



Prepared For: Hindmarsh

Lindfield Learning Village Stage 2

Construction Noise and Vibration Management Sub Plan

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1 Introduction

White Noise Acoustics has been engaged to undertake the acoustic assessment of the noise and vibration impacts during the construction stage of the Lindfield Learning Village Stage 2 project.

The assessment has been undertaken in conjunction with the requirements of Item B16 of the projects *Conditions of Consent* and the EPA's Interim Construction Noise Guideline which is detailed in this report.

This report includes the recommended noise and vibration mitigations and management controls for the operation of construction activities on the site to ensure impacts to surrounding receivers are minimised.

2 Development Description

The proposed development includes the construction of Stage 2 of the Lindfield Learning Village project which is located to the south of Dunstan Grove on the old UTS Kuring-Gai Campus.

The surrounding receivers to the site include residential receivers within proximity to the site.

The site location is detailed in Figure 1 below.

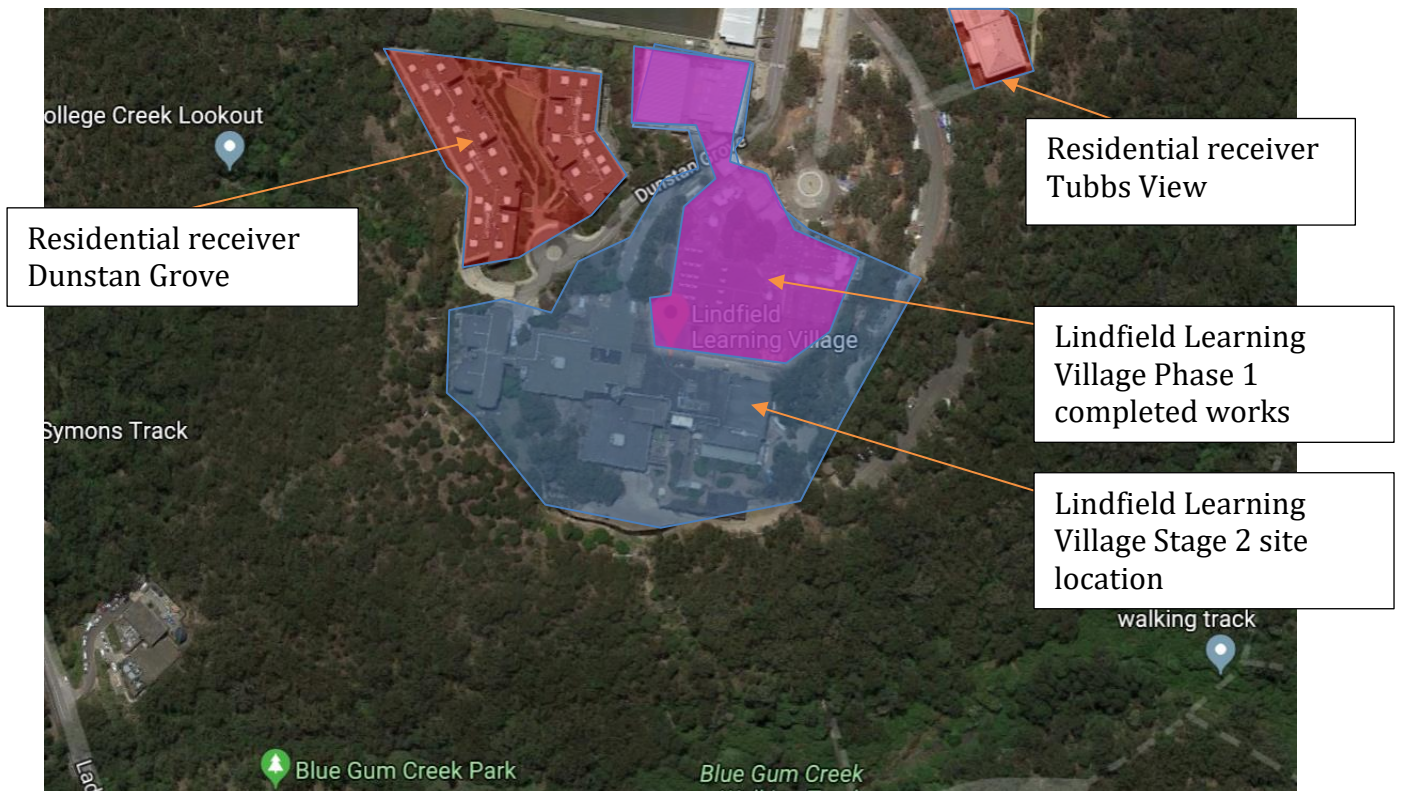


Figure 1 – Site Location including surrounding residential receivers

2.1 Conditions of Consent

The management of noise and vibration associated with the required construction works to be undertaken as part of the project will be undertaken in conjunction with the requirements of the DA Conditions of Consent, including Item B16 that requires the construction of the project to comply with NSW Dept of Env & Climate Change "*Interim Construction Noise Guideline*" 2009 and includes the following:

