Sustainability Management Plan

SMCSWSSJ-JHL-WEC-SU-PLN-000001

Document and Revision History

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0	03/05/2021	Draft Issued for Review	Vereine Masson	Tony Deacy
1	14/03/2022	Updated to include BEW and address Metro comments	Michelle Huang	Thiru Jallendran

Management reviews

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Terms of definitions

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

Terms	Explanation
ASR	Annual Sustainability Report
BCA	Building Code of Australia
BEW	Bankstown Early Works
CBD	Central Business District
CEMF	Construction Environmental Management Framework
CERT	Carbon Estimate and Reporting Tool
CoA	Conditions of Approval
DPE	Department of Planning & Environment
ECMP	Energy and Carbon Management Plan
EIS	Environmental Impact Statement
GHG	Greenhouse Gas
FTE	Full Time Employee
ISC	Infrastructure Sustainability Council
IS	Infrastructure Sustainability
JH	John Holland Group Pty Limited
JHLOR	John Holland and Laing O'Rourke joint venture
Laing O'Rourke	Laing O'Rourke Australia Construction Pty Limited
Minister, the	NSW Minister for Planning
MMP	Materials Management Plan
MSDR	Monthly Sustainability Data Report
NCC	National Construction Code
ODS	ODS Track (web-based submission management framework)
SDGs v4.0	Transport for NSW Sustainability Design Guidelines v4.0
SLC	Sustainability Leadership Committee
SMCSW	Sydney Metro City and Southwest
SWMC	Southwest Metro Corridor works
SME's	Small and Medium sized Enterprises
SMP	Sustainability Management Plan
QSR	Quarterly Sustainability Report
TfNSW	Transport for New South Wales
WMRP	Waste Management and Recycling Plan

1. Introduction

1.1 Purpose and Application

This Sustainability Management Plan (SMP) outlines John Holland and Laing O'Rourke Joint Venture's (JHLOR) approach to managing sustainability requirements during the construction of the Southwest Metro Corridor works (SWMC) and Bankstown Early Works (BEW) as part of the Sydney Metro City and Southwest program of work. Specified sustainability requirements must be met in order to enhance the Project's sustainability performance. Consistent with the Project's Sustainability Policy, the intended outcomes of the SMP with regards to sustainability include:

- enhancement of sustainability performance; and
- fulfilment of compliance obligations; and,
- achievement of sustainability objectives.

The SMP enables the Project to manage sustainability in a systematic manner, and is applicable to the Project, and all of the Project's activities, products and services that the Project determines it can either control or influence considering a life cycle perspective.

2. Context

2.1 Sydney Metro

Sydney Metro is Australia's biggest public transport project.

Services started in May 2019 in the city's North West (Stage 1) with a train every four minutes in the peak. Metro rail Stage 2 will be extended into the CBD and beyond to Bankstown in 2024. There will be new CBD metro railway stations underground at Martin Place, Pitt Street and Barangaroo and new metro platforms under Central Station.

In 2024, Sydney will have 31 metro railway stations and a 66 km standalone metro railway system – the biggest urban rail project in Australian history. There will be ultimate capacity for a metro train every two minutes in each direction under the Sydney city centre.

Sydney Metro City and Southwest project comprises of two (2) core components:

- Chatswood to Sydenham, includes works associated with the Sydney Station Upgrade and
- Sydenham to Bankstown which received planning approval on 19 December 2018. This component includes works associated with the Southwest Metro Corridor works (SWMC) and Bankstown Early Works (BEW). SWMC and BEW will be referred to as "the Project" or 'the works" in this document,

2.2 Understanding the Project's Context

The Project has determined external and internal issues that are relevant to its purpose and that affect its ability to achieve its intended sustainability outcomes. An overview of the key high-level issues that are relevant is provided below.

2.2.1 Key High-Level Issues

Key external cultural, social, political, legal, regulatory, financial, technological, economic, natural and competitive circumstances are detailed in this section.

The client is Sydney Metro, a Transport for NSW project. Transport for NSW are a state government department whose role is to lead the development of a safe, efficient, integrated transport system in NSW. Their culture and values include;

- Customer focus – placing the customer at the centre of everything they do
- Collaboration – valuing each other and creating better outcomes by working together
- Integrity – taking responsibility and communicating openly
- Safety – prioritising safety for their people and customers
- Solutions – delivering sustainable and innovative solutions to meet NSW's transport needs

Subsequently, Sydney Metro's guiding principles embed sustainability commitments to the community, customers, and key partners (government and industry), these are seen in Figure 1 below:

Figure 1. Sydney Metro's six guiding principles

- Sydney Metro's Sustainability Strategy for Stage 2 states 'sustainability' means optimising environmental and social outcomes, transport service quality, and cost effectiveness.
- The Southwest Metro Corridor Works (SWMC) and Bankstown Early Works (BEW) form a subsection of the second stage of the Sydney Metro program.
- The client has budgeted approximately $227M for SWMC and it is scheduled for completion in December 2022.
- The client has budgeted approximated $25M for BEW and is scheduled for completion in June 2022.
- The Project is located on the T3 Bankstown line between Sydenham Station and Bankstown (Stacey Street) and at Bankstown Station as detailed in Figures 3, 4 and 5 in Section 2.4. Works will predominately occur within the rail corridor, with limited activities occurring within station precincts. Major station precinct works will be undertaken by other Principal Contractors.

2.2.2 Structure and interface with other management plans

The Sydney Metro Sustainability Framework illustrated in Figure 2 below shows how the project-wide Sustainability objectives, targets and initiatives were developed and how they interface with the SWMC and BEW specific targets and initiatives, contract requirements and this Sustainability Management Plan and sub-plans.

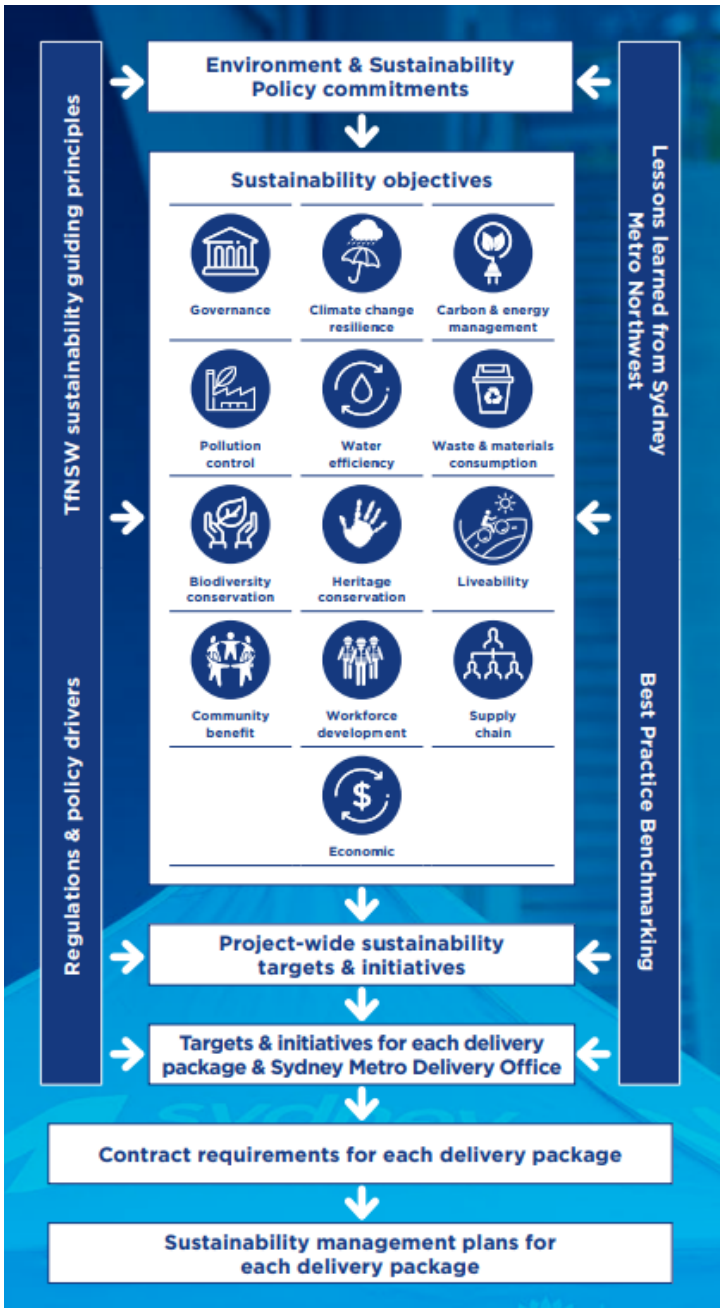


Figure 2. Sydney Metro Sustainability Framework

- Extracted from Sydney Metro's Sustainability Strategy for Stage 2, the project-wide sustainability objectives can be seen in Table 1 below:

Table 1. Sydney Metro Sustainability objectives (source: Sydney Metro City & Southwest Sustainability Strategy 2017 - 2024, 2019 update)

SUSTAINABILITY THEMES & OBJECTIVES	
Governance	› Demonstrate leadership by embedding sustainability objectives into decision making. › Demonstrate a high level of performance against objectives and appropriate benchmarks. › Be accountable and report publicly on performance.
Carbon & energy management	› Improve the shift toward lower carbon transport. › Reduce energy use and carbon emissions during construction. › Reduce energy use and carbon emissions during operations. › Support innovative and cost effective approaches to energy efficiency, low-carbon / renewable energy sources and energy procurement.
Environmental performance	› Reduce sources of pollution and optimise control at source to avoid environmental harm. › Comply with environmental obligations outlined in applicable project planning approvals.
Climate change resilience	› Infrastructure and operations will be resilient to the impacts of climate change.
Resources – water efficiency	› Minimise use of potable water. › Maximise opportunities for reuse of rainwater, stormwater, wastewater and groundwater.
Resources – waste & materials	› Minimise waste through the Project lifecycle. › Reduce materials consumption. › Consider embodied impacts in materials selection. › Maximise beneficial reuse of spoil.
Biodiversity conservation	› Protect and create biodiversity through appropriate planning, management and financial controls.

SUSTAINABILITY THEMES & OBJECTIVES

Heritage conservation	› Protect and promote heritage through appropriate design, planning, and management controls.
Liveability	› Promote improved public transport patronage by maximising connectivity and interchange capabilities. › Provide well-designed stations and precincts that are comfortable, accessible, safe and attractive.
Community benefit	› Make a positive contribution to community health and well-being. › Ensure community and local stakeholder engagement and involvement in the development of the Project. › Contribute to the delivery of legacy projects to benefit local communities. › Create opportunities for local business involvement during the delivery and operations phases. › Optimise community benefit of residual land development. › Minimise negative impacts on the community and local businesses during construction and operation.
Supply chain	› Influence contractors, subcontractors and materials suppliers to adopt sustainability objectives in their works and procurement.
Workforce development	› Increase opportunities for employment of local people, participation of local businesses, and participation of SME's. › Enable targeted and transferable skills development which resolves local and national skills shortages, supports industry to compete in home and global markets, and embeds a health and safety culture within all induction and training activities, promoting continuous improvement. › Increase workforce diversity and inclusion, targeting indigenous workers and businesses, female representation in non-traditional trades, and long term unemployed. › Inspire future talent and develop capacity in the sector, engaging young people via education and work experience, collaborating with higher education institutions to provide programs responding to rapid transit and other infrastructure requirement, and supporting vocational career development through apprenticeships and traineeships.
Economic	› Consider adopting a whole-of-life costing model to maximise sustainability benefits. › Optimise development opportunities for residual land. › Capture sustainability benefits in the business case for the project.

- Extracted from Sydney Metro's Sustainability Strategy for Stage 2, the project-wide sustainability targets and initiatives can be seen in Table 2 below:

Table 2. Sydney Metro Sustainability objectives and targets (source: Sydney Metro City & Southwest Sustainability Strategy 2017 - 2024, 2019 update)

SUSTAINABILITY THEMES & TARGETS	
Governance	› A high level of attainment (minimum ISCA IS Rating of 65 'Excellent') for relevant infrastructure. › 5 Star Green Star ratings for relevant buildings. › Align with a high rating using the TfNSW Sustainable Design Guidelines.
Carbon & energy management	› Achieve at least a 20 per cent reduction in carbon emissions associated with construction, when compared to business as usual.* › Offset 25 per cent of the electricity needs for the construction phase of the project. › Achieve at least a 20 per cent reduction in carbon emissions associated with operations, when compared to business as usual.* › Maximise the capture and reuse of energy generated from braking trains. › Design buildings (stations and stabling buildings) to achieve at least a 15 per cent improvement over performance requirements set out in Section J of the National Construction Code. › Source 5-20 per cent of the low voltage electricity required at above ground stations from onsite renewable energy sources where feasible. › Offset 100 per cent of the electricity needs for the operational phase of the project.
Environmental performance	› Zero major pollution incidents. › New emission standards will be identified and applied to diesel equipment and vehicles during construction.
Climate change resilience	› Mitigate all extreme and high level risks. › Mitigate a minimum of 25 per cent of medium level risks (examples include increased flooding, increased temperatures, sea level rise, and increased storm events).
Resources – water efficiency	› Reduce water use by at least 10 per cent compared to business as usual.* › Source at least 33 per cent of the water used in construction from non-potable sources. › Source at least 33 per cent of the water used in operations from non-potable sources. › Implement rainwater harvesting and reuse systems at construction sites and feasible above ground stations.

SUSTAINABILITY THEMES & TARGETS	
Resources – waste & materials	› Reduce the environmental footprint of materials used on the project by at least 15 per cent compared to business as usual.* › Use concrete which has an average Portland cement replacement level of more than 25 per cent. › 100 per cent beneficial reuse of usable spoil. › Recycle or reuse 90 per cent of recyclable construction and demolition waste. › Recycle or reuse 60 per cent of office waste during the construction phase. › Recycle or reuse 80 per cent of the waste generated during operations. › Recycle or reuse 65 per cent of office waste during operations. › 60 per cent of reinforcing steel is produced using energy-reducing processes in its manufacture. › Source 100 per cent reused, recycled timber or responsibly sourced timber.
Biodiversity conservation	› Minimise vegetation clearing. › Native landscaping targets to be established.
Heritage conservation	› Prepare a Heritage Strategy, including stakeholder engagement with relevant stakeholders. › Implement the Heritage Strategy during design and delivery, to conserve and activate. › Maximise opportunities for archaeological research and future interpretation of archaeological finds. › Opportunities for heritage interpretation identified and implemented at appropriate station precincts.
Liveability	› Station interchanges designed in accordance with the Interchange Access Plans and modal hierarchy. › Stations and precincts designed in accordance with the Sydney Metro Design Guidelines. › Promote access by cycling, through provision of bicycle parking, and safeguard for future expansion of bicycle facilities.
Community benefit	› Implement initiatives which will provide tangible benefits to local community groups during the construction period. › Implement initiatives which will provide tangible benefits to the broader local community beyond the construction period. › Identify key drivers for affordable housing and work with other lead agencies to identify opportunities and develop an appropriate response.
Supply chain	› All principal contractors develop and implement sustainable procurement strategies.
Workforce development	› Refer to the Sydney Metro City & Southwest Workforce Development and Industry Participation Strategy, which is a separate document to be read in conjunction with this strategy and outlines priorities, objectives and targets to address workforce development.

* Note: 'Business as usual' (BAU) is defined as that which is used in the applicable rating scheme for the respective target (e.g. ISCA Rating Tool, Green Star and TfNSW CERT).

2.3 Needs and Expectations of Interested Parties

The Project has determined the interested parties that are relevant to the Project; the relevant needs and expectations of these interested parties, and which of these needs and expectations become its compliance obligations with regards to sustainability.

Substantial ongoing effort will be made to manage the Project's understanding of the needs and expectations of Interested Parties, further detail can be found in the Interface Management Plan (SMCSWSSJ-JHL-WSS-IF-PLN-000019) and the Community Communications Strategy (CCS) (SMCSWSSJ-JHL-WSS-CL-PLN-000023). A high-level overview of the most relevant parties is provided in the table below.

Table 3. SWMC and BEW interest parties' needs and expectations

Interested Party	Needs and Expectations
Transport for NSW	Environment and Sustainability Policy Environment and Sustainability Framework Sustainable Design Guidelines v4.0
Sydney Metro	Environment and Sustainability Policy Sustainability Strategy Contract documents
Parent Companies	Policies Systems Procedures
Infrastructure Sustainability Council of Australia (V1.2)	Technical Manual V1.2
Neighbours	Good neighbours
Travelling Public	Uninterrupted travel
Rail Operators	Defined within contract documents
Other Contractors	Defined within contract documents
Local Government and Utilities	Defined within contract documents

2.4 Project Scope

The SWMC and BEW projects are as described in the Scope of Works and Technical Criteria (SWTC) in the Third and Fourth Amendment Deed consecutively.

2.4.1 South-West Metro Corridor (SWMC) Works (Third Amendment Deed)

A brief overview is provided below for information only. The Southwest Metro Corridor works include the design and construction of:

- a new combined service route (CSR) for Sydney Metro City & Southwest systems between Sydenham and Bankstown, excluding areas installed under the Southwest Corridor Conversation Enabling Works and at each Station and Traction Substations
- Local route connections from the CSR to trackside equipment, including the installation of footings and foundation

- the replacement of 2 existing crossovers and the installation of 1 new crossover at Campsie, including all associated signalling systems and OHW adjustments
- adjustments to Overhead Wiring Structures (OHWS) within the Bankstown and ARTC corridors
- 3No track hi-rail pads and associated access roads
- the relocation of existing Sydney Trains signalling and communications systems clear of affected Stations and Traction Substations
- Security and segregation fencing along the Bankstown Corridor
- various civils and enabling works, including retaining walls, ballast retention walls, local drainage and culvert refurbishment,
- works to repair, refresh and update bridges including the addition or upgrade of vertical protection screens, safety screens, railings to the following overbridges;
    - Livingstone Road
    - Albermarle Street
    - Melford Street
    - Loch Street
    - Moreton Street
    - Stacey Street
- the following underbridges;
    - Meeks Road dive
    - Charlotte Avenue
    - Ness Avenue
    - Foord Avenue
    - Charles Street
    - Wairoa Street
    - Belmore Oval
- And the following footbridges;
    - Church Street
    - Duke Street
- temporary site facilities required for design and construction of the Works;
- temporary arrangements for people and vehicles to safely access all property, including publicly accessible space affected by the Contractor's Activities;
- temporary infrastructure, safety screens and ground support installed or erected to undertake design and construction of the Works;
- temporary arrangements for Utility Services including water, electricity, stormwater, sewerage, gas and electronic communications;
- temporary works and measures required as a consequence of requirements arising from the stakeholder and community liaison process; and

- all other temporary works and measures required for the construction of the Works.

The South West Metro Corridor work location and site layout is highlighted in Figure 3 and 4 below.

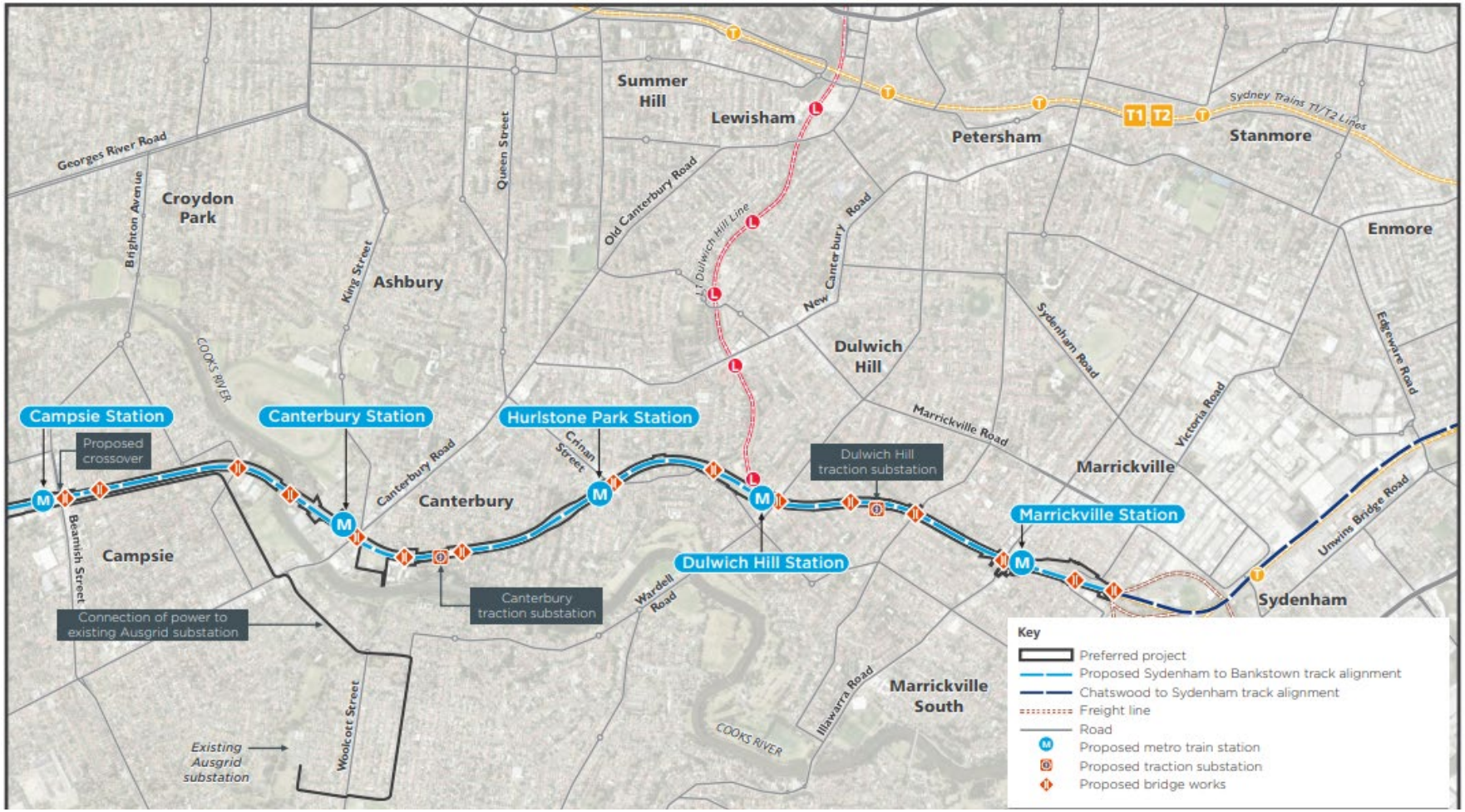


Figure 3. Site Layout (source: Sydney Metro City & Southwest - Sydenham to Bankstown - Submissions and Preferred Infrastructure Report, 2018)

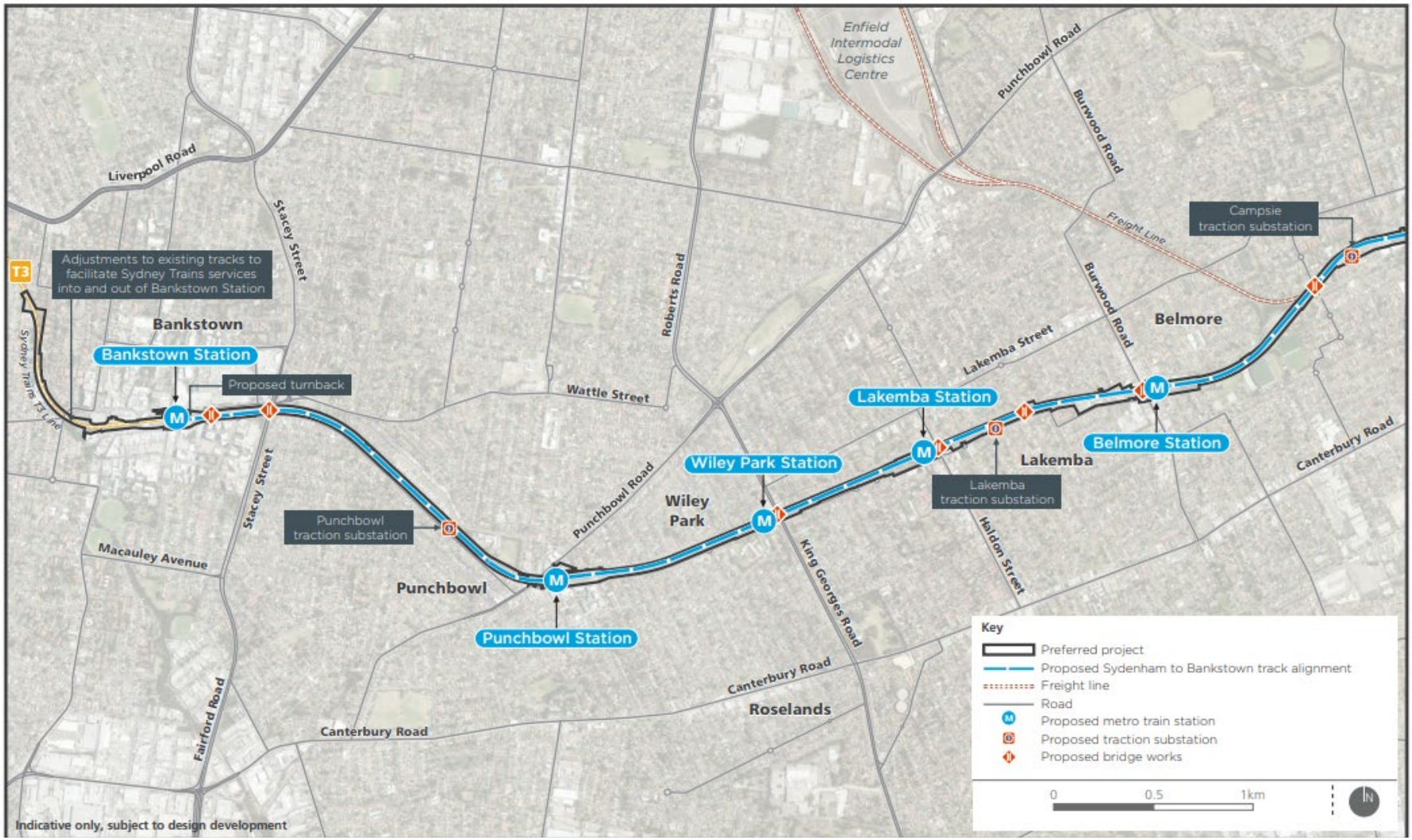


Figure 4. Site Layout (source: Sydney Metro City & Southwest - Sydenham to Bankstown - Submissions and Preferred Infrastructure Report, 2018)

2.4.2 Bankstown Early Works (BEW) (Fourth Amendment Deed)

The Bankstown Early Works (BEW) includes the following construct only scope at Bankstown Station:

- Construction of new Sydney Metro platforms (DOWN side only) to accommodate 6 car trains sets
- Installation of new Metro CSR (including GST and ULX)
- Bankstown Station Service Building construction, including MEP fitout
- Removal of existing rail crossover 360 and associated signalling equipment
- OHW&S – install new and remove redundant assets
- Utilities relocation and protection works
- Civil, drainage, earthworks
- Excludes: Track slab, track realignment, architectural finishes and fixtures to Metro platform (i.e. structural elements only).

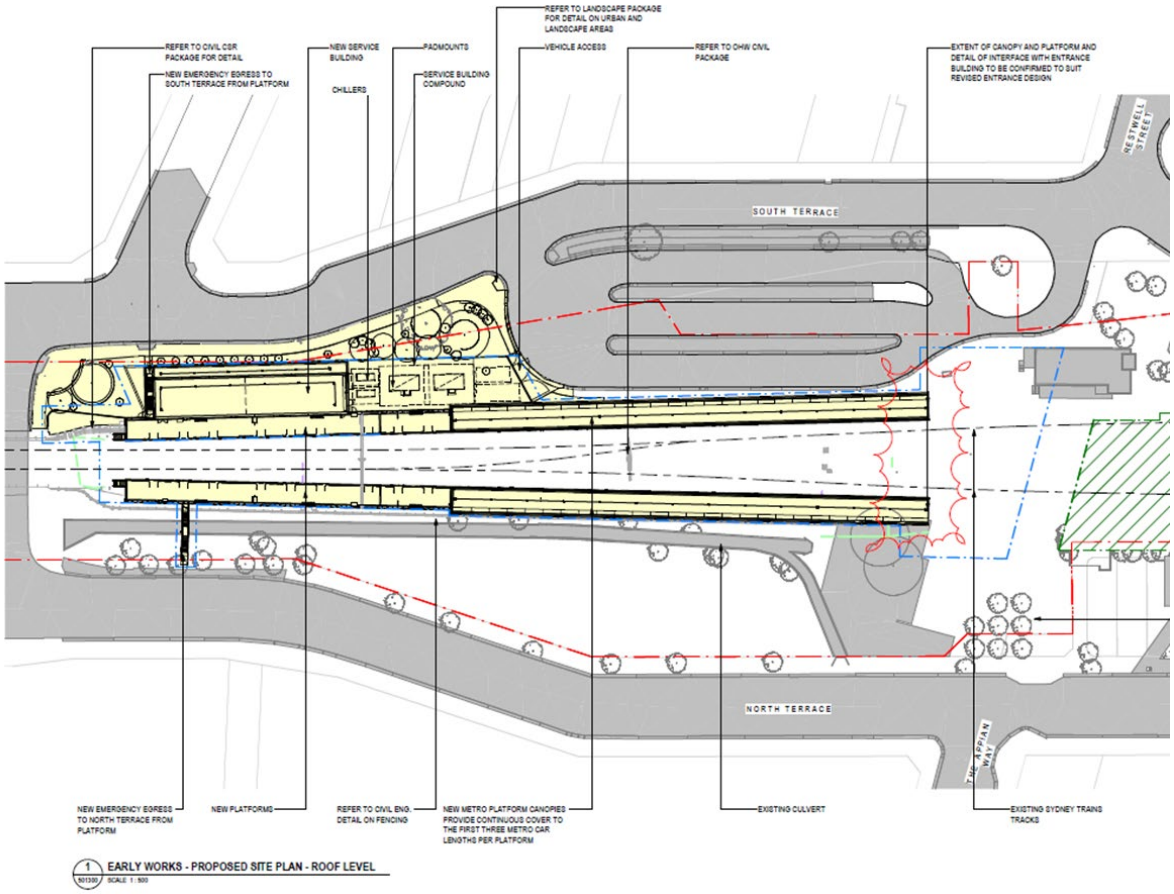


Figure 5. Bankstown Early Works scope (source: Metro T2M – Bankstown Station Design & Precinct Plan – Sydney Metro Southwest Metro Design Services, 2021)

3. Leadership

3.1 Sustainability Leadership Committee

A Sustainability Leadership Committee (SLC) will be established on the project. Membership will include Metro's Sustainability Leads, the Project Director, Project Manager, Commercial/Procurement Manager, Design Manager, Environmental Manager, Construction Manager, Community and Stakeholder Engagement Manager, Workforce Development Manager, and the Sustainability Manager.

The SLC will meet on a regular basis to demonstrate leadership and commitment with respect to sustainability by:

- Taking accountability for the effectiveness of the Project's approach to sustainability
- Ensuring that the sustainability policy and objectives are established and are compatible with the strategic direction and the context of the Project
- Ensuring the integration of sustainability requirements into the Project's processes
- Identifying opportunities for best practice, and the mechanisms by which they can be delivered
- Ensuring that the resources needed for sustainability are available
- Communicating the importance of effective sustainability management and of conforming to the requirements
- Ensuring that the Project achieves its intended outcomes
- Directing and supporting persons to contribute to the effectiveness of sustainability efforts
- Promoting continual improvement; and,
- Supporting other relevant management roles to demonstrate their leadership as it applies to their areas of responsibility.

3.2 Sustainability Policy

Project management have written a Sustainability Policy for the Project. It provides a framework for the objectives that have been set in this SMP and includes a commitment to going beyond the mitigation of negative impacts to restorative actions (i.e. net positive benefits for society and the environment) and also to sustainable procurement.

The Project Sustainability Policy supports the Metro Environment and Sustainability Policy. For further information on the Project Sustainability Policy and Metro's Environment and Sustainability Policy see Appendix A.

3.3 Project Roles, Responsibilities and Authorities

Project management ensure that the responsibilities and authorities for relevant roles are assigned and communicated within the Project.

Sustainable infrastructure cannot be delivered by one person or one discipline, it requires a multidisciplinary approach underpinned by collaboration. On the Project the following roles are critical to sustainability:

Table 4. Critical roles and responsibilities within JHLOR

Role	Responsibility
Project Director	Overall responsibility and authority for; • ensuring that the management of sustainability conforms to the requirements of this SMP • reporting on the performance of the Project with regards to sustainability, to top management and interested parties
Sustainability Manager	IS Assessor Day to day responsibility and authority for; • ensuring that the management of sustainability conforms to the requirements of this SMP • reporting on the performance of the Project with regards to sustainability to project management As per the applicable compliance obligations, the Sustainability Manager must; • possess a recognised qualification relevant to the position and the SWMC Contractor's Activities and have recent relevant experience in sustainability management on projects similar to the Project Works; • have at least five years' sustainability management experience in the design and construction of sustainable infrastructure or buildings; • be available as the Principal's Representative's primary contact with the SWMC Contractor on sustainability matters; • be responsible for and have the authority to develop and implement the Sustainability Management Plan; and • be engaged throughout the execution of the SWMC Contractor's Activities and be on or around the Site during the construction phase of the Project Works and Temporary Works with responsibilities limited to sustainability management of the SWMC Contractor's Activities.
Sustainability Co-ordinator	IS Assessor Dedicated to assisting the Sustainability Manager fulfil their duties, must; • have at least two years' sustainability management experience in the design and construction of sustainable infrastructure or buildings
Commercial Manager	As per the Sustainability Manager, but with a focus on commercial and procurement matters.
Design Manager	As per the Sustainability Manager, but with a focus on design matters
Construction Manager	As per the Sustainability Manager, but with a focus on construction matters
Environmental Manager	As per the Sustainability Manager, but with a focus on environmental matters
Community and Stakeholder Engagement Manager	As per the Sustainability Manager, but with a focus on community and stakeholder matters
Workforce Development Manager	As per the Sustainability Manager, but with a focus on workforce development matters

Also noteworthy are critical roles undertaken by personnel external to the JHLOR JV. They have been identified as key facilitators which the Project will proactively seek to work with, they are detailed in the table below.

Table 5. Critical roles and responsibilities by personnel external to JHLOR

Role	Responsibility
Metro Project Leaders	Overall responsibility and authority for; • ensuring that the Project's management of sustainability conforms to Metro's requirements • reporting on the performance of the Project with regards to sustainability, to Metro's top management and interested parties
Metro Sustainability Leads	Day to day responsibility and authority for; • ensuring that the Project's management of sustainability conforms to Metro's requirements • reporting on the performance of the Project with regards to sustainability, to Metro's top management and interested parties
Independent Certifier	Responsibility and authority for certifying compliance with all applicable sustainability compliance obligations
Metro Technical Specialists	Day to day responsibility and authority for; • ensuring that the Project's management of sustainability (including in relation to their areas of expertise) conforms to the technical requirements of Metro (e.g. concrete structures)

4. Planning

4.1 Risks and Opportunities

The Project Team have determined the sustainability risks and opportunities associated with its activities, products and services that it can control and those that it can influence, and their associated impacts, considering a life cycle perspective.

The Project has determined those aspects that have or can have a significant impact, by using established criteria. Comprehensive information has been consolidated within the Project's Risk and Opportunity Register prepared in accordance with the Risk Management Plan.

Sustainability opportunities are also documented within a stand-alone Sustainability Opportunities Register (see Appendix D for an excerpt).

Effectively managing opportunities is central to achieving sustainable outcomes. It is typically the management of opportunities, rather than risks, that allow compliance benchmarks to be surpassed and best practice to be achieved. In order to do this the Project has leveraged recent experience from other successful projects Laing O'Rourke and John Holland have been involved in. These relevant projects include:

- John Holland's NorthLink WA Southern Section project for Main Road Western Australia as part of the $1.2bn NorthLink WA Program. This project achieved a Leading IS Design rating of 93 (version 1.2) and in doing so achieved a number of firsts, all of which stemmed from effectively and proactively managing sustainability opportunities;
- Laing O'Rourke Fulton Hogan and AECOM in an alliance with Public Transport Victoria, Metro Trains Melbourne and Vic Roads delivered the Bayswater Level Crossing Removal Project. The project received a 'Leading' IS Design Rating with an unprecedented score of 93.5 out of 110, and set a new industry benchmark in sustainable delivery.
- CPB Contractors John Holland Dragados Joint Venture for the $1.15bn Sydney Metro Northwest Tunnel and Stations Civil Works project, which achieved a Leading IS As-Built Rating of 92 (version 1.2), the highest As-Built rating achieved to date

4.1.1 Climate Change Risk Assessment

The Project has undertaken a preliminary climate change risk assessment in respect of the Works in accordance with the guidance and requirements included in the TfNSW Climate Risk Assessment Guidelines 2016, the Infrastructure Sustainability Council of Australia's IS Rating Tool Technical Manual V1.2 – Climate Change Adaptation chapter and TfNSW Sustainable Design Guidelines v4.0 – TfNSW Climate Risk Assessment Guideline SD-081. The risk assessment will be reviewed and updated throughout the design and is used as an input to inform the Design Work. Climate change risks and adaptation will be documented in the Design Documentation submitted to the Principal's Representative at Design Stage 1, 2 and 3.

