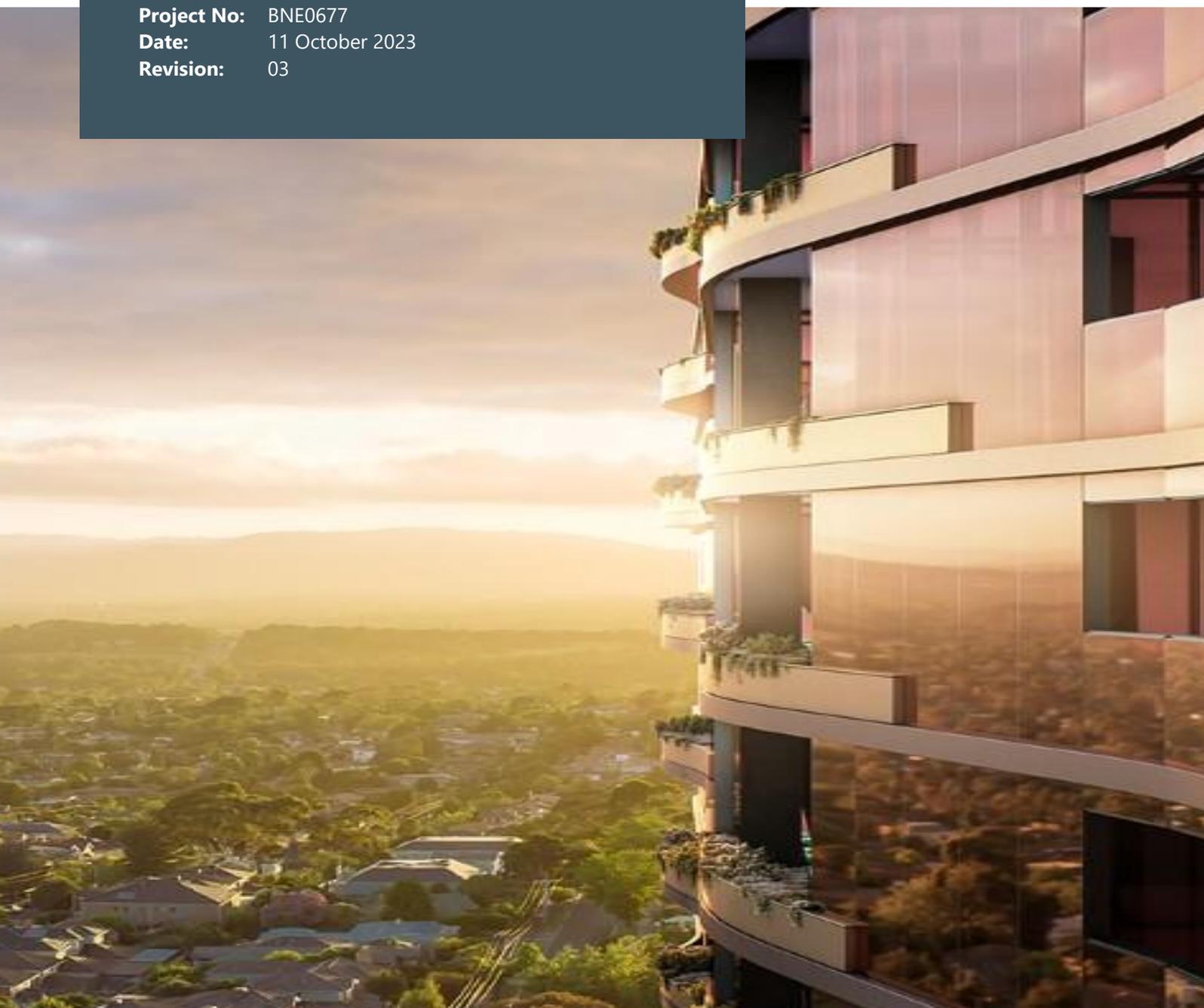


# 29 Shirley St, Byron Bay

## BASIX Assessment Report

Prepared for: Vitale Developments

**Project No:** BNE0677  
**Date:** 11 October 2023  
**Revision:** 03



**Project:** 29 Shirley St, Byron Bay  
**Location:** 29 Shirley Street  
 Byron Bay, NSW, 2481  
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**Project No:** BNE0677  
**Revision:** 03  
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Rev	Date	Comment	Author	Technical Review	Authorisation
01	23/08/2022	DA Issue	JK	HAS	MB
02	06/10/2023	DA Issue	JK	CT	PB
03	11/10/2023	Minor Update for DA Issue	JK	CT	PB

