

# **PROPOSED COMMERCIAL DEVELOPMENT**

35-65 Paramount Rd & 99 Olympia St, Tottenham

## **SUSTAINABLE MANAGEMENT PLAN & WATER SENSITIVE URBAN DESIGN RESPONSE**

**FOR  
COWES BAY GROUP PTY LTD**

20 October 2022

File 1457A



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| Issue | Date              | Prepared | Checked | Status |
|-------|-------------------|----------|---------|--------|
| A     | 18 December 2019  | LD       | JT      | Draft  |
| B     | 19 December 2019  | LD       | JT      | Final  |
| C     | 8 April 2020      | LD       | JT      | Draft  |
| D     | 14 April 2020     | LD       | JT      | Final  |
| E     | 30 September 2022 | JW       | LD      | Draft  |
| F     | 18 October 2022   | JW / HM  | LD      | Draft  |
| G     | 20 October 2022   | JW / HM  | LD      | Final  |

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# 1. Introduction

Ark Resources has been engaged by Cowes Bay Group Pty Ltd to provide advice in relation to environmentally sustainable development outcomes from the proposed development at 35-65 Paramount Rd & 99 Olympia St, Tottenham.

This Sustainable Management Plan has been prepared to meet the Application Requirements of Clauses 15.01-2S, 19.03-3S and 53.18 (Building Design and WSUD Policies) of the Maribyrnong Planning Scheme.

This report contains a summary of:

- Environmental objectives adopted for the development
- Sustainable design initiatives integrated into the design of the project.

Performance outcomes in this report are based on:

- Discussions and correspondence with:
  - Mark Seymour Cowes Bay Group Pty Ltd
- Existing drawings of Building A prepared by Concept Y Architecture and dated September 2015
- Architectural drawings prepared by Qanstruct Pty Ltd set out below.

| Description                                  | Drawing No. | Revision | Date       |
|--|-------------|----------|------------|
| Cover Sheet & Locality                       | TP00        | B        | 18/10/2022 |
| Existing Conditions & Demolition             | TP01        | B        | 18/10/2022 |
| Sredna Street Conservation Works             | TP02        | B        | 18/10/2022 |
| Paramount Road Conservation Works            | TP03        | B        | 18/10/2022 |
| Overall Development Plan                     | TP10        | B        | 18/10/2022 |
| Site Sections                                | TP11        | B        | 18/10/2022 |
| Building B Plans                             | TP20        | B        | 18/10/2022 |
| Building B Overall Elevations (North & East) | TP22        | B        | 18/10/2022 |
| Building B Overall Elevations (South & West) | TP23        | B        | 18/10/2022 |
| Building B1 Office Details                   | TP25        | B        | 18/10/2022 |
| Building B2 Office Details                   | TP26        | B        | 18/10/2022 |
| Building C Plans                             | TP30        | B        | 18/10/2022 |
| Building C Overall Elevations                | TP32        | B        | 18/10/2022 |
| Building C1 Office Details                   | TP33        | B        | 18/10/2022 |
| Building C2 Office Details                   | TP34        | B        | 18/10/2022 |
| Building C3 Office Details                   | TP35        | B        | 18/10/2022 |
| Building D Plans                             | TP40        | B        | 18/10/2022 |
| Building D Overall Elevations                | TP42        | B        | 18/10/2022 |
| Building D Office Details                    | TP43        | B        | 18/10/2022 |

## 2. Site Description

The proposed development comprises the following 4 industrial warehouse buildings with associated office spaces:

- Warehouse Building A is existing to remain.
- Warehouse Building B to be demolished and replaced, with an existing office building to remain and be refurbished.
- Warehouse Building C to be partially demolished and replaced, with an existing sawtooth building to partially remain and be refurbished for offices.
- Warehouse Building D is new.

The development is located within the Maribyrnong City Council, and has a total site area of approximately 119,800 m<sup>2</sup>. The surrounding buildings are predominantly of industrial use with an area of residential buildings to the north.

An image of the site and the surrounding locale is provided below.



Image accessed September 2022 ©Google Earth

### 3. Summary of Key ESD Initiatives

A detailed analysis has been undertaken in order to nominate the ESD initiatives required and confirm the performance outcomes achieved. The results of this analysis are set out in the remainder of this report.

The following key sustainable design initiatives have been incorporated into this project:

- 5 x 99kWp rooftop solar photovoltaic systems (one per warehouse tenancy);
- Rainwater harvesting system for toilet flushing;
- High-performance glazing and energy efficient building services, appliances and fixtures; and
- Environmentally preferable internal finishes.

An assessment of sustainable design outcomes of the proposed development has been undertaken with BESS and MUSIC benchmarking tools. The information presented in this report demonstrates that:

- The overall performance of the building fabric of the class 5 offices will be specified to deliver an annual energy performance of the building envelope 10% better than the minimum permitted by NCC 2019.
- The combination of design features and services initiatives meets all the standards of the BESS sustainability assessment tool.
- The development meets the Best Practice standard for stormwater quality.

The results of the performance assessment are summarised below.

#### 3.1. Built Environment Sustainability Scorecard (BESS)

The BESS assessment tool for new projects was developed by the Council Alliance for a Sustainable Built Environment (CASBE).

The BESS tool provides an objective performance based analysis of *nine* key sustainable building design categories at the planning permit stage of the building lifecycle.

BESS is widely regarded as an appropriate sustainability assessment tool for both residential and non-residential development projects. Since its launch, several Victorian councils including Banyule, Bass Coast, Bayside, Bendigo, Boroondara, Brimbank, Cardinia, Darebin, Dandenong, Frankston, Geelong, Hobsons Bay, Hume, Kingston, Knox, Manningham, Maribyrnong, Maroondah, Melbourne, Monash, Moonee Valley, Moreland, Port Phillip, Stonnington, Whitehorse, Whittlesea, Wyndham, Yarra and Yarra Ranges have adopted BESS.

The BESS tool builds on the NCC energy efficiency measures and provides a framework for assessing building performance outcomes in relation to:

- |              |                              |                 |
|--------------|------------------------------|-----------------|
| • Management | • Stormwater                 | • Waste         |
| • Water      | • Indoor Environment Quality | • Urban Ecology |
| • Energy     | • Transport                  | • Innovation    |

BESS scores for the development are summarised in the following table.

| Element                    | Required Score | Project Score | Compliance |
|----------------------------|----------------|---------------|------------|
| Management                 | 0%             | 35%           | Yes        |
| Water                      | 50%            | 50%           | Yes        |
| Energy                     | 50%            | 71%           | Yes        |
| Stormwater                 | 100%           | 100%          | Yes        |
| Indoor Environment Quality | 50%            | 50%           | Yes        |
| Transport                  | 0%             | 39%           | Yes        |
| Waste                      | 0%             | 33%           | Yes        |
| Urban Ecology              | 0%             | 25%           | Yes        |
| Innovation                 | 0%             | 0%            | Yes        |
| <b>Project BESS Score</b>  | <b>50%</b>     | <b>54%</b>    | <b>Yes</b> |

The project meets the standard required for *water*, *energy*, *stormwater* and *Indoor Environment Quality*. The project also meets the 50% BESS Score required to demonstrate Best Practice.

Please refer Appendix A for the BESS Report.

## 4. Sustainable Design Initiatives and Systems

| Issue                      | Performance Commitments / Description  | Comments  |
|----------------------------|--|---|
| <b>Building Management</b> |  |   |
| Metering                   | Individual utility meters will be provided for each tenancy.   |   |
| Section J Compliance       | Preliminary Section J1.5a façade calculations have been undertaken for the class 5 office spaces to demonstrate compliance is achievable.  | Preliminary calculations are provided in Appendix B, however these are not to be used for certification. Façade performance will be verified during detailed design via a dynamic thermal simulation in accordance with the NCC JV3 methodology.                                |
| <b>Water</b>               |  |   |
| Water Efficiency           | <p>The following water efficient fittings and appliances will be specified:</p> <ul style="list-style-type: none"> <li>• WELS 4 star showers (&gt;6 but &lt;=7.5 litres/minute)</li> <li>• WELS 4 star toilets (4.5/3 litre flush)</li> <li>• WELS 4 star urinals</li> <li>• WELS 5 star kitchen taps</li> <li>• WELS 5 star basin taps (5 litres/minute)</li> </ul> | Water using fixtures and appliances will be specified during design development in accordance with this water efficiency performance standard.  |
| Rainwater Harvesting       | <p>A rainwater harvesting system will be installed comprising:</p> <ul style="list-style-type: none"> <li>• Rainwater harvesting from approximately half of the total roof areas;</li> <li>• A total storage volume of 150 kilolitres (5 x 30kL);</li> <li>• Re-use of water for toilet flushing and irrigation.</li> </ul>  | <p>Please refer to <i>Stormwater Management Plan</i> prepared by Davis, Naismith &amp; McGovern (revision D, 17 October 2022).</p> <p>Please refer to Appendix C for details of predicted harvested rainwater volumes and Appendix D for an indicative maintenance program.</p> |

| Issue                       | Performance Commitments / Description  | Comments   |
|-----------------------------|--|--|
| Water Efficient Landscaping | <p>Where appropriate, water sensitive landscape design will be incorporated into the development by specifying a combination of the following:</p> <ul style="list-style-type: none"> <li>• Drought tolerant and/or indigenous plant species that are best suited to local climate; and</li> <li>• Automated drip irrigation system</li> </ul> | These initiatives will ensure efficient use of water and also reduce the total potable water used for landscape works.   |
| <b>Energy</b>               |  |  |
| Renewable Energy System     | A solar photovoltaic system will be installed to each of the five warehouse tenancies, to offset greenhouse emissions. These systems will provide a total peak generation capacity of 99 kW per tenancy.   | <p>Note that the 99kW systems are predicted to result in equivalent avoided greenhouse emissions of approximately 122 tonnes CO<sub>2</sub>-e each year.</p> <p>Refer to Appendix E for details of proposed system capacity and panel numbers.</p> |
| Energy Performance          | The building will be specified to deliver an annual energy performance 10% better than the minimum permitted by NCC 2019.  | This will be verified during detailed design via a dynamic thermal simulation in accordance with the NCC JV3 methodology.  |
| Gas Free Development        | The project will not have gas services connected. Gas free developments not only avoid ongoing service charges for tenants, but it takes advantage of the improvement in emissions from grid connected electricity in addition to the energy generated on-site.  |  |
| Heating & Cooling           | Space heating and cooling to office spaces will be provided by reverse cycle heat pumps with minimum seasonal CoP & EER of 4.0 calculated in accordance with AS 3823.4 2014.   | Efficient reverse cycle units in conjunction with a thermally efficient building envelope are considered to be an environmentally acceptable method of space conditioning.   |
| Domestic Hot Water          | Domestic hot water units will be electric instantaneous installed at the point of use to avoid standing heat losses.   |  |

| Issue  | Performance Commitments / Description  | Comments   |
|--|--|--|
| Lighting   | Energy efficient lighting systems will be installed throughout the development including: <ul style="list-style-type: none"> <li>Lighting designed to achieve a maximum lighting power density of at least 20% lower than required by Table J6.2a of the NCC.</li> </ul>       | Note that external lighting for the development will be designed with the objective of preventing light spill to the night sky.  |
| <b>Stormwater Management</b>                     |  |  |
| WSUD   | The Stormwater Quality objectives will be achieved for the development using measures set out in the <i>Stormwater Management Plan</i> prepared by Davis, Naismith & McGovern (revision D, 17 October 2022).   |  |
| Construction Stormwater Pollution Reduction Plan | A construction phase stormwater pollution reduction plan will be prepared and implemented during construction to ensure that litter, sediments and other pollution are prevented from entering the stormwater system.  | Please refer to Appendix F for the preliminary Site Management Plan.   |
| <b>Indoor Environment Quality</b>                |  |  |
| Daylight Access                                  | The development achieves a Green Star Daylight Hand Calculation result of 35% across all offices.<br><br>Roof lights (to 10% of warehouse roofs) have been specified to improve daylight access into warehouse floor areas outside the hand calculation daylight access zones. | The combination of window location, external shading and roof lights will improve daylight access and manage glare for all occupants, and a pass has been claimed in the BESS tool for IEQ.<br><br>Refer to Appendix A for the daylight results. |
| Mechanical Ventilation – Offices                 | The mechanical ventilation system will be designed to achieve an increase in outdoor air (in L/s) of at least 50% above the AS 1668.2:2012 and CO2 monitoring to maintain a maximum of 800ppm. requirements for office tenancies.  |  |

