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# 2 Seymour Avenue – Build to Rent

Sustainable Design Assessment Report

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<b>Description:</b>	<p>This report provides a brief summary of the proposed sustainable design strategy for the proposed Build to Rent Residential development on Seymour Avenue in Montario Quarter.</p> <p>The report outlines overall intent and sustainable design features to be included within the design, as well as an overall assessment of the expected outcome for the project.</p>

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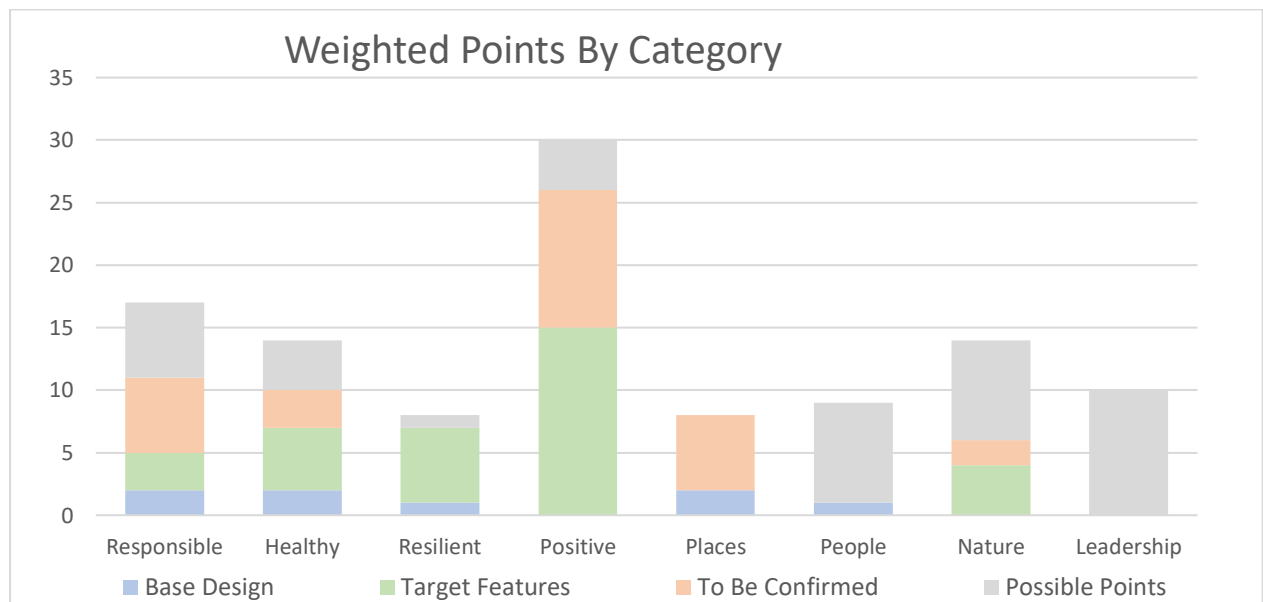
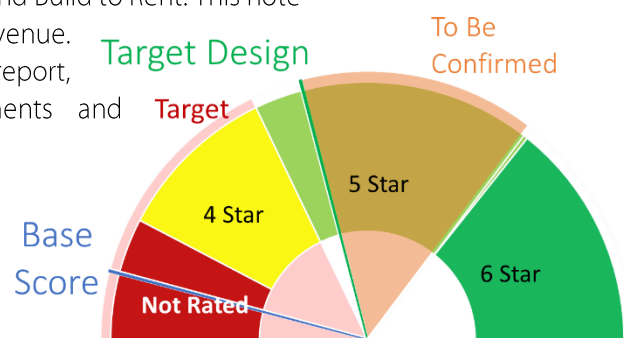
## Executive Summary

FCDS are commissioned to assist the design team in achieving a 5-Star certified outcome for the two proposed residential developments on Seymour Avenue in Shenton Park. Both projects have made commitments for formal certification at a 5-Star level, including targeting:

- >7 Star NatHERS Average (~15% improvement over BCA)
- Carbon Neutral Certification in operation
- Embedded meter network, with self-check functionality
- Building envelope pressure testing
- ~60kW PV Array

The two projects are both residential; a Build to Sell and Build to Rent. This note addresses the Build to Sell Scheme, at 2 Seymour Avenue. The Build to Sell scheme is addressed in a separate report, albeit it addresses many of the same elements and requirements.

FCDS assessment of the current project documentation indicates an expected score of 8 points, with an additional 33 expected inclusions. There remain a total of 28 points still to be confirmed.



