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Operational Noise Impact Assessment

Residential Aged Care Facility

Paling Court, Grasmere NSW

Report Number 610.11787-R2

8 October 2012

Michael Brown Planning Strategies
PO Box 295
CAMDEN NSW 2570

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Operational Noise Impact Assessment

Residential Aged Care Facility

Paling Court, Grasmere NSW

PREPARED BY:

SLR Consulting Australia Pty Ltd
ABN 29 001 584 612
2 Lincoln Street Lane Cove NSW 2066 Australia

(PO Box 176 Lane Cove NSW 1595 Australia)
T: 61 2 9428 8100 F: 61 2 9427 8200
E: sydney@slrconsulting.com www.slrconsulting.com

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Reference	Status	Date	Prepared	Checked	Authorised
610.11787-R2	Revision 0	8 October 2012	Robert Trieu	Dick Godson	Dick Godson

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1 INTRODUCTION

SLR Consulting Australia Pty Ltd (SLR Consulting) has been engaged by Michael Brown Planning Strategies (MBPS) to prepare an Operational Noise Impact Assessment for the proposed Residential Aged Care Facility (RACF) redevelopment at Paling Court, Grasmere NSW.

The purpose of this report is to determine the potential noise impacts on nearby sensitive receivers and where necessary, to make acoustical recommendations in order that the facility can operate in an acoustically compliant manner. The assessment has been prepared in order to satisfy Camden Council's Request for Additional Information (RAI) for the subject development.

The report presents SLR Consulting methodology, assessment criteria and recommendations regarding the following operational noise sources:

- Noise emissions from the mechanical plant room;
- Noise emissions from the rubbish compactor room;
- Noise emissions from the loading dock; and
- Noise emissions from vehicle movements within car parks.

Specific acoustic terminology is used in this report. An explanation of common acoustic terms is provided in **Appendix A**.

2 DEVELOPMENT DESCRIPTION

2.1 Site Location

The Paling Court Residential Aged Care Facility and the Grasmere Heritage Villa ("Grasmere Cottage") comprise part of the comprehensive Seniors Living complex located at Lot 10 DP 845472 (No 90) Werombi Road, Grasmere.

The facility abuts a single storey group of modest independent living units to the immediate east and the administration office and nursing home to the north, all built concurrently with the RACF.

All properties on the eastern side of Werombi Road are project related and form part of the Carrington Centennial Care (CCC) Seniors Living complex. The Paling Court RACF is indicated in **Figure 1**.

The nearest non-project related sensitive receivers are located on the western side of Werombi Road as well as three dwellings located south of CCC on the same side of Werombi Road as CCC.

Figure 1 Site Aerial

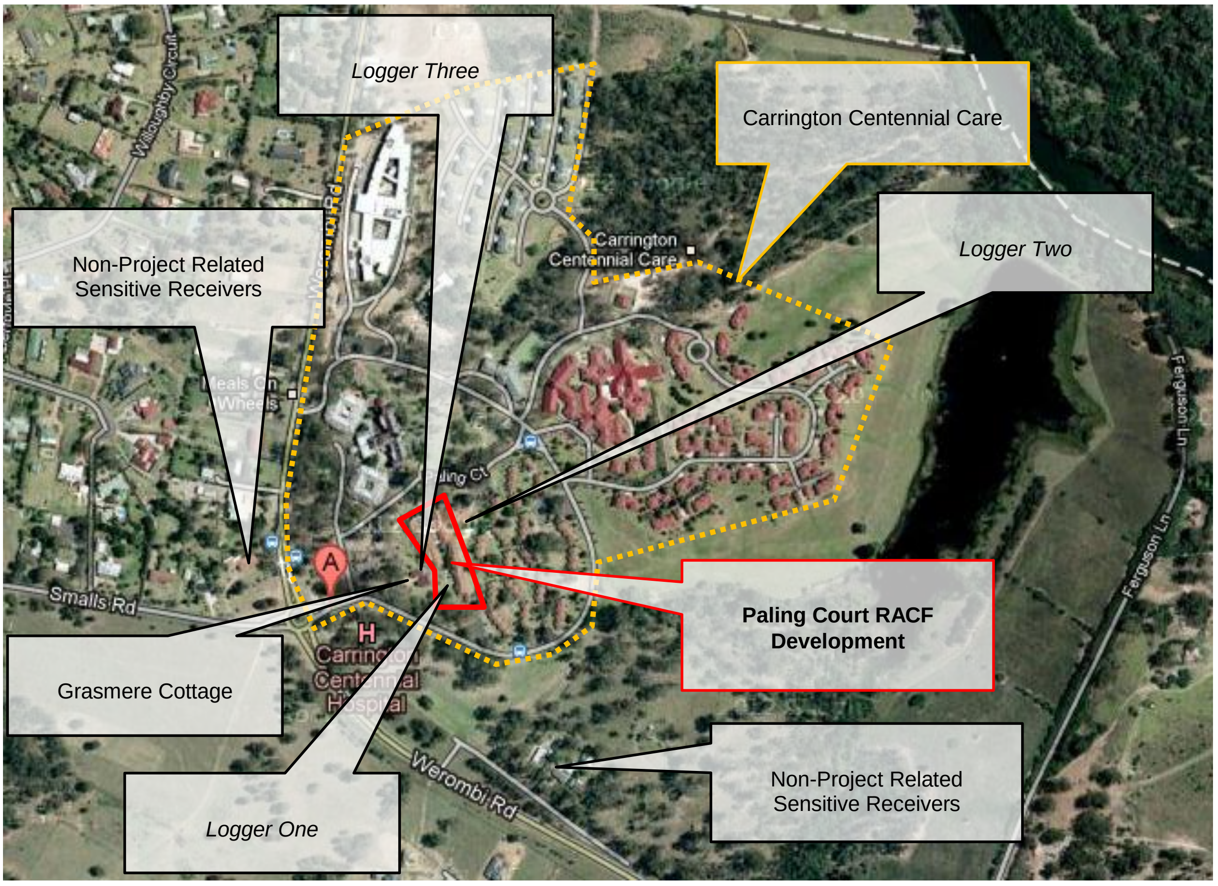


Image courtesy of Google Earth. Boundaries are approximate.

3 NOISE MONITORING

In order to characterise the existing acoustical environment in the area of the development, a survey of environmental noise levels was conducted from Thursday 20 September to Thursday 27 September 2012 at the logging locations shown in **Figure 1**.

The logger locations were selected with consideration to other noise sources which may have influenced the readings, security issues for the noise monitoring equipment and gaining permission for access from residents and landowners. Instrumentation for the survey comprised three SVAN 957 environmental noise loggers (Serial numbers 20669, 23244 and 23815) fitted with windshields.

The noise loggers were programmed to continuously record the ambient noise levels. The sample time interval was set at 15 minutes and the time weighting function set to “Fast”. Calibration of the loggers was checked prior to and subsequent to the measurements. Drift in calibration did not exceed ±0.5 dBA. All equipment carried appropriate and current NATA (or manufacturer) calibration certificates.

The measured noise data has been filtered to remove data measured during adverse weather conditions following consultation with historical weather reports provided by the Bureau of Meteorology (BOM) as recorded from the Camden weather station.

Daily graphs for each noise logger are attached in **Appendix B**. The graphs represent each 24 hour period by incorporating median values of the L_{A1}, L_{A10} and L_{A90} together with the logarithmic average of the L_{Aeq} levels for the corresponding 15 minute periods, as well as relevant weather data.

3.1 Data Processing

In order to assess the acoustical implications of the proposed development on the levels of noise received at nearby sensitive receivers, the measured data was processed in accordance with to the NSW Environment Protection Authority’s (EPA’s) *Industrial Noise Policy* (INP).

Table 1 details the Rated Background Level (RBL) and L_{Aeq} noise levels recorded during the daytime, evening and night-time periods. Data affected by adverse meteorological conditions and by spurious and uncharacteristic events has been excluded from the results, and were also excluded from the data used to determine the noise emission criteria.

Table 1 Measured Ambient Noise Levels Corresponding to EPA Industrial Noise Policy Assessment Time Periods – dBA re 20 µPa

Logger Location/ID	Daytime 0700 hrs – 1800 hrs		Evening 1800 hrs – 2200 hrs		Night-time 2200 hrs – 0700 hrs	
	RBL [1]	LAeq [2]	RBL	LAeq	RBL	LAeq
One (s/n – 20669)	37	50	30	44	30 (25) [3]	44
Two (s/n – 23815)	35	47	30	43	30 (27) [3]	41
Three (s/n – 23244)	36	52	32	43	30 (24) [3]	44

Note 1: The RBL noise level is representative of the average minimum background sound level (in the absence of the source under consideration), or simply the background level.

Note 2: The L_{Aeq} is essentially the average sound level. It is defined as the steady sound level that contains the same amount of acoustical energy as a given time-varying sound.

Note 3: Measured level in brackets. In accordance with the INP, where the RBL is found to be less than 30 dBA, then it is set to 30 dBA.

4 CRITERIA

Operational Noise – NSW EPA Industrial Noise Policy

Responsibility for the control of noise emissions in New South Wales is vested in Local Government and the EPA.

Camden Council's Environmental Noise Policy for commercial premises is guided by and refers to much of the information that is contained in the NSW EPA INP.

The EPA oversees the Industrial Noise Policy (INP) January 2000 which provides a framework and process for deriving noise criteria. The INP criteria for industrial noise sources have two 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.

Intrusiveness Criterion

For assessing intrusiveness, the background noise generally needs to be measured. The intrusiveness criterion specifies that the equivalent continuous noise level (L_{Aeq}) of the source should not be more than 5 dBA above the measured Rated Background Level (RBL), over any 15 minute period.

Amenity Criterion

The amenity criterion 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 criteria 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 criterion 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 criterion.

Area Classification

The INP, for the purposes of determining the appropriate noise amenity criteria, characterises a "Suburban" noise environment as an area that has local traffic with characteristically intermittent traffic flows or with some limited commerce or industry. This area often as the following characteristics:

- Decreasing noise levels in the evening period (1800-2200); and/or
- Evening ambient noise levels defined by the natural environment and infrequent human activity.

This area may be located in either a rural, rural-residential or residential zone, as defined on a Local Environment Plan or other planning instrument.

Project Specific Noise Levels

Having defined the area type, the processed results of the unattended noise monitoring have been used to determine project specific noise criteria. The intrusive and amenity criteria for nearby sensitive receivers are presented in **Table 2**. These criteria are nominated for the purpose of assessing potential noise impacts from the proposed development.

In this case, the ambient noise environment is not controlled by industrial noise sources and therefore the amenity criteria become the Recommended Amenity Criteria for Residences in a Suburban Area (ie ANL or Acceptable Noise Level). For each assessment period, the lower (ie the more stringent) of the amenity or intrusive criteria are adopted. These are shown in bold text in **Table 2**. The criteria adopted for this assessment are based results from logger location two, which recorded the lowest noise levels and is therefore conservative.

Table 2 Operational Noise Criteria for Sensitive Receivers Surrounding the Development Site

Receiver	**Time of Day**	**ANL [1] LAeq(period)**	**Measured RBL [2] LA90(15minute)**	**Measured LAeq(period) Noise Level)**	**Criteria for New Sources**	
					Intrusive LAeq(15minute)	**Amenity [3] LAeq(period)**
Residential	Day	55	35	47	**40**	55
	Evening	45	30	43	**35**	45
	Night	40	30	41	**35**	40

Note 1: ANL = "Acceptable Noise Level" for residences in suburban areas.

Note 2: RBL = "Rating Background Level".

Note 3: Assuming existing noise levels are unlikely to decrease in the future.

5 NOISE ASSESSMENT

5.1 Noise Sources and Receivers

Operational noise emissions from the RACF will be of minimal impact, primarily due to the location of the following identified noise sources:

- Lower ground floor mechanical plant room;
- Lower ground floor rubbish compactor room;
- Lower ground floor loading dock; and
- Vehicle noise from below ground car parking areas.

It is noted that the Grasmere Cottage is project related, as are the existing surrounding independent living units (including those of the development itself), and as such, received noise levels at project related receivers are not subject to the RACF operational noise compliance. Non-project related sensitive receivers are identified in **Figure 1**.

Plans indicating noise sources/areas discussed herein are attached in **Appendix C**.

5.2 Mechanical Plant and Compactor

Precise details of mechanical plant and the compactor are unknown at this stage, as selection will take place during the detailed design phase of the project.

It is observed from the preliminary plans that there will be a dedicated plant room for mechanical plant as well as the compactor. All equipment would need to be selected, positioned and acoustically treated (if necessary) in order to ensure compliance with the criteria set out in **Table 2**.

It is anticipated that the noise criteria will be met through the use of conventional noise control methods (eg selection on the basis of quiet operation and, where necessary, providing enclosures or localised barriers). Further, it is observed that the mechanical plant room is located on the lower ground floor ('basement one') and that the compactor room is located on the lower car park floor ('basement two'). Both floors are below ground, therefore greatly attenuating potential airborne noise emissions.

5.3 Car Park

Two floors of below-ground parking are proposed; located on the lower ground floor and lower car park floor respectively. As for the mechanical plant room, noise emissions from vehicle movements within the car park will be contained within the floors, resulting in negligible impact to sensitive receivers.

5.4 Loading Dock

The loading dock and waste collection area are located on the lower ground floor and lower car park floor respectively.

Truck delivery noise levels are based on archival data obtained from loading dock activities where vehicle reversing alarms and truck engines produce the highest noise levels.

$L_{Aeq(15minute)}$ noise levels have been predicted to the nearest non-project related sensitive receivers identified in **Figure 1**, based on the following assumption:

- One heavy truck in any single hour using either the loading dock or waste collection area. Noise events include truck entry, reversing and eventual exit.

- The loading dock and waste collection area will only be used during daytime hours (7 am to 6 pm).

Table 3 Predicted Loading Dock / Waste Collection Area Noise Levels at Nearest Non-Project Related Receivers

Assessment Location	Predicted $L_{Aeq(15minute)}$ Noise Level (dBA)	Daytime Intrusive Criteria – $L_{Aeq(15minute)}$ (dBA)	Exceedance
Residential West of Werombi Road	34	40	Nil
Residential South East of CCC	40	40	Nil

6 CONCLUSION

SLR Consulting has conducted an Operational Noise Impact Assessment for the proposed redevelopment of the Paling Court Residential Aged Care Facility within the Carrington Care Centre at Grasmere, NSW.

The scope of the assessment involved establishing project specific operational noise criteria in accordance with the NSW Industrial Noise Policy and the identification and assessment of potential noise emissions to satisfy Camden Council's Request for Additional Information.

Mechanical plant and compactor equipment details are unknown at DA stage however it is envisaged that the project specific noise criteria will be met through the use of conventional noise control methods and the location of the equipment rooms below ground level. Such details will be reviewed at the detailed design stage or when equipment selection is known.

The car parks are also located below ground level and the vehicle noise emissions within the car park will consequently have negligible impact on the nearby sensitive receivers.

Noise emissions from the loading dock were assessed against the daytime intrusive criteria, when deliveries are likely to occur, and are predicted to be compliant.

Noise emissions from the proposed development will be of minimal impact upon the surrounding area. The proposed development is not expected to differ significantly from the existing Carrington Care Centre operations, and as such, it is concluded that the proposed development is suitable for operation on the basis of acoustics.

1 Sound Level or Noise Level

The terms "sound" and "noise" are almost interchangeable, except that in common usage "noise" is often used to refer to unwanted sound.