B14	The Construction Noise and Vibration Management Sub-Plan must address, but not be limited to, the following: (a) be prepared by a suitably qualified and experienced noise expert;
	(b) describe procedures for achieving the noise management levels in EPA's Interim Construction Noise Guideline (DECC, 2009);
	(c) describe the measures to be implemented to manage high noise generating works such as piling, in close proximity to sensitive receivers;
	(d) include strategies that have been developed with the community for managing high noise generating works;
	(e) describe the community consultation undertaken to develop the strategies in condition B14(d);
	(f) include a complaints management system that would be implemented for the duration of the construction; and
	(g) include a program to monitor and report on the impacts and environmental performance of the development and the effectiveness of the management measures in accordance with condition B11.

This report has been undertaken in compliance with the items above and details the required management controls to comply with the Conditions of Consent detailed above.

3 Existing Acoustic Environment

The Lindfield Learning Village site is located on the site formally used as the UTS Ku-Ring-Gai Campus. The site is located within an area which does not include significant transportation industrial or commercial noise sources.

Existing environmental noise levels at the site are dominated by traffic noise generated predominantly from surrounding roadways.

As part of this previously conducted *Lindfield Learning Village, Phase 2 and 3 – Revised Noise Impact Assessment* dated 18th August 2020 an assessment of background noise levels has been undertaken, which will be used as the basis of this report. The site survey included the use of two noise monitoring locations including representative locations for the residential receivers within proximity to the site as detailed in Figure 1 above.

3.1 Noise Survey Results

The results of the noise survey undertaken within the *Lindfield Learning Village, Phase 2 and 3 – Revised Noise Impact Assessment* dated 18th August 2020 report have been used as the basis of this assessment and are summarised in Table 1 below.

Table 1 – Results of Noise Survey at the Site

Measurement Location	Time of Measurement	L _{Aeq, t} dB(A)	L _{A90, 15min} dB(A)	Comments
Residential Receiver Location – Dunstan Grove	Daytime	56 (15 hour) 59 (worst 1 hour)	42	Noise level at the site dominated by vehicle movements on surrounding roadways and the surrounding natural environment
	Evening	56 (15 hour) 59 (worst 1 hour)	40	
	Nighttime	47 (9 hour) 52 (worst 1 hour)	38	
Residential Receiver Location – Tubbs View	Daytime	56 (15 hour) 59 (worst 1 hour)	40	
	Evening	51 (15 hour) 53 (worst 1 hour)	39	
	Nighttime	47 (9 hour) 51 (worst 1 hour)	35	

4 Construction Noise and Vibration Assessment

This section of the report details the assessment of noise associated with the proposed construction activities associated with the development. The assessment has been undertaken to assess the potential noise impacts from construction and excavation on surrounding receivers to the site.

The proposed construction and excavation activities to be undertaken on the site include the excavation and construction on the site. The development will then be constructed using normal construction processes.

4.1 Construction Noise

The assessment of construction noise impacts generated from the site has been undertaken in accordance with the requirements of the EAP Interim Construction Noise Guideline.

The EPA's Interim Construction Noise Guideline defines normal day time hours as the following:

2.2 Recommended standard hours

The recommended standard hours for construction work are shown in Table 1; however, they are not mandatory. There are some situations, as described below, where construction work may need to be undertaken outside of these hours. The likely noise impacts and the ability to undertake works during the recommended standard hours should be considered when scheduling work.

Table 1: Recommended standard hours for construction work

Work type	Recommended standard hours of work*
Normal construction	Monday to Friday 7 am to 6 pm Saturday 8 am to 1 pm No work on Sundays or public holidays
Blasting	Monday to Friday 9 am to 5 pm Saturday 9 am to 1 pm No blasting on Sundays or public holidays

* The relevant authority (consent, determining or regulatory) may impose more or less stringent construction hours.

4.1.1 Approved Hours of Work

Works on the site will be undertaken in accordance with the requirements of the DA *Conditions of Consent* which will define the normal working hours for the project.

The *Conditions of Consent* also include the following condition regarding the operation of rock breaking on the site.

C8. Rock breaking, rock hammering, sheet piling, pile driving and similar activities may only be

carried out between the following hours:

(a) 9am to 12pm, Monday to Friday;

(b) 2pm to 5pm Monday to Friday; and

(c) 9am to 12pm, Saturday.

4.2 Proposed Construction Period

Based on the proposed works to be undertaken as part of the project the expected periods for construction phases include the following:

- Demolition- Mid September – End of October 2020
- Ground/Civil Works- End of October – End of January 2020
- Roof & Façade Restoration- End of September- End of December 2020
- Construction- Mid October- November 2021

4.3 Proposed Appliances

The proposed appliances which will be used as part of the excavation and construction of the project are detailed in the table below.