Design features are set to prioritise low carbon operation, as well as occupant health and wellbeing and a connection to nature. Specific recommended elements include:

- 50kW PV array for the building
- Risk assessments for building operation, covering climate change, grid and operations
- Low carbon construction
- Fossil fuel elimination
- Formalised commissioning oversight and performance verification
- Integration of nature and views

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# 1. Introduction

This report provides a summary of the sustainable design inclusions and intended pathway for the Build to Rent component of the development of Lots 35 and 36 Montario Quarter in Shenton Park. The development includes two buildings, a Build to Rent and a more typical build to sell residential tower. Overall the site includes almost 300 dwellings as well as residential amenities a work hub and café/bar.

The project has set itself high sustainable design targets, seeking to achieve a minimum 5-star Green Star certified outcome and has already registered with the GBCA.

## 1.1 Site Description

The project is located at 2 Seymour Avenue in Shenton Park.

The overall project budget is around \$90M and includes ~15,000m<sup>2</sup> of occupied area comprising 226 sole occupancy dwellings:

Number of Bedrooms	1	2	3	Total
Number of Apartments	127	77	22	226
Total Number of Occupants	254	231	88	573

The development includes 13 occupied levels above ground and 235 car bays.

The design includes residential amenities on level 2 and the lower ground floor, including a pool, gym, games room, library and external spaces including a BBQ and lawn area.

Key project program dates are to be confirmed:

- Design Approval
- Construction Commence
- Tender
- Construction Completion

## 1.2 Sustainability Targets

The project is aiming to achieve at least 35% (5-Star / Australian Excellence level) under the Green Star Buildings rating system.

Design features to prioritise energy efficiency and simplification of operations as well as improving occupant comfort are being prioritised.

Category	Target	Design Team Response
<b>General Sustainability</b>	Best Practice Design	The project is targeting a formal certification at 35% under the Green Star Buildings rating tool – representative of 5 stars – Australian Excellence
	Operational Performance	Monitor and tune building performance in operation – targeting a 5 Star NABERS equivalence – around 3 MWhrs per apartment per annum. ~ 40kWhrs per m <sup>2</sup> per annum.
<b>Energy Consumption</b>	15% Improvement over BCA 2019 - Envelope	This will require insulation and glazing performance in excess of minimum standard.
	15% Improvement over BCA 2019 Minimum Practice - Overall	<ul style="list-style-type: none"> <li>• Energy efficient services (lighting and mechanical in particular) to be provided.</li> <li>• Reverse cycle heat pump for domestic hot water.</li> </ul>
	Renewable Energy	The project should include a large solar photovoltaic array, up to around 60kW peak output – pending roof configuration
<b>Water Consumption</b>	Low Flow Tapware	Ensure all taps, showers, WC's, urinals, dishwashers and washing machines provided are within 1 star of the best available WELS rating.
	Waterwise Irrigation	Utilise drought tolerant and native planting where possible. Utilise rain / moisture sensing and sub-soil drip irrigation for all planted areas.
<b>Waste Targets</b>	75%+ Recycling in operation	Design to facilitate capture of recyclable goods and use of comingled recycling. Minimum four waste streams to be collected.
	>90% Recycling in construction	Use of high efficiency resource recovery facility to sort waste in construction.
<b>Durability</b>	>10 Years for Common Area Finishes	Internal finishes shall target >10 year life spans, with minimal repair and maintenance rather than regular replacement.
<b>Indoor Environment Quality</b>	Mixed Mode Operation	<p>Key spaces to be able to function in air conditioned or naturally ventilated modes.</p> <p>Provide CO<sub>2</sub> detection and control in areas with variable occupancy.</p> <p>Provide ducted outside air intakes for all apartments, with filtration and air flow control to meet AS 1668.2 requirements.</p>