Sound (or noise) consists of minute fluctuations in atmospheric pressure capable of evoking the sense of hearing. The human ear responds to changes in sound pressure over a very wide range. The loudest sound pressure to which the human ear responds is ten million times greater than the softest. The decibel (abbreviated as dB) scale reduces this ratio to a more manageable size by the use of logarithms.

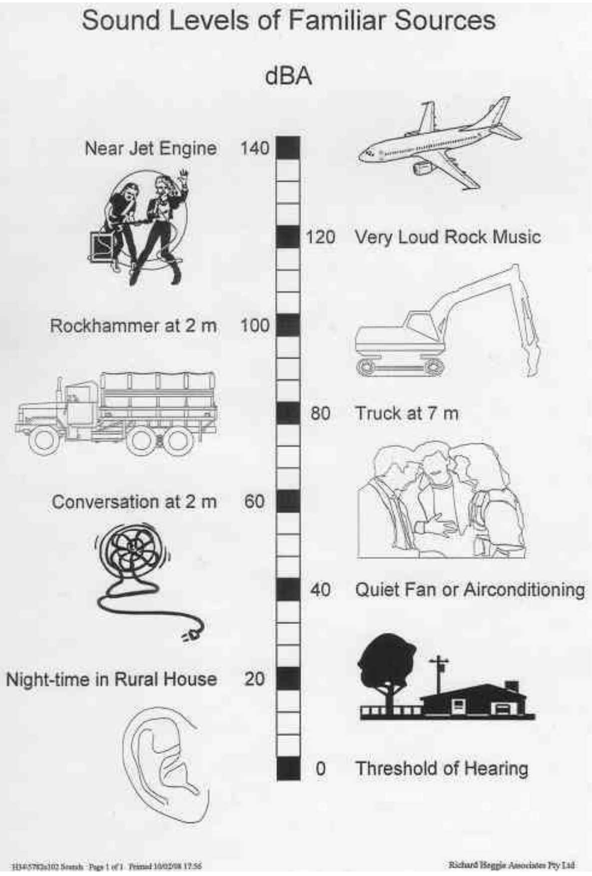
The symbols SPL, L or L_P are commonly used to represent Sound Pressure Level. The symbol L_A represents A-weighted Sound Pressure Level. The standard reference unit for Sound Pressure Levels expressed in decibels is 2 x 10^{-5} Pa.

2 "A" Weighted Sound Pressure Level

The overall level of a sound is usually expressed in terms of dBA, which is measured using a sound level meter with an "A-weighting" filter. This is an electronic filter having a frequency response corresponding approximately to that of human hearing.

People's hearing is most sensitive to sounds at mid frequencies (500 Hz to 4000 Hz), and less sensitive at lower and higher frequencies. Thus, the level of a sound in dBA is a good measure of the loudness of that sound. Different sources having the same dBA level generally sound about equally loud.

A change of 1 dBA or 2 dBA in the level of a sound is difficult for most people to detect, whilst a 3 dBA to 5 dBA change corresponds to a small but noticeable change in loudness. A 10 dBA change corresponds to an approximate doubling or halving in loudness. The figure below lists examples of typical noise levels



Other weightings (eg B, C and D) are less commonly used than A-weighting. Sound Levels measured without any weighting are referred to as "linear", and the units are expressed as dB(lin) or dB.

3 Sound Power Level

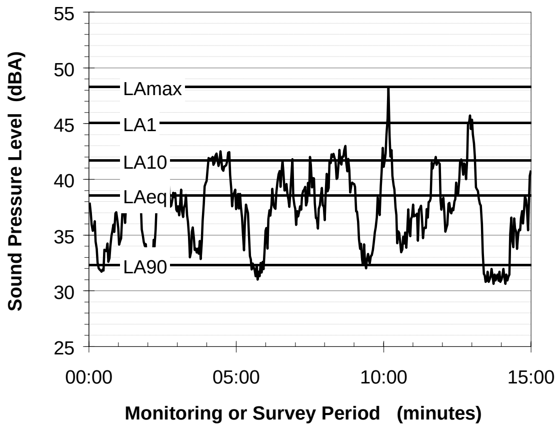
The Sound Power of a source is the rate at which it emits acoustic energy. As with Sound Pressure Levels, Sound Power Levels are expressed in decibel units (dB or dBA), but may be identified by the symbols SWL or L_W, or by the reference unit 10^{-12} W.

The relationship between Sound Power and Sound Pressure may be likened to an electric radiator, which is characterised by a power rating, but has an effect on the surrounding environment that can be measured in terms of a different parameter, temperature.

4 Statistical Noise Levels

Sounds that vary in level over time, such as road traffic noise and most community noise, are commonly described in terms of the statistical exceedance levels L_{AN}, where L_{AN} is the A-weighted sound pressure level exceeded for N% of a given measurement period. For example, the L_{A1} is the noise level exceeded for 1% of the time, L_{A10} the noise exceeded for 10% of the time, and so on.

The following figure presents a hypothetical 15 minute noise survey, illustrating various common statistical indices of interest.



Of particular relevance, are:

L_{Amax}	The maximum noise level during the 15 minute interval
L_{A1}	The noise level exceeded for 1% of the 15 minute interval.
L_{A10}	The noise level exceed for 10% of the 15 minute interval. This is commonly referred to as the average maximum noise level.
L_{A90}	The noise level exceeded for 90% of the sample period. This noise level is described as the average minimum background sound level (in the absence of the source under consideration), or simply the background level.
L_{Aeq}	The A-weighted equivalent noise level (basically the average noise level). It is defined as the steady sound level that contains the same amount of acoustical energy as the corresponding time-varying sound.

When dealing with numerous days of statistical noise data, it is sometimes necessary to define the typical noise levels at a given monitoring location for a particular time of day. A standardised method is available for determining these representative levels.

This method produces a level representing the "repeatable minimum" L_{A90} noise level over the daytime and night-time measurement periods, as required by the EPA. In addition the method produces mean or "average" levels representative of the other descriptors (L_{Aeq}, L_{A10}, etc).

5 Tonality

Tonal noise contains one or more prominent tones (ie distinct frequency components), and is normally regarded as more offensive than "broad band" noise.

6 Impulsiveness

An impulsive noise is characterised by one or more short sharp peaks in the time domain, such as occurs during hammering.

7 Frequency Analysis

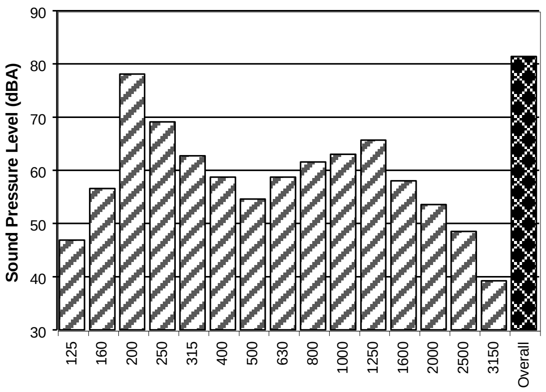
Frequency analysis is the process used to examine the tones (or frequency components) which make up the overall noise or vibration signal. This analysis was traditionally carried out using analogue electronic filters, but is now normally carried out using Fast Fourier Transform (FFT) analysers.

The units for frequency are Hertz (Hz), which represent the number of cycles per second.

Frequency analysis can be in:

- Octave bands (where the centre frequency and width of each band is double the previous band)
- 1/3 octave bands (3 bands in each octave band)
- Narrow band (where the spectrum is divided into 400 or more bands of equal width)

The following figure shows a 1/3 octave band frequency analysis where the noise is dominated by the 200 Hz band. Note that the indicated level of each individual band is less than the overall level, which is the logarithmic sum of the bands.



8 Vibration

Vibration may be defined as cyclic or transient motion. This motion can be measured in terms of its displacement, velocity or acceleration. Most assessments of human response to vibration or the risk of damage to buildings use measurements of vibration velocity. These may be expressed in terms of "peak" velocity or "rms" velocity.

The former is the maximum instantaneous velocity, without any averaging, and is sometimes referred to as "peak particle velocity", or PPV. The latter incorporates "root mean squared" averaging over some defined time period.

Vibration measurements may be carried out in a single axis or alternatively as triaxial measurements. Where triaxial measurements are used, the axes are commonly designated vertical, longitudinal (aligned toward the source) and transverse.

The common units for velocity are millimetres per second (mm/s). As with noise, decibel units can also be used, in which case the reference level should always be stated. A vibration level V, expressed in mm/s can be converted to decibels by the formula 20 log (V/V_o), where V_o is the reference level (10^{-9} m/s). Care is required in this regard, as other reference levels may be used by some organizations.

9 Human Perception of Vibration

People are able to "feel" vibration at levels lower than those required to cause even superficial damage to the most susceptible classes of building (even though they may not be disturbed by the motion). An individual's perception of motion or response to vibration depends very strongly on previous experience and expectations, and on other connotations associated with the perceived source of the vibration. For example, the vibration that a person responds to as "normal" in a car, bus or train is considerably higher than what is perceived as "normal" in a shop, office or dwelling.

10 Over-Pressure

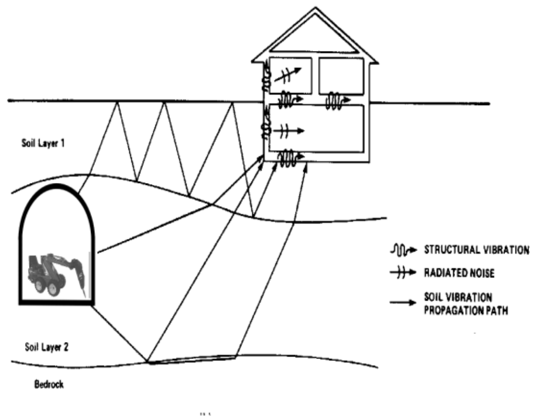
The term "over-pressure" is used to describe the air pressure pulse emitted during blasting or similar events. The peak level of an event is normally measured using a microphone in the same manner as linear noise (ie unweighted), at frequencies both in and below the audible range.

11 Ground-borne Noise, Structure-borne Noise and Regenerated Noise

Noise that propagates through a structure as vibration and is radiated by vibrating wall and floor surfaces is termed "structure-borne noise", "ground-borne noise" or "regenerated noise". This noise originates as vibration and propagates between the source and receiver through the ground and/or building structural elements, rather than through the air.

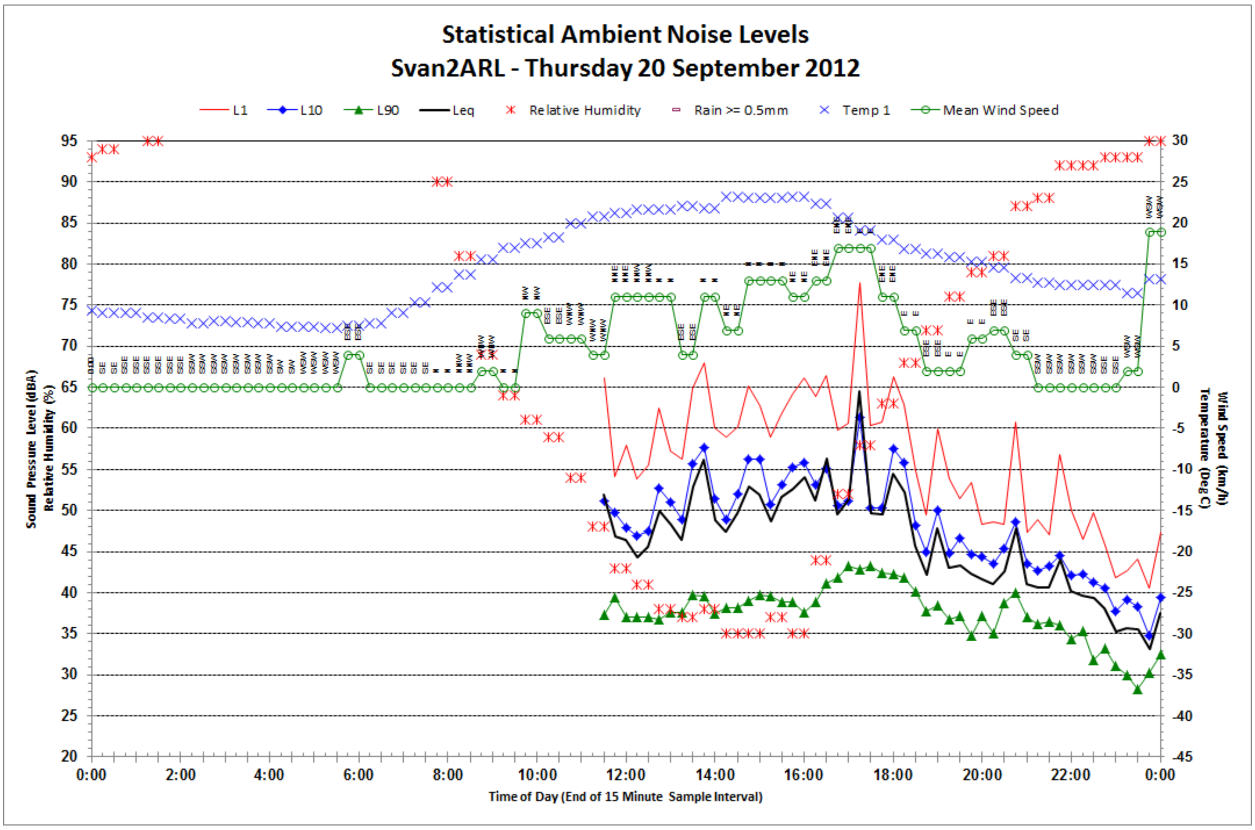
Typical sources of ground-borne or structure-borne noise include tunnelling works, underground railways, excavation plant (eg rockbreakers), and building services plant (eg fans, compressors and generators).

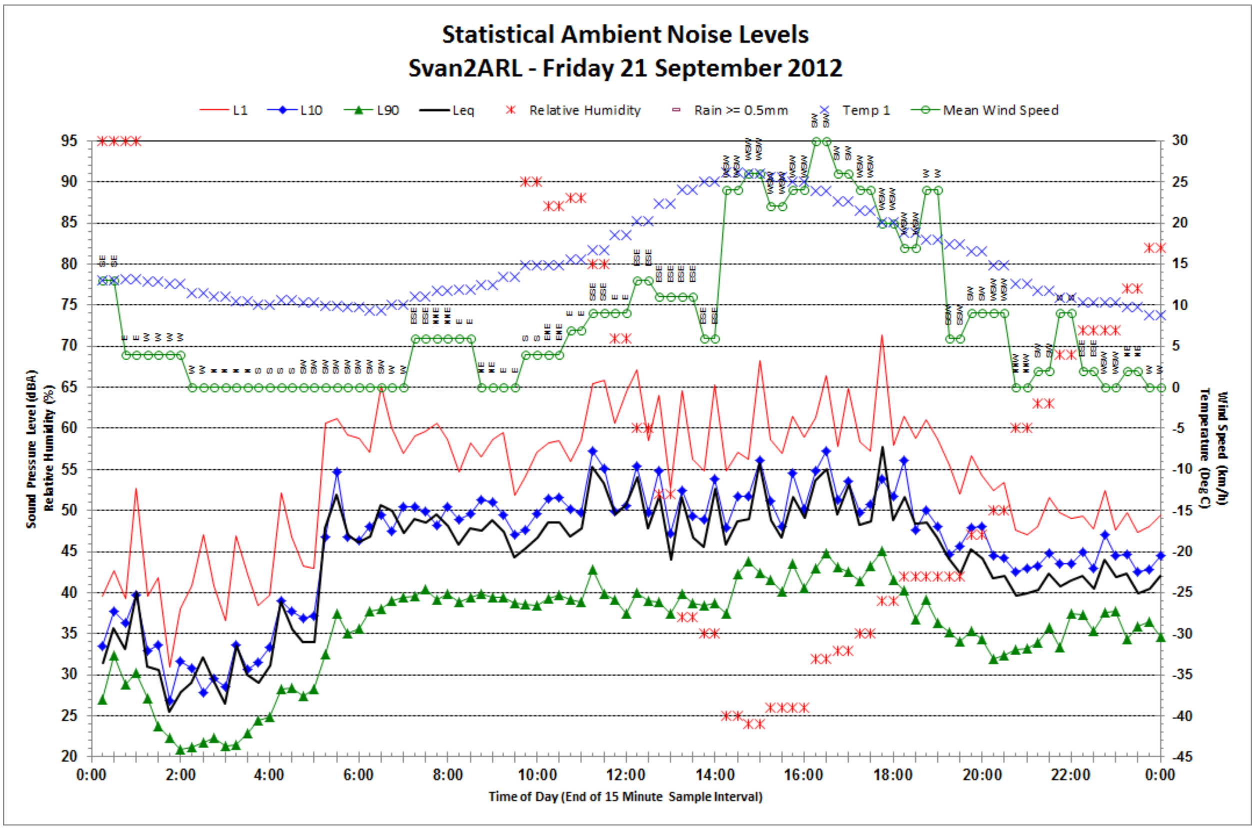
The following figure presents the various paths by which vibration and ground-borne noise may be transmitted between a source and receiver for construction activities occurring within a tunnel.