Table 2 – Noise Level from Expected Demotion Appliances

Tasks	Equipment	Sound Power Levels per task dB(A) L ₁₀	Aggregate Sound Power Level per Task dB(A) L ₁₀
Site Demolition works	Jack hammer mounted on skid steer	118	122
	Hand held jack hammer	111	
	Concrete saw	119	
	Skid steer	110	
	Power hand tools	109	
Construction Works	Piling	115	120
	Welder	101	
	Saw cutter	109	
	Dump truck	109	
	Concrete saw	119	
	Power hand tools	109	
	Cranes	110	

Notes: Noise levels of proposed equipment to be used on the site based on the Australian Standard AS2436-2010 and noise level measurements previously undertaken of similar equipment on construction sites.

4.4 Construction Noise Criteria

This section of the report details the relevant construction noise criteria which is applicable to the site including the EPA's *Interim Construction Noise Guideline* (ICNG).

4.4.1 Interim Construction Noise Guideline

Noise criteria for construction and excavation activities are discussed in the *Interim Construction Noise Guideline* (ICNG). The ICNG also recommends procedures to address potential impacts of construction noise on residences and other sensitive land uses. The main objectives of the ICNG are summarised as follows:

- Promote a clear understanding of ways to identify and minimise noise from construction works;
- Focus on applying all “feasible” and “reasonable” work practices to minimise construction noise impacts;
- Encourage construction to be undertaken only during the recommended standard hours unless approval is given for works that cannot be undertaken during these hours;
- Streamline the assessment and approval stages and reduce time spent dealing with complaints at the project implementation stage; and
- Provide flexibility in selecting site-specific feasible and reasonable work practices in order to minimise noise impacts.

The ICNG contains a quantitative assessment method which is applicable to this project. Guidance levels are given for airborne noise at residences and other sensitive land uses.

The quantitative assessment method involves predicting noise levels at sensitive receivers and comparing them with the Noise Management Levels (NMLs). The NML affectation categories for receivers have been reproduced from the guideline and are listed in the table below.

Table 3 – Noise Management Levels from Construction – Quantitative Assessment

Receiver Type	Time of Day	Noise Management Level LAeq(15minute) ^{1,2}	How to Apply
Residential	Recommended standard hours: Monday to Friday 7 am to 6 pm Saturday 8 am to 1 pm No work on Sundays or public holidays	Noise affected RBL + 10 dB	The noise affected level represents the point above which there may be some community reaction to noise. <ul style="list-style-type: none"> Where the predicted or measured LAeq(15minute) is greater than the noise affected level, the proponent should apply all feasible and reasonable work practices to meet the noise affected level. The proponent should also inform all potentially impacted residents of the nature of works to be carried out, the expected noise levels and duration, as well as contact details.
		Highly noise affected 75 dBA	The highly noise affected level represents the point above which there may be strong community reaction to noise. <ul style="list-style-type: none"> Where noise is above this level, the relevant authority (consent, determining or regulatory) may require respite periods by restricting the hours that the very noisy activities can occur, taking into account: <ol style="list-style-type: none"> Times identified by the community when they are less sensitive to noise (such as before and after school for works near schools, or mid-morning or mid-afternoon for works near residences. If the community is prepared to accept a longer period of construction in exchange for restrictions on construction times.
	Outside recommended standard hours	Noise affected RBL + 5 dB	<ul style="list-style-type: none"> A strong justification would typically be required for works outside the recommended standard hours. The proponent should apply all feasible and reasonable work practices to meet the noise affected level. Where all feasible and reasonable practices have been applied and noise is more than 5 dB above the noise affected level, the proponent should negotiate with the community.

Table 3 – Continued

Receiver Type	Time of Day	Noise Management Level LAeq(15minute) ^{1,2}	How to Apply
Classrooms at schools and other educational institutions	When is use	Internal Noise level 45 dB(A)	During construction, the proponent should regularly update the occupants of the premises regarding noise levels and hours of work.
<p><i>Note 1</i> Noise levels apply at the property boundary that is most exposed to construction noise, and at a height of 1.5 m above ground level. If the property boundary is more than 30 m from the residence, the location for measuring or predicting noise levels is at the most noise-affected point within 30 m of the residence. Noise levels may be higher at upper floors of the noise affected residence.</p> <p><i>Note 2</i> The RBL is the overall single-figure background noise level measured in each relevant assessment period (during or outside the recommended standard hours). The term RBL is described in detail in the NSW Industrial Noise Policy (EPA 2000).</p>			

Based on the table above the suitable construction noise management levels for works undertaken on the site is detailed in Table 6 below.

Table 4 – Site Construction Noise Management Levels

Noise Source	Time Period	Receiver Type	Construction Noise Management Level ¹	'High Noise Affected' Level ¹
Construction Noise	During period of approved hours of works as detailed within the DA <i>Conditions of Consent</i>	Residential Receivers	52 dB(A) LAeq (15min)	75 dB(A) LAeq (15min)
		Education Receivers	Internal Noise level 45 dB(A)	-
<i>Note 1: Construction noise management levels based on the Interim Construction Noise Guideline</i>				

In addition to the normal working hours a period of extended working hours has been approved for the site.

