Bennetts Green

Home Improvement Centre & Bulky Goods Development (Lots 1, 2 & 3) - DA Acoustic Assessment

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1 INTRODUCTION

This report presents an assessment of the potential cumulative noise impacts associated with the proposed modification to the approved home Improvement centre and bulky goods development on lots 1, 2 & 3 along Pacific Highway at Bennetts Green.

In this report we will:

- Identify relevant State, Council and Australian Standard noise emission criteria applicable to the development.
- Identify nearby noise sensitive receivers and operational noise sources with the potential to adversely impact nearby developments.
- Predict operational noise emissions and assess them against the relevant acoustic criteria.
- If necessary, determine building and/or management controls necessary to ensure ongoing compliance with noise emission goals.

This assessment is based on the overall site plan ATP-0200, project 316137, revision P08, provided by the Buchanan Group.

2 SITE DESCRIPTION

The site is located on the western side of the Pacific Highway, south of Lake Street, at Bennetts Green. The site also has frontage to South Street and is currently undeveloped.

It is bounded by South Street to the north, Pacific Highway to the south and part of Tulootaba reserve to the west. Land (vacant/undeveloped at this stage) to the east of the subject site is part of future developments which will be subject to separate development applications. South Street is a four lane local road with medium – low volumes of traffic. Pacific Highway is a four lane arterial road with high volumes of traffic.

Figure 1 below illustrates the location of subject site and surrounding receivers.

The site already has development consent for a home improvement centre of approx. 13,538 m^2, separate bulky goods tenancies of approx. 16,184 m^2 and a fast food outlet. Acoustic impacts associated with the home improvement centre was previously investigated by this office and detailed in the acoustic report, reference: 20120328.1/2310A/R3/YK.

A S96 application is now being proposed for the site to include reconfiguration of lot boundaries, change the size of the home improvement centre and amending the layout of the bulky goods tenancies. Some minor modifications to access are also proposed. In addition, two separate development applications are also proposed for the northern lot (lot 3), one for the service station and fast food outlet and another for the bulky goods components.

- Lot 1 – Home Improvement Centre – Bunnings Warehouse with 325 on grade parking spaces.

- Lot 2 – Bulky Goods Tenancies & Family Restaurant – Anaconda, 4 other tenancies (tbc) and 1 family restaurant, with a total of 272 on grade parking spaces.

- Lot 3 – Service Station, Take Away Food & Drink Premises (or Fast Foot Outlet) and Bulky Goods Tenancies, with a total of 280 on grade parking spaces.

Proposed hours of operation will be as follows:

Table 1 – Proposed Operating Hours

Space	Day	Time
Bunnings Home Improvement Centre	Monday to Friday	6.00 am to 10.00pm
	Saturday – Sunday	6.00 am to 7.00pm
Anaconda, bulky goods tenancies	Monday to Wednesday	9.00 am to 5.30pm
	Thursday	9.00 am to 9.00pm
	Friday	9.00 am to 6.00pm
	Saturday	9.00 am to 5.00pm
	Sunday	10.00 am to 5.00pm
Family Restaurant, Service Station and Take Away Food & Drink Premises	Monday – Sunday	24 hours a day
All Loading Dock Operations	Monday – Sunday	8.00 am to 4.00pm

2.1 SURROUNDING RECEIVERS

Existing developments in the vicinity of the site include;

- The potentially nearest affected residential receivers are the residential properties located immediately to the west and south of the subject site, across South Street.
- Receivers to the east of the site, across Pacific Highway, are all industrial and bulky goods uses and **are unlikely to be impacted** by the subject proposal, due to the high levels of noise already being generated for their use and by traffic movements along Pacific Highway.

2.2 ACCESS ROUTES/VEHICLE ENTRY AND EXIT POINTS

- ***Lot 1 – Bunnings Home Improvement Centre***
    - All service vehicles associated with Bunnings will enter the site from South Street and exit to Pacific Highway. Access from South Street (in place of the approved entrance from Pacific Highway) will better cater for access to the loading docks in the amended building layout.
    - All staff and customer access to this lot will occur via the two Pacific Highway access roads.
- ***Lot 2 – Anaconda, bulky goods tenancies & Family Restaurant***
    - All service vehicles associated with the bulky goods tenancies and family restaurant will enter and exit the site from Pacific Highway.
    - All staff and customer access to this lot will occur via the two Pacific Highway access roads or via Lake Street.

- ***Lot 3 – Service Station, Take Away Food & Drink Premises (or Fast Foot Outlet) and Bulky Goods Tenancies.***

    - All service vehicles associated with the service station and the take away food & drink premises will enter and exit the site from Pacific Highway.

    - All service vehicles associated with the bulky goods tenancies will enter the site from Lake Street and exit the site from Pacific Highway.

    - All staff and customer access to this lot will occur via the two Pacific Highway access roads.

