

Sustainable Design Report

Block 8
Central Park

Frasers Property Australia Pty Ltd

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Frasers Property Australia Pty Ltd

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Document prepared by:

Surface Design Pty Ltd
ABN 19 570 343 498
68 York Street, SYDNEY NSW 2000 Australia
T: +61 2 9249 1400
E: info@surfacedesign.com.au

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1. Executive Summary

This report has been prepared to outline the proposed sustainable design initiatives to be incorporated into the Block 8 Central Park, Chippendale NSW project and demonstrate compliance with the Director General Requirements that apply to the site. This document has been prepared on behalf of Frasers Property Australia Pty Ltd for submission as part of the Planning Application to the NSW Department of Planning and Infrastructure. The project aims to meet appropriate environmental benchmark standards for multi-residential redevelopments which are in alignment with the original site commitments.

This document has been prepared in response to the Director General Requirements document dated 25 September 2012 with specific reference to Section 7 items of the letter.

Sustainability Targets

The sustainability objectives of this development are to:

Objective 1: Achieve certified Green Star Multi-Residential v1 Design rating

Objective 2: Improve upon BASIX Energy and Water Efficiency provisions

Sustainable Design

The sustainable design initiatives for the Block 8 Central Park development have been identified in the Sections 3 to 5 of this document. These initiatives relate to building fabric design, services design and transportation. The initiatives are expected to achieve certified Green Star rating of 5 star with the Green Building Council of Australia. The targets are to be achieved for the project through the utilisation of the existing Central Plant that has been planned for the site which includes the Central Thermal Plant (CTP) and Recycled Water Treatment Plant (RWTP).

2. Introduction

This report defines the proposed sustainable design initiatives to be incorporated into the Block 8 Central Park development, Chippendale NSW. This report has been prepared on behalf of Frasers Broadway Pty Ltd to accompany a State Significant Development Application for a mixed use development known as Block 8 at Central Park, Chippendale. Frasers prides itself on delivering high quality and environmentally responsible development projects and Block 8 demonstrates the Frasers ethos.

This document is to be read in conjunction with Architectural design drawings and other design reports for the application. This document outlines the ESD objectives to be met for the development and the initiatives that will need to be considered and documented in the design development stage of the project.

2.1 Project Description

Block 8 is located at the south western corner of the Central Park site and is bound by Irving Street and proposed student housing to the north, Central Park Avenue and Chippendale Green to the east, O'Connor Street and existing commercial and industrial development to the south, and Abercrombie Street and existing residential and mixed use development to the west.

The current Block 8 proposal is consistent with the Central Park approved Concept Plan (as modified) and comprises the following:

- o 13 storey mixed use building including residential and retail uses;
- o 178 apartments;
- o Terraces, balconies and/or loggias to all apartments;
- o Residents' lounge;
- o Ground floor retail tenancies;
- o Basement car parking; and
- o Public domain works.

Block 8 will provide a mix of much needed residential accommodation in an area well serviced by public transport, and in close proximity to the retail, work and education opportunities offered by the Sydney Central Business District and surrounds.

2.2 Director General Requirements

This report acknowledges the letter prepared by Director General dated 25 September 2012 which noted the following in Section 7 of the document:

The EIS shall:

- o *detail how the development will incorporate ESD principles in the design, construction and ongoing operation phases of the development; and*
- o *demonstrate that the development has been assessed against a suitably accredited rating scheme to meet industry best practice and achieve a suitable Green Star rating, consistent with the approved Concept Plan (as modified).*

2.3 Project Response

ESD Report

This report has been prepared in reference to the above details and defines the sustainable design initiatives to be adopted for the project to satisfy DGR for an ESD Report to be prepared for the project. The design has focused on building fabric design, services building design initiatives for water and energy efficiency and transportation provisions to address the DGR requirements.

Accredited Rating Scheme

This report outlines the sustainable design initiatives to be adopted for the project to satisfy the regulatory requirements that apply in NSW under BASIX and NatHERS.

