

ACOUSTIC LOGIC CONSULTANCY

noise and vibration consultants
abn 11 068 954 343

Reference: 2008246.3/2011A/R0/GW
20 November, 2008

Bovis Lend Lease

No. Pages: 5

ATTN: MR RICHARD EATON

IMAX – EXCAVATION AND CONSTRUCTION NOISE IMPACT STATEMENT

1. INTRODUCTION

This letter confirms that the noise impact from the excavation and construction activities of Darling Walk into IMAX building has been reviewed. The issues raised in the letter from Markham dated 10 November 2008 are addressed in this letter.

2. NOISE PREDICTION TO THE CINEMAS

2.1 CRITERIA

The background noise limits of the cinemas shall comply with criteria NC-25 which details as below:

Directors | Matthew Palavidis | Victor Fattoretto | Matthew Carter | Matthew Shields

Sydney | Ph 02 8338 9888 | fax 02 8338 8399 | 9 Sarah Street Mascot NSW 2020
Melbourne | Ph 03 9614 3199 | fax 03 9614 3755 | Level 7, 31 Queen Street Melbourne VIC 3000
Canberra | Ph 02 6162 9797 | fax 02 6162 9711 | Unit 14/71 Leichhardt Street Kingston ACT 2604

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Table 1 –NC-25 Criteria

Frequency	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1K Hz	2K Hz	4K Hz	8K Hz	16K Hz
dB	65	54	44	37	31	27	24	22	21	21

It is noted that the NC-25 is approximately equal to 35 dB(A) L_{eq} . The noise criteria used by the previous report 30 dB(A) L_{eq} is already more conservative than the requirements of NC-25.

2.2 NOISE SOURCE

Noise impact will be determined from all processes and equipment, which are involved in the activities outlined below by defining the levels of sound, which they generate.

The A-weighted sound pressure levels at 7m distance for all the component parts of the above-described activities are outlined in the tables below.

Table 2 - Sound Data

CONSTRUCTION ACTIVITY	EQUIPMENT /PROCESS	SOUND PRESSURE LEVEL @7m - dB(A)
Piling Works	Bored Piling	88
	CFA Piling	88
Demolition/excavation	Bulldozer- Caterpillar D7, D9	88
	Bulldozer- Caterpillar D10	93
	Front End Loader – Wheeled	90
	Jack Hammers with Silencing Bags	83
	Air Track Drill-800 CFM Compressor	96
	Scraper Caterpillar 631	89
	Scraper Caterpillar 651	85
	Grader Caterpillar 16	85
	Compactor Caterpillar 825	85
	Compactor Vibrating Plate	92
	Vibratory Roller	89
	Water Cart	88
	Dump Trucks- 35 Tonne	96
	Excavator – Kato 750	86
	Rock Breaker Hydraulic on Kato 750	97
Truck	80	

	Crane- Truck Mounted	85
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Construction	Compressor- 600CFM	75
	Compressor- 1500 CFM	80
	Backhoe	88
	Spreader- Asphalt, concrete	70
	Asphalt Truck	92
	Asphalt Paver	89
	Tip Truck	83
	Generator- Diesel	79
	Spraying Machine	75
	Mechanical Broom	83
	Concrete Truck	83
	Concrete Pump	84
	Concrete Vibrators	80
	Drill- Air	85
	Drill- Pneumatic	85
	Welders	85
	Concrete Saw	93
	Concrete Leveller	90
Cherry Picker- on Truck	80	

The noise levels presented in the above table are derived from the following sources, namely:

1. Noise data provided by client.
2. On-site measurements
3. Table D2 of Australian Standard 2436-1981
4. Data held by this office from other similar studies.

2.3 PREDICTED NOISE LEVELS

The noise emission from the project site has been predicted based on the following elements:

1. The wall structure of the IMAX building is concrete precast construction.
2. The roof/ ceiling of the IMAX cinemas is Metal deck roof/ ceiling cavity with insulation/ Orteck ceiling structure.
3. Distance attenuation.
4. Barrier effect.
5. Noise spectrum of typical excavation and construction noise by this office.

The predicted typical excavation/construction noise into the cinemas has been presented in Table below.

Table 3 –Predicted Noise Levels Within Cinemas

Frequency	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1K Hz	2K Hz	4K Hz	8K Hz	16K Hz
Predicted	44	51	48	33	17	<10	<10	<10	<10	<10
Criteria	65	54	44	37	31	27	24	22	21	21
Compliance	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

The predicted noise levels indicate that the excavation/construction noise emissions comply with NC-25 requirements therefore is acoustically acceptable.

3. NOISE IMPACT TO FUCTION ROOMS

The existing ambient noise levels within Star Room Function Centre were measured by this office of previous job conducted for IMAX and presented as below:

Table 4 –Measured Ambient Noise Levels

Space	Measured Background Noise Levels
Centre of Star Room Function Centre	52 dB(A)

The noise impacts from the excavation and construction activities of the project site will be less than the existing ambient noise levels therefore are acceptable.