The climate change projections and guidance used to underpin the climate change risk assessment is the most recent available and is consistent with industry best practice, including NWRLSRT-PBA-SRT-SU-REP-000022 Sydney Metro – City & Southwest Technical Services Climate Resilience Report.

The Project has also identified and described in the Design Documentation, climate change initiatives which demonstrate that the Works have been designed to combat and be resilient to the effects of climate change during each Design Stage have included measures to mitigate:

Table 6. Climate Change Risk mitigation targets

SWMC	BEW
All climate change risks classified as “extreme” and “high”	
At least 25% of all climate change risks classified as “medium”	At least 50% of all climate change risks classified as “medium”

See the Design Management Plan (SMCSWSSJ-JHL-WSS-DM-PLN-000206) and T2M Draft Sustainability Design Report (Teambinder mail reference SMCSWSSJ-SMD-SSJ-SMD-GEN-000849) for more information.

4.2 Compliance Obligations

The Project has determined the compliance obligations related to sustainability, determined how these obligations apply, and taken these compliance obligations into account when establishing and updating this SMP.

The key project sustainability compliance obligations are derived from the following contract documents:

Table 7. Key Sustainability compliance obligation documents

SWMC	BEW
Scope of Works and Technical Requirements (SWTC Appendix B7)	Scope of Works and Technical Requirements (SWTC Appendix F08)
Management Requirements – Sustainability (MR-Sy) (3rd Amendment)	N/A
Construction Environmental Management Framework (CEMF)	
Revised Environmental Management Measures (REMMs)	
Planning Approval – Conditions of Approval (CoA)	
Environmental Protection License (EPL)	

A full register of compliance obligations are included in Appendix E for SWMC and Appendix F for BEW.

4.3 Objectives

The Project has established sustainability objectives, taking into account risks and opportunities and compliance obligations. The primary sustainability objectives are detailed below:

- Excellent IS As-built rating (55 points) for SWMC

- Gold SDG Rating for BEW (achieve a total score between 245 and 289 as per Table 6 in the TfNSW SDG v4.0 – see Figure 5 below)

Table 6: Requirements to achieve Sustainable Design Guidelines rating

Rating	Percentage of points
Pass	All applicable P1 performance level requirements must be met.
Bronze	All applicable P1 performance level requirements and minimum 85% of the total applicable points in the P2 column.
Silver	All applicable P1 performance level requirements and minimum 85% of the total applicable points in the P3 column.
Gold	All applicable P1 performance level requirements and minimum 85% of the total applicable points in the P4 column.
Platinum	All applicable P1 performance level requirements and minimum 85% of the total applicable points in the P5 column.

Figure 5. TfNSW SDG v4.0 document, Table 6: Requirements to achieve SDG rating

The project will aspire to significantly exceed the minimum stipulated score by achieving an 'As built' rating score of 65 using the IS rating tool v1.2, or any equivalent level of performance using a demonstrate equivalent rating tool, as per Condition E42 of SSI 8256. Supporting the IS As-Built rating and SDG v4.0 rating objectives are several more specific minimum targets. Details on these targets are available in Appendix B. These objectives and targets have been designed to encompass and exceed similar sustainability obligations detailed elsewhere within the contract documents. This has been done to rationalise the number of objectives which the project needs to report against.

4.4 Planning Action

The Project has planned to take actions to address sustainability risks and opportunities, its compliance obligations, and its objectives. The Project has determined what will be done, what resources will be required, who will be responsible, when it will be completed and how the results will be evaluated. Supporting this is a Sustainability Action Plan which will be completed by all subcontractors within 4 weeks of subcontract award.

Actions to mitigate risks and opportunities have been planned in accordance with the Risk Management Plan (SMCSWSSJ-JHL-WSS-RM-PLN-000010). Actions to attend to sustainability opportunities are documented and planned within a Sustainability Opportunity Register (see Appendix D for an excerpt). This Register is a key item reviewed within regular sustainability leadership committee meetings.

Actions to attend to compliance obligations have been planned and documented in a Requirements Analysis Allocation and Traceability Matrix (RVTM) for the project (the RVTM is a single integrated system used to log requirements from both contractual documents and the outputs of service or solution engineering activities) (see Appendix D for an excerpt).

Actions to attend to objectives are being planned and documented within ODS Track, a web-based document and submission management framework for all deliverables associated with the IS Rating. It is specifically designed to assist in the management of the large number of deliverables that accompany a submission for a sustainability rating. ODS Track has been tailor made for situations where deliverables must be requested from multiple parties and allows what, when, who and how to be defined for each deliverable (see Appendix G for an excerpt). ODS Track is a key item reviewed within regular sustainability leadership committee meetings.

Note, all registers/trackers detailed within this section are live documents that are regularly reviewed and adapted as new information comes to hand. Where possible registers/trackers centralise information from multiple management plans, removing duplication and providing improved flexibility, increased efficiency, performance, and outcomes.

More detailed planning information is also provided in relation to materials, energy and waste in sub-plans;

- Material Management Plan (SMCSWSSJ-JHL-WEC-SU-PLN-000003)
- Energy and Carbon Management Plan (SMCSWSSJ-JHL-WEC-SU-PLN-000004)
- Waste and Recycling Management Plan (SMCSWSSJ-JHL-WEC-SU-PLN-000002)

Similarly, applicable sustainability actions have also been integrated into the following Project plans;

- Contract Management Plan
- Interface Management Plan
- Risk Management Plan
- Procurement Plan
- Engineering Management Plans
- Environmental Management Plans
- Construction and Site Management Plan
- Community Communications Strategy
- Workforce Development Plan
- Interface Management Plan
- Design Management Plan

5. Implementation

5.1 Resources

The Project has determined and made provision for the resources needed for the establishment, implementation, maintenance and continual improvement of the sustainability management system on the Project. Key human resources have been allocated as per Section 3 Roles, Responsibilities and Authorities.

5.2 Competence and Awareness

The Project :

- Use Training Needs Analysis to determine the necessary competence of persons doing work under its control that affects its materials performance and its ability to fulfil its compliance obligations;
- Obtain records of suitable education, training, experience and verification of competency to ensure that these persons are competent on the basis of appropriate education, training or experience;
- Determine any further training needs associated with sustainability;
- where applicable, take actions to acquire the necessary competence, and evaluate the effectiveness of the actions taken

The Project ensures, via the Project Induction, Tool Box Talks and Pre-Start Meetings (or similar) that persons doing work under the Projects control are aware of the:

- sustainability policy.
- the significant issues and related actual or potential impacts associated with their work in relation to sustainability.
- their contribution to the effectiveness of sustainability management, including the benefits of enhanced sustainability performance.
- the implications of not conforming with the sustainability management requirements, including not fulfilling the organisation's compliance obligations

5.3 Knowledge Sharing

Effective and ongoing sustainability knowledge sharing has occurred within the Project team and with the client, supply chain and parent organisations during the tender and target costing phases. Knowledge sharing continues post-award with these and other key stakeholders and wider industry.

Knowledge sharing takes many forms: informal and formal, spoken and written. It is encouraged at all times, and involves the sustainability leadership committee, facilitated workshops and regular meetings in order to foster mutually beneficial relationships with key stakeholders and subject matter experts.

Knowledge sharing is undertaken in a timely and targeted manner to enable enhanced outcomes to be achieved. While the knowledge sharing process is ongoing, critical junctures are identified below;

- Stakeholder engagement
- Design management
- Procurement
- Construction planning

See the Interface Management Plan (SMCSWSSJ-JHL-WSS-IF-PLN-000019) and the Community and Stakeholder Engagement Plan (SMCSWSSJ-JHL-WSS-CL-PLN-000023) for further information.

5.4 Decision Making

JHLOR ensures that decision making in relation to significant issues* is characterised by:

- A consideration of options including business-as-usual and other proven approaches taken in comparable situations.
- An evaluation of options that considers environmental, social and economic aspects through multi-criteria analysis or other scored means
- An evaluation of options based on the useful forecast life of the infrastructure asset (i.e. 100-year design life).

*The most significant decisions have been made during earlier phases (i.e. planning and tendering and community engagement). These decisions had wide-ranging ramifications for many other economic, social and environmental issues, including those that were most commonly raised within submissions to the EIS, they are listed below in order of total number of issues raised:

- Traffic, Transport and Access
- Noise and Vibration
- Heritage
- Social Impact
- Business Impact
- Landscape and Visual Impact
- Hydrology, Flooding and Water Quality
- Biodiversity

During design, options were developed by Metro (TfNSW), Arcadis and others. These options were reviewed by TfNSW and the preferred option has now been contracted for delivery. Where possible, Metro and Arcadis will assist with the provision of evidence that these significant decisions were evaluated by considering environmental, social and economic aspects by incorporating their value into cost-benefit analysis.

During the delivery of the Project, significant design and construction issues will be identified. Significant issues are defined as issues that have an impact upon the following aspects:

- Departures from the design
- Cost efficiency
- Product performance
- Program efficiency
- Environmental outcomes
- Stakeholder impacts
- Social outcomes (community, workforce, diversity).
- Customer satisfaction.
- Reputation.
- Safety.

Once these significant issues have been identified, they will be analysed against other options as described above through the utilisation of an MCA (See Appendix C).

Generally, when determining what opportunities (derived from knowledge sharing activities) to include, the following question applies:

- Will undertaking the opportunity reduce capital expenditure and comply with applicable requirements?

Where the answer is ‘yes’, the opportunity will typically be included automatically. Other opportunities that may require additional expenditure, or modification/relaxation of applicable requirements are considered for inclusion based on the following questions (a consensus on the answers to these questions will generally be sought during SLC or other appropriate workshops):

- Will undertaking the opportunity reduce whole-of-life cost or impacts?
- Will undertaking the opportunity attend to a material risk or opportunity for the Project, the client or other stakeholders?

Accordingly, once decision making in relation to opportunities has occurred, the opportunities’ status is updated in the Opportunity Register (Appendix D) as either ‘Included’ or ‘Abandoned’. If the answers to the relevant questions are unclear, the opportunity status will remain 'Under consideration' and further information will be sought.

6. Performance Evaluation

6.1 Monitoring Measurement and Analysis

The Project team shall monitor, measure, analyse and evaluate its sustainability performance. The Project undertakes weekly sustainability inspections during construction.

Additional monitoring (e.g. materials, energy, water and waste) is also undertaken in accordance with the applicable compliance requirements, including in relation to:

- Overdue sustainability deliverables
- No. of sustainability initiatives 'included', 'under consideration' or 'abandoned'
- Electricity usage
- Renewable energy generation
- Greenhouse gas emissions
- Carbon Emissions Reporting Tool (CERT)
- National Greenhouse and Energy Reporting (NGERs)
- Fuel consumption
- Waste
- Spoil
- Steel
- Concrete
- Aggregate
- Portland cement replacement
- Paints and Adhesives
- VOCs
- Water consumption
- And more…

6.2 Reporting

The Project shall evaluate its sustainability performance. The Project communicates relevant sustainability performance information both internally and externally, as identified in its communication processes and as required by its compliance obligations. The Project evaluates and documents compliance within Project reports and takes action if needed, reports include:

Table 8. Project reporting requirements

SWMC	BEW
Monthly Project Reports	Included in SWMC monthly project report
Monthly Sustainability Data Report (MSDR)	
Annual Sustainability Report (ASR)	

6.3 Audit

The Project audits are conducted separately for each JHLOR project rating, unless otherwise specified, and at planned intervals to provide information on whether the Project:

- is meeting its compliance obligations;
- conforms to the SMP; and,
- Determine if the SMP is effectively implemented and maintained.

The Project has established, implemented and maintain an audit programme for the Project for each rating, including the frequency, methods, responsibilities, planning requirements and reporting of its audits. Sustainability audits are conducted at least quarterly with at least one per year being 'independent'.

The scope of the audits may vary but it is important that the most material issues are audited regularly during the rating period. Sustainability audits cover the most material environmental, social and economic issues. 'Regularly' needs to be described and justified for each project. The audit reports demonstrate that these requirements have been fulfilled.

6.4 Management Review

Project Management review the implementation of the SMP at Project level, at planned intervals, to ensure its continuing suitability, adequacy and effectiveness. Reviews are performed by the Sustainability Leadership Committee. The management reviews incorporate community participation (e.g. record of minutes from community meetings being input to management review).

The management review includes consideration of:

- the status of actions from previous management reviews;
- changes in:
- external and internal issues that are relevant to sustainability;
- the needs and expectations of interested parties, including compliance obligations;
- risks and opportunities;
- the extent to which sustainability objectives have been achieved;
- information on the Project's sustainability performance, including trends in:
- nonconformities and corrective actions;
- monitoring and measurement results;
- fulfilment of its compliance obligations;
- audit results;
- adequacy of resources;
- relevant communication(s) from interested parties, including the community; and,
- opportunities for continual improvement

The outputs of the management reviews include:

- conclusions on the continuing suitability, adequacy and effectiveness of the SMP;

- decisions related to continual improvement opportunities;
- decisions related to any need for changes to the SMP, including resources;
- actions, if needed, when sustainability objectives have not been achieved;
- opportunities to improve integration of the SMP with other Project processes, if needed; and,
- any implications for the strategic direction of the Project.

The Project shall retain documented information as evidence of the results of management reviews.

7. Improvement

When a nonconformity occurs, including in relation to sustainability, the Project shall:

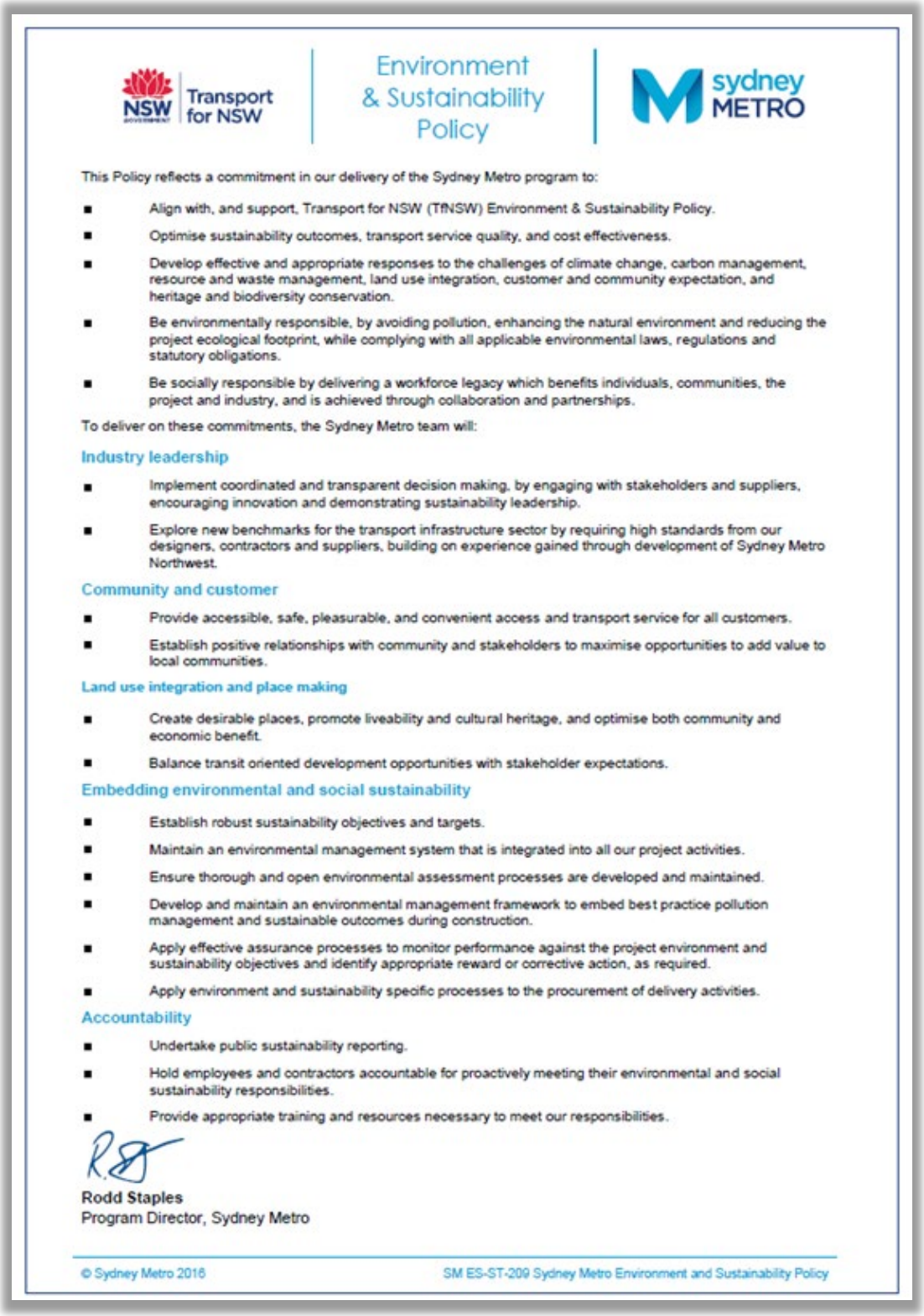
- react to the nonconformity and, as applicable:
  - take action to control and correct it;
  - deal with the consequences, including mitigating adverse sustainability impacts;
- evaluate the need for action to eliminate the causes of the nonconformity, in order that it does not recur or occur elsewhere, by:
  - reviewing the nonconformity;
  - determining the causes of the nonconformity;
  - determining if similar nonconformities exist, or could potentially occur;
- implement any action needed;
- review the effectiveness of any corrective action taken; and,
- make changes to the SMP, if necessary.

Corrective actions shall be appropriate to the significance of the effects of the nonconformities encountered, including the sustainability outcomes(s).

The Project shall retain documented information as evidence of:

- the nature of the nonconformities and any subsequent actions taken; and,
- the results of any corrective action

8. Appendix A Policies



NSW Transport for NSW

Environment & Sustainability Policy

sydney METRO

This Policy reflects a commitment in our delivery of the Sydney Metro program to:

- Align with, and support, Transport for NSW (TfNSW) Environment & Sustainability Policy.
- Optimise sustainability outcomes, transport service quality, and cost effectiveness.
- Develop effective and appropriate responses to the challenges of climate change, carbon management, resource and waste management, land use integration, customer and community expectation, and heritage and biodiversity conservation.
- Be environmentally responsible, by avoiding pollution, enhancing the natural environment and reducing the project ecological footprint, while complying with all applicable environmental laws, regulations and statutory obligations.
- Be socially responsible by delivering a workforce legacy which benefits individuals, communities, the project and industry, and is achieved through collaboration and partnerships.

To deliver on these commitments, the Sydney Metro team will:

Industry leadership

- Implement coordinated and transparent decision making, by engaging with stakeholders and suppliers, encouraging innovation and demonstrating sustainability leadership.
- Explore new benchmarks for the transport infrastructure sector by requiring high standards from our designers, contractors and suppliers, building on experience gained through development of Sydney Metro Northwest.

Community and customer

- Provide accessible, safe, pleasurable, and convenient access and transport service for all customers.
- Establish positive relationships with community and stakeholders to maximise opportunities to add value to local communities.

Land use integration and place making

- Create desirable places, promote liveability and cultural heritage, and optimise both community and economic benefit.
- Balance transit oriented development opportunities with stakeholder expectations.

Embedding environmental and social sustainability

- Establish robust sustainability objectives and targets.
- Maintain an environmental management system that is integrated into all our project activities.
- Ensure thorough and open environmental assessment processes are developed and maintained.
- Develop and maintain an environmental management framework to embed best practice pollution management and sustainable outcomes during construction.
- Apply effective assurance processes to monitor performance against the project environment and sustainability objectives and identify appropriate reward or corrective action, as required.
- Apply environment and sustainability specific processes to the procurement of delivery activities.

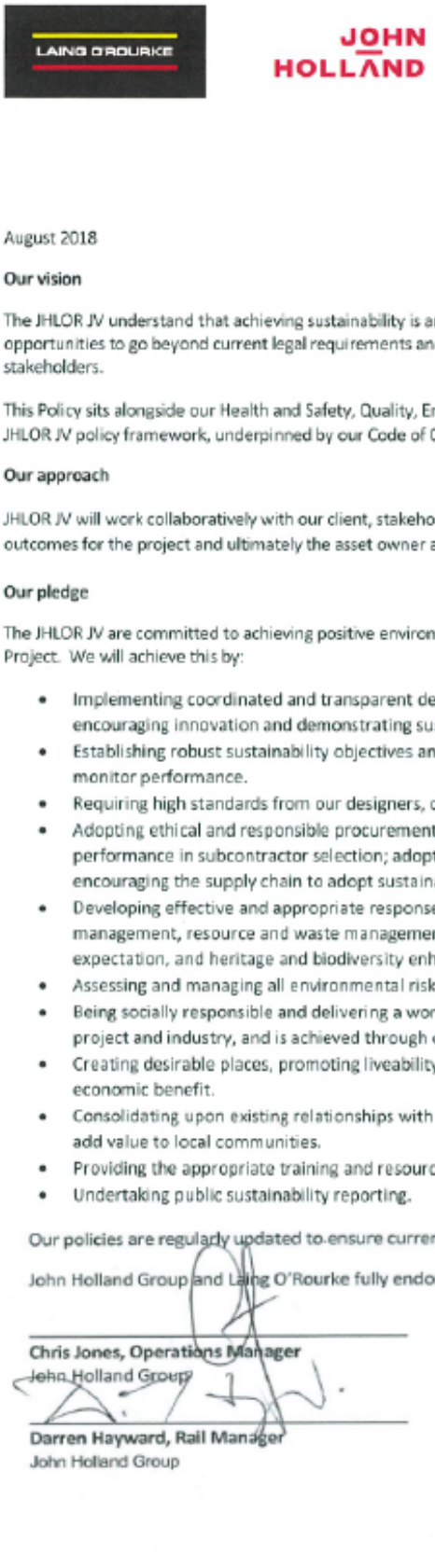
Accountability

- Undertake public sustainability reporting.
- Hold employees and contractors accountable for proactively meeting their environmental and social sustainability responsibilities.
- Provide appropriate training and resources necessary to meet our responsibilities.

Rodd Staples
Program Director, Sydney Metro

SM ES-ST-209 Sydney Metro Environment and Sustainability Policy

Figure 6. TfNSW and Sydney Metro's overarching Environmnet & Sustainability Policy



Sustainability Policy

August 2018

Our vision

The JHLOR JV understand that achieving sustainability is an integral part of delivering our works. We will seek opportunities to go beyond current legal requirements and business as usual to deliver value for the project's stakeholders.

This Policy sits alongside our Health and Safety, Quality, Environment, Supply Chain and People policies as part of the JHLOR JV policy framework, underpinned by our Code of Conduct.

Our approach

JHLOR JV will work collaboratively with our client, stakeholders and the supply chain to ensure the best sustainable outcomes for the project and ultimately the asset owner are attained.

Our pledge

The JHLOR JV are committed to achieving positive environmental, social and economic outcomes in relation to the SSJ Project. We will achieve this by:

- Implementing coordinated and transparent decision making, by engaging with stakeholders and suppliers, encouraging innovation and demonstrating sustainability leadership.
- Establishing robust sustainability objectives and targets, and applying effective assurance processes to monitor performance.
- Requiring high standards from our designers, contractors and suppliers
- Adopting ethical and responsible procurement practices by incorporating environmental and social performance in subcontractor selection; adopting a preference for local industry participation and encouraging the supply chain to adopt sustainability practices.
- Developing effective and appropriate responses to the challenges of climate change, carbon management, resource and waste management, land use integration, customer and community expectation, and heritage and biodiversity enhancement.
- Assessing and managing all environmental risks.
- Being socially responsible and delivering a workforce legacy which benefits individuals, communities, the project and industry, and is achieved through collaboration and partnerships.
- Creating desirable places, promoting liveability and cultural heritage, and optimising both community and economic benefit.
- Consolidating upon existing relationships with community and stakeholders to maximise opportunities to add value to local communities.
- Providing the appropriate training and resources necessary to meet our sustainability responsibilities
- Undertaking public sustainability reporting.

Our policies are regularly updated to ensure currency and strive for best practice as our environment evolves.

John Holland Group and Laing O'Rourke fully endorse this JHLOR JV Policy.

Chris Jones, Operations Manager
John Holland Group

Patrick Cashin, Director
Laing O'Rourke Australia

Darren Hayward, Rail Manager
John Holland Group

David D Robotham, General Manager – Rail
Laing O'Rourke Australia

SMCSWSSJ-JHL-WSS-WD-POL-000004

Figure 7. JHLOR JV Project Sustainability Policy

9. Appendix B Objectives

The following is an excerpt from the DRAFT ISCA Scorecard prepared during tender. The ISCA scorecard is a stand-alone spreadsheet which shall remain live until project completion is achieved. Details shall be updated upon finalising the weightings assessment, which will be submitted to the IS Verifier's for acceptance after the formal weighting's assessment workshop is undertaken with a multidisciplinary team.

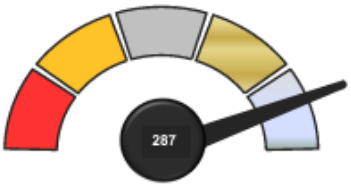
	Credit	Name of credit	Materiality Score	Score Possible	No. Levels	Target Level	Target Score	Working Level	Working Score
Σ		**Total**		110 pts			67.1 pts		0.7 pts
		Rating		Leading			Excellent		Ineligible
Man	Man-1	Sustainability leadership and commitment	2	1.02	3	3	1.02	2	0.68
	Man-2	Risk and opportunity management	2	1.02	2	2	1.02	0	0.00
	Man-3	Organisational structure, roles and responsibilities	2	1.02	2	2	1.02	0	0.00
	Man-4	Inspection and auditing	2	1.02	2	2	1.02	0	0.00
	Man-5	Reporting and review	2	1.02	3	3	1.02	0	0.00
	Man-6	Knowledge sharing	2	2.29	3	3	2.29	0	0.00
	Man-7	Decision-making	2	3.31	3	2	2.21	0	0.00
Pro	Pro-1	Commitment to sustainable procurement	2	1.27	3	3	1.27	0	0.00
	Pro-2	Identification of suppliers	2	1.27	3	3	1.27	0	0.00
	Pro-3	Supplier evaluation and contract award	2	1.27	3	3	1.27	0	0.00
	Pro-4	Managing supplier performance	2	1.27	3	2	0.85	0	0.00
Cli	Cli-1	Climate change risk assessment	4	5.10	3	2	3.40	0	0.00
	Cli-2	Adaptation options	4	5.10	3	2	3.40	0	0.00
Ene	Ene-1	Energy and carbon monitoring and reduction	2	9.17	3	1.0	3.06	0.0	0.00
	Ene-2	Renewable energy	2	1.53	3	1.0	0.51	0.0	0.00
Wat	Wat-1	Water use monitoring and reduction	1	2.29	3	1.0	0.76	0.0	0.00
	Wat-2	Replace potable water	1	1.27	3	1.0	0.42	0.0	0.00
Mat	Mat-1	Materials footprint measurement and reduction	2	6.11	3	2	4.07	0	0.00
	Mat-2	Environmentally labelled products and supply chains	2	1.02	3	1	0.34	0	0.00
Dis	Dis-1	Receiving water quality	2	2.42	3	2	1.61	0	0.00
	Dis-2	Noise	4	4.84	3	2	3.23	0	0.00
	Dis-3	Vibration	3	3.63	3	2	2.42	0	0.00
	Dis-4	Air quality	1	1.21	3	2	0.81	0	0.00
	Dis-5	Light pollution	2	1.02	1	1	1.02	0	0.00
Lan	Lan-1	Previous land use	2	2.55	3	3.0	2.55	0.0	0.00
	Lan-2	Conservation of on site resources	Scoped Out						
	Lan-3	Contamination and remediation	2	2.04	3	1	0.68	0	0.00
	Lan-4	Flooding design	3	2.29	2	1	1.15	0	0.00
Was	Was-1	Waste management	2	2.04	2	2	2.04	0	0.00
	Was-2	Diversion from landfill	2	3.57	3	3	3.57	0	0.00
	Was-3	Deconstruction/ Disassembly/ Adaptability	Scoped Out						

Eco	Eco-1	Ecological value	2	7.64	3	1	2.55	0	0.00
	Eco-2	Habitat connectivity	1	1.53	3	1	0.51	0	0.00
Hea	Hea-1	Community health and well-being	2	2.55	3	1	0.85	0	0.00
	Hea-2	Crime prevention	2	2.55	2	2	2.55	0	0.00
Her	Her-1	Heritage assessment and management	1	1.27	3	2	0.85	0	0.00
	Her-2	Monitoring and management of heritage	1	1.27	3	2	0.85	0	0.00
Sta	Sta-1	Stakeholder engagement strategy	4	2.55	3	1	0.85	0	0.00
	Sta-2	Level of engagement	4	2.55	3	2	1.70	0	0.00
	Sta-3	Effective communication	4	2.55	2	2	2.55	0	0.00
	Sta-4	Addressing community concerns	4	2.55	2	2	2.55	0	0.00
Urb	Urb-1	Urban design	Scoped Out						
	Urb-2	Implementation	Scoped Out						
Inn	Inn-1	Innovation	2	10.00	10	2	2.00	0	0.00

The following is an excerpt from the DRAFT SDG v4.0 Scorecard prepared by Arcadis during Phase 1 Design. The SDG v4.0 scorecard is a stand-alone spreadsheet which shall remain live until project completion is achieved. Details shall be updated at each 6 month construction period post detailed design phase. As BEW construction period is just over 6 months, the 6 month construction submission will also serve as the completion submission.

Transport for NSW

Sustainable Design Guidelines version 4.0 Report



Project Name: Bankstown Early Works
Project CapEx ($ M): 25
Expected construction start date:
Expected construction completion date:

Detailed Design CDR

	Pass	Bronze	Silver	Gold	Platinum
Available Score	0	60	193	289	374
85% Score	0	51	164	245	317

Requirement	Reference Design	Detailed Design SDR	Detailed Design CDR	6 Month Construction Report	6 Month Construction Report	6 Month Construction Report	6 Month Construction Report	6 Month Construction Report	6 Month Construction Report	Completion
1			P2							
			11							
2			P4							
			37							
2A			P1							
			0							
3			P5							
			51							
4			P4							
			18							
5			P1							
			0							
6			P1							
			0							
7			P2							
			6							
8			P5							
			26							
8A			P1							
			0							
9			P1							
			0							
10			P1							
			0							
11			P1							
			0							
12			P5							
			48							
13			P5							
			44							
14			P5							
			46							
Rating type	Target	Target	Target							Target
Total Score			287							
Rating			Gold							

Return to

10. Appendix C MCA Template

		Analysis			Scoring			
		OPPORTUNITY 1						
Multicriteria Factors		Importance (%)	Option 1	Option 2	Weightin	Option 1	Option 2	negative = negative impact
Description					%			
Economic	Initial costs	5			5%			0 = same as bau
	Installation time and cost	5			7%			postive = positive impact
	Maintenance Costs After Construction	5			7%			
Environmental	Installation energy	3			2%			
	Construction Waste	3			5%			
	LCA (embodied carbon)	5			5%			
	Compliance with CEMP (ability to comply with noise, dust, vibration criteria)	2			2%			
	Ecolabel	1			2%			
	Heritage	1			1%			
Construction	Time/schedule	10			5%			
	Construction footprint	1			2%			
	Constructability (time and assembly), pre-fabrication of materials.	3			7%			
	Human and plant Resources	5			1%			
Technical	Durability (40 y design life)	10			8%			
	Compliance with SWTC (minimial interface with relevant parties)	5			2%			
	Simplicity of Maintenance	5			5%			
	Structural Integrity	10			10%			
	Security	4			2%			
	Conductivity - Earthing and	10			10%			
Social	Impacts on community	1			3%			
	Impact on users	1			3%			
Safety	Safety in design	3			3%			
	Construction safety	2			3%			
				SCORING	100%	0	0	
				WEIGHTED RANKING		#DIV/0!	#DIV/0!	
		100						

=Option 1 total scoring / MAX(Option 1 total scoring, Option 2 total scoring)

=Option 2 total scoring / MAX(Option 1 total scoring, Option 2 total scoring)

11. Appendix D Opportunity Register – SWMC and BEW

The following is an excerpt from the Sustainability Opportunity Register. The Sustainability Opportunity Register is a stand-alone register which shall remain live until project completion is achieved. Further details shall be populated during the course of design.

