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Boiler House Yarra Bend, Alphington, Victoria 3078

Sustainable Management Plan

Glenvill

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Project title	Boiler House Yarra Bend, Alphington, Victoria 3078	**Job Number**
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Document Revision History

Revision Ref	Issue Date	Purpose of issue / description of revision
—	06 April 2020	Draft Issue for Design Team Review
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Document Validation (latest issue)

Principal author	Checked by	Verified by
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Executive Summary

This Sustainability Management Plan (SMP) has been prepared to assess the proposed design for the Boiler House residential development in Alphington at the Town Planning stage.

This SMP outlines the development's proactive approach to meeting the council's ESD principles and values, and it addresses the key sustainable building categories as defined by City of Yarra to demonstrate that a holistic ESD review has been carried out.

The key sustainability categories assessed in this report are:

- Management
- Indoor Environment Quality
- Energy Efficiency
- Water Resources
- Stormwater Management
- Building Materials
- Transport
- Waste Management
- Urban Ecology

This SMP is generally based on the following:

- Sustainable Design Assessment in the Planning Process (SDAPP);
- Built Environment Sustainability Scorecard (BESS) - To provide an assessment of sustainable design outcomes of this plan.
- The EnviroDevelopment v2 (Masterplan) rating tool and the existing Yarrabend 6 Element rating.
- Additional best practice initiatives are included in the Alphington Paper Mill Development Plan, the plan initiatives aim to ensure the environmental performance of this development and to demonstrate that the project's commitment to sustainability meets and, in some cases, exceeds the council's minimum requirements.

Contents

1.0

Introduction

1.0 Introduction

1.1 Project Information

This report relates to the proposed mixed-use residential development at Boiler House Yarra Bend, Alphington, Victoria 3078 and provides an overview of the project's environmental design response and commitment to sustainability.

The relevant details of the project are provided below.

- Project Address: Boiler House Yarra Bend, Alphington, Victoria 3078
- Applicant: Glenvill

1.2 Design Overview

The proposed Boiler House development in Alphington consists 2 buildings with a total of 7 townhouses, 94 apartments of varying sizes and a basement level for car parking. The project site sits within the wider Yarrabend development on the site of the former Amcor Paper Mill and is under the planning jurisdiction of City of Yarra.

Figure 1 – General Layout of the Boiler House Residential Development within the Yarrabend site

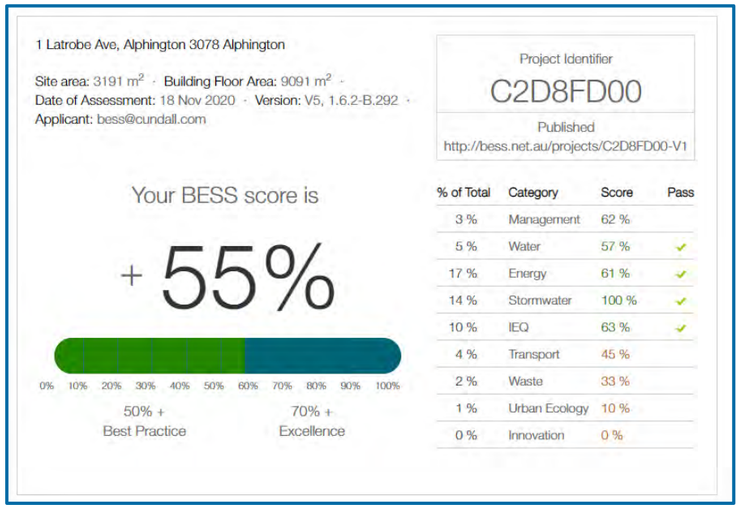
1.3 Sources of Information

The following sources of information have been used in the preparation of this report:

- Sustainable Design Assessment in the Planning Process (SDAPP) – City of Yarra
- Built Environment Sustainability Scorecard (BESS)
- Yarrabend EnviroDevelopment Communities Certification

1.4 Built Environment Sustainability Scorecard

The Built Environment Sustainability Scorecard (BESS) assesses energy, water efficiency, thermal comfort and overall environmental sustainability performance of new buildings and alterations. It was created to assist builders and developers to demonstrate that they meet sustainability information requirements as part of a planning permit applications. The BESS tool assesses projects against a benchmark in nine environmental categories.



1.5 Additional Initiatives Beyond Best practices

This development goes beyond the requirements assessed in BESS (reported above) with initiatives that improve the environmental performance of the development. Where this is done, it has been reported within the Key Sustainable Building Categories as defined by City of Yarra.

These initiatives have been sourced from industry standard benchmarking tools, and the sources have been included where applicable.

1.6 Report Format

This Sustainability Design Assessment responds to each of the Key Sustainable Building Categories, following the guidelines provided by the City of Yarra. This is summarised in the following table:

Objectives	Summarizing the general intent, aims and the purposes of the category.
Issues	A list of relevant topics addressed in each category. As each town planning application responds to different opportunities and constraints, it is not required to address all issues.
Assessment Method Description	The SMP describes what standards have been used to assess the applicable issues.
Benchmarks Description	This SMP briefly describes the benchmark applied as outlined within the chosen standard. A benchmark description is provided for each environmental issue that has been identified as relevant.
Method for compliance and responsibility for implementation	This SMP shows how the proposed design meets the benchmarks of the chosen standard through making references to the design brief, drawings, specifications, consultant reports or other evidence that proves compliance with the chosen benchmark. A list of responsible persons to deliver the initiative and the proposed timing with respect to the building phase (design and implementation) is also included.

2.0

Sustainable Management Categories

2.0 Sustainable Management Categories

2.1 Management

2.1.1 Objectives

The objectives of the project with regard to management are to:

- To ensure appropriate sustainable design principles and strategies are considered from the preliminary design stage of each development by encouraging early involvement of a suitably qualified ESD professional.
- To encourage and recognise developments that use thermal modelling to inform passive design at the early design stage.
- To provide building users with information that allows monitoring of energy and water consumption.
- To encourage and recognise initiatives that will help building users to use the building more efficiently.

2.1.2 Design Responses

Issue	Referenced tool / document	Assessment method description	Benchmarks Requirements	Method for compliance and responsibility for implementation
Individual utility meters (electricity & water)	☒SDAPP (inc. BESS) ☐Alphington park ESD Strategy ☐EnviroDevelopment	BESS benchmarks to be used.	Utility meters (electricity, water) will be provided for all individual dwellings.	Metering requirements to be included in project brief. **Responsibility for implementation** Design phase: Building design engineers Implementation: Builder
Common area metering (electricity & water)	☒SDAPP (inc. BESS) ☒Alphington park ESD Strategy ☐EnviroDevelopment	BESS benchmarks to be used.	Sub-meters (electricity, water) will be provided for all major common area sub-systems.	Metering requirements to be included in project brief. **Responsibility for implementation** Design phase: Building design engineers Implementation: Builder
Building Users Guide	☒SDAPP (inc. BESS) ☐Alphington park ESD Strategy ☒EnviroDevelopment	BESS benchmarks to be used.	Commitment to produce a Building User Guide for the whole development, explaining to residents and commercial tenants the sustainability features and intents of the development. The guide may include connection of rainwater tanks to toilets, energy efficiency design choices incorporated in the building, appropriate usage of air-conditioning systems and appropriate usage of lighting systems and controls.	Building Users Guide to be provided to building occupants. **Responsibility for implementation** Design phase: Building designers / developer Implementation: Builder & Body corporate
Reduce waste to landfill	☐SDAPP (inc. BESS) ☐Alphington park ESD Strategy ☒EnviroDevelopment	Environmental Development benchmarks to be used.	Divert at least 70% of all demolition and construction waste from landfill.	To be included in project construction specification. **Responsibility for implementation** Implementation: Builder
Environmental Management Plan	☐SDAPP (inc. BESS) ☐Alphington park ESD Strategy ☒EnviroDevelopment	No specific benchmark references.	Before construction, prepare a site-specific environmental management plan outlining the considerations and processes for reducing the environmental impact of the construction process.	To be included in project construction specification. **Responsibility for implementation** Implementation: Builder
Construction gross pollutant trap	☐SDAPP (inc. BESS) ☐Alphington park ESD Strategy ☒EnviroDevelopment	No specific benchmark references.	During construction, provide appropriate gross pollutant traps where required to prevent pollution of waterways and the build-up of silt deposits.	To be included in project construction specification. **Responsibility for implementation** Implementation: Builder

2.2 Water Resources

2.2.1 Objectives

The objectives of the project with regard to sustainable use of water resources are to:

- Reduce potable water use during operation;
- Reduce sewer discharges and pressure on local infrastructure;
- Design a site that is relatively drought resilient;
- Employ efficiency considerations for both demand-side management (e.g. efficiency of fittings); and
- Reduce operational water costs.

2.2.2 Design Responses

Issue	Referenced tool / document	Assessment method description	Benchmarks Requirements	Method for compliance and responsibility for implementation
Potable Water Use Reduction (Interior Uses)	☒SDAPP (inc. BESS) ☐Alphington park ESD Strategy ☒EnviroDevelopment	BESS and ED benchmarks to be used.	Achieve a 25% reduction in potable water use using the BESS calculation methodology.	Design features to be included in the project brief. Rainwater tanks to be shown on drawings. The following WELS ratings will be achieved for all sanitaryware and appliances: ▪ WC's – 4 Star ▪ Dishwashers– 4 Star / 14 L per cycle ▪ Kitchen/Bathroom/ Taps – 5 Star ▪ Showerheads – 3 Star (<7.5l per minute) **Rainwater tank** ▪ A minimum 30 kL of rainwater tank for Boiler house West which will be connected for toilet flushing in all dwellings till level 2. ▪ A minimum 25kL of rainwater tank for Boiler house East which will be connected for toilet flushing in all dwellings till level 2. **Responsibility for implementation** Design phase: Building design engineers and architect Implementation: Builder
Water Efficient Landscaping	☒SDAPP (inc. BESS) ☒Alphington park ESD Strategy ☒EnviroDevelopment	BESS benchmarks to be used.	Demonstrate that irrigation will be delivered via the most efficient system for that situation. Water should be directly applied to the vegetation to limit evaporation or runoff. Mulch at a minimum depth of 75mm is applied to planted areas.	The irrigation system will ensure water is directly applied to the vegetation to limit evaporation, runoff or wastage. Mulch will be applied to planted areas. Drought tolerant plant species will be prioritised in the design. **Responsibility for implementation** Design phase: Building designer / Landscape architect Implementation: Builder
Building Systems Water Use Reduction	☒SDAPP (inc. BESS) ☐Alphington park ESD Strategy ☒EnviroDevelopment	BESS Benchmarks to be used.	Measures have been taken to reduce potable water consumption by 80% in the building's air conditioning chillers and when testing fire safety systems.	No water-based air-conditioning systems will be provided. Fire test water capture and reuse to be provided. The design features to be included in the project brief. **Responsibility for implementation** Design phase: Building design engineers Implementation: Builder

2.3 Energy Efficiency

2.3.1 Objectives

The objectives of the project with regard to energy use are to:

- Design to reduce greenhouse gas emissions of the development compared to conventional design;
- Reduce the peak energy demand;
- Reduce the operational demand for energy through efficient plant and appliances with good management;
- Reduce operational energy costs; and
- Promote awareness of energy efficiency for occupants and the community.

