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ACOUSTICS PLUS

# Proposed Installation of Mechanical Plant

## 23 Gayton Crescent London, NW3 1UA

## Environmental Noise Assessment

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| Environmental Noise Assessment<br>Proposed Installation of Mechanical Plant | |
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| **Reviewer:** | [redacted] | **Andy Dodd** | **Consultant** | **06/04/2016** |

# 1. INTRODUCTION

1.1 Acoustics Plus Ltd (APL) is an independent firm of multi-disciplinary acoustic engineers. APL is engaged by both private and public sector clients. APL is a registered member of The Association of Noise Consultants (ANC) and the author is a corporate member of The Institute of Acoustics (IOA).

1.2 APL has been instructed by the Applicant's architect, MG Architects, to consider and advise upon the noise implications of a proposed installation of a climate control system.

1.3 The climate control system will consist of 1No. external condenser unit that will be located in the courtyard garden.

1.4 It is understood the Local Planning Authority (LPA) require further information on noise levels from the proposed installation in order to fully assess the noise impact upon the surrounding neighbourhood. This report provides the response to the LPA, on behalf of the Applicant.

# 2. BASELINE SITUATION

2.1 The Application Site (the "site") is situated at 23 Gayton Crescent. The site and its surroundings can be seen in Figures 1 to 15. A site location plan is shown below.

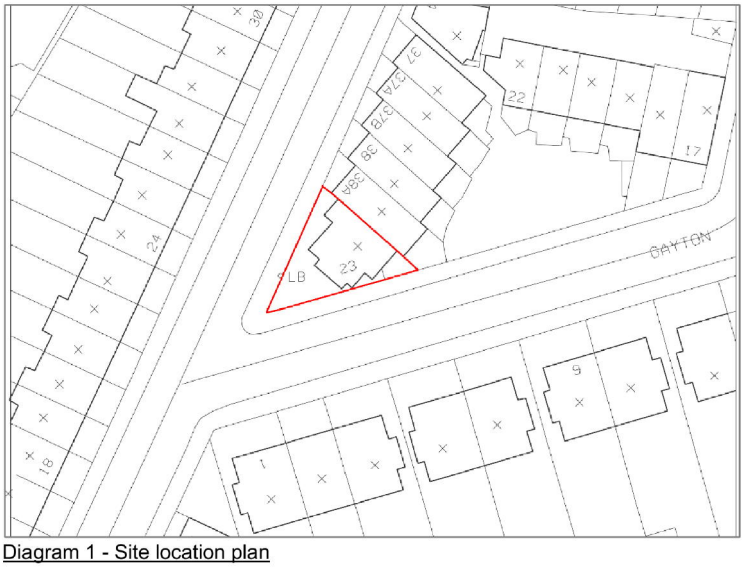



Diagram 1 - Site location plan

2.2 It is understood that the proposal is to install a mechanical climate cooling system which will require the installation of an external condenser unit. Primary heating to the property is provided by other means.

2.3 The external condenser unit associated with the climate cooling system will be located at ground floor level in the front courtyard garden. The proposed location of the condenser can be seen in Diagrams 2 and 3 below.

