



Welbourne Health Centre
Borras Construction Limited
Noise Impact Assessment for Non-Material
Amendment to External Plant Areas

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Executive Summary

Inhabit has been commissioned to provide a noise statement for the new plant to be installed at Welbourne Health Centre, Tottenham Hale, in the London Borough of Haringey, in line with BS4142, Local Authority adopted noise policy, relevant standards and guidance.

This assessment is based on the noise survey undertaken between 16:00 11th January to 16:30 16th January 2018, and attended measurements taken on the 19th and 20th September 2017 by Sandy Brown.

The survey's results of the attended measurements taken on site near the Welbourne Heath Centre result to be L_{A90} 59 dB during the day (07:00 – 23:00), and L_{A90} 51 dB during the night (23:00 – 07:00).

The London Borough of Haringey Council states in the 'Development Management DPD' adopted on July 17 that noise pollution can adversely impact on the amenity and health of building occupiers as well as the wider public. The Council will seek to ensure that new developments both minimise noise pollution and appropriately manage its impact.

The assessment has been undertaken considering the operational hour of the new units, 5 of them will be running during daytime (07:00 – 23:00) and 1 on them will run during night-time (23:00 – 07:00).

In order to comply with the London Borough of Haringey Council's Local Plan with respect to noise, the cumulative noise emissions from all proposed development should not exceed the following typical operational hours limits when measured at 1 m from the windows of the nearest noise sensitive premises taking into account all noise mitigation and attenuation applied.

Representative Background Noise Level L_{A90}	
Daytime (07:00-23:00hrs)	Night-time (23:00-07:00hrs)
49 dB(A)	41 dB(A)

Table 1 – Representative Background Noise Levels by operational hour

Based upon the assessment of plant items operating at the capacity and during the times of day provided by Ambivent Mechanical Engineers, the application of proprietary acoustic mitigation results in compliance of the noise emissions with the Local Authority Noise Policy, BS4142:2014+A12019 and indicates that no nuisance will be present to the residents located at Level 2 of Welbourne House.

It is important to note that the 4xCU units will run simultaneously for a relatively brief period of the year, and typically where environmental conditions require. For the large majority of the year fewer units will operate simultaneously, reducing the overall cumulative noise level. This should be considered in line with the mitigation as further evidence that nuisance will not be present, based upon the guidance provided in Paragraph 210(g) of the National Planning Policy Framework



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1.0 Introduction

Inhabit Europe Ltd. has been commissioned to undertake a noise impact assessment for the new units to be installed at the Welbourne Centre, Tottenham Hale, as part of a proposed non-material amendments application. The assessment has been carried out in line with relevant National and Local Authority noise policy, standards, and guidance. This report assesses the likely environmental impact of the proposed development with respect to noise.

With reference to the requirements set out in The London Borough of Haringey Council's 'Development Management DPD' adopted in July 2017, this report:

- utilises the third-party site-acquired data and determine the appropriate criteria to adopt from the Haringey Council's noise policy.
- assesses the noise impact of the proposed external plant items in support of the Non-Material Amendment
- provides technical recommendations to mitigate noise impacts in line with the prevailing and relevant standards and guidance documents.

The following report relates solely to the noise impact of the proposed external plant that will be located at the southwest corner of Welbourne Health Centre.

2.0 Legislation and Guidance

In deriving an assessment methodology, consideration has been given to the prevailing and relevant legislative framework, local policies, and best practice guidance documents.

2.1 National Planning Policy Framework

The National Planning Policy Framework (NPPF, 2021), makes reference to noise in paragraph 174(e), paragraph 185(a) and (b), and paragraph 210(g) as follows:

Paragraph 174

'Planning policies and decisions should contribute to and enhance the natural and local environment by:

...

(e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans'

Paragraph 185

'Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:

a) mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life;

b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason'



Paragraph 210

'Planning policies should:

g) when developing noise limits, recognise that some noisy short-term activities, which may otherwise be regarded as unacceptable, are unavoidable to facilitate minerals extraction'

The NPPF refers to the Noise Policy Statement for England (NPSE, 2010), that assists in deriving adverse effect levels based the significance of impact of the new noise making development:

NOEL – No Observed Effect Level

The level below which no detectable effect on the health and quality of life due to noise can be detected.

LOAEL – Lowest Observed Adverse Effect Level

The level above which adverse effects on health and quality of life due to noise can be detected.

SOAEL – Significant Observed Adverse Effect Level

The level above which significant adverse effects on health and quality of life due to noise can be detected.

2.2 BS4142:2014+A1:2019 - Methods for Rating and Assessing Industrial and Commercial Sound

BS4142:2014+A1:2019 provides methods for rating and assessing industrial and commercial sound. The standard is used to rate sound from fixed installations. The standard requires a "Specific Sound Level", in terms of L_{Aeq} , is determined either by measurement or calculation at a receptor location. This Specific Sound Level may then be corrected for the character of sound and is then termed the "Rating Level".

Once the Rating Level has been determined, the background sound level is subtracted from it and the greater the difference, the greater the likelihood of an 'adverse impact'. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact. The standard advocates that each site and situation should take the context of the scenario into consideration and that "not all adverse impacts will lead to complaints and not every complaint is proof of an adverse impact".

The standard provides reference periods over which the assessment should take place which have been reproduced in the table below.

Period	Hours
Typical Daytime	07:00 – 23:00
Typical Night-time	23:00 – 07:00

Table 2 – Reference Periods

Based on the Joint Nordic Method, BS4142 sets out the following additional penalty to the noise emission limit for sound displaying tonal characteristics:

- 2 dB for a tone which is just perceptible at the noise receptor.
- 4 dB where it is clearly perceptible.
- 6 dB where it is highly perceptible



2.3 London Borough of Haringey Council Policy

The London Borough of Haringey Council states in the 'Development Management DPD' adopted on July 2017 states that:

Policy DM1:

*"D: Development proposals must ensure a high standard of privacy and amenity for the development's users and neighbours. The Council will support proposals that: Address issues of vibration, **noise**, fumes, odour, light pollution and microclimatic conditions likely to arise from the use and activities of the development"*

Policy DM23:

"D: The Council will seek to ensure that new noise sensitive development is located away from existing or planned sources of noise pollution. Proposals for potentially noisy development must suitably demonstrate that measures will be implemented to mitigate its impact.

E: A noise assessment will be required to be submitted if the proposed development is a noise sensitive development, or an activity with the potential to generate noise."

Furthermore, it states in section 4.60 'Noise and Vibration' that *"noise pollution can adversely impact on the amenity and health of building occupiers as well as the wider public. The Council will seek to ensure that new developments both minimise noise pollution and appropriately manage its impact."*

In the absence of specific limits set out by London Borough of Haringey Council, limits have been adopted in line with the guidance set out in BS4142:2014+A12019 and in the spirit of aforementioned relevant statements taken from the National Planning Policy Framework and Noise Policy Statement for England.

In addition, and to provide a suitable internal acoustic environment for the residential dwellings, limits have been set at 1m from the residential windows to account for the potential for windows to be used for background ventilation during the day and night-time period. Annex G of BS8233:2014 has been cited to establish the sound insulation across an open window, stating *"If partially open windows were relied upon for background ventilation, the insulation would be reduced to approximately 15 dB"*. Guideline noise limits have therefore been set to provide internal ambient noise levels with bedrooms that do not exceed $L_{Aeq, 16hour}$ 35dB and $L_{Aeq, 8hour}$ 30dB.

3.0 Background Information

3.1 Site Description

Welbourne Health Centre is located in Tottenham Hale, in the London Borough of Haringey. A new plant area is proposed to be installed at the rear of the site with a total of 6No. condenser units. The nearest residential receptor has been identified on the southwest elevation, specifically the facing windows onto the residential dwellings located at level 2 of Welbourne House, located approximately 6 m vertically from the proposed plant area.

It is not known whether or not these windows open into bedrooms or areas used for resting/sleeping as defined by BS8233:2014, and as such for the purposes of this assessment it is assumed that bedrooms are located on this elevation to ensure a worst-case assessment is undertaken in regards to disturbance to occupants.



3.2 Background Noise Survey

An unattended continuous noise survey was undertaken by Sandy Brown between 16:00 11th January to 16:30 16th January 2018. These measurements were supplemented by attended measurements obtained at a series of locations:

- Island Sites (L1 to L5): 11, 16 & 22 January 2018
- Ashley Road East (L6 to L8): 1 & 2 May 2018
- Ashley Road West (L9 to L11): 19 & 20 September 2017
- Welbourne (L12 to L15): 19 & 20 September 2017

Specifically, position L12 is deemed to be the most representative location for the purposes of the Noise Impact Assessment of the proposed plant.

