ARUP

Cleanaway Operations Pty Ltd

Melbourne Energy and Resource Centre

Sustainability Management Plan

Reference: MERC-ARU-MEL-SAEM-RPT-0001

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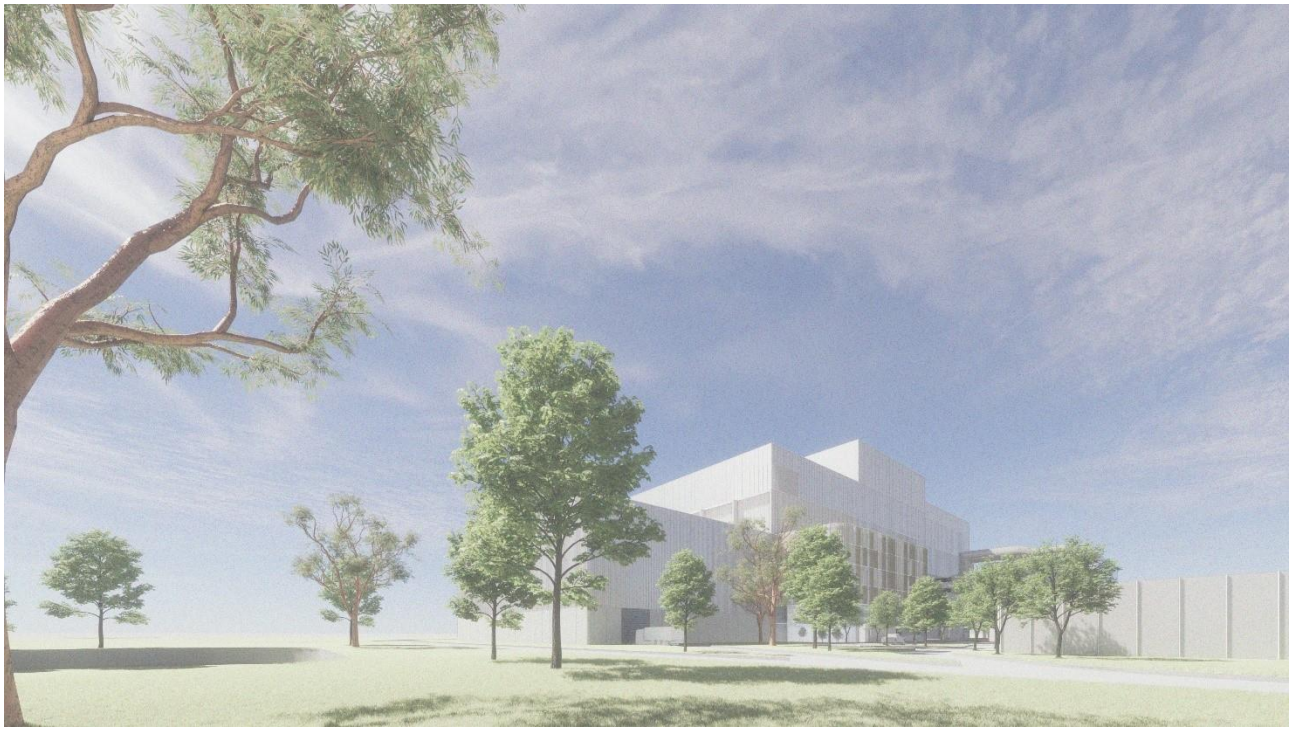

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Job number 287710-01

Arup Australia Pty Ltd | ABN 76 625 912 665

Arup Australia Pty Ltd
Sky Park One Melbourne Quarter
699 Collins Street
Docklands
VIC 3008
Australia
arup.com

ARUP

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			Prepared by	**Checked by**	**Approved by**
		Name	Autumn Qu	Jason Yang	Jenna Beckett
		Signature			
		Filename			
		Description			
			Prepared by	**Checked by**	**Approved by**
		Name			
		Signature			

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Abbreviations and glossary

Abbreviations	Definition
BCA	Building Code of Australia
BCS	Biodiversity Conservation Strategy
BESS	Built Environmental Sustainability Scorecard
CHMP	Cultural Heritage Management Plan
DF	Daylight Factor
EPA	Environment Protection Authority
FEED	Front-End-Engineering
IED	Industrial Emissions Directive
MERC	Melbourne Energy and Resource Centre
MSW	Municipal Solid Waste
MW	Megawatts
MUSIC	Model for Urban Stormwater Improvement Conceptualisation
NCC	National Construction Code
PSP	Precinct Structure Plan
PVC	Polyvinyl Chloride
SHGC	Solar Heat Gain Coefficient
SMP	Sustainability Management Plan
VOC	Volatile Organic Compounds
VLT	Visible Light Transmission
WtE	Waste-to-energy
WSUD	Water Sensitivity Urban Design
WWR	Window-to-Wall Ratio

1. Introduction

1.1 Overview

Cleanaway Operations Pty Ltd (Cleanaway) is an Australian waste management, recycling, and industrial services company. Cleanaway is developing a waste-to-energy (WtE) facility in Victoria known as the Melbourne Energy and Resource Centre (MERC) (the Proposal).

The MERC has been designed to thermally treat a design capacity of 380,000 tonnes per annum (tpa) of waste feedstock, consisting of residual Municipal Solid Waste (MSW) and residual commercial waste, which is waste that would otherwise be sent to landfill. Waste feedstock processed by the MERC will be subject to a Waste Acceptance Protocol to determine eligibility and suitability for processing both prior to arrival and upon arrival on-site. The Proposal will also incorporate maturation and processing of bottom ash to recover recyclable metals, with the intent to utilise the remaining ash as an aggregate in construction.

Residual waste is waste that is left over from recycling and resource recovery operations and waste from source separated collections. Source separation involves separating waste into common material streams or categories for separate collection. Waste processed at the site will be subject to a Waste Acceptance Protocol to ensure only appropriate waste is used as feedstock.

The WtE process would generate approximately 46.3MW gross of electricity, 4.7MW of which would be used to power the facility itself and the associated on-site by-product and residue handling processes, with 41.6MW (328,700 MWh/year) exported to the grid as base load electricity. In addition to supplying electricity to the grid, there is also potential to supply energy in the form of heat and/or process steam to local industrial users.

Some residual materials are produced because of the WtE process, including Incinerator Bottom Ash (IBA), boiler ash and flue gas treatment residue. The boiler ash and flue gas treatment residue are typically combined and together are referred to as Air Pollution Control residue (APCr). Overall, the WtE process typically leads to about 90% reduction in the volume, or 80% reduction in mass (tonnes), of waste that would otherwise go to landfill. If IBA is reused as an alternative construction product to virgin materials, this percentage increases further to approximately 95% reduction in volume and mass of waste that would otherwise go to landfill. The final volume of waste diverted from landfill is dependent on the classification and market for the residues and by-products generated by the WtE facility.

The Proposal includes the construction and operation of an IBA maturation and processing facility on site. The purpose of this facility is to store the IBA to mature (stabilise) it, before mechanically processing IBA from the WtE facility into an aggregate for reuse. As part of this process, both ferrous and non-ferrous metals will be recovered from the IBA for recycling and sale to market.

The Proposal also includes a stabilisation facility for APCr, a necessary treatment step to immobilise leachable components of the APCr prior to removal from site by vehicle and disposal at an appropriately licenced landfill.

The Proposal will use best available techniques and technologies in the engineering design, operation, maintenance and monitoring activities associated with the MERC. Moving grate technology has been chosen as the means to thermally treat incoming waste to recover energy and other resources. Current international best-practice techniques, including automated combustion controls and advanced flue gas treatment technology will be applied so that air emissions meet stringent emission standards. The moving grate combustion system is a common form of thermal WtE technology in which the waste is fed through the combustion chamber on a travelling grate. This enables efficient and complete combustion of the waste, with primary combustion air introduced from below the grate and secondary combustion air introduced directly into the combustion zone above the grate. Moving grate technology has been used globally for over 100 years, and in that time the technology has been subject to continual improvement responding to regulatory, industry and public demands. There are approximately 500 similar operational examples across Europe alone, the majority of which use the moving grate-type technology being proposed for the MERC.

The Proposal involves the building of all onsite infrastructure required to support the WtE facility, including site utilities, internal roads, weighbridges, parking and hardstand areas, stormwater infrastructure, fencing

and landscaping. The Proposal will also include a visitor and education centre to help educate and inform the community on the circular economy, recycling, resource recovery, the benefits of landfill diversion and the WtE process. The intent behind this education is to drive a shift in community thinking and actions around waste management.

The Victorian Waste to Energy Framework (2021) recognises the role of WtE to divert waste from landfills, helping Victoria transition to a circular economy. *Recycling Victoria* recognises a role for WtE investment and supports WtE facilities where they meet best-practice environment protection requirements. This includes reducing waste to landfill, supporting waste avoidance, reusing and recycling, and demonstrating social license with affected communities. The Victorian Environment Protection Authority (EPA) Energy from Waste Guideline (Publication 1559, 1 July 2017) also notes that efficient recovery of energy from the thermal processing of waste is considered a resource recovery as opposed to a waste disposal option.

The EPA VIC Guideline: Energy from Waste stipulates that *'Proponents of EfW proposals…will be expected to demonstrate that the siting, design, construction and operation of EfW facilities will incorporate best practice measures for the protection of the land, water and air environments as well as for energy efficiency and greenhouse gas emissions management. Facilities should be able to provide evidence of how they minimise and manage emissions (including pollutants, odour, dust, litter, noise and residual waste) in accordance with relevant statutory requirements.*'

The WtE facility has been designed to meet the European Industrial Emissions Directive (IED) (2010) and the associated Best Available Techniques Reference (BREF) Document for Waste Incineration published December 2019, which sets the European Union environmental standards for waste incineration. The facility will also comply with the technical criteria set out in the EPA Victoria Guideline: Energy from Waste publication 1559.1.

The purpose of this specialist assessment is to demonstrate compliance with the various authority requirements, develop community support and social license.

1.2 Purpose

This report provides an overview of the Sustainability Management Plan (SMP) for the MERC at 510 Summerhill Road Wollert, Victoria. The purpose of this Sustainability Management Plan is to demonstrate compliance with the various authority sustainability requirements including Whittlesea Planning Scheme, National Construction Code (NCC) and Built Environmental Sustainability Scorecard (BESS). The requirements can be summarised in Table 1:

Table 1: Compliance Requirements

Policies	Compliance Requirements
Whittlesea Planning Scheme (Clause 15.01-2L) For a non-residential building with a gross floor area of more than 1000 square metres, A Sustainability Management Plan (including an assessment using BESS STORM, Green Star, MUSIC or other methods) and a Green Travel Plan	– A Sustainability Management Plan to be prepared using BESS or Green Star – A Stormwater Management Plan to be provided using STROM or MUSIC to A Hydrology and Flood Risk Technical Report (Arup, 2022) has been prepared for the Proposal to demonstrate compliance. It is considered to overlap with the BESS stormwater category and is effectively targeted within the BESS rating and meets and exceeds the City of Whittlesea planning objectives. The MUSIC model results from the report demonstrates that MERC development has achieved 100% in the BESS category for Stormwater Treatment. – A Transport Impact Assessment has been prepared by Traffix Group to provide a detailed traffic engineering assessment of the traffic, vehicle access, loading and parking arrangements associated with the proposed development.
Supporting Assessments (as part of the BESS scorecard)	– Building's envelope thermal performance to exceed the minimum requirements in National Construction Code (NCC) Section J by at least 10%. – Daylight calculations to show that >33% of floor area can achieve the target daylight factor of 2%.

For the purposes of the Sustainability Management Plan, the focus is largely on the occupied areas (refer to Figure 1) of the development whilst opportunities for the whole site have also been reviewed for certain categories.

While the Minister for Planning is the responsible authority for deciding the application, the application will be assessed against the provisions of the Whittlesea Planning Scheme. Accordingly, an overview of the applicable requirements for the Proposal for City of Whittlesea has been outlined in Section 2 and are directly addressed within this report. The requirements are assessed against the current concept design for the Proposal.

It should be noted that the design work undertaken to date represents beginning of the design process and more details are to be developed at later stages. The project team has committed to achieving the targeted performance for the project and will provide the design details as design develops.

Overall, the design of the Proposal is considered to meet and exceed the NCC and BESS requirements and is committed to meeting the targets, as outlined within this report.

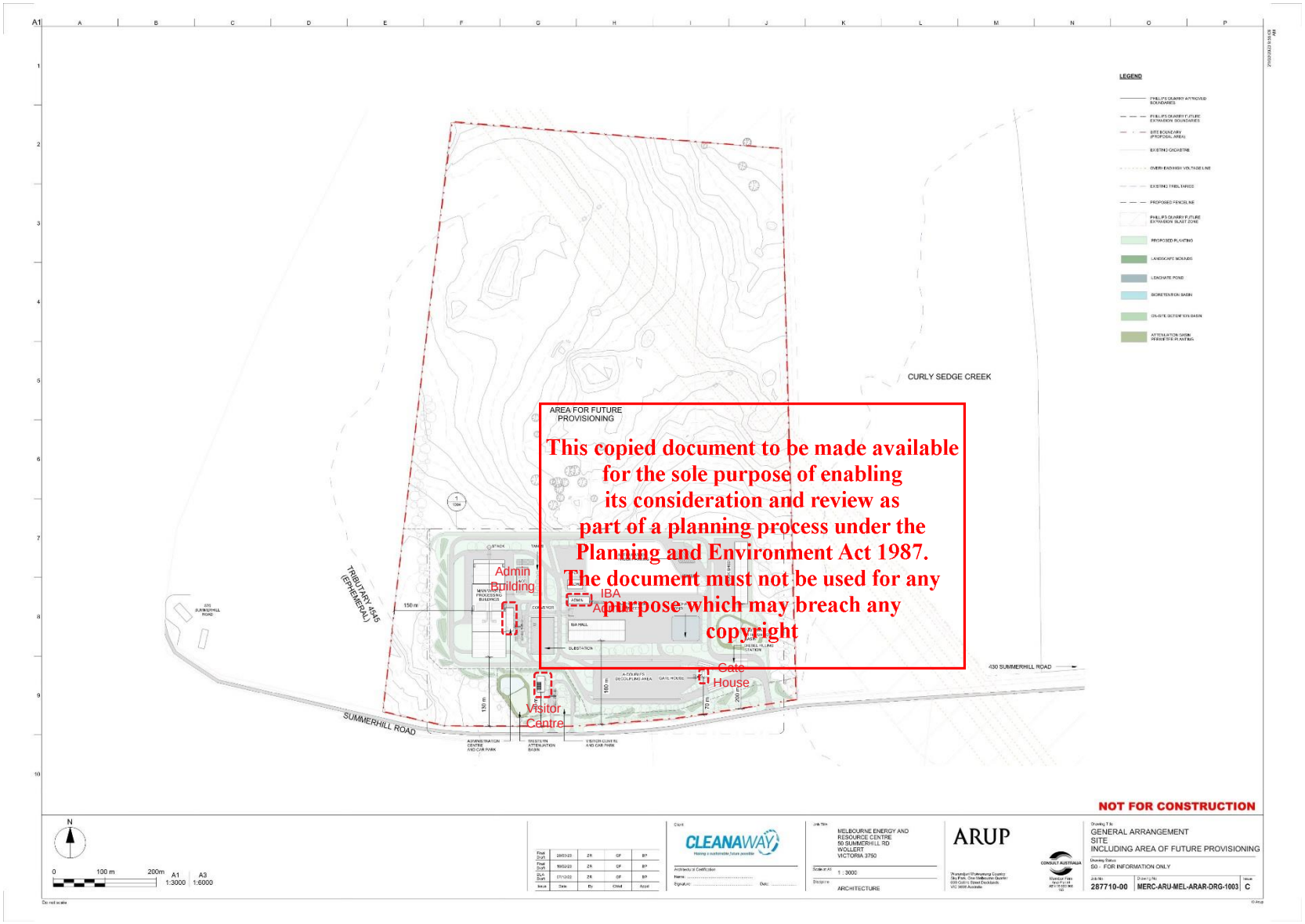


Figure 1: Melbourne Energy and Resource Centre (MERC) Occupiable Areas

1.3 Sustainability initiatives

Cleanaway's sustainability position for the Proposal has a strong focus on energy and waste. Cleanaway will also audit, verify and validate their performance using industry best practice.

