Sustainable Management Plan

STEAMD BUILDING

Our Lady of Sion

Project Reference 124085

4th April 2022 – Rev. 1

Prepared For:

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REV	DESCRIPTION	DATE	AUTHOR	REVIEWED	APPROVED
0	DRAFT FOR REVIEW	01/02/2022	TP		
1	TOWN PLANNING ISSUE	08/04/2022	TP	BP	TP

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TABLE OF CONTENTS

Executive Summary

Meinhardt has been commissioned by Williams Ross Architects to prepare this Sustainable Management Plan (SMP) for the proposed new STEAMD Building at Our Lady of Sion College, Box Hill.

The City of Whitehorse subscribes to the Sustainable Design Assessment in the Planning Process (SDAPP) which requires lodgement of a Sustainable Management Plan (SMP) with the town planning application, outlining the proposed ESD strategy and addressing the 9 key sustainable building categories.

This SMP addresses the key sustainable design criteria in Clause 22.10 of the Whitehorse Planning Scheme and demonstrates that a holistic environmentally sustainable development review has been undertaken during a project's early design stages.

A BESS assessment of the proposed development confirms the following sustainability performance targets:

Category	Score	Pass
Management	100%	No threshold
Water (50% threshold)	57%	**Yes**
Energy (50% threshold)	66%	**Yes**
Stormwater (100% threshold)	100%	**Yes**
Indoor Environment Quality (50% threshold)	74%	**Yes**
Transport	66%	No threshold
Waste	50%	No threshold
Urban Ecology	62%	No threshold
Innovation	20%	No threshold
Total BESS Score	**67%**	**Yes, BEST PRACTICE**

We confirm that the design of the proposed STEAMD building at the Our Lady of Sion College in Box Hill responds adequately to the objectives of the State & Local Planning Policy Frameworks and exceeds the required 'Best practice' BESS score, defined as an overall score of 50% or higher.

1 Introduction

1.1 Purpose and Scope of the Report

The City of Whitehorse town planning requirements relating to ESD (Clause 22.10) stipulate the submission of a Sustainable Management Plan (SMP) for a development of this size and type.

The SMP is to respond to the following:

- Provide a detailed assessment of the development and identify relevant sustainability targets or performance standards.
- Identify achievable environmental performance outcomes in accordance with the objectives of the Whitehorse Planning Scheme (Clause 22.10-2).
- Demonstrate that the proposed building has the design potential to achieve the relevant environmental performance outcomes, under consideration of the site's opportunities and constraints.
- Document how the performance outcomes will be achieved, including identification of the different areas of responsibility, and provide a schedule for implementation, ongoing management, maintenance and monitoring. It will also identify how the design elements, technologies and operational practices that comprise the SMP can be maintained over time.

The SMP demonstrates that a holistic ESD review has been undertaken during the project design stages by address the 10 key sustainable building categories.

1) Management
2) Water Efficiency
3) Energy Efficiency
4) Stormwater Management
5) Indoor Environment Quality
6) Transport
7) Waste Management
8) Urban Ecology
9) Innovation
10) Building Materials

Initiatives for each of the above categories are presented in Section 4 *ESD Initiatives* below.

1.2 SMP Structure

The following sections form part of the ESD Management Plan:

- Assessment of initiatives that relate to the nine Key Sustainable Building Categories;
- A Green Star desktop assessment, based on input from the following sources:
  - Architectural Plans
  - Preliminary Thermal Dynamic Energy model
  - Preliminary Daylight Model
  - Stormwater assessment (Melbourne Water STORM Calculator)
  - Discussions with the architect and consultant team
- Responsibilities and schedule for ESD Management Plan implementation; and
- On-going ESD management.

1.3 Sources of Information

This Sustainable Management Plan is based on following information:

Consultant	Document(s)	Date	Revision
Architect Williams Ross	Architectural Plans & Elevations	07/04/2022	A
Building Services BRT	Building Services Coping Study	10/09/2021	00
Traffic Consultant TrafficWorks	Traffic Impact Assessment Report	07/04/2022	8
Civil ACOR	Schematic Design Sketch MUSIC Modelling Report	April 2022	C
Landscape Architect ACLA	Landscape Plans For Town Planning	07/04/2022	3

1.4 Project Overview

The proposed building will consist of the following spaces:

- Administration
- Teaching
  - Music
  - Art & Design
  - Science
- Gym / Weights
- Staff Workstations
- Staff Social and amenities
- Roof Deck

The site for the proposed building has an existing structure that is to be demolished. The remainder is mostly hard covered with some remnant trees.

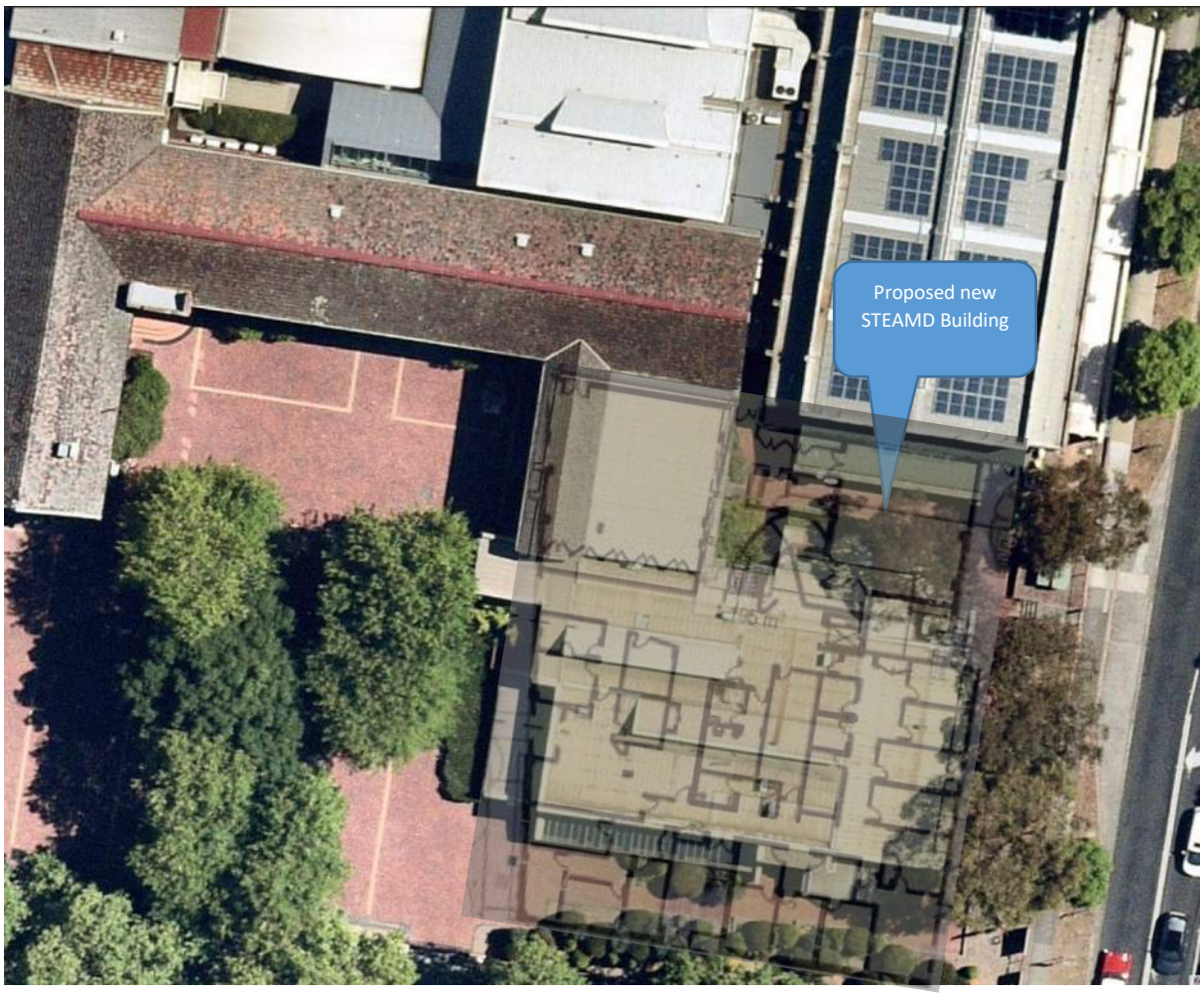


Figure 1 - NEARMAP photo of existing site with proposed building superimposed

1.5 Statutory Requirements

1.5.1 Whitehorse Planning Scheme

The Whitehorse Planning Scheme in clause 22.10-2 states the objective "*that development should achieve best practice in environmentally sustainable development from the design stage through to construction and operation*".

The application requirements for non-residential developments with a gross floor area of more than 1000m^2 includes the development of a Sustainability Management Plan (this report) for which a BESS or another approved assessment tool for assessing the sustainability of new development may be used.

The Whitehorse City Council is a CASBE member (Council Alliance for a Sustainable Built Environment) and as such subscribes to the Sustainable Design Assessment in the Planning Process (SDAPP) framework which endorses the Built Environment Sustainability Scorecard (BESS). The design team has decided to use the BESS and STORM tools to assess the sustainability footprint of this development.

1.5.2 National Construction Code (NCC)

The proposed development will be assessed against the requirements of the NCC 2019. Two sections of the code are directly related to the sustainability aspects of the project:

- Section F - Health and Amenity, Part F4 Light & Ventilation and Part F6 Condensation Management
- Section J - Energy Efficiency, all Parts.

Confirmation of compliance with the requirements of these Sections will occur during the final design stages before commencement of construction.

The strategy outlining how compliance with the relevant parts of the code is achieved is presented in Section 5 *BCA Compliance* below.

2 Development of ESD Strategy

2.1 Objectives

The College is committed to the sustainable use of natural resources and reducing its impact on the natural environment. Our Lady of Sion recognises the key benefits of environmentally sustainable design in all their new developments through:

- An overall reduction of the environmental impact of a development;
- Lower annual operating costs for the developments;
- Highest comfort level for all building occupants;
- Healthy indoor environments; and
- Environmental awareness.

2.2 ESD Principles

During the design process, ESD initiatives have been considered for their environmental impact, value for money, capital cost and operational costs.

The following principles have influenced design decisions during the early design process and will guide the final design stages:

First: Passive Design
The building will incorporate best practice passive design principles with the aim to reduce energy and water demands as much as possible, under consideration of the Indoor Environment Quality (IEQ - thermal comfort, daylight, air quality and acoustics).

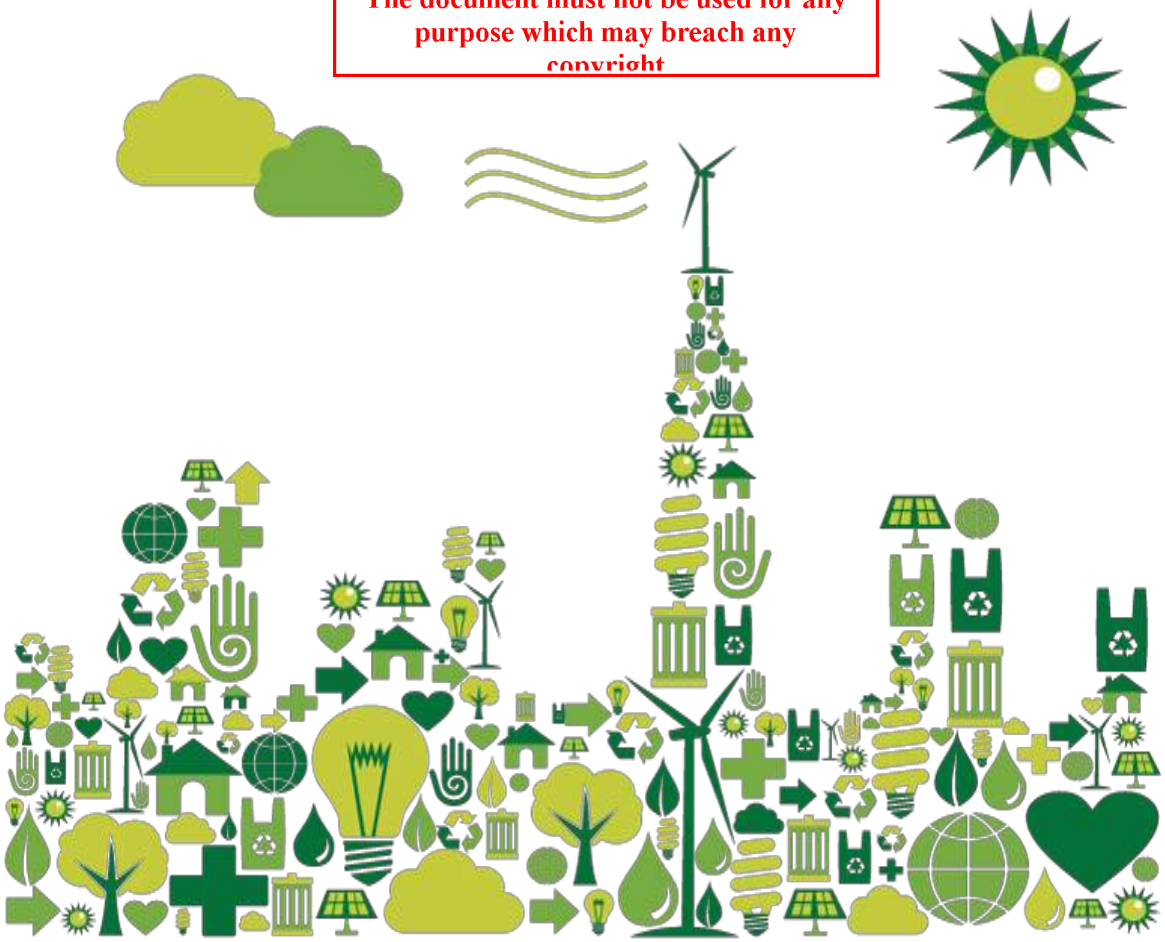
Second: Equipment Efficiencies
Once a reasonable balance between building energy demand (heating, cooling and artificial lighting), water consumption and IEQ is achieved, consideration will be given to the efficiency of equipment and emissions of systems. When analysing energy, emphasis will be placed on related CO_2 emissions rather than the quantity of energy required.

