

Lend Lease (Millers
Point) Pty Limited

**Barangaroo South -
Concept Plan
Amendment
(MP06_0162 MOD4)**

Assessment of
Interaction with Sydney
Metro

ARUP

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July 2010

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Job number 220316

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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).

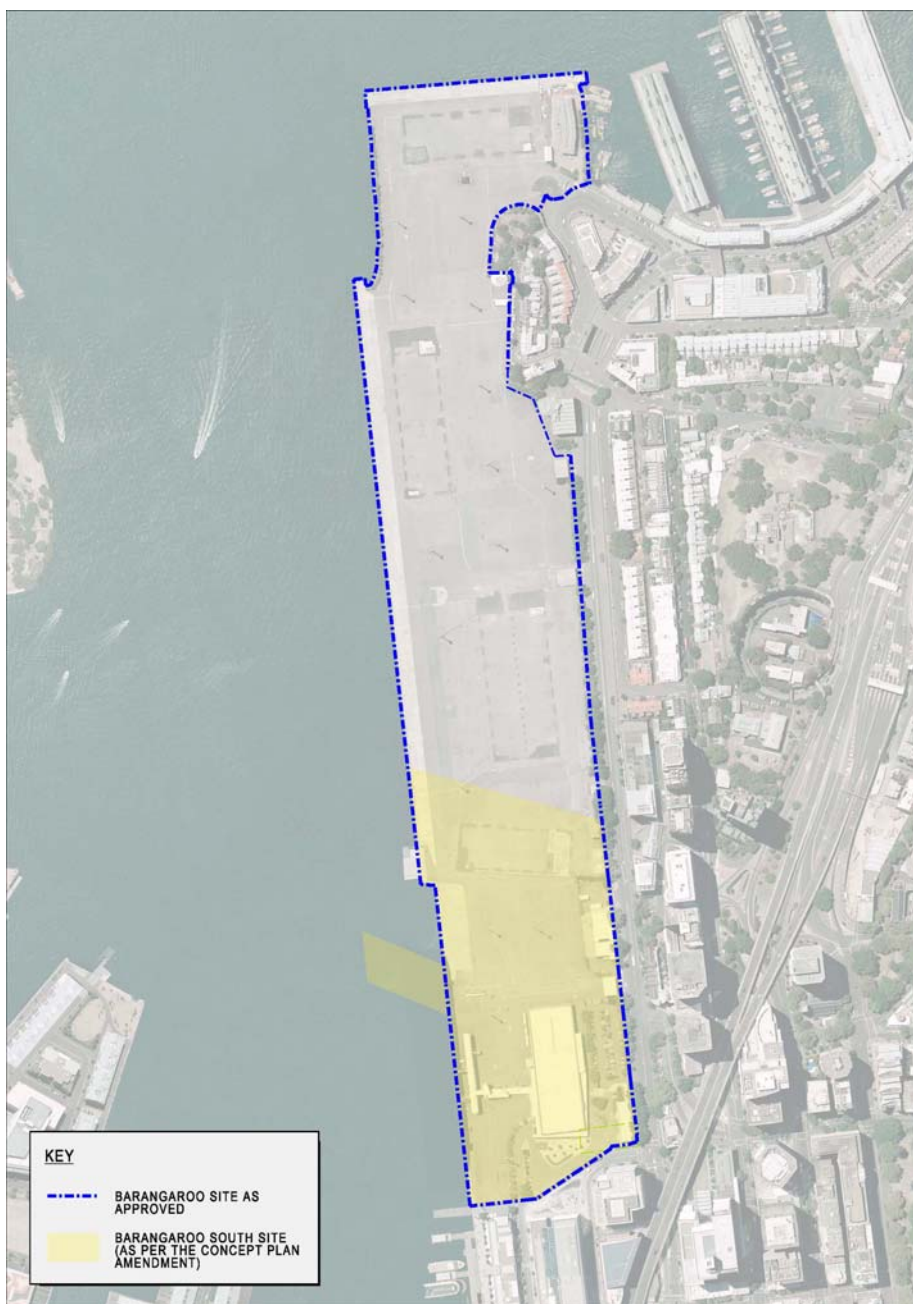


Figure 1: Indicative Site Boundary for Barangaroo South

1.2 Planning History

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 388,300m² 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 508,300m² 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 489,500m² of gross floor area (GFA) contained within 7 blocks on a total site area of 22 hectares.

The proposed Concept Plan Amendment (MP06_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

Arup understand that Lend Lease has received Director General's Requirements (DGR's) dated July 2, 2010, applicable to the Barangaroo South Concept Plan Amendment.

Lend Lease has engaged ARUP to provide advice in relation to Item 2 Bullet point 4 of the DGR's dated July 2, 2010, applicable to MP06_0162 MOD4 which states:

'Demonstrate how the proposed scheme relates to and safeguards the (approved) metro rail infrastructure'.