1.3.1 Waste-to-energy

The WtE facility will be designed to thermally treat approximately 380,000 tonnes per annum of residual MSW and residual C&I waste streams, which would otherwise be disposed of to landfill. The MERC will generate approximately 45.5 megawatts (MW) of base load electricity, some of which will be used to power the facility itself, with the remaining power exported to the grid. In addition to supplying energy to the grid, there is also the potential to supply energy in the form of heat and steam to local industrial users, which will need to be investigated during the Front-End-Engineering Design (FEED) in Phase 2.

1.3.2 ISO 14001 Certification

This certification outlines the requirements for environmental management systems which can achieve an enhancement of environmental performance to achieve environmental objectives.

The MERC has adopted an environmental management system into all aspects of work as part of the independent certification of the facility to the requirements of ISO 14001 (certification for Environmental Management Systems), Health & Safety AS/NZS 4801 and Good Environmental Choice Australia (GECA). This demonstrates Cleanaway's commitment to achieving responsible environmental outcomes.

1.3.3 BESS

The Built Environment Sustainability Scorecard (BESS) is the dedicated tool in Victoria for assessing sustainable design at the planning permit stage. It is designed to assist development applicants and councils achieve sustainable design outcomes for the community. Cleanaway is committed to achieving 'Best Practice' using BESS to demonstrate sustainability initiatives across various categories. In addition to the overall score, the proposal is also committed to achieving minimum performance requirements for water, energy, stormwater, and indoor environment quality (IEQ) in accordance with BESS.

1.4 Site Context

The proposed development located at 510 Summerhill Road, Wollert, is within the Farming Zone (approximately 98.6% of the site), with the north-east corner covered by the Rural Conservation Zone (Figure 2).

- The low Walk Score for the site indicates that almost all arrivals and departures to and from the site will be made by vehicle (Figure 3). Given the remote location of the non-residential site and the low number of occupants, the low Walk Score has no significant impact on the Proposal
- The site is also located within the Melbourne Strategic Assessment (MSA) area, and any development will be subject to approval conditions in accordance with the Biodiversity Conservation Strategy (BCS) As shown in Figure 4, the surrounding land users include existing and future industrial, existing residential, future residential, future conservation and future public facilities (parkland, small retail etc.)
- A site visit, research and high-level analysis has informed the building positions and orientations within the Project area. The main WtE building is proposed to sit in a lower and relatively flatter southwestern section of the site. This position and orientation mitigates the height of the building and stack from the main access road, whilst also reducing the length of vehicle movement and the amount of time trucks will be present on the site.

Figure 2: Existing view of site looking east capturing the entry road, Summerhill Road

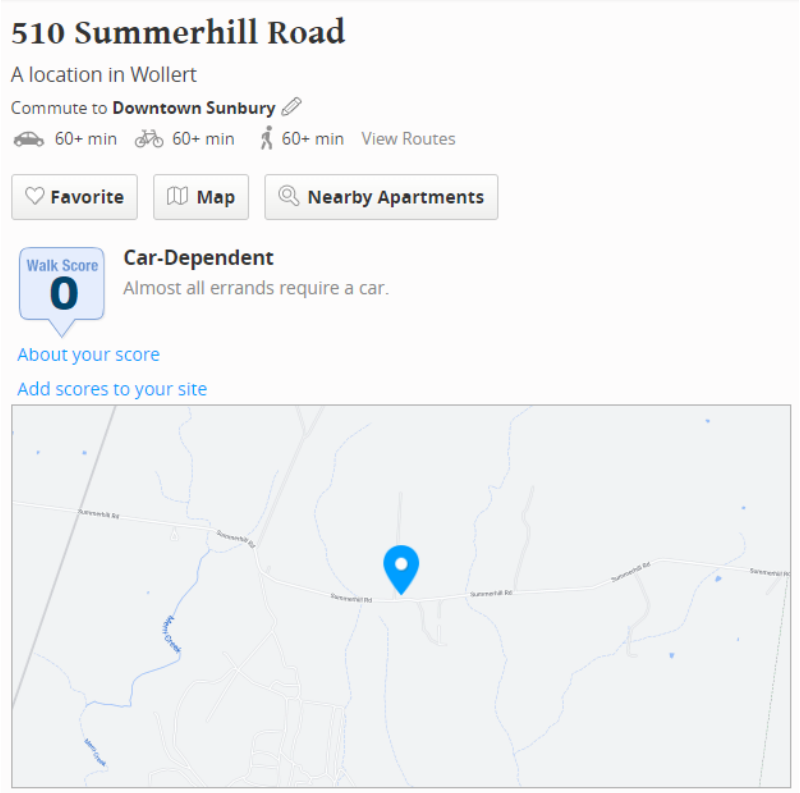


Figure 3: Site Walk Score

Figure 4: Map overview of site location

2. Policy Review

2.1 Whittlesea Planning Scheme

According to Section 15.01-2L from Whittlesea Planning Scheme, a Sustainability Management Plan (including an assessment using BESS, STORM, Green star, MUSIC or other methods) and a Green Travel Plan is required for a non-residential building with a gross floor area of more than 1,000 square meters.

2.2 BESS

The Built Environment Sustainability Scorecard (BESS) is the dedicated tool in Victoria for assessing sustainable design at the planning permit stage. It is designed to assist development applicants and councils achieve sustainable design outcomes for the community. The BESS tool has been adopted in this SMP to benchmark the sustainable design outcomes of this development.

The nine environmental categories that are assessed within the BESS tool are listed below including the mandatory pass scores for some categories. These categories are consistent with the environmental objectives in the Whittlesea Planning Scheme.

- Management
- Water (Mandatory Category Scores – 50 %)
- Energy (Mandatory Category Scores – 50 %)
- Stormwater (Mandatory Category Scores – 100 %)
- Indoor Environment Quality (IEQ) (Mandatory Category Scores – 50 %)
- Transport
- Waste
- Urban Ecology
- Innovation.

The overall BESS score is shown as a percentage, representing a percentage improvement over a benchmark project. The benchmark project is created from the project information that is input into BESS and is based on minimum National Construction Code and Minimum Energy Performance Standards.

The BESS overall score is determined by the category scores, factoring in the weighting of each category. A minimum score of 50% in BESS is required to satisfy the planning policy. This equates to a 'Best Practice' rating and included in this is the requirement to pass a minimum of 4 categories. 70% score is considered to represent 'Excellence'. A formal BESS report with more details is attached in Appendix A.3.

2.3 National Construction Code

The NCC Section J describes the minimum energy requirements for new buildings and major refurbishments in Australia and is also referenced in BESS.

The NCC Section J provisions were subject to a major upgrade in 2019 which came into force on 1 May 2020 and have been applied to this Proposal.

- In accordance with the BESS criteria in the energy category, MERC will need to demonstrate a minimum 10% improvement in required performance over the NCC 2019 Section J1.5 requirements for the windows and walls using the Section J DTS Method 2 provisions
- A 10% improvement in insulation levels over the NCC 2019 is targeted for the roofs and exposed floors in accordance with the BESS requirements.

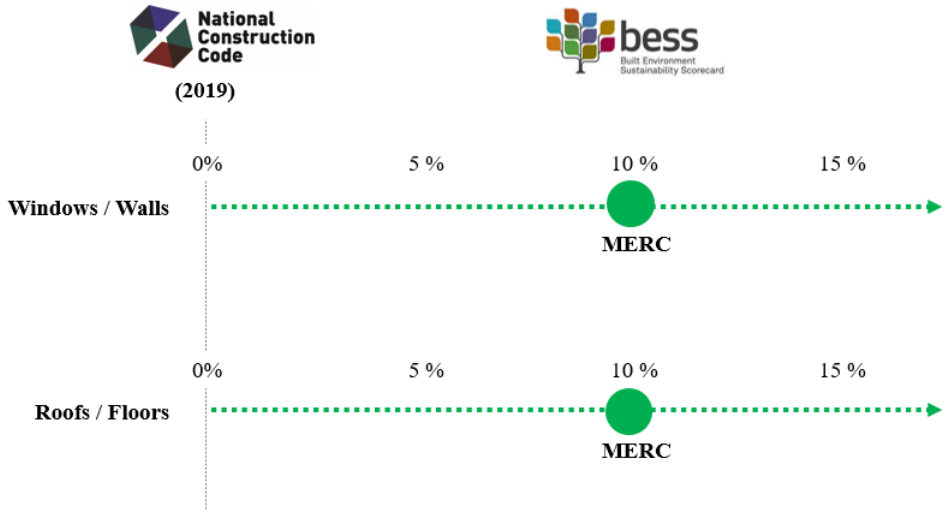


Figure 5: Improvement % over NCC 2019 in accordance with BESS Criteria

Ongoing design reviews for the above requirements have been documented in this SMP, but the design details will be subject to further iterations in later stages.

2.4 Supporting Plans

The Whittlesea Planning Scheme requires supporting information and plans as part of the Sustainability Management Plan.

2.4.1 Stormwater

The Whittlesea Planning Scheme requires stormwater management targets to be met in accordance with the BESS criteria using STORM or MUSIC modelling. According to BESS, a STORM rating of at least 100% or equivalent modelling results (e.g., MUSIC) need to be achieved.

A Hydrology and Flood Risk Technical Report (Arup, 2022) has been prepared for the Proposal to demonstrate compliance. It is considered to overlap with the BESS stormwater category and is effectively targeted within the BESS rating and meets and exceeds the City of Whittlesea planning objectives.

The MUSIC model results from the report demonstrates that MERC development has achieved 100% in the BESS category for Stormwater Treatment.

Please refer to Section 3.5 and the Hydrology and Flood Risk Technical Report (Arup, 2022) included in this planning submission for more details.

2.4.2 Transport

A Transport Impact Assessment has been prepared by Traffix Group to provide a detailed traffic engineering assessment of the traffic, vehicle access, loading and parking arrangements associated with the proposed development. Refer to the Transport Impact Assessment (Traffix Group, 2022) included in this planning submission for details.

3. Design Strategy

3.1 Strategy Overview

The MERC is committed to achieving a Best Practice BESS rating, requiring a minimum of 50% on the BESS Scorecard. For those sustainable design categories not included in BESS (Figure 6), the recommendations of the Whittlesea Planning Scheme are also directly addressed within this report.

	Indoor Environmental Quality	Energy	Water	Stormwater	Materials	Transport	Waste	Ecology	Innovation	Management
NatHERS		✓								
NABERS	✓	✓	✓				✓			
BESS	✓	✓	✓	✓		✓	✓	✓	✓	✓
STORM				✓						
MUSIC				✓						
Green Star	✓	✓	✓		✓	✓	✓	✓	✓	✓

Figure 6: Sustainable design categories for different assessment tools

It is considered that by pursuing these targets, including a range of innovative design features, the objectives stipulated in the Whittlesea Planning Scheme will be achieved. The BESS pathway presented in Section 3.2 to 3.11 outlines in further detail the design features and strategies that will be used to achieve this goal.

It should be noted that the specific BESS points that are targeted for the Proposal may change as design develops and construction documentation is provided. However, the Proposal is committed to the overall goal of the 'Best Practice' rating (>50%) and the mandatory scores for the energy, water, IEQ and stormwater categories as mentioned in Section 2.2.

3.2 Management

The Management category within BESS encourages the implementation of practices that support best practice outcomes throughout the different phases of planning, design, construction, commissioning and operation of a development. The following features are proposed based on best practice, current design direction and progress, and these are included in the current BESS scorecard. Some features are commitments only at this stage of design and will be included in the specification for the construction contractor to implement.

- **ESD (Environmental Sustainable Development) Professional –** Cleanaway has engaged ESD specialists at Arup to provide sustainability advice throughout the early stages of the design process
- **Thermal Performance Modelling and Glazing Assessment** – preliminary modelling has been undertaken in accordance with the Deemed to Satisfy pathway for NCC2019 Section J, highlighting the required glazing and wall performance on the basis of the glazing extents proposed. Please refer to Appendix A.2 for overview of study undertaken and ongoing design coordination
- **Building Tuning** – Cleanaway is committed to seasonal tuning of the principal building HVAC systems to be carried out for at least 12 months after completion of the Proposal
- **Metering** – Cleanaway is committed to providing utility meters for all individual commercial tenants (if any) and submetering of all major common area services. This will be included in the specification for construction contractor to implement

- **Building Users Guide** – Cleanaway is committed to providing a Building Users Guide to occupants to provide meaningful operations and maintenance information relevant to building users.

