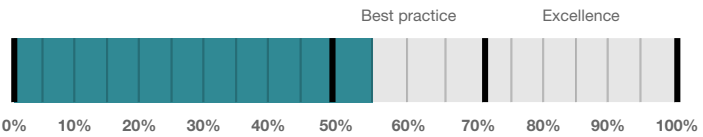
# BESS Report

Built Environment Sustainability Scorecard

This BESS report outlines the sustainable design commitments of the proposed development at 26 Erskine Ave Reservoir Victoria 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.

## Your BESS Score

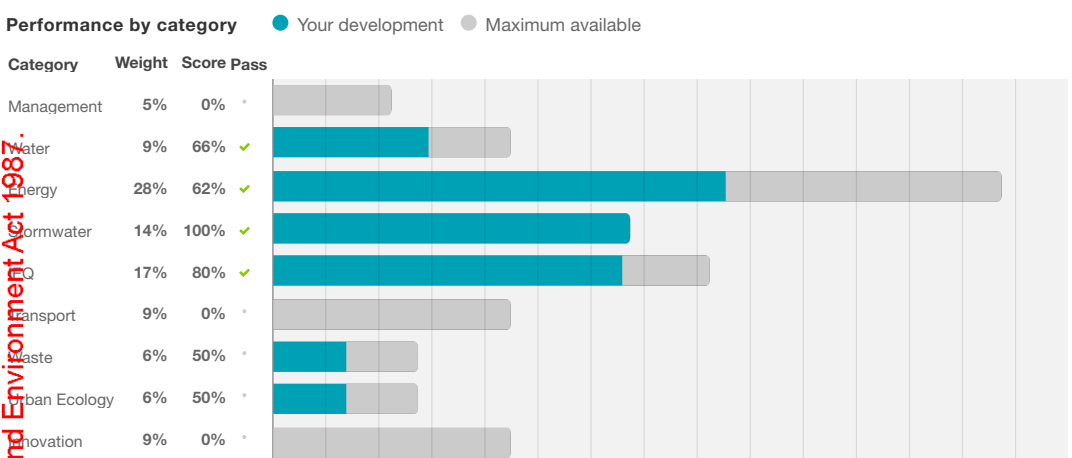



**55%**

## Project details

| | |
|---|---|
| **Address** | 26 Erskine Ave Reservoir Victoria 3073 |
| **Project no** | 4231D7CB-R1 |
| **BESS Version** | BESS-8 |
| **Site type** | Multi dwelling (dual occupancy, townhouse, villa unit etc) |
| **Account** | thang.l@arczero.com.au |
| **Application no.** | D/121/2024 |
| **Site area** | 703.00 m² |
| **Building floor area** | 406.00 m² |
| **Date** | 11 September 2024 |
| **Software version** | 2.0.0-B.558 |

## Performance by category



## Dwellings & Non Res Spaces

### Dwellings

| Name | Quantity | Area | % of total area |
|---|---|---|---|
| **Townhouse** | | | |
| Townhouse 4 | 1 | 116 $m^2$ | 28% |
| Townhouse 1 | 1 | 108 $m^2$ | 26% |
| Townhouse 2 | 1 | 94.0 $m^2$ | 23% |
| Townhouse 3 | 1 | 88.0 $m^2$ | 21% |
| **Total** | **4** | **406 $m^2$** | **100%** |

## Supporting information

### Floorplans & elevation notes

| Credit | Requirement | Response | Status |
|---|---|---|---|
| Water 3.1 | Annotation: Water efficient garden details | | - |
| Energy 3.3 | Annotation: External lighting controlled by motion sensors | | - |
| Energy 3.4 | Location of clothes line (if proposed) | | - |
| Stormwater 1.1 | Location of any stormwater management systems (rainwater tanks, raingardens, buffer strips) | | - |
| IEQ 2.2 | Annotation: Dwellings designed for 'natural cross flow ventilation' (If not all dwellings, include a list of compliant dwellings) | | - |
| IEQ 3.1 | Annotation: Glazing specification (U-value, SHGC) | | - |
| IEQ 3.3 | North-facing living areas | | - |
| Waste 2.1 | Location of food and garden waste facilities | | - |
| Urban Ecology 2.1 | Location and size of vegetated areas | | - |
| Urban Ecology 2.4 | Location of taps and floor waste on balconies / courtyards | | - |

### Supporting evidence

| Credit | Requirement | Response | Status |
|---|---|---|---|
| Energy 3.5 | Average lighting power density and lighting type(s) to be used | | - |
| Stormwater 1.1 | STORM report or MUSIC model | | - |
| IEQ 2.2 | A list of dwellings with natural cross flow ventilation | | - |
| IEQ 3.1 | Reference to floor plans or energy modelling showing the glazing specification (U-value and Solar Heat Gain Coefficient, SHGC) | | - |
| IEQ 3.3 | Reference to the floor plans showing living areas orientated to the north | | - |

