IGS INTEGRATED GROUP SERVICES

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Sustainable Management Plan

28 Albert Road,
South Melbourne

Project No.: 25005
Date: 21/03/2025

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Document Control

Version	Date	Issue	Author		Reviewer	
01	06/12/2024	Issue for Submission	Gokul Nisha	GN	Earnest Joseph	EJ
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03	21/03/2025	Issue for Submission	Gokul Nisha	GN	Earnest Joseph	EJ

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Executive Summary

The proposed mixed-use development at 28 Albert Road, South Melbourne has been designed to meet the objectives of the City of Port Philip Planning Scheme Clause 15.01-2L-02 'Environmentally sustainable development', and NCC2019 Section J energy efficiency requirements.

The development has achieved an overall BESS score of above 50% of nine key BESS categories which is generally in line with 'Best Practise' sustainable design.

Category	Contributes to Overall Score	Project Category Score
Management	4.5%	50%
Water	9.0%	59%
Energy	27.5%	53%
Stormwater	13.5%	100%
IEQ	16.5%	55%
Transport	9.0%	23%
Waste	5.5%	66%
Urban Ecology	5.5%	23%
Innovation	9%	0%
Total Rate	**100%**	**52%**

Based on the level of information available at this stage of the design process, the proposed Mixed Used Development at 28 Albert Road, South Melbourne demonstrates 'Best Practise' in ESD and meets the City of Port Philip ESD objectives.

1. Introduction

The Sustainable Management Plan (SMP) has been prepared to summarise the environmental objectives and initiatives incorporated into the design of the proposed mixed-use development and demonstrates how these components incorporate environmentally sustainable design initiatives in accordance with the City of Port Philip's Planning Scheme ESD objectives.

The ESD initiatives proposed for this development are based on:

- Architectural Drawing Package dated 29.01.2025 Issued for VCAT Application prepared by Artisan Architects.
- Discussions and correspondence with the Architects and Services Engineers.

The Site

The proposed 25-storey Mixed Use Development is located at 28 Albert Road, South Melbourne with convenient access to the gardens, entertainment and recreational facilities, schools and public transport. There are train stations and tram stops located within 1000m walking distance from the development and the development has achieved a ranking of 'Walker's Paradise' via Walkscore.com.

Site Location

The development is located within the City of Port Phillip and consists of:

- Basement 01 to 03: Carpark and Services Storage;
- Lower Ground Level: Bin Rooms and Services;
- Ground Level: Restaurant, Hotel Lobby, Residential Lobby and Café;
- Level 01: Restaurant, Communal Areas and Services;
- Level 02 to 09: Hotel; and
- Level 10 to 25: Residential Apartments.

2. Summary of key ESD Initiatives

The SMP provides a detailed sustainability assessment of the proposed development. It assesses all key sustainable design initiatives outlined in BESS sustainable design rating tool, demonstrates that a holistic ESD review has been undertaken during the project early design stage and sets up the environmental benchmarks with quantifiable and measurable performance indicators. These indicators will be achieved by the project as evidence demonstrating the development achieves 'Best Practice'.

2.1 Incorporation of Environmentally Sustainable Design Objectives

The proposed development aims to incorporate the following Environmentally Sustainable Design initiatives to comply with the City of Port Philip's Planning Scheme and will align with the Sustainability initiatives committed to in the Sustainable Management Plan endorsed by the City of Port Philip.

Key Sustainability Initiatives	Commitments as per the Endorsed SMP	Commitments maintained/enhanced in the SMP for s87A Amendment
Solar PV Provisions	Minimum 16kW-e was committed on Roof level	The commitment to provide minimum 16kW-e solar PV on Roof level has been retained.
Rainwater Harvesting	Minimum 9kL Rainwater Tank was provided for Toilet Flushing.	The Rainwater Tank size has been increased to 10kL in the updated SMP and WSUD Response.
Individual Metering	Individual utility metering was only provided to dwellings	The updated SMP commits to provide individual utility metering to all individual tenants.
Common Area submetering	Common Area submetering was only allocated to residential portion	The updated SMP has allocated common area submetering to the whole development.
NatHERS Assessment	The average NatHERS Rating of above 6.6-stars was committed.	This has been maintained in the updated SMP. Refer to Appendix B – NatHERS Report for details.
Non-Residential Section J Compliances	Open source DTS calculation was carried out to demonstrate compliances with DTS requirements	A comprehensive JV3 Verification Modelling has been carried out to demonstrate compliances. Refer to Appendix C – JV3 Verification Report for details.
WELS Rating	Low-flow sanitary fittings were committed to.	The WELS rating requirements have been maintained as per the endorsed SMP.
Services and Appliances	Energy efficient HVAC systems (within one of the best available) and centralised electric heat pump type DHW systems were provisioned	Air-cooled VRF with minimum COP of 3.5 and Centralised electric heat pump type DHW systems are provisioned and designed for the development.
WSUD	STORM Calculation was carried out to demonstrate compliances with a score of 103%. The rainwater tank capacity was prescribed to be 9kL minimum for toilet flushing.	STORM Calculation has been revised to demonstrate compliances with a score of 111%. The rainwater tank capacity has been increased to be 10kL minimum for toilet flushing.
IEQ	Low VOC Paints, carpets and adhesives along with low formaldehyde products to be used for the development	The updated SMP will ensure Low VOC Paints, carpets and adhesives along with low formaldehyde products will be used for the development.
Sustainable Materials	Development commitment to avoid the use of endangered rainforest timbers and promote the use of eco-friendly material alternatives for concrete, asphalt, insulation and other building component	The updated SMP has retained the requirements prescribed as per endorsed SMP with regards to the use of Sustainable Materials.

EV Charging Stations	6 EV charging stations were committed to in the endorsed SMP.	This commitment is maintained and EV charging stations are provided from Basement 3 to Basement 1 with 2xEV charging points per basement.
Urban Ecology	Light to medium coloured roofing to be specified to mitigate Urban heat island effect.	This commitment is maintained in the updated SMP.

In line Planning Permit No.1051/20217/A Condition 25, the following items shall be annotated in the Architectural documents submitted for s87A amendment:

- Rainwater Tank size, location and connections.
- All exposed and covered permeable areas within the site to be clearly denoted.
- EV charging stations provided in basement levels.
- Architectural elevations to show the openable component of windows.
- All locations of indoor and outdoor air-conditioning units and the DHW systems.
- Locations of the CO_2 sensors in car park spaces and ventilation systems (supply and exhaust fan rooms)
- Note to be added on Roof GA on the use of Light to Medium coloured roofing materials with SRI of minimum 50.
- Location of bicycle parking spaces and total numbers.
- Location and size of Rooftop solar PV systems.

Additionally, the Architectural plans must include the following note at minimum:

Plans must be read in conjunction with the endorsed ESD report and all initiatives contained within must be implemented to the satisfaction of the responsible authority.

2.2 Utilise Energy Efficiently and Sustainably

Mechanical Plant – For Residential dwellings, energy efficient air-conditioning system equivalent to 4-Star energy rating is proposed.

Domestic Hot Water – For Residential dwellings, electric heat pump domestic hot water system with COP of above 3.5 or equivalent will be proposed.

Energy Efficient Lighting – Lighting power density is designed to be more than 20% below NCC 2019 Section J6 lighting power density requirement for the residential component of the development.

Net Zero Carbon / Carbon Neutral Capability – The development's design will be future proofed and built to enable near net zero carbon emissions capability in operation. Gas has only been provided to the commercial kitchen cooking purposes. No gas connection is provided to the Hotel and Residential portion of the development. The DHW for the whole development will be via electric heat-pump type centralised hot water systems.

Renewable energy Photovoltaic (PV) Panels of approx. 16kW to supply power to the development.

2.3 Utilise Potable Water Use Efficiently and Sustainably

On-site water uses and infiltration measures to meet CSIRO Best Practice Stormwater Management (Water Sensitive Urban Design) treatment quality requirements.

To minimise the amenity water consumption and discharge to the municipal sewerage system, water efficient fixtures with the WELS rating as summarised below are to be used for the development.

- Kitchen Taps - 6 Star WELS Rating
- Bathroom Taps - 6 Star WELS Rating
- Dishwasher - 6 Star WELS Rating
- WCs - 4 Star WELS Rating
- Urinals - 5 Star WELS Rating

- Showerhead - 4 Star WELS Rating (≤ 6.0 L/min)
- Washing Machine - 4 Star WELS Rating

Alternative Water Sources – Minimum 10,000 litre rainwater tank will be installed for the development and will be used for toilet flushing.

2.4 Minimising Waste Going to Landfill

Construction Waste - the building contractor will be engaged to prepare a Waste Management Plan (WMP) which forms part of a Site Management Plan (SMP) and 80% (by mass) of all demolition & construction waste to be reused or recycled.

Operational Waste – A waste auditor has been engaged to implement the operational waste initiatives within the development to ensure the recycling facilities are as convenient for occupants as facilities for general waste.

2.5 Use Sustainable Sourced Materials

Internal paints, adhesives, sealants and flooring are selected with low VOC content; engineered wood is to be selected to have low formaldehyde emissions.

2.6 Net Zero Carbon Emissions

The current design of the development has limited integration with Natural gas infrastructure to enable a streamlined transition to a carbon neutral building operation in the future. The following strategies have been implemented in order to facilitate a future proofed Net Zero in Operation building:

- Natural Gas mains are only provided within the building for commercial kitchen cooking. All other separable portions will be powered by electrical infrastructure such as the Air-cooled VRF HVAC systems with a minimum COP of 3.5 or equivalent, centralised electric heat pump type domestic hot water system with minimum COP of 3.5 or equivalent etc.
- Domestic cooking will via electric induction cooktops for the hotel and residential portions.
- Gas mains only provisioned to facilitate commercial cooking.
- Minimum 16kW-e rooftop solar PV to minimise energy consumption from main electricity grid.

Greenhouse gas emissions during construction phase can be minimised by adopting the following strategies resulting in a lower embodied carbon footprint compared to standard building practices.

- Materials to be sourced from local suppliers to reduced embodied carbon footprint incurred during material transportation.
- Encourage to use of timber for load bearing and non-load bearing purposes where feasible.
- Filter and select products with lower embodied carbon emissions such as Green concrete, products with recycled materials etc.
- Construction sites powered by onsite or off-site renewable energy sources.

3. BESS Sustainable Assessment

The Built Environment Sustainability Scorecard (BESS) assesses energy and water efficiency, thermal comfort, and overall environmental sustainability performance of the proposed development. It assesses the project against a standard design practice building in nine environmental categories and the percentage contribution of each category varies depending on the scale and typology of the development.

A score of 50% and higher equates to 'Best Practise' via BESS rating. In order to meet BESS 'Best Practise' requirement, the development is targeting an overall score of above 50% and exceeds the pass rates on four mandatory categories.

- Water;
- Energy;
- Stormwater; and
- Indoor Environment Quality (IEQ)

The proposed mixed-use development achieves an overall score of 50% and the BESS assessment report is enclosed as Appendix A for details.

3.1 Management

Best practice for building management means that sustainability is integrated from concept design through the construction process. Good decisions made early will always deliver the maximum benefit for the lowest cost.

For that reason, all the key credits available in this category are being targeted and incorporated in the design:

- For Residential components, a preliminary NatHERS thermal modelling has been carried out;
- For non-residential components, a preliminary JV3 energy modelling has been undertaken;
- Install utility meters (electricity and water) for all individual dwellings; and
- For Residential components, provide sub-metering facilities for common area energy and water monitoring.

3.2 Water

Water will be used efficiently throughout the whole building development with inclusion of efficient fixtures and fittings, collection and reuse of rainwater and water efficient landscaping design.

These water saving initiatives are proposed to ensure the efficient use of water and collection and re-use of stormwater and to minimise the associated water costs.

BESS rating tool is used to assess the overall development water efficiency and demonstrates the design potential to achieve an over 50% improvement compared to an identical size 'reference' project and meet the Excellence sustainable design.

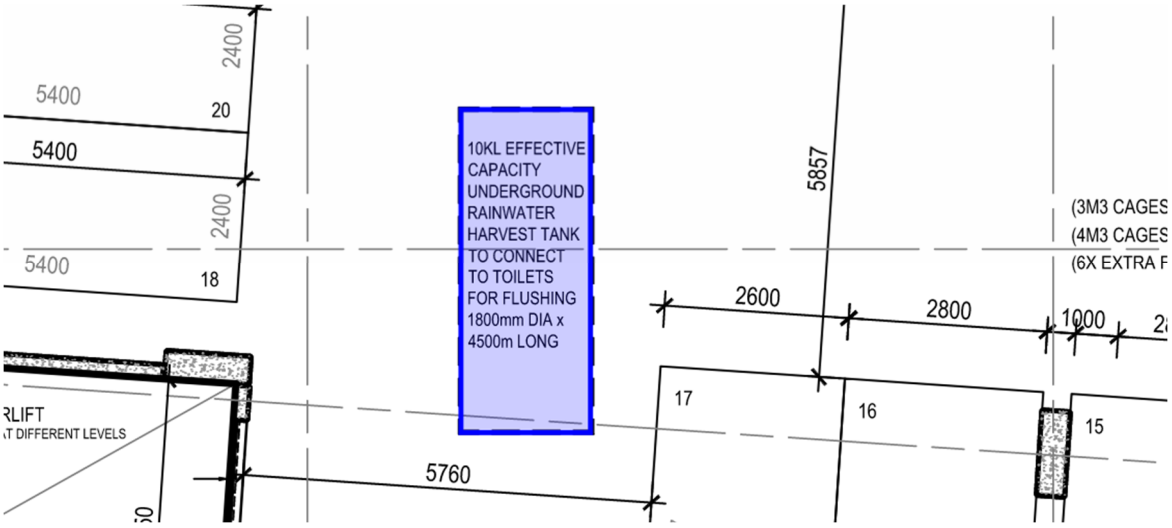
3.2.1 Water Efficient Fixtures

To minimise the amenity water consumption and discharge to the municipal sewerage system, water efficient fixtures will be used for the development.

- Kitchen Taps - 6 Star WELS Rating
- Bathroom Taps - 6 Star WELS Rating
- Dishwasher - 6 Star WELS Rating
- WCs - 4 Star WELS Rating
- Urinals - 5 Star WELS Rating
- Showerhead - 4 Star WELS Rating (≤ 6.0 L/min)
- Washing Machine - 4 Star WELS Rating

3.2.2 Rainwater Harvesting

Rainwater will be harvested from the roof areas. A minimum of 10,000-litre rainwater tank is proposed to collect rainwater from the roof and will be used for toilet flushing.



Proposed Rainwater Tank within Basement 03

3.2.3 Water Efficient Landscaping

Low water use plant selection (e.g., Xeriscaping) or water efficient landscaping design is proposed (e.g., drip irrigation with timers and rain sensors) to minimise water usage for irrigation.

3.2.4 Building Services Water Use Reduction

Air cooled air-conditioning system is proposed for the development and fire testing water is to be collected via the 10kL rainwater tank and reused to reduce potable water consumption.

