

NOISE IMPACT ASSESSMENT

NEW CONDENSER UNIT ALPHA 6 GLOBAL LOGISTICS HUB

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	Name	Position
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This document has been prepared for the client only and solely for the purposes expressly defined herein. We owe no duty of care to any third parties in respect of its content. Therefore, unless expressly agreed by us in signed writing, we hereby exclude all liability to third parties, including liability for negligence, save only for liabilities that cannot be so excluded by operation of applicable law.

This report has been prepared based upon a scope of works and associated resources agreed between the client and Philip Dunbavin Acoustics Ltd (PDA). This report has been prepared with all reasonable skill, care and diligence and has been based upon the interpretation of data collected. This has been accepted in good faith as being accurate and valid at the time of the collection. This report has been based solely on the specific design assumptions and criteria stated herein.



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APPENDIX A – DEFINITION OF ACOUSTIC TERMS



1.0 SUMMARY

At the request of Cushman & Wakefield, PDA Ltd has conducted an environmental noise survey and assessment of the likely noise egress of the proposed new condenser unit at the Alpha 6 Global Logistics Hub. This report is intended to support the discharge of Planning Conditions 3a and b, namely that:

“3a. Externally mounted ancillary plant, equipment and servicing shall be selected and/or acoustically treated in accordance with a scheme designed so as to achieve a rating level of 5dB (LAeq) below the typical background (LA90) level at the nearest noise sensitive location.”

and-

“3b. Prior to operation of the scheme a verification report shall be submitted to and approved in writing by the City Council as local planning authority to validate that the work undertaken throughout the development conforms to the recommendations and requirements in the approved acoustic report.”

An environmental noise survey was carried out at a location representative of the nearest noise sensitive properties in order to obtain the Background Level applicable for said properties.

Modelling of the predicted noise emissions associated with plant and car parking usage has been carried out to produce a predicted specific sound level at the nearest noise sensitive receivers. The results of this exercise have been compared with the aforementioned Background Level.

Based on the environmental noise survey and modelling of noise emissions, we have predicted the rating level of the noise emitted by the proposed new unit to be -43dB during the day-time and -35dB during the night time relative to the background noise level. As such, this would indicate that the proposed plant and activities described in this report would be highly unlikely to produce an adverse impact on nearby noise sensitive receivers.#

With regards to the aforementioned Planning Conditions, we are of the opinion that both should be discharged.

2.0 SITE DESCRIPTION

The site consists of an industrial warehouse on a larger industrial park, adjacent to the A538, M56 and Manchester Airport. The nearest noise sensitive receiver is the Holiday Inn Express Manchester Airport approximately , with the nearest residences approximately 550m to the north-west of the site.



Figure 1 - Map of the site, including PDA Ltd survey position (source: OpenStreetMaps).

3.0 ASSESSMENT CRITERIA

In our assessment, we have referred to the National Planning Policy Framework and its associated planning practice guidance in order to gauge the suitability of the proposed condenser unit. In order to assess the likelihood of an adverse impact on neighbouring noise sensitive receivers, we have referred to the guidance given in BS 4142:2014+A1:2019.

3.1 National Planning Policy Framework

National Planning Policy is guided by the National Planning Policy Framework (NPPF) updated in February 2025. With regard to Noise the Framework states the following;

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

- *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.*

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:

- *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;*
- *identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.*

The terms 'significant adverse impact' and 'adverse impact' are defined in the explanatory notes of the 'Noise Policy Statement for England (NPSE)' which states;

There are two established concepts from toxicology that are currently being applied to noise impacts, for example, by the World Health Organisation. They are:

NOEL – No Observed Effect Level

This is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise.

LOAEL – Lowest Observed Adverse Effect Level

This is the level above which adverse effects on health and quality of life can be detected.

Extending these concepts for the purpose of this NPSE leads to the concept of a significant observed adverse effect level.

SOAEL – Significant Observed Adverse Effect Level

This is the level above which significant adverse effects on health and quality of life occur.

