RODNEY STEVENS ACOUSTICS
Acoustic Consultants
Member Australian Acoustical Society

REPORT R170387R1

Revision 1

Traffic Noise Assessment
Proposed Educational Building
Smeaton Grange Road, Narellan

PREPARED FOR:
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Traffic Noise Assessment

Proposed Educational Building

Smeaton Grange Road, Narellan

PREPARED BY:

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DOCUMENT CONTROL

Reference	Status	Date	Prepared	Checked	Authorised
R170387R2	Revision 0	29 March 2018	Camilo Castillo	Tom Carney	Rodney Stevens
R170387R2	Revision 1	03 April 2018	Camilo Castillo	Tom Carney	Rodney Stevens

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1 INTRODUCTION

Rodney Stevens Acoustics Pty Ltd (here forth referred to as RSA) has been engaged by Alleanza Architecture to conduct a road noise impact assessment for development application (DA) lodgement of the proposed educational building (Block L) at Magdalene Catholic High School located at Smeaton Grange Road, Narellan.

This report addresses traffic noise impacts from Harley and Narellan Roads and Sedgwick Street into the amenity of the proposed building.

The establishment of noise criteria for mechanical plant is also presented in this report.

This assessment is to form part of the supporting documentation for the DA submission to Camden Council. Specific acoustic terminology is used in this report. An explanation of common acoustic terms is provided in Appendix A.

2 PROJECT DESCRIPTION

2.1 Site Location

The proposed development site is located at Smeaton Grange Road, Narellan. The site is bounded by industrial and commercial premises to the west, east and north and Narellan Road to the south. The site and its surroundings are shown in Figure 2-1.

Figure 2-1 Site Location

Aerial image courtesy of Near Map © 2018

2.2 Proposed Development

The proposal is to construct a new 2 storey dwelling to the south east of the existing Magdalene Catholic High School complex. The new building will contain a number of general learning areas (GLA)

The floor plans of the proposed development are presented in Appendix C.

3 BASELINE NOISE SURVEY

3.1 Unattended Noise Monitoring

In order to characterise the existing acoustical environment of the area RSA Acoustics carried out unattended noise monitoring between Thursday 22nd March and Wednesday 28th March 2018, the first noise logger was located on the eastern boundary of the site. This logging location is deemed to be representative of the traffic noise levels experienced at the site from Hartley Road and Sedgwick Street.

The second noise logger was located at the rear of the site. This logging location is deemed to be representative of the ambient noise levels experienced at the site.

Logger location was selected with consideration to other noise sources which may influence readings, security issues for noise monitoring equipment and gaining permission for access from residents and landowners.

Instrumentation for the survey comprised of 2 RION NL-42 environmental noise loggers (serial numbers 810779 and 546393) fitted with microphone windshields. Calibration of the logger was checked prior to and following measurements. Drift in calibration did not exceed ±0.5 dB(A). All equipment carried appropriate and current NATA (or manufacturer) calibration certificates. Measured data has been filtered to remove data measured during adverse weather conditions upon consultation with historical weather reports provided by the Bureau of Meteorology (BOM).

The logger determines L_{A1}, L_{A10}, L_{A90} and L_{Aeq} levels of the ambient noise. L_{A1}, L_{A10}, L_{A90} are the levels exceeded for 1%, 10% and 90% of the sample time respectively (see Glossary for definitions in Appendix A). Detailed results at the monitoring location are presented in graphical format in Appendix B. The graphs show measured values of L_{A1}, L_{A10}, L_{A90} and L_{Aeq} for each 15-minute monitoring period.

3.2 Ambient Noise Results

In order to establish the ambient noise criteria of the area, the data obtained from the noise logger has been processed in accordance with the procedures contained in the NSW Environmental Protection Authority's (EPA) *Noise Policy for Industry* (NPfI, 2017) to establish representative noise levels that can be expected in the residential vicinity of the site. The monitored baseline noise levels are detailed in Table 3-1.

Table 3-1 Measured Baseline Noise Levels Corresponding to Defined NPfI Periods

Location	Measurement Descriptor	Measured Noise Level – dB(A) re 20 µPa		
		Daytime 7 am - 6 pm	Evening 6 pm – 10 pm	Night-time 10 pm – 7 am
Logger at western boundary of site	L_{Aeq}	56	57	51
	RBL (Background)	43	47	41

Notes: All values expressed as dB(A) and rounded to nearest 1 dB(A);

L_{Aeq} Equivalent continuous (energy average) A-weighted sound pressure level. It is defined as the steady sound level that contains the same amount of acoustic energy as the corresponding time-varying sound.

L_{A90} Noise level present for 90% of time (background level). The average minimum background sound level (in the absence of the source under consideration).

4 NOISE GUIDELINES AND CRITERIA

4.1 Road Noise Criteria

The determination of an acceptable level of traffic noise impacting the internal educational spaces requires consideration of the activities carried out within the space and the degree to which noise will interfere with those activities.

4.2 Camden Council Requirements

Camden Council in their Environmental Noise Policy (ENP) 2008, Section 5.3, Table 5.3.2 has the following requirements for internal noise.

Table 4-1 Road Traffic Noise Criteria For Sensitive Landuse

Sensitive Land Use	Road Traffic Noise Criteria For Sensitive Land use
Proposed school classrooms (For existing schools see Technical Note x)	LAeq (1 hour) 40(internal)

Note: "X" increases where existing schools are affected by noise from proposed roads, the daytime criteria is LAeq (1hr) 45 dB(A) (internal)

4.3 Operational Noise Project Trigger Noise Levels

Responsibility for the control of noise emissions in New South Wales is vested in Local Government and the EPA. The EPA oversees the Noise Policy for Industry (NPfI) October 2017 which provides a framework and process for deriving project trigger noise level. The NPfI project noise levels for industrial noise sources have two (2) components:

- Controlling the intrusive noise impacts for residents and other sensitive receivers in the short term; and
- Maintaining noise level amenity for particular land uses for residents and sensitive receivers in other land uses.

4.3.1 Intrusiveness Noise Levels

For assessing intrusiveness, the background noise generally needs to be measured. The intrusiveness noise level essentially means that the equivalent continuous noise level (LAeq) of the source should not be more than 5 dB(A) above the measured Rated Background Level (RBL), over any 15 minute period.

4.3.2 Amenity Noise Levels

The amenity noise level is based on land use and associated activities (and their sensitivity to noise emission). The cumulative effect of noise from industrial sources needs to be considered in assessing the impact. The noise levels relate only to other industrial-type noise sources and do not include road, rail or community noise. The existing noise level from industry is measured.

If it approaches the project trigger noise level value, then noise levels from new industrial-type noise sources, (including air-conditioning mechanical plant) need to be designed so that the cumulative effect does not produce total noise levels that would significantly exceed the project trigger noise level.

4.3.3 Area Classification

The NPfI characterises the “Urban” noise environment as an area with an acoustical environment that:

- is dominated by ‘urban hum’ or industrial source noise,
- where urban hum means the aggregate sound of many unidentifiable, mostly traffic and/or industrial related sound sources
- has through-traffic with characteristically heavy and continuous traffic flows during peak periods
- is near commercial districts or industrial districts
- has any combination of the above.

The area surrounding the proposed development falls under the “Urban” area classification.

4.3.4 Project Specific Trigger Noise Levels

Having defined the area type, the processed results of the unattended noise monitoring have been used to determine project specific project trigger noise level. The intrusive and amenity project trigger noise level for nearby residential premises are presented in Table 4-2. These project trigger noise levels are nominated for the purpose of assessing potential noise impacts from the proposed development.

Table 4-2 Operational Project Trigger Noise Levels

Receiver	Time of Day	ANL [1] $L_{Aeq(15min)}$	Measured		Project Trigger Noise Levels	
			RBL [2] $L_{A90(15min)}$	Existing $L_{Aeq(Period)}$	Intrusive $L_{Aeq(15min)}$	Amenity $L_{Aeq(15min)}$
Residential	Day	60	43	56	**48**	58
	Evening	50	47	57	52	**48**
	Night	45	41	51	46	**43**

Note 1: ANL = “Amenity Noise Level” for residences in Urban Areas.

Note 2: RBL = “Rating Background Level”.

5 NOISE IMPACT ASSESMENT

5.1 Road Traffic Noise

5.1.1 Road Traffic Noise Intrusion Assessment

In order to ascertain the existing noise levels from traffic noise, the measured noise logger data was processed in accordance to the NSW Road Noise Policy assessment time periods. Table 5-1 details the traffic noise levels.

Table 5-1 Measured Traffic Noise Levels

Logger Location	Noise Level – dB(A) re 20 µPa
	$L_{Aeq\ (1hour)}$ 07:00 – 22:00
Eastern Boundary	56

Traffic noise levels recorded by the noise logger have been corrected to account for the distance from the road to the proposed façades.

5.2 Mechanical Plant Noise Assessment

A specific mechanical plant selection has not been supplied at this stage. It is anticipated that the building will be serviced by typical mechanical ventilation/air conditioning equipment.

It is likely that the criteria set out in Table 4-2 will be met through the use of conventional noise control methods (e.g. selection of equipment on the basis of quiet operation and, where necessary, providing enclosures, localised barriers, silencers and lined ductwork).

An appropriately qualified acoustic consultant should review the mechanical plant associated with the development at the detailed design stage when final plant selections have been finalised.

6 RECOMMENDED NOISE CONTROL TREATMENT

The calculation procedure establishes the required noise insulation performance of each surface component such that the internal noise level is achieved whilst an equal contribution of traffic noise energy is distributed across each component. Building envelope components with a greater surface area must therefore offer increased noise insulation performance.

The recommended acoustic treatment is based on the following floor finishes:

- Classrooms: Carpet and underlay
- Hallways Hard Flooring

The acoustic requirements shown in this report will increase further where the classroom floor finishes are tiled or timber.

The noise criteria presented in Section 4.2 and in Table 4-1 apply to a 'windows closed condition'. Standard window glazing of a building will typically attenuate noise ingress by 20 dB(A) with windows closed and 10 dB(A) with windows open (allowing for natural ventilation). Accordingly, the external noise threshold above which a classrooms will require mechanical ventilation is an $L_{Aeq(1hour)}$ of 50 dB(A).

Where windows must be kept closed, the adopted ventilation systems must meet the requirements of the Building Code of Australia and Australian Standard 1668 – The use of ventilation and air conditioning in buildings.

All recommendations must be checked by others to ensure compliance with other non-acoustic requirements that Council or other authority may impose (e.g. Thermal requirements for BASIX compliance).

6.1 Glazing

The R_w rating required for each window will vary from room to room. Recommendations for windows also apply to any other item of glazing located on the external facade of the building in a habitable room unless otherwise stated.

Note that the R_w rating is required for the complete glazing and frame assembly. The minimum glazing thicknesses will not necessarily meet the required R_w rating without an appropriate frame system.

The window systems must be tested in accordance with both of the following:

- Australian Window Association Industry Code of Practice Window and Door – Method of Acoustic Testing; and
- AS 1191 Acoustics – Method for laboratory measurement of airborne sound insulation of building elements.

It is necessary to submit such Laboratory certification for the proposed glazing systems (i.e. windows and framing systems) (e.g. NAL or CSIRO) for approval by RSA Acoustics prior to ordering or commitment.

The entire frame associated with the glazing must be sealed into the structural opening using acoustic mastics and backer rods. Normal weather proofing details do not necessarily provide the full acoustic insulation potential of the window system. The manufacturers' installation instructions for the correct acoustic sealing of the frame must be followed.

It is possible that structural demands for wind loading or fire rating or the like may require more substantial glass and framing assemblies than nominated above. Where this is the case the acoustic requirements must clearly be superseded by the structural or fire rating demands.

6.1.1 Rw Requirements for Glazing

The glazing will be required to achieve a minimum rating of R_w 30 throughout the site, this can be achieved by using quality aluminium frames with quality seals and 6.38mm glass panes. Other thinner glazing systems may be available but their Rw rating must be reviewed in accordance with Section 6. No further acoustic requirements are needed.

