

An aerial photograph of Sydney, Australia, featuring the Sydney Football Stadium in the foreground. The stadium is a large, modern, oval-shaped structure with a white, curved roof. The surrounding area includes parking lots, green spaces, and residential buildings. In the background, the Sydney city skyline is visible, including the Sydney Tower and the Sydney Harbour Bridge. The text "JOHN HOLLAND SUSTAINABILITY MANAGEMENT PLAN" is overlaid in large, bold, red capital letters.

# JOHN HOLLAND SUSTAINABILITY MANAGEMENT PLAN

Sydney Football Stadium Redevelopment

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SFS-JHG-00-PLN-PM120000

21<sup>st</sup> June 2021

Revision 04

Rev	Date	Prepared by	Reviewed by	Approved by	Remarks
01	25/08/20	M. Williams	S.Jia	M. Stephenson	Final for CC4
02	02/11/20	M Williams	S Jia	C Newling	Includes DPIE comments
03	26/11/20	M Williams	S Jia	C Newling	Clarification of DPIE response
04	21/6/21	C Newling	H Hofland	C Newling	Updated for Mod 4

# Table of Contents

<b>1</b>	<b>Introduction.....</b>	<b>6</b>
1.1	Purpose .....	6
1.2	Project Scope .....	6
<b>2</b>	<b>JH System and Approach.....</b>	<b>10</b>
2.1	Policy.....	10
2.2	JH Sustainability Framework.....	10
2.3	Sustainability Management System .....	11
2.4	Sustainability Requirements.....	12
2.4.1	Overview .....	12
2.4.2	Risk and Opportunities .....	12
2.4.3	Leadership and Collaboration .....	12
2.4.4	Training, Awareness and Communication.....	12
2.4.5	Governance and Continuous Improvement Reporting .....	13
<b>3</b>	<b>Sustainability in Design.....</b>	<b>14</b>
3.1	Introduction.....	14
3.2	Compliance Pathway for LEED.....	14
3.3	ESD Innovation.....	25
3.4	Whole of Life Assessment /Life Cycle Costing .....	27
3.5	Solar PV .....	27
3.6	Life Cycle Assessment (LCA) .....	30
3.7	LEED Submission Process .....	32
<b>4</b>	<b>Sustainability in Delivery.....</b>	<b>34</b>
4.1	Introduction.....	34
4.2	Environmental Management Plans .....	34
4.3	Social Sustainability.....	36
4.3.1	Promotion of Diversity.....	36
4.3.2	Modern Slavery in the supply chain .....	37
4.3.3	Community Engagement .....	37
<b>5</b>	<b>Sustainability in Commissioning and Handover .....</b>	<b>39</b>
5.1	Introduction.....	39
5.2	Commissioning Management.....	39
5.3	Indoor Air Quality Management and Assessment .....	39
5.4	Monitoring and Verification .....	39
	<b>Annexure A – Sustainability Policy .....</b>	<b>40</b>
	<b>Annexure B – DPIE Comments .....</b>	<b>42</b>

## Compliance Table

The following table summarises specific project requirements outlined in the SSDA Conditions and Project Brief.

Requirement	Reference in this document
<b>SSDA Condition B20</b>  <i>Prior to the commencement of construction of the stadium structure above the concourse level, the Applicant must: (a) prepare a revised ESD report and associated design plans in consultation with the Planning Secretary including:</i>	
(i) details of the proposed ESD measures that would be incorporated into the final design and how these would achieve the targeted Leadership in Energy and Environmental Design (LEED) v4 Gold Certificate;	Section 3.2
(ii) details to demonstrate that the chosen ESD measures are consistent with the those identified in the Environmentally Sustainable Design Strategy prepared by LCI dated 01/05/2019;	Section 3.2
(iii) details to demonstrate that a 150kWp Photovoltaic system will be installed as part of the main stadium, separate from the members facilities, as referred to in Condition B20(viii);	Section 3.5
(iv) a detailed Whole-of-Life Assessment to identify opportunities to reduce the carbon emissions across the life of the project including the materiality recommendations in accordance with Appendix B of the Environmentally Sustainable Design Strategy prepared by LCI dated 01/05/2019;	Section 3.4
(v) a Life Cycle Analysis that shows how climate, energy and water risks and opportunities have been identified and how the design of the stadium has incorporated these opportunities and / or mitigated risks;	Section 3.6
(vi) details of opportunities to use alternatives to standard concrete mixes that reduce carbon emissions associated with Portland cement, including opportunities for replacement of Portland cement with Geopolymer concrete for roadways and paths, or where the Portland cement content in concrete used is reduced by replacing it with supplementary cementitious materials;	Section 3.6
(vii) details to identify how the construction and operation of the project will incorporate the opportunities in condition B20e(viii); and	Section 4
(viii) details of the photovoltaic system that is to be installed for the Stadium Members Facilities; and	Section 3.5
(b) include a review of the proposed ESD measures by a suitably qualified consultant and a statement certifying that the design is capable of incorporating the identified ESD measures and achieving the targeted Leadership in Energy and Environmental Design (LEED) v4 Gold Certificate; and	Section 3.2

Requirement	Reference in this document
(c) submit the revised ESD report, the design plans, the Planning Secretary's comments / advice and the review of the proposed ESD measures to the Certifying Authority for approval, prior to the construction of the stadium structure above the concourse level.	NOTE
<b>Project Brief Revision D – Section F2</b> <i>The Contractor must develop an ESD Management Plan that complies with the performance requirements outlined in the Project Brief, and:</i>	
(i) identifies a pathway to achieve the LEED or Green Star rating;	Section 3.2
(ii) ensures that Australian best practice sustainable outcomes are achieved through: the design, construction, commissioning and completion of the Works; and the operation of the Stadium;	Section 3 Section 4 Section 5
(iii) measures performance against either: The United States Green Building Council (USGBC) LEED v4 rating tool by pursuing a Gold rating; or The Green Building Council of Australia (GBCA) Green Star – Design & As Built v1.2 by pursuing a '5 Star' rating; and	Section 3.2
allows the Principal to suitably review progress against ESD performance requirements outlined in this Chapter F2.	Section 2
<i>As part of the ESD Management Plan, the following ESD Initiatives, as a minimum, must be considered in the design and construction of the Works and the operation of the Stadium:</i>	
compliance pathway to compliance with LEED or Green Star;	Section 3.2
social sustainability; and	Section 4.3
ESD innovation.	Section 3.3

**Definitions and Abbreviations**

<b>Terms/Abbreviations</b>	<b>Definitions</b>
JHG	John Holland Group
LCI	Lehr Consultants International
INSW	Infrastructure New South Wales
SCGT	Sydney Cricket Ground Trust (Now Venues NSW)
SFF	Stadium Fitness Facilities
SFSR	Sydney Football Stadium Redevelopment
USGBC	US Green Building Council
LEED	Leadership in Energy and Environmental Design
CEMP	Construction Environmental Management Plan
CIAQP	Construction Indoor Air Quality Plan

# Sydney Football Stadium Redevelopment (SFSR) Sustainability Management Plan (SuMP)

## 1 Introduction

### 1.1 Purpose

Sustainability is at the heart of our business and our desire to achieve leading best practice in everything we do. This Sustainability Management Plan (SuMP) provides the detail on how sustainability is embedded across John Holland's business and effectively implemented on Projects, across multiple disciplines including Design, Procurement, Construction, Environment and Sustainability; and Community and Stakeholder management.

The purpose of the SuMP is to outline the processes and procedures of identifying and implementing initiatives that meet the Sustainability targets and requirements and to satisfy condition B20 of the development consent (SSD-9835)

It also affirms the relationship between the various project plans, the team's roles, responsibilities, and the delivery process. The objectives of the Sustainability Plan are to:

- Provide a framework to manage and deliver the sustainability outcomes for the Design, Delivery and into the Operational phases of the project;
- Sets sustainability benchmarks and targets for the project to achieve;
- Establish systems, controls, responsibilities, protocols and reporting mechanisms to ensure compliance with sustainability targets and aspirations of the project deed requirements.

The SFSR Project Brief states in section F2.2 (b) that;

*"Prior to the commencement of the work in connection with the Contract, a formalised ESD Management Plan must be submitted to the Principal, as set out in the Preliminaries, which specifically outlines how the initiatives listed in paragraph F2.2(a) [i.e LEED Rating, Social Sustainability, ESD Innovation] have been addressed"*

### 1.2 Project Scope

The Sydney Football Stadium Redevelopment Stage 2 (The Project) is an Infrastructure NSW initiative to build a new rectangular stadium. The Project is part of the SCSGT Precinct, adjacent to the SCSGT and part of the wider Moore Park sports and entertainment precinct,

Stage 2 works include Detailed design, construction and operation of a new stadium comprising

- construction of the stadium, including:
  - 45,000 seats (additional 10,000 - person capacity in the playing field in concert mode) in four tiers including general admission areas, members seating and corporate / premium seating;
  - roof cover over all permanent seats and a rectangular playing pitch;
  - a mezzanine level with staff and operational areas;
  - internal pedestrian circulation zones, media facilities and other administration areas on the seating levels;



- a basement level (at the level of the playing pitch) accommodating pedestrian and vehicular circulation zones, 50 car parking spaces, facilities for teams and officials, media and broadcasting areas, storage and internal loading areas;
- food and drink kiosks, corporate and media facilities; and
- four signage zones.
- construction and establishment of the public domain within the site, including:
  - hard and soft landscaping works;
  - publicly accessible event and operational areas;
  - public art; and
  - provision of pedestrian and cycling facilities.
- wayfinding signage and lighting design within the site;
  - reinstatement of the existing Moore Park Carpark 1 (MP1) upon completion of construction works with 540 at-grade car parking spaces and vehicular connection to the new stadium basement level;
  - operation and use of the new stadium and the public domain areas within the site for a range of sporting and entertainment events; and
  - extension and augmentation of utilities and infrastructure.



