ACOUSTICS AND AIR

BARANGAROO STAGE 1

SECTION 75W APPLICATION
CONCRETE BATCH PLANT
NOISE & VIBRATION ASSESSMENT

REPORT NO. 10232-B
VERSION D

SEPTEMBER 2012

PREPARED FOR

LEND LEASE DESIGN AND PROJECT MANAGEMENT
THE BOND, 30 HICKSON ROAD
MILLERS POINT NSW 2000

DOCUMENT CONTROL

Version	Status	Date	Prepared By	Reviewed By
A	Draft	28 March 2012	Brian Clarke	Ben Lawrence
B	Draft	10 April 2012	Brian Clarke	Ben Lawrence
B	Final	15 April 2012	Brian Clarke	Ben Lawrence
C	Final	23 April 2012	Brian Clarke	Ben Lawrence
D	Final	03 September 2012	Brian Clarke	Ben Lawrence

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GLOSSARY OF ACOUSTIC TERMS

Most environments are affected by environmental noise which continuously varies, largely as a result of road traffic. To describe the overall noise environment, a number of noise descriptors have been developed and these involve statistical and other analysis of the varying noise over sampling periods, typically taken as 15 minutes. These descriptors, which are demonstrated in the graph below, are here defined.

Maximum Noise Level (L_{Amax}) – The maximum noise level over a sample period is the maximum level, measured on fast response, during the sample period.

L_{A1} – The L_{A1} level is the noise level which is exceeded for 1% of the sample period. During the sample period, the noise level is below the L_{A1} level for 99% of the time.

L_{A10} – The L_{A10} level is the noise level which is exceeded for 10% of the sample period. During the sample period, the noise level is below the L_{A10} level for 90% of the time. The L_{A10} is a common noise descriptor for environmental noise and road traffic noise.

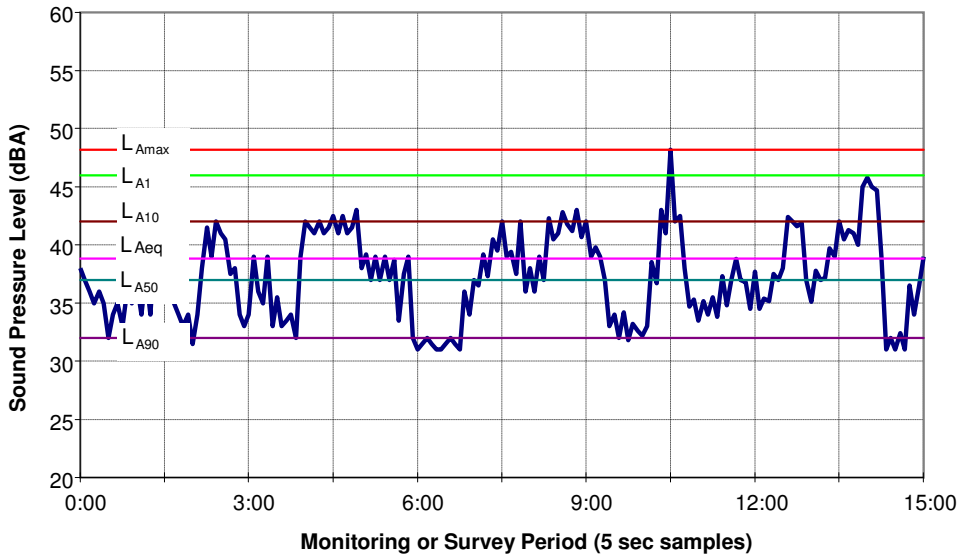
L_{A90} – The L_{A90} level is the noise level which is exceeded for 90% of the sample period. During the sample period, the noise level is below the L_{A90} level for 10% of the time. This measure is commonly referred to as the background noise level.

L_{Aeq} – The equivalent continuous sound level (L_{Aeq}) is the energy average of the varying noise over the sample period and is equivalent to the level of a constant noise which contains the same energy as the varying noise environment. This measure is also a common measure of environmental noise and road traffic noise.

ABL – The Assessment Background Level is the single figure background level representing each assessment period (daytime, evening and night time) for each day. It is determined by calculating the 10^{th} percentile (lowest 10^{th} percent) background level (L_{A90}) for each period.

RBL – The Rating Background Level for each period is the median value of the ABL values for the period over all of the days measured. There is therefore an RBL value for each period – daytime, evening and night time.

Typical Graph of Sound Pressure Level vs Time



1 INTRODUCTION

This report was prepared by Wilkinson Murray for Lend Lend Lease Project Management and Construction to support an application that is to be made pursuant to Section 75W of the Environmental Planning and Assessment Act 1979 to modify the Project Approval issued by the Minister for Planning in respect of MP10_0023 for Bulk excavation and basement car parking within Barangaroo South. The application seeks approval to install and operate a concrete batch plant on site which will be used supply the site with concrete.

This report reflects the potential noise impacts associated with the operation of the proposed batch plant with respect to construction noise management goals and objectives that have been established in previous project applications for the site. In addition, a review of cumulative noise impact of this batch plant operation in combination with other activities has been conducted.

In the case of vibration associated with this plant, and given the proposed location of the plant there is no potential for adverse impact at surrounding receivers. Therefore, this issue has not been addressed any further in this assessment.

2 SITE DESCRIPTION

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 22 ha Barangaroo site is generally rectangular in shape and has a 1.4 kilometre harbour foreshore frontage, with an eastern street frontage to Hickson Road. The locational context of the site is shown in Figure 2-1.

