Lend Lease Pty Ltd

Temporary Concrete Batching Plan (SSD5967-2013)

Transport Assessment

222061-14

Rev B | 22 October 2013

Job number 222061-14

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1 Introduction

1.1 Study Background

This report has been prepared by Arup for Lend Lease Pty Ltd to support a State Significant Development Application (SSD5967-2013) for a temporary concrete batching plant at Barangaroo. A number of Project Approvals have been obtained for works at Barangaroo South, including for bulk excavation and the construction of an integrated building basement (including temporary use of a concrete batching plant being Modification 4 to MP10_0023), as well as for buildings C3, C4 and C5. Construction work has commenced at Barangaroo South under these Project Approvals and the majority of the site is now a construction site.

Arup has prepared a series of construction traffic management plans as part of these project applications, which addressed the cumulative traffic impacts of construction activity from Barangaroo South and Headland Park main works. This application seeks approval for the on-site production of pre-mixed concrete through the use of a concrete batch plant.

The installation and use of a temporary concrete batching plant has been approved under Modification 4 to MP10_0023 for the Stage 1A basement at Barangaroo South. The SSD Development Application (DA) seeks approval for the continuing operation of the temporary concrete batching plant to supply concrete for the construction of all buildings and infrastructure at Barangaroo South, in addition to the currently approved use of the temporary concrete batching plant for the construction of the Stage 1A Basement.

1.2 Purpose of Report

This report has been prepared to accompany the SSD for the temporary concrete batching plant. It responds to the transport related issues identified in the Director General Requirements (DGRs) for SSD5967-2013 as summarised below.

Prepare Traffic Impact Assessment (TIA) that evaluates:

- *Daily and peak traffic movements likely to be generated by the project*
- *Cumulative impacts associated with other construction activities on the Barangaroo site*
- *Details of access arrangements for workers to/from the site, emergency vehicles and service vehicle movements*
- *Details of any proposed transportation of materials via the Harbour and proposed locations for handling materials*

2 Proposed Use

2.1 Background

This development application seeks approval to utilise the batch plant for concrete production for the entire Barangaroo South site – i.e. the basement structure and associated commercial/residential buildings. This is expected to commence in November 2013 and continue up to June 2015. The batch plant will maximise the environmental sustainability, and timely construction, of the works permitted under the current approvals for the Barangaroo precinct.

The provision of the plant will result in a significant reduction in the number of truck movements[1] to and from the site, providing both environmental and social benefits. Mixed concrete can only be stored for a limited amount of time and reliance on off-site deliveries can have significant negative implications on the construction schedule.

2.2 Required Concrete Production

For the 20 months between November 2013 and June 2015, approximately 200,000m^3 of concrete will be required on-site. This is based on concrete production estimates provided by Lend Lease to Arup in September 2013 as shown in Figure 1. This includes the concrete required for the basement structure as well as the construction of the commercial and residential buildings.

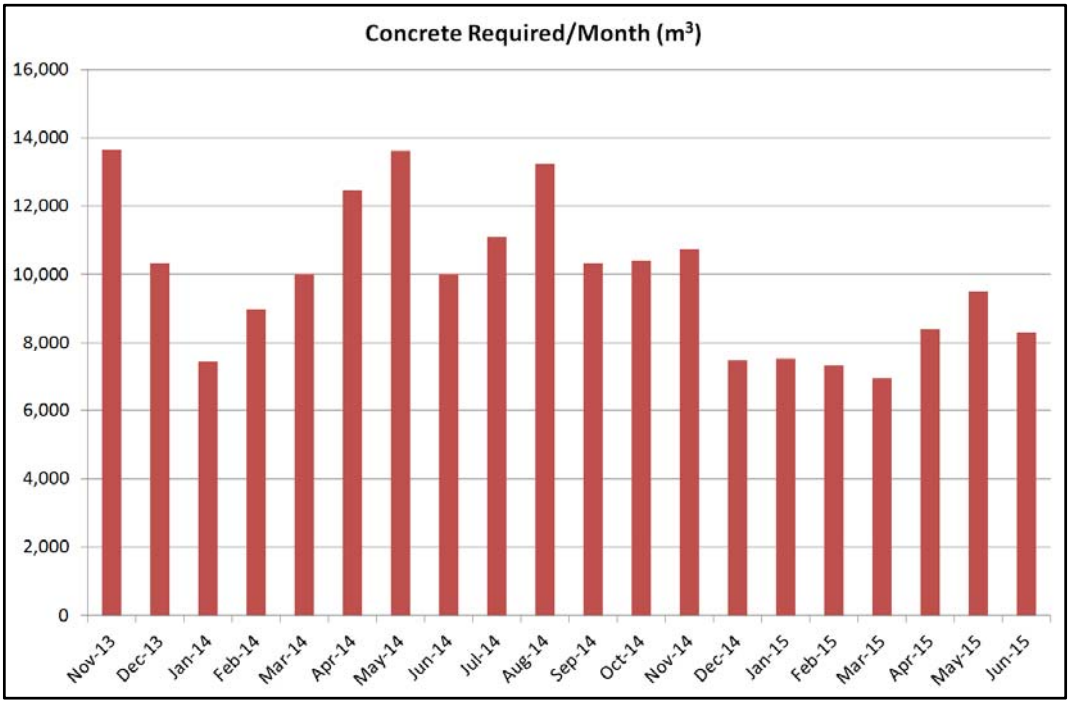

Figure 1 Required Concrete Production

[1] For the purposes of this report, a traffic movement is defined as the one-way flow of a single vehicle at a particular location. A single truck entering the site, and departing some time later, is regarded to contribute two movements to the total traffic flow

2.3 Concrete Batch Plant Operation

The operational capacity of the plant is 145m^3 per hour. The batch plant will operate between 7.00am and 6.00pm Monday – Friday and between 7.00am and 5.00pm on Saturdays as per existing approvals for the site. This equates to production of 1,600m^3 of concrete on weekdays and 1,450m^3 on Saturdays. On large pour days (i.e. pours of 2,000m^3), the additional concrete that cannot be supplied by the plant (approximately 20% of the total requirement) will be sourced off-site.

There is no change to the estimated maximum operating capacity of the plant since the previous MP10_0023 Mod4 approvals. Lend Lease propose to increase the volume of concrete produced by the plant to allow for its use across the entire Stage 1A site (i.e. increase from 1,200m^3 for the basement to 1,600m^3 for the whole site).

For the purposes of estimating total truck movements, it is assumed the batch plant will produce 80% of the total concrete requirement over the course of its operation. This is considered a conservative assumption, and it is likely the proportion of concrete produced by the batch plant will be higher than this 80% figure, given large pours are unlikely to occur on a daily basis.

3 Transport Assessment

3.1 Forecast Concrete Truck Movements

3.1.1 Methodology

To produce the concrete within the batch plant, cementitious material and aggregate will be required to be delivered to site. For every $1m^3$ of concrete produced on site, 0.5t of cementitious material and 1.9t of aggregate will be required. A cement powder tanker has the capacity to transport on average 27t of powdered cementitious material, and an aggregate tipper truck can transport up to 32t of aggregate material.

In comparison to this, one traditional concrete agitator truck has the capacity to carry $6.5m^3$ of concrete.

Therefore for every $100m^3$ of concrete required on-site, the following numbers of trucks are required:

(i) Without concrete batch plant:

- *Agitator truck movements:*

$100m^3$/ ($6.5m^3$/truck) * 2 = 31 movements

Total Truck movements per $100m^3$ of concrete: 31

(ii) With concrete batch plant:

- *Cement powder tanker movements:*

{(0.5t*100*80%) / 27t}* 2 = 3 movements

- *Aggregate tipper truck movements:*

{(1.9t*100*80%) / 32t}* 2 = 10 movements

- *Agitator truck movements:*

($100m^3$*20%) / ($6.5m^3$/truck) * 2 = 6 movements

Total Truck movements per $100m^3$ of concrete: 19

Therefore, for every $100m^3$, 11 trucks are removed from the road network with the concrete batch plant in place (reducing the agitator use from 31 truck movements to 6 truck movements).

