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Date Plans Provided: 27/07/2021



Job Details

Date: 17th May 2021
Project: Sustainable Design Assessment for 3-Unit Development
Client: Nigel Oldman
Address: 119 Powell Drive, Hoppers Crossing VIC 3029
Planning No: TBC
Assessor: Rob Iacono
Job No: 200606

Revision

A:	29 th July 2020	Preliminary SDA Report
B:	4 th September 2020	SDA Report
C:	17 th May 2021	Amended SDA Report

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Introduction

The Subject site is located at 119 Powell Drive, Hoppers Crossing. The plans prepared by Higgs and Design Group (Job No: 200606) proposes 2 double storey units and 1 single storey unit. The site has a total area of 921.32m² and is orientated north to south and has minimal wall on boundary construction. The driveways are proposed to the north of the development.

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The following report is to be read in conjunction with the following documents.

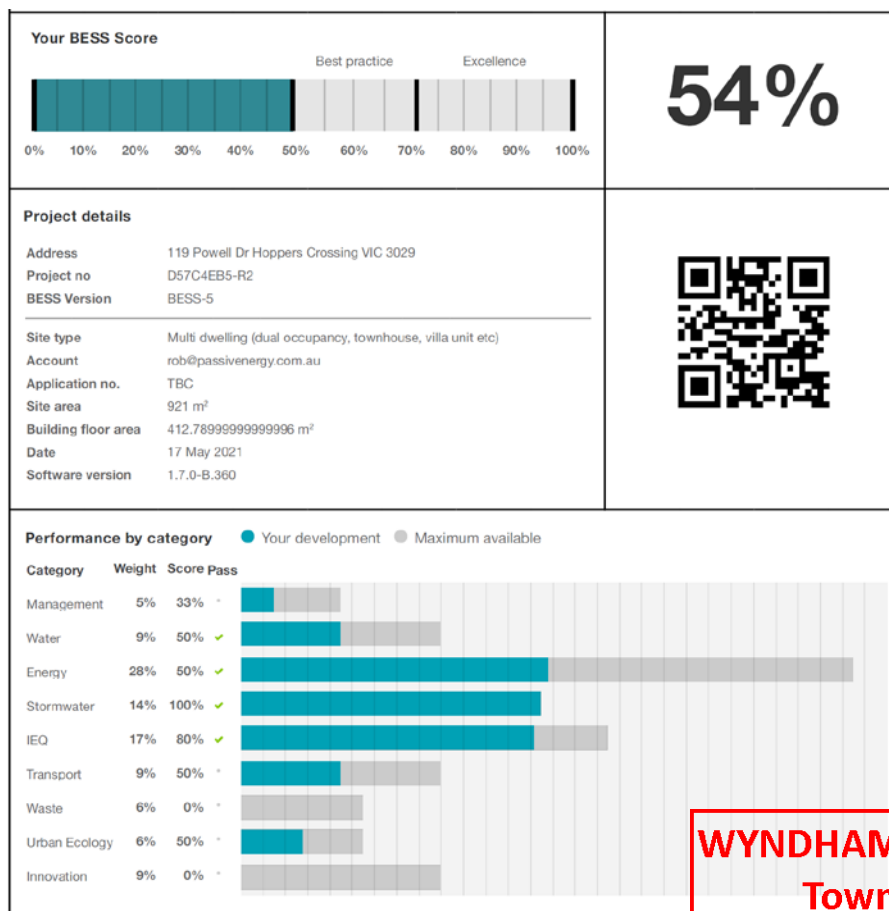
- BESS assessment
- 6 star energy ratings
- STORM assessment
- Walk score

BESS Assessment (Project number D57C4EB5)

The BESS (Built Environment Sustainable Scorecard) V3, 1.6.2-B.290 was used to assess

- Water
- Energy
- Stormwater
- Indoor Environment Quality (IEQ)
- Transport
- Waste
- Urban Ecology &
- Innovation

Following is a list of initiatives inputted into the scorecard to achieve a best practice score of 54%



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Water requirements

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. Grey water)

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Initiatives

- 3000L water tank connect to a minimum 96m² of roof area to Unit 1, 103m² of roof area to Unit 2 and 185m² of roof area to Unit 3, this area may increase once the civil engineer finalises the drainage plans for council endorsement.
- Rainwater tanks connected to toilet flushing.
- Water efficient landscaping. A landscape plan prepared by a suitable landscape architect to nominate water efficient vegetation throughout the development.
- For outdoor water reductions, plants, shrubs and lawn which require low amounts of water (drought-resistance) should be chosen. Native plants will be selected as they use less water and are more resistant to local plant diseases. Plant slopes with plants that will retain water and help reduce runoff.
- Group plants according to their watering needs.
- Mulch will slow evaporation of moisture while discouraging weed growth. Adding 2 - 4 inches of organic material such as compost or bark mulch will increase the ability of the soil to retain moisture.
- Shower heads to be 3 Star WELS rating(>6.0L/min but <= 7.5L/min).
- Kitchen taps to be 5 Star WELS rating.
- Bathroom taps to be 5 Star WELS rating.
- Dishwashers to be 4 Star WELS rating.
- Toilets to be 4 Star WELS rating.

Energy

Objectives

- To improve the efficient use of energy, by ensuring development demonstrates design potential for ESD initiatives.

Initiatives

- Each dwelling will achieve a minimum 6 star energy rating.
- Internal lighting will achieve a maximum 4watts/m².
- LED lighting fixtures will be considered for alternatives to fluorescent fittings to reduce energy consumption.
- External lighting will be controlled by motion sensors.
- Nominated heating and cooling systems will be within 1 star of the best relevant system in the market.
- Nominated gas hot water system to be at least 5 star rating.

