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10 March 2021

SITE COMPATIBILITY STATEMENT (ACOUSTICS) FOX HILL GOLF CLUB CONCEPTUAL SENIORS LIVING DEVELOPMENT FOX HILL CRESCENT. PROSPECT.

1.0 INTRODUCTION

Atkins Acoustics was retained by *Integrated Projects* to assess potential exposure to external noise and prepare a Site Compatibility Statement for a conceptual Seniors Living development at Prospect. The conceptual proposal comprises fourteen (14) apartment buildings accommodating four hundred and five (405) apartments.

The development site is located off Fox Hill Crescent, Prospect *(Figure 1).* Site investigations revealed that the southern portion of the development area is exposed to road traffic noise from the Great Western Highway and the M4 Motorway. Traffic data provided in *RMS* reports and traffic counts confirm that the Highway generates in excess of 40,000 vehicles per day, 2021 traffic projections reported for the M4 are in excess of 100,000 vehicles per day.

2.0 ACOUSTIC DESIGN OBJECTIVES

For assessing noise amenity for future residential development exposed to traffic noise including Senior Living Developments, NSW Policies are referenced in the *State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004 (Clause 34)* and the *State Environmental Planning Policy (ISEPP) (Infrastructure) 2007 (Clause 102).*

SEPP (Housing for Seniors or People with a Disability) 2004 (Clause 34),

Referring to *Clause 34* the proposal should consider the visual and acoustic privacy of neighbours in the vicinity and residents by –

- *appropriate site planning, the location and design of windows and balconies, the use of screening devices and landscaping, and*

- *ensure acceptable noise levels in bedrooms of new dwellings by locating them away from driveways, parking areas and paths,*

SEPP (Infrastructure) 2007 (Clause 102).

The trigger point for the application of the *ISEPP* with respect to sensitive land use development adjacent to busy roads, is greater than 20,000 vehicles per day. *Clause 102* of *ISEPP* states that if a development is for residential use, the consent authority must be satisfied that appropriate design measures will be undertaken and the following *(Table 1)* internal L_{Aeq} design levels are satisfied:

Table 1. ISEPP Internal Noise Criteria - Road Traffic

Type of Occupancy	Sound Pressure Level LAeq, Period	Time Period
Sleeping Areas (bedrooms)	35	Night 10.00pm to 7.00am
Other habitable rooms (excl. garages, kitchens, bathrooms and hallways	40	Anytime

NOTE: $L_{Aeq\ 9\ hours}$ (night), $L_{Aeq\ 15\ hours}$ (day)

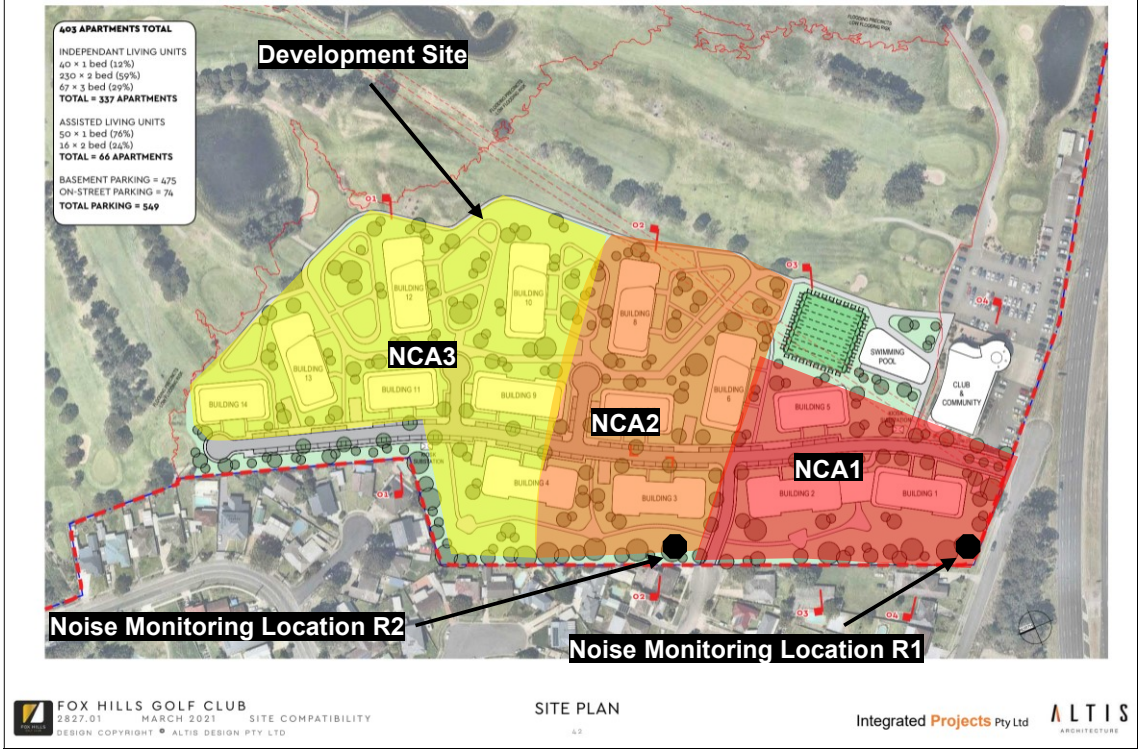
For assessment purposes the *ISEPP* refers to procedures referenced in the Development near Rail Corridors and Busy Roads – Interim Guideline. *Table 3.1* of the Interim Guideline refers to airborne traffic noise and $L_{Aeq,15\ hour}$ (day) and $L_{Aeq,9\ hour}$ (night) descriptors.

If internal noise levels from road infrastructure with windows/doors open exceed the criteria *(Table 1)* by more than 10dBA, the *DPIG* recommend that the design of ventilation for the exposed rooms be such that occupants can leave the windows/doors closed, if they desire, and also meet the ventilation requirements of the Building Code of Australia. With windows/doors open for natural ventilation, typical noise attenuation across exposed building facades is in the order of 10dBA. Window/door configurations with standard weight per size glazing and acoustic rated seals typically attenuate external noise by 20dBA, with the windows/doors closed.

3.0 THE SITE

The subject development area is located off Fox Hill Crescent, Prospect *(Figure 1).* Site attended audits identified that road traffic on the Great Western Highway and the M4 Motorway controlled the day and night ambient noise, across the site. No other significant noise sources were identified during site attended audits.

Figure 1. Site Location



4.0 SITE NOISE MEASUREMENTS

In order to establish the existing road traffic noise exposure for the site, unattended continuous measurements were conducted from Monday 21 September to Monday 28 September 2020. The reference measurement locations and indicative noise catchment areas *(NCA)* established for the site are shown in *Figure 1.*

Instrumentation selected for the measurements comprised SVANTEK 954 Sound Level Meters. Instrument reference levels were checked prior to and after the measurements with a NATA calibrated Bruel & Kjaer Sound Level Calibrator Type 4230, with no significant drift recorded. The meters were set to A-weighting, fast response and fifteen (15) minute sampling periods.

The ambient noise levels were measured and assessed as A-weighted sound pressure levels. The parameter regarded as the most important for assessing road traffic noise is the "L_{Aeq}", or the A-weighted energy equivalent continuous (constant) sound level. *Attachment 1* presents the measurement results in graphical form. *Table 2* presents a summary of the ambient noise sound pressure levels, the day and night façade corrected (plus 2.5dBA) L_{Aeq} noise levels.

Table 2. Summary of Ambient Noise Measurement Results
dBA 20 x 10^{-6} Pa

Reference	Rating Background Noise Level RBL			Equivalent Continuous Level L_{Aeq}			Façade Corrected Levels L_{Aeq}	
	Day RBL	Evening RBL	Night RBL	Day LAeq	Evening LAeq	Night LAeq	Day LAeq 15hrs	Night LAeq 9 hrs
R1	59.2	58.2	52.3	63.8	61.8	60.5	65.9	63.0
R2	48.2	48.2	43.4	56.8	53.1	52.2	58.6	54.7

5.0 CONCEPTUAL (ACOUSTIC) DESIGN REVIEW

The corrected measured façade traffic noise levels (*Table 1*) have been utilised in conjunction with the conceptual architectural plans, building setbacks, façade orientation to determine indicative noise reduction requirements to address the *ISEPP* internal design noise levels.

For assessment purposes three (3) indicative noise catchment areas *(NCA)* have been identified *(Figure 1)*. For apartments in *NCA 1* with exposure to the Great Western Highway and M4 Motorway traffic noise, window/door glazing in bedrooms and habitable rooms will require upgrading. For windows/doors orientated away the road traffic, the acoustic performance of the systems could be reduced. Final façade design detailing would be dependent on building orientation, window/door sizes and locations, noise attenuation provided by onsite buildings and potential for reflected noise from neighbouring buildings. For assessment purposes, it was assumed that with windows and doors closed, alternative ventilation options may be required to satisfy Council and BCA requirements.

For apartments in *NCA 2* with exposure to the Great Western Highway and M4 Motorway traffic noise, windows/doors may require to be closed, assuming a 20dBA noise reduction across the façade with standard glazing weight per size. For windows/doors orientated away from the traffic noise they could remain open. Final façade detailing would be dependent on building orientation, window/door sizes and locations, noise attenuation provided by onsite buildings and potential for reflected noise from neighbouring buildings. For assessment purposes, it was assumed that with windows and doors closed, alternative ventilation options may be required to satisfy Council and BCA requirements.