Figure 2-1 Barangaroo Site and Proposed Batch Plant Site

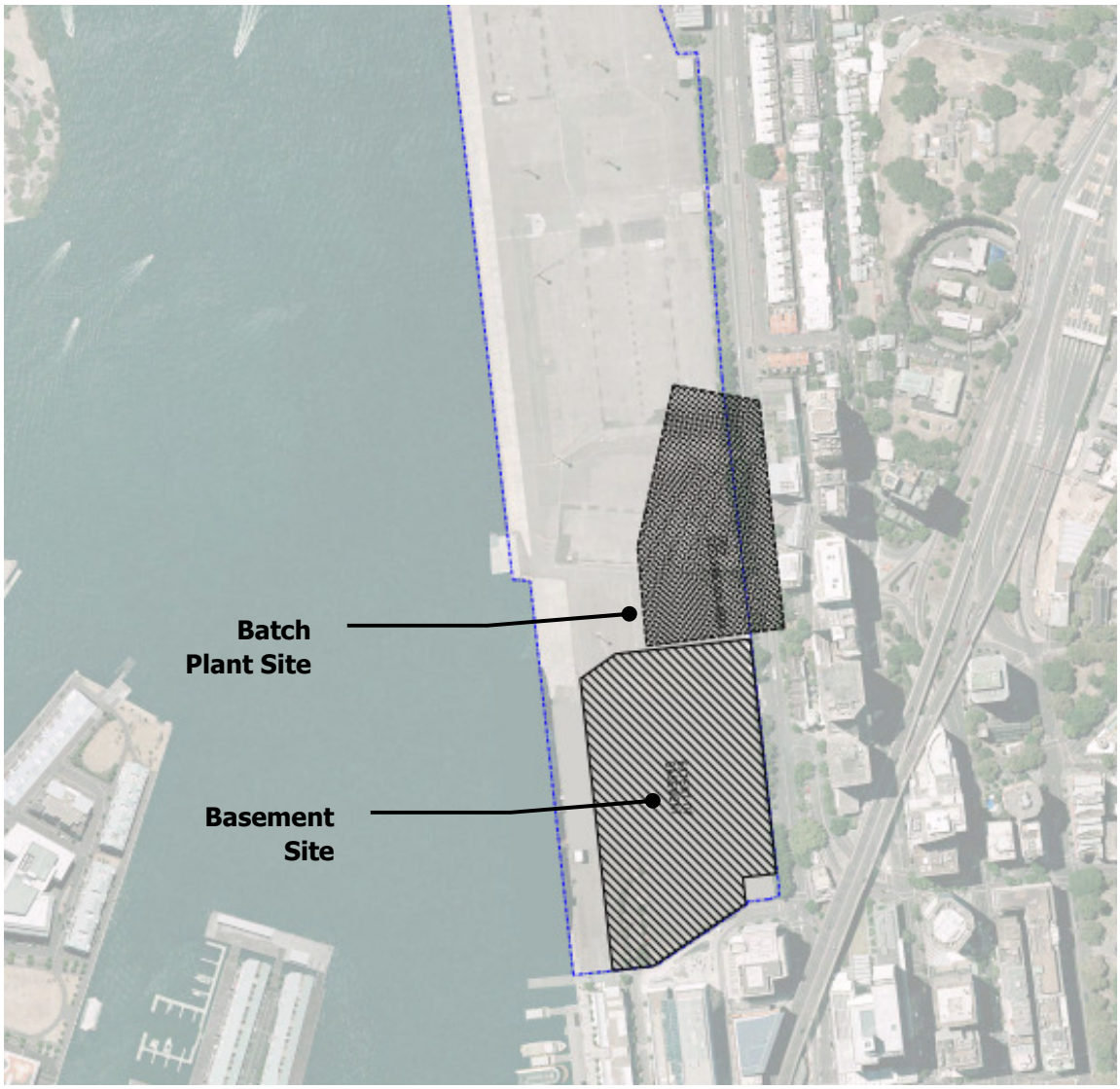
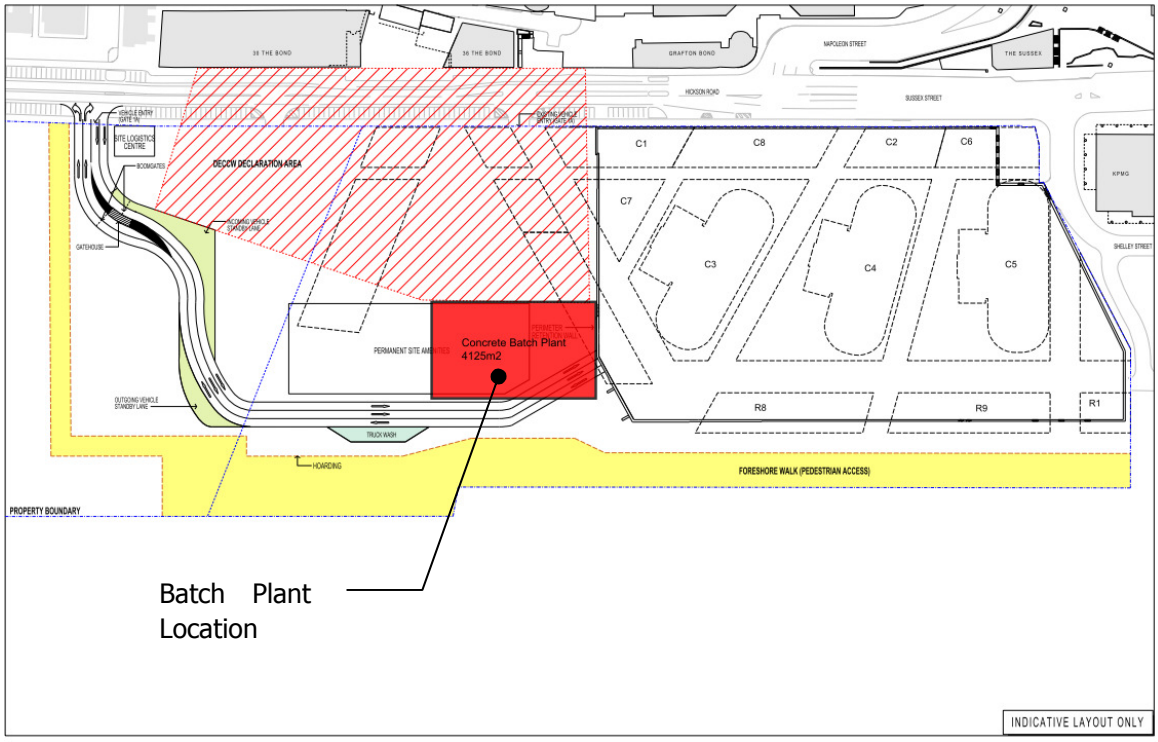


Figure 2-2 shows the site layout and indicative location of the batch plant.