The projects noise management levels for works undertaken during the approved extended hours period are detailed in the table below.

Table 5 – Site Construction Noise Management Levels

Noise Source	Time Period	Receiver Type	Extended Hours Construction Noise Management Level
Construction Noise	Proposed extended hours period including: (6pm to 12am during weekdays and 7:30am to 8:00am and 1pm to 5:30pm on Saturday & Sunday)	Residential receivers on Tubbs View	49 dB(A) LAeq (15min)
		Residential receivers on Dunstan Grove	47 dB(A) LAeq (15min)
<i>Note: Background noise levels based on the previously obtained noise levels as detailed in the projects Noise Impact Assessment</i>			

4.5 Construction Noise Management – Qualitative Assessment

Based on the assessment conducted of the expected construction noise levels generated from the site, levels are generally expected to require the building contractor to engage in management of activities on the site and engagement with the local community.

Notwithstanding, the following management controls are recommended to mitigate construction noise levels on the site:

1. Construction to be undertaken within the approved hours detailed within the projects *Conditions of Consent*.
2. All plant and equipment are to be maintained such that they are in good working order.
3. A register of complaints is to be recorded in the event of complaints being received, including location, time of complaint, nature of the complaint and actions resulting from the complaint.
4. If required a noise level measurement of the offending plant item generating complaints is to be conducted and noise mitigations undertaken to reduce noise levels to within Noise Management levels in the event magnitude of noise levels is found to be above suitable levels.
5. The use of percussive and concrete sawing should be undertaken behind a closed façade when possible.
6. For works undertaken outside of normal day time hours (proposed to include the period 6pm to 6am) the external façade of the building should be closed. In the event there are temporary openings in the façade these should be closed using a solid material such as 6mm FC sheet or 12mm plywood.
7. The use of high noise generating equipment including hydraulic hammers, rock cutters or the like should not be undertaken prior to 8am Monday to Friday or 8.30am Saturdays.
8. The loading of trucks should be conducted such that there is not a requirement to stack truck on the roadways adjacent to the residence on Dunstan Grove and or Tubbs view.
9. Where possible to use of squawkers or the like should be used in place of reversing alarms.

In addition to the recommended mitigations above details of the proposed construction (including excavation) works to be conducted on the site, including type of activities to be conducted as well as the expected duration of activities should be provided to the neighbouring receivers.

In the event noise levels are found to require additional noise reduction then all possible and practical mitigations are required to be included in the construction of the project. Possible acoustic treatments and controls may include the following:

1. Use of alternative appliances to complete the required works which result in reduced noise impacts on surrounding neighbours.
2. Period when noisy appliances are undertaken, such as undertaking noisy works on locations with the greatest distance to residential receivers during morning periods if possible.
3. Construction of acoustic screening to permanently located high noise generating equipment such as pumps and generators.
4. Scheduling of high noise generating works outside of noise sensitive periods if possible.
5. Other site specific treatments and controls which may become possible once works commence.

4.6 Construction Noise Assessment – Quantitative Assessment

A quantitative assessment of the construction noise levels resulting from the proposed works to be undertaken as part of the Lindfield Learning Village project on surrounding residential receivers has been undertaken.

The assessment has been based on the expected noise levels to be generated on the site including those detailed in Section 4.7 above. Calculations of the resulting construction noise levels of the residential receivers within proximity to the site is detailed in the table below.

Table 6 - Quantitative Assessment of Construction Noise to Neighboring Residence

Source Noise	Equipment	Sound Power Levels dB(A) L ₁₀	Aggregate Sound Power Level dB(A) L ₁₀	Calculated Construction Noise Level – Dunstan Grove	Calculated Construction Noise Level – Tubbs View
Site Demolition works	Jack hammer mounted on skid steer	118	122	Up to 75 dB(A) when items used externally	Up to 70 dB(A) when items used externally
	Hand held jack hammer	111			
	Concrete saw	119			
	Skid steer	110			
	Power hand tools	109			
Construction Works	Piling	115	120	Up to 73 dB(A) when items used externally	Up to 68 dB(A) when items used externally
	Welder	101			
	Saw cutter	109			
	Dump truck	109		Up to 48 dB(A) when items used within the building with a closed façade	Up to 43 dB(A) when items used within the building with a closed façade
	Concrete saw	119			
	Power hand tools	109			
	Cranes	110			

Notes: Calculated qualitative noise levels are based on the overall Aggregate Sound Power Level for the expected demolition and construction works to be undertaken in the site.

Based on the qualitative assessment of construction noise suitable management controls and community notifications are required to be conducted.

The required management of construction noise impacts are include in Section 4.7 above.