Third: Environmental Impact
The environmental impact, although often difficult to measure, will be considered for every material and technology assessed. A lifecycle approach will be adopted considering resource extraction, manufacture, installation, operation and end-of-life treatment.

Forth: Financial Viability
Where feasible, the initiatives will be analysed under consideration of capital expenditure, operational costs including maintenance and end-of-life treatment cost. Payback periods of up to 15 years are considered reasonable for most energy related equipment.

3 ESD Initiatives

The following section outlines ESD initiatives included in the development. The initiatives are aligned with the nine BESS categories for assessing sustainable design; complemented by an additional Building Materials section:



3.1 Management

OBJECTIVE

To encourage a holistic and integrated design and construction process and ongoing high performance

3.1.1 Environmental Management Plan (EMP)	
Description	Environmental Management Plans (EMPs) are an important tool for minimisation of adverse environmental impacts during any construction project. Prior to construction commencing, the contractor is to develop a project and site-specific EMP, covering items such as environmental risks, air quality, noise, soil contamination, water quality, impacts to flora and fauna and waste management.
Environmental Benefits	- Protection of immediate environment
Performance Targets	The contractor is required to provide a comprehensive and site specific construction EMP and should be ISO14001 accredited.
Reference Standard	Green Star Design & As-Built – Credit 7.1: Formalised Environmental Management System.
Commitment	Committed

3.1.2 Building Users Guide (BUG)	
Environmental Benefits	Building users that understand the environmental design philosophy and operations of individual systems are key to ensuring efficient operation of the building and a low environmental footprint.
Performance Targets	-
Reference Standard	-
Commitment	Committed

3.1.3 Metering	
Description	Accessible metering is to be provided to monitor building energy and water consumption, including all common area energy and water uses, combined apartment energy and water uses, mechanical equipment and domestic hot water heater. The metering is to be accurate and to inform energy consumption practices and reduce wasted energy. Common area and apartment meters to separately measure power and lighting (one set of meters per floor).
Environmental Benefits	Possible energy and water savings due to close monitoring of usage and comparison against modelled targets.
Performance Targets	-
Reference Standard	Green Star Design & As Built – Credit 6: Metering and Monitoring
Commitment	Committed

3.2 Water Efficiency

OBJECTIVE

To ensure the efficient use of water; to reduce total operating potable water use; and to encourage the appropriate use of alternative water source

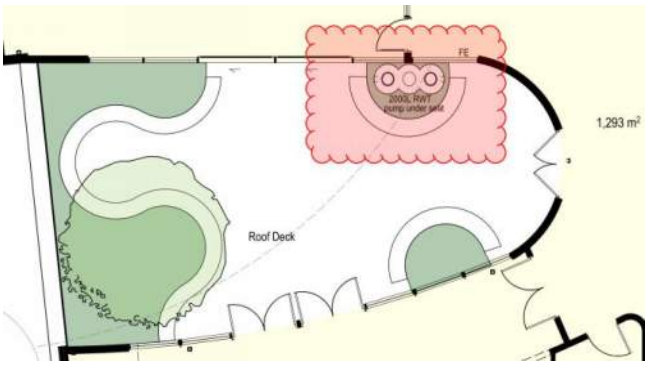
3.2.1 Domestic Water Efficiency

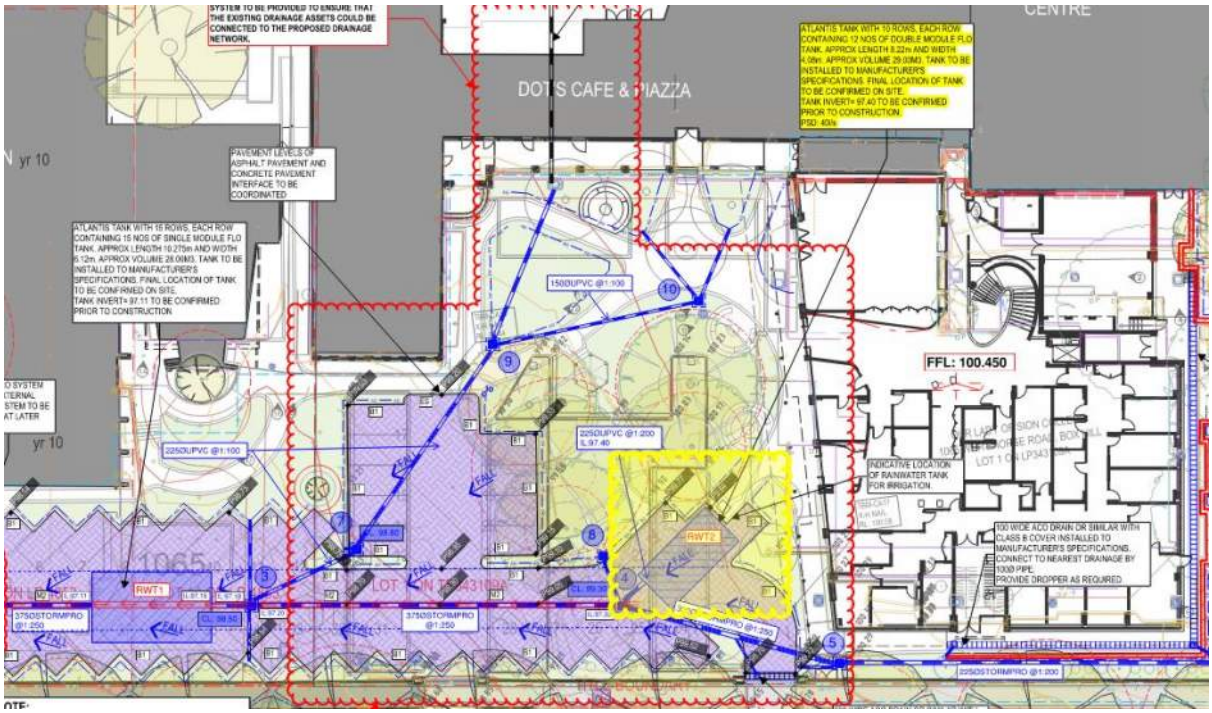
Description	Water fittings and fixtures including basin taps, shower heads, toilets dishwashers and washing machines in Australia are supplied with a WELS rating, which rates the water consumption of these devices and converts it into a star rating system. Higher WELS rated devices use less water (measured in litres per minute or litres per flush). Using higher efficiency devices (where the device is supplied by potable mains water) helps a building reduce its overall potable water use.
Environmental Benefits	Reduction of potable water use
Performance Targets	The following WELS rating will be adopted at minimum: **Fixture of Fitting** / **WELS Rating** Toilets / 4 Stars Taps / 6 Stars We note that taps for cleaning equipment will not be flow restricted.
Reference Standard	Water Efficiency Labelling and Standards (WELS)
Commitment	Committed

3.2.2 Water Check Meters

Description	Separate check meters for each floor will enable closer monitoring of the water consumption and may instigate remedial actions should unusually high water use be recorded.
Environmental Benefits	Potential water savings through early detection of system malfunctions and/or adverse building user behaviour.
Performance Targets	-
Reference Standard	-
Commitment	Committed

3.2.3 Rainwater Harvesting	
Description	Rainwater will be harvested from all non-trafficable roof areas and stored in - A 20,000L rainwater tank located in the carpark area - A 2,000L slimline tank or similar on the Roof Deck The 2,000L tank will be used for educational purposes, displaying to students the tank setup including pump, filtration system, mains backup and landscape irrigation. The captured rainwater will be treated and used for landscape irrigation and equipment washdown.
Environmental Benefits	- Reduced water consumption - Student education
Performance Targets	-
Reference Standard	-
Commitment	Committed





3.3 Energy Efficiency

OBJECTIVE

To ensure the efficient use of energy; to reduce total operating greenhouse emissions; and to reduce energy peak demand

3.3.1 Passive Solar Design

Description	Passive solar design principles have been addressed in the current proposal where possible under the given site constraints: - Shading devices are proposed for a large proportion of the East and West glazing. - overhangs provide additional solar protection - existing trees on east and west of the building will provide additional shade. - insulated spandril panels have been introduced to reduce the solar load through vision panels
Environmental Benefits	- Reduces energy demand for air-conditioning and lighting - Improves thermal comfort
Performance Targets	-
Reference Standard	-
Commitment	Committed

3.3.2 Efficient Artificial Lighting Systems

Description	LED throughout, dimmable lights, daylight sensors where appropriate, PIR sensors and a mix of direct and indirect lighting to reduce differential glare.
Environmental Benefits	- CO2 emissions reduction - Visual Comfort
Performance Targets	Maximum illumination power density (4.5 W/m^2) as per table J6.2a of the NCC BCA 2019 Vol 1
Reference Standard	NCC BCA 2019 Section J6
Commitment	Committed

3.3.3 Solar Photovoltaics	
Description	Solar Photovoltaic Technology (conversion of sunlight into electricity) has developed significantly over the past decade. Efficiencies have improved while cost have been reduced to a point where a solar PV installation has a solid business case. It is assumed that the leisure centre will be able to absorb most of the electricity produced, system sizing is therefore a function of available roof space and budget. A 68kW$_{peak}$ solar PV system is currently proposed to be installed on the roof. In addition a 2kW$_{peak}$ solar PV system is proposed for the canopy of the roof deck. This solar system will be accessible to students for educational purposes.
Environmental Benefits	- Onsite electricity production - Peak energy grid-demand reduction - CO2 emissions reduction - Student education
Performance Targets	-
Reference Standard	-
Commitment	Committed

3.4 Stormwater Management

OBJECTIVE

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

3.4.1 Water Sensitive Urban Design (WSUD)

Description	Water Sensitive Urban Design (WSUD) is the approach taken to minimise the impacts on a city's stormwater system due to urban development, with the aim of reducing the peak flows and total volume of stormwater leaving a site, and providing cleaner, better-quality stormwater to reduce the levels of pollution in local rivers and bays. WSUD can use many different techniques depending on the type of site. For this development rainwater from the roof will be harvested and re-used for landscape irrigation. Stormwater from the landscape and on-grade parking spaces will be mechanically treated to reduce pollution and collected in an inground detention tank for discharge to council legal point of discharge.
Environmental Benefits	- Reduction of stormwater leaving the site during a storm event
Performance Targets	100% BESS flow and emission reduction targets, established through MUSIC modelling
Reference Standard	BESS
Commitment	Committed

Refer Appendix A – MUSIC Report .