Green Star Rating

This report outlines the proposed approach to comply with the sustainable design target to achieve a formal certified Green Star rating. The Green Star Multi-Residential v1 rating tool has been adopted for the project as this is the most appropriate tool to adopt for this development at the time of this application. This approach is considered consistent with the approved Concept Plan (as modified).

2.4 Reference Documents

The following documents and planning provisions have been used in preparation of this report:

Reference	Title	Revision
DA 000	Location Plan	E
DA 001	Site Plan	E
DA 100	Basement 3 floor plans	D
DA 101	Basement 2 Floor Plans	D
DA 102	Basement 1 Floor Plans	D
DA 103	Ground Floor Plan	E
DA 104	Level 1 Floor Plan	E
DA 105	Level 2 Floor Plan	E
DA 106	Level 3-7 Floor Plan Typical	D
DA 107	Level 8 Floor Plan	E
DA 108	Level 9 Floor Plan	E
DA 109	Level 10 Floor Plan	E
DA 110	Level 11 Floor Plan	E
DA 111	Level 12 Floor Plan	D
DA 112	Roof Plan	D
DA 300	North Elevation	D
DA 301	South Elevation	D
DA 302	East Elevation	D
DA 303	West Elevation (Abercrombie St)	D
DA 400	SECTION AA	D
DA401	SECTOPM BB	D
-	Director General Requirements document	25 September 2012

2.5 References

BASIX: The BASIX assessment tool check elements of a proposed design against sustainability targets. The Building Sustainability Index (BASIX) aims to deliver equitable, effective water and greenhouse gas reductions across the state. BASIX is one of the strongest sustainable planning measures to be undertaken in Australia. BASIX reduces water and energy consumption in homes across NSW. These environmental outcomes also provide a long term financial saving for the homeowner – and a valuable contribution to the sustainable future of our communities.

Green Star: Green Star is a comprehensive, national, voluntary environmental rating system that evaluates the environmental design and construction of buildings and communities. Green Star was developed for the property industry in order to:

- o establish a common language
- o set a standard of measurement for built environment sustainability
- o promote integrated, holistic design;
- o recognise environmental leadership;
- o identify and improve life-cycle impacts; and
- o Raise awareness of the benefits of sustainable design, construction and urban planning.

For the purposes of this report any references to Green Star refers to the Green Star Multi-Residential v1 Design tool only.

NatHERS - Nationwide House Energy Rating Scheme

NatHERS is an accreditation methodology that enables the design of a home or apartment to be assessed by skilled professionals using sophisticated computer modelling programmes to improve the quality of design and achieve building approvals.

WELS - Water Efficient Labelling and Standards (WELS) scheme.

WELS is Australia's water efficiency labelling scheme that requires certain products to be registered and labelled with their water efficiency in accordance with the standard set under the national Water Efficiency Labelling and Standards Act 2005.

3. Sustainable Design

3.1 Building Fabric Design

The building fabric design is measured with Authority applications such as the BCA and BASIX contributing to the thermal comfort of the building space as well as the energy consumption requirements for heating and cooling. The design requirements are further explained in Section 4.1 and 4.2.

Material Specifications

Material specifications for the project have considered elements of sustainability that relate to the following factors of durability, embodied energies, renewable sources content, ease of manufacturing, ability to be recycled / reused / reconditioned, maintenance, local availability, VOC content, emission production, affordability and toxicity. The materials specified for this project are to consider the above environmental measures through a comparison between different product types and manufacturers where possible. The design team is to adopt this approach in assessing suppliers and products for the development.

Natural Ventilation

The apartments and lobby spaces are intended to operate as a mixed mode building, the building fabric is comprised of the operable elements to facilitate natural ventilation, the floor plan with the loggias encourages the use of the operable façade.

It is anticipated that when exterior conditions are suitable, residents will utilise the operable windows and doors to the facade which will provide natural ventilation.

