Ecologically Sustainable Development

Lot 14

657-767 Mamre Road, Kemps Creek
Lot 14

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Date
8/11/2022

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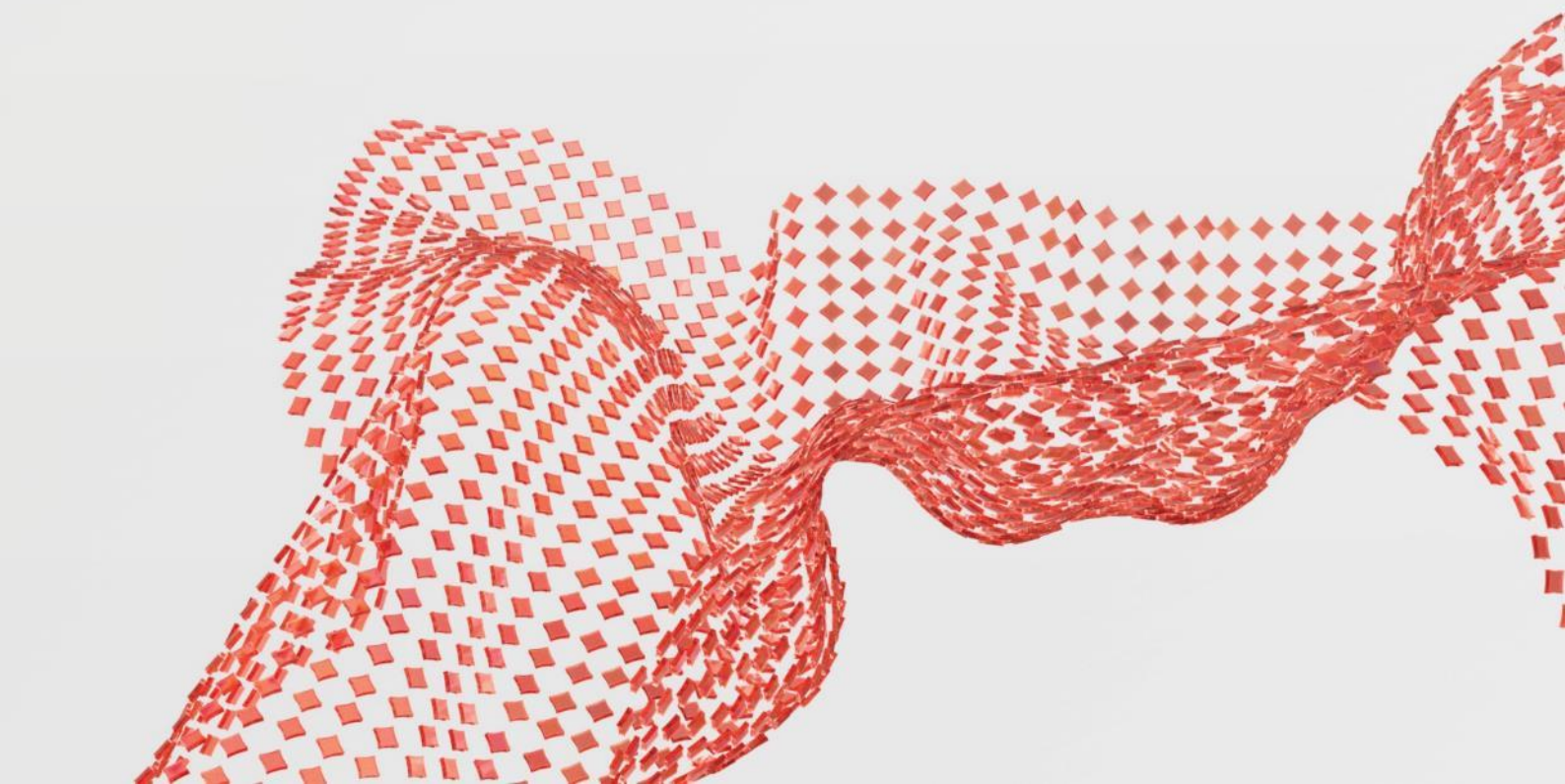

