

Sustainable Management Plan (SMP) - residential

For planning applications being considered by Darebin City Council of 10 or more units or townhouses and non-residential developments of 1000sq.m plus.

ESD in the Planning Permit Application Process:

Darebin City Council is committed to promoting Environmentally Sustainable Design (ESD) as an integral part of new developments within the municipality. This is in accordance with State and Local Planning Policy, including Plan Melbourne, Darebin's ESD Policy 22.12 and the Darebin Municipal Strategic Statement (MSS),

ESD can be done easily by following the Sustainable Design Assessment in the Planning Process (SDAPP) program. This is a practical approach to assessing the sustainability of your project during the planning permit application process to achieve more sustainable building outcomes for the long-term benefit of the wider community.

Large planning permit applications within Darebin City Council are required to include a Sustainable Management Plan (SMP). Your application is a 'large' planning application if it is a residential development of 10 or more units or townhouses and 1000sq.m plus for non-residential. All information on the SDAPP program can be obtained on our webpage: www.darebin.vic.gov.au

What is a Sustainable Management Plan (SMP)?

An SMP is a detailed sustainability assessment of a proposed design at the planning stage. An SMP addresses the 10 Key Sustainable Building Categories and demonstrates that a holistic ESD review has been undertaken during a project's early design stages. It may be necessary to engage a sustainability consultant to prepare an SMP including a BESS and STORM report or a Green Star and MUSIC report for very large or complex sites.

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Response Guidelines

Project Information

The applicant should state the property address and the proposed development's use and extent. They should describe neighbouring buildings that impact on or may be impacted by the development. It is required to outline relevant areas, such as site permeability, water capture areas and gross floor area of different building uses.

Environmental Categories

The applicant should describe the development's sustainable design approach and summarise the project's key ESD objective under the 10 Key Sustainable Building Categories. These are Management, Energy, Water, Stormwater, Indoor Environment Quality, Transport, Waste, Urban Ecology and Materials. Any innovative ESD items or design approaches should also be included.

Objectives

Within this section the general intent, the aims and the purposes of the category are explained.

Design response

This section comprises a list of ESD considerations in italics. These are to be deleted by the applicant and information about their own development inserted for assessment by the ESD Officer and planner. The response should include the following:

- Assessment Method Description - what standards have been used to assess the applicable issues. Refer to the section 'Relevant Standards' under each Sustainable Building Category
- Benchmarks Description - The applicant is required to briefly explain the benchmark applied as outlined within the chosen standard.
- How does the proposal comply with the benchmarks? – Demonstrate this by making references to the design brief, drawings, specifications, consultant reports or other evidence that proves compliance with the chosen benchmark.

ESD Matters on Architectural Drawings

Architectural drawings should reflect all relevant ESD matters where feasible. As an example, window attributes, sun shading and materials should be noted on elevations and finishes schedules, water tanks and renewable energy devices should be shown on plans. The site's permeability should be clearly noted. It is also recommended to indicate water catchment areas on roof- or site plans to confirm water re-use calculations.

ESD and Stormwater tools

The SMP must have the full BESS/Green Star and Melbourne water STORM/Insite/MUSIC assessments attached to the SMP template. BESS reports must be published online. A copy can be made of the published report on the BESS website if any changes to the BESS report are required.

Project Information:

Planning Permit Applicant:

Property Address:

Project Description:

Project Description:

Site Area (m²):	Site Coverage – impervious surfaces (m²):

The sustainable design approach of your building project and its key ESD objectives:

Note: The *Trade Practices Act 1974* contains provisions relating to misleading or deceptive conduct and false or misleading representations. The Act ensures that the public, and in that the Council, are provided with accurate information in order to make informed decisions. Organisations which make environmental or 'green' claims should ensure that their claims are scientifically sound and appropriately substantiated as serious penalties can apply for activities that are in breach of the Act.

