

Appendix N: Sustainability Management Plan



MetCONNX

Byford Station ESD Report

R30-NDY-RPT-SU-000-00003

Design Report – Byford Station – ESD Report

Connecting communities.
Creating opportunities.



METRONET

Byford Rail Extension

Byford Station ESD Report

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Terms and definitions

The terms, abbreviations and acronyms used in this plan are defined in Table 1.

Table 1 Terms and Definitions

Term/Abbreviation	Definition
AD	Alliance Development
ALT	Alliance Leadership Team
AMT	Alliance Management Team
BaU	Business as Usual
BRE	Byford Rail Extension
EIS	Entry into Service
EPD	Environmental Product Declaration
ESD	Environmental and Sustainability Design
GBCA	Green Building Council of Australia
GS	Green Star
GSAP	Green Star Accredited Professional
FDD	Final Detailed Design
IDD	Interim Detailed Design
IS	Infrastructure Sustainability
ISAP	Infrastructure Sustainability Accredited Professional
ISC	Infrastructure Sustainability Council
LCA	Life Cycle Assessment
MEL	Morley-Ellenbrook Line
MLA	METRONET Lead Agency
MO	METRONET Office
NOPs	Non Owner Participants
PAA	Project Alliance Agreement
PSP	Principal Shared Path
PTA	Public Transport Authority
RAATM	Requirements Analysis Allocation and Traceability Matrix
SRE	Senior Responsible Engineer
SLC	Sustainability Leadership Committee
SuMP	Sustainability Management Plan
SWTC	Scope of Work and Technical Criteria
WA	Western Australia

1. Executive Summary

The METRONET Sustainability strategy outlines the key sustainability strategy in the context of the broader phases and components of METRONET. The Byford Rail Extension includes an extension of electrified rail from Armadale 7.5km south to Byford, to enable potential future construction of additional electrified rail to Mundijong. The rail corridor is to follow existing passenger rail corridor (Australind) from Armadale to Byford, with new station developments at both Byford and Armadale.

The Byford Rail Extension is committed to achieving the following sustainability ratings:

- ‘4 star’ Green Star Railway Stations v1.1 Design & As-built rating for the Byford Station.
- ‘5 star’ Green Star Railway Stations v1.1 Design & As-built rating for the Armadale Station.
- ‘Silver’ Infrastructure Sustainability (IS) Design & As-Built v2.0 rating from the Infrastructure Sustainability Council of Australia (ISCA) with the scope for the rating to be confirmed with PTA during the initial sustainability alignment workshop.

The targeted Green Star ratings are determined by the classification of the two stations under the METRONET Sustainability Strategy, with Byford Station classified as a “Town Centre” and the new Armadale Station is classified as a “Strategic Centre”, as such requiring a formal 4 and 5 star Green Star rating is achieved respectively.

Green Star assess the sustainability attributes of the stations through nine categories; Management, Indoor Environment Quality (IEQ), Energy, Transport, Water, Materials, Land Use and Ecology, Emission and Innovation. The METRONET Sustainability Strategy also outlines the key objectives that are categorised; People and Place, Environment, Economy and Governance. Both the categories of Green Star and Objectives of the METRONET Sustainability Strategy align closely and strong, holistic, consideration of sustainability has been given throughout the design of the Byford Station to ensure a best practice and cost effective sustainability strategy is established, adding real value to the project.

The project specific Green Star pathways, and credits chosen, have been developed to support the achievement of the METRONET Sustainability Objectives, Targets and Transport Infrastructure Target Outcomes outlined in the METRONET Sustainability Strategy, the METRONET ESD Specification for Green Star Stations (Standard Credits for Volume Certification) approved by PTA Facilities and Infrastructure, the Sustainability Opportunities Register and any project specific, best value objectives have been considered, developed and implemented where relevant into the design of the project – demonstrating that a 4 star rating can be achieved for the Byford Station.

This report details the project specific Green Star pathway for Byford and the current status of all considered sustainability opportunities and initiatives that will continue to be workshopped and developed for Byford Station in the next phase of design.



Acknowledgment of Country

MetCONNX acknowledges the Whadjuk People and the Gnala Karla Booja People as the Traditional Custodians of the land and waters on which Byford Rail Extension Project is located. We pay our respects to Elders, past, present and emerging, and thank them for their continuing connection to country, culture and community.



2. Project Overview

2.1 METRONET Vision and Objectives

As one of the largest single investments in Perth’s public transport, METRONET will transform the way the people of Perth commute and connect. It will create jobs and business opportunities and stimulate local communities and economic development to assist communities to thrive. The METRONET vision is for a well-connected Perth with more transport, housing and employment choices. In delivering METRONET, the WA Government has considered peoples’ requirements for work, living and recreation within future urban centres with a train station at the heart.

The objectives are to:

- Support economic growth with better-connected businesses and greater access to jobs
- Deliver infrastructure that promotes easy and accessible travel and lifestyle options
- Create communities that have a sense of belonging and support Perth’s growth and prosperity
- Plan for Perth’s future growth by making the best use of our resources and funding
- Lead a cultural shift in the way government, private sector and industry work together to achieve integrated land use and transport solutions for the future of Perth.

2.2 Byford Rail Extension overview

The Byford Rail Extension (BRE) Project has been identified as an essential component of the METRONET program. The Project will extend the electrified passenger rail service from Armadale to Byford, providing a strong transport connection between these two centres, supporting economic growth and providing greater access to jobs. The Project has been developed in line with policy objectives for highly integrated transport and land use planning.

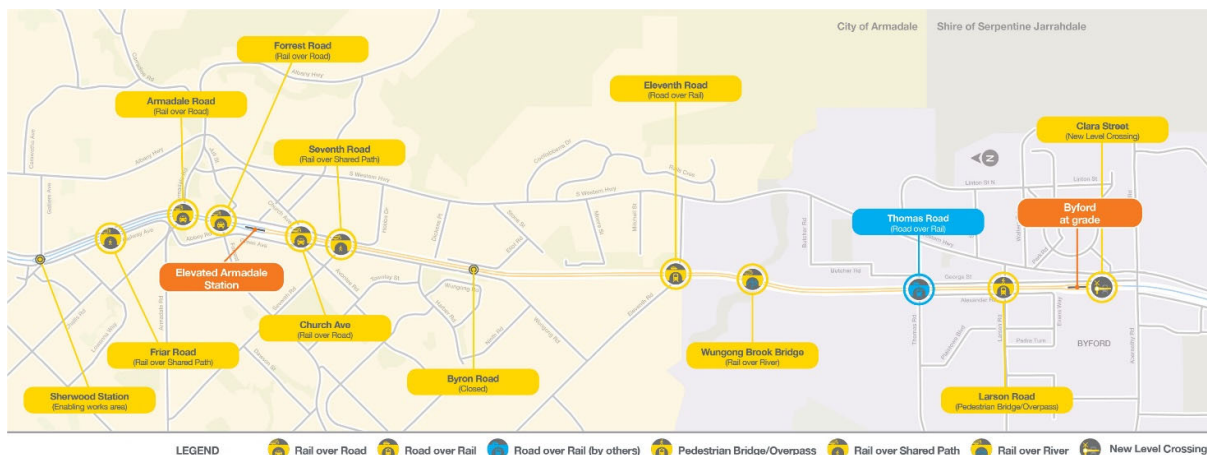


Figure 1: METRONET Byford Rail Extension Project

2.2.1 Project features

The Byford Station Precinct works for the BRE Project include:

- Demolition of existing station at Armadale and construction of a new elevated station
- Construction of a new Byford station at grade (Base Case)
- Construction of approximately 8km of dual track narrow gauge electrified passenger railway line extending from Armadale station to the newly created Byford station, with a dedicated platform for the Australind line
- Removal of level crossings between the Byford and Armadale stations
- Construction of Principal Shared Paths (PSPs) and associated infrastructure (including 'rail over road' and 'road over rail' bridges and roads)
- Parking areas at Armadale and Byford stations
- Bus interchange at Armadale and Byford stations
- Upgrade of local roads surrounding both Armadale and Byford stations.