3.2 Services Design

Heating & Cooling Systems

A central heating and cooling system is to be provided with connection to the site Central Thermal Plant that will provide both chilled and hot water to the building. The building services will utilise this energy through heat exchangers within the building and circulates the coolant / heating throughout the building to the local fan coil units via the close loop circuit. The use of the Central thermal plant provides greater efficiencies than stand alone systems typically employed in this type of building. The final central plant design is subject to further design development.

Ventilation Systems

Ventilation systems to apartments include kitchen and bathroom exhaust systems that will be exhausted directly to the exterior through the façade via ducting in ceiling spaces. Air supply to the apartments will be via the operable building facade predominantly with some makeup air provided from common hall ways. Inlets are proposed above doorways that meet pressurisation requirements. Common area ventilation systems are to include variable speed modes where appropriate and are to be linked to light switches where feasible to limit the extent of operation and improve energy efficiency of these areas.

For proposed ventilation systems to be provided to all common area spaces we refer to the BASIX certificate.

Hot water system

A centralised hot water system is to be installed within the building and will be serviced by the Central Thermal Plant. Insulation shall be provided to all pipework within the building to reduce heat losses and improve energy performance. The final details of the centralised hot water system are subject to further design development.

Water Fixtures

All water fixtures to be installed to the building are to be water efficient and meet the following minimum targets:

- o Kitchen and Bathroom Taps: 5 star WELS
- o Water Closets to Apartments and Common Areas: 4 star WELS
- o Showers: 3 star WELS with maximum flow rate of 7.5 L/min

No urinals are proposed to the building at this stage.

By specifying low flow water fixtures this will reduce the overall water consumption for the site in operation, sewer conveyances from the site and pollution generation.

Internal Lighting

All internal lighting design is to meet the following requirements where possible to reduce the energy consumption associated with interior lighting:

- o Include appropriate zoning, switching and controls to reduce consumption when not occupied. Common residential areas are to be fitted with sensors and time-clock controls to detect occupants after-hours and only operate at 100% when required. After hours common residential spaces are to be lit to 50% only
- o Push button controls are to be installed for all back of house areas to reduce energy consumption to these areas when unoccupied
- o Light fittings specifications are to be efficient and limited to fluorescent and LED fittings where appropriate

External Lighting

All new external lighting except where required for security reasons is to be solar powered where possible. Generally solar external lighting is to be provided to landscaping areas or pathways around the site where security issues are not of concern. All security external lighting is to include Photoelectric (PE) / Photodiode sensors or similar controls to detect when external lighting should switch on and off to reduce the energy consumption associated with external lighting where possible.

No external lighting is to be installed such that any direct light beam results into the night sky either generated from within the building or outside boundary where possible. The path of any direct light's angle of incidence that is directed to the sky must be obstructed by a non-transparent surface and the lighting design and is to comply with AS4282 'Control of the Obtrusive Effects of Outdoor Lighting'.

Common Metering

Metering is to be provided throughout the building and central services for all major building plant and equipment. This includes energy metering for all major energy uses which exceed 20kVA. An effective monitoring system is to be provided which may include a Building Management Control System (BMCS) which would monitor energy and water consumption throughout the building as required.

Separate metering of light and power shall be provided to common areas such as lobby areas which are linked to a monitoring system.

Water metering for all major water uses within the building is to be provided which includes central services (cooling towers), rainwater tanks, irrigation systems, potable water, non-potable water sources and there is an effective mechanism in place for monitoring water consumption linked to BMCS.