The notes also offer an explanation of the term 'adverse impacts' as follows;

... refers to the situation where the impact lies somewhere between LOAEL and SOAEL. It requires that all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life while also taking into account the guiding principles of

sustainable development (paragraph 1.8). This does not mean that such adverse effects cannot occur.

Although no specific noise limits for LOAEL and SOAEL have been defined, in 2014 the UK Government published a planning practice guidance document for noise which indicates where these limits fall with relation to the perception of noise. A summary is reproduced in Section 3.2 below, and the full document is published at <https://www.gov.uk/guidance/noise--2>. It is considered that guidance from other acoustic standards may be employed to determine suitable levels within the overall principal of the National Planning Policy Framework.

The National Planning Policy Framework also states:

Planning policies and decisions should ensure that new development can be integrated effectively with existing businesses and community facilities (such as places of worship, pubs, music venues and sports clubs). Existing businesses and facilities should not have unreasonable restrictions placed on them as a result of development permitted after they were established. Where the operation of an existing business or community facility could have a significant adverse effect on new development (including changes of use) in its vicinity, the applicant (or 'agent of change') should be required to provide suitable mitigation before the development has been completed.

The focus of planning policies and decisions should be on whether proposed development is an acceptable use of land, rather than the control of processes or emissions (where these are subject to separate pollution control regimes). Planning decisions should assume that these regimes will operate effectively. Equally, where a planning decision has been made on a particular development, the planning issues should not be revisited through the permitting regimes operated by pollution control authorities.

3.2 Planning Practice Guidance – Noise

In March 2014 (updated July 2019) the UK Government published further guidance on the assessment of noise for planning purposes in the form of the on-line publication, Planning Practice Guidance on noise (<http://www.gov.uk/guidance/noise--2>). This document offers further guidance on the typical levels which constitute the NOEL, LOAEL and SOAEL. The relevant section is reproduced in the table below;

Table 1 - Planning Practice Noise Level Guidance

Response	Examples of Outcomes	Increasing Effect Level	Action
No Observed Effect Level			
Not present	No Effect	No Observed Effect	No specific measures required
No Observed Adverse Effect Level			
Present and not intrusive	Noise can be heard, but does not cause any change in behaviour, attitude or other physiological response. Can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life.	No Observed Adverse Effect	No specific measures required
Lowest Observed Adverse Effect Level			
Present and intrusive	Noise can be heard and causes small changes in behaviour, attitude or other physiological response, e.g. turning up volume of television; speaking more loudly;	Observed Adverse Effect	Mitigate and reduce to a minimum

	where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a small actual or perceived change in the quality of life.		
Significant Observed Adverse Effect Level			
Present and disruptive	The noise causes a material change in behaviour, attitude or other physiological response, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant Observed Adverse Effect	Avoid
Present and very disruptive	Extensive and regular changes in behaviour, attitude or other physiological response and/or an inability to mitigate effect of noise leading to psychological stress, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory	Unacceptable Adverse Effect	Prevent

It is notable from the above planning guidance that development should not normally be permitted above Significant Observed Adverse Effect Levels, and should aim to minimise Other Adverse Effect Levels (below SOAEL but above LOAEL). However, it is clear that noise is permitted to approach and/or exceed the Lowest Observed Adverse Effect Level, providing that noise is mitigated and reduced to a minimum.

3.3 BS 4142:2014 + A1:2019

The effect of industrial noise on the nearest noise sensitive residences has been assessed in accordance with BS4142:2014+A1:2019 – ‘Methods for rating and assessing industrial and commercial sound’. This standard describes a method of determining the level of sound of a commercial nature, together with procedures for assessing the impact of such a sound at nearby noise sensitive receivers.

In accordance with BS 4142 the background sound level is the typical A-weighted sound pressure level at the assessment position that is exceeded for 90% of a given time interval (L_{A90}). The specific sound level is the equivalent continuous (L_{Aeq}) sound pressure level at the assessment position produced by the commercial source over a given time interval.