1. Management

Objective:

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

Design Issue	Design response	Drawing reference
Pre-app meeting, ESD professional	<i>Has an ESD professional been part of the design process from the beginning. Were they at a pre-application meeting with council?</i>	
Environmental Management Plan; Construction and Operation	<i>Minimum Standard Met Contractor has valid ISO14001 (environmental management) accreditation</i>	
Thermal performance modelling	<i>To encourage and recognise developments that use thermal modelling to inform passive design at the early design stage. Have energy reports been done for at least 20% of the units in varying locations?</i>	
Building tuning	<i>Ensure the building services are regularly inspected, cleaned and tuned so they work at their optimum level</i>	
Metering	<i>Are there separate meters for residential, communal and non-residential spaces. Are there separate meters for individual residents for water, electricity and gas?</i>	
Building Users' Guide	<i>Provide all residents with a copy of a building users guide or have information in a prominent location on the buildings ESD features e.g. water tanks and how residents can save on energy and costs e.g shorter showers, thermal curtains, etc.</i>	
Other	<i>n/a</i>	

Relevant Standards:

- ASHRAE and CIBSE Commissioning handbooks
- International Organization for standardization – ISO14001 – Environmental Management Systems

References and useful information:

Waste Reduction for Construction

<https://www.sustainability.vic.gov.au/You-and-your-home/Waste-and-recycling/Household-waste/Construction-waste>

Site Management Plans

<https://www.melbournewater.com.au/planning-and-building/developer-guides-and-resources/standards-and-specifications/develop-site>

2. Water Efficiency

Objectives:

- To ensure the efficient use of water and associated utility bills.
- To reduce mains water use
- To encourage the collection and reuse of rainwater and stormwater
- To encourage the appropriate use of alternative water sources (e.g. grey water)

Design Issue	Design response	Drawing reference
Minimising Water Demand	<i>Install appliances to within one star of the best available (refer to the WELS website) and provide details in the BESS report</i>	
Water for Toilet Flushing	<i>Connect as many toilets as possible to a water tank/s to avoid using drinking quality water for flushing</i>	
Location and size of water tank/s	<i>Try to keep water tanks away from bedrooms to reduce noise issues. Install water tanks above the minimum requirement where possible. Minimise the distance between water tanks and toilets/ point of use to reduce pump sizes.</i>	
Area of roof draining to rainwater tank	<i>Ensure roof area going to tank and area listed under the STORM/ MUSIC tool are consistent. Provide a plan showing where all impervious areas are draining.</i>	
Water Meter	<i>Provide information on how multiple unit developments will be metered.</i>	
Gardens with a low water requirement	<i>Use drought tolerant and indigenous plants.</i>	
Landscape Irrigation	<i>Provide description and water source for landscape irrigation if irrigation is required.</i>	
Others	<i>n/a</i>	

Relevant Standards:

- BESS, Green Star, BREEAM and LEED provide benchmarks for relevant issues
- Water Efficient Labelling Scheme (WELS) provides information on appliances and fittings; highest available ratings are recommended.
- NCC provide minimum standards; improvements on these minimum requirements are strongly encouraged

References and useful information:

Water Efficient Labelling Scheme (WELS) www.waterrating.gov.au

Your home - <http://www.yourhome.gov.au/water>

Melbourne Water Saving Water - <https://www.melbournewater.com.au/community-and-education/help-protect-environment/using-and-saving-water/using-and-saving-water-home>

3. Energy Efficiency

Objectives:

- To ensure the efficient use of energy and reduce total operating greenhouse emissions
- To reduce energy peak demand and minimize associated energy costs