Apartment Metering

For each dwelling the following metering provisions are proposed:

- A domestic Cold Water meter is to be installed and there is to be an effective mechanism in place for monitoring water consumption at the dwelling level is to be provided.
- Energy metering of electricity consumption for each dwelling (apartment) and gas (where gas uses exceeds kitchen cooking uses) and there is an effective mechanism in place for monitoring water consumption at the dwelling level via visual inspection within the dwelling
- Hot water metering from the centralised system and there is an effective mechanism in place for monitoring water consumption at the dwelling level via visual inspection
- Smart metering to each dwelling (apartment) installed in an easily accessible and visible locations (nominally near entry and exit points)

3.3 Transportation

Reduction in Personal Vehicle Usage

To reduce the extent of greenhouse gas emissions associated with personal vehicle use for the development the following initiatives have been adopted:

- Provision for small vehicles such as moped / motorcycle parking
- Implementation of car share scheme which includes on-site parking for this car share scheme
- Access to public transport networks is to be encouraged through the site layout and links to other buildings on the site
- Location and availability of retail and amenities around the site from other blocks and on the site
- Cyclist parking for residents and visitors as per the provisions below

Cyclist facilities

Provisions of cyclist facilities are required within the Block 8 Central Park development to encourage cycling as a mode of transport and ensuring adequate cyclist facilities are provided. Secure bicycle storage for residents is to be provided for each residential dwelling protected from the elements, we refer to basement plans for location of all secure racks. Visitors parking is provided for 10% of all visitors expected to the site on grade in a highly visible, well lit, well signposted and with good surveillance.

4. Regulatory Compliance - BASIX and BCA

4.1 BASIX Compliance - Residential Areas

BASIX sets sustainability targets for water and energy as well as minimum performance levels for the thermal comfort of the proposed development. The targets are calculated based on NSW average benchmarks and measures improvements on energy, water efficiency and thermal comfort. The following summarises the proposed methodology to comply with the minimum BASIX targets that will apply to the development.

4.1.1 Energy

The Block 8 Central Park development is required to target minimum 20% in energy improvement in greenhouse gas emissions compared to the NSW benchmark of 3,292kg of CO₂ per person per year. The following items are to be implemented to reach the energy reduction target.

Project Features

The following initiatives are to be included in the design of Block 8 Central Park and will improve the overall energy consumption for the building above minimum BASIX targets:

- o Efficient Central heating and cooling systems are proposed connected to Central Thermal Plant
- o High performance building fabric which includes the adoption of double glazing with performance coatings for all external glazing and loggia spaces with performance laminates and glazing to all internal elevations
- o Detailing and specification appropriate insulation to all exposed floors, roofs and external walls. Current specifications include:
 - Minimum R2.0 insulation to all exposed floors
 - Minimum R3.0 insulation to all exposed roofs
 - Minimum R2.5 insulation to all external walls
 Final construction details are subject to detailed NatHERS modelling assessments
- o Use of efficient lighting fixtures to apartments and common areas. Typically the apartment lighting will be limited to LED and fluorescent fittings only. Common plant areas will fluorescent fittings only and with metal halide fittings limited to car park entry points only. All common residential areas will be either LED or fluorescent fittings only
- o Lighting operation to common areas will be fitted with time-clock controls, motion sensors or timer settings to improve energy efficiency
- o Basement car park ventilation systems is to include carbon monoxide monitors with variable speed fans to limit operation when not required
- o Installation of energy efficient appliances as per the schedule below
- o Specification of minimum R0.30 insulation to all hydraulic hot water pipework

Appliances

Appliances are to be installed as part of the development and the star ratings to be adopted are as follows:

Appliance Type	Minimum Energy Star Rating
Dishwasher	3 stars
Fridges	3 stars
Washing Machines	3.5 stars
Dryers	2.5 stars
Ovens	Electric No energy star rating exists

4.1.2 Water Efficiency

The Block 8 Central Park development is required to target a reduction of greater than 40% in potable water consumption based on the NSW benchmark of 90, 340 litres of water per person per year. The following items are to be implemented to meet this water reduction target.

