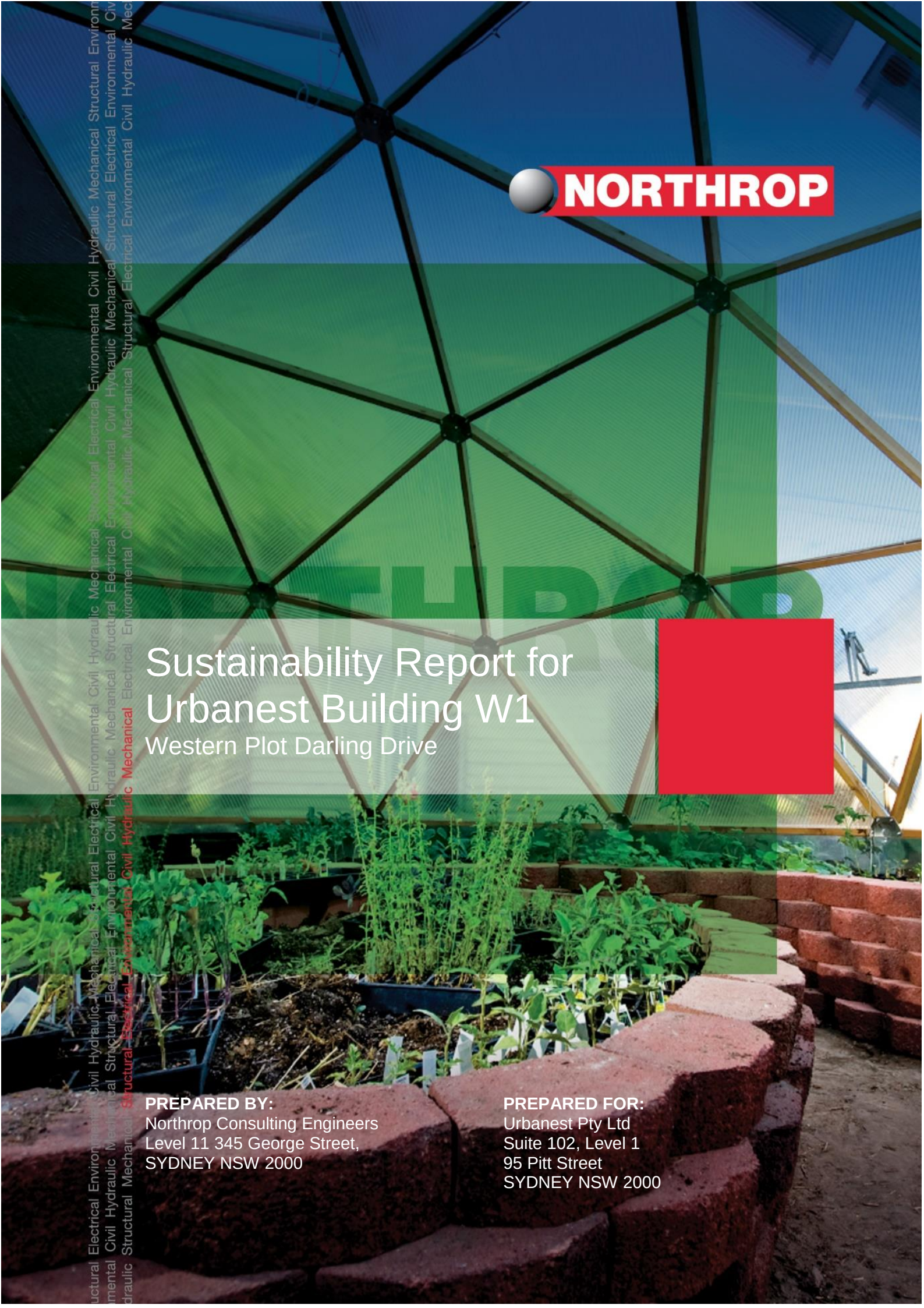

NORTHROP

Sustainability Report for Urbanest Building W1

Western Plot Darling Drive

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REVISIONS SCHEDULE

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25.08.15	A	Draft
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EXECUTIVE SUMMARY

The intent of this report is to outline the sustainability strategy adopted for the new Urbanest Building W1 project, and demonstrate compliance with sustainability objectives set for the development.

The Building W1 development will be targeting the following sustainability objectives:

- Achieve compliance with site wide sustainability targets set in the SSDA2 Concept Proposal;
- Building Code of Australia – compliance with the requirements of Section J Energy Efficiency (mandatory); and,
- Green Star – Achievement of a self-assessed 4 star 'Australian Best Practice' Green Star Urbanest Custom As-Built certified rating.

  It is proposed that the project be required to provide documentation, prepared by a suitably qualified consultant indicating that the development has been designed in accordance with the principles of a 4 Star Green Star rating. Evidence of the projects consistency with Green Star Principals shall be provided to the Certifying Authority prior to the relevant Construction Certificate. This approach is consistent with approval for the adjacent W2 Student Accommodation building.

Targeting the principles of a four (4) star 'Australian Best Practice' rating under the Green Star Urbanest Custom Tool demonstrates that the environmental impact of the development has been minimised and the building design demonstrates 'Australian Best Practice' in terms of environmentally sustainable design.

Sustainability initiatives proposed for the building include, but are not limited to:

- Space efficient building floor plates;
- High quality common areas and facilities targeted at students, including a catering facility, television and games rooms, study and group and work rooms on the lower levels;
- Energy efficient heating, ventilation and air conditioning including natural ventilation to corridors;
- Water efficient building services including rainwater collection and fire system reuse
- Secure bicycle storage;
- Provision of effective waste minimisation practices to reduce all operational waste to four (4) recycling waste streams;
- Recycling of at least 80% of construction and demolition waste;
- Inclusion of integrated student learning portals;
- Dematerialisation through the use of prefabricated bathroom and kitchens; and,
- The provision of real time data on building HVAC system performance and mass transport options.

Table of Contents

1 INTRODUCTION

The intent of this report is to outline the sustainability strategy adopted for the new Urbanest Building W1 and demonstrate compliance with Sustainability objectives set for the development.

This report supports a State Significant Development (SSD) Development Application (DA) submitted to the Minister for Planning pursuant to Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

The Application (referred to as SSDA 12) follows the approval of a staged SSD DA (SSDA 2) in December 2013. SSDA 2 sets out a Concept Proposal for a new mixed use residential neighbourhood at Haymarket referred to as “Darling Square”, previously known as “The Haymarket”. Darling Square forms part of the Sydney International Convention, Exhibition and Entertainment precinct (SICEEP) Project, which will deliver Australia’s global city with new world class convention, exhibition and entertainment facilities and support the NSW Government’s goal to “make NSW number one again”.

More specifically this subsequent DA seeks approval for a residential building (student accommodation) within the Western development plot (Darling Drive) of Darling Square and associated public domain works. The DA has been prepared and structured to be consistent with the Concept Proposal DA.

1.1 Overview of Proposed Development

The proposal relates to a detailed (‘Stage 2’) DA for a residential building (student accommodation) in the Darling Drive Plot of Darling Square together with associated public domain works. The Darling Square Site is to be developed for a mix of residential and non-residential uses, including but not limited to residential buildings, commercial, retail, community and open space. The Darling Drive Plot is one of six development plots identified within the approved Concept Proposal.

More specifically, this SSD DA seeks approval for the following components of the development:

- Demolition of existing site improvements;
- Associated tree removal and planting;
- Construction and use of one residential building within the Darling Drive Plot, to be used for student accommodation purposes;
- Public domain improvements, including provision of a new urban courtyard space between student accommodation buildings W1 and W2; and
- Extension and augmentation of physical infrastructure / utilities as required.

1.2 Background

The NSW Government considers that a precinct-wide renewal and expansion of the existing convention, exhibition and entertainment centre facilities at Darling Harbour is required, and is committed to Sydney reclaiming its position on centre stage for hosting world-class events with the creation of SICEEP.

Following an extensive and rigorous Expressions of Interest and Request for Proposals process, a consortium comprising AEG Ogden, Lend Lease, Capella Capital and Spotless was announced by the NSW Government in December 2012 as the preferred proponent to transform Darling Harbour and create SICEEP.

- Key features of the Preferred Master Plan include:
- Delivering world-class convention, exhibition and entertainment facilities, including:
    - Up to 40,000m^2 exhibition space;
    - Over 8,000m^2 of meeting rooms space, across 40 rooms;
    - Overall convention space capacity for more than 12,000 people;
    - A ballroom capable of accommodating 2,000 people; and
    - A premium, red-carpet entertainment facility with a capacity of 8,000 persons.
- Providing a hotel complex at the northern end of the precinct.
- A vibrant and authentic new neighbourhood at the southern end of the precinct, now called 'Darling Square', including apartments, student accommodation, shops, cafes and restaurants.
- Renewed and upgraded public domain that has been increased by a hectare, including an outdoor event space for up to 27,000 people at an expanded Tumbalong Park; and
- Improved pedestrian connections linking to the proposed Ultimo Pedestrian Network drawing people between Central, Chinatown and Cockle Bay Wharf as well as east-west between Ultimo/Pyrmont and the City.

