



EMERGEN

SUSTAINABILITY REPORT

5 MACRAE ROAD, APPLECROSS

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DISCLAIMER

This report confirms the design intent of the targeted sustainability initiatives proposed for the project. The strategies and measures outlined must be implemented and adhered to throughout construction in order to achieve the intended sustainability rating at Practical Completion. Any deviations from the recommendations may impact the project's ability to meet the targeted outcomes.





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1 INTRODUCTION

This document has been prepared for Griffin Group, outlining the sustainability initiatives targeted for the upcoming residential development. An evaluation has been conducted to gauge the project's feasibility in meeting the compliance standards of NCC 2022 Section J and committing to initiatives to achieve a 4-star Green Star Buildings v1 rating. The 4-star Green Star strategy, outlining the targeted points is provided in Appendix 1.



Figure 1 Proposed Residential Development

1.1 OVERVIEW OF TARGET

The client's sustainability objectives for the site encompass:

- Attainment of a 4-Star Green Star Buildings v1 rating.

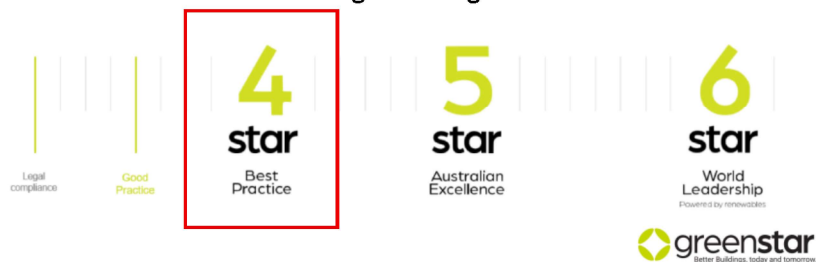


Figure 2 Green Star Rating Scale

1.2 THE BENCHMARK

Green Star Buildings is the rating tool for the design and construction of new building and major refurbishments. Green Star Buildings aim to meet current and future demands of the built environment with aspirational benchmarks for design, construction, and operational performance. It also provides a pathway for building owners to address carbon emissions over time.





Green Star Building features eight categories representing the issues that will define the next decade of the built environment.



Responsible

Recognises activities that ensure the building is designed, procured, built and handed over in a responsible manner.



Places

Supports the creation of safe, enjoyable, integrated and comfortable places.



Healthy

Promotes actions and solutions that improve the physical and mental health of occupants.



People

Encourages solutions that address the social health of the community.



Resilient

Encourages solutions that address the capacity of the building to bounce back from short-term shocks and long-term stresses



Nature

Encourages active connections between people and nature and rewards creating biodiverse green spaces in cities.



Positive

Encourages a positive contribution to key environmental issues of carbon, water and the impact of materials.



Leadership

Recognises projects that set a strategic direction, build a vision for industry or enhance the industry's capacity to innovate.

Figure 3 Green Star Categories

Each category groups a number of issues related to a certain impact. These are known as Credits. A Credit addresses an initiative that improves or has the potential to improve a project's performance.

Credits are weighted in relation with each other by varying the number of points available. Each credit defines a clear outcome that a project must meet. Where the outcome is verified to have been met, a project will be rewarded with the relevant available points.

Once all credits are assessed, the total number of points achieved is compared against the available points in the rating tool, and a certified rating is awarded.





2 SUSTAINABLE DESIGN TARGETS

The design team will utilise a structured approach to a sustainable outcome for the design and construction of the development which includes the following sustainability commitments from 4-star Greenstar Buildings v1.