3.3 Energy Performance

The whole development will benchmark BESS Energy Efficiency as followings:

- **BESS Energy 1.1:** JV3 modelling is undertaken to verify building fabric performance. The proposed building will demonstrate equivalent or better energy efficiency when compared to NCC section J reference building with reference services
- **BESS Energy 1.2**: For residential portion – A preliminary NatHERS rating assessment has been undertaken and an average NatHERS rating of at least 6.6 Star is targeted for the dwellings;
- **BESS Energy 2.1**: More than 10% reduction in Green House Gas emissions for the development;
- **BESS Energy 2.6**: The development is proposed to be all-electric;
- **BESS Energy 2.7**: The energy efficient building services are proposed for the whole development to reduce the electricity consumption by more than 10% compared to NCC 2019 Section J reference building;
- **BESS Energy 3.1:** The carpark spaces are proposed to install CO sensor to monitor and control the operation of the car park exhaust fan speed;
- **BESS Energy 3.2:** Electric Heat Pump domestic hot water systems are proposed to the development and reduce electricity consumption when against the BESS benchmark;
- **BESS Energy 3.6:** For the residential dwellings, lighting power density is proposed to be at least 20% lower than required by NCC 2019 Section J6 Table 6.2a; and
- **BESS Energy 3.7:** For non-residential spaces, lighting power density is proposed to meet the requirements of NCC2019 Section J6 Table 6.2a.; and
- **BESS Energy 4.2:** Minimum 16kW Solar PV panels are proposed to be on-site.

Overall, the development is targeting to achieve over 50% energy efficiency improvement compared to an identical size ‘reference’ project and meet the Excellence sustainable design.

3.3.1 Building Sealing

Building sealing will be in accordance with NCC 2019 Volume 1 Part J3 Building Sealing / Volume 2 Part, 3.12.3 Building Sealing.

No power data points etc. will be installed on external walls where insulation removal for electrical safety would compromise the external wall envelope. Alternatively, if installed, acoustic fire rated wall boxes will be installed behind these power and data points.

3.3.2 Energy Efficient System

For the proposed development, energy efficient HVAC, lighting and domestic hot water systems will be designed to minimize operational energy use and greenhouse gas emissions and reduce peak energy demand.

For residential dwellings the energy efficient system will include:

- A minimum 4-Star energy star rating split air conditioning system or equivalent for the residential dwellings space heating, cooling and ventilation;
- Electric heat pump domestic hot water system or equivalent for DHW supply;
- Energy efficient LED light fittings for the whole development as much as possible and lighting power density is proposed to be at least 20% lower than required by NCC Section J6 Table 6.2a with dwellings occupied spaces to be equal to or below 4 W/m2; and

A NatHERS modelling report is enclosed as Appendix B for reference.

For the Non-residential component of the development, the energy efficient system will include:

- Energy efficient air cooled variable refrigerant volume AC system with COP of 3.5 or equivalent;
- Heat pump electric domestic hot water system or equivalent; and
- The lighting power density is proposed to meet the requirements of NCC2019 Section J6 Table 6.2a.

A JV3 modelling report is enclosed as Appendix C for reference.

3.3.3 Car Park ventilation

The car park ventilation system will include variable speed drives (VSDs) on the fans and will be controlled by CO sensors to minimise unnecessary energy use.

3.3.4 Energy Efficient cooking

Residential Kitchen cooktops will be electric induction type. These are significantly more energy efficient than traditional electric coil or ceramic cooktops as they do not need to heat up an electric coil.

3.4 Stormwater

Stormwater quality is a significant issue as the high levels of impervious surfaces transport stormwater quickly into the drainage system along with sediment and pollutants.

The strategy for improving stormwater quality in the proposed development include:

- Minimum 10kL rainwater tank is connected to the dwellings tower roof for rainwater collection and will be used for toilet flushing.

The STORM Calculation has been undertaken as shown below to demonstrate 100% on BESS Stormwater score. Refer to Appendix D – Water Sensitive Urban Design Response for details.

3.4.1 Site Management Plan

A stormwater pollution reduction strategy will be contractually required to be adopted by the Main Contractor to ensure the earth is not eroded and prevent construction debris and litter from entering the stormwater systems.

The strategy will be required to specifically address the following in respect to stormwater:

- No impact on offsite surface or ground water(s) due to construction activities;
- Site stormwater to be managed to minimise any contaminated water discharged from site, such as:
  - Materials and waste to be stored at least 2m away from drainage lines;
  - All inadvertent chemical spills will be required to be cleaned up immediately;
  - The road will be required to be kept clean, with the number of sweepers cleaning the road to be in response to mess created;
  - Application and inclusion of a range of mitigation measures for soil depositing on roads, stormwater, dust and noise;
  - Incorporate prevention measures to stormwater from adjacent properties from entering site;
  - Removal of sediment and rubbish from sediment fences and stormwater inlet filters after storm events, and checking of sediment traps after storm events;
  - Capping and bunding of stockpiled or treatment piles of contaminated spoils;
  - Stormwater discharge quality will be required to meet SEPP (Waters of Victoria) standards; and
  - Regular inspections of the effectiveness of sediment control and surface run-off measures, including during and immediately after storm events, with necessary improvements.

3.4.2 Maintenance Program

The maintenance procedure shall be in conjunction with the building maintenance and specification and shall comply with relevant / applicable authority design guidelines and codes of practice requirements. The stormwater management strategy shall adopt the following maintenance procedures.

- Annually / 6-month drain and flushing of rainwater tank cleaning tank internally from debris and sediment collection captured from roof surface, by building management as part of building maintenance programme.
- Quarterly inspection of gutters to ensure they are free of debris and clean as required.
- Quarterly inspection of stormwater downpipes and grates to ensure no water leakage, they are free of debris and clean as required.
- Yearly inspections of rainwater tanks and supports to ensure no leakage, inspect joints and clean as required.
- Water storage tanks should be inspected, cleaned and disinfected in accordance with AS 3500.
- Bi-annual inspection of pumps to ensure correct operation, no leakage and clean as required.
- Service items and equipment in conformance with the maintenance schedules as per the operation and maintenance manuals.
  - Carry out the manufacturers' recommended maintenance instruction.
  - Attend to reported defects and complaints.
  - Check for and repair corrosion.

- Check for and rectify any unsafe conditions.
- Replace faulty or damaged parts and consumable components.
- connections, for deterioration and for freedom of movement of assembly.
- Identification of pipes, conduits and ducts maintenance: To AS 1345.
- Safety signs maintenance: To AS 1319.
- Remove waste and clean all parts of the installation.
- Remove temporary protective coatings, packaging and labels.
- Clean screens and strainer baskets.

3.5 Indoor Environment Quality

The proposed development will improve the indoor environment quality and achieve a healthy indoor environment quality for the wellbeing of building occupants through adoption of the followings into the design.

3.5.1 Overall Daylight Access

The development will aim for more than 80% of the bedrooms achieve a daylight factor of at least 0.5% to 90% of the floor area; more than 80% of the living spaces achieve a daylight factor of at least 1% to 90% of the floor area for the apartments.

For non-residential spaces, more than 35% of non-residential spaces will achieve a daylight factor of at least 2% of the floor area.

3.5.2 Glare (Internal Sources)

All bare light sources in non-residential spaces will be managed with baffles, louvres, translucent diffusers, ceiling design or other means that obscures the direct light source from all viewing angles of occupants.

3.5.3 Lighting comfort

Lights installed in the development regularly occupied areas will be flicker-free.

3.5.4 Ventilation

For residential apartments, natural ventilation is introduced in the form of operable windows and doors. 100% of the dwellings will achieve effective natural ventilation via cross ventilation, single sided ventilation or mechanically assisted natural ventilation (fresh air supply rates between 2.5-5 L/s) to meet BESS requirements.

For non-residential spaces, the mechanical ventilation systems will be designed to provide outdoor air levels to be at least 50% above AS 1668:2012 to the all the regularly occupied spaces with CO_2 sensors proposed for the development to maintain a maximum CO_2 concentration of 800ppm.

3.5.5 VOC and Formaldehyde Minimisation

- Low Volatile Organic Compound (VOC) paints, adhesive and sealant to be used in the development.

Product Type Category	Max TVOC Content (g/l of ready-to-use product)
General purpose adhesives	50
Design & As Built wall and ceiling paint, all sheen levels	16
Trim, varnishes and wood stains	75
Primers, sealers and prep coats	65
One and two pack performance coatings for floors	140
Acoustic sealants, architectural sealant, waterproofing membranes and sealant, fire retardant sealants and adhesives	250
Structural glazing adhesive, wood flooring and laminate adhesives and sealants	100

- Low VOC Carpets to be used in the development.

Test protocol	Limit
ASTM D5116 – Total VOC limit	0.5mg/m²/h per hour
ASTM D5116 – 4 – PC (4-Phenylcyclohexene)	0.5mg/m²/h per hour
ISO 16000/EN 13419 – TVOC at three days	0.5mg/m²/h per hour
ISO 10580/ISO/TC 219 (Document N238) – TVOC at 24 hours	0.5mg/m²/h per hour

- Low formaldehyde wood products to be used in the development.

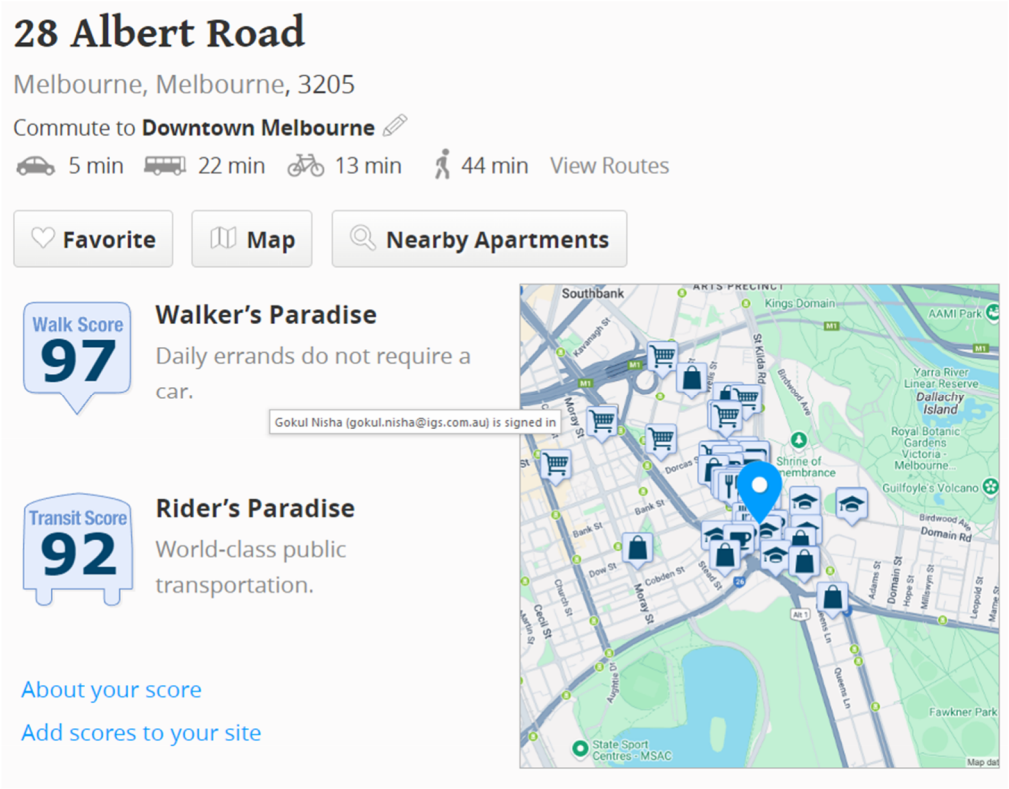
Test protocol	Emission limit/ Unit of Measurement
AS/NZS 2269:2004, testing procedure AS/NZS 2098.11:2005 method 10 for Plywood	≤1.0mg/L
AS/NZS 1859.1:2004 – Particle Board, with use of testing procedure AS/NZS 4266.16:2004 method 16	≤1.5mg/L
AS/NZS 1859.2:2004 – MDF, with use of testing procedure AS/NZS 4266.16:2004 method 16	≤1.0mg/L
AS/NZS 4357.4 – Laminated Veneer Lumber (LVL)	≤1.0mg/L
Japanese Agricultural Standard MAFF Notification NO.701 Appendix Clause 3 (11) - LVL	≤1.0mg/L
JIS A 5908:2003 – Particle Board and Plywood, with use of testing procedure JISA 1460	≤1.0mg/L
JIS A 5905:2003 – MDF, with use of testing procedure JIS A 1460	≤1.0mg/L
JIS A1901 (not applicable to Plywood, applicable to high pressure laminates and compact laminates)	≤0.1mg/m²hr
ASTM D5116 (applicable to high pressure laminated and compact laminates	≤0.1mg/m²hr
ISO 16000 part 9, 10 and 11 (also known as EN 13419), applicable to high pressure laminates and compact laminates	≤0.1mg/m²hr (at 3 days)
ASTM D6007	≤0.12mg/m³
ASTM E1333	≤0.12mg/m³
EN 717-1 (also known as DIN EN 717-1)	≤0.12mg/m³
EN 717-2 (also known as DIN EN 717-2)	≤3.5mg/m³hr

3.6 Transport

3.6.1 Proximity to Public Transport

28 Albert Road is surrounded trams, trains and buses. This location is in the Melbourne neighbourhood and nearby parks include South African Memorial Reserve, Bowen Crescent Reserve and Shrine Reserve.

It has an exceptional walk score of 97 known as a 'Walkers Paradise'. Hence, the building's design and location will be shown to reduce emissions from transport, encourage walkability and public transport use, and reduce vehicle kilometres travelled.



3.6.2 Bicycle Parking

At least 28 bicycle parking are proposed for the residence and 6 bicycle parking for visitors. This allocation supports promoting the use of sustainable personal transport and is especially relevant given the suitable location of the development.

3.7 Waste Management

BESS rating tool has been used to assess the overall development waste collection and reuse and demonstrate the project has the design potential to achieve the Excellence design for the Waste Management.

3.7.1 Construction Waste Management Plan

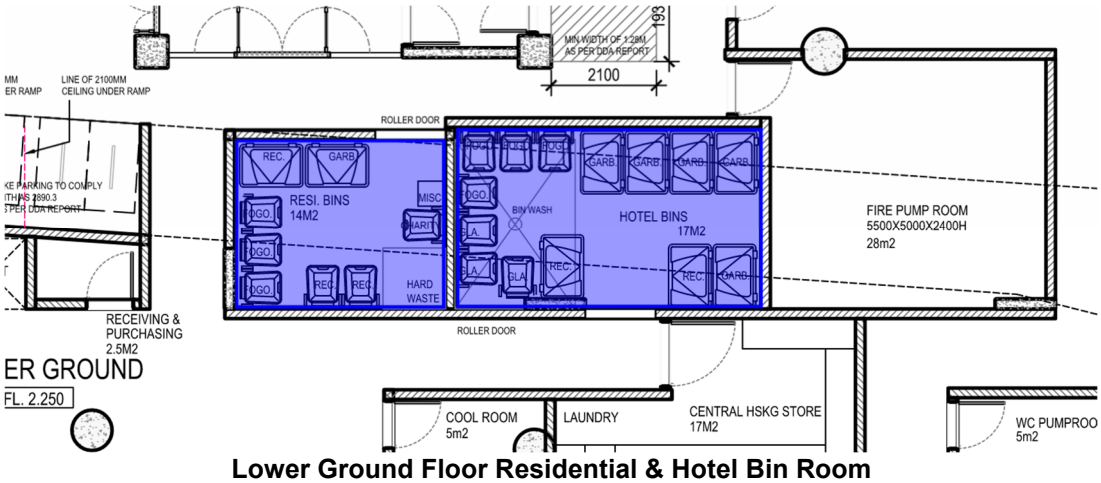
Building Contractor will provide Construction Site Management Plan prior to any construction works. As part of the Construction Site Management Plan, a Construction Waste Management Plan will be prepared to encourage waste avoidance, reuse, and recycling during the construction and at least 80 per cent of construction and demolition waste are to be reused or recycled.