Figure 1: Indicative photomontage of proposed stadium (Source: Cox Architecture)



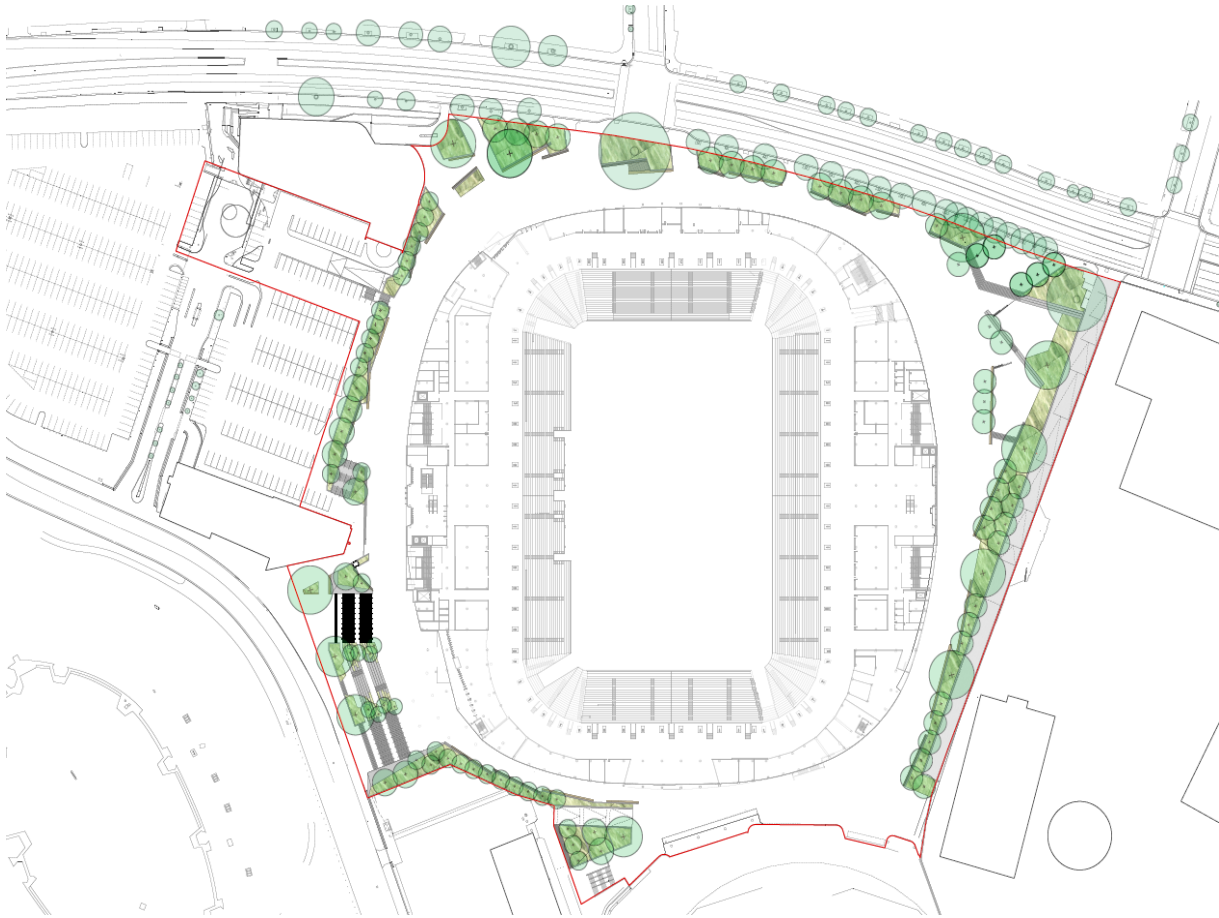


Figure 2: Site layout and public domain plan (source: Cox Architecture and ASPECT Studios)

#### The Stadium Fitness Facility (SFF) scope is as follows:

The Stadium Fitness Facility (SFF) is owned and operated by Venues NSW and provides fitness amenities for members of the Sydney Cricket and Sports Ground.

Stadium Fitness Facilities is integrated into the SFS redevelopment and will reinstate the facilities that operated in conjunction with the former, demolished stadium on the site. The proposed Stadium Fitness Facilities comprise:

A low level pavilion building located behind the southern entry abutment wall and a basement level structure, which is largely integrated into the under-croft space beneath the approved SFS entry stairs to accommodate

1. Gymnasium, training area and three group fitness areas.
2. Two squash courts, sauna, spa and steam room as well as wet and dry change rooms.
3. Day spa and treatment rooms
4. Café with indoor and outdoor seating
5. 25 metre (m) and a 50m open-air swimming pool.
6. Function spaces on the rooftop, poolside and at the café for members and their guests.
7. Basement level plant and equipment, landscaping and associated services.

The Stadium Fitness Facilities will largely occupy the vacant under-croft space below the SFS entry stairs, being largely imperceptible and occupying land that already forms part of the approved SFS redevelopment footprint. A modest pavilion building, swimming pools, and minor outdoor structures will also occupy land that

was formerly used for the Indoor Cricket Centre, part of the Sydney Cricket Ground's (SCG) practice area, part of a tennis court, and part of the wall extending from the Moore Park Terraces to the south along Driver Avenue. This small area of additional land is controlled by Venues NSW and has been integrated into the site as part of the Stage 1 SSD DA (9249).



Figure 3 - Location of stadium fitness facilities in relation to the stadium

## 2 JH System and Approach

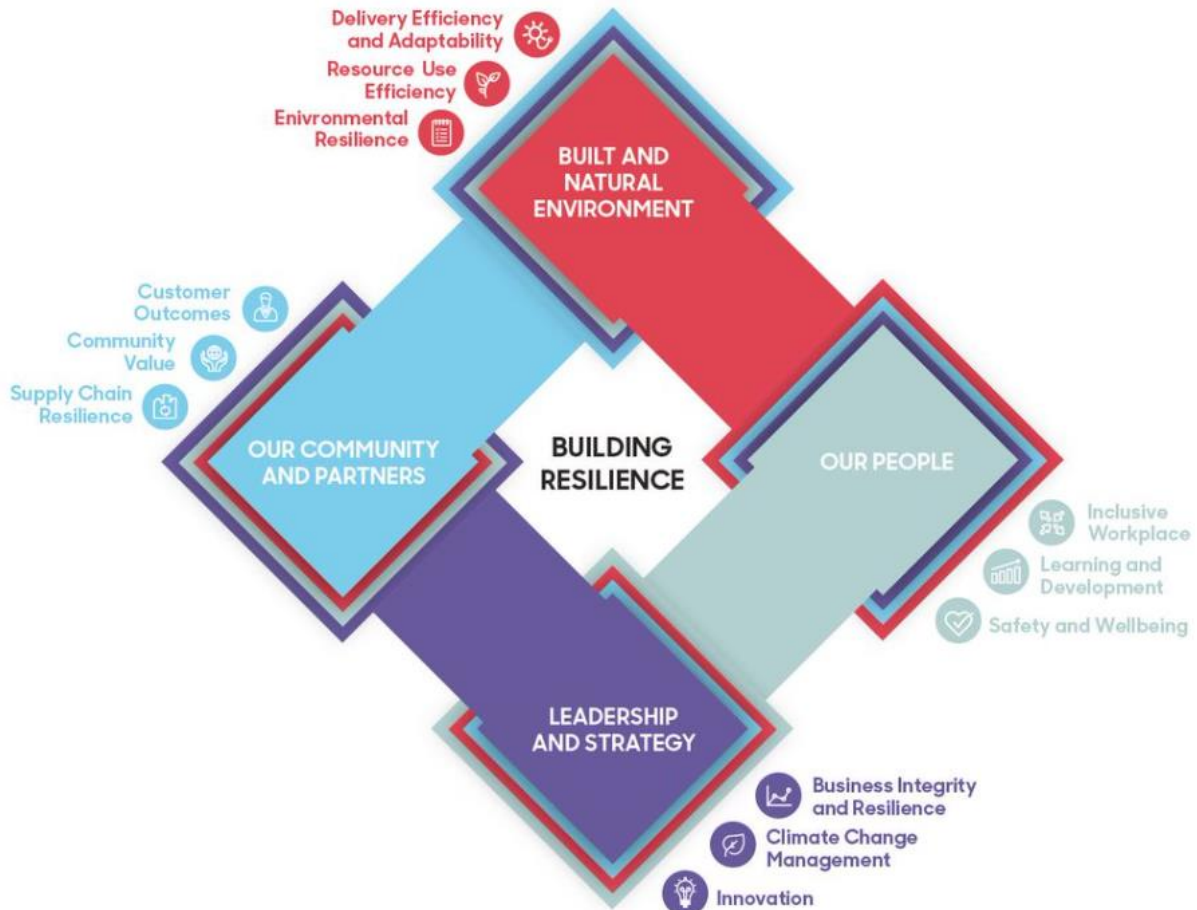
### 2.1 Policy

John Holland's Sustainability Policy (Annexure A) spells out the business' commitment to sustainability through *"integrating economic growth, environmental resilience, and social progress as priorities into decision-making at every level of the business, with the ambition to create long-term value."*

### 2.2 JH Sustainability Framework

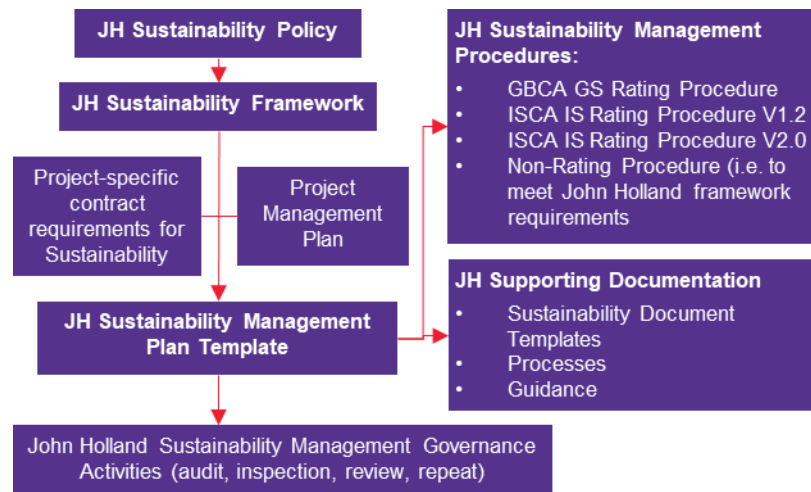
Our Sustainability Framework governs the way we work through 4 key pillars (Leadership and Strategy, Our Community and Partners, Built and Natural Environment; and Our People) and 12 Sustainability Elements. These 12 Sustainability Elements focus on the key interactions with our supply chain, customers, communities and the environment, throughout the project lifecycle. The Framework also enables John Holland to work towards the UN Sustainable Development Goals.

The Framework is designed to leverage our people and diverse expertise by encouraging a thoughtful, collaborative, interconnected approach to decision making, centring on building resilience. Each component of our framework is interconnected, each of the 4 pillars and their 12 elements define our inclusive and thoughtful approach to decision-making that we see as a 'whole of business' challenge – that is one we are all working towards together. More detail on JH's Sustainability Framework can be found on the JH Intranet Group Sustainability page.



## 2.3 Sustainability Management System

John Holland's Sustainability Management System (SMS) is applicable to all Infrastructure and Building Projects and details how sustainability is implemented across all projects regardless of whether the project is registered to achieve a sustainability rating or not. The Sustainability Management System fits within John Holland's Integrated Management System (IMS) certified to AS/NZ ISO9001, AS/NZ ISO14001 and AS/NZ ISO4801 and can be accessed via the John Holland Intranet and John Holland HSES Portal. The SMS provides proven procedures, tools and templates to support the Project to achieve successful delivery with a strong focus on resource use (energy, water, waste, materials) efficiency.



The position of the Sustainability Management Plan to other plans within the JH Integrated Management System and overarching documentation framework is shown below.

- Construction Management Plan
  - Design Management Plan
  - Sustainability Management plan
  - Construction Environmental Management Plan (CEMP) and sub-plans, including:
    - Soil & Water Management Plan;
    - Noise and Vibration Management Plan
    - Waste Management Plan
    - Heritage Management Plan



## 2.4 Sustainability Requirements

### 2.4.1 Overview

This Sustainability Plan describes the processes, procedures and initiatives that John Holland will implement to meet the sustainability obligations specified in SSDA 9835: condition B20. The Sustainability Management Plan describes how Sydney Football Stadium (SFS) project team will formally implement sustainability management techniques, which will achieve the both John Hollands Group level policies, objectives and targets, as well as the project objectives, targets and Key Performance Indicators (KPIs). The Sustainability Plan represents the overarching management plan for control of sustainability requirements and will be used as a guide to inform the development of the Sustainability Plan in the delivery phase.

