R7 Building
Barangaroo South

Sustainability Report – Project Application
August 2014

Lend Lease

Document History

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1.0 Introduction

This report supports a State Significant Development Application (SSDA) (SSD 6623-) submitted to the Minister for Planning pursuant to Part 4 of the Environmental Planning and Assessment Act 1979 (EP&A Act). The SSDA seeks approval for a stand-alone building known as Building R7, along with the associated works within Stage 1A of Barangaroo South, as described in the Overview of Proposed Development section of this report.

This Sustainability report has been produced by the Lend Lease Sustainable Design team to describe the principles to be incorporated into the design, construction and ongoing operation phases of the project to minimise its impact on the environment.

1.1 Site Location

Barangaroo is located on the north western edge of the Sydney Central Business District, bounded by Sydney Harbour to the west and north, the historic precinct of Millers Point (for the northern half), The Rocks and the Sydney Harbour Bridge approach to the east; and bounded to the south by a range of new development dominated by large CBD commercial tenants.

The Barangaroo site has been divided into three distinct redevelopment areas (from north to south) – the Headland Park, Barangaroo Central and Barangaroo South (Stage 1). The R7 SSDA site area is located within the Southwest corner of Barangaroo South Stage1A as shown in the Figure 1 location plan.

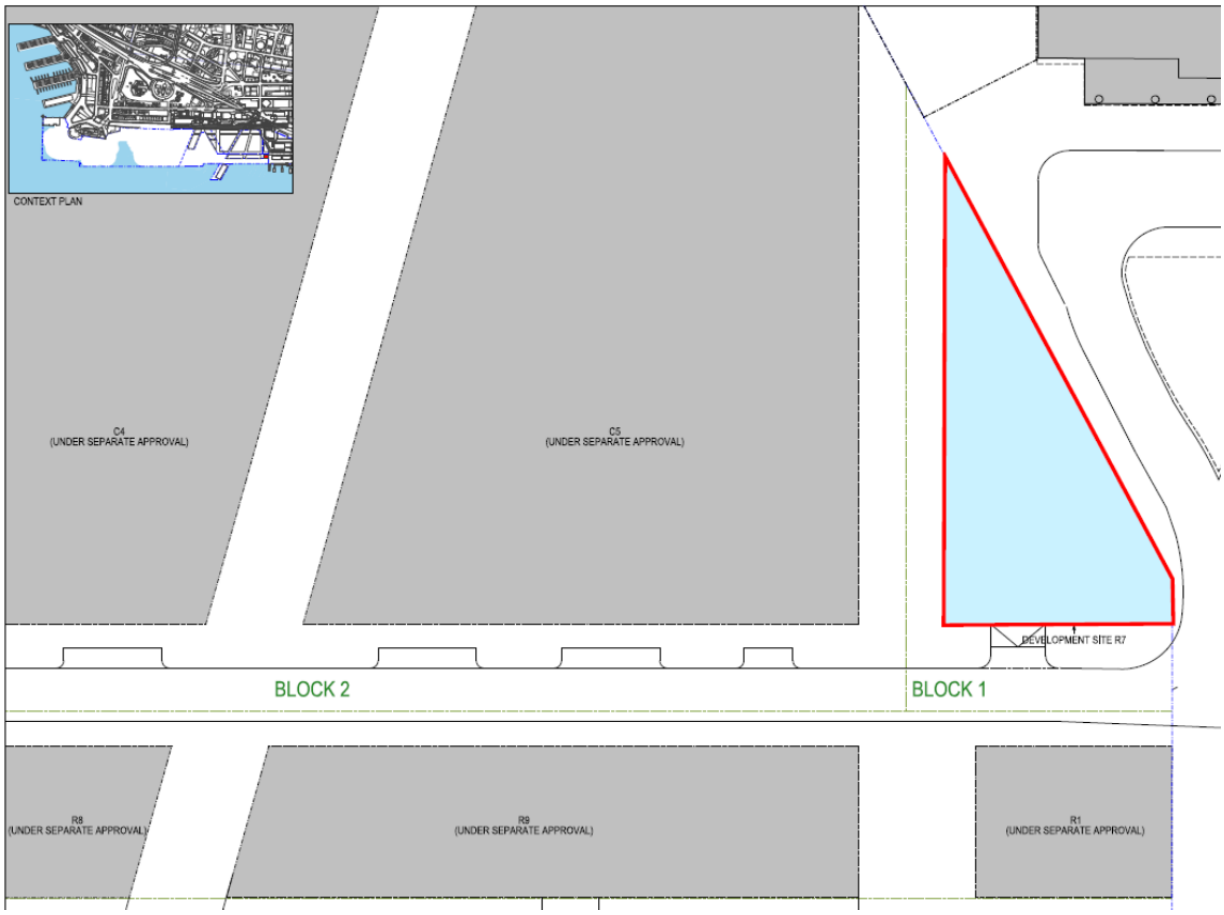

Figure 1: Building R7 Application Site Plan

1.2 Overview of proposed development

The Building R7 SSDA seeks approval for a five level (ground plus four levels) building within 'Stage 1A' of the Barangaroo South Site, and associated landscaped area at ground level.