Project Features

The following initiatives are to be included in the design of Block 8 Central Park and will improve the overall energy consumption for the building above minimum BASIX targets:

- o Site rainwater collection and distribution within the building to serve toilet flushing and site landscaping
- o Use of central services systems
- o Specification and implementation of water efficient fixtures and appliances as per the schedule below
- o Selected planted on indigenous and drought tolerant or low water species

The project does not incorporate a pool or spa

Appliances and Fixtures

Appliances and fixtures are to be installed as part of the development and the star ratings to be adopted are as follows:

Appliance / Fixture Type	WELS Rating
Dishwasher	3 star
Washing Machines	3 star
Showers	3 star limited to 7.5L/min
Kitchen Taps	5 star
Basin Taps	5 star
Water Closets	4 star

4.1.3 Thermal Comfort

The Block 8 Central Park development is required to meet the minimum performance levels for the thermal comfort of the dwelling, expressed as energy required to heat and cool the dwelling (MJ/m²).

A detailed modelling assessment has been undertaken that has utilised NatHERS accredited software to ensure thermal comfort for a dwelling's occupants, appropriate to climate and season and reduce the demand for new energy infrastructure by managing peak demand for energy required cooling and heating.

These assessments have been completed for the project to date and are included in the BASIX certificate and NatHERS Starbands:

NatHERS Star Bands	Energy Loads Thermal [MJ/m ²]
Sydney East Region	72
Block 8 Central Park	41
Improvement %	42.5%

4.2 Building Code of Australia - Retail Spaces only

4.2.1 Thermal Constructions and Insulation

The building fabric constructions are to be designed to meet the minimum National Construction Code (NCC) Series Section J 2013 provisions. The main construction to the retail areas includes aluminium shopfront systems with insulated glazed spandrel panels. It is proposed that a minimum R2.80 insulation is proposed to retail external walls to satisfy NCC provisions for minimum insulation.

Roof insulation is proposed to the any exposed spaces that meet BCA 2013 Section J energy efficiency provisions of R3.20 assuming no more than 0.5% losses for services installations. Where losses in insulation are determined then additional allowances should be made according to Part J1 requirements. Floor insulation shall be provided between car park areas and retail spaces.

All insulation products to be used on the project are to contain zero ozone depleting potential in both manufacturing process and product composition. This is considered an important environmental factor in reducing the emission impacts of the associated construction materials.

4.2.2 Glazing

The glazing systems are to meet the minimum NCC Energy Efficiency provisions of Part J2. Any glazing specification is subject to further design development and a review of the extent of glazing as noted on the architectural elevations.

4.2.3 Rooflights

No rooflights are proposed to the retail areas of the development.

5. Green Star

5.1 Green Star Target

Green Star is a voluntary environmental rating system for assessing different building types against the environmental design targets. The rating separately evaluates the environmental initiatives of designs, projects and/or buildings based on the criteria listed below across nine (9) categories

The Block 8 Central Park development is targeting a Certified 5 star rating under the Multi Unit Residential v1 Design tool with the Green Building Council of Australia (GBCA). The project has been formally registered with the GBCA and is anticipated to achieve the formal rating within the first 12 months of the Construction stage.

5.1.1 Scorecard

To achieve a 5 star rating a project must achieve 60 or more weighted points across all categories whilst meeting the minimum environmental conditional requirements. The following table illustrates the proposed methodology for the Central Park Block 8 project to meet this minimum score however the final targets may vary as the design of the project develops:

Table 1: Proposed Green Star Scorecard across Multi-Residential v1 tool categories

Credit Category	Points Available	Targeted Credits
Management	18	16
Indoor Environment Quality	20	9
Energy	26	8
Transport	14	12
Water	10	9
Materials	19	13
Land Use	10	4
Emissions	15	12
Innovation	5	0
Total Credits (unweighted)		83
Total Credits (weighted)		60
Rating		5 star

For a full list of targeted Green Star initiatives for each credit and category we refer to the schedule provided in Appendix A.

5.2 Green Star Methodology

Management

The Green Star credits within the management category promote the adoption of environmental principles from project inception, design and construction phases to the operation of the building and its systems. The category aims to highlight the importance of a holistic and integrated approach to constructing a building with good environmental performance.