On 21 March 2013 a critical step in realising the NSW Government's vision for the SICEEP Project was made, with the lodgment of the first two SSD DAs with the (now) Department of Planning and Environment. The key components of these proposals are outlined below.

1.2.1 Public Private Partnership SSD DA (SSD 12_5752)

The Public-Private Partnership (PPP) SSD DA (SSDA 1) includes the core facilities of the SICEEP Project, comprising the new, integrated and world-class convention, exhibition and entertainment facilities along with ancillary commercial premises and public domain upgrades. SSDA1 was approved on 22 August 2013.

1.2.2 Concept Proposal (SSD 13_5878)

The Concept Proposal SSD DA (SSDA 2) establishes the vision and planning and development framework which will be the basis for the consent authority to assess detailed development proposals within the Darling Square Site. SSDA2 was approved on 5 December 2013. The Stage 1 Concept Proposal approved the following key components and development parameters:

- Indicative staging of demolition and development of future development plots;
- Land uses across the site including residential and non-residential uses;
- Street and laneway layouts and pedestrian routes;
- Open spaces and through-site links;
- Six separate development plots, development plot sizes and separation, building envelopes, building separation, building depths, building alignments, and benchmarks for natural ventilation and solar access provisions;
- A maximum total gross floor area (non-residential and residential GFA);
- Above ground car parking including public car parking;
- Residential car parking rates;
- Design Guidelines to guide future development and the public domain; and
- A remediation strategy.

In addition to the approval of SSDA2, the following approvals have been granted for various stages of the Darling Square site:

- Darling Drive (part) development plot (SSDA3) for the construction and use of a residential building/W2 (student accommodation) and the provision of associated public domain works approved on 7 May 2014;
- North-West development plot (SSDA4) for the construction and use of a mixed use commercial development and public car park building and associated public domain works approved on 7 May 2014; and
- South-West development plot (SSDA5) – construction and use of a mixed use residential development and associated public domain works approved on 21 May 2014.
- North-East development plot (SSDA7) – construction and use of a mixed use residential development and associated public domain works approved on 16 April 2014.

Approval was also granted on 15 June 2014 for SSDA6 which includes the construction and use of the International Convention Centre (ICC) Hotel and provision of public domain works.

This report has been prepared to support a detailed Stage 2 SSD DA for a residential building/W1 (student accommodation) and associated public domain works within Darling Square (SSDA 12), consistent with the Concept Proposal (SSDA 2).

1.3 Site Description

The SICEEP Site is located within Darling Harbour. Darling Harbour is a 60 hectare waterfront precinct on the south-western edge of the Sydney Central Business District that provides a mix of functions including recreational, tourist, entertainment and business.

With an area of approximately 20 hectares, the SICEEP Site is generally bound by the light rail Line to the west, Harbourside shopping centre and Cockle Bay to the north, Darling Quarter, the Chinese Garden and Harbour Street to the east, and Hay Street to the south (refer to **Figure 1**). The Darling Square Site is:

- Located in the south of the SICEEP Site, within the northern portion of the suburb of Haymarket;
- Bounded by the Powerhouse Museum to the west, the Pier Street overpass and Little Pier Street to the north, Harbour Street to the east, and Hay Street to the south; and
- Irregular in shape and occupies an area of approximately 43,807m^2.

Figure 1 – Aerial Photograph of the SICEEP Site

The Concept Proposal DA provides for six (6) separate development plots across the Darling Square Site (refer to **Figure 2**):

1. North Plot;
2. North East Plot;
3. South East Plot;
4. South West Plot;
5. North West Plot; and
6. Western Plot (Darling Drive).

The Application Site area relates to the northern portion of the Western Plot and surrounds as detailed within the architectural and landscape plans submitted in support of the DA.

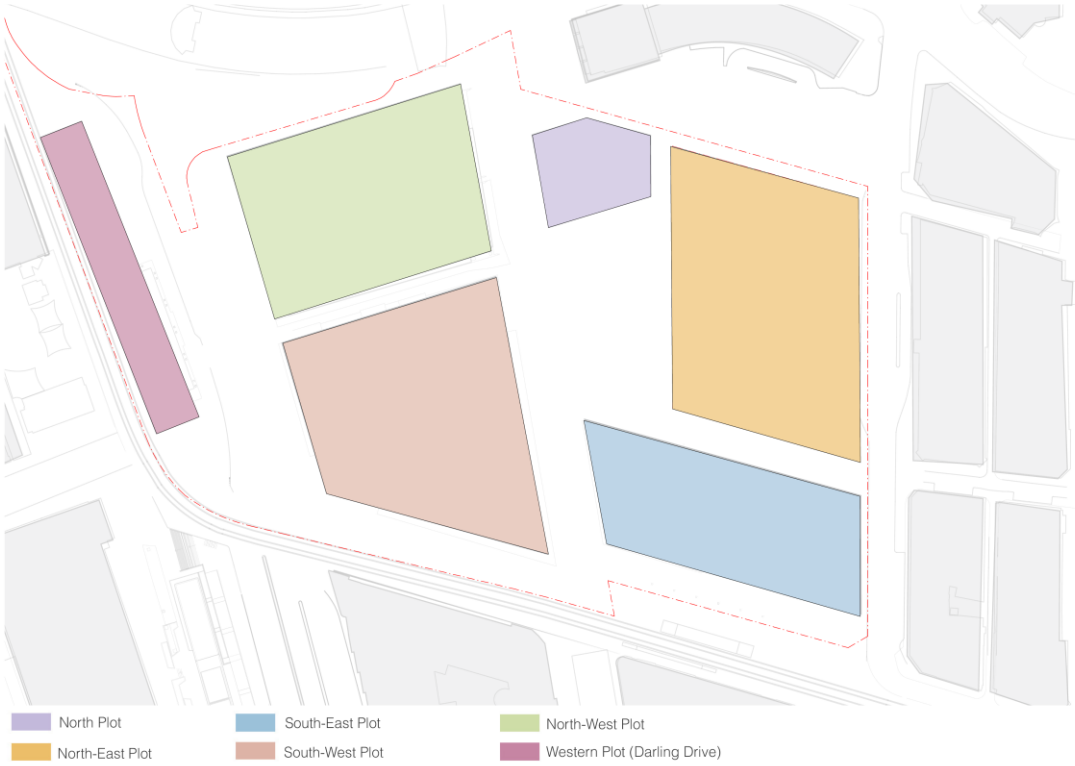


Figure 2 – Concept Proposal Development Plots

1.4 PROJECT DESCRIPTION

The Building W1 project comprises of a 22 storey student accommodation building located to the south of the SICEEP site. The building will provide a high quality living environment for students, form an integral part of the urban environment of the precinct and activate the surrounding area of Ultimo.

The Ground Floor includes student amenities such as secure bike storage facilities, dedicated study areas, meeting rooms, reception, office, and service areas for mechanical plant and waste.

Level One includes dining areas, lounge rooms and food preparation, servery and storage areas. Levels 2 - 21 are dedicated to student accommodation, with single and twin occupancy units with ensuites. Each bedroom is provided with all necessary furniture including seating, beds, bookshelves and desks.

1.5 SUSTAINABILITY OBJECTIVES

The Building W1 development will be targeting the following sustainability objectives:

- Compliance with site wide sustainability targets set in the SSDA2 Concept Proposal;
- Building Code of Australia – Achieve compliance with the requirements of Section J Energy Efficiency (mandatory); and,
- Green Star – Achieve a 4 star 'Australian Best Practice' Green Star Urbanest Custom As-Built certified rating (self-assessed).

  It is proposed that the project be required to provide documentation, prepared by a suitably qualified consultant indicating that the development has been designed in accordance with the principles of a 4 Star Green Star rating. Evidence of the projects consistency with Green Star Principals shall be provided to the Certifying Authority prior to the relevant Construction Certificate. This approach is consistent with approval for the adjacent W2 Student Accommodation building.

1.6 LIMITATIONS OF THE REPORT

Due care and skill has been exercised in the preparation of this report.

No responsibility or liability to any third party is accepted for any loss or damage arising out of the use of this report by any third party. Any third party wishing to act upon any material contained in this report should first contact Northrop for detailed advice, which will take into account that party's particular requirements.

2 THE URBANEST DESIGN PHILOSOPHY

Student Accommodation specialist, Urbanest, has a mission to set a new Australian benchmark for student accommodation. Urbanest has been providing high quality student accommodation to Australia since February 2008.

Urbanest owns, designs, builds, and manages each of its student accommodation facilities. Urbanest is a long-term property owner/manager and is committed to the success and suitability for the whole life cycle of each of its developments.



Every Urbanest development has a specific focus on high quality design, sustainability, and community engagement to ensure that each development enhances the economic, social, and environmental attributes of its local community.

Urbanest developments are often infill brownfield developments, which provide high density living on an existing low to medium density CBD site. Urbanest development sites are specifically chosen to enable active transport by its residents, with attributes including secure bicycle storage, and close proximity to public transport hubs, walking paths and quality amenities such as computer rooms, gyms and media centres.

At the conceptual stages of each development, decisions are made on their merits over the full lifecycle of the building, rather than focusing only on the upfront capital costs. Urbanest develops and manages their buildings; hence sustainable practices are pursued beyond design and construction, and into the building operation and management.

Urbanest appreciates the value of whole of life sustainability analysis.

