Food Processing and Packaging Facility at Part Lot 2304

Templar Road, Erskine Park | Noise impact assessment

Prepared for Commercial & Industrial Property Pty Ltd | 30 July 2013

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Final

Report J13058RP1 | Prepared for Commercial & Industrial Property Pty Ltd | 30 July 2013

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Date	30/7/13	Date	30/7/13

Document Control

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1 Introduction

This noise impact assessment has been prepared to accompany a State Significant Development Application for the proposed food processing and packaging facility. The development is located at Templar Road, Erskine Park, within the Penrith Local Government Area.

The facility will consist of a new building for temperature controlled and ambient storage and distribution. The facility will be designed to operate 24 hours seven days per week.

Local residences are located to the north within the residential area of Erskine Park, approximately 1,200 m from the proposed site. Approximately 550 m south of the site, is the Emmaus Retirement Village. Further south on Bakers Lane are the Emmaus Catholic College, Trinity Catholic Primary School and Mamre Christian College.

1.1 Glossary of acoustic terms

A number of technical terms are required for the discussion of noise and vibration. These are explained in Table 1.1**.**

Table 1.1 Glossary of acoustic terms

Term	Description
dB(A)	Noise is measured in units called decibels (dB). There are several scales for describing noise, the most common being the 'A-weighted' scale. This attempts to closely approximate the frequency response of the human ear.
EPA	The NSW Environment Protection Authority
RNP	NSW Road Noise Policy (Published by the OEH, 2011).
INP	NSW Industrial Noise Policy (Published by the Environment Protection Authority (now OEH) in 2000).
L_1	The noise level exceeded for 1 % of a measurement period.
L_{10}	A noise level which is exceeded 10 % of the time. It is approximately equivalent to the average of maximum noise levels.
L_{90}	Commonly referred to as the background noise, this is the level exceeded 90 %of the time.
L_{eq}	It is the energy average noise from a source, and is the equivalent continuous sound pressure level over a given period. The $L_{eq,15min}$ descriptor refers to an Leq noise level measured over a 15 minute period.
L_{max}	The maximum root mean squared sound pressure level received at the microphone during a measuring interval.
RBL	The Rating Background Level (RBL) is an overall single value background level representing each assessment period over the whole monitoring period. The RBL is used to determine the intrusiveness criteria for noise assessment purposes and is the median of the ABL's.
SI	SI ("Still Isothermal") refers to calm weather conditions (ie. The absence of any wind or temperature gradients).
Sound Power Level	This is a measure of the total power radiated by a source. The sound power of a source is a fundamental property of the source and is independent of the surrounding environment.
Temperature Inversion	A positive temperature gradient. A meteorological condition where atmospheric temperature increases with altitude.
($\sigma\theta$) sigma-theta	The standard deviation of horizontal wind fluctuation.

It is useful also to have some appreciation of the scale of decibels, the unit of noise measurement. The following gives some practical indication as to what an average person perceives about changes in noise levels:

- differences of less than approximately 2dB are imperceptible in general, ie, most people would find it difficult to discern which is the louder of two noise sources having levels within 2dB of each other; and
- a difference in noise levels of around 10dB appears as either doubling or halving of loudness.

1.2 Key noise issues

The main potential noise issues with respect to the proposal are broadly as follows:

- noise from earthworks. We understand that earthworks for the subject site have been completed;
- noise associated with the construction of the project;
- noise associated with the operation, which is expected to be dominated by on-site trucking movements and loading/unloading at the docks;
- noise associated with the increased traffic to/from the site during construction and operation; and
- cumulative noise from all existing and proposed industrial operations part of the larger development precinct incorporating similar operations.

The acoustic study focussed on the key issues and included noise measurement, derivation of suitable criteria in accordance with the NSW Government's Industrial Noise Policy (INP) and recommendations for suitable mitigation such that sensitive receptors are not adversely impacted. The assessment will also extend to traffic noise impact on residences in accordance with the NSW Road Noise Policy (RNP).

2 Existing acoustic environment

A key element in assessing environmental noise impact from industry is to quantify the ambient and background noise, including any existing industrial noise where present. From our observations, the dominant noise sources at existing residential areas at the time are related to traffic on Erskine Park Road and Mamre Road.

The existing acoustic environment was measured by means of short-term attended and long-term unattended noise monitoring. Long term unattended noise monitoring was conducted to establish the level of ambient noise at residences. This was supplemented by attended noise monitoring to quantify the existing industrial and road traffic noise at potentially affected receivers.

2.1 Unattended noise monitoring

Long term noise monitoring was conducted at two locations from 17 July to 29 July 2013 as described in Table 2.1 and shown in Figure 2.1.

Table 2.1 Noise logging details

ID	Location	Approximate position with respect to the site
Location 1	69 Weaver Street, Erskine Park	1900 m north-east
Location 2	Emmaus Village, Bakers Lane, Erskine Park	550 m south

The Rating Background noise Levels (RBL) and ambient noise levels derived from long term noise monitoring at the two locations are summarised in Table 2.2. Appendix A contains daily noise data and charts for each location. The measurement data was analysed in accordance with the INP, using weather data from the Bureau of Meteorology's Horsley Park station.

Table 2.2 Summary of measured background and ambient noise levels

Location[1]	Rating Background Level, dB(A)			Ambient (L_{eq}) Noise Level, dB(A)		
	Day	Evening	Night	Day	Evening	Night
Location 1 (NE)	36	37	34	53	48	48
Location 2 (S)	35	36	35	47	42	42

Notes: 1. levels shown are weather excluded.

Large distribution and warehouse developments currently operate in the area surrounding the site and several more were under construction during the noise surveys. Ambient noise at Location 1 was not influenced by such activity and is therefore representative of the background noise levels in the area.

The noise environment at Location 2 was dominated by natural noise sources, occasional hobby aircraft noise with a small traffic noise contribution. No industrial noise or construction activity was audible at this location.

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Locality plan and assessment locations
Figure 2.1

2.2 Prevailing weather conditions

The site's operational criteria are derived from the NSW Government INP which prescribes criteria that are assessable during prevailing weather conditions.

The efficiency of noise propagation over long distances can be significantly affected by the weather conditions. Of most interest are source to receiver winds and the presence of temperature inversions as both these conditions can enhance received noise levels. To account for these phenomena the EPA in their INP specify meteorological analysis procedures to determine the prevalent weather conditions that enhance noise propagation with a view to determining whether they can be described as a feature of the project area.

In this study one year's half-hourly weather data from the Bureau of Meteorology's weather station at Penrith was analysed. This was done in accordance with the procedures defined in the INP, and as otherwise advised by the EPA.

2.2.1 Prevailing winds

The INP recommends consideration of wind effects if they are a "feature" of the area. The INP defines "feature" as the presence of source-to-receiver wind speed (measured at 10 m above ground level) of 3 m/s or less, occurring for 30% of the time in any assessment period and season.

This is further clarified by defining source-to-receiver wind direction as being the directional component of wind. The INP states that where wind is identified to be a feature of the area then assessment of noise impacts should consider the highest wind speed below 3 m/s, which is considered to prevail for at least 30% of the time.

A thorough review of the vector components of the half-hourly wind data described above was undertaken. The INP assessable wind directions are identified in Appendix B, where the wind analysis indicates that occurrences approach or exceed the 30% threshold.

It is demonstrated that assessable source-to-receiver winds do not occur during day period. Winds from the south and south-west are however prevalent during the evening and nights which will enhance noise levels from the site towards Erskine Park residences. The site will operate 24 hours 7 days a week so a worst case 3 m/s wind from the south has therefore been assessed.

2.2.2 Temperature inversions

The INP states that the assessment of the impact of temperature inversions be confined to the night time noise assessment period where temperature inversions occur.

Sigma theta data, which is required to determine the prevalence of temperature inversions, was not obtainable from the weather station. In our experience and as documented in the INP, the influence of temperature inversions for the relative distances between the site and residences are marginal (ie 1dB to 1.5dB) and imperceptible in practice. Furthermore, Erskine Park is not generally known to be susceptible to temperature inversions (ie inversions are unlikely to occur more than the INP's threshold of 30% of winter nights). Hence, no further assessment of temperature inversions is included in this assessment.

3 Noise criteria

3.1 Operational noise

3.1.1 Industrial noise criteria

The NSW Government's INP stipulates guidelines for assessment of noise from the operation of industrial facilities. The main objectives of the policy are to protect the community from excessive intrusive noise, and to preserve the amenity for specific land uses. In order to do so the INP provides two criteria to assess industrial noise sources, namely, the intrusiveness criteria and the amenity criteria.

3.1.2 Intrusive criteria

The intrusiveness criterion requires that the $L_{eq,15min}$ noise levels from the newly-introduced source during each of the day, evening and night time periods do not exceed the existing rating background noise levels (RBL) by more than 5dB at the most affected noise sensitive location. Table 3.1 shows the derived noise criteria adopting the INP's minimum recommended background level, used in the absence of monitored data (or unsuitable data as described earlier).

Table 3.1 Intrusiveness noise criteria

Receiver No	Location	Noise Level Criteria, $L_{eq, 15min}$ dB(A)		
		Day	Evening[1]	Night
1	*Erskine Park residences*	41	41	39
2	*Emmaus Village, Baker Lane*	40	40	40

Notes: 1. The evening criteria adopts the daytime levels as per the INP, where evening background levels are higher than day

3.1.3 Amenity criteria

The INP stipulates acceptable and maximum noise levels from all industry consistent with maintaining amenity for specific land uses. The acceptable target noise levels are presented in Table 3.2 for each assessment period and for appropriate surrounding land uses. In this case the 'suburban' category has been applied to determine the target noise levels at the existing residences. Also presented are goals for school classrooms that apply to the teaching facilities on Bakers Lane, Erskine Park.

Table 3.2 Noise amenity targets for specific land uses

Residential land use	Target acceptable amenity industrial noise levels, dB(A) $L_{eq,period}$		
	Day	Evening	Night
Suburban	55	45	40
Urban	60	50	45
School classroom - internal	35 - 40 Noisiest 1-hour when in use		

Notes: 1. These target levels apply to the total noise attributable to all industrial sites (as scheduled in the Protection of Environment (Operations) Act).

Table 3.3 summarises the applicable criteria. In all cases, the intrusiveness criteria have been adopted as they are the limiting (lower) criteria.

Table 3.3 Project specific noise criteria

Locations	Period	RBL, dB(A)	Intrusiveness, dB(A) $L_{eq,15min}$	Amenity (suburban), dB(A) $L_{eq,period}$	Project specific noise level, dB(A)
Northern Residences	Day	36	41	55	**41**
	Evening	37	41	45	**41**
	Night	34	39	40	**39**
Southern Residences	Day	35	40	55	**40**
	Evening	36	40	45	**40**
	Night	35	40	40	**40**

3.2 Sleep disturbance

The INP criteria are appropriate for assessing noise from continuous and intermittent sources, such as engine noise from mobile plant and general processing plant and equipment. However, transient noise sources also require assessment.

Given the transient nature of these events, the L_{eq} noise level from such sources would not be representative since the noise in question may not be present for much of the time. Hence, the above criteria are not appropriate for this type of noise. The most important effect of these transient noises would be the possibility of disturbing the sleep of nearby residents. The EPA's INP Application Notes indicates that to prevent sleep disturbance, the $L_{1,1min}$ noise level from an intrusive source should not exceed the background noise level by more than 15 dB. More recent advice from the EPA has confirmed that the L_{max} and $L_{1,1min}$ descriptor can be considered interchangeable for such assessments. On this basis, the maximum noise level from any operational event should not exceed the levels shown in Table 3.4 for the night time assessment period.

Table 3.4 Sleep disturbance noise criteria (10pm to 7am)

Location	Location	Sleep disturbance criteria, L_{max} dB(A)
Northern Residences	Erskine Park	49
Southern Residences	Emmaus Village, Bakers Lane, Erskine Park	50

Notes 1. Criteria are based on the minimum RBL threshold of 30 dB(A) as defined in the INP.

2. Sleep disturbance criteria apply during the night assessment period only.

3. Criteria are assessable at the façade of the most affected sleeping area.

However, this criterion does not take account of more recent research on the effects on sleep of road traffic noise. The EPA's Road Noise Policy (RNP) indicates that maximum noise levels below 50 to 55 dB(A) inside residences from road traffic sources are unlikely to cause awakening reactions. If bedroom windows are partly open, this corresponds to an external maximum noise level of approximately 60 to 65 dB(A) outside a residence.

In our experience, adopting the former more stringent criterion would be desirable in the first instance, and if exceedances are predicted, consideration should be given to the potential number of such events and the more recent research above.

3.3 Construction noise criteria

The Office of Environment and Heritage OEH's (OEH) Interim Construction Noise Guidelines (ICNG) provides guidelines for the assessment and management of noise from construction works. The ICNG recommends a qualitative approach for relatively small scale projects such as this.

i Noise management level

The ICNG suggests the following time restriction for construction activities where the noise is audible at residential premises:

- Monday to Friday 7.00 am - 6.00 pm
- Saturday 8.00 am - 1.00 pm
- No construction work is to take place on Sundays or public holidays.

Table 3.5 is an extract from the ICNG and provides noise management levels for residential receivers for day and out of hours periods. These time restrictions are the primary management tool of the ICNG.

Table 3.5 ICNG residential criteria

Time of day	Management level $L_{eq, 15min}$	How to apply
Recommended standard hours: Monday to Friday 7:00 am to 6:00 pm Saturday 8:00 am to 1:00 pm No work on Sundays or public holidays	Noise affected RBL + 10 dB	The noise affected level represents the point above which there may be some community reaction to noise. • Where the predicted or measured LAeq (15 min) is greater than the noise affected level, the proponent should apply all feasible and reasonable work practices to meet the noise affected level. • The proponent should also inform all potentially impacted residents of the nature of works to be carried out, the expected noise levels and duration, as well as contact details.
	Highly noise affected 75 dB(A)	The highly noise affected level represents the point above which there may be strong community reaction to noise. • Where noise is above this level, the relevant authority (consent, determining or regulatory) may require respite periods by restricting the hours that the very noisy activities can occur, taking into account: i) times identified by the community when they are less sensitive to noise (such as before and after school for works near schools, or mid-morning or mid-afternoon for works near residences ii) if the community is prepared to accept a longer period of construction in exchange for restrictions on construction times

Table 3.5 ICNG residential criteria

Time of day	Management level $L_{eq, 15min}$	How to apply
Outside recommended standard hours	Noise affected RBL + 5dB	• A strong justification would typically be required for works outside the recommended standard hours. • The proponent should apply all feasible and reasonable work practices to meet the noise affected level. • Where all feasible and reasonable practices have been applied and noise is more than 5 dB(A) above the noise affected level, the proponent should negotiate with the community. • For guidance on negotiating agreements see section 7.2.2.