For apartments in *NCA 3* noise from the Great Western Highway and M4 Motorway field measurements have shown that noise levels are expected to satisfy the *ISEPP* equivalent external noise levels, assuming 10dB reduction across the façade with open windows/doors. Final façade detailing would be dependent on building orientation, window/door sizes and locations, noise attenuation provided by onsite buildings and potential for reflected noise from neighbouring buildings.

6.0 SUMMARY

Atkins Acoustics was retained by *Integrated Projects* to prepare a Site Compatibility Statement (Acoustics) with respect to exposure to external noise. The conceptual proposal provides for a Seniors Living Development, comprising fourteen (14) apartment buildings accommodating four hundred and five six (405) apartments.

The subject development area is shown in *Figure 1.* Site attended audits identified that road traffic noise from the Great Western Highway and the M4 Motorway controlled the day and night ambient noise, across the site. No other significant noise sources were identified during site attended audits.

Site investigations revealed that the southern portion of the proposed development area is exposed to road traffic noise from the Great Western Highway and the M4 Motorway. Traffic data provided in *RMS* reports and traffic counts confirm that the Highway generates in excess of 40,000 vehicles per day and the M4 in excess of 100,000 vehicles per day, trigger mandatory requirements under the *ISEPP* to address road traffic noise impacts on the development.

For assessment purposes three (3) indicative noise catchment areas *(NCA)* have been identified *(Figure 1)*.

For apartments in *NCA 1* with exposure to the Great Western Highway and M4 Motorway traffic noise, window/door glazing in bedrooms and habitable rooms will require upgrading. For windows/doors orientated away the road traffic, the acoustic performance of the systems could be reduced.

For apartments in *NCA 2* with exposure to the Great Western Highway and M4 Motorway traffic noise, windows/doors may require to be closed, assuming a 20dBA noise reduction across the façade with standard glazing weight per size. For windows/doors orientated away from the traffic noise they could remain open.

For apartments in *NCA 3* noise from the Great Western Highway and M4 Motorway, field measurements have shown that traffic noise levels are expected to satisfy the *ISEPP* equivalent external levels, assuming 10dB reduction across the façade with open windows/doors.

The above indicative findings demonstrate that the site could be developed for residential purposes and with appropriate design and detailing satisfy the *ISEPP (Clause 102)* design requirements. Final façade detailing would be dependent on building orientation, window/door sizes and locations, noise attenuation provided by onsite buildings and potential for reflected noise from neighbouring buildings.

Referring to the requirements of *SEPP (Housing for Seniors or People with a Disability) 2004 (Clause 34),* final detailing would be dependent on building orientation, window/door locations, etc and developed during detailed design development phases.

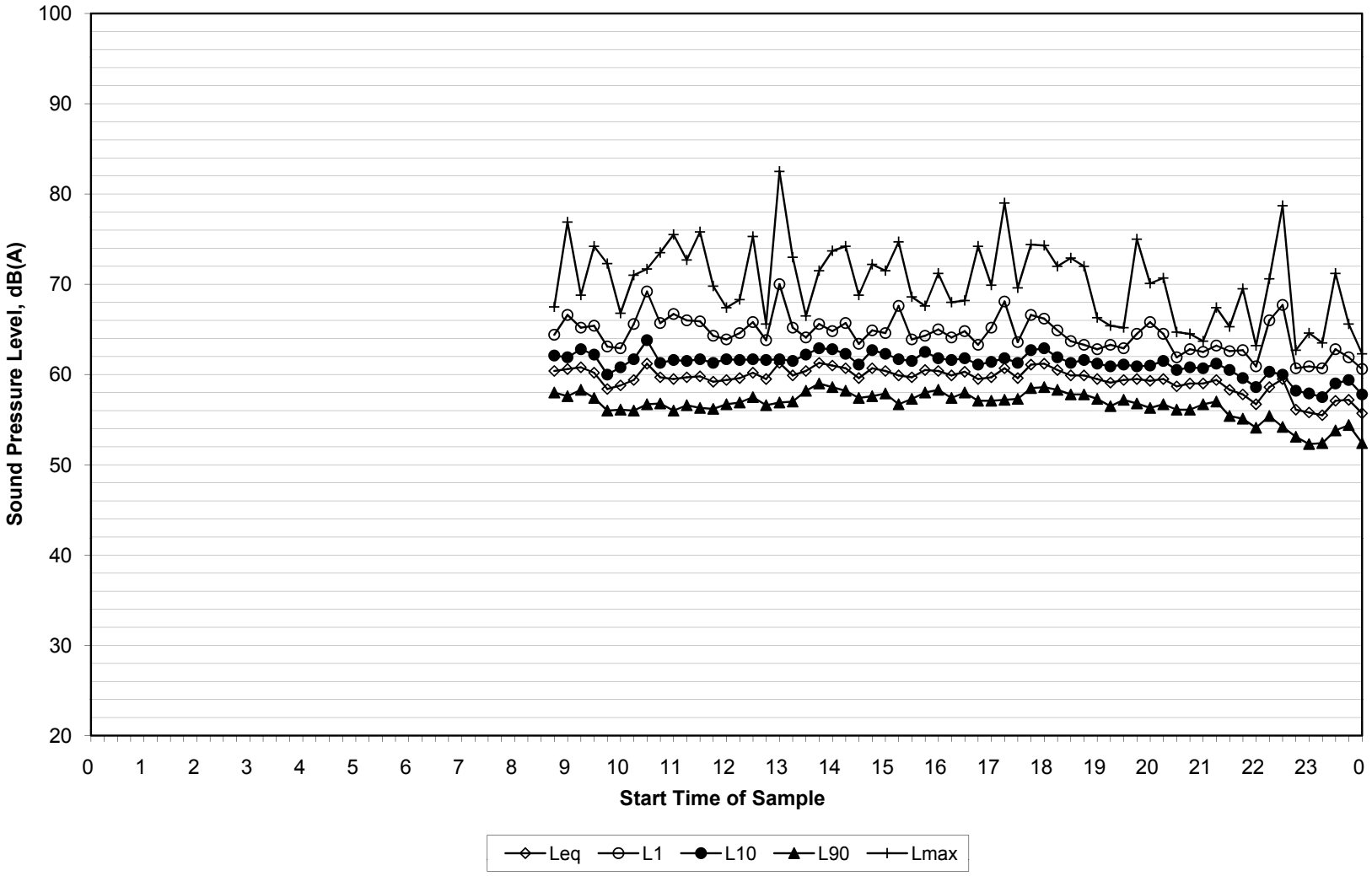
The information presented in this report has been prepared to support a Site Compatibility Statement (Acoustics). The information referenced is preliminary in natural and based on a number of indicative assumptions. Final detailing including satisfying *SEPP, BCA*, *Council,* acoustic design requirements would be addressed during detailed design development phases.

ATKINS ACOUSTICS & ASSOCIATES PTY LTD.

