

20180922.2/1412A/R0/YK

14/12/2018

Iglu No. 209 Pty Ltd
Level 4
68 York Street
SYDNEY NSW 2000**Iglu II, 80-88 Regent Street, Redfern - Response to NSW Department of
Planning and Environment Acoustic Queries**

This letter presents our response to the noise queries raised by the NSW Department of Planning and Environment in their letter.

1. DPE – 17

Provide a numerical amount of the predicted noise levels within the building and the numerical amount of how the recommended treatments have reduced this to meet the assessment criteria. This shall include specific reference to the proposed breezeway dualair component system.

Sections 4.1 and 4.2 of the DA acoustic report (reference: 20180922.1/2108A/R0/YK) outline the assessment criteria and existing environmental noise levels respectively. These are summarised below;

Table 1 – Internal Noise Criteria

Space	Time	Internal Traffic Noise Criteria
Bedrooms (sleeping areas)	Night-time (10pm07am)	35 dB(A)Leq _(9hr)
All other habitable spaces	24 hours	40 dB(A)Leq _(15hr)
Open Plan Office/General Office Areas	When in use	40 – 45 dB(A)Leq _(15mins)
Retail Stores	When in use	40 – 45 dB(A)Leq _(15mins)
Common Rooms	When in use	40 – 45 dB(A)Leq _(15mins)
Games Rooms	When in use	40 – 45 dB(A)Leq _(15mins)

SYDNEY
A: 9 Sarah St
MASCOT 2020
T: (02) 8339 8000SYDNEY MELBOURNE BRISBANE CANBERRA
LONDON DUBAI SINGAPORE GREECE

ABN: 11 068 954 343

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Table 2 – Measured Existing Traffic Noise Levels

Location	Measured Traffic Noise Level	
	Daytime (7am-10pm)	Night time (10pm-7am)
Along Regent Street (approx. 3m from curb)	68 dB(A) _{Leq(15 hour)}	66 dB(A) _{Leq(9 hour)}
Along William Lane (site boundary)	65 dB(A) _{Leq(15 hour)}	62 dB(A) _{Leq(9 hour)}

Internal noise levels were calculated based on the expected level and spectral characteristics of the external noise, the area of building elements exposed to the noise source, the absorption characteristics of the rooms and the noise reduction performance of the building elements.

Table 4 of the DA acoustic report outlines minimum glazing constructions required to ensure compliance with the internal noise goals detailed in Table 1 above.

- We have been advised that the proposed “ventilation box” is now being replaced with the Breezway Dualair Acoustic Louvre Window System. The noise levels predicted below are based on this system. The following transmission loss (TL) was provided for this system by Breezway, based on CSIRO test TL638-01-1.

Table 3 – TL of Breezway Dualair System

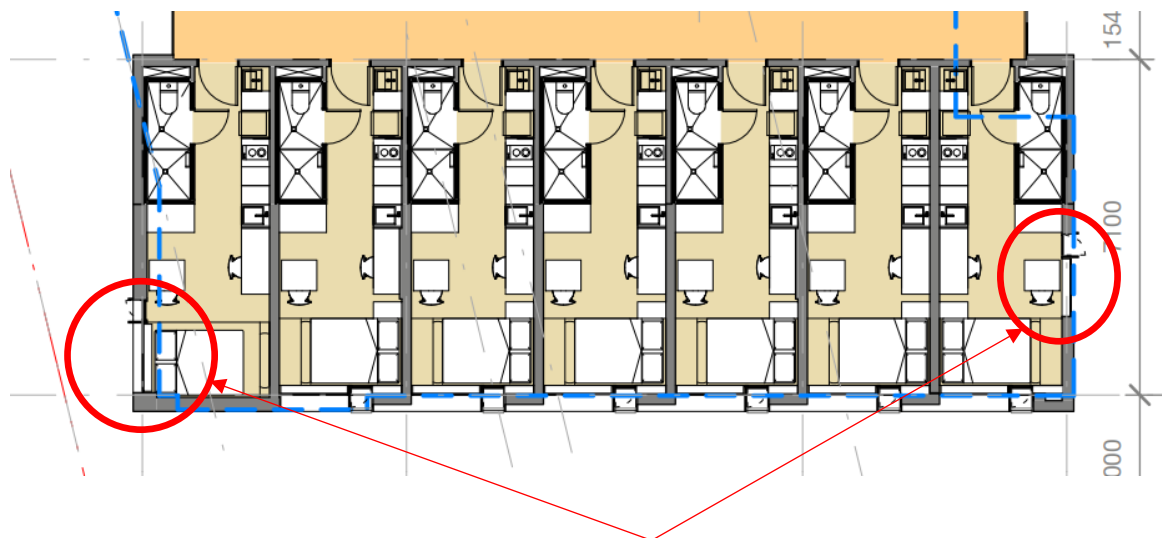
125	250	500	1k	2k	4k
22.2	25.4	36.1	38.6	33.6	37.8