6.2 Roof/Ceiling

The following roof/ceiling construction recommendations are given as guidance only. The client is responsible for selecting adequate systems in order to achieve the recommended acoustic ratings.

The roof/ceiling structure must have a minimum Rw + Ctr 40 rating. This can be met by the following minimum construction:

- A low slope sheet metal roof
- Bradford Anticon 60 MD over purling
- 150mm timber or steel purlins;
- Rondo furring channel at 600 mm maximum centers
- 185 Gold Batts R 3.5; and
- 2 x 13mm Gyprock Fyrchek Plasterboard (minimum density 10.5 kg/m^2 per sheet).

If ventilators, heat extraction units or other openings into the ceiling cavity for lighting, ventilation, decoration or other purposes are to be provided, then care should be taken to ensure that such units are properly attenuated and all penetrations are properly sealed off so as not to degrade the rating of the roof/ceiling construction system. Care should also be taken to avoid any noise paths into the ceiling cavity via the eaves

6.3 External Walls

It is understood that all external walls for the proposed addition will be brick veneer with studwork internally and the top floor will be studwork with express jointed fibre cement cladding to the exterior face.

The masonry external walls will be required to achieve a rating of R_w + Ctr 50. This Rw rating is generally achieved with a standard construction with insulation. No further acoustic requirements are needed.

6.4 Detailing

Note that well-detailed construction and careful installation is needed to achieve the required R_w acoustic ratings. All gaps are to be minimised and fully sealed with an acoustic rated sealant, such as FireBan One by Bostik or Sikaflex Pro 2HP by Sika.

6.5 Mechanical Ventilation

Where mechanical ventilation is desired, it must be approved by Council and in accordance with the relevant regulations such as the National Construction Code (NCC Vol.1, Part 4.5 *Ventilation of rooms*) and AS1668.2-2002 *The use of ventilation and air conditioning*.

Conceptually a mechanical ventilation system would consist of a small inline fan which draws air through a duct from an opening in the eaves of the residence. To maintain the acoustic performance of the building envelope the first 3 m of duct should consist of 0.6 mm thick steel ductwork which is internally lined with 50 mm acoustic insulation. The duct should have no dimension greater than 300 mm and the inlet should be acoustically sealed into the eaves.

Care would need to be taken when installing air conditioning systems to ensure that the acoustic performance of the building envelope is not compromised. For split systems with no outside air supply the only requirement would involve sealing of refrigerant pipe work penetrations where they pass through the external wall or roof/ceiling. For air conditioning systems which provide outside air, a similar treatment to that required for mechanical ventilation described above would need to be provided to the inlet air duct.

7 CONCLUSION

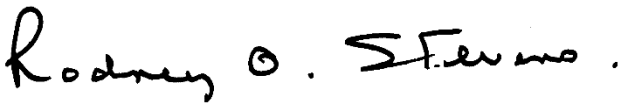
RSA has conducted a noise impact assessment of the proposed educational building (Block L) at Magdalene Catholic High School located at Smeaton Grange Road, Narellan. The assessment has comprised the establishment of noise criteria and assess noise impacts with regard to relevant statutory requirements.

A noise survey has been conducted and the processed data has been used to determine traffic noise from Harley and Narellan Roads and Sedgwick Street at the project site.

Based on the noise impact study conducted, the proposed development is assessed to comply with the Camden Council's noise criteria with recommendations from this report. It is therefore recommended that planning approval be granted for the proposed development on the basis of acoustics.

Noise emission criteria for mechanical plant has been established in accordance with the EPA's Noise Policy for Industry for intrusiveness and Amenity. A further noise survey should be carried out once a mechanical plant schedule has been finalised

Approved:-



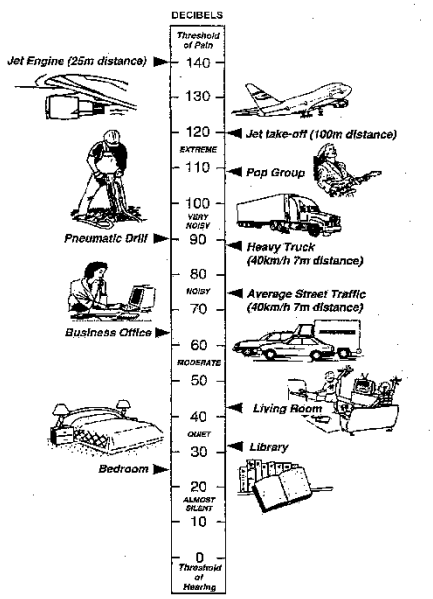
Rodney Stevens

Manager/Principal

Appendix A – Acoustic Terminology

A-weighted sound pressure	The human ear is not equally sensitive to sound at different frequencies. People are more sensitive to sound in the range of 1 to 4 kHz (1000 – 4000 vibrations per second) and less sensitive to lower and higher frequency sound. During noise measurement an electronic '*A-weighting*' frequency filter is applied to the measured sound level *dB(A)* to account for these sensitivities. Other frequency weightings (B, C and D) are less commonly used. Sound measured without a filter is denoted as linear weighted dB(linear).
Ambient noise	The total noise in a given situation, inclusive of all noise source contributions in the near and far field.
Community annoyance	Includes noise annoyance due to: character of the noise (e.g. sound pressure level, tonality, impulsiveness, low-frequency content) character of the environment (e.g. very quiet suburban, suburban, urban, near industry) miscellaneous circumstances (e.g. noise avoidance possibilities, cognitive noise, unpleasant associations) human activity being interrupted (e.g. sleep, communicating, reading, working, listening to radio/TV, recreation).
Compliance	The process of checking that source noise levels meet with the noise limits in a statutory context.
Cumulative noise level	The total level of noise from all sources.
Extraneous noise	Noise resulting from activities that are not typical to the area. Atypical activities may include construction, and traffic generated by holiday periods and by special events such as concerts or sporting events. Normal daily traffic is not considered to be extraneous.
Feasible and reasonable measures	Feasibility relates to engineering considerations and what is practical to build; reasonableness relates to the application of judgement in arriving at a decision, taking into account the following factors: Noise mitigation benefits (amount of noise reduction provided, number of people protected). Cost of mitigation (cost of mitigation versus benefit provided). Community views (aesthetic impacts and community wishes). Noise levels for affected land uses (existing and future levels, and changes in noise levels).

Impulsiveness	Impulsive noise is noise with a high peak of short duration or a sequence of these peaks. Impulsive noise is also considered annoying.
Low frequency	Noise containing major components in the low-frequency range (20 to 250 Hz) of the frequency spectrum.
Noise criteria	The general set of non-mandatory noise levels for protecting against intrusive noise (for example, background noise plus 5 dB) and loss of amenity (e.g. noise levels for various land use).
Noise level (goal)	A noise level that should be adopted for planning purposes as the highest acceptable noise level for the specific area, land use and time of day.
Noise limits	Enforceable noise levels that appear in conditions on consents and licences. The noise limits are based on achievable noise levels, which the proponent has predicted can be met during the environmental assessment. Exceedance of the noise limits can result in the requirement for either the development of noise management plans or legal action.
Performance-based goals	Goals specified in terms of the outcomes/performance to be achieved, but not in terms of the means of achieving them.
Rating Background Level (RBL)	The rating background level is the overall single figure background level representing each day, evening and night time period. The rating background level is the 10th percentile min L_{A90} noise level measured over all day, evening and night time monitoring periods.
Receptor	The noise-sensitive land use at which noise from a development can be heard.
Sleep disturbance	Awakenings and disturbance of sleep stages.
Sound and decibels (dB)	Sound (or noise) is caused by minute changes in atmospheric pressure that are detected by the human ear. The ratio between the quietest noise audible and that which should cause permanent hearing damage is a million times the change in sound pressure. To simplify this range the sound pressures are logarithmically converted to decibels from a reference level of 2 x 10-5 Pa. The picture below indicates typical noise levels from common noise sources.



dB is the abbreviation for decibel – a unit of sound measurement. It is equivalent to 10 times the logarithm (to base 10) of the ratio of a given sound pressure to a reference pressure.

Sound power Level (SWL)

The sound power level of a noise source is the sound energy emitted by the source. Notated as SWL, sound power levels are typically presented in *dB(A)*.

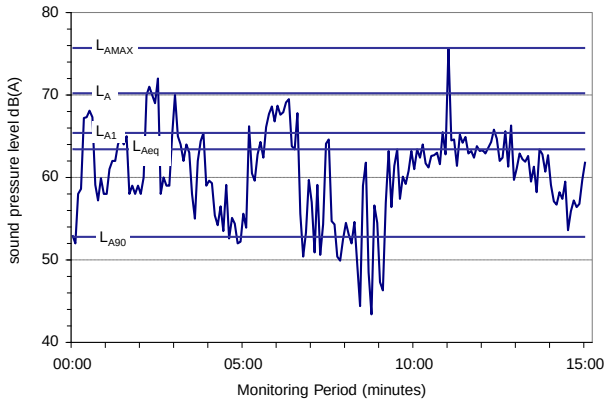
Sound Pressure Level (SPL)

The level of noise, usually expressed as SPL in *dB(A)*, as measured by a standard sound level meter with a pressure microphone. The sound pressure level in *dB(A)* gives a close indication of the subjective loudness of the noise.

Statistic noise levels

Noise levels varying over time (e.g. community noise, traffic noise, construction noise) are described in terms of the statistical exceedance level.

A hypothetical example of A weighted noise levels over a 15 minute measurement period is indicated in the following figure:



Key descriptors:

L_{Amax} Maximum recorded noise level.

L_{A1} The noise level exceeded for 1% of the 15 minute interval.

L_{A10} Noise level present for 10% of the 15 minute interval. Commonly referred to the average maximum noise level.

L_{Aeq} Equivalent continuous (energy average) A-weighted sound pressure level. It is defined as the steady sound level that contains the same amount of acoustic energy as the corresponding time-varying sound.

L_{A90} Noise level exceeded for 90% of time (background level). The average minimum background sound level (in the absence of the source under consideration).

Threshold

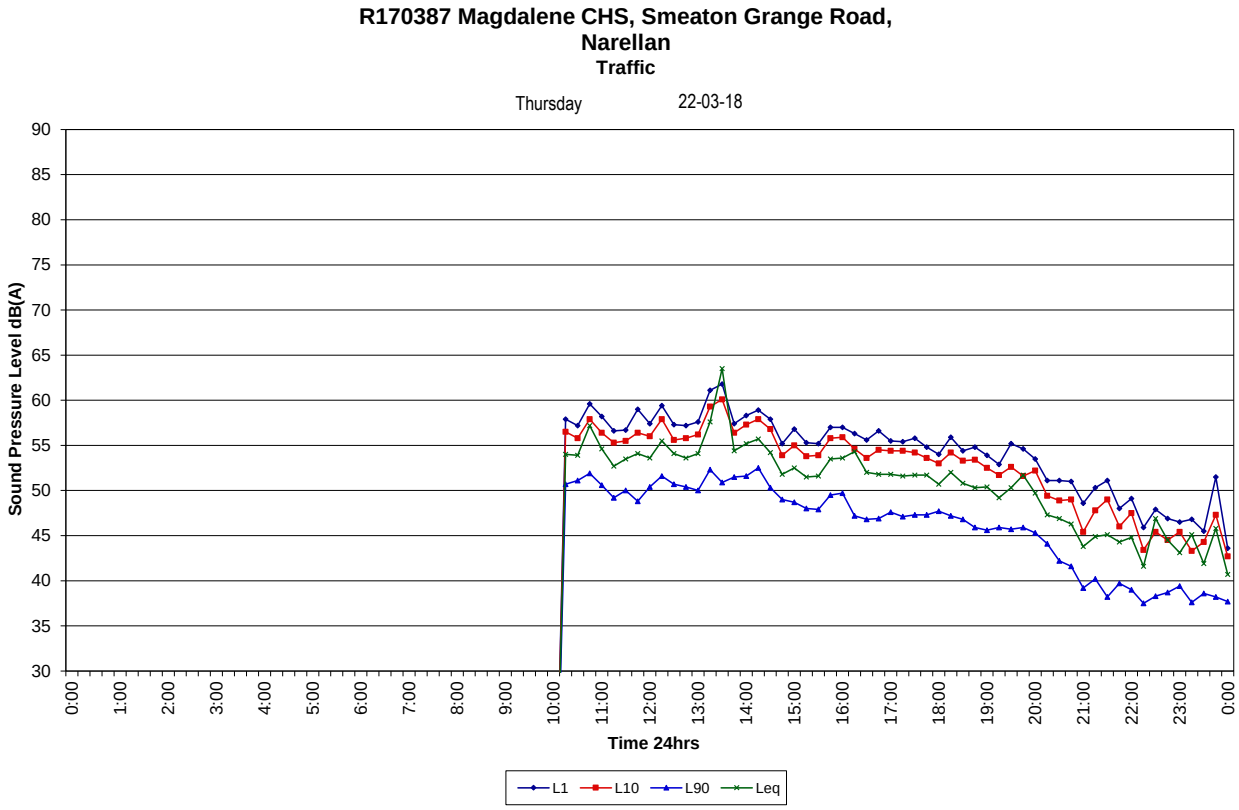
The lowest sound pressure level that produces a detectable response (in an instrument/person).