Design Issue	Design response	Drawing reference
NCC Energy Efficiency requirements exceeded	<i>Provide preliminary NatHERS energy ratings for 10 to 20% of dwellings or provide information on how energy efficiency requirements will be achieved.</i> <i>Exceed the minimum NCC requirements wherever possible.</i>	
Hot Water System	<i>Avoid gas hot water. Install solar hot water or electric heat pump hot water.</i>	
Peak energy demand	<i>Minimum BESS standard met</i>	<i>Indicate ventilation flows</i>
Passive solar design	<i>Maximise north facing windows, particularly to living areas. Minimise west glazing.</i> <i>Install operable windows to all rooms. Have cross flow ventilation wherever possible.</i>	<i>Note type on plans</i>
Glazing	<i>Install double glazing to reduce heat loss particularly in living/ kitchens and south facing rooms.</i> <i>Do not have excessive glazing facing south as this will lead to heat loss</i>	<i>Show shading elements on plans including size</i>
Efficient Shading	<i>Fixed shading to the north at an adequate size to shade effectively. Provide a section of the shading.</i> <i>Adjustable external shading to east and west glazing that covers the glazing.</i>	
Efficient heating and cooling system	<i>Install ceiling fans</i> <i>Install HVAC units within one star of the highest star rating possible based on the size of the room.</i>	
Efficient Lighting	<i>Reduce the illumination density by at least 20% than what is required by the NCC.</i>	<i>Show number size, angle and direction on plans</i>
Electricity Generation	<i>Install photo voltaic (solar) panels for electricity to each dwelling or common areas such as carparks and hallways. These areas use a significant level of energy</i> <i>Install or provide space for battery storage.</i>	<i>Draw and label clothes lines</i>
Reduction in electricity needs	<i>External clothes lines maximised and drawn and labelled on the plans.</i> <i>Use induction cook tops</i> <i>CO2 sensors in basement carparks and natural ventilation through doors and walls where possible.</i> <i>Use energy efficient appliances to within one star of the best available.</i>	<i>Indicate plant system and size on plans</i>
Electric car charging	<i>Provide battery charging points or at a minimum the wiring required to install EV in the future.</i>	

Relevant Standards:

- Green Star, BREEAM and LEED provide benchmarks for relevant issues
- Window Efficiency Rating Scheme (WERS) compares summer and winter performance

- Minimum Energy Performance Standards (MEPS) Regulations in Australia
- Energy Ratings are available for various appliances, incl. air-conditioning
- NCC provisions provide minimum standards; improvements on these minimum requirements are strongly encouraged

References and useful information:

Your Home www.yourhome.gov.au

National Construction Code Australia www.abcb.gov.au

Window Efficiency Rating Scheme (WERS) www.wers.net

Minimum Energy Performance Standards (MEPS) www.energyrating.gov.au

Energy rating of appliances - https://reg.energyrating.gov.au/comparator/product_types/

Energy information <http://www.sustainability.vic.gov.au/>

Australian Electric Vehicle Association <http://aeva.asn.au/>

AIRAH (Australian Institute of Refrigeration, Airconditioning and Heating)

http://www.airah.org.au/iMIS15_Prod/AIRAH/ASHRAE

4. Stormwater Management

Objectives:

- To reduce the impact of stormwater runoff
- To improve the water quality of stormwater runoff
- To achieve best practice stormwater quality outcomes
- To incorporate Water Sensitive Urban Design principles

Design Issue	Design response	Drawing reference
STORM or MUSIC rating	<i>Minimum Standard of 100% met or exceeded. Include the full STORM/InSITE or MUSIC report with the SMP.</i>	
Rainwater Tanks	<i>Provide details of any water tanks including area of roof run-off, size of tank and proposed water uses (e.g. toilet flushing, garden). Indicate rain water tank's location and size on plans (if applicable). Wherever possible exceed the minimum standard. Connect tanks to toilets as they are used all year.</i>	<i>Indicate rain water tank's location and size on plans</i>
Stormwater Treatment	<i>Reduce stormwater pollution by installing permeable paving, raingardens, swales, tree pits, etc. to filter pollution before it goes to the local creeks. They should be located in communal areas. All treatments such as raingardens or swales must be detailed including area to be treated, size, type of treatment, sections, plants, maintenance, etc.</i>	<i>Draw and label clearly on the plans</i>
Stormwater detention	<i>Most developments will require on-site stormwater detention. Check with the Darebin engineering department for acceptable flows and storage volume. The on-site detention system may be able to be combined with a retention tank used to meet stormwater requirements.</i>	
Impervious surfaces	<i>Maximise permeable surfaces to reduce stormwater. Install ribbon/ landscape strip driveways where possible.</i>	
Other	<i>n/a</i>	

