Frasers Property Australia Pty Limited
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HORSLEY DRIVE BUSINESS PARK

Two Staged Speculative Warehouse/Industrial Facility

PROPOSED LOT 3 IN Lot 5 DP1212087

Burilda Close, Wetherill Park

REPORT ON ECOLOGICALLY SUSTAINABLE DEVELOPMENT & ENERGY EFFICIENCY

SSD 7917

ESD & Energy Efficiency Report V1 dated 4 October 2016

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Introduction

This report has been prepared to respond to the NSW Planning and Environment, State Significant Development – Secretary's Environmental Assessment Requirements (SSD 7917). The report includes an assessment of how the development will incorporate ecologically sustainable development principles in all phases of the development and Energy Efficiency.

Ecologically Sustainable Development & Energy Efficiency approach

The warehouse/industrial and office facilities will include a number of features that will reduce outgoings related to electricity, water and maintenance costs as well as providing an environment that contributes to improved worker health and comfort and minimises its environmental impact.

These initiatives contribute to the facility targeting a 6 star rating under the Green Building Council of Australia's Green Star Design and As Built v1 tool. This rating represents World Leadership in environmentally sustainable design and will ensure that property remains competitive against newer properties as electricity, carbon and water costs continue to rise.

Key sustainability features that will be incorporated to achieve the 6 star Green Star Design & As Built rating are outlined below.

Design initiatives

A range of initiatives are incorporated into the design and construction of the proposed facility as outlined below.

Energy efficiency & carbon reduction

- LED highbay lighting to all warehouse and office areas.
- Solar PV system to generate renewable energy for use on site.
- Geothermal or high efficiency office heating, ventilation and air conditioning system
- Ground or air source heat pump hot water system.
- 10% translucent roof sheeting to warehouse will provide high levels of daylight.
- Electricity sub-metering to allow for monitoring, management and reporting of building performance.

Water conservation & management

- High efficiency water fittings (4 to 6 star WELS rating).
- Rainwater harvesting for use in toilet flushing and irrigation.
- Fire sprinkler test water recycling into existing fire sprinkler or rainwater tanks.
- Drought resistant landscaping installed for water saving & facility long-term amenity.
- Water sub-metering to allow for monitoring, management and reporting of building performance.
- Stormwater treatment system to improve quality of runoff.

Waste recycling & materials

- A dedicated waste recycling facility to facilitate waste recycling during operation.
- Use of reduced environmental materials – certified timber and steel, best practice PVC.
- Full life cycle analysis to understand key building material and design impacts and identify areas for further improvement.
- Fibre cement warehouse slab achieving significant reductions in concrete and steel.
- Environmentally certified carpet tiles in office areas.

Health and comfort

- 10% translucent roof sheeting to warehouse will provide high levels of daylight.
- Increased outside air rates to office areas.
- Increased insulation and glazing performance to office areas.
- Daylight glare control and thermal control with internal roller blinds to offices and fixed shading.
- Non-toxic paints, adhesives, sealants and MDF.

Construction stage

During the construction stage the following key initiatives will minimise environmental impacts and also facilitate a more efficient operating building.

- Implementation of best practice ISO14001 certified environmental management plan to minimise environmental impacts during construction.
- Site wide construction waste strategy – to reduce waste generation and increase recycling rates above 90%.
- Engagement of an independent commissioning agent to manage the building services commissioning process.

Summary of key initiatives

The following four scenarios are presented to summarise the key initiatives that relate to the sustainability performance of the proposed 6 star Green Star facility in comparison to BCA, 4 star and 5 star Green Star.

	Traditional BCA Compliant	4 star Green Star Best Practice	5 star Green Star Australian Excellence	6 star Green Star World Leadership
Energy				
Building fabric	BCA compliant	BCA compliant	5% improvement on BCA – improved glazing and/or insulation	10% improvement on BCA – double glazing, increased façade & roof insulation
Translucent sheeting	5% of warehouse roof	10% of warehouse roof	10% of warehouse roof	10% of warehouse roof
Hot water system	Electric storage	Heat pump (air source)	Heat pump (air source or geothermal)	Heat pump (air source or geothermal)
Office heating and cooling	DX split reverse cycle AC units	DX split reverse cycle AC units, inverter driven	High efficiency or Geothermal – reverse cycle ducted	High efficiency or Geothermal – reverse cycle ducted
Office outside air	BCA compliant	BCA compliant	50% increase on OA	Min 50% increase on OA
Lighting - Office	T5 or T8 with minimal control	T5 with basic control	LED with individual control	LED with individual control
Lighting - Warehouse	Metal halide with no control	T5HO with basic control	LED with daylight control	LED with daylight control
Lighting - External	Metal halide	Metal halide	Metal Halide or LED with time clock control	LED with time clock control
Renewable energy	None1	None	None	Solar PV system (100kW)
Energy storage	None	None	None	Customer dependant
Electric vehicles charging	None	None	None	Included
Water				
Water fixtures	Average efficiency – 3 star WELS rated	Min 4 star WELS rated	5 & 6 star WELS rated	5 & 6 star WELS rated
Recycled water	None	Rainwater for irrigation to Council requirements	Rainwater for 80% irrigation & toilet flushing	Rainwater for 80%+ irrigation & toilet flushing
Fire test water recycling	None	Min 80% of fire test water recycled	80% of fire test water recycled	80%+ of fire test water recycled
Other				
Sub-metering	None	Electricity and water with web based monitoring system	Electricity and water with web based monitoring system	Electricity and water with web based monitoring system
Commissioning	None	Minimal	Commissioning manager and plan	Commissioning manager and plan

Operational phase - energy efficiency, greenhouse gas emissions and water savings

Based on the above scenarios and initiatives, the estimated electricity, greenhouse emissions and water usage are shown below.

This indicates that the proposed 6 star Green Star facility will achieve the following savings over and above a BCA compliant facility:

- 69% reduction in electricity usage
- 69% reduction in greenhouse gas emissions from operating energy
- 53% reduction in potable water usage

	Traditional BCA Compliant	4 star Green Star Best Practice	5 star Green Star Australian Excellence	6 star Green Star World Leadership
Usage				
Electricity p.a.	619,410 kWh	478,249 kWh	356,821 kWh	190,701 kWh
Greenhouse emissions p.a.	520,304 kg CO_2	401,729 kg CO_2	299,729 kg CO_2	160,189 kg CO_2
Water p.a.	563 kL	264 kL	264 kL	264 kL

Key modelling operating assumptions for demonstrating savings

- Warehouse operational hours – 6am to 6pm Monday to Friday, 6am to Midday Saturday (66 hours/week).
- Office operational hours – 8am to 6pm, Monday to Friday (50 hours/week).
- Usage for traditional facility is from existing FPA owned facilities.
- Electricity and water use is for typical distribution warehouse and does not include any major process equipment.
- 100% of solar electricity used on site.

Conclusion

As can be seen the proposed approach to be adopted during design, construction and operation will achieve reductions in waste to land fill and will reduce outgoings related to electricity, water and maintenance costs as well as providing an environment that contributes to improved worker health and comfort and minimises its environmental impact.

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