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NEWCOLD SYDNEY, HARRIS AVENUE, MARSDEN PARK

SSD Noise Assessment

24 January 2020

NewCold

TJ669-01F02 Noise Assessment (r5)

35 1982-2017 ACOUSTIC ENGINEERING EXCELLENCE

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1 Introduction

1.1 Overview

Renzo Tonin & Associates was engaged to conduct an environmental noise impact assessment of operational noise for a new cold storage facility, NewCold Sydney, located at Harris Avenue, Marsden Park. This report forms part of a Section 96 (2) application to an existing State Significant Development Application. The development was approved in July 2016 for a Swires facility however the ownership of the site has now transferred to NewCold.

The report quantifies the noise impacts from activities associated with the development at the nearest sensitive receivers in accordance with the Blacktown City Council and EPA requirements. In preparing this report reference has been made to the Acoustic Logic report *Swire Cold Storage Facility, Marsden Park Noise Impact Assessment*, dated 22 July 2015 (Acoustic Logic DA Report).

The work documented in this report was carried out in accordance with the Renzo Tonin & Associates Quality Assurance System, which is based on Australian Standard / NZS ISO 9001. Appendix A contains a glossary of acoustic terms used in this report.

1.2 Site description

The site is located on Lot 16 Hollinsworth Road, Marsden Park. The site is currently a greenfield site located towards the centre of Marsden Park Industrial Precinct.

The site is bounded by Hollinsworth Road to the south, Harris Avenue to the west, Darling Street to the north and an industrial premise to the east. Existing industrial premises surround the proposed development on all sides. The nearest residential receivers are located approximately 290 metres to the south and 450 metres to the southwest. A location map is presented in Figure 1 below.

Figure 1: Location map (Source – Nearmap_Sept_2019)

1.3 Proposed development

The application relates to the construction of a cold storage facility, which will encompass the following:

- Cold storage warehousing:
    - Chiller warehouse and dispatch,
    - Freezer warehouse and dispatch,
    - High bay,
- Loading docks located along the southern façade
- Car and truck parking
- Administration offices and technical rooms

To allow for future expansion the proposal will be built in 2 stages. This assessment addresses the complete Stage 2 development.

1.4 Hours of operation

The facility is proposed to operate 24 hours a day, 7 days a week.

1.5 Assessment methodology

In order to assess the potential noise impact from the proposed development the following methodology was used:

- Identify nearest most potentially affected receiver locations to the subject site;
- Use existing ambient noise and background levels to establish noise goals in accordance with the NPfI and local council;
- Using predictive noise modelling, determine the extent of noise from the proposed development at nearby receiver locations;
- Identify where noise emission from the site may exceed the relevant criteria, and
- Where noise emission from the site may exceed the relevant criteria provide recommendations to reduce noise impacts from the site.

1.6 Reference material

The architectural drawing package prepared by EMKC *(File name AU0012 DA06 [E].pdf)*, dated 24 July 2019, was referenced for this noise assessment:

2 Assessment locations & existing noise environment

2.1 Nearest sensitive receivers

The development site is bounded by industrial premises. The nearest receivers are identified in Table 1 and outlined in Figure 2 below:

Table 1: Receiver locations

Receiver ID	Receiver type/Address	Description	Distance from site (m)
A1	Residential 105 Hollinsworth Rd, Marsden Park	Detached single storey residential dwelling located south of the site	290
A2	Residential 140 Hollinsworth Rd, Marsden Park	Existing caravan park, Ingenia Lifestyle Stoney Creek, located southwest of site.	450
A3	Industrial 16 Hollinsworth Rd, Marsden Park	Industrial premises, Reece Civil, located along eastern boundary.	Adjacent

2.2 Existing noise environment

Criteria for the assessment of operational noise are usually derived from the existing noise environment of an area, excluding noise from the subject development.

Appendix B of the NSW EPA *Industrial Noise Policy* (INP) outlines two methods for determining the background noise level of an area, being 'B1 – Long-term background noise method' and 'B2 – Short-term background noise method'. This assessment has used long-term noise monitoring.

As the noise environment of an area almost always varies over time, background and ambient noise levels need to be determined for the operational times of the proposed development. For example, in a suburban or urban area the noise environment is typically at its minimum at 3am in the morning and at its maximum during the morning and afternoon traffic peak hours. The INP outlines the following standard time periods over which the background and ambient noise levels are to be determined:

- Day: 07:00-18:00 Monday to Saturday and 08:00-18:00 Sundays & Public Holidays
- Evening: 18:00-22:00 Monday to Sunday & Public Holidays
- Night: 22:00-07:00 Monday to Saturday and 22:00-08:00 Sundays & Public Holidays

2.3 Noise measurement locations

Background noise monitoring has previously been undertaken for the original SSD Application and included within the Acoustic Logic DA Report. The background noise monitoring data within this report

has been adopted for this assessment and used to establish the existing acoustic environment at the sensitive receiver locations surrounding the construction site.

The long-term measurement location is outlined in Table 2 and shown in Figure 2.

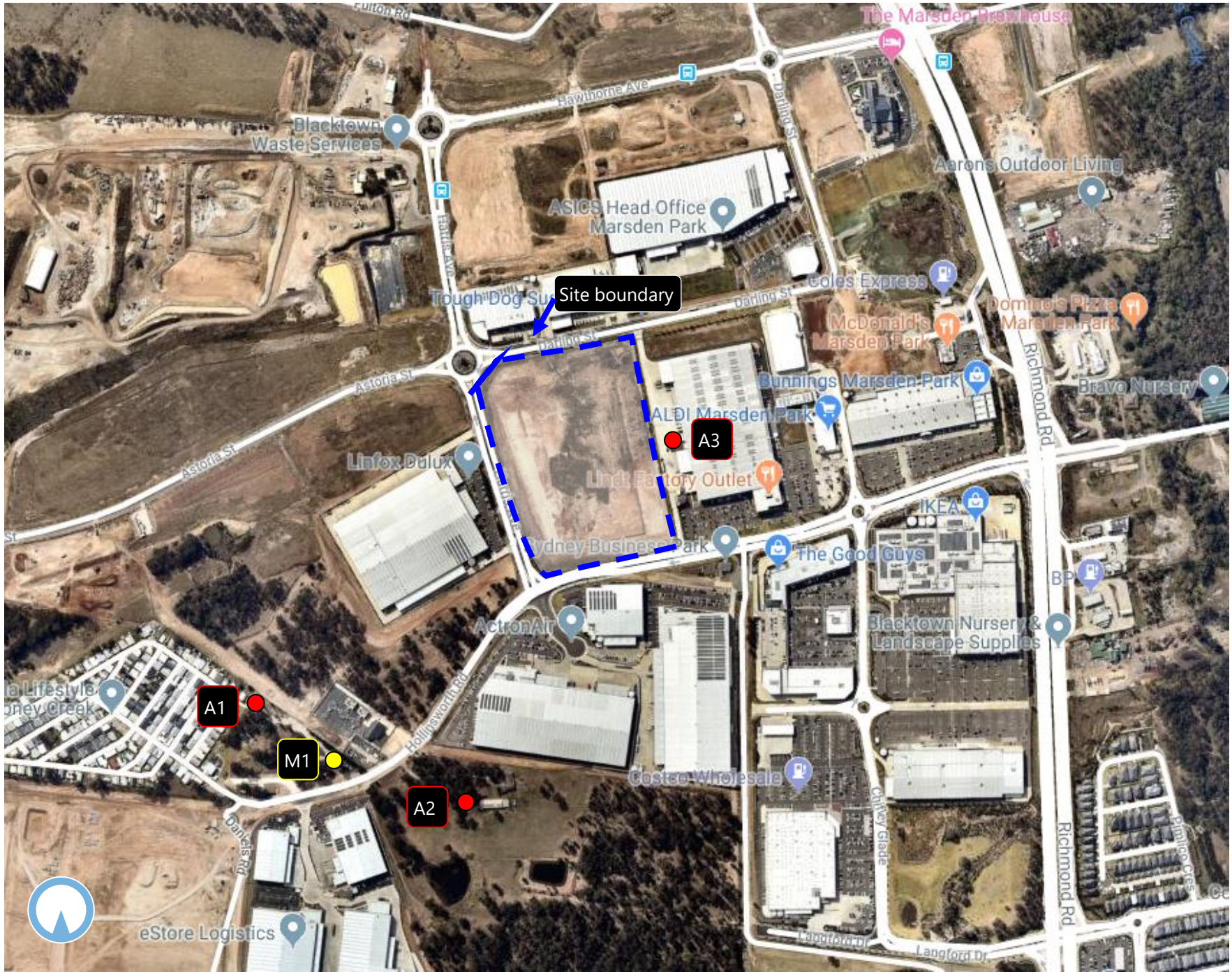
Table 2: Noise monitoring location

ID	Location	Description
M1	140 Hollinsworth Rd, Marsden Park	Noise monitor was located in the free field, adjacent to the eastern boundary of the caravan park, near the existing substation. Results from this noise monitor represent the ambient and background noise environment for receivers A1 and A2.