| Issue                        | Performance Commitments / Description   | Comments   |
|------------------------------|---|--|
| Volatile Organic Compounds   | <p>All interior paints, adhesives and sealants will be Low VOC type to improve indoor environmental quality for occupants.</p> <p>Low VOC carpets will be selected for the development.</p> <p>Low formaldehyde engineered wood products (minimum E1 grade) will be specified.</p>  | <p>Low VOC paints, adhesives and sealants, carpets and engineered wood products will be specified to meet the requirements Indoor Pollutants (Credit 13) of the Green Star Design &amp; As Built Tool Version 1.3, or alternative green product certification such as GECA or Green Tag.</p> |
| <b>Sustainable Transport</b> |   |  |
| Bicycle Facilities           | <p>Readily accessible bicycle storage facilities have been provided to encourage bicycle use by including horizontal bicycle racks for staff and visitors located at the entrance to the warehouse tenancies. 35 spaces will be provided as follows:</p> <ul style="list-style-type: none"> <li>• Building B1 entry: 7 bike racks</li> <li>• Building B2 entry: 7 bike racks</li> <li>• Building C entry: 14 bike racks (split at C1 and C3 offices)</li> <li>• Building D entry: 7 bike racks</li> </ul> | <p>Note that the bicycle facilities provided exceeds the ratio set out in Clause 52.34 of the Maribyrnong Planning Scheme.</p>   |
| Electric Vehicle Charging    | <p>Electric vehicle charging infrastructure will be provided for 5% of car-parking spaces.</p>  | <p>A scalable load management system shall be installed to ensure that electric vehicles are charged proportionately within the constraints of the nominated peak building demand and the car park electrical distribution infrastructure.</p>   |
| Public Transport Access      | <p>The site is within close proximity of Tottenham Station (200m), allowing staff and visitors to access the site using public transport.</p>   |  |
| <b>Waste Management</b>      |   |  |
| Operational Waste Management | <p>Operational waste removal will be managed by a contractor, including recycling.</p> <p>Recycling facilities will be at least as convenient as facilities for general waste.</p>  |  |

| Issue                           | Performance Commitments / Description   | Comments   |
|---------------------------------|---|--|
| Construction Waste Minimisation | <p>A target recycling rate of 80% of construction and demolition waste has been adopted for the construction phase of the development to minimise the volume of waste to landfill.</p> <p>This will be achieved by the development of a comprehensive waste minimisation strategy including:</p> <ul style="list-style-type: none"> <li>• Separation of all commercially viable recyclable waste streams;</li> <li>• Training in waste minimisation for all site staff and contractors to form part of site induction training;</li> <li>• Record keeping of landfill waste and recyclable stream volumes to track performance against the 80% recyclable target; and</li> <li>• Quarterly reporting of volumes and percentages for each waste stream.</li> </ul> | A dedicated recycling contractor will be engaged to facilitate separation of commercially viable recyclable waste streams in accordance with the target adopted. |

## 5. Implementation Strategy

The ESD initiatives set out in this report will be coordinated by the Project Manager in conjunction with the following project design team members:

- Architect
- Thermal Performance Assessor
- Building Services Consultant
- Waste Management Consultant

An implementation schedule is set out in the following table.

| ESD Initiative Implementation Schedule |                             |   |                              |                    |
|--|-----------------------------|---|------------------------------|--------------------|
| #                                      | Initiative                  | Requirement   | Responsibility               | Stage              |
|  | Coordination of Initiatives | Full implementation   | Project Manager              | All                |
| 1                                      | Metering                    | Specify meters in accordance with nominated schedule                                    | Building Services Engineer   | Design Development |
| 2                                      | Water Efficiency            | Specify fixtures in accordance with nominated WELS star ratings                         | Architect                    | Design Development |
| 3                                      | Rainwater Harvesting        | Design and specify rainwater harvesting system including toilet flushing and irrigation | Building Services Engineer   | Design Development |
| 4                                      | Landscaping                 | Specify water efficient landscaping and irrigation                                      | Landscape architect          | Design Development |
| 5                                      | Energy performance          | Prepare JV3 modelling for certification   | Thermal Performance Assessor | Design Development |
| 6                                      | Heating & Cooling           | Specify units in accordance with nominated MEPS star ratings                            | Building Services Engineer   | Design Development |
| 7                                      | Hot Water                   | Specify nominated hot water system  | Building Services Engineer   | Design Development |
| 8                                      | Lighting                    | Specify nominated energy efficient lighting types                                       | Building Services Engineer   | Design Development |

| <b>ESD Initiative Implementation Schedule</b> |                                      |  |                            |                    |
|---|--------------------------------------|--|----------------------------|--------------------|
| <b>#</b>                                      | <b>Initiative</b>                    | <b>Requirement</b>   | <b>Responsibility</b>      | <b>Stage</b>       |
| 9   | Solar PV Array                       | Specify system in accordance with the nominated schedule.              | Building Services Engineer | Design Development |
| 10  | EV Charging                          | Specify charging infrastructure in accordance with nominated schedule. | Building Services Engineer | Design Development |
| 11  | Environmentally Preferable Materials | Specify materials in accordance with nominated schedule.               | Architect                  | Design Development |
| 12  | Bicycle Facilities                   | Specify bike hoops   | Architect                  | Design Development |
| 13  | Construction Waste Minimisation      | Prepare construction waste minimisation plan                           | ESD consultant             | Design Development |

## 6. Conclusion

This report sets out a range of sustainable design features, which are integrated into the design and specification of the proposed development, to improve environmental outcomes during occupation.

In terms of performance outcomes, the analysis presented in this report demonstrates that the proposed development:

- Attains an overall BESS score of 54% and passes the mandatory water, energy, stormwater and indoor environment quality elements;
- Achieves an overall energy performance 10% better than the minimum permitted by NCC 2019;
- Attains the *Best Practice* standard for urban stormwater quality.

Accordingly, the sustainable design outcomes from the proposed development are adequate for a development of this scale and are consistent with the objectives set out in Clauses 15.01-2S, 19.03-3S and 53.18 (Building Design and WSUD Policies) of the Maribyrnong Planning Scheme.

# Appendix A. BESS Results

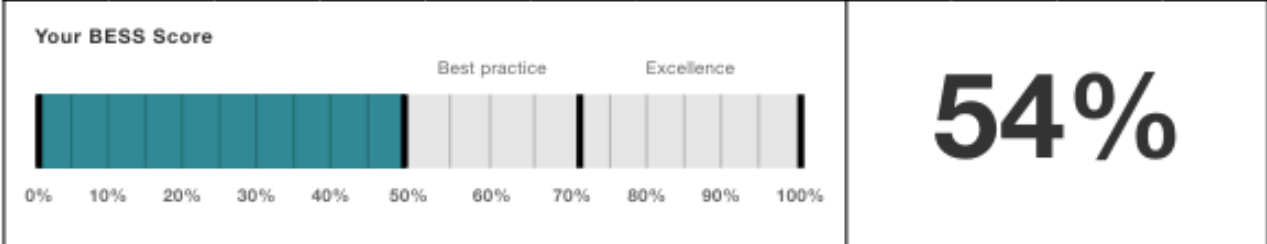
## BESS Report

Built Environment Sustainability Scorecard



This BESS report outlines the sustainable design commitments of the proposed development at 35-65 Paramount Rd Tottenham VIC 3012. 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 Maribyrnong 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.

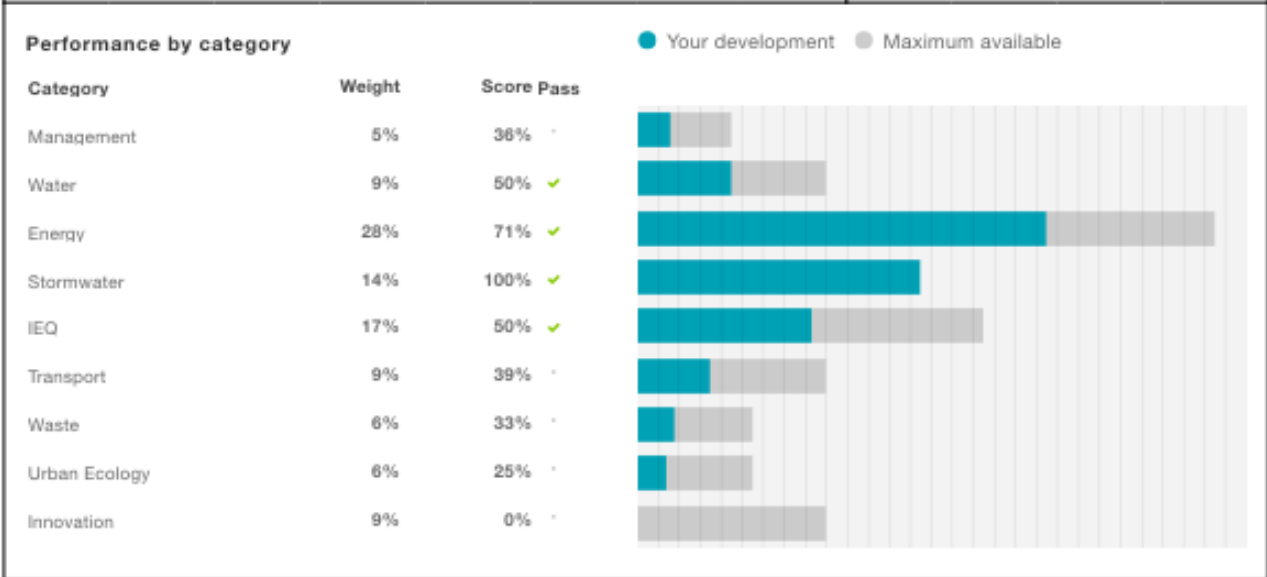


**Project details**

|              |                                       |
|--------------|---------------------------------------|
| Address      | 35-65 Paramount Rd Tottenham VIC 3012 |
| Project no   | C1223335-R1                           |
| BESS Version | BESS-6                                |

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|                     |                             |
|---------------------|-----------------------------|
| Site type           | Non-residential development |
| Account             | info@arkresources.com.au    |
| Application no.     | na                          |
| Site area           | 119,800.00 m <sup>2</sup>   |
| Building floor area | 61,479.00 m <sup>2</sup>    |
| Date                | 19 October 2022             |
| Software version    | 1.7.0-B.388                 |



## Buildings

| Name   | Height | Footprint             | % of total footprint |
|--------|--------|-----------------------|----------------------|
| Bldg A | 2      | 15,182 m <sup>2</sup> | 25%                  |
| Bldg B | 2      | 31,703 m <sup>2</sup> | 52%                  |
| Bldg C | 2      | 7,195 m <sup>2</sup>  | 11%                  |
| Bldg D | 2      | 6,170 m <sup>2</sup>  | 10%                  |

## Dwellings & Non Res Spaces

### Non-Res Spaces

| Name                                   | Quantity | Area                        | Building   | % of total area |
|--|----------|-----------------------------|------------|-----------------|
| <b>Office</b>                          |          |                             |            |                 |
| Offices B                              | 1        | 1,310 m <sup>2</sup>        | Bldg B     | 2%              |
| Offices C                              | 1        | 1,065 m <sup>2</sup>        | Bldg C     | 1%              |
| Offices A                              | 1        | 1,229 m <sup>2</sup>        | Bldg A     | 1%              |
| Offices D                              | 1        | 350 m <sup>2</sup>          | Bldg D     | < 1%            |
| <b>Total</b>                           | <b>4</b> | <b>3,954 m<sup>2</sup></b>  | <b>6%</b>  |                 |
| <b>Unconditioned Warehouse/factory</b> |          |                             |            |                 |
| Warehouses B                           | 1        | 30,393 m <sup>2</sup>       | Bldg B     | 49%             |
| Warehouse A                            | 1        | 15,182 m <sup>2</sup>       | Bldg A     | 24%             |
| Warehouse D                            | 1        | 5,820 m <sup>2</sup>        | Bldg D     | 9%              |
| Warehouse C                            | 1        | 6,130 m <sup>2</sup>        | Bldg C     | 9%              |
| <b>Total</b>                           | <b>4</b> | <b>57,525 m<sup>2</sup></b> | <b>93%</b> |                 |

Building Type composition



● Unconditioned Warehouse/factory ● Office

Building composition



● Bldg B ● Bldg A ● Bldg C

## Supporting information

### Floorplans & elevation notes

| Credit            | Requirement  | Response | Status |
|-------------------|--|----------|--------|
| Management 3.2    | Individual utility meters annotated  |          | -      |
| Management 3.3    | Common area submeters annotated  |          | -      |
| Water 3.1         | Water efficient garden annotated   |          | -      |
| Energy 4.2        | Floor plans showing location of photovoltaic panels as described.  |          | -      |
| Stormwater 1.1    | Location of any stormwater management systems used in STORM or MUSIC modelling (e.g. Rainwater tanks, raingarden, buffer strips) |          | -      |
| Transport 1.4     | All nominated non-residential bicycle parking spaces   |          | -      |
| Transport 1.5     | All nominated non-residential visitor bicycle parking spaces   |          | -      |
| Transport 2.1     | Location of electric vehicle charging infrastructure   |          | -      |
| Waste 2.2         | Location of recycling facilities   |          | -      |
| Urban Ecology 2.1 | Vegetated areas  |          | -      |

### Supporting evidence

| Credit          | Requirement   | Response | Status |
|-----------------|---|----------|--------|
| Management 2.3a | Section J glazing assessment  |          | -      |
| Energy 1.1      | Energy Report showing calculations of reference case and proposed buildings   |          | -      |
| Energy 3.7      | Provide a written description of the average lighting power density to be installed in the development and specify the lighting type(s) to be used. |          | -      |
| Energy 4.2      | Specifications of the solar photovoltaic system(s).   |          | -      |
| Stormwater 1.1  | STORM report or MUSIC model   |          | -      |
| IEQ 1.4         | A short report detailing assumptions used and results achieved.   |          | -      |

