

December 2020

88 Mill Point Road

Sustainable Design Strategy

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ACN: 163 742 890	
ABN: 84 163 742 890	

Title:	88 Mill Point Road – Sustainability Strategy - DA Report
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Client:	Southlink Investment Properties Pty Ltd trading as Peakstone
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Description:	<p>This report provides FCDS summary of the proposed sustainability strategy for the development at 88 Mill Point Road.</p> <p>The project intends to include sufficient design features to achieve at least 60% (5—Star / Australian Best Practice) of the credits available under the Green Star Design and As Built V1.3 tool – self-assessed.</p> <p>This report highlights key sustainable design features and outcomes, as represented in the current design and as committed to by the project delivery team. The report is to assist the determination by the design review panel and the City of South Perth.</p> <p>Rev A is the initial report.</p>

Revision	Date	Checked by	Transmitted by
A	7 th December 2020		GEA
B	14 th December 2020		GEA

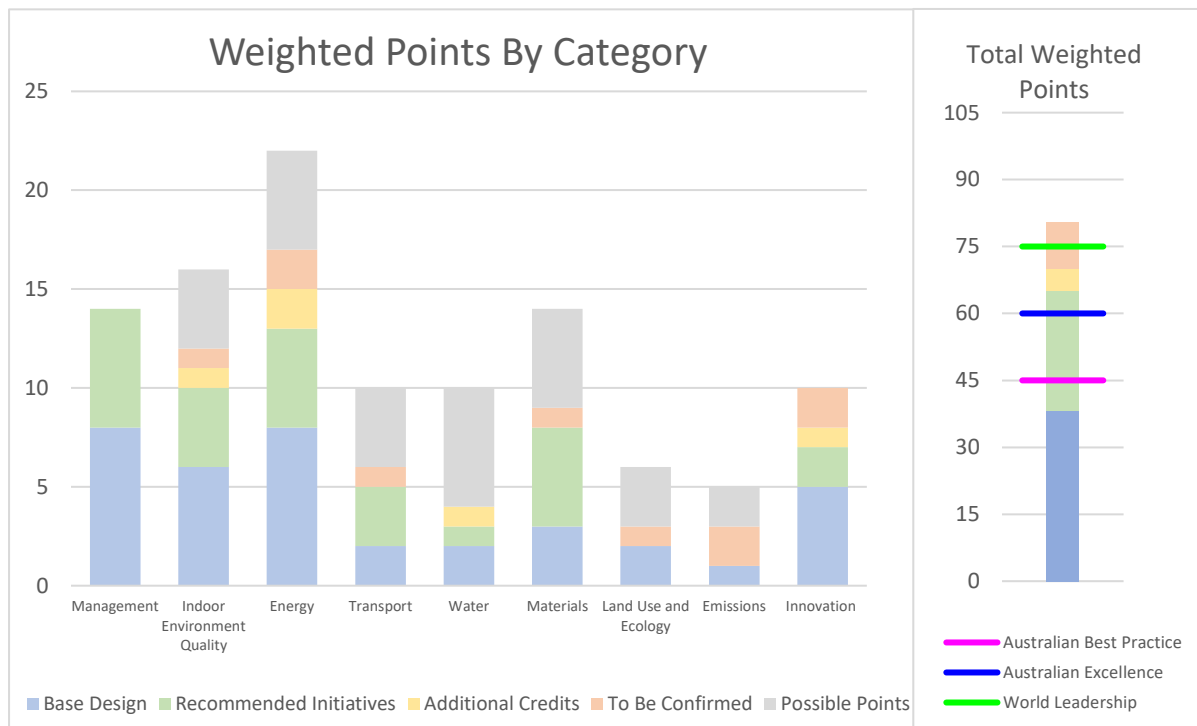
Distribution	Revision							
Receiver	A	B						
NSPM	X	X						
Hassell	X	X						
Design Team	X	X						
Peak Stone		X						

Executive Summary

FCDS have been commissioned to provide early project strategic advice for sustainable design relating to the proposed mixed-use development of the 88 Mill Point Road site in South Perth, WA.

The site is subject to planning conditions which require the design team demonstrate excellence in sustainable design by delivering an outcome equivalent to a 5-Star Green Star Design and As Built V1.3 rating.

This report, with the attached scorecard, outlines the project team's expected pathway to meeting this target. At this stage, the design is relatively early, with final modelling and system selections yet to be completed. However, the project team have developed a 'recommended' approach to approximately 66% of the available green star points – about 10% over the target level.



As can be seen above, the design has focused on features which improve IEQ (Indoor Environment Quality), reduce energy consumption and improve management outcomes for the building. Strong materiality outcomes are also intended. Some of the key features intended to be included are:

- Solar Generation
 - The design team are seeking to include around 100kW of peak electrical generation capacity.
- Central Plant
 - Services will utilise a central plant area, taking advantage of improved efficiency, less maintenance and lower noise impacts for occupants.
- Efficient Envelope
 - Exceeding BCA requirements for building envelope performance, including representative sampling of building leakage rates.
- Sustainable Transport
 - On site bike parking and electrical vehicle infrastructure
- Sustainable Operations
 - Site specific waste management and minimisation plan, along with green groundskeeping, procurement and cleaning policies.

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1. Introduction

1.1 Site Description

The proposed 88 Mill Point Road is to be located close to the corner of Mill Point Road and Labouchere Road in South Perth, WA.



The development will have 37 above ground floors above two basements. Ground floor will include be car parking and services area, with lobby space and commercial spaces such as a wine bar, co-working area and a café.

Level 2 – podium – includes significant landscaped area, meeting the requirements of a Fitwel™ restorative garden, and providing outdoor dining, water play, games area, theatre and gym.

1.2 Project Strategic Aims

This project is aiming to represent a prestigious and responsible address, offering high end living for occupants, whilst leaving a small ecological footprint.

The design is therefore seeking to implement design features to achieve the following aims:

- Outstanding Internal Environment
 - Access to views, good thermal comfort, low toxicity finishes
- Resource Efficient
 - Low water use, low energy use, centralised services
- Smart and Well Managed
 - Embedded meter network, legionella control
- Small Footprint
 - Sustainable materials, responsible suppliers, local skills

The design team are therefore seeking to self-assess design performance, aiming to achieve a minimum of 60% of the available green star credits for the development.

2. Management Features

The following design elements are intended to be included by the project team:

2.1 Building Commissioning

The designers will be seeking to complete commissioning in accordance with internationally recognised standards such as Airah or CIBSE. The commissioning will also include some building envelope pressure testing to confirm build quality and reduce energy loss through air leakage.

2.2 Building Tuning

Buildings are generally understood to take between 3 and 12 months to settle down and operate in accordance with the design intent, however, the process of management and control of this process is often left to chance or to follow an informal process during the Defects Liability Phase.

FCDS will assist the building to optimise its operation during the first 12 months of operation. Scope will include energy consumption review against budgets and engagement with contractors to demonstrate satisfactory operation of installed systems in all weather and load conditions.

2.3 Commissioning Agent

The design team expect to utilise a commissioning agent. This individual will assist in reviewing designs and specify strict commissioning and operational requirements for the contractors delivering the project. The Commissioning Agent will be independent of the design and construction teams.

2.4 Climate Change

The project will represent a significant and long-term investment in the South Perth community and, as such, will consider the likely risks brought about by climate change. Specific features to address climate change issues, such as improved façade performance and solar generation, will be implemented to future-proof the development.

2.5 Waste Management

The design will include systems and infrastructure to allow and promote recycling. This includes large and convenient stores at ground level which can service the retail, commercial and residential components separately. The residential tower is to be provided with general waste and recycling chutes to ensure recycling is convenient for occupants.

The provision of the ability to segregate waste streams will provide operational flexibility in the future and would be expected to reduce operational costs, particularly as the cost of landfill increases over time.

Recycling bins are also expected to be provided through the public access area.

2.6 Construction Practices

The design team expect the main contractor for the project will implement a site-specific environmental management plan, including reporting and audit to a third-party standard such as ISO 14001. The contractor will be expected to provide mental and physical health support to their staff.

In addition, waste during construction is to be diverted from landfill, with the project team seeking to reuse or recycle at least 90% by mass of all construction and demolition waste.

2.7 Metering and Monitoring

The design team will include an embedded, private metering network to assist in management of energy consumption. The system will allow the site to share solar power generation between retail and residential uses and to serve central systems – improving its viability.

The system will also allow the development to tender power provision, resulting in reduced operating costs for owners and providing more flexibility to choose low or no carbon power supplies.

Meter data will also be used to tune the building in operation and engage with tenants to reduce their use.



3. Indoor Environment Quality

A high level of indoor amenity will be of paramount importance to the success of the project. Occupants, visitors and staff for the building will expect comfortable conditions internally, without glare or noise and good access to views and daylight. Some of the key design features are summarised below:

3.1 Air Quality

Air quality is important for all uses; however, the intended design approach is expected to vary. For the commercial spaces, filtered outside air will be ducted into the occupied space, with quantities controlled to ensure high quality air, without compromising energy efficiency. Common areas are expected to include CO₂ monitoring and control to reduce peak load, without compromising free cooling during periods of mild ambient conditions. Retail tenancies will be able to operate in mixed mode functions, allowing improved air quality when conditions are suitable.

For the residential spaces, outside air provision is to be occupant controlled, with exhaust rates from toilets and kitchens ensuring occupied spaces are provided with more outside air than is required for minimum code compliance.

The design will include ducted exhaust for contaminated spaces such as kitchens and the car park.

3.2 Glare Control

The design includes balconies for all apartments, providing overhang shading as well as improving occupant amenity.

For the ground floor spaces, the development provides a high degree of self-shading with overhangs, local trees and adjacent buildings limiting low-angle western sun to occupied areas.

3.3 Low Toxicity Products

The design team will be selecting finishes and composite wood products with low Volatile Organic Compound (VOC) and low formaldehyde content. This includes carpets, adhesives and sealants. Wall and ceiling paints will target a level <5 g/L for VOC content.

3.4 Thermal Comfort

A review of the current design has shown expected NatHERS outcomes of more than 7 stars for most apartments. Tinted double single glazing will be used to minimise thermal loads on apartments, targeting a 15% improvement over minimum BCA requirements.

