

Lend Lease Pty Ltd

**Barangaroo South - Concept Plan
Amendment (MP06_0162MOD6)**

Traffic Impact Assessment

Rev B | 21 March 2013

This report takes into account the particular instructions and requirements of our client.

It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party.

Job number 222061

Arup
Arup Pty Ltd ABN 18 000 966 165



Arup
Level 10 201 Kent Street
PO Box 76 Millers Point
Sydney 2000
Australia
www.arup.com

ARUP

Contents

	Page
1 Introduction	1
1.1 Background	1
1.2 Planning History	1
1.3 Purpose of this Report	2
2 Existing Traffic Conditions	3
2.1 Road Network	3
2.2 Traffic Volumes	3
2.3 Main Road Intersections	3
3 Proposed Modifications to Concept Plan	5
3.1 Floor Space and Traffic Generation	5
3.2 Road Configuration	5
3.3 Site Access During Construction	6
4 Conclusions	7

Tables

Table 1 Two Way Peak Hour Traffic Volumes

Figures

Figure 1 AM Peak Hour Traffic Volumes (AECOM, 2011)

Figure 2 PM Peak Hour Traffic Volumes (AECOM, 2011)

Figure 3 Ground Floor Indicative Layout

Figure 4 Key Pedestrian Routes to Barangaroo Site

1 Introduction

1.1 Background

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

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.

On 16 December 2010 the Minister approved Modification No.4 to the Concept Plan to allow:

- 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.

The proposed Concept Plan Amendment (MP 06_0162 MOD 6) seeks the Minister's consent for:

- Realignment of Globe Street. The proposed alignment is to connect with Hickson Road on the approved temporary alignment; and
- Small redistribution of floor space between Blocks 3 and 4 however the overall GFA will not change.

1.3 Purpose of this Report

This report has been prepared to accompany the Project Application for modification of the Barangaroo Concept Plan. It responds to the transport related issues addressed in the Director General Requirements (DGRs) for MP06_0162 as summarised below.

Prepare Traffic Impact Assessment (TIA) that evaluates:

- *Daily and peak movements likely to be generated by the concrete batching plant and any vehicle movement changes caused by amendments the building envelopes (i.e. a reduction in GFA). '*
- *Cumulative impacts associated with other construction activities at Barangaroo.*
- *Details of service arrangements for workers to/from the site, emergency vehicles and service vehicle movements.*

2 Existing Traffic Conditions

2.1 Road Network

Hickson Road runs along the eastern boundary of the site. It is a wide two lane, two way road that forms a northern extension of Sussex Street to the north of Napoleon Street. Sussex Street runs along the western side of Sydney CBD between Napoleon to the north and Hay Street to the south. It is two way north of King Street and one way southbound south of King Street.

Other local roads adjacent to the site are Napoleon Street and Shelley Street. Napoleon Street provides connection between Kent Street and Hickson Road. It is a relatively wide road and has moderate downward slope from Kent Street to Hickson Road. Shelley Street provides a connection between Hickson Road (to the north) and Erskine Street (to the south).

2.2 Traffic Volumes

Traffic counts were undertaken on Hickson Road and Sussex Street by AECOM in November 2011 and are presented in Table 1. The traffic volumes on Hickson Road and Sussex Street progressively increase towards the south as vehicles join this southbound route on the western side of the city. This is particularly evident in the PM peak, when Sussex Street is utilised as a major departure route from the city to the Western Distributor-Anzac Bridge and routes further south and east.

Table 1 Two Way Peak Hour Traffic Volumes

Road	Location	AM Peak			PM Peak		
		NB	SB	Total	NB	SB	Total
Hickson Rd	N of Napoleon St	647	250	897	469	659	1,128
Sussex St	N of Erskine St	628	619	1,247	479	808	1,287
Sussex St	N of King St	597	1,005	1,602	294	1,223	1,517

Source: AECOM traffic surveys 8th November 2011

2.3 Main Road Intersections

Most existing road intersections to the south of Barangaroo, along Sussex Street and within the Sydney CBD generally are controlled by traffic signals. The intersections along Sussex Street, i.e. at Erskine Street, King Street and Market Street are controlled by traffic signals.