3 WHOLE OF PRECINCT SUSTAINABILITY INITIATIVES

An integrated approach has been taken to sustainability across the total SICEEP site. In addition to the building based initiatives, a number of whole of precinct initiatives will be delivered to benefit the community including:

3.1 Enhanced Connections and Public Transport Links

The master plan design for the precinct lays out a connected and enhanced navigation through the site; enticing the local community as well as visitors through improved walkability and innovative interactive way finding, making public transport the easy and obvious choice for people providing affordable, green and safe travel options.

3.2 Car Share Network

Car Share networks reduce the cost of car ownership and minimise embodied carbon. A precinct wide car sharing scheme is being put in place in partnership with GoGet. This Car Share Network will provide with access to vehicles without the majority of the costs and environmental impact.

3.3 Passive Signage

Simple material that indicates the sustainability attributes of key items. This could include:

- Labelling of key materials that indicate what it is, where it is from, how much embodied carbon it contains and how it may be recycled – "This bench is made from plantation spotted gum from North Queensland and has absorbed 100kgs of carbon dioxide from the atmosphere";
- Design attributes that support sustainable outcomes – "this landscaped area treats stormwater runoff to reduce pollution into the harbour";
- Directional information such as links to public transport; and,
- Heritage and Indigenous references to the precinct's past.

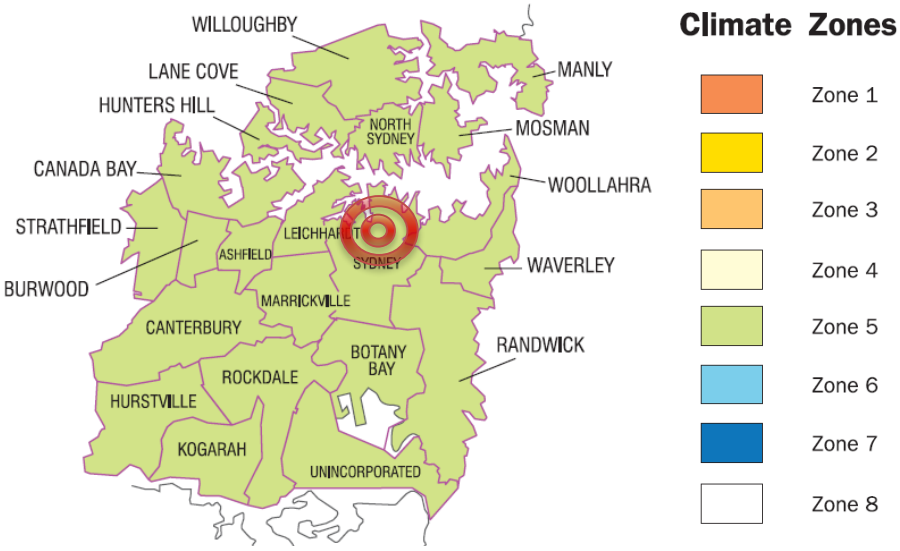
3.4 Dynamic Informatics Systems and Technology

- Online and mobile phone applications that provide more detailed information about the sustainability credentials of the precinct that can be automatically activated by proximity or scanning QR codes with a smartphone; and
- Interactive signage and lighting, in combination with augmented visuals on smart devices, to highlight physical building elements.

4 BCA SECTION J REQUIREMENTS

The Urbanest Building W1 student accommodation development will meet the minimum Deemed-to-Satisfy requirements of Section J Energy Efficiency of the BCA 2015.

The Deemed-to-Satisfy (DTS) provisions of Section J apply to building elements forming the envelope of the building. The development is located in Climate Zone 5 as per Table A1.1, and is classified as a Class 3 building.



Areas subject to compliance include:

- Ground Floor – Study spaces, offices, meeting rooms and common areas including the reception and other common facilities;
- Level 1: Dining, lounge, and Servery areas;
- Levels 2-21: Single and twin occupancy units with ensuites rooms.

Section J addresses energy efficiency requirements relating to:

- Building fabric;
- Glazing;
- Building sealing;
- Air conditioning and ventilation;
- Artificial lighting and power;
- Hot water supply; and,
- Access for maintenance and facilities for monitoring.

The DTS requirements are as described in the following sections.

4.1 Building Fabric

4.1.1 Roofs and Ceilings:

The roof or ceiling of Level 21 must achieve;

- Minimum total R-Value of 3.2m2.K/W if roof solar absorptance is greater than 0.4
- Minimum total R-Value of 3.7m2.K/W if roof solar absorptance is greater than 0.4 and less than 0.6
- Minimum total R-Value of 4.2m2.K/W if roof solar absorptance is greater than 0.6

The table below demonstrates how this could be achieved (worst case scenario);

Item Description	R-Value	
Outdoor Air Film	0.04	
Metal roof	0.00	
R3.5 Insulation	***3.50***	
Reflective Airspace	0.74	
13mm Plasterboard/Ceiling Tiles	0.06	
Indoor Air Film	0.12	Required
Total R-Value:	*4.46*	*4.2*

4.1.2 External Envelope Walls:

The external envelope walls of the conditioned spaces must achieve a minimum Total R-Value of 2.8m2.K/W.

The table below demonstrated how this could be achieved;

Item Description	R-Value	
Outdoor Air Film	0.04	
110mm Brickwork	0.18	
Unventilated air space	0.19	
R2.5 Insulation	***2.5***	
10mm Plasterboard	0.06	
Outdoor Air Film	0.04	Required
Total R-Value:	*3.01*	*2.8*

4.1.3 Internal Envelope Walls:

Where the adjacent non-conditioned space is enclosed with mechanical ventilation of not more than 1.5 air changes per hour of outside air, the internal envelope walls must achieve a minimum Total R-Value of 1.0m2.K/W.

All other internal envelope walls must achieve a minimum Total R-Value of 1.8m2.K/W.

The table below demonstrated how this could be achieved;

Item Description	R-Value	
Indoor Air Film	0.12	
Concrete Cladding	0.09	
R1.5 Insulation	***1.5***	
10mm Plasterboard	0.06	
Indoor Air Film	0.12	Required
Total R-Value:	*1.89*	*1.8*

4.1.4 Floors – Suspended Slab:

A suspended floor without an in-slab heating or cooling system where the non-conditioned space is enclosed with mechanical ventilation of not more than 1.5 air changes per hour of outside air, requires a minimum Total R-Value of 1.0 m2/K/W in the downwards direction.

Where the non-conditioned space is enclosed with mechanical ventilation of not more than 1.5 air changes per hour of outside air, the suspended floor must achieve a minimum Total R-Value of 1.25 m2.K/W in the downwards direction.

The table below demonstrated how this could be achieved;

Item Description	R-Value	
Indoor Air Film	0.12	
R1.0 Insulation	***1.0***	
Concrete Panel	0.09	
Indoor Air Film	0.12	Required
Total R-Value:	*1.33*	*1.25*

4.2 Glazing

The glazing in the external fabric facing each orientation in each storey, including any mezzanine, must be assessed separately in accordance with the DTS Glazing Calculators as issued by the BCA.

Compliance is determined by the glazing area, the façade orientation, the area of the facade, horizontal shading provided, and the glazing performance. Vertical shading cannot be entered in to the Glazing Calculator. Glazing performance is measured by Total U-Value (the total U-Value for the glazing unit including the frame) and the Solar Heat Gain Coefficient (SHGC).

It is the intent of the design to achieve a similar outcome to the Building W1 project, achieving compliance with the glazing of the following properties;

- Glazing performance: U-value (Uw): 3.0 SHGC: 0.30

This will be confirmed in design development via updated DTS calculations, or potential JV3 alternative solution.

4.3 Building Sealing

4.3.1 External Windows and Doors:

To restrict air infiltration, a seal must be fitted to each edge of a door, operable window or the like when serving a conditioned space, or the external fabric of a habitable room or public area. This requirement does not apply to windows complying with AS 2047, fire doors, and, roller shutter doors used only for out-of-hours security. A seal required for the bottom edge of an external swing door must be a draft protection device. For other locations, the seal may be a foam or rubber compressible strip, fibrous seal or the like.

Main entrances which lead to a conditioned space of an area greater than 50m2, such as that on the Ground Floor to the Reception, must have an airlock, self-closing door, revolving door or the like.

4.3.2 Exhaust Fans:

Miscellaneous exhaust fans, such as a bathroom or kitchen exhaust fans must be fitted with a sealing device, such as a self-closing damper when serving a conditioned space or a habitable room.

4.3.3 Construction of Roofs, Walls, and Floors:

Roofs, ceilings, walls, floors and any opening such as a window, door or the like must be constructed to minimise air leakage when forming part of the envelope or external fabric of a habitable room or a public area.

The construction must be enclosed by internal lining systems that are close fitting at ceiling, wall, or floor junctions, or sealed by caulking, skirting, architraves, cornices, or the like.

The above requirements do not apply to openings required for smoke hazard management.

4.4 Air Conditioning and Ventilation

Design certification confirming the subject space has been designed in accordance with Part J5 of Section J BCA 2015 must be provided by the Mechanical System Designer.

4.5 Artificial Lighting and Power

Design certification confirming the subject space has been designed in accordance with Section J BCA 2015 requirements must be provided by the Electrical Lighting and Power System Designer.