Relevant Standards:

- STORM rating, minimum 100% is required
- Meeting Clause 53.18 Stormwater management is required for most developments.
- Water Sensitive Urban Design
- Environmental Protection Authority Victoria
- NCC provisions and the Building regulations provide minimum standards; improvements on these minimum requirements are strongly encouraged

References and useful information:

Melbourne Water STORM calculator www.storm.melbournewater.com.au

STORM help http://storm.melbournewater.com.au/help/treatment_types.asp

MUSIC (model for urban stormwater improvement conceptualisation) <http://www.toolkit.net.au/music/>

Water Sensitive Urban Design Principles

<https://www.melbournewater.com.au/building-and-works/stormwater-management/introduction-wsud>

Raingarden Maintenance guidelines <https://www.melbournewater.com.au/building-and-works/stormwater-management/options-treating-stormwater/raingardens>

Moreland Raingarden and Tree Pit Design Package <http://www.moreland.vic.gov.au/environment-and-waste/water/wsud-design-package.html>

Environmental Protection Authority Victoria www.epa.vic.gov.au

Clearwater - <https://www.clearwatervic.com.au/>

5. Indoor Environment Quality (IEQ)

Objectives:

- To achieve a healthy indoor environment quality for the wellbeing of building occupants.
- To provide a naturally comfortable indoor environment to lower the need for building services, such as artificial lighting, mechanical ventilation, cooling and heating.

Design Issue	Design response	Drawing reference
Daylight	<p>Ensure all rooms have a window, skylight or daylight tube wherever possible. Draw and label clearly on the plans.</p> <p>Maximise the size of windows while considering heat loss and heat gain.</p> <p>Avoid rooms with borrowed light, battle axe windows and small light courts.</p> <p>Consider what development could occur on the neighbouring property and block daylight access</p>	For light wells, deep apartments or borrowed light show sections to reveal how much light it will receive.
Natural Ventilation	<p>Ensure all rooms including bedrooms, bathrooms and stairwells have an operable window and draw on plans the type of windows. Install 2 openings to corner rooms.</p> <p>Provide natural ventilation to all common areas such as lobbies, hallways and carparks wherever possible.</p> <p>Minimise the use of awning windows as they allow for the lowest level of ventilation.</p>	Show window opening types on plans and elevations
Thermal comfort	<p>Maximise apartments with access to north sun for winter.</p> <p>Install north facing clerestory windows with shading for rooms without north windows.</p> <p>Reduce or eliminate apartments facing south. If rooms must face south locate bedrooms, bathrooms and laundries south, not living areas.</p>	Show openings/eaves/shading devices on plans and elevations
Hazardous Materials and VOC	<p>Minimise the use of toxic materials.</p> <p>Consider the use of low VOC paints, glues, grouts and sealants to protect occupants health.</p>	Note on plans
Acoustics	<p>Install double glazing to reduce noise and heat loss through windows.</p>	Note on plans
Others	n/a	

Relevant Standards:

- BESS and Green Star provide benchmarks for relevant issues
- Better Apartment Design Standards (BADs)
- Good Environmental Choice Australia Standards (GECA)
- Eco specifier
- BCA provisions provide minimum standards; improvements on these minimum requirements are strongly encouraged

References and useful information:

Sustainability Victoria Energy Housing manual

<https://www.sustainability.vic.gov.au/You-and-your-home/Building-and-renovating/Energy-Smart-Housing-Manual>

<https://www.planning.vic.gov.au/policy-and-strategy/better-apartments>

Your Home www.yourhome.gov.au

Good Environmental Choice Australia Standards www.geca.org.au

Eco specifier <http://www.ecospecifier.com.au/>

6. Transport

Objectives:

- To minimise car dependency
- To ensure that the built environment is designed to promote the use of public transport, walking and cycling