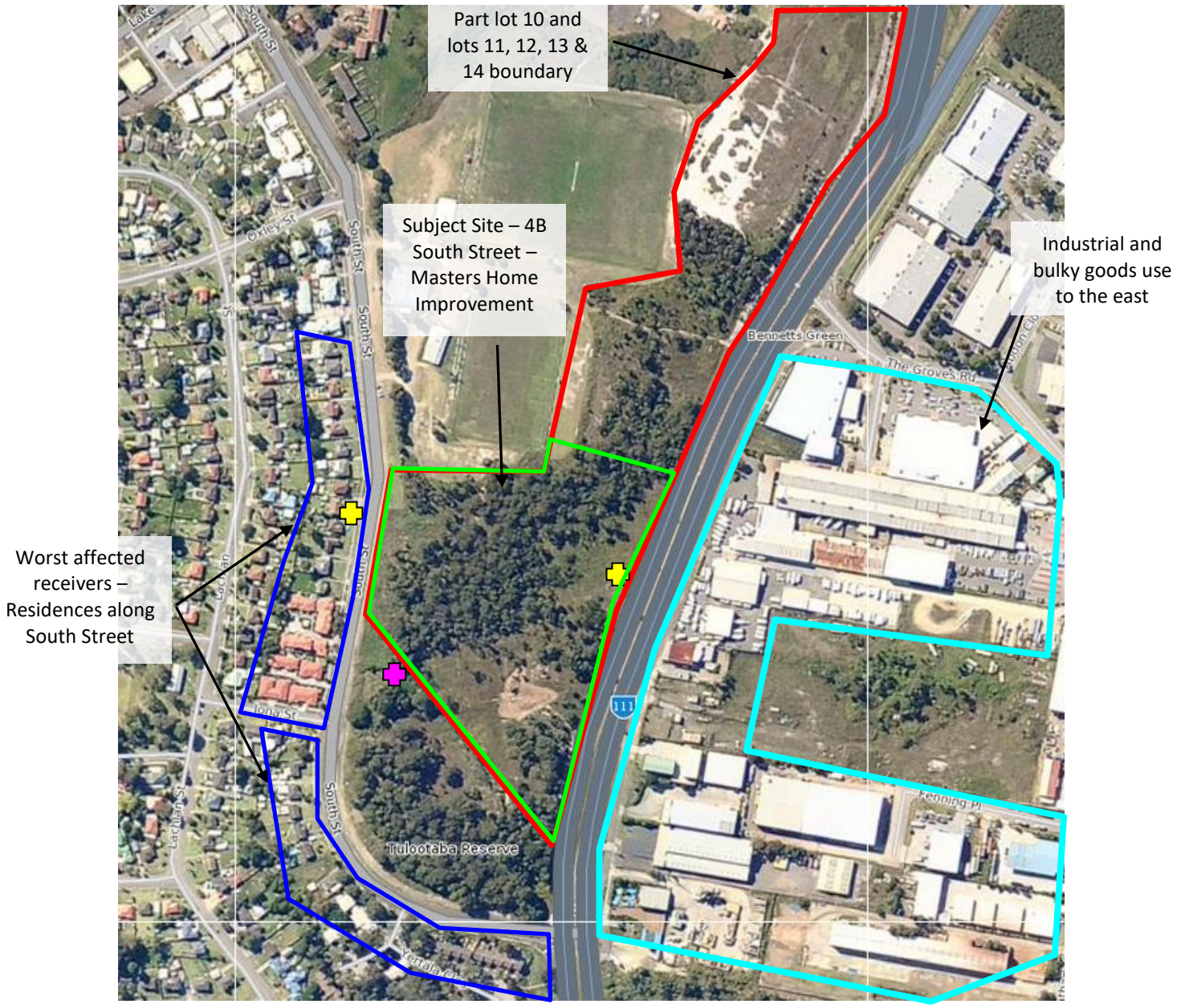


Figure 1 – Site and Measurement Locations

Unattended Noise Monitor Location

Attended Noise Measurement Locations

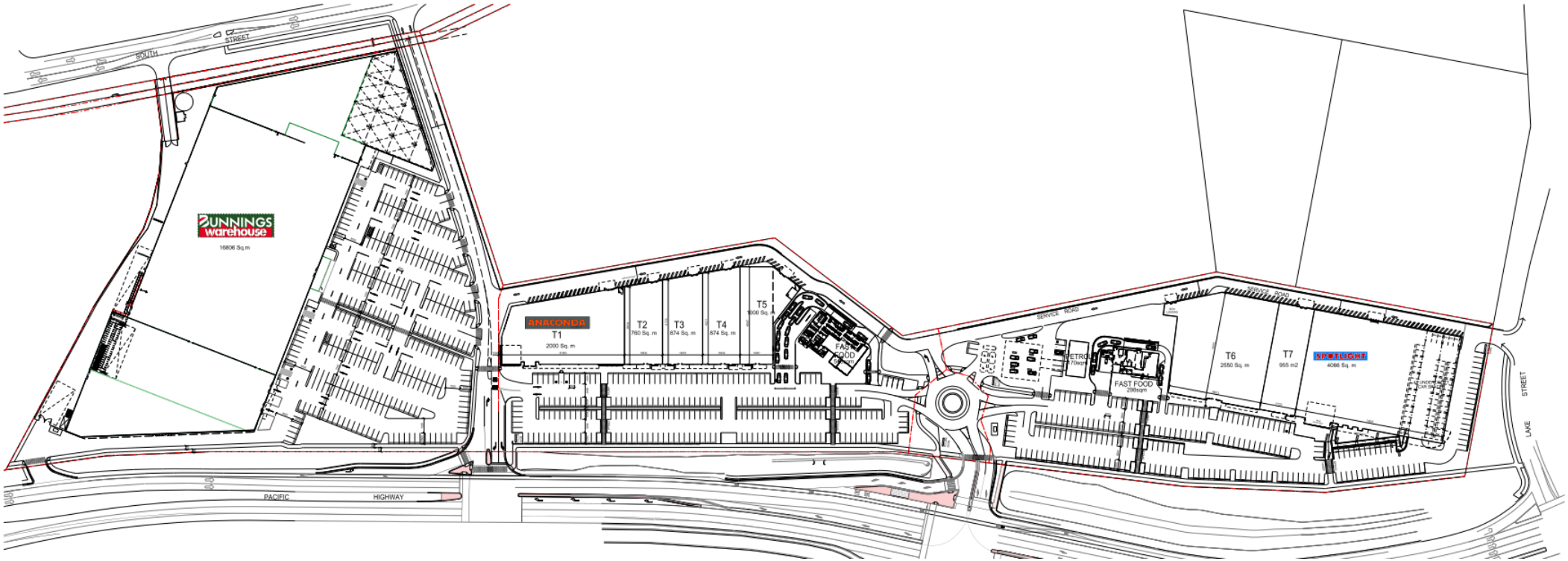


Figure 2 – Proposed Site Layout

3 NOISE DESCRIPTORS

Environmental noise constantly varies in level, due to fluctuations in local noise sources including noise from nearby road traffic. Accordingly, a 15-minute measurement interval is normally utilised. Over this period, noise levels are monitored on a continuous basis and statistical and integrating techniques are used to determine noise description parameters.

In the case of environmental noise three principle measurement parameters are used, namely L_{A10}, L_{A90} and L_{Aeq}.

The L_{A10} and L_{A90} measurement parameters are statistical levels that represent the average maximum and average minimum noise levels respectively, over the measurement intervals.

The L_{A10} parameter is commonly used to measure noise produced by a particular intrusive noise source since it represents the average of the loudest noise levels produced by the source.

Conversely, the L_{A90} level *(which is commonly referred to as the background noise level)* represents the noise level heard in the quieter periods during a measurement interval. The L_{A90} parameter is used to set the allowable noise level for new, potentially intrusive noise sources since the disturbance caused by the new source depends on how audible it is above the pre-existing noise environment, particularly during quiet periods, as represented by the L_{A90} level.

The L_{Aeq} parameter represents the average noise energy during a measurement period. This parameter is derived by integrating the noise levels measured over the measurement period. L_{Aeq} is important in the assessment of traffic noise impacts as it closely corresponds with human perception of a changing noise environment; such is the character of industrial noise.

4 EXISTING BACKGROUND NOISE LEVELS

A survey of the existing ambient noise levels on site was conducted using both long-term unattended noise monitoring and short-term attended noise measurements.

Long term monitoring was conducted using an Acoustic Research Laboratories noise monitor. The noise monitor was installed along the western boundary of the site, as illustrated in Figure 1. The monitor was set to an A – weighted fast response and record continuously at 15-minute time intervals. The monitor was calibrated at the start and end of the monitoring period using a Rion NC-73 calibrator. No significant drift was noted. The noise monitor was installed on site from the 25th April to 02nd May 2017.

Attended noise measurements were also conducted by this office, to supplement the long term unattended monitoring data. Measurements were conducted at the boundary of the residential receivers along South Street and at the boundary of the site along Pacific Highway (refer to figure 1).

Measured background noise levels are representative of the ambient atmosphere at the affected sensitive receivers along South Street. Refer to Appendix 1 for detailed noise monitoring data.

Table 2 – Measured Rating Background Noise Levels

Location	**Rating Background Noise Level dB(A)$L_{90(period)}$**			
	Early Morning (6am – 7am)	Daytime (7am – 6pm)	Evening (6pm – 10pm)	Night (10pm – 7am)
Monitor Location (figure 1)	44	42	43	35

Table 3 – Measured Average Noise Levels

Location	**Average Noise Level dB(A)$L_{eq(period)}$**
	Daytime (7am – 10pm)
South Street	60
Pacific Highway	73

5 NOISE EMISSION GUIDELINES AND ASSESSMENT CRITERIA

We note that there are no specific acoustic controls stipulated by the City of Lake Macquarie council, with regards to noise impacts from new commercial/industrial developments. In the absence of this the following noise impact from the subject development will be assessed against the provisions of the NSW Environment Protection Authority (EPA).

5.1 ACTIVITY NOISE (INCLUDES NOISE FROM ANY FUTURE MECHANICAL PLANT OR EQUIPMENT ASSOCIATED WITH THE PROPOSAL)

5.1.1 EPA Industrial Noise Policy

The EPA INP outlines assessment criteria for noise from mechanical plant and equipment. The recommended assessment objectives vary depending on the potentially affected receivers, the time of day, and the type of noise source. The INP has two requirements which both have to be complied with, namely an amenity criterion and an intrusiveness criterion.

The intrusiveness and amenity criteria for this project have been determined using these guidelines and the noise monitoring results.

In addition, the EPA in its Application Notes to the INP sets out methods for the assessment of sleep disturbance.

5.1.1.1 Intrusiveness Criterion

This guideline is intended to limit the audibility of noise emissions at residential receivers and requires that noise emissions measured using the L_{eq} descriptor not exceed the background noise level by more than 5 dB(A). Where applicable, the intrusive noise level should be penalised *(increased)* to account for any annoying characteristics such as tonality.

Allowable noise level is as follows:

Table 4 – Allowable Intrusive Noise Levels

Location	Time of Day	Rating Background Noise Level dB(A)$L_{90(period)}$	Intrusiveness Noise Objective dB(A)$L_{eq(15min)}$ (Background + 5dB)
All Potentially Affected Residential Properties	Day Time (7am – 6pm)	42	47
	Evening (6pm – 10pm)	43	48
	Night (10pm – 7am)	35	40

5.1.1.2 Amenity Criterion

This guideline is intended to limit the absolute noise level from all industrial noise sources to a level that is consistent with the general environment.

The INP sets out acceptable noise levels for various localities. Table 2.1 on page 16 of the policy indicates 4 categories to distinguish different residential areas. They are rural, suburban, urban and urban/industrial interface.

Table 5 provides the recommended ambient noise levels for the surrounding suburban residential and industrial receivers for the day, evening and night periods. For the purposes of this condition:

- Day is defined as the period from 7am to 6pm Monday to Saturday and 8am to 6pm Sundays and Public Holidays;
- Evening is defined as the period from 6pm to 10pm; and
- Night is defined as the period from 10pm to 7am Monday to Saturday and 10pm to 8am Sundays and Public Holidays.

Table 5 – INP Recommended Amenity Noise Levels

Type of Receiver	Time of day	Recommended Acceptable Noise Level dB(A) $L_{eq(period)}$
Residential – Suburban	Day (7am – 6pm)	55
	Evening (6pm – 10pm)	45
	Night (10pm – 7am)	40
Industrial Premises	When in use	70

5.1.2 Sleep Disturbance Impacts

Any noise generated on site between 10pm and 7am should be assessed for potential sleep disturbance impacts on surrounding residential properties.

Sleep arousal is a function of both the noise level and the duration of the noise. The method for assessment of potential sleep disturbance is set out in the application note to the INP, as summarised below.