Table 4 – Recommended Minimum Glazing Construction

Levels	Space	Façade	Glazing Thickness	Acoustic Seals	Predicted Internal Noise Level dB(A) _{Leq}
Ground & Level 00 (Mezzanine)	Retail	East (Regent Street)	10.38mm laminate	Yes	40 – 45 (depending on retail tenancy)
		South (Marian Street)			
	Office*	South or West (William Lane)	6.38mm laminate	Yes	40 – 43
Level 1	Community Space	East	10.38mm laminate	Yes	37 – 40
		South	6.38mm laminate		
		West or Courtyard	6mm float/toughened		
	Rooms	South or West	10.38mm laminate		31 – 33 (depending on location of room and glazing size)

Levels	Space	Façade	Glazing Thickness	Acoustic Seals	Predicted Internal Noise Level dB(A) _{Leq}
Levels 2 to 10	Rooms	East and North	12.38mm laminate for the fixed glass element + Breezway Dualair Acoustic Louvre Window System	Yes	35
		North or South (first apartments – see figure below)	12.38mm laminate for the fixed glass element + Breezway Dualair Acoustic Louvre Window System		32 – 35
		North, South & West	10.38mm laminate for the fixed glass element + Breezway Dualair Acoustic Louvre Window System		28 – 32 (depending on location of room)
	Living/Kitchen (Common)	North and South	6.38mm laminate for the fixed glass element + Breezway Dualair Acoustic Louvre Window System		38 – 40 (lower noise level predicted from level 7 and above)
	Corridor	North or South	6mm float/toughened		<45
Levels 11 to 17	Rooms	East and North	10.38mm laminate for the fixed glass element + Breezway Dualair Acoustic Louvre Window System	Yes	34
		North or South (first apartments – see figure below)	10.38mm laminate for the fixed glass element + Breezway Dualair Acoustic Louvre Window System	Yes	31 – 34
		North, South & West	6.38mm laminate for the fixed glass element + Breezway Dualair Acoustic Louvre Window System		27 – 31 (depending on location of room)
	Living/Kitchen (Common)	North and South	6.38mm laminate for the fixed glass element + Breezway Dualair Acoustic Louvre Window System		37 – 39 (lower noise level predicted from level 7 and above)
	Corridor	North or South	6mm float/toughened		<45

***Assumed as general/open plan office space. If this space is proposed to be part of future fit-out, any sensitive areas such as meeting rooms, private office etc. located along the façade will need to be reviewed, as these spaces will require an upgraded façade construction.**



Some examples of the detailed calculations of noise propagation from source to receiver are presented below.

