



DEPARTMENT OF PLANNING, LANDS AND HERITAGE	
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# Montario Quarter – Victoria House

ESD DA Submission

**Graham Agar**  
FULL CIRCLE DESIGN SERVICES



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# Full Circle Design Services

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<b>Description:</b>	<p>This document summarises the ESD inclusions for the proposed mixed use development for FJM property in Montario Quarter, Victoria House, Shenton Park in the City of Subiaco, WA.</p> <p>At schematic design stage, the report presents design features which are included in the documentation as well as outlining the intent of the team to reach the targeted 4-star Green Star equivalence.</p>

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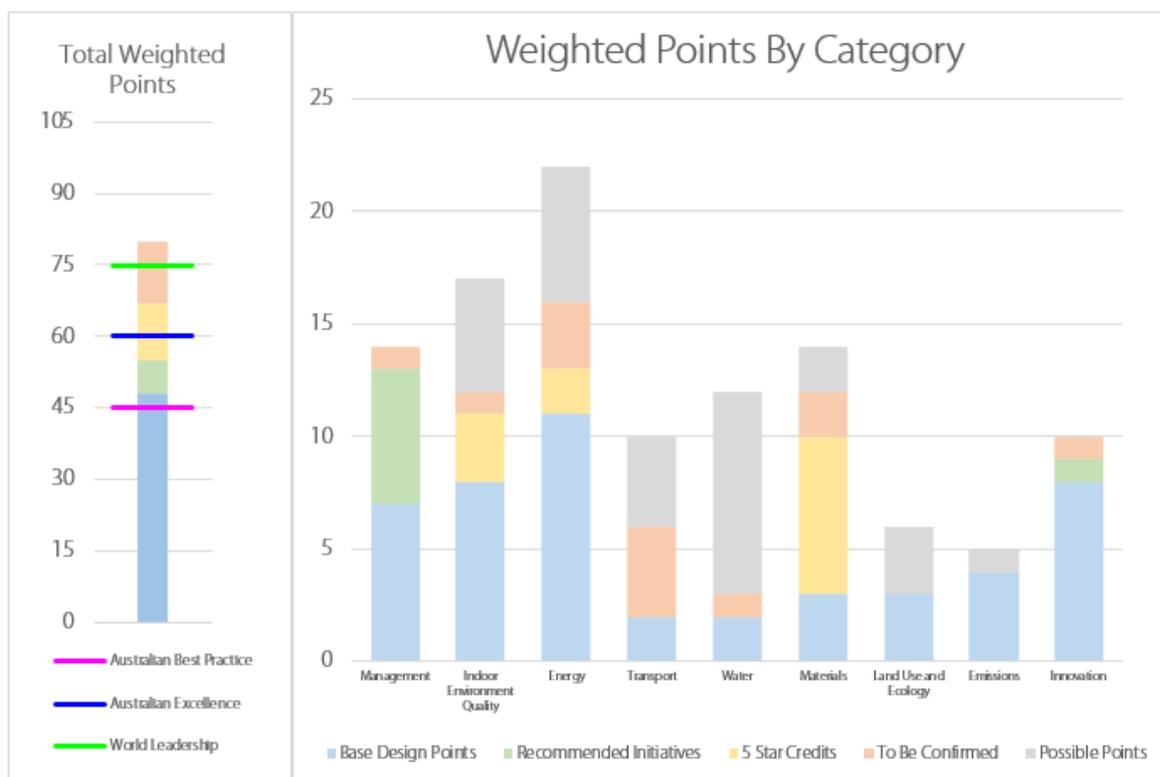


## Executive Summary

FJM Property have set a goal of achieving a self-assessed 4 Star Green Star Rating for the redevelopment at Victoria House, Shenton Park in the City of Subiaco. The project will reinvent the precinct and invigorate the heritage aspects of the Old Shenton Park Hospital. The development will integrate commercial spaces, retail and hospitality tenancies along with a variety of residential apartments and townhouses. A basement will be provided to deliver car parking to occupants and visitors.

The Old Shenton Park Hospital, Victoria House, is a heritage listed building that holds a strong connection to the health and wellbeing sectors. This redevelopment will pay homage to these sectors through a variety of strategies focusing on community and place making while ensuring occupant happiness and comfort.

Whilst Green Star equivalence is considered important, the project team will largely be targeting sustainable features which add value to owners and occupiers, in improved occupant outcomes and reduced operating expenses. This report outlines the intended sustainable design initiatives contained within the design and outlines the means by which the design team intend to demonstrate equivalence with 'Australian Best Practice in sustainable design – 4 Stars.



Based on FCDS current assessment of the project, the design would achieve 48 weighted points without significant modifications to design or costs – against a target of 45 points for a 4-star (Australian Best Practice) rating. In addition, the team has identified 7 points which we are recommended as adding value to the project, as well as achieving Green Star credits. There are a further 12 points identified as potential to reach 5 stars if desired, and 13 points which require further design development to confirm their applicability.

The design team are therefore very confident of meeting the target level of sustainable design inclusions.



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## 1. Introduction

Victoria House will, at completion, include three towers with a total of 81 apartments. In addition, the current design includes around some of commercial space, which is inspected to include food and beverage offerings, commercial and office space as well as retail outlets.

FJM Property have set a goal of achieving a 4 Star Green Star Rating for this development. It aims to reinvigorate the Old Shenton Park Hospital. This development is located close to good public transport links, with the Shenton Park train station less than 500m away.



The building is to be constructed on the site of the Old Shenton Park Hospital, Victoria House and will therefore be on a site which has previously been developed. The development will utilise portion of the existing heritage listed building, including the façade along with internal and external walls.



The three towers, rising on the western side of the site, will be between 4 and 6 stories tall respectively and will have access to views in all directions to either the city, and surrounding parkland and public open spaces.

This document summarises the current sustainable design initiatives which are expected to be included within the documentation and demonstrates how the overall project will achieve its target level of 48 points under a Green Star Design and As Built V1.2 self-assessment.



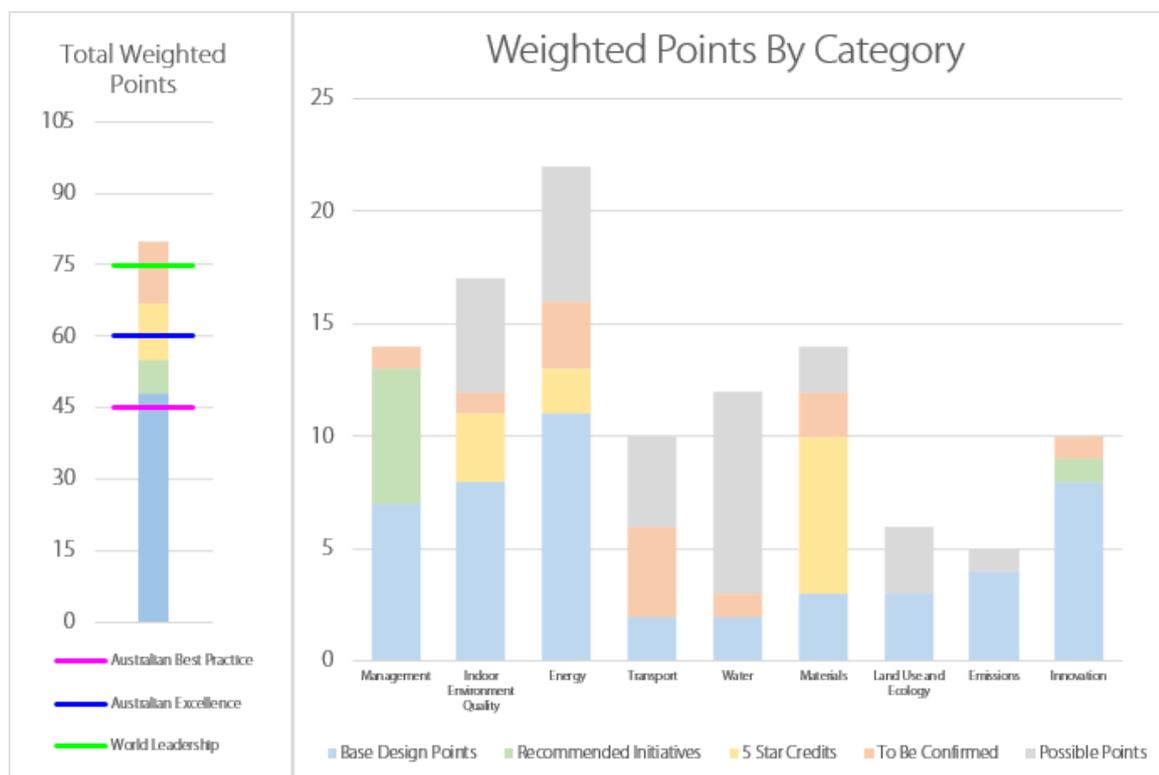
## 2. Sustainable Design Approach

The project brief for the Victoria House development includes the requirement to achieve a 4 star Green Star self-assessment under Green Star Design and As Built V1.2 – classified as Australian Best Practice in sustainable design. This is considered a high level of sustainable design features, however, the design team approach has been, firstly, to include elements which will add value to the project in terms of occupant amenity, sale-ability and reduction in operating costs.

Based on FCDS current assessment of the project, the design would achieve 48 weighted points without significant modifications to design or costs – against a target of 45 points for a 4-star rating. In addition, the team has identified 7 points which we are recommended as adding value to the project, as well as achieving Green Star credits. There are a further 12 points identified as possible, if desired to achieve a 5 star rating, and 13 points which require further design development to confirm their applicability.

The design team are therefore very confident of meeting the target level of sustainable design inclusions.

The graphs below show the overall point allocation, the majority of the credits being included in management, indoor environment quality, energy and materials. This reflects the approach above – amenity sale-ability and reduction in operating costs.



The following sections outline the credits within each category which are expected to be achieved.

Please also refer to the attached Green Star scorecard.



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## 2.1 Management Considerations

The following elements are expected to be included:

### 2.1.1 Green Star Accredited Professional

Graham Agar of Full Circle Design Services has been appointed the project ESD consultant and has been a GSAP (Green Star Accredited Professional) since 2008 and will fulfil this role for the project.

### 2.1.2 Commissioning and Tuning

The requirements for commissioning, maintenance reviews and building tuning are intended to be fulfilled by a commissioning agent, or similar professional who will oversee the commissioning and tuning of the building. Commissioning is intended to be carried out to international standards and may include building pressure testing on the façade.