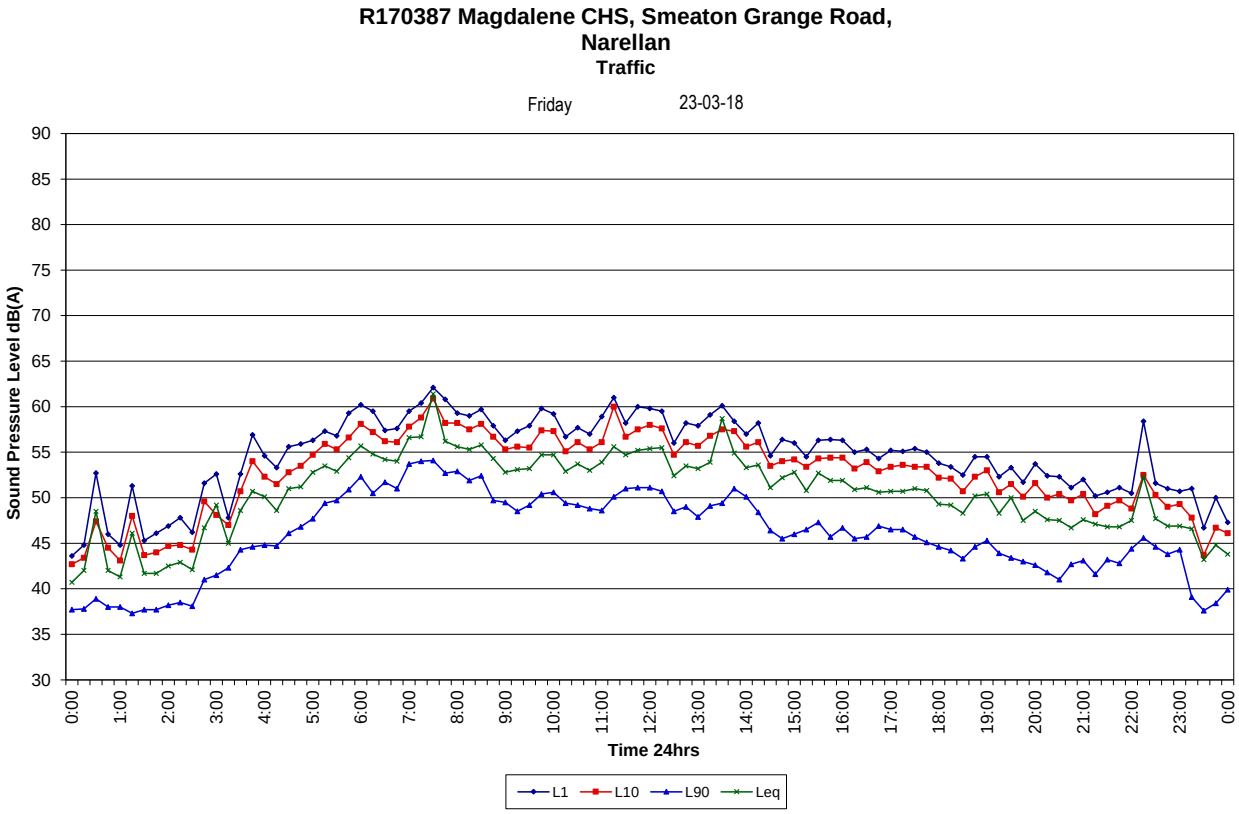
Tonality

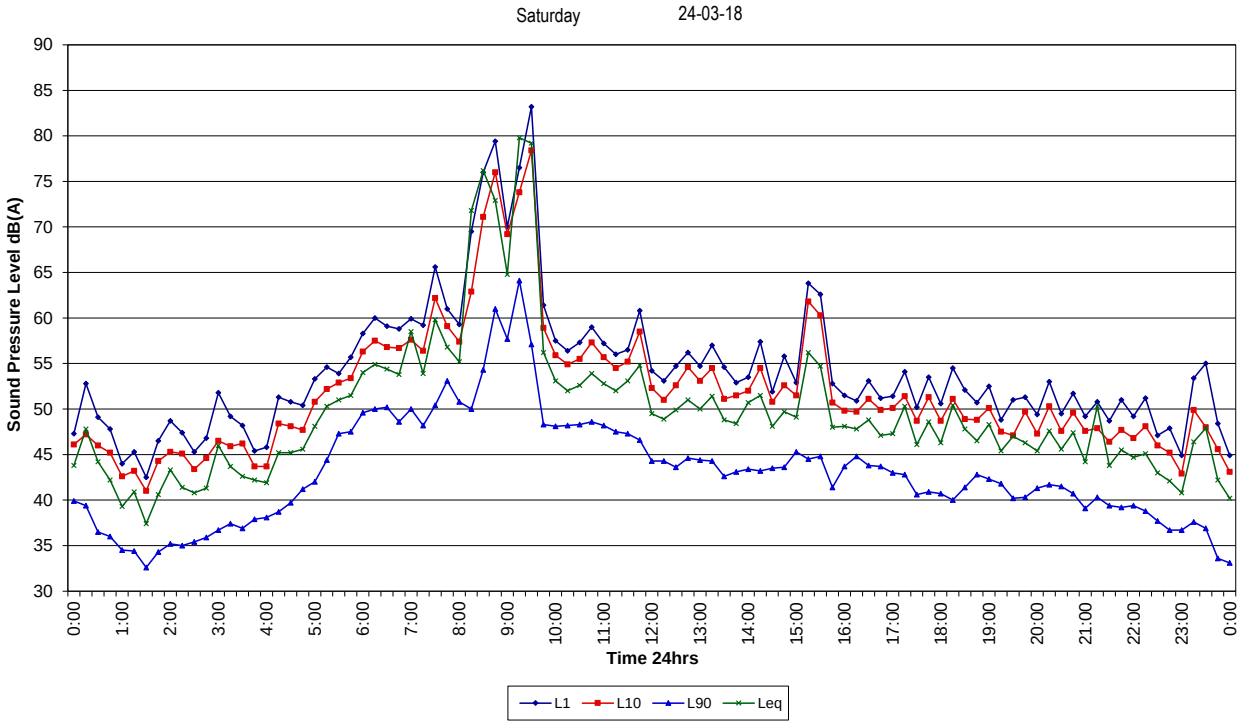
Tonal noise contains one or more prominent tones (and characterised by a distinct frequency components) and is considered more annoying. A 2 to 5 dB(A) penalty is typically applied to noise sources with tonal characteristics

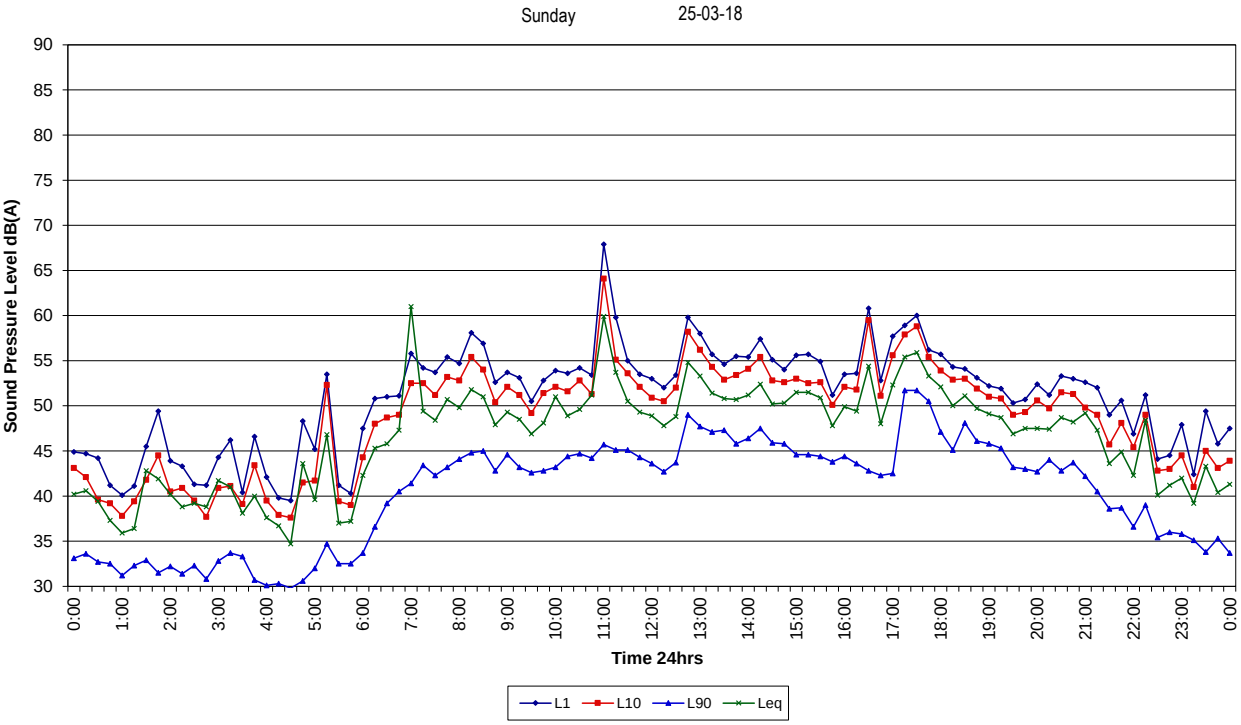
Appendix B – Baseline Noise Survey Graphs