Figure 2-2 Batch Plant Location



2.1 Concrete Batch Plant Hours

The proposed batch plant will operate during normal construction hours which are between 7.00am and 6.00pm Monday to Friday and between 7.00am and 5.00pm on Saturdays. These hours are consistent with approved construction hours for the South Barangaroo site.

No work, with the exception of emergency work, will be undertaken on Sundays or Public Holidays.

2.2 Hoardings / Site Fences

As part of the previous works for PA1, the construction site would be secured by a combination of hoardings and fencing that will remain as part of these works. The proposed location and construction of hoardings/site fences is described in Table 2-1.

Table 2-1 Proposed Construction Hoardings / Site Fences

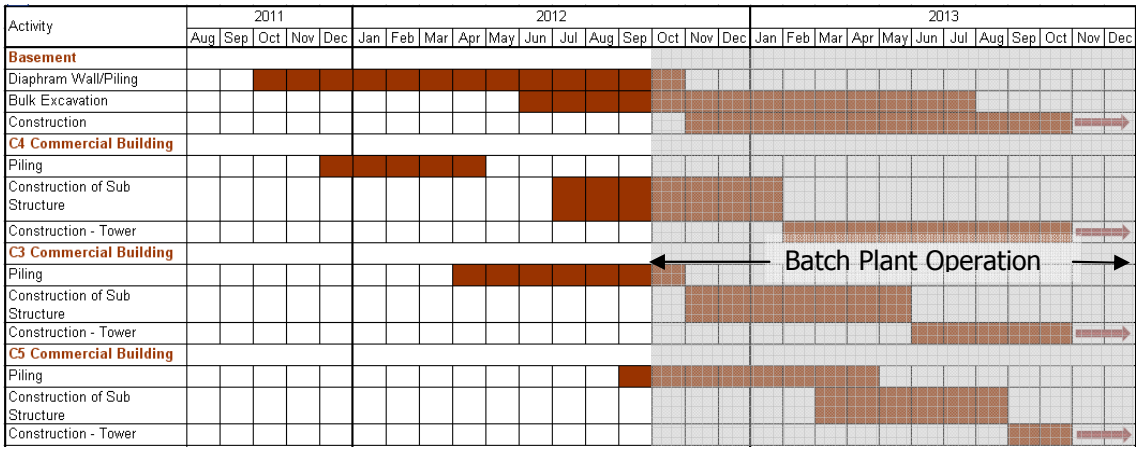
Frontage	Proposed Fencing
Hickson Road	Class A painted hoarding along Hickson Road extending north from the Margaret Street intersection. Vehicle gates will be located at the northern end of Stage 1 for access to and from site, to coincide with existing

Frontage	Proposed Fencing
	crossovers associated with the former Port use. This area will be secured by gatemen and stop/go personnel to control pedestrian and vehicle traffic.
Shelly Street	Shelley Street will be protected by Class A 3 m painted plywood hoarding.
Western Frontage	A 2.4m plywood hoarding that bounds the site.
Northern Frontage	Class A painted hoarding of minimum 2.4m height.

2.3 Construction Activities

Based on an indicative development programme, the concrete batch plant will be operational from October 2012 to December 2014. Figure 2-3 illustrates this with respect to various stages of the Barangaroo Project (see shaded section).

Figure 2-3 Expected Construction Program showing Batch Plant Operation



Note: Dates are estimates only and are subject to change.

It is important that the cumulative noise impacts from all site construction activities in the area are considered. Other construction activities that may occur concurrently include C3, C4 and C5 construction and Basement works.

The Headland Park is likely to be carried out by a contractor separately commissioned by the Barangaroo Delivery Authority. We have not allowed for any contribution from the Headland Parks works.

2.4 Construction Traffic

The following Table 2-2 provides estimates for Barangaroo Stage 1A allowing for a batch plant between October 2012 and December 2014, a conservative reduction in deliveries of concrete by 30% has been considered. The reduction in deliveries is in the order of 20,500 loads; therefore, 41,000 total movements have been adopted for this period.

Table 2-2 Estimated Concrete Deliveries

Period	Works	Avg/Day/Qtr with Batch Plant	Avg/Day/Qtr No Batch Plant
Oct 12 - Dec 12	Stage 2 Piling / Bulk Ex / Detailed Ex / C4 Core / Ground Slab	55	84
Jan 13 - Mar 13	Stage 2 Piling / Detail Ex / SOG / C4 Core	72	110
April 13 - June 13	Stage 2 Piling / SOG / C4 & C3 Core / Sea Water intake	72	110
July 13 - Sept 13	Mez & GF Structure / C3 & C4 Core / C4 Low rise	98	150
Oct 13 - Dec 13	Basement GF Structure / C4 / C3	98	150
Jan 14 - Mar 14	C4 Mid/highrise / LGR infra Rough in / Facade	72	110
April 14 - June 14	C4 Structure complete / C4 Fitout / Basement services	72	110
July 14 - Sept 14	C4, C3, C5, Facade / Finishes / Fitout / Services	52	80
Oct 14 - Dec 14	C4, C3, C5, Facade / Finishes / Fitout / Services	46	70
	Average Concrete Deliveries per Day	633	974
	Days per Qtr	60	60
	Total Concrete Deliveries	37986	58440
	Saving in Deliveries	20454	

3 CONSTRUCTION NOISE MANAGEMENT LEVELS

Table 3-1 presents the applicable noise management levels for construction activities at surrounding receivers. These levels were established in the initial project application for the Basement works PA1 and are included in the Barangaroo project construction noise and vibration management plan.