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Document Control

Version	Date	Comment	Prepared By
1	03 May 2022	Issued for Development Application	Andrew Thai
2	08 November 2022	Revised with comments adopted	Andrew Thai
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Executive Summary

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1.0

1.0 Executive Summary

1.1 Introduction

This Ecologically Sustainable Development (ESD) Report has been prepared by Frasers Property Industrial Construction Pty Limited (Frasers Property) and Altis Property Partners (Altis). The identified portion of the land, that is the subject of this ESD report currently defined as Lot 14, 657-767 Mamre Road, Kemps Creek. The Site forms part of the broader estate (known as The Yards), that was approved under SSD 9522 in December 2020, for the purpose of Warehouse, Logistics and Industrial Facilities. Under SSD 9522 MOD2, the proposed allotment is notated as Lot 10.

The proposed development aims be a leader in sustainable design by seeking independent third-party certification against Green Star with a 6-star rating from the Green Building Council of Australia.

The Mamre Road Precinct Development Control Plan 2021 includes the following controls relating to this development application

DCP ITEM	Section in Report
4.2.5 Building Design • Developments with a construction cost of $1 million or more are to demonstrate a commitment to achieving no less than 4 stars under Green Star or 4.5 stars under the Australian Building Greenhouse Rating system (now part of the National Australian Built Environment Rating System (NABERS)).	• Section 1.4 – Green Star Certification
4.2.5 Building Design • Control 18: Development applications shall demonstrate Ecological Sustainable Design (ESD) measures have been incorporated into the design, including a consideration of: – Building and window orientation; – Window size and glass type; – Material, colour and surface treatments (note control 19 in relation to roof colour); – Insulation; – Landscaping and trees to provide shade and moderate the building microclimate; – Natural ventilation and light with generous, all weather openings; – Utilise extensive roof areas for energy and water collection; – Air flow, ventilation and building morphology to support cooling; and – Circular economy in the design, construction and operation of buildings, public domain, infrastructure, and energy, water and waste systems.	• Section 1.3 – Sustainable Design Strategies • Section 1.5 – Urban Heat Island • Section 2 – Energy Efficiency • Section 3 – Greenhouse Gas Emissions Section 4 – Water Efficiency
• Control 19: Light coloured materials should be used in roof construction to reduce the urban heat effect.	• Section 1.5 – Urban Heat Island
• Control 20: Building services, excluding manufacturing plant and operations, should promote: – Separate metering of water and electricity for multiple uses or tenants; – Shut-off valves at stormwater outlets to trap toxic spills; – Waterless urinals; – Energy efficient lighting; – Gas boosted solar hot water for staff amenities (kitchen, toilets, showers); – Rainwater and recycled water for toilet flushing, irrigation or other non-potable uses; – Waste heat recovery systems; – Integrated systems for energy generation – waste and water; – Air-cooled systems, ground source heat rejection or pond heat rejection; and – Energy storage systems combined with the use of photo voltaic cells for roof areas.	• Section 1.3 – Sustainable Design Strategies • Section 2 – Energy Efficiency • Section 4 – Water Efficiency
• Control 20: Measures to improve air quality and visual and thermal comfort to be considered include: – Low VOC paints and low-formaldehyde floor covering, adhesives and furniture; – Glazed facades to be shaded and/or use performance glass to control radiant heat; – Occupant control of comfort parameters (e.g. operable windows, control of air flow); – Protection from noise (e.g. open windows or between production and office areas); – Provision of quality landscaped outdoor amenity areas for staff; – Hydronic heating and ceiling fans; and – Materials with low reflectance values.	• Section 1.3 – Sustainable Design Strategies • Section 1.5 – Urban Heat Island