## Credit summary

### Management Overall contribution 4.5%

| | |
|---|---|
| | 0% |
| 1.1 Pre-Application Meeting | 0% |
| 2.2 Thermal Performance Modelling - Multi-Dwelling Residential | 0% |
| 4.1 Building Users Guide | 0% |

### Water Overall contribution 9.0%

| | | | |
|---|---|---|---|
| | Minimum required 50% | 66% | ✔ Pass |
| 1.1 Potable Water Use Reduction | | 59% | |
| 3.1 Water Efficient Landscaping | | 100% | |

### Energy Overall contribution 27.5%

| | | | |
|---|---|---|---|
| | Minimum required 50% | 62% | ✔ Pass |
| 1.2 Thermal Performance Rating - Residential | | 0% | ✔ Achieved |
| 2.1 Greenhouse Gas Emissions | | 54% | |
| 2.6 Electrification | | 100% | |
| 2.7 Energy consumption | | 100% | |
| 3.3 External Lighting | | 100% | |
| 3.4 Clothes Drying | | 100% | |
| 3.5 Internal Lighting - Houses and Townhouses | | 100% | |
| 4.4 Renewable Energy Systems - Other | | N/A | ✣ Scoped Out |
| | | No other (non-solar PV) renewable energy is in use. | |
| 4.5 Solar PV - Houses and Townhouses | | 0% | ⊘ Disabled |
| | | No 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% | 80% | ✔ Pass |
| 2.2 Cross Flow Ventilation | | 100% | |
| 3.1 Thermal comfort - Double Glazing | | 100% | |
| 3.2 Thermal Comfort - External Shading | | 0% | |
| 3.3 Thermal Comfort - Orientation | | 100% | |

**Transport** Overall contribution 9.0%

| | | |
|---|---|---|
| | | 0% |
| 1.1 Bicycle Parking - Residential | | 0% |
| 1.2 Bicycle Parking - Residential Visitor | | N/A Scoped Out |
| | | Not enough dwellings. |
| 2.1 Electric Vehicle Infrastructure | | 0% |

**Waste** Overall contribution 5.5%

| | | |
|---|---|---|
| | | 50% |
| 1.1 - Construction Waste - Building Re-Use | | 0% |
| 2.1 - Operational Waste - Food & Garden Waste | | 100% |

**Urban Ecology** Overall contribution 5.5%

| | | |
|---|---|---|
| | | 50% |
| 2.1 Vegetation | | 75% |
| 2.2 Green Roofs | | 0% |
| 2.3 Green Walls and Facades | | 0% |
| 2.4 Private Open Space - Balcony / Courtyard Ecology | | 100% |
| 3.1 Food Production - Residential | | 0% |

**Innovation** Overall contribution 9.0%

| | | |
|---|---|---|
| | | 0% |
| 1.1 Innovation | | 0% |

## Credit breakdown

### Management Overall contribution 0%

| 1.1 Pre-Application Meeting | | 0% |
|---|---|---|
| Score Contribution | This credit contributes 50% 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 | | 0% |
|---|---|---|
| Score Contribution | This credit contributes 33.3% towards the category score. | |
| Criteria | Have preliminary NatHERS ratings been undertaken for all thermally unique dwellings? | |
| Question | Criteria Achieved ? | |
| Townhouse | No | |

| 4.1 Building Users Guide | | 0% |
|---|---|---|
| Score Contribution | This credit contributes 16.7% towards the category score. | |
| Criteria | Will a building users guide be produced and issued to occupants? | |
| Question | Criteria Achieved ? | |
| Project | No | |

## Water

Overall contribution 6% Minimum required 50%

| 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?: | No |
| Are you installing a rainwater tank?: | Yes |

| Fixtures, fittings & connections profile | |
|---|---|
| Showerhead: All | 4 Star WELS (>= 6.0 but <= 7.5) |
| Bath: All | Small Square Tub/ Combined Shower |
| Kitchen Taps: All | >= 5 Star WELS rating |
| Bathroom Taps: All | >= 5 Star WELS rating |
| Dishwashers: All | Default or unrated |
| WC: All | Default or unrated |
| Urinals: All | Scope out |
| Washing Machine Water Efficiency: All | Default or unrated |
| Which non-potable water source is the dwelling/space connected to?: | |
| Townhouse 1 | RWT1 |
| Townhouse 2 | RWT2 |
| Townhouse 3 | RWT3 |
| Townhouse 4 | RWT4 |
| Non-potable water source connected to Toilets: All | Yes |
| Non-potable water source connected to Laundry (washing machine): All | Yes |
| 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?: | |
| RWT1 | 84.0 m² |
| RWT2 | 62.0 m² |
| RWT3 | 60.0 m² |
| RWT4 | 86.0 m² |
| Tank Size: | |
| RWT1 | 2,000 Litres |
| RWT2 | 1,500 Litres |
| RWT3 | 1,500 Litres |
| RWT4 | 2,000 Litres |
| Irrigation area connected to tank: | |
| RWT1 | 3.0 m² |
| RWT2 | 0.0 m² |
| RWT3 | 3.0 m² |
| RWT4 | 3.0 m² |

