely opportunities to meet this requirement. This mapping exercise will be undertaken during PDR when the bill of quantities is further developed, and will be progressed through DDR and during construction. The other option under consideration is the adoption of the ISCA v2.0 approach to sustainability labelled products (credit Rso-7), which will be undertaken in consultation with ISCA.

14 Social Accountability

SA8000 is the International Standard that defines and measures social performance in eight areas important to social accountability in workplaces. These include:

1. Child Labour
2. Forced or Compulsory Labour
3. Health and Safety
4. Freedom of Association and Right to Collective Bargaining
5. Discrimination
6. Disciplinary Practices
7. Working Hours
8. Remuneration
9. Management System

GRCLR, in collaboration with delivery partner, CAF and sub-contractor Laing O'Rourke, will be responsible for the majority of the workforce and procurement for the design and construction of the SOM scope. For Australian-based activities GRCLR (and sub-contractors) are governed by relevant Australian and state laws which are aligned with the principles of SA8000. In addition, each organisation operates under their respective Codes of Conduct, Sustainability Policies, and human resources and procurement policies and processes, which support the intent and objectives of key international frameworks, including SA8000, the International Labour Organisation, the Universal Declaration of Human Rights and the United Nations Global Compact. These policies and processes extend to cover procurement from suppliers across the world.

Relevant references include:

- CAF's Code of Conduct, Business Procurement Policy and Supplier Code of Conduct, which describe CAF's requirements regarding respect for human rights, working conditions, business ethics, the environment, health and safety, and confidentiality.
<https://www.caf.net/upload/accionista/corporate-social-responsability-policy-of-CAF.pdf>
https://www.caf.net/upload/accionista/informe-anual-modern-slavery-act-2015_2018_en.pdf
<https://www.caf.net/en/proveedores/proveedores.php>
- Laing O'Rourke's Global Code of Conduct sets out standards for working together and with others – and describes the way they manage the social, economic and environmental impacts of operations. The Code provides practical guidance on issues such as bribery and corruption, equal opportunities and human rights, safety, sustainability and security.
<http://www.laingorourke.com/who-we-are/governance/code-of-conduct.aspx>
<http://www.laingorourke.com/responsibility/marketplace.aspx>
<http://www.laingorourke.com/responsibility/governance/modern-slavery.aspx>
- TransDev's Corporate Social Responsibility plan, Human Rights Group Statement and Code of Ethics describe TransDev's approach and commitment to these globally important issues.
<https://www.transdev.com.au/about-us/growing-responsibly/>
<https://www.transdev.com/en/about-us/ethics-and-compliance/>

15 Climate Change Risk Assessment and Adaptation

A Climate Risk Assessment (CRA) is used to address climate change risks and uncertainties by identifying measures to adapt and build resilience. It involves the identification and assessment of the risks climate change poses to the project and prioritises any risks that require appropriate actions for adaptation.

The CRA will be undertaken in accordance with:

- TfNSW Enterprise Risk Management (TERM) Standard 30-ST-164 (Version 5.0);
- TfNSW Climate Risk Assessment Guidelines (V3.0 February 2018);
- TfNSW SDG v4.0 CR3 requirement – Climate change risk;
- Australian Standard 2013, *AS 5334 - 2013 Climate change adaption for settlements and infrastructure – A risk based approach*; and
- ISCA 2016, *Infrastructure Sustainability Rating Tool Technical Manual: Cli 1 – Climate Risk Management*.

The CRA process is shown in Figure 10, and further details are included in Appendix E.

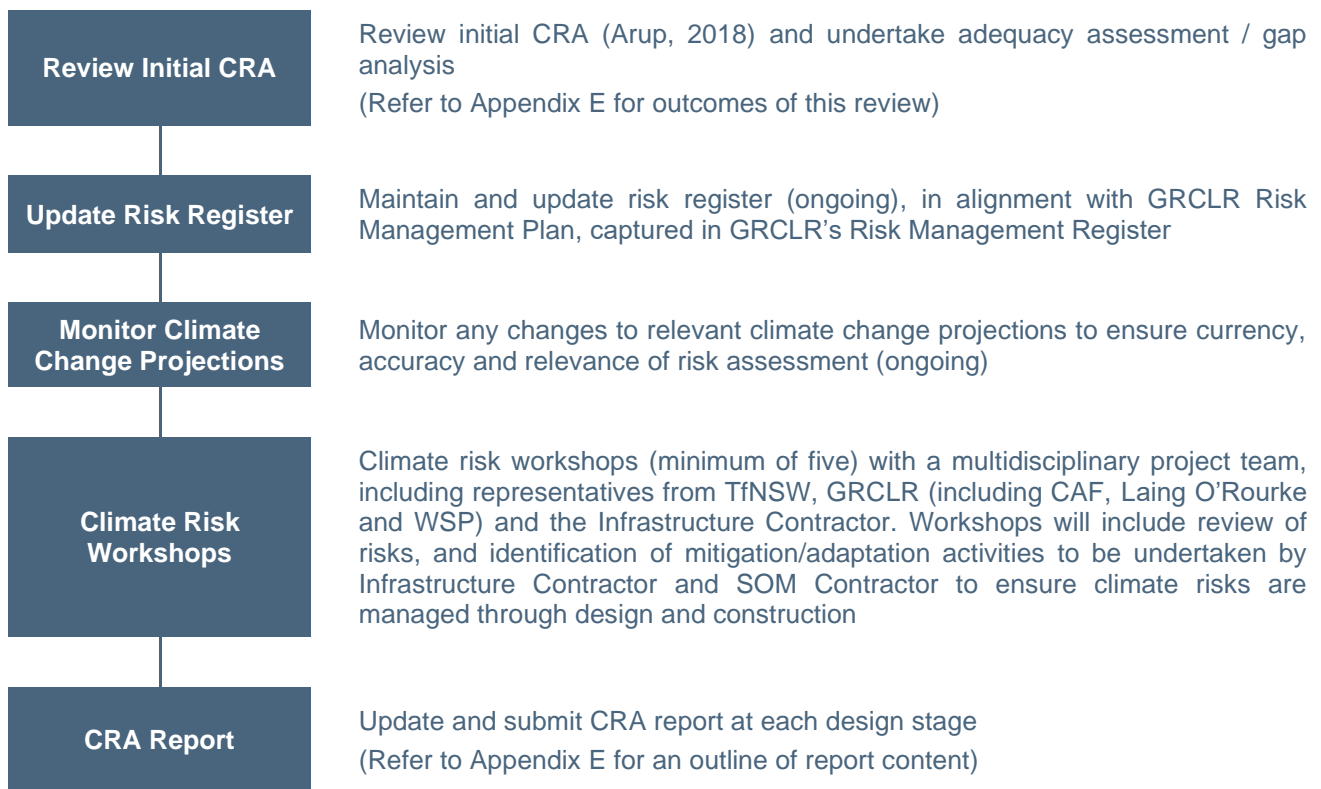


Figure 100: Climate Risk Assessment Process

16 Using Resources

16.1 Modelling

Resource reductions performance against the targets and objectives outlined in Section 6.2 will be assessed against a 'base case', in accordance with IS 1.2 Using Resources credits (Ene-1, Wat-1, Mat-1). A base case is determined from the reference design (e.g. tender design), then adding/subtracting emissions/resource usage for any scope changes, then making any adjustments to account for design decisions that were included in the reference design that go beyond Business As Usual (BAU).

Initiatives and activities to reduce resource consumption that are identified and included in the design are then subtracted from the base case to determine the 'actual design' consumption/emissions. This is demonstrated in . The base case will be calculated using data generated during SDR and PDR and subsequently submitted to ISCA for verification and approval. Emission reductions will be tracked through design and construction through a DDR life cycle assessment.

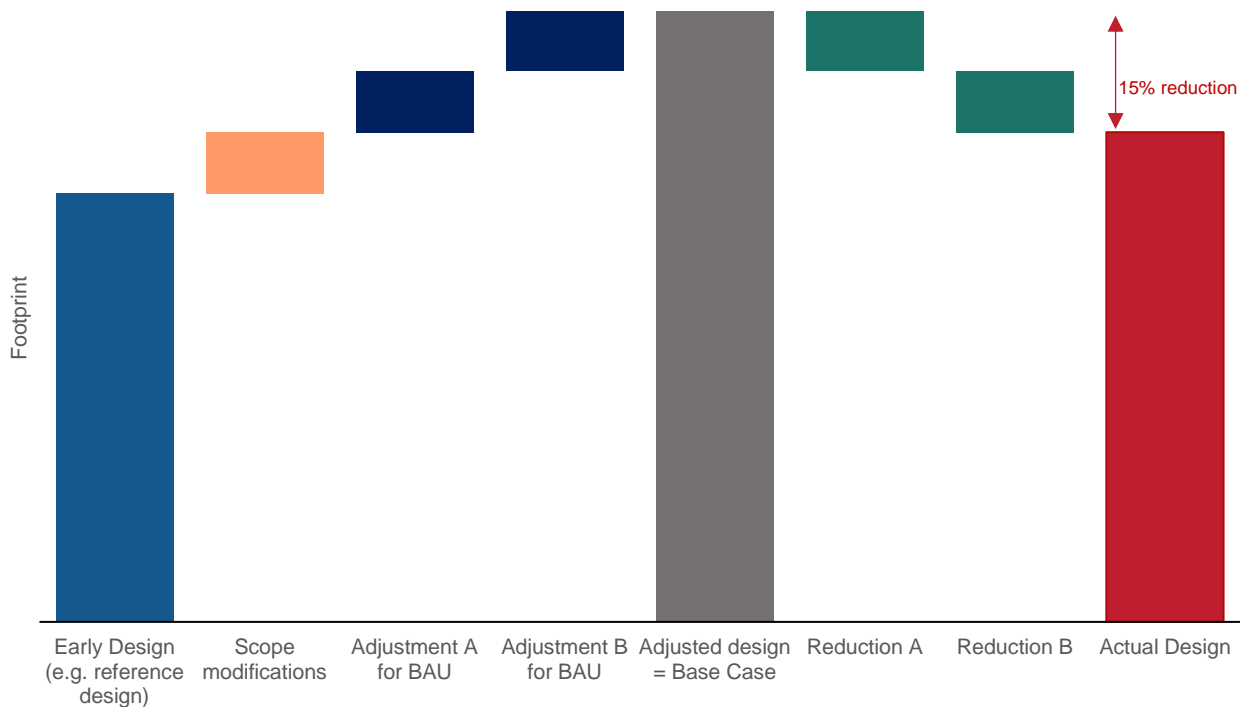


Figure 111: Base Case Determination and Resource Reduction

16.2 Energy, Carbon and Materials Management

The IS Energy and materials categories require energy use, GHG emissions and management strategies to be measured, verified and reported on during all infrastructure lifecycle stages. It also requires identification and evaluation of opportunities to understand sources of energy use, GHG emissions and material lifecycle impacts and develop effective management processes as part of a process of continual improvement.

The process for energy and materials management is outlined in Figure 12.