Subjectively it is recorded (in the original baseline noise survey report) that ambient noise climate consisted predominantly of road traffic, described as 'heavy' throughout day and night. Additional noise sources contributing to the ambient noise climate comprised of patrons at The Volunteer public house and dirt bikes at the measurement location L12.

It is also stated in the original baseline noise survey report: *"the results of the surveys are presented herein and can be used as part of an assessment of noise ingress to the proposed developments and for setting appropriate limits for noise egress associated with the operation of the developments"*. As such these results form the basis for background noise levels for the purposes of assessment.

The original background noise survey is provided in Appendix A of this report for reference.

3.3 Relevant Results and basis of assessment

Tables 3 and 4 below provide the lowest recorded and representative background noise levels L_{A90} measured at position L12:

Lowest Background Noise Level L_{A90}	
Daytime (07:00-23:00hrs)	Night-time (23:00-07:00hrs)
59 dB(A)	51 dB(A)

Table 3 – Summary of Lowest Background Noise Levels from the attended noise measurement L12

A target level for the cumulative impacts of all plant items in operation has been set at 10 dB below the levels described in Table 3 above, detailed in Table 4 below. In doing so, an assessment of No Observed Effect Level in line with the Noise Policy Statement for England has been targeted.

Representative Background Noise Level L_{A90}	
Daytime (07:00-23:00hrs)	Night-time (23:00-07:00hrs)
49 dB(A)	41 dB(A)

Table 4 – Summary of Representative Background Noise Levels



4.0 Noise Impact Assessment

4.1 Plant Details

It is understood that 6 units will be installed at southwest of Welbourne Health Centre, all details available in Appendix C.

- 1x CU PURY-P300YNW-A2 75% Capacity Standard Mode
- 1x CU PURY-P450YNW-A2 75% Capacity Standard Mode,
- 1x CU PURY-P400YNW-A2 75% Capacity Standard Mode
- 1x CU PURY-P350YNW-A2 75% Capacity Standard Mode
- 2x DX PUZM140YKA2 100% Cooling Mode

It understood that 4xCU units and 1x DX unit will operate simultaneously during daytime (07:00 - 23:00) between Monday to Friday; and 1x DX unit will operate 24 hours a day for 7 days a week (00:00 - 00:00).

Plant is proposed to be installed at the rear of the building in the location highlighted in green below. Specific layouts of plant items in this location are provided in Appendix B:



Figure 1: Proposed plant location



4.2 BS4142:2014+A12019 Assessment

The worst-case scenario plant operations have been provided by Ambivent Mechanical Engineers and are described in Table 5 below :

Model	Operational Mode	Capacity	Daytime (07:00-23:00)	Night-time (23:00 – 07:00)
CU PURY-P300YNW-A2	Standard Heating	75%	Yes	No
CU PURY-P350YNW-A2	Standard Heating	75%	Yes	No
CU PURY-P400YNW-A2	Standard Heating	75%	Yes	No
CU PURY-P450YNW-A2	Standard Heating	75%	Yes	No
DX PUZM140YKA2	Cooling	100%	Yes	Yes

Table 5 – Summary of worst-case scenario operational modes

Table 6 and 7 show the noise impact assessment for daytime and night-time with no acoustic attenuation applied to the units.

Element	Level		Comments
Cumulative Noise Level	63	dB(A)	SPL at 1 m from manufacturer datasheet at quiet mode, measured in an anechoic room (L _{Aeq})
Reflections	+3	dB	1 acoustically hard reflective surface near the unit, wall at the back of the units
Distance losses	-16	dB	Point source distance attenuation over 6m (1m from residential window at second floor level)
Specific Sound Level	50	dB	Specific sound level before acoustic feature corrections
Acoustic Feature Correction	+2	dB	2dB for Tonality
Rating Level	52	dB(A)	At the closest receptor
Representative background	49	dB(A)	Representative measured L _{A90,15min} during night-time reference period
Difference (Rating Level – Background)	+3	dB(A)	BS4142: Adverse Impact (borderline) NPSE: Lowest Observed Adverse Effect Level (LOAEL)

Table 6 BS4142 Noise Impact Assessment – Day Time (07:00hrs - 23:00)



Element	Level		Comments
Cumulative Noise Level	44	dB(A)	SPL at 1 m from manufacturer datasheet at quiet mode, measured in an anechoic room (L _{Aeq})
Reflections	+3	dB	1 acoustically hard reflective surface near the unit, wall at the back of the units
Distance losses	-16	dB	Point source distance attenuation over 6m (1m from residential window)
Specific Sound Level	31	dB	Specific sound level before acoustic feature corrections
Acoustic Feature Correction	+2	dB	2dB for Tonality
Rating Level	33	dB(A)	At the closest receptor
Representative background	41	dB(A)	Representative measured L _{A90,15min} during night-time reference period
Difference (Rating Level – Background)	-8	dB(A)	BS4142: Lot to No Impact NPSE: No Observable Effect Level (NOEL)

Table 7 BS4142 Noise Impact Assessment – Night-time (23:00hrs - 07:00)

4.3 Informative noise impact assessment for residential comfort

Tables 8 and 9 show the noise impact assessment for daytime and night-time to provide a comfortable internal environment for the residents of Welbourne House in line with targets set in section 2.3 to meet the BS 8233:2014.

Element	Level		Comments
Cumulative Noise Level	63	dB(A)	SPL at 1 m from manufacturer datasheet at quiet mode, measured in an anechoic room (L _{Aeq})
Reflections	+3	dB	1 acoustically hard reflective surface near the unit, wall at the back of the units
Distance losses	-16	dB	Point source distance attenuation over 6m (1m from residential window at second floor level)
Specific Sound Level	50	dB	Specific sound level before acoustic feature corrections
Acoustic Feature Correction	+2	dB	2dB for Tonality
Rating Level	52	dB(A)	At the closest receptor
Representative background	45	dB(A)	Representative measured L _{A90,15min} during night-time reference period
Difference (Rating Level – Background)	+7	dB(A)	BS4142: Adverse Impact (borderline) NPSE: Lowest Observed Adverse Effect Level (LOAEL)

Table 8 Informative Noise Impact Assessment based on BS8233 criteria – Day Time (07:00hrs - 23:00)



Element	Level		Comments
Cumulative Noise Level	44	dB(A)	SPL at 1 m from manufacturer datasheet at quiet mode, measured in an anechoic room (L _{Aeq})
Reflections	+3	dB	1 acoustically hard reflective surface near the unit, wall at the back of the units
Distance losses	-16	dB	Point source distance attenuation over 6m (1m from residential window)
Specific Sound Level	31	dB	Specific sound level before acoustic feature corrections
Acoustic Feature Correction	+2	dB	2dB for Tonality
Rating Level	33	dB(A)	At the closest receptor
Representative background	40	dB(A)	Representative measured L _{A90,15min} during night-time reference period
Difference (Rating Level – Background)	-7	dB(A)	BS4142: Lot to No Impact NPSE: No Observable Effect Level (NOEL)

Table 9 Informative Noise Impact Assessment based on BS8233 criteria – Night-time (23:00hrs - 07:00)

Based upon all assessments undertaken above acoustic mitigation measures will be required to reduce noise to a suitable level during the day.

4.4 Acoustic Mitigation

Based upon the assessments undertaken, and coordination with Ambivalent Mechanical Engineers, it is recommended to install the proprietary acoustic treatment as provided by the manufacturer of the plant items. Resultant sound pressure levels of the plant with the attenuation are provided in Table 10. Specifications of this attenuation is provided in Appendix C.

	63	125	250	500	1000	2000	4000	8000
PURY-P300YNW-A2	33.8	36.4	42.4	42.8	35	34.2	33.5	25.4
PURY-P350YNW-A2	36.8	42.4	43.4	44.8	37	37.2	38.5	30.9
PURY-P400YNW-A2	38.8	34.4	41.9	43.8	35	35.2	34	24.4
PURY-P450YNW-A2	41.8	36.4	43.4	45.3	36.5	37.2	36.5	26.9

Table 10 Units sound pressure level with proprietary enclosure



4.5 Noise Impact Assessment with Mitigation Measure

The tables below show the plant impact assessment with the acoustic enclosure installed.