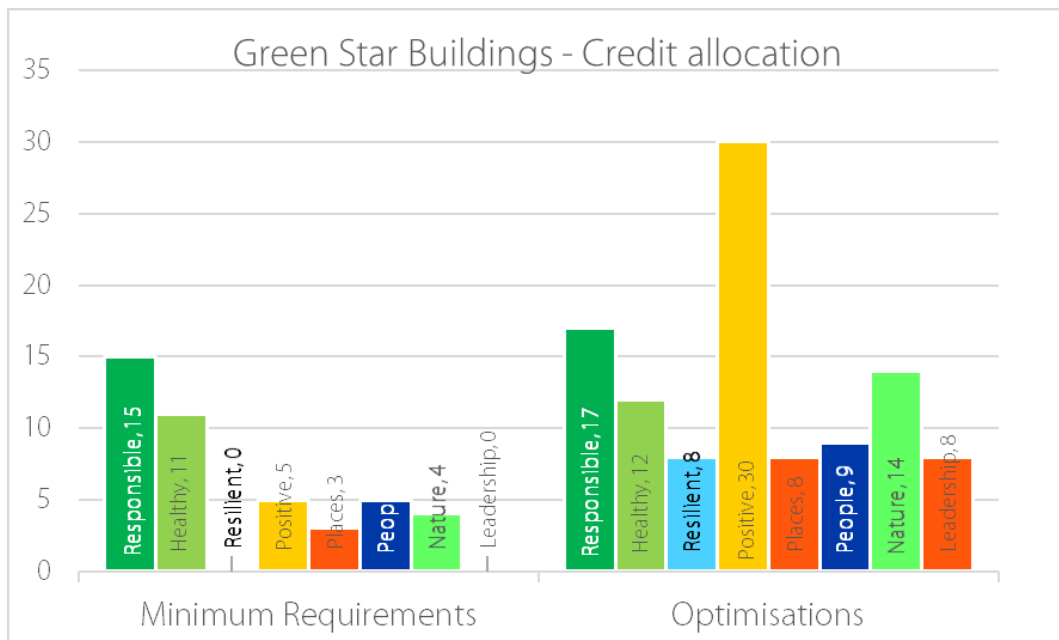
The project is aiming to undertake a formal certification.

### 1.3 Green Star Buildings

Green Star Buildings assesses proposed facilities for people against a number of sustainable design metrics, specifically, the tool requires that buildings:

- Protect of environmentally significant areas
- Reduce carbon emissions in **construction** and operations, aligning with a pathway to Net Zero by 2030
- Aare water efficient
- Provides a high quality indoor environment
- Promotes physical activity
- Consider and address climate change impacts
- Reduces environmental impacts during construction
- Embraces diversity
- Reduces operational waste
- Undergoes performance verification

Performance is assessed across a number of categories, as described below. Many credits have an emphasis of planning and consultancy:.



Projects have a relatively low percentage requirement to achieve certification as best practice as only 15% above minimum performance requirements, however, a 6-Star certification requires design team to achieve almost three quarters of all available optimisations.

Star Rating	Buildings
4 Star – Best Practice	15 Points
5 Star – Australian Excellence	35 points
6 Star – World Leadership	70 Points



### 1.3.1 Assessment Categories

Buildings	Sustainable Design Features
<b>Responsible</b>	Features which are intended to minimise ecological footprint by control of the design, construction and commissioning process. The features also include elements to optimise operational performance through design of effective spaces and measuring consumption.
<b>Healthy</b>	Features aiming to ensure the building provides a strong response to occupant health and wellbeing.
<b>Resilient</b>	Rewards projects preparing and for the imminent impacts of climate change, including provision of support to the surrounding community. Shocks to power infrastructure, ongoing weather pattern adjustment and the urban heat island effect
<b>Positive</b>	Design elements which contribute positively to the environment. Buildings must minimise harm as a starting point and also act as a restorative force for good to achieve points.
<b>Places</b>	Features which reflect outcomes that are linked to the location and nature of the development. Points are achieved by reducing the impacts of transport – on the environment and occupant health.
<b>People</b>	Features which improve social sustainability outcomes within the development and community.
<b>Nature</b>	Features and design solutions which prioritise and restore the natural environment around prospective developments
<b>Leadership</b>	The category for projects to demonstrate leadership beyond the scope of the current Green Star framework, addressing Challenges which have been developed by the GBCA or which break barriers and inspire others to follow.

### 1.3.2 Project Approach

The design team are focusing on providing an efficient, durable and effective learning environment. As such, design features within the Healthy, resilient and positive categories are being prioritised.

Features within the Places, People and Nature categories are largely set by project location and nature.

The following sections present a summary of the project approach within the various categories.

## 2. Responsible Design Features

The Responsible category refers to credits which are intended to minimise ecological footprint by control of the design, construction and commissioning process. The features also include elements to optimise operational performance through design of effective spaces and measuring consumption.

The following section outlines FCDS expectation with respect the Responsible design elements intended to be included by the project team:

### 2.1 Marketing Excellence

The design team will produce documentation to describe sustainable design features of the development for key stakeholders – including prospective occupants of each dwelling.

### 2.2 Environmentally Responsible Construction

The main contractor will be expected to implement an environmental management system, using ISO 14001 practices to monitor its implementation on site.

The plan will include waste management and minimisation, targeting a minimum of 80% of construction and demolition waste diversion from landfill.