1.3 Purpose of This Report

This report has been prepared to accompany the SSDA for the Building R7 works at Barangaroo South. It addresses the relevant Secretary's Environmental Assessment Requirements (SEARs) for the project, outlines the targets proposed for the development and in particular demonstrates the compliance of the works with the relevant requirements from the Statement of Commitments included in the approved Concept Plan.

The environmental sustainability initiatives for the development aim to be world class, and will complement work by the Council of the City of Sydney on its Sustainable Sydney 2030 plans. The overall Barangaroo South development aims to provide:

- Inspiring architecture with healthy, light filled homes and workplaces;
- Low energy buildings that respond to the environment and the people within;
- Transport links and options that make it easy to leave the car at home;
- A mixed use precinct with outdoor spaces that everyone can share and enjoy;
- Centralised precinct services that support a carbon neutral, water positive and zero waste outcome;
- A long term Governance structure that also delivers carbon reduction and community benefits;
- A focused approach on delivering social initiatives that will assist in establishing a healthy and happy community integrated into the Sydney CBD; and
- A broad based skill development program that will meet a wide range of learning and skilling needs – from blue and white collar to green.

2.0 Referenced Documentation

The following documentation has been reviewed in preparing this report:

- DBJ R7 Design Drawings, dated 1-Aug-14
- DBJ R7 Architectural Design Report, dated 1-Aug-14

3.0 Relevant Precinct Initiatives

The Barangaroo South precinct has established a range of significant sustainability targets that will be delivered progressively throughout the development phase. This short overview provides a summary of the alignment of the Building R7 SSDA against the aspirations of the broader precinct.

Healthy Buildings:

Target:

- Tuned to Sydney's climate and connected to outdoors.
- Passive design, low energy buildings.
- Use of some sustainable materials, including recycled content and low emissions.

R7 Response:

- The east and north facades will experience a fair degree of solar shading from surrounding buildings placing emphasis on glazing with high light transmission and high insulation levels.
- The western facade is more exposed to afternoon sun and will thus consider appropriate glazing and shading. The lattice of vertical shading devices will assist in this regard.
- Materials, sealants and adhesives will be chosen responsibly to be consistent with Green Star to minimise VOCs and formaldehyde.

Energy and Carbon:

Target:

- Onsite photovoltaic generation sized for the public domain and the recycled water treatment system.
- 20% reduction in embodied carbon within the built form.
- Aspirational 75% reduction relative to BAU in operational energy use related carbon.

R7 response:

- A rooftop solar photovoltaic array is proposed to support the precinct wide on-site solar commitment. While the R7 roof experiences site shading from T3 and other, the estimated energy yield (kWh/Wp) will still be 70%+ of what the tower roofs yield.
- Use of sustainable materials including responsibly sourced timber, prefabricated elements, and low embodied carbon concrete are proposed to assist in achievement of the 20% embodied carbon requirement.
- Low energy design incorporating external shading, low energy LED lighting, use of fan coil units with digital motors, and connection to the precinct district cooling plant.

Water Positive:

Target:

- A water positive outcome – where more water is exported than potable water is imported.
- Treatment and reuse of a proportion of on-site stormwater catchment.
- On-site waste water treatment and water recycling.
- Capacity to export recycled water allowing neighbours to reduce their potable water demands.

R7 response:

- Connection to non-potable water supply from Recycled Water Treatment Plant for flushing toilets.
- Selection of low flow fittings and controls to minimise water use.
- A rainwater tank is proposed to capture rainwater at roof level and supply recycled water for irrigation.
- Stormwater run-off from the site will be treated as part of the precinct wide stormwater strategy.

Zero Waste:

Target:

- Greater than 90% diversion of construction waste from landfill

R7 response:

- Recycling of construction waste in accordance with the Barangaroo South (Stage 1) Waste Management Plan.
- Operational waste to landfill reduction strategies through onsite separation of waste.

Sustainable Transport:

Target:

- A new connection/entry point for the CBD (with provision for light rail, ferries, and the Barangaroo Pedestrian Link).
- Infrastructure and support for cyclists and pedestrians.

R7 response:

- R7 is well serviced by public transport and pedestrian links as part of the broader public domain and precinct works.

Landscape and Biodiversity:

Target:

- Use of native flora and encourage habitats for fauna.
- Inclusion of water-sensitive urban design.
- Planning for climate change.
- Landscaped public spaces and selected green roof features.

R7 response:

- Plantings are proposed for R7 at roof level.

4.0 Sustainability Contribution

The proposed SSDA will address the sustainability requirements included in the Statement of Commitments of the approved Concept Plan. The table below summarises these requirements and confirms how the project will address each requirement.

