



Modularium

To be built at 195-197 Sydney Road, Fairlight, NSW

Issue	File Ref.	Description	Author	Date
A	18-1018	DRAFT - Ecologically Sustainability Development Report	LK / DH	03/09/18
B	18-1018	Ecologically Sustainability Development Report	DH	09/10/18

This report has been prepared by Efficient Living Pty Ltd on behalf of our Modularium. At all times Efficient Living has acted with due diligence and employed all reasonable skill and care in the preparation of this report. The information contained within is based upon the documents and information, accepted in good faith as being true and accurate, provided by the client, architects and consultants. This report is for the exclusive use of the client. No responsibility or liability is accepted for the use of this report by any third party or in matters outside the agreed scope of works. Should any third party wish to use or rely upon the contents of this report, written approval must be sought from Efficient Living.



Contents

1. INTRODUCTION	5
2. DEVELOPMENT DESCRIPTION	5
3. ASSESSMENT OF DEVELOPMENT AGAINST SUSTAINABLE DEVELOPMENT PRINCIPLES	6
3.1 Principle 01: Greenhouse gas emissions abatement including energy efficiency initiative	6
3.2 Principle 02: Passive design for thermal comfort, ahead of reliance upon mechanical air conditioning solutions	7
3.3 Principle 03: Renewable energy generation & energy storage initiatives	8
3.4 Principle 04: Design for climate resilience	8
3.5 Principle 05: Mains potable water savings/water efficiency initiatives	9
3.6 Principle 06: Stormwater management: quality and quantity	10
3.7 Principle 07: Demolition and construction-phase resource recovery, material reuse, recycling	11
3.8 Principle 08: Operational-phase waste reduction, resource recovery, and recycling	12
3.9 Principle 09: Biodiversity protection and/or enhancement, city greening	12
3.10 Principle 10: End of trip facilities and promotion of active and public transport	13
3.11 Principle 11: Application of rating tools	13

Executive Summary

Efficient Living has been engaged by Modularium to author this Environmental Sustainability Development Report as a part of the Development Application for the proposed located at 195-197 Sydney Road, Fairlight, NSW.

The sustainability initiatives are based upon the Manly Council Local Environment Plan 2013 and Manly Development Control Plans 2013 that pertains to the overall planning of the local area.

The report will illustrate the reduction in environmental impact of the construction of the proposed development at 195-197 Sydney Road, Fairlight, NSW through 11 Sustainable Development Principles developed by the City of Sydney Council.

The report clearly demonstrates that the proposed development successfully considers and responds to these items and the intent of 11 Sustainable Development Principles, in a variety of ways and as generally listed in the following table:

Sl.No.	Sustainable Development Principles	Project Initiatives
1	Greenhouse gas emissions abatement including energy efficiency initiative	<ul style="list-style-type: none"> • BASIX Energy Score of 30 • Average 6.0 Stars NatHERS Rating • Energy efficient fluorescent/LED light fittings • Appropriate lighting lux levels • Building Monitoring and Control Systems (BMCS) • Lift systems to incorporate regenerative breaking technology • Energy star rated electrical appliances • Naturally ventilated, comfortable apartments with no active heating/cooling • Motion sensor activated lighting for corridors and carpark areas • Building Management Commissioning
2	Passive design for thermal comfort, ahead of reliance upon mechanical air conditioning solutions;	<ul style="list-style-type: none"> • Average 6.0 Stars NatHERS Rating • Adopt passive building design principles and efficient cross flow ventilation paths

3	Renewable energy generation & energy storage initiatives	<ul style="list-style-type: none"> • 10kW photovoltaic system • Salt corrosion resistant panels • Solar hot water system
4	Design for resilience	<ul style="list-style-type: none"> • Design for extreme rainfall events • Local native plants • Climate Change Adaptation Plan
5	Mains potable water savings/ water efficiency initiatives	<ul style="list-style-type: none"> • BASIX Water Score of 50 (+10 above required) • Reduce water consumption through water-efficient fixtures and fittings. • Metering and monitoring of major water use, leak detection • Appropriate low water landscape design • Substitute with an alternative water source • Reuse: fire sprinkler system will be contained within a closed loop and re-used • Greywater system
6	Stormwater management: quality and quantity	<ul style="list-style-type: none"> • On-site detention (OSD) tank strategy • Appropriate devices and filtration system • Water Sensitive Urban Design (WSUD) employed
7	Demolition and construction-phase resource recovery, material reuse, recycling	<ul style="list-style-type: none"> • Material selection based on environmental benefits, fit-for-purpose and cost-effectiveness • Waste management plan
8	Operation-phase waste reduction, resource recovery, recycling	<ul style="list-style-type: none"> • Safe practices for storage, handling and collection of waste and recycling • Prevent stormwater pollution • Waste management plan
9	Biodiversity protection and/or enhancement, city greening	<ul style="list-style-type: none"> • Landscaping • Water Sensitive Urban Design (WSUD)
10	End of trip facilities and promotion of active and public transport	<ul style="list-style-type: none"> • Bicycle parking and storage • Access to public transport • Walkable neighbourhood • Active transport and bike share program
11	Application of rating tools	<ul style="list-style-type: none"> • BASIX Water Score targeted: 45 or higher • BASIX Energy Score targeted: 30 or higher • Average NatHERS Rating of 6.0