It is noted that this meets the City of Whittlesea's mandatory objectives and several of the best practice recommendations. If the above is implemented, then this will provide the project with a BESS Management Score of 87%.

87% BESS Management Score

3.3 Water

Water conservation is a critical element for sustainable buildings. It minimises the development's effects on droughts and water shortages, helps preserve the environment and protects against rising water costs. Water conservation is reflected to some degree in all standards and is compatible with many rating tools. The following features are commitments at current stage and will be included in the specification for construction contractor to implement.

- **Potable Water Use Reduction** – the Proposal will reduce water use (in comparison to a reference building) by >25%, through the use of efficient fixtures and fittings (within 1 Star of best available) and rainwater collection which will be made available for reuse in toilets and for irrigation purposes.

- **Efficient Fixtures and Fittings** – BESS refers to the Water Efficiency Labelling and Standards (WELS) for water fixtures and fittings, which is Australia's water saving scheme aiming at reducing demand for high quality drinkable water. The following targets for water fixtures are committed, contributing to a 57% for the BESS Water Category. The design changes will be reviewed against the overall reduction targets to ensure the reduction target is achieved.
  - Showerhead: 4 Star WELS
  - Kitchen Taps: 5 Star WELS
  - Bathroom: 5 Star WELS
  - Dishwashers: 4 Star WELS
  - WC: 4 Star WELS
  - Urinals: 6 Star WELS

- **Building Systems Water Use Reduction** – MERC is committed to reduce potable water consumption by >80% in the buildings air-conditioning chillers (if applicable) and when testing fire safety systems.

- **Water efficient landscaping** – All plants species selected are endemic to the area. It is not planned to provide irrigation to all the landscaped areas and it is recommended that the installation of plants are to be done during the cooler months from May to August. Irrigation will be proposed to screening areas and feature planting at the Visitor Centre using recycled wastewater generated by the facility. The irrigation method will be subsurface system due to the use of recycled water. Please refer to the Architecture and Landscape Design Strategy Report for more details

- **Rainwater Collection** – Multiple rainwater tanks to be sized to collect rainwater from the roof for use in the WtE process.

It is noted that this meets the mandatory requirement for a 50% score in this category whilst also meeting the City of Whittlesea's mandatory objectives and several of the best practice recommendations. If the above is implemented, then this will provide the project with a BESS Water Score of 57%.

57% BESS Water Score

3.4 Energy – Occupied Spaces

According to NCC 2019, Section J of Volume One is applicable to spaces with air-conditioning, but service maintaining specialised conditions for equipment or process is not considered as air-conditioning. Therefore, the main waste treatment plants are exempt from the requirements applicable to typical air-conditioning services of BCA regarding energy efficiency. The focus of this energy initiative is for occupied spaces including the Admin Building, IBA Admin, Gate House and Visitor and Education Centre. The following features are proposed and will be included as part of the development.

- **Greenhouse Gas Emissions –** several strategies can be implemented for the commitment to reduce the greenhouse gas emissions of the building, including:
  - High performance façades with double glazing to reduce cooling and heating energy consumption
  - Energy efficient lighting and smart controls, where the lighting system will consume at least 10% less energy than a standard practice building through use of motion sensors, daylight sensors, timers and LEDs
  - Ventilation and air-conditioning that meets high performance requirements by specifying energy efficient units that exceed business as usual requirements
  - Design to allow a generous space within the staircase to encourage the stairs to be used as often as possible. Wayfinding signage and point of decision prompts will be provided to occupants to use stairs over lifts.
- **Thermal Design –** The Proposal is committed to a minimum 10% reduction in energy use for heating and cooling compared to a reference case (the NCC 2019 Section J method 2). Design options to achieve the 10% reduction target have been proposed as part of the concept design coordination (Appendix A.2.7 to A.2.9). The specific performance requirements for building fabrics (e.g. glazing, walls, roofs and floors) will be provided as design progresses.
  - High performing glazing (details to be provided at later stage to achieve a minimum 10% improvement over a reference case using Section J method 2)
  - 10% improvement on insulation levels compared to NCC Section J 2019 requirements for roofs and exposed floors requiring R-values of at least 3.6 m^2.K/W for the roofs and 2.2 m^2.K/W for the exposed floors.
- **Efficient Systems –** the Proposal is committed to employ heating, cooling and water heating systems within one star of the most efficient equivalent capacity unit available, or not less than 85% of the most efficient unit available.

It is noted that this meets the mandatory requirement for a 50% score in this category whilst also meeting the City of Whittlesea's mandatory objectives and several of the best practice recommendations. If the above is implemented, then this will provide the project with a BESS Energy Score of 65%. Please refer to the Appendix AA.3 for overview of study undertaken.

65% BESS Energy Score

3.5 Stormwater

Stormwater collected on site can often pick up pollutants including litter, rubbish and chemicals, such as those leaking from cars or pesticides used in landscape maintenance. These can have environmental impacts if they make their way into the stormwater system as this is usually ejected into natural water systems. Treating the water before discharging to the drainage system is a simple step in reducing the site's wider environmental impact.

- **Stormwater Management** – Peak stormwater flows, up to and including the 10-year ARI (10% AEP) event will be equal to or lower than pre-development conditions. The on-site detention (OSD) basin has been sized to achieve these targets. Please refer to Hydrology and Flood Risk Technical Report for more details. The concept stormwater drainage design includes a minor network of inlet pits and pipes. The Proposal area drainage network has been split into two primary catchment areas consistent with the existing site conditions. The western portion of the site will drain to the proposed attenuation basin at the south-west of the site and the eastern portion of the site will drain to the proposed attenuation basin at the south-east of the site

- **Urban Stormwater Management Best Practice –** the project has demonstrated best practice Water Sensitive Urban Design (WSUD) through the use of MUSIC tool and the results are shown in Table 2. Please refer to the Hydrology and Flood Risk Technical Report (Arup, 2022) for more details.

Table 2: Summary of MUSIC model results

Pollutant	Source load (kg/yr)	Residual Load (kg/yr)	Reduction	Target Reduction	Target Achieved (Yes/No)
Total Suspended Solids	16300	1470	91.0%	80%	Yes
Total Phosphorus	25.7	13.1	49.0%	45%	Yes
Total Nitrogen	313	86.6	72.3%	45%	Yes
Gross Pollutants	3940	221	94.4%	70%	Yes

It is noted that this meets the mandatory requirement for a 100% score in this category whilst also meeting the Whittlesea Planning Scheme's mandatory objectives and several of the best practice recommendations.

100% BESS Stormwater Score

3.6 Indoor Environment Quality

We spend the majority of our time indoors so the quality of the indoor environment is crucial for our health and wellbeing. Where Indoor Environment Quality (IEQ) is addressed in other rating tools such as Green Star, there are a range of considerations that are taken into account, such as indoor air quality, acoustic comfort, lighting comfort, visual comfort, indoor pollutants and thermal comfort.

- **Daylight** – High levels of daylight (>2% Daylight Factor) have been calculated to be achieved to at least 33% of regular use areas (by floor area) of the development. Please refer to Appendix A for Daylight Assessment

- **Mechanical Ventilation** – the project is committed to increase outdoor air rates by 50% compared to the minimums required by AS1668:2012, and maintain CO_2 concentrations at 800ppm or less in the occupied spaces (e.g. Admin Building, IBA Admin, Gate House and Visitor and Education Centre)

- **Healthy Materials** – the project is committed to avoid materials which are toxic in manufacture and use, ensuring that >95% of paints, adhesives, sealants and carpets meet Green Star requirements for 'Total VOC Limits', and that >95% of all engineered wood products meet Green Star limits for formaldehyde. (See Green Star v1.3, credit 13 for specified limits).

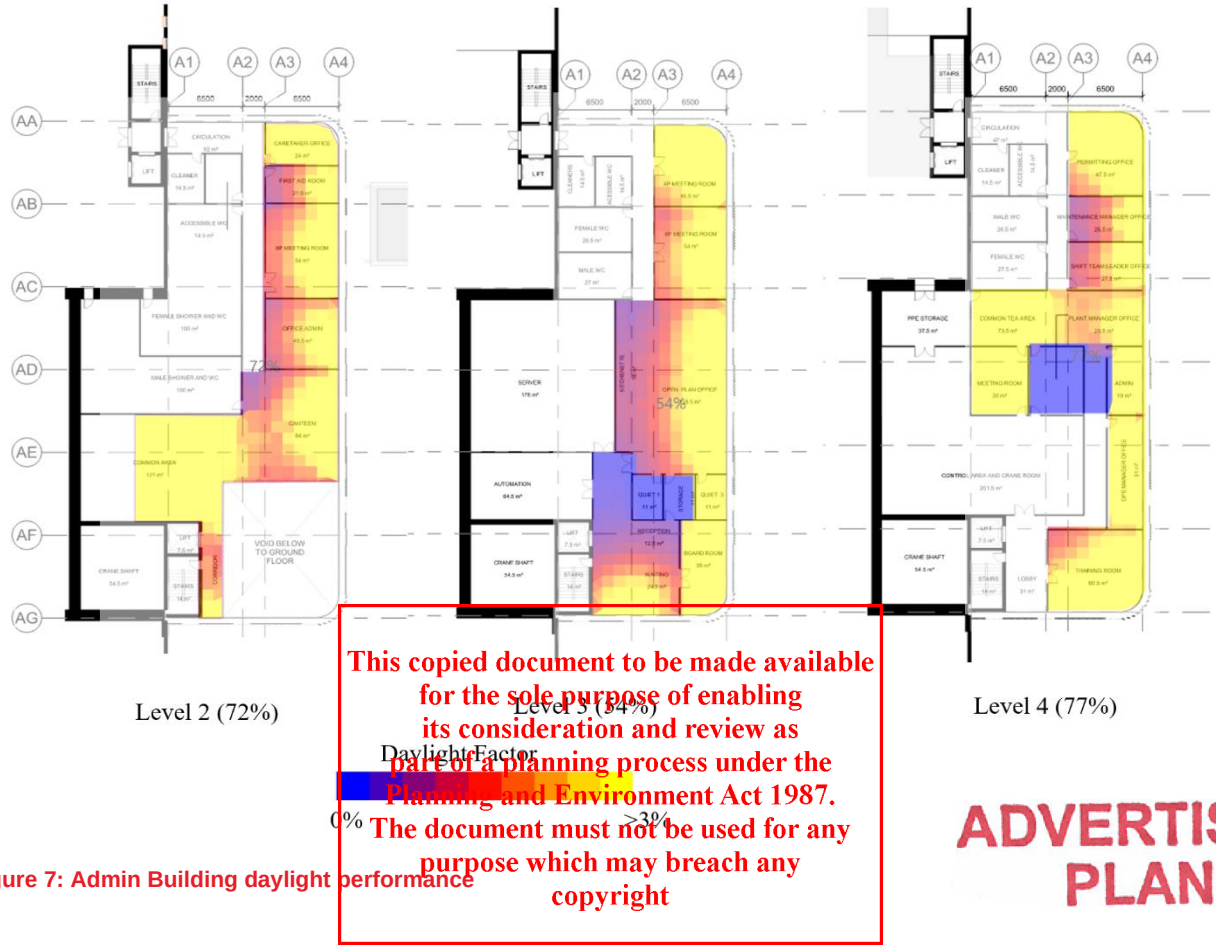


Figure 7: Admin Building daylight performance

76% BESS IEQ Score

3.7 Transport

Light passenger and commercial vehicles have been indicated to produce over 11% of Australia's greenhouse gas emissions. Provision of sustainable transport options is critical to the site as it facilitates the choice of convenient and sustainable transport options.

The following features are targeted:

- **Bicycle Parking –** Clause 52.34-5 of the Whittlesea Planning Scheme specifies the bicycle parking requirements for new developments. A 'waste-to-energy facility' land-use does not have a specified bicycle parking requirement under Clause 52.34-5 of the Whittlesea Planning Scheme. According to Section 10 of Transport Impact Assessment prepared by Traffix Group, there is no requirement for bicycle parking and given the site's location there is not expected to be any demand for bicycle parking. To meet BESS requirements, the project will include space for a minimum of 3 bicycle spaces (2 for employees and 1 for visitors) where there is no planning scheme requirement. As such, the development makes space allowance for bicycle parking and end-of-trip facilities that could be provided if external road conditions were upgraded in the future by Council to provide for suitable cycling access. Given the

area of bike storage (40.5 m^2) on the current floor plan (Figure 8), the requirements of minimum of three bicycle spaces can be easily achieved

- **End of Trip** – To meet the BESS requirements, the project is committed to providing at least one accessible shower and two secure lockers. Given the area of End of Trip (67.5m^2) on the current floor plan (Figure 8), the requirements of End of Trip facilities can be easily achieved.

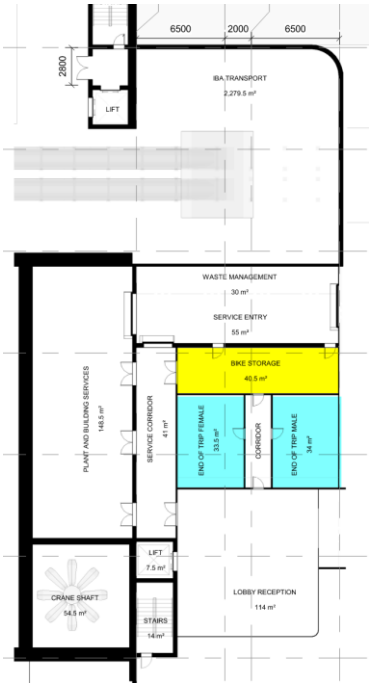


Figure 8: Admin Building - Bike Storage and End of Trip Area

- **Electric vehicle (EV) charging spaces** – As indicated on the ground floor plan (Table 9 and Table 10), the project will provide four EV charging stations in total (two at the Visitor and Education Centre carpark and two at the Admin Building carpark).

