5 Skyline Place, Frenchs Forest – mixed use development

Acoustic addendum report – MOD2023/0617 for DA2021/0212

Platino Properties Pty Ltd

23 February 2024

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S4	0	C Gordon	E Milton	*on file	E Milton	*on file	23/02/2024

GHD Pty Ltd | ABN 39 008 488 373
Contact: Chris Gordon, Technical Director - Acoustics | GHD
133 Castlereagh Street, Level 15
Sydney, New South Wales 2000, Australia
T +61 2 9239 7100 | **F** +61 2 9239 7199 | **E** sydmail@ghd.com | **ghd.com**

[Compliance statement]

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1. Introduction

GHD has been engaged by Platino Properties Pty Ltd to prepare an addendum acoustic report for the proposed mixed use development at 5 Skyline Place, Frenchs Forest. The purpose of this report is to address noise impacts on the proposed residential areas of the development from the surrounding land uses for the modification application (MOD2023/0617 for DA2021/0212).

GHD has previously prepared two reports related to this development which assessed the noise impacts from the surrounding land uses and provided mitigation measures to achieve satisfactory internal noise levels:

– *Individual Acoustic Expert Report_Platino Properties Pty Ltd ats Northern Beaches Council* (dated 2 March 2023) – this report was prepared for the NSW Land & Environment Court proceedings (case number 2022/161509) and addressed the Contentions related to acoustics provided in the Statement of Facts and Contentions.

  The main purpose of this expert report was to quantify and assess the noise impacts from the surrounding existing and potential future land uses, which includes industrial premises, truck movements and a child care centre.

– *Acoustic calculation information addendum_Platino Properties Pty Ltd ats Northern Beaches Council* (dated 6 March 2023) – this addendum provided background information regarding assumptions and results of the assessment provided in the above Expert Report

1.1 Scope and limitations

1.1.1 Scope of works

The scope of works undertaken are as follows:

– Review the previous acoustic modelling results and acoustic reports related to the project
– Update the noise modelling to reflect the latest design. In particular this would focus the change of use of level 1 from commercial to residential
– Prepare an acoustic addendum detailing the findings of the updated modelling.
– Where required, provide additional acoustic mitigation measures required to achieve the relevant acoustic standards

1.1.2 Limitations

This report: has been prepared by GHD for Platino Properties Pty Ltd and may only be used and relied on by Platino Properties Pty Ltd for the purpose agreed between GHD and Platino Properties Pty Ltd as set out in section 1.1.1 of this report.

GHD otherwise disclaims responsibility to any person other than Platino Properties Pty Ltd arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report (refer section(s) [00] of this report). GHD disclaims liability arising from any of the assumptions being incorrect.

2. Updated assessment

2.1 Changes to the design

Subsequent to the previous assessments detailed in Section 1 above, Platino Properties has lodged a modification to change the use of the Level 1 eastern building from non-residential use to residential use. Northern Beaches Council have raised concerns that the original acoustic assessment does not satisfactorily assess the acoustic impacts on this area. The following extract is taken from the letter from Council regarding the changes:

> *The modification application has only addressed the economic justification for the removal of the first-floor commercial floor space. Insufficient details and information have been provided with the application to satisfy Council that removing the first-floor commercial level will result in a building that remains compatible with the surrounding land uses in terms of the response to the surrounding built form character and mitigate potential amenity impacts on the future residents located on the first floor (including acoustic and air quality as a result of the surrounding and uses and trucks).*

This updated assessment takes into account the change in use of the Level 1 area as requested by Council.

2.2 Noise criteria

Northern Beaches Council had previously raised concerns regarding land use conflict between the B7 Business Park zoning and proposed development. With regards to this, existing and future use acoustic impacts are considered and assessed against the internal design sound level presented in AS2107, in particular those units facing the surrounding land uses. The relevant internal design sound level ranges are provided in Table 2.1 below. This is consistent with the previous acoustic assessment.