ATTACHMENT 1. AMBIENT BACKGROUND SOUND PRESSURE LEVELS

Ambient Sound Pressure Levels

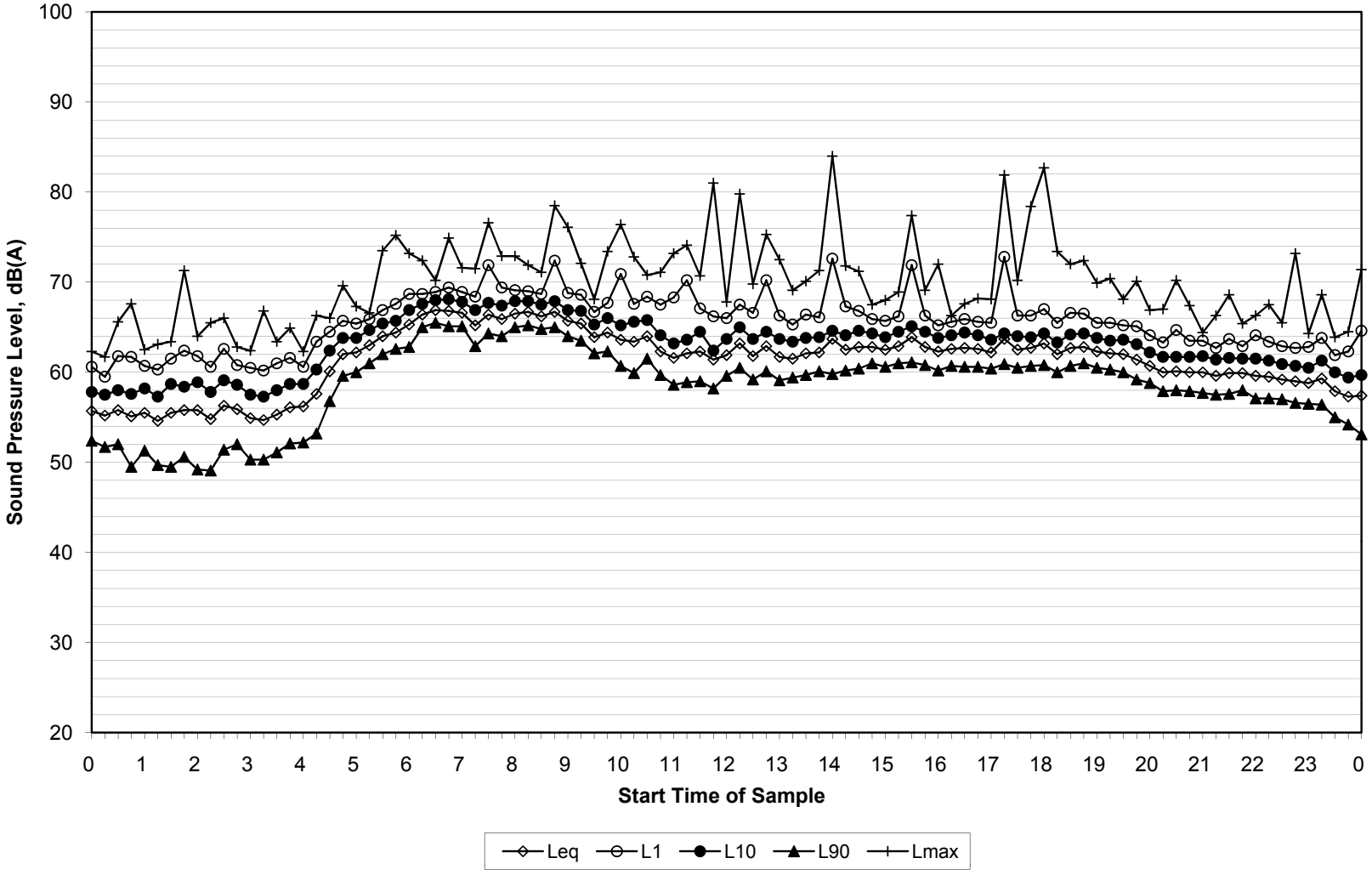
Monday, 21 September 2020



Measurement Location R1
Fox Hill

Ambient Sound Pressure Levels

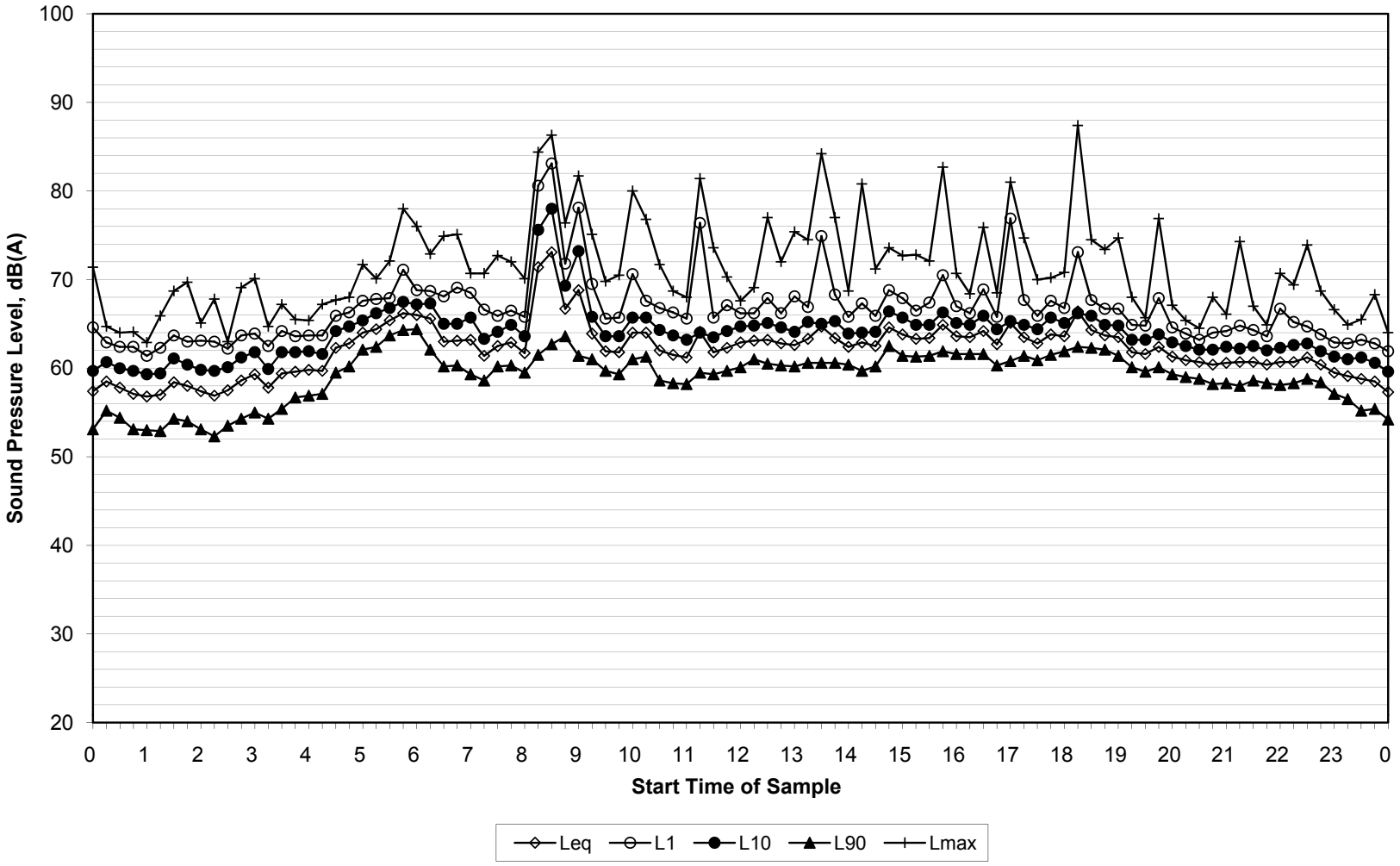
Tuesday, 22 September 2020



Measurement Location R1
Fox Hill

Ambient Sound Pressure Levels