1. INTRODUCTION

Efficient Living has been engaged by Modularium to develop an Ecologically Sustainability Development Report as a part of Development Application for the proposed multi-residential development located at 195-197 Sydney Road, Fairlight, NSW.

This report examines the sustainability design features within the development align favourably with the Manly Council Local Environment Plan 2013 and Manly Development Control Plans 2013 alongside incoherence with the 11 Sustainable Development Principles developed by the City of Sydney Council, namely:

- Greenhouse gas emissions abatement including energy efficiency initiative;
- Passive design for thermal comfort, ahead of reliance upon mechanical air conditioning solutions;
- Renewable energy generation & energy storage initiatives;
- Design for climate resilience;
- Mains potable water savings/ water efficiency initiatives;
- Stormwater management: quality and quantity;
- Demolition and construction-phase resource recovery, material re-use, recycling;
- Operation-phase waste reduction, resource recovery, recycling;
- Biodiversity protection and/or enhancement, city greening;
- End of trip facilities and promotion of active and public transport; and
- Application of rating tools.

2. DEVELOPMENT DESCRIPTION

The building development, the subject of this report, is located at 195-197 Sydney Road, Fairlight, NSW. It comprises of a whole city block, being bounded by Sydney Road and vehicular access to the site will be from Sydney Road.

The building consists of:

- Basement and Ground Level – 40 car spaces + 1 car sharing space
- Ground Level – Ground Level to Level 5 - 75 residential apartments
- Ground Level – communal space with BBQ and communal room cooking facilities that can accommodate 2-3 small groups gathering simultaneously.

The primary aim of the development is to provide a quality and affordable lodging that integrates access to transport, sense of community and optimize liveability. Significant work has been undertaken to firmly establish leading practice ESD design into the proposed development.

3. ASSESSMENT OF DEVELOPMENT AGAINST SUSTAINABLE DEVELOPMENT PRINCIPLES

3.1 Principle 01: Greenhouse gas emissions abatement including energy efficiency initiative

Aim of the principle:

To encourage the reduction of greenhouse gas emissions associated with the use of energy use in building operations by incorporating the latest efficient technologies.

Project initiatives:

The primary aim of the development is to create a vibrant residential community that integrates sustainable environmental passive design techniques to minimize operational cost.

The project is targeting the following sustainability performance:

- The project will achieve a BASIX Energy Score of 30, above the required score of 25 representing design excellence; and
- The residential component will achieve a minimum averaged NatHERS Rating of 6.0 Stars across the development. This target is above minimum BASIX heating and cooling targets and will contribute to achieving a BASIX Energy Score of 30.

Furthermore, the project will consider the following technologies to reduce energy use and greenhouse gas emissions:

- Install energy efficient fluorescent/LED light fittings;
- Appropriate lighting lux levels relative to the use of the space (Refer to AS1680 Lighting Standards);
- Building Monitoring and Control Systems (BMCS) incorporated to monitor and optimize building controls;
- It is envisaged that the energy use of the lifts will be minimised through the use of high-efficiency drives called the regenerative breaking technology;
- Naturally ventilated, comfortable apartments with no active heating/cooling to be provided
- New and replacement installed electrical appliances must be rated not less than one star below the maximum available for that appliance type of Energy Star rating scheme at the time of the installation;

- Use of motion sensor activated lighting for corridors and carpark areas to minimize energy use when not occupied; and
- An onsite Building Manager will be commissioned to undertake a formal building commissioning phase upon completion.

3.2 Principle 02: Passive design for thermal comfort, ahead of reliance upon mechanical air conditioning solutions

Aim of the principle:

To develop a building design that adopts bioclimatic design principles by taking advantage of natural heating, cooling and daylighting.

Project initiatives:

The project site is located at 195-197 Sydney Road, Fairlight, NSW with a total site area of 1789 sqm. The slope of the terrain maximises northern orientation and allow access to solar amenity. Also, the slope protects the site from southerly winds which is further sheltered by the neighbouring development to the South.

