

Attachment A6

**Ecologically Sustainable Development
Report
757-763 George Street, Haymarket**

ESD Report for Planning Proposal

757-763 George Street Hotel Development, Haymarket

PREPARED FOR SAMPRIAN PTY LTD

Revision Information

Project 757-763 George Street, Haymarket
Title Ecologically Sustainable Design (ESD) Report for Planning Proposal

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1. Introduction

LCI has been engaged to assess the Ecologically Sustainable Design (ESD) features for the proposed 757-763 George Street development located at Haymarket, NSW. This report will form part of the concept Planning Proposal (PP) being submitted to the City of Sydney. Included are details of how the ESD objectives as defined by the Sydney DCP 2012 can be incorporated in the design competition, detailed design phase and ongoing operation phases of the development.

The ESD strategies outlined will address the following specific statutory requirements:

- > City of Sydney Council Development Control Plan 2012
 - Part 3.6 Ecologically Sustainable Development
- > NCC 2019 Section J

The recommended ESD strategies include:

- > 5 Star NABERS Energy Hotel Whole Building rating for the development
- > 5 Star Green Star – Design & As Built v1.3 rating for the whole development

These ESD strategies holistically address the environmental sustainability performance objectives of the development by reducing greenhouse gas emissions, potable water usage and waste sent to landfill, and delivering a healthy and human-centric design response that attracts and retains talent to Haymarket area.

1.1. Project Description

The subject site is located at the north-west corner of George Street and Valentine Street, Haymarket. The site comprises two built structures fronting George Street, the former Sutton Meat Foreast Meat Company Building on the corner site and a concrete framed building with a driveway access to the rear.

Grimshaw Architects have prepared an indicative reference scheme to support a planning proposal which facilitates the following:

- > Basement 2 – Car Parking accessible through a Car Lift, Back of House (BOH) Storage, Mechanical Plantrooms and Hydraulic Plantrooms
- > Basement 1 – BOH End of Trip (EOT) Facility, BOH Bike Storage, Bin Store along with Electrical, Mechanical, Fire and Hydraulics Plantrooms
- > Ground Floor – Hotel Entrance and Lobby areas, Retail Tenancies, Hotel Amenities, BOH Offices and the Loading Dock.
- > Level 2 Mezzanine – Hotel Amenities
- > Level 3 – Hotel Amenities, Sky Lounge and External Terrace Areas
- > Levels 5 to 8 – Guestrooms
- > Level 9 – Guestrooms and Plantroom
- > Level 10 – Guestrooms and Hotel Terrace
- > Levels 11 to 29 – Guestrooms
- > Levels 30 and 31 – Roof Plant

2. Statutory Requirements

The following statutory requirements are to be met by the proposed development. The proposed development should meet these requirements through incorporating the sustainable design features outlined in this report.

Sydney Development Control Plan 2012

Section 3.6 of the Sydney Development Control Plan (DCP) outlines a framework to apply ecologically sustainable design strategies to the construction and operation of a development within the Sydney local government area. The provisions within Section 3.6 include:

- > Consideration for a Green Star Design and As-Built Rating
- > DCP Section 3.6.1 Energy Efficiency:
 - Incorporating passive design
 - Provision of LED luminaires where public domain lighting is to be provided
 - Electric sub-metering for large sources of energy consumption
 - Carparking designed and constructed to allow for future electrical vehicle charging

Energy Efficiency is addressed in Sections 5.1, 5.2 and 5.3 of this report.

- > DCP Section 3.6.2 Water Efficiency
 - High WELS ratings for showerheads, water tap outlets, urinals and toilet cisterns
 - Rainwater capture and reuse
 - Connection to any available local dual reticulation system
 - Separate water metering to tenancies, cooling towers, irrigation and other major uses
 - Cooling towers are connected to a recirculating cooling water loop and have conductivity meters

Water Efficiency is addressed in Section 5.4 of this report.

- > DCP Section 3.6.3 Photovoltaics:
 - Consideration for on-site photovoltaics

Photovoltaics is addressed in Section 5.5 of this report.