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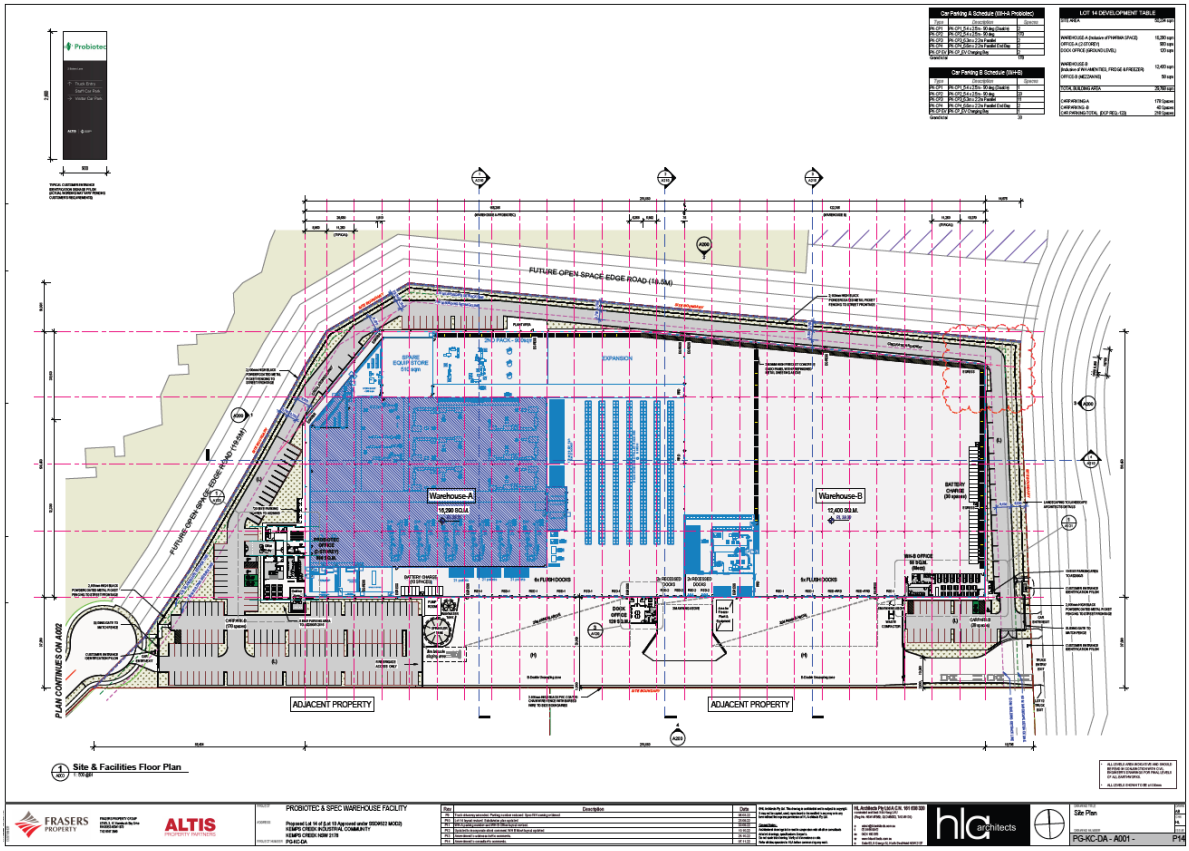
1.2 Development Summary

The Proposed Development seeks development consent for the construction, fit-out and operation of a warehouse and distribution buildings. An indicative layout of the proposed development and location of Lot 14 is illustrated in Figure 1.

Figure 1: Site Layout for Proposed Development (Frasers Property & Altis 2022)



1.3 Sustainable Design Strategies

This section addresses in general, the key issues of Ecologically Sustainable Development (ESD) as it relates to the Proposed Development. There are opportunities to achieve ESD with the whole development. Also, there are areas for consideration and recommendations (identified in Table 1 below) that apply to individual buildings.