The design team are targeting the following performance features:

3.5 Services

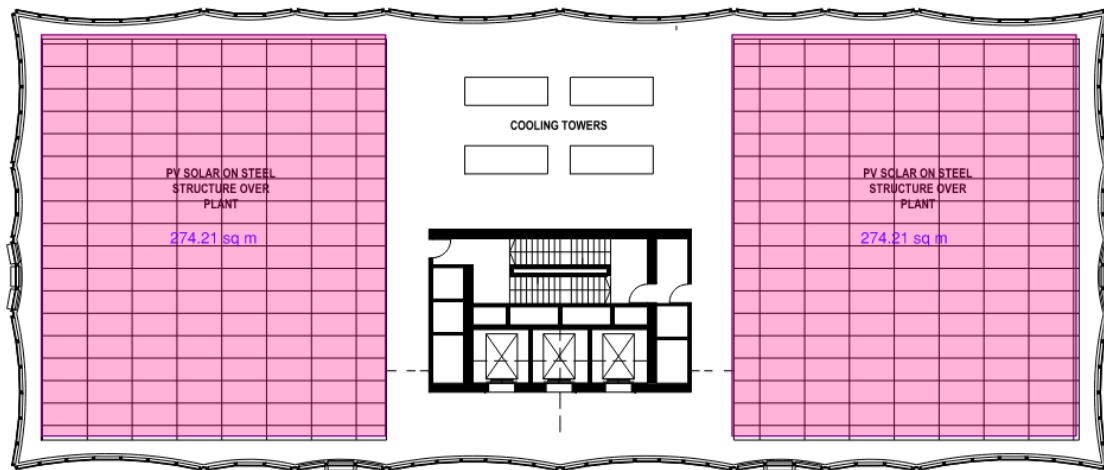
The mechanical and electrical designs are seeking to improve over minimum BCA requirements. LED lighting and efficient air conditioning systems are expected to reduce building operational costs and energy consumption. Electric central hot water plant will be used, with a high CoP (Coefficient of Performance), eliminating fossil fuel use from the site.

3.6 Envelope

The design team expect to use a modelled approach to Section J compliance, with a target of a 15% improvement in building envelope performance over minimum requirements. This will include targeting improved NatHERS ratings for the residential component.

3.7 Renewable Generation

The design expects to implement a large, 100kW PV array at roof level, above mechanical plant.



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Based on a 320W panel, the current arrangement is expected to have a panel capacity of around 110kW.

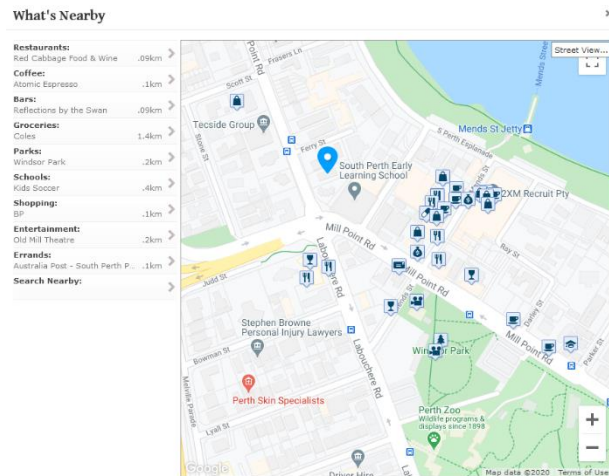
The renewable generation plus the building embedded meter network will avoid the need to export energy and will allow occupants access to low carbon, low cost electricity.

4. Transportation

4.1 Local Amenities

The project is well situated for access to local amenity and, when completed, will provide significant additional features to assist the local community.

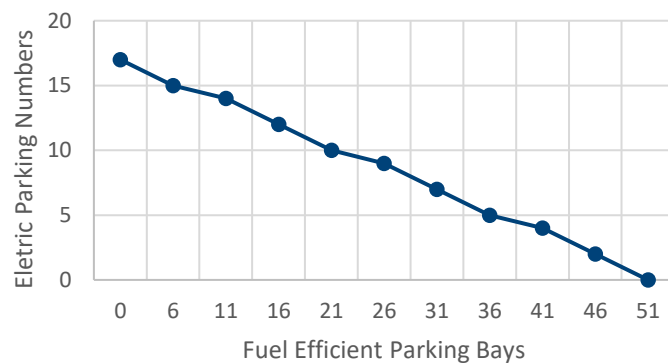
The development site is already considered somewhat walkable by walkscore.com.au, a rating which will increase when the development comes online. The project easily meets the green star threshold for local amenities.



4.2 Vehicle Infrastructure

The design has separated pedestrians from cars, with car parking in two basement levels below ground and an active street frontage. In addition, the design will include some electric car charging, spaces for fuel efficient vehicles and the potential for vehicle share programs. The requirements for green star equivalency are shown right:

Low Emission Vehicle Infrastructure

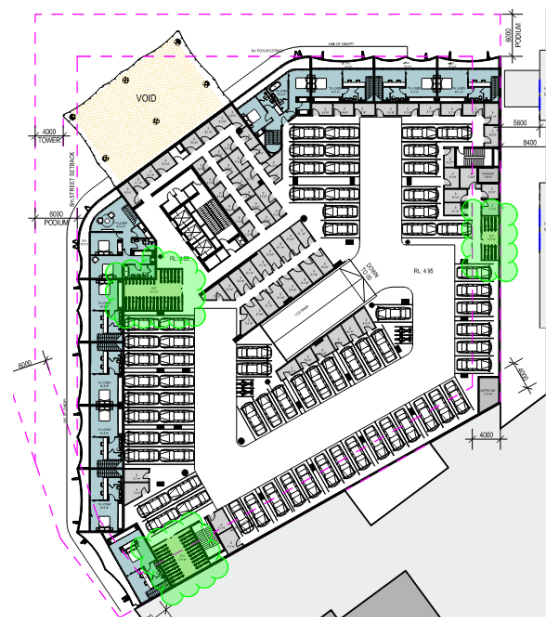


4.1 Public Transport

The design is ideally located to connect to major bus routes and is easily walkable to the ferry.

4.2 Bike Infrastructure

The design currently includes connections to local pedestrian ways for connectivity of bikes. Bike parking facilities, including end-of-trip facilities to services the entire development are located at ground and first floor level, with direct access from the car park.



5. Water Consumption

5.1 Sanitary Fixtures

All sanitary fixtures provided within the project to are seeking to meet the performance requirements below:

Fixture Type	Minimum WELS rating	Maximum Flow Allowable
Taps	5 stars	4.5-6 L/min
Urinals	5 stars	1.0 L / Flush + Smart demand flush device
Toilets	4 stars	<3.5 L average flush <4.7L full flush <3.2 half flush
Showers	3 stars	6.0 – 7.5 L/min
Clothes Washing Machines	4 stars	
Dishwashers	5 stars	

5.2 Fire Systems

The building sprinkler design will seek to capture water used for testing and will include floor by floor isolation valves to avoid wastage during maintenance or modification of the system.

5.3 Landscape

The design includes extensive landscaped areas which will require irrigation. The design intent will be to utilise smart irrigation controls which can detect rainfall and reduce irrigation volumes to match.

6. Sustainable Materials

The design team are aiming for sustainable materiality selections as follows:

6.1 High Durability

The design team will select finishes which are able to achieve an economic life of at least 10 years. This includes preferential selection of modular or repairable elements (for example, carpet tiles) or natural finishes. Similarly, higher efficiency and quality services design, e.g. VRF air conditioning or LED lighting will also be considered.

This option reduces operational maintenance expenditure and is expected to improve visual amenity for the building over the long term.

6.2 Sustainable Credentials

During the construction phase, consideration will be given to utilisation of steel, PVC, insulation, finishes and the like with strong sustainable design credentials. Generally, this will include being produced under and ISO 14001 certified EMS, inclusion of a high recycled content and with product stewardship arrangements.

The design team will target reduction of Portland cement content in concrete where practical.

6.3 Embodied Energy

The design team intend to complete a life cycle analysis for the project, considering embodied and operational energy. Indicatively, the project is targeting a 15% improvement over a benchmark case on average across assessment categories.

7. Emissions and Ecology

The site emissions and ecological value are to be addressed as follows:

7.1 Ground Plane

The proposed development will provide activation at street level, including café and wine bar tenancies and a co-working space.

The lobby area also provides space for residents to use for functions, or working from home.

7.2 Light Pollution

The building design is to minimise light spill to neighbours or the night sky through careful selection and location of luminaires.

7.3 Heat Island and Ecology

The design intends to utilise light colours and integrate planting within the building façade to reduce the urban heat island effect – making this a cool, welcoming space for visitors and occupants.

The site footprint is expected to meet Green Star benchmarks for 75% low urban heat island materials.



8. Innovation

In addition to the above, the design includes features which would be expected to be awarded under the Green Star Innovation category. This category considers things such as social sustainability, exceeding Green Star Benchmarks and contributions to industry development.

Key outcomes to be targeted are as follows:

8.1 Tenancy Design Review

The design team will complete a maintenance and services review on any proposed tenancy. This assists tenants in achieving strong design outcomes, as well as making sure the design is integrated with the overall project intent.

8.2 Ultra-Low VOC Paints

The design team intend to select paints with a VOC (Volatile Organic Content) below 5g/l for walls and ceilings. This level of VOC will significantly improve occupant comfort during initial building occupation.

8.3 Tenant Engagement

As noted above, the building metering system will provide the potential for occupants and tenants to engage with building management and understand their utility use. Live performance monitoring, bill reconciliation and peer group comparisons can be used to air occupants in managing their own use and improving overall building performance.

8.4 Green Facilities Management

The strata company will be required to maintain the high sustainable design quality of the development in operation through the implementation of green cleaning, procurement and groundskeeping practices.

This will entail selecting consumable products within the building with low ecological footprints and preferably from local renewable sources. Similarly, pest control and cleaning products will seek to be low environmental impact for occupant health and wellbeing.