2.3.2 Design Responses

Issue	Referenced tool / document	Assessment method description	Benchmarks description	Method for compliance and responsibility for implementation
Greenhouse Gas Emissions	☒SDAPP (inc. BESS) ☒Alphington park ESD Strategy ☒EnviroDevelopment	NatHERs, Building Code of Australia, BESS benchmarks and EnviroDevelopment benchmarks.	The building will be designed to reduce the sites annual greenhouse gas by at least 10%.	The design responses below to be implemented. **Responsibility for implementation** Design phase: Building and Services design team Implementation: Builder
House Energy Rating Scheme (HERs)	☒SDAPP (inc. BESS) ☒Alphington park ESD Strategy ☒EnviroDevelopment	NatHERs and Building Code of Australia.	The average HERs rating achieved will meet or exceed the legal (BCA) minimum at the time of planning application, i.e.: ▪ 6.5 Star minimum average rating for the development	Thermal performance requirements to be included in project brief. **Responsibility for implementation** Design phase: Building Designer Implementation: Builder
Domestic Hot Water	☒SDAPP (inc. BESS) ☐Alphington park ESD Strategy ☐EnviroDevelopment	BESS benchmarks to be used. Built in calculation tools have been used to determine the reduction in energy consumption of the system.	The hot water system is to use 10% less energy than the reference case.	Domestic hot water systems will be 5 Star gas instantaneous for the apartments development. Hot water system to be included in project brief. **Responsibility for implementation** Design phase: Hydraulic services design team Implementation: Hydraulic services subcontractor
Efficient Heating and Cooling Systems	☒SDAPP (inc. BESS) ☒Alphington park ESD Strategy ☒EnviroDevelopment	BESS benchmarks to be used. Built in calculation tools have been used to determine the reduction in energy consumption of the system.	All apartments must be provided with reverse cycle split-systems. A/C systems will be at least 3 stars in both heating and cooling modes. Furthermore, all air conditioning systems must be specified with a COP >3.2 and EER >3.0	A/C efficiency requirements to be included in project brief. **Responsibility for implementation** Design phase: Mechanical services design team Implementation: Mechanical services subcontractor
Lighting	☒SDAPP (inc. BESS) ☒Alphington park ESD Strategy ☐EnviroDevelopment	BESS benchmarks to be used.	The proposed illumination power density (W/m2) must be at least 20% lower than the maximum BCA allowances. Motion sensors and timers will be provided to transient spaces such as corridors and storage areas. As required by the BCA Section J6.5, external lighting will include either daylight sensors or a time switch. All common facilities will use energy efficient LED lighting.	Lighting requirements to be included in project brief. **Responsibility for implementation** Design phase: Electrical services design team Implementation: Electrical services subcontractor
Energy efficient appliances	☐SDAPP (inc. BESS) ☐Alphington park ESD Strategy ☒EnviroDevelopment	EnviroDevelopment benchmarks to be used.	Where installed, dishwashers to have an energy consumption of less than 245kWh per annum.	To be included in project brief. **Responsibility for implementation** Design phase: Building designer Implementation: Builder
Carpark Ventilation	☒SDAPP (inc. BESS) ☐Alphington park ESD Strategy	BESS benchmarks to be used.	Carbon monoxide monitoring will be used to control the operation and speed of the ventilation fans.	**Responsibility for implementation** Design phase: Building designer

Issue	Referenced tool / document	Assessment method description	Benchmarks description	Method for compliance and responsibility for implementation
	☐EnviroDevelopment			Implementation: Builder
Renewable Energy Systems	☒SDAPP (inc. BESS) ☐Alphington park ESD Strategy ☐EnviroDevelopment	BESS benchmarks to be used.	A renewable energy system is installed to provide some of the development's energy requirements.	A rooftop solar PV system of 20 kW to be included in the building design. **Responsibility for implementation** Design phase: Building designer and electrical engineer Implementation: Builder

2.4 Stormwater Management

2.4.1 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 water sensitive urban design principles.

2.4.2 Design Responses

Issue	Referenced tool / document	Assessment method description	Benchmarks description	Method for compliance and responsibility for implementation
Stormwater runoff quality	☒SDAPP (inc. BESS) ☒Alphington park ESD Strategy ☒EnviroDevelopment	BESS benchmarks to be used together with the CSIRO targets as outlined in the City of Yarra planning	▪ Melbourne Water's STORM calculator has been used to demonstrate the proposed development meets the council's stormwater management requirements ▪ A minimum score of 100% is required to demonstrate compliance with Melbourne Water's STORM calculator, the proposed development achieves a STORM score of 100% with the use of rainwater tanks with a capacity of 30 kL for Boiler house West and 25 kL for Boiler house East.	A preliminary STORM assessment has been completed; the project achieves the benchmark targets based on the following details: • A minimum 30 kL of rainwater storage tank for Boiler house West recycling the water for toilet flushing and irrigation to all units till Level 2. Additionally, a 300mm deep raingarden of 5 sq.m. is also required to treat rooftop communal terrace. Suitable filtration system will be included. • A minimum 25 kL of rainwater storage tank for Boiler house East recycling the water for toilet flushing and irrigation to all units till Level 2. **Responsibility for implementation** Design phase: Civil and hydraulic engineers Implementation: Builder

2.5 Indoor Environment Quality

2.5.1 Objectives

The objectives of the development with regard to Indoor Environment Quality (IEQ) are to provide occupants with a generally pleasant and comfortable internal space whilst reducing or avoiding potentially detrimental health impacts. Specific goals are to provide an internal environment that is healthy and comfortable in terms of:

- Air quality and odour;
- Sight (e.g. natural light, external views and glare);
- Sound; and thermal comfort.

2.5.2 Design Responses

Issue	Referenced tool / document	Assessment method description	Benchmarks description	Method for compliance and responsibility for implementation
Volatile Organic Compounds (VOCs)	☐SDAPP (inc. BESS) ☒Alphington park ESD Strategy ☒EnviroDevelopment	Green Star benchmarks to be used. Intent is to reduce off-gassing and internal air quality issues; low VOC products will be specified as standard. Commitment to use low VOC sealants and adhesives. Commitment to use low VOC Paints.	At least 95% of all paints, adhesives and sealants to meet the T-VOC content limits of Appendix A T-VOC content limits as per Table IEQ8.3 of the Green Star Technical Manual for the whole development.	VOC for paints, adhesives, sealants and carpet limits to be included in project brief for architectural design and building services. **Responsibility for implementation** Design phase: Building designer Implementation: Builder
Thermal comfort	☒SDAPP (inc. BESS) ☒Alphington park ESD Strategy ☒EnviroDevelopment	BESS benchmarks to be used.	Double glazing or better will be used for all habitable rooms to provide comfortable indoor spaces and reduce energy needed for heating and cooling. The regularly occupied areas on the site will exceed BCA Section J requirements for insulation and glazing, which will provide a high level of thermal comfort for the whole development. All glazing systems forming part of the building envelope will be double glazed at a minimum.	At least double glazing to be used throughout the development. Glazing type to be included in the specification **Responsibility for implementation** Design phase: Building designer Implementation: Builder
Formaldehyde Minimisation	☐SDAPP (inc. BESS) ☒Alphington park ESD Strategy ☐EnviroDevelopment	Green Star benchmarks to be used.	At least 95% of all engineered wood products used to internal areas of the whole development to be low formaldehyde, using the international E1 standard or recognised equivalent.	Engineered wood products requirements to be included in project brief for architectural design. **Responsibility for implementation** Design phase: Building designer Implementation: Builder
Daylight Access	☒SDAPP (Inc. BESS) ☐Alphington park ESD Strategy ☐EnviroDevelopment	BESS benchmarks to be used.	Living and bedroom spaces must achieve a daylight factor greater than 1 and 0.5 respectively. At least 90% of dwellings must have an external window in all bedrooms.	Using BESS built-in calculation pathway, at least 80% of living and bedroom spaces comply with the daylight requirements. All bedrooms have access to an external window. Responsibility for implementation Design phase: Architect Implementation: Builder
Natural Ventilation	☒SDAPP (Inc. BESS) ☐Alphington park ESD Strategy ☐EnviroDevelopment	BESS benchmarks to be used.	Apartments must be naturally ventilated to provide thermal comfort to the occupants.	At least 60% of the apartments comply with BESS' natural ventilation requirements. **Responsibility for implementation** Design phase: Architect Implementation: Builder

2.6 Transport

2.6.1 Objectives

Specific goals are to provide transport options that are healthy and comfortable in terms of:

- Reduce dependency on car use;
- Encourage public transport use; and
- Encourage low / no emission alternatives such as walking, cycling, motorbikes / mopeds or carpooling.

2.6.2 Design Responses

Issue	Referenced tool / document	Assessment method description	Benchmarks description	Method for compliance and responsibility for implementation
Bicycle Spaces	☒SDAPP (inc. BESS) ☐Alphington park ESD Strategy ☐EnviroDevelopment	BESS benchmarks & City of Yarra Planning Scheme	Provide at least 1 secure bike rack per dwelling for residents. Provide at least 1 secure bike rack per 5 dwellings for residential visitors.	The development includes: - at least 101 secure bike racks are provided for the residents. - at least 20 visitor bike racks have been provided. **Responsibility for implementation** Design phase: Building designer Implementation: Builder
Trip Reduction	☒SDAPP (inc. BESS) ☒Alphington park ESD Strategy ☒EnviroDevelopment	Walk Score to be used. Intent is to promote walkable neighbourhoods, encouraging developments built in close proximity to commercial areas.	Locate development within walking distances of local services.	The proposed development obtains a walk score of 72 - “Very Walkable”, which is the third highest score category in the tool and is equal to the Melbourne average metropolitan score of 72. The equivalent walkability of the site will only increase once the rest of the Yarrabend development is completed, as this will add further retail, health and community facilities within a few hundred metres. The residential development is located within easy walking distance to multiple amenities, including food, retail, schools, parks etc. **Responsibility for implementation** Inherent to site location.
Access to Public Transport	☒SDAPP (inc. BESS) ☒Alphington park ESD Strategy ☒EnviroDevelopment	Transit Score to be used.	Locate development within walking distance of public transport.	The proposed development obtains a transit score of 51 - “Good Transit”. The residential development is located close to Heidelberg Road which has multiple bus stops. The site is also close to Alphington train station. **Responsibility for implementation** Inherent to site location.

2.7 Waste Management

2.7.1 Objectives

The objectives of the project with regards to waste management during both construction and operation of the building are to:

- Reduce the total amount of waste sent to landfill;
- Avoid the generation of waste (where possible) as the primary philosophy;
- Encourage waste reuse and recycling where waste avoidance is not feasible;
- Design the building (and its contents) for longevity and durability; and
- Implement good waste management practices throughout all phases.