Certain acoustic features can increase the impact over that expected from a simple comparison between the specific sound level and the background level. Where such features are present, these are taken into account by adding corrections to the specific sound level.

From the addition of the above penalties where appropriate the rating level is established, this being the value that is compared with the background noise. According to BS 4142 an initial estimate of the impact is given based on the rating level value as follows:

“a rating level 10 dB(A) or more above the background is an indication of significant adverse impact, depending on the context.”

“a rating level 5 dB(A) above the background is an indication of an adverse impact, depending on the context.”



“where the rating level does not exceed the background level, this is an indication of the specific sound source having a low impact, depending on the context.”

4.0 SURVEY DETAILS

An ambient environmental noise survey was carried out at the boundary of the premises of the Alpha 6 Global Logistics Hub. This position was intended to capture representative assessments of the environmental noise levels of the area, which could then be used to assess the likely noise levels at the façade of the nearest noise sensitive receiver.

4.1 Survey Summary

The ambient noise survey measurements were made between 15:06 on Friday the 14th of March 2025 and 14:06 on Monday the 17th of March 2025 at the north-eastern boundary of the Alpha 6 Global Logistics Hub, overlooking the A538. This position is shown in Figure 2.



Figure 2 - Map of the measurement position and nearest noise sensitive receiver (Source: Google Maps)

Measurements were taken using an NTI XL2 sound level meter enclosed in a weatherproof enclosure with a windshield. The NTI XL2 is a Class 1 sound level meter in accordance with IEC 61672-1:2002, which is capable of operating as an integrating sound level meter with frequency analysis and statistical functions. The meter was set to measure broadband sound pressure levels, octave frequency band sound pressure levels and statistical parameters.

The meter was calibrated both before and after set-up, with no significant drift observed. Measurements were made and partially attended by Sky Hawkins MSc AMIOA of PDA Ltd.

4.2 Subjective Description of Noise Sources

Subjectively the noise climate at the survey location consisted primarily of noise from the A538 and frequent intermittent aircraft noise.

4.3 Survey Results Summary

The survey time history is shown in Figure 3 below.