Intersection surveys were conducted by AECOM on Tuesday 8th November 2011 (a typical weekday outside of school holiday periods). The existing morning and afternoon peak hour intersection traffic volumes at these intersections are illustrated in Figure 1 and Figure 2.



Figure 1 AM Peak Hour Traffic Volumes (AECOM, 2011)

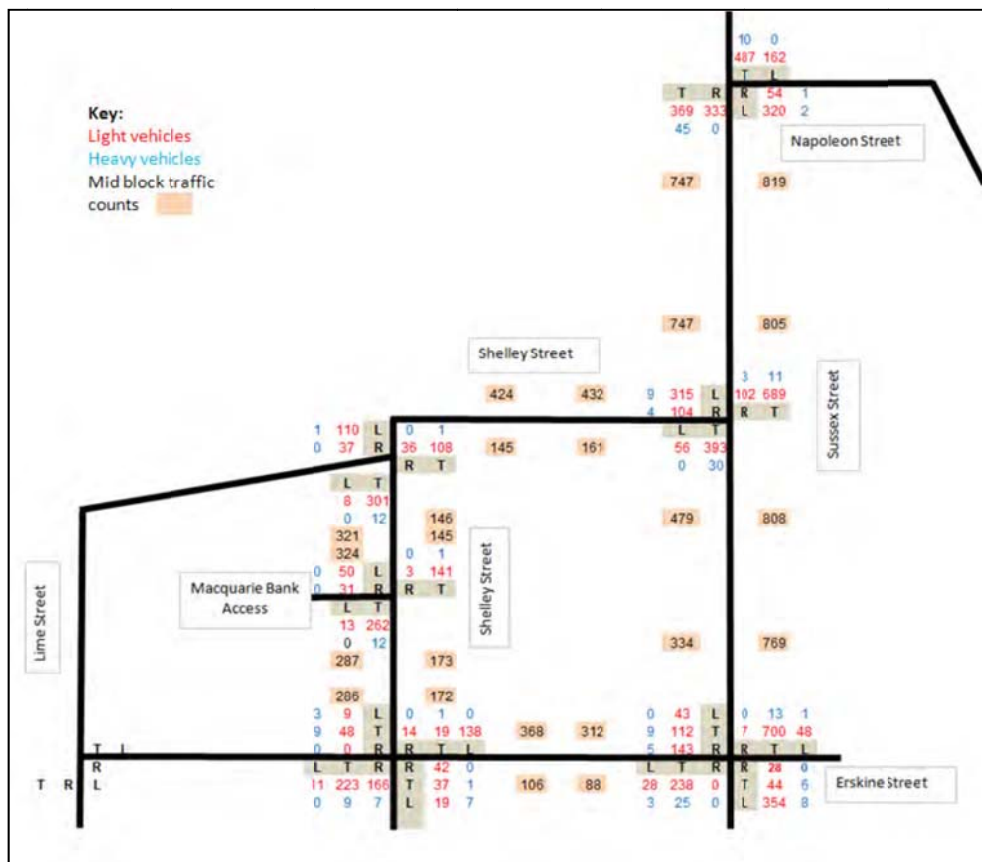


Figure 2 PM Peak Hour Traffic Volumes (AECOM, 2011)

3 Proposed Modifications to Concept Plan

3.1 Floor Space and Traffic Generation

The latest modification of the Concept Plan seeks no change to the total floor area for the whole site which remains at 565,965m² GFA. Therefore there is to be no change in total vehicle movements associated with the precinct compared with the approved Concept Plan (Mod 4).

3.2 Road Configuration

The application proposes a modification to the approved internal road network layout within the Barangaroo South precinct. This involves the realignment of Globe Street to run perpendicular to Hickson Road and connect with it approximately 80m north of Napoleon Street. It is envisaged this intersection will ultimately be controlled by traffic signals.

Following the connection of Globe Street with Hickson Road, it is likely the northern section of Shelley Street will be closed to vehicular traffic to accommodate the newly constructed Wynyard Walk landing (subject to approval by the road authority).

The ground floor indicative layout as proposed is outlined in Figure 3 below.