In summary, the ICNG noise level goals for activities during the standard hours are 10 dB above the existing background levels. For activities outside of the above hours the noise levels should be no more than 5 dB above the existing background levels.

The residential construction noise criteria for the proposal are therefore provided in Table 3.6.

It is assumed that construction hours of the facility will be limited to standard hours as defined in Table 3.5.

Table 3.6 Residential construction noise criteria

Location	Noise criteria, $L_{eq,15min}$, dB(A)
Erskine Park residences	46
Emmaus Village, Bakers Lane, Erskine Park	45

3.4 Road traffic noise

The potential impacts of traffic noise resulting from both the construction and operational related traffic on public roads are assessed against criteria defined in the NSW Government's Road Noise Policy (RNP). The application of appropriate criteria for this project has followed the two-step process identifying the assessment and relative increase criteria as outlined in Section 3.4.1 of the RNP.

Site related traffic will use routes that are currently relatively heavily trafficked and part of the broader road network. Within closer proximity to the site are Lenore Drive and Templar Road, and no residences front these roads. Hence, no further analysis of road traffic noise is included in this report.

4 Predicted noise levels

The key noise issues associated with the proposed development include operational noise (related to transportation) and construction noise. These issues have been addressed based on worst case scenario predictions and past experience with similar developments.

4.1 Operational noise

The following assessment is based on Site Plan drawing 13424 DA-010 dated June 2013, and as provided by CIP (refer to Appendix C). It is understood that the proposed site will be used 24 hours a day, 7 days a week. Site traffic access will be via Templar Road, which runs south off Lenore Drive.

General noise producing operations on site would include pallet handling and truck movements. In particular, on-site trucking activities will be the dominate noise source. The site plans outline several dispatch and receiving docks in the current site layout, with 5 dispatch docks to the east adjacent to the robot sorter, and 4 receiving docks to the east of the red meat chiller. It has been assumed that there will be one truck idling within the truck parking area to the west of the pallet storage area, and another travelling along the southern truck access route.

The proposed layout of the loading docks as shown will be partly or totally shielded from off site receivers including residences to the north and south of the site. The effects on noise emanating from the site is impeded by existing or proposed neighbouring buildings to some extent in most directions as depicted in the noise contours shown in Figures 4.1 and 4.2.

The noise predictions include a typical to worst case scenario whereby 12 trucks are in use simultaneously on site. That is, trucks are producing noise by virtue of moving around the site or idling while being loaded/unloaded. Trucks will reverse into the docks and powered or unpowered forklifts will be used to load/unload them from beneath awning structures on the western and east side of the building.

Based on data in our files for similar operations, the noise emission levels from on-site trucking operations were used to predict received noise at residences. The results of noise predictions are summarised in Table 4.1.

The representative sound power level associated with a truck is 99 dB(A) $L_{eq,15min}$. The results indicate that with 12 trucks active at any one time on site, the INP's strictest criterion can be satisfied.

Table 4.1 Operational noise predictions

Receptor	Period	Predicted $L_{eq,15min}$ noise level, dB(A)		Criteria, $L_{eq,15min}$, dB(A)
		Calm	3 m/s Southerly wind	
Erskine Park Residences	Day	<30	<30	**41**
	Evening	<30	30	**41**
	Night	<30	30	**39**
Emmaus Retirement Village	Day	31	31	**40**
	Evening	34	31	**40**
	Night	34	31	**40**

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Predicted Noise Levels - calm weather
Figure 4.1

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Predicted Noise Levels - 3m/s southerly wind

Figure 4.2

4.2 Sleep disturbance

The loading of trucks during the night time period has been assessed. Typical maximum noise level event activities are likely to include reversing alarms. A typical L_{max} sound power level of 110 dB(A) (ie 105 dB(A) Lw for the reverse alarms plus a 5 dB tonality correction as per the INP) has been used in the noise model. Results are provided in Table 4.2.

Table 4.2 Predicted maximum noise levels at worst affected residential receivers

Receiver	Predicted L_{max} Noise Level, dB(A)		Lmax, Noise Criteria, dB(A)
	Calm	3 m/s south wind	
Erskine Park	<30	<30	49
Emmaus Village	<30	<30	50

Results show that the sleep disturbance criterion of 45 dB(A) will be met during calm and wind conditions.

4.3 Cumulative industrial noise

Currently approved industrial developments adjacent to the project have the potential to generate noise at the same residential receivers assessed part of this study. A 3 dB reduction in the amenity noise criteria has been applied. This accounts for an equivalent environmental noise contribution from one neighbouring site. This implies a modified suburban residential amenity goal for the subject site of 52 dB(A)$L_{eq,11hr}$, 42 dB(A)$L_{eq,4hr}$ and 37 dB(A)$_{Leq,9hr}$ for the daytime, evening and night time periods respectively (see Table 3.2).

This generally does not alter the project specific noise targets derived earlier, reducing the night period criterion to 37 dB(A) which is still above the predicted noise levels for calm and wind-affected scenarios. It should be noted that operations at sites further away from the subject site will result in different received noise levels at given receiver locations. Further, the $L_{eq,period}$ noise level from the site will be significantly reduced from the above predicted $L_{eq,15min}$. A detailed cumulative noise impact assessment should be undertaken once details of proposed operations at neighbouring sites are clarified.

4.4 Construction noise

4.4.1 Earthworks noise

We understand that all earthworks have been completed for the subject site and therefore no further assessment is provided. However, as shown later for building construction, similar plant is modelled that could equally be used for earthworks and hence impacts from either can be assessed.

4.4.2 Building construction

Noise from proposed building works on site was predicted for the surrounding residential locations. Simultaneous operation of 6 trucks, 2 cranes, 2 scrapers, 2 dozers and 5 excavators (30T) were used to represent typical activities.

Representative sound power levels associated with these equipment used in noise modelling are summarised in Table 4.3.

Table 4.3 Representative equipment sound power levels

Equipment	$L_{eq,15min}$ Sound Power Level, dB(A)
Dump Trucks	100
Dozer	113
Scraper	103
Excavator	109
Crane	105

A worst case scenario assuming the simultaneous operation of all aforementioned construction equipment was used for the analysis to the south of the proposed construction site. Table 4.4 presents the predicted noise levels at the potentially worst affected residential receivers due to construction activities.

Table 4.4 Predicted construction noise levels at worst affected residential receivers

Receiver	Predicted $L_{eq,15min}$ Noise Level, dB(A)	Daytime $L_{eq,15min}$ Noise Criterion, dB(A)	Highly affected criterion, dB(A)
Erskine Park	41	46	75
Emmaus Village	52	45	75

Table 4.4 demonstrates that the noisiest of construction works will comply with construction criteria for the northern receptors. The predicted construction noise levels are expected to exceed criteria at the nearest southern receptors (Emmaus Village), although noise levels will be below the highly affected noise criteria.

5 Recommendations and Mitigation

5.1 Construction

While there is the potential for construction noise to exceed the recommended criteria (without mitigation) at the potentially closest residences to the south, there are several mitigation measures that may be employed to reduce noise impacts. These include:

- scheduling construction activities such that the concurrent operation of plant is limited;
- preparation of a construction noise management plan (to be included in the project Construction Environmental Management Plan) prior to construction to ensure that all employees understand and take responsibility for noise control at site;
- properly maintaining plant to ensure rated noise emission levels are not exceeded;
- undertaking construction activities guided by AS2436-1981 "Guide to Noise Control on Construction, Maintenance and Demolition Sites";
- providing a contact telephone number via which the public may seek information or make a complaint. A log of complaints should be maintained and actioned by the site superintendent in a responsive manner.

5.2 Operations

Operational noise predictions indicate that sensitive receivers will not be exposed to noise above relevant criteria. There are mitigation measures that may be employed to further reduce noise impacts. These include:

- scheduling truck movements and loading dock operations such that concurrent operation of vehicles is minimised. This would include limiting onsite vehicle idling while loading; and
- preparation of an operational noise management plan (to be included in the project Construction Environmental Management Plan) prior to operation to ensure that all employees understand and take responsibility for noise control at site.

6 Conclusion

EMM have completed a noise impact assessment of the proposed construction and operation of the food processing and packaging facility at Templar Road, Erskine Park. The assessment included baseline noise logging, establishment of criteria for construction and operations, and predicted noise levels at the potentially most exposed receptors to the site.

Based on the conservative noise assessment herein, noise impacts are not anticipated from the food processing and packaging facility as predictions for operational noise indicate that recommended INP noise criteria will be satisfied at sensitive residential locations.

Appendix A

Noise logging data and charts

Table A.1 96 Weaver St, Erskine Park

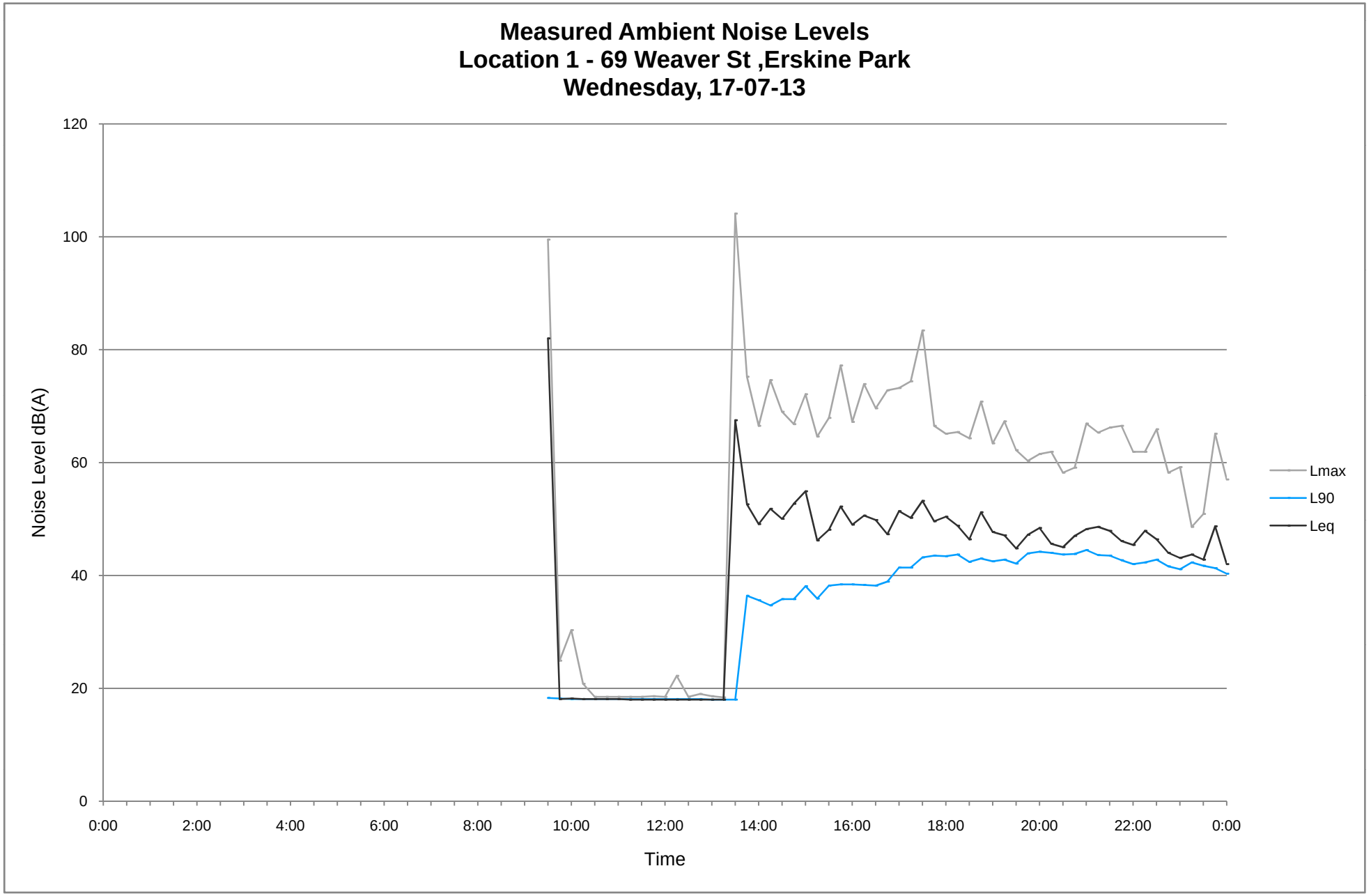
Date	ABL Day	ABL Evening	ABL Night	Leq 11hr Day	Leq 4hr Evening	Leq 9hr Night
Wednesday, 17-07-13	0	42.1	39.8	0	47.5	50.4
Thursday, 18-07-13	36.1	39	37.9	52.1	48.7	45.6
Friday, 19-07-13	0	39.2	34.1	0	47.3	49.7
Saturday, 20-07-13	40.6	36.9	31.5	54.4	52.8	47.8
Sunday, 21-07-13	35.6	34.9	32.1	54.1	44.3	50.3
Monday, 22-07-13	38.6	35.4	33.5	53.4	45.9	44.5
Tuesday, 23-07-13	32.1	34.5	35.6	50.1	45.1	43.1
Wednesday, 24-07-13	34.5	0	0	47.7	0	0
Summary Values						
RBLs	**35.9**	**36.9**	**34.1**			
Avg Leq				**52.5**	**48.3**	**48.1**