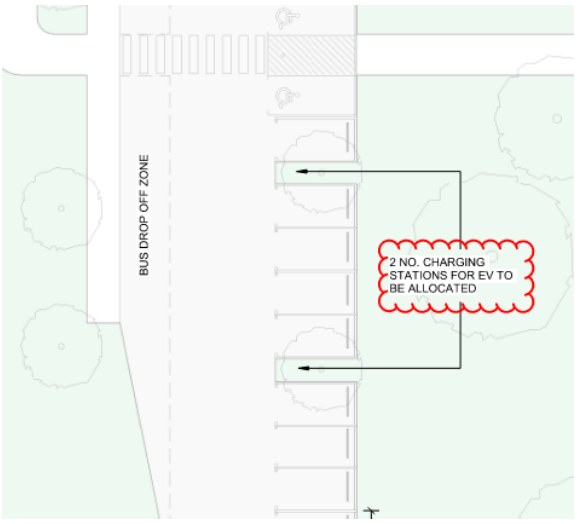


Figure 9: Visitor Centre Carpark- EV Charging Stations

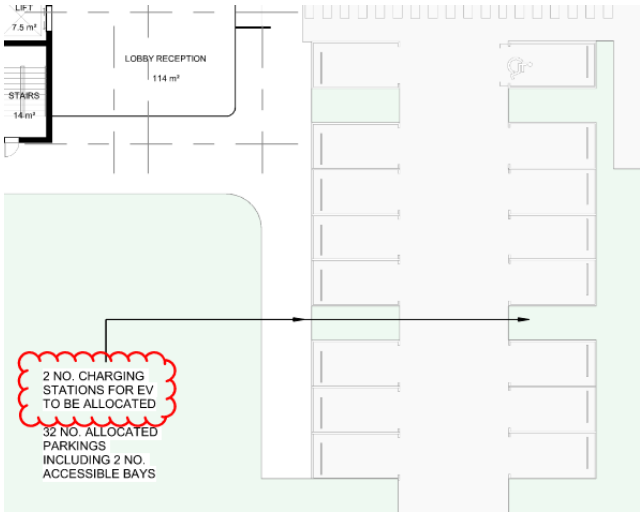


Figure 10: Admin Carpark- EV Charging Stations

- **Bus Parking** – According to Section 6.2 of Transport Impact Assessment prepared by Traffix Group, bus parking bays are to be provided within the Visitor Centre carpark accessed directly via Summerhill Road. In addition, a bus parking bay is proposed adjacent to the Administration Centre carpark for drop-off/pick-up of visitors.

If the above is implemented, then this will provide the project with a BESS Transport Score of 75%.

75% BESS Transport Score

3.8 Operational Waste

Up to 40% of the waste going to Australia's landfills is related to the construction and demolition of buildings. Simple design decisions can influence the amount of construction waste being produced and operational waste streams being separated. Even more waste is produced during the occupancy phase of buildings. Poor waste practices and treatment of the environment in the past have not only led to a degradation of our water, air and land resources but also represent a big financial burden to current and future generations.

The following features are proposed included as part of the development.

- **Operational waste management plan –** The site will generate small amounts of operational waste from the Site Office, Visitor and Education Centre, delivery of consumables and maintenance works. This includes paper and card, comingled recyclables, organic waste and e-waste. A requirement for a waste management plan will be requested as a condition of permit
- **Convenient recycling –** As shown on the floor plans, the waste management areas are in both the Visitor Centre and Admin Building. The project is committed to demonstrate that recycling facilities are as conveniently located as those for general waste. The waste generated by operators of the facility will be source-separated for recycling, where practicable, and collected regularly by waste collection contractors or council as required.

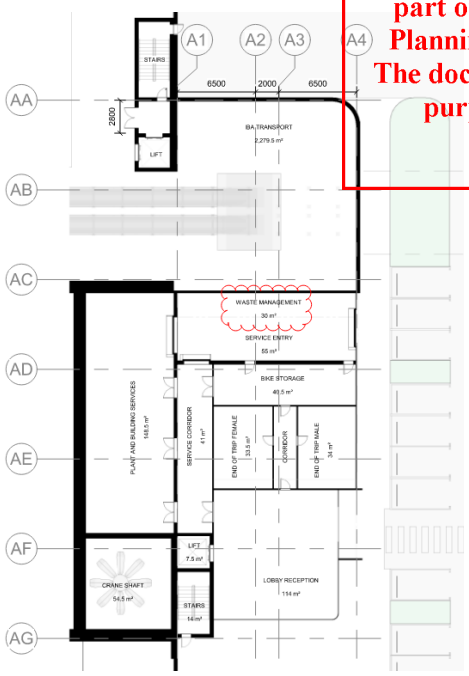


Figure 11: Admin Building – Waste Management Area

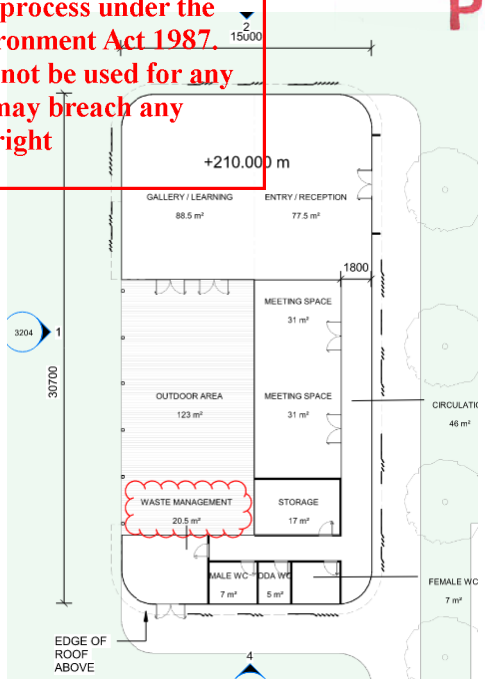


Figure 12: Visitor Centre – Waste Management Area

It is noted that this meets the City of Whittlesea's mandatory objectives and several of the best practice recommendations. If the above is implemented, then this will provide the project with a BESS Waste Score of 50%.

50% BESS Waste Score

3.9 Urban Ecology

Improving site ecology can introduce important biodiversity to a site whilst providing pleasant green space for occupants to enjoy. The proposed development provides an opportunity to improve the ecological value of the existing site.

Targeted surveys are currently being undertaken for growling grass frog, matted flax-lily and golden sun moths. The result of the surveys will demonstrate any that the development will have no negative impact on endangered threatened or vulnerable species. In addition, the project site has been developed for farmland in the past. As such, the ecological value of the site is low.

The following features are proposed and included as part of the development:

- **Water efficient landscaping** – It is not planned to provide irrigation to all the landscaped areas and it is recommended that the installation of plants is undertaken during the cooler months (from May to August) to avoid the need for irrigation. Irrigation will be proposed to planted screening areas and feature planting at the Visitor and Education Centre using recycled wastewater generated by the facility. The irrigation method will be via a subsurface system, due to the use of recycled water
- **Cultural Heritage Management Plan -** an assessment of the potential impact of the proposed activity on Aboriginal cultural heritage is being prepared (CHMP 18833)
- **Vegetated Area** – Approximately 40% of the total site area is covered with vegetation. As documented on the landscape plan (Figure 13), this includes an area along the western boundary extending 300m north of the project area where planting is proposed to create a landscape buffer between the Proposal site and the property at 620 Summerhill Road
- **Communal Spaces** – the current floor plan shows a total of approximately 255 m^2 of communal spaces which meets the BESS requirements (>227 m^2).

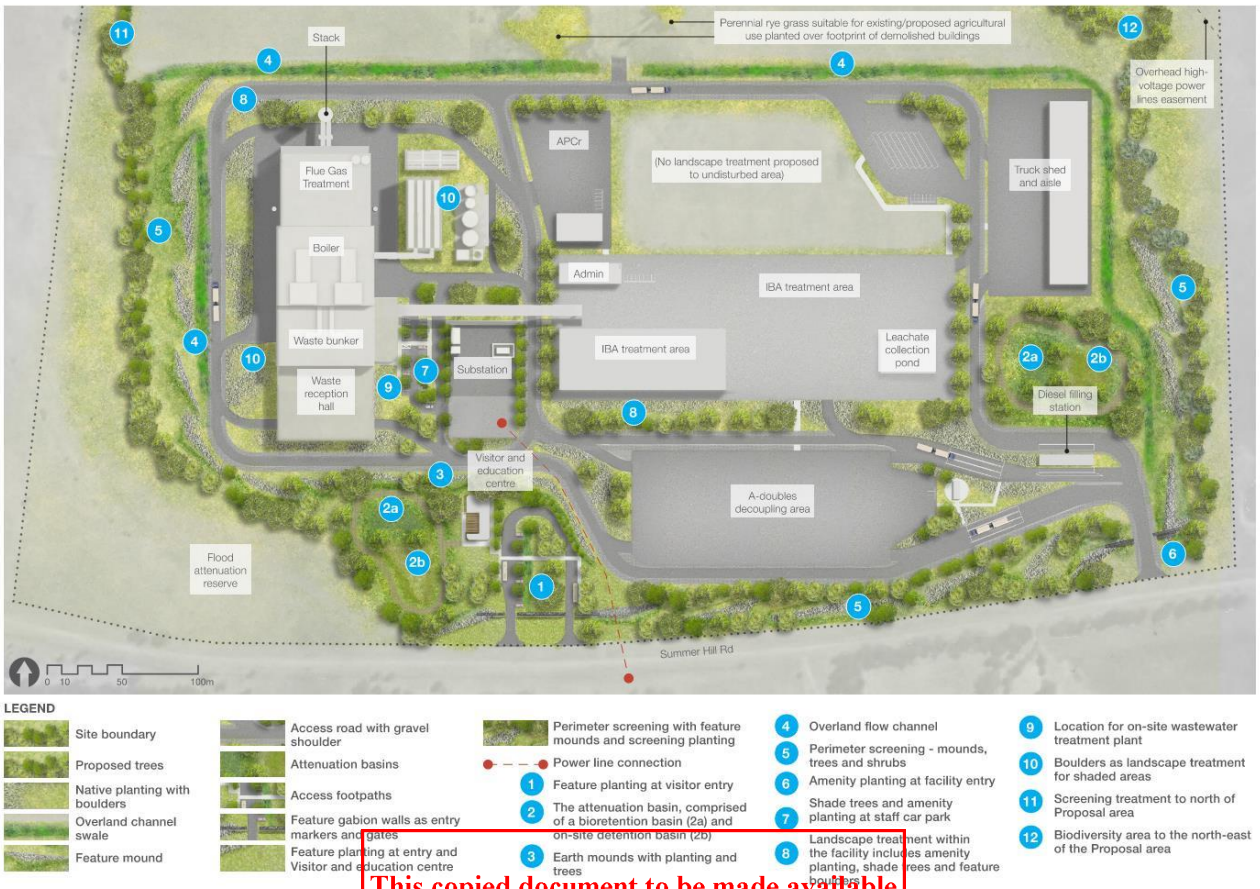


Figure 13: Landscape concept plan

62% BESS Ecology Score

3.10 Materials

It is projected that 49% that the total emissions from global new construction between 2020 and 2050 is due to embodied carbon – the emissions associated with the extraction, processing, preparation and transport of the building materials. As all of these emissions occur before or during the initial construction of the building, they have a relatively larger impact in the immediate future (compared to emissions during the building's operation), and as such should be a key area for carbon reduction.

While not directly addressed in the BESS tool, the following features are proposed and included as part of the development.

- **Reduced Portland Cement** – the project will reduce the Portland cement content of concrete used in the construction of the MERC by replacing it with supplementary cementitious materials. This item addresses the project's primary embodied material impacts
- **Lifetime Planning –** the project will select low maintenance and highly durable materials where practical including high touch and high impact surfaces such as carpets, chairs, lifts, wall finishes and corridors.
- **Construction Materials –** cladding and lightweight construction materials with lower embodied carbon will be implemented.
- **Reuse of Excavated Materials** – the excavated materials from the site will be reused where possible to minimise the landfills

It is noted that these sustainable design features are included in the innovation design section within BESS as there is no BESS category for materials.

Best Practice Targets Adopted (not addressed directly in BESS)

3.11 Innovation

Innovation in sustainability refers to design that exceeds Business As Usual (BAU) sustainability intent or 'usual' approaches to improve building performance. Innovative sustainable design can have direct environmental impacts but also positive social and well-being elements.

The following features are proposed and included as part of the development, each contributing one innovation point to the final BESS score (appreciating that a maximum of 10 such points are available).

- **Contractor Education** (from Green Star) – providing an overview of the project's sustainable design features to at least 75% of the site working trades. This will be incorporated as part of induction to the site with health and safety by the construction contractor
- **Ultra-low VOC paints** (from Green Star) – requiring that at least 50% of the painted surfaces as part of the base building's internal spaces will have paints with volatile organic compound levels of less than 5 g/L to ensure high indoor air quality is maintained
- **Responsible PVC** (from Green Star) – The project recognises the impacts of PVC materials and will seek to adopt the GBCA's *Best Practice Guidelines for PVC*, with either an audit verification certificate for each PVC specified or used in the project or alternative uses of PVC implemented where possible.

It is noted that the sustainable design features related to materials in Section 3.10 are also included as innovation points in the BESS pathway, as BESS has no category for materials.

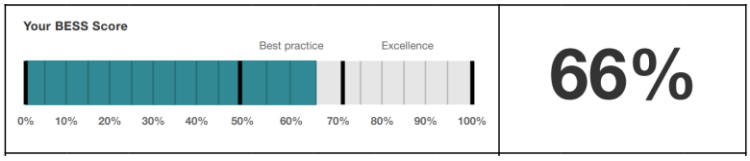
30% BESS Innovation Score

4. Summary

This Sustainability Management Plan has demonstrated compliance in accordance with Clause 15.01-2L of the Whittlesea Planning Scheme. Table 3 summarises the compliance review outcomes for the proposed development.

Table 3: Summary of Policies Compliance

Policies	Compliance Review
Whittlesea Planning Scheme (Clause 15.01-2L) For a non-residential building with a gross floor area of more than 1000 square metres, A Sustainability Management Plan (including an assessment using BESS STORM, Green Star, MUSIC or other methods) and a Green Travel Plan	✓ A Sustainability Management Plan has been prepared using BESS. The project is targeting 66% ('Best Practice'), exceeding the minimum requirement of 50%. Figure 14 provides a summary of the targeted score for each category. A full BESS report has been included in Appendix A.3. ✓ A Hydrology and Flood Risk Technical Report (Arup, 2022) has been prepared for the Proposal to demonstrate compliance. It is considered to overlap with the BESS stormwater category and is effectively targeted within the BESS rating and meets and exceeds the City of Whittlesea planning objectives. The MUSIC model results from the report demonstrates that MERC development has achieved 100% in the BESS category for Stormwater Treatment. ✓ A Transport Impact Assessment has been prepared by Traffix Group to provide a detailed traffic engineering assessment of the traffic, vehicle access, loading and parking arrangements associated with the proposed development.
Supporting Assessments (as part of the BESS scorecard)	✓ Preliminary assessment has been undertaken to demonstrate that building's envelope thermal performance exceeds the minimum requirements in National Construction Code (NCC) Section J by at least 10%. Please refer to Appendix A.2 for more details. ✓ Daylight calculations have shown that approximately 67% (>33%) of the floor area can achieve the target daylight factor of 2%.