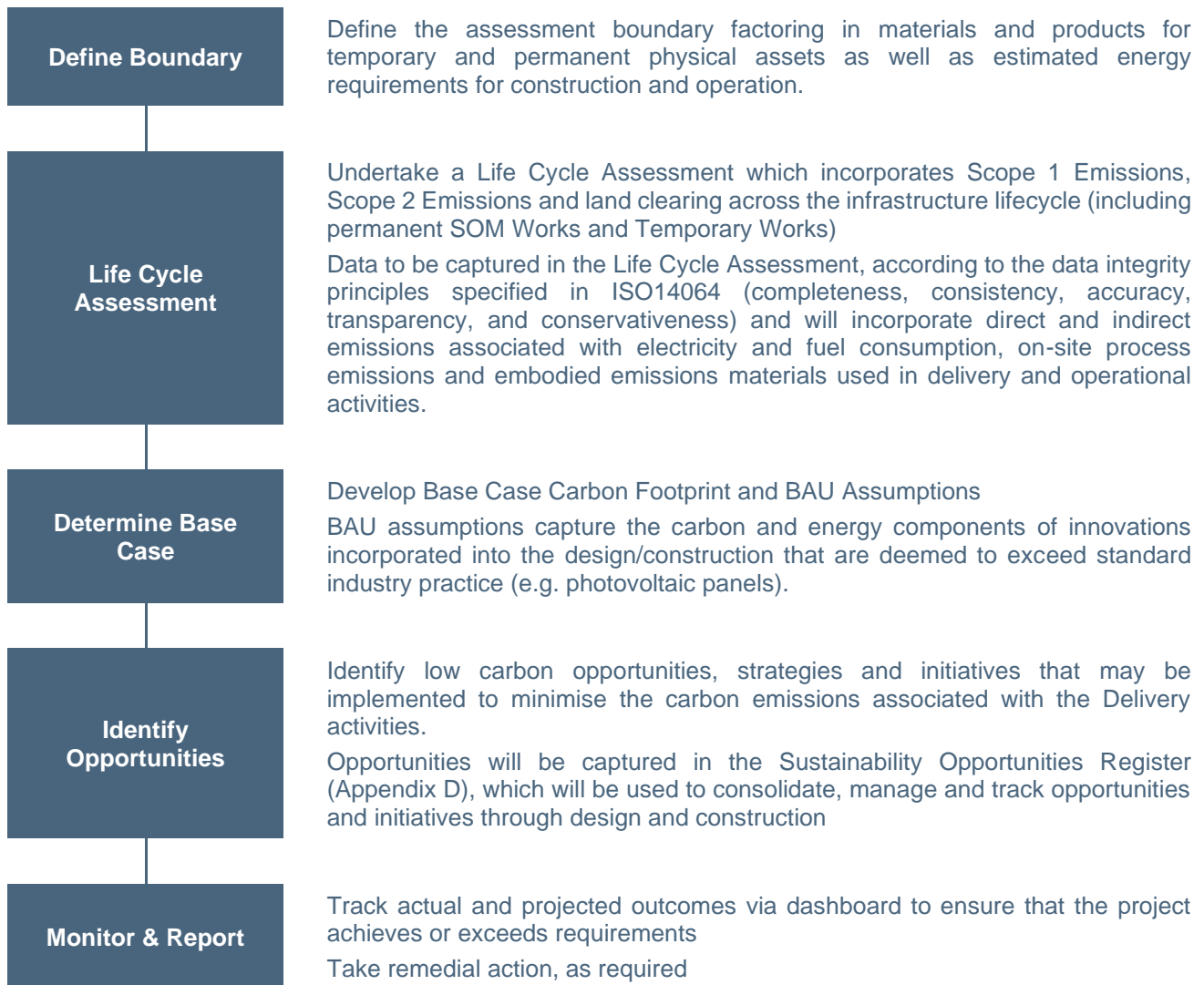


Figure 122: Energy and Materials Management Process

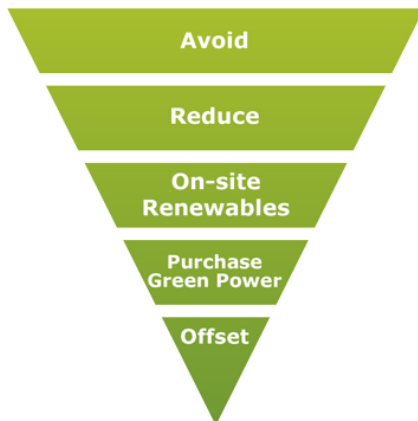
16.3 Energy Reduction and Renewable Energy

16.3.1 Energy Reduction Hierarchy

Energy-efficient design and construction principles are critical in creating infrastructure that is affordable and enduring. The project is committed to achieving greenhouse gas reductions during project construction and operation with initiatives such as:

- Construction planning reducing truck or materials movements
- Procuring recycled products/materials to ensure that new high embodied carbon materials are not required for the project
- Substituting materials with more carbon efficient materials such as reducing the percentage of portland cement

Reductions will be achieved through the implementation of construction and operational initiatives, such as energy efficient design and sustainable construction practices or energy substitutes such as renewable energy, which have been selected using a hierarchical approach as shown in Figure 13 - Energy Reduction Hierarchy.



Avoid: resource use through design refinement
Reduce: energy consumption by installing items such as efficient lighting, whitegoods, maintenance equipment, etc
Renewables: explore opportunities for renewables
Purchase: investigate green energy procurement
Offset: Reduction targets through energy offset/carbon credits.

Figure 13 - Energy Reduction Hierarchy

16.3.2 Renewable Energy

Renewable energy opportunities, while primarily considered during design for long term operational reductions, will also be considered during construction.

GRCLR have established a criterion for consideration when renewable energy options are proposed for construction. The options are given a score (1-5) for each of the following categories, and the total score provides the basis for implementation.

1. Security of supply (connection, availability)
2. Emissions factors
3. Cost of supply (monthly across life of the project - 16 months)

16.4 Water Management

The IS Water category requires water reduction, substitution and management strategies to be measured, verified and reported on during all infrastructure lifecycle stages.

The process for water management is outlined in Figure 125.

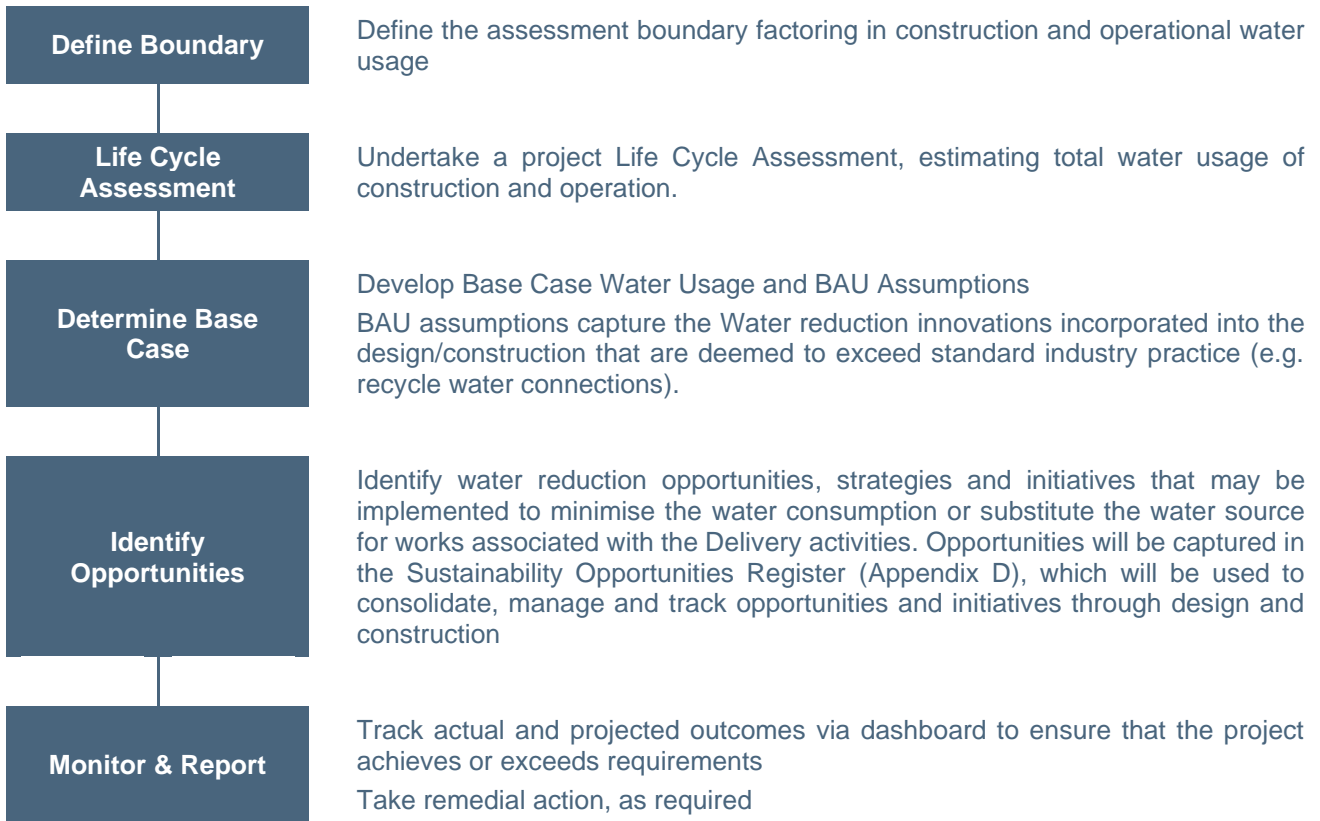


Figure 134: Water Management Process

17 Management and Governance

17.1 Risk Management

Sustainability risks and opportunities will be continually identified throughout the design and construction of the project with formal reviews occurring at least annually. High level sustainability risks and opportunities for the Project will be integrated within the Project's risk management plan.

A sustainability representative will participate in the risk management process by attending risk review meeting as part of the Senior Leadership Team and participating in risk workshops.

17.2 Auditing and Monitoring

Assurance, monitoring, auditing, corrective action and continuous improvement will be undertaken in accordance with the Quality Management Plan.

In addition to audit requirements captured in the GRCLR Audit Schedule (PLR1SOM-GLR-ALL-PM-SCH-001001), opportunities for obtaining ISCA credits through undertaking audits and/or reviews may include the following, if required:

- Management Systems Review/Audit - ISCA Man-4: Environment and/or Sustainability audits of the management system are conducted. At least one external review or audit is conducted during design, and during construction, at least four audits are conducted per year where at least one is external;
- Energy/GHG Review/Audit - ISCA Ene-1: monitoring and modelling of energy use and GHG emissions, and actions undertaken to reduce them;
- Noise Review/Audit - ISCA Dis-2: monitoring and modelling of noise, including divergences/exceedances;
- Lighting Review/Audit - ISCA Dis-5: night time audit of mitigation measures during construction;
- Contaminated Site Review/Audit - ISCA Lan-3: site assessment and remediation appraisal, per National Environment Protection (Assessment of Site Contamination) Measure (1999);
- Waste Review/Audit - ISCA Was-1: monitoring and management of waste, including both systems and data i.e. the systems used to manage waste and the data recording and reporting;
- Ecological Review/Audit - ISCA Eco-1: review of Ecological Management Plan (or equivalent);
- Heritage Assessment Review/Audit - ISCA Her-1: review of Heritage Assessment / Management Plan (or equivalent);
- Stakeholder Engagement & Communications Strategy Review/Audit - ISCA Sta-1, Sta-3 & Sta-4: review of Stakeholder Engagement Strategy, effectiveness of community communications and addressing of community concerns, issues or feedback; and
- Urban Design / Landscape Management Plans Review/Audit - ISCA Urb-1 & Urb-2: review of Urban & Landscape Design Plan, and/or compliance check of implementation of urban design and landscape management plans or maintenance manuals or similar.

Specific additional audits and reviews that will be undertaken to achieve the ISCA credit levels detailed above will be explored in consultation with TfNSW and ISCA during the development and review of GRCLR's overall ISCA pathway.

Additionally, ongoing verification will occur through the IS Rating process (refer to Section 0).

17.2.1 Internal Tracking Tools

Key internal tools that have been developed to track sustainability performance include:

- Sustainability Dashboard: a live document used to track overall progress and will be updated regularly as a key tool for internal management and reporting, including the following:
 - ISCA credit status: red, amber, green;
 - ISCA score: target, projected, realised;
 - Savings in water, emissions, electricity, materials, waste; and
 - Opportunities: identified, dismissed, accepted/implemented;
- Sustainability Requirements Matrix (Appendix B): following initial development, this matrix will be reviewed and updated regularly in line with each design stage and prior to construction, and includes the following:
 - SOM Deed reference;
 - Description of the requirement;
 - Notes / Actions;
 - Timing;
 - Whether the requirement is related to:
 - Governance;
 - Design (Prescriptive / Non-Prescriptive);
 - Construction (Prescriptive / Non-Prescriptive);
 - Each of the ISCA credits; and
 - Each of the Design Disciplines;
- ISCA Tracker (Appendix C): a live document that captures progress against all ISCA credits, including:
 - Credit title;
 - Requirements for Levels 1, 2 and 3;
 - Materiality score;
 - Target level and confidence of attaining;
 - Evidence requirements and reference;
 - Discussion / comments;
 - Risk mitigation action;
 - Compliance strategy; and
 - Scope split
- Sustainability Opportunities Register (Appendix D): a live document that will be updated on an ongoing basis, which captures opportunities across the SOM Deed, including:
 - Opportunity summary;
 - Opportunity description;

- Sustainability benefit/cost evaluation (related to ISCA credits), as well as financial and schedule impacts;
- Tracker to tag each opportunity as ‘progress’, ‘further investigation required’, or ‘dismiss’;
- Justifications and actions; and
- Any related references.

17.3 Reporting

The reporting methodology used to address the specified reporting requirements in the relevant sections of Exhibit A, Annexure 13 (*Reporting Requirements*) of the SOM Contract is outlined in the Contract Management Plan. This will be supported by inputs from the independent sustainability professional, engaged under ISCA Man-3.