Note: 1. The long-term (unattended) noise monitoring was conducted at Locations M1 from 5 May 2014 to 12 May 2014.

APPENDIX A of this report presents a description of noise terms. The graphical recorded outputs from long-term noise monitoring are included in APPENDIX B (Acoustic Logic DA Report).

Figure 2: Site, receiver and noise monitoring locations (Source – Nearmap_Sept_2019)



2.4 Existing background noise levels

Existing background noise levels are taken from the Acoustic Logic DA report and reiterated in Table 3 below.

Table 3: Measured existing background (L_{90}) noise levels, dB(A)

Location	L_{90} background noise levels		
	Day[1]	Evening[2]	Night[3]
Location M1 - 140 Hollinsworth Rd, Marsden Park	38	35	32

Notes:
1. Day represents the period from 7am to 6pm, Monday to Saturday and 8am to 6pm, Sunday & Public Holidays
2. Evening represents the period from 6pm to 10pm, Monday to Sunday & Public Holidays
3. Night represents the period from 10pm to 7am, Monday to Saturday and 10pm to 8am, Sundays & Public Holidays

3 Project noise goals

The following sections presents criteria applicable to noise generated by the warehouse, on-site vehicle movements, loading dock, carparks, mechanical equipment, as well as noise generated from potential increased traffic on the surrounding road network.

3.1 NSW Noise Policy for Industry

Noise impact is assessed in accordance with the NSW 'Noise Policy for Industry' (NPfI), 2017. The assessment procedure has two components:

- Controlling intrusive noise impacts in the short-term for residences; and
- Maintaining noise level amenity for residences and other land uses.

In accordance with the NPfI, noise impact should be assessed against the project noise trigger level which is the lower value of the project intrusiveness noise levels and project amenity noise levels.

3.1.1 Project intrusive noise levels

According to the NPfI, the intrusiveness of a noise source may generally be considered acceptable if the equivalent continuous (energy-average) A-weighted level of noise from the source (represented by the $L_{Aeq,15min}$ descriptor) does not exceed the background noise level measured in the absence of the source by more than 5dB(A). The project intrusiveness noise level, which is only applicable to residential receivers, is determined as follows:

$L_{Aeq,15minute}$ Intrusiveness noise level = Rating Background Level ('RBL') plus 5dB(A)

Based on the background noise monitoring results and the proposed operating hours of the facility, the intrusiveness noise levels for residential receivers are reproduced in Table 4 below.

Table 4: Intrusiveness noise levels

Receiver	Intrusiveness noise level, $L_{Aeq,15min}$		
	Day	Evening	Night
A1 and A2	38 + 5 = 43	35 + 5 = 40	32 + 5 = 37

Notes: Day: 7:00 to 18:00 Monday to Saturday and 8:00 to 18:00 Sundays & Public Holidays
Evening: 18:00 to 22:00 Monday to Sunday & Public Holidays
Night: 22:00 to 7:00 Monday to Saturday and 22:00 to 8:00 Sundays & Public Holidays

4.2.2 Amenity noise levels

The project amenity noise levels for different time periods of day are determined in accordance with Section 2.4 of the NPfI. The NPfI recommends amenity noise levels ($L_{Aq,period}$) for various receivers including residential, commercial, industrial receivers and sensitive receivers such as schools, hotels, hospitals, churches and parks. These "recommended amenity noise levels" represent the objective for

total industrial noise experienced at receiver location. However, when assessing a single industrial development and its impact on an area, "project amenity noise levels" apply.

The recommended amenity noise levels applicable for the subject area are reproduced in Table 5 below.

Table 5: Project amenity noise levels

Type of Receiver	Noise Amenity Area	Time of Day	Recommended amenity noise level, L_{Aeq}, dB(A)
Residential	Suburban	Day	55
		Evening	45
		Night	40
Industrial premises	All	When in use	70

Notes:
1. Daytime 7.00 am to 6.00 pm; Evening 6.00 pm to 10.00 pm; Night-time 10.00 pm to 7.00 am.
2. On Sundays and Public Holidays, Daytime 8.00 am - 6.00 pm; Evening 6.00 pm - 10.00 pm; Night-time 10.00 pm - 8.00 am.
3. The L_{Aeq} index corresponds to the level of noise equivalent to the energy average of noise levels occurring over a measurement period.
4. The recommended amenity noise levels refer only to noise from industrial sources. However, they refer to noise from all such sources at the receiver location, and not only noise due to a specific project under consideration. The levels represent outdoor levels except where otherwise stated

To ensure that the total industrial noise level (existing plus new) remain within the recommended amenity noise levels for an area, the project amenity noise level that applies for each new industrial noise source is determined as follows:

$L_{Aeq,period}$ Project amenity noise level = $L_{Aeq,period}$ Recommended amenity noise level – 5dB(A)

Furthermore, given that the intrusiveness noise level is based on a 15 minute assessment period and the project amenity noise level is based on day, evening and night assessment periods, the NPfI provides the following guidance on adjusting the $L_{Aeq,period}$ level to a representative $L_{Aeq,15minute}$ level in order to standardise the time periods.

$L_{Aeq,15minute}$ = $L_{Aeq,period}$ + 3dB(A)

The project amenity noise levels ($L_{Aeq,\ 15min}$) applied for this project are reproduced in Table 6 below, based on a 'suburban' noise amenity area.

Table 6: Project amenity noise levels

Type of Receiver	Noise Amenity Area	Time of Day	Recommended Noise Level, dB(A)	
			$L_{Aeq,\ Period}$	$L_{Aeq,\ 15min}$
Residence	Suburban	Day	55 – 5 = 50	50 + 3 = **53**
		Evening	45 – 5 = 40	40 + 3 = **43**
		Night	40 – 5 = 35	35 + 3 = **38**
Industrial premises	All	When in use	70 – 5 = 65	65 + 3 = **68**

Type of Receiver	Noise Amenity Area	Time of Day	Recommended Noise Level, dB(A)	
			$L_{Aeq,\ Period}$	$L_{Aeq,\ 15min}$

Notes:
1. Daytime 7.00 am to 6.00 pm; Evening 6.00 pm to 10.00 pm; Night-time 10.00 pm to 7.00 am.
2. On Sundays and Public Holidays, Daytime 8.00 am - 6.00 pm; Evening 6.00 pm - 10.00 pm; Night-time 10.00 pm - 8.00 am.
3. The L_{Aeq} index corresponds to the level of noise equivalent to the energy average of noise levels occurring over a measurement period.

3.1.2 Project noise trigger levels

In accordance with the NPfI the project noise trigger levels, which are the lower (i.e. more stringent) value of the project intrusiveness noise level and project amenity noise level, have been determined as shown in Table 7 below.

Table 7: Project noise trigger levels

Receiver Location	$L_{Aeq,\ 15min}$ Project noise trigger levels, dB(A)		
	Day	Evening	Night
Residential A1 & A2	43	40	37
Industrial premises A3	68	68	68

Notes:
1. Conversion of trigger levels from internal to external for school classroom assumes 10dB(A) loss from outside to inside through open window.

3.1.3 Sleep disturbance noise levels

The potential for sleep disturbance from maximum noise level events from premises during the night-time period needs to be considered. In accordance with NPfI, a detailed maximum noise level event assessment should be undertaken where the subject development night-time noise levels at a residential location exceed:

- $L_{Aeq,15min}$ 40dB(A) or the prevailing RBL plus 5dB, whichever is the greater, and/or
- L_{AFmax} 52dB(A) or the prevailing RBL plus 15dB, whichever is the greater.

Where there are noise events found to exceed the initial screening level, further analysis is undertaken to identify:

- The likely number of events that might occur during the night assessment period,
- The extent to which the maximum noise level exceeds the rating background noise level.

The sleep disturbance noise levels for the project are presented in Table 8.