- > DCP Section 3.6.4 Wind Turbines
 - Consideration for on-site wind turbines

Wind Turbines are addressed in Section 5.5 of this report.

- > DCP Section 3.6.5 Materials and Building Components:
 - Paints and floor coverings with low Volatile Organic Compounds (VOCs) where possible
 - Engineered wood with low formaldehyde emissions where possible
 - Where possible use construction materials, fittings and finishes that have recycled content or environmentally friendly certification

- Design building components for longevity, adaptation, disassembly, re-use and recycling
- Minimise materials used in construction

Materials and Building Components are addressed in Section 5.6 and 5.7 of this report.

National Construction Code (NCC) 2019 Section J

The National Construction Code (NCC)/ Building Code of Australia (BCA) 2019 includes within Section J mandatory minimum energy efficiency performance requirements for building developments (Class 3, Class 5 to 9). The objective is to reduce building greenhouse gas emissions by efficiently using operational energy.

Section J is focused on establishing minimum acceptable practice in the building industry.

To meet the Performance Requirements JP1 and JP3 of Section J of the BCA, compliance of the design and function of the building can be demonstrated with the Deemed-To-Satisfy (DTS) provisions of Section J Parts J1 to J7. To meet performance requirement JP2 of Section J, compliance can be demonstrated with the DTS of Section J Part J8.

3. NABERS Energy

The National Australian Building Energy Rating Scheme (NABERS) is a performance-based tool used to measure the operational impacts in existing buildings. The NABERS rating scheme rates energy, water, waste and IEQ in offices, shopping centres, data centres, hotels, and apartment buildings. Depending on the building type, the base building, tenancy or whole building can be rated.

A NABERS Energy rating for a hotel considers only base building. The rating considers the difference in energy consumption between a 3-Star hotel and a 5-Star hotel. This is due to the amenities that are available to guests (gym, restaurant, pool, room service) and the operational hours of these amenities.



Figure 1: Available NABERS Certification ratings

4. Green Star Design and As-Built v1.3

As recommended by the Sydney DCP (2012), the project should aim to achieving a 5 Star Green Star Design and As-Built v1.3 rating which exceeds 'Best Practice' and is considered to exhibit 'Australian Excellence'. The Green Star rating system provides a framework to assess how a building reduces its impact on the environment while meeting the economic and social needs for its occupants and surrounding communities.

The Green Star rating system assessing buildings through the following categories:

- > Management
- > Indoor Environmental Quality
- > Energy
- > Transport
- > Water
- > Materials
- > Land Use and Ecology
- > Emissions
- > Innovation

Points are awarded for a building project's ability to secure as many credits from each category. Each credit targets the environmental impact of a specific design feature. The total number of points awarded determines if the project earns a rating as shown in Figure 2. The Green Star Design and As-Built v1.3 pathway for 757-763 George Street is summarised in Appendix A.



Figure 2: Available Green Star Certification ratings

5. Ecologically Sustainable Design Initiatives

The following ESD initiatives provide a framework for how the future development will be designed to consider and reflect design building principles to improve environmental performance and reduce ecological impact. These initiatives will assist the development to meet statutory requirements.

5.1. Electrical

The following ESD initiatives should be considered for Electrical services:

- > Provision of power factor correction to reduce building maximum demand and energy consumption from the grid
- > Provision of energy efficient LED lighting throughout
- > Use of motion sensors for back of house areas and carparking to automatically switch luminaires off after a period of inactivity
- > Emergency lighting will be of a centrally monitored system with automated self-testing to minimise ongoing maintenance and costs. Individual emergency lighting will be provided with lithium battery and long-life LED luminaire
- > Provision of digital power meters for lighting, power and mechanical equipment to meet NABERS requirements. All digital power meters will interface with BMCS to cater for energy consumption monitoring within the building

5.2. Mechanical

The following ESD initiatives should be considered for Mechanical services:

- > High efficiency chillers
- > Condensing heating hot water units
- > Variable speed drives on fans and pumps, to modulate air and water flow during part load conditions
- > High efficiency or EC motors
- > Energy management systems integrated with a direct digitally controlled Building Management and Control System (BMCS) allowing monitoring, targeting and load management of selected plant
- > Free cooling – economy cycles on all air handling units, irrespective of the cooling capacity
- > Secondary Systems
 - Energy efficient FCU's with EC/DC motors to provide air-conditioning
 - Preference to be given to energy efficient equipment, with consideration of cost, suitability and maintenance
- > Refrigerant Type
 - Zero ODP and Low GWP refrigerants shall be specified in the design

- > BMCS System
 - Building Management Control System (BMCS) to schedule and optimise plant efficiency. The air-conditioning system to be designed to either shut down or be set to a wider temperature control band, when a space is unoccupied

5.3. Architectural

- > Passive heating and cooling techniques:
 - Shading of windows to prevent solar penetration in summer but allow passive heating in winter.
 - Building thermal mass and insulation combinations, avoiding thermal bridging.
 - High performance glazed façade that balances daylight ingress and thermal performance
 - Materials selected for the façade will be part of a modular system based on panel efficiencies thus minimising waste

5.4. Hydraulic

ESD initiatives from Hydraulic Services are as follows:

- > High WELS equivalent fixtures and fitting selections
- > Water metering and monitoring for each floor level, mechanical plant and hot water plant
- > All water sub-meters are connected to the BMS
- > Hot Water System
 - The buildings heating hot water requirements shall be met by way of a series of high-efficient gas fired boilers
- > Hot Water Pipework
 - Additional insulation is provided for the domestic hot water pipework insulation to meet NCC Section J 7.2 (2019) minimum requirements.
 - The thicker insulation (38mm) will achieve a 26% reduction in energy losses when compared with the industry standard 25mm thickness.
- > Water Sensitive Urban Design (WSUD)
 - Rainwater capture and reuse

5.5. Renewable Energy

- > A photovoltaic system and wind turbine may be considered for the development. This is subject to a feasibility study during Detailed Design.

5.6. Materials

- > Construction and fit-out materials with low embodied energy
- > Responsible building materials – best practice PVC products, steel sourced from sustainable supply chains
- > Maintained ecological value of the project site
- > Reduced indoor pollutants such as volatile organic compounds and formaldehyde emissions

- > Redevelopment of previously developed urban project site will have minimised impact on the local ecology and ecosystem
- > Procurement of materials from regional suppliers to reduce travel and carbon footprint

5.7. Waste Minimisation

- > Recycling and diversion from landfill of construction and demolition waste
- > Applying life cycle assessment principles in relation to:
 - specifying green concrete and steel (such as Portland cement replacement, captured/reclaimed water for mix water, and recycled aggregates and reinforcing steel manufactured from energy-reducing processes)
 - minimising mass or volume of materials
 - implementing sound procurement practices
- > An Operational Waste Management Plan (OWMP) has been prepared by a qualified waste auditor for implementation to the design to promote best practice waste management of the facility, including;
 - Separation of comingled recyclables
 - Recovery of baled cardboard
 - Storage of beverage containers for container deposit recycling
 - Segregation of organic waste for processing offsite

5.8. Transport

- > The proposed development seeks to minimise greenhouse gas emissions produced by transport to and from the site through the following initiatives:
 - Carpark design and construction to allow for the future provision of electric vehicle charging stations
 - The site is located within walking distance to Central Train Station
 - Staff and visitor bicycle parking and end-of-trip facilities for cyclists

6. Conclusion

This ESD Report provides a framework to meet the sustainability objectives required for this project. In addition, through various ESD initiatives outlined in this report, the project will be able to achieve the minimum requirements of the Sydney DCP (2012), NCC (2019) Section J and NABERS Energy Rating for hotels. Several ESD initiatives and benchmarks have been identified which could be explored and implemented into later stages of design and operation.

Adherence with the minimum ESD requirements in this report should ensure the proposed development is capable of being designed and constructed to a Best Practice Standard. This effectively addresses and mitigates against environmental, social and economic impacts to the Haymarket site.

Appendix A: Green Star Design and As-Built v1.3 Pathway



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