Table 1: Sustainability Commitments from targeted 4-star Greenstar

DESCRIPTION	GOAL	SUSTAINABILITY COMMITMENTS	CREDITS
RESPONSIBLE CREDIT			
INDUSTRY DEVELOPMENT	Engaging a GSAP	Project team to engage a GSAP, provide financial transparency and detail out sustainability targets for all stakeholders.	1
RESPONSIBLE CONSTRUCTION	Construction and demolition waste diversion	90% diversion of construction and demolition (C&D) waste from landfills.	1
HEALTHY CREDIT			
LIGHT QUALITY	Daylight	60% of the combined living and bedroom area of each unit will comply with the daylight requirements. The daylight levels will also be present in at least 20% of the area of each bedroom and living area. Daylight will be calculated using Daylight Autonomy.	2
ACOUSTIC COMFORT	Internal Noise Levels, Acoustic Separation, Impact Noise Transfer	The building will achieve maximum internal noise levels. The building will provide acoustic separation. The building will minimise impact noise transfer.	2
CONNECTION TO NATURE	Views, plants and nature-inspired design	The building provides views, a nature inspired design and 5% of the buildings floor or site area is allocated to engageable nature.	1
RESILIENT CREDIT			
HEAT RESILIENCE	Heat Island Effect Reduction	At least 75% of the whole site area (excl. PV, SHW, skylights, translucent sheeting) will comprise one or combination of strategies that reduce heat island effect.	1
POSITIVE CREDIT			
UPFRONT CARBON EMISSIONS	Reducing Upfront carbon	The building's upfront carbon emissions from materials and products will be 20% less than those of a reference building.	3
ENERGY USE	Residential pathway: 7-star NatHERS average	Must achieve a 7-star average and 5.5-star minimum NatHERS rating for each sole occupancy unit.	NA





ENERGY SOURCE	Renewable Electricity & Renewable Energy	All energy under the control of the building owner/operator and all non-electricity energy provided for uses that are not under the building owner's control will be sourced from renewables. Fossil fuels cannot be used on site for any domestic hot water, space heating or cooking under any circumstances regardless of base build or tenant use.	6
PEOPLE CREDIT			
INCLUSIVE CONSTRUCTION PRACTICES	Need analysis	Perform a needs analysis of site workers and site workers to determine appropriate actions. Programs and policies developed must be relevant to all works for the full duration of construction.	1
	Physical and mental health program	The head contractor must show that they have introduce programs and solutions to at least 5 of the health issues. The programs must cover 80% of the workforce that are at the site for 3 days or more.	
	Evaluating the program's effectiveness	Provide an evaluation report to the client with the information of the programs delivered, attendance, available languages. A review on the delivery of intended outcomes and future recommendations.	
NATURE CREDIT			
Biodiversity Enhancement	Landscape area, Diversity of species, Biodiversity management plan	The building's site will include an appropriate landscape area. The landscaping includes a diversity of species and prioritises the use of climate-resilient and indigenous plants. The project team will develop a site-specific Biodiversity Management Plan and provide it to the building owner representative at Practical Completion.	2
TOTAL TARGETED POINTS (Minimum 15 points required)			20

The project team has provided a 5 points buffer for the 4-star Green Star strategy. The design team will finalise at least 15 points at detailed design in order to achieve the desired outcome.

Detailed Greenstar Strategy sheet can be found in Appendix 1.





3 DETAILED REQUIREMENTS

This section outlines the specific Green Star commitments that the project design and construction team will undertake to achieve a 4-star Green Star rating.

3.1 RESPONSIBLE

3.1.1 INDUSTRY DEVELOPMENT

3.1.1.1 Green Star Accredited Professional

Emergen has a number of GSAPs that will satisfy this credit.

The GSAP's will host a design team workshop, including reviewing potential credits and explaining the Green Star certification process.

An ESD Specification will be provided regarding all services identifying the requirements of the Green Star Buildings tool for the initiatives included by the design team.

3.1.1.2 Financial Transparency

The Head Contractor will complete, and include in the submission, the *Green Star Financial Transparency Disclosure Template*. The template assists the project team to submit the cost of sustainable building practices of the project including design, construction, and documentation to the GBCA.

3.1.2 RESPONSIBLE CONSTRUCTION

3.1.2.1 Environmental Management System

The builder/ head contractor will have a formalised systematic and methodical approach to planning, implementing, and auditing in place during construction. The responsible party will have an Environmental Management System (EMS) certified to a recognised standard such as AS/NZS ISO 14001, BS 7750 or the European Community's EMAS.

The EMS can be stand-alone or part of an integrated management system and must be valid for the duration of construction activities.

3.1.2.2 Environmental management plan

The Environmental Management Plan (EMP) must be project specific and cover the scope of construction activities. It must be implemented from the start of construction and include all works within the project scope.

3.1.2.3 Construction and demolition waste

Projects will divert at least 90% of construction and demolition waste from landfill.

3.1.2.4 Sustainability training

The head contractor will provide the following training to 95% of all contractors and subcontractors present on site for at least three days:

- Information on the sustainable building certification(s) sought, including:
 - the sustainability attributes of the building and their benefits.
 - the value of certification; and
 - the role site worker(s) play in delivering a sustainable building





3.1.3 VERIFICATION AND HANDOVER

3.1.3.1 Metering and monitoring

The building will have accessible energy and water metering for all common uses, major uses, and major sources.