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Stormwater

Objectives

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

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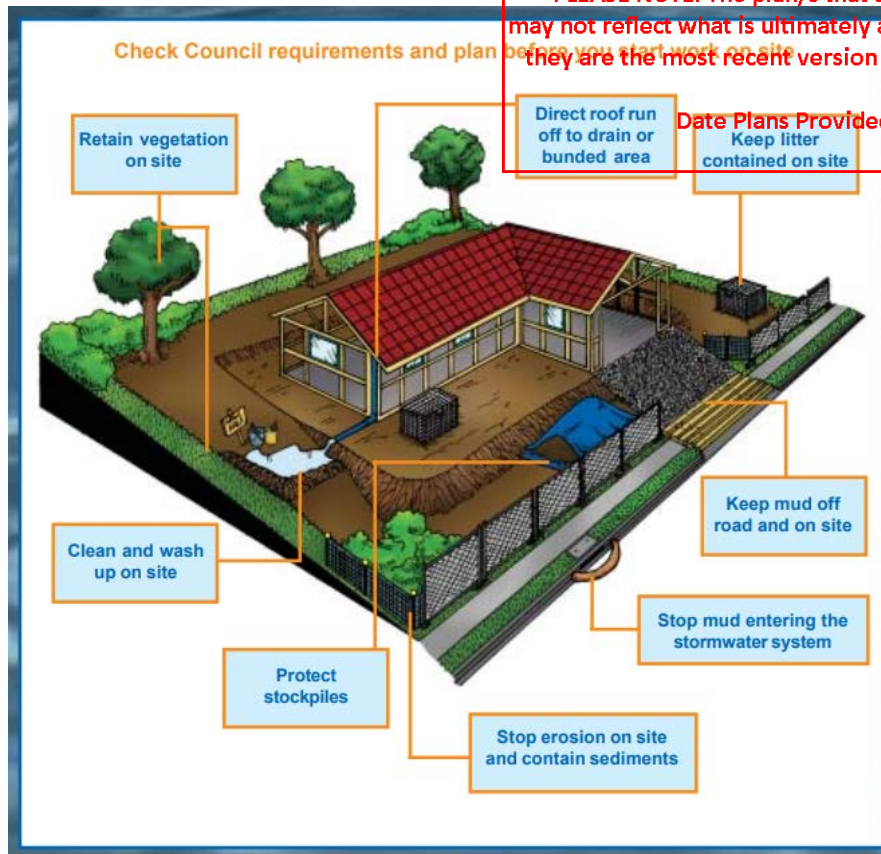
Initiatives

A Stormwater Treatment Objective- Relative Measure (STORM) calculator was used to produce a 100% outcome.

- A minimum 117m² of the driveway will be permeable.
- Unit 1 will require
 - 3000 litre water tanks connected to 96m² of roof space.
- Unit 2 will require
 - 3000 litre water tanks connected to 103m² of roof space.
- Unit 3 will require
 - 3000 litre water tanks connected to 185m² of roof space.
- Each unit is connected to a 3000 litre rainwater tank, which will be connected to the toilets.

**Note: Please refer to the WSUD report prepared by PassivEnergy for more detail on the stormwater management of the development.*

Stormwater Site Management Initiatives



PLEASE NOTE: The plan/s that are being provided to you may not reflect what is ultimately approved by Council however they are the most recent version as at the date shown below:

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Sourced from: Keeping our Stormwater Clean – A Builder's Guide, Melbourne Water.

6 Site Rules To Keep The Stormwater Clean:

1. Check council requirements and plan before you start work on site.
2. Stop erosion onsite and contain sediments.
3. Protect stockpiles.
4. Keep mud off road and on site.
5. Keep litter contained on site.
6. Clean and wash up on site.

The methods and processes specified in "Keeping our Stormwater Clean – A Builder's Guide, developed by Melbourne Water will be adhered to by the builder/developer for managing the construction site.

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Indoor Environment Quality (IEQ)

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.

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Initiatives

- All habitable rooms will allow for natural cross ventilation.
- Double glazed windows have been nominated to all living areas and bedrooms to assist with the thermal comfort.
- Adjustable external shading will be provided to the first floor east, west and north facing glazing at habitable rooms.
- All carpets, internal paints and all finishes and flooring will be selected for their low VOC properties.
- Where artificial lighting is required, only energy efficient LED light fixtures should be selected or CFL's for common areas like kitchens.

