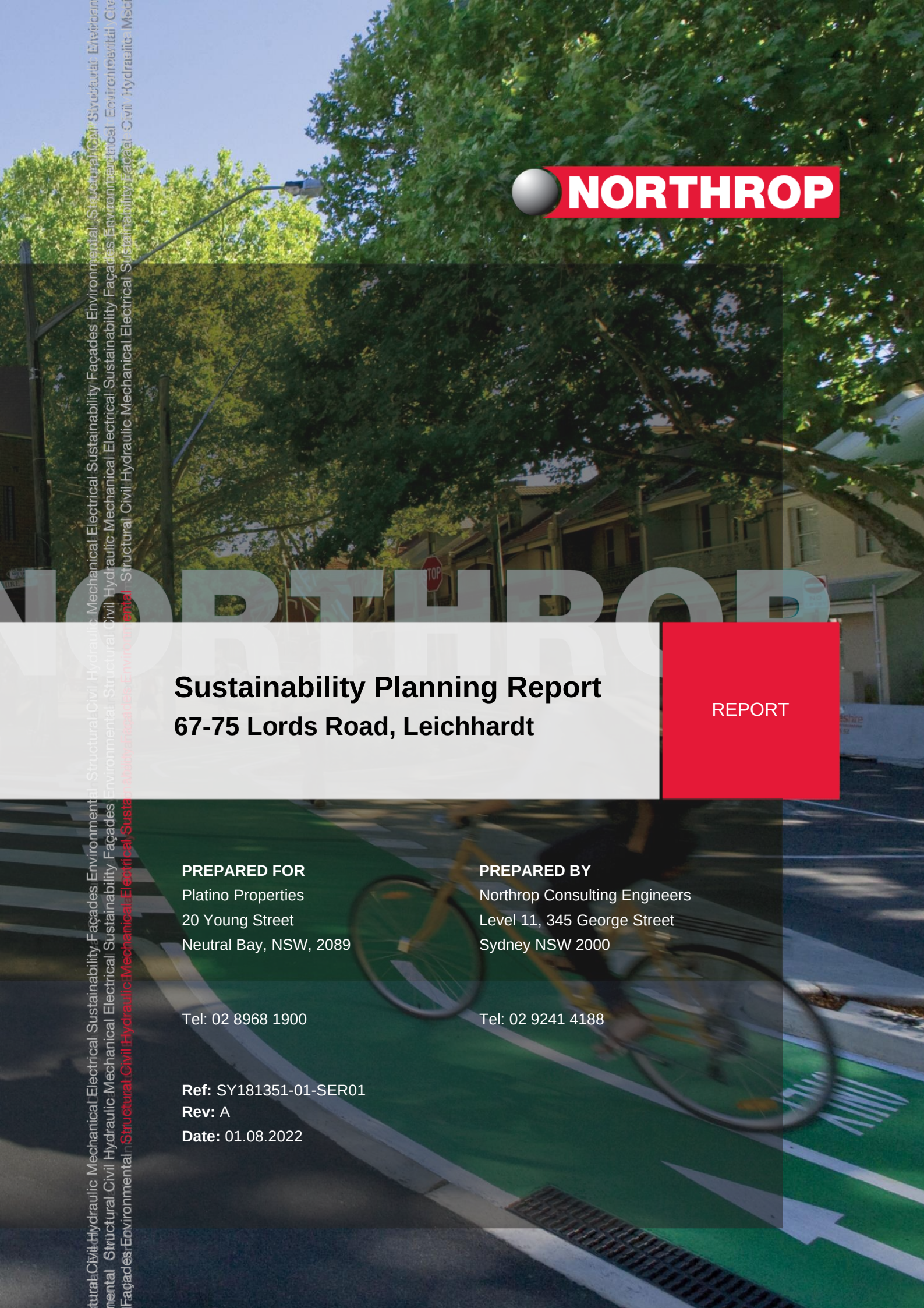


Sustainability Planning Report

67-75 Lords Road, Leichhardt

REPORT

PREPARED FOR
Platino Properties
20 Young Street
Neutral Bay, NSW, 2089

Tel: 02 8968 1900

PREPARED BY
Northrop Consulting Engineers
Level 11, 345 George Street
Sydney NSW 2000

Tel: 02 9241 4188

Ref: SY181351-01-SER01
Rev: A
Date: 01.08.2022

SUSTAINABILITY PLANNING REPORT

Activity Schedule

Date	Revision	Issue	Prepared By	Approved By
20.07.2018	A	Preliminary	Northrop	I.V.Eerden
01.08.2022	A	Final	Northrop	A.Girgis

Northrop Consulting Engineers Pty Ltd

ACN 064 775 088 | ABN 81 094 433 100

Level 11, 345 George Street, Sydney NSW 2000

02 9241 4188 | sydney@northrop.com.au | www.northrop.com.au

EXECUTIVE SUMMARY

Northrop has reviewed the current design documentation for the redevelopment of 67-75 Lords Road, Leichhardt NSW in order to assess the project against current legislation and best practice in Ecologically Sustainable Design (ESD).

Key sustainability principles have been incorporated as part of the Urban Design concept for the site. As a minimum, the applicant intends to include the following objectives to contribute to the achievement of the sustainability targets set by PRCUTS for the Precinct:

- Designed to the 5 star Green Star Buildings v1 rating
- At least 15% canopy coverage across the site within 10 years of the completion of the development to enhance amenity and mitigate urban heat
- Provision of vegetation, green roofs and materials with a high solar reflectance index, with particular focus on western and northern building facades.
- Increased BASIX targets of Energy 40 and BASIX water 50 for all residential development
- Preparation of a Green Travel Plan to bring about better transport arrangements to manage travel demands, particularly promoting more sustainable modes of travel and modes that have a low environmental impact
- Provision will for all car spaces in the development to be connected to a level 1 or faster car-charger
- Requirements for bike parking and car share facilities to be provided consistent with PRCUTS.

This report outlines the sustainability initiatives associated with Australian Best Practice across eight key areas:

- Energy Efficiency
- Indoor Environment Quality
- Water Management
- Sustainable Transport
- Waste Management
- Materials Selection
- Land Use and Ecology
- Community and Liveability

A detailed Sustainability Report will be prepared and submitted with future development applications to provide comprehensive information regarding the sustainability measures to be incorporated into the design.