4.7 Construction Vibration Impacts

An assessment of the potential for vibration generated as part of the required construction activities on the project (including limited demolition, ground works and construction) has been undertaken.

As the proposed demolition includes limited areas within the existing building on the site are not attached to neighbouring structures and the proximity of neighbouring structures to the development site (which include residential receives). Ground works on the site include limited amounts of ground works including the play areas and do not include bulk excavation. Based on the proposed vibration levels to be generated from the proposed demolition excavation and construction on the site are expected to comply with all vibration criteria detailed in this report.

In the event that vibration rolling or compacting of ground conditions is required within 10m of neighbouring buildings than attended vibration measurements during the use of this equipment should be undertaken to ensure vibration does not result in unreasonable levels of vibration impact on the neighbouring building structures. Alternatively the use of an alternative appliance such as compaction rollers or the like.

Based on the location of the site and the proximity of the surround buildings vibration generated from proposed construction activities on the site are not expected to result in magnitudes approaching the project vibration criteria detailed in this report.

4.8 Noise and Vibration Monitoring

As part of the management of noise from the proposed excavation and construction activities to be undertaken on the site the following noise and vibration measurements are recommended to be undertaken:

1. Noise – Continuous noise monitoring is to be undertaken at the site during the proposed periods of demolition. Monitoring will be conducted at 2 locations including positions which are representative to the following residential receivers:
 - a. Dunstan Grove – to the north west of the site.
 - b. Tubbs View – to the north east of the site.
2. Vibration – Based on the proximity of the surrounding receivers to the works magnitudes of vibration resulting from construction activities required to be undertaken on the site are not expected to approach vibration limits detailed in this report, therefore vibration monitoring is not recommended.

Attended vibration measurements could be undertaken at a receiver location in the event complaints resulting from construction activities resulting from the perception of vibration are experienced by the occupants of buildings within the vicinity of the site.

5 Community Engagement

During the proposed construction of the project (including excavation and construction) the building contractor is required to engage in community interaction. The community interaction and notification is required to include the following:

1. Notification of the proposed works to be undertaken on the site and the periods when works will be conducted, including information regarding the programme of works such as excavation. This should include the expected period when activities such as hydraulic hammering, rock breaking, concrete or rock sawing is required to be undertaken.
2. Details of the relevant site representative where complaints can be registered.
3. Details of the methodology to respond to complaints raised from the surrounding receivers.
4. A register of complaints, to be kept on site including record of time and nature of the complaint as well as the outcomes and comments regarding investigations resulting from the complaint.
5. Letter drop box drops to the residence within proximity to the site is to be undertaken. Information included in the letter drop drops will include working hours, proposed program of works, contact for complaints and the like.

Engagement with the community has been undertaken (as required by Items 16 d) and e) of the consent) to include the mitigation of noise from the high noise works. This includes the strategies detailed in the *Community Communication Strategy* (dated September 2020) and includes Table 4 for the engagement of the community regarding construction noise generated from the site (including high noise works).

5.1 Community Consultation

Community consultation has been and will continue to be undertaken by Hindmarsh during the proposed construction phases of the project.

Community consultation will include within the following, which are included in Appendix C:

- 1) *The Community Communication Strategy, Lindfield Learning Village – Stage 2.*
- 2) *Community Consultation Report, Lindfield Learning Village Stage 2 – SSDA.*
- 3) *The Hindmarsh Environmental and Sustainability Checklist.*

Community engagement and consultation has been undertaken and details are included within the *Community Consultation Report, Lindfield Learning Village Stage 2 – SSDA* including Section 2 *Engagement Outcomes*.

A project update was sent to surrounding receivers on 26th October 2020 detailing the anticipated construction activities and noise generating works. The following management measures to for high noise works were proposed:

- If high noise generating works are planned, neighbours will be notified of this before work starts.
- If piling and similar activities are required, effective equipment will be chosen and respite periods for local residents will be put in place. Rock breaking hours will be strictly limited to approved hours of:
 - 9:00am to 12:00pm, Monday to Friday
 - 2:00pm to 5:00pm Monday to Friday; and
 - 9:00am to 12:00pm, Saturday.
- For high noise generating works, if complaints are received, work will be managed to reduce the impact to local residents by implementing shorter time periods, or alternating with quieter work methods were practical.

The surrounding receivers were given till 2nd November 2020 to provide feedback on the proposed high noise works management measures via email or telephone hotline. A copy of this letterbox drop is attached in the Appendix. The above letterbox drop aims at undertaking the community consultation requirements to develop strategies to management high noise works under Conditions.

The project update is included in Appendix

5.2 Contingency Plans

In the event noise or vibration complaints are received from surrounding receivers the following methodology to assess impacts from the construction activities will be undertaken:

1. Review processes being conducted on the site and identify the item of plant or activity generating the source of the noise.
2. Assess the works being conducted and implement possible and practical mitigations to the item identified in the point above including work practices (alternatives), location of works, time when works are being conducted. Mitigations will include possible and practical methods when possible.
3. Detail a response to activity including noise monitoring/measurements if required.