17.3.1 Monthly Report

As a minimum, the sustainability section of the Monthly Report will address and detail:

- GRCLR’s performance against the targets identified in this DSMP, summarised within a compliance table and a dashboard showing the status of compliance with the sustainability requirements and specified targets of the Contractor’s Activities;
- Progress towards achieving the "Design" and "As Built" ISCA IS rating tool v1.2, including completed and updated checklists and scorecards;
- Data to support reporting on targets, and a commentary / analysis of trends including actions to be undertaken to improve performance, for the following:
 - Greenhouse gas emissions throughout construction in accordance with the requirements of the Principal’s CERT;
 - Current and accumulated level of energy use and greenhouse gas emissions and performance against the target identified in this Plan;
 - Electricity consumption and generation, including any on-site renewable energy generation, renewable energy sources and offsets for the SOM Works, and performance against the targets in this Plan;
 - Fuel consumption and performance against fuel consumption targets;
 - Volume and percentage of potable and non-potable water consumed for the SOM Works, and performance against targets;
 - Quantities of waste generated, recycled, beneficially re-used or disposed of and performance against waste targets, including spoil targets;
 - Volume weighted average of substitute cementitious content in concrete used for the SOM Works, and the substitute materials specified and categorised;
 - Details of sustainable training and inductions provided to major Subcontractors and suppliers including sustainable procurement;
 - Details where low carbon and greenhouse gas reduction initiatives have been implemented in the design and construction of the SOM Works and Temporary Works;
 - Climate change risk assessments undertaken and details of where the assessments have influenced the design and construction for the SOM Works and Temporary works;

- Life cycle assessments undertaken, and details of environmental impact reduction initiatives which have been implemented in the design and construction of the SOM Works and Temporary Works; and
- Details of any innovative sustainable design initiatives.

17.3.2 Annual Sustainability Report

During the Delivery Phase, GRCLR will prepare and submit an annual sustainability report to TfNSW on 31 August each year for review in accordance with Section 2.2.5. of Annexure 13. The report will demonstrate and detail performance in sustainability in relation to this Plan and include progress against sustainability goals and targets over the last year including annual sustainability reporting metrics in line with the NSW Government Resource Efficiency Policy 2014.

Appendix A – Environment and Sustainability Policies

GREAT RIVER CITY LIGHT RAIL ENVIRONMENT AND SUSTAINABILITY POLICY

Intent

Great River City Light Rail Pty Ltd (GRCLR) is the Supply, Operate and Maintain (SOM) Contractor for Parramatta Light Rail Stage 1. We understand what goes into making every journey an exceptional customer experience that is safe, reliable and integrated with other modes of transport.

GRCLR will design, construct, operate and maintain a world-class light rail network that empowers prosperity for the Greater Parramatta Area and supports the realisation of the Future Transport 2056 Strategy.

GRCLR is committed to ensuring an environmentally sustainable future for Parramatta Light Rail, our customers and the Greater Parramatta Area.

Policy

To achieve this, GRCLR will:

1. Lead effectively and live our accountabilities and responsibilities at all levels of the organisation, starting with the Directors through to employees and Subcontractors. This includes all upholding the principles of social sustainability and social accountability across our workforce, our activities and our supply chain;
2. Comply with all environmental requirements included in relevant legislation, the Conditions of Approval, Preferred Infrastructure Report and the Environmental Impact Statement;
3. Integrate sustainability principals across all GRCLR activities, including design, construction, procurement, commissioning, operations and maintenance;
4. Collaborate with and proactively engage with all stakeholders at all levels;
5. Create a culture of continuous improvement for environment and sustainability management;
6. Understand, comply with and embrace our environment and sustainability compliance obligations;
7. Establish annual objectives for environmental management and regularly verify the compliance and effectiveness of the measures to ensure that objectives are met;
8. Promote an environmentally aware, sustainability-focused culture within GRCLR, stakeholders, customers and the Greater Parramatta Community;
9. Commit to the prevention of pollution, protection of biodiversity, implementation of restorative actions, minimisation of resource use and waste, reduction of greenhouse gas emissions, and enhancement of climate change resilience through adaptation and mitigation across the delivery of works and during operations; and
10. Plan effectively, and provide and use the necessary resources to meet environmental objectives.

To support this policy, GRCLR has established an Integrated Management System (IMS), with appropriate policies, procedures and practices in place, which captures the requirements of AS/NZS ISO 14001:2016.

This Policy will be communicated to and applies to all GRCLR employees and Subcontractors, and will be made publicly available.



[REDACTED]
[REDACTED]
[REDACTED]
Project Director



Document Owner	Document Number	Version	Date of Issue	24/09/2021
[REDACTED]	PLR1SOM-GLR-ALL-PM-PRO-000004	3	Last Review Date	09/09/2021
			Review period	Annual
			Next review Date	09/09/2022

Appendix A2 – TfNSW Parramatta Light Rail Environment and Sustainability Policy

Parramatta
Light Rail

Transport
for NSWNSW
MAKING IT HAPPEN

Parramatta Light Rail Environment and Sustainability Policy

This policy relates to the delivery of the Parramatta Light Rail (PLR) project and is aligned with the Transport for New South Wales (TfNSW) Environment and Sustainability Policy approved by the Secretary in August 2015.

The PLR project will not only deliver a sustainable transport outcome but will also contribute to the urban renewal, sustainable growth and transformation of the Greater Parramatta to Olympic Peninsula Priority Growth area including Westmead Health Precinct, Greater Parramatta, Sydney Olympic Park and Camellia.

This policy outlines the commitment to:

- Develop effective and appropriate responses to sustainability including climate resilience, urban place making and integration of public and active transport modes.
- Minimising environmental impacts of the project and embedding sustainability principals into the planning, construction and operational phases of the project.
- Proactively comply with all applicable environmental laws, regulations and statutory obligations in both domestic and international jurisdictions where they apply.

To deliver on policy commitments the PLR team will work in the following areas:

Leadership

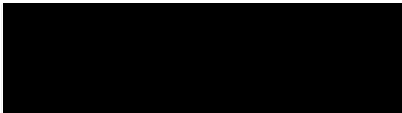
- Encourage innovation through design and procurement in the areas of sustainability and climate resilience.
- Explore new benchmarks for sustainability in the transport infrastructure sector by expecting quality, value for money and benefit maximisation (environment, economic and social) from our designers, contractors, and suppliers.
- Implement coordinated and transparent decision-making, through collaboration across government departments, stakeholders and suppliers.

Customers, Community and Stakeholders

- Deliver our customers an efficient accessible and convenient transport service.
- Establish positive relationships with the local community to maximise opportunities to create places our customers are drawn to by enhancing liveability, community and economic outcomes.
- Work with the community and our stakeholders to develop workforce skills and diversity.
- Develop and maintain collaborative relationships with our key stakeholders and other important partnerships in order to obtain mutually beneficial sustainability outcomes.

Embedding Sustainability

- Establish, monitor, measure and report on sustainability objectives and targets.
- Develop and integrate an environmental and sustainability management system throughout the project lifecycle.
- Apply assurance processes to monitor performance and identify appropriate rewards and corrective actions.
- Be responsible in the sourcing of goods and services by implementing best practice sustainable procurement protocols.
- Hold project employees and contractors accountable for proactively meeting their environmental, sustainability and climate resilience responsibilities and provide appropriate training, information and resources for all project personnel.


Project Director

23 March 2017

Date

Appendix B – Sustainability Requirements Matrix

A snapshot of the Sustainability Requirements Matrix is included in this appendix. Refer to PLR1SOM-GLR-ALL-EN-REG-000001 for the live document which will be updated separately to this DSMP.

Source	Reference	Requirements	Item Applies to / Involvement - (Design, Construction, Operation, Management, Procurement)	Main Responsible Party (CAF, GR2LR, VSP, LORAC, SPS)	Contact Person	ISCA Category	CAF Design Packages - Alex Heidari Rail Systems - (DP 3, 4, 5, 8)	CAF Design Packages - Alex Heidari Substation Power - (DP 6, 10)	CAF Design Packages - Lia Camellio / Renzo Tonin Noise & Vibration - (DP 17)	CAF Design Packages - Darren MacDonald LRVs - (DP 7)	CAF Design Packages - Darren MacDonald SaMF Maintenance Plant - (DP
Exhibit B (SPR) Scope and Performance Requirements											
Exhibit B, SPR	7.13.	General Requirements									
Exhibit B, SPR	7.13 (a)	The Contractor must comply with the Sustainability Requirements set out in Appendix D - Sustainability Requirements.	All	All		All	●	●	●	●	●
Exhibit B, SPR	7.2.20	SaMF Sustainability Elements									
Exhibit B, SPR	7.2.20 (a)	The Contractor must comply with the sustainability requirements of Appendix D - Sustainability Requirements [See below for Appendix D - Sustainability Requirements]	All	All	All	All	●	●	●	●	●
Exhibit B, SPR	7.2.20 (b)	The Contractor must provide on-site solar photovoltaic (pv) generating systems integrated within the SaM Facility boundary that:	Design	SPS / LORAC	LORAC Design (Darren)	Ene	●	●	●	●	●
Exhibit B, SPR	7.2.20 (b) (i)	Have a minimum of 300 kW rated power output;	Design	SPS / LORAC	LORAC Design (Darren)	Ene	●	●	●	●	●
Exhibit B, SPR	7.2.20 (b) (ii)	Produces a minimum of 360 MWh in the first year of operation;	Design	SPS / LORAC	LORAC Design (Darren)	Ene	●	●	●	●	●
Exhibit B, SPR	7.2.20 (b) (iii)	Is oriented and tilted to optimise energy generation;	Design	SPS / LORAC	LORAC Design (Darren)	Ene	●	●	●	●	●
Exhibit B, SPR	7.2.20 (b) (iv)	Connects to the PLR low voltage network; and	Design	SPS / LORAC	LORAC Design (Darren)	Ene	●	●	●	●	●
Exhibit B, SPR	7.2.20 (b) (v)	Allows for export of power, taking into consideration the following Sections of the Principal's Technical Note - TN 0312016 - "Requirements for photovoltaic installations connected via inverters to the RailCorp low voltage (LV) distribution network" 5 May 2016;	Design	SPS / LORAC	LORAC Design (Darren)	Ene	●	●	●	●	●
Exhibit B, SPR	7.2.20 (b) (v) (A)	Section 4.14 - Export into LDNSP network; and	Design	SPS / LORAC	LORAC Design (Darren)	Ene	●	●	●	●	●
Exhibit B, SPR	7.2.20 (b) (v) (B)	Section 4.16 - P1 System connected solely to LDNSP	Design	SPS / LORAC	LORAC Design (Darren)	Ene	●	●	●	●	●
Exhibit B, SPR	7.2.20 (c)	The design of the SaMF facility must allow for the provision of battery storage in the future considering the draft voluntary standard, DR AS/NZS 5133:2017.	Design	VSP	VSP Design Manager	Ene, Inn	●	●	●	●	●
Exhibit B, SPR	7.2.20 (d)	The Contractor must make a physical allowance for storing up to 500 kWh of battery and an appropriate storage facility (stand-alone room or within existing plant room) with the ability to have this storage facility appropriately fire rated in the future.	Design	SPS / LORAC	LORAC Design (Darren) VSP Design Manager	Ene, Inn	●	●	●	●	●
Exhibit B, SPR	7.2.20 (e)	The Contractor must provide and install:	Design	SPS / LORAC	LORAC Design (Darren)	Ene	●	●	●	●	●
Exhibit B, SPR	7.2.20 (e) (i)	High quality solar panels (Bloomberg Tier 1 manufacturer, although others may be considered on merit);	Design	SPS / LORAC	LORAC Design (Darren)	Ene	●	●	●	●	●
Exhibit B, SPR	7.2.20 (e) (ii)	The Contractor must provide for recycling and general waste in all bin locations	Design	VSP	VSP Design Manager	Vas	●	●	●	●	●
Exhibit B, SPR	7.2.20 (e) (iii)	A pv racking system to ensure optimal power generation potential;	Design	SPS / VSP	LORAC Design (Darren) VSP Design Manager	Ene	●	●	●	●	●
Exhibit B, SPR	7.2.20 (e) (iv)	Systems and equipment produced by a well-known, quality manufacturer;	Design	SPS / LORAC	LORAC Design (Darren)	Pro, Ene	●	●	●	●	●
Exhibit B, SPR	7.2.20 (e) (v)	Inverters that are housed internally	Design	SPS / VSP	LORAC Design (Darren) VSP Design Manager	Ene	●	●	●	●	●
Exhibit B, SPR	7.2.20 (e) (vi)	Connection to the low voltage power system;	Design	SPS / VSP	LORAC Design (Darren) VSP Design Manager	Ene	●	●	●	●	●
Exhibit B, SPR	7.2.20 (e) (vii)	System requirements as specified by the electricity distributor (if necessary);	Design	SPS / VSP	LORAC Design (Darren) VSP Design Manager	Ene	●	●	●	●	●
Exhibit B, SPR	7.2.20 (e) (viii)	A system capable of providing power data export via Ethernet link, and includes inbuilt Bluetooth (where possible);	Design	SPS / VSP	LORAC Design (Darren) VSP Design Manager	Ene	●	●	●	●	●
Exhibit B, SPR	7.2.20 (e) (ix)	A system able to work with smart meters; and	Design	SPS / VSP	LORAC Design (Darren) VSP Design Manager	Ene	●	●	●	●	●
Exhibit B, SPR	7.2.20 (e) (x)	Safe roof access, including walkways with handrails, and water points for cleaning and maintenance.	Design	VSP	LORAC Design (Darren) VSP Design Manager	n/a	●	●	●	●	●
Exhibit B, SPR	7.2.20 (f)	The solar panels must be certified for all applicable loading conditions.	Design	SPS / LORAC	LORAC Design (Darren) VSP Design Manager	Ene	●	●	●	●	●

Appendix C – ISCA Tracker

A snapshot of the ISCA Tracker is included in this appendix. Refer to **PLR1SOM-GLR-ALL-EN-REG-001002** for the live document which will be updated separately to this DSMP.

