

2 April 2019

Taylor Construction
Level 13, 157 Walker Street
North Sydney NSW 2060

Attention: Daniel Pribadi

Dear Daniel

LINDFIELD LEARNING VILLAGE - ACOUSTIC COMPLIANCE MEASUREMENTS

Marshall Day Acoustics (MDA) has been engaged by Taylor Construction to conduct acoustic compliance measurements for newly re-developed Lindfield Learning Village located at 100 Eton Road, Lindfield, NSW, 2070.

Our instructions were to carry out certification measurements to satisfy development conditions E7 and E8 only.

CRITERIA

We have been provided with the Development Consent Conditions by Taylor Construction, the relevant consent conditions E7 & E8 have been listed below.

Operational Noise Limits

- E7. Noise associated with the operation of any plant, machinery, School public address system, School bell or other equipment on the Subject Site and community use of the School hall outside of school hours, must not exceed 5 dB(A) above the background noise level when measured at the boundary of any sensitive receiver.
- E8. The Applicant must undertake short term noise monitoring in accordance with the *Noise Policy for Industry* where valid data is collected following the commencement of use of the development. The monitoring program must be carried out by an appropriately qualified person and a monitoring report must be submitted to the Planning Secretary within two months of commencement use of each stage of the development to verify that operational noise levels do not exceed the recommended noise levels for mechanical plant identified in condition B40. Should the noise monitoring program identify any exceedance of the recommended noise levels referred to above, the Applicant is required to implement appropriate noise attenuation measures so that operational noise levels do not exceed the recommended noise levels or provide attenuation measures at the affected noise sensitive receivers.

For the purpose of our assessment we have been advised by Taylor Construction via email on 20 March 2019 that all requirements of Condition B40 (as referred to in Condition E8) have been met prior to our compliance measurements. Copies of the certification certificates for condition B40 are provided in Appendix A.

MEASUREMENT PROCEDURE

On-site measurements were conducted on 12 March 2019 between 1600hrs and 1830hrs and 30 March 2019 between 0900-1100hrs, using the following sound level meters for attended and simultaneous measurements:

- Brüel and Kjær G4 Type 2250 Hand-held Analyzer, S/N: 3010249.
- 01dB Smart Monitor, S/N: DUO10496
- 01dB Smart Monitor, S/N: DUO10419

All units were calibrated before and after testing using a 01dB Stell acoustic calibrator and showed no significant signs of calibration drift.

Taylor Construction staff were on site to confirm mechanical plant was switched on/off and also to talk into the school PA/Bell during compliance testing.

Compliance measurements were conducted at the 3 most affected residential receiver locations R1, R2 & R3 as marked in Figure 1 below.

Figure 1: Compliance Measurement Locations



AMBIENT BACKGROUND NOISE MEASUREMENTS

For the purpose of our assessment and to satisfy the relevant consent conditions above, background noise levels were measured on the evening of our compliance measurements during a period with no operational noise sources on 12 March 2019 at locations R1, R2 and R3. These background measurements and noise criteria are provided in Table 1 below.

During this period there was no adverse weather conditions influencing the noise data, eg wind or rain.

Table 1: Background noise measurements and criteria

Measurement Location	dB L _{A90}	Criteria = dB L _{A90} + 5dbA
R1	44	49
R2	43	48
R3 ¹	46 ¹	51

Note ¹: Measured on 30 March 2019 after basketball game measurements.

OPERATIONAL NOISE MEASUREMENTS

Mechanical services

Two sets of measurements were carried out to assess the noise emissions from the mechanical plant:

- Plant switched off, with background noise levels as reported in Table 1
- Plant switched on, with noise levels and compliances reported in Table 2.

Note that the mechanical plant was switched off during the measurement of the Basketball Court, Auditorium and School PA Bell System.

Basketball Court

The basketball court measurements were conducted on 30 March 2019 with an average internal noise level of 68dB L_{Aeq15min} and 81dB L_{Amax}. Measurements were conducted during a basketball game which was organised out of school hours for the purpose of compliance measurements.

The basketball game consisted of 6 people playing a regular 3 vs 3 basketball game at a competitive level to give a representative noise level of a regular-noisy basketball game. During breaks between games all players were bouncing basketballs and practicing shooting so there were no gaps in the noise data over the measurement period.

A background noise measurement was conducted after the basketball game had finished to set the noise criteria for certification.