The meters will be connected to a monitoring system capable of capturing and processing the data produced by the meters.

The meters and automatic monitoring systems will:

- Provide continual information (up to 1-hour interval readings).
- Be commissioned and validated per NABERS protocol or similar.
- Ensure all meters including utility meters and sub-meters to have accuracy declarations and/or certificates.
- Ensure sub-meters that are not to be used as utility (billing) meters should either have Certificates for accuracy issued by NMI or a test certificate from the European Measuring Instruments Directive - 2004/22/CE

The monitoring system will accurately and clearly present the metered data and include reports on consumption trends for the automatic monitoring system. The monitoring strategy must be developed in accordance with a recognised Standard, such as CIBSE TM39 Building Energy Metering. The monitoring strategy will include a metering schedule and identify the location and types of meters.

The monitoring system will raise an alarm when the energy or water use increases beyond certain parameters and automatically issue an instant alert to the facilities manager. The process to assess, correct and validate alerts or faults must be detailed and contained in an accessible location.

3.1.3.2 Commissioning and tuning

The project team will perform the following prior to construction:

- Set environmental performance targets via a Design Intent Report.
- Perform a services and maintainability review
- During construction and practical completion:
 - Commission the building; and
 - Engage building tuning service provider After practical completion:
 - Tune the building over the next 12 months

During construction and before practical completion, all building systems will be commissioned as per a recognised commissioning standard (CIBSE or ASHRAE commissioning guides). A commissioning specification will be included in the construction documentation listing requirements for each system.

A commissioning plan will be developed prior to practical completion.

Airtightness will be considered as part of the commissioning process during the following stages:

- Schematic design: review of design including an air barrier system schematic.
- Design Development: review for tightness including air barrier continuity on building plans, sections and details. Scope of work and necessary coordination between trades and responsibilities must be considered.
- Construction: A plan for stages of commissioning for air tightness must be defined and included in the project timeline.
- The building will undertake an airtightness test in accordance with AS/NZS ISO 997.





3.1.4 BUILDING INFORMATION

The Builder will provide operations and maintenance information for all nominated building systems to the building owner (or designated representative).

The Builder will develop a building logbook to present to the building owner (or designated representative) before practical completion of the project.

Building User Guide will be developed by Emergen which is a source of up-to-date, relevant information for the building user.

All building user information will be available to the building owner and facilities management team at the time of practical completion.

3.1.5 OPERATIONAL WASTE

The design team will provide for the storage of general waste, recycling and FOGO waste in the one area, located at ground floor level in the parking area adjacent to the lobby. Each bin type will be colour coded to ensure residents place the waste in correct bins.

A dedicated area for storage and collection of waste streams will be conveniently located at ground floor level in the parking area adjacent to the lobby. The bin store will accommodate bins for a one week collection cycle. Bins will be placed on the verge by the caretaker for collection on collection day. Calculation of waste requirements is based on the City of Melville waste policy.

A waste specialist and/or contractor will sign-off on the designs to confirm they are adequately sized and located for the safe and convenient storage and collection of the waste streams identified at Practical Completion.

3.2 HEALTHY

3.2.1 CLEAN AIR

3.2.1.1 Ventilation system attributes

Ventilation systems will be designed to comply with the separation distances as outlined in the Figure below, based on the Australian Standards 1668.2:2012 (table 3.4).

All new and existing ductwork that serves the building must be cleaned prior to occupation in accordance with a recognised Standard. This includes all ductwork in the base building that serves the building from the air handling unit(s) to the supply vents.





Airflow rate within the minimum distance (L/s)	Minimum separation distance from discharges to intakes, or natural ventilation opening of adjacent Sole Occupancy Unit, or site boundary (m)	Minimum separation distances from discharges to intakes, or natural ventilation opening within Sole Occupancy Unit (m)
<100 L/s	1	N/A
<200 L/s	2	1
<400 L/s	3	2
<600 L/s	4	3
<800 L/s	5	4
<1000 L/s	6	5
≥1000 L/s	7	6

Figure 4 Separation Distances

3.2.1.2 Provision of Outdoor Air

The regularly occupied areas will be provided with good access to outdoor air, appropriate for the activities and conditions by the following:

- Where ventilation is by natural means, the building will meet natural ventilation requirements as per AS1668.4:2012.

