Hansen Yuncken

TAFE Meadowbank
Multi-Trades and Digital Technology Hub
Main Works

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 proposed main works of the TAFE, Meadowbank project and develop a Construction Noise and Vibration Management Plan.

The assessment has been undertaken in conjunction with the requirements of the EPA's Interim Construction Noise Guideline and the projects *Conditions of Consent* including the following:

1. The *Noise and Vibration Impact Assessment for SSDA TAFE Meadowbank Multi-Trades and Digital Technology Hub (Revision G)'* prepared by JHA Services and dated 30 June 2020.
2. The projects *Development Consent* including item B17.

This report includes the recommended noise and vibration mitigations and management controls for the required works associated with the Main Works construction activities on the site to ensure impacts to surrounding receivers are minimised as result of the construction activities on the site.

2 Development Description

The proposed development includes the redevelopment of the TAFE Meadowbank site to include the proposed Multi-Trades and Digital Technology Hub and carpark. The required construction works include demolition of existing structures and construction of the project on the Meadowbank site.

The surrounding receivers to the site comprise a number of residential, commercial and school receivers including the following:

1. Commercial/industrial receivers to the north of the site on Rhodes Street.
2. An education receiver to the south of the site on See Street.
3. Residential receivers to the north of the site on Macpherson Street.
4. Residential receivers to the south of the site on See Street.

The site location, in relation to surrounding buildings, is shown in Figure 1 below.