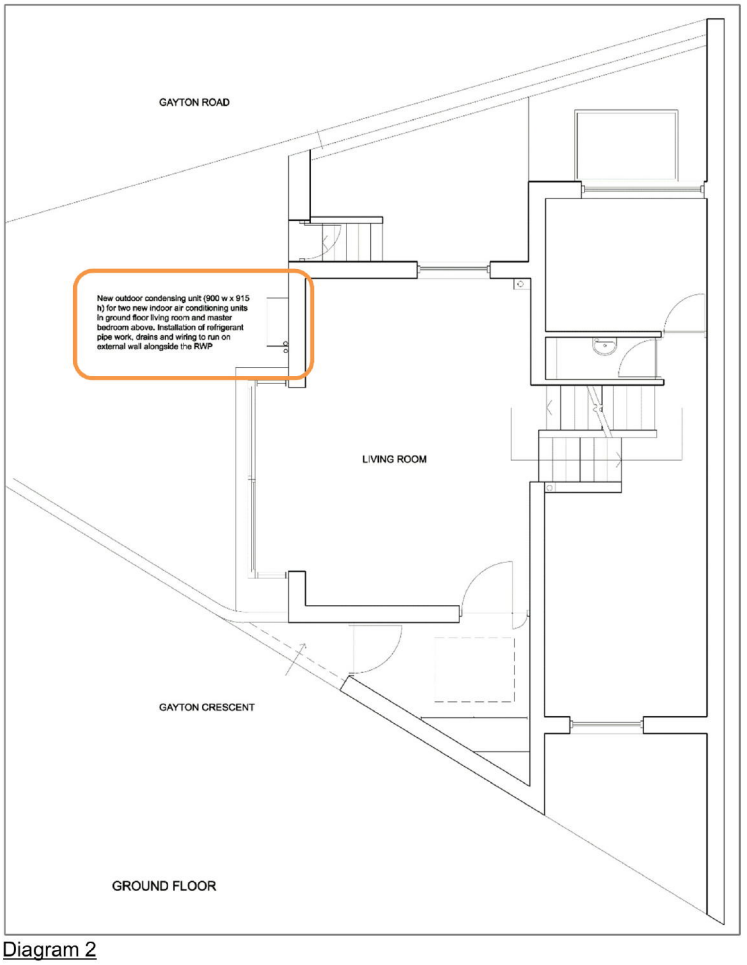



Diagram 2

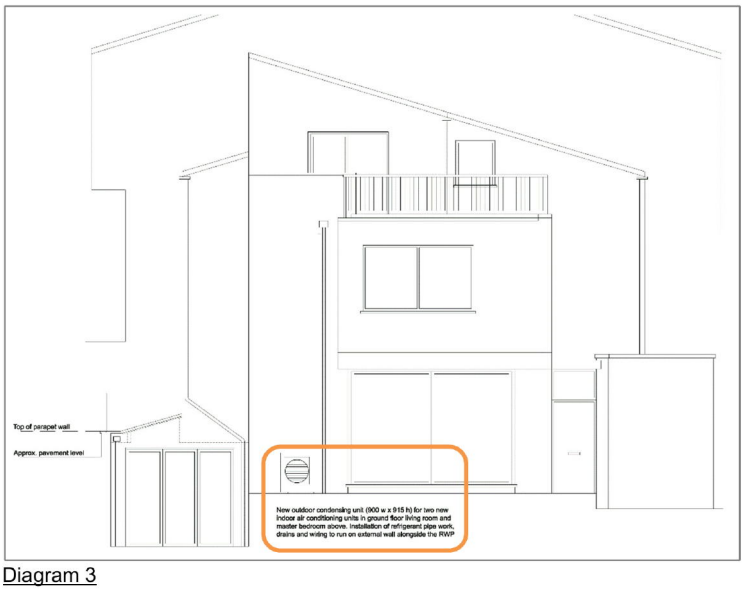



Diagram 3

2.4 The nearest noise sensitive façade to the enclosure belongs to the ground and first floor windows of the adjacent property located at 38A Gayton Road. The distance from the nearest noise sensitive façade to the location of the proposed condenser unit was determined from scaled drawings and determined to be approximately 16m.

2.5 The proposed condenser unit is a Mitsubishi MXZ-4D83VA. The noise data for this unit was obtained from published data from manufacturer Mitsubishi (a copy of the data sheet is provided in Appendix A).

## 3. EQUIPMENT

3.1 All background noise measurements were obtained using the following equipment:

- Svantek Class 1 Sound Level Meter Type 971
  Serial No. 51704
- Rion Calibrator Type NC-74 Class 1
  Serial No. 00410215

3.2 The relevant equipment carries full and current traceable calibration. The equipment, where necessary, was calibrated prior to and after the measurements were carried out.

## 4. NOISE OUTLINE

4.1 In order to produce an environmental noise assessment, consideration must be given to the prevailing background noise in the locality of the installation.