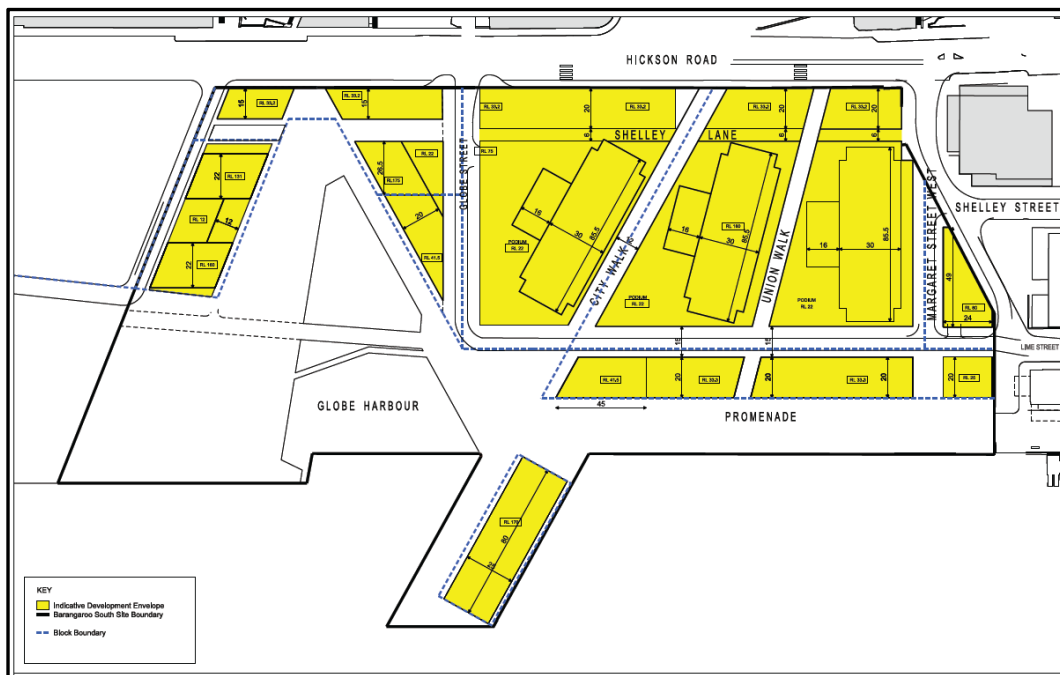


Figure 3 Ground Floor Indicative Layout

3.3 Site Access During Construction

3.3.1 Pedestrian Routes Approaching the Site

There are a number of existing pedestrian routes which will facilitate movement for construction workers to and from the Barangaroo South site. These pedestrian routes are consistent with those already outlined in the existing Barangaroo Concept Plan approvals.

Existing pedestrian crossing facilities on Napoleon Street (pedestrian refuge) and Hickson Road (zebra crossing) will facilitate access for construction workers into the site. Dedicated pedestrian crossing legs at the Margaret Street / Kent Street and Sussex Street / Shelley Street intersections will remain in place during the Wynyard Walk bridge and tunnel works, which will allow safe pedestrian movement across Napoleon Street towards the Barangaroo site.

There is also a proposed temporary pedestrian bridge across Hickson Road mid-way between Napoleon Street and Shelley Street to supplement ground level access.

A pedestrian refuge in the middle of Napoleon Street has recently been installed in March 2012, allowing a two staged crossing of Napoleon Street. This intersection is to be upgraded to include traffic signals prior to occupancy of the commercial buildings at Barangaroo.

A summary of the key pedestrian routes for construction workers accessing the Barangaroo site is presented in Figure 4.