| | |
|---|---|
| **Is connected irrigation area a water efficient garden?:** | |
| RWT1 | No |
| RWT2 | No |
| RWT3 | - |
| RWT4 | Yes |
| **Other external water demand connected to tank?:** | |
| RWT1 | - |
| RWT2 | - |
| RWT3 | - |
| RWT4 | - |

| **1.1 Potable Water Use Reduction** | | 59% |
|---|---|---|
| Score Contribution | This credit contributes 83.3% 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 | 660 kL | |
| Output | Proposed (excluding rainwater and recycled water use) | |
| Project | 577 kL | |
| Output | Proposed (including rainwater and recycled water use) | |
| Project | 400 kL | |
| Output | % Reduction in Potable Water Consumption | |
| Project | 39 % | |
| Output | % of connected demand met by rainwater | |
| Project | 86 % | |
| Output | How often does the tank overflow? | |
| Project | Never / Rarely | |
| Output | Opportunity for additional rainwater connection | |
| Project | 134 kL | |

| **3.1 Water Efficient Landscaping** | | 100% |
|---|---|---|
| Score Contribution | This credit contributes 16.7% towards the category score. | |
| Criteria | Will water efficient landscaping be installed? | |
| Question | Criteria Achieved ? | |
| Project | Yes | |

## Energy

Overall contribution 17% Minimum required 50%

| 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)?: | No |
| Are you installing any other renewable energy system(s)?: | No |
| Energy Supply: | All-electric |

| Dwelling Energy Profiles | |
|---|---|
| Below the floor is: All | Ground or Carpark |
| Above the ceiling is: All | Outside |
| Exposed sides: All | 3 |
| NatHERS Annual Energy Loads - Heat: All | 110 MJ/sqm |
| NatHERS Annual Energy Loads - Cool: All | 27.6 MJ/sqm |
| NatHERS star rating: All | 7.0 |
| Type of Heating System: All | Reverse cycle space |
| Heating System Efficiency: All | 3 Stars (2019 MEPS) |
| Type of Cooling System: All | Refrigerative space |
| Cooling System Efficiency: All | 5 Stars (2019 MEPS) |
| Type of Hot Water System: | |
| Townhouse 1 | Electric Heat Pump Band 1 |
| Townhouse 2<br>Townhouse 3<br>Townhouse 4 | Electric Heat Pump Band 2 |
| Clothes Line: All | Private outdoor clothesline |
| Clothes Dryer: All | No clothes dryer |

### 1.2 Thermal Performance Rating - Residential

0% ✔ Achieved

| | |
|---|---|
| Score Contribution | This credit contributes 17.6% towards the category score. |
| Criteria | What is the average NatHERS rating? |
| Output | Average NATHERS Rating (Weighted) |
| Townhouse | 7.0 Stars |

### 2.1 Greenhouse Gas Emissions

54%

| | |
|---|---|
| Score Contribution | This credit contributes 17.6% 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) |
| Townhouse | 8,732 kg CO2 |
| Output | Proposed Building with Proposed Services (Actual Building) |
| Townhouse | 7,788 kg CO2 |
| Output | % Reduction in GHG Emissions |
| Townhouse | 10 % |

| | | | |
|---|---|---|---|
| **2.6 Electrification** | | 100% | |
| Score Contribution | This credit contributes 17.6% towards the category score. | | |
| Criteria | Is the development all-electric? | | |
| Question | Criteria Achieved? | | |
| Project | Yes | | |
| **2.7 Energy consumption** | | 100% | |
| Score Contribution | This credit contributes 23.5% towards the category score. | | |
| Criteria | What is the % reduction in annual energy consumption against the benchmark? | | |
| Output | Reference Building with Reference Services (BCA only) | | |
| Townhouse | 82,007 MJ | | |
| Output | Proposed Building with Proposed Services (Actual Building) | | |
| Townhouse | 32,985 MJ | | |
| Output | % Reduction in total energy | | |
| Townhouse | 59 % | | |
| **3.3 External Lighting** | | 100% | |
| Score Contribution | This credit contributes 2.9% towards the category score. | | |
| Criteria | Is the external lighting controlled by a motion detector? | | |
| Question | Criteria Achieved ? | | |
| Townhouse | Yes | | |
| **3.4 Clothes Drying** | | 100% | |
| Score Contribution | This credit contributes 5.9% 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 | | |
| Townhouse | 1,890 kWh | | |
| Output | Proposed | | |
| Townhouse | 378 kWh | | |
| Output | Improvement | | |
| Townhouse | 80 % | | |
| **3.5 Internal Lighting - Houses and Townhouses** | | 100% | |
| Score Contribution | This credit contributes 2.9% towards the category score. | | |
| Criteria | Does the development achieve a maximum illumination power density of 4W/sqm or less? | | |
| Question | Criteria Achieved? | | |
| Townhouse | Yes | | |
| **4.4 Renewable Energy Systems - Other** | | N/A | ◈ Scoped Out |
| This credit was scoped out | No other (non-solar PV) renewable energy is in use. | | |
| **4.5 Solar PV - Houses and Townhouses** | | 0% | ⊘ Disabled |
| This credit is disabled | No solar PV renewable energy is in use. | | |

