Sustainable Design Assessment (SDA)

63 Barber Drive

Hoppers Crossing 3029

December 5 2019

REVISED 29 April 2021

REVISED 24 June 2021

Table of Contents

Project Information

Municipality:	**Wyndham**
Project Name:	Proposed Unit Development
Project Address:	63 Barber Drive Hoppers Crossing
Zoning:	GRZ General Residential Zone
Applicant:	CES Design
Assessment by:	Laurie Joesika
Total Site Area:	**862m²**
Building Floor Area:	**488m²**
Number of Res. Dwellings:	**3**

Environmentally Sustainable Design Initiatives

The proposed unit development at 63 Barber Drive Hoppers Crossing has been designed to provide maximum thermal comfort with reduced energy requirements for its occupants. The orientation allows for living areas and bedrooms to be located to face north for Unit 2 and 3 with north solar access restricted by garage placement for Unit 1. This is compensated for by the use of double glazed windows. Thermal mass is achieved with concrete slab construction and brick veneer, with light weight, well insulated cladding to the first floor providing for excellent thermal insulation. Landscaping provides shade while encouraging biodiversity through the use of native plants, reducing water requirements. Water tanks have been provided to each unit to assist with the treatment of storm water and a raingarden assists with storm water run-off from the driveway. Each unit has been provided with solar hot water systems. The average NATHERS rating for the 3 dwellings is 6.1 stars.

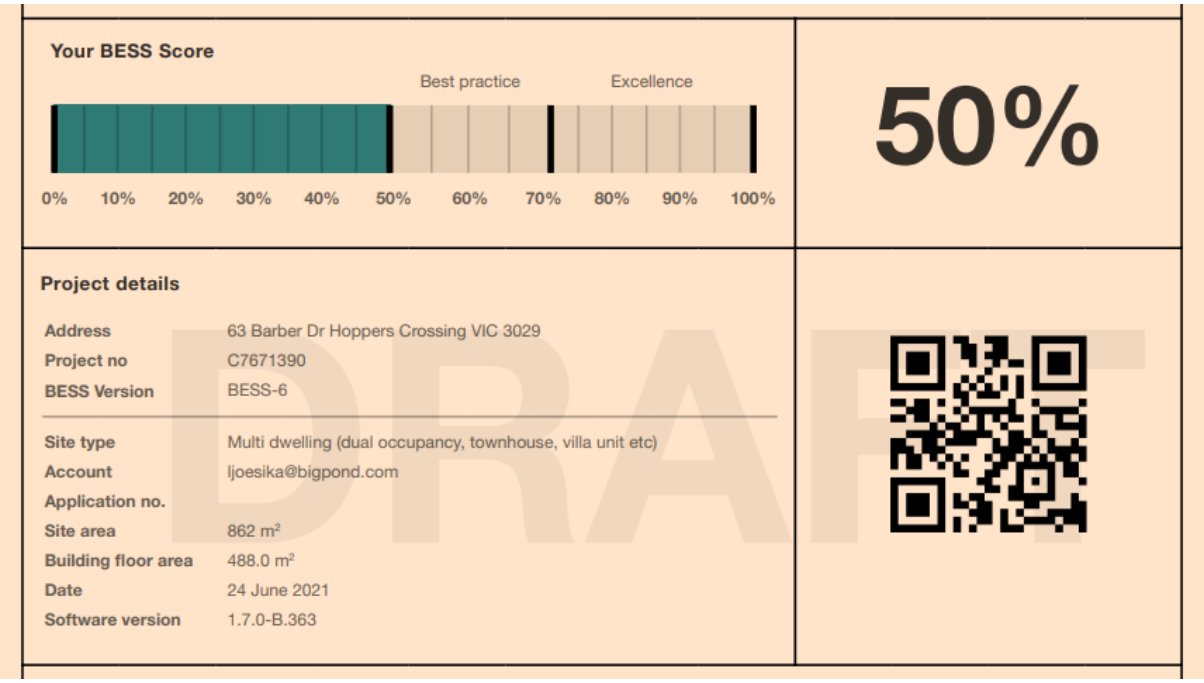
Built Environment Sustainability Scorecard (BESS)