TABLE OF CONTENTS

1. INTRODUCTION

Northrop Consulting Engineers (Northrop) have been engaged by Platino Properties to undertake a sustainability assessment to accompany the Planning Proposal for the redevelopment of 67-75 Lords Road, Leichhardt NSW.

Northrop have reviewed the Urban Design Study prepared by SJB Architects in preparation of the development of this report. Sustainability initiatives have been proposed for future consideration in developing the design of the precinct.

Eight key areas were explored to consider the potential social, economic and environmental impacts of the site:

1.1 Site Description

The site is located on the western edge of Leichhardt, approximately 8km from Sydney's CBD, and bounded by Lords Road to the south, Lambert Park to the North and the Sydney Light Rail L1 line to the West. Boarding the western boundary of the site is a densely vegetated Light Rail embankment and the Hawthorne Canal which drains to Parramatta River. Platino Properties intends to repurpose the land to facilitate five buildings for residential and commercial uses.

The proposal seeks to directly align with the recommendations of PRCUTS and would seek to amend the Leichhardt LEP as follows:

- Rezone the site from IN2 Light Industrial to R3 Medium Density Residential
- Increase the maximum FSR from 1:1 to 2.4
- Apply a maximum height of buildings of 30m.

The indicative land use mix is as follows:

- Total of approximately 220 dwellings including:
    - Residential apartments including affordable housing: approximately 160 dwellings
    - Seniors independent living units: approximately 60 dwellings
- Non-residential: minimum 2,000sqm
- Total floor space: approximately 25,500sqm

Figure 1: Site Context

1.2 Sustainability Objectives

The project will be targeting the following sustainability objectives to enhance the environmental performance of the site:

- BASIX Certification – compliance with the requirements of the NSW SEPP BASIX 2004;
- SEPP 65 – Compliance with the requirements of *SEPP 65 – Design Quality of Residential Apartment Development* and the related *Apartment Design Guide.*
- Parramatta Road Corridor Urban Transformation (PRCUT) - Planning and Design Guidelines
    - High performance buildings
        - BASIX Energy score of 40%
        - BASIX Water score of 50%
    - Reduced and decoupled strategic parking
        - Smart street and Bicycle parking
    - Urban resilience and infrastructure Services
        - Urban heat island effect reduction
        - Stormwater flowrates to not exceed predevelopment discharge levels
        - Stormwater runoff quality enhanced by reducing pollutants
        - Climate resilience strategies for key infrastructure and assets
- Additional sustainability initiatives to incorporate Australian Best Practice Sustainability principles within the project design, as follows;
    - Energy Efficiency
    - Indoor Environment Quality
    - Water Management
    - Sustainable Transport
    - Waste Management
    - Materials Selection
    - Land Use and Ecology
    - Community & Liveability

1.3 Referenced Documentation

The following documentation was referenced in the development of this report:

- 67-75 Lords Road Masterplan - Urban Design Study – Prepared by SJB Architects (June 2022)

1.4 Limitations

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. ENERGY EFFICIENCY

2.1 Passive Design

The site characteristics and orientations can have a large effect on the amount of energy that is required to heat, cool and ventilate a building.

Key considerations will include designing high performance facades including glazing selection and extent, external shading, daylight direction devices, insulation levels, surface properties and possible natural ventilation openings.

2.1.1 Winter Gardens

The inclusion of winter gardens in individual apartments will help to reduce energy consumption associated with heating and cooling throughout the year. During winter, these areas benefit from solar heat gain and provide a naturally warm space for occupants, reducing the need for space heating. During summer, appropriately shaded winter gardens will receive less direct sun and act as second façade layer to the building and reducing heat gain to the rest of the apartment.

In addition to reducing heating and cooling loads, winter gardens improve the provision of natural daylight to apartments and increase occupant control over ventilation through the provision of large external openings.

2.1.2 Natural Ventilation

The method of natural ventilation applicable to a development of this nature is single sided ventilation. Single sided ventilation, unlike fan-forced ventilation, uses the natural forces of wind and buoyancy to exchange air through appropriately sized openings (windows) on one side of an apartment. Naturally ventilating a building can significantly reduce energy consumption of HVAC systems, whilst providing 100% outdoor air into the spaces it serves, creates a very clean environment for occupants.

In Leichhardt, the predominant wind directions occur from the south east, south and west; this would be the governing factor when considering building orientation on the site as seen in the wind rose diagram in Figure 2. Natural ventilation will be maximised by implementing a precinct wide consideration of wind direction and speeds in preparation of building orientation design to optimise passive cooling opportunities across the site.

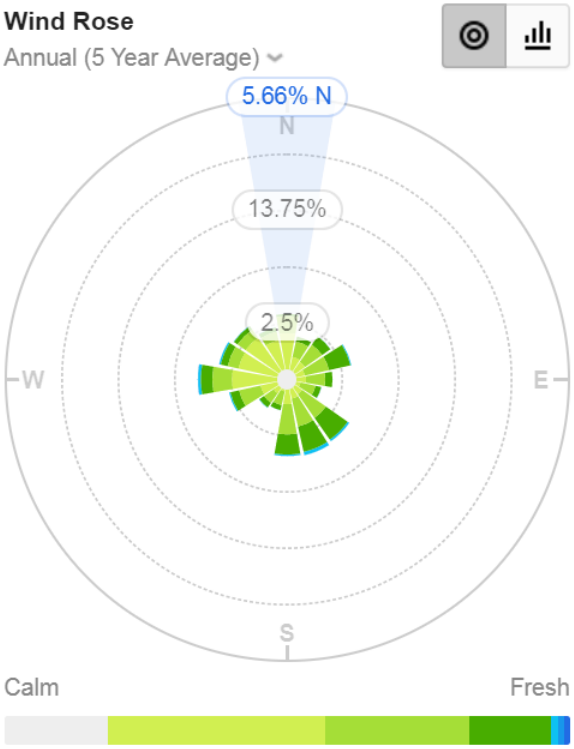


Figure 2: Prevailing Winds (5 year average) – Leichhardt NSW

2.1.3 Solar Amenity

Good solar amenity is essential for considering passive design principles for the site. A balance between natural daylight and solar access is required to optimise thermal performance of the buildings on the site to create comfortable living environments and minimise the carbon footprint of the development.