Table 5 – Level 1 Rooms along Southern Façade (overlooking Marian Street)

Item	Noise Level dB – Frequency(Hz)								
	63	125	250	500	1k	2k	4k	8k	A-wt
Noise level incident on façade dB(A) _{Leq}	68	64	62	58	58	53	46	42	62
Noise break-in through proposed façade glazing (total glazed area ≤ 6.5m ²)	8	8	8	8	8	8	8	8	
Octave Room Correction for the bedroom/studio (≥5m x ≥2.6m – smaller room size represents a worst case)	-3	-4	-5	-6	-6	-7	-8	-9	
Transmission loss of 10.38mm laminate glazing	-22	-27	-31	-34	-36	-37	-49	-52	
Predicted Noise Level – dB_{Leq}	51	42	34	27	23	17	0	0	32
Internal Noise Criteria dB(A)_{Leq}	≤ 35								
Complies	Yes								

Table 6a – Level 2 Rooms along Eastern Façade (overlooking Regent Street) – Glazed Window

Item	Noise Level dB – Frequency(Hz)								
	63	125	250	500	1k	2k	4k	8k	A-wt
Noise level incident on façade dB(A) _{Leq}	71	67	65	61	61	56	49	45	65
Noise break-in through proposed façade glazing (total glazed area ≤ 4m ²)	6	6	6	6	6	6	6	6	
Octave Room Correction for the bedroom/studio (≥4m x ≥2.6m – smaller room size represents a worst case)	-2	-3	-4	-5	-6	-7	-8	-9	
Transmission loss of 12.38mm laminate glazing	-26	-29	-31	-33	-37	-40	-46	-52	
Predicted Noise Level – dBL_{eq}	48	41	35	29	24	15	1	0	32

Table 6b – Level 2 Rooms along Eastern Façade (overlooking Regent Street) – Double Glazed Louvre System

Item	Noise Level dB – Frequency(Hz)								
	63	125	250	500	1k	2k	4k	8k	A-wt
Noise level incident on façade dB(A) _{Leq}	71	67	65	61	61	56	49	45	65
Noise break-in through proposed façade glazing (total glazed area ≤ 1.4m ²)	1	1	1	1	1	1	1	1	
Octave Room Correction for the bedroom/studio (≥4m x ≥2.6m – smaller room size represents a worst case)	-2	-3	-4	-5	-6	-7	-8	-9	
Transmission loss of 12.38mm laminate glazing	-19	-22	-25	-36	-39	-34	-38	-41	
Predicted Noise Level – dBL_{eq}	50	43	37	21	18	17	5	0	32

Table 7 – Cumulative Impact to Level 2 Rooms along Eastern Façade (overlooking Regent Street)

Item	Noise Level dB – Frequency(Hz)								
	63	125	250	500	1k	2k	4k	8k	A-wt
Predicted Noise Level Glazed Window – dB_{Leq}	48	41	35	29	24	15	1	0	32
Predicted Noise Level Double Glazed louvre system – dB_{Leq}	50	43	37	21	18	17	5	0	32
Cumulative level $dB(A)_{Leq}$	52	45	39	30	25	19	6	0	35
Internal Noise Criteria $dB(A)_{Leq}$	≤ 35								
Complies	Yes								

2. DPE – 18

Demonstrate the predicted construction noise levels, mitigation and management strategies.

We note that a construction program and methodology of proposed works is not available at this early stage (this is not typically undertaken prior to project approval) and as such, a detailed noise and vibration impact assessment cannot be undertaken at this point.

It is recommended that a detailed construction noise and vibration impact assessment be carried out after project approval, when construction program and methodology is finalised, to determine the level of impact on surrounding properties from the proposed activities and develop a relevant management plan.

Noise and vibration impacts associated with the development of the subject proposal will be assessed against the provisions of the NSW Environment Protection Authority's documents *Interim Construction Noise Guideline* and *Assessing Vibration: A Technical Guideline*.

As such, only an indicative analysis is possible at this stage and this is detailed in Appendix 1.

3. DPE – 19

Provide a noise emission assessment for the podium level communal open space.

A new outdoor courtyard space is proposed on level 1 (podium level) of the subject development. It is proposed to integrate with the existing outdoor courtyard space associated with the adjoining Iglu I development.

- Iglu I – Level 1 courtyard space 95m².
- Iglu II – Level 1 courtyard space 89m².

