

Lend Lease (Millers  
Point) Pty Limited

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**Barangaroo South –  
Concept Plan  
Amendment  
(MP06\_0162 MOD4)**

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ESD Report

ARUP

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ESD Report

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Job number 220316-00

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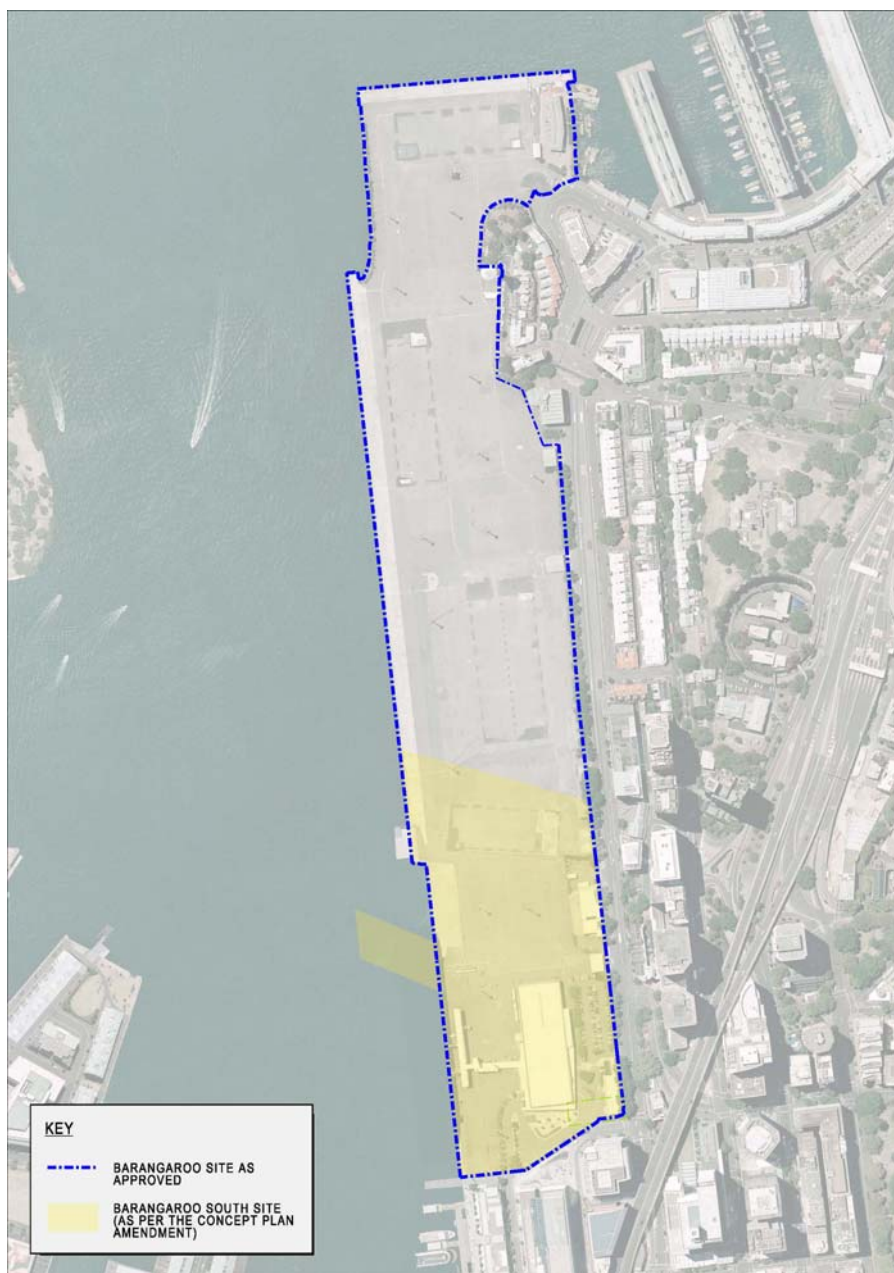
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# 1 Introduction

## 1.1 Background

On the 20 December 2009, Lend Lease (Millers Point) Pty Limited (Lend Lease) was appointed as the preferred proponent to develop Barangaroo South; comprising of Blocks 1 to 4 and associated public recreation areas.