4.2 Measurements of background noise were obtained over a 24 hour period at a location deemed representative of background noise levels experienced at the nearest noise sensitive façade. The measurements obtained during the exercise were undertaken in the courtyard garden of 23 Gayton Crescent. The main source of ambient noise was traffic noise along Gayton Road and Gayton Crescent. The ambient noise climate throughout the day and night period was considered to be particularly low for an urban area.

4.3 The particulars of the measurement exercise are recorded below. The weather conditions were considered appropriate to monitor environmental noise

Date: 30th – 31st March 2016
Start Time: 11:30 hrs
Location: front courtyard garden, 23 Gayton Crescent, London, NW3

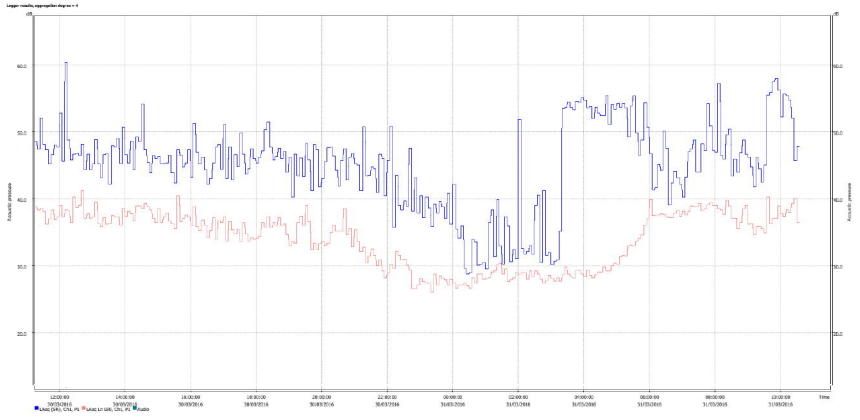
Weather conditions

| Date | Wind speed/direction | Precipitation | Temp |
|---|---|---|---|
| 30/03/16 | 16 km/h W | 0mm | 10 ºC |
| 31/03/16 | 14 km/h W | 0mm | 10 ºC |

4.4 Minimum background and average noise levels are shown in Table 1 below:

| WHO period | Lowest $L_{A90,15min}$ | Average $L_{Aeq,T}$ |
|---|---|---|
| 07:00-19:00hrs | 34 | 49 |
| 19:00-23:00hrs | 30 | 45 |
| 23:00-07:00hrs | 27 | 49 |

Table 1



## 5. DESIGN CRITERIA

5.1 Information regarding the noise levels not to be exceeded by the installation was extracted from the LPA (London Borough of Camden) Local Development Framework 2010-2025 Section DP28 Noise and Vibration:

**Table E: Noise levels from plant and machinery at which planning permission will not be granted**

| Noise description and location of measurement | Period | Time | Noise level |
|---|---|---|---|
| Noise at 1m external to a sensitive façade | Day, evening and night | 0000-2400 | 5dB(A)<LA90 |
| Noise that has a distinguishable discrete continuous note (whine, hiss, screech, hum) at 1m external to a sensitive façade | Day, evening and night | 0000-2400 | 10dB(A)<LA90 |
| Noise that has distinct impulses (bangs, clicks, clatters, thumps) at 1m external to a sensitive façade | Day, evening and night | 0000-2400 | 10dB(A)<LA90 |
| Noise at 1m external to a sensitive façade where LA90>60dB | Day, evening and night | 0000-2400 | 55dB(A) $L_{Aeq}$ |

5.2 It is not expected that the proposed plant will generate distinguishable discrete continuous notes. The octave band data sheet shows no such characteristic. As the proposed plant will be utilised for residential use, the anticipated operational hours are at any time. The plant noise emission criteria that should not be exceeded is therefore based on 5dB(A)<LA90 and is shown in Table 2.

| Daytime (07:00-19:00hrs) | Evening (19:00-23:00hrs) | Night (23:00-07:00hrs) |
|---|---|---|
| $L_{Aeq}$ 29dB | $L_{Aeq}$ 25dB | $L_{Aeq}$ 22dB |

Table 2

## 6. CALCULATIONS

6.1 In order to predict the noise impact of the climate control system, consideration has been given to noise egress from the condenser unit to the nearest noise sensitive façade.