To assess potential sleep arousal impacts, a two stage test is carried out:

- Step 1 – An "emergence" test is first carried out. That is, the L_1 noise level of any specific noise source should not exceed the background noise level (L_{90}) by more than 15 dB(A) outside a resident's bedroom window between the hours of 10pm and 7am. If the noise events are within this, then sleep arousal impacts are unlikely and no further analysis is needed. This is consistent with the Noise Guide for Local Government. The guideline level is set out below.

Table 6 – Sleep Arousal Emergence Test

Location	Sleep Arousal Emergence Test dB(A)$L_{1(1min)}$ (6am to 7am)
Residential Properties along South Street	59

- Step 2 – If there are noise events that could exceed the emergence level, then an assessment of sleep arousal impact is required to be carried out taking into account the level and frequency of noise events during the night, existing noise sources, etc. This test takes into account the noise level and number occurrences of each event with the potential to create a noise disturbance. As is recommended in the explanatory notes of the EPA Industrial Noise Policy, this more detailed sleep arousal test is conducted using the guidelines in the EPA Road Noise Policy. Most relevantly, the Road Noise Policy states:

  For the research on sleep disturbance to date it can be concluded that:

  - *Maximum internal noise levels below 50-55dB(A) are unlikely to awaken people from sleep.*
  - *One to two noise events per night with maximum internal noise levels of 65-70dB(A) are not likely to affect health and wellbeing significantly.*

These internal noise level guidelines have been adopted in this assessment.

5.2 NOISE FROM INCREASED TRAFFIC GENERATION ON PUBLIC STREETS

5.2.1 NSW EPA Road Noise Policy (RNP)

Council's DCP does not outline any specific noise criteria with respect to traffic generation associated with developments. In the absence of this, The NSW EPA RNP guideline will be used for this assessment.

For land use developments with the potential to generate additional traffic on existing road networks, the development must comply with the requirements for new developments detailed in the NSW EPA Road Noise Policy guideline. Increased noise levels on Pacific Highway will be assessed against the "arterial" roads acoustic criteria, while increased traffic on South Street will be assessed against the "local" roads acoustic criteria.

Noise levels generated by traffic should not exceed the noise levels set out in the table below when measured at a nearby property. However, if the existing traffic noise levels exceed those in the table below, the new development must not cause an increase in the overall traffic noise level of more than 2 dB (refer to section 3.4 of the Road Noise Policy document). This level represents a minor impact that is considered barely perceptible to an average person.

Table 7 – NSW Road Noise Policy – Criteria for Residential land uses

Road Type	Time of day	Criteria for Acceptable Traffic Noise Level Arterial Roads
Arterial	Day (7am to 10pm)	60 dB(A)$L_{eq(15hr)}$
	Night (10pm to 7am)	55 dB(A)$L_{eq(9hr)}$
Local	Day (7am to 10pm)	55 dB(A)$L_{eq(Worst\ 1hr)}$
	Night (10pm to 7am)	50dB(A)$L_{eq(Worst\ 1hr)}$

The Road Noise Policy does not outline any specific criteria for industrial or bulky goods receivers.

6 NOISE EMISSION ASSESSMENT

Primary noise sources associated with the subject proposal, with the potential to cause impacts on the surrounding receivers include;

- Noise from the use of loading docks (truck manoeuvring and material handling) – will be assessed with reference to the EPA Industrial Noise Policy.
- Noise from any mechanical plat/equipment associated with the developments – will be assessed with reference to the EPA Industrial Noise Policy.
- Noise from traffic generated on the surrounding public roads – will be assessed with reference to the EPA Road Noise Policy.

In all cases, the predicted noise levels in the following sections are based on the proviso that the acoustic treatments/management controls recommended in section 7 are implemented.

6.1 ACTIVITY NOISE

Noise emissions associated with the loading dock activities at the subject development are predicted below. The predicted levels are based on the following assumptions:

- ***Lot 1 – Home Improvement Centre***
    - One semi-trailer (19-metre-long – worst case) and one small rigid truck accessing the loading dock in any fifteen-minute period.
    - Trucks/trailer will access the loading/unloading via the South Street Entrance. They will depart the property via the Pacific Highway.
    - One forklift for loading/unloading. Worst case assumption of forklift operating the entire time of a fifteen-minute period.
    - One electric forklift for loading/unloading in the nursery unloading area. The forklift only manoeuvres in this space and within the warehouse, not going past the acoustic wall. Forklift only in operation during the daytime period (i.e. 7am – 6pm), with a worst case assumption of the forklift operating for the entire time of a fifteen-minute period.
    - Loading dock activities are only proposed between the hours of 8am – 4pm (no operations prior to 7am or after 6pm).
- ***Lot 2 – Anaconda & bulky goods tenancies and Family Restaurant***
    - One semi-trailer (19-metre-long – worst case) and one small rigid truck accessing the bulky goods tenancies loading/unloading area (assumed towards the rear of this Lot, adjacent to service road) in any fifteen-minute period.
    - Trucks/trailer will access the loading/unloading area via the Pacific Highway Entrance. They will depart the property via the Pacific Highway/Gove Street Intersection.

- One forklift for loading/unloading. Worst case assumption of forklift operating the entire time of a fifteen-minute period.

- Loading/unloading operations are only proposed between the hours of 8am – 4pm (no operations prior to 7am or after 6pm).

- Sound power level of vocal noise from a patron in the family restaurant space is 73 dB(A)L_{eq}, with one on two speaking at any one time. This is based on measurements of patron noise in similar developments (with background recorded music).

- Only background music is playing in the restaurant space, with a sound pressure level (SPL) of 65dB(A)L_{eq}.

- Maximum of 150 patrons assumed for the family restaurant. All façade operable elements are assumed as closed at all times, with glazed elements assumed as standard glazing (i.e. 4mm float or toughened glass).

- ***Lot 3 – Service Station, Take Away Food & Drink Premises (or Fast Foot Outlet) and Bulky Goods Tenancies***

  - One petrol tanker and one semi-trailer (assumed as McDonald's delivery) accessing the service station and the fast food outlet, in any fifteen-minute period.

  - Service vehicles (oil tanker, semi-trailers or any other delivery vehicles) associated with the service station and fast food outlet, will access the site via the Pacific Highway Entrance. They will depart the property via the Pacific Highway/Gove Street Intersection.

  - Petrol tanker and all deliveries (service station and fast food outlet) are only proposed between the hours of 8am – 4pm (no operations prior to 7am or after 6pm).

  - One semi-trailer (19-metre-long – worst case) and one small rigid truck accessing the bulky goods tenancies loading/unloading area (assumed towards the rear of this Lot, adjacent to service road) in any fifteen-minute period.

  - Trucks/trailer will access the loading/unloading area via the Lake Street Entrance. They will depart the property via the Pacific Highway/Gove Street Intersection.

  - One forklift for loading/unloading. Worst case assumption of forklift operating the entire time of a fifteen-minute period.

  - Loading/unloading operations are only proposed between the hours of 8am – 4pm (no operations prior to 7am or after 6pm).

  - Sound power level of vocal noise from a patron in fast food space is 73 dB(A)L_{eq}, with one on two speaking at any one time. This is based on measurements of patron noise in similar developments.

- Maximum of 100 patrons assumed for the fast food sapce. All façade operable elements are assumed as closed at all times, with glazed elements assumed as standard glazing (i.e. 4mm float or toughened glass).

- Colston Budd Rogers & Kafes Pty Ltd's traffic report for the s96 application (reference: 10398/2, dated July 2017) predicts the following two-way traffic generation volumes.

  - *Lot 1 – Home Improvement Centre*

    - Weekday afternoon peak hour – 330 vehicles.
    - Weekend peak hour – 950 vehicles.

  - *Lot 2 (Anaconda & bulky goods tenancies and Family Restaurant) & Lot 3 (Service Station, Fast Foot Outlet & bulky goods tenancies)*

    This report notes that given the family restaurant, service station and fast food outlet are part of the overall bulky goods development, a significant portion of its trade is likely to be customers already visiting other areas of the development (linked trips). Part 3.25 of the traffic report references the RMS guideline which indicates 15% of retail traffic would be passing trade, 50% of fast food traffic would be passing trade and 20% to petrol station would be passing trade. Hence, the resulting two-way traffic generation volumes are predicted;

    - Weekday afternoon peak hour – 155 vehicles.
    - Weekend peak hour – 215 vehicles.

  - *Cumulative or total additional two-way traffic generation on the surrounding road network;*

    - Weekday afternoon peak hour – 485 vehicles.
    - Weekend peak hour – 1,165 vehicles.