Table 8: Sleep disturbance assessment levels

Receiver type	Assessment Level $L_{Aeq,15min}$	Assessment Level L_{AFmax}
Residential	40	52

3.2 NSW Road Noise Policy (RNP)

Noise impact from the potential increase in traffic on the surrounding road network is assessed against the NSW Road Noise Policy (RNP, Department of Environment, Climate Change and Water NSW, 2011). The RNP sets out criteria to be applied to particular types of road and land uses. These noise criteria are to be applied when assessing noise impact and determining mitigation measures for developments that are potentially affected by road traffic noise, with the aim of preserving the amenity appropriate to the land use.

With regard to the surrounding road network, Hollinsworth Road, Harris Avenue and Darling Street are classified as sub-arterial roads. The criteria for residential receivers are presented in the Table 9 below. These criteria are for noise levels assessed in front of a building facade.

Table 9: Road traffic noise assessment criteria for residential land uses

Road category	Type of project/land use	Assessment Criteria, dB(A)	
		Day 7:00am-10:00pm	Night 10:00pm-7:00am
Arterial/sub-arterial roads	Existing residences affected by additional traffic on existing arterial/sub-arterial roads generated by land use developments.	$L_{Aeq,(15\ hour)}$ 60 (external)	$L_{Aeq,(9\ hour)}$ 55 (external)

Note: Land use developers must meet internal noise goals in the Infrastructure SEPP (Department of Planning NSW 2007) for residences near busy roads (see RNP Appendix C10).

Where existing traffic noise levels are above the noise assessment criteria, the primary objective is to reduce these through feasible and reasonable measures to meet the assessment criteria. A secondary objective is to protect against excessive decreases in amenity as the result of a project by applying the relative increase criteria.

In assessing feasible and reasonable mitigation measures, an increase of up to 2 dB represents a minor impact that is considered barely perceptible to the average person.

4 Noise assessment

The primary operational noise sources associated with the development are considered to be:

- Warehouse operations (see Section 4.1.1);
- On-site vehicle movement (see Section 4.1.1);
- Loading dock operations (see Section 4.1.3);
- Carpark (see Section 4.1.4);

This section of the report addresses noise emission associated with these sources at the nearest noise-sensitive receivers. Where necessary, noise mitigation and/or management measures will be identified

4.1 Noise predictions

4.1.1 Warehouse operations

Internal noise levels within the proposed warehouse will be typically associated with refrigeration plant equipment. Internal noise levels will not typical exceed 75 dB(A) L_{eq} sound pressure level. This level has been used to assess breakout noise from the facility. The following inputs from the Acoustic Logic DA Report have been utilised:

- A sound pressure level of 75 dB(A) L_{eq} adopted within the entire warehouse except for the offices and technical rooms.
- Doors to the loading dock are open.
- The walls and roof are constructed from 0.42mm BMT sheet metal.

The assessment is considered conservative as the construction of walls and roof will most likely include a refrigeration panel on the inside of the sheet metal cladding for cold storage requirements. For this assessment, just the cladding has been adopted. Noise predictions at the identified assessment locations are presented in Table 10 below. Noise compliance is achieved at all residential receivers for all periods.

Table 10: Warehouse assessment

Assessment Location	Predicted Noise Level $L_{Aeq,15min}$			Project Specific Noise Goal $L_{Aeq,15min}$		
	Day	Evening	Night	Day	Evening	Night
A1 - 99 Hollinsworth Rd, Marsden Park	25	25	25	43	40	37
A2 - 105 Hollinsworth Rd, Marsden Park	23	23	23	43	40	37
A3 - Industrial premises	42			68		

Notes: Day is defined as 7:00am to 6:00pm, Monday to Saturday and 8:00am to 6:00pm Sundays & Public Holidays.
Evening is defined as 6:00pm to 10:00pm, Monday to Sunday & Public Holidays.
Night is defined as 10:00pm to 7:00am, Monday to Saturday and 10:00pm to 8:00am Sundays & Public Holidays.

4.1.2 On-site vehicular movements

The site's heavy vehicle entrance and exit is located along Darling Street at the north-east corner of the site. A truck movement corresponds to a truck entering the site, travelling south along the eastern boundary, parking (if required) along the southern boundary, unloading at the western dock and leaving via the Darling St exit.

The site's light vehicle entrance and exit is located along Hollinsworth Road Darling Street. Light vehicles will directly enter a carpark. Carpark operations are assessed in Section 4.1.4.

According to The Transport Planning Partnership document, *Cold Storage Facility, Sydney Business Park (Marsden Park) Transport Impact Assessment*, dated 18/04/2017 (NewCold Traffic Report), the number of peak hour truck movements is shown in Table 11. Also shown is the adopted source noise level.

Table 11: Heavy vehicle noise level and number of movements

Noise source	Sound Power Level, dB(A) re: 1pW[1]	Number of movements[2]		
	$L_{Aeq\ 15\ minute}$	Day	Evening	Night
Semi-trailer/ B-Double	107	28	12	12

Notes 1. Noise levels taken from Renzo Tonin & Associate's database
2. Movement corresponds to a truck entering the site, travelling south along the eastern boundary, unloading at the southern dock and travelling north along the western boundary before leaving via the Darling St exit

Noise predictions at the identified assessment locations are presented in Table 12 below. Noise compliance is achieved at all receivers for all periods.

Table 12: On-site vehicular noise assessment

Assessment Location	Predicted Noise Level $L_{Aeq,15min}$			Project Specific Noise Goal $L_{Aeq,15min}$		
	Day	Evening	Night	Day	Evening	Night
A1 - 99 Hollinsworth Rd, Marsden Park	32	28	28	43	40	37
A2 - 105 Hollinsworth Rd, Marsden Park	29	26	26	43	40	37
A3 - Industrial premises	56			68		

Notes: Day is defined as 7:00am to 6:00pm, Monday to Saturday and 8:00am to 6:00pm Sundays & Public Holidays.
Evening is defined as 6:00pm to 10:00pm, Monday to Sunday & Public Holidays.
Night is defined as 10:00pm to 7:00am, Monday to Saturday and 10:00pm to 8:00am Sundays & Public Holidays.

4.1.3 Loading dock activity

The loading docks are located along the western façade of the warehouse. The following noise levels from Renzo Tonin & Associate's database have been used for the assessment and are shown in Table 13. The number of trucks being loaded/unloaded at any one time are consistent will the number of peak hour truck movements shown in Table 11.

Table 13: Loading dock activity – Sound power levels

Activity	Sound Power Level, dB(A) re: 1pW
	$L_{Aeq\ 15\ minute}$
Semi-trailer/ B-Double idling	95
Forklift	90

Noise predictions at the identified assessment locations are presented in Table 14 below. Noise compliance is achieved at all receivers for all periods.

Table 14: Loading dock assessment

Assessment Location	Predicted Noise Level $L_{Aeq,15min}$			Project Specific Noise Goal $L_{Aeq,15min}$		
	Day	Evening	Night	Day	Evening	Night
A1 - 99 Hollinsworth Rd, Marsden Park	25	25	25	43	40	37
A2 - 105 Hollinsworth Rd, Marsden Park	21	21	21	43	40	37
A3 - Industrial premises	<20			68		

Notes: Day is defined as 7:00am to 6:00pm, Monday to Saturday and 8:00am to 6:00pm Sundays & Public Holidays.
Evening is defined as 6:00pm to 10:00pm, Monday to Sunday & Public Holidays.
Night is defined as 10:00pm to 7:00am, Monday to Saturday and 10:00pm to 8:00am Sundays & Public Holidays.

4.1.4 Carpark

The proposed carpark is located along the southern boundary of the site, as street level, and has a capacity of 133 spaces. The carpark entry and exit is located along Hollinsworth Road.

According to the NewCold Traffic Report, the number of peak hour vehicle movements is respectively 130, 110 and 130 for the day, evening and night.

The noise sources generated by carparks include, vehicle doors closing, vehicle engines starting, vehicles accelerating and vehicles moving. Noise level measurements from our database and library files were used for the purpose of this assessment.

Noise predictions at the identified assessment locations are presented in Table 15 below. Noise compliance is achieved at all receivers for all periods.

Table 15: Car park noise assessment

Assessment Location	Predicted Noise Level $L_{Aeq,15min}$			Project Specific Noise Goal $L_{Aeq,15min}$		
	Day	Evening	Night	Day	Evening	Night
A1 - 99 Hollinsworth Rd, Marsden Park	22	21	22	43	40	37
A2 - 105 Hollinsworth Rd, Marsden Park	<20	<20	<20	43	40	37
A3 - Industrial premises	38			68		

Notes: Day is defined as 7:00am to 6:00pm, Monday to Saturday and 8:00am to 6:00pm Sundays & Public Holidays.
Evening is defined as 6:00pm to 10:00pm, Monday to Sunday & Public Holidays.
Night is defined as 10:00pm to 7:00am, Monday to Saturday and 10:00pm to 8:00am Sundays & Public Holidays.