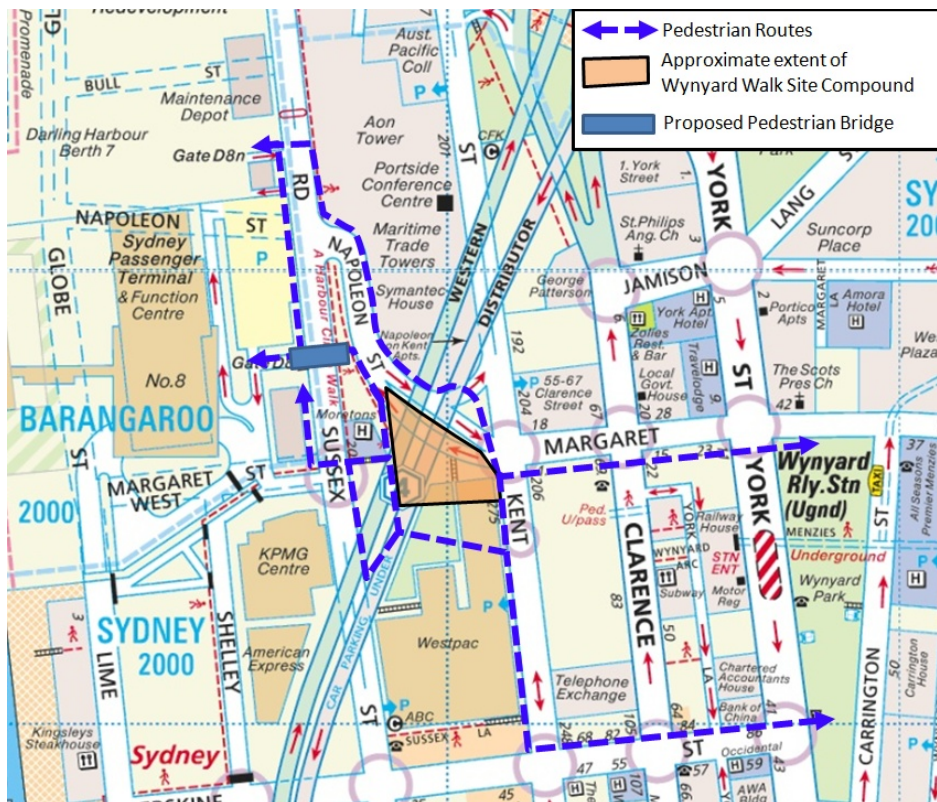


Figure 4 Key Pedestrian Routes to Barangaroo Site

3.3.2 Internal Site Vehicle Access and Car Parking Areas

No changes to site access for construction vehicles are proposed as part of this Concept Plan modification.

The gatehouse at the access to the site is to be located approximately 40 metres inset from Hickson Road to prevent any queuing on Hickson Road by trucks entering the site. Any truck queuing will occur within on site. All vehicles will enter the site in a forwards direction. The gatehouse will be centred on the access road to prevent trucks parking along the kerbside to enquire about directions on site.

3.3.3 Emergency Vehicle Access

No changes are proposed to emergency vehicle access as part of this Concept Plan amendment. Site entries are to be clearly signposted for the benefit of all approaching site traffic, in particular emergency services vehicles.

4 Conclusions

Arup has prepared this traffic impact assessment for the proposed amendment to the Barangaroo South Concept Plan (MP06_0162 MOD6).

As the Concept Plan amendment proposes no alteration to the total floor space at Barangaroo South, there is to be no change in total vehicle movements associated with the precinct compared with the approved Concept Plan (Mod 4).

20 December 2012

Abbey Johnson
Lend Lease
Level 4, 30 The Bond
30 Hickson Road
Millers Point
NSW 2000

Dear Abbey

Barangaroo South - Concept Plan Amendment MP06_162 MOD6

This letter was prepared by AECOM for Lend Lease Millers Point Pty Ltd to support the S75W application Mod 6 for the Barangaroo Concept Plan. AECOM has reviewed and assessed the drawings and relevant documentation prepared in respect of the S75W Concept Plan modification 6 submission.

The proposed concept plan amendment does not change the conclusions and recommendations of the 'Air Quality Impact Assessment - Barangaroo Concept Plan Amendment (MP 06_0162 MOD 4) for Lodgement to DOP' report dated 27 July 2010, which supported the Barangaroo Concept Plan MP06_162 Mod 4 to achieve the requirements as set out in the relevant Director-General's Requirements.

On this basis, AECOM is of the opinion that the proposed Concept Plan Mod 6 amendments do not require any additional supporting information, analysis or commentary in relation to potential air quality impacts at this stage of the design.

