

Westfield Liverpool ELP & Office Tower

ESD & Energy Efficiency Report

Scentre Group


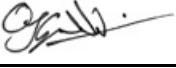
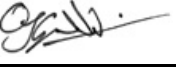
Job No: 1023089
Doc Ref: 1023089-RPT-ESD-002
Revision: C
Revision Date: 25 July 2019

Project title	Westfield Liverpool ELP & Office Tower	Job Number
Report title	ESD & Energy Efficiency Report	1023089

Document Revision History

Revision Ref	Issue Date	Purpose of issue / description of revision
—	17 June 2019	Issued for review by project team and comment
A	26 June 2019	Revised to address client comments
B	27 June 2019	Approved version
C	25 July 2019	Updated design

Document Validation (latest issue)

25/07/2019	25/07/2019	25/07/2019
		
X	X	X
Principal author	Checked by	Verified by
Signed by: Morton, Hannah	Signed by: Grimaldi, Oliver	Signed by: Grimaldi, Oliver

Executive Summary

This Ecologically Sustainable Development (ESD) report documents the sustainability commitments for the proposed development at Westfield Liverpool Shopping Centre. This plan has been written to address the Liverpool Council – DA Checklist 2018. The report summarises the key initiatives that Scentre Group will target to be implementing and investigating to deliver the benefits of best practice sustainable design as practically as possible.

The project will be designed according to best practice ESD principles across a wide range of environmental impact categories including energy, water, materials, ecology, emission, transport, health & wellbeing. Rigorous management and governance procedures will ensure that sustainability outcomes will be delivered in operation, and development will be certified in accordance with independent third-party rating systems in design, construction and operation.

The Commercial Office and ELP will be designed to the following sustainability principles / methodologies:

- 5 Star Green Star Design & As Built v1.1 for the office tower & Retail ELP
- 5 Star NABERS Energy for Office (Base Building)
- Partial NABERS ratings are not available however the retail ELP will be designed in accordance with principles adopted by low-energy shopping centres.

Strategies to be incorporated in the design may include:

- Design the façade and building services to be better than Section J NCC 2019.
- Selection of non-toxic finishes to improve health & wellbeing.
- Efficient fittings, fixtures and appliances to minimise water demand.
- Use of recycled water to reduce mains water consumption.
- Load reduction, passive design, energy-efficient building services and smart controls to reduce energy consumption.
- Promotion of healthy and active living through design and education strategies in the office building, including recreational and end-of-trip facilities, prominent placement of stairs and access to fresh food.
- Enhanced commissioning and tuning practices to translate design intent into actual performance.
- Environmental and waste management to ISO14001 standard during demolition and construction.
- Incorporation of crime prevention through environmental design (CPTED).
- Selective procurement to consider the supply chain impacts of materials used in construction in terms of environmental and social responsibility, and to reduce embodied carbon.

Contents

1.0	Introduction	3
1.1	Purpose of this report	3
1.2	The Project	3
1.3	Proposed development	4
1.4	Summary of ESD Requirements	4
1.5	Council requirements	5
2.0	Energy Efficiency Report	6
2.1	General	6
2.2	NCC Section J	6
2.3	NABERS Energy Office & Retail Intent	6
3.0	Water Management Plan	7
3.1	Potable Water Minimisation	7
3.2	Stormwater Run-Off	7
4.0	Other ESD Initiatives	8
4.1	Waste	8
4.2	Materials and supply chain	8
4.3	Health & wellbeing	9
4.4	Travel & transport	10
4.5	Land & nature	10
4.6	Pollution	10
4.7	Governance	10
4.8	Community & connectivity	11
5.0	Conclusion	12
6.0	Appendix – Green Star Pathways	13

1.0 Introduction

1.1 Purpose of this report

Cundall have been engaged by Scentre Group to develop an Ecologically Sustainable Development (ESD) and Energy Efficiency Strategy for the proposed Westfield Liverpool ELP redevelopment and new office building located on Elizabeth Drive in Liverpool, NSW. This report documents the sustainability commitments for the proposed development at Westfield Liverpool.

The report summarises the key initiatives that Scentre Group will commit to implementing and the range of other initiatives that will be evaluated during design development to deliver energy efficiency, water conservation and Best Practice Sustainable Design.

1.2 The Project

The Westfield Liverpool site is located in the heart of a major commercial centre, which is approximately 35 kilometres inland and southwest of the Sydney CBD. The shopping mall building was first opened for business in 1972 and was last redeveloped in 2006. Figure 1.1 shows a Google Earth image of the site and its context.



Figure 1.1 – Site showing surrounding streets and spaces. The red box indicates the approximate extent of the redevelopment works.