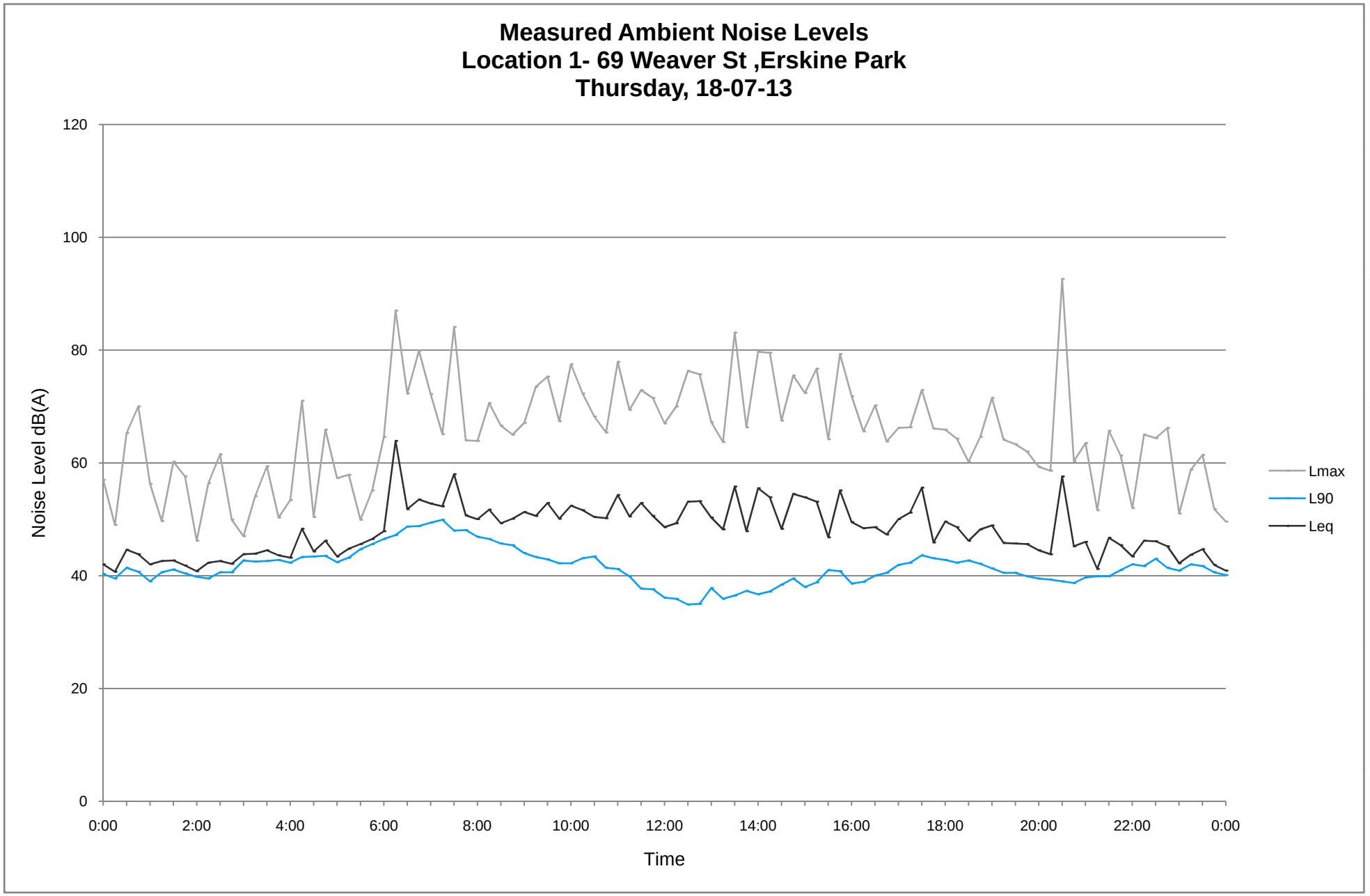
Notes: 1. 0 indicates periods with too few valid samples due to weather or logger operation.

Table A.2 Emmaus Village, Bakers Lane

Date	ABL Day	ABL Evening	ABL Night	Leq 11hr Day	Leq 4hr Evening	Leq 9hr Night
Wednesday, 17-07-13	0	40.4	38.7	0	43.8	44.4
Thursday, 18-07-13	39	40	39.2	47	45.2	46
Friday, 19-07-13	0	39.6	37	0	45.8	41.8
Saturday, 20-07-13	0	36.6	30.9	0	46	37.9
Sunday, 21-07-13	0	34.3	34.7	0	39.5	41.3
Monday, 22-07-13	0	35.3	36.4	0	40.6	42.9
Tuesday, 23-07-13	37.6	33.4	33.4	46.9	38.5	40.6
Wednesday, 24-07-13	35.1	34.2	34.2	46.9	38.6	42.2
Thursday, 25-07-13	37.2	38.1	34.5	48.8	41.6	41.9
Friday, 26-07-13	33.3	32.9	32	45.5	38	39.4
Saturday, 27-07-13	33.1	36	35.6	46.1	39.5	41.2
Sunday, 28-07-13	33.8	36.2	36.4	44.9	39.5	43.3
Monday, 29-07-13	0	0	0	0	0	0
Summary Values						