Table 2.1 Design sound level for different areas of occupancy in buildings

Item	Type of occupancy	Design sound level ($L_{Aeq,t}$) range
7	RESIDENTIAL BUILDINGS	
	Houses and apartments in suburban areas or near minor roads	
	Apartment common areas (e.g. foyer, lift lobby	45 to 50
	Living areas	30 to 40
	Sleeping areas (night time)	30 to 35
	Work areas	35 to 40

2.3 Assumptions and noise levels

This assessment is based on the following assumptions and noise levels, which are consistent with the previous assessment:

Scenario 1 assessment ($L_{Aeq, 15min}$):

– Basis of the assessment

- trucks passing by the proposed development with 6 truck movements in the daytime period and 3 truck movements during the evening and night-time periods in any worst case 15-minute period. The sound power level of the truck has been set at 108 dBA.
- a light industry facility operating 24 hours a day. Internal noise level has been set at 90 dBA based on a typical light industrial facility, with noise emanating out through an open roller door.
- a child care facility with 100 children playing outdoors at any one time. The overall sound power level has been set at 97 dBA distributed across a typically sized outdoor area. The sound power level has been established using the Association of Australasian Acoustic Consultant's *Guideline for Child Care Centre Acoustic Assessment* (Version 3.0, dated September 2020), being 100 children aged 3 to 5 years (data provided in Table 1 of this guideline)

This assessment is considered conservative as it hypothetically models 3 noise sources at approximately 12 metres from the façade of the proposed development (at Level 1 as opposed to Level 2 previously assessed), which in reality is unlikely to occur, resulting in lower noise levels at the facade.

Scenario 2 assessment (L_{Amax} sleep disturbance):

– Basis of the assessment
  - trucks passing by the proposed development based with sound power level of 108 dBA.
  - modelled at 12 metres from any facade of the proposed development (at Level 1 as opposed to Level 2 previously assessed).

The source levels for both scenarios are shown in Table 2.2 below.

Table 2.2 Source noise levels – Sound Power Levels (SWL)

Source	Noise level, dB at individual frequencies, Hz								Overall SWL, dBA
	63	125	250	500	1000	2000	4000	8000	
Truck	112	114	104	102	103	100	96	89	108
Industrial premises – internal noise level	80	84	84	90	84	79	74	70	90
100 children (aged 3-5 years)	66	76	94	96	96	93	88	81	100

The assessment is based on the same building construction previously recommended in the Acoustic Expert Report, as follows:

Glazing:

– The glazing elements will be the weakest acoustic path and should be designed to minimise noise intrusion to the internal areas of the development.
– The size of any glazed element should be minimised. Where possible, these should be orientated at 90 degrees to the noise source.
– To achieve the internal noise requirement of the State Environmental Planning Policy (Seniors Living) 2004 and Australian Standard AS2107:2016 (bedrooms 30 – 35 dBA, living areas 30 – 40 dBA),
  - Bedroom windows should achieve a minimum weighted sound reduction index Rw 38. This could be achieved with thick laminated glazing or double glazing, with acoustic seals.
  - Living area windows should achieve a minimum weighted sound reduction index Rw 38. This could be achieved with thick laminated glazing or double glazing, with acoustic seals.
  - The Rw requirement for glazing would be reduced should the glazing be used in conjunction with a wintergarden, described below.

Wintergardens:

– While there are no specific criteria for outdoor areas such as balconies, noise modelling indicates there is the potential for acoustic impacts when occupants are using these areas. Based on guidance in the Apartment Design Guide, the use of wintergardens may be appropriate to reduce acoustic impacts.

  To achieve a suitable level of noise reduction, operable louvres or sliding windows could be used to allow the occupants to have these open or closed depending on the level of noise at any given time. The louvres or windows should be designed to be fully sealed with no gaps and should be constructed using aluminium or minimum 6 mm glazing with Rw 25.

2.4 Results

Based on the noise sources above, noise modelling was undertaken using CadnaA to determine the resultant façade noise level at Level 1, being the nearest residential unit (previously level 2).

2.4.1 Scenario 1

Figure 2.1 below shows the configuration of sources and receiver for scenario 1 assessment ($L_{Aeq, 15min}$) , along with the noise contours and predicted noise level at the façade. One building has been used as an example.

Based on the updated modelling, there is a minor increase in noise levels of less than 1 dB. For conservatism, modelling has been undertaken based on an increase of 1 dB at the façade of the Level 1 residential units.