3.2.1.3 Exhaust or elimination of pollutants

It will be demonstrated that pollutants from printing and photocopying equipment, cooking processes and equipment are limited from the nominated area by either:

- Removing the source of pollutants; or
- Exhausting the pollutants directly to the outside.

For the first option, sources of pollutants, such as printing or photocopy equipment, kitchen stoves or vehicles, must be compliant with minimum emissions standards or not be present within the nominated area.

For the second option, specified sources of pollutants shall be exhausted directly to the outside of the project in accordance with a recognised Standard, and/or physically separated from occupants.

3.2.2 LIGHT QUALITY

3.2.2.1 Lighting comfort

Lighting within the building will meet the following criteria:

- All lighting will be flicker-free.
- Light sources will have a minimum Colour Rendering Index (CRI) average R1 to R8 of 85 or higher and have a CRI R9 of 50 or higher.





- Light sources will meet best practice illuminance levels for each task within each space type with a maintained illuminance that meets the levels recommended in AS/NZS 1680.1:2006 series applicable to the project type and including maintenance.
- The maintained illuminance values will achieve a uniformity of no less than that specified in Table 3.2 of AS/NZS 1680.1:2006, with a maintenance factor method as defined in AS/NZS 1680.4.; and
- All light sources will have a minimum of 3 MacAdam Ellipses.

3.2.2.2 Daylight

Daylight modelling in accordance with Greenstar requirements will be undertaken at detailed design stage.

- 60% of the combined living and bedroom area of each unit will comply with the daylight requirements. Kitchens are not included in the calculations.
- The daylight levels will also be present in at least 20% of the area of each bedroom and living area.
- Daylight will be calculated using Daylight Autonomy.

Blockout blinds or curtains will be provided to all bedrooms. If blinds or curtains are part of a packaged décor, blockout blinds will be offered as standard inclusion.

3.2.2.3 Glare

Bare light sources will be fitted with baffles, louvers, translucent diffusers, ceiling design, or other means that obscures the direct light source from all viewing angles of occupants, including occupants looking directly upwards.

3.2.3 ACOUSTIC COMFORT

An Acoustic Comfort Strategy will be prepared by the Acoustic Consultant describing how building design will deliver this to occupants addressing criteria: quiet enjoyment of space; functional use of space; control of intrusive or high levels of noise; privacy; noise transfer; and speech intelligibility.

3.2.3.1 Maximum Internal Noise Levels

Greenstar measures in accordance with the NSW sleep disturbance criteria as below:

- Up to two noise events per night: maximum internal noise levels below 70 dB L_{max};
- All other events: maximum internal noise levels below 55 dB L_{max}.

The project will endeavour to meet this however is uncertain as this is not typical for WA projects.

3.2.3.2 Acoustic Separation

All walls and floors (excluding riser walls) separating enclosed spaces will exceed the minimum NCC requirements by 5 points.

Party walls separating open plan kitchens (where joinery units are fixed) from another open plan kitchen/living room shall be discontinuous in construction (discontinuous in accordance with the National Construction Code)

Entry doors will have perimeter and threshold seals.

3.2.3.3 Impact Noise Transfer

Impact noise transfer measured in accordance with ISO 16283-2 through a floor where:

- Floors are located above nominated areas; or





- Adjacent spaces belonging to different tenancies which share a floor must not exceed dB LnT,w:
 - 55 for floors above residential accommodation spaces
 - 60 for all other spaces

3.2.4 EXPOSURE TO TOXINS

3.2.4.1 Paints, adhesives, sealants and carpets

At least 95% of internally applied paints, adhesives, sealants (by volume) and carpets (by area) will meet TVOC Limits below. Compliance can be achieved via a recognised and current at time of purchase Product Certification Scheme; laboratory product testing; or there are none of these materials present at PC.