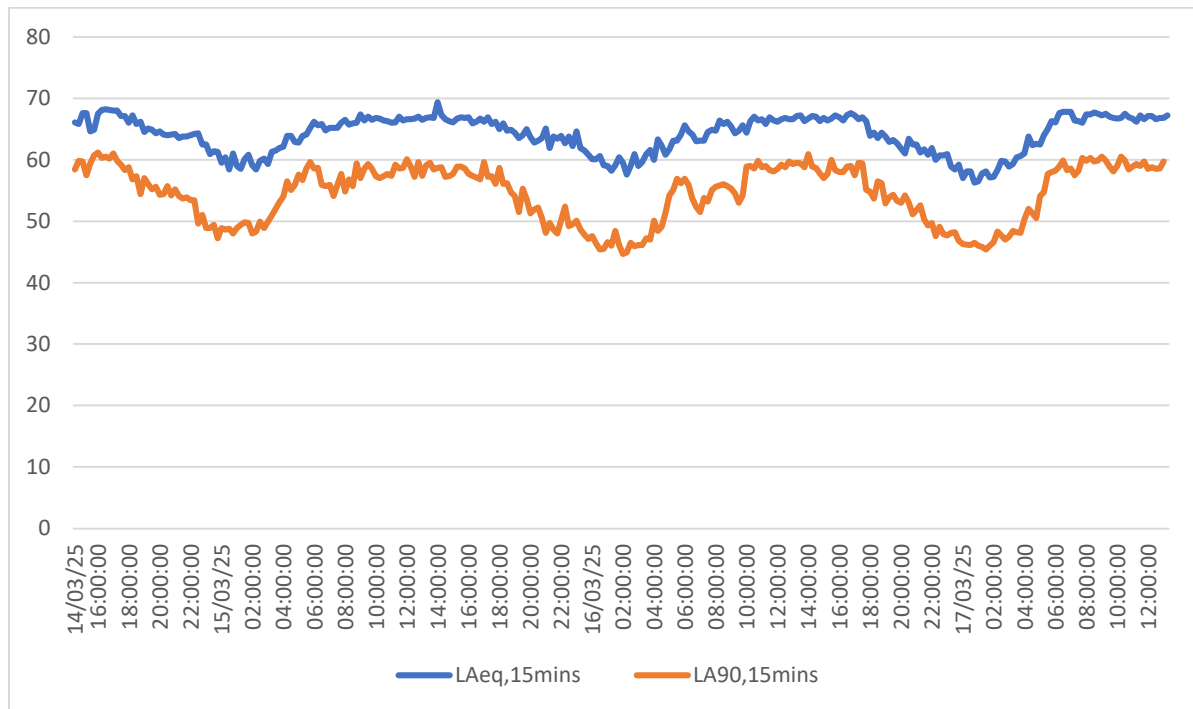


Figure 3 - Survey time history graph

The noise survey results are summarised in Table 2 below.

Table 2 – Environmental Noise Measurements Summary

Measurement Period	Average Sound Level (dB LAeq,T)	Background Sound Level (dB LA90,15mins)
15:06 - 23:06 14/03/2025	66	54
23:06 – 07:06 14 into 15/03/2025	62	49
07:06 - 23:06 15/03/2025	66	58
23:06 – 07:06 15 into 16/03/2025	62	46
07:06 - 23:06 16/03/2025	65	59
23:06 – 07:06 16 into 17/03/2025	62	48
15:06 - 14:06 17/03/2025	67	59



The representative background levels have been determined in accordance with guidance given within BS 4142:2014+A1 2019, which states in Section 8.1.4:

“To obtain a representative background sound level a series of either sequential or aggregated measurements should be carried out for the period(s) of interest, possibly on more than one occasion. A representative level should account for the range of background sound levels and should not automatically be assumed to be either the minimum or modal value.”

In accordance with this guidance, we have reviewed the distribution of observed LA90 values for both day-time and night-time measurements on a case-by-case basis. We have determined that for all instances except daytime on the 15th of March 2025 that the modal LA90 value was the most representative value. For the day-time on the 15th of March, the two most common values were 57 and 59, as such we concluded that a representative background level would be the median between these two points, being 58 dB LA90,15mins.

The results presented in Table 2 will be referred to subsequently within this report.

5.0 ENVIRONMENTAL NOISE PROPOGATION FROM PROPOSED PLANT

In order to predict the noise levels produced by activities associated with the proposed new condenser unit at the façade of the nearest noise sensitive presences, we have used SoundPLAN 9.1 to prepare a 3-dimensional computer noise model as described within this section.

5.1 Plant Noise Model Methodology

All calculations have followed the methodology contained within ISO 9613-2:2014 Attenuation of sound during propagation outdoors - Part 2: General method of calculation.

The location of the proposed condenser was derived from the MLA Architects drawing FFM2-MLA-XX-XX-DR-A-23003 dated 22nd of May 2024. The site and its surroundings have been modelled using topographical data sourced from Google Maps, and building data sourced from OpenStreetMap.

The proposed condenser unit is a Mitsubishi PURY-M350YNW-A1 condenser unit, which is stated by it's manufacturer's datasheet to have a sound power level of 83dB and 81dB in heating and cooling mode respectively. A separate manufacturer's datasheet provides octave band noise levels, which have been calibrated to a sound power of 83dB. We have modelled this as a point source at a location representative of the proposed new condenser unit. The sound power level of this modelled source is shown in Table 3

Table 3 - Summary of spectral data used for condenser unit modelling.

Plant Item	Octave Band (Z Weighted) Sound Pressure Levels							
	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz
PURY-M350YNW-A1	89	84	84	82	77	72	67	60

The road and concreted areas between the proposed site and nearest noise sensitive receivers has been modelled with a ground absorption of 0, with areas predominantly given over to foliage being modelled with a ground absorption of 1.