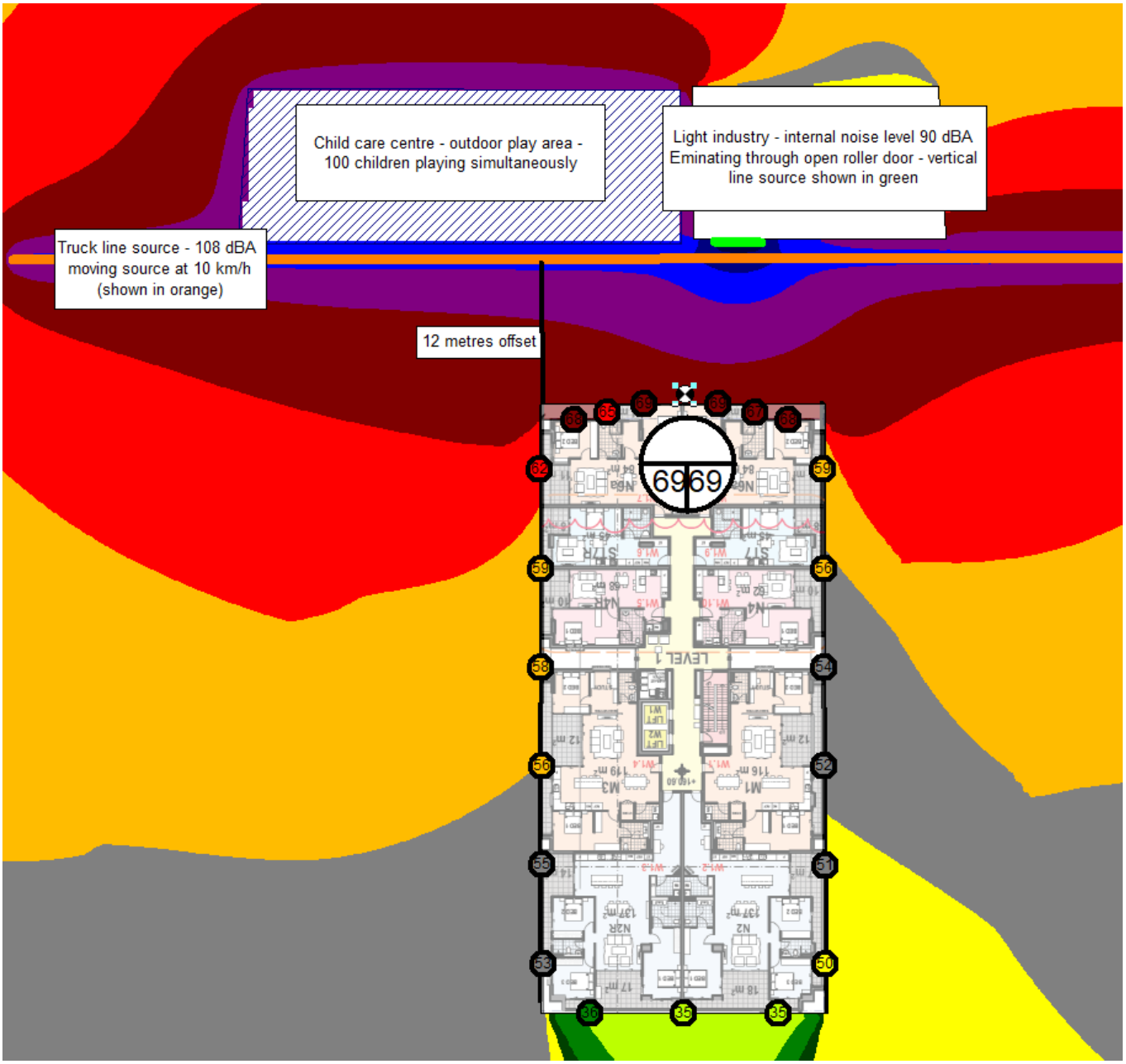


Figure 2.1 Noise modelling configuration and results - Scenario 1 assessment ($L_{Aeq, 15min}$)

Once the façade noise level was determined, modelling was undertaken using INSUL Sound Insulation Program to determine the required façade treatments to achieve the internal noise targets of AS/NZS 2107–2016, Acoustics—Recommended design sound levels and reverberation times for building interiors.

Figure 2.2 shows the results for noise intrusion impacts into a typical sized bedroom, with area of 16 m^2 and a window size of 2.5 m^2. The resultant internal noise level is 31 dBA, which is compliant with the internal noise targets of AS/NZS 2107–2016, being 30 – 35 dBA.

Figure 2.3 shows the results for noise intrusion impacts into a typical sized living area, with area of 36 m^2 and a sliding glazed door size of 16 m^2. The resultant internal noise level is 36 dBA, which is compliant with the internal noise targets of AS/NZS 2107–2016, being 30 – 40 dBA

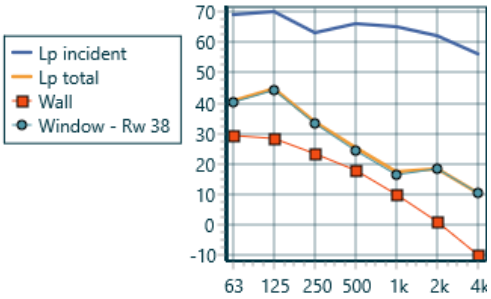
Title

5 Skyline Place, Frenchs Forest

Comment

Noise intrusion from surrouding land uses as detailed in report (facade noise level 69 dbA) into bedroom areas