4.1.5 Cumulative

Based on the predicted noise level for the relevant on-site activities (i.e. warehouse operations, on-site vehicle movements, loading dock and carpark), as well as the relevant times periods for each activity, a cumulative noise impact assessment has been carried out and is presented in Table 16 below. Noise compliance is achieved at all receivers for all periods.

Table 16: Cumulative noise assessment

Assessment Location	Predicted Noise Level $L_{Aeq,15min}$			Project Specific Noise Goal $L_{Aeq,15min}$		
	Day	Evening	Night	Day	Evening	Night
A1 - 99 Hollinsworth Rd, Marsden Park	34	31	32	43	40	37
A2 - 105 Hollinsworth Rd, Marsden Park	31	29	29	43	40	37
A3 - Industrial premises	56			68		

Notes: Day is defined as 7:00am to 6:00pm, Monday to Saturday and 8:00am to 6:00pm Sundays & Public Holidays.
Evening is defined as 6:00pm to 10:00pm, Monday to Sunday & Public Holidays.
Night is defined as 10:00pm to 7:00am, Monday to Saturday and 10:00pm to 8:00am Sundays & Public Holidays.

4.1.6 Sleep Disturbance

Sleep disturbance would most potentially be caused by a single event of a truck reverse alarm, vehicle door closing, engine starting in the carpark area, and/or truck air brake release in the loading dock due to the relatively high L_1 noise levels that can be generated. The following noise levels from Renzo Tonin & Associate's database have been used for the assessment and are shown in Table 17.

Table 17: Sleep disturbance - Sound power levels

Activity	Sound power level, dB(A) re: 1pW
	$L_{1\ (1\text{-minute})}$
Truck Air brake release	115
Truck reverse alarm	105
Vehicle door closing	100
Vehicle engine starting	100

Of the sources within Table 17, the truck air brake release is the loudest, has the greatest potential noise impact and has been used for the assessment. Noise predictions at the identified assessment locations are presented in Table 18 below. Noise compliance is achieved at all residential receivers.

Table 18: Sleep disturbance noise assessment

Assessment Location	Predicted Noise Level, dB(A)		Sleep disturbance criteria, dB(A)	
	$L_{Aeq,15min)}$ dB(A)	$L_{1\ (1\text{-}minute)}$ dB(A)	$L_{Aeq,15min}$	$L_{A1,1minute}$ or L_{Amax}
A1 - 99 Hollinsworth Rd, Marsden Park	32	41	40	52
A2 - 105 Hollinsworth Rd, Marsden Park	29	40	40	52

Notes: Night is defined as 10:00pm to 7:00am, Monday to Saturday and 10:00pm to 8:00am Sundays & Public Holidays.
1) Predictions based on truck air brake release

5 Recommendations

The following recommendations provide in-principle solutions to address Project acoustic requirements. This information is presented for the purpose of consent authority approvals process and cost planning and shall not be used for construction unless otherwise approved in writing by the acoustic consultant. Assistance of an acoustic consultant must be sought during the detailed design phase of the project in order to confirm all details and specification.

Before committing to any form of construction or committing to any contractor, advice should be sought from an acoustic consultant to ensure that adequate provisions are made for any variations which may occur as a result of changes to the project.

The advice provided here is in respect of acoustics only. Supplementary professional advice may need to be sought in respect of fire ratings, structural design, buildability, fitness for purpose and the like.

The following is provided in addition to the operational scenarios presented for the assessment.

5.1 Boundary walls

This assessment has assumed:

- Southern boundary retaining wall height between 2.3m and 2.7m,
- Western boundary retaining wall height between 2m and 2.5m.

5.2 Acoustic performance of building envelope

- A detailed review of the building envelope should be carried out during the design development process, inclusive of walls and roof constructions.
- This assessment has assumed the wall and roof performances outlined in Section 4.1.1. Higher acoustic performance can be readily achieved and may be required.

5.3 Mechanical Plant

Mechanical plant associated with the development has the potential to impact on nearby noise sensitive properties. In order to carry out a quantitative assessment of mechanical equipment, a complete specification of equipment is required. At this stage of the development, appropriate detail for mechanical plant is not typically available. A qualitative assessment has therefore been carried out and in-principle noise management measures outlined:

- Acoustic assessment of mechanical services equipment should be undertaken during the detail design phase of the development to ensure that the cumulative noise of all equipment does not exceed the applicable noise criteria. Development Consent Conditions typically

require detailed assessment of mechanical plant and equipment prior to issue of the Construction Certificate.

- Noise control treatment can affect the operation of the mechanical services system. An acoustic engineer should be consulted during the initial design phase of mechanical services system to reduce potential redesign of the mechanical system.
- Mechanical plant noise emission can be controlled by appropriate mechanical system design and implementation of common engineering methods, which may include:
    - Procurement of 'quiet' plant.
    - Air-conditioners and condensers should include day/night modes to further reduce noise emission.
    - Strategic positioning of plant away from sensitive neighbouring premises to maximise intervening acoustic shielding between the plant and sensitive neighbouring premises.
    - Commercially available acoustic attenuators for air discharge and air intakes of plant.
    - Acoustically lined and lagged ductwork.
    - Acoustic barriers between plant and sensitive neighbouring premises.
    - Partial or complete acoustic enclosures over plant.
    - Acoustic louvres.
- The specification and location of mechanical plant should be confirmed prior to installation on site, and
- Fans shall be mounted on vibration isolators and balanced in accordance with Australian Standard 2625 'Rotating and Reciprocating Machinery – Mechanical Vibration'.

6 Road traffic generated by development

6.1 Road traffic generated by development

Additional noise from traffic generated by a development on the surrounding road network is assessed against the EPA Road Noise Policy. The assessment involves consideration of the existing traffic noise levels and the potential change in noise as a result of the development.

Except for movements along Richmond Road, traffic associated with the site will not travel past any residential properties. The nearest residential receivers to traffic movements associated with the site, are located 280m to the south along Hollinsworth Road. On this basis, the traffic noise generated by the development is insignificant and complies with the requirements of the RNP.

The NewCold Traffic Report specifies that Richmond Road has an existing daily traffic volume of 33,000 vehicles. The additional traffic noise generated by the development is less than 2dB(A) and is therefore acceptable.

7 Conclusion

Renzo Tonin & Associates has carried out an acoustic assessment to support a Section 96 (2) application to an existing State Significant Development Application, for a new cold storage facility, NewCold Sydney, located at Harris Avenue, Marsden Park.

The report has quantified operational noise emission from the proposed development and has assessed noise at the nearest sensitive receivers. The report has been prepared in accordance with Blacktown Sydney Council and NSW Environmental Protection Authority (EPA). Noise compliance has been demonstrated at all receivers for all periods of operation.

Further detailed acoustic assessment and design review will be required during the design development. This further detailed assessment may also be required to address specific conditions stipulated by the consent authority.