2.2.2 General scope of works

The Project's general scope of works includes designing, procuring, manufacturing, constructing, installing and commissioning all rail infrastructure and ancillary works to support an electrified operational passenger rail between Armadale and Byford Stations. Also, in the case of the Australind train service, tying into the non-electrified rail network south of Byford Station.

The Project activities include all site investigation, design, planning, scheduling, procurement, cost control, approvals, construction, OH&S management, environmental management, quality management, testing and commissioning, Entry Into Service (EIS), training and operational readiness required to tie the rail extension to Byford into the existing rail network including the associated road, utilities and other required works to interface with adjacent works and contracts. This will include bulk earthworks and retaining structures, grade separations, roads, and drainage, the demolition and removal and treatment of waste material and contaminated material resulting from construction of the Works, and temporary works constructed for the purpose of facilitating the Works.

The project scope also includes any new road works, modifications to existing roads and signalised intersections, utilities (diversion, protection, and new installation) and any other ancillary works to enable the BRE Project.

2.2.3 Future Proofing the works

As part of the Project, space must be allowed within the rail corridor for the option of a 4-track scenario for a potential high-speed regional service from Bunbury. The additional 2 tracks shall be constructed in the eastern half of the rail corridor, so that future infrastructure can be constructed without impacting on existing rail operations. The Project should also allow for the possibility of future extension of the electrified line south of Byford to Mundijong, and a future stabling yard south of Abernethy Road.

2.3 Alliance vision and delivery approach

The BRE Project will be delivered under an Alliance contract to support the management of project and stakeholder interfaces and to mitigate project risks. A collaborative alliance approach will see

the Works carried out in a cooperative, coordinated and efficient manner, in compliance with the Alliance Principles.

MetCONNX understands that the successful delivery of the Project is critically linked to meeting the PTA’s Key Project Objectives. These objectives have shaped our vision for the Project that is around delivering a high-quality product and creating exceptional value-for-money. We are committed to a no-blame culture and to the prompt and mutual resolution of any issues that may arise.

During the AD Stage, an interactive Alliance Leadership Team (ALT) Visioning Workshop was held with representatives from the PTA and MetCONNX to develop a suitable Alliance Vision for the Project, refer Figure 2.

“ Collaborating to deliver excellence in transport infrastructure with certainty which connects and activates the community, for current and future generations ”

Figure 2: AD Stage Alliance Vision Development Outcomes (developed with the PTA)

To support the realisation of this vision, we will develop a robust and highly collaborative alliance culture in which everyone challenges 'business-as-usual' and pursues better outcomes in the design and construction of the Project. In line with this, during the AD Stage the MetCONNX team refined their priorities for the Project as being:

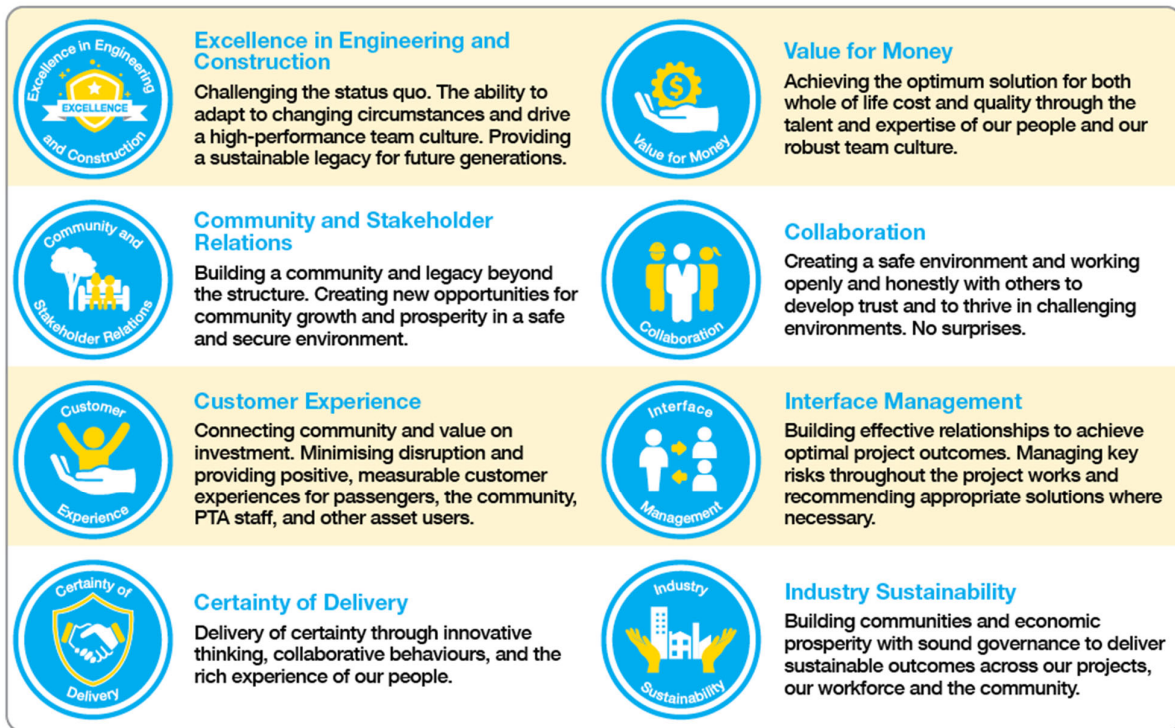


Figure 3: MetCONNX Priorities aligned with Key Project Objectives

2.4 Alliance Governance

The Project Alliance Agreement (PAA) provides the legal and commercial framework for delivering the Project as an Alliance. The ALT comprises two representatives from the Owner Participant and one representative from each of the Non Owner Participants (NOPs). Membership of the ALT is limited to no more than five representatives in total.

During the AD Stage alliance governance has been established and driven by the ALT. The ALT provides strategic leadership ensuring that the Alliance performance and progress is achieved, and escalated issues are promptly resolved.

The Alliance Manager, in consultation with the Alliance Management Team (AMT), will ensure appropriate resources are engaged and mobilised on the Project to provide adequate resources to implement the requirements of this Plan.

The Project Alliance will adopt MetCONNx partner Laing O'Rourke's best corporate governance practices on the Project, on a best-for-project basis.

2.5 Project Management Framework Integration

The Project Management Framework integrates the Project's requirements and MetCONNx partner Laing O'Rourke's proven project-specific management plans and sub-plans to facilitate a seamless approach to design and construction, assurance, organisation and value creation management.

Underpinned by strong governance and compliance systems, the framework embodies the PTA's Project Objectives and Critical Success Factors.

The Alliance Management Plan (R30-MET-PLN-PM-000-00001) is a key plan in this framework, and it documents, amongst other things, the performance expectations of the ALT and the AMT, and defines how the performance of the ALT, Alliance Manager and AMT will be monitored, measured and reviewed during the course of the Project.