- Predicted noise levels are based on the following noise levels;

Table 8 – Source Noise Level

Noise Source	Sound Power Level (SWL)
Tanker or Trailer engine (semi-trailer driving at approx. 5km/h)	105dB(A)L_{eq}
Forklifts manoeuvring (assumed gas forklifts – diesel forklifts not recommended)	94dB(A)L_{eq}
Electric Forklift manoeuvring	85dB(A)L_{eq}
Materials Handling (loading unloading trucks)	90dB(A)L_{eq}
Cars travelling at 10 – 20km/hr	94dB(A)L_{eq}
Patron noise	7 dB(A)L_{eq} / patron

Operational noise levels are predicted and assessed against relevant criteria from section 5. Relative position of noise source and noise receiver, taking into account distance attenuation and noise screening (where appropriate).

Table 9 – Predicted Cumulative Noise Emission Predictions

Receiver Location	Time Period	Predicted Noise Level dB(A)$L_{eq(15min)}$	Criteria dB(A)$L_{eq(15mins)}$	Complies
Residential Receivers along South Street (between Oxley and Iona Streets)	Early Morning (6am – 7am) – Nosie from staff and patron vehicle movements associated with lot 1, service station, family restaurant and fast food outlet (no loading dock operations during this period). Also, operational noise from service station, family restaurant and fast food outlet.	<37	40	Yes – Refer to recommendations in section 7.
	Morning (7am – 6pm)	46	47	
	Evening (6pm – 10pm) – Nosie from staff and patron vehicle movements associated with lot 1, service station, family restaurant, fast food outlet (no loading dock operations during this period). Also, operational noise from service station, family restaurant and fast food outlet.	<40	45	
	Night (10pm – 7am) Nosie from staff and patron vehicle movements associated with family restaurant, service station and fast food outlet (no tanker or deliveries permitted during this period). Also, operational noise from family restaurant, service station and fast food outlet.	<35	40	
Industrial and Bulky Goods Receivers along Pacific Highway	When in use	60	70	Yes

As showing the table above, noise emanating from vehicles using the loading docks is compliant with noise emission goals at all nearby development.

6.1.1 Sleep Disturbance Impacts

The home improvement centre is proposed to operate from 6am Monday to Friday. Additionally, the family restaurant, service station and fast food outlet is proposed to operate 24/7.

As such noise impacts from typical vehicle activities,

- Engine Starting.
- Car door slamming.
- Vehicles movements (driving into the property and circulating within the carparking area).

during the night-time period (10pm – 7am), must be assessed against the EPA's provisions for sleep disturbance.

Step 1 – Emergence Test

Intermittent noise sources associated with the carpark (**deliveries and loading dock activities will not occur during this period**) are detailed below;

- Car Engine Starting noise – 94 dB(A)L_{Max}
- Car door slamming – 94 dB(A)L_{Max}.

Noise emission predictions are detailed below. Predictions are based on the assumption that a car is parked in a parking bay, closest to the nearest affected residential receiver.

Predicted levels are as follows;

Table 10 – Predicted Sleep Disturbance Impacts

Receiver	Time Period	Noise Source	Predicted Noise Level dB(A)$L_{1(1min)}$	Sleep Disturbance Emergence Test Background + 15 dB(A) $L_{1(1minute)}$	Compliance
Residential Receivers along South Street (between Oxley and Iona Streets)	Night-time (10pm-7am)	Engine Starting	<45	59	Yes
		Car door slamming	<45		Yes

6.2 MECHANICAL PLANT AND EQUIPMENT

Detailed acoustic assessment of mechanical plant is not typically undertaken at DA stage as plant selections and locations are not finalised.

We recommend that a detailed review of plant items be undertaken at Construction Certificate stage, once mechanical plant selections have been undertaken. All plant items will be capable of complying with the EPA INP acoustic guidelines which are presented in the table below;

Table 11 – Mechanical Plant Noise Emission Objectives

Receiver	Time of day	Measured Background Noise Level dB(A) $L_{90(15minutes)}$	Amenity Criteria dB(A) $L_{eq(period)}$	Intrusiveness Criteria Background + 5 dB(A) $L_{eq(15minutes)}$
All affected surrounding residential receivers	Day	42	55	47
	Evening	43	45	48
	Night	35	40	40
Bulky goods tenancies	When In Use	-	70	-

6.3 INCREASED TRAFFIC ON PUBLIC STREETS (STAFF, VISITORS AND SERVICE VEHICLES)

- Service vehicles associated with the home improvement centre, will access the loading/unloading via the South Street Entrance. They will depart the property via the Pacific Highway.

- Service vehicles associated with the bulky goods developments and the family restaurant, will access the loading/unloading via the Pacific Highway Entrance. They will depart the property via the Pacific Highway/Gove Street Intersection.

- Service vehicles (oil tanker, semi-trailers or any other delivery vehicles) associated with the service station and fast food outlet, will access the site via the Pacific Highway Entrance. They will depart the property via the Pacific Highway/Gove Street Intersection.

- General vehicular access (staff and visitors) to and from the site will be via driveways located along Pacific Highway, South Street and Lake Street.

The majority of the traffic is anticipated to use the Pacific Highway entrance to access the car parking areas at the front of both lots. Some vehicular access is also expected to occur via South Street (separate to service entry for Bunnings) and Lake Street.

Colston Budd Rogers & Kafes Pty Ltd's traffic report for the s96 application (reference: 10398/2, dated July 2017) outlines the following cumulative (lots 1, 2 & 3) two-way traffic generations;

- Weekday afternoon peak hour – 485 vehicles.

- Weekend peak hour – 1,165 vehicles.

The original approved development was predicted to have a total of 465 and 1,070 vehicles per hour two-way during weekday afternoon and weekend peak hour respectively. Hence, the cumulative additional traffic generated by both the subject lots will only result in an increase of 20 and 95 vehicles per hour two-way during weekdays and weekends peak hour periods. This only corresponds to an increase of approximately 5 cars or less per hour and will not add to the previously predicted and approved noise levels.

7 RECOMMENDATIONS AND MANAGEMENT CONTROLS

We recommend the following acoustic treatments/management controls:

- A noise screen is recommended along the South Street Service vehicle entrance as illustrated below. Screen must be of a solid imperforate construct (FC sheet, lapped and capped timber, masonry etc.) and at least 1.5m high.

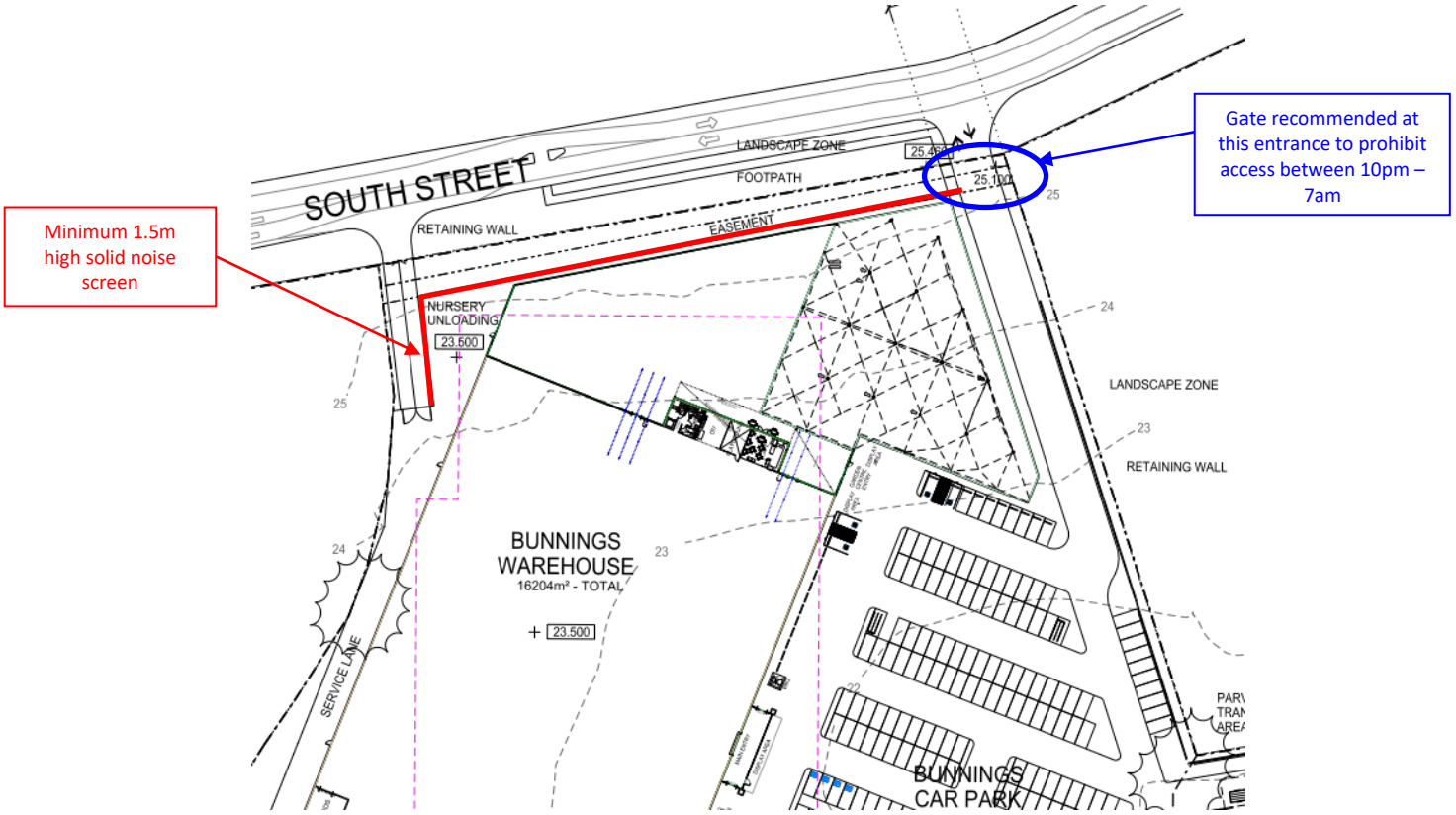


Figure 3 – Recommended Treatments

- All service vehicles arriving at the nursery unloading area **must** switch off their engines during idling.