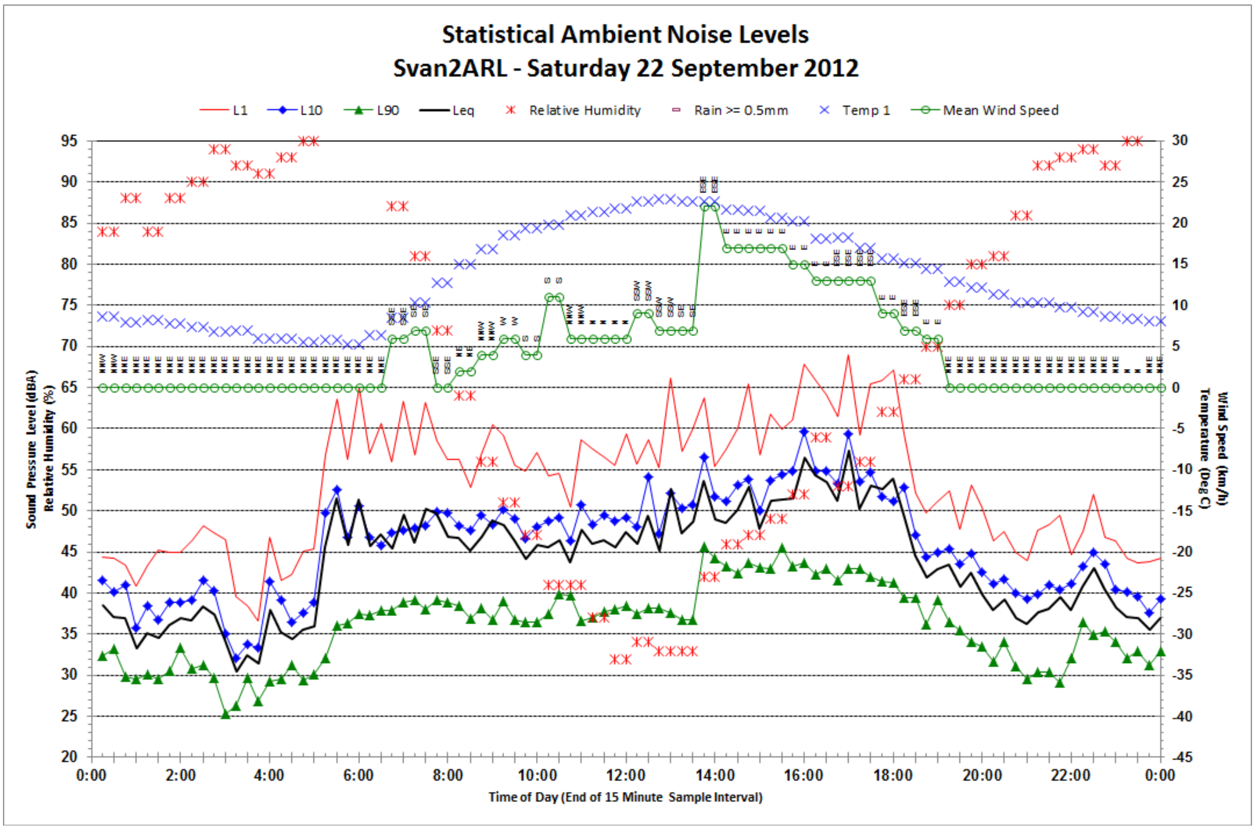
The term "regenerated noise" is also used in other instances where energy is converted to noise away from the primary source. One example would be a fan blowing air through a discharge grill. The fan is the energy source and primary noise source. Additional noise may be created by the aerodynamic effect of the discharge grill in the airstream. This secondary noise is referred to as regenerated noise.