3.7.2 Construction Phase Stormwater Pollution Reduction

The Building Contractor will implement an Environmental Management Plan (EMP) to include the site management procedures to reduce the stormwater pollution during construction phase.

3.7.3 Waste Management Plan

A Waste Management Plan will be prepared for this development to assess the requirements for waste storage including size, location and accessibility and the recycling facilities are proposed as convenient for occupants as facilities for general waste.



Lower Ground Floor Residential & Hotel Bin Room

3.7.4 Food & Garden Waste

Compost bins will be provided in the designated bin area within the development for Council's collection and recycling of food & garden waste.

3.7.5 Operational Waste – Convenience of Recycling

The recycling facilities are proposed as convenient for building users as facilities for general waste.

3.8 Urban Ecology

3.8.1 Communal Spaces

At least 220m² of communal space is proposed within the development.

3.8.2 Green Walls and Roofs

The development will incorporate a green roof.

3.8.3 Urban Heat Island Effect

The building roof colour is to be light – medium colour with minimum SRI value of 50 to mitigate urban heat island effect.

3.9 Material Selection

Careful selection of construction materials can help to limit the environmental impacts of the production, transport and incorporation of these materials in our buildings. In many cases there are similarly performing, comparable but more environmentally friendly product selection options available.

The goals in environmentally sustainable construction material selection should be to:

- Limit the use of new materials where possible - to help minimise the detrimental outcomes of product manufacture or modification
- Select durable materials and re-use materials where possible – increase the lifespan of all products.
- To minimise the environmental impacts materials used by encouraging the use of materials with a favourable lifecycle assessment based on the fate of materials, their recycling / reuse potential, their embodied energy, their biodiversity, human health, and environmental toxicity impacts.

3.9.1 Greener Concrete Mixes

20-35% slag and/or flyash or similar geopolymer mixes will be incorporated in on-site on-ground poured structural and paving concrete mixes where vehicles will not be regularly driving over the concrete, subject to structural engineer's approval.

A concrete mix with circular economy components and lower embodied energy will be used. Waste product slag and/or flyash (Supplementary Cement materials SCMs) will partially substitute carbon intensive Portland cement in concrete mixes.

3.9.2 Green Aggregate Option

Aggregate and sand will be from circular economy and lower embodied energy sources.
50% recycled aggregate or recycled glass sand will be used as sub-base under paths and or roads subject to design engineer's approval.

3.9.3 Greener pipe bedding options

100% recycled glass sand will be used for pipe bedding (plumbing pipe, electrical cable etc) In preference to mined virgin sand, subject to the design engineer's approval.

3.9.4 Light Coloured Roofing

The building roof colour is to be light – medium colour (as per the BCA definitions) rather than dark to deliver a cooler surrounding microclimate) and help mitigate the overall Urban Heat Island effect.

Lighter external surfaces also result in lower cooling requirements and less air-conditioning use.

3.9.5 Sustainable Timbers

Timbers sourced from unmanaged (often overseas) rainforests disrupt under threat ecosystems. No unsustainable rainforest timbers will be incorporated i.e. no Oregon, Western Red Cedar, Meranti, Merbau, Teak or Luan.

3.9.6 Accredited Plantation Timber

Framing timber will be sourced from accredited sustainable plantations (either FSC or PEFC/AFS accreditation) that mitigates damage to ecosystems for flora and fauna.

3.9.7 Glasswool Insulation

Where glasswool insulation is to be used, a product with greater than 50% recycled glass and without the use of formaldehyde as a binder (such as Earthwool or Green Tag certified CSR Bradford Gold batts) will be used.

3.9.8 Carpet Underlay

Where carpet is installed, underlay with recycled content will be used under carpets. Alternatively, a carpet underlay that is third party GECA certified will be used (e.g. Cloudwalk carpet cushion range).

4. Overall BESS Scores Aiming to Target

With inclusion of all ESD initiatives summarised above, the proposed design is estimated to be able to achieve an overall score of above 50% of nine key BESS categories and demonstrating 'Best Practice' sustainable design.

Category	Contributes to overall Score	Project Category Score
Management	4.5%	50%
Water	9.0%	59%
Energy	27.5%	53%
Stormwater	13.5%	100%
Indoor Environment Quality (IEQ)	16.5%	55%
Transport	9.0%	23%
Waste	5.5%	66%
Urban Ecology	5.5%	23%
Innovation	9%	0%
Total Rate	**100%**	**52%**

5. Conclusion

This SMP provides a summary of sustainable design features, which are integrated into the design of the proposed 28 Albert Road, South Melbourne development to demonstrate 'Best Practise' in ESD to meet the City of Port Phillip's Planning Scheme.

In terms of the building performance, the ESD strategy for the proposed development has incorporated all key sustainable initiatives addressed by the City of Port Phillip and BESS (Built Environment Sustainability Scorecard) to the City of Port Phillip sustainability requirements.

- Building has been designed to adopt net zero carbon emissions in operation in the future;
- Thermally enhanced building fabrics to achieve an average NatHERS rating above 6.6-star target;
- Minimum 4.0-Star energy rating air conditioning system for the dwellings or equivalent;
- Electric heat pump domestic hot water system with minimum COP of 3.5 or equivalent for the dwellings;
- Renewable energy Photovoltaic (PV) Panels of minimum 16kW to supply power to the development;
- 10,000 litres rainwater harvesting system for toilet flushing;
- Water efficient fixtures and fittings with minimum WELS rating as specified;
- Improved stormwater quality via rainwater harvesting system and landscaping design;
- Effective natural ventilation to 100% of the dwellings;
- Provision for high levels of natural light into the primary residential spaces;
- A construction Waste Management Plan (WMP) to be prepared and implemented and a minimum 80% of all demolition and construction waste to be reused or recycled;
- Use of more environmentally friendly material alternatives for concrete, asphalt, insulation and other building component
- Light to medium coloured roofing to help mitigate the effects of the Urban Heat Island effect

Therefore, the proposed mixed-use development has been designed to meet and exceed the City of Port Phillip's ESD objectives and the project team will ensure the performance outcomes proposed in this Environmentally Sustainable Design Statement be implemented prior to occupancy at no cost to the City of Port Phillip and be to the satisfaction of the Responsible Authority.

IGS INTEGRATED GROUP SERVICES

Appendix A – BESS Summary Report

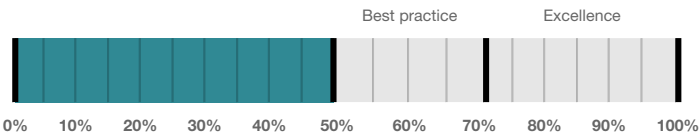
BESS Report

Built Environment Sustainability Scorecard

This BESS report outlines the sustainable design commitments of the proposed development at 28 Albert Rd South Melbourne Victoria 3205. 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 Port Phillip 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

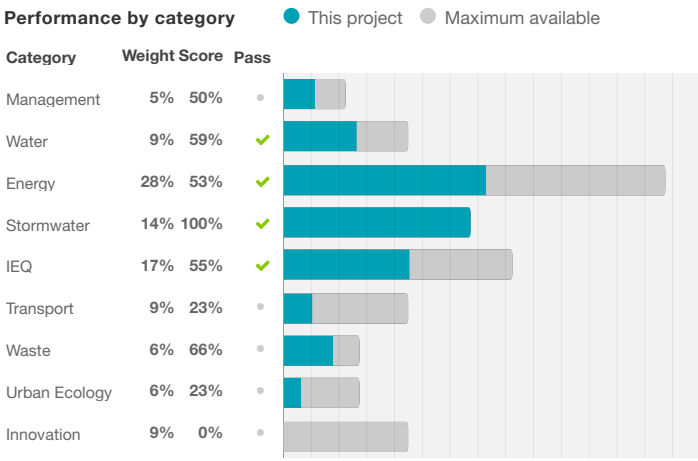


52%

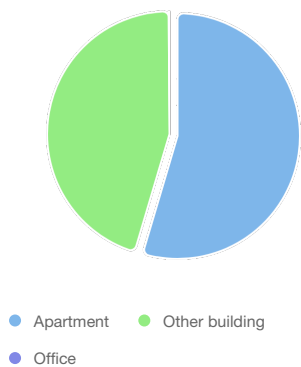
Project details

Name	28 Albert Rd, South Melbourne VIC 3205, Australia
Address	28 Albert Rd South Melbourne Victoria 3205
Project ID	A7702074-R3
BESS Version	BESS-8
Site type	Mixed use development
Account	li.huan@igs.com.au
Application no.	
Site area	1,010 m²
Building floor area	10,428 m²
Date	06 March 2025
Software version	2.0.1-B.580

Performance by category



Project composition



Buildings

Name	Height	Footprint	% of total footprint
28 Albert Rd	25	99,225 m²	100%

Dwellings & Non Res Spaces

Dwellings

Name	Quantity	Area	Building	% of total area
Apartment				
C1/C1-A/C1-B	10	175 m²	28 Albert Rd	16%
C2/C2-A/C2-B	8	135 m²	28 Albert Rd	10%
Penthouse	1	750 m²	28 Albert Rd	7%
D2	3	200 m²	28 Albert Rd	5%
A3	10	45.0 m²	28 Albert Rd	4%
D1	2	165 m²	28 Albert Rd	3%
C4	1	215 m²	28 Albert Rd	2%
C3	1	140 m²	28 Albert Rd	1%
B1/B1-A	2	85.0 m²	28 Albert Rd	1%
A1/A1-A	3	45.0 m²	28 Albert Rd	1%
A2	1	75.0 m²	28 Albert Rd	< 1%
Total	**42**	**5,695 m²**	**54%**	

Non-Res Spaces

Name	Quantity	Area	Building	% of total area
Office				
Office	1	10.0 m²	28 Albert Rd	< 1%
Total	**1**	**10 m²**	**< 1%**	
Other building				
3F-9F	1	3,774 m²	28 Albert Rd	36%
GF Restaurant, Lobbies	1	950 m²	28 Albert Rd	9%
Total	**2**	**4,723 m²**	**45%**	

Supporting Evidence

Shown on Floor Plans

Credit	Requirement	Response	Status
Management 3.1	Annotation: Individual utility meters to be provided to all individual dwellings		-
Management 3.2	Annotation: Individual utility meters to be provided to all individual commercial tenancies		-
Management 3.3	Annotation: Sub-meters to be provided to all major common area services (list each)		-
Water 3.1	Annotation: Water efficient garden details		-
Energy 3.1	Carpark with natural ventilation or CO monitoring system		-

Credit	Requirement	Response	Status
Energy 4.2	Location and size of solar photovoltaic system		-
Stormwater 1.1	Location of any stormwater management systems (rainwater tanks, raingardens, buffer strips)		-
IEQ 1.1	If using BESS daylight calculator, references to floorplans and elevations showing window sizes and sky angles.		-
IEQ 1.2	If using BESS daylight calculator, references to floorplans and elevations showing window sizes and sky angles.		-
IEQ 1.5	Floor plans with compliant bedrooms marked		-
IEQ 2.1	Dwellings meeting the requirements for being 'naturally ventilated'		-
Transport 2.1	Location of electric vehicle charging infrastructure		-
Waste 2.1	Location of food and garden waste facilities		-
Waste 2.2	Location of recycling facilities		-
Urban Ecology 1.1	Location and size of communal spaces		-
Urban Ecology 2.2	Location and size of green roof		-

Supporting Documentation

Credit	Requirement	Response	Status
Management 2.2	Preliminary NatHERS assessments		-
Management 2.3a	Section J glazing assessment		-
Management 2.3b	Preliminary modelling report		-
Energy 1.1	Energy Report showing calculations of reference case and proposed buildings		-
Energy 3.1	Details of either the fully natural carpark ventilation or CO monitoring system proposed		-
Energy 3.6	Average lighting power density and lighting type(s) to be used		-
Energy 3.7	Average lighting power density and lighting type(s) to be used		-
Energy 4.2	Specifications of the solar photovoltaic system(s)		-
Stormwater 1.1	STORM report or MUSIC model		-
IEQ 1.1	If using an alternative daylight modelling program, a short report detailing assumptions used and results achieved.		-
IEQ 1.2	If using an alternative daylight modelling program, a short report detailing assumptions used and results achieved.		-
IEQ 1.4	A short report detailing assumptions used and results achieved.		-
IEQ 1.5	A list of compliant bedrooms		-
IEQ 2.1	A list of naturally ventilated dwellings		-

Credit summary

Management Overall contribution 4.5%

	50%
1.1 Pre-Application Meeting	0%
2.2 Thermal Performance Modelling - Multi-Dwelling Residential	100%
2.3 Thermal Performance Modelling - Non-Residential	100%
3.1 Metering - Residential	100%
3.2 Metering - Non-Residential	100%
3.3 Metering - Common Areas	100%
4.1 Building Users Guide	0%

Water Overall contribution 9.0%

	Minimum required 50%	59%	✔ Pass
1.1 Potable Water Use Reduction		42%	
3.1 Water Efficient Landscaping		100%	
4.1 Building Systems Water Use Reduction		100%	

Energy Overall contribution 27.5%

	Minimum required 50%	53%	Pass
1.1 Thermal Performance Rating - Non-Residential		40%	
1.2 Thermal Performance Rating - Residential		50%	✔ Achieved
2.1 Greenhouse Gas Emissions		35%	
2.2 Peak Demand		0%	
2.6 Electrification		0%	⊘ Disabled
	Credit is available when the energy supply is set to all-electric (no gas or wood).		
2.7 Energy consumption		100%	
3.1 Carpark Ventilation		100%	
3.2 Hot Water		100%	
3.4 Clothes Drying		0%	
3.6 Internal Lighting - Apartments		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		54%	
4.4 Renewable Energy Systems - Other		N/A	✣ Scoped Out
	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%	55%	Pass
1.1 Daylight Access - Living Areas		66%	
1.2 Daylight Access - Bedrooms		66%	
1.3 Winter Sunlight		0%	
1.4 Daylight Access - Non-Residential		35%	✔ Achieved
1.5 Daylight Access - Minimal Internal Bedrooms		100%	
2.1 Effective Natural Ventilation		100%	
2.3 Ventilation - Non-Residential		66%	✔ Achieved
3.4 Thermal comfort - Shading - Non-Residential		0%	
3.5 Thermal Comfort - Ceiling Fans - Non-Residential		0%	
4.1 Air Quality - Non-Residential		100%	

Transport Overall contribution 9.0%

	23%
1.1 Bicycle Parking - Residential	0%
1.2 Bicycle Parking - Residential Visitor	0%
1.3 Bicycle Parking - Convenience Residential	0% ⊘ Disabled
	Credit 1.1 must be achieved first.
1.4 Bicycle Parking - Non-Residential	0%
1.5 Bicycle Parking - Non-Residential Visitor	0%
1.6 End of Trip Facilities - Non-Residential	0% ⊘ Disabled
	Credit 1.4 must be complete first.
2.1 Electric Vehicle Infrastructure	100%
2.2 Car Share Scheme	0%
2.3 Motorbikes / Mopeds	0%