Contractors visiting site for more than 3 days will be required to undertake site familiarisation and sustainable design training covering design features for this development, as well as a wider overview of sustainability issues.

### 2.3 Commissioning, Verification and Handover

The design team have been provided clear design targets for environmental performance – refer to Section 2 above.

The designers and contractors will complete a constructability and maintainability review as part of the shop drawing process.

Commissioning will be in accordance with best practice international standards, including CIBSE, ASHRA and Airah. The building envelope will be tested for air leakage prior to practical completion.

Common area services will be closely monitored over the first 12 months of operation to minimise performance issues and optimise operational efficiency against design targets.

The designers will include meters for each dwelling, utilising utility meter reading systems to monitor and report on performance.

Detailed handover documentation will be provided to building stakeholders in electronic format, including As Built drawings and functional control descriptions.



## 2.2 Sustainable Design Professional

The project team have included sustainable design considerations from schematic design phase and will continue through to practical completion and beyond.

## 2.3 Waste Minimisation

Beyond the minimum requirement to divert 80% of construction and demolition waste, the contractor will be expected to control materials brought to site and the waste disposal process to achieve a net 90% diversion of all construction and demolition waste, by mass, by practical completion.

## 2.4 Responsible Products

This category review products selected for building structure, envelope, systems and finishes and provides points for projects which can demonstrate performance improvement over standard practice.

Key elements supporting these features are:

- Design and Construction procurement processes to align with ISO 20400 – Sustainable Procurement Guidance
- Mechanical, electrical and hydraulic systems are to include at least 20% (by cost) achieving a Responsible Products Value, greater than 6, as per the table below:
- Finishes to follow similar sustainable requirements, with a net score of at least 9 for more than 20% of products

Metric	Score
• Industry specific environmental product declarations (EPD)	2 Points
• Product specific environmental product declarations (EPD)	4 Points
• ISO14001 certification	3 Points
• Reused Product	15 Points
• FSC Certified	10 Points
• Best Practice PVC certification	5 Points

Based on our understanding of the project and recent experience in this space, FCDS expect the project team will deliver sustainable material selections in building envelope and structure, as well as the building services.

FCDS expect to work with the Project Design team to prioritise sustainable finishes, including painting and floor coverings which meet international best practice performance requirements.



### 3. Healthy Design Features

The Healthy credit category is about ensuring the building provides a strong response to occupant health and wellbeing. Features supporting air quality, views, access to light and noise contribute to point scoring within this category:

#### 3.1 Ventilation System Attributes

Outside air and natural ventilation systems are to comply with the prescriptive requirements of AS 1668.2 (mechanical ventilation) and AS 1668.4 (natural ventilation) for air quantity, intake location and exhaust separation.

Local exhaust systems are to be provided to isolate occupied spaces from contamination such as kitchens.

#### 3.2 Lighting Systems

Lighting systems are to be flicker free and provide a minimum Colour Rendering Index (CRI) average R1 to R8 > 85, and a CRI R9 > 50r, with a maximum of 3 MacAdam Ellipses.

The design will meet best practice illuminance levels for each task within each space type with a maintained illuminance values must achieve a uniformity of no less than that specified in Table 3.2 of AS/NZS 1680.1:2006

#### 3.3 Glare Control

External shading systems will provide some coverage from direct solar penetration, however, occupants will be able to appoint their own window treatments.

Lighting systems are to be provided with diffusers or other design features which maintain direct glare from the luminaries below the UGR (Unified Glare Rating) limit within AS 1680.1

#### 3.4 Access to Daylight

All occupants have excellent access to natural lighting through strong passive design (north facing windows with overhangs) and relatively shallow plans.

#### 3.5 Noise Levels

The use of high-quality mechanical plant and good architectural detailing will result in comfortable internal noise levels, generally matching AS 2107.

#### 3.6 Connection to Nature

At least 60% (close to 100% for this project) of spaces are within 8m of a view to outside, including nature.

FCDS recommend the project team target the use of natural finishes and motifs to further promote the connection of users to nature.