## Credit summary





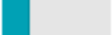



### Management Overall contribution 4.5%

|   |  | 36%  |
|---|--|------|
| 1.1 Pre-Application Meeting                         |  | 0%   |
| 2.3 Thermal Performance Modelling - Non-Residential |  | 50%  |
| 3.2 Metering - Non-Residential                      |  | 100% |
| 3.3 Metering - Common Areas                         |  | 100% |
| 4.1 Building Users Guide                            |  | 0%   |

### Water Overall contribution 9.0%

|  |  | Minimum required 50% | 50%  | ✓ Pass       |
|--|--|----------------------|------|--------------|
| 1.1 Potable water use reduction          |  |                      | 40%  |              |
| 3.1 Water Efficient Landscaping          |  |                      | 100% |              |
| 4.1 Building Systems Water Use Reduction |  |                      | N/A  | ◇ Scoped Out |
| N/A                                      |  |                      |      |              |



**Energy** Overall contribution 27.5%

|   |  |                             |            |   |
|---|--|-----------------------------|------------|---|
|  |  | <b>Minimum required 50%</b> | <b>71%</b> | <b>✔ Pass</b>                                       |
| 1.1 Thermal Performance Rating - Non-Residential                                  |  |                             | 37%        |   |
| 2.1 Greenhouse Gas Emissions  |   |                             | 100%       |   |
| 2.2 Peak Demand   |   |                             | 100%       |   |
| 2.3 Electricity Consumption   |   |                             | 100%       |   |
| 2.4 Gas Consumption   |   |                             | N/A        | ⚠ Scoped Out  |
|   |  |                             |            | No gas connection in use                            |
| 3.1 Carpark Ventilation   |   |                             | N/A        | ⚠ Scoped Out  |
|   |  |                             |            | N/A   |
| 3.2 Hot Water   |   |                             | 100%       |   |
| 3.7 Internal Lighting - Non-Residential   |   |                             | 100%       |   |
| 4.1 Combined Heat and Power (cogeneration / trigeneration)                        |   |                             | N/A        | ⚠ Scoped Out  |
|   |  |                             |            | No cogeneration or trigeneration system in use.     |
| 4.2 Renewable Energy Systems - Solar  |   |                             | 100%       |   |
| 4.4 Renewable Energy Systems - Other  |   |                             | N/A        | ⊘ Disabled  |
|   |  |                             |            | No other (non-solar PV) renewable energy is in use. |

**Stormwater** Overall contribution 13.5%

|  |  |                              |             |               |
|--|--|------------------------------|-------------|---------------|
|  |  | <b>Minimum required 100%</b> | <b>100%</b> | <b>✔ Pass</b> |
| 1.1 Stormwater Treatment   |  |                              | 100%        |               |

**IEQ** Overall contribution 16.5%

|   |  |                             |            |               |
|---|--|-----------------------------|------------|---------------|
|  |  | <b>Minimum required 50%</b> | <b>50%</b> | <b>✔ Pass</b> |
| 1.4 Daylight Access - Non-Residential   |  |                             | 77%        | ✔ Achieved    |
| 2.3 Ventilation - Non-Residential   |  |                             | 48%        | ✔ 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%**

|   |  |  |
|---|--|--|
|   |  | <b>39%</b>                                       |
| 1.4 Bicycle Parking - Non-Residential         |  | 6%   |
| 1.5 Bicycle Parking - Non-Residential Visitor |  | 100%   |
| 1.6 End of Trip Facilities - Non-Residential  |  | N/A <input checked="" type="checkbox"/> 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%**

|  |  |            |
|--|--|------------|
|  |  | <b>33%</b> |
| 1.1 - Construction Waste - Building Re-Use         |  | 0%         |
| 2.1 - Operational Waste - Food & Garden Waste      |  | 0%         |
| 2.2 - Operational Waste - Convenience of Recycling |  | 100%       |

**Urban Ecology Overall contribution 5.5%**

|                                       |  |            |
|---------------------------------------|--|------------|
|                                       |  | <b>25%</b> |
| 1.1 Communal Spaces                   |  | 0%         |
| 2.1 Vegetation                        |  | 50%        |
| 2.2 Green Roofs                       |  | 0%         |
| 2.3 Green Walls and Facades           |  | 0%         |
| 3.2 Food Production - Non-Residential |  | 0%         |

**Innovation Overall contribution 9.0%**

|                |  |           |
|----------------|--|-----------|
|                |  | <b>0%</b> |
| 1.1 Innovation |  | 0%        |

## Credit breakdown

### Management Overall contribution 2%

|  |  |
|--|--|
| <b>1.1 Pre-Application Meeting</b>                         | 0%   |
| Score Contribution   | This credit contributes 41.3% 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   |
| <b>2.3 Thermal Performance Modelling - Non-Residential</b> | 50%  |
| Score Contribution   | This credit contributes 17.4% towards the category score.  |
| Criteria   | Has a preliminary facade assessment been undertaken in accordance with NCC2019 Section J1.5?   |
| Question   | Criteria Achieved ?  |
| Office   | Yes  |
| Criteria   | Has preliminary modelling been undertaken in accordance with either NCC2019 Section J (Energy Efficiency), NABERS or Green Star?   |
| Question   | Criteria Achieved ?  |
| Office   | -  |
| <b>3.2 Metering - Non-Residential</b>                      | 100%   |
| Score Contribution   | This credit contributes 13.8% towards the category score.  |
| Criteria   | Have utility meters been provided for all individual commercial tenants?   |
| Question   | Criteria Achieved ?  |
| Office   | Yes  |
| Unconditioned Warehouse/factory                            | Yes  |
| <b>3.3 Metering - Common Areas</b>                         | 100%   |
| Score Contribution   | This credit contributes 13.8% towards the category score.  |
| Criteria   | Have all major common area services been separately submetered?  |
| Question   | Criteria Achieved ?  |
| Office   | Yes  |
| Unconditioned Warehouse/factory                            | Yes  |
| <b>4.1 Building Users Guide</b>                            | 0%   |
| Score Contribution   | This credit contributes 13.8% towards the category score.  |
| Criteria   | Will a building users guide be produced and issued to occupants?   |
| Question   | Criteria Achieved ?  |
| Project  | -  |

**Water** Overall contribution 4% Minimum required 50%

| <b>Water Approach</b>   |                                    |
|---|------------------------------------|
| What approach do you want to use for Water?:                                | Use the built in calculation tools |
| <b>Project Water Profile Question</b>                                       |                                    |
| 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                                |
| <b>Water fixtures, fittings and connections</b>                             |                                    |
| Building:   |                                    |
| Offices A<br>Warehouse A  | Bldg A                             |
| Offices B<br>Warehouses B   | Bldg B                             |
| Offices C<br>Warehouse C  | Bldg C                             |
| Offices D<br>Warehouse D  | Bldg D                             |
| Showerhead: All   | 4 Star WELS (>= 6.0 but <= 7.5)    |
| Bath: All   | Scope out                          |
| Kitchen Taps: All   | >= 5 Star WELS rating              |
| Bathroom Taps: All  | >= 5 Star WELS rating              |
| Dishwashers: All  | >= 4 Star WELS rating              |
| WC: All   | >= 4 Star WELS rating              |
| Urinals: All  | >= 4 Star WELS rating              |
| Washing Machine Water Efficiency: All                                       | Scope out                          |
| Which non-potable water source is the dwelling/space connected to?:         |                                    |
| Offices A<br>Warehouse A  | RWT A                              |
| Offices B<br>Warehouses B   | RWT B1                             |
| Offices C<br>Warehouse C  | RWT C                              |
| Offices D<br>Warehouse D  | RWT D                              |
| 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                                 |
| <b>Rainwater Tanks</b>  |                                    |

|  |                      |
|--|----------------------|
| <b>What is the total roof area connected to the rainwater tank?:</b> |                      |
| RWT A  | 7,590 m <sup>2</sup> |
| RWT B1   | 7,970 m <sup>2</sup> |
| RWT C  | 5,018 m <sup>2</sup> |
| RWT D  | 2,910 m <sup>2</sup> |
| RWT B2   | 7,230 m <sup>2</sup> |
| <b>Tank Size:</b>  |                      |
| RWT A  | 30,000 Litres        |
| RWT B1   | 30,000 Litres        |
| RWT C  | 30,000 Litres        |
| RWT D  | 30,000 Litres        |
| RWT B2   | 30,000 Litres        |
| <b>Irrigation area connected to tank:</b>                            |                      |
| RWT A  | -                    |
| RWT B1   | -                    |
| RWT C  | -                    |
| RWT D  | -                    |
| RWT B2   | -                    |
| <b>Is connected irrigation area a water efficient garden?:</b>       |                      |
| RWT A  | Yes                  |
| RWT B1   | Yes                  |
| RWT C  | Yes                  |
| RWT D  | Yes                  |
| RWT B2   | Yes                  |
| <b>Other external water demand connected to tank?:</b>               |                      |
| RWT A  | -                    |
| RWT B1   | -                    |
| RWT C  | -                    |
| RWT D  | -                    |
| RWT B2   | -                    |

|   |  |  |
|---|--|--|
| <b>1.1 Potable water use reduction</b>          |  | 40%  |
| 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   | 35188 kL   |  |
| Output  | Proposed (excluding rainwater and recycled water use)  |  |
| Project   | 26499 kL   |  |
| Output  | Proposed (including rainwater and recycled water use)  |  |
| Project   | 21710 kL   |  |
| Output  | % Reduction in Potable Water Consumption   |  |
| Project   | 38 %   |  |
| Output  | % of connected demand met by rainwater   |  |
| Project   | 68 %   |  |
| Output  | How often does the tank overflow?  |  |
| Project   | Very Often   |  |
| Output  | Opportunity for additional rainwater connection  |  |
| Project   | 5470 kL  |  |
| <b>3.1 Water Efficient Landscaping</b>          |  | 100%   |
| Score Contribution                              | This credit contributes 16.7% towards the category score.  |  |
| Criteria  | Will water efficient landscaping be installed?   |  |
| Question  | Criteria Achieved ?  |  |
| Project   | Yes  |  |
| <b>4.1 Building Systems Water Use Reduction</b> |  | N/A  Scoped Out |
| This credit was scoped out                      | N/A  |  |

**Energy** Overall contribution 20% Minimum required 50%

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

|   |  |
|---|--|
| System Size (lesser of inverter and panel capacity):    |  |
| 10. Total kWpV  | pe West (Offices)  |
| 10. Total kWpV  | pe West (Offices)  |
| 238 Total kWpV  | pe West (Warehouses)   |
| 238 Total kWpV  | pe West (Warehouses)   |
| <b>Orientation (which way is the system facing)?:</b>   |  |
| Total PV East (Offices)                                 | East   |
| Total PV West (Offices)                                 | West   |
| Total PV East (Warehouses)                              | East   |
| Total PV West (Warehouses)                              | West   |
| <b>Inclination (angle from horizontal):</b>             |  |
| Total PV East (Offices)                                 | 13.0 Angle (degrees)   |
| Total PV West (Offices)                                 | 13.0 Angle (degrees)   |
| Total PV East (Warehouses)                              | 13.0 Angle (degrees)   |
| Total PV West (Warehouses)                              | 13.0 Angle (degrees)   |
| <b>Which Building Class does this apply to?:</b>        |  |
| Total PV East (Offices)                                 | Office   |
| Total PV West (Offices)                                 | Office   |
| Total PV East (Warehouses)                              | Unconditioned Warehouse/factory  |
| Total PV West (Warehouses)                              | Unconditioned Warehouse/factory  |
| <b>1.1 Thermal Performance Rating - Non-Residential</b> | <b>37%</b>   |
| Score Contribution                                      | This credit contributes 34.4% towards the category score.  |
| Criteria  | What is the % reduction in heating and cooling energy consumption against the reference case (NCC 2019 Section J)? |
| <b>2.1 Greenhouse Gas Emissions</b>                     | <b>100%</b>  |
| Score Contribution                                      | This credit contributes 13.6% towards the category score.  |
| Criteria  | What is the % reduction in annual greenhouse gas emissions against the benchmark?                                  |

|  |  |              |
|--|--|--------------|
| <b>2.2 Peak Demand</b>   |  | 100%         |
| Score Contribution   | This credit contributes 4.3% towards the category score.   |              |
| Criteria   | What is the % reduction in the instantaneous (peak-hour) demand against the benchmark?   |              |
| <b>2.3 Electricity Consumption</b>                                 |  | 100%         |
| Score Contribution   | This credit contributes 13.6% towards the category score.  |              |
| Criteria   | What is the % reduction in annual electricity consumption against the benchmark?   |              |
| <b>2.4 Gas Consumption</b>   | N/A  | ✦ Scoped Out |
| This credit was scoped out   | No gas connection in use   |              |
| <b>3.1 Carpark Ventilation</b>                                     | N/A  | ✦ Scoped Out |
| This credit was scoped out   | N/A  |              |
| <b>3.2 Hot Water</b>   |  | 100%         |
| Score Contribution   | This credit contributes 6.8% towards the category score.   |              |
| Criteria   | What is the % reduction in annual energy consumption (gas and electricity) of the hot water system against the benchmark?  |              |
| <b>3.7 Internal Lighting - Non-Residential</b>                     |  | 100%         |
| Score Contribution   | This credit contributes 13.6% towards the category score.  |              |
| Criteria   | Does the maximum illumination power density (W/m <sup>2</sup> ) in at least 90% of the area of the relevant building class meet the requirements in Table J6.2a of the NCC 2019 Vol 1? |              |
| Question   | Criteria Achieved ?  |              |
| Office   | Yes  |              |
| Unconditioned Warehouse/factory                                    | Yes  |              |
| <b>4.1 Combined Heat and Power (cogeneration / tri-generation)</b> | N/A  | ✦ Scoped Out |
| This credit was scoped out   | No cogeneration or tri-generation system in use.   |              |
| <b>4.2 Renewable Energy Systems - Solar</b>                        |  | 100%         |
| Score Contribution   | This credit contributes 6.8% 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   |              |
| Office   | 22,373 kWh   |              |
| Unconditioned Warehouse/factory                                    | 531,368 kWh  |              |
| Output   | % of Building's Energy   |              |
| Office   | 18 %   |              |
| Unconditioned Warehouse/factory                                    | 184 %  |              |
| <b>4.4 Renewable Energy Systems - Other</b>                        | N/A  | ⊘ Disabled   |
| This credit is disabled  | No other (non-solar PV) renewable energy is in use.  |              |