6.2 In considering the propagation of noise from the condenser, consideration was given to point source propagation and building edge diffraction.

6.3 Noise leaving the condenser unit was propagated over the relevant distance to the nearest noise sensitive façade, the adjacent ground floor window of 38A Gayton Road. The output level of the condenser unit was corrected by a further +6dB to account for the reflecting planes behind and beneath the condenser unit.

6.4 A further correction to account for building edge diffraction of -10dB was assumed. This was extracted from the Department of Energy and Climate Change Planning Standard MCS020.

6.5 The planning standard MCS020 states the following (Note 5):

*"Note 5: Barriers between the heat pump and the assessment position (STEP 5) A correction should be made for attenuation due to barriers between the air source heat pump and an assessment position. A correction will be necessary if an installer is unable to see an assessment position from the top edge of the air source heat pump. Use the following instructions to determine whether a correction is appropriate:*

- *For a solid barrier (e.g. a brick wall or a fence) that completely obscures an installer's vision of an assessment position from the top edge of the air source heat pump attenuation of -10 dB may be assumed.*
- *Where a solid barrier completely obscures an installer's vision of an assessment position from the top or side edges of the air source heat pump, but moving a maximum distance of 25 cm in any direction to the air source heat pump allows an assessment position to be seen, attenuation of -5 dB may be assumed.*
- *If it is possible for an installer to see any part of an assessment position from the top or side edges of the air source heat pump no attenuation may be assumed. "*

6.6 The calculation exercise provided the following results.

| Predicted noise impact | Octave Band Centre Frequency (Hz) | | | | | | | | dBA |
|---|---|---|---|---|---|---|---|---|---|
| | 63 | 125 | 250 | 500 | 1k | 2k | 4k | 8k | |
| MXZ-4D83VA (cooling) | 48 | 50 | 49 | 50 | 44 | 40 | 36 | 28 | 50 |
| Distance attenuation (over 16m) | -24 | -24 | -24 | -24 | -24 | -24 | -24 | -24 | |
| Building edge diffraction | -10 | -10 | -10 | -10 | -10 | -10 | -10 | -10 | |
| Reverberant correction | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | |
| Façade level | 20 | 22 | 21 | 22 | 16 | 12 | 8 | 0 | 22 |

Table 3

6.7 In order to comply with the requirements of the LPA, any noise from the proposed installation of mechanical plant should not exceed a level of 22 dBA (5dB below the lowest measured background noise over the operational hours of the plant) at 1m from the nearest noise sensitive façade.

6.8 The lowest measured background noise was $L_{A90,5min}$ 27dB that occurred during the period between 22:50hrs to 00:35hrs on 30th – 31st March 2016.

6.9 The calculated noise impact is 22dBA. The calculation exercise (Table 3) demonstrates that the proposed installation meets the LPA criteria.

## 7. CONCLUSION

7.1 The foregoing assessment indicates that the proposed installation will meet the requirements imposed by the LPA. Additional mitigation measures will not be required.

7.2 If an alternative supplier or manufacturer of condenser is chosen, the acoustic performance should be checked prior to installation to ensure that the installation will still meet the requirements imposed by the LPA.

7.3 It is recommended that the condenser unit is mounted on anti-vibration mounts to ensure that structure borne noise and vibration into the fabric of the building is minimised.