Project	Category	Title	Description	Status	Materiality	Champion	Comment
SWMC	**Materials**	**Optimise Ready Mixed Concrete**	There is an opportunity to optimise the use of ready mixed concrete and Portland cement with High performance concrete . Also, lean design , alternatives,	Under Consideration	High	Ross Simpson & Ed Olivier	
BEW	**Materials**	**Optimise Ready Mixed Concrete**	There is an opportunity to optimise the use of ready mixed concrete and Portland cement with High performance concrete . Also, lean design , alternatives,	Under Consideration	High	Vince Andreacchio	
SWMC	**Materials**	**Optimise Concrete Reinforcement**	There is an opportunity to optimise the use of reinforcement mesh (e.g. lean design (e.g. high strength/low volume), extended design life, alternatives (e.g. fibre reinforcement, high recycled content, cross laminated timber)) so that there is reduced demand for high impact materials	Under Consideration	High	Ross Simpson & Ed Olivier & Procurement team	
SWMC	**Materials**	**Optimise Concrete in Drainage Design**	There is an opportunity to optimise the use of pre-cast concrete or alternative materials (e.g. extended design life, alternative products such as Tiltex, Portland cement replacement) so that there is reduced demand for high impact materials	Under Consideration	High	Arcadis/ Civil Team	

Project	Category	Title	Description	Status	Materiality	Champion	Comment
BEW	**Materials**	**Optimise Concrete in Drainage Design**	There is an opportunity to optimise the use of pre-cast concrete or alternative materials (e.g. extended design life, alternative products such as Tiltex, Portland cement replacement) so that there is reduced demand for high impact materials	Under Consideration	High	Arcadis/ Civil Team / Michelle Huang / Vince Andreacchio	
SWMC	**Materials**	**Optimise Structural Steel**	There is an opportunity to optimise the use of structural steel (e.g. high recycled content, cross laminated timber) so that there is reduced demand for high impact materials	Under Consideration	High	Arcadis/ Ross Simpson & Ed Olivier	Optimise fencing, track and retaining walls
SWMC	**Governance**	**Sustainability Leadership Committee**	There is an opportunity to engage JHLOR JV and Metro Management via a SLC	Included	High		CR 20.04.21 An SLC will be established as per SSJ
BEW	**Governance**	**Sustainability Leadership Committee**	There is an opportunity to engage JHLOR JV and Metro Management via a SLC	Included	High		CR 20.04.21 An SLC will be established as per SSJ

Project	Category	Title	Description	Status	Materiality	Champion	Comment
SWMC	**Carbon and Energy**	**Photo Voltaic Systems**	There is an opportunity to use small scale renewable energy technologies in construction	Included	High	James Moran / Neil Campbell	CR 20.04.21 As per SSJ site tower lights are solar. Hybrid lights or rechargeable battery lights will be used in the rail corridor because the solar cannot be lifted . The use of photovoltaic technologies also eliminates the smell and noise of diesel-based portable light towers and also demonstrates savings by avoiding fuel consumption. PV will be included on the site facility.
BEW	**Carbon and Energy**	**Photo Voltaic Systems**	There is an opportunity to use small scale renewable energy technologies in construction	Included	High	Liam Ferris	CR 20.04.21 As per SSJ site tower lights are solar. Hybrid lights or rechargeable battery lights will be used in the rail corridor because the solar cannot be lifted . The use of photovoltaic technologies also eliminates the smell and noise of diesel-based portable light towers and also demonstrates savings by avoiding fuel consumption. PV will be included on the site facility.
SWMC	**Carbon and Energy**	**Biodiesel**	There is an opportunity to use biodiesel for construction plant equipment such as excavators, generators and site vehicles	Under Consideration	Medium		CR 20.04.21 Sustainability team to investigate opportunity for SWMC works. Geiken generator uses biodiesel. CM 1/11/21 LOR initiative to have 100% of plant using Biodiesel

Project	Category	Title	Description	Status	Materiality	Champion	Comment
BEW	**Carbon and Energy**	**Biodiesel**	There is an opportunity to use biodiesel for construction plant equipment such as excavators, generators and site vehicles	Under Consideration	Medium		CR 20.04.21 Sustainability team to investigate opportunity for SWMC works. Geiken generator uses biodiesel. CM 1/11/21 LOR initiative to have 100% of plant using Biodiesel
SWMC	**Carbon and Energy**	**Green Power**	There is an opportunity to purchase green power during construction	Included	High		OL 07/09/2021 Currently in the process of having a 100% carbon neutral power for the project. 25% Green powerpack is still included. CM 1/11/21 Energy company is now Powershop
BEW	**Carbon and Energy**	**Green Power**	There is an opportunity to purchase green power during construction	Included	High		OL 07/09/2021 Currently in the process of having a 100% carbon neutral power for the project. 25% Green powerpack is still included. CM 1/11/21 Energy company is now Powershop
SWMC	**Procurement**	**Supplier Training**	There is an opportunity to hold a supply chain event for supplier awareness	Under Consideration	High	MH	OL 07/09/2021 Under consideration but on hold due to COVID Can be facilitated by Supply Chain Sustainability School https://www.supplychainschool.org.au/about/

Project	Category	Title	Description	Status	Materiality	Champion	Comment
BEW	**Procurement**	**Supplier Training**	There is an opportunity to hold a supply chain event for supplier awareness	Under Consideration	High	MH	OL 07/09/2021 Under consideration but on hold due to COVID Can be facilitated by Supply Chain Sustainability School https://www.supplychainschool.org.au/about/
SWMC	**Materials**	**Optimise Concrete Pipes**	There is an opportunity to optimise the use of concrete pipes (e.g.EPD's)	Under Consideration	Medium	Construction/ Procurement	
BEW	**Materials**	**Optimise Concrete Pipes**	There is an opportunity to optimise the use of concrete pipes (e.g.EPD's)	Under Consideration	Medium	Construction/ Procurement	
SWMC	**Materials**	**Optimise PVC Pipe**	There is an opportunity to optimise the use of PVC pipes (e.g. lean design (e.g. design out pit and pipe for swales), extended design life, alternatives (e.g. recycled plastic pipes)) so that there is reduced demand for high impact materials	Under Consideration	Medium	Ross Simpson / Ed Olivier & Construction team	OL to find supplier name and get quote
BEW	**Materials**	**Optimise PVC Pipe**	There is an opportunity to optimise the use of PVC pipes (e.g. lean design (e.g. design out pit and pipe for swales), extended design life, alternatives (e.g. recycled plastic pipes)) so that there is reduced demand for high impact materials	Under Consideration	Medium	Ben Clay & Construction team	OL to find supplier name and get quote
SWMC	**Materials**	**Optimise Aggregates**	There is an opportunity to optimise the use of aggregates e.g. lean design, geo grids for track formation, recycled aggregates; so that there is reduced demand for high impact materials	Under Consideration	High	Nathan Harris & Yugar	CR 20.04.21 Options currently under consideration: Use of geogrid Recycled aggregate for gabion walls

Project	Category	Title	Description	Status	Materiality	Champion	Comment
BEW	**Materials**	**Optimise Aggregates**	There is an opportunity to optimise the use of aggregates e.g. lean design, geo grids for track formation, recycled aggregates; so that there is reduced demand for high impact materials	Under Consideration	High	Vince Andreacchio & Brenton Holmes	CR 20.04.21 Options currently under consideration: Use of geogrid Recycled aggregate for gabion walls
SWMC	**Carbon and Energy**	**Optimise Site Sheds / Facilitates**	There is an opportunity to optimise the site facilities and undertake a IS V2 credit challenge	Under Consideration	Medium		Spec provided to Select. Potential for innovation challenge
BEW	**Carbon and Energy**	**Optimise Site Sheds / Facilitates**	There is an opportunity to optimise the site facilities and undertake a IS V2 credit challenge	Under Consideration	Medium		Spec provided to Select. Potential for innovation challenge
SWMC	**Waste and Recycling**	**Optimise C&D Waste**	There is an opportunity to apply the waste hierarchy (eliminate (e.g. pre-cast systems, reusable form, packaging take back), reuse (preferably onsite), recycle, waste to energy, dispose) so that waste is diverted from landfill	Included	Medium		CR 21.04.21 As per SSJ include targets in as contract requirements in waste management packages
BEW	**Waste and Recycling**	**Optimise C&D Waste**	There is an opportunity to apply the waste hierarchy (eliminate (e.g. pre-cast systems, reusable form, packaging take back), reuse (preferably onsite), recycle, waste to energy, dispose) so that waste is diverted from landfill	Included	Medium	MH	CR 21.04.21 As per SSJ include targets in as contract requirements in waste management packages

Project	Category	Title	Description	Status	Materiality	Champion	Comment
SWMC	**Carbon and Energy**	**Optimise Construction Diesel**	There is an opportunity to optimise the use of diesel during construction (e.g. electric and hybrid equipment, operator behaviour, biodiesel) so that there is reduced emissions and noise pollution associated with diesel consumption	Under Consideration	Medium		CR 20.04.21 Solar panels installed at Bankstown site compound. Site connected to grid. Powerboards used on site in place of diesel powered generators to power hand tools. Reduce generator use by using mains power wherever possible - (i.e. rail systems work). K45 (energy efficient lighting) to be used during construction Plant selection specification during supplier engagement CM 1/11/21 Organise a Toolbox Talk and Snapshot to educate energy usage Solar Panels waiting to be installed once approved
BEW	**Carbon and Energy**	**Optimise Construction Diesel**	There is an opportunity to optimise the use of diesel during construction (e.g. electric and hybrid equipment, operator behaviour, biodiesel) so that there is reduced emissions and noise pollution associated with diesel consumption	Included	Medium		CR 20.04.21 Transfer of solar panels to Canterbury Site Compound is currently being considered. Site connected to grid. Tower lights to be used during construction are a mixture of Hybrid (rail corridor) and solar lights Reduce generator use by using mains power wherever possible - (i.e. rail systems work). K45 (energy efficient lighting) to be used during construction Plant selection specification during supplier engagement CM 1/11/21 Organise a Toolbox Talk and Snapshot to educate energy usage

Project	Category	Title	Description	Status	Materiality	Champion	Comment
							Solar Panels waiting to be installed once approved
SWMC	**Waste and Recycling**	**Optimise Spoil Handling**	There is an opportunity to apply the waste hierarchy (eliminate e.g. avoid disturbing large areas)and utilise geogrid for track formation.	Included	High	Construction Team	Use of Geogrid currently under consideration. Benefits described below • Reduced material use • Reduced spoil and associated waste impacts An alternative design to accelerate the construction period, Tensar TX160 geogrids between the capping layer and subgrade has been used. The geogrids will improve the stability of the track formation, reduce differential settlements of the track and reduce track maintenance.

Project	Category	Title	Description	Status	Materiality	Champion	Comment
BEW	**Waste and Recycling**	**Optimise Spoil Handling**	There is an opportunity to apply the waste hierarchy (eliminate e.g. avoid disturbing large areas)and utilise geogrid for track formation.	Included	High	Construction Team	Use of Geogrid currently under consideration. Benefits described below • Reduced material use • Reduced spoil and associated waste impacts An alternative design to accelerate the construction period, Tensar TX160 geogrids between the capping layer and subgrade has been used. The geogrids will improve the stability of the track formation, reduce differential settlements of the track and reduce track maintenance.
SWMC	**Workforce Development and Industry Participation**	**ANZ SME's**	There is an opportunity to utilise ANZ SME's to promote regional economic development and competition	Included	Medium	Charmaine Hoy & Procurement Team	CR 22.04.21 JV have committed to use 45 ANZ SME's
SWMC	**Workforce Development and Industry Participation**	**Local SME's**	There is an opportunity to utilise Local SME's to promote local economic development and competition	Included	Medium	Charmaine Hoy & Procurement Team	CR 22.04.21 JV have committed to use 30 Local SME's
SWMC	**Workforce Development and Industry Participation**	**Certified Aboriginal Businesses**	There is an opportunity to utilise Aboriginal Businesses to promote local economic development and competition	Included	Medium	Charmaine Hoy & Procurement Team	CR 22.04.21 JV have committed to 9 certified aboriginal businesses
BEW	**Workforce Development and Industry Participation**	**Certified Aboriginal Businesses**	There is an opportunity to utilise Aboriginal Businesses to promote local economic development and competition	Under Consideration	Medium	Charmaine Hoy & Procurement Team	CR 22.04.21 JV have committed to 9 certified aboriginal businesses

Project	Category	Title	Description	Status	Materiality	Champion	Comment
	Workforce Development and Industry Participation	**Sustainable Jobs**	There is an opportunity to create Local Sustainable Jobs to promote financial independence	Included	Medium	Charmaine Hoy & Procurement Team	CR 22.04.21 JV have committed to 20% of workforce being local sustainable jobs, and 1% of local sustainable jobs being allocated to Aboriginal workers
	Workforce Development and Industry Participation	**Apprentices &Trainees**	There is an opportunity to utilise apprentices and trainees to promote career development and address future skills shortages	Included	Medium	Charmaine Hoy & Procurement Team	CR 22.04.21 JV have committed to A minimum ratio of one apprentice to every four trades people employed will be applied for JHLOR JV direct labour resources
	Workforce Development and Industry Participation	**Female Diversity**	There is an opportunity to increase female participation and women in leadership roles	Included	Medium	Charmaine Hoy & Procurement Team	
	Workforce Development and Industry Participation	**Aboriginal Workforce**	There is an opportunity to increase aboriginal participation within the workforce	Included	High	Charmaine Hoy & Procurement Team	
	Workforce Development and Industry Participation	**Pre-employment programs**	There is an opportunity for the project (and our subcontractors) to be involved in Sydney Metro Pre-employment programmes to develop suitable candidates where there is a shortage (e.g. female, aboriginal, long term unemployed)	Included	Medium	Charmaine Hoy & Procurement Team	
SWMC	**Materials**	**Optimise CSR and Cable Joint Pits**	There is an opportunity to rationalise the length and size of the Combined Services Route	Included	Medium	Arcadis & Yuga & Ross Simpson & Ed Olivier	CR 22.04.21 Replacement of signal controls copper with optic fibre - lighter, more efficient, cost effective. Reuse of existing infrastructure wherever praticable

Project	Category	Title	Description	Status	Materiality	Champion	Comment
BEW	**Materials**	**Optimise CSR and Cable Joint Pits**	There is an opportunity to rationalise the length and size of the Combined Services Route	Under Consideration	Medium	Arcadis & Yuga & Ross Simpson & Ed Olivier	CR 22.04.21 Replacement of signal controls copper with optic fibre - lighter, more efficient, cost effective. Reuse of existing infrastructure wherever praticable
SWMC	**Materials, Community Benefit & Ecology**	**Replacement of concrete with steel**	There is an opportunity to substitute concrete elements with steel - Geiken Piling Method Reduced vegetation clearing and reduced impact to neighbours	Included	High	Ed Olivier, Ross Simpson & Arcadis	
SWMC	**Procurement**	**Australian Supply Chain Sustainability School**	There is an opportunity to use the Australian Supply Chain within the supplier evaluation process and to help develop contractors	Included	Medium		CR 21.04.21 Supply chain sustainability school information included in tender information pack to assist suppliers with sustainability requirements of the Project. Will be discussed further with potential suppliers during the course of the procurement process.

Project	Category	Title	Description	Status	Materiality	Champion	Comment
BEW	**Procurement**	**Australian Supply Chain Sustainability School**	There is an opportunity to use the Australian Supply Chain within the supplier evaluation process and to help develop contractors	Included	Medium		CR 21.04.21 Supply chain sustainability school information included in tender information pack to assist suppliers with sustainability requirements of the Project. Will be discussed further with potential suppliers during the course of the procurement process.
SWMC	**Community Benefit**	**Social Traders**	There is an opportunity to provide employment via social enterprise organisations	Included	Medium		CR 21.04.21 Clean Force -social enterprise to be used for SWMC project
BEW	**Community Benefit**	**Social Traders**	There is an opportunity to provide employment via social enterprise organisations	Included	Medium		CR 21.04.21 Clean Force -social enterprise to be used for SWMC project
SWMC	**Community Benefit**	**Community Partnerships**	There is an opportunity to partner with community and deliver beneficial outcomes	Under Consideration	Medium	MH/ WC	CR 21.04.21 In progress. Sustainability Team liaising with Place Manager MH 17/12/22 Conversations between JHL and IWWA have commenced MH15/1/22 JHL and IWWA discussed feasible and achieveable beneficial outcomes

Project	Category	Title	Description	Status	Materiality	Champion	Comment
BEW	**Community Benefit**	**Community Partnerships**	There is an opportunity to partner with community and deliver beneficial outcomes	Under Consideration	Medium	MH/ WC	CR 21.04.21 In progress. Sustainability Team liaising with Place Manager MH 17/12/22 Conversations between JHL and IWWA have commenced MH15/1/22 JHL and IWWA discussed feasible and achieveable beneficial outcomes
SWMC	**Water Efficiency**	**Recycled Water for Concrete Batching**	There is an opportunity to collaborate with suppliers to maximise reuse of concrete production operation water (CPO) into concrete production at off-site batch plants	Included	Medium		CR 21.04.21 To included as per SSJ (Holcim current concrete supplier) - included in RFQ documentation
BEW	**Water Efficiency**	**Recycled Water for Concrete Batching**	There is an opportunity to collaborate with suppliers to maximise reuse of concrete production operation water (CPO) into concrete production at off-site batch plants	Included	Medium		CR 21.04.21 To included as per SSJ (Holcim current concrete supplier) - included in RFQ documentation
SWMC	**Governance**	**ODS Track to track, report and delegate responsibility to relevant disciplines for ISCA**	There is an opportunity to utilise technology systems to track and report sustainability performance against ISCA rating requirements more efficiently	Under Consideration	Medium		CR 21.04.21 To be included as per SSJ

Project	Category	Title	Description	Status	Materiality	Champion	Comment
BEW	**Governance**	**ODS Track to track, report and delegate responsibility to relevant disciplines for SDGs**	There is an opportunity to utilise technology systems to track and report sustainability performance against ISCA rating requirements more efficiently	Under Consideration	Medium		CR 21.04.21 To be included as per SSJ
SWMC	**Governance**	**ISC Tracker created to track, report and delegate responsbility to relevant disciplines for ISC**	There is an opportunity to utilise technology systems to track and report sustainability performance against ISCA rating requirements more efficiently	Under Consideration	Medium		CR 21.04.21 To be included as per SSJ
BEW	**Governance**	**Tracker created to trakc, report and delegate responsbility to relevant disciplines for SDGs**	There is an opportunity to utilise technology systems to track and report sustainability performance against ISCA rating requirements more efficiently	Under Consideration	Medium		CR 21.04.21 To be included as per SSJ

Project	Category	Title	Description	Status	Materiality	Champion	Comment
SWMC	**Community Benefit and Heritage**	**Positively contribute to local heritage values during construction**	There is an opportunity to engage with local heritage groups and provide digital interpretation regarding the rail corridor	Under Consideration	Medium		07/09/2021 OL Arcadis is developing this idea and consulting with heritage consultants CM 1/1/21 Interactive digital heritage map has been developed, under going final reviews/changes
BEW	**Community Benefit and Heritage**	**Positively contribute to local heritage values during construction**	There is an opportunity to engage with local heritage groups and provide digital interpretation regarding the rail corridor	Under Consideration	Medium		07/09/2021 OL Arcadis is developing this idea and consulting with heritage consultants CM 1/1/21 Interactive digital heritage map has been developed, under going final reviews/changes
SWMC	**Community Benefit**	**Catering for construction events provided by local businesses**	There is an opportunity to utilise the Local catering capabilities	Included	Medium		
BEW	**Community Benefit**	**Catering for construction events provided by local businesses**	There is an opportunity to utilise the Local catering capabilities	Included	Medium		

Project	Category	Title	Description	Status	Materiality	Champion	Comment
SWMC	**Community Benefit**	**Catering for construction events provided by social enterprise groups**	There is an opportunity to utilise the Local social enterprise groups catering capabilities for Comm's and Stakeholder events	Under Consideration	Medium		Kick start information provided to construction team. Contact to see if there are local Canterbury to Bankstown for shutdowns
BEW	**Community Benefit**	**Catering for construction events provided by social enterprise groups**	There is an opportunity to utilise the Local social enterprise groups catering capabilities for Comm's and Stakeholder events	Under Consideration	Medium		Kick start information provided to construction team. Contact to see if there are local Canterbury to Bankstown for shutdowns
SWMC	**Community Benefit**	**Participate with the Client in relevant school programmes**	There is an opportunity to contribute to community education programmes and skills development by participating with the Client in relevant school programmes	Under Consideration	High	MH/ WC	Discuss with Charmaine MH 9/3/22 - organising STEM workshop with IWWA
BEW	**Community Benefit**	**Participate with the Client in relevant school programmes**	There is an opportunity to contribute to community education programmes and skills development by participating with the Client in relevant school programmes	Under Consideration	High	MH/ WC	Discuss with Charmaine MH 9/3/22 - organising STEM workshop with IWWA

Project	Category	Title	Description	Status	Materiality	Champion	Comment
SWMC	**Community Benefit**	**School awareness programmes, including engaging in Parent company's girls in STEM initiatives**	There is an opportunity to contribute to the girls in STEM programme / STEM programmes for schools	Under Consideration	Medium	MH/ WC	Discuss with Charmaine MH 9/3/22 - organising STEM workshop with IWWA
BEW	**Community Benefit**	**School awareness programmes, including engaging in Parent company's girls in STEM initiatives**	There is an opportunity to contribute to the girls in STEM programme / STEM programmes for schools	Under Consideration	Medium	MH/ WC	Discuss with Charmaine MH 9/3/22 - organising STEM workshop with IWWA
	Community Benefit	**Contribute to local junior schools**	There is an opportunity to take part in 'Plant a tree day' @ local junior schools - held in July each year	Under Consideration	Medium		
	Community Benefit	**Contribute to local junior schools**	There is an opportunity to take part in 'Plant a tree day' @ local junior schools - held in July each year	Under Consideration	Medium		
	Materials and Waste	**OHW Structures**	Reusing existing OHW structures if structurally acceptable	Abandoned	Medium	Yugar	

Project	Category	Title	Description	Status	Materiality	Champion	Comment
SWMC	**Carbon and Energy**	**Photo Voltaic Systems**	There is an opportunity to use small scale renewable energy technologies for the site facilities	Included	High	Tony Water & Ed B	CR 21.04.21 To implemented as per SSJ if solar panels are transferred to Canterbury Site Compound CM 1/11/21 PV panels awaiting to be approved for Canterbury 11/02/2022 Permanent Connection that supports bidirectional energy flow approved for Canterbury Compound. Electricians are currently undertaking works to establish and turn on the solar.
BEW	**Carbon and Energy**	**Photo Voltaic Systems**	There is an opportunity to use small scale renewable energy technologies for the site facilities	Included	High	Liam Ferris	MH 9/12/22 PV to be approved for install MH 17/12/22 PV installed on compound
	Workforce Development and Industry Participation	**Aboriginal participation (Subcontractor reward)**	Endorsement and references from SSJ for New Start (aboriginal Businesses).	Under Consideration	High	Charmaine Hoy	
	Materials	**Recovered Glass**	There is an opportunity to utilise recovered glass sand as bedding sand in the civil works.	Included	Medium	Civils team	

Project	Category	Title	Description	Status	Materiality	Champion	Comment
SWMC	**Knowledge share**	**Sustainability mailbox**	There is an opportunity to implement a site wide initiative where all staff are encouraged to contribute to the knowledge share of sustainability milestones, initiatives and targets/ requirements.	Included	Low	Sustainability Team	CR 21.04.21 Contact IT and discuss the baseline requirements for establishing a mailbox for the project. Request the establishment of a mailbox for the project. Present the initiative at a toolbox talk or workshop. Create a mail list and notify the project. Receive suggestions and action them/ include them in weekly updates/ newsreels. CM 1/11/21 Sustainability Snapshots have been initiated, collated email address for all members in the sustainability team has been created
BEW	**Knowledge share**	**Sustainability mailbox**	There is an opportunity to implement a site wide initiative where all staff are encouraged to contribute to the knowledge share of sustainability milestones, initiatives and targets/ requirements.	Included	Low	Sustainability Team	CR 21.04.21 Contact IT and discuss the baseline requirements for establishing a mailbox for the project. Request the establishment of a mailbox for the project. Present the initiative at a toolbox talk or workshop. Create a mail list and notify the project. Receive suggestions and action them/ include them in weekly updates/ newsreels. CM 1/11/21 Sustainability Snapshots have been initiated, collated email address for all members in the sustainability team has been created

Project	Category	Title	Description	Status	Materiality	Champion	Comment
SWMC	**Water**	**Polymer & Seeded ERSED control**	Seed and erosion control alternative multipurpose mode of dust suppression and erosion control designed for applications over numerous surfaces.	Under Consideration	Low	Enviro team / supervisors	CR 21.04.2021 Use of polymer for dust suppression to implemented as per SSJ. Potential savings to be included water balance study. To be discussed with construction team https://www.vitalindustries.com.au/products-services/ 11/02/2021 Alternative supplier found and implemented on the project with evidence of onboarding to Project supplier list provided (https://spraygrass.com.au/?gclid=EAIaIQobChMIufzdy6P29QIVD5lmAh12gABvEAAYAiAAEgI1ifD_BwE)

Project	Category	Title	Description	Status	Materiality	Champion	Comment
BEW	**Water**	**Polymer & Seeded ERSED control**	Seed and erosion control alternative multipurpose mode of dust suppression and erosion control designed for applications over numerous surfaces.	Under Consideration	Low	Enviro team / supervisors	CR 21.04.2021 Use of polymer for dust suppression to implemented as per SSJ. Potential savings to be included water balance study. To be discussed with construction team https://www.vitalindustries.com.au/products-services/ 11/02/2021 Alternative supplier found and implemented on the project with evidence of onboarding to Project supplier list provided (https://spraygrass.com.au/?gclid=EAIaIQobChMIufzdy6P29QIVD5lmAh12gABvEAAYAiAAEgI1ifD_BwE)
SWMC	**Water**	**Dry Vac trucks**	Non-Destructive Excavation (Vacuum) Trucks offer an alternative to water trucks onsite	Included	High	Construction Team	Implemented on the project where possible
BEW	**Water**	**Dry Vac trucks**	Non-Destructive Excavation (Vacuum) Trucks offer an alternative to water trucks onsite	Included	High	Construction Team	Implemented on the project where possible

Project	Category	Title	Description	Status	Materiality	Champion	Comment
SWMC	**Materials**	**Reduced depth of foundations**	There is opportunity to reduce the depth of foundations in some instances due to rock	Abandoned	Medium	Ed Olivier, Ross Simpson	CR 21.04.21 During FRP meeting with Treadwell it was suggested by Treadwell that a base plate could be used where there is rock rather than increasing the depth to solve the issue. This would result in a material saving 10/02/2022 Fencing package was indefinitely placed on hold due to Client-based decision making changes. As a result, the schedule of package completion was altered, with piles for the fence completed in advance
	Materials	**Reuse of existing infrastructure**		Included	Low		CR 21.04.21 There is the opportunity to reuse some of the existing chain and mesh fencing at the Canterbury Site Compound CM 1/11/21 Existing chain fenicng was used where possible, damaged fences were replaced

Project	Category	Title	Description	Status	Materiality	Champion	Comment
	Materials	**Fencing post materials**	There is potential to utilise an alternative recycled material for the fence posts	Under Consideration	High	Ed Olivier, Ross Simpson	CR 21.04.21 There is the opportunity to use alternative material for the fence posts (FRP). This was implemented on Tranche using Wagner fence posts https://www.wagner.com.au/main/what-we-do/composite-fibre-technologies/cft-home/ 11/02/2022 Design consultant, Arcadis is currently undertaking an MCA to compare the BAU with FRP alternative
	Carbon and Energy	**Reduce diesel consumption**	There is an opportunity to substitute diesel tower lights with hybrid and solar tower lights, and therefore reduce the consumption of diesel.	Included	High	James Moran / Neil Campbell	
SWMC	**Waste and Recycling**	**Divert Waste from Landfill**	There is an opportunity to reduce single use material consumption on site.	Included	Medium	Sustainability Team	07/09/2021 Sust Graduate has organised a trial with Simply Cups to collect and recycle single use coffee cups. Currently no alcohol breath testing is being undertaken due to COVID Keep Cups, Paper straws etc.

Project	Category	Title	Description	Status	Materiality	Champion	Comment
BEW	**Waste and Recycling**	**Divert Waste from Landfill**	There is an opportunity to reduce single use material consumption on site.	Included	Medium	Sustainability Team	07/09/2021 Sust Graduate has organised a trial with Simply Cups to collect and recycle single use coffee cups. Currently no alcohol breath testing is being undertaken due to COVID Keep Cups, Paper straws etc.
	Community Benefit	**International Women's Day Clothing Drive**	There is an opportunity to donate gently-used, nearly new professional attire.	Under Consideration	Medium	Loretta	
SWMC	**Waste and Recycling**	**Divert Waste from Landfill**	There is an opportunity to divert soft plastic from landfill by recycling it through REDCycle (https://www.redcycle.net.au/) or Plastic Police (https://crossconnections.com.au/plastic-police-partnerships/)	Under Consideration	Medium	Sustainability Team	Opportunity for community benefit if we collect plastics and partner with a local school - the school will receive furniture made from plastics
BEW	**Waste and Recycling**	**Divert Waste from Landfill**	There is an opportunity to divert soft plastic from landfill by recycling it through REDCycle (https://www.redcycle.net.au/) or Plastic Police (https://crossconnections.com.au/plastic-police-partnerships/)	Under Consideration	Medium	Sustainability Team	Opportunity for community benefit if we collect plastics and partner with a local school - the school will receive furniture made from plastics
	Community Benefit	**Strengthen the economic viability of the community**	There is an opportunity to offset loss of café business with a site coffee/ sandwich cart.	Under Consideration	Medium	Loretta	

Project	Category	Title	Description	Status	Materiality	Champion	Comment
SWMC	**Community Benefit**	**Support local - IWWA/BYMS**	There is an opportunity to positively contribute to the community	Under Consideration	High	Loretta	OL 07/09/2021 Opportunities to support local community groups (IWWA/BYMS etc, from SWMC Priority Community and Wellbeing Matrix)
BEW	**Community Benefit**	**Support local - IWWA/BYMS**	There is an opportunity to positively contribute to the community	Under Consideration	High	Loretta	OL 07/09/2021 Opportunities to support local community groups (IWWA/BYMS etc, from SWMC Priority Community and Wellbeing Matrix)
SWMC	**Community Benefit**	**Clean Up Australia Day**	Potential for local cleanup	Included	High	Loretta	date completed: 5March 2021 MH 9/3/22 Another planned for 11/3/22
BEW	**Community Benefit**	**Clean Up Australia Day**	Potential for local cleanup	Included	High	Loretta	date completed: 5March 2021 MH 9/3/22 Another planned for 11/3/22
SWMC	**Community Benefit**	**Mental Health Education**	Project have mental health and wellbeing programmes	Included		Project Mental Health Champions	
BEW	**Community Benefit**	**Mental Health Education**	Project have mental health and wellbeing programmes	Included		Project Mental Health Champions	
	Water Efficiency	**Fixed line dust suppression / Dust cannon**	Dust canon and fixed line to reduce potable water for dust suppression	Included	Medium	Sustainability team	Information received from BioX - with Nigel Bucknell for review 1/11/21 Canterbury Bowls Club Demolition - using several dust cannons to suppress dust

Project	Category	Title	Description	Status	Materiality	Champion	Comment
SWMC	**Waste and Recycling**	**Divert Waste from Landfill**	There is an opportunity to be part of the Return and Earn scheme, and donate proceeds to a charity organisation.	Under Consideration	Medium		CR 21.04.21 Use of Clean Force and return and earn scheme implemented for Canterbury Site Compound
BEW	**Waste and Recycling**	**Divert Waste from Landfill**	There is an opportunity to be part of the Return and Earn scheme, and donate proceeds to a charity organisation.	Under Consideration	Medium		CR 21.04.21 Use of Clean Force and return and earn scheme implemented for Canterbury Site Compound
SWMC	**Waste and Recycling**	**Recycled Geofab**	Recycled geofab in place of BAU	Under Consideration	Low	Sustainability team/ constructin team	1/11/21 CM Environmental team to confirm availability of recycled geofab 10/02/2022
BEW	**Waste and Recycling**	**Recycled Geofab**	Recycled geofab in place of BAU	Under Consideration	Low	Sustainability team/ constructin team	1/11/21 CM Environmental team to confirm availability of recycled geofab 10/02/2022

Project	Category	Title	Description	Status	Materiality	Champion	Comment
	Materials	**Tuftduct**	Recycled plastic product in place of traditional concrete GLT's on site.	Included	High	Sustainability team/ constructin team	CR 21.0.2021 To be implemented as per SSJ. Benefits described below • Cost - Reduce cost compared to tradition materials by approx. 50% • Constructability - Safer to handle on site and quicker to install (they 20% of what a concrete GLT weighs) • Environmental - Reduced carbon emission compared to concrete • Enviro and economic - Better lifecycle cost for Client i.e. more durable from a maintenance point of view, GLT lids crack easily and require more products to repair(render etc).
	Materials	**Fencing reduction**	Fencing re design to reduce materials	Under Consideration	High		
	Carbon and Energy	**Green Travel - travel cards**	Opal cards for staff to travel between sites along the corridor. Reduced CO2 and reduced parking impacts on local community	Under Consideration	Low		Business case to be developed
	Energy, Carbon, Materials and Waste	**ISCA innovation challenge**	There is an opportunity to trial V2.0 (or V2.1) resource credits incl Ene, Wat and Ros	Included	Low		10/02/2022 Workforce Credits are currently considered to be completed as an innovation Alternative Versions for credits are currently being considered by Arcadis
	Materials	**Diamond Grid**	Alternative to cattle track for mud tracking off site	Included		Ed. B	02/11/2021 'Just Grid It' was onboarded to the project and used across the sites of the project.

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SWMC	**Materials**	**EcoPact Concrete**	EcoPact is an alternative Holcim product that reduces emissions by approx 20% by using alternative products in the mix	Included		Ed O	22/09/2021 Ed O to meet with construction team to discuss applicability of mixes on SWMC project 10/02/2022 The construction delivery team undertook this initiative in order to complete all works required to gain approval for use on the project. The mix was approved
BEW	**Materials**	**EcoPact Concrete**	EcoPact is an alternative Holcim product that reduces emissions by approx 20% by using alternative products in the mix	Included		Sustainability Team / Vince Andreacchio / MMA	MH 2/3/22: Sust. team received additional information regarding EcoPact at ISC Conference. MH 6/3/22: BEW Construction team has notified Sust. team that MMA have been directed to order EcoPact
SWMC	**Materials**	**Reconophalt**	Using recycled asphalt for the Hi-Rail pads	Under Consideration		OL	14/12/21The hi-rail pads package is about to be awarded. ME will discuss this option with the subcontractor and advise the outcome. Works are scheduled to commence mid-late January.
SWMC	**Waste and Recycling**	**Coffee Cup Recycling**	Establish coffee cup recycling on site	Included		CM	1/11/21 CM Coffee Cup recycling initiated on site
BEW	**Waste and Recycling**	**Coffee Cup Recycling**	Establish coffee cup recycling on site	Included		CM	1/11/21 CM Coffee Cup recycling initiated on site

Project	Category	Title	Description	Status	Materiality	Champion	Comment
SWMC	**Water**	**GuardDog Drain Protection**	A new innovative Sediment erosion control that filters contaminated stormwater runoff Made from 100% recycled psot-consumer and industrial waste	Included		CM	https://stratex.com.au/guarddog/ Certus implemented the guard dog on site, about to order more
SWMC	**Waste and Recycling**	**Mask and Gloves Recycling**	Establish disposable mask and gloves recycling for Rapid Antigen Testing clinic on site	Included		CM	
BEW	**Waste and Recycling**	**Mask and Gloves Recycling**	Establish disposable mask and gloves recycling for Rapid Antigen Testing clinic on site	Included		CM	
SWMC	**Waste and Recycling**	**Ciggarette butt recycling**	Establish ciggarette butt recycling bin on site	Under Consideration		CM	
BEW	**Waste and Recycling**	**Ciggarette butt recycling**	Establish ciggarette butt recycling bin on site	Under Consideration		CM	
SWMC	**Waste and Recycling**	**Batteries and old technology recycling**	Establish batteries and old tech recycling bin on site	Under Consideration		WC	
BEW	**Waste and Recycling**	**Batteries and old technology recycling**	Establish batteries and old tech recycling bin on site	Under Consideration		WC	
SWMC	**Carbon and Energy**	**Use of hybrid site vehicles on site**	Procure hybrid site vehicles to be utilised on site to reduce the use of fuel/diesel	Under Consideration		CM	

Project	Category	Title	Description	Status	Materiality	Champion	Comment
BEW	**Carbon and Energy**	**Use of hybrid site vehicles on site**	Procure hybrid site vehicles to be utilised on site to reduce the use of fuel/diesel	Under Consideration		CM	

12. Appendix E Obligations Register - SWMC

The following is an excerpt from the Sustainability Obligations Register pertaining to Sustainability Management. This excerpt includes details of the applicable sustainability obligations. The Register is a stand-alone register which shall remain live until project completion is achieved.