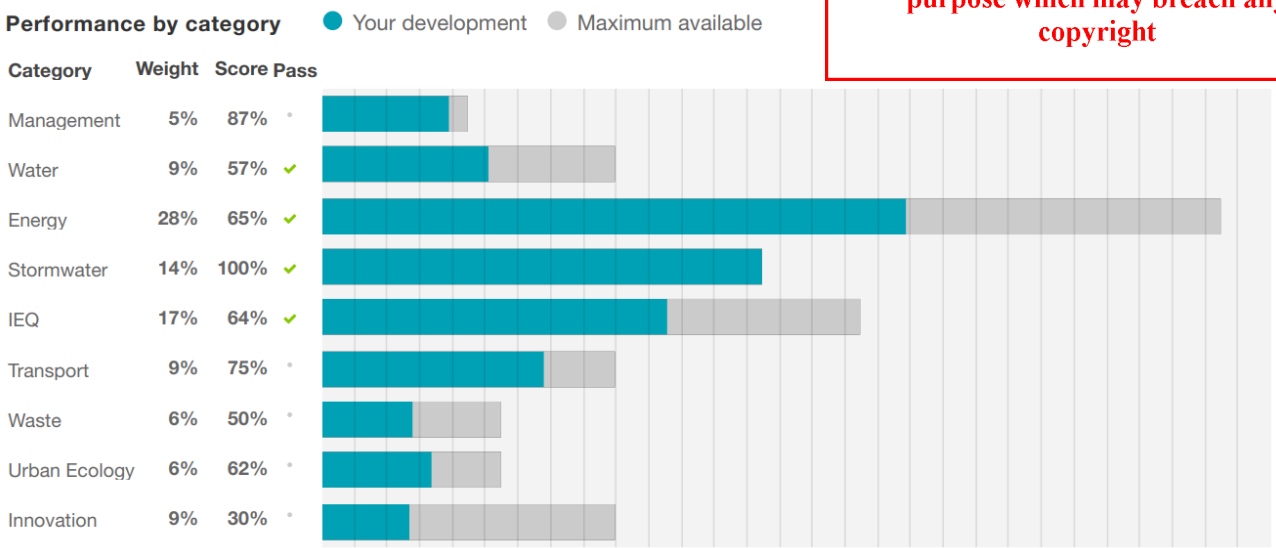


Figure 14: BESS Scorecard summary

5. References

To complete the analysis and reporting, a series of standards and documents were reviewed and considered as part of the process.

The following standards were used as references:

- National Construction Code Volume One 2019
- BESS Online Tool
- Whittlesea Planning Schemes

The following documents support the targets within the SMP and should be referred to for more details:

- Architectural Drawings 11th of November 2022
- Transport Impact Assessment G30331R-02B by Traffix Group
- Sustainability Management Plan by Arup
- Front End Engineering Design Report MERC-ARU-MEL-GLDM-RPT-0002 by Arup
- Cultural Heritage management Plan CHMP 18833
- Architecture & Landscape Design Strategy R–port (MERC - ARU-SYD-ARBU-RPT-001) October 2022

Appendix A

A.1 Preliminary Daylight Studies

The following pages outline the methodology and results for the project as they pertain to the quality of daylight in the primary spaces identified. Only the primary spaces (i.e., spaces that are likely to be occupied for >2 hours) were assessed in this process. As a mandatory BESS requirement, a minimum 33% of primary spaces is required to pass the Indoor Environment Quality (IEQ) category.

A.1.1 Variables

The model developed for completing the Section J assessment is the same model that was used to complete the daylight assessment. The assessment has been undertaken assuming a uniform design sky of 10,000 lux. Other variables were required to assess the daylight factor (DF%) of the model. These are shown in Table 4.

It is noted that due to the building's location on the site, that surrounding buildings and trees were not modelled as it is unlikely, they would have a marked impact on the outcome from a daylight perspective.

Table 4: Variables to Assess Daylight Factor

Element	Value
Weather file	Melbourne RMY
Daylight Calculation Methodology	Daylight Factor (% of floor area to achieve >2% daylight factor)
Areas Tested	Regular use areas – Any room or internal space of a non-residential building other than a bathroom, laundry, toilet, cupboard, corridor, stair, lobby, copying room, photographic darkroom, clothes drying room and other space of the specialised nature occupied neither frequently nor for extended periods.
Surrounding Trees/Buildings	None
Glazing Visible Light Transmission (VLT) %	45% (achievable with SHGC of 0.3)
Wall LRV	50%
Floor LRV	10%
Ceiling LRV	70%
Context/Other LRV	30%

A.1.2 Areas Tested – Visitor and Education Centre

Most of the primary spaces in the Visitor and Education Centre are highly glazed and while they have shading, it is expected that they will have good assess to daylight.

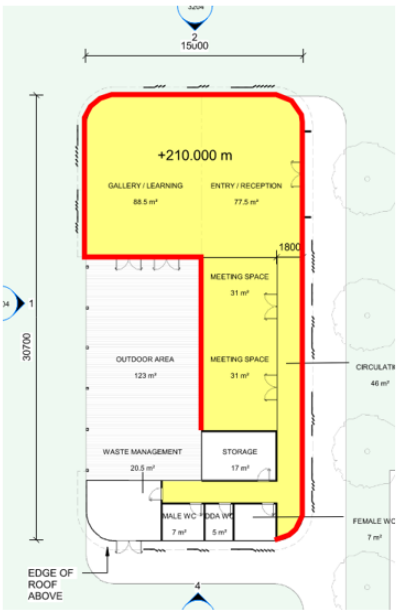


Figure 15: Visitor and Education Centre – Area Tested for Daylight Studies (highlighted in yellow)

A.1.3 Area Tested - Admin Building

The regular use areas in the Admin Building occur on Level 2, 3 and 4. These areas are highly glazed with shading. It is expected that they will have good assess to daylight.

Figure 16: Admin Building on Levels 2,3 and 4 – Area Tested for Daylight Studies (highlighted in yellow)

A.1.4 Results (Visitor and Education Centre)

Due to large portion of glazing on the building, most of the areas are well daylit, with the exception of part of the circulation area.

Overall, the building achieves a Daylight Factor of greater than 2% in 95% of its regular use areas, which represents a good practice result comparing with the BESS mandatory requirement of 33%.

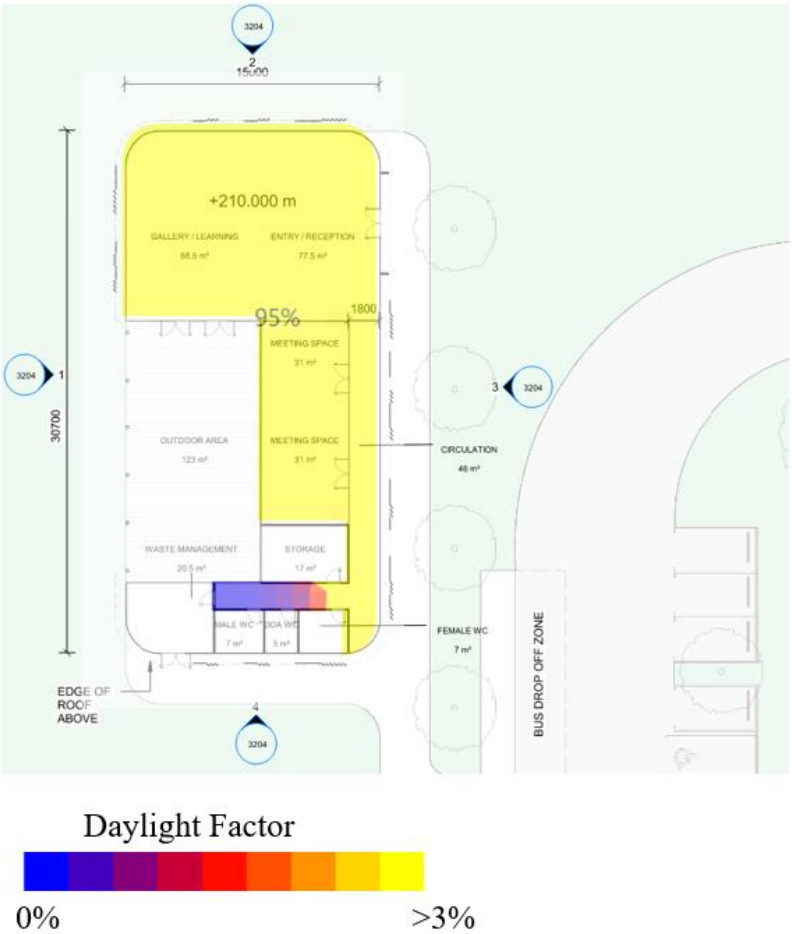


Figure 17: Daylight Results of the Visitor and Education Centre

A.1.5 Results (Admin Building)

Due to the narrow depth and extent of glazing on the Admin Building, most of the areas are well daylit.

Overall, the building achieves a Daylight Factor of greater than 2% in 67% on average across the whole building of its primary area, which represents a good practice result comparing with the BESS mandatory requirement of 33%.

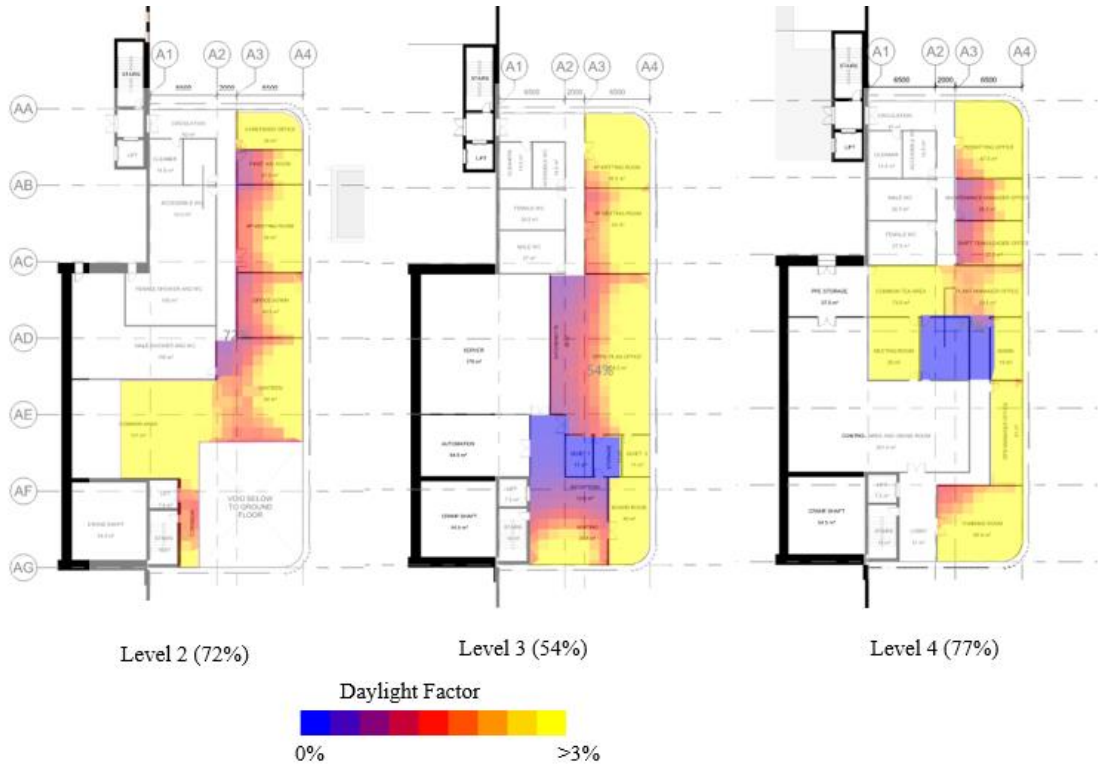


Figure 18: Daylight Results from the Admin Building

A.1.6 Results (Visitor and Education Centre and Admin Building)

With the variables described previously and the location of the primary spaces within the building, both buildings achieve high Daylight Factor (DF%) results.

These results indicate that much of the primary space in both buildings are well daylit, and these represent good practice results.

The layout plans of IBA Admin Building are not available at the current design stage but the daylight performance is expected to be satisfactory due to the small floor plate.

Table 5: Daylight Results for Visitor Centre and Admin Building

Daylight Results	Primary Space Floor Area (m^2)	Area with >2% Daylight Factor (m^2)	% Floor Area with >2% Daylight Factor
Visitor canter	277	263	95%
Admin Building	1212	812	67%

A.2 Façade Modelling and NCC Section J

This section outlines the preliminary façade modelling methodology and results to meet the requirements of the NCC Section J and BESS scorecard. The modelling was undertaken to determine thermal performance requirements of the façade to satisfy the energy efficiency provisions of Section J, Part J1.

Given the early concept stage design of the Proposal, the detailed extent of glazing / solid wall extent is unknown. Therefore, an estimation of the glazing / solid wall extent has been provided which is considered in the daylighting review and assessment. These estimates can be used as a basis for further design iterations and refinement.

In addition to meeting requirements under the NCC Section J, the Proposal is committed to meeting BESS scorecard requirements, which exceeds the minimum NCC requirements by 10%.

A.2.1 Thermal Envelope (U-value)

The buildings' overall thermal performance is dictated by the construction of the building's walls and windows. U-value is the thermal transmittance of the composite element allowing for the effect of any airspaces, thermal bridging and associated surface resistances. An overall maximum U-value of 2.0 $W/m^2.K$ is defined by the NCC. The performance of the glass and walls must be considered together.

A.2.1.1 Design Review

Given the concept design stage, various design options have been provided to inform the design. The Section J calculation will be updated as design develops. Please refer to Design Recommendations in the Appendix A.2.7 to A.2.9 for more details.