# Figures

**23 Gayton Crescent, London, NW3 1UA**


Figure 1


Figure 2

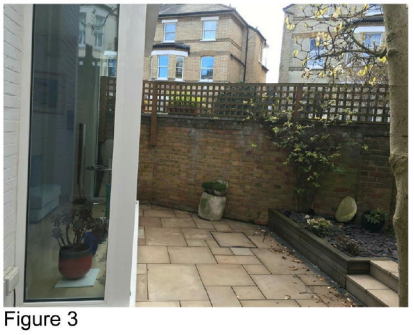


Figure 3

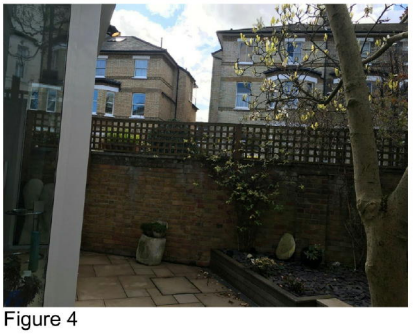


Figure 4


Figure 5


Figure 6


Figure 7


Figure 8

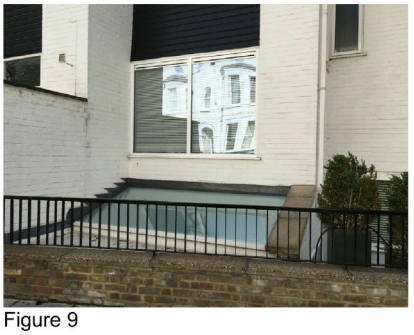


Figure 9


Figure 10

Figure 11

Figure 12

Figure 13

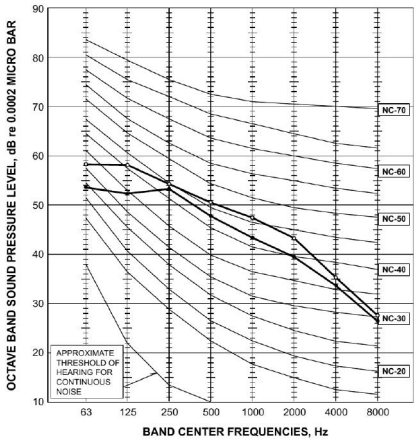
Figure 14

Figure 15

# Appendix A

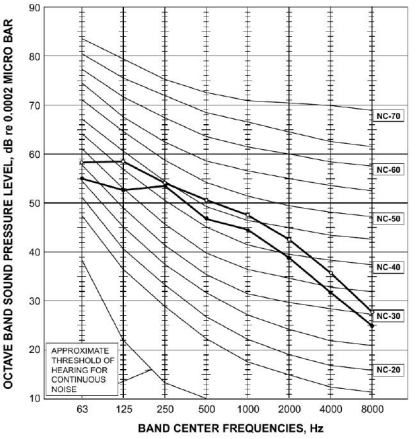
## MXZ-3D54VA

| FAN SPEED | FUNCTION | SPL(dB(A)) | LINE |
|---|---|---|---|
| High | Cooling | 50 | ●—● |
| High | Heating | 53 | ○—○ |



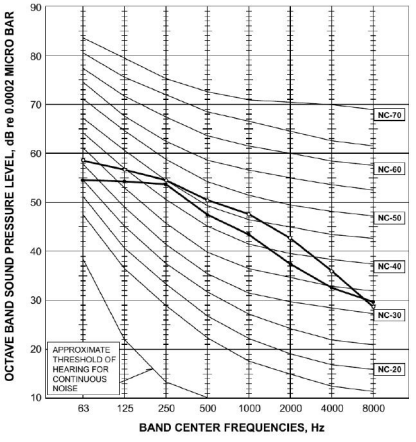

## MXZ-3D68VA

| FAN SPEED | FUNCTION | SPL(dB(A)) | LINE |
|---|---|---|---|
| High | Cooling | 50 | ●—● |
| High | Heating | 53 | ○—○ |




## MXZ-4D72VA

| FAN SPEED | FUNCTION | SPL(dB(A)) | LINE |
|---|---|---|---|
| High | Cooling | 50 | ●—● |
| High | Heating | 53 | ○—○ |




## MXZ-4D83VA

| FAN SPEED | FUNCTION | SPL(dB(A)) | LINE |
|---|---|---|---|
| High | Cooling | 48 | ●—● |
| High | Heating | 51 | ○—○ |