Table 1: Summary of Sustainable Design Strategies

Theme	Recommendations
Transport	• To reduce the reliance on private vehicles and relieve any traffic pressures on nearby roads and local communities, the following approaches should be investigated: • Secure bicycle parking facilities. • Extension of existing bus routes or the provision of a regular bus service from the Project to nearby public transport facilities. • Promote car-pooling/car-sharing initiatives.
Stormwater	• Develop a stormwater management plan that incorporates water sensitive urban design (WSUD) such as: • Infiltration trenches and bio retention basins. • Bioswales.

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Theme	Recommendations
	• Rain gardens. • Gross pollutant traps. • Rainwater tanks. • These initiatives reduce the quantity and quality of storm water runoff, protect waterways and ecosystems, minimise drainage infrastructure costs and enhance liveability.
Materials	• Endeavour to use material with minimal carbon dioxide equivalent (CO2e) emissions and embodied energy during the construction and operation of the Project. • All timber products used at the site should be procured from certified sustainably harvested resources. No timber should be specified from rainforest or old growth forest. • Use insulation and refrigerants with zero ozone depleting potential. • Use of all paints, carpets, adhesives and sealants that have low volatile organic compounds (VOCs) during the construction and operation phase. • Use low emission Formaldehyde composite wood products during the development of the Project. • Promote the use of regional or local manufacturers.
Water	• Implement rainwater harvesting techniques to minimise potable water use by using rainwater collected from warehouse and/or office roofs for non-potable uses such as toilet flushing and irrigation. If implemented during the construction stage, rainwater harvesting could be used to mitigate dust generation. • Adopt a landscaping plan that promotes the use of plants that are drought resistant and have low water requirements. • Use water efficient fixtures with high WELS rating. • Timely maintenance of fixtures and fittings.
Indoor Environment Quality	• Consider a design to optimise occupant satisfaction in accessibility, usability, air quality and public space utility by adopting a high level of indoor environmental quality. This can be achieved by: • Optimising natural light in work environment through clear roof sheeting in the warehouse. • Optimising fresh air ventilation by increase outdoor air into conditioned spaces • Optimising thermal comfort through passive solar design such as insulation, air conditioning, glazing, curtains, external louvers/eves, high performance glass and a reflective roof or ‘cool roof’. • Minimising internal noise transference between warehouse tenants by: • Using noise absorbent fillers to reduce any reverberation. • Installing walls with a high acoustic transmission loss value. • Using door seals. • Installing eco-certified workstations within the office space.
Noise	• Consider a warehouse wall and roofing design that limits internal noise transmission to nearby neighbourhood residences. This can be accomplished by using: • Concrete walls. • Zincalume roofing with insulation. • Door seals.
Energy Efficiency	• Investigate the possible viability of the following energy sources to reduce bought electricity: • Solar panels (photovoltaics) or future proofing building for future installation. • Adopt the use of the air conditioning design features to minimise the associated bought electricity.

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Theme	Recommendations
	• Adopt the use of energy efficient appliances and equipment used within the office and warehouse space.
Waste	• Ensure the bulk earthworks on-site balance cut and fill where possible. • Construction contractor develops and implements a Waste Management Plan.
Land Use and Ecology Impact	• Use indigenous planting appropriate to the area. • Design external lighting to avoid releasing light into the night sky or beyond the site boundary. • Adopt the use of water sensitive urban design (WSUD) described above. • Employ specialist advice to develop an independent ecological report to identify any protected local flora and fauna.

1.4 Green Star Certification

The Proposed Development is committed to delivering 'Australian Excellence' in sustainable buildings, as defined by the Green Building Council of Australia. Every proposed warehouse, logistics and industrial facility within this estate will aim achieve as 6-star Green Star 'Design & As-Built' certification (Australian Excellence).

Green Star is a voluntary sustainability rating system for buildings in Australia. It was launched in 2003 by the Green Building Council of Australia. The Green Star rating system assesses the sustainability of projects, at all stages of the built environment life-cycle. Ratings can be measured and achieved at the planning phase or during the design, construction or fit out phases of building. A Green Star Performance rating will also be pursued for this SSD project during the ongoing operational phase.