Opportunities will be explored as part of the detailed development stage to enhance the solar amenity across the site, including:

- Well performing glazing
- Selection of glazing with high Visual Light Transmittance (VLT)
- Winter gardens
- Optimised shading through window screening

2.2 HVAC Systems

Typically apartment buildings in Sydney are served by individual reverse cycle split air conditioning systems for each dwelling. While split systems provide high flexibility for individual control and simplicity from a body corporate outgoings point of view, this is not always that best outcome from an energy, operational cost and aesthetic perspective.

Various options will be investigated to provide an improved energy efficient outcome system that provides a better level of control. This will include equipment selection (with priority for higher energy efficiency ratios), control strategies and day/night-time zoning.

Additionally, the feasibility of district heating and cooling systems will be explored to investigate the opportunities to provide the central production and distribution of thermal energy.

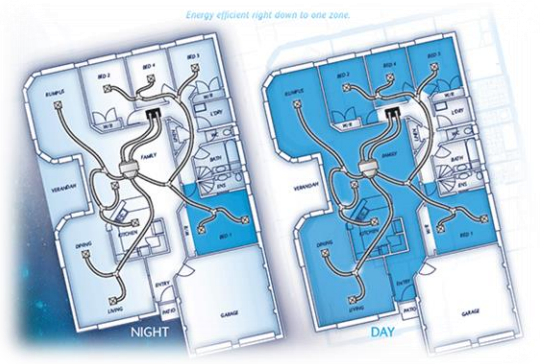


Figure 3 Day/night zoning configuration

2.3 Energy Efficient Appliances

Minimum Energy Performance Standards (MEPS) specify the minimum level of energy performance that appliances, lighting and electrical equipment must meet or exceed before they can be offered for sale or used for commercial purposes.

High MEPS rated appliances will be considered beyond mandatory product ranges in Australia and New Zealand. These products must be registered through an online database and meet a number of legal requirements before they can be sold in either of these countries.

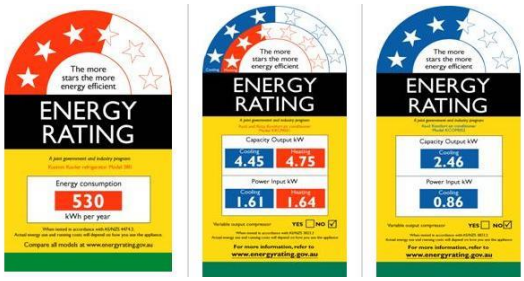


Figure 4: Typical Energy rating labels

2.4 Energy Efficient Artificial Lighting

The provision of highly energy efficient lighting is to be incorporated into the building design to minimise the lighting density. In particular, LED lighting provides the maximum efficiency and has become a robust cost effective lighting technology.

Control strategies are also vital to reduce excess energy use, including:

- Daylight sensor and motion sensor control for hallways, lobbies and shared spaces.
- Lift lighting connected to lift call buttons.
- Motion sensor or time-based lighting for undercover car parking, switch rooms and service areas.
- Motion sensors in fire stairs to trigger between standby (dimmed) and full light outputs

2.5 Alternative Energy Sources

2.5.1 Solar Photovoltaic (PV)

Rooftop solar power within the development has the potential to provide a portion of the building energy use across the year. Using a system connected to the base building systems will offset energy used by the central services such as lifts and common area lighting. Rooftop solar will also provide a benefit to the projects BASIX compliance levels for the residential developments of the site and NABERS ratings for commercial office areas.

If there was a desire to maximise the amount of solar PV to be installed, this could be incorporated with an embedded network to allow the use of the output electricity in the precinct.

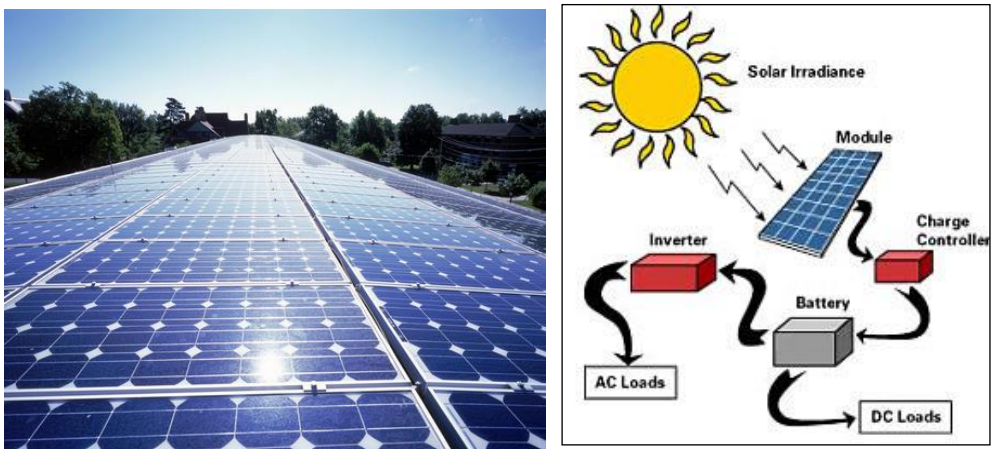


Figure 5: Solar PV components

2.6 Smart Energy Metering and Monitoring

Metering for each tenant will allow them to monitor their own energy use and result in behavioural or equipment changes. Real-time energy tracking will also raise occupant awareness of the potential excess energy in their everyday environment.

A user-friendly interface for monitoring will also increase interaction with the building and give the tenants a greater sense of control of their space. Display screens located in accessible common areas will be considered to display energy consumption in the building in effort to reduce the carbon footprint of the precinct.

2.7 Embedded Networks

A Micro grid is a private electricity network that uses local energy generation sources (e.g. rooftop solar) which can be connected to battery storage systems and supply loads within that network. An integrated micro grid would allow the precinct to manage the system within its borders and interact with the larger grid network as a single entity under an Embedded Network arrangement. .