Element	Level		Comments
Cumulative Noise Level (with mitigation)	55	dB(A)	SPL at 1 m from manufacturer datasheet at quiet mode, measured in an anechoic room (L_{Aeq}), with attenuators
Reflections	+3	dB	1 acoustically hard reflective surface near the unit, wall at the back of the units
Distance losses	-16	dB	Point source distance attenuation over 6m (1m from residential window)
Specific Sound Level	42	dB	Specific sound level before acoustic feature corrections
Acoustic Feature Correction	+2	dB	2dB for Tonality
Rating Level	44	dB(A)	At the closest receptor
Representative background	49	dB(A)	Representative measured $L_{A90,15min}$ during night-time reference period
Difference (Rating Level – Background)	-5	dB(A)	BS4142: Lot to No Impact NPSE: No Observable Effect Level (NOEL)

Table 11 BS4142 Noise Impact Assessment with mitigation measure – Daytime (07:00hrs - 23:00)

Element	Level		Comments
Cumulative Noise Level (with mitigation)	55	dB(A)	SPL at 1 m from manufacturer datasheet at quiet mode, measured in an anechoic room (L_{Aeq}), with attenuators
Reflections	+3	dB	1 acoustically hard reflective surface near the unit, wall at the back of the units
Distance losses	-16	dB	Point source distance attenuation over 6m (1m from residential window)
Specific Sound Level	42	dB	Specific sound level before acoustic feature corrections
Acoustic Feature Correction	+2	dB	2dB for Tonality
Rating Level	44	dB(A)	At the closest receptor
Representative background	45	dB(A)	Representative measured $L_{A90,15min}$ during night-time reference period
Difference (Rating Level – Background)	-1	dB(A)	BS4142: Lot to No Impact NPSE: No Observable Effect Level (NOEL)

Table 12 Informative Noise Impact Assessment based on BS8233 criteria with mitigation measure– Daytime (07:00hrs - 23:00)



4.6 Discussion of Results

Based upon the assessment of plant items operating at the capacity and during the times of day provided by Ambivent Mechanical Engineers, the application of proprietary acoustic mitigation results in compliance of the noise emissions with the Local Authority Noise Policy, BS4142:2014+A12019 and indicates that no nuisance will be present to the residents located at Level 2 of Welbourne House.

It is important to note that the 4xCU units will run simultaneously for a relatively brief period of the year, and typically where environmental conditions require. For the large majority of the year fewer units will operate simultaneously, reducing the overall cumulative noise level. This should be considered in line with the mitigation as further evidence that nuisance will not be present, based upon the guidance provided in Paragraph 210(g) of the National Planning Policy Framework

5.0 Conclusion

Inhabit has been commissioned to undertake a noise impact assessment for the new units to be installed at the Welbourne Centre, Tottenham Hale, in line with NFFP, BS4142, Local Authority adopted noise policy, relevant standards and guidance

A representative background sound level of 49 dB $L_{A90,15min}$ has been determined over the proposed operational hours of the plant items during daytime 07:00-23:00 and 41 dB $L_{A90,15min}$ during night-time 23:00-07:00.

The BS4142 plant noise impact assessment has determined that, with the application of proprietary acoustic mitigation measures, the cumulative noise emissions from all plant operating simultaneously during the indicated times and at the indicated duties, will result in compliance with BS4142:2014+A1 2019 and be reduced sufficiently so as to not present a nuisance to the residential dwelling located on level 2 of Welbourne House.

In conclusion, there is no reason as to why planning permission should not be granted under the associated NMA application on the basis of noise alone.



APPENDIX A: Original Noise Survey



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Consultants in Acoustics, Noise & Vibration

18113-R02-C

14 June 2018

Tottenham Hale Centre, Haringey, London

Environmental noise survey report

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Version	Date	Comments	Author	Reviewer
A	8 Jun 18		Dilan Neumann	Andrew Long
B	12 Jun 18		Dilan Neumann	Andrew Long
C	14 Jun 18		Dilan Neumann	Andrew Long

Summary

Sandy Brown has been commissioned to provide acoustic advice in relation to the proposed mixed-use developments at Tottenham Hale, London. The proposed developments includes the redevelopment of land at five plots known as North Island, Ferry Island, Welbourne, Ashley Road West and Ashley Road East (the 'Site').

Environmental noise surveys have been carried out by Sandy Brown at the North Island, Ferry Island and Ashley Road East plots and by Acoustic & Engineering Consultants Limited (AEC) at the Welbourne and Ashley Road West plots.

An unattended noise logging survey and attended sample measurements were carried out to establish the typical noise levels around the Site. These were performed over the early morning, day time and night time.

The results of the survey are summarised within this report, along with details of the method and conditions.

The results can be used to determine suitable limits for noise egress associated with the proposed buildings, and as part of an assessment of any provision for facade sound insulation in order to provide suitable internal conditions within the completed development.

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 Results of unattended measurements at position P 30

1 Introduction

Sandy Brown has been commissioned to provide acoustic advice in relation to the proposed mixed-use developments at the following plots at Tottenham Hale, Haringey, London:

- Ferry Island
- North Island
- Ashley Road East
- Ashley Road West
- Welbourne.

Unattended and attended measurements around the Ferry Island, North Island and Ashley Road East plots were carried out by Sandy Brown. Attended measurements around the Welbourne and Ashley Road West plots were carried out by Acoustic & Engineering Consultants Limited (AEC). These were undertaken to establish the variation in typical noise around the Site over both daytime and night-time periods.

This report presents the survey methods and results.

2 Site description

2.1 The Site and its surroundings

The development Site is shown in the red line plan in Figure 1.

Ferry Island and North Island are collectively known as the 'Island Sites'.



Figure 1 Site plan indicating proposed plot locations

3 Method

Details of the equipment used, the noise indices and the weather conditions during the surveys are provided in Appendix A. Further information on the specific survey method is provided in this section.

3.1 Unattended measurements

Unattended noise monitoring was undertaken by Sandy Brown at the Site over 6 days to determine the existing background sound levels at the Island Sites and in the vicinity of nearby noise sensitive premises.

The unattended measurements were performed over 15 minute periods between 16:00 on Thursday 11 January 2018 and 16:30 on Tuesday 16 January 2018. The equipment was installed and retrieved by Sam Daintree and Dilan Neumann.

The measurement position is indicated in Figure 2, denoted by the letter 'P'. A photograph showing the measurement location is provided in Figure 3. This location was chosen to be reasonably representative of noise levels incumbent upon the proposed buildings to the west of the Island Sites and those experienced by the nearest noise sensitive premises along The Hale and Station Road.

The measurements were considered to be free-field.



Figure 2 Position of unattended measurements (image courtesy of Google Earth Pro)



Figure 3 Photograph of the measurement location

3.2 Attended measurements

Attended sample measurements were performed by Sandy Brown at several locations around the Island sites and Ashley Road East.

Attended sample measurements were made by AEC at a number of locations around the Ashley Road West and Welbourne Plots.

Attended measurements were undertaken to determine the existing noise levels from road traffic, pedestrians and other significant noise sources in the area.

The measurement locations are indicated in Figure 5 as positions L1 to L15.

Measurements were undertaken on the following dates:

- Island Sites (L1 to L5): 11, 16 & 22 January 2018
- Ashley Road East (L6 to L8): 1 & 2 May 2018
- Ashley Road West (L9 to L11): 19 & 20 September 2017
- Welbourne (L12 to L15): 19 & 20 September 2017