The system assesses and rates buildings and fit-outs against a range of environmental categories and aims to encourage leadership in environmentally-sustainable design and construction. The rating will also showcase innovation in sustainable building practices, and deliver superior occupant health, productivity and operational cost savings.

Green Star certification is a formal process in which an independent assessment panel, reviews documentary evidence that a project meets Green Star benchmarks within each credit. The assessment panel awards points, with a Green Star rating, determined by comparing the overall building score against that of the rating scale:

Table 2: Green Star Rating Scheme

Score	Rating	Category
10-19	One Star	Minimum Practice
20-29	Two Star	Average Practice
30-44	Three Star	Good Practice
45-59	Four Star	Best Practice
60-74	Five Star	Australian Excellence
74+	Six Star	World Leadership

Green Star rating tools for building and fit-out design and construction, reward projects that achieve best practice or above. This means that ratings of 1, 2 or 3 are not awarded.

The proposed development is targeting to achieve a 6-star rating, representing world leadership.

1.5 Urban Heat Island

The Proposed Development aims to reduce the urban heat island impact through implementation of external green wall for all entrance foyers, light coloured roofing material (zincalume roofing), provision of solar panels on the roof to absorb solar radiation and convert it into electrical energy and translucent roof sheeting.

Energy Efficiency

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2.0 Energy Efficiency

Energy efficiency is using less energy to achieve the same operational outcomes. In order to achieve a 6-star Green Star rating, a building must achieve an exemplary level of energy efficiency through multiple design aspects.

2.1 Sources of Energy Use

The main sources of energy used in a typical distribution warehouse, include:

- Mechanical ventilation of warehouse and storage areas;
- Air conditioning of office area;
- Internal and external lighting; and
- Office and warehouse equipment

The above constitute around 90% of a typical warehouse facility energy consumption.

2.2 Measures to Improve Energy Efficiency

In order to improve energy efficiency, initiatives such as efficient lighting, air conditioning and on-site renewable energy need to be effectively implemented. These will be considered for every warehouse and office in the Proposed Development. See a full list in Table 3.

Table 3: Summary of Energy Efficiency Measures

Design Aspects	Initiatives for Reference Warehouse	Initiatives for Proposed Warehouse
Ventilation	Use of climate-controlled ventilation in warehouse and mezzanine storage level with high efficiency air package units	Same as Reference Warehouse
Solar Design	Minimum insulation, building sealing and glazing requirements that comply with Section J of the Building Code. There is no consideration on the extent of glazing and the orientation of glazing.	Incorporate passive solar design principles that reduce the air conditioning of office space and mechanical ventilation of warehouse space. This can be accomplished by using: • Limited glass on east and west facing office walls. • Enhanced glazing, such as high solar performance insulated glazing units. • Block-out curtains on the interior of office windows. • Plant deciduous trees on east and west facing office walls to disperse direct sunlight during summer and promote sunlight in winter. • Use a highly reflective roof or 'cool roof' to decrease internal thermal fluctuations. • Wall insulation for office space.
Energy Sources	All electric storage hot water heating and no consideration for solar panels.	Investigate the viability of the following energy sources to reduce bought electricity: • Solar water heating or high efficiency electric heat pump • Solar panels (photovoltaics) or future proofing building for future
Air Conditioning Design	Standard air conditioning equipment efficiency. No energy sub-metering and energy monitoring and tracking platform.	Adopt the use of the following air conditioning design features to minimise the associated bought electricity. This can be achieved through implementing: • Energy efficient air conditioning equipment.