### Project Team

**Client / Principal** Vitale Developments  
**Architect** Hayball Architects  
**Project Manager** URBIS  
**ESD Consultant** ADP Consulting  
**Building Services Consultant** ADP Consulting



# Contents

<b>Executive Summary</b> .....	<b>3</b>
<b>1. Introduction</b> .....	<b>4</b>
1.1 Project Context.....	4
1.2 Assessment Assumptions and References .....	4
1.3 BASIX Assessment.....	5
<b>2. BASIX Compliance</b> .....	<b>6</b>
2.1 Water Strategies .....	6
2.2 Energy Strategies.....	7
<b>3. Thermal Comfort</b> .....	<b>9</b>
3.1 National House Energy Rating Scheme (NatHERS) Assessment .....	9
3.2 Thermal Comfort Compliance .....	10

## Appendices

Appendix A	12
NatHERS Group Certificate .....	12
Appendix B	13
Certified Stamped Drawings .....	13
Appendix C	14
BASIX Certificate .....	14
(Note: All appendices and certificates will be provided as part of the final BASIX report and submission).	

# Executive Summary

ADP Consulting has been engaged to undertake the following BASIX assessment and certification for the new development to be located at 29 Shirley Street, Byron Bay, NSW 2481.

The proposed development comprises of the following:

- > Two residential buildings (25 residential units – Class 2)
- > One basement level of residential parking
- > Ground level including pool and common amenities

This BASIX report has been prepared to support the DA submission as a legislative requirement in accordance with the Environmental Planning and Assessment Act (2000) and BASIX (2004).

Based on project specific inputs and the minimum legislative provisions outlined in this report, the proposed development meets the minimum BASIX requirements for energy, water, and thermal comfort respectively.

Table 1 BASIX Target and Achieved Scores

<b>BASIX</b>	<b>Target</b>	<b>Score Achieved</b>
Water	40%	<b>43%</b>
Energy	40%	<b>43%</b>
Thermal Comfort	Pass	<b>Pass</b>

# 1. Introduction

ADP Consulting has been engaged by Vitale Developments to undertake the following BASIX assessment and certification for the proposed residential development located at 29 Shirley Street, Byron Bay, NSW.

The purpose of this report is to provide a summary of the Environmentally Sustainable Design (ESD) initiatives adopted as part of the proposed building design. Key areas of improvement within the BASIX indices of water, energy and thermal comfort have been identified and meet the minimum compliance measures outlined by the state of NSW.

This report has been prepared as a contribution to the Development Application (DA) submission of the above noted project.

## 1.1 Project Context

The project site is located in Byron Bay surrounded by already existing residential buildings. It is located within walking distance of centres and transitioning from low density residential to the south of Shirley Street to a larger format on the beach side.

Proposed Development Site Context



The development contains carparking facilities for residents, communal landscaped common areas and 25 residential dwellings (Class 2).

## 1.2 Assessment Assumptions and References

This BASIX assessment has been based on the following DA architectural drawings and updates provided periodically by Hayball Architects on the following dates:

- > Development Approval Issue Architectural set - 26/09/2023

### 1.3 BASIX Assessment

The Building Sustainably Index (BASIX) for the state of NSW forms the minimum compliance control for any new residential (Class 1 & 2) developments as defined by the Department of Planning Industry and Environment.

The BASIX assessment outlines a minimum target of improvement for the proposed development's water, energy, and thermal comfort performance. The minimum benchmark of improvement for each index is based on the location, size, height, and dwelling density of project development.