8.5 Legionella Control

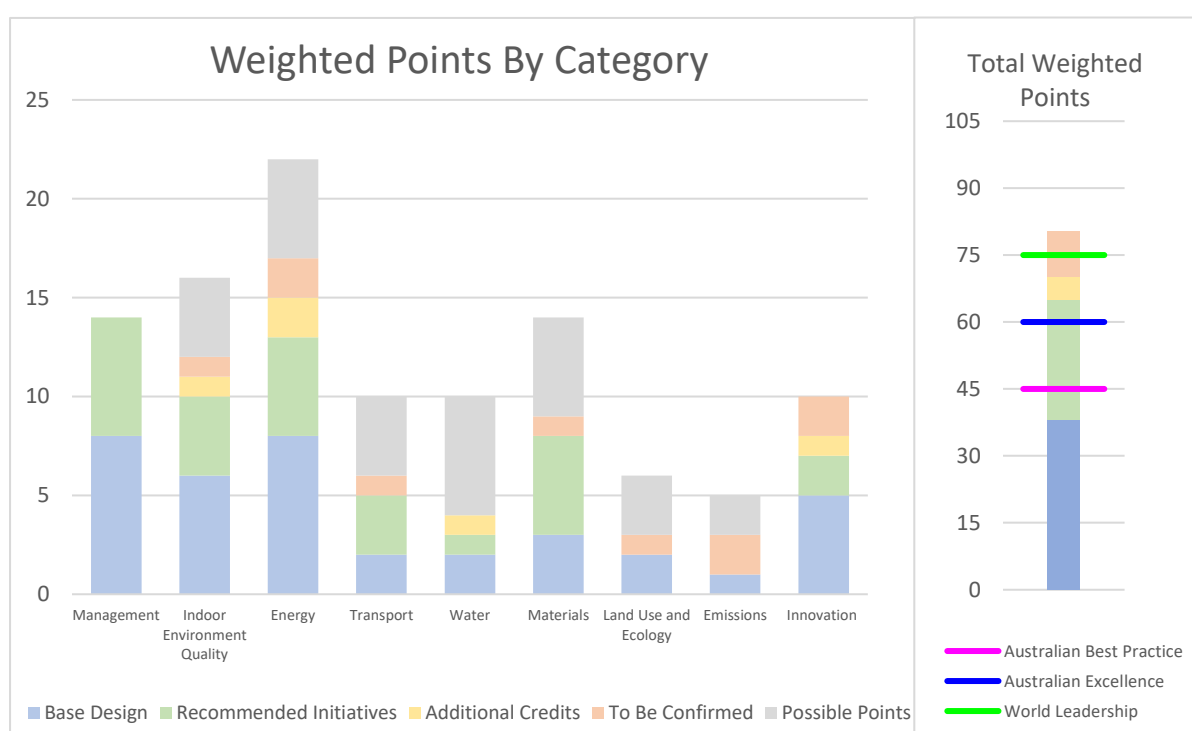
The design will utilise a centralised hot water system with design features – such as UV sterilization – to minimise the risk of legionella growth within the system.

9. Self-Assessment Summary

FCDS note that this is a self-assessment of design intent against published Green Star benchmarks. It is in no way equivalent to a formal assessment by the GBCA. This report represents our current expectation of performance, based on design intent, our experience and the project planning. Notwithstanding, the report does demonstrate that the design is set to include at least 60% of the available Green Star initiatives for the project.

Currently, FCDS believe the project would score at least 65 points under the Green Star Design and As Built V1.3 tool, based on current planning and expected design inclusions. This could increase to 75, with an additional 10 points requiring design and contract finalisation to confirm. This represents a significant improvement over the target 60%.

Further details of our assessment are provided in the attached scorecard.





Full Circle
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Planning | Design | Delivery | Performance

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Design and AsBuilt V1.3 Green Star Credit List

88 Mill Point Road

This is the initial self-assessment for the 88 Mill Point Road residential project. The design is seeking to achieve a 5-Star Green Star certified result, using the Green Star Design and AsBuilt V1.3 rating system. Note that costs within this sheet are considered indicative only and should be reviewed and assessed by relevant design team members.

Rev B is based around a cooling tower / reverse cycle heat pump mechanical base design option.

This scorecard is in no way equivalent to a formal Green Star assessment.

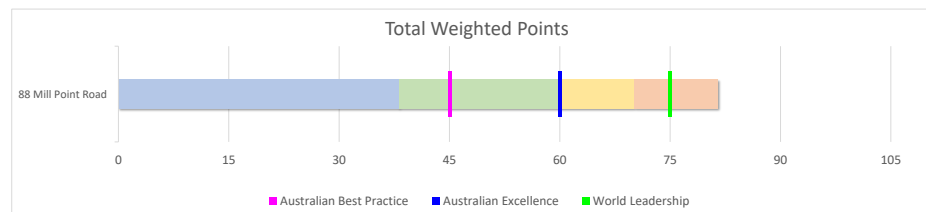
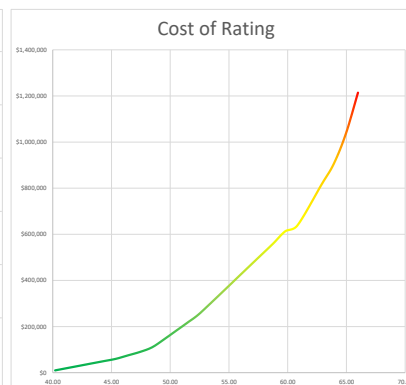
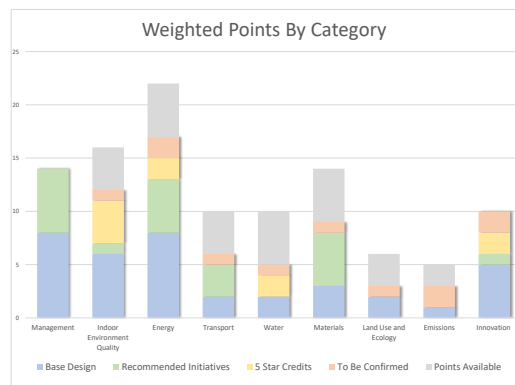
Project Name	88 Mill Point Road
Project Number	2020_053
Client Name	NSP
Issue Date	5th November 2020
Revision	B
Reason for Issue	Initial Assessment

GFA	
NLA	
Building Type	Residential
Building UFA	
Building GFA	
Number of Car Bays	
Number of Occupants	
Local Council	City of South Perth
Building Owner	South Link Investments
Building Tenant	Various

BCD Consultant	PCDS
Project Manager	NPM
Architect	Hassell
Fire Engineer	Strategic Fire
Mechanical Engineer	Fleth
Electrical Engineer	Fleth
ICA	ICA
Building Surveyor	Building Surveyor
Hydraulic Engineer	Fleth
Structural Engineer	Atelier JV
Civil Engineer	Atelier JV
Acoustic Engineer	Acoustic Engineer
Waste Consultant	Tallis
Climate Change Modeller	Climate Change Modeller
Transport Planner	Transcore
Landscape	Plan E
Life Cycle Modeller	Life Cycle Modeller
Quantity Surveyor	Quantity Surveyor
Facade Engineer	Atelier JV

Builder / Main Contractor	Builder / Main Contractor
Mechanical Contractor	Mechanical Contractor
Electrical Contractor	Electrical Contractor
Hydraulic Contractor	Hydraulic Contractor
Fire Contractor	Fire Contractor
Facade Contractor	Facade Contractor
Lift Contractor	Lift Contractor

Category	Available Points	Base Design	Recommended Initiatives	5 Star Credits	To Be Confirmed	Points Not Achieved	Total Cost	Ongoing Cost	Cost Per Point
Management	14	8	6	0	0	0	\$ 140,000	\$ 10,000	10,000
Indoor Environment Quality	16	6	1	4	1	4	\$ 937,067	\$ -	78,089
Energy	22	8	5	2	2	5	\$ 1,483,333	\$ -	87,255
Transport	10	2	3	0	1	4	\$ 100,000	\$ -	16,667
Water	10	2	0	2	1	5	\$ 308,500	\$ -	61,700
Materials	14	3	5	0	1	5	\$ 50,000	\$ -	5,556
Land Use and Ecology	6	2	0	0	1	3	\$ -	\$ -	-
Emissions	5	1	0	0	2	2	\$ -	\$ -	-
Innovation	10	5	1	2	2	0	\$ 20,000	\$ -	2,000
	97	38	22	10	11	26	\$ 3,038,900	\$ 10,000	37,313
		38	60	70	81				



Credit	Cost	Cumulative Points	Cumulative Cost
2.1 - Implementation of a Climate Adaptation Plan	\$10,000	40.21	\$10,000
19A.1a - LCA - Energy Efficiency	\$30,000	43.30	\$40,000
19A.2a - LCA - Additional Category Reporting	\$10,000	44.33	\$50,000
19A.2d - LCA - Design Review	\$10,000	45.36	\$60,000
2.3 - Building Systems Tuning	\$15,000	46.39	\$75,000
17A - Transport Performance	\$15,000	47.42	\$90,000
Man-1 - Tenancy Review	\$20,000	48.45	\$110,000
17.4 - Active transport facilities	\$35,000	49.48	\$145,000
2.1 - Services and Maintainability Review	\$37,500	50.52	\$182,500
2.4 - Independent Commissioning Agent	\$37,500	51.55	\$220,000
2.2 - Building Commissioning	\$40,000	52.58	\$260,000
15.1b - Renewable Energy	\$200,000	56.70	\$460,000
16.1b - Peak Energy Reference Building	\$50,000	57.73	\$510,000
17.3 - Low emission vehicle infrastructure	\$50,000	58.76	\$560,000
11.3 - Localised Lighting Control	\$53,400	59.79	\$613,400
Emi-11 - Microbial Control	\$25,000	60.82	\$638,400
9.2 - Provision of Outside Air	\$178,000	62.89	\$816,400
11.2 - Surface Illuminance	\$89,000	63.92	\$905,400
18.2 - Rainwater Reuse	\$130,500	64.95	\$1,035,900
18.1 - Sanitary Fixtures	\$178,000	65.98	\$1,213,900
18.3 - Sanitary Fixtures	\$178,000	67.01	\$1,391,900
18.4 - Sanitary Fixtures	\$178,000	68.04	\$1,569,900
18.5 - Sanitary Fixtures	\$178,000	69.07	\$1,747,900
18.6 - Sanitary Fixtures	\$178,000	70.10	\$1,925,900
18.7 - Sanitary Fixtures	\$178,000	71.13	\$2,103,900
18.8 - Sanitary Fixtures	\$178,000	72.16	\$2,281,900
18.9 - Sanitary Fixtures	\$178,000	73.19	\$2,459,900
19.0 - Sanitary Fixtures	\$178,000	74.22	\$2,637,900
19.1 - Sanitary Fixtures	\$178,000	75.25	\$2,815,900
19.2 - Sanitary Fixtures	\$178,000	76.28	\$2,993,900
19.3 - Sanitary Fixtures	\$178,000	77.31	\$3,171,900
19.4 - Sanitary Fixtures	\$178,000	78.34	\$3,349,900
19.5 - Sanitary Fixtures	\$178,000	79.37	\$3,527,900
19.6 - Sanitary Fixtures	\$178,000	80.40	\$3,705,900
19.7 - Sanitary Fixtures	\$178,000	81.43	\$3,883,900
19.8 - Sanitary Fixtures	\$178,000	82.46	\$4,061,900
19.9 - Sanitary Fixtures	\$178,000	83.49	\$4,239,900
19.10 - Sanitary Fixtures	\$178,000	84.52	\$4,417,900
19.11 - Sanitary Fixtures	\$178,000	85.55	\$4,595,900
19.12 - Sanitary Fixtures	\$178,000	86.58	\$4,773,900
19.13 - Sanitary Fixtures	\$178,000	87.61	\$4,951,900
19.14 - Sanitary Fixtures	\$178,000	88.64	\$5,129,900
19.15 - Sanitary Fixtures	\$178,000	89.67	\$5,307,900
19.16 - Sanitary Fixtures	\$178,000	90.70	\$5,485,900
19.17 - Sanitary Fixtures	\$178,000	91.73	\$5,663,900
19.18 - Sanitary Fixtures	\$178,000	92.76	\$5,841,900
19.19 - Sanitary Fixtures	\$178,000	93.79	\$6,019,900
19.20 - Sanitary Fixtures	\$178,000	94.82	\$6,197,900
19.21 - Sanitary Fixtures	\$178,000	95.85	\$6,375,900
19.22 - Sanitary Fixtures	\$178,000	96.88	\$6,553,900
19.23 - Sanitary Fixtures	\$178,000	97.91	\$6,731,900
19.24 - Sanitary Fixtures	\$178,000	98.94	\$6,909,900
19.25 - Sanitary Fixtures	\$178,000	99.97	\$7,087,900
19.26 - Sanitary Fixtures	\$178,000	101.00	\$7,265,900
19.27 - Sanitary Fixtures	\$178,000	102.03	\$7,443,900
19.28 - Sanitary Fixtures	\$178,000	103.06	\$7,621,900
19.29 - Sanitary Fixtures	\$178,000	104.09	\$7,799,900
19.30 - Sanitary Fixtures	\$178,000	105.12	\$7,977,900