2.0 Energy Efficiency

Design Aspects	Initiatives for Reference Warehouse	Initiatives for Proposed Warehouse
		• Energy sub metering that is linked to tracking and monitoring systems to allow for self- assessment, problem solving and ongoing improvements during operations. • Independent units being installed in board rooms and server rooms to deal with differing loads and operating hours within the office building. • Separate operating systems for separate areas with different occupancy periods. • Ensure temperature sensors are located in areas that avoid direct solar gain or heat transfer through walls. • Adequately insulated pipework and ductwork to avoid further loads on air conditioning. • Regular tuning and maintenance of the system to allow the system to function as per its original energy efficient intent.
Lighting	Standard fluorescent tubes for lighting	Use LED lighting strategies with advanced controls systems to dim or turn off lights when not in use.
Appliances and Equipment	No control over the energy efficiency of appliances and equipment installed.	Adopt the use of energy efficient appliances and equipment used within the office and warehouse space.

Greenhouse Gas Emissions

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3.0 Greenhouse Gas Emissions

3.1 Relevant Legislation and Standards

The main legislation governing Greenhouse Gas Emissions is National Greenhouse and Energy Reporting Act 2007. The National Carbon Offset Standard has also been developed by the Australian Government to provide guidance for Corporations to offset their Greenhouse Gas Emissions.

3.1.1 NATIONAL GREENHOUSE AND ENERGY REPORTING FRAMEWORK

The National Greenhouse and Energy Reporting Act 2007 establishes a mandatory obligation on Corporations which exceed defined thresholds to report their Greenhouse Gas Emissions (GHG); energy consumption and energy production.

Corporate and facility reporting thresholds for GHG emissions and energy consumption (or energy production) are provided in Table 4. As Table 4 shows, the emissions are measured in terms of tonnes of CO2-e (t.CO2-e). Emissions are normalised to their equivalent Global Warming Potential (GWP) of CO2.

Table 4: NGER reporting thresholds (Source: DCCEE, 2007)

Corporate Threshold		Facility Threshold	
GHG Emissions (Scope 1&2)	Energy Usage	GHG Emissions (Scope 1&2)	Energy Usage
50,000 t.CO2-e	200 TJ	25,000 t.CO2-e	100 TJ

If a Corporation has operational control over facilities whose GHG emissions or energy use in a given reporting year:

- individually exceed the relevant facilities threshold; or
- when combined with other facilities under the corporation's operational control, exceed relevant corporate thresholds, that Corporation must report its GHG emissions or energy use for that year under the NGER Act.

This may include the Project's lessee-company, construction or other contractors.

It is anticipated that during construction, there will be multiple parties with operational control over different aspects of the site development. For this reason, while it is anticipated that there may be some reporting requirement under the NGER scheme, this is likely to be apportioned across the NGER reporting corresponding to several Corporations. Once operational, the Project could have combined Scope 1 and Scope 2 emissions greater than 25,000 tonnes CO2-e in a financial year. If this is the case, the reporting of emissions is expected to be required under the NGER scheme.

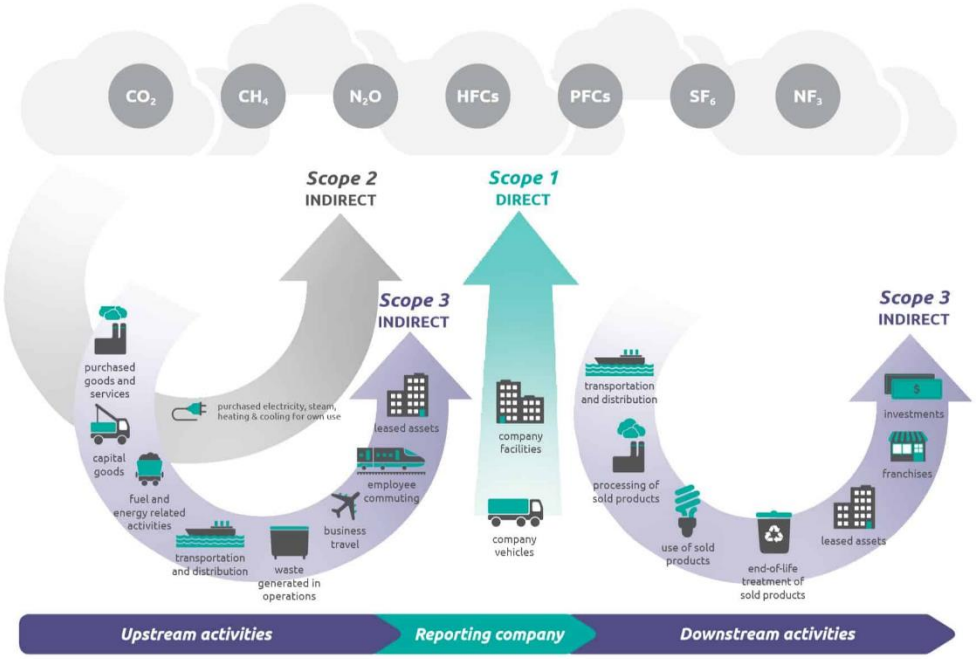
3.2 Sources for Greenhouse Gas Emissions