Currently the following initiatives are targeted within the management category and are subject to further design development:

- Appointment of a Green Star Accredited Professional for the duration of the project (Surface Design have been appointed by Frasers)
- Comprehensive commissioning process and building tuning is to be undertaken with reviews by an Independent Commissioning Agent (Thwaite Consulting have been appointed by Frasers)
- Implementation of comprehensive Environmental and Waste Management Plans for the construction phase including waste reduction target of greater than 80% to landfill excluding excavated soil materials
- Installation of comprehensive metering systems for central and building systems that facility effective metering and monitoring water and energy consumption.

Indoor Environment Quality (IEQ)

The Green Star credits within the IEQ category aim to enhance the comfort and wellbeing of the building occupants. Currently the following initiatives are targeted within the IEQ category and are subject to further design development:

- Greater than 6 stars NatHERS Rating average for all apartments
- Completion of hazardous materials survey and remediation of the existing site
- Use and specification of low- volatile organic compound (VOC) limits for paint products, adhesives and sealants, flooring and wall and ceiling coverings meet the total Volatile organic compound content limits
- Use of low formaldehyde engineered wood products
- Achieve ideal lighting levels to kitchen cooktops, sinks and bathroom basins to greater than 300 lux
- Dedicated kitchen exhausts required for 90% of kitchens in development

Energy

The Green Star credits within the Energy category aim to reduce the overall energy consumption for the project directly contributing to greenhouse gas emissions and energy production capacity. Through the design phase the following initiatives are to be targeted

- 20% improvement in operational energy for the development which includes apartment energy consumption, common and external spaces and central services
- Installation of highest available energy star ratings for washers, fridges and dishwashers
- Gas hot water systems

Transport

The Green Star credits within the Transport category aim to reduce the overall automotive movement by encouraging the use of alternative transportation and reducing private car commutes. Given the site location there residents will be able to take advantage of local public transport networks to reduce dependency on public transport vehicles and available facilities around the site such as retail shops.

Currently the following initiatives are targeted within the transport category and are subject to further design development:

- Implementation of parking spaces for small vehicles and moped/motorbikes
- Adoption of an appropriate car share scheme including parking spaces on site
- Dedicated bicycle parking for residents and visitors

Water

The Green Star credits within the Water category aim to reduce the overall water potable consumption and provide effective mechanisms for recycling of water uses on site. Currently the following initiatives are targeted within the water category and are subject to further design development:

- Use and specification of water efficient fixtures and fittings within minimum 3 WELS ratings for showers and minimum 4 WELS ratings for other fittings
- Reductions in potable water use for the site irrigation to greater than 90%
- Use and specification of water efficient fixtures and fittings
- Capture and recycling for minimum 80% of all fire test water that is discharged during fire maintenance testing excluding sprinkler draw-downs
- Reduction in potable water use associated with cooling tower water makeup by more than 90% compared to standard benchmark

Materials

The credits within the Materials category aims to reduce the consumption of natural resources and encourage the reuse of materials. Currently the following initiatives are targeted within the water category and are subject to further design development:

- Provisions for appropriate recycling storage space that facilitates the recycling of general residential materials and the use of central waste chutes to promote the ease of the management of wastes
- Specification and implement of a reduction in Portland cement up to 30% across all different concrete mix designs and the use of recycled sands and reclaimed water in concrete mix designs
- Specification of minimum 90% of all common PVC items to be manufactured to EMS guidelines and hold relevant accreditations
- Specification of the use certified timber products certified to AFS/PEFC, FSC or from recycled timber sources
- Façade is to be designed for disassembly using bolted connections to allow for ease of disassembly when required and promote the reuse of materials
- Use and specification of materials in the apartments with a reduced environmental impact

Land Use

The Green Star credits in the Land Use category promote the utilisation of existing urban development sites and reclaimed contaminated lands. The initiatives available to site include utilisation of reclaimed contaminated sites for new residential use and reuse of existing urban land.