Design Issue	Design response	Drawing reference
Minimising the provision of Car Parks	<i>Provide a description of any parking dispensation being sought and provide details for consideration. Car parks requirements should be reduced near public transport.</i>	
Providing Bike Storage	<p><i>Provide the total number of bike storage facilities and ratio to the total number of building users and visitors. Show on relevant floor/site plans</i></p> <p><i>Bike storage should be undercover, secure, easy to access, have doorways at least 1200mm wide and be located on the ground floor if possible</i></p> <p><i>Has bike parking been provided for at 100% of the apartments?</i></p> <p><i>Provide a variety of bike holds such as on wall and on ground so all occupants and visitors can access their bikes easily.</i></p>	<i>Draw size and dimensions on the plans including access pathway sizes</i>
Car Sharing	<i>Provide a description of any on or off site car share service and show on relevant site plans</i>	
Provisions for alternative transport	<i>Provide details of local public transport.</i>	
Electric car charging	<i>A minimum of 5% of carparks to be EV ready, 10% to have the infrastructure in place to install EV at a later date, Provide purchaser option for EV charging</i>	
Other	<i>n/a</i>	

Relevant Standards

- BESS, Green Star
- Council Legislation

References and useful information:

Bicycle Victoria <https://www.bicyclenetwork.com.au/>

Bike Parking Experts <https://www.bicyclenetwork.com.au/general/bike-parking-experts/>

Off-setting Car Emissions Options www.greenfleet.com.au

Electric Vehicle Council Australia - <https://electricvehiclecouncil.com.au/about-ev/charger-map/>

7. Waste Management

Objectives:

- To ensure waste avoidance, reuse and recycling during the design, construction and operation stages of development
- To ensure long term reusability of building materials
- To meet Councils' requirement that all multi-unit developments must provide a Waste Management Plan in accordance with the *Guide to Best Practice for Waste Management in Multi-unit Developments 2010*, published by Sustainability Victoria.

Design Issue	Design response	Drawing reference
Construction Waste Management Plan (WMP)	<p><i>Can the materials or fixtures in the existing building be used or sold by someone else e.g windows to a second hand dealer?</i></p> <p><i>Can building materials be recycled or reused to minimise waste e.g. concrete, bricks, timber</i></p> <p><i>How can packaging be reduced?</i></p>	
Operation Waste Management Plan	<p><i>Minimise the number of waste and recycling collections to once or twice a week by providing large bin rooms.</i></p> <p><i>Install waste, recycling, food and glass chutes or bin rooms on each floor for developments of 4 or more levels.</i></p> <p><i>Provide details of separation of waste including recycling, glass, food waste, green waste, hard waste and E-waste. Indicate space allocation for waste on plans.</i></p>	<i>Draw size and dimensions on the plans including access pathway sizes</i>
Size and location of waste and recycling areas	<i>Include storage areas, location of where bins will be collected from, dimensions of bins and space to access the bins. Recycling bins must be as accessible as waste bins. Private bins cannot be stored on council land for collection. Bins should be collected from basement or ground floor carparks. If there is inadequate space, collection from side streets and rear laneways is encouraged.</i>	
Other	<i>n/a</i>	

Relevant Standards:

- Green Star, BREEAM and LEED provide benchmarks for relevant issues
- Better Practice Guide for Waste Management in Multi-Unit Dwellings (2002)
- ISO14001 Environmental Management System (EMS)

References and useful information:

Construction and Waste Management <https://www.epa.vic.gov.au/your-environment/waste/construction-and-demolition-waste>

Preparing a WMP – Darebin webpage Waste management Plan

Metropolitan Waste and Resource Recovery Group Multi Units Toolkit
<https://www.mwrrg.vic.gov.au/planning/multi-unit-developments-toolkit/>

Guide to best practice for waste management in multi-unit developments

<https://www.sustainability.vic.gov.au/About-Us/Publications/Guide-to-Best-Practice-for-Waste-Management-in-Multiunit-Developments>

8. Urban Ecology

Objectives:

- To protect and enhance biodiversity
- To provide sustainable landscaping
- To protect and manage all remnant indigenous plant communities
- To encourage the planting of indigenous vegetation and edible gardens