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Transport

Objectives

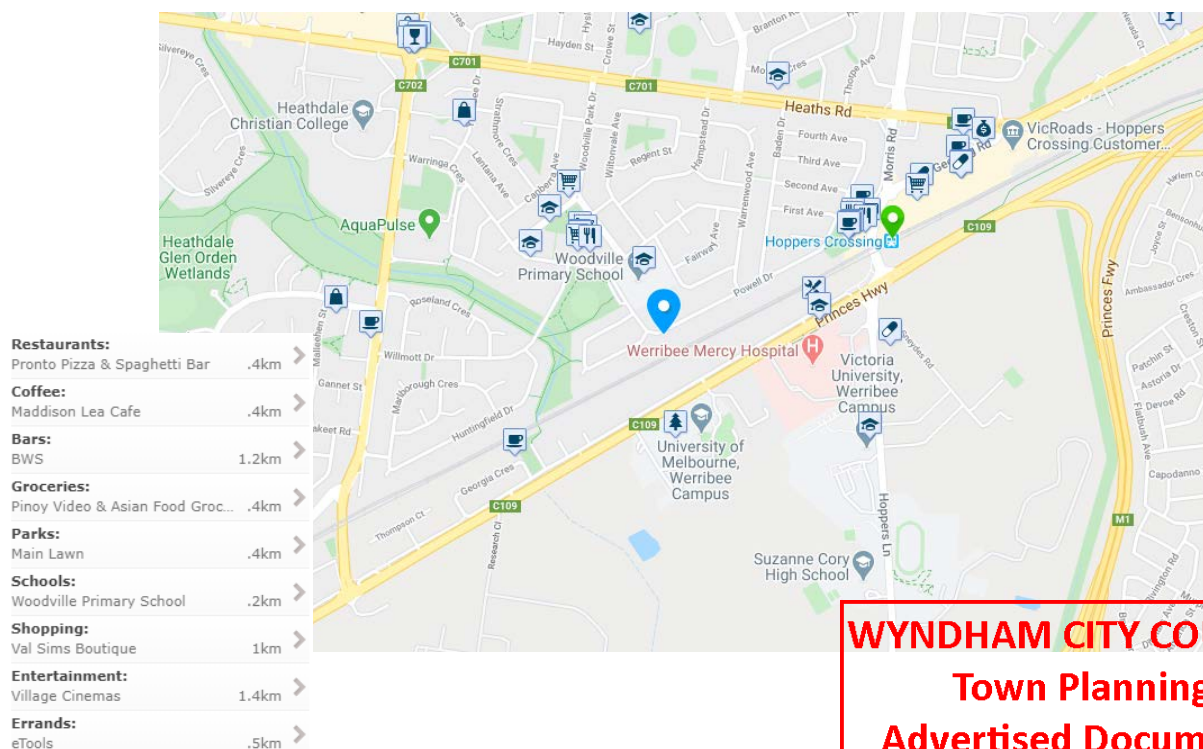
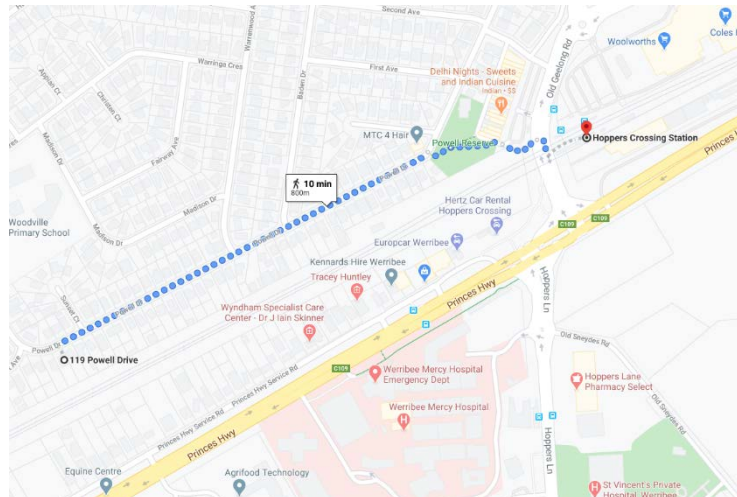
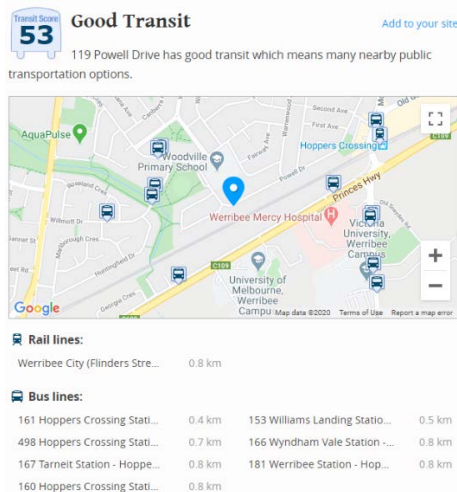
- To ensure that the built environment is designed to promote the use of walking, cycling and public transport, in that order and to minimise car dependency.
- To promote the use of low emissions vehicle technologies and supporting infrastructure.
- The Walk Score is a number between 0 and 100 that measures the walkability of any address to shops, restaurant, parks, entertainment etc.

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Initiatives

- There is 1 parking spot for bicycles per unit.
- 119 Powell Drive has a Walk Score of 58 out of 100. This location is Somewhat Walkable so some errands can be accomplished on foot.
- This location is in the Hoppers Crossing neighbourhood in Melbourne. The closest park is Main Lawn.
- The site is situated 0.80km to Hoppers Crossing train station



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Waste management

Objectives

- To promote waste avoidance, reuse and recycling during the design, construction and operation stages of the 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.

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Initiatives

- Re-use of excavated material on-site and disposal of any excess to an approved site;
- Green waste mulched and re-used in landscaping either on-site or off-site;
- Bricks, tiles, concrete recycled off-site and plasterboard returned to supplier for recycling;
- Framing timber to be recycled elsewhere;
- Windows, doors, joinery, plumbing, fittings and metal elements recycled off-site;
- All asbestos, hazardous and/or intractable wastes are to be disposed of in accordance with Workcover Authority and EPA requirements;
- Locations of on-site storage facilities for material to be reused on-site, or separated for recycling off-site

Materials

Objectives

- To reduce the environmental impact of materials by recycling of existing material or use of environmentally friendly materials and materials with low embodied energy.

Initiatives

- The development will use sustainable timber, where it meets the Australian Forestry Standard(AFS) or Forest Stewardship Council(FSC) standard and will use E1 or E0-grade engineered wood products.
- The development will use 20-35% supplementary cementitious materials(SCM) as a partial cement alternative, subject to the structural engineer's approval.
- Using recyclable and long lifecycle materials, such as steel, concrete and bricks.
- Materials proposed are local and readily available reducing embodied energy from transportation.
- Industry accepted benchmarks and/or third party certified low VOC and non-toxic products will be used for the development.

Urban ecology

Objectives

- To protect and enhance biodiversity with the municipality
- To provide environmentally sustainable landscapes and natural habitats, and minimise 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.

Initiatives

- Light colour roofing will be used to minimise UHI effect.
- The development will specify mostly native or indigenous plants.
- Landscape architect to prepare water efficient landscape design.

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6 Star energy ratings

- Energy ratings were modelled in First Rate 5 software Version 5.3.6 (2021)

	Heating	Cooling	Total	Rating
Unit 1	112.5MJ/m2	24.3MJ/m2	136.8MJ/m2	6.0 Stars
Unit 2	99.0MJ/m2	28.8MJ/m2	127.8MJ/m2	6.3 Stars
Unit 3	105.6MJ/m2	18.2MJ/m2	123.8MJ/m2	6.4 Stars

Plans are Version 5.3.6 (2021) that are being provided to you may not reflect what is ultimately approved by Council however they are the most recent version as at the date shown below:

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Preliminary Energy Rating Assumptions:

Insulation:	Value	
First Floor	R2.0	R2.0 insulation installed between all posi-trusses/floor joists.
External Walls	R2.5	R2.5 insulation installed between all external stud walls with anti-glare foil (excluding garage).
Internal Walls	R2.5	R2.5 insulation installed between all garage, laundry(Unit 1 and Unit 2) and bathroom internal stud walls.
Roof	R5.0	R5.0 insulation installed between all roof trusses (excluding garage).

Glazing – Unit 1/2

Type -

Aluminium framed double-glazed

Awning U-Value: 4.1 SHGC: 0.47

Sliding Door/Fixed U-Value: 4.1 SHGC: 0.52

Location -

All proposed windows and sliding doors.