Total VOC limits	
Paints, Adhesives and Sealants	
Product category	Max. Total Volatile Organic Compounds (TVOC) content in grams per litre (g/L) of ready to use product
General purpose adhesives and sealants	50
Interior wall and ceiling paint, all sheen levels	16
Trim, varnishes, and wood stains	75
Primers, sealers, and prep coats	65
One and two pack performance coatings for floors	140
Acoustic sealants, architectural sealant, waterproofing membranes and sealant, fire retardant sealants and adhesives	250
Structural glazing adhesive, wood flooring and laminate adhesives and sealants	100

Figure 5 TVOC Limits – Paints, Adhesives & Sealants

Carpets		
Compliance option	Test protocol	Limit
	ASTM D5116 - Total VOC limit*	limit* 0.5mg/m ² per hour
ASTM D5116	ASTM D5116 - 4-PC (4-Phenylcyclohexene) *	0.05mg/m ² per hour
ISO 16000 / EN 13419	ISO 16000 / EN 13419 - TVOC at three days	0.5 mg/m ² per hour
ISO 10580 / ISO/TC 219 (Document N238)	ISO 10580 / ISO/TC 219 (Document N238) - TVOC at 24 hours	0.5mg/m ² per hour

* mg/m²hr may also be represented as mg/m²/hr

Figure 6 TVOC Limits - Carpets

3.2.4.2 Engineered wood products.

At least 95% (by area) of all engineered wood products will meet specified formaldehyde emission limits below. Compliance can be achieved via a recognised and current at time of purchase Product Certification Scheme, or laboratory product testing. Excluding formwork, car parking applications and non-engineered wood products.





Test protocol	Emissions Limit / Unit of Measurement
AS/NZS 2269:2004, testing procedure AS/NZS 2098.11:2005 method 10 for Plywood	≤1mg/L
AS/NZS 1859.1:2004 - Particle Board, with use of testing procedure AS/NZS 4266.16:2004 method 16	≤1.5 mg/L
AS/NZS 1859.2:2004 - MDF, with use of testing procedure AS/NZS 4266.16:2004 method 16	≤1mg/L
AS/NZS 4357.4 - Laminated Veneer Lumber (LVL)	≤1mg/L
Japanese Agricultural Standard MAFF Notification No.701 Appendix Clause 3 (11) - LVL	≤1mg/L
JIS A 5908:2003- Particle Board and Plywood, with use of testing procedure JIS A 1460	≤1mg/L
JIS A 5905:2003 - MDF, with use of testing procedure JIS A 1460	≤1mg/L
JIS A1901 (not applicable to Plywood, applicable to high pressure laminates and compact laminates)	≤0.1 mg/m ² hr*
ASTM D5116 (applicable to high pressure laminates and compact laminates)	≤0.1 mg/m ² hr
ISO 16000 part 9, 10 and 11 (also known as EN 13419), applicable to high pressure laminates and compact laminates	≤0.1 mg/m ² hr (at 3 days)
ASTM D6007	≤0.12mg/m ³ **
ASTM E1333	≤0.12mg/m ³ ***
EN 717-1 (also known as DIN EN 717-1)	≤0.12mg/m
EN 717-2 (also known as DIN EN 717-2)	≤3.5mg/m ² hr

** The test report must confirm that the conditions of Table above comply for the particular wood product type, the final results must be presented in EN 717-1 equivalent (as presented in the table) using the correlation ratio of 0.98.

*** The final results must be presented in EN 717-1 equivalent (as presented in the table), using the correlation ratio of 0.98.

Figure 7 Emissions Limit

3.2.4.3 Lead, asbestos and PCBs

Comprehensive hazardous materials survey will be performed on existing structures on site in accordance with relevant Environmental and OH&S legislation (pg. 86). Where these materials identified, materials must be stabilised/removed and disposed of in accordance with best practice guidelines; or simply conclude none found on site.

3.2.5 CONNECTION TO NATURE

3.2.5.1 Views

At least 60% of regularly occupied areas will have a clear line of sight to a high quality internal or external view. All floor areas within 8m from a compliant view meet this credit criterion.

3.2.5.2 Nature-inspired design

Five additional nature-inspired design interventions will be provided in alignment with the following principles:

- Elements that provide multiple natural sensory experiences
- Elements that reflect natural and cultural patterns and forms
- Using natural materials





- Large scale and holistically incorporated natural motifs and art

3.2.5.3 Outdoor Plants

At least 5% of the building's total regularly occupied areas or land within the site boundary (whichever is greater) will be planted area located externally, either vertical or horizontally. The planted areas must be accessible and necessary infrastructure to allow the activity to occur.

3.3 RESILIENT

3.3.1 CLIMATE CHANGE RESILIENCE

3.3.1.1 Climate Change Pre-screening Checklist

The project team will complete the climate change pre-screening checklist and communicate the building's exposure to climate change risks to the applicant.