Design Issue	Design response	Drawing reference
On Site Topsoil Retention	<i>Retain on-site topsoil and put back in place after construction</i>	
Reuse of Already Developed Land		
Existing trees and vegetation	<i>Retain significant trees and existing vegetation wherever possible.</i>	<i>Draw and label any trees to remain or be removed</i>
Landscape areas to be designated	<i>Provide a description of all new, existing retained and existing demolished landscaped areas and indicate how the design has enhanced the sites biodiversity.</i>	<i>Show on relevant site/floor/landscape plans.</i>
Maximising vegetation	<i>Install green walls, green roofs and green facades.</i> <i>Install planter boxes on ground level and on balconies and landscape strips to the side and centre of driveways.</i> <i>Discuss the installation of street trees with council, particularly where crossovers are being removed.</i>	<i>Draw and label on the drawings</i>
Other		

Relevant Standards:

- Green Star, BREEAM and LEED provide benchmarks for relevant issues
- Council Legislation

References and useful information:

Department of Sustainability and Environment www.dse.vic.gov.au

Growing Green Guide (green roofs, facades and walls) City of Melbourne

<http://www.growinggreenguide.org/>

Green Roof Technical Manual <http://www.yourhome.gov.au/materials/green-roofs-and-walls>

9. Innovation

Objective:

- To encourage innovative technology, design and processes in all development, which positively influence the sustainability of buildings

Design Issue	Design response	Drawing reference
Significant Enhancement to the Environmental Performance	<i>Carbon Neutral building Significant sized photovoltaic (solar panel) system</i>	
Innovative Social Improvement	<i>Well designed, large communal spaces for residents provided when not expected under BADS. Communal sharing of facilities such as a communal laundry or shed/ studio.</i>	
New Technology	<i>Solar PV batteries installed.</i>	<i>Draw and label any trees to remain or be removed</i>
New Design Approach	<i>Build to rent, design</i>	<i>Show on relevant site/floor/ landscape plans.</i>
Other	<i>Please note Low VOC and 80% construction waste recycled are not innovative.</i>	<i>Draw and label on the drawings</i>

Relevant Standards:

- Green Star, BREEAM and LEED provide benchmarks for relevant Issues
- Exceeding typical performance benchmarks or enhancing typical building processes
- BCA provisions provide minimum standards; improvements on these minimum requirements are strongly encouraged

References and useful information:

Green Building Council Australia www.gbca.org.au

Victorian Eco Innovation lab www.ecoinnovationlab.com

Environment Design Guide <http://www.environmentdesignguide.com.au/>

10. Building Materials

Objectives:

- To minimise the environmental impact of materials used by encouraging the use of materials with a favourable lifecycle assessment
- Materials are not listed in BESS however they must be addressed in the SMP.

Design Issue	Design response	Drawing reference
Retention of existing structure and materials.	<i>Provide a description of the intended re-use of existing structures and /or materials within the proposed design. Show on relevant floor/site/demolition plans and elevations/sections. Can the materials or fixtures in the building be used or sold by someone else e.g windows to a second hand dealer</i>	
Reused or Recycled Materials	<i>Can recycled materials be used e.g. recycled timber, recycled content concrete?</i>	<i>Indicate structures to be retained</i>
Embodied Energy minimised	<i>Provide a description of intended materials to be used that have sustainable production processes (including low embodied energy etc.) Try to minimise the use of concrete and aluminium.</i>	
Sustainable Timber	<i>Use third party certified timber and timber products to avoid illegally logged timber.</i>	
Design for Disassembly	<i>Where possible screw in fixtures and fittings and avoid glues.</i>	
Other		

Relevant Standards:

- Green Star, BREEAM and LEED provide benchmarks for relevant Issues
- Good Environmental Choice Australia Standards
- Ecospecifier
- Forest Stewardship Council Certification Scheme
- Programme for the Endorsement of Forest Certification (PEFC)
- BCA provisions provide minimum standards; improvements on these minimum requirements are strongly encouraged