The development has been assessed using the BESS assessment tool (www.bess.net.au). **50%**

A summary of the results is shown in the table below. For the full BESS Report please refer to Appendix

% of Total	Category	Score	Pass
5%	**Management**	40%	N

9%	Water	50%	Y
28%	Energy	50%	Y
14%	Stormwater	100%	Y
17%	IEQ	60%	Y
9%	Transport	0%	N
6%	Waste	50%	Y
6%	Urban Ecology	75%	Y
9%	Innovation	0%	N



1.0 Indoor Environment Quality

Objectives:

- To achieve a healthy indoor environment quality for the wellbeing of building occupants, including the provision of fresh air intake, cross ventilation, and natural daylight.
- To achieve thermal comfort levels with minimised need for mechanical heating, ventilation and cooling.
- To reduce indoor air pollutants by encouraging use of materials with low toxic chemicals.
- To reduce reliance on mechanical heating, ventilation, cooling and lighting systems.

- To minimise noise levels and noise transfer within and between buildings and associated external areas.

Considerations:

- Access to daylight

The bedroom areas all exceed to BCA minimum of 10%, most rooms achieve under 25% of floor area with many achieving under 20% for maximum energy efficiency. The additional windows allow for access to two directions increasing cross flow ventilation. See table below for details

- Access to natural ventilation

All habitable rooms well exceed the minimum 5% ventilation requirements of the BCA. See table below for details

Unit 1

Room Name	Floor Area(m²)	Window Area (m²)	% of floor area light	% of floor area ventilation
Bed 2(1)	10.8	4.02	37.7%	39%
Bed 2 (2)	13.7	2.55	18.6%	5.6%
Living	25.1	12.24	48%	31%
Kitchen	17.4	2.34	13%	8%

Unit 2

Room Name	Floor Area(m²)	Window Area (m²)	% of floor area light	% of floor area ventilation
Bed 1	11.3	3.36	26.3%	19.4%
Bed 2	11.9	2.64	22.2%	13%
Bed 3	14.3	2.55	17.8%	10.7%
Kit	18.6	3.9	21.2%	10.4%
Living	42.7	9.77	22.8%	11.1%

Unit 3

Room Name	Floor Area(m²)	Window Area (m²)	% of floor area light	% of floor area ventilation
Bed 1	11.7	3.36	28.7%	17.1 %
Bed 2	10.6	2.64	24.9%	14.9 %
Bed 3	16.1	2.64	16.4%	9.8%
Kit	16.6	3.93	23.7%	14.2%
Living	41.3	13.24	32%	16%

- External views

The proposed units have been designed to maximise views of the private open space with living areas provided with direct access to the rear private open spaces. First floor windows

restrict views to neighbouring private open space through obscure glazing and restricted openings.

- Reduction in volatile organic compounds

It is intended that the fitout of the proposed new unit, be carried out using elements of low Volatile Organic Compounds (VOC's) including joinery, paint, carpet, coatings, sealants, pressed wood products etc.

2.0 Energy Efficiency

Objectives:

- To improve the efficient use of energy, by ensuring development demonstrates design potential for ESD initiatives at the planning stage.
- To reduce total operating greenhouse gas emissions.
- To reduce energy peak demand through particular design measures (eg. appropriate building orientation, shading to glazed surfaces, optimise glazing to exposed surfaces, space allocation for solar panels and external heating and cooling systems).

Considerations:

- Energy rating of building fabric in excess of minimum BCA requirements

Preliminary ratings have been conducted on the proposed units and resulted in an average rating of 6.1 stars which satisfies the required 6.0 star rating

- External shading devices to north, east and west facing glazing

Shading has been provided to the east and west through the inclusion of shading devices