#### 3.7 Low Toxicity Products

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

## 4. Resilient Design Features

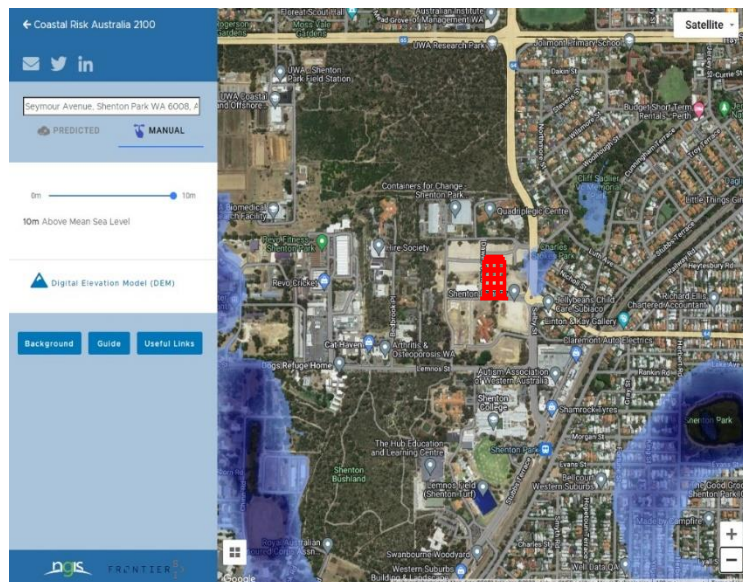
The Resilient category of credits highlight the need for projects to be ready for the imminent impacts of climate change and to provide a level of support to the surrounding community. Shocks to power infrastructure, ongoing weather pattern adjustment and the urban heat island effect are considered within the category.

### 4.1 Climate Change Resilience

FCDS have undertaken a base review of the project and the potential likely impacts of climate change on the site, based on the following likely impacts of climate change in South West WA:

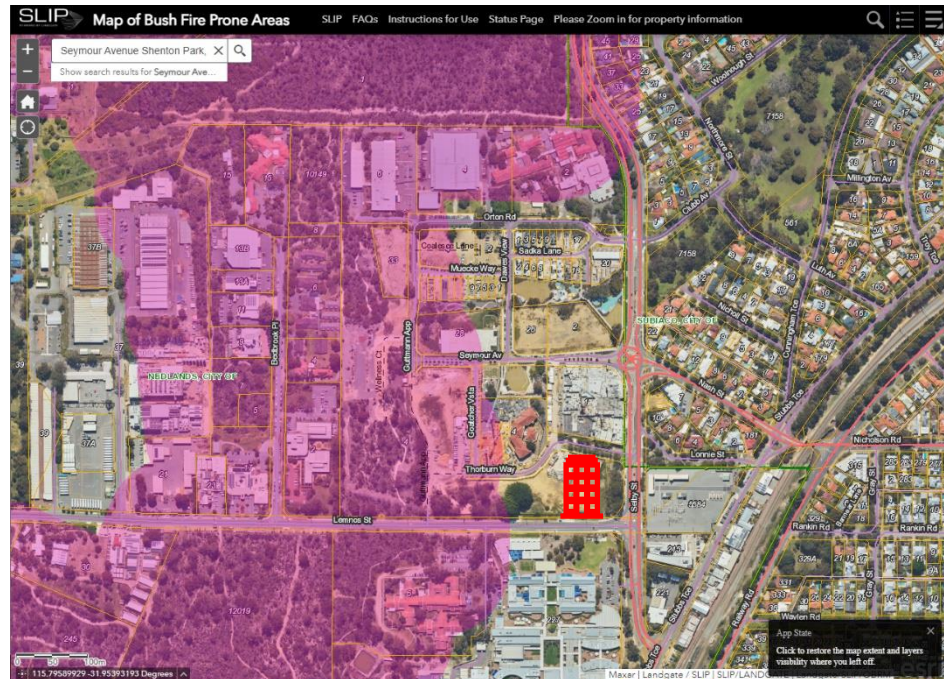
Variable	Current	Predicted	Expected Change	Possible Range
Annual Average Temperature (°C)	25.8°C	26.6°C	+0.8°C	26.4 – 27°C
Number of days over 35°C	28	35.3	+7.3	33.1-38.7
Annual Average Rainfall (mm)	835.1mm	785mm	-6%	726.5 – 827mm
Annual Average Potential Evaporation	1800mm	1836mm	+2%	1818-1872mm
Annual Relative Humidity	55%	54.4%	-0.6%	53.7 – 55%

The site not considered susceptible to flooding under climate change scenarios – a 10m sea level rise is shown right, with the higher predicted rise shown below:





The site is moderate risk of bushfire, with 'prone' areas to the west of site, but not the specific development area:




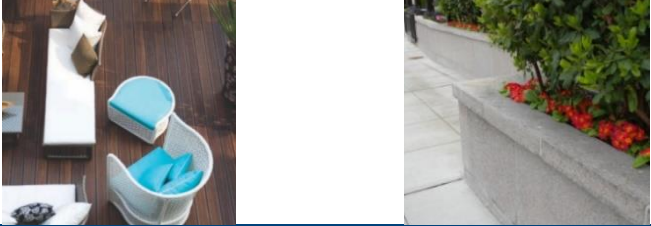

#### 4.1 Climate Change Risk Management

Following the base risk review above, the design team have included the following features to mitigate risks and provide an improved outcome for occupants and the local community:

Climate Change Impact	Risk	Proposed Response
Increased temperatures lead to increased bushfire risk and intensity.	Moderate due to current classification of site.	Provide MERV8 + air filtration on air conditioning systems. Provide dedicated air intake point, with filters, for all dwellings Utilise cooling towers for heat rejection
Rising sea levels and increased flood risk.	Very low.	Avoid key infrastructure below ground level. Ensure structure can adapt to changing water levels.
Reduced rainfall	Increasing requirement for irrigation, increased cost of scheme water.	Utilise smart irrigation, including moisture detection and prioritise drought tolerant planting. Utilise native grass for turfed areas. Provide rainwater capture for toilet flushing and cooling tower recharge
Increased temperatures lead to increased reliance on air conditioning.	Building is unable to provide comfortable environment for extended periods.	Provide high efficiency air conditioning systems with automatic controls. Upgrade building envelope in excess of BCA minimum requirements.
Increased temperatures lead to increased power demand.	Operating cost increases as electrical prices increase. Power security becomes questionable.	Good control systems and energy efficient design. Installation of solar photovoltaics for renewable generation.

## 4.2 Heat Resilience

The project should include the selection of light colours to external finishes as well as shaded area (from fixed building shading and planting) and landscape integrated into the site to minimise the impacts of urban heat island on the site. The following table shows the recommended colour palettes with respect colours and solar absorbance:

Usage	Initial SRI	3 Year SRI	Sample Product				
Metal Roof > 15° Pitch	>34	>39	 <table border="0"> <tr> <td> <b>Shale Grey™</b> SA = 0.43 SRI = 66         </td> <td> <b>Dunes+</b> SA = 0.47 SRI = 61         </td> <td> <b>Windsprayer+</b> SA = 0.58 SRI = 46         </td> <td> <b>Pale Eucalypte</b> SA = 0.60 SRI = 43         </td> </tr> </table>	<b>Shale Grey™</b> SA = 0.43 SRI = 66	<b>Dunes+</b> SA = 0.47 SRI = 61	<b>Windsprayer+</b> SA = 0.58 SRI = 46	<b>Pale Eucalypte</b> SA = 0.60 SRI = 43
<b>Shale Grey™</b> SA = 0.43 SRI = 66	<b>Dunes+</b> SA = 0.47 SRI = 61	<b>Windsprayer+</b> SA = 0.58 SRI = 46	<b>Pale Eucalypte</b> SA = 0.60 SRI = 43				
Hardscape			<p>Bamboo (35-48) <span style="float: right;">Grey Limestone (54)</span></p> 				
Metal Roof < 15° Pitch	>82	>64	<p>White Concrete (86)</p>  <table border="0"> <tr> <td> <b>Classic Cream™</b> SA = 0.32 SRI = 82         </td> <td> <b>Surfmist+</b> SA = 0.32 SRI = 82         </td> </tr> </table>	<b>Classic Cream™</b> SA = 0.32 SRI = 82	<b>Surfmist+</b> SA = 0.32 SRI = 82		
<b>Classic Cream™</b> SA = 0.32 SRI = 82	<b>Surfmist+</b> SA = 0.32 SRI = 82						

The site layout has limited hard stand and, with appropriate shading and colour selection compliance should be achievable.



## 5. Positive Design Features

The Positive category refers to design elements which contribute positively to the environment. Buildings must actively reduce their harm, but also act as a restorative force for good in order to achieve credits. The category assesses energy use, energy source, water consumption and refrigerant emissions, aligning with the National Standard for carbon neutral assessment and certification (Climate Active).

### 5.1 Upfront Carbon Emissions

The design team will target material selections which reduce the embodied energy by a minimum of 10%. Features to support this include the reuse of structures and civil infrastructure on site, as well as the use of natural finishes, waste diversion and high durability as part of the proposed solution.

### 5.2 Energy Use

The design team will ensure low energy use by improving performance against BCA Section J minimum, across building envelope, air conditioning and ventilation systems and lighting.

### 5.3 Energy Source

Ideally, the design will omit all fossil fuels from site or – at least – have a clear plan for their removal as soon as practical.