References and useful information:

Building Materials <http://www.yourhome.gov.au/materials>

Embodied Energy <http://www.yourhome.gov.au/materials/embodied-energy>

Waste minimisation <http://www.yourhome.gov.au/materials/waste-minimisation>

Good Environmental Choice Australia Standards www.geca.org.au

Ecospecifier <http://www.ecospecifier.com.au/>

Forest Stewardship Council Certification Scheme <http://au.fsc.org/>

Programme for the Endorsement of Forest Certification (PEFC) <http://www.pefc.org/>

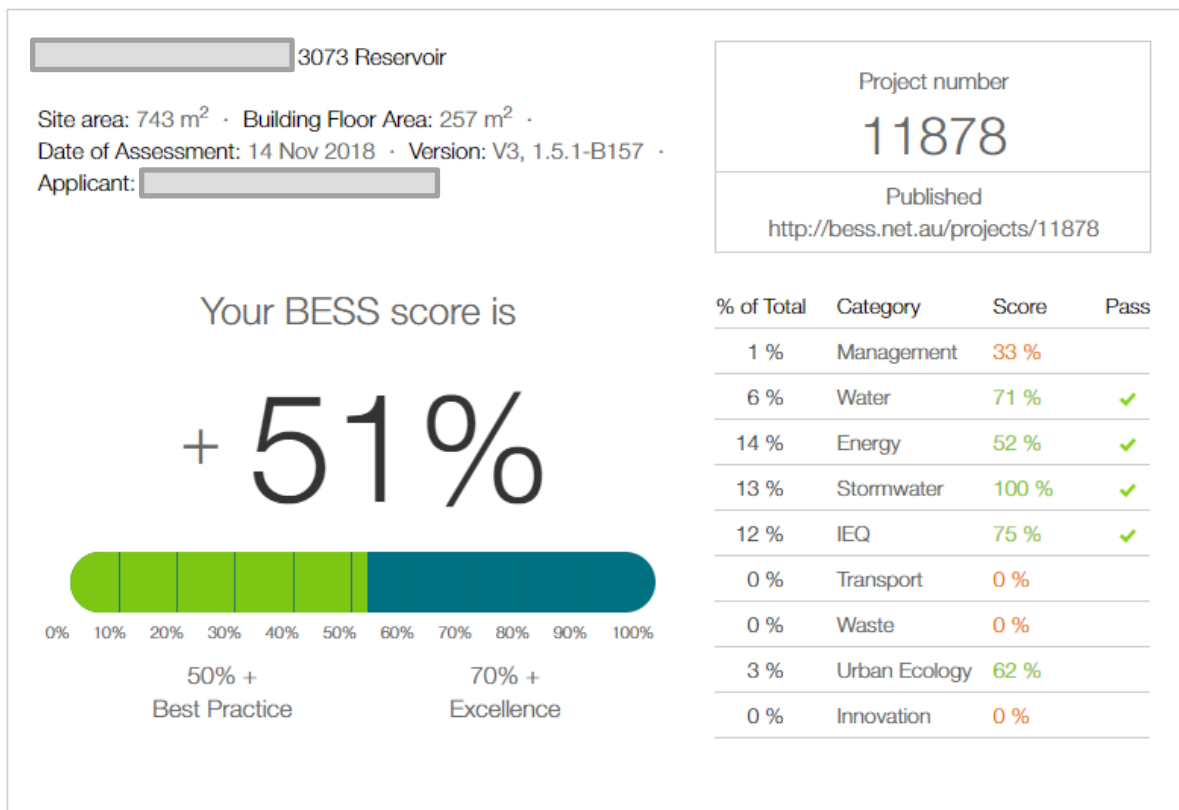
Appendix 1 –BESS report

BESS Report



This BESS report outlines the sustainable design commitments of the proposed development at 32 Delaware St Reservoir VIC 3073. 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 Darebin 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.



This is only the front page of the BESS report. If the BESS report is published the council will have access to the full report on the BESS website.