Standard Sources



Exterior Sound Pressure Level	63	125	250	500	1k	2k	4k	Overall dBA
	69.0	70.0	63.0	66.0	65.0	62.0	56.0	69.1

Path

Element 1 | **Element 2** | Element 3 | Element 4 | Element 5 | Element 6 | Element 7 | Element 8

Description: Window - Rw 38 Area: 2.50 m^2

		63	125	250	500	1k	2k	4k	Overall dBA
-Sound Transmission Loss	Get R	-24	-21	-25	-37	-44	-39	-41	
-Facade Shape Level diff.	Facade	0	0	0	0	0	0	0	
Insertion Loss		0	0	0	0	0	0	0	
+10 Log(A)		4.0	4.0	4.0	4.0	4.0	4.0	4.0	

Receiving Room Volume: 45 m3

Notes		63	125	250	500	1k	2k	4k	Overall dBA
-10 Log(V)+11		-6	-6	-6	-6	-6	-6	-6	
Reverberation Time (secs)	RT	0.5	0.5	0.5	0.5	0.5	0.5	0.5	
+10 Log(T)		-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	
Element Sound Level Contribution		40	44	33	24	16	18	10	31.1
Room Sound Level		41	44	34	25	17	18	10	35.7
D2m,nT		31.5	28.7	32.4	43.8	50.8	46.7	48.7	37.8

Path

Element 1 | **Element 2** | Element 3 | Element 4 | Element 5 | Element 6 | Element 7 | Element 8

Description: Window - Rw 38 Area: 2.50 m^2

		63	125	250	500	1k	2k	4k	NC
-Sound Transmission Loss	Get R	-24	-21	-25	-37	-44	-39	-41	
-Facade Shape Level diff.	Facade	0	0	0	0	0	0	0	
Insertion Loss		0	0	0	0	0	0	0	
+10 Log(A)		4.0	4.0	4.0	4.0	4.0	4.0	4.0	

Receiving Room Volume: 45 m3

Notes		63	125	250	500	1k	2k	4k	NC
-10 Log(V)+11		-6	-6	-6	-6	-6	-6	-6	
Reverberation Time (secs)	RT	0.5	0.5	0.5	0.5	0.5	0.5	0.5	
+10 Log(T)		-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	
Element Sound Level Contribution		40	44	33	24	16	18	10	31.1
Room Sound Level		41	44	34	25	17	18	10	31.4
D2m,nT		31.5	28.7	32.4	43.8	50.8	46.7	48.7	37.8

Figure 2.2 Noise intrusion calculations for bedrooms

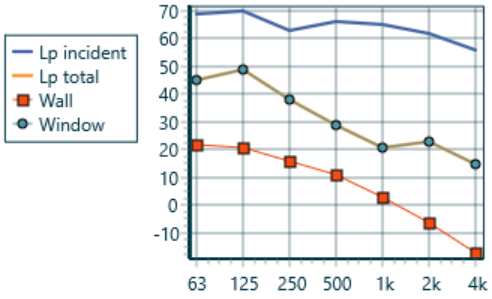
Title

5 Skyline Place, Frenchs Forest

Comment

Noise intrusion from surrouding land uses as detailed in report (facade noise level 69 dBA) into living areas

Standard Sources



Exterior Sound Pressure Level	63	125	250	500	1k	2k	4k	Overall dBA
	69.0	70.0	63.0	66.0	65.0	62.0	56.0	69.1

Path

Element 1 | Element 2 | Element 3 | Element 4 | Element 5 | Element 6 | Element 7 | Element 8

Description Wall Area 5 m²

		63	125	250	500	1k	2k	4k	Overall dBA
-Sound Transmission Loss	Get R	-42	-44	-42	-50	-57	-63	-68	
-Facade Shape Level diff.	Facade	0	0	0	0	0	0	0	
Insertion Loss		0	0	0	0	0	0	0	
+10 Log(A)		7.0	7.0	7.0	7.0	7.0	7.0	7.0	

Receiving Room Volume 100 m3

Notes		63	125	250	500	1k	2k	4k	Overall dBA
-10 Log(V)+11		-9	-9	-9	-9	-9	-9	-9	
Reverberation Time (secs)	RT	0.5	0.5	0.5	0.5	0.5	0.5	0.5	
+10 Log(T)		-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	
Element Sound Level Contribution		22	21	16	11	3	-6	-17	12.3
Room Sound Level		45	49	38	29	21	23	15	35.7
D2m,nT		27.2	24.2	28.2	40.1	47.1	42.2	44.2	33.5