A.2.2 Solar Admittance

Solar admittance is the fraction of incident irradiance on a wall-glazing construction that adds heat to a building's space. The solar admittance must comply with the NCC requirements. For MERC, only the office areas form part of the envelope as shown in Appendix A.2.5. Therefore, it is best to consider these areas in isolation rather than as an overall building average.

For glazing the solar heat gain coefficient (SHGC) represents the solar admittance unless shaded where correction factors can be applied.

A.2.2.1 Design Review

Given the concept design stage, various design options have been provided to inform the design. The Section J calculation will be updated as design develops. Please refer to Design Recommendations in the Appendix A.2.7 to A.2.9 for more details.

A.2.3 Our Process

Arup has developed a rapid digital prototyping design analysis tool for evaluating the NCC, taking concept design models and undertaking the prerequisite calculations for compliance as shown in Figure 19. This enables 3d configurations test of a building's façade and iterative calculation for optimum design solutions.

The design proposal that has been tested are detailed in Appendix A.2.7 to A.2.9.

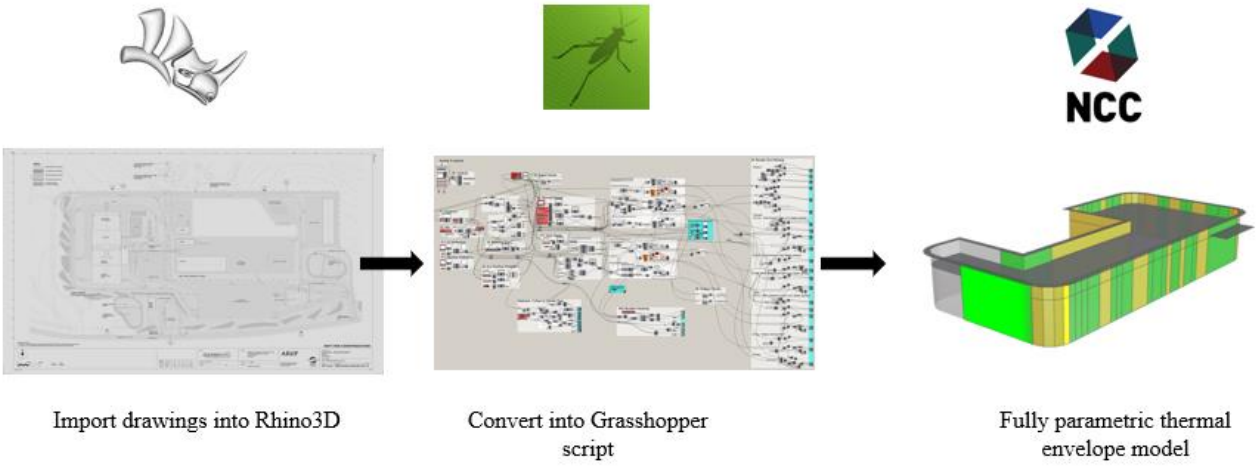


Figure 19: Process for digital prototyping design analysis tool

A.2.4 Building Definitions

The Admin Building and Visitor and Education Centre have been assessed independently for Section J compliance. This will allow both buildings to comply on their own merits, rather than relying on "trading off" one façade for the other, should such things be necessary.

The layout plans of IBA Admin Building are not available at current stage. Therefore, it is excluded from this assessment.

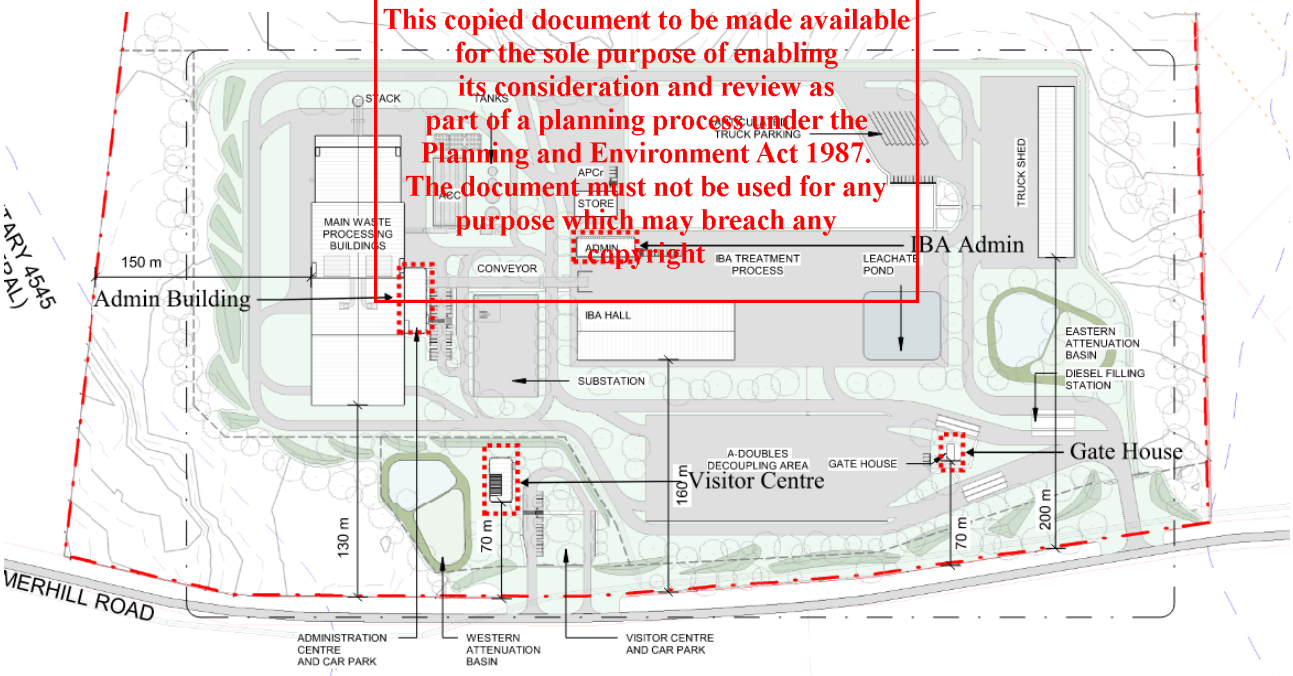


Figure 20: Map of Building Locations

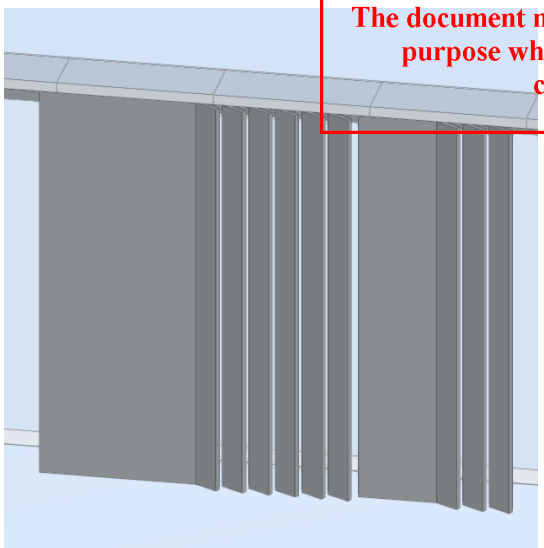
A.2.5 Areas Tested

According to NCC 2019, Section J of Volume One is applicable to spaces with air-conditioning. Therefore, the model is for occupied spaces of the Admin Building, IBA Admin, Gate House and Visitor and Education Centre as outlined in red in Figure 21. The ground floor and Level 1 of the Admin Building are not occupied spaces (e.g. waste management, transport, storage), and are therefore excluded from the NCC Section J requirements.

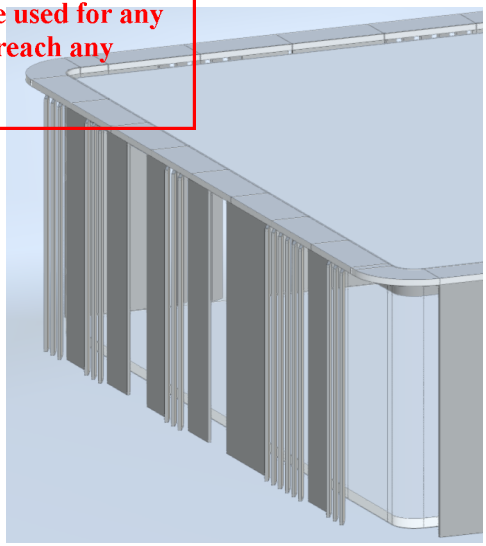
Figure 21: Assessed Walls for Visitor Centre and Admin Building

A.2.6 Shading Extent

The building has several different shading solutions in differing sections as shown in Figure 22. These shading extents alter the calculation process for NCC Section J and also have an effect on the outcome for daylight. According to the current architectural material schedule, the vertical shadings are aluminium perforated panels (FT-3A) with 40% opening. The horizontal shades (canopy) occur on both Admin Building and Visitor Centre. The shading extents used for both buildings are modelled as per the current architectural drawings.



Type 1: 250mm angled (30°) and flat (various width) vertical shades at full height on both admin building and visitor centre (40% opening)



Type 2: 600mm horizontal shades on both admin building and visitor centre

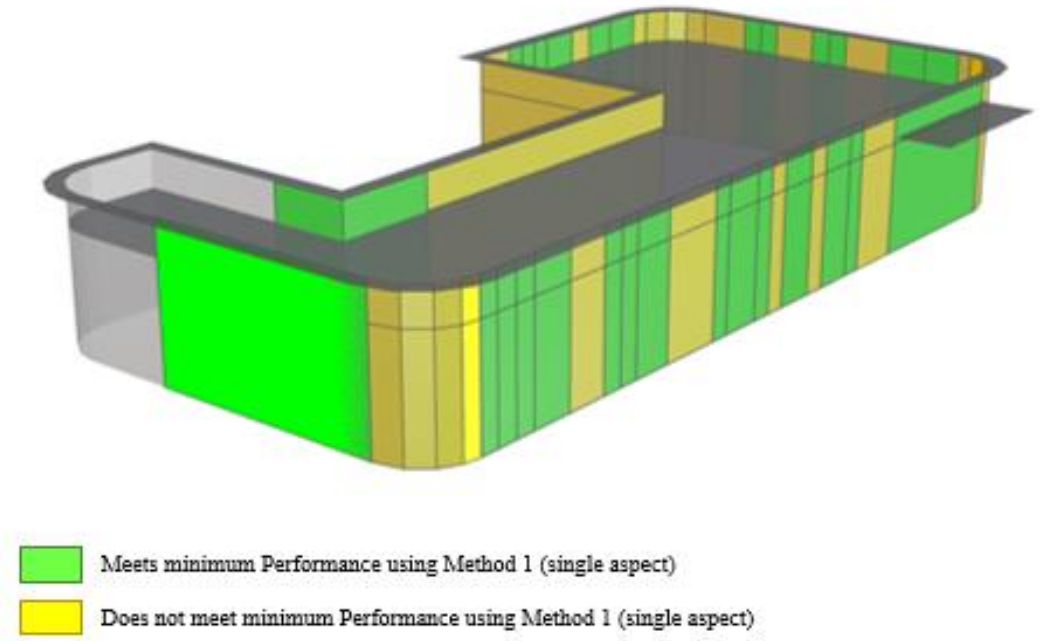
Figure 22: Shading Extents

A.2.7 Visitor and Education Centre Results

The Visitor Centre has quite high Window to Wall Ratio (WWR). Therefore, the Solar Heat Gain Coefficient (SHGC) need to be maximum 0.22 to achieve minimum 10% improvement on NCC Section J1.5. Options to further improve the design for more flexible glass selection have been provided on the next page.

Table 6: Visitor and Education Centre – NCC Section J Results

		NCC Section J Minimum Compliance
Window Wall Construction values	Window to wall ratio (WWR%)	62%
	U-Value (W/m^2.K)	2.4
	SHGC	0.22
	Wall R-Value (m^2.K/W)	1.4
Thermal Performance (Improvement on NCC)		12%
Solar Performance (Improvement on NCC)		11%



Note: Method 2 (Average of Multiple Aspects) has been used to show that the performance requirements can be achieved on average when multiple aspects are included.

Figure 23: Visitor and Education Centre – NCC Section J Assessment Result

A.2.7.1 Visitor and Education Centre Design Recommendations

The following design recommendations have been proposed to achieve minimum 10% improvement on NCC Section J1.5. The design options have been proposed to inform the design direction but does not represent the final design.

The specific glass product to be advised by the glass suppliers to include detailed performance information such as VLT, reflectance and colour/appearance.

Table 7: Visitor and Education Centre Façade Design Recommendations

Visitor and Education Centre	Design Options	WWR (%)	Shading Strategy		Wall performance	Glazing performance		Glass selection notes
			Canopy Shading depth (mm)	Vertical shading perforati on (%)	Overall System R-Value ($m^2 \cdot K/W$)	Overall System U-Value ($W/m^2 \cdot K$)	Overall System SHGC	
Current design	**1**	**62**	**600**	**40**	**1.4**	**2.4**	**0.22**	**Double glazed unit with Double Silver Low-E coating**
Lower WWR	**2**	**50**	**600**	**40**	**1.4**	**2.9**	**0.27**	**Double glazed unit with Single Silver Low-E coating**
Solid Sunshade (no perforation)	**3**	**62**	**600**	**0**	**1.4**	**2.4**	**0.24**	**Double glazed unit with Single Silver Low-E coating**

A.2.8 Admin Building Results

Similar to Visitor and Education Centre, the Admin Building has relatively high Window to Wall Ratio (WWR%). Therefore, the SHGC need to be below 0.23 to achieve minimum 10% improvement on NCC Section J1.5. Options to further improve the design for more flexible glass selection have been provided on the next page.