Source Document	Requirement Clause	Requirement	Document	Description	Responsibility	Timing
CEMF	3.2	Construction Sustainability Management Plan	SMP	Sustainability Management	Sustainability Manager	Design and Construction
CEMF	3.2 a	Principal Contractors are required to prepare and implement a Sustainability Management Plan (SMP) relevant to the scale and nature of their scope of works. The SMP shall comprise of a main SMP document and issue-specific sub-plans.	SMP	Sustainability Management	Sustainability Manager	Design and Construction
CEMF	3.2 b	As a minimum the SMP will address and detail:	SMP	Sustainability Management	Sustainability Manager	Design and Construction
CEMF	3.2 b i	The requirements of the relevant planning approval documentation, any relevant conditions of all other permits and licences, the Contractor's corporate EMS, the sustainability provisions of the contract documentation and this Construction Environmental Management Framework.	SMP	Sustainability Management	Sustainability Manager	Design and Construction
CEMF	3.2 b ii	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;	SMP	Sustainability Management	Sustainability Manager	Design and Construction
CEMF	3.2 b iii	A sustainability policy statement and strategies for adaptation to climate change, resource management (including energy, water and waste), workforce development, procurement and biodiversity enhancement;	SMP	Sustainability Management	Sustainability Manager	Design and Construction
CEMF	3.2.b iv	Sustainability initiatives to be implemented during the project.	SMP	Sustainability Management	Sustainability Manager	Design and Construction
CEMF	3.2 b v	How sustainability initiatives will be identified and implemented;	SMP	Sustainability Management	Sustainability Manager	Design and Construction
CEMF	3.2 b vi	The processes and methodologies for assurance, monitoring, auditing, corrective action, continuous improvement and reporting on sustainability performance;	SMP	Sustainability Management	Sustainability Manager	Design and Construction
CEMF	3.2 b vii	The processes and methodologies which will be used to achieve the required scores under rating systems identified in contract documents;	SMP	Sustainability Management	Sustainability Manager	Design and Construction
CEMF	3.2 b viii	The processes and procedures for undertaking climate change risk assessments;	SMP	Sustainability Management	Sustainability Manager	Design and Construction
CEMF	3.2. b ix	The processes and procedures for the identification and implementation of climate change adaption measures;	SMP	Sustainability Management	Sustainability Manager	Design and Construction

Source Document	Requirement Clause	Requirement	Document	Description	Responsibility	Timing
CEMF	3.2 b x	The approach to sustainable procurement including: - The processes and procedures that will be used to provide environmental and social improvement; - The processes and environmental and social criteria that will be used for the selection of Subcontractors; - The processes that will be used to ensure ethical sourcing of labour and materials - Where equipment, materials or labour are procured from locations outside Australia, the processes that will be used to ensure human rights impacts and risks are identified and mitigated. - Interfaces with other Project Plans.	SMP	Sustainability Management	Sustainability Manager	Design and Construction
CEMF	3.2 c	Depending on the scope of the works, the SMP will also include, as a separate sub-plans:	NA	NA	NA	NA
CEMF	3.2 c i	A Construction Workforce Development Plan	CWDP	Workforce Development	Workforce Development Manager	Design and Construction
CEMF	3.2 c ii	A Waste Management & Recycling Plan	WMRP	Waste and Recycling	Sustainability Manager	Design and Construction
CEMF	3.2 c iii	A Construction Carbon and Energy Management Plan	ECMP	Energy and Carbon	Sustainability Manager	Design and Construction
CEMF	13	Carbon and Energy Management	ECMP	Energy and Carbon	Sustainability Manager	Design and Construction
CEMF	13.1	Carbon and Energy Management Objectives	ECMP	Energy and Carbon	Sustainability Manager	Design and Construction
CEMF	13.1 a	The following carbon and energy management objectives will apply to construction: i. Reduce energy use and carbon emissions during construction. ii. Support innovative and cost effective approaches to energy efficiency, low carbon / renewable energy sources and energy procurement. iii. Design to reduce energy use and carbon emissions during operations.	ECMP	Energy and Carbon	Sustainability Manager	Design and Construction
CEMF	13.2	Carbon and Energy Management Implementation	ECMP	Energy and Carbon	Sustainability Manager	Design and Construction

Source Document	Requirement Clause	Requirement	Document	Description	Responsibility	Timing
CEMF	13.2 a	Principal Contractors will develop and implement a Carbon and Energy Management Plan that will include, as a minimum: i. The carbon and energy mitigation measures as detailed in the environmental approval documentation. ii. The relevant requirements of the Sydney Metro Environment and Sustainability Policy and the Sydney Metro Sustainability Strategy. iii. The responsibilities of key project personnel with respect to the implementation of the plan. iv. The low carbon strategies and initiatives that will be implemented to minimise the carbon emissions associated with construction. v. The energy efficiency strategies and initiatives that will be implemented to minimise energy use associated with construction. vi. Carbon emission estimates determined using a carbon footprint assessment undertaken in accordance with ISO 14064-1, ISO14064-2 and ISO14064-3 that incorporates direct and indirect emissions associated with construction. vii. Compliance record generation and management.	ECMP	Energy and Carbon	Sustainability Manager	Design and Construction
CEMF	13.2 b	Reporting of carbon and energy will be undertaken throughout the construction works in accordance with the National Greenhouse and Energy Reporting Act 2007.	ECMP	Energy and Carbon	Sustainability Manager	Construction
CEMF	13.2 c	The Contractors would be required to retain appropriate records and prepare carbon footprint assessments (inclusive of Scope 1, 2 and 3 emissions) at various stages of construction	ECMP	Energy and Carbon	Sustainability Manager	Construction
CEMF	13.3	Carbon and Energy Mitigation	ECMP	Energy and Carbon	Sustainability Manager	Design and Construction
CEMF	13.3a	Example of carbon and energy mitigation measures include: i. Equipment and material selection will have consideration of energy efficiencies. ii. Construction workers will be encouraged to use sustainable transport options and green travel plans will be developed. iii. Inclusion of renewable energy sources to power temporary facilities and equipment where feasible. iv. Designing and operating Site offices for energy efficiency. v. Offsetting a portion of construction greenhouse gas emissions. vi. Efficient operation of vehicles and equipment.	ECMP	Energy and Carbon	Sustainability Manager	Design and Construction
CEMF	14.1	Materials Management Objectives	MMP	Materials	Sustainability Manager	Design and Construction

Source Document	Requirement Clause	Requirement	Document	Description	Responsibility	Timing
CEMF	14.1 a	The following materials management objectives would apply to the construction of the project: i. Reduce material use throughout the project life-cycle. ii. Consider embodied impacts in materials selection. iii. Use recycled materials. iv. Recycle and reuse materials onsite. v. Influence subcontractors and materials suppliers to adopt sustainability objectives in their works and procurement.	MMP	Materials	Sustainability Manager	Design and Construction
CEMF	14.2	Materials Management Implementation	MMP	Materials	Sustainability Manager	Design and Construction
CEMF	14.2 a	Principal Contractors will be required to develop and implement a Sustainable Procurement Policy that will include as a minimum: i. The materials mitigation measures as detailed in the environmental approval documentation. ii. The relevant requirements of the City & Southwest Environment and Sustainability Policy and the City & Southwest Sustainability Strategy. iii. The responsibilities of key project personnel with respect to the implementation of the policy. iv. Compliance record generation and management. v. Ethical sourcing of materials. vi. Local sourcing.	MMP	Materials	Sustainability Manager	Design and Construction
CEMF	14.2 b	The Contractors will be required to retain records detailing the consideration of sustainability in the procurement of all materials.	MMP	Materials	Sustainability Manager	Construction
CEMF	14.3	Materials Mitigation	MMP	Materials	Sustainability Manager	Design and Construction
CEMF	14.3 a	Examples of materials mitigation measures include: i. Consideration of quality and durability in the procurement of materials. ii. Using recycled materials. iii. Using materials with a lower embodied impact. iv. Using recycled steel in concrete reinforcement. v. Developing deconstruction plans to enable recycling and reuse at end-of-life. vi. Using low-VOC, low emission materials. vii. Using sustainably sourced timber and wood products. viii. Low-carbon concrete. ix. Consideration of whole-of-life costs during procurement.	MMP	Materials	Sustainability Manager	Design and Construction
CEMF	17	Waste Management and Recycling	WRMP	Waste and Recycling	Sustainability Manager	Design and Construction

Source Document	Requirement Clause	Requirement	Document	Description	Responsibility	Timing
CEMF	17.1	Waste Objectives	WRMP	Waste and Recycling	Sustainability Manager	Design and Construction
CEMF	17.1 a	The following waste objectives will apply to construction: i. Minimise waste throughout the project life-cycle. ii. Waste management strategies will be implemented in accordance with the Waste Avoidance and Resource Recovery Act 2001 management hierarchy as follows: - Avoidance of unnecessary resource consumption. - Resource recovery (including reuse, reprocessing, recycling and energy recovery). - Disposal.	WRMP	Waste and Recycling	Sustainability Manager	Design and Construction
CEMF	17.1 b	Targets for the recovery, recycling or reuse of construction waste, and beneficial reuse of spoil will be provided by the Principal Contractor.	WRMP	Waste and Recycling	Sustainability Manager	Design and Construction
CEMF	17.2	Waste Implementation	WRMP	Waste and Recycling	Sustainability Manager	Design and Construction
CEMF	17.2 a	Principal Contractors will develop and implement a Waste Management and Recycling Plan which will include as a minimum: i. The waste management and recycling mitigation measures as detailed in the environmental approval documentation. ii. The responsibilities of key project personnel with respect to the implementation of the plan. iii. Waste management and recycling monitoring requirements. iv. A procedure for the assessment, classification, management and disposal of waste in accordance with the Waste Classification Guidelines (DECC, 2008). v. Compliance record generation and management.	WRMP	Waste and Recycling	Sustainability Manager	Design and Construction
CEMF	17.2 b	Principal Contractors will undertake the following waste monitoring as a minimum: i. Weekly inspections will include checking on the waste storage facilities on site. ii. All waste removed from the site will be appropriately tracked from 'cradle to grave' using waste tracking dockets	WRMP	Waste and Recycling	Sustainability Manager	Construction
CEMF	17.2 c	Principal Contractors will report all necessary waste and purchasing information to TfNSW as required for TfNSW to fulfil their WRAPP reporting requirements	WRMP	Waste and Recycling	Sustainability Manager	Construction
CEMF	17.2 d	Compliance records will be retained by the Principal Contractors in relation to waste management including records of inspections and waste dockets for all waste removed from site	WRMP	Waste and Recycling	Sustainability Manager	Construction

Source Document	Requirement Clause	Requirement	Document	Description	Responsibility	Timing
CEMF	17.3	Waste Mitigation	WRMP	Waste and Recycling		Design and Construction
CEMF	17.3 a	Examples of waste management and recycling mitigation measures include: i. All waste materials removed from the sites will be directed to an appropriately licensed waste management facility. ii. The use of raw materials (noise hoarding, site fencing, etc...) will be reused or shared, between sites and between construction contractors where feasible and reasonable. iii. Recyclable wastes, including paper at site offices, will be stored separately from the other waste	WRMP	Waste and Recycling		
SWTC Appendix B07	1	1 General	SMP	Sustainability		n/a
SWTC Appendix B07	1.1	1.1 Introduction	SMP	Sustainability		n/a
SWTC Appendix B07	1.1 (a)	(a) This Appendix B07 contains the sustainability requirements that the SSJ Contractor must comply with during the SSJ Contractor's Activities. These requirements relate to the design and construction elements of the SWM Corridor Works and are in addition to MR-Sustainability (MR-Sy) which describes requirements and processes in relation to the management of sustainability related aspects for the SWM Corridor Works and Temporary Works.	SMP	Sustainability		Design and Construction
SWTC Appendix B07	1.2	1.2 Scope	SMP	Sustainability		n/a
SWTC Appendix B07	1.2 (a)	(a) The SSJ Contractor must:	SMP	Sustainability		Design and Construction
SWTC Appendix B07	1.2 (a) i)	(i) deliver on the sustainability requirements across the key themes outlined in the Sydney Metro City & Southwest Sustainability Strategy including:	SMP	Sustainability		Design and Construction
SWTC Appendix B07	1.2 (a) i) A	A. governance;	SMP	Sustainability		Design and Construction
SWTC Appendix B07	1.2 (a) i) B	B. climate change resilience;	SMP	Sustainability		Design and Construction
SWTC Appendix B07	1.2 (a) i) C	C. carbon and energy management;	SMP	Sustainability		Design and Construction
SWTC Appendix B07	1.2 (a) i) D	D. community benefit;	SMP	Sustainability		Design and Construction

Source Document	Requirement Clause	Requirement	Document	Description	Responsibility	Timing
SWTC Appendix B07	1.2 (a) i) E	E. water efficiency;	SMP	Sustainability		Design and Construction
SWTC Appendix B07	1.2 (a) i) F	F. waste and materials;	SMP	Sustainability		Design and Construction
SWTC Appendix B07	1.2 (a) i) G	G. heritage conservation;	SMP	Sustainability		Design and Construction
SWTC Appendix B07	1.2 (a) i) H	H. biodiversity conservation;	SMP	Sustainability		Design and Construction
SWTC Appendix B07	1.2 (a) i) I	I. pollution control;	SMP	Sustainability		Design and Construction
SWTC Appendix B07	1.2 (a) i) J	J. liveability; and	SMP	Sustainability		Design and Construction
SWTC Appendix B07	1.2 (a) i) K	K. Supply Chain; and	SMP	Sustainability		Design and Construction
SWTC Appendix B07	1.2 (a) ii)	(ii) achieve the sustainability targets included in this Appendix B07 and MR-Sy;	SMP	Sustainability		Design and Construction
SWTC Appendix B07	1.2 (a) iii)	(iii) implement design and construction support initiatives which are included in the Sustainability Management Plan; and	SMP	Sustainability		Design and Construction
SWTC Appendix B07	1.2 (a) iv)	(iv) use the ISCA IS Rating Scheme version 1.2 to achieve the minimum ratings specified in MR - Sustainability.	SMP	Sustainability		Design and Construction
SWTC Appendix B07	2	2 Performance and technical requirements	SMP	Sustainability		n/a
SWTC Appendix B07	2.1	2.1 Climate Change	SMP	Climate Change	Sustainability Manager	n/a
SWTC Appendix B07	2.1 (a)	(a) The SSJ Contractor must implement design and construction initiatives to ensure compliance with the climate change risk mitigation requirements included in MR - Sustainability.	SMP	Climate Change	Sustainability Manager	Design and Construction
SWTC Appendix B07	2.2	2.2 Carbon Management and energy efficiency	ECMP	Energy and Carbon	Sustainability Manager	n/a
SWTC Appendix B07	2.2 (a)	(a) The SSJ Contractor must implement design and construction support initiatives to ensure compliance with the greenhouse gas emission reduction target included in MR - Sustainability.	ECMP	Energy and Carbon	Sustainability Manager	Design and Construction

Source Document	Requirement Clause	Requirement	Document	Description	Responsibility	Timing
SWTC Appendix B07	2.2 (b)	(b) The SSJ Contractor must provide design inputs to the Interface Contractor's operational Electricity Consumption Software Model, including:	ECMP	Energy and Carbon	Design Manager / Construction Manager	Design
SWTC Appendix B07	2.2 (b) i)	(i) estimates of the total operational electricity use for all equipment designed as part of the SWM Corridor Works; and	ECMP	Energy and Carbon	Design Manager / Construction Manager	Design
SWTC Appendix B07	2.2 (b) ii)	(ii) estimates of electricity use for each key system within the scope of the SWM Corridor Works, including; rail systems.	ECMP	Energy and Carbon	Design Manager / Construction Manager	Design
SWTC Appendix B07	2.2 (c)	(c) The inputs described in section 2.2(b) must be provided at each Design Stage using a template provided by the Principal's Representative.	ECMP	Energy and Carbon	Design Manager / Construction Manager	Design
SWTC Appendix B07	2.2 (d)	(d) The SSJ Contractor must identify and implement feasible opportunities for using onsite sources of renewable energy during construction; and	ECMP	Energy and Carbon	Sustainability Manager	Construction
SWTC Appendix B07	2.2 (e)	(e) The SSJ Contractor must achieve or exceed the following ISCA IS Rating Scheme version 1.2 credit requirements.	ECMP	Energy and Carbon	Sustainability Manager	Design and Construction
SWTC Appendix B07	2.2 (e) i)	(i) level 1 for credit ene-1 'energy and carbon monitoring and reduction target' demonstrating a greenhouse gas emissions reduction below a base case footprint	ECMP	Energy and Carbon	Sustainability Manager	Design and Construction
SWTC Appendix B07	2.2 (f)	(f) The SSJ Contractor must ensure that all vehicles, plant and equipment, are:	ECMP	Energy and Carbon	Sustainability Manager	Construction
SWTC Appendix B07	2.2 (f) i)	(i) selected and operated for optimum energy efficiency;	ECMP	Energy and Carbon	Sustainability Manager	Construction
SWTC Appendix B07	2.2 (f) ii)	(ii) not left idling when not in use;	ECMP	Energy and Carbon	Sustainability Manager	Construction
SWTC Appendix B07	2.2 (f) iii)	(iii) fitted with catalytic converters, diesel particulate filters or equivalent devices where reasonable and feasible; and	ECMP	Energy and Carbon	Sustainability Manager	Construction
SWTC Appendix B07	2.2 (f) iv)	(iv) well maintained and serviced in accordance with relevant equipment maintenance documentation to reduce emissions due to poor engine performance.	ECMP	Energy and Carbon	Sustainability Manager	Construction
SWTC Appendix B07	2.2 (g)	(g) The SSJ Contractor must ensure that the energy efficiency of all new plug-in electrical equipment within any site facilities meets the minimum standards outlined in the NSW Government Resource Efficiency Policy 2014, requirement E3 "minimum standards for new electrical appliances and equipment".	ECMP	Energy and Carbon	Sustainability Manager	Construction
SWTC Appendix B07	2.2 (h)	(h) The SSJ Contractor must use a minimum 5% bio diesel mix for all diesel powered plant and equipment and a minimum 10% blended	ECMP	Energy and Carbon	Sustainability Manager	Construction

Source Document	Requirement Clause	Requirement	Document	Description	Responsibility	Timing
		ethanol mix for all petrol powered plant and equipment where practicable.				
SWTC Appendix B07	2.2 (i)	(i) The SSJ Contractor must ensure all eligible small scale renewable energy certificates are provided to the Principal's Representative.	ECMP	Energy and Carbon	Sustainability Manager	n/a
SWTC Appendix B07	2.3	2.3 Resource - water	CSWMP	Water		n/a
SWTC Appendix B07	2.3.1	2.3.1 Water efficiency	CSWMP	Water		n/a
SWTC Appendix B07	2.3.1 (a)	The SSJ Contractor must minimise water demand including total water consumption and potable water consumption during both the construction and the operations phases by:	CSWMP	Water		Design and Construction
SWTC Appendix B07	2.3.1 (a) i)	(i) using water efficient controls, fixtures and fittings;	CSWMP	Water		Construction
SWTC Appendix B07	2.3.1 (a) ii)	(ii) harvesting rainwater where feasible;	CSWMP	Water		Construction
SWTC Appendix B07	2.3.1 (a) iii)	(iii) using water from recycled water networks where available; and	CSWMP	Water		Construction
SWTC Appendix B07	2.3.1 (a) iv)	(iv) collecting, treating and reusing stormwater and wastewater, where feasible.	CSWMP	Water		Design and Construction
SWTC Appendix B07	2.3.1 (b)	(b) The SSJ Contractor must achieve or exceed the following ISCA IS Rating Scheme version 1.2 credit requirements:	CSWMP	Water		Design and Construction
SWTC Appendix B07	2.3.1 (b) i)	(i) level 1 for credit wat-1 'water use monitoring and reduction', demonstrating a reduction in water use compared to a base case footprint.	CSWMP	Water		Design and Construction
SWTC Appendix B07	2.3.1 (c)	c) The SSJ Contractor must not use potable water as a substitute for non-potable water where on-site or local sources of non-potable water are suitable for the SSJ Contractor's Activities and are available.	CSWMP	Water		Design and Construction
SWTC Appendix B07	2.3.1 (d)	(d) The SSJ Contractor must ensure that all construction equipment requiring water must be selected taking into account the water efficiency of the equipment and associated construction methodology.	CSWMP	Water		Construction
SWTC Appendix B07	2.3.1 (e)	(e) The SSJ Contractor must ensure that water efficient construction methods are described in all construction method statements or similar to be applied by the SSJ Contractor.	CSWMP	Water		Construction

Source Document	Requirement Clause	Requirement	Document	Description	Responsibility	Timing
SWTC Appendix B07	2.3.1 (f)	(f) For water used in offsite concrete batching plants which supply the SSJ Contractor's Activities:	CSWMP	Water		Design and Construction
SWTC Appendix B07	2.3.1 (f) i)	(i) the SSJ Contractor must ensure that 80% of offsite and onsite batching plant concrete production operation water is recycled and incorporated into concrete production;	CSWMP	Water		Design and Construction
SWTC Appendix B07	2.3.1 (f) ii)	(ii) suspended solids content of recycled concrete production water must be controlled such that the water density is less than 1.01 g/mL and the suspended solids content does not exceed 15,000 ppm; and	CSWMP	Water		Design and Construction
SWTC Appendix B07	2.3.1 (f) iii)	(iii) the SSJ Contractor must pass requirements relating to concrete production operation water down through its Supply Chain.	CSWMP	Water		Construction
SWTC Appendix B07	2.3.1 (g)	(g) The SSJ Contractor must meter water supply from recycled water networks (where used) and potable sources for the SSJ Contractor's Activities.	CSWMP	Water		Construction
SWTC Appendix B07	2.3.2	2.3.2 Water sensitive urban design		Water	Design Manager	n/a
SWTC Appendix B07	2.3.2 (a)	(a) The SSJ Contractor and Construction Contractor must adopt an integrated approach to urban water cycle management during design and construction to minimise impacts on stormwater quality.		Water	Design Manager	Design and Construction
SWTC Appendix B07	2.3.2 (b)	(b) The integrated approach must achieve:		Water	Design Manager	Design and Construction
SWTC Appendix B07	2.3.2 (b) i)	(i) a reduction in potable water demand through the use of rainwater and/or greywater where a reticulated reuse is not available, and adopt the use of water efficient appliances and fittings;		Water	Design Manager	Design and Construction
SWTC Appendix B07	2.3.2 (b) ii)	(ii) a reduction in wastewater generation;		Water	Design Manager	
SWTC Appendix B07	2.3.2 (b) iii)	(iii) stormwater quality targets which are suitable for either reuse or discharge into local streams and waterways; and		Water		Design and Construction
SWTC Appendix B07	2.3.2 (c)	(c) The SSJ Contractor must demonstrate in the Design Documentation how it will achieve a reduction in urban stormwater pollutants in accordance with Table 1.		Water	Design Manager	Design

Source Document	Requirement Clause	Requirement	Document	Description	Responsibility	Timing
SWTC Appendix B07	2.3.2 (c)	Table 1 : Water Quality Objectives		Water	Design Manager	Design
SWTC Appendix B07	2.3.2 (c)	Pollutant: Suspended solids Minimum Requirement: 85% retention of the average annual load		Water	Design Manager	Design
SWTC Appendix B07	2.3.2 (c)	Pollutant: Total Phosphorous Minimum Requirement: 65% retention of the average annual		Water	Design Manager	Design
SWTC Appendix B07	2.3.2 (c)	Pollutant: Total Nitrogen Minimum Requirement: 45% retention of the average annual load		Water	Design Manager	Design
SWTC Appendix B07	2.3.2 (c)	Pollutant: Litter Minimum Requirement: Retention of litter greater than 50mm for flows up to 25% of the 1 year ARI peak flow.		Water	Design Manager	Design
SWTC Appendix B07	2.3.2 (c)	Pollutant: Coarse sediment Minimum Requirement: Retention of sediment coarser than 0.125mm for flows up to 25% of the 1 year ARI peak flow.		Water	Design Manager	Design
SWTC Appendix B07	2.3.2 (c)	Pollutant: Oil and Grease Minimum Requirement: In areas with concentrated hydrocarbon deposition, no visible oils for flows up to 25% of the 1 year ARI peak flow		Water	Design Manager	Design

Source Document	Requirement Clause	Requirement	Document	Description	Responsibility	Timing
SWTC Appendix B07	2.3.2 (d)	(d) The provisions to achieve these outcomes must be consistent with the designs being developed for the SWM Corridor Works. These provisions will include, where feasible:		Water	Design Manager	Design
SWTC Appendix B07	2.3.2 (d) i)	(i) grass or vegetated swales to capture stormwater drainage to all at-grade car parks. Ensure bio retention systems with 100mm freeboard to stormwater drainage pits to cater for larger rain events;		Water	Design Manager	Design
SWTC Appendix B07	2.3.2 (d) ii)	(ii) pavement planes which fall to provide passive irrigation to adjacent garden beds, turf/grass areas and trees;		Water	Design Manager	Design
SWTC Appendix B07	2.3.2 (d) iii)	(iii) drainage of all areas of pavement using trench drains and conveyed to adjacent planting beds;		Water	Design Manager	Design
SWTC Appendix B07	2.3.2 (d) iv)	(iv) creating rain gardens in larger planting beds using swales with 100mm freeboard to a stormwater drainage pits to cater for larger rain events; and		Water	Design Manager	Design
SWTC Appendix B07	2.3.2 (d) v)	(v) area drains in planted swales having invert levels to allow temporary inundation to planting areas during rain events.		Water	Design Manager	Design
SWTC Appendix B07	2.4	2.4 Resource – waste and materials	WRMP	Waste and Recycling	Sustainability Manager	n/a
SWTC Appendix B07	2.4.1	2.4.1 Waste	WRMP	Waste and Recycling	Sustainability Manager	n/a
SWTC Appendix B07	2.4.1 (a)	(a) The SSJ Contractor must ensure that at least 95% of inert and non-hazardous construction and demolition waste, excluding spoil, and at least 60% of office waste generated during the SSJ Contractor's Activities is recycled or alternatively beneficially reused.	WRMP	Waste and Recycling	Sustainability Manager	Construction

Source Document	Requirement Clause	Requirement	Document	Description	Responsibility	Timing
SWTC Appendix B07	2.4.1 (b)	(b) The SSJ Contractor must identify and implement opportunities for recycling and reuse of non-putrescible general solid wastes (other than construction and demolition waste and office waste) during the SSJ Contractor's Activities.	WRMP	Waste and Recycling	Sustainability Manager	Construction
SWTC Appendix B07	2.4.1 (c)	(c) The SSJ Contractor must negotiate and implement packaging take-back arrangements with suppliers.	WRMP	Waste and Recycling	Sustainability Manager	Construction
SWTC Appendix B07	2.4.1 (d)	(d) The SSJ Contractor must use compostable or reusable temporary erosion control devices where practicable.	WRMP	Waste and Recycling	Sustainability Manager	Construction
SWTC Appendix B07	2.4.1 (e)	(e) The SSJ Contractor must provide construction waste recycling facilities within the Construction Site where practicable.	WRMP	Waste and Recycling	Sustainability Manager	Construction
SWTC Appendix B07	2.4.2	2.4.2 Materials	MMP	Materials	Sustainability Manager	n/a
SWTC Appendix B07	2.4.2 (a)	(a) Materials included in designs and specified by the SSJ Contractor for the SWM Corridor Works and Temporary Works must comply with the requirements set out in MR-Sustainability.	MMP	Materials	Sustainability Manager	Design and Construction
SWTC Appendix B07	2.4.2 (b)	(b) The SSJ Contractor must include in designs and specify recycled and recyclable materials where possible, without compromise to the structural integrity, longevity and visual quality of materials and structures.	MMP	Materials	Design Manager	Design and Construction
SWTC Appendix B07	2.4.2 (c)	(c) The SSJ Contractor must achieve or exceed the following ISCA IS Rating Scheme version 1.2 credit requirements:	MMP	Materials	Sustainability Manager	Design and Construction
SWTC Appendix B07	2.4.2 (c) i)	(i) level 2 for credit mat-1 'materials footprint measurement and reduction', demonstrating a 15% reduction in materials lifecycle impacts compared to a base case footprint.	MMP	Materials	Sustainability Manager	Design and Construction

Source Document	Requirement Clause	Requirement	Document	Description	Responsibility	Timing
SWTC Appendix B07	2.4.2 (d)	(d) The SSJ Contractor must use reusable formwork where practicable.	MMP	Materials	Sustainability Manager	Construction
SWTC Appendix B07	2.4.3	2.4.3 Volatile Organic Compounds	MMP	Materials	Design Manager	n/a
SWTC Appendix B07	2.4.3 (a)	(a) The SSJ Contractor must prepare designs and specifications which require the use low volatile organic compounds (VOC) paints, finishes, sealants and adhesives and zero or low formaldehyde emission composite wood products (as defined in the Green Star Design and As Built Rating Tool) in the SWM Corridor Works.	MMP	Materials	Design Manager	Design
SWTC Appendix B07	2.4.3 (b)	(b) All surface coatings used by the SSJ Contractor must comply with the Australian paint approval scheme volatile organic compounds limits where fit for purpose (to be agreed with Sydney Metro).	MMP	Materials	Design Manager	Design and Construction
SWTC Appendix B07	2.4.3 (c)	(c) All paint products must comply with the maximum total volatile organic compounds (TVOC) outlined in Table 2 below.	MMP	Materials	Design Manager	Design and Construction
SWTC Appendix B07	2.4.3 (c)	Table 2 : Paint Products Maximum TVOC	MMP	Materials	Design Manager	n/a
SWTC Appendix B07	2.4.3 (c)	Product Type/Sub Category: Walls and ceilings – interior semi gloss Maximum TVOC content (g/litre of ready to use product): 16	MMP	Materials	Design Manager	Design and Construction
SWTC Appendix B07	2.4.3 (c)	Product Type/Sub Category: Walls and ceilings – interior low sheen Maximum TVOC content (g/litre of ready to use product): 16	MMP	Materials	Design Manager	Design and Construction
SWTC Appendix B07	2.4.3 (c)	Product Type/Sub Category: Walls and ceilings – interior flat washable Maximum TVOC content (g/litre of ready to use product): 16	MMP	Materials	Design Manager	Design and Construction
SWTC Appendix B07	2.4.3 (c)	Product Type/Sub Category: Ceilings – interior flat Maximum TVOC content (g/litre of ready to use product): 14	MMP	Materials	Design Manager	Design and Construction
SWTC Appendix B07	2.4.3 (c)	Product Type/Sub Category: Trim – gloss, semi-gloss, satin, varnishes and woodstains Maximum TVOC content (g/litre of ready to use product): 75	MMP	Materials	Design Manager	Design and Construction
SWTC Appendix B07	2.4.3 (c)	Product Type/Sub Category: Timber and binding primers Maximum TVOC content (g/litre of ready to use product): 30	MMP	Materials	Design Manager	Design and Construction
SWTC Appendix B07	2.4.3 (c)	Product Type/Sub Category: Latex primer for galvanised iron and zincalume Maximum TVOC content (g/litre of ready to use product): 60	MMP	Materials	Design Manager	Design and Construction
SWTC Appendix B07	2.4.3 (c)	Product Type/Sub Category: Interior latex undercoat Maximum TVOC content (g/litre of ready to use product): 65	MMP	Materials	Design Manager	Design and Construction
SWTC Appendix B07	2.4.3 (c)	Product Type/Sub Category: Interior sealer Maximum TVOC content (g/litre of ready to use product): 65	MMP	Materials	Design Manager	Design and Construction

Source Document	Requirement Clause	Requirement	Document	Description	Responsibility	Timing
SWTC Appendix B07	2.4.3 (c)	Product Type/Sub Category: One and two pack performance coatings for floors Maximum TVOC content (g/litre of ready to use product): 140	MMP	Materials	Design Manager	Design and Construction
SWTC Appendix B07	2.4.3 (c)	Product Type/Sub Category: Any solvent-based coatings whose purpose is not covered in table Maximum TVOC content (g/litre of ready to use product): 200	MMP	Materials	Design Manager	Design and Construction
SWTC Appendix B07	2.4.3 (d)	(d) All sealants and adhesives must comply with TVOC emissions limits in Table 3 below.	MMP	Materials	Design Manager	Design and Construction
SWTC Appendix B07	2.4.3 (d)	Table 3 : Sealants and Adhesives Maximum TVOC	MMP	Materials	Design Manager	n/a
SWTC Appendix B07	2.4.3 (d)	Product Type: Indoor carpet adhesive Maximum TVOC content (g/litre of product): 50	MMP	Materials	Design Manager	Design and Construction
SWTC Appendix B07	2.4.3 (d)	Product Type: Carpet pad adhesive Maximum TVOC content (g/litre of product): 50	MMP	Materials	Design Manager	Design and Construction
SWTC Appendix B07	2.4.3 (d)	Product Type: Wood flooring and Laminate adhesive Maximum TVOC content (g/litre of product): 100	MMP	Materials	Design Manager	Design and Construction
SWTC Appendix B07	2.4.3 (d)	Product Type: Rubber flooring adhesive Maximum TVOC content (g/litre of product): 60	MMP	Materials	Design Manager	Design and Construction
SWTC Appendix B07	2.4.3 (d)	Product Type: Sub-floor adhesive Maximum TVOC content (g/litre of product): 50	MMP	Materials	Design Manager	Design and Construction
SWTC Appendix B07	2.4.3 (d)	Product Type: Ceramic tile adhesive Maximum TVOC content (g/litre of product): 65	MMP	Materials	Design Manager	Design and Construction
SWTC Appendix B07	2.4.3 (d)	Product Type: Cove base adhesive Maximum TVOC content (g/litre of product): 50	MMP	Materials	Design Manager	Design and Construction
SWTC Appendix B07	2.4.3 (d)	Product Type: Dry wall and panel adhesive Maximum TVOC content (g/litre of product): 50	MMP	Materials	Design Manager	Design and Construction
SWTC Appendix B07	2.4.3 (d)	Product Type: Multipurpose construction adhesive Maximum TVOC content (g/litre of product): 70	MMP	Materials	Design Manager	Design and Construction
SWTC Appendix B07	2.4.3 (d)	Product Type: Structural glazing adhesive Maximum TVOC content (g/litre of product): 100	MMP	Materials	Design Manager	Design and Construction
SWTC Appendix B07	2.4.3 (d)	Product Type: Architectural sealants Maximum TVOC content (g/litre of product): 250	MMP	Materials	Design Manager	Design and Construction
SWTC Appendix B07	2.4.4	2.4.4 Spoil management	SMP	Spoil Management	Environment Manager / Construction Manager	n/a

Source Document	Requirement Clause	Requirement	Document	Description	Responsibility	Timing
SWTC Appendix B07	2.4.4 (a)	(a) The SSJ Contractor must identify and implement initiatives to both reduce spoil quantities which will be generated during the performance of the Contractor's Activities and beneficially reuse 100% of reusable spoil, including topsoil, in accordance with the spoil hierarchy in environmental documents.	SMP	Spoil Management	Environment Manager / Construction Manager	Design and Construction
SWTC Appendix B07	2.4.4 (b)	(b) The SSJ Contractor must utilise or reuse appropriate site-won materials onsite where feasible.	SMP	Spoil Management	Environment Manager / Construction Manager	Design and Construction
SWTC Appendix B07	2.5	2.5 Biodiversity conservation	CEMP	Biodiversity	Environment Manager	Construction
SWTC Appendix B07	2.5 (a)	(a) The SSJ Contractor must prepare designs which support the minimisation of clearance of vegetation, particularly native vegetation.	CEMP	Biodiversity	Design Manager	Design
SWTC Appendix B07	2.5 (b)	(b) The SSJ Contractor must minimise clearance of vegetation, particularly native vegetation.	CEMP	Biodiversity	Design Manager / Environment Manager / Construction Manager	Design and Construction
SWTC Appendix B07	2.5 (c)	(c) The SSJ Contractor must undertake any landscaping and revegetation works as soon as practicable.	CEMP	Biodiversity	Construction Manager	Construction
SWTC Appendix B07	2.6	2.6 Pollution control	CEMP	Pollution		n/a
SWTC Appendix B07	2.6 (a)	(a) The SSJ Contractor and the Construction Contractor must identify and implement pollution control initiatives in design and construction which target zero major pollution incidents.	CEMP	Pollution	Environment Manager	Design and Construction
SWTC Appendix B07	2.6 (b)	(b) The SSJ Contractor must, where practicable, ensure that all excavators and mobile cranes used for the contractor's activities, which are onsite for more than three months, comply with United States Environmental Protection Agency Tier 4 exhaust emission standards.	CEMP	Pollution		Construction

Source Document	Requirement Clause	Requirement	Document	Description	Responsibility	Timing
SWTC Appendix B07	3	3 Design Documentation and reporting	SMP			n/a
SWTC Appendix B07	3 (a)	(a) Sustainability must be addressed by the SSJ Contractor within Design Documentation for all relevant design packages at each Design Stage for the SWM Corridor Works and Temporary Works.	SMP	Sustainability	Sustainability Manager	
SWTC Appendix B07	3 (b)	(b) The SSJ Contractor must produce and submit to the Principal's Representative a quarterly Sustainable Design Report which includes:	SMP	Sustainability	Sustainability Manager	Design
SWTC Appendix B07	3 (b) i)	(i) a compliance table which shows the status of the compliance with sustainability requirements from this Appendix B07 and MR-Sy which are addressed in design;	SMP	Sustainability	Sustainability Manager	Design
SWTC Appendix B07	3 (b) ii)	(ii) evidence of how the sustainable design initiatives achieve the targets in MR-Sy and the STWC;	SMP	Sustainability	Sustainability Manager	Design
SWTC Appendix B07	3 (b) iii)	(iii) a graphical representation of the achievement of sustainability targets in MR-Sy and this Appendix B07;	SMP	Sustainability	Sustainability Manager	Design
SWTC Appendix B07	3 (b) iv)	(iv) illustrations of key sustainability initiatives;	SMP	Sustainability	Sustainability Manager	Design
SWTC Appendix B07	3 (b) v)	(v) evidence to show where climate change mitigation and adaptation measures or changes have been implemented in design;	SMP	Sustainability	Sustainability Manager	Design
SWTC Appendix B07	3 (b) vi)	(vi) scoring achieved using the ISCA IS Rating Scheme 'design' rating including supporting completed checklists and scorecards;	SMP	Sustainability	Sustainability Manager	Design
SWTC Appendix B07	3 (b) vii)	(vii) demonstration of progress toward achieving ISCA ene-1, mat-1, and wat-1 credits and an updated IS Rating pathway;	SMP	Sustainability	Sustainability Manager	Design
SWTC Appendix B07	3 (b) viii)	(viii) details of where low carbon initiatives have been implemented in the design of the SWM Corridor Works and Temporary Works;	SMP	Sustainability	Sustainability Manager	Design
SWTC Appendix B07	3 (b) ix)	(ix) initiatives which have been implemented to minimise the embodied carbon emissions of concrete mixes which will be used in the SWM Corridor Works and Temporary Works;	SMP	Sustainability	Sustainability Manager	Design
SWTC Appendix B07	3 (b) x)	(x) a demonstration and description of innovative sustainable design initiatives; and	SMP	Sustainability	Sustainability Manager	Design
SWTC Appendix B07	3 (b) xi)	(xi) other studies as required by the Principal's Representative.	SMP	Sustainability	Sustainability Manager	Design
SWTC Appendix B07	4	4 Sustainability Manager	SMP	Sustainability	Sustainability Manager	Design and Construction

Source Document	Requirement Clause	Requirement	Document	Description	Responsibility	Timing
SWTC Appendix B07	4 (a)	(a) The SSJ Contractor must provide a Sustainability Manager who must:	SMP	Sustainability	Sustainability Manager	Design and Construction
SWTC Appendix B07	4 (a) i)	(i) possess a recognised qualification relevant to the position and the Services and have recent relevant experience in sustainability management on projects similar to the SWM Corridor Works;	SMP	Sustainability	Sustainability Manager	Design and Construction
SWTC Appendix B07	4 (a) ii)	(ii) be a Infrastructure Sustainability Accredited Professional (ISAP) accredited by ISCA;	SMP	Sustainability	Sustainability Manager	Design and Construction
SWTC Appendix B07	4 (a) iii)	(iii) have a recognised and demonstrated competence in sustainability management in the design and construction of sustainable infrastructure or buildings;	SMP	Sustainability	Sustainability Manager	Design and Construction
SWTC Appendix B07	4 (a) iv)	(iv) be available as the Principal's Representative's primary contact with the SSJ Contractor on sustainability matters; and	SMP	Sustainability	Sustainability Manager	Design and Construction
SWTC Appendix B07	4 (a) v)	(v) be responsible for and have the authority to develop and implement the Sustainability Management Plan.	SMP	Sustainability	Sustainability Manager	Design and Construction
Management Requirements - Sustainability (MR-Sy) requirements	1	1 Introduction				
Management Requirements - Sustainability (MR-Sy) requirements	1.1.	1.1 Purpose				
Management Requirements - Sustainability (MR-Sy) requirements	1.1.(a)	(a) This Management Requirements – Sustainability (MR-Sy) describes requirements and processes in relation to management, reporting and sustainability related aspects of the Works, Temporary Works and the Contractor's Activities.				
Management Requirements - Sustainability (MR-Sy) requirements	1.1.(b)	(b) This MR-Sy must be read in conjunction with other parts of the Contract.				