Ref No.	Title	Aim of Credit	Sub-Element	Credit Criteria Summary	Design Team Actions	Points Available	Base Design	Recommended Initiatives	5 Star Credits	To Be Confirmed	Unlikely Points	Comments	Capital Cost	Ongoing Cost
1.1	Green Star Credited 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.	GSAP	1 point is available where a Green Star Accredited Professional – Design & As Built (GSAP) has been contractually engaged to: * Provide advice, support and information related to Green Star principles, structure, timing and processes; * Provide guidance and support in all stages of the project leading to certification.		1	1					FCDS are undertaking this scope of works.		
2.0			Environmental Performance Targets	This is a minimum mandatory requirement for this credit.	Provide a design intent report - form early within the design phase - or an Owners Project Requirements document.	0	0					FCDS concept design report will include target setting for the development.		
2.1			Services and Maintainability Review	1 point is available where a comprehensive services and maintainability review of the project is performed.	Undertake a maintainability review of services and fabric prior to construction.	1		1				Shared with 2.4 - appoint independent commissioning agent to undertake design review on behalf of the owner.	\$	37,500
2.2	Commissioning and Tuning	To encourage and recognise commissioning, handover and tuning initiatives that ensure all building services operate to their full potential.	Building Commissioning	1 point is available where comprehensive pre-commissioning activities are performed for all nominated building systems. As a minimum building air permeability testing must be undertaken.	Develop commissioning plan and follow international system for commissioning.	1		1				Main cost is expected to be in building envelope test.	\$	40,000
2.3			Building Systems Tuning	1 point is available where a tuning process is in place that addresses all nominated building systems.	Tuning requirements to be communicated with prospective tenants.	1		1				Building tuning can improve building performance in operation.	\$	15,000
2.4			Independent Commissioning Agent	1 point is available for utilisation of an Independent Commissioning Agent (ICA) to advise, monitor, and verify the commissioning and tuning of the nominated building systems throughout the design, tender, construction, commissioning and tuning phases.	Appoint commissioning agent to assist during design and construction phases.	1		1				Shared with 2.1 - Independent Commissioning Agents can assist with design and construction phases.	\$	37,500
3.1	Adaptation and Resilience	To encourage and recognise projects that are resilient to the impacts of a changing climate and natural disasters.	Implementation of a Climate Adaptation Plan	3 points are available where: * A project specific climate adaptation plan has been developed in accordance with a recognised standard; and * Solutions have been included into the building design and construction that specifically address the risk assessment component of the adaptation plan.	Find someone to complete an action plan and implement the findings.	2		2				Considering sight proximity to water and use of two basements, flooding is considered a high risk for this site.	\$	10,000
4.1	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.	Building Operations and Maintenance and User Information	1 point is awarded where it is demonstrated that comprehensive Operations and Maintenance information is developed and made available to the facilities management team and a relevant and current building user information, is developed and made available to all relevant stakeholders.	Address the following systems: * Mechanical * BMS * Lighting Controls * Electrical Systems * Hydraulic Systems * Fire Protection Systems * Lifts and other vertical transport systems * Building Envelope	1	1					Provision of detail O&M manuals and users guides are considered good practice.		
5.1	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.	Environmental Building Performance	1 point is awarded where there is a commitment to set targets and measure results for environmental performance.	Landlord to commit to NABERS Energy and Water ratings in operation.	1	1					Building to target operational NABERS ratings - will not be feasible for >3 years post practical completion.	\$	10,000
5.2			End of Life Waste Performance	1 point is awarded where there is a commitment to set targets and measure results that minimise construction waste from end of life of interior fit outs or other building attributes.	Landlord to target 10+ year life time for common area finishes.	1	1					Selection of high durability finishes are important to avoid poor aesthetic outcomes.		
6.0	Metering and Monitoring	To recognise the implementation of effective energy and water metering and monitoring systems.	Effective Metering	Accessible metering must be provided to monitor energy and water consumption of all energy and water common uses, major uses, and sources. The metering system must be self checking and reporting.	Include meters and separate sub meters for all major uses. All meters downstream of the main building meter must be sub-metered.	0	0					BCA minimum compliant metering would be expected to achieve this outcome.		
6.1			Advanced Monitoring Strategy	1 point is available where a monitoring strategy is addressed through a monitoring system, capable of capturing and processing the data produced by the installed energy and water meters, and accurately and clearly presenting data consumption trends.	Include meter reading and processing system as part of BMS.	1	1					Embedded metering system will be required to cover billing for occupants. Extent and cost of system will depend on service provision.		
7.0			Environmental Management Plan	The conditional requirement is met where a comprehensive project specific Environmental Management Plan (EMP) is in place for construction.	Develop project specific best practice EMP.	0	0					Will be standard practice for a project of this nature.		
7.1			Formalised Environmental Management System	1 point is available where a formalised systematic and methodical approach to planning, implementing and auditing is in place during construction, to ensure conformance with the EMP.	Demonstrate systematic and methodical approach to planning implementing and auditing during construction to comply with EMP. -ISO 14001 certification. Otherwise, auditor statement.	1	1					Most Tier 1 and 2 Contractors are ISO 14001 certified.		
7.2	Responsible Construction Practices	To reward projects that use best practice formal environmental management procedures during construction.	High Quality Staff Support	1 point is available where high quality staff support practices are in place that: * Promote positive mental and physical health outcomes of site activities and culture of site workers, through programs and solutions on site; and * Enhance site workers' knowledge on sustainable practices through on-site, off-site, or online education programs	Contractor to address three distinct issues with workplace programs and policies which go beyond minimum OH&S requirements and extend to wellbeing promotion. Issues include: * healthier eating and active living * reduced harmful alcohol and drug and tobacco-free living * increase social cohesion, community, and cultural participation * understanding depression * preventing violence and injury * suicide prevention * decrease psychological distress In addition the contractor must provide ESD training to site staff.	1	1					Most Tier 1 Contractors will provide these support services for staff		
8.1	Operational Waste	To recognise projects that implement waste management plans that facilitate the re-use, upcycling, or conversion of waste into energy and stewardship of items to reduce the quantity of outgoing waste.	Operational Waste Performance Approach	1.1 A Waste Management Plan has been developed, by a qualified waste auditor, that addresses best practice requirements as outlined in this credit.	Deliver O&MWP by Qualified Waste Auditor									
			Operational Waste Deemed to Satisfy	2.1 Separation of Waste Streams - bins or containers are provided for general public use that allow for separation of the applicable waste streams or use of commingled recycling where appropriate; 2.2 Dedicated Waste Storage Area - a dedicated, sufficiently sized storage area for the separation and collection of various waste streams is provided; 2.3 Access to Waste Storage Area - best practice access requirements for waste collection, as described in this credit.	* Separate out general waste, paper, cardboard, glass, plastic, one other or commingled recycling where appropriate. * Dedicated waste Storage Area * Appropriate Access	1	1					The project includes a large and well situated waste store. Tallis is completing a waste management plan.		