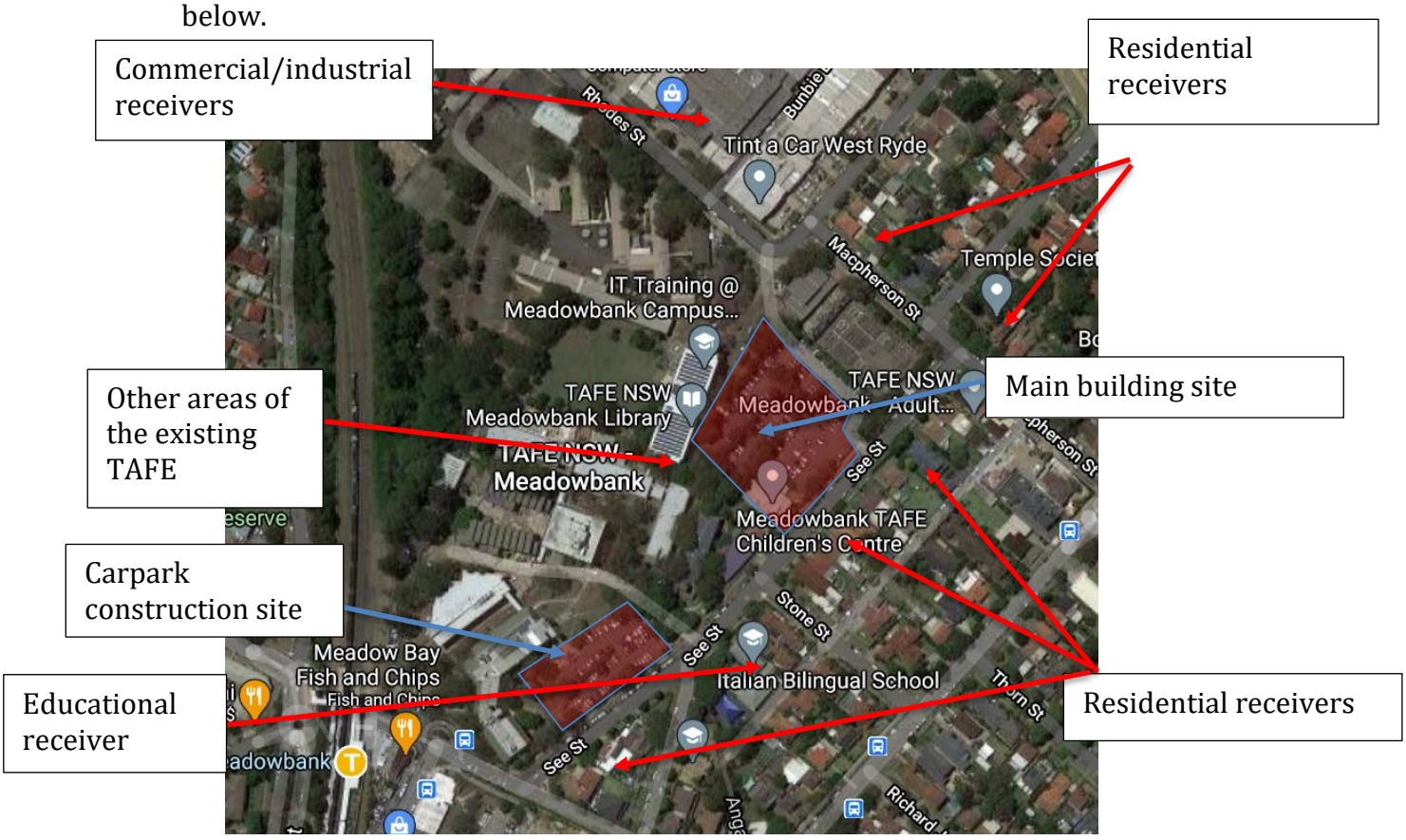


Figure 1 – Site Location and Surrounding Receivers

3 Project Requirements

The Construction Noise and Vibration Management plan for the project has been developed in compliance with the *Conditions of Consent* for the project the EPA's Interim Construction Noise Guideline and the following project documentation:

1. The *Noise and Vibration Impact Assessment for SSDA TAFE Meadowbank Multi-Trades and Digital Technology Hub (Revision G)'* prepared by JHA Services and dated 30 June 2020.
2. The *Development Consent* for the project including item B17 which includes the following:

B17. The Construction Noise and Vibration Management Sub-Plan (CNVMSP) 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) include the recommended noise management and mitigation measures included within the report titled *'Noise and Vibration Impact Assessment for SSDA TAFE Meadowbank Multi-Trades and Digital Technology Hub (Revision G)'* prepared by JHA Services and dated 30 June 2020;

(d) hours of construction in accordance with conditions C3 to C7;

(e) describe the measures to be implemented to manage high noise generating works such as piling, in close proximity to sensitive receivers;

(f) include strategies that have been developed with the community for managing high noise generating works;

(g) describe the community consultation undertaken to develop the strategies in condition B17(f);

(h) include a complaints management system that would be implemented for the duration of the construction; and

(i) 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 B14(d).

4 Existing Acoustic Environment

The site of the project comprises an area within the existing TAFE Meadowbank precinct.

Noise levels at the site are predominantly a result of surrounding roadways and existing land uses within proximity of the site.

The previously conducted *Noise and Vibration Impact Assessment for SSDA TAFE Meadowbank Multi-Trades and Digital Technology Hub (Revision G)'* prepared by JHA Services and dated 30 June 2020 includes background noise levels which have been recorded at the site and have been used as the basis of this report.

4.1 Existing Background Noise Levels at the site

Section 3.2 of the *Noise and Vibration Impact Assessment for SSDA TAFE Meadowbank Multi-Trades and Digital Technology Hub (Revision G)'* prepared by JHA Services and dated 30 June 2020 includes details of the noise survey undertaken at the site in August 2019.

A summary of the acoustic survey is detailed in the tables below.

Table 1 – Results of the Previously Conducted Noise Survey at the Site

Measurement Location	Time of Measurement	$L_{A90, 15min}$ dB(A)	Comments
Location 1 – Corner of See and Macpherson Streets	Day	41	Background noise levels associated with existing traffic movements on surrounding roadways
Location 2 – South of the site on See Street	Day	42	
Noise levels based on levels detailed within the *Noise and Vibration Impact Assessment for REF, TAFE Meadowbank* prepared by JHA and dated 20/3/2020.			

5 Construction Noise and Vibration Assessment

This section of the report details the assessment of noise associated with the proposed works to be undertaken as part of the Main Works. Activities associated with the proposed TAFE, Meadowbank project, including:

1. Construction of the building.
2. Internal fit out and fittings of the building.

The assessment has been undertaken to assess the potential noise and vibration impacts from the main works on surrounding receivers.

5.1 Construction Noise

The assessment of construction noise impacts generated from works on the site has been undertaken in accordance with the requirements of the Environmental Protection Authorities (EPA) Interim Construction Noise Guideline as required by the *Conditions of Consent*.

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.