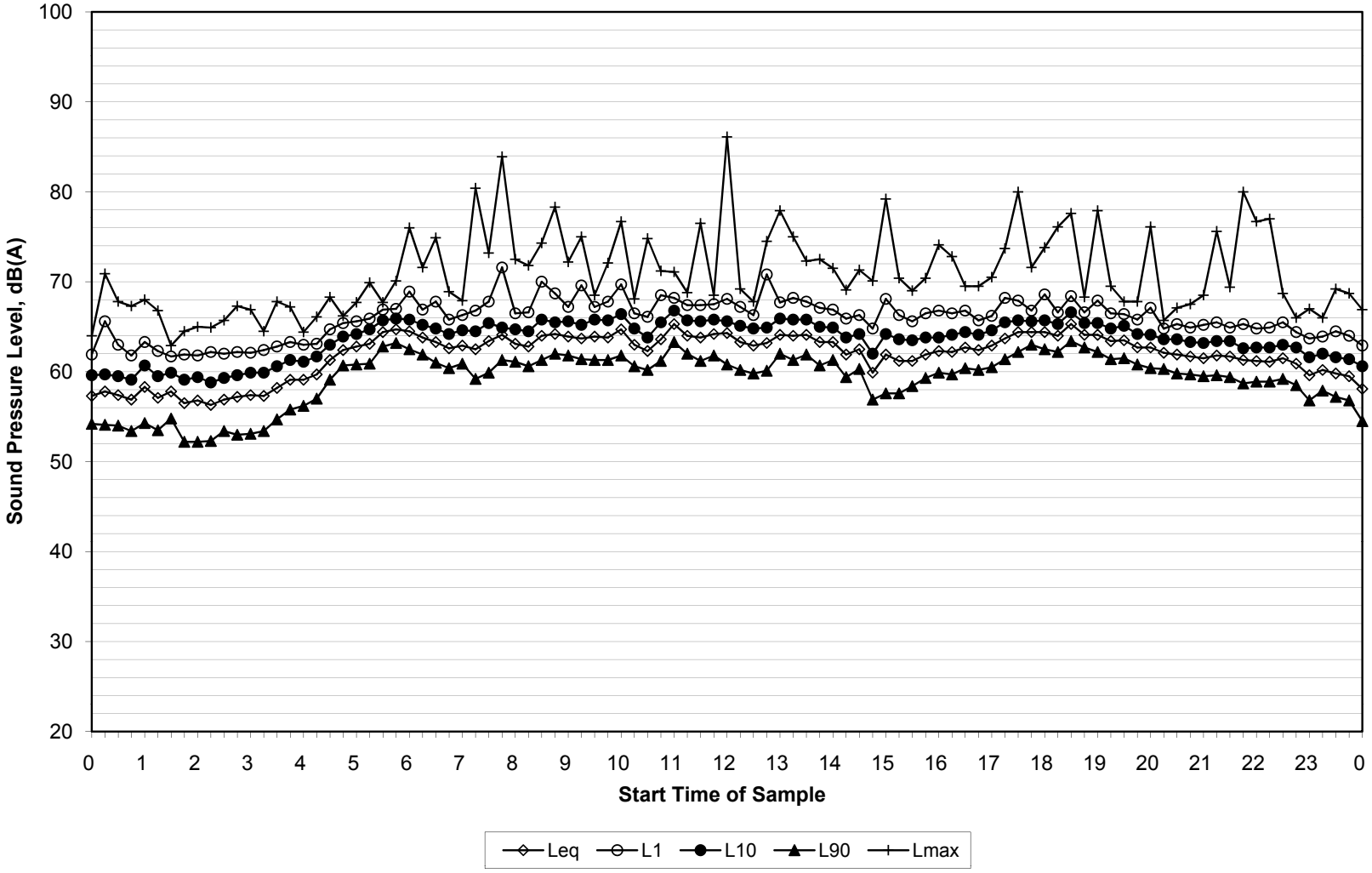
Wednesday, 23 September 2020



Measurement Location R1
Fox Hill

Ambient Sound Pressure Levels

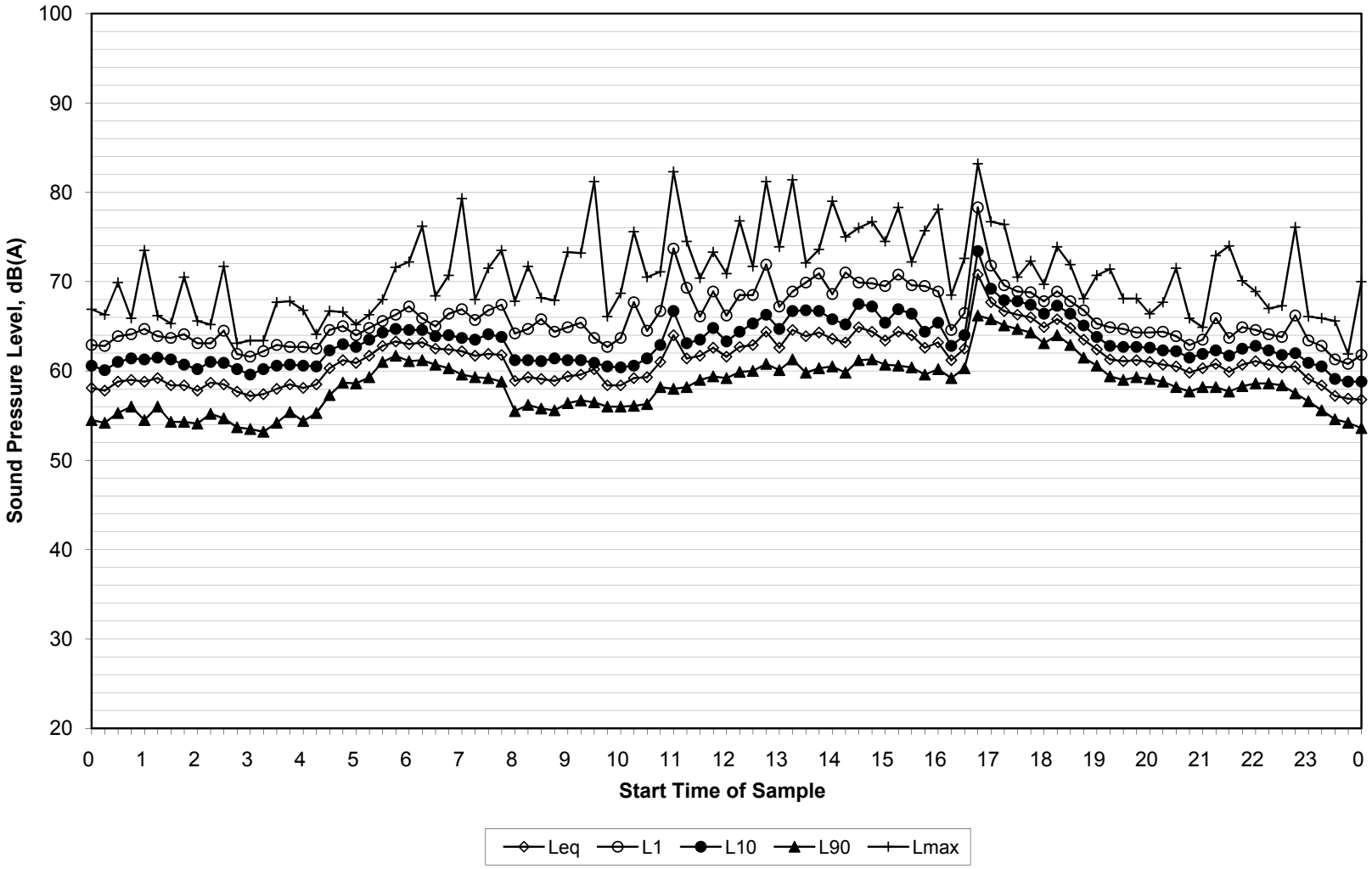
Thursday, 24 September 2020



Measurement Location R1
Fox Hill

Ambient Sound Pressure Levels

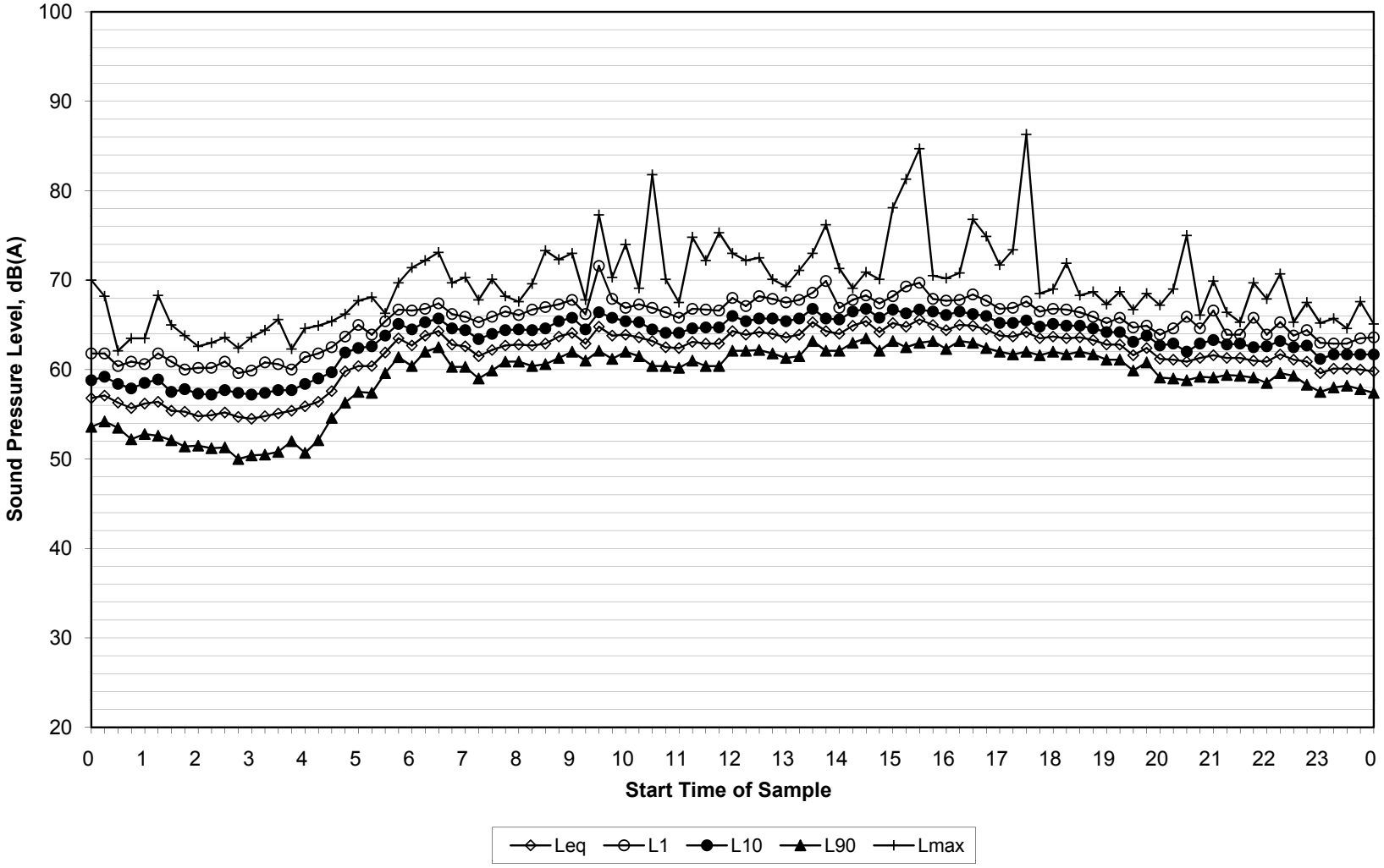
Friday, 25 September 2020