Design team members are required to fully document commissioning requirements within their specifications, including:

- Design parameters
- Commissioning Activities
- Description of operation
- Witnessing requirements
- Performance requirements and allowable tolerances

### 2.1.3 Services and Maintainability Review

The project will undertake comprehensive services and maintainability review at key points in the design process prior to construction to identify any commissioning and maintenance issues as well as identify any performance opportunities. Tenancy fitout designs will also be reviewed to ensure optimal integration into the landlord systems.

### 2.1.4 Building Information

The project brief included the requirement for project handover documentation to be generated and maintained in an editable format on an online platform.

ESD specification will include the requirements for O+M information to be generated in accordance with the Green Star Benchmarks and to be provided in an online manner for future use. FCDS will also produce a design report which will act as a building users guide to present relevant information in a simple manner to facilities management and occupants.



The Green Building Council of Australia certifies that

**Graham Agar**

has obtained the following qualification

**Green Star® Accredited Professional**

The Green Star® Accredited Professional qualification recognises advanced knowledge, experience and competency in the application of the Green Star® rating tools.

Jul 2010 - Jun 2016 (Continual Enrolment)

**GSAP Training**

Design & As Built (Aug 2009)

Performance (Sep 2014)

**Romilly Madaw**  
Chief Executive  
Green Building Council of Australia





### 2.1.5 Commitment to Performance

As part of minimising life cycle costs, the design team have included an embedded meter network which will be connected to major electrical and water uses and individual occupants. The strata company is expected to monitor and report on common area usage through building operation. Digital reporting of energy performance to occupants is being considered by the design team.

The project team are also expecting to minimise the project end of life waste production by designing common areas with a 10+ year life expectancy.

### 2.1.6 Building Performance Monitoring

The building is to be provided with a metering and monitoring system which will allow review of energy and water consumption in real time as well as allowing historical analysis of data.

The metering system will include at least two levels (tiers) of metering, with all uses downstream of the main meter having a separate sub-meter to allow checking of accuracy.

The metering system shall be set up to produce alerts if any metering inaccuracy is found. Inaccuracies are defined as errors in excess of meter tolerances (eg, class 1 meters shall not have errors / inaccuracies of more than 2% due to metering accuracy class). Monitoring systems shall to report the maximum demand as well as consumption and be capable of providing reports on 15 minute, 60 minute, 24 hour, monthly and annual consumption.

### 2.1.7 Construction Environmental Management

The specification will include a requirement for the builder to be ISO 14001 certified and implement a site specific environmental management plan.

The specification will also include a requirement for on-site sustainability inductions for all contractors on site for more than three days – delivered as part of the safety induction.

### 2.1.8 Operational Waste

The design team currently includes a waste planning expert who is reviewing the flow of waste from the various uses within the building. As the design develops this will analysis will form the basis of an Operational Waste Management Plan (OWMP) that addresses best practice in waste management.



## 2.2 Indoor Environment Quality

### 2.2.1 Quality of Indoor Air

The design will provide natural ventilation as a means to provide outdoor air for apartments. Currently, the team are reviewing the potential to integrate outside air intakes with air conditioning systems to improve the control of air flow and air quality in the space.

In addition, all kitchen exhausts are to be ducted to outside the occupied zone, including for commercial kitchens on ground level.

### 2.2.2 Acoustic Comfort

The design team are to target acoustic comfort by:

- All spaces are to be within 5dB(A) of the satisfactory sound levels of AS 2107
- Commercial spaces are to achieve reverberation times in accordance with AS 2107 recommendations.

At this stage, the design team do not expect to achieve the requirements for noise separation.

### 2.2.3 Lighting Comfort

The electrical design will include high frequency ballasts or electronic ballasts for High Intensity Discharge lighting, with a minimum colour rendering index of 80 and a minimum of 3 McAdam ellipses for residential lighting.

Within apartments, the electrical design will include power points to facilitate the use of stand lamps or similar for local illumination of tasks, such as reading.

### 2.2.4 Visual Comfort

The design will be provided with strong solar passive design and external shading to avoid glare.

At least 40% of the floor area is expected to have good access to natural light, however, lux levels in kitchens may not be sufficient for the Green Star benchmark – this will be confirmed as the design progresses.

The above notwithstanding the design easily complies with the requirements for access to views, with most apartments being around 8m deep.

### 2.2.5 Reduced Exposure to Pollutants

The ESD specification will include emissions limits and reporting requirements for all:

- Paint
- Floor coverings
- Adhesives
- Sealants
- Composite wood products



## 2.2.6 Thermal Comfort

The residential component of the project is to be modelled in accordance with NatHERS protocols and is expected to achieve an average of at least 7 stars. As the design progresses, consideration will be given to increasing the average rating to 8 stars to further improve passive design and occupant comfort.

The commercial and retail area of the project will be mechanical designed to ensure optimal temperature conditions and air movement are obtained for occupant comfort.

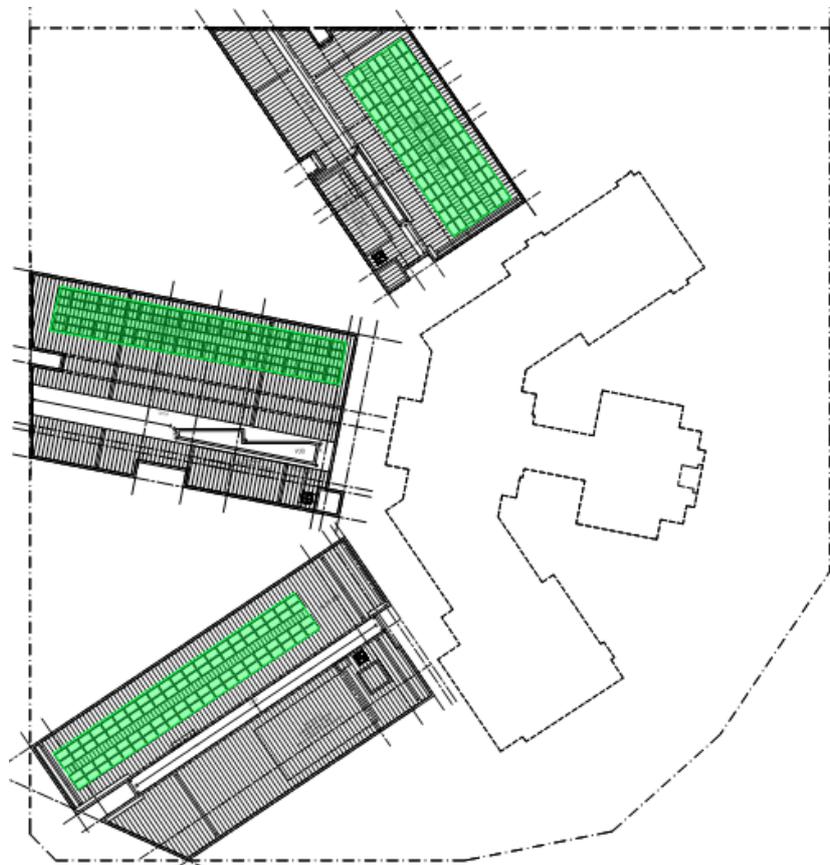
## 2.3 Energy

The design will be highly energy efficient, in terms of building envelope and services design. Indicatively, the design team will be aiming for:

- Increased insulation of ~15% over minimum BCA requirements in new construction areas
- Use of no more than 85% of the BCA allowance for glazing
- High efficiency mechanical plant, targeting 15% energy reduction over BCA allowances
- Use of solar PV – between 75kW and 100kW peak output.
- Use of natural gas for hot water generation

The features above are expected to reduce total energy consumption as well as peak energy consumption.

The roof layout below shows the intended areas for solar panel inclusion. The varied orientation means the design will have a flatter production curve and be less likely to export power from site – leading to better economic returns on the investment.





## 2.4 Transport

### 2.4.1 Public Transport

The site has reasonable access to public transport and local amenity provision will improve as the area is developed.

Bike parking will be facilitated for the area, including providing bike racks or similar for residents within their stores. The team is also considering other methods of mode transport to reduce reliance on standard fuel cars.

## 2.5 Water

### 2.5.1 Tapware

The design will review the potential to include tapware only which is within 1 star of the best WELS rating available, provided fittings which can provide good amenity and value for money are available:

Fixture Type	Best Available WELS rating
Taps	6 stars
Urinals	6 stars
Toilets	6 stars
Showers	4 stars*
Clothes Washing Machines	5 stars
Dishwashers	6 stars

\* Showers must use less than 7.5 l/minute to be considered compliant.



Air conditioning systems are expected to be air cooled, with limited water use for fire testing. Irrigation design is ongoing, but is expected to minimise usage through controls, plant selection and watering systems.

## 2.6 Materials

### 2.6.1 Responsible Materials

In addition to the above, the design is expected to include requirements for sustainable sourcing of steel and PVC (best practice or PVC replacement).

Depending on design progression, the team may also include requirements for timber procurement.

### 2.6.2 Material Selection

As described above, the team are recommending a materiality review be undertaken to select materials with low life cycle costs and improved environmental reporting. The majority of this analysis would be undertaken during DD.

A detailed analysis on building embodied energy and operational performance to minimise overall life cycle impact is being considered by the team. At this stage in the design initial considerations are focusing on longevity of selections and reduction of operational energy as far as practical.



### 2.6.3 Construction and Demolition Waste

The main construction contract will have a specified requirement to achieve at least 90% recycling rate. This performance has been reached recently by Instant Waste – a comingled construction waste collection and sorting facility.

## 2.7 Ecology

The site's ability to achieve points due to ecological impact is fairly limited.

The building is to be constructed on a previously developed site, with the existing building understood to have been decontaminated as part of Landcorp's work.

The design team will also be seeking – through the use of light colours and solar panels – to reduce the heat island effect of the site.

## 2.8 Emissions

### 2.8.1 Stormwater

The site will use a mixture of stormwater collection, storage and treatment, with on-site flows being captured and suitably filtered prior to infiltration back into the ground. By minimising exposed roads and car parks the design minimises the risk of contamination by free oils and hydrocarbons.

Indicatively the design is targeting filtration performance in either column B or C below:

Pollutant	Reduction Target (% of the typical urban annual load)		
	A	B	C
Total suspended solids (TSS) <sup>1</sup>	80%	80%	90%
Gross Pollutants	85%	90%	95%
Total Nitrogen (TN) <sup>2</sup>	30%	45%	60%
Total Phosphorus (TP) <sup>2</sup>	30%	60%	70%
Total Petroleum Hydrocarbons <sup>3</sup>	60%	90%	90%
Free Oils <sup>3</sup>	90%	90%	98%

<sup>1</sup> Load based on the following particulate size distribution (by mass): 20% <20 µm; 20% 20-60 µm; 20% 60-150 µm; 20% 150-400 µm; 20% 400-2000 µm.