Construction works on the site will be undertaken in accordance with the hours approved and included in the *Conditions of Consent* which include the following:

Construction Hours

C3. Construction, including the delivery of materials to and from the site, may only be carried out between the following hours:
- (a) between 7am and 6pm, Mondays to Fridays inclusive;
- (b) between 8am and 1pm, Saturdays; and
- (c) no work may be carried out on Sundays or public holidays.

C4. Notwithstanding condition C3, provided noise levels do not exceed the existing background noise level plus 5dB, works may also be undertaken during the following hours:
- (a) between 6pm and 7pm, Mondays to Fridays inclusive; and
- (b) between 1pm and 4pm, Saturdays.

C5. Construction activities may be undertaken outside of the hours in condition C3 if required:
- (a) by the Police or a public authority for the delivery of vehicles, plant or materials; or
- (b) in an emergency to avoid the loss of life, damage to property or to prevent environmental harm; or
- (c) where the works are inaudible at the nearest sensitive receivers.

C6. Notification of such construction activities as referenced in condition C4 must be given to affected residents before undertaking the activities or as soon as is practical afterwards.

C7. 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.

5.2 Proposed Appliances

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

Table 2 – Noise Level from Expected Demolition Appliances

Tasks	Equipment	Sound Power Levels per task dB(A) L_{10}	Aggregate Sound Power Level per Task dB(A) L_{10}
Construction Activities	Welding	101	120
	Saw cutter	109	
	Dump truck	109	
	Concrete saw	119	
	Power hand tools	109	
	Movement of forklifts and trucks	105	
	Concrete pumping	110	
	Concrete finishing (concrete helicopters)	95	
	Form working fixing (including hampering)	90	
	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.

5.3 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).

5.3.1 Interim Construction Noise Guideline

Noise criteria for construction and demolition 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 guidelines 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 3.30 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. • 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. • 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: 1. 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. 2. 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	• 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
Office, retail outlets	When in use	Highly noise affected 70 dBA	The external noise levels should be assessed at the most-affected occupied point of the premises
Classrooms at schools and other educational institutions	When in Use	45 dB(A) internally	The external noise levels should be assessed at the most-affected occupied point of the premises

Note 1 *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.*

Note 2 *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).*

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

Table 4 – Site Construction Noise Management Levels

Noise Source	Time Period	Receiver Type	Construction Noise Management Level	'High Noise Affected' Level
Construction Noise	Construction works to be undertaken in compliance with the project's approvals	Receivers to the south of the site	52 dB(A) $L_{Aeq\ (15min)}$	75 dB(A) $L_{Aeq\ (15min)}$
		Residence to the north	51 dB(A) $L_{Aeq\ (15min)}$	75 dB(A) $L_{Aeq\ (15min)}$
		Commercial receivers to the north	51 dB(A) $L_{Aeq\ (15min)}$	70 dB(A) $L_{Aeq\ (15min)}$
		School/Education receivers to the south	52 dB(A) $L_{Aeq\ (15min)}$	45 dB(A) $L_{Aeq\ (15min)}$ internally when in use

Note 1: Construction noise management levels based on the Interim Construction Noise Guideline

5.4 Construction Vibration Assessment

This section of the report details the assessment of construction vibration impacts on surrounding receivers.

The effects of ground borne vibration on buildings may be segregated into the following three categories:

- Human comfort – vibration in which the occupants or users of the building are inconvenienced or possibly disturbed. Refer to further discussion in Section 5. 4.1.
- Effects on building contents – where vibration can cause damage to fixtures, fittings and other non-building related objects. Refer to further discussion in Section 5..4.2.
- Effects on building structures – where vibration can compromise the integrity of the building or structure itself. Refer to further discussion in Section 5. 4.2.

5.4.1 Vibration Criteria – Human Comfort

Vibration effects relating specifically to the human comfort aspects of the project are taken from the guideline titled *"Assessing Vibration – A Technical Guideline"*. (AVTG) This type of impact can be further categorised and assessed using the appropriate criterion as follows:

- Continuous vibration – from uninterrupted sources (refer to Table 5).
- Impulsive vibration – up to three instances of sudden impact e.g. dropping heavy items, per monitoring period (refer to Table 6).
- Intermittent vibration – such as from drilling, compacting or activities that would result in continuous vibration if operated continuously (refer to Table 7).