- Heating system types and associated energy-efficiency rating/benchmark

At least 6 star rated units to be proposed

- Cooling system types and associated energy-efficiency rating/benchmark

At least 4 star rated units to be proposed

- Hot water system type and associated energy-efficiency rating/benchmark

Units are provided with solar hot water systems

- Location of fixed clothes drying lines/ racks

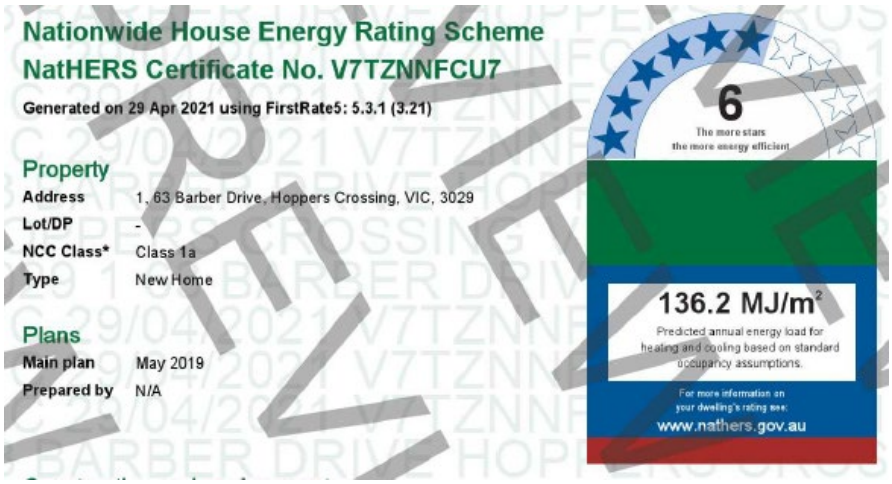
Fixed clothes lines have been provided for both units, located to receive full sun exposure

- Lighting strategy

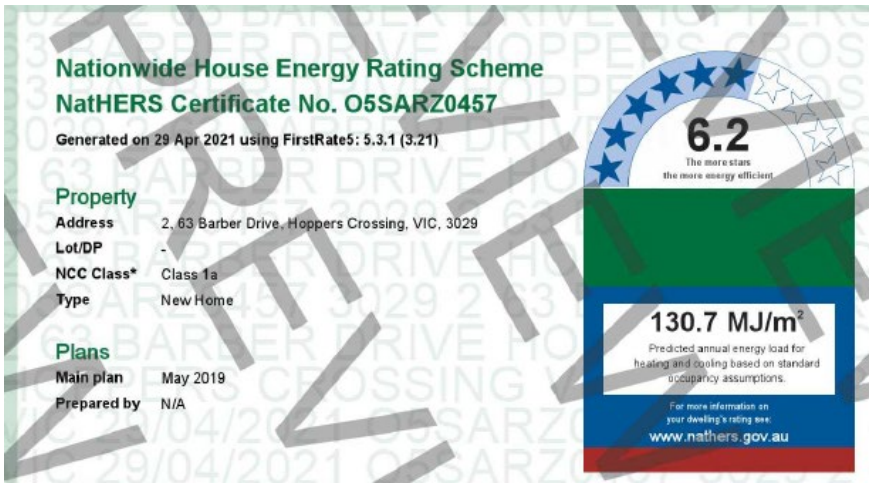
The main living and bedroom areas will be provided with LED downlights (installed with thermal covers to allow insulation to run continuous) or batten fittings. The average w/m² for the dwelling will be under 4

- Location and size of renewable energy systems including photovoltaic (PV) solar power, solar hot water, wind turbines, geo-thermal etc.

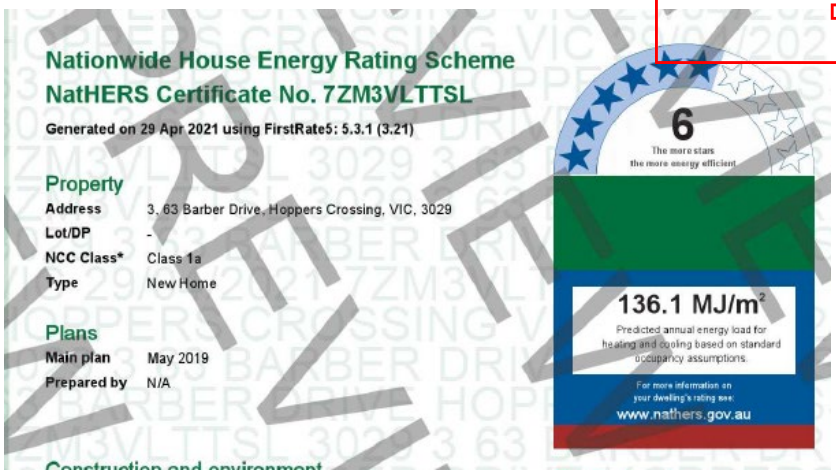
Solar hot water units are located to face north providing optimum solar access. Each unit is provided with a 1100L Rainwater tank