ISCA Point Score Summary - Design & As-Built														Minimum Achievement Score		Minimum Target Score		Incentive Reward Score						
Rating Levels														Minimum Achievement Score	Minimum Target Score	Incentive Reward Score								
Credit	L1 Criteria	L2 Criteria	L3 Criteria	Minimum Score	No. Items	Target (Design)	Confidence (Design)	Target (As-Built)	Confidence (As-Built)	Recommended Risk Mitigation Action	Meeting Notes of GRGLR (Advice) Thursday 24th Oct.	Responsibility (Primary and Secondary)	Evidence Requirements	Evidence Documentation	Compliance Strategy	Scope to Deliver	GRGLR Sustainability Manager Scope	CAF Sustainability Manager Scope	LOR Scope	MSP Scope	External Scope			
Meas-5	Reporting and review	Sustainability performance reports to be sent annually for senior management. AND The sustainability report includes sustainability objectives and targets for improvement. AND Sustainability performance is reviewed formally with senior management.	The requirements for Level 1 are achieved. AND Sustainability performance is reported at least quarterly to senior management.	2	3	3	0.84	0.56	0.28	0.74	0.49	0.25	CAF	Annual sustainability reports (Level 1) Minimum of annual management review meetings (Level 1) Quarterly sustainability reports (Level 2) Minimum of quarterly management review meetings (Level 2) Evidence that sustainability reports are made public (Level 3) Minimum of stakeholder mapping/consultation management reviews (Level 3)	Annual Sustainability Report (Sept 2019) Quarterly sustainability reports	Sustainability Reports will be done by the Sustainability Manager. Reviews will be done by senior management.	Includes in role responsibilities	Manage Sustainability Reporting	Manage Sustainability Reporting	Contribute to Sustainability Reports - LOR Construction	Contribute to Sustainability Reports - MSP Duration			
Meas-6	Knowledge sharing	Sustainability knowledge is shared within the project.	The requirements for Level 1 are achieved. AND Sustainability knowledge is shared with project stakeholders. AND Sustainability knowledge is shared from outside the project.	2	3	3	1.88	1.28	0.63	3	1.66	1.11	0.55	GRGLR and CAF	As an example of sustainability knowledge sharing (Level 1) Documentation of sharing knowledge with project stakeholders - e.g. present where, briefing notes and meeting minutes (Level 2) Documentation of sharing knowledge with stakeholders and the wider industry including literature search (Level 3)	* Sustainability working group meeting minutes + Minutes of Duration Improvement Workshop (10/16/19)	Sustainability Reporting for external communication purposes will be done by the Sustainability Manager to present appropriate information to project stakeholders.	Includes in role responsibilities	Participate in knowledge sharing forums	Participate in knowledge sharing forums	Participate in knowledge sharing forums	Participate in knowledge sharing forums		
Meas-7	Decision-making	For significant issues, decision making is characterised by: Consideration of environmental, social and economic aspects where appropriate in comparable situations. AND Evaluating options primarily on the basis of financial aspects and environmental, social and economic aspects through the use of multi-criteria analysis or other agreed measures. AND	For significant issues, decision making is characterised by: Consideration of environmental, social and economic aspects where appropriate in comparable situations. AND Evaluating options by considering environmental, social and economic aspects through the use of multi-criteria analysis or other agreed measures. AND Evaluating options based on	2	3	2	1.81	0.91	0.45	2	1.60	0.80	0.40	CAF	Duration report or similar evidence of implementation of the above guidelines for one or more significant issues (Level 1) Evidence that the duration report uses a form of multi-criteria analysis or other process if chosen to evaluate via environmental, social and economic aspects (Level 2) Evidence that the duration report uses a form of multi-criteria analysis or other process if chosen to evaluate via environmental, social and economic aspects (Level 3)	CAF This needs to be incorporated into the duration report to include key DDC decisions on both items. Needs to include labels of the duration report.	A multi-criteria analysis of environmental, social and economic aspects will be done on the duration report during project delivery	Includes in role responsibilities	Overight support	Manage the HAN-7 Decision Making activities and documentation	Includes MOA for major construction issues	Obtain MSP input in order to inform decision		

Appendix D – Sustainability Opportunities Register

A snapshot of the Sustainability Opportunities Register is included in this Appendix. Refer to [PLR1SOM-GLR-ALL-EN-REG-001001](#) for the live document which will be updated separately to this DSMP.

PLR SOM - SUSTAINABILITY OPPORTUNITIES REGISTER

QUALITATIVE DESCRIPTION OF VALUE ENGINEERING / SUSTAINABILITY INITIATIVE						ISCA			STATUS & FOLLOW UP				QUANTIFIED SAVINGS				DOCUMENTATION AND EVIDENCE			Other comments	
REF	Design Discipline	Further Classification	Raised by	Reference scenario (ISCA Base Case)	Explanation of initiative or optimisation	Energy	Water	PD	DLC	Status	Action required	Designer comment	Responsibility	Program savings (weeks)	Quantified Benefits (energy, water, materials)	CAPEX (\$)	OPEX (\$/yr)	SWTC Reference	Reference Category		Optimisation Document
SUS-IN-001	Lighting, Mechanical, Architecture	SA MF - PK 31, PK 41, PK 40	Tender Initiative	NCC 2016 reference building	Combined Section J improvements to the SA MF. This includes lighting, mechanical and building fabric contributing to the overall improved building energy consumption performance. At a minimum this will demonstrate the 15% improvement required over NCC 2016 Reference Building.	x				Implemented	Quantity energy saving				15% energy reduction against Section J NCC 2016 Reference Building						
SUS-IN-002	Lighting, Mechanical, Architecture	BOCC - PK 19	Tender Initiative	NCC 2016 reference building	Combined Section J improvements to the SA MF. This includes lighting, mechanical and building fabric contributing to the overall improved building energy consumption performance. At a minimum this will demonstrate the 15% improvement required over NCC 2016 Reference Building.	x				Implemented	Quantity energy saving				15% energy reduction against Section J NCC 2016 Reference Building						PK15 DDR Energy Consumption Report - PLR1SOM-GLR-ALL-SB-RPT-153006 - Section 5.2
SUS-IN-003	Lighting	SA MF - PK 45	Chris Cody	LORAC to confirm	All external and unconditioned space lighting to be LED to the SA MF. This includes unconditioned maintenance working areas, car park, stabling area, yard security lighting etc.	x				Implemented	Quantity				All specified luminaires have LED light sources. It is estimated that the use of LED light sources will provide a > 50% reduction on the SDG lighting power density targets.						Refer to lighting luminaire schedule Appendix I and Section 7.3.2, PK45 Design Report.
SUS-IN-004	Lighting	BOCC - PK 19	Chris Cody	LORAC to confirm	All external and unconditioned space lighting to be LED to the BOCC. This includes external lighting to landscaped areas and carpark.	x				Implemented					All specified luminaires have LED light sources. Internal lighting achieves > 15% reduction on Lighting Power Density against Section J.6 NCC 2016. External lighting achieves > 15% reduction on TRNSV SDG 4 v/m2 Target.						Refer to Lighting Luminaire Schedule, PK19 Design Report; Appendix I.
SUS-IN-005	Lighting	TPS - PK 20	Chris Cody	LORAC to confirm	All external lighting to be LED all TPS locations. This includes external security lighting only.	x				Implemented					All external luminaires have LED light sources. External lighting achieves > 15% reduction on TRNSV SDG 4 v/m2 Target.						Refer to Lighting Luminaire Schedule, PK20 Design Report; Appendix I.

Appendix E – Climate Change Risk Assessment – Supporting Information

Initial CRA

An initial CRA developed for PLR Stage 1 (Arup, 2018) was completed in January 2018 based on a concept design for the EIS. The scope of the CRA was:

[...] future climate related risks to both the physical asset (PLR corridor, track, LRV stops, ancillary equipment and facilities) and the operation and customer experience. The primary factor of the assessment is to;

- *Assess potential vulnerabilities that need to be considered in the design, construction and the operation processes of the PLR Stage 1*
- *Provide recommended control measures to incorporate into the design, and*
- *Provide a working document that assists the mitigation of climate risks through each phase of project delivery and operation.*

The CRA used two different time periods:

- 2030, representing the near-term design life of the project asset components; and
- 2090, representing the long-term design life of the project asset components.

It identified the following risk types:

- 2030 scenario: 27 low, 15 medium and no high; and
- 2090 scenario: 21 low, 19 medium and two high.

Review of initial CRA

During SDR a review of the CRA was undertaken in accordance with section 3.3 in the latest revision of the *TfNSW Climate Risk Assessment Guidelines* (V3.0 February 2018). The purpose of this review was to ensure the following are still actual/accurate/appropriate:

- Climate change projections for relevant time series (2030 and 2090);
- Climate change risk and ratings;
- Climate adaptation actions and mitigations; and
- Residual risk ratings.

The results of the review are shown in Table E1. The 'Status' column indicates whether the relevant CRA component is still valid or applicable ('tick' or 'cross') or whether further action is required (indicated by a '!'). These actions will be addressed during the climate risk assessment.

Table E1: Initial CRA Review/Adequacy Assessment (as at June 2019)

CRA component	Review notes	Status
TfNSW CRA Guidelines	The initial CRA was undertaken in accordance with a previous version (V1.0) of TfNSW's Climate Risk Assessment Guidelines. No major differences existing between V1.0 and the latest version of the Guidelines (V3.0 February 2018), aside from the requirement to undertake a review of the CRA at detailed design phase, which will be undertaken.	✓
Historical climate data	Historical climate data was obtained from BoM to establish a climate baseline for the project area.	✓
Data on hot days	NSW and ACT Regional Climate Modelling (NARClIM) data was used as a reference source for the number of hot days (days over 35°C) experienced within the Sydney region.	✓
Climate projection data	Climate projection data was sourced from the CSIRO's Australian Climate Futures (hereafter referred to as Climate Futures). The Climate Futures data was selected instead of the NARClIM data (except for data on hot days) as it provides for more preferable time intervals and more detailed projections.	✓
Representative Concentration Pathway (RCP)	Out of the four RCPs, the worst-case scenario was used (RCP 8.5 – assumes global annual GHG emissions continue to rise throughout the 21st century).	✓
Climate change projection time series	The 2030 (near-term design life of project assets) and 2090 (long-term design life of project assets) time series were used in the initial CRA.	✓
Sea level rise projections	Projections in the now abandoned NSW Government's <i>NSW Sea Level Rise Policy Statement</i> (November 2009) were used in the initial CRA because City of Parramatta Council had not yet issued alternate sea level rise projections. No updated projections are currently available from the City of Parramatta Council. The projections used in the CRA are still the most suitable source.	✓
Flooding	Additional modelling to be undertaken for PLR will be used to update the flooding predictions used in the CRA.	!
Risk definition	As the initial CRA covered the full project scope, some risk descriptions may be modified to more clearly indicate the confirmed scope, and the contractor best placed to manage/mitigate through design, construction and operation. New risks will be added as they are identified.	!
Current controls accurate	Current controls may be amended or further developed to ensure their thoroughness, accuracy and relevance, including responsibilities	!
Risk ratings (initial and residual)	Risk ratings will be reviewed and amended to ensure consistency and accuracy	!
Adaptation measures	Adaptation measures may be added, amended or further developed to ensure their thoroughness, accuracy and relevance, including responsibilities.	!