Table 3-1 Site Specific Construction Noise Management Levels

Location	Construction Noise Management Level, $L_{Aeq(15\ minutes)}$ - dBA				Maximum Construction Noise Level, L_{Aeq} - dBA
	Day	Evening	Night	Saturday (extended)	
Hickson Road Residences	63	58	54	55	75
High Street Residences	57	49	46	50	75
Dawes Point Residences	56	49	45	51	75
Balmain East Residences	59	50	45	51	75
Darling Island / Sydney Wharf Residences	57	49	44	55	75
All Commercial Properties	70				
Schools / Preschools	55*				
Parks / Outdoor Play Areas	65				

Note: * The external noise goal of 55dBA is based on a 10 dB reduction through an open window.

4 CONCRETE BATCH PLANT NOISE LEVELS

In order to determine representative nose levels of the concrete batch plant noise measurements of a similar plant located at Bulahdelah were conducted in March 2012. The noise measurements were conducted with the concrete batch plant operating. The operations included trucks arriving and departing along with the front end loader operating on site.

Figure 4-1 to Figure 4-3 show the Bulahdelah batch plant site.

Figure 4-1 Concrete Batch Plant

Figure 4-2 Loader

Figure 4-3 Dump Trucks

Three 15 minute noise levels were conducted around the site with all plant operating. The results of measurements were processed to determine typical plant noise levels which are detailed in Table 3-1.

Table 4-1 Concrete Batch Plant Noise Levels – $L_{Aeq(15\ minute)}$ – dB.

Noise Level	Frequency - Hertz								A
	63	125	250	500	1000	2000	4000	8000	
Sound Pressure Level at 30 m	79	73	69	68	67	65	62	59	72
Sound Power Level	116	111	107	105	105	102	100	97	110

In addition, details the noise levels of construction plant that may be used during demolition, excavation and construction of other stages of the project. These SWLs have been used in assessments of construction noise of the basement and commercial buildings which are relevant when reviewing the cumulative noise impact of the concrete batch plant. The table presents both Sound Power Level (SWL) and Sound Pressure Levels (SPL) at 7m for the equipment. Sound Power Levels (SWL) is independent of measurement position.

Table 4-2 Typical Construction Plant Sound Levels – dBA

Plant	Sound Power Level	Sound Pressure Level at 7m
Bulldozer	114	94
Pug Mill - Remediation Plant	100	75
Excavator	108	82
Rotary Hoe	109	84
Mobile Crane	104	79
Concrete Truck	109	84
Angle Grinder	109	84
Concrete Pump - 120 mm diameter / 50 bar	112	87
Bentonite Plant	104	79
Sheet Metal Forming (Grinding, Hammer)	105	80
Concrete Crushing and Screening Plant	116	91
Concrete Saw	116	91
Crawler Cranes	98	73
Ground Water Pump	106	81
Mobile Crane	98	73
Rotary Boring Drill Rig	107	82
Site Cranes	104	79
Dump Truck	108	83
Front End Loader	112	87
Excavator	107	82
Hammer Hydraulic	122	97

Plant	Sound Power Level	Sound Pressure Level at 7m
Auger Vibro Pile	110	85
Bored Pile Rig	112	87
Piling - Vibrating	108	83
Concrete Saw	113	88
Compressor	100	75
Bobcat	103	78
Hand Tools	90	65
Jackhammer	105	80

Note: Predicted noise levels at receivers are based on 15-minute periods.

5 CONSTRUCTION NOISE ASSESSMENT

Assessment of likely noise at surrounding commercial and residential receivers has been assessed for the site during batch plant operation in isolation and the cumulative noise of other simultaneous construction activities as detailed in Figure 2-3.

Site-related noise emissions were modeled with the "CadnaA" noise prediction program, using the ISO 9613 noise prediction algorithms. Factors that are addressed in the noise modeling are:

- equipment sound level emissions and location;
- screening effects from buildings;
- receiver locations;
- ground topography;
- noise attenuation due to geometric spreading;
- ground absorption; and
- atmospheric absorption.

The modelling assumes a "typical worst case" scenario whereby all the plant is running continuously. As such, the modelling represents likely noise levels that would occur during intensive periods of construction. Therefore, the presented noise levels can be considered in the upper range of noise levels that can be expected at surrounding receivers when the various construction scenarios occur.

Once noise sources have been applied in the model the resultant noise levels at identified surrounding receivers are predicted. These results are then compared with established site specific Noise Management Levels (NMLs).

Table 5-1 presents predicted noise level from batch plant operations in isolation at surround residences and commercial receivers.

Table 5-1 Predicted Batch Plant Noise Levels at Surrounding Receivers – $L_{Aeq,15min}$

Location	Predicted Noise Level dBA	Weekday			Saturday (Extended)		
	Day	Management Level dBA	Exceedance dBA	Compliance	Management Level dBA	Exceedance dBA	Compliance
Hickson Road Residences	59	63		Yes	55	4	**No**
High Street Residences	52	57		Yes	50	2	**No**
Dawes Point Residences	39	56		Yes	51	-	Yes
Balmain East Residences	38	59		Yes	51	-	Yes
Darling Island Residences	43	57		Yes	55	-	Yes
Sydney Wharf Residences	43	57		Yes	55	-	Yes
Lime Street, (King Street Wharf)	46	70	-	Yes	70	-	Yes
30 Hickson Rd	53	70	-	Yes	70	-	Yes
Shelley Street	47	70	-	Yes	70	-	Yes
Temporary Cruise Terminal	45	70	-	Yes	70	-	Yes
The Sussex Hotel	48	70	-	Yes	70	-	Yes

*Extended Saturday management goals which are based on RBL plus 5 has been applied for proposed Sunday works

A review of predicted noise levels indicates that noise levels associated with the operation of the proposed concrete batch plant operation will comply with weekday construction noise management levels.