Source Document	Requirement Clause	Requirement	Document	Description	Responsibility	Timing
Management Requirements - Sustainability (MR-Sy) requirements	1.1.(c)	(c) The Contractor must comply with the requirements of this MR-Sy and any Reference Documents listed in Annexure A to this MR-Sy.				Design and Construction
Management Requirements - Sustainability (MR-Sy) requirements	1.2.	1.2 Definitions				
Management Requirements - Sustainability (MR-Sy) requirements	1.2.	Refer to MR-Prelude and the General Conditions for a definition of terms used in this MR-Sy				
Management Requirements - Sustainability (MR-Sy) requirements	2	2 Management requirements				
Management Requirements - Sustainability (MR-Sy) requirements	2	2 General				
Management Requirements - Sustainability (MR-Sy) requirements	2.(a)	(a) Where noted in Annexure C – SSJ Specific Requirements or Annexure D SWM Corridor Specific Requirements, the Contractor must comply with the requirements of this MR-Sy, as amended by Annexure C or Annexure D applicable for the SSJ Works and the Corridor Works respectively.				Design and Construction
Management Requirements - Sustainability (MR-Sy) requirements	2.(b)	(b) The Contractor must provide copies of all the Documents required in this MR-Sy in ".pdf" format that comply with the Level AA accessibility requirements in the Web Content Accessibility Guidelines (WCAG 2.0).				Design and Construction

Source Document	Requirement Clause	Requirement	Document	Description	Responsibility	Timing
Management Requirements - Sustainability (MR-Sy) requirements	2.(c)	(c) The Contractor must ensure that sustainability is addressed throughout the performance of the Contractor's Activities and that sustainability is embedded into the design and construction of the Works and the Temporary Works.				Design and Construction
Management Requirements - Sustainability (MR-Sy) requirements	3.	3 Governance				
Management Requirements - Sustainability (MR-Sy) requirements	3.(a)	(a) The Contractor must develop, implement and maintain governance structures, processes and systems that ensure integration and implementation of all sustainability considerations, initiatives and reporting.	SMP	Sustainability	Sustainability Manager	Design and Construction
Management Requirements - Sustainability (MR-Sy) requirements	3.(b)	(b) For the Contractor's Activities related to the Works, the Contractor must:	SMP	Sustainability	Sustainability Manager	
Management Requirements - Sustainability (MR-Sy) requirements	3.(b)(i)	(i) enter into a Ratings Agreement to obtain an Infrastructure Sustainability Rating for the Contractor's Activities, and provide a copy to the Principal's Representative;	SMP	Sustainability	Sustainability Manager	Design and Construction
Management Requirements - Sustainability (MR-Sy) requirements	3.(b)(ii)	(ii) use the IS Rating Scheme to achieve an "As Built" rating score of at least 55 for the constructed Works;	SMP	Sustainability	Sustainability Manager	Design and Construction
Management Requirements - Sustainability (MR-Sy) requirements	3.(b)(iii)	(iii) use the IS Rating Scheme credit weightings provided by the Principal's Representative; and	SMP	Sustainability	Sustainability Manager	Design and Construction

Source Document	Requirement Clause	Requirement	Document	Description	Responsibility	Timing
Management Requirements - Sustainability (MR-Sy) requirements	3.(b)(iv)	(iv) use the ISCA Base Case Assumptions provided by the Principal's Representative to develop Base Case Footprints for relevant IS Rating Scheme credits;	SMP	Sustainability	Sustainability Manager	Design and Construction
Management Requirements - Sustainability (MR-Sy) requirements	3.(c)	(c) The rating scores under the IS Rating Scheme must be verified by Infrastructure Sustainability Council of Australia verifiers in accordance with the IS Rating Scheme process using the IS Rating Scheme tool version 1.2.	SMP	Sustainability	Sustainability Manager	Design and Construction
Management Requirements - Sustainability (MR-Sy) requirements	3.(d)	(d) The sustainability objectives and requirements described in the Contract must be allowed for and addressed in:				
Management Requirements - Sustainability (MR-Sy) requirements	3.(d)(i)	(i) design briefings for all personnel involved in the preparation of Design Documentation;				
Management Requirements - Sustainability (MR-Sy) requirements	3.(d)(ii)	(ii) the Design Documentation;				
Management Requirements - Sustainability (MR-Sy) requirements	3.(d)(iii)	(iii) site inductions for all of the Contractor's personnel and Subcontractor's personnel engaged in the Contractor's Activities; and				

Source Document	Requirement Clause	Requirement	Document	Description	Responsibility	Timing
Management Requirements - Sustainability (MR-Sy) requirements	3.(d)(iv)	(iv) Management Plans for the management, coordination and delivery of the Contractor's Activities.	SMP	Sustainability	Sustainability Manager	Design and Construction
Management Requirements - Sustainability (MR-Sy) requirements	3.(e)	(e) The Contractor must also:				
Management Requirements - Sustainability (MR-Sy) requirements	3.(e)(i)	(i) participate in Sustainability Forums, hosted by the Principal's Representative on a regular (at least monthly) basis and present progress updates, sustainability performance information and sustainability lessons learned and provide other information as requested;				
Management Requirements - Sustainability (MR-Sy) requirements	3.(e)(ii)	(ii) develop, implement, maintain and submit to the Principal's Representative for review in accordance with the Contract, a Sustainability Assurance Framework to identify and track compliance with the sustainability requirements defined in the Contract,; and				
Management Requirements - Sustainability (MR-Sy) requirements	3.(e)(iii)	(iii) prepare and submit each year, by 31 August to the Principal's Representative for review in accordance with the Contract, an annual sustainability report which demonstrates the Contractor's performance in economic, social, environmental and governance areas over the last Financial Year.	SMP	Sustainability	Sustainability Manager	Design and Construction
Management Requirements - Sustainability (MR-Sy) requirements	4.	4 Climate Change				
Management Requirements - Sustainability (MR-Sy) requirements	4.	The Contractor must:				

Source Document	Requirement Clause	Requirement	Document	Description	Responsibility	Timing
Management Requirements - Sustainability (MR-Sy) requirements	4.(a)	(a) identify and describe in the Design Documentation, and implement climate change initiatives which demonstrate that the Works have been designed to combat and be resilient to the effects of climate change during each Design Stage referred to in MR-T;	SMP	Sustainability	Design Manager / Sustainability Manager	Design
Management Requirements - Sustainability (MR-Sy) requirements	4.(b)	(b) undertake climate change risk assessments in respect of the Works in accordance with the guidance and requirements included in the TfNSW Climate Risk Assessment Guidelines 2016 and the Infrastructure Sustainability Council of Australia's IS Rating Tool Technical Manual V1.2 – Climate Change Adaptation chapter. The risk assessments must be used as an input to inform the Design Work and be documented in the Design Documentation submitted to the Principal's Representative at Design Stage 1;	SMP	Sustainability	Design Manager / Sustainability Manager	Design
Management Requirements - Sustainability (MR-Sy) requirements	4.(c)	(c) identify all necessary adaptation measures that comprehensively address risks classified as "extreme" and "high" during the design life of the Works using AS/NZS ISO 31000:2009 Risk management – Principles and guidelines;	SMP	Sustainability	Design Manager / Sustainability Manager	Design
Management Requirements - Sustainability (MR-Sy) requirements	4.(d)	(d) implement measures to mitigate:				
Management Requirements - Sustainability (MR-Sy) requirements	4.(d)(i)	(i) all climate change risks classified as "extreme" and "high" in clause 4 (b) above; and	SMP	Sustainability	Design Manager / Sustainability Manager	Design
Management Requirements - Sustainability (MR-Sy) requirements	4.(d)(ii)	(ii) implement measures to mitigate at least 25% of all climate change risks classified as "medium"" in clause 4 (b) above.	SMP	Sustainability	Design Manager / Sustainability Manager	Design

Source Document	Requirement Clause	Requirement	Document	Description	Responsibility	Timing
Management Requirements - Sustainability (MR-Sy) requirements	4.(e)	(e) ensure that the climate change projections and guidance which the Contractor uses to underpin the climate change risk assessment in clause 4 (b) above are the most recent available and are consistent with industry best practice, including NWRLSRT-PBA-SRT-SU-REP-000022 Climate Resilience Report.	SMP	Sustainability	Design Manager / Sustainability Manager	Design
Management Requirements - Sustainability (MR-Sy) requirements	5.	5 Carbon and Energy Management				
Management Requirements - Sustainability (MR-Sy) requirements	5.	The Contractor must:				
Management Requirements - Sustainability (MR-Sy) requirements	5.(a)	(a) undertake greenhouse gas assessment and reporting which covers the, SWM Corridor Works, the Temporary Works and Contractors Activities, in accordance with the requirements of TfNSW's Carbon Estimate and Reporting Tool (CERT). All reports required to be produced under the CERT must be provided to the Principal's Representative for review by the Principal's Representative in accordance with the Contract;	ECMP	Energy and Carbon		Design and Construction
Management Requirements - Sustainability (MR-Sy) requirements	5.(b)	(b) demonstrate, using the CERT, that the Contractor has achieved at least a 20% reduction in greenhouse gas emissions associated with the Contractors Activities, measured against the CERT Base Case generated using the CERT, during Design Stage 3 and again prior to the Date of Construction Completion of the final Portion to reach Construction Completion;	ECMP	Energy and Carbon		Design and Construction
Management Requirements - Sustainability (MR-Sy) requirements	5.(c)	(c) ensure, and provide evidence to the Principal's Representative that, as a minimum, 25% of the total electricity being used in carrying out the Contractor's Activities is being offset through either one or a combination of the following:	ECMP	Energy and Carbon		Construction
Management Requirements - Sustainability	5.(c)(i)	(i) purchase of Australian Carbon Offset Credits; and	ECMP	Energy and Carbon		Construction

Source Document	Requirement Clause	Requirement	Document	Description	Responsibility	Timing
(MR-Sy) requirements						
Management Requirements - Sustainability (MR-Sy) requirements	5.(c)(ii)	(ii) purchase of renewable energy from an Accredited Renewable Energy Supplier.	ECMP	Energy and Carbon		Construction
Management Requirements - Sustainability (MR-Sy) requirements	5.(d)	(d) develop and implement Green Travel Plans for the personnel engaged in delivery of the Contractor's Activities.	ECMP	Energy and Carbon		Construction
Management Requirements - Sustainability (MR-Sy) requirements	6.	6 Resources				
Management Requirements - Sustainability (MR-Sy) requirements	6.1.	6.1 Water efficiency				
Management Requirements - Sustainability (MR-Sy) requirements	6.1.	The Contractor must:				
Management Requirements - Sustainability (MR-Sy) requirements	6.1.(a)	(a) undertake a water balance study and submit it to the Principal's Representative (prior to the commencement of construction work) that identifies the sources, uses and estimated quantities of potable and non-potable water which will be either created or used in the performance of the Contractor's Activities;				Design and Construction

Source Document	Requirement Clause	Requirement	Document	Description	Responsibility	Timing
Management Requirements - Sustainability (MR-Sy) requirements	6.1.(b)	(b) ensure that the water balance study in clause 6.1 (a) above identifies initiatives to reduce water demand and use non-potable water, which must be adopted in order to achieve the targets set out in clause 9; and				Design and Construction
Management Requirements - Sustainability (MR-Sy) requirements	6.1.(c)	(c) meter the water supplied for the Contractor's Activities from both recycled water networks and potable sources in order to report against the targets set out in clause 9 below.				Construction
Management Requirements - Sustainability (MR-Sy) requirements	6.2.	6.2 Materials	MMP	Materials		
Management Requirements - Sustainability (MR-Sy) requirements	6.2.	The Contractor must:	MMP	Materials		
Management Requirements - Sustainability (MR-Sy) requirements	6.2.(a)	(a) include evidence in its Design Stage 1, Design Documentation of how materials use has been minimised through materials avoidance, reduction and innovative design;	MMP	Materials	Design Manager	Design
Management Requirements - Sustainability (MR-Sy) requirements	6.2.(d)	(d) maximise the use of recycled steel, in the Works and Temporary Works;	MMP	Materials	Procurement Manager	Construction
Management Requirements - Sustainability (MR-Sy) requirements	6.2.(e)	(e) use low volatile organic compounds (VOC) paints, finishes, sealants and adhesives and low emission formaldehyde composite wood products in the Works and the Temporary Works;	MMP	Materials	Design Manager / Procurement Manager	Design and Construction

Source Document	Requirement Clause	Requirement	Document	Description	Responsibility	Timing
Management Requirements - Sustainability (MR-Sy) requirements	6.2.(f)	(f) ensure that all surface coatings used in the Works comply with the VOC Limits defined in the Australian Paint Approval Scheme;	MMP	Materials	Design Manager / Procurement Manager	Design and Construction
Management Requirements - Sustainability (MR-Sy) requirements	6.2.(g)	(g) source the following materials for the Works and Temporary Works in accordance with the following requirements:	MMP	Materials		
Management Requirements - Sustainability (MR-Sy) requirements	6.2.(g)(i)	(i) concrete must be sourced from members of the Cement Concrete and Aggregate Australia; or a “similar” international association or organisation by agreement with the Principal’s Representative;	MMP	Materials	Procurement Manager	Construction
Management Requirements - Sustainability (MR-Sy) requirements	6.2.(g)(ii)	(ii) steel must be sourced from suppliers that are certified under the Australian Certification Authority for Reinforcing and Structural Steels or a “demonstrated equivalent” approved association or organisation, where agreed by the Principal’s Representative;	MMP	Materials	Procurement Manager	Construction
Management Requirements - Sustainability (MR-Sy) requirements	6.2.(g)(iii)	(iii) steel must be sourced from steelmakers with an ISO 14001:2015 Environmental management certified Environmental Management System;	MMP	Materials	Procurement Manager	Construction
Management Requirements - Sustainability (MR-Sy) requirements	6.2.(g)(iv)	(iv) fabricated steel products must be in accordance with AS 5131:2016 Structural steelwork – Fabrication and erection and certified through the National Structural Steelwork Compliance Scheme;	MMP	Materials	Procurement Manager	Construction
Management Requirements - Sustainability (MR-Sy) requirements	6.2.(g)(v)	(v) at least 60% by mass of all reinforcing steel has been produced using energy-reducing processes, which include Polymer Injection Technology or its equivalent, in its manufacture;	MMP	Materials	Procurement Manager	Construction

Source Document	Requirement Clause	Requirement	Document	Description	Responsibility	Timing
Management Requirements - Sustainability (MR-Sy) requirements	6.2.(g)(vi)	(vi) Polyvinyl chloride must be compliant with the Green Building Council of Australia Best Practice Guidelines for PVC in the Built Environment; and	MMP	Materials	Procurement Manager	Construction
Management Requirements - Sustainability (MR-Sy) requirements	6.2.(g)(vii)	(vii) timber products must be sourced from one or more of the following:	MMP	Materials		
Management Requirements - Sustainability (MR-Sy) requirements	6.2.(g)(vii)A.	A. re-used timber;	MMP	Materials	Procurement Manager	Construction
Management Requirements - Sustainability (MR-Sy) requirements	6.2.(g)(vii)B.	B. post-consumer recycled timber;	MMP	Materials	Procurement Manager	Construction
Management Requirements - Sustainability (MR-Sy) requirements	6.2.(g)(vii)C.	C. timber suppliers in Australia certified by the Forest Stewardship Council, Australia; or	MMP	Materials	Procurement Manager	Construction
Management Requirements - Sustainability (MR-Sy) requirements	6.2.(g)(vii)D.	D. timber suppliers in Australia, certified under the Program for the Endorsement of Forest Certification.	MMP	Materials	Procurement Manager	Construction
Management Requirements - Sustainability (MR-Sy) requirements	6.2.(h)	(h) record the percentage of steel sourced from Australian manufacturers and make this information available to the Principal's Representative upon request;	MMP	Materials	Procurement Manager	Construction

Source Document	Requirement Clause	Requirement	Document	Description	Responsibility	Timing
Management Requirements - Sustainability (MR-Sy) requirements	6.2.(i)	(i) identify and implement initiatives to both reduce spoil quantities which will be generated during the performance of the Contractor's Activities and maximise the beneficial reuse of spoil; and	MMP	Materials	Procurement Manager	Construction
Management Requirements - Sustainability (MR-Sy) requirements	6.2.(j)	(j) ensure that 100% of spoil which can be re-used, is beneficially reused in accordance with the spoil reuse hierarchy identified in the Environmental Documents and is not disposed to landfill.	CSWMP		Construction Manager	Construction
Management Requirements - Sustainability (MR-Sy) requirements	7	7 Supply Chain	PMP	Supply Chain	Procurement Manager / Commercial Manager	
Management Requirements - Sustainability (MR-Sy) requirements	7	The Contractor must		Supply Chain	Procurement Manager / Commercial Manager	
Management Requirements - Sustainability (MR-Sy) requirements	7.(a)	(a) develop, implement and maintain a sustainable procurement policy and processes that comply with the requirements of BS 8903:2010 "Principles and framework for procuring sustainably – Guide", and include them in the Sustainability Management Plan;	PMP	Supply Chain	Procurement Manager / Commercial Manager	Construction
Management Requirements - Sustainability (MR-Sy) requirements	7.(b)	(b) achieve, as a minimum, the following for its procurement activities using the IS Rating Scheme version 1.2 tool:	PMP	Supply Chain	Procurement Manager / Commercial Manager	Construction
Management Requirements - Sustainability (MR-Sy) requirements	7.(b)(i)	(i) Level 2 for Pro-1 "Commitment to sustainable procurement";	PMP	Supply Chain	Procurement Manager / Commercial Manager	Construction

Source Document	Requirement Clause	Requirement	Document	Description	Responsibility	Timing
Management Requirements - Sustainability (MR-Sy) requirements	7.(b)(ii)	(ii) Level 3 for Pro-2 “Identification of suppliers”;	PMP	Supply Chain	Procurement Manager / Commercial Manager	Construction
Management Requirements - Sustainability (MR-Sy) requirements	7.(b)(iii)	(iii) Level 3 for Pro-3 “Supplier evaluation and contract award”; and	PMP	Supply Chain	Procurement Manager / Commercial Manager	Construction
Management Requirements - Sustainability (MR-Sy) requirements	7.(b)(iv)	(iv) Level 2 for Pro-4 “Managing supplier performance”.	PMP	Supply Chain	Procurement Manager / Commercial Manager	Construction
Management Requirements - Sustainability (MR-Sy) requirements	7.(b)(v)	(v) The Principal’s Community and Stakeholder representatives will be required to assist the Contractor in addressing the requirements of the ISCA V1.2 technical manual for the credits that relate to Stakeholder and Community Management. Specifically, these credits and targeted levels are: Sta-1 – Stakeholder engagement strategy (Lv 2) Sta-2 - Level of engagement (Lv 2) Sta-3 - Effective communication (Lv 2) Sta-4 – Addressing community concerns (Lv 2) Hea-1 - Community health and well-being (Lv 3)				Design and Construction
Management Requirements - Sustainability (MR-Sy) requirements	7.(d)	(d) demonstrate that sustainability training is being provided to High Impact Suppliers; and	PMP	Supply Chain	Procurement Manager / Commercial Manager / Sustainability Manager	Construction

Source Document	Requirement Clause	Requirement	Document	Description	Responsibility	Timing
Management Requirements - Sustainability (MR-Sy) requirements	7.(e)	(e) use a risk based approach to ensure that where High Impact Materials are sourced from a Developing Country the supplier's operations are in compliance with:	PMP	Supply Chain	Procurement Manager / Commercial Manager	Construction
Management Requirements - Sustainability (MR-Sy) requirements	7.(e)(i)	(i) all relevant laws and regulations local to that country;	PMP	Supply Chain	Procurement Manager / Commercial Manager	Construction
Management Requirements - Sustainability (MR-Sy) requirements	7.(e)(ii)	(ii) the International Labour Organization's Fundamental Conventions; and	PMP	Supply Chain	Procurement Manager / Commercial Manager	Construction
Management Requirements - Sustainability (MR-Sy) requirements	7.(e)(iii)	(iii) the “Ten Principles” of the UN Global Compact.	PMP	Supply Chain	Procurement Manager / Commercial Manager	Construction
Management Requirements - Sustainability (MR-Sy) requirements	7 (f)	develop, implement and maintain a sustainable procurement policy and processes that comply with the requirements of BS 8903:2010 “Principles and framework for procuring sustainably – Guide”, and include them in the Sustainability Management Plan; For SWM Corridor Works any existing plan from SSJ can be appended to demonstrate conformance	PMP	Supply Chain	Procurement Manager / Commercial Manager	Construction
Management Requirements - Sustainability (MR-Sy) requirements	8.	8 Community Benefit	SMP	Community Benefit	Project Leader / Community Stakeholder Manager / Sustainability Manager	
Management Requirements - Sustainability (MR-Sy) requirements	8.(a)	(a) The Contractor must identify and implement at least two community benefit initiatives in each of the following categories which provide demonstrable and tangible benefits to:	SMP	Community Benefit	Project Leader / Community Stakeholder Manager / Sustainability Manager	Design and Construction

Source Document	Requirement Clause	Requirement	Document	Description	Responsibility	Timing
Management Requirements - Sustainability (MR-Sy) requirements	8.(a)(i)	(i) local community groups, during the construction period; and	SMP	Community Benefit	Project Leader / Community Stakeholder Manager / Sustainability Manager	Design and Construction
Management Requirements - Sustainability (MR-Sy) requirements	8.(a)(ii)	(ii) the broader local community beyond the construction period.	SMP	Community Benefit	Project Leader / Community Stakeholder Manager / Sustainability Manager	Design and Construction
Management Requirements - Sustainability (MR-Sy) requirements	9	9 Sustainability Reporting	SMP	Sustainability Management	Design Manager / Sustainability Manager	Design and Construction
Management Requirements - Sustainability (MR-Sy) requirements	9 (a)	(a) The Contractor must prepare and submit a report named the “Climate Change Impact Assessment Report” to the Principal's Representative for review in accordance with the Contract, at Design Stage 1, Design Stage 2, Design Stage 3 Design and again prior to the Date of Completion of the last Portion to reach Completion.	SMP	Sustainability Management	Design Manager / Sustainability Manager	Design
Management Requirements - Sustainability (MR-Sy) requirements	9.(b)	(b) The Climate Change Impact Assessment Report must:	SMP	Sustainability Management	Design Manager / Sustainability Manager	Design

Source Document	Requirement Clause	Requirement	Document	Description	Responsibility	Timing
Management Requirements - Sustainability (MR-Sy) requirements	9.(b)(i)	(i) be prepared in accordance with the guidance and requirements included in the TfNSW Climate Risk Assessment Guidelines;	SMP	Sustainability Management	Design Manager / Sustainability Manager	Design
Management Requirements - Sustainability (MR-Sy) requirements	9.(b)(ii)	(ii) identify any project-specific climate change risks (utilising climate modelling data); and	SMP	Sustainability Management	Design Manager / Sustainability Manager	Design
Management Requirements - Sustainability (MR-Sy) requirements	9.(b)(iii)	(iii) identify risk mitigation measures which have been and will be implemented to reduce risk levels.	SMP	Sustainability Management	Design Manager / Sustainability Manager	Design
Management Requirements - Sustainability (MR-Sy) requirements	9.(c)	(c) The Contractor must prepare and submit to the Principal's Representative for review in accordance with the Contract, a report titled the "Greenhouse Gas Inventory Report", to be prepared using the CERT at Design Stage 1, , Design Stage 3, annually thereafter and again prior to the Date of Construction Completion of the last Portion to reach Construction Completion.	SMP	Sustainability Management	Design Manager / Sustainability Manager	Design and Construction
Management Requirements - Sustainability (MR-Sy) requirements	9.(d)	(d) The Greenhouse Gas Inventory Report must include data relating to emissions associated with electricity and fuel consumption, on-site process emissions and embodied emissions for all materials used in the Contractor's Activities, Works and Temporary Works.	ECMP	Sustainability Management	Design Manager / Sustainability Manager	Design and Construction
Management Requirements - Sustainability (MR-Sy) requirements	9.(e)	(e) The Contractor must provide an inventory of non-road diesel powered vehicles to be used for the Contractor's Activities within 1 month of the commencement of the Delivery Phase and subsequently, annually using TfNSW's Air Emission Data Collection Workbook 9TP-FT-439.	ECMP	Sustainability Management		Construction

Source Document	Requirement Clause	Requirement	Document	Description	Responsibility	Timing
Management Requirements - Sustainability (MR-Sy) requirements	9.(h)	(h) In addition and until the Date of Completion of the last Portion to reach Completion, the Contractor must submit to the Principal's Representative for review in accordance with the Contract, a report titled the "Monthly Sustainability Data Report" (MSDR) by the seventh day of each month (A lag of one month is acceptable. For example, the Monthly Sustainability Data Report containing data for October is due on the seventh day of December).	SMP	Sustainability Management	Sustainability Manager	Construction
Management Requirements - Sustainability (MR-Sy) requirements	9.(i)	(i) The Contractor's MSDR must as a minimum, detail the Contractor's performance against the targets identified in the Sustainability Management Plan, Spoil Management Plan, Carbon and Energy Management Plan, and Materials Management Plan (all required under MR-PA), using the Sydney Metro City & Southwest Sustainability Reporting Template SME ES-FT- 439 including reporting on:	SMP	Sustainability Management	Sustainability Manager	Construction
Management Requirements - Sustainability (MR-Sy) requirements	9.(i)(i)	(i) Scope 1 Carbon Emissions, Scope 2 Carbon Emissions, Scope 3 Carbon Emissions and Total Carbon Emissions;	SMP	Sustainability Management	Sustainability Manager	Construction
Management Requirements - Sustainability (MR-Sy) requirements	9.(i)(ii)	(ii) performance against the Carbon Emission Target identified in the Carbon and Energy Management Plan;	SMP	Sustainability Management	Sustainability Manager	Construction
Management Requirements - Sustainability (MR-Sy) requirements	9.(i)(iii)	(iii) electricity consumption and generation, including any on-site renewable energy generation and any renewable energy sourced for the construction of the Works and Temporary Works and performance against Electricity Consumption Targets included in the Sustainability Management Plan;	SMP	Sustainability Management	Sustainability Manager	Construction
Management Requirements - Sustainability (MR-Sy) requirements	9.(i)(iv)	(iv) quantity of greenhouse gas emissions associated with electricity consumption which have been offset, and method of offset;	SMP	Sustainability Management	Sustainability Manager	Construction

Source Document	Requirement Clause	Requirement	Document	Description	Responsibility	Timing
Management Requirements - Sustainability (MR-Sy) requirements	9.(i)(v)	(v) fuel consumption and performance against Fuel Consumption Targets;	SMP	Sustainability Management	Sustainability Manager	Construction
Management Requirements - Sustainability (MR-Sy) requirements	9.(i)(vi)	(vi) volume of potable mains water consumed for the Contractor's Activities, and performance against the Mains Water Consumption Target;	SMP	Sustainability Management	Sustainability Manager	Construction
Management Requirements - Sustainability (MR-Sy) requirements	9.(i)(vii)	(vii) volume of non-potable water consumed for the Contractor's Activities, including details of the sources of non-potable water, and performance against the Non-Potable Water Consumption Target;	SMP	Sustainability Management	Sustainability Manager	Construction
Management Requirements - Sustainability (MR-Sy) requirements	9.(i)(viii)	(viii) percentage of water consumed for the Contractor's Activities which has been sourced from non-potable sources;	SMP	Sustainability Management	Sustainability Manager	Construction
Management Requirements - Sustainability (MR-Sy) requirements	9.(i)(ix)	(ix) waste generation, recycling and disposal; total quantity of waste generated; quantity of non-putrescible general solid waste generated and percentage which has been recycled or reused; quantity of construction and demolition waste generated and percentage which has been recycled or reused; quantity of office waste generated and percentage which has been recycled or reused;	SMP	Sustainability Management	Sustainability Manager	Construction
Management Requirements - Sustainability (MR-Sy) requirements	9.(i)(x)	(x) the volume of spoil reused within the Site, beneficially reused off-site or disposed of off-site against the Spoil Targets identified in the Spoil Management Plan;	SMP	Sustainability Management	Sustainability Manager	Construction
Management Requirements - Sustainability	9.(i)(xi)	(xi) destinations for spoil which has been beneficially reused off-site or disposed of off-site;	SMP	Sustainability Management	Sustainability Manager	Construction

Source Document	Requirement Clause	Requirement	Document	Description	Responsibility	Timing
(MR-Sy) requirements						
Management Requirements - Sustainability (MR-Sy) requirements	9.(i)(xii)	(xii) quantities of steel and concrete which have been used for the Contractor's Activities;	SMP	Sustainability Management	Sustainability Manager	Construction
Management Requirements - Sustainability (MR-Sy) requirements	9.(i)(xiii)	(xiii) volume weighted average percentage cementitious content in concrete used for the Contractor's Activities which has comprised fly ash or slag; and	SMP	Sustainability Management	Sustainability Manager	Construction
Management Requirements - Sustainability (MR-Sy) requirements	9.(i)(xiv)	(xiv) such other information that the Principal's Representative may request.	SMP	Sustainability Management	Sustainability Manager	Construction
Management Requirements - Sustainability (MR-Sy) requirements	10	10 Construction Environmental Management Framework (CEMF)				
Management Requirements - Sustainability (MR-Sy) requirements	10	The Contractor must comply with the relevant clauses of the CEMF SM ES-ST-204 as listed in Annexure B of this MR-Sy.	SMP	Sustainability Management		
Management Requirements - Sustainability (MR-Sy) requirements	Annexure A:	Reference Documents				

Source Document	Requirement Clause	Requirement	Document	Description	Responsibility	Timing
Management Requirements - Sustainability (MR-Sy) requirements	Annexure A:	The following are Reference Documents: • NWRLSRT-PBA-SRT-SU-REP-000013 Climate Change Resilience Report. • Air Emission Data Collection Workbook 9TP-FT-439. • Sydney Metro City & Southwest Sustainability Reporting Template SME ES-FT- 439. • Sydney Metro Construction Environmental Management Framework CEMF SM ES-ST-204. • TfNSW Climate Risk Assessment Guidelines 9TP-SD-081 (available on internet). • TfNSW Carbon Estimation and Reporting Tool “CERT” (available on internet).				
Management Requirements - Sustainability (MR-Sy) requirements	Annexure B:	CEMF Requirements included in the Contractor’s Activities				
Management Requirements - Sustainability (MR-Sy) requirements	Annexure B (a)	The Contractor must comply with the requirements of CEMF Clause 1.3 Environment and Sustainability Policy	SMP	Sustainability Management		
Management Requirements - Sustainability (MR-Sy) requirements	Annexure B (b)	The Contractor must comply with the requirements of CEMF Clause 2.1 Legislation except the Principal retains the obligation to address any legislation which is not relevant to the Contractor’s Activities.	Relevant Management Plans	Sustainability Management		Design and Construction
Management Requirements - Sustainability (MR-Sy) requirements	Annexure B (c)	The Contractor must comply with the requirements of CEMF Clause 3.1 Environmental and Sustainability Management System	Relevant Management Plans	Sustainability Management		Design and Construction
Management Requirements - Sustainability	Annexure B (d)	The Contractor must comply with the requirements of CEMF Clause 3.2 Construction Sustainability Management Plan (referred to as the SMP)	SMP	Sustainability Management		Design and Construction

Source Document	Requirement Clause	Requirement	Document	Description	Responsibility	Timing
(MR-Sy) requirements						
Management Requirements - Sustainability (MR-Sy) requirements	Annexure B (e)	The SMP must also include a matrix of all the Contract requirements (including those in the SWTC and MR-Sy) relating to sustainability, referencing the relevant document clause.	SMP	Sustainability Management	Sustainability Manager	Design and Construction
Management Requirements - Sustainability (MR-Sy) requirements	Annexure B (f)	The Contractor must provide an SMP with the following sub-plans: a) Construction Carbon and Energy Management Plan; b) Waste Management and Recycling Plan; and c) A Materials Management Plan	SMP	Sustainability Management	Sustainability Manager	Design and Construction
Management Requirements - Sustainability (MR-Sy) requirements	Annexure B (g)	In relation to the Workforce Development Plan the Contractor must comply with the requirements of MR-PA and not clause 3.2 (d) of the CEMF.	WDIPP		Workforce Development Manager	Design and Construction
Management Requirements - Sustainability (MR-Sy) requirements	Annexure B (h)	The Contractor must comply with the requirements of CEMF Clause 13.1 Carbon and Energy Management Objectives	ECMP	Energy and Carbon	Sustainability Manager	Design and Construction
Management Requirements - Sustainability (MR-Sy) requirements	Annexure B (i)	The Contractor must comply with the requirements of CEMF Clause 13.2 Carbon and Energy Management Implementation	ECMP	Energy and Carbon	Sustainability Manager	Design and Construction
Management Requirements - Sustainability (MR-Sy) requirements	Annexure B (j)	The Carbon and Energy Management Plan must include estimates of Scope 1, Scope 2 and Scope 3 emissions and the Carbon Emission Target.	ECMP	Energy and Carbon	Sustainability Manager	Design and Construction

Source Document	Requirement Clause	Requirement	Document	Description	Responsibility	Timing
Management Requirements - Sustainability (MR-Sy) requirements	Annexure B (k)	The Contractor must comply with the requirements of CEMF Clause 13.3 Carbon and Energy Mitigation	ECMP	Energy and Carbon	Sustainability Manager	Design and Construction
Management Requirements - Sustainability (MR-Sy) requirements	Annexure B (l)	The Contractor must comply with the requirements of CEMF Clause 14.1 Materials Management Objectives	MMP	Materials	Sustainability Manager	Design and Construction
Management Requirements - Sustainability (MR-Sy) requirements	Annexure B (m)	The Contractor must comply with the requirements of CEMF Clause 14.2 Materials Management Implementation	MMP	Materials	Sustainability Manager	Design and Construction
Management Requirements - Sustainability (MR-Sy) requirements	Annexure B (n)	The Contractor must comply with the requirements of CEMF Clause 14.3 Materials Mitigation	MMP	Materials	Sustainability Manager	Design and Construction
Management Requirements - Sustainability (MR-Sy) requirements	Annexure B (o)	The Contractor must comply with the requirements of CEMF Clause 17.1 Waste Objectives	WRMP	Waste and Recycling	Sustainability Manager	Design and Construction
Management Requirements - Sustainability (MR-Sy) requirements	Annexure B (p)	The Contractor must comply with the requirements of CEMF Clause 17.2 Waste Implementation	WRMP	Waste and Recycling	Sustainability Manager	Design and Construction
Management Requirements - Sustainability (MR-Sy) requirements	Annexure B (q)	The Contractor must comply with the requirements of CEMF Clause 17.3 Waste Mitigation	WRMP	Waste and Recycling	Sustainability Manager	Design and Construction

Source Document	Requirement Clause	Requirement	Document	Description	Responsibility	Timing
IS Technical Manual V1.2	Man-1	There are commitments to mitigating negative environmental, social and economic impacts within a publicly stated Sustainability Policy. The Policy must be in place for the entire duration of the project and must be endorsed by senior management. There must be at least one commitment to restorative actions within the Policy. Restorative actions reverse a general trend of deterioration by improving or enhancing environmental or social values.	SMP	Sustainability Management	Sustainability Manager	Design and Construction
IS Technical Manual V1.2	Man-1	Sustainability commitments articulated in the Sustainability Policy must be embedded into sustainability objectives and/or targets. Sustainability objectives and/or targets must cover environmental, social and economic aspects. Every policy commitment must have at least one objective and/or target linked to it. The sustainability objectives and/or targets must be reflected in the major project contracts (e.g. for designer, constructor, operator etc.).	SMP	Sustainability Management	Sustainability Manager	Design and Construction
IS Technical Manual V1.2	Man-2	Environmental, social and economic risk and opportunities are to be assessed. Risk registers are suitable evidence and must include environmental, social and economic topics and must cover the whole project scope. The risk assessment shall be reviewed at least annually.	SMP	Sustainability Management	Sustainability Manager	Design and Construction
IS Technical Manual V1.2	Man-3	A member(s) of the senior management team shall have central responsibility for managing sustainability. 'Senior management' refers to the top level of management within the project.	SMP	Sustainability Management	Sustainability Manager	Design and Construction
IS Technical Manual V1.2	Man-3	A principal participant in the team is an IS Accredited Professional whose role is to provide sustainability advice. The IS Accredited Professional must participate throughout the relevant phases.	SMP	Sustainability Management	Sustainability Manager	Design and Construction
IS Technical Manual V1.2	Man-3	An independent sustainability professional is engaged to monitor and review sustainability performance. The independent sustainability professional needs to have qualifications in an environmental, social or economic field. They also need to have at least 10 years' experience practicing in one or more of these aspects, including at least five years' experience providing sustainability advice. Monitoring and review needs to be undertaken at least quarterly for the design phase and at least six monthly for the construction phase.	SMP	Sustainability Management	Sustainability Manager	Design and Construction
IS Technical Manual V1.2	Man-4	Internal sustainability inspections of site management are undertaken at least weekly during construction. Internal inspections must be undertaken by a manager or a sustainability or environmental professional. Sustainability inspections must use a checklist which covers environmental and social aspects and the inspection must be documented in a report.	SMP	Sustainability Management	Sustainability Manager	Design and Construction

Source Document	Requirement Clause	Requirement	Document	Description	Responsibility	Timing
IS Technical Manual V1.2	Man-4	Sustainability audits of the management system are conducted. At least one external review or audit is conducted during design. During construction at least four audits are conducted per year where at least one is external. Internal audits must be conducted by a suitably qualified auditor who is part of the project or asset management team. Suitably qualified means satisfying the competency requirements of ISO19011:2011 - Guidelines for auditing management systems, or equivalent. External audits must be conducted by a suitably qualified auditor who is not part of the project or asset management team.	SMP	Sustainability Management	Sustainability Manager	Design and Construction
IS Technical Manual V1.2	Man-5	Sustainability performance is reported at least quarterly to senior management. The sustainability report includes sustainability objectives and/or targets and identifies areas for improvement.	SMP	Sustainability Management	Sustainability Manager	Design and Construction
IS Technical Manual V1.2	Man-5	Sustainability performance is reported annually publicly.	SMP	Sustainability Management	Sustainability Manager	Design and Construction
IS Technical Manual V1.2	Man-5	Sustainability performance is reviewed formally at least annually by senior management. Management review incorporates stakeholder participation. Stakeholder participation in management review should include discussion of sustainability objectives or targets, and indicators; discussion of sustainability performance; discussion of actions to improve performance; and opportunity for stakeholder input to revision of objectives or targets and actions. All key stakeholders (as identified by stakeholder analysis or similar) should be represented in the management review. process.	SMP	Sustainability Management	Sustainability Manager	Design and Construction
IS Technical Manual V1.2	Man-6	Sustainability knowledge is shared within the project.	SMP	Sustainability Management	Sustainability Manager	Design and Construction
IS Technical Manual V1.2	Man-6	Sustainability knowledge is shared beyond project boundaries to parent organisations and/or other key stakeholders.	SMP	Sustainability Management	Sustainability Manager	Design and Construction
IS Technical Manual V1.2	Man-6	Sustainability knowledge is shared from outside the project onto the project.	SMP	Sustainability Management	Sustainability Manager	Design and Construction
IS Technical Manual V1.2	Man-6	Sustainability knowledge is shared beyond project and key stakeholder boundaries to the wider industry.	SMP	Sustainability Management	Sustainability Manager	Design and Construction
IS Technical Manual V1.2	Man-6	Sustainability knowledge sharing includes 'lessons learnt' (that had negative consequences) as well as 'good practices'. The knowledge sharing examples must include at least one simple cost benefit case study.	SMP	Sustainability Management	Sustainability Manager	Design and Construction