Traffic Logger






R170387 Magdalene CHS, Smeaton Grange Road, Narellan
Traffic
Saturday 24-03-18
Sound Pressure Level dB(A)
Time 24hrs
L1 L10 L90 Leq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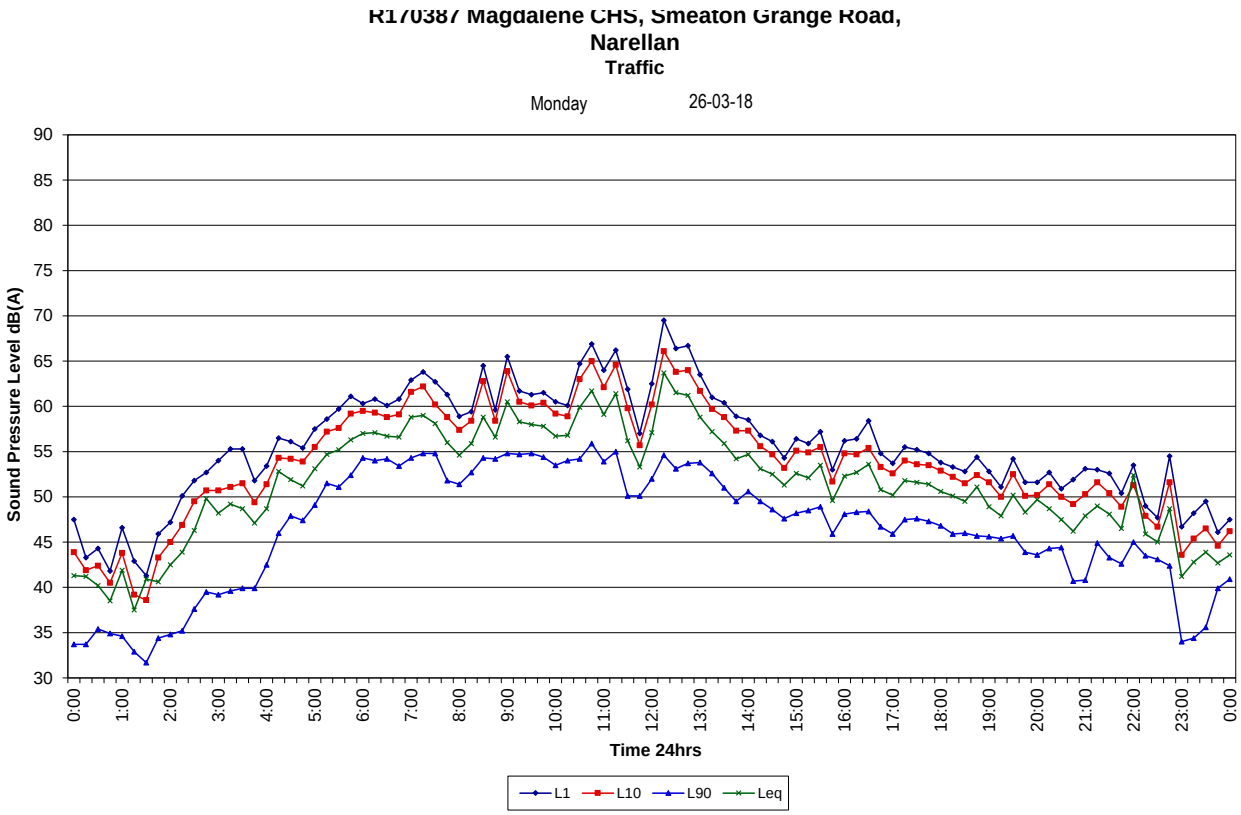
Traffic
Sunday 25-03-18
Sound Pressure Level dB(A)
Time 24hrs
L1 L10 L90 Leq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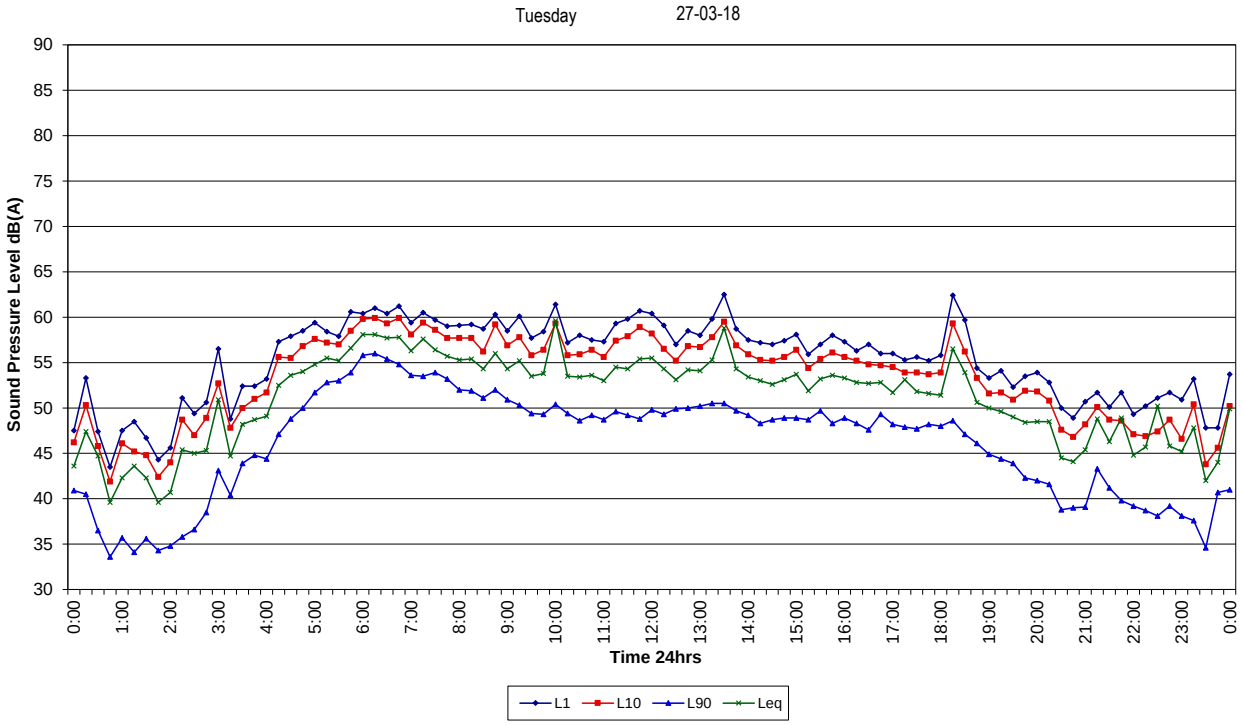
Traffic
Monday 26-03-18
Sound Pressure Level dB(A)
Time 24hrs
L1 L10 L90 Leq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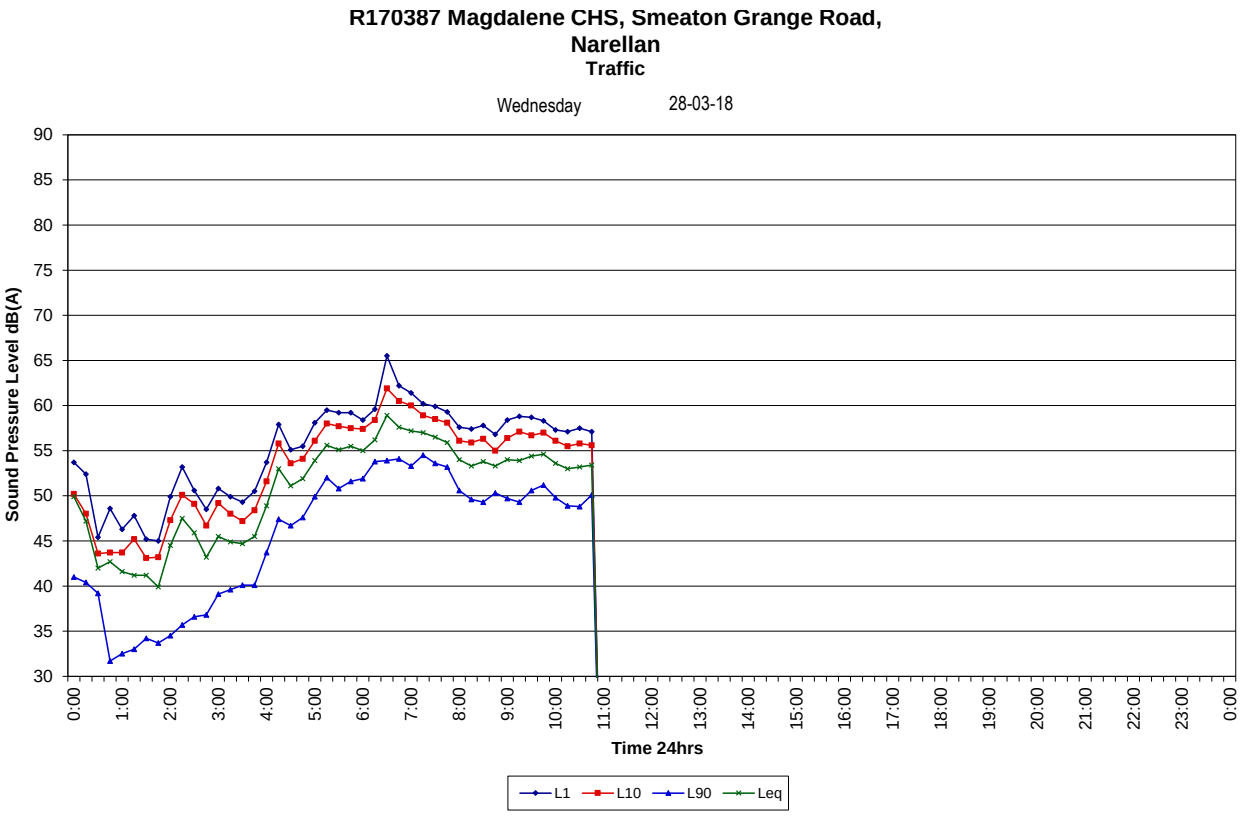
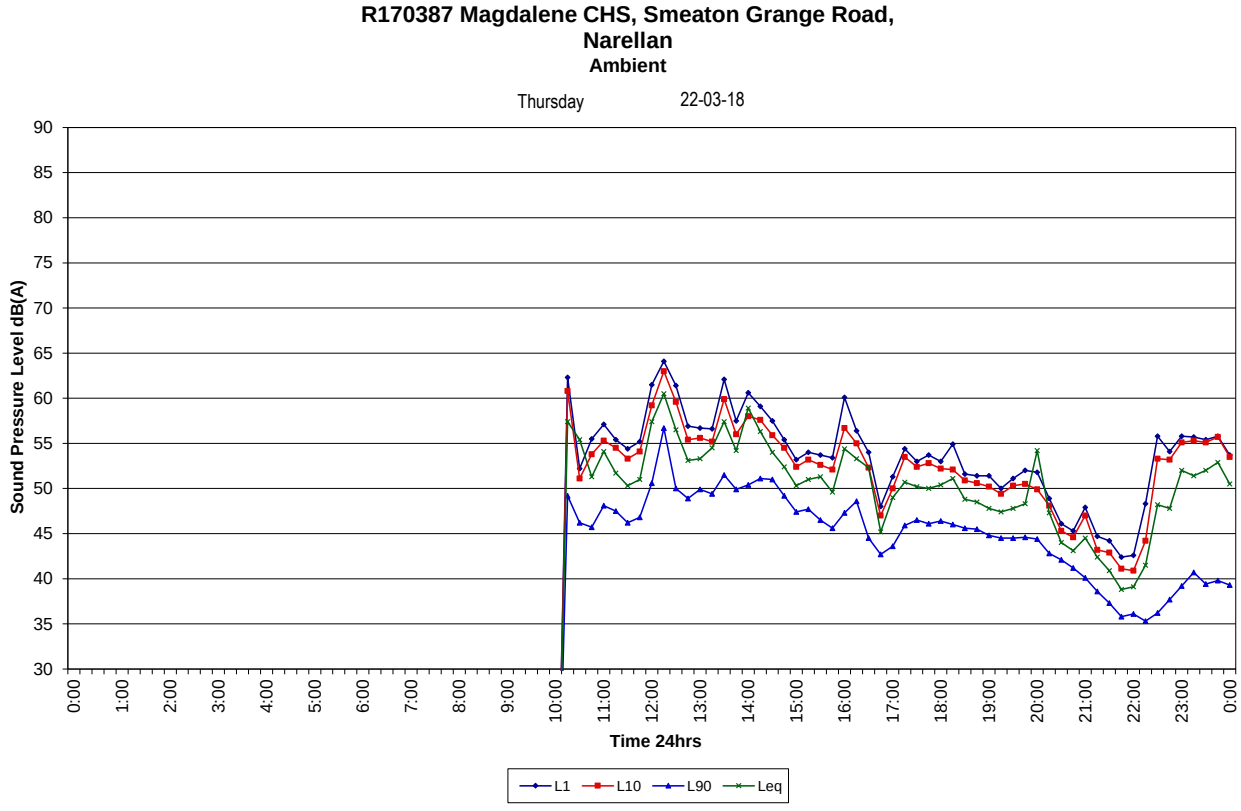
Traffic
Tuesday 27-03-18
Sound Pressure Level dB(A)
Time 24hrs
L1 L10 L90 Leq