<sup>2</sup> Load includes particulate and dissolved fraction.

<sup>3</sup> This requirement is not applicable where the site contains less than a total of 200m<sup>2</sup> of uncovered areas where vehicles are likely to transit and/or park e.g. roads, loading docks, refuelling bays, car parking etc.



## 2.8.2 Light Pollution

The project design is expected to comply with AS 4282 'Control of the Obtrusive Effects of Outdoor Lighting' – based on the assumption of residences adjacent.

In addition, relative to its particular mounting orientation, no external luminaire has an Upward Light Output Ratio that exceeds 5% or direct illuminance from external luminaries 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

Ongoing review of landscaping and building security lighting will test these assumptions as design progresses.

## 2.8.3 Microbial Control

The design will not include cooling towers which therefore significantly reduces the risk of microbial growth on the project.

In addition, the team will review the potential to include a pasteurization cycle, or UV sterilisation in the hot water system to kill legionella bacteria in the water.

## 2.9 Innovation

Innovation in Green Star could best be renamed as 'other'. The category includes a number of ways to score points, including world or Australian sustainable design firsts, as well as exceeding benchmarks for other credits, market transformation and social sustainability.

### 2.9.1 Heritage and Identity

The project is respectfully reusing the former Victoria Hospital administration block and ward building as the commercial and retail hub of the development

### 2.9.2 Tenancy Review

The design team will review any tenancy fit out designs for compliance with base building design intent.

### 2.9.3 High Quality Amenities

The project is providing high quality amenity spaces for the occupants, in the form of the commercial and retail hub and surrounding parklands. These areas will provide an opportunity for social interaction and access to the natural environment both visually and physically.

### 2.9.4 Ultra Low VOC Paints

The design is seeking to utilise very low VOC (<5 g/Ltr) paints for walls and ceilings. These areas make up more than 50% of the total internal painting on site and will contribute to improved air quality outcomes for occupants.

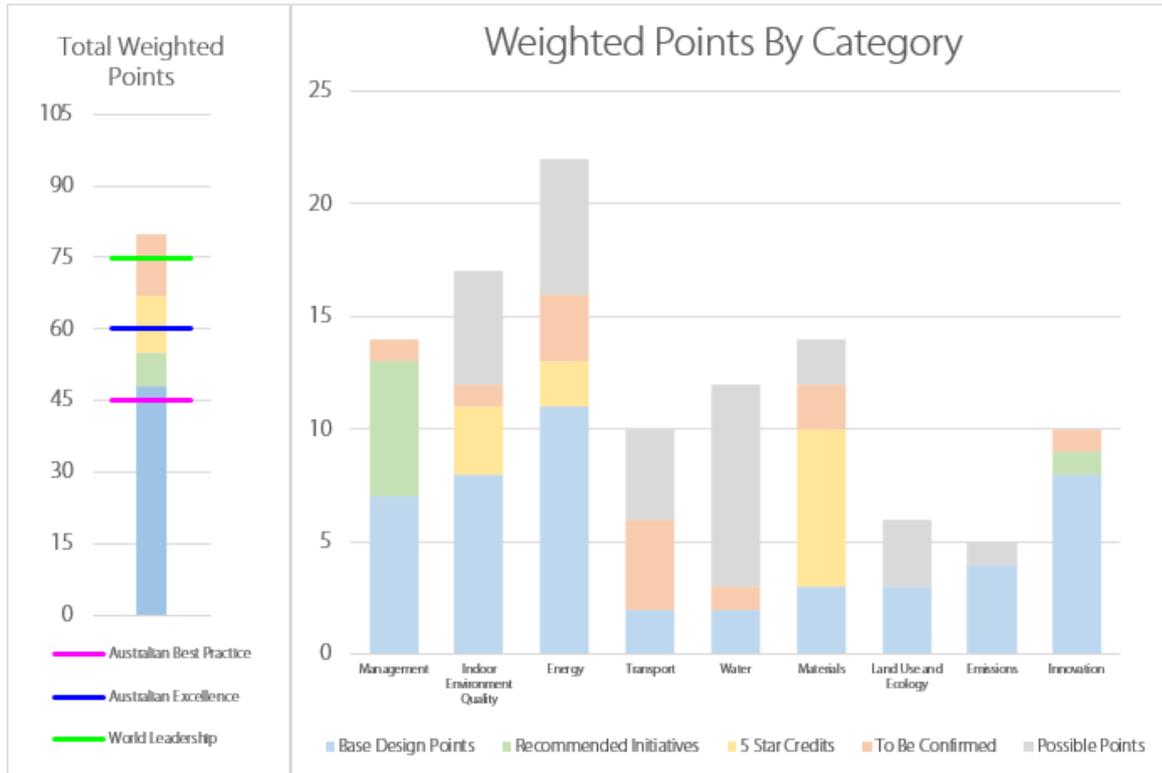
### 2.9.1 Occupant Engagement

The project team are reviewing the potential to undertake occupant survey and analysis as part of the handover process. The survey will include sustainability metrics which will allow the designers to review inclusions and make informed decisions for future projects around ESD features and real outcomes.



### 3. Conclusion

As noted above, the design team are confident that the solutions, as nominated above, will achieve an overall outcome of more than 45 points in the self-assessment.



Currently, the design team have identified 48 points which are considered standard design, or a briefed requirement for the project.

In addition to the standard design elements, there are a further 7 points which are recommended for consideration or inclusion and six points which could be included to assist with Green Star outcomes. There are also 13 points which require further design development to determine their status.

The current design will easily exceed the required self-assessed 4 star target level, however there is the opportunity to stretch the target of the project to a 5 star level, with the inclusion of the 7 recommended initiatives and a further 12 credits identified for inclusion.



# Full Circle

## Design Services

Planning | Design | Delivery | Performance

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# OCCUPANT SATISFACTION

Credit number 14

Points available: 4

## AIM OF CREDIT

To encourage the assessment of thermal comfort, acoustics, indoor air quality, lighting and any other comfort issues for building occupants and promote high occupant satisfaction levels.

## CREDIT CRITERIA

14.1	Action	Occupant Satisfaction Survey	1 point is available when at least one occupant satisfaction survey is carried out during the <i>performance period</i> .
14.2	Data	Occupant Satisfaction Levels	Up to 3 points are available where survey respondents indicate the level of satisfaction during the <i>performance period</i> .

## COMPLIANCE REQUIREMENTS

For purposes of credit criteria 14.1 and 14.2, the Occupant Satisfaction Survey must be delivered to the regular occupants of all *primary spaces* in the building. A space may be excluded from the survey if its use requires specific non-comfort based internal conditions.

## INITIAL CERTIFICATION

### 14.1 OCCUPANT SATISFACTION SURVEY

One (1) point is awarded when at least one occupant satisfaction survey is carried out in accordance with the following requirements. Two separate compliance pathways are provided for this criterion.

- A. Conduct an occupant satisfaction survey in line with 14.1A; or
- B. Complete a NABERS Indoor Environment rating 14.1B.

#### 14.1A CONDUCT OCCUPANT SATISFACTION SURVEY

##### 14.1A.1 Survey delivery

The Occupant Satisfaction Survey ('the survey') must be delivered to regular occupants during the *performance period*. Applicants must:

- a. Deploy a recognised survey in accordance with 14.1.2;
- b. Achieve at least the response rate for a  $\pm 10\%$  precision level, as detailed in 14.1.3; and
- c. Share the responses with the Green Building Council of Australia (GBCA).

##### 14.1A.2 Recognised surveys

Recognised surveys that are suitable for use with this credit include:

- Building Occupant Satisfaction Survey Australia (BOSSA), (**GBCA recommended survey**);
- Occupant Indoor Environment Quality (IEQ) Survey; and
- Building User Survey (BUS).

Note: See Guidance section for further information on recognised surveys and links to their websites.

### 14.1A.3 Sample size and response rates

Responses must be collected from a representative sample of regular building occupants. The total number of responses must be calculated as a factor of the number of full-time equivalent (FTE) people who work at the premises (this excludes visitors). The minimum required response levels for a given 'population' of full-time-equivalent people in the building, must at least equal the sample specified in Table 1, for a precision level of +/-10% (given a confidence level of 95%).

**Table 1: Sample size by population**

(For  $\pm 5\%$ ,  $\pm 7\%$  and  $\pm 10\%$  Precision Levels where Confidence Level is 95% and  $P=0.5$ )

Size of Population	Sample Size (n) for Precision (e) of:		
	$\pm 5\%$	$\pm 7\%$	$\pm 10\%$
100	81	67	51
125	96	78	56
150	110	86	61
175	122	94	64
200	134	101	67
225	144	107	70
250	154	112	72
275	163	117	74
300	172	121	76
325	180	125	77
350	187	129	78
375	194	132	80
400	201	135	81
425	207	138	82
450	212	140	82
500	222	145	83
600	240	152	86
700	255	158	88
800	267	163	89
900	277	166	90
1,000	286	169	91
2,000	333	185	95
3,000	353	191	97
4,000	364	194	98
5,000	370	196	98
6,000	375	197	98
7,000	378	198	99
8,000	381	199	99
9,000	383	200	99
10,000	385	200	99
15,000	390	201	99
20,000	392	204	100
25,000	394	204	100
50,000	397	204	100
100,000	398	204	100
>100,000	400	204	100

Source: Determining Sample Size, <http://edis.ifas.ufl.edu/pd006>

## 14.1B NABERS INDOOR ENVIRONMENT RATING

For this pathway, one (1) point is awarded where the building has achieved a NABERS Indoor Environment rating after January of 2015 that was conducted during the Performance Period or is valid for at least three months of the performance period.

## 14.2 OCCUPANT SATISFACTION LEVELS

Up to three (3) points are awarded based on the outcomes of the occupant satisfaction survey. Two separate compliance pathways are provided for this criterion.

- A. Conduct an occupant satisfaction survey in line with 14.1A; or
- B. Complete a NABERS Indoor Environment rating 14.1B.

## 14.2A OCCUPANT SATISFACTION MARKET POSITION

For this pathway up to three (3) points are awarded based on the average score across the following five occupant survey areas:

- Indoor air quality — outdoor air, stuffiness;
- Thermal comfort — indoor temperature, air speed or drafts, access to controls;
- Acoustic comfort — internal noise, noise levels from HVAC, noise from outside;
- Daylight and artificial lighting — brightness, access to controls; and
- Building cleanliness — cleanliness, odours, maintenance.

Points are awarded in accordance with Table 2 'Occupant satisfaction market position'. A higher the market position percentile value correlates to a higher occupant satisfaction level when compare with other buildings in the market.