As the primary and overarching plan, it will:

- Describe the Alliance governance structure, authorisations limits and delegated authorities
- Support Alliance Project Team personnel in managing and performing obligations to fulfil the requirements of the approved SWTC, in accordance with the PAA.

This plan is a key plan in the Project management plan framework. This plan should be read in conjunction with the management plans listed in Figure 4: Project management framework Integration .



Figure 4: Project management framework Integration

2.6 Purpose of the Report

The purpose of this report is to provide a progress update on the implementation of environmental and sustainability design criteria and initiatives as at the end of the of the reference design stage for Byford Station.

3. Design Description

3.1 ESD Requirements Scope

The BRE project will be delivered as an integrated transport and land use program which will have a myriad of different components, and therefore no single sustainability certification scheme is considered to adequately cover all components of the project, as decided by METRONET. The following certification schemes were identified to align to the different components and for the purposes of the sustainability benchmarking for the BRE Project, the project boundaries will be set up in accordance with METRONET’s Sustainability Strategy for IS and Green Star, as follows:

Table 2 Sustainability Certifications

Program Component	Sustainability Certification Scheme
Transport Infrastructure – whole of project	ISC Infrastructure Sustainability (IS) v2.1 Rating (Design & As Built)
Transport Infrastructure – Stations	GBCA Green Star Railway Stations v1.1 Rating (Design & As Built)

The scope boundary for the ESD requirements in this report for Byford Station and precinct includes:

- Platforms and concourse
- Station Structures
- Amenities
- Bus Interchange
- Station Car Park
- Station Landscaping

A diagram demonstrating the relationship between the boundaries for the whole of project, Armadale and Byford stations, and the Green Star and ISC certifications can be found in Appendix A: Sustainability Boundaries – Green Star and ISC. The boundaries must be confirmed at the Alignment Workshop to be held August 2022.

3.1.1 Future Proofing the works

As part of the Project, space must be allowed within the rail corridor for the option of a 4-track scenario for a potential high-speed regional service from Bunbury. The additional 2 tracks shall be constructed in the eastern half of the rail corridor so that future infrastructure can be constructed without impacting on existing rail operations. The Project will also allow for the possibility of the future extension of the electrified line south of Byford to Mundijong, and a future stabling yard south of Abernethy Road.

3.1.2 Green Star Rating Framework

Green Star assess the sustainability attributes of the stations through nine categories; Management, Indoor Environment Quality (IEQ), Energy, Transport, Water, Materials, Land Use and Ecology, Emission and Innovation.

3.1.3 Infrastructure Sustainability Council (ISC) Rating Framework

The IS rating boundary covers the whole of project including the Byford station and precinct. Scope boundaries for the IS rating considers:

- Project management system scope and influence
- Physical footprint and systems
- Impacted communities and stakeholders, and interdependent assets
- Whole of life sustainability including construction, operations and maintenance, decommissioning

The physical footprint overlaps with the boundary for Green Star. Green Star provides the primary framework for ESD initiatives. As the secondary certification for scope of this package, requirements between Green Star and ISC will be aligned wherever possible for efficiency. In order to contribute to the whole of project IS rating, the interfaces for the IS rating on this package will be managed under the following scenarios:

- Applying BRE Project Management sustainability processes and procedures (development led by the BRE Sustainability Team) to the design and construction of the Byford Station and station precinct for certification under both certifications eg. Governance, Procurement, Resilience, Workforce, Environment categories.
- Applying derived requirements from studies and options assessments related to sustainability eg. Climate Change, Lifecycle Assessment, Resource Efficiency Mapping.
- Aligning and applying BRE Environment, Heritage and Stakeholder Management processes and procedures to the design and construction of the Byford Station and precinct under both certifications eg. Emissions management (water quality, noise, vibration, air quality, light pollution), and heritage management.
- Aligning and aggregating sustainable outcomes from Byford Station and precinct ESD initiatives into whole of life outcomes for certification under both certifications eg. Energy, water, materials and waste initiatives.

At the time of this report, the most of the IS rating required process, procedures, studies and integration have not been developed and implemented. These will be developed and implemented during future design stages.

3.2 Key Impacts

MetCONNX undertook a materiality assessment in August 2022 as part of the Infrastructure Sustainability Certification. The materiality assessment requires projects to identify 'material' or priority sustainability aspects in consideration of the project's context. The assessment was completed with a broad representation of internal (senior discipline leads) and external (affected parties) stakeholders through the facilitation of a series of workshops. To determine topic materiality, MetCONNX responded to a questionnaire relating to project impacts and importance to key stakeholders. The assessment was then submitted to the Infrastructure Sustainability Council with evidence to justify selection outcomes in the lead up to third party verification.

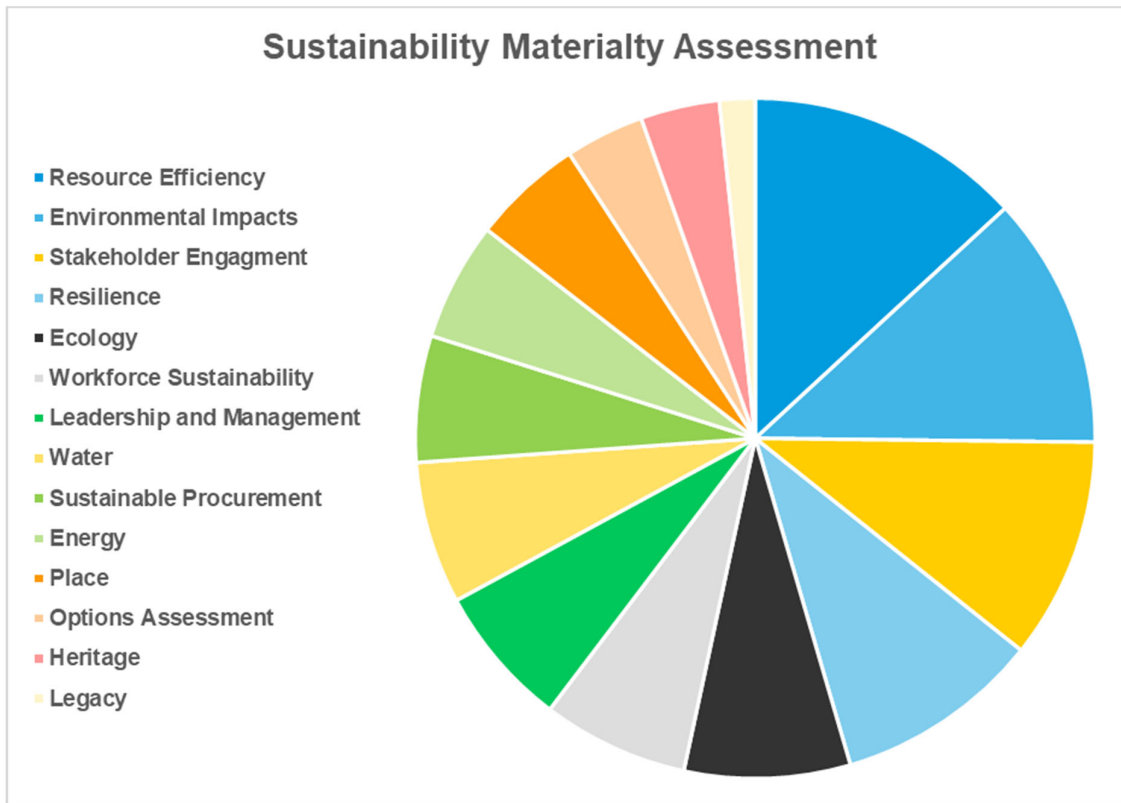


Figure 5 Sustainability Materiality Assessment (Aspects in order of magnitude)

The materiality assessment is a key step in setting up the sustainability strategy for the Project as it identifies actual and potential impacts on the Project’s ‘quadruple bottom line’. These impacts include negative and positive impacts, short-term and long-term impacts, intended and unintended impacts, and reversible and irreversible impacts. From this assessment, the project’s Sustainability Charter was derived (see

<https://www.metronet.wa.gov.au/Portals/31/Project%20Documents/Byford%20Rail%20Extension/Byford%20Rail%20Extension%20Sustainability%20Charter.pdf>).