1.3 Proposed development

The project is a redevelopment of the existing Westfield Liverpool centre, comprising:

- An upgrade to the retail entry forecourt.
- A new entertainment, leisure and dining precinct on level 3 and 4.
- A new eight-storey commercial tower and ground level lobby entry.

The proposed design and the surrounding areas are shown in Figure 1.2.

Figure 1.2 – 3D render of proposed development

1.4 Summary of ESD Requirements

The project is required to comply with the National Construction Code (NCC) Section J requirements for building fabric including insulation and glazing.

Additional requirements have been requested by Liverpool City Council. Table 1 outlines the sections of this report in which these will be addressed.

Section 2 and 3 detail the Energy Efficiency and Water Management Strategy for the project, while Section 4 covers additional sustainability initiatives which are being considered for the project, beyond minimum requirements.



1.5 Council requirements

The following comments have been provided by Council to be addressed by the project.

Table 1 Council ESD requirements and project response

Item #	Council comment	Project response
22	<i>Section 5.1 in Part 4 of the LDCP 2008 requires that the applicant submit an Energy Efficiency Report from a suitably qualified consultant to accompany any application for new commercial office development. The report is to demonstrate that the building can achieve no less than 4 stars under the Australian Building Greenhouse Rating Scheme (ABGRS). It appears that the ABGRS has been superseded by the National Australian Built Environment Rating System (NABERS) and it is expected that any Energy Efficiency Report to Council should refer to this policy. This matter shall be satisfactorily addressed.</i>	The office building will be designed to achieve a minimum 4.5 Star NABERS Energy Base Building rating. Please see Section 2 for details of the energy efficiency strategy.
24	<i>Section 5.2 in Part 4 of the LDCP 2008 requires that a comprehensive Water Management Plan is to be submitted with all non-residential development. It appears that a Water Management Plan has not been submitted to Council for assessment. This matter shall be satisfactorily addressed.</i>	Please see Section 3 for details of the water management strategy.

2.0 Energy Efficiency Report

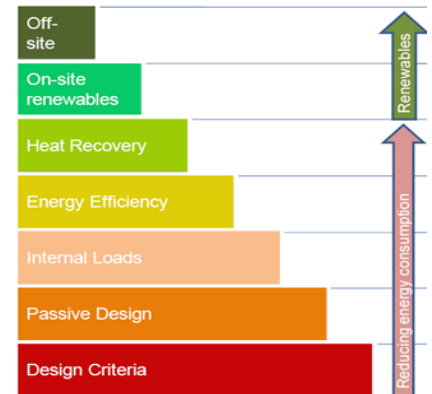
2.1 General

Scentre Group is conscious of their large energy consumption and on a national level, NABERS energy ratings are being carried out to determine the current performance of their retail portfolio.

The redevelopment will aspire to exceed the performance requirements of the NCC Section J, reducing energy consumption, and thereby greenhouse gas (GHG) emissions, by combining a well-designed facade with high-efficiency systems, services as well as smart controls to ensure key services are only operating when required by tenants.

Some of the design initiatives that may be implemented include:

- High performing façade incorporating low-e solar control glazing with appropriate shading.
- High efficiency HVAC systems (including cooling, heating, pumps, fans & BMS).
- Efficient LED lighting systems with efficiency controls such as zoning, motion sensors, daylight dimming and time clock control.
- Implement economy cycle during favourable outdoor conditions.
- Energy efficient lift motors and controls.
- Incorporation of best practice commissioning, maintenance and building tuning into the project programme.
- Ongoing metering and monitoring of energy trends.
- Renewable energy generation will be evaluated, and installed where financially and technically viable. This is most likely to comprise photovoltaic panels on the roof.



2.2 NCC Section J

The National Construction Code (NCC) Section J sets minimum energy performance requirements for all new developments, which cover air-conditioning, ventilation, lighting, power and hot water, as well as building fabric considerations including thermal construction and insulation, building sealing, glazing and shading. The proposed design will be developed to exceed the NCC energy efficiency requirements. JV3 modelling will be undertaken to inform the design development.

2.3 NABERS Energy Office & Retail Intent

The office building will be designed to achieve a minimum 5 Star NABERS Energy Base Building rating during operation. This equates to 71 kg / CO₂ per m² per annum, or less.

Partial NABERS ratings are not available however the retail ELP will be designed in accordance with principles adopted by low-energy shopping centres.

Detailed modelling will be undertaken during design development to refine the design, commissioning and control strategy to deliver this outcome.

3.0 Water Management Plan

3.1 Potable Water Minimisation

Mains water use will be minimised for the project by selecting efficient fittings, fixtures and appliances to reduce demand, and by investigating the feasibility of utilising recycled water for non-potable uses.