On Saturdays, a small exceedance of construction noise management goals of between 2 and 4dBA is predicted at High Street and Hickson Road residences, respectively. These exceedances are considered small and manageable. It should be noted that the predicted batch plant noise levels at these receivers are below existing ambient L_{Aeq} noise levels.

It is also noted that these predicted levels are well below the maximum management level of 75dBA.

In the case of childcare centres, internal and external noise criteria have been established for the day period. Table 5-2 details predicted noise levels for these centres.

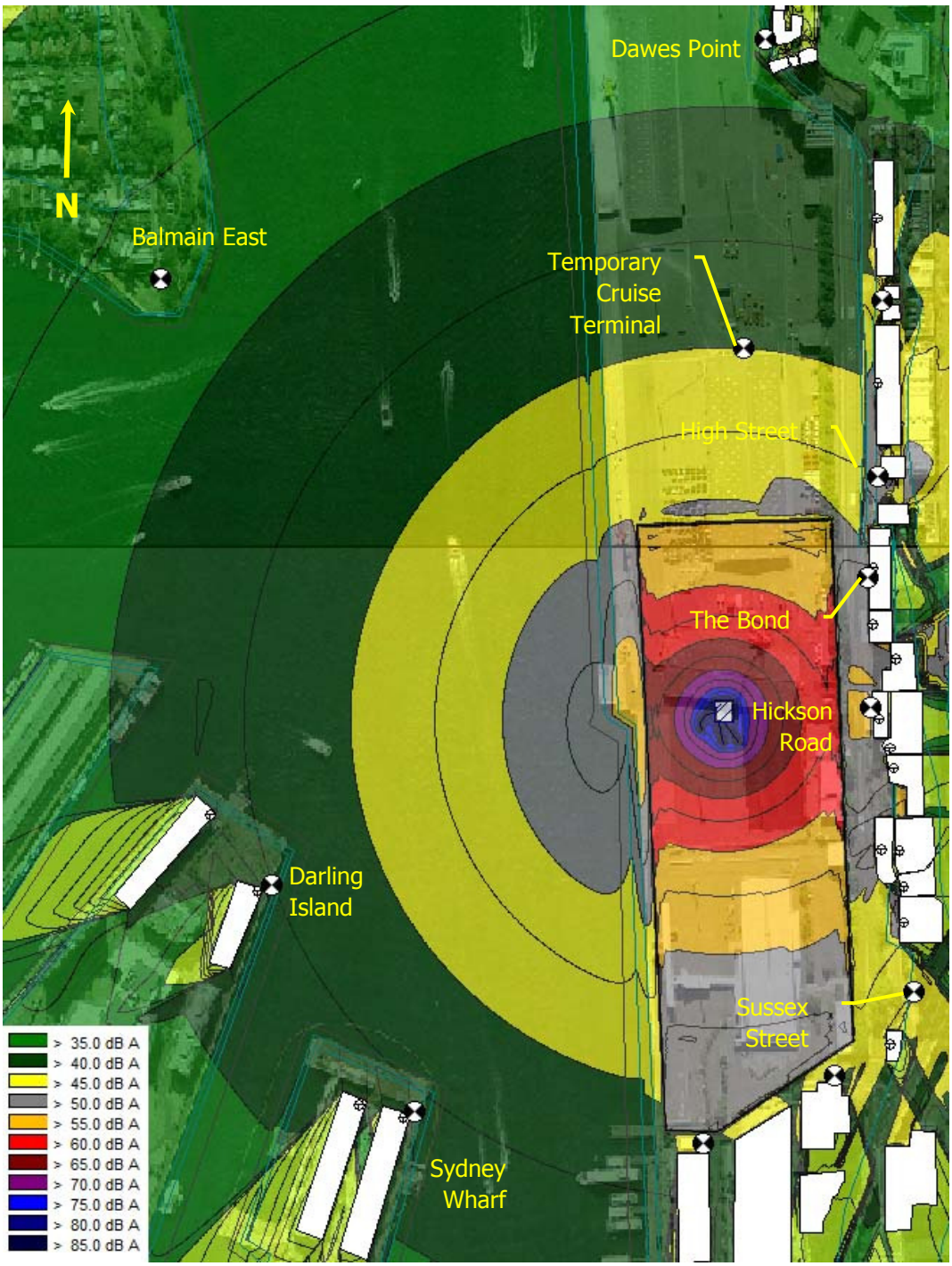
Table 5-2 Concrete Batch Plant Noise Levels at Childcare Centres– $L_{Aeq,15\ min}$

Location	Predicted Noise Level dBA		External Playground			Internal Criteria		
			Management Level dBA	Exceedance dBA	Compliance	Management Level dBA	Exceedance dBA	Compliance
	External	Internal						
Billabond Child Care Centre	53	43	65	-	Yes	55	-	Yes
KU Lance Preschool	41	31	65	-	Yes	55	-	Yes

Noise levels from concrete batch plant operation are predicted to be well below applicable internal and external noise goals at these receivers.

Figure 5-1 illustrates predicted noise levels for the batch plant in isolation at the South Barangaroo site and surrounding environs.

Figure 5-1 Predicted Noise Level Associated With the Concrete Batch Plant Operation - $L_{Aeq,15min}$



6 CUMULATIVE CONSTRUCTION NOISE LEVELS

A review of the cumulative noise levels at surrounding receivers associated with the operation of the Concrete Batch Plant operating simultaneously with the basement works and the construction of buildings C3, C4 and C5 have been assessed.