Measurement Location R1
Fox Hill

Ambient Sound Pressure Levels

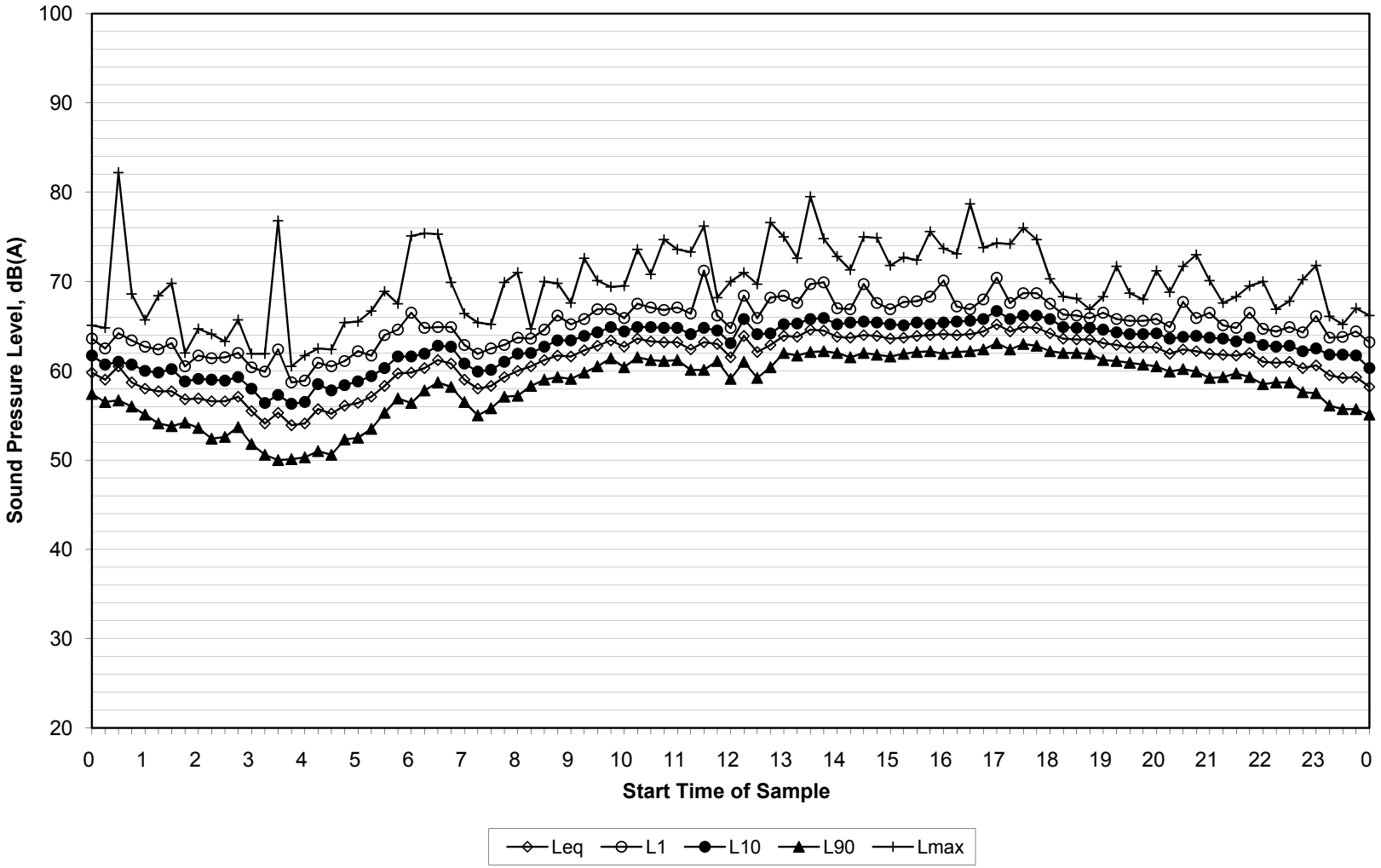
Saturday, 26 September 2020



Measurement Location R1
Fox Hill

Ambient Sound Pressure Levels

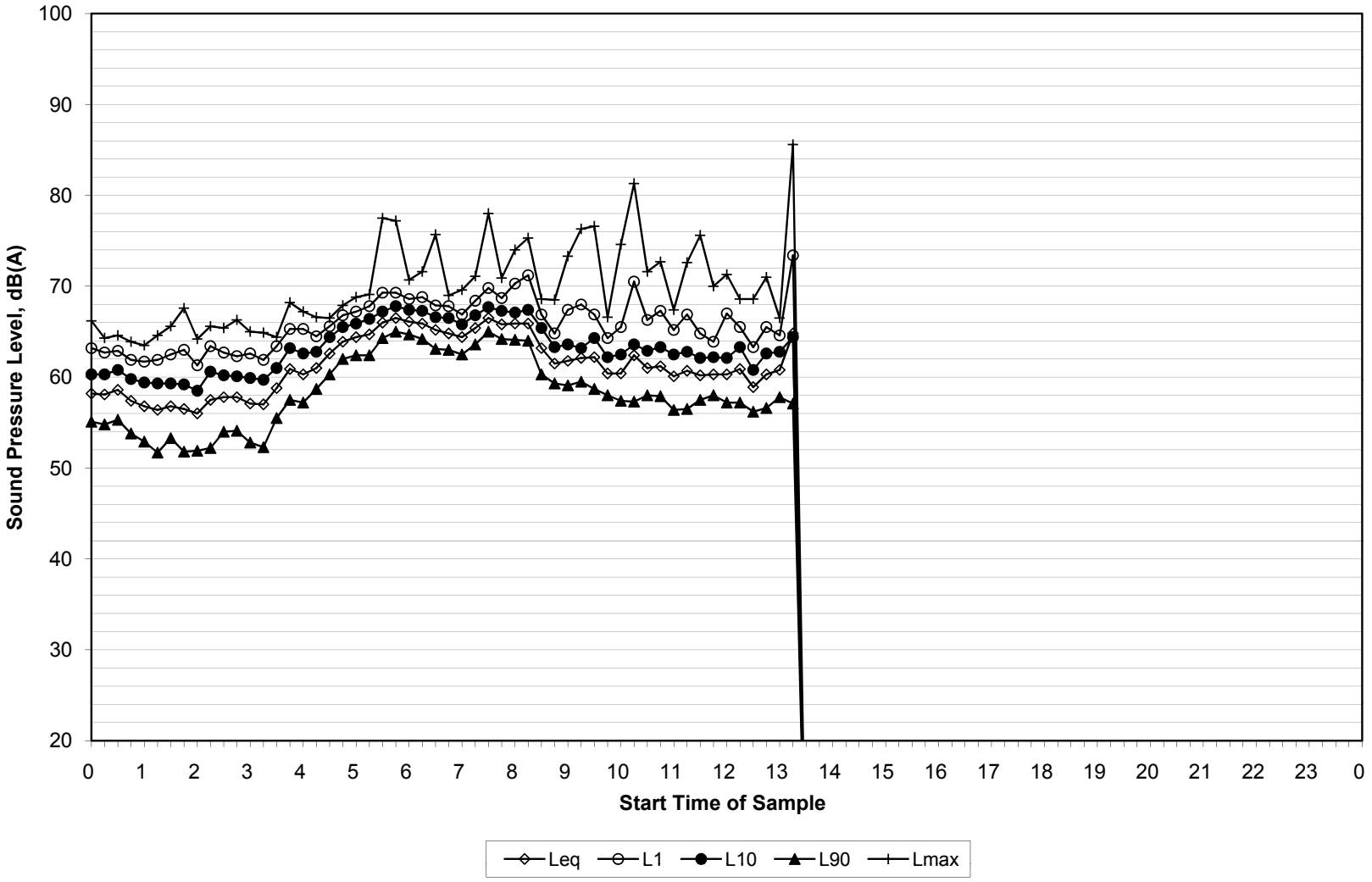
Sunday, 27 September 2020



Measurement Location R1
Fox Hill

Ambient Sound Pressure Levels