3.5 Indoor Environment Quality

OBJECTIVE

To achieve a healthy indoor environment quality for the wellbeing of building occupants

3.5.1 VOCs and Formaldehyde

Description	Paints, Adhesives, Sealants, Flooring Materials and Engineered Timber products used in the construction and fitout of the development will adhere to strict VOC and Formaldehyde limits provided by the Green Star Design & As Built v1.2 tool. Operational procurement policies will include strict VOC limits on any product or material introduced to the facility including consumables and pool equipment.
Environmental Benefits	- Improved building occupant health and wellbeing
Performance Targets	At least 95% of all internally applied paints, adhesives, sealants and carpets to meet stipulated 'Total VOC Limits' set out in the relevant Green Star credit. At least 95% of all engineered wood products to meet stipulated formaldehyde limits set out in the relevant Green Star credit.
Reference Standard	Green Star Design & As-Built – Credit 13.1: Paints, Adhesives, Sealants, and Carpets. Green Star Design & As-Built – Credit 13.2: Engineered Wood Products.
Commitment	Committed

3.5.2 Thermal Comfort

Description	Thermal comfort plays an important role in the health and wellbeing of all building users. Maintaining optimal thermal comfort conditions can be achieved by providing an efficient building envelope and a well-designed mechanical heating and cooling system to cope with peak hot and cold conditions. Significant increases of the BCA2019 Section J energy efficiency requirements assure a high level of thermal performance. The proposed mechanical systems, combined with external shading and high-performance glazing will assure a high level of thermal comfort is achieved.
Environmental Benefits	- Improved building occupant comfort, health, and wellbeing
Performance Targets	-
Reference Standard	-
Commitment	Committed

3.5.3 Daylight Quality	
Description	Sufficient levels of daylight are required to achieve energy savings and enhance the health and wellbeing of building users. High quality daylight will be as natural as possible, i.e. toned glazing will be avoided. A daylight analysis has confirmed that high levels of daylight will be available for 64% of the regularly occupied area. Refer to Section 6 Daylight Modelling for further details on the analysis. Refer to Appendix C – Daylight Plots for a graphical representation of the daylight factors.
Environmental Benefits	Providing building occupants with good exposure to natural daylight is beneficial to health, well-being and visual comfort. In addition, regular exposure to daylight aids the body's circadian rhythms and thus supports the natural wake-sleep cycle.
Performance Targets	At least 40% of the nominated floor are to achieve a daylight factor equal to or greater than DF2%.
Reference Standard	BESS daylight criteria
Commitment	Committed to compliance to BESS daylight criteria as far as feasible

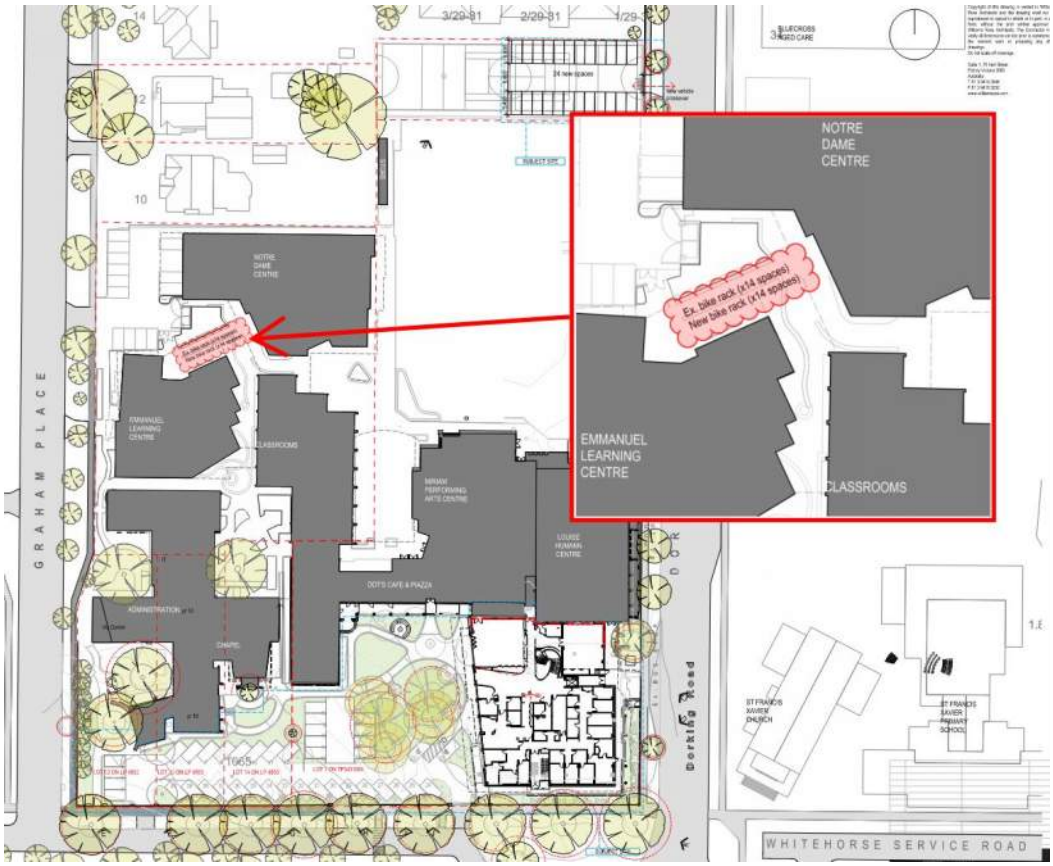
3.6 Transport

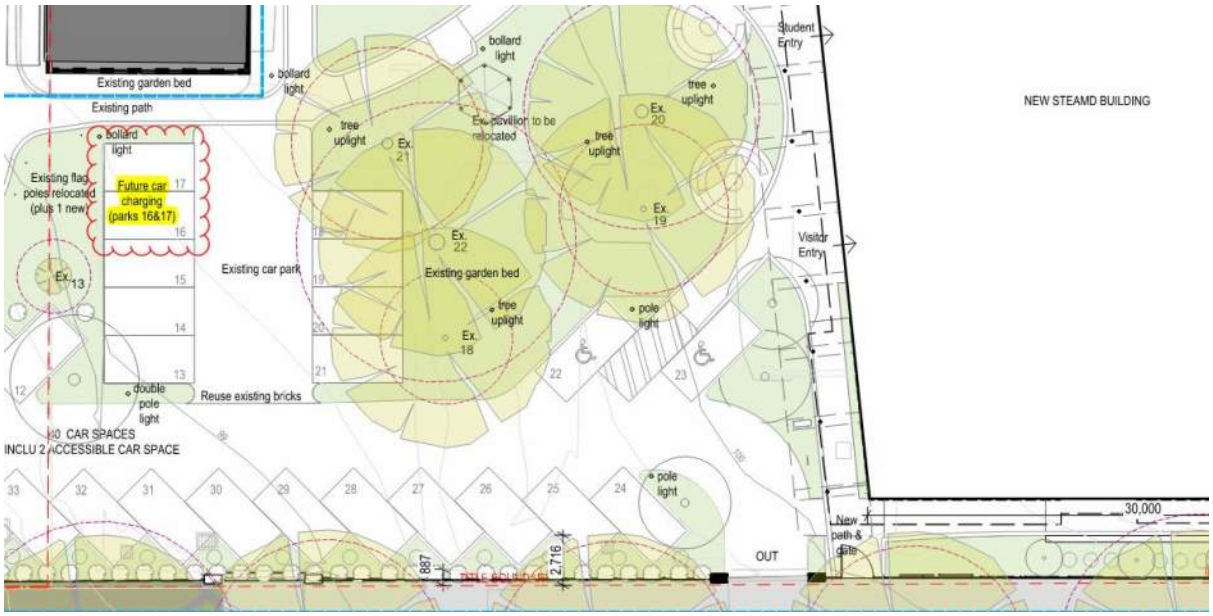
OBJECTIVE

To reduce the carbon emissions arising from occupant travel to and from the project, when compared to a reference building. Also, this helps to promote the health and fitness of commuters and increased liveability of the location

3.6.1 Sustainable Transport

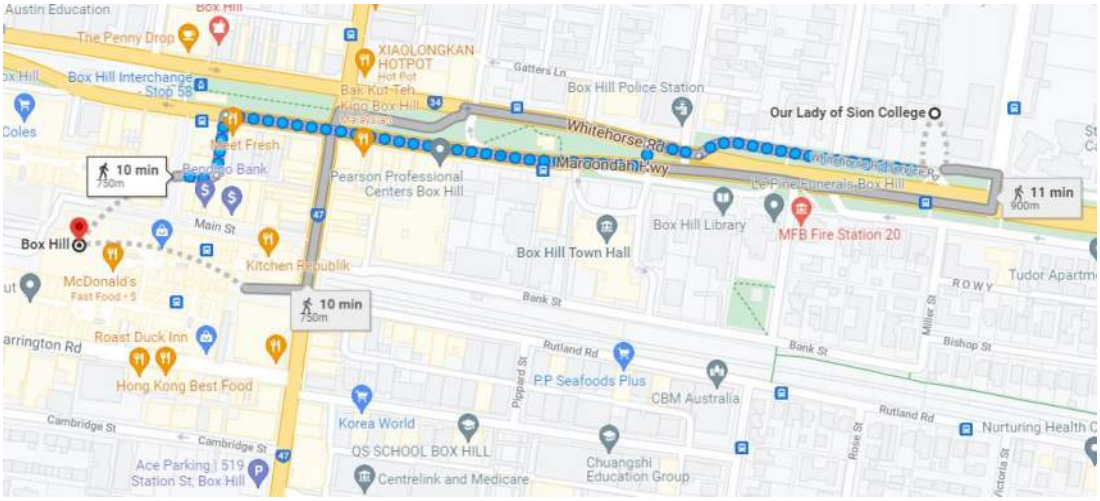
Description	The following measures have been taken to promote sustainable transport. - Two parking spaces dedicated to electric vehicles with charging infrastructure provided for each space. - 14 No new bicycle parking spaces for students, staff and visitors - Existing end-of-trip facilities are deemed sufficient to service staff and students.
Environmental Benefits	- Reduction in carbon emissions associated with the travel to the development.
Performance Targets	Compliance with BESS Transport category
Reference Standard	BESS
Commitment	Committed

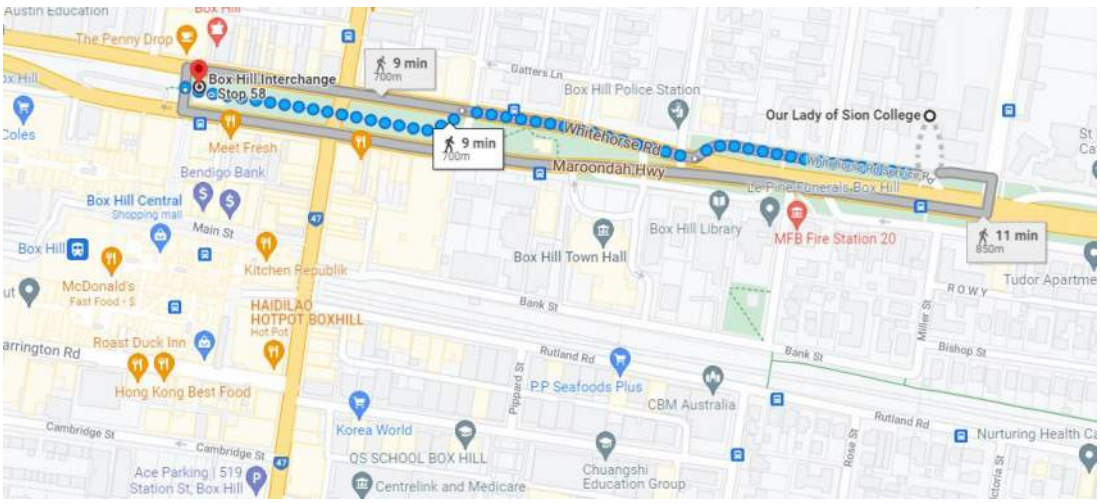


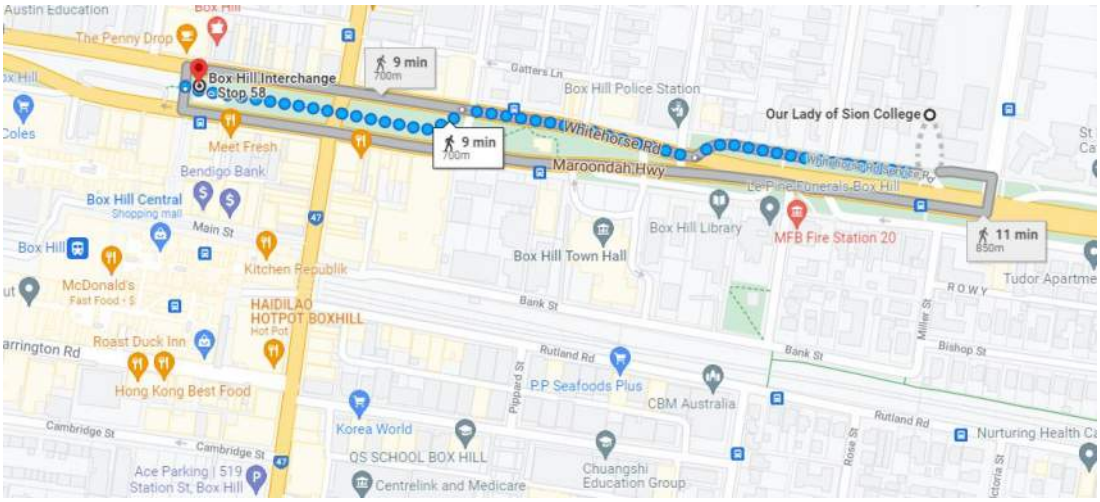


ADVERTISED PLAN

3.6.2 Access to Public Transport	
Description	The site is located in close vicinity to public transport hubs: - 800m from Box Hill Central Train Station - 700m from Box Hill Tram Interchange - 35m from bus strop servicing the 271 and 279 lines.
Environmental Benefits	- Reduction in carbon emissions associated with the travel to the development.
Performance Targets	-
Reference Standard	-
Commitment	Not required