2.7.2 Design Responses

Issue	Referenced tool / document	Assessment method description	Benchmarks description	Method for compliance and responsibility for implementation
Operational Waste – Convenience of Recycling	☒SDAPP (inc. BESS) ☒Alphington park ESD Strategy ☒EnviroDevelopment	BESS benchmarks to be used.	Recycling facilities are as conveniently located as those for general waste for the whole development.	The basement bin store includes general waste and co-mingled recycling bins. **Responsibility for implementation** Design phase: Building designer / Waste Management Consultant Implementation: Builder / Construction Waste subcontractor
Garden / Green Waste	☐SDAPP (inc. BESS) ☐Alphington park ESD Strategy ☒EnviroDevelopment	EnviroDevelopment benchmarks to be used.	Ensure that there are arrangements in place (e.g. contract with appropriate organisation, body corporate procedures or local government service) to provide collection and reuse of green waste for the whole development.	The developer has committed to ensure that arrangements are in place to provide collection and reuse of green waste. Design phase: Building designer / Waste Management Consultant Implementation: Builder / Construction Waste subcontractor **Responsibility for implementation** Design phase: Building designer / Waste Management Consultant Implementation: Builder / Construction Waste subcontractor

2.8 Urban Ecology

2.8.1 Objectives

The project aims to minimise impacts to or improve the local ecology, more specifically aiming to:

- Provide a socially coherent and community-based development;
- Control erosion and pollutants in runoff;
- Avoid localised emissions (e.g. light, noise pollution and ozone depleting substances); and
- Protect and enhance biodiversity.

2.8.2 Design response

Issue	Referenced tool / document	Assessment method description	Benchmarks description	Method for compliance and responsibility for implementation
Communal Spaces	☒SDAPP (inc. BESS) ☐Alphington park ESD Strategy ☐EnviroDevelopment	BESS benchmarks to be used.	Common spaces to be provided in the development for the benefit of the occupants.	Communal spaces in form on communal terrace and courtyards have been provide din the development for the benefit of the occupants. **Responsibility for implementation** Design phase: Building designer Implementation: Builder
Erosion Control	☐SDAPP (inc. BESS) ☐Alphington park ESD Strategy ☒EnviroDevelopment	EnviroDevelopment benchmarks to be used.	Plan, implement and maintain effective erosion and sediment control measures during construction and operation. As a minimum, these should exceed relevant legislative and regulatory requirements. Erosion control measures may include blankets, silt fences and drain filters to ensure top soil is not eroded to drains and creeks.	To be included in project brief **Responsibility for implementation** Design phase: Building designer Implementation: Builder
External Lighting	☐SDAPP (inc. BESS) ☐Alphington park ESD Strategy ☒EnviroDevelopment	EnviroDevelopment benchmarks to be used.	External lighting will be designed so that it is directed at the building and the ground and not directed to the sky or towards other properties for the whole development.	To be included in project brief. **Responsibility for implementation** Design phase: Electrical services design team Implementation: Builder / Electrical services subcontractor
Healthy and active communities	☐SDAPP (inc. BESS) ☐Alphington park ESD Strategy ☒EnviroDevelopment	EnviroDevelopment benchmarks to be used.	Ensure all dwellings have access to neighbourhood parks within 400m (or a five-minute walk) for a pocket park, and up to 800m (or a ten-minute walk) for playing fields.	Alphington Park is located within 400m from the project site, ensuring access to playing fields within 800m for all dwellings. Additionally, three primary open spaces are proposed within the Alphington Paper Mill master plan, and the Yarra River park to the south, thus ensuring access to neighbourhood parks within 400m.
Urban Ecology	☐SDAPP (inc. BESS) ☐Alphington park ESD Strategy ☒EnviroDevelopment	EnviroDevelopment benchmarks to be used.	More than 90% of all plant species introduced to the site for landscaping public spaces, or for landscaping private areas prior to sale are locally native. Plant selection should consider flora that provide a diverse range of food resources to fauna. Plant selection that provides resources for limited fauna types/species is to be avoided.	To be included in project brief **Responsibility for implementation** Design phase: Landscape architect Implementation: Builder

2.9 Building Materials

2.9.1 Objectives

The project aims to minimise the environmental impact of materials selection using an approach that considers the lifecycle implications in relation to the following issues:

- Embodied energy;
- Eco-preferred content;
- Environmental impacts during product manufacture;
- Toxicity (e.g. PCB's, cadmium, lead);
- Recycled content;
- Forestry practices; and
- Environmental recognition and certification (e.g. GECA materials & products, FSC timber, etc.).

Issue	Referenced tool / document	Assessment method description	Benchmarks description	Method for compliance and responsibility for implementation
Excluding unsustainable imported timber	☐SDAPP (inc. BESS) ☐Alphington park ESD Strategy ☒EnviroDevelopment	EnviroDevelopment benchmarks to be used	Supply all structural timber must be from a sustainable source which is Australian Forestry Standard (AFS) or Forestry Stewardship Council (FSC) certified.	Unsustainable timber exclusion to be included in project brief. Unsustainable timber imports excluded. Oregon, Western Red Cedar, Meranti, Luan, Teak, Merbau etc. not used on project unless FSC certified (or equivalent). **Responsibility for implementation** Design phase: Building designer Implementation: Builder
Recycled or plantation timber	☐SDAPP (inc. BESS) ☐Alphington park ESD Strategy ☒EnviroDevelopment	EnviroDevelopment benchmarks to be used	95% of all timber used on site will be either recycled or plantation timber.	Recycled or plantations timber to be included in project brief. **Responsibility for implementation** Design phase: Building designer Implementation: Builder
PVC	☐SDAPP (inc. BESS) ☒Alphington park ESD Strategy ☒EnviroDevelopment	EnviroDevelopment and Alphington Paper Mill Benchmarks to be used	PVC content is to be sourced from an ISO 14001 certified supplier.	To be included in project brief. **Responsibility for implementation** Design phase: Building designer Implementation: Builder
Roads	☐SDAPP (inc. BESS) ☐Alphington park ESD Strategy ☒EnviroDevelopment	EnviroDevelopment benchmarks to be used	Use recycled materials for base or sub-in 95% of constructed roads.	To be included in project brief. **Responsibility for implementation** Design phase: Building designer Implementation: Builder
Plasterboard	☐SDAPP (Inc. BESS) ☐Alphington park ESD Strategy ☒EnviroDevelopment	EnviroDevelopment benchmarks to be used	The building envelope must use plasterboard with >10% recycled gypsum	To be included in project brief. Responsibility for implementation Design phase: Building designer Implementation: Builder

3.0

Appendices

3.0 Appendices

Appendix A - Maximum TVOC Content Limits

Paints	
Product Type /Sub-Categories	**Max TVOC content (g/l of ready to use product)**
Walls and ceilings - interior gloss	75
Walls and ceilings - interior semi-gloss	16
Walls and ceilings - interior low sheen	16
Walls and ceilings - interior flat washable	16
Ceilings - interior flat	14
Trim - gloss, semi-gloss, satin, varnishes and wood stains	75
Timber and binding primers *	30
Latex primer for galvanized iron and zincalume	60
Interior latex undercoat	65
Interior sealer	65
One and two pack performance coatings for floors *	140
Any solvent-based coatings whose purpose is not covered in table	200
Maximum TVOC Content Limits for Paints, Varnishes and Protective Coatings *EU Directive	

Adhesive	
Product Type	**Max TVOC content (g/l of ready to use product)**
Indoor carpet adhesive	50
Carpet pad adhesive	50
Wood flooring and Laminate adhesive	100
Rubber flooring adhesive	60
Sub-floor adhesive	50
Ceramic tile adhesive	65
Cove base adhesive	50
Dry Wall & Panel adhesive	50
Multipurpose construction adhesive*	70
Structural glazing adhesive	100
Architectural sealants*	250
Maximum TVOC limits for Adhesives & Sealants *Sealants used to enhance the fire- and water-proofing properties are included	

Appendix B - Sample House Energy Ratings

Overview

House energy rating calculations were undertaken for a representative sample of apartments in the development to inform the BESS assessment.

Methodology

The apartments have been assessed using FirstRate5 Ver:5.2.11, second generation software approved by the National House Energy Rating Scheme (NatHERS). The software predicts annual heating and cooling loads that would be required to maintain predicated comfort levels within each space.

Building Fabric Performance

Building Element	Thermal Construction Detail
External Wall	Lightweight construction with R2.0 added insulation
External Roof	Slab construction or framed roof with R3.5 added insulation
Ceiling Areas Below Terraces	Slab construction with R2.0 added insulation
Elevated Floors	Slab construction with R2.0 added insulation
Whole Window System	Frame: Aluminium Glass: Double glazed clear Glazing systems performances: Sliding and fixed windows U-value: < 3.37, SHGC: 0.48 ± 5% Operable windows (awning windows assumed) U-value: < 3.54, SHGC: 0.44 ± 5% Fixed windows U-value: < 3.35, SHGC: 0.47 ± 5%

Thermal performance of window system is for total window system (glass + frame)

3.1.1 Summary Results

The following table summarises the assessment results for the apartment types tested.

Dwelling	Level	Heating (MJ/m^2)	Cooling (MJ/m^2)	Rating (Stars)
0.01	Lower + Upper Ground	89.6	4.6	6.9
0.04	Lower + Upper Ground	61.8	5.5	7.7
0.09	Lower + Upper Ground	114.3	5.8	6.1
0.07	Upper Ground	70.8	16.1	7.1
0.06	Upper Ground	100.8	6.3	6.5
2.03	2	122	15.5	5.7
3.11	3	68.2	8	7.4
5.04	5	101.3	9.9	6.4
1.13	1	93.7	11.8	6.6
4.04	4	83.3	9.9	6.9
4.06	4	83.1	10.7	6.9
5.01	5	72	20.2	6.9
0.10	Lower + Upper Ground	113.7	5.0	6.2
Average				**6.7**

Appendix C – BESS Assessment

The BESS assessment will be submitted online. The project number is C2D8FD00, please refer to the online submission for details.

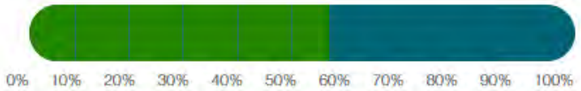
1 Latrobe Ave, Alphington 3078 Alphington

Site area: 3191 m² · Building Floor Area: 9091 m² ·
Date of Assessment: 18 Nov 2020 · Version: V5, 1.6.2-B.292 ·
Applicant: bess@cundall.com

Project Identifier
C2D8FD00
Published
http://bess.net.au/projects/C2D8FD00-V1

Your BESS score is

+ 55%



50% + Best Practice

70% + Excellence

% of Total	Category	Score	Pass
3 %	Management	62 %	
5 %	Water	57 %	✓
17 %	Energy	61 %	✓
14 %	Stormwater	100 %	✓
10 %	IEQ	63 %	✓
4 %	Transport	45 %	
2 %	Waste	33 %	
1 %	Urban Ecology	10 %	
0 %	Innovation	0 %	

BESS Report

This BESS report outlines the sustainable design commitments of the proposed development at 1 Latrobe Ave Alphington VIC 3078. 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 Yarra City Council.