Appendix 2 – STORM report



STORM Rating Report

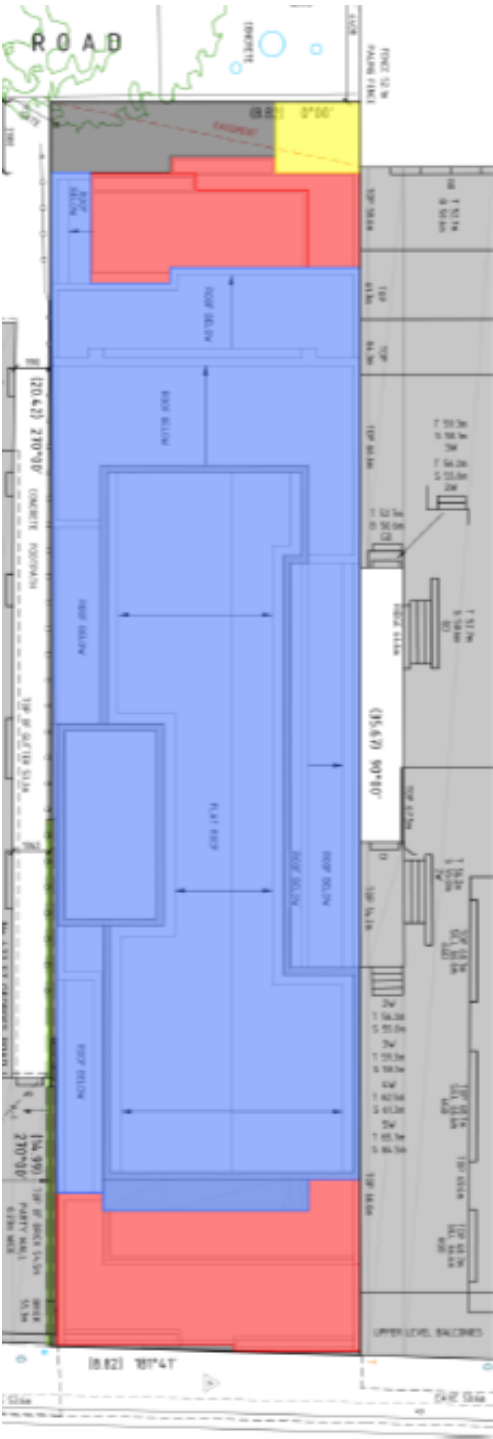
TransactionID: 689138
 Municipality: DAREBIN
 Rainfall Station: DAREBIN
 Address: 1 test Street

NORTHCOTE
 VIC 3070

Assessor: JANINE PARKER
 Development Type: Residential - Multiunit
 Allotment Site (m2): 1,135.00
 STORM Rating %: 109

Description	Impervious Area (m2)	Treatment Type	Treatment Area/Volume (m2 or L)	Occupants / Number Of Bedrooms	Treatment %	Tank Water Supply Reliability (%)
roof 1	63.00	Rainwater Tank	2,500.00	3	166.00	82.00
roof 2	58.00	Rainwater Tank	2,000.00	3	170.00	82.00
roof 3	60.00	Rainwater Tank	2,000.00	3	170.00	82.00
roof 4	70.00	Rainwater Tank	3,000.00	4	170.00	82.00
driveway treated	50.00	Raingarden 100mm	1.00	0	128.10	0.00
driveway untreated	65.00	None	0.00	0	0.00	0.00
roof 1 untreated	22.00	None	0.00	0	0.00	0.00
roof 2 untreated	18.00	None	0.00	0	0.00	0.00
roof 3 untreated	20.00	None	0.00	0	0.00	0.00
roof 4 untreated	22.00	None	0.00	0	0.00	0.00

Appendix 3 Stormwater site plan



Legend	
Impervious area	16.2 sq m
Permeable paving	4.8 sq m
Roof	233.3 sq m
Terrace	58.5 sq m
Total site area	313.0 sq m

10
11

CITY OF DAKOTA
STATUTORY PLAN