3.1.2 Daily Vehicle Movements

Utilising the concrete batch plant for the entire site has the potential to remove a significant number of truck movements from the local road network. In November 2013 13,637m^3 of concrete would be required to service the basement and commercial buildings, equating to 682m^3 on average per day (based on a 20 day working month). The average and peak reduction in daily truck movements during November 2013 are as follows:

- **Average day, November 2013 (682m^3 concrete required)**

No batch plant: 210 truck movements

With batch plant: 127 truck movements

Reduction: 83 truck movements

- **Large pour day (2,000m^3 concrete required)**

No batch plant: 615 truck movements

With batch plant: 372 truck movements

Reduction: 243 truck movements

The monthly difference in average daily truck movements, with and without the concrete batch plant in operation, is summarised in Figure 2 (utilising total monthly concrete production volumes from Figure 1).

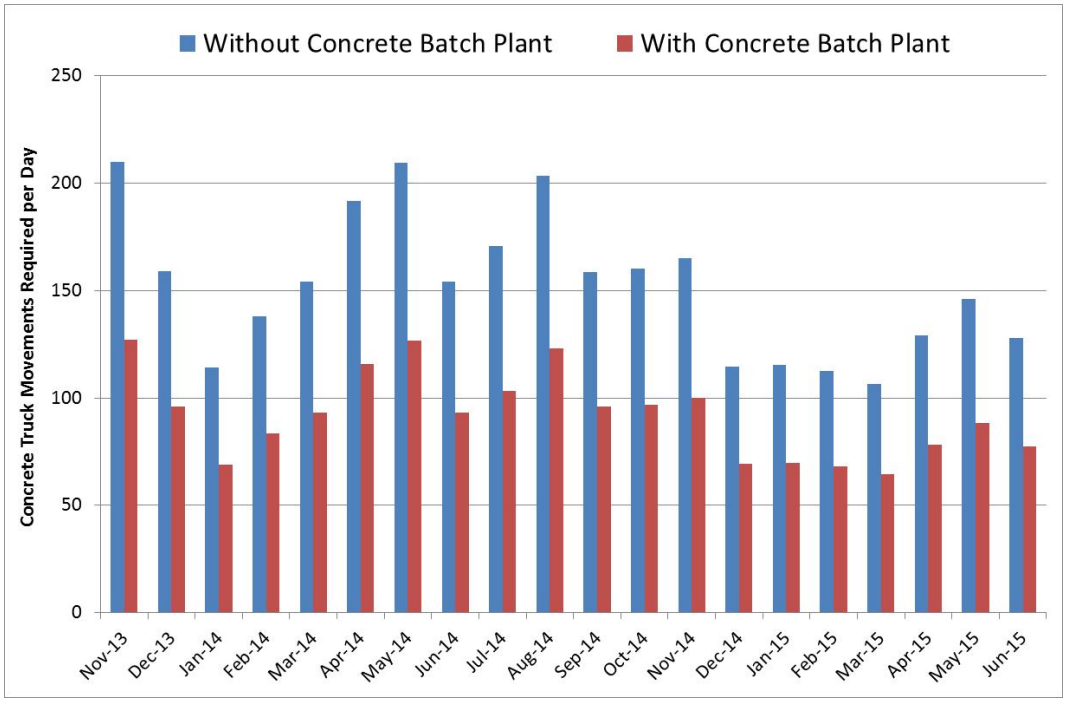

Figure 2 Variation in Average Daily Concrete Truck Movements

Based on forecast concrete volumes over each month, Table 1 compares the monthly differences between the operational status of the batch plant (i.e. whether the batch plant is in operation or not.)

Table 1 Forecast Daily Truck Movements with On-Site Batch Plant

Activity	**Nov-13**	**Dec-13**	**Jan-14**	**Feb-14**	**Mar-14**	**Apr-14**	**May-14**	**Jun-14**	**Jul-14**	**Aug-14**
Average concrete agitator truck movements per day (**no batch plant**)	210	159	114	138	154	192	210	154	171	203
Average concrete agitator truck movements per day (**with batch plant**)*	42	32	23	28	31	38	42	31	34	41
Average cement powder tanker movements per day	20	15	11	13	15	18	20	15	16	20
Average aggregate tipper truck movements per day	65	49	35	43	48	59	65	48	53	63
Average total truck movements per day (with batch plant)	127	96	69	84	93	116	127	93	103	123
Reduction in daily truck movements	**83**	**63**	**45**	**55**	**61**	**76**	**83**	**61**	**67**	**80**
Activity	**Sep-14**	**Oct-14**	**Nov-14**	**Dec-14**	**Jan-15**	**Feb-15**	**Mar-15**	**Apr-15**	**May-15**	**Jun-15**
Average concrete agitator truck movements per day (**no batch plant**)	159	160	165	115	115	112	107	129	146	128
Average concrete agitator truck movements per day (**with batch plant**)*	32	32	33	23	23	22	21	26	29	26
Average cement powder tanker movements per day	15	15	16	11	11	11	10	12	14	12
Average aggregate tipper truck movements per day	49	49	51	35	36	35	33	40	45	39
Average total truck movements per day (with batch plant)	96	97	100	69	70	68	65	78	88	77
Reduction in daily truck movements	**63**	**63**	**65**	**45**	**46**	**44**	**42**	**51**	**58**	**50**

* 20% of concrete to arrive to site via traditional means

3.1.3 Hourly Vehicle Movements

One of the key benefits of an on-site concrete batch plant is that it allows for the delivery of bulk raw materials to occur outside the commuter peak hours, reducing the impact on the local road network.

On days of large concrete pours, up to 2,000m^3 of pre-mixed concrete will be required to service the site – previously requiring more than 600 truck movements over the course of the day. The proposed concrete batch plant has the capacity to produce approximately 80% of the required concrete on-site (1,600m^3), resulting in a significant reduction in truck movements during commuter peak hours (up to 40 vehicles per hour). The hourly variation in truck movements on days of large concrete pours is presented in Figure 3.

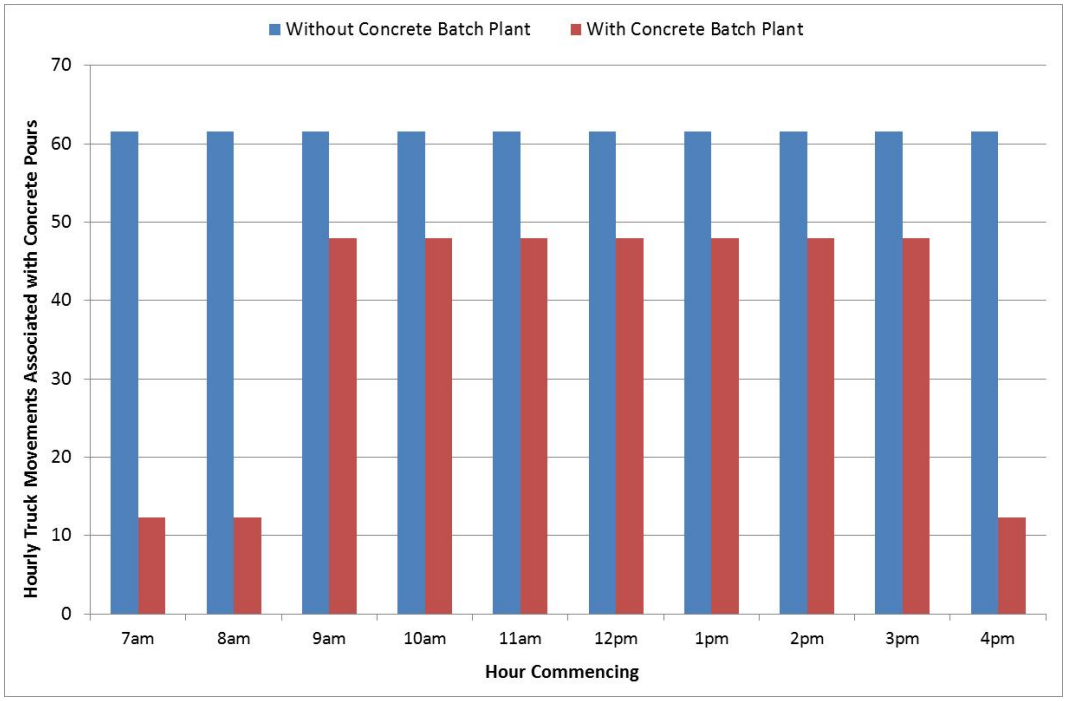

Figure 3 Hourly Variation in Concrete Truck Movements (large pour day)

Assuming that agitator deliveries arrive evenly throughout the day, and confining the delivery of raw materials to after 9am and prior to 4pm still results in less hourly truck movements throughout each hour of the day when compared with the traditional methods of delivery of pre-mixed concrete. This demonstrates the significant benefit the batch plant will deliver to the road network operation.