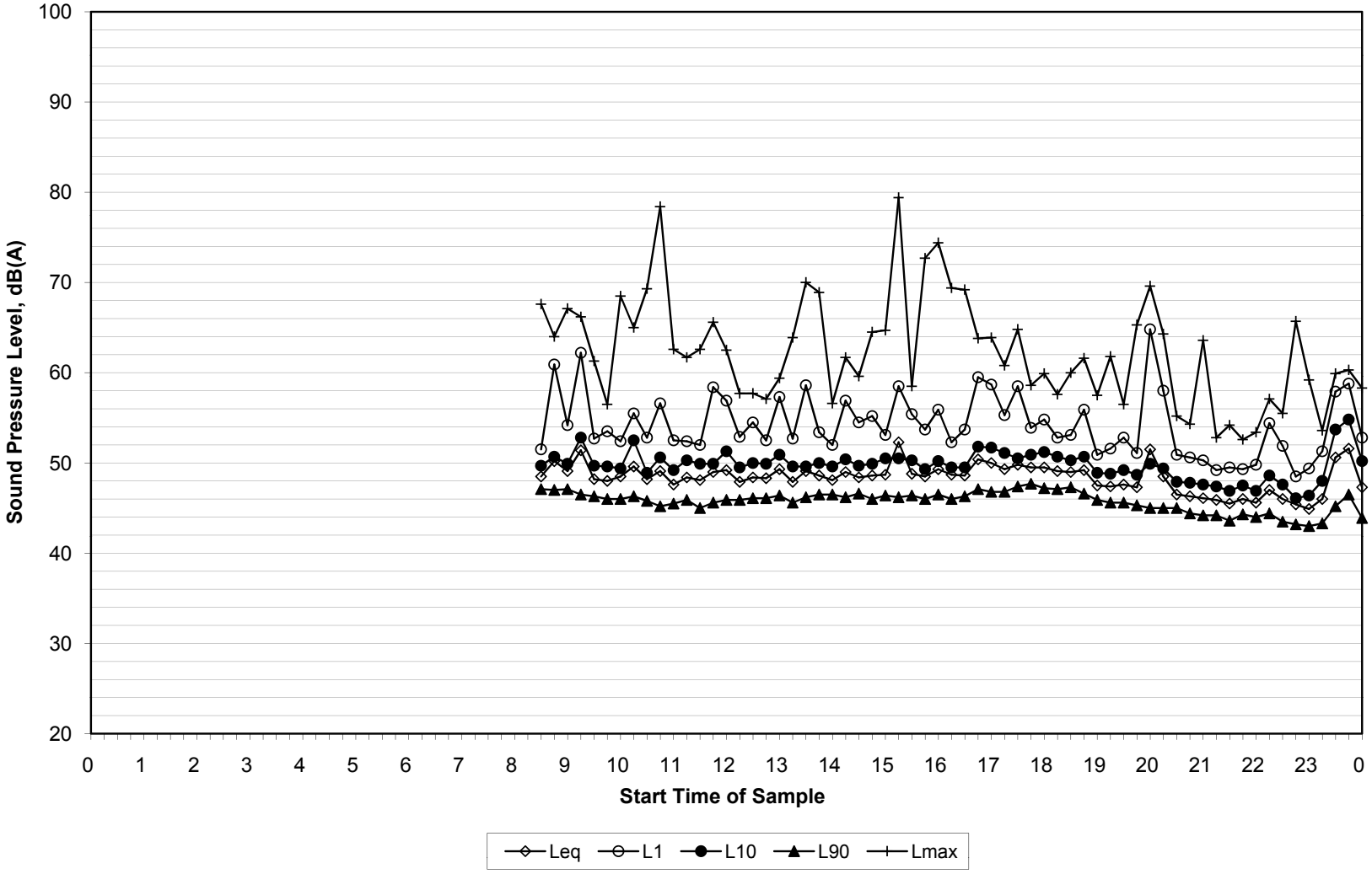
Monday, 28 September 2020



Measurement Location R1
Fox Hill

Ambient Sound Pressure Levels

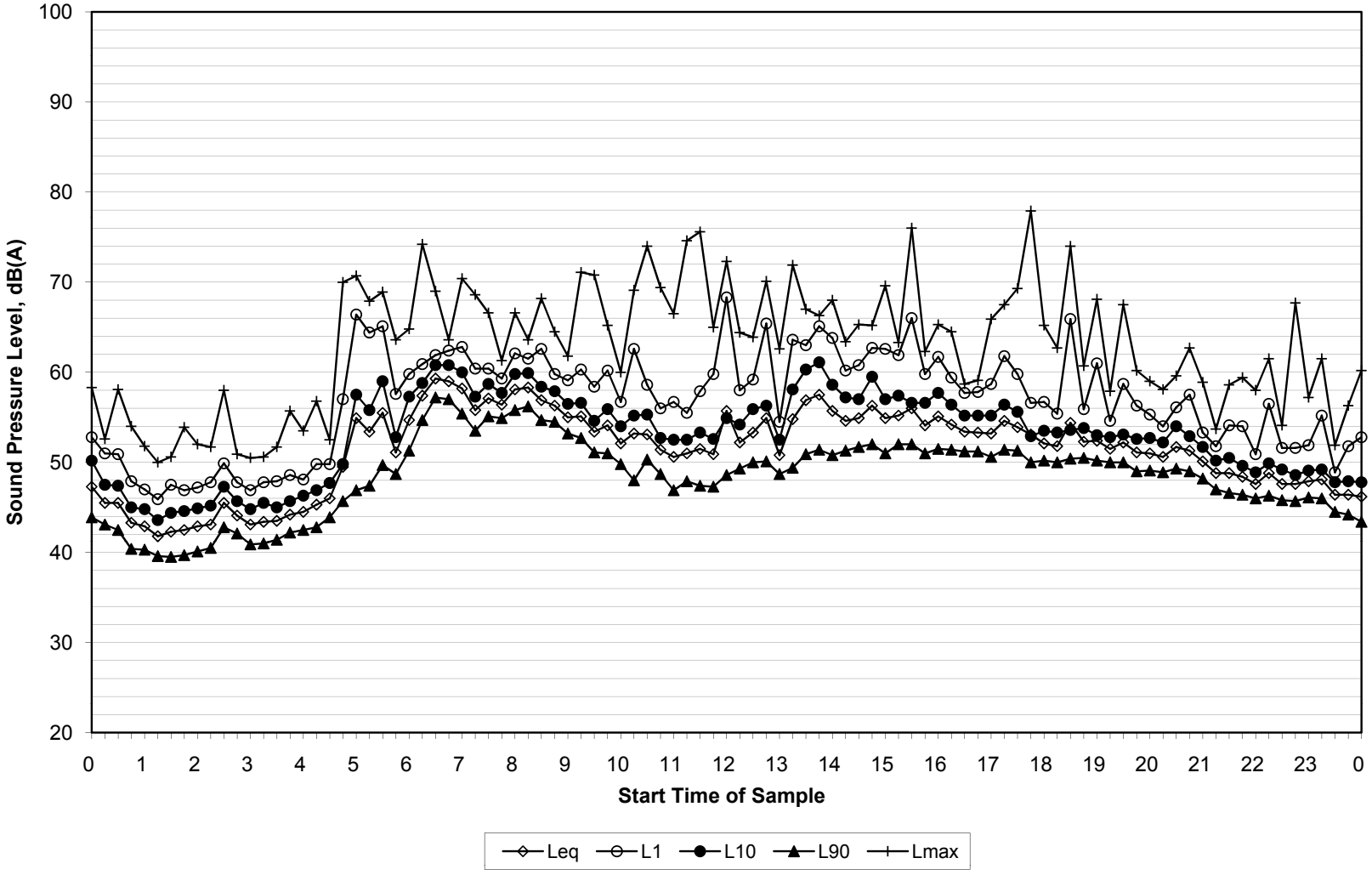
Monday, 21 September 2020



Measurement Location R2
Fox Hill

Ambient Sound Pressure Levels

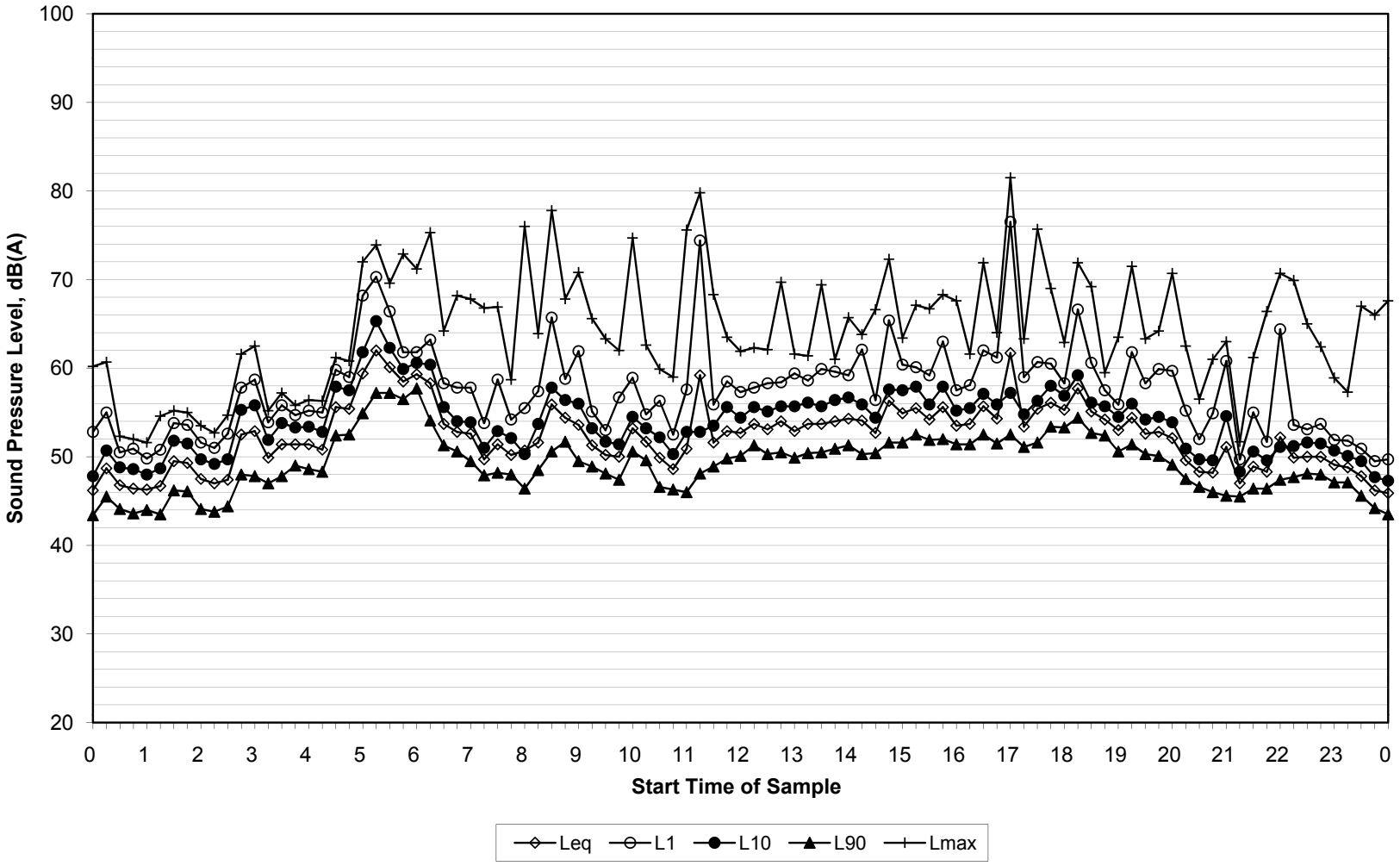
Tuesday, 22 September 2020



Measurement Location R2