The following initiatives may be implemented or will be considered during the design development:

- The selection of water-efficient fittings and fixtures. The following are a guideline to water efficiency:

Table 2 Council ESD requirements and project response

Fixture / Equipment Type	WELS Rating
Taps	6 star
Urinals	6 star
Toilets	4 star
Showers	3 star

- Fire test water system contained in a closed loop.
- Precedent given native landscaping with low irrigation demand.
- Integration of water metering and facilities management plans for prevention of excessive water consumption through leakages of amenities and hardware.
- Feasibility study of rainwater harvesting for reuse in non-potable uses such as landscape irrigation or toilet-flushing. The most efficient use for an alternative water source will be determined during detailed design, based on water quality, availability and reliability of water supply, and the minimisation of energy required for treatment and pumping.

3.2 Stormwater Run-Off

The development does not increase the hard surface area of the site and consequently the run-off volumes or intensity. The area of car park roof is reduced which will reduce the volume of run-off from potentially contaminated surfaces.

The potential capture of rainwater from the office roof and a portion of the adjacent ELP roofs will be investigated to determine if a location for a rainwater tank can be accommodated on, or within, the existing structure.

4.0 Other ESD Initiatives

The following additional initiatives have been identified, going beyond minimum requirements.

4.1 Waste

An operational Waste Management Plan (OWMP) will be created to achieve a waste diversion rate of 75% by 2025 and 90% by 2030.

- Implement best practice construction waste management plans and engage with the supply chain.
- Integrate into the building architecture, appropriately sized operational waste recycling enclosures, separating general waste from recycling waste, providing adequate signage and training measures to drive behavioural change of retail tenants.

Initiatives to promote more engagement at centre level with waste contractors to ensure and enforce their contractual recycling obligations to design out waste will be developed and could include:

- Eliminating unnecessary elements.
- Standardising sizes and details to reduce offcuts.
- Reducing complexity to simplify construction process.
- Evaluating the reuse and recycling opportunities of materials before specifying.
- Maximising off-site fabrication of elements to reduce waste.

A construction waste management plan will be implemented in accordance with best practice guidelines.

A company-wide Environmental Management Plan (ISO14001) will be implemented on all projects from 2020.



4.2 Materials and supply chain

Materials used in construction are responsible for waste generation, resource depletion, GHG emissions and water consumption. In order to minimise these impacts compared to a standard development, the following principles will be reviewed during procurement of materials:

- Portland Cement reduction in concrete mixes by using industrial waste product such as fly ash.
- Selection of responsible steel products sourced from accredited steel makers and fabricators.
- Selection of FSC or AFS certified timbers.
- Selection of Best Practice Certified PVC products.
- Specification of sustainable products where appropriate, such as those containing recycled content, third-party environmentally certified products, and those with product stewardship agreements in place.
- Local procurement to support the local economy and reduce transport emissions.

4.3 Health & wellbeing

Scentre Group's purpose is to create extraordinary places connecting and enriching communities. This is supported by its commitment to design shopping centres mindful of customer's health and well-being. The following key initiatives will be investigated during design development to improve occupant health and wellbeing in the office building:

4.3.1 Indoor air quality

- The entry of outdoor air pollutants to the space will be minimised. The building services will be designed to comply with ASHRAE Standard 62.1:2013 regarding minimum separation distances between pollution sources and outdoor air intakes. Compliance will be demonstrated in accordance with the distances specified in Table 5.5.1 of the Standard.
- Exceeding mandatory outdoor air rates by 50% to further dilute unpreventable internal pollution will be reviewed and adopted if this does not impose too significant an energy consumption penalty.
- Carbon dioxide (CO₂) monitoring system will be installed to monitor CO₂ levels in space and outside air supply to be modulated accordingly to maintain CO₂ concentration level in the occupied space below 800ppm.
- Paints, adhesives, sealants, carpets, and engineered wood products used in the building will meet the maximum Total Volatile Organic Compounds (TVOC) and formaldehyde limits to provide a safe and healthy environment for the occupants.

4.3.2 Visual comfort

The project will deliver well-lit spaces that provide high levels of visual comfort to building occupants through a combination of natural and artificial lighting.

- The development of the ELP and retail will aim to maximise available natural lighting into the space through integration of light wells, sky lights and voids to reduce lighting energy consumption.
- The office floor plate depth and façade design will maximise daylight penetration to reduce reliance on electric lighting.
- Glare control mechanisms such as internal blinds or curtains will help maximise visual comfort.
- Accurate colour perception of the space using high colour rendering index (CRI) fittings, flicker free lighting.
- Limiting glare by baffles, louvres, translucent diffusers, ceiling design or other means.
- In nominated areas, a combination of direct and indirect lighting to improve uniformity of lighting.