3.2 Construction Vehicle Routes

The expected routes for construction vehicles into and out of the Barangaroo South site remained unchanged from the existing approvals. 70% of construction vehicles are forecast to approach the worksite from the southern and western parts of Sydney. The remainder would approach from the northern direction (i.e. via the Harbour Bridge). Margaret Street would not be used as a construction route between 6am and 10am and from 2pm to 8pm.

3.3 Road Network Benefits

3.3.1 Construction Vehicle Movements

An assessment has been made of the cumulative impacts of the construction activities within the Barangaroo South precinct, based on the works described in Table 2 below.

Table 2 Construction Details of Works in Barangaroo South Precinct

Project	**Project Duration***	
	Start	*Finish*
Barangaroo South Works		
Bulk Excavation and Basement Car Parking	Oct 2011	Dec 2015
T1 Commercial Building	Mar 2014	Sep 2016
T2 Commercial Building	May 2013	Aug 2015
T3 Commercial Building	Oct 2013	Mar 2016
R8/R9 Residential Buildings	Jan 2014	Aug 2015
Batch Plant Operation	Nov 2013	Jun 2015
Hickson Road Stormwater Works	Jan 2013	Dec 2013
Works External to Barangaroo South		
Wynyard Walk	Apr 2013	Jul 2015
Headland Park Main Works	Apr 2013	Jul 2015
Barangaroo Central – Waterfront Promenade	Jan 2014	Jan 2015

* The above dates are indicative only and allow for future tenant fit out works within the individual buildings

Construction vehicle activity generated by works external to Barangaroo South have been forecast based on the supporting planning documents to each of the project application, as follows:

- **Headland Park**: *Barangaroo Headland Park Early Works – Construction Traffic Management Plan and Impact Assessment, Halcrow (October 2010)*
- **Wynyard Walk**: *Wynyard Walk Review of Environmental Factors (BPL-R-EN-059[A]), April 2012*

  Bridge Works - Traffic Management Plan (BPL-R-GN-053), May 2012
- **Barangaroo Central – Waterfront Promenade:** *Barangaroo Central Waterfront Promenade and Interim Public Domain – Traffic Impact Assessment, Aurecon (Rev 4, 30 Oct 12)*

The number of construction vehicles generated by works within the Barangaroo South site is based on recent delivery schedule provided to Arup by Lend Lease in July 2013. This delivery schedule provides a more accurate and up to date forecast of anticipated construction activity from that previously outlined in the planning documents for the basement and commercial buildings.

This analysis has adopted a conservative approach and assumed truck movements associated with the concrete batch plant are evenly distributed throughout the day. As previously noted the delivery of raw materials to the batch plant can be confined to outside peak hours, and therefore the road network impacts on the road network will be reduced from that forecast. The assumption of 80% operation of the batch plant is consistent with previous documentation.

The highest combined level of construction activity generated by all worksites in the AM/PM peak hours will be a total of 116 truck movements. This is forecast to occur in July 2014 and considers all construction activities including delivery of materials and visits by tradesmen (e.g. plumbers, electricians). A detailed breakdown of construction vehicle movements up to 2016 is provided in Table 3 on the following page

Barangaroo Forecast Construction Vehicle Activity - Truck Movements per Hour

Project	2013				2014												2015												2016											
	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Basement Construction	6	8	8	8	8	8	8	10	10	10	10	10	10	10	10	10	8	8	8	4	4	4	4	4	4	4	4	4	2	2	2	2	2	2	2	2	2	0	0	0
T2 Commercial Building	6	10	10	10	12	12	12	12	12	12	10	10	10	6	6	6	4	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
T1 Commercial Building	0	0	0	0	2	2	2	6	6	6	8	8	8	10	10	10	10	10	10	8	8	8	6	6	6	6	6	6	4	4	4	2	2	2	0	0	0	0	0	0
T3 Commercial Building	0	2	2	2	6	6	6	8	8	8	10	10	10	10	10	10	8	8	8	6	6	6	6	6	6	4	4	4	2	2	2	0	0	0	0	0	0	0	0	0
R8/R9 Residential Buildings	0	0	0	0	4	4	4	8	8	8	6	6	6	6	6	6	6	6	6	4	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Concrete Batch Plant Operation	6	12	12	9	6	8	9	11	11	9	10	11	9	9	9	6	6	6	6	7	8	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Barangaroo South Total	***18***	***32***	***32***	***29***	***38***	***40***	***41***	***55***	***55***	***53***	***54***	***55***	***53***	***51***	***51***	***48***	***42***	***42***	***42***	***29***	***30***	***30***	***16***	***16***	***16***	***14***	***14***	***14***	***8***	***8***	***8***	***4***	***4***	***4***	***2***	***2***	***2***	***0***	***0***	***0***
Headland Park Main Works	28	24	24	24	20	20	20	20	20	20	20	20	20	16	16	16	16	16	16	16	16	16	16	16	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wynyard Walk Bridge Works	12	12	12	12	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Barangaroo Central Waterfont Promenade	0	0	0	0	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total All Worksites	**58**	**66**	**66**	**66**	**104**	**104**	**104**	**114**	**114**	**114**	**116**	**116**	**116**	**108**	**108**	**108**	**98**	**98**	**98**	**44**	**44**	**44**	**38**	**38**	**38**	**14**	**14**	**14**	**8**	**8**	**8**	**4**	**4**	**4**	**2**	**2**	**2**	**0**	**0**	**0**

3.3.2 Road Network Operation

LINSIG intersection modelling was undertaken as part of this assessment during the AM (8am-9am) and PM (5pm-6pm) commuter peak periods. The purpose of this modelling is to determine the operation of key intersections in the Barangaroo precinct during the peak construction traffic period, expected in July 2014. This will quantify the benefit of permitting the use of the concrete batch plant to service the entire site.

The analysis has considered the number of construction vehicle movements both without and without the batch plant, with the results summarised in Table 4.

Table 4 Intersection Analysis

Peak	Intersection	Construction Traffic Peak (No Concrete Batch Plant)			Construction Traffic Peak (With Concrete Batch Plant)		
		LOS	DOS	AVD (sec)	LOS	DOS	AVD (sec)
AM	Hickson Rd & Napoleon St	A	0.77	7	A	0.76	6
	Sussex St & Shelley St	C	0.90	30	B	0.89	28
	Sussex St & Erskine St	C	0.92	40	C	0.88	38
	Erskine St & Shelley St	B	0.82	17	B	0.81	17
	Shelley St & Lime St	A	0.01	1	A	0.01	1
PM	Hickson Rd & Napoleon St	A	0.54	3	A	0.53	3
	Sussex St & Shelley St	B	0.89	26	B	0.86	24
	Sussex St & Erskine St	F	1.03	90	F	1.01	77
	Erskine St & Shelley St	B	0.48	16	B	0.47	16
	Shelley St & Lime St	A	0.04	2	A	0.04	2

The analysis confirms that key intersections surrounding the site would operate at improved levels should the batch plant be utilised on site. The most significant improvement is forecast at the Sussex Street / Erskine Street intersection in the PM peak hour, with average vehicle delays reducing by approximately 15% if the batch plant were to be in operation.

3.4 Site Access

3.4.1 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. 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.

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

3.4.2 Internal Site Vehicle Access and Car Parking Areas

No changes to site access for construction vehicles are proposed as part of this development application.

The primary access for construction vehicles entering the Barangaroo site is located on Hickson Road, approximately 350m north of the Sussex Street / Napoleon Street intersection. The gatehouse at the access to the site is located approximately 40 metres inset from Hickson Road to prevent any queuing on Hickson Road by trucks entering the site. Any truck queuing therefore occurs within on site. All vehicles enter the site in a forwards direction.