Climate Change Impact Assessment Report

A Climate Change Impact Assessment Report will be updated and submitted at each design stage. Table E2 outlines the information that will be provided in the report.

Table E2: CRA Report summary

Report component	Details
Climate Data and Project Assets	<ul style="list-style-type: none"> ▪ Relevant historical weather events that have impacted the project site to inform the project baseline; ▪ Relevant climate variables and data sources for at least two different time periods; and ▪ Tabulated breakdown of key project components relevant to the project time period.
Scope and Engagement	<ul style="list-style-type: none"> ▪ Identification of assessment boundaries and scope of works; and ▪ List of project personnel providing input into the development of the risk statements.
Risk Assessment Approach and Assessment	<ul style="list-style-type: none"> ▪ A summary of risk assessment parameters applied; ▪ A summary of the total number of climate risks identified for the project and breakdown of 'extreme/very high', 'high', 'medium' and 'low' risks for all time periods assessed; ▪ Discussion regarding the risk tolerance and level of acceptability to be provided for all 'extreme/very high' and 'high' risks, and at least 25% of all 'medium' risks; and ▪ A copy of the project's climate risk statements.
Adaptation and Residual risk ratings	<ul style="list-style-type: none"> ▪ Summarises the adaptation actions identified for all 'extreme/very high' and 'high' risks, and at least 25% of 'medium' risks; ▪ Adaptation actions within the risk assessment table to be included in the report appendices; ▪ Summary of how the adaptation actions identified will reduce the residual risk ratings; and ▪ Inclusion of residual risk rating with the risk assessment table included in the report appendices.

Appendix F – Infrastructure Sustainability Rating Management Plan Template

Infrastructure Sustainability Rating Management Plan

{Insert Rating Type here}

{Insert project/asset name here}

Dated:

20th March 2018

Version:

Final

Prepared by:

{Insert Company Name} in collaboration with the

Infrastructure Sustainability Council of Australia Pty Ltd

Suite 6.03, 220 George Street

SYDNEY NSW 2000

{Insert Logo/s here}



{Insert logo/s here}

{Insert logo/s here}

{Instructions in Green highlights – these need to be deleted}

{Places to review and replace text in Yellow highlights}

Document Control

Version	Date	Prepared	Reviewed and Revised	Approved
				Project Director

{Insert logo/s here}

Key Contacts

Project Registrant Contact (insert Organisation)

Name:

Address:

Phone:

Mobile:

Emails:

Project Proponent Contact (insert Organisation)

Name:

Address:

Phone:

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Project Director (insert Organisation)

Name:

Address:

Phone:

Mobile:

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IS Project Assessor (insert Organisation)

Name:

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ISCA Case Manager (Infrastructure Sustainability Council of Australia)

Name:

Address: Suite 6.03, 220 George Street, Sydney 2000

Phone: +61 2 9252 9733

Mobile:

Email:

{Insert logo/s here}

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1. Introduction

1.1. ISCA and the IS rating scheme

ISCA is a member based industry association committed to the delivery of more sustainable outcomes from the design, construction and operation of Australia’s infrastructure.

The IS rating scheme for infrastructure is developed and administered by ISCA. The IS rating scheme is a comprehensive rating system for evaluating sustainability across planning, design, construction and operation of infrastructure.

The IS rating scheme is comprised of:

- The Infrastructure Sustainability (IS) rating tool, incorporating:
 - IS Scorecard
 - IS Materials Calculator
 - IS Technical Manual (available through training or registered projects/assets)

The IS rating scheme consists of the following sustainability themes and categories:

Themes	Categories
Management and Governance	Management Systems
	Procurement and Purchasing
	Climate Change Adaptation
Using Resources	Energy & Carbon
	Water
	Materials
Emissions, Pollution and Waste	Discharges to Air, Land & Water
	Land
	Waste
Ecology	Ecology
People and Place	Community Health, Well-being and Safety
	Heritage
	Stakeholder Participation
	Urban & Landscape Design
Innovation	Innovation

Each of these themes and categories should be addressed throughout the delivery of this project.t

1.2. Purpose of the IS Management Plan

Optional text to be included

The purpose of this management plan is to facilitate the management and implementation of an IS Design/As Built rating on x project/asset

The objectives of this management plan are to:

- Outline the approach to applying the IS rating tool on {project name}...
- Describe and facilitate planning towards key IS timing and milestone requirements on the project.
- Outline ISCA’s role and specific support requirements for the duration of the rating process.
- Assign responsibility and key tasks associated with achieving the IS rating.

{Insert Logo/ here}

1.3. IS Rating Objectives

The objectives for pursuing an IS rating are:

- List

{Insert Logo/ here}

2. Project Description

2.1. General

Include general information about the project. This should include some information on location, context, size, infrastructure type.

2.1. Project Program

Include detail on the project program including key procurement and delivery milestones.

2.2. IS Rating Scope and Boundaries

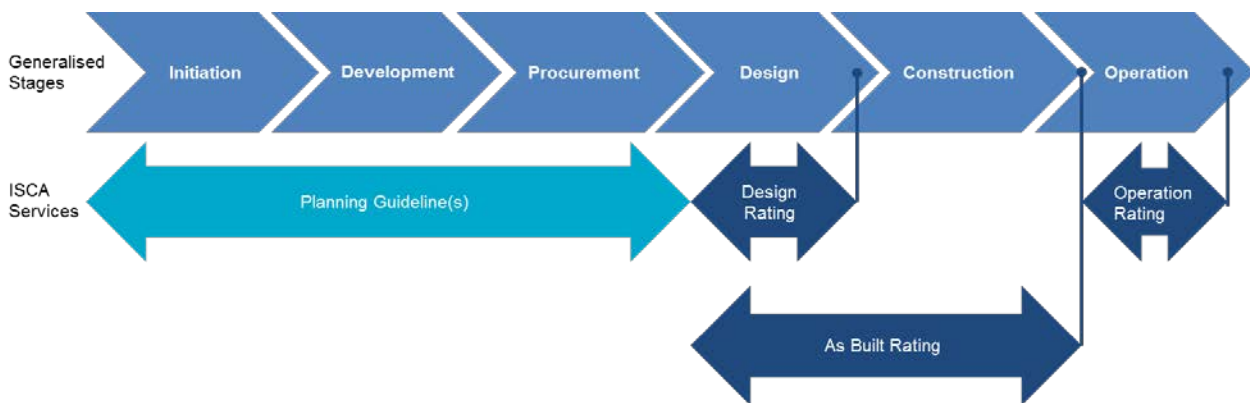
Include any relevant information that might influence the IS rating scope and boundary. i.e. packages of works, works included and works excluded etc.

3. IS Rating Process

Across the infrastructure lifecycle, there are a number of ways that the IS rating scheme is currently being applied:

1. Design, Construction and Operation: Infrastructure projects or assets can use the IS rating tool as a performance management tool to integrate sustainability through registering, assessing and then verifying and certifying a rating through ISCA. Projects can be currently certified for Design, As Built and Operation ratings.
2. ISCA encourages the use of the IS rating tool to improve the sustainability of planning, design, construction and operation of all infrastructure projects and assets. IS can be informally applied to assess the sustainability of all projects without registering and seeking verification.
3. Planning: The IS rating tool is also used as a sustainability framework and decision support tool for projects at the various stages of infrastructure planning to assist with integrating applied sustainability from business to case to project procurement stages.

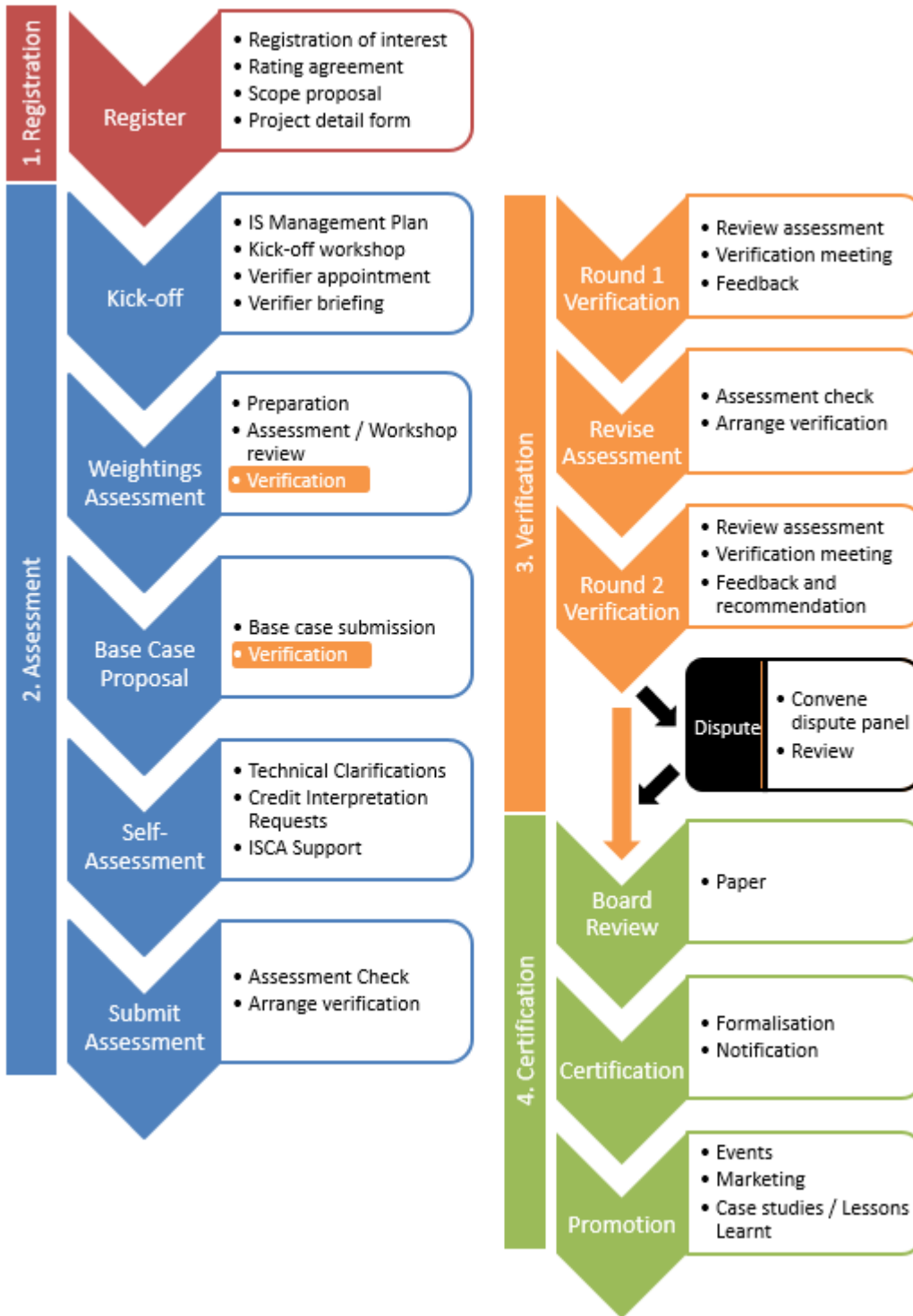
Application of the IS rating tool in design, construction and operation of infrastructure is through 1 (above) and is primarily through pursuit of certified IS ratings. Application in the planning phases (2 above) will be supported by the 'IS Planning Guideline' which is available to download for free from the ISCA website. The infrastructure stages intended to be covered by the guideline(s) and how these relate to the current rating types are illustrated below:



3.1. Design and Construction Phases

The below diagram outlines the process for completing an IS rating. The diagram includes required activities from Registration through to Certification.

{Insert Logo/ here}



3.2. Procedures and Forms

Relevant procedures and forms are presented in the below table. All procedures and forms are available within the appropriate assessment folder in the rating site on SharePoint.