UNIT 1 FIRSTRATE5 CERTIFICATE



UNIT 2 FIRSTRATE5 CERTIFICATE



Nationwide House Energy Rating Scheme
NatHERS Certificate No. 7ZM3VLTTSL
Generated on 29 Apr 2021 using FirstRate5: 5.3.1 (3.21)

Property
Address 3, 63 Barber Drive, Hoppers Crossing, VIC, 3029
Lot/DP -
NCC Class* Class 1a
Type New Home

Plans
Main plan May 2019
Prepared by N/A

6
The more stars the more energy efficient

136.1 MJ/m²
Predicted annual energy load for heating and cooling based on standard occupancy assumptions.

For more information on your dwelling's rating see:
www.nathers.gov.au

UNIT 3 FIRSTRATE5 CERTIFICATE

3.0 Water Resources

Objectives:

- To improve water efficiency.
- To reduce total operating potable water use.
- To encourage the collection and reuse of stormwater.
- To encourage the appropriate use of alternative water sources (eg. greywater).

Considerations:

- Water-efficiency rating of new showerheads

Provide minimum 4 Star WELS rating more than 6.0L/min. but not more than 7.5L/min.

- Water-efficiency rating of new tapware

Provide minimum 5 Star WELS rating

- Water efficiency rating of new toilet cisterns

Provide minimum 4 Star WELS rating

- Size, capacity and location of rainwater tanks

Rain water tanks with a capacity of 1100l are located in the rear private open space.

Provisions for a more water efficient landscaping

The landscaping nominates water efficient landscaping

- Size and general location of greywater treatment/storage systems

No greywater treatment is included in this development

4.0 Stormwater

Objectives:

- To reduce the impact of stormwater run-off.
- To improve the water quality of stormwater run-off.
- To achieve best practice stormwater quality outcomes.
- To incorporate the use of water sensitive urban design, including stormwater re-use.

Considerations:

- Total site area

The total site area of the development is 862m² the site is relatively flat

- Total number and area of impervious surfaces and their related treatments prior to off-site release

The impervious surfaces of the site are:
Dwellings: 303.2m² provided with 3200L water tanks
Hard surfaces:196m² bordered by a raingarden min 3m² to collect stormwater run off

- Total number and area of pervious surfaces (detention through on-site filtration)

301m² - detention of stormwater through on-site filtration

- Provide additional STORM calculations (www.storm.melbournewater.com.au/)

Rating of 100% achieved

Melbourne Water **STORM Rating Report**

TransactionID:	1117794
Municipality:	WYNDHAM (South West of Skeleton Creek)
Rainfall Station:	WYNDHAM (South West of Skeleton Creek)
Address:	63 Barber Drive
	Hoppers Crossing
	VIC 3029
Assessor:	Kris Kencevski
Development Type:	Residential - Multiunit
Allotment Site (m2):	862.00
STORM Rating %:	100

Description	Impervious Area (m2)	Treatment Type	Treatment Area/Volume (m2 or L)	Occupants / Number Of Bedrooms	Treatment %	Tank Water Supply Reliability (%)
Roof Area	373.00	Rainwater Tank	3,200.00	8	85.40	76.20
Driveway	216.00	Raingarden 100mm	3.00	0	125.10	0.00

5.0 Building Materials

Objectives:

- To reduce the embodied energy and CO2 impact of materials.
- To maximise the responsible sourcing materials.
- To maximise the use of recycled material.
- To maximise the reuse of materials.
- To reduce the use of material that contains high levels of VOC (or other toxic elements).