Yours sincerely



Principal Engineer
david.rollings@aecom.com

Direct Dial: +61 2 4911 4985
Direct Fax: +61 2 4911 4999

Your ref
Our ref 220316/#
File ref

ARUP

Lend Lease
Level 4, 30 The Bond
30 Hickson Road
Millers Point NSW 2000

Level 10 201 Kent Street
PO Box 76 Millers Point
Sydney 2000
Australia

t +61 2 9320 9320
d +61 2 9320 9341
f +61 2 9320 9321

bruce.kelly@arup.com
www.arup.com

21 December 2012

Barangaroo South – Concept Plan Amendment MP06 162 MOD 6 Climate Change & Sea Level Rise Report - Cover Letter

This letter has been prepared by Arup for Lend Lease Millers Point Pty Ltd to support an Application made pursuant to section 75W of the Environmental Planning and Assessment Act 1979 to modify Project Approval granted by the Minister for Planning in respect of MP06_162 for the Barangaroo Concept Plan.

Arup has reviewed the block boundary plans prepared by Rogers Stirk Harbour & Partners (RSHP) with respect to this S75W Concept Plan MOD 6 submission.

The Climate Change & Sea Level Rise Report – Issue (dated 28 July 2010) prepared by Arup to support the MOD 4 Project Application addressed the climate change induced sea level rise issues associated with the wider Barangaroo South site.

The modifications to the Concept Plan as part of this Section 75W submission are within the scope of the original report. The proposed MOD 6 amendment does not change the assessment and recommendations of the MOD 4 report.

On this basis, Arup is of the opinion that the proposed modification as contained in the Section 75W submission for MP06_162 will not result in any additional impact and requires no further investigations or analysis in relation to climate change and sea level rise at this stage of planning and design.

Yours sincerely



Bruce Kelly
Associate

Your ref
Our ref 220316/#
File ref

ARUP

Lend Lease
Level 4, 30 The Bond
30 Hickson Road
Millers Point NSW 2000

Level 10 201 Kent Street
PO Box 76 Millers Point
Sydney 2000
Australia

t +61 2 9320 9320
d +61 2 9320 9341
f +61 2 9320 9321

bruce.kelly@arup.com
www.arup.com

21 December 2012

Barangaroo South – Concept Plan Amendment MP06 162 MOD 6 Geotechnical Report - Cover Letter

This letter has been prepared by Arup for Lend Lease Millers Point Pty Ltd to support an Application made pursuant to section 75W of the Environmental Planning and Assessment Act 1979 to modify Project Approval granted by the Minister for Planning in respect of MP06_162 for the Barangaroo Concept Plan.

Arup has reviewed the block boundary plans prepared by Rogers Stirk Harbour & Partners (RSHP) with respect to this S75W Concept Plan MOD 6 submission.

The Geotechnical Report – Rev B (dated 28 July 2010) prepared by Arup to support the MOD 4 Project Application provided a desktop study of the likely geotechnical conditions and issues based on available data. This study highlighted issues and possible strategies in the context of the wider Barangaroo South site.

The modifications to the Concept Plan as part of this Section 75W submission are within the scope of the original report. The proposed MOD 6 amendment does not change the assessment and recommendations of the MOD 4 report.

On this basis, Arup is of the opinion that the proposed modification as contained in the Section 75W submission for MP06_162 will not result in any additional impact on the geotechnical desktop study from that identified within the Geotechnical Report and requires no further investigation or analysis at this stage of planning and design.

Yours sincerely



Bruce Kelly
Associate

Your ref
Our ref 220316/#
File ref

ARUP

Lend Lease
Level 4, 30 The Bond
30 Hickson Road
Millers Point NSW 2000

Level 10 201 Kent Street
PO Box 76 Millers Point
Sydney 2000
Australia

t +61 2 9320 9320
d +61 2 9320 9341
f +61 2 9320 9321

bruce.kelly@arup.com
www.arup.com

21 December 2012

Barangaroo South – Concept Plan Amendment MP06 162 MOD 6 Assessment of Interaction with Sydney Metro Report - Cover Letter

This letter has been prepared by Arup for Lend Lease Millers Point Pty Ltd to support an Application made pursuant to section 75W of the Environmental Planning and Assessment Act 1979 to modify Project Approval granted by the Minister for Planning in respect of MP06_162 for the Barangaroo Concept Plan.