Source Document	Requirement Clause	Requirement	Document	Description	Responsibility	Timing
IS Technical Manual V1.2	Man-7	For significant issues, decision making is characterised by: - Considering options including business as usual, non-asset, technical limits and an option that specifically aims to address sustainability aspects. - Evaluating options by considering environmental, social and economic aspects through incorporating their value into cost-benefit analysis or other quantified means. - Evaluating options based on the forecast useful life of infrastructure asset and using social rates of return for discounting. At least one significant environmental or social aspect must be included and the means of evaluation must be described and justified.	SMP	Sustainability Management	Sustainability Manager	Design and Construction
IS Technical Manual V1.2	Pro-1	There is a commitment to require sustainability aspects to be considered in the procurement process in a publicly stated policy. The Policy must be in place for the entire duration of the project and must be endorsed by senior management.	PMP	Supply Chain	Procurement Manager / Commercial Manager	Design and Construction
IS Technical Manual V1.2	Pro-1	Sustainable procurement commitments articulated in the Sustainability Policy must be embedded into sustainability objectives and/or targets. (this could be in a strategy, plan or other management system documents). Every policy commitment must have at least one objective and/or target linked to it.	PMP	Supply Chain	Procurement Manager / Commercial Manager	Design and Construction
IS Technical Manual V1.2	Pro-2	Potential suppliers requested to provide details of their sustainability policy and its implementation. It must be made clear that sustainability incorporates environmental, social and economic aspects.	PMP	Supply Chain	Procurement Manager / Commercial Manager	Design and Construction
IS Technical Manual V1.2	Pro-2	Engagement with potential suppliers must be undertaken to explain sustainability requirements and expectations and their importance in the bid process. It must also help to stimulate innovation in relation to sustainability. At least one of the relevant innovations must be implemented. The managing organisation may choose to apply the engagement practices uniformly to all potential suppliers. Alternatively, it is acceptable to only apply these practices to suppliers of high impact procurement category goods and services. High impact category good and services are those identified as being potentially high environmental or social impact by a risk assessment or similar approach. At least one example of engagement with potential suppliers must be provided.	PMP	Supply Chain	Procurement Manager / Commercial Manager	Design and Construction

Source Document	Requirement Clause	Requirement	Document	Description	Responsibility	Timing
IS Technical Manual V1.2	Pro-3	Supplier evaluation considers sustainability aspects through use of multicriteria analysis or other scored means. the evaluation needs to consider sustainability through the use of multi-criteria analysis or other scored means. The analysis must incorporate at least one sustainability (non-financial) criterion and the weighting of the non-financial criteria must be greater than 20% in total. The analysis could be used to assist the evaluation in several ways including (a) initial screening of potential suppliers down to an acceptable short-list, and/or (b) selection of a preferred supplier. The managing organisation may choose to apply the above practices uniformly to all suppliers. Alternatively, it is acceptable for organisations to only apply these practices to suppliers of high impact procurement category goods and services. High impact category good and services are those identified as being potentially high environmental or social impact by a risk assessment or similar approach.	PMP	Supply Chain	Procurement Manager / Commercial Manager	Design and Construction
IS Technical Manual V1.2	Pro-3	Supplier contracts incorporate sustainability objectives and/or targets. the resulting supplier contracts need to incorporate sustainability objectives and/or targets. It must be made clear that sustainability incorporates environmental, social and economic aspects.	PMP	Supply Chain	Procurement Manager / Commercial Manager	Design and Construction
IS Technical Manual V1.2	Pro-4	Supplier sustainability performance is monitored for the duration of contracts, against the objectives and/or targets. Poor sustainability performance or noncompliance is actively managed. At least one example showing where non-compliance was managed must be provided.	PMP	Supply Chain	Procurement Manager / Commercial Manager	Design and Construction
IS Technical Manual V1.2	Cli-1	A number of readily available climate change projections are identified and adopted for the asset region over the forecast useful life of the asset.	SMP	Climate Change	Design Manager / Sustainability Manager	Design and Construction
IS Technical Manual V1.2	Cli-1	Direct and indirect climate change risks to the asset over the forecast useful life are identified and assessed. A multi-disciplinary team participated in identifying climate change risks and issues. A comprehensive set of affected external stakeholders participated in identifying climate change risks and issues.	SMP	Climate Change	Design Manager / Sustainability Manager	Design and Construction
IS Technical Manual V1.2	Cli-1	Modelling is undertaken to characterise the likely impacts of the projected climate change for all High and Extreme priority climate change risks.	SMP	Climate Change	Design Manager / Sustainability Manager	Design and Construction

Source Document	Requirement Clause	Requirement	Document	Description	Responsibility	Timing
IS Technical Manual V1.2	Cli-2	Adaptation options to treat all extreme and high priority climate change risks are identified, assessed and appropriate measures implemented. After treatment there are no extreme or high priority residual climate change risks. Adaptation options to treat at least 50% of all medium priority climate change risks are identified, assessed and appropriate measures implemented.	SMP	Climate Change	Design Manager / Sustainability Manager	Design and Construction
IS Technical Manual V1.2	Ene-1	Modelling of energy use and GHG emissions, and actions taken to reduce them, is undertaken, covering at least Scope 1, Scope 2 and land clearing across the infrastructure lifecycle. Modelling demonstrates a reduction in GHG emissions compared to a base case footprint of 20%	ECMP	Energy and Carbon	Design Manager / Sustainability Manager	Design and Construction
IS Technical Manual V1.2	Ene-1	Monitoring of energy use and GHG emissions, and actions taken to reduce them, is undertaken, covering at least Scope 1, Scope 2 and land clearing across the infrastructure lifecycle. Monitoring demonstrates a reduction in GHG emissions compared to a base case footprint of 20%.	ECMP	Energy and Carbon	Sustainability Manager	Construction
IS Technical Manual V1.2	Ene-1	The monitoring and modelling of energy and GHG emissions must be either managed by, reviewed by, or audited by a suitably qualified person. A suitably qualified person for the purposes of this credit is someone who has a formal qualification and a minimum of five years' experience in energy or GHG management.	ECMP	Energy and Carbon	Sustainability Manager	Design and Construction
IS Technical Manual V1.2	Ene-2	Opportunities for use of renewable energy fully investigated. Non-renewable energy is substituted with energy from renewable sources where practicable. Fully investigated means: - establishing criteria for deciding whether to invest in a renewable energy option, - identifying renewable energy options available to the project or asset, - assessing each option against the criteria to enable a decision on which options to implement, - justifying the options selected for implementation and the options not selected, and investigating at least three renewable energy technologies. Possible renewable energy technologies could include large and small-scale wind power, solar photovoltaic power, solar thermal heat and power, bioenergy and biofuels (i.e. fuel switching).	ECMP	Energy and Carbon	Sustainability Manager	Design and Construction
IS Technical Manual V1.2	Wat-1	Modelling of water use is undertaken	SMP	Water	Sustainability Manager	Design and Construction
IS Technical Manual V1.2	Wat-1	Monitoring of water use is undertaken	SMP	Water	Sustainability Manager	Construction
IS Technical Manual V1.2	Wat-2	Modelling demonstrates that some proportion of total water use is from non-potable sources (substituting for potable).	SMP	Water	Sustainability Manager	Design and Construction

Source Document	Requirement Clause	Requirement	Document	Description	Responsibility	Timing
IS Technical Manual V1.2	Wat-2	Monitoring demonstrates that some proportion of total water use is from non-potable sources (substituting for potable).	SMP	Water	Sustainability Manager	Construction
IS Technical Manual V1.2	Mat-1	Modelling of material lifecycle impacts is undertaken using the Materials Calculator (or other suitable Lifecycle Assessment technique) across the infrastructure lifecycle. Modelling demonstrates a reduction in materials lifecycle impacts compared to a base case footprint of 20%.	MMP	Materials	Sustainability Manager	Design and Construction
IS Technical Manual V1.2	Mat-1	Monitoring of material lifecycle impacts is undertaken using the Materials Calculator (or other suitable Lifecycle Assessment technique) across the infrastructure lifecycle. Monitoring demonstrates a reduction in materials lifecycle impacts compared to a base case footprint of 20%.	MMP	Materials	Sustainability Manager	Construction
IS Technical Manual V1.2	Mat-2	3-9% of materials/products by value have an ISCA approved environmental label. ISCA Approved Environmental Labels; - GECA Good Environmental Choice Australia Ecolabel - Green Building Council of Australia BEP - Eco specifier Green Tag - ISEAL Alliance compliant whole supply chain Stewardship Scheme Certification - Environmental Product Declarations – product-specific - Environmental Product Declarations – industry-wide	MMP	Materials	Sustainability Manager	Design and Construction
IS Technical Manual V1.2	Dis-1	Measures to minimise adverse impacts to receiving water environmental values during operation have been identified and implemented. Modelling of water discharges and receiving waters demonstrates no adverse impact on receiving water environmental values. Modelling demonstrates the infrastructure does not increase peak stormwater flows for rainfall events of up to a 1.5 year ARI event discharge.	DMP	Water Quality	Design Manager	Design
IS Technical Manual V1.2	Dis-1	Measures to minimise adverse impacts to receiving water environmental values during construction have been identified and implemented. Monitoring of water discharges and receiving waters demonstrates no adverse impact on receiving water environmental values. Monitoring demonstrates the infrastructure does not increase peak stormwater flows for rainfall events of up to a 1.5 year ARI event discharge	CEMP	Water Quality	Environment Manager	Construction

Source Document	Requirement Clause	Requirement	Document	Description	Responsibility	Timing
IS Technical Manual V1.2	Dis-2	Measures to mitigate noise during construction have been identified and implemented. Monitoring of noise is undertaken at appropriate intervals and in response to complaints during construction. For construction, modelling and monitoring demonstrates no recurring exceedances or major divergences from the noise management process in ISCA approved noise guidelines. Noise goals should be determined based on relevant regulations and the advice of a qualified acoustic specialist. ISCA approved noise guidelines include; - Department of Environment and Climate Change, NSW, Interim Construction Noise Guideline, July 2009 - Transport Construction Authority, NSW, 'Construction Noise Strategy', 13 September 2011	CEMP	Noise	Environment Manager	Construction
IS Technical Manual V1.2	Dis-2	Measures to mitigate noise during operation have been identified and implemented. For operation, modelling demonstrates no recurring exceedances or major divergences of noise goals. Noise goals should be determined based on relevant regulations and the advice of a qualified acoustic specialist.	DMP	Noise	Design Manager	Design
IS Technical Manual V1.2	Dis-3	Measures to mitigate vibration during construction have been identified and implemented. Monitoring of vibration is undertaken at appropriate intervals and in response to complaints during construction. For construction, modelling and monitoring demonstrates no exceedances of vibration goals for structural damage to buildings and structures. Vibration goals should be determined based on relevant regulations and the advice of a qualified acoustic specialist. No physical damage has been caused to any buildings or structures by vibration caused by construction	CEMP	Noise	Environment Manager	Construction
IS Technical Manual V1.2	Dis-3	Measures to mitigate vibration during operation have been identified and implemented. For operation, modelling demonstrates no exceedances of vibration goals for human comfort criteria. Vibration goals should be determined based on relevant regulations and the advice of a qualified acoustic specialist.	DMP	Vibration	Design Manager	Design
IS Technical Manual V1.2	Dis-4	Measures to minimise adverse impacts to local air quality during construction have been identified and implemented. Monitoring of air emissions and/or air quality is undertaken at appropriate intervals and in response to complaints during construction. Monitoring demonstrates no recurring or major exceedances of air emission or air quality goals. Air emission or air quality goals should be based on relevant regulations and the advice of a qualified air quality specialist.	CEMP	Vibration	Environment Manager	Construction

Source Document	Requirement Clause	Requirement	Document	Description	Responsibility	Timing
IS Technical Manual V1.2	Dis-4	Measures to minimise adverse impacts to local air quality during operation have been identified and implemented. Modelling demonstrates no recurring or major exceedances of air emission or air quality goals. Air emission or air quality goals should be based on relevant regulations and the advice of a qualified air quality specialist.	DMP		Design Manager	Design
IS Technical Manual V1.2	Dis-5	Measures to prevent light spill during construction have been identified and implemented.	CEMP	Light Spill	Environment Manager	Construction
IS Technical Manual V1.2	Dis-5	The lighting design for operation prevents horizontal light spill through compliance with the numerical limits for obtrusive light in Tables 2.1 and 2.2 of AS4282.	DMP	Light Spill	Design Manager	Design
IS Technical Manual V1.2	Dis-5	The lighting design for operation prevents upward light spill by ensuring that, relative to its particular mounting orientation, 95% (by number) of external public lighting luminaires within the project boundary have an Upward Light Ratio less than 5% (for roads and public spaces this must be less than 3% in accordance with AS1158).	DMP	Light Spill	Design Manager	Design
IS Technical Manual V1.2	Lan-1	Where practicable land used for the project is 'previously disturbed'. 'previously disturbed' does not include; - agricultural land - rehabilitated mines/landfills - parks, recreation grounds, - vegetated sites - grass verges (or similar)		Land Use	Design Manager / Construction	Design and Construction
~~IS Technical Manual V1.2~~	~~Lan-2~~	~~95% of all topsoil (by volume) retains its productivity and is beneficially re-used on or nearby to the project. Opportunities to improve topsoil productivity of previously disturbed areas have been identified and incorporated into the project. Correct separation, handling and storage of topsoil and subsoil must be demonstrated. Topsoil is defined as the surface layer of soil containing partly decomposed organic debris, which is usually high in nutrients, contains many seeds, and is rich in the fungus, mycorrhizae. Note; topsoil is not always present~~	~~CSWMP~~	-	~~Construction Manager / Environment Manager~~	~~Design and Construction~~

Source Document	Requirement Clause	Requirement	Document	Description	Responsibility	Timing
IS Technical Manual V1.2	Lan-3	Regarding contamination, site assessment follows the recommended approach in Schedule A 'Recommended general process for assessment of site contamination' of National Environment Protection (Assessment of Site Contamination) Measure 1999. Sustainability appraisal of remediation options is undertaken against the sustainability indicators in Table 1 of 'A Framework for Assessing the Sustainability of Soil and Groundwater Remediation'. The effectiveness and durability of the remedial solution, and maintenance and monitoring, have been considered over the lifetime of the infrastructure and beyond. The site assessment and remediation appraisal should be managed, reviewed or audited by a suitably qualified professional. A suitably qualified professional should meet the requirements of Schedule B(9) of the NEPM 1999 (as amended 2013). While a contaminated land auditor accredited by the relevant state authority would be acceptable, others who meet the NEPM requirements would also be acceptable.	CSWMP	Contamination and Remediation	Construction Manager / Environment Manager	Design and Construction
IS Technical Manual V1.2	Lan-4	The run-off, flood risk, and potential increased flood risk elsewhere as a result of the project have all been assessed over their expected working life, in line with the requirements of 'Flood plain management in Australia: best practice principles and guidelines' and appropriate flood resilience measures have been included in the design so that there is no increase in flood risk.	DMP	Flooding	Design Manager	Design
IS Technical Manual V1.2	Was-1	Predictions for waste quantities and types have been developed for construction. Measures to minimise waste during construction have been identified and implemented. Monitoring of all wastes is undertaken during construction.	WRMP	Waste and Recycling	Sustainability Manager	Construction
IS Technical Manual V1.2	Was-1	Predictions for waste quantities and types have been developed for operation. Measures to minimise waste during operation have been identified and implemented	WRMP	Waste and Recycling	Sustainability Manager	Design
IS Technical Manual V1.2	Was-1	Waste monitoring and management has been managed, reviewed or audited by a suitably qualified professional. It should be undertaken at least annually for construction. A suitably qualified professional means someone with at least five years' waste management experience, or a NABERS Assessor, or equivalent. The review or audit should cover both systems and data i.e. the systems used to manage waste and the data recording and reporting. The scope of the waste review/audit should include an objective assessment of the accuracy and completeness of reported waste information	WRMP	Waste and Recycling	Sustainability Manager	Construction

Source Document	Requirement Clause	Requirement	Document	Description	Responsibility	Timing
IS Technical Manual V1.2	Was-1	Waste handling and disposal/recycling all the way to final destination has been audited at appropriate intervals. Auditing to final destination must be undertaken at least 6 monthly for construction. The audit should include a physical/visual verification of waste destinations.	WRMP	Waste and Recycling	Sustainability Manager	Construction
IS Technical Manual V1.2	Was-2	All of the following targets for landfill diversion have been achieved or bettered: 100% by volume of spoil >90% by volume of inert and non-hazardous waste >60% by volume of office waste material.	WRMP	Waste and Recycling	Sustainability Manager	Construction
IS Technical Manual V1.2	Was-3	A deconstruction plan is developed based on good practice. The deconstruction plan is reviewed and updated. Reviews should consider changes to technology and infrastructure planning.	WRMP	Waste and Recycling	Design Manager / Sustainability Manager	Design
IS Technical Manual V1.2	Was-3	50% by value of components or pre-fabricated units used can be easily separated on disassembly/ deconstruction into material types suitable for recycling or reuse.	WRMP	Waste and Recycling	Design Manager / Sustainability Manager	Design
IS Technical Manual V1.2	Eco-1	The ecological value of the infrastructure site is maintained	CEMP	Biodiversity	Design Manager / Environment Manager	Design and Construction
IS Technical Manual V1.2	Eco-2	There is low or moderate degree of existing habitat connectivity identified. The existing degree of habitat connectivity is maintained (offsetting allowed)	CEMP	Biodiversity	Design Manager / Environment Manager	Design and Construction
IS Technical Manual V1.2	Hea-1	Measures to positively contribute to community health and wellbeing for one priority issues have been identified and implemented.	CCSMP	Community Benefit	Community and Stakeholder Manager	Design and Construction
IS Technical Manual V1.2	Hea-2	The likelihood of crime has been reduced through implementing appropriate CPTED guidelines in design		Crime Prevention	Design Manager	Design
IS Technical Manual V1.2	Hea-2	The likelihood of crime has been reduced through implementing appropriate CPTED guidelines in construction. Temporary construction diversions and lighting are designed to meet CPTED guidance.		Crime Prevention	Safety Manager	Construction
IS Technical Manual V1.2	Hea-2	All tunnels or underpasses have end to-end visibility.		Crime Prevention	Design Manager / Safety Manager	Design and Construction
IS Technical Manual V1.2	Her-1	Community heritage values have been identified through consultation and integrated into studies. Community and key stakeholders have participated in the heritage studies. Heritage values beyond those listed in government registers have been identified, considered and addressed. Heritage has been interpreted to promote local heritage values	CEMP	Heritage	Environment Manager / Design Manager	Design and Construction

Source Document	Requirement Clause	Requirement	Document	Description	Responsibility	Timing
IS Technical Manual V1.2	Her-1	Measures to minimise adverse impacts to heritage during construction have been identified and implemented. Heritage aspects must be managed, reviewed or audited by a suitably qualified professional. A suitably qualified professional is someone who has a formal cultural heritage qualification and minimum of five years' experience.	CEMP	Heritage	Environment Manager / Design Manager	Design and Construction
IS Technical Manual V1.2	Her-1	Measures to minimise adverse impacts to heritage during operation have been identified and implemented. Heritage has been interpreted to promote local heritage values. Opportunities have been identified and implemented to enhance heritage values. Heritage aspects must be managed, reviewed or audited by a suitably qualified professional. A suitably qualified professional is someone who has a formal cultural heritage qualification and minimum of five years' experience.	CEMP	Heritage	Environment Manager / Design Manager	Design and Construction
IS Technical Manual V1.2	Her-2	Modelling demonstrates maintenance of heritage values. Modelling demonstrates enhancements to heritage values. Modelling of future states must demonstrate that heritage values have been (or will be) successfully enhanced. enhancement opportunities include: - an adaptive reuse - tourism, information and education - merchandising - celebratory events	CEMP	Heritage	Environment Manager / Design Manager	Design and Construction
IS Technical Manual V1.2	Her-2	Monitoring of heritage is undertaken at appropriate intervals during construction. Monitoring demonstrates maintenance of heritage values. Monitoring reports should be prepared describing the success or otherwise of heritage management. A suitably qualified professional or committee should oversee heritage monitoring. A suitably qualified professional is someone who has a formal cultural heritage qualification and minimum of five years' experience.	CEMP	Heritage	Environment Manager / Design Manager	Design and Construction

Source Document	Requirement Clause	Requirement	Document	Description	Responsibility	Timing
IS Technical Manual V1.2	Sta-1	A comprehensive stakeholder engagement strategy is developed and includes; - Commitment statement that demonstrates a high level of commitment to stakeholders and that the engagement processes are valued - Determine the level of engagement appropriate to the needs of the project. - Regulations and requirements - Previous community engagement activities - Analysis of stakeholders including a table that identifies all relevant stakeholders and indicates their likely level of interest in the project and their specific issues - Community engagement program including a description of project specific stakeholder engagement techniques - A timetable including key community engagement milestones that demonstrate early engagement - Resources and responsibilities - community feedback procedure - Monitoring and reporting - Management functions - Evaluation process	CCSMP	Community and Stakeholder	Community and Stakeholder Manager	Design and Construction
IS Technical Manual V1.2	Sta-1	The stakeholder engagement strategy must be independently reviewed by a suitably qualified professional. A suitably qualified professional: (a) has at least five years' experience in stakeholder engagement, is a current member of the International Association for Public Participation and has completed the IAP2 Certificate In Public Participation, or (b) has at least ten years' experience in stakeholder engagement.	CCSMP	Community and Stakeholder	Community and Stakeholder Manager	Design and Construction
IS Technical Manual V1.2	Sta-1	Stakeholders, including the community, have input to the stakeholder engagement strategy by way of a facilitated workshop(s), which is used to guide completion of the final strategy.	CCSMP	Community and Stakeholder	Community and Stakeholder Manager	Design and Construction
IS Technical Manual V1.2	Sta-2	Negotiable issues are identified in the stakeholder engagement strategy and the level of participation on these issues is at least 'collaborate' or higher on the IAP2 spectrum. Stakeholders are informed about non-negotiable issues.	CCSMP	Community and Stakeholder	Community and Stakeholder Manager	Design and Construction

Source Document	Requirement Clause	Requirement	Document	Description	Responsibility	Timing
IS Technical Manual V1.2	Sta-3	The community has been provided with information that: - was provided in a timely manner - supported community participation - was meaningful and relevant - was accessible This has been verified by: - suitably qualified independent reviews/audits OR - community feedback with >80% support demonstrated via surveys of representative community groups may be suitable. Alternatives to community surveys such as well constructed and analysed complaint and enquiry databases A suitably qualified professional must: - have at least five years' experience in stakeholder engagement, is a current member of the International Association for Public Participation and has completed the IAP2 Certificate In Public Participation, or - have at least ten years' experience in stakeholder engagement.	CCSMP	Community and Stakeholder	Community and Stakeholder Manager	Design and Construction
IS Technical Manual V1.2	Sta-4	The community believe their concerns have been considered and addressed. AND This has been verified by: - suitably qualified independent reviews/audits OR - community feedback with >80% support demonstrated via surveys of representative community groups may be suitable. Alternatives to community surveys such as well constructed and analysed complaint and enquiry databases A suitably qualified professional must: - have at least five years' experience in stakeholder engagement, is a current member of the International Association for Public Participation and has completed the IAP2 Certificate In Public Participation, or - have at least ten years' experience in stakeholder engagement.	CCSMP	Community and Stakeholder	Community and Stakeholder Manager	Design and Construction

Source Document	Requirement Clause	Requirement	Document	Description	Responsibility	Timing
~~IS Technical Manual V1.2~~	~~Urb-1~~	~~An urban and landscape design plan is developed and implemented that includes the following:~~ ~~1. Site analysis;~~ ~~2. Vision and objectives for the infrastructure;~~ ~~3. Site planning; and~~ ~~4. Strategies that respond to:~~ ~~a. the relevant People and Place principles outlined in the Australian Urban Design Protocol (AUDP) or~~ ~~b. other ISCA approved guidelines.~~ ~~The plan preparation, implementation and monitoring must be managed, reviewed or audited by a suitably qualified professional. A suitably qualified professional for the purposes of this credit is a person with a planning or design qualification with a minimum of five years' experience.~~				
~~IS Technical Manual V1.2~~	~~Urb-1~~	~~The urban and landscape design plan must be independently reviewed. Review is required by a Design Review Panel. Many state governments have access to a Design Review Panel typically involved their office of the state government architect. Design review should be implemented in accordance with the IS Design Review Guide (available on the ISCA website).~~				
~~IS Technical Manual V1.2~~	~~Urb-2~~	~~Urban and landscape designs are constructed and ongoing management is incorporated into urban design and landscape management plans. A suitably qualified professional must manage, review or audit the urban design and landscape management plans~~				
~~IS Technical Manual V1.2~~	~~Urb-2~~	~~The infrastructure is managed in accordance with the urban and landscape design plan and achieves a high degree of compliance. The urban design and landscaping must be managed, reviewed or audited by a suitably qualified professional to ensure a high degree of compliance with the management plans. The suitably qualified professional must be involved at regular intervals throughout construction of the urban and landscape design components of the project including conducting site inspections both during and at the end of construction.~~				
IS Technical Manual V1.2	Inn-1	Identify and deliver innovations	SMP	Climate Change	Design Manager / Sustainability Manager	Design and Construction
S2B REMMS	SCC1	Sustainability initiatives and targets would be reviewed and incorporated into the detailed design to support the achievement of the project's sustainability objectives. A best practice level of performance would be targeted using relevant sustainability rating tools e.g. ISCA as built 'excellent' level rating.	SMP	Sustainability Management	Sustainability Manager	Design and Construction

Source Document	Requirement Clause	Requirement	Document	Description	Responsibility	Timing
S2B REMMS	SCC2	A sustainable procurement strategy would be developed and implemented to apply to Principal Contractors, their subcontractors and their suppliers.	PMP	Supply Chain	Procurement Manager / Commercial Manager	Design and Construction
S2B REMMS	SCC3	A workforce development and industry participation strategy would be developed covering both construction and operation.	WDIPP	Workforce Development	Workforce Development Manager	Design and Construction
S2B REMMS	SCC4	The need for climate change risk treatments would be assessed and incorporated into the detailed design, where required.	SMP	Climate Change	Design Manager / Sustainability Manager	Design and Construction
S2B REMMS	SCC5	An iterative process of greenhouse gas assessments and design refinements would be carried out during detailed design and construction to identify opportunities to minimise greenhouse gas emissions. Performance would be measured in terms of a percentage reduction in greenhouse gas emissions from a defined reference footprint.	ECMP	Energy and Carbon	Design Manager / Sustainability Manager	Design and Construction
S2B REMMS	SCC6	Sustainability reporting (and corrective action where required) would be undertaken during construction.	SMP	Sustainability Management	Sustainability Manager	Construction
S2B REMMS	SCC7	The construction workforce development plan would be implemented.	WDIPP	Workforce Development	Workforce Development Manager	Construction
S2B REMMS	SCC8	25 per cent of the greenhouse gas emissions associated with consumption of electricity during construction would be offset.	SMP	Sustainability Management	Sustainability Manager	Construction
S2B REMMS	WM1	Detailed design would include measures to minimise excess spoil generation. This would include a focus on optimising the design to minimise spoil volumes, and the reuse of material on-site.	WRMP	Waste and Recycling	Design Manager	Design
S2B REMMS	WM2	A recycling target of at least 90 per cent would be adopted.	WRMP	Waste and Recycling	Sustainability Manager	Design and Construction
S2B REMMS	WM3	Spoil would be managed in accordance with the spoil management hierarchy.	CSWMP	Waste and spoil management	Construction Manager / Environment Manager	Design and Construction
S2B REMMS	WM4	Target 100 per cent reuse of reusable spoil.	CSWMP	Waste and spoil management	Construction Manager / Environment Manager	Design and Construction
S2B REMMS	WM5	Construction waste would be minimised by accurately calculating materials brought to the site and limiting materials packaging.	MMP	Materials	Sustainability Manager /	Construction

Source Document	Requirement Clause	Requirement	Document	Description	Responsibility	Timing
					Construction Manager	
S2B REMMS	WM6	All waste would be assessed, classified, managed and disposed of in accordance with the Waste Classification Guidelines (EPA, 2014).	WRMP	Waste and Recycling	Sustainability Manager / Environment Manager	Construction
S2B REMMS	WM7	Waste segregation bins would be located at various locations within the project area, if space permits, to facilitate segregation and prevent cross contamination.	WRMP	Waste and Recycling	Sustainability Manager	Design and Construction

13. Appendix F Obligations Register – BEW

Source Document	Section	Title/Categories	Requirement	Responsible
SWTC App F08	**1**	**General**		
SWTC App F08	1.1	Overview and Scope		
SWTC App F08	1.1 (a)	Overview and Scope	This Appendix F08 describes requirements and processes in relation to the management and reporting of sustainability related aspects of the SSJ Contractor's Activities	
SWTC App F08	1.1 (b)	Overview and Scope	The SSJ Contractor must comply with the compliances documents listed in Annexure A	
SWTC App F08	**2**	**Management Requirements**		
SWTC App F08	2.1	General		
SWTC App F08	2.1 (a)	General MRs	The SSJ Contractor must provide copies of all the documents required in this Appendix F08 in ".pdf" format that comply with the Level AA accessibility requirements in the Web Content Accessibility Guidelines (WCAG 2.0).	
SWTC App F08	2.1 (b)	General MRs	The SSJ Contractor must ensure that sustainability is addressed throughout the performance of the SSJ Contractor's Activities and that sustainability is embedded into construction of the Bankstown Early Works and the Temporary Works.	
SWTC App F08	**3**	**Governance**		

Source Document	Section	Title/Categories	Requirement	Responsible
SWTC App F08	3 (a)	Governance	The SSJ Contractor must develop, implement and maintain governance structures, processes and systems that ensure integration and implementation of all sustainability considerations, initiatives and reporting	MH
SWTC App F08	3 (b)	Governance	The SSJ Contractor must achieve a gold rating using the Transport for NSW Sustainable Design Guidelines (SDG) version 4.0	MH
SWTC App F08	3 (c)	Governance	In relation to the SDG rating, the SSJ Contractor must:	
SWTC App F08	3 (c)(i)	Governance	(i) provide a completed scorecard and supporting information for the Bankstown Early Works to the Principal's Representative in accordance with the requirements set out in the SDG guidance.	MH
SWTC App F08	3 (d)	Governance	The sustainability objectives and requirements outlined in this SWTC must be eallowed for and addressed in:	
SWTC App F08	3 (d)(i)	Governance	(i) Contract Management Plans for the delivery and management of the Bankstown Early Works and Temporary Works	MH

Source Document	Section	Title/Categories	Requirement	Responsible
SWTC App F08	3 (e)	Governance	The SSJ Contractor must also:	
SWTC App F08	3 (e)(i)	Governance	(i) participate in sustainability forums, hosted by the Principal's Representative on a quarterly basis and must present progress updates, sustainability performance information and sustainability lessons learned and provide other information as requested; and	
SWTC App F08	3 (e)(ii)	Governance	(ii) develop, implement, maintain and submit to the Principal's Representative for review, a Sustainability Assurance Framework to identify and track compliance with the sustainability requirements	MH
SWTC App F08	**4**	**Climate Change**		
SWTC App F08	4 (a)	Climate Change	The SSJ Contractor must:	

Source Document	Section	Title/Categories	Requirement	Responsible
SWTC App F08	4 (a)(i)	Climate Change	(i) ensure all relevant climate change mitigation and adaptation measures identified in the Principal's Design Documentation, including any specifications, are implemented during the delivery of the Bankstown Early Works	
SWTC App F08	4 (a)(ii)	Climate Change	(ii) not allocate the responsibility for mitigation of risks related to climate change to the Operator or the Principal's Representative without prior approval from the Principal's Representative	

Source Document	Section	Title/Categories	Requirement	Responsible
SWTC App F08	**5**	**Carbon Management and Energy Efficiency**		
SWTC App F08	5 (a)	Carbon Management and Energy Efficiency	The SSJ Contractor must:	
SWTC App F08	5 (a)(i)	Carbon Management and Energy Efficiency	(i) undertake greenhouse gas assessment and reporting which covers the Bankstown Early Works, the Temporary Works and the SSJ Contractor's Activities, in accordance with the requirements of TfNSW's Carbon Estimate and Reporting Tool (CERT). All reports required to be produced under the CERT must be provided to the Principal's Representative for review;	
SWTC App F08	5 (a)(ii)	Carbon Management and Energy Efficiency	(ii) demonstrate, using the CERT, that the SSJ Contractor has achieved at least a 20% reduction in greenhouse gas emissions associated with the SSJ Contractor's Activities, measured against the CERT Base Case generated using the CERT, prior to the Date of Construction Completion of the final Portion to reach Construction Completion;	
SWTC App F08	5 (a)(iii)	Carbon Management and Energy Efficiency	(iii) ensure, and provide evidence to the Principal's Representative that, as a minimum, 25% of the total electricity being used in carrying out the SSJ Contractor's Activities is being offset through either one or a combination of the following: A. purchase of Australian Carbon Offset Credits; and B. purchase of renewable energy from an Accredited Renewable Energy Supplier.	MH

Source Document	Section	Title/Categories	Requirement	Responsible
SWTC App F08	5 (b)	Carbon Management and Energy Efficiency	The SSJ Contractor must ensure that all vehicles, plant and equipment, are:	
SWTC App F08	5 (b)(i)	Carbon Management and Energy Efficiency	(i) selected and operated for optimum energy efficiency	
SWTC App F08	5 (b)(ii)	Carbon Management and Energy Efficiency	(ii) not left idling when not in use	
SWTC App F08	5 (b)(iii)	Carbon Management and Energy Efficiency	(iii) fitted with catalytic converters, diesel particulate filters or equivalent devices where reasonable and feasible; and	MH
SWTC App F08	5 (b)(iv)	Carbon Management and Energy Efficiency	(iv) well maintained and services in accordance with relevant equipment maintenance documentation to reduce emissions due to poor engine performance	MH
SWTC App F08	5 (c)	Carbon Management and Energy Efficiency	The SSJ Contractor must ensure that the energy efficiency of all new plug-in electrical equipment within any site facilities meets the minimum standards outlined in the NSW Government Resource Efficiency Policy 2019, requirement E3 “minimum standards for new electrical appliances and equipment”	MH
SWTC App F08	5 (d)	Carbon Management and Energy Efficiency	The SSJ Contractor must use a minimum 5% bio diesel mix for all diesel powered plant and equipment and a minimum 10% blended ethanol mix for all petrol powered plant and equipment where practicable.	CM

Source Document	Section	Title/Categories	Requirement	Responsible
SWTC App F08	**6**	**Resources**		
SWTC App F08	6.1	Water efficiency		
SWTC App F08	6.1 (a)	Water efficiency	The SSJ Contractor must undertake a water balance study and submit it to the Principal's Representative (prior to the commencement of Bankstown Early Works) that identifies the sources, uses and estimated quantities of potable and non-potable water which will be either created or used in the performance of the SSJ Contractor's Activities.	Arcadis- See Appendix H
SWTC App F08	6.1 (b)	Water efficiency	The SSJ Contractor must ensure that the water balance study in section 6.1(a) above identifies initiatives which will be implemented to reduce water demand and use non-potable water	Arcadis – See Appendix H
SWTC App F08	6.1 (c)	Water efficiency	The SSJ Contractor must meter the water supplied for the SSJ Contractor's Activities from both recycled water sources and potable sources in order to report against the targets set out in the Sustainability Management Plan	MH
SWTC App F08	6.1 (d)	Water efficiency	The SSJ Contractor must not use potable water as a substitute for non-potable water where on-site or local sources of non-potable water are suitable for the SSJ Contractor's Activities and are available	MH/subcontractor

Source Document	Section	Title/Categories	Requirement	Responsible
SWTC App F08	6.1 (e)	Water efficiency	The SSJ Contractor must ensure that all construction equipment requiring water must be selected taking into account the water efficiency of the equipment and associated construction methodology	MH
SWTC App F08	6.1 (f)	Water efficiency	The SSJ Contractor must ensure that water efficient construction methods are described in all construction method statements to be applied by the SSJ Contractor	MH
SWTC App F08	6.1 (g)	Water efficiency	For water used in onsite and offsite concrete batching plants which supply the SSJ Contractor's Activities:	MH
SWTC App F08	6.1 (g)(i)		not used	

Source Document	Section	Title/Categories	Requirement	Responsible
SWTC App F08	6.1 (g)(ii)	Water efficiency	(ii) the SSJ Contractor must ensure that 80% of offsite and onsite batching plant concrete production operation water is recycled and incorporated into concrete production;	MH
SWTC App F08	6.1 (g)(iii)	Water efficiency	(iii) suspended solids content of recycled concrete production water must be controlled such that the water density is less than 1.01 g/mL and the suspended solids content does not exceed 15,000 ppm; and	MH
SWTC App F08	6.1 (g)(iv)	Water efficiency	(iv) the SSJ Contractor must pass requirements relating to concrete production operation water down through its Supply Chain	MH
SWTC App F08	**6.2**	**Materials**		
SWTC App F08	6.2 (a)	Concrete	The SSJ Contractor must:	
SWTC App F08	6.2 (a)(i)	Concrete	(i) minimise embodied carbon and lifecycle impacts of concrete by using:	

Source Document	Section	Title/Categories	Requirement	Responsible
SWTC App F08	6.2 (a)(i)A	Concrete	A. blended cement that complies with the concrete specifications, and has a minimum of 25% of cementitious content such as fly ash and ground granulated blast furnace slag;	MH
SWTC App F08	6.2 (a)(i)B	Concrete	B. alternatively a triple blend mix comprising of a combination of Portland cement, fly ash, slag and/or other approved cementitious material may be proposed, and maximum cementitious materials limits may be exceeded, providing the proposed mix complies with all other technical requirements and it can be demonstrated to have a lower embodied greenhouse gas footprint associated with cementitious materials compared to a benchmark. The benchmark will be an equivalent concrete mix using fly ash replacement proportions outlined in the concrete specifications. The embodied greenhouse gas footprint is to be calculated through the concrete compliance tool provided by the Principal;	MH
SWTC App F08	6.2 (a)(i)C	Concrete	C. mixes that are unable to meet the requirements of A and B due to constructability or other technical reasons, will require approval by the Principal. Approval will only be granted where alternatives have been explored and justification as to why the requirements of A and B cannot be met is deemed appropriate. Evidence must be provided that the mix used will still enable the project to meet the minimum cement replacement across the project by average of total concrete volume.	MH

Source Document	Section	Title/Categories	Requirement	Responsible
SWTC App F08	6.2 (a)(ii)	VOCs	(ii) use low Volatile Organic Compounds (VOC) paints, finishes, sealants and adhesives and low emission formaldehyde composite wood products in the Bankstown Early Works and the Temporary Works; and	MH
SWTC App F08	6.2 (a)(iii)	VOCs	(iii) ensure that all surface coatings used in the Bankstown Early Works and Temporary Works comply with the VOC limits defined in the Australian Paint Approval Scheme.	MH

<table>
<tr><th>Source Document</th><th>Section</th><th>Title/Categories</th><th>Requirement</th><th>Responsible</th></tr>
<tr><td>SWTC App F08</td><td>6.2 (a)(iv)</td><td>VOCs</td><td>(iv) Use paint products which comply with the maximum total Volatile Organic
Table 4 - Paint Products Maximum TVOC
<table>
<tr><th>Product Type/Sub Category</th><th>Maximum TVOC content (g/litre of ready to use product)</th></tr>
<tr><td>Walls and ceilings – interior semi gloss</td><td>16</td></tr>
<tr><td>Walls and ceilings – interior low sheen</td><td>16</td></tr>
<tr><td>Walls and ceilings – interior flat washable</td><td>16</td></tr>
<tr><td>Ceilings – interior flat</td><td>14</td></tr>
<tr><td>Trim – gloss, semi-gloss, satin, varnishes and woodstains</td><td>75</td></tr>
<tr><td>Timber and binding primers</td><td>30</td></tr>
<tr><td>Latex primer for galvanised iron and zincalume</td><td>60</td></tr>
<tr><td>Interior latex undercoat</td><td>65</td></tr>
<tr><td>Interior sealer</td><td>65</td></tr>
<tr><td>One and two pack performance coatings for floors</td><td>140</td></tr>
<tr><td>Any solvent-based coatings whose purpose is not covered in table</td><td>200</td></tr>
</table></td><td>MH</td></tr>
</table>

<table>
<tr><th>Source Document</th><th>Section</th><th>Title/Categories</th><th>Requirement</th><th>Responsible</th></tr>
<tr><td>SWTC App F08</td><td>6.2 (a)(v)</td><td>Sealants and Adhesives</td><td>(v) Use sealants and adhesives which comply with TVOC emissions limitis in Table 5 below.