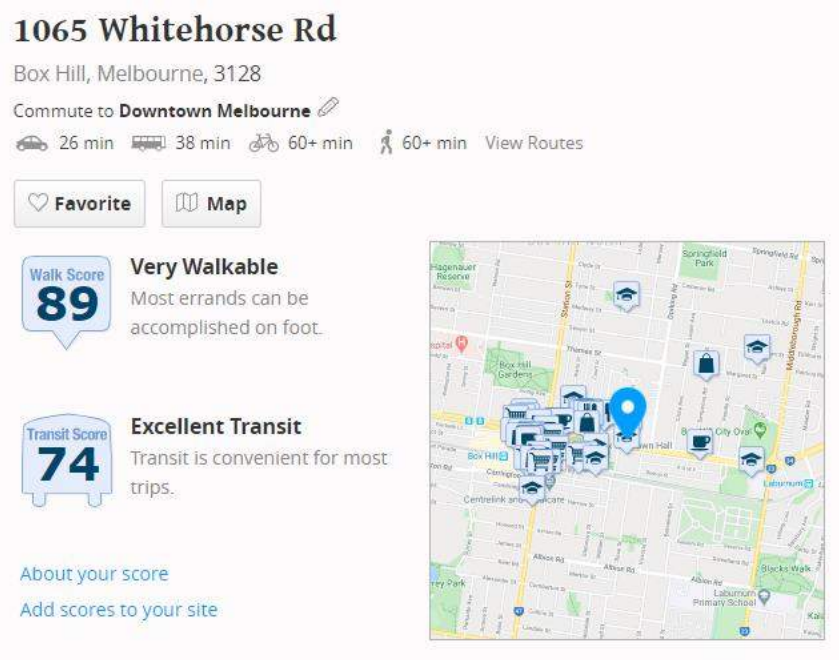






ADVERTISED
PLAN

3.6.3 Walkable Neighbourhoods	
Description	The site achieves an almost perfect walk score of 89 being close vicinity to many food, retail and service outlets.
Environmental Benefits	- Reduction in carbon emissions associated with the travel to shops, hospitality outlets and service providers.
Performance Targets	- Walkscore of ≥ 80
Reference Standard	- Green Star credit 17B.5 Walkable Neighbourhoods
Commitment	Not required



3.7 Waste Management

OBJECTIVE

To ensure waste avoidance, re-use and recycling during the construction and operational stages of a development

3.7.1 Demolition and Construction Waste Management

Description	Large volumes of waste materials are often generated from building demolition and construction activities. Most of these waste materials have the potential to be reused or recycled, including common materials such as timber, concrete, steel, bricks and plasterboard.
Environmental Benefits	- Reduction of volume and toxicity of waste going to landfill - Recycling of valuable materials
Performance Targets	Construction and demolition waste to landfill does not exceed 10 kg/m2 GFA, or at least 90% of all construction and demolition waste generated is diverted from landfill.
Reference Standard	Green Star Design and As-Built – Credit 22 Construction and Demolition Waste.
Commitment	Committed

3.8 Urban Ecology

OBJECTIVE

To protect and enhance biodiversity and to encourage the planting of indigenous vegetation

3.8.1 Light Pollution

Description	Ecological light pollution is the effect of artificial light on individual organisms and on the structure of ecosystems as a whole. It is widely recognised as being a major threat to birds, nocturnal wildlife and insect species. External lighting that emits direct light-beams beyond the site boundary and into the night sky is also considered wasteful as this portion of the light does not fulfil a purpose. Well-designed external lighting only provides illumination where required, when required and ensures that no direct light beam is directed into the night sky or beyond the site boundary.
Environmental Benefits	- Reduced impact on nocturnal fauna and human neighbours - Reduced energy use
Performance Targets	External lighting to prevent direct light beams onto neighbouring properties and into the night sky
Reference Standard	Green Star Design & As-Built – Credit 27: Light Pollution
Commitment	Committed

3.9 Innovation

OBJECTIVE

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

3.9.1 Innovation #1 Building Air Permeability Rates	
Description	The project is targeting a leakage rate ≤ 5.0 $m^3/(h.m^2)$ at 50 Pa. Compliance with this initiative is possible due to the modular construction methodology that includes a rigorous quality assurance process while the modules are manufactured in the factory. Onsite testing of at least one typical level will assure the target leakage rate is achieved once the modules are assembled on site.
Environmental Benefits	- Improved energy efficiency - Reduced risk of interstitial condensation
Performance Targets	- leakage rate of ≤ 5.0$m^3/(h.m^2)$ at 50 Pa
Reference Standard	S/NZS ISO 9972:2015 *Thermal performance of buildings - Determination of air permeability of buildings - Fan pressurization method*
Commitment	Committed

3.9.2 Innovation #2 Ultra-low VOC paints	
Description	Volatile Organic Compounds (VOCs) of internal paints to be reduced to less than 5g/L or eliminated
Environmental Benefits	- Improved indoor air quality - Reduced exposure to VOC's for contractors
Performance Targets	-
Reference Standard	Green Star Design & As-Built – Credit 13.1: Paints, Adhesives, Sealants, and Carpets.
Commitment	Committed

3.10 Building Materials

OBJECTIVE

To minimise the environmental impacts of materials used by encouraging the use of materials with favourable life cycle impacts

3.10.1 Choice of Building Materials	
Description	All materials proposed are reviewed by the project ESD consultant and project working group on an ongoing basis. Criteria for evaluation are: - Material locality, local materials preferred; - Material toxicity (including raw materials extractions and production process); - Environmental impact due to raw material extraction; - Embodied energy; - Material durability / longevity; - End-of-life treatment; and - Maintenance requirements.
Environmental Benefits	- Reduction of resource extraction - Reduction of toxic by-products from resource extraction and/or manufacture
Performance Targets	-
Reference Standard	Green Star Design & As-Built – Credit 19: Life Cycle Impacts Green Star Design & As-Built – Credit 21: Sustainable Products
Commitment	Aspirational

3.10.2 Concrete	
Description	Cement has a substantial ecological impact, primarily from energy required to heat up raw materials, as well as the CO2 released as part of the calcification process. Replacing cement with cementitious replacement material (CRMs) reduces the volume of regular cement (i.e. Portland Cement) used and hence reduce the carbon footprint of the building. Further ecological improvement can be made by using recycled water, and manufactured aggregate in the concrete. The project is currently targeting 30% cement replacement, 50% recycled water and 25% manufactured sand.
Environmental Benefits	- Reduction of manufacturing energy - Resource efficiency
Performance Targets	- Replacement of ≥30% of cement with replacement cementitious materials (such as fly ash). - 50% recycled water - 40% recycled aggregate or 25% manufactured sand
Reference Standard	Green Star Design & As-Built – Credit 19.B.1: Life Cycle Impacts – Concrete.
Commitment	Committed

3.10.3 Sustainable Timber	
Description	Responsibly sourced timber has a low environmental impact because it ensures that old growth forests and important habitat areas are not damaged. Forestry certification schemes ensure that timber is sourced from responsible and sustainable plantations and mills. Only FSC / PEFC / AFS certified timber will be specified for the project.
Environmental Benefits	- Protection of old-growth forest - Protection of endangered timber species
Performance Targets	FSC / PEFC / AFS certification with relevant Chain of Custody accreditation included on all delivery dockets.
Reference Standard	Green Star Design & As-Built – Credit 20.2: Responsible Building Materials – Timber.
Commitment	Committed

4 BESS Assessment

The sustainability footprint of the project has been assessed using the online BESS tool, targeting a minimum 'Best Practice' score of 50%. The percentage threshold represents a percentage improvement over a hypothetical 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.

In addition to the overall scoring, four BESS categories have mandatory pass scores:

- Water - 50%
- Energy - 50%
- Stormwater - 100%
- Indoor Environment Quality (IEQ) - 50%

The BESS score of the project is 62%

% of Total	Category	Score	Pass
5%	Management	100%	
9%	Water (50% threshold)	57%	✓
28%	Energy (50% threshold)	66%	✓
14%	Stormwater (100% threshold)	100%	✓
17%	IEQ (50% threshold)	74%	✓
9%	Transport	66%	
6%	Waste	50%	
0%	Urban Ecology	0%	
9%	Innovation	20%	
100%	**Summary**	**62%**	✓

Refer Appendix B – BESS Report

5 BCA Compliance

Verification of compliance with the energy efficiency performance requirements of Section J will be determined using the JV3 energy modelling compliance path. For this project the Building Code of Australia 2019 applies as determined by the relevant building surveyor.

In addition to the building envelope thermal performance requirements of Section J, the project will implement the following energy efficiency initiatives:

- Reduced thermal bridging
- Air-tightness testing.

The following thermal performance values are proposed for the building envelope:

Element	Proposed Performance	
	Whole-of-System Values	Estimated Added Insulation
Externally Exposed Floors	R2.5 [m^2K/W]	R2.0 [m^2K/W]
External Walls	R4.0 [m^2K/W]	R3.0-3.5 [m^2K/W]
Roof / Ceiling	R5.0 [m^2K/W]	R4.5 [m^2K/W]
Fenestration (total system values)	U2.5[W/m^2K], SHGC0.4 ±10%	-

6 Daylight Modelling

Meinhardt has undertaken daylight modelling to assess the daylight in the nominated spaces.

The model uses the following parameters for surface reflectance's and glazing visible light transmittance (VLT):

Parameter	Parameter Value
Floor Reflectance	30%
Wall Reflectance	70%
Ceiling Reflectance	80%
Glazing Visible Light Transmittance	50%
Analysis Grid	0.5m x 0.5m
Analysis Grid Level	800mm from finished floor level

The results are as follows:

Assessed Primary Area	Assssed Area (m^2)	% Area meeting sDA requirement	Compliant Area (m^2)	Total %
Overall TOTAL	**1881.8**		**1200.7**	**64%**
L0 - DP L&T	18.1	93%	16.8	
L0 - DIR. ORG	16.0	89%	14.2	
L0 - DP FAITH	17.1	93%	15.9	
L0 - DP PA	10.9	0%	0.0	
L0 - DP PA	10.9	0%	0.0	
L0 - PRINCIPAL PA	18.8	100%	18.8	
L0 - PRINCIPAL	31.2	97%	30.1	
L0 - BM	18.3	100%	18.3	
L0 - D. BM & ASSIST BM	18.1	95%	17.2	
L0 - ACCOUNTS REC.	14.5	98%	14.3	
L0 - ACCOUNTS PAY	14.3	83%	11.9	
L0 - RISK MAN	14.8	95%	14.1	
L0 - HR MAN	15.2	92%	13.9	
L0 - COLLEGE REG	14.9	100%	14.9	
L0 - COMMS & DEV	17.8	61%	10.8	

L0 - DP STUDENTS	15.6	10%	1.6	
L0 - DP PA	12.7	88%	11.1	
L0 - RECEPTION	22.0	0	0	
L0 - RECEPTION	18.0	0	0	
Total L0	319.2		224.0	70%
L1 - ART 1 (SENIOR)	108.9	100%	108.9	
L1 - DRAMA	113.9	27%	30.9	
L1 - TEXTILES	109.6	38%	41.1	
L1 - ART 2 (JUNIOR)	115.9	69%	79.6	
L1 - ART & DESIGN HUB	65.9	0%	0.0	
L1 - PROJECT LAB	66.4	80%	53.5	
L1 - STAFF WORKROOM	251.8	54%	135.4	
L1 - ART & DESIGN HUB	63.0	0	0	
Total L1	895.3		449.3	50%
L2 - PROJECT LAB	109.6	100%	109.6	
L2 - SCIENCE 1	150.5	65%	97.9	
L2 - SCIENCE 3	126.7	90%	114.5	
L2 - SCIENCE 4	140.3	47%	66.6	
L2 - SCIENCE 2	140.2	99%	138.8	
Total L2	667.4		527.4	79%

BESS Compliance	Bedrooms	Living Areas
Total Spaces	63.0	93.0[1]
Total meeting 90% 0.5DF threshold (Bedroom spaces)	62.0	
Total meeting 90% 1.0DF threshold (Living Spaces)		44.0
Total % of spaces meeting threshold (80% to pass)	98%	47%

[1] Studio apartments are considered living areas for the purpose of this assessment.

7 Execution of Sustainable Management Plan

The below table outlines all major responsibilities and responsible parties for implementation of the Sustainability Management Plan.