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9.1	Quality of Indoor Air	To recognise projects that provide high air quality to occupants.	Ventilation System Attributes	1 point is awarded where: * The entry of outdoor pollutants is mitigated; AND * The system is designed for ease of maintenance and cleaning; AND * The system has been cleaned prior to occupation and use.	Require tenants to implement these requirements. * Locate outside air intakes appropriately. * Provide cleaning access to all elements of HVAC system * Clean prior to use and occupation - Construction Management process for new systems.	1						Credit is considered very difficult to achieve for domestic style air conditioning systems.		
9.2			Provision of Outside Air	2 points are awarded where the nominated area is provided with sufficient outside air to ensure levels of indoor pollutants are maintained at acceptable levels. For mechanically ventilated or mixed mode spaces: * 1 point is awarded where outside air is provided at a rate 50% greater than that required in AS1668.2:2012 or CO2 concentrations are maintained below 800ppm. * 2 points are awarded where outside air is provided at a rate 100% greater than that required in AS1668.2:2012 or CO2 concentrations are maintained below 700ppm For naturally ventilated spaces: * 2 points are awarded where the requirements of AS1668.4:2012 are met.	Require tenants to deliver increased outside air rates and provide heat reclaim to offset energy consumption. Provide CO2 sensors as often as thermostats if performance based approach is taken.	2		2		Potential to include ducted outside air for apartments to improve indoor air quality and reduce mould growth issues. Cost based on \$1,000 per apartment.	\$ 178,000			
9.3			Exhaust or Elimination of Pollutants	1 point is awarded where the nominated pollutants, such as those arising from printing equipment, cooking processes and equipment and vehicle exhaust, are limited by either removing the source of pollutants from the nominated area, or exhausting the pollutants directly to the outside of the project while limiting their entry into other areas.	Provide systems to avoid the contamination of internal spaces.	1	1					Provide ducted kitchen exhaust for all apartments and food tenancies. A print room exhaust is to be provided for the co-working facility.		
10.1			Internal Noise Levels	1 point is available where internal ambient noise levels in the nominated area are suitable and relevant to the activity type in the room. This includes all sound generated by the building systems and any external noise ingress.	Employ Acoustic consultant to demonstrate that internal ambient noise levels, in the nominated area, are no more than 5dB(A) above the "satisfactory" sound levels provided in Table 1 of AS/NZS 2107:2016.	1					1	Acoustic consultant to advise design requirements and costs, credit expected to be achieved.		
10.2			Reverberation	1 point is available where the nominated area has been built to reduce the persistence of sound to a level suitable to the activities in the space.	Employ acoustic consultant and specify appropriate finishes and fixtures - achieve less than maximum recommended time in AS 2107.	0	NA					Credit is NA for residential spaces.		
10.3	Acoustic Comfort	To reward projects that provide appropriate and comfortable acoustic conditions for occupants.	Acoustic Separation	1 point is available where the nominated enclosed spaces have been built to minimise crosstalk between rooms and between rooms and open areas.	Employ acoustic consultant and specify appropriate separation between spaces. A) The partition between the spaces should be constructed to achieve a weighted sound reduction index (Rw) of at least 45. OR: The sound insulation between enclosed spaces complies with: Dw + LAeq,T > 75 Dw - Weighted sound level difference between two spaces LAeq,T - Indoor ambient noise level in the space adjacent to the enclosed space The sound tests from which DW is derived must be measured in accordance with ISO 140-4:1998. Measurements must be based on finished rooms, accounting for any carpets and acoustically absorbent ceilings specified. The measurements can be conducted in either furnished or unfurnished spaces.	1						Acoustic consultant to advise design requirements and costs, not expected to be achieved.		
11.0	Lighting Comfort	To encourage and recognise well-lit spaces that provide a high degree of comfort to users.	Minimum Lighting Comfort	It is a requirement for this credit that lights are flicker free and that the lights accurately address the perception of colour in the space	* A minimum Class A1 ballast; * High frequency ballasts for all fluorescent lamps, or * Electronic ballasts in High Intensity Discharge (HID) lighting. To address the perception of colour, all light sources must have a minimum Colour Rendering Index (CRI) of 80.	0	0					Considered standard design practice.		
11.1			General Illuminance and Glare Reduction*	1 point is awarded where in the nominated areas: 1.1 Lighting levels comply with best practice guidelines And 1.2 Glare is eliminated	* Comply with 8.3.4 of AS 180.1-2006 AS 1680 * All bare light sources provided with diffuser of some form, including prevention from glare looking directly up or * Unified Glare Rating calculated for the lighting on a representative floor is < Table 8.2 of 1860.1 (Can be modelled)	1					1	Considered unlikely to be achieved for residential areas.		
11.2			Surface Illuminance	1 point is available where, in the nominated area, a combination of lighting and surfaces improve uniformity of lighting to give visual interest	Average surface reflectance > 0.75 for ceilings, 30% of working plane illuminance on ceiling or, for residential, provide at least one wall in each living space, kitchen and bedroom with specific wall washing or wall mounted fittings.	1			1			Provide a wall mounted or wall washing light fitting in all residential spaces. Allow \$500 per apartment.	\$ 89,000	
11.3			Localised Lighting Control	1 point is available where, in the nominated area, occupants have the ability to control the lighting in their immediate environment.	* Provide occupants with lighting control in their direct environment eg. a two component lighting system	1		1				Provide power sockets in relevant areas to allow for installation of reading / task lights in occupied zones. Include task lighting for kitchen benches and	\$ 53,400	
12.0	Visual Comfort	To recognise the delivery of well-lit spaces that provide high levels of visual comfort to building occupants.	Glare Reduction	It is a condition of this credit that glare in the nominated area from sunlight through all viewing façades is reduced through a combination of blinds, screens, fixed devices, or other means.	Demonstrate exclusion of sun either by blinds or modelling.	0	0					Residential spaces can be deemed to comply, commercial spaces are provided with good shading.		
12.1			Daylight	Up to 2 points are available where a percentage of the nominated area receives high levels of daylight during 80% of the nominated hours. * 40% Nominated Area - 1 point * 60% Nominated Area - 2 points	40 / 60% Of the nominated area has a Daylight factor of at least 2.0% at finished floor level.	2	1					Project is expected to achieve one point for daylight access.		
12.2			Views	1 point is awarded where 60 % of the nominated area has a clear line of sight to a high quality internal or external view. 1 point is available where at least 95% of all internally applied paints, adhesives, sealants and carpets meet stipulated 'Total VOC Limits', or, where no paints, adhesives, sealants or carpets are used in the building.	Complete assessment of space.	1	1					Most spaces are within 8m of a façade.		
13.1	Reduced Exposure to Pollutants	To recognise projects that safeguard occupant health through the reduction in internal air pollutant levels.	Paints, Adhesives, sealants and carpets	1 point is available where at least 95% of all engineered wood products meet stipulated formaldehyde limits or no new engineered wood products are used in the building.	Paints, adhesives and sealants to comply with Green Star criteria.	1	1					Standard design practice		
13.2			Formaldehyde	1 point is available where at least 95% of all engineered wood products meet stipulated formaldehyde limits or no new engineered wood products are used in the building.	All composite wood product to be low or no formaldehyde.	1	1					Standard design practice		
14.1	Thermal Comfort	To encourage and recognise projects that achieve high levels of thermal comfort.	Thermal Comfort	1 point is available where a high degree of thermal comfort is provided to occupants in the space equivalent to 80% of all occupants being satisfied in the space.	Achieve a 7 Star Average outcome for NATHERS ratings	1	1					Project will target 7 star NATHERS average as a minimum.		
14.2			Advanced Thermal Comfort	1 additional point is available where a high degree of thermal comfort is provided to occupants in the space equivalent to 90% of all occupants being satisfied in the space.	Achieve an 8 Star Average outcome for NATHERS ratings.	1			1			8 Star target considered a stretch for this target. Budget of \$100 per m2 of façade - split with 15.1a below.	\$ 616,667	

Ref No.	Title	Aim of Credit	Sub-Element	Credit Criteria Summary	Design Team Actions	Points Available	Base Design	Recommended Initiatives	5 Star Credits	To Be Confirmed	Unlikely Points	Comments	Capital Cost	Ongoing Cost
15.0	Energy	Green House Gas Emissions	Energy Conditional Requirement	Up to 5 points out of 20 points are available where it is demonstrated that the building's predicted greenhouse gas impact has been reduced by employing 'best practice' attributes.	Complete building energy / thermal model.	0								
15.1a			Façade Improvement		Complete building energy / thermal model. 1 Point per 2% improvement over reference, to a maximum of 4 Points. Indicatively, 1 point for: * 10% increase in roof and ceiling R values + <0.4 Solar Abs for roofs + U<3.3 for Roof Lights + 15% Reduction in Roof light SHGC + 10% Reduction in wall glazing U value + SHGC <85% of Method 2 Allowance + Display Glazing U<5 and SHGC <85% Maximum.	4			2			Budget of \$100 per m2 of façade - split with 14.2 above.	\$ 1,233,333	
15.1b			Services Design	Up to 20 points are available where it is demonstrated that there is a percentage reduction in the predicted energy and greenhouse gas performance of the proposed building.	Complete building energy / thermal model. 2 Points for meeting benchmark case, plus 1.4 points for every 10% further improvement Indicatively, 1 point for: * 10% Reduction in lighting energy + Automated systems for 95% of nominated area + <100m2 switching zones. + 15% reduction in fan power + 10% reduction in pump power + 4% increase in gas water heaters + 5% increase in EER for splits + 15% higher EER for chillers. + Use of renewable energy or electric heat pump (COP > 3.5) for DHW	16	3					Considered standard design for this building, considering the use of water based heat rejection for mechanical plant and central Reverse Cycle Heat Pumps for DHW.		
15.1c			Off Site Renewable Energy		Points are increased by 50% where a commitment is made to procure 100% Green Power. Connect building to low carbon district energy system and complete Green House Gas calculator.									
15.1d			District Services		1 Point to provide a plan to eliminate fossil fuels on site by 2030 and make plan public.									
15.1e			Transition Plan		2 Points are awarded where no fossil fuels are burnt on site (53% of total energy is acceptable if there are no other options and carbon offsets are implemented up front).	1						Based on use of electric heat pumps for domestic hot water and space heating.		
15.1f			Fuel Switching		1 Point where on site renewable energy storage is provided to match the requirements of the building to reduce evening peak demand.	2						Based on use of electric heat pumps for domestic hot water and space heating.		
15.1g			On-Site Storage											
15.1h			Renewable Energy					4				Based on 100kW PV Array	\$ 200,000	
15.1i			Overall Performance			2				1		FCDS expectations based on experience.		
15.1j			GHG reduction - Initiative 3											
16.1A	Transport	Peak Energy Reduction	Peak Energy DTS	1 Point awarded if project provides 15% of building peak in renewable energy	Provide renewable energy based on electrical engineer assessment of building peak load.	2								
16.1B			Peak Energy Reference Building	Reduce peak energy by 20% for 1 point or 30% for 2 points.	Complete building energy / thermal model and justify reduction.			1		1		Based on 100kW PV Array	\$ 50,000	
17.1	Sustainability Impacts from Transport	To reward projects that implement design and operational measures to reduce the carbon emissions from staff transport to and from the project compared to a benchmark building.	Public Transport Access	Up to 3 points are awarded based on the accessibility of the site by public transport. This score is determined by the Access by Public Transport Calculator	Complete assessment of space.	3	1					Site has reasonable connection to public transport.		
17.2			Reduced provision of car Parking	1 is awarded where there is a reduction of car parking spaces for staff or visitors in the proposed building when compared against the maximum rates allowed as determined by the Accessibility of the site.	GBCA limits car bays to 205 for 1 point. GBCA limits car bays to 277 for 0.5 points.	1						Site has more than 300 car bays.		
17.3			Low emission vehicle infrastructure	1 point is awarded where parking spaces for staff or visitors and/or dedicated infrastructure is provided to support the uptake of low-emission vehicles.	Provide alternate vehicle support. Requires 51 hybrid or small car bays, 17 electric vehicle bays and charging points or 9 car share spaces and vehicles.	1	1					Provision of a mix of sustainable parking options is recommended for the development.	\$ 50,000	
17.4			Active transport facilities	1 point is awarded where bicycle parking and associated facilities are provided to a proportion of staff, occupants, and short term visitors.	Provide 111 Residential Cyclist Facilities, 3 commercial / retail bike parks plus 9 Visitor cyclist bays	1	1					Current plans do not include commercial bike facilities or visitor facilities.	\$ 35,000	
17.5			Walkable neighbourhoods	1 point is awarded where either: At least 4 amenities (Class 7) or at least 8 amenities (all other classes) are within 400m of the development. OR The project achieves a walk score of at least 70 (Class 7) or at least 80 (all other classes), as determined by the website www.walkscore.com, using their 'street smart' method of calculation.	Complete assessment of space.	1	1					Site has ample local amenities		
17A			Transport Performance	Up to 10 points are awarded where the carbon emissions from staff transport to and from the building is predicted to be reduced and participation in active transport is increased, when compared to a benchmark building.	Reduce impacts against a reference building. Requires dedicated transport plan.	3		1		1		Consider undertaking transport performance approach, would be expected to achieve at least one point.	\$ 15,000	