Table 8: Admin Building – NCC Section J Results

		NCC Section J Minimum Compliance
Window Wall Construction values	Window to wall ratio (WWR%)	65%
	U-Value (W/m^2.K)	2.4
	SHGC	0.23
	Wall R-Value (m^2.K/W)	1.4
Thermal Performance (Improvement on NCC)		10%
Solar Performance (Improvement on NCC)		11%

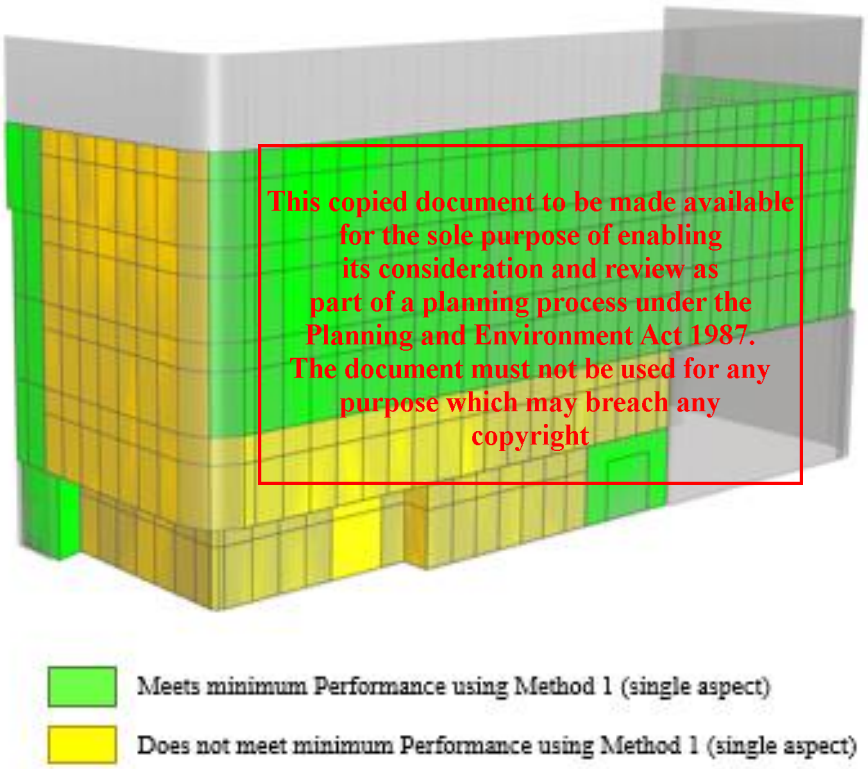


Figure 24: Admin Building - NCC Section J Assessment Result

A.2.8.1 Admin Building Design Recommendations

The following design recommendations have been proposed to achieve minimum 10% improvement on NCC Section J1.5. The design options have been proposed to inform the design direction but does not represent the final design.

The specific glass product to be advised by the glass suppliers to include detailed performance information such as VLT, reflectance and colour/appearance.

Table 9: Admin Building Façade Design Recommendations

Admin Building	Design Option	WWR (%)	Shading Strategy		Wall performance	Glazing performance		Glass selection notes
			Canopy Shading depth (mm)	Vertical shading perforation (%)	Overall System R-Value ($m^2 \cdot K/W$)	Overall System U-Value ($W/m^2 \cdot K$)	Overall System SHGC	
Current design	1	65	600	40	1.4	2.4	0.23	Double glazed unit with Double Silver Low-E coating
Lower WWR	2	50	600	40	1.4	2.8	0.3	Double glazed unit with Single Silver Low-E coating
Solid Sunshade (no perforation)	3	65	600	0	1.4	2.4	0.28	Double glazed unit with Single Silver Low-E coating

A.2.9 Gate House – Results and Design Recommendations

Similar to Visitor and Education Centre, the Gate House Building has relatively high Window to Wall Ratio (WWR%). Therefore, the SHGC need to be below 0.24 to achieve minimum 10% improvement on NCC Section J1.5 as per the current design. Options to further improve the design for more flexible glass selection have been provided in the table below.

Table 10: Gate House Façade Design Recommendations

Gate house	WWR	Shading strategy (Canopy Shading Depth (mm))	Wall Performance (Overall System R-Value)	Glazing performance (Overall System U-Value)	Overall system SHGC	Glass selection notes
Current design	61%	600	1.4	2.5	0.24	Double glazed unit with Single Silver Low-E coating
Lower WWR	50%	600	1.4	3.0	0.29	Double glazed unit with Non Silver Low-E coating

A.3 BESS Report

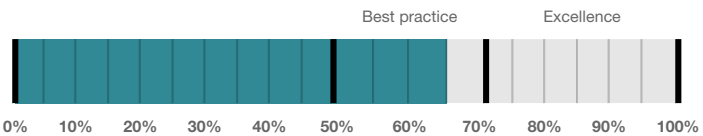
BESS Report

Built Environment Sustainability Scorecard

This BESS report outlines the sustainable design commitments of the proposed development at 510 Summerhill Rd Wollert VIC 3750. 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 Whittlesea 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.

Your BESS Score



66%

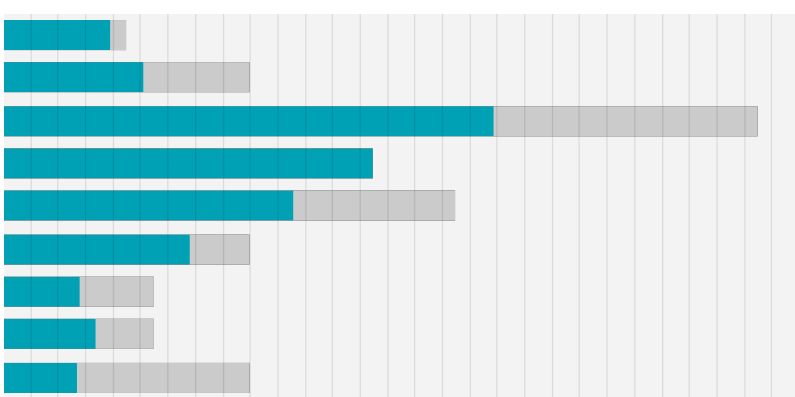
Project details

Address	510 Summerhill Rd Wollert VIC 3750
Project no	15E0D407-R1
BESS Version	BESS-7
Site type	Non-residential development
Account	wayne.lobo@arup.c
Application no.	
Site area	820,000.00 m²
Building floor area	4,493.00 m²
Date	22 December 2022
Software version	1.7.1-B.393

Performance by category

Your development · Maximum available

Category	Weight	Score	Pass
Management	5%	87%	·
Water	9%	57%	✓
Energy	28%	65%	✓
Stormwater	14%	100%	✓
IEQ	17%	64%	✓
Transport	9%	75%	·
Waste	6%	50%	·
Urban Ecology	6%	62%	·
Innovation	9%	30%	·



Buildings

Name	Height	Footprint	% of total footprint
IBA Processing	18	4,504 m²	17%
Visitor Centre	5	461 m²	1%
IBA Admin	24	516 m²	1%
APCR Storage	5	527 m²	1%
Truck Shed	5	3,044 m²	11%
Main Processing Building	56	12,985 m²	49%
Substation	22	3,200 m²	12%
ACC	22	1,198 m²	4%
Gate House	4	51.0 m²	< 1%

Dwellings & Non Res Spaces

Non-Res Spaces

Name	Quantity	Area	Building	% of total area
Office				
Admin Centre	1	3,465 m²	Main Processing Building	77%
IBA Admin	1	516 m²	IBA Admin	11%
Visitor Centre	1	461 m²	Visitor Centre	10%
Gate House	1	51.0 m²	Gate House	1%
Total	**4**	**4,493 m²**	**100%**	

Supporting information

Floorplans & elevation notes

Credit	Requirement	Response	Status
Management 3.2	Individual utility meters annotated		-
Management 3.3	Common area submeters annotated		-
Water 3.1	Water efficient garden annotated		-
Stormwater 1.1	Location of any stormwater management systems used in STORM or MUSIC modelling (e.g. Rainwater tanks, raingarden, buffer strips)		-
Transport 1.4	All nominated non-residential bicycle parking spaces		-
Transport 1.5	All nominated non-residential visitor bicycle parking spaces		-
Transport 1.6	Showers, change rooms and lockers as nominated		-
Transport 2.1	Location of electric vehicle charging infrastructure		-
Waste 2.2	Location of recycling facilities		-
Urban Ecology 1.1	Size and location of communal spaces		-
Urban Ecology 2.1	Vegetated areas		-

Supporting evidence

Credit	Requirement	Response	Status
Management 2.3a	Section J glazing assessment		-
Energy 1.1	Energy Report showing calculations of reference case and proposed buildings		-
Energy 3.7	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 1.4	A short report detailing assumptions used and results achieved.		-

Credit summary

Management Overall contribution 4.5%

87%

1.1 Pre-Application Meeting	100%
2.3 Thermal Performance Modelling - Non-Residential	50%
3.2 Metering - Non-Residential	100%
3.3 Metering - Common Areas	100%
4.1 Building Users Guide	100%

Water Overall contribution 9.0%

Minimum required 50% 57% ✔ Pass

1.1 Potable water use reduction	40%
3.1 Water Efficient Landscaping	100%
4.1 Building Systems Water Use Reduction	100%

Energy Overall contribution 27.5%

	Minimum required 50%	65%	✔ Pass
1.1 Thermal Performance Rating - Non-Residential		37%	
2.1 Greenhouse Gas Emissions		100%	
2.2 Peak Demand		100%	
2.3 Electricity Consumption		100%	
2.4 Gas Consumption		N/A	Scoped Out
			No gas connection in use
2.6 Electrification		100%	
3.1 Carpark Ventilation		N/A	Scoped Out
			No enclosed carpark.
3.2 Hot Water		100%	
3.7 Internal Lighting - Non-Residential		100%	
4.1 Combined Heat and Power (cogeneration / trigeneration)		N/A	Scoped Out
			No cogeneration or trigeneration system in use.
4.2 Renewable Energy Systems - Solar		0%	Disabled
			No solar PV renewable energy is in use.
4.4 Renewable Energy Systems - Other		0%	Disabled
			No other (non-solar PV) renewable energy is in use.

Stormwater Overall contribution 13.5%

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

IEQ Overall contribution 16.5%

	Minimum required 50%	64%	✔ Pass
1.4 Daylight Access - Non-Residential		67%	✔ Achieved
2.3 Ventilation - Non-Residential		66%	✔ Achieved
3.4 Thermal comfort - Shading - Non-residential		66%	
3.5 Thermal Comfort - Ceiling Fans - Non-Residential		0%	
4.1 Air Quality - Non-Residential		100%	

Transport Overall contribution 9.0%

75%

1.4 Bicycle Parking - Non-Residential	100%
1.5 Bicycle Parking - Non-Residential Visitor	100%
1.6 End of Trip Facilities - Non-Residential	100%
2.1 Electric Vehicle Infrastructure	100%
2.2 Car Share Scheme	0%
2.3 Motorbikes / Mopeds	0%

Waste Overall contribution 5.5%

50%

1.1 - Construction Waste - Building Re-Use	N/A	Scoped Out
	Not a previously developed site.	
2.1 - Operational Waste - Food & Garden Waste	0%	
2.2 - Operational Waste - Convenience of Recycling	100%	

Urban Ecology Overall contribution 5.5%

62%

1.1 Communal Spaces	100%
2.1 Vegetation	100%
2.2 Green Roofs	0%
2.3 Green Walls and Facades	0%
3.2 Food Production - Non-Residential	0%

Innovation Overall contribution 9.0%

30%

1.1 Innovation	30%

Credit breakdown

Management

Overall contribution 4%

1.1 Pre-Application Meeting		100%
Score Contribution	This credit contributes 37.5% towards the category score.	
Criteria	Has an 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	Yes	
2.3 Thermal Performance Modelling - Non-Residential		50%
Score Contribution	This credit contributes 25.0% towards the category score.	
Criteria	Has a preliminary facade assessment been undertaken in accordance with NCC2019 Section J1.5?	
Question	Criteria Achieved ?	
Office	Yes	
Criteria	Has preliminary modelling been undertaken in accordance with either NCC2019 Section J1 (Energy Efficiency), NABERS or Green Star?	
Question	Criteria Achieved ?	
Office	No	
3.2 Metering - Non-Residential		100%
Score Contribution	This credit contributes 12.5% towards the category score.	
Criteria	Have utility meters been provided for all individual commercial tenants?	
Annotation	Cleanaway is committed to providing utility meters for all individual commercial tenants (if any). This will be included in the specification for Construction Contractor to implement.	
Question	Criteria Achieved ?	
Office	Yes	
3.3 Metering - Common Areas		100%
Score Contribution	This credit contributes 12.5% towards the category score.	
Criteria	Have all major common area services been separately submetered?	
Annotation	Cleanaway is committed to providing submetering of all major common area services. This will be included in the specification for Construction Contractor to implement.	
Question	Criteria Achieved ?	
Office	Yes	

4.1 Building Users Guide	100%
Score Contribution	This credit contributes 12.5% towards the category score.
Criteria	Will a building users guide be produced and issued to occupants?
Annotation	Cleanaway is committed to providing a Building Users Guide to occupants to provide meaningful operations and maintenance information relevant to building users.
Question	Criteria Achieved ?
Project	Yes

Water

Overall contribution 5% Minimum required 50%

Section Notes: The WELS Water Ratings for water fixtures, fittings and connections are a commitment at current stage. This will be included in the spec for Contractor to implement.