Responsibilities	Responsible Parties
Natural Ventilation	Architect
Daylight	Architect
VOC's and Formaldehyde	Architect, Contractor
Building Fabric	Architect, ESD Consultant
Artificial Lighting	Electrical Engineer
Space Heating & Ventilation	Mechanical Engineer
Heat Recovery Ventilation	Mechanical Engineer
On-Site Renewable Energy (Solar PV)	Electrical Engineer
Potable Water Demand	Architect, Hydraulic Engineer
Rainwater Harvesting and Reuse	Hydraulic Engineer
Landscaping Irrigation	Landscape Designer
Water Sensitive Urban Design (Stormwater)	Civil Engineer, Hydraulic Engineer
Construction Stormwater Management	Contractor
Building Materials	Architect, Contractor
Bicycle Storage	Architect
Construction Waste Management	Contractor
Operational Waste Management	Architect, Client
Construction Environmental Management Plan	Contractor
Commissioning	Building Services Engineers, ICA, Contractor

8 Conclusion

This Sustainable Management Plan successfully addresses the 9 Key Sustainable Building Categories as per the City of Whitehorse Council town planning requirements.

A **BESS assessment** has also been carried out for the proposed development, confirming a compliant design with a score of **67%**.

Where possible, all the ESD initiatives are shown or noted on the architectural plans, as requested by council.

We conclude that this SMP responds adequately to the objectives of the State & Local Planning Policy Frameworks and meets or exceeds all ESD related town planning requirements.

Appendix A – MUSIC Report

CONSULTANTS

Level 2
6 Palmer Pde
Cremorne VIC 3121

03 9885 4335

ENGINEERS

MANAGERS

INFRASTRUCTURE
PLANNERS

DEVELOPMENT
CONSULTANTS

OUR LADY OF SION COLLEGE

1065 WHITEHORSE ROAD BOX HILL VIC 3128

STORMWATER MANAGEMENT PLAN

VIC210277

STORMWATER MANAGEMENT

Design

This Stormwater Management Plan takes into account the Victorian best practice stormwater performance targets as set out in the Urban Stormwater Best Practice Environmental Management Guidelines (BPEMG). As per the guideline stormwater discharged from the site to authority's point of discharge should have the following reductions.

- 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

In addition to achieving the above requirements, WSUD requirements will also be met by rainwater harvesting and by installing SPEL Hydrosystem. A MUSIC model has been conducted to demonstrate the treatment train effectiveness in meeting those requirements.

It should be noted that MUSIC model has been carried out only for the proposed development.

Based on the MUSIC model, the following are required to meet the above objectives.

- Water runoff from all roofed areas to be collected to a minimum of 20KL water tank. It should also be noted that the level 3 canopy area is to be collected to a 2KL water tank.
- The rainwater tank to be connected to all the toilets for reuse of water and also for irrigation
- Rainwater tank collection, storage and distribution to be designed and installed in accordance with plumbing regulations and relevant Australian Standards including AS/NZS 3500.3 and HB230-2008 Rainwater Tank Design and Installation Handbook
- Stormwater runoff from carpark and all paved areas to have primary treatment through gross pollutant traps such as SPEL stormsacks in each stormwater pit in the paved areas.
- All site runoffs including the tank overflow, to be captured in a stormwater quality improvement device before discharging to council's approved legal point of discharge
- SPEL Hydrosystem treatment or equivalent device has been recommended to treat the stormwater prior to leaving the site
- On-site detention (OSD) requirements do not form the part of this report. Any OSD requirements to be confirmed by the council engineer and to be addressed during the design development stage

Figure 1 below provides high level indicative arrangements/model set up of the stormwater management of the site and Figure 2 shows the effectiveness of the proposed arrangement.

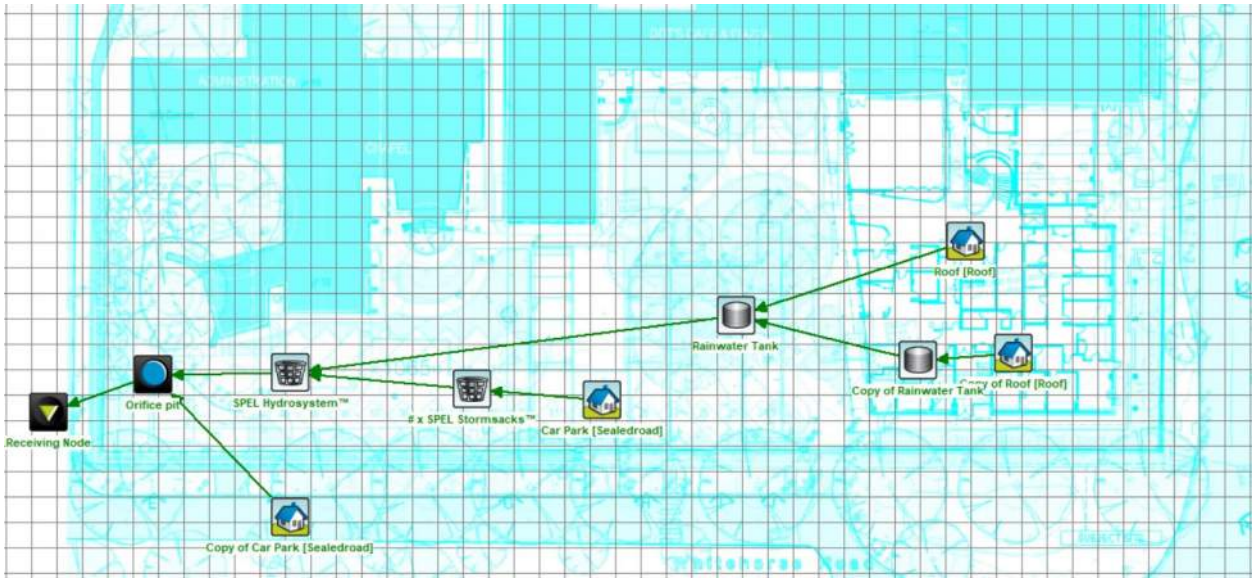
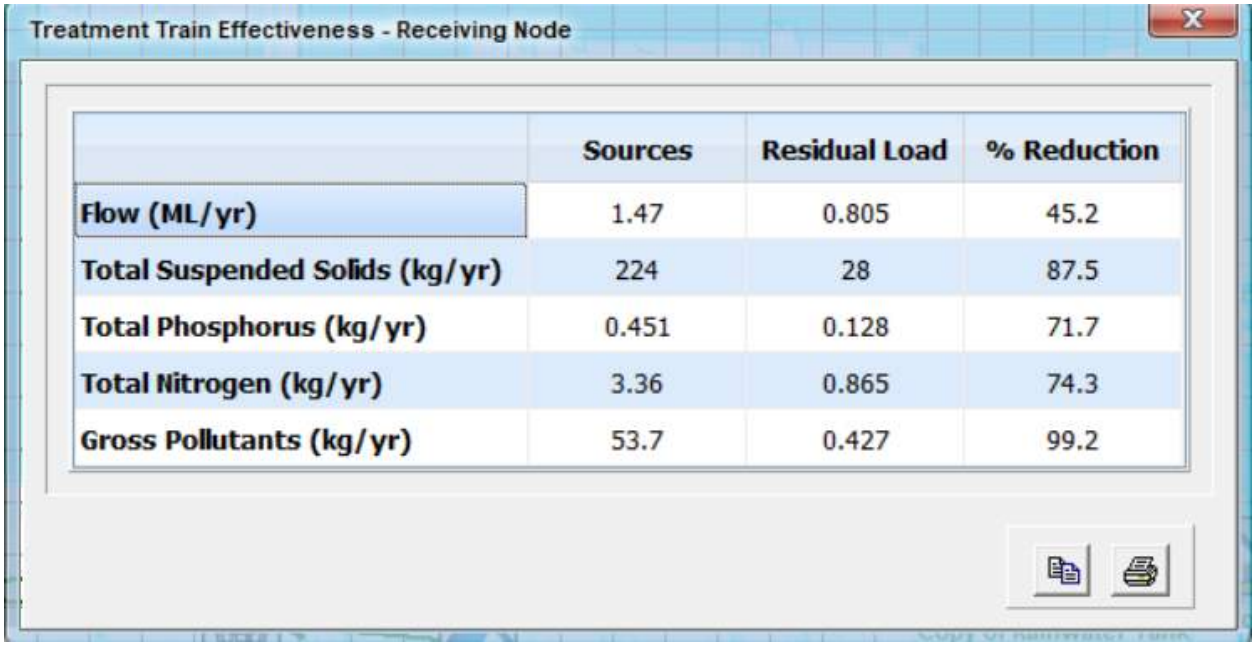


Figure 1: MUSIC Model Setup



	Sources	Residual Load	% Reduction
Flow (ML/yr)	1.47	0.805	45.2
Total Suspended Solids (kg/yr)	224	28	87.5
Total Phosphorus (kg/yr)	0.451	0.128	71.7
Total Nitrogen (kg/yr)	3.36	0.865	74.3
Gross Pollutants (kg/yr)	53.7	0.427	99.2

Figure 2: Treatment Train Effectiveness Result from MUSIC Model

CONSTRUCTION PHASE

During Construction, the building shall implement best practice stormwater protection by keeping stormwater clean, which can be downloaded via: https://www.clearwatervic.com.au/user-data/resource-files/Keeping_Our_Stormwater_Clean-A_Builders_Guide[1].pdf

At minimum, during construction phase, the contractor shall provide the following works to comply with requirements.

- Manage all construction activities within site boundaries
- Retain vegetation around the perimeter of the site wherever possible throughout construction up until landscaping
- Cover stockpiles, contain litter in bins within the site
- Manage any chemical disposal as per EPA guidelines
- Provide soil and erosion control plan and at all times and remain responsible for compliance with all laws and regulations pertaining to safety and protection of the environment
- Provide crushed rock at site entrance to provide dry access point to vehicles
- Provide geotextile filter fabric fence along the whole site boundary to prevent any sediment from entering the adjacent lots or downstream stormwater systems
- Wrap the grated pit covers in geotextile fabric during construction works to prevent the council's drainage infrastructure and receiving waters from sedimentation and contamination
- Ensure to keep the access road clean of all construction material during and prior to construction works
- Submit soil and sediment erosion control plan to council prior to construction

Further to above, any specific requirements set by Bendigo City Council will need to be complied by the contractor during the construction stage.

If you have any queries regarding the above response, please feel free to contact us on 9885 4335.

Yours sincerely,

Jude Linton

Civil Engineer

ACOR Consultants (VIC) Pty Ltd

MIRIAM PERFORMING ARTS CENTRE

LOUISE HUMANN CENTRE

DOTS CAFE & PIAZZA

ADMINISTRATION yr 10

IT

Vis Comm

yr 10

EXISTING STORMWATER PIPE. INVERTS AND SIZE OF THE PIPES TO BE CONFIRMED PRIOR TO NEXT DESIGN STAGE.

INVERTS AND SIZE OF EXISTING DRAINAGE SYSTEM TO BE PROVIDED TO ENSURE THAT THE EXISTING DRAINAGE ASSETS COULD BE CONNECTED TO THE PROPOSED DRAINAGE NETWORK.

ATLANTIS TANK WITH 10 ROWS, EACH ROW CONTAINING 12 NOS OF DOUBLE MODULE FLO TANK. APPROX LENGTH 8.22m AND WIDTH 4.08m. APPROX VOLUME 29.00M3. TANK TO BE INSTALLED TO MANUFACTURER'S SPECIFICATIONS. FINAL LOCATION OF TANK TO BE CONFIRMED ON SITE.
TANK INVERT= 97.40 TO BE CONFIRMED PRIOR TO CONSTRUCTION.
PSD: 40l/s

PAVEMENT LEVELS OF ASPHALT PAVEMENT AND CONCRETE PAVEMENT INTERFACE TO BE COORDINATED

ATLANTIS TANK WITH 15 ROWS, EACH ROW CONTAINING 15 NOS OF SINGLE MODULE FLO TANK. APPROX LENGTH 10.275m AND WIDTH 6.12m. APPROX VOLUME 28.00M3. TANK TO BE INSTALLED TO MANUFACTURER'S SPECIFICATIONS. FINAL LOCATION OF TANK TO BE CONFIRMED ON SITE.
TANK INVERT= 97.11 TO BE CONFIRMED PRIOR TO CONSTRUCTION

ORIFICE PIT RESTRICTING FLOW TO PRE-DEVELOPMENT LEVEL. TO BE CONFIMED WITH COUNCIL ON DETENTION REQUIREMENT.
PSD: 124l/s TO BE CONFIRMED

EXISTING SEP. COUNCIL'S LEGAL POINT OF DISCHARGE.
BREAK INTO EXISTING PIT AND MAKE GOOD TO COUNCIL STANDARD AND SATISFACTION.
IL96.85

SPEL HYDRO SYSTEM WITH AN EXTERNAL BYPASS SYSTEM TO BE DESIGNED AT LATER STAGE.