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18.1	Potable Water	To encourage building design that minimises potable water consumption in operations.	Sanitary Fixtures	1 point is awarded where all fixtures are within one star of the best available WELS rating.	Provide suitable fixtures	1			1			Credit may be expensive if including Appliances. Allowance of \$1,000 per apartment.	\$ 178,000	
			Rainwater Reuse	1 point is awarded when a rainwater tank is installed to collect and reuse rainwater within the project's site boundary and the rainwater tank size meets the following criteria: 261.25 kl tank required		1			1			Could be considered, but likely to be an expensive credit.	\$ 130,500	
			Heat Rejection	2 points are awarded where no water is used for heat rejection.		2					2	Points would require central reverse cycle chiller to be achieved.		
			Landscape Irrigation	Drip irrigation and moisture sensor override installed or no water used for irrigation.		1	1					Provision of moisture detection in irrigation control is not considered onerous.		
			Fire System Test Water	The fire system does not expel water for testing; or The fire system includes temporary storage for 80% of the routine fire protection system test water and maintenance drain-downs for reuse on-site, and if sprinkler systems are installed, each floor must be fitted with isolation valves or shut-off points for floor-by-floor testing.	Credit is NA if: 2 A sprinkler system is not required under Part E of the NCC, or 3 A sprinkler system is not provided by the project team, and Does not include a water-based fire protection system.	1	1					Considered standard Practice		
			Potable Water Performance	Up to 12 points are awarded where it is demonstrated that building's predicted potable water consumption has been reduced below that of a 'Benchmark Building'. 12 Points represents 95% reduction.	Complete performance assessment and report	4				1		Credits would not be available if cooling towers are used.		
19A.1a	Material Life Cycle Impacts - LCA Approach	Assess and reduce the environmental impacts of building materials for the whole building over its entire life cycle.	LCA - Energy Efficiency	Up to 6 points are available where a whole-of-building whole-of-life (cradle-to-grave) life cycle assessment (LCA) is conducted for the project and a reference case. Points are awarded based on the extent of environmental impact reduction against six environmental impacts categories when compared to the reference case. Energy Points are capped at 5.	Employ eTool and request analysis - includes Peer Review Utilise EN 15978, 60 year life cycle (unless otherwise specified), all modules A to D Assess: Climate Change, Stratospheric ODP, Acidification Potential, Eutrophication potential, Tropospheric Ozone Formation, Mineral and Fossil Fuel depletion	3		3				Appointment of LCA professional to complete modelling and analysis. Points likely to be achieved based on energy performance.	\$ 30,000	
19A.1b			LCA - Materials											
19A.2a			LCA - Additional Category Reporting		Report on: Human Toxicity, Land Use, Resource Depletion, Ionising Radiation, Particulate Matter	4		1					\$ 10,000	
19A.2b			LCA-Material Selection Improvement	Up to 4 additional points are available for additional reporting and analysis, as follows:	Change at least one material selection following the initial LCA.									
19A.2c			LCA - Construction process Improvement		Change at least one construction process after the first iteration of the LCA.									
19A.2d			LCA - Design Review		Complete initial LCA review during concept design and present updates to the report as design progresses.			1					\$ 10,000	
20.1	Responsible Materials	To reward projects that include building materials that are responsibly sourced or have a sustainable supply chain.	Responsible Steel Fabricator	1 point is awarded when 95% of the buildings steel is sourced from a Responsible Steel Maker and or steel framed buildings, at least 60% of the fabricated structural steelwork is supplied by a steel fabricator/steel contractor accredited to the Environmental Sustainability Charter of the Australian Steel Institute (ASI); or * For concrete framed buildings, at least 60% (by mass) of all reinforcing bar and mesh is produced using energy-reducing processes in its manufacture (measured by average mass by steel maker annually).	Discuss requirements with main contractor and steel supplier	1	1					Considered standard practice for large projects.		
20.2			Certified Timber	1 point where at least 95% (by cost) of all timber used in the building and construction works is either: * certified by a forest certification scheme that meets the GBCA's 'Essential' criteria for forest certification or * is from a recycled source		1								
20.3			Best Practice PVC	2 point is available where 90% (by cost) of all cables, pipes, flooring and blinds in a project either: * Do not contain PVC and have an Environmental Product Declaration (EPD); or * Meet Best Practice Guidelines for PVC.		1	1					Considered standard practice for large projects.		
21.00	Product Transparency and Sustainability	To encourage sustainability and transparency in product specification.	Product Transparency and Sustainability	Up to 3 points are awarded when products meet transparency and sustainability requirements under one of the following initiatives: 1.1 Reused Products 1.2 Environmental Product Declarations 1.3 Third-Party Certification 1.4 Stewardship Programs 1.5 Manufacturer ISO 14001 certification	Points are calculated based percentage of compliant products. This is demonstrated by the Product Score (PS), which is the value of the compliant products multiplied by the Product Sustainability Factor, divided by the Project Contract Value (PCV). 3% = 1 Point, 6% = 2 Points, 9% = 3 Points	3				1		To be reviewed as design progresses.		
22.2	Reduction of Construction and Demolition Waste	To reward projects that reduce construction waste going to landfill by reuse or recycling building materials	Percentage Benchmark	1 point is awarded where the project reduces the amount of construction and demolition waste going to landfill to less than 90% of the total construction waste. Waste shall be reported in kg/m ²	Specify requirement for waste reduction and deliver outcome.	1	1					Standard practice for projects with single bin waste collection and offsite storage.		

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23.0	Ecological Value	To reward projects that improve the ecological value of their site	Endangered, Threatened or Vulnerable Species	To be awarded points in this credit, the project must demonstrate that no endangered, threatened or vulnerable species were present on the site at time of purchase.		0	0					Site does not include endangered, threatened or vulnerable species on site.		
23.1			Ecological Value	Up to 3 points are awarded where the ecological value of the site is improved by the project	The number of points is determined by the Green Star Change in Ecological Value Calculator	3	1					Site has no existing value. Use of native planting on site will achieve at least one point.		
24	Sustainable Sites	To reward projects that choose to develop sites that have limited ecological value, re-use previously developed land and remediate contaminate land.	Conditional Requirement	The Conditional Requirement is met where, 5 years prior to the project's Green Star Registration date, the project site meet the following conditions: * The project is not on land containing old growth forest * The project does not impact on any wetland listed as being 'High National Importance' * Where the project may have an impact on any wetland NOT listed as being of 'High National Importance', Wetland Protection Measures must be in place* * The project must not have a significant impact on 'Matters of National Significance' listed under the Environmental Protection and Biodiversity Conservation Act 1999		0	0					Conditional requirement met.		
24.1			Reuse of Land	1 point is awarded where either: 75% of the site was Previously Developed Land at the date of site purchase (see Compliance Requirements) or at the project's Green Star registration date for previously owned land.		1	1					Site was already built on.		
24.2			Contamination and Hazardous Materials	1 point is available where the site, or an existing building, was previously contaminated and the site has been remediated in accordance with a best practice remediation strategy.	* The site was contaminated such that the uses permitted under the relevant planning scheme were initially precluded or * A comprehensive hazardous materials survey has been carried out on any existing buildings or structures on the project site, in accordance with the relevant Environmental and Occupational Health and Safety (OH&S) legislation. * Where the survey identified asbestos, lead or PCBs in any existing buildings or structures the materials have been stabilized, or removed and disposed of in accordance with best practice guidelines; or the survey concluded that no hazardous materials were found in any existing buildings or structures on the project site.	1						Site is not expected to have been contaminated.		
25.1	Heat Island Effect	To encourage and recognise projects that reduce the contribution of the project site to the heat island effect.	Heat Island Effect	To meet the credit at least 75% of the site comprises one, or a combination, of the following: * Vegetation * Green roofs; * Roofing materials, including shading structures, having the following: o For roof pitched <15° a three year SRI >64; o For roof pitched >15° a three year SRI >84; Only where three year SRI for products is not available use the following: o For roof pitched <15° an initial SRI > 82; o For roof pitched >15° an initial SRI > 39; * Un-shaded hard-scaping elements with a three year SRI> 34 or an initial SRI >39; * Hard-scaping elements shaded by overhanging vegetation or roof structures; * Water bodies and/or water courses; and * Areas directly to the south of vertical building elements, including green walls and shaded by these elements at the summer solstice.	Review design and confirm finishes and colours.	1				1		Site is expected to have too much hardscape to achieve compliance requirements.		
26.1	Stormwater	To reward projects that minimise peak storm water flows and reduce pollutants entering public sewer infrastructure	Reduced Peak Discharge to Sewer	1 point is awarded where the post-development peak 2 year Average Recurrence Interval (ARI) event discharge from the site does not exceed the predevelopment peak 2 year ARI event discharge	Detention requirements	1				1		Method for stormwater discharge to be reviewed.		
26.2			Reduced Pollution Targets	1 one additional point, the first point must be awarded and all stormwater discharged from site meets the Pollution Reduction Targets in Column A of Table 1.	Filtration Requirements: * TSS - 80% * Gross Pollutants - 85% * Total Nitrogen - 30% * Phosphorus - 30% * Petroleum Hydrocarbons - 60% * Free Oil - 90%	1				1		Method for stormwater discharge to be reviewed.		
27.0	Light Pollution	To reward projects that minimise light pollution.	Light Pollution to Neighbouring Bodies	For the project to be awarded a point for this credit, the project must comply with AS 4282 'Control of the Obtrusive Effects of Outdoor Lighting'	External lighting compliance to meet this requirement.	0	0							
27.1			Light Pollution to Night Sky	1 point is available where it can be demonstrated that a specified reduction in light pollution has been achieved by the project. Two options are available for demonstrating a reduction in light pollution.	2a Relative to its particular mounting orientation, no external luminaire has an Upward Light Output Ratio that exceeds 5%; OR 2b Direct illuminance from external luminaires produces a maximum initial point illuminance value no greater than 0.5 lux to the site boundary and no greater than 0.1 lux to 4.5 metres beyond the site into the night sky, when modelled using a calculation plane set at the highest point of the building.	1	1					Light spill is to be minimised from the site.		
28	Microbial Control	To recognise projects that implement systems to minimise the impacts associated with harmful microbes in building systems.	Legionella Impacts in Refrigeration Systems	1 point is awarded where the building either: * is naturally ventilated; * has a waterless heat-rejection system; or * has a water-based heat rejection system that includes measures for Legionella control and a Legionella Risk Management Plan has been provided	Avoid the use of cooling towers.	1					1	Cooling towers are currently proposed.		
29	Refrigerant Impacts	To encourage operational practices that minimise the environmental impacts of refrigeration equipment.	Refrigerants Impacts	1 point is awarded where: The combined Total System Direct Environmental Impact of the refrigerant systems in the building is less than 15, OR The combined Total System Direct Environment Impact (TSDIE) of the refrigerant systems is between 15 and 35, AND a leak detection system is in place. OR All refrigerants in the project have an ozone depletion potential of zero, and a global warming potential of 10 or less; OR Where there are no refrigerants employed by nominated building systems, this point is awarded.	Specify refrigerant detection and low impact refrigerants. Note 0 ODP is minimum criteria	1						Credit could be achieved with chilled / heating water systems.		