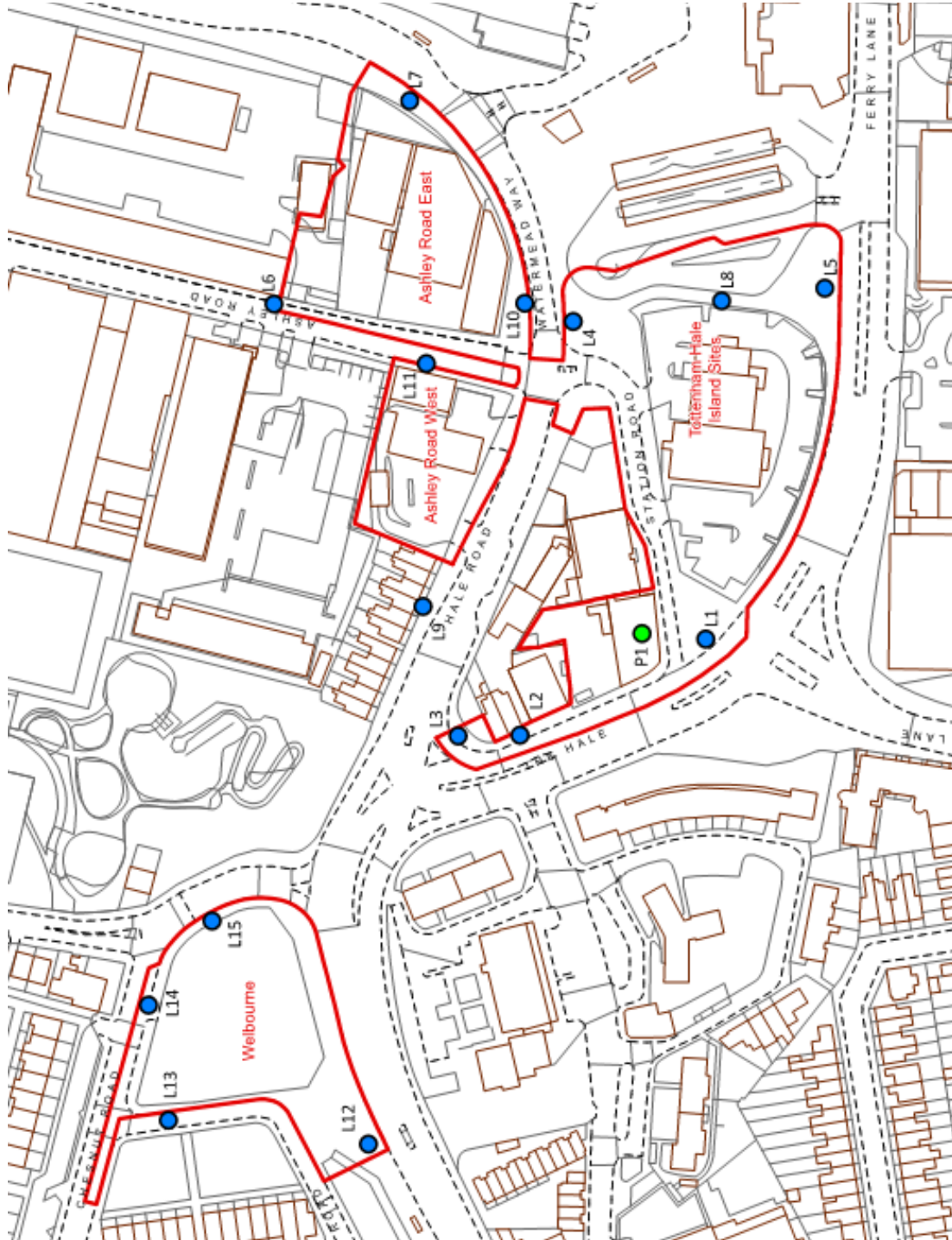


Figure 4 Attended sample measurement locations

In most cases the microphone was mounted on a tripod approximately 1.5 m above the ground level and at least 3 m from any other reflective surface, aside from the following locations where measurements were made at 1 m from the facade of an adjacent building:

- L2
- L6
- L9
- L10
- L13
- L14
- L15.

A -3 dB correction has been applied to all measurements undertaken at these locations, in order to present a noise level representative of free-field conditions.

Photographs of measurement positions L1 to L8 are shown in Figure 6 to Figure 13.



Figure 6 Photograph of measurement location L1



Figure 7 Photograph of measurement location L2



Figure 8 Photograph of measurement location L3



Figure 9 Photograph of measurement location L4



Figure 10 Photograph of measurement location L5



Figure 11 Photograph of measurement location L6



Figure 12 Photograph of measurement location L7



Figure 13 Photograph of measurement location L8

4 Measurement results

4.1 Observations

The dominant noise source observed at the Site during the surveys was noted to be road traffic along nearby roads which are relatively heavily trafficked carrying cars, buses, lorries and emergency vehicles throughout day and night.

Noise associated with pedestrian activity was less significant.

Noise arising from bus movements at the Tottenham Hale Bus Station was audible at times at locations near to the Island Sites and Ashley Road East. However standing busses generally switched their engines off rather than left them idling. Noise associated with the station operation was not considered to be a major contributor to the local acoustic climate in the context of noise from traffic along nearby roads.

Noise associated with patrons at The Volunteer public house and nearby dirt bikes was noted to at Welbourne.

4.2 Unattended measurement results

The results of the unattended noise measurements are summarised in the following tables. Graphs showing the results of both the 15 minute and 1 minute unattended measurements are provided in Appendix B.

The day and night time ambient noise levels measured during the unattended survey are presented in Table 1.

Table 1 Ambient noise levels measured during the survey

Date	Daytime (07:00 – 23:00) $L_{Aeq,16h}$ (dB)	Night (23:00 – 07:00) $L_{Aeq,8h}$ (dB)
Thursday 11 January	-	61
Friday 12 January	65	61
Saturday 13 January	65	61
Sunday 14 January	63	62
Monday 15 January	65	60
Tuesday 16 January	-	-
Average	65	61

The minimum background sound levels measured during the unattended survey are given in Table 2.

Table 2 Minimum background sound levels measured during the survey

Date	Daytime (07:00 – 23:00) $L_{A90,15min}$ (dB)	Night (23:00 – 07:00) $L_{A90,15min}$ (dB)
Thursday 11 January	55 *	47
Friday 12 January	57	49
Saturday 13 January	56	49
Sunday 14 January	52	45
Monday 15 January	55	48
Tuesday 16 January	59 *	-

* Measurement not made over full period due to monitoring start and end time

The lowest background sound levels measured during the survey were $L_{A90,15min}$ 52 dB during the daytime and $L_{A90,15min}$ 45 dB at night.

A statistical analysis of the day time and night-time background noise levels is presented in Figure 14 and Figure 15.

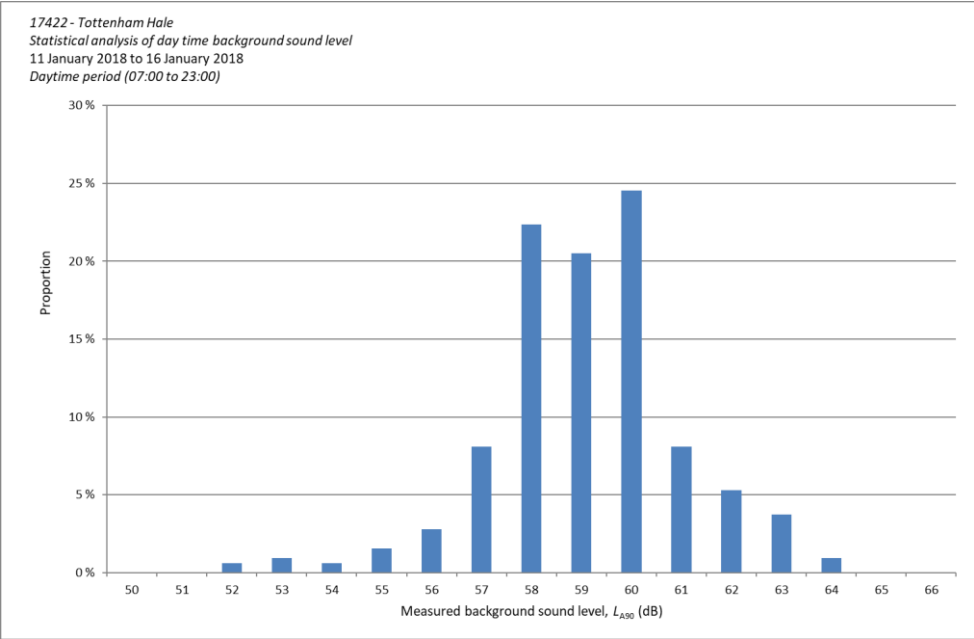


Figure 14 Statistical analysis of background sound levels in the daytime period, L_{A90}

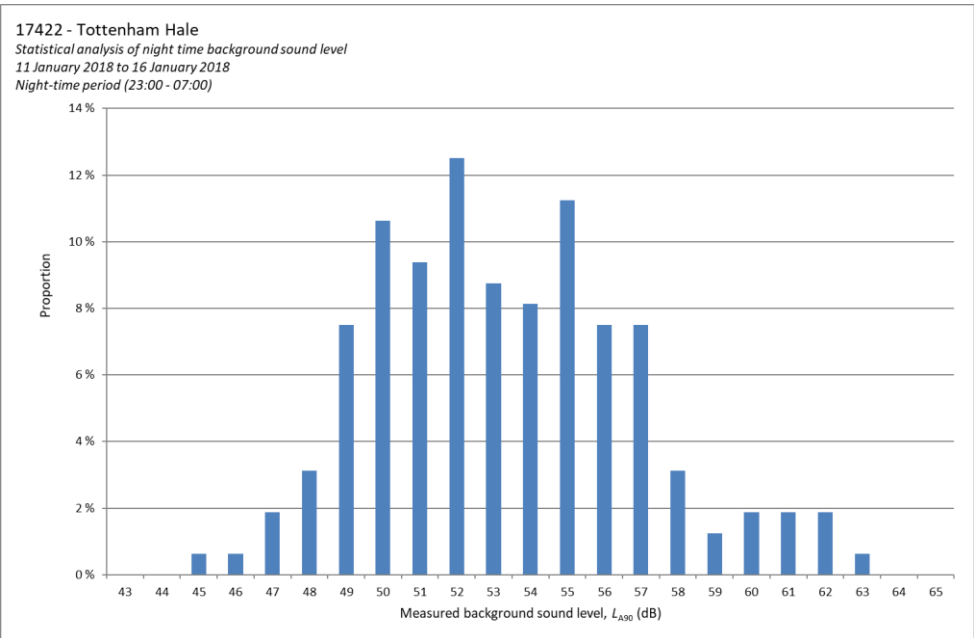


Figure 15 Statistical analysis of background sound levels in the night-time period, L_{A90}