Fox Hill

Ambient Sound Pressure Levels

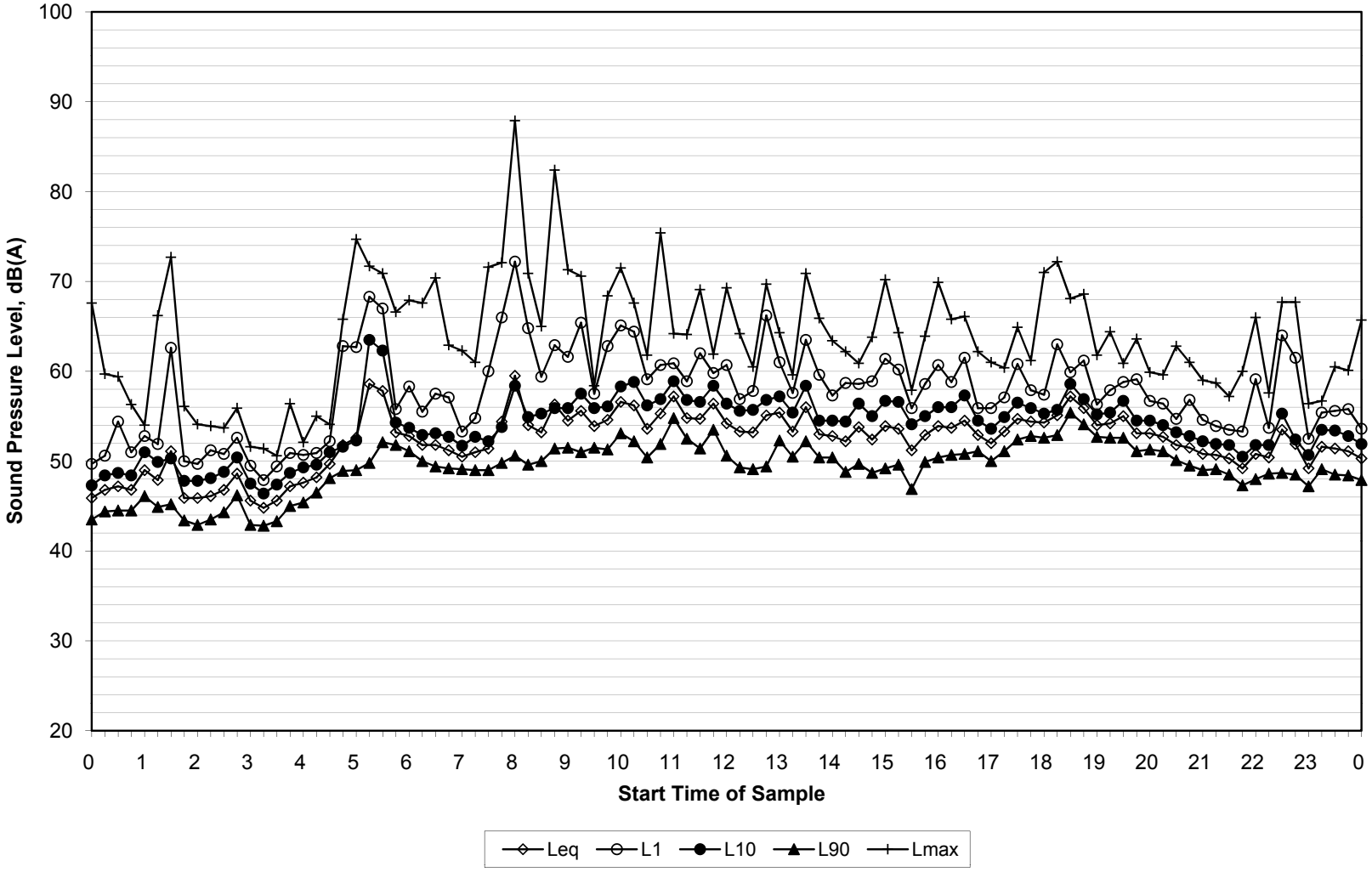
Wednesday, 23 September 2020



Measurement Location R2
Fox Hill

Ambient Sound Pressure Levels

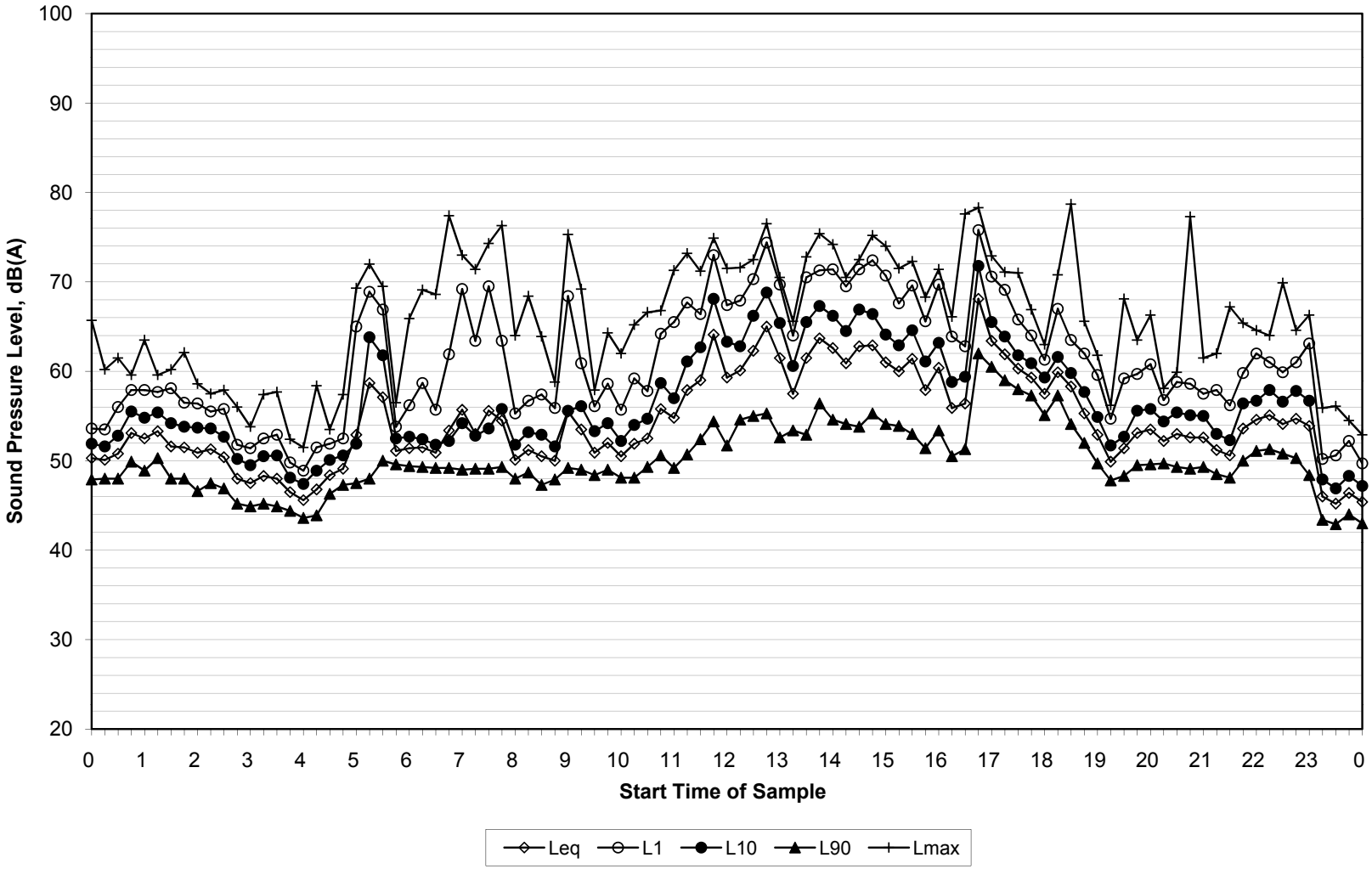
Thursday, 24 September 2020



Measurement Location R2
Fox Hill

Ambient Sound Pressure Levels

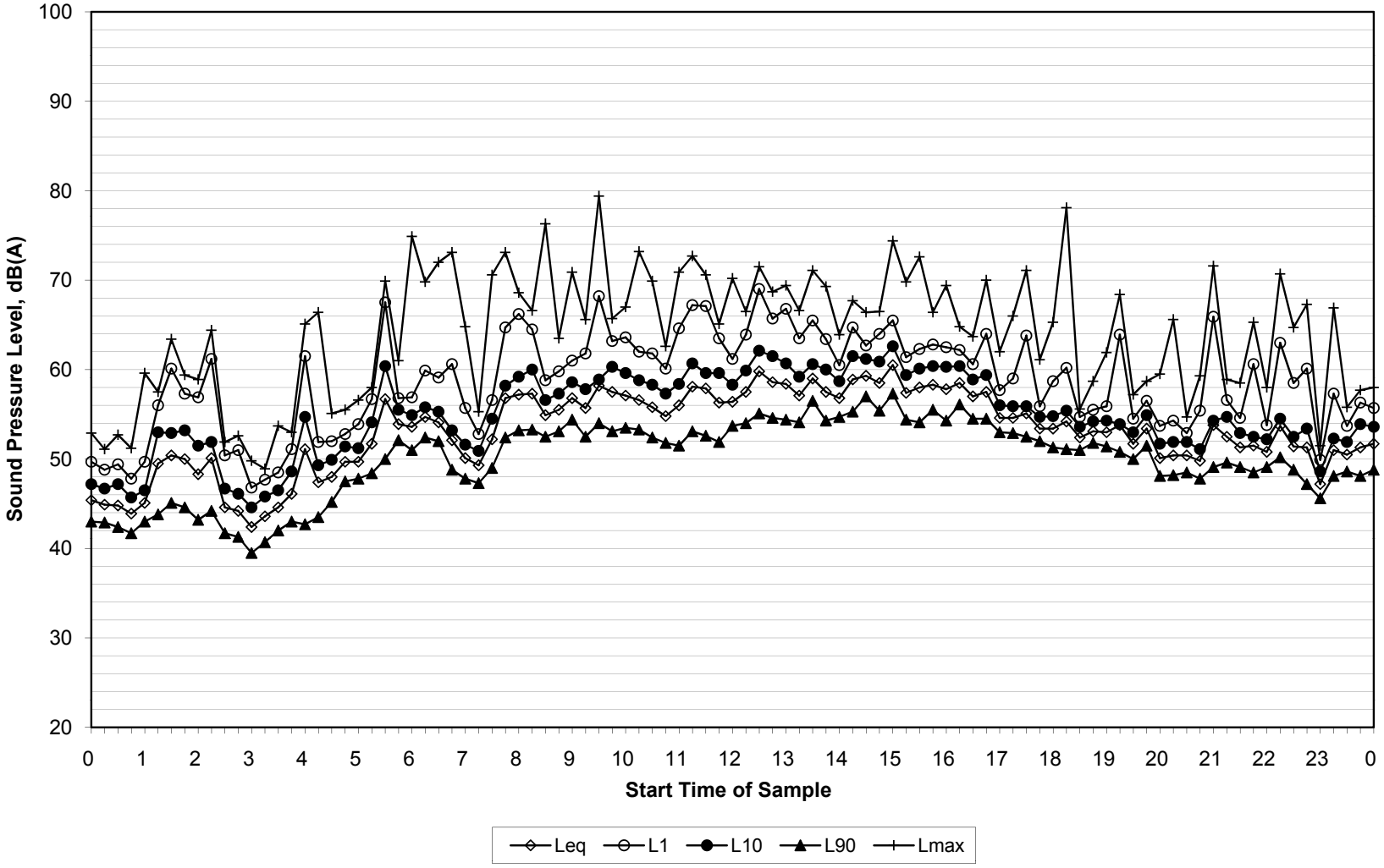