### 5.4 Water Use

The development is targeting a minimum 15% reduction in water consumption against benchmarks, including the provision of low flow fixtures are being provided for sanitary uses in accordance with the table below:

Material	PER embodied energy MJ/kg
Air dried sawn hardwood	0.5
Stabilised earth	0.7
Concrete blocks	1.5
In situ concrete	1.9
Precast tilt-up concrete	1.9
Kiln dried sawn hardwood	2
Precast steam-cured concrete	2
Clay bricks	2.5
Gypsum plaster	2.9
Kiln dried sawn softwood	3.4
Autoclaved aerated concrete (AAC)	3.6
Plasterboard	4.4
Fibre cement	4.8
Cement	5.6
Local dimensioned granite	5.9
Particleboard	8
Plywood	10.4
Glue-laminated timber	11
Laminated veneer lumber	11
MDF (medium density fibreboard)	11.3
Glass	12.7
Imported Dimensioned Granite	13.9
Hardboard	24.2
Galvanised steel	38
Acrylic paint	61.5
PVC (polyvinyl chloride)	80
Plastics — general	90
Copper	100
Synthetic rubber	110
Aluminium	170

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

### 5.5 Net Zero Energy and Emissions Reduction

The design team are confident that the proposed energy efficient design features and onsite renewable generation will represent an annual energy consumption reduction of at least 30% against BCA minimum requirements.

### 5.6 Overall Footprint Reduction

The design team are confident that the proposed design features will result in a net life cycle emissions reduction of at least 30% when assessed by an LCA practitioner.



## 6.2 Sustainable Transport

Green Star Buildings requires project teams to make provision for car sharing as well as EV Parking and future charging. Exact requirements are to be set by a sustainable transport professional, however, FCDS provide the following indicative guidance.

Considering the location of the development, strong consideration should be given to EV charging facilities, including potential for paid fast charging.

Attribute	Green Star Target	Design Requirement
Ready to charge EV Parking	5% of all parking spaces	12 EV Bays
Future car share parking spaces with potential for EV	Additional 5% of bays	12 Car Share Bays
Load management and infrastructure	Cater for 25% of all car parking spaces.	56 Bays (32 additional)
Cater for 7kW and 22kW charging points	Design team to confirm mix	
Cable paths for future provision	Potential to provide charging to all bays	

## 6.3 Contribution to Place, Culture Heritage and Identity

The design provides an enjoyable location for the general public, with large public access areas which FCDS expect will be fully activated by the Shire of Harvey.

The space also includes substantial heritage buildings providing a strong cultural and heritage outcome.

# 7. People Design Features

The People category of credits provides an increased emphasis on social sustainability outcomes within the Green Star system. Projects are required to consider gender inclusivity and provide staff support around issues such as mental and physical health as part of their impact on the people building the project as well as the people who will use it long term. The category also rewards projects that deliver strong outcomes for Indigenous or disadvantaged and under-represented social groups.

## 7.1 Minimum Requirements

The main contractor will be required to provide gender specific bathrooms and PPE on site and provide policies and training on discrimination, racism, bullying, drug and alcohol awareness and mental health. This will include introducing programs and solutions to address at least five current health issues such as suicide prevention, healthy eating and depression.

## 7.2 Needs Analysis

The contractor will be required to complete a needs analysis of site workers and contractors to inform the programs and policies implemented.

## 7.3 Accessible Navigation

The design team will ensure the building's design and construction must be able to be navigated and enjoyed by stakeholders of diverse ages, genders, and abilities (for example physical, sight, sound, mind, spectrum). The design will provide equal access to the building, diverse wayfinding and inclusive spaces.

## 8. Nature Design Features

The Nature category is based on providing design solutions which prioritise and restore the natural environment around prospective developments. Features consider biodiversity, previous site usage, site emissions and waterway protection. Projects are required to demonstrate best practice performance across the range of local impact areas considered.

### 8.1 Minimum Requirements

- The site is not an old growth forest, prime agricultural land or within 100m of a nationally significant wetland.
- The external lighting will comply with AS 4282 – Control of the obtrusive effects of Outdoor Lighting
- No external light fitting will have an Upward Light Output Ratio (ULOR) of more than 5%.

### 8.2 Ecological Value

The current and future ecological value of the site will be retained through the use of primarily native planting, with green spaces across the site.