Category	Commitment	Approved Concept Plan	R7 SSDA
General ESD	78	There is to be an environmental focus on the Water, Energy, Micro-Climate, Environmental Quality/Amenity, Landscape, Transport, Waste and Materials strategies for the development. Each building on site will achieve the primary benchmark of a "5 star" standard of Commercial: Green Star 5 star, and Residential: Green Star Residential score >60, and each development will be required to demonstrate how it satisfies each of the following Key Performance Indicators for each of the ESD focus areas referred to below.	Certification using Green Star Office v3 and Multi Unit Residential v1 is not relevant to this building type; however, the design proposals are commensurate with the components of those tools, necessary for a 5 Star rating, that are relevant to a retail building through the Barangaroo South precinct initiatives and infrastructure as well as the following proposed features for R7: ▪ Strong passive design response including external shading and high performance glazing to minimise energy use, provide for high indoor environmental quality (IEQ), and maintain access to views and daylight. ▪ Selection of materials, adhesives and sealants to minimise VOC and formaldehyde off-gasing as well as lower embodied carbon of the building. ▪ Connection to site wide infrastructure including the stormwater system, district cooling plant and recycled water plant. ▪ Inclusion of a rooftop solar photovoltaic array.
Water	79	There is to be a 35% reduction in Potable Water Consumption compared to a standard practice development and a 40% reduction in flow to sewer compared to a standard practice development.	The 35% reduction in potable water demand is met through low flow fixtures, appropriate demand controls for high volume kitchen sinks, and use of recycled water from the precinct recycled water plant for flushing. A rainwater tank is proposed to capture rainwater and reuse for irrigation. As the building will be cooled by the district cooling plant heat rejection will be via the central harbour heat rejection system. R7 will connect to the Barangaroo South Recycled Water Treatment Plant which is designed to a capacity that allows a Water Positive outcome (i.e. that produces more recycled water than potable water imported onto site).
Energy	80	There is to be a 35% reduction in Greenhouse Gas Emissions compared to a standard practice development. 20% of power is to be purchased from low impact, renewable sources or alternatively there should be a 20% reduction in GHG emissions through carbon offsets. The purchase of renewable energy should be at World Best Practice level.	The building envelope and glazing selection for R7 will consider managing winter heat loss and summer solar gains while maintain a transparency to visible light to enable significant lighting energy savings. The building will connect to the district cooling plant which will provide superior cooling efficiency relative to packaged type plant that would typically be used for this size of building.

Category	Commitment	Approved Concept Plan	R7 SSDA
			The use of LED lighting will more than half lighting energy use relative to halogen lighting historically used in this type of application. As part of the Barangaroo South precinct, R7 will participate in the carbon neutral scheme through the purchase of voluntarily retired renewable energy certificates (RECs).
Micro-Climate	81	Key public open spaces (parks and squares) are to receive direct sunlight in mid-winter.	Solar studies confirm R7 is not affecting the key public open spaces. Overshadowing of public spaces already exists from other surrounding buildings.
Landscape	82	Primarily non-invasive species are to be used on the site.	This requirement will be met through the choice of appropriate plant species.
Transport	83	Ensure that there is sufficient public transport to achieve points under the public transport credit for Green Star Rating Tools for commercial buildings and a future Green Star tool for residential buildings.	Proximity to Wynyard station trains and buses within short walking distances will ensure a high score in the Green Star Office v3 and MURT v1 public transport credits. R7 will benefit from a level of cyclist amenities proposed for the public domain (within the Public Realm SSDA).
Waste	84	Centralised recycling areas are to be provided in all buildings and 100% of waste bins for public use are to allow for waste separation.	Waste collection areas in the basement (separate application) have been provided allowing for the streaming of waste and recyclables from R7. The operational waste management plan requirements will be include within the tenant fitout guidelines. Food and wet waste will be separated and to supply a waste to energy scheme as part of the precincts waste management strategy and zero waste commitment.
Wind	85	Wind tunnel modelling and verification of proposed treatments will be carried out at the building design application stage due to the significant exposure of the site to the southerly and westerly winds. Any development proposal for the southern portion of the site should be subjected to a wind tunnel study, carried out in accordance with the procedures outlined in industry recognised guidelines such as the Australasian Wind Engineering Society Quality Assurance Manual.	This is addressed in a separate wind.

5.0 Conclusion

The R7 SSDA supports the sustainability aspirations set for the Barangaroo South precinct. The precinct-wide sustainability initiatives such as the district cooling plant, on-site renewables strategy and precinct recycled water plant are supported within this plan. These initiatives are essential to ensure the precinct achieves the many sustainability objectives.

The R7 project aims to deliver a sustainable building, with low operational energy consumption, reduced potable water use, minimisation of waste to landfill, and appropriate materials selection while at the same time maintaining a high level of indoor environmental quality.