Table 5 - Continuous vibration acceleration criteria (m/s2) 1 Hz-80 Hz

Location	Assessment period	Preferred Values		Maximum Values	
		z-axis	x- and y-axis	z-axis	x- and y-axis
Residences	Daytime	0.010	0.0071	0.020	0.014
	Night-time	0.007	0.005	0.014	0.010
Offices, schools, educational institutions and places of worship	Day or night-time	0.020	0.014	0.040	0.028
		0.04	0.029	0.080	0.058
Workshops	Day or night-time	0.04	0.029	0.080	0.058

Table 6 - Impulsive vibration acceleration criteria (m/s2) 1 Hz-80 Hz

Location	Assessment period	Preferred Values		Maximum Values	
		z-axis	x- and y-axis	z-axis	x- and y-axis
Residences	Daytime	0.30	0.21	0.60	0.42
	Night-time	0.10	0.071	0.20	0.14
Offices, schools, educational institutions and places of worship	Day or night-time	0.64	0.46	1.28	0.92
Workshops	Day or night-time	0.64	0.46	1.28	0.92

Table 7 Intermittent vibration impacts criteria (m/s1.75) 1 Hz-80 Hz

Location	Daytime		Night-time	
	Preferred Values	Maximum Values	Preferred Values	Maximum Values
Residences	0.20	0.40	0.13	0.26
Offices, schools, educational institutions and places of worship	0.40	0.80	0.40	0.80
Workshops	0.80	1.60	0.80	1.60

5.4.2 Vibration Criteria – Building Contents and Structure

The vibration effects on the building itself are assessed against international standards as follows:

- For transient vibration: British Standard BS 7385: Part 2-1993 "Evaluation and measurement for vibration in buildings Part 2: Guide to damage levels from ground borne vibration" (BSI 1993); and
- For continuous or repetitive vibration: German DIN 4150: Part 3 – 1999 "Effects of Vibration on Structure" (DIN 1999).

5.4.2.1 Standard BS 7385 Part 2 - 1993

For transient vibration, as discussed in standard BS 7385 Part 2-1993, the criteria are based on peak particle velocity (mm/s) which is to be measured at the base of the building. These are summarised in Table 8 and illustrated in the Figure below.

Table 8 - Transient vibration criteria as per standard BS 7385 Part 2 - 1993

Line in Figure below	Type of Building	Peak Component Particle Velocity in Frequency Range of Predominant Pulse	
		4 Hz to 15 Hz	15 Hz and Above
1	Reinforced or framed structures Industrial and heavy commercial buildings	50 mm/s at 4 Hz and above	
2	Unreinforced or light framed structures Residential or light commercial type buildings	15 mm/s at 4 Hz increasing to 20 mm/s at 15 Hz	20 mm/s at 15 Hz increasing to 50 mm/s at 40 Hz and above

Standard BS 7385 Part 2 – 1993 states that the values in Table 8 relate to transient vibration which does not cause resonant responses in buildings. Where the dynamic loading caused by continuous vibration events is such that it results in dynamic magnification due to resonance (especially at the lower frequencies where lower guide values apply), then the values in Table 8 may need to be reduced by up to 50% (refer to Line 3 in the Figure below).