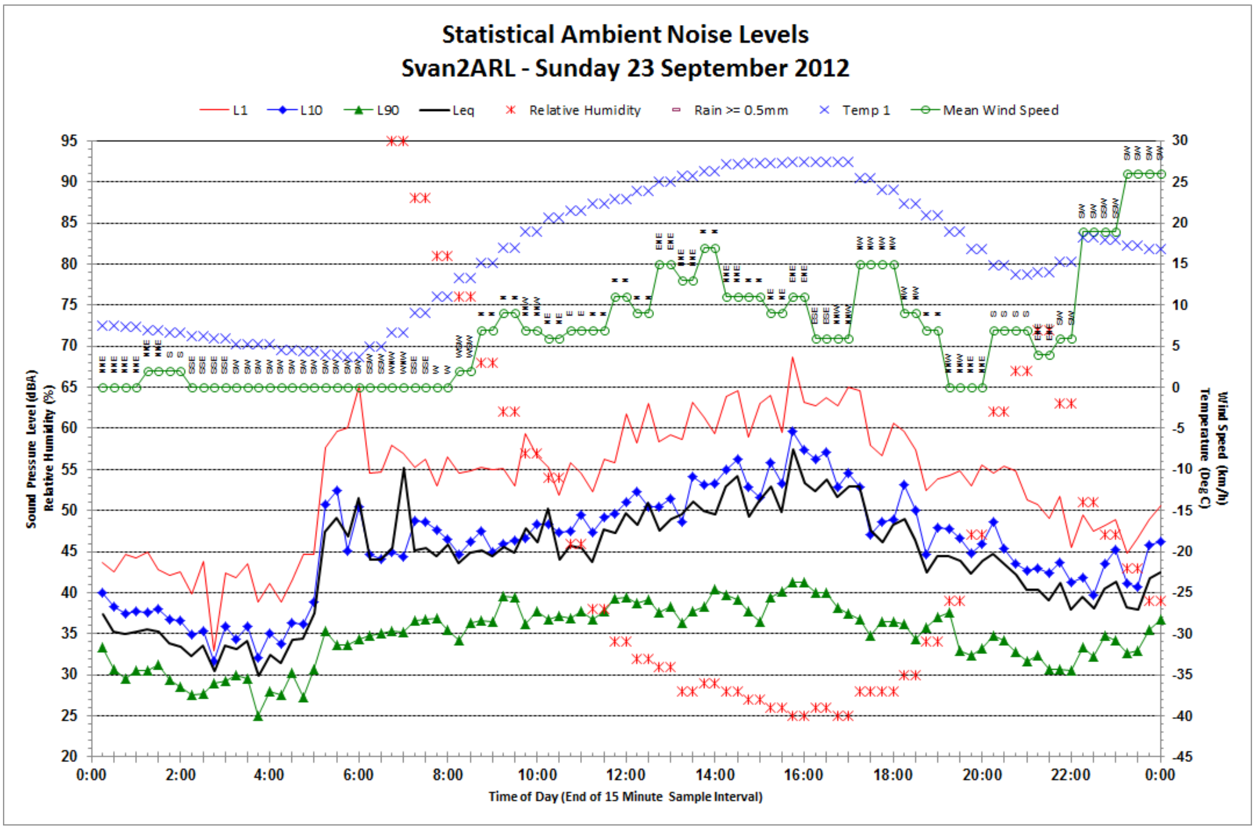
Logger One – s/n 20669

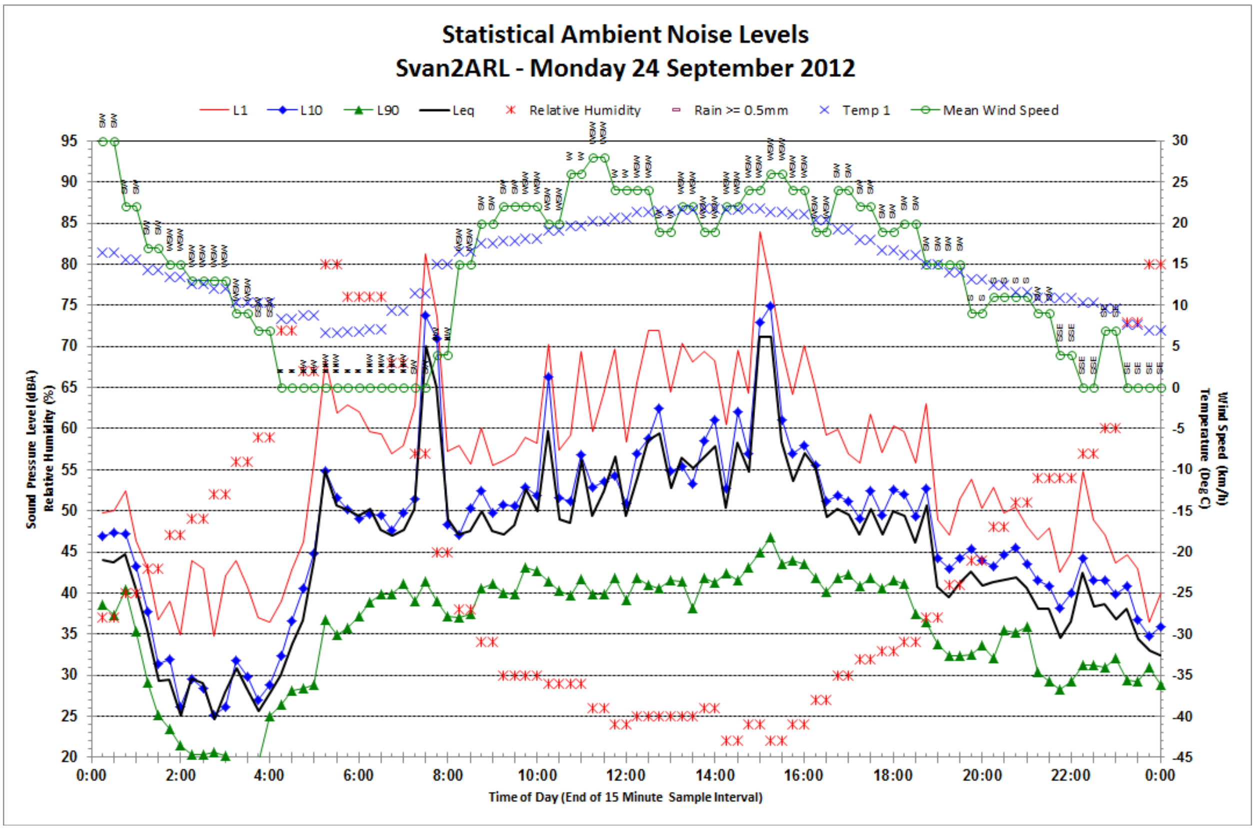


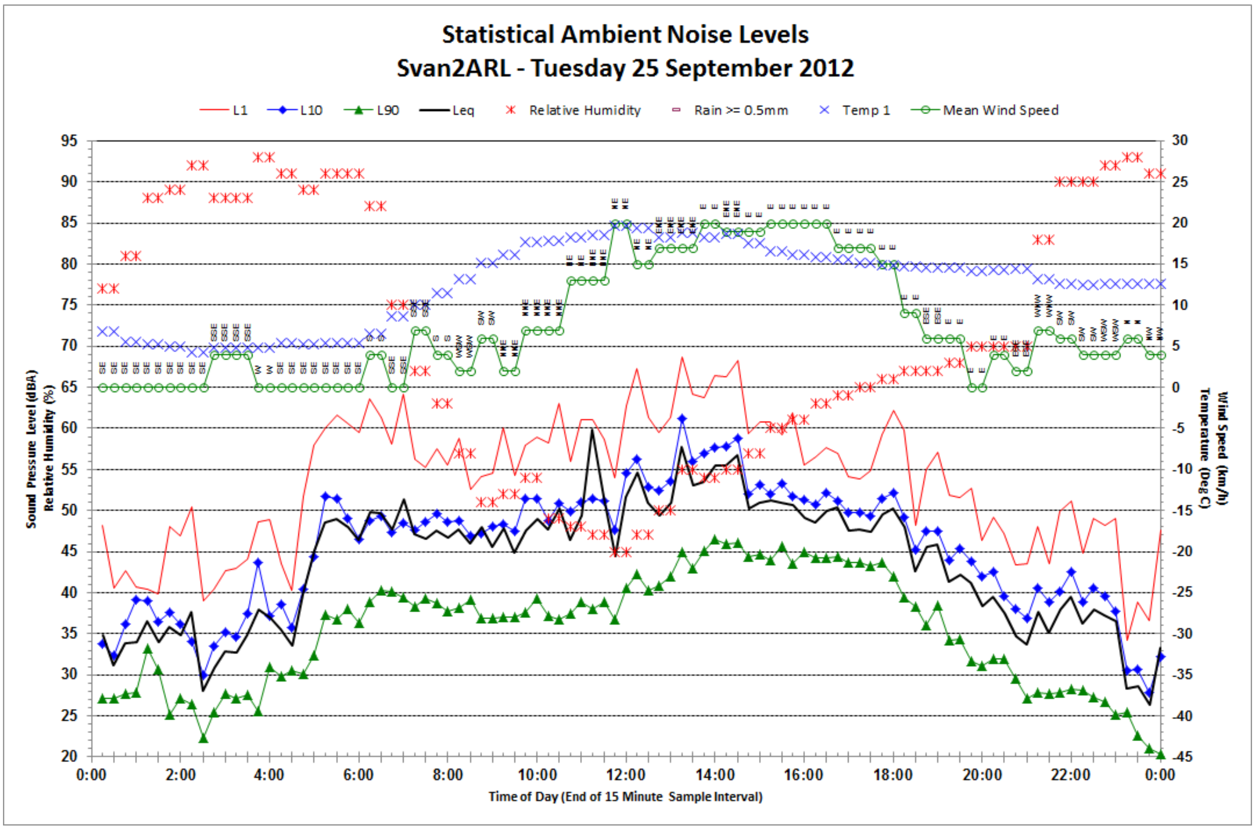


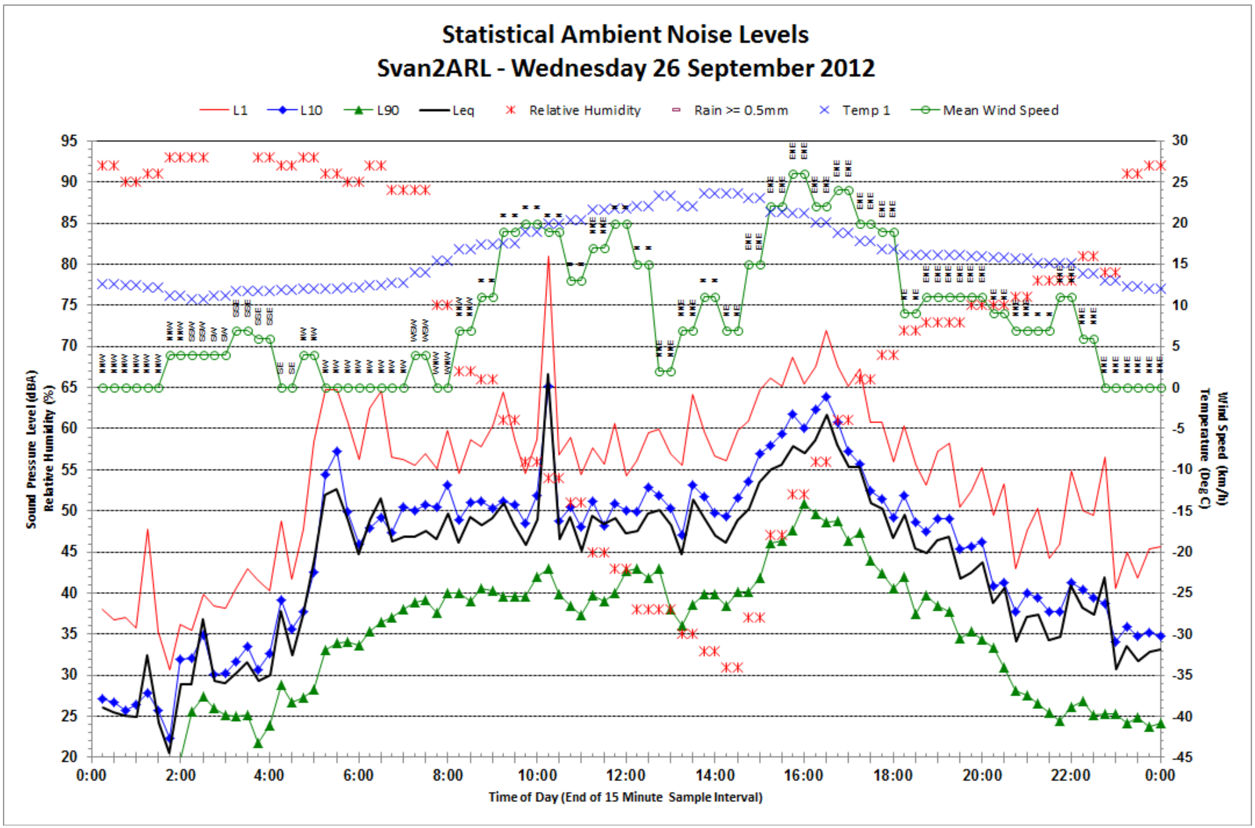
Noise Monitoring Graphs

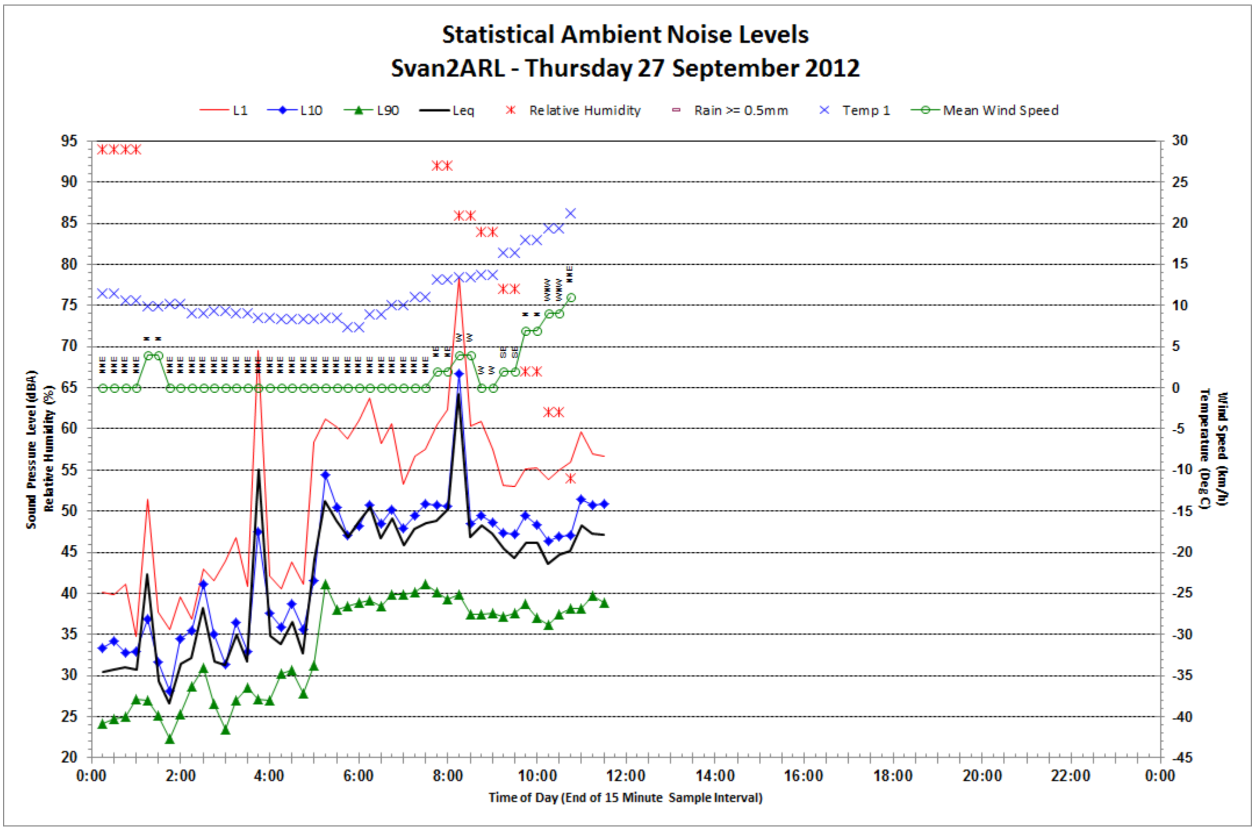




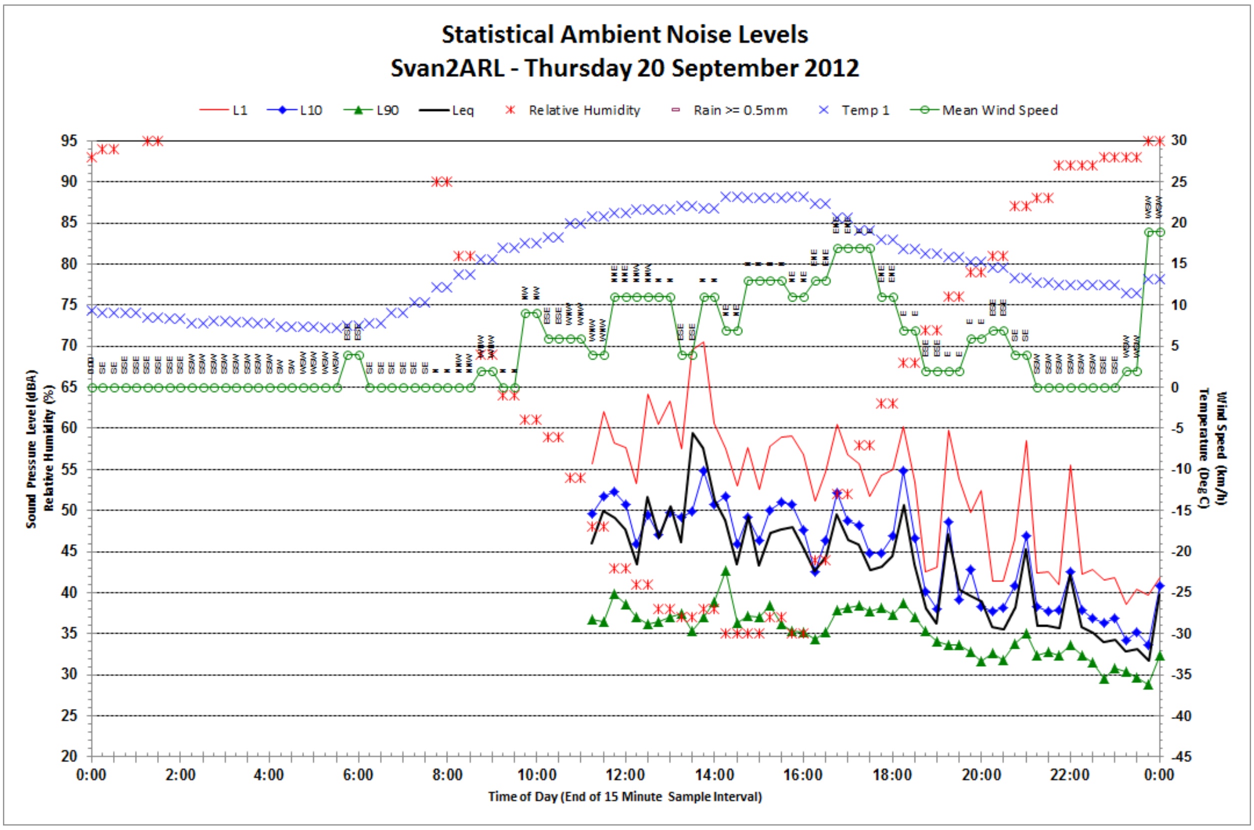

Statistical Ambient Noise Levels
Svan2ARL - Monday 24 September 2012
L1
L10
L90
Leq
Relative Humidity
Rain >= 0.5mm
Temp 1
Mean Wind Speed
Sound Pressure Level (dBA)
Relative Humidity (%)
Wind Speed (km/h)
Temperature (Deg C)
Time of Day (End of 15 Minute Sample Interval)

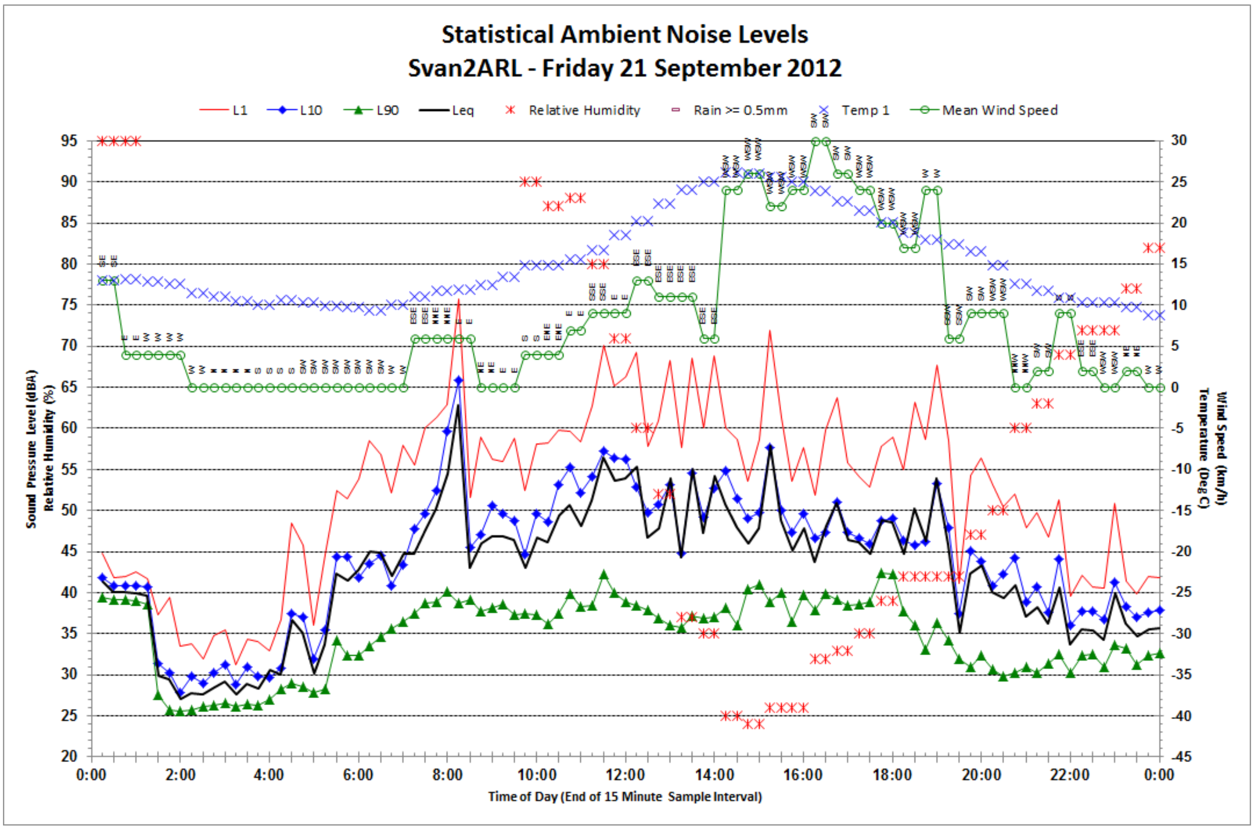

Statistical Ambient Noise Levels
Svan2ARL - Tuesday 25 September 2012
L1
L10
L90
Leq
Relative Humidity
Rain >= 0.5mm
Temp 1
Mean Wind Speed
Sound Pressure Level (dBA)
Relative Humidity (%)
Wind Speed (km/h)
Temperature (Deg C)
Time of Day (End of 15 Minute Sample Interval)


Statistical Ambient Noise Levels
Svan2ARL - Wednesday 26 September 2012
L1
L10
L90
Leq
Relative Humidity
Rain >= 0.5mm
Temp 1
Mean Wind Speed
Sound Pressure Level (dBA)
Relative Humidity (%)
Wind Speed (km/h)
Temperature (Deg C)
Time of Day (End of 15 Minute Sample Interval)