Arup has reviewed the block boundary plans prepared by Rogers Stirk Harbour & Partners (RSHP) with respect to this S75W Concept Plan MOD 6 submission.

The Assessment of Interaction with Sydney Metro Report – Issue (dated 27 July 2010) prepared by Arup to support the MOD 4 Project Application addressed the general principles of the foundations of the various Barangaroo structures, their proximity to the Metro corridor and any impact this might have on the Metro.

The modifications to the Concept Plan as part of this Section 75W submission are within the scope of the original report. The proposed MOD 6 amendment does not change the assessment and recommendations of the MOD 4 report.

On this basis, Arup is of the opinion that the proposed modification as contained in the Section 75W submission for MP06_162 will not result in any additional impact on the Metro from that identified within the Assessment of Interaction with Sydney Metro Report and requires no further investigation or analysis at this stage of planning and design..

Yours sincerely



Bruce Kelly
Associate



WorleyParsons

resources & energy

Infrastructure & Environment

Level 11, 141 Walker Street,
Sydney NSW 2060
Australia
Telephone: 02 8923 6887
Facsimile: +61 2 8923-6877
www.worleyparsons.com
ABN 61 001 279 812

20 March 2013

File: 301015-02803

Abbey Johnson,
Lend Lease
Level 4, 30 The Bond,
30 Hickson Road,
Millers Point NSW 2000
abbey.johnson@lendlease.com

Dear Abbey,

RE: BARANGAROO SOUTH – CONCEPT PLAN AMENDMENT MP06_162 MOD 6

This letter has been prepared by WorleyParsons Services Pty Ltd for Lend Lease Millers Point Pty Ltd to support the S75W application mod 6 for the Barangaroo Concept Plan.

WorleyParsons has reviewed and assessed the drawings and relevant documentation prepared in respect of the S75W Concept Plan modification 6 submission.

The proposed concept plan amendment does not change the assessment and recommendations of:

- Barangaroo Concept Plan Amendment (MP06_0162 MOD 4) – Marine Ecology, Water Quality and Contaminated Sediment Impact Assessment (dated 29th July, 2010); and
- Barangaroo Concept Plan Amendment (MP06_0162 MOD 4) – Navigation Study (dated 26th July, 2010)

that supported the Barangaroo Concept Plan MP06_0162 Mod 4 to achieve the requirements as set out in the relevant Director General Requirements.

On this basis, WorleyParsons is of the opinion that the proposed Concept Plan Mod 6 amendments do not require any additional supporting information, analysis or commentary at this stage of the design.

Yours sincerely,

Patrick MCCALLUM
Sector Manager, Ports and Marine
WorleyParsons

14 January 2013

WM Project Number: 10232
Our Ref: AJ 181212 Mod6 Operation.doc

Abbey Johnson
Lend Lease
Level 4, 30 The Bond
30 Hickson Road
Millers Point
NSW 2000

Dear Abbey,

**RE: BARANGAROO SOUTH – CONCEPT PLAN AMENDMENT MP06_162 MOD 6
OPERATIONAL NOISE AND VIBRATION**

This letter has been prepared by Wilkinson Murray Pty Ltd for Lend Lease Millers Point Pty Ltd to support the S75W application mod 6 for the Barangaroo Concept Plan.

Wilkinson Murray Pty Ltd has reviewed and assessed the drawings and relevant documentation prepared in respect of the S75W Concept Plan modification 6 submission. Wilkinson Murray has prepared the noise and vibration assessments to support the Project Applications for all major components of the South Barangaroo project.

The review has taken into account the operational noise and vibration that was prepared to support for mod 4 by Arup Pty Ltd titled: "*Barangaroo - South Concept Plan Amendment - (MP06_0162 MOD 4) Acoustic Report dated June 2010*".

Based on this review it has been determined that from an operational noise and vibration perspective the proposed concept plan amendment is minor. Therefore there will be no significant change to the noise and vibration emissions from the South Barangaroo Site as a result of the proposed modification.

On this basis, Wilkinson Murray is of the opinion that the proposed Concept Plan Mod 6 amendments do not require any additional supporting information, analysis or commentary at this stage of the design.

Yours faithfully

WILKINSON MURRAY



Brian Clarke
Senior Associate