- It is recommended service vehicles turn off engines during idling or loading/unloading (all lots).

- 1 electric forklift is permitted in the nursery unloading area at any given time. Forklift is only permitted to operate in this external area and within the warehouse, between the hours of 7am to 6pm.

- All loading dock operations, including petrol tanker delivery, garbage collection and any other deliveries or collections must commence after 7am. No external operations must occur after 6pm.

- A gate is recommended to the South Street entrance for general traffic. This access cannot be used between the hours of 10pm – 7am (refer Figure 3 above).

- Detailed review of all external mechanical plant and equipment associated with the subject proposal should be undertaken at construction certificate stage (once plant selections and locations are finalised). Acoustic treatments should be determined in order to control plant noise emissions to the levels set out in section 6.2 of this report.

8 CONCLUSION

Noise impacts associated with the proposed modifications to the approved home Improvement centre and bulky goods development (including a family restaurant) on lots 1, 2 & 3 along Pacific Highway at Bennetts Green, have been assessed.

Project specific noise criteria was established using background noise level measured on site and the legislative requirements of the NSW Environment Protection Authority.

The following was concluded;

- Cumulative noise impacts associated with the lot 1, lot 2 (bulky goods tenancies including family restaurant) and lot 3 (service station, fast food outlet and bulky goods tenancies) developments will comply with the project specific noise levels (refer section 5.1), at all surrounding affected receivers, provided the recommendations and management controls outlined in section 7 of this report are implemented.

- Sleep disturbance impact will also comply with the project specific noise levels (refer section 5.1.2), provided the recommendations and management controls outlined in section 7 of this report are implemented.

- Additional traffic generated as a result of the subject proposal will only marginally exceed the previously approved development and this exceedance will not impact on the previously predicted and approved noise levels.

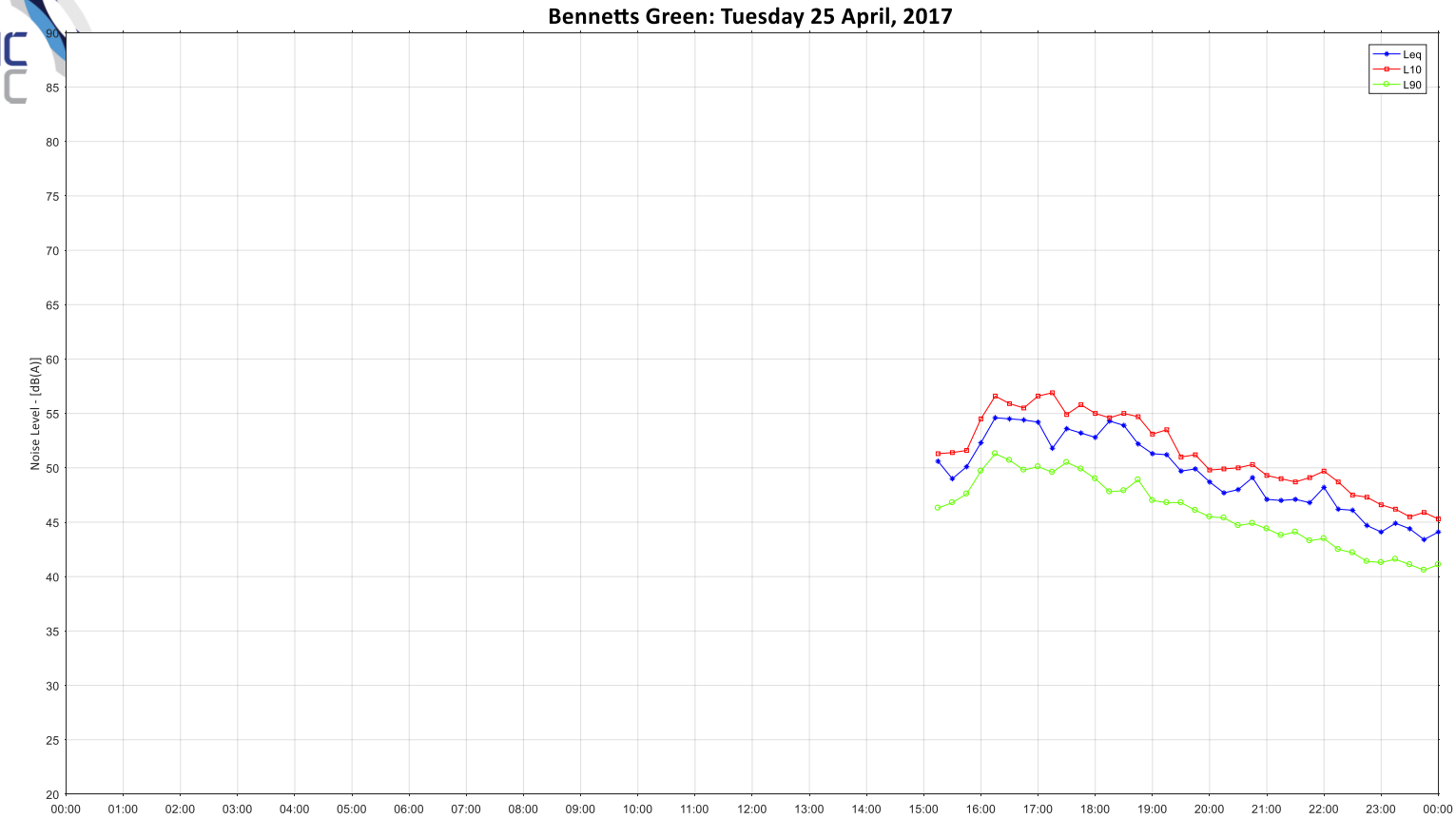
We trust this information is satisfactory. Please contact us should you have any further queries.