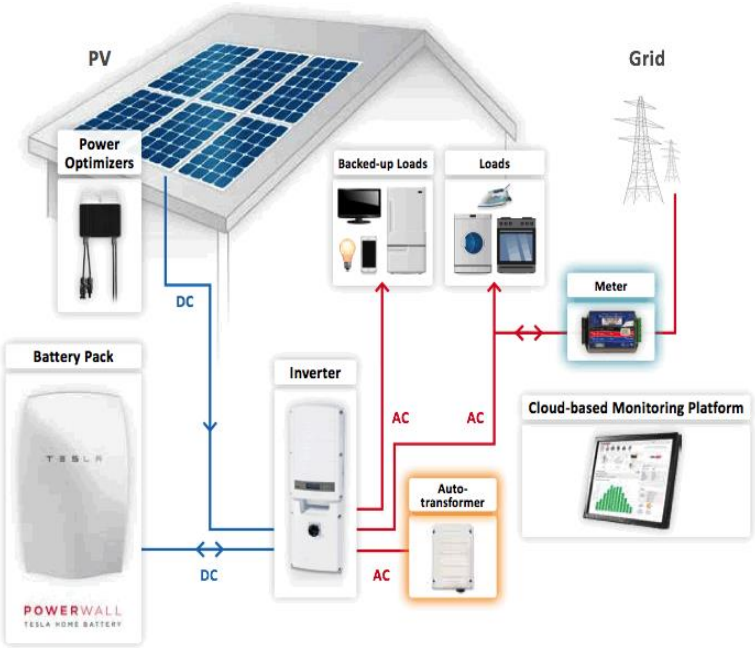


Figure 6: Example of connectivity of an embedded network

The embedded network would serve each of the dwellings within the building and connect these to a central connection point. Electricity can be purchased in bulk at a lower cost than is available to individual residents which could potentially provide revenue generation opportunities for Platino Properties if managed privately. Billing is then provided by either the building or through a third party (Origin, OC Energy, WIN Energy etc).

These systems are attractive as they can often provide reduced energy costs for residents and can assist in the distribution of onsite energy generation and storage.

Overall the use of an embedded network would allow further exploration of PV generation and the installation of battery storage to provide lower electricity bills for residents.

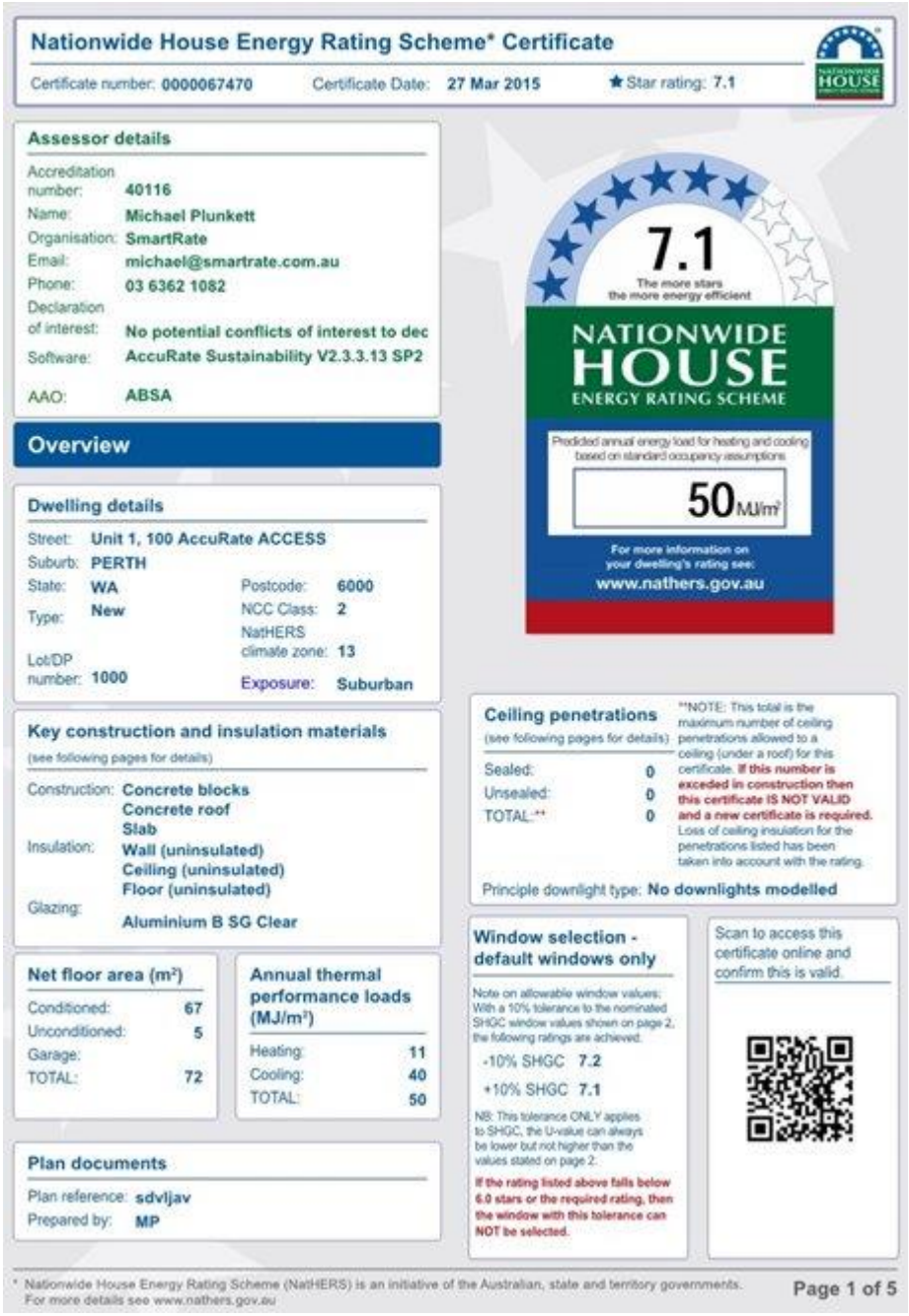
3. INDOOR ENVIRONMENT QUALITY

Comfortable, healthy and enriching spaces are of high significance for their all building occupants. The promotion of indoor environment quality results in a greater liveability of the development.

3.1 Thermal Comfort

Thermal comfort is typically dictated by the building fabric selections, façade performance, air-conditioning system design & selection and individual controls.