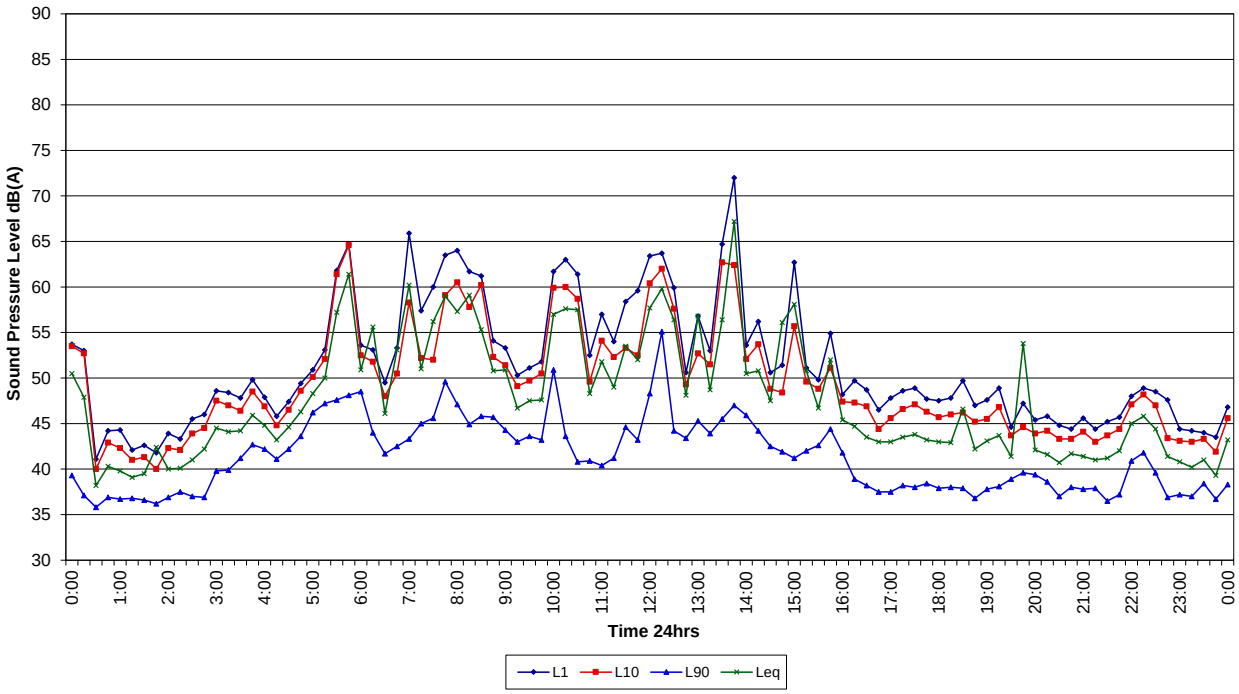


Ambient Logger



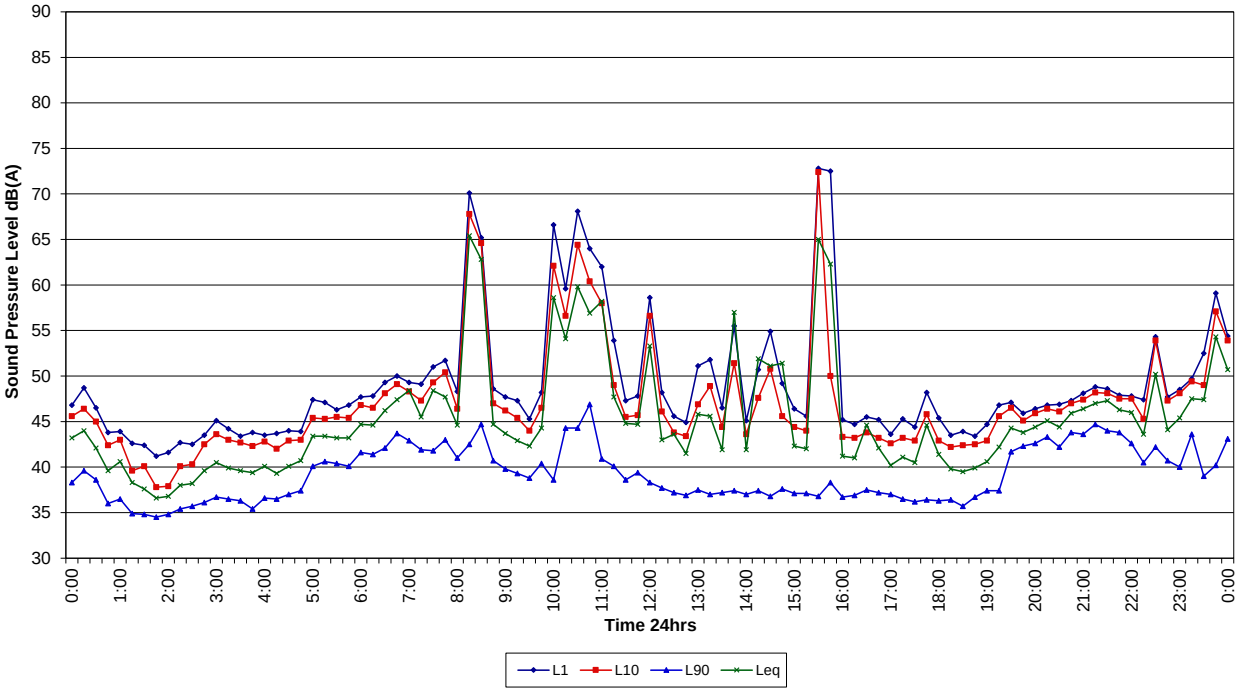
R170387 Magdalene CHS, Smeaton Grange Road, Narellan
Ambient