Passive building design principles have been applied to the project by orientation, massing, and the provision of a building façade that limits solar heat loads within the building. The built form of the building has a large impact on the ability of the residential component being able to achieve its targeted average 6.0 Stars NatHERS Rating.

Following are the passive design initiatives being adapted to assist in achieving sustainability ratings:

- The built form is a rectangular deep plan with both horizontal and vertical stepping to maximize natural ventilation, adequate daylight penetration and optimise view from the building;
- The communal living rooms for residential accommodation must receive a minimum of 3 hours of direct sunlight between 9 am and 3 pm in midwinter (Manly DCP 2013);
- Materials will be selected to provide high levels of thermal mass to control internal apartment temperature in winter as well as summer;
- Building fabric elements such as roof, wall and floor will contain high-efficiency insulation to ensure comfortable dwelling without the need for active heating/cooling.
- Green-roof / roof-top gardens provide increased thermal mass and shield the buildings from increased solar gains and will decrease energy consumption of the overall buildings;
- Building will be sealed appropriately as per BCA NSW Section J(A)2 to avoid air-infiltration;
- The typical unit design will consider effective cross ventilation paths and operable glazing within units;
- Providing balconies for the units which have a shading effect to adjacent units;

- Glazing will be appropriately sized and selected to minimise heat losses during winter and heat gains during summer;
- Glazing performance will be optimised to ensure the development achieves an average NatHERS Rating of 6.0 Stars across the apartments;
- Windows installed should be rated under the Window Energy Rating Scheme; and
- All apartment layouts will consider maximizing solar access and its effective control.

3.3 Principle 03: Renewable energy generation & energy storage initiatives

Aim of the principle:

To reduce emissions and manage resources through integrated local green infrastructure.

Project initiatives:

A 10kW photovoltaic system will be installed facing north ideally to provide an offset to the energy loads of communal spaces and systems such as common area lighting and ventilation.

Salt corrosion resistant panels are recommended for the area which is exposed to the sea air.

3.4 Principle 04: Design for climate resilience

Aim of the principle:

To encourage development that is adaptive and resilient to changing environment over time and natural disasters.

Project initiatives:

The project articulates design for climate resilience in a measurable, evidence-based, and accessible way that can inform design planning and practice patterns which better enable communities to survive and thrive multiple shocks and stresses.

The development will demonstrate the integration of Northern Beaches Council Planning requirement by the consultative planning process, appropriate land use and zoning and robust planning approval process.

The project will be designed for extreme rainfall events to minimise the flood risk to life and property associated with land use.

Landscaping will incorporate planting of local native plants that grow in Pittwater areas which can withstand harsh climatic condition during drought.

It will consider to document a Climate Change Adaptation Plan that addresses a summary of projects, climate change scenarios and its impact, identify potential risks and list of activities and responsibilities for all high and extreme risk identified.

3.5 Principle 05: Mains potable water savings/water efficiency initiatives

Aim of the principle:

To encourage building design that minimises potable water demand in operations.

Project initiatives:

The potable water management proposed for the development is based on Reduce, Substitute and Reuse strategy.

The project is targeting the following sustainability water performance:

- The project will achieve a BASIX Water Score of 45, above the required score of 40 representing design excellence.

Reduce:

High efficiency-rating water fixtures and appliances to be installed within units (and common areas)

- 4 Stars WELS toilets, 5 Stars WELS tapware, 4.5L to 6L/min showerheads; and
- 4.5 WELS rated dishwashers, 4.0 WELS rated clothes washers within communal spaces (none provided within units)

It is envisaged that sub-metering will be installed to enable effective water usage monitoring and leak detection.

Landscaping and associated systems will be designed to reduce the consumption of potable water required for irrigation through the installation of subsoil drip irrigation and moisture sensor controls.

Substitute:

On-site rainwater capture from a minimum of 729m² of roof space retained within a minimum 5kL central storage tank to be used for the irrigation of approximately 900m² of communal landscape, car washing bay.

Reuse:

It is envisaged that the potable water consumption by fire sprinkler system will be contained within a closed loop and re-used.

3.6 Principle 06: Stormwater management: quality and quantity

Aim of the principle:

To minimize peak stormwater outflows from the site and reduce pollutants entering the public sewer infrastructure.

Project initiatives:

For the purposes of the Manly LEP 2013 clause 6.4(3), the project will comply with 'Stormwater Control Policy'.

An on-site detention (OSD) tank strategy will be developed in accordance with Specification for on-site Stormwater Management 2003. The OSD tanks will incorporate flow control measures to ensure peak flows generated under proposed conditions do not exceed flows generated under pre-developed conditions, in accordance with Specification for on-site Stormwater Management 2003 requirements.