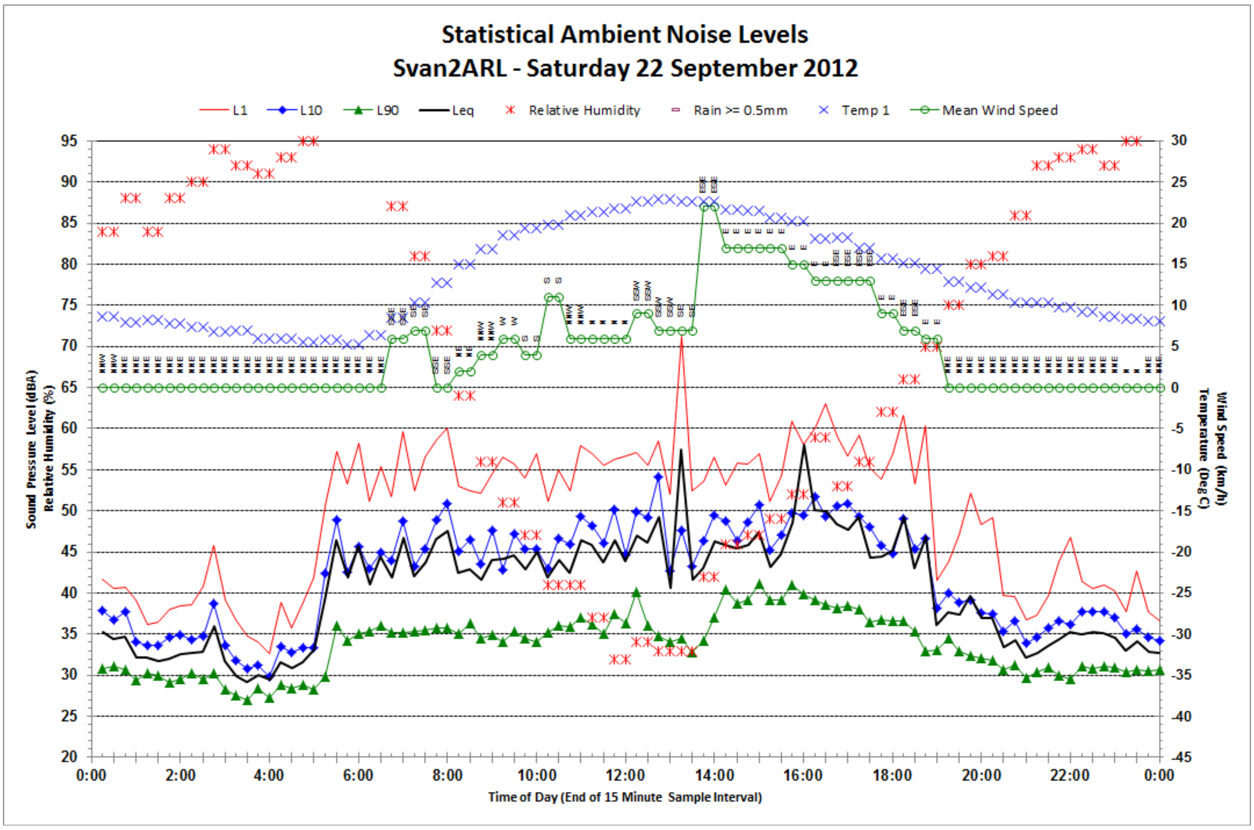

Statistical Ambient Noise Levels
Svan2ARL - Thursday 27 September 2012
L1
L10
L90
Leq
Relative Humidity
Rain >= 0.5mm
Temp 1
Mean Wind Speed
Sound Pressure Level (dBA)
Relative Humidity (%)
Wind Speed (km/h)
Temperature (Deg C)
Time of Day (End of 15 Minute Sample Interval)