4. Design Inputs

4.1 Project Design Requirements

ESD design inputs, standards and other key parameters have been used in preparation of this report. ESD requirements are broad, complex and interact with multiple technical design disciplines. As appropriate, specific design package reports have included the relevant ESD requirements. This report provides a central reference document summarising the ESD requirements that have been met by the project design.

4.1.1 Requirements Identification

Project design requirements are developed from the following compliance obligations as a minimum:

- BRE-PTAWA-PM-RPT-00001. to 0008. Scope of Work and Technical Criteria Books 1A, 1B, 2, 3A, 3B, 3C, 4 and 5

- Green Star - Railway Stations v1.1, Green Building Council Australia
- Infrastructure Sustainability rating tool version 2.1 Technical Manual and associated guides.

4.1.2 Types of ESD Requirements

Integrating ESD throughout the design process is critical to the success of sustainability for MetCONN. The Sustainability Team will work closely with the Design Team to ensure all ESD and other sustainability design requirements, including evidence requirements, are identified at Design Stage 1 (this report) and revisited to ensure compliance, appropriateness and further opportunities at Design Stage 2, Design Stage 3 and prior to construction.

The timing and implementation into design and construction of each requirement will be dependent upon the design and construction program. In the development of a requirements management process, the Sustainability Manager, Design Manager and Design Team SREs will review the sustainability requirements to first ensure that they fit into the Requirement Types as described in the Requirements Management Plan (and that the sustainability outcomes are delivered) as follows:

- System wide: 'system wide' requirements are delivered via a specification e.g. a concrete specification (including sustainability requirements). This allows a consistent approach where several design packages 'close' a technical requirement by reference to the same specification.
- Package specific: requirements applied to a single (or small number) of specific design packages and be closed only in that design package (e.g. requirement to provide a solar PV array).
- Disaggregated: requirements required to be applied into several /all design packages. The requirements will only be closed once all those packages have been delivered and later constructed and cumulative design outcomes aggregated.
- Derived: requirement may require the development of a specialist study e.g. a climate risk assessment report, to efficiently implement the report findings into design. Additional requirements may be derived from the report and applied to design packages or specifications. The Sustainability Team and Sustainability Champions in design functions will provide specialist input into the development of management plans and design briefings, ensuring that ALL personnel involved in design development understand sustainability requirements/ objectives and expected outcomes relevant to a particular design package. Briefings will be via workshop, attendance at design team meetings and one to one as required.

The Design team will ensure requirements have been recorded in a Requirements Analysis Allocation and Traceability Matrix (RAATM) for the project.

This process will ensure that prior to release, the design packages include all sustainability requirements relevant to that package of works. All sustainability requirements will be detailed in the respective design and delivery assurance frameworks.

5. Environmental & Sustainability Design Criteria

5.1 Green Star Design Response

The Environmental and Sustainability Design (ESD) response for Byford station is predominantly based on the following Green Building council of Australia's Green Star for Railway stations (version 1.1) assessment tool. This independent, third party assessment framework identifies key environmental and sustainability initiatives and criteria and rates these against 'Business As Usual' (BAU) benchmarks to determine a final certification score in 'Design Review' stage and 'As Built' phase of the Project.

In accordance with the scope of works and technical criteria (the Contract), the Byford Station is required to achieve a minimum '4 star' (Best Practice) outcome for both 'Design Review' and 'As Built' phases of delivery, which represents a minimum of 45 points. Below is a snapshot of current targeted points and associated project responses to Green Star requirements that have been developed to date as part of this design package. The Green Star points target are a snapshot of the design strategy at the time of writing this report and are likely to evolve with the design and construction delivery of the Project.

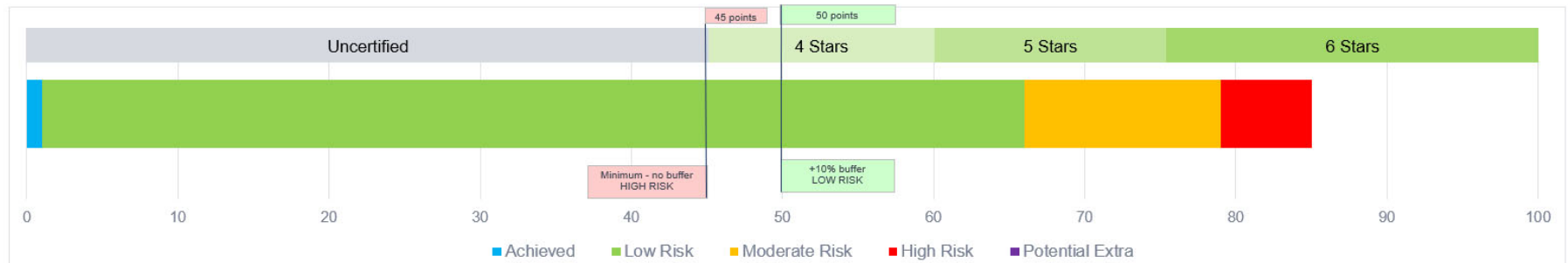


Figure 6 Green Star certification targets

5.1.1 Management

The project adopts practices and processes that enable and support best practice sustainability outcomes throughout the different phases of the project's design, construction and its ongoing operation. The project considers the implementation of processes and strategies that support positive sustainability outcomes during construction, ensuring that the project will be used to its optimum operational potential.

Table 3 Green Star Management

Credit	Project Response	Responsibility
1. Green Star Accredited Professional	The project engages a Green Star Accredited Professional to support the Green Star certification process.	MetCONN
2. Commissioning	Commissioning and handover initiatives ensure all building services operate to their full potential and as designed. Commissioning requirements are captured in the relevant design packages and specifications.	PTA All Services MetCONN
3. Adaptation & Resilience	The project is resilient to the impacts of a changing climate and natural disasters. A Climate Adaptation Plan and risk register has been prepared for the project, with the risks relevant to Byford Station captured in the plan. Additional workshops are required to seek further stakeholder and design team inputs into the risk register and necessary adaptations for Armadale Station. The plan will be further developed across the design stage of the project.	Sustainability SQP PTA/METRONET MetCONN
4. Building Information	Development and provision of building information that facilitates operator and user understanding of a station building's systems, their operation and maintenance requirements, and their environmental targets, to enable optimised performance.	All Services MetCONN
5. Commitment to Performance	Building owners (Rail Authority), building occupants (station staff) and facilities management teams set targets and monitor environmental performance in collaboration with design teams to monitor fundamental sustainability performance metrics in the station building.	PTA/N&I All Services MetCONN
6. Metering & Monitoring	Implementation of effective energy and water metering systems. The energy and water metering strategy is captured in the relevant design packages.	Electrical and Hydraulics
7. Responsible Construction Practices	Responsible construction practices that manage environmental impacts, enhance staff health and wellbeing, and improve sustainability knowledge on site.	MetCONN
8. Operational Waste	The project implements waste management plans that facilitate the re-use, recycling, or conversion of waste into energy, and stewardship of items to reduce the quantity of outgoing waste. MetCONN have engaged an operational waste consultant to prepare an Operational Waste Management Plan to be implemented by PTA/N&I.	PTA/N&I MetCONN
9. Culture, Heritage & Identity	The project celebrates and incorporates the heritage, culture and historical context of the project site, supporting communities and places with the development of a sense of place and identity.	Architect Landscape Public Art
10. Urban Precincts	The Project undertakes a concept review process designed to facilitate sustainable urbanism.	MetCONN Architect Landscape
11. Safe Places	The project reduces the likelihood of crime through good design informed by crime risk assessments, CPTED workshoping and design coordination.	Architect Landscape Services MetCONN Local Police