Note that where a Sustainability Management Plan is required, the BESS report must be accompanied by a report that further demonstrates the development's potential to achieve the relevant environmental performance outcomes and documents the means by which the performance outcomes can be achieved.

1 Latrobe Ave, Alphington 3078 Alphington

Site area: 3191 m^2 · Building Floor Area: 9091 m^2 ·
Date of Assessment: 18 Nov 2020 ·
Version: V5, 1.6.2-B.292 ·
Applicant: bess@cundall.com

Project Identifier

C2D8FD00

Published
http://bess.net.au/projects/C2D8FD00-V1

Your BESS score is

+ 55%

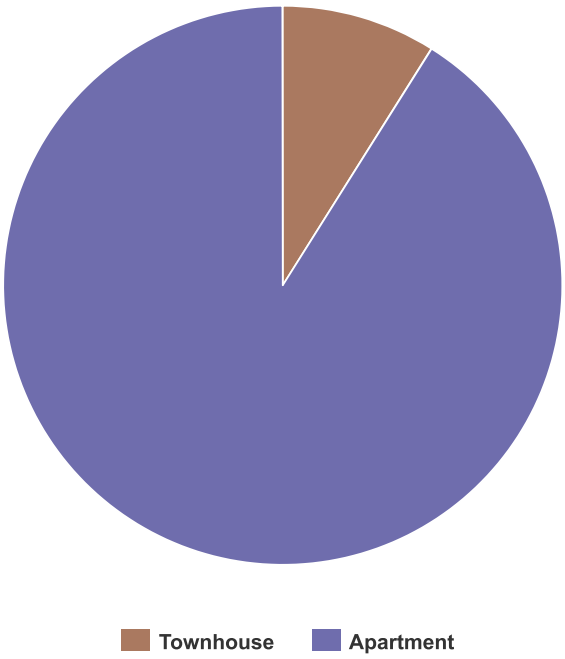
0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

50% + Best Practice

70% + Excellence

% of Total	Category	Score	Pass
3 %	Management	62 %	
5 %	Water	57 %	✔
17 %	Energy	61 %	✔
14 %	Stormwater	100 %	✔
10 %	IEQ	63 %	✔
4 %	Transport	45 %	
2 %	Waste	33 %	
1 %	Urban Ecology	10 %	
0 %	Innovation	0 %	

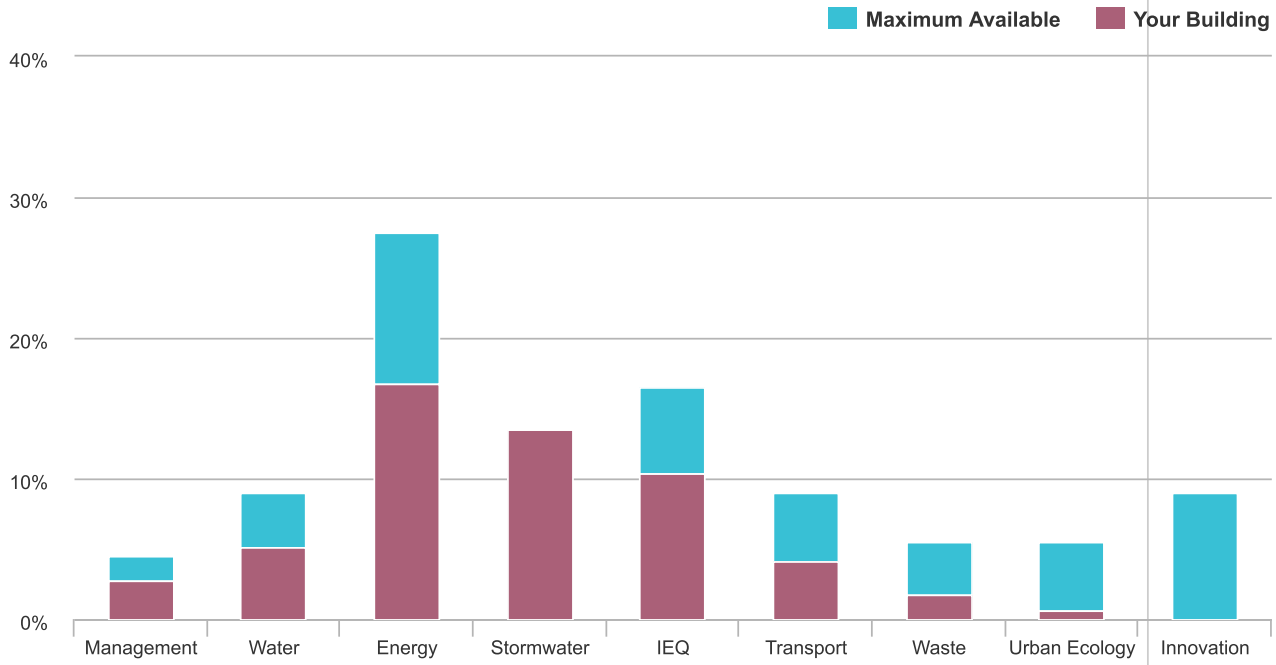
Building Composition



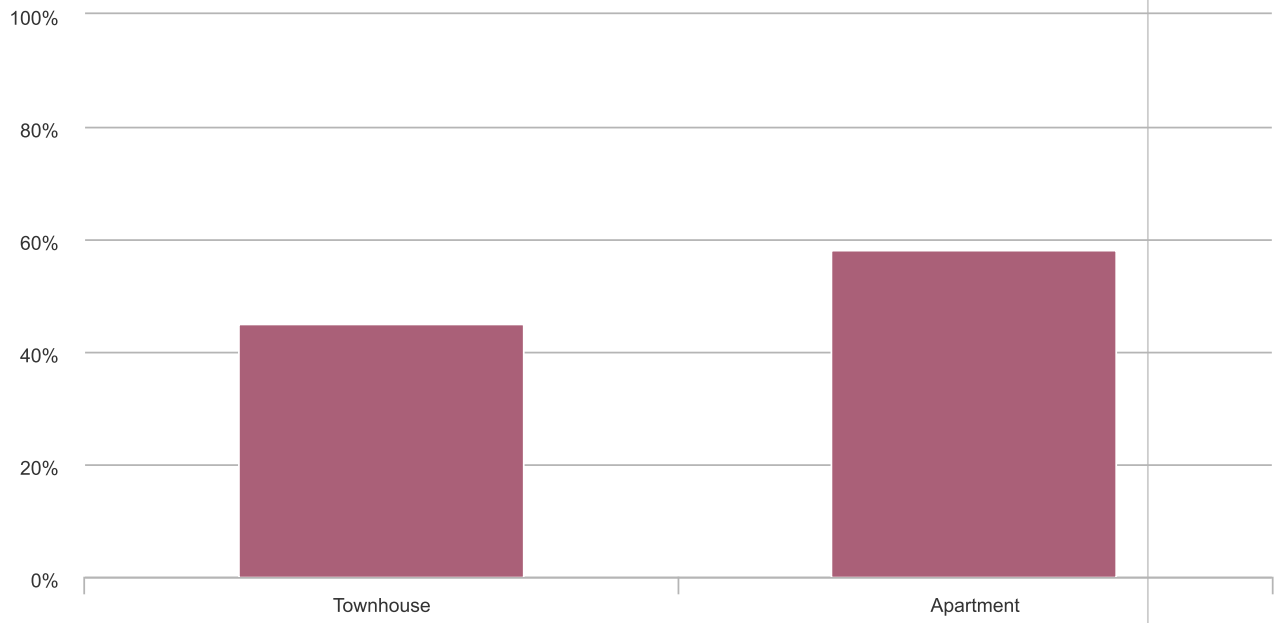
Dwellings

Type	Name	Quantity	Area
Townhouse	T1	3	100 m^2
Townhouse	T2	1	213 m^2
Townhouse	T3	3	100 m^2
Apartment	T4	5	73 m^2
Apartment	T5	20	80 m^2
Apartment	T6	7	135 m^2
Apartment	T7	21	80 m^2
Apartment	T8	15	68 m^2
Apartment	T9	10	87 m^2
Apartment	T10	8	107 m^2
Apartment	T11	5	110 m^2
Apartment	T12	2	123 m^2
Apartment	T13	1	146 m^2

How did this Development Perform in each Environmental Category?



How does each Dwelling or Non-Residential Space type perform?



Sustainable design commitments by category

The sustainable design commitments for this project are listed below. These are to be incorporated into the design documentation and subsequently implemented.

Management

62% - contributing 3% to overall score

Credit	Disabled	Scope cut	Score
Management 2.2 Thermal Performance Modelling - Multi-Dwelling Residential			100 %
Management 3.1 Metering			100 %
Management 3.3 Metering			100 %
Management 4.1 Building Users Guide			100 %

Management 2.2 Thermal Performance Modelling - Multi-Dwelling Residential

100%

Score Contribution	This credit contributes 25.6% towards this section's score.

Aim	To encourage and recognise developments that have used modelling to inform passive design at the early design stage

Questions

Have preliminary NatHERS ratings been undertaken for all thermally unique dwellings? *

Townhouse	Apartment
Yes	Yes

Management 3.1 Metering 100%

Score Contribution	This credit contributes 11.6% towards this section's score.
Aim	To provide building users with information that allows monitoring of energy and water consumption

Questions

Have utility meters been provided for all individual dwellings? *

Apartment
Yes

Management 3.3 Metering 100%

Score Contribution	This credit contributes 11.6% towards this section's score.
Aim	To provide building users with information that allows monitoring of energy and water consumption

Questions

Have all major common area services been separately submetered? *

Apartment
Yes

Management 4.1 Building Users Guide 100%

Score Contribution	This credit contributes 12.8% towards this section's score.
Aim	To encourage and recognise initiatives that will help building users to use the building efficiently

Questions

Will a building users guide be produced and issued to occupants? *

Project wide
Yes

Water

57% - contributing 5% to overall score

Credit	Disabled	Scoped out	Score
Water 1.1 Potable water use reduction			40 %
Water 3.1 Water Efficient Landscaping			100 %
Water 4.1 Building Systems Water Use Reduction			100 %

Water Approachs

What approach do you want to use Water?	Use the built in calculation tools
Do you have a reticulated third pipe or an on-site water recycling system?	No
Are you installing a swimming pool?	No
Are you installing a rainwater tank?	Yes

Water fixtures, fittings and connections

	T1	T2	T3
Showerhead	3 Star WELS (>= 6.0 but <= 7.5)	3 Star WELS (>= 6.0 but <= 7.5)	3 Star WELS (>= 6.0 but <= 7.5)
Bath	Scope out	Scope out	Scope out
Kitchen Taps	>= 5 Star WELS rating	>= 5 Star WELS rating	>= 5 Star WELS rating
Bathroom Taps	>= 5 Star WELS rating	>= 5 Star WELS rating	>= 5 Star WELS rating
Dishwashers	>= 4 Star WELS rating	>= 4 Star WELS rating	>= 4 Star WELS rating
WC	>= 4 Star WELS rating	>= 4 Star WELS rating	>= 4 Star WELS rating
Urinals	Scope out	Scope out	Scope out
Washing Machine Water Efficiency	Scope out	Scope out	Scope out
Which non-potable water source is the dwelling/space connected to?	BH East RWT	BH East RWT	BH West RWT
Non-potable water source connected to Toilets	Yes	Yes	Yes
Non-potable water source connected to Laundry (washing machine)	No	No	No

