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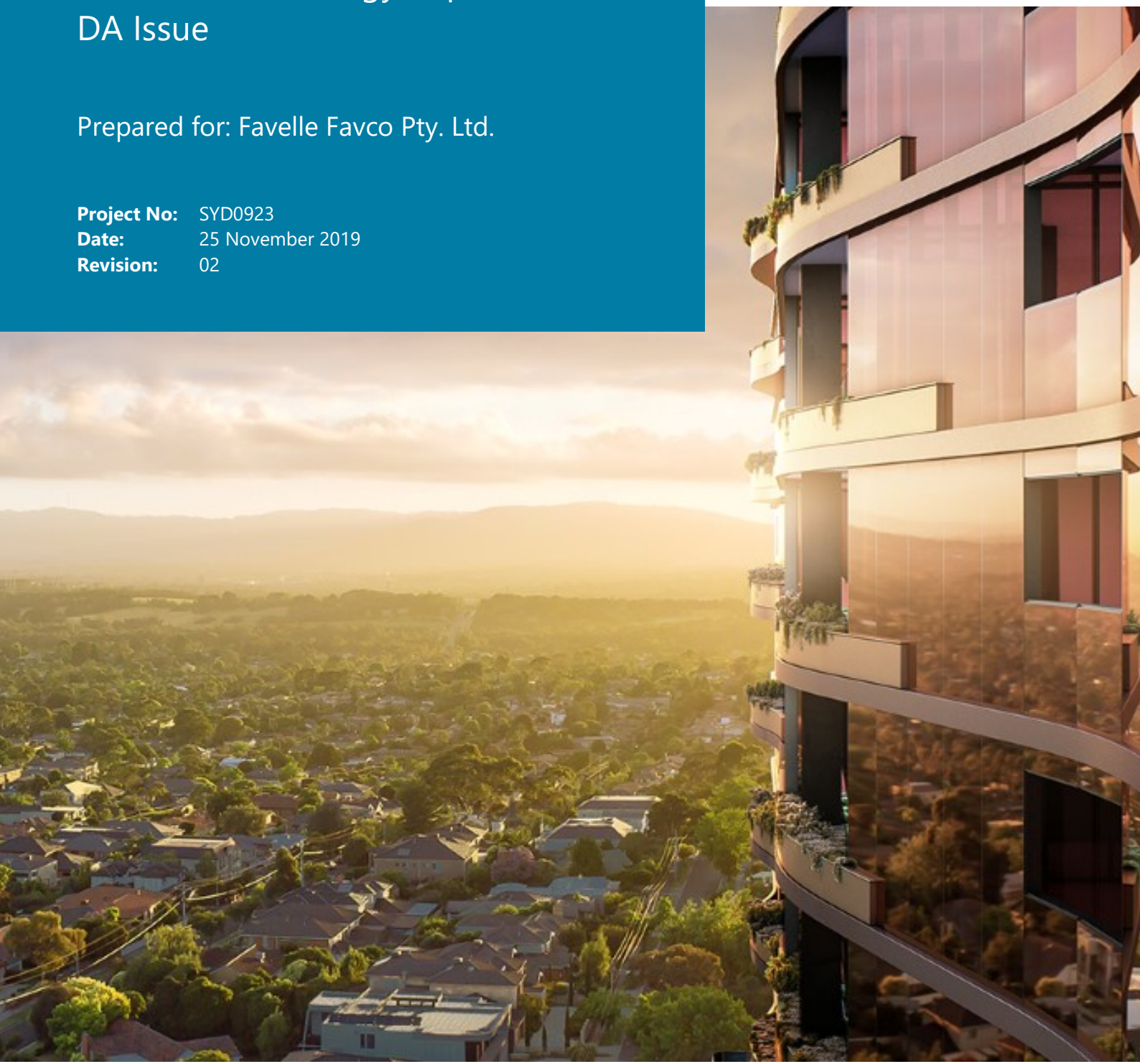
# 28 Yarrunga St, Prestons

## Revised ESD Strategy Report
## DA Issue

Prepared for: Favelle Favco Pty. Ltd.