### 2.4.2 Risk and Opportunities

John Holland have engaged LCI Consultants to provide specialist advice related to ESD and to ensure the design outcomes within the LEED rating are adequately addressed by the design team and trade contractors.

John Holland's Environment & Sustainability team will manage sustainability during delivery and collate information from subcontractors to be used to demonstrate compliance with LEED at the completion of the project. In addition the delivery team will be responsible for a number of initiatives that will deliver upon the Social Sustainability targets for the project, particularly around modern slavery, workforce development and stakeholder engagement.

### 2.4.3 Leadership and Collaboration

The Sustainability Manager is responsible for preparing and updating the Sustainability Plan. The Sustainability Plan must be prepared and initially submitted to the Principal's Representative and the department of planning (DPIE) prior to any construction above the concourse level. The Sustainability Manager will control revisions of this Plan, which will be authorised by the Project Director.

### 2.4.4 Training, Awareness and Communication

To ease sustainability in delivery phase and achieve the targeted outcomes, a range of training items will be available.

- Project Induction – The general site induction includes information about the LEED rating and any issues or risks that the general workforce should be aware of.
- Competency and training – Key team members may undertake additional, specific training in sustainability as required.
- Communication platforms and forums – LEED and other sustainability stories or topics will be shared across a selection of media channels including the site newsletter, email distribution lists, physical notice boards, toolbox talks and prestarts.
- Case studies and lessons learnt will be generated at appropriate times and share SFSR sustainability outcomes with the broader team and industry.



### **2.4.5 Governance and Continuous Improvement Reporting**

- In addition to complying with the requirements of the Project Brief, LEED pathway and SSDA conditions. The Plan will be reviewed and updated yearly, as a minimum or as required, taking into account:
  - I. New elements of the Project Works and Temporary Works not covered by the existing Sustainability Plan
  - II. Changes in design or construction sequence, staging, methodology or resourcing
  - III. The status and progress of the Contractor's Activities.

## 3 Sustainability in Design

### 3.1 Introduction

LCI have been engaged to provide sustainability design advice and co-ordinate the LEED pathway for design consultants and trade subcontractors.

At the conclusion of the construction phase, LCI will take information collated by the JHG delivery team and submit to the USGBC for assessment for a LEED rating.

### 3.2 Compliance Pathway for LEED

A Gold level has been targeted, which equates to achieving at least 60 points across the LEED BD+C v4 categories. Additional credits have been targeted to provide a buffer in case certain points drop away during the design or delivery phases.

Category	Points Available	Points Targeted
<b><i>Integrative Process</i></b>	1	1
<b><i>Location and Transport</i></b>	16	13
<b><i>Sustainable Sites</i></b>	10	1
<b><i>Water Efficiency</i></b>	11	11
<b><i>Energy and Atmosphere</i></b>	33	17
<b><i>Materials &amp; Resources</i></b>	13	6
<b><i>Indoor Environmental Quality</i></b>	16	11
<b><i>Innovation</i></b>	6	6
<b><i>Regional Priority – Bonus points for Australian Projects</i></b>	4	2
<b><i>Total</i></b>	<b>110</b>	<b>68</b>

The following table summarises the design and delivery responses to address the targeted LEED Credits. The current status of each initiative is reported as one of the following;

- Adopted – Integrated into the design documentation or delivery plans
- Adopted (Partial) – Intent of credit is being followed but not all LEED criteria achieved
- Ongoing – The design doesn't meet the credit requirement yet but may in the future
- Not Applicable – Deemed by USGBC to not be applicable for a project of this type
- Dismissed – The credit is applicable/available but it is not targeted or not pursued.

Credit	Design Response	Status	LEED Points
<b>Integrative Process</b>			<b>1</b>
IP102 Integrative Process	The design process uses preliminary analysis of energy and water consumption to inform outcomes and involves all disciplines in sustainability strategy	Adopted	1
<b>Location and Transport</b>			<b>13</b>
LT101 LEED for Neighbourhood Development Location	SFSR is not located in a precinct with a LEED Neighbourhood Rating	Not Applicable	0
LT102 Sensitive Land Protection	SFSR is located on land that was previously developed	Adopted	1
LT103 High Priority Site	SFSR is not located in a historic district, a priority zone/community or brownfield remediation site.	Not Applicable	0
LT104 Surrounding Density and Diverse Use	Conserve land and protect farmland and wildlife habitat by encouraging development in areas with existing infrastructure.  SFSR located at high density location and in close proximity to diverse use facilities.	Adopted	5
LT107 Access to Quality Transit	Encourage development in locations shown to have multimodal transportation choices or otherwise reduced motor vehicle use,  Ample of public transportation to site (light rail, regular buses and dedicated buses during events)	Adopted	5
LT108 Bicycle Facilities	Promote bicycling and transportation efficiency and reduce vehicle distance travelled. Improve public health by encouraging utilitarian and recreational physical activity.  SFSR providing cyclist parking and EOT for Non- Event and Event Day stadium staff but not sufficient parking for Event visitors. Operational processes such as temporary stores and/or valet services may be explored nearer to completion but this credit is not included at this stage.	Adopted (Partial)	0
LT110 Reduced Parking Footprint	Minimize the environmental harms associated with parking facilities, including automobile dependence, land consumption, and rainwater runoff.  SFSR parking capacity will not exceed minimum code requirement but unlikely to achieve a 40% reduction from base ratios. Credit intent may be met by demonstrating that existing nearby parking inherently reduces new parking provisions (but building code/ SSDA conditions already recognise this)	Adopted	1
LT111 Green Vehicles	Designate 5% of all parking spaces as preferred parking for green vehicles and install EV charging facility for 2% of all parking spaces.	Ongoing	1

<p>Potential for parking spaces to be marked up for small vehicles, subject to operator acceptance.</p> <p>Spatial capacity and cable routes for future provision of 10 electric vehicle charging points but infrastructure not provided as part of scope.</p>			
<b>Sustainable Sites</b>			<b>1</b>
SS101: Construction Activity Pollution Prevention	<p>Reduce pollution from construction activities by controlling soil erosion, waterway sedimentation, and airborne dust.</p> <p>JHG has implemented an erosion and sedimentation control plan for all construction activities associated with the project</p> <p><i>See Section 4.2 for further detail</i></p>	Adopted	PR
SS104: Site Assessment	<p>Complete and document a site survey or assessment that includes; Topography, Hydrology, Climate, Vegetation, Soils, Human use, Human health effects.</p> <p>SFSR surveys undertaken in May 2019 included testing of contamination in soil and ground water. Remediation was not discovered but during demolition asbestos-containing materials were found and dealt with appropriately.</p>	Adopted	1
SS105: Site Development - Protect or Restore Habitat	<p>Conserve existing natural areas (40% of site) and restore damaged areas (30%) to provide habitat and promote biodiversity.</p> <p>SFSR cannot conserve and restore these areas but the Construction Environmental Management Plan (CEMP) details protection of certain trees and 95% of new vegetation will be native to the Australian bioregion.</p>	Adopted (Partial)	0
SS107: Open Space	<p>Create exterior open space that encourages interaction with the environment, social interaction, passive recreation, and physical activities.</p> <p>SFSR concourse and surrounding area will be fully revitalised and open to the public and act as a connection to Moore Park but the 30% site area requirements for LEED cannot be met.</p>	Adopted (Partial)	0
SS108: Rainwater Management	<p>Reduce runoff volume and improve water quality by replicating the natural hydrology and water balance of the site.</p> <p>SFSR works include significant stormwater upgrades water sensitive urban design elements like tree pits and rainwater tank which may be considered a natural way to manage up to 95<sup>th</sup> percentile of rain events.</p>	Dismissed	0
SS110: Heat Island Reduction	<p>Minimize effects on microclimates and human and wildlife habitats by reducing heat islands through vegetation, solar PV arrays and solar reflective surfaces.</p> <p>The SFSR lightweight roof, pitch, solar PV array and landscaping will reflect heat but the choice of paver in</p>	Adopted (partial)	0

	the public realm and MP1 car park surface will not meet the LEED SRI requirements.		
SS112: Light Pollution Reduction	<p>Increase night sky access, improve night time visibility, and reduce the consequences of development for wildlife and people.</p> <p>SFSR external lighting design will not meet prescribed LEED requirements.</p>	Ongoing	0
<b>Water Efficiency</b>			<b>11</b>
WE101/WE901: Outdoor Water Use Reduction	<p>Reduce outdoor water consumption used for irrigation</p> <p>SFSR will minimise outdoor water use by 100% (no potable use) through the following initiatives;</p> <ul style="list-style-type: none"> <li>- Native plant selection to minimise demand</li> <li>- Drip irrigation system with moisture sensor operation to use water efficiently</li> <li>- Rainwater tanks to capture clean water from the lightweight roof (shared with indoor water use).</li> </ul> <p>The SFS pitch can be excluded from LEED calculations as it is considered an athletic field, However, it will be fully irrigated from a dedicated bore water storage tank supplied from the SCG bore.</p>	Adopted	2
WE102/WE902: Indoor Water Use Reduction	<p>Reduce indoor water consumption through efficient fixtures and fittings and rainwater reuse.</p> <p>SFSR is using water efficient fittings and fixtures as per rates in the project brief</p> <p>The majority of WC and Urinal fixtures are connected to a rainwater reuse system comprising more than 350kL of storage for rainwater captured from the roof. This system will minimise indoor water use by more than 50%.</p> <p>NOTE: This system is not connected to the bore water supply to minimise risk of contaminated groundwater reuse or mineral deposition in fixtures.</p>	Adopted	6
WE104/WE112 Water Metering	<p>Support water management and identify opportunities for additional water savings by tracking water consumption.</p> <p>SFSR will include an Environmental Monitoring System (EMS) that will track water use for key end uses including potable water consumption, recycled water consumption, external landscape consumption, pitch irrigation and overall HW consumption for central plant</p>	Adopted	1
WE110: Cooling Tower Water Use	<p>SFSR will conserve water use by utilising air cooled HVAC plant to fully avoid cooling tower water consumption.</p>	Adopted	2