Phase	Primary Procedure	Secondary Procedures	Relevant forms/templates
Registration	Registration Procedure		Rating Agreement
			Scope Proposal Form
			Weightings Assessment
			Rating Profile template
			IS Management Plan
Assessment	Assessment Procedure		Kick-off agenda template
		<i>Base Case establishment procedure</i>	Base Case proposal form
		<i>Technical Clarifications (TC) and Credit Interpretation Requests (CIR) procedure</i>	TC Form CIR Form
			Case Study template/s
Verification	Verification Procedure		Credit Summary Form (pre-populated for use in self-assessment for verification)
			Scorecard for verification
Certification	Certification Procedure		Certification form
			Communication Plan / Key messages

4. Governance

4.1. Sustainability Policy

Include the existing project sustainability policy. If there is no project sustainability policy the corporate sustainability policy should be included and it should be clearly stated that this policy applies to the project.

4.2. Sustainability Strategy (as appropriate)

Include any relevant information about other sustainability strategies/management plans or systems which will influence the implementation of sustainability on this project.

4.3. Roles and Responsibilities

Below is some optional text which could be included in the roles and responsibilities section. ISCA's support role should be clearly outlined in this section to enable the Case Manager to better support and assist the project/asset team where required. It also allows ISCA to manage resources throughout the rating process.

It may not be necessary to include a name

Role	Name	Responsibility
IS Assessor	xx	<ul style="list-style-type: none"> Principal point of contact for ISCA in relation to the IS rating process. Is an IS Accredited Professional (ISAP) (preferred) Part of the project/asset management team. Provides sustainability advice. Has ongoing involvement in the project including during design and construction phases (note that these responsibilities could be transferred between individuals/organisations). Has a detailed understanding of the IS rating process and can support the management team to understand the key aspects and milestones. Monitors and reviews progress towards IS rating achievement. Accountable for review and approval of readiness of documentation for verification.
ISCA Case Manager	xx	<ul style="list-style-type: none"> Provides technical support to the assessor and project/asset management team during the IS rating process. <ul style="list-style-type: none"> Advice regarding the IS rating tool, IS rating process and information contained within the IS Technical Manual Attendance at regular progress meetings Facilitating workshops/forums with various members of the project/asset management team Review and advice on Weightings Assessment, Base Case, and TCs/CIRs Advice regarding the self-assessment submission and evidence requirements Manages the formal verification and feedback processes.
IS Verifiers	xx	<ul style="list-style-type: none"> Industry experts nominated by ISCA from a verification panel. Independently verify the Weightings Assessment, Base Case and self-assessment of the project/asset using the IS rating tool. Make a recommendation for the Design and/or As Built ratings for the project/asset.

5. Management

5.1. SharePoint (Information exchange)

All IS related information should be accessed through a rating SharePoint site. All relevant procedures and forms are contained within the relevant 'Assessment' folder within each rating site. The rating site should also be used by the Assessor to submit their self-assessment when they are ready for Verification.

ISCA establishes a rating site for each registered project. This rating site is secure and is only accessible by ISCA staff and other invitees. ISCA are the managers of this site and have administrative control. Invitations will be sent to the Assessor (plus others when requested by the Assessor) and the two rating Verifiers. The Assessors and Verifiers both have different access permissions.

To access the site, the invitees will receive an email invitation from their Case Manager. If they follow the link on the email it should take them to a login page through Office365. To access the site they must have an Office365 login and password. If they do not have one they will need to make one. Once they have logged into the site they should be able to see a SharePoint site and one folder called 'Assessment'.

5.2. Progress Meetings

Include any information about progress meetings that will be regularly scheduled with some or all of the following key IS stakeholders:

- ISCA
- In-house project team
- External advisors/consultants
- Etc.

5.3. Training

Include any training requirements for delivery of the project. This might include provisions for project personnel to undertake the IS Training for Professionals, Intro to IS, or IS for Project Managers (optional text included)

IS Training

The project has committed to having at least 2 IS Accredited Professionals involved as part of the project team at all times.

The IS Training for Professionals is facilitated by ISCA and will enable participants to have a good understanding of the IS rating scheme and be able to assess projects/assets using the IS rating tool. By attending the two-day course, people will:

- Learn how to apply IS tool to project/assets
- Achieve a better understanding of infrastructure sustainability
- Connect with like-minded individuals in the infrastructure industry
- Learn how to evaluate sustainability performance of projects/assets

5.4. Knowledge Sharing

Include information on knowledge sharing requirements for the project. This might include the identification of case studies / good news which ISCA can help to promote. Management objectives could be set around monthly information sharing sessions where a story/case study is submitted to ISCA to upload in the Knowledge Hub or on their news section of the website.

5.5. Timing

Milestone	Activity	Agreed Timing
Registration	Approve rating profile for ISCA rating directory	
Assessment	Kick-off workshop	
	Submit Weightings Assessment and Base Case for verification	
	Submit Technical Clarifications and Credit Interpretation Requests for review and endorsement	
Verification	Submit round 1 self-assessment	
	Submit round 2 self-assessment	
Certification	Certification	
	Lessons learnt workshop	

6. Implementation

{Some optional headings for this section}.

This section of the management plan will describe the key implementation activities which the project team is using to implement the IS rating scheme.

6.1. Weightings Assessment

{If relevant} present information/detail on the verified Weightings Assessment

Relevant documents are presented in appendix x.

6.2. Base Case

{If relevant} present information/detail on the verified Base Case

Relevant documents are presented in appendix x.

6.3. Preliminary Self-Assessment

A preliminary self-assessment has been/will be completed to understand the IS rating score which might be achieved by this project.

The outcomes of this assessment showed that

The outcomes of this preliminary self-assessment has been presented in appendix x.

6.4. Credit Allocation / Share Responsibility

Include a description of any credit allocation/shared responsibility analysis completed following the preliminary self-assessment. This might include ownership of some credits once the contractor has been awarded, submission of some documents to ISCA to support the assessment submission, or submission of some documents to the contractor for inclusion in their assessment submission. Etc.

Relevant documents are presented in appendix x.

6.5. Technical Clarifications and Credit Interpretation Requests

{If relevant} present any information related to TCs/CIRs which might have been submitted for verification.

Relevant documents are presented in appendix x.

7. Business Case Capture

The relationship between project or business excellence and sustainability is not always clear or well understood. It is therefore inherently valuable to track the costs and benefits associated with use of the IS rating tool. This will help with decision making and implementation of specific initiatives and to establish the overall costs and benefits (i.e. business case) for applying IS and the generation of case studies throughout the process.

ISCA encourages tracking of both quantitative and qualitative costs and benefits associated with applying the IS rating tool. The following table provides a framework for collecting and reporting costs and benefits. (This could be attached as an appendix rather)

Active tracking should be undertaken using the Spreadsheet incorporating the below Business Case Capture table.

	Costs			Savings/Benefits	
	Description		\$	Description	\$
ISCA rating fees					
Assessment costs:		hrs	\$/hr		
Assessor time					
Preparation and assessment submission					
Rating facilitation					
Others time					
Other costs					
Initiatives investigated/pursued:					
Management and Governance					
Energy					
Water					
Materials					
Other resources					
Emissions and pollution					
Waste (reduction)					
Ecology					
Stakeholder engagement					
Community					
Social licence / reputation					
Innovation					
Tendering					
Risk management					
TOTAL					
Cost-Benefit Analysis:					
What is the overall cost-benefit of applying IS (benefit-cost)?					
BCR (benefit/cost)?					
Do you have any cost-benefit case studies for specific initiatives?					

{Insert Logo/ here}

8. Reporting and Review

Include any required reporting and review requirements. These requirements could also be linked to IS credits where reporting and review are required. E.g. Man-5 reporting and review

Stakeholder	Report Type	Frequency	Description

{Insert Logo/ here}

9. Communication

Include key points from the communication plan here and refer to the IS Communication Plan for full details.

Also provide a requirement the project will connect the organisations communication manager with the ISCA Engagement Manager.

Appendix G – Environmental Product Declaration for Urbos 100 Tram for the City of Zaragoza



URBOS 100
for the City of Zaragoza
Environmental Product Declaration
according to ISO 14025

Technological Innovation in support of the **environment** to reach further with **less power consumption**. Based on a **catenary-free** innovative operating system, **Urbos 100** conforms to the strictest **environmental requirements**, for perfect integration in architectural environments while maintaining **high running performance**.

A new generation of train that guarantees maximum power-efficiency and full passenger ride comfort. **Versatile, with Personality and Environmentally Friendly.**



Environmental Product Declarations Programme:
The international EPD® System
operated by EPD International AB
www.environdec.com

PCR review was conducted by:
The Technical Committee of the International EPD® System
Chair: Massimo Marino
Contact via info@environdec.com

Independent verification of the declaration and data,
according to ISO 14025:2006:
 Internal External

Third Party Verifier:
Marcel Gómez Ferrer
www.marcelgomez.com
LCA study: Instituto Tecnológico de Aragón
www.itainnova.es

Registration number S-P-00284 V 2.0 / Date: 2015.03.05
Valid until 2018.03.05
UN CPC 495

EPDs within the same product category but from different programmes may not be comparable.



CONSTRUCCIONES Y AUXILIAR DE FERROCARRILES S.A.

CAF COMMITMENT

Railways and the environment. On track to efficiency.

CAF, CONSTRUCCIONES Y AUXILIAR DE FERROCARRILES, S.A. is an international leader in the design, manufacture, maintenance and supply of equipment and components for railway systems across the globe. The company was founded at the beginning of the 20th century and initially served primary industries in Northern Spain. Since then the company has grown into the international company it is today with over 7,000 qualified professionals, over 25% of whom are degree qualified. The company holds onto its roots with the company headquarters still being in the original site at Beasain.

This education level combined with a commitment to R+D+I and the know-how built up from over 100 years of experience has meant that CAF has continued to lead and innovate their own state-of-the-art technology, which has significantly improved efficiency, safety and comfort of its products and of the sector itself. This technology includes solutions such as the GREENTECH energy efficiency family with the EVODRIVE kinetic energy recovery system, the FREEDRIVE for catenary-free running, or the EDRIS energy consumption controller, and others for the control of fleets and their maintenance such as AURA, NAOS for traffic and energy control, together with AURIGA the ERTMS wayside and onboard system of the CAFs group.

CAF integrates Corporate Social Responsibility into the company's general policy and is fully aware of the potential impact of industrial

activities on the environment. For this reason the organisation includes Environmental protection as one of its primary objectives.

CAF's environmental management is aimed at controlling and minimizing environmental impact from emissions into the atmosphere, residues and energy consumption, with the principle aim of preserving natural resources. To achieve this CAF has implemented a sustainability function into the production processes, making the most of natural resources and generating energy via renewable methods. The CAF group operates photovoltaic solar, small scale wind and sustainable mobility business; with a hydro-electric plant and photovoltaic panels at their facilities to meet the energy requirements: The implemented environmental management system has been certified in accordance with ISO 14001 since 2001.

In order to provide more efficient and more environmentally friendly means of transport, CAF is currently implementing the "Product Sustainability Function", introducing eco design methods in the engineering processes to optimise and control the environmental impact of products throughout their entire operating cycle.

As a result of this effort, CAF has developed this **world's first verified EPD®** of a tram: The **Urbos Tram for the city of Zaragoza**.

ZARAGOZA TRAM

The Zaragoza tram is a passenger urban transport vehicle belonging to the third generation Urbos redesigned to improve maintenance ease and lightness, reducing the consumption of both resources and energy during its entire operating life.

In 2009, CAF was awarded the production and delivery of 21 URBOS trams for the city of Zaragoza. These are 100% low floor and consist of 5 modules each. The units are fitted with an on-board energy storage system (ACR) which permits both catenary free LRV travel between stops, and energy saving via maximum braking energy recovery. The first unit was set into service in April, 2011.

The Zaragoza Tram Project was awarded "Best project in the world" in the "Light Rail Awards 2012".

Technical Data

Composition	Mc-S-T-S-Mc
Train length (mm):	32.314
Maximum speed (km/h)	70

Equipment

- Cab air conditioning
- Passenger saloon air conditioning
- Audio and visual information for passengers
- Events recorder (black box)
- Control and supervision system
- On board passenger counting system
- Video surveillance ACR



FREEDRIVE OPERATION

- 1.** The vehicle starts running with the Freedrive system fully charged.
- 2.** Between the stops the Freedrive system supplies energy to the traction system.
- 3.** The kinetic energy generated during the braking phase is recovered in the Freedrive system starting the recharge process.
- 4.** When the vehicle arrives at the stop, the Freedrive system is fully charged.



This is an on-board energy storage system which permits dispensing with the overhead electric lines (catenary) between stops in urban environments. The Rapid Charge Accumulator (ACR) is a groundbreaking technology, entirely unprecedented in revenue service, which contributes to improved integration of urban transport in the cities, reducing visual impact in heritage districts and increasing energy efficiency.