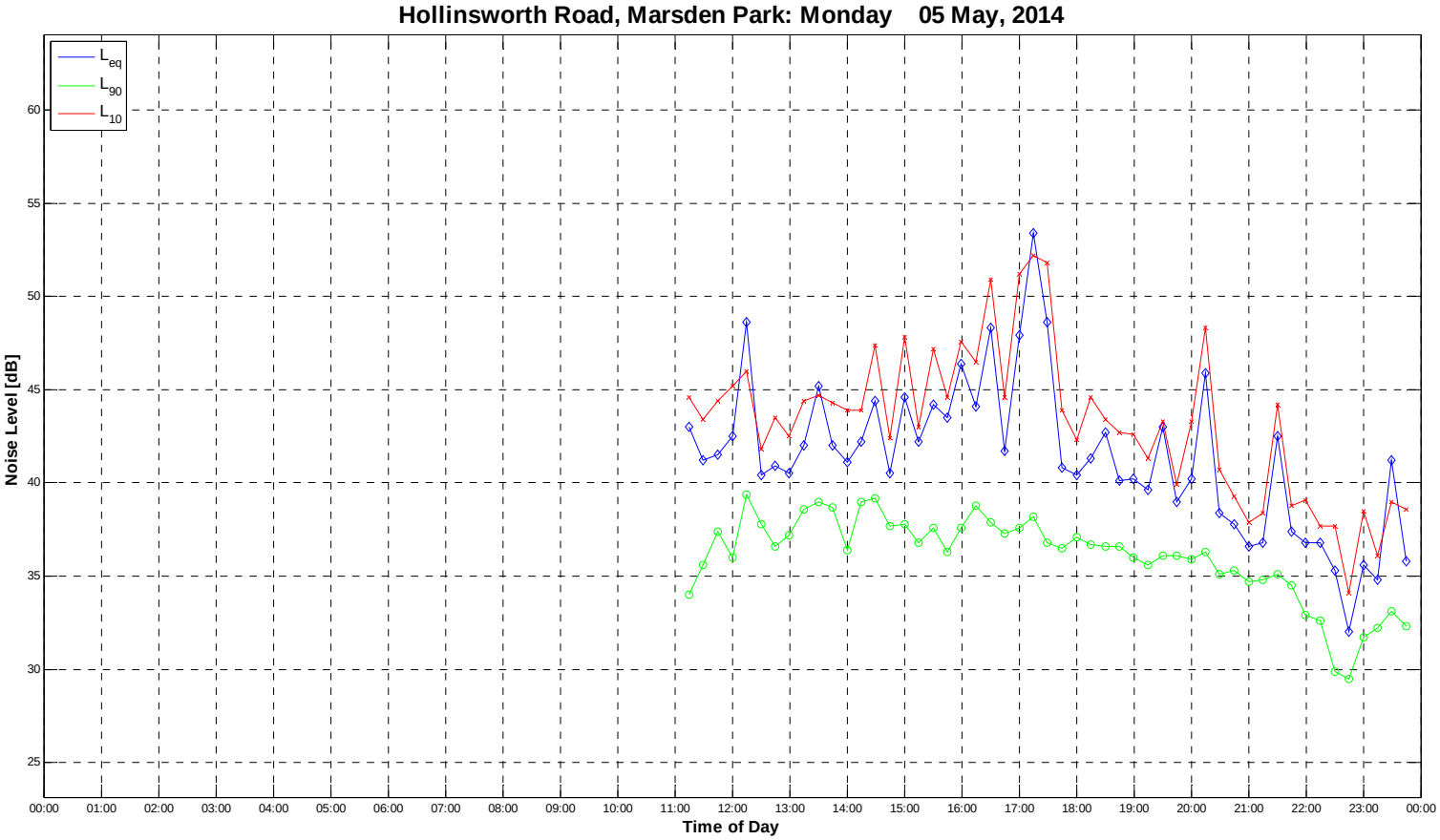
APPENDIX A Glossary of terminology

The following is a brief description of the technical terms used to describe noise to assist in understanding the technical issues presented.

Adverse weather	Weather effects that enhance noise (that is, wind and temperature inversions) that occur at a site for a significant period of time (that is, wind occurring more than 30% of the time in any assessment period in any season and/or temperature inversions occurring more than 30% of the nights in winter).
Ambient noise	The all-encompassing noise associated within a given environment at a given time, usually composed of sound from all sources near and far.
Assessment period	The period in a day over which assessments are made.
Assessment point	A point at which noise measurements are taken or estimated. A point at which noise measurements are taken or estimated.
Background noise	Background noise is the term used to describe the underlying level of noise present in the ambient noise, measured in the absence of the noise under investigation, when extraneous noise is removed. It is described as the average of the minimum noise levels measured on a sound level meter and is measured statistically as the A-weighted noise level exceeded for ninety percent of a sample period. This is represented as the L90 noise level (see below).
Decibel [dB]	The units that sound is measured in. The following are examples of the decibel readings of every day sounds: 0dB The faintest sound we can hear 30dB A quiet library or in a quiet location in the country 45dB Typical office space. Ambience in the city at night 60dB CBD mall at lunch time 70dB The sound of a car passing on the street 80dB Loud music played at home 90dB The sound of a truck passing on the street 100dB The sound of a rock band 115dB Limit of sound permitted in industry 120dB Deafening
dB(A)	A-weighted decibels. The A- weighting noise filter simulates the response of the human ear at relatively low levels, where the ear is not as effective in hearing low frequency sounds as it is in hearing high frequency sounds. That is, low frequency sounds of the same dB level are not heard as loud as high frequency sounds. The sound level meter replicates the human response of the ear by using an electronic filter which is called the "A" filter. A sound level measured with this filter switched on is denoted as dB(A). Practically all noise is measured using the A filter.
dB(C)	C-weighted decibels. The C-weighting noise filter simulates the response of the human ear at relatively high levels, where the human ear is nearly equally effective at hearing from mid-low frequency (63Hz) to mid-high frequency (4kHz), but is less effective outside these frequencies.
Frequency	Frequency is synonymous to pitch. Sounds have a pitch which is peculiar to the nature of the sound generator. For example, the sound of a tiny bell has a high pitch and the sound of a bass drum has a low pitch. Frequency or pitch can be measured on a scale in units of Hertz or Hz.
Impulsive noise	Having a high peak of short duration or a sequence of such peaks. A sequence of impulses in rapid succession is termed repetitive impulsive noise.
Intermittent noise	The level suddenly drops to that of the background noise several times during the period of observation. The time during which the noise remains at levels different from that of the ambient is one second or more.
L_{Max}	The maximum sound pressure level measured over a given period.
L_{Min}	The minimum sound pressure level measured over a given period.

L_1	The sound pressure level that is exceeded for 1% of the time for which the given sound is measured.
L_{10}	The sound pressure level that is exceeded for 10% of the time for which the given sound is measured.
L_{90}	The level of noise exceeded for 90% of the time. The bottom 10% of the sample is the L90 noise level expressed in units of dB(A).
L_{eq}	The "equivalent noise level" is the summation of noise events and integrated over a selected period of time.
Reflection	Sound wave changed in direction of propagation due to a solid object obscuring its path.
SEL	Sound Exposure Level (SEL) is the constant sound level which, if maintained for a period of 1 second would have the same acoustic energy as the measured noise event. SEL noise measurements are useful as they can be converted to obtain Leq sound levels over any period of time and can be used for predicting noise at various locations.
Sound	A fluctuation of air pressure which is propagated as a wave through air.
Sound absorption	The ability of a material to absorb sound energy through its conversion into thermal energy.
Sound level meter	An instrument consisting of a microphone, amplifier and indicating device, having a declared performance and designed to measure sound pressure levels.
Sound pressure level	The level of noise, usually expressed in decibels, as measured by a standard sound level meter with a microphone.
Sound power level	Ten times the logarithm to the base 10 of the ratio of the sound power of the source to the reference sound power.
Tonal noise	Containing a prominent frequency and characterised by a definite pitch.