Energy and Atmosphere			17
EA101/EA110: Fundamental Commissioning and Verification	<p>Support the design, construction, and eventual operation of a project that meets the owner's project requirements for energy, water, indoor environmental quality, and durability.</p> <p>An Independent Commissioning Agent has been engaged to produce a comprehensive commissioning and tuning plan to drive subcontractor activity and ensure systems are operate efficiently as intended.</p> <p><i>More information provided in Section 5 of this plan</i></p>	Adopted	6
EA103/EA903: Minimum Energy Performance	<p>Reduce the environmental and economic harms of excessive energy use by achieving a minimum level of energy efficiency for the building and its systems.</p> <p>SFSR systems have been assessed initially to demonstrate that energy demand has been reduced by around 16% (based on ASHRAE 90.1) using energy efficient equipment and incorporating a 150kW onsite solar PV array.. This modelling will continue to be updated as the design finalises.</p>	Adopted	6
EA106/EA118: Building-level and Advanced Energy Metering	<p>Support energy management and identify opportunities for additional energy savings by tracking building-level energy use.</p> <p>The BMCS package will include an Environmental Management System (EMS) component that will monitor all energy uses and allow trends and alarms when the readings are outside expected values. Loads include, chillers, boilers, pumps &amp; fans (through VSDs), lighting &amp; small power network and any other loads &gt;10% of total energy use.</p>	Adopted	1
EA108/EA126: Refrigerant Management	<p>Reduce stratospheric ozone depletion.</p> <p>SFSR air conditioning equipment will be selected to use low impact refrigerants that minimise damage to the atmosphere as they leak, such as HFO type.</p> <p>Refrigeration units may be able to be excluded in LEED in non-retail environments but suppliers will be encouraged to also select environmentally friendly alternatives.</p>	Adopted	1
EA121: Demand Response	<p>Increase participation in demand response technologies and programs that make energy generation and distribution systems more efficient, increase grid reliability, and reduce greenhouse gas emissions.</p> <p>SFSR will not include any dynamic network demand controls at this stage.</p>	Dismissed	0
EA123: Renewable Energy Production	<p>Reduce the environmental and economic harms associated with fossil fuel energy by increasing self-supply of renewable energy.</p> <p>Due to limited safely accessible area on the lightweight roof the targeted Solar PV array of 350kWp cannot be</p>	Adopted	1

	achieved. Instead >150kWp will be included above plantrooms on the East and West Grandstands. This has reduced LEED points but the overall Gold target can still be achieved through all the remaining initiatives.		
EA128: Green Power and Carbon Offsets	<p>Encourage the reduction of greenhouse gas emissions through the use of grid-source, renewable energy technologies and carbon mitigation projects.</p> <p>To mitigate the risk of reduced points from the smaller PV Array, JHG will consider the up-front purchase of Carbon Credits/Green Power to offset emissions associated with predicted energy consumption for an initial period. i.e. First 5 years of operation</p>	Ongoing	2
<b>Materials &amp; Resources</b>			<b>6</b>
MR101: Storage and Collection of Recyclables	<p>Reduce the waste that is generated by building occupants and hauled to and disposed of in landfills.</p> <p>An operational waste management has been produced to ensure sufficient areas have been included to manage waste effectively, including recyclables and food waste storage.</p>	Adopted	PR
MR103/MR123: Construction and Demolition Waste Management	<p>Reduce construction and demolition waste disposed of in landfills and incineration facilities by recovering, reusing, and recycling materials.</p> <p>JHG are committed to recycling at least 90% of all demolition and construction waste.</p> <p><i>More information provided in Section 4.2 of this plan</i></p>	Adopted	PR
MR108: Building Life-cycle Impact Reduction	<p>Encourage adaptive reuse and optimize the environmental performance of products and materials through a whole-building life cycle assessment (LCA).</p> <p>Edge Environment have been engaged to undertake LCA modelling for the proposed design. The modelling shows that with some introduction of flyash to concrete structures, the use of recycled material in reinforcing steel and energy efficiency in operation the embodied carbon can be reduced by 17% along with other environmental emissions improvements of around the same magnitude.</p> <p><i>More information provided on Section 3.6 of this plan</i></p>	Adopted	3
MR112: Building Product Disclosure and Optimisation - Environmental Product Declarations	<p>Selecting products from manufacturers who have verified improved environmental life-cycle impacts.</p> <p>SFSR subcontractors have been encouraged to select products with EPDs, such that more than 20 products with EPDs will be used across the project.</p>	Ongoing	1
MR112: Building Product Disclosure and Optimisation -	<p>Selecting products verified to have been extracted or sourced in a responsible manner.</p> <p>This credit requires materials that meet a certain percentage of the project budget to have recycled</p>	Ongoing	0

Sourcing of Raw Materials	material content or third party certification (such as recycled content of concrete and steel and certified timber used at SFSR)		
MR114: Building Product Disclosure and Optimisation - Material Ingredients	selecting products for which the chemical ingredients in the product are inventoried using an accepted methodology and for selecting products verified to minimize the use and generation of harmful substances. These certifications are not yet widely available.	Dismissed	0
<b>Indoor Environmental Quality</b>			<b>11</b>
EQ101: Minimum Indoor Air Quality Performance	Contribute to the comfort and well-being of building occupants by establishing minimum standards for indoor air quality (IAQ). SFSR HVAC systems will have sufficient quantities of outdoor air to keep contaminants well diluted, in accordance with relevant codes and standards and CO2 sensors will be in place to monitor conditions continuously.	Adopted	PR
EQ104: Environmental Tobacco Smoke Control	Prevent or minimize exposure of building occupants, indoor surfaces, and ventilation air distribution systems to environmental tobacco smoke. Australia's strict public health restrictions make this readily achievable.	Adopted	PR
EQ110: Enhanced Indoor Air Quality Strategies	Promote occupants' comfort, well-being, and productivity by improving indoor air quality. SFSR spaces will enjoy enhanced air quality through initiatives such as; Long floor mats to minimise dust ingress Improved air filters in air handling units Large openings to naturally ventilated spaces CO2 sensors to manage airflow	Adopted	2
EQ112: Low-emitting Materials	Reduce concentrations of chemical contaminants that can damage air quality, human health, productivity, and the environment. All finishes and fitout materials (paints, adhesives, joinery, carpet, resilient flooring, insulation and ceiling tiles) will be selected to be low VOC and low formaldehyde.	Adopted	3
EQ113: Construction Indoor Air Quality Management Plan	Promote the well-being of construction workers and building occupants by minimizing indoor air quality problems associated with construction and renovation. During construction, JHG's site management practices will ensure that dust and mould are minimised by storing materials effectively and keeping the site clean. <i>More information provided in Section 5.3 of this plan</i>	Adopted	1

EQ114: Indoor Air Quality Assessment	<p>Establish better quality indoor air in the building after construction and during occupancy.</p> <p>At the completion of construction, HVAC systems will be flushed by running plant for an extended period of time and replacing filters.</p> <p><i>More information provided in Section 5.3 of this plan</i></p>	Adopted	1
EQ115: Thermal Comfort	<p>Promote occupants' productivity, comfort, and well-being by providing quality thermal comfort.</p> <p>As part of Section J assessments, LCI Consultants have modelled the fabric of the building to ensure thermal comfort is well maintained, achieving a PMV of +/- 1.0 for more than 98% of occupied hours.</p>	Adopted	1
EQ117: Interior Lighting	<p>Promote occupants' productivity, comfort, and well-being by providing high-quality lighting.</p> <p>Lighting selections by the Electrical subcontractor have ensured that lighting levels are sufficient for the space task, Colour Render Index is &gt;80, more than 75% are LED fittings with long service life and reflectance of walls and ceilings have been considered for glare control.</p>	Adopted	2
EQ121: Daylight	<p>Connect building occupants with the outdoors, reinforce circadian rhythms, and reduce the use of electrical lighting by introducing daylight into the space.</p> <p>Most enclosed spaces within the stadium will enjoy good levels of daylight in order to view the pitch but not all areas will have daylight so overall floor area ratios are not met for LEED.</p>	Adopted (partial)	0
EQ123: Quality Views	<p>Give building occupants a connection to the natural outdoor environment by providing quality views.</p> <p>Most enclosed spaces within SFSR will enjoy good views of the pitch but not all areas will have views so overall floor area ratios are not met for LEED.</p>	Adopted (partial)	0
EQ124: Acoustic Performance	<p>Provide workspaces and classrooms that promote occupants' well-being, productivity, and communications through effective acoustic design.</p> <p>Acoustic design will meet brief requirements but may not meet all levels prescribed in LEED.</p>	Ongoing	1
<b>Innovation</b>			<b>6</b>
Pilot Credit - Prevention through Design	<p>Support high-performance cost-effective employee safety and health outcomes across the building life-cycle through early attention to safety and health hazards.</p> <p><a href="https://www.usgbc.org/credits/new-construction-core-and-shell-schools-new-construction-retail-new-construction-healthc-219?view=language">https://www.usgbc.org/credits/new-construction-core-and-shell-schools-new-construction-retail-new-construction-healthc-219?view=language</a></p> <p>JHG is committed to ensuring safety is paramount in design solutions. We hold regular safety in design</p>	Ongoing	1

	reviews to design out issues to mitigate risk. The design of the stadium also considers public safety, incorporating a Crime Prevention Through Environmental Design (CPTED) assessment.		
Pilot Credit - Social Equity within the Supply Chain	<p>Promote and further social equity by integrating strategies that address identified social and community issues, needs and disparities among those affected by the project</p> <p><a href="https://www.usgbc.org/credits/new-construction-core-and-shell-schools-new-construction-retail-new-construction-healthc-236">https://www.usgbc.org/credits/new-construction-core-and-shell-schools-new-construction-retail-new-construction-healthc-236</a></p> <p>In response to this pilot credit, JHG is engaging with our supply chain to reduce the occurrence of Modern Slavery. Subcontractors are assessed for their progress in this area as part of the tender and selection process. See section 4.3.2 for more detail.</p>	Ongoing	1
Pilot Credit - Social Equity within the project team	<p>Promote and further social equity by integrating strategies that address identified social and economic needs and disparities among those working on the project</p> <p><a href="https://www.usgbc.org/credits/new-construction-core-and-shell-schools-new-construction-retail-new-construction-healthc-235">https://www.usgbc.org/credits/new-construction-core-and-shell-schools-new-construction-retail-new-construction-healthc-235</a></p> <p>In response to this pilot credit, JHG is delivering Diversity programs that improve skills, employment and mental health of the SFSR workforce. See section 4.3.1 for more details.</p>	Ongoing	1
Innovation - Community Outreach and Involvement	<p>Encourage responsiveness to community needs by involving the people who live or work in the community in project design and planning and in decisions about how it should be improved or how it should change over time.</p> <p><a href="https://www.usgbc.org/credits/new-construction-core-and-shell-schools-new-construction-retail-new-construction-healthc-200?return=/credits/New%20Construction/v4.1">https://www.usgbc.org/credits/new-construction-core-and-shell-schools-new-construction-retail-new-construction-healthc-200?return=/credits/New%20Construction/v4.1</a></p> <p>JHG undertakes multi-layered Stakeholder Engagement activities with the local community including design feedback, cultural and heritage interpretation and ongoing consultation on construction. More details of these activities are outlined in section 4.3.3</p>	Ongoing	1
Exemplary Performance - MR123: Construction and Demolition Waste Management	<p>Reduction Of Total Waste Material.</p> <p>Do not generate more than 2.5 pounds of construction waste per square foot (12.2 kilograms of waste per square meter) of the building's built area.</p>	Ongoing	1
LEED Accredited Professional	Encourage the team integration required by a LEED project and to streamline the application and certification process.	Adopted	1