**Project No:** SYD0923
**Date:** 25 November 2019
**Revision:** 02



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|---|---|
| **Project:** | 28 Yarrunga St, Prestons |
| **Location:** | 28 Yarrunga Street<br>Prestons, NSW, 2170 |
| **Prepared by:** | ADP Consulting Pty Ltd<br>Level 3, 8 Spring Street<br>Sydney NSW 2000 |
| **Project No:** | SYD0923 |
| **Revision:** | 02 |
| **Date:** | 25 November 2019 |

| Rev | Date | Comment | Author | Signature | Technical Review | Signature | Authorisation & QA | Signature |
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| 01 | 14/08/19 | DA Issue | ZN | | DD | | MM | |
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| | |
|---|---|
| **Client** | Favelle Favco Pty. Ltd. |
| **Architect** | Bureau SRH Architecture |

# Contents

# Executive Summary

ADP Consulting have been engaged to provide an ESD Strategy Report for the proposed development at 28 Yarrunga Street, Prestons, NSW 2170.

This ESD Report has identified measures to address Council's DA requirements in accordance with the following framework:

- Liverpool City Council - Local Environmental Plan (LEP) 2008;
- Liverpool City Council – Development Control Plan (DCP) 2008

It is understood that this document is required by Council to progress the projects Development Application (DA).

In order to demonstrate compliance with the above, the following works are intended to be carried out following DA approval and for construction purposes;

- Improvement on minimum compliance requirements either through building code or council requirements, where possible;
- Review of the architectural design against the Section J DTS provisions of the NCC 2019 Building Code of Australia.
- Adopt the JV3 alternative verification method to demonstrate that the building can comply with Section J of the NCC 2019. The intent of proposed architectural design will likely be met through a performance-based approach, such as:
  - Identification of a uniform glazing specification in line with the architectural intent of the facades;
  - Trading of various fabric and glazing elements as required to meet the proposed design intent of the building;

The ESD initiatives discussed in this report will be investigated in further detail and developed through the detailed design stages to ensure that the development is compliant with the above frameworks and NCC Section J 2019.

# 1. Introduction

## 1.1 Project Background

This report outlines the key Environmentally Sustainable Design (ESD) initiatives for the proposed development at 28 Yarrunga Street, Prestons, NSW 2170. The scope and systems described in this report cater for these performance requirements and will be further developed through the design stages.

The proposed development will be carried out in two stages, comprising the following:

Table 1 Development Summary

| Stage 1 Development | Stage 2 Development |
|---|---|
| > Warehouse – 2 levels | Warehouse – 2 levels |
| > Office Suites – 3 levels (Ground mezzanine, Level 1 and Level 1 mezzanine) | Office Suites – 3 levels (Ground mezzanine, Level 1 and Level 1 mezzanine) |
| > Loading dock and dock offices | Dock offices |
| > Landscaped areas | Basement carparking spaces |

The ESD Report is intended to form part of the overarching ESD Strategy in line with the following planning controls:

> Liverpool City Council - Local Environmental Plan (LEP) 2008;

> Liverpool City Council – Development Control Plan (DCP) 2008

It is understood that this document is required by Council to progress the projects Development Application (DA).

## 1.2 Report Scope and Limitations

The scope of this report includes a high-level assessment of the energy and water efficiency requirements for the development to comply with the local Council's DA framework, including:

> Design review against the Section J DTS provisions of the NCC 2019 Building Code of Australia (BCA);

> Other ESD measures adopted for the site, including (but not limited to) renewables and passive design principles.

## 1.3 Liverpool DCP 2008

Based on a review of the projects current architectural scheme (proposed for DA), we propose the following sustainability measures for consideration. These strategies are intended to support the architectural intent, reduce the environmental impacts of the development, and maximise occupant comfort within the proposed office spaces.

We have considered the following areas of sustainability:

- Energy efficiency and Greenhouse Gas (GHG) emissions;
- Water efficiency and conservation.

The ESD principles for the development have been selected to meet the objectives of Section 22 - 23 of the Liverpool DCP 2008. The ESD principles include:

- Reduction of greenhouse gas emissions through energy efficient measures;
- Reduction of potable water use through water efficient measures;
- On-site electricity generation using Solar Photovoltaics (PV);
- Climate change adaptation and resilience;
- Indoor Environment Quality (where applicable to occupies zones i.e. office spaces);
- Life Cycle Analysis and Sustainable Materials;
- BCA Section J compliance.