Glazing – Unit 3

Type -

Aluminium framed singled-glazed

Awning U-Value: 4.5 SHGC: 0.50

Sliding Door/Fixed U-Value: 4.5 SHGC: 0.61

Location -

All proposed windows and sliding doors.

Exhaust Fans:

Location – As per working drawings

Kitchen, ensuite and bathroom.

Note: All exhaust fans to be installed with self closing dampers

Weather Protection:

Note -

Weatherstrip draft protection device to be installed to the bottom of all external doors

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BESS Report

Built Environment Sustainability Scorecard

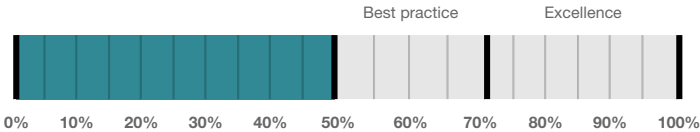
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This BESS report outlines the sustainable design commitments of the proposed development at 119 Powell Dr Hoppers Crossing VIC 3029. The BESS report and accompanying documents and evidence are submitted in response to the requirement for a Sustainable Design Assessment or Sustainability Management Plan at Wyndham City Council.

Note that where a Sustainability Management Plan is required, the BESS report and accompanying documents and evidence are submitted in response to the requirement for a Sustainable Design Assessment or Sustainability Management Plan at Wyndham City Council. PLEASE NOTE: The plan/s that are being provided to you may not reflect what is ultimately approved by Council however they are the most recent version as at the date shown below:

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Your BESS Score



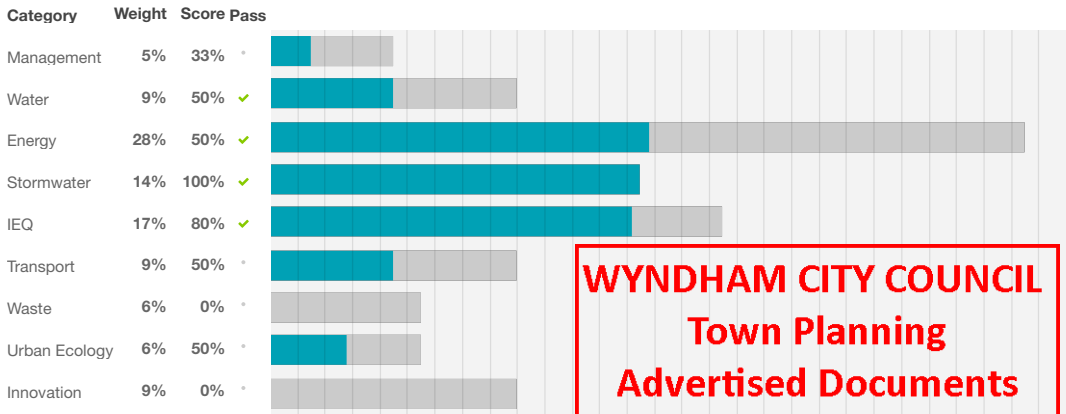
54%

Project details

Address	119 Powell Dr Hoppers Crossing VIC 3029
Project no	D57C4EB5-R2
BESS Version	BESS-5
Site type	Multi dwelling (dual occupancy, townhouse, villa unit etc)
Account	rob@passivenenergy.com.au
Application no.	TBC
Site area	921 m²
Building floor area	412.7899999999996 m²
Date	17 May 2021
Software version	1.7.0-B.360



Performance by category



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Dwellings & Non Res Spaces

Dwellings

Name	Quantity	Area	% of total area
Townhouse			
Unit 3	1	142 m ²	34%
Unit 2	1	141 m ²	34%
Unit 1	1	131 m ²	31%
Total	3	412 m²	100%

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Supporting information

Floorplans & elevation notes

Credit	Requirement	Response	Status
Water 3.1	Water efficient garden annotated		-
Energy 3.3	External lighting sensors annotated		-
Energy 3.4	Clothes line annotated (if proposed)		-
Stormwater 1.1	Location of any stormwater management systems used in STORM or MUSIC modelling (e.g. Rainwater tanks, raingarden, buffer strips)		-
IEQ 2.2	Dwellings meeting the requirements for having 'natural cross flow ventilation'		-
IEQ 3.1	Glazing specification to be annotated		-
IEQ 3.2	Adjustable shading systems		-
Transport 1.1	All nominated residential bicycle parking spaces		-
Urban Ecology 2.1	Vegetated areas		-

Supporting evidence

Credit	Requirement	Response	Status
Management 2.2	Preliminary NatHERS assessments		-
Energy 3.5	Provide a written description of the average lighting power density to be installed in the development and specify the lighting type(s) to be used.		-
Stormwater 1.1	STORM report or MUSIC model		-
IEQ 2.2	A list of dwellings with natural cross flow ventilation		-
IEQ 3.1	Reference to floor plans or energy modelling showing the glazing specification (U-value and Solar Heat Gain Coefficient, SHGC)		-
IEQ 3.2	Reference to floor plans and elevations showing shading devices		-

Credit summary

Management Overall contribution 4.5%

1.1 Pre-Application Meeting			
2.2 Thermal Performance Modelling - Multi-Dwelling Residential			
4.1 Building Users Guide			

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Water Overall contribution 9.0%

		Minimum required 50%	50%	✓ Pass
1.1 Potable water use reduction			40%	
3.1 Water Efficient Landscaping			100%	

Energy Overall contribution 27.5%

		Minimum required 50%	50%	✓ Pass
1.2 Thermal Performance Rating - Residential			0%	
2.1 Greenhouse Gas Emissions			100%	
2.2 Peak Demand			0%	
2.3 Electricity Consumption			100%	
2.4 Gas Consumption			100%	
2.5 Wood Consumption			N/A	✚ Scoped Out
			No wood heating system present	
3.2 Hot Water			100%	
3.3 External Lighting			100%	
3.4 Clothes Drying			100%	
3.5 Internal Lighting - Residential Single Dwelling			100%	
4.4 Renewable Energy Systems - Other			N/A	⊗ Disabled
			None	
4.5 Solar PV - Houses and Townhouses			N/A	⊗ Disabled
			None	