## Stormwater

Overall contribution 14% Minimum required 100%

| 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 | 101 |
| Output | Min STORM Score |
| Project | 100 |

## IEQ

Overall contribution 13% Minimum required 50%

| **2.2 Cross Flow Ventilation** | 100% |
|---|---|
| Score Contribution | This credit contributes 20% towards the category score. |
| Criteria | Are all habitable rooms designed to achieve natural cross flow ventilation? |
| Question | Criteria Achieved ? |
| Townhouse | Yes |
| **3.1 Thermal comfort - Double Glazing** | 100% |
| Score Contribution | This credit contributes 40% towards the category score. |
| Criteria | Is double glazing (or better) used to all habitable areas? |
| Question | Criteria Achieved ? |
| Townhouse | Yes |
| **3.2 Thermal Comfort - External Shading** | 0% |
| Score Contribution | This credit contributes 20% towards the category score. |
| Criteria | Is appropriate external shading provided to east, west and north facing glazing? |
| Question | Criteria Achieved ? |
| Townhouse | No |
| **3.3 Thermal Comfort - Orientation** | 100% |
| Score Contribution | This credit contributes 20% towards the category score. |
| Criteria | Are at least 50% of living areas orientated to the north? |
| Question | Criteria Achieved ? |
| Townhouse | Yes |

## Transport

Overall contribution 0%

| 1.1 Bicycle Parking - Residential | | 0% |
|---|---|---|
| Score Contribution | This credit contributes 50% towards the category score. | |
| Criteria | How many secure and undercover bicycle spaces are there for residents? | |
| Question | Bicycle Spaces Provided ? | |
| Townhouse | 0 | |

| 1.2 Bicycle Parking - Residential Visitor | | N/A Scoped Out |
|---|---|---|
| This credit was scoped out | Not enough dwellings. | |

| 2.1 Electric Vehicle Infrastructure | | 0% |
|---|---|---|
| Score Contribution | This credit contributes 50% towards the category score. | |
| Criteria | Are facilities provided for the charging of electric vehicles? | |
| Question | Criteria Achieved ? | |
| Project | No | |

## Waste

Overall contribution 3%

| 1.1 - Construction Waste - Building Re-Use | | 0% |
|---|---|---|
| Score Contribution | This credit contributes 50% 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 50% towards the category score. | |
| Criteria | Are facilities provided for on-site management of food and garden waste? | |
| Question | Criteria Achieved ? | |
| Project | Yes | |

## Urban Ecology Overall contribution 3%

| 2.1 Vegetation | | 75% |
|---|---|---|
| Score Contribution | This credit contributes 50% 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 | 20 % | |

| 2.2 Green Roofs | | 0% |
|---|---|---|
| Score Contribution | This credit contributes 12.5% towards the category score. | |
| Criteria | Does the development incorporate a green roof? | |
| Question | Criteria Achieved ? | |
| Project | No | |

| 2.3 Green Walls and Facades | | 0% |
|---|---|---|
| Score Contribution | This credit contributes 12.5% towards the category score. | |
| Criteria | Does the development incorporate a green wall or green façade? | |
| Question | Criteria Achieved ? | |
| Project | No | |

| 2.4 Private Open Space - Balcony / Courtyard Ecology | | 100% |
|---|---|---|
| Score Contribution | This credit contributes 12.5% towards the category score. | |
| Criteria | Is there a tap and floor waste on every balcony and courtyard (including any roof terraces)? | |
| Question | Criteria Achieved ? | |
| Townhouse | Yes | |

| 3.1 Food Production - Residential | | 0% |
|---|---|---|
| Score Contribution | This credit contributes 12.5% towards the category score. | |
| Criteria | What area of space per resident is dedicated to food production? | |
| Question | Food Production Area | |
| Townhouse | 0.0 m² | |
| Output | Min Food Production Area | |
| Townhouse | 3 m² | |

## Innovation Overall contribution 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**

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