Emissions

The credits within the Emissions category aims to reduce the environmental impacts of a buildings emissions. Currently the following initiatives are targeted within the emissions category and are subject to further design development:

- All thermal insulation products to be specified and installed are to contain zero Ozone Depleting Potential (ODP) in composition and manufacture
- All refrigerants to be used in the services is to contain zero ODP
- All external lighting to be designed to be efficient and no pollution to external night sky

Appendix A

Green Star Tracking

Appendix A - Green Star Tracking

Credit No.	Title	Points Available	Targeted Credits	Comments	
Management	Man-1	Green Star Professional	2	2	
	Man-2	Commissioning Clauses	2	2	Comprehensive commissioning process and training of building management
	Man-3	Building Tuning	1	1	Comprehensive 12 month building tuning process
	Man-4	Independent Commissioning Agent	1	0	
	Man-5	Building Users' Guide	1	1	Building Users Guide
	Man-6	Environment Management	3	2	Environmental Management plan to be implemented during construction
	Man-7	Waste Management	2	2	Waste Management plan to be implemented during construction with minimum 80% of all construction wastes to be diverted from landfill
	Man-16	Metering	6	6	Comprehensive metering systems to be implemented for central, building and apartment services
	<u>Management Total</u>		18	16	1 point = 0.44 weighted points
Indoor Air Quality	IEQ-4	Daylight	2	0	
	IEQ-5	Thermal Comfort	2	0	
	IEQ-6	Hazardous Materials	1	1	Management and appropriate disposal of existing hazardous waste on site
	IEQ-7	Internal Noise Levels	2	1	Appropriate fabric design and specification for the management of building services
	IEQ-8	Volatile Organic Compounds	4	4	Specification of low VOC paints, adhesives and sealants, flooring and walls /ceilings
	IEQ-9	Formaldehyde Minimisation	1	1	Specification of low formaldehyde products
	IEQ-13	Electric Lighting Levels	1	1	Appropriate lighting levels to kitchen cook tops & sink and bathroom basins
	IEQ-20	Private External Space	1	0	
	IEQ-21	Dwelling Ventilation	3	1	Dedicated kitchen exhaust allowance to be made to façade
	IEQ-22	Natural Ventilation	3	0	
	<u>Indoor Air Quality Total</u>		20	9	1 point = 1 weighted points
Energy	Ene-	Conditional Requirement	NA	NA	Minimum NatHERS conditional requirement to be met by more than 10% improvement
	Ene-1	Greenhouse Gas Emissions	20	4	Minimum energy efficiency savings of 20% targeted to benchmark
	Ene-7	Unoccupied Areas	2	1	Shut-down switch for mechanical and lighting to be provided at exit point of all apartments
	Ene-11	Energy Efficient Appliances	2	2	Specification of highest available energy star rating for washing machines, fridges and dishwashers. Clothes line more than 7.5m to be provided to all apartments
	Ene-12	Peak Electricity Demand Reduction	2	1	Hot water to be supplied by gas
	<u>Energy Total</u>		26	8	1 point = 0.96 weighted points
Transport	Tra-1	Provision for Car Parking	2	0	
	Tra-2	Fuel Efficient Transport	2	2	10% of all car spaces are designed to be Small car spaces. 5% motorcycle parking to be provided, 5% of car spaces to be dedicated to Car Share. Car Share to be located on grade or within close entry points
	Tra-3	Cyclist Facilities	3	3	Cyclist parking for residents and visitors
	Tra-4	Commuting Mass Transport	5	5	Existing public transport networks
	Tra-5	Trip Reduction Mixed-Use	2	2	10 different services to be available within 400m walking distance of the project
	<u>Transport Total</u>		14	12	1 point = 0.71 weighted points
Water	Wat-1	Occupant Water Amenity	5	4	Minimum water efficient fixture specifications and use of rainwater storage tank
	Wat-3	Landscape Irrigation	1	1	Reduction in potable water consumption for site landscaping by more than 90%
	Wat-4	Heat Rejection Water	2	2	Reduction in potable water consumption associated with central cooling plant
	Wat-5	Fire System Water	1	1	80% of all fire test water that is discharges is to be recovered
	Wat-7	Water Efficient Appliances	1	1	All dishwashers and washing machines is within one point of the highest WELS rating
	Wat-8	Swimming Pool / Spa Efficiency	2	0	
	<u>Water Total</u>		10	9	1 point = 1.5 weighted points