RBLs	**35.1**	**36.1**	**35.2**			
Avg Leq				**46.7**	**42.4**	**42.4**

Notes: 1. 0 indicates periods with too few valid samples due to weather or logger operation.


Measured Ambient Noise Levels
Location 1 - 69 Weaver St ,Erskine Park
Wednesday, 17-07-13
Noise Level dB(A)
120
100
80
60
40
20
0
0:00
2:00
4:00
6:00
8:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
0:00
Time
Lmax
L90
Leq


Measured Ambient Noise Levels
Location 1- 69 Weaver St ,Erskine Park
Thursday, 18-07-13
Noise Level dB(A)
120
100
80
60
40
20
0
0:00
2:00
4:00
6:00
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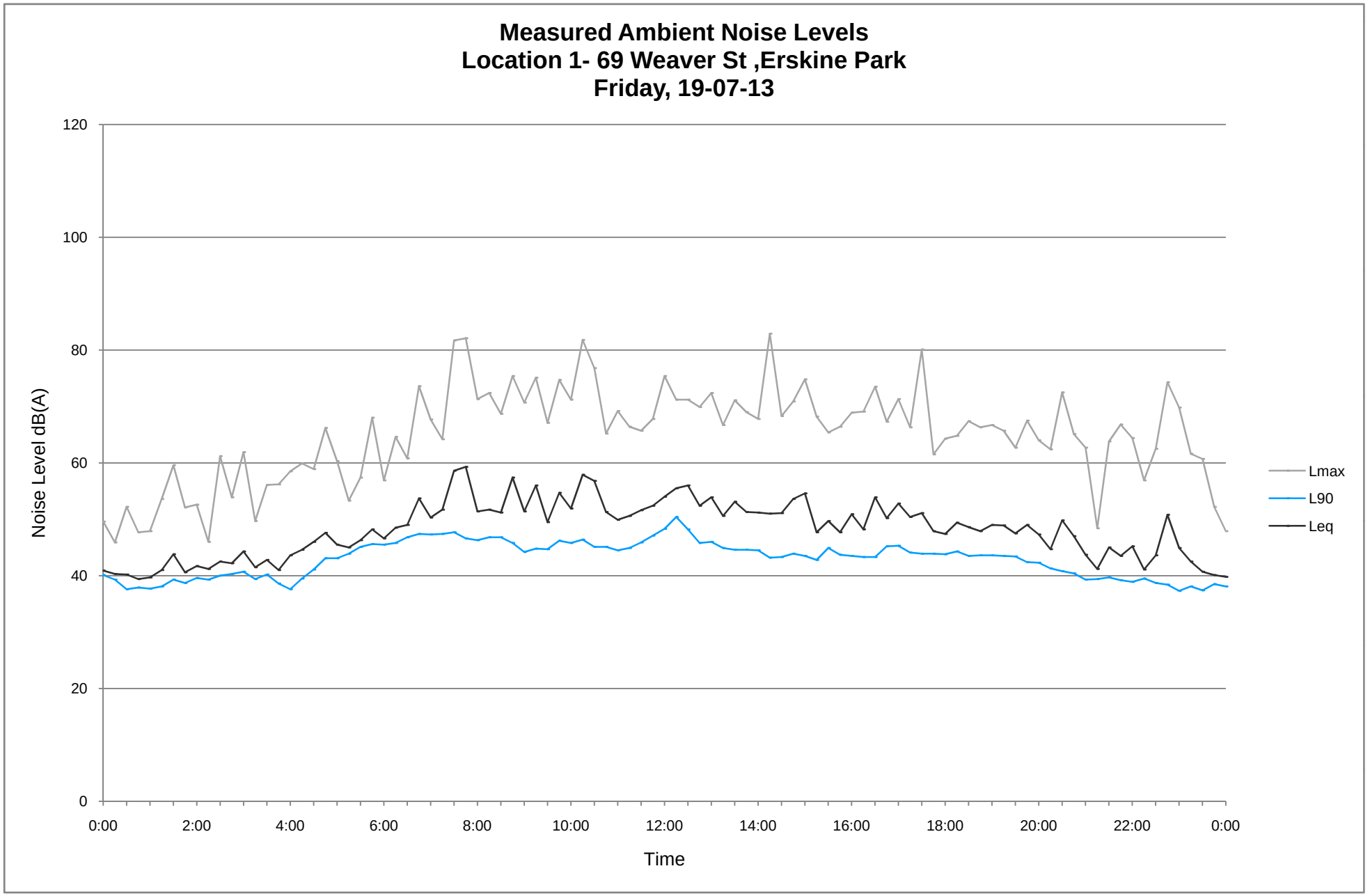
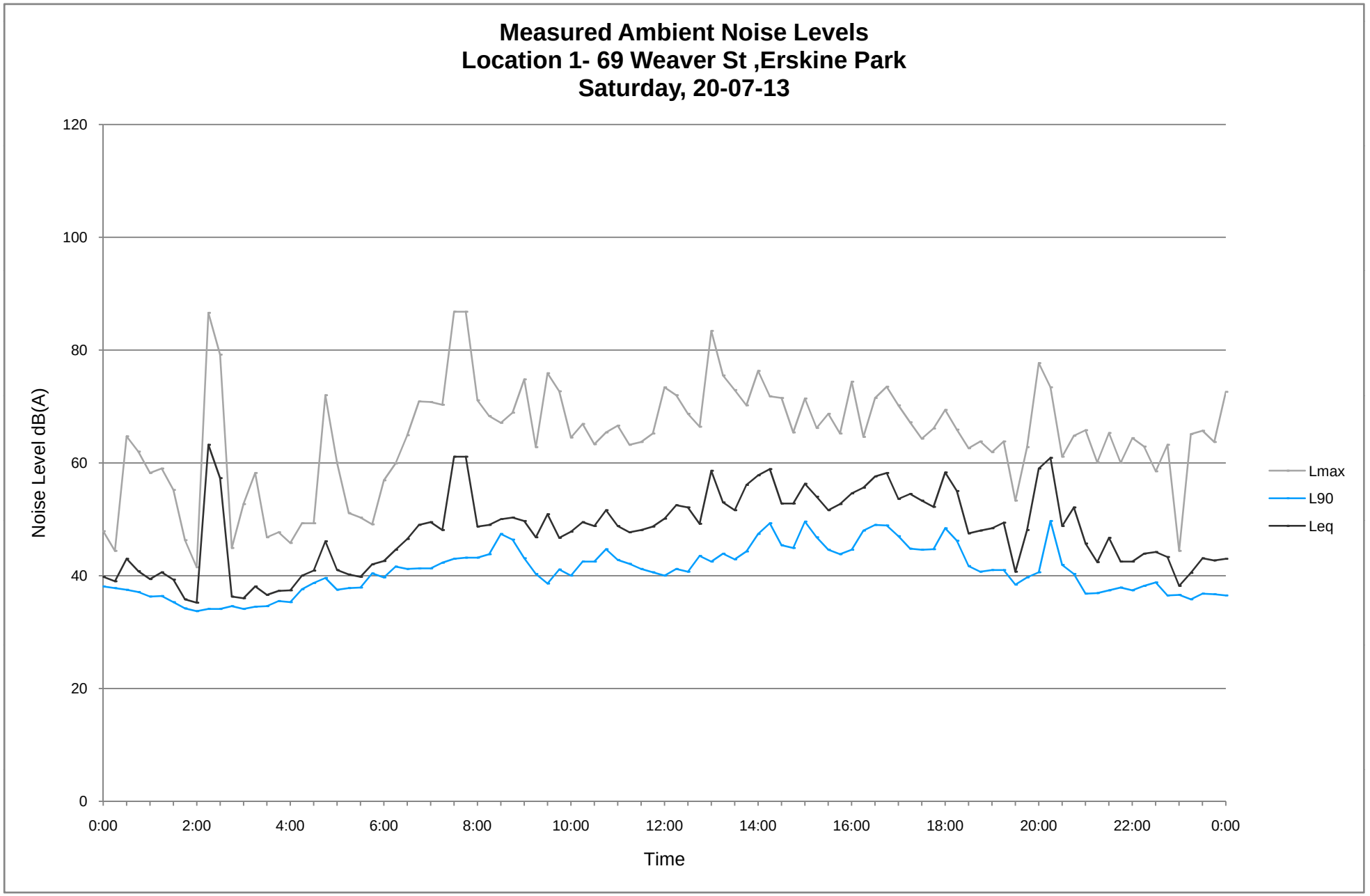
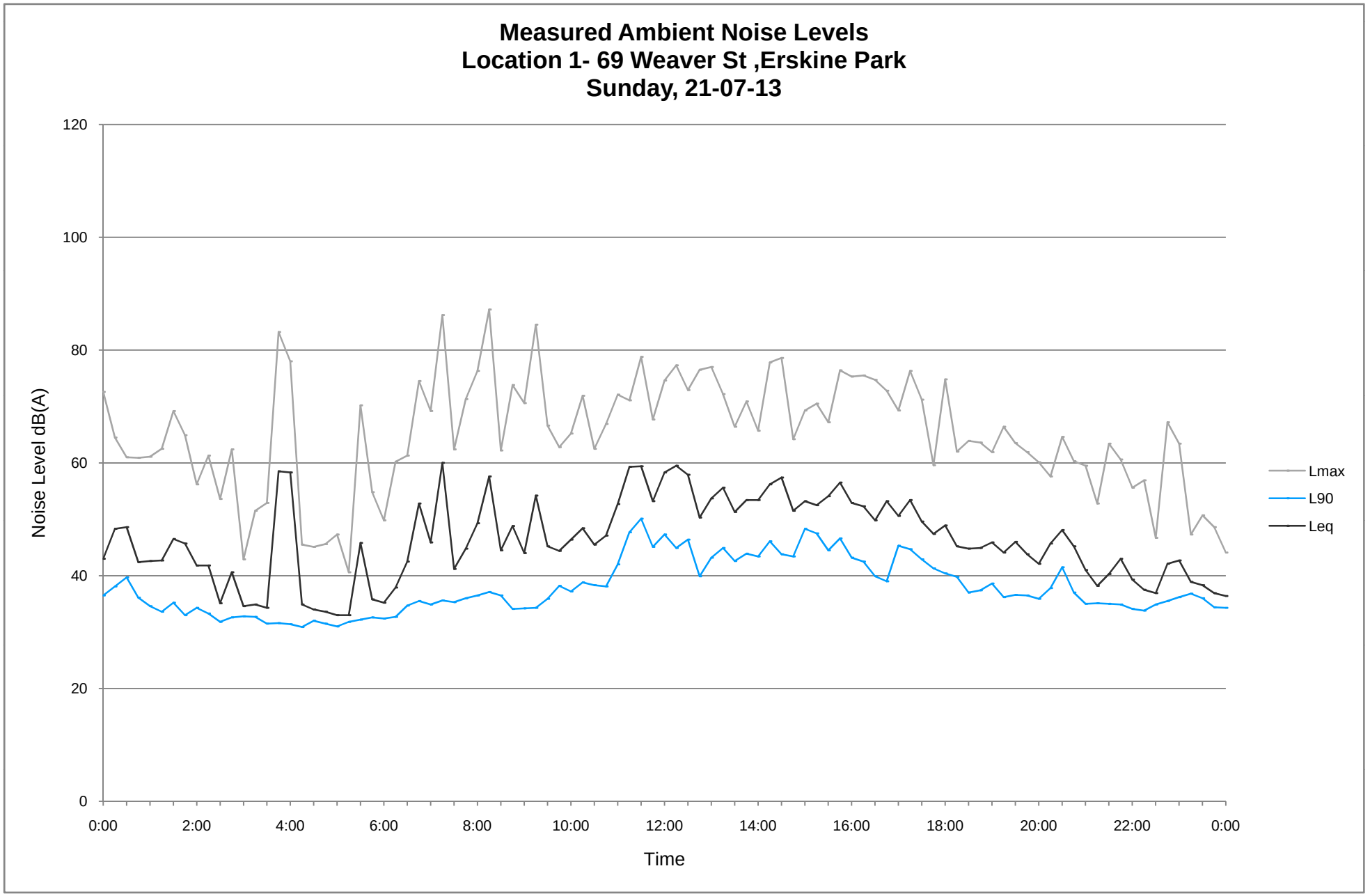
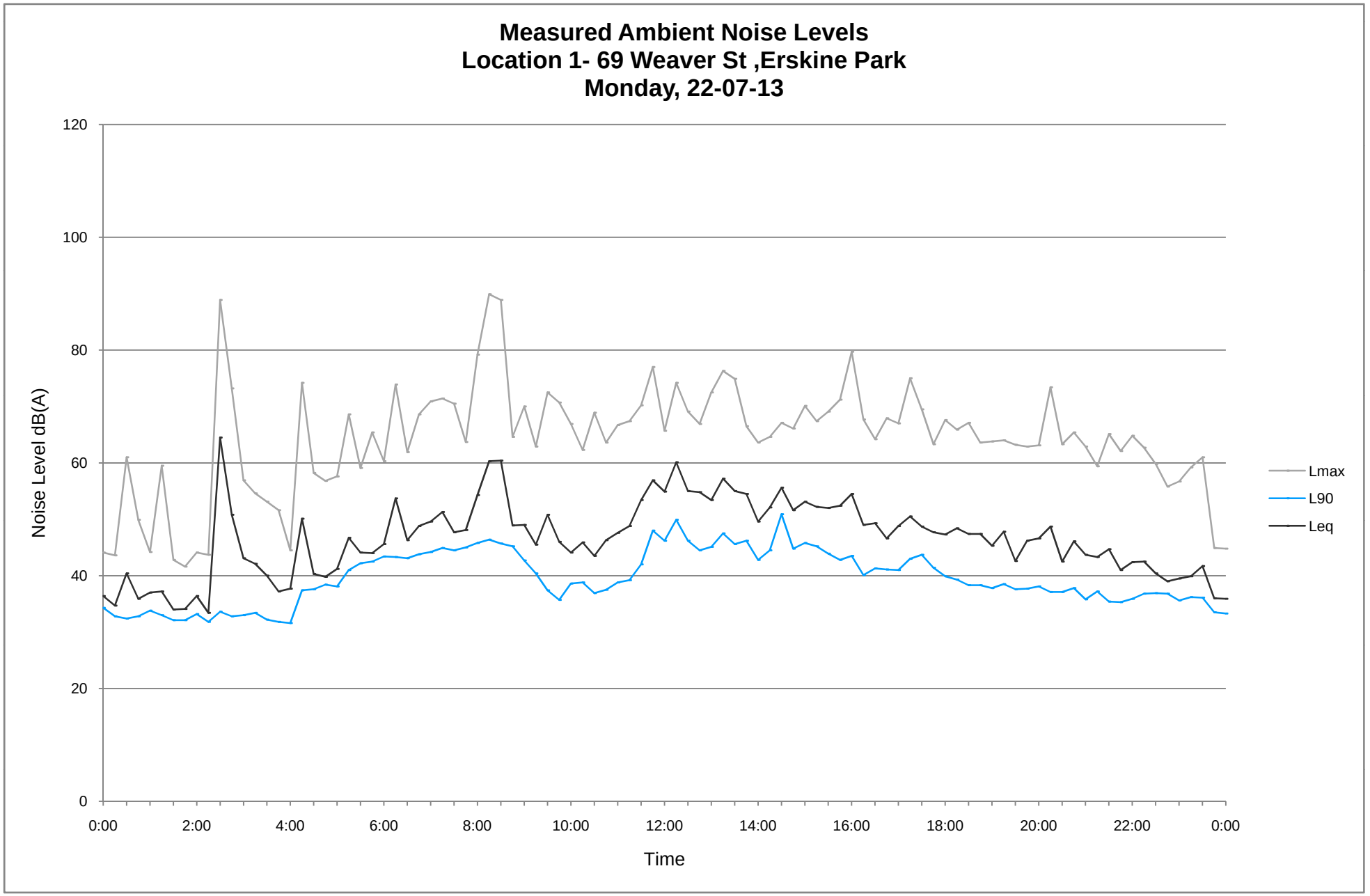
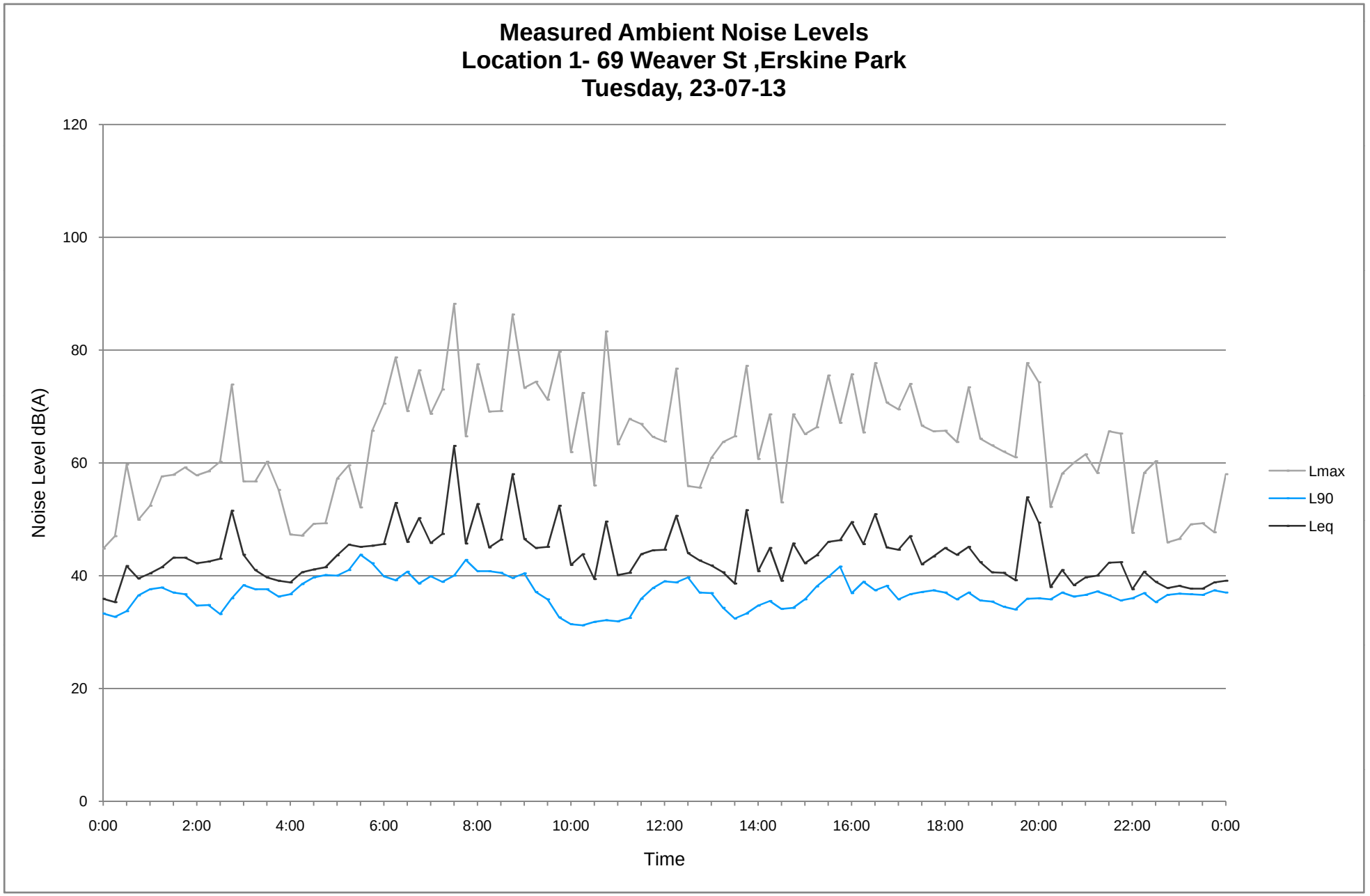
20:00
22:00
0:00
Time
Lmax
L90
Leq