Credit	Project Response	Responsibility
12. Wayfinding	The project minimises occupant stress and anxiety through the implementation of excellent wayfinding practices.	Architect Landscape Services

5.1.2 Indoor Environment

The project employs initiatives that enhance the comfort and well-being of the occupants. The initiatives aim to achieve sustainably performance improvements that also improve occupant’s experience of the space and looks to ensure that any initiatives that are introduced to reduce energy use do not have a negative impact on the health and well-being of occupants.

Table 4 Green Star Indoor Environment

Credit	Project Response	Responsibility
13. Indoor Air Quality	<p>The mechanical system will be designed to mitigate entry of outdoor pollutants, including minimum separation distances between pollution sources and outdoor air intakes in line with ASHRAE Standard 62.1:2013.</p> <p>Adequate access for maintenance and cleaning of mechanical services will be incorporated into the design, and all new and existing ductwork to be re-used will be cleaned prior to occupation.</p> <p>The mechanical design will ensure pollutants are exhausted directly to the outside. Provisions will be made for exhaust in the basement carparks for vehicles and non-recirculating exhaust to kitchens (both residential and commercial).</p>	Mechanical
14. Acoustic Comfort	<p>The project provides appropriate and comfortable acoustic conditions for occupants.</p> <ul style="list-style-type: none"> Internal Noise Levels Audibility Hearing Loop Coverage 	Acoustics Electrical Audibility Specialist/Comms
15. Lighting Comfort	<p>Well-lit spaces provide a high degree of comfort to users.</p> <ul style="list-style-type: none"> Minimum Lighting Comfort 	Electrical
16. Visual Comfort	<p>The delivery of well-lit spaces provides high levels of visual comfort to railway station staff and patrons.</p> <p>Daylight modelling and access to high quality views calculations will be undertaken for Byford Station in accordance with Green Building Council of Australia (GBCA) protocol.</p>	Architect MetCONNX Sustainability SQP
17. Indoor Pollutants	<p>95% of all paints, adhesives, sealants and carpets used in the building will meet the Total Volatile Organic Compound (TVOC) limits stipulated by the Green Building Council of Australia (GBCA).</p> <p>95% of all engineered wood products used in the building will meet the formaldehyde limits stipulated by the GBCA.</p> <p>The project will also strive to target the ultra-low VOC (content <5g/L) requirements for at least 50% of paints, as per the Innovation credit in Section 3.9.</p>	Architect All Services MetCONNX Paint Contractor

5.1.3 Energy

The project is designed and constructed to reduce the overall operational energy consumption below that of a comparable standard-practice building. These reductions are directly related to reduced greenhouse gas emissions, lower overall energy demand as well as a reduction in operating costs for building owners and occupants. The project considers initiatives to reduce greenhouse gas emissions by facilitating efficient energy usage and encouraging the utilisation of energy generated by low-emission sources.

Table 5 Green Star Energy

Credit	Project Response	Responsibility
19. Greenhouse Gas Emissions	The Project encourages energy efficiency in design through, the reduction of greenhouse gas (GHG) emissions associated with the use of energy in the station operations and will strive to drive uptake of renewable energy, wherever possible. Energy modelling for the station will be undertaken in line with Green Star Credit 19 requirements to determine percentage reduction against 'Business as Usual'.	Architect Section J Consultant Electrical Mechanical Hydraulics VT Consultant
20. Peak Electricity Demand Reduction	The Project encourages the reduction of peak demand load on the electricity network infrastructure through the inclusion of onsite renewables in the form of Solar PV system and will strive to maximise capacity installation wherever feasible.	Electrical

5.1.4 Transport

The project includes initiatives that facilitate a reduction of the occupant's dependency on private car use. The project encourages the use of renewable energy sourced vehicles, public transport and cycling or walking as an important means of reducing overall greenhouse gas emissions.

Table 6 Green Star Transport

Credit	Project Response	Responsibility
21. Sustainable Transport	The Project implements design and operational measures that reduce the carbon emissions arising from occupant and users single use car travel to and from the location. This also promotes the health and fitness of commuters, and the increased liveability of the location. Byford Station includes: <ul style="list-style-type: none"> Active transport facilities, including secure bicycle parking for patrons and staff, and showers and changing amenities for staff. Low emission vehicle infrastructure dedicated to electric vehicles. Maximised parking allocation to enable/encourage uptake of rail commuting from Byford in lieu of single use car travel. 	GSAP PTA MetCONN Architect Electrical Transport Planner

Credit	Project Response	Responsibility
	<ul style="list-style-type: none"> • Station location is close to amenities that facilitate walkability of the project area to minimise single use car transport. • Multiple bus stops and bus routes are incorporated into the precinct to encourage alternative transport to and from the Project location. 	

5.1.5 Water

The project addresses the consumption of valuable water resources within the building operation phase, by including initiatives that lower the use of potable water for both irrigation and fixtures and fittings within the station.

Table 7 Green Star Water

Credit	Project Response	Responsibility
22. Potable Water	<p>Station design minimises potable water consumption in operation as there is no water used for heat rejection. Fixtures and fittings will maximise water efficiency wherever possible, with the following minimum WELS ratings:</p> <ul style="list-style-type: none"> • 5-star taps, • 4-star toilets and 5-star urinals, • 3-star showers (maximum 7.5L/min), and • 5-star dishwashers. <p>Landscape planting will be predominantly native, drought-tolerant and suited to the local climate to minimise ongoing irrigation. Landscape irrigation will aim to prioritise the use of subsoil drip irrigation with moisture control.</p>	<p>Architect Hydraulic Mechanical Landscape</p>

5.1.6 Materials

The project addresses the consumption of resources within the building construction phase, by including initiatives that encourage the selection of materials with a lower environmental impact. The Project also ensures the minimisation of construction and demolition waste, and ongoing operational waste.