Materials	Mat-1	Recycling Waste Storage	2	2	Dedicated general waste chute to be provided to all residential floors; Dedicated waste recycling facilities to the building to be provided	
	Mat-2	Building Reuse	6	NA	Previous site buildings make this point Not Applicable	
	Mat-3	Recycled Content & Reused Products Materials	1	0		
	Mat-4	Concrete	3	1	Specification of the use of Portland cement replacement to 30% overall across all mixes and use of recycled sands and reclaimed water	
	Mat-5	Steel	2	2	Specification of pre-caging and wrapping of materials on delivery of site to 20%. Use and specification of 500MPa reinforcement steel and manufacturers to hold relevant accreditations of energy	
	Mat-6	PVC	2	2	Specification of minimum 90% of all common PVC items to be manufactured to EMS guidelines and hold relevant accreditations	
	Mat-7	Timber	1	1	Specification of the use of AFS/PEFC, FSC and recycled timber products only on the project	
	Mat-8	Design for Disassembly	1	1	95% of the façade is to be designed for disassembly using bolted connections	
	Mat-9	Dematerialisation	2	0		
	Mat-11	Flooring	1	1	All flooring products to meet relevant environmental credentials	
	Mat-12	Joinery	1	1	All joinery products to meet relevant environmental credentials	
	Mat-14	Internal Walls	2	2	All internal walls to meet relevant environmental credentials	
	Mat-15	Universal Design	1	0		
	Materials Total			19	13	1 point = 0.53 weighted points
	Land Use	Eco-	Conditional Requirement	NA	NA	The project is expected to comply with the conditional requirements
Eco-1		Topsoil	1	NA		
Eco-2		Reuse of Land	1	1	Previous site uses make this point achievable for the site	
Eco-3		Reclaimed Contaminated Land	2	2	Existing site contamination has been remediated and points will be available to the project	
Eco-4		Change of Ecological Value	4	1	Given existing site conditions and new development type only 1 point is expected to be achieved	
Eco-5		Outdoor Communal Activities	3	0		
Land Use & Ecology Total			10	4	1 point = 0.7 weighted points	
Emissions	Emi-1	Refrigerant ODP	1	1	All refrigerants to have zero ODP	
	Emi-2	Refrigerant GWP	2	0		
	Emi-3	Refrigerant Leak Detection	1	1	Refrigerant leak detection to be installed as part of the central plant	
	Emi-4	Insolent ODP	1	1	All thermal insulation products to have zero ODP	
	Emi-5	Stormwater	3	3	Central stormwater system on the site complies with the relevant credit criteria	
	Emi-6	Discharge to Sewer	5	5	Greater than 90% reduction in discharge to sewer for the project given fixture specifications and use of water recycling systems	
	Emi-7	Light Pollution	1	1	All external lighting to be designed to be efficient and no pollution to external night sky	
	Emi-8	Legionella	1	0		
	Emissions Total			15	12	1 point = 0.33 weighted points
Innovation	Inn-1	Innovative Strategies and Technologies	2	0		
	Inn-2	Exceeding Green Star Benchmarks	2	0		
	Inn-3	Environmental Design Initiatives	1	0		
	Innovation Total			5	0	
Total Credits (unweighted)			137.00	83.00		
TOTAL CREDITS (WEIGHTED)			100.00	60		
Weighted Score for Targeted Credits				60		