Waste Overall contribution 5.5%

	66%
1.1 - Construction Waste - Building Re-Use	0%
2.1 - Operational Waste - Food & Garden Waste	100%
2.2 - Operational Waste - Convenience of Recycling	100%

Urban Ecology Overall contribution 5.5%

	23%
1.1 Communal Spaces	99%
2.1 Vegetation	0%
2.2 Green Roofs	100%
2.3 Green Walls and Facades	0%
2.4 Private Open Space - Balcony / Courtyard Ecology	0%
3.1 Food Production - Residential	0%
3.2 Food Production - Non-Residential	0%

Innovation Overall contribution 9.0%

	0%
1.1 Innovation	0%

Credit breakdown

Management Overall contribution 4.5%

50%

1.1 Pre-Application Meeting	0%
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	No
2.2 Thermal Performance Modelling - Multi-Dwelling Residential	100%
Score Contribution	This credit contributes 13.7% towards the category score.
Criteria	Have preliminary NatHERS ratings been undertaken for all thermally unique dwellings?
Question	Criteria Achieved ?
Apartment	Yes
2.3 Thermal Performance Modelling - Non-Residential	100%
Score Contribution	This credit contributes 11.3% towards the category score.
Criteria	Has a preliminary facade assessment been undertaken in accordance with NCC2022 Section J4D6?
Question	Criteria Achieved ?
Office	Yes
Other building	Yes
Criteria	Has preliminary modelling been undertaken in accordance with either NCC2022 Section J (Energy Efficiency), NABERS or Green Star?
Question	Criteria Achieved ?
Office	Yes
Other building	Yes
3.1 Metering - Residential	100%
Score Contribution	This credit contributes 6.8% towards the category score.
Criteria	Have utility meters been provided for all individual dwellings?
Question	Criteria Achieved ?
Apartment	Yes
3.2 Metering - Non-Residential	100%

Score Contribution	This credit contributes 5.7% towards the category score.
Criteria	Have utility meters been provided for all individual commercial tenants?
Question	Criteria Achieved ?
Office	Yes
Other building	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?
Question	Criteria Achieved ?
Apartment	Yes
Office	Yes
Other building	Yes

4.1 Building Users Guide 0%

Score Contribution	This credit contributes 12.5% towards the category score.
Criteria	Will a building users guide be produced and issued to occupants?
Question	Criteria Achieved ?
Project	No

Water Overall contribution 9.0%

		Minimum required 50%	59%	✔ Pass

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

Fixtures, fittings & connections profile	
Showerhead:	
A1/A1-A A2 A3 B1/B1-A C1/C1-A/C1-B C2/C2-A/C2-B C3 C4 D1 D2 Penthouse	4 Star WELS (>= 4.5 but <= 6.0)
Office GF Restaurant, Lobbies 3F-9F	Scope out
Bath:	
A1/A1-A A2 A3 B1/B1-A C1/C1-A/C1-B C2/C2-A/C2-B 3F-9F C3 C4 D1 D2 Penthouse	Medium Sized Contemporary Bath
Office GF Restaurant, Lobbies	Scope out

Kitchen Taps:	
A1/A1-A	>= 6 Star WELS rating
A2	
A3	
B1/B1-A	
C1/C1-A/C1-B	
C2/C2-A/C2-B	
C3	
C4	
D1	
D2	
Penthouse	
Office	Default or unrated
GF Restaurant, Lobbies	
3F-9F	
Bathroom Taps: All	>= 6 Star WELS rating
Dishwashers:	
A1/A1-A	>= 6 Star WELS rating
A2	
A3	
B1/B1-A	
C1/C1-A/C1-B	
C2/C2-A/C2-B	
C3	
C4	
D1	
D2	
Penthouse	
Office	Scope out
GF Restaurant, Lobbies	
3F-9F	
WC: All	>= 4 Star WELS rating
Urinals:	
A1/A1-A	Scope out
A2	
A3	
B1/B1-A	
C1/C1-A/C1-B	
C2/C2-A/C2-B	
Office	
3F-9F	
C3	
C4	
D1	
D2	
Penthouse	
GF Restaurant, Lobbies	>= 5 Star WELS rating

Washing Machine Water Efficiency:	
A1/A1-A A2 A3 B1/B1-A C1/C1-A/C1-B C2/C2-A/C2-B C3 C4 D1 D2 Penthouse	>= 4 Star WELS rating
Office GF Restaurant, Lobbies 3F-9F	Scope out
Which non-potable water source is the dwelling/space connected to?: All	Tank 1
Non-potable water source connected to Toilets: All	Yes
Non-potable water source connected to Laundry (washing machine): All	No
Non-potable water source connected to Hot Water System: All	No

Rainwater tank profile	
What is the total roof area connected to the rainwater tank?: Tank 1	726 m²
Tank Size: Tank 1	10,000 Litres
Irrigation area connected to tank: Tank 1	-
Is connected irrigation area a water efficient garden?: Tank 1	Yes
Other external water demand connected to tank?: Tank 1	-

1.1 Potable Water Use Reduction			42%

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	12627 kL
Output	Proposed (excluding rainwater and recycled water use)
Project	9625 kL
Output	Proposed (including rainwater and recycled water use)
Project	9190 kL
Output	% Reduction in Potable Water Consumption
Project	27 %
Output	% of connected demand met by rainwater
Project	21 %
Output	How often does the tank overflow?
Project	Never / Rarely
Output	Opportunity for additional rainwater connection
Project	3034 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 27.5%

		Minimum required 50%	53%	✔ Pass

Use the BESS Deem to Satisfy (DtS) method for Non-residential spaces?:	No
Dwellings Energy Approach	
What approach do you want to use for Dwellings?:	Use the built in calculation tools
Are you installing any solar photovoltaic (PV) system(s)?:	Yes
Are you installing any other renewable energy system(s)?:	No
Energy Supply:	Electricity & Natural Gas
Are you installing a cogeneration or trigeneration system?:	No
Dwelling Energy Profiles	
Building: All	28 Albert Rd
Below the floor is: All	Another Occupancy
Above the ceiling is:	
A1/A1-A A2 A3 B1/B1-A C2/C2-A/C2-B C3 C4 D1 D2	Another Occupancy
C1/C1-A/C1-B Penthouse	Outside
Exposed sides: All	3
NatHERS Annual Energy Loads - Heat: All	48.0 MJ/sqm
NatHERS Annual Energy Loads - Cool: All	30.0 MJ/sqm
NatHERS star rating: All	7.5
Type of Heating System: All	Reverse cycle space
Heating System Efficiency: All	4 Stars (2011 MEPS)
Type of Cooling System: All	Refrigerative space
Cooling System Efficiency: All	4 Stars (2019 MEPS)
Type of Hot Water System: All	Electric Heat Pump Band 1
Is the hot water system shared by multiple dwellings?: All	Yes
Clothes Line: All	No drying facilities
Clothes Dryer: All	Occupant to install
Non-residential buildings profile	
Heating, Cooling & Comfort Ventilation - Electricity Reference fabric & services:	170,500 kWh
Heating, Cooling & Comfort Ventilation - Electricity - proposed fabric and reference services:	150,000 kWh
Heating, Cooling & Comfort Ventilation - Electricity Proposed fabric & services:	145,000 kWh

Heating - Gas - Reference fabric and services:	0.0 MJ
Heating - Gas - Proposed fabric and Reference services:	0.0 MJ
Heating - Gas - Proposed fabric and services:	0.0 MJ
Heating - Wood - reference fabric and services:	-
Heating - Wood - proposed fabric and reference services:	-
Heating - Wood - proposed fabric and services:	-
Hot Water - Electricity - Reference:	1,150,000 kWh
Hot Water - Electricity - Proposed:	25,000 kWh
Hot Water - Gas - Baseline:	0.0 MJ
Hot Water - Gas - Proposed:	0.0 MJ
Lighting - Reference:	150,000 kWh
Lighting - Proposed:	135,000 kWh
Peak Thermal Cooling Load - Reference:	-
Peak Thermal Cooling Load - Proposed:	-

Solar Photovoltaic system profile

System Size (lesser of inverter and panel capacity): PV	16.0 kW peak
Orientation (which way is the system facing)?: PV	North
Inclination (angle from horizontal): PV	10.0 Angle (degrees)
Which Building Class does this apply to?: PV	Apartment

1.1 Thermal Performance Rating - Non-Residential 40%

Score Contribution	This credit contributes 18.4% towards the category score.
Criteria	What is the % reduction in heating and cooling energy consumption against the reference case (NCC2022 Section J)?
Output	Total Improvement
Office	12 %
Other building	12 %

1.2 Thermal Performance Rating - Residential 50% ✔ Achieved

Score Contribution	This credit contributes 8.3% towards the category score.
Criteria	What is the average NatHERS rating?
Output	Average NATHERS Rating (Weighted)
Apartment	7.5 Stars

2.1 Greenhouse Gas Emissions 35%

Score Contribution	This credit contributes 12.9% 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)
Apartment	103,375 kg CO2
Office	1,076 kg CO2
Other building	508,393 kg CO2
Output	Proposed Building with Proposed Services (Actual Building)
Apartment	102,471 kg CO2
Office	139 kg CO2
Other building	65,450 kg CO2
Output	% Reduction in GHG Emissions
Apartment	< 1 %
Office	87 %
Other building	87 %

2.2 Peak Demand 0%

Score Contribution	This credit contributes 2.3% towards the category score.
Criteria	What is the % reduction in the instantaneous (peak-hour) demand against the benchmark?

2.6 Electrification 0% ⊘ Disabled

Credit is available when the energy supply is set to all-electric (no gas or wood).

This credit is disabled	Credit is available when the energy supply is set to all-electric (no gas or wood).

2.7 Energy consumption 100%

Score Contribution	This credit contributes 20.3% towards the category score.
Criteria	What is the % reduction in annual energy consumption against the benchmark?
Output	Reference Building with Reference Services (BCA only)
Apartment	925,093 MJ
Office	4,558 MJ
Other building	2,153,193 MJ
Output	Proposed Building with Proposed Services (Actual Building)
Apartment	433,996 MJ
Office	587 MJ
Other building	277,200 MJ
Output	% Reduction in total energy
Apartment	53 %
Office	87 %
Other building	87 %

3.1 Carpark Ventilation 100%

Score Contribution	This credit contributes 5.1% towards the category score.
Criteria	If you have an enclosed carpark, is it: (a) fully naturally ventilated (no mechanical ventilation system) or (b) 40 car spaces or less with Carbon Monoxide monitoring to control the operation and speed of the ventilation fans?
Question	Criteria Achieved ?
Project	Yes

3.2 Hot Water 100%

Score Contribution	This credit contributes 2.3% 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
Office	3,970 MJ
Other building	1,875,178 MJ
Output	Proposed
Office	86.3 MJ
Other building	40,765 MJ
Output	Improvement
Office	97 %
Other building	97 %

3.4 Clothes Drying 0%

Score Contribution	This credit contributes 2.8% towards the category score.
Criteria	What is the % reduction in annual energy consumption (gas and electricity) from a combination of clothes lines and efficient driers against the benchmark?
Output	Reference
Apartment	20,487 kWh
Output	Proposed
Apartment	20,487 kWh
Output	Improvement
Apartment	0 %

3.6 Internal Lighting - Apartments 100%

Score Contribution	This credit contributes 2.8% towards the category score.
Criteria	Is the maximum illumination power density (W/m2) in at least 90% of the relevant building class at least 20% lower than required by clause J7D3(1)(a) and Table J6.2a of the NCC 2022 Vol 1 (Class 2-9)?
Question	Criteria Achieved ?
Apartment	Yes

3.7 Internal Lighting - Non-Residential 100%

Score Contribution	This credit contributes 4.6% 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 J7D3a of the NCC 2022 Vol 1?
Question	Criteria Achieved ?
Office	Yes
Other building	Yes

4.1 Combined Heat and Power (cogeneration / trigeneration) N/A Scoped Out

No cogeneration or trigeneration system in use.

This credit was scoped out	No cogeneration or trigeneration system in use.

4.2 Renewable Energy Systems - Solar 54%

Score Contribution	This credit contributes 5.1% 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
Apartment	19,389 kWh
Output	% of Building's Energy
Apartment	16 %

4.4 Renewable Energy Systems - Other N/A Scoped Out

No other (non-solar PV) renewable energy is in use.

This credit was scoped out	No other (non-solar PV) renewable energy is in use.

Stormwater Overall contribution 13.5%

Minimum required 100% **100%** ✔ **Pass**

Which stormwater modelling software are you using?:	Melbourne Water STORM tool

1.1 Stormwater Treatment 100%

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

IEQ Overall contribution 16.5%

	Minimum required 50%	55%	✔ Pass

Use the BESS Deemed to Satisfy (DtS) method for daylight to Dwellings?:	No
What approach do you want to use for daylight to Dwellings?:	Provide our own calculations

1.1 Daylight Access - Living Areas		66%
Score Contribution	This credit contributes 11.9% towards the category score.	
Criteria	What % of living areas achieve a daylight factor greater than 1%	
Question	Percentage Achieved ?	
Apartment	80 %	
1.2 Daylight Access - Bedrooms		66%
Score Contribution	This credit contributes 11.9% towards the category score.	
Criteria	What % of bedrooms achieve a daylight factor greater than 0.5%	
Question	Percentage Achieved ?	
Apartment	80 %	
1.3 Winter Sunlight		0%
Score Contribution	This credit contributes 3% towards the category score.	
Criteria	Do 70% of dwellings receive at least 3 hours of direct sunlight in all Living areas between 9am and 3pm in mid-winter?	
Question	Criteria Achieved ?	
Apartment	No	
1.4 Daylight Access - Non-Residential		35% ✔ Achieved
Score Contribution	This credit contributes 19.8% towards the category score.	
Criteria	What % of the nominated floor area has at least 2% daylight factor?	
Question	Percentage Achieved?	
Office	0 %	
Other building	35 %	
1.5 Daylight Access - Minimal Internal Bedrooms		100%
Score Contribution	This credit contributes 3% towards the category score.	
Criteria	Do at least 90% of dwellings have an external window in all bedrooms?	
Question	Criteria Achieved ?	
Apartment	Yes	
2.1 Effective Natural Ventilation		100%
Score Contribution	This credit contributes 11.9% towards the category score.	
Criteria	What % of dwellings are effectively naturally ventilated?	
Question	Percentage Achieved?	
Apartment	100 %	
2.3 Ventilation - Non-Residential		66% ✔ Achieved

Score Contribution	This credit contributes 19.8% towards the category score.

Criteria	What % of the regular use areas are effectively naturally ventilated?
Question	Percentage Achieved?
Office	-
Other building	-

Criteria	What increase in outdoor air is available to regular use areas compared to the minimum required by AS 1668.2:2012?
Question	Percentage Achieved?
Office	50 %
Other building	50 %

Criteria	What CO2 concentrations are the ventilation systems designed to achieve, to monitor and to maintain?
Question	Value
Office	800 ppm
Other building	800 ppm

3.4 Thermal comfort - Shading - Non-Residential 0%

Score Contribution	This credit contributes 9.9% towards the category score.