Table 8 Green Star Materials

Credit	Project Response	Responsibility
23. Life Cycle Impacts	The Project will strive to achieve a reduction of the environmental impacts of building materials and construction methods. Lifecycle Assessment (LCA) modelling will be prepared at each design gate and compared to the base case (BAU) model. Key areas of focus have been identified in Reference Design phase and a strategy is being implemented to reduce impacts in the Project's highest material impact areas. Dedicated workshops are undertaken with the Design and Construction teams to identify 'hot spot' areas of focus. A Resource Efficiency Action Plan has also been developed to ensure design and construction strategies are implemented.	LCA Consultant All Design Team MetCONN PTA/N&I
24. Responsible Building Materials	The project includes building materials that are responsibly sourced or have a sustainable supply chain. >95% of all steel used in the building structure aims to be sourced from a Responsible Steel Maker, as defined under Green Star. >95% of all timber used in the building and construction works is targeted to be either reused or sourced from a Forest Stewardship Council (FSC) or Programme for the Endorsement of Forest Certification (PEFC) accredited scheme. >90% of all permanent formwork, pipes, flooring, blinds and cables installed will be non-PVC alternative materials or will meet Green Star's Best Practice Guidelines for PVC.	All Design Team MetCONN PTA/N&I
25. Sustainable Products	As far as possible, products used in the Project will aim to meet transparency and sustainability requirements through careful selection of materials such as plasterboard, ceiling tiles, carpet and other materials that have Third-Party Sustainability Certification, compliant environmental product declaration; have recycled content or are reused.	All Design Team MetCONN PTA/N&I
26. Construction & Demolition Waste	The Project aims to reduce construction waste going to landfill by reusing or recycling building materials. A dedicated Waste contractor has been engaged and will be responsible for the tracking of construction and demolition waste.	MetCONN Waste Contractor

5.1.7 Land Use and Ecology

The Project includes initiatives that aim to reduce the negative impacts on site’s ecological value as a result of urban development, minimise harm and enhance the quality of local ecology.

Table 9 Green Star Land Use and Ecology

Credit	Project Response	Responsibility
27. Ecological Value	The Project will aim to have no net ecological impact on the ecological value of the site, with a stretch target to improve the ecological value of the site (including offsets). Ecological value calculations will be undertaken in accordance with Green Star requirements.	PTA Landscape MetCONNx
28. Sustainable Sites	The project chooses to develop sites that have limited ecological value, that reuse previously developed land, and that remediate contaminated land. The site does not include any old growth forest or wetland of High National Importance, does not impact on Matters of National Significance.	MetCONNx

5.1.8 Emissions

The Project considers the environmental impacts of the pollution generated by the various sources in operation, including rainfall runoff of the Project site that may impact local waterways, refrigerant leaks, and disturbances to native animals and their migratory patterns as a result of light pollution

Table 10 Green Star Emissions

Credit	Project Response	Responsibility
30. Stormwater	The Project is required to minimise peak storm water outflows from the site and aims to reduce pollutants entering stormwater infrastructure and/or local water bodies. The stormwater management strategy aims to ensure the post-development peak event discharge from the site does not exceed the pre-development peak event discharge.	Civil Engineer
31. Light Pollution	The Project aims to minimise light pollution. The lighting in external areas of the Station will comply with AS 4282:1997 to minimise the obtrusive effects of external lighting and minimise use of up-lighting.	Landscape Electrical
32. Microbial Control	The Project implements air cooled heating and ventilation systems that eliminate the impacts associated with harmful microbes in building cooling systems.	Mechanical

5.1.9 Innovation

The Project looks to maximise innovative practices, processes and strategies that promote sustainability in the built environment and demonstrates that sustainability principles have been incorporated at a broader level.

Table 11 Green Star Innovation

Credit	Project Response	Responsibility
34A. Innovation Technology & Process	The Project will explore opportunities to implement initiatives that demonstrate that a sustainability technology or process is not commonly used in the state and look to share learnings and opportunities with the broader industry to facilitate uptake.	MetCONNX PTA/N&I METRONET
34B. Market Transformation	The Project will explore opportunities to implement initiatives that could substantially contribute to the broader market transformation towards sustainable development in Australia. Knowledge sharing will look to ensure that these initiatives can be used in other buildings and contribute to market transformation or to increased adoption of the solution.	MetCONNX PTA/N&I METRONET
34C. Improving on Green Star Benchmarks	The Project will explore opportunities to demonstrate a substantial improvement to a specific benchmark (environment, social, economic), addressed by an existing Green Star credit which the project is targeting.	MetCONNX PTA/N&I METRONET
34D. Innovation Challenge	The Project will explore opportunities to demonstrates compliance with any of the Innovation Challenges listed on the GBCA website. These Innovation Challenges have been designed to challenge owners, developers, tenants and project teams to create even more sustainable projects.	MetCONNX PTA/N&I METRONET
34E. Global Sustainability	The Project will explore opportunities to demonstrate compliance with an approved credit from another World Green Building Council (WGBC) member rating tool that covers a sustainability topic that is not included in the Green Star – Railway Stations rating tool.	MetCONNX

5.2 Options Assessment

Options for significant project initiatives are to be evaluated using the Multi-Criteria Analysis (MCA) tool, which considers environmental, social and economic impacts. The full process is outlined in the Project's Sustainability Management Plan (SuMP) [R30-MET-PLN-SU-000-00001] and contains requirements for:

- Multi-disciplinary input
- Default category weightings for assessment
- Qualitative and quantitative criteria
- Whole of life costing including externalities

An Opportunities Register is maintained for the project and reported to the client monthly, as a separate activity from this report.

Key sustainability initiatives will be quantified in later stages of design. Opportunities under discussion include:

- Options assessed for solar installation to meet 100kW SWTC requirement.
- Re-use of inert C&D waste from current Armadale station demolition is being assessed to keep the materials on site. Key areas of client interest are RAP, CRC, ballast, track sleepers
- Tree Retention strategy is being used to inform design footprint and construction footprint to minimise clearing.

6. Design Outputs

6.1 Design Performance

Project targets are derived for the whole project and take account of both the IS rating and Greenstar rating boundaries, some targets will be project wide and will be based on the more stringent criteria from either Greenstar or the IS-rating.

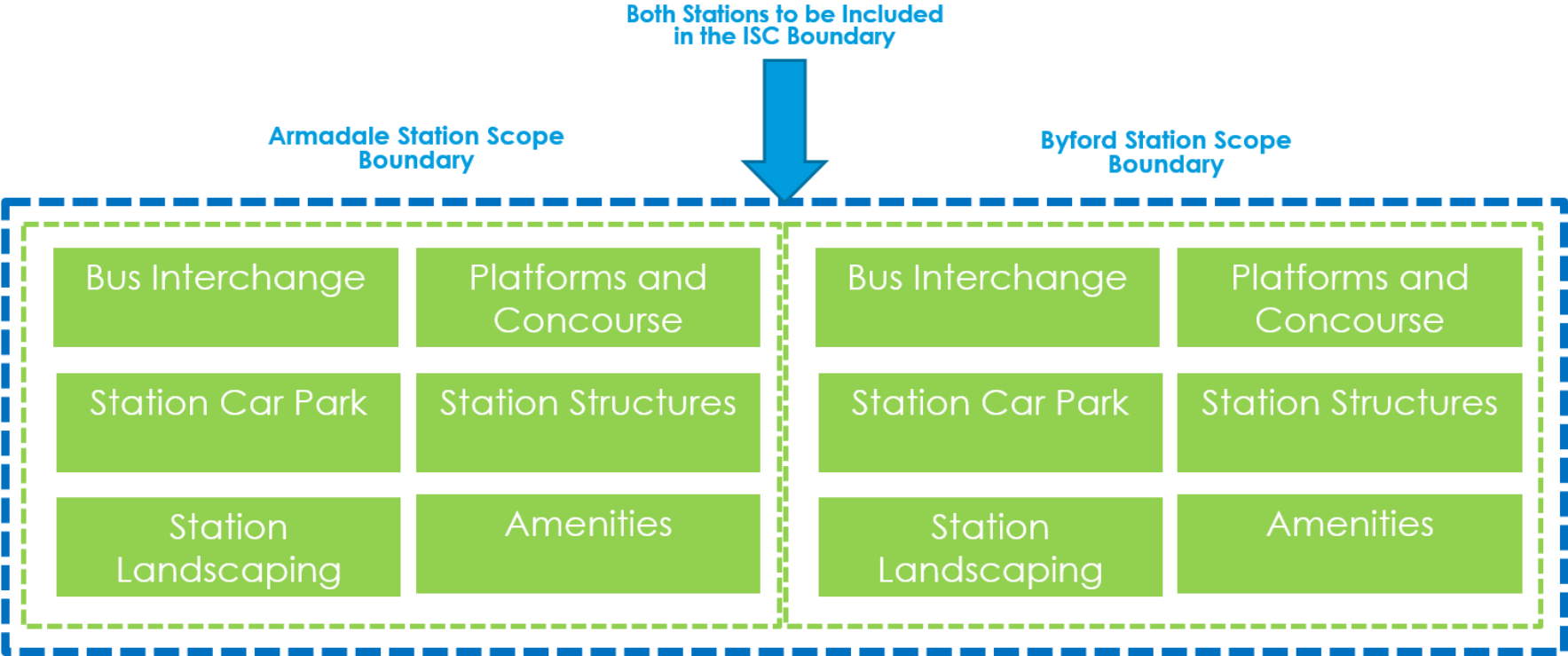
Progress against targets is reviewed in an informal setting monthly in the Sustainability Leadership Committee (SLC) forum. Every six months a management review will be initiated to formally review progress and corrective actions set to rectify any non-conformances with targets. Performance against the targets will be reported publicly in the Annual Sustainability Report. Indicative progress is provided below in relation to Armadale ESD contribution to over project performance.