	T1	T2	T3
Non-potable water source connected to Hot Water System	No	No	No

	T4	T5	T6
Showerhead	3 Star WELS (>= 6.0 but <= 7.5)	3 Star WELS (>= 6.0 but <= 7.5)	3 Star WELS (>= 6.0 but <= 7.5)
Bath	Scope out	Scope out	Scope out
Kitchen Taps	>= 5 Star WELS rating	>= 5 Star WELS rating	>= 5 Star WELS rating
Bathroom Taps	>= 5 Star WELS rating	>= 5 Star WELS rating	>= 5 Star WELS rating
Dishwashers	>= 4 Star WELS rating	>= 4 Star WELS rating	>= 4 Star WELS rating
WC	>= 4 Star WELS rating	>= 4 Star WELS rating	>= 4 Star WELS rating
Urinals	Scope out	Scope out	Scope out
Washing Machine Water Efficiency	Scope out	Scope out	Scope out
Which non-potable water source is the dwelling/space connected to?	BH East RWT	BH East RWT	BH West RWT
Non-potable water source connected to Toilets	Yes	Yes	No
Non-potable water source connected to Laundry (washing machine)	No	No	No
Non-potable water source connected to Hot Water System	No	No	No

	T7	T8	T9
Showerhead	3 Star WELS (>= 6.0 but <= 7.5)	3 Star WELS (>= 6.0 but <= 7.5)	3 Star WELS (>= 6.0 but <= 7.5)
Bath	Scope out	Scope out	Scope out
Kitchen Taps	>= 5 Star WELS rating	>= 5 Star WELS rating	>= 5 Star WELS rating
Bathroom Taps	>= 5 Star WELS rating	>= 5 Star WELS rating	>= 5 Star WELS rating
Dishwashers	>= 4 Star WELS rating	>= 4 Star WELS rating	>= 4 Star WELS rating
WC	>= 4 Star WELS rating	>= 4 Star WELS rating	>= 4 Star WELS rating
Urinals	Scope out	Scope out	Scope out
Washing Machine Water Efficiency	Scope out	Scope out	Scope out
Which non-potable water source is the dwelling/space connected to?	BH West RWT	BH West RWT	BH East RWT
Non-potable water source connected to Toilets	No	Yes	Yes

	T7	T8	T9
Non-potable water source connected to Laundry (washing machine)	No	No	No
Non-potable water source connected to Hot Water System	No	No	No

	T10	T11	T12
Showerhead	3 Star WELS (>= 6.0 but <= 7.5)	3 Star WELS (>= 6.0 but <= 7.5)	3 Star WELS (>= 6.0 but <= 7.5)
Bath	Scope out	Scope out	Scope out
Kitchen Taps	>= 5 Star WELS rating	>= 5 Star WELS rating	>= 5 Star WELS rating
Bathroom Taps	>= 5 Star WELS rating	>= 5 Star WELS rating	>= 5 Star WELS rating
Dishwashers	>= 4 Star WELS rating	>= 4 Star WELS rating	>= 3 Star WELS rating
WC	>= 4 Star WELS rating	>= 4 Star WELS rating	>= 4 Star WELS rating
Urinals	Scope out	Scope out	Scope out
Washing Machine Water Efficiency	Scope out	Scope out	Scope out
Which non-potable water source is the dwelling/space connected to?	BH West RWT	BH West RWT	BH West RWT
Non-potable water source connected to Toilets	No	No	Yes
Non-potable water source connected to Laundry (washing machine)	No	No	No
Non-potable water source connected to Hot Water System	No	No	No

	T13
Showerhead	3 Star WELS (>= 6.0 but <= 7.5)
Bath	Scope out
Kitchen Taps	>= 5 Star WELS rating
Bathroom Taps	>= 5 Star WELS rating
Dishwashers	>= 4 Star WELS rating
WC	>= 4 Star WELS rating
Urinals	Scope out
Washing Machine Water Efficiency	Scope out
Which non-potable water source is the dwelling/space connected to?	BH East RWT
Non-potable water source connected to Toilets	Yes
Non-potable water source connected to Laundry (washing machine)	No

	T13
Non-potable water source connected to Hot Water System	No

Rainwater Tanks

	BH West RWT	BH East RWT
Name	BH West RWT	BH East RWT
What is the total roof area connected to the rainwater tank? Square Metres	1059.0	721.8
Tank Size Litres	30000.0	25000.0
Irrigation area connected to tank Square Metres	0.0	-

Water 1.1 Potable water use reduction 40%

Score Contribution	This credit contributes 71.4% towards this section's score.
Aim	Water 1.1 Potable water use reduction (interior uses) What is the reduction in total water use due to efficient fixtures, appliances, and rainwater use? To achieve points in this credit there must be >25% potable water reduction. You are using the built in calculation tools. This credit is calculated from information you have entered above.
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.

Calculations

Reference (kL) *

Project wide

11016

Proposed (excluding rainwater and recycled water use) (kL) *

Project wide

8431

Rainwater or recycled water supplied (Internal + External) (kL) *

Project wide

681

Proposed (including rainwater and recycled water use) (kL) *

Project wide

7750

% Reduction in Potable Water Consumption * Percentage %

Project wide

29 %

Water 3.1 Water Efficient Landscaping 100%

Score Contribution	This credit contributes 14.3% towards this section's score.
Aim	Are water efficiency principles used for landscaped areas? This includes low water use plant selection (e.g. xeriscaping). Note: food producing landscape areas and irrigation areas connected to rainwater or an alternative water source are excluded from this section.

Questions

Will water efficient landscaping be installed? *

Project wide
Yes

Water 4.1 Building Systems Water Use Reduction 100%

Score Contribution	This credit contributes 14.3% towards this section's score.
Aim	Will the project minimise water use for building systems such as evaporative cooling and fire testing systems?

Questions

Where applicable, have measures been taken to reduce potable water consumption by >80% in the buildings air-conditioning chillers and when testing fire safety systems? *

Project wide
Yes

Energy 61% - contributing 17% to overall score

Credit	Disabled	Scope cut	Score
Energy 1.2 Thermal Performance Rating - Residential			17 %
Energy 2.1 Greenhouse Gas Emissions			100 %
Energy 2.3 Electricity Consumption			100 %
Energy 2.4 Gas Consumption			100 %
Energy 2.5 Wood Consumption			N/A

Energy 3.1 Carpark Ventilation	100 %
Energy 3.2 Hot Water	100 %
Energy 3.3 External Lighting	100 %
Energy 3.5 Internal Lighting - Residential Single Dwelling	100 %
Energy 3.6 Internal Lighting - Residential Multiple Dwellings	100 %
Energy 4.2 Renewable Energy Systems - Solar	100 %

Dwellings Energy Approachs

What approach do you want to use for Energy?	Use the built in calculation tools
Are you installing a solar photovoltaic (PV) system?	Yes
Are you installing any other renewable energy system(s)?	No
Gas supplied into building	Natural Gas

Dwelling Energy Profiles

	T1	T2	T3
Below the floor is	Ground or Carpark	Ground or Carpark	Ground or Carpark
Above the ceiling is	Another Occupancy	Another Occupancy	Another Occupancy
Exposed sides	1	2	1
NatHERS Annual Energy Loads - Heat MJ/sqm	89.6	61.8	114.3
NatHERS Annual Energy Loads - Cool MJ/sqm	4.6	5.5	5.8
NatHERS star rating	6.9	7.7	6.1
Type of Heating System	D Reverse cycle space	D Reverse cycle space	D Reverse cycle space
Heating System Efficiency	3 Star	3 Star	3 Star
Type of Cooling System	Refrigerative space	Refrigerative space	Refrigerative space
Cooling System Efficiency	3 Stars	3 Stars	3 Stars
Type of Hot Water System	I Gas Instantaneous 5 star	I Gas Instantaneous 5 star	I Gas Instantaneous 5 star
Central Hot Water System	No	No	No
Clothes Line	A No drying facilities	A No drying facilities	A No drying facilities
Clothes Dryer	A No clothes dryer	A No clothes dryer	A No clothes dryer

	T4	T5	T6
Below the floor is	Another Occupancy	Another Occupancy	Another Occupancy
Above the ceiling is	Another Occupancy	Outside	Another Occupancy
Exposed sides	2	2	1
NatHERS Annual Energy Loads - Heat MJ/sqm	70.8	100.8	68.2

	T4	T5	T6
NatHERS Annual Energy Loads - Cool MJ/sqm	16.1	6.3	8.0
NatHERS star rating	7.1	6.5	7.4
Type of Heating System	D Reverse cycle space	D Reverse cycle space	D Reverse cycle space
Heating System Efficiency	3 Star	3 Star	3 Star
Type of Cooling System	Refrigerative space	Refrigerative space	Refrigerative space
Cooling System Efficiency	3 Stars	3 Stars	3 Stars
Type of Hot Water System	I Gas Instantaneous 5 star	I Gas Instantaneous 5 star	I Gas Instantaneous 5 star
Central Hot Water System	No	No	No
Clothes Line	A No drying facilities	A No drying facilities	A No drying facilities
Clothes Dryer	A No clothes dryer	A No clothes dryer	A No clothes dryer

	T7	T8	T9
Below the floor is	Another Occupancy	Another Occupancy	Another Occupancy
Above the ceiling is	Outside	Another Occupancy	Outside
Exposed sides	1	2	2
NatHERS Annual Energy Loads - Heat MJ/sqm	101.3	93.7	122.0
NatHERS Annual Energy Loads - Cool MJ/sqm	9.9	11.8	15.5
NatHERS star rating	6.4	6.6	5.7
Type of Heating System	D Reverse cycle space	D Reverse cycle space	D Reverse cycle space
Heating System Efficiency	3 Star	3 Star	3 Star
Type of Cooling System	Refrigerative space	Refrigerative space	Refrigerative space
Cooling System Efficiency	3 Stars	3 Stars	3 Stars
Type of Hot Water System	I Gas Instantaneous 5 star	I Gas Instantaneous 5 star	I Gas Instantaneous 5 star
Central Hot Water System	No	No	No
Clothes Line	A No drying facilities	A No drying facilities	A No drying facilities
Clothes Dryer	A No clothes dryer	A No clothes dryer	A No clothes dryer

	T10	T11	T12
Below the floor is	Ground or Carpark	Another Occupancy	Ground or Carpark
Above the ceiling is	Another Occupancy	Outside	Outside
Exposed sides	1	3	1
NatHERS Annual Energy Loads - Heat MJ/sqm	83.3	83.1	72.0
NatHERS Annual Energy Loads - Cool MJ/sqm	9.9	10.7	20.2