Water Sensitive Urban Design (WSUD) to be considered for the protection and enhancement of water quality, by improving the quality of stormwater runoff from urban catchments.

It is considered that stormwater runoff is to be treated using appropriate devices and filtration system to improve stormwater quality.

3.7 Principle 07: Demolition and construction-phase resource recovery, material reuse, recycling

Aim of the principle:

To reduce construction waste going to during construction by reusing or recycling building materials. Selecting durable, low embodied source materials from renewable and recycled sources saves cost over the lifespan of the development and reduce pressure on natural resources.

Project initiatives:

The project team will choose material based on their low embodied energy content and suitability of the proposed design which is locally sourced. The proposed design shall use low volatile organic compound (VOC) content material, Forest Stewardship Certified woods, post-industrial recycled material and reuse material of the existing development.

Demolition and construction-phase resource recovery will be in accordance with Manly DCP 2013 Clause 3.8 Waste Management Plan and Guidelines.

The Waste Management Plan will follow the requirements of the Northern Beaches Council Policy for Construction Site Management Plans and ensure:

- Waste minimization and resource recovery –
 - To avoid waste through design and ordering correct material quantities;
 - To encourage improved environmental outcomes through increased source separation of materials;
 - To meet ecologically sustainable development principles by conserving resources and energy and reducing waste from any demolition process.
- More efficient management of waste and recyclable materials;
- It is envisaged to maximize reuse and recycling of building construction materials, household generated waste and industrial commercial waste; and

3.8 Principle 08: Operational-phase waste reduction, resource recovery, and recycling

Aim of the principle:

To implement waste management plans that facilitate the re-use and minimization through the development and on-going operation.

Project initiatives:

It is considered that the Building Manager will establish a project-specific Waste Management Plans that focus on waste materials stream and reuse strategies.

The Waste Management Plan will follow the requirements of Northern Beaches Council Policy for waste management and will be intended to reach the following outcomes:

- Access – to ensure waste systems are easy to use and that collection vehicles are able to access buildings to remove waste safely and easily;
- Separation – to ensure separation of waste streams by providing separate bins or containers for general waste, paper and cardboard, glass and plastic;
- Safety – to ensure safe practices for storage, handling and collection of waste and recycling; and
- Pollution prevention – to prevent stormwater pollution that may occur as a result of poor waste storage and management practices.

3.9 Principle 09: Biodiversity protection and/or enhancement, city greening

Aim of the principle:

To restore and protect ecological processes, adding landscape values, shade, sense of place, and communal spaces.

Project initiatives:

The project aims to connect landscape and architecture to the site and allow a biophilic connection between the resident and nature.

It is envisaged that the communal space will incorporate robust landscaping, project-specific furniture and fixtures and lighting to suit the space function and ambience.

Native plants will be selected for vegetation to ensure low water consumption required for irrigation.

Water Sensitive Urban Design (WSUD) will be considered to minimize potable water consumption through water-efficient fixture and fittings and the use of appropriate alternative water source for irrigation, toilet flushing, car-washing and laundry.

3.10 Principle 10: End of trip facilities and promotion of active and public transport

Aim of the principle:

To connect communities, services, transport modes and green spaces to reduce car dependency and promote health.

Project initiatives:

The site is located on a key transport link with bus stops available with transport both city bound and towards manly beach less than 100m away. The area will be served by several bus routes, all reducing the need for private car use. The routes include Route 143 and Route 144.

The project will incorporate bicycle parking and storage facilities to encourage the use of alternative transportation modes.

The project is conveniently located to amenities such as Fairlight shopping village, North harbour reserve, Manly Boatshed, Fairlight beach and Manly Pavilion which allows the site to be a walkable neighbourhood.

The proposal provides a single car share space which will be located on-street. Car-share services such as GoGet can be available for every residents, visitors and the general public.

Active transport guide and bike-share programs will be implemented to inform residents with safety, storage and cycle ways in close proximity.

3.11 Principle 11: Application of rating tools

Aim of the principle:

To agree on a formal registration or commitment to sustainable development by engaging ESD consultants on the early stage of the project which can avoid conflict and help communication with Council and Community.

Project initiatives:

The project is targeting the following sustainability performance:

- BASIX Water Score targeted: 50 or higher; (+10 above required)
- BASIX Energy Score targeted: 30 or higher; (+5 above required)
- The residential component will achieve a minimum averaged NatHERS Rating of 6.0 Stars across the development; and
- Plans at DA stage 2 will physically show/state BASIX commitments