Accessibility

The Zaragoza tram has been carefully designed, in collaboration with persons with reduced mobility collectives, achieving a paramount comfort level for all passengers. The tram floor is low along the whole passenger saloon. In this way, the existing barriers are eliminated along the whole LRV and the entry and exit of passengers from platforms located at the level of the sidewalk is extremely comfortable.

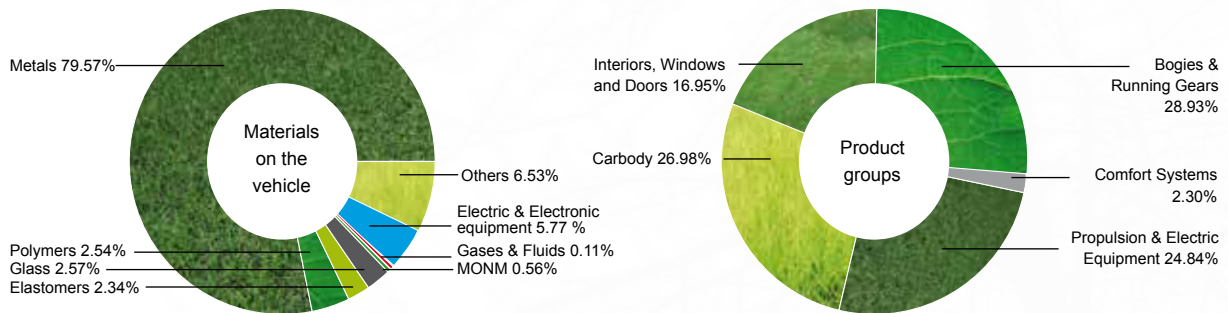


LIST OF MATERIALS

In the design of the Urbos 100 for the City of Zaragoza, materials have been selected according to the functional, technical and regulatory requirements, as well as considering their recyclability and ease of dismantling at the end of their operating life. The following table shows the summarised inventory of the tram materials.

Materials Used	Carbody	Interiors, Windows and Doors	Bogies and Running Gears	Propulsion and Electric Equipment	Comfort Systems	TOTAL
Metals	23,84%	10,38%	28,34%	14,94%	2,07%	79,57%
Polymers	0,01%	0,43%	0,09%	2,00%	0,01%	2,54%
Elastomers	0,92%	0,80%	0,37%	0,25%	0,01%	2,34%
Glass	0,00%	2,52%	0,01%	0,04%	0,00%	2,57%
Gases & Fluids	0,01%	0,00%	0,01%	0,09%	0,00%	0,11%
MONM*	0,00%	0,56%	0,00%	0,0018%	0,00%	0,56%
Electric & Electronic equipment	0,00%	0,11%	0,00%	5,67%	0,0014%	5,77%
Others	2,21%	2,15%	0,11%	1,86%	0,21%	6,53%
TOTAL	26,98%	16,95%	28,93%	24,84%	2,30%	100,00%

* Modified organic natural materials



Values in % with respect to the vehicle total mass

In accordance with their policy, CAF meets the environmental requirements right from the very first stages of their projects. The use of materials related to high environmental impact values has been reduced to the bare minimum. Those materials which may involve a risk and which cannot be avoided using current technology are taken into account and controlled during the design and development stages.

PRODUCT ENVIRONMENTAL IMPACT

Noise

The main sources of noise emission involve the effects of the rolling gear, the HVAC unit and the vehicle's traction equipment. In accordance with standard ISO 3095, the unit's exterior noise emission is as follows:

Noise	dB(A)
Standstill	59
Constant Speed (40 km/h)	71

Energy Consumption

Energy consumption during operation has been calculated based on a simulation coherent with the reference document TecRec 100:001. Specification and verification of energy consumption for railway Rolling stock and takes account of the route, timetables and frequency of the line the vehicle has been designed for (Valdespartera – Parque Goya), as well as its mechanical, electrical and auxiliary system characteristics. The considered vehicle occupation is for 200 passengers, corresponding to an occupied seat arrangement and 3.5 passengers/m² of standing passengers in the assigned areas.

The energy consumption results are calculated with catenary reception extreme values. Two possible scenarios are considered: One where the required energy during braking is regenerated on the catenary (100% receptivity) and another where all the energy is dissipated (0% receptivity).

Manufacturing Phase Electric Consumption (kWh)

By Functional Unit	0.0133
--------------------	--------

Use Phase Electric Consumption (kWh/Km)

0% Receptivity	4.22
100% Receptivity	3.93

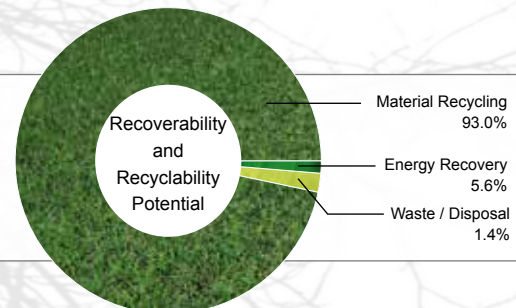
**The electric consumption for an average passenger ride, 2 km, is equivalent to approximately 2 and a half minutes of clothes ironing, 10 songs played on a stereo, or 6 minutes of playing videogames.*

POTENTIAL RECOVERABILITY AND RECYCLABILITY PROFILE

As a result of the studied design and modularity used during assembly and dismounting, high recyclability and recoverability potential ratios are achieved at the end of the trams' operating lives which, in accordance with UNI-LCA-001:00, are:

TZ Recoverability and Recyclability Potential

Recyclability Rate	93.0%
Recoverability Rate	98.6%



ENVIRONMENTAL PROFILE OF THE PRODUCT LIFE CYCLE

Environmental profile for the functional unit [1pass.1km]	Material and Component Production [UPSTREAM]	Transport and vehicle assembly [CORE]	Vehicle use [DOWNSTREAM]				TOTAL	
			Energy consumption		Maintenance and Consumables	End of Life	0% Receptivity	100% Receptivity
			0% Receptivity	100% Receptivity				
RENEWABLE RESOURCES CONSUMPTION								
Materials [kg/ pass.km] (TOTAL)	1,86E-05	5,62E-06	4,34E-10	4,05E-10	1,80E-06	6,88E-09	2,60E-05	2,60E-05
Wood	5,98E-06	1,97E-06	1,53E-10	1,42E-10	5,50E-07	2,22E-09	8,51E-06	8,51E-06
Carbon dioxide	1,24E-05	3,65E-06	2,81E-10	2,62E-10	1,22E-06	4,65E-09	1,73E-05	1,73E-05
Peat	1,56E-07	3,69E-10	1,41E-14	1,31E-14	3,25E-08	1,39E-11	1,89E-07	1,89E-07
Water use (*) [(l)/pass.km]	2,13E-02	2,36E-03	1,70E-07	1,58E-07	1,13E-03	1,37E-05	2,48E-02	2,48E-02
Energy [MJ/ pass.km] (TOTAL)	5,43E-04	2,24E-04	3,54E-02	3,30E-02	6,63E-05	5,59E-07	3,39E-02	3,16E-02
Hydropower	1,87E-04	7,70E-05	1,22E-02	1,13E-02	2,28E-05	5,27E-07	1,25E-02	1,16E-02
Windpower	2,52E-04	1,04E-04	1,64E-02	1,53E-02	3,08E-05	2,38E-08	1,68E-02	1,57E-02
Solar energy	5,78E-05	2,38E-05	3,77E-03	3,51E-03	7,06E-06	3,83E-09	3,86E-03	3,60E-03
NON RENEWABLE RESOURCES CONSUMPTION								
Materials[kg/ pass.km] (TOTAL)	3,60E-04	4,35E-06	2,25E-07	1,86E-10	1,17E-04	2,68E-06	4,84E-04	4,84E-04
Gravel	1,47E-04	2,19E-06	1,33E-10	1,24E-10	9,32E-05	2,31E-06	2,45E-04	2,45E-04
Calcite	7,91E-05	8,59E-07	3,84E-11	3,57E-11	6,50E-06	5,64E-08	8,65E-05	8,65E-05
Iron	4,82E-05	8,91E-07	1,53E-11	1,43E-11	1,38E-05	5,70E-08	6,30E-05	6,30E-05
Energy[MJ/ pass.km] (TOTAL)	6,80E-04	2,80E-04	4,44E-02	4,13E-02	8,30E-05	9,58E-07	4,62E-02	4,17E-02
Coal	1,62E-04	6,69E-05	1,06E-02	9,85E-03	1,98E-05	1,19E-07	1,08E-02	1,01E-02
Nuclear	2,41E-04	9,94E-05	1,57E-02	1,46E-02	2,94E-05	6,13E-07	1,61E-02	1,50E-02
NG Combined Cycle	1,24E-04	5,09E-05	8,06E-03	7,50E-03	1,51E-05	1,07E-07	8,25E-03	7,69E-03
WASTE [kg/ pass.km] (TOTAL)	2,85E-07	3,78E-06	1,45E-12	1,35E-12	7,57E-05	4,86E-06	8,46E-05	8,46E-05
Hazardous	2,11E-07	2,96E-06	1,03E-12	9,58E-13	0,00E+00	2,36E-07	3,41E-06	3,41E-06
Non Hazardous	7,45E-08	8,22E-07	4,22E-13	3,93E-13	7,57E-05	4,63E-06	8,12E-05	8,12E-05
ENVIRONMENTAL IMPACT [/pass.km]								
Global Warming Potential (kg CO2-Eq)	6,83E-04	8,93E-05	6,89E-03	6,43E-03	7,35E-05	2,18E-06	7,74E-03	7,28E-03
Acidifying Potential (kg SO2-Eq)	5,53E-06	4,94E-07	4,67E-05	4,35E-05	5,79E-07	9,20E-09	5,33E-05	5,01E-05
Eutrophication Potential (kg PO4 -3 -Eq)	4,16E-06	4,78E-08	1,00E-05	9,36E-06	1,99E-07	2,09E-09	1,44E-05	1,38E-05
Photochemical Ozone Creation Potential (kg C2H4-Eq)	3,19E-07	2,04E-08	1,82E-06	1,70E-06	3,75E-08	3,38E-10	2,19E-06	2,07E-06
Ozone Depletion Potential (kg CFC-11-Eq)	6,14E-10	1,19E-11	8,01E-10	7,47E-10	2,69E-10	2,68E-13	1,70E-09	1,64E-09

(*) except the use in hydroelectric power generation

The quality of the compiled data has been analysed with a Pedigree Matrix analysis (Pedigree Matrix - Weidema and Suhr Wesnaes, 1996). It has been verified that the quality of the data is "extremely high" in the CAF train assembly process and in the Urbos AXL composition, and it is "high" quality for the environmental assessment basis data.

ENVIRONMENTAL PROFILE OF THE PRODUCT LIFE CYCLE

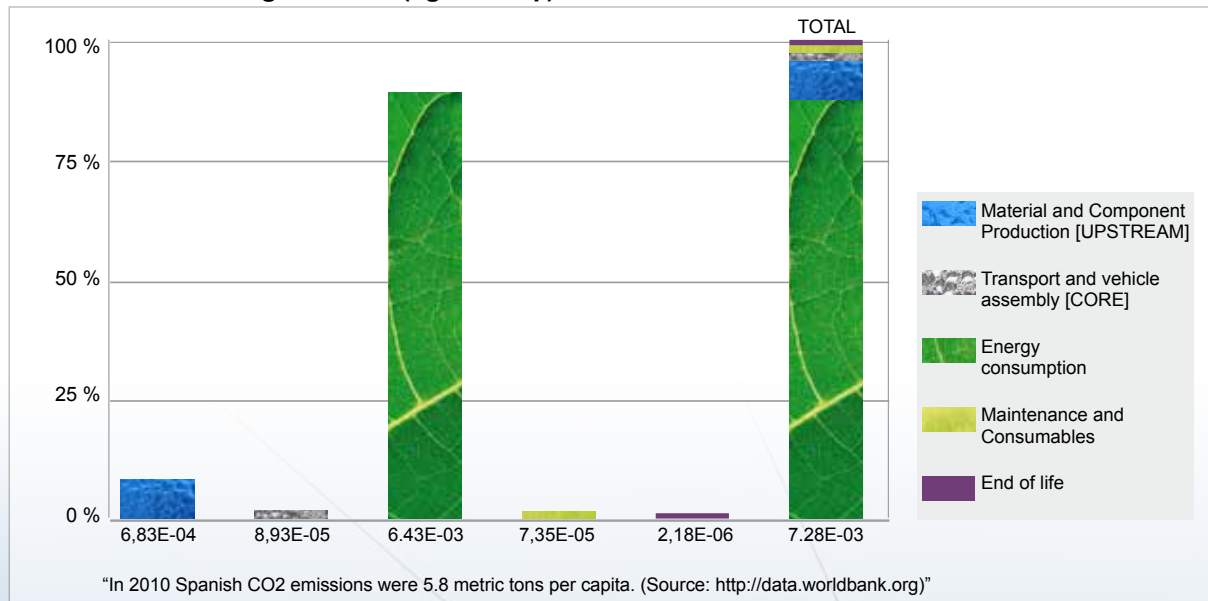
Under a Life Cycle approach, cost and environmental impacts reduction of the operation use have been core targets of the Urbos platform design process. Low specific energy consumption per passenger has been achieved, thanks to the lightness and large capacity of the train, together with a low consumption of maintenance materials, as a result of the reliability and durability of the components, and the modularity and standardisation of the solutions employed.