Auditorium

The Auditorium measurements were conducted by playing constant pink noise through the auditorium's PA system. A constant noise level of 94dbA was calibrated and measured at the auditorium mixing desk location. This level was derived from the predicted maximum auditorium internal noise levels in Acoustic Logic Report '*Lindfield Learning Village - Noise Impact Assessment*' –Dated 13 June 2018.

School PA Bell System

The school PA/Bell system was measured with the assistance of a staff member talking into the PA system at a 'normal' announcement level constantly throughout the measurement. The staff member was asked to talk constantly with minimal gaps or pauses between speech.

It should be noted that all compliance measurements for the basketball court, auditorium and School PA Bell System were conducted with all external mechanical plant switched off as advised by Taylor Construction.

RESULTS OF MEASUREMENTS

Table 2: Compliance Measurement Test Results

Element measurement	Measurement Location	Measured Noise Level	Criteria	Compliance
<i>Mechanical Plant</i>				
All External Mechanical Plant On	R1	43	49	✓
All External Mechanical Plant On	R2	47	48	✓
Basketball Court	R3 ¹	50	51	✓
Auditorium (94dbA Internal)	R1	45	49	✓
Auditorium (94dbA Internal)	R2	45	48	✓
School PA Test (constant talking)	R1	41	49	✓
School PA Test (constant talking)	R2	45	48	✓

Note¹: Basketball court noise emission measurements were conducted at the worst affected location (R3) along the site fence-line boundary directly below the louvres. Compliance at R3 during use of the basketball court will result in compliance at all other receiver locations.

As presented in Table 2, cumulative operational noise has not been measured as part of our compliance assessment at this stage.

CONCLUSION

Based on the test results summarised in Table 2 above we make the following comments:

Noise compliance testing to satisfy conditions E7 and E8 have been conducted.

All operational noise levels from the external mechanical plant, school bell/announcement system, basketball court and auditorium comply with the noise criteria set out in this report at the most sensitive residential receiver boundaries.

Yours faithfully

MARSHALL DAY ACOUSTICS PTY LTD



Nick Lynar

Consultant

APPENDIX A B40 CERTIFICATION CERTIFICATES



22/10/2018

DesignInc

Level 2, 77 Pacific Highway
North Sydney, NSW 2060

Attention: **Mr Timothy Garry**

Dear Sir,

CERTIFICATE OF DESIGN - MECHANICAL SERVICES

Project: UTS Ku-Ring-Gai Campus, Lindfield REF Scope of Works

Pursuant to the provisions of Clause A2.2 of the National Construction Code of Australia (NCC), we hereby certify that the above design is in accordance with the normal engineering practice and meets the requirements of the Building Code of Australia and relevant Australian Standards as applicable. In particular the following NCC Sections/clauses and Australian Standards:

NCC (2016): Section C - Part C3.15, Section E - Part E2.2, Section F - Parts 4.5 to 4.7, 4.9 & 4.12, and Section J - Part J5

Australian Standards: AS 1668 Part 1 & 2

Specifically, the following measures are factored into the design:

Measure and/or system	Standard of Performance
Air-handling systems	BCA2016 Clause E2.2(b) & (c)
Automatic shutdown of air-handling systems	BCA2016 NSW Table E2.2b & Clause 5 of Specification E2.2a
Smoke exhaust system to the Performing Arts Auditorium fire compartment	BCA2016 NSW Table E2.2b & Specification E2.2b (including Figure 2).
Mechanical ventilation	BCA2016 Clause F4.5, F4.9(b)(ii) & AS 1668.2-2012
Air-conditioning and ventilation systems	BCA2016 Part J5 (energy efficiency) AS 3666.1-2011
Kitchen exhaust	Clause F4.12 of BCA2016, and AS/NZS 1668.1 and AS1668.2.
Service penetrations for mechanical ventilation or air-conditioning systems through fire rated elements	BCA2016 Clause C3.15

We are appropriately qualified and as such we certify that the design complies with the above as detailed on the following documentation:

Drawings:					
Title	Rev	Title	Rev	Title	Rev
SYD18152-LI-M000	B	SYD18152-LI-M300	B	SYD18152-LI-M301	B
SYD18152-LI-M302	B	SYD18152-LI-M303	B	SYD18152-LI-M-A104	B
SYD18152-LI-M-A105	B	SYD18152-LI-M-A106	B	SYD18152-LI-M-A107	B
SYD18152-LI-M-B104	B	SYD18152-LI-M-B105	B	SYD18152-LI-M-B106	B
SYD18152-LI-M-B107	B	SYD18152-LI-M-C104	B	SYD18152-LI-M-C105	B
SYD18152-LI-M-C106	B	SYD18152-LI-M-C107	B	SYD18152-LI-M-D105	B
SYD18152-LI-M-D106	B	SYD18152-LI-M-D107	B	SYD18152-LI-M-E104	B
SYD18152-LI-M-E105	B	SYD18152-LI-M-F104	B	SYD18152-LI-M-F105	B
SYD18152-LI-M-F106	B	SYD18152-LI-M-F107	B	SYD18152-LI-M-G105	B
SYD18152-LI-M-G106	B	SYD18152-LI-M-J102	B		
Specifications					
Mechanical Specification		Rev A			