The residential portion of the project will consider targeting an average NatHERS rating of 6 stars. The commercial components will target designing systems with optimised air distribution and individual level of control.



Nationwide House Energy Rating Scheme® Certificate

Certificate number: 0000067470 Certificate Date: 27 Mar 2015 ★Star rating: 7.1

Assessor details

Accreditation number: 40116
Name: Michael Plunkett
Organisation: SmartRate
Email: michael@smartrate.com.au
Phone: 03 6362 1082
Declaration of interest: No potential conflicts of interest to dec
Software: AccuRate Sustainability V2.3.3.13 SP2
AAO: ABSA

Overview

Dwelling details

Street: Unit 1, 100 AccuRate ACCESS
Suburb: PERTH
State: WA Postcode: 6000
Type: New NCC Class: 2
NatHERS climate zone: 13
Lot/DP number: 1000 Exposure: Suburban

Key construction and insulation materials

(see following pages for details)

Construction: Concrete blocks, Concrete roof, Slab
Insulation: Wall (uninsulated), Ceiling (uninsulated), Floor (uninsulated)
Glazing: Aluminium B SG Clear

Net floor area (m²)

Conditioned: 67
Unconditioned: 5
Garage:
TOTAL: 72

Annual thermal performance loads (MJ/m²)

Heating: 11
Cooling: 40
TOTAL: 50

Plan documents

Plan reference: sdvljav
Prepared by: MP

7.1
The more stars the more energy efficient
NATIONWIDE HOUSE ENERGY RATING SCHEME
Predicted annual energy load for heating and cooling based on standard occupancy assumptions
50 MJ/m²
For more information on your dwelling's rating see:
www.nathers.gov.au

Ceiling penetrations

(see following pages for details)

Sealed: 0
Unsealed: 0
TOTAL:** 0

NOTE: This total is the maximum number of ceiling penetrations allowed to a ceiling (under a roof) for this certificate. **If this number is exceeded in construction then this certificate IS NOT VALID and a new certificate is required. Loss of ceiling insulation for the penetrations listed has been taken into account with the rating.

Principle downlight type: **No downlights modelled**

Window selection - default windows only

Note on allowable window values: With a 10% tolerance to the nominated SHGC window values shown on page 2, the following ratings are achieved.

-10% SHGC 7.2
+10% SHGC 7.1

NB: This tolerance ONLY applies to SHGC, the U-value can always be lower but not higher than the values stated on page 2.

If the rating listed above falls below 6.0 stars or the required rating, then the window with this tolerance can NOT be selected.

Scan to access this certificate online and confirm this is valid.

* Nationwide House Energy Rating Scheme (NatHERS) is an initiative of the Australian, state and territory governments. For more details see www.nathers.gov.au

Page 1 of 5

Figure 7: Typical NatHERS home owners certificate

3.2 Trickle Ventilation

A trickle vent is a very small opening within a buildings fabric that allows a small amount of ventilation into spaces when major elements of the ventilation systems, such as windows and doors, are closed. Trickle ventilators can also provide a greater level of control over the provision of outside air to inside spaces. A number of products are available that control ventilation flow based on temperature and pressure, allowing outside air into spaces when it would be beneficial to the internal conditions and automatically shutting this off when it would result in increased heating or cooling costs.

A well-controlled trickle vent will also reduce condensation risk, avoid over ventilation (reducing air-conditioning energy and improve comfort through minimising drafts. The provision of trickle ventilators would not remove the requirements for openable windows but could assist with acoustic and ventilation controls while providing a continuous source of fresh outside air.

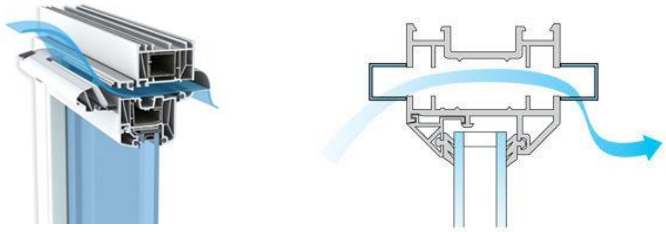


Figure 8: Example of trickle ventilation systems

3.3 Low Toxicity Finishes

Interior finishes such as paints, adhesives, sealants and flooring contain volatile organic compounds (VOC) that are inherent to the use of solvents during the manufacturing process. Consequently, these become sources of indoor pollutants which have health implications. The design team will consider and aim to minimise the VOC and formaldehyde content of all products specified in the design process of the development.

3.4 Acoustic Comfort

Acoustic considerations are important for creating comfortable indoor spaces and increasing the liability of the Lords Road development. Such considerations will be made with particular attention to external noise sources including near-by light rail as well as games fields.

Passive building design features will assist with noise reduction in induvial apartments. While winter gardens and window screening provide additional barriers for noise attenuation, single sided ventilation restricts opening to one side of the apartments, reducing intrusion of external noise.

Acoustic conditions of the site will be assessed in the future stages of the development to ensure that appropriate internal noise levels and reverberation levels are compliant with AS/NZ 2107:2016 standards.

4. WATER MANAGEMENT

4.1 Stormwater management

The site will comply with the PRCUTS stormwater management requirements including post-development peak Average Recurrence Interval (AIR) event discharge from the site does not exceed the pre-development peak 5-year ARI event discharge and all stormwater discharged from the site meets the following Pollution Reduction Targets:

- Total Nitrogen by 45%
- Total Phosphorus by 65%
- Total suspended solids by 85%

4.2 Water Efficient Fixtures and Fittings

Water Efficient Fixtures and Fittings will reduce the water consumption of the site. As an indication, the following Water Efficiency Label (WELS) rated fittings and fixtures will be considered:

- Wash hand basin taps - 5 star WELS
- General taps - 5 star WELS
- Toilets dual flush - 4 star WELS
- Urinals - 6 star WELS
- Shower heads – 4 Star WELS

4.3 Water Reuse

4.3.1 Rain Water Harvesting

At a minimum, inclusion of rainwater harvesting will be considered for non-potable uses. Possible rainwater reuse opportunities could be to supply irrigation systems, car washing, communal laundries and cooling tower make up supply, to reduce the potable water demand on site and lessen the impact to the local authority networks.