150ØUPVC @1:100

225ØUPVC @1:100

225ØUPVC @1:200
IL:97.40

CL: 97.90
INLET IL:97.30
OUTLET IL:97.05

CL: 97.84

225Ø UPVC @1:200

375ØSTORMPRO @1:250

RWT1

CL: 98.50

CL: 98.80

RWT2

CL: 99.30

375ØSTORMPRO @1:250

300ØSTORMPRO @1:250

225ØSTORMPRO @1:200

FFL: 100.450

INDICATIVE LOCATION OF RAINWATER TANK FOR IRRIGATION.

100 WIDE ACO DRAIN OR SIMILAR WITH CLASS B COVER INSTALLED TO MANUFACTURER'S SPECIFICATIONS. CONNECT TO NEAREST DRAINAGE BY 100Ø PIPE.
PROVIDE DROPPER AS REQUIRED.

REFER TO STERUCTURAL FOR RETAINING WALL DETAILS

200 WIDE ACO DRAIN OR SIMILAR WITH CLASS D COVER INSTALLED TO MANUFACTURER'S SPECIFICATIONS. CONNECT TO NEAREST DRAINAGE BY 100Ø PIPE.
PROVIDE DROPPER AS REQUIRED.

200 WIDE ACO DRAIN OR SIMILAR WITH CLASS D COVER INSTALLED TO MANUFACTURER'S SPECIFICATIONS. CONNECT TO NEAREST DRAINAGE BY 100Ø PIPE.
PROVIDE DROPPER AS REQUIRED.

NOTE:
REFER TO LANDSCAPE PLAN FOR PAVEMENT LEVELS OF THE FOOTPATH. PAVEMENT INTERFACE TO BE COORDINATED.

ALL GRATED PITS IN THE DRIVEWAY TO BE FITTED WITH SPEL STORM SACKS FOR WSUD PURPOSE

IMPORTANT NOTE:
DETENTION REQUIREMENTS TO BE CONFIRMED WITH COUNCIL PRIOR TO NEXT DESIGN STAGE.

RAINWATER TANK SIZE AND INVERTS TO BE FINALISED.

DEPTH AND SIZE OF ALL EXISTING DRAINAGE ASSETS TO BE CONFIRMED TO ENSURE THE DESIGN FEASIBILITY OF THE DRAINAGE SYSTEM

NEW VEHICLE CROSSOVER AS PER COUNCIL'S REQUIREMENT

EXISTING REDUNDANT DRAINAGE SYSTEM TO BE REMOVED BACKFILLED AND COMPACTED APPROPRIATELY.
CONTRACTOR TO ENSURE SITE HAS A FUNCTIONAL DRAINAGE SYSTEM AT ALL TIMES

REDUNDANT CROSSOVER TO BE REMOVED, NATURE STRIP FOOTPATH, KERB AND CHANNEL TO BE REINSTATED TO COUNCIL STANDARD AND SATISFACTION

TITLE BOUNDARY

Whitehorse Road

SUBJECT SITE

DESIGN NOTES

PIPE ALIGNMENTS ARE ILLUSTRATIVE ONLY AND WOULD BE SUBJECT TO CHANGE BASED ON FINAL PERMIT REQUIREMENTS, COORDINATION WITH OTHER SERVICES AND ARCHITECTURAL CONSIDERATIONS

ONSITE DETENTION ALIGNMENTS INDICATIVE AND SUBJECT TO CHANGE / REMOVAL AFTER CONSULTATION WITH COUNCIL ENGINEERING DEPARTMENT

REMOVE REDUNDANT CROSSOVER. REINSTATE KERB AND NATURE STRIP TO THE STANDARD AND SATISFACTION OF COUNCIL

CONSTRUCT NEW CROSSOVER TO THE STANDARD AND SATISFACTION OF COUNCIL

REFER TO LANDSCAPE AND STRUCTURAL PLAN FOR RETAINING WALL SPECIFICATIONS AND DETAIL

CONNECTION INTO EXISTING COUNCIL PIT AS LPOD CONNECTION TO COUNCIL STANDARDS AND REQUIREMENTS. I.L. TO BE CONFIRMED PRIOR TO DETAILED DESIGN STAGE.

BUILDER/CONTRACTOR MUST CONFIRM EXISTING STORMWATER PIPE DEPTH PRIOR TO COMMENCEMENT OF DRAINAGE WORK AND ANY DISCREPANCIES MUST BE REPORTED TO THE DESIGN ENGINEER ASSESSMENT

ALL AGI DRAIN TO BE CONNECTED TO MAIN STORMWATER SYSTEM

CONTRACTOR TO ENSURE MINIMUM OF 300mm COVER IS MAINTAINED THROUGHOUT ALL DRAINAGE SYSTEM.

WATER TREATMENT MEASURES & CONDITIONS TBC UPON PROVISION OF ESD / SDA REQUIREMENTS.

UNDERGROUND RAINWATER TANK WITH 28000L VOLUME HAS BEEN PROPOSED FOR DETENTION PURPOSE BASED ON PRELIMINARY CALCULATION.

ADDITIONAL UNDERGROUND RAINWATER TANK WITH 29000L VOLUME HAS BEEN PROPOSED FOR REUSE PURPOSE. 20000L FOR REUSE AND 9000L FOR DETENTION PURPOSE BASED ON PRELIMINARY CALCULATION.

EXACT LOCATION AND NUMBER OF DOWNPIPES TO BE CONFIRMED BY THE ARCHITECT. LOCATION OF RAINWATER TANK FOR IRRIGATION TO BE FINALISED PRIOR TO NEXT DESIGN STAGE

LEGEND

- PIT NUMBER
- GRATED PIT
- PROPOSED BRICK PAVEMENT ON CONCRETE SLAB
- PROPOSED CONCRETE FOOTPATH
- PROPOSED STORMWATER PIPE
- PROPOSED RETAINING WALL
- B1 — B1 TYPE BARRIER KERB
- M2 — PROPOSED CONCRETE SPOON DRAIN
- ES — EDGE STRIP

ANY EXISTING PAVEMENTS DISTURBED/DEMOLISHED DUE TO PROPOSED DRAINAGE WORKS ARE TO BE REINSTATED BACK TO ITS ORIGINAL CONDITION AFTER COMPLETION OF WORKS.

ALL DRAINAGE WORKS ARE TO BE IN ACCORDANCE WITH AS3500.3-2018 PART 3 "STORMWATER DRAINAGE SYSTEMS" AND IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.

STORMWATER CONNECTION TO EXISTING SYSTEM AND MAKE GOOD. CONTRACTOR/ BUILDER TO CONFIRM EXACT LOCATION AND INVERT OF EXISTING STORMWATER GRATED PIT TO ENSURE DESIGN INTENT IS ACHIEVABLE.

CONTRACTOR IS TO ENSURE THAT ANY EXISTING STORWMATER REMAINS FUNCTIONAL OR IS REDIRECTED TO AN ALTERNATIVE POINT OF DISCHARGE DURING CONSTRUCTION. AN ALLOWANCE SHOULD BE MADE FOR ALL TEMPORARY WORKS AS REQUIRED.

REFER TO ARCHITECTURAL DRAWINGS FOR DOWNPIPE LOCATIONS AND SIZES.

THIS PLAN IS TO BE READ IN CONJUNCTION WITH ARCHITECTURAL, STRUCTURAL AND ALL OTHER SERVICES PLANS FOR ALL WORKS

REFER TO ARBORIST REPORT FOR TREES TO BE RETAINED ON SITE

REFER TO ARCHITECTURAL DRAWINGS FOR EXTENT OF DEMOLITION WORKS ON SITE

DETENTION VOLUME CALCULATION IS APPROXIMATE ONLY AND IS SUBJECT TO COUNCIL APPROVAL

DIAL BEFORE YOU DIG www.1100.com.au

WARNING
BEWARE OF UNDERGROUND SERVICES

THE LOCATIONS OF UNDERGROUND SERVICES SHOWN ARE APPROXIMATE ONLY AND THEIR EXACT POSITION SHOULD BE PROVEN ON SITE.

ADVERTISED PLAN

This drawing has been assigned an electronic code that signifies the drawing has been checked and approved by:

Issue	Description	Date	Drawn	Approved
C	SCHEMATIC DESIGN	07/04/22	JL	AS
B	SCHEMATIC DESIGN	03/12/21	JL	AS
A	SCHEMATIC DESIGN	03/09/21	AS	DS

1cm at full size

North

Client: OUR LADY OF SION COLLEGE

Architect: williamsross

ACOR CONSULTANTS
ACOR Consultants (VIC) Pty Ltd
Level 1, 173 Burke Road
Glen Iris VIC 3146
T +61 3 9885 4335

Project: OLSC STAGE 2 WORKS
1065 WHITEHORSE ROAD
BOX HILL VIC 3128

Drawing Title: SCHEMATIC DESIGN PLAN

Drawn	Date	Scale A1	Q.A. Check	Date
JL	APRIL 2022	1:200	AS	APRIL 2022
Designed	Project No.		Dwg. No.	Issue
JL	VIC210277		SKC01	C

Appendix B – BESS Report

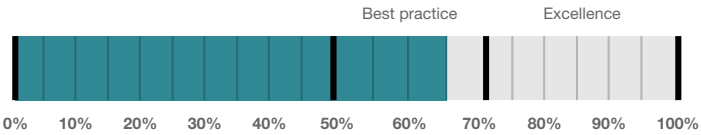
BESS Report

Built Environment Sustainability Scorecard

This BESS report outlines the sustainable design commitments of the proposed development at Our Lady of Sion College Box Hill VIC 3128. 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 Whitehorse 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

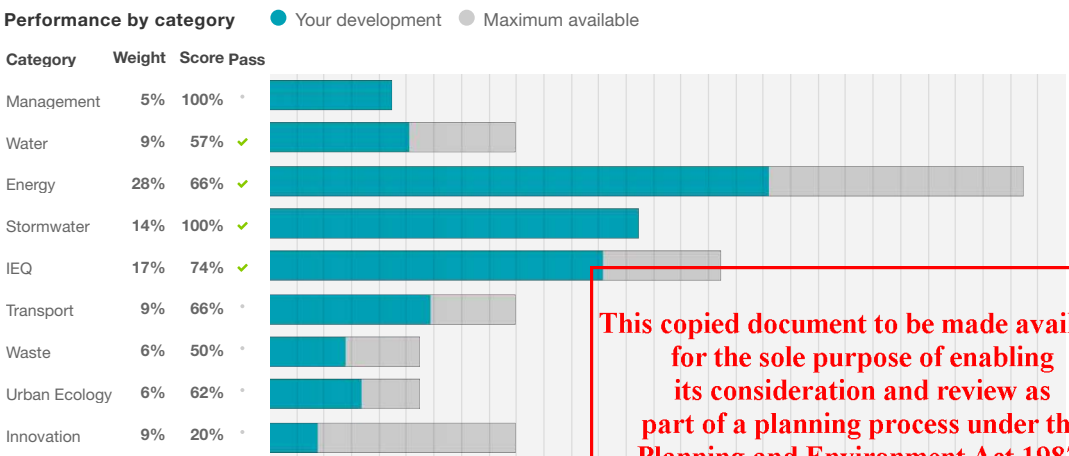


67%

Project details

Address	Our Lady of Sion College Box Hill VIC 3128
Project no	175BFC73-R1
BESS Version	BESS-6
Site type	Non-residential development
Account	bess@meinhardtgroup.com
Application no.	
Site area	4,177 m²
Building floor area	3,898.0 m²
Date	08 April 2022
Software version	1.7.0-B.384

Performance by category



Buildings

Name	Height	Footprint	% of total footprint
STEAMD & Admin	3	1,440 m²	100%

Dwellings & Non Res Spaces

Non-Res Spaces

Name	Quantity	Area	Building	% of total area
Public building				
STEAMD	1	3,898 m²	STEAMD & Admin	100%
Total	**1**	**3,898 m²**	**100%**	

Supporting information

Floorplans & elevation notes

Credit	Requirement	Response	Status
Management 3.3	Common area submeters annotated	To be printed Refer SMP Section 3.1.3 for the metering and monitoring commitment.	✔
Water 3.1	Water efficient garden annotated	To be printed Refer Landscape drawings	✔
Energy 4.2	Floor plans showing location of photovoltaic panels as described.	To be printed Refer to architectural roof plans and commitment in SMP, Section 3.3.3	✔
Stormwater 1.1	Location of any stormwater management systems used in STORM or MUSIC modelling (e.g. Rainwater tanks, raingarden, buffer strips)	To be printed Refer Appendix A: MUSIC Modelling report of the SMP	✔
Transport 1.4	All nominated non-residential bicycle parking spaces	To be printed Refer SMP, Section 3.6.1	✔
Transport 1.5	All nominated non-residential visitor bicycle parking spaces	To be printed Refer SMP, Section 3.6.1	✔
Transport 1.6	Showers, change rooms and lockers as nominated	To be printed existing facilities considered sufficient	✔
Transport 2.1	Location of electric vehicle charging infrastructure	To be printed Refer Architect's Proposed site plan 2107_TP08(A), and Section 3.6 Traffic of the SMP	✔
Waste 2.2	Location of recycling facilities	To be printed Existing operational waste strategy is in place at the school. This includes recycling bins, signage and education.	✔
Urban Ecology 1.1	Size and location of communal spaces	To be printed 234 sqm is a nominal figure as the school grounds provide significantly more	✔