3.4.3 Emergency Vehicle Access

No changes are proposed to emergency vehicle access as part of this development application. 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 to support a State Significant Development Application (SSD5967-2013) for a temporary concrete batching plant at Barangaroo.

The cumulative impacts of construction traffic activity associated with all construction works currently planned in the precinct have been assessed with the use of an on-site concrete batch plant. The batch plant will allow for the delivery of bulk raw materials to occur outside the commuter peak hours, reducing the impact on the local road network. Traffic modelling indicates intersections in the precinct will operate at improved levels compared with the previous approvals.

Appendix A

LinSig Intersection Results

Barangaroo Construction Traffic

User and Project Details

Project:	**Barangaroo Transport**
Title:	**Construction Traffic Flows**
Location:	Barangaroo, Sydney NSW 2000
File name:	AM_No Batch Plant_Early 2014.lsg3x
Author:	Eoin Cunningham
Company:	Arup Pty Ltd
Address:	Level 10, 201 Kent Street, Sydney
Notes:	Base model courtesy of AECOM

Network Results

Item	Lane Description	Lane Type	Deg Sat (%)	Av. Delay Per PCU (s/pcu)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Max. Back of Uniform Queue (pcu)	Mean Max Queue (pcu)
Network: Construction Traffic Flows	-	-	**91.6%**	-	-	-	-	-
J1: TCS- 3939 Sussex St - Shelley St	-	-	**90.1%**	-	-	-	-	-
1/1	Sussex St (Nth Arm) Ahead	U	78.7%	29.1	441	1401	5.9	7.7
1/2+1/3	Sussex St (Nth Arm) Ahead	U	70.4%	24.3	401	1423:1338	5.0	6.2
2/1	Sussex St (Sth Arm) Ahead Left	U	70.0%	22.3	335	1196	5.8	6.9
2/2	Sussex St (Sth Arm) Ahead	U	78.3%	22.7	539	1722	7.2	8.9
3/1	Shelley St (Wst Arm) Left	U	90.1%	51.5	465	1670	5.8	9.7
3/2	Shelley St (Wst Arm) Right	U	40.9%	24.8	182	1440	1.9	2.2
4/1	Nth Exit - Sussex St Ahead	U	0.0%	0.0	311	Inf	0.0	0.0
4/2	Nth Exit - Sussex St Ahead	U	0.0%	0.0	1004	Inf	0.0	0.0
5/1	Sth Exit - Sussex St Ahead	U	0.0%	0.0	623	Inf	0.0	0.0
5/2	Sth Exit - Sussex St Ahead	U	0.0%	0.0	401	Inf	0.0	0.0
6/1	West Exit - Shelley St Ahead	U	0.0%	0.0	24	Inf	0.0	0.0
J2: TCS 310 - Sussex St - Erskine St	-	-	**91.6%**	-	-	-	-	-
1/2+1/1	Sussex St (Nth Arm) Left Ahead	U	67.3%	20.4	426	1115:1385	10.6	11.6
1/3+1/4	Sussex St (Nth Arm) Ahead Right	U+O	59.2%	33.7	463	1343:1348	27.3	28.0
2/1	Erskine St (East Arm) Left	U	78.3%	48.6	325	1062	8.7	10.4
2/2+2/3	Erskine St (East Arm) Right Ahead	U+O	18.4%	25.9	92	1224:1224	1.5	1.6
3/2+3/1	Sussex St (Sth Arm) Ahead Left	U	91.6%	51.2	724	1722:1385	16.3	21.1
4/2+4/1	Erskine St (West Arm) Left Ahead	U	57.8%	34.8	292	1200:1200	7.4	8.1
4/3	Erskine St (West Arm) Right	O	65.5%	65.8	145	1229	4.2	5.1
5/1	Nth Exit - Sussex St Ahead	U	0.0%	0.0	335	Inf	0.0	0.0
5/2	Nth Exit - Sussex St Ahead	U	0.0%	0.0	539	Inf	0.0	0.0
6/1	East Exit - Erskine St	U	0.0%	0.0	201	Inf	0.0	0.0
7/1	Sth Exit (Sussex St)	U	0.0%	0.0	671	Inf	0.0	0.0
7/2	Sth Exit (Sussex St)	U	0.0%	0.0	528	Inf	0.0	0.0

8/1	West Exit - Erskine Ahead	U	0.0%	0.0	193	Inf	0.0	0.0
J3: TCS 305 - Shelley St - Erskine St	**-**	**-**	**82.2%**	**-**	**-**	**-**	**-**	**-**
1/2+1/1	Shelley St (Nth Arm) Left Ahead Right	O+U	4.6%	4.5	39	1309:1208	0.1	0.1
2/2+2/1	Erskine St (East Arm) Right Left Ahead	O+U	46.3%	24.3	193	1304:1272	7.0	7.5
3/1+3/2	Shelley St (Sth Arm) Ahead Right Left	U+O	82.2%	15.9	1006	1385:1395	7.0	9.3
4/1	Erskine St (West Arm) Left Ahead	U	9.9%	24.8	26	1204	0.3	0.4
4/2	Erskine St (West Arm) Ahead Right	O	7.2%	24.9	18	1150	0.2	0.3
5/1	Nth Exit - Shelley St Ahead	U	0.0%	0.0	392	Inf	0.0	0.0
5/2	Nth Exit - Shelley St Ahead	U	0.0%	0.0	357	Inf	0.0	0.0
6/1	East Exit - Erskine St Ahead	U	0.0%	0.0	292	Inf	0.0	0.0
6/2	East Exit - Erskine St Ahead	U	0.0%	0.0	145	Inf	0.0	0.0
7/1	Sth Exit - Shelley St	U	0.0%	0.0	56	Inf	0.0	0.0
8/1	West Exit - Erskine St	U	0.0%	0.0	36	Inf	0.0	0.0
8/2	West Exit - Erskine St	U	0.0%	0.0	4	Inf	0.0	0.0
J4: Sussex St - Napolean St	**-**	**-**	**77.1%**	**-**	**-**	**-**	**-**	**-**
1/1	Hickson Rd (Nth Arm) Left	U	7.2%	1.4	100	1385	0.0	0.0
1/2	Hickson Rd (Nth Arm) Ahead	U	20.3%	1.3	350	1722	0.0	0.1
2/1	Napolean St (East Arm) Left	O	77.1%	12.1	492	1634	0.0	1.6
2/2	Napolean St (East Arm) Right	O	29.3%	9.4	80	1724	0.2	0.4
3/1	Sussex St (Sth Arm) Ahead	U	45.6%	2.0	786	1722	0.3	0.7
3/2+3/3	Sussex St (Sth Arm) Ahead Right	U+O	76.4%	12.5	529	1722:1348	19.1	20.7
4/1	Nth Exit - Hickson Rd Ahead	U	0.0%	0.0	826	Inf	0.0	0.0
4/2	Nth Exit - Hickson Rd Ahead	U	0.0%	0.0	40	Inf	0.0	0.0
5/1	East Exit - Napolean St	U	0.0%	0.0	629	Inf	0.0	0.0
6/1	Sth Exit - Sussex St Ahead	U	0.0%	0.0	441	Inf	0.0	0.0
6/2	Sth Exit - Sussex St Ahead	U	0.0%	0.0	401	Inf	0.0	0.0
J5: Hickson Rd - Globe St	**-**	**-**	**51.1%**	**-**	**-**	**-**	**-**	**-**
1/1	Hickson Rd (Nth Arm) Ahead Right	O	17.7%	1.3	296	1670	0.0	0.1