Stormwater Overall contribution 13.5%

		Minimum required 100%	100%	✓ Pass
1.1 Stormwater Treatment			100%	

IEQ Overall contribution 16.5%

		Minimum required 50%	80%	✓ Pass
2.2 Cross Flow Ventilation			100%	
3.1 Thermal comfort - Double Glazing			100%	
3.2 Thermal Comfort - External Shading			100%	
3.3 Thermal Comfort - Orientation			0%	

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Transport Overall contribution 9.0%

		50%
1.1 Bicycle Parking - Residential		100%
1.2 Bicycle Parking - Residential Visitor		N/A  Scoped Out
		Not enough dwellings.
2.1 Electric Vehicle Infrastructure		0%

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Waste Overall contribution 5.5%


		0%
1.1 - Construction Waste - Building Re-Use		0%
2.1 - Operational Waste - Food & Garden Waste		0%

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Urban Ecology Overall contribution 5.5%

		50%
2.1 Vegetation		100%
2.2 Green Roofs		0%
2.3 Green Walls and Facades		0%
2.4 Private Open Space - Balcony / Courtyard Ecology		0%
3.1 Food Production - Residential		0%

Innovation Overall contribution 9.0%

		0%
1.1 Innovation		N/A  Disabled
		None

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Credit breakdown**Management** Overall contribution 1%

1.1 Pre-Application Meeting		0%
Score Contribution	This credit contributes 9.0% towards the category score.	
Criteria	Has any ESD professional been engaged to provide sustainability advice from schematic design to construction? AND Has the ESD professional been involved in a pre-application meeting with Council?	
Question	Criteria Achieved ?	
Project	No	
2.2 Thermal Performance Modelling - Multi-Dwelling Residential		100%
Score Contribution	This credit contributes 33.3% towards the category score.	
Criteria	Have preliminary NatHERS ratings been undertaken for all thermally unique dwellings?	
Question	Criteria Achieved ?	
Townhouse	Yes	
4.1 Building Users Guide		0%
Score Contribution	This credit contributes 16.7% towards the category score.	
Criteria	Will a building users guide be produced and issued to occupants?	
Question	Criteria Achieved ?	
Project	No	

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Water Overall contribution 4% Minimum required 50%

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Water Approach		
What approach do you want to use Water?		
Project Water Profile Question		
Do you have a reticulated third pipe or an on-site water recycling system?		
Are you installing a swimming pool?		
Are you installing a rainwater tank?		
Water fixtures, fittings and connections		
Showerhead		
Bath		
Kitchen Taps		
Bathroom Taps		
Dishwashers		
WC		
Urinals		
Washing Machine Water Efficiency		
Which non-potable water source is the dwelling/space connected to?		
Non-potable water source connected to Toilets		
Non-potable water source connected to Laundry (washing machine)		
Non-potable water source connected to Hot Water System		
Rainwater Tanks		
What is the total roof area connected to the rainwater tank?		
Tank Size		
Irrigation area connected to tank		
Other external water demand connected to tank?		

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1.1 Potable water use reduction		40%
Score Contribution	This credit contributes 16.7% towards the category score.	
Criteria	What is the reduction in total potable water use due to efficient fixtures, appliances, rainwater use and recycled water use? To achieve points in this credit there must be >25% potable water reduction.	
Output	Reference (kL)	
Project	584	
Output	Proposed (excluding rainwater and recycled water use) (kL)	
Project	485	
Output	Rainwater or recycled water supplied (Internal + External) (kL)	
Project	51	
Output	Proposed (including rainwater and recycled water use) (kL)	
Project	433	
Output	% Reduction in Potable Water Consumption	
Project	25 %	
3.1 Water Efficient Landscaping		100%
Score Contribution	This credit contributes 16.7% towards the category score.	
Criteria	Will water efficient landscaping be installed?	
Question	Criteria Achieved ?	
Project	Yes	

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Energy

Overall contribution 14%

Minimum required 50%

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Use the built in calculation tools

Dwellings Energy Approach

What approach do you want to use for Energy?

Project Energy Profile Question

Are you installing a solar photovoltaic (PV) system?

No

Are you installing any other renewable energy system(s)?

No

Gas supplied into building

Natural Gas

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Dwelling Energy Profiles

Below the floor is

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Above the ceiling is

All

Outside

Exposed sides

All

4

NatHERS Annual Energy Loads - Heat

All

112 MJ/sqm

Unit 2

99.0 MJ/sqm

Unit 3

106 MJ/sqm

NatHERS Annual Energy Loads - Cool

All

24.3 MJ/sqm

Unit 2

28.8 MJ/sqm

Unit 3

18.2 MJ/sqm

NatHERS star rating

All

6.0

Unit 2

6.3

Unit 3

6.4

Heating System Efficiency

All

4 Star

Type of Cooling System

All

Refrigerative space

% Contribution from solar hot water system

All

-

Is the hot water system shared by multiple dwellings?

All

No

Clothes Line

All

D Private outdoor clothesline

1.2 Thermal Performance Rating - Residential

0%

Score Contribution

This credit contributes 30.0% towards the category score.

Criteria

What is the average NatHERS rating?

Output

Average NATHERS Rating (Weighted)

Townhouse

6.2 Stars

2.1 Greenhouse Gas Emissions

100%

Score Contribution

This credit contributes 10.0% towards the category score.

Criteria

What is the % reduction in annual greenhouse gas emissions against the benchmark?

Output

Reference Building with Reference Services (BCA only)

Townhouse

24,232 kg CO2

Output

Proposed Building with Proposed Services (Actual Building)

Townhouse

8,095 kg CO2

Output

% Reduction in GHG Emissions

Townhouse

66 %

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2.2 Peak Demand

Score Contribution

This credit contributes 0% towards the category score.

Criteria

What is the % reduction in the instantaneous (peak-hour) demand against the benchmark?

Output

Peak Thermal Cooling Load - Baseline

Townhouse

40.0 kW

Output

Peak Thermal Cooling Load - Proposed

Townhouse

39.6 kW

Output

Peak Thermal Cooling Load - % Reduction

Townhouse

1 %

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2.3 Electricity Consumption

100%

Score Contribution

This credit contributes 10.0% towards the category score.

Criteria

What is the % reduction in annual electricity consumption against the benchmark?

Output

Reference

Townhouse

21,065 kWh

Output

Proposed

Townhouse

5,796 kWh

Output

Improvement

Townhouse

72 %

2.4 Gas Consumption

100%

Score Contribution

This credit contributes 10.0% towards the category score.