4.6 Hot Water Supply

Design certification confirming the subject space has been designed in accordance with Section J BCA 2015 requirements must be provided by the Hydraulic System Designer.

4.7 Access for Maintenance and Facilities for Monitoring

Access must be provided to all plant, equipment and components that require maintenance in accordance with the BCA Part I2.

A facility to record the energy consumption of air-conditioning plant, artificial lighting, appliance power, central hot water supply, internal transport devices, or other ancillary plants must be provided in accordance with BCA Part J8.3b.

5 THE URBANEST GREEN STAR CUSTOM TOOL

Urbanest has worked with the GBCA to develop a Green Star Rating tool specifically for student housing projects, a first for Australia. The development of the Urbanest Green Star Custom Tool demonstrates Urbanest's commitment to set a new benchmark in sustainability performance for their student accommodation projects. This tool ensures that for each project sustainability is incorporated from conceptual design though construction to occupancy and operation.

"The GBCA is delighted to be working with Northrop Consulting Engineers on the development of a Green Star – Custom rating tool for Urbanest student accommodation projects."

- **Romilly Madew, Chief Executive, Green Building Council of Australia**

Urbanest Building W1 is being designed in accordance with the principals of a four (4) star rating under the Green Star Urbanest Custom tool. This demonstrates that the environmental impact of the W1 building will be minimised and that the building design demonstrates 'Australian Best Practice' in terms of environmentally sustainable design.

The four (4) star Green Star Urbanest Custom As Built design incorporates design considerations and principals in accordance with the credits set out in the:

- **GREEN STAR SCORECARD** (included in Appendix A). This document summarises the targeted points for the project and delineates the Green Star 'buffer' or the points targeted over and above 45 points.

5.1 GREEN STAR URBANEST CUSTOM TOOL

The Green Star Urbanest Custom Tool incorporates eight environmental categories as follows:

- Management;
- Indoor Environment Quality;
- Energy;
- Transport;
- Water;
- Materials;
- Ecology; and,
- Emissions.

Innovation is included as an additional category where the project seeks to demonstrate exceptional sustainability leadership.

Credits are positioned within the environmental categories and points are available within each credit as illustrated for the Management category in the figure below. Targeted credits and associated credit points for the Urbanest W1 development are summarised in the Green Star 'Scorecard' included in Appendix A. The Green Star 'Scorecard' demonstrates the project is targeting 45 credit points plus a 10% 'buffer' to achieve the 4 star Green Star 'Australian Best Practice' design rating.

The Green Star 'Scorecard' is a moving document and hence will be modified throughout the design development.

Sustainability initiatives specific to each environmental category and credit are described in detailed in the sub-sections below.

5.2 TARGETED GREEN STAR CREDITS

The Project has been designed in accordance with and incorporated the requirements of the following Green Star Urbanest Custom Tool credits;

5.2.1 MANAGEMENT

MAN-1 Green Star Accredited Professional

A Green Star Accredited Professional (GSAP) will be contractually engaged to advise on all features and stages of the Green Star Certification process, and provide environmental design advice based on Green Star from the design phase through to construction completion.

MAN-5 User and Maintenance Guides

A simple and easy-to-use Building Users' Guide, which includes information relevant for the building users, occupants, and tenants' representatives, will be developed and made available to the building owner.

A Building Maintenance Guide, which provides detailed guidance on accessing and maintaining both the building's services and external building fabric, will be developed by the design team and made available to the building owner.

MAN-6 Environmental Management

The contractor will implement a comprehensive, project-specific Environmental Management Plan (EMP) for the works in accordance with Section 3 of the NSW Environmental Management System guidelines 2009. The EMP includes provisions for construction Indoor Air Quality (IAQ) for the works that meets or exceeds the recommended control measures of Chapters 3 and 4 of the Sheet Metal and Air Conditioning National Contractors Association (SMACNA) IAQ Guidelines for Occupied Buildings under Construction, 2008.

The contractor will hold a valid ISO 14001 Environmental Management System (EMS) accreditation prior to and throughout construction.

MAN-7 Waste Management

The contractor will implement a Waste Management Plan (WMP), retain waste records and submit quarterly reports to Urbanest to demonstrate that 80% of all demolition and construction waste is diverted from land fill.

MAN-10 Learning Resources

Three (3) of the tenancy or building's environmental attributes will be displayed in a manner that can be readily understood by users, and reflect an environmental initiative rewarded within a Green Star Credit. Of these, one attribute will relate to energy use and one attribute will relate to water use. Each attribute will be clearly displayed in the Reception/Lobby area and the measurable environmental and economic benefits communicated to the casual observer through mechanisms such as television screens or iPads. This information will also be displayed on the Urbanest W1 intranet used by all building users.

Attributes proposed for display include:

- Highly efficient building fabric to reduce energy required for heating and cooling;
- Operable windows or vents to allow users to control thermal comfort and reduce need for heating and cooling;
- Installation of the highest rated Water Efficiency Labelling Scheme (WELS) fixtures and fittings to reduce potable water consumption; and,
- Rainwater collection and reuse system to allow for toilet flushing and laundry use to reduce potable water consumption and stormwater discharge from the site.

MAN-17 Operational Waste

Waste stream management: An operational waste management plan, which includes the identification of, reduction of, and handling of common and additional waste and recycling streams, will be developed by an experienced waste auditor for implementation in the project.

Operational waste disposal: All identified common and additional recycling streams will be recycled upon collection.

Common waste streams include general waste and co-mingled waste. Additional streams to be recycled may include: bulky goods; e-waste; and, batteries, collected on the Ground Floor.

MAN-18 Commissioning and Tuning

Early in the design process, targets for environmental performance of the design will be set by the project design team. A comprehensive services and maintainability review of the project will be performed by the Independent Commissioning Agent (ICA). Comprehensive pre-commissioning activities and commissioning activities will be performed for all nominated systems. A building tuning process will be put in place and responsibilities assigned to have all nominated systems tuned after handover. All activities will be supervised by an Independent Commissioning Agent (ICA) that reports directly to Urbanest.

5.2.2 INDOOR ENVIRONMENT QUALITY

IEQ-1 Provision of Outside Air

All bedrooms will be provided with ventilation openings that can be adjusted to provide a constant stream of outside air.

The entry of outdoor pollutants will be minimised by:

- Locating the outdoor air intakes (including doors and windows used for natural ventilation or the provision of a constant stream of outside air) such that the shortest distance from the intake to any specific potential outdoor contaminant source is in accordance with ASHRAE Standard 62.1-2007, Section 5, Table 5-1; and,
- Designing the outdoor air intakes in accordance with ASHRAE Standard 62.1-2007, Section 5.6 (including all sub-clauses).

Outside air will be provided as follows:

- All bedrooms, will be provided with ventilation openings (operable windows or trickle ventilators) that can be adjusted to provide a constant stream of outside air.
- 95% of the common areas (located on the Ground Floor and Level 1) will be provided with ventilation openings that can be adjusted to provide a constant stream of outside air, or will be naturally ventilated in accordance with AS1668.4-2012.

Where operable windows are unlikely to be able to supply a constant stream of outdoor air because of acoustic considerations, the use of trickle ventilators or alternative solutions will ensure that a constant stream of outside air can be provided.

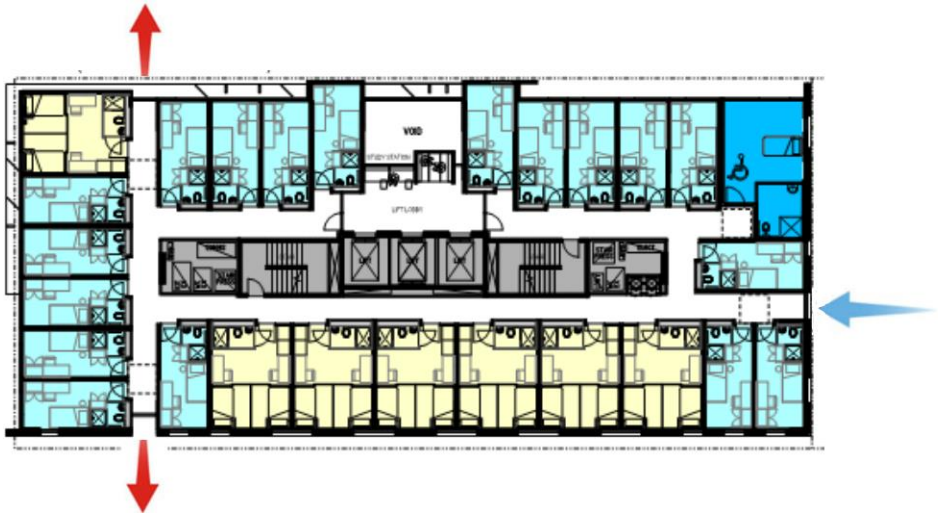


Figure 4: Corridor spaces are provided with three ventilation points to promote cross ventilation in these spaces.

IEQ-2 Quality of Ventilation

Each bedroom, will be provided with effective single sided natural ventilation through the provision of operable windows.