2/2+2/1	Hickson Rd (Sth Arm) Ahead Left	U	51.1%	2.3	866	1700:1670	11.7	12.2
3/1	Globe St (West Arm) Left Right	O	39.7%	7.7	154	1724	0.0	0.3
4/1	Nth Exit - Hickson Rd	U	0.0%	0.0	709	Inf	0.0	0.0
5/1	Sth Exit (Hickson Rd) Ahead	U	0.0%	0.0	450	Inf	0.0	0.0
6/1	West Exit (Globe St)	U	0.0%	0.0	157	Inf	0.0	0.0
J6: Lime St - Shelley St	**-**	**-**	**19.8%**	**-**	**-**	**-**	**-**	**-**
1/1	Shelley St (East Arm) Left Ahead	O	1.3%	1.0	24	1800	0.0	0.0
2/1	Shelley St (Sth Arm) Right Left	U	15.8%	1.2	285	1800	0.0	0.1
2/2	Shelley St (Sth Arm) Right	U	19.8%	1.2	357	1800	0.0	0.1
3/1	Lime St (West Arm) Ahead Right	O	9.2%	3.6	51	1600	0.0	0.1
4/1	East Exit (Shelley St) Ahead	U	0.0%	0.0	248	Inf	0.0	0.0
4/2	East Exit (Shelley St) Ahead	U	0.0%	0.0	399	Inf	0.0	0.0
5/1	Sth Exit - Shelley St Ahead	U	0.0%	0.0	33	Inf	0.0	0.0
6/1	West Exit - Lime St	U	0.0%	0.0	37	Inf	0.0	0.0
J7: Macquarie Carpark	**-**	**-**	**24.5%**	**-**	**-**	**-**	**-**	**-**
1/1	Carpark Sink	U	0.0%	0.0	120	Inf	0.0	0.0
2/1	Car park Entry Left Right	O	3.7%	3.6	19	1400	0.0	0.0
3/1	Shelley CP -Nth Right Ahead	O	2.3%	1.3	33	1600	0.0	0.0
4/1	Shelley CP -Sth Left Ahead	U	24.5%	1.5	392	1600	0.0	0.2
4/2	Shelley CP -Sth Ahead	U	22.3%	1.4	357	1600	0.0	0.1
5/1	CP - Nth Exit Ahead	U	0.0%	0.0	285	Inf	0.0	0.0
5/2	CP - Nth Exit Ahead	U	0.0%	0.0	357	Inf	0.0	0.0
6/1	Sth Exit Ahead	U	0.0%	0.0	39	Inf	0.0	0.0
J8: Sussex St Carpark	**-**	**-**	**31.2%**	**-**	**-**	**-**	**-**	**-**
1/1	Sussex CP Nth Left Ahead	U	31.2%	1.5	561	1800	0.0	0.2
1/2	Sussex CP Nth Ahead	U	25.7%	1.3	463	1800	0.0	0.2
2/1	Entry Sussex CP Left	O	0.0%	0.0	0	1400	0.0	0.0
3/1	Entry Sussex CP	U	0.0%	0.0	135	Inf	0.0	0.0
4/1	Sussex CP Sth Exit Ahead	U	0.0%	0.0	426	Inf	0.0	0.0
4/2	Sussex CP Sth Exit Ahead	U	0.0%	0.0	463	Inf	0.0	0.0

Barangaroo Construction Traffic

User and Project Details

Project:	**Barangaroo Transport**
Title:	**Construction Traffic Flows**
Location:	Barangaroo, Sydney NSW 2000
File name:	AM_With Batch Plant_Early 2014.lsg3x
Author:	Eoin Cunningham
Company:	Arup Pty Ltd
Address:	Level 10, 201 Kent Street, Sydney
Notes:	Base model courtesy of AECOM

Network Results

Item	Lane Description	Lane Type	Deg Sat (%)	Av. Delay Per PCU (s/pcu)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Max. Back of Uniform Queue (pcu)	Mean Max Queue (pcu)
Network: Construction Traffic Flows	-	-	**88.9%**	-	-	-	-	-
J1: TCS- 3939 Sussex St - Shelley St	-	-	**88.9%**	-	-	-	-	-
1/1	Sussex St (Nth Arm) Ahead	U	76.0%	27.3	426	1401	5.6	7.1
1/2+1/3	Sussex St (Nth Arm) Ahead	U	67.8%	23.3	386	1423:1338	4.8	5.9
2/1	Sussex St (Sth Arm) Ahead Left	U	65.8%	20.2	315	1196	5.2	6.2
2/2	Sussex St (Sth Arm) Ahead	U	76.1%	21.0	524	1722	6.6	8.2
3/1	Shelley St (Wst Arm) Left	U	88.9%	48.8	459	1670	5.7	9.2
3/2	Shelley St (Wst Arm) Right	U	40.9%	24.7	182	1440	1.9	2.2
4/1	Nth Exit - Sussex St Ahead	U	0.0%	0.0	291	Inf	0.0	0.0
4/2	Nth Exit - Sussex St Ahead	U	0.0%	0.0	983	Inf	0.0	0.0
5/1	Sth Exit - Sussex St Ahead	U	0.0%	0.0	608	Inf	0.0	0.0
5/2	Sth Exit - Sussex St Ahead	U	0.0%	0.0	386	Inf	0.0	0.0
6/1	West Exit - Shelley St Ahead	U	0.0%	0.0	24	Inf	0.0	0.0
J2: TCS 310 - Sussex St - Erskine St	-	-	**88.1%**	-	-	-	-	-
1/2+1/1	Sussex St (Nth Arm) Left Ahead	U	64.7%	18.6	411	1115:1385	10.3	11.2
1/3+1/4	Sussex St (Nth Arm) Ahead Right	U+O	57.3%	33.4	448	1343:1348	27.1	27.8
2/1	Erskine St (East Arm) Left	U	78.3%	48.6	325	1062	8.7	10.4
2/2+2/3	Erskine St (East Arm) Right Ahead	U+O	18.4%	25.9	92	1224:1224	1.5	1.6
3/2+3/1	Sussex St (Sth Arm) Ahead Left	U	88.1%	44.7	694	1722:1385	15.0	18.5
4/2+4/1	Erskine St (West Arm) Left Ahead	U	56.9%	34.4	287	1200:1200	7.2	7.8
4/3	Erskine St (West Arm) Right	O	65.5%	65.9	145	1229	4.2	5.1
5/1	Nth Exit - Sussex St Ahead	U	0.0%	0.0	315	Inf	0.0	0.0
5/2	Nth Exit - Sussex St Ahead	U	0.0%	0.0	524	Inf	0.0	0.0
6/1	East Exit - Erskine St	U	0.0%	0.0	201	Inf	0.0	0.0
7/1	Sth Exit (Sussex St)	U	0.0%	0.0	656	Inf	0.0	0.0
7/2	Sth Exit (Sussex St)	U	0.0%	0.0	513	Inf	0.0	0.0

8/1	West Exit - Erskine Ahead	U	0.0%	0.0	193	Inf	0.0	0.0
J3: TCS 305 - Shelley St - Erskine St	**-**	**-**	**81.4%**	**-**	**-**	**-**	**-**	**-**
1/2+1/1	Shelley St (Nth Arm) Left Ahead Right	O+U	4.6%	4.5	39	1309:1208	0.1	0.1
2/2+2/1	Erskine St (East Arm) Right Left Ahead	O+U	46.3%	24.2	193	1304:1272	7.0	7.5
3/1+3/2	Shelley St (Sth Arm) Ahead Right Left	U+O	81.4%	15.5	995	1385:1395	6.7	8.9
4/1	Erskine St (West Arm) Left Ahead	U	9.9%	24.8	26	1204	0.3	0.4
4/2	Erskine St (West Arm) Ahead Right	O	7.2%	24.9	18	1150	0.2	0.3
5/1	Nth Exit - Shelley St Ahead	U	0.0%	0.0	389	Inf	0.0	0.0
5/2	Nth Exit - Shelley St Ahead	U	0.0%	0.0	354	Inf	0.0	0.0
6/1	East Exit - Erskine St Ahead	U	0.0%	0.0	287	Inf	0.0	0.0
6/2	East Exit - Erskine St Ahead	U	0.0%	0.0	145	Inf	0.0	0.0
7/1	Sth Exit - Shelley St	U	0.0%	0.0	56	Inf	0.0	0.0
8/1	West Exit - Erskine St	U	0.0%	0.0	36	Inf	0.0	0.0
8/2	West Exit - Erskine St	U	0.0%	0.0	4	Inf	0.0	0.0
J4: Sussex St - Napolean St	**-**	**-**	**76.3%**	**-**	**-**	**-**	**-**	**-**
1/1	Hickson Rd (Nth Arm) Left	U	6.6%	1.4	92	1385	0.0	0.0
1/2	Hickson Rd (Nth Arm) Ahead	U	18.6%	1.3	320	1722	0.0	0.1
2/1	Napolean St (East Arm) Left	O	76.3%	11.6	492	1634	0.0	1.6
2/2	Napolean St (East Arm) Right	O	27.8%	8.7	80	1724	0.1	0.3
3/1	Sussex St (Sth Arm) Ahead	U	43.3%	1.9	745	1722	0.2	0.6
3/2+3/3	Sussex St (Sth Arm) Ahead Right	U+O	75.0%	11.7	529	1722:1348	19.1	20.6
4/1	Nth Exit - Hickson Rd Ahead	U	0.0%	0.0	785	Inf	0.0	0.0
4/2	Nth Exit - Hickson Rd Ahead	U	0.0%	0.0	40	Inf	0.0	0.0
5/1	East Exit - Napolean St	U	0.0%	0.0	621	Inf	0.0	0.0
6/1	Sth Exit - Sussex St Ahead	U	0.0%	0.0	426	Inf	0.0	0.0
6/2	Sth Exit - Sussex St Ahead	U	0.0%	0.0	386	Inf	0.0	0.0
J5: Hickson Rd - Globe St	**-**	**-**	**48.7%**	**-**	**-**	**-**	**-**	**-**
1/1	Hickson Rd (Nth Arm) Ahead Right	O	17.7%	1.3	296	1670	0.0	0.1