**Stormwater** Overall contribution 14% Minimum required 100%

Section Notes: Averages provided of the east and west of the site

|  |  |
|--|--|
| Which stormwater modelling are you using?: | MUSIC or other modelling software                          |
| <b>1.1 Stormwater Treatment</b>            | 100%   |
| Score Contribution                         | This credit contributes 100.0% towards the category score. |
| Criteria                                   | Has best practice stormwater management been demonstrated? |
| Question                                   | Flow (ML/year)   |
| Project                                    | 3.5 % Reduction  |
| Question                                   | Total Suspended Solids (kg/year)                           |
| Project                                    | 81.2 % Reduction   |
| Question                                   | Total Phosphorus (kg/year)                                 |
| Project                                    | 70.5 % Reduction   |
| Question                                   | Total Nitrogen (kg/year)                                   |
| Project                                    | 53.0 % Reduction   |

IEQ Overall contribution 8% Minimum required 50%

|   |  |            |
|---|--|------------|
| <b>1.4 Daylight Access - Non-Residential</b>                | 77%  | ✓ Achieved |
| Score Contribution  | This credit contributes 35.3% towards the category score.  |            |
| Criteria  | What % of the nominated floor area has at least 2% daylight factor?  |            |
| Question  | Percentage Achieved?   |            |
| Office  | 35 %   |            |
| Unconditioned Warehouse/factory                             | 80 %   |            |
| <b>2.3 Ventilation - Non-Residential</b>                    | 48%  | ✓ Achieved |
| Score Contribution  | This credit contributes 35.3% towards the category score.  |            |
| Criteria  | What % of the regular use areas are effectively naturally ventilated?  |            |
| Question  | Percentage Achieved?   |            |
| Office  | -  |            |
| Unconditioned Warehouse/factory                             | 100 %  |            |
| Criteria  | What increase in outdoor air is available to regular use areas compared to the minimum required by AS 1668.2:2012? |            |
| Question  | What increase in outdoor air is available to regular use areas compared to the minimum required by AS 1668:2012?   |            |
| Office  | 50 %   |            |
| Unconditioned Warehouse/factory                             | -  |            |
| Criteria  | What CO2 concentrations are the ventilation systems designed to achieve, to monitor and to maintain?               |            |
| Question  | Value  |            |
| Office  | 0 ppm  |            |
| Unconditioned Warehouse/factory                             | -  |            |
| <b>3.4 Thermal comfort - Shading - Non-residential</b>      | 0%   |            |
| Score Contribution  | This credit contributes 17.6% towards the category score.  |            |
| Criteria  | What percentage of east, north and west glazing to regular use areas is effectively shaded?                        |            |
| Question  | Percentage Achieved?   |            |
| Office  | -  |            |
| Unconditioned Warehouse/factory                             | -  |            |
| <b>3.5 Thermal Comfort - Ceiling Fans - Non-Residential</b> | 0%   |            |
| Score Contribution  | This credit contributes 5.9% towards the category score.   |            |
| Criteria  | What percentage of regular use areas in tenancies have ceiling fans?   |            |
| Question  | Percentage Achieved?   |            |
| Office  | -  |            |
| Unconditioned Warehouse/factory                             | -  |            |
| <b>4.1 Air Quality - Non-Residential</b>                    | 100%   |            |
| Score Contribution  | This credit contributes 5.9% towards the category score.   |            |

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

**Transport** Overall contribution 4%

|  |   |  |
|--|---|--|
| <b>1.4 Bicycle Parking - Non-Residential</b>         |   | 6%   |
| Score Contribution                                   | This credit contributes 25.0% towards the category score.   |  |
| Criteria   | Have the planning scheme requirements for employee bicycle parking been exceeded by at least 50% (or a minimum of 2 where there is no planning scheme requirement)? |  |
| Question   | Criteria Achieved ?   |  |
| Office   | Yes   |  |
| Unconditioned Warehouse/factory                      | No  |  |
| Question   | Bicycle Spaces Provided ?   |  |
| Office   | 28  |  |
| Unconditioned Warehouse/factory                      | 0   |  |
| <b>1.5 Bicycle Parking - Non-Residential Visitor</b> |   | 100%   |
| Score Contribution                                   | This credit contributes 12.5% towards the category score.   |  |
| Criteria   | Have the planning scheme requirements for visitor bicycle parking been exceeded by at least 50% (or a minimum of 1 where there is no planning scheme requirement)?  |  |
| Question   | Criteria Achieved ?   |  |
| Office   | Yes   |  |
| Unconditioned Warehouse/factory                      | Yes   |  |
| Question   | Bicycle Spaces Provided ?   |  |
| Office   | 6   |  |
| Unconditioned Warehouse/factory                      | 1   |  |
| <b>1.6 End of Trip Facilities - Non-Residential</b>  |   | N/A <input checked="" type="checkbox"/> Disabled |
| This credit is disabled                              | Credit 1.4 must be complete first.  |  |
| <b>2.1 Electric Vehicle Infrastructure</b>           |   | 100%   |
| Score Contribution                                   | This credit contributes 25.0% towards the category score.   |  |
| Criteria   | Are facilities provided for the charging of electric vehicles?  |  |
| Question   | Criteria Achieved ?   |  |
| Project  | Yes   |  |
| <b>2.2 Car Share Scheme</b>                          |   | 0%   |
| Score Contribution                                   | This credit contributes 12.5% towards the category score.   |  |
| Criteria   | Has a formal car sharing scheme been integrated into the development?   |  |
| Question   | Criteria Achieved ?   |  |
| Project  | No  |  |
| <b>2.3 Motorbikes / Mopeds</b>                       |   | 0%   |
| Score Contribution                                   | This credit contributes 12.5% towards the category score.   |  |
| Criteria   | Are a minimum of 5% of vehicle parking spaces designed and labelled for motorbikes (must be at least 5 motorbike spaces)?   |  |
| Question   | Criteria Achieved ?   |  |
| Project  | No  |  |

**Waste** Overall contribution 2%

|   |   |      |
|---|---|------|
| <b>1.1 - Construction Waste - Building Re-Use</b>         |   | 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   | -   |      |
| <b>2.1 - Operational Waste - Food &amp; Garden Waste</b>  |   | 0%   |
| 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   | No  |      |
| <b>2.2 - Operational Waste - Convenience of Recycling</b> |   | 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 1%

|  |  |
|--|--|
| <b>1.1 Communal Spaces</b>                   | 0%   |
| Score Contribution                           | This credit contributes 12.5% towards the category score.  |
| Criteria                                     | Is there at least the following amount of common space measured in square meters : * 1m <sup>2</sup> for each of the first 50 occupants * Additional 0.5m <sup>2</sup> for each occupant between 51 and 250 * Additional 0.25m <sup>2</sup> for each occupant above 251? |
| Question                                     | Common space provided  |
| Office                                       | -  |
| Unconditioned Warehouse/factory              | -  |
| Output                                       | Minimum Common Space Required  |
| Office                                       | 216 m <sup>2</sup>   |
| Unconditioned Warehouse/factory              | 425 m <sup>2</sup>   |
| <b>2.1 Vegetation</b>                        | 50%  |
| Score Contribution                           | This credit contributes 50.0% towards the category score.  |
| Criteria                                     | How much of the site is covered with vegetation, expressed as a percentage of the total site area?   |
| Question                                     | Percentage Achieved ?  |
| Project                                      | 13 %   |
| <b>2.2 Green Roofs</b>                       | 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   |
| <b>2.3 Green Walls and Facades</b>           | 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   |
| <b>3.2 Food Production - Non-Residential</b> | 0%   |
| Score Contribution                           | This credit contributes 12.5% towards the category score.  |
| Criteria                                     | What area of space per occupant is dedicated to food production?   |
| Question                                     | Food Production Area   |
| Office                                       | -  |
| Unconditioned Warehouse/factory              | -  |
| Output                                       | Min Food Production Area   |
| Office                                       | 80 m <sup>2</sup>  |
| Unconditioned Warehouse/factory              | 288 m <sup>2</sup>   |

**Innovation** Overall contribution 0%

|                       |   |
|-----------------------|---|
| <b>1.1 Innovation</b> | 0%  |
| Score Contribution    | This credit contributes 100.0% towards the category score.                      |
| Criteria              | What percentage of the Innovation points have been claimed (10 points maximum)? |

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## A.1 Daylight Calculations - Offices

### GreenStar Hand Calculations

| Room                      | Room Area     | Daylight Area | Daylight percentage |
|---------------------------|---------------|---------------|---------------------|
| Building A Offices - G    | 813           | 159.84        | 19.7%               |
| Building A Offices - L1   | 117           | 25.85         | 22.1%               |
| Building B1 - G           | 220           | 137.48        | 62.5%               |
| Building B1 - L1          | 302           | 201.9         | 66.9%               |
| Building B1 - Dock Office | 90            | 17.89         | 19.9%               |
| Building B2 - G           | 439.9         | 153.6         | 34.9%               |
| Building B2 - Dock Office | 90            | 28.69         | 31.9%               |
| Building C1 - Office      | 65.51         | 50.05         | 76.4%               |
| Building C2 - Office      | 612.9         | 141.7         | 23.1%               |
| Building C3 - Office      | 284           | 121.43        | 42.8%               |
| Building D Offices - G    | 115           | 61.84         | 53.8%               |
| Building D Offices - L1   | 169           | 64.84         | 38.4%               |
|                           | <b>3318.3</b> | <b>1165</b>   | <b>35.1%</b>        |

# Appendix B. NCC J1.5 Façade Calculator

Preliminary J1.5 Façade calculations have been carried out to determine window/wall ratios and thermal performance is achievable with the proposed design. NCC Section J compliance will be verified during detailed design via a dynamic thermal simulation in accordance with the NCC methodology.