4.3.2 Fire Sprinkler System

During the design of the fire protection design in the consideration of sprinkler systems, the recirculation and storage of sprinkler testing water will be considered. This water can potentially be captured and stored in storage tanks for reuse during the next sprinkler test or connected to the rainwater tank for top up supply.

4.4 Water Sensitive Urban Design

Implementing Water Sensitive Urban Design (WSUD) practices reduces the reliance of stormwater infrastructure whilst enhancing the biodiversity of a site. Special attention to vegetation selection and water quality measures will need to be considered in order to appropriately address the proximity to the adjacent Hawthorne Canal.

Figure 8: Bioswales could be located in streetscapes to improve the water quality in the precinct

WSUD options that will be considered as part of this design approach are:

- Rain Gardens or plantings around building entrances;
- Sub-surface stormwater detention systems
- Tree Gardens/pits & Bio swales for storm water runoff treatment
- Native vegetation where applicable

4.5 Smart Water Metering & Monitoring

Water sub-metering with alarms for leak detection for common area facilities will provide a system for effective maintenance of the site. Smart metering which is connected to a monitoring system will allow for real-time consumption tracking and flag potential leaks at the moment they occur, minimising water wastage and protecting the building from water damage.

5. SUSTAINABLE TRANSPORT

5.1 Green travel Plan

A Green travel plan will be prepared for the site to bring about better transport arrangements to manage travel demands, particularly promoting more sustainable modes of travel and modes that have a low environmental impact. This will capitalise on internal and external opportunities for Sustainable transport options.

5.2 Pedestrian and Cycle Links

Pedestrian pathways and cycle ways will be integral to the design of the precinct to encourage public transport use and high urban amenity areas. Cycle ways and pathways can provide ease of connection to near-by light rail stations and surrounding suburbs as indicated in the precinct's Travel Plan.

It is opportune for Platino Properties to provide clearly marked cyclist pathways and pedestrian access around these areas, designed to include sufficient accessibility to ensure for a resilient precinct.

5.3 Cyclist Facilities and Access

The practice of cycling assists human health and reduces environmental impact by mitigating pollutants that would otherwise have been released by other transport options. According to the ABS over one third of daily car trips are less than 3km in length. Most of these trips could be replaced with cycling. Providing secure bike storage facilities for residents will promote the use of bicycles as a form of transport.

Providing secure storage, either as a communal storage cage in the basement or a nook adjacent to dwelling entries, assists in encouraging cycling though the precinct. The provision of bike racks outside of the main building entries across the site will also be implemented where possible.

Figure 9: Hybrid bike rack and bench

5.4 Car share hubs

The provision of a building precinct specific share car network would allow building occupants to relinquish car ownership entirely and would greatly reduce the number of parking spaces required within the building. The provision of a cluster of vehicles could be coupled with a site mobile phone app, allowing for a centralised booking system.

A third party such Go-Get could also be provided with a dedicated space, as recommended in the Travel Plan, with residents given access to their booking system. This would reduce management requirements and move responsibility for the provision and maintenance of vehicles away from Platino Properties or building management.

5.5 Electric Vehicle Charging stations

Provision will for all car spaces in the development to be connected to a level 1 or faster car-charger.

6. WASTE MANAGEMENT

6.1 Construction and demolition waste

Building materials account for approximately half of all materials and about half the solid waste generated worldwide incurring significant environmental impacts at each process interval. It is proposed that a significant portion of construction and demolition waste is to be diverted from landfill to reduce the carbon footprint of the site whilst reducing waste fees associated with landfill rates. This commitment could be incorporated in to the head contractors' Environmental Management Plan for the site. Reclamation of high value building materials should be considered first preference. Where reclamation is not viable, materials such as asphalt, bricks, timber, plastics (including PVC) and concrete should be recycled accordingly.

6.2 Waste Sortation

Waste-sorting bins will be considered for all internal and external spaces to enable users to sort their rubbish and recyclables. Back of house areas will require sufficiently sized and conveniently located waste storage and sorting areas for ease of removal by waste contractors.

An organic waste stream could be introduced with a communal worm farm or compost system to support community gardens and educational programs rolled out in the precinct.

Figure 10: Waste stream sortation

6.3 Unified bin design

Unified bin design throughout the precinct is proposed as part of a waste strategy to create a waste sortation culture in the building. Not only should each be a different colour e.g. Red for general waste, yellow for co-mingled recycling, blue for paper and green for organics but should be consistent throughout the site. This is to assist with clarity and develop effective waste sortation prior to disposal. The waste strategy should be as part of the Waste Management Plan and considered during the early stages of the development to ensure appropriate design integration across all building uses.

6.4 Waste education

Waste educational in terms of effective signage displays or programs would have a positive benefit to the community as part of a wider approach to enhance community participation, create social diversity and provide fun educational activities for residents and surrounding suburbs.

This inititive could be coupled with the digital signage in the common lobbies as a way of updating residents of different waste pick updates or other useful Cumberland LGA initiatives.

Figure 11: Waste Education Programs

7. MATERIALS SELECTION

7.1 Sustainable Use of Resources

When choosing building materials for this project, particular attention will be paid to:

- **Low Embodied CO_2** – Many modern building materials such as aluminium or concrete are high in embodied energy (the energy required to produce, transport and install a material), and with that contribute substantially to the overall carbon footprint of the building.
- **Sustainability of Resource** – many building materials are derived from finite resources and should be avoided or limited. Major building elements should have recycled content where possible (recycled steel and/or aggregates in concrete, recycled timber, cellulose fibre insulation using recycled paper etc.).
- **Health Impact** – All materials should be considered in regard to their impact on occupants' health. For example, some types of fibreglass insulations have very fine fibres that, once airborne, can easily enter into the lungs and cause severe irritation.
- **Third Party Certifications** – materials which have been certified or approved by independent bodies such as Ecospecifier or Good Environmental Choice Australia should be preferred over non-certified products. These rating systems provide evaluation of various products across a range of environmental performance criteria.
- **Recycled Content** – Recycled content should be specified in:
    - Concrete – fly ash and recycled aggregates; and
    - Structural and reinforcement steel
    - Recycled building rubble

Figure 12: Examples of Third Party Certification Labels

7.2 Locally sourced products

Locally sourcing products for use in the construction of the precinct would help to keep transport and distribution impacts to a minimum. It will also help to support local employment and improve economic resilience of the Sydney manufacturing industry.