Criteria	What percentage of east, north and west glazing to regular use areas is effectively shaded?
Question	Percentage Achieved?
Office	-
Other building	-

3.5 Thermal Comfort - Ceiling Fans - Non-Residential 0%

Score Contribution	This credit contributes 3.3% towards the category score.
Criteria	What percentage of regular use areas in tenancies have ceiling fans?
Question	Percentage Achieved?
Office	-
Other building	-

4.1 Air Quality - Non-Residential 100%

Score Contribution	This credit contributes 3.3% towards the category score.

Criteria	Do all paints, sealants and adhesives meet the maximum total indoor pollutant emission limits?
Question	Criteria Achieved ?
Office	Yes
Other building	Yes

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

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

Transport Overall contribution 9.0%

		23%

1.1 Bicycle Parking - Residential		0%
Score Contribution	This credit contributes 12.8% towards the category score.	
Criteria	How many secure and undercover bicycle spaces are there for residents?	
Question	Bicycle Spaces Provided ?	
Apartment	28	
Output	Min Bicycle Spaces Required	
Apartment	42	

1.2 Bicycle Parking - Residential Visitor		0%
Score Contribution	This credit contributes 12.8% towards the category score.	
Criteria	How many secure bicycle spaces are there for visitors?	
Question	Visitor Bicycle Spaces Provided ?	
Apartment	6	
Output	Min Visitor Bicycle Spaces Required	
Apartment	9	

1.3 Bicycle Parking - Convenience Residential		0% ⊘ Disabled
		Credit 1.1 must be achieved first.
This credit is disabled	Credit 1.1 must be achieved first.	

1.4 Bicycle Parking - Non-Residential		0%
Score Contribution	This credit contributes 10.6% 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 ?	
Office	No	
Other building	No	
Question	Bicycle Spaces Provided ?	
Office	-	
Other building	-	

1.5 Bicycle Parking - Non-Residential Visitor		0%
Score Contribution	This credit contributes 5.3% 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 ?	
Office	No	
Other building	No	
Question	Bicycle Spaces Provided ?	
Office	-	
Other building	-	

1.6 End of Trip Facilities - Non-Residential		0%	⊘ Disabled
			Credit 1.4 must be complete first.
This credit is disabled	Credit 1.4 must be complete first.		

2.1 Electric Vehicle Infrastructure		100%
Score Contribution	This credit contributes 23.4% 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 11.7% 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 11.7% 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 5.5%

66%

1.1 - Construction Waste - Building Re-Use	0%
Score Contribution	This credit contributes 33.3% towards the category score.
Criteria	If the development is on a site that has been previously developed, has at least 30% of the existing building been re-used?
Question	Criteria Achieved ?
Project	No

2.1 - Operational Waste - Food & Garden Waste	100%
Score Contribution	This credit contributes 33.3% towards the category score.
Criteria	Are facilities provided for on-site management of food and garden waste?
Question	Criteria Achieved ?
Project	Yes

2.2 - Operational Waste - Convenience of Recycling	100%
Score Contribution	This credit contributes 33.3% 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 3.3%

		23%

1.1 Communal Spaces		99%
Score Contribution	This credit contributes 11.7% 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?	
Question	Common space provided	
Apartment	77.0 m²	
Office	0.0 m²	
Other building	143 m²	
Output	Minimum Common Space Required	
Apartment	77 m²	
Other building	143 m²	
2.1 Vegetation		0%
Score Contribution	This credit contributes 46.8% towards the category score.	
Criteria	How much of the site is covered with vegetation, expressed as a percentage of the total site area?	
Question	Percentage Achieved ?	
Project	-	
2.2 Green Roofs		100%
Score Contribution	This credit contributes 11.7% towards the category score.	
Criteria	Does the development incorporate a green roof?	
Question	Criteria Achieved ?	
Project	Yes	
2.3 Green Walls and Facades		0%
Score Contribution	This credit contributes 11.7% towards the category score.	
Criteria	Does the development incorporate a green wall or green façade?	
Question	Criteria Achieved ?	
Project	No	
2.4 Private Open Space - Balcony / Courtyard Ecology		0%
Score Contribution	This credit contributes 6.4% towards the category score.	
Criteria	Is there a tap and floor waste on every balcony and courtyard (including any roof terraces)?	
Question	Criteria Achieved ?	
Apartment	No	
3.1 Food Production - Residential		0%

Score Contribution	This credit contributes 6.4% towards the category score.
Criteria	What area of space per resident is dedicated to food production?
Question	Food Production Area
Apartment	-
Output	Min Food Production Area
Apartment	27 m²

3.2 Food Production - Non-Residential	0%

Score Contribution	This credit contributes 5.3% towards the category score.
Criteria	What area of space per occupant is dedicated to food production?
Question	Food Production Area
Office	-
Other building	-
Output	Min Food Production Area
Office	1 m²
Other building	60 m²

Innovation **Overall contribution 9.0%**

	0%

1.1 Innovation	0%

Score Contribution	This credit contributes 100% towards the category score.
Criteria	What percentage of the Innovation points have been claimed (10 points maximum)?

Disclaimer

The Built Environment Sustainability Scorecard (BESS) has been provided for the purpose of information and communication. While we make every effort to ensure that material is accurate and up to date (except where denoted as 'archival'), this material does in no way constitute the provision of professional or specific advice. You should seek appropriate, independent, professional advice before acting on any of the areas covered by BESS.

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Appendix B – NatHERS Report

IGS INTEGRATED GROUP SERVICES

Value | Innovation | Trust

ESD Services
NCC 2019 NatHERS Assessment Report

28 Albert Road, South Melbourne

Project No. 25005
Date: 21/03/2025

Level 4, 108 Elizabeth Street
Melbourne VIC 3000
Web: www.igs.com.au

Document Control

Version	Date	Issue	Author		Reviewer	
00	08/10/2024	Issue for Review	Gokul Nisha	GN	Li Huan	LH
01	06/12/2024	Issue for Submission	Gokul Nisha	GN	Li Huan	LH
02	21/03/2025	Issue for Submission	Gokul Nisha	GN	Earnest Joseph	EJ

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1. Summary

Thermal performance assessment of the Class 2 apartments using accredited FirstRate5 Version 5.3.2b software has been conducted on all residential sample apartments to NCC 2019 Section J0.2.

NCC 2019 Volume 1 Section J0.2 requires all Class 2 apartment units to achieve a minimum rating of 5.0 stars individually and an average (all apartments) rating of 6.0 stars.

From the assessment, all sample apartments have achieved a minimum NatHERS rating of above 5.0 stars, an average rating of above 6.0 stars and no dwellings exceed the maximum NatHERS annual cooling load of 30 MJ/m^2.

The following residential thermal performance assessor details are provided for building permit purposes.

Assessor's Name:	Li Huan
Accreditation Number:	DMN/12/1395
AAO:	FirstRate5 House Energy Rating Organization

Refer to Appendix 1 for NatHERS star rating results. The official star rating certificate can be provided by FirstRate5 House Energy Rating Organization on request and at the client's cost of $100 (+GST) per certificate which includes $30(+GST) per certificate application required by FirstRate5 House Energy Rating Organization and $70(+GST) for processing, uploading per energy model and downloading per certificate. The certificate can be generated no later than three (3) months after the report is issued.

2. Overview

Project: 28 Albert Road, South Melbourne

Applicable NCC: 2019

Climate Zone: 6

NCC Classification and Verification method:

- Class 2 – Apartments with shared underground carpark spaces
- Class 2 building fabric and services – NCC 2019 deemed-to-satisfy provisions, Part J0.

Reference Documents: This report has been based upon review of a set of Architectural Drawings dated 29.01.2025 issued for VCAT Application.

3. Modelling Inputs Assumptions

Building Fabric Thermal Performance

Element	Type	Description	Minimum Added Insulation	Total System R-value
Wall	All	Refer architectural drawings		
	Internal	Walls Adjoining Communal Areas (Stairs and Corridors)	R1.5	≥ R1.8
	Internal	Neighbour Party Walls (Insulation to each side of shaft liner)	R1.5	
	Internal	All other internal walls	-	
	External	Exposed External Walls	R2.5	≥ R2.8
Floor	Typical Floor	Cantilevering Floors	R2.0	≥ R2.3
		Suspended concrete Slab over Basement	-	
		Between Neighbouring Apartments	-	
Ceiling		Ceilings Adjoining Neighbour Balcony Above	R2.0	≥ R2.3
		Concrete Slab to Rooftop	R4.0	≥ R4.3
Electricals		All recessed downlights	IC-4 rated	

Note: ***Total System R-Value including allowance for thermal bridging must be calculated to NCC 2019 Volume One Section J1.2 requirements.***

Windows Thermal Performance

Element	Type	Description
Windows (Typical)	Frame	AS (Improved) Aluminium Frames or equivalent
	External Glazing	Double Glazed
	Overall Window System Properties	Uw ≤ 2.22, SHGCw = 0.21 to 0.23 VLT ≥ 50%

4. NatHERS Assessment Results

Location	Building Apartment Number	Number of Apartments	NatHERS Rating	Energy (MJ/m²)			Net Conditioned Floor Area
				Total	Heating	Cooling	(m²)
Level 10	1002	**2**	6.3	105.5	87.6	17.9	39.2
Level 10	1003	**2**	5.5	129.5	99.6	29.9	70.4
Level 11	1101	**2**	6.6	93.7	79.4	14.3	167.5
Level 11	1102	**2**	6.8	88	75.9	12.1	39.6
Level 11	1103	**2**	6.3	104.9	88.9	16	40.9
Level 11	1104	**1**	5.9	116.7	89.7	27	76
Level 15	1501	**1**	6.9	87.1	72.6	14.5	168.8
Level 15	1502	**3**	6.9	84.5	70.1	14.4	39.8
Level 15	1503	**2**	6.4	100.1	81.1	19	131.6
Level 22	2201	**3**	6.9	83.3	70.2	13.1	192.1
Level 22	2202	**2**	6.5	96.8	79.9	16.9	154.5
TOTALS		**22**		**94.9**	**78.4**	**16.5**	**2227.9**
WEIGHTED AVERAGE					**6.6**		
CALCULATED MINIMUM					**5.5**		

Appendix C – JV3 Verification Report

IGS INTEGRATED GROUP SERVICES

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NCC 2019 JV3 Verification Report

28 Albert Road,
South Melbourne

Project No. 25005
Date: 21/03/2025

Level 4, 108 Elizabeth Street
Melbourne VIC 3000
Web: www.igs.com.au

Document Control

Version	Date	Issue	Author		Reviewer	
00	05/09/2024	Draft Issue for Review	Earnest Joseph	EJ	Li Huan	LH
01	10/09/2024	Issue for Review	Earnest Joseph	EJ	Li Huan	LH
02	08/10/2024	Issue for Review	Earnest Joseph	EJ	Li Huan	LH
03	06/12/2024	Issue for Submission	Earnest Joseph	EJ	Li Huan	LH
04	21/03/2025	Issue for Submission	Earnest Joseph	EJ	Li Huan	LH

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Appendices

1. Executive Summary

IGS was engaged to assess whether the proposed mixed-use development at 28 Albert Road, South Melbourne will comply with NCC 2019 Volume 1 Amendment 1 Section J using verification method JV3 Modelling.

This assessment was required due to the building façade thermal performances for the non-residential portion that do not currently comply with the deemed-to-satisfy (DTS) provisions of NCC 2019 Volume 1 Amendment 1 Section J Façade Calculation via NCC Façade calculator.

As requested in the JV3 Modelling Verification Method, three distinct models have been used for the assessment for each building:

1. **Reference Building:** Reference Building is modelled as per NCC 2019 Volume 1 Amendment 1 requirements;
2. **Proposed Building (Services as Reference):** Proposed Building is modelled with the same services as the Reference Building; and
3. **Proposed Building (Services as Specified):** Proposed Building is modelled with the proposed services.

The analysis demonstrates that the Proposed Building complies with the limits set in the JV3 Verification Method as detailed in Table 1 below.

Table 01. Summary of JV3 energy results

			Reference Building	**Proposed Building** (Services as Reference)	**Proposed Building** (Services as Specified)
Annual Energy Consumption	Total Electricity Use	kWh/yr	320,680	320,454	295,629
	Total Energy Use	MJ/yr	1,154,446	1,153,633	1,064,263
	Total GHG Emission	Kg CO_2/yr	372,886	372,623	343,757
	GHG Emissions Density	Kg CO_2/m^2/yr	**107**	**107**	**99**
				✓ **Section J Compliant**	

This mixed-use residential development is to target high energy efficient sustainable design target and refer to the building services design drawings and specifications for energy efficient building services design and the onsite renewable energy provisions.

2. Methodology

2.1 Software

The energy modelling was carried out using DesignBuilder version 7.3.0.27, which uses Energy Plus v9.4.0 as the calculation engine.

The software integrates site specific climate data with dynamic thermal simulation and custom-built HVAC systems to provide a powerful energy analysis tool. The dynamic simulation engine of the software suite is accredited with ANSI/ASHRAE Standard 140-2007 “Standard Method of Test for Evaluation of Building Energy Analysis Computer Programs”.

As this is an energy modelling exercise on all commercial spaces, some intricacies of the architectural design were simplified. Where simplifications were necessary, every effort was made to retain the neutral thermal impact on both Reference Building and Proposed Building.

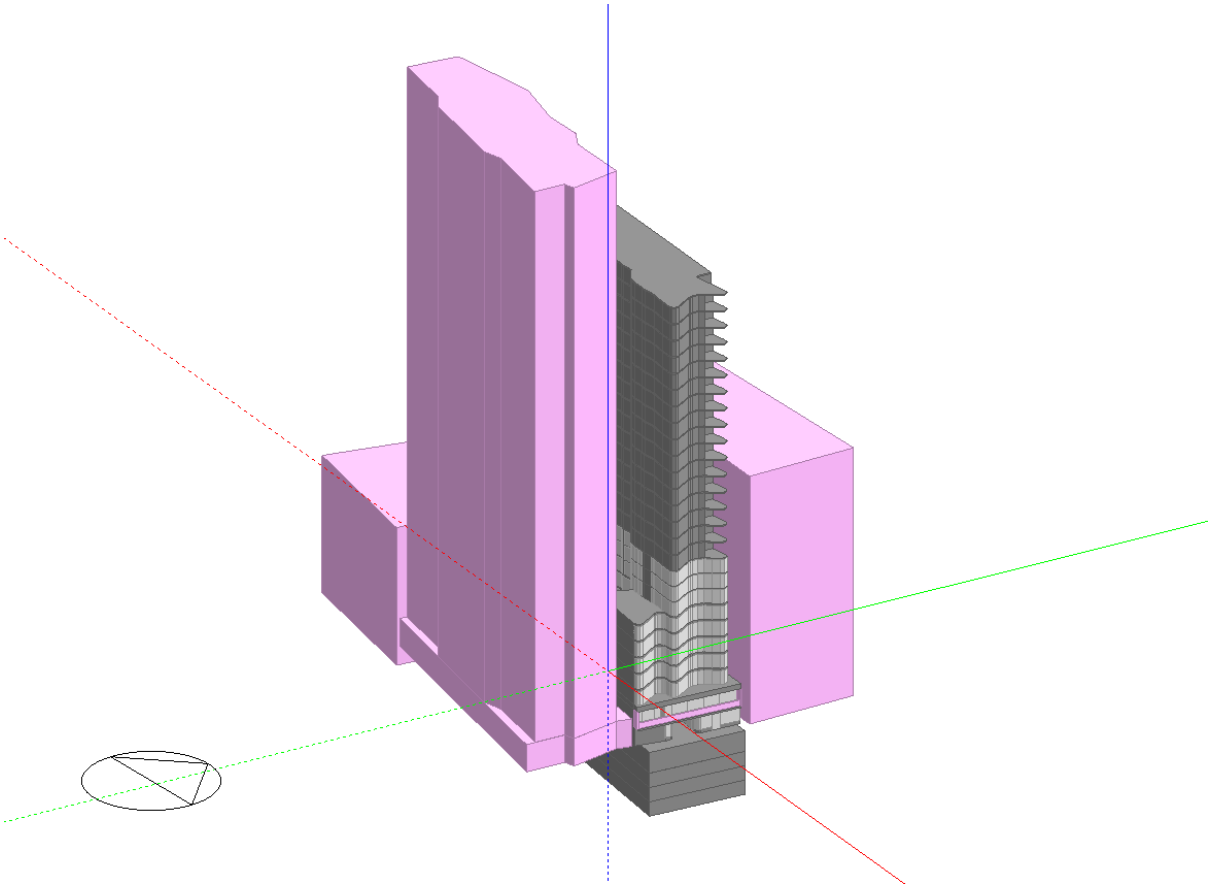


Figure 01 – Southeast view of the building

2.2 Modelling Assumptions

Verification was carried out based on the procedures and parameters detailed in JV3 of NCC 2019 Volume 1 Amendment 1 Section J.