From a review of the time history in Appendix B, the statistical analyses in Figure 14 and Figure 15, and from observations on Site, the representative background noise levels at the measurement position are considered to be:

- Day time: $L_{A90,15min}$ 58 dB
- Night-time: $L_{A90,15min}$ 49 dB.

L_{AFmax} 80 dB was considered to represent typical maximum noise levels associated with individual events overnight at the measurement position.

4.3 Attended measurement results

The sound pressure levels recorded during the attended measurements are summarised in Table 3 to Table 17.

Table 3 Attended measurements - Location L1

Date	Start time	Period (T)	Sound pressure level (dB)		
			$L_{Aeq,T}$	L_{AFmax}	$L_{A90,T}$
11-Jan-18	16:17	09:47	72	89	64
16-Jan-18	13:16	10:00	71	84	65
16-Jan-18	14:16	10:00	71	88	63
16-Jan-18	15:16	10:00	69	86	63
22-Jan-18	23:00	10:00	68	85	58
23-Jan-18	00:00	10:00	68	83	58
23-Jan-18	01:03	10:00	68	86	55

Table 4 Attended measurements - Location L2

Date	Start time	Period (T)	Sound pressure level (dB)		
			$L_{Aeq,T}$	L_{AFmax}	$L_{A90,T}$
11-Jan-18	16:29	13:50	70	88	58
16-Jan-18	13:27	10:00	70	82	58
16-Jan-18	14:27	10:00	73	99	58
16-Jan-18	15:28	10:00	67	88	61
22-Jan-18	23:11	10:00	67	79	52
23-Jan-18	00:40	10:00	64	78	50
23-Jan-18	01:14	10:00	61	77	48

Table 5 Attended measurements - Location L3

Date	Start time	Period (T)	Sound pressure level (dB)		
			$L_{Aeq,T}$	L_{AFmax}	$L_{A90,T}$
11-Jan-18	16:45	15:00	70	82	64
16-Jan-18	13:38	10:00	72	83	64
16-Jan-18	14:38	10:00	69	81	63
16-Jan-18	15:39	10:00	70	88	62
22-Jan-18	23:21	10:00	67	80	57
23-Jan-18	00:51	10:00	66	81	52
23-Jan-18	01:24	10:00	65	79	51

Table 6 Attended measurements - Location L4

Date	Start time	Period (T)	Sound pressure level (dB)		
			$L_{Aeq,T}$	L_{AFmax}	$L_{A90,T}$
11-Jan-18	17:02	15:00	73	89	65
16-Jan-18	13:50	10:00	74	87	65
16-Jan-18	14:50	10:00	73	89	65
16-Jan-18	15:51	10:00	73	85	63
22-Jan-18	23:34	10:00	71	86	61
23-Jan-18	00:16	10:00	72	90	56
23-Jan-18	01:37	10:00	68	83	52

Table 7 Attended measurements - Location L5

Date	Start time	Period (T)	Sound pressure level (dB)		
			$L_{Aeq,T}$	L_{AFmax}	$L_{A90,T}$
11-Jan-18	17:19	15:00	74	102	63
16-Jan-18	14:01	10:00	71	90	64
16-Jan-18	15:02	10:00	70	85	64
16-Jan-18	16:02	10:00	69	85	64
22-Jan-18	23:45	10:00	71	85	60
23-Jan-18	00:28	10:00	73	101	57
23-Jan-18	01:48	10:00	66	82	56

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Table 8 Attended measurements - Location L6

Date	Start time	Period (T)	Sound pressure level (dB)		
			$L_{Aeq,T}$	L_{AFmax}	$L_{A90,T}$
01-May-18	06:05	15:00	61	83	49
01-May-18	07:45	15:00	62	80	50
01-May-18	16:17	15:00	61	83	51
01-May-18	17:14	15:00	57	73	50
01-May-18	23:07	15:00	52	71	48
02-May-18	00:01	15:00	52	70	47

Table 9 Attended measurements - Location L7

Date	Start time	Period (T)	Sound pressure level (dB)		
			$L_{Aeq,T}$	L_{AFmax}	$L_{A90,T}$
01-May-18	06:23	15:00	76	88	67
01-May-18	07:05	15:00	75	91	65
01-May-18	16:37	15:00	79	105	64
01-May-18	17:32	15:00	76	101	62
01-May-18	23:26	15:00	75	95	60
02-May-18	00:19	15:00	71	85	54

Table 10 Attended measurements - Location L8

Date	Start time	Period (T)	Sound pressure level (dB)		
			$L_{Aeq,T}$	L_{AFmax}	$L_{A90,T}$
01-May-18	06:41	15:00	64	87	59
01-May-18	07:26	15:00	63	82	58
01-May-18	16:56	15:00	63	80	58
01-May-18	17:50	15:00	62	75	58
01-May-18	23:43	15:00	62	72	57
02-May-18	00:37	15:00	62	74	55

Table 11 Attended measurements - Location L9

Date	Start time	Period (T)	Sound pressure level (dB)		
			$L_{Aeq,T}$	L_{AFmax}	$L_{A90,T}$
19-Sep-17	13:34	15:00	68	82	61
19-Sep-17	14:34	15:00	69	86	62
19-Sep-17	15:31	15:00	68	81	61
19-Sep-17	23:01	10:00	67	77	57
19-Sep-17	23:37	10:00	67	78	56
20-Sep-17	00:23	10:00	66	81	53
20-Sep-17	06:05	10:00	69	78	58
20-Sep-17	06:30	10:00	70	80	60

Table 12 Attended measurements - Location L10

Date	Start time	Period (T)	Sound pressure level (dB)		
			$L_{Aeq,T}$	L_{AFmax}	$L_{A90,T}$
19-Sep-17	13:52	15:00	69	83	61
19-Sep-17	14:51	15:00	68	79	61
19-Sep-17	15:52	15:00	69	89	61
19-Sep-17	23:13	10:00	66	76	56
19-Sep-17	23:48	10:00	66	75	54
20-Sep-17	00:37	10:00	66	78	53
20-Sep-17	06:18	10:00	70	81	60
20-Sep-17	06:43	10:00	69	84	59

Table 13 Attended measurements - Location L11

Date	Start time	Period (T)	Sound pressure level (dB)		
			$L_{Aeq,T}$	L_{AFmax}	$L_{A90,T}$
19-Sep-17	14:13	15:00	62	83	54
19-Sep-17	15:09	15:00	62	78	53
19-Sep-17	16:16	15:00	60	82	55
19-Sep-17	23:25	10:00	58	76	51
20-Sep-17	00:10	10:00	57	74	50

Table 14 Attended measurements - Location L12

Date	Start time	Period (T)	Sound pressure level (dB)		
			$L_{Aeq,T}$	L_{AFmax}	$L_{A90,T}$
19-Sep-17	13:31	15:00	68	86	60
19-Sep-17	14:42	16:00	68	82	62
19-Sep-17	15:56	16:00	67	82	59
19-Sep-17	23:00	10:00	68	76	58
19-Sep-17	23:36	10:00	66	74	55
20-Sep-17	00:11	10:00	65	74	51
20-Sep-17	06:10	10:00	68	77	56
20-Sep-17	06:20	10:00	68	77	58
20-Sep-17	06:30	10:00	69	75	59
20-Sep-17	06:40	10:00	70	78	58
20-Sep-17	06:50	10:00	69	88	62

Table 15 Attended measurements - Location L13

Date	Start time	Period (T)	Sound pressure level (dB)		
			$L_{Aeq,T}$	L_{AFmax}	$L_{A90,T}$
19-Sep-17	13:49	16:00	53	73	46
19-Sep-17	14:59	16:00	57	80	47
19-Sep-17	16:13	12:00	54	73	46