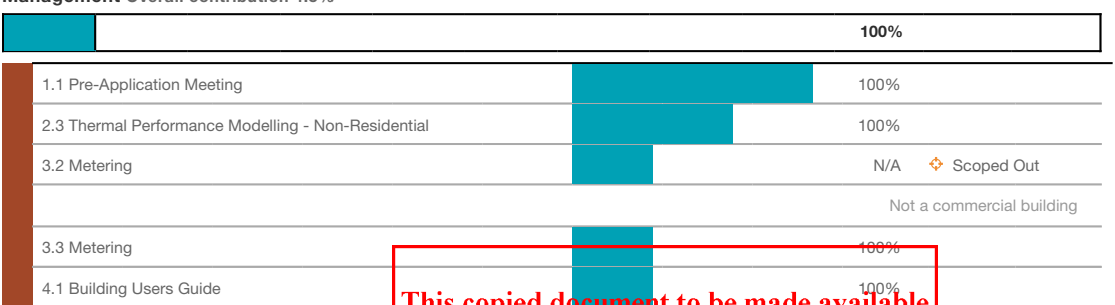
Credit	Requirement	Response	Status
Urban Ecology 2.1	Vegetated areas	To be printed Refer Lanscape Concept Plans by ACLA	✔
Urban Ecology 2.2	Green roof	To be printed Refer Rooftop Landscape Concept Plan by ACLA	✔

Supporting evidence

Credit	Requirement	Response	Status
Management 2.3a	Section J glazing assessment	To be printed 124085_OLOS STEAMD_JV3 Modelling Report_ R01 Refer uploaded JV3 report	✔
Management 2.3b	Preliminary modelling report	To be printed 124085_OLOS STEAMD_JV3 Modelling Report_ R01 refer uploaded JV3 report	✔
Energy 1.1	Energy Report showing calculations of reference case and proposed buildings	To be printed modelling report attached	✔
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.	To be printed SMP Refer SMP Section 3.3.2 for a commitment to a maximum illumination power density of 4.5 W/m2.	✔
Energy 4.2	Specifications of the solar photovoltaic system(s).	To be printed Sustainable Management Plan Commitment to solar PV as per SMP	✔
Stormwater 1.1	STORM report or MUSIC model	To be printed SMP, Appendix A MUSIC Modelling report Refer Appendix A: MUSIC Modelling report of the SMP	✔
IEQ 1.4	A short report detailing assumptions used and results achieved.	To be printed Refer uploaded daylight report	✔

Credit summary

Management Overall contribution 4.5%



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%	66%	✔ 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	
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		100%	
4.4 Renewable Energy Systems - Other		N/A	⊘ Disabled
		No other (non-solar PV) renewable energy is in use.	

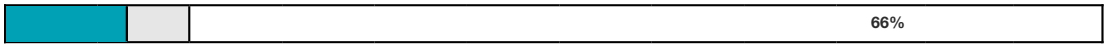
Stormwater Overall contribution 13.5%

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

IEQ Overall contribution 16.5%

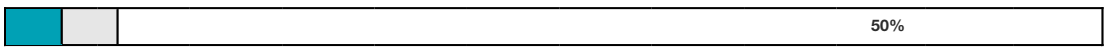
	Minimum required 50%	74%	✔ Pass
1.4 Daylight Access - Non-Residential		64%	✔ Achieved
2.3 Ventilation - Non-Residential		88%	✔ Achieved
3.4 Thermal comfort - Shading - Non-residential		85%	
3.5 Thermal Comfort - Ceiling Fans - Non-Residential		0%	
4.1 Air Quality - Non-Residential		100%	

Transport Overall contribution 9.0%



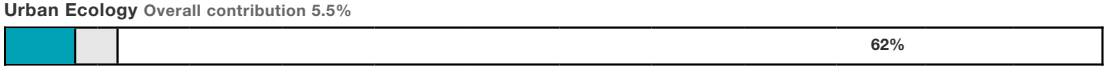
1.4 Bicycle Parking - Non-Residential	100%
1.5 Bicycle Parking - Non-Residential Visitor	100%
1.6 End of Trip Facilities - Non-Residential	100%
2.1 Electric Vehicle Infrastructure	100%
2.2 Car Share Scheme	0%
2.3 Motorbikes / Mopeds	0%

Waste Overall contribution 5.5%



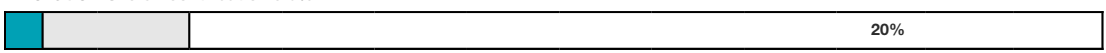
1.1 - Construction Waste - Building Re-Use	N/A ◇ Scoped Out
New building with connections to existing buildings on existing campus. Building re-use would be a rhetorical question.	
2.1 - Operational Waste - Food & Garden Waste	0%
2.2 - Operational Waste - Convenience of Recycling	100%

Urban Ecology Overall contribution 5.5%



1.1 Communal Spaces	100%
2.1 Vegetation	75%
2.2 Green Roofs	100%
2.3 Green Walls and Facades	0%
3.2 Food Production - Non-Residential	0%

Innovation Overall contribution 9.0%



1.1 Innovation	20%

Credit breakdown

Management Overall contribution 4%

1.1 Pre-Application Meeting		100%
Score Contribution	This credit contributes 42.9% 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		100%
Score Contribution	This credit contributes 28.6% towards the category score.	
Criteria	Has a preliminary facade assessment been undertaken in accordance with NCC2019 Section J1.5?	
Question	Criteria Achieved ?	
Public building	Yes	
Criteria	Has preliminary modelling been undertaken in accordance with either NCC2019 Section J (Energy Efficiency), NABERS or Green Star?	
Question	Criteria Achieved ?	
Public building	Yes	
3.2 Metering		N/A ⌖ Scoped Out
This credit was scoped out	Not a commercial building	
3.3 Metering		100%
Score Contribution	This credit contributes 14.3% towards the category score.	
Criteria	Have all major common area services been separately submetered?	
Question	Criteria Achieved ?	
Public building	Yes	
4.1 Building Users Guide		100%
Score Contribution	This credit contributes 14.3% towards the category score.	
Criteria	Will a building users guide be produced and issued to occupants?	
Question	Criteria Achieved ?	
Project	Yes	

Water

Overall contribution 5% Minimum required 50%

Section Notes: Fire protection system test water to be collected in rainwater tank

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?:	No
Are you installing a swimming pool?:	No
Are you installing a rainwater tank?:	Yes
Water fixtures, fittings and connections	
Building:	STEAMD & Admin
Showerhead:	Scope out
Bath:	Scope out
Kitchen Taps:	>= 6 Star WELS rating
Bathroom Taps:	>= 6 Star WELS rating
Dishwashers:	>= 5 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?:	-1
Non-potable water source connected to Toilets:	No
Non-potable water source connected to Laundry (washing machine):	No
Non-potable water source connected to Hot Water System:	No
Rainwater Tanks	
What is the total roof area connected to the rainwater tank?:	
Roof Deck	44.0 m²
In-ground	1,225 m²
Tank Size:	
Roof Deck	1,500 Litres
In-ground	20,000 Litres
Irrigation area connected to tank:	
Roof Deck	24.0 m²
In-ground	1,015 m²
Is connected irrigation area a water efficient garden?:	
Roof Deck	Yes
In-ground	Yes
Other external water demand connected to tank?:	
Roof Deck	-
In-ground	-

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	7566 kL
Output	Proposed (excluding rainwater and recycled water use)
Project	5013 kL
Output	Proposed (including rainwater and recycled water use)
Project	4622 kL
Output	% Reduction in Potable Water Consumption
Project	38 %
Output	% of connected demand met by rainwater
Project	85 %
Output	How often does the tank overflow?
Project	Often
Output	Opportunity for additional rainwater connection
Project	2923 kL

3.1 Water Efficient Landscaping	100%
Score Contribution	This credit contributes 14.3% towards the category score.
Criteria	Will water efficient landscaping be installed?
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?
Question	Criteria Achieved ?
Project	Yes

Energy

Overall contribution 18% Minimum required 50%

Use the BESS Deem to Satisfy (DtS) method for Energy?:	No

Non-Residential Building Energy Profile	
Heating, Cooling & Comfort Ventilation - Electricity - reference fabric and reference services:	110,137 kWh
Heating, Cooling & Comfort Ventilation - Electricity - proposed fabric and reference services:	98,864 kWh
Heating, Cooling & Comfort Ventilation - Electricity - proposed fabric and proposed services:	98,864 kWh
Heating - Wood - reference fabric and reference services:	0.0 MJ
Heating - Wood - proposed fabric and reference services:	0.0 MJ
Heating - Wood - proposed fabric and proposed services:	0.0 MJ
Hot Water - Electricity - Baseline:	18,093 kWh
Hot Water - Electricity - Proposed:	18,093 kWh
Lighting - Baseline:	46,899 kWh
Lighting - Proposed:	42,200 kWh
Peak Thermal Cooling Load - Baseline:	364 kW
Peak Thermal Cooling Load - Proposed:	337 kW

Solar Photovoltaic systems	
System Size (lesser of inverter and panel capacity):	
Roof System	68.0 kW peak
Roof Deck	2.0 kW peak
Orientation (which way is the system facing)?:	
Roof System	North
Roof Deck	North
Inclination (angle from horizontal):	
Roof System	10.0 Angle (degrees)
Roof Deck	30.0 Angle (degrees)

1.1 Thermal Performance Rating - Non-Residential 37%

Score Contribution	This credit contributes 44.4% towards the category score.
Criteria	What is the % reduction in heating and cooling energy consumption against the reference case (NCC 2019 Section J)?
Output	Total Improvement
Public building	10 %

2.1 Greenhouse Gas Emissions		100%
Score Contribution	This credit contributes 11.1% towards the category score.	
Criteria	What is the % reduction in annual greenhouse gas emissions against the benchmark?	
Output	Reference Building with Reference Services (BCA only)	
Public building	130,795 kg CO2	
Output	Proposed Building with Proposed Services (Actual Building)	
Public building	119,296 kg CO2	
Output	% Reduction in GHG Emissions	
Public building	8 %	

2.2 Peak Demand		100%
Score Contribution	This credit contributes 5.6% towards the category score.	
Criteria	What is the % reduction in the instantaneous (peak-hour) demand against the benchmark?	
Output	Peak Thermal Cooling Load - Baseline	
Public building	364 kW	
Output	Peak Thermal Cooling Load - Proposed	
Public building	337 kW	
Output	Peak Thermal Cooling Load - % Reduction	
Public building	7 %	

2.3 Electricity Consumption		100%
Score Contribution	This credit contributes 11.1% towards the category score.	
Criteria	What is the % reduction in annual electricity consumption against the benchmark?	
Output	Reference	
Public building	128,230 kWh	
Output	Proposed	
Public building	116,957 kWh	
Output	Improvement	
Public building	8 %	

2.4 Gas Consumption		N/A	Scoped Out
This credit was scoped out	No gas connection in use		

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 5.6% towards the category score.		
Criteria	What is the % reduction in annual energy consumption (gas and electricity) of the hot water system against the benchmark?		
Output	Reference		
Public building	18,093 kWh		
Output	Proposed		
Public building	18,093 kWh		
Output	Improvement		
Public building	0 %		

3.7 Internal Lighting - Non-Residential		100%	
Score Contribution	This credit contributes 11.1% 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?		
Question	Criteria Achieved ?		
Public building	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		100%	
Score Contribution	This credit contributes 5.6% towards the category score.		
Criteria	What % of the estimated energy consumption of the building class it supplies does the solar power system provide?		
Output	Solar Power - Energy Generation per year		
Public building	85,011 kWh		
Output	% of Building's Energy		
Public building	53 %		

4.4 Renewable Energy Systems - Other		N/A	⊘ 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?
Question	Flow (ML/year)
Project	45.2 % Reduction
Question	Total Suspended Solids (kg/year)
Project	87.5 % Reduction
Question	Total Phosphorus (kg/year)
Project	71.7 % Reduction
Question	Total Nitrogen (kg/year)
Project	74.3 % Reduction