James von Dinklage and Richard Lee of LCI Consultants are accredited LEED professionals.			
<b>Regional Priority – Bonus points for Australian Project</b>			
RP Credit 1.1: Regional Priority - Renewable Energy Production	Given the abundance of renewable energy opportunity and coal fired power as a default baseline, Australian projects are awarded extra points where minimum renewable energy generation thresholds are met – see credit EA123	Ongoing	0
RP Credit 1.2: Regional Priority - Green Power and Carbon Offset	Given the abundance of renewable energy opportunity and coal fired power as a default, Australian projects are awarded extra points where US offsets (similar to Green Power) are procured – see credit EA128	Ongoing	0
RP Credit 1.5: Regional Priority - Outdoor water use reduction	Given Australia's unique climatic conditions and history of drought, minimising water use has a regional priority that awards an extra point where WE101 is targeted and achieved	Adopted	1
RP Credit 1.6: Regional Priority - Indoor water use reduction	Given Australia's unique climatic conditions and history of drought, minimising water use has a regional priority that awards an extra point where WE102 is targeted and achieved	Adopted	1

**These features are generally consistent with the Environmentally Sustainable Design Strategy developed by LCI Consultants and issued 01/05/2019;**

Key requirements from the previous ESDS and their current status on compliance are summarised in the following table;

Requirement	Detail	Status of compliance
Conditions of Consent	<p>Achievement of the principles of sustainable development</p> <p>Address Environmentally Sustainable Design Strategy by Aurecon, 2018.</p> <p>Undertake Life Cycle Assessment.</p> <p>Comply with Greenhouse gas, energy and carbon targets identified in Sustainable Sydney 2030.</p> <p>Achieve Gold Leadership in Energy and Environmental Design (LEED) rating using existing stadium as the reference building.</p> <p>Implement water sensitive urban design and energy conservation including</p> <ul style="list-style-type: none"> <li>- Rainwater harvesting and reuse</li> <li>- Water Efficient fixtures</li> <li>- Install Rooftop Solar PV</li> <li>- Storage of surplus energy generated by rooftop PV</li> </ul>	<p>All compliant except;</p> <p>Existing Stadium cannot be used as reference for NCC Section J or LEED.</p> <p>Storage of Surplus energy from rooftop PV is not cost-effective.</p>

	<ul style="list-style-type: none"> <li>- Use of electric vehicles for on-site tasks</li> <li>- Energy efficient electrical equipment, fittings and fixtures.</li> </ul>	
NSW Government Resources Efficiency Policy (GREP)	<p>Undertake energy efficiency projects</p> <p>Minimum standards for new electrical appliances and equipment</p> <p>10% lower energy demand than NCC minimum</p> <p>Minimum fuel efficiency for new light vehicles</p> <p>Purchase minimum 5% Green Power</p> <p>Report on Water use</p> <p>Achieve specified levels of water efficiency for showerheads, taps and toilets</p> <p>Report on Waste generation</p> <p>All surface coatings to comply with Australian Paint Approval Scheme (APAS)</p>	<p>All compliant</p> <p>~16% lower than LEED reference</p> <p>Similar for NCC Section J compliance; ~6-7% reduction via fabric improvement and solar PV</p> <p>Includes operational requirements that Operator must continue to meet.</p>
Sustainable Sydney 2030 Goals	<p>70% reduction in greenhouse gas emissions by 2030 and achieve a net zero emissions city by 2050.</p> <p>50% of electricity demand met by renewable sources; zero increase in potable water use from 2006 baseline, achieved through water efficiency and recycled water;</p> <p>Total canopy cover increased by 50% from 2008 baseline</p> <p>At least 10% of total trips made in the city are by bicycle and 50% by pedestrian movement</p> <p>Provision of pathways to interconnect with surrounding pedestrian and cyclist networks. Cycling to and from the SFSR is encouraged through cyclist parking and end-of-trip facilities for staff.</p>	<p>Targets generally not met.</p> <p>Integration with nearby public transport is achievable.</p>

### 3.3 ESD Innovation

Section F2.5.3(a) of the SFSR Project Brief identifies some potential areas of innovation to be investigated. As the design phase continues some of these initiatives are still under investigation.

Innovation	Findings	Status
<b>Energy storage connected to the PV arrays such as battery</b>	<p>Behind-the-Meter Embedded Generation opportunity presented by Plenary Group to INSW in June 2020, incorporating;</p> <ul style="list-style-type: none"> <li>- ~850kW of Car Park shading mounted solar PV</li> <li>- ~30MWh Battery Storage</li> <li>- Green Power sourced from Wind or other renewable energy sources</li> </ul> <p>Offer to operator was not commercially acceptable and was</p>	On-Hold
<b>Thermal Storage</b>	<p>Preliminary Lifecycle Costing estimates by Mechanical Subcontractor do not justify investment in chilled water storage. The introduction of the Stadium Fitness Facilities and Mezzanine fitouts may warrant some low-load storage.</p> <p>Localised Hot Water Storage Systems are being investigated to minimise distribution losses. These systems are storage type rather than instantaneous to limit peak demand capacity and charges.</p>	Ongoing
<b>Mixed mode for Suites and other Premium Product Areas;</b>	The HVAC system uses zoning to minimise energy consumption when spaces are unoccupied or when the doors are open to the suite balconies and viewing areas.	Ongoing
<b>Treatment of greywater for reuse</b>	Rather than provide systems that require ongoing maintenance and energy consumption, rainwater capture has been maximised from the large lightweight stadium roof and stored in membrane-lined tanks created by the voids between core structural walls/derricks.	Dismissed
<b>Use of bore water for Pitch growth;</b>	Bore Water is available from 2 bores maintained by the SCG staff. A dedicated 120kL tank will receive Bore Water at up to 1.5L/s for irrigating the pitch.	Adopted
<b>Commit to avoid all “red list” building materials;</b>	Material used in this type of building are typically required to be more durable and resilient than in a commercial or residential building and therefore more natural alternatives are harder to find. Low VOC finishes and low formaldehyde joinery have been proposed.	Dismissed

<b>Local Material Procurement</b>	John Holland is engaging with local subcontractors to maximise local workforce and procurement of local materials. This is contained in the Project Management Plan (SFS-JHG-00-PLN-PM010000[1]) and the status of procurement is reported monthly to the client.	Ongoing
<b>Renewable material procurement</b>	John Holland is engaging with suppliers of concrete and steel to maximise recycled content in materials. Other examples include recycled plastics in asphalt and recycled plastic reinforcement in concrete during construction (e-mesh). These initiatives are quantified in the Lifecycle Analysis (LCA) report	Ongoing
<b>Advanced stormwater management using raingardens and tree pits</b>	The stormwater drainage system has undergone significant design optimisation and the landscaping design will incorporate water sensitive urban design (WSUD) elements such as tree pits.	Adopted
<b>Advanced digital management</b>	The building is being documented in BIM software that will incorporate related information beyond spatial characteristics such as programming and maintenance.	Adopted
<b>Visual displays of energy and water use; and</b>	The Environmental Monitoring System (EMS) will monitor all energy and water meters provided and be able to output this information to the digital screen content management system (if required by the operator)	Ongoing
<b>Provision of community infrastructure</b>	The new stadium will remove fencing that closes off pedestrian access to the current site. This will provide an open space around the site and create a communal setting that connects the community with the site.	Adopted

Other innovative design features and delivery initiatives are under consideration and will be added to the plan as adopted or dismissed. The Whole of Life Assessment report will also describe initiatives that have either been adopted into the design or dismissed on commercial grounds (i.e. no payback)

### 3.4 Whole of Life Assessment /Life Cycle Costing

Project Brief section B2 (a) (iv) lists a design objective to *promote environmental sustainability and embrace a Whole of Life (WOL) approach to operations and maintenance*. Additionally, Project Brief Section C10.1 states that a Lifecycle Costing Design report must be produced that describes *“consideration of utilising natural daylight, ventilation, rainwater and the like to minimise consumption”*

An LCC/Whole of Life Design Report will be compiled by LCI at the conclusion of the design phase to demonstrate that Whole of Life considerations have been made in developing the design. Some items that have been considered include;

- Air Cooled HVAC plant rather than Water Cooled HVAC plant to reduced material usage and water consumption without significant energy impact.
- Potential for chilled water storage.
- Horizontal kitchen exhaust discharge and combined dishwasher exhaust to reduce ductwork, simplify maintenance and reduce energy consumption.
- Deletion of air conditioning to open food kiosks in the concourse to reduce wasted energy and maintenance.
- Localised rather than centralised domestic hot water to minimise pipework and operational losses
- Rainwater capture rather than extensive borewater reuse to minimise ongoing energy and maintenance demand of treatment plant.
- Solar PV sizing and location to minimise payback.
- Addressable lighting controls with motion detection and LED lighting throughout to minimise energy in operation.
- Consideration of resilient finishes to floors, walls and ceilings.

***These initiatives have been developed through the detailed design phase and are consistent with the targets in the Environmentally Sustainable Design Strategy (ESDS) issued 01/05/2019.***

### 3.5 Solar PV

One of the key sustainability requirements for the project beyond the LEED Gold Rating was to locate up to 350kW of Solar PV panels on the roof to generate renewable energy onsite.

However, during the design development process it became apparent that the lightweight roof form cannot support nearly 3000m<sup>2</sup> of PV panels without significant additional structural steel and in a way that allows regular safe access to the panels for cleaning and maintenance.

Instead, around 150kW of solar PV panels are proposed across the maximum extent of roofs above the Level 5 plantrooms on the East and West grandstands. These locations are not visible from the ground (as per SSDA B7 requirement), have safe and easy access and are in close proximity to the electrical switchboards. An additional 30kW solar array will be incorporated for the Stadium Fitness Facilities.

These changes were approved in Modification No. 4 to the development consent.