Considerations:

- Storage for Recycling Waste

Refer to site plan for locations of general waste and recycling bins and compost bins

- Reuse of Materials and other Recycled Materials

The existing dwelling will not be recycled

- Embodied Energy

The proposed new units will be constructed mainly from brick veneer with timber frame and weatherboard cladding, all of which are low embodied energy materials. Concrete used for the slab and landscaping should include recycled content such as cement extender including fly ash or blast furnace slag. Incorporate recycled aggregate wherever possible. The sourcing of local products will reduce transport requirements.

- Sustainable Timber

Timber should be certified through either Forest Stewardship Council (FSC) or Australian Forest Certification Scheme (AFCS)

- Design for Disassembly

The majority of materials selected for use in construction of the proposed unit will be able to be recycled at the end of the buildings life-span. Materials such as brick and timber are readily recyclable, and fixtures and fittings can be re-used and recycled.

- Environmental toxicity

Materials that are toxic are to be avoided in the construction and demolition process

6.0 Transport

Objectives:

- To ensure that the built environment is designed to promote the use of walking, cycling and public transport, in that order.
- To minimise car dependency.
- To promote the use of low emissions vehicle technologies and supporting infrastructure.

Considerations:

- Provide convenient and secure bike storage facilities for building users and guests

Bike storage and access is provided through side gates or garages leading to service areas for secure bike storage. A shed is provided in each private open space which provides weatherproof storage.

- Provide end of trip change facilities for bike users

Bike users can easily access the dwelling and bathroom facilities through the rear or garage doors located off the side access ways.

- Access to public transport

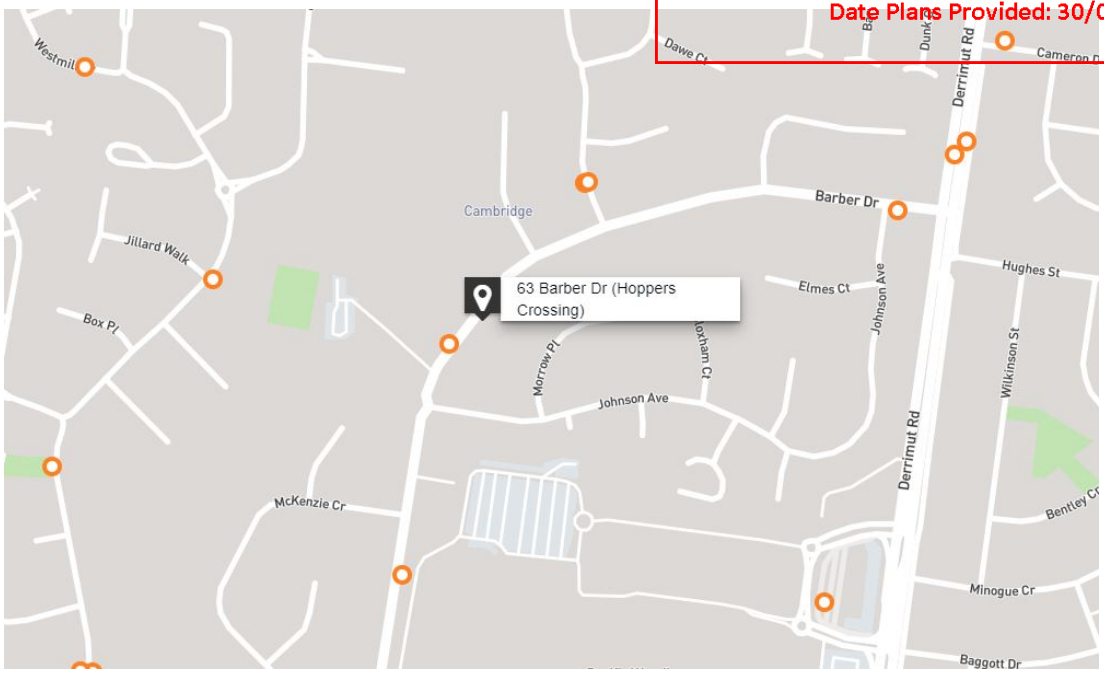
The site is located 41m from the closest bus stop in Barber Drive which in turn connects to the local train station

- Access to car share services

No car share services are available

- Reduction in extent of onsite car parking

On-site parking is provided and no reduction is necessary.