We also confirm compliance with the following council consent conditions:

B40 - Prior to commencement of construction, plant and equipment must be selected and designed to achieve the relevant intrusiveness criteria set out in Table 2 of the letter titled 'Lindfield Learning Village – Response to EPA Queries' prepared by Acoustic Logic, dated 13 August 2018. The Certifier must verify that all reasonable and feasible noise mitigation measures have been incorporated into the design to ensure the development will not exceed the recommended operational noise levels identified.

B41 - The school PA system and bells must be designed in accordance with the design criteria outlined in the letter titled 'Lindfield Learning Village – Response to EPA Queries' prepared by Acoustic Logic, dated 13 August 2018 and installed to facilitate adjustment in response to any complaints of offence noise that may be received during its operation.

Note; This condition relates to installation that can facilitate adjustment. Evacuation alarms, PA performances and Bells would need to achieve the performance of audibility to meet the Standards. Any adjustment or alteration would likely compromise required performance and must be consulted by erbas™ & the Principal Certifier prior to any amendments being made to any related systems on site.

B50 – All mechanical ventilation systems must be designed in accordance with Part F4.5 of the BCA and must comply with the AS 1668.2-2012 The use of air-conditioning in buildings – Mechanical ventilation in buildings and AS/NZS 3666.1:2011 Air handling and water systems of buildings–Microbial control to ensure adequate levels of health and amenity to the occupants of the building and to ensure environment protection. Details must be submitted to the satisfaction of the Certifier prior to the commencement of construction.



sydney
melbourne
manila

Company: Erbas and Associates Pty Ltd
Project Number: SYD18152
Full Name of the Certifier: Mark Albertella
Position: Associate Mechanical Engineer
Qualifications: BE (mech)

Signature: **Date: 03/10/2018**

A handwritten signature in black ink, appearing to be the initials "MA" or similar, written in a cursive style.



Quality
ISO 9001

SAI GLOBAL

24 October 2018

Rebecca Willott
Senior Project Director
Department of Education
259 George Street
Sydney NSW 2000

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SSDA Application Number: SSD16_8114
Lindfield Learning Village – Condition B40 Design of Mechanical Plant and Equipment - Noise Mitigation

Dear Rebecca,

SSD Condition:

Design of Mechanical Plant and Equipment

~~B41~~B40. Prior to commencement of construction, plant and equipment must be selected and designed to achieve the relevant intrusiveness criteria set out in Table 2 of the letter titled 'Lindfield Learning Village – Response to EPA Queries' prepared by Acoustic Logic, dated 13 August 2018. The Certifier must verify that all reasonable and feasible noise mitigation measures have been incorporated into the design to ensure the development will not exceed the recommended operational noise levels identified.

Document Reference:

Document	Dated
181022_Mechanical Design Certificate_3	22 nd October 2018

Savills Review:

Savills has reviewed the documents as submitted, and appended, in conjunction with the scope required as outlined in the SSD Conditions of Consent. In our opinion, the information provided adequately addresses the condition.

Erbus Engineering has provided a certificate confirming compliance with this condition under the REF scope and is again submitted herewith to satisfy the identical SSDA condition.

Please confirm the Department's concurrence with the above, after which, please forward on to DPE if required as noted below.

Please note we have issued this package to the certifier for their records and action as required.

Issue to:

Department of Education					
For Review:	YES	For Approval	YES	Other:	N/A
Planning Secretary					

For Information:	N/A	For Approval	N/A	Other:	N/A
Private Certifying Authority					
For Information:	YES	For Approval	YES	Other:	N/A

Yours sincerely,



Sasha Serrao
 Project Manager
 Savills Project Management

- CC: Andrew Kyraicou – Department of Education
 Jim Lewis - Department of Education
 Robert Walker – Savills Project Management
 Stewart Boyce – BCA Logic Pty Ltd
 Sarita Ellison - BCA Logic Pty Ltd