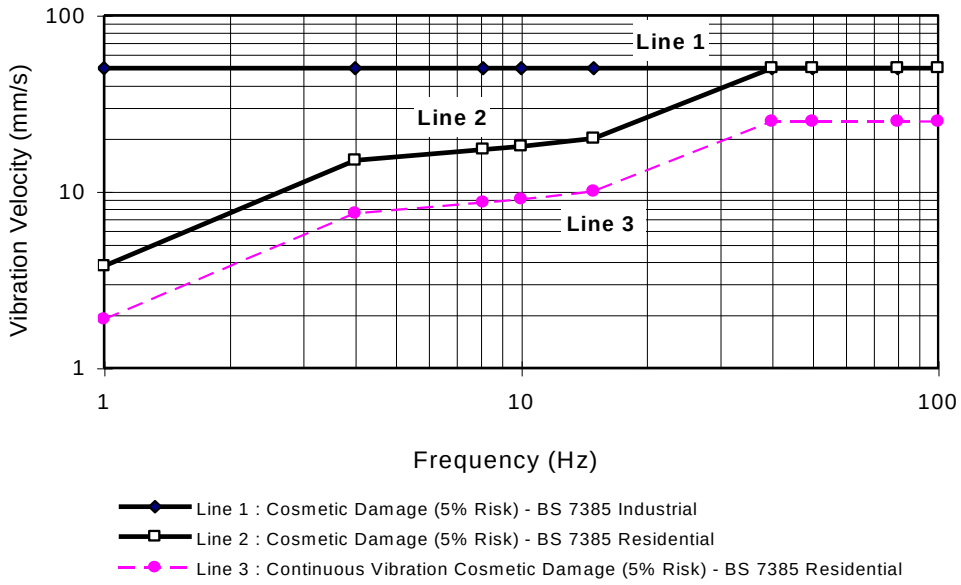


Figure 2 - BS 7385 Part 2 – 1993, graph of transient vibration values for cosmetic damage

In the lower frequency region where strains associated with a given vibration velocity magnitude are higher, the recommended values corresponding to Line 2 are reduced. Below a frequency of 4 Hz where a high displacement is associated with the relatively low peak component particle velocity value, a maximum displacement of 0.6 mm (zero to peak) is recommended. This displacement is equivalent to a vibration velocity of 3.7 mm/s at 1 Hz.

The standard also states that minor damage is possible at vibration magnitudes which are greater than twice those given in Table 8, and major damage to a building structure may occur at values greater than four times the tabulated values.

Fatigue considerations are also addressed in the standard and it is concluded that unless calculation indicates that the magnitude and number of load reversals is significant (in respect of the fatigue life of building materials) then the values in Table 8 should not be reduced for fatigue considerations.

5.4.2.2 Standard DIN 4150 Part 3 - 1999

For continuous or repetitive vibration, standard DIN 4150 Part 3-1999 provides criteria based on values for peak particle velocity (mm/s) measured at the foundation of the building; these are summarised in Table 9. The criteria are frequency dependent and specific to particular categories of structures.

Table 9 - Structural damage criteria as per standard DIN 4150 Part 3 - 1999

Type of Structure	Peak Component Particle Velocity, mm/s			
	Vibration at the foundation at a frequency of			Vibration of horizontal plane of highest floor at all frequencies
	1 Hz to 10 Hz	10 Hz to 50 Hz	50 Hz to 100 Hz[1]	
Buildings used for commercial purposes, industrial buildings and buildings of similar design	20	20 to 40	40 to 50	40
Dwellings and buildings of similar design and/or use	5	5 to 15	15 to 20	15
Structures that, because of their sensitivity to vibration, do not correspond to those listed in lines 1 and 2 and are of great intrinsic value (e.g. buildings that are under a preservation order)	3	3 to 8	8 to 10	8
Note 1: For frequencies above 100Hz, at least the values specified in this column shall be applied.				

5.5 Summary of Construction Vibration Criteria

Based on the details of the vibration criteria detailed in the sections above the recommended construction vibration impact criteria to protect the neighbouring receivers to the site includes the following:

1. Residential buildings – 10 mm/s.
2. Commercial buildings – 10 mm/s.
3. Educational receivers – 7 mm/s.

5.6 Construction Noise Management

Construction noise management has been undertaken such that noise from the construction activities on the site will be mitigated to surrounding receivers. The proposed construction noise mitigations have been development in conjunction with those included in the *Noise and Vibration Impact Assessment for SSDA TAFE Meadowbank Multi-Trades and Digital Technology Hub (Revision G)'* prepared by JHA Services and dated 30 June 2020.

A project update was sent to surrounding receivers on 30/10/2020 detailing the anticipated construction activities and noise generating works. The following management measures to for high noise works were proposed:

A copy of this letterbox drop is attached in Appendix B. This letterbox drop aims at undertaking the community consultation requirement to develop strategies to manage high noise works under Condition B17(f).

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

As there are neighbouring within close proximity to the site the use of high noise emitting equipment are to be managed as detailed in this section of the report. The following management controls are recommended to mitigate construction noise levels on the site:

1. All requirements of the *Conditions of Consent* are followed.
2. Plant and equipment should be located such that noise and vibration emissions are limited to surrounding receivers when possible, including:
    a. Use of alternative appliances during sensitive periods when possible.
3. Any equipment to be switched off when not in use.
4. Toolbox meetings should be undertaken with all contractors commencing works on the site detailing the requirements to limit noise impacts to neighbouring properties, including their responsibilities as detailed in this report.
5. All plant and equipment are to be maintained such that they are in good working order.
6. 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.
7. If required, a noise level measurement of any offending plant item generating complaints is to be conducted. If the magnitude of noise levels is found to be above suitable levels, noise mitigations must be undertaken to reduce noise levels to within the recommended Noise Management levels.
8. Where possible the ripping or saw cutting of material should be undertaken in lieu of hammering.