It is expected that the Solar PV will generate around 180-200MWh of electricity per year which is around 4-5% of annual energy consumption. This is sufficient to achieve 1-2 points of the 6 points targeted in the EA903 Optimize Energy Performance credit and 1 point in the LEED EA123 Renewable Energy Production credit. ***This is consistent with the ESDS previously submitted and still allows a LEED Gold Rating to be achieved.***

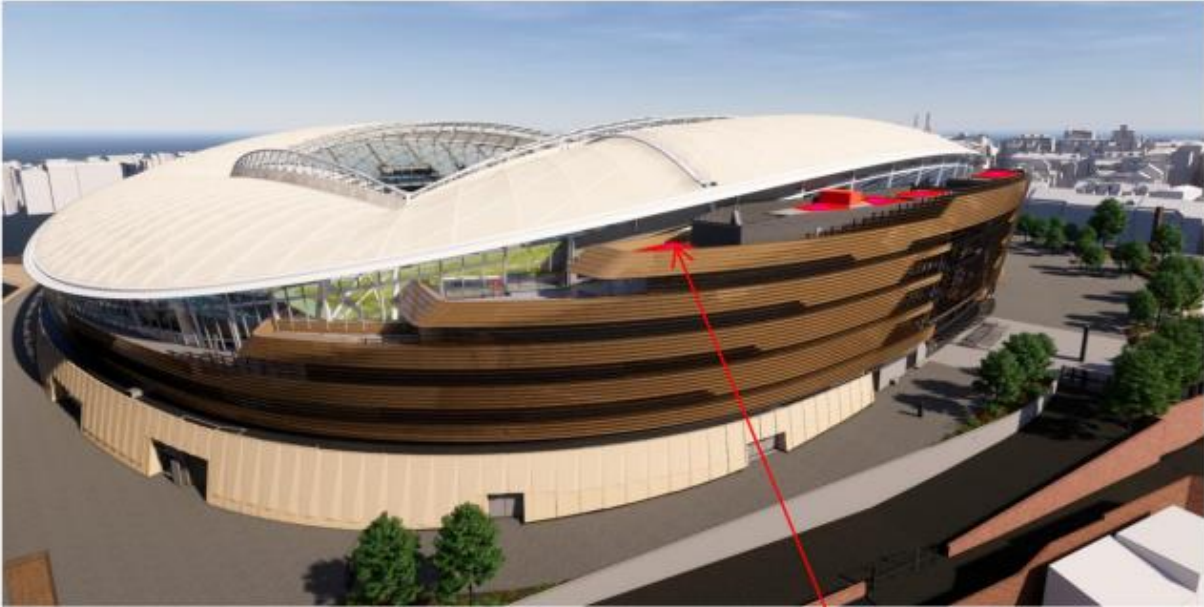


Figure 1 100% Proposed Design: South East L05 lift over run impact

Proposed location of PV

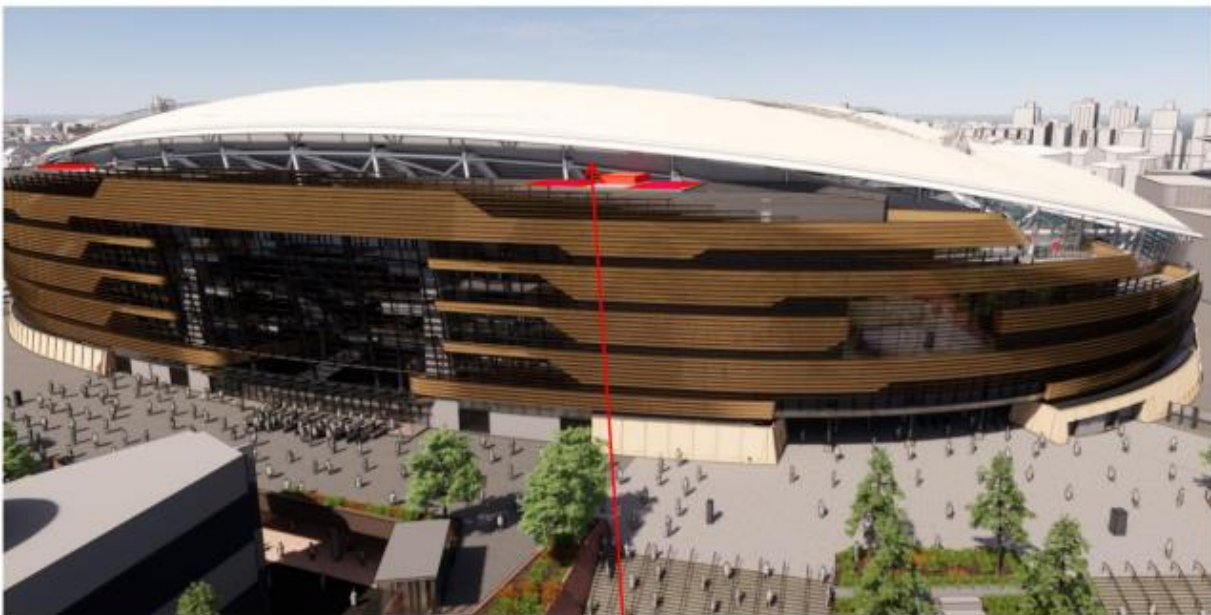


Figure 2 100% Proposed Design: South West L05 lift over run impact

Proposed location of PV



### 3.6 Life Cycle Assessment (LCA)

In addition to assessing energy, water and maintenance costs for the Whole of Life/LCC report, the quantity of materials used in the project and the overall energy and water use has been assessed using the EN15978 *Sustainability of construction works. Assessment of environmental performance of buildings* framework.

Edge Environment were engaged to undertake an LCA study which was presented to the design team in preliminary form in April 2020 to inform the design process and identify areas for improvement. LEED points are achieved where a design shows at least a 10% reduction in lifecycle impact across three out of six metrics.

**Table 1 | LEED MR108 requirements, Option 4, Whole-Building Life-Cycle Assessment**

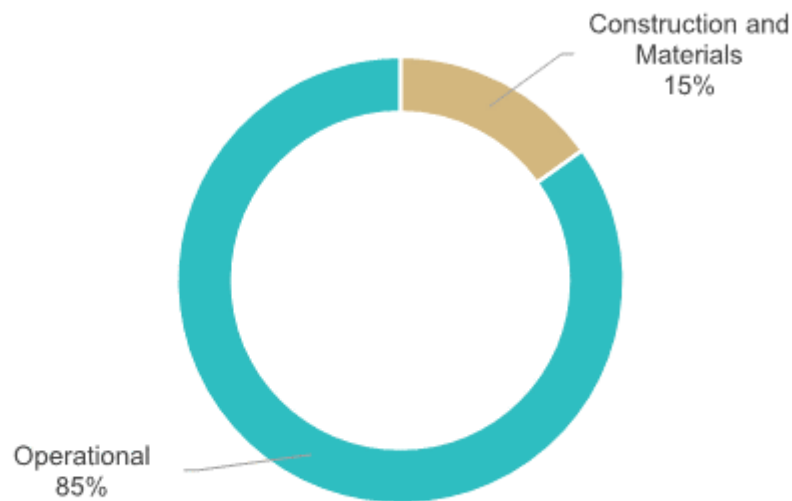
Option	Requirement
<b>Option 4</b>	For new construction (buildings or portions of buildings), conduct a life-cycle assessment of the project's structure and enclosure that demonstrates a minimum of 10% reduction, compared with a baseline building, in at least three of the six impact categories listed below, one of which must be climate change potential. No impact category assessed as part of the life-cycle assessment may increase by more than 5% compared with the baseline building.
<b>Exemplary performance</b>	Achieve any improvement over the required credit thresholds (10%) in all six impact measures.

Three scenarios were tested with varying proportions of cement replacement with supplementary cementitious materials (SCM).

**Table 1 | Design Scenario Descriptions**

	Recycled Scenario 1 (RS 1) Steel SCM to Piles only	Recycled Scenario 2 (RS 2) Steel SCM to Piles only	Recycled Scenario 3 (RS 3) Steel No SCM
<b>Material Considerations</b>	0% SCM to all elements but piles 30% SCM replacement to concrete structures 40% SCM replacement to only piles 75% Recycled Reinforcement Steel (RS)	0% SCM to all elements but piles 40% SCM replacement to only piles 75% Recycled Reinforcement Steel (RS)	0% SCM to all concrete elements 75% Recycled Reinforcement Steel (RS)

SFSR project will substitute at least 30% of Portland cement with SCM as an average across all mixes and procure reinforcement steel from a supplier with evidence of a high recycled content and/or low energy use in manufacture.



**Figure 1** | Ratio of Project's Climate Change impacts between Operational and Construction Phases

The donut chart above shows that construction materials are not the key driver in the LCA study and that operational energy reduction is more impactful. The interim study by Edge Environment took LCI's initial energy consumption estimates and used these in the study as "current design" for Operational Performance. A "Worst Case" set of operational performance criteria was also tested to observe results if the energy consumption were to increase through the design phase to around 5% higher.

**Table 5** | LCA Results with Recycled Steel included as a consideration

Environmental Indicator	WCO M 1	WCO M 2	WCO M 3	CDO M 1	CDO M 2	CDO M 3	RS 1	RS 2	RS 3
Material Option	High SCM	Moderate SCM	No SCM	High SCM	Moderate SCM	No SCM	High SCM & RS	Moderate SCM & RS	No SCM & RS
Operational Performance	Worst case	Worst case	Worst case	Current design	Current design	Current design	Worst case	Worst case	Worst case
Climate Change Potential	13%	13%	12%	17%	17%	16%	14%	13%	13%
Ozone Depletion Potential	13%	13%	12%	15%	15%	14%	15%	14%	13%
Acidification Potential	10%	9%	8%	12%	12%	11%	11%	10%	9%
Eutrophication Potential	13%	13%	12%	17%	17%	16%	14%	13%	13%
Ozone Creation Potential	12%	12%	11%	13%	13%	12%	18%	18%	18%
Abiotic Depletion Potential	13%	13%	12%	17%	17%	16%	14%	13%	13%
LEED Credit Points	Pass			Exemplary			Exemplary	Pass	

In all instances the design will achieve the targeted points under LEED. In some instances an additional point may be available for making 'Exemplary' reductions of more than 10% in all metrics.

A final version of the LCA study will be provided at the end of the project for the LEED submission including, if necessary, the reconciling of any significant variances in material use during construction or changes in operational energy/water estimates.

The LCA Study also addresses a number of materials initiatives identified in the ***Environmentally Sustainable Design Strategy (ESDS) issued 01/05/2019***

<i>ESDS Initiative</i>	<i>Status</i>
Specifying concrete mixes to achieve a 40% cement replacement using supplementary cementitious materials such as fly ash and ground granulated blast furnace slag.	Concrete piles include 40% SCM replacement, other concrete includes 30% SCM
Using geopolymer concrete in non-structural building elements such as hard landscaping benches, stormwater pits and pipes, wheel stops and stairways.	Geopolymer concrete is not currently available in NSW but suppliers are located in Victoria and Queensland. Precast elements (such as wheelstops) may be available.
Reducing reinforcement requirements by 5%, using high strength steel to reduce lap lengths, ligatures and overall reinforcing requirements.	This supply option is being investigated
Designing to achieve a 5% reduction in structural steel requirements through structural design efficiencies	The roof design includes structural steel and has been refined for efficiency.
Reduce aluminium content in external louvres and shading devices by dematerialisation or substitution. A 20% reduction in aluminium requirements for construction of the shading elements in the stadium facade was modelled.	This is being investigated.

### 3.7 LEED Submission Process

John Holland's Design Managers and Project Managers will seek relevant documentation from the Design Consultants and Sub-contractors during the different stages of the design and delivery process. LCI will collect and compile for submission all necessary information as outlined in the LEED Specification (SFS-LCI-00-SP-ES70XX01) and as required to achieve a LEED v4 Gold Rating.

Subcontractors must prepare and submit documentation required for the ESD Consultant in presentable and appropriately formatted manner as required for the submission. The formatting of the submission will be in accordance with the requirements stated by the U.S Green Building Council (USGBC). Some of the requirements to be provided by the sub-contractor are listed below:

- Sub-contractors shall refer to the latest version of the LEED v4 BD+C guidelines

- All supporting LEED related documents (copy of receipts, letters, reports, drawings etc) shall be ordered according to the relevant LEED Credit category and filled in the above-mentioned folder(s) in the relevant section.
- All letters and memo must be formally signed and dated letters on company letterhead nominating this specific project.
- All supporting documents shall clearly highlight requested information.



## 4 Sustainability in Delivery

### 4.1 Introduction

SFSR JHG Sustainability and Environment Manager will be responsible for the tracking of sustainability initiatives during delivery in accordance with the CEMP. This includes the collection of information related to materials used, waste generated and energy/water consumed in delivery.