4. NOISE IMPACT TO OUTDOOR DINNING AREAS

It is noticed that the outdoor dinning areas are located along the northern façade of the IMAX building which is screened from the project site by the IMAX building and the predicted worst noise levels are presented as below.

Table 5 –Predicted Noise Levels to Outdoor Dinning Areas

Space	Predicted Noise Levels dB(A)	AS2107-2000 Recommended Noise Levels dB(A)	Exceed	Acceptable exceeding by Council requirements	Compliance
Outdoor Dinning	≤ 55	50 dB(A)	5 dB(A)	≤ 10 dB(A)	Yes

5. VIBRATION ISSUE

The vibration criteria set up by previous report Section 8 including:

- Australian Standard 2187
- Australian Standard 2670

The human comfort requirements have been included in the previous report Section 8.3. Provided detailed noise and vibration management plan of the previous report by this office the vibration levels to IMAX shall not exceed the specified criteria and therefore it is acceptable.

6. CONCLUSION

The issues raised by MARKHAM dated 10 November 2008 have been reviewed and detailed noise levels and vibration requirements have been stated in this report. The noise emissions from the excavation and construction activities from the Darling Walk site comply with the requirements of NC-25 and Council "Code of Practice for Construction Hours/Noise within the Central Business District" therefore the proposed restricted construction hours by Markham is unnecessary.

We trust this information is satisfactory. Please contact us should you have any further queries.

Yours faithfully,

A handwritten signature in black ink, appearing to read "George Wei". The signature is written in a cursive, flowing style.

ACOUSTIC LOGIC CONSULTANCY PTY LTD
George Wei

ACOUSTIC LOGIC CONSULTANCY

noise and vibration consultants
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ATTN: MR RICHARD EATON

168-174 DAY ST – DARLING WALK EXCAVATION AND CONSTRUCTION NOISE IMPACT STATEMENT

This letter confirms that the noise impact from the excavation and construction activities of Darling Walk into 168-174 Day St building has been reviewed.

Due to the existing high traffic noise levels generated by Day St and Western Distributer, regardless the existing glazing thickness of the existing commercial building at 168-174 Day St, the noise emission from the excavation and construction activities of Darling Walk will not exceed the existing ambient noise within the commercial space at 168-174 Day St by:

- 7am to 8am $L_{av\ max} \leq \text{Background} + 5\ \text{dB(A)}$
- 8am to 7 pm $L_{av\ max} \leq \text{Background} + 10\ \text{dB(A)}$

Directors | Matthew Palavidis | Victor Fattoreto | Matthew Carter | Matthew Shields

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Therefore it is concluded that the noise impact from the excavation and construction activities of Darling Walk into 168-174 Day St comply with the Council requirements.

We trust this information is satisfactory. Please contact us should you have any further queries.

Yours faithfully,

A handwritten signature in black ink, appearing to read "George Wei". The signature is written in a cursive style with a large initial 'G' and 'W'.

ACOUSTIC LOGIC CONSULTANCY PTY LTD
George Wei

20 November 2008

WM Project Number: 08324
Our Ref: MA 201108 DOP.doc
Fax/Email: michael.antonelli@lendlease.com.au

Michael Antonelli
Bovis Lend Lease
30 The Bond
30 HICKSON ROAD
MILLERS POINT NSW 2000

Dear Sir

Re: Darling Walk - EA Noise issues

We understand that the Department of Planning has raised the following issues with respect to noise in response to the project EA. The following responses to these issues that have been raised are provided.

West Facing Retail Promenade

There has been concern raised regarding increased noise because of the west facing retail promenade on the ground floor of the new Darling Walk development.

Typically retail areas do not generate significant noise levels as the only noise sources are that associated with retail activities are patrons and shop music. We consider the acoustic impact of such activities will be insignificant based on the following facts

- Ambient background noise levels are relatively high, in the order of 60 dBA. These noise levels are typical of a CBD area.
- The nearest residences are over 100 metres from the western retail areas and will be shielded from residences by the bulk of the new Darling Walk buildings.
- The Western commercial remises at Darling Harbour Exhibition Centre are significantly remote from the retail areas in the order of 180 m.

Given the above facts and the retail nature of the proposed ground level tenancies we consider any acoustic impact will be negligible and not acoustically significant.

Car Park Vehicle Noise

An 800 space carpark is proposed to be located in the basement of the development which will be accessed underneath the northern building. This building is in close proximity of Harbour and Bathurst Streets along with the traffic on the Western Distributor.

All these roads carry in excess of 20,000 vehicles a day. Given the large traffic volumes any noise contribution from additional cars using the proposed car park will be insignificant at surrounding receivers.

I trust this information is sufficient. Please contact us if you have any further queries.

Yours faithfully

WILKINSON MURRAY PTY LIMITED



Brian Clarke
Senior Associate

Wilkinson Murray Pty Limited

ABN 41 192 548 112 • Level 2, 123 Willoughby Road, Crows Nest NSW 2065, Australia • **Asian Office: Hong Kong**
t +61 2 9437 4611 • f +61 2 9437 4393 • e acoustics@wilkinsonmurray.com.au • w www.wilkinsonmurray.com.au