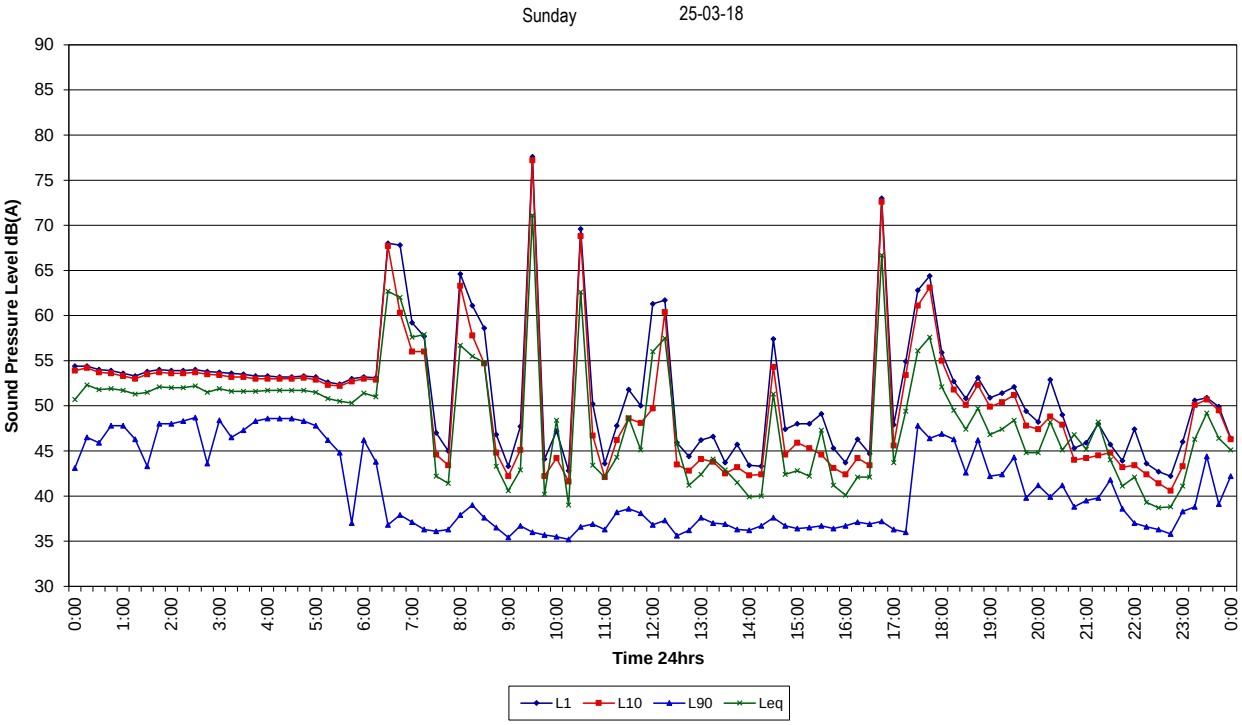
Friday 23-03-18

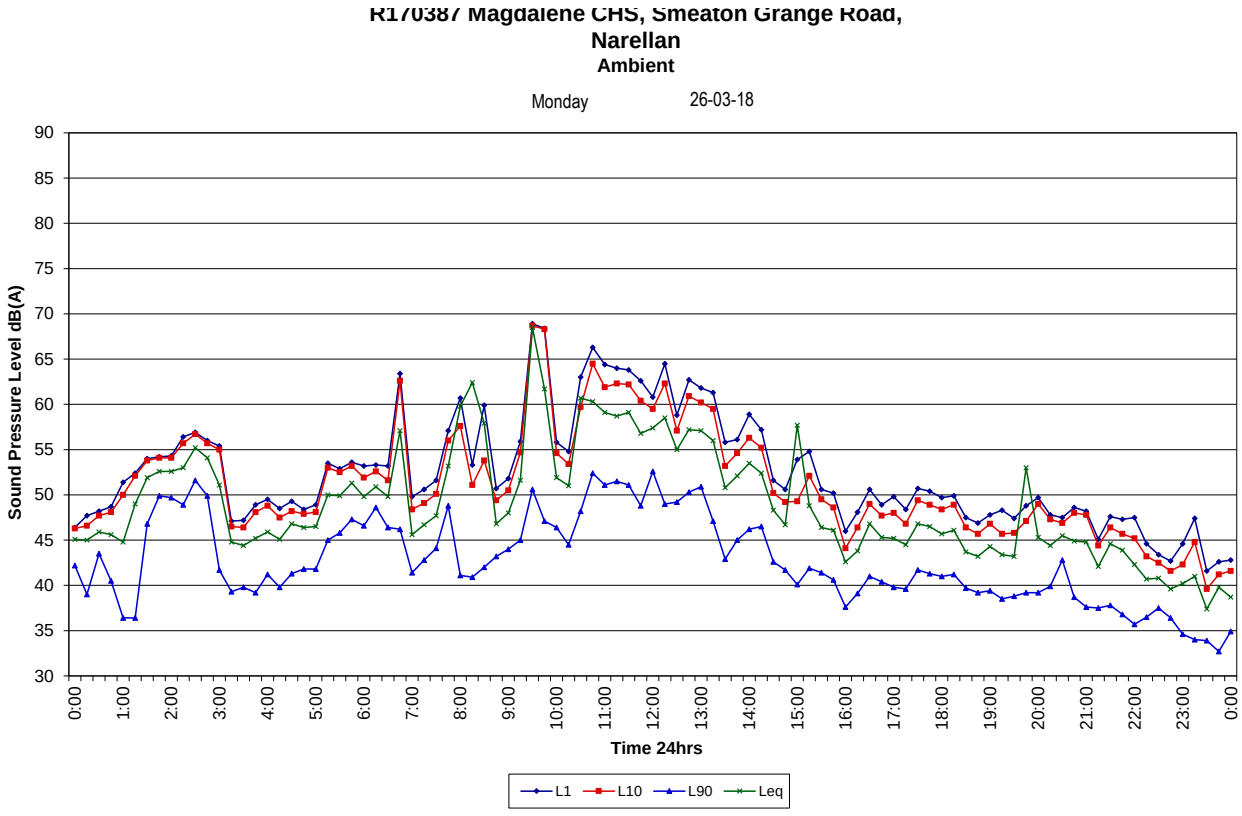


R170387 Magdalene CHS, Smeaton Grange Road, Narellan
Ambient

Saturday 24-03-18

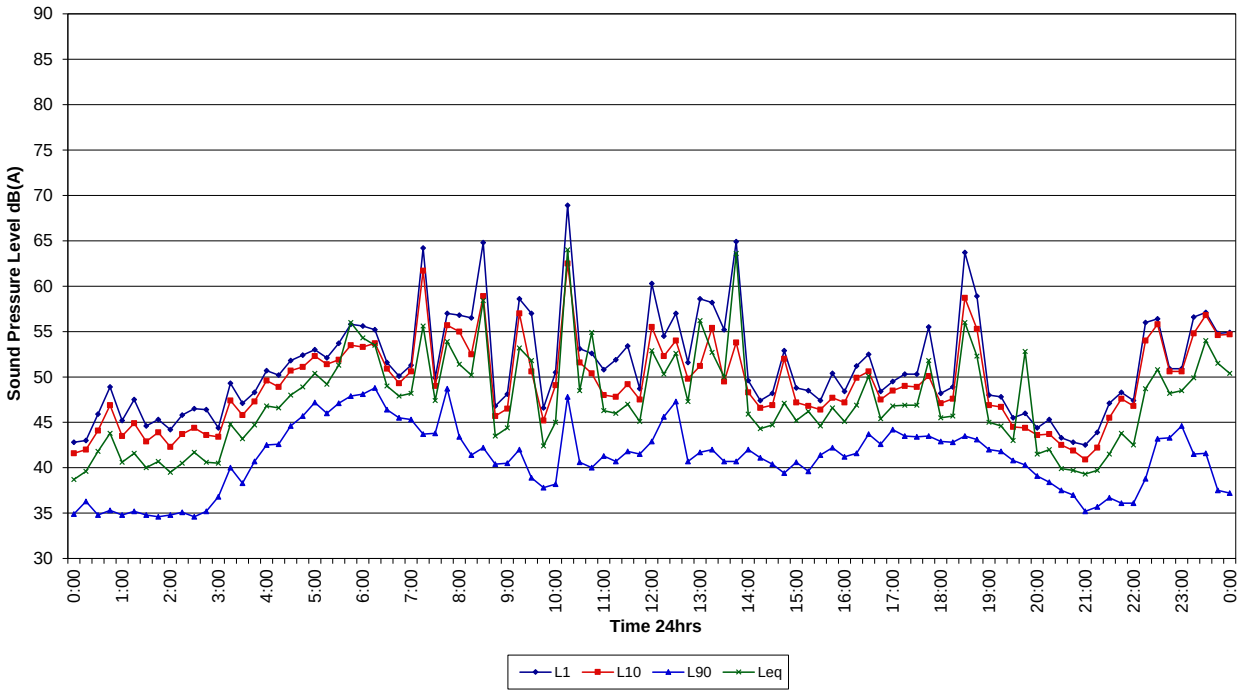



R170387 Magdalene CHS, Smeaton Grange Road, Narellan
Ambient
Sunday 25-03-18
Sound Pressure Level dB(A)
Time 24hrs
L1 L10 L90 Leq


R170387 Magdalene CHS, Smeaton Grange Road, Narellan
Ambient
Monday 26-03-18
Sound Pressure Level dB(A)
Time 24hrs
L1 L10 L90 Leq

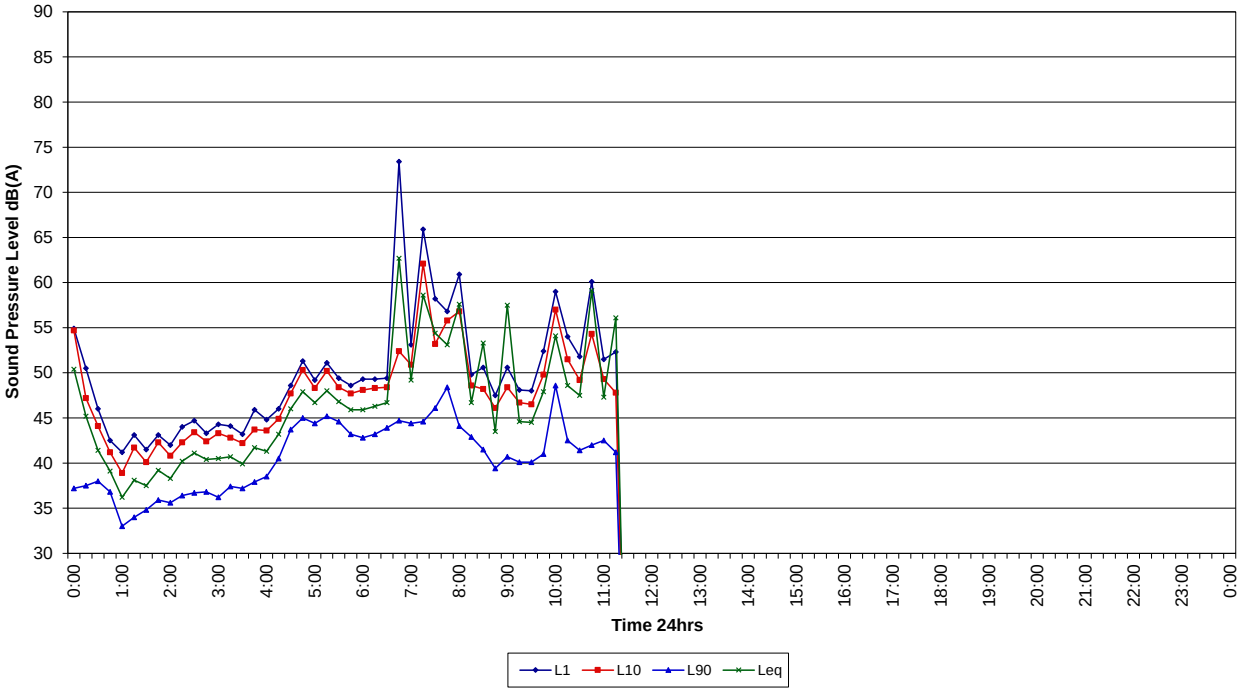
R170387 Magdalene CHS, Smeaton Grange Road, Narellan
Ambient

Tuesday 27-03-18

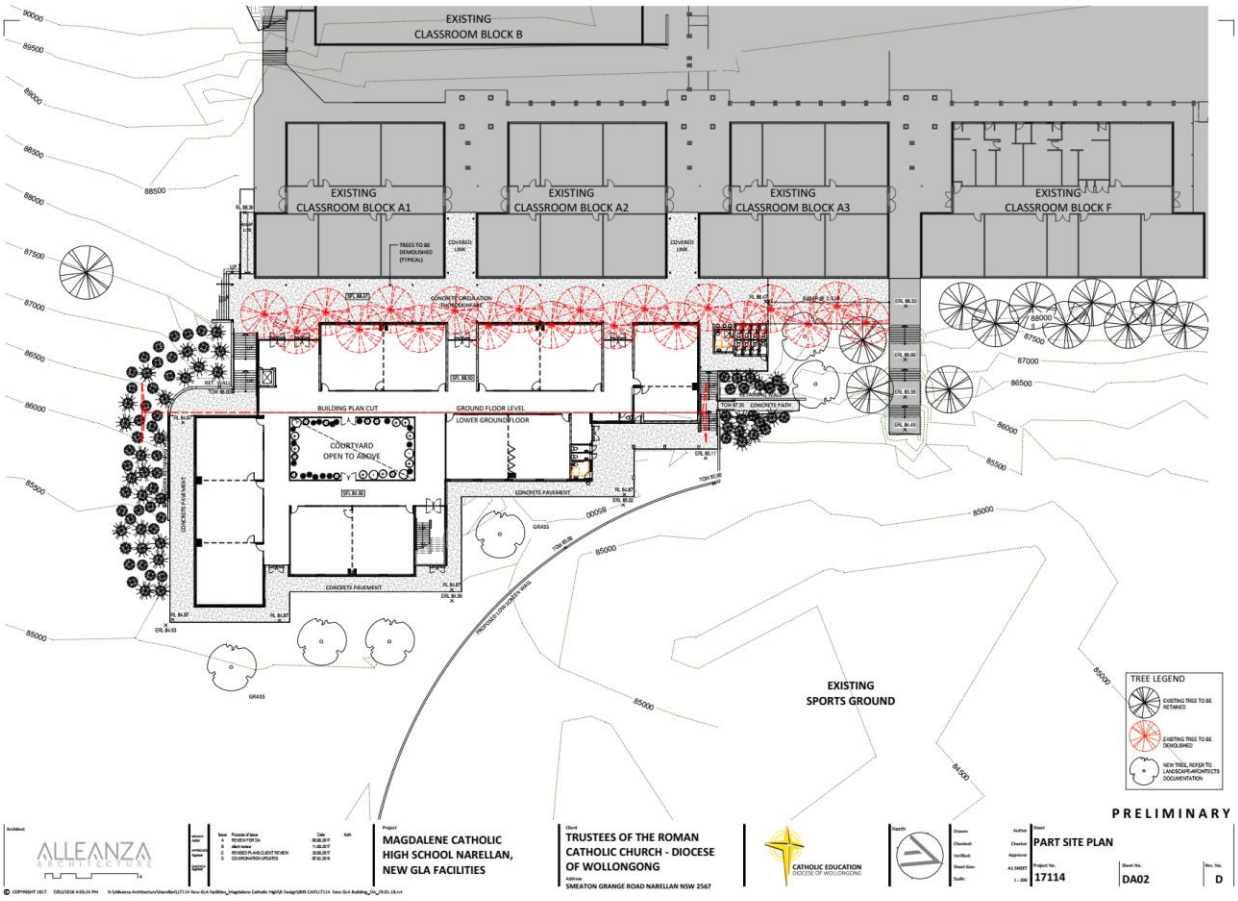


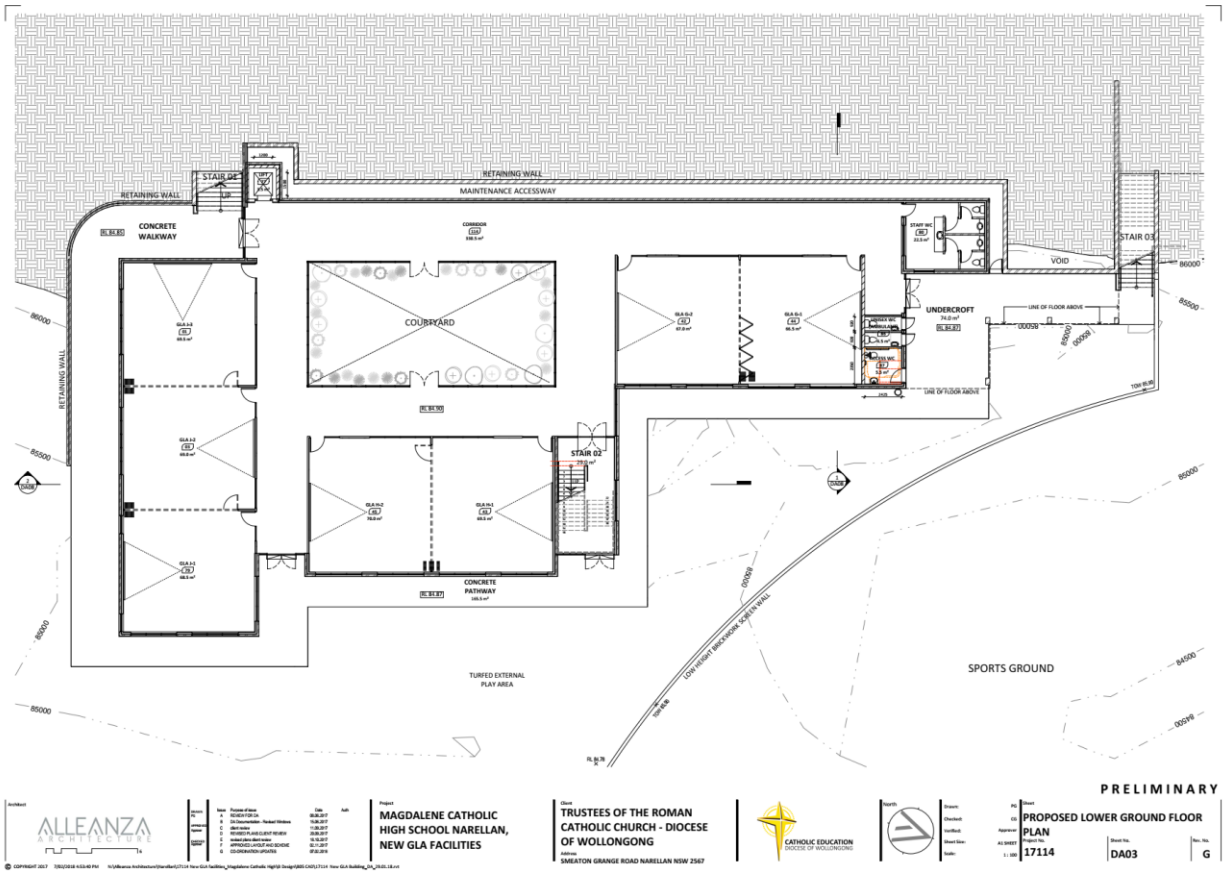
R170387 Magdalene CHS, Smeaton Grange Road, Narellan
Ambient