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Table 16 Attended measurements - Location L14

Date	Start time	Period (T)	Sound pressure level (dB)		
			$L_{Aeq,T}$	L_{AFmax}	$L_{A90,T}$
19-Sep-17	14:25	15:00	63	90	57
19-Sep-17	15:37	17:00	62	82	57
19-Sep-17	16:47	15:00	61	87	56
19-Sep-17	23:12	10:00	60	71	53
19-Sep-17	23:48	10:00	60	75	54

Table 17 Attended measurements - Location L15

Date	Start time	Period (T)	Sound pressure level (dB)		
			$L_{Aeq,T}$	L_{AFmax}	$L_{A90,T}$
19-Sep-17	14:06	16:00	52	68	45
19-Sep-17	15:18	18:00	55	75	46
19-Sep-17	16:27	17:00	52	72	45
19-Sep-17	22:42	13:00	52	68	47
19-Sep-17	23:24	10:00	51	68	46
19-Sep-17	23:59	10:00	49	60	45

5 Conclusion

Noise surveys have been carried out to determine the existing background sound levels in the vicinity of the proposed developments at Tottenham Hale and the surrounding noise sensitive premises.

The results of the surveys are presented herein and can be used as part of an assessment of noise ingress to the proposed developments and for setting appropriate limits for noise egress associated with the operation of the developments.

A summary of the recorded background noise levels is presented below.

Island Sites

The representative background sound levels from the unattended measurements were $L_{A90,15min}$ 58 dB during the day, and $L_{A90,15min}$ 49 dB during the night.

Attended sample measurements indicate that typical background sound levels around the Island Sites vary between L_{A90} 58-65 dB (daytime) and L_{A90} 48-61 dB (night time).

Ashley Road East

Attended sample measurements indicate that typical background sound levels around Ashley Road East vary between L_{A90} 50-65 dB (daytime) and L_{A90} 47-67 dB (night time).

Ashley Road West

Attended sample measurements indicate that typical background sound levels around Ashley Road West vary between L_{A90} 53-61 dB (daytime) and L_{A90} 51-60 dB (night time).

Welbourne

Attended sample measurements indicate that typical background sound levels around Welbourne vary between L_{A90} 45-60 dB (daytime) and L_{A90} 45-62 dB (night-time).

Appendix A

Survey details

Equipment

Sandy Brown equipment

A Rion NL-52 sound level meter was used to undertake the unattended measurements. The attended measurements were carried out using a Rion NL-52 and B&K 2250. The calibration details for the equipment used during the survey are provided in Table A1.

Table A1 Equipment calibration data

Equipment description	Type/serial number	Manufacturer	Calibration expiry	Calibration certification number
<i>Unattended: Position P (11 January 2018 – 16 January 2018)</i>				
Sound level meter	NL-52/00264531	Rion	14 Jul 18	09292
Microphone	UC-59/09678	Rion	14 Jul 18	09292
Pre-amp	NH-25/64656	Rion	14 Jul 18	09292
Calibrator	NC-74/34367630	Rion	14 Jul 18	09287
<i>Attended: Positions L1 – L5 (11 January 2018)</i>				
Sound level meter	NL-52/00320633	Rion	25 May 20	TCRT18/1462
Microphone	UC-59/12576	Rion	25 May 20	TCRT18/1462
Pre-amp	NH-25/10641	Rion	25 May 20	TCRT18/1462
Calibrator	N7-74/34125430	Rion	15 May 20	TRCT18/1420
<i>Attended: Positions L1 – L8 (16 and 22 January 2018)</i>				
Sound level meter	2250/3009283	Brüel & Kjær	14 Jun 18	CDK1603872, 09295
Microphone	4189/3005042	Brüel & Kjær	14 Jun 18	CDK1603872, 09295
Pre-amp	ZC0032/23792	Brüel & Kjær	14 Jun 18	CDK1603872, 09295
Calibrator	4231/3016124	Brüel & Kjær	10 Jun 18	CDK1603872

Calibration of the sound level meters used for the tests is traceable to national standards. The calibration certificates for the sound level meters used in this survey are available upon request.

The sound level meters and microphones were calibrated at the beginning and end of the measurements using their respective sound level calibrators. No significant deviation in calibration occurred.

AEC equipment

Measurements taken at positions L9 – 11 were performed with a B&K 2260 Real Time Analyser (AEC Kit 2). Measurements taken at positions L12 – L15 were performed with a Cirrus CR171B Real Time Analyser (AEC Kit 3).

Noise indices

The equipment was set to record a continuous series of broadband sound pressure levels. Noise indices recorded included the following:

- $L_{Aeq,T}$ The A-weighted equivalent continuous sound pressure level over a period of time, T.
- $L_{AFmax,T}$ The A-weighted maximum sound pressure level that occurred during a given period with a fast time weighting.
- $L_{A90,T}$ The A-weighted sound pressure level exceeded for 90% of the measurement period. Indicative of the background sound level.

The L_{A90} is considered most representative of the background sound level for the purposes of complying with any Local Authority requirements.

Sound pressure level measurements are normally taken with an A-weighting (denoted by a subscript 'A', eg L_{A90}) to approximate the frequency response of the human ear.

A more detailed explanation of these quantities can be found in BS7445: Part 1: 2003 *Description and measurement of environmental noise, Part 1. Guide to quantities and procedures*.

Weather conditions

During the unattended noise measurements between 11 January 2018 and 16 January 2018 at the Island Sites, weather reports for the area indicated that temperatures varied between 3°C at night and 11°C during the day, and the wind speed was less than 5 m/s. There were two short periods of rain.

During the attended measurements carried out on Thursday 11 January 2018 around the Island Sites, the weather was generally clear and dry and no rain occurred. Wind speeds varied but were less than 5 m/s.

During the attended measurements carried out on 16 January 2018 around the Island Sites, the weather was generally clear and dry and no rain occurred. Wind speeds varied but were less than 5 m/s.

During the attended measurements carried out on 1 May 2018 around the Ashley Road East, the weather was generally clear and dry and no rain occurred. Wind speeds varied but were less than 6 m/s.

The weather conditions during the noise survey carried out on 19 and 20 September 2017 around the Ashley Road West and Welbourne, as described by AEC, are shown below:

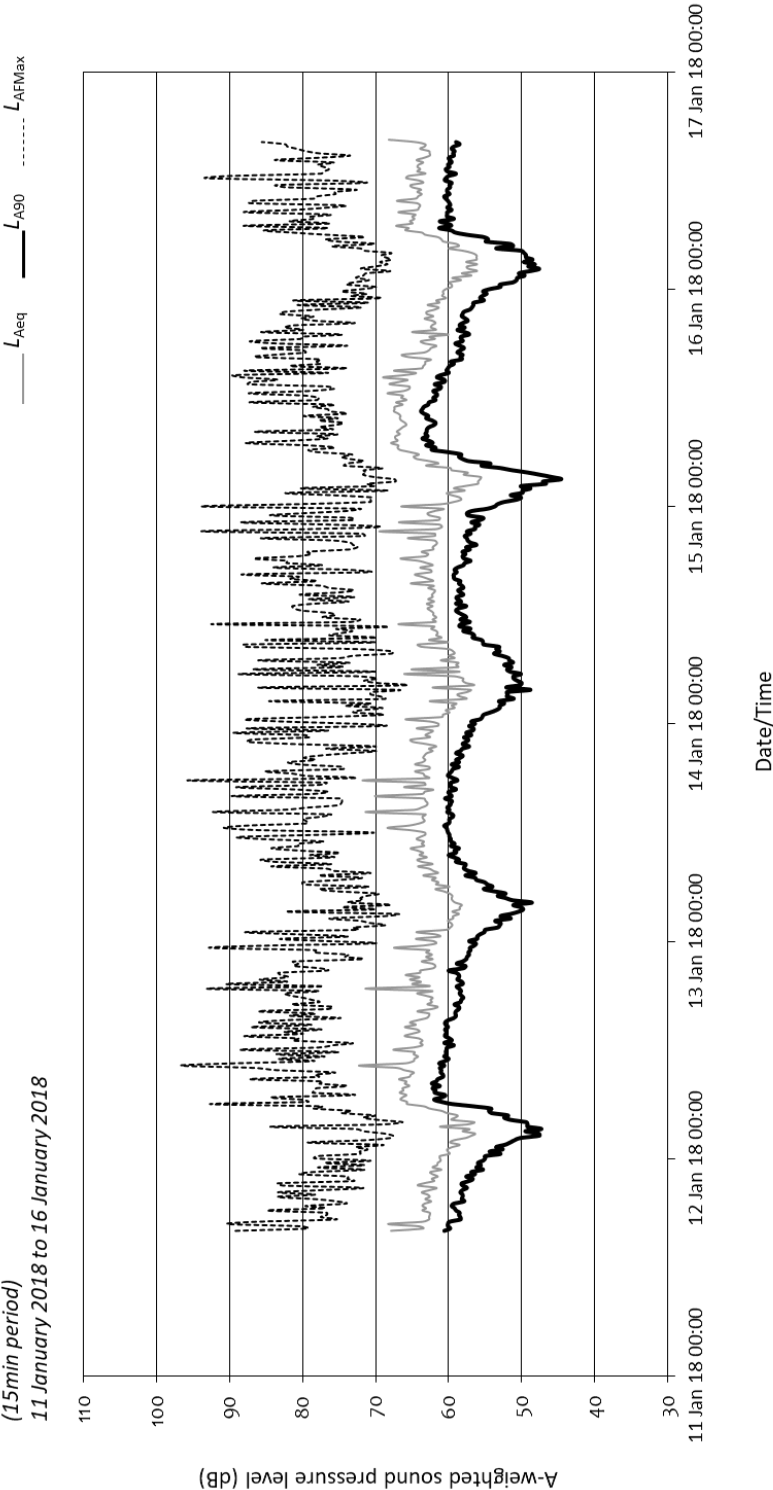
- Day, 15°C, 50% cloud cover skies and calm
- Night, 7°C, clear skies and calm