Consumption during use, particularly energy consumption during the 30 years of operating life, causes the main environmental effects of an Urbos tram, as shown in the adjoining graph which

uses the reference environmental indicator “Global Warming Potential”, for a 100% catenary receptivity scenario.

The ACR on board energy storage system allows for a reduction of energy consumption during operation of the tram and minimises the difference of impacts between the extreme receptivity scenarios. In this way, the tram units fitted with this system are much less sensitive to the availability of the catenary for receiving energy and therefore, the energy consumption during the use stage is less than on vehicles which are not fitted with this technology.

Total Global Warming Potential (kg CO2 eq.)



INFORMATION ABOUT THE ENVIRONMENTAL DECLARATION

This environmental declaration was made following the requirements of the reference document "PCR 2009:05 Version 2.11 Product category rules for preparing an environmental product declaration for Rail Vehicles. UNCPC CODE: 495" published by Environdec (www.environdec.com) and is based on the data of the URBOS 100 tram units for the City of Zaragoza, for all the stages of the product's life cycle (production of raw materials and components, assembly of the vehicle, distribution, use and end of life). The functional unit in this study is the transport of 1 passenger over 1km and the operating life of the vehicle analyzed has been set at 30 years.

The Urbos 100 environmental impact study has been quantified by means of an Life Cycle Analysis in accordance with standards ISO 14040 and ISO 14044. The method of the characterization of the environmental impact of the compiled operating life inventory was CML 2001. Information regarding the materials and production of the vehicle has been obtained directly from the Management Systems of CAF and the information provided by the suppliers themselves. Data from the Ecoinvent database (version 2.0) has been used for the environmental definition of the processes and materials. Those processes not available in Ecoinvent database were generated using first hand data.

For vehicle assembly, the effect of the procurement of materials and components making it up have been considered, as well as

the transport of materials (over 80% of the tram weight) to the assembly plant, the assembly itself, handling of the waste from both the assembly and dismantling of the vehicle and the transport of the vehicle from CAF's Zaragoza plant to Valdesparatera depot during year 2009.

For the environmental impact of the energy consumption during assembly, the 2009 Spanish electricity production mix has been taken into account, with data provided by the Spanish Ministry for Industry. For environmental impact characterization of the energy consumption during use phase an average of 66,500 km per year has been considered and electricity mix supplied for operation during year 2013 has been considered.

The maintenance of the train has been considered for the entire operating life, with inventories for the materials and spare parts of a Life Cycle Cost (LCC) of Urbos 100 study, including operation related consumables, such as traction sand or brake pads, but not those involved in train cleaning operations or passenger waste treatment and disposal.

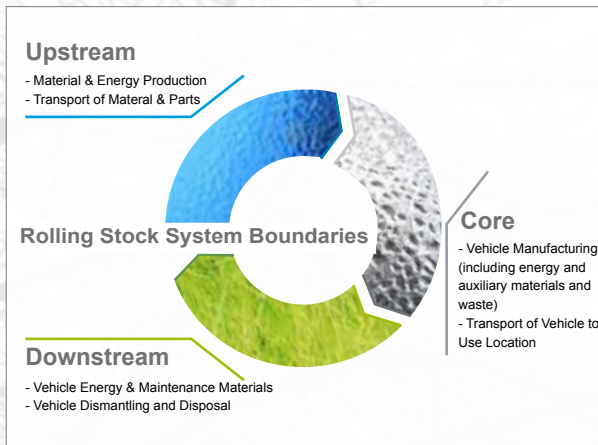
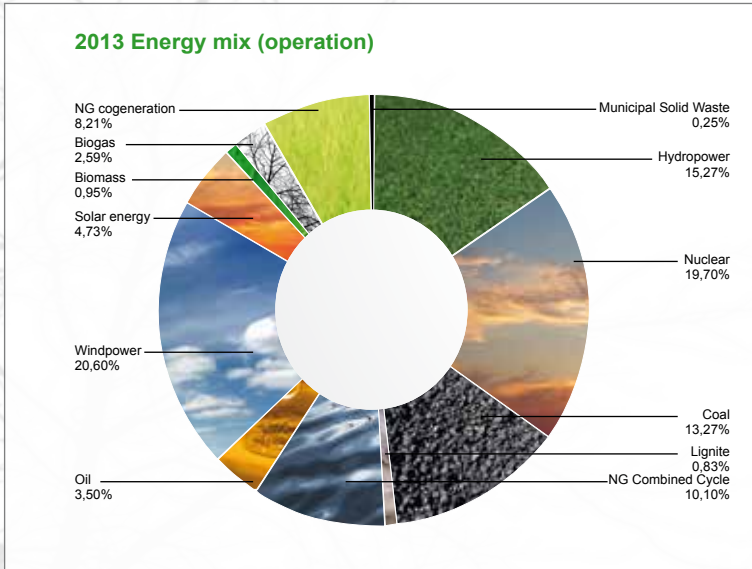
In the end of life, and vehicle dismantling stage, has been modelled according to UNI-LCA-001:00 Railway Rolling Stock - Recyclability and Recoverability Calculation Method (89.4% recyclability / 92.7 % recoverability). The potential advantage of recycling and recovery of the energy from incineration processes has not been accounted for in the study.

Reference Documentation

- ISO14040:2006. Environmental management. Life cycle assessment. Principles and framework.
- ISO14044:2006. Environmental management. Life cycle assessment. Requirements and guidelines.
- ISO 14025:2006 Environmental labels and declarations. Type III environmental declarations. Principles and procedures.
- PCR 2009:05. Product category rules for preparing an environmental product declaration for Rail Vehicles.
- General Programme Instructions for environmental product declarations, EPD, version 2.1
- ISO 22628:2002. Road vehicles. Recyclability and recoverability. Calculation method.
- TecRec 100:001. Specification and verification of energy consumption for railway Rolling stock.
- EN 15663:2009. Railway applications. Definition of vehicle reference masses.
- ISO 3085. Railway applications - Acoustics - Measurement of noise emitted by railbound vehicles.
- Railway Industry Substance List, (www.unife-database.org).
- UNI-LCA-001:00 Railway Rolling Stock - Recyclability and Recoverability Calculation Method.



DEFINITIONS:



Acidification (potential):

Acidification results from the emission of sulphur dioxide and nitrogen oxides. In the atmosphere, these oxides react with the existing steam, forming acids which fall back to the earth in the form of rain or snow, or as dry deposits. Its effect on the earth generally shows itself in the form of reduced forest development and in aquifer ecosystems, such as lakes, acidification is apparent in the disappearance of some living organisms. Other objects such as constructions, monuments and buildings may also be damaged as a result of the effects of acid rain. Acidification potential measures an emitting substance's contribution to acidification expressed in sulphur dioxide equivalents (SO₂).

Eutrophication (potential):

Eutrophication results in the enrichment of water ecosystems with organic compounds and nutrients, which give rise to an increased production of plankton, algae and other water plants with the resulting reduction in water quality. In this case the main sources related to this phenomenon are nitrogen and phosphorous. A secondary effect is the decomposition of dead organic material, a process which consumes oxygen and may result in anaerobic environments. The eutrophication potential, expressing in equivalent PO₄-3, quantifies nutrient enrichment via the release of a substance in water or land.

Global Warming (potential):

Greenhouse effect emissions into the atmosphere absorb some of the infrared solar radiation reflected on the earth's surface resulting in a troposphere temperature increase. The global warming potential is an index, in equivalent kg of CO₂, to measure the global warming contribution of a substance released into the atmosphere in a span of 100 years.

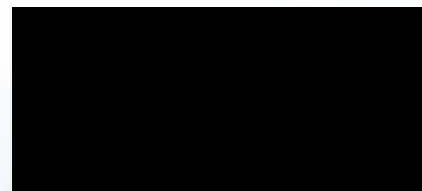
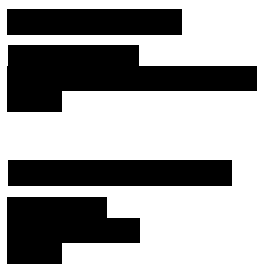
Ozone depletion (potential):

The ozone layer in the atmosphere protects the flora and fauna from harmful ultraviolet radiation from the sun. Some substances emitted into the atmosphere deplete this layer resulting in a higher level of UV radiation on the earth. The ozone layer depletion potential is the contribution of a substance compared with the impact caused by CFC-11.

Ozone photochemical formation/ Photochemical oxidation (potential):

The photo-chemical formation of the ozone in the troposphere is mainly provoked by the decomposition of volatile organic compounds (VOCs) in the presence of nitrogen oxides (Nox) and light. The formation of ozone by means of this process can be quantified by using the so-called ozone photo-chemical formation potentials (POCPs) expressed in equivalent kg of ethane (C₂H₄).





PRODUCTION PLANTS: SPAIN - FRANCE - U.S. - BRAZIL - MEXICO

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Appendix H – Project Decision Making Framework

Decision Making Framework

1.1.1 Introduction

As described in section 8.4 above, a formal decision making process must be adopted for the project to enable all significant project decisions from an early stage to be reviewed against qualitative and quantitative sustainability criteria.

This Significant Decision Making Framework has been developed to define what is considered a “Significant” Project Decision and detail the Projects Decision Making Process.

1.1.2 What is a “Significant Decision”

For the PLR SOM Project, a significant issue is considered to be one that has a substantial implication for project cost, schedule or community/environmental impact.

For the purpose of this framework a Significant Decision to address these issues has been defined as the following:

1. A decision made by, or requiring the endorsement of the Senior Leadership Team (SLT)
2. A Major Design Change (requiring approval of the Senior Engineering Manager or Project Director)
3. Major Departures from Project Requirements or Scope
4. Significant changes to manage risk and/or opportunities

Decisions that may also classify as significant include:

5. Selection of major material types.
6. Financial impacts of greater than \$1 million
7. Have significant impacts on project stakeholders including the community or social impacts.

1.1.3 Multi Criteria Analysis

To assist in identifying preferred options and to inform significant decisions the decision making process will be underpinned by a Multi-Criteria Analysis (MCA) that provides a rapid qualitative assessment of options by incorporating environment, sustainability and economic factors.

The project MCA reviews options against seven assessment criteria divided into four distinct categories, with each category contributing a weighted percentage of the overall score (out of 4). A breakdown of assessment criteria and the contributed weightings is provided below:

Social Impacts (15%)

1. The reliability of the solution (10%)
2. Impact on sensitive receivers or project customers (5%)

Environment and Resources (20%)

3. Environmental Impacts (10%)
4. Resource consumption (10%)

Economic (45%)

- 5. Economic Impacts / Cost

Safety (20%)

- 6. Safety in the Operability / Maintenance of the option (10%)
- 7. Ease / safety in construction of the option (10%)

1.1.4 Decision Making Process

During project delivery the following decision-making process will be undertaken:



1. An issue is identified and presented to the appropriate member of the management team, including but not limited to, the Senior Engineering Manager, Design Managers, Project Director, Construction Manager, Commercial Manager and/or Environment and Sustainability Manager.
2. Scope – Determine whether the identified issue meets the criteria for a significant issue as defined above. Where the issue is not considered significant, no further action taken. If the issue meets the above criteria, proceed to item 3.
3. Options – Determine the options to be considered.
4. Scoring – Score the options using the MCA Sustainability Evaluation Tool.
5. Review and Rank – The MCA will automatically weight the scores. A summary score (out of 4) will be calculated for each component as well as provide an overall score for each option. The model will generate a ranking to indicate which options is the most favourable.
6. Summary and Output - a summary report of the overall score of each option against the relevant sustainability criteria will be recorded for inclusion in the project monthly reporting. Where relevant in design, the summary report will be included in the sustainability in design report for the design package.