Table 12 Design Performance

METRONET Pillar	Objective	Minimum Target
Governance	Obtain an Infrastructure Sustainability Council (ISC) Rating using the V2.1 tool.	Silver Rating (50 points).
	Obtain a Green Star Rating for Each Station Precinct.	<ul style="list-style-type: none"> • 5 star (Armadale Station) • 4 Star (Byford Station)
People and Place Connectivity, amenity & liveability; Resilience & adaptability	Reduce the Contribution of both Station Precincts to the 'urban heat island effect'.	Hard landscaping materials are selected to ensure average area solar reflectance is minimised as far as possible. Where possible, soft landscaping is preferred.

METRONET Pillar	Objective	Minimum Target
Society	Ensure appropriate consultation and integration with a diverse representation of community and stakeholders.	Local Indigenous community member inputs have directly contributed to the inclusion of project Urban and Landscape design elements relating to at least three heritage features.
		Implement at least three actions corresponding to stakeholder feedback on final station precinct design that support the diverse needs of the community in accessing public transport. These actions are to exceed legal compliance requirements.
	Deliver initiatives that contribute long-lasting societal or environmental outcomes for the community, outside of the project's scope of delivery.	Two priority legacy initiatives, as identified with Stakeholders, and beyond the purpose of the project itself, will be delivered as a 'lasting legacy' that aims to positively contribute to society or the environment.
	Develop resilient infrastructure that can withstand climate and natural hazards.	Mitigate 100% of high or above climate change and natural hazard risks.
	Support the development of a diverse and inclusive working environment by surveying employees and implementing improvement actions.	Employees are surveyed annually, with at least 60% employee participation rate in Wellbeing and Diversity and Inclusion Surveys.
Environment Energy and Carbon; water; waste; resource efficiency; environmental values and biodiversity	Minimise impact to environment	20% reduction of carbon emissions in construction and operational phases compared to a base case footprint.
		15% reduction in water use in construction and operational phases compared to a base case footprint.
		Monitoring demonstrates no recurring or major exceedances of project CEMP targets for receiving water quality, noise, vibration and dust impacts, as per ISC v2.1 requirements.
	Native vegetation retention is prioritised. Where impacts are unavoidable aim to minimise, rehabilitate or offset impacts to native vegetation.	Explore opportunities to mitigate biodiversity loss and aim to achieve a no net loss in biodiversity (inclusive of off-sets) measured in accordance with the ISC V2.1 framework.
Maximise resource efficiency	Achieve the following diversion rates from landfill: • 85% clean/inert spoil (including 50% onsite re-use) • 70% all other inert streams • 60% office waste	
	15% reduction in materials lifecycle impacts, compared to a base case footprint.	
Economy Support equitable economic development opportunities	Address sustainability risks and opportunities in the supply chain, building a robust procurement process which achieves sustainable outcomes through collaboration.	>90% of sub-contracts with identified 'material' sustainability opportunities and/or risk will implemented a Project specific Sustainability Action Plan.
		>3% spend on materials or products with sustainability labels used on permanent infrastructure

Appendix A: Sustainability Boundaries – Green Star and ISC



Appendix B: Green Star Railways v1.1 Scorecard

Refer over.



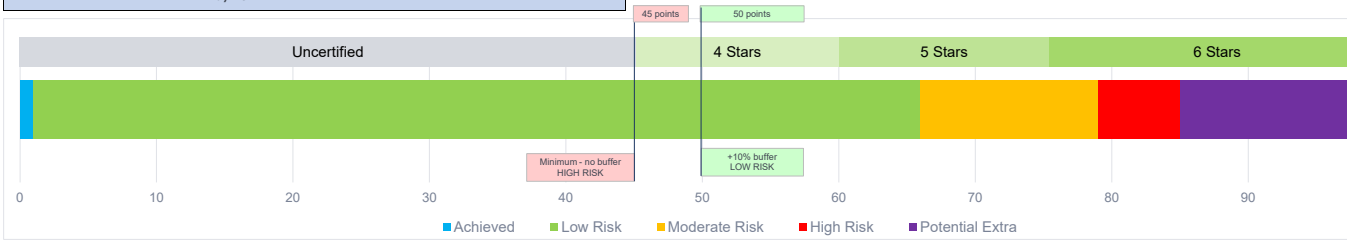
Green Star - Railway Stations v1.1 Scorecard



Project: Byford Railway Extension - Byford Station
Targeted Rating: 4 Star - Best Practice (45 points)

Date: May-23

Core Points Available	Achieved	Low Risk	Moderate Risk	High Risk	Potential Extra
100	1	59	13	6	11