The Greenhouse Gas Protocol (WRI & WBCSD, 2004) establishes an international standard for accounting and reporting of greenhouse gas emissions. The Greenhouse Gas Protocol has been adopted by the International Organization for Standardization, endorsed by greenhouse gas initiatives (such as the Carbon Disclosure Project) and is compatible with existing greenhouse gas trading schemes.

Under this protocol, three "scopes" of emissions (scope 1, scope 2 and scope 3) are defined for greenhouse gas accounting and reporting purposes. This terminology has been adopted in Australian greenhouse gas reporting and measurement methods and has been employed in this assessment. Figure 3 below, is a visual representation of potential sources of Greenhouse Gas Emissions. The definitions for scope 1, scope 2 and scope 3 emissions are provided in the following sections.

3.0 Greenhouse Gas Emissions

Figure 2: Overview of Scopes and Emissions across a reporting Entity. Source: WRI & WBC SD 2004



3.2.1 SCOPE 1: DIRECT EMISSIONS

Direct greenhouse gas emissions are defined as emissions that occur from sources owned or controlled by the reporting entity. For the Project, direct greenhouse gas emissions primarily result from sources below.

- Contractor-owned vehicles used during the construction of the Project.
- Tenant-owned vehicles used during the operation of the Project.
- Operator-owned vehicles used during the operation of the Project.
- Carbon sequestered within cleared vegetation.
- Project facilities (not including electricity).
- Back-up power generators (if relevant).

3.2.2 SCOPE 2: INDIRECT EMISSIONS

Scope 2 emissions are indirect greenhouse gas emissions from the generation of purchased energy by the Project. Scope 2 in relation to the Project covers purchased electricity, defined as electricity that is purchased or otherwise brought into the organisational boundary of the entity. Scope 2 emissions physically occur at the facility that generates the electricity, rather than the facility that uses the electricity. Therefore, they are often referred to as indirect greenhouse gas emissions.

3.2.3 SCOPE 3: OTHER INDIRECT EMISSIONS5

Scope 3 emissions are defined as those emissions that are a consequence of the activities of an entity, but which arise from sources not owned or controlled by that entity. For the Project, other indirect greenhouse gas emissions primarily result from sources below.

- Privately owned vehicles travelling to and from the Project site during the construction and operational phase.
- Tenants' employee business travel.
- Taxis to and from the Project.
- Public transport serving the Project.
- Off-site waste disposal.

3.0 Greenhouse Gas Emissions

The Greenhouse Gas Protocol allows optional reporting of scope 3 emissions. If an organisation believes that scope 3 emissions are a significant component of the total emissions inventory, these can be reported along with scope 1 and scope 2 emissions. However, the Greenhouse Gas Protocol notes that reporting scope 3 emissions can result in double counting of emissions and can also make comparisons between organisations and/or products difficult (because reporting is voluntary). Double counting needs to be avoided when compiling national (country) inventories under international agreements such as the Kyoto Protocol. The Greenhouse Gas Protocol also recognises that compliance regimes are more likely to focus on the "point of release" of emissions (i.e., direct emissions) and/or indirect emissions from the purchase of electricity.