2/2+2/1	Hickson Rd (Sth Arm) Ahead Left	U	48.7%	2.1	825	1700:1670	10.8	11.2
3/1	Globe St (West Arm) Left Right	O	29.9%	6.6	116	1724	0.0	0.2
4/1	Nth Exit - Hickson Rd	U	0.0%	0.0	709	Inf	0.0	0.0
5/1	Sth Exit (Hickson Rd) Ahead	U	0.0%	0.0	412	Inf	0.0	0.0
6/1	West Exit (Globe St)	U	0.0%	0.0	116	Inf	0.0	0.0
J6: Lime St - Shelley St	**-**	**-**	**19.7%**	**-**	**-**	**-**	**-**	**-**
1/1	Shelley St (East Arm) Left Ahead	O	1.3%	1.0	24	1800	0.0	0.0
2/1	Shelley St (Sth Arm) Right Left	U	15.7%	1.2	282	1800	0.0	0.1
2/2	Shelley St (Sth Arm) Right	U	19.7%	1.2	354	1800	0.0	0.1
3/1	Lime St (West Arm) Ahead Right	O	9.1%	3.6	51	1600	0.0	0.1
4/1	East Exit (Shelley St) Ahead	U	0.0%	0.0	245	Inf	0.0	0.0
4/2	East Exit (Shelley St) Ahead	U	0.0%	0.0	396	Inf	0.0	0.0
5/1	Sth Exit - Shelley St Ahead	U	0.0%	0.0	33	Inf	0.0	0.0
6/1	West Exit - Lime St	U	0.0%	0.0	37	Inf	0.0	0.0
J7: Macquarie Carpark	**-**	**-**	**24.3%**	**-**	**-**	**-**	**-**	**-**
1/1	Carpark Sink	U	0.0%	0.0	120	Inf	0.0	0.0
2/1	Car park Entry Left Right	O	3.7%	3.6	19	1400	0.0	0.0
3/1	Shelley CP -Nth Right Ahead	O	2.3%	1.3	33	1600	0.0	0.0
4/1	Shelley CP -Sth Left Ahead	U	24.3%	1.5	389	1600	0.0	0.2
4/2	Shelley CP -Sth Ahead	U	22.1%	1.4	354	1600	0.0	0.1
5/1	CP - Nth Exit Ahead	U	0.0%	0.0	282	Inf	0.0	0.0
5/2	CP - Nth Exit Ahead	U	0.0%	0.0	354	Inf	0.0	0.0
6/1	Sth Exit Ahead	U	0.0%	0.0	39	Inf	0.0	0.0
J8: Sussex St Carpark	**-**	**-**	**30.3%**	**-**	**-**	**-**	**-**	**-**
1/1	Sussex CP Nth Left Ahead	U	30.3%	1.4	546	1800	0.0	0.2
1/2	Sussex CP Nth Ahead	U	24.9%	1.3	448	1800	0.0	0.2
2/1	Entry Sussex CP Left	O	0.0%	0.0	0	1400	0.0	0.0
3/1	Entry Sussex CP	U	0.0%	0.0	135	Inf	0.0	0.0
4/1	Sussex CP Sth Exit Ahead	U	0.0%	0.0	411	Inf	0.0	0.0
4/2	Sussex CP Sth Exit Ahead	U	0.0%	0.0	448	Inf	0.0	0.0

Barangaroo Construction_PM Peak With Batch Plant

Project and User Details

Project:	**Barangaroo Transport**
Title:	**LinSig Modelling PM**
Location:	Barangaroo, Sydney NSW 2000
Company:	Arup Pty Ltd
Address:	Level 10, 201 Kent Street, Sydney

Network Results

Item	Lane Description	Lane Type	Deg Sat (%)	Av. Delay Per PCU (s/pcu)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Max. Back of Uniform Queue (pcu)	Mean Max Queue (pcu)
Network: LinSig Modelling PM	-	-	**103.1%**	-	-	-	-	-
J1: TCS- 3939 Sussex St - Shelley St	-	-	**88.9%**	-	-	-	-	-
1/1	Sussex St (Nth Arm) Ahead	U	57.4%	13.1	453	1401	4.4	5.1
1/2+1/3	Sussex St (Nth Arm) Ahead	U	53.7%	12.4	431	1423:1338	4.1	4.6
2/1	Sussex St (Sth Arm) Ahead Left	U	52.5%	34.9	217	1196	5.3	5.9
2/2	Sussex St (Sth Arm) Ahead	U	58.0%	32.5	345	1722	8.4	9.1
3/1	Shelley St (Wst Arm) Left	U	88.9%	43.3	405	1670	4.6	8.2
3/2	Shelley St (Wst Arm) Right	U	22.0%	31.6	46	1440	0.6	0.7
4/1	Nth Exit - Sussex St Ahead	U	0.0%	0.0	150	Inf	0.0	0.0
4/2	Nth Exit - Sussex St Ahead	U	0.0%	0.0	750	Inf	0.0	0.0
5/1	Sth Exit - Sussex St Ahead	U	0.0%	0.0	499	Inf	0.0	0.0
5/2	Sth Exit - Sussex St Ahead	U	0.0%	0.0	431	Inf	0.0	0.0
6/1	West Exit - Shelley St Ahead	U	0.0%	0.0	67	Inf	0.0	0.0
J2: TCS 310 - Sussex St - Erskine St	-	-	**103.1%**	-	-	-	-	-
1/2+1/1	Sussex St (Nth Arm) Left Ahead	U	102.6%	136.6	441	920:1385	13.0	26.6
1/3+1/4	Sussex St (Nth Arm) Ahead Right	U+O	99.8%	114.1	489	920:1348	28.5	39.3
2/1	Erskine St (East Arm) Left	U	84.8%	50.8	369	920	9.8	12.4
2/2+2/3	Erskine St (East Arm) Right Ahead	U+O	17.8%	19.8	103	1224:1224	1.3	1.4
3/2+3/1	Sussex St (Sth Arm) Ahead Left	U	74.7%	40.8	518	1722:1385	7.7	9.2
4/2+4/1	Erskine St (West Arm) Left Ahead	U	25.1%	24.0	146	1200:1200	2.9	3.0
4/3	Erskine St (West Arm) Right	O	103.1%	191.4	243	1320	7.6	17.5
5/1	Nth Exit - Sussex St Ahead	U	0.0%	0.0	217	Inf	0.0	0.0
5/2	Nth Exit - Sussex St Ahead	U	0.0%	0.0	345	Inf	0.0	0.0
6/1	East Exit - Erskine St	U	0.0%	0.0	172	Inf	0.0	0.0
7/1	Sth Exit (Sussex St)	U	0.0%	0.0	757	Inf	0.0	0.0
7/2	Sth Exit (Sussex St)	U	0.0%	0.0	668	Inf	0.0	0.0