Yours faithfully,

Acoustic Logic Consultancy Pty Ltd
Yogendra Kalkunte

APPENDIX 1

NOISE MONITORING DATA


Bennetts Green: Tuesday 25 April, 2017
Noise Level - [dB(A)]
Leq
L10
L90
90
85
80
75
70
65
60
55
50
45
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35
30
25
20
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01:00
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16:00
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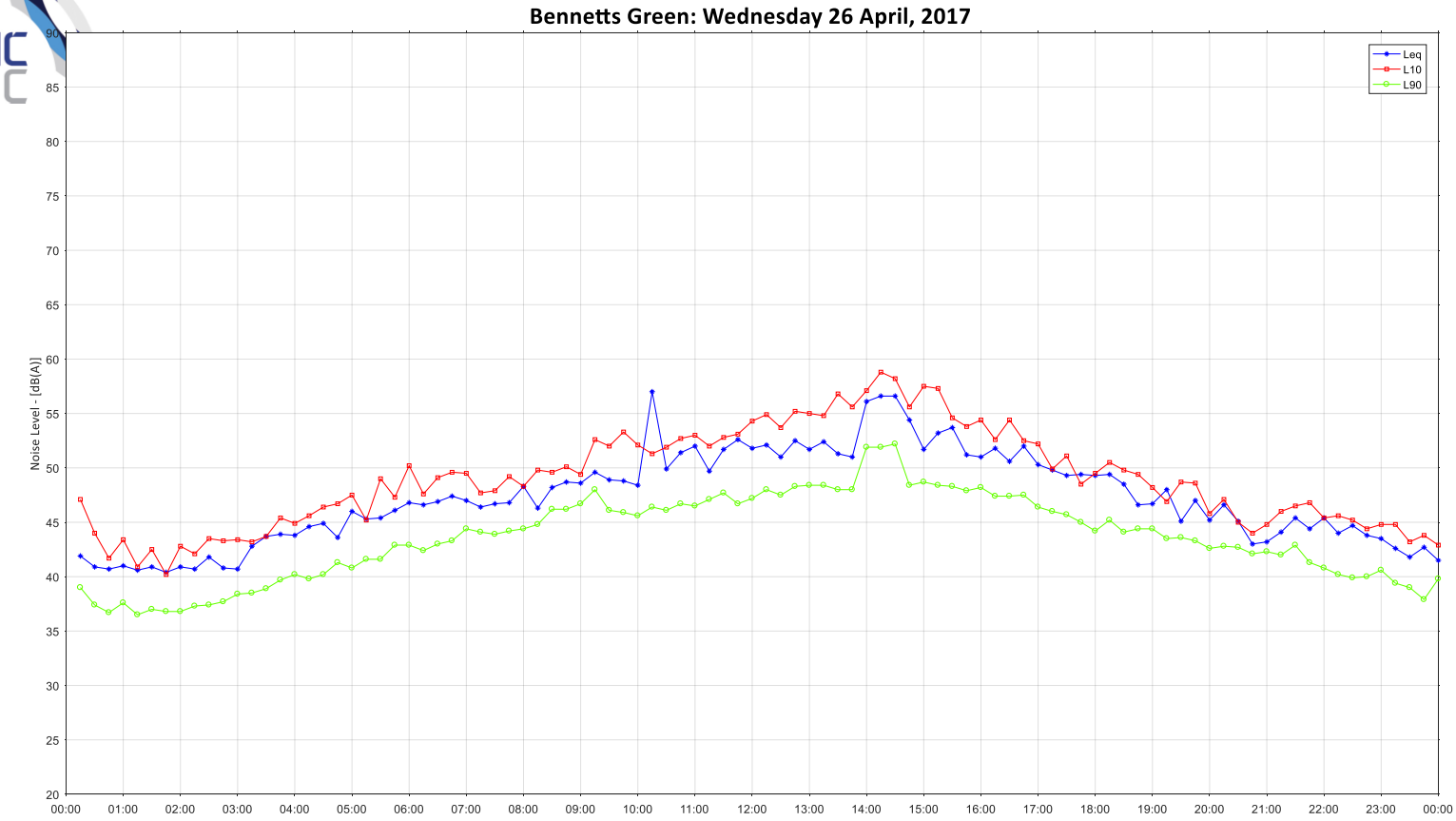
20:00
21:00
22:00
23:00
00:00

D08960725


Bennetts Green: Wednesday 26 April, 2017
Noise Level - [dB(A)]
Leq
L10
L90
90
85
80
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65
60
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01:00
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16:00
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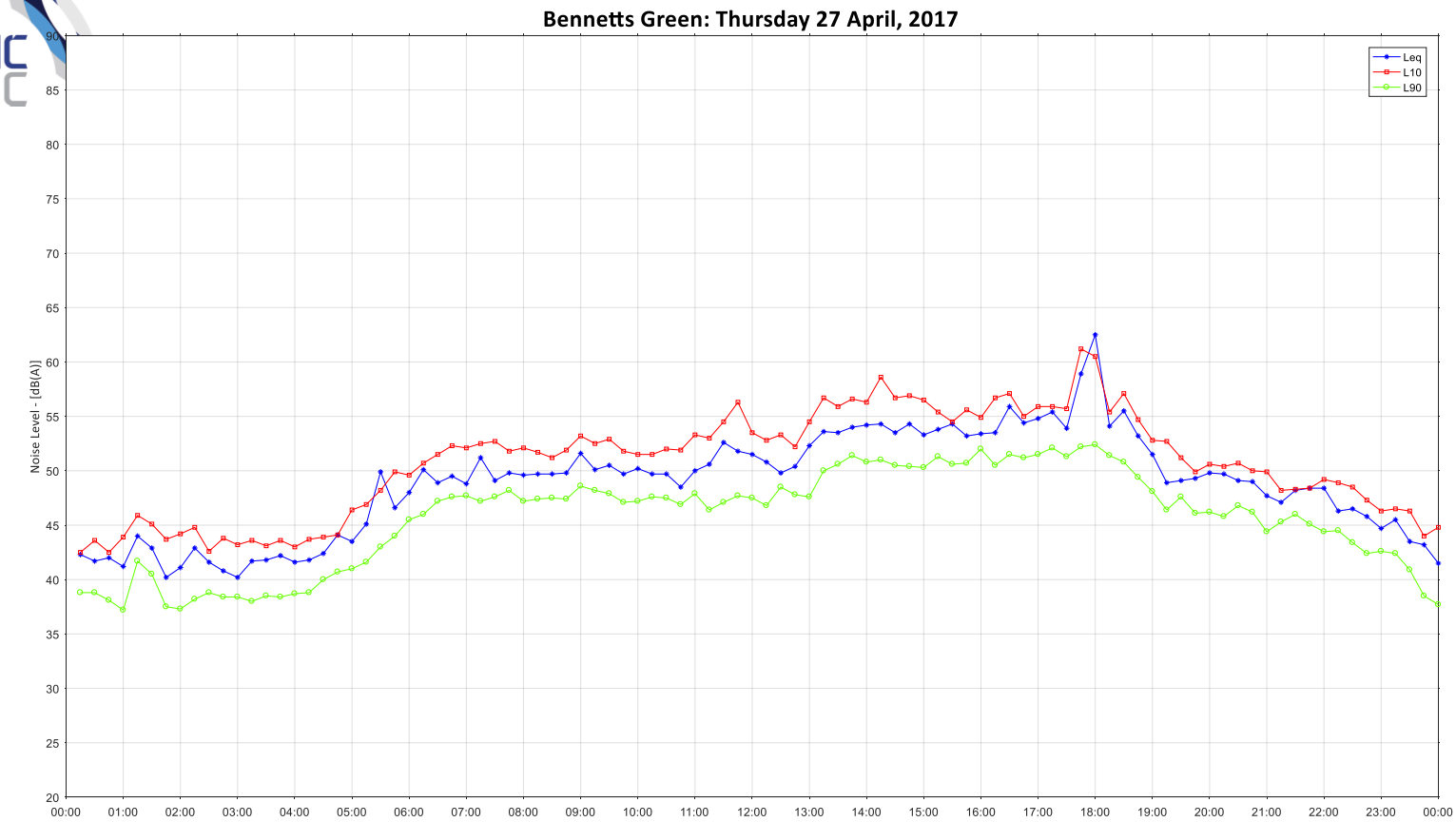
18:00
19:00
20:00
21:00
22:00
23:00
00:00

D08960725


Bennetts Green: Thursday 27 April, 2017
Leq
L10
L90
Noise Level - [dB(A)]
90
85
80
75
70
65
60
55
50
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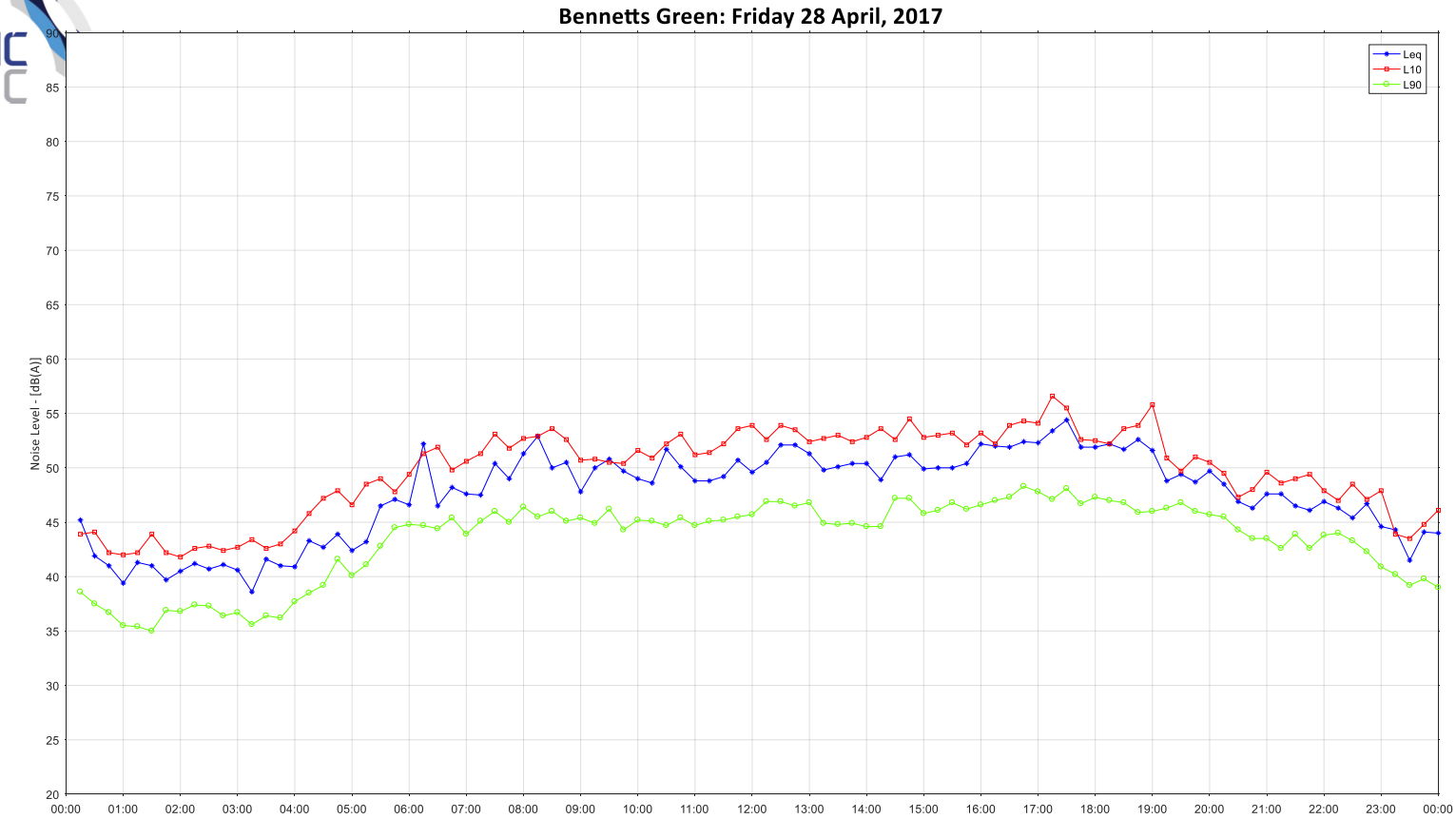
21:00
22:00
23:00
00:00