The weather conditions are considered suitable for obtaining representative measurements.

Appendix B

Results of unattended measurements at position P

17422 - Tottenham Hale
Results of noise logging survey at position P
(15min period)
11 January 2018 to 16 January 2018

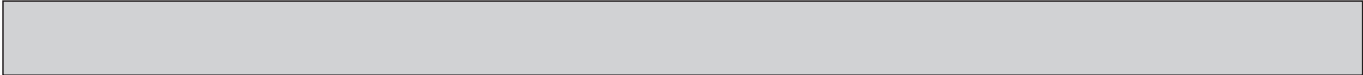


APPENDIX B: Plant Layout



APPENDIX C: Plant Noise Technical Information

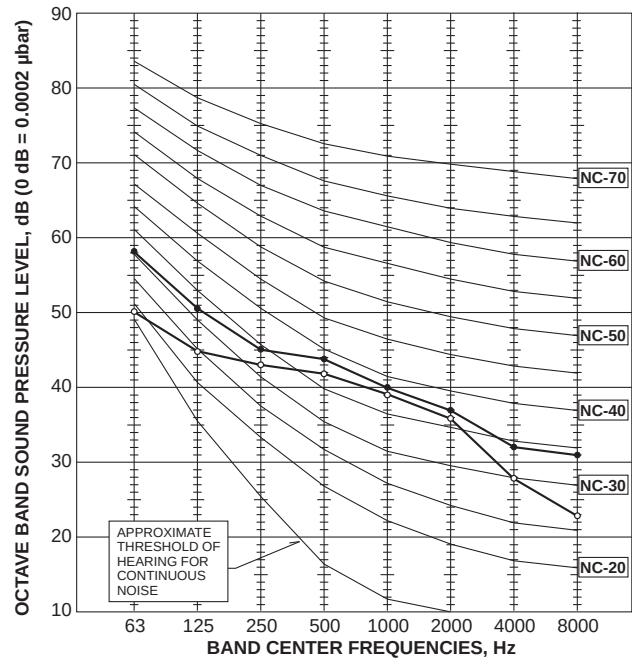




5-3. NOISE CRITERION CURVES

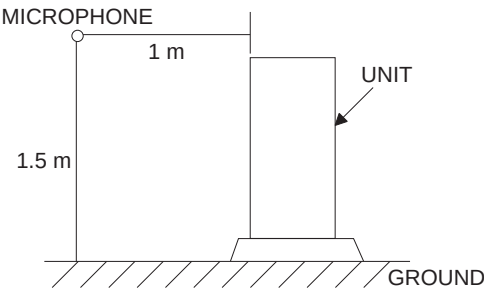
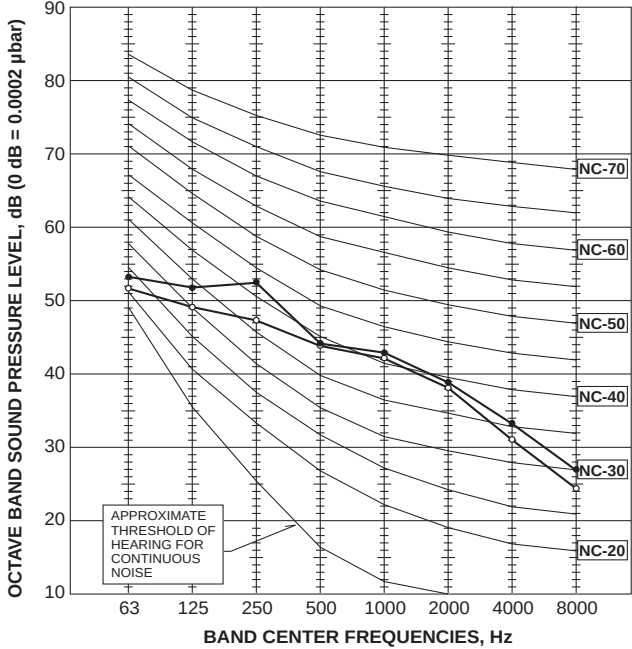
PUZ-ZM35VKA
PUZ-ZM50VKA

MODE	SPL(dB)	LINE
COOLING	44	
HEATING	46	



PUZ-ZM60VHA
PUZ-ZM71VHA

MODE	SPL(dB)	LINE
COOLING	47	
HEATING	49	



Flexible Noise Setting

New



The low-noise mode, which conventionally only had one pattern, has been increased to four patterns so that a mode can be selected from a total of five patterns, including the rated pattern. The low-noise mode has four patterns 85%, 70%, 60% and 50% in respect to the fan speed. This can be set with the outdoor unit's DIP switch. The pattern can be selected according to the customer's requests when low-noise operation is required.

*In the low noise mode, the capacity will reduce.



PWL (dBA)

	Fan Speed Setting	Capacity	P200		P250		P300		P350		P400		P450		P500		P550	
			PWL (dBA)	kW cooling	PWL (dBA)	kW cooling	PWL (dBA)	kW cooling	PWL (dBA)	kW cooling	PWL (dBA)	kW cooling	PWL (dBA)	kW cooling	PWL (dBA)	kW cooling	PWL (dBA)	kW cooling
Foot Print (W x D) mm			920 x 740		920 x 740		920 x 740		1240 x 740		1240 x 740		1240 x 740		1750 x 740		1750 x 740	
Cooling	100%	100%	76	20	78.5	25.1	80	30	81	35.8	83	40.3	83	44.8	82	50.1	83.5	56.4
	85%	90%	71	18	73.5	22.6	74.5	27	76	32.2	77	36.3	78.5	40.3	76.5	45.1	78	50.8
	70%	75%	66.5	15	69.5	18.8	70.5	22.5	73	26.9	73	30.2	74	33.6	73.5	37.6	74.5	42.3
	60%	70%	64	14	66.5	17.6	67.5	21	70.5	25.1	72	28.2	73	31.4	73	35.1	73	39.5
	50%	60%	63	12	64	15.1	66	18	68	21.5	71	24.2	72	26.9	72.5	30.1	72.5	33.8

	Fan Speed Setting	Capacity	P200		P250		P300		P350		P400		P450		P500		P550	
			PWL (dBA)	kW cooling	PWL (dBA)	kW cooling	PWL (dBA)	kW cooling	PWL (dBA)	kW cooling	PWL (dBA)	kW cooling	PWL (dBA)	kW cooling	PWL (dBA)	kW cooling	PWL (dBA)	kW cooling
Foot Print (W x D) mm			920 x 740		920 x 740		920 x 740		1240 x 740		1240 x 740		1240 x 740		1750 x 740		1750 x 740	
Heating	100%	100%	78	22.8	80	28.7	86.5	34.1	83	41	88	43	89	48.2	84	54.2	89	59.3
	85%	90%	74.5	20.5	76	25.8	78.5	30.7	81	36.9	80	38.7	83	43.4	81	48.8	82.5	53.4
	70%	75%	71.5	17.1	74.5	21.5	74.5	25.6	77	30.8	75	32.3	76.5	36.2	77.5	40.7	78.5	44.5
	60%	70%	69	16.0	72.5	20.1	72	23.9	74.5	28.7	71.5	30.1	73	33.7	75	37.9	76	41.5
	50%	60%	63	13.7	67	17.2	69.5	20.5	71	24.6	71	25.8	72	28.9	73	32.5	73	35.6

Flexible Noise Setting

New



The low-noise mode, which conventionally only had one pattern, has been increased to four patterns so that a mode can be selected from a total of five patterns, including the rated pattern. The low-noise mode has four patterns 85%, 70%, 60% and 50% in respect to the fan speed. This can be set with the outdoor unit's DIP switch. The pattern can be selected according to the customer's requests when low-noise operation is required.