8/1	West Exit - Erskine Ahead	U	0.0%	0.0	150	Inf	0.0	0.0
J3: TCS 305 - Shelley St - Erskine St	**-**	**-**	**48.4%**	**-**	**-**	**-**	**-**	**-**
1/2+1/1	Shelley St (Nth Arm) Left Ahead Right	O+U	25.9%	14.5	190	1309:1208	2.6	2.7
2/2+2/1	Erskine St (East Arm) Right Left Ahead	O+U	22.9%	24.8	150	1304:1272	7.0	7.2
3/1+3/2	Shelley St (Sth Arm) Ahead Right Left	U+O	48.4%	12.8	493	1385:1395	3.2	3.7
4/1	Erskine St (West Arm) Left Ahead	U	12.4%	19.2	46	1204	0.5	0.6
4/2	Erskine St (West Arm) Ahead Right	O	12.1%	19.5	43	1150	0.5	0.5
5/1	Nth Exit - Shelley St Ahead	U	0.0%	0.0	210	Inf	0.0	0.0
5/2	Nth Exit - Shelley St Ahead	U	0.0%	0.0	206	Inf	0.0	0.0
6/1	East Exit - Erskine St Ahead	U	0.0%	0.0	146	Inf	0.0	0.0
6/2	East Exit - Erskine St Ahead	U	0.0%	0.0	243	Inf	0.0	0.0
7/1	Sth Exit - Shelley St	U	0.0%	0.0	53	Inf	0.0	0.0
8/1	West Exit - Erskine St	U	0.0%	0.0	45	Inf	0.0	0.0
8/2	West Exit - Erskine St	U	0.0%	0.0	19	Inf	0.0	0.0
J4: Sussex St - Napoleon St	**-**	**-**	**54.3%**	**-**	**-**	**-**	**-**	**-**
1/1	Hickson Rd (Nth Arm) Left	U	16.5%	1.6	228	1385	0.0	0.1
1/2	Hickson Rd (Nth Arm) Ahead	U	33.6%	1.6	579	1722	0.0	0.3
2/1	Napoleon St (East Arm) Left	O	51.9%	6.3	305	1634	0.0	0.5
2/2	Napoleon St (East Arm) Right	O	21.2%	7.9	64	1724	0.2	0.4
3/1	Sussex St (Sth Arm) Ahead	U	34.4%	1.6	592	1722	3.9	4.2
3/2+3/3	Sussex St (Sth Arm) Ahead Right	U+O	54.3%	7.9	308	1722:1348	3.5	4.1
4/1	Nth Exit - Hickson Rd Ahead	U	0.0%	0.0	624	Inf	0.0	0.0
4/2	Nth Exit - Hickson Rd Ahead	U	0.0%	0.0	32	Inf	0.0	0.0
5/1	East Exit - Napoleon St	U	0.0%	0.0	536	Inf	0.0	0.0
6/1	Sth Exit - Sussex St Ahead	U	0.0%	0.0	453	Inf	0.0	0.0
6/2	Sth Exit - Sussex St Ahead	U	0.0%	0.0	431	Inf	0.0	0.0
J5: Hickson Rd - Barangaroo	**-**	**-**	**43.6%**	**-**	**-**	**-**	**-**	**-**
1/1	Hickson Rd (Nth Arm) Ahead Right	O	38.7%	1.8	647	1670	0.0	0.3

2/2+2/1	Hickson Rd (Sth Arm) Ahead Left	U	38.8%	1.8	656	1700:1670	10.3	10.6
3/1	Globe Street (West Arm) Left Right	O	43.6%	8.7	160	1724	0.0	0.4
4/1	Nth Exit - Hickson Rd	U	0.0%	0.0	498	Inf	0.0	0.0
5/1	Sth Exit (Hickson Rd) Ahead	U	0.0%	0.0	984	Inf	0.0	0.0
6/1	Globe Street (Barangaroo)	U	0.0%	0.0	158	Inf	0.0	0.0
J6: Lime St - Shelley St	**-**	**-**	**28.0%**	**-**	**-**	**-**	**-**	**-**
1/1	Shelley St (East Arm) Left Ahead	O	3.7%	1.0	67	1800	0.0	0.0
2/1	Shelley St (Sth Arm) Right Left	U	14.0%	1.2	252	1800	0.0	0.1
2/2	Shelley St (Sth Arm) Right	U	11.4%	1.1	206	1800	0.0	0.1
3/1	Lime St (West Arm) Ahead Right	O	28.0%	4.7	150	1600	0.0	0.2
4/1	East Exit (Shelley St) Ahead	U	0.0%	0.0	194	Inf	0.0	0.0
4/2	East Exit (Shelley St) Ahead	U	0.0%	0.0	257	Inf	0.0	0.0
5/1	Sth Exit - Shelley St Ahead	U	0.0%	0.0	166	Inf	0.0	0.0
6/1	West Exit - Lime St	U	0.0%	0.0	58	Inf	0.0	0.0
J7: Macquarie Carpark	**-**	**-**	**14.3%**	**-**	**-**	**-**	**-**	**-**
1/1	Carpark Sink	U	0.0%	0.0	16	Inf	0.0	0.0
2/1	Car park Entry Left Right	O	14.3%	3.7	82	1400	0.0	0.1
3/1	Shelley CP -Nth Right Ahead	O	10.4%	1.3	166	1600	0.0	0.1
4/1	Shelley CP -Sth Left Ahead	U	13.1%	1.3	210	1600	0.0	0.1
4/2	Shelley CP -Sth Ahead	U	12.9%	1.3	206	1600	0.0	0.1
5/1	CP - Nth Exit Ahead	U	0.0%	0.0	252	Inf	0.0	0.0
5/2	CP - Nth Exit Ahead	U	0.0%	0.0	206	Inf	0.0	0.0
6/1	Sth Exit Ahead	U	0.0%	0.0	190	Inf	0.0	0.0
J8: Sussex St Carpark	**-**	**-**	**27.2%**	**-**	**-**	**-**	**-**	**-**
1/1	Sussex CP Nth Left Ahead	U	24.5%	1.3	441	1800	0.0	0.2
1/2	Sussex CP Nth Ahead	U	27.2%	1.4	489	1800	0.0	0.2
2/1	Entry Sussex CP Left	O	0.0%	0.0	0	1400	0.0	0.0
3/1	Entry Sussex CP	U	0.0%	0.0	0	Inf	0.0	0.0
4/1	Sussex CP Sth Exit Ahead	U	0.0%	0.0	441	Inf	0.0	0.0
4/2	Sussex CP Sth Exit Ahead	U	0.0%	0.0	489	Inf	0.0	0.0

Project and User Details

Project:	**Barangaroo Transport**
Title:	**LinSig Modelling PM**
Location:	Barangaroo, Sydney NSW 2000
Company:	Arup Pty Ltd
Address:	Level 10, 201 Kent Street, Sydney