The proposed residential development has been assessed as 2 residential flat buildings, consisting of 25 individual (class 2) dwellings in total. For this type of development, the following minimum BASIX targets must be achieved as defined by the State of NSW:

- > 40% improvement in Water consumption
- > 40% Improvement in Energy consumption
- > All units to 'pass' the minimum thermal performance requirements for heating and cooling (as defined by the development's climate zone)

The minimum targets required for water and energy represent a percentage saving and improvement for the development when compared to that of an average benchmark development for NSW.

The thermal comfort targets are assessed on an individual dwelling basis and are defined by the developments proposed location in NSW. Each dwelling must not exceed the maximum annual predicted heating and cooling load capacities outlined by BASIX; this is assessed using the NatHERS thermal comfort software First Rate 5. For the proposed development, the following individual dwelling targets must be achieved:

- > Maximum dwelling heating load for Class 2                      19.3 MJ/m<sup>2</sup>
- > Maximum dwelling cooling load for Class 2                      44.4 MJ/m<sup>2</sup>
- > Average dwelling heating load for Class 2                      17.5 MJ/m<sup>2</sup>
- > Average dwelling cooling load for Class 2                      40.3 MJ/m<sup>2</sup>

## 2. BASIX Compliance

The following section provides a summary of the water, energy and thermal comfort initiatives proposed for development to meet compliance with the minimum BASIX requirements.

### 2.1 Water Strategies

The following table outlines the water strategy proposed for the development. The project is currently achieving a **43% improvement** on the BASIX average benchmark. The target is based on a minimum 40% compliance score.

This will be achieved providing the following water commitments are implemented:

Table 2 Water Commitments

<b>BASIX Base Case</b>	<b>Water Conservation Strategies</b>
Individual Dwellings	Fixtures and fittings to be included: <ul style="list-style-type: none"> <li>&gt; 4-star showerheads (6 – 7.5 L/min)</li> <li>&gt; 4-star kitchen and bathroom taps</li> <li>&gt; 5-star flush toilets</li> </ul>
Appliances <sup>1</sup> (For Individual Dwellings)	<ul style="list-style-type: none"> <li>&gt; Dishwasher: 4-star WELS rated</li> <li>&gt; Clothes Washer: 4-star WELS rated</li> </ul>
Pool and Spa:	Approx. upper limit of 156.63kL communal pool, located on the ground floor Individual pools for all units in ground floor Approx. upper limit of 11.03kL Spa, located on the ground floor
Alternative Water Use	5kL onsite rainwater tank connected to common landscape areas for irrigation
BASIX Water Target	40%
<b>BASIX Water Score</b>	<b>43%</b>

<sup>1</sup> More information on water efficient appliances can be found at [www.waterrating.gov.au](http://www.waterrating.gov.au)

## 2.2 Energy Strategies

The following table outlines the energy strategy proposed for the development. The project is currently achieving a **43% improvement** on the BASIX average benchmark. The target is based on a minimum 40% compliance score.

This will be achieved providing the following energy commitments are implemented:

Table 3 Energy Commitments

BASIX Base Case	Energy Conservation Strategies
Individual Dwellings (For all dwellings)	<ul style="list-style-type: none"> <li>&gt; Dedicated LED light fittings located throughout each dwelling<sup>2</sup> (All downlights to be sealed)</li> <li>&gt; All kitchen exhausts to have individual fans ducted to the façade or roof with the following efficiency measures:               <ul style="list-style-type: none"> <li>– manual on/off switch</li> </ul> </li> <li>&gt; All bathroom and laundry exhausts to have individual fans ducted to the façade or roof with the following efficiency measures:               <ul style="list-style-type: none"> <li>– Interlocked to light</li> </ul> </li> <li>&gt; Individual air conditioning systems to living and bedroom areas               <ul style="list-style-type: none"> <li>– 1-phase system with EER 3.0 - 3.5 (cooling and heating)</li> </ul> </li> <li>&gt; Hot water system:               <ul style="list-style-type: none"> <li>– Electric instantaneous</li> </ul> </li> </ul>
Appliances	Efficient appliances <sup>3</sup> for each apartment as follows: <ul style="list-style-type: none"> <li>&gt; Electric cooktop and electric oven</li> <li>&gt; 4-star Refrigerators</li> <li>&gt; 4-star Dishwashers</li> <li>&gt; 4-star Clothes Washer</li> <li>&gt; 5-star Clothes Dryer</li> </ul>
Common Areas	<b>Ventilation systems and efficiency measures as follows:</b> <ul style="list-style-type: none"> <li>&gt; Car parks requiring ventilation supply and exhaust with CO monitors and VSD fans</li> <li>&gt; Bike store requiring ventilation supply and exhaust – time clock controlled</li> <li>&gt; Bin rooms, air conditioning system</li> <li>&gt; Plant or service rooms, ventilation exhaust – thermostatically controlled</li> </ul>