## 1.4 Site Location

The site location is shown in Figure 1 below within the Prestons Industrial Area, NSW.

Figure 1 Site Location Plan (source: Six Maps)

The building is located within Zone 6 as per the Australian Building Codes Board (ABCB) Climate Zone map (refer to Figure 2) and has been classified as mixed use NCC Building Class 5 (Office), Class 7a (Parking), and Class 7b (Warehouse).

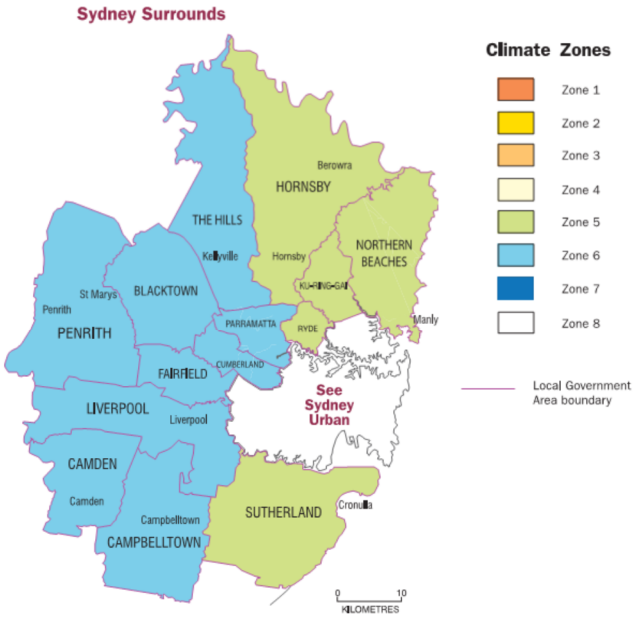


Figure 2 ABCB Climate Zone

# 2. Water Conservation

## 2.1 General

This section outlines the water conservation design measures in line with Section 22 of the Liverpool City Council DCP, and additional opportunities that are to be considered during the Detailed Design Stage.

The extent of the building design can contribute to environmental sustainability by integrating measures for improved water quality and efficiency. Water can be conserved in several ways, including; reducing water demand from the mains and re-using water, which would otherwise be lost as run-off or wastewater.

All mains water is treated to drinking water standard. However, only about 1% of domestic water consumption is used for drinking. Uses such as toilet flushing, laundry and outdoor uses do not require water to be treated to such a high standard. Such uses can be satisfactorily supplied using non-potable water supplied from the non-potable water main. Benefits include significant water cost savings and substantial reductions in potable water usage.

## 2.2 Design Measures and Opportunities

The use of potable water can be minimised through the following design measures:

- Consideration of separate pipework for the utilisation of recycled stormwater for non-potable purposes;
- Stormwater runoff control, capture and reuse, including water quality management in accordance with Council guidelines;
- Select water efficient plants and/or, indigenous vegetation for landscape in accordance with Council's recommendations;
- A reduction in potable water use, through the installation of highly efficient fittings and fixtures. To prevent water waste, potable water flows will be reduced in line with WELS certified taps, shower heads, and toilets;
- The selection of highly efficient whitegoods (such as dishwashers) for use in the office spaces, in line with an efficient WELS star rating.

# 3. Energy Conservation

## 3.1 General

This section outlines the energy conservation design measures in line with Section 23 of the Liverpool City Council DCP, and additional opportunities that are to be considered during the Detailed Design Stage.

The Building will be designed in line with the NCC 2019 Section J Energy Efficiency provisions and will consider an optimised façade performance. The heating, ventilation, and air-conditioning system will be developed with a view to minimise the operational energy consumption of the proposed development, whilst providing the building occupants with a thermally comfortable space.

## 3.2 Design Measures and Opportunities

The production of greenhouse gas emissions can be minimised through the following design measures:

**High Performance Building Fabric**

- Provision of high-performance double-glazing, with a thermally broken frame to account for the proposed glazing elements;
- Provision of appropriately angled shading fins to the western and eastern façade for protection from the solar irradiance experienced from the low angle winter sun;
- Provision for high levels of insulation to the external walls, roof, and exposed floorings that form part of the building envelope;
- Encourage passive solar design and maximise natural light to reduce reliance on artificial lighting.