**Table 2 Occupant satisfaction market position**

Market position (Percentile)	Points Awarded
0 <sup>th</sup> to 50 <sup>th</sup> percentile	0
50 <sup>th</sup> to 65 <sup>th</sup> percentile	1
65 <sup>th</sup> to 80 <sup>th</sup> percentile	2
80 <sup>th</sup> to 100 <sup>th</sup> percentile	3

## 14.2B OCCUPANT SATISFACTION LEVELS - NABERS

For this pathway, up to three (3) points are awarded based on the Market Position (score) in the NABERS Indoor Environment report for each of the five survey areas as specified in 14.2A. The market position score is a percentile value and points are awarded based on Table 2. The NABERS Indoor Environment report must be in accordance with 14.1B.

## RECERTIFICATION

### 14.1 OCCUPANT SATISFACTION SURVEY

One (1) point is awarded when at least one occupant satisfaction survey is carried out to the regular occupants of all *primary spaces* in the building.

The focus of this credit criterion is data from the relevant *performance period*. On this basis the Compliance Requirements for Recertification are the same as Initial Certification. Please make reference to the Compliance Requirements for 14.1 Occupant Satisfaction Survey as detailed under Initial Certification.

### 14.2 OCCUPANT SATISFACTION LEVELS

Up to three (3) points are awarded based on the outcomes of the occupant satisfaction survey.

The focus of this credit criterion is data from the relevant *performance period*. On this basis the Compliance Requirements for Recertification are the same as Initial Certification. Please make reference to the Compliance Requirements for 14.2 Occupant Satisfaction Levels, as detailed under Initial Certification.

## DEFINITIONS

**Performance Period** – Relates to the continuous time period against which a credit is measured or data is collected. It is the most recent 12-month period of operations preceding the submission for certification. However, there is a 90-day grace period between the end of the *performance period* and the submission date, to allow applicants to gather the required documentation.

**Primary space** –Is an area where a person is expected to work, or remain for an extended period of time. These spaces include (but are not limited to):

- Offices, either open plan or private;
- Classrooms, staff offices, computer labs;
- Commercial kitchens and preparation areas where food is sold;
- Retail / sales floor, exhibition halls, multi-purpose rooms (as a general setting); and
- Industrial spaces, warehouse areas, shop floors, work stations.

These examples are indicative, and the predominant use of the space determines the space type classification. Where the functional requirements of the space demand specific conditions, (e.g. laboratories, auditoriums, cinemas, or archives), exclusions may be justified in a Credit Interpretation Request (CIR).

**Percentile** – is a statistical measure that indicates the percentage of occurrences that fall below a given occurrence. For example the 75<sup>th</sup> percentile indicates that 75% of all occurrences fall below that value. Or conversely a value in the 75<sup>th</sup> percentile is in the top 25% of all occurrences. The percentile index is used to rank response levels for occupant satisfaction surveys giving the applicant an understanding of where their building performs relative to the rest of the market.

## GUIDANCE

### RECOGNISED SURVEYS (14.1)

Occupant satisfaction surveys are used to evaluate the degree to which buildings enable their users to fulfil their intended goals. A comprehensive building occupant satisfaction survey method includes assessments of occupant wellbeing, and interactions with their indoor environment. These surveys complete the feedback loop, essential for the successful management and improvement of operational practices in high-performing buildings.

Surveys recognised in this credit include:

- Building Occupants Survey System Australia (BOSSA), University of Sydney, Australia
- Occupant Indoor Environment Quality (IEQ) Survey, Centre for Built Environment, University of California Berkeley, United States
- Building User Survey (BUS), United Kingdom

### **Building Occupants Survey System Australia (BOSSA)**

The Green Building Council of Australia (GBCA) has joined the Management Committee for Building Occupants Survey System Australia (BOSSA), developed by the University of Sydney and other partners. The BOSSA survey is recommended for use with this credit.

BOSSA is a post occupancy evaluation (POE) system for Australia's office buildings. As the BOSSA database grows with each additional building surveyed, it will underpin an ongoing program of architectural science research aimed at improving occupant health, comfort and productivity outcomes from sustainable office buildings. The BOSSA POE questionnaire is comparable to existing international benchmarking systems such as Building User Survey (UK) and Centre of Built Environment Berkeley (USA).

## USE OF NON-RECOGNISED SURVEYS (14.1.2)

Where a recognised survey is not used, an alternate third-party peer-reviewed survey may be used subject to GBCA approval. To be recognised in Green Star – Performance any survey must at least cover; indoor air quality, thermal comfort, acoustics comfort, daylight and artificial lighting, and building cleanliness.

The survey must be based on a 7 point scale for responses, with the mid-point response indicating a 'neutral' reaction.

Where applicants wish to use a survey other than a recognised survey listed in the credit they should contact the GBCA for approval through a credit interpretation request (CIR).

## SAMPLE SIZE AND RESPONSE RATES (14.1.3)

Survey sample sizes and related response rates can be determined using Table 1 for any population size bigger than 100. A precision rate of at least 10% must be achieved. For population sizes smaller than 100 response rates must be at least 75%.

For all population calculations, the number of regular occupants should be taken as the maximum number of occupants regularly working at the premises during the *performance period*. Where there is no access to more precise figures, population sizes can be estimated by using typical occupancy on a persons per square meter basis.

The sample sizes of Table 1 reflect the number of obtained responses and not necessarily the number of surveys distributed or interviews carried out.

## ALTERNATIVE COMPLIANCE METHODS

A Credit Interpretation Request (CIR) may be submitted to the Green Building Council of Australia (GBCA) when an applicant wishes to advocate for an alternative yet equivalent method of meeting Compliance Requirements. It is a formal process, reviewed either by the GBCA, or by independent external assessors, depending on the complexity of the issue.

A Credit Interpretation Request and other queries may be submitted by accessing the Green Star Project Manager page on the GBCA website.

## STANDARDS AND GUIDELINES

### Referenced documents

The following documents are referenced in this credit:

Building Occupants Survey System Australia (BOSSA), University of Sydney, Australia

<http://www.bossasystem.com/occupant-survey>

Occupant Indoor Environment Quality (IEQ) Survey, Centre for Built Environment, University of California Berkeley, United States

<http://www.cbe.berkeley.edu/research/survey.htm>

Building User Survey (BUS), United Kingdom

<http://www.busmethodology.org.uk/>

## DOCUMENTATION REQUIREMENTS

### INITIAL CERTIFICATION

#### Submission Template

Complete the Submission Template 14 *Occupant Satisfaction*.

#### Supporting Documents

Provide supporting documentation as required to demonstrate compliance. This may include:

##### 14.1 Occupant satisfaction survey and 14.2 Occupant satisfaction levels

- A copy of the Occupant Comfort Survey Results; or
- A valid NABERS IE report for the building.

### RECERTIFICATION

#### Submission Template

Complete Recertification Submission Template 14 *Occupant Satisfaction*.

#### Supporting Documents

Provide supporting documentation as required to demonstrate compliance. This may include:

##### 14.1 Occupant satisfaction survey and 14.2 Occupant satisfaction levels

- A copy of the Occupant Comfort Survey Results; or
- A valid NABERS IE report for the building.

## REVISIONS AND AMENDMENTS

Version No.	Date of Release	Description
1.1	08/04/2016	Minor wording corrections throughout to improve clarity. Included requirements for <i>Recertification</i> throughout the credit, clearly labeled as such.
1.0	03/03/2015	Initial release.

DEPARTMENT OF PLANNING, LANDS AND HERITAGE	
DATE	FILE
25-Jul-2019	208-5-1

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## Design and As Built V1.2 Green Star Credit List

## Montario Quarter

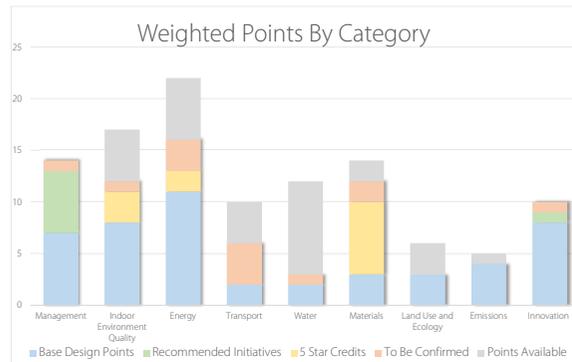
This is the schematic phase self assessment for the Lot 38 Montario Quarter project. The scorecard represents an initial expectation of credits and performance, based on revised architectural drawings from May 2019, the project brief, discussions with FJM and FCDS experience with the rating tool. This document is intended to be the basis for goal setting and feasibility analysis for a formal Green Star rating. It is in no way equivalent to a formal Green Star certification.

<b>Project Name</b>	Montario Quarter
<b>Project Number</b>	2018_034
<b>Client Name</b>	FJM Property
<b>Issue Date</b>	18th June 2019
<b>Revision</b>	D
<b>Reason for Issue</b>	Schematic Design / DA

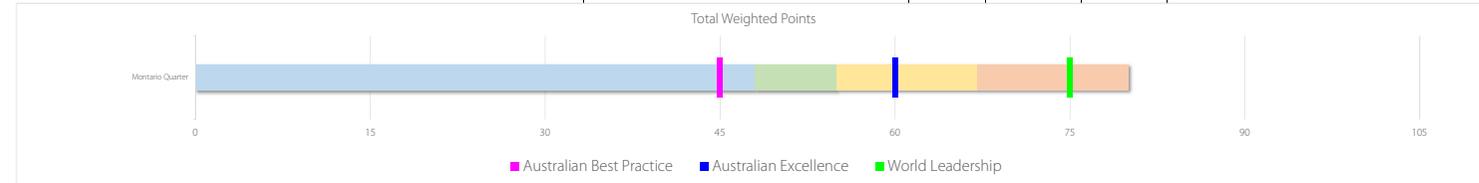
<b>GFA</b>	
<b>NLA</b>	
<b>Building Type</b>	Multiple Dwelling & Mixed use
<b>Building UFA</b>	
<b>Building GFA</b>	
<b>Number of Car Bays</b>	
<b>Number of Occupants</b>	
<b>Local Council</b>	MRA / City of Subiaco / City of Nedlands
<b>Building Owner</b>	FJM Property
<b>Building Tenant</b>	Various