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IEQ-iii	30A - Innovative Technology or Process	Indoor Plants	Plants	1 Additional point may be achieved when indoor plants are evenly distributed across the nominated area and are regularly maintained. At least 0.050m ² of planting per m ² of occupied space is required (excluding enclosed spaces <10m ²)	107 m ² of Planting							Not feasible in residential projects.		
IEQ-iv		Individual Thermal Comfort	Individual Thermal Comfort	One additional point is available where the project has achieved either the first or second Thermal Comfort point, is mechanically ventilated, and meets the requirements of the following requirements for individual thermal comfort control.	The individual comfort control system must allow control over at least one of the following: * air velocity; * temperature (whether radiant or from direct air temperature); or * air direction.							Not feasible in residential projects.		
ENE-i		Onsite Renewable Energy	Renewable Energy	Up to two points may be rewarded in the Innovation Category for installing renewable energy sources on site.	Renewable Energy Contribution (including shared renewable services) 15% = 1 Point 30% = 2 Points					2		Credit may be achieved, depending on final modelling.		
ENE-iv		Building Integrated Photovoltaics	BIPVs	1 point is available where Building Integrated Photovoltaic (BIPV) systems contribute to the reduction of greenhouse gas emissions by at least 15%. This point can be awarded in addition to the 'Onsite Renewable Energy' points highlighted above.	Incorporate a Building Integrated Photovoltaic (BIPV) systems that contributes to the reduction of greenhouse gas emissions by at least 15%.									
Wat-i		Potable Water Performance	Heat Rejection Systems in Equipment requiring process cooling	One Innovation point is available where water use from process cooling in medical, laboratory, or industrial equipment, is at least 10% of the building's total water consumption.	In such a case, an innovation point can be achieved if: * 95% of the water requirement for once-through cooling of equipment requiring process cooling is sourced from non-potable water; OR * All equipment requiring process cooling uses cooling systems other than once through cooling systems.									
Wat-ii		Potable Water Performance	Passive Treatment	Projects that use of passive water treatment systems (such as vegetation to treat water passively) to achieve at least one point in the potable water calculator.	Using the potable water calculator, the design team may claim an innovation point should the design utilise a passive water treatment system. This might include vegetations or the like.									
Emi-iii		Legionella Impacts	Microbial Control	A project team may claim an Innovation point where it is demonstrated that warm water systems have also been designed to manage the risk of microbial contamination. This may be done in association with operational practices that are to be implemented, as long as there are also design features that facilitate the achievement of the aim of the credit.				1				Central hot water systems can be supplemented with UV sterilisation relatively easily.	\$ 25,000	

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Man-ii	30B - Market Transformation	Soft Landings Framework	Soft Landings	1 additional point may be awarded where project teams carry out commissioning and tuning of the building in accordance with the Soft Landings Framework (BSRIA)	Contact GBICA to discuss this requirement.									
ENE-v		Greenhouse Gas Emissions	Passive Design	Projects that achieve more than 15 points through passive design or without energy generation or the purchase of offsets or Green Power in the 'Greenhouse Gas Emissions' credit can claim an Innovation point.										
ENE-ii		Early Adoption of BCA 2019	BCA 2019	2 Points are awarded where projects adopt BCA 2019 before the end of the transition phasing in April 2019.	Provide certificate from approving authority.									
Mat-ii		Life Cycle Impacts - Concrete	Sustainable sourcing of Concrete Aggregates	Project teams who demonstrate the use of concrete aggregates that have chain of custody, or come from a responsible source can claim an Innovation Category point										
Man-i	30C - Exceeding Benchmarks	Supplementary or Tenancy Fit out Systems Review	Tenancy Review	1 Point may be awarded where project teams and building owners carry out a comprehensive services and maintainability review of supplementary or tenancy fit out systems.				1				Comprehensive design review for tenancy spaces is expected to be undertaken.	\$ 20,000	
Man-iii		Building Air Permeability Rates	Facade Pressure Testing	Up to 2 points may be awarded where project teams can demonstrate air permeability rates from the normal (1 point) or Best practice (2 points) columns.								Can only be confirmed after testing.		
IEQ-i		Indoor Pollutants	Ultra Low VOC Paints	One additional point may be awarded where over 50% of paints (by cost) specified in the building have a maximum TVOC content of 5g/L.	This must be verified by one of the approved paint test methods.		1					Standard practice for Perth projects.		
IEQ-ii		Indoor Pollutants	Mattresses	One additional point may be awarded where 95% of all mattresses that are to be supplied to the building meet the Green Guard emission criteria for bedding listed in the table below. Health and hospitality only.	Formaldehyde 0.0135ppm (0.0165mg/m3) Total VOC 0.22mg/m									
ENE-iii		1 point is available where a reduction in Peak Electricity Demand of 45% is achieved 2 point is available where a reduction in Peak Electricity Demand of 60% is achieved	Peak Electricity Demand Reduction	Incorporate systems to reduce peak electricity demand significantly. This should be achieved through a mixtures of energy efficiency, on-site renewable energy and other technologies.						1		To be reviewed during modeling phase.		
Tra-i		Sustainable Transport	No new car parks on site	One (1) point will be awarded where no new car parking is provided on-site. This applies regardless of who operates the car parking, even if it's operated by an external party.										
Wat-iii		Potable Water	Discharge to sewer	An innovation point can be claimed for a 90% or greater reduction in flow to sewer as determined by the Potable Water calculator.										
Mat-i		Life Cycle Carbon Analysis	LCA	Exceed minimum performance in LCA by at least 150%	One additional point - up to two points - is available for each 20% improvement over 150%									
Mat-iii		Sustainable Products	Product Transparency and Sustainability	One (1) Innovation point is awarded where the percentage of compliant products is increased by 3% to 12%. A further 3% improvement is rewarded with a second point.										
Mat-iv		Reduction of Construction and Demolition Waste	Reduction of Construction and Demolition Waste	1 point is available where the construction and demolition waste going to landfill meets a fixed benchmark of 5 kg of waste per square meter of NLA.										
Emi-i		Stormwater Pollution Targets	Increased Reduction Targets	Up to two additional points may be awarded where projects can demonstrate achieving Pollution Reduction Targets from column B (1 point) or C (2 points) as stated in Table 26.3.	Currently, the use of biological treatment systems is generally considered the only viable method of achieving compliance with the Pollution Reduction Targets of column C.									
Emi-ii		Water Sensitive Urban Design	WSUD	Project teams may develop an Innovation Challenge that demonstrate that the criteria of the credit have been exceeded by employing Water Sensitive Urban Design principles.										