| NCC 2019 Wall-Glazing Calculator v3.0   |                        |                           |               |                        |                |   |                  |   |                    |                        |                                      |       |
|---|------------------------|---------------------------|---------------|------------------------|----------------|---|------------------|---|--------------------|------------------------|--------------------------------------|-------|
| Wall and glazing energy efficiency in Class 2-9 buildings - Method 2 of Specification J1.5a, NCC 2019   |                        |                           |               |                        |                |   |                  |   |                    |                        |                                      |       |
| Building name and description   |                        |                           |               |                        | Classification |   |                  | Climate Zone  |                    |                        |                                      |       |
| 35-65 Paramount Rd & 99 Olympia St Tottenham (Building A, B, C & D Offices & Dock Offices)  |                        |                           |               |                        | Other          |   |                  | 6   |                    |                        |                                      |       |
| Calculated Area-Weighted U-Value  |                        |                           |               |                        | 1.79           |   |                  | Calculated Representative Air-Conditioning Energy Value |                    |                        |                                      | 495.0 |
| Allowable Area-Weighted U-Value   |                        |                           |               |                        | 2.00           |   |                  | Allowable Representative Air-Conditioning Energy Value  |                    |                        |                                      | 556.1 |
| Building total U-Value allowance met  |                        |                           |               |                        | 90%            |   |                  | Building total SHGC allowance met                       |                    |                        |                                      | 90%   |
| Check Values  |                        | Wall Element Requirements |               |                        | Met            |   |                  | Display Glazing Element Requirements                    |                    | -                      |                                      |       |
| Visible   |                        |                           |               |                        |                |   |                  |   |                    |                        |                                      |       |
| Use of this calculator does not guarantee compliance with the NCC. The disclaimer and a version update check are available at the bottom of the page. |                        |                           |               |                        |                |   |                  |   |                    |                        |                                      |       |
| Element Description   |                        |                           |               |                        | U-Value        |   | SHGC and Shading |   |                    |                        |                                      |       |
| ID  | Description (optional) | Element Type              | Facing Sector | Area (m <sup>2</sup> ) | U-Value        | U-Value Element share of allowance used | SHGC             | Glazing Height (m)                                      | Shading Height (m) | Shading Projection (m) | SHGC Element share of allowance used |       |
| 1   |                        | Wall                      | North         | 380.12                 | 1.00           | 5% of building total                    |                  |   |                    |                        | Not counted                          |       |
| 2   |                        | Wall                      | East          | 654.16                 | 1.00           | 9% of building total                    |                  |   |                    |                        | Not counted                          |       |
| 3   |                        | Wall                      | South         | 348.03                 | 1.00           | 5% of building total                    |                  |   |                    |                        | Not counted                          |       |
| 4   |                        | Wall                      | West          | 297.34                 | 1.00           | 4% of building total                    |                  |   |                    |                        | Not counted                          |       |
| 5   |                        | Wall                      | Internal      | 1238.13                | 1.00           | 17% of building total                   |                  |   |                    |                        | Not counted                          |       |
| 6   | Spandrel               | Wall                      | North         | 11.62                  | 1.00           | 0% of building total                    |                  |   |                    |                        | Not counted                          |       |
| 7   | Spandrel               | Wall                      | East          | 15.80                  | 1.00           | 0% of building total                    |                  |   |                    |                        | Not counted                          |       |
| 8   | Spandrel               | Wall                      | South         | 19.59                  | 1.00           | 0% of building total                    |                  |   |                    |                        | Not counted                          |       |
| 9   | Spandrel               | Wall                      | West          | 8.46                   | 1.00           | 0% of building total                    |                  |   |                    |                        | Not counted                          |       |
| 10  |                        | Glazing                   | South         | 3.66                   | 4.05           | 0% of building total                    | 0.395            | 1.7   | 1.7                | 0.15                   | 0% of building total                 |       |
| 11  |                        | Glazing                   | South         | 4.76                   | 4.05           | 0% of building total                    | 0.395            | 1.7   | 1.7                | 0.15                   | 0% of building total                 |       |
| 12  |                        | Glazing                   | South         | 3.66                   | 4.05           | 0% of building total                    | 0.395            | 1.7   | 1.7                | 0.15                   | 0% of building total                 |       |
| 13  |                        | Glazing                   | West          | 2.43                   | 4.05           | 0% of building total                    | 0.395            | 2.7   | 2.85               | 1.5                    | 0% of building total                 |       |
| 14  |                        | Glazing                   | West          | 21.70                  | 4.05           | 1% of building total                    | 0.395            | 1.75  | 1.75               | 1.5                    | 1% of building total                 |       |
| 15  |                        | Glazing                   | North         | 15.84                  | 4.05           | 1% of building total                    | 0.395            | 1.75  | 1.75               | 1.8                    | 1% of building total                 |       |
| 16  |                        | Glazing                   | West          | 4.77                   | 4.05           | 0% of building total                    | 0.395            | 2.65  | 2.65               | 10.55                  | 0% of building total                 |       |
| 17  |                        | Glazing                   | North         | 6.36                   | 4.05           | 0% of building total                    | 0.395            | 2.65  | 2.65               | 1.5                    | 1% of building total                 |       |
| 18  |                        | Glazing                   | East          | 4.77                   | 4.05           | 0% of building total                    | 0.395            | 2.65  | 2.65               | 8.35                   | 0% of building total                 |       |
| 19  |                        | Glazing                   | North         | 11.99                  | 4.05           | 1% of building total                    | 0.395            | 1.75  | 1.75               | 1.8                    | 1% of building total                 |       |
| 20  |                        | Glazing                   | East          | 23.71                  | 4.05           | 1% of building total                    | 0.395            | 1.75  | 1.75               | 1.5                    | 1% of building total                 |       |
| 21  |                        | Glazing                   | North         | 32.76                  | 4.05           | 2% of building total                    | 0.395            | 1.8   | 1.8                | 0.15                   | 6% of building total                 |       |
| 22  |                        | Glazing                   | East          | 21.60                  | 4.05           | 1% of building total                    | 0.395            | 1.8   | 1.8                | 0.15                   | 3% of building total                 |       |
| 23  |                        | Glazing                   | South         | 34.58                  | 4.05           | 2% of building total                    | 0.395            |   |                    |                        | 3% of building total                 |       |
| 24  |                        | Glazing                   | West          | 22.80                  | 4.05           | 1% of building total                    | 0.395            |   |                    |                        | 3% of building total                 |       |
| 25  |                        | Glazing                   | North         | 2.55                   | 4.05           | 0% of building total                    | 0.395            | 1.7   | 3.7                | 22.5                   | 0% of building total                 |       |
| 26  |                        | Glazing                   | North         | 2.55                   | 4.05           | 0% of building total                    | 0.395            | 1.7   | 3.7                | 22.5                   | 0% of building total                 |       |
| 27  |                        | Glazing                   | North         | 2.55                   | 4.05           | 0% of building total                    | 0.395            | 1.7   | 3.7                | 22.5                   | 0% of building total                 |       |
| 28  |                        | Glazing                   | East          | 2.55                   | 4.05           | 0% of building total                    | 0.395            | 1.7   | 1.7                | 1                      | 0% of building total                 |       |
| 29  |                        | Glazing                   | East          | 2.16                   | 4.05           | 0% of building total                    | 0.395            | 2.4   | 2.7                | 1                      | 0% of building total                 |       |
| 30  |                        | Glazing                   | East          | 2.55                   | 4.05           | 0% of building total                    | 0.395            | 1.7   | 1.7                | 1                      | 0% of building total                 |       |
| 31  |                        | Glazing                   | South         | 2.55                   | 4.05           | 0% of building total                    | 0.395            |   |                    |                        | 0% of building total                 |       |
| 32  |                        | Glazing                   | South         | 2.55                   | 4.05           | 0% of building total                    | 0.395            |   |                    |                        | 0% of building total                 |       |
| 33  |                        | Glazing                   | South         | 2.55                   | 4.05           | 0% of building total                    | 0.395            |   |                    |                        | 0% of building total                 |       |
| 34  |                        | Glazing                   | North         | 17.55                  | 4.05           | 1% of building total                    | 0.395            | 2.7   | 3.3                | 5.1                    | 1% of building total                 |       |
| 35  |                        | Glazing                   | East          | 22.41                  | 4.05           | 1% of building total                    | 0.395            |   |                    |                        | 3% of building total                 |       |
| 36  |                        | Glazing                   | East          | 2.43                   | 4.05           | 0% of building total                    | 0.395            |   |                    |                        | 0% of building total                 |       |
| 37  |                        | Glazing                   | East          | 28.76                  | 4.05           | 2% of building total                    | 0.395            | 2.7   | 3.3                | 3                      | 2% of building total                 |       |
| 38  |                        | Glazing                   | South         | 43.61                  | 4.05           | 2% of building total                    | 0.395            | 2.7   | 3.3                | 1.5                    | 3% of building total                 |       |
| 39  |                        | Glazing                   | North         | 15.98                  | 4.05           | 1% of building total                    | 0.395            | 2.7   | 3.3                | 1.7                    | 2% of building total                 |       |
| 40  |                        | Glazing                   | East          | 19.95                  | 4.05           | 1% of building total                    | 0.395            | 2.7   | 3.3                | 3                      | 1% of building total                 |       |
| 41  |                        | Glazing                   | East          | 7.40                   | 4.05           | 0% of building total                    | 0.395            | 2.55  | 2.55               | 0.2                    | 1% of building total                 |       |
| 42  |                        | Glazing                   | East          | 7.40                   | 4.05           | 0% of building total                    | 0.395            | 2.55  | 2.55               | 0.2                    | 1% of building total                 |       |
| 43  |                        | Glazing                   | East          | 8.11                   | 4.05           | 0% of building total                    | 0.395            | 2.65  | 2.65               | 1.5                    | 1% of building total                 |       |
| 44  |                        | Glazing                   | East          | 7.40                   | 4.05           | 0% of building total                    | 0.395            | 2.55  | 2.55               | 0.2                    | 1% of building total                 |       |
| 45  |                        | Glazing                   | East          | 7.40                   | 4.05           | 0% of building total                    | 0.395            | 2.55  | 2.55               | 0.2                    | 1% of building total                 |       |
| 46  |                        | Glazing                   | East          | 7.40                   | 4.05           | 0% of building total                    | 0.395            | 2.55  | 2.55               | 0.2                    | 1% of building total                 |       |
| 47  |                        | Glazing                   | East          | 7.40                   | 4.05           | 0% of building total                    | 0.395            | 2.55  | 2.55               | 0.2                    | 1% of building total                 |       |
| 48  |                        | Glazing                   | East          | 7.40                   | 4.05           | 0% of building total                    | 0.395            | 2.55  | 2.55               | 0.2                    | 1% of building total                 |       |
| 49  |                        | Glazing                   | East          | 7.40                   | 4.05           | 0% of building total                    | 0.395            | 2.55  | 2.55               | 0.2                    | 1% of building total                 |       |
| 50  |                        | Glazing                   | East          | 7.40                   | 4.05           | 0% of building total                    | 0.395            | 2.55  | 2.55               | 0.2                    | 1% of building total                 |       |
| 51  |                        | Glazing                   | South         | 30.38                  | 4.05           | 2% of building total                    | 0.395            |   |                    |                        | 2% of building total                 |       |
| 52  |                        | Glazing                   | South         | 30.38                  | 4.05           | 2% of building total                    | 0.395            |   |                    |                        | 2% of building total                 |       |

|    |         |          |       |      |                      |       |      |      |  |                          |
|----|---------|----------|-------|------|----------------------|-------|------|------|--|--------------------------|
| 53 | Glazing | South    | 30.38 | 4.05 | 2% of building total | 0.395 |      |      |  | 2% of building total     |
| 54 | Glazing | South    | 30.38 | 4.05 | 2% of building total | 0.395 |      |      |  | 2% of building total     |
| 55 | Glazing | South    | 30.38 | 4.05 | 2% of building total | 0.395 |      |      |  | 2% of building total     |
| 56 | Glazing | South    | 30.38 | 4.05 | 2% of building total | 0.395 |      |      |  | 2% of building total     |
| 57 | Glazing | East     | 2.03  | 4.05 | 0% of building total | 0.395 | 0.7  | 0.7  |  | 0.2 0% of building total |
| 58 | Glazing | East     | 4.21  | 4.05 | 0% of building total | 0.395 | 1.45 | 1.45 |  | 0.2 0% of building total |
| 59 | Glazing | East     | 3.48  | 4.05 | 0% of building total | 0.395 | 1.2  | 1.2  |  | 0.2 0% of building total |
| 60 | Glazing | East     | 7.40  | 4.05 | 0% of building total | 0.395 | 2.55 | 2.55 |  | 0.2 1% of building total |
| 61 | Glazing | East     | 3.48  | 4.05 | 0% of building total | 0.395 | 1.2  | 1.2  |  | 0.2 0% of building total |
| 62 | Glazing | East     | 7.40  | 4.05 | 0% of building total | 0.395 | 2.55 | 2.55 |  | 0.2 1% of building total |
| 63 | Glazing | East     | 3.48  | 4.05 | 0% of building total | 0.395 | 1.2  | 1.2  |  | 0.2 0% of building total |
| 64 | Glazing | East     | 7.40  | 4.05 | 0% of building total | 0.395 | 2.55 | 2.55 |  | 0.2 1% of building total |
| 65 | Glazing | East     | 3.48  | 4.05 | 0% of building total | 0.395 | 1.2  | 1.2  |  | 0.2 0% of building total |
| 66 | Glazing | East     | 7.40  | 4.05 | 0% of building total | 0.395 | 2.55 | 2.55 |  | 0.2 1% of building total |
| 67 | Glazing | East     | 3.48  | 4.05 | 0% of building total | 0.395 | 1.2  | 1.2  |  | 0.2 0% of building total |
| 68 | Glazing | East     | 7.40  | 4.05 | 0% of building total | 0.395 | 2.55 | 2.55 |  | 0.2 1% of building total |
| 69 | Glazing | East     | 3.48  | 4.05 | 0% of building total | 0.395 | 1.2  | 1.2  |  | 0.2 0% of building total |
| 70 | Glazing | South    | 10.65 | 4.05 | 1% of building total | 0.395 | 3    | 3    |  | 1.2 1% of building total |
| 71 | Glazing | South    | 30.00 | 4.05 | 2% of building total | 0.395 |      |      |  | 2% of building total     |
| 72 | Glazing | South    | 30.00 | 4.05 | 2% of building total | 0.395 |      |      |  | 2% of building total     |
| 73 | Glazing | South    | 30.00 | 4.05 | 2% of building total | 0.395 |      |      |  | 2% of building total     |
| 74 | Glazing | North    | 10.34 | 4.05 | 1% of building total | 0.395 |      |      |  | 2% of building total     |
| 75 | Glazing | Internal | 2.25  | 4.05 | 0% of building total | 0.395 |      |      |  | Not counted              |
| 76 | Glazing | Internal | 2.25  | 4.05 | 0% of building total | 0.395 |      |      |  | Not counted              |
| 77 | Glazing | Internal | 2.25  | 4.05 | 0% of building total | 0.395 |      |      |  | Not counted              |
| 78 | Glazing | South    | 33.48 | 4.05 | 2% of building total | 0.395 | 2.7  | 3.3  |  | 0.4 3% of building total |
| 79 | Glazing | West     | 16.90 | 4.05 | 1% of building total | 0.395 | 2.7  | 3.3  |  | 2.3 2% of building total |
| 80 | Glazing | West     | 9.99  | 4.05 | 1% of building total | 0.395 | 2.7  | 3.3  |  | 2.4 1% of building total |
| 81 | Glazing | North    | 14.49 | 4.05 | 1% of building total | 0.395 |      |      |  | 2% of building total     |
| 82 | Glazing | South    | 18.11 | 4.05 | 1% of building total | 0.395 | 1.32 | 1.35 |  | 0.3 1% of building total |
| 83 | Glazing | West     | 19.09 | 4.05 | 1% of building total | 0.395 |      |      |  | 3% of building total     |
| 84 | Glazing | West     | 2.70  | 4.05 | 0% of building total | 0.395 | 2.7  | 2.7  |  | 0.6 0% of building total |
| 85 | Glazing | West     | 9.63  | 4.05 | 1% of building total | 0.395 | 1.8  | 1.8  |  | 0.6 1% of building total |
| 86 | Glazing | West     | 5.15  | 4.05 | 0% of building total | 0.395 | 1.8  | 1.8  |  | 0.6 0% of building total |
| 87 | Glazing | West     | 4.64  | 4.05 | 0% of building total | 0.395 | 2.7  | 2.7  |  | 1.2 0% of building total |
| 88 | Glazing | West     | 0.77  | 4.05 | 0% of building total | 0.395 | 1.8  | 1.8  |  | 1.2 0% of building total |
| 89 | Glazing | West     | 4.95  | 4.05 | 0% of building total | 0.395 | 1.8  | 1.8  |  | 1.2 0% of building total |
| 90 | Glazing | West     | 6.16  | 4.05 | 0% of building total | 0.395 |      |      |  | 1% of building total     |
| 91 | Glazing | West     | 8.62  | 4.05 | 0% of building total | 0.395 |      |      |  | 1% of building total     |
| 92 | Glazing | West     | 14.94 | 4.05 | 1% of building total | 0.395 |      |      |  | 2% of building total     |
| 93 | Glazing | West     | 14.94 | 4.05 | 1% of building total | 0.395 |      |      |  | 2% of building total     |
| 94 | Glazing | West     | 2.48  | 4.05 | 0% of building total | 0.395 |      |      |  | 0% of building total     |
| 95 | Glazing | West     | 2.70  | 4.05 | 0% of building total | 0.395 |      |      |  | 0% of building total     |
| 96 | Glazing | West     | 10.67 | 4.05 | 1% of building total | 0.395 |      |      |  | 1% of building total     |
| 97 | Glazing | West     | 8.60  | 4.05 | 0% of building total | 0.395 | 1.8  | 1.8  |  | 0.6 1% of building total |
| 98 | Glazing | West     | 4.27  | 4.05 | 0% of building total | 0.395 | 1.8  | 1.8  |  | 0.6 0% of building total |