D08960725


Bennetts Green: Friday 28 April, 2017
Noise Level - [dB(A)]
Leq
L10
L90
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85
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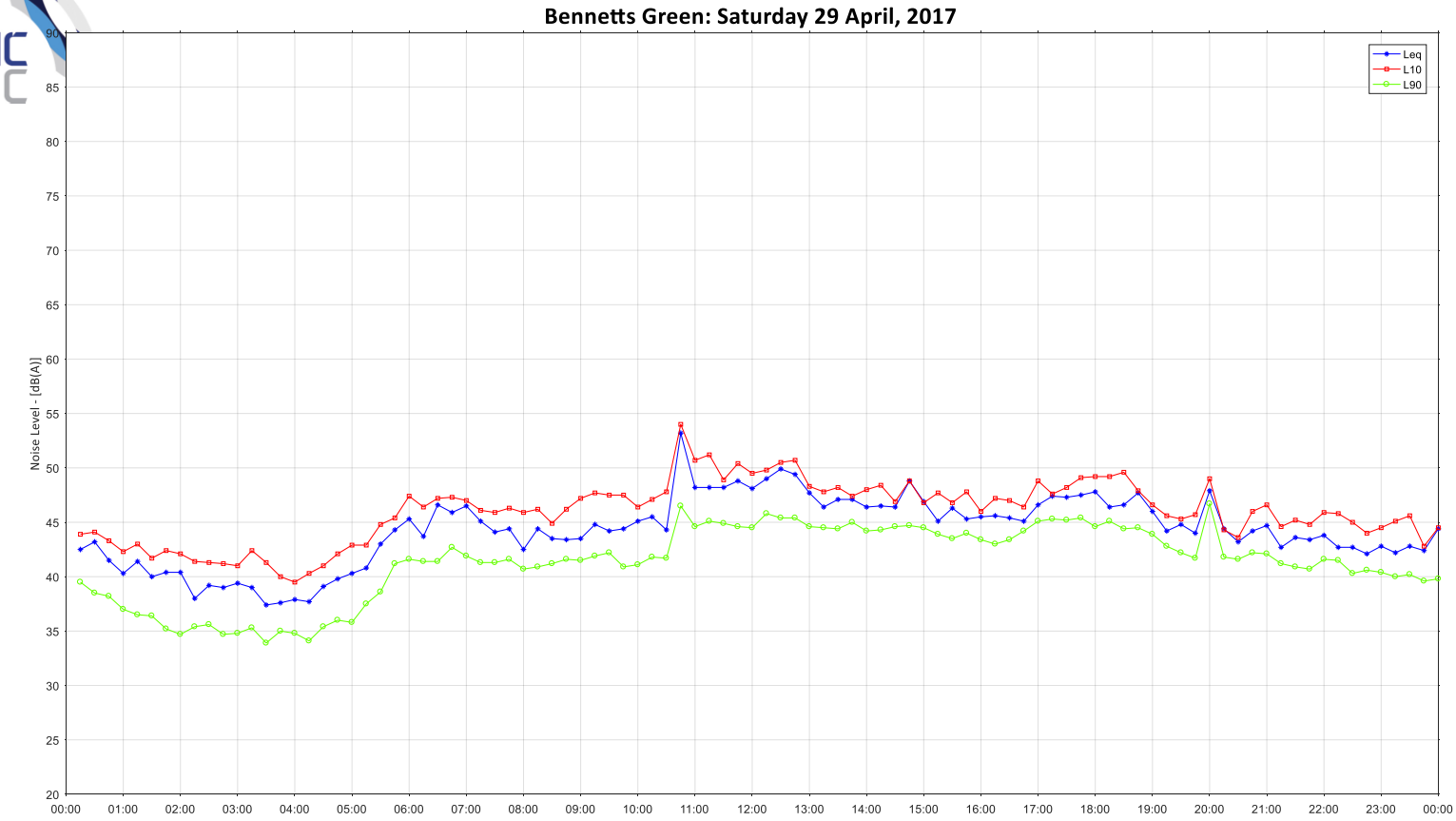
D08960725


Bennetts Green: Saturday 29 April, 2017
Leq
L10
L90
Noise Level - [dB(A)]
90
85
80
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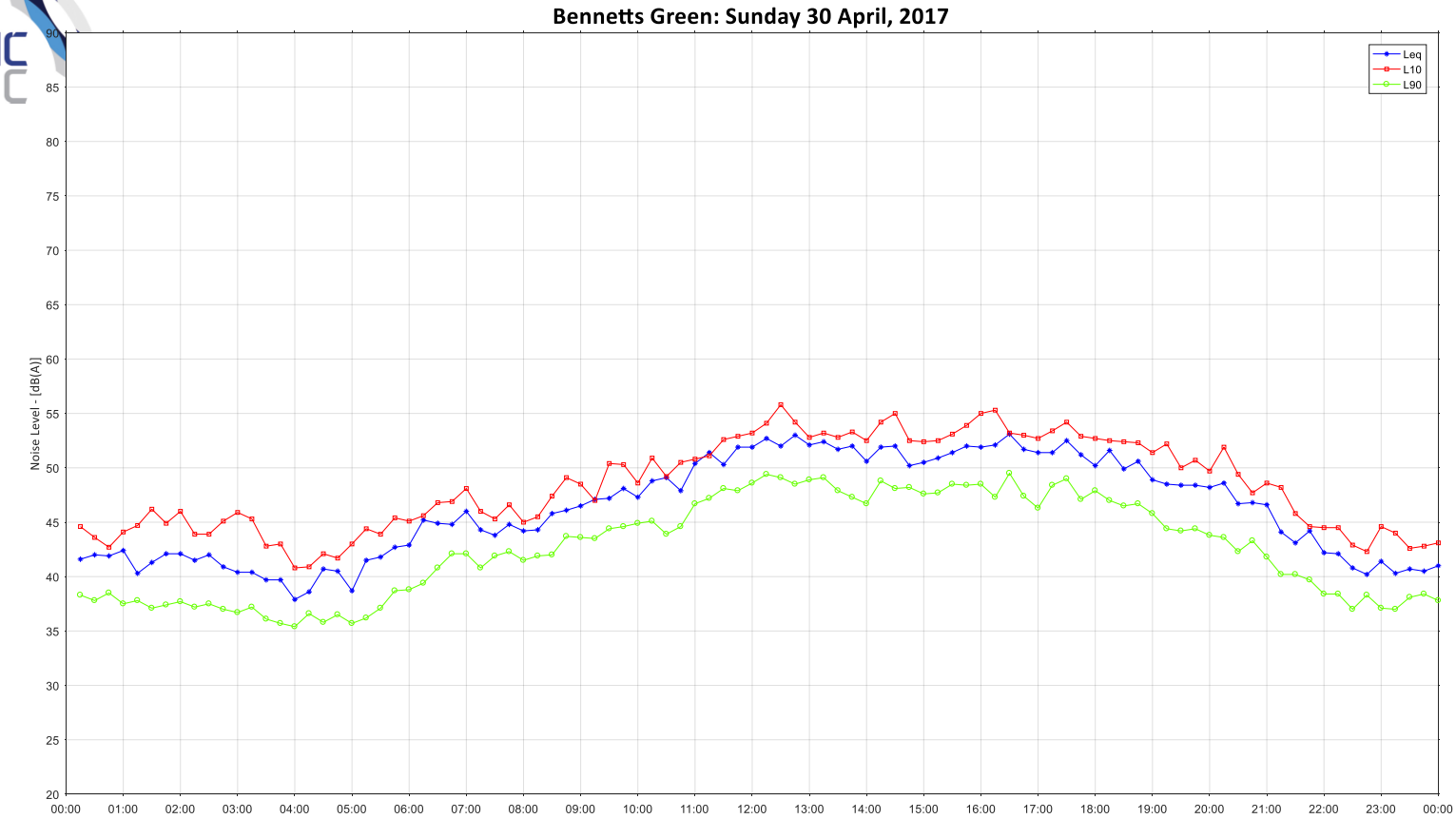
D08960725