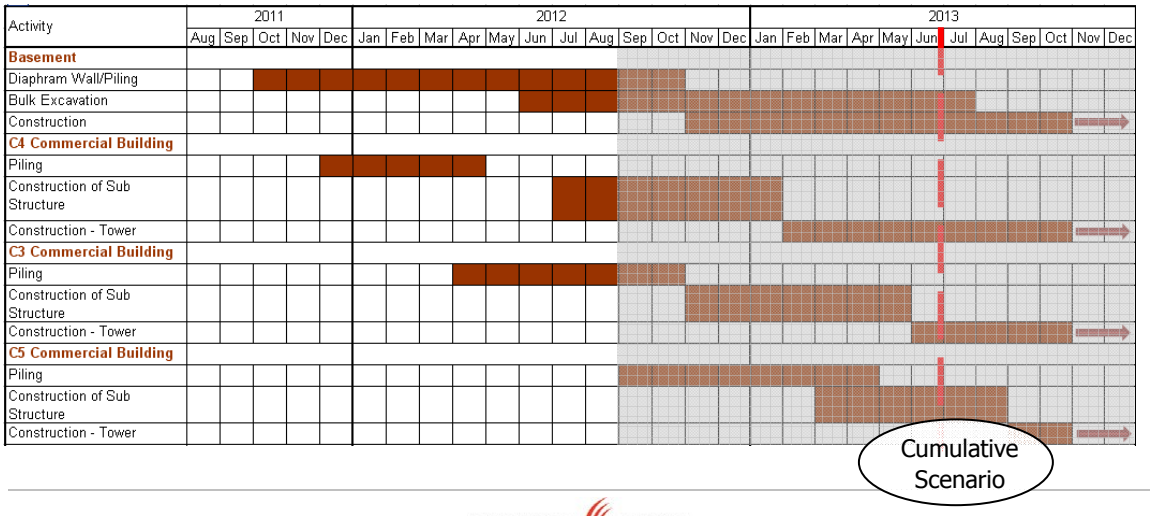
The cumulative noise levels predicted at residences in the building C5 (Wilkinson Murray Report 10-232-C5 Version D) assessment are detailed in Table 6-1

Table 6-1 C5 Predicted Cumulative Noise Levels at School Receivers – $L_{Aeq(15\ min)}$

Location	Predicted Noise Level dBA - Day
1 – Hickson Road Residences	73
5 - High Street Residences	56
6 - Dawes Point Residences	52
7 - Balmain East Residences	52
8 - Darling Island Residences	57
9- Sydney Wharf Residences	58
Lime Street, (King Street Wharf)	67
30 Hickson Road	64
Shelly Street	70
Temporary Cruise Terminal	59
Sussex Street	68
Billabong Child Care Centre	64
KU Lance Preschool	56

Figure 6-1 illustrates the indicative construction scenario where the batch plant will operate simultaneously with the basement buildings C3, C4 and C5.

Figure 6-1 Expected Construction Program showing Batch Plant Operation



Note: Dates are estimates only and are subject to change.

Table 6-2 details the equipment and works that have been modelled in the Cumulative Construction Scenario.

Table 6-2 Cumulative Construction Scenario

Scenario Description	Daytime Works
Basement Bulk Excavation C3 and 4 tower construction C5 substructure construction Concrete Batch Plant Operation	Basement – Truck movements (6), Excavator Mounted w Hydraulic Hammer (2) (or rock breaker) Groundwater pumps , Excavator w Rock Saw, dewatering plant C3 / C4 – Forklift and power tools assumed. External Lift and Cranes 4 truck movements in 15-minutes assumed C5 – 2 concrete pumps, 2 forklifts, 4 compressors, 2 cranes, a boom truck and lift are assumed to operate in 15-minutes. Also concrete trucks and normal delivery trucks assumed to be 12 movements in 15-minutes Concrete Batch Plant and Dump Trucks delivering aggregate.

It is noted that this cumulative construction scenario is similar to the cumulative construction scenario assessed in the C4 and C5 project applications. The locations of plant and equipment have been adjusted to accommodate the proposed batch plant. For this reason predicted cumulative noise levels will vary from those predicted in the C4 and C5 assessment.

Table 6-3 and 6-4 presents predicted cumulative noise level at surrounding residences, commercial receivers and residences.

Table 6-3 Predicted Cumulative Plant Noise Levels at Surrounding Receivers – $L_{Aeq,15min}$

Location	Predicted Noise Level dBA - Day			Weekday			Saturday (Extended)		
	Batch Plant	*Basement and Buildings C3. C4 and C5*	Total	Criteria Day dBA	Exceedance dBA	Compliance	Criteria dBA	Exceedance dBA	Compliance
Hickson Road Residences	*59*	*74*	**74**	63	11	No	55	19	No
High Street Residences	*52*	*59*	**60**	57	3	No	50	10	No
Dawes Point Residences	*39*	*53*	**53**	56	-	Yes	51	2	No
Balmain East Residences	*38*	*53*	**53**	59	-	Yes	51	2	No
Darling Island Residences	*43*	*58*	**58**	57	1	No	55	3	No
Sydney Wharf Residences	*43*	*60*	**60**	57	3	No	55	5	No
Lime Street, (King Street Wharf)	*46*	*67*	**67**	70	-	Yes	70	-	Yes
30 Hickson Rd	*53*	*65*	**65**	70	-	Yes	70	-	Yes
Shelly Street	*47*	*70*	**70**	70	-	Yes	70	-	Yes
Temporary Cruise Terminal	*45*	*61*	**61**	70	-	Yes	70	-	Yes
The Sussex Hotel	*48*	*68*	**68**	70	-	Yes	70	-	Yes

*Extended Saturday management goals which are based on RBL plus 5 has been applied for proposed Sunday works

Table 6-4 Concrete Batch Plant Noise Levels at Childcare Centres– $L_{Aeq,15\ min}$

Location	Predicted Noise Level dBA		External Playground			Internal Criteria		
			Criteria dBA	Exceedance dBA	Compliance	Criteria dBA	Exceedance dBA	Compliance
	External	Internal						
Billabond Child Care Centre	65	55	65	-	Yes	55	-	Yes
KU Lance Preschool	56	46	65	-	Yes	55	-	Yes

A review of predicted noise levels associated with the cumulative noise scenario indicates that the contribution from the concrete batch plant is well below the overall cumulative noise levels that are predicted at surrounding receivers. That is, the noise from the batch plant does not contribute significantly to overall construction noise levels at surrounding receivers in this scenario.