Climate Change Resilience		Climate Change Pre-screening Checklist_R2		
Pre-screening item	Applies to project	Has data regarding future climate exposure been reviewed?	Has a risk to the project been identified?	Has a risk treatment been identified?
The project area has previously been impacted by extreme climate events (e.g. storms/tropical cyclones, extreme rainfall and flooding, damaging winds, damaging hail, bushfires, heatwaves, drought, or coastal inundation).	Yes	Choose an item.	Choose an item.	Choose an item.
The project is located in a cyclone zone.	No	Choose an item.	Choose an item.	Choose an item.
The project is located in or adjacent to a bushfire prone area.	Choose an item.	Choose an item.	Choose an item.	Choose an item.
The project is located in or adjacent to a flood prone area.	Choose an item.	Choose an item.	Choose an item.	Choose an item.
The project is located at or adjacent to the coastline or tidally influenced waterway.	Choose an item.	Choose an item.	Choose an item.	Choose an item.
The project will accommodate occupants vulnerable to the impacts of climate extremes (e.g. children, elderly, low mobility, seeking medical treatment).	Choose an item.	Choose an item.	Choose an item.	Choose an item.

Note: if the pre-screening item does not apply to the project, the questions in the remaining three columns do not need to be checked off.

Figure 8 Climate Change Pre-screening Checklist Sample

3.3.1.2 Heat Resilience

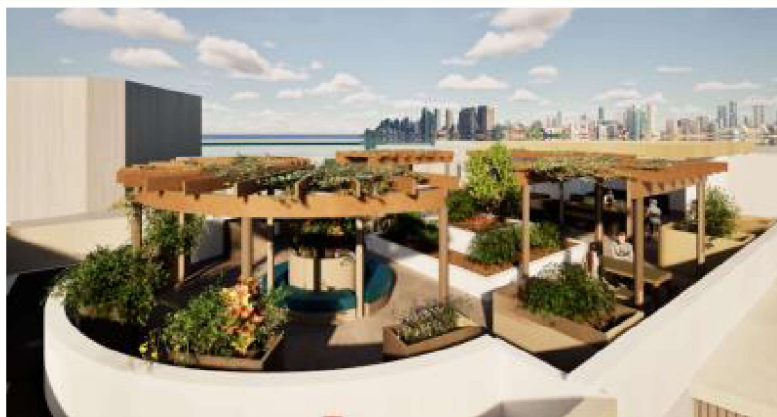


Figure 9 Proposed Communal Roof garden - Concept

The following strategies will be used to reduce the heat island effect:

- Vegetation
- Green roofs
- Roofing materials, including shading structures, having the following:
 - For roof pitched <15°– a three-year SRI of minimum 64





- For roof pitched >15°– a three-year SRI of minimum 34
- Unshaded hard-scaping elements with a three-year SRI of minimum 34 or an initial SRI of minimum 39.
- Hardscaping elements shaded by overhanging vegetation.

3.4 POSITIVE

3.4.1 UPFRONT CARBON EMISSIONS

The building will aim to achieve upfront carbon emissions that are at least 20% lower than those of a reference building.

The design team will focus on material selection that reduces embodied energy. This approach includes the use of sustainably sourced steel for the building roof and the implementation of construction processes that prioritize high durability and waste reduction.

3.4.2 ENERGY USE

3.4.2.1 Building Fabric

The preliminary construction specification in line with NCC 2022 is as per below.

Table 2: Class 2 Specification

ELEMENT	LOCATION / TYPE	CONSTRUCTION DESCRIPTION	INSULATION REQUIREMENT
External & Party Walls	External Walls	Steel cladding; steel stud frame; 13mm plasterboard lining	R2.7 bulk insulation within wall cavity
	Corridor Walls	Steel cladding; steel stud frame; 13mm plasterboard lining	R2.7 bulk insulation within wall cavity
	Party Walls	Double stud framed wall; plasterboard lining to both sides	R2.0 insulation to both sides of plasterboard
Internal Walls	Internal Apartment Walls	Steel stud frame; plasterboard lining	No insulation required
Floors	Construction Type 1	CSOG (Concrete Slab on Ground) to ground floor;	No insulation required
	Construction Type 2	Suspended concrete slab to upper floors	R1.3 floor insulation to Level 1 only/exposed floor
	Floor Coverings	As per architectural drawings, defaults applied if not specified	Not applicable
Ceilings / Roofs	Construction Type 1	Framed roof with ceiling lining; concrete roof slab	R5.0 ceiling insulation (GF); R5.0 ceiling insulation (Level 5)
	Construction Type 2	concrete roof slab (to neighbour/conditioned space)	No insulation required