Network Results

Item	Lane Description	Lane Type	Deg Sat (%)	Av. Delay Per PCU (s/pcu)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Max. Back of Uniform Queue (pcu)	Mean Max Queue (pcu)
Network: LinSig Modelling PM	-	-	**100.8%**	-	-	-	-	-
J1: TCS- 3939 Sussex St - Shelley St	-	-	**86.1%**	-	-	-	-	-
1/1	Sussex St (Nth Arm) Ahead	U	55.6%	12.7	439	1401	4.1	4.8
1/2+1/3	Sussex St (Nth Arm) Ahead	U	51.6%	12.0	414	1423:1338	3.8	4.3
2/1	Sussex St (Sth Arm) Ahead Left	U	48.9%	33.6	202	1196	4.9	5.3
2/2	Sussex St (Sth Arm) Ahead	U	55.5%	31.7	330	1722	8.0	8.6
3/1	Shelley St (Wst Arm) Left	U	86.1%	37.7	392	1670	4.5	7.3
3/2	Shelley St (Wst Arm) Right	U	22.0%	31.6	46	1440	0.6	0.7
4/1	Nth Exit - Sussex St Ahead	U	0.0%	0.0	135	Inf	0.0	0.0
4/2	Nth Exit - Sussex St Ahead	U	0.0%	0.0	722	Inf	0.0	0.0
5/1	Sth Exit - Sussex St Ahead	U	0.0%	0.0	485	Inf	0.0	0.0
5/2	Sth Exit - Sussex St Ahead	U	0.0%	0.0	414	Inf	0.0	0.0
6/1	West Exit - Shelley St Ahead	U	0.0%	0.0	67	Inf	0.0	0.0
J2: TCS 310 - Sussex St - Erskine St	-	-	**100.8%**	-	-	-	-	-
1/2+1/1	Sussex St (Nth Arm) Left Ahead	U	100.8%	118.9	426	920:1385	12.3	23.5
1/3+1/4	Sussex St (Nth Arm) Ahead Right	U+O	97.3%	94.3	473	920:1348	28.1	36.2
2/1	Erskine St (East Arm) Left	U	83.2%	47.5	369	920	9.7	12.1
2/2+2/3	Erskine St (East Arm) Right Ahead	U+O	17.5%	19.2	103	1224:1224	1.3	1.4
3/2+3/1	Sussex St (Sth Arm) Ahead Left	U	72.1%	40.6	488	1722:1385	6.8	8.1
4/2+4/1	Erskine St (West Arm) Left Ahead	U	24.6%	23.1	146	1200:1200	2.8	3.0
4/3	Erskine St (West Arm) Right	O	98.3%	141.2	243	1320	7.4	14.2
5/1	Nth Exit - Sussex St Ahead	U	0.0%	0.0	202	Inf	0.0	0.0
5/2	Nth Exit - Sussex St Ahead	U	0.0%	0.0	330	Inf	0.0	0.0
6/1	East Exit - Erskine St	U	0.0%	0.0	172	Inf	0.0	0.0
7/1	Sth Exit (Sussex St)	U	0.0%	0.0	742	Inf	0.0	0.0
7/2	Sth Exit (Sussex St)	U	0.0%	0.0	652	Inf	0.0	0.0

8/1	West Exit - Erskine Ahead	U	0.0%	0.0	150	Inf	0.0	0.0
J3: TCS 305 - Shelley St - Erskine St	**-**	**-**	**46.5%**	**-**	**-**	**-**	**-**	**-**
1/2+1/1	Shelley St (Nth Arm) Left Ahead Right	O+U	25.9%	14.6	190	1309:1208	2.5	2.7
2/2+2/1	Erskine St (East Arm) Right Left Ahead	O+U	22.9%	25.0	150	1304:1272	7.0	7.2
3/1+3/2	Shelley St (Sth Arm) Ahead Right Left	U+O	46.5%	12.6	480	1385:1395	3.1	3.5
4/1	Erskine St (West Arm) Left Ahead	U	12.4%	19.2	46	1204	0.5	0.6
4/2	Erskine St (West Arm) Ahead Right	O	12.1%	19.5	43	1150	0.5	0.5
5/1	Nth Exit - Shelley St Ahead	U	0.0%	0.0	204	Inf	0.0	0.0
5/2	Nth Exit - Shelley St Ahead	U	0.0%	0.0	199	Inf	0.0	0.0
6/1	East Exit - Erskine St Ahead	U	0.0%	0.0	146	Inf	0.0	0.0
6/2	East Exit - Erskine St Ahead	U	0.0%	0.0	243	Inf	0.0	0.0
7/1	Sth Exit - Shelley St	U	0.0%	0.0	53	Inf	0.0	0.0
8/1	West Exit - Erskine St	U	0.0%	0.0	45	Inf	0.0	0.0
8/2	West Exit - Erskine St	U	0.0%	0.0	19	Inf	0.0	0.0
J4: Sussex St - Napoleon St	**-**	**-**	**52.9%**	**-**	**-**	**-**	**-**	**-**
1/1	Hickson Rd (Nth Arm) Left	U	15.6%	1.5	216	1385	0.0	0.1
1/2	Hickson Rd (Nth Arm) Ahead	U	31.8%	1.5	548	1722	0.0	0.2
2/1	Napoleon St (East Arm) Left	O	51.3%	6.2	305	1634	0.0	0.5
2/2	Napoleon St (East Arm) Right	O	20.2%	7.2	64	1724	0.2	0.3
3/1	Sussex St (Sth Arm) Ahead	U	31.9%	1.5	549	1722	0.5	0.7
3/2+3/3	Sussex St (Sth Arm) Ahead Right	U+O	52.9%	7.5	308	1722:1348	3.5	4.0
4/1	Nth Exit - Hickson Rd Ahead	U	0.0%	0.0	581	Inf	0.0	0.0
4/2	Nth Exit - Hickson Rd Ahead	U	0.0%	0.0	32	Inf	0.0	0.0
5/1	East Exit - Napoleon St	U	0.0%	0.0	524	Inf	0.0	0.0
6/1	Sth Exit - Sussex St Ahead	U	0.0%	0.0	439	Inf	0.0	0.0
6/2	Sth Exit - Sussex St Ahead	U	0.0%	0.0	414	Inf	0.0	0.0
J5: Hickson Rd - Barangaroo	**-**	**-**	**38.7%**	**-**	**-**	**-**	**-**	**-**
1/1	Hickson Rd (Nth Arm) Ahead Right	O	38.7%	1.8	647	1670	0.0	0.3

2/2+2/1	Hickson Rd (Sth Arm) Ahead Left	U	36.2%	1.7	613	1700:1670	8.8	9.1
3/1	Globe Street (West Arm) Left Right	O	31.9%	7.2	117	1724	0.0	0.2
4/1	Nth Exit - Hickson Rd	U	0.0%	0.0	498	Inf	0.0	0.0
5/1	Sth Exit (Hickson Rd) Ahead	U	0.0%	0.0	941	Inf	0.0	0.0
6/1	Globe Street (Barangaroo)	U	0.0%	0.0	115	Inf	0.0	0.0
J6: Lime St - Shelley St	**-**	**-**	**27.9%**	**-**	**-**	**-**	**-**	**-**
1/1	Shelley St (East Arm) Left Ahead	O	3.7%	1.0	67	1800	0.0	0.0
2/1	Shelley St (Sth Arm) Right Left	U	13.7%	1.2	246	1800	0.0	0.1
2/2	Shelley St (Sth Arm) Right	U	11.1%	1.1	199	1800	0.0	0.1
3/1	Lime St (West Arm) Ahead Right	O	27.9%	4.6	150	1600	0.0	0.2
4/1	East Exit (Shelley St) Ahead	U	0.0%	0.0	188	Inf	0.0	0.0
4/2	East Exit (Shelley St) Ahead	U	0.0%	0.0	250	Inf	0.0	0.0
5/1	Sth Exit - Shelley St Ahead	U	0.0%	0.0	166	Inf	0.0	0.0
6/1	West Exit - Lime St	U	0.0%	0.0	58	Inf	0.0	0.0
J7: Macquarie Carpark	**-**	**-**	**14.2%**	**-**	**-**	**-**	**-**	**-**
1/1	Carpark Sink	U	0.0%	0.0	16	Inf	0.0	0.0
2/1	Car park Entry Left Right	O	14.2%	3.6	82	1400	0.0	0.1
3/1	Shelley CP -Nth Right Ahead	O	10.4%	1.3	166	1600	0.0	0.1
4/1	Shelley CP -Sth Left Ahead	U	12.8%	1.3	204	1600	0.0	0.1
4/2	Shelley CP -Sth Ahead	U	12.4%	1.3	199	1600	0.0	0.1
5/1	CP - Nth Exit Ahead	U	0.0%	0.0	246	Inf	0.0	0.0
5/2	CP - Nth Exit Ahead	U	0.0%	0.0	199	Inf	0.0	0.0
6/1	Sth Exit Ahead	U	0.0%	0.0	190	Inf	0.0	0.0
J8: Sussex St Carpark	**-**	**-**	**26.3%**	**-**	**-**	**-**	**-**	**-**
1/1	Sussex CP Nth Left Ahead	U	23.7%	1.3	426	1800	0.0	0.2
1/2	Sussex CP Nth Ahead	U	26.3%	1.4	473	1800	0.0	0.2
2/1	Entry Sussex CP Left	O	0.0%	0.0	0	1400	0.0	0.0
3/1	Entry Sussex CP	U	0.0%	0.0	0	Inf	0.0	0.0
4/1	Sussex CP Sth Exit Ahead	U	0.0%	0.0	426	Inf	0.0	0.0
4/2	Sussex CP Sth Exit Ahead	U	0.0%	0.0	473	Inf	0.0	0.0