2.2.1 NCC Class Classification

The modelling will follow relevant Class 5 provisions for the building offices, Class 06 Café or Restaurant and Class 2 provisions for common areas in accordance with NCC 2019 Volume 1 Amendment 1.

2.2.2 Limitations

The assumptions were based on review of a set of Architectural Drawings dated 29.01.2025 Issued for VCAT Application.

Computer building simulation provides an estimate of building performance only. This estimate is based on a necessarily simplified and idealized version of the building that does not and cannot fully represent all of the intricacies of the building once built. As a result, simulation results only represent an interpretation of the potential performance of the building. No guarantee or warranty of building performance can be based on simulation results alone.

2.2.3 Airconditioned Spaces

The air-conditioning spaces assessed in the model are in accordance with the mechanical services air-conditioning system design.

Commercial Airconditioned Spaces (m^2)
3,486

2.2.4 Walls and Glazing

The total wall and glazing construction thermal performance for both the Reference and the Proposed Building are as follows. For Reference Building, Method 1 (Single Aspect) approach was adopted for this development.

Refer to Appendix B for Façade Calculator – Reference Building.

External and Internal Façade

Total Construction	Reference Building	Proposed Building
External Wall & Spandrels	R value 2.8	Minimum R value 2.8
Internal Wall (Conditioned to Unconditioned Spaces)	R value 1.4	Minimum R-Value 1.4

Note: *Total system- values with allowance for thermal bridging in accordance with AS/NZS 4859.1 to NCC 2019 Volume 1 Amendment 1 Section J1.*

Window System

Total Construction	Reference Building	Proposed Building
External Window System	Refer to Appendix A	External Fixed Windows U-value ≤ 2.4; $SHGC_w$ ≤ 0.20 VLT ≥ 50% External Glazed Doors U-value ≤ 2.8; $SHGC_w$ ≤ 0.20 VLT ≥ 50%

Note: *Whole-of-window energy performance has been calculated by the glazing fabricator using LBNL THERM software v7 or later in accordance with AFRC modelling protocol and the windows Modelling report has been submitted to IGS ESD team.*

2.2.5 Floor

The total floor construction thermal performance for both the Reference and the Proposed Building are as follows:

Total Construction	Reference Building	Proposed Building
Floors (Conditioned to unconditioned spaces or slab-on-ground)	R2.0	R2.5

Note: *Total system- values with allowance for thermal bridging in accordance with AS/NZS 4859.1 to NCC 2019 Volume 1 Amendment 1 Section J1.*

2.2.6 Roof

The total roof construction thermal performance for both the Reference and the Proposed Building are as follows:

Total Construction	Reference Building	Proposed Building
Roof and Ceiling Construction	R value 3.2	Minimum R value 5.0

Note: *Solar absorptance of the upper surface of the roof not more than 0.45. Total system- values with allowance for thermal bridging in accordance with AS/NZS 4859.1 to NCC 2019 Volume 1 Amendment 1 Section J1.*

2.2.7 Roof light

N/A

2.2.8 Shading

External shading due to horizontal projections and adjacent buildings is taken into account.

No internal shading has been allowed for in the analysis.

2.2.9 Occupancy, Air Conditioning, Lighting and Internal Heat Gain Profiles

All models use the building operation profiles within NCC 2019 Volume 1 Amendment 1 Specification JVc for occupancy, air-conditioning, lighting and internal heat gains.

Building Class	Profiles as per NCC Specification 35
Class 05 - Office	Table 2c and Table 2d: Class 5
Class 06 – Café or Restaurant	Table 2f: Class 6 Café or Restaurant
Class 02 – Common Areas	Table 2a: Class 2

2.2.10 Infiltration

For Reference Building and Proposed Building, the infiltration value is 0.7 air changes per hour throughout all zones when there are no mechanically supplied outdoor, and 0.35 air changes per hour at all other times.

2.2.11 Internal Design Conditions

Winter: 21°C DB, RH uncontrolled
Summer: 24°C DB, RH uncontrolled

2.2.12 Lighting

Maximum lighting power density to NCC 2019 Volume 1 Amendment 1 Table J6.2a is used to model both Reference Building and Proposed Building.

2.2.13 HVAC

In line with JV3 verification method, the reference services and proposed services are modelled as air cooled packaged air conditioning system to provide cooling and space heating.

Item	Reference Building	Proposed Building with the same services as the Reference Building	Proposed Building with Proposed Services
Air-Conditioner Cooling - COP	2.9	2.9	3.5
Air-Conditioner Heating - COP	2.9	2.9	3.5

2.2.14 Ventilation Fans

Ventilation fan efficiencies are modelled as 70% for the Reference Building with reference services and 70% for the Proposed Building with proposed services.

3. Results

The results of the modelling exercise are as follows:

Item	Reference Building	Proposed Building with the same services as the Reference Building	Proposed Building with Proposed Services
Heating Electricity Consumption (kWh)	120,520	122,929	103,107
Cooling (kWh)	33,862	31,367	26,343
Lighting (kWh)	150,277	150,277	150,277
Ventilation Fans (kWh)	16,021	15,881	15,901
Pump (kWh)	-	-	-
Heat Rejection (kWh)	-	-	-
Solar PV Output	-	-	-
Airconditioned Area (m^2)	3486	3486	3486
Total Energy Use (kWh/yr)	320,680	320,454	295,629
Total GHG Emissions (Kg CO_2/yr)	372,886	372,623	343,757
GHG Emissions Density (Kg CO_2/m^2/yr)	**107**	**107**	**99**

4. Conclusion

Compliance with Section J of the NCC 2019 Volume 1 Amendment 1 for the development have been shown by verification method JV3. The annual energy consumption was calculated to be:

- Reference Building: 107 Kg $CO_2/m^2/yr$
- Proposed Building (with reference services): 107 Kg $CO_2/m^2/yr$
- Proposed Building (with proposed services): 99 Kg $CO_2/m^2/yr$

We can therefore advise that the proposed model will comply with the requirements of Section J of the NCC 2019 Volume 1 Amendment 1 through compliance with the modelling outcomes as detailed in JV3.

IGS INTEGRATED GROUP SERVICES

Appendix A – Proposed Windows to Façade Calculator

Façade

Report

Calculator

Project Summary

Date
3/12/2024

Name
IGS ESD

Company
Integrated Group Services

Position
IGS ESD Team

Building Name / Address
28 Albert Rd South Melbourne Melbourne

Building State

VIC

Climate Zone

Climate Zone 6 - Mild temperate

Building Classification

Class 3 - hotel

Storeys Above Ground
25

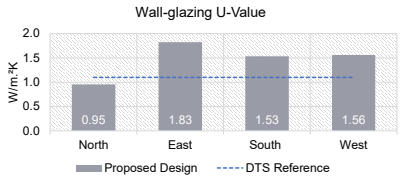
Tool Version
1.2 (June 2020)

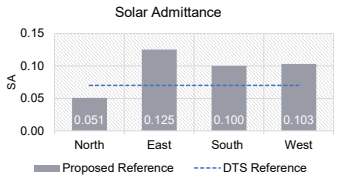
The summary below provides an overview of where compliance has been achieved for Specification J1.5a - Calculation of U-Value and solar admittance - Method 1 (Single Aspect) and Method 2 (Multiple Apects).

Compliant Solution =
Non-Compliant Solution =

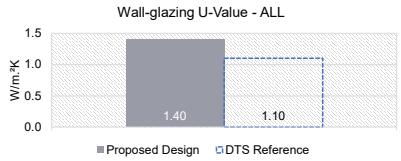
	Method 1 North	Method 1 East	Method 1 South	Method 1 West	Method 2 All
Wall-glazing U-Value (W/m².K)	0.95	1.83	1.53	1.56	1.40
Solar Admittance	0.05	0.13	0.10	0.10	
AC Energy Value					300

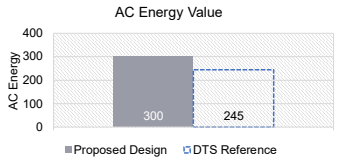
Method 1





Method 2





Project Details

	North	East	South	West
Glazing Area (m²)	230.54	294.36	509.95	197.75
Glazing to Façade Ratio	25%	63%	50%	51%
Glazing References	IGS_Glazing_G1	IGS_Glazing_G2	IGS_Glazing_G3 IGS_Glazing_1	IGS_Glazing_G4
Glazing System Types	Fixed	Fixed	Fixed	Fixed
Glass Types	IGS Glazing - Type 1	IGS Glazing - Type 2	IGS Glazing - Type 3 IGS Glazing - Type 1	IGS Glazing - Type 3
Frame Types	Aluminium	Aluminium	Aluminium	Aluminium
Average Glazing U-Value (W/m².K)	2.70	2.70	2.70	2.70
Average Glazing SHGC	0.20	0.20	0.20	0.20
Shading Systems				
Wall Area (m²)	673.96	175.14	505.95	186.45
Wall Types	Wall	Wall	Wall	Wall
Methodology	Wall			
Wall Construction	IGS_Wall	IGS_Wall	IGS_Wall	IGS_Wall
Wall Thickness	80	80	80	80
Average Wall R-value (m².K/W)	2.80	2.80	2.80	2.80
Solar Absorptance	0.6	0.6	0.6	0.6

Façade

Report

Calculator

Project Summary

Date
9/10/2024

Name
IGS ESD

Company
Integrated Group Services

Position
IGS ESD Team

Building Name / Address
28 Albert Rd South Melbourne Melbourne

Building State
VIC

Climate Zone
Climate Zone 6 - Mild temperate

Building Classification
Class 6 - restaurants, cafes, bars

Storeys Above Ground
25

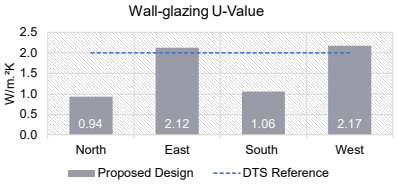
Tool Version
1.2 (June 2020)

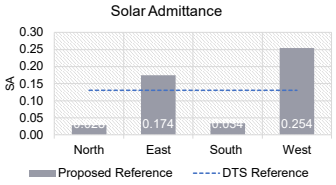
The summary below provides an overview of where compliance has been achieved for Specification J1.5a - Calculation of U-Value and solar admittance - Method 1 (Single Aspect) and Method 2 (Multiple Apects).

Compliant Solution =
Non-Compliant Solution =

	Method 1 North	Method 1 East	Method 1 South	Method 1 West	Method 2 All
Wall-glazing U-Value (W/m².K)	0.94	2.12	1.06	2.17	1.15
Solar Admittance	0.03	0.17	0.03	0.25	
AC Energy Value					78

Method 1





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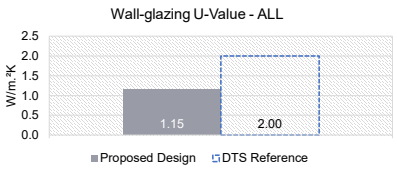
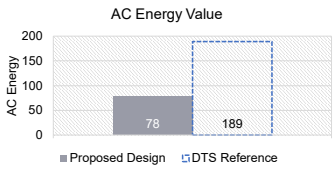




Project Details

	North	East	South	West
Glazing Area (m²)	110.76	65.75	127.56	34.54
Glazing to Façade Ratio	27%	82%	33%	85%
Glazing References	IGS_Glazing_G1 IGS_Glazing_1	IGS_Glazing_G1 IGS_Glazing_1 IGS_Glazing_G2	IGS_Glazing_G1 IGS_Glazing_1	IGS_Glazing_G1
Glazing System Types	Fixed	Fixed	Fixed	Fixed
Glass Types	IGS Glazing - Type 1	IGS Glazing - Type 1 IGS Glazing - Type 2	IGS Glazing - Type 1	IGS Glazing - Type 1
Frame Types	Aluminium	Aluminium	Aluminium	Aluminium
Average Glazing U-Value (W/m².K)	2.50	2.50	2.50	2.50
Average Glazing SHGC	0.30	0.30	0.30	0.30
Shading Systems	Device Horizontal	Device Horizontal	Device Horizontal	Device Horizontal
Wall Area (m²)	298.74	13.95	261.64	6.26
Wall Types	Wall	Wall	Wall	Wall
Methodology	Wall			
Wall Construction	IGS_Wall	IGS_Wall	IGS_Wall	IGS_Wall
Wall Thickness	80	80	80	80
Average Wall R-value (m².K/W)	2.80	2.80	2.80	2.80
Solar Absorptance	0.6	0.6	0.6	0.6

IGS INTEGRATED GROUP SERVICES

Appendix B – Reference Windows to Façade Calculator

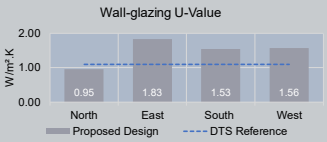
Façade

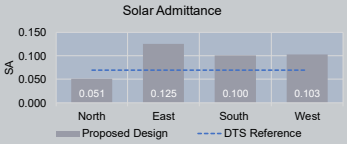
Wall Glazing Areas + Results

User Input | Active Row - All Inputs Required | User Dropdown | Calculator

Results | **Class 3 - hotel** | **Climate Zone 6 - Mild temperate**

Method 1





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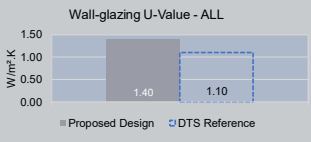
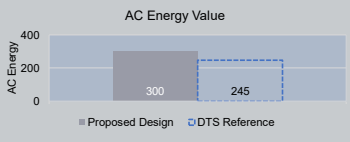