In the event noise levels are found to exceed permissible levels and additional noise reduction is necessary 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. Review of periods and locations 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. This would include periods when exams and the like are being conducted within the educational facilities.
5. Other site-specific treatments and controls which may become possible once works commence.

5.7 Construction Traffic

Construction traffic accessing the site, including the movements of heavy vehicles, are required to comply with the projects *Conditions of Consent.*

5.8 Construction Vibration Management

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

To ensure the vibration impact criteria detailed in this report are complied with, the following safe working mitigations and/or working distances should be implemented as detailed in the table below.

Table 10 – Vibration Mitigation

Construction Phase	Activity	Vibration Mitigation
Construction works	Materials and Equipment Movement	Minimize dropping of materials and equipment where possible. The location of storing of materials should be conducted at a location with a maximum distance to existing buildings where possible.

In addition to the above, Toolbox meetings should be undertaken with all contractors commencing works on the site detailing the requirements to limit vibration impacts to neighbouring properties. This should include their responsibilities as detailed in this report and the required responses to vibration events.

6 Noise and Vibration Monitoring

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

1. Noise –
    a. Attended noise level measurements of typical demolition and excavation activities should be undertaken at site.

       Attended construction noise surveys of the site and surrounding impacts on neighbours should be undertaken during the following as a minimum:
        i. Start of Demolition
        ii. Commencement of any rock breaking or sawing on the site.
        iii. In response to any ongoing complaints received from neighbours.

2. Vibration – Based on the construction activities required to be undertaken as part of the Main Works vibration is not expected to be generated with a magnitude which would exceed levels detailed in Section 5.4 above.

   It I noted that the major source of vibration which includes excavation will be completed as part of the Early Works Phase 2 works and are not included in the Main Works phase of the project.

7 Community Engagement and Notification

Community notification of the proposed construction period and periodic updates regarding scheduled works is required to be conducted.

The community notification is to be undertaken in accordance with the *Community Communication Strategy* dated October 2020, and included in Appendix C.

The community notification will be undertaken in accordance with the *Community Communication* Strategy, including Table 3, which may include the following:

- Provision of newsletters.
- Letter box drops to neighbours within close proximity will be undertaken during the construction phase of the project, the letter box drop will include:
    - Notification of expected programme for use of high noise emitting equipment.
    - Method of contact for the complaints.
    - Hours when equipment will be in use, working hours.
- Face to face meetings and briefings.
- A4, single or double sided, printed in colour that can include FAQs if required.
- Notifications are distributed under varying templates with different headings to suit different purposes:
    - Works notification are used to communicate specific information/ impacts about a project to a more targeted section of the community.
    - Project update is used when communicating milestones and higher level information to the wider community i.e. project announcement, concept design/DA lodgement, construction award, completion. Always includes the project summary, information booths/ sessions if scheduled, progress summary and contact info.

7.1 Proposed Program

The proposed program for the required works is detailed and provided by Hansen Yuncken for the proposed activities to be undertaken as part of the project.

The expected period of the commences in April 2021 with the projected completion in 2022.

7.2 Complaints

The management and handling of complaints during the construction phase of the project will be undertaken in accordance with the requirements of the *Community Communication Strategy* dated October 2020.

In the event of a complaint being made directly to Hansen Yuncken, it will be redirected to the following SINSW communication channels:

1. Phone: 1300 482 651
2. Email: schoolinfrastructure@det.nsw.edu.au

The management and action of complaints will be undertaken in accordance with the requirements of the *Community Communication Strategy,* including Section 8.5 (*Enquiries and Complaints Management)* and included in Appendix C.

In the event of complaints site assessment including noise and vibration measurements/monitoring will be undertaken as detailed in section 6 of this report.

A schedule of the complaints will include a record of the complaints made and include any actions undertaken as result, including investigations and changes to work practices, and as detailed in the *Community Communication Strategy.*

8 Conclusion

This report details the construction noise and vibration assessment of the proposed Main Works activities to be undertaken as part of the proposed TAFE Meadowbank project.