	T10	T11	T12
NatHERS star rating	6.9	6.9	6.9
Type of Heating System	D Reverse cycle space	D Reverse cycle space	D Reverse cycle space
Heating System Efficiency	3 Star	3 Star	3 Star
Type of Cooling System	Refrigerative space	Refrigerative space	Refrigerative space
Cooling System Efficiency	3 Stars	3 Stars	3 Stars
Type of Hot Water System	I Gas Instantaneous 5 star	I Gas Instantaneous 5 star	I Gas Instantaneous 5 star
Central Hot Water System	No	No	No
Clothes Line	A No drying facilities	A No drying facilities	A No drying facilities
Clothes Dryer	A No clothes dryer	A No clothes dryer	A No clothes dryer

		T13
Below the floor is		Another Occupancy
Above the ceiling is		Another Occupancy
Exposed sides		3
NatHERS Annual Energy Loads - Heat	MJ/sqm	113.7
NatHERS Annual Energy Loads - Cool	MJ/sqm	5.0
NatHERS star rating		6.2
Type of Heating System		D Reverse cycle space
Heating System Efficiency		3 Star
Type of Cooling System		Refrigerative space
Cooling System Efficiency		3 Stars
Type of Hot Water System		I Gas Instantaneous 5 star
Central Hot Water System		No
Clothes Line		A No drying facilities
Clothes Dryer		A No clothes dryer

Solar Photovoltaic systems

		Solar PV
Name		Solar PV
System Size (lesser of inverter and panel capacity)	kW peak	20.0
Orientation (which way is the system facing)?		North
Inclination (angle from horizontal)	Angle (degrees)	10.0
Which Building Class does this apply to?		Apartment

Energy 1.2 Thermal Performance Rating - Residential 17%

Score Contribution	This credit contributes 28.5% towards this section's score.
Aim	Reduce reliance on mechanical systems to achieve thermal comfort in summer and winter - improving comfort, reducing greenhouse gas emissions, energy consumption, and maintenance costs.
Criteria	What is the average NatHERS rating?

Calculations

Average NATHERS Rating (Weighted) * Stars

Townhouse	Apartment
6.8	6.6

Energy 2.1 Greenhouse Gas Emissions 100%

Score Contribution	This credit contributes 9.5% towards this section's score.
Aim	Reduce the building's greenhouse gas emissions
Criteria	What is the % reduction in annual greenhouse gas emissions against the benchmark?

Calculations

Reference Building with Reference Services (BCA only) * kg CO2

Townhouse	Apartment
45850.2	484124.4

Proposed Building with Proposed Services (Actual Building) * kg CO2

Townhouse	Apartment
16924.0	192912.9

% Reduction in GHG Emissions * Percentage %

Townhouse	Apartment
63 %	60 %

Energy 2.3 Electricity Consumption 100%

Score Contribution	This credit contributes 9.5% towards this section's score.
Aim	Reduce consumption of electricity
Criteria	What is the % reduction in annual electricity consumption against the benchmark?

Calculations

Reference * kWh

Townhouse	Apartment
40287.5	416950.9

Proposed * kWh

Townhouse	Apartment
13510.0	153501.2

Improvement * Percentage %

Townhouse	Apartment
66 %	63 %

Energy 2.4 Gas Consumption

100%

Score Contribution	This credit contributes 9.5% towards this section's score.
Aim	Reduce consumption of gas
Criteria	What is the % reduction in annual gas consumption against the benchmark?

Calculations

Reference * MJ

Townhouse	Apartment
92546.4	1144640.7

Proposed * MJ

Townhouse	Apartment
61162.0	707036.3

Improvement * Percentage %

Townhouse	Apartment
33 %	38 %

Energy 2.5 Wood Consumption

N/A

This credit was scoped out: No reason provided

Aim	Reduce consumption of wood
Criteria	What is the % reduction in annual wood consumption against the benchmark?

Energy 3.1 Carpark Ventilation

100%

Score Contribution	This credit contributes 9.5% towards this section's score.

Questions

If you have an enclosed carpark, is it: (a) fully naturally ventilated (no mechanical ventilation system) or (b) 40 car spaces or less with Carbon Monoxide monitoring to control the operation and speed of the ventilation fans? *

Project wide
Yes

Energy 3.2 Hot Water 100%

Score Contribution	This credit contributes 4.7% towards this section's score.
Criteria	What is the % reduction in annual hot water system energy use (gas and electricity) against the benchmark?

Calculations

Reference * kWh

Townhouse	Apartment
25707.3	317955.7

Proposed * kWh

Townhouse	Apartment
17400.4	201832.1

Improvement * Percentage %

Townhouse	Apartment
32 %	36 %

Energy 3.3 External Lighting 100%

Score Contribution	This credit contributes 0.4% towards this section's score.

Questions

Is the external lighting controlled by a motion detector? *

Townhouse
Yes

Energy 3.5 Internal Lighting - Residential Single Dwelling 100%

Score Contribution	This credit contributes 0.4% towards this section's score.
Aim	Reduce energy consumption associated with internal lighting

Questions

Does the development achieve a maximum illumination power density of 4W/sqm or less? *

Townhouse
Yes

Energy 3.6 Internal Lighting - Residential Multiple Dwellings 100%

Score Contribution	This credit contributes 8.6% towards this section's score.
Aim	Reduce energy consumption associated with internal lighting

Questions

Is the maximum illumination power density (W/m2) in at least 90% of the relevant building class at least 20% lower than required by Table J6.2a of the NCC 2019 Vol 1 (Class 2-9) and Clause 3.12.5.5 NCC 2019 Vol 2 (Class 1 & 10)? *

Apartment
Yes

Energy 4.2 Renewable Energy Systems - Solar 100%

Score Contribution	This credit contributes 4.3% towards this section's score.
Aim	To encourage the installation of on-site renewable energy generation
Criteria	Does the solar power system provide 5% of the estimated energy consumption of the building class it supplies?

Calculations

Solar Power - Energy Generation per year * kWh

Apartment
24236.7

% of Building's Energy * Percentage %

Apartment
6 %

Stormwater

100% - contributing 14% to overall score

Credit	Disabled	Score
Stormwater 1.1 Stormwater Treatment		100 %

Which stormwater modelling are you using?	Melbourne Water STORM tool

Stormwater 1.1 Stormwater Treatment

100%

Score Contribution	This credit contributes 100.0% towards this section's score.
Aim	To achieve best practice stormwater quality objectives through reduction of pollutant load (suspended solids, nitrogen and phosphorus)
Criteria	Has best practice stormwater management been demonstrated?

Questions

STORM score achieved *

Project wide
100

Calculations

Min STORM Score *

Project wide
100

IEQ

63% - contributing 10% to overall score

Credit	Disabled	Score
IEQ 1.1 Daylight Access - Living Areas		67 %
IEQ 1.2 Daylight Access - Bedrooms		67 %
IEQ 1.5 Daylight Access - Minimal Internal Bedrooms		100 %
IEQ 2.1 Effective Natural Ventilation		67 %
IEQ 3.1 Thermal comfort - Double Glazing		100 %

Use the BESS Deemed to Satisfy (DtS) method for IEQ?	No
Are all living areas and bedrooms less than 8m deep (6m if south facing)?	Yes

Do all living areas and bedrooms have a floor-to-ceiling height of at least 2.7m?	Yes
Does all glazing to living areas achieve at least 60% Visible Light Transmittance (VLT)?	Yes
Do all living areas have an external facing window (not into a courtyard, light well or other major obstruction)?	Yes
Does the building(s) comply with the requirements of the building separation tables?	Yes
What approach do you want to use for IEQ?	Use the built in calculation tools

Please provide the following room profiling information below.

	T1, 0.12	T1, 0.12	T1, 0.13
Name	0.12	0.12	0.13
Room Designation	Bedroom	Living	Bedroom
Quantity	1	1	1
Auto-Pass	No	No	No
Room Floor Area Square Metres	10.2	20.0	10.0
Vertical Angle Angle (degrees)	17.8	35.0	17.8
Horizontal Angle (degrees) Angle	89.0	89.0	89.0
Window Area Square Metres	2.7	8.7	2.7
Window Orientation	South	South	South
Glass Type	Green Single (VLT 0.69)	Green Single (VLT 0.69)	Green Single (VLT 0.69)

	T1, 0.13	T1, 0.14	T1, 0.14
Name	0.13	0.14	0.14
Room Designation	Living	Bedroom	Living
Quantity	1	2	1
Auto-Pass	No	No	No
Room Floor Area Square Metres	19.0	10.0	20.0
Vertical Angle Angle (degrees)	35.0	27.0	27.0
Horizontal Angle (degrees) Angle	89.0	89.0	89.0
Window Area Square Metres	7.5	2.7	12.0
Window Orientation	South-East	North	North
Glass Type	Green Single (VLT 0.69)	Green Single (VLT 0.69)	Green Single (VLT 0.69)

	T1, 0.07	T1, 0.07	T1, 0.02
Name	0.07	0.07	0.02
Room Designation	Bedroom	Living	Bedroom
Quantity	1	1	1
Auto-Pass	No	No	No

	T1, C.C7	T1, C.07	T1, 0.02
Room Floor Area Square Metres	10.0	19.0	10.0
Vertical Angle Angle (degrees)	32.0	32.0	35.0
Horizontal Angle Angle (degrees)	47.0	42.0	89.0
Window Area Square Metres	3.2	6.5	3.2
Window Orientation	South	South	West
Glass Type	Green Single (VLT 0.69)	Green Single (VLT 0.69)	Green Single (VLT 0.69)

	T1, C.C2	T1, 1.04	T1, 1.04
Name	0.02	1.04	1.04
Room Designation	Living	Bedroom	Living
Quantity	1	2	1
Auto-Pass	No	No	No
Room Floor Area Square Metres	18.0	10.0	21.0
Vertical Angle Angle (degrees)	35.0	90.0	33.0
Horizontal Angle Angle (degrees)	89.0	178.0	52.0
Window Area Square Metres	6.0	2.5	8.7
Window Orientation	West	East	North
Glass Type	Green Single (VLT 0.69)	Green Single (VLT 0.69)	Green Single (VLT 0.69)

	T1, 1.C2	T1, 1.02	T1, 1.08
Name	1.02	1.02	1.08
Room Designation	Bedroom	Living	Bedroom
Quantity	1	1	2
Auto-Pass	No	No	No
Room Floor Area Square Metres	10.0	17.0	10.0
Vertical Angle Angle (degrees)	90.0	47.0	90.0
Horizontal Angle Angle (degrees)	150.0	65.0	180.0
Window Area Square Metres	2.2	6.3	2.0
Window Orientation	North	North	South
Glass Type	Green Single (VLT 0.69)	Green Single (VLT 0.69)	Green Single (VLT 0.69)

	T1, 1.C8	T1, 2.1C	T1, 2.10
Name	1.08	2.10	2.10
Room Designation	Living	Bedroom	Living

	T1, 1.08	T1, 2.10	T1, 2.10
Quantity	1	1	1
Auto-Pass	No	No	No
Room Floor Area Square Metres	19.0	10.0	25.0
Vertical Angle Angle (degrees)	35.0	23.0	23.0
Horizontal Angle Angle (degrees)	90.0	178.0	47.0
Window Area Square Metres	8.0	2.9	7.2
Window Orientation	South	South	South
Glass Type	Green Single (VLT 0.69)	Green Single (VLT 0.69)	Green Single (VLT 0.69)