Criteria

What is the % reduction in annual gas consumption against the benchmark?

Output

Reference

Townhouse

53,418 MJ

Output

Proposed

Townhouse

42,475 MJ

Output

Improvement

Townhouse

20 %

2.5 Wood Consumption

N/A

✦ Scoped Out

This credit was scoped out

No wood heating system present

3.2 Hot Water

100%

Score Contribution

This credit contributes 5.0% towards the category score.

Criteria

What is the % reduction in annual hot water system energy use (gas and electricity) against the benchmark?

Output

Reference

Townhouse

14,838 kWh

Output

Proposed

Townhouse

11,990 kWh

Output

Improvement

Townhouse

19 %

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3.3 External Lighting

Score Contribution	This credit contributes 5.0% towards the category score.
Criteria	Is the external lighting controlled by a motion detector?
Question	Criteria Achieved ?
Townhouse	Yes

3.4 Clothes Drying

Score Contribution	This credit contributes 10% towards the category score.
Criteria	Does the combination of clothes lines and efficient dryers reduce energy (gas+electricity) consumption by more than 10%?
Output	Reference
Townhouse	1,944 kWh
Output	Proposed
Townhouse	389 kWh
Output	Improvement
Townhouse	80 %

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3.5 Internal Lighting - Residential Single Dwelling

Score Contribution	This credit contributes 5.0% towards the category score.
Criteria	Does the development achieve a maximum illumination power density of 4W/sqm or less?
Question	Criteria Achieved ?
Townhouse	Yes

4.4 Renewable Energy Systems - OtherN/A ☐ Disabled

This credit is disabled None

4.5 Solar PV - Houses and TownhousesN/A ☐ Disabled

This credit is disabled None

Stormwater Overall contribution 14% Minimum required 100%

Which stormwater modelling are you using? Melbourne Water STORM tool

1.1 Stormwater Treatment

100%

Score Contribution	This credit contributes 100.0% towards the category score.
Criteria	Has best practice stormwater management been demonstrated?
Question	STORM score achieved
Project	100
Output	Min STORM Score
Project	100

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IEQ Overall contribution 13% Minimum required 50%**2.2 Cross Flow Ventilation**

Score Contribution

This credit contributes 20.0% towards the category score.

Criteria

Are all habitable rooms designed to achieve natural cross flow ventilation?

Question

Criteria Achieved ?

Townhouse

Yes

3.1 Thermal comfort - Double Glazing

Score Contribution

This credit contributes 40.0% towards the category score.

Criteria

Is double glazing (or better) used to all habitable areas?

Question

Criteria Achieved ?

Townhouse

Yes

3.2 Thermal Comfort - External Shading

100%

Score Contribution

This credit contributes 20.0% towards the category score.

Criteria

Is appropriate external shading provided to east, west and north facing glazing?

Question

Criteria Achieved ?

Townhouse

Yes

3.3 Thermal Comfort - Orientation

0%

Score Contribution

This credit contributes 20.0% towards the category score.

Criteria

Are at least 50% of living areas orientated to the north?

Question

Criteria Achieved ?

Townhouse

No

Transport Overall contribution 4%**1.1 Bicycle Parking - Residential**

100%

Score Contribution

This credit contributes 50.0% towards the category score.

Criteria

Is there at least one secure bicycle space per dwelling?

Question

Bicycle Spaces Provided ?

Townhouse

3

Output

Min Bicycle Spaces Required

Townhouse

3

1.2 Bicycle Parking - Residential Visitor

N/A

✦ Scoped Out

This credit was scoped out

Not enough dwellings.

2.1 Electric Vehicle Infrastructure

0%

Score Contribution

This credit contributes 50.0% towards the category score.

Criteria

Are facilities provided for the charging of electric vehicles?

Question

Criteria Achieved ?

Project

No

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Waste Overall contribution 0%

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1.1 - Construction Waste - Building Re-Use

Score Contribution

This credit contributes 50.0% towards the category score.

Criteria

If the development is on a site that has been previously developed, has at least 30% of the existing floor area re-used.

Question

Criteria Achieved ?

Project

No

2.1 - Operational Waste - Food & Garden Waste

0%

Score Contribution

This credit contributes 50.0% towards the category score.

Criteria

Are facilities provided for on-site management of food and garden waste?

Question

Criteria Achieved ?

Project

No

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Urban Ecology

Overall contribution 3%

2.1 Vegetation

Score Contribution

This credit contributes 50.0% towards the category score.

Criteria

How much of the site is covered with vegetation, expressed as a percentage of the total site area.

Question

Please refer to the plan.

Project

36 %

2.2 Green Roofs

0%

Score Contribution

This credit contributes 12.5% towards the category score.

Criteria

Does the development incorporate a green roof?

Question

Criteria Achieved ?

Project

-

2.3 Green Walls and Facades

0%

Score Contribution

This credit contributes 12.5% towards the category score.

Criteria

Does the development incorporate a green wall or facade?

Question

Criteria Achieved ?

Project

No

2.4 Private Open Space - Balcony / Courtyard Ecology

0%

Score Contribution

This credit contributes 12.5% towards the category score.

Criteria

Is there a tap and floor waste on every balcony / in every courtyard?

Question

Criteria Achieved ?

Townhouse

No

3.1 Food Production - Residential

0%

Score Contribution

This credit contributes 12.5% towards the category score.

Criteria

Is there at least 0.25m² of space per resident dedicated to food production?