Bennetts Green: Sunday 30 April, 2017
Noise Level - [dB(A)]
Leq
L10
L90
90
85
80
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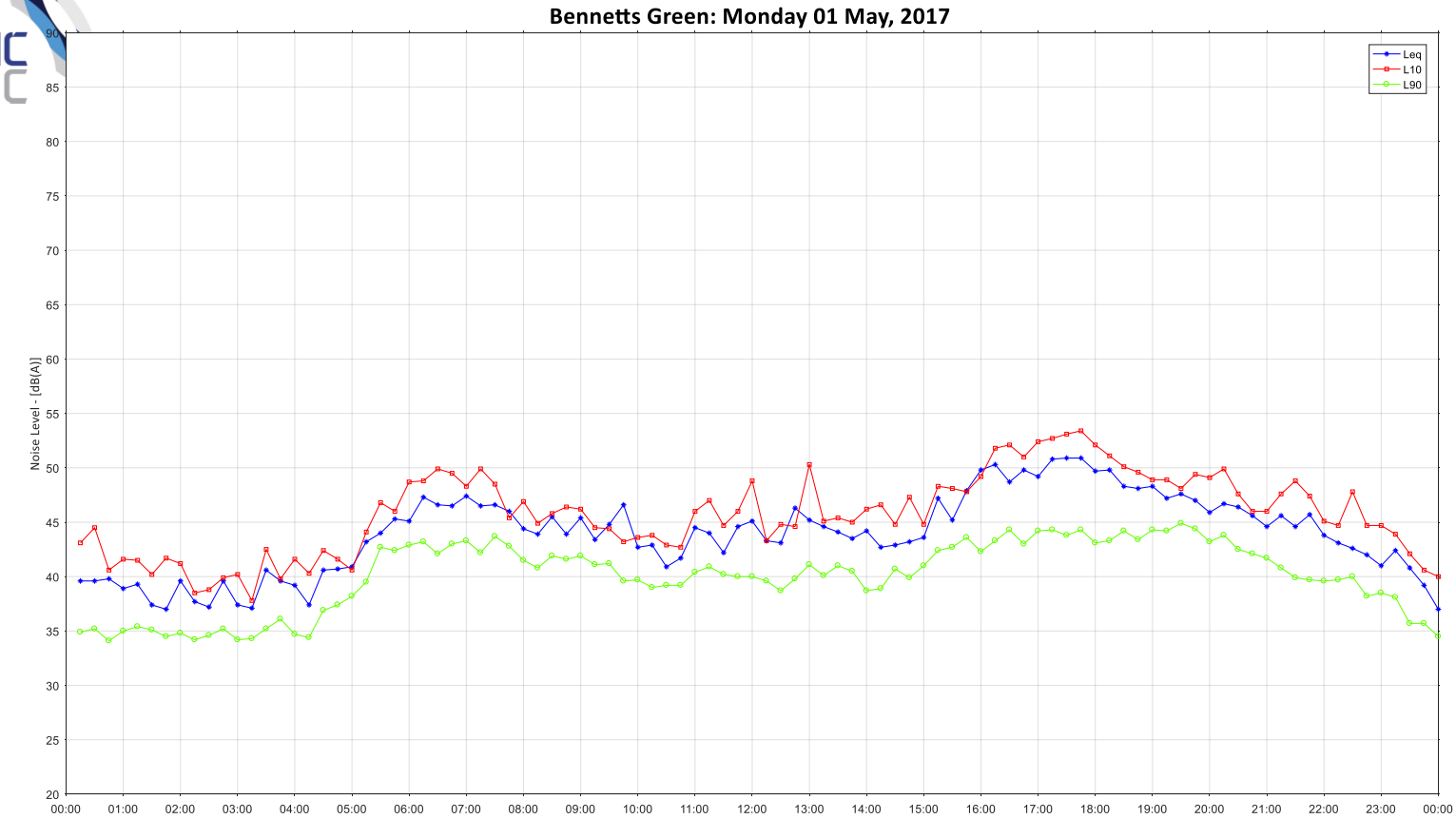
D08960725


Bennetts Green: Monday 01 May, 2017
Leq
L10
L90
Noise Level - [dB(A)]
90
85
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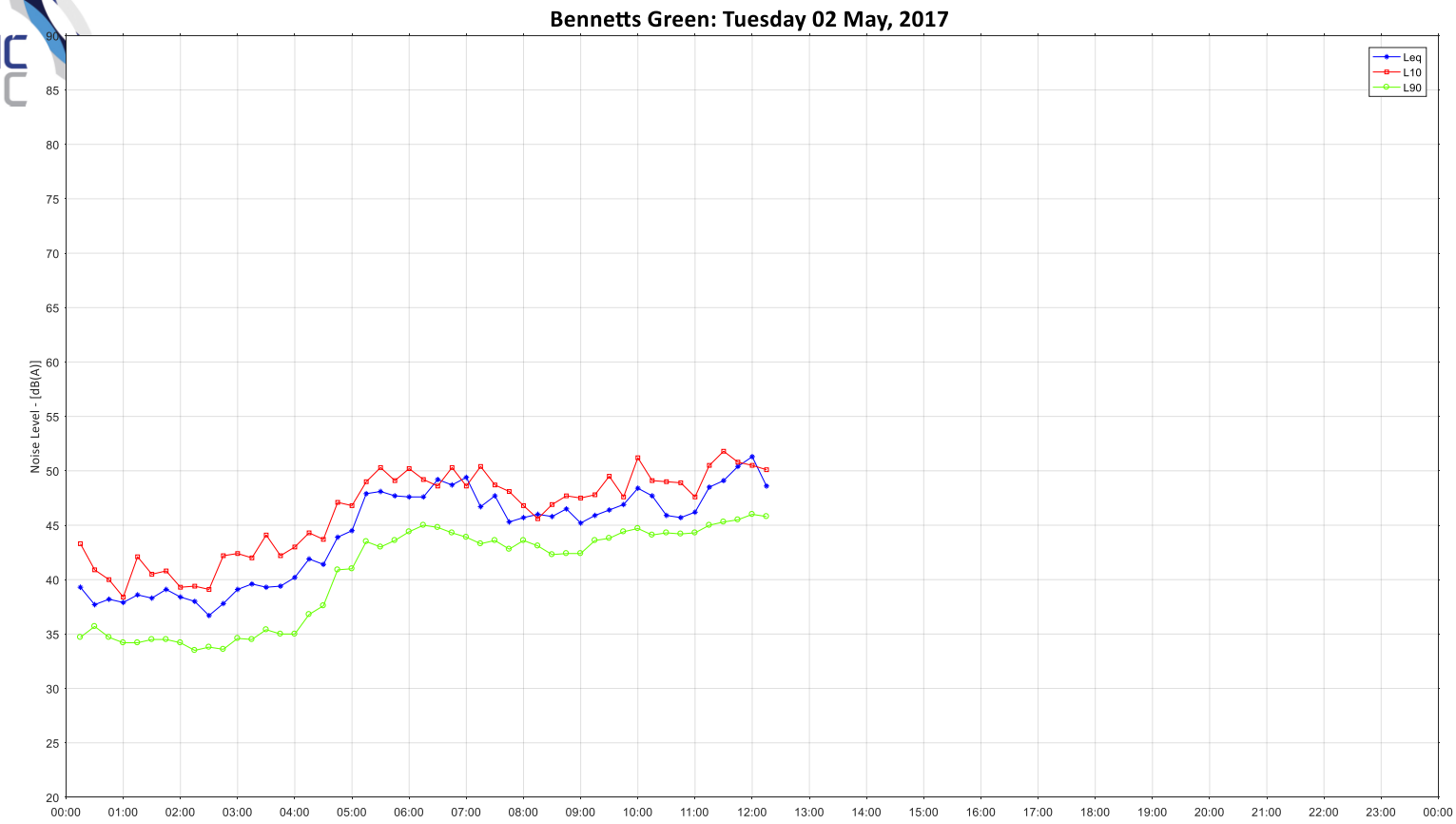
D08960725


Bennetts Green: Tuesday 02 May, 2017
Leq
L10
L90
Noise Level - [dB(A)]
90
85
80
75
70
65
60
55
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