Utilising local manufacturing and suppliers should also help to minimise lead time for products, build positive relationships and make supply chain auditing easier. Overall the sourcing of locally sourced products should be explored and implemented where economically feasible.

8. LAND USE AND ECOLOGY

8.1 Increased Ecological Value

Being situated near community infrastructure, the development is considered to have a significant urban activation potential.

The development will significantly improve the ecological value of the site with the following being considered;

- Street landscaping;
- Vertical gardens;
- Roof gardens.

Native vegetation will also minimise the ongoing environmental impact of the project by minimising soil erosion and land degradation, improving water quality and provides habitat for native flora and forna.

8.2 Native vegetation

Native vegetation plays a key part in the biodiversity and ecological stability of the site.

Endemic native vegetation plantings have the benefit of:

- Controls erosion through protecting soils and riverbanks
- Reduces land degradation and salinity
- Improves water quality and availability
- Provides habitat for a wealth of unique and threatened species.

In addition, native vegetation stores a significant amount of carbon, mitigating the effects of climate change. The planting of native vegetation throughout the precinct will reduce the water needed for irrigation systems, reduce vegetation maintenance requirements, promote biodiversity and improve compliance under BASIX.

8.3 Heat Island Effect

Urban heat island effect is defined as hard surfaces within a development heating up due to lower Solar Reflectance Indexes (SRI), compared to a natural area. This results in additional heat retention in the surrounding area, as well as allowing more heat to penetrate individual buildings.

The following will be considered in the development to reduce heat island effect;

- Canopy Coverage for upto 15% of the site
- Roof Gardens;
- Artificial water bodies & water courses;
- Increased vegetation areas;
- Selection of paint finishes with high SRI properties such as light coloured exterior finishes.

8.4 Rooftop Gardens

Plants have the ability to reduce the overall heat absorption of the building which then reduces energy consumption. The primary cause of heat build-up in cities is solar radiation, the absorption of heat by roads and buildings in the city and the storage of this heat in the material. By installing roof gardens, the development is creating a passive solution to this build-up of heat with the plant surfaces cooling the space through the process of transpiration. This will help to minimize temperature rise in these spaces to no more than 4-5°C above ambient improving thermal conditions within the buildings across the site and minimising the precinct effect on urban heat islands.

Figure 13: roof gardens help to cool the space and reduce the urban heat island effect.

8.5 Non obtrusive outdoor lighting

Light pollution released into the night sky (sky glow) or spilling on to neighbouring properties can harm the environment in many ways including effects on:

- Migratory birds – nocturnal birds use the moon and stars for navigation and can become disoriented by lights shining upwards into the sky;
- The disruption of biological rhythms and other effects on the behaviour of nocturnal animals and insects;
- Greenhouse gas emissions are emitted to unnecessarily light the night sky.

Ensuring that no outdoor lights face up into the night sky would not attract any additional costs and would provide ongoing operational and maintenance savings and reduce the sites impact on the natural environment.

9. COMMUNITY AND LIVABILITY

9.1 Communal Gardens & Facilities

The provision of urban agriculture that promotes education and community through garden facilities, will promote community cohesion within the residents of the precinct and provide a valuable educational facility.

The community gardens should be incorporated in to the space design with the overall aim of creating a self-sustaining community initiative managed by the residents of the building. Initially there will need to be a commitment of time and financing for the construction of the physical gardens and for the education of residents regarding the effective management of these facilities.

Overall the benefits of providing the provision for urban agricultural facilities will include;

- Providing residents with access to fresh food,
- Reducing household waste going to landfill though the provision of composting facilities
- Reducing the need to provide private “backyard” space
- Promoting community engagement
- Educating residents about food production; and
- Providing biological diversity across the site.

Figure 14: Community gardens would promote social cohesion and a sense of community

9.2 Environmental Education

To assist the environmental education of building occupants and visitors, the following opportunities will be considered;

9.2.1 Community programs

Scheduled events and programs is a good way to encourage access to a diverse range of people in the community; celebrating culture and heritage that drives positive growth and joy in the neighbourhood.

Community events could include sustainable educational workshops with varying topics, for example, permaculture classes, composting and worm farming to complement the proposed communal gardens.

9.2.2 Environmental Displays

Creating interactive spaces is an effective way to encourage environmental education whilst providing a fun and vibrant atmosphere. Interactive digital display screens can be used as a tool to provide such a space which provides education to the occupants by making resource savings and consumption data readily accessible in the public space, such as the lobby areas or lifts. Information could for example detail live water and energy consumption data in the form of a touch screen display and relate back to the carbon footprint of the site in context of the individual, building or precinct.

9.3 Wayfinding

At its essence, wayfinding is the science of understanding how people perceive the environment and make decisions while navigating unfamiliar spaces and then responding with intuitive signage and information layouts.

Figure 15: Internal Wayfinding example

A high-functioning way finding system makes the environment “unique” and enhances the visitors’ experience as it increases their comfort, builds their confidence, and encourages them to discover unique events, attractions and destinations on their own.

Way Finding can also be utilised to direct occupants to key facilities and amenities in fun and creating ways. Like the interactive façade initiative above, public art incorporated into way finding signage in the building could open opportunities for local schools and community group competitions.

10. GREEN STAR

10.1 Overview

The Green Star rating tool is an internationally recognised system that provides independent verification of sustainable outcomes throughout the life cycle of the built environment. Green Star was developed by the Green Building Council of Australia (GBCA), which is the nation's leading authority on sustainable buildings and communities.

The relevant Green Star rating tool for the Lords Road Leichhardt Development is Greenstar Buildings, which focuses on the design and construction of new buildings.

The Green Star – Buildings framework incorporates ESD principals across nine major categories. These include:

Points are awarded to a project based on the degree to which the project meets the various requirements within these eight categories.