An assessment of noise and vibration impacts from the required processes to be undertaken during the Main Works for the activities has been undertaken and suitable treatments, management controls, periodic measurements and community engagement have been detailed in this report.

The assessment has been undertaken in conjunction with the requirements of the EPA's Interim Construction Noise Guideline, the projects *Conditions of Consent.*

This report includes the recommended noise and vibration mitigations and management controls for the operation of demolition, excavation and construction activities on the site to ensure impacts to surrounding receivers are minimised as required by the projects *Conditions of Consent*.

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

Regards

Ben White
Director
White Noise Acoustics

9 Appendix A – Glossary of Terms

Ambient Sound	The totally encompassing sound in a given situation at a given time, usually composed of sound from all sources near and far.
Audible Range	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.
Character, acoustic	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.
Decibel [dB]	The level of noise is measured objectively using a Sound Level Meter. The following are examples of the decibel readings of every day sounds; 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
dB(A)	*A-weighted decibels* 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.
Frequency	Frequency is synonymous to *pitch*. 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.
Loudness	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
L_{Max}	The maximum sound pressure level measured over a given period.
L_{Min}	The minimum sound pressure level measured over a given period.
L_1	The sound pressure level that is exceeded for 1% of the time for which the given sound is measured.
L_{10}	The sound pressure level that is exceeded for 10% of the time for which the given sound is measured.
L_{90}	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).
L_{eq}	The "equivalent noise level" is the summation of noise events and integrated over a selected period of time.
Background Sound Low	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
Ctr	A frequency adaptation term applied in accordance with the procedures described in ISO 717.
dB (A)	'A' Weighted overall sound pressure level

Noise Reduction	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
NR Noise Rating	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.
R_w	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 Rw 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”.
R'_w	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.
Sound Isolation	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
Sound Pressure Level, L_P dB	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.
Sound Power Level, L_W dB	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
Speech Privacy	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.
Transmission Loss	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.

10 Appendix B - Ben White CV

Curriculum Vitae – Benjamin White

58 Carrington Road, Randwick
NSW 2031

Employment Experience:

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

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.

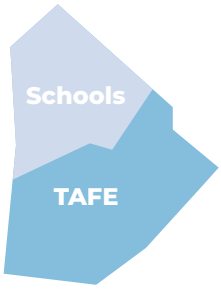
11 Appendix C – Community Communication Strategy

nsw.gov.au/meadowbankprecinct

Meadowbank Education and Employment Precinct

Project update

October 2020



Multi-Trades and Digital Technology Hub at TAFE NSW Meadowbank | PLANNING APPROVAL

Project overview

A project is underway to transform TAFE NSW Meadowbank into a technology-focussed campus which will include a new Multi-Trades and Digital Technology Hub, to provide a unique industry innovation and collaboration space. This will transform training delivery to be more digitally interactive and industry-focussed.

Progress summary

The tender for Early Contractor Involvement was awarded to Hansen Yuncken in May to complete design and construction work.

Site establishment works were completed in August with the installation of site fencing and hoarding, site office and work sheds and equipment deliveries.

Early works are now underway to prepare the site for construction.

Accelerated assessment

The State Significant Development (SSD) application for this project was fast tracked by the Department of Planning, Industry and Environment. The SSD was approved on 25 August 2020. This means main works construction can begin soon.

Keeping you updated

We will keep you updated and provide more information about the construction timetable in the coming weeks. You can contact us using the information below.

About the Precinct

The Meadowbank Education and Employment Precinct will reimagine the way we learn and connect.

With education at its heart, the wider Precinct will connect students to training and employment opportunities with local industry and the surrounding community. The Precinct will have improved accessibility with upgraded pedestrian and cycleway routes to help access the stations, schools and TAFE.

School Infrastructure NSW

schoolinfrastructure@det.nsw.edu.au

1300 482 651

schoolinfrastructure.nsw.gov.au

TAFE NSW

meadowbankprecinct@tafensw.edu.au

1800 752 142

Managing construction impacts

As part of the consent to carry out the work, the main contractor is required to develop plans that details how construction impacts on nearby local residents will be minimized. These impacts include noise, vibration and vehicle movements.