5.3 Complaints Handling Management System

A system for residence to be able to register complaints is to be undertaken during the construction period. The complaints system is to include the following:

1. Details of the relevant site contact where complaints can be registered including possible phone numbers and email contact points.
2. Details of the methodology to respond to complaints raised from the surrounding receivers.
3. The register of complaints, to be kept including record of time and nature of the complaint as well as the outcomes and comments regarding investigations resulting from the complaint.
4. A record of the outcomes and actions resulting from the complaints received is to be included as part of the register.

6 Conclusion

This report details the construction noise and vibration assessment of the proposed construction of the proposed Lindfield Learning Village Stage 2 project.

An assessment of noise and vibration impacts from the required processes to be undertaken during the construction period of the project (including limited demolition, ground works and construction) has been undertaken and suitable treatments, management controls, perioding measurements and community engagement has been detailed in this report.

Providing the recommendations in this report are included in the construction of the site, compliance with the relevant EPA's Interim Construction Noise Guideline and Item B16 of the propjets *Conditions of Consent* will be achieved.

For any additional information please do not hesitate to contact the person below.

Regards



Ben White
Director
White Noise Acoustics

7 Appendix A – Glossary of Terms

<i>Ambient Sound</i>	The totally encompassing sound in a given situation at a given time, usually composed of sound from all sources near and far.
<i>Audible Range</i>	The limits of frequency which are audible or heard as sound. The normal ear in young adults detects sound having frequencies in the region 20 Hz to 20 kHz, although it is possible for some people to detect frequencies outside these limits.
<i>Character, acoustic</i>	The total of the qualities making up the individuality of the noise. The pitch or shape of a sound's frequency content (spectrum) dictate a sound's character.
<i>Decibel [dB]</i>	The level of noise is measured objectively using a Sound Level Meter. The following are examples of the decibel readings of every day sounds; <ul style="list-style-type: none"> 0dB the faintest sound we can hear 30dB a quiet library or in a quiet location in the country 45dB typical office space. Ambience in the city at night 60dB Martin Place at lunch time 70dB the sound of a car passing on the street 80dB loud music played at home 90dB the sound of a truck passing on the street 100dB the sound of a rock band 115dB limit of sound permitted in industry 120dB deafening
<i>dB(A)</i>	<i>A-weighted decibels</i> The ear is not as effective in hearing low frequency sounds as it is hearing high frequency sounds. That is, low frequency sounds of the same dB level are not heard as loud as high frequency sounds. The sound level meter replicates the human response of the ear by using an electronic filter which is called the "A" filter. A sound level measured with this filter switched on is denoted as dB(A). Practically all noise is measured using the A filter. The sound pressure level in dB(A) gives a close indication of the subjective loudness of the noise.
<i>Frequency</i>	Frequency is synonymous to <i>pitch</i> . Sounds have a pitch which is peculiar to the nature of the sound generator. For example, the sound of a tiny bell has a high pitch and the sound of a bass drum has a low pitch. Frequency or pitch can be measured on a scale in units of Hertz or Hz.
<i>Loudness</i>	A rise of 10 dB in sound level corresponds approximately to a doubling of subjective loudness. That is, a sound of 85 dB is twice as loud as a sound of 75 dB which is twice as loud as a sound of 65 dB and so on
<i>L_{Max}</i>	The maximum sound pressure level measured over a given period.
<i>L_{Min}</i>	The minimum sound pressure level measured over a given period.
<i>L₁</i>	The sound pressure level that is exceeded for 1% of the time for which the given sound is measured.
<i>L₁₀</i>	The sound pressure level that is exceeded for 10% of the time for which the given sound is measured.
<i>L₉₀</i>	The level of noise exceeded for 90% of the time. The bottom 10% of the sample is the L ₉₀ noise level expressed in units of dB(A).
<i>L_{eq}</i>	The "equivalent noise level" is the summation of noise events and integrated over a selected period of time.
<i>Background Sound Low</i>	The average of the lowest levels of the sound levels measured in an affected area in the absence of noise from occupants and from unwanted, external ambient noise sources. Usually taken to mean the L _{A90} value
<i>C_{tr}</i>	A frequency adaptation term applied in accordance with the procedures described in ISO 717.
<i>dB (A)</i>	'A' Weighted overall sound pressure level