Wall Glazing Area

Compliant Solution =
Non-Compliant Solution =

North	Glazing Reference	Height (m)	Width (m)	Glazing Area (m²)	Shading Reference	Wall Reference	Wall Area (m²)	Total Area (m²)	Internal
1	IGS_Glazing_G1			230.54		IGS-Wall R2.8	673.96	904.50	
2									
3									
4									
5									
6									

	Result	Target				
Wall-glazing U-Value (W/m².K)	0.95	1.10	Glazing Area (m²)	230.54	Average Glazing U-Value (W/m².K)	2.70
Solar Admittance	0.051	0.070	Wall Area (m²)	673.96	Average Glazing SHGC	0.20
			Glazing to Façade Ratio	25%	Average Wall R-Value (m².K/W)	2.80

East	Glazing Reference	Height (m)	Width (m)	Glazing Area (m²)	Shading Reference	Wall Reference	Wall Area (m²)	Total Area (m²)	Internal
1	IGS_Glazing_G2			294.36		IGS-Wall R2.8	175.14	469.50	
2									
3									
4									
5									
6									

	Result	Target				
Wall-glazing U-Value (W/m².K)	1.83	1.10	Glazing Area (m²)	294.36	Average Glazing U-Value (W/m².K)	2.70
Solar Admittance	0.125	0.070	Wall Area (m²)	175.14	Average Glazing SHGC	0.20
			Glazing to Façade Ratio	63%	Average Wall R-Value (m².K/W)	2.80

South	Glazing Reference	Height (m)	Width (m)	Glazing Area (m²)	Shading Reference	Wall Reference	Wall Area (m²)	Total Area (m²)	Internal
1	IGS_Glazing_G3			498.87		IGS-Wall R2.8	505.95	1004.82	
2	IGS_Glazing_1			11.08				11.08	
3									
4									
5									
6									

	Result	Target				
Wall-glazing U-Value (W/m².K)	1.53	1.10	Glazing Area (m²)	509.95	Average Glazing U-Value (W/m².K)	2.70
Solar Admittance	0.100	0.070	Wall Area (m²)	505.95	Average Glazing SHGC	0.20
			Glazing to Façade Ratio	50%	Average Wall R-Value (m².K/W)	2.80

West	Glazing Reference	Height (m)	Width (m)	Glazing Area (m²)	Shading Reference	Wall Reference	Wall Area (m²)	Total Area (m²)	Internal
1	IGS_Glazing_G4			197.75		IGS-Wall R2.8	186.45	384.20	
2									
3									
4									
5									
6									

	Result	Target				
Wall-glazing U-Value (W/m².K)	1.56	1.10	Glazing Area (m²)	197.75	Average Glazing U-Value (W/m².K)	2.70
Solar Admittance	0.103	0.070	Wall Area (m²)	186.45	Average Glazing SHGC	0.20
			Glazing to Façade Ratio	51%	Average Wall R-Value (m².K/W)	2.80

Reference Building

Include shading?

	Method 1 Glazing to Façade Ratio	Wall U-Value (W/m².K)	Glazing U-Value (W/m².K)	Shading Multiplier	SHGC	Method 2 Wall U-Value (W/m².K)	Glazing U-Value (W/m².K)	SHGC
North	25%	0.36	3.27	1.000	0.27	0.36	2.03	0.00
East	63%	0.36	1.54	1.000	0.16			
South	50%	0.36	1.84	1.000	0.16			
West	51%	0.36	1.80	1.000	0.16			

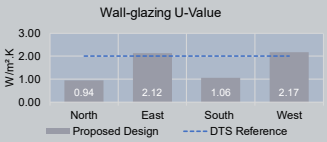
Façade

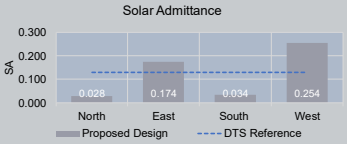
Wall Glazing Areas + Results

User Input | Active Row - All Inputs Required | User Dropdown | Calculator

Results | **Class 6 - restaurants, cafes, bars** | **Climate Zone 6 - Mild temperate**

Method 1





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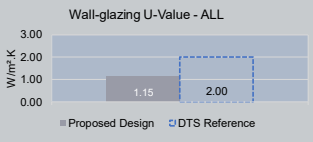
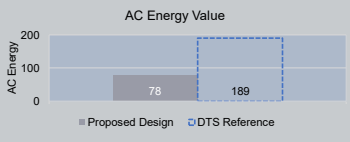




Wall Glazing Area

Compliant Solution =
Non-Compliant Solution =

North	Glazing Reference	Height (m)	Width (m)	Glazing Area (m²)	Shading Reference	Wall Reference	Wall Area (m²)	Total Area (m²)	Internal
1	IGS_Glazing_G1			102.75	Device	IGS-Wall R2.8	298.74	401.49	
2	IGS_Glazing_1			8.01	Device			8.01	
3									
4									
5									
6									

	Result	Target				
Wall-glazing U-Value (W/m².K)	0.94	2.00	Glazing Area (m²)	110.76	Average Glazing U-Value (W/m².K)	2.50
Solar Admittance	0.028	0.130	Wall Area (m²)	298.74	Average Glazing SHGC	0.30
			Glazing to Façade Ratio	27%	Average Wall R-Value (m².K/W)	2.80

East	Glazing Reference	Height (m)	Width (m)	Glazing Area (m²)	Shading Reference	Wall Reference	Wall Area (m²)	Total Area (m²)	Internal
1	IGS_Glazing_G1			24.36	0.35P X 3.2H	IGS-Wall R2.8	13.95	38.31	
2	IGS_Glazing_1			4.59	0.35P X 3.2H			4.59	
3	IGS_Glazing_G2			36.8	1.3P X 2.5H			36.80	
4									
5									
6									

	Result	Target				
Wall-glazing U-Value (W/m².K)	2.12	2.00	Glazing Area (m²)	65.75	Average Glazing U-Value (W/m².K)	2.50
Solar Admittance	0.174	0.130	Wall Area (m²)	13.95	Average Glazing SHGC	0.30
			Glazing to Façade Ratio	82%	Average Wall R-Value (m².K/W)	2.80

South	Glazing Reference	Height (m)	Width (m)	Glazing Area (m²)	Shading Reference	Wall Reference	Wall Area (m²)	Total Area (m²)	Internal
1	IGS_Glazing_G1			122.88	Device	IGS-Wall R2.8	261.64	384.52	
2	IGS_Glazing_1			4.68	Device			4.68	
3									
4									
5									
6									

	Result	Target				
Wall-glazing U-Value (W/m².K)	1.06	2.00	Glazing Area (m²)	127.56	Average Glazing U-Value (W/m².K)	2.50
Solar Admittance	0.034	0.130	Wall Area (m²)	261.64	Average Glazing SHGC	0.30
			Glazing to Façade Ratio	33%	Average Wall R-Value (m².K/W)	2.80

West	Glazing Reference	Height (m)	Width (m)	Glazing Area (m²)	Shading Reference	Wall Reference	Wall Area (m²)	Total Area (m²)	Internal
1	IGS_Glazing_G1			34.54		IGS-Wall R2.8	6.26	40.80	
2									
3									
4									
5									
6									

	Result	Target				
Wall-glazing U-Value (W/m².K)	2.17	2.00	Glazing Area (m²)	34.54	Average Glazing U-Value (W/m².K)	2.50
Solar Admittance	0.254	0.130	Wall Area (m²)	6.26	Average Glazing SHGC	0.30
			Glazing to Façade Ratio	85%	Average Wall R-Value (m².K/W)	2.80

Reference Building

Include shading?

	Method 1					Method 2		
	Glazing to Façade Ratio	Wall U-Value (W/m².K)	Glazing U-Value (W/m².K)	Shading Multiplier	SHGC	Wall U-Value (W/m².K)	Glazing U-Value (W/m².K)	SHGC
North	27%	0.36	5.80	0.350	0.81	0.36	4.82	0.00
East	82%	0.36	2.35	0.704	0.22			
South	33%	0.36	5.37	0.350	0.81			
West	85%	0.36	2.30	1.000	0.16			

Appendix D – Water Sensitive Urban Design Response

IGS INTEGRATED GROUP SERVICES

Value | Innovation | Trust

WATER SENSITIVE URBAN DESIGN

28-32 Albert Road,
South Melbourne VIC 3205

Project No.: 25005
Date: 06/03/2025

Level 4, 108 Elizabeth Street
Melbourne VIC 3000
Web: www.igs.com.au

Document Control

Version	Date	Issue	Author		Reviewer	
00	06/03/2025	Issue for Submission	Gokul Nisha	GN	Earnest Joseph	EJ

TABLE OF CONTENTS

1. Executive Summary

The City of Port Philip recognises the importance of stormwater management and the effects on the surrounding environment and this STORM Assessment & Water Sensitive Urban Design (WSUD) Response is to demonstrate how the proposed development responds to the principles and requirements of Water Sensitive Urban Design outlined in Clause 19.03-3L as follows:

- To ensure that urban development effectively mitigates urban stormwater runoff through the implementation of a comprehensive and optimal strategy for urban stormwater management.
- To alleviate strain on the potable water supply, mitigate the risk of flooding, and enhance the ecological health of downstream rivers.
- To foster a culture of innovation and excellence in the utilization of Integrated Water Cycle Management (IWCM) techniques within the realm of development.
- To mandate that development endeavours, enhance stormwater performance and promote the adoption of alternative sources for potable water.

To achieve the best practice water quality performance objectives as set out in the Urban Stormwater Best Practice Environmental Management Guidelines, Victoria Stormwater Committee 1999. Currently, the water quality performance objectives are:

- Suspended Solids - 80% retention of typical urban annual load;
- Total Nitrogen - 45% retention of typical urban annual load;
- Total Phosphorus - 45% retention of typical urban annual load; and
- Litter - 70% reduction of typical urban annual load.

New developments must also incorporate treatment measures that improve the quality of water and reduce flow of water discharged into waterways (such as collection and use of rainwater/stormwater on site) and encourage the use of measures to prevent litter being carried off-site in stormwater flows.

The proposed development has addressed these requirements by identifying the impervious surfaces within the site and implementing treatments to mitigate the impacts of stormwater leaving the site. In order to demonstrate compliance, a score of 100% or higher must be achieved using the Stormwater Treatment Objective – Relative Measure (STORM) tool, demonstrating these performance objectives have been achieved.

A comprehensive STORM rating has been carried out, based on the following WSUD measures:

- Treatment area of 1,010m^2.
- Roof and Trafficable Terrace catchment area of 726.6m^2 draining to 10kL in-ground rainwater tank on Basement 03.
- Exposed permeable vegetated catchment of 67m^2 draining to Civil detention systems.
- Remaining impervious catchment area of 216.4m^2 draining to Civil detention systems.

2. Overview

2.1 Introduction

This WSUD Report has been prepared by IGS to be considered part of the Sustainable Management Plan for the proposed mixed-use development at 28 – 32 Albert Road, South Melbourne. The site located in City of Port Philip.

2.2 The Site

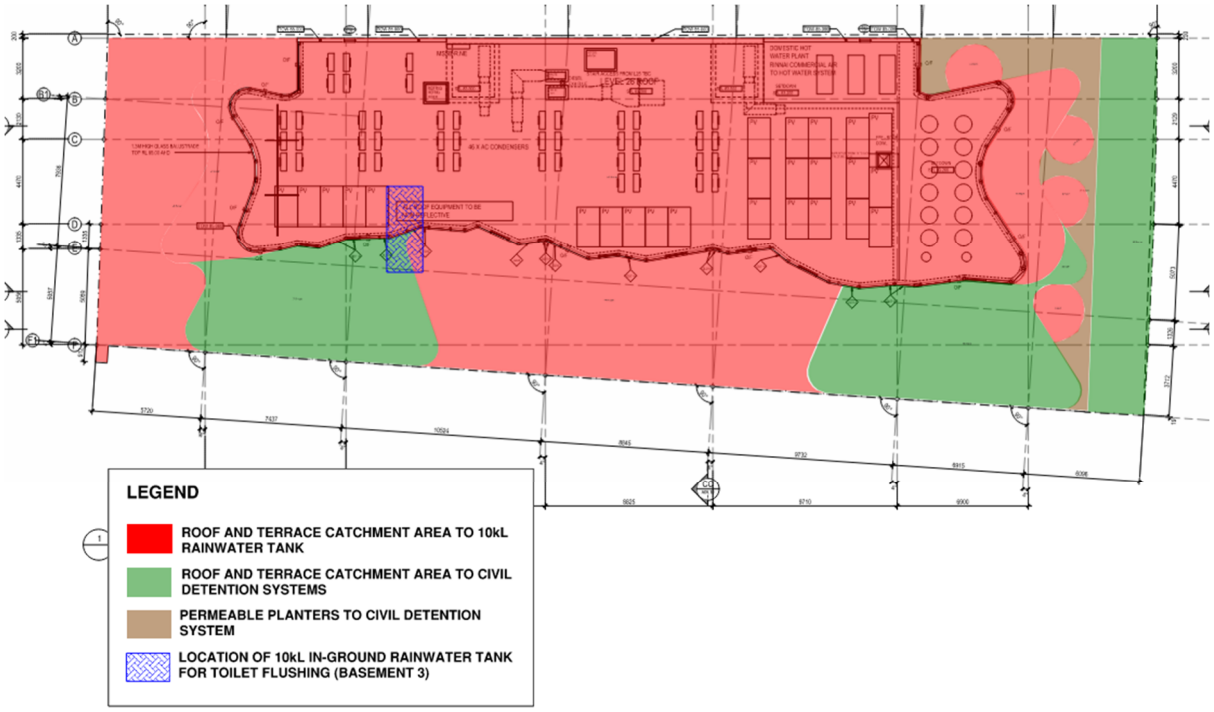
The proposed 25-storey Mixed Use Development is located at 28 Albert Road, South Melbourne with convenient access to the gardens, entertainment and recreational facilities, schools and public transport. There are train stations and tram stops located within 1000m walking distance from the development and the development has achieved a ranking of 'Walker's Paradise' via Walkscore.com.

The development is located within the City of Port Phillip and consists of:

- Basement 01 to 03: Carpark and Services Storage;
- Lower Ground Level: Bin Rooms and Services;
- Ground Level: Restaurant, Hotel Lobby, Residential Lobby and Café;
- Level 01: Restaurant, Communal Areas and Services;
- Level 02 to 09: Hotel; and
- Level 10 to 25: Residential Apartments.

2.3 Site Layout Plan

The site layout of the proposed development is shown below.



Site Layout Plan

3. Water Quality Design Details

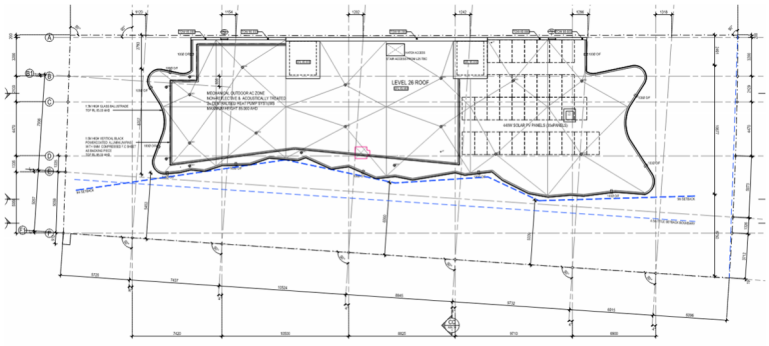
3.1 Water Quality Objectives

The treatment of stormwater targets to achieve the annual pollutant loads set out in the Best Practice Environmental Management Guidelines as followed:

- 80% reduction in Total Suspended Solids (TSS) from typical urban loads.
- 45% reduction in Total Nitrogen (TN) from typical urban loads.
- 45% reduction in Total Phosphorus (TP) from typical urban loads; and
- 70% reduction in Gross Pollutants (GP) from typical urban loads.