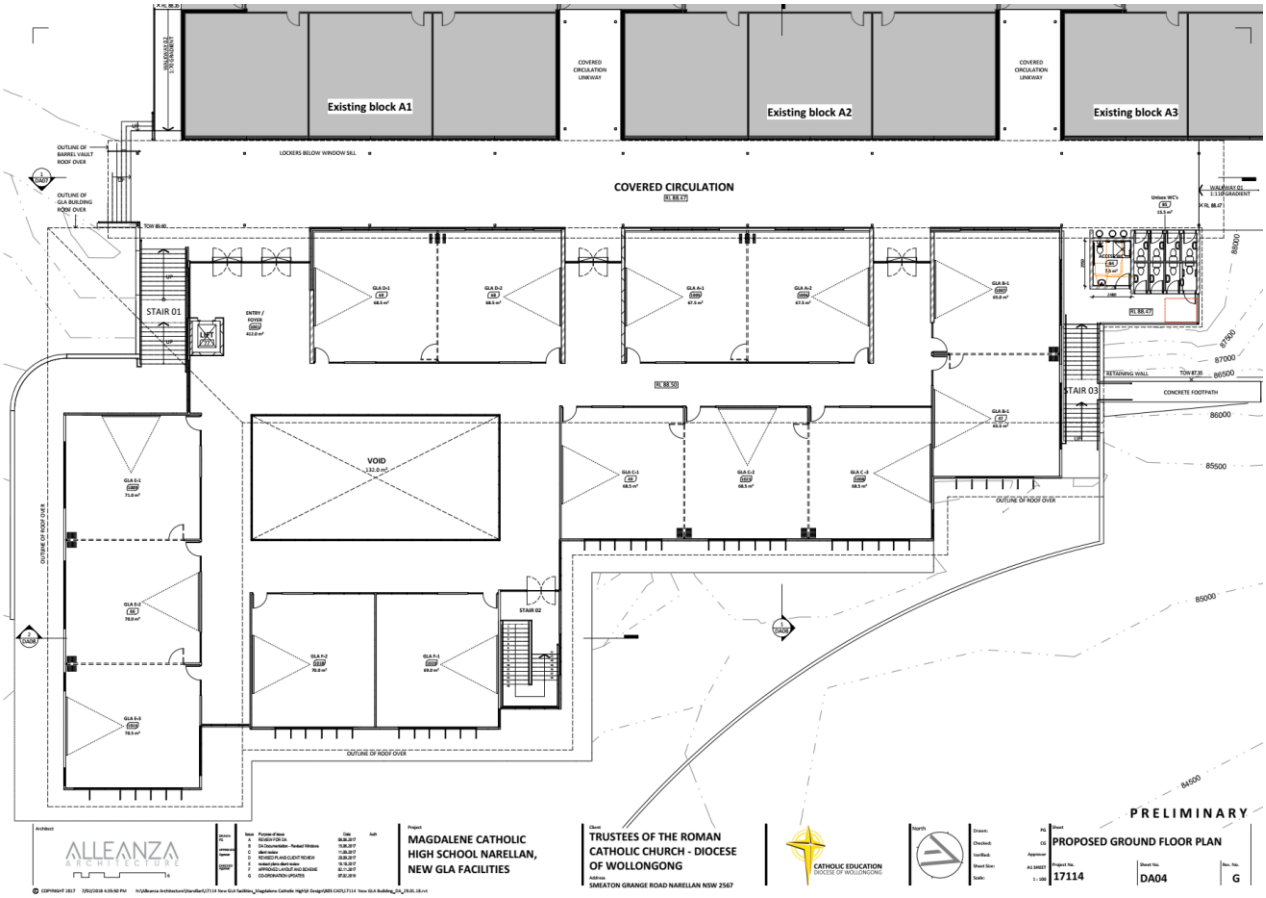
Wednesday 28-03-18

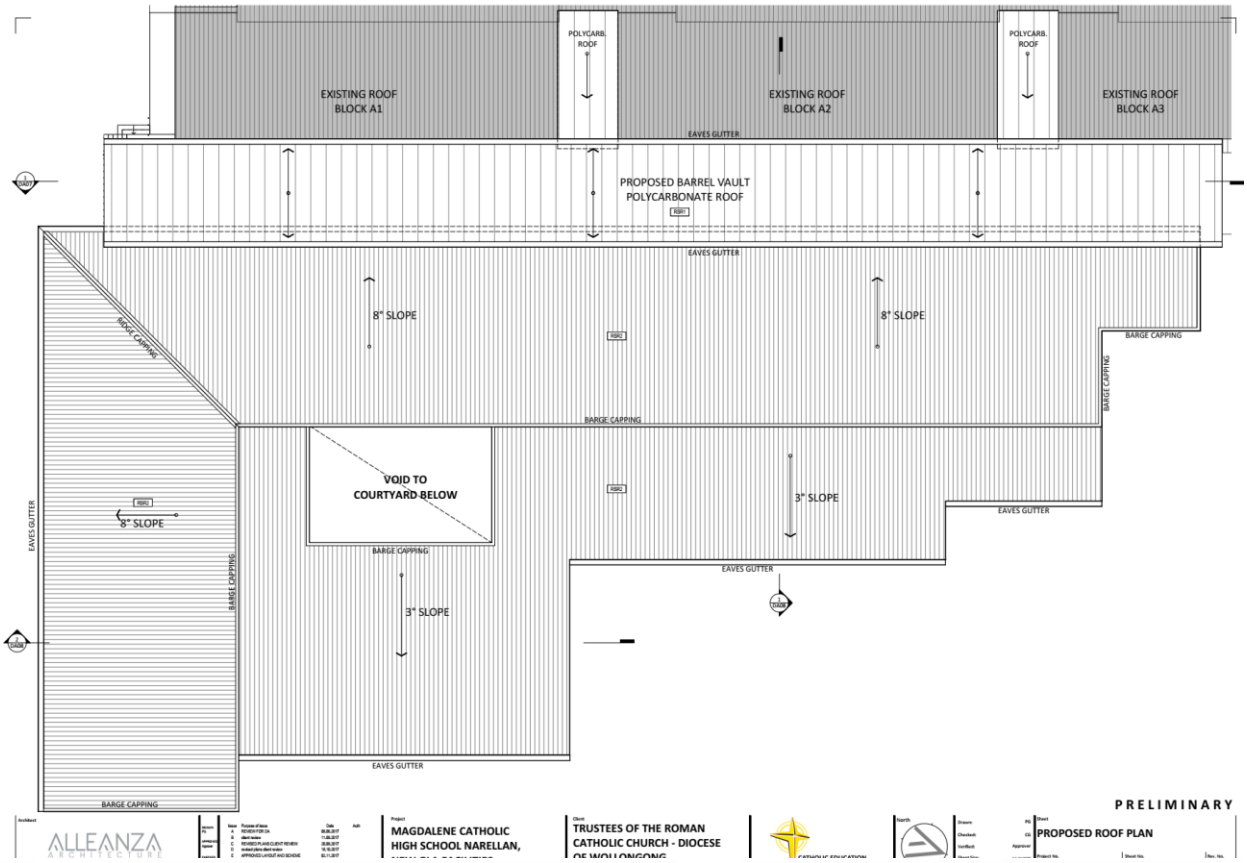


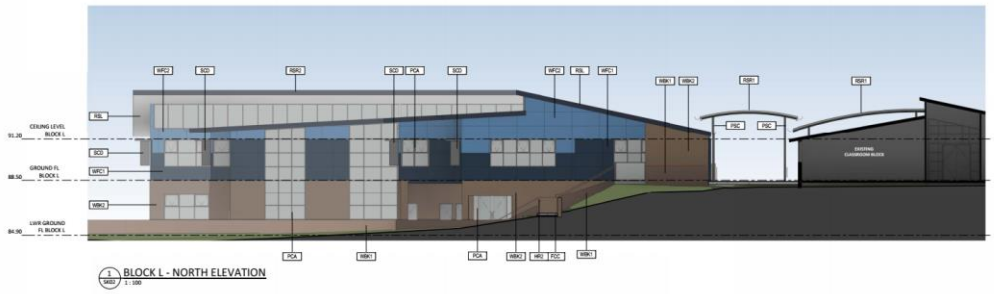
Appendix C – Architectural Plans



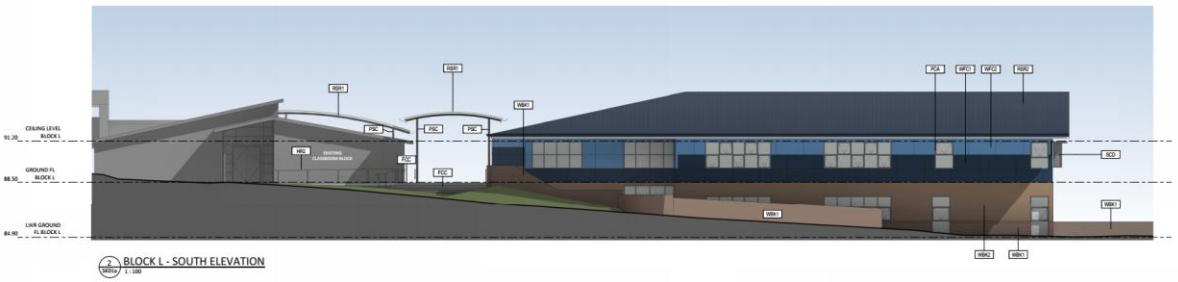

STAIR 04
RETAINING WALL
MAINTENANCE ACCESSWAY
CONCRETE WALKWAY
COURTYARD
STAIR 03
VOID
UNDERCROFT
STAIR 02
CONCRETE PATHWAY
TURFED EXTERNAL PLAY AREA
SPORTS GROUND
PRELIMINARY
MAGDALENE CATHOLIC HIGH SCHOOL NARELLAN, NEW GLA FACILITIES
TRUSTEES OF THE ROMAN CATHOLIC CHURCH - DIOCESE OF WOLLONGONG
SMEATON GRANGE ROAD NARELLAN NSW 2567
PROPOSED LOWER GROUND FLOOR PLAN
17114
DA03
G