Measured Ambient Noise Levels
Location 1- 69 Weaver St ,Erskine Park
Friday, 19-07-13
Noise Level dB(A)
120
100
80
60
40
20
0
0:00
2:00
4:00
6:00
8:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
0:00
Time
Lmax
L90
Leq


Measured Ambient Noise Levels
Location 1- 69 Weaver St ,Erskine Park
Saturday, 20-07-13
Noise Level dB(A)
120
100
80
60
40
20
0
0:00
2:00
4:00
6:00
8:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
0:00
Time
Lmax
L90
Leq


Measured Ambient Noise Levels
Location 1- 69 Weaver St ,Erskine Park
Sunday, 21-07-13
Noise Level dB(A)
120
100
80
60
40
20
0
0:00
2:00
4:00
6:00
8:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
0:00
Time
Lmax
L90
Leq


Measured Ambient Noise Levels
Location 1- 69 Weaver St ,Erskine Park
Monday, 22-07-13
Noise Level dB(A)
120
100
80
60
40
20
0
0:00
2:00
4:00
6:00
8:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
0:00
Time
Lmax
L90
Leq


Measured Ambient Noise Levels
Location 1- 69 Weaver St ,Erskine Park
Tuesday, 23-07-13
Noise Level dB(A)
120
100
80
60
40
20
0
0:00
2:00
4:00
6:00
8:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
0:00
Time
Lmax
L90
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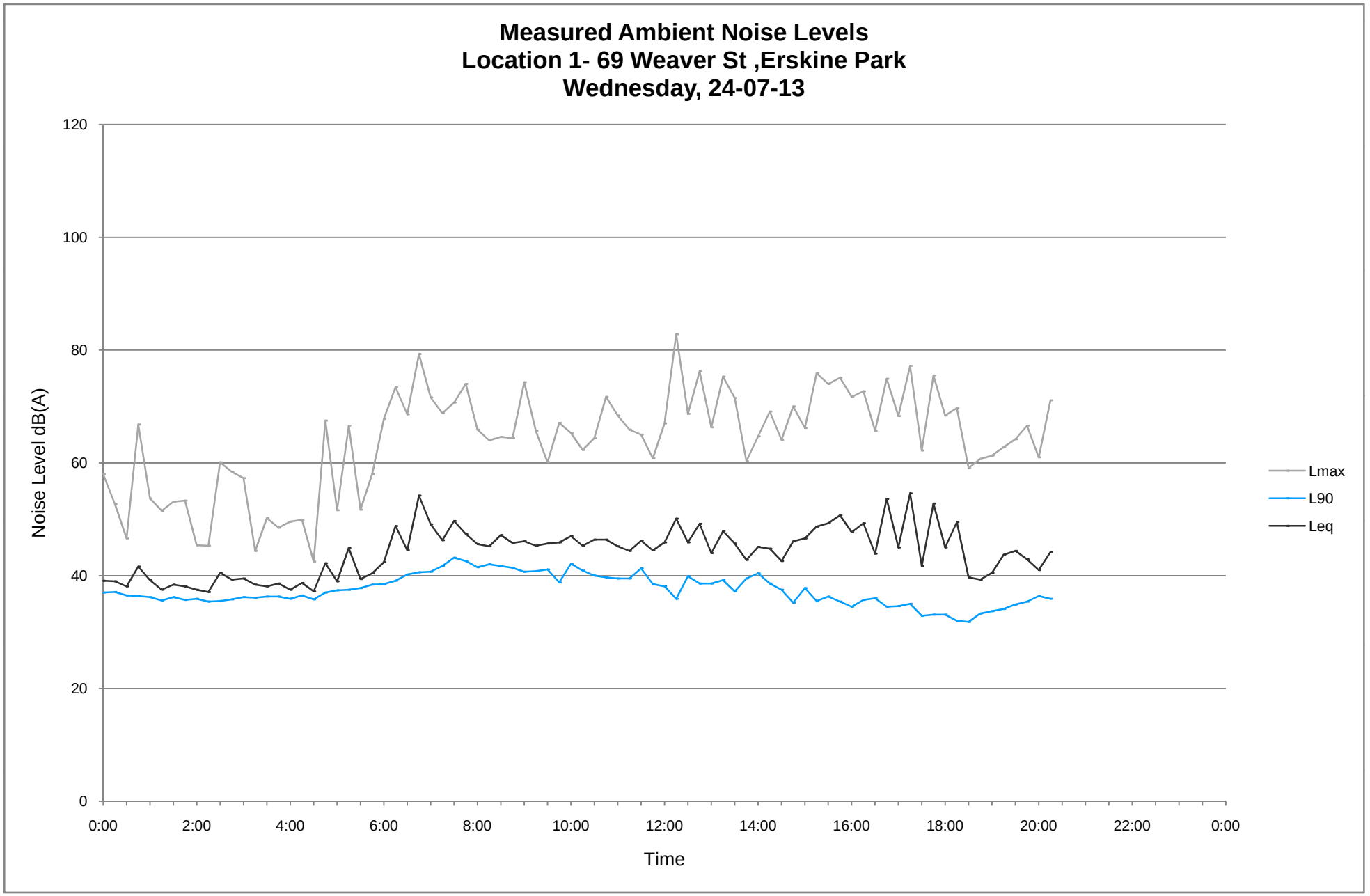
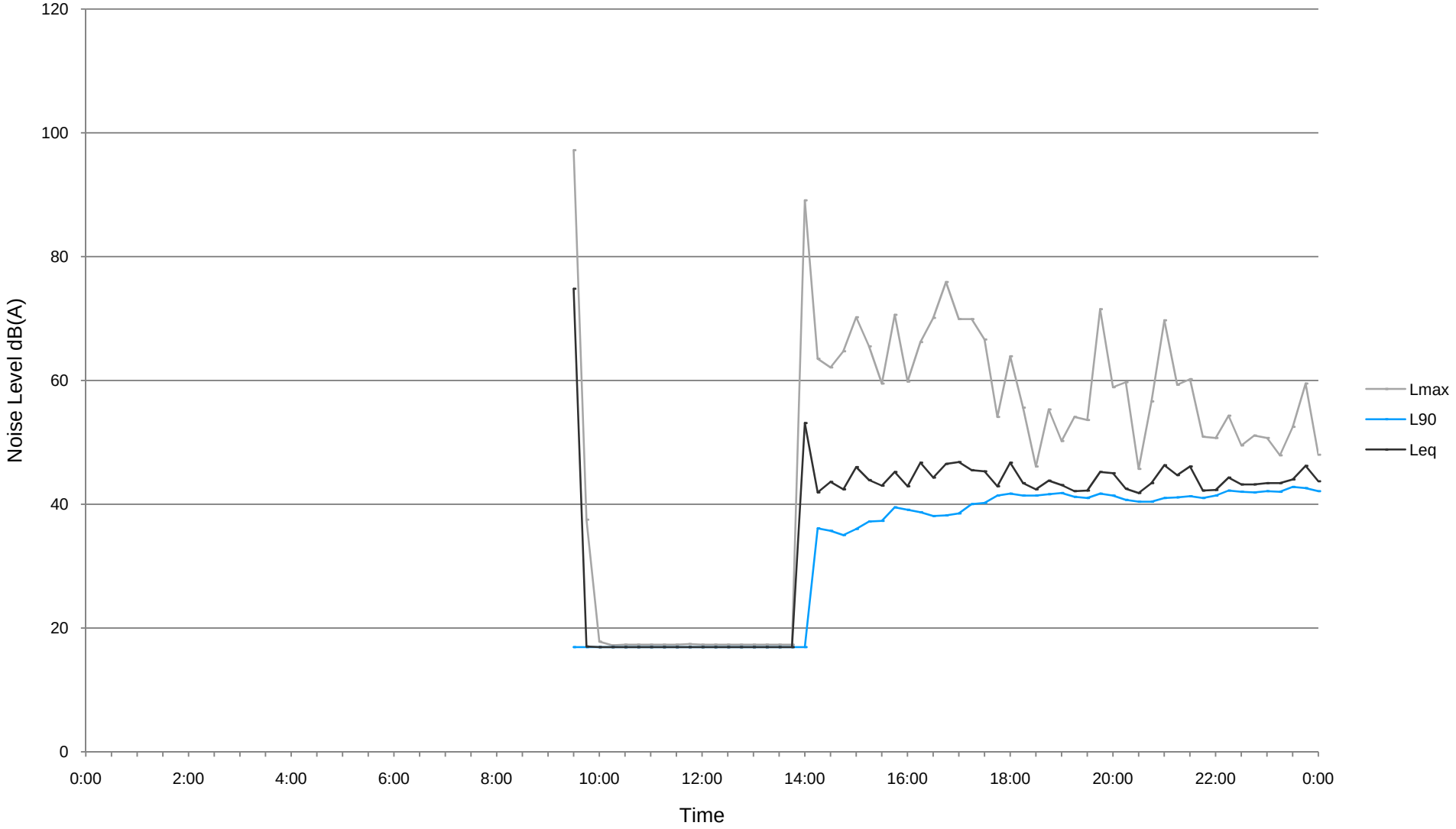
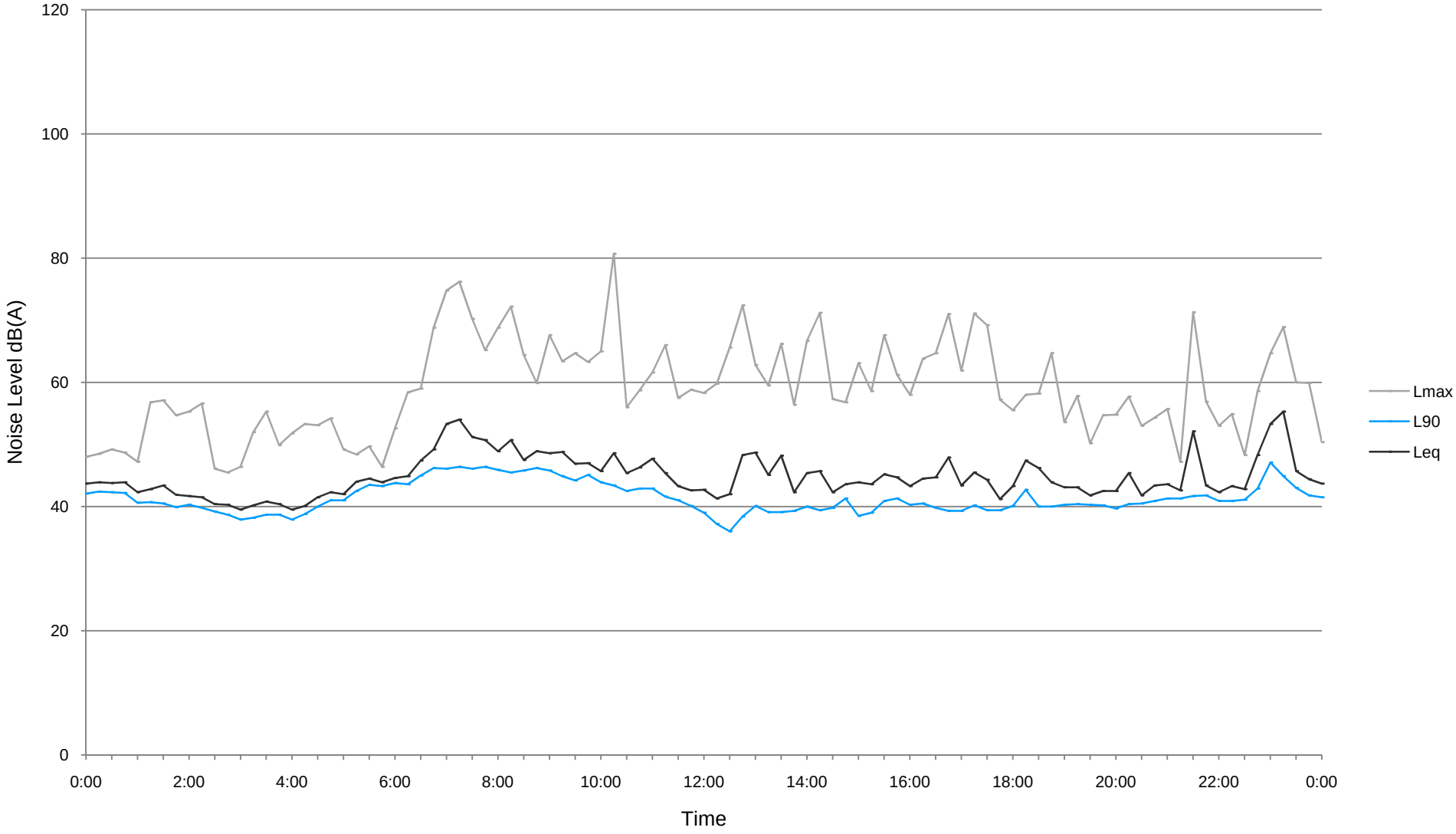

Measured Ambient Noise Levels
Location 1- 69 Weaver St ,Erskine Park
Wednesday, 24-07-13
Noise Level dB(A)
120
100
80
60
40
20
0
0:00
2:00
4:00
6:00
8:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
0:00
Time
Lmax
L90
Leq

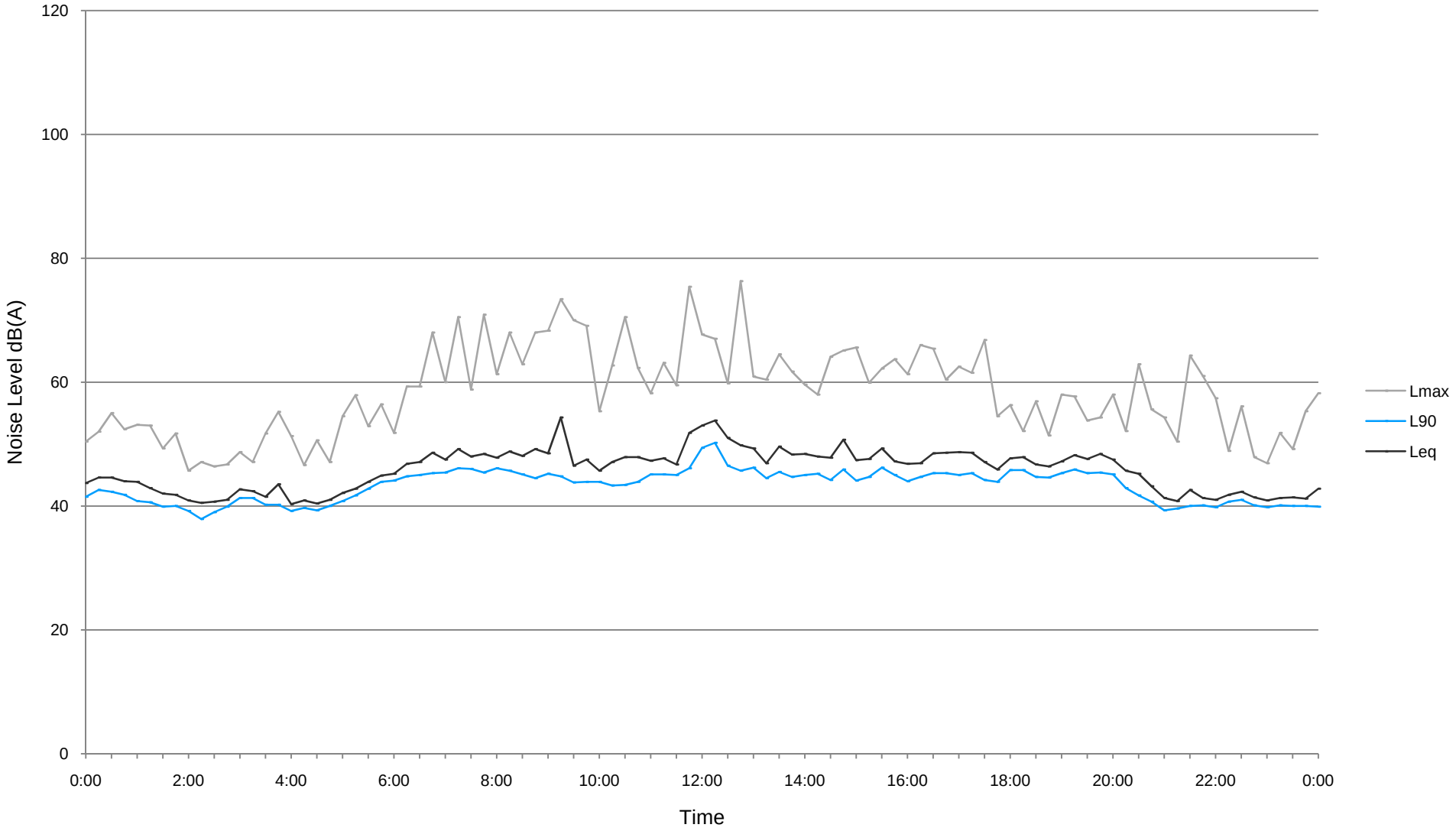
Measured Ambient Noise Levels
Location 2 - Emmaus Village, Bakers Lane, Erskine Park
Wednesday, 17-07-13



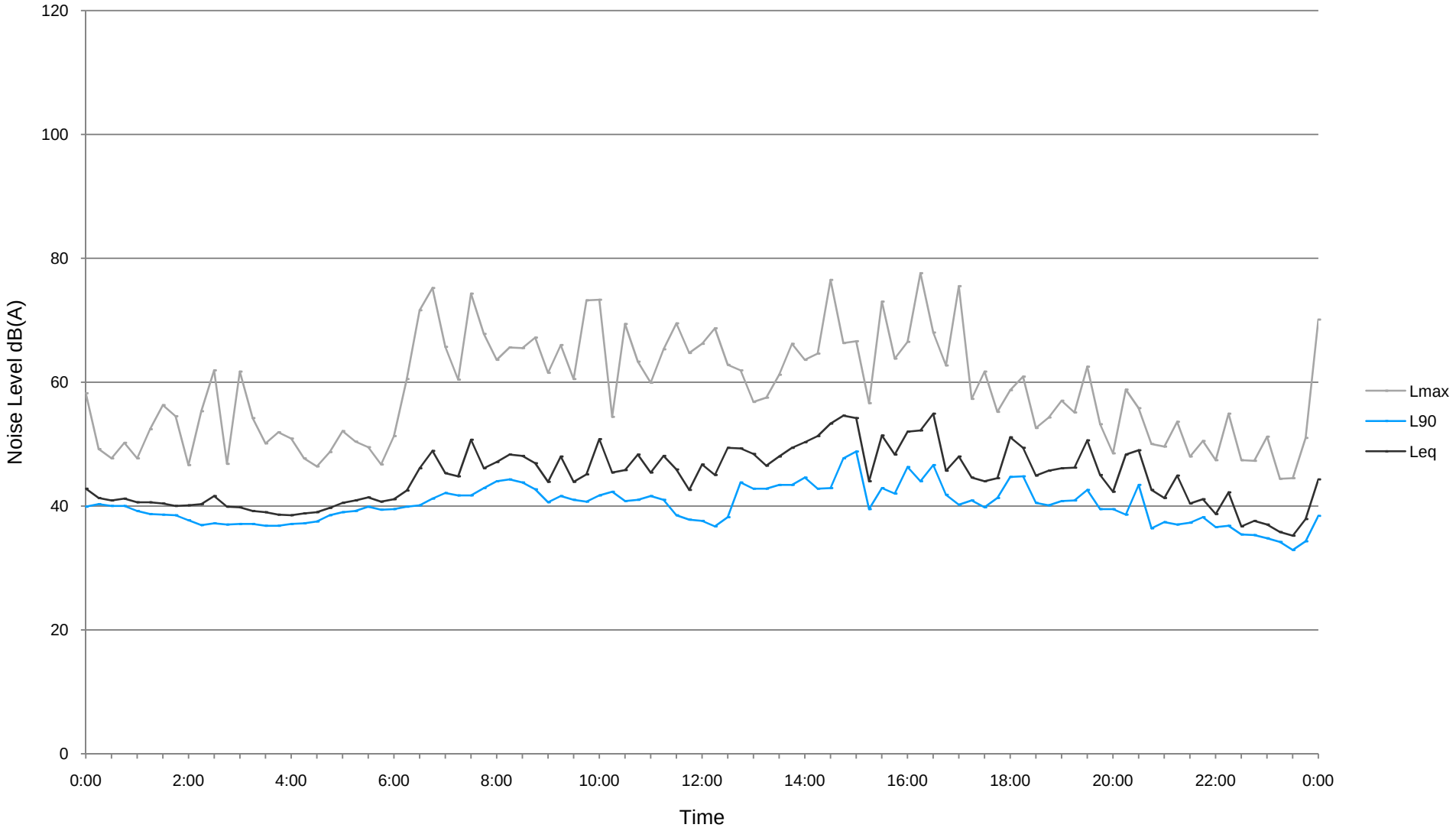
Measured Ambient Noise Levels
Location 2 - Emmaus Village, Bakers Lane, Erskine Park
Thursday, 18-07-13