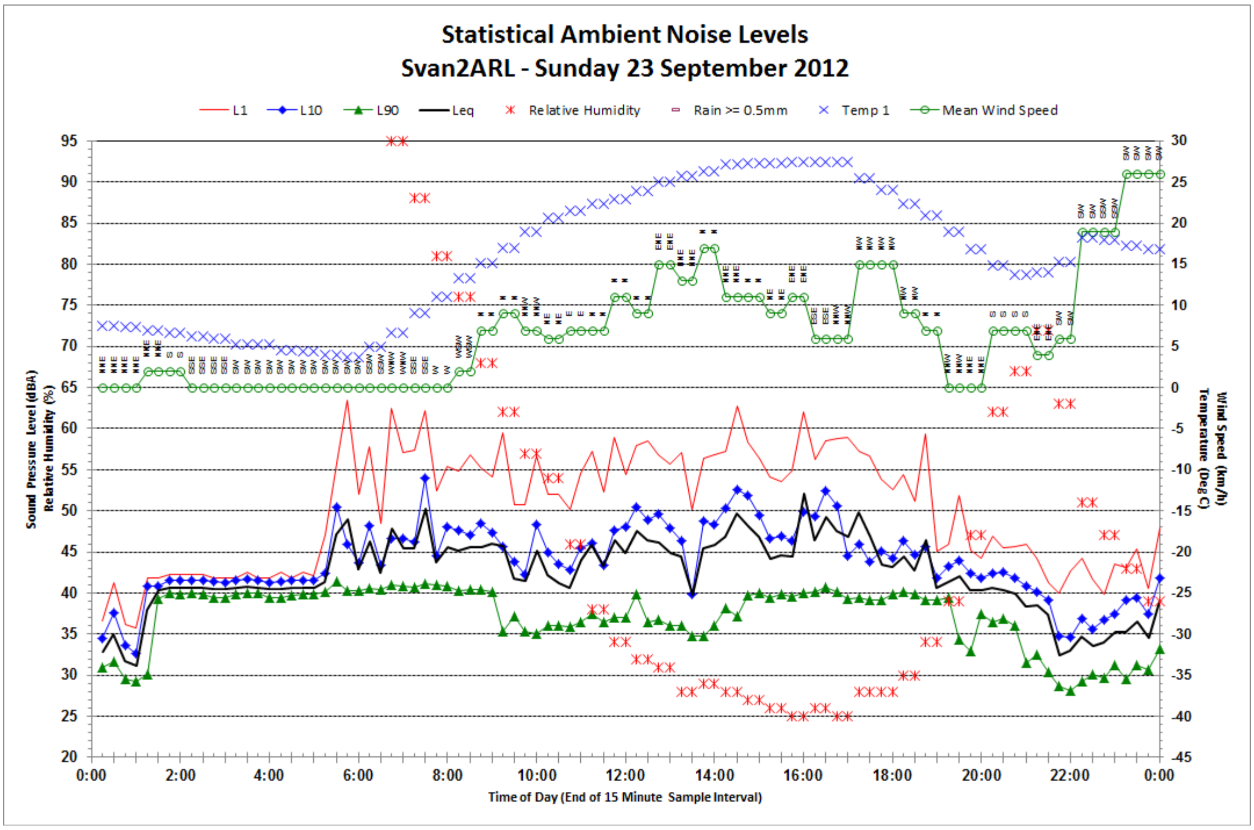
Logger Two – s/n 23815



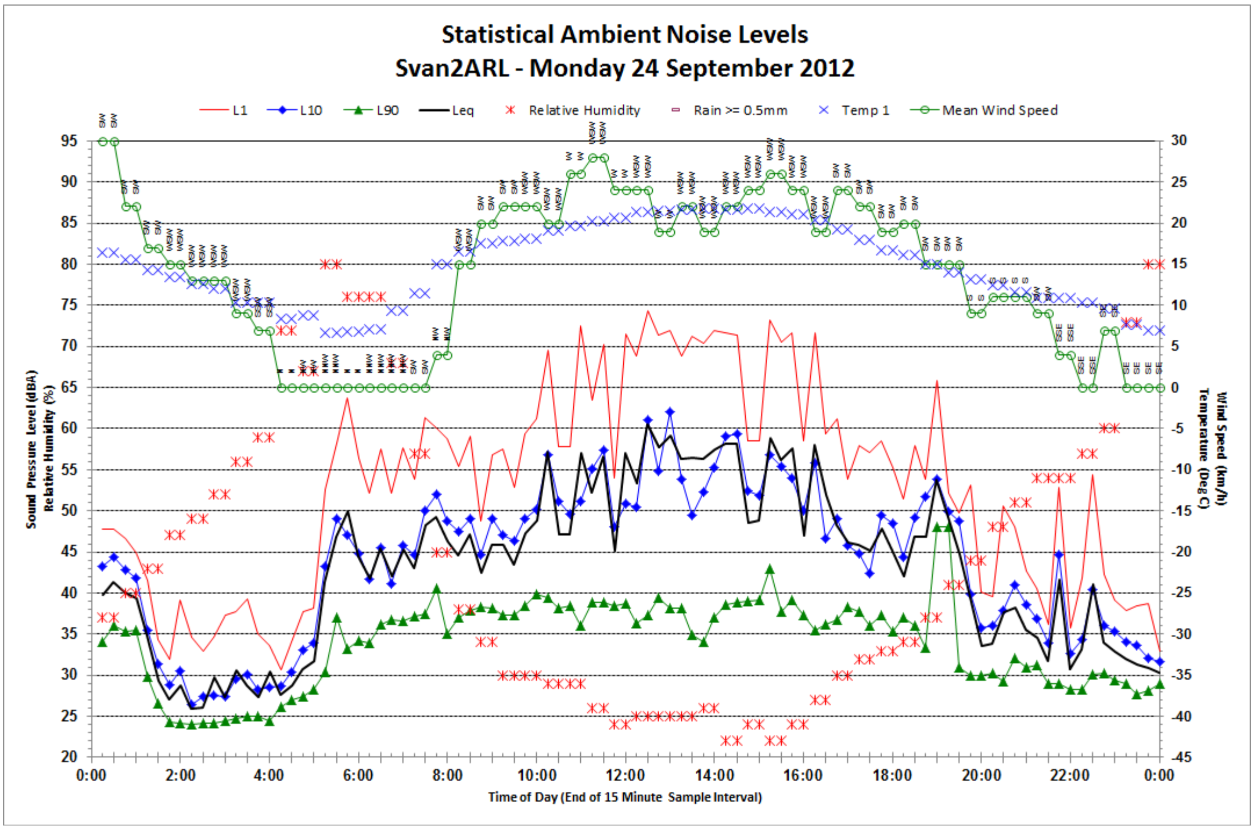


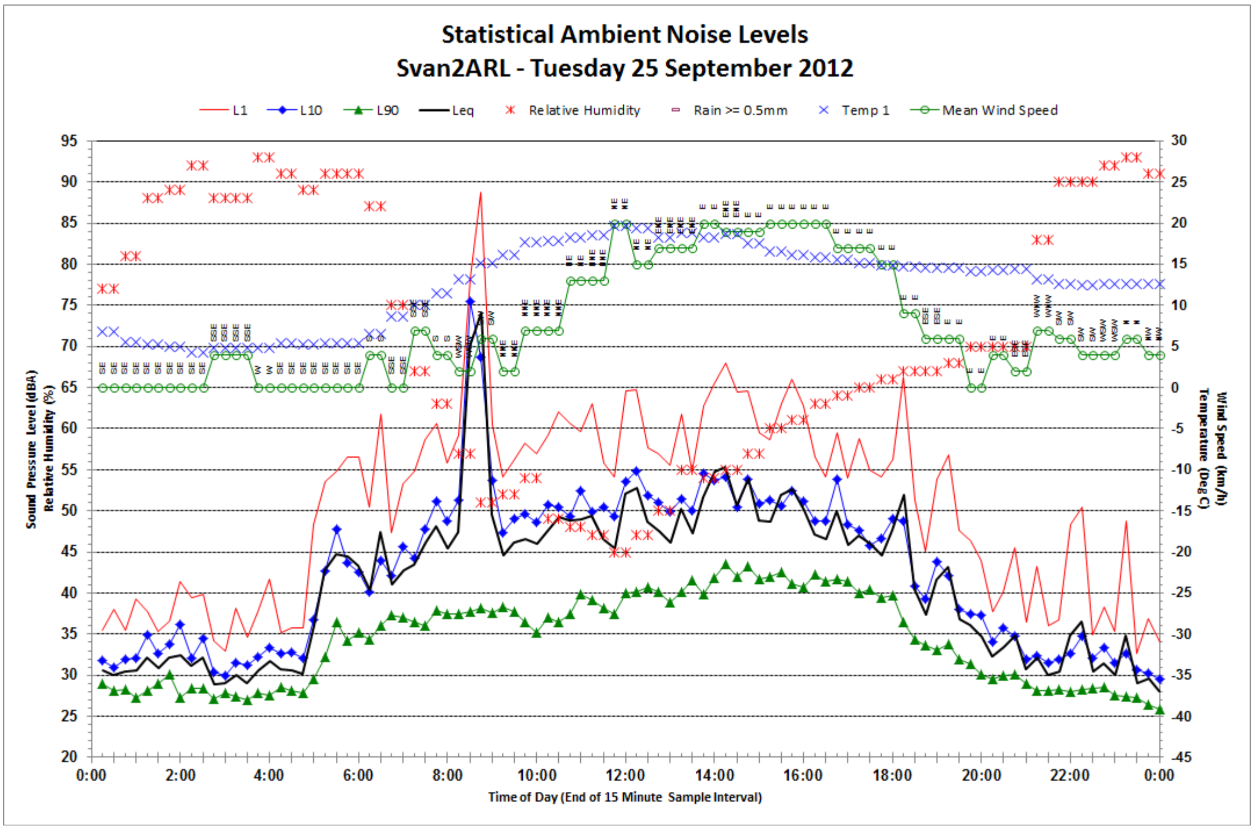
Noise Monitoring Graphs

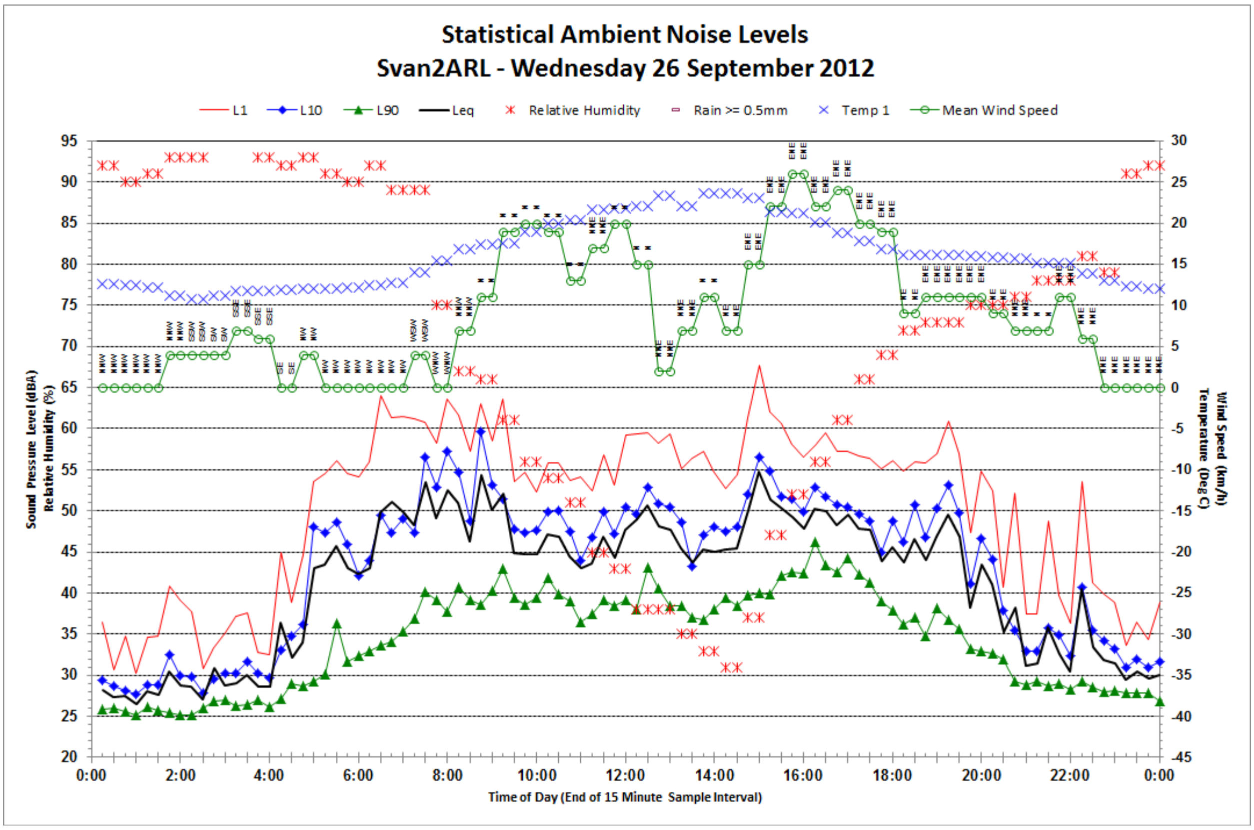




Noise Monitoring Graphs



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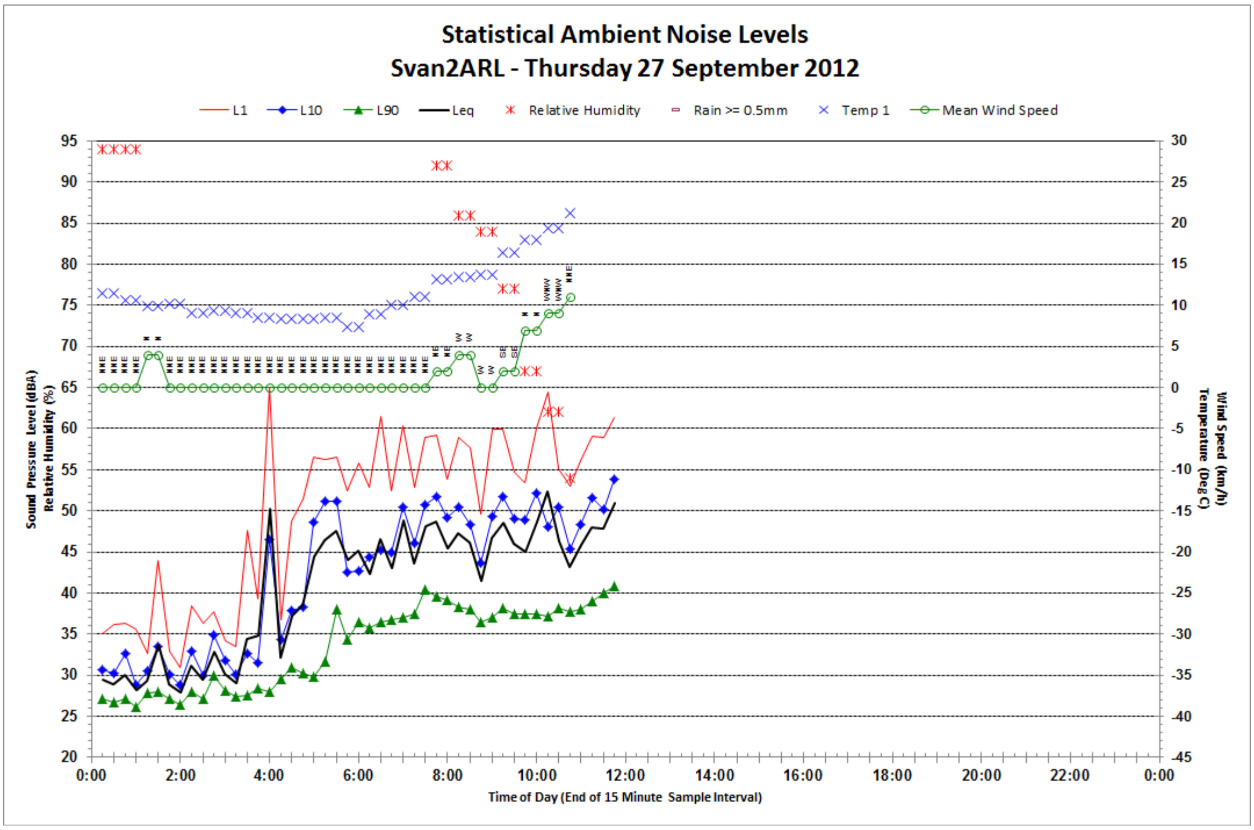
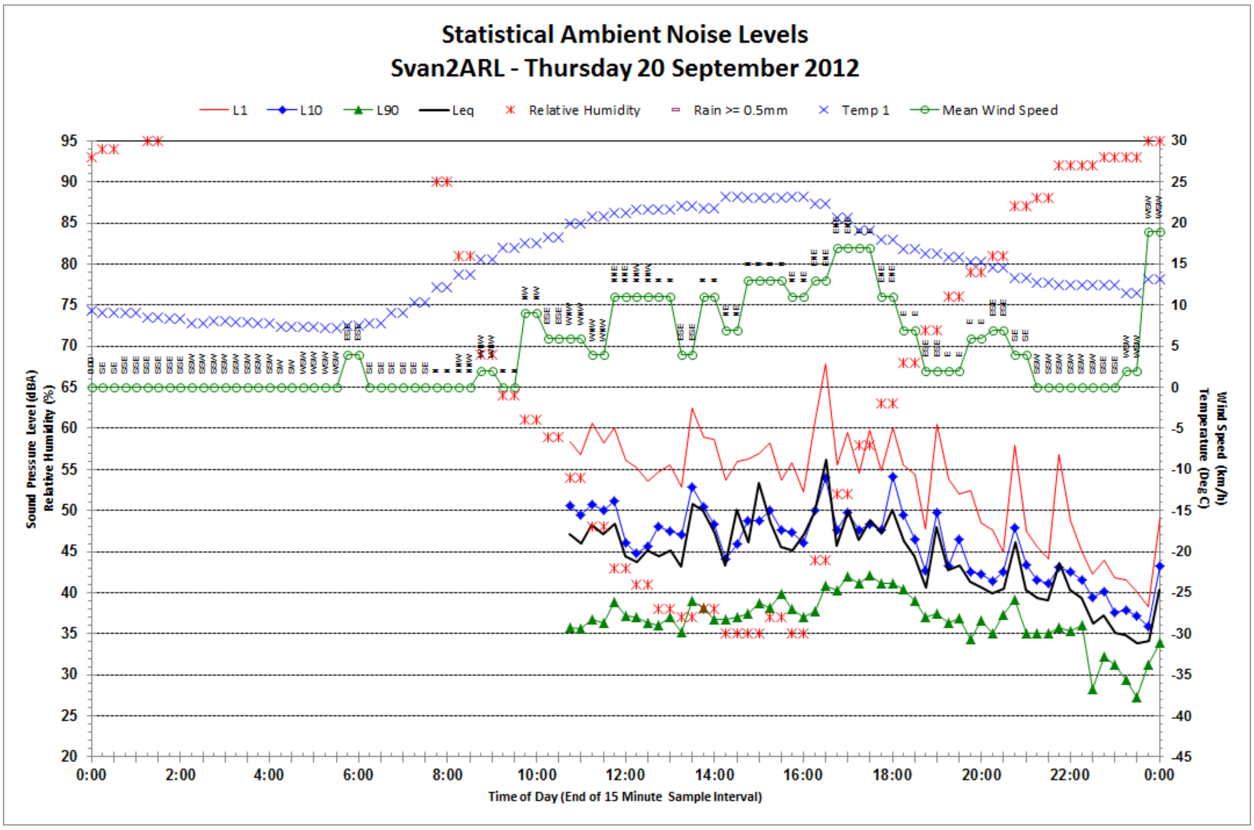
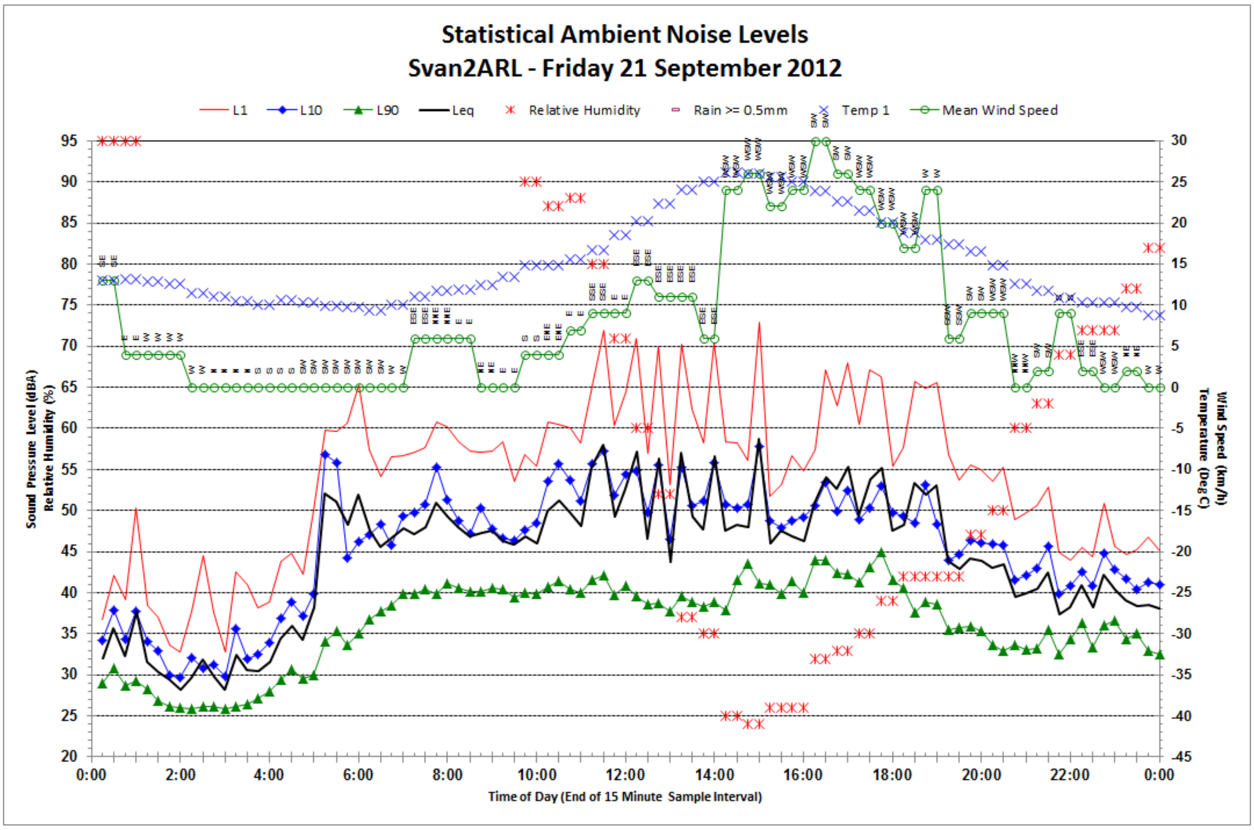
Relative Humidity (%)
Wind Speed (km/h)
Temperature (Deg C)
Time of Day (End of 15 Minute Sample Interval)

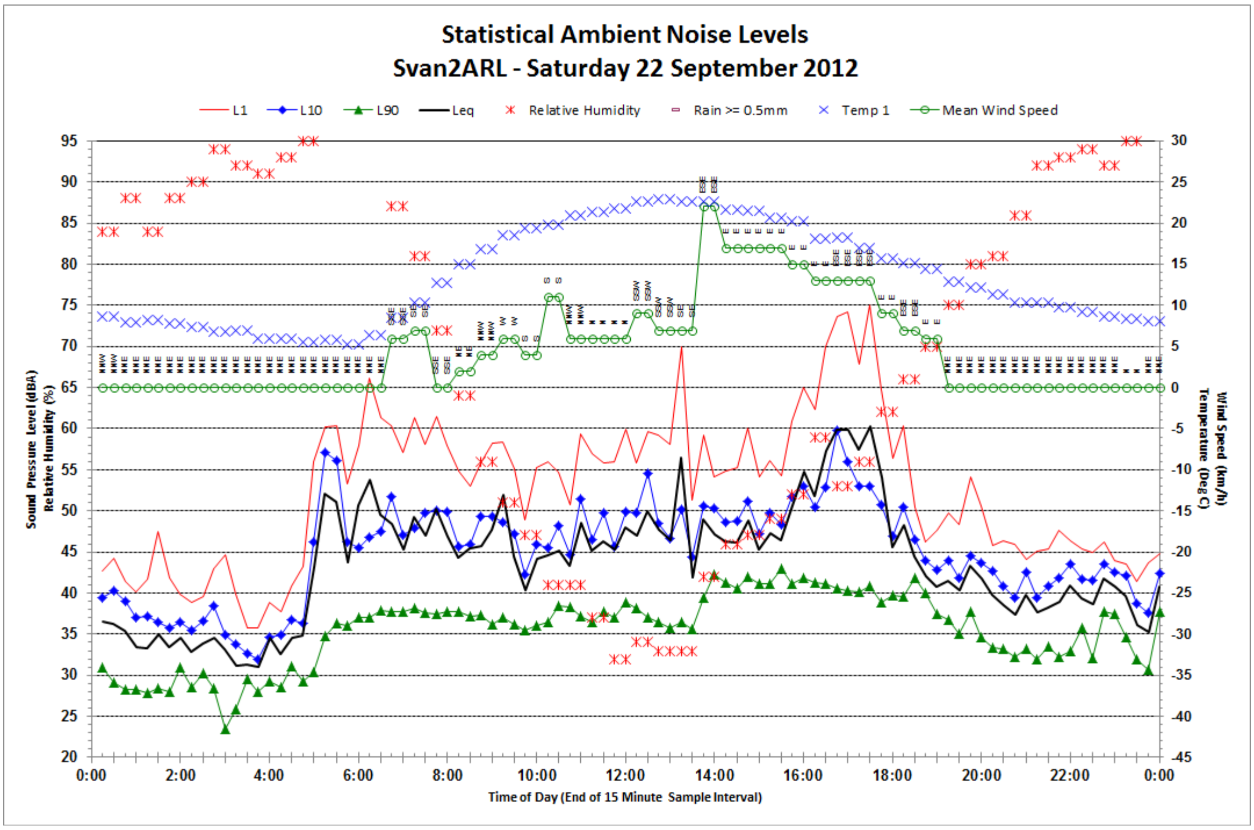

Statistical Ambient Noise Levels
Svan2ARL - Thursday 27 September 2012
L1
L10
L90
Leq
Relative Humidity
Rain >= 0.5mm
Temp 1
Mean Wind Speed
Sound Pressure Level (dBA)
Relative Humidity (%)
Wind Speed (km/h)
Temperature (Deg C)
Time of Day (End of 15 Minute Sample Interval)