<sup>2</sup> Dedicated LED must be the predominate (i.e., 80% of fittings) light fitting in each room

<sup>3</sup> More information on energy efficient appliances can be found at [www.energyrating.gov.au](http://www.energyrating.gov.au)

<b>BASIX Base Case</b>	<b>Energy Conservation Strategies</b>	
Common Areas	<ul style="list-style-type: none"> <li>&gt; Switch Room + Comms room, air conditioning system – thermostatically controlled</li> <li>&gt; Stairs, no mechanical ventilation</li> <li>&gt; Basement Lobby / Communal Facilities, air conditioning system – time clock controlled</li> </ul> <p><b>Lighting systems and efficiency measures as follows:</b></p> <ul style="list-style-type: none"> <li>&gt; Car park area - LEDs – motion sensors</li> <li>&gt; Bike store – LEDs – motion sensors</li> <li>&gt; Waste rooms – LEDs - motion sensors</li> <li>&gt; Plant or service rooms – LEDs with manual ON/OFF switch</li> <li>&gt; MSSB and Comms room – LEDs with manual ON/OFF switch</li> <li>&gt; Stairs – LEDs with motion sensors</li> <li>&gt; Lift Cars – LEDs – Connected to lift call button</li> <li>&gt; Basement Lobby / Communal Facilities – LEDs with manual ON/OFF switch</li> </ul>	
	Central Systems	<ul style="list-style-type: none"> <li>&gt; Vertical Transport               <ul style="list-style-type: none"> <li>– Gearless traction lifts with VVVF motor and regenerative drive</li> </ul> </li> </ul>
	Swimming Pool	<ul style="list-style-type: none"> <li>&gt; Heating system               <ul style="list-style-type: none"> <li>– Electric heat pump, controlled by timer</li> </ul> </li> </ul>
	Spa	<ul style="list-style-type: none"> <li>&gt; Heating system               <ul style="list-style-type: none"> <li>– Electric heat pump, controlled by timer</li> </ul> </li> </ul>
	Building Integrated Photovoltaic System (BIPV)	<ul style="list-style-type: none"> <li>&gt; 95 kW peak array</li> </ul>
	Building Management System	<ul style="list-style-type: none"> <li>&gt; BMS is not included in the current strategy</li> </ul>
	<b>Basix Energy Target</b>	<b>40%</b>
	<b>Energy Score</b>	<b>43%</b>

# 3. Thermal Comfort

## 3.1 National House Energy Rating Scheme (NatHERS) Assessment

Thermal Comfort for each dwelling has been assessed out in accordance with the BASIX Thermal Comfort Protocol as defined by the Department of Planning Industry and Environment.

Thermal comfort levels for all proposed dwellings (Class 2) have been assessed using the HERO (thermal modelling software). This approach has been approved by the National House Energy Rating Scheme (NatHERS) and aims to predict annual heating and cooling loads of each dwelling.