4.3.3 Thermal comfort

Detailed assessment of thermal comfort including macro-climate and micro-climate assessments will be undertaken during the design development. Particular areas of focus would include open areas in the Retail ELP. Discomfort from wind and rain will be reduced through architectural design and natural wind barriers (such as plants). Solar shading and selection of materials will be investigated to reduce the impact from direct radiation and extremities of temperatures.

4.3.4 Acoustic comfort

- Design of internal ambient noise levels to be no more than 5dB(A) above the "satisfactory" sound levels in Table 1 of AS/NZS 2107:2000 in office spaces.
- Target acceptable reverberation levels and consider providing acoustic noise separation between sensitive enclosed spaces.

4.4 Travel & transport

Low-impact transport will be addressed by the design as well as the site. The following initiatives are being considered to improve amenity, promote health and/or reduce transport related GHG emissions.

- Promote lower emission vehicles by providing electric vehicle charging points to 5% of all new office car parking spaces and/or dedicating 15% of all new car parking spaces to fuel efficient vehicles (small cars, hybrids, motorbikes).
- Provide bicycle parking as a minimum to the Liverpool City Council requirements, for both regular office occupants and visitors to the building and associated end-of-trip facilities such as showers and lockers.

4.5 Land & nature

The site is not currently ecologically valuable and does not contain any threatened species. The project will enhance existing ecological value by reusing a previously developed site and adding landscaping. Landscaping will preference indigenous plant species.

Heat island effect will be reduced through the selection of roofing materials with a high SRI and increased landscaping.

4.6 Pollution

Pollution to water, soil and the sky will be minimised during construction and operation. The following will be considered during the detailed design phase:

- Demonstrate that the post-development peak event stormwater discharge from the site does not exceed the pre-development peak event stormwater discharge.
- Select refrigerants and insulants with a low ozone depleting potential and global warming potential.
- Minimise the impacts of external light pollution to the local community by designing outdoor lighting in accordance with current best practise standards for obtrusive light.

4.7 Governance

The project team and all relevant contractors will undertake commissioning process activities for all nominated building systems that serve the project, including the following:

- Environmental performance targets will be set and documented.
- Best practice commissioning will be undertaken in accordance with CIBSE or ASHRAE standards.
- Climate change adaptation and resilience will be reviewed for the building design to adapt to potential climate changes and extreme weather events with the intention of minimising risk and disruption to the occupants, the building and the community.
- Building operation and maintenance information will be provided for all building systems, as well as building user information to educate building occupants on the sustainability features of the buildings and how to use these to reduce environmental impact.

4.8 Community & connectivity

The ELP will be designed to maximise community benefit, encourage active, healthy lifestyles, maintain good pedestrian linkages and facilitate safe social interaction.

The following strategies will be considered in creating a successful project which attracts visitors and maximises opportunities for interaction and integration.

- Incorporation of crime prevention through environmental design (CPTED).
- Incorporation of elements which facilitate business diversity, innovation, economic development and resilience.

5.0 Conclusion

The initiatives outlined in this report demonstrate how the Westfield Liverpool ELP & Office Tower development will incorporate best practice ESD initiatives into its design, construction and ongoing operation.

Strategies to be explored and developed in later design stages include:

- Design the façade and building services to be better than Section J NCC 2019.
- Selection of non-toxic finishes to improve health & wellbeing.
- Efficient fittings, fixtures and appliances to minimise water demand.
- Use of recycled water to reduce mains water consumption.
- Load reduction, passive design, energy-efficient building services and smart controls to reduce energy consumption.
- Promotion of healthy and active living through design and education strategies in the office building, including recreational and end-of-trip facilities, prominent placement of stairs and access to fresh food.
- Enhanced commissioning and tuning practices to translate design intent into actual performance.
- Environmental and waste management to ISO14001 standard during demolition and construction.
- Incorporation of crime prevention through environmental design (CPTED).
- Selective procurement to consider the supply chain impacts of materials used in construction in terms of environmental and social responsibility, and to reduce embodied carbon.

6.0 Appendix – Green Star Pathways

Please note that the points claimed may vary during detailed design.

Formal certification will not be sought for the retail component of the development.

Formal certification of the office space will be considered.

Cundall Johnston & Partners PTY

Level 1 48 Alfred Street Milsons Point NSW 2061
Australia Tel: +61 (0)2 8424 7000

Asia Australia Europe MENA UK and Ireland
www.cundall.com