The area of land that is subject to the Concept Plan Amendment is indicatively shown in Figure 1, and is herein referred to as “Barangaroo South” or the “Site”. It comprises an open apron which is largely reclaimed over water and is identified in the existing approved Concept Plan as Blocks 1 – 4 and the immediately adjacent public recreation area. Barangaroo South also extends beyond the western edge of the existing apron and includes a north-west oriented intrusion into the existing waters of Darling Harbour (see Figure 1).



**Figure 1: Indicative Site Boundary for Barangaroo South**

## 1.2 Planning History

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On 9 February 2007 the Minister approved a Concept Plan for the site and on 12 October 2007 the land was rezoned to facilitate its redevelopment. The Approved Concept Plan allowed for:

- a mixed use development involving a maximum of 388,300m<sup>2</sup> of gross floor area (GFA) contained within 8 blocks on a total site area of 22 hectares;
- approximately 11 hectares of new public open space/public domain, with a range of formal and informal open spaces serving separate recreational functions and including a 1.4km public foreshore promenade;
- maximum building heights and maximum GFA for each development block within the mixed use zone; and
- public domain landscape concept, including parks, streets and pedestrian connections.

A condition of consent also required two enlarged water intrusions into the Barangaroo site, one at the northern end and one at the southern end and the creation of a natural northern headland.

Modification No. 1 was approved in September 2007 which corrected a number of minor typographical errors.

On 25 February 2009 the Minister approved Modification No. 2 to the Concept Plan. The Approved Concept Plan as modified allowed for a mixed use development involving a maximum of 508,300m<sup>2</sup> of gross floor area (GFA) contained within 8 blocks on a total site area of 22 hectares.

On 11 November 2009 the Minister approved Modification No. 3 to the Concept Plan to allow for a modified design for the Headland Park and Northern Cove. The Approved Concept Plan as modified allowed for a mixed use development involving a maximum of 489,500m<sup>2</sup> of gross floor area (GFA) contained within 7 blocks on a total site area of 22 hectares.

The proposed Concept Plan Amendment (MP 06\_0162 MOD 4) seeks the Minister's consent for:

- additional GFA within Barangaroo South, predominantly related to an increase in residential GFA;
- redistribution of the land use mix;
- an increase in height of a number of the proposed towers within Barangaroo South;
- the establishment of the new pier and landmark building extending into the Harbour; and
- reconfiguration and activation of the public waterfront area through the introduction of uses including retail and residential to the west of Globe Street.

## 1.3 Purpose

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Arup has prepared this Ecologically Sustainable Development (ESD) assessment for the Barangaroo South site. The purpose of the assessment is to inform and accompany the Barangaroo South Concept Plan Amendment (MP06\_0162) application.

This report outlines the Ecologically Sustainable Development (ESD) strategy for the Barangaroo South development. This report outlines the targets proposed for the development and in particular demonstrates the compliance with the Approved Concept Plan with the relevant requirements from the Statement of Commitments attached to the existing Concept Plan approval (as modified).

The ESD initiatives for the development aim to be world class, and will provide support for and complement work by 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.
- Ultra 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 and target 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.
- 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 Precinct Initiatives

Barangaroo South has established a range of significant sustainability targets that will be delivered progressively throughout the development phase. This short overview provides the context for considering their 'Concept Plan' application against the aspirations of the broader project.

The descriptions in this section below are provided for information only and will be subject to more detailed reports and approvals as part of the subsequent building works applications

The proposed precinct wide targets are:

- **Healthy Buildings:**
  - World-leading 6-Star Green Star Commercial Office Design and Build certification with abundant daylight and fresh air
  - 5 Star Green Star Residential
  - Tuned to Sydney's climate and connected to outdoors
  - Passive design, ultra low energy buildings
  - Use of some sustainable materials – recycled content and low emissions
- **Energy and Carbon:**
  - A carbon neutral outcome supported by the use of new offsite renewable energy generation
  - Significant reduction in building energy consumption
  - 20% reduction in embodied carbon due to building materials
  - Efficient precinct infrastructure using central cooling plant and harbour heat rejection
  - Onsite photovoltaic generation sized for the public domain and blackwater treatment system
- **Water Positive:**
  - 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
  - Sewer mining to reduce network demands
- **Zero Waste:**
  - Greater than 90% diversion of construction waste from landfill
  - Greater than 80% diversion of operational waste from landfill
  - 'Closed loop' return of usable soil and energy from waste processing
  - The potential to extend this service to adjoining properties
- **Sustainable Transport:**
  - A new connection/entry point for the CBD (with provision for light rail, ferries, Barangaroo Pedestrian Link)
  - Reduced car parking ratios for Retail and Commercial using City of Sydney DCP rates for Residential and Tourism. (Ref. TMAP Supplementary Report)
  - Shared Retail and Commercial and Tourism use car parking
  - Infrastructure and support for cyclists and pedestrians (Ref. TMAP Supplementary Report)
  - Real-time commuter updates
  - Green travel plan to promote vehicle sharing, small cars and electric cars
  - Safe, low-speed onsite environment

- **Landscape And Biodiversity:**
  - 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

Many of these targets involve various third parties and authorities, and will need partnerships and commitments to work with and toward these targets.