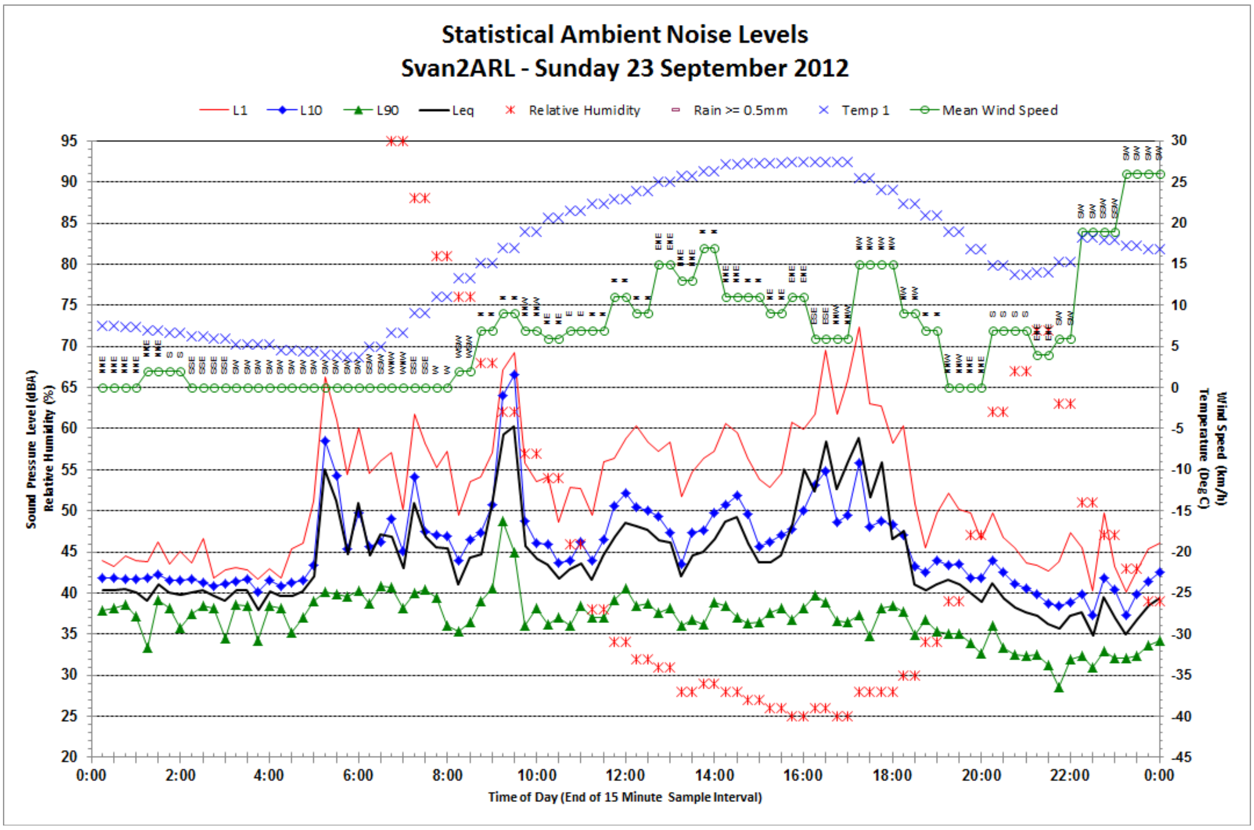
Logger Three – s/n 23244



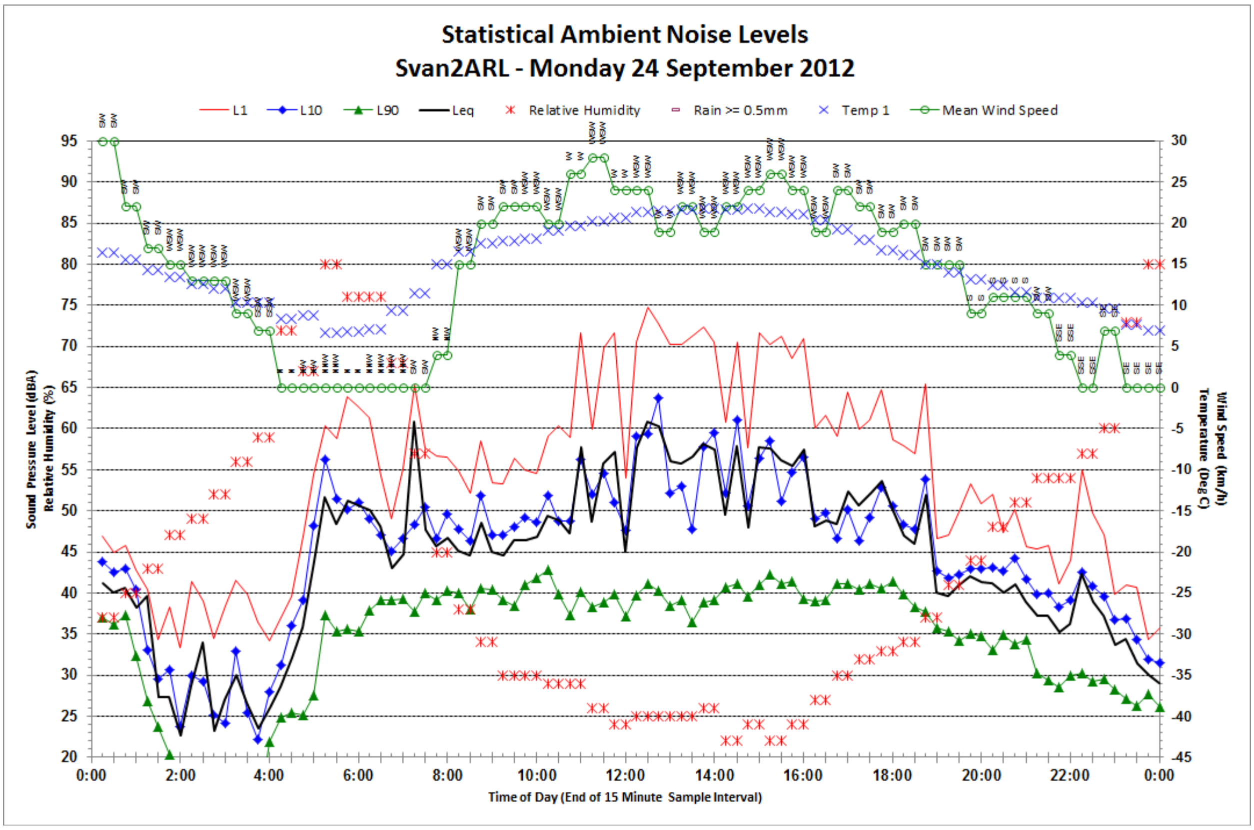


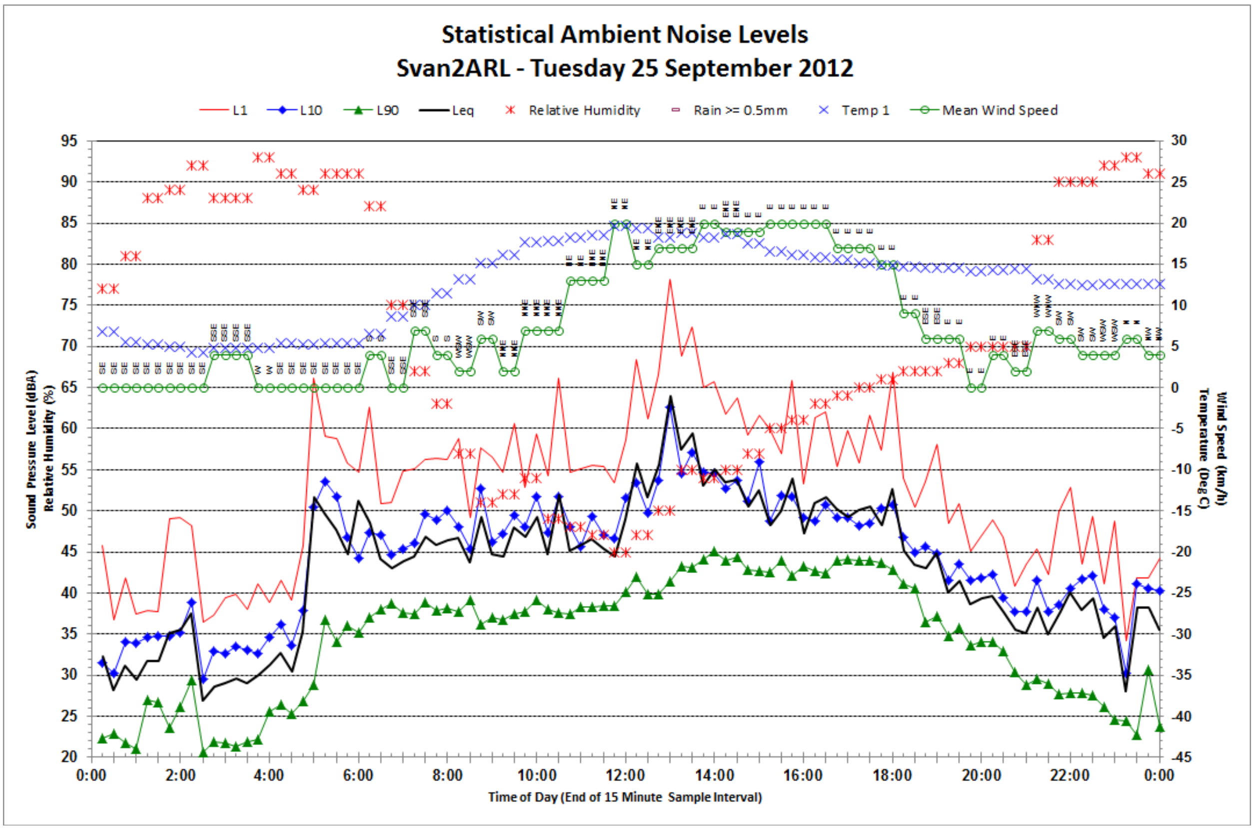
Noise Monitoring Graphs

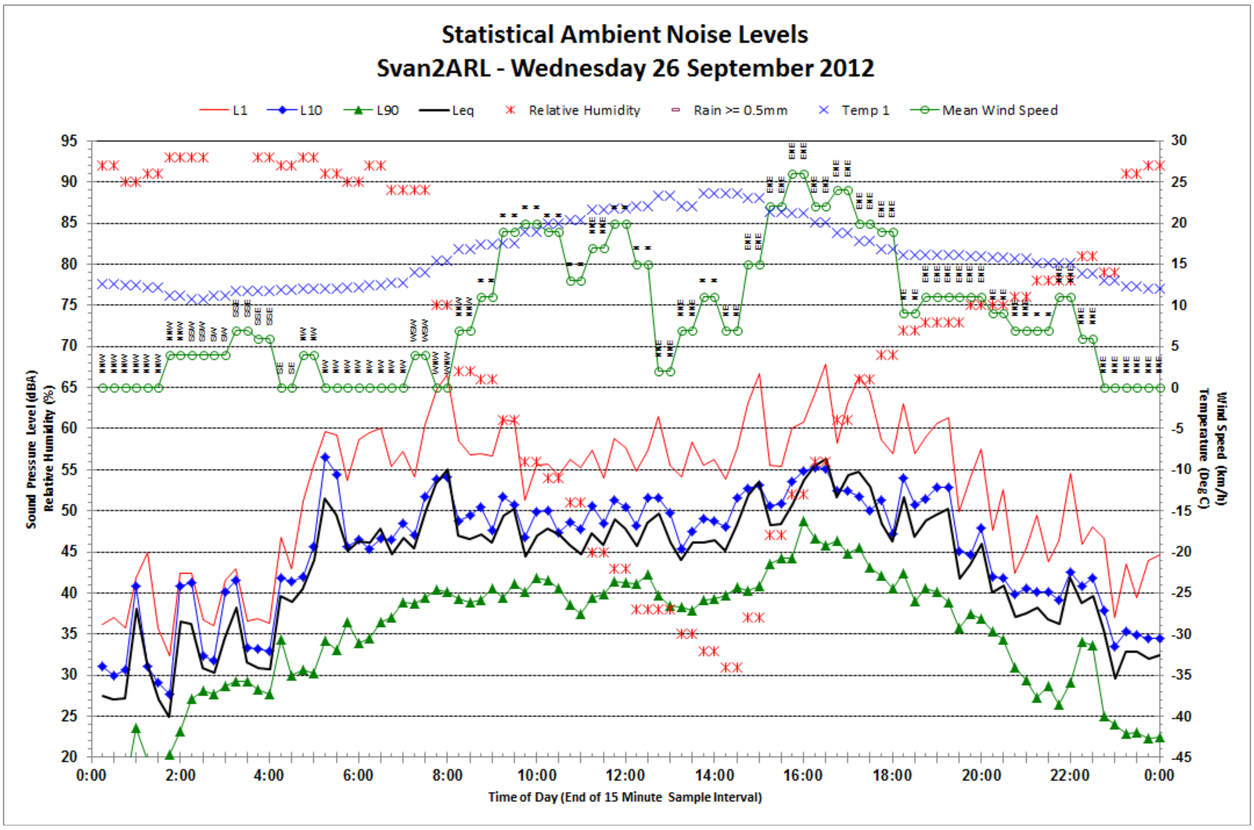


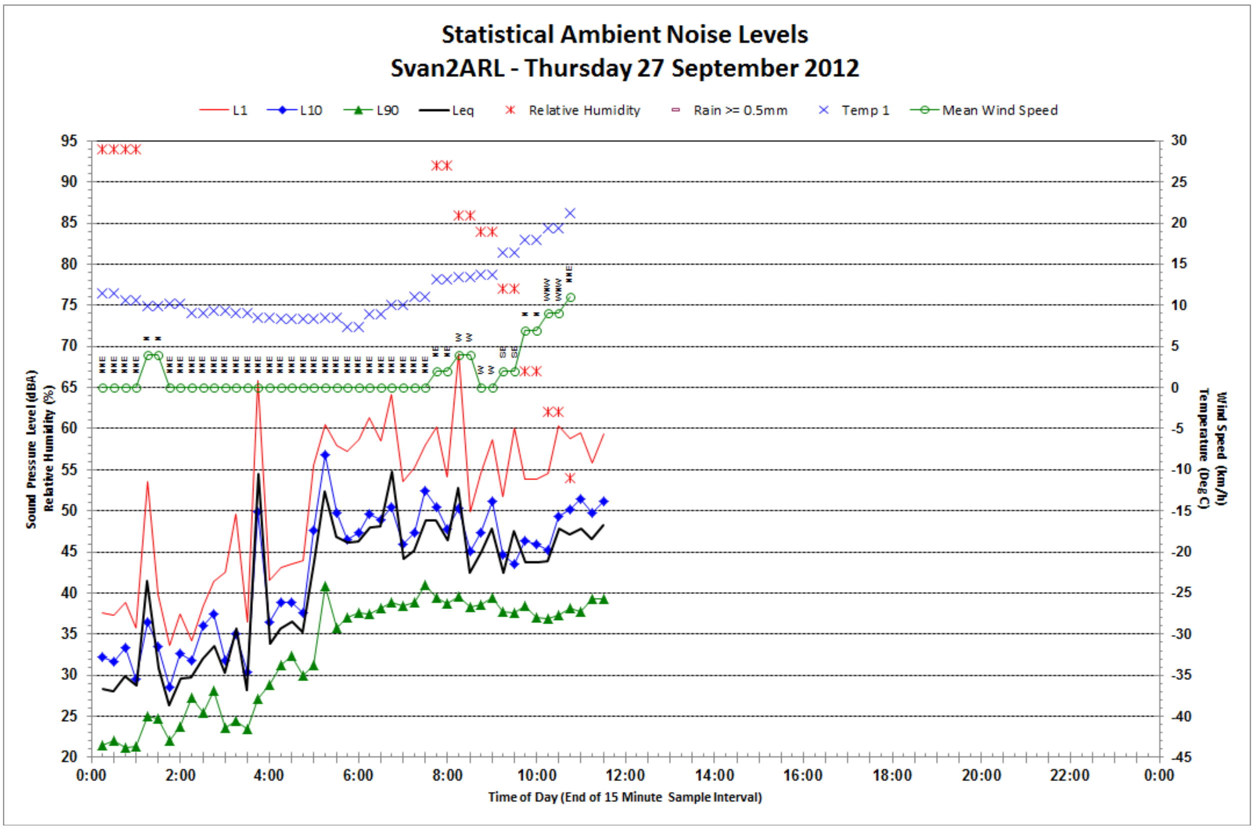


Noise Monitoring Graphs

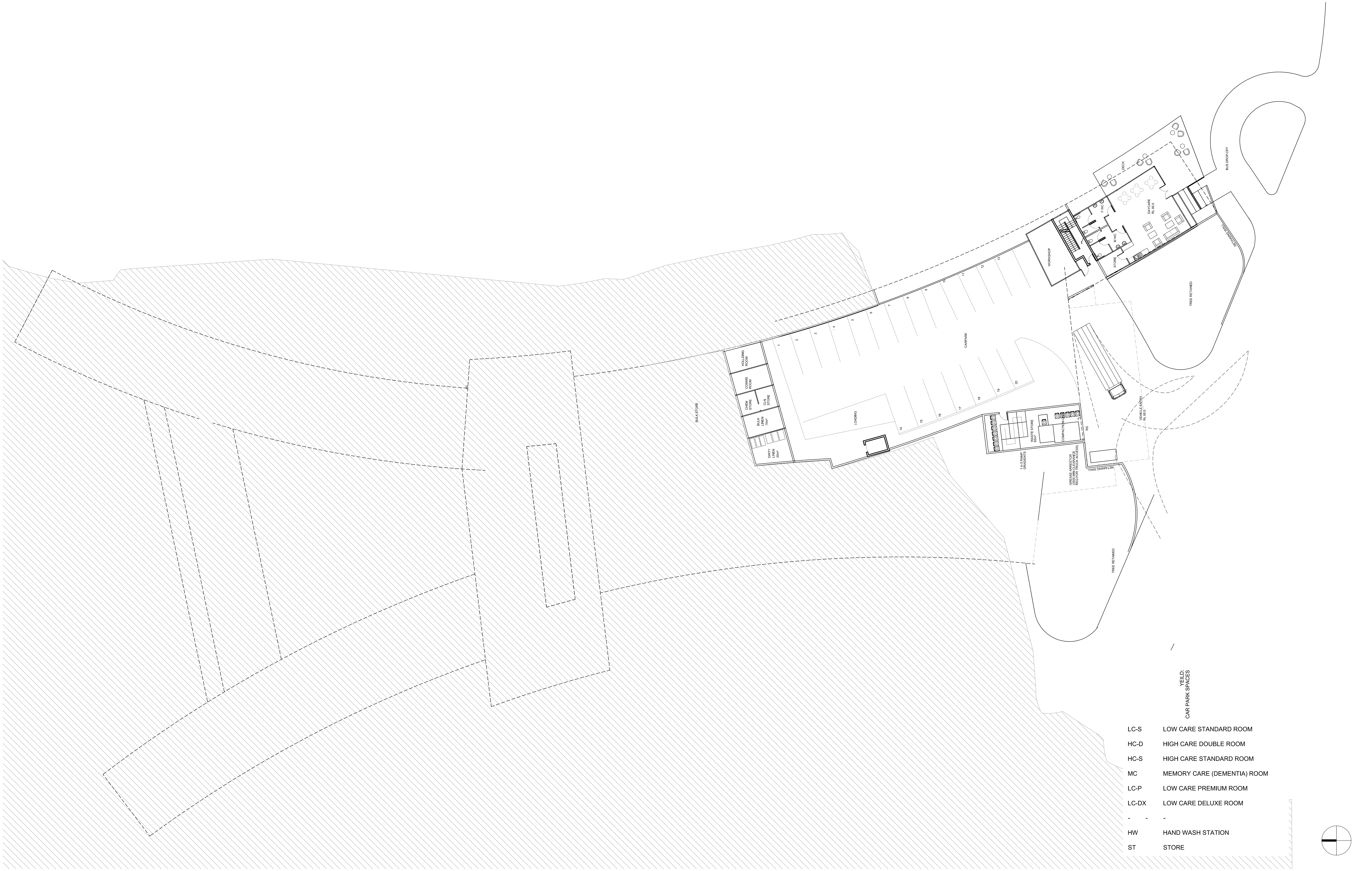





Statistical Ambient Noise Levels
Svan2ARL - Wednesday 26 September 2012
L1
L10
L90
Leq
Relative Humidity
Rain >= 0.5mm
Temp 1
Mean Wind Speed
Sound Pressure Level (dBA)
Relative Humidity (%)
Wind Speed (km/h)
Temperature (Deg C)
Time of Day (End of 15 Minute Sample Interval)


Statistical Ambient Noise Levels
Svan2ARL - Thursday 27 September 2012
L1
L10
L90
Leq
Relative Humidity
Rain >= 0.5mm
Temp 1
Mean Wind Speed
Sound Pressure Level (dBA)
Relative Humidity (%)
Wind Speed (km/h)
Temperature (Deg C)
Time of Day (End of 15 Minute Sample Interval)

Preliminary Site Plans



YEILD:
CAR PARK SPACES

LC-S	LOW CARE STANDARD ROOM
HC-D	HIGH CARE DOUBLE ROOM
HC-S	HIGH CARE STANDARD ROOM
MC	MEMORY CARE (DEMENTIA) ROOM
LC-P	LOW CARE PREMIUM ROOM
LC-DX	LOW CARE DELUXE ROOM
- -	-
HW	HAND WASH STATION
ST	STORE

AMENDMENTS

ISSUE	DESCRIPTION	APPROVED	SIGNED	DATE
P1	FOR INFORMATION	JG		30-03-2012
P2	FOR INFORMATION	DHU		10-04-2012

THIS DRAWING ISSUE HAS BEEN REVIEWED FOR

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DIRECTOR

PROJECT ARCHITECT

CONSULTANTS

BLACKETT MAGUIRE & GOLDSMITH
David Blackett
T: (02) 9211 7777 E: david@bmplusg.com.au

MOTT MACDONALD HUGHES TRUEMAN
John Williams
T: (02) 9439 2633 E: jwilliams@hughestrueman.com.au

ACCESSIBLE BUILDING SOLUTION
Howard Moutrie
124 Upper Washington Drive, Bonnet Bay NSW 2226
T: (02) 95280276 E: hmoutrie@optusnet.com.au

PLANNING STRATEGIES
Michael Brown
Suite 5, Harrington Plaza, Fairwater Drive, Harrington Park, NSW 2567
T: (02) 0418620718 E: michael@michaelbrown.com.au

ENERGIA DESIGNS
Suruchi Pathak
3 Winter Avenue, Kellyville NSW 2155
T: (02) 96292977 **E: admin@**energiadesign.com.au

CLIENT
CARRINGTON CENTENNIAL CARE
02 9458 0220

LOWER CARPARK FLOOR PLAN
-

DATE	SCALE @ B1	DRAWN
30 MAR 2012	1:200	DHU

PROJECT NUMBER	DRAWING No.	ISSUE
2011077	DA100	P2

PROJECT
PALING COURT RACF,
CAMDEN, NSW

Jackson Teece Architecture
744 Hunter Street
Newcastle West New South Wales 2302 Australia
T 61 2 4969 5199 F 61 2 4969 6177
E newcastle@jacksonteece.com
Jackson Teece Chesterman Willis Pty Ltd
Trading as Jackson Teece
ABN 15 083 837 290
Nominated Architect Ian Brodie (4275)

JACKSON TEECE

AMENDMENTS

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John Williams
T: (02) 9439 2633 E: jwilliams@hughestrueman.com.au

ACCESSIBLE BUILDING SOLUTION
Howard Moutrie
124 Upper Washington Drive, Bonnet Bay NSW 2226
T: (02) 95280276 E: hmoutrie@optusnet.com.au

PLANNING STRATEGIES
Michael Brown
Suite 5, Harrington Plaza, Fairwater Drive, Harrington Park, NSW 2567
T: (02) 0418620718 E: michael@michaelbrown.com.au

ENERGIA DESIGNS
Suruchi Pathak
3 Winter Avenue, Kellyville NSW 2155
T: (02) 96292977 E: admin@energiadesign.com.au

CLIENT
CARRINGTON CENTENNIAL CARE
02 9458 0220

LOWER GROUND FLOOR PLAN
-

DATE	SCALE @ B1	DRAWN
30 MAR 2012	1:200	DHU
PROJECT NUMBER	**DRAWING No.**	**ISSUE**
2011077	**DA101**	**P2**