In this regard, it is noted that the National Greenhouse and Energy Reporting scheme applies only to scope 1 and scope 2 emissions (DCCEE, 2007).

3.3 Measures to Reduce Greenhouse Gas Emissions

To reduce Greenhouse Gas Emissions, the following approach will be applied to the Proposed Development:

1. Design for reduced emissions which includes the selection of lower greenhouse gas intensive building materials;
2. Design for improved energy efficiency (refer to Section 2) to minimise greenhouse gas emissions through operations; and
3. Purchase certified carbon offsets.

Table 5 outlines measures, based on scope of emission, which will be considered for every warehouse in the Proposed Development to reduce Greenhouse Gas Emissions.

Table 5: Summary of Greenhouse Gas Mitigation Measures

Scope	Recommendations
1	Support the education of contractor owned vehicle drivers in techniques to conserve fuel during the construction phase e.g. implement a no-idling policy.
	Support alternatively fuelled and 'modernised' tenant owned equipment and vehicles used during the operational phase – including compressed natural gas, hydrogen, electric, compressed air and hybrid vehicles.
	Support tenant management procedures that consider the reduction of fuel use as far as practical during the operation phase.
	Make use of renewable energy sources where practical for the generation, use or purchase of electricity, heating and cooling.
	Install tenant energy sub-metering systems.
2	Design energy efficient buildings to meet national / international benchmarking schemes (e.g. 6-star Green Star ratings).
3	Support the use of the low emission vehicles to and from the proposed Project, including the provision of recharging stations priority queuing and parking.
	Develop an integrated solid waste management plan to implement waste saving initiatives such as composting and recycling.

Water

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4.0 Water

4.1 Potable Water Demand

The water demand was assessed based on the “Average Daily Water Use by Property Type”, a Sydney Water publication (Sydney Water, 2015). This document provides guidance on potable water demand based on floor areas that are generated from a development. This document is supported by studies that Sydney Water has undertaken to determine a realistic assessment of the average water demand.

The values presented in Table 6 show how an average daily water demand of 85.7 kL/day for the site was derived.

Table 6: Potable Water Demand

Space type	Average daily demand	Floor area	Average daily demand
Industrial – Warehousing	2.82 L/m²/day	30,000 m²	84.6 kL/day
Commercial – Office	2.27 L/m²/day	465 m²	1.1 kL/day
		Total	85.7

4.2 Measures to Reduce Potable Water Demand

As presented in the sustainable design strategies (refer to Table 1) rainwater harvesting techniques will be implemented to minimise potable water use by using rainwater collected from warehouse and/or office roofs for non-potable uses such as toilet flushing and irrigation. The design plans show water tanks for rain water harvesting at the suggested locations. However, there are no final designs yet for the sizes of these tanks, since the final use of the warehouses is not known at this stage.

Indoor/Domestic Water

- Install high-efficiency dishwashing equipment and run only when full; and
- Fit restrooms with water-saving fixtures. Water efficient urinals, dual-flush toilets, and motion-detecting faucets can all reduce water usage. Motion detectors on restroom lights, and high-efficiency hand dryers, also contribute toward savings. As a minimum the WELS star ratings for the fittings would be:
  - 4 Star WC;
  - 6 Star urinals;
  - 6 Star tapware; and
  - 3 Star showers.

Outdoor Water Use

- Use a weather-based irrigation control or soil moisture sensor for automatic irrigation system control;
- Choose native, drought-resistant plants for landscaping; and
- Audit and optimize irrigation systems to achieve maximum distribution uniformity of water.

Conclusion

This report has addressed the ESD requirements to support the Development Application for a proposed 6-star Green Star warehouse, logistics and industrial facility.

The approach will be benchmarked against the Green Building Council of Australia's Green Star rating scheme with a 6-star Australian Excellence rating targeted for the proposed development.

5.0

References

6.0

6.0 References

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