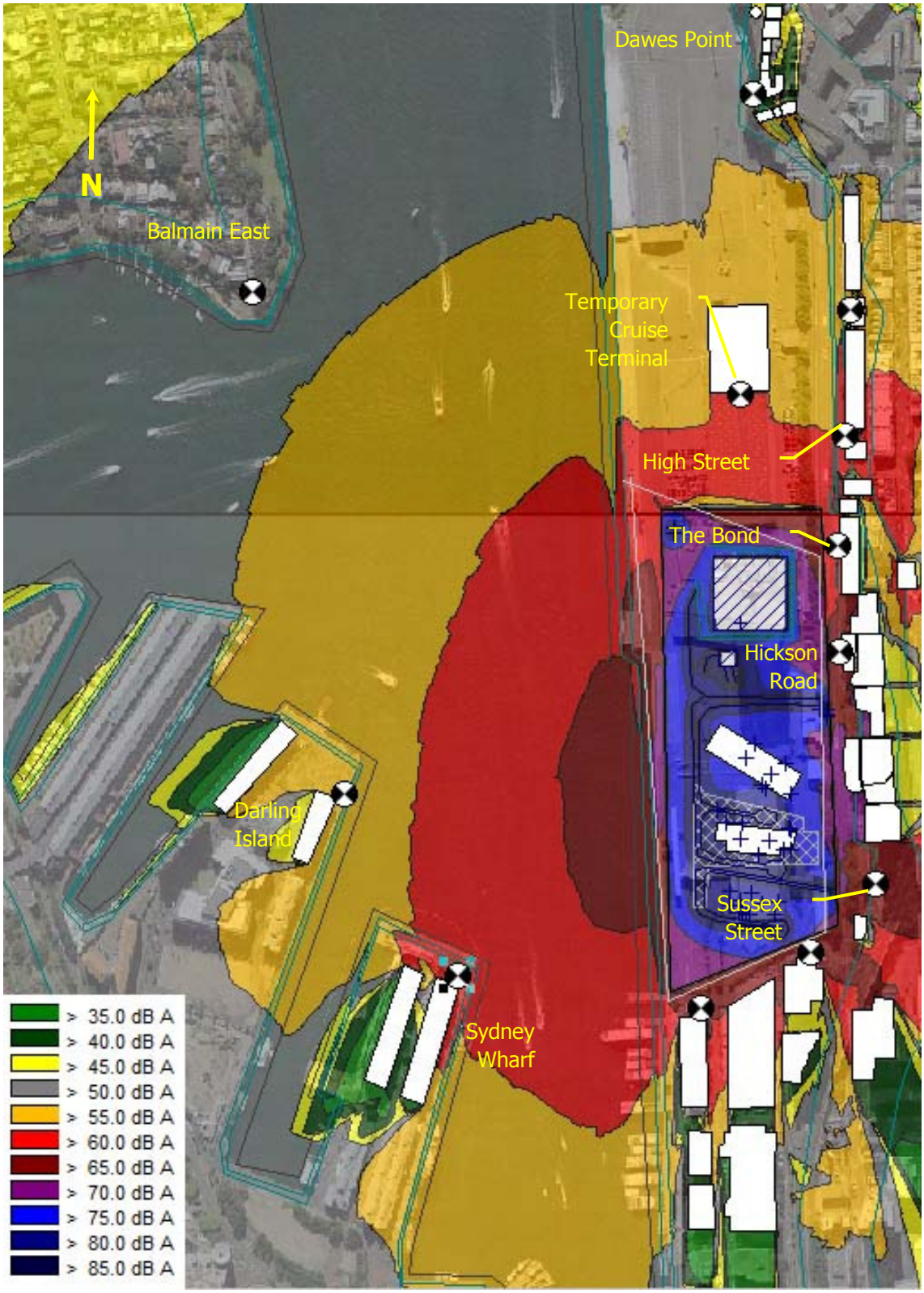
This is illustrated in Table 6-5 which shows the increase in predicted cumulative construction noise levels as a result of proposed batch plant operations.

Table 6-5 Predicted cumulative noise level increase resulting form Batch Plant Operation

Location	Predicted cumulative noise level increase resulting from Batch Plant Operations (dBA)
Hickson Road Residences	-
High Street Residences	1
Dawes Point Residences	-
Balmain East Residences	-
Darling Island Residences	-
Sydney Wharf Residences	-
Lime Street	-
30 Hickson Road	-
Shelley Street	-
Temporary Cruise Terminal	-
The Sussex Hotel	-

Therefore, it can be concluded that the noise contribution from the operation of the batch plant will not result in an unacceptable cumulative noise impact at surrounding residential or commercial receivers. It is noted that there are relatively large exceedances predicted at residences on Hickson Road however these are due to other construction activities that are the subject of separate project applications.

Figure 6-2 Predicted Noise Level associated the Cumulative Operation $L_{Aeq,15min}$



6.1 Cumulative Noise Impact with Headland Park Works

Noise from Basement works C4, C3 and C5 construction works when combined with Headland works has been assessed. The following has been determined:

Basement Construction Works findings are that – "*Based on the above findings the increase in construction noise levels at residences as a result of the South Barangaroo site in combination with Headland Park construction is small. Whereby the construction noise from the Headland Park site will be dominant at nearby residences"*

C4 Construction Works findings are that – "*The predicted construction noise levels due to the works associated with stage C4 are more than 10dB below those predicted construction noise from Headland Park Construction Works at Balmain East and Dawes Point Residences (based on predictions conducted by Acoustic Logic Consultancy Pty Ltd for the Barangaroo Delivery Authority BDA). As such the impact of C4 construction noise on theses receivers is considered negligible."*

The conclusion is the same for the C3 and C5 works.