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inn-300.1	Innovation 300 - Innovation Challenges	1 Point To increase the availability of affordable, sustainable housing and to increase living affordability.	Affordable Housing	<ul style="list-style-type: none">* Demonstrate that the project contains a mix and diversity of lot sizes at an affordable purchase price for low to moderate income households. This may include the supply of social housing within the development, or through the provision of worker housing;* Establish partnerships between the project's owner and organisations dedicated to housing affordability to ensure the stock is allocated as intended; and* Provide an incentive program through rebates, free sustainability items, or reductions in the recommended retail price (RRP) for appliances to these occupants.										
inn-300.2		1 Point To encourage investment by projects in infrastructure for use by the broader community, such as the incorporation of spaces that are publicly accessible.	Community Benefits	<ul style="list-style-type: none">* Perform a 'needs analysis' of the surrounding community. This may include community briefings, meetings or workshops;* Develop a strategy for how the project will provide social/community benefits and consult with the broader community on the proposed plan; and* Implement the plan and deliver outcomes as defined by the community benefits strategy.										
inn-300.3		1 Point To encourage the use, interpretation and celebration of buildings with cultural heritage.	Culture, Heritage and Identity	<p>To claim this Innovation Challenge your project team must:</p> <ul style="list-style-type: none">* Demonstrate that the building selected is recognised as a place of heritage value, as defined in the Burra Charter or through a heritage listing within a state or local register.* Demonstrate how the building is occupied or has been significantly refurbished, in such a manner as to celebrate and makes visible heritage elements.* Make information on the heritage values of the building available to the public visitors to the site through site displays or a context aware smart phone application.										
inn-300.4		1 Point To increase the amount of information available to industry on the costs and benefits of sustainable building.	Financial Transparency	<p>To claim this Innovation Challenge your project team must:</p> <ul style="list-style-type: none">* Agree to complete the 'Financial Transparency Disclosure Template' that comprehensively itemises design, construction, documentation and project costs. In the case of building operations, the information provided will relate to the cost of collecting documentation, building operations and any building upgrades.* Provide this information in Excel format at the time of the project's Green Star submission.* Agree to participate in the yearly GBCA report, using anonymized data provided by project teams.	1							FCDS will complete this reporting.		
inn-300.5		1 Point To improve the sustainability performance of site offices thus increasing health and productivity outcomes of site workers.	High Performance Site Offices	<p>To claim this Innovation Challenge your project team must:</p> <ul style="list-style-type: none">* Review the 'High Performance Site Office Checklist' to understand the Innovation Challenge requirements.* Demonstrate that a site shed(s) that complies with at least 75% of the requirements in the Checklist has been procured and has been used by the majority of construction workers on site.* Demonstrate that an assessment of the satisfaction of the occupants of the site office was done during its use, and where issues were found, they have been addressed, ideally using BOSSA.					1			To be discussed with the contractor.		
inn-300.6		1 Point To support high-performance, cost-effective and health-promoting project outcomes through an early analysis of the interrelationships among systems.	Integrating Healthy Environments	<ul style="list-style-type: none">* Conduct an analysis of community health needs and outline the distribution of health issues among impacted communities.* Prioritize strategies to address identified needs. Identify actions that could be taken to enhance health supportive features of the project and those that could minimize potential risks. Identify actions that can be taken within the project's design, construction or operation that will promote health equity.* Intentionally implement selected strategies to address identified community and occupant health needs.* Develop a monitoring plan with performance metrics to evaluate the project's impact on occupant and community health throughout the project life cycle (design, construction and operations).										
inn-300.7		2 Points To encourage projects that use materials, products or services produced or generated within Australia.	Local Procurement	<p>There are two criteria available for this Innovation Challenge. Each is independent of the other.</p> <p>Local Products and Materials</p> <p>1 point is awarded where the project team demonstrates that a percentage of the products and materials used in the project were produced or manufactured in Australia.</p> <p>Local Services and Skilled Labour</p> <p>1 point is awarded where the project team demonstrates that a percentage of the services and skilled labour employed by the project come from the local area surrounding the site.</p>										
inn-300.8		1 Point To engage, educate and sell the benefits of sustainable building practices and Green Star to building occupants and the wider community through marketing information developed on the basis of comprehensive market research.	Marketing Excellence	<p>To claim this Innovation Challenge your project team must:</p> <ul style="list-style-type: none">* Develop methodology and perform market research on the investment drivers of end-users of the building. Re out or community e.g. likely investors, occupants or staff. Note that this is not intended to be generic market research based on published reports. Rather, it is market research that involves the project itself and potential likely end users.* Develop a marketing strategy that addresses these drivers in relation to the sustainability measures implemented.* Implement this marketing strategy and provide developed samples at the time of the project's Green Star submission.* Provide information on the benefits of sustainability in a public and prominent way within your building (or sales office).* Provide the information required to create a case study at the time of the project's Green Star submission.										
inn-300.9		1 Point To increase the availability of information on the benefits and outcomes of sustainable design practices and sustainable operation practices across the industry.	Occupant Engagement	<p>A. Occupant Survey 1 point is awarded where the Applicant carries out a pre and post occupancy survey.</p> <p>B. Connection to Nature 1 point is awarded where the project commits to providing ongoing feedback to 'Biophilic' research undertaken by Dr. Peter Fisher at RMIT University.</p>										
inn-300.10		Carbon Positive Roadmap	Powered By Renewables	* 1 Point if building services are 50% more efficient than typical and use 100% renewable energy (tenanted buildings only). Or										
inn-300.11		Carbon Positive Roadmap	Responsible Carbon Impacts	3 Points where building material carbon impacts are eliminated or offset										
inn-300.12		Carbon Positive Roadmap	Carbon Positive - New Buildings	1 Point where Refrigerant, Water, Waste and Transport Carbon Emissions are eliminated or offset.										
inn-300.13		Reconciliation Action Plan	Reconciliation Action Plan	1 Point To encourage organisations to take formalised steps to provide opportunities for Aboriginal and Torres Strait Islander peoples.	1. Develop a Reconciliation Action Plan (RAP) as defined and endorsed by Reconciliation Australia. The RAP must be endorsed by Reconciliation Australia. The Green Star project being rated must play a central role in the delivery of the Reconciliation Action Plan.									
inn-300.14		Social Enterprise for Affordable Housing	Affordable Housing	<p>A. Commercial Property(ies):</p> <ul style="list-style-type: none">* One point is awarded when the commercial property (or all commercial properties) that make up the Green Star project is / are registered as an 'H4H Participating Property(ies)', whereby the property owner agrees to donate to H4H 0.1% of the sale price at the time the property(ies) is / are sold (i.e. has a PC registered on Title); or* One point is awarded when the property owner enters an H4H Participation Agreement agreeing to donate to H4H 0.1% of the / all participating property(ies)' lease income during the term and extended term(s), payable at the start of each term or extended term.	<p>B. Residential Wholesale Property(ies):</p> <ul style="list-style-type: none">* One point is awarded when a wholesaler (developer, or urban renewal authority) sells all its residential properties that make up a Green Star project as 'H4H Participating Properties' (i.e. PC registered, or agreed to be registered, on Title); and* One additional point is awarded if the wholesaler also makes a donation to H4H of an amount equal to, or exceeding, 0.1% of the total of the sale prices of all properties that make up the Green Star project.									
inn-300.15		Social Return on Investment	Social Return on Investment	1 Point To recognise holistic methods to assess return on investment on the productivity, health and other social benefits provided by a project.	<ul style="list-style-type: none">* Complete an analysis of the direct costs and benefits provided by elements of the project above and beyond standard practice. This analysis can include those costs and benefits resulting from the sustainability initiatives implemented in targeting credits for your project's Green Star rating (excluding Innovation credits); and* Complete an analysis of the indirect costs and benefits provided by the project in the areas of productivity, health, crime									
inn-300.16		Universal Design	Universal Design	1 Point is awarded where the design meets best practice for Universal Design.						1		To be reviewed with Hassell.		

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Inn-300.17		Tenant Energy Disclosure	Tenant Energy Disclosure	1 Point is awarded where tenants provide detailed reporting on their energy consumption.			1					Credit is relatively simple to achieve with embedded network.		
Inn-300.20		Contribution to Industry Benchmarking	Industry Benchmarking	To claim this Innovation Challenge your project team must provide operational energy consumption data for at least 10 unique buildings. The data is required to include the following: I Building location (postcode); II Building size; III Space use; IV Energy consumption data for at least one (1) year; and V Hourly peak demand data for at least one (1) year. If a project team is unable to provide hourly peak demand data, the following hierarchy of data collection applies: hourly peak, daily peak and monthly peak. In providing this information to the GBCA, the project team must acknowledge that the GBCA has the right to publish this data in an anonymised format and include with data from other industry contributors to formulate publicly available benchmarks. Project teams are required to complete the 'Operational Energy Data' Excel template available on the GBCA website.						1		Recommend discussion with building owner for available data.		
Inn-30E.1a			Quality of Amenities Performance Pathway: Needs Analysis	1 point is available where a percentage of the nominated area is provided as a high quality, universally accessible, indoor/outdoor amenity space(s) intended for use by staff or regular occupants and suitable for their enjoyment. The size and qualities of the space(s) are determined via a needs analysis involving the target group.										
Inn-30E.1b		Green Star Interiors	Quality of Amenities Prescriptive Pathway: Amenity Space	1 point is available where at least 5% of the nominated area comprises high quality amenity space(s) (a general amenity area or, additional breakout space), intended for use by staff or regular occupants, and which meet at least three of the specified criteria for: interaction, ventilation, daylight, views, landscaping and noise.					1			Would require additional ~600m2 of amenity space on podium. Allowance of \$1,000 per m2.	\$600,000	
Inn-30E.2			Ergonomics	1 point is available where the work settings in the nominated area address the ergonomic needs of the user, and information is provided to support continuous use.										
Inn-30E.3		Green Star Communities	Community Investment	Points are available based on the level of investment in community infrastructure, demonstrated in accordance with one of the following compliance pathways: a. The infrastructure investment provided is at least \$4000 per residential dwelling, or b. The infrastructure provided is at least \$32 per square metre of non-residential space. Facilities: I Community centres; II Museums; III Schools; IV Universities; V Business incubation hubs; VI Hospitals and health care facilities; VII Child care facilities; VIII Indoor recreation centres; IX Public buildings; X Public transport infrastructure (including overpasses and bridges); XI Public art installations; XII Youth centres; XIII Religious facilities; and XIV Arts precincts.										
Inn-30E.4			Incentive Programs	Residential: Points are available based on the provision of incentives provided to encourage sustainable practices that reduce the ongoing cost of living and working, where the dollar value of incentives provided is ≥ \$750 per residential dwelling. Non-Residential: points are available based on the provision of incentives provided to encourage sustainable practices that reduce the ongoing cost of living and working, where the dollar value of incentives provided is ≥ \$6 per square metre of non-residential space.										
Inn-30E.5	Innovation 30E - Global Sustainability		Green Cleaning	1 point is available where cleaning services are delivered in accordance with a green cleaning policy or scope of works and are applicable to all common areas (i.e. areas controlled solely by the building owner). Develop green cleaning policy. Include details regarding: a. Environmental goals and objectives; b. Implementation procedures and strategies; c. Environmental performance measurements, including metrics; d. Quality assurance for ongoing improvement; e. Responsible parties; and f. Cleaning personnel requirements (including documented monitoring and reporting procedures).										
Inn-30E.6		Green Star Performance	Procurement and Purchasing	1 point is available where a Sustainable Procurement Framework is used to set commitment targets and measure results for purchasing consumables during the performance period.			1							
Inn-30E.7			Groundskeeping Practices	Site Maintenance Procedures 1 point is available where a best practice process to maintain landscaped areas and hard surface is in place and operational during the performance period.			1							
Inn-30E.8			Design for Resilience											
Inn-30E.9		BREEAM - New Construction 2014	Efficient Use of Land											
Inn-30E.10			Responsible Construction Practices											
Inn-30E.11			Integration with Public Art											
Inn-30E.12			Building related life-cycle costs											
Inn-30E.13		DGNB	Value Retention Suitability for Third Party Use											
Inn-30E.14			Backup Capacity of Technical Systems											
Inn-30E.15			Integrative Design Process											
Inn-30E.16		LEED	Design for Adaptability											
Inn-30E.17			Clean Construction											
Inn-30E.18			Social Equity in the Supply Chain											
Inn-30E.19			Habitat Exchange											
Inn-30E.20		Living Building Challenge 3.0	Beauty											
Inn-30E.21		HWB	Well Building Standard											
Inn-30E.22		Passive House	Passive House											
Inn-30E.23			Plastic Ban	Ban plastics from all tenancies on site.										