5.2 Environmental Noise Model Results

The results of the environmental noise model were as shown in Figure 4.

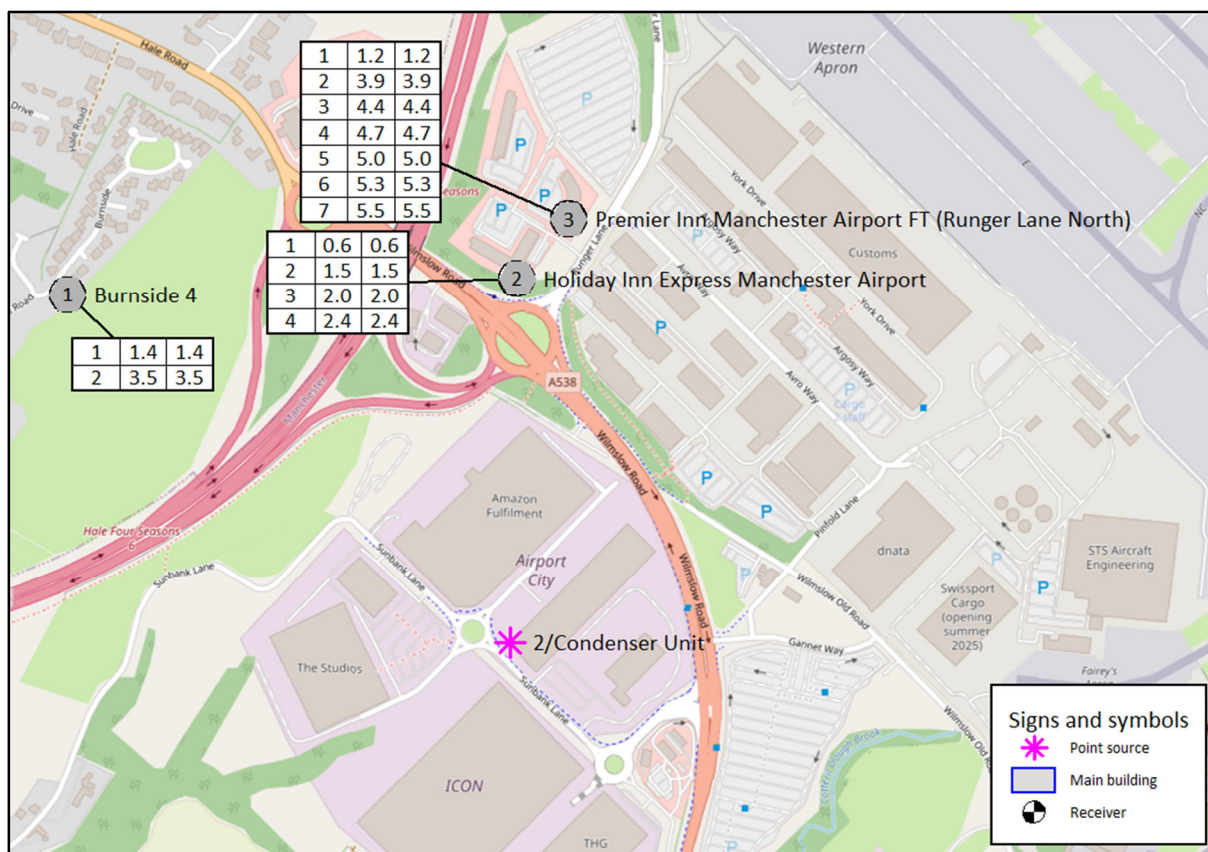


Figure 4 - Noise Model Results (where the left-most column of tables represents the floor, and the right-most column represents the noise level at the façade).

The buildings modelled represent the closest sensitive receivers to the proposed new site. As such they can be expected to be the worst affected receivers, and where an adverse impact is not indicated for them, it can be assumed that all other comparable receivers will experience the same lack of adverse impact.

As can be seen above, the greatest level modelled was 6dB(A). This will be used as the specific sound level for the worst affected dwelling going forward.