LCI will take this information and combine with design documentation and reports to compile the submission for LEED. LCI will identify data gaps and co-ordinate with JHG to obtain information prior to the release of subcontractors.

JHG will also be responsible for Social Sustainability initiatives and collate reporting where available and provide to LCI for the LEED submission.

### 4.2 Environmental Management Plans

Environmental Management Plans have been generated for the SFSR project in line with JHG's AS/NZS14001 accredited systems. The plans demonstrate pathways for compliance with DA consent conditions and requirements and will also be used as evidence for some LEED credits.

As part of delivering these plans, the JHG delivery team will also collate information regarding material usage (i.e. concrete, steel, timber docket) and material data for Low Emitting products like low VOC paints and low formaldehyde joinery.

Plan	Purpose	LEED Credits
<b>Construction Environmental Management Plan</b> SFS-JHG-00-PLN-PM060000	Enables the Project to manage its environmental responsibilities in a systematic manner and contribute to the environmental pillar of sustainability. This CEMP is applicable to the Project and applies to the environmental aspects of the Project's activities, products and services that the Project determines it can either control or influence considering a lifecycle perspective.	SS101
<b>Construction Noise and Vibration Management Sub Plan</b> SFS-JHG-00-PLN-PM060001	outlines the relevant assessment criteria, assessment of impacts and the management techniques that should be used to manage noise and vibration impacts from the Stage 2 works, of which the most significant noise and vibration generating activities are the stadium bowl construction and infrastructure works.	SS101
<b>Construction Waste Management Sub Plan</b> SFS-JHG-00-PLN-PM060002	Prevent environmental impacts from waste generated during all phases of the Project. - Correctly manage and dispose of waste through identification of waste types and ensuring appropriate segregation, storage and disposal - Create better waste outcomes through minimising waste and maximising re-use and recycling opportunities.	MR103, MR123

	- Ensure a clean and tidy workplace that minimises environmental, quality and safety risks.	
<b>Construction Soil and Water Management Sub Plan</b> SFS-JHG-00-PLN-PM060003	<ul style="list-style-type: none"> <li>- Ensure best management practice controls and procedures are implemented during the construction activities to avoid or minimise the risk of increased erosion and/or sediment deposition on the surrounding environment and prevent surface and groundwater degradation;</li> <li>- Detail measures to manage construction activities during wet-weather events;</li> <li>- Ensure that work activities are managed so as not to cause a flood risk;</li> <li>- Ensure that Water Quality Objectives (WQOs) are met throughout all construction activities;</li> <li>- Ensure compliance with all legislative water quality requirements; and</li> <li>- Through implementation of the above, reduce the impact of construction activities on the environment.</li> </ul>	SS101
<b>Construction Air Quality Management Sub Plan</b> SFS-JHG-00-PLN-PM060004	<p>Ensure best management practice controls and procedures are implemented during the construction activities to avoid or minimise the risk of air quality and odour impacts.</p> <ul style="list-style-type: none"> <li>- Minimise dust generation and any other potential air quality impacts as a result of construction activities.</li> <li>- Implement proactive measures to mitigate impacts at the source, path and receiver to minimise complaints from and potential impacts to sensitive receivers.</li> <li>- Manage potential air quality issues so they are identified and controlled to meet legislative requirements.</li> </ul>	SS101

## 4.3 Social Sustainability

Section F2.5.2 of the Project Brief suggests three social sustainability initiatives that should be considered by the SFSR team.

- (i) promotion of diversity within the Stadium;
- (ii) modern slavery within the supply chain; and
- (iii) community engagement.

JHG's Sustainability and Environment Manager will be responsible for establishing controls and tracking compliance to ensure these initiatives are achieved during delivery. Each of these items is recognised as a Pilot Credit or Innovation in the LEED rating system. Other initiatives could also be pursued if more relevant.

### 4.3.1 Promotion of Diversity

JHG is committed to improving diversity across the business in the areas of gender, age and skills. Our commitment to workforce development and training includes the following outcomes;

- a) Ensuring our workforce and our subcontractors' workers are paid in line with the relevant industry award levels in accordance with the Workplace Relations Management Plan (SFS-JHG-PLN-WRMP-001)
- b) Employing Apprentices to learn on the project, either directly or through our subcontractors.

In line with the NSW Infrastructure Skills Legacy Program (ISLP) there is a strong focus on apprenticeships, with a target of 20% of all trades positions on the project to be made up of apprentices. Monitoring and reporting is in the form of monthly reports received from the subcontractors and reconciled against John Holland's access control system (eify) data.

In addition, John Holland is piloting a Future Construction Leaders program at SFS – an apprentice development program modelled off our successful graduate engineer program, which aims to improve upon national apprenticeship completion rates and develop a pipeline of future construction leaders experienced in all aspects of site-based operations. John Holland will directly employ up to 4 carpentry apprentices for SFS.

This will be complemented through the delivery of a range of nationally accredited training courses in collaboration with NSW Training Services, to support workers to address skills gaps, fulfil project scope, retain employment, and strengthen employment pathways and career development opportunities into the future. This aligns with the ISLP's efforts to address current and emerging skills shortages to ensure NSW has a skilled workforce that is highly trained to meet the forecasted infrastructure demands of the future.

- c) Making life-skills training available on site, for instance English and/or Numerical Literacy.

The SFS preparation-for-work (PFW) program is a collaborative model providing accredited entry level technical skills and employability training for up to 15 unemployed Aboriginal and Torres Strait Islander people. The program is designed to prepare job ready candidates for entry-level opportunities on the project. The program is being developed in consultation with potential employers and delivered in line with specific job roles and existing vacancies with SFS contract partners.

Caring in Construction is an industry best practice suicide prevention and mental wellbeing program at SFS which gives workers access to relevant, appropriate and practical information that promotes mental health and wellbeing, while creating a safe and non-

judgemental environment to talk about these issues in the workplace. Quarterly events are focused on prevention and early intervention of mental health issues; aligned to national health initiatives and delivered in collaboration with local service providers. Topics covered include suicide prevention, lifestyle choices, self-care, mental health for under 25s, healthy relationships etc. A report highlighting program outcomes and learnings will be issued to the John Holland building, safety working group on completion of the project.

The LEED Credit that most closely aligns with this intent is the Pilot Credit IPpc90 *Social Equity Within the Project Team*. The Sustainability and Environment Manager will engage with subcontractors to obtain assurances that workers are being paid appropriately and that training is being provided to the workforce.

Reporting will be reported month to the client via the monthly report.

#### 4.3.2 Modern Slavery in the supply chain

The procurement of construction goods and services is complicated and in many instances involves contracting from overseas where standards of employment can be very different to Australia.

JHG is committed to eradicating modern slavery from our supply chain by engaging early in the tender process with subcontractors and suppliers to understand their exposure to modern slavery risk and how it can be mitigated.

The SFSR delivery team will establish and distribute supplier assessments/scorecards to at least 10 different 'Tier 1 suppliers' covering a significant proportion of project spend. The assessments must be signed by the CEO/CFO of the tenderer and returned to the JHG. The assessment must cover the following areas;

- No child / forced / bonded labor
- Health and safety procedures and training
- Right of freedom of association
- Non-discrimination
- Discipline / harassment and grievance procedures
- Fair working hours and compensation
- Anti-corruption and bribery

This approach is outlined in LEED Pilot Credit IPPC91 "*Social equity within the supply chain*"

#### 4.3.3 Community Engagement

In this initiative, the local community is approached for input to, and feedback about, the proposed design of the development.

Public exhibition occurred in accordance with the requirements of the Environmental Planning and Assessment Act, 1979 (EP&A Act). In total, 84 submissions were received in response to the public exhibition of the EIS. These included submissions made by State and local Government agencies and authorities, organisations, and from the general public. Infrastructure NSW considered all issues raised in the submissions and prepared a detailed response.

These design changes include:

- changes to the roof including rationalising the materials and structure,
- changes to the facade including integrating the louvred screens into the facade system, changing the base of the stadium to textured and coloured precast concrete in the style of sandstone, and changing the colour of the louvres to a bronze metallic finish;
- internal changes to the stadium including removing landscaping within the inaccessible terraces on Level 2, 3, and 4 and repurposing the accessible terraces on Level 5 for building plant; and
- changes to the public domain including changes to the geometry and location of planting (while retaining in excess of the 1.5:1 ratio of trees replaced to lost), changes to the entry stairs off Driver Avenue and Moore Park Road to accommodate pedestrian flows, rationalising access from the MP1 carpark, providing an entry ramp in the south eastern corner of the site, and changes to the interface with Fox Studios including new planting and the reinstatement of their vehicle entry ramp.

Ongoing consultation during the construction phase would be in accordance with the Community Communication Strategy prepared by Infrastructure NSW which includes the following:

- Continued engagement with the Community Consultative Committee which was established to provide a forum for open discussion between representatives of the project, the community and other stakeholders on issues directly relating to operations, environmental performance and community relations, and to keep the community informed on these matters.
- Continued agency consultation and engagement to address technical and environmental issues
- A Community Forum will be scheduled at the commencement of each stage of construction.
- Good neighbour activities such as door-knocks, letterbox drops, local visual messaging signage and site signage will be used to provide specific project information to project neighbours and others who may be impacted by site works as they travel through the area.
- Consultation with the local aboriginal groups to explore options for Cultural Heritage Interpretation

In LEED, this activity is covered under the Pilot Credit Innovation: “*Community outreach and involvement*”

The JHG Communications, Stakeholder and External Authorities Manager will collate evidence of engagement with the local community and make this available to LCI for inclusion in the final LEED submission.

## 5 Sustainability in Commissioning and Handover

### 5.1 Introduction

An independent commissioning agent (ICA) has been engaged to champion the commissioning process and ensure a smooth transition from delivery into operation so that the building will operate efficiently as intended. The ICA must work with the trade subcontractors and plan out how to commission all systems with sufficient time and as simply as possible.

LCI Consultants will collate information provided for the LEED submission

### 5.2 Commissioning Management

The Commissioning Plan has not yet been produced but will cover mechanical and electrical systems and assemblies in accordance with ASHRAE Guideline 0–2005 and ASHRAE Guideline 1.1–2007 for HVAC&R systems, as they relate to energy, water, indoor environmental quality, and durability. A monitoring process will be developed to track performance during the first 10 months of operation and inform tuning activities.

For additional LEED outcomes, commissioning activities may also extend to the building façade with potential for physical testing, subject to complexity and duration.

The ICA will be responsible for planning the commissioning management and championing it during delivery, in close collaboration with the JHG Services Project Manager.

### 5.3 Indoor Air Quality Management and Assessment

LEED Credit EQ113 requires a Construction Indoor Air Quality Management Plan to be produced that includes guidance from Sheet Metal and Air Conditioning National Contractors Association (SMACNA) IAQ Guidelines for Occupied Buildings under Construction, 2nd edition, 2007.

The Construction IAQ Plan (SFS-JHG-00-PLN-PM060010) covers key actions needed to protect equipment from dust and mould.