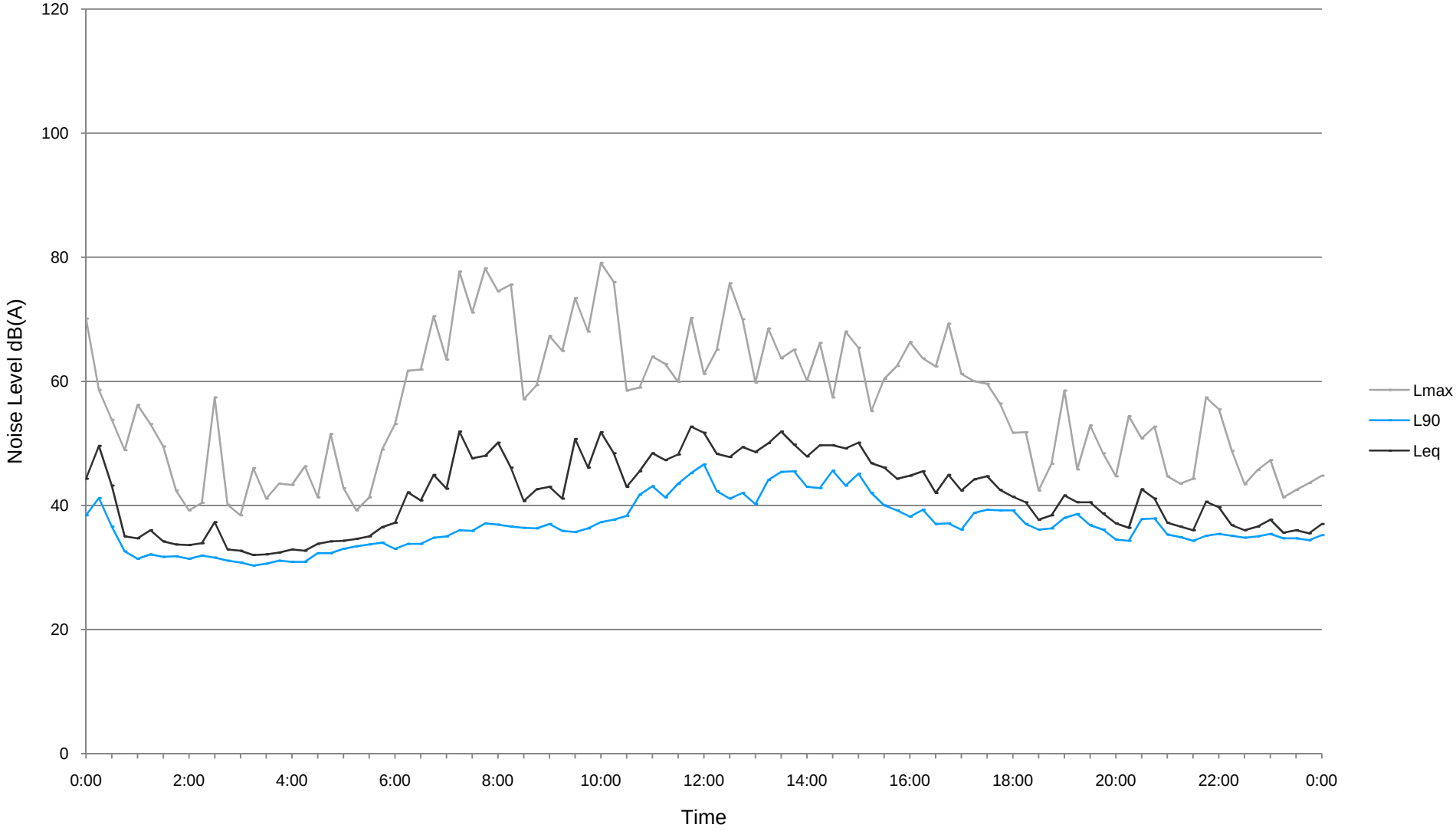
Measured Ambient Noise Levels
Location 2 - Emmaus Village, Bakers Lane, Erskine Park
Friday, 19-07-13



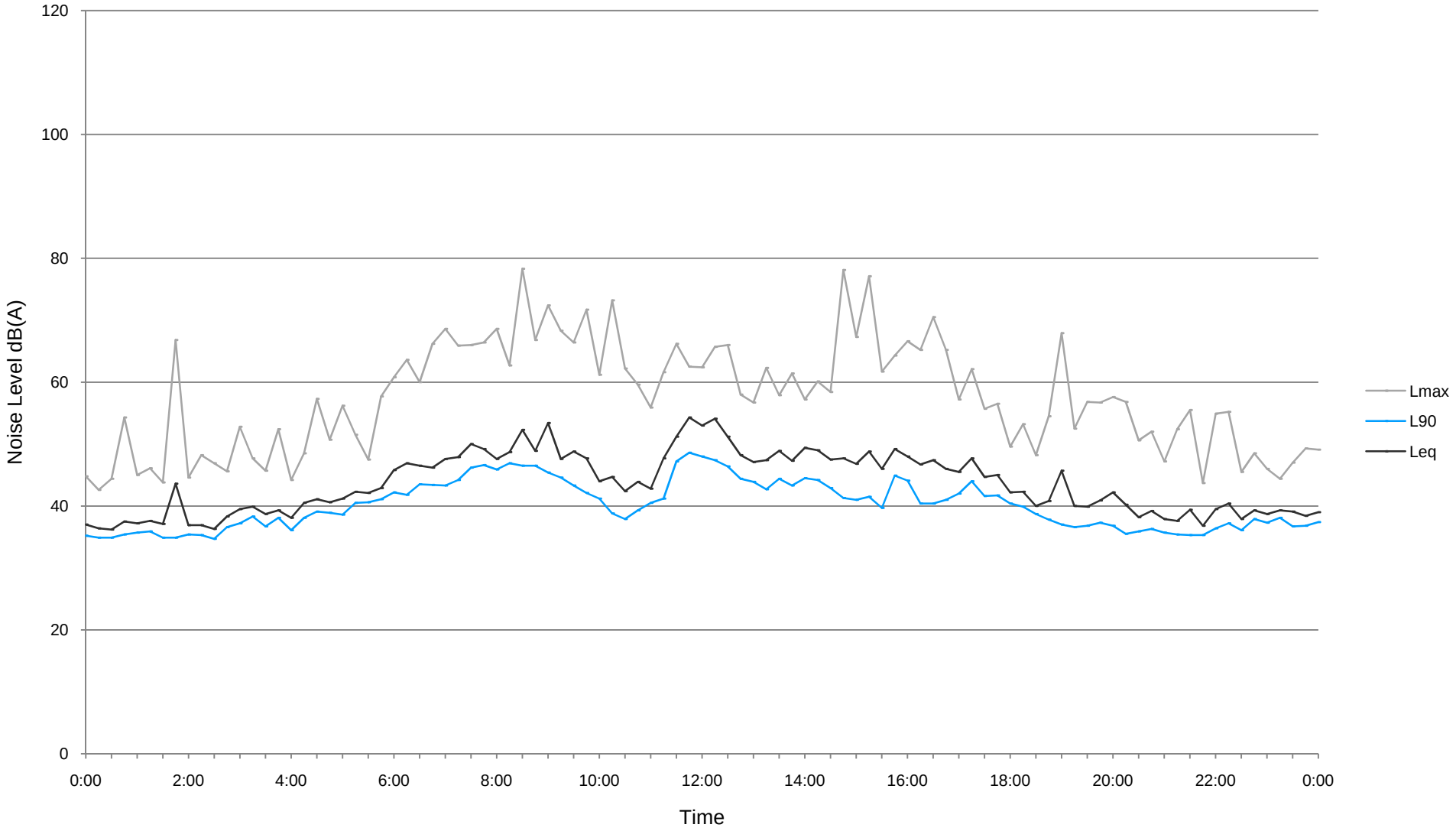
Measured Ambient Noise Levels
Location 2 - Emmaus Village, Bakers Lane, Erskine Park
Saturday, 20-07-13



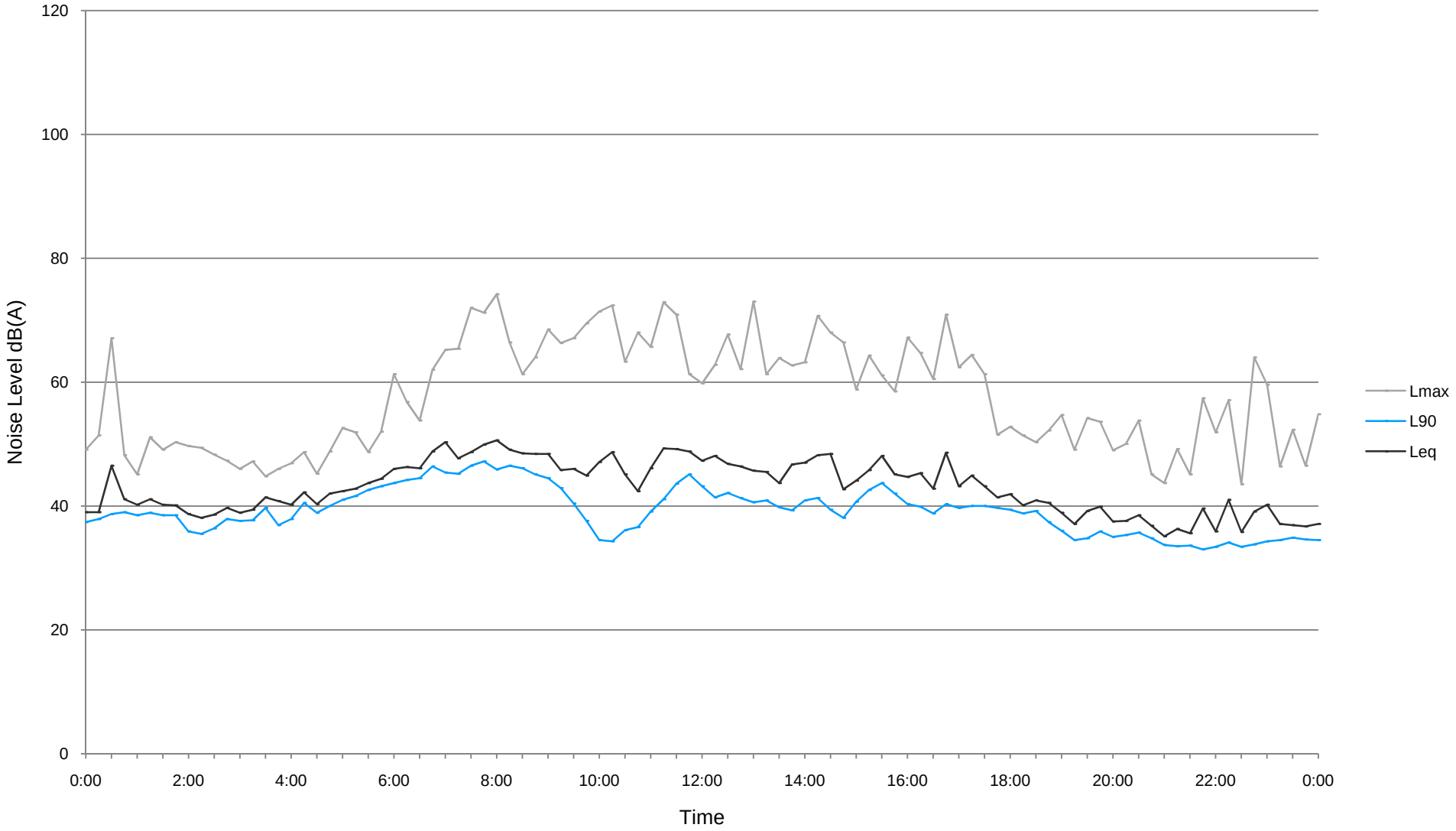
Measured Ambient Noise Levels
Location 2 - Emmaus Village, Bakers Lane, Erskine Park
Sunday, 21-07-13