APPENDIX B Long-term noise monitoring results


Hollinsworth Road, Marsden Park: Monday 05 May, 2014
L_eq
L_90
L_10
Noise Level [dB]
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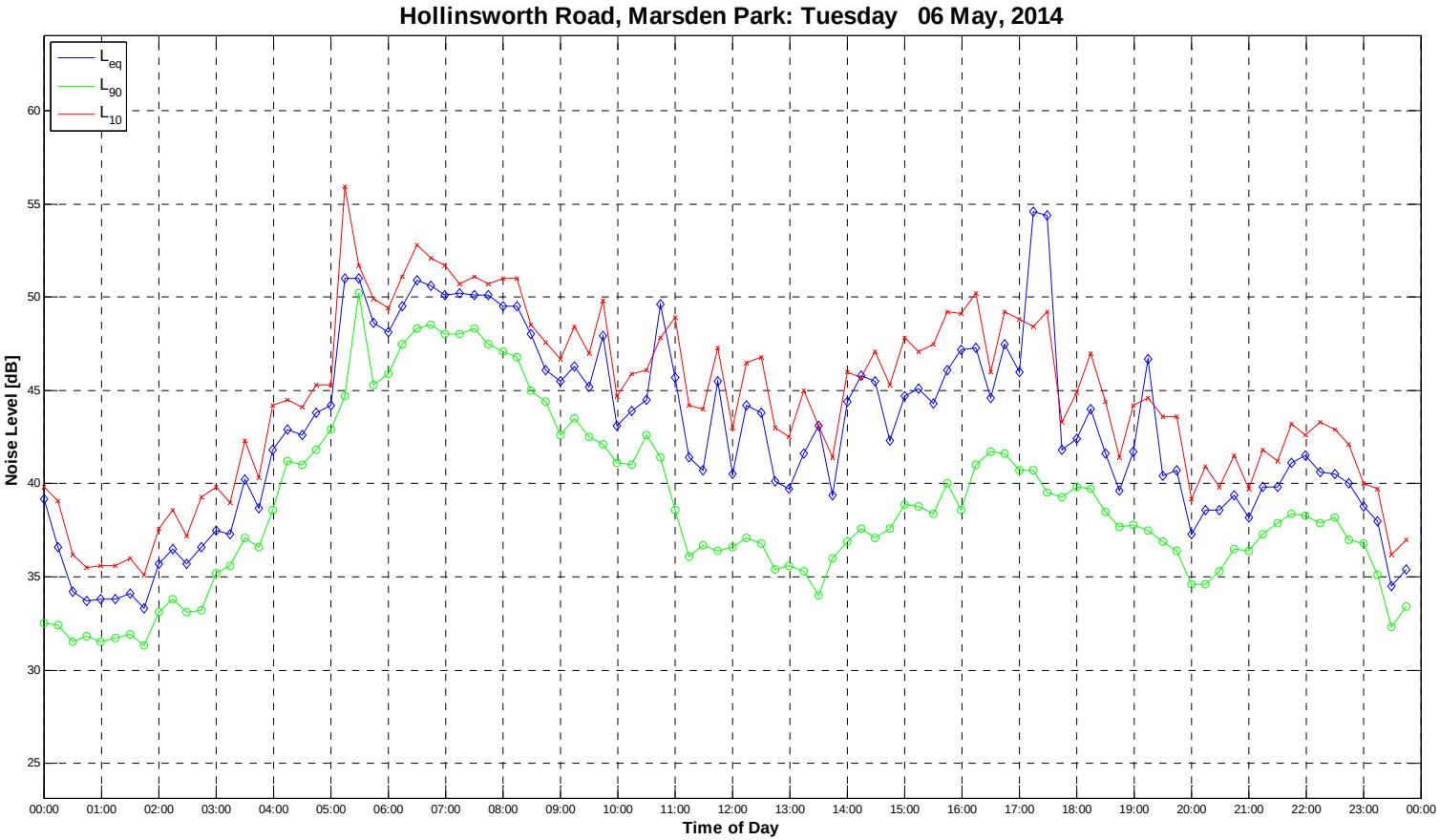
Time of Day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L_eq
L_90
L_10
Noise Level [dB]
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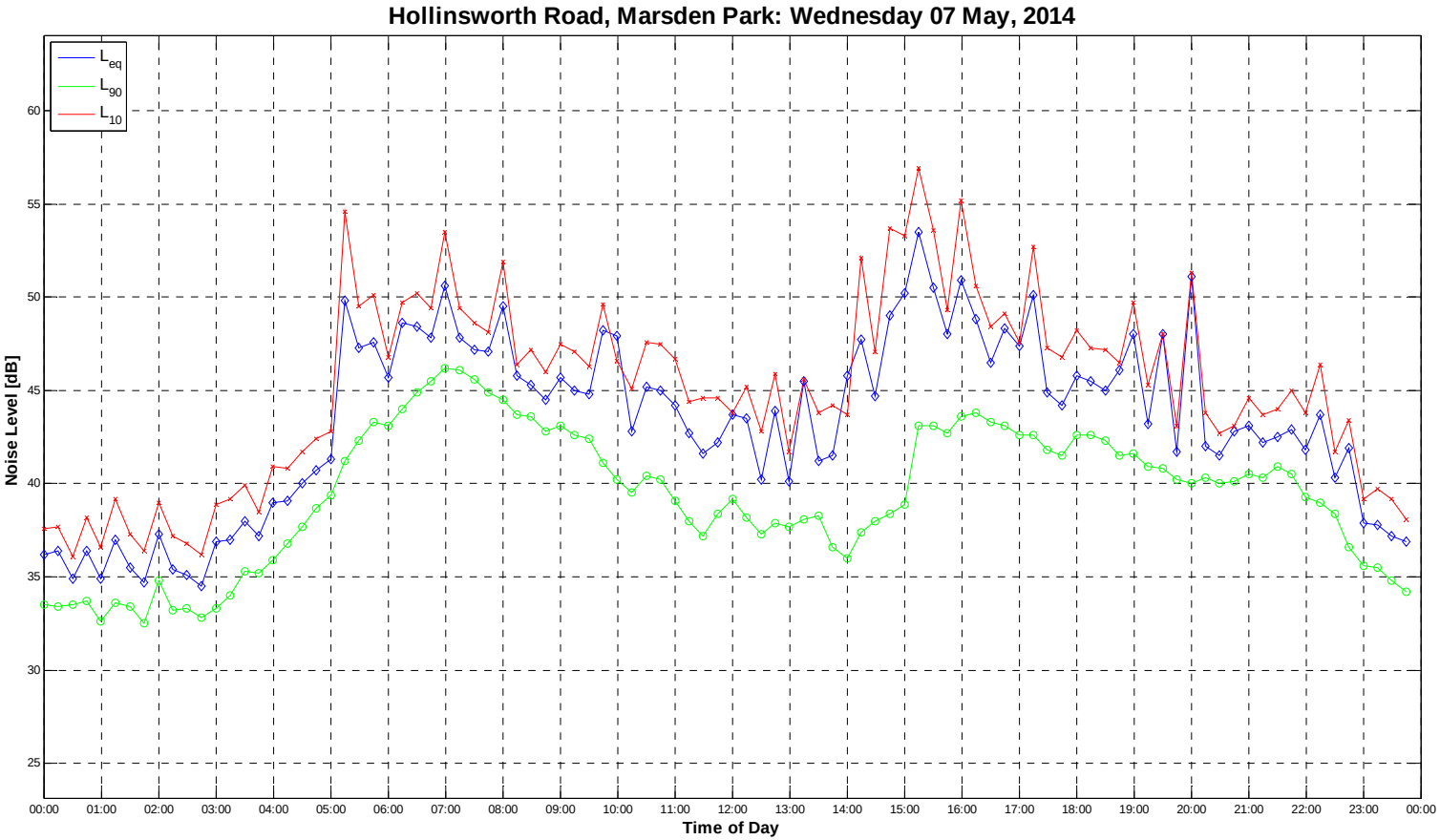
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L_eq
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Noise Level [dB]