<b>ESD Consultant</b>	FCDS
<b>Project Manager</b>	FJM Property
<b>Architect</b>	MJA / Finespun
<b>Fire Engineer</b>	Floth
<b>Mechanical Engineer</b>	Link Engineering
<b>Electrical Engineer</b>	Best
<b>ICA</b>	
<b>Building Surveyor</b>	MNG
<b>Hydraulic Engineer</b>	Floth
<b>Structural Engineer</b>	Hera
<b>Civil Engineer</b>	JDSi
<b>Acoustic Engineer</b>	
<b>Waste Consultant</b>	
<b>Climate Change Modeller</b>	
<b>Transport Planner</b>	Flyt
<b>Landscape</b>	
<b>Life Cycle Modeller</b>	
<b>Quantity Surveyor</b>	
<b>Façade Engineer</b>	

Category	Available Points	Base Design Points	Recommended Initiatives	5 Star Credits	To Be Confirmed	Points Not Achieved	Total Cost	Cost Per Point
Management	14	7	6	0	1	0	\$ 90,500	\$ 6,464
Indoor Environment Quality	17	8	0	3	1	5	\$ 900,000	\$ 75,000
Energy	22	11	0	2	3	6	\$ 105,000	\$ 6,563
Transport	10	2	0	0	4	4	\$ -	\$ -
Water	12	2	0	0	1	9	\$ -	\$ -
Materials	14	3	0	7	2	2	\$ 14,000	\$ 1,167
Land Use and Ecology	6	3	0	0	0	3	\$ -	\$ -
Emissions	5	4	0	0	0	1	\$ -	\$ -
Innovation	10	8	1	0	1	0	\$ 25,000	\$ 2,500
<b>Total</b>	<b>100</b>	<b>48</b>	<b>7</b>	<b>12</b>	<b>13</b>	<b>30</b>	<b>\$ 1,134,500</b>	<b>\$ 14,181</b>



Credit	Cost	Cumulative Points	Cumulative Cost
Implementation of a Climate Adaptation Plan	\$ 7,500	50.00	\$ 57,500
Building Systems Tuning	\$ 13,000	51.00	\$ 70,500
Environmental Building Performance	\$ 15,000	52.00	\$ 85,500
Building Commissioning	\$ 25,000	53.00	\$ 110,500
Occupant Engagement	\$ 25,000	54.00	\$ 135,500
Independent Commissioning Agent	\$ 30,000	55.00	\$ 165,500
LCA - Materials and Additional Life Cycle Impact Reporting	\$ 8,000	59.00	\$ 173,500
LCA - Energy Efficiency	\$ 6,000	62.00	\$ 179,500
GHG reduction - Initiative 2	\$ 105,000	64.00	\$ 284,500
Provision of Outside Air	\$ 400,000	66.00	\$ 684,500
Advanced Thermal Comfort	\$ 500,000	67.00	\$ 1,184,500



Ref No.	Title	Aim of Credit	Sub-Element	Credit Criteria Summary	Design Team Actions	No. of Points Available	Base Design Points	Recommended Initiatives	5 Star Credits	To Be Confirmed	Unlikely Points	Comments	Approximate 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	Commissioning and Tuning	To encourage and recognise commissioning, handover and tuning initiatives that ensure all building services operate to their full potential.	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 have completed an OPT		
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						Services and maintainability reviews will be undertaken on tenancies to identify performance improvement opportunities.	
2.2			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					Building air tightness testing is a minimum requirement of the credit. Relatively few practitioners are available in Perth.	\$ 25,000
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					Tuning is to be undertaken by the building modeller to compare performance against predictions. Tuning extent is only for common areas, not individual dwellings.	\$ 13,000
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					Independent commissioning agents provide value for complex projects.	\$ 30,000
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	2 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				Climate change risk assessments provide benefits to long term building owners. Recommend review works that have been done for the precinct as part of a Green Star communities rating.	\$ 7,500	
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 and BMS * Lighting Controls * Electrical Systems * Hydraulic Systems * Fire Protection Systems * Lifts and other vertical transport systems * Building Envelope	1	1					Building O+M's and users guides will be produced by the contractors. FCDS design report will include building user information.		
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.	* Strata company monitor and report performance of building to occupants.	1		1				Building performance monitoring is strongly recommended to ensure design meets documented intent. Requirement to achieve the credit is for strata to commit to ongoing monitoring and reporting of performance to occupants. Cost is to implement this for the first 12 months.	\$ 15,000	
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 fitouts or other building attributes.	* Common area finishes to have a life cycle of at least 10 years, barring minor wear and tear and damage.	1	1						Credit is for strata to maintain common area finishes for a minimum of 10 years. Design is to include high durability products, modular and natural finishes where possible.	
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					Building metering will be provided for main uses and individual apartments.		
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						Design will include an embedded network for billing and distribution of solar or other renewable energy. Minimal additional costs for green star.	
7.0	Responsible Construction Practices	To reward projects that use best practice formal environmental management procedures during construction.	Environmental Management Plan	The conditional requirement is met where a comprehensive project-specific Environmental Management Plan (EMP) is in place at construction.	Develop project specific best practice EMP.	0	0							
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						Builder would be expected to comply with these requirements for this type of building.	
7.2			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 OHS 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		Additional health and wellbeing initiatives to be reviewed with proposed contractor.	
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 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					Design of waste store and recycling are critical for successful building operation. Discuss with Contractor accordingly. Encycle are providing design advice for space planning and operational considerations.		

Ref No.	Title	Aim of Credit	Sub-Element	Credit Criteria Summary	Design Team Actions	No. of Points Available	Base Design Points	Recommended Incentives	5 Star Credits	To Be Confirmed	Unlikely Points	Comments	Approximate Cost	
91	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					1	Credit is very difficult to achieve, except with large, central air handling units.		
92			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: * 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	Requires outdoor air for apartments to be ducted and/or controlled for entry into the conditioned space. Retail / commercial areas would require CO2 detection within the space.	2			2				Increased outside air has performance improvement outcomes, however, typical apartment design does not include dedicated ducting or control of outside air intakes.	\$ 400,000
93			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 dedicated kitchen exhaust risers and photocopy exhaust for each office.	1	1							Apartments will be provided with ducted exhaust, as will the food and beverage tenancy with cooking capability.
100	Acoustic Comfort	To reward projects that provide appropriate and comfortable acoustic conditions for occupants.	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					Internal noise levels should target compliance with AS 2107		
			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	1	1						Reverberation times is considered N/A for Apartments - Applicable for office space	
			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 + LAeqT > 75	1						1	Acoustic consultant has advised that this credit is expected to be very expensive to achieve.	
110	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 and 3 McAdam Ellipses for Residential Lighting	0	0					Lighting design will achieve this outcome.		
111			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 1801-2006 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	Difficult to achieve in apartments		
112			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	For residential, provide at least one wall in each living space, kitchen and bedroom with specific wall washing or wall mounted fittings.	1						1	Difficult to achieve for most projects.	
113			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							Compliance for apartments includes provision of electric socket for standlamps or similar in living areas and bedrooms.
120	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 are automatically deemed compliant, shading schemes for commercial areas to be reviewed.		
121			Daylight	Up to 2 points are available where a percentage of the nominated area receives high levels of daylight during 80% of the nominated areas. * 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	1	Apartments are generally relatively shallow, with daylight provision to living areas, however, Green Star benchmarks are very high.	
122			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.	Complete assessment of space.	1	1							Apartments are generally less than 8m deep and have good access to views.
131	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 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.	Paints, adhesives and sealants to comply with Green Star criteria.	1	1					Considered standard practice.		
132			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							
141	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.	Complete building energy / thermal model. PMV with +/-1	1	1					Average of 7 Star NatHERS required		
142			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.	Complete building energy / thermal model. PMV with +/-0.5	1				1			Average of 8 Star NatHERS suggested for residential spaces	\$ 500,000

	Ref No.	Title	Aim of Credit	Sub-Element	Credit Criteria Summary	Design Team Actions	No. of Points Available	Base Design Points	Recommended Initiatives	5 Star Credits	To Be Confirmed	Unlikely Points	Comments	Approximate Cost		
Energy	15.0	Green House Gas Emissions	To encourage the reduction of greenhouse gas emissions associated with the use of energy in building operations.	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	0					* 1 Point for 15% increase in R values * 1 Point for <15% of allowance for glazing & 15% improvement for Section J1.4			
	15.1			Energy Emissions Reduction	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.	16	4				2			* 1 point for 15% improvement on HVAC * 1 point for using natural gas for domestic hot water TBC Procure <50% of building's electrical consumption through accredited GreenPower products	
				Façade improvement		Complete building energy / thermal model.	4	1				1	2		Target 5% improvement for façade TBC 10% improvement	
				GHG reduction - Initiative 1		Solar PV			4						Allowance for 75kW of PV, approximately 900W per apartment.	
				GHG reduction - Initiative 2		Improved Services Efficiency							2		Indicative budget only - approximately \$1,000 per apartment.	\$ 105,000
	16.1B	Peak Energy Reduction	To encourage the reduction of peak demand load on the electricity network infrastructure by	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.	2	2					Points would be expected to be achieved based on solar provision.			
Transport	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					Based on access to Public Transport calculator outputs.			
	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 Incomplete for 1 point. GBCA limits car bays to Incomplete for 0.5 points.	1					1	Project includes substantial numbers of 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 Incomplete hybrid or small car bays, Incomplete electric vehicle bays and charging points or Incomplete car share spaces and vehicles	1					1	Design includes two electric car bays, would require additional 10 fuel efficient car bays + 7 motor bike bays.			
	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 Residential Cyclist Facilities plus Visitor cyclist bays	1	1							Bike racks only for residential. End of trip facilities for staff are required for commercial component.	
	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	Walk score of only 46 achieved	
	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						3		Flyt to provide feedback on potential for any additional points.	
Water	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	Current design would be expected to comply based on no shower provision. Note 5 Star requirement for WCs and 4.5 l/min target for showers			
	18.2			Rainwater Reuse	1 point is awarded when a rainwater tank is installed to collect and reuse rainwater within the project's site boundary.		1							Tank size to be based on final GFA, but not considered practical based on lack of common areas for use of water.		
	18.3			Heat Rejection	2 points are awarded where no water is used for heat rejection.		2	2							Heat rejection is by air cooling.	
	18.4			Landscape Irrigation	Drip irrigation and moisture sensor override installed or no water used for irrigation.		1							1	Easily achievable, irrigation to be specified and installed accordingly. Not achievable for turf.	
	18.5			Fire System Test Water	The fire system does not dispense 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: - A sprinkler system is not required under Part E of the NCC, or - A sprinkler system is not provided by the project team, and Does not include a water-based fire protection system.	1						1		Sprinklers are expected, minimal cost to implement water capture and reuse.	\$ -

Ref No.	Title	Aim of Credit	Sub-Element	Credit Criteria Summary	Design Team Actions	No. of Points Available	Base Design Points	Recommended Initiatives	5 Star Credits	To Be Confirmed	Unlikely Points	Comments	Approximate Cost	
Materials	19A.1	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.	Employ eTool and request analysis - includes Peer Review (unless 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			Points require in depth review of building materials and associated life cycle impacts.	\$ 6,000	
	19A.2			LCA - Materials and Additional Life Cycle Impact Reporting	1 additional point is available where the LCA conducted by projects includes reporting of five impact categories in addition to those required under the whole-of-building whole-of-life methodology.	Undertake initial study at concept phase and demonstrate design improvement through the process. Change construction methodology to achieve improvements	4		4					\$ 8,000
	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				Building has limited steel content and would be expected to comply with relatively limited additional cost.		
	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 reused source		1				1		Credit can be pursued but represents a significant construction administration workload. To be reviewed after finishes and timber usages are confirmed.	
	20.3			Best Practice PVC	1 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.	
	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	Products 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 <sup>2</sup> .	Specify requirement for waste reduction and deliver outcome.	1	1					Use of Instant Waste or Cleanaway generally achieves this outcome.	