*In the low noise mode, the capacity will reduce.



The City Multi YNW-A range of VRF outdoor units are available with five fan speed settings. The reduced fan speed settings will reduce the noise level and also the cooling / heating capacity. The fan speed settings don't directly relate to the reduction in cooling capacity; use the below table to see corresponding reductions in noise levels and available cooling / heating capacity. The fan speed setting is set by a DIP switch on the outdoor unit and needs to be changed at installation by the installing contractor (Mitsubishi supply to site in 100% fan speed mode). The YNW-A range is available in three footprints, S, M and L. It may be possible to select a unit with higher cooling capacity and run it at a lower fan speed without increasing physical footprint.

SPL (dBA)

	Fan Speed Setting	Capacity	P200		P250		P300		P350		P400		P450		P500		P550	
			SPL (dBA)	kW cooling	SPL (dBA)	kW cooling	SPL (dBA)	kW cooling	SPL (dBA)	kW cooling	SPL (dBA)	kW cooling	SPL (dBA)	kW cooling	SPL (dBA)	kW cooling	SPL (dBA)	kW cooling
Foot Print (W x D) mm			920 x 740		920 x 740		920 x 740		1240 x 740		1240 x 740		1240 x 740		1750 x 740		1750 x 740	
Cooling	100%	100%	59	20	60.5	25.1	61	30	62.5	35.8	65	40.3	65.5	44.8	63.5	50.1	66	56.4
	85%	90%	52	18	54.5	22.6	55.5	27	57	32.2	58	36.3	59.5	40.3	58	45.1	59.5	50.8
	70%	75%	47.5	15	50.5	18.8	51.5	22.5	54	26.9	54	30.2	55	33.6	55	37.6	56	42.3
	60%	70%	45	14	47.5	17.6	48.5	21	51.5	25.1	53	28.2	54	31.4	54	35.1	54	39.5
	50%	60%	44	12	45	15.1	47	18	49	21.5	52	24.2	53	26.9	53	30.1	53	33.8

	Fan Speed Setting	Capacity	P200		P250		P300		P350		P400		P450		P500		P550	
			SPL (dBA)	kW cooling	SPL (dBA)	kW cooling	SPL (dBA)	kW cooling	SPL (dBA)	kW cooling	SPL (dBA)	kW cooling	SPL (dBA)	kW cooling	SPL (dBA)	kW cooling	SPL (dBA)	kW cooling
Foot Print (W x D) mm			920 x 740		920 x 740		920 x 740		1240 x 740		1240 x 740		1240 x 740		1750 x 740		1750 x 740	
Heating	100%	100%	59	22.8	61	28.7	67	34.1	64	41	69	43	70	48.2	64.5	54.2	70	59.3
	85%	90%	55.5	20.5	57	25.8	59.5	30.7	62	36.9	61	38.7	64	43.4	62	48.8	63.5	53.4
	70%	75%	52.5	17.1	55.5	21.5	55.5	25.6	58	30.8	56	32.3	57.5	36.2	58.5	40.7	59.5	44.5
	60%	70%	50	16.0	53.5	20.1	53	23.9	55.5	28.7	52.5	30.1	54	33.7	56	37.9	57	41.5
	50%	60%	44	13.7	48	17.2	50.5	20.5	52	24.6	52	25.8	53	28.9	53.5	32.5	53.5	35.6

Air Conditioning

Product Information

Acoustic Kits

PUHY and PURY series units (YJM)

Making a
World of
Difference



CITY MULTI



A range of Acoustic Kits designed for noise reduction. An industry first, these kits offer up to an 8dBA noise level reduction from standard.

Key Features

- Up to 8dBA noise reduction
- Manufacturer approved
- From £607 to £2326^{*1}

^{*1} May vary slightly depending on application and size of order

^{*2} Colour for representation only, real colour is matched to standard outdoor unit colour (off white)



Air Conditioning | Commercial Heating
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Air Conditioning

Product Information

Acoustic Kits

PUHY and PURY series units (YJM)

Making a
World of
Difference

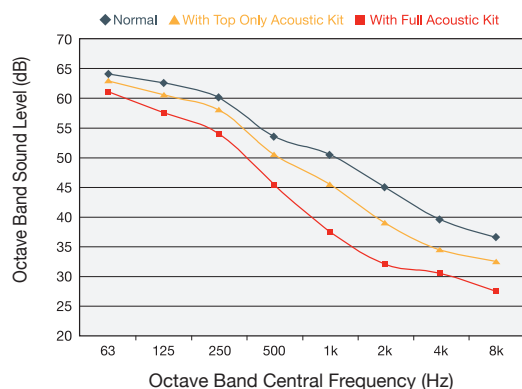
TYPES OF KIT

Both a 'full kit' and 'top only' kit are available. The 'full kit' comprises left, right and back louvres with a top attenuator. The 'top only' has a top attenuator only.

If space is an issue, then the 'top only' kit is available which can still reduce the noise level by up to 4dBA.

The noise level is calculated from an average of the noise at a height of 1m and distance of 1m from the front, back, left, right and 1m above the top. All noise measurements are performed in an anechoic chamber.

PURY-EP200YJM-A ACOUSTIC NOISE LEVEL DATA*



* Indication only

SUPPLY AND/OR INSTALLATION

Please contact Ambient Acoustics directly for supply and installation costs.

Installation costs will vary depending on location and number of units to be fitted with acoustic kits.

Ambient Acoustics Ltd
PO Box 1585, Wedmore, Somerset, BS28 4WZ
Tel: 01934 712802
Fax: 01934 710420
Email: sales@ambientacoustics.co.uk

Ambient Acoustics is an independent supplier of acoustic attenuation products, all warranties and liabilities rest with Ambient Acoustics Ltd. The acoustic attenuation kits have been tested and approved by Mitsubishi Electric UK.



Telephone: 01707 282880

email: airconditioning@meuk.mee.com web: www.mitsubishielectric.co.uk/aircon

UNITED KINGDOM Mitsubishi Electric Europe Living Environmental Systems Division
Travellers Lane, Hatfield, Hertfordshire, AL10 8XB, England General Enquiries Telephone: 01707 282880 Fax: 01707 278881

IRELAND Mitsubishi Electric Europe Westgate Business Park, Ballymount, Dublin 24, Ireland
Telephone: Dublin (01) 419 8800 Fax: Dublin (01) 419 8890 International code: (003531)

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BASIC ACOUSTIC KIT COSTS



S-module



L-module



XL-module

For all PUHY and PURY Series (YJM)

3 models are available, small, large and extra large. Small fits on the S-module outdoor units, large fits on the L-module outdoor units and extra large on the XL-module outdoor units.

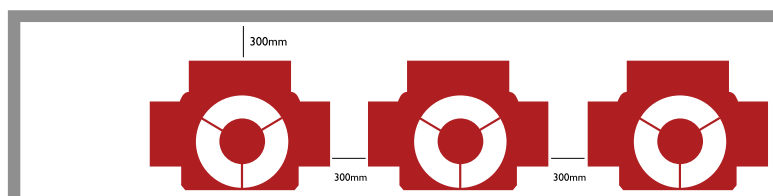
S-module	Complete acoustic kit target price	£1452
	Top attenuator only target price	£607
L-module	Complete acoustic kit target price	£1585
	Top attenuator only target price	£648
XL-module	Complete acoustic kit target price	£2326
	Top attenuator only target price	£1102

All costs include delivery.

INSTALLATION

Due to the wrap around coil of the YJM, the louvres are attached to 3 sides of the unit. Therefore, when installing multiple module systems, a 300mm gap between each louvre is required.

See diagram below.



1 full kit per outdoor unit is required, unless specifying top attenuator only. In this case, space units as normal.



www.greengateway.mitsubishielectric.co.uk

Mitsubishi Electric's commitment
to the environment