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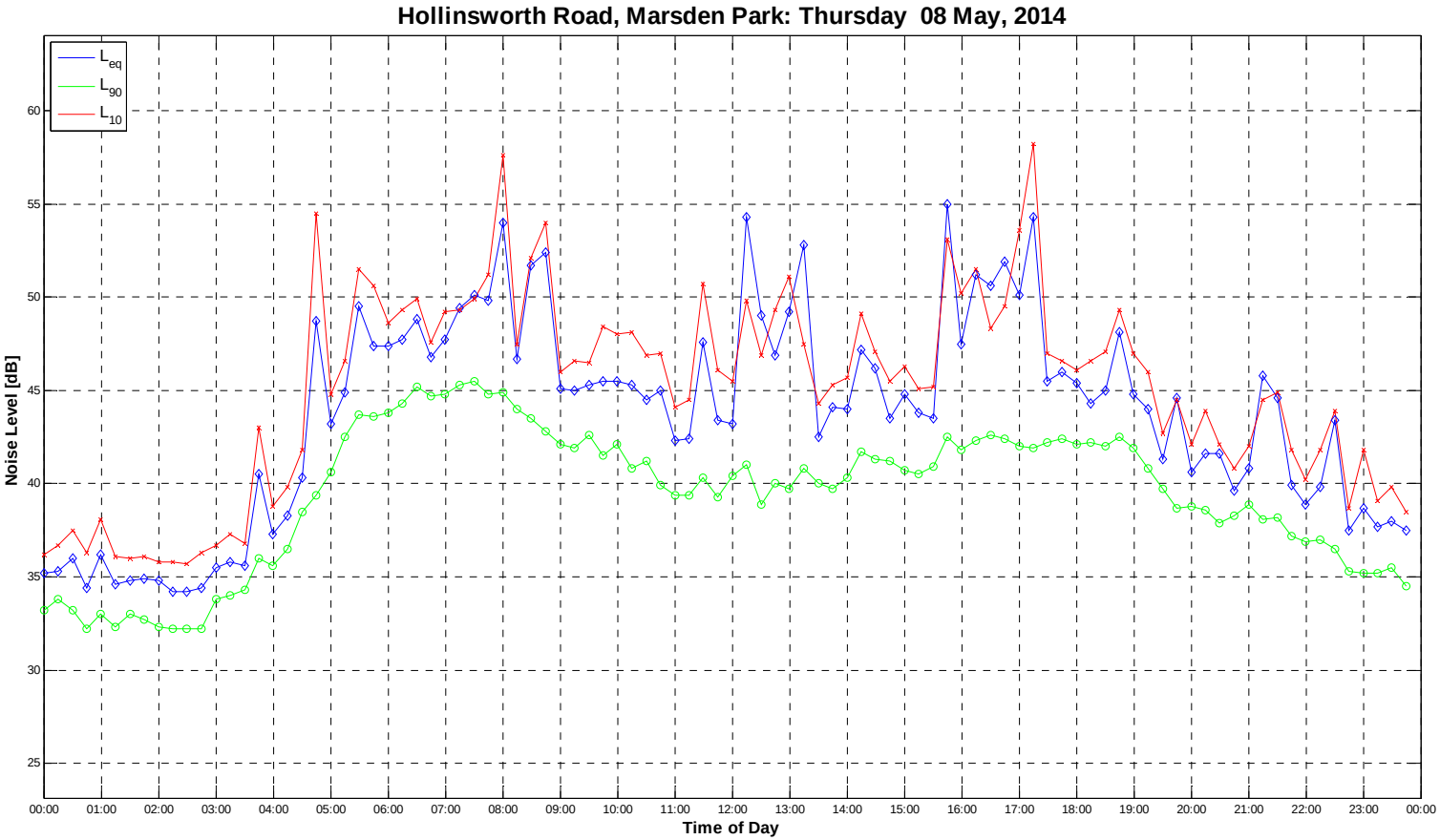
Hollinsworth Road, Marsden Park: Thursday 08 May, 2014
L_eq
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Noise Level [dB]
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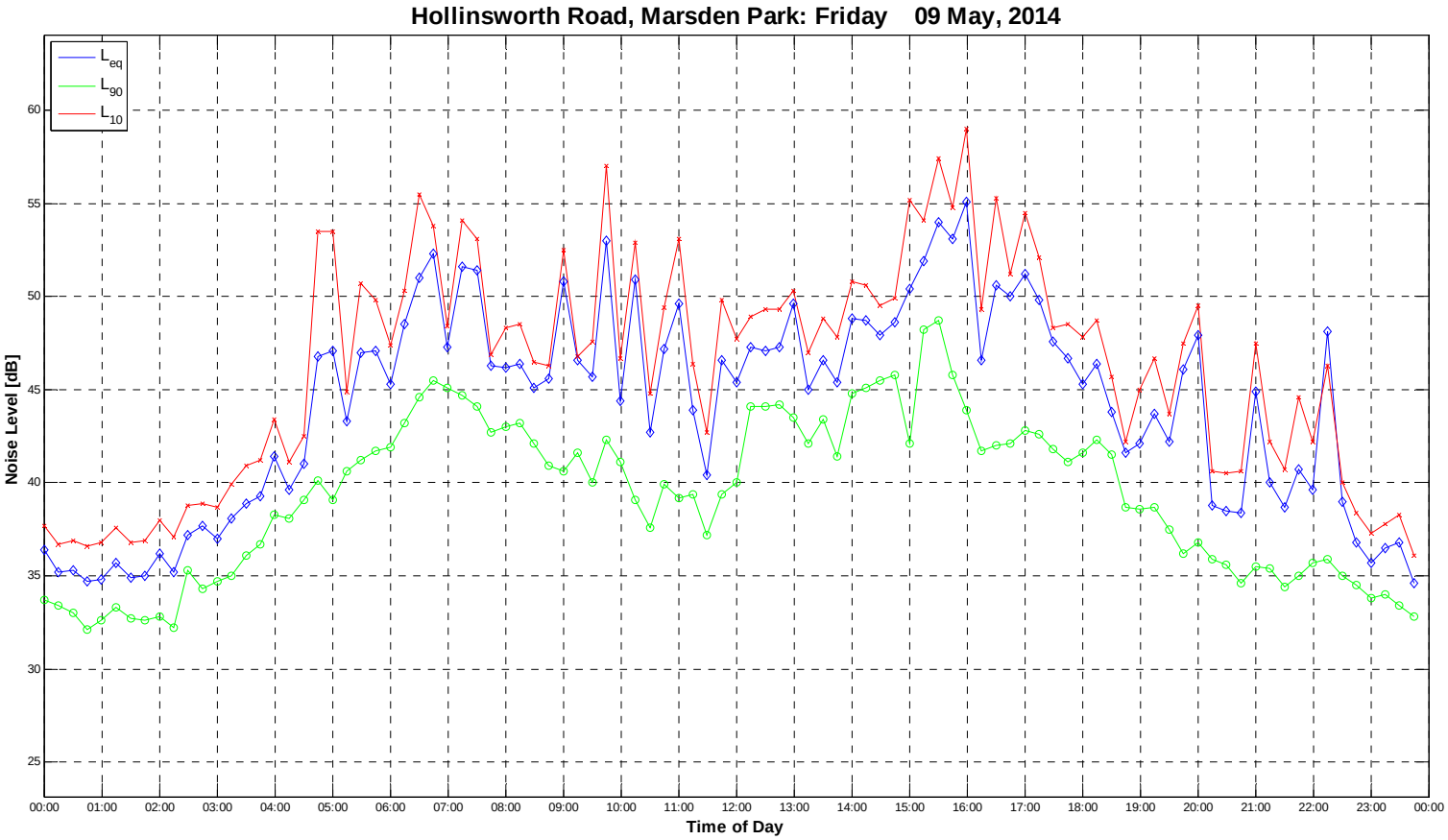
Hollinsworth Road, Marsden Park: Friday 09 May, 2014
L_eq
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Noise Level [dB]
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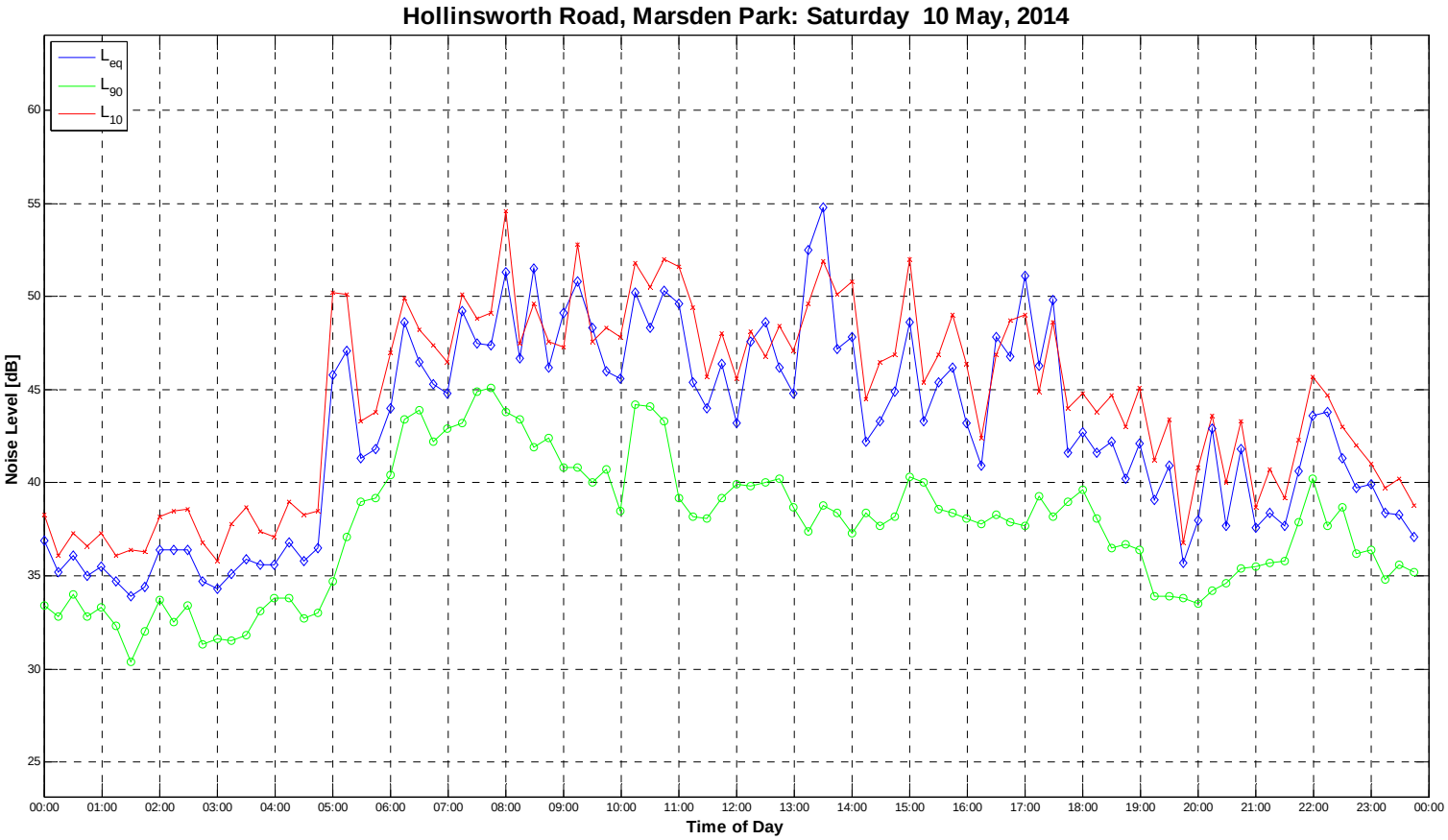