Question

Food Production Area

Townhouse

-

Output

Min Food Production Area

Townhouse

3 m²**Innovation**

Overall contribution 0%

1.1 Innovation

N/A

⊘ Disabled

This credit is disabled

None

Disclaimer

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Date Plans Provided: 27/07/2021

**WYNDHAM CITY COUNCIL
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Advertised Documents**

Plan: 23 of 29

Nationwide House Energy Rating Scheme

NatHERS Certificate No. QU7T1KXUUQ

Generated on 29 Jul 2020 using FirstRate5: 5.3.0a (3.21)

Property

Address 1, 119 Powell Drive, Hoppers Crossing, VIC, 3029
Lot/DP -
NCC Class* Class 1a
Type New Home

Plans

Main plan 18-01452 / 20 July 2020
Prepared by Hagreaves Design Group

Construction and environment

Assessed floor area (m²)*	Exposure type
Conditioned* 99	suburban
Unconditioned* 7.6	NatHERS climate zone
Total 127.8	60, Hoppers Crossing
Garage 21.2	



Accredited assessor

Name	Robert Iacono
Business name	PassivEnergy
Email	rob@passivenergy.com.au
Phone	0401 248 348
Accreditation No.	DMN/11/1259
Assessor Accrediting Organisation	DMN
Declaration of interest	Declaration completed: no conflicts

National Construction Code (NCC) requirements

The NCC's requirements for NatHERS-rated houses are detailed in 3.12.0(a)(i) and 3.12.5 of the NCC volume two. For apartments the requirements are detailed in J0.2 and J5 to J8 of the NCC Volume One.

In NCC 2019, these requirements include minimum star ratings and separate heating and cooling load limits for detached buildings and apartments through the NatHERS assessment. Requirements additional to the NatHERS assessment that must also be satisfied include, but are not limited to: insulation installation methods, thermal breaks, building sealing, water heating and pump and fan energy efficiency. The NCC and NatHERS Heating and Cooling Load Limits (Australian Building Codes Board Standard) are available at www.abcb.gov.au.

State and territory variations and additions to the NCC may also apply.

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the more energy efficient

Date Plans Provided: 27/07/2021

136.8 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

Thermal performance

Heating	Cooling
112.5	24.3
MJ/m²	MJ/m²

About the rating

NatHERS software models the expected thermal energy loads using information about the design and construction, climate and common patterns of household use. The software does not take into account appliances, apart from the airflow impacts from ceiling fans.

Verification

To verify this certificate, scan the QR code or visit When using either link, ensure you are visiting www.FR5.com.au.



WYNDHAM CITY COUNCIL

**Town Planning
Advertised Documents**

Plan: 24 of 29

Nationwide House Energy Rating Scheme

NatHERS Certificate No. PAGJRQMOPR

Generated on 29 Jul 2020 using FirstRate5: 5.3.0a (3.21)

Property

Address 2, 119 Powell Drive, Hoppers Crossing, VIC, 3029
Lot/DP -
NCC Class* Class 1a
Type New Home

Plans

Main plan 18-01452 / 20 July 2020
Prepared by Hagreaves Design Group

Construction and environment

Assessed floor area (m²)*	Exposure type
Conditioned* 104	suburban
Unconditioned* 13.8	NatHERS climate zone
Total 139.1	60, Hoppers Crossing
Garage 21.3	



Accredited assessor

Name Robert Iacono
Business name PassivEnergy
Email rob@passivenergy.com.au
Phone 0401 248 348
Accreditation No. DMN/11/1259
Assessor Accrediting Organisation DMN
Declaration of interest Declaration completed: no conflicts

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In NCC 2019, these requirements include minimum star ratings and separate heating and cooling load limits that need to be met by buildings and apartments through the NatHERS assessment. Requirements additional to the NatHERS assessment that must also be satisfied include, but are not limited to: insulation installation methods, thermal breaks, building sealing, water heating and pump and fan energy efficiency. The NCC and NatHERS Heating and Cooling Load Limits (Australian Building Codes Board Standard) are available at www.abcb.gov.au.

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127.8 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

Thermal performance

Heating	Cooling
99	28.8
MJ/m²	MJ/m²

About the rating

NatHERS software models the expected thermal energy loads using information about the design and construction, climate and common patterns of household use. The software does not take into account appliances, apart from the airflow impacts from ceiling fans.

Verification

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Plan: 25 of 29

Nationwide House Energy Rating Scheme

NatHERS Certificate No. LJHIR782HC

Generated on 29 Jul 2020 using FirstRate5: 5.3.0a (3.21)

Property

Address 3, 119 Powell Drive, Hoppers Crossing, VIC, 3029
Lot/DP -
NCC Class* Class 1a
Type New Home

Plans

Main plan 18-01452 / 20 July 2020
Prepared by Hagreaves Design Group

Construction and environment

Assessed floor area (m²)*	Exposure type
Conditioned* 121	suburban
Unconditioned* 5	NatHERS climate zone
Total 166.1	60, Hoppers Crossing
Garage 40.1	



Accredited assessor

Name	Robert Iacono
Business name	PassivEnergy
Email	rob@passivenergy.com.au
Phone	0401 248 348
Accreditation No.	DMN/11/1259
Assessor Accrediting Organisation	DMN
Declaration of interest	Declaration completed: no conflicts

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The NCC's requirements for NatHERS-rated houses are detailed in 3.12.0(a)(i) and 3.12.5 of the NCC volume two. For apartments the requirements are detailed in J0.2 and J5 to J8 of the NCC Volume One.

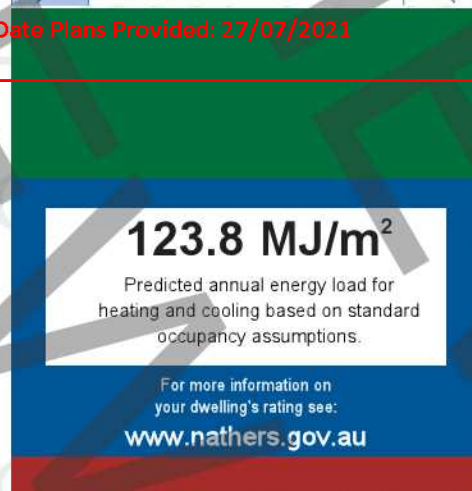
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Thermal performance

Heating	Cooling
105.6	18.2
MJ/m²	MJ/m²

About the rating

NatHERS software models the expected thermal energy loads using information about the design and construction, climate and common patterns of household use. The software does not take into account appliances, apart from the airflow impacts from ceiling fans.