In line with the recommendations given by BS 4142, we have considered appropriate penalties to be applied for tonality, impulsivity and intermittency in order to produce a rating level from the Specific Sound Level.

It is our experience that modern building services plant are unlikely to be significantly tonal, intermittent or impulsive at the distances considered for this development (more than 480m to the nearest noise sensitive receiver). As such, no correction has been applied. The rating level is therefore 6dB(A), which is equal to the modelled specific noise level presented in Section 5.2.

6.0 NOISE IMPACT ASSESSMENT

During the measurements summarised in Table 2, the lowest background noise levels measured were 54dB and 46dB $L_{A90,15mins}$ during the day-time and night-time respectively. We have assessed the impact of the proposed condenser against these values. The dominant noise sources at the measurement position were the A538 and aircraft noise, we would expect both of those sources to be present at the Holiday Inn Express.

It should however be noted that the façade of the Holiday Inn Express is further from the A538 than the measurement position. Our measurement position was 11.7m from the centre of the nearest carriage way of the A538. Considering that the Holiday Inn Express façade is at its closest point 37m from the centre of its nearest carriage way, the expected distance attenuation would be 5dB.

As a conservative assessment we have assumed that all noise in the area originates from the A538, the background levels would therefore be calculated to be 49dB and 41dB $L_{A90,15mins}$ during the day-time and night-time respectively. Considering that the greatest predicted specific noise level from the proposed condenser unit was 6dB, the rating levels would be -43dB and -35dB (during the day-time and night-time respectively) relative to the background level.

BS 4142 advises that an initial estimate of the impact of a given noise source can be obtained as follows:

“A rating level 10 dB(A) or more above the background is an indication of significant adverse impact, depending on the context.”

A rating level 5 dB(A) above the background is an indication of an adverse impact, depending on the context.”

The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact.

Where the rating level does not exceed the background level, this is an indication of the specific sound source having a low impact, depending on the context.”

Considering that the rating levels are substantially below the background noise, this is an indication of the specific sound source having a low impact, depending on the context.

With regards to context, we would consider that the high noise environment adjacent to the airport and major transport links would further reduce sensitivity to industrial noise. It should also be noted that far louder plant items were observed in operation at premises neighbouring the site during our attendance.

Based on the assessment made thus far, we would conclude that the plant item is likely to be inaudible at the nearest sensitive receivers. With regards to the Planning Practice Guidance for Noise, this would be considered “not present” which is equivalent to the “No Observed Effect Level” described within the National Planning Policy Framework. In such instances, the Planning Practice Guidance advises that “no specific measures [are] required”.

7.0 COMMISSIONING TESTS

In order to support the noise impact assessment previously given, commissioning tests were carried out on the condenser unit in-situ. Measurements were made between 14:37 and 15:02 on Monday the 17th of March 2025 at a distance of approximately 3 meters from the edge of the condenser unit.

Measurements were taken using an NTI XL2 sound level meter mounted on a tripod with a windshield. The NTI XL2 is a Class 1 sound level meter in accordance with IEC 61672-1:2002, which is capable of operating as an integrating sound level meter with frequency analysis and statistical functions. The meter was set to measure broadband sound pressure levels, octave frequency band sound pressure levels and statistical parameters.

The meter was set-up and partially attended by Sky Hawkins MSc AMIOA of PDA Ltd.

7.1 Commissioning Testing Summary

It was observed that the condenser unit was effectively inaudible during operation. It was confirmed that cold air was being produced internally during testing, demonstrating that the condenser was in use. However despite this, only a very small amount of noise was produced by the unit during operation, which was inaudible at even a small distance from the unit.