Table 5 - Sealants and Adhesives Maximum TVOC
<table><tr><th>Product Type</th><th>Maximum TVOC content (g/litre of product)</th></tr><tr><td>Indoor carpet adhesive</td><td>50</td></tr><tr><td>Carpet pad adhesive</td><td>50</td></tr><tr><td>Wood flooring and Laminate adhesive</td><td>100</td></tr><tr><td>Rubber flooring adhesive</td><td>60</td></tr><tr><td>Sub-floor adhesive</td><td>50</td></tr><tr><td>Ceramic tile adhesive</td><td>65</td></tr><tr><td>Cove base adhesive</td><td>50</td></tr><tr><td>Dry wall and panel adhesive</td><td>50</td></tr><tr><td>Multipurpose construction adhesive</td><td>70</td></tr><tr><td>Structural glazing adhesive</td><td>100</td></tr><tr><td>Architectural sealants</td><td>250</td></tr></table></td><td>MH</td></tr>
</table>

Source Document	Section	Title/Categories	Requirement	Responsible
SWTC App F08	6.2 (b)	Material Sourcing	The SSJ Contractor must source materials for the Bankstown Early Works and Temporary Works in accordance with the following requirements:	
SWTC App F08	6.2 (b)(i)	Concrete	(i) concrete must be sourced from members of the Cement Concrete and Aggregate Australia; or a “similar” association or organisation by agreement with the Principal’s Representative;	
SWTC App F08	6.2 (b)(ii)	Steel	(ii) steel must be sourced from suppliers that are certified under the Australian Certification Authority for Reinforcing and Structural Steels or a “demonstrated equivalent” association or organisation, where agreed by the Principal’s Representative;	
SWTC App F08	6.2 (b)(iii)	Steel	(iii) steel must be sourced from steelmakers with an ISO 14001:2015 Environmental management certified Environmental Management System;	
SWTC App F08	6.2 (b)(iv)	Structural Steel	(iv) fabricated structural steelwork must be sourced from a steel fabricator/steel contractor accredited to the Environmental Sustainability Charter of the Australian Steel Institute; or a “similar” association or organisation by agreement with the Principal’s Representative;	
SWTC App F08	6.2 (b)(v)	Steel	(v) fabricated steel products must be in accordance with AS 5131:2016 Structural steelwork – Fabrication and erection and certified through the National Structural Steelwork Compliance Scheme;	

Source Document	Section	Title/Categories	Requirement	Responsible
SWTC App F08	6.2 (b)(vi)	PVC	(vi) polyvinyl chloride must be compliant with the GBCA Best Practice Guidelines for PVC in the Built Environment;	
SWTC App F08	6.2 (b)(vii)	Timber	(vii) all timber products must be sourced from one or more of the following: A. re-used timber; B. post-consumer recycled timber; C. timber sources in Australia certified by the Forest Stewardship Council, Australia; or D. timber sources in Australia, certified under the Program for the Endorsement of Forest Certification.	
SWTC App F08	6.2 (b)(viii)	Reinforcing Steel	(viii) at least 60% by mass of all reinforcing steel must be produced using energy-reducing processes, which include polymer injection technology or its equivalent, in its manufacture.	
SWTC App F08	6.2 (b)(ix)	Structural elements	(ix) major structural elements and cladding must be permanently marked during manufacture to ensure that opportunities for reuse are maximised;	
SWTC App F08	6.2 (b)(x)	Reinforcing Steel	(x) for buildings or other relevant structures a portion of all reinforcing steel is assembled using off site optimal fabrication techniques.	
SWTC App F08	6.2 (c)	Spoil	The SSJ Contractor must:	
SWTC App F08	6.2 (c)(i)	Spoil	(i) identify and implement initiatives to both reduce spoil quantities which will be generated during the performance of the Bankstown Early Works and Temporary Works; and	
SWTC App F08	6.2 (c)(ii)	Spoil	(ii) benefitically reuse 100% of reusable spoil, including topsoil, in accordance with the spoil hierarchy in environmental documents	

Source Document	Section	Title/Categories	Requirement	Responsible
SWTC App F08	6.2 (d)	Steel	The SSJ Contractor must record the percentage of steel sourced from Australian manufacturers and make this information available to the Principal's Representative upon request	
SWTC App F08	6.3	Waste		
SWTC App F08	6.3 (a)	Waste	The SSJ Contractor must:	
SWTC App F08	6.3 (a)(i)	Waste	(i) minimise the generation of waste; and	
SWTC App F08	6.3 (a)(ii)	Waste	(ii) demonstrate through construction planning and construction methods, the achievement of waste minimisation, recycling and resource recovery	
SWTC App F08	6.3 (b)	Waste	The SSJ Contractor must:	
SWTC App F08	6.3 (b)(i)	Waste	(i) recycle or reuse at least 96% of inert and non-hazardous construction and demolition recycleable waste, excluding spoil; and	
SWTC App F08	6.3 (b)(ii)	Waste	(ii) recycle or reuse 60% of office waste	
SWTC App F08	6.3 (c)	Waste	The SSJ Contractor must identify and implement opportunities for recycling and reuse of non-putrescible general solid wastes (other than construction and demolition waste and office waste) during the SSJ Contractor's Activities.	
SWTC App F08	6.3 (d)	Waste	The SSJ Contractor must investigate packaging take-back arrangements with suppliers and implement where feasible.	
SWTC App F08	6.3 (e)	Waste	The SSJ Contractor must use compostable or reusable temporary erosion control devices where practicable.	
SWTC App F08	6.3 (f)	Waste	The SSJ Contractor must avoid the production of hazardous waste where practicable.	
SWTC App F08	**7**	**Biodiversity**		
SWTC App F08	7 (a)	Biodiversity	The SSJ Contractor must minimise clearance of vegetation, particularly native vegetation	

Source Document	Section	Title/Categories	Requirement	Responsible
SWTC App F08	7 (b)	Biodiversity	The SSJ Contractor must undertake any landscaping and revegetation works as soon as practicable.	
SWTC App F08	**8**	**Pollution Control**		
SWTC App F08	8 (a)	Pollution Control	The SSJ Contractor must identify and implement pollution control initiatives in construction which target zero major pollution incidents.	
SWTC App F08	8 (b)	Pollution Control	The SSJ Contractor must, where practicable, ensure that all excavators and mobile cranes used for the contractor's activities, which are onsite for more than three months, comply with United States Environmental Protection Agency Tier 4 exhaust emission standards.	
SWTC App F08	**9**	**Supply Chain**		
SWTC App F08	9 (a)	Supply Chain	The SSJ Contractor must develop, implement and maintain a sustainable procurement policy and processes that are consistent with ISO20400:2017 Sustainable Procurement - guidance, and are documented in the Sustainability Plan	
SWTC App F08	9 (b)	Supply Chain	The SSJ Contractor must demonstrate that procurement practices are consistent with the guidance provided in the Infrastructure Sustainability Council of Australia IS Rating Scheme version 1.2:	
SWTC App F08	9 (a)(i)	Supply Chain	(i) Level 2 for credit Pro-1 "Commitment to sustainable procurement";	
SWTC App F08	9 (a)(ii)	Supply Chain	(ii) Level 3 for credit Pro-2 "Identification of suppliers";	

Source Document	Section	Title/Categories	Requirement	Responsible
SWTC App F08	9 (a)(iii)	Supply Chain	(iii) Level 3 for credit Pro-3 “Supplier evaluation and contract award”; and	
SWTC App F08	9 (a)(iv)	Supply Chain	(iv) Level 2 for credit Pro-4 “Managing supplier performance”.	
SWTC App F08	9 (c)	Supply Chain	The SSJ Contractor must demonstrate that sustainability training is being provided to high impact suppliers.	
SWTC App F08	9 (d)	Supply Chain	The SSJ Contractor must use a risk based approach to ensure that where High Impact Materials are sourced from a developing country the supplier's operations are in compliance with:	
SWTC App F08	9 (d)(i)	Supply Chain	(i) all relevant laws and regulations local to that country;	
SWTC App F08	9 (d)(ii)	Supply Chain	(ii) the International Labour Organization's Fundamental Conventions; and	
SWTC App F08	9 (d)(iii)	Supply Chain	(iii) the “Ten Principles” of the UN Global Compact.	
SWTC App F08	9 (e)	Supply Chain	The SSJ Contractor must comply with all relevant modern slavery legislation, and provide the Principal’s Representative with a copy of reporting relevant to the Bankstown Early Works at least 1 month prior to the end of each financial year.	
SWTC App F08	**10**	**Social Sustainabilitiy**		
SWTC App F08	10 (a)	Social Sustainabilitiy	The SSJ Contractor must identify and implement at least two social sustainability initiatives in each of the following categories which provide demonstrable and tangible benefits to:	
SWTC App F08	10 (a)(i)	Social Sustainabilitiy	(i) local community groups during the construction period; and	WC

Source Document	Section	Title/Categories	Requirement	Responsible
SWTC App F08	10 (a)(ii)	Social Sustainabilitiy	(ii) the broader local community beyond the construction period.	WC
SWTC App F08	**11**	**Sustainability Reporting**		
SWTC App F08	11 (a)	Sustainability Reporting	The SSJ Contractor must prepare and submit a report named the "Climate Change Impact Assessment Report" to the Principal's Representative prior to the Date of Completion of the last Portion to reach Completion	
SWTC App F08	11 (b)	Sustainability Reporting	The Climate Change Impact Assessment Report must:	
SWTC App F08	11 (b)(i)	Sustainability Reporting	(i) identify the climate change risk mitigation measures relevant to the Bankstown Early Works, as outlined in design documentation and specifications; and	
SWTC App F08	11 (b)(ii)	Sustainability Reporting	(ii) confirm the climate change risk mitigation measures which have been constructed or installed during delivery of the Bankstown Early Works	
SWTC App F08	11 (c)	Sustainability Reporting	The SSJ Contractor must prepare and submit a report titled the "Greenhouse Gas Inventory Report", to be prepared using the CERT, in accordance with the timeframes specified in the CERT, and prior to the Date of Construction Completion of the last Portion to reach Construction Completion.	
SWTC App F08	11 (d)	Sustainability Reporting	The Greenhouse Gas Inventory Report must include data relating to emissions associated with electricity and fuel consumption, on-site process emissions and embodied emissions for all materials used in the SSJ Contractor's Activities, Bankstown Early Works and Temporary Works.	

Source Document	Section	Title/Categories	Requirement	Responsible
SWTC App F08	11 (e)	Sustainability Reporting	The SSJ Contractor must provide to the Principal's Representative copies of documents which are required to be submitted to achieve the SDG 'Gold' rating for the Bankstown Early Works.	
SWTC App F08	11 (e)(i)	Sustainability Reporting	(i) Documents produced during planning and design stages that support the achievement of the SDG 'Gold' rating will be provided by the Principal as part of the final Design SDG submission	
SWTC App F08	11 (f)	Sustainability Reporting	The SSJ Contractor must provide an annual inventory of non-road diesel powered vehicles to be used for the SSJ Contractor's Activities using TfNSW's Air Emission Data Collection Workbook 9TP-FT-439.	MH
SWTC App F08	**12**	**Temporary site facilities**		
SWTC App F08	12 (a)	Temporary site facilities	The SSJ Contractor must ensure that, where reasonable and feasible, any temporary site facilities provided by the SSJ Contractor incorporate:	WC
SWTC App F08	12 (a)(i)	Temporary site facilities	(i) energy efficient lighting schemes and light fittings;	
SWTC App F08	12 (a)(ii)	Temporary site facilities	(ii) plug-in electrical equipment which complies with the requirements of the Equipment Energy Efficiency Program (E3) "Minimum Energy Performance Standards" and has at least a five star Energy Rating Label;	
SWTC App F08	12 (a)(iii)	Temporary site facilities	(iii) high performance thermal insulation in all walls, ceilings and floors that optimise thermal performance;	
SWTC App F08	12 (a)(iv)	Temporary site facilities	(iv) natural daylighting;	
SWTC App F08	12 (a)(v)	Temporary site facilities	(v) natural ventilation;	

Source Document	Section	Title/Categories	Requirement	Responsible
SWTC App F08	12 (a)(vi)	Temporary site facilities	(vi) rainwater harvesting;	
SWTC App F08	12 (a)(vii)	Temporary site facilities	(vii) water efficient fixtures, fittings and controls;	
SWTC App F08	12 (a)(viii)	Temporary site facilities	(viii) air conditioning refrigerants with low or zero global warming potential; and	
SWTC App F08	12 (a)(ix)	Temporary site facilities	(ix) crime prevention through environmental design principles.	
SWTC App F08	12 (b)	Temporary site facilities	Any security and warning lighting used by the SSJ Contractor must be installed so that light is not directed at neighbouring properties or in such a way that light reflects onto structures or neighbouring properties.	
CEMF	3.2	Construction Sustainability Management Plan		
CEMF	3.2 a	Construction Sustainability Management Plan	Principal Contractors are required to prepare and implement a Sustainability Management Plan (SMP) relevant to the scale and nature of their scope of works. The SMP shall comprise of a main SMP document and issue-specific sub-plans.	
CEMF	3.2 b	Construction Sustainability Management Plan	As a minimum the SMP will address and detail:	

Source Document	Section	Title/Categories	Requirement	Responsible
CEMF	3.2 b i	Construction Sustainability Management Plan	The requirements of the relevant planning approval documentation, any relevant conditions of all other permits and licences, the Contractor's corporate EMS, the sustainability provisions of the contract documentation and this Construction Environmental Management Framework.	
CEMF	3.2 b ii	Construction Sustainability Management Plan	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;	
CEMF	3.2 b iii	Construction Sustainability Management Plan	A sustainability policy statement and strategies for adaptation to climate change, resource management (including energy, water and waste), workforce development, procurement and biodiversity enhancement;	
CEMF	3.2.b iv	Construction Sustainability Management Plan	Sustainability initiatives to be implemented during the project.	
CEMF	3.2 b v	Construction Sustainability Management Plan	How sustainability initiatives will be identified and implemented;	
CEMF	3.2 b vi	Construction Sustainability Management Plan	The processes and methodologies for assurance, monitoring, auditing, corrective action, continuous improvement and reporting on sustainability performance;	
CEMF	3.2 b vii	Construction Sustainability Management Plan	The processes and methodologies which will be used to achieve the required scores under rating systems identified in contract documents;	

Source Document	Section	Title/Categories	Requirement	Responsible
CEMF	3.2 b viii	Construction Sustainability Management Plan	The processes and procedures for undertaking climate change risk assessments;	
CEMF	3.2. b ix	Construction Sustainability Management Plan	The processes and procedures for the identification and implementation of climate change adaption measures;	
CEMF	3.2 b x	Construction Sustainability Management Plan	The approach to sustainable procurement including: - The processes and procedures that will be used to provide environmental and social improvement; - The processes and environmental and social criteria that will be used for the selection of Subcontractors; - The processes that will be used to ensure ethical sourcing of labour and materials - Where equipment, materials or labour are procured from locations outside Australia, the processes that will be used to ensure human rights impacts and risks are identified and mitigated. - Interfaces with other Project Plans.	
CEMF	3.2 c	Construction Sustainability Management Plan	Depending on the scope of the works, the SMP will also include, as a separate sub-plans:	
CEMF	3.2 c i	Construction Sustainability Management Plan	A Construction Workforce Development Plan	

Source Document	Section	Title/Categories	Requirement	Responsible
CEMF	3.2 c ii	Construction Sustainability Management Plan	A Waste Management & Recycling Plan	
CEMF	3.2 c iii	Construction Sustainability Management Plan	A Construction Carbon and Energy Management Plan	
CEMF	13	Carbon and Energy Management		
CEMF	13.1	Carbon and Energy Management	Carbon and Energy Management Objectives	
CEMF	13.1 a	Carbon and Energy Management	The following carbon and energy management objectives will apply to construction: i. Reduce energy use and carbon emissions during construction. ii. Support innovative and cost effective approaches to energy efficiency, low carbon / renewable energy sources and energy procurement. iii. Design to reduce energy use and carbon emissions during operations.	
CEMF	13.2	Carbon and Energy Management Implementation		

Source Document	Section	Title/Categories	Requirement	Responsible
CEMF	13.2 a	Carbon and Energy Management Implementation	Principal Contractors will develop and implement a Carbon and Energy Management Plan that will include, as a minimum: i. The carbon and energy mitigation measures as detailed in the environmental approval documentation. ii. The relevant requirements of the Sydney Metro Environment and Sustainability Policy and the Sydney Metro Sustainability Strategy. iii. The responsibilities of key project personnel with respect to the implementation of the plan. iv. The low carbon strategies and initiatives that will be implemented to minimise the carbon emissions associated with construction. v. The energy efficiency strategies and initiatives that will be implemented to minimise energy use associated with construction. vi. Carbon emission estimates determined using a carbon footprint assessment undertaken in accordance with ISO 14064-1, ISO14064-2 and ISO14064-3 that incorporates direct and indirect emissions associated with construction. vii. Compliance record generation and management.	
CEMF	13.2 b	Carbon and Energy Management Implementation	Reporting of carbon and energy will be undertaken throughout the construction works in accordance with the National Greenhouse and Energy Reporting Act 2007.	
CEMF	13.2 c	Carbon and Energy Management Implementation	The Contractors would be required to retain appropriate records and prepare carbon footprint assessments (inclusive of Scope 1, 2 and 3 emissions) at various stages of construction	
CEMF	13.3	Carbon and Energy Mitigation		

Source Document	Section	Title/Categories	Requirement	Responsible
CEMF	13.3a	Carbon and Energy Mitigation	Example of carbon and energy mitigation measures include: i. Equipment and material selection will have consideration of energy efficiencies. ii. Construction workers will be encouraged to use sustainable transport options and green travel plans will be developed. iii. Inclusion of renewable energy sources to power temporary facilities and equipment where feasible. iv. Designing and operating Site offices for energy efficiency. v. Offsetting a portion of construction greenhouse gas emissions. vi. Efficient operation of vehicles and equipment.	
CEMF	14.1	Materials Management Objectives		
CEMF	14.1 a	Materials Management Objectives	The following materials management objectives would apply to the construction of the project: i. Reduce material use throughout the project life-cycle. ii. Consider embodied impacts in materials selection. iii. Use recycled materials. iv. Recycle and reuse materials onsite. v. Influence subcontractors and materials suppliers to adopt sustainability objectives in their works and procurement.	
CEMF	14.2	Materials Management Implementation		

Source Document	Section	Title/Categories	Requirement	Responsible
CEMF	14.2 a	Materials Management Implementation	Principal Contractors will be required to develop and implement a Sustainable Procurement Policy that will include as a minimum: i. The materials mitigation measures as detailed in the environmental approval documentation. ii. The relevant requirements of the City & Southwest Environment and Sustainability Policy and the City & Southwest Sustainability Strategy. iii. The responsibilities of key project personnel with respect to the implementation of the policy. iv. Compliance record generation and management. v. Ethical sourcing of materials. vi. Local sourcing.	
CEMF	14.2 b	Materials Management Implementation	The Contractors will be required to retain records detailing the consideration of sustainability in the procurement of all materials.	
CEMF	14.3	Materials Mitigation		

Source Document	Section	Title/Categories	Requirement	Responsible
CEMF	14.3 a	Materials Mitigation	Examples of materials mitigation measures include: i. Consideration of quality and durability in the procurement of materials. ii. Using recycled materials. iii. Using materials with a lower embodied impact. iv. Using recycled steel in concrete reinforcement. v. Developing deconstruction plans to enable recycling and reuse at end-of-life. vi. Using low-VOC, low emission materials. vii. Using sustainably sourced timber and wood products. viii. Low-carbon concrete. ix. Consideration of whole-of-life costs during procurement.	
CEMF	17	Waste Management and Recycling		
CEMF	17.1	Waste Management and Recycling	Waste Objectives	
CEMF	17.1 a	Waste Management and Recycling	The following waste objectives will apply to construction: i. Minimise waste throughout the project life-cycle. ii. Waste management strategies will be implemented in accordance with the Waste Avoidance and Resource Recovery Act 2001 management hierarchy as follows: - Avoidance of unnecessary resource consumption. - Resource recovery (including reuse, reprocessing, recycling and energy recovery). - Disposal.	

Source Document	Section	Title/Categories	Requirement	Responsible
CEMF	17.1 b	Waste Management and Recycling	Targets for the recovery, recycling or reuse of construction waste, and beneficial reuse of spoil will be provided by the Principal Contractor.	
CEMF	17.2			
CEMF	17.2 a	Waste Implementation	Principal Contractors will develop and implement a Waste Management and Recycling Plan which will include as a minimum: i. The waste management and recycling mitigation measures as detailed in the environmental approval documentation. ii. The responsibilities of key project personnel with respect to the implementation of the plan. iii. Waste management and recycling monitoring requirements. iv. A procedure for the assessment, classification, management and disposal of waste in accordance with the Waste Classification Guidelines (DECC, 2008). v. Compliance record generation and management.	
CEMF	17.2 b	Waste Implementation	Principal Contractors will undertake the following waste monitoring as a minimum: i. Weekly inspections will include checking on the waste storage facilities on site. ii. All waste removed from the site will be appropriately tracked from 'cradle to grave' using waste tracking dockets	
CEMF	17.2 c	Waste Implementation	Principal Contractors will report all necessary waste and purchasing information to TfNSW as required for TfNSW to fulfil their WRAPP reporting requirements	

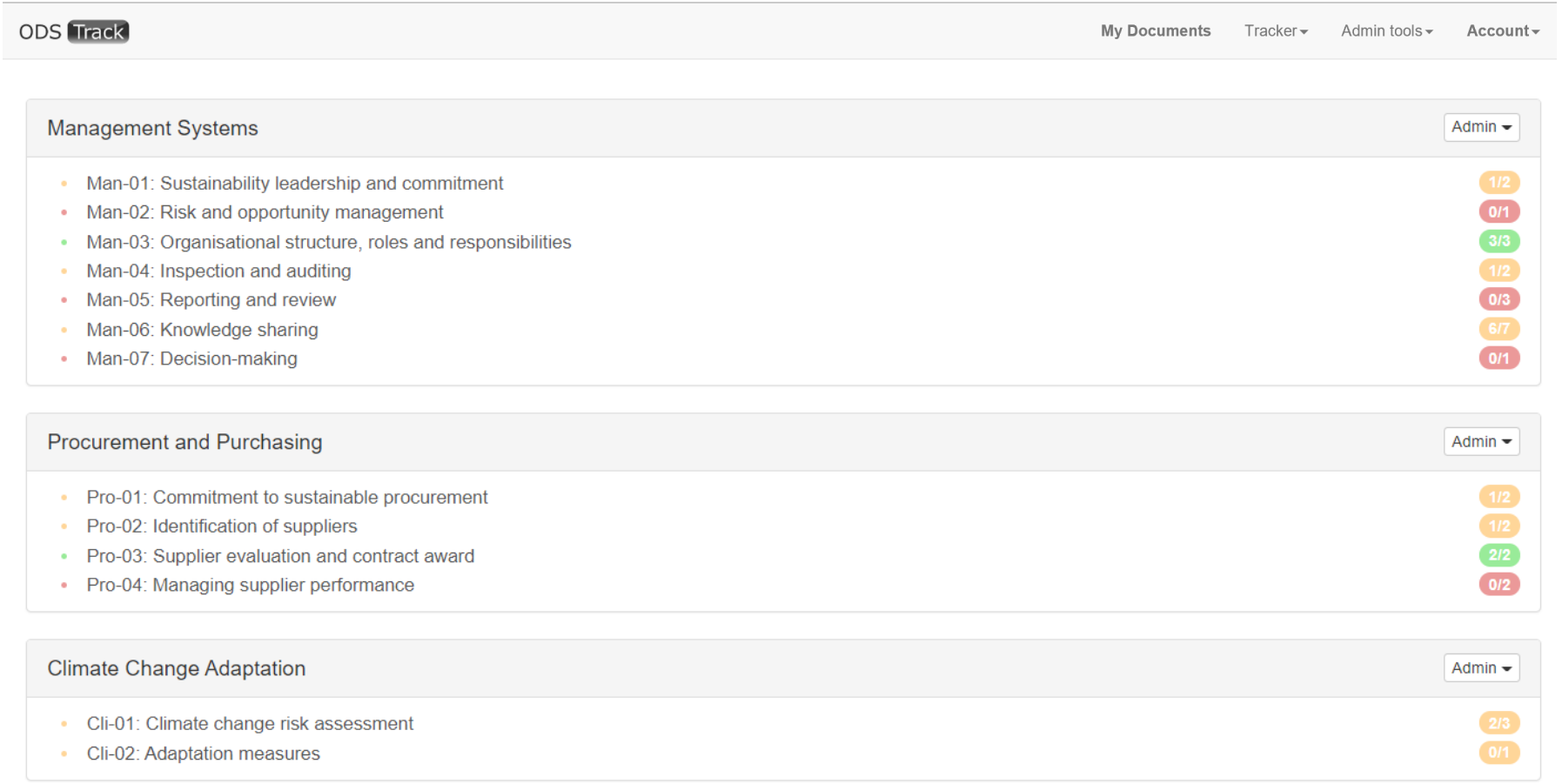
Source Document	Section	Title/Categories	Requirement	Responsible
CEMF	17.2 d	Waste Implementation	Compliance records will be retained by the Principal Contractors in relation to waste management including records of inspections and waste dockets for all waste removed from site	
CEMF	17.3	Waste Mitigation		
CEMF	17.3 a	Waste Mitigation	Examples of waste management and recycling mitigation measures include: i. All waste materials removed from the sites will be directed to an appropriately licensed waste management facility. ii. The use of raw materials (noise hoarding, site fencing, etc...) will be reused or shared, between sites and between construction contractors where feasible and reasonable. iii. Recyclable wastes, including paper at site offices, will be stored separately from the other waste	
REMMS	SCC1	Sustainability Initiatives	Sustainability initiatives and targets would be reviewed and incorporated into the detailed design to support the achievement of the project's sustainability objectives. A best practice level of performance would be targeted using relevant sustainability rating tools e.g. ISCA as built 'excellent' level rating.	
REMMS	SCC2	Sustainable Procurement	A sustainable procurement strategy would be developed and implemented to apply to Principal Contractors, their subcontractors and their suppliers.	
REMMS	SCC3	Workforce Development	A workforce development and industry participation strategy would be developed covering both construction and operation.	
REMMS	SCC4	Climate Change	The need for climate change risk treatments would be assessed and incorporated into the detailed design, where required.	

Source Document	Section	Title/Categories	Requirement	Responsible
REMMS	SCC5	GHG	An iterative process of greenhouse gas assessments and design refinements would be carried out during detailed design and construction to identify opportunities to minimise greenhouse gas emissions. Performance would be measured in terms of a percentage reduction in greenhouse gas emissions from a defined reference footprint.	
REMMS	SCC6	Sustainability Reporting	Sustainability reporting (and corrective action where required) would be undertaken during construction.	
REMMS	SCC7	Workforce Development	The construction workforce development plan would be implemented.	
REMMS	SCC8	GHG	25 per cent of the greenhouse gas emissions associated with consumption of electricity during construction would be offset.	
REMMS	WM1	Spoil	Detailed design would include measures to minimise excess spoil generation. This would include a focus on optimising the design to minimise spoil volumes, and the reuse of material on-site.	
REMMS	WM2	Waste	A recycling target of at least 90 per cent would be adopted.	
REMMS	WM3	Spoil	Spoil would be managed in accordance with the spoil management hierarchy.	
REMMS	WM4	Spoil	Target 100 per cent reuse of reusable spoil.	
REMMS	WM5	Waste	Construction waste would be minimised by accurately calculating materials brought to the site and limiting materials packaging.	
REMMS	WM6	Waste	All waste would be assessed, classified, managed and disposed of in accordance with the Waste Classification Guidelines (EPA, 2014).	

Source Document	Section	Title/Categories	Requirement	Responsible
REMMS	WM7	Waste	Waste segregation bins would be located at various locations within the project area, if space permits, to facilitate segregation and prevent cross contamination.	

14. Appendix G ODS As-built Rating Tracker

The following is an excerpt from the ODS Tracker. This excerpt includes detail of the applicable deliverables. The tracker is a stand-alone tracker which shall remain live until project completion is achieved. Further detail shall be populated during the course of the As-Built Rating.



Energy and Carbon

Admin

- Ene-01: Energy and carbon monitoring and reduction 0/2
- Ene-02: Renewable energy 0/1

Water

Admin

- Wat-01: Water use monitoring and reduction 0/1
- Wat-02: Replace potable water 0/2

Materials

Admin

- Mat-01: Materials lifecycle impact measurement and reduction 0/2
- Mat-02: Environmentally Labelled products and supply chains 0/1

Discharges to Air, Land and Water

Admin

- Dis-01: Receiving water quality 4/6
- Dis-02: Noise 2/3
- Dis-03: Vibration 2/3
- Dis-04: Air quality 0/1
- Dis-05: Light pollution 0/1

Land

Admin

- Lan-01: Previous land use 0/3
- Lan-02: Conservation of on site resources 0/2
- Lan-03: Contamination and remediation 0/1
- Lan-04: Flooding design 0/1

Waste

Admin

- Was-01: Waste management 0/5
- Was-02: Diversion from landfill 0/1
- Was-03: Deconstruction, Disassembly, Adaptability 0/2

Ecology

Admin

- Eco-01: Ecological value 0/1
- Eco-02: Habitat connectivity 0/1

Community Health, Well-being and Safety

Admin

- Hea-01: Community health and wellbeing 0/2
- Hea-02: Crime prevention 0/3

Heritage

Admin

- Her-01: Heritage assessment and management 0/3
- Her-02: Monitoring of heritage 1/2

Stakeholder Participation

Admin

- Sta-01: Stakeholder engagement strategy 1/2
- Sta-02: Level of engagement 0/1
- Sta-03: Effective communication 0/1
- Sta-04: Addressing community concerns 0/1

Urban and Landscape Design

Admin

- Urb-01: Urban Design 0/0
- Urb-02: Implementation 0/0

Innovation

Admin

- Inn-01: Innovative strategies & technologies 0/1

15. Appendix H Water Balance Study Report - BEW

Sydney Metro – Integrated Management System (IMS)

(Uncontrolled when printed)

Contractor:	METRON T2M
Project:	Southwest Metro Design Services (SMDS)
Report Title	Water Balance Study – Bankstown Early Works
Version Number	002
Date:	27/08/21

1. Background

Sustainability performance is being assessed for Bankstown through targeting an SDG "Gold" rating achievement for both Bankstown Early Works and Bankstown Main Works (separate packages).

This Water Balance Study has been prepared to demonstrate compliance to the following SDG compulsory requirements (CRs) as well as relevant requirements from SWTC Appendix documents for the Bankstown Early Works package:

Requirement	Addressed
TfNSW Sustainable Design Guidelines	
CR 8: Projects with CapEx >$15 million to prepare a water Balance Study Report which identifies and quantified relevant reductions in anticipated water use through the implementation of water efficiency measures.	This Report.
CR 8A: Appliances and equipment in the following categories with star ratings under the Water Efficiency Labelling Scheme (WELS) must have at least the following star ratings: ○ toilets and urinals, washing machines, dishwashers – 4 stars ○ taps and flow controllers – 4.5 stars	Architectural schedule for fixtures and fittings and Appendix A of this report.
SWTC Appendix B07	
2.4.1 Water Efficiency The Service Provider must minimise water demand including total water consumption and potable water consumption during the operations phases by: ○ using water efficient controls, fixtures and fittings; ○ harvesting rainwater where feasible; ○ using water from recycled water networks where available; and ○ collecting, treating and reusing stormwater and wastewater, where feasible.	Refer to Sections 5 and 6 of this report.

The objective of this study is to demonstrate an equal to or greater than 10% reduction in total water usage when compared to a BAU case, in accordance with P3 of SDG CR8 and compliance with CR8a. In the absence of a more specialised operational water modelling tool, the *Green Star Potable*

Water Calculator V01 was used to establish a base case, predicted actual water usage (based on Stage 3) and savings (expressed as the difference between the base case and actual use predictions) for the Early Works package.

This report iteration is reflective of Stage 3 Detailed Design (Early works package), while the Main Works Package remains at Stage 2. The Early Works package boundary is reflected in Figure 1.