Disclaimer:

This calculator has been developed to assist in developing a better understanding of the glazing energy efficiency parameters of NCC 2019. While the author believes that the calculator, if used correctly, is likely to produce accurate results, it is provided "as is" and without any representation or warranty of any kind, including that it is fit for any purpose or of merchantable quality, or functions as intended or at all. Your use of this calculator is entirely at your own risk and the author accepts no liability of any kind.

Made by Alex Zeller

[Email alex.wallglazingcalculator@gmail.com with any suggestions for improvement](mailto:alex.wallglazingcalculator@gmail.com)

[Check for version update](#)

# Appendix C. Rainwater Harvesting

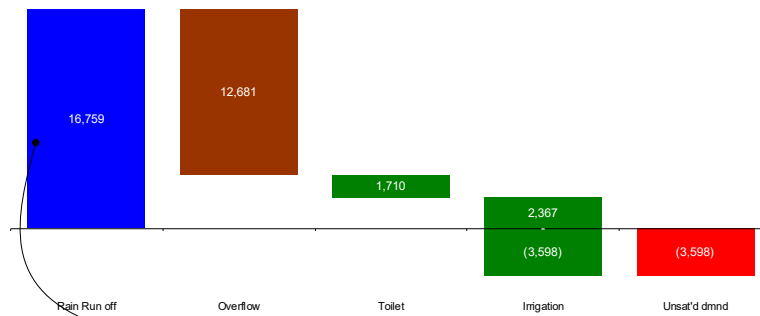
Predicted harvested rainwater volumes, water savings and supply reliability are shown below, modelled with the WSUD inputs from *Stormwater Management Plan* prepared by Davis, Naismith & McGovern (revision D, 17 October 2022).

Property **35-65 Paramount Rd & 99 Olympia St,**  
Version **Tottenham**

| Inputs:            |                                 |         |   | Irrigation Schedule |    |  |   |   |   |   |   |   |   |
|--------------------|---------------------------------|---------|---|---------------------|----|--|---|---|---|---|---|---|---|
| <b>Commercial</b>  | Floor Area - NLA (m2)           | 61479   |   | Jan                 | 10 |  |   |   |   |   |   |   |   |
|                    | PPL [ M / F ]                   | 443     | 443                                     | Feb                 | 10 |  | y |   |   |   |   |   |   |
|                    | Flush/Person/Day [ M - Urinal ] | 2       |   | Mar                 | 10 |  | y |   |   |   |   |   |   |
|                    | Flush/Person/Day [ M / F - WC ] | 0.3     | 2.3                                     | Apr                 | 5  |  |   | y |   |   |   |   |   |
|                    | Litres/Flush [ Urinal / WC ]    | 1       | 3.3                                     | May                 | 5  |  |   |   | y |   |   |   |   |
|                    | Total Daily usage (litres)      | 4686    |   | Jun                 | 5  |  |   |   |   | y |   |   |   |
| <b>Residential</b> | PPL                             | 0       |   | Jul                 | 5  |  |   |   |   |   | y |   |   |
|                    | Flush/Person/Day                | 5       |   | Aug                 | 5  |  |   |   |   |   |   | y |   |
|                    | Litres/Flush                    | 4.00    |   | Sep                 | 5  |  |   |   |   |   |   |   | y |
|                    | Total Daily usage (litres)      | 0       |   | Oct                 | 5  |  |   |   |   |   |   |   |   |
| <b>Development</b> | Total Daily usage (litres)      | 4686    |   | Nov                 | 10 |  |   |   |   |   |   |   | y |
|                    |                                 |         |   | Dec                 | 10 |  |   | y |   |   |   |   | y |
|                    | Roof area (m2)                  | 28,760  |   |                     |    |  |   |   |   |   |   |   |   |
|                    | Collection Evaporation          | 5%      | Recalc, update pivots, table and graphs |                     |    |  |   |   |   |   |   |   |   |
|                    | Tank Capacity (litres)          | 150,000 |   |                     |    |  |   |   |   |   |   |   |   |
|                    | Irrigation Area (m2)            | 15,430  |   |                     |    |  |   |   |   |   |   |   |   |
|                    | Toff if Total Rain (mm)         | 10      |   |                     |    |  |   |   |   |   |   |   |   |
|                    | in the last                     | 5 days  |   |                     |    |  |   |   |   |   |   |   |   |

box 2

## System components (kls per year)



box 3

## System components (kls per year) based on 12 years of actual historical daily rainfall

|                                       | 12 years of Averages (k l) |       |         |         |         |         |       |         |         |         |         |         | Total    |
|---------------------------------------|----------------------------|-------|---------|---------|---------|---------|-------|---------|---------|---------|---------|---------|----------|
|                                       | Jan                        | Feb   | Mar     | Apr     | May     | Jun     | Jul   | Aug     | Sep     | Oct     | Nov     | Dec     |          |
| Rain Run off                          | 1,130                      | 1,168 | 1,026   | 1,743   | 1,416   | 1,452   | 1,292 | 1,458   | 1,400   | 1,304   | 1,811   | 1,558   | 16,759   |
| Overflow                              | (804)                      | (799) | (652)   | (1,397) | (1,062) | (1,163) | (904) | (1,080) | (1,101) | (1,014) | (1,553) | (1,152) | (12,681) |
| Rain Water saved                      | 327                        | 368   | 374     | 346     | 354     | 288     | 388   | 378     | 300     | 290     | 259     | 406     | 4,077    |
| Toilet                                | (145)                      | (132) | (145)   | (141)   | (145)   | (141)   | (145) | (145)   | (141)   | (145)   | (141)   | (144)   | (1,710)  |
| (Shortfall)/Surplus before Irrigation | 181                        | 236   | 229     | 206     | 209     | 148     | 243   | 232     | 159     | 144     | 118     | 262     | 2,367    |
| Irrigation                            | (1,054)                    | (964) | (1,093) | (225)   | (219)   | (212)   | (251) | (238)   | (238)   | (212)   | (399)   | (861)   | (5,965)  |
| Unsatisfied Demand                    | (873)                      | (728) | (864)   | (19)    | (10)    | (64)    | (8)   | (5)     | (79)    | (68)    | (280)   | (600)   | (3,598)  |

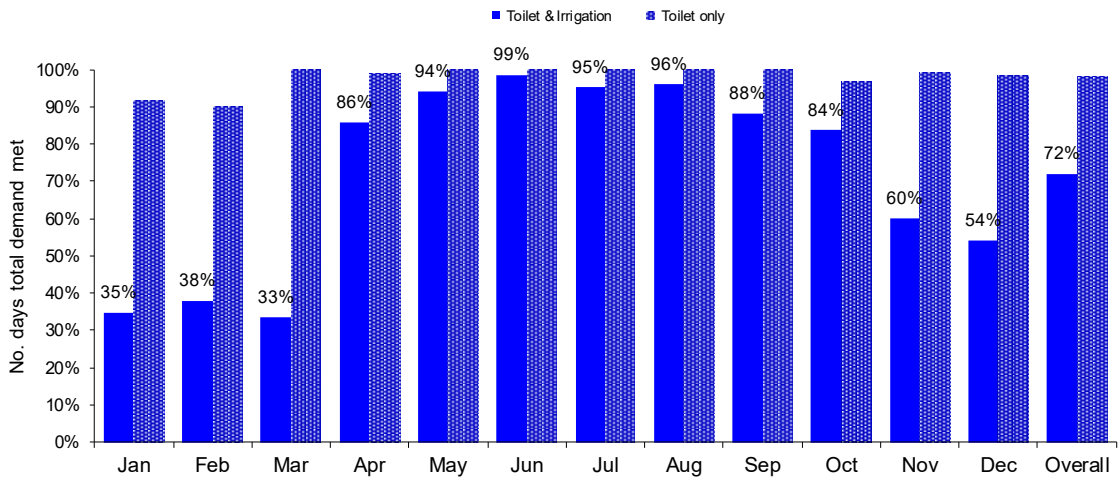
|                                       | Actual Years (k l) |          |          |          |          |         |         |          |          |          |         |          | Total     |
|---------------------------------------|--------------------|----------|----------|----------|----------|---------|---------|----------|----------|----------|---------|----------|-----------|
|                                       | 2009               | 2010     | 2011     | 2012     | 2013     | 2014    | 2015    | 2016     | 2017     | 2018     | 2019    | 2020     |           |
| Rain Run off                          | 13,683             | 21,317   | 21,155   | 17,191   | 18,524   | 12,953  | 13,319  | 18,429   | 17,054   | 15,281   | 11,418  | 20,825   | 201,150   |
| Overflow                              | (9,664)            | (17,218) | (16,833) | (12,742) | (14,742) | (9,273) | (9,149) | (14,607) | (12,776) | (11,235) | (7,534) | (16,437) | (152,209) |
| Rain Water saved                      | 4,018              | 4,099    | 4,322    | 4,449    | 3,783    | 3,681   | 4,170   | 3,822    | 4,278    | 4,046    | 3,884   | 4,388    | 48,941    |
| Toilet                                | (1,710)            | (1,710)  | (1,710)  | (1,715)  | (1,710)  | (1,710) | (1,710) | (1,715)  | (1,710)  | (1,710)  | (1,710) | (1,706)  | (20,530)  |
| (Shortfall)/Surplus before Irrigation | 2,308              | 2,389    | 2,612    | 2,734    | 2,072    | 1,970   | 2,460   | 2,107    | 2,568    | 2,336    | 2,173   | 2,682    | 28,410    |
| Irrigation                            | (6,558)            | (5,401)  | (5,555)  | (5,863)  | (5,786)  | (6,249) | (6,018) | (5,709)  | (5,786)  | (6,403)  | (7,252) | (5,015)  | (71,595)  |
| Unsatisfied Demand                    | (4,250)            | (3,012)  | (2,943)  | (3,129)  | (3,714)  | (4,279) | (3,558) | (3,602)  | (3,218)  | (4,067)  | (5,079) | (2,333)  | (43,185)  |