Public transport map showing bus stops

7.0 Waste Management

Objectives:

- To promote waste avoidance, reuse and recycling during the design, construction and operation stages of development.
- To ensure durability and long term reusability of building materials.
- To ensure sufficient space is allocated for future change in waste management needs, including (where possible) composting and green waste facilities.

Considerations:

- Allocated space(s) for general waste, recycling and green waste

Refer to site plan for locations of general, and recycling bin locations. Compost waste is provided for each unit

- Operation Waste Management Plan

Dedicated storage areas are provided for the collection and storage of waste which are easily accessible to the occupants and street front. Operational waste will be managed by separating recycled waste from general waste to be disposed of in the council provided bins, and using the provided compost bins to dispose of food scraps and compostable items.

- Construction Waste Management Plan

Construction waste is to be managed through ensuring allowance for sufficient space at construction stage to accommodate new materials, waste and recycling streams. Skips are to be clearly labelled and protected from contamination, wind and rain. Regular pick up are to be arranged to avoid overloading or false use. Suppliers should be asked to collect and recycle packaging. Sub-contractors should be made fully aware of the sites waste management practices. An aim of 70% of all demolition and construction waste should be achieved

8.0 Urban Ecology

Objectives:

- To protect and enhance biodiversity within the municipality.
- To provide environmentally sustainable landscapes and natural habitats, minimising the urban heat island effect.
- To encourage the retention of significant trees.
- To encourage the planting of indigenous vegetation.
- To encourage the provision of space for productive gardens, particularly in larger residential developments.

Considerations:

- Landscaped areas to be designated

The proposed landscaping includes a variety of native and exotic low water use plants adding to the biodiversity of the site and attracting native wildlife to the site, while providing landscaped sanctuary for occupants. Impermeable surfaces are limited to aid in the management of stormwater.

- Retention and inclusion of native vegetation

There is no native vegetation existing at the site. The new proposal will include the addition of new native vegetation

9.0 Innovation and ESD Excellence

Objectives:

- To encourage innovative technology, design and processes in all development, so as to positively influence the sustainability of buildings.

Considerations:

- Significant enhancement of best practice ESD standards

The proposed development has been designed to meet best practice standards which remaining a cost effective build

- Unique sustainable design element or new technology implemented to enhance ESD outcomes

No new or unique elements have been implemented

- Excellent passive design approach

Passive design is implemented through the placement of the living areas to the north where available and limiting the exposure to the east/west, and by using shading to provide summer protection to glazing. Thermal mass is provided through the use of a concrete slab and brick veneer walls

- Responding to local climate conditions

The design responds to local climate conditions by providing double glazed windows to Unit 1 to enable maximum retention of heat in the winter and access to cross flow ventilation through the main living areas for cooling breezes in the summer months.

10.0 Construction and Building Management

Objectives:

- Best practice for building management means that sustainability is integrated from concept design through the construction process. Good decisions made early will always deliver the maximum benefit for the lowest cost.
- Best practice building management also means giving future occupants the information they need to be able to run their buildings in the most efficient way.

Considerations:

- Tuning of building systems

As this is a small development of 3 townhouse units, building systems are designed to need limited tuning. The passive design approach will maintain the operation of the building at comfortable levels through the use of opening and shutting windows

- Building User's Guide that explains a building's ESD principles

It is not anticipated that a Building Users guide is required for this development

- Operation Environmental Management Plan

It is not anticipated that an Environmental Management plan is required for this development

- Environmental credentials of project team

Project team credentials is currently unknown.

Supporting Documents

Assessment Tools:

Built Environment Sustainability Scorecard (BESS) assessment – www.bess.net.au

Energy Efficiency:

Nationwide House Energy Rating Scheme (NatHERS) assessment - www.nathers.gov.au

Stormwater:

Storm Calculator Report – www.storm.melbournewater.com.au

Drawings:

Town planning drawings A00-A130 CES Design

APPENDIX