Water Approach	
What approach do you want to use for Water?:	Use the built in calculation tools
Project Water Profile Question	
Do you have a reticulated third pipe or an on-site water recycling system?:	Yes
Are you installing a swimming pool?:	No
Are you installing a rainwater tank?:	Yes
Reticulated third pipe or an on-site water recycling system	
Recycled Profile Name:	Irrigation
Irrigation area connected to reticulated third pipe or an on-site water recycling system only (i.e. not also connected to rainwater system):	-
Water Efficient Garden?:	Yes
Other external water demand connected to reticulated third pipe or an on-site water recycling system only (i.e. not also connected to rainwater system):	
Water fixtures, fittings and connections	
Building:	
Visitor Centre	Visitor Centre
IBA Admin	IBA Admin
Admin Centre	Main Processing Building
Gate House	Gate House
Showerhead:	
Visitor Centre IBA Admin	Scope out
Admin Centre	4 Star WELS (>= 6.0 but <= 7.5)
Gate House	-
Bath:	
Visitor Centre IBA Admin Admin Centre	Scope out
Gate House	-
Kitchen Taps:	
Visitor Centre IBA Admin	Default or unrated
Admin Centre	>= 5 Star WELS rating
Gate House	-

Bathroom Taps:	
Visitor Centre IBA Admin Admin Centre	>= 5 Star WELS rating
Gate House	-
Dishwashers:	
Visitor Centre IBA Admin	Scope out
Admin Centre	>= 4 Star WELS rating
Gate House	-
WC:	
Visitor Centre IBA Admin Admin Centre	>= 4 Star WELS rating
Gate House	-
Urinals:	
Visitor Centre IBA Admin Admin Centre	>= 6 Star WELS rating
Gate House	-
Washing Machine Water Efficiency:	
Visitor Centre IBA Admin Admin Centre	Scope out
Gate House	-
Which non-potable water source is the dwelling/space connected to?:	
Visitor Centre IBA Admin Admin Centre	-1
Gate House	-
Non-potable water source connected to Toilets:	
Visitor Centre IBA Admin Admin Centre	Yes
Gate House	-
Non-potable water source connected to Laundry (washing machine):	
Visitor Centre IBA Admin Admin Centre	No
Gate House	-
Non-potable water source connected to Hot Water System:	
Visitor Centre IBA Admin Admin Centre	No
Gate House	-

1.1 Potable water use reduction	40%
Score Contribution	This credit contributes 71.4% 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
Project	7199 kL
Output	Proposed (excluding rainwater and recycled water use)
Project	5197 kL
Output	Proposed (including rainwater and recycled water use)
Project	5197 kL
Output	% Reduction in Potable Water Consumption
Project	27 %

3.1 Water Efficient Landscaping	100%
Score Contribution	This credit contributes 14.3% towards the category score.
Criteria	Will water efficient landscaping be installed?
Annotation	All plants species selected for the project are endemic to the area and within the EVC 55, 125 and 132 vegetation communities. It is not planned to provide irrigation to all the landscaped areas and it is recommended that the installation of plants are to be done during the cooler months from May to August. Irrigation will be proposed to screening areas and feature planting at the visitor center using recycled waste water generated by the facility. The irrigation method will be subsurface system due to the use of recycled water
Question	Criteria Achieved ?
Project	Yes

4.1 Building Systems Water Use Reduction	100%
Score Contribution	This credit contributes 14.3% towards the category score.
Criteria	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?
Annotation	More details will be provided as design progresses.
Question	Criteria Achieved ?
Project	Yes

Energy

Overall contribution 18% Minimum required 50%

Use the BESS Deem to Satisfy (DtS) method for Energy?:	Yes
Do all exposed floors and ceilings (forming part of the envelope) demonstrate a minimum 10% improvement in required NCC2019 insulation levels (total R-value upwards and downwards)?:	Yes
Does all wall and glazing demonstrate meeting the required NCC2019 facade calculator (or better than the total allowance)?:	Yes
Are heating and cooling systems within one Star of the most efficient equivalent capacity unit available, or Coefficient of Performance (CoP) & Energy Efficiency Ratios (EER) not less than 85% of the CoP & EER of the most efficient equivalent capacity unit available?:	Yes
Are water heating systems within one star of the best available, or 85% or better than the most efficient equivalent capacity unit?:	Yes
Non-Residential Building Energy Profiles	
Heating, Cooling & Comfort Ventilation - Electricity Reference fabric & services: All	-
Heating, Cooling & Comfort Ventilation - Electricity - proposed fabric and reference services: All	-
Heating, Cooling & Comfort Ventilation - Electricity Proposed fabric & services: All	-
Heating - Wood - reference fabric and services: All	-
Heating - Wood - proposed fabric and reference services: All	-
Heating - Wood - proposed fabric and services: All	-
Hot Water - Electricity - Reference: All	-
Hot Water - Electricity - Proposed: All	-
Lighting - Reference: All	-
Lighting - Proposed: All	-
Peak Thermal Cooling Load - Reference: All	-
Peak Thermal Cooling Load - Proposed: All	-

1.1 Thermal Performance Rating - Non-Residential 37%

Score Contribution	This credit contributes 40.0% towards the category score.
Criteria	What is the % reduction in heating and cooling energy consumption against the reference case (NCC 2019 Section J)?

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?
Annotation	This will be provided at later stage when the design is further developed.

2.2 Peak Demand		100%	
Score Contribution	This credit contributes 5.0% towards the category score.		
Criteria	What is the % reduction in the instantaneous (peak-hour) demand against the benchmark?		
Annotation	This will be provided at a later stage when the design is further developed.		
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?		
Annotation	This will be provided at a later stage when the design is further developed.		
2.4 Gas Consumption		N/A	Scoped Out
This credit was scoped out	No gas connection in use		
2.6 Electrification		100%	
Score Contribution	This credit contributes 10.0% towards the category score.		
Criteria	Is the development all-electric?		
Annotation	All electric design for the occupiable areas		
Question	Criteria Achieved?		
Project	Yes		
3.1 Carpark Ventilation		N/A	Scoped Out
This credit was scoped out	No enclosed carpark.		
3.2 Hot Water		100%	
Score Contribution	This credit contributes 10.0% towards the category score.		
Criteria	What is the % reduction in annual energy consumption (gas and electricity) of the hot water system against its benchmark?		
Annotation	More details be provided at a later stage when the design is further developed.		
3.7 Internal Lighting - Non-Residential		100%	
Score Contribution	This credit contributes 10.0% towards the category score.		
Criteria	Does the maximum illumination power density (W/m2) in at least 90% of the area of the relevant building class meet the requirements in Table J6.2a of the NCC 2019 Vol 1?		
Annotation	The requirements will be included in the specification for Construction Contractor to implement.		
Question	Criteria Achieved ?		
Office	Yes		
4.1 Combined Heat and Power (cogeneration / trigeneration)		N/A	Scoped Out
This credit was scoped out	No cogeneration or trigeneration system in use.		
4.2 Renewable Energy Systems - Solar		0%	Disabled
This credit is disabled	No solar PV renewable energy is in use.		

4.4 Renewable Energy Systems - Other		0%	⊘ Disabled
This credit is disabled	No other (non-solar PV) renewable energy is in use.		

Stormwater

Overall contribution 14% Minimum required 100%

Which stormwater modelling are you using?:	MUSIC or other modelling software	
1.1 Stormwater Treatment		100%
Score Contribution	This credit contributes 100.0% towards the category score.	
Criteria	Has best practice stormwater management been demonstrated?	
Annotation	Please refer to the Hydrology and Flood Risk Technical Report (Arup, 2022) for more details. Reduction in flow will be calculated as part of the sizing design. h	
Question	Flow (ML/year)	
Project	0.0 % Reduction	
Question	Total Suspended Solids (kg/year)	
Project	91.0 % Reduction	
Question	Total Phosphorus (kg/year)	
Project	49.0 % Reduction	
Question	Total Nitrogen (kg/year)	
Project	72.3 % Reduction	

IEQ Overall contribution 11% Minimum required 50%

1.4 Daylight Access - Non-Residential		67%	✔ Achieved
Score Contribution	This credit contributes 35.3% towards the category score.		
Criteria	What % of the nominated floor area has at least 2% daylight factor?		
Annotation	67% for Admin Building 95% for Visitor Centre		
Question	Percentage Achieved?		
Office	67 %		
2.3 Ventilation - Non-Residential		66%	✔ Achieved
Score Contribution	This credit contributes 35.3% towards the category score.		
Annotation	Commitment only at this stage. Will be included in the spec for Contractor to implement.		
Criteria	What % of the regular use areas are effectively naturally ventilated?		
Question	Percentage Achieved?		
Office	0 %		
Criteria	What increase in outdoor air is available to regular use areas compared to the minimum required by AS 1668.2.2012?		
Question	What increase in outdoor air is available to regular use areas compared to the minimum required by AS 1668.2.2012?		
Office	50 %		
Criteria	What CO_2 concentrations are the ventilation systems designed to achieve, to monitor and to maintain?		
Question	Value		
Office	800 ppm		
3.4 Thermal comfort - Shading - Non-residential		66%	
Score Contribution	This credit contributes 17.6% towards the category score.		
Annotation	Commitment only at this stage. Will be included in the facade design at later stage.		
Criteria	What percentage of east, north and west glazing to regular use areas is effectively shaded?		
Question	Percentage Achieved?		
Office	50 %		
3.5 Thermal Comfort - Ceiling Fans - Non-Residential		0%	
Score Contribution	This credit contributes 5.9% towards the category score.		
Criteria	What percentage of regular use areas in tenancies have ceiling fans?		
Question	Percentage Achieved?		
Office	-		
4.1 Air Quality - Non-Residential		100%	
Score Contribution	This credit contributes 5.9% towards the category score.		
Annotation	Commitment only at this stage. Will be included in the spec for Contractor to implement.		

Criteria	Do all paints, sealants and adhesives meet the maximum total indoor pollutant emission limits?
Question	Criteria Achieved ?
Office	Yes
Criteria	Does all carpet meet the maximum total indoor pollutant emission limits?
Question	Criteria Achieved ?
Office	Yes
Criteria	Does all engineered wood meet the maximum total indoor pollutant emission limits?
Question	Criteria Achieved ?
Office	Yes

Transport Overall contribution 7%

1.4 Bicycle Parking - Non-Residential	100%
Score Contribution	This credit contributes 25.0% towards the category score.
Criteria	Have the planning scheme requirements for employee bicycle parking been exceeded by at least 50% (or a minimum of 2 where there is no planning scheme requirement)?
Annotation	A 'waste-to-energy facility' land-use does not have a specified bicycle parking requirement under Clause 52.34-5 of the Whittlesea Planning Scheme. There is no requirement for bicycle parking and given the site's location there is not expected to be any demand for bicycle parking. The development makes space allowance for bicycle parking and end-of-trip facilities that could be provided if external road conditions where upgraded in the future by Council to provide for suitable cycling access.
Question	Criteria Achieved ?
Office	Yes
Question	Bicycle Spaces Provided ?
Office	2

1.5 Bicycle Parking - Non-Residential Visitor	100%
Score Contribution	This credit contributes 12.5% towards the category score.
Criteria	Have the planning scheme requirements for visitor bicycle parking been exceeded by at least 50% (or a minimum of 1 where there is no planning scheme requirement)?
Annotation	A 'waste-to-energy facility' land-use does not have a specified bicycle parking requirement under Clause 52.34-5 of the Whittlesea Planning Scheme. There is no requirement for bicycle parking and given the site's location there is not expected to be any demand for bicycle parking. The development makes space allowance for bicycle parking and end-of-trip facilities that could be provided if external road conditions where upgraded in the future by Council to provide for suitable cycling access.
Question	Criteria Achieved ?
Office	Yes
Question	Bicycle Spaces Provided ?
Office	1

1.6 End of Trip Facilities - Non-Residential	100%
Score Contribution	This credit contributes 12.5% towards the category score.
Criteria	Where adequate bicycle parking has been provided. Is there also: * 1 shower for the first 5 employee bicycle spaces plus 1 to each 10 employee bicycles spaces thereafter, * changing facilities adjacent to showers, and * one secure locker per employee bicycle space in the vicinity of the changing / shower facilities?
Annotation	EoT requirements to be further reviewed as develops.
Question	Number of showers provided ?
Office	1
Question	Number of lockers provided ?
Office	2
Output	Min Showers Required
Office	1
Output	Min Lockers Required
Office	2

2.1 Electric Vehicle Infrastructure	100%
Score Contribution	This credit contributes 25.0% towards the category score.
Criteria	Are facilities provided for the charging of electric vehicles?
Annotation	The plans indicated 2 charging bays within administration carpark area and 2 charging bays within visitor centre carpark.
Question	Criteria Achieved ?
Project	Yes

2.2 Car Share Scheme	0%
Score Contribution	This credit contributes 12.5% towards the category score.
Criteria	Has a formal car-sharing scheme been integrated into the development?
Question	Criteria Achieved ?
Project	No

2.3 Motorbikes / Mopeds	0%
Score Contribution	This credit contributes 12.5% towards the category score.
Criteria	Are a minimum of 5% of vehicle parking spaces designed and labelled for motorbikes (must be at least 5 motorbike spaces)?
Question	Criteria Achieved ?
Project	No

Waste Overall contribution 3%

1.1 - Construction Waste - Building Re-Use		N/A	Scoped Out
This credit was scoped out	Not a previously developed site.		
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		
2.2 - Operational Waste - Convenience of Recycling		100%	
Score Contribution	This credit contributes 50.0% towards the category score.		
Criteria	Are the recycling facilities at least as convenient for occupants as facilities for general waste?		
Annotation	A waste management plan will need to be completed at detailed design stage including admin & visitor centre.		
Question	Criteria Achieved ?		
Project	Yes		

Urban Ecology Overall contribution 3%

1.1 Communal Spaces		100%
Score Contribution	This credit contributes 12.5% towards the category score.	
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?	
Annotation	The number will be updated as per the update layout plans at later design stage.	
Question	Common space provided	
Office	255 m²	
Output	Minimum Common Space Required	
Office	227 m²	
2.1 Vegetation		100%
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?	
Annotation	The landscape treatment area includes mounds and rock outcrops proposed by the project, therefore the estimate area where plants are to be installed is about 40%. This [illegible] 300m north of the project area [illegible] proposal from the property at 620 Summerhill Road.	
Question	[illegible]	
Project	[illegible]	
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	No	
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 green façade?	
Question	Criteria Achieved ?	
Project	No	
3.2 Food Production - Non-Residential		0%
Score Contribution	This credit contributes 12.5% towards the category score.	
Criteria	What area of space per occupant is dedicated to food production?	
Question	Food Production Area	
Office	0.0 m²	
Output	Min Food Production Area	
Office	90 m²	

Innovation Overall contribution 3%

Section Notes: Commitment at this stage but the requirements will be included in the specification. The Contractor will need to provide evidence during construction.

Innovations	
Description:	
Contractor Education	(from Green Star) – providing an overview of the project's sustainable design features to at least 75% of the site working trades. This will be incorporated as part of the introduction to the site with health and safety etc.
Ultra-low VOC Paints	(from Green Star) – requiring that at least 50% of the painted surfaces as part of the base building's internal spaces will have paints with volatile organic compound levels of less than 5 g/L to ensure high indoor air quality is maintained.
Portland Cement Reduction	Portland Cement content in concrete mixes will be reduced by 30% compared to a reference case as defined in the Green Star Design and As Built Submission Guidelines
Points Targeted:	
Contractor Education	1
Ultra-low VOC Paints	1
Portland Cement Reduction	1

1.1 Innovation		30%
Score Contribution	This credit contributes 100.0% towards the category score.	
Criteria	What percentage of the Innovation points have been claimed (10 points maximum)?	

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