Path

Element 1 | Element 2 | Element 3 | Element 4 | Element 5 | Element 6 | Element 7 | Element 8

Description Window Area 16 m²

		63	125	250	500	1k	2k	4k	Overall dBA
-Sound Transmission Loss	Get R	-24	-21	-25	-37	-44	-39	-41	
-Facade Shape Level diff.	Facade	0	0	0	0	0	0	0	
Insertion Loss		0	0	0	0	0	0	0	
+10 Log(A)		12.0	12.0	12.0	12.0	12.0	12.0	12.0	

Receiving Room Volume 100 m3

Notes		63	125	250	500	1k	2k	4k	Overall dBA
-10 Log(V)+11		-9	-9	-9	-9	-9	-9	-9	
Reverberation Time (secs)	RT	0.5	0.5	0.5	0.5	0.5	0.5	0.5	
+10 Log(T)		-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	
Element Sound Level Contribution		45	49	38	29	21	23	15	35.6
Room Sound Level		45	49	38	29	21	23	15	35.7
D2m,nT		27.2	24.2	28.2	40.1	47.1	42.2	44.2	33.5

Figure 2.3 Noise intrusion calculations for living rooms

1.

2.4.2 Scenario 2

Noise modelling was undertaken using CadnaA to determine maximum noise levels from a passing truck to assess the potential for sleep disturbance impacts. A moving point source was used with sound power 108 dBA, moving at 10 km/h..

Based on the updated modelling, there is a minor increase in noise levels of less than 1 dB. For conservatism, modelling has been undertaken based on an increase of 1 dB at the façade of the Level 1 residential units.

Internal noise levels were assessed against guidance provided in the EPA's Road Noise Policy, which provides the following guidance on internal noise levels

> *From the research on sleep disturbance to date it can be concluded that:*
>
> *maximum internal noise levels below **50–55 dB(A)** are unlikely to awaken people from sleep*

Based on the recommendations provided in the expert report and shown above for scenario 1, the predicted internal maximum noise level from a truck passby is **L_{Amax} 39 dBA**. Based on the guidance in the Road Noise Policy, this noise level is unlikely to awaken people from sleep.

3. Recommendations

The following recommendations are provided to achieve satisfactory internal noise levels. Note that these are consistent with the recommendations outlined in the previous two acoustic reports.

Glazing:

– The glazing elements will be the weakest acoustic path and should be designed to minimise noise intrusion to the internal areas of the development.
– The size of any glazed element should be minimised. Where possible, these should be orientated at 90 degrees to the noise source.
– To achieve the internal noise requirement of the State Environmental Planning Policy (Seniors Living) 2004 and Australian Standard AS2107:2016 (bedrooms 30 – 35 dBA, living areas 30 – 40 dBA),
    - Bedroom windows should achieve a minimum weighted sound reduction index Rw 38. This could be achieved with thick laminated glazing or double glazing, with acoustic seals.
    - Living area windows should achieve a minimum weighted sound reduction index Rw 38. This could be achieved with thick laminated glazing or double glazing, with acoustic seals.
    - The Rw requirement for glazing would be reduced should the glazing be used in conjunction with a wintergarden, described below.

Wintergardens:

– While there are no specific criteria for outdoor areas such as balconies, noise modelling indicates there is the potential for acoustic impacts when occupants are using these areas. Based on guidance in the Apartment Design Guide, the use of wintergardens may be appropriate to reduce acoustic impacts.

  To achieve a suitable level of noise reduction, operable louvres or sliding windows could be used to allow the occupants to have these open or closed depending on the level of noise at any given time. The louvres or windows should be designed to be fully sealed with no gaps and should be constructed using aluminium or minimum 6 mm glazing with Rw 25.

4. Conclusion

GHD has prepared an addendum report for Platino Properties Pty Ltd for the proposed mixed use development at 5 Skyline Place, Frenchs Forest following the lodgement of a modification application to change the use of the Level 1 eastern building from non-residential use to residential use.

This report addresses the worst case noise impacts on the level 1 residential areas of the eastern building. Noise levels have only marginally increased from the previous assessment, which was undertaken at level 2.

The mitigation measures previously provided (and outlined in Section 3 above) are still sufficient to reduce the internal noise level to within the satisfactory range of AS2107:2016 and the Road Noise Policy. As such, no additional noise mitigation measures are required for the Level 1 residential units.

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