In the case of the operation of the batch plant the worst case noise levels at the two receiver areas most potentially affected (Dawes Point and Balmain Residences), compared with the predicted noise from the Headland Park works are presented in Table 5-10.

Table 5-1 Cumulative Noise Impact with Headland Park Construction

Location	Predicted Worst Case Noise from Basement C3, C4 and C5 Construction	Predicted Range of Noise from Headland Park Construction	Comment
6 – Dawes Point Residences	53	77 to 90	Batch Plant noise negligible
7 – Balmain East Residences	53	67 to 70	Batch Plant noise negligible

As such, the contribution from this site at these locations is considered acoustically negligible.

6.2 Construction Traffic

The PA1 assessment of traffic noise and subsequent applications indicated that compliance with relevant traffic noise criteria will occur with projected traffic volumes that were determined without an on-site Concrete Batch Plant. Therefore, any reduction in traffic volumes, as detailed in Table 2-2, will also reduce the noise contribution from this source to surrounding receivers.

6.3 Noise and Vibration Management and Mitigation Procedures

Noise levels from operation from the proposed Batch Plant have been predicted to generally comply at most receivers with the noise management levels nominated in the guidelines at surrounding receivers. Residences on Hickson Road and High Street will be subject to the

highest construction levels.

In the case of cumulative noise associated with basement and tower works exceedances of noise management gaols are predicted. These exceedances are of a similar magnitude to the noise levels of the basement and C3, C4 and C5 assessments. This indicates the main contribution to the exceedances is a result of other construction projects at South Barangaroo.

Therefore, no specific noise control measures are considered necessary for Batch Plant operations that are beyond the measures that have not been previously identified in previous assessment.

The management and control of noise that have been included in the site Environmental Management Plan for the whole site are reproduced as follows:

A range of possible approaches to reducing the impact of construction noise is described below. It is proposed that these strategies be applied to the areas of potential exceedance identified in the preceding section.

- *Plant Noise Audit* – Noise emission levels of all critical items of mobile plant and equipment should be checked for compliance with noise limits appropriate to those items prior to the equipment going into regular service. To this end, testing should be established with the contractor.
- *Operator Instruction* – Operators should be trained in order to raise their awareness of potential noise problems and to increase their use of techniques to minimise noise emission.
- *Equipment Selection* – All fixed plant at the work sites should be appropriately selected, and where necessary, fitted with silencers, acoustical enclosures and other noise attenuation measures in order to ensure that the total noise emission from each work site is acceptable.
- *Site Noise Planning* – Where practical, the layout and positioning of noise-producing plant and activities on each work site should be optimised to minimise noise emission levels.
- *Install a noise barrier* between the site and the street frontages with minimum 17mm thick structural plywood or similar. (The site would be surrounded by hoardings erected in accordance with the City of Sydney Guidelines.) This recommendation has been made for the PA1 basement application and has been included in modelling.

6.3.1 Community Liaison & General Approaches to Mitigation

An effective community relations programme should be put in place to keep the community that has been identified as being potentially affected appraised of progress of the works, and to forewarn potentially affected groups (e.g. by letterbox drop, meetings with surrounding residences, etc) of any anticipated changes in noise and vibration emissions prior to critical stages of the works, and to explain complaint procedures and response mechanisms. This programme will be included in Lend Leases' *Community and Stakeholder Engagement Strategy* that has been specifically developed for the Barangaroo Project.

Close liaison should be maintained between the communities overlooking work sites and the parties associated with the construction works to provide effective feedback in regard to perceived emissions. In this manner, equipment selections and work activities can be coordinated where necessary to minimise disturbance to neighbouring communities, and to

ensure prompt response to complaints, should they occur.

6.3.2 Noise and Vibration Management Plan

A Noise and Vibration Management Plan has been prepared for the PA1 Basement stage works. This plan has been incorporated into Lend Lease's Environmental Management Plan.

This plan details the mitigation, monitoring and community liaison measures. The plan will be updated to incorporate any additional measures that emerge as the project design evolves and work methodologies become better defined.

Areas that are addressed in plan include:

- noise and vibration monitoring;
- response to complaints**;**
- responsibilities;
- monitoring of noise emissions from plant items;
- reporting and record keeping;
- non compliance and corrective action; and
- community consultation and complaint handling.

The plan also includes noise monitoring and reporting procedures adopted for the project. These include real time fixed noise monitors which are supplemented by attended noise monitoring where necessary.

7 CONCLUSION

A review of the potential noise impact associated with the use of a concrete batch plant at the South Barangaroo site has been conducted. It has been determined the noise from the plant and associated activities will comply with established weekday daytime noise management goals.

On Saturdays, general compliance is indicated at most surrounding receivers. It is noted that a small exceedances are indicated at High Street and Hickson Road residences. These exceedances, which are up to 4 dBA, are well below the maximum management level of 75 dBA and are considered small and manageable. It is noted that the predicted batch plant noise levels at High Street and Hickson Road residences are below measured existing ambient L_{Aeq} noise levels at these locations.

In addition, a review of the cumulative noise impact at residences has been conducted and it has been determined that the addition of the concrete batching plant will not result in an unacceptable increase in construction noise levels at surrounding receivers during the daytime.

Based on this assessment it has been determined that the operation of the proposed concrete batch plant will not result in an unacceptable noise impact at surrounding receivers.

Further, the use of a concrete batching plant will result in a reduced need for concrete haulage trucks on the surrounding road network which will in turn reduce traffic noise levels associated with this activity.

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