Notwithstanding these observations however, a summary of measurements made for the commissioning tests are as follows:

Table 4 – Summary of Plant Commissioning Noise Levels

Measurement Number	Measurement Period	Average Sound Level (dB L _{Aeq,T})	Background Sound Level (dB L _{A90,15mins})	Measurement Description
C01	01:00	59	53	Condenser in operation
C02	15:00	57	55	Condenser unit shutoff

There was no audible emission from the unit, as such it seems likely that the noise from the unit itself is 10dB or more below the existing ambient noise level. However for a highly conservative assessment, if we assume that all the measured sound in C01 was coming from the condenser, then considering propagation from the condenser where Q=4, the expected Sound Power Level would be 74 dB(A). This is 9dB lower than the manufacturer's datasheet sound power level used for modelling under Section 5.2. This is indicative of the model over-estimating the likely noise level produced by the condenser at the nearest noise sensitive receiver. This supports the conclusion given in Section 6.0 that the noise of the condenser unit would not be an adverse impact.

7.2 Comments with respect to planning conditions

It is noted that Planning Condition 3a requires that:

“Externally mounted ancillary plant, equipment and servicing shall be selected and/or acoustically treated in accordance with a scheme designed so as to achieve a rating level of 5dB (L_{Aeq}) below the typical background (L_{A90}) level at the nearest noise sensitive location.”

We consider the commissioning tests carried out and summarised in this section to confirm the conclusions drawn in Section 6.0, namely that noise from the condenser unit is substantially below the target threshold required. We would therefore consider that the planning condition **should be discharged**.

Planning Condition 3b requires that:



“Prior to operation of the scheme a verification report shall be submitted to and approved in writing by the City Council as local planning authority to validate that the work undertaken throughout the development conforms to the recommendations and requirements in the approved acoustic report. The report shall also undertake post completion testing to confirm that the noise criteria have been met”

We consider the commissioning tests carried out and summarised in this section should be adequate to fulfil this requirement. We would therefore consider that the planning condition **should be discharged**.

APPENDIX A – DEFINITION OF ACOUSTIC TERMS

The decibel

This is the basic unit of noise, denoted dB.

A Weighting

This is a weighting process which simulates the human ear's different sensitivity at different frequencies. A weighting can be shown two typical ways, 50 dB(A) L_{eq} or 50 dB L_{Aeq} . Both mean the same thing. (See below for a definition of L_{eq}). The dB(A) level can be regarded as the overall level perceived by human beings.

L_{eq} and $L_{eq(s)}$

This is the equivalent continuous noise level which contains the same acoustic energy as the actual time-varying sound. In other words it is a kind of average noise level. It is denoted dB L_{eq} or, for A-weighted figures dB(A) L_{eq} or dB L_{Aeq} . It can also be expressed in terms of frequency analysis (see later). $L_{eq(s)}$ is the sample L_{eq} level.

L_n

This is the level exceeded for n% of the time. It is denoted dB L_n or, for A-weighted figures dB(A) L_n or dB L_{An} . It can be expressed in terms of frequency analysis (see later). L_{90} is the level exceeded for 90% of the time and is a measure of the lowest level typically reached. L_{10} is the level exceeded for 10% of the time and is the highest level typically reached. L_{50} is the level exceeded for 50% of the time and, mathematically, it is the median.

L_{max}

This is the maximum level reached during a measurement period. The "time constant", or the ability of the equipment to respond to impulses is usually expressed along with it, e.g. "Fast", "Slow", etc. It is denoted dB L_{max} or, for A-weighted figures dB(A) L_{max} , dB L_{Amax} , etc. It can also be expressed in terms of frequency analysis.

Frequency Analysis

Whereas dB(A) gives a very useful overall figure, it has its limitations in that it cannot be used to model or predict the effect of noise control and mitigation as this nearly always has radically different performance at different frequencies.

Frequency analysis expresses an overall noise level at each frequency or band of frequencies in the audible range. Octave band analysis divides the audible range into 10 bands from 31.5 Hz to 16 kHz and the noise level in each band can be expressed in any form e.g. L_{eq} , L_{90} , L_{max} etc. One third octave band analysis uses 30 bands.

Narrow band analysis takes the process to resolutions of less than 1 Hz. This is useful for identifying the existence of tones (whines, hums, etc.) and in pin-pointing the sources.