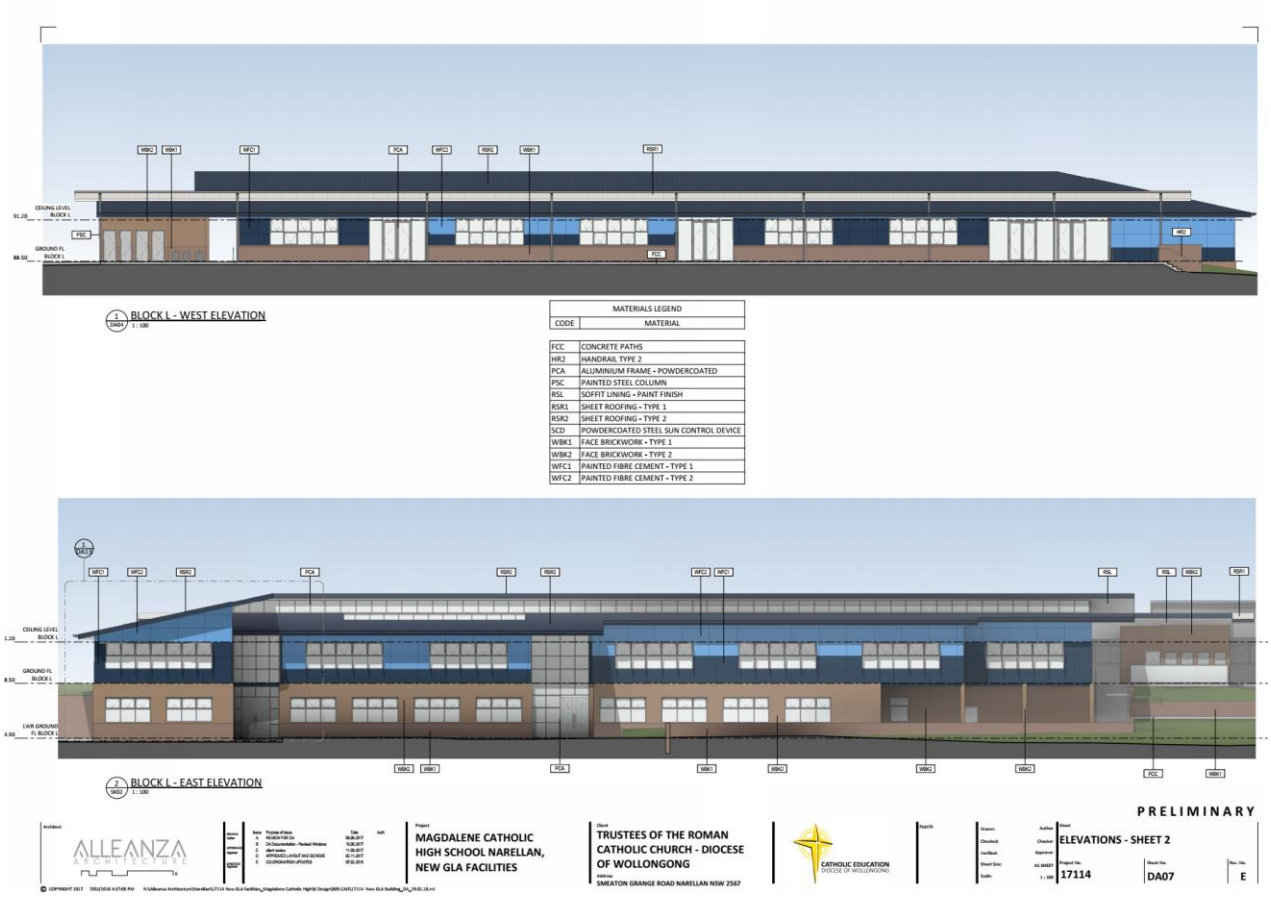

Existing block A1
Existing block A2
Existing block A3
COVERED CIRCULATION
STAIR 01
STAIR 02
STAIR 03
VOID
PRELIMINARY
MAGDALENE CATHOLIC HIGH SCHOOL NARELLAN, NEW GLA FACILITIES
TRUSTEES OF THE ROMAN CATHOLIC CHURCH - DIOCESE OF WOLLONGONG
SMEATON GRANGE ROAD NARELLAN NSW 2567
PROPOSED GROUND FLOOR PLAN
17114
DA04
G





MATERIALS LEGEND	
CODE	MATERIAL
FCC	CONCRETE PATHS
HR2	HANDRAIL TYPE 2
PCA	ALUMINIUM FRAME - POWDERCOATED
PSC	PAINTED STEEL COLUMN
RSL	SOFFIT LINING - PAINT FINISH
RSR1	SHEET ROOFING - TYPE 1
RSR2	SHEET ROOFING - TYPE 2
SCD	POWDERCOATED STEEL SUN CONTROL DEVICE
WBK1	FACE BRICKWORK - TYPE 1
WBK2	FACE BRICKWORK - TYPE 2
WFC1	PAINTED FIBRE CEMENT - TYPE 1
WFC2	PAINTED FIBRE CEMENT - TYPE 2




BLOCK L - WEST ELEVATION
1 : 100
MATERIALS LEGEND
CODE MATERIAL
FCC CONCRETE PATHS
HR2 HANDRAIL TYPE 2
PCA ALUMINIUM FRAME - POWDERCOATED
PSC PAINTED STEEL COLUMN
RSL SOFFIT LINING - PAINT FINISH
RSR1 SHEET ROOFING - TYPE 1
RSR2 SHEET ROOFING - TYPE 2
SCD POWDERCOATED STEEL SUN CONTROL DEVICE
WBK1 FACE BRICKWORK - TYPE 1
WBK2 FACE BRICKWORK - TYPE 2
WFC1 PAINTED FIBRE CEMENT - TYPE 1
WFC2 PAINTED FIBRE CEMENT - TYPE 2
BLOCK L - EAST ELEVATION
1 : 100
PRELIMINARY
ALLEANZA ARCHITECTURE
MAGDALENE CATHOLIC HIGH SCHOOL NARELLAN, NEW GLA FACILITIES
TRUSTEES OF THE ROMAN CATHOLIC CHURCH - DIOCESE OF WOLLONGONG
SMEATON GRANGE ROAD NARELLAN NSW 2567
CATHOLIC EDUCATION DIOCESE OF WOLLONGONG
ELEVATIONS - SHEET 2
17114
DA07
E

Appendix D – Calibration Certificates

Acoustic Research Labs Pty Ltd
Level 7 Building 2 423 Pennant Hills Rd
Pennant Hills NSW AUSTRALIA 2120
Ph: +61 2 9484 0800 A.B.N. 65 160 399 119
www.acousticresearch.com.au

Sound Level Meter
IEC 61672-3.2006

Calibration Certificate

Calibration Number C16716

Client Details Rodney Stevens Acoustics Pty Ltd
1 Majura Close
St Ives Chase NSW 2075

Equipment Tested/ Model Number : Rion NL-42EX
Instrument Serial Number : 00546393
Microphone Serial Number : 152907
Pre-amplifier Serial Number : 46605

Pre-Test Atmospheric Conditions		Post-Test Atmospheric Conditions	
Ambient Temperature :	23.5°C	**Ambient Temperature :**	23.6°C
Relative Humidity :	51.6%	**Relative Humidity :**	50.8%
Barometric Pressure :	98.97kPa	**Barometric Pressure :**	98.87kPa

Calibration Technician : Vicky Jaiswal
Calibration Date : 09/01/2017
Secondary Check: Riley Cooper
Report Issue Date : 10/01/2017

Approved Signatory : Juan Aguero

Clause and Characteristic Tested	Result	Clause and Characteristic Tested	Result
10: Self-generated noise	*Pass*	14: Level linearity on the reference level range	*Pass*
11: Acoustical tests of a frequency weighting	*Pass*	15: Level linearity incl. the level range control	*Pass*
12: Electrical tests of frequency weightings	*Pass*	16: Toneburst response	*Pass*
13: Frequency and time weightings at 1 kHz	*Pass*	17: Peak C sound level	*Pass*
		18: Overload Indication	*Pass*

The sound level meter submitted for testing has successfully completed the class 2 periodic tests of IEC 61672-3:2006, for the environmental conditions under which the tests were performed.

However, no general statement or conclusion can be made about conformance of the sound level meter to the full requirements of IEC 61672-1:2002 because evidence was not publicly available, from an independent testing organisation responsible for pattern approvals, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1:2002 and because the periodic tests of IEC 61672-3:2006 cover only a limited subset of the specifications in IEC 61672-1:2002.

Least Uncertainties of Measurement -

Acoustic Tests		Environmental Conditions	
31.5 Hz to 8kHz	*±0.12dB*	*Temperature*	*±0.05°C*
12.5kHz	*±0.18dB*	*Relative Humidity*	*±0.46%*
16kHz	*±0.31dB*	*Barometric Pressure*	*±0.017kPa*
Electrical Tests			
31.5 Hz to 20 kHz	*±0.12dB*		

NATA
WORLD RECOGNISED ACCREDITATION

This calibration certificate is to be read in conjunction with the calibration test report.

Acoustic Research Labs Pty Ltd is NATA Accredited Laboratory Number 14172.
Accredited for compliance with ISO/IEC 17025.

The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration and inspection reports.

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Acoustic Research Labs Pty Ltd
Level 7 Building 2 423 Pennant Hills Rd
Pennant Hills NSW AUSTRALIA 2120
Ph: +61 2 9484 0800 A.B.N. 65 160 399 119
www.acousticresearch.com.au

Sound Level Meter
IEC 61672-3.2013
Calibration Certificate

Calibration Number C17537

Client Details Rodney Stevens Acoustics Pty Ltd
1 Majura Close
St Ives Chase NSW 2075

Equipment Tested/ Model Number : Rion NL-42
Instrument Serial Number : 00810779
Microphone Serial Number : 148338
Pre-amplifier Serial Number : 22257

Pre-Test Atmospheric Conditions		Post-Test Atmospheric Conditions	
Ambient Temperature :	22°C	**Ambient Temperature :**	22.3°C
Relative Humidity :	45.5%	**Relative Humidity :**	47.1%
Barometric Pressure :	94.4kPa	**Barometric Pressure :**	99.35kPa

Calibration Technician : Jason Gomes
Calibration Date : 13/10/2017
Secondary Check: Riley Cooper
Report Issue Date : 17/10/2017

Approved Signatory : Ken Williams

Clause and Characteristic Tested	Result	Clause and Characteristic Tested	Result
12: Acoustical Sig. tests of a frequency weighting	*Pass*	17: Level linearity incl. the level range control	*Pass*
13: Electrical Sig. tests of frequency weightings	*Pass*	18: Toneburst response	*Pass*
14: Frequency and time weightings at 1 kHz	*Pass*	19: C Weighted Peak Sound Level	*Pass*
15: Long Term Stability	*Pass*	20: Overload Indication	*Pass*
16: Level linearity on the reference level range	*Pass*	21: High Level Stability	*Pass*

The sound level meter submitted for testing has successfully completed the class 2 periodic tests of IEC 61672-3:2006, for the environmental conditions under which the tests were performed.

However, no general statement or conclusion can be made about conformance of the sound level meter to the full requirements of IEC 61672-1:2002 because evidence was not publicly available, from an independent testing organisation responsible for pattern approvals, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1:2002 and because the periodic tests of IEC 61672-3:2006 cover only a limited subset of the specifications in IEC 61672-1:2002.

Least Uncertainties of Measurement -

Acoustic Tests		Environmental Conditions	
31.5 Hz to 8kHz	*±0.16dB*	*Temperature*	*±0.05°C*
12.5kHz	*±0.2dB*	*Relative Humidity*	*±0.46%*
16kHz	*±0.29dB*	*Barometric Pressure*	*±0.017kPa*
Electrical Tests			
31.5 Hz to 20 kHz	*±0.12dB*		

All uncertainties are derived at the 95% confidence level with a coverage factor of 2.

This calibration certificate is to be read in conjunction with the calibration test report.

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