The operable windows and/or trickle ventilators will provide effective sided natural ventilation, in accordance with the following guidelines:

- There is a breeze path between two ventilation openings either within the room or from one room to another. Openings must be present equally in terms of area on either side
- The length of the breeze path must be less than 5 times the height of the room and should be measured between openings and around internal walls obstructions and partitions.
- Ventilation openings must be located either in opposite or adjacent external walls or between an external wall and an operable skylight;
- The total free area of ventilation openings is at least 10% of the internal floor area of the space. Each opening must have a total minimum free unobstructed area of at least 1sqm;
- There is no more than one doorway or opening smaller than 2m2 between ventilation openings; and
- All internal doors that the breeze path travels through are provided with door catches.

OR

- The maximum depth of the living area or bedroom is 2.5 times the room height;
- All bedrooms will be fitted with low-level and a high-level ventilation openings. The area of ventilation openings will be at least 5% of the internal floor area served by the opening;
- The total free area of ventilation openings will be at least 10% of the internal floor area of the living area or bedroom in the cluster;
- The bottom of the high-level ventilation opening will be located 1.8m above the Finished Floor Level (FFL). There will be a difference of 1.5m between the bottom edge of the high-level and the top edge of the low-level ventilation openings. There is no minimum height requirement for the low opening;
- The maximum distance from a wall perpendicular to a ventilation opening will be less than 2m; and
- The maximum distance between multiple openings along one facade within a space will be less than 2m.

Operable windows in bedrooms located adjacent to the light rail will take into account restrictions due to the light rail. Operable window openings will be limited by security fittings or similar in accordance with the BCA.

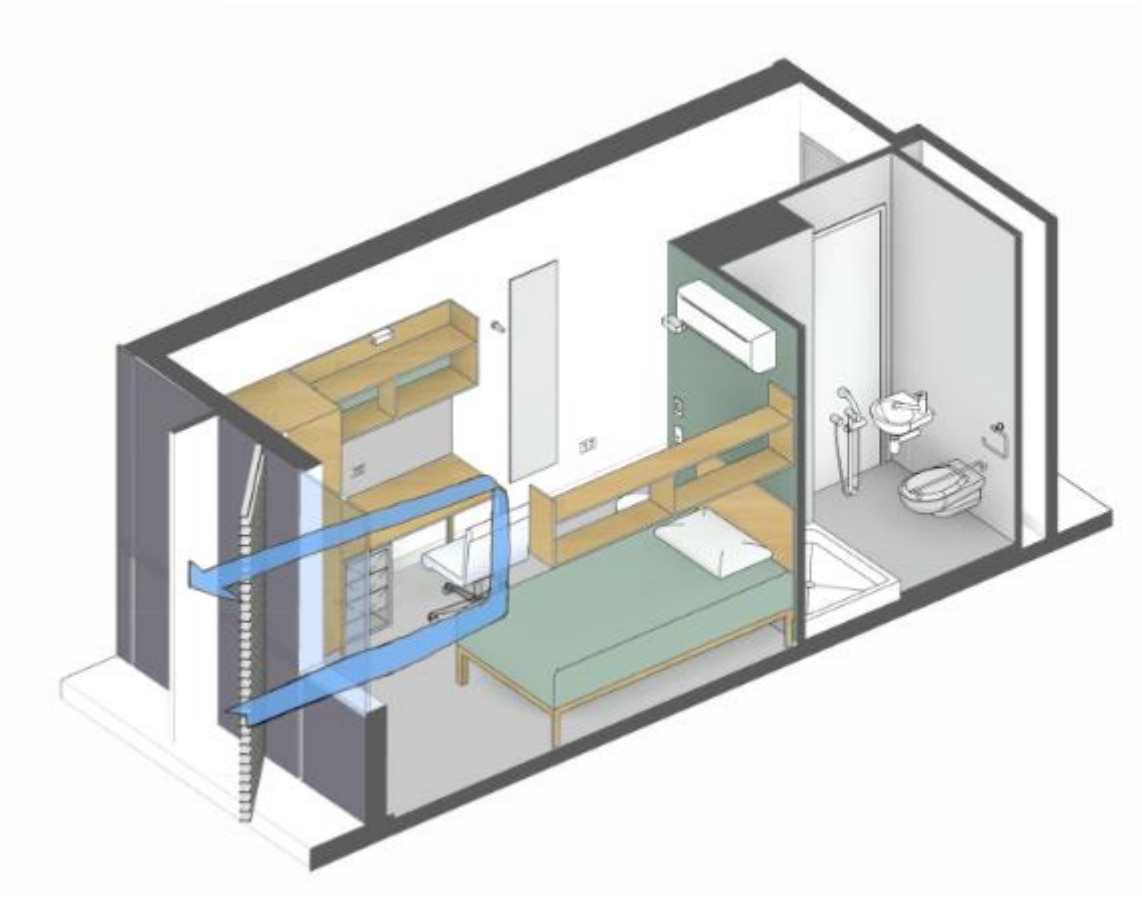


Figure 3. Example of Single Sided Ventilation in a Bedroom

IEQ-4 Daylight

At least 50% of the area of each bedroom will meet the daylight criteria. Additionally, 30% of the common areas including the Reception and Communal Facilities on the Ground Floor and Level 1 will meet the daylight criteria. The daylight criteria is met through the simple calculation method.

Guidelines for the simple calculation method are as follows:

- A line designating the compliant floor area is to be drawn at a distance of 1.5 times the height of the windows from the wall.
- The line of compliant floor area may not be drawn past solid or glazed partitions.
- Any partition or furniture (for example, a bookshelf) over 1.5m in height must be included and treated as a partition. Non-fixed fitout items (i.e. desks, chairs etc.) are excluded.
- External shading must not impinge a direct 45 degree line from the mid-height (centre) of the window. This must include surrounding buildings. Glazed areas where this condition applies should be considered solid for this manual calculation.

Operable windows in accordance with these guidelines will be provided to 90% of the bedrooms.

IEQ-5 Quality of Ventilation

A high level of thermal comfort will be achieved for 95% of the bedrooms in the development and 98% of the year through the provision of individual comfort control systems to the building's occupants.

Spaces provided with a continuous supply of outside air can be provided with individual comfort control by allowing occupants to have control over individual ventilation openings which comply with the requirements of IEQ-1. Bedrooms will be provided with operable windows, where windows are unable to provide a constant stream of outdoor air due to acoustic reasons alternate natural ventilation points will be provided.

IEQ-8 Volatile Organic Compounds

Volatile organic compounds from products used in internal applications are harmful to indoor air quality.

All paints will meet the Green Star Total Volatile Organic Compound (TVOC) Content Limits in accordance with the GBCA requirements.

All adhesives and sealants will meet the Green Star Total Volatile Organic Compound (TVOC) Content Limits in accordance with the GBCA requirements.

All floor coverings will meet the Green Star Total Volatile Organic Compound (TVOC) Content Limits in accordance with the GBCA requirements.

All wall and ceiling coverings will meet the Green Star Total Volatile Organic Compound (TVOC) Content Limits in accordance with the GBCA requirements.

IEQ-11 Daylight Glare Control

Glare from sunlight in all bedrooms is reduced through the provision of internal blinds.
All blinds must meet the following criteria:

- The blinds must eliminate 95% of all direct sunlight penetration;
- They must be controlled by all affected occupants within each space within each individual space; and,
- Blinds must have a visual light transmittance (VLT) of $\leq$ 10%.

IEQ-13 Lighting Comfort

All lamps in the space will be flicker free, with a Colour Rendering Index (CRI) > 80 (Table 7.2 AS1680.1:2006), a maximum correlated colour temperature of 5300K ("intermediate" colour appearance, Table 7.1 AS 1680.1:2006).

In order to reduce glare:

- All lighting in the bedrooms will comply with AS1680.1:2006 Section 8.3.4, or with Section 8.3.3 for specialised lighting; and,
- There will be no direct view of any bare lamp; or,
- All bare lamps will be fitted with baffles, louvers, translucent diffusers, or other means that directly obscure the lamp from common view.

In order to achieve appropriate general illumination levels:

- Lighting levels provided in the nominated area will be appropriate to the tasks performed in each space. The nominated area includes all common areas and tertiary (circulation and storage) spaces. A space can be excluded if the use of the space (for example, a cinema or other common facilities) justifies different appropriate lighting levels.
- The appropriate lighting levels for each task within each space type is defined as lighting with a maintained illuminance that meets the levels recommended in AS1680.2.1-2008 and does not exceed these levels by more than 25%.
- The appropriate lighting levels for the different space types and activity types are listed in Table D1 of AS1680.2.1-2008.

5.2.3 ENERGY

ENE-1 Energy Improvement

The building's predicted greenhouse gas emissions will show a 15% improvement over the predicted greenhouse gas emissions of the 'Benchmark Building' as determined by the Custom Greenhouse Gas Emissions Calculator.

Proposed energy efficiency initiatives include: tri-generation; highly efficient building fabric; highly efficient central plant; natural ventilation; and, high efficient low maintenance lighting.

ENE-7 Unoccupied Spaces

Bedrooms: Each bedroom will include occupancy controls to minimise air-conditioning and lighting energy. At a minimum this will include a dwelling shutdown switch near the main entry door to turn off all lighting and air-conditioning and heating.

Common Areas: Common areas will include automated controls such as motion sensors and timers to minimise air-conditioning and lighting energy use when unoccupied.