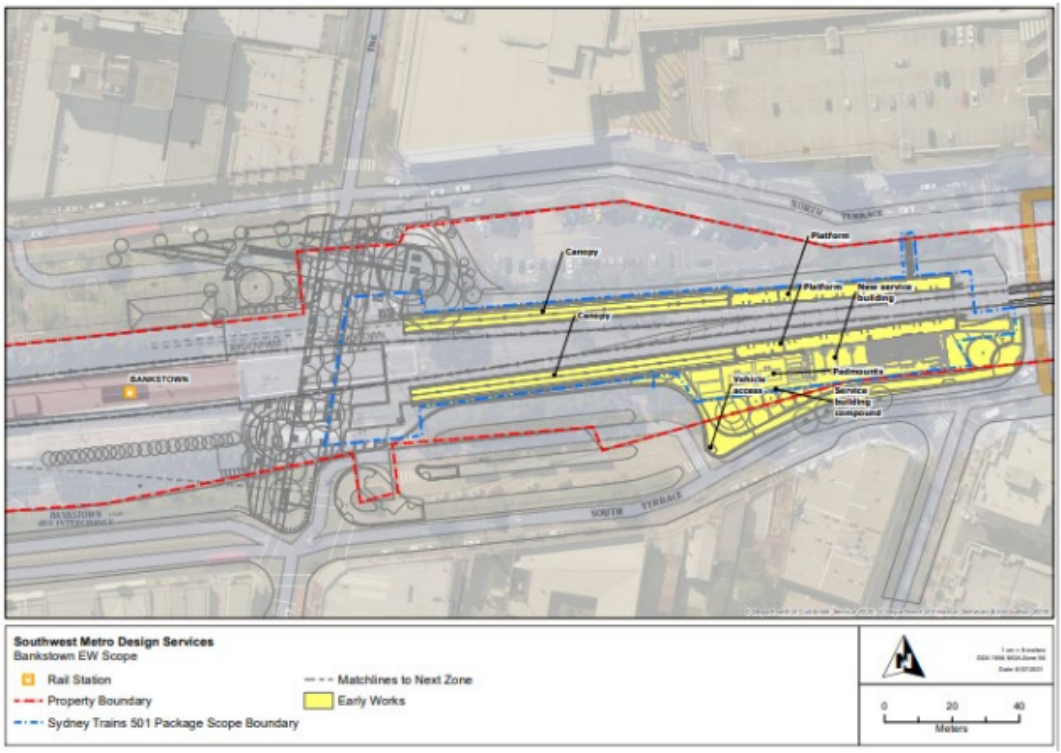


Figure 1: Bankstown Early Works boundary

2. Bankstown Scope

Operational water usage within the Bankstown Early Works package would be generated via the following demand sources:

- Sinks, toilets and taps used by staff within the Service Building (potable water)
- Irrigation to soft landscaping surrounding the Service Building (non-potable water)

A summary of design changes associated with the Early Works package from a Landscape Design perspective is provided below:

- The number and type of water fixtures proposed for the services building remain unchanged from those proposed in Stage 2.

- Planting schedule has been modified slightly, however the area of proposed soft landscape (i.e. areas to be irrigated) remain unchanged from those presented within Stage 2. A revised planting schedule specific for Early Works is provided as an appendix to this report.
- In terms of water supply, a 5000 L water harvesting tank, designed to capture surface run off from the service building roof, for landscape irrigation, has been included within Early Works designs submitted for Stage 3. This will reduce the amount of potable water used for irrigation throughout the life cycle of the project.

3. Construction Water

Estimates of construction water use would be developed in consultation with the construction contractor prior to works commencing and have not been included as part of calculations within this report. Construction water use monitoring will be included within the construction contract. A key objective during construction will be to reduce the overall construction water footprint as much as possible, and to replace potable with non-potable water reuse, where certain criteria are met (as per Section 5.3.1 of the TfNSW Water Discharge and Reuse Guideline DMS-SD-024). It is anticipated that construction water usage would associated with dust suppression, fill compaction, onsite concrete mixing, wash down of site plant and vehicles along with establishment phase landscape irrigation.

4. Operational Water

The water service system at Bankstown is designed to meet the requirements of:

- SMDS Bankstown SWTC Appendix B04 *Mechanical and Electrical Services*
- SMDS Bankstown SWTC Appendix C01 *Metro Station Proposed Building Works Schedules*
- SMDS Bankstown SWTC Appendix D06 *AS/NZS 3500.1-2015*
- the 2019 *National Construction Code (NCC).*

4.1 Water Supply

4.1.1 Potable water

Potable water for both the Early Works package is sourced from Sydney Water mains supply.

4.1.2 Non-potable water

Non-potable water for the Early Works package is sourced from surface runoff and is used for irrigation where possible. Water Harvesting for use as irrigation is included within the Early Works design for Stage 3. An assessment to determine feasibility for using roof harvested water for staff toilet flushing within the Service Building was undertaken involving members of the design team.

It was determined that toilets would use approximately 3.5L of water per flush and be flushed on average 12 times per day (totalling 42 litres of water per day or 15.4 kL per year).

The soft landscaping area surrounding the service building would require approximately 71.4 kL of water per year, which would be variable depending on rainfall patterns and season.

Under the existing scenario, the presence of the 5000L tank would provide back up irrigation water that can be stored during periods of high rainfall and used for irrigation supply during dry spells. It therefore can be speculated that retaining this store of water is beneficial as it would be fully utilised, offsetting mains water that would otherwise be required for irrigation.

It was however acknowledged that mains water for toilet flushing would be partially or fully offset following periods of rainfall, which would then recharge depending on the duration of rainfall, use of toilets and available tank capacity. Under this scenario one full tank would equate to approximately 119 days of toilet flushing activity. This scenario would also require redesign of the plumbing network to such that the tank can feed into the system with mains back up.

It was therefore determined that, given the relatively low total water usage associated with staff toilets within the service building (owing to low usage rates and high efficiency), the additional costs of redesign, and the conclusion that the harvested water would likely offset mains water regardless of the application (i.e. as a replacement for toilets or as irrigation), the perceived marginal benefits of including non-potable water use for toilet flushing were deemed insignificant and not developed further.

4.2 Water Demand

Water usage associated with operational water use at Bankstown can be attributed the following elements:

- Sanitation fixtures and fittings (toilets, hand washing basins, kitchen basins)
- Landscape irrigation
- Water-based heat rejection (building cooling)
- Cleaners sinks

It should be noted that there is no wet fire protection system for the Service Building at Bankstown and has therefore not been considered further in the model. Further details on key water demand elements is provided below.

4.2.1 Sanitation fixtures

Sanitation fixtures and fittings include indoor taps and sinks, toilets, cleaners taps, outlined in further detail below in Table 1. All data on sanitation fixtures and fittings is extracted the Bankstown Stage 3 Architectural Drawing Packages (SMCSWSWM-MTM-WBK-AT-PKG-501000) and presented in Table 1. Documentation outlining material specifications for new appliances is provided in Appendix D.

Occupancy profiles based on staff numbers have been developed for this assessment to predict use rates for sanitation fixtures, such as toilets and sanitary basins within the service building.

Table 1: Sanitation fixtures at Bankstown Station

	Number of appliances	*Appliance Type*	*WELS star rating system*	*Water efficiency (l/min) if known*
Sydney Metro Service Building				

	Number of appliances	Appliance Type	WELS star rating system	Water efficiency (l/min) if known
Toilets	2	Staff use only	4	N/A
Staff Toilet Basins	2	Handwashing	6	4.5
Cleaner sinks	2	Cleaning	4	7.5
Kitchenette sink	1	Tea sink	6	4.5

4.2.2 Irrigation

Landscape irrigation for Bankstown Early Works is proposed to be undertaken via handwatering during select periods (such as during the establishment phase and prolonged periods of low rainfall/drought). Irrigation would be reduced through the selection of native, drought tolerant species. A breakdown of soft landscaping crop coefficients is provided below (weighted average).

A copy of the Bankstown Station Planting Schedule is provided in Appendix C, and a summary of the crop coefficient allocation is provided in Appendix D.

Table 2: Irrigation data at Bankstown per landscaping plans

Soft Landscape Element	Landscaped Area (m2)	Average crop coefficient[1]	Irrigation Method
Feature trees	74	0.25	Initial hand watering during establishment phase, followed by passive irrigation with intermittent watering during dry periods.
Ornamental bush tucker planting	213	0.62	
Total	**287**	**0.5**	

4.2.3 Heat Rejection

Critical cooling systems and non-critical air conditioning within the Bankstown station buildings are designed with air cooled condenser units. These units are refrigerant based and do not require a continuous water supply. Critical equipment cooling within the service building at Bankstown (chillers) are also designed to be air-cooled. The only water usage requirement for the chiller systems would be through the use of an adiabatic spray kit, affixed to the system. The purpose of the spray kit is specifically to cool the coils down to maintain chiller performance on very hot days only (>40°C).

The overall total water volume demanded by the adibiatic spray kit at Bankstown has been calculated at approximately 243.1 L/hr. Due to the variable nature of this function, total water demand and comparison to a reference case is unable to be quantified using the potable water calculator tool.

We are however able to predict adibiatic spray usage through analysing best available climate modelling data. As per section 3.2.1 of the Bankstown Stage 1 Climate Change Impact Assessment Report (SMCSWSM-MTM-WBK-SU-REP-000002), the Sydney Metropolitan region is expected to

[1] The average crop coefficient for each station is a value based on individual irrigation coefficient values for each species planted (based on Tables within Appendix A of the Potable Water Calculator Guideline), multiplied by the total proportion of that species relative to the group total (by way of area).

experience an increase in average, minimum and maximum temperatures for both the near (2030) and far future (2070). Models accessed through the CSIRO's "Climate Thresholds Calculator" estimate that by 2030, the current baseline average of 1.6 days over 40°C would increase by from 1.6 to 2.7 (i.e. 1.1 day increase by 2030 using RCP of 8.5). A conservative assumption is applied, that during these days, temperatures would remain above the 40°C threshold by on average 6 hours each day. A conservative prediction of total per annum water usage associated with this function is therefore expressed via the following equation.

2.7 * 6 = 16.2

243.1 * 16.2 = **3.938 kL/ year**

When considered alongside other potable water demand sources (i.e. sanitation fixtures), the amount of water used for chiller cooling would be insignificant (i.e. less than 5%), has been added within final tables against heat rejection with no opportunities for savings (reference and as built equal).

4.2.4 Fire Protection

There is no wet fire protection system for the Service Building or Bankstown Metro Station and has therefore not been considered further in the model.

5. Modelling Results

Operational water consumption for inputs identified above for the Bankstown Early Works package has been calculated using the *Green Star Potable Water Calculator*, with relevant extracts included in Appendix A.

The results presented reflect cumulative water demands/water savings. A detailed breakdown of the results is provided in the calculator extracts provided in Appendix A. The reference case outputs are based on a standardised system outlined in the Potable Water Calculator Guideline. The following table summarises the outputs of this study.

Table 3: Bankstown Station Operational Water Demand and saving against reference case

	Actual Case water balance outputs	Reference Case water balance outputs	Resulting savings
End Use	Annual demand (kL/annum)	Annual demand (kL/annum)	Annual demand (kL/annum)
Toilets	15.4	17.6	2.2
Basin and Sink Taps	4.1	5.4	1.3
Heat Rejection	3.9	3.9	0
Landscape Irrigation	71.4	124	52.6
Total potable water consumption (kL/annum)	94.8	150.9	56.1

	Actual Case water balance outputs	Reference Case water balance outputs	Resulting savings
End Use	Annual demand (kL/annum)	Annual demand (kL/annum)	Annual demand (kL/annum)
Percentage reduction in potable water consumption			37.2% reduction

6. Analysis and Conclusions

The results indicate "reference case" and "actual" operational water usage to enable a comparison to quantify savings/losses. Models are based on both assumptions built into the *Greenstar Potable Water Calculator* as well as assumptions based on best available knowledge and best practice. A summary of assumptions is provided in the following section. The total reduction in potable water resulting from implementing efficiency measures for the Bankstown Early Works package is 37.2%.

The following conclusions are derived from the results:

- Approximately 2.31% of total potable water savings are associated with staff basin and sink taps. WELS 6 Star rated tap fixtures (push on) are selected for kitchen sinks and toilet handwashing basins, while cleaner sinks are WELS 4 Star rated for the Early Works service building.
- Approximately 3.92% of potable water savings are attributable to the toilets within the service building (staff only use). Toilets selected are 4 WELS Star rated.
- Water savings associated with landscape irrigation are the most significant on a per unit basis. This component accounts for approximately 82.17% of the total water expenditure, and accounts for over 93% of the total water savings. These savings are primarily driven by species selection of soft landscaping features surrounding the service building (all indigenous, drought tolerant), irrigation method (hand watering as required) as well as rainwater harvesting.

6. Assumptions

The assumptions contained in the Green Star Potable Water Calculator include the following:

- The water demand from fixtures and fittings toilets and taps in staff areas) is dependent on calculations developed by the Green Building Council of Australia (GBCA) and based on the occupancy entered in the calculator. It has been assumed that staff hand basins and kitchenette sinks would be used equal to a proportion of fixture number (i.e. there are five taps in total each equating to 20% of total use, in accordance with the Potable Water Guideline).
- Irrigation (crop) coefficients were assigned by the Senior Landscape Architect for the Project to each flora species selected within the planting schedule for Bankstown Stage 2. Coefficients for various plant categories were selected using Appendix A of the Potable

Water Calculator Guide for plants that most closely resemble those selected within the plans.

APPENDIX A – Material Data Specifications for Sanitation Fixtures and Fittings at Bankstown Service Building

SPECIFICATION / FINISH	SUPPLIER	USE	REFERENCE IMAGE
Product: Caroma Leda Wall Faced Invisi Series II Toilet Suite Material: Colour: White Rating: 4 stars	Caroma or equivalent	Ambulant/Staff Toilets	
Product: Presto 605 timed flow tap Material: Finish: Chrome plated Size: Rating: 6 stars	Thornthwaite	Ambulant/Staff Handwashing	
Product: : Zip Hydrotap 4-in-1 touch-free wave with Accessible mixer chrome, with under bench command centre H5WD21Z00AU Rating: WELS 6 star rated, 3L/min	Zip	Kitchen Tap	
Product: Cadet Laundry Wall Set Material: Finish: Colour: Size: Rating: WELS 4 star rated, 7.5L/min	Caroma or equivalent	Cleaner's Store	

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APPENDIX B – Potable Water Calculator Key Inputs and Results

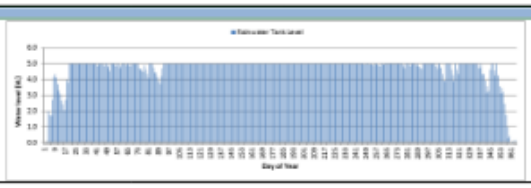
0. GENERAL

BUILDING OCCUPANCY, AREAS AND OPERATION

Space type description	Area (m²)	Peak days of operation (remaining days assumed off-peak)	Occupancy profile	Maximum design occupancy used in water use		Percentage of building users who occupy the space continually for periods greater than one hour.
				Proposed building design occupancy (m2/person)	Default design occupancy (Not applicable for residential areas)	
Sydney Metro - Staff	63	5 days a week	Staff		Office (10m2/person)	100%
Non occupied areas		n/a	n/a			
TOTAL AREA	63					

Rainwater Collection

Rainfall collection area (m2)		459
Run-off co-efficient	Pitched roof with profiled metal sheeting	0.9
Storage capacity (kL)		5
Rainwater tank reliability %		92%



RESULTS: WATER DEMAND FROM IRRIGATION

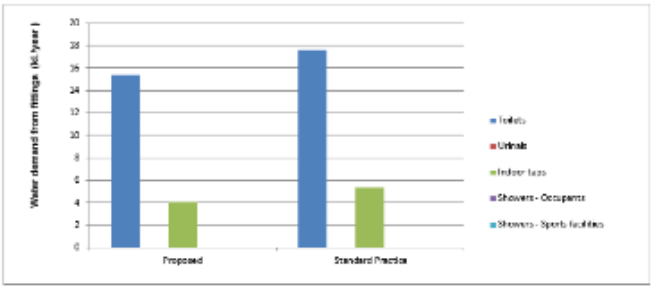
Annual irrigation requirement from each zone

Zone name and description	Annual irrigation requirement for each zone (kL/year)	
	Proposed Building	Standard Practice Building
0	0.0	0.0
Ornamental bush tucker planting	53.0	92.0
Feature Trees	18.4	32.0
0	0.0	0.0
0	0.0	0.0
0	0.0	0.0
0	0.0	0.0
0	0.0	0.0
0	0.0	0.0
0	0.0	0.0
TOTAL for all zones (kL/year)	**71.4**	**124.0**

Note: The irrigation requirement for a particular zone will only be computed once every field related to that zone has been completed in the table above.

RESULTS: WATER DEMAND FROM FITTINGS

	Proposed Building water demand (kL/year)	Standard Practice Building water demand (kL/year)
Toilets	15.4	17.6
Urinals	0.0	0.0
Indoor taps	4.1	5.4
Showers - Occupants	0.0	0.0
Showers - Sports facilities	0.0	0.0
TOTAL	19.5	23.0



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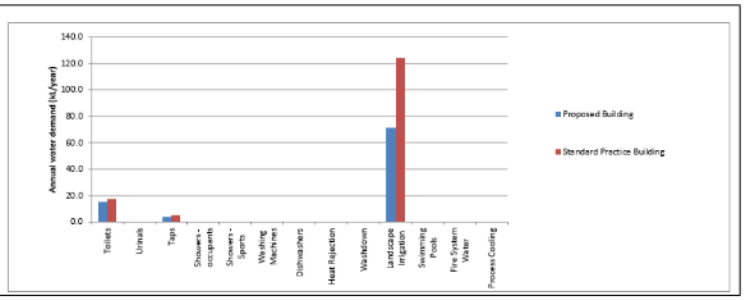
Summary of demand from each Potable water use

	Proposed Building	Standard Practice Building
Toilets	15.4	17.6
Urinals	0.0	0.0
Taps	4.1	5.4
Showers - occupants	0.0	0.0
Showers - Sports	0.0	0.0
Washing Machines	0.0	0.0
Dishwashers	0.0	0.0
Heat Rejection	0.0	0.0
Washdown	0.0	0.0
Landscape Irrigation	71.4	124.0
Swimming Pools	0.0	0.0
Fire System Water	0.0	0.0
Process Cooling	0.0	0.0
TOTAL	90.9	146.9



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APPENDIX C – Bankstown Station Early Works Planting Schedule

BANKSTOWN STATION - EARLY WORKS - PLANTING SCHEDULE

CODE	BOTANICAL NAME	COMMON NAME	POT SIZE	SPECIES %	SPACING	MATURE SIZE (HxW)	COLOUR	FLOWER	INDIGENOUS	QTY	NOTES
	TREES										
	FEATURE TREES										
FR	*Ficus rubiginosa*	Port Jackson Fig	400L	N/A	AS SHOWN	25 x 20m			YES	2	Evergree, Feature shade
			TOTAL	0%							
	OTHER TREES										
RB	*Corymbia gummifera*	Red Bloodwood	200L	N/A	AS SHOWN	8 x 6m			YES	4	Evergreen, Service Building
PE	*Podocarpus elatus*	Illawarra Plum	75L	N/A	AS SHOWN	12 x 7m			YES	3	Evergreen, Ornamental
			TOTAL	0%							
P2	ORNAMENTAL BUSH TUCKER PLANTING										
	SHRUBS										
AC	*Alpinia caerulea*	Native Ginger	200mm	5%	4/m²	2 x 1m			YES	TBC	Evergreen, Bush Food
AD	*Austromyrtus dulcis*	Midgenberry	200mm	10%	4/m²	1 x 1m			YES	TBC	Evergreen, Bush Food
BM	*Backhousia myrtifolia*	Cinnamon Myrtle	200mm	5%	4/m²	7 x 4m			YES	TBC	Evergreen, Bush Food
BBC	*Banksia 'Birthday Candle'*	Birthday Candles Banksia	200mm	10%	4/m²	0.5 x 1m			YES	TBC	Evergreen, Ornamental
RP	*Rubus parvifolius*	Native Raspberry	200mm	5%	4/m²	2 x 2m			YES	TBC	Evergreen, Bush Food
SA	*Syzygium australe*	Tucker Bush Cherry	200mm	5%	4/m²	4 x 3m			YES	TBC	Evergreen, Ornamental
WES	*Westringia 'Grey Box'*	Coastal Rosemary	200mm	10%	4/m²	0.5 x 0.5			YES	TBC	Evergreen, Ornamental
			TOTAL	50%							
	GRASSES AND GROUNDCOVERS										
BB	*Bulbine Bulbosa*	Bulbine Lily	140mm	5%	6/m²	1 x 0,5m			YES	TBC	Grassland understorey
BT	*Baloskion tetraphyllum*	Tassel Cord Rush	140mm	5%	6/m²	2 x 1.5			YES	TBC	Evergreen, Ornamental
CA	*Carex Appressa*	Tall Sedge	140mm	5%	6/m²	1 x 0.5			YES	TBC	Grassland understorey
CG	*Carpobrotus glaucescens*	Pig Face	140mm	3%	6/m²	0.3 x 2			YES	TBC	Evergreen, Bush Food
DR	*Dianella revoluta*	Blue Flax Lily	140mm	5%	6/m²	0.5 x 0.5			YES	TBC	Evergreen, Ornamental
FN	*Ficinia Nodosa*	Knotted Club Rush	140mm	5%	6/m²	1 x 1m			YES	TBC	Grassland understorey
KP	*Kunzea Pomifera*	Muntries (Emu Apples)	140mm	5%	6/m²	0.5 x 2m			YES	TBC	Grassland understorey
LJR	*Liriope 'Just Right'*	Turf Lily	140mm	5%	6/m²	0.5 x 0.5			YES	TBC	Evergreen, Ornamental
MP	*Myoporum parvifolium*	Creeping Boobialla	140mm	3%	6/m²	0.3 x 3			YES	TBC	Evergreen, Bush Food
PA	*Pennisetum alopecuroides*	Swamp Fountain Grass	140mm	5%	6/m²	0.5 x 0.5			YES	TBC	Evergreen, Ornamental
PL	*Poa Labillardieri*	Common Tussock Grass	140mm	5%	6/m²	1 x 0.5			YES	TBC	Grassland understorey
			TOTAL	50%							

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APPENDIX D – Irrigation Crop Co-efficient Summary

Crop coefficient (Kc) ***Based on Stage 3 Design***

23/07/2020

	Irrigation Treatment	Pot size P (cm2)	Crop Coefficient (C) (Kc)	Weighted Score (P*D)	Marrickville 607m2 Passive Irrigation			Dulwich Hill 537m2 Rainwater Tank and Back Up Supply/Drip			Hurlstone Park 283m2 Drip Irrigation			Canterbury 655m2 Drip Irrigation			Campsie 218m2 Drip Irrigation			Belmore 333m2 Drip Irrigation			Lakemba 95.5m2 Passive Irrigation			Wiley Park 1019m2 Drip Irrigation+Passive Irrigation			Punchbowl 681m2 Drip			Bankstown Early Works 287m2 Rainwater tank and passive		
Trees					Qty	Irrigated area	Area total	Qty (area)	Irrigated area	Area total	Qty (area)	Irrigated area	Area total	Qty (area)	Irrigated area	Area total	Qty (area)	Irrigated area	Area total	Qty (area)	Irrigated area	Area total	Qty (area)	Irrigated area	Area total	Qty (area)	Irrigated area	Area total	Qty (area)	Irrigated area	Area total	Qty (area)	Irrigated area	Area total
Acer negundo	Box Elder	2000	0.35	700		0	0					0			0	0		0	0		0	0		0	0		0	0	1	700	2000		0	0
Angophora costata	Smooth-barked Apple	2000	0.25	500		0	0	3	1500	6000		0	0		0	0		0	0		0	0		0	0		0	0		0	0		0	0
Backhousia citriodora	Lemon-scented Myrtle	1000	0.25	250		0	0		0	0		0	0		0	0		0	0		0	0		0	0	5	1250	5000	2	500	2000		0	0
Brachychiton populneus	Kurrajong	2000	0.1	200		0	0	3	600	6000		0	0		0	0		0	0		0	0		0	0		0	0		0	0		0	0
Callistemon viminalis	Weeping Bottlebrush	1000	0.25	250		0	0		0	0		0	0		0	0		0	0		0	0		0	0	5	1250	5000		0	0		0	0
Callistemon 'Kings Park Special'		2000	0.25	500		0	0		0	0		0	0		0	0	12	6000	24000		0	0		0	0		0	0		0	0		0	0
Corymbia ficifolia 'Summer Red'	Corymbia Summer Red	1000	0.1	100		0	0		0	0	13	1300	13000		0	0		0	0		0	0		0	0		0	0		0	0		0	0
Elaeocarpus eumundii	Eumundi Quandong	1000	0.1	100		0	0		0	0		0	0		0	0		0	0	3	300	3000		0	0		0	0		0	0		0	0
Elaeocarpus reticulatus	Blueberry ash	1000	0.1	100		0	0		0	0		0	0		0	0		0	0	2	200	2000	4	400	4000	13	1300	13000	4	400	4000		0	0
Eucalyptus piperita	Sydney Peppermint		0.1	0		0	0		0	0		0	0		0	0		0	0		0	0		0	0		0	0		0	0		0	0
Eucalyptus punctata	Grey Gum	2000	0.1	200		0	0	1	200	2000		0	0		0	0		0	0		0	0		0	0		0	0	4	800	8000		0	0
Gleditsia		2000	0.6	1200		0	0		0	0		0	0		0	0	1	1200	2000		0	0		0	0		0	0		0	0		0	0
Glochidion ferdinandi	Cheese Tree	1000	0.5	500		0	0		0	0		0	0		0	0		0	0		0	0		0	0		0	0	1	500	1000		0	0
Melaleuca decora	White feather honeymyrtle	2000	0.25	500		0	0	3	1500	6000		0	0		0	0		0	0		0	0		0	0		0	0		0	0		0	0
Robinia pseudoacacia 'Frisia'	Golden Robinia	2000	0.5	1000		0	0		0	0		0	0		0	0		0	0	3	3000	6000		0	0		0	0		0	0		0	0
Syzygium australe 'Straight and Narrow'	Lilly Pilly	2000	0.5	1000		0	0	10	10000	20000		0	0		0	0		0	0		0	0		0	0		0	0		0	0	3	3000	6000
Tristaniopsis laurina	Water Gum	2000	0.25	500		0	0	2	1000	4000		0	0	1	500	2000		0	0		0	0		0	0		0	0		0	0		0	0
Ficus rubiginosa	Port Jackson Fig	4000	0.5	2000		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	4000	8000
Banksia serrata	Old-man banksia	750	0.25	187.5		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0
Allocasuarina littoralis	Black She-oak	2000	0.5	1000		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	4000	8000
Zelkova serrata'Green Vase'	Japanese Elm	1000	0.85	850	13	11050	13000	7	5950	7000		0	0		0	0		0	0		0	0		0	0		0	0		0	0		0	0
Shrubs																																		
Acmena smithii var. minor 'Cherry Surprise'	lilly pilly dwarf	400	0.25	100		0	0		0	0	7	700	2800		0	0		0	0		0	0		0	0	25	2500	10000		0	0		0	0
Alpinia caerulea	Native Ginger	400	0.5	200		0	0		0	0		0	0		0	0		0	0		0	0		0	0		0	0	16	3200	6400		0	0
Austromyrtus dulcis	Midgenberry	400	0.7	280		0	0		0	0		0	0		0	0		0	0		0	0		0	0		0	0	9	2520	3600		0	0
Banksia 'Birthday Candle'	Dwarf Banksia	400	0.25	100		0	0		0	0		0	0		0	0		0	0		0	0		0	0		0	0	9	900	3600		0	0
Banksia spinulosa	Hairpin Banksia		0.25	0		0	0		0	0		0	0		0	0		0	0		0	0		0	0		0	0		0	0		0	0
Buxus microphylla var. microphylla	Korean Box	400	0.6	240		0	0		0	0		0	0		0	0		0	0		0	0	12	2880	4800	15	3600	6000		0	0	8	1920	3200
Callistemon 'Endeavour'	Bottlebrush cvs	400	0.25	100		0	0		0	0		0	0	29	2900	11600		0	0		0	0		0	0		0	0	4	400	1600		0	0
Callistemon 'Green John'	Bottlebrush cvs	400	0.25	100	15	1500	6000		0	0		0	0		0	0		0	0		0	0		0	0		0	0	33	3300	13200		0	0
Callistemon 'Scarlet Flame'	Bottlebrush cvs	400	0.25	100		0	0		0	0		0	0		0	0		0	0	20	2000	8000		0	0		0	0		0	0		0	0
Callistemon Better John		400		0		0	0		0	0		0	0		0	0	252	0	100800		0	0		0	0	520	0	208000		0	0		0	0
Callistemon viminalis 'Green John'	Bottlebrush cvs	400	0.25	100		0	0		0	0		0	0		0	0		0	0		0	0		0	0	140	14000	56000		0	0		0	0
Callistemon viminalis 'Macarthur'	Macarthur Bottlebrush	400	0.25	100		0	0		0	0		0	0		0	0		0	0		0	0	37	3700	14800		0	0		0	0		0	0
Clivia miniata	Bush Lily	400	0.25	100	17	1700	6800		0	0		0	0		0	0		0	0		0	0		0	0		0	0		0	0		0	0
Correa pulchella 'Fire Bells'	Native Fuchsia cvs	400	0.25	100		0	0		0	0		0	0		0	0		0	0		0	0		0	0		0	0	5	500	2000		0	0
Doryanthes excelsa	Gymea Lilly	400	0.25	100		0	0	3	300	1200		0	0		0	0		0	0	3	300	1200		0	0	17	1700	6800		0	0		0	0
Murraya paniculata	Orange Jasmine	400	0.5	200		0	0		0	0	9	1800	3600		0	0		0	0		0	0		0	0		0	0		0	0	19	3800	7600
Photinia robusta 'Red Robin'	Photinia	400	0.5	200		0	0		0	0	8	1600	3200		0	0		0	0		0	0		0	0		0	0		0	0	19	3800	7600
Rhaphiolepis indica	Indian Hawthorn	400	0.25	100		0	0		0	0		0	0	13	1300	5200		0	0	6	600	2400	34	3400	13600		0	0	12	1200	4800		0	0
Rhaphiolepis 'Snow Maiden'	Indian Hawthorn	400	0.25	100		0	0	6	600	2400		0	0		0	0		0	0		0	0		0	0		0	0		0	0		0	0
Rosmarinus officinalis 'Blue Lagoon'	Rosemary	200	0.25	50		0	0		0	0		0	0		0	0		0	0		0	0	50	2500	10000		0	0		0	0		0	0
Sarcococca confusa	Sweet Box	400	0.5	200	15	3000	6000		0	0		0	0		0	0		0	0		0	0		0	0		0	0		0	0	45	9000	18000
Syzygium 'Aussie Boomer'	Lillypilly cvs	400	0.25	100		0	0		0	0		0	0		0	0		0	0		0	0		0	0		0	0	9	900	3600		0	0
Syzygium luehmannii	Riberry		0.25	0		0	0		0	0		0	0		0	0		0	0		0	0		0	0		0	0		0	0		0	0
Syzygium 'Resilience'	Resilience Lillypilly	400	0.25	100	6	600	2400		0	0		0	0		0	0		0	0		0	0		0	0		0	0		0	0		0	0
Westringia 'Aussie Box'	Coastal Rosemary cvs		0.25	0		0	0		0	0		0	0		0	0		0	0	13	0	0		0	0		0	0		0	0		0	0
Westringia 'Blue Gem'	Coastal Rosemary cvs	400	0.25	100	6	600	2400		0	0		0	0		0	0		0	0		0	0	44	4400	17600	30	3000	12000	20	2000	8000		0	0
Westringia fruticosa	Coastal rosemary	200	0.25	50		0	0		0	0		0	0		0	0	298	14900	59600		0	0		0	0		0	0		0	0		0	0
Westringia 'Grey Box'	Coastal Rosemary	400	0.25	100		0	0		0	0		0	0	7	700	2800		0	0		0	0		0	0		0	0		0	0		0	0
Westringia 'Mundi'	Coastal Rosmary	200	0.25	50		0	0	81	4050	16200	220	11000	44000		0	0		0	0		0	0		0	0		0	0		0	0		0	0
Westringia 'Noringa'	Coastal Rosmary	200	0.25	50		0	0	10	500	2000		0	0		0	0		0	0		0	0		0	0		0	0		0	0		0	0
Grasses and Groundcovers																																		
Anigozanthos 'Big Red'	Kangaroo Paw	200	0.5	100		0	0	140	14000	28000		0	0		0	0		0	0		0	0		0	0		0	0		0	0		0	0
Carex appressa	Tall Sedge			0		0	0		0	0		0	0		0	0		0	0		0	0		0	0		0	0		0	0		0	0
Dianella caerulea	Blue Flax Lily	200	0.5	100		0	0	52	5200	10400		0	0		0	0		0	0	156	15600	31200		0	0		0	0	255	25500	51000		0	0
Dianella 'Little Jess'	Blue Flax Lily cvs	200	0.5	100	885	88500	177000		0	0	370	37000	74000	200	20000	40000		0	0	370	37000	74000		0	0	333	33300	66600	85	8500	17000		0	0
Dianella 'Little Rev'	Blue Flax Lily cvs	200	0.5	100		0	0		0	0		0	0		0	0		0	0	180	18000	36000		0	0	48	4800	9600		0	0	19	1900	3800
Dianella revoluta	Spiky Head Mat Rush	200	0.5	100	700	70000	140000		0	0	240	24000	48000		0	0		0	0		0	0		0	0		0	0		0	0		0	0
Dichelachne micrantha	Short-hair Plume grass	200	0.5	100		0	0		0	0		0	0		0	0		0	0		0	0		0	0	1422	142200	284400		0	0	37	3700	7400
Dichondra 'Silver Falls'	Dichondra	200	0.5	100		0	0		0	0		0	0		0	0		0	0		0	0		0	0	20	2000	4000		0	0		0	0
Fincia nodosa	Knobby Club Rush	200	0.5	100		0	0		0	0		0	0	195	19500	39000		0	0		0	0		0	0		0	0		0	0		0	0
Imperata cylindrica	Cogon grass	200	0.5	100		0	0	228	22800	45600		0	0		0	0		0	0		0	0		0	0		0	0		0	0		0	0
Juncus usitatus	Common Rush	200	0.5	100		0	0		0	0		0	0	195	19500	39000		0	0		0	0		0	0		0	0		0	0		0	0
Liriope 'Evergreen Giant'	Turf Lily cvs	200	0.5	100		0	0		0	0	285	28500	57000		0	0		0	0		0	0		0	0		0	0		0	0		0	0
Liriope 'Just Right'	Liriope cvs	200	0.5	100		0	0		0	0		0	0	190	19000	38000	168	16800	33600		0	0		0	0	235	23500	47000		0	0		0	0
Liriope muscari 'Pink Pearl'	Lily Turf	200	0.5	100		0	0		0	0		0	0		0	0		0	0		0	0		0	0		0	0		0	0		0	0
Liriope muscari 'Silverlawn'	Lily Turf cvs	200	0.5	100		0	0		0	0		0	0		0	0		0	0		0	0	78	7800	15600		0	0	100	10000	20000		0	0
Lomandra confertifolia	Mat Rush	200	0.5	100	625	62500	125000		0	0		0	0		0	0		0	0		0	0		0	0		0	0		0	0		0	0
Lomandra hystrix 'Tropic Cascade'	Bottlebrush cvs	200	0.5	100		0	0		0	0		0	0		0	0		0	0		0	0		0	0	628	62800	125600		0	0		0	0
Lomandra longifolia	Spiky Head Mat Rush	200	0.5	100	700	70000	140000		0	0		0	0		0	0		0	0		0	0		0	0		0	0		0	0		0	0
Lomandra multiflora	Many-flowered Mat Rush	200	0.5	100		0	0		0	0	295	29500	59000	405	40500	81000	318	31800	63600	44	4400	8800		0	0	550	55000	110000	290	29000	58000		0	0
Lomandra 'Nyalla'	Mat Rush			0		0	0		0	0		0	0		0	0		0	0	120	0	0		0	0		0	0		0	0		0	0
Lomandra 'Tanika'	Mat Rush	200	0.5	100	375	37500	75000		0	0		0	0	325	32500	65000		0	0		0	0		0	0	85	8500	17000		0	0		0	0
Lomandra'Verday'	Mat Rush cvs	200	0.5	100		0	0		0	0		0	0		0	0		0	0	278	27800	55600		0	0		0	0		0	0		0	0
Myoporum parvifolium	Creeping Boobialla	200	0.5	100		0	0		0	0		0	0		0	0		0	0		0	0		0	0	250	25000	50000	55	5500	11000		0	0
Pandorea pandorana	Wonga Wonga Vine			0		0	0		0	0		0	0		0	0		0	0		0	0		0	0	27	0	0		0	0		0	0
Poa labillardierei	Common Tussock-grass	200	0.5	100		0	0	96	9600	19200		0	0		0	0		0	0		0	0		0	0		0	0		0	0	37	3700	7400
Themeda triandra	Kangaroo Grass	200	0.5	100		0	0		0	0		0	0	95	9500	19000		0	0		0	0		0	0		0	0		0	0		0	0
Trachelospermum asiaticum	Asiatic Jasmine	200	0.5	100	405	40500	81000		0	0		0	0		0	0		0	0		0	0		0	0		0	0		0	0		0	0
Viola hederacea	Native Violet	200	0.5	100		0	0		0	0		0	0		0	0		0	0		0	0		0	0		0	0	20	2000	4000		0	0
Totals						387450	774600		51600	103200		119000	238000		160500	321000		48600	97200		102800	205600		7800	15600		357100	714200		80500	161000		38820	77000
Average Crop Coefficient						**0.500193648**			**0.5**			**0.5**			**0.5**			**0.5**			**0.5**			**0.5**			**0.5**			**0.5**			**0.5041558**	

*The scores inside each box represent the pot size (area in mm2) multiplied by the proposed number of individuals being planted. The weighted average crop coefficient