<i>Noise Reduction</i>	The difference in sound pressure level between any two areas. The term “noise reduction” does not specify any grade or performance quality unless accompanied by a specification of the units and conditions under which the units shall apply
<i>NR Noise Rating</i>	Single number evaluation of the background noise level. The NR level is normally around 5 to 6 dB below the “A” weighted noise level. The NR curve describes a spectrum of noise levels and is categorised by the level at 1000 Hz ie the NR 50 curve has a value of 50 dB at 1000 Hz. The NR rating is a tangential system where a noise spectrum is classified by the NR curve that just encompasses the entire noise spectrum consideration.
<i>R_w</i>	Weighted Sound Reduction Index - Laboratory test measurement procedure that provides a single number indication of the acoustic performance of a partition or single element. Calculation procedures for R _w are defined in ISO 140-2:1991 “Measurement of Sound Insulation in Buildings and of Building Elements Part 2: Determination, verification and application of precision data”.
<i>R'_w</i>	Field obtained Weighted Sound Reduction Index - this figure is generally up to 3-5 lower than the laboratory test determined level data due to flanked sound transmission and imperfect site construction.
<i>Sound Isolation</i>	A reference to the degree of acoustical separation between any two areas. Sound isolation may refer to sound transmission loss of a partition or to noise reduction from any unwanted noise source. The term “sound isolation” does not specify any grade or performance quality and requires the units to be specified for any contractual condition
<i>Sound Pressure Level, L_p dB</i>	A measurement obtained directly using a microphone and sound level meter. Sound pressure level varies with distance from a source and with changes to the measuring environment. Sound pressure level equals 20 times the logarithm to the base 10 of the ratio of the rms sound pressure to the reference sound pressure of 20 micro Pascals.
<i>Sound Power Level, L_w dB</i>	Sound power level is a measure of the sound energy emitted by a source, does not change with distance, and cannot be directly measured. Sound power level of a machine may vary depending on the actual operating load and is calculated from sound pressure level measurements with appropriate corrections for distance and/or environmental conditions. Sound power levels is equal to 10 times the logarithm to the base 10 of the ratio of the sound power of the source to the reference sound power of 1 picoWatt
<i>Speech Privacy</i>	A non-technical term but one of common usage. Speech privacy and speech intelligibility are opposites and a high level of speech privacy means a low level of speech intelligibility. It should be recognised that acceptable levels of speech privacy do not require that speech from an adjacent room is inaudible.
<i>Transmission Loss</i>	Equivalent to Sound Transmission Loss and to Sound Reduction Index in terminology used in countries other than Australia. A formal test rating of sound transmission properties of any construction, by usually a wall, floor, roof etc. The transmission loss of all materials varies with frequency and may be determined by either laboratory or field tests. Australian Standards apply to test methods for both situations.

8 Appendix B – CV of Ben White

Curriculum Vitae – Benjamin White

58 Carrington Road, Randwick
NSW 2031



Employment Experience:

Director - White Noise Acoustics: Present	March 2019 –
Director/Engineer - Acoustic Logic Consultancy: July 2018	March 2001 –

Experience:

Ben White the Director of White Noise has over 17 years of experience in acoustic.

Ben has significant experience in providing acoustic services and expert advice in the following areas:

- Residential acoustic reports including aircraft noise (AS2021) assessments, traffic noise, train noise and vibration assessments.
- Noise emission assessments for various projects including assessments with planning requirements using EPA, Department of Planning, Council DCP's and similar regulatory requirements.
- Planning approvals including Development Applications for multi dwelling residential developments, commercial developments, hotels and boarding houses, places of entertainment, carparks, mixed use developments, shopping centres and the like.
- Expert court witness including Land and Environment Court and other expert witness work.
- Project planning and specifications for types of projects including residential, commercial, retail, hotel accommodation, warehouses and industrial developments and mixed-use projects.
- Project delivery for all types of projects including, design advice and project delivery requirements at all stages of projects during design and construction.
- Certification works including on site testing for the provision of certification of all types of projects including items required to comply with Part F5 of the BCA as well as project specific acoustic requirements.
- Mechanical design and advice for the treatments of mechanical services with project requirements.
- External façade design and specification.
- Specialised acoustic design advice including areas of projects.
- Issues with existing building include site surveys and audits as well as advice regarding rectification if required.

9 Appendix C- Project Update



Lindfield Learning Village

Project update

October 2020

Investing in our schools

The NSW Government is investing \$6.7 billion over four years to deliver more than 190 new and upgraded schools to support communities across NSW. This is the largest investment in public education infrastructure in the history of NSW.

The NSW Department of Education is committed to delivering new and upgraded schools for communities across NSW. The delivery of these important projects is essential to the future learning needs of our students and supports growth in the local economy.

Project overview

School Infrastructure NSW is planning for the delivery of Stage 2 of Lindfield Learning Village. This stage will provide additional learning spaces, specialist technical learning spaces and a senior home base focusing on specialised expertise and wellbeing support to transition students between school and their first post-school destinations.

Key features of Stage 2 include:

- refurbishment of the existing buildings
- internal fit out works, delivered in phases
- new kiss and drop and bus access
- new covered outdoor learning area (COLA) and additional play space
- repurposing of the existing lecture theatres into new drama and music teaching theatres
- relocation of Aurora College (NSW Department of Education's Selective Virtual High School) to Lindfield Learning Village.