ENE-11 Energy Efficient Appliances

Dishwashers will have the highest available rating under the Australian Government's 'Energy Rating' labelling system. A communal laundry will be provided as a common facility.

5.2.4 TRANSPORT

TRA-1 Provision of Car Parking

The site is located within close proximity to public transport nodes, providing the students with full access to their surrounding city, without the need to own their own private vehicle. No car parking will be provided.

TRA-3 Cyclist Facilities

Secure bicycle storage will be provided for at least 5% of rooms, a minimum of 28 spaces.

TRA-4 Commuting Mass Transport

Many commuting mass transport options are available to building users, with the light rail line adjacent to the W1 development and Town Hall Station in close proximity.

TRA-5 Trip Reduction – Mixed Use

Walk Score is a number between 0 and 100 that measures the walkability of any address. It is indicative of the number and type of existing amenities located nearby to the W1 project site. The project achieves a walk score of 99, a 'Walker's Paradise', in accordance with the website www.walkscore.com using their street smart method of calculation. For the purposes of this calculation at this stage, the address of the site has been taken as 500 Harris Street (across the street within 10m of the proposed project site). With the ongoing development of the Haymarket, further amenities will be provided within close proximity of the development.

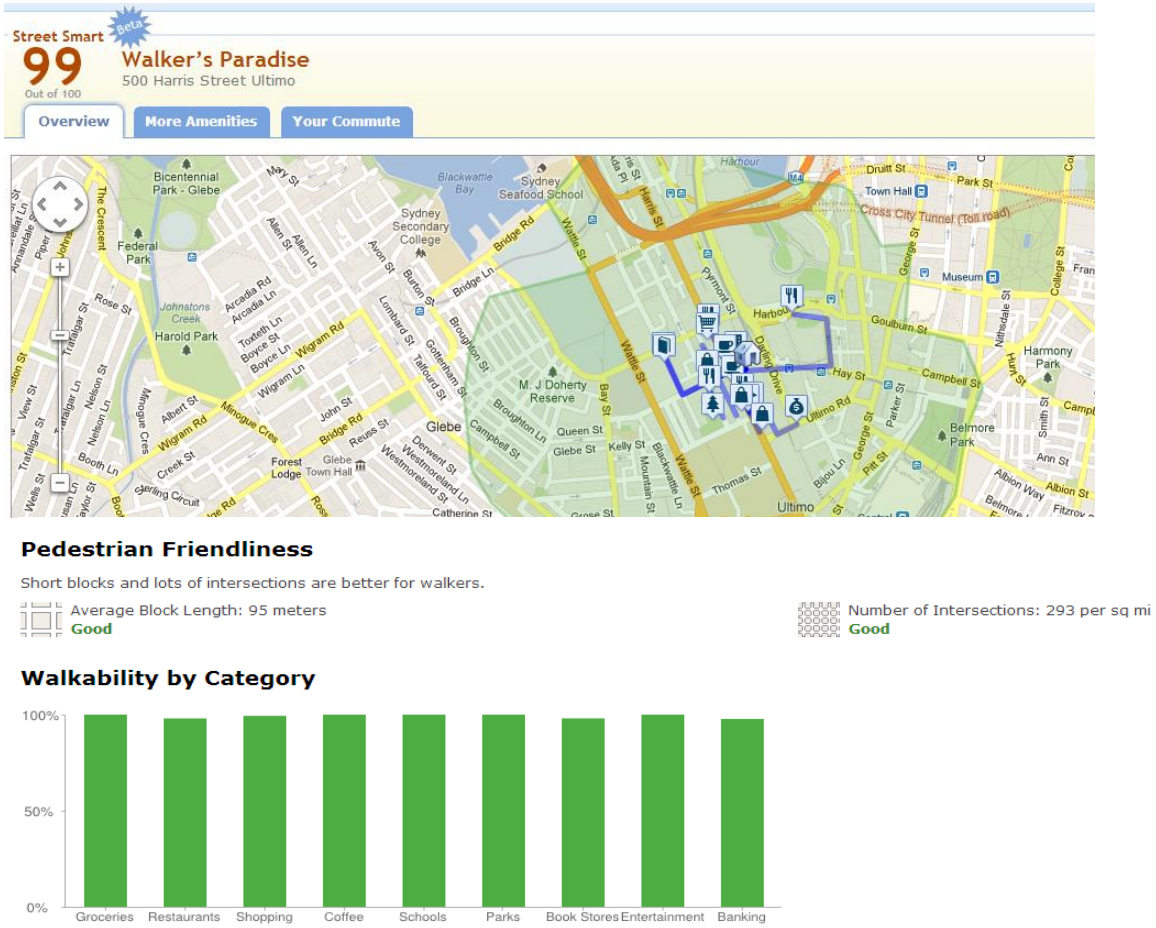


Figure 4. Street Smart Walk Score Results

TRA-6 Transport Design and Planning

A dedicated space will be provided to display information about local public transport, cycling, walking.

The space will:

- Encourage the use of public transportation options;
- Be in a location that is accessible to all building users, in the reception on the Ground Floor, and on the intranet used by all building users;
- As a minimum, provide power and network access points to facilitate an electronic 'real-time' system or internet access point; and,
- Be signposted at its location in the Reception area on the Ground Floor.

5.2.5 WATER

WAT-1 Occupant Amenity Water

The building's predicted potable water consumption will be reduced by 40% against a 'Benchmark Building' in accordance with the Green Star Custom Potable Water Calculator Guide.

Initiatives to reduce potable water consumption include:

- Installation of the highest rated Water Efficiency Labelling Scheme (WELS) fixtures and fittings to reduce potable water consumption;
- A rainwater collection and reuse system will be installed to allow for toilet flushing and laundry use, reduce potable water consumption and stormwater discharge from the site. The water reuse system will be developed further during detailed design; and,
- Installation of a fire system water reuse system on the roof.

WAT-7 Water Efficient Appliances

All dishwashers will have the highest available rating under the Australian Government's Water Efficiency Labelling Scheme (WELS) rating system as per the WELS Standard AS/NZS6400:2005 Water-Efficient Products – Rating and Labelling. All dishwashers not covered by WELS will show an improvement of 10% over the performance in energy consumption of typical equipment of the same kind.

5.2.6 MATERIALS

MAT-4 Concrete

A reduction of Portland cement by 30% will be achieved, measured by mass across all concrete used in the project compared to the Green Star MAT-4 Concrete Reference Case.

The mix water for all concrete used in the project will contain at least 50% captured or reclaimed water (measured across all concrete mixes in the project), and one of the following criteria will be met:

- At least 40% of coarse aggregate in the concrete is crushed slag aggregate or another alternative materials (measured by mass across all concrete mixes in the project), provided that use of such materials does not increase the use of Portland cement by over five kilograms per cubic meter of concrete; or,

- At least 25% of fine aggregate (sand) inputs in the concrete are manufactured sand or other alternative materials (measured by mass across all concrete mixes in the project), provided that use of such materials does not increase the use of Portland cement by over five kilograms per cubic meter of concrete.

MAT-5 Steel

At least 95% (by mass) of all structural and reinforcing steel used in the building's structure will be sourced from a responsible steel maker.

At least 95% (by mass) of all reinforcing bar and mesh will meet or exceed 500MPa strength grade, and at least 60% (by mass) of all reinforcing bar and mesh will be produced using energy-reducing processes in its manufacture (measured by average mass by steel maker annually).

MAT-6 PVC

All common uses of PVC (100% by cost) will meet the Best Practice Guidelines for PVC in the Built Environment.

Common uses of PVC products include pipes, conduit and associated fittings; wire and cable insulation; and flooring and resilient wall covering products that contain PVC. Flooring refers to vinyl flooring or a carpet containing PVC backing.

5.2.7 LAND USE AND ECOLOGY

ECO- Conditional Requirement

The site is not on prime agricultural land, land containing old-growth forest, or, within 100 metres of a wetland listed as being of 'high ecological value'.

ECO-4 Change of Ecological Value

The site has no threatened or vulnerable species; there will be no net reduction of native vegetation cover; and the ecological value of the site will not be diminished.

5.2.8 EMISSIONS

EMI-7 Light Pollution

The lighting design will comply with AS 4282 'Control of the Obtrusive Effects of Outdoor Lighting'. No external luminaire will have an Upward Light Output Ratio that exceeds 5% relative to its particular mounting orientation. Direct illuminance from external luminaries will produce 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.

EMI-12 Impacts from Refrigeration

Refrigeration equipment will not use any water based heat rejection systems.