Ref No.	Title	Aim of Credit	Sub-Element	Credit Criteria Summary	Design Team Actions	No. of Points Available	Base Design Points	Recommended Initiatives	5 Star Credits	To Be Confirmed	Unlikely Points	Comments	Approximate Cost	
Land Use and Ecology	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						Project is not considered to improve site ecology outcomes.		
				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							
	24			Conditional Requirement	The Conditional Requirement is met where, 5 years prior to the project's Green Star Registration date, the project site met 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'	0	0				Site meets conditional requirements.			
	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	1	1					Site was previously developed.		
	24.2	Sustainable Sites	To reward projects that choose to develop sites that have limited ecological value, re-use previously developed land and remediate contaminate land.	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 (EOHS) 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	1					Site has already been decontaminated and made suitable for use by Landcorp.	
	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 >34. 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					Existing roofing is dark, however, use of solar panels, light roof and light paving in the landscape would be expected to achieve this outcome.	
	Emissions	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	1	1					Site is not expected to increase stormwater flows.	
					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;	1	1					Expected to be achieved if infiltrated on site	
		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					
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	1	1				Design will avoid light spill to the surrounds.		
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 waterless heat-rejection systems; 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 not expected on site.		
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 (TSDEI) 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					Not expected to be achieved with multiple small split systems.			

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IEQ-i	Inn-30A - Innovative Technology or Process	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.	Individual 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.											
ENE-i		Up to two points may be rewarded in the Innovation Category for installing renewable energy sources on site.	Onsite Renewable Energy	Renewable Energy Contribution (including shared renewable services) 5% = 1 Point 10% = 2 Points			2					Based on inclusion of ~75kW of on site PV.	\$ 50,000		
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						Second point could be achieved if building is modelled. First point would be achieved on the basis of a 75kW PV array included.		
Man-i	Inn-30C - Improving on Green Star Benchmarks	Supplementary or Tenancy Fitout Systems Review	Tenancy Review	One (1) additional point may be awarded where project teams and building owners carry out a comprehensive services and maintainability review of supplementary or tenancy fitout systems, in addition to all nominated base building systems as outlined above. This review must be undertaken to ensure the design and function of such systems are properly integrated with base building systems.			1					Tenant design review for commercial space is to be undertaken by design team.			
IEQ-ii		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					Ultra low VOC paints will be used for walls and ceilings.			
Mat-ii		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%					2			Project would be targeting additional points if LCA is included		
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 26.1.	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.		1						Stormwater is infiltrated on site.		
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.							1			Precinct strategy to be reviewed, credit may be achieved for and by all sites.	

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Inn-300.3	Innovation 30D - Innovation Challenges	1 Point To encourage the use, interpretation and celebration of buildings with cultural heritage.	Culture, Heritage and Identity	To claim this Innovation Challenge your project team must: * 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.		10	1					Victoria Hospital is on the State Heritage Register, Municipal Inventory and National Trust register.		
Inn-300.4		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 * 3 Points available where building services are 50% more efficient than typical with the remainder and all occupants using 100% renewable energy.						2		Must undertaken Green Star- Performance		
Inn-300.8		1 Point To increase the amount of information available to industry on the costs and benefits of sustainable building.	Financial Transparency	To claim this Innovation Challenge your project team must: * 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		Credit will be undertaken with the GBCA if formal certification is to be pursued.	
Inn-300.13		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	A. Occupant Survey 1 point is awarded where the Applicant carries out a pre and post occupancy survey. 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.				1					Pre and Post occupancy surveys could be completed by someone like Rate My Space	\$25,000
Inn-300.14		1 Point To encourage organisations to take formalised steps to provide opportunities for Aboriginal and Torres Strait Islander peoples.	Reconciliation Action Plan	To claim this Innovation Challenge your project team must: 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. 2. Demonstrate evidence that relevant Indigenous organisations have been consulted in the development of the RAP. 3. A structure is in place to deliver the plan including a RAP Working Group, with a RAP Coordinator as part of the Working Group, comprising Indigenous and non-Indigenous staff members from all business areas. 4. Public reporting is undertaken to Reconciliation Australia (or equivalent body) and in the organisation's Annual Report, or project website, to report on tangible achievements towards reconciliation goals. 5. At least 80% of the RAP targets have been met in the first reporting cycle.							1			
Inn-30E.1b		Innovation 30E -Global Sustainability	To recognise the provision of high quality amenities for fitout occupants' use.	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					Common areas and ground floor amenity - by way of Food and Beverage and Park lands would be expected to meet this requirement.	

## Design and As Built V1.2 Green Star Credit List

## Montario Quarter

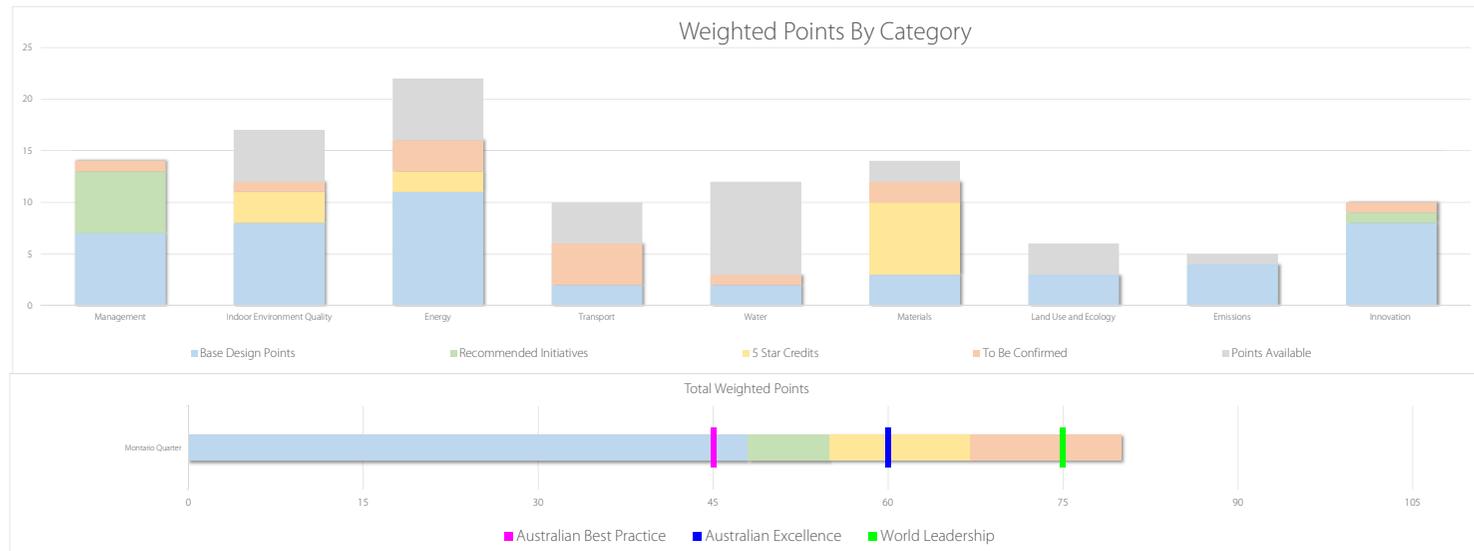
This is the schematic phase self assessment for the Lot 38 Montario Quarter project.  
The scorecard represents an initial expectation of credits and performance, based on revised architectural drawings from May 2019, the project brief, discussions with FJM and FCDS experience with the rating tool.  
This document is intended to be the basis for goal setting and feasibility analysis for a formal Green Star rating. It is in no way equivalent to a formal Green Star certification.

<b>Project Name</b>	Montario Quarter
<b>Project Number</b>	2018_034
<b>Client Name</b>	FJM Property
<b>Issue Date</b>	18th June 2019
<b>Revision</b>	D
<b>Reason for Issue</b>	Schematic Design / DA

<b>GFA</b>	
<b>NLA</b>	
<b>Building Type</b>	Multiple Dwelling & Mixed use
<b>Building UFA</b>	
<b>Building GFA</b>	
<b>Number of Car Bays</b>	
<b>Number of Occupants</b>	
<b>Local Council</b>	WRA / City of Subiaco / City of Nedlands
<b>Building Owner</b>	FJM Property
<b>Building Tenant</b>	Various

<b>ESD Consultant</b>	FCDS
<b>Project Manager</b>	FJM Property
<b>Architect</b>	MJA / Finespun
<b>Fire Engineer</b>	Floth
<b>Mechanical Engineer</b>	Link Engineering
<b>Electrical Engineer</b>	Best
<b>ICA</b>	
<b>Building Surveyor</b>	MNG
<b>Hydraulic Engineer</b>	Floth
<b>Structural Engineer</b>	Hera
<b>Civil Engineer</b>	JOSI
<b>Acoustic Engineer</b>	
<b>Waste Consultant</b>	
<b>Climate Change Modeller</b>	
<b>Transport Planner</b>	Flyt
<b>Landscape</b>	
<b>Life Cycle Modeller</b>	
<b>Quantity Surveyor</b>	
<b>Façade Engineer</b>	