Table 3: Window specification for all Apartment

WINDOW SPECIFICATION		U-VALUE	SHGC (+/- 5%)
TYPE 1	Single Glazed Clear	6.7	0.57

Table 4: NatHERS Results

DWELLING	LEVEL	HEATING	COOLING	TOTAL	STAR RATING
G	G	46	26.8	72.8	6.3
SW	L1	41.3	37.3	78.6	6
SE	L1	15.2	32.2	47.4	7.8
NW	L3	41.4	10.9	52.3	7.5
NE	L3	32.6	3.6	36.2	8.4
SW	L3	30.5	21.5	52	7.6
SE	L3	25.5	4.4	29.9	8.8
NW	L5	52.5	21.4	73.9	6.3
NE	L5	46.6	12	58.6	7.2
SW	L5	39.6	29.1	68.7	6.6
SE	L5	35.9	11.6	47.5	7.8

Note: Project team is confident that the development will be able to meet the average of 7 stars and meet NCC 2022 requirements based on the results above.

3.4.2.2 PV Generation

PV generation will reduce the operational energy loads and peak demand of the building due to the expected load profile correlating to the available solar resource. PV system capacity will be designed by the Electrical Consultant at detailed design.

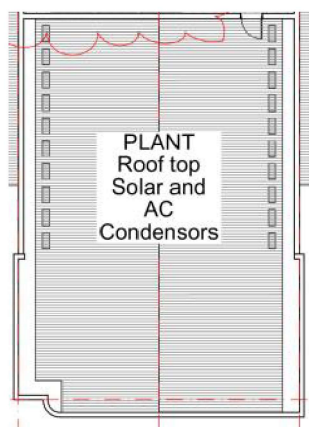


Figure 10 Proposed Rooftop PV Location





3.4.3 WATER USE

3.4.3.1 Sanitary fixture and appliance efficiency

The sanitary fixtures will be in line with the below.

Table 5: WELS Rating Requirements

FIXTURE / EQUIPMENT TYPE	WELS RATING
Taps	5 Star
Toilets	4 Star
Showers	3 Star
Washing Machine	4 Star
Dishwashers	5 Star

3.5 PEOPLE

3.5.1 INCLUSIVE CONSTRUCTION PRACTISES

3.5.1.1 On-site Facilities, Policies, and Training

The Builder will ensure the following is provided or available on-site:

- Separate gender inclusive bathroom facilities and changing amenities with a high degree of privacy
- Diverse gender-specific fit-for-purpose personal protective equipment (PPE) for diverse body sizes and types

The Builder will:

- Implement policies to address issues of discrimination, racism, and bullying on-site.
- Introduce on-site redress procedures for any relevant breaches and corrective measures to be put in place should any incident be identified.
- Empower a diverse lead team to manage these policies on-site.
- Provide training to all contractors and subcontractors on these policies (as per below)
 - Training will be provided to 95% of all contractors and subcontractors present on site for at least three days for:
 - Information on drug and alcohol awareness and mental health
 - Information on policies implemented on discrimination, racism, bullying on site, and safe ways to report poor behaviour.

The responsible party will carry out a needs analysis of potential site workers and sub-contractors at tender.

The Builder will show that they have introduced programs and solutions to address at least five of the following: Suicide prevention; Healthy eating and active living; Reduce harmful alcohol and tobacco consumption and avoid drug use; Increased social cohesion, community, and cultural participation; Understanding depression; Preventing violence and injury; Decreased psychological stress; Finding fulfilment at work or mindful meditation; Other issues identified in the Needs Analysis.





3.6 NATURE

3.6.1 IMPACTS TO NATURE

3.6.1.1 Not built on, or impacted, a site with high ecological value

At the date of purchase or option contract, the building, infrastructure, or construction works do not clear:

- Old-growth forest,
- Prime agricultural land,
- Any wetland listed as being of 'High National Importance',

3.6.1.2 External Lighting

External lighting shall be selected to provide only downward component.

3.6.2 BIODIVERSITY ENHANCEMENT

3.6.2.1 Landscape area.

At a minimum, external landscape in the building, whether horizontal or vertical will be provided at a ratio of either 15% of the site area or at a ratio of 1:500 of the GFA, whichever is larger. Vertical or horizontal landscapes are acceptable.