You can view the consent conditions, including those required for managing construction impacts via the Department of Planning, Industry and the Environment's Major Projects portal at planningportal.nsw.gov.au/major-projects/project/14386.

Your feedback

You can contribute to the development of strategies 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 Friday 6 November 2020 via email or phone.

Email: schoolinfrastructure@det.nsw.edu.au
Phone: 1300 482 65

Activity	Consent condition and proposed activities
General	Proposed actions: ▪ We will provide advance notice of work to the local community, particularly when we anticipate high noise generating works. ▪ Noise levels on site will not exceed the noise control guidelines that are 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 currently approved to take place between 7:00am and 6:00pm Mondays to Fridays and between 8:00am and 1:00pm on Saturdays. No night work is currently approved for this project and no work is currently approved on Sundays or public holidays.
Construction	Consent condition: ▪ All reasonable steps must be taken to minimise dust generated during all works. Proposed actions: ▪ Exposed surfaces and stockpiles will be managed with regular watering to minimise dust. ▪ Public roads will be kept clean. ▪ All trucks entering or leaving the site with loads will have their loads covered.
Construction	Consent condition: ▪ Measures are to be implemented to ensure road safety and network efficiency during construction. Proposed actions: ▪ 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	Consent condition: ▪ Achieve the noise management levels in EPA's Interim Construction Noise Guideline (DECC, 2009). ▪ Measures are to be implemented to manage high noise generating works, in close proximity to sensitive receivers.

Activity	Consent condition and proposed activities

	Proposed actions:
	▪ If high noise generating works are planned, neighbours will be notified of this before work starts.
	▪ If rock breaking, rock hammering, sheet piling, pile driving 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.

Construction	**Consent condition:**
	Provide a mechanism for the community to discuss or provide feedback regarding construction impacts
	
	Proposed actions:
	▪ 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:
	  ▪ Phone: 1300 482 651
	  ▪ Email: schoolinfrastructure@det.nsw.edu.au

Frequently asked questions

Why has the planning approval for this project been fast tracked?

This project was in the fifth wave of projects that had their assessments fast tracked.

The Department of Planning, Industry and Environment (DPIE) made a decision on the SSD applications for the fifth tranche of projects during late August 2020. This will mean the project can get underway sooner and the overall construction pipeline can continue to grow.

Does this mean the usual checks and community consultation will be waived to fast track the projects?

The assessment process is being accelerated, not changed. The usual planning rules and policies will apply, and all projects will be assessed under the Environmental Planning and Assessment Act 1979.

Will the community still get to have a say on projects that are being fast-tracked?

All of the projects being fast tracked have completed the substantive planning work and are post the exhibition and community consultation phase. We will continue to engage and inform the community during the project.

Due to the need to meet requirements under Public Health Orders, a range of digital engagement tools will be used to communicate with the community and stakeholders to seek any comment or feedback. This will include digital project updates, online sharing of information session material, the Precinct website, community information line and mailbox.

When will main works construction begin?

Main works construction will begin soon. We will notify local residents and businesses prior to work starting.

Will street parking be impacted during construction?

There will be minimal impacts to street parking as there will be parking available on site for workers. The impact of our project on the community is considered in our planning. We work with councils and the community to identify issues and put in place mitigation measures.

What steps will be taken to control noise and dust?

The contractor will implement dust and noise control measures. Dust and noise are minimised with hoarding, shade cloth and spraying water.

Will utility services be interrupted as part of construction?

SINSW co-ordinates upgrades or new supplies with local providers to minimise disruption. In the event that there will be any disruption to the local area, we will notify businesses and residents well in advance.

What will the construction hours be?

SINSW works with local council and stakeholders to minimise the impact of construction works on the local community. This means that we comply with the local council's standard working hours. Adherence to these guidelines is often a condition of development approval. Work hours are 7:00am to 6:00pm Monday to Friday and 8:00am to 1:00pm on Saturday.

How will traffic be managed?

Traffic management will be in place where required for the safety of the local community and workers. Traffic controllers will be used to manage entry and exit of vehicles to and from the construction site as necessary. Vehicles will give way to pedestrians at all times.

Who can I contact about the work?

You can contact School Infrastructure NSW during business hours on 1300 482 651 or email schoolinfrastructure@det.nsw.edu.au.

In an emergency, call triple zero (000).