Category	Available Points	Base Design Points	Recommended Initiatives	5 Star Credits	To Be Confirmed	Points Not Achieved	Total Cost	Cost Per Point
Management	14	7	6	0	1	0	\$ 90,500	\$ 6,464
Indoor Environment Quality	17	8	0	3	1	5	\$ 900,000	\$ 75,000
Energy	22	11	0	2	3	6	\$ 105,000	\$ 6,563
Transport	10	2	0	0	4	4	\$ -	\$ -
Water	12	2	0	0	1	9	\$ -	\$ -
Materials	14	3	0	7	2	2	\$ 14,000	\$ 1,167
Land Use and Ecology	6	3	0	0	0	3	\$ -	\$ -
Emissions	5	4	0	0	0	1	\$ -	\$ -
Innovation	10	8	1	0	1	0	\$ 25,000	\$ 2,500
<b>Total</b>	<b>100</b>	<b>48</b>	<b>7</b>	<b>12</b>	<b>13</b>	<b>30</b>	<b>\$ 1,134,500</b>	<b>\$ 14,181</b>
		<b>48</b>	<b>55</b>	<b>67</b>	<b>80</b>			



Ref No.	Title	Aim of Credit	Sub-Element	Credit Criteria Summary	Design Team Actions	No. of Points Available	Base Design Points	Recommended Incentives	5 Star Credits	To Be Confirmed	Unlikely Points	Comments	
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 process; * Provide guidance and support in all stages of the project leading to certification.		1	1					FCDS are undertaking this scope of works.	
2.0	Commissioning and Tuning	To encourage and recognise commissioning, handover and tuning initiatives that ensure all building services operate to their full potential.	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 have completed an OPT	
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						Services and maintainability reviews will be undertaken on tenancies to identify performance improvement opportunities.
2.2			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					Building air tightness testing is a minimum requirement of the credit. Relatively few practitioners are available in Perth.
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					Tuning is to be undertaken by the building modeller to compare performance against predictions. Tuning extent is only for common areas, not individual dwellings.
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					Independent commissioning agents provide value for complex projects.
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	2 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				Climate change risk assessments provide benefits to long term building owners. Recommend review works that have been done for the precinct as part of a Green Star communities rating.	
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 and BMS * Lighting Controls * Electrical Systems * Hydraulic Systems * Fire Protection Systems * Lifts and other vertical transport systems * Building Envelope	1	1					Building O+M's and users guides will be produced by the contractors. FCDS design report will include building user information.	
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.	* Strata company monitor and report performance of building to occupants.	1		1				Building performance monitoring is strongly recommended to ensure design meets documented intent. Requirement to achieve the credit is for strata to commit to ongoing monitoring and reporting of performance to occupants. Cost is to implement this for the first 12 months.	
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 fitouts or other building attributes.	* Common area finishes to have a life cycle of at least 10 years; barring minor wear and tear and damage.	1	1						Credit is for strata to maintain common area finishes for a minimum of 10 years. Design is to include high durability products, modular and natural finishes where possible.
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					Building metering will be provided for main uses and individual apartments.	
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						Design will include an embedded network for billing and distribution of solar or other renewable energy. Minimal additional costs for green star.
7.0	Responsible Construction Practices	To reward projects that use best practice formal environmental management procedures during construction.	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						
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						Builder would be expected to comply with these requirements for this type of building.
7.2			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		Additional health and wellbeing initiatives to be reviewed with proposed contractor.
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 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					Design of waste store and recycling are critical for successful building operation. Discuss with Contractor accordingly.  Encycle are providing design advice for space planning and operational considerations.	

Ref No.	Title	Aim of Credit	Sub-Element	Credit Criteria Summary	Design Team Actions	No. of Points Available	Base Design Points	Recommended Initiatives	5 Star Credits	To Be Confirmed	Unlikely Points	Comments	
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					1	Credit is very difficult to achieve, except with large, central air handling units.	
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: * 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	Requires outdoor air for apartments to be ducted and/or controlled for entry into the conditioned space. Retail / commercial areas would require CO2 detection within the space.	2			2			Increased outside air has performance improvement outcomes, however, typical apartment design does not include dedicated ducting or control of outside air intakes.	
9.3			Exhaust or Elimination of Pollutants	1 point is awarded where the nominated pollutants, such as those arising from painting 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 dedicated kitchen exhaust risers and photocopy exhaust for each office.	1	1						Apartments will be provided with ducted exhaust, as will the food and beverage tenancy with cooking capability.
10.0	Acoustic Comfort	To reward projects that provide appropriate and comfortable acoustic conditions for occupants.	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					Internal noise levels should target compliance with AS 2107	
			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	1	1					Reverberation times is considered N/A for Apartments - Applicable for office space	
			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 + LAeqT > 75	1					1	Acoustic consultant has advised that this credit is expected to be very expensive to achieve.	
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 and 3 McAdam Ellipses for Residential Lighting	0	0					Lighting design will achieve this outcome.	
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 1801-2006 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	Difficult to achieve in apartments	
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	For residential, provide at least one wall in each living space, kitchen and bedroom with specific wall washing or wall mounted fittings.	1						1	Difficult to achieve for most projects.
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						Compliance for apartments includes provision of electric socket for standlamps or similar in living areas and bedrooms.
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				
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 areas. * 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	1	Apartments are generally relatively shallow, with daylight provision to living areas, however, Green Star benchmarks are very high.
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.			Complete assessment of space.	1	1						Apartments are generally less than 8m deep and have good access to views.
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 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.	Paints, adhesives and sealants to comply with Green Star criteria.	1	1					Considered standard 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						
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.	Complete building energy / thermal model. PMV with +/-1	1	1					Average of 7 Star NatHERS required	
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.	Complete building energy / thermal model. PMV with +/-0.5	1				1			Average of 8 Star NatHERS suggested for residential spaces

Ref No.	Title	Aim of Credit	Sub-Element	Credit Criteria Summary	Design Team Actions	No. of Points Available	Base Design Points	Recommended Initiatives	5 Star Credits	To Be Confirmed	Unlikely Points	Comments	
15.0	Green House Gas Emissions	To encourage the reduction of greenhouse gas emissions associated with the use of energy in building operations.	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	0					* 1 Point for 15% increase in R values * 1 Point for <15% of allowance for glazing & 15% improvement for Section J1.4	
			Energy Emissions Reduction		Complete building energy / thermal model.	16	4			2		* 1 point for 15% improvement on HVAC * 1 point for using natural gas for domestic hot water TBC Procedure <50% of building's electrical consumption through accredited GreenPower products	
			Façade improvement	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.	4	1			1	2	Target 5% improvement for façade TBC 10% improvement	
			GHG reduction - Initiative 1		Solar PV		4					Allowance for 75kW of PV, approximately 900W per apartment.	
			GHG reduction - Initiative 2		Improved Services Efficiency					2		Indicative budget only - approximately \$1,000 per apartment.	
16.1B	Peak Energy Reduction	To encourage the reduction of peak demand load on the electricity network infrastructure by	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.	2	2					Points would be expected to be achieved based on solar provision.	
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					Based on access to Public Transport calculator outputs.	
			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 Incomplete for 1 point. GBCA limits car bays to Incomplete for 0.5 points.	1					1	Project includes substantial numbers of car bays.	
			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 Incomplete hybrid or small car bays, Incomplete electric vehicle bays and charging points or Incomplete car share spaces and vehicles	1				1		Design includes two electric car bays, would require additional 10 fuel efficient car bays + 7 motor bike bays.	
			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 Residential Cyclist Facilities plus Visitor cyclist bays	1	1						Bike racks only for residential. End of trip facilities for staff are required for commercial component.
			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 <a href="http://www.walkscore.com">www.walkscore.com</a> , using their 'street smart' method of calculation.	Complete assessment of space.	1						1	Walk score of only 46 achieved
			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					3		Flyt to provide feedback on potential for any additional points.
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	Current design would be expected to comply based on no shower provision. Note 5 Star requirement for WCs and 4.5 l/min target for showers	
			Rainwater Reuse	1 point is awarded when a rainwater tank is installed to collect and reuse rainwater within the project's site boundary.		1							Tank size to be based on final GFA, but not considered practical based on lack of common areas for use of water.
			Heat Rejection	2 points are awarded where no water is used for heat rejection.		2	2						Heat rejection is by air cooling.
			Landscape Irrigation	Drip irrigation and moisture sensor override installed or no water used for irrigation.		1						1	Easily achievable, irrigation to be specified and installed accordingly. Not achievable for turf.
			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: - A sprinkler system is not required under Part E of the NCC, or - A sprinkler system is not provided by the project team, and Does not include a water-based fire protection system.	1					1		Sprinklers are expected, minimal cost to implement water capture and reuse.

Ref No.	Title	Aim of Credit	Sub-Element	Credit Criteria Summary	Design Team Actions	No. of Points Available	Base Design Points	Recommended Initiatives	5 Star Credits	To Be Confirmed	Unlikely Points	Comments
Materials	19A.1	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.	Employ eTool and request analysis - Includes Peer Review (unless 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 Undertake initial study at concept phase and demonstrate design improvement through the process. Change construction methodology to achieve improvements	3			3			Points require in depth review of building materials and associated life cycle impacts.
	19A.2		LCA - Materials and Additional Life Cycle Impact Reporting	1 additional point is available where the LCA conducted by projects includes reporting of five impact categories in addition to those required under the whole-of-building whole-of-life methodology.		4			4			
	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 processed in its manufacture (measured by average mass by steel maker annually).	Discuss requirements with main contractor and steel supplier	1	1					Building has limited steel content and would be expected to comply with relatively limited additional cost.
	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 reused source		1				1		Credit can be pursued but represents a significant construction administration workload. To be reviewed after finishes and timber usages are confirmed.
	20.3		Best Practice PVC	1 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.
	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	Products 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 <sup>2</sup> .	Specify requirement for waste reduction and deliver outcome.	1	1					

Ref No.	Title	Aim of Credit	Sub-Element	Credit Criteria Summary	Design Team Actions	No. of Points Available	Base Design Points	Recommended Initiatives	5 Star Credits	To Be Confirmed	Unlikely Points	Comments
Land Use and Ecology	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						Project is not considered to improve site ecology outcomes.
				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					
	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 met 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'	0	0					Site meets conditional requirements.
	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	1	1					Site was previously developed.
	24.2	Heat Island Effect	To encourage and recognise projects that reduce the contribution of the project site to the heat island effect.	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 (EOHS) legislation. - Where the survey identified asbestos, lead or PCBs in any existing buildings or structures the materials have been stabilised, 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	1				
25.1	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 >34; 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					Existing roofing is dark, however, use of solar panels, light roof and light paving in the landscape would be expected to achieve this outcome.
Emissions	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	1	1					Site is not expected to increase stormwater flows.
				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;	1	1				
	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'	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	1	1				
	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 waterless heat-rejection systems; 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				
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 Environmental Impact (TSDEI) 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						Not expected to be achieved with multiple small split systems.