CATEGORY / CREDIT	AIM OF THE CREDIT / SELECTION	CODE	CREDIT CRITERIA	POINTS AVAILABLE	Achieved	Low Risk	Moderate Risk	High Risk	Potential Extra
Management				20					
Green Star Accredited Professional	To recognise the appointment and active involvement of a Green Star Accredited Professional in order to ensure that the rating tool is applied effectively and as intended.	1.0	Accredited Professional	1	1				
Commissioning and Tuning	To encourage and recognise commissioning, handover and tuning initiatives that ensure all building services operate to their full potential.	2.0	Environmental Performance Targets	-		Complies			
		2.1	Services and Maintainability Review	1			1		
		2.2	Project Commissioning	1		1			
		2.3	Project Systems Tuning	1					
		2.4	Independent Commissioning Agent	1				1	
Adaptation and Resilience	To encourage and recognise projects that are resilient to the impacts of a changing climate and natural disasters.	3.1	Implementation of a Climate Adaptation Plan	2		2			
Building Information	To recognise the development and provision of building information that facilitates understanding of a building's systems, operation and maintenance requirements, and environmental targets to enable the optimised performance.	4.0	Building Information	1		1			
Commitment to Performance	To recognise practices that encourage building owners, building occupants and facilities management teams to set targets and monitor environmental performance in a collaborative way.	5.1	Environmental Building Performance	1					1
		5.2	End of Life Waste Performance	1					1
Metering and Monitoring	To recognise the implementation of effective energy and water metering and monitoring systems.	6.0	Metering	-				Complies	
		6.1	Monitoring Systems	1					1
Responsible Construction Practices	To reward responsible construction practices that manage environmental impacts, enhance staff health and wellbeing, and improve sustainability knowledge on site.	7.0	Environmental Management Plan	-		Complies			
		7.1	Environmental Management System	1		1			
		7.2	High Quality Staff Support	1		1			
Operational Waste	Performance Pathway	8A	Performance Pathway - Specialist Plan	1					1
Culture, Heritage and Identity	To encourage and recognise projects that celebrate and incorporate the heritage, culture and historical context of the project site, supporting communities and places with the development of a sense of place and identity.	9.1	Understanding Culture, Heritage and Identity	1		1			
		9.2	Enhancing Culture, Heritage and Identity	1		1			
Urban Precincts	To encourage and recognise projects that undertake a design review process designed to facilitate sustainable urbanism.	10.0	Concept Review	-		Complies			
		10.1	Site Planning and Layout	1		1			
		10.2	Urban Design and Public Realm	1		1			
Safe Places	To encourage and recognise projects that reduce the likelihood of crime through good design.	11.0	Crime Risk Assessment	-			Complies		
		11.1	Safe Places Through Design	1			1		
Wayfinding	To recognise projects that minimise occupant stress and anxiety through the implementation of excellent wayfinding practices.	12.0	Wayfinding Review	-		Complies			
		12.1	Excellent Wayfinding Review	1		1			
Total				20	1	11	3	0	4

Indoor Environment Quality				17					
Quality of Indoor Air	To recognise projects that provide high air quality to occupants.	13.1	Ventilation System Attributes	1		1			
		13.2	Provision of Outdoor Air	2		1			
		13.3	Exhaust or Elimination of Pollutants	1			1		
Acoustic Comfort	To reward projects that provide appropriate and comfortable acoustic conditions for occupants.	14.1	Internal Noise Levels	1		1			
		14.2	Reverberation	1		1			
		14.3	Audibility	1		1			
		14.4	Hearing Loop Coverage	1		1			
Lighting Comfort	To encourage and recognise well-lit spaces that provide a high degree of comfort to users.	15.0	Minimum Lighting Comfort	-		Complies			
		15.1	General Illuminance and Glare Reduction	1		1			
Visual Comfort	To recognise the delivery of well-lit spaces that provide high levels of visual comfort to building occupants.	15.2	Surface Illuminance	1					
		16.0	Glare Reduction	-		Complies			
		16.1	Daylight	2			1	1	
Indoor Pollutants	To recognise projects that safeguard occupant health through the reduction in internal air pollutant levels.	16.2	Views	1			1		
		17.1	Paints, Adhesives, Sealants and Carpets	1		1			
Thermal Comfort	To encourage and recognise projects that achieve high levels of thermal comfort.	17.2	Engineered Wood Products	1		1			
		18.1	Staff Thermal Comfort	1			1		
		18.2	Patron Thermal Comfort	1					1
Total				17	0	9	4	1	1

Energy				22						
Greenhouse Gas Emissions	Reference Building Pathway	19B.0	Conditional Requirement: Reference Building Pathway	-		Complies				
		19B.1	GHG Emissions Reduction: Building Fabric	-		1				
		19B.2	GHG Emissions Reduction	20		10	2	1		
		19B.3	Off-site Renewables	10.8						
		19B.4	District Services	9						
		19E.5.1	Transition Plan	1						
		19E.5.2	Fuel Switching	2		2				
Peak Electricity Demand Reduction	Performance Pathway	19E.5.3	On-Site Storage	1						
		20B	Performance Pathway - Reference Building	2		2				
Total				22	0	15	2	1	0	

Transport				7					
Sustainable Transport	To reward projects that implement design and operational measures that reduce the carbon emissions arising from occupant travel to and from the project, when compared to a benchmark building.	21.1	Intermodal Connectivity	3		3			
		21.2	Reduced Car Parking Provision	1		1			
		21.3	Low Emission Vehicle Infrastructure	1					1
		21.4	Active Transport Facilities	1		1			
		21.5	Walkable Neighbourhoods	1		1			
Total				7	0	6	0	0	1

Water				10					
Potable Water	Performance Pathway	22A	Potable Water - Performance Pathway	10		3		3	
Total				10	0	3	0	3	0

Materials				13					
Life Cycle Impacts	Performance Pathway - Life Cycle Assessment	23A.1	Comparative Life Cycle Assessment	6		4	1		
		23A.2	Additional Life Cycle Impact Reporting	1		1			
Responsible Building Materials	To reward projects that include materials that are responsibly sourced or have a sustainable supply chain.	24.1	Structural and Reinforcing Steel	1		1			
		24.2	Timber	1		1			
		24.3	Permanent Formwork, Pipes, Flooring, Blinds and Cables	1		1			
Sustainable Products	To encourage sustainability and transparency in product specification.	25	Product Transparency and Sustainability	2					1
Construction and Demolition Waste	Percentage Benchmark	26.0	Reporting Accuracy	-		Complies			
		26B	Percentage Benchmark	1				1	
Total				13	0	8	1	1	1

Land Use & Ecology				6					
Ecological Value	To reward projects that improve the ecological value of their site.	27.0	Endangered, Threatened or Vulnerable Species	-		Complies			
		27.1	Ecological Value	3			1		
Sustainable Sites	To reward projects that choose to develop sites that have limited ecological value, re-use previously developed land and remediate contaminate land.	28.0	Conditional Requirement	-		Complies			
		28.1	Reuse of Land	1					
		28.2	Contamination and Hazardous Materials	1					
Heat Island Effect	To encourage and recognise projects that reduce the contribution of the project site to the heat island effect.	29	Heat Island Effect Reduction	1					
Total				6	0	0	1	0	0

Emissions				5					
Stormwater	To reward projects that minimise peak stormwater flows and reduce pollutants entering public sewer infrastructure.	30.1	Stormwater Peak Discharge	1			1		
		30.2	Stormwater Pollution Targets	1					
Light Pollution	To reward projects that minimise light pollution.	31.0	Light Pollution to Neighbouring Bodies	-		Complies			
		31.1	Light Pollution to Night Sky	1			1		
Microbial Control	To recognise projects that implement systems to minimise the impacts associated with harmful microbes in building systems.	32	Legionella Impacts from Cooling Systems	1		1			
Refrigerant Impacts	To encourage operational practices that minimise the environmental impacts of refrigeration equipment.	33	Refrigerants Impacts	1					
Total				5	0	1	2	0	0

Innovation				10					
Innovative Technology or Process	The project meets the aims of an existing credit using a technology or process that is considered innovative in Australia or the world.	34A	Innovative Technology or Process						
Market Transformation	The project has undertaken a sustainability initiative that substantially contributes to the broader market transformation towards sustainable development in Australia or in the world.	34B	Market Transformation						
Improving on Green Star Benchmarks	The project has achieved full points in a Green Star credit and demonstrates a substantial improvement on the benchmark required to achieve full points.	34C	Improving on Green Star Benchmarks	10		2			

Innovation Challenge	Where the project addresses a sustainability issue not included within any of the Credits in the existing Green Star rating tools.	34D	Innovation Challenge		4				
Global Sustainability	Project teams may adopt an approved credit from a Global Green Building Rating tool that addresses a sustainability issue that is currently outside the scope of this Green Star rating tools.	34E	Global Sustainability						4
Total				10	0	6	0	0	4



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