- Combined new level 1 outdoor courtyard space – 184m².

Section 6 of the DA acoustic assessment (reference: 20180922.1/2108A/R0/YK) outlines the measured ambient noise levels to and the relevant noise emission criteria applicable for the development. The noise emission requirements are consistent with those adopted during the Iglu 1 DA acoustic assessment. These are summarised below.

Table 8 – Measured Rating Background Noise Levels

Location	Rating Background Noise Level dB(A) _{L₉₀(period)}		
	Daytime (7am – 6pm)	Evening (6pm – 10pm)	Night (10pm – 12am)
Subject Site	56	52	45

Table 9 – Activity Noise External Noise Emission Criteria

Type of Receiver	Time of day	Recommended Amenity Noise Level dB(A) _{L_{eq}(15mins)}
Any surrounding affected residential receiver	Daytime (7am-6pm)	58
	Evening (6pm-10pm)	48
	Night-time (10pm-7am)	43
Commercial	When in Use	65

**Table 10 – Internal Criteria for Residential Receivers – Acoustic Objectives dB(A)_{L_{eq}(15mins)}
(Background + 3dB)**

Location	31.5Hz	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	A-wt
Apartment 161 Redfern Street	37	37	36	32	30	28	20	11	5	32
Criteria	40	40	39	35	33	31	23	14	8	35

The courtyard space will generally be used as a relaxation space, with seating facilities. This space will only be accessible to tenants and will not be permitted to be used for parties and amplified events.

Noise emission predictions to the surrounding sensitive receivers are based on the following assumptions;

- A total of 50 patrons occupying this space at any given time (approx. 1 patron/3m²).
- Sound power level of vocal noise from a patron is 72 dB(A) _{L_{eq}}, with one on two speaking at any one time. This is based on measurements of elevated speech patron noise in other

outdoor terrace spaces (with no amplified music). Sound spectrum used in this analysis is as follows:

Table 11 – L_{eq} Sound Power Level Spectrum of Single Patron

Noise Level dB – Frequency (Hz)									
31.5	63	125	250	500	1k	2k	4k	8k	A-wt
57	57	65	65	71	68	63	54	42	72

- No amplified music is permitted in this space and the courtyard will be closed from 10pm to 7am.
- The internal noise criteria require all external doors and windows of the affected residence closed. We will assume standard glazing to all façade glazed elements, which represents a conservative approach (these glazing systems are more likely to be thick single glazing i.e. 6.38mm, 10mm or 10.38mm laminate). STC of standard full height sliding door with acoustic seals is as follows;

Table 12 – Transmission Loss of Standard Glazed Sliding Door with Seals

31.5	63	125	250	500	1k	2k	4k	8k
15	19	22	24	27	33	28	34	40

Noise levels are predicted below, assuming patrons are evenly distributed across the space. The potentially nearest affected receivers are the residential apartments located in the multi-storey mixed used properties at 9 Gibbons Street and 161 Redfern Street.

Table 13 – Noise Emissions from the Rooftop Terrace (External)

Type of Receiver	Predicted Noise Level $dB(A)_{Leq(15mins)}$	Recommended External Noise Level Criteria $dB(A)_{Leq(15mins)}$
Residential apartments in the properties at 9 Gibbons Street and 161 Redfern Street – overlooking this courtyard space	46	48*

*Evening period requirement is more stringent than daytime.

Table 14 – Noise Emissions from Rooftop Terrace (Internal)

Descriptor	31.5Hz	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	A-wt
Predicted Noise Level dB(A) _{Leq(15mins)}	<27	<27	<32	<30	<33	<24	<24	<9	0	<32
Criteria dB(A) _{Leq(15mins)}	40	40	39	35	33	31	23	14	8	35
Complies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

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

Yours faithfully,



Acoustic Logic Consultancy Pty Ltd
Yogendra Kalkunte

APPENDIX 1

PRELIMINARY CONSTRUCTION NOISE AND VIBRATION IMPACT ASSESSMENT AND MANAGEMENT PLAN