APPENDIX A: GREEN STAR SCORECARD

Urbanest Haymarket Stage 2 - Green Star Custom Tool Scorecard

Version: 001 | Date: 26/08/2015 | Green Star Urbanest Custom Tool | Prepared by: AGG

Credit	Credit Name	Aim of Credit Addressed	Available Points	Points Targeted	Weighted Points	Credit Aim and Criteria
Management						
MAN-1	Green Star Accredited Professional	Yes	2	2	1.6	A Green Star Accredited Professional (GSAP) has been contractually engaged to advise on all features and stages of the Green Star Certification process; and, provide environmental design advice based on Green Star from the design phase through to construction completion.
MAN-5	User and Maintenance Guides	Yes	2	2	1.6	A simple and easy-to-use Building Users' Guide, which includes information relevant for the building users, occupants, and tenants' representatives, is developed and made available to the building owner. A Building Maintenance Guide, which provides detailed guidance on accessing and maintaining both the building's services and external building fabric, is developed by the design team and made available to the building owner.
MAN-6	Environmental Management	Yes	2	1	0.8	The contractor implements a comprehensive, project-specific Environmental Management Plan (EMP) for the works in accordance with Section 3 of the NSW Environmental Management System Guidelines 2009. The EMP includes provisions for construction Indoor Air Quality (IAQ) for the works that meets or exceeds the recommended control measures of Chapters 3 and 4 of the Sheet Metal and Air Conditioning National Contractors Association (SMACNA) IAQ Guidelines for Occupied Buildings under Construction, 2008. The contractor has a valid ISO 14001 Environmental Management System (EMS) accreditation prior to and throughout construction.
MAN-7	Waste Management	Yes	2	2	1.6	The contractor implements a Waste Management Plan (WMP), retains waste records and submits quarterly reports to the building owner; and 80% (by mass) of all demolition and construction waste is reused or recycled.
MAN-10	Learning Resources	Yes	1	0	0.0	Three of the building's environmental attributes are displayed in a manner that can be readily understood by building users, and reflect an environmental initiative rewarded within a Green Star Credit; One attribute must relate to energy use; One attribute must relate to water use; and, Each attribute must be clearly displayed and the measurable environmental and economic benefits communicated to the casual observer. The environmental data of the energy and water initiatives is clearly and permanently presented and displayed in real-time (e.g. through screens or other mechanisms).
MAN-16	Metering	Yes	3	2	1.6	Metering Strategy: Accessible metering to be provided to monitor the energy and water consumption of the tenant from all energy and water sources. The metering must be provided separately for the distinct uses in the project. Monitoring strategy: A comprehensive monitoring strategy, which includes frequency of monitoring, and estimated end consumption for each use, has been developed for the installed meters. The monitoring strategy (as delineated above) is addressed through a system capable of capturing and processing the data produced by the installed energy or water meters (or both), and presenting that data in an accurate and easy to read report on consumption trends.
MAN-17	Operational Waste	Yes	1	1	0.8	An operational waste management plan, which includes the identification of, reduction of, and handling of common and additional waste and recycling streams, has been developed by an experienced waste auditor for implementation in the project. All identified common and additional recycling streams are recycled upon collection.
MAN-18	Commissioning and Tuning	Yes	4	2	1.6	Early in the design process, targets for environmental performance of the design be set. A comprehensive services and maintainability review of the project is performed. Comprehensive pre-commissioning activities and commissioning activities are performed for all nominated systems. A building tuning process is in place and responsibilities assigned to have all nominated systems tuned after handover. All activities were supervised by an Independent Commissioning Agent (ICA) that reports directly to the client.
Sub-total			**17**	**12**		
Weighted Sub-total				**9.9**	**9.9**	
Indoor Environment Quality						
IEQ-1	Provision of Outside Air	Yes	3	3	2.7	The entry of outdoor pollutants is minimised through exhausting through the roof. The entry of outdoor pollutants must be minimised by locating and designing the outdoor air intakes in accordance with ASHRAE Standard 62.1-2007. Outside air must be provided as follows: - All clusters are provided with operable windows or trickle ventilators that can be adjusted to provide a constant stream of outside air; AND - 95% of the common areas are provided with ventilation openings that can be adjusted to provide a constant stream of outside air OR Naturally ventilated in accordance with AS1668.4-2012; OR provided with at least 50% outside air rates greater than the requirements of AS1668.2-2012;
IEQ-2	Quality of Ventilation	Yes	2	2	1.8	Each cluster is provided with effective natural ventilation. - Each bedroom is provided with effective natural ventilation. - Each living area is provided with effective natural ventilation.
IEQ-4	Daylight	Yes	3	1	0.9	90% of all clusters, 50% of the area of each bedroom and 50% of each of the living areas meets the daylight criteria. 30% of the common area complies with the daylight criteria. The daylight criteria is met through the simple calculation method.
IEQ-5	Thermal Comfort	Yes	1	1	0.9	A high level of thermal comfort is achieved for 95% of the bedrooms in the development and 98% of the year, demonstrated by: The provision of individual comfort control systems to the building's occupants. Naturally ventilated spaces or spaces provided with a continuous supply of outside air can be provided with individual comfort control by allowing occupants to have control over individual ventilation openings which comply with the requirements of IEQ-1.
IEQ-6	Hazardous Materials	-	na	na	na	A comprehensive hazardous materials survey has been carried out on the project site, as defined by the relevant Environmental and Occupational Health and Safety (OH&S) legislation. Whenever asbestos, lead or Polychlorinated Biphenyls (PCBs) were found, they have been removed in accordance with the standards and legislations listed below: - Asbestos – relevant Occupational Health and Safety (OH&S) legislation and environmental legislation; - Lead – AS4361 'Guide to Lead Paint Management'; and, - Polychlorinated Biphenyls (PCBs) – ANZECC Polychlorinated Biphenyls Management Plan. For new development with no existing buildings on site, this credit not applicable.

Urbanest Haymarket Stage 2 - Green Star Custom Tool Scorecard

Version: 001 | Date: 26/08/2015 | Green Star Urbanest Custom Tool | Prepared by: AGG

Credit	Credit Name	Aim of Credit Addressed	Available Points	Points Targeted	Weighted Points	Credit Aim and Criteria
IEQ-7	Internal Noise Levels	-	2	0	0.0	The internal noise level (combined building services noise and external noise intrusion), irrespective of building location does not exceed: 35 dBLAeq(+/-5dB)(1 hour) in any bedroom in the building during the night time period 10pm to 7am; and 40 dBLAeq (1 hour) in any living area at any time. Where operable windows are the primary method of ventilation, the criteria applies with these windows open. The bounding apartment construction to habitable areas results in an airborne noise isolation standard of Rw + Ctr ≥ 53; and, The floor construction above habitable rooms of adjacent dwellings (i.e. floor cover) results in an impact isolation standard of Ln,w-Cl ≤ 55. An appropriately qualified acoustic professional has been appointed to assist the project team in the assessment and mitigation of external noise sources, through consultation at critical stages of the proposed development including at a minimum: - Design of the building; Construction of the building; and, Post construction sign-off stage of the building.
IEQ-8	Volatile Organic Compounds	Yes	4	4	3.6	95% of internally applied paint products, all adhesives and sealants, all flooring coverings used internally, and 95% of all mattresses meet Green Star TVOC Content Limits in accordance with the correct testing methods.
IEQ-9	Formaldehyde Minimisation	Yes	1	1	0.9	All engineered wood products (including exposed and concealed applications) either have low formaldehyde emissions or contain no formaldehyde in accordance with Green Star Formaldehyde emissions limits.
IEQ-11	Daylight Glare Control	Yes	1	1	0.9	Glare from sunlight in all bedrooms is reduced through a combination of blinds, screens, fixed devices, or other means.
IEQ-13	Lighting Comfort	Yes	3	2	1.8	All lamps in the space are flicker free, with a Colour Rendering Index (CRI) > 80 (Table 7.2 AS1680.1:2006), a maximum correlated colour temperature of 5300K ("intermediate" colour appearance, Table 7.1 AS 1680.1:2006) and the following occurs: Glare: - All lighting in the clusters complies with AS1680.1:2006 Section 8.3.4, or with Section 8.3.3 for specialised lighting; and, There is no direct view of any bare lamp; or, - All bare lamps have been fitted with baffles, louvers, translucent diffusers, or other means that directly obscure the lamp from common view. General Illumination: Lighting levels provided in the nominated area are appropriate to the tasks performed in each space. The nominated area includes all clusters, common areas and tertiary spaces. A space can be excluded if the use of the space (for example, a cinema) justifies different appropriate lighting levels. The appropriate lighting levels for each task within each space type is defined as lighting with a maintained illuminance that meets the levels recommended in AS1680.2.1-2008 and does not exceed these levels by more than 25%. The appropriate lighting levels for the different space types and activity types are listed in Table D1 of AS1680.2.1-2008.
IEQ-16	Reduced Exposure to Pollutants	Yes	1	1	0.9	90% of the kitchens within the clusters are ventilated with dedicated and separated extract fans.
IEQ-27	Quality of Amenities	Yes	1	1	0.9	At least one common area or a number of common areas are provided in accordance with all of the following: - The combined area of all common areas is equivalent to no less than 5% of the GFA of the Clusters, or, where the occupancy is known, 1m2 per person; - Each common area is designed to be accessible to all building users, day lit (excluding common areas that, for functional reasons, require the exclusion of daylight), well ventilated, non-smoking, with a connection to the natural environment, and is located to avoid external noise, odour, air pollution, and if outdoors excessive exposure to the sun.
Sub-total			**22**	**17**		
Weighted Sub-total				**15.5**	**15.5**	
Energy						
ENE-	Conditional Requirement	Yes	Cond	Yes	Yes	15% reduction of predicted greenhouse gas emissions in comparison to the 'Benchmark Building' as determined by the Greenhouse Gas Emissions Calculator.
ENE-1	Greenhouse Gas Emissions	Yes	20	1	0.9	15% reduction of predicted greenhouse gas emissions in comparison to the 'Benchmark Building' as determined by the Greenhouse Gas Emissions Calculator.
ENE-3	Peak Electricity Demand Reduction	Yes	2	2	1.8	The building includes two features recognised as reducing peak electricity demand, such as: - One point is awarded for IEQ-5 'Thermal Comfort'; and, - A heating system with a non-electric primary energy source is installed e.g. solar hot water system.
ENE-7	Unoccupied Areas	Yes	2	2	1.8	Each cluster includes occupancy controls to minimise air-conditioning and lighting energy. At a minimum this must include a shutdown switch near the main entry door to each bedroom to turn off all lighting, air-conditioning and heating. All common areas include automated controls to minimise air-conditioning and lighting energy use when unoccupied.
ENE-11	Energy Efficient Appliances	Yes	2	1	0.9	One point is awarded where: All clothes dryers and dishwashers have the highest available rating under the Australian Government's 'Energy Rating' labelling system; A dwelling design that provides no private laundry facility will be deemed to be equivalent to installing a clothes dryer of the highest available energy rating.
Sub-total			**26**	**6**		
Weighted Sub-total				**5.5**	**5.5**	
Transport						
TRA-1	Provision of Car Parking	Yes	1	1	0.9	Car parking is permitted, and no car parking for the project is provided.
TRA-3	Cyclist Facilities	Yes	1	1	0.9	Secure bicycle storage is provided for 5% of students.
TRA-4	Commuting Mass Transport	Yes	5	5	4.4	Five points are awarded based on the number and quality of commuting mass transport options available to building users, as determined by the Green Star Commuting Mass Transport Calculator.
TRA-5	Walkable Neighbourhoods	Yes	1	1	0.9	The project achieves a walk score of at least 90, as determined by the website www.walkscore.com using their street smart method of calculation.