3.2 Treatment Train

The following study has been developed based on the site characteristics and the range of Stormwater Quality Improvement Devices available. The overall concept will satisfy the requirements of downstream environmental protection.



Treated Catchment Area: 726m^2
Imperviousness: 100%

10kL Rainwater Tank

Legal Point of Discharge

3.3 Rainwater Tank

Rainwater tanks can reduce the harm to Stormwater waterways caused by too much stormwater. Tank water can be reused for toilet flushing, laundry washing, gardens and lawn irrigation and cars wash, this will significantly be reducing the potable / drinking cold water consumption.

Rainwater tanks collect stormwater run-off from impervious surfaces such as roofs, the tank will be fitted with an overflow outlet that in the event of tank full capacity the excessive pour down will be redirected or fall into the stormwater drainage system.

Rainwater tanks are generally used for watering gardens are much less efficient than tanks used for flushing toilets.

Advantages of rainwater tanks are that they:

- Minimise water usage when used in the toilet, laundry or garden.
- Reduce strain on the stormwater drainage system.
- Retain water close to source.
- Reduce site run-off and flood peaks.

4. STORM Calculation

Based on the Melbourne Water STORM Rating Report, the development achieves a STORM score of 100%. A comprehensive STORM rating has been carried out, based on the following WSUD measures:

- Treatment area of 1,010m^2.
- Roof and Trafficable Terrace catchment area of 726.6m^2 draining to 10kL in-ground rainwater tank on Basement 03.
- Exposed permeable vegetated catchment of 67m^2 draining to Civil detention systems.
- Remaining impervious catchment area of 216.4m^2 draining to Civil detention systems.

Melbourne Water **STORM Rating Report**

TransactionID:	0
Municipality:	PORT PHILLIP
Rainfall Station:	PORT PHILLIP
Address:	28-32 Albert Road
	South Melbourne
	VIC 3205
Assessor:	IGS ESD Team
Development Type:	Residential - Mixed Use
Allotment Site (m2):	1,010.00
STORM Rating %:	111

Description	Impervious Area (m2)	Treatment Type	Treatment Area/Volume (m2 or L)	Occupants / Number Of Bedrooms	Treatment %	Tank Water Supply Reliability (%)
Roof and Terrace Catchment Area	726.60	Rainwater Tank	10,000.00	100	144.60	68.00
Untreated Area	216.40	None	0.00	0	0.00	0.00

5. Site Management Plan

A stormwater pollution reduction strategy will be contractually required to be adopted by the Main Contractor to ensure the earth is not eroded and prevent construction debris and litter from entering the stormwater systems. The construction site will be managed in accordance with the EPA (1991) 'Construction techniques for sediment pollution control'.

The developer must ensure that:

- No water containing oil, foam, grease, scum or litter will be discharged to the stormwater drainage system from the site;
- All stored wastes are kept in designated areas or covered containers that prevent escape into the stormwater system;
- The amount of mud, dirt, sand, soil, clay or stones deposited by vehicles on the abutting roads is minimised when vehicles are leaving the site.
- No mud, dirt, sand, soil, clay or stones are washed into, or are allowed to enter the stormwater drainage system;
- The site is developed and managed to minimise the risks of stormwater pollution through the contamination of run-off by chemicals, sediments, animal wastes or gross pollutants in accordance with currently accepted best practice.

A strategy will be required to specifically address the following (not limited to) in respect to stormwater:

- No impact on offsite surface or ground water(s) due to construction activities;
- Site stormwater to be managed to minimise any contaminated water discharged from site, such as:
  - Materials and waste to be stored at least 2m away from drainage lines;
  - All inadvertent chemical spills will be required to be cleaned up immediately;
  - The road will be required to be kept clean, with the number of sweepers cleaning the road to be in response to mess created;
  - Application and inclusion of a range of mitigation measures for soil depositing on roads, stormwater, dust and noise;
  - Incorporate prevention measures to stormwater from adjacent properties from entering site;
  - Installation of hay bales around stormwater drains to minimise sediment entering stormwater;
  - Removal of sediment and rubbish from sediment fences and stormwater inlet filters after storm events, and checking of sediment traps after storm events;
  - Capping and bunding of stockpiled or treatment piles of contaminated spoils;
  - Stormwater discharge quality will be required to meet SEPP (Waters of Victoria) standards; and
  - Regular inspections of the effectiveness of sediment control and surface run-off measures, including during and immediately after storm events, with necessary improvements.

6. Maintenance Program

The proposed rainwater harvesting system will be routinely maintained as part of the maintenance programme and specifically the following maintenance will be required:

- First flush devices to be cleaned at least every 6 months;
- Roof and other collection areas to be inspected regularly, at minimum every 3 months to ensure they are maintained free of pollutants, leaves and other debris;
- Manufacturers required maintenance for type of tank(s) and pump(s) installed to be performed typically annually; and
- As installed design details/diagrams to be provided to the building management team as part of the building handover.
- The WSUD Maintenance Manual may form part of a broader Maintenance Program that covers other aspects of maintenance such as a Builder's User's Guide or a Building Maintenance Guide.

The maintenance procedure shall be in conjunction with the building maintenance and specification and shall comply with relevant / applicable authority design guidelines and codes of practice requirements. The stormwater management strategy shall adopt the following maintenance procedures.

- Quarterly routine maintenance procedure to thoroughly maintain raingarden free of debris and general clean-up process by building management as part of building maintenance programme.
- Annually / 6-month drain and flushing of rainwater tank cleaning tank internally from debris and sediment collection captured from roof surface, by building management as part of building maintenance programme.
- Quarterly inspection of gutters to ensure they are free of debris and clean as required.
- Quarterly inspection of stormwater downpipes and grates to ensure no water leakage, they are free of debris and clean as required.
- Yearly inspections of rainwater tanks and supports to ensure no leakage, inspect joints and clean as required.
- Water storage tanks should be inspected, cleaned and disinfected in accordance with AS 3500.
- Bi-annual inspection of pumps to ensure correct operation, no leakage and clean as required.
- Service items and equipment in conformance with the maintenance schedules as per the operation and maintenance manuals.

- Carry out the manufacturers' recommended maintenance instruction.
- Attend to reported defects and complaints.
- Check for and repair corrosion.
- Check for and rectify any unsafe conditions.
- Replace faulty or damaged parts and consumable components.
- connections, for deterioration and for freedom of movement of assembly.
- Identification of pipes, conduits and ducts maintenance: To AS 1345.
- Safety signs maintenance: To AS 1319.
- Remove waste and clean all parts of the installation.
- Remove temporary protective coatings, packaging and labels.
- Clean screens and strainer baskets.

6.1 Maintenance Checklist

Regular maintenance will keep the rain harvesting system functioning optimally, so it continues to deliver cleaner rainwater and lots of it for use in and around the property. The property owner is responsible for checking the maintenance items in this checklist at the recommended frequency.

This Rain Harvesting Maintenance Checklist outlines basic maintenance tasks and timelines. The maintenance log should be filled in once each maintenance check is complete. Upkeep of this maintenance log should continue throughout the life of the rainwater tank.

After every rainfall event

Inspect	Maintain	
Wet system pipes	Manually or automatically drain to prevent anaerobic fermentation, tannin leaching and freezing in colder climates.	☐

Every 3 rainfall events

Inspect	Maintain	
First flush diverters with flow control washers	Remove and clean the outlet, filter screen and flow control washer to prevent blockages and ensure the unit empties after each rainfall event.	☐

Monthly

Inspect	Maintain	
Bucket style rain heads	Remove leaves and debris from catchment area and brush or hose off screen as required to prevent blockages and decomposing vegetation.	☐
Enclosed rain heads	Remove leaves and debris from cover and brush or hose off screen as required to ensure optimal performance.	☐
Maelstrom filters	Brush or hose off filters and screens as required to keep filters functioning optimally and ensure high water yields.	☐

Quarterly (every 3 months)

Inspect	Maintain	
Roof, gutters, and gutter mesh	Clean and remove leaves and debris as required to preserve water quality and quantity; trim back overhanging branching and vegetation as required consider installing gutter mesh for easier maintenance.	☐
Rain heads with self-cleaning screens	Brush or hose off screen/s as required to remove any leaves or debris for optimal rainwater quality and quantity.	☐
First flush diverters with advanced release valves	Remove and clean the advanced release valve as required to prevent blockages and ensure the unit continues to empty as desire after each rainfall event, ensure the auto-release settings are still appropriate for your needs and preferences.	☐
Tank inlet screens	Remove any leaves and debris and clean as appropriate to prevent water bounce and ensure higher water catchment; ensure there are no holes that mosquitoes could enter through;	☐

	consider replacing with a Maelstrom filter for finer filtering, improved water catchment and easier maintenance.	
Filter pits	Remove any leaves and debris and clean screens as appropriate to preserve water quality and quantity; ensure there are no holes that mosquitoes could enter through	☐

Every 6 months

Inspect	**Maintain**	
Tank overflow screens or flap valves	Clean as appropriate to ensure optimal functioning, ensure there are no holes that mosquitos could enter; ensure there are no obstructions blocking your tank outlets.	☐
Water pumps and pump filters	Check and clean pump filters and required to preserve longevity and function, check the maintenance guidelines for your pump and perform any required maintenance.	☐
Water filters	Inspect filter components and replace cartridges as necessary	☐

Annually

Inspect	**Maintain**	
Air gaps or backflow prevention	Hose or brush off screens to clean as required; test to ensure backflow prevention is working.	☐
Stored rainwater	Complete water quality testing using appropriate testing processes.	☐

Biennially (every 2 years)

Inspect	**Maintain**	
Rainwater tank	Remove accumulated sediment and/or sludge from the base of tank for improved water quality, repair any cracks, holes or gaps.	☐

Maintenance Frequency												
	Jan	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
All Tasks	×			×			×			×		

6.2 Sample Maintenance Guide for Reference

In general, your water tank requires only a very little maintenance to keep it working well and looking good. Here are some helpful hints in caring for your tank.

1.1 Inlet leaf strainer.
This is a fine stainless-steel mesh about the same size as your typical fly screen. The water passes through this strainer as it enters you tank and is located on the top of your tank. This strainer should be cleaned regularly to ensure it does not become blocked with leaves etc.

1.2 Tank Lid.
It is a good idea to keep leaf build-up and sticks etc off the lid of your tank. Pot plants or other items should not be placed on the top of your tank.

1.3 External surfaces of tank.
While not necessary to clean the outside of your tank the occasional hose off (with rainwater of course) is recommended to keep your tank looking at its best. This removes dust and dirt build up. Ensure to keep debris build-up away from the base/wall of your tank. Don't allow dirt build-up around the bottom lip.

1.4 Base area.
The most important aspect of your tank setup is its base. Inspect the base area every 6 -12 months for any movement or damage to the slab or pavers. If the base begins to move or crack, empty the tank to remove the weight and have the fault corrected to prevent damage to the tank. Remember that there is no warranty for the tank if the base has failed. All tanks must be fully supported by a flat and level base.

1.5 Sediment build up inside.
Over time your tank will build up a sediment layer on the bottom of the tank which is normal. This layer build up is dust that settles out of the water which has run off your roof and gutters. This is harmless and natural. It should not be disturbed or removed until the build-up reaches the tank outlet or approx. 20 mm thick. This will take many years depending on the location and environment. Plumbers can come and clean your tank out for you. Or simply wait for your tank to be empty and then open the bottom valve (or disconnect your pump, if required) and with a high-pressure washer or hose thru the removed inlet strainer you can stir up the sediment and allow it to run out. This will remove most of the build-up.

1.6 Pump Systems.
Please refer to the operating instructions relevant to your pump. Surface-mounted pumps must be kept clear of ground water (flooding) and overgrown vegetation and should have adequate ventilation. All pumps should be removed and serviced every few years to help ensure they remain in good working order and to prolong the pump life. If you have a pit with pumped collection system, the pit/s should be checked about every 6 to 12 months and they will need to be cleaned out when required to avoid damage being caused to the sump pump.

1.7 Smelly water.
Some customers who have a lot of leaves in their gutters can sometimes have a smell from their tank. Ensure the gutters and leaf strainers are kept clean. A small amount of chlorine in the tank will kill off the bacteria causing the smell. Best to use the tablets from a pool supplier but ensure you check with them the recommended dosage depending on your tank capacity. The chlorine will disinfect the water and then after a week or so most will be evaporated out of the water.

1.8 Mozzies.
Most mozzies or wrigglers make their way into your tank from first breading in clogged gutters. They wash down the downpipe and are small enough to pass through the inlet strainer and into your tank. To treat your tank for this problem use the same method as described in Smelly water above.

1.9 Sediment Filters.

Sediment filters are recommended when tanks are connected to toilets. To open the filter housing you first need to isolate the water from the tank and the mains (if connected). Release pressure from the filter by turning on a tap or flushing the connected toilet. Unscrew the filter housing, remove the filter and replace it with a new one. Re-fit the housing, slowly open up the water source/s and then turn off any taps which were turned on. This filter will need to be replaced every 6-12 months depending on usage.

1.10 Carbon Block Filters.

Carbon filters are a secondary filter usually fitted when your tank is connected to the laundry to help remove odours or water discolouration. The replacement method is the same as a sediment filter above and it should also be replaced every 6-12 months. The carbon filter will normally show its need for replacement by causing the water flow to slow down. Make sure you have the sediment filter before the carbon filter in line with the flow of water.

1.11 Evolution Tank Filters.

These systems have the filters mounted in the top of the tank and are easily removed for cleaning and/or replacement in much the same way as described above. Remove the Rainbank and filter cover from the top of the tank, turn off the isolation valves, and unscrew the filter caps to lift the filter cartridges out.

These systems have either a single or 2-stage filtration. Check under the cover on the tank for more details.

1.12 Leaf Eater Rainheads.

The rainheads (if installed) are usually located at the top of your downpipes. These have a wire mesh screen on a 45-degree slope and many have a secondary filter located internally of the rainhead. These filters need to be checked regularly to ensure they are free of debris. To access the internal filter, release the clips on each side and then remove the mesh and pull out the internal filter, rinse with water and re-fit.

1.13 First Flush Diverters.

If you have first flush diverters installed, frequently unscrew the cap at the base of the diverter and remove the filter. Wash the filter with clean water. There is also a flow restrictor inside the cap which should be removed and washed. Re-fit the flow restrictor facing “top”, insert the filter and screw the cap back on.

Remember that regular maintenance will improve the water quality and extend the life of your system.

7. Acknowledgements

- Information from PJT Green Plumbing's 'Maintenance Guide for Your Rainwater Tank' was used as a sample maintenance Guide for reference.
- Rainwater Harvesting Maintenance Information via https://rainharvesting.com.au is used to develop the maintenance checklist.