box 4

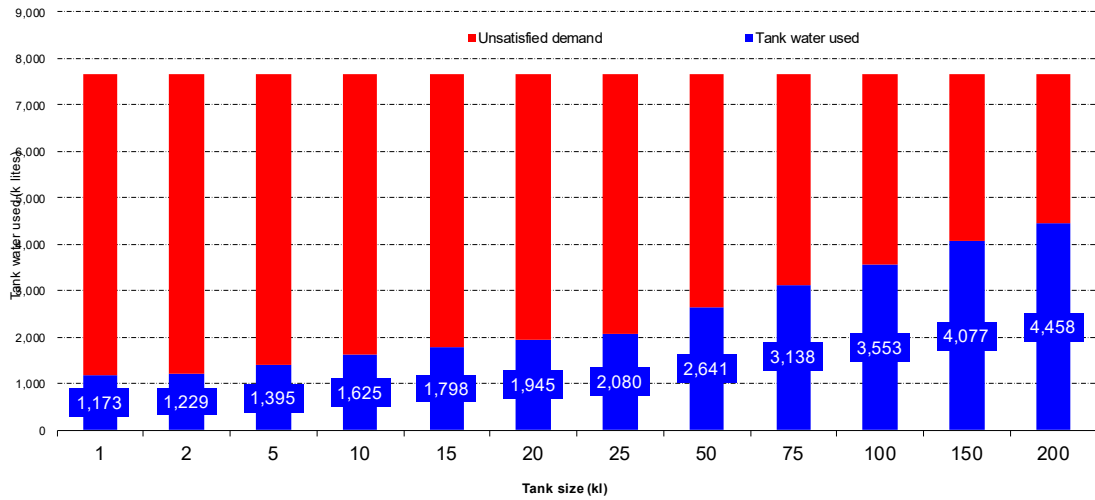
## Reliability of supply (daily demand met)- Tank size what ifs

| Tank | Jan | Feb | Mar | Apr | May | Jun  | Jul | Aug | Sep | Oct | Nov | Dec | Overall |
|------|-----|-----|-----|-----|-----|------|-----|-----|-----|-----|-----|-----|---------|
| 1k   | 13% | 11% | 12% | 20% | 30% | 29%  | 33% | 35% | 26% | 24% | 21% | 16% | 23%     |
| 2k   | 13% | 11% | 12% | 20% | 30% | 30%  | 33% | 35% | 27% | 24% | 21% | 16% | 23%     |
| 5k   | 22% | 20% | 20% | 33% | 46% | 45%  | 51% | 53% | 43% | 39% | 34% | 29% | 36%     |
| 10k  | 27% | 27% | 26% | 44% | 58% | 57%  | 63% | 66% | 54% | 51% | 43% | 39% | 46%     |
| 20k  | 31% | 33% | 30% | 58% | 69% | 70%  | 72% | 74% | 63% | 61% | 51% | 49% | 55%     |
| 50k  | 35% | 37% | 32% | 65% | 75% | 76%  | 74% | 77% | 69% | 68% | 60% | 54% | 60%     |
| 100k | 35% | 37% | 32% | 67% | 86% | 89%  | 87% | 89% | 78% | 78% | 60% | 54% | 66%     |
| 200k | 45% | 49% | 42% | 86% | 96% | 100% | 97% | 98% | 90% | 88% | 71% | 73% | 78%     |

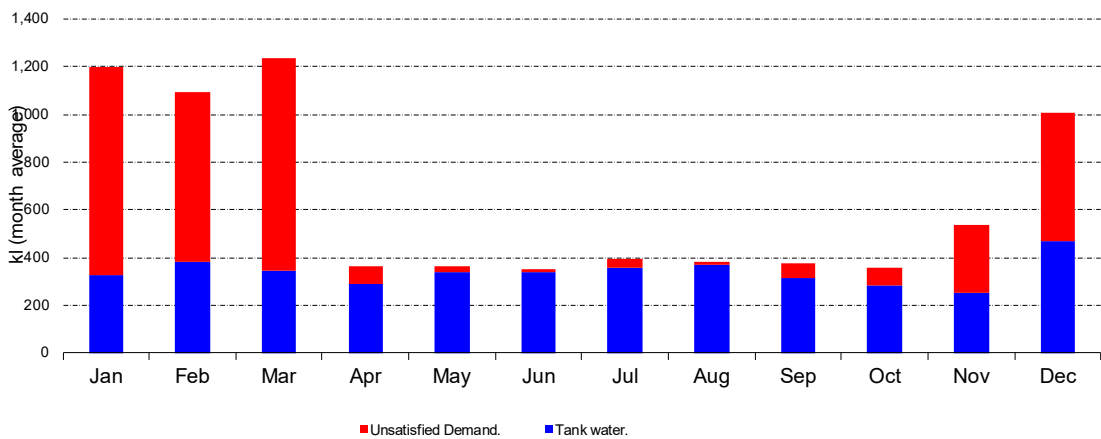
**Graph 2 - Reliability of supply from tank (average across 12 years)**



**Graph 3 -Tank water used (per year) V Tank size  
Kls per year**



**Graph 4 - Tank water used v unsatisfied demand  
by month (kls per month)**



## Appendix D. WSUD Maintenance Manual

### Rainwater Harvesting System Maintenance Program

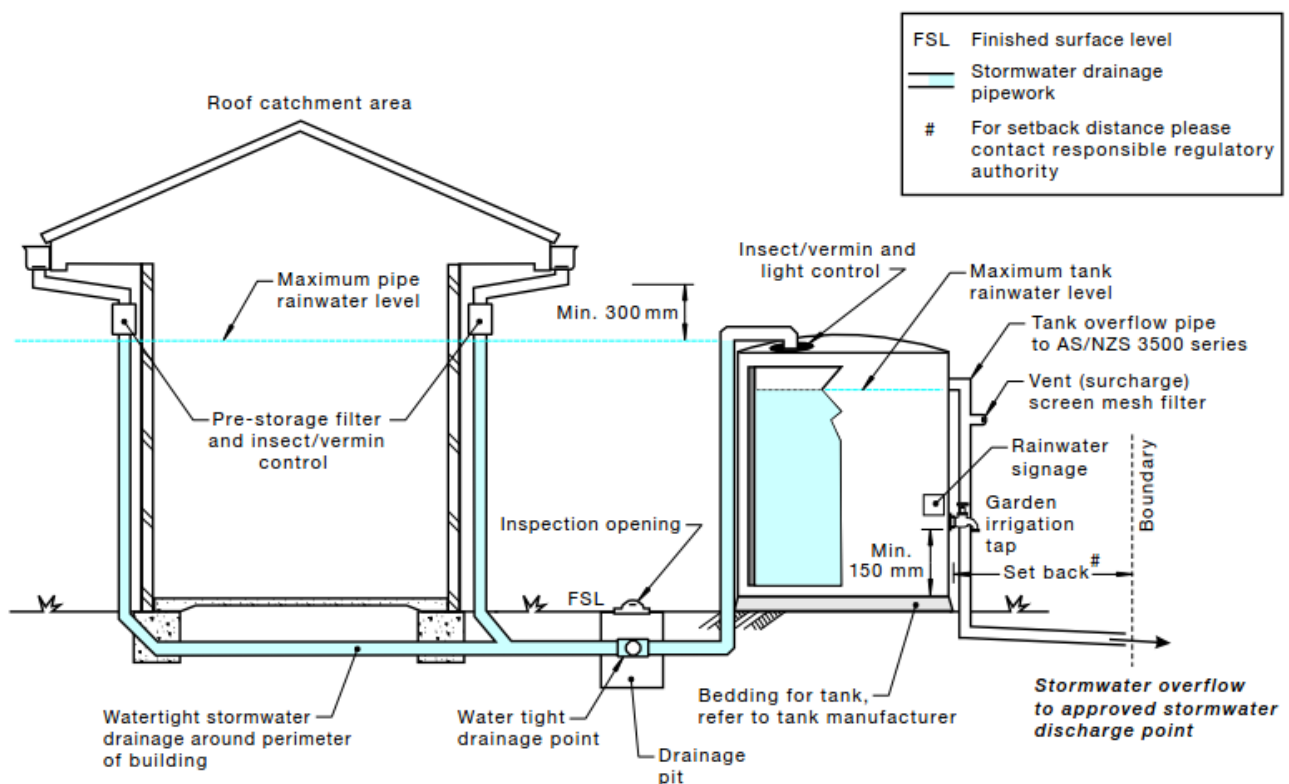
Once installed, a systematic maintenance program will be implemented by the building manager's maintenance contractor to ensure the rainwater harvesting system operates as designed and water quality is maintained.

The scope of the maintenance program will include inspection and rectification of issues associated with:

- Roof gutters and downpipes
- First flush screens and filtration devices
- Pumps
- Distribution pipework and reticulation systems
- Overflow systems

Inspections of the system and any maintenance works required will be undertaken on a quarterly basis or as per manufacturers guidelines.

The rainwater harvesting system will be installed in accordance with the guidelines set out in the Rainwater Design & Installation Handbook published by the National Water Commission<sup>1</sup>. A schematic diagram of the rainwater tank installation is provided below.



<sup>1</sup> Rainwater Design & Installation Handbook, National Water Commission, 2008

### D.1 Maintenance Checklist

| Rainwater Tank Element       | Inspection Item   | Y/N | Likely Maintenance Task  |
|------------------------------|---|-----|--|
| Roof gutters and downpipes   | Is there leaf litter or debris in the gutters?  |     | Remove by hand and dispose responsibly   |
| First flush diverter         | Is there anything blocking the first flush diverter (Leaves etc.)?  |     | Remove by hand and dispose responsibly   |
| Potable mains back up device | Is the potable mains back up switch operating correctly?  |     | Repair or replace device. Consider a manual switching device.                  |
| Mesh cover                   | Has the mesh cover deteriorated or have any holes in it?  |     | Replace mesh cover.  |
| Tank volume                  | Is there large amounts of sediment or debris sitting in the bottom of the tank, reducing the volume available in the tank to store water? |     | Remove sediment and dispose responsibly.                                       |
| Pump                         | Is the pump working effectively? Have you heard it on a regular basis?  |     | Check the potable mains back up is not permanently on. Repair or replace pump. |
| Pipes and taps               | Are pipes and taps leaking?   |     | Repair as needed.  |
| Overflow                     | Is the overflow clear and connected to the storm water network?   |     | Remove blockages and/or restore connections to stormwater network.             |

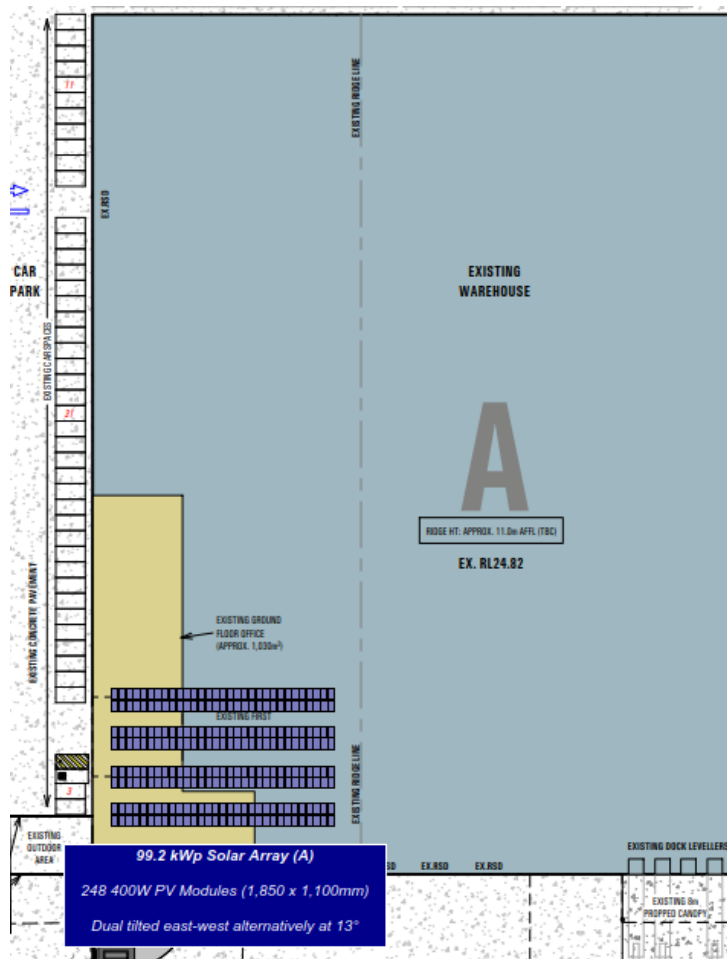
| Maintenance Frequency |     |     |     |     |     |     |     |     |     |     |     |     |
|-----------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|                       | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
| All tasks             | X   |     |     | X   |     |     | X   |     |     | X   |     |     |

## Appendix E. Solar Photovoltaic System

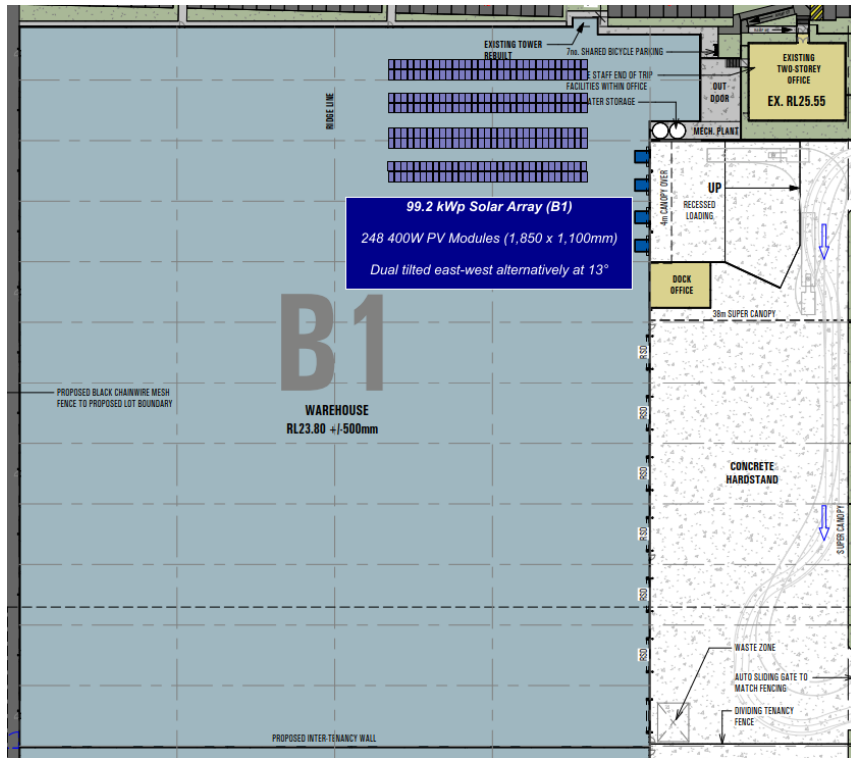
High-efficiency solar PV modules with a total capacity of 99 kWp per warehouse tenancy, will be installed at roof level as per the preliminary layout indicated below.