Urbanest Haymarket Stage 2 - Green Star Custom Tool Scorecard

Version: 001 | Date: 26/08/2015 | Green Star Urbanest Custom Tool | Prepared by: AGG

Credit	Credit Name	Aim of Credit Addressed	Available Points	Points Targeted	Weighted Points	Credit Aim and Criteria
TRA-6	Transport Design and Planning	Yes	1	1	0.9	At least one dedicated space for providing information about local public transport, cycling, walking. The space must: • encourage the use of public transportation options; • be in a location that is accessible to all building users, ideally in a main reception or lobby area; • as a minimum, provide power and network access points to facilitate an electronic 'real-time' system or internet access point; • be signposted at its location and throughout appropriate areas of the development indicating its existence, purpose and location.
Sub-total			**9**	**9**		
Weighted Sub-total				**8.0**	**8.0**	
Water						
WAT-1	Potable Water	Yes	10	2	1.7	The building's predicted potable water consumption has been reduced by 20% below that of the 'Benchmark Building'.
WAT-5	Fire System Water	-	2	0	0.0	There is sufficient temporary storage for a minimum of 80% of the water used for routine testing of the fire protection system for re-use on-site; and each floor is fitted with a sprinkler system that has isolation valves or shut-off points for localised drain-down.
WAT-7	Potable Water Use in Appliances	No	1	1	0.8	All dishwashers and clothes washers are at or within one point of the highest available rating under the Australian Government's WELS rating system as per the WELS Standard AS/NZS6400:2005 Water-Efficient Products – Rating and Labelling. For those not covered by WELS, all dishwashers and clothes washers are to show an improvement of 10% over the performance in energy consumption of typical equipment of the same kind. Combined clothes washers and dryers that use water during their drying mode must not be used if points are to be achieved under this credit.
Sub-total			**13**	**3**		
Weighted Sub-total				**2.5**	**2.5**	
Materials						
MAT-2	Building Reuse	-	4	0	0.0	At least 50% of the total façade of the existing building by area comprises reused building façade. 60% of the existing major structure, by gross building volume, is reused.
MAT-3	Recycled Content, Reused Products and Materials	-	1	0	0.0	Materials selected for base building construction or integrated fitout works which have a post-consumer recycled content of at least 20% (by mass) or are reused items, and represent at least 0.5% of the project's total contract value.
MAT-4	Concrete	-	3	0	0.0	Reduction of Portland cement by 30% measured by mass across all concrete used in the project compared to the Green Star reference case. The mix water for all concrete used in the project contains at least 50% captured or reclaimed water (measured across all concrete mixes in the project), and one of the following criteria is met: • At least 40% of coarse aggregate in the concrete is crushed slag aggregate or another alternative materials (measured by mass across all concrete mixes in the project), provided that use of such materials does not increase the use of Portland cement by over five kilograms per cubic meter of concrete; or, • At least 25% of fine aggregate (sand) inputs in the concrete are manufactured sand or other alternative materials (measured by mass across all concrete mixes in the project), provided that use of such materials does not increase the use of Portland cement by over five kilograms per cubic meter of concrete
MAT-5	Steel	Yes	2	1	0.5	All structural and reinforcing steel to be manufactured by a responsible steel maker, and where reinforcing steel comprises 60% or more of the total steel used in the structure of the building: at least 95% or reinforcing bar and mesh must meet or exceed a 500 MPa strength grade; and, at least 60% must be produced using energy reducing processes in its manufacture.
MAT-6	PVC	Yes	2	2	1.0	At least 90% of the common uses of PVC products in buildings by cost must meet Best Practice Guidelines for PVC in the Built Environment, or do not contain PVC.
MAT-7	Timber	-	1	0	0.0	95% (by cost) of all timber used in the building and construction works is certified under FSC International and/or PEFC accredited certifications schemes or is from a reused source; or is sourced from a combination of both.
MAT-9	Dematerialisation	Yes	1	1	0.5	50% of kitchens are prefabricated modules (pods), and 50% of bathrooms are prefabricated modules (pods).
MAT-11	Flooring	TBC	3	0	0.0	Requires all flooring in all clusters to have a reduced environmental impact in accordance with the Green Star Flooring Calculator.
MAT-12	Assemblies		3	0	0.0	All assemblies in all clusters to have a reduced environmental impact in accordance with the Green Star Assemblies Calculator.
MAT-13	Furniture		3	0	0.0	All furniture used in the clusters in the project to have a reduced environmental impact in accordance with the Green Star Furniture Calculator.
Sub-total			**23**	**4**		
Weighted Sub-total				**2.1**	**2.1**	
Land Use and Ecology						
ECO-	Conditional Requirement	Yes	Yes	Yes	Yes	Site is not located on prime agricultural land, land containing old growth forest, or within 100m of a wetland ecological value'. Where the site is located within 100 metres of a wetland NOT listed as being of high ecological value, then the project can only be deemed eligible for a Green Star certified rating if the Green Star Wetland Protection Measures have been completed.
ECO-1	Topsoil	-	1	0	0	From the date of site purchase to the completion of design/construction, no topsoil was removed from site; and, all topsoil affected by the construction works was separated and protected from degradation, erosion or mixing with fill or waste; and 95% of all topsoil on site (by volume) retains its productivity.
ECO-2	Reuse of Land	Yes	1	1	0.75	75% of the site was Previously Developed Land at the date of site purchase.
ECO-3	Reclaimed Contaminated Land	-	2	0	0	The site contained Significant Contamination; and the developer/owner has undertaken remedial steps to decontaminate the site prior to construction.
ECO-4	Change of Ecological Value	Yes	4	1	0.75	The ecological value of the land is either maintained or enhanced, as determined by the Green Star - Change of Ecological Value Calculator based on a comparison of the state of the site before and after design/construction.
Sub-total			**8**	**2**		
Weighted Sub-total				**1.5**	**1.5**	
Emissions						

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Credit	Credit Name	Aim of Credit Addressed	Available Points	Points Targeted	Weighted Points	Credit Aim and Criteria
EMI-5	Stormwater	Yes	3	2	0.7	The post-development peak 2 year Average Recurrence Interval (ARI) event discharge from the site does not exceed the pre-development peak 2 year ARI event discharge; and all stormwater discharged from site meets the Pollution Reduction Targets in Column B of Green Star Table Emi-5.1.
EMI-6	Discharge to Sewer	Yes	4	1	0.4	The building outflows to the sewerage system due to building occupants' usage have been reduced by more than 30% against an average-practice benchmark (one point).
EMI-7	Light Pollution	Yes	2	2	0.7	The lighting design complies with AS 4282 'Control of the Obtrusive Effects of Outdoor Lighting', and relative to its particular mounting orientation, no external luminaire has an Upward Light Output Ratio that exceeds 5%.
EMI-12	Impacts from Refrigeration	Yes	5	1	0.4	The refrigeration equipment does not use a water based heat rejection system.
Sub-total			**14**	**6**		
Weighted Sub-total				**2.1**	**1.4**	
Innovation						
INN-1	Innovation	TBC	5	2	2	Points may be achieved for pioneering initiatives in sustainable design, process or advocacy.
Sub-total			**5**	**2**	**2**	
Total Points (Weighted)			Total Available	**Total Targeted**	**Total Targeted**	4 star Green Star: Requires 45 points with a recommended 10% buffer during the design stage.
			100.0	49	48	