2 Relevant Information

Arup has reviewed the following documents that are considered relevant to this commission:

- A document entitled: Sydney Metro, CBD Metro Development Guidelines within the vicinity of Sydney Metro Network Line 1, Document Number CBD 2100 PBACH R GN 0159 dated March 30 2010, FINAL
- A set of drawings which accompany the Project Application entitled Bulk Excavation and Basement Carpark PA No MP10_0023, as listed in **Table 1**.

| | |
|--------------|--------------------------|
| BB1_PA1_A000 | Title Sheet |
| BB1_PA1_A001 | Aerial Location Plan |
| BB1_PA1_A002 | Site Analysis Plan |
| BB1_PA1_A003 | Site Survey |
| BB1_PA1_A004 | Demolition |
| BB1_PA1_A005 | Ground Plan |
| BB1_PA1_A006 | Basement Plan Level B1A |
| BB1_PA1_A007 | Basement Plan Level B1A |
| BB1_PA1_A008 | Basement Plan Level CP1 |
| BB1_PA1_A009 | Basement Plan Level CP2 |
| BB1_PA1_A010 | Basement Plan Level CP3 |
| BB1_PA1_A011 | Basement Plan Level CP4 |
| BB1_PA1_A012 | Basement Plan Level CP5 |
| BB1_PA1_A013 | Basement Plan Level CP6 |
| BB1_PA1_A014 | Cross Section 1-1 |
| BB1_PA1_A015 | Longitudinal Section 1-1 |
| BB1_PA1_L001 | Landscape Plan |

Table 1 - Bulk Excavation and Basement Car Parking Project Application Drawings

- Selected drawings to accompany this Project Application entitled Barangaroo South Concept Plan Amendment (MP06_0162 MOD4), as listed in **Table 2**.

| | |
|---------------------|-------------------------|
| RSHP_A_MP_2400_P_00 | Site Plan |
| RSHP_A_MP_2100_P_00 | Masterplan Ground Level |
| RSHP_A_MP_4110_S_AA | Site Section AA |
| RSHP_A_MP_4130_S_CC | Site Section CC |

Table 2 – Concept Plan Amendment Project Application Drawings

3 Discussion

The Metro protection corridor is defined by the first and second reserve documented in the *Development Guidelines within the vicinity of Sydney Metro Network Line 1*, prepared by the Sydney Metro Authority, CBD Metro, document reference CBD-2100-PBACH-R-GN-0159 dated 30 March 2010, Revision A-1, Status Final. This corridor runs beneath the southern end of the Barangaroo South site.

This concept plan amendment proposes a number of commercial and residential buildings which will be located over the metro corridor.

Furthermore the development incorporates a common basement; Stage 1 of which will extend up to the northern side of the Metro corridor. We note that the MP10_0023 Project Application drawings referenced in this report reflect the first stage of the basement structure which is ultimately to service all the requirements of the Barangaroo South development. Lend Lease has advised Arup that the subsequent stages of the basement works will be the subject of either an amendment to the Bulk Excavation and Basement Car Parking Project Application MP10_0023 or a separate Project Application. It is anticipated that the subsequent stages will result in the basement being extended over the Metro corridor.

The basement design will incorporate a continuous retention and groundwater control wall to the final perimeter of the Stage 1 basement in its entirety. The design detail and depth of the final arrangements of the basement perimeter retention system is the subject of further design development as part of MP10_0023.

Based on a technical review of the referenced drawings and documentation together with discussions with LLMP, the following comments are noted with regard to the proposed Concept Plan Amendment and the Metro corridor:

- In the proximity of the Barangaroo Metro Station and Service Building Box, it is proposed that the overall Stage 1 basement slabs and podium ground plane slab, together with the future above ground structures coordinate with and are supported by the Metro Station and Service Building Box structure which is to be constructed by others under a separate approval;
- To the west of the Station and Service Building Box, the vertical transitions in the basement structure adjacent and over the Metro tunnels will be addressed typically with conventional concrete frame construction supported on local piled foundations;
- Although the subject of future project applications and consultation with the Metro, any columns that are required to support the future tower closest to and above the rail corridor are proposed to pass between and be founded at a depth below the Metro tunnels where applicable. Lower rise buildings such as the future proposed tower podiums will typically be founded on piled foundations bridging the Metro tunnels or passing between the tunnels as proposed above in the case of the tower. The proposed commercial building on Hickson Road in part directly over the Station and Service Building Box would be designed to co ordinate vertical loads to pass onto the walls of the Box (or transfers), with the approval of Sydney Metro; and
- The proposed entry and exit commercial and loading dock vehicular ramp structure off the proposed Margaret Street West extension provided to service the basement and passing over the Metro rail tunnels, is proposed to be supported on piled foundations (or other suitable) either side of the Metro tunnels.

Through further detailed design, the requirements of the document Sydney Metro, CBD Metro Development Guidelines will need to be considered in demonstrating that the proposed works do not have adverse structural or operational impacts on the SMN-1 Metro.

4 Conclusion

In the context of the proposed Concept Plan Amendment for Barangaroo South (MP06_0162 MOD4) and other documentation provided by Lend Lease, Arup is of the opinion that the proposed development will not impede the Metro rail corridor or affect the future operations of the Metro project.