Friday, 25 September 2020



Measurement Location R2
Fox Hill

Ambient Sound Pressure Levels

Saturday, 26 September 2020



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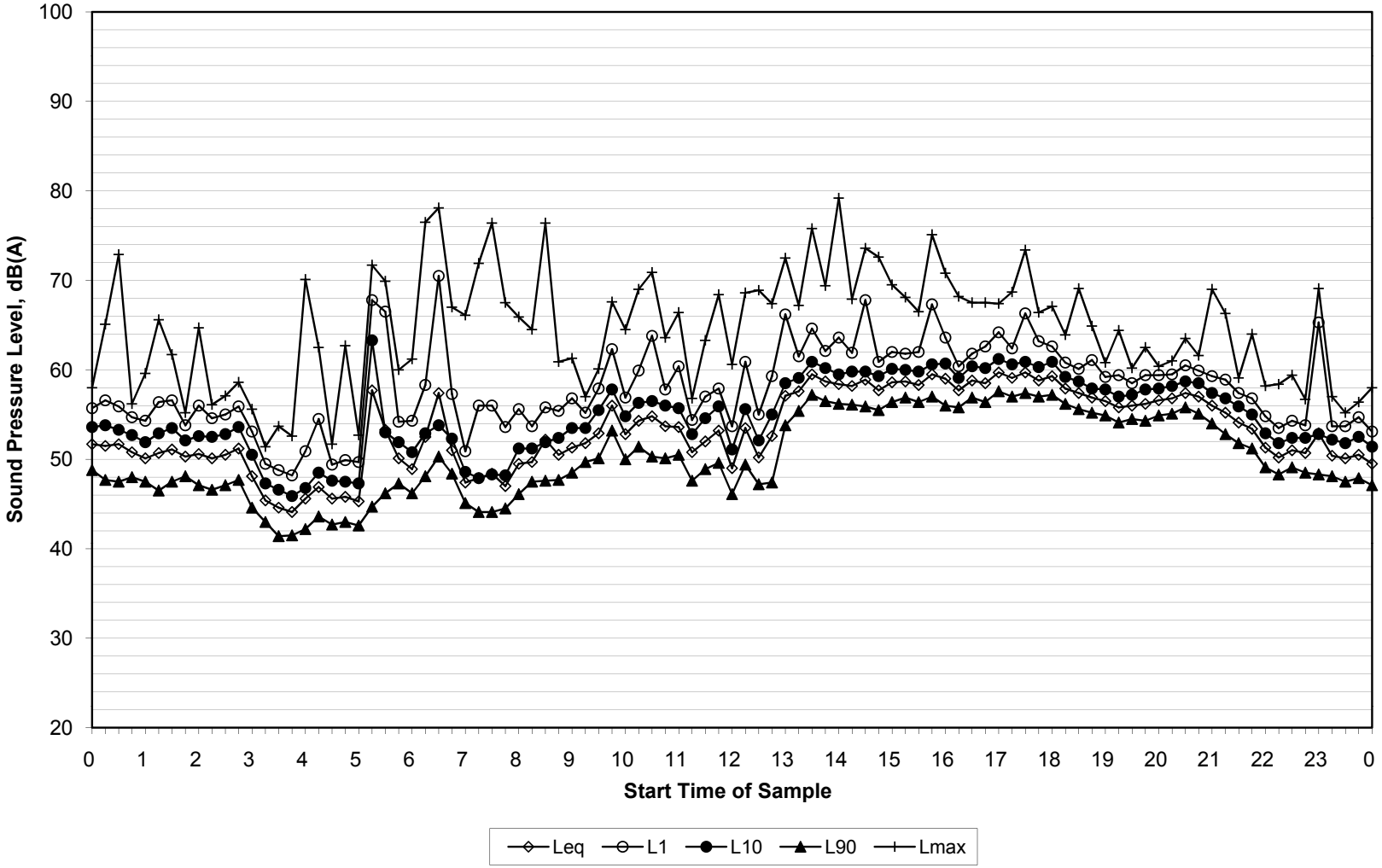

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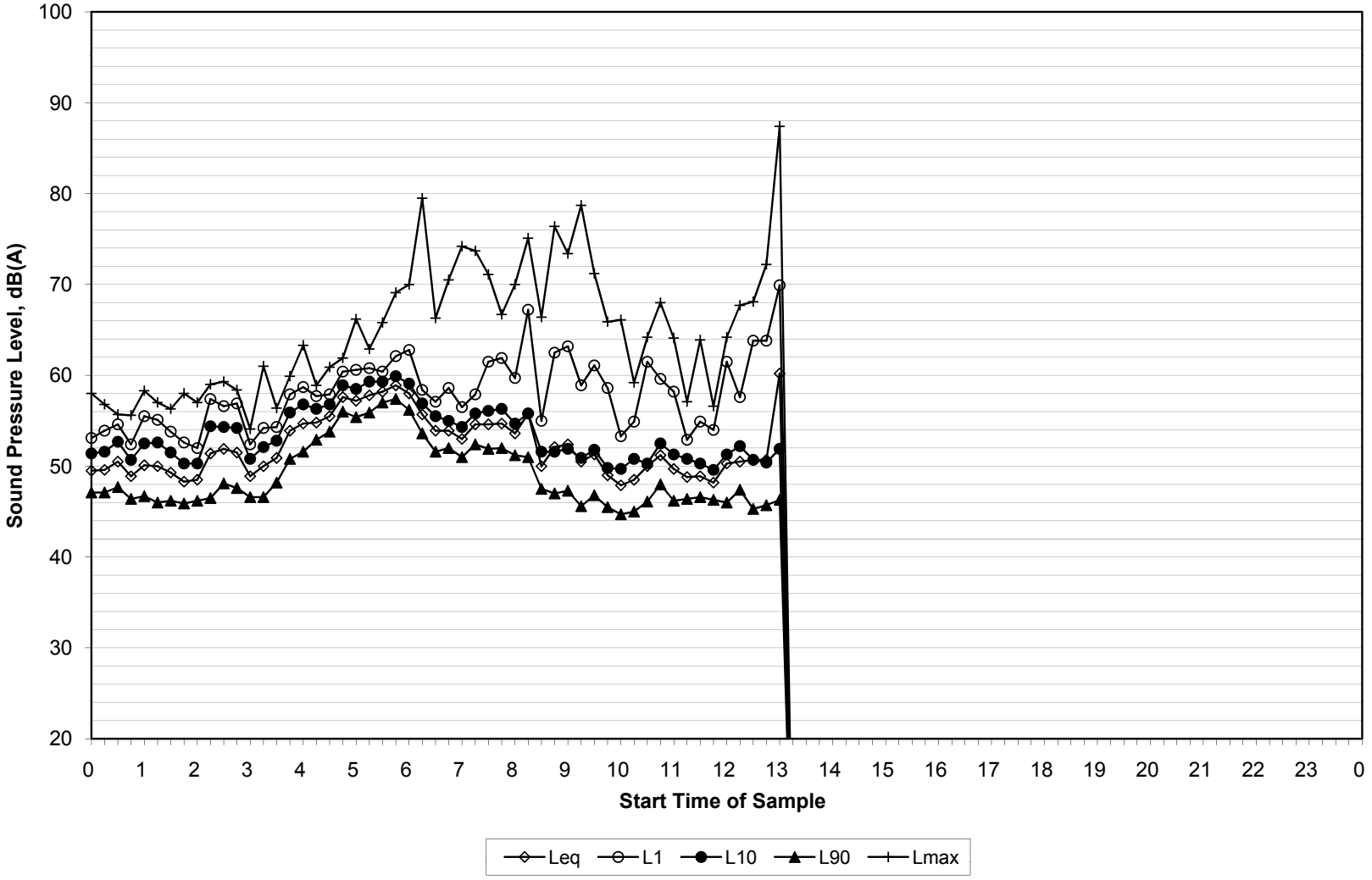

Measurement Location R2
Fox Hill