10.1.1 Rating Tool Eligibility

The eligibility criteria for the Green Star – Buildings rating tool include:

- **Building Type** - It is a new building or a major refurbishment, but not a single dwelling home, a parking garage, or an uninhabited structure
- **Distinct Boundary** - There is a distinct boundary to the building – it has its own address, title, and entrance. It is also the entire building
- **Timing of submission for certification** - The Certified rating is achieved within two years from practical completion
- **Minimum Expectations** - The Minimum Expectations are met
- **Star Rating requirement** - The building achieves at least a 4 star rating

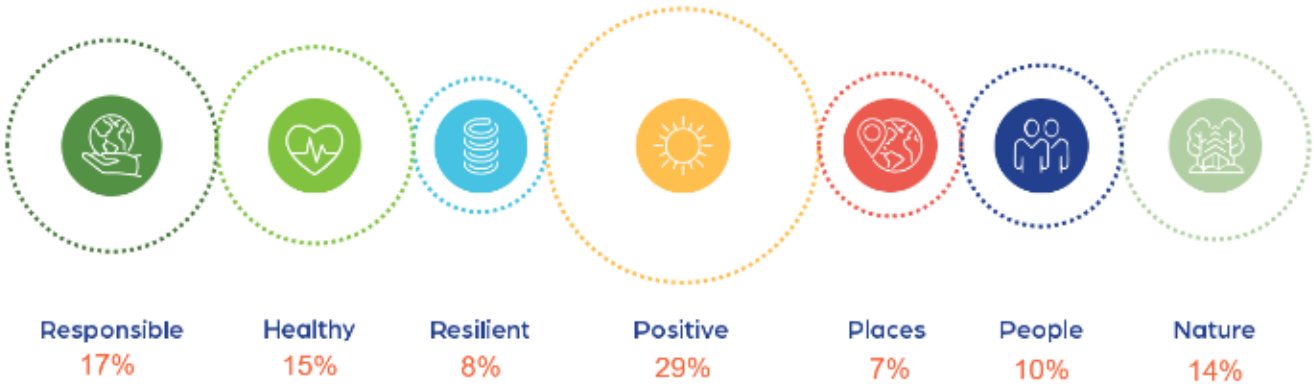
67-75 Lords Road, Leichhardt meets the eligibility criteria noted above and will aim to submit a for a certified rating within 2 years of project completion.

10.1.2 Rating Bands and Categories

Green Star Design & As Built awards achievement at 3 levels (4, 5 or 6 star), depending on the points achieved after assessment by an independent panel. The points corresponding to each award level (rating) are as follows:

- **4 Star** – reflects a Best Practice environmental performer. It builds on the Minimum Expectations to deliver a building that is either climate positive or a higher performer in energy, water, and health related issues (15 out of 100 points)
- **5 Star** – demonstrates Australian Excellence by being a high environmental performer that addresses social issues relevant to the building owner (35 out of 100 points)
- **6 Star** – showcases World Leadership. It has been built to be a highly efficient building fully powered by renewables that addresses a significant number of environmental and social issues, and contributes to the community (70 out of 100 points)

Points are assigned to the eight categories according to the below:



10.1.3 Green Star Targeted rating

67-75 Lords Road, Leichhardt is targeting 68 points for a 5 Star Green Star rating. These points and their associated credits are displayed below

Code	Credit	Minimum Expectation	Credit Achievement	Exceptional Performance	Total points available	Proposed Pathway
	Responsible				**17**	
1	Industry Development		**1**		**1**	**1**
2	Responsible Construction	●	**1**		**1**	**1**
3	Verification and Handover	●	**1**		**1**	**1**
4	Responsible Resource Management	●			**0**	●
5	Responsible Procurement		**1**		**1**	**1**

6	Responsible Structure		3	2	5	3
7	Responsible Envelope		2	2	4	2
8	Responsible Systems		1	1	2	
9	Responsible Finishes		1	1	2	
						9
	Healthy				14	
10	Clean Air	●	2		2	2
11	Light Quality	●	2	2	4	2
12	Acoustic Comfort	●	2		2	2
13	Exposure to Toxins	●	2		2	2
14	Amenity and Comfort		2		2	
15	Connection to Nature		1	1	2	
						8
	Resilient				8	
16	Climate Change Resilience	●	1		1	1
17	Operations Resilience		2		2	2
18	Community Resilience		1		1	
19	Heat Resilience		1		1	1
20	Grid Resilience		3		3	
						4
	Positive				30	
21	Upfront Carbon Emissions	●	3	3	6	3
22	Energy Use	●	3	3	6	6
23	Energy Source	●	3	3	6	●
24	Other Carbon Emissions		2	2	4	
25	Water Use	●	3	3	6	6

26	Life Cycle Impacts		2		2	2
						17
	Places				8	
27	Movement and Place	●	3		3	●
28	Enjoyable Places		2		2	
29	Contribution to Place		2		2	
30	Culture, Heritage and Identity		1		1	
	People				9	
31	Inclusive Construction Practices	●	1		1	1
32	Indigenous Inclusion		2		2	
33	Procurement and Workforce Inclusion		2	1	3	
34	Design for Inclusion		2	1	3	
						1
	Nature				14	
35	Impacts to Nature	●	2		2	●
36	Biodiversity Enhancement		2	2	4	
37	Nature Connectivity		2		2	
38	Nature Stewardship		2		2	
39	Waterway Protection		2	2	4	
	Leadership				0	
40	Market Transformation				0	TBD
41	Leadership Challenges				0	TBD
						TBD

11. CONCLUSION

The new development at Lords Road, Leichhardt will incorporate a number of key initiatives to reduce the impact on the environment and enhance the liveability of the precinct.

As a result, the development will achieve compliance with the sustainability targets set by PRCUTS for the Precinct as follows:

- Designed to the 5 star Green Star Buildings v1 rating
- At least 15% canopy coverage across the site within 10 years of the completion of the development to enhance amenity and mitigate urban heat
- Provision of vegetation, green roofs and materials with a high solar reflectance index, with particular focus on western and northern building facades.
- Increased BASIX targets of Energy 40 and BASIX water 50 for all residential development
- Preparation of a Green Travel Plan to bring about better transport arrangements to manage travel demands, particularly promoting more sustainable modes of travel and modes that have a low environmental impact
- Provision will for all car spaces in the development to be connected to a level 1 or faster car-charger
- Requirements for bike parking and car share facilities to be provided consistent with PRCUTS.

Future detailed design stages of the development will explore integrating core sustainability principles and firming up a strategy for implementation.