Ref No.	Title	Aim of Credit	Sub-Element	Credit Criteria Summary	Design Team Actions	No. of Points Available	Base Design Points	Recommended Initiatives	5 Star Credits	To Be Confirmed	Unlikely Points	Comments	
Innovation	IEQ-I	Inn-30A - Innovative Technology or Process	Individual 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.									
	ENE-I		Onsite Renewable Energy	Renewable Energy Contribution (including shared renewable services) 5% = 1 Point 10% = 2 Points		2						Based on inclusion of ~75kW of on site PV.	
	ENE-III		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						Second point could be achieved if building is modelled. First point would be achieved on the basis of a 75kW PV array included.	
	Man-I	Inn-30C - Improving on Green Star Benchmarks	Supplementary or Tenancy Fitout Systems Review	Tenancy Review	One (1) additional point may be awarded where project teams and building owners carry out a comprehensive services and maintainability review of supplementary or tenancy fitout systems, in addition to all nominated base building systems as outlined above. This review must be undertaken to ensure the design and function of such systems are properly integrated with base building systems.		1					Tenant design review for commercial space is to be undertaken by design team.	
	IEQ-II		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					Ultra low VOC paints will be used for walls and ceilings.	
	Mat-II		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%				2			Project would be targeting additional points if LCA is insured
	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 26.1.	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.	1						Stormwater is infiltrated on site.
	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.						1		

Ref No.	Title	Aim of Credit	Sub-Element	Credit Criteria Summary	Design Team Actions	No. of Points Available	Base Design Points	Recommended Initiatives	5 Star Credits	To Be Confirmed	Unlikely Points	Comments	
Innovation	Innovation 30D - Innovation Challenges	Inn-30D.3	Culture, Heritage and Identity	1 Point To encourage the use, interpretation and celebration of buildings with cultural heritage.	To claim this Innovation Challenge your project team must: * 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.	10	1					Victoria Hospital is on the State Heritage Register, Municipal Inventory and National Trust register.	
		Inn-30D.4	Powered By Renewables	Carbon Positive Roadmap	* 1 Point if building services are 50% more efficient than typical and use 100% renewable energy (tenanted buildings only). Or * 3 Points available where building services are 50% more efficient than typical with the remainder and all occupants using 100% renewable energy.					2		Must undertaken Green Star- Performance	
		Inn-30D.8	Financial Transparency	1 Point To increase the amount of information available to industry on the costs and benefits of sustainable building.	To claim this Innovation Challenge your project team must: * 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		Credit will be undertaken with the GBCA if formal certification is to be pursued.
		Inn-30D.13	Occupant Engagement	1 Point To increase the availability of information on the benefits and outcomes of sustainable design practices and sustainable operation practices across the industry.	A. Occupant Survey 1 point is awarded where the Applicant carries out a pre and post occupancy survey. 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.				1				Pre and Post occupancy surveys could be completed by someone like Rate My Space
		Inn-30D.14	Reconciliation Action Plan	1 Point To encourage organisations to take formalised steps to provide opportunities for Aboriginal and Torres Strait Islander peoples.	To claim this Innovation Challenge your project team must: 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. 2. Demonstrate evidence that relevant Indigenous organisations have been consulted in the development of the RAP. 3. A structure is in place to deliver the plan including a RAP Working Group, with a RAP Coordinator as part of the Working Group, comprising Indigenous and non-Indigenous staff members from all business areas. 4. Public reporting is undertaken to Reconciliation Australia (or equivalent body) and in the organisation's Annual Report, or project website, to report on tangible achievements towards reconciliation goals. 5. At least 80% of the RAP targets have been met in the first reporting cycle.						1		
		Inn-30E.1b	Innovation 30E -Global Sustainability	To recognise the provision of high quality amenities for fitout occupants' use.	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.							

# Occupant Engagement

Points Available: 1

Previously known as 'Market Intelligence and Research'.

## Aim

To increase the availability of information on the benefits and outcomes of sustainable design practices and sustainable operation practices across the industry.

## Rating Tool Eligibility



Green Star  
Design & As Built



Green Star  
Interiors



Green Star  
Performance\*



Legacy Green Star  
Rating Tools

\*Note: The 'Occupant Survey' pathway cannot be targeted for projects registered under *Green Star – Performance*.

## Why is this Innovation Challenge Important?

The actual sustainability performance of assets is poorly understood by the industry and the occupants of those assets. While energy and water are closely monitored during building operation, indicators such as improvements to productivity, reduced sick leave and the costs of running complex systems are not.

This Innovation Challenge aims to encourage owners, developers and operators to perform regular occupancy studies on the operating asset. In the interest of increasing transparency, it also encourages the public disclosure of the data and benefits of achieving the benchmarks through a Green Star rating.

## Compliance Requirements

Project teams shall **select one** of two available pathways in order to target this Innovation Challenge. The two available pathways are:

- |                                |  |
|--------------------------------|--|
| <b>A. Occupant Survey</b>      | <b>1 point</b> is awarded where the Applicant carries out a pre and post occupancy survey.   |
| <b>B. Connection to Nature</b> | <b>1 point</b> is awarded where the project commits to providing ongoing feedback to 'Biophilic' research undertaken by Dr. Peter Fisher at RMIT University. |

Proposals for other research focus are welcomed. Such suggestions must correspond to a specific academic research currently undertaken and related to specific benefits of sustainability features of the built environment. These suggestions should be submitted to the GBCA for review as a CIR demonstrating their equivalency to the above two pathways.

### A. Occupant Survey

Note for *Green Star – Performance* projects: this Pathway can not be targeted for projects registered under *Green Star – Performance*. This is on the basis that the 'Occupant Satisfaction' credit within this rating tool already addresses this sustainability issue. Please consider the 'Connection to Nature' pathway for your project.

To claim this Innovation Challenge your project team must:

- Demonstrate that a **pre-occupancy survey** on staff or occupants (where known) has been performed. Where the building is speculative, the pre-occupancy survey does not need to be performed until a tenant has been signed up, provided such tenant is occupying another space; and
- Complete a **post-occupancy survey** on a significant proportion of occupants (including tenanted spaces) no earlier than 6 months and no later than 12 months after from practical completion. The Applicant must also commit to providing the results upon completion with the GBCA, for information purposes only. This can be provided at a date later than the project's Green Star submission.

For Design rating projects or As Built rating projects, a commitment from the owner is required. If the asset is intended for sale, the new owner must commit to the survey, or the Innovation Challenge is forfeited and the one point will be removed from the project's final score.

## B. Connection to Nature

To claim this Innovation Challenge your project must incorporate connections from your built environment project to the natural environment. These connections can include internal or external views to nature, water or landscaping, green walls, atriums, indoor plants and water features, roof gardens and other natural features (including e-media such as images of wildlife and landscapes). These connections provide an opportunity for projects to further their environmental credentials via elements of the natural world, potentially making their occupants more aware of life forms other than their own, their dependency on them for free ecological services, and their place in the richness of our own lives and that of the planet. There is significant evidence that exposure to elements of Nature is therapeutic<sup>1</sup>.

The project team is required to provide ongoing feedback to research led by Dr. Peter Fisher at RMIT. Dr. Fisher can be contacted on +61 3 9925 9927 / 0418 500 396 or [peter.fisher2@rmit.edu.au](mailto:peter.fisher2@rmit.edu.au).

This feedback may include reporting of measurable improvements in building occupant productivity and 'wellness' such as: less absenteeism, increased staff retention and decreased need for retraining, improved patient recovery or student achievements and more. Various categories of spaces are acceptable ranging from conventional offices to other places of congregation such as commercial and public venues.

The aim of the research is to establish a connection to nature tool to inform future design and occupant health. The tool will aim to incentivise the incorporation of features emulative of nature to produce improved health and wellbeing outcomes for building occupants. It is anticipated that the research will provide a more exacting valuation of benefits.

## Guidance

The *Green Star – Performance* rating tool includes an 'Occupant Satisfaction' credit. The *Green Star – Performance* credit is an example of how this initiative is applied in building operations. The challenge is how your project can apply this initiative to other rating tools.

For your information and reference this credit is attached to this Handbook as an Appendix.

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<sup>1</sup> National Wildlife Federation, (1 September 2012) 'Wilderness Therapy Uses Nature to Help People Heal', accessed on 27 September 2015, <http://blog.nwf.org/2012/01/wilderness-therapy-uses-nature-to-help-people-heal/>.

## References

Building Occupants Survey System Australia – BOSSA - <http://www.bossasystem.com/>

Additional information on the 'Connection to Nature' pathway is provided below:

Biohabitats, 'Thoughts on Giving Children the Gift of Nature' (2012), <http://www.biohabitats.com/newsletters/giving-children-the-gift-of-nature>

Centre for Urban Greenery and Ecology, 'Naturizing outside-in: Reconnecting buildings with the natural world through a design innovation metric' (2013), <https://www.cuge.com.sg/research/citygreen/cg6-naturising-outside-in.html>.

Los Angeles Natural History Museum, 'Nature Lab', <https://vimeo.com/71040258>

Planet Ark, 'Nature: A Valuable Investment for Homeowners and Businesses' (2014), <http://treeday.planetark.org/documents/doc-1183--planet-ark-release---nature-a-valuable-investment-2014-06-25.pdf>

Scientific American, 'How hospital gardens help patients heal' (2012), <http://www.scientificamerican.com/article/nature-that-nurtures/>

Special Broadcasting Service, 'Is there room for Nature in our cities?' (2013), <http://www.sbs.com.au/news/article/2013/03/04/there-room-nature-our-cities>

## Documentation Requirements

### A. Occupant Survey

#### Design Review / Design Submission

Provide the following required documentation:

- **Submission Template** outlining how the project has achieved the Innovation Challenge requirements. The Submission Template also enables project teams to provide feedback on the Innovation Challenge to inform future developments.

Provide documentation to support the claims made within the Submission Template. This may include:

- **Letter of confirmation from the building owner** regarding conducting the surveys and the estimated time-frame. The letter will also clearly confirm the benchmarks that are being targeted (e.g. 10% response rate from the building occupants).

#### As Built Submission

Provide the following required documentation:

- **Submission Template** outlining how the project has achieved the Innovation Challenge requirements. The Submission Template also enables project teams to provide feedback on the Innovation Challenge to inform future developments.

Provide documentation to support the claims made within the Submission Template. This may include:

- **Sample Post-occupancy Comfort Survey** developed specifically for your project. The survey will be required to address occupant satisfaction, including the assessment of occupant well-being and interaction within their indoor environment; and
- **Copy of Post-occupancy Comfort Survey results** where available. Where Post-occupancy Comfort Survey results are not yet available at the time of submission, the project team must commit to make the results available to the GBCA as soon as they become available.