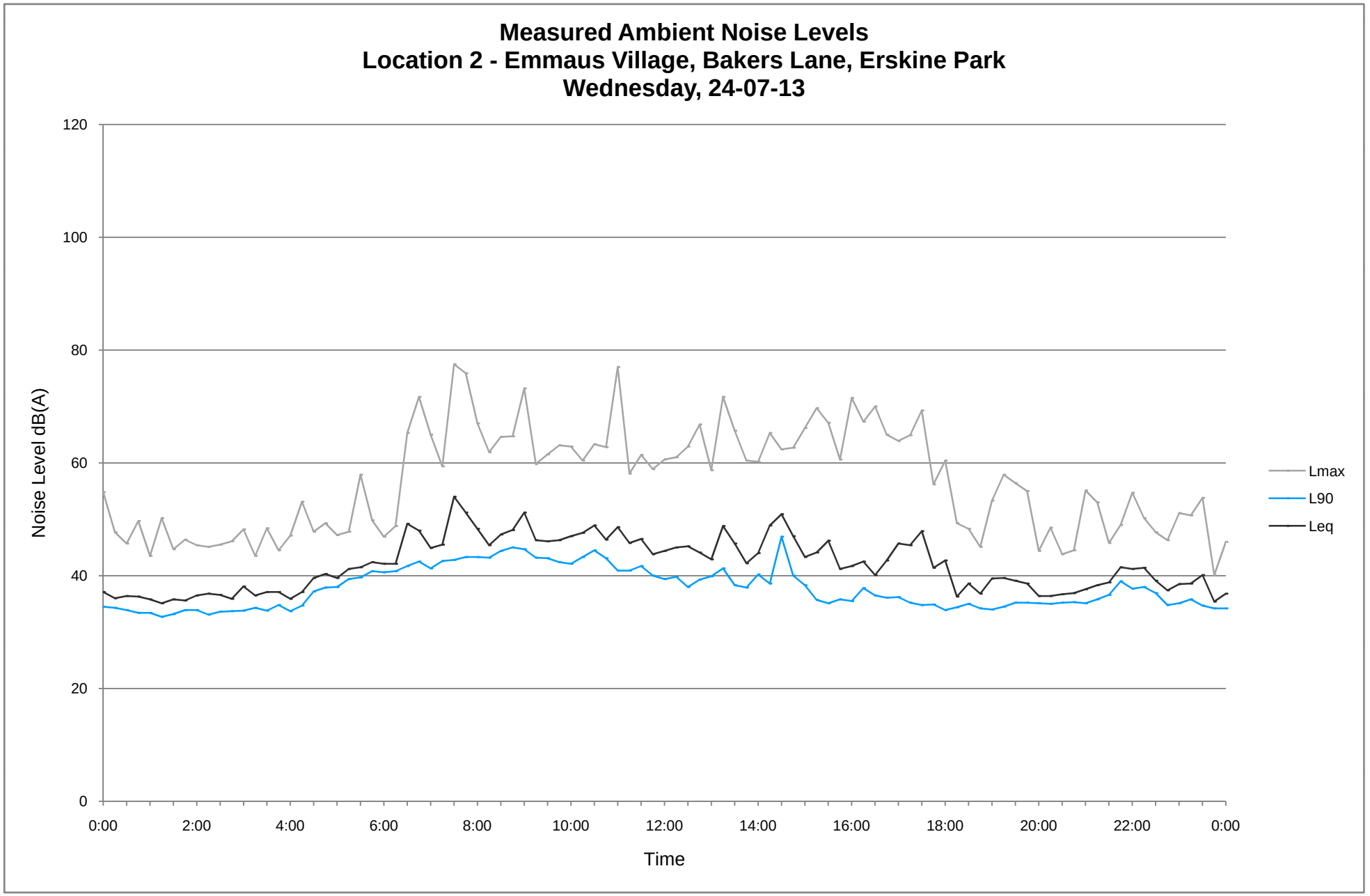


Measured Ambient Noise Levels
Location 2 - Emmaus Village, Bakers Lane, Erskine Park
Monday, 22-07-13

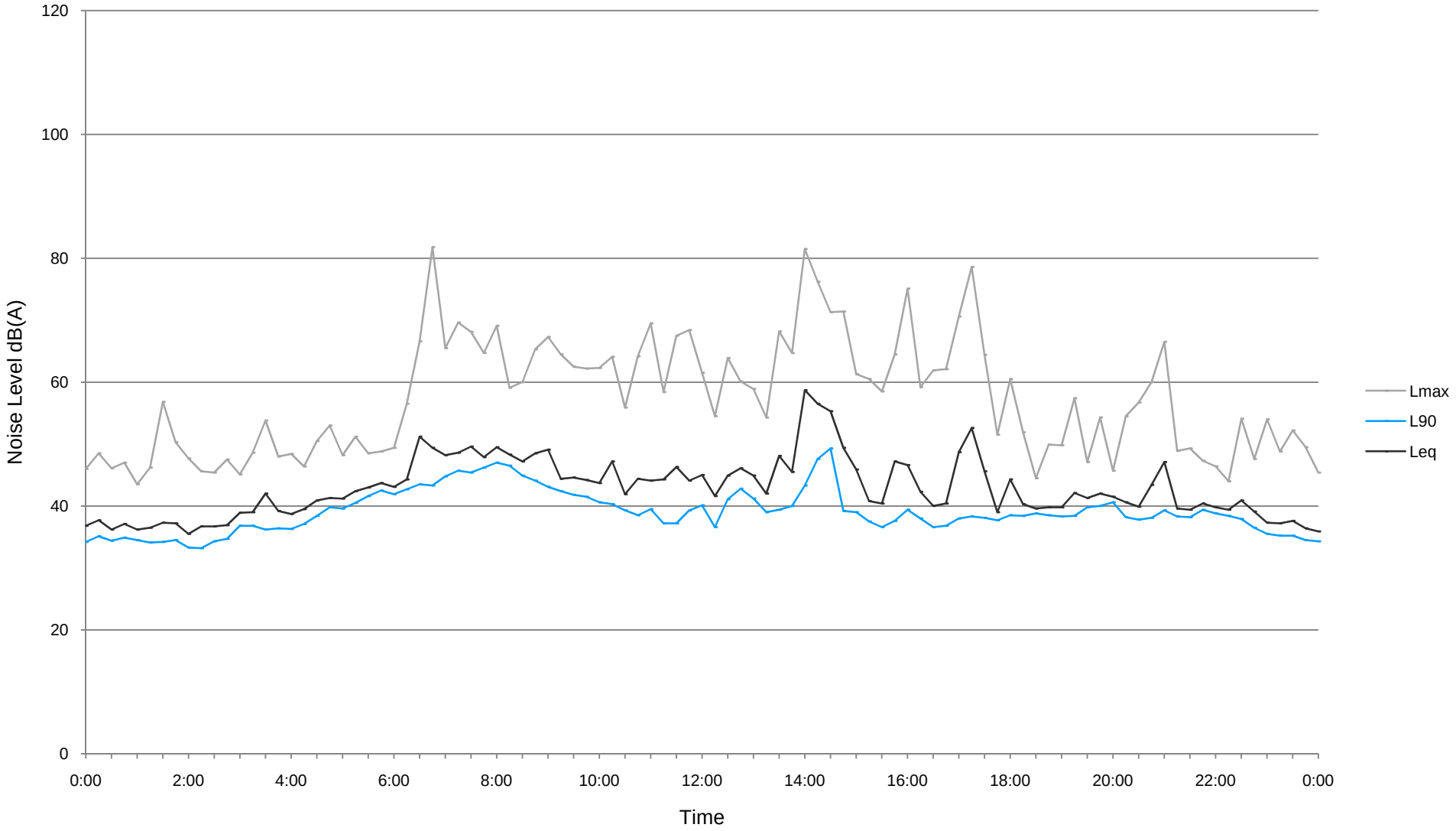


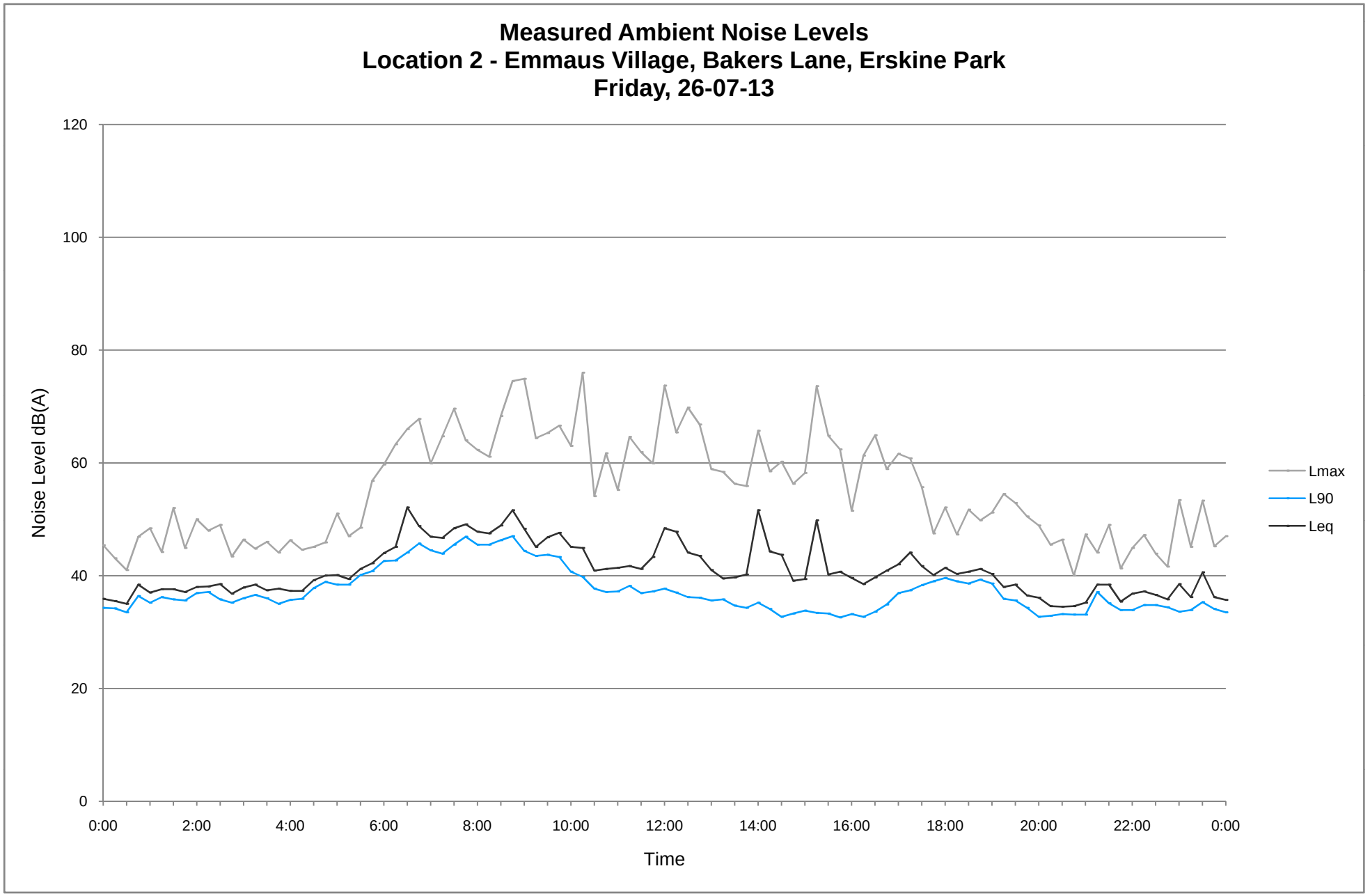
Measured Ambient Noise Levels
Location 2 - Emmaus Village, Bakers Lane, Erskine Park
Tuesday, 23-07-13



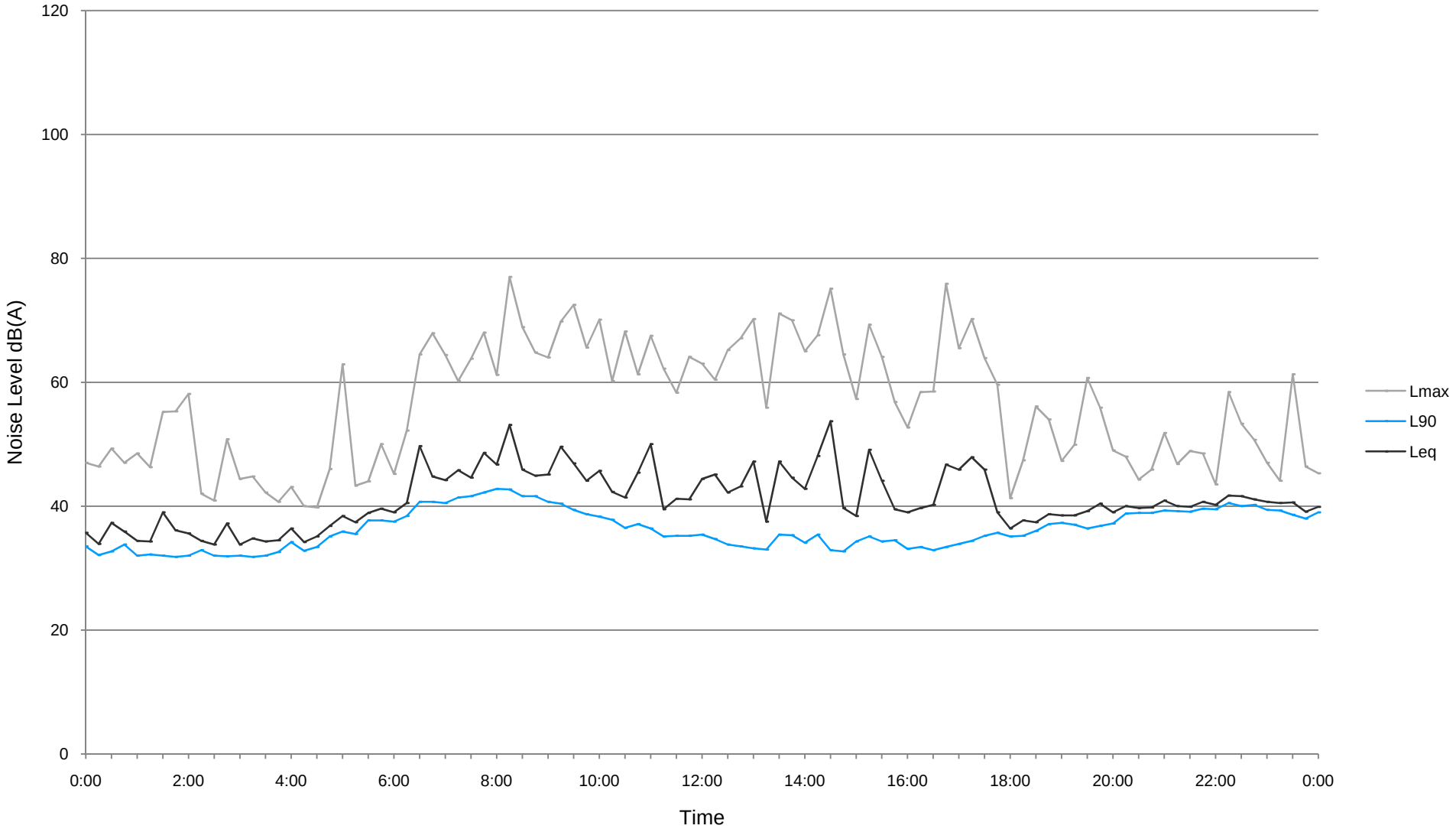

Measured Ambient Noise Levels
Location 2 - Emmaus Village, Bakers Lane, Erskine Park
Wednesday, 24-07-13
Noise Level dB(A)
120
100
80
60
40
20
0
0:00
2:00
4:00
6:00
8:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
0:00
Time
Lmax
L90
Leq