IEQ Overall contribution 12% Minimum required 50%

1.4 Daylight Access - Non-Residential		64%	✔ 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?		
Question	Percentage Achieved?		
Public building	64 %		
2.3 Ventilation - Non-Residential		88%	✔ Achieved
Score Contribution	This credit contributes 35.3% towards the category score.		
Criteria	What % of the regular use areas are effectively naturally ventilated?		
Question	Percentage Achieved?		
Public building	-		
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 1668:2012?		
Public building	100 %		
Criteria	What CO2 concentrations are the ventilation systems designed to achieve, to monitor and to maintain?		
Question	Value		
Public building	700 ppm		
3.4 Thermal comfort - Shading - Non-residential		85%	
Score Contribution	This credit contributes 17.6% towards the category score.		
Criteria	What percentage of east, north and west glazing to regular use areas is effectively shaded?		
Question	Percentage Achieved?		
Public building	77 %		
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?		
Public building	0 %		
4.1 Air Quality - Non-Residential		100%	
Score Contribution	This credit contributes 5.9% towards the category score.		
Criteria	Do all paints, sealants and adhesives meet the maximum total indoor pollutant emission limits?		
Question	Criteria Achieved ?		
Project	Yes		

Criteria	Does all carpet meet the maximum total indoor pollutant emission limits?
Question	Criteria Achieved ?
Project	Yes

Criteria	Does all engineered wood meet the maximum total indoor pollutant emission limits?
Question	Criteria Achieved ?
Project	Yes

Transport Overall contribution 6%

1.4 Bicycle Parking - Non-Residential	100%
Score Contribution	This credit contributes 22.2% 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)?
Question	Criteria Achieved ?
Public building	Yes
Question	Bicycle Spaces Provided ?
Public building	12

1.5 Bicycle Parking - Non-Residential Visitor	100%
Score Contribution	This credit contributes 11.1% 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)?
Question	Criteria Achieved ?
Public building	Yes
Question	Bicycle Spaces Provided ?
Public building	2

1.6 End of Trip Facilities - Non-Residential	100%
Score Contribution	This credit contributes 11.1% 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	Existing end-of-trip facilities are deemed sufficient. Below numbers are arbitrary
Question	Number of showers provided ?
Public building	2
Question	Number of lockers provided ?
Public building	12
Output	Min Showers Required
Public building	1
Output	Min Lockers Required
Public building	12

2.1 Electric Vehicle Infrastructure	100%
Score Contribution	This credit contributes 22.2% towards the category score.
Criteria	Are facilities provided for the charging of electric vehicles?
Question	Criteria Achieved ?
Project	Yes

2.2 Car Share Scheme		0%
Score Contribution	This credit contributes 11.1% 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 22.2% 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	New building with connections to existing buildings on existing campus. Building re-use would be a rhetorical question.	

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?	
Annotation	A food composter for the campus herb garden will be installed - however, this will occur independently of this project.	
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?	
Question	Criteria Achieved ?	
Project	Yes	

Urban Ecology Overall contribution 3%

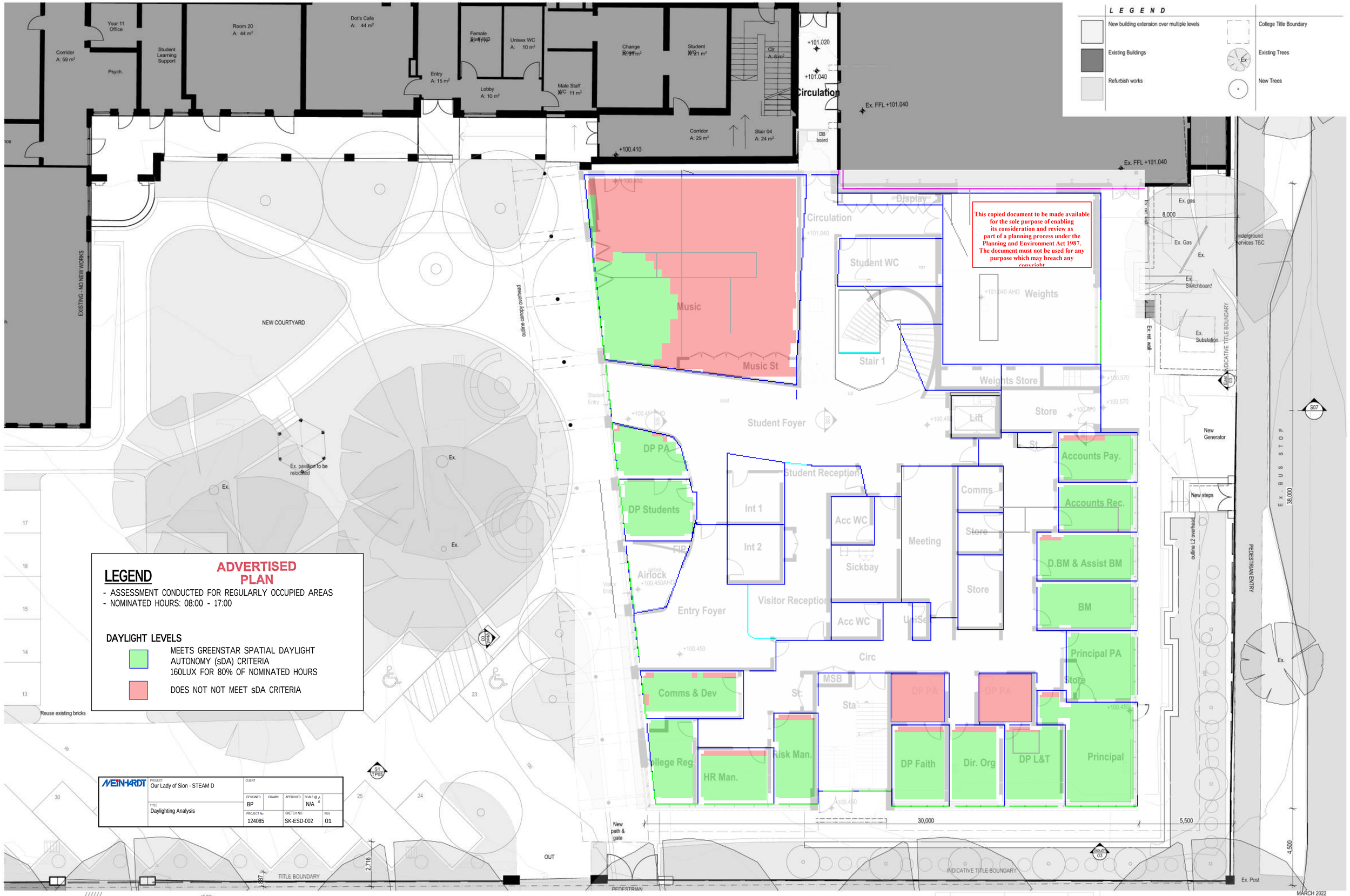
1.1 Communal Spaces		100%
Score Contribution	This credit contributes 12.5% towards the category score.	
Criteria	Is there at least the following amount of common space measured in square meters : * 1m² for each of the first 50 occupants * Additional 0.5m² for each occupant between 51 and 250 * Additional 0.25m² for each occupant above 251?	
Annotation	234 sqm is a nominal figure as the school grounds provide significantly more	
Question	Common space provided	
Public building	234 m²	
Output	Minimum Common Space Required	
Public building	234 m²	
2.1 Vegetation		75%
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	Soft Landscape = 1,015 sqm; total site under development 4,177 sqm	
Question	Percentage Achieved ?	
Project	24 %	
2.2 Green Roofs		100%
Score Contribution	This credit contributes 12.5% towards the category score.	
Criteria	Does the development incorporate a green roof?	
Annotation	Roof Deck, 104 sq	
Question	Criteria Achieved ?	
Project	Yes	
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?	
Annotation	School has existing productive gardens.	
Question	Food Production Area	
Public building	-	
Output	Min Food Production Area	
Public building	98 m²	

Innovation Overall contribution 2%

Innovations	
Description:	
Ultra-low VOC paints	Innovation credit requirements as per Green Star Design & As-Built tool.
Building Air Tightness	Maximum Leakage rate 5m3/m2.h
Points Targeted:	
Ultra-low VOC paints	1
Building Air Tightness	1

1.1 Innovation		20%
Score Contribution	This credit contributes 100.0% towards the category score.	
Criteria	What percentage of the Innovation points have been claimed (10 points maximum)?	

Appendix C – Daylight Plots



ADVERTISED PLAN

LEGEND

- ASSESSMENT CONDUCTED FOR REGULARLY OCCUPIED AREAS
- NOMINATED HOURS: 08:00 - 17:00

DAYLIGHT LEVELS

- MEETS GREENSTAR SPATIAL DAYLIGHT AUTONOMY (sDA) CRITERIA 160LUX FOR 80% OF NOMINATED HOURS
- DOES NOT NOT MEET sDA CRITERIA

MEINHARDT	PROJECT: Our Lady of Sion - STEAM D	CLIENT			
	TITLE: Daylighting Analysis	DESIGNED: BP	DRAWN	APPROVED	SCALE @ A3: N/A
		PROJECT No: 124085	SKETCH NO: SK-ESD-002		REV: 01

williamsross

OLSC STEAMD & Administration Centre

STEAMD & Administration
L1 Floor Plan

MARCH 2022
1:100, 1:1
2107
TP09

LEGEND

- New building extension over multiple levels
- Existing Buildings
- Refurbish works
- College Title Boundary
- Existing Trees
- New Trees

Yr 10 Coord
Yr 10 4 A: 61 m²
Media
Vis Comm
Ex Stair
Stair 04 A: 10 m²
Ramp up
Circulation A: 109 m²
Raise Floor Level
Existing Step
New wall
+105.140
+105.140
Computer Tech
Main Comms Rm A: 10 m²
outline canopy overhead
Store
Store
Textiles
+105.140 AHD
st
st
st
Drama
5,000
St
Stair 1
Store
Meeting
Meeting
Lift
rt 2 (Junior)
eakout
Print Rm
Staff Workroom
Art & Design Hub
Booth
Booth
Unisex
Unisex
Acc WC
SB
Project Lab
Stair 2
Corridor
st
st
Art 1 (Senior)
Daily Org
Seminar
Kitch.
Board Rm
2,100
2,000
2,500
3,000
INDICATIVE TITLE BOUNDARY
INDICATIVE TITLE BOUNDARY
S07
S1 TP09
South 03
East 03

LEGEND

- ASSESSMENT CONDUCTED FOR REGULARLY OCCUPIED AREAS
- NOMINATED HOURS: 08:00 - 17:00

DAYLIGHT LEVELS

- MEETS GREENSTAR SPATIAL DAYLIGHT AUTONOMY (sDA) CRITERIA 160LUX FOR 80% OF NOMINATED HOURS
- DOES NOT NOT MEET sDA CRITERIA

ADVERTISED PLAN

MEINHARDT	PROJECT: Our Lady of Sion - STEAM D		CLIENT		
	TITLE: Daylighting Analysis	DESIGNED: BP	DRAWN	APPROVED	SCALE @ A: N/A 0
		PROJECT No: 124085	SKETCH NO: SK-ESD-002		REV: 01

williamsross

OLSC STEAMD & Administration Centre

STEAMD & Administration L2 Floor Plan

MARCH 2022
1:100, 1:1
2107
TP10

LEGEND

- New building extension over multiple levels
- Existing Buildings
- Refurbish works
- College Title Boundary
- Existing Trees
- New Trees

Ex. roof below
New roof below
outline canopy overhead
Ex roof below
Student WC
Science 3
display
Science 4
5,000
Project Lab
+109.140
Breakout
Lift
Meeting
Meeting
display
Science 1
1,293 m²
Roof Deck
Science Prep
Chem St
Quiet
Staff Ac
Staff Unisex
Staff Unisex
Staff Social
Stair 2
Science 2
Meeting
1,500
2,500
1,500
TITLE BOUNDARY
TITLE BOUNDARY
East 03
South 03
S07
S1 TPDS
TPDS

LEGEND

- ASSESSMENT CONDUCTED FOR REGULARLY OCCUPIED AREAS
- NOMINATED HOURS: 08:00 - 17:00

DAYLIGHT LEVELS

- MEETS GREENSTAR SPATIAL DAYLIGHT AUTONOMY (sDA) CRITERIA 160LUX FOR 80% OF NOMINATED HOURS
- DOES NOT NOT MEET sDA CRITERIA

MEINHARDT	PROJECT: Our Lady of Sion - STEAM D		CLIENT		
	TITLE: Daylighting Analysis	DESIGNED: BP	DRAWN	APPROVED	SCALE @ A: N/A 0
		PROJECT No: 124085	SKETCH NO: SK-ESD-002		REV: 01

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OLSC STEAMD & Administration Centre

STEAMD & Administration
L3 Floor Plan

MARCH 2022
1:100, 1:1
2107
TP11