Project summary

The construction contract for Lindfield Learning Village Stage 2 has been awarded to Hindmarsh Construction Australia Pty Ltd.

The State Significant Development (SSD) application for Stage 2 is being assessed by the Department of Planning, Industry and Environment (DPIE).

You can find more information about the progress of the SSD application on the Department of Planning, Industry and the Environment's Major Projects portal at: <https://www.planningportal.nsw.gov.au/major-projects/project/4416>.

Restoration and remediation work has been carried out since September 2020. These works include internal renovations to existing buildings and upgrades to existing services.

Managing Construction impacts

As part of the formal planning process for Lindfield Learning Village Stage 2, we are developing plans that detail how construction impacts on nearby residents will be minimised. These impacts include noise, vibration and vehicle movements.

You can contribute to the development of these plans to effectively manage construction impacts. Your feedback is sought on how we propose to manage construction activities listed in the table below. Please provide your feedback by Monday 2 November 2020 via email at schoolinfrastructure@det.nsw.edu.au or phone 1300 482 651.

Activity	How we propose to minimise or manage the impact on nearby residents
General	<ul style="list-style-type: none"> ▪ We will provide advance notice of work to the local community, particularly when we anticipate high noise generating works. ▪ Noise levels on site will be managed in accordance with the noise control guidelines outlined in the EPA Environmental Noise Control Manual for construction and demolition works. ▪ Construction works, including the delivery of materials to and from the site, are proposed to take place between 7:00am and 6:00pm Mondays to Fridays and between 8:00am and 1:00pm on Saturdays. No work is currently proposed for Sundays or public holidays. We may also carry out work where noise levels that do not exceed the existing background noise level plus 5dB between 6:00am and 7:00pm Monday to Friday and between 1:00pm and 4:00pm Saturdays. ▪ We will provide advance notice if any work is approved to take place outside of the above hours. ▪ In line with the NSW Environmental Planning and Assessment (COVID-19 Development – Construction Work Days) Order 2020, during the COVID-19 pandemic, School Infrastructure NSW construction sites can operate on weekends and public holidays. This is to allow workers to abide by social distancing rules while on construction sites by distributing building work across the week. Under this Order, work on weekends is limited to the approved weekday construction hours for this project.
Construction	<ul style="list-style-type: none"> ▪ Procedures for achieving the noise management levels in EPA's Interim Construction Noise Guideline (DECC, 2009). ▪ Measures to manage high noise generating works such as piling and similar activities. ▪ Noise reducing work practices. <p>Proposed actions:</p> <ul style="list-style-type: none"> ▪ Work will occur within approved standard work hours. ▪ If high noise generating works are planned, neighbours will be notified of this before work starts. ▪ If piling and similar activities are required, effective equipment should be chosen, and respite periods for local residents should be put in place. These activities will be strictly limited to approved hours of: <ul style="list-style-type: none"> □ 9:00am to 12:00pm, Monday to Friday □ 2:00pm to 5:00pm, Monday to Friday □ 9:00am to 12:00pm, Saturday. ▪ High noise generating works will be managed to reduce the impact to local residents by implementing shorter time periods or alternating with quieter work methods where practical. ▪ No work will be carried out on Sundays or public holidays unless necessary to maintain social distancing guidelines or approved by the Department of Planning, Industry and Environment. ▪ Where necessary, site hoarding will be installed to mitigate noise impacts. ▪ Workers and contractors are regularly trained to use equipment in ways to minimise noise. ▪ Avoid the use of radios or stereos outdoors where neighbours can be affected. ▪ Avoid the overuse of public address systems. ▪ Avoid shouting and minimise talking loudly or slamming vehicle doors. ▪ Develop a one-page summary of the consent conditions for the site noticeboard for workers to quickly reference this information.

Activity	How we propose to minimise or manage the impact on nearby residents
Construction	<p>Measures to ensure road safety and network efficiency during construction.</p> <p>Proposed actions:</p> <ul style="list-style-type: none">▪ Trucks will be well maintained and will be required to observe speed limits.▪ Trucks will only use approved truck routes to and from the site.
Construction	<p>Mechanism for the community to discuss or provide feedback regarding construction impacts.</p> <p>Proposed actions:</p> <p>The community information phone line and email address will be available throughout the project and for a minimum of 12 months following completion of the project:</p> <ul style="list-style-type: none">▪ Phone: 1300 482 651▪ Email: schoolinfrastructure@det.nsw.edu.au

For more information or to offer feedback about this project contact School Infrastructure NSW.

Website: www.schoolinfrastructure.nsw.gov.au

Email: schoolinfrastructure@det.nsw.edu.au

Phone: 1300 482 651

For information about school activities and operations, contact the school directly.

Website: www.lindfieldlearningvillage.com

Email: lindfieldlearningvillage@det.nsw.edu.au

Phone: 02 9415 8006