PV modules will be oriented in pairs to the east and west at 10-15° tilt and have at least 400Wp capacity (i.e. over 33% more efficient than traditional 300Wp 60-cell modules). High-efficiency modules deliver more compact arrays with inherently lower embodied ecological impact per unit of generation than standard efficiency modules.

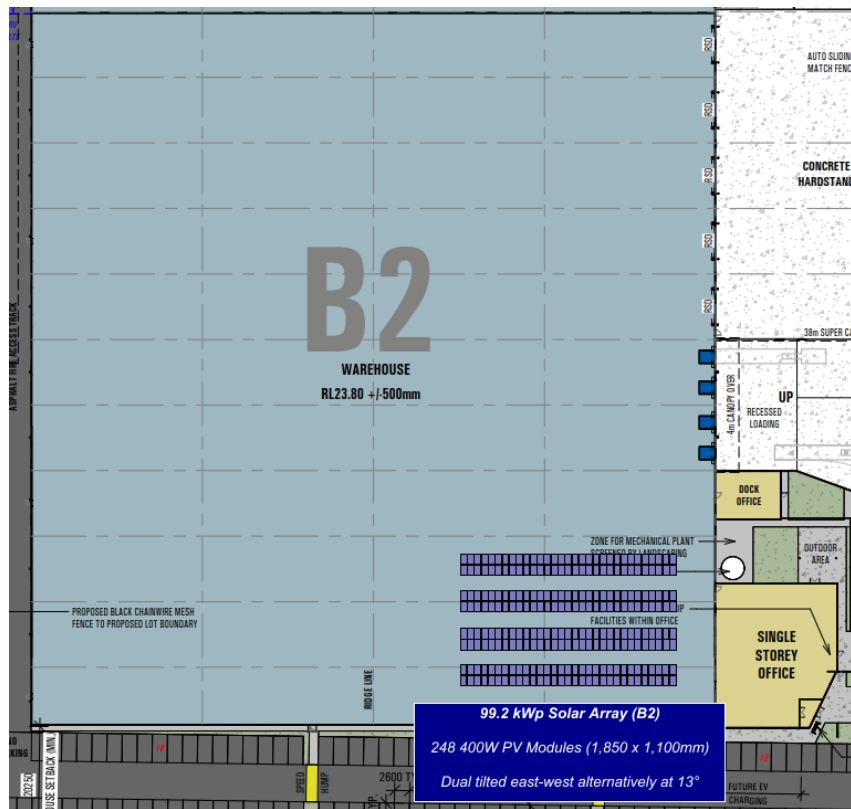
The undulating east-west configuration prevents self-shadowing of the array and provides a low-profile installation with maximised packing factor. It also helps maximise self-consumption due to its flatter and broader power output yield profile.



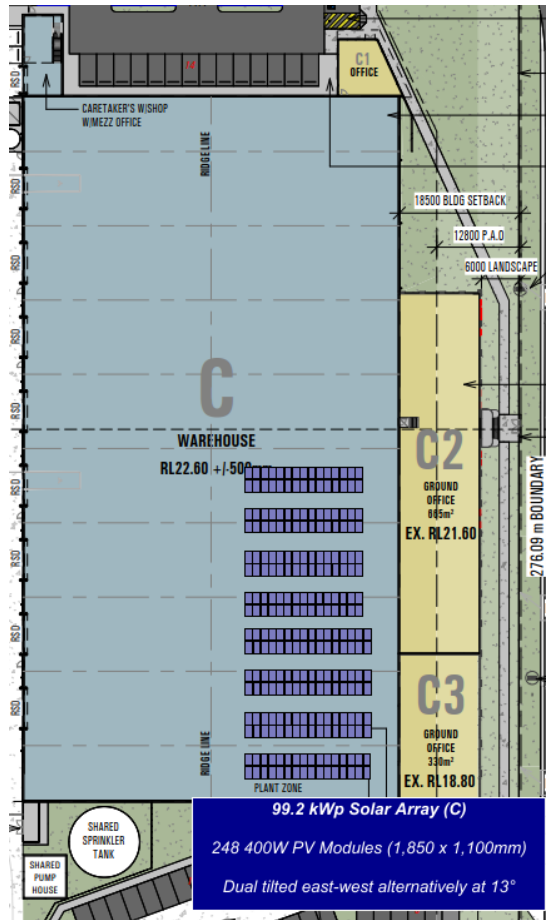
Indicative Solar Photovoltaic array layout - Warehouse A



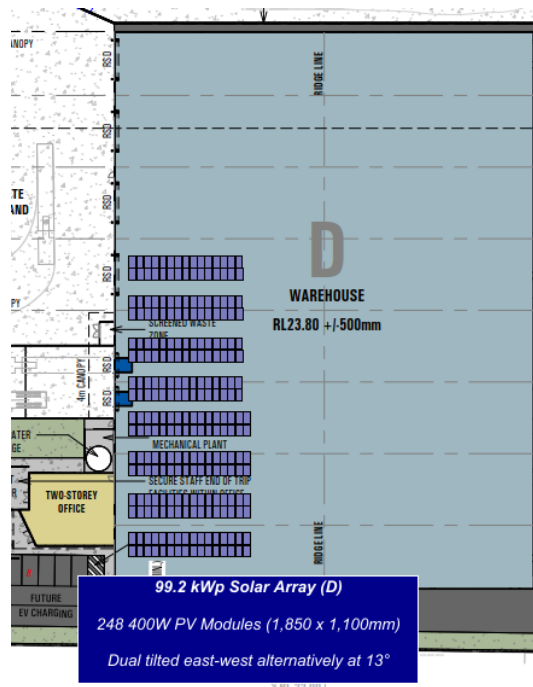
Indicative Solar Photovoltaic array layout - Warehouse B1



Indicative Solar Photovoltaic array layout - Warehouse B2



Indicative Solar Photovoltaic array layout - Warehouse C



Indicative Solar Photovoltaic array layout - Warehouse D

Total yield of this array will be approximately 122 MWh per annum equating to an estimated annual carbon emissions offset of 122 tonnes CO<sub>2-e</sub> per annum, per warehouse.

### Individual East Array Output

#### RESULTS

**60,210 kWh/Year\***

| Month         | Solar Radiation<br>(kWh / m <sup>2</sup> / day) | AC Energy<br>(kWh) |
|---------------|---|--------------------|
| January       | 6.76  | 8,130              |
| February      | 5.96  | 6,546              |
| March         | 4.89  | 5,980              |
| April         | 3.27  | 3,919              |
| May           | 1.99  | 2,520              |
| June          | 1.74  | 2,102              |
| July          | 1.76  | 2,225              |
| August        | 2.56  | 3,269              |
| September     | 3.87  | 4,765              |
| October       | 5.01  | 6,298              |
| November      | 5.36  | 6,487              |
| December      | 6.64  | 7,970              |
| <b>Annual</b> | <b>4.15</b>                                     | <b>60,211</b>      |

#### Location and Station Identification

|                     |                                     |
|---------------------|-------------------------------------|
| Requested Location  | 35-65 Paramount Road, Tottenham VIC |
| Weather Data Source | Lat, Lng: -37.79, 144.86 1.0 mi     |
| Latitude            | 37.79° S                            |
| Longitude           | 144.86° E                           |

#### PV System Specifications

|                     |                   |
|---------------------|-------------------|
| DC System Size      | 49.6 kW           |
| Module Type         | Premium           |
| Array Type          | Fixed (open rack) |
| Array Tilt          | 13°               |
| Array Azimuth       | 97°               |
| System Losses       | 11.42%            |
| Inverter Efficiency | 96%               |
| DC to AC Size Ratio | 1.2               |

#### Performance Metrics

|                 |       |
|-----------------|-------|
| Capacity Factor | 13.9% |
|-----------------|-------|

### Individual West Array Output

#### RESULTS

**61,738 kWh/Year\***

| Month         | Solar Radiation<br>(kWh / m <sup>2</sup> / day) | AC Energy<br>(kWh) |
|---------------|---|--------------------|
| January       | 6.93  | 8,328              |
| February      | 6.13  | 6,713              |
| March         | 5.02  | 6,133              |
| April         | 3.39  | 4,056              |
| May           | 2.08  | 2,625              |
| June          | 1.84  | 2,229              |
| July          | 1.79  | 2,280              |
| August        | 2.68  | 3,416              |
| September     | 4.09  | 5,037              |
| October       | 5.03  | 6,305              |
| November      | 5.53  | 6,670              |
| December      | 6.64  | 7,947              |
| <b>Annual</b> | <b>4.26</b>                                     | <b>61,739</b>      |

#### Location and Station Identification

|                     |                                     |
|---------------------|-------------------------------------|
| Requested Location  | 35-65 Paramount Road, Tottenham VIC |
| Weather Data Source | Lat, Lng: -37.79, 144.86 1.0 mi     |
| Latitude            | 37.79° S                            |
| Longitude           | 144.86° E                           |

#### PV System Specifications

|                     |                   |
|---------------------|-------------------|
| DC System Size      | 49.6 kW           |
| Module Type         | Premium           |
| Array Type          | Fixed (open rack) |
| Array Tilt          | 13°               |
| Array Azimuth       | 277°              |
| System Losses       | 11.42%            |
| Inverter Efficiency | 96%               |
| DC to AC Size Ratio | 1.2               |

#### Performance Metrics

|                 |       |
|-----------------|-------|
| Capacity Factor | 14.2% |
|-----------------|-------|

## Appendix F. Site Management Plan

During the construction phase, the key pollutants at risk of entering the stormwater system include:

- Sediments (soil, sand, gravel and concrete washings); and
- Litter, debris etc.

These pollutants arise from factors such as dirt from construction vehicles, stockpiles located close to surface runoff flow paths, and surface runoff from disturbed areas during earthmoving and construction works. It is therefore important to have measures that either prevent or minimise the pollutant loads entering stormwater system during construction.

In order to mitigate the impacts of the above pollutants on the stormwater system, the following stormwater management strategies will be implemented during the construction phase as appropriate:

- Installation of onsite erosion and sediment control measures. All installed control measures shall be regularly inspected & maintained to ensure their effectiveness. Such measures may include (but not limited to):
  - Silt fences
  - sediment traps
  - hay bales
  - geotextile fabrics
- Where possible, litter bins with a lid will be used to prevent litter from getting blown away and potentially entering stormwater drains.

Additionally, the following work practices shall be adopted to reduce stormwater pollution:

- Site induction by the head contractor/ builder to make personnel aware of stormwater management measures in place
- Employ suitable measures to reduce mud being carried off-site into the roadways such as installing a rumble grid/ gravel/ crushed-rock driveway (or equivalent measure) to provide clean access for delivery vehicles, removing mud from vehicle tyres with a shovel etc.
- Safe handling and storage of chemicals, paints, oils and other elements that could wash off site to prevent them from entering stormwater drains.
- Where practicable, stockpiles will be covered, located within the site's fence and away from the lowest point of the site where surface runoff will drain to. This initiative will minimise erosion.

Accordingly, the measures presented above are considered appropriate for the proposed development at this stage of the project. The measures will reduce the pollutants entering stormwater system from the site during construction works thereby protecting waterways.

Furthermore, the initiatives are consistent with the Application Requirements set out in Clause 22.18 of the City of Maribyrnong Planning Scheme.