PROJECT
PALING COURT RACF,
CAMDEN, NSW

Jackson Teece Architecture
744 Hunter Street
Newcastle West New South Wales 2302 Australia
T 61 2 4969 5199 F 61 2 4969 6177
E newcastle@jacksonteece.com
Jackson Teece Chesterman Willis Pty Ltd
Trading as Jackson Teece
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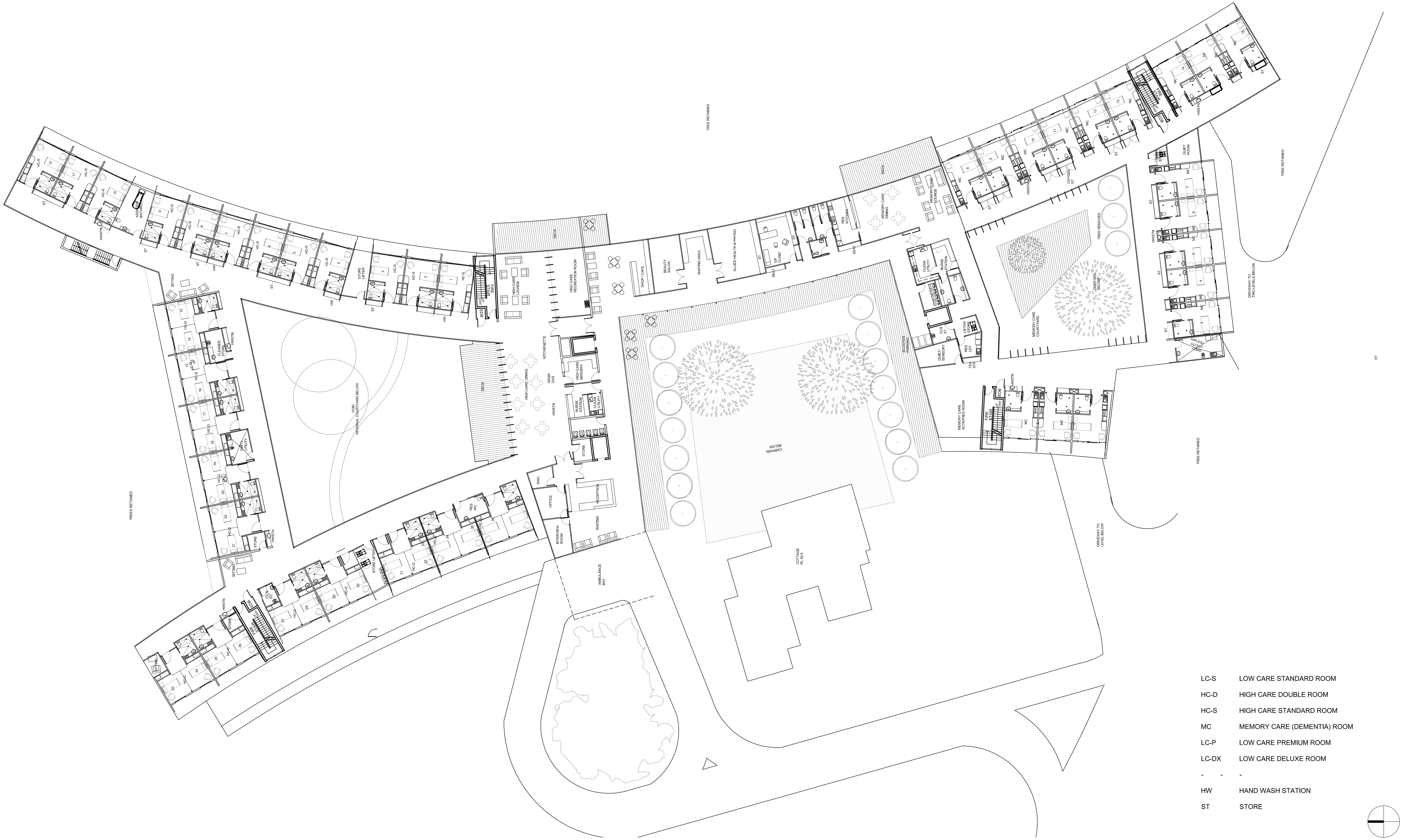
JACKSON TEECE



LC-S	LOW CARE STANDARD ROOM
HC-D	HIGH CARE DOUBLE ROOM
HC-S	HIGH CARE STANDARD ROOM
MC	MEMORY CARE (DEMENTIA) ROOM
LC-P	LOW CARE PREMIUM ROOM
LC-DX	LOW CARE DELUXE ROOM
- -	-
HW	HAND WASH STATION
ST	STORE

AMENDMENTS

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PROJECT ARCHITECT

CONSULTANTS

BLACKETT MAGUIRE & GOLDSMITH
David Blackett
T: (02) 9211 7777 E: david@bmplusg.com.au

MOTT MACDONALD HUGHES TRUEMAN
John Williams
T: (02) 9439 2633 E: jwilliams@hughestrueman.com.au

ACCESSIBLE BUILDING SOLUTION
Howard Moutrie
124 Upper Washington Drive, Bonnet Bay NSW 2226
T: (02) 95280276 E: hmoutrie@optusnet.com.au

PLANNING STRATEGIES
Michael Brown
Suite 5, Harrington Plaza, Fairwater Drive, Harrington Park, NSW 2567
T: (02) 0418620718 E: michael@michaelbrown.com.au

ENERGIA DESIGNS
Suruchi Pathak
3 Winter Avenue, Kellyville NSW 2155
T: (02) 96292977 **E: admin@**energiadesign.com.au

CLIENT
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02 9458 0220

UPPER GROUND FLOOR PLAN
-

DATE	SCALE @ B1	DRAWN
30 MAR 2012	1:200	DHU

PROJECT NUMBER	DRAWING No.	ISSUE
2011077	DA102	P2

PROJECT
PALING COURT RACF,
CAMDEN, NSW

Jackson Teece Architecture
744 Hunter Street
Newcastle West New South Wales 2302 Australia
T 61 2 4969 5199 F 61 2 4969 6177
E newcastle@jacksonteece.com
Jackson Teece Chesterman Willis Pty Ltd
Trading as Jackson Teece
ABN 15 083 837 290
Nominated Architect Ian Brodie (4275)

JACKSON TEECE

LC-S	LOW CARE STANDARD ROOM
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HC-S	HIGH CARE STANDARD ROOM
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LC-P	LOW CARE PREMIUM ROOM
LC-DX	LOW CARE DELUXE ROOM
- -	-
HWS	HAND WASH STATION
ST	STORE

AMENDMENTS

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PROJECT ARCHITECT

CONSULTANTS

BLACKETT MAGUIRE & GOLDSMITH
David Blackett
T: (02) 9211 7777 E: david@bmplusg.com.au

MOTT MACDONALD HUGHES TRUEMAN
John Williams
T: (02) 9439 2633 E: jwilliams@hughestrueman.com.au

ACCESSIBLE BUILDING SOLUTION
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124 Upper Washington Drive, Bonnet Bay NSW 2226
T: (02) 95280276 E: hmoutrie@optusnet.com.au

PLANNING STRATEGIES
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T: (02) 0418620718 E: michael@michaelbrown.com.au

ENERGIA DESIGNS
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T: (02) 96292977 **E: admin@energiadesign.com.au**

CLIENT
CARRINGTON CENTENNIAL CARE
02 9458 0220

FIRST FLOOR PLAN
-

DATE	SCALE @ B1	DRAWN
30 MAR 2012	1:200	DHU
PROJECT NUMBER	**DRAWING No.**	**ISSUE**
2011077	**DA103**	**P2**

PROJECT
PALING COURT RACF,
CAMDEN, NSW

Jackson Teece Architecture
744 Hunter Street
Newcastle West New South Wales 2302 Australia
T 61 2 4969 5199 F 61 2 4969 6177
E newcastle@jacksonteece.com
Jackson Teece Chesterman Willis Pty Ltd
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