	T1, 2.14	T1, 2.14	T1, 2.06
Name	2.14	2.14	2.06
Room Designation	Bedroom	Living	Bedroom
Quantity	1	1	1
Auto-Pass	No	No	No
Room Floor Area Square Metres	9.5	18.6	9.0
Vertical Angle Angle (degrees)	29.0	29.0	21.0
Horizontal Angle Angle (degrees)	61.0	151.0	15.0
Window Area Square Metres	2.5	5.2	2.5
Window Orientation	West	West	East
Glass Type	Green Single (VLT 0.69)	Green Single (VLT 0.69)	Green Single (VLT 0.69)

	T1, 2.06	T1, 1.04	T1, 1.08
Name	2.06	1.04	1.08
Room Designation	Living	Bedroom	Bedroom
Quantity	1	1	1
Auto-Pass	No	No	No
Room Floor Area Square Metres	25.0	14.2	12.0
Vertical Angle Angle (degrees)	21.0	90.0	32.0
Horizontal Angle Angle (degrees)	68.0	170.0	18.0
Window Area Square Metres	7.0	2.5	3.0
Window Orientation	East	East	South
Glass Type	Green Single (VLT 0.69)	Green Single (VLT 0.69)	Green Single (VLT 0.69)

	T1, 2.10	T1, 2.02	T1, 2.02

	T1, 2.10	T1, 2.02	T1, 2.02
Name	2.10	2.02	2.02
Room Designation	Bedroom	Bedroom	Living
Quantity	1	1	1
Auto-Pass	No	No	No
Room Floor Area Square Metres	12.0	10.0	18.0
Vertical Angle Angle (degrees)	23.0	90.0	30.0
Horizontal Angle Angle (degrees)	25.0	180.0	77.0
Window Area Square Metres	2.5	3.0	7.0
Window Orientation	South	West	West
Glass Type	Green Single (VLT 0.69)	Green Single (VLT 0.69)	Green Single (VLT 0.69)

	T1, 1.02	T1, 4.12	T1, 4.12
Name	1.02	4.12	4.12
Room Designation	Bedroom	Bedroom	Living
Quantity	1	2	1
Auto-Pass	No	No	No
Room Floor Area Square Metres	10.0	11.0	14.5
Vertical Angle Angle (degrees)	47.0	80.0	80.0
Horizontal Angle Angle (degrees)	26.0	126.0	157.0
Window Area Square Metres	6.0	3.5	7.0
Window Orientation	North	West	West
Glass Type	Green Single (VLT 0.69)	Green Single (VLT 0.69)	Green Single (VLT 0.69)

	T1, 4.05	T1, 4.05	T1, 4.05
Name	4.05	4.05	4.05
Room Designation	Living	Bedroom	Bedroom
Quantity	1	1	1
Auto-Pass	No	No	No
Room Floor Area Square Metres	19.0	11.0	9.0
Vertical Angle Angle (degrees)	78.0	78.0	78.0
Horizontal Angle Angle (degrees)	60.0	136.0	180.0
Window Area Square Metres	7.6	2.5	2.5
Window Orientation	East	East	East

	T1, 4.05	T1, 4.05	T1, 4.05
Glass Type	Green Single (VLT 0.69)	Green Single (VLT 0.69)	Green Single (VLT 0.69)

	T1, 4.05	T1, 5.02	T1, 5.02
Name	4.05	5.02	5.02
Room Designation	Bedroom	Bedroom	Living
Quantity	1	2	1
Auto-Pass	No	No	No
Room Floor Area Square Metres	12.0	10.0	16.0
Vertical Angle Angle (degrees)	78.0	90.0	90.0
Horizontal Angle Angle (degrees)	27.0	180.0	71.0
Window Area Square Metres	1.6	3.7	6.9
Window Orientation	East	West	West
Glass Type	Green Single (VLT 0.69)	Green Single (VLT 0.69)	Green Single (VLT 0.69)

IEQ 1.1 Daylight Access - Living Areas 67%

Score Contribution	This credit contributes 26.1% towards this section's score.
Aim	To provide a high level of amenity and energy efficiency through design for natural light.
Criteria	What % of living areas achieve a daylight factor greater than 1%

Calculations

Calculated percentage * Percentage %

Apartment
80 %

IEQ 1.2 Daylight Access - Bedrooms 67%

Score Contribution	This credit contributes 26.1% towards this section's score.
Aim	To provide a high level of amenity and energy efficiency through design for natural light.
Criteria	What % of bedrooms achieve a daylight factor greater than 0.5%

Questions

Percentage Achieved ? * Percentage %

Apartment

55 %

Calculations

Calculated percentage * Percentage %

Apartment

84 %

IEQ 1.5 Daylight Access - Minimal Internal Bedrooms 100%

Score Contribution	This credit contributes 8.7% towards this section's score.
Aim	To provide a high level of amenity and energy efficiency through design for natural light and ventilation.

Questions

Do at least 90% of dwellings have an external window in all bedrooms? *

Apartment

Yes

IEQ 2.1 Effective Natural Ventilation 67%

Score Contribution	This credit contributes 26.1% towards this section's score.
Aim	To provide fresh air and passive cooling opportunities.
Criteria	What % of dwellings are effectively naturally ventilated?

Questions

% Achieved ? *

Apartment

60 %

IEQ 3.1 Thermal comfort - Double Glazing 100%

Score Contribution	This credit contributes 1.7% towards this section's score.
Aim	To provide comfortable indoor spaces and reduce energy needed for heating and cooling

Questions

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

Townhouse
Yes

Transport

45% - contributing 4% to overall score

Credit	Disabled	Scoped out	Score
Transport 1.1 Bicycle Parking - Residential			100 %
Transport 1.2 Bicycle Parking - Residential Visitor			100 %

Transport 1.1 Bicycle Parking - Residential

100%

Score Contribution	This credit contributes 22.4% towards this section's score.
Aim	To encourage and recognise initiatives that facilitate cycling
Criteria	Is there at least one secure bicycle space per dwelling?

Questions

Bicycle Spaces Provided ? *

Townhouse	Apartment
9	95

Calculations

Min Bicycle Spaces Required *

Townhouse	Apartment
7	94

Transport 1.2 Bicycle Parking - Residential Visitor

100%

Score Contribution	This credit contributes 22.4% towards this section's score.
Aim	To encourage and recognise initiatives that facilitate cycling
Criteria	Is there at least one visitor bicycle space per 5 dwellings?

Questions

Visitor Bicycle Spaces Provided ? *

Townhouse	Apartment

2	19

Calculations

Min Visitor Bicycle Spaces Required *

Townhouse	Apartment
2	19

Waste

33% - contributing 2% to overall score

Credit	Disabled Scoped out Score
Waste 2.2 - Operational Waste - Convenience of Recycling	100 %

Waste 2.2 - Operational Waste - Convenience of Recycling

100%

Score Contribution	This credit contributes 33.3% towards this section's score.
Aim	To minimise recyclable material going to landfill

Questions

Are the recycling facilities at least as convenient for occupants as facilities for general waste? *

Project wide
Yes

Urban Ecology

10% - contributing 1% to overall score

Credit	Disabled Scoped out Score
Urban Ecology 1.1 Communal Spaces	100 %

Urban Ecology 1.1 Communal Spaces

100%

Score Contribution	This credit contributes 10.2% towards this section's score.
Aim	To encourage and recognise initiatives that facilitate interaction between building occupants

Criteria	Is there at least the following amount of common space measured in square meters : * 1m² for each of the first 50 occupants * Additional 0.5m² for each occupant between 51 and 250 * Additional 0.25m² for each occupant above 251?

Questions

Common space provided * Square Metres

Apartment
547.0

Calculations

Minimum Common Space Required * Square Metres

Apartment
127

Innovation

0% - contributing 0% to overall score

Items to be marked on floorplans

0 / 16 floorplans & elevation notes complete.

Management 3.1: Individual utility meters annotated	Incomplete
Management 3.3: Common area submeters annotated	Incomplete
Water 3.1: Water efficient garden annotated	Incomplete
Energy 3.1: Carpark with natural ventilation or CO monitoring system	Incomplete
Energy 3.3: External lighting sensors annotated	Incomplete
Energy 4.2: Floor plans showing location of photovoltaic panels as described.	Incomplete
Stormwater 1.1: Location of any stormwater management systems used in STORM or MUSIC modelling (e.g. Rainwater tanks, raingarden, buffer strips)	Incomplete
IEQ 1.1: If using BESS daylight calculator, references to floorplans and elevations showing window sizes and sky angles.	Incomplete
IEQ 1.2: If using BESS daylight calculator, references to floorplans and elevations showing window sizes and sky angles.	Incomplete

IEQ 1.5: Floor plans with compliant bedrooms marked	Incomplete
IEQ 2.1: Dwellings meeting the requirements for being 'naturally ventilated'	Incomplete
IEQ 3.1: Glazing specification to be annotated	Incomplete
Transport 1.1: All nominated residential bicycle parking spaces	Incomplete
Transport 1.2: All nominated residential visitor bicycle parking spaces	Incomplete
Waste 2.2: Location of recycling facilities	Incomplete
Urban Ecology 1.1: Size and location of communal spaces	Incomplete

Documents and evidence

0 / 11 supporting evidence documentation complete.

Management 2.2: Preliminary NatHERS assessments	Incomplete
Energy 3.1: Provide a written explanation of either the fully natural carpark ventilation or carbon monxide monitoring, describing how these systems will work, what systems are required for them to be fully integrated and who will be responsible for their implementation throughout the design, procurement and operational phases of the building life.	Incomplete
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.	Incomplete
Energy 3.6: 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.	Incomplete
Energy 4.2: Specifications of the solar photovoltaic system(s).	Incomplete
Stormwater 1.1: STORM report or MUSIC model	Incomplete
IEQ 1.1: If using an alternative daylight modelling program, a short report detailing assumptions used and results achieved.	Incomplete
IEQ 1.2: If using an alternative daylight modelling program, a short report detailing assumptions used and results achieved.	Incomplete
IEQ 1.5: A list of compliant bedrooms	Incomplete
IEQ 2.1: A list of naturally ventilated dwellings	Incomplete
IEQ 3.1: Reference to floor plans or energy modelling showing the glazing specification (U-value and Solar Heat Gain Coefficient, SHGC)	Incomplete

Appendix D – Water Sensitive Urban Design Response

Summary Overview

The City of Yarra Planning Scheme under clause 53.18 "Stormwater Management in Urban Development" requires the proposed development at Boiler House to demonstrate, as part of its town planning application, its ability to meet the water quality performance objectives as set out in the Urban Stormwater - Best Practice Environmental Management Guidelines, published by the Victorian Stormwater Committee 1999 which outline the minimum quality of stormwater exiting the development.

In response to this, the Water Sensitive Urban Design Response proposed for this development has been assessed using Melbourne Water's STORM calculator.