Verification

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STORM Rating Report

TransactionID: 1155736
Municipality: WYNDHAM (North/East of Skeleton Ck)
Rainfall Station: WYNDHAM (North/East of Skeleton Ck)
Address: 119 Powell Drive

Hoppers Crossing
VIC 3029

Assessor:

Development Type: Residential - Multiunit
Allotment Site (m2): 921.32
STORM Rating %: 100

Description	Impervious Area (m2)	Treatment Type	Treatment Area/Volume (m2 or L)	Occupants / Number Of Bedrooms	Treatment %	Tank Water Supply Reliability (%)
Unit 1 RWT Roof Area	96.00	Rainwater Tank	3,000.00	3	139.00	92.10
Unit 1 Untreated Roof Area	3.09	None	0.00	0	0.00	0.00
Unit 2 RWT Roof Area	103.00	Rainwater Tank	3,000.00	3	136.00	93.50
Unit 2 Untreated Roof Area	3.91	None	0.00	0	0.00	0.00
Unit 3 RWT Roof Area	185.00	Rainwater Tank	3,000.00	3	101.30	96.60
Unit 3 Untreated Roof Area	3.75	None	0.00	0	0.00	0.00
Driveway	68.17	None	0.00	0	0.00	0.00

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Program Version: 1.0.0

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Rainwater Tanks

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Date Plans Provided: 27/07/2021

Stormwater
Sensitive
Homes

How does a rainwater tank help protect our local streams?

Most people install a rainwater tank primarily to harvest stormwater from their roof and conserve their mains water use. In addition to conserving water, a rainwater tank also helps treat stormwater and protect local streams from high storm flows by reducing the volume of stormwater and quantity of pollutants coming from a house block that would otherwise be delivered to the local stream.

What do I use my tank water for?

Garden irrigation, laundry and toilet flushing consume much of our home water use. In most cases these uses do not require the water to be of drinking quality standard that is provided by mains water. By plumbing your rainwater tank to your toilet or laundry and substituting these mains water needs with the rainwater harvested from your roof, you can conserve mains water whilst reducing the amount of stormwater that enters our streams.



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A typical home uses approximately 250,000 litres of water each year.
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Rainwater Tanks



Why can't I use my rainwater tank for my garden alone?

So that your tank is not too full to collect rainwater when it rains, you need to be consistently using your tank water all year round.

If tank water is used for your garden alone, your tank will remain full and unused during the winter months when your garden does not require watering. With a full tank, your capacity to capture and store the regular winter rainfall and thus benefit the local waterway is significantly reduced.

By plumbing your rainwater tank to your toilet or laundry, your tank water is used consistently all year round allowing rainfall to refill the tank more often especially in winter. This ultimately reduces the volume of stormwater that is delivered to the stream and the quantity of pollutants that are washed with it.

The Victorian Government has recognised the importance of plumbing your tank to your toilet and offers a cash rebate for the installation of connected rainwater tanks (www.dse.vic.gov.au). In addition, a 5 star energy standard has been introduced that requires a connected 2000Lt rainwater tank or solar hot water service to be installed in all new houses and apartments (class 1 and 2 buildings). (www.buildingcommission.com.au).

How do I choose a rainwater tank?

The most important thing to consider when choosing a rainwater tank is to first identify what you want from your rainwater tank. The size and type of rainwater tank you choose will vary depending on your homes water needs and the reliability you seek from your rainwater tank supply. There are a number of factors that may influence this and the following questions should be considered when planning your tank installation:

- what is the water demand of your home?
- how many people are living in your home?
- what is your intended use of rainwater?
- what reliability do you want from your tank?
- what is the total area of roof draining into your tank?
- what is average rainfall of your area?
- do you need extras like a pressure pump, the ability to top up your tank with drinking water, a backflow prevention device or a first flush device?
- are the materials used on your roof suitable to collect rainwater?
- are there physical constraints of your property that may influence the type of rainwater tank you need?

Once you know how much water you can collect and how much water you are going to use then a tank size can be selected to provide the reliability of water supply that you need.

For more information:

Melbourne Water's Water Sensitive Urban Design Website: www.wsud.melbournewater.com.au

Municipal Association of Victoria Clearwater Program: www.clearwater.asn.au

Water Sensitive Urban Design in the Sydney Region: www.wsud.org

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Types of rainwater tanks

Rainwater tanks come in a variety of materials, shapes and sizes and can be incorporated into building design so they don't impact on the aesthetics of the development. They can be located above ground, underground, under the house or can even be incorporated into fences or walls.

There are three main tank systems to consider and a variety of materials to choose from. Features of these are outlined below and in the pictures above:

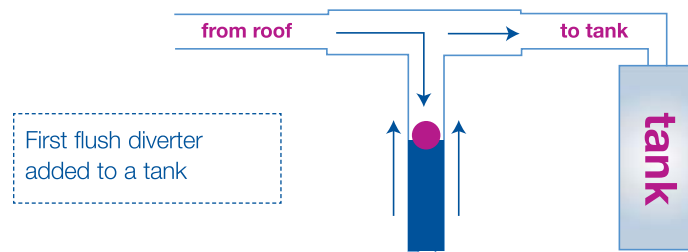
Tank systems:

Gravity Systems - rely on gravity to supply rainwater to the household and the garden by placing the tank on a stand at height.

Dual Supply Systems - top your rainwater tank with mains water when tank level is low ensuring reliable water supply.

Pressure Systems - use a pump to deliver rainwater to household and garden fixtures.

To reduce the amount of sediment and debris entering a tank, mesh screens and 'first flush diverters' can be fitted. A screen will filter large debris such as leaves and sticks while 'first flush diverters' store the 'first flush' of the rainfall that carries the sediment and other pollutants initially washed from your roof (see figure below).



Costs & rebates

Costs of installing a tank vary however a standard 2000Lt tank or bladder will cost around \$1000.

Additional plumbing and/or.....

- Above ground tanks cost approximately \$250 for a 500 litre tank.
- Below ground tanks cost between \$300-\$600 per 1000 litres of storage
- The costs of pumps start from \$200.

Additional plumbing and/or excavation costs vary on intended use, pipe layout, materials and site accessibility.

The Victorian Government offers a total rebate of \$300 for the installation of a rainwater tank that is plumbed to toilet and connected by a licensed plumber. For further details refer to the Department of Sustainability and Environment website www.dse.vic.gov.au.

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Town Planning
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Urban Stormwater Best Practice Environmental Management Guidelines Victorian Stormwater Committee, CSIRO publishing, 1999.

WSUD Engineering Procedures: Stormwater, Melbourne Water, 2005.

Delivering Water Sensitive Urban Design: Final Report of Clean Stormwater – a planning framework, ABM, 2004.

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