To satisfy the BASIX thermal comfort requirements, the following objectives must be achieved:

- > The individual heating and cooling loads for each dwelling must not exceed the limit specified in the BASIX scheme
- > The average heating and cooling loads of all dwellings in a development must not exceed the specified average limit

These requirements have been provided below:

Table 4 Thermal Comfort Targets

Targets	Max. Heating Load (MJ/m <sup>2</sup> )	Max. Cooling Load (MJ/m <sup>2</sup> )
Individual Dwelling Loads (Class 2)	19.3	44.4
Average Dwelling Loads (Class 2)	17.5	40.3

- > The following building fabric and glazing assumptions provide 7.4-star NatHERS star rating (average) along with compliance with the maximum heating and cooling load under BASIX Thermal Comfort protocol when the units are modelled in HERO (3.1.0.6).

## 3.2 Thermal Comfort Compliance

Thermal Comfort modelling has been undertaken to establish compliance with the minimum requirements noted in section 3.1.

The table below outlines the building envelope constructions assumed as part of the modelling assessment and provides the average heating and cooling loads achieved for proposed development.

Table 5 Construction Details

Building Element	Material & Detail
Exposed Floor	> Floor between units in ground floor and basement (Car Park): Suspended concrete floor, <b>R2.0 insulation required.</b>
	> Exposed floor for Unit 201, <b>R2.0 insulation required</b>
Internal Floor (Between Levels)	> Concrete floor, <b>no insulation required.</b>
Floor Coverings	> Carpet in Bedrooms and WIR
	> Tiles in wet areas
	> Timber in Kitchen/Living
Ceiling (between apartments)	> Plasterboard ceiling, <b>no insulation required.</b>
Exposed Roof/Ceiling	> Exposed concrete roof with plasterboard ceiling, <b>R3.0 insulation required in ceiling.</b>
External Walls	> Brick Walls, <b>R2.5 Insulation required.</b>
Party Walls	> Between units: Concrete Walls or Lightweight Walls, <b>min R2.0 insulation required.</b>
Internal Partition Walls (within units)	> Lightweight internal walls, <b>no insulation required.</b>
Internal Walls (between internal corridor and unit; between unit and Lift/Stairs)	> Concrete walls: <b>R2.0 insulation required</b>
Glazing	Whole of window values (glazing and frame):
	> Fixed and sliding windows/doors: total U-value $\leq 3.2$ and SHGCw = 0.35 ( $\pm 10\%$ )
	> Awning windows: total U-value $\leq 3.21$ and SHGCw = 0.35 ( $\pm 10\%$ )
	> Skylights: total U-value $\leq 2.53$ and SHGCw = 0.21 ( $\pm 10\%$ )
Operable Windows / Doors	> Bi-fold/Concertina, Casement, Fixed and Awning windows/doors as per window schedule.
Ceiling Fans	> 1 x 1200mm ceiling fan in each Bedroom.
	> 1 x 1200mm ceiling fans in every Kitchen/Living

Building Element	Material & Detail
Entry Doors	> Sealed and weather-stripped
Exhaust Fans	> 1 x Sealed and weather-stripped exhaust fan in each Ensuite, Bathroom, Laundry and Kitchen
Recessed downlights	> Sealed (as per NatHERS default numbers)
Roof Colour	> Medium, Solar absorbance $\leq 0.5$
External Walls Colour	> Medium, Solar absorbance $\leq 0.4$
Overshadowing	> As per drawings and site plan.
<b>BASIX Target</b>	> Average Thermal Load: Heating <b>17.5 MJ/m<sup>2</sup></b> Cooling <b>40.3 MJ/m<sup>2</sup></b>
<b>Calculated Thermal Comfort Score</b>	> Average Thermal Load: Heating <b>4.3 MJ/m<sup>2</sup></b> Cooling <b>26.8 MJ/m<sup>2</sup></b>

Please note: glazing values quoted above are based on AFRC figures and are values for the total glazing system including frame.

For all apartments, the following assumptions have been made:

- > All windows and doors are weather stripped
- > Window openings have been calculated as per the BASIX protocol based on input from the architectural team for fixed windows, awnings windows and sliding doors. (Please refer last 3 pages of stamped drawings to see the exact window type requirements)

# **Appendix A**

## **NatHERS Group Certificate**



# **Appendix B**

# **Certified Stamped Drawings**



# **Appendix C**

## **BASIX Certificate**

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