Basis of Assessment

Alterations on the permeability of a site can cause changes to the volume, velocity and quality of stormwater drainage into creeks, rivers and other natural waterways. Clause 53.18 of the City of Yarra Planning Scheme aims to achieve improved stormwater quality.

The policy is based on the best practice performance objectives outlined in the Urban Stormwater Best Practice Environmental Management Guidelines (CSIRO 1999).to achieve the objectives of the State Environment Protection Policy (Water of Victoria). These performance objectives are:

- Suspended solids- 80% retention of typical urban annual load
- Total Nitrogen – 45% retention of typical urban annual load
- Total Phosphorus – 45% retention of typical urban annual load
- Litter – 70% reduction of typical urban annual load.

The policy also aims to promote use of Water Sensitive Urban Design (WSUD) strategies as well as stormwater re-use; minimise peak stormwater flows and pollutants; and mitigate the detrimental effect of development on downstream waterways.

In accordance with the requirements outlined in Clause 22.16-4 the application must address the following:

- Site layout plan showing location of proposed stormwater treatment measures.
- Outline as to how the proposed stormwater treatment measures achieve the objectives of the WSUD policy.
- A Site Management Plan which details how the site will be managed through construction.
- A maintenance programme setting out future operational and maintenance arrangements.

Performance Measurement Tool

The WSUD Response proposed for this development has been assessed using the industry accepted measurement tool Stormwater Treatment Objective – Relative Measure (STORM) Calculator developed by Melbourne Water.

The STORM Calculator helps define the treatment type and size that is required to meet the nominated Best Practice targets, using the following potential WSUD treatment measures:

- Rainwater tanks
- Wetlands
- Infiltration systems
- Swales
- Ponds
- Rain gardens
- Buffers

Proposed Stormwater Treatment

The following treatment proposed for the Boiler House residential development meet the objectives of Clause 22.23:

Boiler house West

Impervious Area Names	Impervious Area (m^2)	Treatment	Treatment size	Number of bedrooms
Catchment Area	1,000	Rainwater tank (to toilets)	30,000 L	80
POS connected to raingarden	59	Raingarden (300mm deep)	5	
Untreated Impervious area	715	None	-	-
Permeable area (planter boxes)	150	None	-	-
Total Site Area	1924.0	STORM Rating	100%	

Boiler house East

Impervious Area Names	Impervious Area (m^2)	Treatment	Treatment size	Number of bedrooms
Catchment Area	721	Rainwater tank (to toilets)	25,000 L	50
Untreated Impervious area	499	None	-	-
Permeable area (planter boxes)	0	None	-	-
Total Site Area	1220	**STORM Rating**	**100%**	

Exposed planter boxes are considered to be permeable for the purpose of STORM assessment. For Boiler house West courtyard, it has been assumed that 150 m2 of the area will be permeable landscaped areas. See note for STORM mark-up on the next page. Rainwater tanks will be used for toilet flushing in all dwellings till level 2.

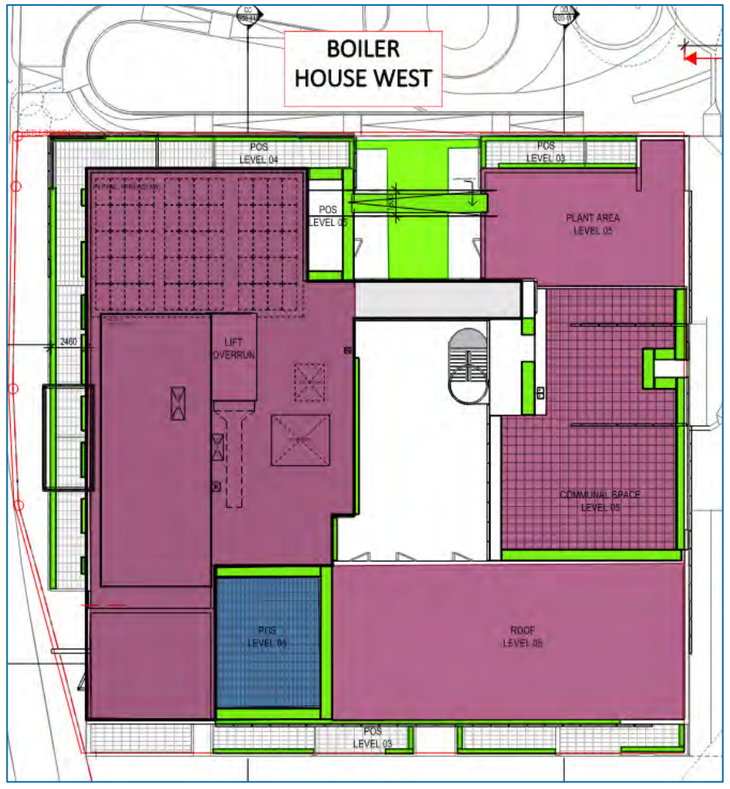
The proposed treatment achieves **100%** in the STORM calculator, thus achieving the objectives of the clause. Treatments and collection areas proposed as part of the WSUD response are included in figures below. The final sizing and detailing of systems will be agreed with the civil engineer and hydraulic engineer.

*Note: The proposed rainwater tank(s) will be used to meet toilet flushing demand. Rainwater tank(s) capacity and extent of toilet flushing to be confirmed based on water balance calculations during detailed design.

Melbourne Water STORM Rating Report

TransactionID:	1054112
Municipality:	YARRA
Rainfall Station:	YARRA
Address:	1 LaTrobe Avenue Boiler House West Alphington VIC 3078
Assessor:	CUNDALL
Development Type:	Residential - Subdivision
Allotment Site (m2):	1,924.00
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 A - Treated	1,000.00	Rainwater Tank	30,000.00	80	170.00	82.00
Impermeable Areas	715.00	None	0.00	0	0.00	0.00
POS Treatment	59.00	Raingarden 300mm	5.00	0	134.00	0.00



Melbourne Water STORM Rating Report

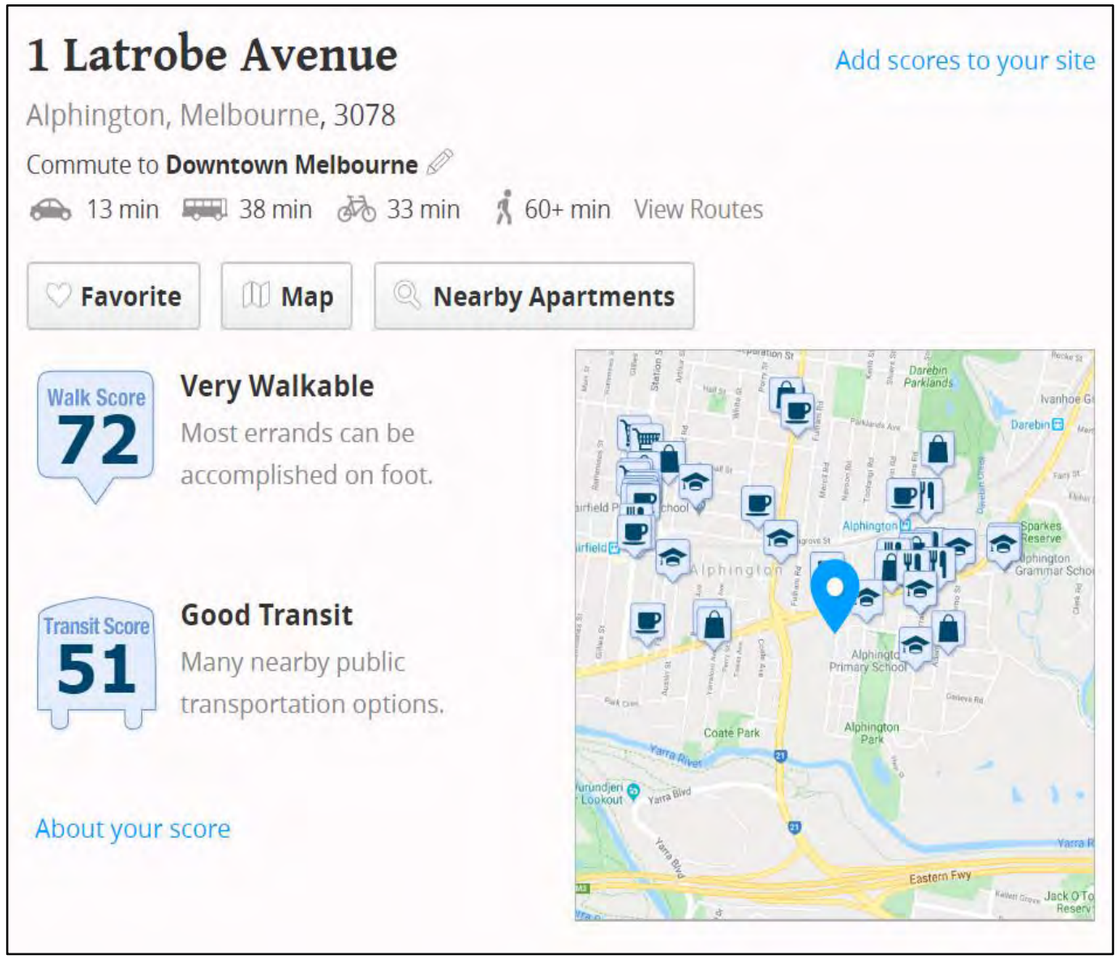
TransactionID:	1054788
Municipality:	YARRA
Rainfall Station:	YARRA
Address:	1 LaTrobe Avenue Boiler House East Alphington VIC 3078
Assessor:	CUNDALL
Development Type:	Residential - Subdivision
Allotment Site (m2):	1,220.00
STORM Rating %:	100

Description	Impervious Area (m2)	Treatment Type	Treatment Area/Volume (m2 or L)	Occupants / Number Of Bedrooms	Treatment %	Tank Water Supply Reliability (%)
Impermeable Area	499.00	None	0.00	0	0.00	0.00
Catchment Area	721.00	Rainwater Tank	25,000.00	50	170.00	82.00

Appendix E – Walkscore

Walkscore is an online tool which using algorithms to provide a site with points that are based on the number of amenities located nearby. Walkscore for any site can be found on www.walkscore.com. For an address, Walkscore provides a 'Walk Score' and 'Transit Score'. Walk score is based on analysing walking routes to nearby amenities. While, transit score is based on accessibility of the location through public transport. These scores are applicable to the site due to its location.

Images in this section show Walk and Transit Score applicable to the site and a description of those scores.



Transit Score®	Description
90–100	**Rider's Paradise** World-class public transportation.
70–89	**Excellent Transit** Transit is convenient for most trips.
50–69	**Good Transit** Many nearby public transportation options.
25–49	**Some Transit** A few nearby public transportation options.
0–24	**Minimal Transit** It is possible to get on a bus.

Walk Score®	Description
90–100	**Walker's Paradise** Daily errands do not require a car.
70–89	**Very Walkable** Most errands can be accomplished on foot.
50–69	**Somewhat Walkable** Some errands can be accomplished on foot.
25–49	**Car-Dependent** Most errands require a car.
0–24	**Car-Dependent** Almost all errands require a car.

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