LANDSCAPE AREA CALCULATIONS

SITE AREA

Total Site Area = 1012m²

LANDSCAPE AREA

Total landscape area ground floor	171.60m ²
Soft landscape area ground floor	118.71m ²
Total open space rooftop	392m ²
Landscape area rooftop planters	45.45m ²
Soft landscape area as percentage of site area	16.22%

Figure 11 Proposed Landscape Area Calculation

3.6.2.2 Diversity of species

Landscape will be shown to be diverse and include multiple species/genus/etc.

Greater than 60% of plants must be indigenous and the site must include at least one significant (nesting) tree or equivalent habitat provision per 500m² of landscaped area.

No invasive species are allowed, as per the *Australian Weeds Strategy 2017 to 2027*.

There are two pathways to demonstrate diversity in plant selection and climate resilience.



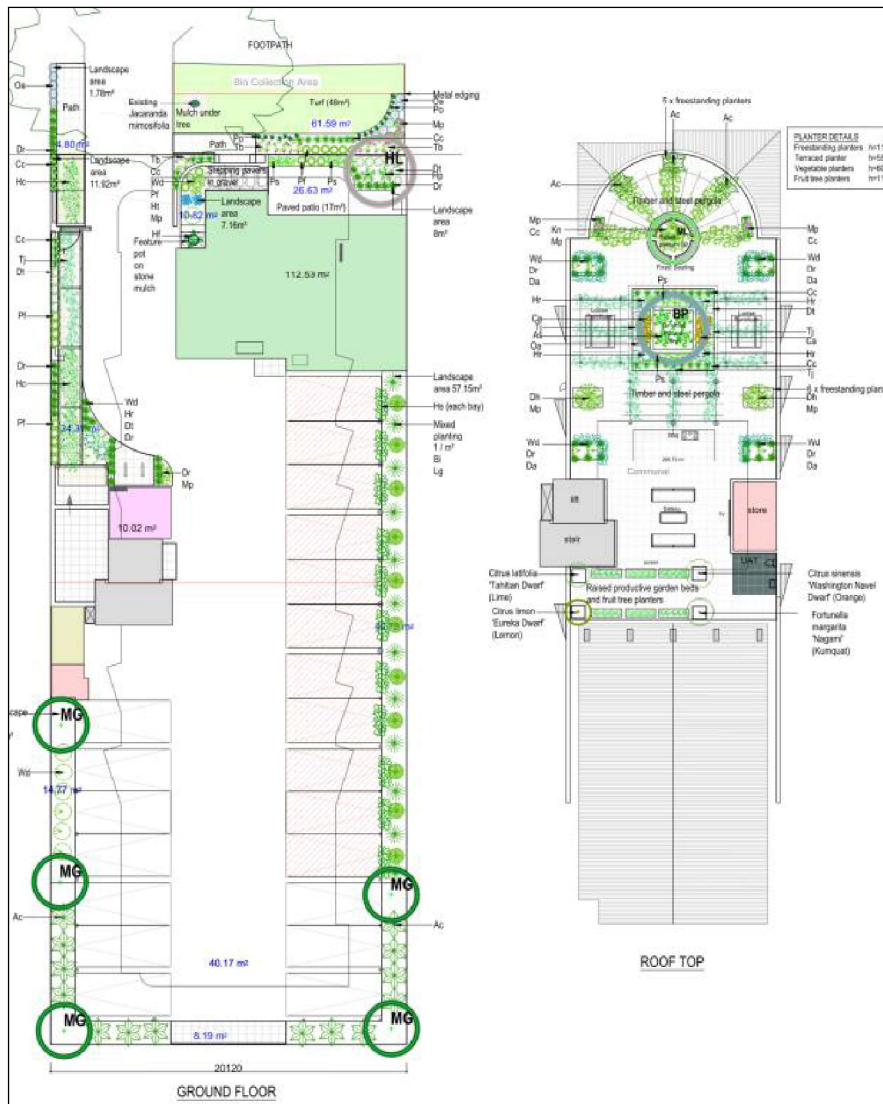


Figure 12 Proposed Landscape at Ground and Rooftop

3.6.2.3 Biodiversity management plan

A suitably qualified professional, such as a qualified ecologist or landscape architect, will prepare a Biodiversity Management Plan at Practical Completion. The plan will outline key actions that need to be undertaken in order to maintain the ecological integrity of biodiversity on the site, whether this is existing or that created as part of the development.