**Efficient Heating, Ventilation, and Air Conditioning (HVAC) Design**

- A highly efficient central HVAC plat will be provided for heating and cooling throughout the building, incorporating;
  - Highly efficient water-cooled chillers configured for optimum performance;
  - Outside air will be provided to all occupied spaces and will explore opportunities to provide between 25% - 50% more fresh air to occupants, optimising their indoor health and wellbeing. Outside air flow rates can be monitored by the building control system and $CO_2$ sensors will be provided.
  - Heat-recovery ventilation to pre-heat cold air in winter and offset heating loads.

The utilisation of $CO_2$ sensors is intended to control the amount of outside air supplied by air handling units to space with variable occupancy. Where $CO_2$ levels are lower than the set point, the volume of outside air is reduced. Energy saving is achieved through avoiding unnecessary conditioning of high outside air volumes.

Economy cycle operation of air handling units will be provided, using outside air directly for space cooling (when outdoor ambient temperatures are favourable). This is intended to reduce energy consumption through minimising the operation of the HVAC system.

# 4. Energy Efficiency

The Project will explore opportunities to deliver the following sustainability initiatives:

## 4.1 Solar Energy Generation & Battery Storage

On-site solar photovoltaic (PV) generation will be explored as an effective method of producing zero greenhouse gas emission energy. This will help to minimise the developments electricity consumption from the grid. The developments large, unobstructed roof area can utilise on-site energy generation to completely offset their energy usage, or positively produce energy back into the electricity grid for credit. We will explore opportunities for the integration of battery storage options into the developments Solar PV design to further offset the developments electricity consumption and associated costs as the energy stored in the batteries can be used when its energy demand exceeds its energy output.

## 4.2 Passive Cooling & Indoor Air Quality

Natural ventilation will be considered during the design phase of a project, as it can drastically reduce the amount of energy required for cooling while at the same time helping to improve the indoor air quality. Natural cross ventilation can be achieved by having windows on more than one aspect of the building with direct exposure to prevailing winds, or windows that open to notably different pressure regions. Limiting the number of fixed windows and considering the warehouse/office layout and depth can have also have a significant effect on natural ventilation.

## 4.3 Daylight & Shading

Daylighting initiatives will support the benefits and impacts of natural light and solar gains. This includes considering indoor environmental quality, glare discomfort, energy savings (reduction in artificial lighting) and energy costs (associated with increased cooling). Access to natural daylight should be taken advantage of where possible, and appropriate shading devices and glazing selections will need to be considered to minimise the negative daylighting impacts on the space. Incorporating solar shade structures can dramatically reduce the radiant temperature of a space, improving thermal comfort levels and reducing the energy required to cool the space. It can also increase the usability of the space in periods of significant heat.

## 4.4 Energy Efficient Lighting

The lighting design will consider high efficiency LED lighting to provide adequate lighting levels with minimum energy expenditure. Careful consideration should be made to the design of daylight controls so that artificial lighting can be adjusted easily in response to daylight levels without causing undesirable switching effects or interactions. The use of sensors will ensure back of house and outdoor lighting is automatically switched off when not required, while whole of life considerations such as maintenance costs and access should also be considered.

# 5. Conclusions and Recommendations

This ESD Report has identified the measures for addressing Liverpool Council's DA requirements in accordance with the legislation and framework outlined in Section 1.

In order to demonstrate compliance with the above, the following works are recommended to be carried out following DA approval;

- Improvement on minimum compliance requirements either through building code or council requirements, where possible;
- Review of the architectural design against the Section J DTS provisions of the NCC 2019 Building Code of Australia.
- Adopt the JV3 alternative verification method to demonstrate that the building can comply with Section J of the NCC 2019. The intent of proposed architectural design will likely be met through a performance-based approach, such as:
  - Identification of a uniform glazing specification in line with the architectural intent of the facades;
  - Trading of various fabric and glazing elements as required to meet the proposed design intent of the building.
  - Further developing the initiatives outlined in this report.

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