Measured Ambient Noise Levels
Location 2 - Emmaus Village, Bakers Lane, Erskine Park
Thursday, 25-07-13

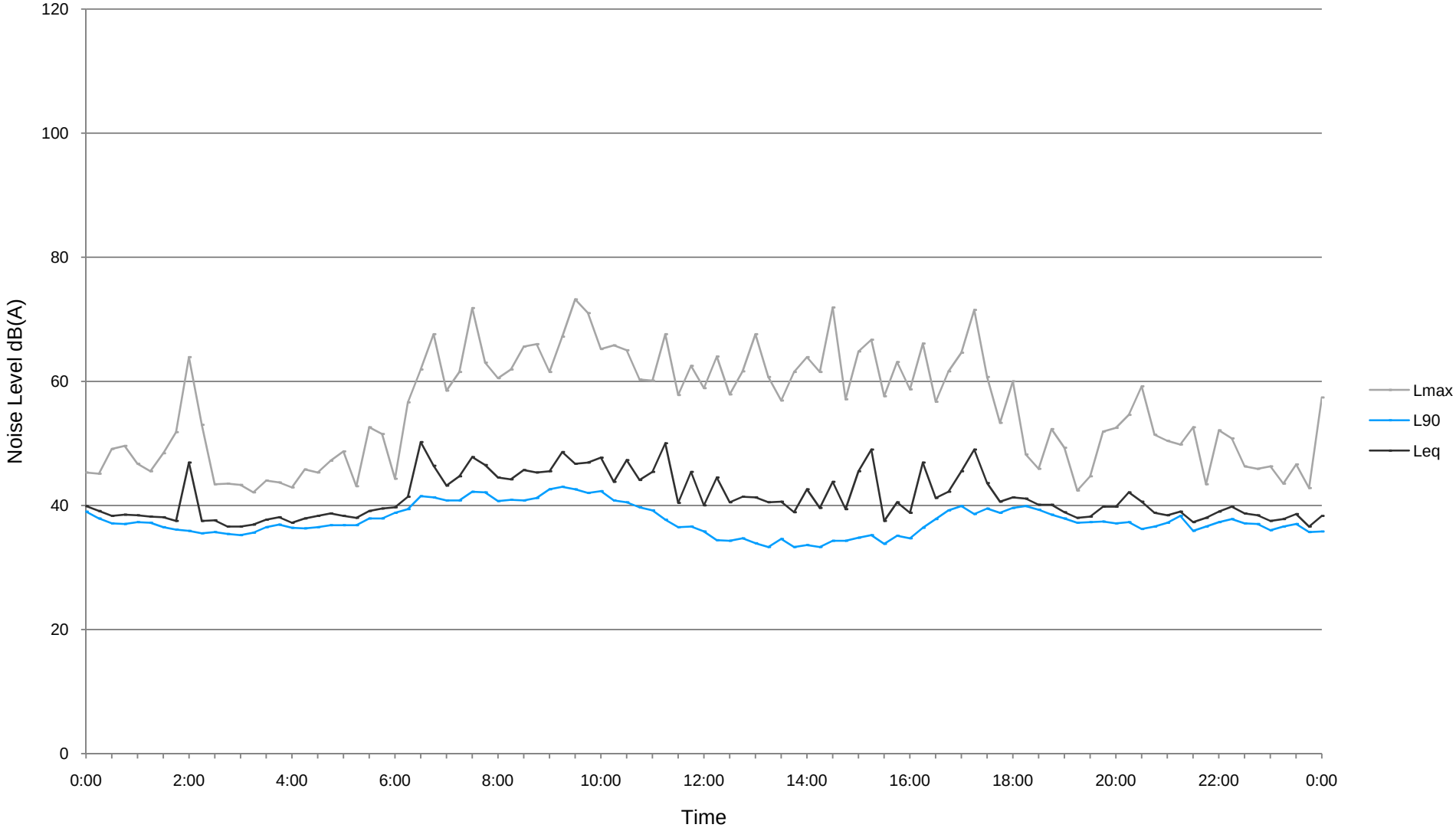


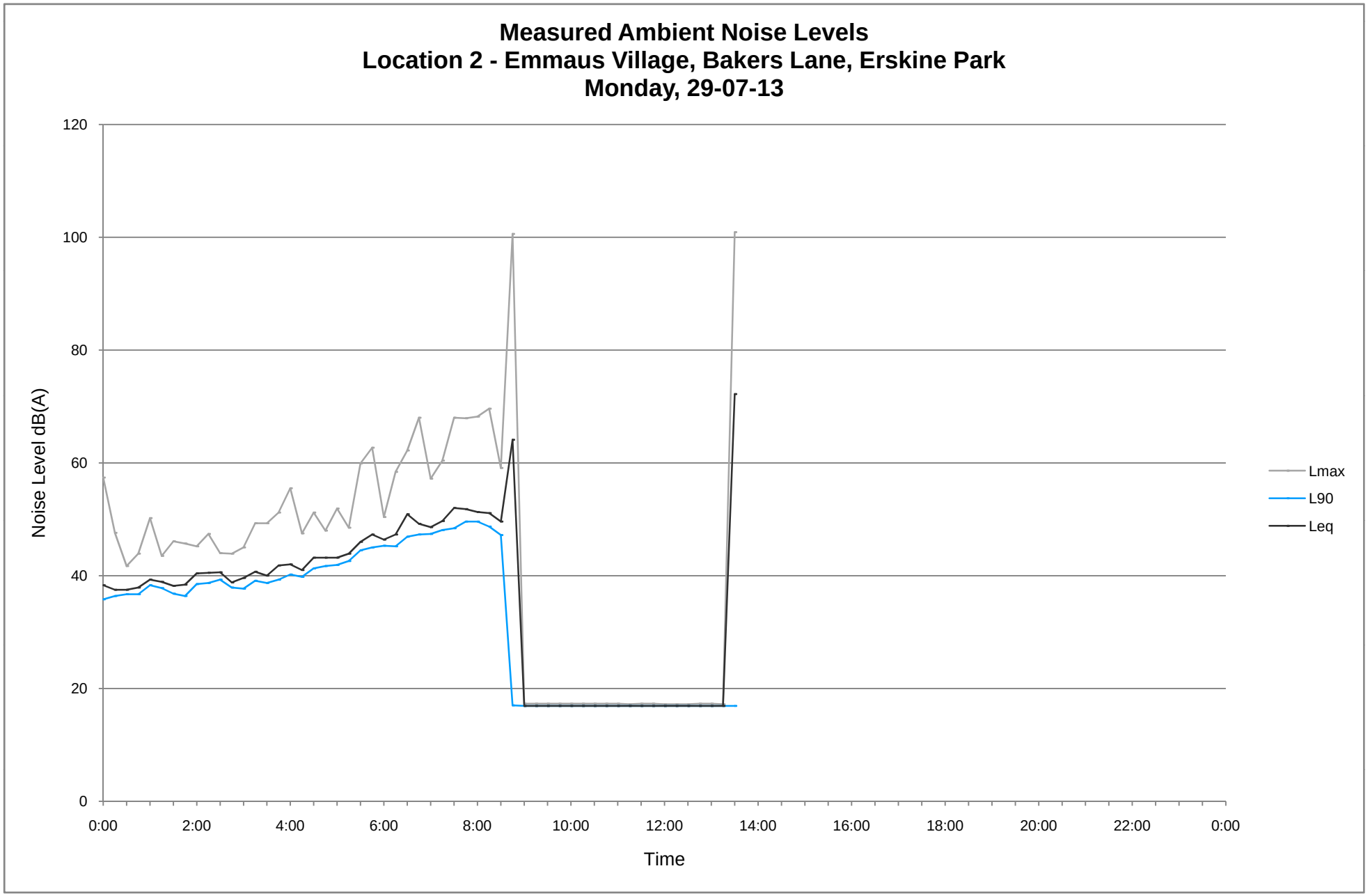

Measured Ambient Noise Levels
Location 2 - Emmaus Village, Bakers Lane, Erskine Park
Friday, 26-07-13
Noise Level dB(A)
120
100
80
60
40
20
0
0:00
2:00
4:00
6:00
8:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
0:00
Time
Lmax
L90
Leq

Measured Ambient Noise Levels
Location 2 - Emmaus Village, Bakers Lane, Erskine Park
Saturday, 27-07-13



Measured Ambient Noise Levels
Location 2 - Emmaus Village, Bakers Lane, Erskine Park
Sunday, 28-07-13




Measured Ambient Noise Levels
Location 2 - Emmaus Village, Bakers Lane, Erskine Park
Monday, 29-07-13
Noise Level dB(A)
120
100
80
60
40
20
0
0:00
2:00
4:00
6:00
8:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
0:00
Time
Lmax
L90
Leq

Appendix B

Wind Analysis

Table B.1 Day percentage of wind speed (vector at 22.5° intervals)

Direction	Winter	Autumn	Spring	Summer
22.5°	20	29.2	24.9	23.8
45°	14.9	25.4	25.6	23.6
67.5°	11	24.2	24.2	22.5
90°	7.8	22.7	21.9	20.7
112 .5°	10.8	22.2	23.2	20.4
135°	14.3	22.8	23.7	24.3
157.5°	19.4	24.7	24.8	25
180°	21.1	24.3	23	23.3
202.5°	23.1	23.2	20.2	21.5
225°	22.7	20.9	15.9	17.6
247.5°	22.1	19.6	12.6	13.8
270°	21.6	19.1	11	9.8
292.5°	22.3	20.9	14.3	11.7
315°	21.7	24.9	19.6	16.4
337.5°	22.5	29.4	22.6	19
360°	21.7	29.5	23.6	21.6

Notes: 1. Bold highlight denotes occurrence of 30 % and greater.

Table B.2 Evening percentage of wind speed (vector at 22.5° intervals)

Direction	Winter	Autumn	Spring	Summer
22.5°	13.3	17.9	24.7	25.2
45°	10.3	17.4	25.8	**30**
67.5°	7.9	17.7	24.2	29.4
90°	6.6	15.6	25.3	**31.4**
112 .5°	9.7	22.1	26.6	**35.6**
135°	20.1	26.9	27.2	**34.2**
157.5°	28.5	**35.3**	28.8	26.1
180°	**34**	**37.5**	28.8	20.6
202.5°	**37.2**	**38.8**	28	19
225°	**38.8**	**37.2**	26.2	18.6
247.5°	**36.6**	**36.3**	25	14.4
270°	**30.7**	25.6	20.6	8.5
292.5°	25	18.7	18.9	6.8
315°	22	16.7	15.7	7.2
337.5°	17.7	19.3	18.6	10
360°	14.6	18.7	22.2	17.7

Notes: 1. Bold highlight denotes occurrence of 30 % and greater.

Table B.3 Night percentage of wind speed (vector at 22.5° intervals)

Direction	Winter	Autumn	Spring	Summer
22.5°	16.4	11.1	12.6	12.3
45°	12.9	8.2	9.5	12.4
67.5°	8.1	6.4	7.8	11.3
90°	7.3	6.1	7.2	9.8
112 .5°	13.6	10.6	10.5	16
135°	23	21.4	19.9	29.6
157.5°	**30.9**	**30**	**32.7**	**38.9**
180°	**30.9**	**33.6**	**37.5**	**43.2**
202.5°	**30.3**	**35.5**	**40**	**43.9**
225°	26.5	**32.9**	**38.7**	**43.5**
247.5°	24	**31.2**	**36.5**	**38.6**
270°	20	25.8	28.6	25.7
292.5°	18.5	21	21.7	12.7
315°	18	15.6	17.7	8.9
337.5°	18.4	15.8	18	10.4
360°	17.4	12.7	14.3	10.8

Notes: 1. Bold highlight denotes occurrence of 30 % and greater.

Appendix C

Site plan

DEVELOPMENT SUMMARY

TOTAL SITE AREA	43,347 sqm
TOTAL WAREHOUSE	16,392 sqm
AMENITIES	1,303 sqm
SERVICE BUILDINGS	943 sqm
MEZZANINE OFFICES	1,036 sqm
MEZZANINE PRODUCTION AREA	1,343 sqm
TOTAL BUILDING AREA	21,017sqm
EFFICIENCY	43.0 %
AWNINGS	731 sqm
CARPARKING PROVIDED	250 spaces
HEAVY DUTY PAVEMENT (H)	15,275 sqm
LIGHT DUTY PAVEMENT (L)	6,348 sqm

CARPARKING REQUIRED (AS PER COUNCIL DCP)	
WAREHOUSE - 1 per 100 sqm	164 spaces
OFFICE - 1 per 40 sqm	26 spaces
TOTAL CARPARKING REQUIRED	190 spaces

FOR APPROVAL

WRITTEN DIMENSIONS TO TAKE PRECEDENCE OVER SCALE. BUILDER SHALL CHECK AND VERIFY ALL DIMENSIONS ON SITE. DISCREPENCIES TO BE BROUGHT TO THE ATTENTION OF THE ARCHITECT.

REVISIONS: NO.	DATE	DESCRIPTION	NO.	DATE	DESCRIPTION
--	29.07.2013	FOR APPROVAL			

CLIENT: The GPT Group; CIP — Developing Relationships | Building Success — Sydney | Melbourne | Brisbane | Adelaide | Perth — www.cipproperty.com.au | National Enquiries: 1800 829 877

PROJECT: FOOD PROCESSING & PACKAGING FACILITY AT PART LOT 2304 TEMPLAR ROAD, ERSKINE PARK, NSW.

ARCHITECTS DOCUMENTATION: NICHOLAS & ALEXANDER ARCHITECTS
37 Bevan Street, Albert Park, 3206
Tel : 9696 5822
Fax : 9696 5833
Email : naarch@bigpond.net.au
A.C.N. 070 432 932

NORTH POINT:

SHEET TITLE: LOCALITY & SITE PLAN

DOCUMENTATION	AG	DATE	JUNE 2013
DRAWN	AG	SCALE	AS SHOWN @ A0
CHECKED	ND	PLOT SCALE	1 : 1
DRWG. No.	13424	SHEET. No. DA-010	REV. --