### 8.3 Stormwater

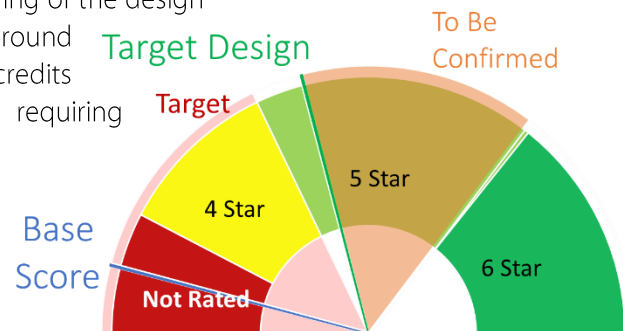
The design is to infiltrate a proportion of stormwater into local ground water, aiming to minimum outflow and achieve pollution reduction matching the performance below:

Pollutant	Contaminant Reduction
Total Suspended Solids (TSS)	90%
Gross Pollutants	95%
Total Nitrogen	60%
Total Phosphorus	70%

## 9. Assessment Review

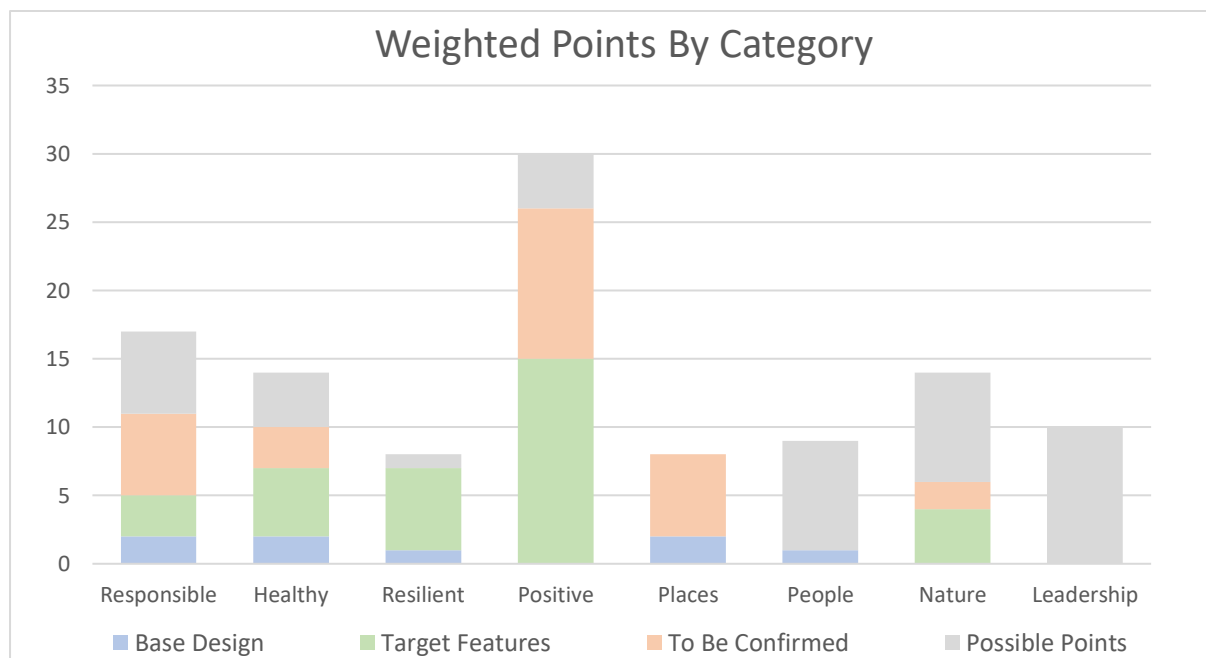
Based on the current design, and FCDS understanding of the design intent, we believe the base project would achieve around 8 credits. There are an additional 33 of credits recommended for inclusion and 28% of credits requiring design confirmation.

Our current recommendation includes pursuing a carbon neutral framework approach which offers additional marketing benefit for the project as well as its Green Star benefits.



Design features are set to prioritise low carbon operation, as well as improve occupant health and wellbeing and a connection to nature. Specific recommended elements include:

- Implement nature and natural motifs in design and occupant experience – including public art.
- Undertake risk assessment consultancy and mitigate high or extreme risks for, Climate Change, Operations Resilience and Grid Resilience
- Manage stormwater on site to avoid pollutant outflow and verify with stormwater modelling
- Offset carbon footprint associated with construction phase, including residual footprint for existing buildings on site
- Utilise native planting on site and target improved outcomes for the local ecology
- Commit to at least 5 years green power procurement
- Avoid all fossil fuels on site – including provision of electric cooking for tenancies
- Low flow tapware and appliances
- Appointment of specialist consultant to undertake Independent Commissioning Agent role to CIBSE Soft Landings framework.
- Performance verification for noise and air quality





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