Hollinsworth Road, Marsden Park: Saturday 10 May, 2014
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Noise Level [dB]
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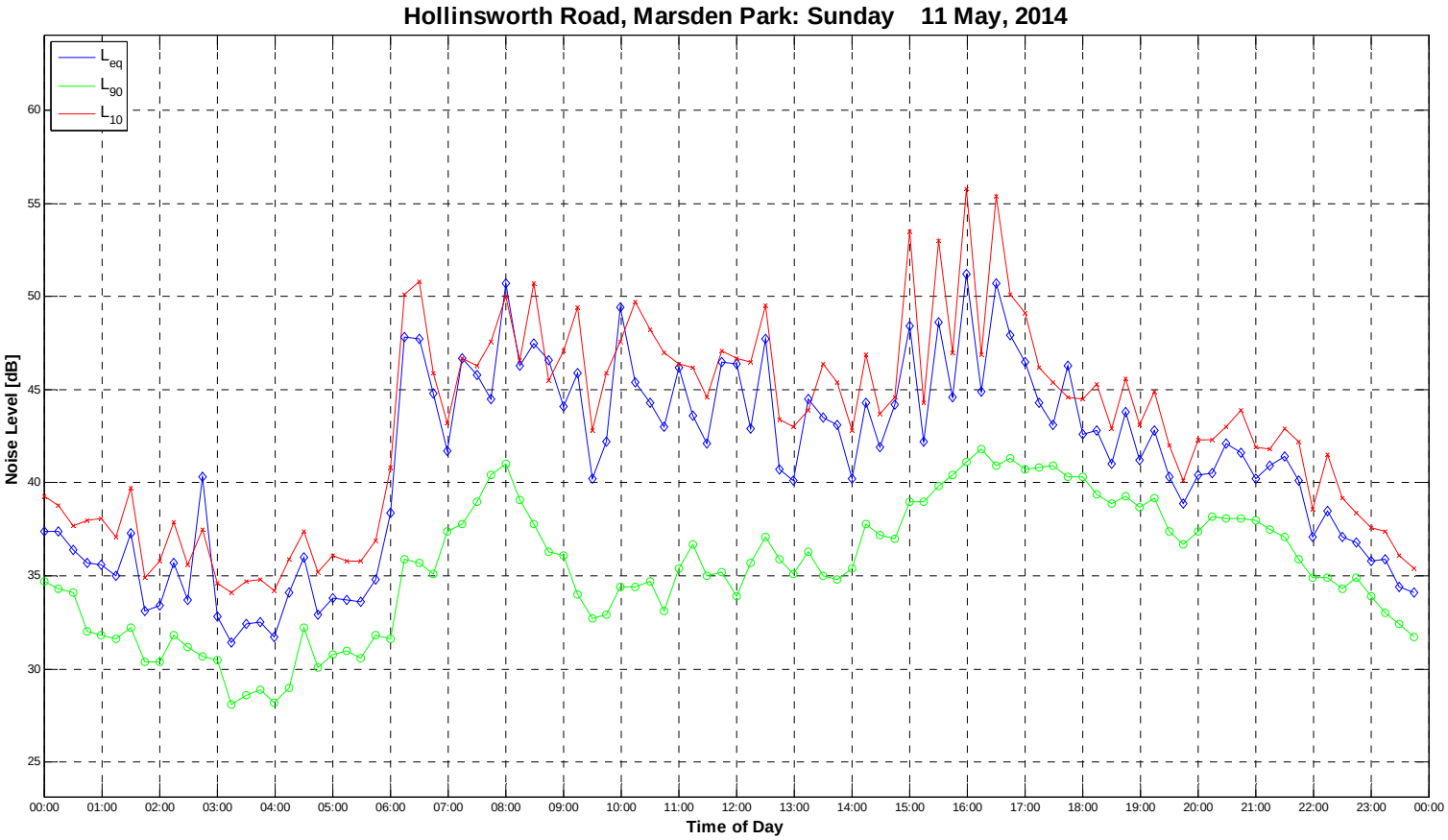
Hollinsworth Road, Marsden Park: Sunday 11 May, 2014
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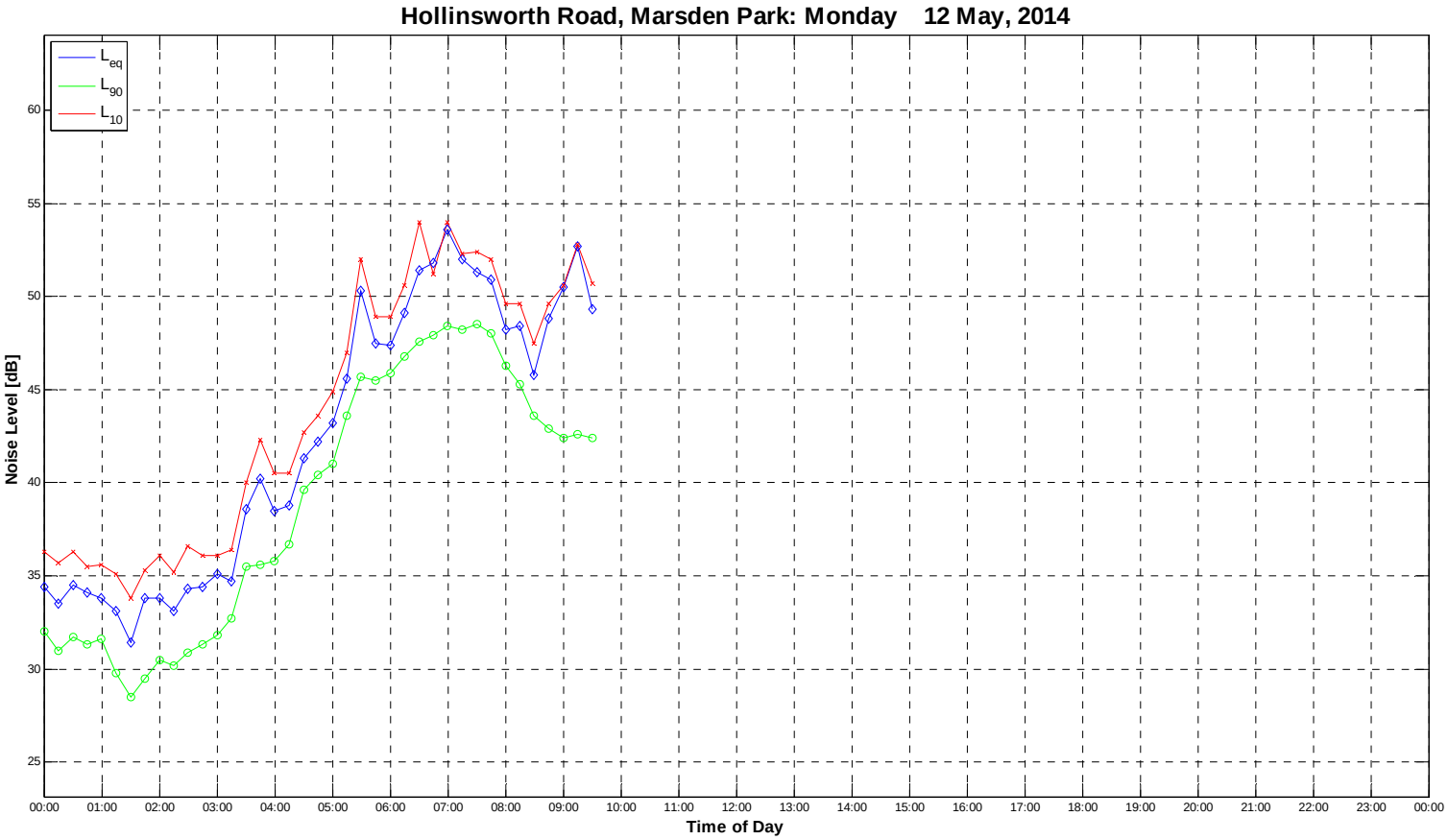
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L_10
Noise Level [dB]
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