- Source Control - ensuring that all trades across the Project utilise low VOC products
- Storage of materials with high levels of absorption. Gyproc, timber, ceiling tiles etc
- Cover or seal Odorous products
- No smoking
- Dust minimisation during construction.
- Regular Cleaning of the site
- General Housekeeping

At the completion of the project and prior to occupants taking possession, the HVAC plant will need to be run for an extended period to ‘flush’ out dust and dirt that may have gotten into the system during construction (LEED EQ114). BMS logs are required to show uninterrupted operation and that the flush has occurred.

### 5.4 Monitoring and Verification

The BMCS/EMS provided will allow electrical and water meters to be monitored remotely. LCI will generate indicative targets through the energy modelling process that can be populated into the software as trends/targets to be tracked.



## **Annexure A – Sustainability Policy**

# Policy

JOHN  
HOLLAND

## Sustainability Policy

### Our commitment

John Holland is committed to integrating economic growth, environmental resilience, and social progress as priorities into decision-making at every level of the business, with the ambition to create long-term value.

### Our approach

John Holland will undertake its business in a manner that maximises positive social and economic impact for our people and stakeholders. We are adopting a resilient and enduring strategic approach to meet and mitigate the existing and emerging challenges for society and our infrastructure environment. John Holland acknowledges that sustainability enables long term financial resilience.

### Sustainability Policy in practice

- Create a sense of place for communities, by making a positive and meaningful difference to the community by genuinely engaging with the community and stakeholders
- Work closely with our customers to achieve optimal and resilient outcomes for users and society
- Decision making to integrate economic, social, environmental and governance aspects, and seek to achieve positive outcomes in each
- Minimise whole of life asset impact by future proofing our assets and responding to climate change
- Address environment considerations in a manner that is sensitive to the needs of our stakeholders and the environment, creating enhanced environmental outcomes wherever practical
- Be recognised as an industry leader in making our workplaces safer through innovation, collaboration and effective planning and management of risks
- Enhance workforce health and wellbeing and inclusion and diversity, through employee empowerment to deliver sustainable outcomes
- Source sustainably and ethically, including prioritising local industry participation, social procurement initiatives and a commitment to avoiding modern slavery
- Encourage innovation amongst our delivery teams and supply chain to achieve sustainable outcomes
- Manage all activities ethically, measuring and reporting the sustainability performance of the project
- Govern for sustainability by implementing project systems and processes to ensure the effective and efficient delivery and operation of the project
- Support the UN Sustainable Development Goals



Joe Barr  
Chief Executive Officer  
John Holland Group Pty Ltd  
February 2019

Caring  
Empowering  
Imaginative  
Future-focused

## **Annexure B – DPIE Comments**

<b>Project</b>	Redevelopment of Sydney Football Stadium – Stage 2 (SSD 9835)		
<b>Document</b>	John Holland Sustainability Management Plan (SMP)		
<b>Date received from Infrastructure NSW</b>	26 August 2020		
<b>Date comments sent to Infrastructure NSW</b>	30 September 2020		

Comment No.	Condition	DPIE comments	SMP Document reference	JHG Response
1.	<p><b>B20</b> Prior to the commencement of construction of the stadium structure above the concourse level, the Applicant must:</p> <p><b>(a)</b> prepare a revised ESD report and associated design plans in consultation with the Planning Secretary including:</p> <p>(i) details of the proposed ESD measures that would be incorporated into the final design and how these would achieve the targeted Leadership in Energy and Environmental Design (LEED) v4 Gold Certificate;</p>	<p>The SMP contains details of the proposed ESD measures. Section 3.2 provides a framework for compliance pathway for LEED. The Plan aims to achieving a Gold level requiring at least 60 points across the LEED BD+C v4 categories.</p> <p>The condition requires the Applicant to prepare the Plan and associated design plans in consultation with the Planning Secretary. The Applicant failed to consult before preparing the revised plan. However, the Department is satisfied with the presentation given by the Sustainability Consultant (LCI) on 21/09/2020 illustrating the sustainability framework and the process to be followed to achieve LEED Gold Certification.</p> <p>The Department notes that LCI (Consultant) has been engaged to provide sustainability design advice and co-ordinate the LEED pathway for design consultants and trade subcontractors. At the conclusion of the construction phase, LCI will take information collated by the JHG delivery team and submit to the USGBC for assessment for a LEED rating. As the design phase continues, some of ESD initiatives are still under investigation.</p> <p><b>DPIE comment: Please finalise any pending, or under consideration, ESD measures before revising the plan.</b></p> <p>It is unclear how the points will be awarded for different credits with the corresponding design response (adopted</p>	<p>John Holland Sustainability Management Plan, Rev 01, dated 25 August 2020</p> <p>Refer to section 3.2</p>	<p>Column has been added to table to show where points sit.</p> <p>Design refinements and finalisation of evidence is continuing so it is not possible to finalise points under consideration or pending at this stage. The key action is that more than the minimum 60 points are being targeted and while specific points may change over time the LEED v4 Gold target will be achieved.</p>

		or partially adopted) demonstrating that at least 60 or more points to be achieved for the LEED certificate.		
		<b>DPIE comment: Please add a column in the table under section 3.2 to show sub-points for the selected Credits to demonstrate compliance with LEED, v4, Gold Certification requirements.</b>		
2.	(ii) details to demonstrate that the chosen ESD measures are consistent with the those identified in the Environmentally Sustainable Design Strategy prepared by LCI dated 01/05/2019;	<p>The chosen ESD measures appear consistent with the ones identified in the Environmentally Sustainable Design Strategy (ESDS), Rev 2 dated May 2019. However, the Applicant needs to confirm if any departures are made from the ESDS, and whether such departures will have any implications in achieving compliance and/or Gold LEED certification.</p> <p><b>DPIE comment: Please confirm any departures from the ESDS and whether such will have any implications in achieving compliance and/or Gold LEED certification.</b></p>	Refer to sections 3.2 and 3.3	There are no departures that will impact significantly on achieving compliance or LEED Gold certification.
3.	(iii) details to demonstrate that a 350kW Photovoltaic system will be installed on the roof of the stadium and any provisions for storage of the energy from the solar panels to offset the night time / peak usage;	<p>The Plan states that installing 350kW of PV will result in additional steel structures. The Plan also states that using 150kW of PV panels can achieve 1-2 points in the Optimize Energy Performance LEED credit. This is inconsistent with the ESDS that recommended at least 3 points.</p> <p>A Table under section 3.3 – ESD Innovation notes that Energy storage connected to the PV arrays such as battery is on-hold to reach an agreement.</p> <p><b>DPIE comment: The justification provided for 150 kW and energy storage is unsatisfactory.</b></p>	Refer to sections 3.3 and 3.5	The design in its current form cannot accommodate more than 150kW of onsite PV. Any impact on the LEED rating is being managed and a Gold level will be achieved.
4.	(iv) a detailed Whole-of-Life Assessment to identify opportunities to reduce the carbon	<p>Section 3.4 describes whole of Life Assessment / Life Cycle Costing.</p> <p>The Plan states that an LCC/Whole of Life Design Report will be compiled by LCI at the conclusion of the design</p>	Refer to sections 3.2, 3.4 and 3.6	The items for analysis and reporting in the Whole of Life Assessment are consistent with the recommendations made in ESDS.

	emissions across the life of the project including the materiality recommendations in accordance with Appendix B of the Environmentally Sustainable Design Strategy prepared by LCI dated 01/05/2019;	phase to demonstrate that Whole of Life considerations have been made in developing the design.  <b>DPIE comment: Please confirm that the opportunities identified to reduce carbon emissions including materiality recommendations are consistent with the recommendations made in the ESDS.</b>		
5.	(v) a Life Cycle Analysis that shows how climate, energy and water risks and opportunities have been identified and how the design of the stadium has incorporated these opportunities and / or mitigated risks;	The Plan identifies main risks through project Life Cycle and assesses the design result on different environmental risks.  <b>No comment.</b>	3.6	
6.	(vi) details of opportunities to use alternatives to standard concrete mixes that reduce carbon emissions associated with Portland cement, including opportunities for replacement of Portland cement with Geopolymer concrete for roadways and paths, or where the	Section 3.0 of Appendix B of the ESDS describes the following Materiality Recommendations in the Life Cycle Assessment – Design Stage Guidance:  1. Specifying concrete mixes to achieve a 40% cement replacement using supplementary cementitious materials such as fly ash and ground granulated blast furnace slag.  2. Using geopolymer concrete in non-structural building elements such as hard landscaping benches, stormwater pits and pipes, wheel stops and stairways.	Refer to section 3.6	The design will include features consistent with those identified with the exception of Geopolymer concrete which is not yet commercially available in the Sydney concrete supply market.  The LEED Gold Certification requires LCA analysis that shows >10% improvement across environmental footprint categories that has been achieved with the current design. Therefore, the initiatives identified do not materially impact the LEED rating but will be targeted.



	Portland cement content in concrete used is reduced by replacing it with supplementary cementitious materials;	<p>3. Reducing reinforcement requirements by 5%, using high strength steel to reduce lap lengths, ligatures and overall reinforcing requirements.</p> <p>4. Designing to achieve a 5% reduction in structural steel requirements through structural design efficiencies.</p> <p>5. Reduce aluminium content in external louvres and shading devices by dematerialisation or substitution. A 20% reduction in aluminium requirements for construction of the shading elements in the stadium facade was modelled.</p> <p><b>DPIE comment: Please confirm whether the design will follow the materiality recommendations as per the Guidance above, or justify why the recommended initiatives cannot be achieved with no implications to the required Gold LEED Certification.</b></p>		
7.	(vii) details to identify how the construction and operation of the project will incorporate the opportunities in condition B20e(viii); and	<p>Please note that there is no condition B20e(viii) in the consent. The requirement meant to refer to B20(a)(vi) of SSD 9835. CEMP and sub plans (CNVMP, CWMP, CSWMP, CAQMP) cover the issue during the construction of the project.</p> <p><b>DPIE comment: Please confirm how the operation of the project will incorporate the opportunities as per condition B20(a)(vi) in the Plan.</b></p>	Refer to section 4	The operation of the facility is beyond JHG's scope of work. Our interpretation of the clause relates to the operational practices that JHG apply during the delivery phase.
8.	(b) include a review of the proposed ESD measures by a suitably qualified consultant and a statement certifying that the design is capable of incorporating the identified ESD	<p>The Plan states that LCI (suitably qualified consultant) has been engaged to provide sustainability design advice and co-ordinate the LEED pathway for design consultants and trade subcontractors. At the conclusion of the construction phase, LCI will take information collated by the JHG delivery team and submit to the USGBC for assessment for a LEED rating. As the design phase continues some of ESD initiatives are still under investigation to achieve Gold LEED Certificate.</p>	Refer to section 3.2	

	measures and achieving the targeted Leadership in Energy and Environmental Design (LEED) v4 Gold Certificate.	<b>No comment</b> .		
9.	(c) submit the revised ESD report, the design plans, the Planning Secretary's comments / advice and the review of the proposed ESD measures to the Certifying Authority for approval, prior to the construction of the stadium structure above the concourse level.	<b>DPIE comment: Please provide DPIE's comments with your responses to the Certifying Authority who will consider them before approving the Plan.</b>	-	JHG's responses (and updated SMP) are provided in this Revision 03 update.