These world leading initiatives will be evaluated, measured and reviewed progressively throughout the project life.



### 3 Concept Plan Sustainability

The Concept Plan Amendment Application complies with the sustainability requirements included in the Statement of Commitments of the Approved Concept Plan and a detailed comparison of these requirements is provided below.

Clause	Concept Plan Approval Sustainability Requirements	Concept Plan Amendment Application
<b>ESD</b>		
64.	There is to be an environmental focus on strategies for Water, Energy, Micro-Climate, Environmental Quality / Amenity, Landscape, Transport, Waste and Materials 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.	It is proposed that the Concept Plan Amendment support the attainment of a minimum of 5 star Green Star building ratings for commercial and residential buildings.
<b>Water</b>		
65.	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.	It is proposed that the Concept Plan Amendment support greater than 35% potable water reductions and greater than 40% sewer outfall reductions through the provision of demand reduction measures and a blackwater treatment plant (Ref: Infrastructure report).  The definition of the base measure will be articulated as part of future Project Applications as appropriate.
<b>Energy</b>		
66.	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.	It is proposed that the Concept Plan Amendment will support the attainment of 35% reduction in operational energy related carbon emissions and a minimum of 20% of power to be purchased from low impact renewable sources or alternatively a 20% reduction in GHG emissions through carbon offsets. (Ref: Infrastructure report).  The definition of the base measure will be articulated as part of future Project Applications as appropriate.
<b>Micro Climate</b>		
67.	Key public open spaces (parks and squares) are to receive direct sunlight in mid-winter.	Solar access has been studied and diagrams provided as part of the Concept Plan Amendment Application showing the extent of solar access to key public places within the development.

**Landscape**

68. Primarily non-invasive plant species are to be used on the site.

It is proposed that the Concept Plan Amendment support the use of primarily non-invasive plant species.

**Transport**

69. 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.

It is proposed that the Concept Plan Amendment support the following initiatives;

- Car park ratios and numbers are in accordance with the TMAP for the project. This reduces the amount of cars associated with the development compared to normal practice.
- This application does not impede the future metro corridor or future metro operations.
- Road and car park access do not restrict the future incorporation of light rail, bus or taxi stop. The common loading dock and waste collection facilities in the basement reduce truck parking from the streets at ground level, thereby improving amenity for pedestrians and public transport opportunities generally.

(Ref: TMAP (Supplementary) report)

**Waste**

70. Centralised recycling areas are to be provided in all buildings and 100% of waste bins for public use are to allow for waste separation.

It is proposed that the Concept Plan Amendment support centralised waste collection and recycling areas that provide for the streaming of recyclables for the ongoing operation of all buildings and public spaces (Ref: Waste Management Plan report).

Waste minimisation and recycling practices will be adopted during the construction phases of the works.

**Wind**

71. 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.

It is proposed that the Concept Plan Amendment support the objective of undertaking detailed wind tunnel modelling and verification at the building design application stage. Desk studies have already been prepared and are attached to this Concept Plan Amendment.

## 4 Related sustainability aspects

A comprehensive stormwater control and management approach is to be introduced as the precinct is built out for both the run-off that crosses the site from catchment areas beyond the eastern site boundary and the on-site catchment. This will involve partial retention, treatment to defined standards and reuse of the stormwater (ref: Stormwater Concept Plan)

Stormwater control and management is to be in place during the construction stage (ref: Environmental, Construction and Site Management Report).

## 5 Conclusion

Arup has prepared this Ecologically Sustainable Development (ESD) assessment for the Barangaroo South site. The purpose of the assessment is to inform and accompany the Barangaroo South Concept Plan Amendment (MP06\_0162 MOD4) application.

The assessment concludes that through the successful implementation of a range of precinct wide sustainability initiatives as discussed in this report that the ESD requirements of the existing Concept Plan approval are likely to be achieved and in some cases exceeded.